



**Town of Clayton  
Regular Town Council Meeting Agenda  
Monday, March 1, 2021 @ 6:00 PM  
Council Chambers**

THE TOWN OF CLAYTON WILL FOLLOW GUIDELINES FROM THE CENTERS FOR DISEASE CONTROL AND THE NORTH CAROLINA DEPARTMENT OF HEALTH AND HUMAN SERVICES WITH REGARD TO SOCIAL DISTANCING.

BELOW PLEASE FIND CHANGES TO THE COUNCIL MEETING FORMAT:

THE CURRENT TOWN COUNCIL MEETING WILL BE HELD IN PERSON.

ANY MEMBER OF THE PUBLIC THAT WISHES TO ADDRESS THE COUNCIL, MAY DO SO IN PERSON, HOWEVER YOU ARE ASKED TO CONTACT THE TOWN CLERK IN ADVANCE OF THE MEETING.

IF YOU DO NOT WISH TO ATTEND THE MEETING IN PERSON BUT DO WISH TO SHARE ANY PUBLIC COMMENT WITH THE COUNCIL, PLEASE FORWARD YOUR COMMENT(S) TO THE TOWN CLERK NO LATER THAN NOON THE DAY OF THE MEETING. PLEASE INCLUDE YOUR NAME AND ADDRESS. PUBLIC COMMENT(S) RECEIVED WILL BE READ INTO THE RECORD BY THE TOWN CLERK.  
EMAIL: [KMOFFETT@TOWNOFCLAYTONNC.ORG](mailto:KMOFFETT@TOWNOFCLAYTONNC.ORG)

THE PUBLIC MAY VIEW THE LIVE COUNCIL MEETING ON THE TOWN'S YOU TUBE CHANNEL:  
[HTTP://YOUTUBE.COM/C/TOWNOFCLAYTONNC1869](http://youtube.com/c/TownofClaytonNC1869)

BELOW PLEASE FIND ADDITIONAL INFORMATION REGARDING PROCEDURES FOR IN-PERSON MEETINGS:

- ALL persons attending must wear a mask.
- We will be following proper social distancing at all times.
- We will have a separate entrance door and separate exit door.
- Entrance AND Exit will be main door on Second Street.
- Any member of the public attending will be asked to wait in the lobby until item they wish to address is ready for discussion and asked to leave the Chambers once item is complete.
- Lobby will be set to encourage social distancing.
- Chairs will be at least 6' from each other.
- We will have TWO staff members attending the meeting(s) to ensure smooth transition with those attending the meeting.
- One person will serve as LOBBY staff and the other will serve as CHAMBER staff.
- The meeting will be shown on the monitor in the lobby. (YouTube)
- All council or board members will be socially distanced in the council chambers and wearing face masks.\*
- Staff will be socially distanced and seated within the council chambers. Face masks will be worn.\*
- Hand sanitizer will be available, both in the lobby and council chambers.
- Podium/microphone will be sanitized after each speaker.

*\*Masks may be lowered when speaking.*



## 1. CALL TO ORDER

Pledge of Allegiance and Invocation

## 2. ADJUSTMENT OF THE AGENDA

## 3. CONSENT AGENDA

*(Items on the consent agenda are considered routine in nature or have been thoroughly discussed at previous meetings. Any member of the Council may request to have an item removed from the consent agenda for further discussion.)*

### a. Warranty Acceptances

- Cameron Crossings Subdivision - Phase II and III
- Highgate Subdivision - Phase III

[Cameron Crossings Phase II and III Utility Warranty Highgate - Phase III](#)

### b. DRAFT Minutes

- February 1, 2021 - Regular Meeting
- February 10, 2021 - Regular Special Meeting
- February 10, 2021 - Closed Session
- February 15, 2021 - Regular Meeting

[February 1 2021 DRAFT Minutes](#)

[February 10, 2021 DRAFT Minutes](#)

[February 15, 2021 DRAFT Minutes](#)

### c. Proclamations

- Traumatic Brain Injury Awareness Month - March 2021
- Developmental Disability Awareness Month - March 2021

[Proclamation- TBI Awareness Month](#)

[Proclamation- Developmental Disability Awareness Month](#)

### d. Resolution Directing Clerk to Certify Sufficiency

- 2020-160-ANX - Riverwood Golf - Section II - Annexation

[Resolution Directing Clerk to Investigate](#)

**POTENTIAL ACTION:**

Adoption of Consent Agenda as Presented

## 4. ADMINISTRATIVE ITEMS

## 5. INTRODUCTIONS AND SPECIAL PRESENTATIONS

### a. Introduction of Employees

*Presenter:* Joy Garretson, Library Director & Ann Game, Customer Service Director

- Grace Davis, Youth Services Supervisor
- Ewa Capabianco, Customer Service Representative

[Cover](#)

## 6. PUBLIC HEARINGS

### a. 2020-113-PDD - Ashcroft 2

*(Continued from February 15, 2021 Council Meeting)*

*Presenter:* Planning Department

[Cover](#)  
[Updated Application](#)  
[Owner's Consent Forms](#)  
[Boundary Survey](#)  
[Rezoning Exhibit](#)  
[Staff Report Map](#)  
[Staff Report](#)  
[Neighborhood Meeting Materials](#)  
[Consistency Statement](#)  
[Planning Board Recommendations](#)  
[Newspaper Ad](#)  
[Adj Property Letter](#)  
[Ordinance](#)

**POTENTIAL ACTION:** Adoption of Ordinance #2021-03-01

- b. 2020-114-SD - Ashcroft 2 **(Quasi-Judicial)**  
*(Continued from February 15, 2021 Council Meeting)*  
**Presenter:** Planning Department

[Cover](#)  
[Application](#)  
[Staff Report Map](#)  
[Staff Report](#)  
[Neighborhood Meeting Materials](#)  
[TIA](#)  
[NCDOT TIA Review](#)  
[Stormwater Impact Statement](#)  
[Scoring Sheet and Wastewater Allocation](#)  
[Newspaper Ad](#)  
[Adj Property Letter](#)  
[Final Plans - 1-21-21](#)  
[Commercial Regulating Plan](#)  
[Revised Phasing](#)  
[Motion Sheet](#)  
[Approval](#)

**POTENTIAL ACTION:** Approval or Denial of 2020-114-SD - Ashcroft 2

- c. Development Agreement - Ashcroft 2  
*(Continued from February 15, 2021 Council Meeting)*  
**Presenter:** Planning Department

[Map](#)  
[Newspaper Ad](#)  
[Adj Property Letter](#)  
[Development Agreement - Final Pre-Town Council Approval](#)  
[Ordinance](#)  
[Resolution Wastewater Allocation](#)

**POTENTIAL ACTION:** Adoption of Ordinance #2021-03-02 (Development Agreement)

**POTENTIAL ACTION:**  
Allocation)

Adoption of Resolution #2021-12 (Wastewater

- d. 2020-142-ANX - Buckhorn Branch  
*Presenter:* Planning Department  
[Cover](#)  
[Application](#)  
[Aerial Map](#)  
[Town Limits Map](#)  
[Legal Description](#)  
[Survey](#)  
[Resolution Directing Clerk to Certify](#)  
[Newspaper Ad](#)  
[Certificate of Sufficiency](#)  
[Resolution Setting Public Hearing](#)  
[Ordinance](#)

**POTENTIAL ACTION:**

Adoption of Ordinance #2021-03-03

**7. OLD BUSINESS**

- a. Land Acquisition - LCWRF Transmission Pipeline Easement Acquisition  
*Presenter:* JD Solomon, Town Manager  
**POTENTIAL ACTION:** Approval to Proceed with Process
- b. Old Town Hall Update  
*Presenter:* JD Solomon, Town Manager  
**POTENTIAL ACTION:** None - Informational Only
- c. LAPP Grant Update  
*Presenter:* Joshua Baird, Town Engineer  
[Cover](#)  
[LAPP - FY '22-Package](#)  
**POTENTIAL ACTION:** None - Informational Only

**8. NEW BUSINESS**

- a. SAFER Grant  
*Presenter:* Liz Jernigan, Sr. Administrative Support Specialist  
[Cover](#)  
**POTENTIAL ACTION:** Approval to Proceed with Grant Application
- b. Wellness and Safety Kickoff  
*Presenter:* Jeffra Patton, Safety Officer  
**POTENTIAL ACTION:** None - Informational Only

**9. STAFF REPORTS**

- a. Town Manager  
b. Town Attorney

- c. Town Clerk
- d. Other Staff

## **10. OTHER BUSINESS**

- a. Informal Discussion & Public Comment
- b. Council Comments

## **11. ADJOURNMENT**

Quasi-Judicial (evidentiary) – These hearings are different from other public hearings in that they resemble a court hearing where testimony is presented and the Town Council acts like a court of law. During evidentiary hearings, the Town Council receives only sworn testimony and other credible evidence. In addition, the Town Council must make findings of fact based upon the evidence presented. Citizens may give testimony in an evidentiary hearing after they have taken an oath.



**TOWN OF CLAYTON**  
Engineering & Inspections  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

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MEMORANDUM

To: Kimberly Moffett, Town Clerk

From: Andy Simerman, Construction Project Administrator

Copy: Alex Hinkle – Forestar  
Brad Hart – Withers and Ravenel  
Lori Bryant, Development Services Coordinator

Date: February 12, 2021

Subject: Cameron Crossings Subdivision - Phase II and III

Please place a pre warranty acceptance request for the referenced public sanitary sewer and water utilities on the next available agenda. Record drawings have been reviewed and accepted. Following acceptance, the sanitary sewer and water will be subject to a one-year warranty period. Following the warranty period, a final inspection will be done and all deficient items corrected prior to final acceptance.





**TOWN OF CLAYTON**  
Engineering & Inspections  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

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## MEMORANDUM

**To:** Kimberly Moffett, Town Clerk

**From:** Andy Simerman, Construction Project Administrator

**Copy:** Jonathan Barnes, Dalton Engineering and Associates  
Lori Bryant, Development Services Coordinator  
Karen Durham, Engineering  
Ryan Suman, Wakefield Development

**Date:** February 12, 2021

**Subject:** Highgate Subdivision – Phase III

Please place a warranty acceptance request for the referenced public sewer, water, storm sewer utilities, all pertinent easements, sidewalks, curb and gutter, asphalt pavement on the next available agenda. Record drawings have been reviewed and accepted. Following acceptance, the above mentioned infrastructure will be subject to a one-year warranty period. Following the warranty period, a final inspection will be done and all deficient items corrected prior to final acceptance.



**Town of Clayton**  
**Regular Town Council Meeting Minutes**  
**Monday, February 1, 2021 @ 6:00 PM**  
**Council Chambers**

**COUNCIL PRESENT:**

Mayor McLeod  
Mayor Pro Tem Thompson  
Council Member Holder  
Council Member Grannis  
Council Member Bunn  
Council Member Everett

**STAFF PRESENT:**

JD Solomon, Town Manager  
Rich Cappola, D/Town Manager  
Jim Cauley, Town Attorney  
Francis Rasberry, Town Attorney  
Kimberly Moffett, Town Clerk  
Heidi Holland, Deputy Town Clerk  
Samantha Wullenwaber, Planning Director  
Matt Sutphin, Deputy Chief Fire Operations

**COUNCIL ABSENT:**

**1 CALL TO ORDER**

Pledge of Allegiance and Invocation

- a) Mayor McLeod called the meeting to order at 6:00 p.m. He led everyone in the Pledge of Allegiance as well as offering the Invocation.

**2 ADJUSTMENT OF THE AGENDA**

- a) Addition of Item under Consent

It was requested that a Resolution for Hazard Mitigation Plan be placed on the Consent Agenda.

**3 CONSENT AGENDA**

*(Items on the consent agenda are considered routine in nature or have been thoroughly discussed at previous meetings. Any member of the Council may request to have an item removed from the consent agenda for further discussion.)*

- a) DRAFT Minutes
- December 21, 2020 - Closed Session
  - January 4, 2021 - Regular Session
- b) Warranty Acceptance
- Academy Point, Phase 4
- c) Student Art Month Proclamation
- d) Recognition of 150th Anniversary of First Missionary Baptist Church
- e) 2020-142- ANX - Resolution Directing Clerk to Certify Sufficiency
- f) Resolution Adopting Hazard Mitigation Plan

**ACTION:** Adoption of Consent Agenda as Presented

Motion: Mayor Pro Tem Thompson

Second: Council Member Everett

Vote: Unanimous

#### **4 ADMINISTRATIVE ITEMS**

#### **5 INTRODUCTIONS AND SPECIAL PRESENTATIONS**

- a) Development Agreements Informational Update  
*Presenters:* Chad Essick, Poyner Spruill & Russell Kileen, Parker Poe

Mr. Solomon stated there were two large development agreements that would come before council in the next couple months. In preparation for these, an informational update regarding Development Agreements was presented by both Poyner Spruill and Parker Poe Law Firms. Mr. Kileen discussed; when to avoid a Developers Agreement, goals for both the Town and the Developer and proper procedures. Mr. Kileen stated best practice is always to take the time needed to get the agreement right.

Mr. Essick presented and shared information regarding the nuts and bolts of the statutory requirements with regard to a Developer Agreement which include: legal description, term (usually length of full project), uses, public facilities, reservation/dedication of land, conditions, terms, restrictions, historic structures (if they need to be relocated etc. all details would be outlined in the agreement), breach and cure and finally, development schedule.

Optional provisions include: commencement/competition deadlines, performance standards with annual reviews, impact mitigation features, financing conditions and cost-sharing agreements.

Discussed were Exhibits & Attachments to include:

- Referenced code/ordinances
- Site map(s)
- Deeds/legal descriptions
- Street networks
- Typical road sections
- Bike and pedestrian facility plans
- Traffic Impact Analysis (TIA)
- Environmental assessments
- Development application/permit forms
- Master plans
- Design guidelines
- Ancillary agreements

Prohibited Provisions:

- Taxes/impact fees (unless otherwise authorized)
- Added regulatory authority
- Developer commitments (unless otherwise authorized)
- Building/housing code exemptions (unless otherwise authorized)
- Zoning uses not currently allowed in ordinance.

Council Member Grannis asked Mr. Kileen if he could elaborate about innovative approaches and town ordinances. Mr. Kileen stated this has the effect of an ordinance, if the ordinance has a specific standard, you may have the ability to impose something different from ordinance as part of it. This gives the flexibility if the ordinance doesn't specifically meet the requirements. Council Member Grannis also asked about density bonus/flexibility. Mr. Killen provided an example on this subject.

Mr. Solomon shared information with reference to shared right of ways and roadways, access, etc., He discussed phasing and infrastructure might be included in upcoming development agreements.

Mayor McLeod offered his thanks for the updated information and stated there are so many changes that this was a great refresher.

## 6 PUBLIC HEARINGS

- a) 2020-113-PDD - Ashcroft 2  
*Presenter:* Planning Department

Ms. Wullenwaber was present and asked that this item be continued to the February 15, 2021 council meeting.

Mr. Solomon stated there were several reasons to include both the hearing presentation and the development agreement. He stated the planner previously working on this project had resigned and would be going to work for the developer. He stated he did not believe there were any conflicts but wanted to ensure there was time to absorb this project and allow for time if council had any follow up questions for the attorneys.

**ACTION:** Continued to February 15, 2021 Council Meeting

Motion: Mayor Pro Tem Thompson  
 Second: Council Member Everett  
 Vote: Unanimous

- b) 2020-114-SD - Ashcroft 2  
*Presenter:* Planning Department

**ACTION:** Continued to February 15, 2021 Council Meeting

Motion: Mayor Pro Tem Thompson  
Second: Council Member Everett  
Vote: Unanimous

- c) Development Agreement - Ashcroft 2  
*Presenter:* Planning Department

**ACTION:** Continued to February 15, 2021 Council Meeting

Motion: Mayor Pro Tem Thompson  
Second: Council Member Everett  
Vote: Unanimous

- d) 2021-07-OA - Chapter 160D  
*Presenter:* Planning Department

Mr. Solomon stated that some additional time would be needed for this item.

He stated he would like to include discussion regarding the re-establishment of the Board of Adjustment. He also stated he wanted council to have a clear understanding of items that are required and those that are optional in 160D. Finally, there would also be discussion regarding waiver versus variance.

After tonight Mr. Solomon would like I to make a list of changes and modifications that would be brought to council at a future meeting. He stated he would be asking for a special meeting to discuss these changes as there is quite a bit of discussion that needed to take place.

It was discussed with staff whether his would need to go back to Planning Board, Mr. Solomon did not believe it would need to go back to the Planning Board.

A consultant was present and provided a summary of the presentation regarding 160D. He stated this is mandatory in the State with a deadline for compliance July 1, 2021. This is a consolidation of both county and municipality regulations.

He stated these changes create three buckets, administrative process (staff), legislative (policy driven) and quasi-judicial (based on evidence). He shared slides on additional changes on this item.

Council Member Bunn stated he was concerned about the Planning Board and the need to re-establish Board of Adjustment. He felt strongly we needed to allow for a different board to hear appeal process.

Council Member Grannis offered thanks to Ms. Wullenwaber for all the work that had gone into this project. He stated he understood there was a good

portion that was mandated. One of his concerns was related to ordinance changes and what they meant. He stated he did meet with Ms. Wullenwaber today and following that meeting had a better understanding. He was concerned about some of the verbiage and was looking forward to receiving a line item change and felt that was necessary. He also stated he didn't feel any need to rush this and added we needed to re-evaluate the establishment of the Board of Adjustment as a standalone board.

**ACTION:** Re-Establish the Board of Adjustment & Guidelines

Motion: Council Member Holder  
Second: Council Member Bunn  
Vote: Unanimous

Council Member Bunn stated he would also like to see amendments included it that were not mandated by 160D. Council Member Grannis agreed this would be beneficial for everyone.

**ACTION:** Continued to February 15, 2021 Council Meeting w/possibility of holding a Special Meeting.

Motion: Council Member Bunn  
Second: Council Member Grannis  
Vote: Unanimous

- e) Update to Comprehensive List of Fees & Charges - Planning Dept.  
*Presenter:* Samantha Wullenwaber, Planning Director

**ACTION:** Continued to February 15, 2021  
Motion: Council Member Holder  
Second: Council Member Grannis  
Vote: Unanimous

## **7 OLD BUSINESS**

- a) Creation of Position of Assistant Town Engineer  
*Presenter:* Rich Cappola, Deputy Town Manager

Mr. Cappola was present and stated this item was previously discussed during budget conversations. Based on upcoming projects, he would like to fill this position at this time.

**ACTION:** Approval of Position Creation

Motion: Council Member Grannis  
Second: Council Member Holder  
Vote: Unanimous

b) **Wastewater Allocation Update**  
*Presenter:* Rich Cappola, Deputy Town Manager

Mr. Cappola provided an update regarding Wastewater Allocation. He stated we are down about 100,000 gallons from the last report in July 2020. Currently we have approximately 600,000 gallons per day of allocation available.

He discussed upcoming large developments and stated we have been looking at their demands and phasing process and making sure we are only allocating what they need based on phasing rather than all upfront.

Council Member Bunn asked if rain affects numbers. Mr. Cappola stated it could increase it by 10-20% based on amount of rainfall. One or two months of heavy rainfall would not skew overall numbers.

Council Member Grannis asked if any approved developments have gone beyond any statute of limitations as far as wastewater commitments. Mr. Cappola stated none lately have gone beyond their vested rights at this time.

c) **Wastewater Reclamation Facility Program Update**  
*Presenter:* JD Solomon, Town Manager

Mr. Solomon provided an update and presented a PowerPoint. He discussed facts about Clayton's geographic location and went into detail on the RTZ (Research & Training Zone). The town is responsible for providing water, wastewater, planning, building inspections, and other support services. The RTZ provides challenges to water and sewer infrastructure. The legislation (enabled in 2003), protects the RTZ from annexation by the town. Companies in the RTZ are great partners with the town and two companies, Grifols and Novo Nordisk, both have invested over \$2B in each of their campuses. Grifols and Novo make up about 30% of our wastewater flows and in the next 10 years it's estimated they could take up to 50%.

He discussed information he shared with the LGC regarding COVID tragedies at the Fire Department and issues at the Police Department. He also shared facts about the town; sales tax revenues are up 15%-20% over the last year, potable water use is up 5% to 15% over the last year, wastewater capacity allocations are dwindling, bulky waste is up 15% to 20% over the last year, building permits and inspections are up over the last year, industrial base continues to grow, Project Goodwill and Project Life Dust, NC 42 and Ranch Road widening, 3 major mixed-use developments are on schedule, and in-fill development is booming.

He also discussed updated water and wastewater projections, aggressive utility collections which started in September 2020, General Fund CIP forecasts have been updated, and the detailed mid-review of the current budget. Finally he discussed the plan to minimize cost to rate payers.

Council offered their thanks for the presentation and update.

## **8 NEW BUSINESS**

- a) Special Rescue Operations Partnership with Archer Lodge Fire Department and Cleveland Fire Department

*Presenter:* Deputy Chief Matthew Sutphin, Fire Department

Deputy Chief Sutphin provided information regarding a potential partnership for a Special Rescue Operation with both Archer Lodge and Cleveland Fire Departments. This large team could provide better services to everyone. Right now a ground phase committee has been set up and includes members from each department. He stated he would like to get council approval to move forward. This could open up possibilities for future training the department may not normally have access to and may also create possibilities for funding. A future goal would be to be a part of the State Rescue Operations. He stated as they move forward they would bring back additional information.

Mayor Pro Tem Thompson stated he believed regionalization is very important and serves everyone in the best possible way. He further stated it is also being a good steward of tax payer money with ability to combine resources and equipment.

Council Member Grannis stated he believed this was a great idea and a great benefit to everyone.

## **9 STAFF REPORTS**

- a) Town Manager

Mr. Solomon discussed the issue regarding a man hole on Main Street. He gave recognition to the following staff from Public Works for their work on this project; Steven Norris, Christian Holder, Brandon Carroll, Donnie Baker, and James Blalock, Perez Sanchez, Chris Snead, Rusty Clawson with his crew, Robbie Russell, Mark Brannen, Russell Yolland, Ray Rhode, Joey Faison and Kenny Hales. Personnel from the Police Department included; Tim Marquis and Tim Mims. He stated James Blalock made the statement, "different uniform but, one team".

Council Member asked what the plan was to correct this man hole. Mr. Solomon spoke about the issue and stated it is a 100 year old system and runs 600' down the hill. He stated most modern manholes are 400' apart. He stated we will have to install a new man hole. This is still being studied for best fix/repair. Several options will be brought back to council at a future meeting.



He thanked Matt Sutphin and Lee Barbee for their work on hiring the new Emergency Response Coordinator. He stated Acting Police Chief Greg Tart is making good progress at the Police Department.

He discussed the Sculpture Trail selections and stated there are really great sculptures that were selected for this year.

Council Member Holder questioned the steel plate on Front Street and asked how long will that would be there. Mr. Solomon stated he would report back. Mr. Cappola stated more of an in-depth repair is required for that issue.

b) Town Attorney

Mr. Cauley stated referring back to 160D, which is one of several very large projects underway. He stated Mr. Rasberry would be working with staff more on this project.

He discussed other projects they have been working on such as development projects, property acquisitions, Police Department investigation, wastewater reclamation project, real estate, easements, financing and contracts, He stated Clayton is on a fast moving train. He stated he really appreciated the warm welcome and getting to know staff. Mr. Solomon stated currently 5 out of 7 of the firm's staff are on board with the town's projects.

c) Town Clerk

d) Other Staff

**10 OTHER BUSINESS**

a) Informal Discussion & Public Comment

b) Council Comments

Council Member Bunn spoke about nuisance issues in ETJ.

Council Member Everett provided details about sculpture selection. The Public Art Advisory Board will present the 2021 Sculpture Trail selections at the February 15, 2021 council meeting.

**11 ADJOURNMENT**

a) Adjourn the Meeting

With there being nothing further, the meeting was adjourned at 7:25 p.m.

**ACTION:** Motion to Adjourn

**Motion:** Council Member Bunn

**Second:** Council Member Everett

**Vote:** Unanimous

Duly adopted this the 1<sup>st</sup> day of March, 2021 while in regular session.

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Jody L. McLeod  
Mayor

ATTEST:

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Kimberly A. Moffett, CMC, NCCMC  
Town Clerk

February 1, 2021  
Minutes



**Town of Clayton**  
**Regular Town Council Meeting Minutes**  
**Wednesday, February 10, 2021 @ 6:00 PM**  
**Council Chambers**

**COUNCIL PRESENT:**

Mayor McLeod  
Mayor Pro Tem Thompson  
Council Member Holder  
Council Member Grannis  
Council Member Bunn  
Council Member Everett

**STAFF PRESENT:**

JD Solomon, Town Manager  
Rich Cappola, D/Town Manager  
Kimberly Moffett, Town Clerk  
Joshua Baird, Town Engineer  
Samantha Wullenwaber, Planning Director  
Cathy Marraccini, Public Information Officer  
Jim Cauley, Town Attorney  
Francis Rasberry, Town Attorney  
Heidi Holland, Deputy Town Clerk

**COUNCIL ABSENT:**

**1 CALL TO ORDER**

Pledge of Allegiance and Invocation

- a) Mayor McLeod called the meeting to order at 6:03 p.m. He led everyone in the Pledge of Allegiance as well as offering the Invocation.

**2 ADJUSTMENT OF THE AGENDA**

**3 OLD BUSINESS**

- a) Chapter 160D  
*Presenters:* JD Solomon, Town Manager & Chad Sary and Jay McLeod, Stewart Engineering

This item is slated for a Public Hearing at the February 15, 2021 Clayton Town Council meeting.

Mr. Solomon provided an overview of the need for 160D. He explained several options available and stated we chose to do a hybrid version rather than just 160D or rewriting the entire ordinance. He shared the percentage breakdown regarding the types of items that were suggested for amendment. He stated the Planning Board reviewed the draft and there were no questions. When this item went to council there were several questions and additional time was required for staff and council to review. He stated we do have until July to get this adopted. He stated it was hoped that after the workshop this evening that staff would have an updated version to council by Friday and then be able to have this item on the agenda for February 15, 2021. Mr. Solomon stated it is possible that we will need to revisit some sections again in 6 months.

Mr. Solomon went over each of the following Articles 1, 2, 3, 4, 5, 6, & 7 and addressed the proposed changes.

Attorney Rasberry stated both he and Attorney Cauley went over all the

documents and shared their opinions regarding items that were of concern. He stated the 160D revisions were generally driven by residents and developers to make decisions clearer and more predictable as well as allowing for a more defined process. He shared details regarding requirement for quasi-judicial proceeding for decisions where standards are required to be met. It is the opinion the town attorney that the municipality should not have waivers. He stated that with reference to access points this is the one place that a waiver could be used, though it would be preferred to use a modification or deviation. There was discussion regarding quasi-judicial proceedings and it is possible that the town may need to have experts to represent the town should we not have an expert on staff. This would mean additional cost to the town.

Council Member Grannis confirmed his understanding regarding waivers. He asked if there was a state statute banning waivers. Mr. Solomon stated no there was not but rather case law. Council Member Grannis confirmed that when waivers were approved for access points last year that was probably not the most appropriate decision. Stated changes to now include Board of Adjustment rather than Planning Board serving as the Board of Adjustment. Discussed change to Article 3 Section B2 and decisions of Planning Director and appeals. There was brief discussion regarding outdoor dining and outdoor dining in public right of way. Attorney Rasberry stated the town has inherent power over town property and public right of way. Mr. Solomon stated he felt decision needed to remain with the town.

Discussion took place regarding 155.400 (E) Access to Residential Subdivisions and use of the word waiver. Council Member Grannis stated he felt it could not be a waiver but perhaps Conditional Use, however deferred to counsel on appropriate usage. He questioned whether Conditional Use would come before council. Mr. Solomon stated there was previous lengthy discussion and Attorney Rasberry stated there were several ways to accomplish this; including Conditional Use Permit. Attorney Cauley reminded that quasi-judicial proceedings are very different from legislative hearings. He stated his personal preference is that all quasi-judicial items are sent to the Board of Adjustment. Mayor stated he felt the council was very educated on quasi-judicial proceedings, however, he also understood that future councils may not be as well educated on the process or as comfortable at "taking off their legislative hat and putting on their quasi-judicial hat". Next item discussed was cross access connections and removal of stubbed "to the property line". There was discussion regarding on-street parking and that it may count toward meeting off-street requirements. Some language regarding shared parking was added to allow the planning director to authorize up to 20% reduction in parking spaces. Also discussed removal of language in 155.403 regarding high quality sign type. Council Member Grannis stated he had concerns about paragraph addressing copy may change once every 6 minutes. Mayor McLeod shared his recollection regarding why decision was made regarding this issue approximately a year ago. After brief discussion it was agreed by all to leave as is. Ms. Wullenwaber stated she would like to see a percentage assigned to Planning Director discretion regarding signage.

*Council took a brief break at 7:25 p.m. and returned at 7:32 p.m.*

There was discussion regarding curb and gutter and changes to this can only be approved via Master Plan.

There was discussion regarding Article 7 and the re-establishment of the Board of Adjustment, modified membership of the Technical Review Committee, Table 7.1, minor and major medication approval, waivers, modification to approval of Special Use Permits as well as minor and substantial deviations.

Mr. Solomon thanked staff for all the dedication and hard work that went into this project.

There were no questions. Mr. Solomon stated it would be plan to get this item added to the February 15 agenda unless it was desire of council to push this off to the March 1, 2021 meeting. It was consensus of council to have this on the February 15, 2021 council agenda.

**4 CLOSED SESSION**

- a) Closed Session Pursuant to NCGS 143-318.11.(a)(6)

**ACTION:** Motion to Go Into Closed Session at 7:53 p.m.

Motion: Mayor Pro Tem Thompson

Second: Council Member Holder

Vote: Unanimous

**5 ADJOURNMENT**

- a) Adjourn the Meeting

With there being nothing further, the meeting was adjourned at 8:55 p.m.

**ACTION:** Motion to Adjourn

Motion: Council Member Bunn

Second: Council Member Everett

Vote: Unanimous

Duly adopted this the 1<sup>st</sup> day of March, 2021 while in regular session.

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Jody L. McLeod  
Mayor

ATTEST:

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Kimberly A. Moffett, CMC, NCCMC  
Town Clerk

February 10, 2021  
Minutes



**Town of Clayton**  
**Regular Town Council Meeting Minutes**  
**Monday, February 15, 2021 @ 6:00 PM**  
**Council Chambers**

**COUNCIL PRESENT:**

Mayor McLeod  
Mayor Pro Tem Thompson  
Council Member Holder  
Council Member Grannis  
Council Member Bunn  
Council Member Everett

**STAFF PRESENT:**

JD Solomon, Town Manager  
Rich Cappola, D/Town Manager  
Jim Cauley, Town Attorney  
Kimberly Moffett, Town Clerk  
Ann Game, Customer Service Director  
Samantha Wullenwaber, Planning Director  
Dale Medlin, Electrical System Director  
Greg Tart, Acting Police Chief  
Patrick Pierce, Economic Development Director  
Joshua Baird, Town Engineer  
Heidi Holland, Deputy Town Clerk

**COUNCIL ABSENT:**

**1 CALL TO ORDER**

Pledge of Allegiance and Invocation

- a) Mayor McLeod called the meeting to order at 6:02 p.m. He led everyone in the Pledge of Allegiance as well as offering the Invocation.

**2 ADJUSTMENT OF THE AGENDA**

- a) Resolution to set March 1, 2021 Public Hearing for Buckhorn Annexation was added to the Consent agenda. Additionally it was stated that Ewa Capabianco, Item 5a, would be unable to attend the meeting this evening.

**3 CONSENT AGENDA**

*(Items on the consent agenda are considered routine in nature or have been thoroughly discussed at previous meetings. Any member of the Council may request to have an item removed from the consent agenda for further discussion.)*

- a) DRAFT Minutes
  - January 19, 2021 - Regular Session
- b) Amended Resolution #2021-01- COVID Policy & Employee Leave
- c) Resolution to Set Public Hearing - 2020-142-ANX - Buckhorn Branch Annexation
- d) 2020-142-ANX - Certification of Sufficiency  
Buckhorn Branch Annexation

**ACTION:** Adoption of Consent Agenda as Presented

Motion: Council Member Holder  
Second: Mayor Pro Tem Thompson  
Vote: Unanimous

**4 ADMINISTRATIVE ITEMS**

**5 INTRODUCTIONS AND SPECIAL PRESENTATIONS**

a) Introduction of Employees

*Presenters:* Dale Medlin, Electrical System Director

- Ewa Capabianco, Customer Service Representative
- Jacob Robinson, ELT 1

Mr. Medlin introduced Jacob Robinson who is a new employee with the Electrical Department. He previously worked for Customer Service. He attended Lineman School at a local community college and passed with flying colors. He stated he was happy to be with Clayton. Mayor McLeod welcomed him.

b) Introduction of Alex Halloway

*Presenter:* Patrick Pierce, Economic Development Director

- TJCOG - Mapping Volunteer

Mr. Pierce introduced Alex Halloway and offered his appreciation for his many volunteer hours with mapping projects for the downtown area. Mr. Pierce stated this was a huge undertaking and will offer so many opportunities that were not previously available. Mr. Halloway offered his thanks for the opportunity to gain this experience. Mayor McLeod offered his thanks on behalf of the council.

c) 2021 Sculpture Trail Selection

*Presenter:* Sara Perricone, Chair - Public Art Advisory Board

Ms. Perricone was present and shared information about the selections. She offered her thanks to JD Solomon and Mayor McLeod for their support and assistance. She also shared her appreciation for allowing the board to bring in Jim Davis as the consultant for this project. She also offered her thanks to Council Member Everett for participating in the selection process. Sincere thanks and appreciation was offered to Steve Blasko for his consistent knowledge and support. Ms. Perricone offered thanks to Caterpillar for their assistance with obtaining and using their cranes. Also offered were thanks to both Ms. Holland and Ms. Moffett for their assistance throughout the year. She shared a brief background on Mr. Davis and shared information about the many other municipalities he has worked with on other sculpture trails. Ms. Perricone shared a PowerPoint presentation showing the final selections and location of sculptures.

- Red Rhythm - Town Square
- Continuum - Town Square (this piece will be dedicated to the Fire Department)
- Midsummer - Roundabout
- Some Like It Hot - Horne Square
- Valkyrie - Horne Square
- A Question of Balance - Library
- Guardian - Community Center
- Flying Goldfish - Horne Square

Flying Goldfish, which currently in Horne Square, has been gifted to the town for the next year from the artist.

Council Member Grannis offered his thanks to the board for all their dedication and hard work.

- d) Life Saving Award  
*Presenter:* Greg Tart, Acting Police Chief

Chief Tart was present and recognized two Police Officers for their involvement in a recent case. He shared he has spent the last 33 years in law enforcement and stated during the last 3 months with the Clayton Police Department he has worked with some of the finest officers in law enforcement. He stated he was very proud to be a member of the department. He provided details regarding the incident that took place on January 22, where two Clayton officers responded to a possible overdose. Officers Carolos Lerma and Chad Mallett responded. Additionally fire and emergency personnel responded. Upon arrival at the scene, Officer Lerma began CPR and administered a dose of Narcan. As a result the subject regained consciousness and his life was saved. Chief Tart stated this was a team effort. Officer Mallett & Officer Lerma were both presented with Life Saving Award. Both officers received a round of applause. Mayor McLeod offered his thanks and appreciation to both the Chief, for his leadership, and the officers.

## 6 PUBLIC HEARINGS

- a) 2020-113-PDD - Ashcroft 2  
*Presenter:* Planning Department

Ms. Wullenwaber asked that items 6a, 6b & 6c be continued to March 1, 2021.

**ACTION:** Continued to March 1, 2021 Council Meeting

- b) 2020-114-SD - Ashcroft 2 (Quasi-Judicial)  
*Presenter:* Planning Department

**ACTION:** Continued to March 1, 2021 Council Meeting

- c) Development Agreement - Ashcroft 2  
*Presenter:* Planning Department

**ACTION:** Continued to March 1, 2021 Council Meeting

- d) Chapter 160D – Amendments to Code of Ordinance Chapter 155  
*Presenter:* Planning Department

Ms. Wullenwaber provided details about this item. She stated a special work session was held last week and was reviewed page by page. She stated there was discussion regarding variances and whether all variances should be turned over to the Board of Adjustment. Council Member Bunn felt



comfortable with all being turned over to Board of Adjustment. Mayor McLeod agreed.

The Public Hearing was opened at 6:30 p.m. No one wished to speak, the hearing was closed and turned over to council for their deliberation.

**ACTION:** Adoption of Ordinance #2021-02-02 with change to indicate that variances for access be assigned to BOA as well as any corrections regarding minor typographical errors.

Motion: Council Member Holder  
Second: Council Member Bunn  
Vote: Unanimous

- e) Amendment to Comprehensive List of Fees & Charges (As Related to 160D)  
*Presenter:* Planning Department

Ms. Wullenwaber stated changes the fee schedule had to be updated in accordance with the Chapter 160D adoption. The main change was regarding major and minor site plan. Currently there is now one site plan category rather than two. This fee has been benchmarked and is align with, if not less, than neighboring communities. The other change was planned development had to change to conditioning zoning. This will be implemented for the March 1, 2021 submittal.

The public hearing was opened at 6:33 p.m., with no one wishing to speak, this item was turned over to council for deliberation.

**ACTION:** Adoption of Ordinance #2021-02-03

Motion: Council Member Bunn  
Second: Mayor Pro Tem Thompson  
Vote: Unanimous

## **7 OLD BUSINESS**

- a) Land Acquisition - Easements  
*Presenter:* Joshua Baird, Town Engineer

Mr. Baird presented this item and shared background information. This item involved both Little Creek Sewer Outfall Replacement and South Feeder Electric Tie. He stated several easements had already been obtained for these projects. Unfortunately we have not been able to obtain a few easements, several dating back to May 2020. He stated Town staff, land acquisition firm and town attorney have not been able to come to an agreement. Offers have been made but no settlements have been reached. These easements are vital to these projects and timing for both projects are critical. Negotiations for the settlement will continue prior to any condemnation taking place.

Mayor McLeod turned this over to council for their discussion.

**ACTION:** Adoption of Resolution #2021-08

Motion: Council Member Bunn  
Second: Mayor Pro Tem Thompson  
Vote: Unanimous

- b) Award Construction Contract - Little Creek Outfall Project  
*Presenter:* Joshua Baird, Town Engineer

Mr. Baird stated on January 28, 2021 staff opened sealed bids for the Little Creek Outfall Project. Staff received a total of 7 bids. The two lowest bids were from contractors that did not have adequate licensing and were deemed not responsive. The two contractors were notified in writing. The next lowest bid was Providence Construction Services at the base bid with alternate 1B and total bid of \$1,018,659.85. Contract time is 270 days to substantial completion and 300 days to final.

Mayor McLeod turned this over to council for their discussion.

**ACTION:** Adoption of Resolution #2021-09

Motion: Mayor Pro Tem Thompson  
Second: Council Member Everett  
Vote: Unanimous

- c) AMI Program Update  
*Presenters:* JD Solomon, Town Manager & Ann Game, Customer Service Director

Mr. Solomon stated there would two parts to the presentation this evening. Ms. Game would share details about the AMI Program and Mr. Solomon would address citizen concerns regarding AMI meters. Ms. Game provided background information about the project that began in 2019. Network installation was completed in January 2020 and a contractor was brought in to change out meters. To date, over 18,000 water and electric meters are reading off the system and receiving daily reads. As of February 2, the installers have left Clayton and the project is almost complete, with only a handful of meters to be installed. On the electric side there are less than 100 meters left to install.

A big feature of this project is a customer portal allowing customer to have the opportunity to see how their lifestyles impact their utility consumption. Customers are highly encouraged to sign up for this feature. Postcards have been mailed out to customers with instructions on this portal. The project is scheduled to finish up ahead of time.

Mayor McLeod offered his thanks.

- d) Parks & Recreation Partial Re-Opening  
*Presenter:* Scott Barnard, Parks & Rec. Director

Mr. Solomon shared details about partial re-opening on March 1, 2021. The Library would possibly open March 15th or April 1st. A partial opening to town hall would be sometime between March 1st - April 1, 2021. This discussion certainly would be brought back to council prior to that. A key factor in the opening of Town Hall would be the completion of the parking lot.

## 8 NEW BUSINESS

- a) Establishment of Board of Adjustment  
*Presenter:* JD Solomon, Town Manager

Mr. Solomon provided details on the reestablishment. He suggested to amend the ordinance to appoint 5 regular members with 2 alternate members. The members would consist of 3 members residing in corporate limits and 2 members residing in the ETJ. The alternates will consist of 1 member residing in corporate limits and 1 members residing in the ETJ.

The Town Attorney asked when the appointments for this board would be made. These vacancies would be advertised on February 16, 2021 with a window of two weeks for applications. Council would make appointments following recommendations for this board at a future meeting.

**ACTION:** Adoption of Ordinance #2021-02-04 to be amended to indicate a board of 5 members with 2 alternate members

Motion: Council Member Bunn  
Second: Council Member Holder  
Vote: Unanimous

## 9 STAFF REPORTS

- a) Town Attorney
- b) Town Manager

Mr. Solomon offered thanks to the wastewater treatment staff, several who have worked double shifts.

He stated our Front line police officers are doing a great job and they deserve our gratitude. He spoke about the administrative investigation, anything that has taken place with regard to this investigation has been to help ensure a better workplace than six months ago. The draft report was completed approximately one month ago and Mr. Solomon stated he advised council at that time staff review and report would take approximately 60 days to complete. He stated that schedule still held true. Investigation was initiated due to several complaints regarding misbehavior and policy procedure. Mr. Solomon offered thanks to Town Attorney Jim Causley, Kerri Hartzog from the League and Ronnie Mitchell, Police Matter Attorney. Also offered thanks to U.S. ISS, the investigative firm that handled this investigation. He also offered thanks to Town Clerk for assistance as well as the Johnston County Sheriff's Department and Acting Police Chief Greg Tart. Mr. Solomon offered sincere

appreciation to council for their support in all areas. He discussed four big decisions, Decision #1 to investigate, #2 to place chief on leave, #3 to bring in acting chief and #4, how to move forward. He stated this is a personnel issue so not much further could be discussed, however, a total of four folks are no longer with the town. Additionally disciplinary action will take place as needed. Mr. Solomon stated was the environment at the Police Department was better than it was 6 months ago but we still have work to do. He will not discuss much more than he already has. Again, he offered thanks to front line officers. He stated Clayton is a great place to live and work and spend a career as a police officer. We are on the move, on the rise and it's a great place to work.

Mayor Pro Tem Thompson offered his appreciation to Chief Tart for all his dedication to the department and the town. He is very thankful.

Mayor McLeod offered his thanks to citizens and residents. He understands this has been ongoing for a while and patience is very much appreciated. He stated more information will be forthcoming in the next 2-3 weeks.

Mr. Solomon addressed concerns from citizens regarding AMI and electric bills. He discussed bills have been higher and he shared factors that cause spike in bills. He stated we are doing quality assurance checks, have hired a 3rd party company to make sure another level of quality assurance is in place. Town has also completed a statistical review of data over last 5 Decembers and last 5 Januarys which looked at all meter data. A portion of the meters have been tested as they sit in place and a portion of old meters have been compared side by side with new meters. Town will also ask a meter company census to confirm signals are properly received and also reviewing the process for converting data into billing system.

Five other observations about conversion programs were shared to include; it is not uncommon for a data error to occur in first 1-3 months, new meter sometimes are linked to the wrong customer, sometimes data is not transferred to the billing cycle and billing cycles vary. When meters were manually read, the cycles would run between 28-32 days. Over the last month the cycle could vary by 10% if the meter was not read on the weekend or a holiday. The new meters will allow these to be read on a certain day to an even 30 or 31 day cycle. With the transfer of putting meters in, the system has seen a billing cycle ranging from 28-37 days. This could result in a 20% increase/decrease depending on which way the cycle went. This should level out over time.

We have not seen a big ramp up in total sales of electricity over the last 5 years. Also found that 2021 bills are higher than 2020 but in line with previous 5 years. We will continue to work with bills with highest variations. Ms. Game worked this weekend and found one of those bills with transposed numbers and made the needed correction. Staff will continue to work for the next two weeks on this. He stated we are taking this concern very seriously. He asked that anyone who has concerns, please contact us in writing with the concerns so we can address them. We also offer energy audits for customers. He

stated to please call us if you cannot pay your bill, we have numerous ways to assist and work with our customers.

Mayor McLeod asked for best contact information for any concerns. Ms. Game stated there is a link: [utilities@townofclaytonnc.org](mailto:utilities@townofclaytonnc.org) or call Ann Game directly.

Mayor McLeod stated he had received numerous emails about this concern. He offered his thanks to staff for doing a great job. He stated the council does take concerns very seriously and understands how an unexpected higher than normal bill can effect budgets. He further stated if there are errors found on our end credits would promptly be issued. He reassured citizens that everything is being done and thanked everyone for their patience.

c) Town Clerk

d) Other Staff

## 10 OTHER BUSINESS

- a) Mr. Tew was present. He stated he has been a life-long resident of Clayton. He stated that he loves this town. He stated he would like to see council address issues. He offered his thanks regarding Chapter 160D. He welcomed Council Member Everett. His concerns were as follows:
- Website - Agenda concern
  - Code of Ordinance - Research Concerns
  - Allow Facebook to serve as official public notice - asks that we do not allow that to happen
  - Concern about how business is handled - key to relationship - council member oath and effectively communicate with residents - if they don't have time or make time they shouldn't be serving. Indifferent/arrogant - people don't get re-elected. Hoped that council all return phone calls.
  - Town reputation is in need of repair. He felt there are problems as a result of disconnect with council, management and public following Mr. Biggs departure. Shared appreciation for what Mayor Pro Tem Thompson wrote and feels good about management change. Shared concerns about things that the town should have known. He shared that two years ago he requested information about sewer capacity and had a very hard time to receive the information and was told information was a security risk. Concerns about inaccurate information provided by previous Planning Director regarding rezoning. Concerns on why leadership at that time did not ensure that folks who requested this information could obtain same. Shared concerns about previous meeting that town staff did not attend nor was an apology ever received. He feels there has been a good amount of damage done. He stated if you become arrogant you are going to run off good projects. He stated Skip Browder was the best - you could disagree agreeably with him. Feels the Planning Department is obstructionist and make changes as needed.
  - He spoke about old Town Hall, he discussed two houses that have transformed neighborhood. Kevin Lee has done an amazing job.
  - He asked for the Ashcroft Developer Agreement, asked that before we enter into any agreement that they do what they are supposed to do.

His concerns are the involvement with old Town Hall and same developer agreement.

- He shared traffic concerns on Second Street. He feels we do not need street parking. He shared his concerns about traffic and being mostly one way.
- He discussed the Parking Lot expansion and budget. He stated he was told previously in discussion about possibility of eliminating town square parking and perhaps having a performance venue at that location. He would like an update.
- He discussed 1958 deeded cemetery lots in Maplewood Cemetery. Now he would like to be cremated and wondered what he could do with these lots and would like to be referred to whom he can discuss. He shared concerns about perpetual care as well as concerns about the document he received in 1958. Mr. Tew provided a copy of the cemetery deed to Mr. Solomon.
- He offered his appreciation for the hiring of Mr. Solomon. He now understands what a mess there was to clean up and stated he felt we were fortunate to find someone with his credentials.

b) Council Comments

## 11 ADJOURNMENT

a) Adjourn the Meeting

With there being nothing further, the meeting was adjourned at 7:51 p.m.

**ACTION:** Motion to Adjourn

Motion: Council Member Everett

Second: Council Member Grannis

Vote: Unanimous

Duly adopted this the 1<sup>st</sup> of March, 2021 while in regular session.

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Jody L. McLeod  
Mayor

ATTEST:

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Kimberly A. Moffett, CMC, NCCMC  
Town Clerk

February 15, 2021  
Minutes

# *Proclamation*

## *Traumatic Brain Injury (TBI) Awareness Month -2021*

**Whereas**, a Traumatic Brain Injury (TBI) is an injury to the brain occurring after birth as a result of an external force to the head.

**Whereas**, the condition is often a result of a fall, an assault, a motor vehicle accident, being struck by/against, and/or other causes or unknown causes.

**Whereas**, over 200,000 North Carolinians currently live with a TBI-related disability.

**Whereas**, the condition affects the lives of not only the individual/survivor, but also their Parents, Spouses, Siblings, Extended Family, Friends, Healthcare Providers, Insurance Companies, Attorneys, Educators, Government Agencies, and Employers.

**Whereas**, ongoing supports are often needed to support the individual in their daily life skills.

**Whereas**, TBI can sometimes be an “invisible” condition, creating many challenges around stigmas, awareness, understanding, and acceptance of individuals with TBI.

**Whereas**, the most effective way to increase awareness is through everyone’s openness to learn and acknowledge that there are systemic barriers that reduce the likelihood of those with TBI enjoying equitable experiences and living independent, productive lives within their communities.

**Whereas**, policies must be developed, attitudes shaped, and equitable experiences be offered to all individuals, including those with TBI.

**Whereas**, as citizens we should do all in our power to:

- Recognize the value of the disability experience in our lives and the valued role it has in our rich diversity.
- Recognize the barriers presented to those with Traumatic Brain Injury across all aspects of their lives.
- Create ways to include everyone; especially those with Traumatic Brain Injury, to be fully included in all aspects of life.
- Understand the losses (financial, spiritual, human rights, contributions to community, and otherwise) when our communities segregate and create barriers for those with Traumatic Brain Injury.
- Demand policymakers no longer invest in segregation and create inclusive, equitable policies and systems for all.

**Now, therefore**, on behalf of the Clayton Town Council, I do hereby proclaim March 2021 as

### **TRAUMATIC BRAIN INJURY AWARENESS MONTH**

Duly adopted this the 1<sup>st</sup> day of March, 2021 while in regular session.

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Jody McLeod  
Mayor

# *P*roclamation

## *Developmental Disability Awareness Month 2021*

**Whereas**, a Developmental Disability is diverse group of chronic conditions that are due to mental or physical impairments that arise before adulthood; and

**Whereas**, the condition is likely to continue indefinitely and limits the individual in 3 or more of the following areas: Self-care, Receptive and expressive language, Learning, Mobility, Self-direction, Capacity for independent living, and Economic self-sufficiency; and

**Whereas**, the condition creates the individual's need for a combination of special, interdisciplinary services, individualized/person-centered supports, and other forms of long-term assistance that are individually planned and coordinated; and

**Whereas**, the disability experience is a natural part of life and is valued as a part of our rich diversity; and

**Whereas**, disability is a social construct. The 'problem' is not the medical condition that resides within the individual, but the 'problem' is that society does not create welcoming, supporting, and inclusive environments, policies, and/or systems for all, to promote equality and acceptance in all areas of life, including schools, places of employment, and in our communities; and

**Whereas**, the most effective way to increase awareness is through everyone's openness to learn and acknowledge that there are systemic barriers that reduce the likelihood of those with disabilities enjoying equitable experiences and living independent, productive lives within their communities; and

**Whereas**, policies must be developed, attitudes shaped, and equitable experiences be offered to all individuals, including those with developmental disabilities; and

**Whereas**, as citizens we should do all in our power to:

- Recognize the value of the disability experience in our lives and the valued role it has in our rich diversity.
- Recognize the barriers presented to those with disabilities across all aspects of their lives.
- Create ways to include everyone; especially those with developmental disabilities, to be fully included in all aspects of life.
- Understand the losses (financial, spiritual, human rights, contributions to community, and otherwise) when our communities segregate and create barriers for those with disabilities.
- Demand policymakers no longer invest in segregation and create inclusive, equitable policies and systems for all.

Now, therefore, on behalf of the Clayton Town Council, I do hereby proclaim March 2021 as

### **DEVELOPMENTAL DISABILITIES AWARENESS MONTH**

Duly adopted this the 1<sup>st</sup> day of March, 2021 while in regular session.

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Jody McLeod  
Mayor



**ANNEXATION PETITION 2020-160-ANX**

**Riverwood Golf - Section II**

**Parcel:** 167900-56-1805; 167900-76-3795; 167900-85-1824

**Owners:** Fred Smith Properties, James & Janice Halloway & RGCI, LLC

**Contiguous; 298.9 +/- acres**

**TOWN OF CLAYTON  
RESOLUTION DIRECTING THE CLERK TO INVESTIGATE  
A PETITION RECEIVED UNDER G.S. 160A-31**

**WHEREAS**, a petition requesting annexation of an area described in said petition was received on November 3, 2020 by the Town of Clayton; and

**WHEREAS**, G.S. 160A-31 provides that the sufficiency of the petition shall be investigated by the Town Clerk before further annexation proceedings may take place; and

**WHEREAS**, the Town Council of the Town of Clayton deems it advisable to proceed in response to this request for annexation:

**NOW, THEREFORE, BE IT RESOLVED** by the Town Council of the Town of Clayton that:

The Town Clerk is hereby directed to investigate the sufficiency of the above-described petition and to certify as soon as possible to the Town Council the results of her investigation.

Duly adopted this the 15<sup>th</sup> day of February, 2021 while in regular session.

\_\_\_\_\_  
Jody L. McLeod,  
Mayor

ATTEST:

\_\_\_\_\_  
Kimberly A. Moffett, CMC, NCCMC  
Town Clerk



## Town Council Agenda Cover Sheet

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**Meeting Date**

March 1, 2021

**Agenda Location**

Introductions & Special Presentations

**Item Title**

Introducing Grace Davis, new Youth Services Supervisor

**Presenter**

Joy Garretson, Grace Davis

**Summary/Description**

We're welcoming Grace Davis to our library staff as the new Youth Services Supervisor! She started February 15.

**Requested Action**

Informational Only

**Funding Source (If Applicable):**

N/A

**Cost:** N/A   Yes ☐   No ☒

**Additional Documents to be Included in Agenda Packet**

**Meeting Timeline**

Click or tap here to enter text.



## Town Council Agenda Cover Sheet

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**Meeting Date**

March 1, 2021

**Agenda Location**

Public Hearings

**Item Title**

2020-113-PDD Ashcroft 2 Planned Development Rezoning

**Presenter**

Planning Department

**Summary/Description**

Request to rezone 254.85 acres from Residential-Estate (R-E) and Planned Development Residential (PD-R) to Planned Development Mixed Use (PD-MU).

**Requested Action**

Approval/Denial

**Funding Source (If Applicable):**

N/A

**Cost:** N/A    Yes ☐    No ☒

**Additional Documents to be Included in Agenda Packet**

Application  
Staff Report Maps  
Consistency Statement  
Rezoning Exhibit  
Survey  
Neighborhood Meeting Materials  
Newspaper Ad  
Adjacent Property Letter

**Meeting Timeline**

February 1, 2021 – Town Council (continued)  
February 15, 2021 – Town Council (continued)  
March 1, 2021- Town Council



**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## REZONING APPLICATION COVER SHEET

**Name of Project:** Ashcroft - Section 2 **Date:** 08/03/2020  
**Applicant Name:** David DeYoung, AICP - RiverWild

***The following checklist to be completed by applicant:***

- [ X ] Pre-Application Meeting on: May 13, 2020
- [ X ] Review Fee
- [ X ] Advertisement Fee
- [ X ] Completed Application
- [ X ] Owner's Consent Form
- [ X ] Adjacent Property Owner's List
- [ X ] Neighborhood Meeting Notice Letter (1 copy)
- [ X ] 2 Sets of stamped, addressed, empty envelopes for adjacent property owner notification
- [ X ] Signed & Sealed Boundary Survey
- [ X ] Copy of signed & sealed boundary survey in PDF on USB

**Reviewed by:** \_\_\_\_\_



**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## REZONING APPLICATION

- ☐ Standard Rezoning Fee: \$500.00  
☒ Planned Development Rezoning Fee: \$1,000 + \$5.00 per acre  
☐ Advertisement Fee: \$200.00

### SITE INFORMATION

**Name of Project:** Ashcroft - Section 2  
**Acreage of Property:** 241.21 acres **Zoning District:** RE (with WPOD) and PD-R  
**County Tag #:** 05H02013A; 05H02009A; 05H02010A; 176000-70-3713; 176000-60-9362; 166900-79-1467;  
05H02015; 05H02012; 05H02200B; 05H02013 **NC Pin #:** 166900-88-7300 166900-78-4101; 166900-76-7649; 166900-76-7638  
**Address/Location:** Southeast quadrant of Covered Bridge Road and Neuse River  
**Existing Zoning District:** RE (with WPOD) and PD-R **Proposed Zoning District:** PD-MU

### APPLICANT INFORMATION

**Applicant:** Ashcroft Partners, LLC - David DeYoung, AICP, Agent  
**Mailing Address:** 114 W. Main Street  
**Phone Number:** (919) 901-3178 **Fax:**  
**Contact Person:** David DeYoung, AICP  
**Email Address:** David@theriverwildteam.com

### PROPERTY OWNER INFORMATION

**Name:** See Attachment 1  
**Mailing Address:**  
**Phone Number:** **Fax:**  
**Email Address:**

### OFFICE USE ONLY

Date Received: Amount Paid: File Number:

## EXPLANATION OF PROJECT

Ashcroft Section 2 is a proposed mixed use neighborhood of 772 residential units (293 sf units, 299 town home units, and 180 apartment units); and 113,000 sf of commercial area. The 241.21 acre assemblage is currently zoned PD-R and R-E with a portion of the site withing the WPOD. The proposed zoning is a Mixed Use Planned Development. The project accommodates the future Norther Connector and roadway design is as recommended in the TIA. The project includes pedestrian connections to the existing greenway network; a variety of open space areas/amenities to include a clubhouse and pool./ The neighborhood will be developed in multiple phases based on market demand and to meet the needs and functionality of the community during construction.

## APPROVAL CRITERIA

*All applications for a Rezoning must address the following findings:*

1. Consistency with the adopted plans of the Town.  
See Attachment 2 for approval criteria.  
\_\_\_\_\_  
\_\_\_\_\_
2. Suitability of the subject property for uses permitted by the current vs. the proposed district.  
See Attachment 2 for approval criteria.  
\_\_\_\_\_  
\_\_\_\_\_
3. Whether the proposed change tends to improve the balance of uses, or meets specific demand in the Town.  
See Attachment 2 for approval criteria.  
\_\_\_\_\_  
\_\_\_\_\_
4. The capacity of adequate public facilities and services including schools, roads, recreation facilities, wastewater treatment, potable water supply and stormwater drainage facilities is available for the proposed use.  
See Attachment 2 for approval criteria.  
\_\_\_\_\_  
\_\_\_\_\_
5. It has been determined that the legal purposes for which zoning exists are not violated.  
See Attachment 2 for approval criteria.  
\_\_\_\_\_  
\_\_\_\_\_
6. It has been determined that there will be no adverse effect upon adjoining property owners unless such effect can be justified by the overwhelming public good or welfare.  
See Attachment 2 for approval criteria.  
\_\_\_\_\_  
\_\_\_\_\_

7. It has been determined that no one property owner or small group of property owners will benefit materially from the change to the detriment of the general public.

See Attachment 2 for approval criteria.

#### APPLICANT AFFIDAVIT

*I/We, the undersigned, do hereby make application and petition to the Town Council of the Town of Clayton to amend the Zoning Ordinance and change the Official Zoning Map of the Town of Clayton as requested.. I hereby certify that I have full legal right to request such action and that the statements or information made in any paper or plans submitted herewith are true and correct to the best of my knowledge. I understand this application, related material and all attachments become official records of the Planning Department of the Town of Clayton, North Carolina, and will not be returned.*

David DeYoung

*Print Name*

David DeYoung, AICP Digitally signed by David DeYoung, AICP  
Date: 2020.07.29 15:52:43 -0400

*Signature of Applicant*

8/3/2020

*Date*

**Attachment 2  
Ashcroft - Section 2  
Rezoning  
Approval Criteria**



All applications for a Rezoning must address the following findings:

**1. Consistency with the adopted plans of the Town.**

The proposed rezoning to PD-MU is in accord with the general plans for the orderly growth and development of the Town and is consistent with the following Comprehensive Plan Implementation Goals:

- Goal LU2 – Encourage quality development which maximizes existing infrastructure, promotes walking and biking, and enhances travel safety.
- Goals H1 – Encourage a range of housing types and lot sizes that meets the needs of various income levels, family sizes, and ages.

The property assemblage is designated as Low-Density Residential in the Clayton Comprehensive 2040 Plan. This designation allows for mixed-residential uses with a maximum density of 3 units per acre and the Comprehensive Plan provides guidance to permit up to 7 units per acre for Planned Development Districts. In addition, the project provides multiple stormwater control measures (SCM's) and complies with Phase II Watershed Rules - Neuse River Rules. This compliance through the use of SCM's, removes the maximum threshold for density. The overall density of the proposed project is 3.01 du/ac, with a density of 2.26 du/ac for the portion of the project that falls in the Watershed Protection Overlay.

**2. Suitability of the subject property for uses permitted by the current vs. the proposed district.**

The existing RE zoning allows only low-density, single-family dwellings and select uses which are compatible with a rural character. The subject properties are located in an area of Clayton that is transitioning from large-lot rural and agricultural character to family-oriented neighborhoods. With the future construction of the Northern Connector, this area is expected to see continued growth and there will be a need for a variety of new housing types, increased densities, neighborhood retail and associated services.

The subject properties are appropriately located for a PD-MU zoning designation. The adjacent parcels to the south of the proposed subdivision are zoned PD-R as is the Steeplechase assemblage across O'Neil Street. The site is bound to the northeast by the Neuse River and to southeast by the Town of Clayton's future Wastewater Treatment Plant.

The PD-MU district is intended to provide coordinated mixed use development which could include light industrial, commercial, office, educational, civic, institutional, residential and services uses within a planned development with appropriate perimeter buffering and open space. The variety of land uses in this district allows flexibility to respond to market demands



and the needs of tenants, which provides for a variety of physically and functionally integrated land uses.

**3. Whether the proposed change tends to improve the balance of uses, or meets the specific demand in the Town.**

The rezoning from RE to PD-MU allows the development of a neighborhood with varying home options, densities, and price points necessary to satisfy continued demand for housing in the Town as well as provide an additional opportunity for commercial uses. Additionally, the proposed development meets Comprehensive Plan Goal H1 – to encourage a range of housing types and lot sizes that meets the needs of various income levels, family sizes, and ages.

**4. The capacity of adequate public facilities and services including schools, roads, recreation facilities, wastewater treatment, potable water supply and stormwater drainage facilities is available for the proposed use.**

In order to ensure adequate public facilities are in place, the proposed development plan will happen in 10 phases and grow with as demand for residential and commercial uses occur. The development phases will be timed to ensure capacity is available while the Town's new wastewater plant is under construction. A wastewater allocation request has been filed in conjunction with the rezoning and major subdivision master plan applications. A traffic impact analysis has been provided with roadway improvement recommendations and the dedication of right-of-way to accommodate the future construction of the North Connector will occur within the project boundaries. The project has also been designed with SCM's for stormwater control and conveyance and a recreation amenity will be a prominent feature of the development along with trail access to Clayton's River Walk on the Neuse and Sam's Branch Greenway. Additional capacity is programmed through Johnston County Public Schools to accommodate the growing student population in Johnston County.

**5. It has been determined that the legal purposes for which zoning exists are not violated.**

The proposed development will not negatively impact the health, safety, or general welfare of the public and does not violate the legal purposes for which zoning exists.

**6. It has been determined that there will be no adverse effect upon adjoining property owners unless such effect can be justified by the overwhelming public good or welfare.**

The rezoning will not result in an adverse effect upon adjoining property owners. The adjacent parcels are generally zoned and/or developed with similar or higher density development. The site is also bounded on the north by the Neuse River and to the east by property Clayton has developed or intends to develop with public utilities.

**7. It has been determined that no one property owner or small group of property owners will benefit materially from the change to the detriment of the general public.**

No individual or group of small property owners will benefit to the detriment of the general public. As stated above, the proposed rezoning is consistent with the Town of Clayton's Comprehensive Plan, which calls for low density residential (up to 7 du/ac within a PDD).



TOWN OF CLAYTON  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

Consent is required from the property owner(s) if an agent will act on their behalf. A separate form is required from each owner. Consent is valid for one year from date of notary, unless otherwise specified. All fields must be completed.

Project Name: Ashcroft Section 2 Address or PIN #: 166900-88-7300, 166900-76-7649

### AGENT/APPLICANT INFORMATION:

David DeYoung, River Wild  
(Name - type, print clearly)

114 W. Main Street  
(Address)  
Clayton, NC, 27520  
(City, State, Zip)

I hereby give **CONSENT** to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (*list applicable requests*):

All entitlement/development processes

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

### OWNER AUTHORIZATION:

Ashcroft Partners, LLC  
(Name - type, print clearly)

114 W. Main Street STE 102  
(Address)

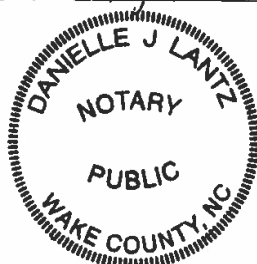
[Signature]  
(Owner's Signature)

Clayton, NC, 27520  
(City, State, Zip)

STATE OF NC  
COUNTY OF JOHNSTON

Sworn and subscribed before me DANIELLE J. LANTZ a Notary Public for the above State and County, this the 3<sup>rd</sup> day of August, 20 20.

SEAL



July 2018

[Signature]  
Notary Public

My Commission  
Expires:

3-11-2024





TOWN OF CLAYTON  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

*Consent is required from the property owner(s) if an agent will act on their behalf. A separate form is required from each owner. Consent is valid for one year from date of notary, unless otherwise specified. All fields must be completed.*

Project Name: Ashcroft / Earp-Moore Tract Address or PIN #: 05H02009A - Covered Bridge Road

### AGENT/APPLICANT INFORMATION:

James H. Lipscomb / Dave DeYoung

(Name - type, print clearly)

328 E. Main Street

(Address)

Clayton, NC 27520

(City, State, Zip)

I hereby give **CONSENT** to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (*list applicable requests*):

Additional Applicant: Stewart Engineering

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

### OWNER AUTHORIZATION:

Richard E. Moore

(Name - type, print clearly)

Richard E. Moore

(Owner's Signature)

1417 Wensford Court

(Address)

Raleigh, NC 27615

(City, State, Zip)

STATE OF

North Carolina

COUNTY OF

Wake

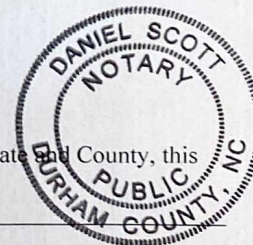
Sworn and subscribed before me Richard E. Moore, a Notary Public for the above State and County, this the 22 day of July, 2020.

SEAL

Daniel Scott  
Notary Public

My Commission  
Expires:

July 24, 2023





TOWN OF CLAYTON  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

Consent is required from the property owner(s) if an agent will act on their behalf. A separate form is required from each owner. Consent is valid for one year from date of notary, unless otherwise specified. All fields must be completed.

Project Name: Ashcroft Section 2 Address or PIN #: 176000-70-3713, 166900-78-4101,  
AND 166900-67-5094

### AGENT/APPLICANT INFORMATION:

David DeYoung, RiverWild  
(Name - type, print clearly)

114 W. Main Street  
(Address)  
Clayton, NC 27520  
(City, State, Zip)

I hereby give CONSENT to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (list applicable requests):

All entitlement/development processes

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

### OWNER AUTHORIZATION:

John Wesley Massey  
(Name - type, print clearly)

8041 St. Andrews Drive  
(Address)

John Wesley Massey  
(Owner's Signature)

Laurinburg, NC 28362  
(City, State, Zip)

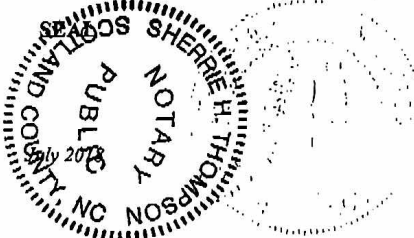
STATE OF NORTH CAROLINA  
COUNTY OF COTLAND

Sworn and subscribed before me, SHERIE H. THOMPSON, a Notary Public for the above State and County, this the 31<sup>st</sup> day of JULY, 2020.

Sherie H. Thompson  
Notary Public

My Commission  
Expires:

SEPTEMBER 6, 2020





**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

*Consent is required from the property owner(s) if an agent will act on their behalf. A separate form is required from each owner. Consent is valid for one year from date of notary, unless otherwise specified. All fields must be completed.*

**Project Name:** Ashcroft Section 2 **Address or PIN #:** 166900-79-1467

### AGENT/APPLICANT INFORMATION:

David DeYoung, Riverwild  
(Name - type, print clearly)

114 W. main Street  
(Address)  
Clayton, NC 27520  
(City, State, Zip)

I hereby give **CONSENT** to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (*list applicable requests*):

major Subdivision Application  
Rezoning Application

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

### OWNER AUTHORIZATION:

James D. Smith  
(Name - type, print clearly)

1814 N. Oneil Street Ext  
(Address)

James D. Smith  
(Owner's Signature)

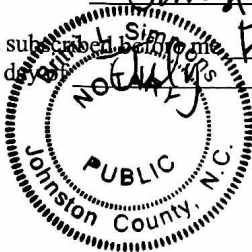
Clayton, NC 27520  
(City, State, Zip)

**STATE OF**  
**COUNTY OF**

North Carolina  
Johnston

Sworn and subscribed before me, the 21 day of July, 2020, Devin L. Simmons, Notary Public for the above State and County, this

**SEAL**



Devin L. Simmons  
Notary Public

**My Commission Expires:**

6/2/2025

July 2018



**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

*Consent is required from the property owner(s) if an agent will act on their behalf. A separate form is required from each owner. Consent is valid for one year from date of notary, unless otherwise specified. All fields must be completed.*

Project Name: Ashcroft Section 2 Address or PIN #: 166900-79-1461

### AGENT/APPLICANT INFORMATION:

David Deyoung, Riverwild  
(Name - type, print clearly)

114 W. Main Street  
(Address)  
Clayton, NC 27520  
(City, State, Zip)

I hereby give **CONSENT** to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (*list applicable requests*):

Major Subdivision Application  
Rezoning Application

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

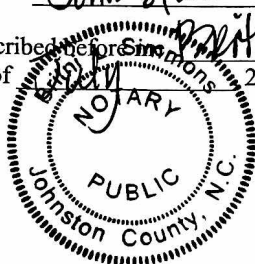
I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

**OWNER AUTHORIZATION:** Daniel G. Smith,  
Co-Trustee  
Jean K. Smith Trust, James D. Smith, 1814 N. O'neil Street Ext  
(Name - type, print clearly) (Co-Trustee) (Address)  
[Signature] Clayton, NC 27520  
(Owner's Signature) (City, State, Zip)

STATE OF North Carolina  
COUNTY OF Johnston

Sworn and subscribed before me, Breith L. Simmons, a Notary Public for the above State and County, this the 22 day of May, 2020.

SEAL



[Signature]  
Notary Public

My Commission  
Expires:

5/2/2025

July 2018





**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

*Consent is required from the property owner(s) if an agent will act on their behalf. A separate form is required from each owner. Consent is valid for one year from date of notary, unless otherwise specified. All fields must be completed.*

Project Name: Ashcroft Section 2 Address or PIN #: 166900-79-1467

### AGENT/APPLICANT INFORMATION:

Dand Deyoeng, Riverwind  
(Name - type, print clearly)

114 W. Main Street  
(Address)  
Clayton, NC 27520  
(City, State, Zip)

I hereby give **CONSENT** to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (*list applicable requests*):

Major Subdivision Application  
Rezoning Application

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

### OWNER AUTHORIZATION:

Stephen R. Smith  
(Name - type, print clearly)

1814 N. O'Neil Street Ext  
(Address)

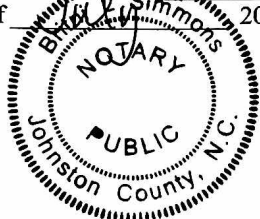
*Stephen R. Smith*  
(Owner's Signature)

Clayton, NC 27520  
(City, State, Zip)

STATE OF North Carolina  
COUNTY OF Johnston

Sworn and subscribed before me, Bertini L. Simmons, a Notary Public for the above State and County, this the 31 day of July, 2020.

SEAL



*Bertini L. Simmons*  
Notary Public

My Commission  
Expires:

5/2/2025

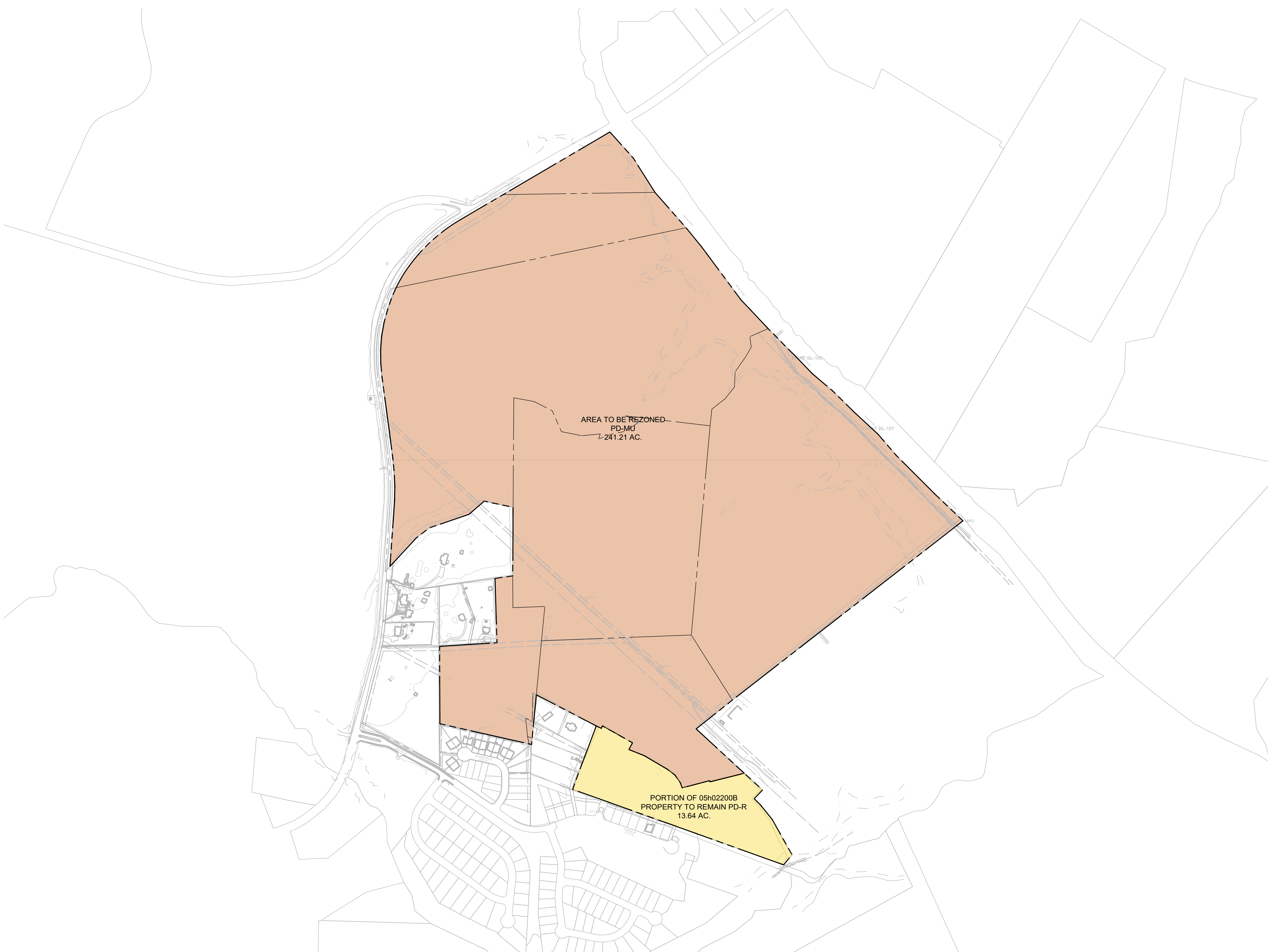
July 2018







L:\Projects\2020\L20017 - Ashcroft\2\DWGS\1-Site Plan\2-Exhibits\2020.09.23 - ZONING MAP.dwg Sep 23, 2020 - 11:37am



**STEWART**  
101 WEST MAIN ST.  
DURHAM, NC 27701  
T 919.380.8750

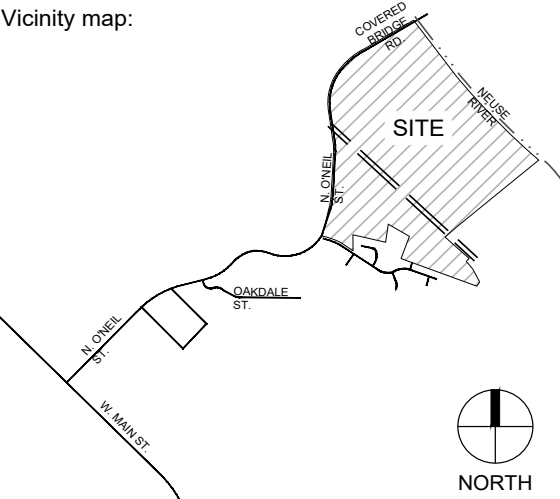
FIRM LICENSE #: C-1051  
www.stewartinc.com  
PROJECT #: L20017

Client:  
RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:  
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

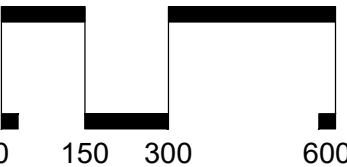
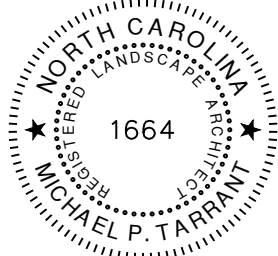
KIMLEY HORN  
421 FAYETTEVILLE ST SUITE 600  
RALEIGH, NC 27601

Vicinity map:



Seal:

PRELIMINARY - DO NOT  
USE FOR CONSTRUCTION



SCALE: 1" = 300'



Project:

**ASHCROFT  
SECTION 2**

Issued for:

**MASTER PLAN**

| No. | Date | Description |
|-----|------|-------------|
|     |      |             |
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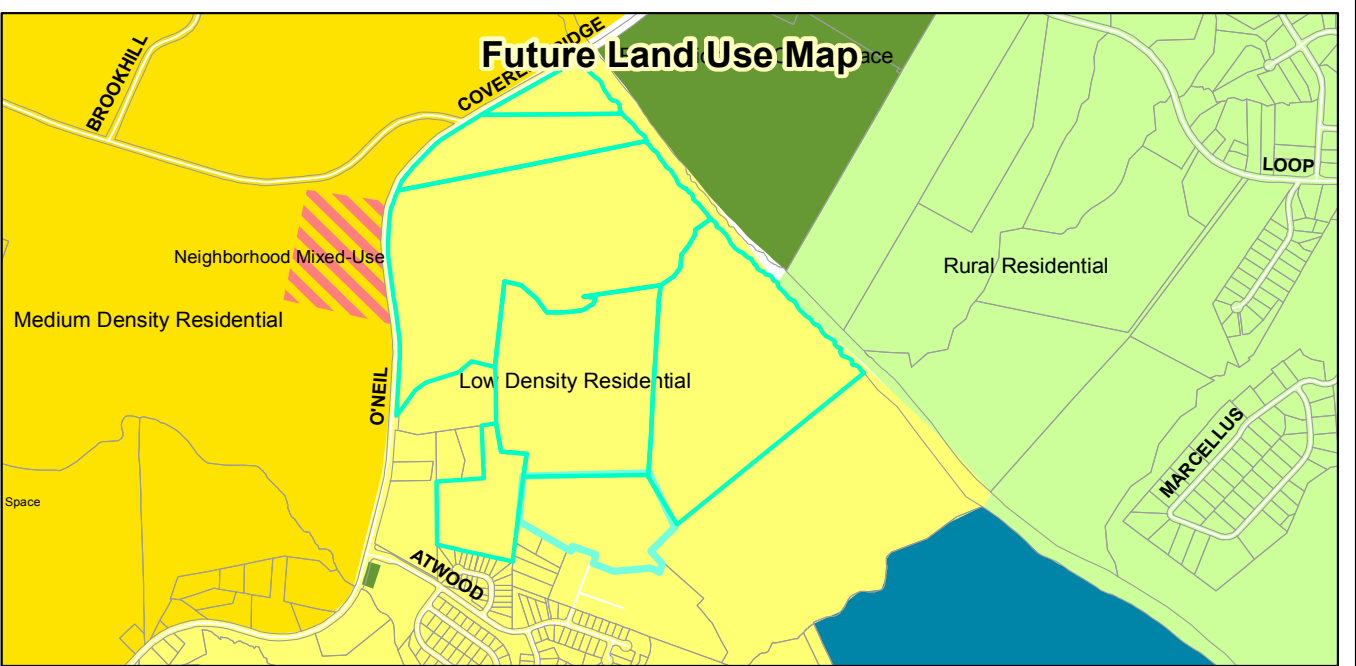
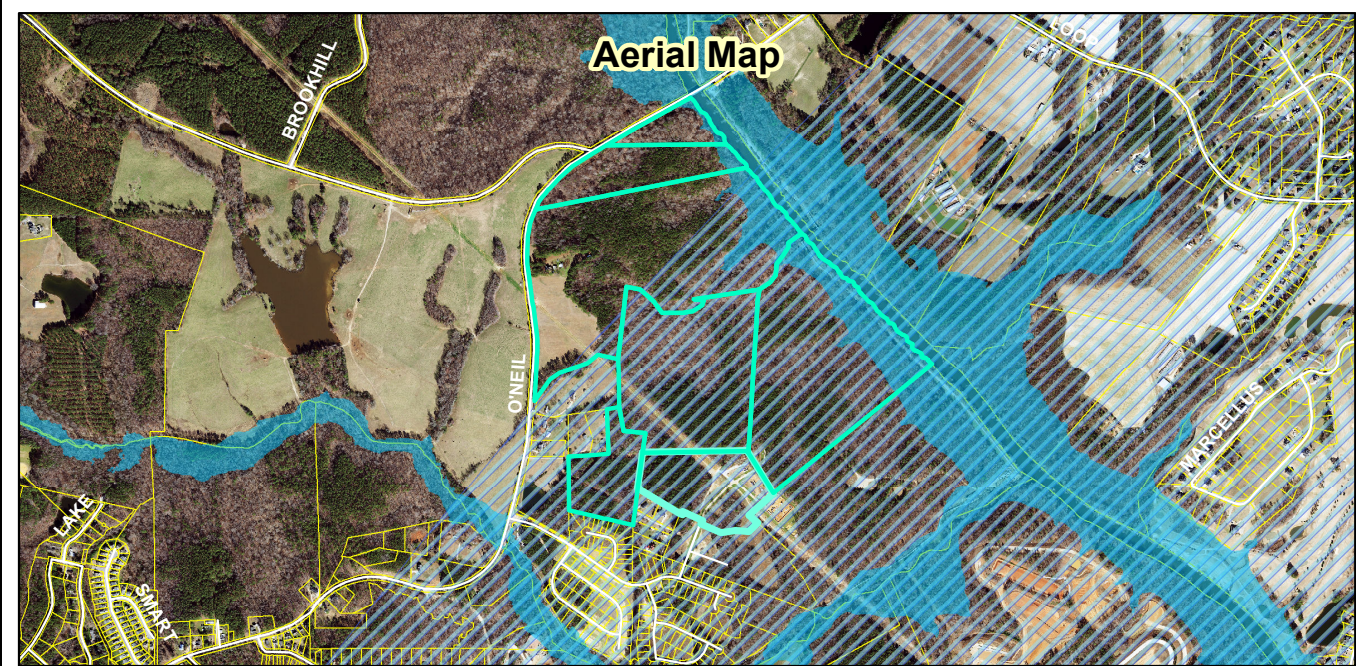
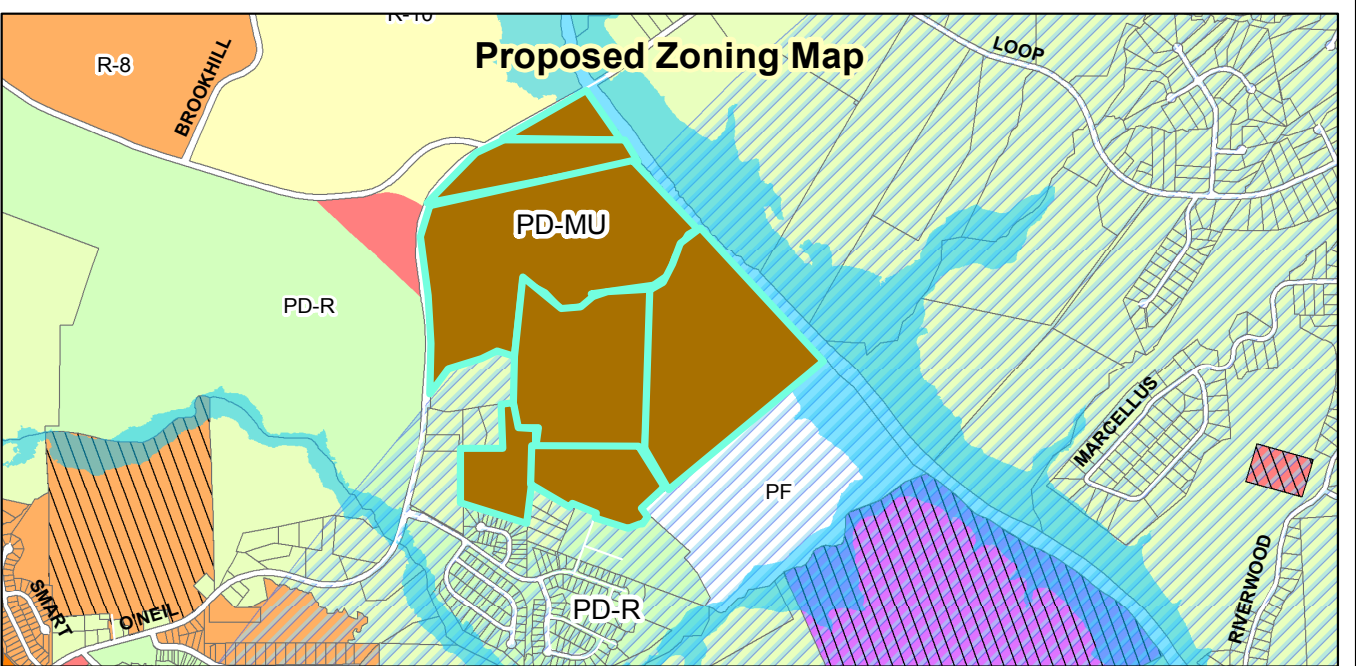
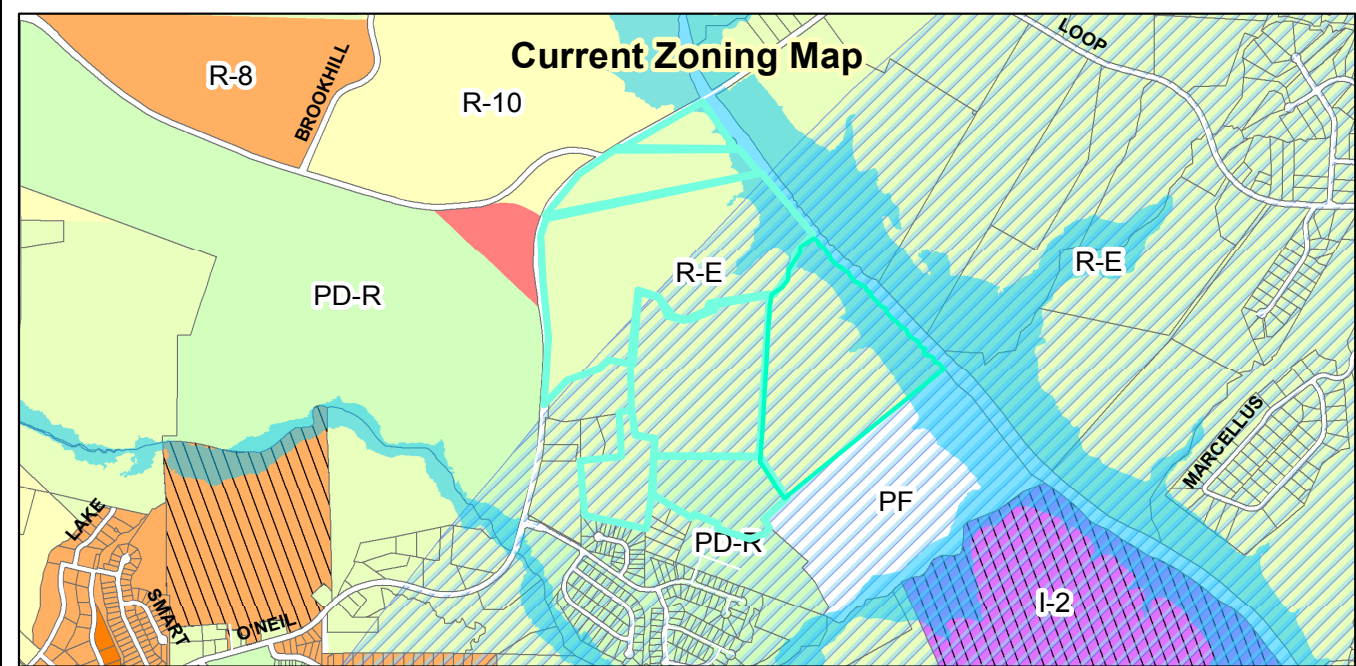
Title:

**SITE PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: MT

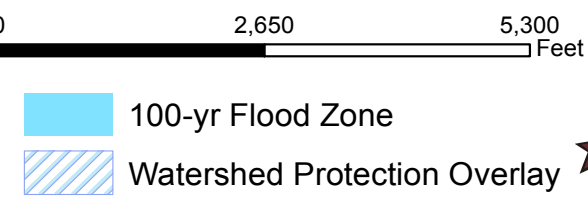
**3.0**





**Ashcroft 2 Planned Development Rezoning, 2020-113-PDD<sup>0</sup>**  
**Ashcroft 2 Preliminary Plat Master Plan, 2020-114-SD**

Applicant: Ashcroft Partners, LLC  
 Property Owners: John Massey, Raymond E. Earp Jr., James Smith,  
 Ashcroft Partners, LLC  
 Tag #(s): 05H02013A, 05H02012, 05H02013, 05H02009A,  
 05H02010A, portion of 05H02200B, 05H02015



**Staff Report Map**  
 Prepared by: TOC Planning Department  
**August 31, 2020**

Disclaimer: Town of Clayton assumes no legal responsibility  
 for the quality fo the data represented here.



Document Path: O:\PLANNING\REZONING\Planned Developments\2020\2020-113-PDD Ashcroft Section 2\Staff Report Maps\Ashcroft 2 Map.mxd





Town of Clayton  
Planning Department  
111 E. Second Street, Clayton, NC 27520  
P.O. Box 879, Clayton, NC 27528  
Phone: 919-553-1545

*Town Council  
February 1, 2021*

## STAFF REPORT

**Application Number: 2020-113- PDD**  
**Project Name: Ashcroft 2 Planned Development Rezoning**

**Tag #(s):** 05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of 05H02200B, 05H02015

**Location:** N O'Neil Street; north of Ashcroft Subdivision

**Overlay:** Partially in the Watershed Protection Overlay

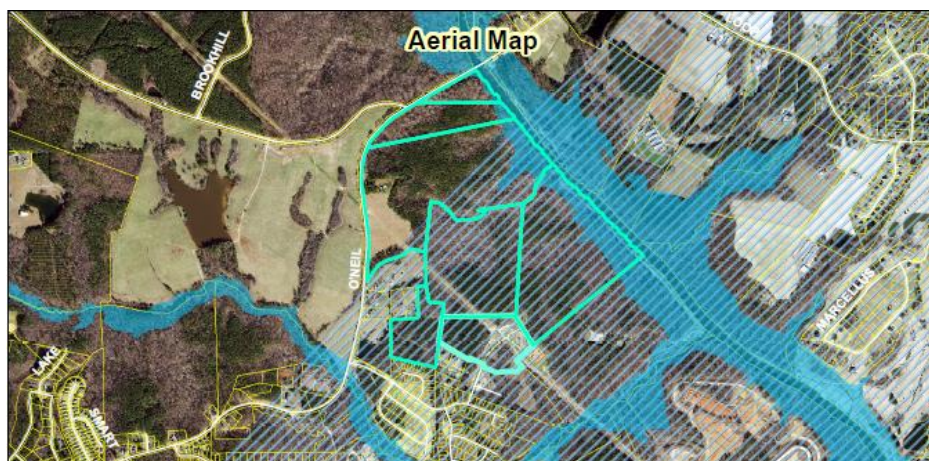
**Applicant:** Ashcroft Partners LLC

**Owner(s):** John W Massey, Raymond E Earp, Jr., James Smith, Ashcroft Partners LLC

**Public Noticing Dates:**

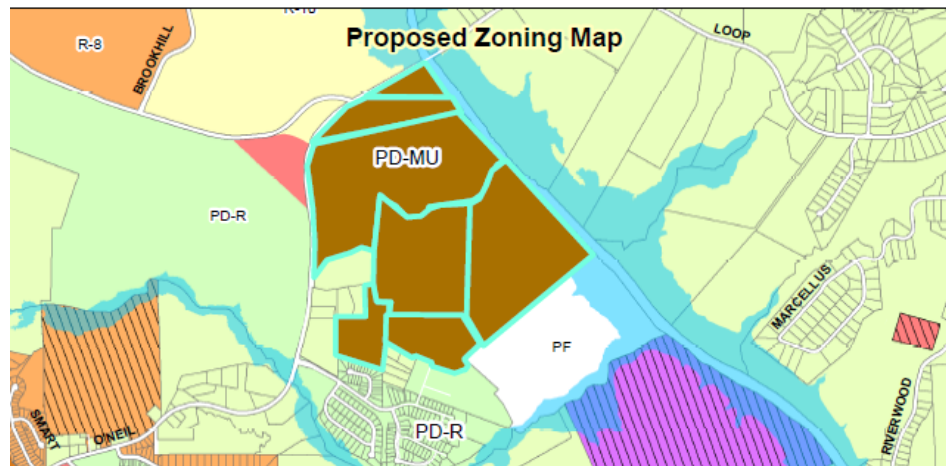
- **Neighborhood Meeting:** September 3, 2020
- **Sign Posted:** January 20, 2021
- **Letters Mailed:** January 20, 2021
- **Newspaper Ad published:** January 20, 2021 and January 27, 2021

**REQUEST:** Request to rezone 241.21 acres of land from Residential-Estate (R-E) and Planned Development Residential (PD-R) to Planned Development Mixed Use (PD-MU). This request is running concurrently with an associated preliminary plat (2020-114-SD), which is serving as a master plan for the development.



**SITE DATA:****Acreage:** 241.21 acres**Existing Use:** Vacant & Single-family**ADJACENT ZONING AND LAND USES:**

| Direction | Zoning                                                            | Existing Use(s)                                        |
|-----------|-------------------------------------------------------------------|--------------------------------------------------------|
| North     | Residential-10 (R-10) & Residential-Estate (R-E)                  | Vacant/Single Family Residential/Clayton River Walk    |
| South     | Planned Development Residential (PD-R) & Residential-Estate (R-E) | Single-Family Residential (including Ashcroft 1)       |
| East      | Public Facilities (PF) & Residential-Estate (R-E)                 | Vacant / Single-Family Residential                     |
| West      | Planned Development Residential (PD-R)                            | Vacant (approved for Steeplechase Meadows Subdivision) |

**STAFF ANALYSIS AND COMMENTARY:****Overview**

The applicant is requesting to rezone the subject properties from Residential-Estate (R-E) and Planned Development-Residential (PD-R) to Planned Development Mixed Use (PD-MU). All of the properties in this request are zoned Residential-Estate currently, with the exception of one parcel that is zoned Planned Development Residential. The applicant is proposing to rezone the northern portion of that parcel to PD-MU and leave the southern portion as PD-R as that portion is a part of the Ashcroft 1 development. The properties are located off N O'Neil Street, just north of the existing Ashcroft subdivision and south of the Neuse River. This application is running concurrently with a preliminary plat application (2020-114-SD), which is serving as a master plan for the overall development. The master plan will outline the permitted uses and dimensional standards within the proposed development.

#### **Consistency with Surrounding Land Uses**

The proposed rezoning request is overall consistent with the surrounding land uses which are primarily single-family residential uses. Ashcroft 1 is located directly south of the proposed development, as well as some stand-alone single-family residences. Ashcroft 1 is zoned Planned Development-Residential. Directly across O'Neil Street is land that was recently approved for the Steeplechase Meadows Planned Development, as well as a vacant parcel zoned Neighborhood Business (B-2).

#### **Consistency with the Comprehensive Plan 2040**

The subject parcels are designated as "Low Density Residential" in the Comprehensive Plan 2040's Future Land Use Map. Per the plan, this designation recommends predominately suburban development of low-density single-family residential lots. The plan also states that mixed residential uses may occur under a Planned Development-Residential designation so long as the density of 3 units/acre is not exceeded. This designation does not account for any type of commercial development. The proposed Planned Development-Mixed Use District would be governed by the associated Master Plan 2020-114-SD which proposes 3.03 units/acre and a commercial component.

Despite inconsistency with the Future Land Use Map, staff is comfortable with the proposed zoning designation of PD-MU. The proposed density of the associated master plan is just over the 3 units/acre envisioned for Low Density Residential, and with the future northern connector running through these parcels the future land use map designation of the surrounding area will likely be modified as part of the Town's Comprehensive Plan update. Additionally, these properties are located in close proximity to land currently designated for "Medium Density Residential" and "Neighborhood Center", directly across O'Neil Street. It is also worth noting that since this is a Planned Development district, the specific uses and densities are governed by the associated Master Plan that is subject to approval by the Town Council. This allows for additional discretion over the uses and layout of the development to ensure that it remains consistent with the intent of the Comprehensive Plan while still allowing for unique and innovative development.

If approved, the future land use map would be updated automatically. Staff recommends the map be updated to "Medium Density Residential" designation for the subject parcels, with a "Neighborhood Center" overlay on the commercial portion. A map depicting this proposal is outlined in the attached consistency and reasonableness statement.

The proposed rezoning is consistent with the following Goals of the Comprehensive Plan 2040:

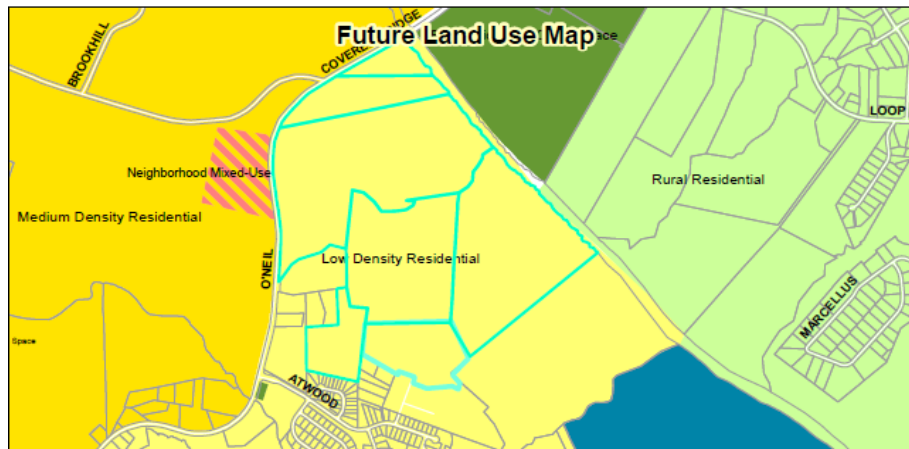
Comprehensive Plan Goals supporting the rezoning request include:

- **Goal LU1:** Preserve Clayton's small-town character while allowing for growth and development in appropriate areas.
- **Goal H1:** Encourage a range of housing types and lot sizes that meets the needs of various income levels, family sizes, and ages.

Comprehensive Plan Goals not supporting the rezoning request include:

- None.





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#### CONSIDERATIONS:

- Planning Board recommended Approval of the proposed Rezoning request.
  - Rezoning is decided by the Town Council.
  - When adopting or rejecting the rezoning, the Town Council shall approve a statement describing whether its action is consistent with adopted plans and/or policies of the Town and explaining why the Council considers the action taken to be reasonable and in the public interest.
  - If the Town Council approves a rezoning that is inconsistent with the Future Land Use Map then the map will automatically be updated.
- 

#### ATTACHMENTS:

- 1) Application
- 2) Staff Report Maps
- 3) Neighborhood Meeting Materials
- 4) Survey
- 5) TC Adjacent Property Letter
- 6) Newspaper Ad
- 7) Consistency & Reasonableness Statement



Date - August 20th, 2020

Dear Clayton Area Property Owner:

The purpose of this letter is to notify you of an application filed with the Town of Clayton for a development proposal involving property adjacent to, or in close proximity to, property shown in your ownership by Johnston County tax records. Per Town of Clayton regulations, a Neighborhood Meeting will be held to provide information to area residents about the proposal. A representative of the applicant will be present to explain their application, answer questions, and solicit comments. The following provides details for the Neighborhood Meeting:

**Meeting Date:** Thursday September 3rd 2020  
**Meeting Time:** 6:00 - 8:00 PM  
**Meeting Location:** Virtual Meeting - Use the link to join! <https://us02web.zoom.us/j/89830589700>

**Type of Application:** Major Subdivision Application/Rezoning  
**Project Address:** SE Quadrant of Covered Bridge Rd. and Neuse River

**Project Description:** Ashcroft Section 2 is a proposed 256 acre mixed-use neighborhood development located in the southeast quadrant of the intersection Covered Bridge Road and the Neuse River. The development plan includes 772 residential units (293 single family units, 299 townhome units, and 180 apartment units); and 105,000 square feet of commercial uses. The project includes the alignment for the Town's future North Connector, ; a variety of open space amenities which tie to the Town's existing greenway network; and a recreation/amenity area with clubhouse, pool, and playground. It is anticipated that the project will be developed in multiple phases over time, based on market demand and to meet the needs and functionality of the community during construction.

**Public Meeting:** The project will be heard by the Town of Clayton Planning Board is scheduled for MONTH ##, 2020. (Date is subject to change)

At a minimum, the following will be available for your inspection at the Neighborhood Meeting:

- A copy of the project application.
- A schedule of all upcoming public meetings for the application.
- A map at a scale that is appropriate to the project and shows neighboring properties and roads.
- A map, drawing, or other depiction of the proposed land use change or development proposal.

Enclosed with this letter is a map showing the location of the property that is subject to Major Site Plan approval.

If you have any questions prior to or after this meeting, you may contact us at 919-813-0123. You may also contact the Town of Clayton Planning Department at 919-553-5002.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D. DeYoung', is written over a large, faint, light blue 'WILD' watermark.

David DeYoung, AICP  
Director of Development

Cc: Town of Clayton Planning Department

**THE RIVER WILD TEAM.COM**

114 W. Main Street, Clayton, NC 27520 | 919.813.0123

## NEIGHBORHOOD MEETING ATTENDANCE ROSTER

**Project:** Ashcroft Section 2

**Application:** Rezoning

**Location/Date:** Virtual/Zoom - September 3rd, 2020 - 6:00 - 8:00 pm

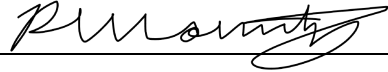
|    | NAME                          | ADDRESS                              |
|----|-------------------------------|--------------------------------------|
| 1  | Dave DeYoung                  | RiverWild                            |
| 2  | Becca Mountz                  | RiverWild                            |
| 3  | Tim Summerville               | STEWART - Consult                    |
| 4  | May Offutt                    | 128 Highmeadow Lane Clayton NC 27520 |
| 5  | Steve Smith                   | 1814 N ONeil Street Clayton NC 27520 |
| 6  | Duane Gott and Chris Mitchell | 180 Highmeadow Lane Clayton NC 27520 |
| 7  |                               |                                      |
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## NEIGHBORHOOD MEETING SUMMARY FORM

### FILL OUT THE FOLLOWING:

Application: Rezoning  
Date of Mailing: August 20th 2020  
Date of Meeting: September 3rd 2020 Time of Meeting: 6:00-8:00 pm  
Location of Meeting: Virtual / Zoom

I hereby attest that letters were mailed to the addresses listed on the Adjacent Property Owners List (attached) ten days prior to the Neighborhood Meeting, and that all required information was presented at the Meeting:

Printed Name: Rebecca Mountz Signature: 

**Meeting Summary/Minutes:** *provide a summary of the discussion held at the meeting, including issues raised and any resolution discussed, and any changes made to the application as a result of the meeting.*

See attached document for meeting minutes.

*Please write clearly (or submit a typed summary). Use additional sheets if necessary.*



# RIVER WILD

## Ashcroft Section 2 Neighborhood Meeting Notes 6:00 - 8:00 PM 9/3/2020

### Attendance

Dave DeYoung - RiverWild

Becca Mountz - RiverWild

Tim Summerville - Stewart

May O. 128 highmeadow lane

Steve

Duane and Chris 150 highmeadow lane

### ***Dave DeYoung goes through his presentation. The following comments are made and responded to.***

May O.- Stated that she lives in the connected townhome villas and side of woods and wondering how much of the wooded area and trees will be removed for the project?

Dave - Explains the concept of blue lined streams and protection areas, also explains buffers around property and how there will also be a new wastewater treatment plan.

Steve- amenities question about the gold course asking if it will be a shared amenity between riverwood and wondering if all amenities will be shared.

Dave - Explains how sites are programmed to have capacity to cater to residents but also cater to shared membership amenities at surrounding neighborhoods.

May - Asked clarification on what the northern connector was.

May - When does phase one start?

Dave - Explains multi phase development starting where ashcroft 1 ends. And talks about access to the neighborhood being more than just through current ashcroft. Points out the intended change to the concept design regarding the access road south of powerlines being moved north of power lines.

Steve - Will there be a grocery store in the shopping center?

Dave- Explains that we would love to have that in the area but with covid we have to see what the market is and what it would warrant closer to that phase of development.

### ***Dave DeYoung goes through his presentation again since more people have joined the meeting. The following comments are made and responded to.***

Duane and Chris - Asked the construction timeline.

Dave - Explains multi phase development starting where ashcroft 1 ends. And talks about access to the neighborhood being more than just through current ashcroft.

Duane and Chris - Asking about the treeline behind highmeadow if it is being cleared or not

Dave - Points out the required buffer but also shows that there is green space located throughout the plan.

Chris - What does hoa cost look like? Will ours go up?

Dave - Doesn't think that the hoa dues would go up substantially, but we really don't have a set answer but Dave will get back to chris on that information - need email address

Chris - What will this do to current home values?

Dave- Currently the trend is when we build a phase it will be one price point but the demand pushes the price up - used east river example of phased price changes.

# RIVER WILD

**May** - How do you think a water treatment plant will affect this development?

**Dave** - The town needs more capacity and so it needs to happen. We don't think that it would be a problem - we wouldn't put one acre estate homes next to it if we did.

**Steve** - What is price point of units from townhomes to estate homes?

**Dave** - Explains current price points in similar neighborhoods but points out that the estate home will be custom homes. We are looking to up our game with having this many different types of homes in one area. Truly want a mixed use development.

**May** - It is super cool to have a mixed use because you have so many different people.

**Chris** - Asking about the peoples houses that are offered from covered bridge that are not in the property of section 2.

**Dave** - Explains that everything in the plan is under contract and how those properties adjacent not in color on the map did not wish to sell their land.

**Steve** - When will the construction of the wastewater treatment plant begin?

**Dave** - The town is pushing hard to get it built and start building in the spring.

| MAILING ADDRESS             | CITY         | STATE | ZIP        | OWNNAME                             | OWNNAME2                            | PARCEL NUMBER(S)                                                                                                        |
|-----------------------------|--------------|-------|------------|-------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|                             |              |       |            |                                     |                                     | 166900-88-7300 166900-75-9962<br>166900-76-7649<br>166900-76-6086<br>166900-66-9129<br>166900-76-1254<br>166900-74-2974 |
| 114 W MAIN ST STE 102       | CLAYTON      | NC    | 27520-2397 | ASHCROFT PARTNERS, LLC              |                                     |                                                                                                                         |
| 142 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | BARRETT, SANDRA LIFE ESTATE         | PARRISH, MICHELLE BARRETT REMAINDER | 166900-66-5624                                                                                                          |
| 1380 N ONEALS ST            | CLAYTON      | NC    | 27520      | BENSON, AMANDA LEIGH                |                                     | 166900-76-1783                                                                                                          |
| 1378 B NORTH O'NEAL EXT     | CLAYTON      | NC    | 27520-0000 | BENSON, ANTHONY MARK                |                                     | 166900-76-0637 166900-76-0536<br>166900-66-9886                                                                         |
| 116 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | BRIAN E. PRUSANK LIVING TRUST       |                                     | 166900-66-6612                                                                                                          |
| 170 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | CAPERS, ANJOLINA WASHINGTON         | CAPERS, TERRELLE CLARENCE           | 166900-66-4637                                                                                                          |
| 196 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | COX, CHARLOTTE                      |                                     | 166900-66-2665                                                                                                          |
| 1907 LAKE WENDELL RD        | WENDELL      | NC    | 27591-7158 | DUDLEY, BLAINE T.                   |                                     | 166900-66-3711                                                                                                          |
| 2019 HARDEE LN              | CLAYTON      | NC    | 27520-9822 | HARDEE, JOSEPH T                    |                                     | 166900-85-1038                                                                                                          |
| 1039 CROCKER RD             | SMITHFIELD   | NC    | 27577-9033 | HICKERSON, PATSY POOLE              |                                     | 166900-67-3527                                                                                                          |
| 88 HIGHMEADOW LN            | CLAYTON      | NC    | 27520-5712 | HILL, DEBORAH                       |                                     | 166900-66-7585                                                                                                          |
| 106 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | JERRY AND FAITH LAYTON LIVING TRUST | LAYTON, JERRY CLINTON TRUSTEE       | 166900-66-6661                                                                                                          |
| 1538 NORTH ONEIL STREET EXT | CLAYTON      | NC    | 27520-0000 | JONES, TRACY L                      |                                     | 166900-68-3043                                                                                                          |
| 8041 ST ANDREWS DR          | LAURINBURG   | NC    | 28352-0000 | MASSEY, JOHN WESLEY                 |                                     | 176000-70-3713 166900-78-4101<br>166900-67-5094                                                                         |
| 180 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | MITCHELL, CHRIS D.                  | GOTT, DUANE ANTONY                  | 166900-66-3790                                                                                                          |
| 128 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | OFFUTT, MAY                         | HUGHES, LLOYD                       | 166900-66-5674                                                                                                          |
| 156 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | RAFFEL, MARY                        | RAFFEL, BRANDON                     | 166900-66-4676                                                                                                          |
| 7230 NC HIGHWAY 42 E        | SELMA        | NC    | 27576-6005 | RAYMOND E EARP JR REVOCABLE TRUST   | EARP, NANCY CREWS TRUSTEE           | 176000-60-9362<br>166900-39-5182                                                                                        |
|                             |              |       |            |                                     |                                     | 166900-76-2281 166900-76-5170<br>166900-76-4165<br>166900-76-2203<br>166900-76-1202                                     |
| 114 W MAIN ST STE 102       | CLAYTON      | NC    | 27520-2397 | RMS INVESTMENTS, LLC                |                                     |                                                                                                                         |
| 96 HIGHMEADOW LN            | CLAYTON      | NC    | 27520-5712 | SHARON HOUTMAN FAMILY TRUST         |                                     | 166900-66-7640                                                                                                          |
| 1814 N ONEIL STREET EXT     | CLAYTON      | NC    | 27520-6236 | SMITH, JAMES D.                     | JEAN K. SMITH TRUST                 | 166900-79-1467                                                                                                          |
|                             | CLAYTON      | NC    | 27528-0000 | TOWN OF CLAYTON                     |                                     | 166900-96-3988 176000-80-8682                                                                                           |
| 1376 NORTH ONEIL STREET EXT | CLAYTON      | NC    | 27520-0000 | WALL, STEVIE GLENN                  | WALL, JACKIE                        | 166900-76-0405                                                                                                          |
|                             |              |       |            |                                     |                                     | 166900-76-7044 166900-76-4107<br>166900-76-7092<br>166900-76-6028                                                       |
| 350 WAGONER DR              | FAYETTEVILLE | NC    | 28303-4647 | WEAVER HOMES, INC                   |                                     |                                                                                                                         |
| 283 GLEN RD STE A           | GARNER       | NC    | 27529-6240 | WESTAN CONSTRUCTION, LLC            |                                     | 166900-76-5112                                                                                                          |
| 9728 CYPRESS FARM DR        | ZEBULON      | NC    | 27597-6700 | WOODS, PAMELA POOLE                 |                                     | 166900-67-4589                                                                                                          |
| 1500 N ONEIL STREET EXT     | CLAYTON      | NC    | 27520-6959 | SPENCE, DEANNA JONES                |                                     | 166900-57-9493                                                                                                          |
| PO BOX 879                  | CLAYTON      | NC    | 27528-0000 | TOWN OF CLAYTON                     |                                     | 166900-96-3988                                                                                                          |

**TOWN OF CLAYTON**  
**ZONING AMENDMENT**  
**CONSISTENCY AND REASONABLENESS STATEMENT**

2020-113-PDD Ashcroft 2 Planned Development Rezoning

The Town Council of the Town of Clayton hereby states:

**Section 1:** The above referenced zoning amendment IS APPROVED.

**Section 2:** The above referenced zoning amendment AMENDS THE FOLLOWING PLAN(S):

The Town of Clayton's Comprehensive Plan 2040, specifically:

- **Future Land Use Map – Modify the properties from “Low Density Residential” to “Medium Density Residential” with a “Neighborhood Center” designation over the portion along O’Neil Street that is shown to contain commercial uses in the associated master plan 2020-114-SD. See attached map.**

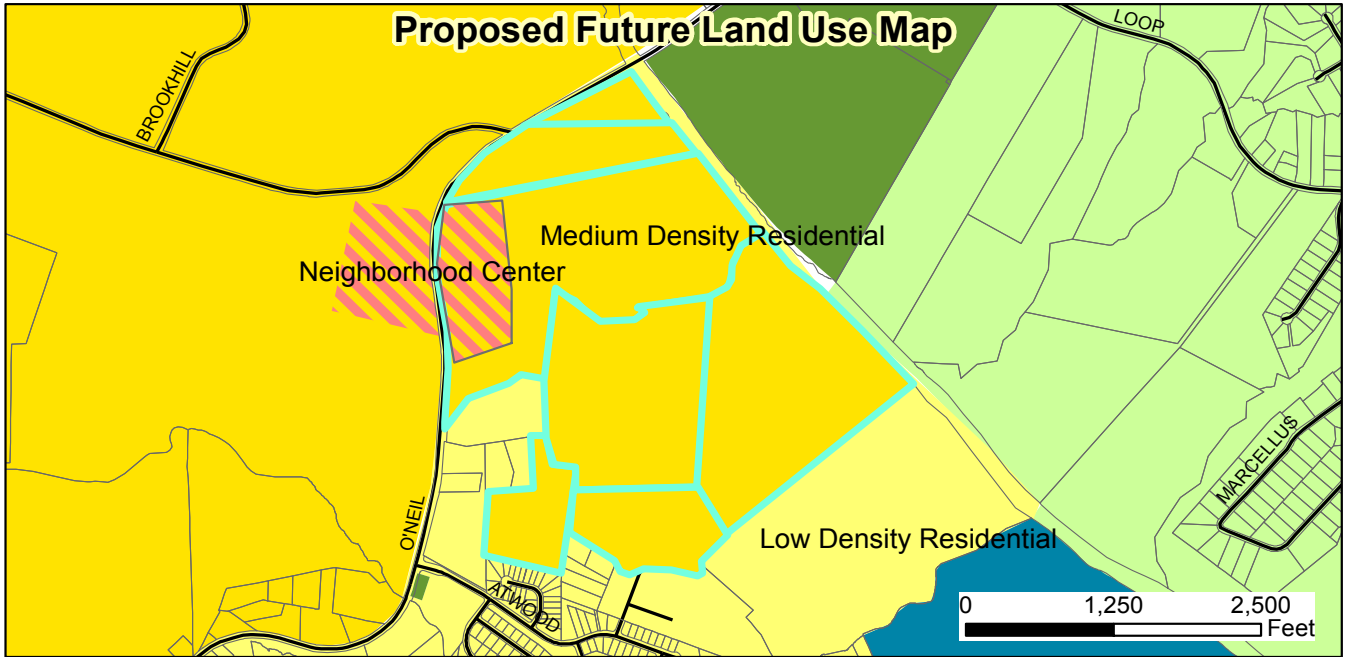
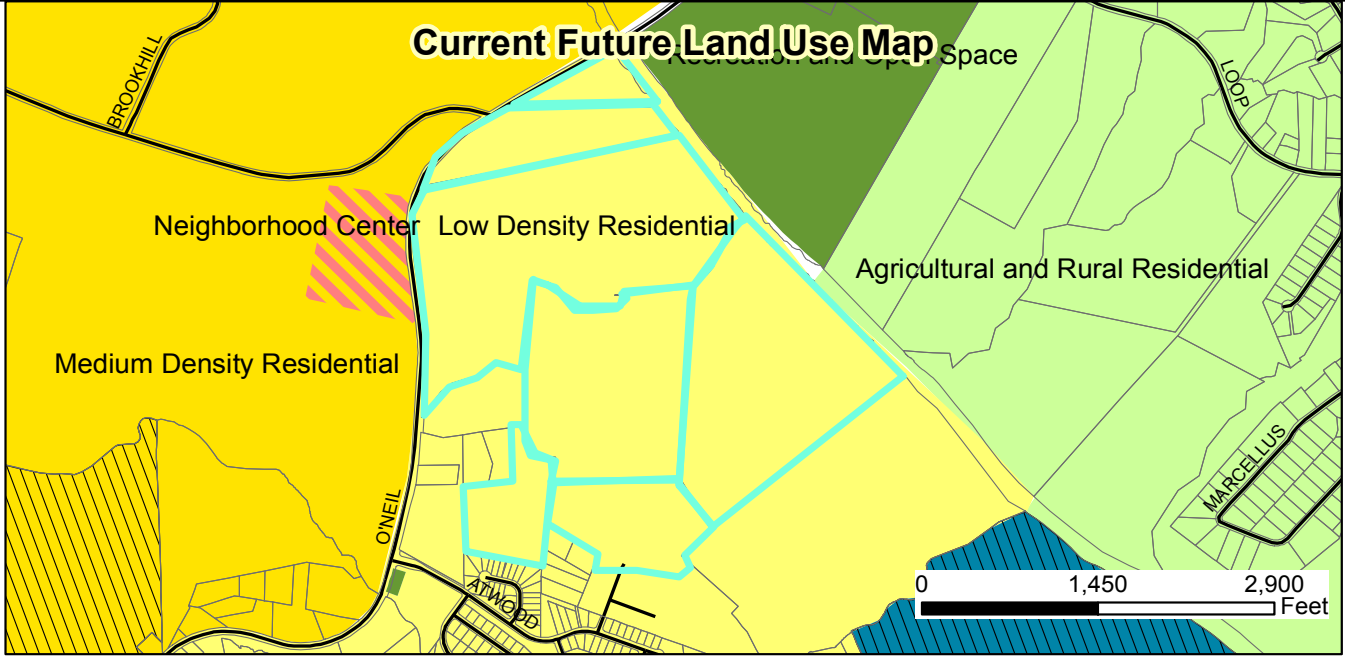
**The proposed rezoning from Residential-Estate (R-E) to Planned Development Mixed Use (PD-MU) is not consistent with the future land use map designation of “Low Density Residential”. Per the Comprehensive Plan 2040, low density residential is predominately single-family residential uses but may include a mixture of residential uses in a Planned Development so long as the density does not exceed 3 units/acre. The “low density residential” designation does not envision commercial development. The proposed associated master plan (2020-114-SD) proposes 3.03 units/acre and incorporates a commercial component.**

**Section 3:** Based upon information presented at the public hearings and by the applicant, and based upon the recommendations and detailed information developed by staff and the Planning Board contained in the staff report, and considering the criteria applicable sections of the Unified Development Code of the Town of Clayton, the above referenced zoning amendment is reasonable and in the public interest.

**The proposed rezoning is consistent with the current development pattern in this area and the modification to the future land use map would be consistent with properties directly across N O’Neil Street that are currently designated as “Medium Density Residential” with a “Neighborhood Center” component. Additionally, despite the inconsistency with the Future Land Use Map designation, the proposed rezoning is still consistent with the following goals and objectives of the Comprehensive Plan 2040:**

- **Goal LU1: Preserve Clayton's small-town character while allowing for growth and development in appropriate areas.**
- **Goal H1: Encourage a range of housing types and lot sizes that meets the needs of various income levels, family sizes, and ages.**





**Future Land Use Map Modification**  
**Aschroft 2 Planned Development Rezoning, 2020-113-PDD**  
**Consistency & Reasonableness**

12/02/2020  
Produced by: TOC Planning  
Disclaimer: Town of Clayton assumes no legal  
responsibility for the quality of the data  
represented here.



Document Path: \\TOC-FILE-01\Shares\ComDev\Planning\PLANNING\REZONING\Planned Developments\2020\2020-113-PDD Ashcroft Section 2\Consistency Statement\Consistency Statement 2020-113-PDD.mxd

**TOWN OF CLAYTON  
PLANNING BOARD WRITTEN RECOMMENDATION  
Planned Development Rezoning**

**2020-113-PDD Ashcroft 2 Planned Development Rezoning**

On September 28, 2020 the Planning Board heard the above-referenced request and made the following vote:

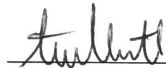
Recommendation to the Town Council to

☒ approve the request

☐ deny the request.

Recommendation(s) made this 28<sup>th</sup> day of September 2020 while in regular session.

Signed:



\_\_\_\_\_  
Andria Merritt, Planning Board Chair

### **PUBLIC NOTICE**

In accordance with NC GS 160A-364 the Clayton Town Council will hold a public hearing and evidentiary hearing on Monday, February 1, 2021, at 6 PM at Town Hall, 111 East Second Street, to consider the following requests:

- 2020-113-PDD Ashcroft 2 Planned Development Rezoning; request to rezone 241 acres from Residential-Estate (R-E) and Planned Development Residential (PD-R) to Planned Development Mixed Use (PD-MU). The properties are located off O'Neil Street, south of Neuse River and north of the existing Ashcroft subdivision. TAG#s: 05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of 05H02200B, 05H02015
- 2020-114-SD Ashcroft 2 Preliminary Plat Master Plan; request for a master plan develop 241 acres of land for commercial and residential uses. The plan includes up to 105,000 SF of commercial and up to 772 residential units. The properties are located off O'Neil Street, south of the Neuse River and north of the existing Ashcroft subdivision. TAG #s: 05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of 05H02200B, 05H02015

For the Rezoning the Town Council will hold a public hearing. The Clayton Town Council reserves the right to approve the request as presented or any portion of the request without necessity of withdrawal or modification of the application or additional public hearing on the matter. Likewise, the Town Council may designate approval to the district requested or another district or districts without modification of the request or additional public hearing.

For the Preliminary Plat (Master Plan) the Council will hold an evidentiary hearing. During an evidentiary hearing, the Clayton Town Council must make findings of fact based upon sworn testimony and other credible evidence. Citizens may give testimony in an evidentiary hearing after they have taken an oath.

This is an open meeting and the public is invited to attend.

**Samantha Wullenwaber, Planning Director**  
**919-553-5002**

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**The Johnstonian Newspaper**

**Please advertise on the following dates:**

**Wednesday, January 20, 2021**

**Wednesday, January 27, 2021**

**Affidavit of publication required.**



Town of Clayton  
Planning Department  
111 E. Second Street, Clayton, NC 27520  
P.O. Box 879, Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

January 20, 2021

**NOTICE**

**SUBJECT:**      **Project:**      2020-113-PDD Ashcroft 2 Planned Development District Rezoning  
2020-114-SD Ashcroft 2 Preliminary Plat Master Plan  
2020-114-SD Ashcroft 2 Development Agreement  
**Address:**      Located off N O'Neil Street, South of the Neuse River  
**TAG #(s):**      05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of  
05H02200B, 05H02015  
**Applicant:**      Ashcroft Partners, LLC

Dear Clayton Area Property Owner:

Notice is hereby given that the Clayton Town Council will hold an evidentiary hearing on **Monday, February 1, 2021 at 6:00 PM**, to make a decision on the above referenced project. The subject parcels total 241.21 acres in size. They are located off N O'Neil Street, south of the Neuse River. See the map on the back of this letter.

The Town Council will hold a public hearing to consider the above referenced rezoning application and development agreement. The applicant is proposing to rezone the subject parcels from Residential-Estate (R-E) and a portion of a parcel from Planned Development Residential (PD-R) to Planned Development Mixed Use (PD-MU). The Town Council will hold an evidentiary hearing to consider the above referenced Preliminary Plat Master Plan application. The applicant is requesting master plan approval for a mixed use development on the subject parcels that will include up to 105,000 SF of commercial development and 772 residential units, comprising of a mixture of single-family, townhome, and apartment units.

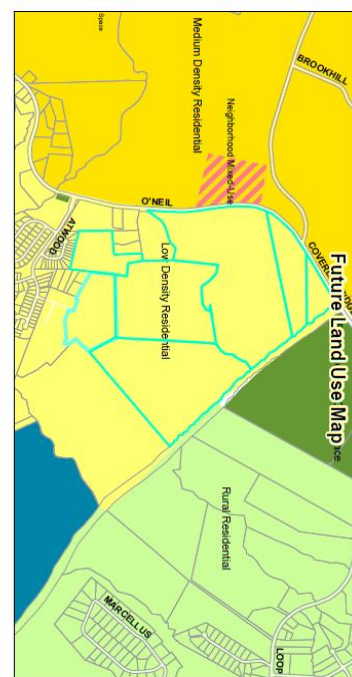
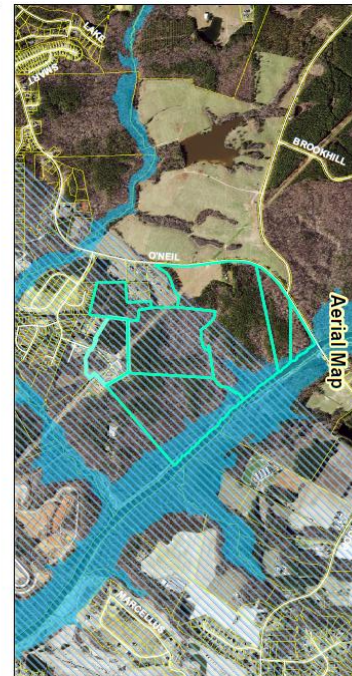
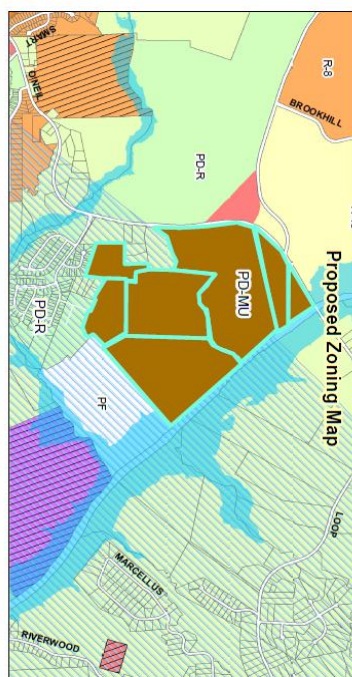
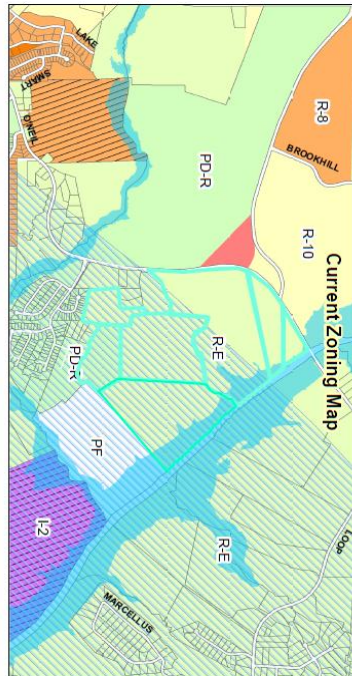
During a public hearing, the Council reserves the right to approve the request as presented or any portion of the request without necessity of withdrawal or modification of the application or additional public hearing on the matter. Likewise, the Town Council may designate approval to the district requested or another district or districts without modification of the request or additional public hearing. During an evidentiary hearing, the Clayton Town Council must make findings of fact based upon sworn testimony and other credible evidence. Citizens may give testimony in an evidentiary hearing after they have taken an oath. Based upon records in the Johnston County Tax Office, you are the owner of property that is within 100 feet of this proposed rezoning request. You are invited to join this meeting and express your opinions on this request to the Town Council.

If you should need additional assistance or information, please contact the Planning Department at (919) 553-5002 or email at [hhogg@townofclaytonnc.org](mailto:hhogg@townofclaytonnc.org).

Sincerely,

Haley Hogg, ACIP, CZO  
Senior Planner





**Ashcroft 2 Planned Development Rezoning, 2020-113-PDD 0**  
**Ashcroft 2 Preliminary Plat Master Plan, 2020-114-SD**

Applicant: Ashcroft Partners, LLC  
 Property Owners: Ashcroft Partners, LLC  
 Design: Raymond E. Camp Jr., James Smith, LLC  
 Tag #s: 05H02013A, 05H02012, 05H02013, 05H0209A, 05H02010A, portion of 05H02206, 05H02015

**Staff Report Map**  
 Prepared by: TOC Planning Department  
 August 31, 2020

Disclaimer: Town of Clayton assumes no legal responsibility for the quality to the data represented here.

Document Path: O:\PLANNING\ZONING\Planned Development\113-PDD-Ashcroft Section 25\Staff Report Map\Ashcroft 2 Map.mxd

**AN ORDINANCE AMENDING THE ZONING ORDINANCE AND  
ZONING MAP  
OF THE TOWN OF CLAYTON, NORTH CAROLINA**

**WHEREAS** a petition has been filed with the Town Council of the Town of Clayton requesting an amendment to the Zoning Ordinance and Zoning Map of the Town of Clayton to include in the Planned Development Mixed Use (PDMU) zone the property described below, said property formerly being zoned Residential-Estate (R-E) and 1and Planned Development Residential (PDR); and

**WHEREAS** said property is owned by John W Massey, Raymond E. Earp Jr., James Smith, Ashcroft Partners LLC; and

**WHEREAS** the Planning Board of the Town of Clayton has reviewed the proposed change(s) and made a recommendation thereupon; and

**WHEREAS** notice of a public hearing to consider the proposed change was published in accordance with law in the Johnstonian, a local newspaper, as required by Section 155.702(D) of the Clayton Unified Development Code and by Section 160A-364 of the North Carolina General Statutes; and

**WHEREAS** a notice of the proposed zoning classification action was mailed to the owner(s) of the parcel(s) of land involved, as shown on the County Tax Listings, and to the owners of all parcels of land abutting that (those) parcel(s) of land and within 100 feet of the subject parcel(s) of land, as shown on the County Tax Listings, by depositing a copy of the same in the United States Mail, first class postage paid, as required by Section 155.702(D) of the Zoning Ordinance of the Town of Clayton and by Section 160A-384 of the General Statutes; and

**WHEREAS** the said public hearing was actually conducted at 6:00 p.m. on February 15, 2021wherein a reasonable opportunity was given to all those in attendance to speak either in favor or against the said change or to make relevant comments;

**THEREFORE**, after duly considering the matter, THE TOWN COUNCIL OF THE TOWN OF CLAYTON DOES HEREBY ORDAIN:

**SECTION 1.** That the Unified Development Code of the Town of Clayton is hereby amended to include in the Planned Development Mixed Use (PDMU) zone the following described property:

General Description:

N. O'Neil Street; north of Ashcroft Subdivision

Specific Description:

NC Parcel Identification Numbers: 76000-70-3713; 176000-60-9362; 166900-79-1467; 166900-88-7300 ; 166900-78-4101; 166900-76-7649; 166900-76-7638

**SECTION 2.** That the official Town of Clayton Zoning Map is hereby amended to include in the Planned Development Mixed Use (PDMU) zone the above-described property and will be so marked.

**SECTION 3.** That if any section, sentence, clause, or phrase of this Ordinance is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Ordinance.

**SECTION 4.** That this ordinance shall become effective immediately upon its adoption.

DULY ADOPTED by the Clayton Town Council this 1st day of March, 2021 while in regular session.

\_\_\_\_\_  
Jody McLeod  
Mayor

ATTEST:

\_\_\_\_\_  
Kimberly A. Moffett, CMC, NCCMC  
Town Clerk



## Town Council Agenda Cover Sheet

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**Meeting Date**

March 1, 2021

**Agenda Location**

Public Hearings

**Item Title**

2020-114-SD Ashcroft 2 Preliminary Plat Master Plan

**Presenter**

Planning Department

**Summary/Description**

Request for approval of a preliminary plat, acting as a master plan, for a mixed use development that includes up to 105,000 SF of commercial development and up to 772 residential units.

**Requested Action**

Approval/Denial

**Funding Source (If Applicable):**

N/A

**Cost:** N/A    Yes ☐    No ☒

**Additional Documents to be Included in Agenda Packet**

Application  
Staff Report Maps  
Neighborhood Meeting Materials  
Master Plan (Final Plan Set, Phasing Plan, Commercial Regulating Plan)  
Traffic Impact Analysis  
NCDOT Congestion Management Analysis & Requirements  
Newspaper Ad  
Adjacent Property Letter  
Wastewater Allocation Request & Scoring Sheet  
Recommended Conditions of Approval - Signed

**Meeting Timeline**

February 1, 2021 – Town Council (continued)  
February 15, 2021 – Town Council (continued)  
March 1, 2021 – Town Council



**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## MAJOR SUBDIVISION PLAN APPLICATION COVER SHEET

**Name of Project:** Ashcroft - Section 2 **Date:** 08/03/2020

**Applicant Name:** David DeYoung, AICP - RiverWild

***The following checklist to be completed by applicant:***

☒ Pre-Application Meeting on: 05/13/2020

☒ Review fee

☒ Advertisement Fee

☒ Copy of plan sets in PDF on USB (only one USB needed)

***11 copies of the following:***

☒ Completed Application

☒ Owner's Consent Form

☒ Adjacent Property Owner's List

☐ [N/A] Road Name Application

☒ Wastewater Allocation Request Form or verification of Wastewater

☒ Signed/Sealed Traffic Impact Analysis (if applicable)

☒ Neighborhood Meeting Notice Letter (1 copy)

☒ Set of stamped, addressed, empty envelopes for adjacent property owner notification

☒ Stormwater Management Statement

***11 copies of the plan set which includes the following:***

☒ Cover Sheet

☒ Preliminary Engineering Plan Sheet

☒ Existing Conditions Sheet

☒ Preliminary Grading Plan Sheet

☒ Signed & Sealed Boundary Survey

☒ Landscaping Plan Sheet

☒ Site Plan Sheet

☒ Architectural Elevations Sheet

☒ Phasing Plan Sheet

☐ [N/A] Lighting Plan Sheet

**Reviewed by:** \_\_\_\_\_





**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## MAJOR SUBDIVISION (PRELIMINARY PLAT) APPLICATION

- ☒ **New Major Subdivision: \$400.00 + \$5.00 per lot**      ☐ **Modification to approved plan**  
☐ **Conventional**      ☐ **Major: \$400.00 + \$5.00 per lot modified**  
☐ **Open Space**      ☐ **Minor: \$200.00 + \$5.00 per lot modified**  
☒ **Master Plan**      **Modified Plan:** \_\_\_\_\_

**Advertising Fee: \$200.00**

### SITE INFORMATION

**Name of Project:** Ashcroft - Section 2      **Acreage of Property:** 256.15  
**Tag #:** 05H02013A; 05H02009A; 05H02010A; 05H02015; 05H02012; 05H02200B; 05H02013      **NC Pin #:** 176000-70-3713; 176000-60-9362; 166900-79-1467; 166900-88-7300 166900-78-4101; 166900-76-7649; 166900-76-7638  
**Location:** Southeast quadrant of the intersection of Covered Bridge Road and Neuse River  
**Number of lots (Existing):** 7      **(Proposed):** 595      **Min. Lot Size:** 4,200 SF  
**Zoning District:** PD-MU      **Electric Provider:** Town of Clayton  
**Wastewater:** ☐ *Septic*    ☒ *Sewer*      **Water:** ☐ *Well*    ☒ *Public/Private Water*  
**Recreation/Open Space Requirement:**    ☒ *Fee in lieu*    ☐ *Land Dedication – acreage:* \_\_\_\_\_

### APPLICANT INFORMATION

**Applicant:** David DeYoung, RiverWild - On Behalf of Ashcroft Partners, LLC  
**Mailing Address:** 114 W Main Street, Clayton, NC 27520  
**Phone Number:** (919) 901-3178      **Fax:** \_\_\_\_\_  
**Contact Person:** David DeYoung, AICP  
**Email Address:** David@theriverwildteam.com

### OFFICE USE ONLY

**Date Received:** \_\_\_\_\_      **Amount Paid:** \_\_\_\_\_      **File Number:** 2020-114-SD

### PROPERTY OWNER INFORMATION

Name: Multiple Property Owners; See Attachment 1

Mailing Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Fax: \_\_\_\_\_

Email Address: \_\_\_\_\_

### EXPLANATION OF PROJECT

*Please provide detailed information concerning all requests. Attach additional sheets if necessary.*

Ashcroft Section 2 is a proposed mixed use neighborhood consisting of 772 residential units

(293 sf units, 299 townhome units, and 180 apartment units) and 105,000 sf of commercial uses.

The project is a true mixed-use development offering both commercial and residential components, including a wide variety of housing choices. The project includes pedestrian connections to the existing greenway network (Sam's Branch Greenway and River Walk on the Neuse (Mountains to Sea Trail), a variety of open space/amenity areas spread throughout the community, and a main amenity area which will include a clubhouse with a pool and fitness center. It is anticipated that the subdivision will be developed in multiple phases (10 shown) based on market demand and to meet the needs and functionality of the community during construction.

### FINDINGS OF FACT

*Section 155.706(I)(10) of the Unified Development Code requires that certain findings must be made by the Town Council before a Major Subdivision may be approved. Outline below (you may attach additional sheets) how the application addresses each of the following findings:*

- (1) That the subdivision meets all required specifications of the town Subdivision Regulations and conforms to the town Unified Development Code.  
See Attachment 2 for the Findings of Fact.

- (2) That the subdivision will not be detrimental to the use or orderly development of other properties in the surrounding area and will not violate the character of existing standards for development of properties in the surrounding area.

See Attachment 2 for the Findings of Fact.

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- (3) That the subdivision design will provide for the distribution of traffic in a manner that will avoid or mitigate congestion within the immediate area, will provide for the unified and orderly use of or extension of public infrastructure, and will not materially endanger the environment, public health, safety, or the general welfare.

See Attachment 2 for the Findings of Fact.

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- (4) That the subdivision will not adversely affect the general plans for the orderly growth and development of the town and is consistent with the planning policies adopted by the Town Council.

See Attachment 2 for the Findings of Fact.

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## MAJOR SUBDIVISION PLAN CHECKLIST

*Pursuant to Article 7, Section 155.706 of the Unified Development Code, applications requesting a public hearing or administrative approval process shall submit a plan set to the Planning Department. These plans may include Master Plan, Site Plan, Subdivision Plan, Regulating Plan, Architectural Elevations, Landscape Plan, Photometric/Lighting Plan, Engineering Plans, and Survey. The plan requirements shall be based on the type of development application or approval process.*

### PLAN FORMAT

*These standards are established to provide information pertaining to the graphic and format presentation of plans. The following is required for all types of plans, except where otherwise noted:*

- All plans and architectural elevations shall be limited to 24" x 36" in size, and **folded to an 8.5" x 11" format.**

- Plans are to be drawn at the same engineering scale of 1" = 20'; 30'; 40'; 50'; 60' (architectural elevations and details are exempt from this requirement) with north oriented in the same direction.
- Plans may be drawn at an engineering scale of 1" = 100', if approved by the Planning Department or the Technical Review Committee (TRC).
- Architectural plans and elevations shall be drawn at an architectural scale of 1" = 3/32', 3/16', 1/8', 1/4', or 3/8'.
- All drawings, except elevations, isometric drawings, and renderings, shall be in two dimensional plan views.
- All text shall be clear and legible.
- Line weight hierarchy on all plans shall be consistent with common drafting standards.
- Multiple sheets shall be consecutively numbered (e.g. Sheet 1 of 4).
- All numerical references shall be rounded up to a maximum of two decimal points.

#### PLAN ELEMENTS AND GRAPHIC DATA (TO BE ON ALL SHEETS)

***The following items include general and project information. This information is required to be present on all plan sheets, except where otherwise noted.***

| Provided                            |     |                                                                                                                   |
|-------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------|
| Yes                                 | N/A |                                                                                                                   |
| <input checked="" type="checkbox"/> |     | Consultant Logo Box (name, address, phone number, fax, and e-mail, firm and license number)                       |
| <input checked="" type="checkbox"/> |     | Project/Application Name                                                                                          |
| <input checked="" type="checkbox"/> |     | Type of Plan                                                                                                      |
| <input checked="" type="checkbox"/> |     | Signature and Professional Seal with date (landscape plans, architectural elevations, engineering plans, surveys) |
| <input checked="" type="checkbox"/> |     | Original/Submittal Date and Revision Date                                                                         |
| <input checked="" type="checkbox"/> |     | Sheet Number                                                                                                      |
| <input checked="" type="checkbox"/> |     | Vicinity Map                                                                                                      |
| <input checked="" type="checkbox"/> |     | North Arrow with NC Grid System                                                                                   |
| <input checked="" type="checkbox"/> |     | Graphic Scale (engineering or architectural graphic and written scale)                                            |

***The following elements are specific to each property and application request, and shall be shown graphically on the specific plan types listed below. These graphics shall be supported by text, labeling, and dimensional information (width, length, and depth).***

## SURVEY

| Provided                            |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes                                 | N/A |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <input checked="" type="checkbox"/> |     | A signed and sealed boundary survey ( <b>not more than a year old unless otherwise approved by the Planning Department</b> ) with the bearings and distances of every property line shown. Distances shall be in feet or meters and decimals thereof. The number of decimal places shall be appropriate to the class of survey required. The survey must include any and all easements of record (referenced by Deed Book and Page) and must be prepared by a surveyor registered in the State of North Carolina. |

## EXISTING CONDITIONS SHEET

| Provided                            |     |                                                                                                                                                                                                                                  |
|-------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes                                 | N/A |                                                                                                                                                                                                                                  |
| <input checked="" type="checkbox"/> |     | The existing topographical conditions of the property with a two foot contour interval showing the location of any natural features such as water courses, wooded areas, steep slopes (above 25%), or other geological features. |
| <input checked="" type="checkbox"/> |     | The existing streets and roadway improvements (medians, landscaping, signage, driveways, etc.) within 100 feet of project boundary.                                                                                              |
| <input checked="" type="checkbox"/> |     | The existing structures located on the subject property.                                                                                                                                                                         |
| <input checked="" type="checkbox"/> |     | The existing structures within 100 feet of project boundary.                                                                                                                                                                     |
| <input checked="" type="checkbox"/> |     | The existing utilities (including inverts of pipes, rim elevations, wells and septic tanks, etc.) within 100 feet of project site.                                                                                               |
| <input checked="" type="checkbox"/> |     | Label subject parcel and adjacent property acreage, owners, and zoning districts.                                                                                                                                                |

## PRELIMINARY SITE PLAN

*The items listed below are required to be delineated (in a tabular format) on the site plan:*

| Provided                            |                          |                                                  |
|-------------------------------------|--------------------------|--------------------------------------------------|
| Yes                                 | N/A                      |                                                  |
| <input checked="" type="checkbox"/> |                          | Site data table in tabular form                  |
| <input checked="" type="checkbox"/> |                          | Name of project (AKA names if applicable)        |
| <input checked="" type="checkbox"/> |                          | Parcel identification number (and/or Tag number) |
| <input checked="" type="checkbox"/> |                          | Property size (acres and square feet)            |
| <input checked="" type="checkbox"/> |                          | Property location (Town limits or ETJ)           |
| <input checked="" type="checkbox"/> |                          | Existing zoning district                         |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Proposed zoning district (if applicable)         |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Overlay (if applicable)                          |



| <b>Provided</b>                     |                                     |                                                                       |
|-------------------------------------|-------------------------------------|-----------------------------------------------------------------------|
| <b>Yes</b>                          | <b>N/A</b>                          |                                                                       |
| <input checked="" type="checkbox"/> |                                     | Existing use                                                          |
| <input checked="" type="checkbox"/> |                                     | Proposed use                                                          |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Number of seats/students/fueling positions (as applicable).           |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Number of housing units proposed, per housing unit type.              |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Proposed density (number of units per acre)                           |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Proposed intensity (gross floor area)                                 |
| <input type="checkbox"/>            | N/A                                 | Building coverage (as percentage of total site)                       |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Impervious surface area (square feet and as percentage of total site) |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Building height (number of stories and in feet)                       |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Required parking (list requirement i.e. 1 space per 300 SF)           |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Proposed parking                                                      |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Required/proposed handicap accessible parking                         |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Provide name of Electric Provider.                                    |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Provide name of Water Provider.                                       |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Provide name of Sewer Provider.                                       |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Max building height.                                                  |

***Other site plan elements:***

| <b>Provided</b>                     |                                     |                                                                                                                                 |
|-------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b>                          | <b>N/A</b>                          |                                                                                                                                 |
| <input checked="" type="checkbox"/> |                                     | Identify adjacent property owners, their parcel ID number, current zoning and present use.                                      |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Put a bubble around the affected area for amendments to previously approved projects.                                           |
| <input checked="" type="checkbox"/> |                                     | Identify the location of lots, buildings and structures with finished floor elevations and applicable setbacks.                 |
| <input checked="" type="checkbox"/> |                                     | Identify existing and future right of ways.                                                                                     |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify Watershed Protection Areas.                                                                                            |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify existing easements by type, and distinguish if public or private.                                                      |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify proposed easements by type, and distinguish if public or private.                                                      |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify Open Space/Common Areas, amenities.                                                                                    |
| <input checked="" type="checkbox"/> |                                     | Identify clear sight triangle at project ingress/egress points with dimensions.                                                 |
| <input checked="" type="checkbox"/> |                                     | Identify main entrance/access driveways, curb and gutter, cross section with ROW. Proposed driveway and setbacks must be shown. |

| Provided                            |                                     |                                                                                                                                                                                                                |
|-------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes                                 | N/A                                 |                                                                                                                                                                                                                |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Provide boundaries of Resource Conservation Areas (see UDC Section 155.500).                                                                                                                                   |
| <input type="checkbox"/>            | N/A                                 | Provide an off-street parking and loading layout (with details, dimensions and access location). Accessible parking requirements are listed in NCSBC Volume 1C, 1999 edition. Show traffic circulation arrows. |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Provide queuing details for drive-up/drive-thru facilities (if applicable).                                                                                                                                    |
| <input checked="" type="checkbox"/> |                                     | Provide the locations and dimensions of existing and proposed sidewalks and accessible routes.                                                                                                                 |
| <input type="checkbox"/>            | N/A                                 | Provide the location and details of refuse collection areas.                                                                                                                                                   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Provide the location, size and orientation of freestanding signs.                                                                                                                                              |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify proposed phasing (phasing lines) of construction on Phasing Plan sheet.                                                                                                                               |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Cul-de-sacs must be dimensioned and meet Town of Clayton minimum design criteria.                                                                                                                              |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify cluster mailbox unit (CBU) locations and details, including parking layout.                                                                                                                           |

## CONCEPTUAL ENGINEERING PLANS

**Note:** Conceptual engineering plans are deemed preliminary in nature. Review and approval of public infrastructure construction plans is a separate process performed by the Engineering Division.

| Provided                            |                                     |                                                                                                                                                                                                                                                                                                            |
|-------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes                                 | N/A                                 |                                                                                                                                                                                                                                                                                                            |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify proposed streets and roadways (public and private) with dimensions and cross sections.                                                                                                                                                                                                            |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify the curve radii for all internal and external vehicular use areas.                                                                                                                                                                                                                                |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify all access points to the project.                                                                                                                                                                                                                                                                 |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify existing conditions and proposed grading plans.                                                                                                                                                                                                                                                   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify Tree Conservation Areas shown on grading plan.                                                                                                                                                                                                                                                    |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Show proposed flow of traffic.                                                                                                                                                                                                                                                                             |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify proposed traffic control signs and striping.                                                                                                                                                                                                                                                      |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify the proposed water distribution system (including size) with location of fire hydrants and point of connection(s).                                                                                                                                                                                |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify the proposed sanitary sewer collection system (including size) and point of connection(s). If a municipal sewer connection is not available, please provide documentation from Johnston County Department of Environmental health that the location of septic tank and drain field is acceptable. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Provide preliminary wastewater allocation calculation.                                                                                                                                                                                                                                                     |

| Provided                            |                                     |                                                                                                                                                                                                                                                                                        |
|-------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes                                 | N/A                                 |                                                                                                                                                                                                                                                                                        |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify proposed grease traps.                                                                                                                                                                                                                                                        |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify backflow prevention devices.                                                                                                                                                                                                                                                  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify slopes steeper than 2.5:1.                                                                                                                                                                                                                                                    |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify the proposed storm water management system with location of inlets, piping and positive outfall along with typical section and top surface area of storm water retention/detention pond, including soil types, slope, bottom and top elevations, and finish floor elevations. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Provide a Stormwater Management Statement.                                                                                                                                                                                                                                             |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Floodplain development permit required for this parcel – see Engineering Dept.                                                                                                                                                                                                         |

## FIRE PLAN

### *Fire Rescue (information to be shown on conceptual engineering plans)*

| Provided                            |                                     |                                                                                                                                                        |
|-------------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes                                 | N/A                                 |                                                                                                                                                        |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify fire hydrant distribution (distance of hose lay).                                                                                             |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify the sprinkler connection locations and size.                                                                                                  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify fire lane designations and circulation around buildings (stripe fire lanes and show minimum stabilized access around all structures).         |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Identify the emergency evacuation route (access in and out of the property).                                                                           |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify fire apparatus turning radius.                                                                                                                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Verify the location of fire hydrants is not interfering with required landscaping (must be 24" clearance of landscaping from bottom of steam fitting). |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify the Lock Box/Knox Box locations.                                                                                                              |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Identify placard locations for hazardous materials.                                                                                                    |

## PHASING PLAN

| Provided                            |                          |                                                                                           |
|-------------------------------------|--------------------------|-------------------------------------------------------------------------------------------|
| Yes                                 | N/A                      |                                                                                           |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Provide a Phasing plan showing all proposed phases and phase titles, in different colors. |

## LANDSCAPE PLAN

| Provided                            |     |                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes                                 | N/A |                                                                                                                                                                                                                                                                                                                                                                                      |
| <input checked="" type="checkbox"/> |     | Provide a landscape plan identifying the location of all proposed landscaping (must be prepared by a landscape architect registered in North Carolina).                                                                                                                                                                                                                              |
| <input checked="" type="checkbox"/> |     | Indicate the location, width and type of all required buffers.                                                                                                                                                                                                                                                                                                                       |
| <input type="checkbox"/>            | N/A | Indicate the location, width and type of landscaping within vehicular use areas.                                                                                                                                                                                                                                                                                                     |
| <input type="checkbox"/>            | N/A | Indicate the location, width and type of landscaping used to screen drive-thru areas, service areas, loading areas, mechanical equipment and above ground utilities.                                                                                                                                                                                                                 |
| <input checked="" type="checkbox"/> |     | Provide a plant list summary table which includes: <ol style="list-style-type: none"> <li>1. A planting key identifying the various planting elements</li> <li>2. The quantity of each type of plant material proposed</li> <li>3. The size, height, caliper and spacing of plant material proposed</li> <li>4. The Botanical and common names of plant material proposed</li> </ol> |
| <input checked="" type="checkbox"/> |     | Verify/identify clear sight distances and safe-sight-triangles at project ingress/egress points.                                                                                                                                                                                                                                                                                     |
| <input checked="" type="checkbox"/> |     | Provide an irrigation note to read as follows: "All landscaped areas shall be provided with an automatically operated irrigation system that will adequately cover all living plant material, such system shall include a rain sensor." (If irrigation will not be utilized, drought-tolerant species must be used).                                                                 |
| <input checked="" type="checkbox"/> |     | Provide a landscape maintenance note which states: "All landscaped areas shall be maintained in an attractive and healthy condition. Dead or diseased plantings shall be removed and replaced in a timely fashion".                                                                                                                                                                  |
| <input checked="" type="checkbox"/> |     | Identify and list any existing plant material which will be used to satisfy landscape requirements.                                                                                                                                                                                                                                                                                  |

## LIGHTING PLAN

| Provided                 |                                     |                                                                                           |
|--------------------------|-------------------------------------|-------------------------------------------------------------------------------------------|
| Yes                      | N/A                                 |                                                                                           |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Conceptual Lighting Plan - any common lighting should not spill over to other properties. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Identify the light source and provide a detail of the fixture.                            |
| <input type="checkbox"/> | N/A                                 | Identify the proposed height of fixtures.                                                 |

## ARCHITECTURAL ELEVATIONS AND FLOORPLAN

| Provided                 |     |                                                                                                                                                                                                                                                                      |
|--------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes                      | N/A |                                                                                                                                                                                                                                                                      |
| <input type="checkbox"/> | N/A | Provide floor plans, elevations, construction materials, finishes and colors, along with type of construction of all buildings per North Carolina Building Code prepared by a professional architect registered in North Carolina. This should be provided in color. |
| <input type="checkbox"/> | N/A | Indicate the height and number of stories for each structure.                                                                                                                                                                                                        |
| <input type="checkbox"/> | N/A | Indicate the location and screening method for all roof mounted structures or equipment.                                                                                                                                                                             |

## APPLICANT AFFIDAVIT

*I/We, the undersigned, do hereby make application and petition to the Town Council of the Town of Clayton to approve the subject Major Subdivision. I hereby certify that I have full legal right to request such action and that the statements or information made in any paper or plans submitted herewith are true and correct to the best of my knowledge. I understand this application, related material and all attachments become official records of the Planning Department of the Town of Clayton, North Carolina, and will not be returned.*

David DeYoung  
 \_\_\_\_\_  
*Print Name*

David DeYoung, Digitally signed by David  
DeYoung, AICP  
Date: 2020.07.31 11:35:02  
+04'00'  
 \_\_\_\_\_  
*Signature of Applicant*

8/3/2020  
 \_\_\_\_\_  
*Date*



**Attachment 2**  
**Ashcroft - Section 2**  
**Major Subdivision Application**  
**Findings of Fact**

***Section 155.706(l)(10) of the Unified Development Code requires that certain findings must be made by the Town Council before a Major Subdivision may be approved. Outline below (you may attach additional sheets) how the application addresses each of the following findings:***

**1. The subdivision is consistent with the adopted plans and policies of the Town.**

The proposed subdivision is in accord with the adopted plans and policies of the town. The proposed subdivision will meet all applicable requirements of the Unified Development Code and is consistent with the Comprehensive Plan including the following Implementation Goals:

- Goal LU2 – Encourage quality development which maximizes existing infrastructure, promotes walking and biking, and enhances travel safety.
- Goals H1 – Encourage a range of housing types and lot sizes that meets the needs of various income levels, family sizes, and ages.

The property assemblage is designated as Low-Density Residential in the Clayton Comprehensive 2040 Plan. This designation allows for mixed-residential uses with a maximum density of 3 units per acre and the Comprehensive Plan provides guidance to permit up to 7 units per acre for Planned Development Districts. In addition, the project provides multiple stormwater control measures (SCM's) and complies with Phase II Watershed Rules - Neuse River Rules. This compliance through the use of SCM's, removes the maximum threshold for density. The overall density of the proposed project is 3.01 du/ac, with a density of 2.26 du/ac for the portion of the project that falls in the Watershed Protection Overlay.

**2. The subdivision meets all required specifications of the Unified Development Code.**

The proposed Ashcroft Section 2 major subdivision, upon rezoning to Planned Development Mixed Use and the approval of a street cross section waiver, will meet the applicable requirements of the town Subdivision Regulations and the Unified Development Code.

The Town of Clayton's typical street sections require sidewalk and curb and gutter on both sides of the street. In accordance with section 155.706(l)(6), this waiver request is to eliminate curb, gutter and sidewalk within the estate section of the development. This request meets the waiver criteria as follows:

1. The granting of the waiver will not be detrimental to the public safety, health, or welfare or injurious to other property or improvements in the neighborhood in which the property is

located;

Granting the waiver eliminates curb, gutter and sidewalk in an estate section of the proposed subdivision. The estate sections are comprised of very large lots (+/- 1 acre each or greater) and are designed to enhance their integration into the existing natural environment. This proposed design limited to this specific area of the development will not be detrimental to public health, safety, welfare, or be injurious to other property or improvements in the neighborhood.

2. The conditions upon which the request for a waiver is based are unique to the property for which the waiver is sought and are not generally applicable to other property;

The waiver is being requested because of the unique size and location of the estate lots. These lots are purposefully located adjacent to the Neuse River to take advantage of river views and proximity to the greenway, while minimizing impacts within the Watershed Protection Overlay.

3. Because of the particular physical surroundings, shape, or topographical conditions of the specific property involved, a particular hardship to the owner would result, as distinguished from a mere inconvenience, if the strict letter of this chapter are enforced; and

As stated above, the physical surroundings are very unique to the estate section of the development. Topography, proximity to the Neuse River, and being situated within the Watershed Protection Overlay are all factors contributing to the request to remove curb, gutter, and sidewalk. In addition to the above, the proposed ditch section within these two sections is a better way to control stormwater near environmentally sensitive features.

4. The purpose of the waiver is not based primarily upon financial consideration.

As stated in the criteria above, the request is based on location, not financial consideration. The waiver requests apply to the estate sections only. All other areas of the development will have curb, gutter, and sidewalk on both sides of the street.

- 3. That the subdivision will not be detrimental to the use or orderly development of other properties in the surrounding area and will not violate the character of existing standards for development of properties in the surrounding area.**

The proposed subdivision will not be detrimental to the use or orderly development of other properties in the surrounding area and will not violate the character of existing standards for development of properties in the surrounding area. Ashcroft Section 2 provides access to and is compatible with existing adjacent subdivisions as well as the recently approved Steeplechase Subdivision across O'Neil Street. The proposed neighborhood will include varying home options, densities, and price points necessary to satisfy continued demand for housing in the Town as well as provide an additional opportunity for commercial uses.

Additionally, the proposed development meets Comprehensive Plan Goal H1 – to encourage a range of housing types and lot sizes that meets the needs of various income levels, family sizes, and ages.

- 4. That the subdivision design will provide for the distribution of traffic in a manner that will avoid or mitigate congestion within the immediate area, will provide for the unified and orderly use of or extension of public infrastructure, and will not materially endanger the environment, public health, safety, or the general welfare.**

The subdivision layout and roadway design are in accord with the July 2020, Traffic Impact Analysis and provide a thoughtful and connected pedestrian and vehicular network. The TIA required improvements will enable safe turning movements and better serve the public. Internal streets will have public sidewalks on each side of the street (with the exception of the estate sections) to provide pedestrian access to the adjacent existing development, amenities, trail networks, including the Clayton River Walk on the Neuse Greenway trail and Sam's Branch Greenway. All proposed improvements within the street ROW comply with published Town of Clayton Standards and Specifications. The Ashcroft Section 2 subdivision accommodates the Town's future Northern Connector (which will ultimately provide access to a proposed wastewater treatment facility and an electrical substation owned by the town) and provides access points to adjacent properties. The subdivision layout was thoughtfully designed to avoid environmental conflicts by appropriately buffering streams and honoring floodplain requirements.



TOWN OF CLAYTON  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

Consent is required from the property owner(s) if an agent will act on their behalf. A separate form is required from each owner. Consent is valid for one year from date of notary, unless otherwise specified. All fields must be completed.

Project Name: Ashcroft Section 2 Address or PIN #: 166900-88-7300, 166900-76-7649

### AGENT/APPLICANT INFORMATION:

David DeYoung, River Wild  
(Name - type, print clearly)

114 W. Main Street  
(Address)  
Clayton, NC, 27520  
(City, State, Zip)

I hereby give **CONSENT** to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (*list applicable requests*):

All entitlement/development processes

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

### OWNER AUTHORIZATION:

Ashcroft Partners, LLC  
(Name - type, print clearly)

114 W. Main Street STE 102  
(Address)

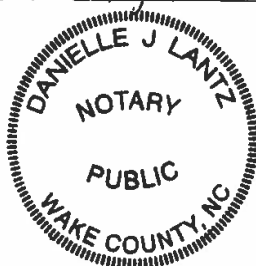
[Signature]  
(Owner's Signature)

Clayton, NC, 27520  
(City, State, Zip)

STATE OF NC  
COUNTY OF JOHNSTON

Sworn and subscribed before me DANIELLE J. LANTZ a Notary Public for the above State and County, this  
the 3<sup>rd</sup> day of August, 20 20.

SEAL



July 2018

[Signature]  
Notary Public

My Commission  
Expires:

3-11-2024



TOWN OF CLAYTON  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

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Project Name: Ashcroft / Earp-Moore Tract Address or PIN #: 05H02009A - Covered Bridge Road

### AGENT/APPLICANT INFORMATION:

James H. Lipscomb / Dave DeYoung

(Name - type, print clearly)

328 E. Main Street

(Address)

Clayton, NC 27520

(City, State, Zip)

I hereby give **CONSENT** to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (*list applicable requests*):

Additional Applicant: Stewart Engineering

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

### OWNER AUTHORIZATION:

Richard E. Moore

(Name - type, print clearly)

Richard E. Moore

(Owner's Signature)

1417 Wensford Court

(Address)

Raleigh, NC 27615

(City, State, Zip)

STATE OF

North Carolina

COUNTY OF

Wake

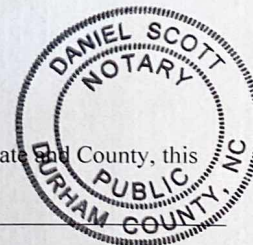
Sworn and subscribed before me Richard E. Moore, a Notary Public for the above State and County, this the 22 day of July, 2020.

SEAL

Daniel Scott  
Notary Public

My Commission  
Expires:

July 24, 2023



July 2018



TOWN OF CLAYTON  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

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Project Name: Ashcroft Section 2 Address or PIN #: 176000-70-3713, 166900-78-4101,  
AND 166900-67-5094

### AGENT/APPLICANT INFORMATION:

David DeYoung, RiverWild  
(Name - type, print clearly)

114 W. Main Street  
(Address)  
Clayton, NC 27520  
(City, State, Zip)

I hereby give CONSENT to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (list applicable requests):

All entitlement/development processes

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

### OWNER AUTHORIZATION:

John Wesley Massey  
(Name - type, print clearly)

8041 St. Andrews Drive  
(Address)

John Wesley Massey  
(Owner's Signature)

Laurinburg, NC 28362  
(City, State, Zip)

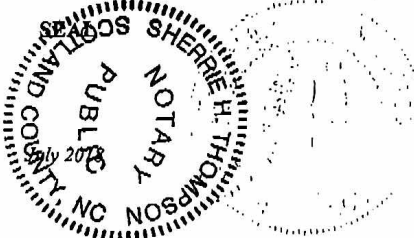
STATE OF NORTH CAROLINA  
COUNTY OF COTLAND

Sworn and subscribed before me, SHERIE H. THOMPSON, a Notary Public for the above State and County, this the 31<sup>st</sup> day of JULY, 2020.

Sherie H. Thompson  
Notary Public

My Commission  
Expires:

SEPTEMBER 6, 2020







**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

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Project Name: Ashcroft Section 2 Address or PIN #: 166900-79-1467

### AGENT/APPLICANT INFORMATION:

David DeYoung, Riverwild  
(Name - type, print clearly)

114 W. main Street  
(Address)  
Clayton, NC 27520  
(City, State, Zip)

I hereby give **CONSENT** to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (*list applicable requests*):

major Subdivision Application  
Rezoning Application

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

### OWNER AUTHORIZATION:

James D. Smith  
(Name - type, print clearly)

1814 N. Oneil Street Ext  
(Address)

James D. Smith  
(Owner's Signature)

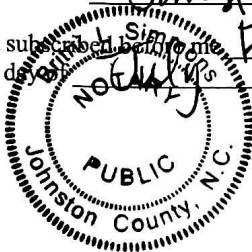
Clayton, NC 27520  
(City, State, Zip)

STATE OF  
COUNTY OF

North Carolina  
Johnston

Sworn and subscribed before me, the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, \_\_\_\_\_, Notary Public for the above State and County, this

SEAL



Notary Public

My Commission  
Expires:

6/2/2025

July 2018



**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

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Project Name: Ashcroft Section 2 Address or PIN #: 166900-79-1461

### AGENT/APPLICANT INFORMATION:

David Deyoung, Riverwild  
(Name - type, print clearly)

114 W. Main Street  
(Address)  
Clayton, NC 27520  
(City, State, Zip)

I hereby give **CONSENT** to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (*list applicable requests*):

Major Subdivision Application  
Rezoning Application

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

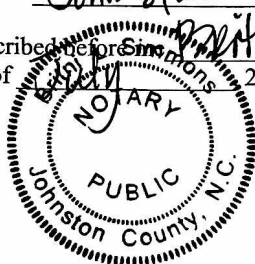
I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

**OWNER AUTHORIZATION:** Daniel G. Smith,  
Co-Trustee  
Jean K. Smith Trust, James D. Smith, 1814 N. O'neil Street Ext  
(Name - type, print clearly) (Address)  
Clayton, NC 27520  
(City, State, Zip)  
[Signature] James D. Smith  
(Owner's Signature)

STATE OF North Carolina  
COUNTY OF Johnston

Sworn and subscribed before me, Breith L. Simmons, a Notary Public for the above State and County, this the 22 day of October, 2020.

SEAL



Notary Public

My Commission Expires:

5/2/2025

July 2018



**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## OWNER'S CONSENT FORM

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Project Name: Ashcroft Section 2 Address or PIN #: 166900-79-1467

### AGENT/APPLICANT INFORMATION:

Dan DeYoung, Riverwind  
(Name - type, print clearly)

114 W. Main Street  
(Address)  
Clayton, NC 27520  
(City, State, Zip)

I hereby give **CONSENT** to the above referenced agent/applicant to act on my behalf, to submit applications and all required materials and documents, and to attend and represent me at all meetings and public hearings pertaining to the following processes (*list applicable requests*):

Major Subdivision Application  
Rezoning Application

Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify that I have authority to execute this consent form as/on behalf of the property owner. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I further agree to all terms and conditions which may be imposed as part of the approval of this application.

### OWNER AUTHORIZATION:

Stephen R. Smith  
(Name - type, print clearly)

1814 N. O'Neil Street Ext  
(Address)

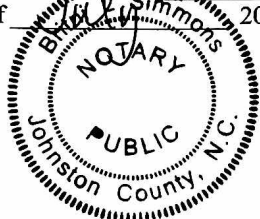
[Signature]  
(Owner's Signature)

Clayton, NC 27520  
(City, State, Zip)

STATE OF North Carolina  
COUNTY OF Johnston

Sworn and subscribed before me, Bertie L. Simmons, a Notary Public for the above State and County, this the 31 day of July, 2020.

SEAL



[Signature]  
Notary Public

My Commission  
Expires:

5/2/2025

July 2018

## ATTACHMENT 1

### PROPERTY OWNER INFORMATION

**Project:** ASHCROFT - Section 2

**Parcels 1, 4, 5**

Tag ID (1): 05H02013A  
(4): 05H02012  
(5): 05H02013  
Owner: John W. Massey  
Address: 8041 St. Andrews Dr.  
Laurinburg, NC 28352

**Parcel 2**

Tag ID: 05H02009A  
Owners: Raymond E. Earp, Jr. (Revocable Trust)  
Nancy Crews Earp (Trustee)  
Address: 7230 NC Highway 42 E  
Selma, NC 27576

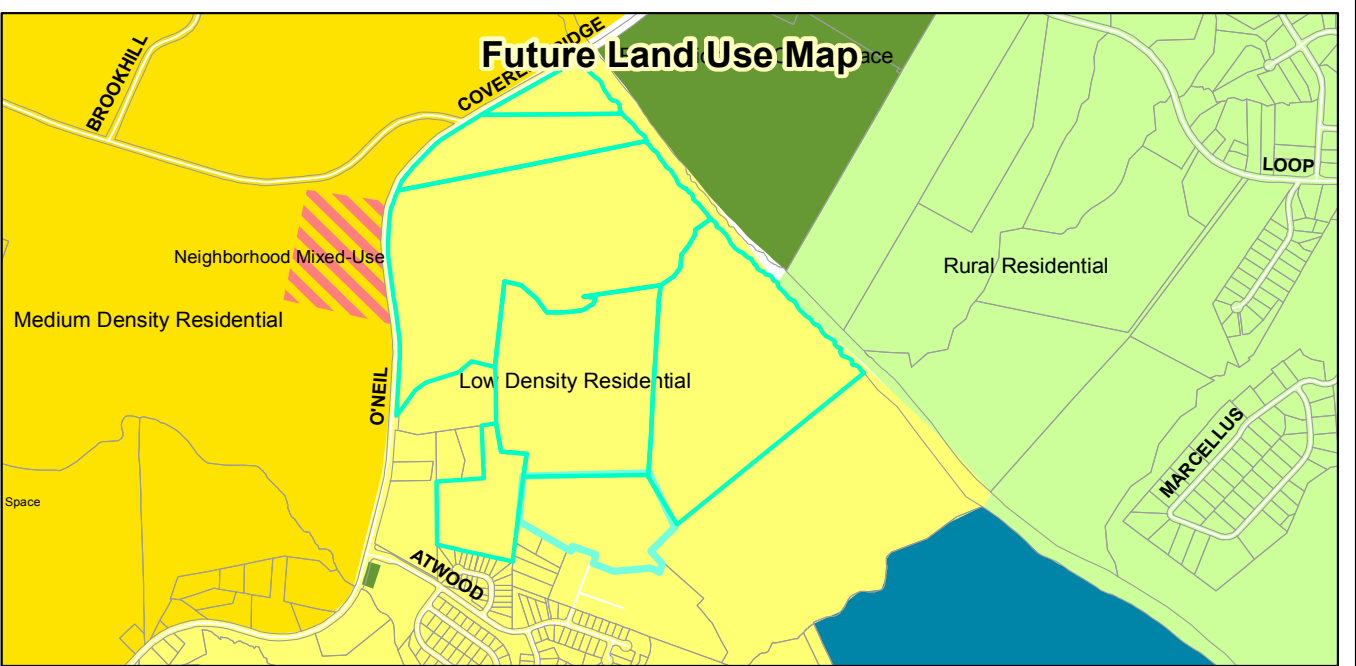
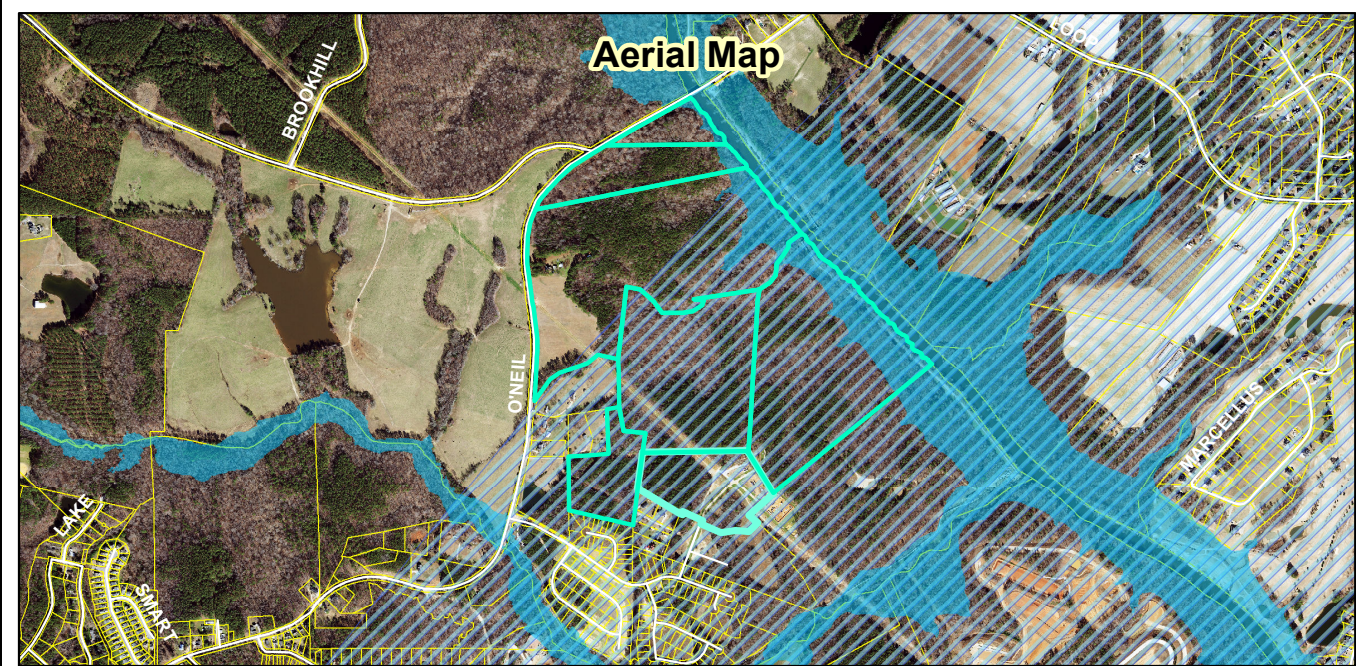
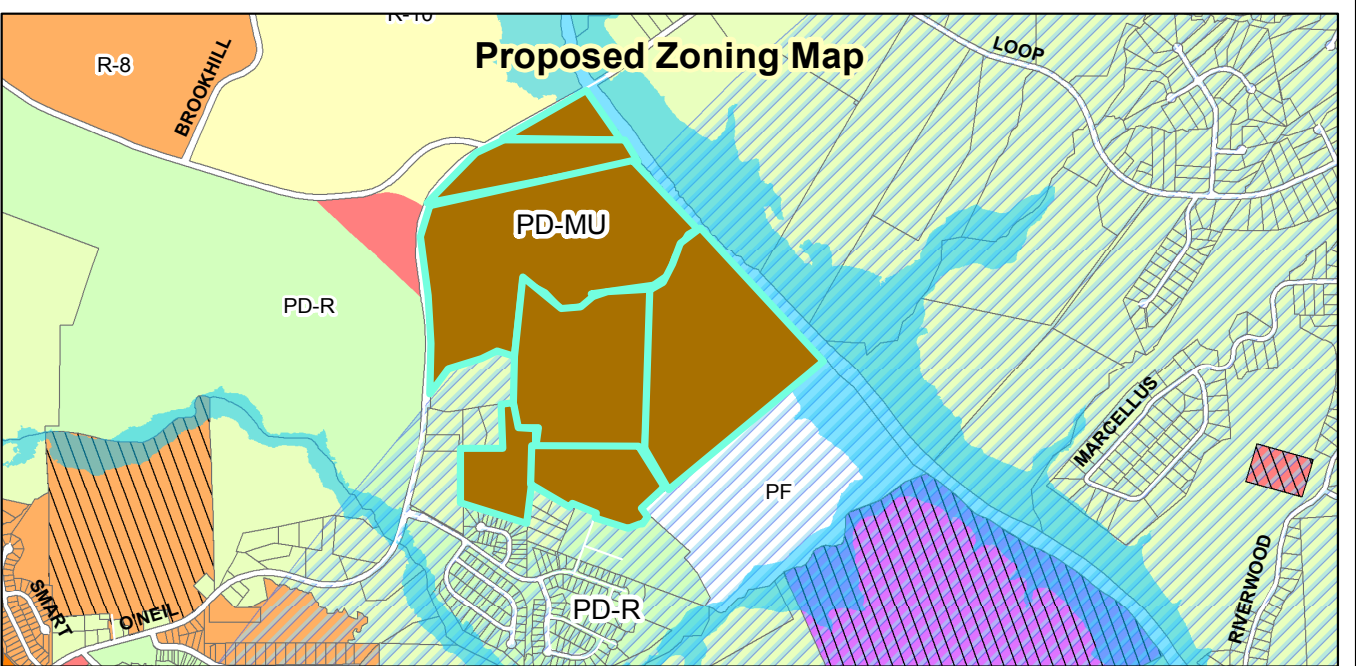
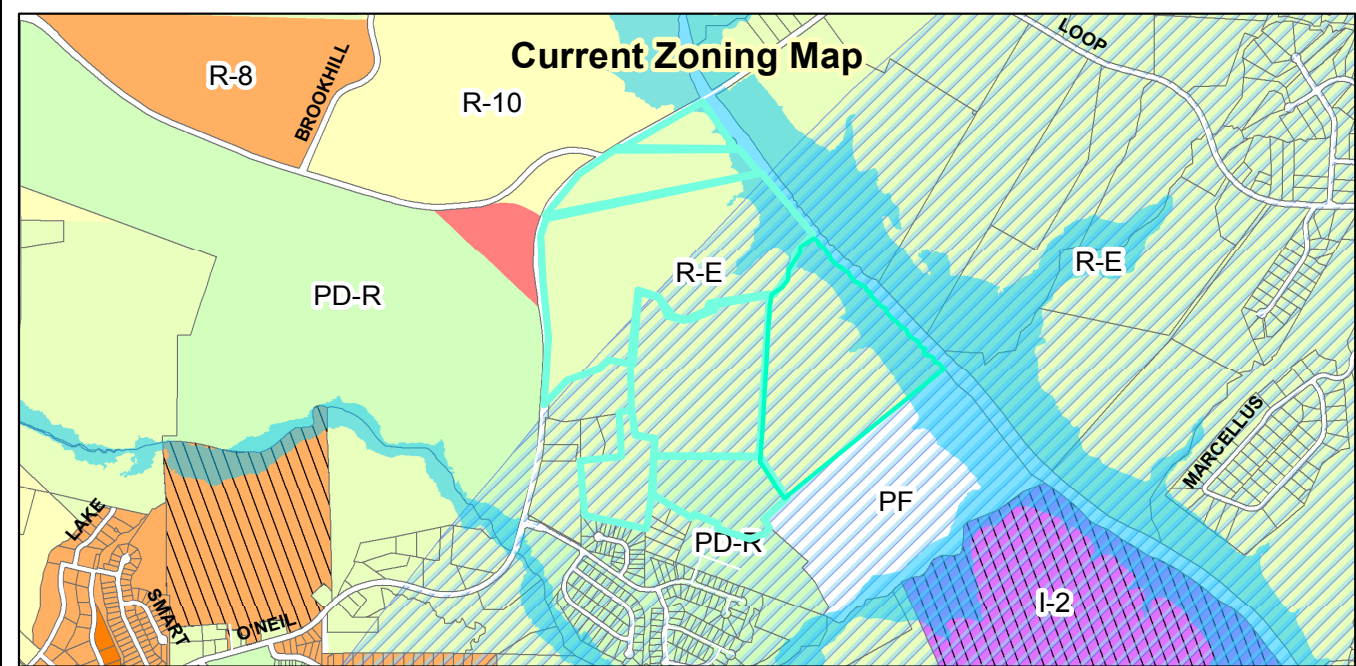
**Parcel 3**

Tag ID: 05H02010A  
Owner: James D. Smith  
Jean K. Smith Trust  
Address: 1814 N. O'Neil St., Ext.  
Clayton, NC 27520

**Parcels 6, 7**

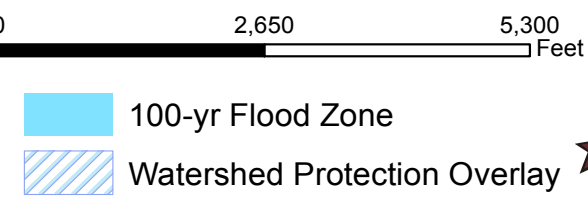
Tag ID (6): 05H02200B  
(7): 05H02015  
Owner: Ashcroft Partners, LLC  
Address: 114 W. Main St., Ste. 102  
Clayton, NC 27520





**Ashcroft 2 Planned Development Rezoning, 2020-113-PDD<sup>0</sup>**  
**Ashcroft 2 Preliminary Plat Master Plan, 2020-114-SD**

Applicant: Ashcroft Partners, LLC  
 Property Owners: John Massey, Raymond E. Earp Jr., James Smith,  
 Ashcroft Partners, LLC  
 Tag #(s): 05H02013A, 05H02012, 05H02013, 05H02009A,  
 05H02010A, portion of 05H02200B, 05H02015



**Staff Report Map**  
 Prepared by: TOC Planning Department  
**August 31, 2020**

Disclaimer: Town of Clayton assumes no legal responsibility  
 for the quality fo the data represented here.



Document Path: O:\PLANNING\REZONING\Planned Developments\2020\2020-113-PDD Ashcroft Section 2\Staff Report Maps\Ashcroft 2 Map.mxd





Town of Clayton  
Planning Department  
111 E. Second Street, Clayton, NC 27520  
P.O. Box 879, Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

*Town Council  
February 1, 2021*

## STAFF REPORT

**Application Number:** 2020-114-SD  
**Project Name:** Ashcroft 2 Preliminary Plat (acting as Master Plan)

**Tag #(s):** 05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of 05H02200B, 05H02015

**Location:** N O'Neil Street; north of Ashcroft Subdivision

**Overlay:** Partially in the Watershed Protection Overlay

**Applicant:** Ashcroft Partners LLC

**Owner(s):** John W Massey, Raymond E Earp, Jr., James Smith, Ashcroft Partners LLC

**Public Noticing:**

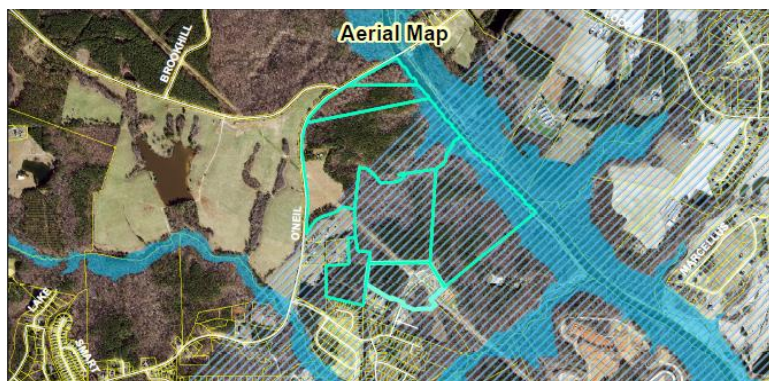
- Neighborhood meeting held on September 3, 2020
- Sign posted January 20, 2021
- Letters mailed January 20, 2021
- Newspaper ad published January 20, 2021 and January 27, 2021

**REQUEST:** Preliminary Plat, acting as a master plan, for a mixed use development that includes up to 105,000 SF of commercial development and up to 772 residential units.

**SITE DATA:**

**Acreage:** 241.21 acres

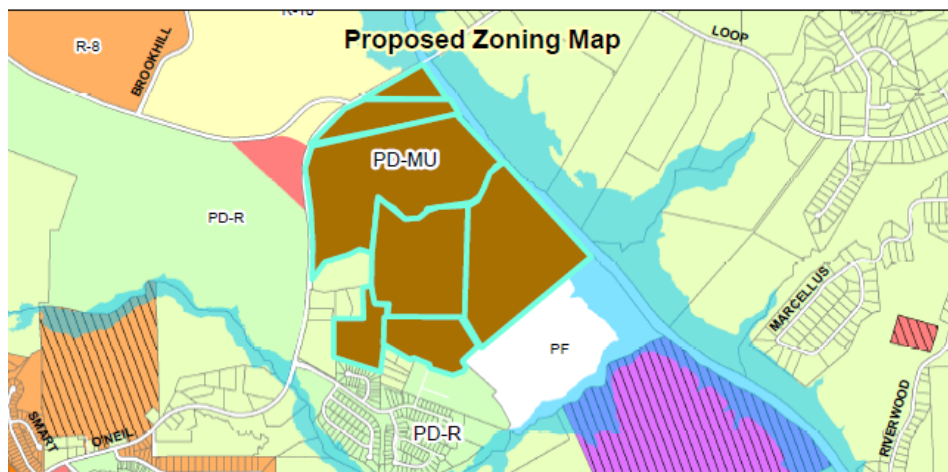
**Existing Use:** Vacant & Single-family





**ADJACENT ZONING AND LAND USES:**

| Direction | Zoning                                                            | Existing Use(s)                                        |
|-----------|-------------------------------------------------------------------|--------------------------------------------------------|
| North     | Residential-10 (R-10) & Residential-Estate (R-E)                  | Vacant/Single Family Residential/Clayton River Walk    |
| South     | Planned Development Residential (PD-R) & Residential-Estate (R-E) | Single-Family Residential (including Ashcroft 1)       |
| East      | Public Facilities (PF) & Residential-Estate (R-E)                 | Vacant / Single-Family Residential                     |
| West      | Planned Development Residential (PD-R)                            | Vacant (approved for Steeplechase Meadows Subdivision) |

**DEVELOPMENT DATA:**

|                              |                                                                                                                                 |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Proposed Uses:               | Up to 105,000 SF commercial and 772 residential units; includes townhomes (299), single family lots (293), and apartments (180) |
| Proposed Density:            | 3.03 units/acre                                                                                                                 |
| Proposed Impervious Surface: | Impervious coverage per lot varies by lot type                                                                                  |
| Fire Protection:             | The Town of Clayton Fire Department will provide fire protection.                                                               |
| Access/Streets:              | Access provide through existing Ashcroft 1, and three access points off O'Neil as well as access off future Northern Connector  |
| Water/Sewer Provider:        | Town of Clayton                                                                                                                 |
| Electric Provider:           | Town of Clayton                                                                                                                 |

## **STAFF ANALYSIS:**

### **Overview**

The applicant is requesting approval of a preliminary plat, acting as a master plan, for Ashcroft 2 subdivision. There is an associated Rezoning application, 2020-113-PDD, running concurrently with this application to rezone the subject properties to Planned Development-Mixed Use (PD-MU). There is also a proposed Development Agreement running alongside this application that will be heard and decided upon by the Town Council. The proposed development is 241 acres in size and will include up to 105,000 SF of commercial development and up to 772 residential units. Below is a breakdown of the pods proposed within this development:

### **Commercial Pod**

The commercial component is located just off O'Neil Street and south of the future Northern Connector. Connections will be made to other pods within the development as well to provide connectivity. The commercial component may include a variety of non-residential uses as outlined in the master plan proposed. Some of the permitted uses proposed in this pod includes: retail, restaurant, office, assembly, fitness center, and indoor/outdoor entertainment. At the request of staff, the applicant also included a list of prohibited uses for this commercial component to ensure consistency with residential uses. All uses in this pod of the development will be limited to those listed within the master plan as permitted. The exact layout and design of this area will be determined in the future as the applicant submits site plans for review. The applicant is only requesting entitlement in the master plan and will submit site plans in the future for a more detailed review.

### **Multi-Family Pod**

The apartments will be located adjacent to the commercial component of the development. They will be accessed directly off the future Northern Connector as well as have connections internally to the commercial and other residential pods. The applicant is proposing up to 180 apartment units in this location. The master plan states that the multi-family pod may include apartments or a nursing home. A site plan for the layout of this pod will be submitted in the future for further review. Future development of this pod will be subject to the dimensional standards, architectural standards, and uses permitted on the master plan. The applicant is only requesting entitlement in the master plan.

### **Single-Family Development**

The master plan is proposing four different single-family lot types for this development. The locations are shown on the master plan via differing colors. In total, there will be 293 single-family lots. The minimum lot sizes for single-family dwellings will range from 4100 SF to .5 acres. The smaller lot types are located in the center of the development, south of the future northern connector, north of the existing Ashcroft 1 subdivision and directly east of the commercial and multi-family pods. The larger lots are proposed north of the northern connector with the estate style homes located furthest north near the Neuse River. Dimensional standards for each lot type are outlined the master plan. Each single-family phase will be reviewed as a minor subdivision to determine the exact arrangement of lots and ensure all dimensional standards are being met. The applicant is only requesting entitlement in the master plan.

### **Townhome Development**

The master plan is proposing two townhome pods in. In total 299 townhome units are included in the master plan. There is one townhome section located just north of the existing Ashcroft 1 subdivision and a second is located just west of O'Neil Street and north of the northern connector and commercial/multi-family pods. The exact layout and design of the townhomes in these sections is not known at this time. The master plan includes options for front loaded townhomes with driveways, alley loaded townhomes, pedestrian mall townhomes, and townhomes with a parking lot. Dimensional standards have been set for the townhomes in the master plan, as well as

architectural features. The exact layout and unit design will be determined in the future and reviewed as a minor subdivision/site plan to ensure compliance with the standards of the master plan. The applicant is only requesting entitlement in the master plan.

#### **Open Space & Amenities**

Per UDC requirements all Planned Developments are required to meet the open space standards for an open space subdivision. This includes 12.5% open space with 25% of that improved open space. The master plan includes an open space sheet outlining how the requirements have been met. They are proposing squares and greens throughout the subdivision that may include amenities for residents such as: tot lots, dog park, walking trails, tables, and seating. The development also includes an amenity center that will consist of 4.30 acres. The plan states that the amenity center will be a minimum of 4,000 SF in size with a minimum pool area of 7500 SF. The amenity center may also include a fitness room, community lounge, and/or playground as well as other amenities listed in the master plan. The dimensional standards of the amenity center are set in this master plan. The exact layout and design will be reviewed in the future as a site plan to ensure compliance with this master plan.

#### **Northern Connector**

At this time, the future Northern Connector has not been funded. However, with the anticipation of future funding the applicant is dedicating ROW as shown on the master plan for this road. The applicant is also building a portion of the Northern Connector (from O'Neil Street to Road 3) to provide access to this development and various pods. Staff is proposing a Condition of Approval be placed upon this development requiring coordination with the Engineering Department at minor site/subdivision level to determine the exact portion of the northern connector to be developed and street section.

#### **Traffic Impact Analysis**

A TIA was performed for this development by Kimley Horn. NCDOT also provided the Town with requirements from Congestion Management after review of the TIA. NCDOT provided two scenarios that would impact what improvements are required for this subdivision. These are based upon the timing of realignment of Covered Bridge Road, which is an improvement anticipated to occur in the future by Steeplechase Subdivision. A copy of the full TIA and NCDOT's congestion management comments are provided as an attachment to this staff report.

#### **Consistency with Adopted Plans:**

##### **Comprehensive Plan**

The subject parcels are designated as "Low Density Residential" in the Comprehensive Plan 2040's Future Land Use Map. Per the plan, this designation recommends predominately suburban development of low-density single-family residential lots. The plan also states that mixed residential uses may occur under a Planned Development-Residential designation so long as the density of 3 units/acre is not exceeded. This designation does not account for any type of commercial development. The proposed master plan includes commercial development and a maximum density of 3.03 units/acre.

Despite inconsistency with the Future Land Use Map, staff is comfortable with the proposed master plan. The proposed density of the associated master plan is just over the 3 units/acre envisioned for Low Density Residential, and with the future northern connector running through these parcels the future land use map designation of the surrounding area will likely be modified as part of the Town's Comprehensive Plan update. Additionally, these properties are located in close proximity to land currently designated for "Medium Density Residential" and "Neighborhood Center", directly across O'Neil Street. It is also worth noting that since this is a Planned Development district, the specific uses and densities are governed by the associated Master Plan that is subject

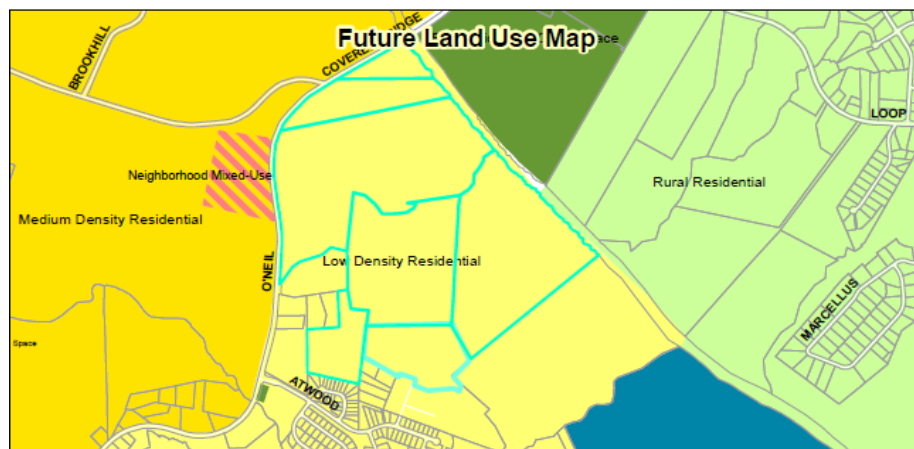
to approval by the Town Council. This allows for additional discretion over the uses and layout of the development to ensure that it remains consistent with the intent of the Comprehensive Plan while still allowing for unique and innovative development. If the associated rezoning to PD-MU is approved for the subject parcels staff has recommended that the parcels' designation be modified to "medium density residential" with a "neighborhood center" overlay on the commercial portion. This recommendation is outlined in the staff report of the associated rezoning. If approved, the proposed master plan would then be consistent with the future land use map designation.

**Comprehensive Plan Goals supporting the Master Plan request include:**

- **Goal LU1:** Preserve Clayton's small-town character while allowing for growth and development in appropriate areas.
- **Goal H1:** Encourage a range of housing types and lot sizes that meets the needs of various income levels, family sizes, and ages.

**Comprehensive Plan Goals not supporting the Master Plan request include:**

- None.



- **Unified Development Code**

The development is overall consistent with the requirements of the Unified Development Code. However, the applicant is requesting a waiver from 155.602(H) and 155.602(I) to develop the estate lots section without curb and gutter and sidewalk (Roads 5 & 11). Per the UDC, a waiver is not needed for sidewalk in this situation since sidewalk is not required where minimum lot sizes are 1 acre or greater. The lots on Roads 5 & 11 are a minimum of 1 acre.

Curb & Gutter is still required though, per the UDC, unless a waiver is granted by the Town Council. The applicant has requested a waiver due to environmental concerns since this portion of the development is located within the watershed protection overlay. See below for justification of this waiver request from the applicant, as outlined in the master plan's vehicular circulation plan sheet. The applicant has also addressed the required waiver criteria from Article 7 in their response to Finding of Fact #2 below. The Engineering department has reviewed this request and is comfortable with the proposed waiver due to the location of the property in the Watershed Protection Overlay. However, the Town will not be

responsible for the maintenance of the ditch sections or the drainage in the ROW as outlined in the associated development agreement.

**ALTERNATIVE STREET SECTION DESIGN WAIVER**

THE TOWN OF CLAYTON TYPICAL STREET SECTIONS REQUIRE THAT CURB AND GUTTER BE PROVIDED ALONG ALL STREETS.

WAIVER REQUEST:

FOR ALL 25' WIDE STREETS WITHIN ASHCROFT SECTION 2, SWALES SHALL BE PROVIDED ALONG BOTH SIDES OF THE STREET IN LIEU OF CURB AND GUTTER.

JUSTIFICATION FOR WAIVER REQUEST:

THE ENVIRONMENTALLY SENSITIVE AREAS ADJACENT TO THESE ROAD TYPES WOULD BENEFIT FROM THE INFILTRATION AND SLOWER CONVEYANCE OF STORMWATER PROVIDED BY VEGETATIVE SWALES IN CONTRAST TO THE STANDARD STORMWATER PIPES FED BY CURB AND GUTTER SYSTEMS.

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**Compatibility with Surrounding Land Uses**

The proposed master plan development is compatible with the surrounding land uses, which are primarily single-family residential. To the south of this development is Ashcroft 1 which is an existing residential subdivision. Directly across O'Neil is currently undeveloped, but was approved to be the Steeplechase Subdivision which will include single-family and townhome development. There is not commercial development in the general vicinity of this proposed master plan, but the master plan does locate the commercial development along O'Neil Street and transitions to residential components to the north and south to provide better compatibility with existing nearby residential uses.

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**CONSIDERATIONS:**

- Each phase of the development will be reviewed as a separate site plan or minor subdivision plan prior to plat recordation or building permit issuance.
- If approved, this master plan will be recorded with Johnston County and shall guide future development for this land.
- Approval of the master plan is contingent upon approval of the associated rezoning and development agreement.

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**FINDINGS OF FACT:**

The applicant has addressed the Findings of Fact outlined below, as listed in the Application as an attachment.

1. Consistency with the adopted plans and policies of the Town.

- Applicant Response:

The proposed subdivision is in accord with the adopted plans and policies of the town. The proposed subdivision will meet all applicable requirements of the Unified Development Code and is consistent with the Comprehensive Plan including the following Implementation Goals:

- Goal LU2 – Encourage quality development which maximizes existing infrastructure, promotes walking and biking, and enhances travel safety.
- Goals H1 – Encourage a range of housing types and lot sizes that meets the needs of various income levels, family sizes, and ages.

The property assemblage is designated as Low-Density Residential in the Clayton Comprehensive 2040 Plan. This designation allows for mixed-residential uses with a maximum density of 3 units per acre and the Comprehensive Plan provides guidance to permit up to 7 units per acre for Planned Development Districts. In addition, the project provides multiple stormwater control measures (SCM's) and complies with Phase II Watershed Rules - Neuse River Rules. This compliance through the use of SCM's, removes the maximum threshold for density. The overall density of the proposed project is 3.01 du/ac, with a density of 2.26 du/ac for the portion of the project that falls in the Watershed Protection Overlay.



- **Staff Commentary:** The proposed master plan meets the standards of the Unified Development Code, with the exception of the lack of curb & gutter on Roads 5 & 11. The applicant is requesting a waiver from this requirement as outlined in the master plan and above in this staff report. The applicant has also outlined the waiver criteria in their response to Finding of Fact #2 below. The plan meets the standards of the comprehensive plan 2040.

2. The subdivision meets all required specifications of this chapter.

- **Applicant Response:**

The proposed Ashcroft Section 2 major subdivision, upon rezoning to Planned Development Mixed Use and the approval of a street cross section waiver, will meet the applicable requirements of the town Subdivision Regulations and the Unified Development Code.

The Town of Clayton's typical street sections require sidewalk and curb and gutter on both sides of the street. In accordance with section 155.706(l)(6), this waiver request is to eliminate curb, gutter and sidewalk within the estate section of the development. This request meets the waiver criteria as follows:

1. The granting of the waiver will not be detrimental to the public safety, health, or welfare or injurious to other property or improvements in the neighborhood in which the property is located;

Granting the waiver eliminates curb, gutter and sidewalk in an estate section of the proposed subdivision. The estate sections are comprised of very large lots (+/- 1 acre each or greater) and are designed to enhance their integration into the existing natural environment. This proposed design limited to this specific area of the development will not be detrimental to public health, safety, welfare, or be injurious to other property or improvements in the neighborhood.

2. The conditions upon which the request for a waiver is based are unique to the property for which the waiver is sought and are not generally applicable to other property;

The waiver is being requested because of the unique size and location of the estate lots. These lots are purposefully located adjacent to the Neuse River to take advantage of river views and proximity to the greenway, while minimizing impacts within the Watershed Protection Overlay.

3. Because of the particular physical surroundings, shape, or topographical conditions of the specific property involved, a particular hardship to the owner would result, as distinguished from a mere inconvenience, if the strict letter of this chapter are enforced; and  
As stated above, the physical surroundings are very unique to the estate section of the development. Topography, proximity to the Neuse River, and being situated within the Watershed Protection Overlay are all factors contributing to the request to remove curb, gutter, and sidewalk. In addition to the above, the proposed ditch section within these two sections is a better way to control stormwater near environmentally sensitive features.

4. The purpose of the waiver is not based primarily upon financial consideration.

As stated in the criteria above, the request is based on location, not financial consideration. The waiver requests apply to the estate sections only. All other areas of the development will have curb, gutter, and sidewalk on both sides of the street.

- **Staff Commentary:** Staff is comfortable with the proposed request and justification regarding the removal of curb & gutter in this section due to the location in the Watershed Protection Overlay. A waiver is not required from sidewalk though, as per 155.602(H) sidewalks are not required where residential lots are a minimum of 1 acre in size. Since the lots in this portion of the development are all a minimum of 1 acre in size, sidewalk is not required in this location.

3. The subdivision will not be detrimental to the use or orderly development of other properties in the surrounding area and will not violate the character of existing standards for development of the properties in the surrounding area.
  - Applicant Response:

The proposed subdivision will not be detrimental to the use or orderly development of other properties in the surrounding area and will not violate the character of existing standards for development of properties in the surrounding area Ashcroft Section 2 provides access to and is compatible with existing adjacent subdivisions as well as the recently approved Steeplechase Subdivision across O'Neil Street. The proposed neighborhood will include varying home options, densities, and price points necessary to satisfy continued demand for housing in the Town as well as provide an additional opportunity for commercial uses. Additionally, the proposed development meets Comprehensive Plan Goal H1 – to encourage a range of housing types and lot sizes that meets the needs of various income levels, family sizes, and ages.
  - Staff Commentary: The proposed subdivision is consistent with the recently approved Steeplechase subdivision across O'Neil and existing Ashcroft 1 subdivision to the south. The applicant provides a mixture of housing options within this master plan.
4. The subdivision design will provide for the distribution of traffic in a manner that will avoid or mitigate congestion within the immediate area, will provide for the unified and orderly use of or extension of public infrastructure, and will not materially endanger the environment, public health, safety, or the general welfare.
  - Applicant Response:

The subdivision layout and roadway design are in accord with the July 2020, Traffic Impact Analysis and provide a thoughtful and connected pedestrian and vehicular network. The TIA required improvements will enable safe turning movements and better serve the public. Internal streets will have public sidewalks on each side of the street (with the exception of the estate sections) to provide pedestrian access to the adjacent existing development, amenities, trail networks, including the Clayton River Walk on the Neuse Greenway trail and Sam's Branch Greenway. All proposed improvements within the street ROW comply with published Town of Clayton Standards and Specifications. The Ashcroft Section 2 subdivision accommodates the Town's future Northern Connector (which will ultimately provide access to a proposed wastewater treatment facility and an electrical substation owned by the town) and provides access points to adjacent properties. The subdivision layout was thoughtfully designed to avoid environmental conflicts by appropriately buffering streams and honoring floodplain requirements.
  - Staff Commentary: The applicant will be providing the required traffic improvements outlined in the TIA and from NCDOT Congestion Management. These improvements and the timing of them are outlined in the associated proposed Development Agreement.

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**RECOMMENDED CONDITIONS OF APPROVAL:**

If approved, staff is recommending conditions of approval be placed upon the application. These conditions are outlined in an attachment to the staff report.

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**ATTACHMENTS:**

- 1) Application
- 2) Map
- 3) Neighborhood Meeting Materials
- 4) Proposed Master Plan
- 5) Traffic Impact Analysis
- 6) NCDOT Congestion Management Analysis
- 7) Newspaper Ad
- 8) Adj. Property Letter
- 9) Wastewater Allocation Request & Scoring Sheet
- 10) Recommended Conditions of Approval- Signed



Date - August 20th, 2020

Dear Clayton Area Property Owner:

The purpose of this letter is to notify you of an application filed with the Town of Clayton for a development proposal involving property adjacent to, or in close proximity to, property shown in your ownership by Johnston County tax records. Per Town of Clayton regulations, a Neighborhood Meeting will be held to provide information to area residents about the proposal. A representative of the applicant will be present to explain their application, answer questions, and solicit comments. The following provides details for the Neighborhood Meeting:

**Meeting Date:** Thursday September 3rd 2020  
**Meeting Time:** 6:00 - 8:00 PM  
**Meeting Location:** Virtual Meeting - Use the link to join! <https://us02web.zoom.us/j/89830589700>

**Type of Application:** Major Subdivision Application/Rezoning  
**Project Address:** SE Quadrant of Covered Bridge Rd. and Neuse River

**Project Description:** Ashcroft Section 2 is a proposed 256 acre mixed-use neighborhood development located in the southeast quadrant of the intersection Covered Bridge Road and the Neuse River. The development plan includes 772 residential units (293 single family units, 299 townhome units, and 180 apartment units); and 105,000 square feet of commercial uses. The project includes the alignment for the Town's future North Connector, ; a variety of open space amenities which tie to the Town's existing greenway network; and a recreation/amenity area with clubhouse, pool, and playground. It is anticipated that the project will be developed in multiple phases over time, based on market demand and to meet the needs and functionality of the community during construction.

**Public Meeting:** The project will be heard by the Town of Clayton Planning Board is scheduled for MONTH ##, 2020. (Date is subject to change)

At a minimum, the following will be available for your inspection at the Neighborhood Meeting:

- A copy of the project application.
- A schedule of all upcoming public meetings for the application.
- A map at a scale that is appropriate to the project and shows neighboring properties and roads.
- A map, drawing, or other depiction of the proposed land use change or development proposal.

Enclosed with this letter is a map showing the location of the property that is subject to Major Site Plan approval.

If you have any questions prior to or after this meeting, you may contact us at 919-813-0123. You may also contact the Town of Clayton Planning Department at 919-553-5002.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D. DeYoung', is written over a large, faint, light blue 'WILD' watermark.

David DeYoung, AICP  
Director of Development

Cc: Town of Clayton Planning Department

**THE RIVER WILD TEAM.COM**

114 W. Main Street, Clayton, NC 27520 | 919.813.0123

## NEIGHBORHOOD MEETING ATTENDANCE ROSTER

**Project:** Ashcroft Section 2

**Application:** Rezoning

**Location/Date:** Virtual/Zoom - September 3rd, 2020 - 6:00 - 8:00 pm

|    | NAME                          | ADDRESS                              |
|----|-------------------------------|--------------------------------------|
| 1  | Dave DeYoung                  | RiverWild                            |
| 2  | Becca Mountz                  | RiverWild                            |
| 3  | Tim Summerville               | STEWART - Consult                    |
| 4  | May Offutt                    | 128 Highmeadow Lane Clayton NC 27520 |
| 5  | Steve Smith                   | 1814 N ONeil Street Clayton NC 27520 |
| 6  | Duane Gott and Chris Mitchell | 180 Highmeadow Lane Clayton NC 27520 |
| 7  |                               |                                      |
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## NEIGHBORHOOD MEETING SUMMARY FORM

### FILL OUT THE FOLLOWING:

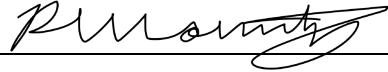
Application: Rezoning

Date of Mailing: August 20th 2020

Date of Meeting: September 3rd 2020 Time of Meeting: 6:00-8:00 pm

Location of Meeting: Virtual / Zoom

I hereby attest that letters were mailed to the addresses listed on the Adjacent Property Owners List (attached) ten days prior to the Neighborhood Meeting, and that all required information was presented at the Meeting:

Printed Name: Rebecca Mountz Signature: 

**Meeting Summary/Minutes:** *provide a summary of the discussion held at the meeting, including issues raised and any resolution discussed, and any changes made to the application as a result of the meeting.*

See attached document for meeting minutes.

*Please write clearly (or submit a typed summary). Use additional sheets if necessary.*

# RIVER WILD

## Ashcroft Section 2 Neighborhood Meeting Notes 6:00 - 8:00 PM 9/3/2020

### Attendance

Dave DeYoung - RiverWild

Becca Mountz - RiverWild

Tim Summerville - Stewart

May O. 128 highmeadow lane

Steve

Duane and Chris 150 highmeadow lane

### ***Dave DeYoung goes through his presentation. The following comments are made and responded to.***

May O.- Stated that she lives in the connected townhome villas and side of woods and wondering how much of the wooded area and trees will be removed for the project?

Dave - Explains the concept of blue lined streams and protection areas, also explains buffers around property and how there will also be a new wastewater treatment plan.

Steve- amenities question about the gold course asking if it will be a shared amenity between riverwood and wondering if all amenities will be shared.

Dave - Explains how sites are programmed to have capacity to cater to residents but also cater to shared membership amenities at surrounding neighborhoods.

May - Asked clarification on what the northern connector was.

May - When does phase one start?

Dave - Explains multi phase development starting where ashcroft 1 ends. And talks about access to the neighborhood being more than just through current ashcroft. Points out the intended change to the concept design regarding the access road south of powerlines being moved north of power lines.

Steve - Will there be a grocery store in the shopping center?

Dave- Explains that we would love to have that in the area but with covid we have to see what the market is and what it would warrant closer to that phase of development.

### ***Dave DeYoung goes through his presentation again since more people have joined the meeting. The following comments are made and responded to.***

Duane and Chris - Asked the construction timeline.

Dave - Explains multi phase development starting where ashcroft 1 ends. And talks about access to the neighborhood being more than just through current ashcroft.

Duane and Chris - Asking about the treeline behind highmeadow if it is being cleared or not

Dave - Points out the required buffer but also shows that there is green space located throughout the plan.

Chris - What does hoa cost look like? Will ours go up?

Dave - Doesnt think that the hoa dues would go up substantially, but we really don't have a set answer but Dave will get back to chris on that information - need email address

Chris - What will this do to current home values?

Dave- Currently the trend is when we build a phase it will be one price point but the demand pushes the price up - used east river example of phased price changes.

# RIVER WILD

**May** - How do you think a water treatment plant will affect this development?

**Dave** - The town needs more capacity and so it needs to happen. We don't think that it would be a problem - we wouldn't put one acre estate homes next to it if we did.

**Steve** - What is price point of units from townhomes to estate homes?

**Dave** - Explains current price points in similar neighborhoods but points out that the estate home will be custom homes. We are looking to up our game with having this many different types of homes in one area. Truly want a mixed use development.

**May** - It is super cool to have a mixed use because you have so many different people.

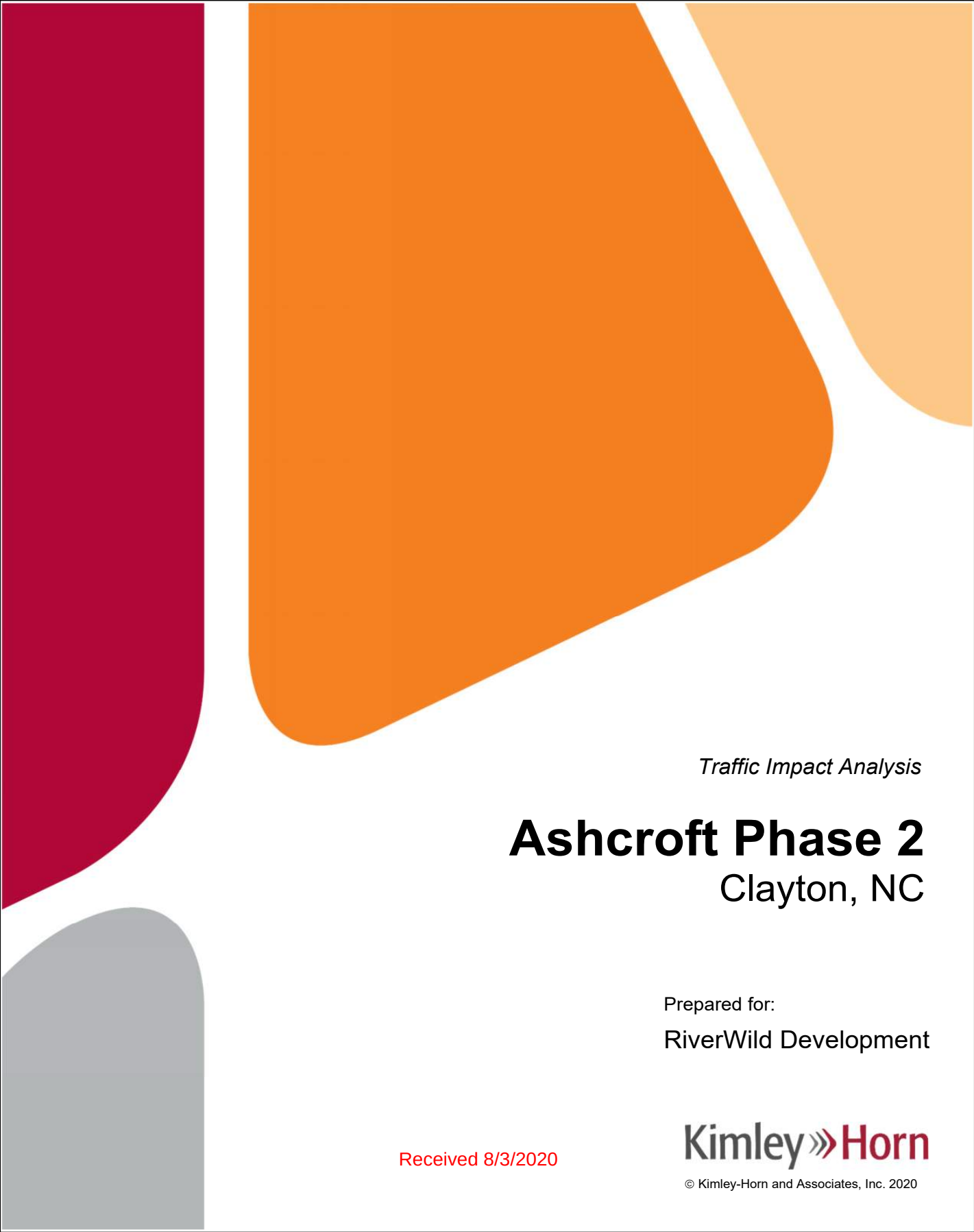
**Chris** - Asking about the peoples houses that are offered from covered bridge that are not in the property of section 2.

**Dave** - Explains that everything in the plan is under contract and how those properties adjacent not in color on the map did not wish to sell their land.

**Steve** - When will the construction of the wastewater treatment plant begin?

**Dave** - The town is pushing hard to get it built and start building in the spring.

| MAILING ADDRESS             | CITY         | STATE | ZIP        | OWNNAME                             | OWNNAME2                            | PARCEL NUMBER(S)                                                                                                        |
|-----------------------------|--------------|-------|------------|-------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|                             |              |       |            |                                     |                                     | 166900-88-7300 166900-75-9962<br>166900-76-7649<br>166900-76-6086<br>166900-66-9129<br>166900-76-1254<br>166900-74-2974 |
| 114 W MAIN ST STE 102       | CLAYTON      | NC    | 27520-2397 | ASHCROFT PARTNERS, LLC              |                                     |                                                                                                                         |
| 142 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | BARRETT, SANDRA LIFE ESTATE         | PARRISH, MICHELLE BARRETT REMAINDER | 166900-66-5624                                                                                                          |
| 1380 N ONEALS ST            | CLAYTON      | NC    | 27520      | BENSON, AMANDA LEIGH                |                                     | 166900-76-1783                                                                                                          |
| 1378 B NORTH O'NEAL EXT     | CLAYTON      | NC    | 27520-0000 | BENSON, ANTHONY MARK                |                                     | 166900-76-0637 166900-76-0536<br>166900-66-9886                                                                         |
| 116 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | BRIAN E. PRUSANK LIVING TRUST       |                                     | 166900-66-6612                                                                                                          |
| 170 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | CAPERS, ANJOLINA WASHINGTON         | CAPERS, TERRELLE CLARENCE           | 166900-66-4637                                                                                                          |
| 196 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | COX, CHARLOTTE                      |                                     | 166900-66-2665                                                                                                          |
| 1907 LAKE WENDELL RD        | WENDELL      | NC    | 27591-7158 | DUDLEY, BLAINE T.                   |                                     | 166900-66-3711                                                                                                          |
| 2019 HARDEE LN              | CLAYTON      | NC    | 27520-9822 | HARDEE, JOSEPH T                    |                                     | 166900-85-1038                                                                                                          |
| 1039 CROCKER RD             | SMITHFIELD   | NC    | 27577-9033 | HICKERSON, PATSY POOLE              |                                     | 166900-67-3527                                                                                                          |
| 88 HIGHMEADOW LN            | CLAYTON      | NC    | 27520-5712 | HILL, DEBORAH                       |                                     | 166900-66-7585                                                                                                          |
| 106 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | JERRY AND FAITH LAYTON LIVING TRUST | LAYTON, JERRY CLINTON TRUSTEE       | 166900-66-6661                                                                                                          |
| 1538 NORTH ONEIL STREET EXT | CLAYTON      | NC    | 27520-0000 | JONES, TRACY L                      |                                     | 166900-68-3043                                                                                                          |
| 8041 ST ANDREWS DR          | LAURINBURG   | NC    | 28352-0000 | MASSEY, JOHN WESLEY                 |                                     | 176000-70-3713 166900-78-4101<br>166900-67-5094                                                                         |
| 180 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | MITCHELL, CHRIS D.                  | GOTT, DUANE ANTONY                  | 166900-66-3790                                                                                                          |
| 128 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | OFFUTT, MAY                         | HUGHES, LLOYD                       | 166900-66-5674                                                                                                          |
| 156 HIGHMEADOW LN           | CLAYTON      | NC    | 27520-5713 | RAFFEL, MARY                        | RAFFEL, BRANDON                     | 166900-66-4676                                                                                                          |
| 7230 NC HIGHWAY 42 E        | SELMA        | NC    | 27576-6005 | RAYMOND E EARP JR REVOCABLE TRUST   | EARP, NANCY CREWS TRUSTEE           | 176000-60-9362<br>166900-39-5182                                                                                        |
|                             |              |       |            |                                     |                                     | 166900-76-2281 166900-76-5170<br>166900-76-4165<br>166900-76-2203<br>166900-76-1202                                     |
| 114 W MAIN ST STE 102       | CLAYTON      | NC    | 27520-2397 | RMS INVESTMENTS, LLC                |                                     |                                                                                                                         |
| 96 HIGHMEADOW LN            | CLAYTON      | NC    | 27520-5712 | SHARON HOUTMAN FAMILY TRUST         |                                     | 166900-66-7640                                                                                                          |
| 1814 N ONEIL STREET EXT     | CLAYTON      | NC    | 27520-6236 | SMITH, JAMES D.                     | JEAN K. SMITH TRUST                 | 166900-79-1467                                                                                                          |
|                             | CLAYTON      | NC    | 27528-0000 | TOWN OF CLAYTON                     |                                     | 166900-96-3988 176000-80-8682                                                                                           |
| 1376 NORTH ONEIL STREET EXT | CLAYTON      | NC    | 27520-0000 | WALL, STEVIE GLENN                  | WALL, JACKIE                        | 166900-76-0405                                                                                                          |
| 350 WAGONER DR              | FAYETTEVILLE | NC    | 28303-4647 | WEAVER HOMES, INC                   |                                     | 166900-76-7044 166900-76-4107<br>166900-76-7092<br>166900-76-6028                                                       |
| 283 GLEN RD STE A           | GARNER       | NC    | 27529-6240 | WESTAN CONSTRUCTION, LLC            |                                     | 166900-76-5112                                                                                                          |
| 9728 CYPRESS FARM DR        | ZEBULON      | NC    | 27597-6700 | WOODS, PAMELA POOLE                 |                                     | 166900-67-4589                                                                                                          |
| 1500 N ONEIL STREET EXT     | CLAYTON      | NC    | 27520-6959 | SPENCE, DEANNA JONES                |                                     | 166900-57-9493                                                                                                          |
| PO BOX 879                  | CLAYTON      | NC    | 27528-0000 | TOWN OF CLAYTON                     |                                     | 166900-96-3988                                                                                                          |



*Traffic Impact Analysis*

# **Ashcroft Phase 2**

Clayton, NC

Prepared for:  
RiverWild Development

Received 8/3/2020

**Kimley»Horn**

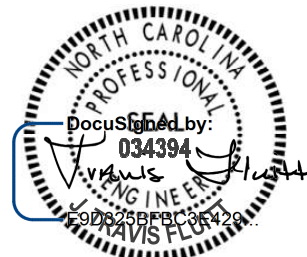
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**Traffic Impact Analysis for**  
**Ashcroft Phase 2**  
**Clayton, North Carolina**

**Prepared for:**  
**RiverWild Development**  
**Clayton, NC**

**Prepared by:**  
**Kimley-Horn and Associates, Inc.**  
**NC License #F-0102**  
**421 Fayetteville Street, Suite 600**  
**Raleigh, NC 27601**  
**(919) 677-2000**

**August 2020**  
**014163000**



8/3/2020



This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

## Executive Summary

Kimley-Horn and Associates, Inc. has prepared a Traffic Impact Analysis (TIA) for the proposed Ashcroft Phase 2 multi-use development located east of N. O’Neil Street on the south side of the Neuse River in Clayton, North Carolina. The site is currently vacant and as currently envisioned will include approximately 300 single-family homes, 300 townhomes, 180 apartments, and 105,000 square feet (SF) of general retail space. The site is proposed to be accessed by one full-movement and one right-in/right-out (RIRO) driveway on N. O’Neil Street, the extension of Covered Bridge Road through the site, and a connection out to Atwood Drive. The development is anticipated to be completed (built-out) by the year 2030.

This report presents trip generation, distribution, traffic analyses, and recommendations for transportation improvements required to meet anticipated traffic demands in conjunction with the proposed development. The traffic conditions studied include the existing (2020) traffic condition and the projected (2030) background and build-out traffic conditions. The Steeplechase development is committed to realigning Covered Bridge Road to intersect N. O’Neil Street approximately 900 feet to the south of the existing intersection. However, due to the uncertainty of the timing of that improvement, analyses were performed with Covered Bridge Road in its current location (Scenario #1) and with the realignment of Covered Bridge Road (Scenario #2).

As shown in [Table ES-1](#), the development has the potential to generate 8,698 net new daily trips, with 608 new trips during the AM peak hour and 734 new trips during the PM peak hour on a typical weekday.

| Table ES-1<br>ITE Traffic Generation (Vehicles) |                                |           |      |       |       |              |     |              |     |
|-------------------------------------------------|--------------------------------|-----------|------|-------|-------|--------------|-----|--------------|-----|
| Land Use Code                                   | Land Use                       | Intensity |      | Daily |       | AM Peak Hour |     | PM Peak Hour |     |
|                                                 |                                |           |      | In    | Out   | In           | Out | In           | Out |
| 210                                             | Single-Family Detached Housing | 300       | d.u. | 1,429 | 1,429 | 55           | 163 | 184          | 108 |
| 221                                             | Multifamily Housing (Mid-Rise) | 300       | d.u. | 1,114 | 1,114 | 31           | 104 | 99           | 58  |
| 221                                             | Multifamily Housing (Low-Rise) | 180       | d.u. | 490   | 490   | 16           | 45  | 48           | 30  |
| 820                                             | Shopping Center                | 105,000   | s.f. | 3,108 | 3,108 | 126          | 78  | 270          | 293 |
| Subtotal                                        |                                |           |      | 6,141 | 6,141 | 228          | 390 | 601          | 489 |
| Internal Capture                                |                                |           |      | 1,042 | 1,042 | 5            | 5   | 103          | 103 |
| Pass-by Capture                                 |                                |           |      | 750   | 750   | 0            | 0   | 75           | 75  |
| Net New External Trips                          |                                |           |      | 4,349 | 4,349 | 223          | 385 | 423          | 311 |

Capacity analyses were performed using Synchro Version 10 software. [Table ES-2](#) summarizes the operation of the study intersections for the AM and PM peak hour traffic conditions.

| <b>Table ES-2<br/>Level-of-Service Summary</b>                                           |                                                                  |                                                                    |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------|
| <b>Condition</b>                                                                         | <b>AM Peak Hour<br/>LOS (Delay)</b>                              | <b>PM Peak Hour<br/>LOS (Delay)</b>                                |
| <b>N. O'Neil Street at Main Street (Signalized)</b>                                      |                                                                  |                                                                    |
| Existing (2020) Traffic                                                                  | B (19.2)                                                         | C (20.5)                                                           |
| Background (2030) Traffic                                                                | E (64.2)                                                         | F (100.8)                                                          |
| Build-out (2030) Traffic                                                                 | F (129.3)                                                        | F (187.6)                                                          |
| <b>N. O'Neil Street at Atwood Drive (Unsignalized)</b>                                   |                                                                  |                                                                    |
| Existing (2020) Traffic                                                                  | WB – B (13.3)<br>SBL – A (7.8)                                   | WB – C (17.2)<br>SBL – A (8.8)                                     |
| Background (2030) Traffic                                                                | WB – C (17.4)<br>SBL – A (8.1)                                   | WB – D (25.7)<br>SBL – B (13.2)                                    |
| Build-out (2030) Traffic                                                                 | WB – D (26.7)<br>SBL – A (8.3)                                   | WB – F (51.6)<br>SBL – B (10.5)                                    |
| <b>N. O'Neil Street/Covered Bridge Road at Covered Bridge Road (Unsignalized)</b>        |                                                                  |                                                                    |
| Existing (2020) Traffic                                                                  | EB – C (22.0)<br>NBL – A (9.0)                                   | EB – F (264.3)<br>NBL – A (8.7)                                    |
| Background (2030) Traffic – <i>Current Location</i>                                      | EB – F (98.9)<br>NBL – B (10.2)                                  | EB – F (>1,000)<br>NBL – A (9.5)                                   |
| Build-out (2030) Traffic – <i>Current Location</i>                                       | EB – F (>1,000)<br>NBL – B (12.4)                                | EB – F (>1,000)<br>NBL – B (11.2)                                  |
| <b>Covered Bridge Road at Pritchard Road/Private Driveway (Signalized)</b>               |                                                                  |                                                                    |
| Existing (2020) Traffic                                                                  | C (33.0)                                                         | D (43.5)                                                           |
| Background (2030) Traffic                                                                | E (58.7)                                                         | F (89.1)                                                           |
| Build-out (2030) Traffic                                                                 | E (72.5)                                                         | F (100.5)                                                          |
| <b>Covered Bridge Road at Steeplechase Driveway 2/South Site Driveway (Unsignalized)</b> |                                                                  |                                                                    |
| Background (2030) Traffic                                                                | EB – B (14.7)<br>NBL – A (8.5)                                   | EB – C (19.0)<br>NBL – A (8.6)                                     |
| Build-out (2030) Traffic                                                                 | EB – C (23.3)<br>WB – D (26.5)<br>NBL – A (8.9)<br>SBL – A (8.4) | EB – E (47.5)<br>WB – F (129.7)<br>NBL – A (8.8)<br>SBL – B (10.3) |
| <b>N. O'Neil Street at Right-in/Right-out Site Driveway (Unsignalized)</b>               |                                                                  |                                                                    |
| Build-out (2030) Traffic                                                                 | WB – B (11.1)                                                    | WB – C (18.1)                                                      |

| <b>Table ES-2 (cont.)<br/>Level-of-Service Summary</b>                        |                                     |                                     |
|-------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Condition</b>                                                              | <b>AM Peak Hour<br/>LOS (Delay)</b> | <b>PM Peak Hour<br/>LOS (Delay)</b> |
| <b>N. O'Neil Street at Covered Bridge Road Extension (Scenario #1)</b>        |                                     |                                     |
| Build-out (2030) Traffic – <i>Unsignalized</i>                                | WB – D (29.4)<br>SBL – A (8.7)      | WB – F (295.5)<br>SBL – B (12.4)    |
| Build-out (2030) Traffic – <i>Signalized</i>                                  | B (14.5)                            | C (24.6)                            |
| <b>N. O'Neil Street at Covered Bridge Road Extension (Scenario #2)</b>        |                                     |                                     |
| Background (2030) Traffic – <i>Signalized with<br/>Committed Improvements</i> | B (13.0)                            | C (24.2)                            |
| Build-out (2030) Traffic – <i>Signalized with<br/>Committed Improvements</i>  | B (36.4)                            | E (66.0)                            |

The following committed improvements by the Steeplechase development were included in the future traffic conditions:

N. O'Neil Street at Steeplechase Driveway #2:

- Construct a northbound left-turn lane on N. O'Neil Street with 150 feet of storage

N. O'Neil Street at Realigned Covered Bridge Road (Scenario #2):

- Realign Covered Bridge Road to intersect N. O'Neil Street approximately 900 feet south of its current alignment
- Construct a northbound left-turn lane on N. O'Neil Street with 150 feet of storage
- Construct a southbound right-turn lane on Covered Bridge Road with 100 feet of storage
- Construct an eastbound right-turn lane on Covered Bridge Road with 150 feet of storage
- Install a traffic signal

The following improvements are recommended to be performed as part of this project to accommodate site traffic volumes:

N. O'Neil Street at Steeplechase Driveway #2/South Site Driveway:

- Construct the South Site Driveway with an exclusive westbound right-turn lane and an exclusive left-turn lane with 125 feet of storage and appropriate tapers
- Construct a northbound right-turn lane on N. O'Neil Street with 75 feet of storage and appropriate tapers
- Construct a southbound left-turn lane on N. O'Neil Street with 75 feet of storage and appropriate tapers

N. O'Neil Street at Right-in/Right-out Site Driveway:

- Construct the Right-in/Right-out Site Driveway with one ingress lane and one egress lane

- Construct a northbound right-turn lane on N. O’Neil Street with 100 feet of storage and appropriate tapers

N. O’Neil Street at Covered Bridge Road Extension (Scenario #1):

- Construct the Covered Bridge Road Extension with an exclusive westbound right-turn lane and an exclusive left-turn lane with 150 feet of storage and appropriate tapers
- Construct a northbound right-turn lane on N. O’Neil Street with 100 feet of storage and appropriate tapers
- Construct a southbound left-turn lane on N. O’Neil Street with 225 feet of storage and appropriate tapers
- Monitor for signal warrants and install a traffic signal when warranted

N. O’Neil Street at Realigned Covered Bridge Road/Covered Bridge Road Extension (Scenario #2):

- Construct the Covered Bridge Road Extension with an exclusive westbound shared through/right lane and an exclusive left-turn lane with 150 feet of storage and appropriate tapers
- Restripe the eastbound approach of Covered Bridge Road to a shared through/right lane
- Construct a northbound right-turn lane on N. O’Neil Street with 100 feet of storage and appropriate tapers
- Construct a southbound left-turn lane on N. O’Neil Street with 225 feet of storage and appropriate tapers
- Modify the committed traffic signal to accommodate the recommended laneage

Analyses indicate that the signalized intersection of O’Neil Street at Main Street is expected to operate at LOS E in the AM peak hour and LOS F in the PM peak hour in the projected background condition and at LOS F in both peak hours at project build-out. However, as noted in previous traffic studies and reviews in the study area, roadway widening is not feasible at this intersection due to existing development. Therefore, no improvements are recommended to be performed at this intersection.

The unsignalized intersection of N. O’Neil Street at Atwood Drive is expected to operate with short to moderate delays on the minor street approach (Atwood Drive) in the background condition and moderate to long delays in the build-out condition. However, it should be noted that while the Atwood Drive approach is very wide and likely functions as a dual lane approach, it was analyzed with a single lane to be conservative. It is also typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay. As SimTraffic simulations indicate no queuing issues at this intersection, no improvements are recommended to be performed at this intersection.

In its current alignment, the unsignalized intersection of N. O'Neil Street at Covered Bridge Road is expected to operate with long delays in the AM and PM peak hours for the minor street approach (Covered Bridge Road) in the future traffic conditions with or without the proposed project in place. As Covered Bridge Road is anticipated to be realigned to the south in the future, no roadway improvements are recommended to be performed at this intersection.

The signalized intersection of Covered Bridge Road at Pritchard Road is expected to operate at LOS E in the AM peak hour and LOS F in the PM peak hour in the study year 2030 with or without the proposed project in place. However, this is with right-turns on red (RTOR) prohibited per NCDOT Congestion Management guidelines. An analyses was also performed with RTOR permitted as they are at the intersection today. In this scenario the overall intersection delays are expected to be significantly shorter than when RTOR are prohibited, especially in the AM peak hour. Therefore, no roadway improvements are recommended to be performed at this intersection.

At the future unsignalized intersection of N. O'Neil Street at the Steeplechase Driveway #2/South Site Driveway, the westbound minor street approach (South Site Driveway) is expected to operate with moderate to long delays at project build-out. However, SimTraffic simulations indicates that minor street approach queues are expected to be accommodated within the recommended storage.

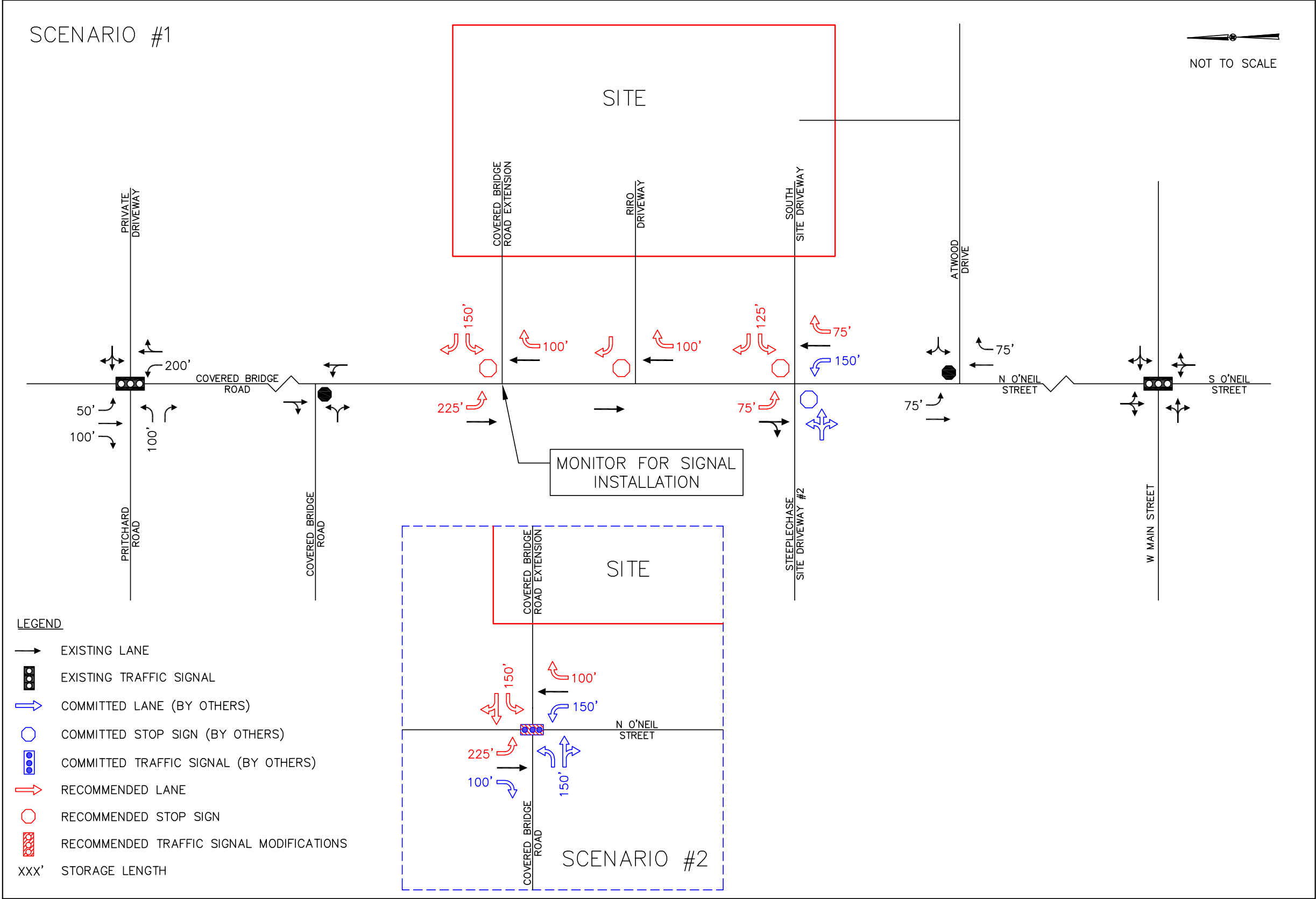
With the existing Covered Bridge Road in its current alignment (Scenario #1), analyses indicate that the future intersection of N. O'Neil Street at Covered Bridge Road Extension is expected to operate with long delays on the minor street approach (Covered Bridge Road Extension) in the PM peak hour if the intersection remains unsignalized. However, with a traffic signal in place, the intersection is expected to operate at LOS B in the AM peak hour and LOS C in the PM peak hour.

With the realignment of Covered Bridge Road at O'Neil Street (Scenario #2) and the committed and recommended improvements in place, the intersection of N. O'Neil Street at Realigned Covered Bridge Road/Covered Bridge Road Extension is expected to operate at LOS E in the PM peak hour. An alternative scenario permitting right-turns on red (RTOR) and permitted-protected left-turn phasing at this intersection found that the intersection is expected to operate at an acceptable LOS.

The committed and recommended roadway laneage is shown on **Figure ES-1**.



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ASHCROFT PHASE 2  
CLAYTON, NC  
TRAFFIC IMPACT ANALYSIS

COMMITTED AND RECOMMENDED ROADWAY  
LANEAGE

FIGURE  
ES-1

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

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## 1.0 Introduction

Kimley-Horn and Associates, Inc. has prepared a Traffic Impact Analysis (TIA) for the proposed Ashcroft Phase 2 multi-use development located east of N. O'Neil Street on the south side of the Neuse River in Clayton, North Carolina. The site is currently vacant and as currently envisioned will include approximately 300 single-family homes, 300 townhomes, 180 apartments, and 105,000 square feet (SF) of general retail space. The site is proposed to be accessed by one full-movement and one right-in/right-out (RIRO) driveway on N. O'Neil Street, the extension of Covered Bridge Road through the site, and a connection out to Atwood Drive. The development is anticipated to be completed (built-out) by the year 2030.

This report presents trip generation, distribution, traffic analyses, and recommendations for transportation improvements required to meet anticipated traffic demands in conjunction with the proposed development. The traffic conditions studied include the existing (2020) traffic condition and the projected (2030) background and build-out traffic conditions. The Steeplechase development is committed to realigning Covered Bridge Road to intersect N. O'Neil Street approximately 900 feet to the south of the existing intersection. However, due to the uncertainty of the timing of that improvement, analyses were performed with Covered Bridge Road in its current location (Scenario #1) and with the realignment of Covered Bridge Road (Scenario #2).

Town of Clayton and North Carolina Department of Transportation (NCDOT) staff provided background data and were consulted regarding the elements to be covered in this analysis. The TIA Scoping Documents are included in the Appendix.

## 2.0 Inventory

### 2.1 Study Area

The study area for this development includes the following intersections:

- N. O'Neil Street at Main Street
- N. O'Neil Street at Atwood Drive
- N. O'Neil Street/Covered Bridge Road at Covered Bridge Road
- Covered Bridge Road at Pritchard Road/Private Driveway
- N. O'Neil Street at Steeplechase Driveway #2/South Site Driveway
- N. O'Neil Street at Right-in/Right-out Site Driveway
- N. O'Neil Street at Covered Bridge Road Extension

**Figure 2.1** shows the site location, and the conceptual site plan is shown on **Figure 2.2**

### 2.2 Existing Conditions

The Ashcroft Phase 2 multi-use development is located east of N. O'Neil Street on the south side of the Neuse River in Clayton, North Carolina. Roadways in the area include N. O'Neil Street/Covered Bridge Road (N), Main Street, Pritchard Road, Covered Bridge Road (W), and Atwood Drive. The existing roadway laneage is shown in **Figure 2.3**.

N. O'Neil Street is a two-lane undivided roadway with a posted speed limit of 55 mph in the vicinity of the site. The speed limit drops to 45 mph at Atwood Drive and down to 25 mph closer to Main Street. N. O'Neil Street becomes Covered Bridge Road (N) north of Covered Bridge Road (W), with the speed limit reduced to 45 mph in the vicinity of Pritchard Road. The estimated 2020 average daily traffic (ADT) volume is approximately 8,300 vehicles per day (vpd) northeast of Main Street and 10,900 vpd north of Covered Bridge Road (W).

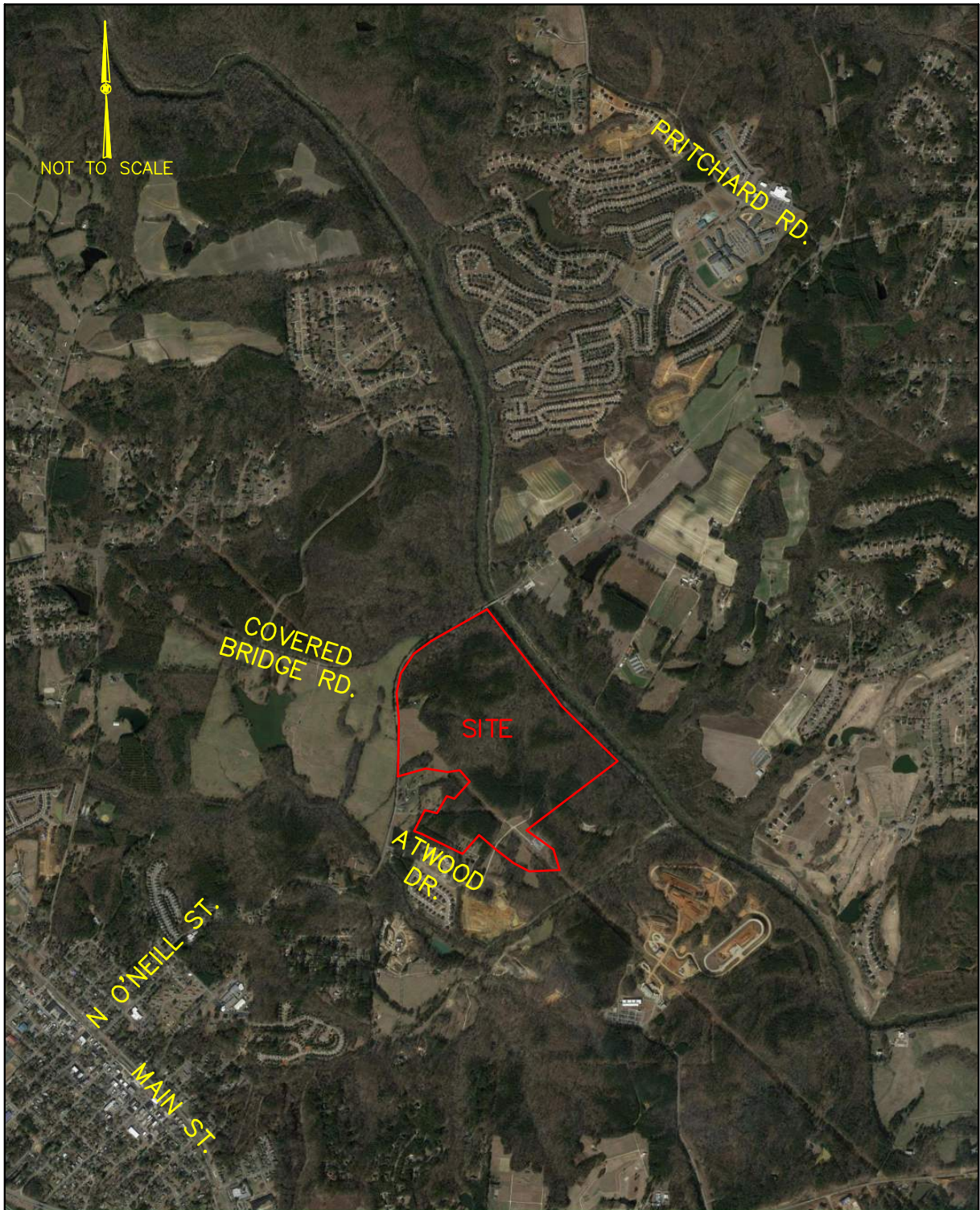
Main Street is a two-lane undivided roadway with on-street parking and a posted speed limit of 25 mph in the vicinity of O'Neil Street. The estimated 2020 average daily traffic (ADT) volume on Main Street is approximately 9,700 vehicles per day (vpd) east of O'Neil Street and 8,300 vpd west of O'Neil Street.

Pritchard Road is a two-lane undivided roadway with a posted speed limit of 45 mph in the vicinity of Covered Bridge Road. The estimated 2020 ADT volume is approximately 8,700 vpd.

Covered Bridge Road (W) is a two-lane undivided roadway with a posted speed limit of 55 mph in the vicinity of N. O'Neil Street. The estimated 2020 ADT volume is approximately 5,000 vpd west of N. O'Neil Street.

Atwood Drive is a two-lane undivided roadway with an assumed speed limit of 25 mph. The estimated 2020 ADT volume is approximately 1,500 vpd.





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ASHCROFT PHASE 2  
CLAYTON, NC  
TRAFFIC IMPACT ANALYSIS

SITE LOCATION

FIGURE  
2.1

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CONCEPTUAL SITE PLAN

FIGURE 2.2

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### 3.0 Traffic Generation

The traffic generation potential of the proposed Ashcroft Phase 2 development was determined using the traffic generation rates published in *Trip Generation* (Institute of Transportation Engineers, Tenth Edition, 2017). As currently envisioned, the development is anticipated to approximately 300 single-family homes, 300 townhomes, 180 apartments, and 105,000 SF of general retail space. Trip generation calculations for the site are summarized below in Table 3.1.

| <b>Table 3.1</b>                         |                                |                  |      |              |              |                     |            |                     |            |
|------------------------------------------|--------------------------------|------------------|------|--------------|--------------|---------------------|------------|---------------------|------------|
| <b>ITE Traffic Generation (Vehicles)</b> |                                |                  |      |              |              |                     |            |                     |            |
| <b>Land Use Code</b>                     | <b>Land Use</b>                | <b>Intensity</b> |      | <b>Daily</b> |              | <b>AM Peak Hour</b> |            | <b>PM Peak Hour</b> |            |
|                                          |                                |                  |      | <b>In</b>    | <b>Out</b>   | <b>In</b>           | <b>Out</b> | <b>In</b>           | <b>Out</b> |
| 210                                      | Single-Family Detached Housing | 300              | d.u. | 1,429        | 1,429        | 55                  | 163        | 184                 | 108        |
| 221                                      | Multifamily Housing (Mid-Rise) | 300              | d.u. | 1,114        | 1,114        | 31                  | 104        | 99                  | 58         |
| 221                                      | Multifamily Housing (Low-Rise) | 180              | d.u. | 490          | 490          | 16                  | 45         | 48                  | 30         |
| 820                                      | Shopping Center                | 105,000          | s.f. | 3,108        | 3,108        | 126                 | 78         | 270                 | 293        |
| Subtotal                                 |                                |                  |      | 6,141        | 6,141        | 228                 | 390        | 601                 | 489        |
| <i>Internal Capture</i>                  |                                |                  |      | <i>1,042</i> | <i>1,042</i> | <i>5</i>            | <i>5</i>   | <i>103</i>          | <i>103</i> |
| <i>Pass-by Capture</i>                   |                                |                  |      | <i>750</i>   | <i>750</i>   | <i>0</i>            | <i>0</i>   | <i>75</i>           | <i>75</i>  |
| <b>Net New External Trips</b>            |                                |                  |      | <b>4,349</b> | <b>4,349</b> | <b>223</b>          | <b>385</b> | <b>423</b>          | <b>311</b> |

As shown in Table 3.1, the development has the potential to generate 8,698 net new daily trips, with 608 new trips during the AM peak hour and 734 new trips during the PM peak hour on a typical weekday.

Internal capture and pass-by reductions were performed per NCDOT Congestion Management guidelines. Pass-by traffic was assigned to the network at the site driveways based on peak hour traffic patterns.

Detailed trip generation calculations are included in the Appendix of this report.



#### 4.0 Site Traffic Distribution

The projected site-generated trips were assigned to the surrounding roadway network. The directional distribution and assignment for this development were based on a review of surrounding land uses and discussions with NCDOT and the Town of Clayton. Separate trip distributions and assignments were developed for the residential and retail portions the development.

The following overall distribution was used for the residential portion of the development:

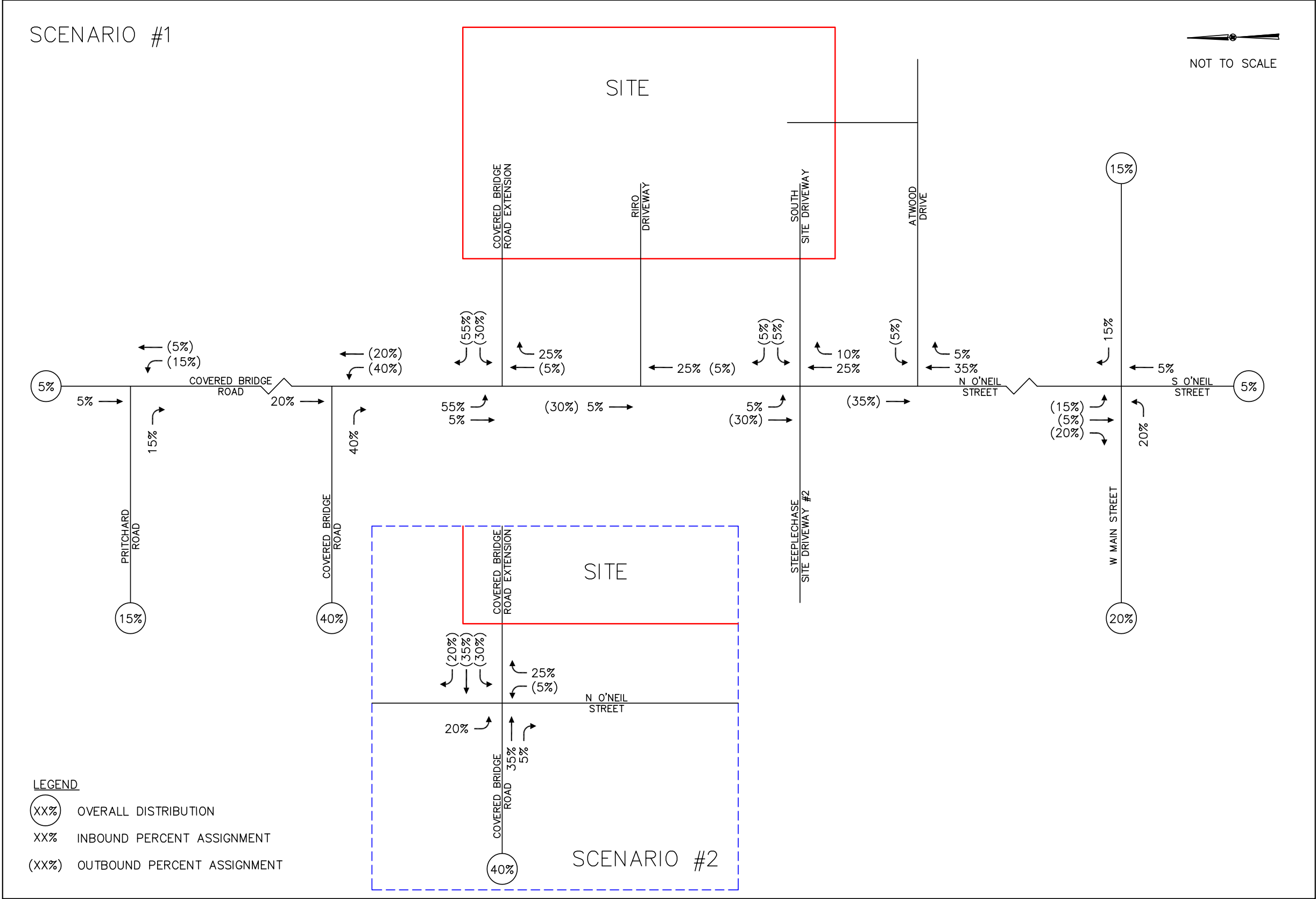
- 40% to/from the west on Covered Bridge Road
- 20% to/from the west on W. Main Street
- 15% to/from the east on W. Main Street
- 15% to/from the west on Pritchard Road
- 5% to/from the north on Covered Bridge Road
- 5% to/from the south on O'Neil Street

The following overall distribution was used for the commercial portion of the development:

- 25% to/from the west on Covered Bridge Road
- 20% to/from development along Covered Bridge Road between Covered Bridge Road and Pritchard Road
- 10% to/from the west on W. Main Street
- 10% to/from the east on W. Main Street
- 10% to/from development along N. O'Neil Street between Atwood Drive and Main Street
- 10% to/from the west on Pritchard Road
- 10% to/from the north on Covered Bridge Road
- 5% to/from the south on O'Neil Street

**Figures 4.1** shows the residential site traffic distribution and percent assignment, and **Figure 4.2** shows the retail site traffic distribution and percent assignment.

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ASHCROFT PHASE 2  
CLAYTON, NC  
TRAFFIC IMPACT ANALYSIS

SITE TRAFFIC DISTRIBUTION AND PERCENT  
ASSIGNMENT – RESIDENTIAL

FIGURE  
4.1

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## 5.0 Projected Traffic Volumes

### 5.1 Existing Traffic

AM peak hour (7:00 to 9:00 AM) and PM peak hour (4:00 to 6:00 PM) turning movement counts were obtained from other studies in the area at the following intersections:

- Covered Bridge Road at Pritchard Road/Private Driveway February 2017
- O'Neil Street at Main Street February 2018
- N. O'Neil Street/Covered Bridge Road at Covered Bridge Road February 2018

At these study intersections, existing year peak hour traffic volumes were estimated by applying a 5% annual growth rate to the turning movement count volumes up to the study year 2020.

As no turning movement counts were available at the intersection of N. O'Neil Street at Atwood Drive, traffic volumes turning on/off of Atwood Drive were estimated by generating the trips for the land uses along Atwood Drive and assigning them to the network. It was assumed that there are/will be approximately 150 single-family homes along Atwood Drive, and based on existing traffic volumes at adjacent residential driveways these trips were assigned with 60% to/from the south and 40% to/from the north. Through volumes on Covered Bridge Road were balanced with the Covered Bridge Road intersection to the north.

The existing AM and PM peak hour traffic volumes are shown on **Figures 5.1** and **5.2**, respectively, and the traffic count data are included in the Appendix.

### 5.2 Historic Growth Traffic

Historic growth traffic is the increase in traffic due to usage increases and non-specific growth throughout the area. Based on discussions with the NCDOT and the Town of Clayton, and to be consistent with other traffic studies in the area, an annual growth rate of 2% was applied to existing traffic volumes to determine background traffic volumes for each study condition. With the additional of approved development traffic, the effective background growth rate is over 3% per year, and with the addition of site traffic, the effective growth rates are projected to be over 5% per year.

### 5.3 Approved Development Traffic

Based on discussions with the Town and NCDOT, three projects were identified for inclusion in this analysis as background traffic: Walton Farm at Riverwood Athletic Club, Steeplechase Residential, and Academy Point (formerly Barbour Tract). Where study intersections between this analysis and those developments did not overlap, approved development traffic was assigned to the network based on the residential distribution from Section 4.0.

Per the *Walton Acres at Riverwood Athletic Club TIA* (Ramey-Kemp, April 2017), the Walton Farm development includes approximately 190 single-family homes and 120 apartments located west of Covered Bridge Road and north of Loop Road. Project build-out is anticipated in 2022, and site traffic for full build-out of that development was included in this analysis. No offsite improvements were required at any of the study intersections included in this traffic study.

The original *Steeplechase TIA* (Ramey-Kemp, March 2018) analyzed the impact of a total of 435 single-family homes and 190 townhomes (in two phases) with a full build-out in 2026. Modifications to the development plan were analyzed in the “Steeplechase Draft Trip Generation/Phasing Letter” (December 2019) that evaluated a less traffic-intense site that would include 124 townhomes and 526 senior-adult detached dwelling units. These volumes were assigned to the network based on the distribution and assignment from the original TIA. The NCDOT District Office review of the revised development in February 2020 indicates that a northbound left-turn lane at the site’s “Driveway #2” on N. O’Neil Street is required.

The Steeplechase development is also required to realign Covered Bridge Road to intersect N. O’Neil Street approximately 900 feet south of the existing intersection location and to construct associated turn lanes and a traffic signal prior to the completion of the 450<sup>th</sup> dwelling unit in the development. However, as the timing of that improvement is unknown, analyses were performed with Covered Bridge Road in the existing alignment (Scenario #1) and with the realignment (Scenario #2).

Per the *Barbour Tract TIA* (Ramey-Kemp, November 2018), the Academy Point development will consist of approximately 121 single-family homes, 15 tri-plex units, and 135 apartments located south of Oakdale Avenue and east of O’Neil Street. Project build-out is anticipated in 2023, and site traffic for full build-out of that development was included in this analysis. No offsite improvements were required at any of the study intersections included in this traffic study.

Weekday AM and PM peak hour volumes for the background traffic condition, which include existing, historic growth, and approved development traffic, are shown on **Figures 5.1** and **5.2**.

#### 5.4 Site Traffic

Project site traffic was generated and assigned to the adjacent roadway network according to the distribution discussed previously in Section 4.0. AM and PM peak hour site traffic volumes are shown on **Figures 5.3** and **5.4** for the AM and PM peak hours, respectively.

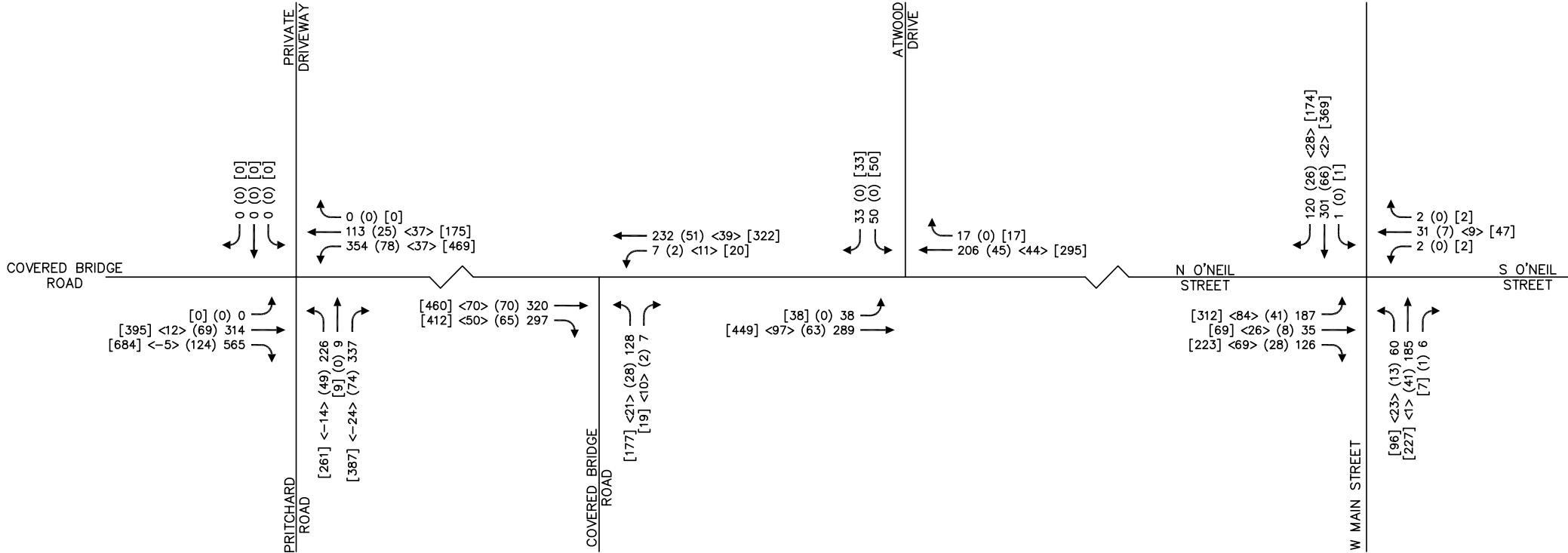
#### 5.5 Build-Out Traffic

Projected build-out traffic volumes include background traffic volumes and total site traffic. Traffic volume calculations are detailed in intersection spreadsheets in the Appendix of this report. The projected (2030) AM and PM peak hour build-out volumes are shown on **Figures 5.5** and **5.6**, respectively.

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LEGEND

- XX EXISTING TRAFFIC VOLUMES
- (XX) BACKGROUND GROWTH
- <XX> APPROVED DEVELOPMENT TRAFFIC
- [XX] TOTAL BACKGROUND TRAFFIC



NOT TO SCALE



ASHCROFT PHASE 2  
CLAYTON, NC  
TRAFFIC IMPACT ANALYSIS

EXISTING (2020) AND  
PROJECTED (2030) BACKGROUND  
AM PEAK HOUR TRAFFIC VOLUMES

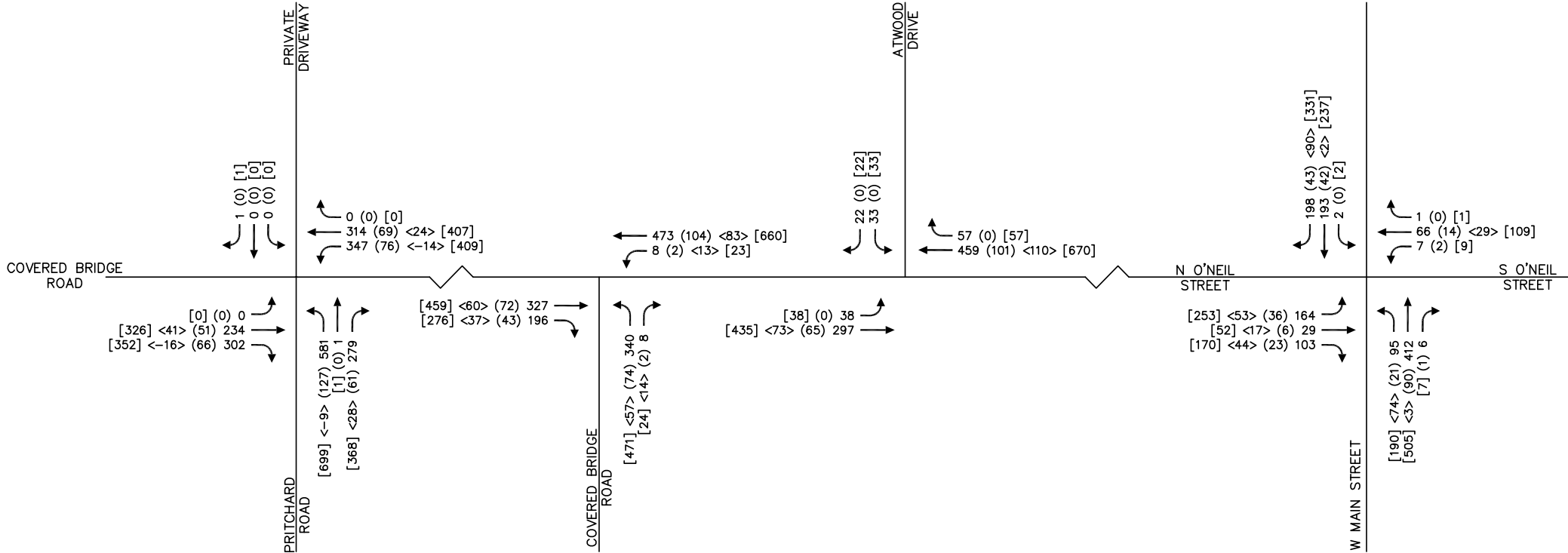
FIGURE  
5.1

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LEGEND

- XX EXISTING TRAFFIC VOLUMES
- (XX) BACKGROUND GROWTH
- <XX> APPROVED DEVELOPMENT TRAFFIC
- [XX] TOTAL BACKGROUND TRAFFIC



ASHCROFT PHASE 2  
CLAYTON, NC  
TRAFFIC IMPACT ANALYSIS

EXISTING (2020) AND  
PROJECTED (2030) BACKGROUND  
PM PEAK HOUR TRAFFIC VOLUMES

FIGURE  
5.2

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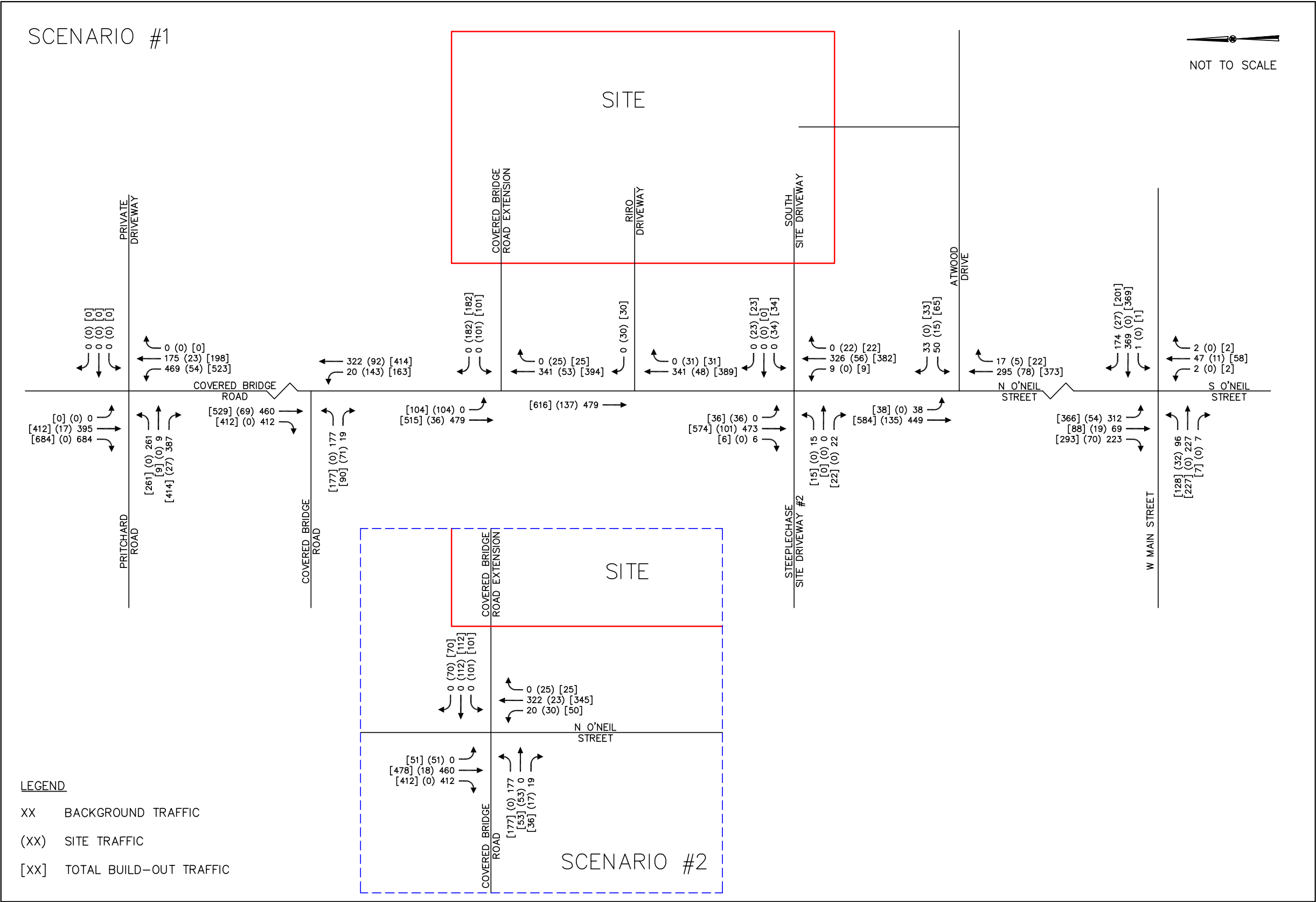
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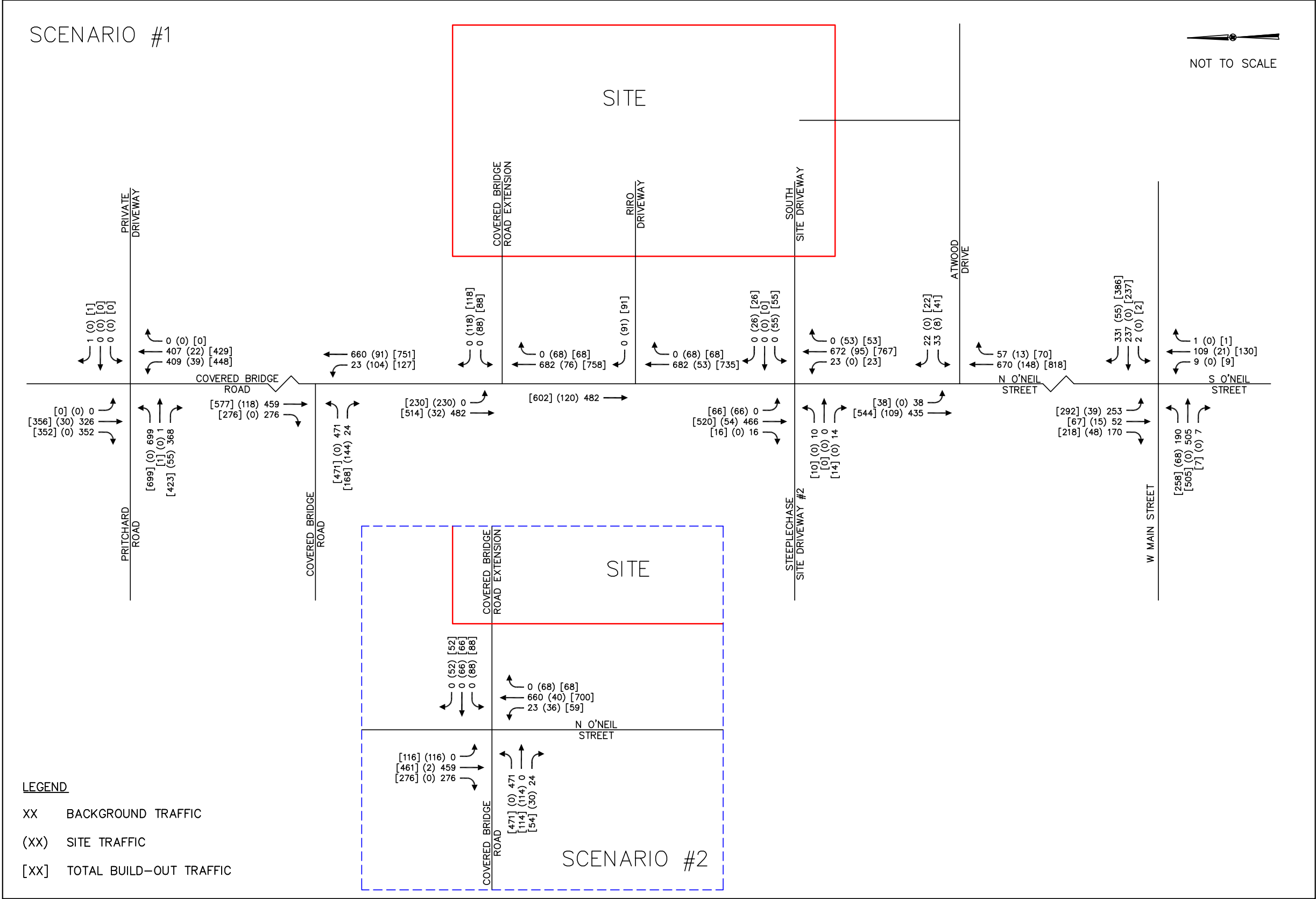


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ASHCROFT PHASE 2  
CLAYTON, NC  
TRAFFIC IMPACT ANALYSIS

PROJECTED BUILD-OUT (2030)  
PM PEAK HOUR TRAFFIC VOLUMES

FIGURE  
5.6

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## 6.0 Capacity Analysis

Capacity analyses were performed for the AM and PM peak hours for the existing (2020) traffic condition and the projected (2030) background and build-out traffic conditions at the study intersections using Synchro Version 10 software to determine the operating characteristics of the adjacent road network and the impacts of the proposed project.

Capacity is defined as the maximum number of vehicles that can pass over a particular road segment or through a particular intersection within a set time duration. Capacity is combined with Level-of-Service (LOS) to describe the operating characteristics of a road segment or intersection. LOS is a qualitative measure that describes operational conditions and motorist perceptions within a traffic stream. The *Highway Capacity Manual (HCM)* defines six levels of service, LOS A through LOS F, with A representing the shortest average delays and F representing the longest average delays. LOS D is the typically accepted standard for signalized intersections in urbanized areas. For signalized intersections, LOS is defined for the overall intersection operation.

For unsignalized intersections, only the movements that must yield right-of-way experience control delay. Therefore, LOS criteria for the overall intersection is not reported by Synchro/SimTraffic Version 10 or computable using methodology published in the *HCM*. It is typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay. Table 6.0 lists the LOS control delay thresholds published in the *HCM* for signalized and unsignalized intersections.

| Table 6.0<br>Level-of-Service Control Delay Thresholds |                                                                |                                                                                                    |                 |
|--------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------|
| Level-of-Service                                       | Signalized Intersections – Control Delay Per Vehicle [sec/veh] | Unsignalized Intersections – Average Control Delay [sec/veh] & Qualitative Operational Description |                 |
| A                                                      | ≤ 10                                                           | ≤ 10                                                                                               | Short Delays    |
| B                                                      | > 10 – 20                                                      | > 10 – 15                                                                                          |                 |
| C                                                      | > 20 – 35                                                      | > 15 – 25                                                                                          |                 |
| D                                                      | > 35 – 55                                                      | > 25 – 35                                                                                          | Moderate Delays |
| E                                                      | > 55 – 80                                                      | > 35 – 50                                                                                          |                 |
| F                                                      | > 80                                                           | > 50                                                                                               | Long Delays     |

A peak hour factor (PHF) of 0.90 was used for all turning movements in each of the traffic conditions, and per NCDOT guidance, right-turns on red (RTOR) were prohibited even if allowed today. Permitted + Protected phasing was used for the northbound left-turn movement on Covered Bridge Road at Pritchard Road since that is how the signal operates today and is not recommended to be modified. A minimum volume of 4 vehicles was used for intersection movements in Synchro even if existing or projected volumes were found to be lower. Signal inputs were generally obtained from the approved development traffic studies, and signal timings

were optimized for each traffic condition with cycle lengths set to meet NCDOT Congestion Management minimums.

### 6.1 O'Neil Street at Main Street

Analyses indicate that the signalized intersection of O'Neil Street at Main Street currently operates at LOS B in the AM peak hour and LOS C in the PM peak hour. The intersection is expected to operate at LOS E in the AM peak hour and LOS F in the PM peak hour in the projected (2030) background condition and at LOS F in both peak hours in the projected build-out traffic condition. As roadway widening at this intersection is not feasible (as noted in NCDOT reviews of previous traffic studies), no improvements are recommended to be performed at this intersection.

Table 6.1 summarizes the operation of the intersection of O'Neil Street at Main Street for the existing (2020) and projected (2030) background and build-out traffic conditions.

| <b>Table 6.1<br/>Level-of-Service<br/>O'Neil Street at Main Street (Unsignalized)</b> |                                     |                                     |
|---------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Condition</b>                                                                      | <b>AM Peak Hour<br/>LOS (Delay)</b> | <b>PM Peak Hour<br/>LOS (Delay)</b> |
| Existing (2020) Traffic                                                               | B (19.2)                            | C (20.5)                            |
| Background (2030) Traffic                                                             | E (64.2)                            | F (100.8)                           |
| Build-out (2030) Traffic                                                              | F (129.3)                           | F (187.6)                           |

## 6.2 N. O'Neil Street at Atwood Drive

Analyses indicate that the unsignalized intersection of N. O'Neil Street at Atwood Drive currently operates with short delays on the minor street approach (Atwood Drive) in both the AM and PM peak hours. The intersection is expected to operate with short to moderate delays on the minor street approach in the background condition and with moderate to long delays in the build-out condition. However, it should be noted that while the Atwood Drive approach is very wide and likely functions as a dual lane approach, it was analyzed with a single lane to be conservative. It is also typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay. As SimTraffic simulations indicate no queuing issues at this intersection, no improvements are recommended to be performed at this intersection.

Table 6.2 summarizes the operation of the intersection of N. O'Neil Street at Atwood Drive for the existing (2020) and projected (2030) background and build-out traffic conditions.

| <b>Table 6.2</b><br><b>Level-of-Service</b><br><b>N. O'Neil Street at Atwood Drive (Unsignalized)</b> |                                     |                                     |
|-------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Condition</b>                                                                                      | <b>AM Peak Hour<br/>LOS (Delay)</b> | <b>PM Peak Hour<br/>LOS (Delay)</b> |
| Existing (2020) Traffic                                                                               | WB – B (13.3)<br>SBL – A (7.8)      | WB – C (17.2)<br>SBL – A (8.8)      |
| Background (2030) Traffic                                                                             | WB – C (17.4)<br>SBL – A (8.1)      | WB – D (25.7)<br>SBL – B (13.2)     |
| Build-out (2030) Traffic                                                                              | WB – D (26.7)<br>SBL – A (8.3)      | WB – F (51.6)<br>SBL – B (10.5)     |



### 6.3 Covered Bridge Road/N. O'Neil Street at Covered Bridge Road

Analyses indicate that the unsignalized intersection of Covered Bridge Road/N. O'Neil Street at Covered Bridge Road currently operates with short delays in the AM peak hour and long delays in the PM peak hour on the minor street approach (Covered Bridge Road).

If Covered Bridge Road is not realigned, analyses indicate that the intersection is anticipated to operate with long delays in the study year 2030 with or without the proposed project in place. However, as Covered Bridge Road is anticipated to be realigned to the south in the future, no roadway improvements are recommended to be performed at this intersection.

Table 6.3 summarizes the operation of the intersection of Covered Bridge Road/N. O'Neil Street at Covered Bridge Road for the existing (2020) and projected (2030) background and build-out traffic conditions.

| <b>Table 6.3</b><br><b>Level-of-Service</b><br><b>Covered Bridge Road/N. O'Neil Street at Covered Bridge Road (Unsignalized)</b> |                                     |                                     |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Condition</b>                                                                                                                 | <b>AM Peak Hour<br/>LOS (Delay)</b> | <b>PM Peak Hour<br/>LOS (Delay)</b> |
| Existing (2020) Traffic                                                                                                          | EB – C (22.0)<br>NBL – A (9.0)      | EB – F (264.3)<br>NBL – A (8.7)     |
| Background (2030) Traffic – <i>Current Location</i>                                                                              | EB – F (98.9)<br>NBL – B (10.2)     | EB – F (>1,000)<br>NBL – A (9.5)    |
| Build-out (2030) Traffic – <i>Current Location</i>                                                                               | EB – F (>1,000)<br>NBL – B (12.4)   | EB – F (>1,000)<br>NBL – B (11.2)   |

#### 6.4 Covered Bridge Road at Pritchard Road/Private Driveway

Analyses indicate that the signalized intersection of Covered Bridge Road at Pritchard Road/Private Driveway currently operates at LOS C in the AM peak hour and LOS D in the PM peak hour. In the study year 2030, analyses indicate that the intersection is expected to operate at LOS E in the AM peak hour and LOS F in the PM peak hour with or without the proposed project in place.

The intersection was also analyzed with right-turns on red (RTOR) permitted in Synchro, which is consistent with field conditions. In this scenario the overall intersection delays are expected to be significantly shorter than when RTOR are prohibited, especially in the AM peak hour. Therefore, no roadway improvements are recommended to be performed at this intersection.

Table 6.4 summarizes the operation of the intersection of Covered Bridge Road at Pritchard Road for the existing (2020) and projected (2030) background and build-out traffic conditions.

| <b>Table 6.4</b><br><b>Level-of-Service</b><br><b>Covered Bridge Road at Pritchard Road (Signalized)</b> |                                     |                                     |
|----------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Condition</b>                                                                                         | <b>AM Peak Hour<br/>LOS (Delay)</b> | <b>PM Peak Hour<br/>LOS (Delay)</b> |
| Existing (2020) Traffic                                                                                  | C (33.0)                            | D (43.5)                            |
| Background (2030) Traffic                                                                                | E (58.7)                            | F (89.1)                            |
| Build-out (2030) Traffic                                                                                 | E (72.5)                            | F (100.5)                           |
| Background (2030) Traffic <i>with RTOR</i>                                                               | C (25.1)                            | E (74.1)                            |
| Build-out (2030) Traffic <i>with RTOR</i>                                                                | C (30.3)                            | F (84.3)                            |

### 6.5 N. O'Neil Street at Steeplechase Driveway #2/South Site Driveway

The Steeplechase project proposes the construction of a full-movement driveway (Steeplechase Driveway #2) on N. O'Neil Street approximately 1,800 feet north of Atwood Drive. The following improvements are committed to be performed by the Steeplechase at that site driveway:

- Construct a northbound left-turn lane on N. O'Neil Street with 150 feet of storage

A full-movement site driveway is proposed as part of the Ashcroft Phase 2 project that was assumed to align with the Steeplechase Driveway #2. The following improvements are recommended to be performed as part of this project to accommodate projected site traffic:

- Construct the South Site Driveway with an exclusive westbound right-turn lane and an exclusive left-turn lane with 125 feet of storage and appropriate tapers
- Construct a northbound right-turn lane on N. O'Neil Street with 75 feet of storage and appropriate tapers
- Construct a southbound left-turn lane on N. O'Neil Street with 75 feet of storage and appropriate tapers

Analyses indicate that the intersection is expected to operate with short to moderate delays on the eastbound minor street approach (Steeplechase Driveway #2) and moderate to long delays on the westbound minor street approach (South Site Driveway) in the study year 2030. However, SimTraffic simulations indicates that minor street approach queues are expected to be accommodated within the recommended storage.

Table 6.5 summarizes the operation of the intersection of N. O'Neil Street at the South Site Driveway for the projected (2030) build-out traffic condition.

| <b>Table 6.5</b><br><b>Level-of-Service</b><br><b>N. O'Neil Street at Steeplechase Driveway #2/South Site Driveway (Unsignalized)</b> |                                                                  |                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------|
| <b>Condition</b>                                                                                                                      | <b>AM Peak Hour<br/>LOS (Delay)</b>                              | <b>PM Peak Hour<br/>LOS (Delay)</b>                                |
| Background (2030) Traffic                                                                                                             | EB – B (14.7)<br>NBL – A (8.5)                                   | EB – C (19.0)<br>NBL – A (8.6)                                     |
| Build-out (2030) Traffic                                                                                                              | EB – C (23.3)<br>WB – D (26.5)<br>NBL – A (8.9)<br>SBL – A (8.4) | EB – E (47.5)<br>WB – F (129.7)<br>NBL – A (8.8)<br>SBL – B (10.3) |

**6.6 N. O'Neil Street at Right-in/Right-out Site Driveway**

A right-in/right-out site driveway is proposed on N. O'Neil Street approximately 1,600 feet south of Covered Bridge Road. The following improvements are recommended to be performed as part of this project to accommodate site traffic volumes:

- Construct the Right-in/Right-out Site Driveway with one ingress lane and one egress lane
- Construct a northbound right-turn lane on N. O'Neil Street with 100 feet of storage and appropriate tapers

Analyses indicate that this intersection is expected to operate with short delays on the minor street approach (Right-in/Right-out Site Driveway) at project build-out.

Table 6.6 summarizes the operation of the intersection of N. O'Neil Street at the Right-in/Right-out Site Driveway for the projected (2030) build-out traffic condition.

| <b>Table 6.6</b><br><b>Level-of-Service</b><br><b>N. O'Neil Street at Right-in/Right-out Site Driveway (Unsignalized)</b> |                                     |                                     |
|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Condition</b>                                                                                                          | <b>AM Peak Hour<br/>LOS (Delay)</b> | <b>PM Peak Hour<br/>LOS (Delay)</b> |
| Build-out (2030) Traffic                                                                                                  | WB – B (11.1)                       | WB – C (18.1)                       |

### 6.7 N. O'Neil Street at Covered Bridge Road Extension

A portion of the eastern leg of Covered Bridge Road Extension is proposed to be constructed as part of this development and was assumed to intersect N. O'Neil Street approximately 900 feet south of Covered Bridge Road.

#### **Scenario #1**

The following improvements are recommended to be performed as part of this project to accommodate site traffic volumes if Covered Bridge Road is not realigned:

- Construct the Covered Bridge Road Extension with an exclusive westbound right-turn lane and an exclusive left-turn lane with 150 feet of storage and appropriate tapers
- Construct a northbound right-turn lane on N. O'Neil Street with 100 feet of storage and appropriate tapers
- Construct a southbound left-turn lane on N. O'Neil Street with 225 feet of storage and appropriate tapers
- Monitor for signal warrants and install a traffic signal when warranted

Analyses indicate that future intersection of N. O'Neil Street at Covered Bridge Road Extension is expected to operate with long delays on the minor street approach (Covered Bridge Road Extension) in the PM peak hour if the intersection remains unsignalized. With a traffic signal in place, the intersection is expected to operate at LOS B in the AM peak hour and LOS C in the PM peak hour.

Table 6.7A summarizes the operation of the intersection of N. O'Neil Street at Covered Bridge Road Extension for the projected (2030) build-out traffic condition for Scenario #1.

| <b>Table 6.7A<br/>Level-of-Service<br/>N. O'Neil Street at Covered Bridge Road Extension (Scenario #1)</b> |                                     |                                     |
|------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Condition</b>                                                                                           | <b>AM Peak Hour<br/>LOS (Delay)</b> | <b>PM Peak Hour<br/>LOS (Delay)</b> |
| Build-out (2030) Traffic – <i>Scenario #1</i><br>(Unsignalized)                                            | WB – D (29.4)<br>SBL – A (8.7)      | WB – F (295.5)<br>SBL – B (12.4)    |
| Build-out (2030) Traffic – <i>Scenario #1</i> (Signalized)                                                 | B (14.5)                            | C (24.6)                            |

#### **Scenario #2**

The Steeplechase development is committed to perform the following improvements at this intersection:

- Realign Covered Bridge Road to intersection N. O’Neil Street approximately 900 feet to the south of its current alignment
- Construct a northbound left-turn lane on N. O’Neil Street with 150 feet of storage
- Construct a southbound right-turn lane on Covered Bridge Road with 100 feet of storage
- Construct an eastbound right-turn lane on Covered Bridge Road with 150 feet of storage
- Install a traffic signal

With the committed improvements in place, the intersection is expected to operate at LOS B in the AM peak hour and at LOS C in the PM peak hour for the background traffic condition. The following improvements are recommended to be performed as part of this project to accommodate site traffic volumes if Covered Bridge Road is realigned:

- Construct the Covered Bridge Road Extension with an exclusive westbound shared through/right lane and an exclusive left-turn lane with 150 feet of storage and appropriate tapers
- Restripe the eastbound approach of Covered Bridge Road to provide an exclusive left-turn lane and a shared through/right lane
- Construct a northbound right-turn lane on N. O’Neil Street with 100 feet of storage and appropriate tapers
- Construct a southbound left-turn lane on N. O’Neil Street with 225 feet of storage and appropriate tapers
- Modify the committed traffic signal to accommodate the Covered Bridge Road Extension approach and recommended laneage

With the recommended improvements in place, the intersection is expected to operate at LOS D in the AM peak hour and LOS E in the PM peak hour. An analysis was also performed with RTOR allowed and permitted-protected left-turn phasing. With these settings, the intersection is expected to operate at an acceptable LOS in both peak hours.

Table 6.7B summarizes the operation of the intersection of N. O’Neil Street at Covered Bridge Road Extension for the projected (2030) build-out traffic condition for Scenario #2.

| <b>Table 6.7B</b><br><b>Level-of-Service</b><br><b>N. O’Neil Street at Covered Bridge Road Extension (Scenario #2)</b> |                                     |                                     |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Condition</b>                                                                                                       | <b>AM Peak Hour<br/>LOS (Delay)</b> | <b>PM Peak Hour<br/>LOS (Delay)</b> |
| Background (2030) Traffic – <i>Scenario #2</i><br>( <i>Signalized with Committed Improvements</i> )                    | B (13.0)                            | C (24.2)                            |
| Build-out (2030) Traffic – <i>Scenario #2</i> ( <i>Signalized<br/>with Committed Improvements</i> )                    | D (36.4)                            | E (66.0)                            |
| Build-out (2030) Traffic – <i>Scenario #2</i> ( <i>Signalized<br/>with Committed Improvements</i> )                    | C (24.7)                            | D (47.0)                            |



## 7.0 Recommendations

### Committed Improvements

The following committed improvements by the Steeplechase development were included in the future traffic conditions:

#### N. O'Neil Street at Steeplechase Driveway #2:

- Construct a northbound left-turn lane on N. O'Neil Street with 150 feet of storage

#### N. O'Neil Street at Realigned Covered Bridge Road (Scenario #2):

- Realign Covered Bridge Road to intersection N. O'Neil Street approximately 900 feet to the south of its current alignment
- Construct a northbound left-turn lane on N. O'Neil Street with 150 feet of storage
- Construct a southbound right-turn lane on Covered Bridge Road with 100 feet of storage
- Construct an eastbound right-turn lane on Covered Bridge Road with 150 feet of storage
- Install a traffic signal

### Recommended Improvements

The following improvements are recommended to be performed as part of this project to accommodate site traffic volumes:

#### N. O'Neil Street at Steeplechase Driveway #2/South Site Driveway:

- Construct the South Site Driveway with an exclusive westbound right-turn lane and an exclusive left-turn lane with 125 feet of storage and appropriate tapers
- Construct a northbound right-turn lane on N. O'Neil Street with 75 feet of storage and appropriate tapers
- Construct a southbound left-turn lane on N. O'Neil Street with 75 feet of storage and appropriate tapers

#### N. O'Neil Street at Right-in/Right-out Site Driveway:

- Construct the Right-in/Right-out Site Driveway with one ingress lane and one egress lane
- Construct a northbound right-turn lane on N. O'Neil Street with 100 feet of storage and appropriate tapers

#### N. O'Neil Street at Covered Bridge Road Extension (Scenario #1):

- Construct the Covered Bridge Road Extension with an exclusive westbound right-turn lane and an exclusive left-turn lane with 150 feet of storage and appropriate tapers
- Construct a northbound right-turn lane on N. O'Neil Street with 100 feet of storage and appropriate tapers
- Construct a southbound left-turn lane on N. O'Neil Street with 225 feet of storage and appropriate tapers

- Monitor for signal warrants and install a traffic signal when warranted

N. O'Neil Street at Realigned Covered Bridge Road/Covered Bridge Road Extension (Scenario #2):

- Construct the Covered Bridge Road Extension with an exclusive westbound shared through/right lane and an exclusive left-turn lane with 150 feet of storage and appropriate tapers
- Restripe the future eastbound approach to a shared through/right lane
- Construct a northbound right-turn lane on N. O'Neil Street with 100 feet of storage and appropriate tapers
- Construct a southbound left-turn lane on N. O'Neil Street with 225 feet of storage and appropriate tapers
- Modify the committed traffic signal to accommodate the Covered Bridge Road Extension approach and recommended laneage

Analyses indicate that the signalized intersection of O'Neil Street at Main Street is expected to operate at LOS E in the AM peak hour and LOS F in the PM peak hour in the projected background condition and at LOS F in both peak hours at project build-out. However, as noted in previous traffic studies and reviews in the study area, roadway widening is not feasible at this intersection due to existing development. Therefore, no improvements are recommended to be performed at this intersection.

The unsignalized intersection of N. O'Neil Street at Atwood Drive is expected to operate with short to moderate delays on the minor street approach (Atwood Drive) in the background condition and moderate to long delays in the build-out condition. However, it should be noted that while the Atwood Drive approach is very wide and likely functions as a dual lane approach, it was analyzed with a single lane to be conservative. It is also typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay. As SimTraffic simulations indicate no queuing issues at this intersection, no improvements are recommended to be performed at this intersection.

In its current alignment, the unsignalized intersection of N. O'Neil Street at Covered Bridge Road is expected to operate with long delays in the AM and PM peak hours for the minor street approach (Covered Bridge Road) in the future traffic conditions with or without the proposed project in place. As Covered Bridge Road is anticipated to be realigned to the south in the future, no roadway improvements are recommended to be performed at this intersection.

The signalized intersection of Covered Bridge Road at Pritchard Road is expected to operate at LOS E in the AM peak hour and LOS F in the PM peak hour in the study year 2030 with or without the proposed project in place. However, this is with right-turns on red (RTOR) prohibited

per NCDOT Congestion Management guidelines. An analyses was also performed with RTOR permitted as they are at the intersection today. In this scenario the overall intersection delays are expected to be significantly shorter than when RTOR are prohibited, especially in the AM peak hour. Therefore, no roadway improvements are recommended to be performed at this intersection.

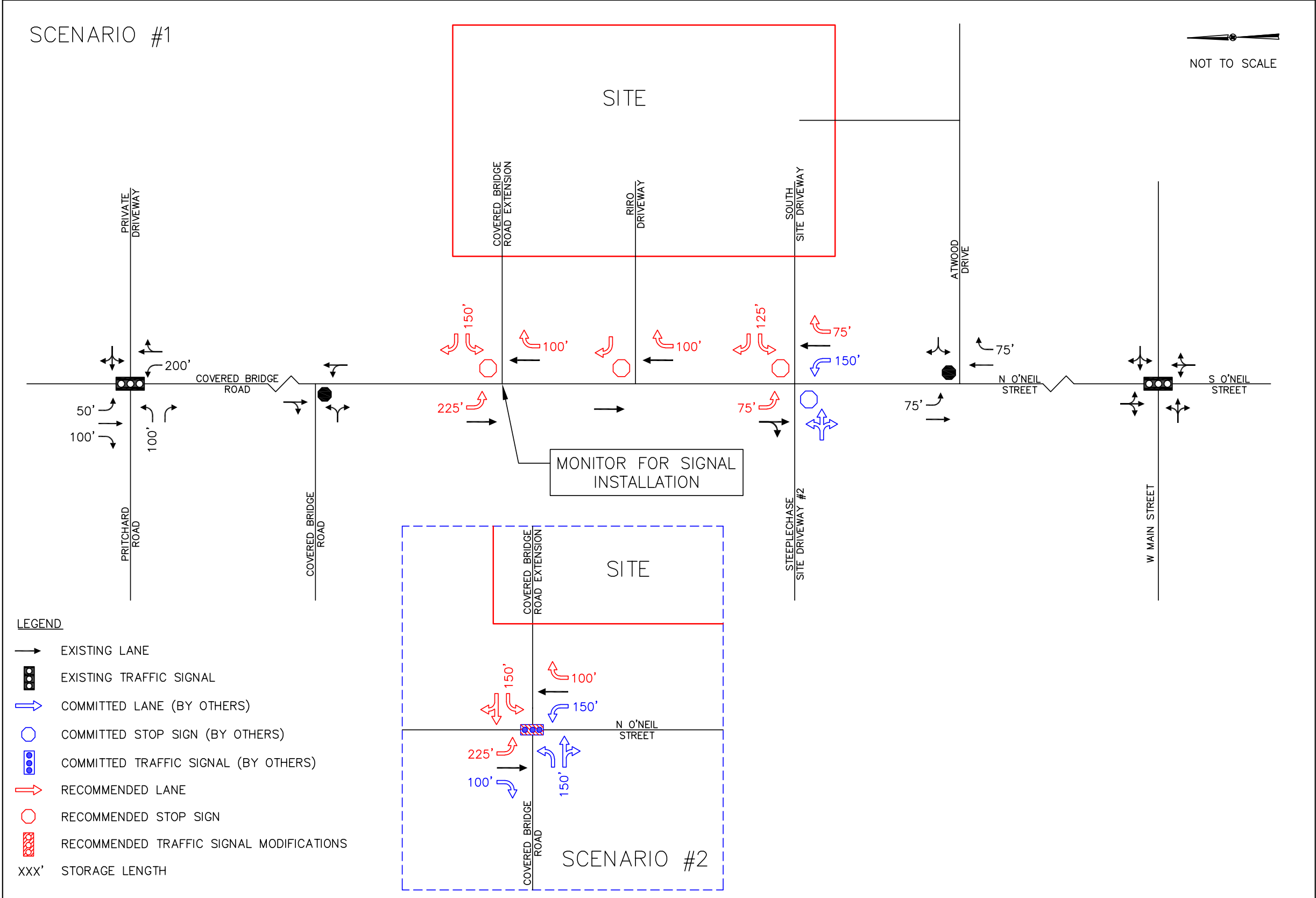
At the future unsignalized intersection of N. O'Neil Street at the Steeplechase Driveway #2/South Site Driveway, the westbound minor street approach (South Site Driveway) is expected to operate with moderate to long delays at project build-out. However, SimTraffic simulations indicates that minor street approach queues are expected to be accommodated within the recommended storage.

With the existing Covered Bridge Road in its current alignment (Scenario #1), analyses indicate that the future intersection of N. O'Neil Street at Covered Bridge Road Extension is expected to operate with long delays on the minor street approach (Covered Bridge Road Extension) in the PM peak hour if the intersection remains unsignalized. However, with a traffic signal in place, the intersection is expected to operate at LOS B in the AM peak hour and LOS C in the PM peak hour.

With the realignment of Covered Bridge Road at O'Neil Street (Scenario #2) and the committed and recommended improvements in place, the intersection of N. O'Neil Street at Realigned Covered Bridge Road/Covered Bridge Road Extension is expected to operate at LOS E in the PM peak hour. An alternative scenario permitting right-turns on red (RTOR) and permitted-protected left-turn phasing at this intersection found that the intersection is expected to operate at an acceptable LOS.

The committed and recommended roadway laneage is shown on **Figure 7.1**.

\\kimley-horn.com\SE\_RAL\RAL\_TPT0\Traffic\014163000 Ashcroft Phase 2\T5 - Report-Submittals\TIA Figures\Ashcroft Phase 2 - TIA figures\_TO.dwg



ASHCROFT PHASE 2  
CLAYTON, NC  
TRAFFIC IMPACT ANALYSIS

COMMITTED AND RECOMMENDED ROADWAY  
LANEAGE

FIGURE  
7.1

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

## **Appendix**

## **Appendix A:**

### **TIA Scoping Documents**





## NCDOT Traffic Impact Analysis Need Screening / Scoping Request



TIA Need  
Screening



TIA  
Scoping



TIA  
Submittal

A Traffic Impact Analysis (TIA) may be required for developments based on the site trip generation estimates, site context, or at the discretion of the NCDOT District Engineer. The Applicant or the TIA Consultant shall submit this form along with the site plan to the District Engineer to determine the TIA need and, if a TIA is required, initiate the TIA scoping process. Without an approved scope, the TIA is incomplete and will be rejected until the study is revised to conform to NCDOT's TIA requirements.

**Project Name:** Ashcroft Phase 2 **Previous Name:** If Applicable  
**Location:** East of O'Neil Street just south of Neuse River **County:** Johnston **Municipality:** Clayton  
**Project Description:** Predominantly residential development consisting of single family homes, townhomes, and apartments with some commercial space

| Project Contact: | Applicant                                                       | TIA Consultant                                                        |
|------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------|
| Company Name     | <u>RiverWild</u>                                                | <u>Kimley-Horn</u>                                                    |
| Contact Person   | <u>David DeYoung</u>                                            | <u>Travis Fluitt</u>                                                  |
| Phone Number     | <u>919-901-3178</u>                                             | <u>919-653-2948</u>                                                   |
| Email            | <u>david@theriverwildteam.com</u>                               | <u>travis.fluitt@kimley-horn.com</u>                                  |
| Mailing Address  | <u>114 W Main Street, Suite 108</u><br><u>Clayton, NC 27520</u> | <u>421 Fayetteville Street, Suite 600</u><br><u>Raleigh, NC 27601</u> |

**Site Plan Prepared By:** Stewart **Site Plan Date:** April 15, 2020  
 See site plan/vicinity map requirements on page 2.  
**Parcel Size:** 256.8 Acre(s) **Anticipated Build-Out Year:** 2030

**Weekday Site Trip Generation - Do NOT adjust for mode split, pass-by, internal capture, or diverted trips.**

| ITE<br>LUC | Proposed Land Use | Size   | Unit | Daily Trips | Peak Hour<br>Type | AM Peak Hour Trips |      |       | PM Peak Hour Trips |      |       | Data<br>Source |
|------------|-------------------|--------|------|-------------|-------------------|--------------------|------|-------|--------------------|------|-------|----------------|
|            |                   |        |      |             |                   | Enter              | Exit | Total | Enter              | Exit | Total |                |
| 210        | Single Family     | 300    | d.u. | 2858        | Adj. Street       | 55                 | 163  | 218   | 184                | 108  | 292   | ITE Equation   |
| 220        | Multifamily       | 300    | d.u. | 2228        | Adj. Street       | 31                 | 104  | 135   | 99                 | 58   | 157   | ITE Equation   |
| 221        | Multifamily       | 180    | d.u. | 980         | Adj. Street       | 16                 | 45   | 61    | 48                 | 30   | 78    | ITE Equation   |
| 820        | Shopping Center   | 105000 | s.f. | 6216        | Adj. Street       | 126                | 78   | 204   | 270                | 293  | 563   | ITE Equation   |
|            |                   |        |      |             |                   |                    |      |       |                    |      |       |                |
|            |                   |        |      |             |                   |                    |      |       |                    |      |       |                |
|            |                   |        |      |             |                   |                    |      |       |                    |      |       |                |
|            |                   |        |      |             |                   |                    |      |       |                    |      |       |                |
|            |                   |        |      |             |                   |                    |      |       |                    |      |       |                |
|            |                   |        |      |             |                   |                    |      |       |                    |      |       |                |
| Total      |                   |        |      | 12282       |                   | 228                | 391  | 618   | 601                | 489  | 1090  | X              |

Refer to the current [NCDOT Congestion Management Capacity Analysis Guidelines](#) for acceptable trip calculation methods and data sources.

\*\*Explain local or other data sources, if used: \_\_\_\_\_

- ☒ The estimated site trips meet NCDOT's TIA trip threshold of 3,000 daily trips.
- ☒ The estimated site trips meet the municipal TIA trip threshold of 100 peak hour trips
- ☐ This project is located in a known [STIP](#) and/ or local CIP project # \_\_\_\_\_
- ☐ This project includes a rezoning request.



## NCDOT Traffic Impact Analysis Need Screening / Scoping Request



TIA Need  
Screening

TIA  
Scoping

TIA  
Submittal

- ☐ The proposed site access is located within 1,000 feet of an interchange.
- ☐ The Applicant requests for a new or modified control-of-access break.
- ☐ The Applicant requests for a new or modified median break.

Applicant's Signature

David DeYoung  
Print Name

Date

**Site Plan/Vicinity Map Requirement for TIA Need Screening:** While the site plan may not be finalized during the TIA scoping stage, the graphic representation of the proposed development shall provide adequate details on the development scope and context. More specifically, the site plan/map shall clearly show the location and type of each access point, spacing to adjacent and opposing driveways or intersections, internal street network, proposed buildings/parcels with their anticipated uses and sizes at full build-out and, if applicable, any nearby interstate, US, NC or Secondary Roads (SR).

**Project Name:** Ashcroft Phase 2

**Project Reference Number:** \_\_\_\_\_

- ☒ **A TIA is Required by the Local Government.** In addition, the study area is expected to include NCDOT maintained transportation facilities.
- ☒ **A TIA is Required by NCDOT,** per the [Policy on Street and Driveway Access to North Carolina Highways](#).

If either or both of the boxes above are checked, the Applicant/TIA Consultant is hereby requested to fill out as much as possible of the following TIA scoping checklist, and return it along with the supporting documents to NCDOT prior to the scoping meeting.

- ☐ **A TIA is NOT required.** This decision is based on the development information presented above. Changes in the development plan will require re-evaluation of the TIA need, and may necessitate a TIA. The Applicant should inform the District Engineer of any significant changes in a timely fashion to avoid delays or rejections of the driveway permit / encroachment agreement applications.

Effective Date: 10/01/2017 (Version 17-721)

Page 2 of 2



## NCDOT Traffic Impact Analysis Need Screening / Scoping Request



### Additional Comments:

The TIA need decision is made by the NCDOT Division \_\_\_\_\_ District \_\_\_\_\_ on \_\_\_\_\_.

\_\_\_\_\_  
NCDOT District Representative's Signature

Email concurrence may be used in lieu of the signature.

\_\_\_\_\_  
Print Name



## NCDOT TIA Scoping Checklist



**Project Name:** Ashcroft Phase 2

**TIA Scoping Date:** 5/19/2020

☒ **TIA Need Screening Forms are Attached.** Project Reference #: \_\_\_\_\_ Decision Date: \_\_\_\_\_

☒ **Site Plan and Access**

☒ Provide a site plan illustrating site access, internal and external roadways, buildings and land uses.

Refer to NCDOT's [Policy on Street and Driveway Access to North Carolina Highways](#) pages 14 and 15 for site plan requirements.

☒ Identify site access.

| New Access      | On Road                  | Access Type            |                     | Driveway Spacing                           |                |                               |
|-----------------|--------------------------|------------------------|---------------------|--------------------------------------------|----------------|-------------------------------|
|                 | Road Name                | Permitted Movements    | Traffic Control     | Distance (ft)                              | Direction      | Nearest Intersection / Access |
| Access A        | N O'Neil Street          | Conventional Full-Mvmt | 2-Way Stop          | 800                                        | South          | Covered Bridge Rd             |
| Access B        | N O'Neil Street          | RIRO                   | 2-Way Stop          | 750                                        | South          | Access A                      |
| Access C        | N O'Neil Street          | Conventional Full-Mvmt | 2-Way Stop          | 1300                                       | South          | Access A                      |
| Access D        |                          |                        |                     |                                            |                |                               |
| Access E        |                          |                        |                     |                                            |                |                               |
| Access F        |                          |                        |                     |                                            |                |                               |
| Access G        |                          |                        |                     |                                            |                |                               |
| Access H        |                          |                        |                     |                                            |                |                               |
| Existing Access | Existing Intersection of |                        | Access Modification | Proposed Interconnectivity (If Applicable) |                |                               |
|                 | Road A                   | Road B                 |                     | Connector #                                | Road Connected | Adjacent Development          |
| Access 1        |                          |                        | Please Select       | Connector 1                                |                |                               |
| Access 2        |                          |                        |                     | Connector 2                                |                |                               |
| Access 3        |                          |                        |                     | Connector 3                                |                |                               |
| Access 4        |                          |                        |                     | Connector 4                                |                |                               |

☐ Additional access clarifications and provisions (e.g., proposed control-of-access or median breaks, modifications of existing access, loading/unloading area access, bike/pedestrian accommodation).

☐

**Proposed K-12 School Site**

- ☐ NCDOT [MSTA School Traffic Calculator](#) for Select School Type shall be used.
- ☐ Peak Hour Factors (PHFs) shall be adjusted/weighted for new school trips (0.5 PHF by default).
- ☐ Internal school circulation analysis is required, and should be submitted in advance or concurrent with the TIA submittal.
- ☐ Clarify traffic operation plans (e.g. traffic circulation pattern, pedestrian access, drop-off/pick-up zone location and configuration, queue storage area and, if applicable, staggered start times).



## NCDOT TIA Scoping Checklist



### ☒ Trip Generation

The TIA Consultant shall prepare trip generation estimates following the current [NCDOT Congestion Management Capacity Analysis Guidelines](#), and submit the calculation sheets and supporting information to the District Engineer for approval prior to capacity analysis.

| ITE LUC                                            | Proposed Land Use | Size                        | Unit | Daily Trips                 | Peak Hour Type | AM Peak Hour Trips |      |       | PM Peak Hour Trips |      |       | Data Source   |
|----------------------------------------------------|-------------------|-----------------------------|------|-----------------------------|----------------|--------------------|------|-------|--------------------|------|-------|---------------|
|                                                    |                   |                             |      |                             |                | Enter              | Exit | Total | Enter              | Exit | Total |               |
| 210                                                | Single Family     | 300                         | d.u. | 2858                        | Adj. Street    | 55                 | 163  | 218   | 184                | 108  | 292   | ITE Equation  |
| 220                                                | Multifamily       | 300                         | d.u. | 2228                        | Adj. Street    | 31                 | 104  | 135   | 99                 | 58   | 157   | ITE Equation  |
| 221                                                | Multifamily       | 180                         | d.u. | 980                         | Adj. Street    | 16                 | 45   | 61    | 48                 | 30   | 78    | ITE Equation  |
| 820                                                | Shopping Center   | 105000                      | s.f. | 6216                        | Adj. Street    | 126                | 78   | 204   | 270                | 293  | 563   | ITE Equation  |
|                                                    |                   |                             |      |                             |                |                    |      |       |                    |      |       |               |
|                                                    |                   |                             |      |                             |                |                    |      |       |                    |      |       |               |
|                                                    |                   |                             |      |                             |                |                    |      |       |                    |      |       |               |
|                                                    |                   |                             |      |                             |                |                    |      |       |                    |      |       |               |
|                                                    |                   |                             |      |                             |                |                    |      |       |                    |      |       |               |
|                                                    |                   |                             |      |                             |                |                    |      |       |                    |      |       |               |
|                                                    |                   |                             |      |                             |                |                    |      |       |                    |      |       |               |
|                                                    |                   |                             |      |                             |                |                    |      |       |                    |      |       |               |
| Unadjusted Site Trips                              |                   |                             |      | 12282                       |                | 228                | 390  | 618   | 601                | 489  | 1090  | X             |
| Internal Capture Trips (Attach Calculation Sheets) |                   |                             |      | 2084                        |                | 5                  | 5    | 10    | 103                | 103  | 206   | Please Select |
| Internal Capture % of Unadjusted Site Trips        |                   |                             |      | 17 %                        |                | 2 %                |      |       | 19 %               |      |       | X             |
| LUC                                                | Proposed Land Use | Any Internal Trips?         |      | Pass-By % of External Trips |                |                    |      |       |                    |      |       |               |
| 820                                                | Shopping Center   | Yes - Adjust External Trips |      | 34 %                        |                | 0 %                |      |       | 34 %               |      |       | Other Data**  |
|                                                    |                   |                             |      | %                           |                | %                  |      |       | %                  |      |       |               |
|                                                    |                   |                             |      | %                           |                | %                  |      |       | %                  |      |       |               |
|                                                    |                   |                             |      | %                           |                | %                  |      |       | %                  |      |       |               |
|                                                    |                   |                             |      | %                           |                | %                  |      |       | %                  |      |       |               |
| Pass-By Trips (Attach Calculation Sheets)          |                   |                             |      | 1500                        |                | 0                  | 0    | 0     | 75                 | 75   | 150   | X             |
| Adjacent Street Volumes                            |                   |                             |      | 15000                       |                |                    |      |       | 1500               |      |       | Local Data**  |
| Non-Pass-By Primary Trips                          |                   |                             |      | 8698                        |                | 223                | 385  | 608   | 423                | 311  | 734   | X             |
| Diverted Trips, if Applicable and Justifiable      |                   |                             |      |                             |                |                    |      |       |                    |      |       | Please Select |

\*\*Explain local or other data sources, if used:

While ITE indicates PM peak hour pass-by reduction could equal a total of 157, pass-by will be capped at 150 (10% of 1500) which is reflected above.

### ☐ Existing Site Trip Information for Redevelopment Projects (Attach separate sheets as needed)

| ITE LUC                   | Existing Land Use | Size | Unit | Daily Trips | Peak Hour Type | AM Peak Hour Trips |      |       | PM Peak Hour Trips |      |       | Data Source   |
|---------------------------|-------------------|------|------|-------------|----------------|--------------------|------|-------|--------------------|------|-------|---------------|
|                           |                   |      |      |             |                | Enter              | Exit | Total | Enter              | Exit | Total |               |
|                           |                   |      |      |             | Please Select  |                    |      |       |                    |      |       | Please Select |
| Total Existing Site Trips |                   |      |      |             |                |                    |      |       |                    |      |       | X             |



## NCDOT TIA Scoping Checklist



### ☒ Trip Distribution

- ☒ Trip distribution diagrams are submitted concurrently with this document (attach separate sheets).
- ☐ Trip distribution diagrams will be submitted separately, along with supporting information, to the District Engineer for review and approval prior to capacity analysis. The trip distribution shall be based on the current and anticipated traffic patterns, as well as instructions noted below.

If required by the District Engineer, the following additional diagrams shall also be submitted:

- ☐ Mixed-Use Developments (separate diagrams for residential, commercial, and office trips)
- ☐ Inter-Development Trips (if 'internal' trips cross public streets)
- ☐ Pass-By Trips
- ☐ Diverted Trips
- ☐ Each Analysis Period

### ☐ Mode Split

- ☐ Provide Data Source and Justification

| Mode<br>Period | Auto |   |   |
|----------------|------|---|---|
| AM Peak        | %    | % | % |
| PM Peak        | %    | % | % |
| Daily          | %    | % | % |
|                | %    | % | % |

- ☐ Identify proper infrastructure and accommodation for other modes of travel.

### ☒ Analysis Peak Periods:

- ☒ Weekday AM Peak 7:00 AM - 9:00 AM
- ☒ Weekday PM Peak 4:00 PM - 6:00 PM
- ☐ Weekday Midday Peak \_\_\_\_\_
- ☐ Weekday PM School Peak \_\_\_\_\_
- ☐ Weekend \_\_\_\_\_ Peak \_\_\_\_\_
- ☐ Other \_\_\_\_\_





## NCDOT TIA Scoping Checklist



### ☒ Study Area Intersections and Data Collection

The study area shall include the site access intersections (both new and existing) identified under “Site Plan and Access” on page 1, as well as the following external and, if applicable, internal intersections.

| External Intersection | Intersection of  |                  | Traffic Control | Intersection Turning Movement Counts |                |                   | Notes           |
|-----------------------|------------------|------------------|-----------------|--------------------------------------|----------------|-------------------|-----------------|
|                       | Road A           | Road B           |                 | New / Existing                       | Date of Counts | Growth Adjustment |                 |
| #1                    | O'Neill Street   | Main Street      | Signal          | Use Existing Counts                  | 2/18           | 5%                |                 |
| #2                    | N O'Neill Street | Atwood Drive     | 2-Way Stop      | Use Existing Counts                  | TBD            | TBD               | Trip gen/assign |
| #3                    | N O'Neill Street | Main Street      | 2-Way Stop      | Use Existing Counts                  | 2/18           | 5%                |                 |
| #4                    | Covered Bridge   | Pritchard Road   | Signal          | Use Existing Counts                  | 2/17           | 5%                |                 |
| #5                    | N O'Neil Street  | Cov. Bridge Ext  | 2-Way Stop      |                                      |                |                   | Full-Mvmt.      |
| #6                    | N O'Neil Street  | Pod A North Drwy | 2-Way Stop      |                                      |                |                   | RI/RO           |
| #7                    | N O'Neil Street  | Pod A South Drwy | 2-Way Stop      |                                      |                |                   | Full-Mvmt.      |
| #8                    |                  |                  |                 |                                      |                |                   |                 |
| #9                    |                  |                  |                 |                                      |                |                   |                 |
| #10                   |                  |                  |                 |                                      |                |                   |                 |
| #11                   |                  |                  |                 |                                      |                |                   |                 |
| #12                   |                  |                  |                 |                                      |                |                   |                 |

| Internal Intersection | Intersection of |        | Access Type     |                     | Intersection Spacing |               |                      |
|-----------------------|-----------------|--------|-----------------|---------------------|----------------------|---------------|----------------------|
|                       | Road A          | Road B | Traffic Control | Permitted Movements | Distance (ft)        | Direction     | Nearest Intersection |
| #101                  |                 |        | Please Select   | Please Select       |                      | Please Select |                      |
| #102                  |                 |        |                 |                     |                      |               |                      |
| #103                  |                 |        |                 |                     |                      |               |                      |
| #104                  |                 |        |                 |                     |                      |               |                      |
| #105                  |                 |        |                 |                     |                      |               |                      |

The following data will be collected:

- ☐ New traffic turning movement counts in ☐ 15-min intervals ☐ 5-min intervals (near schools)  
 Unless otherwise noted above, new traffic counts shall be collected at the existing study intersections during the analysis periods. Weekday counts shall avoid Mondays, Fridays, holidays, school breaks, road closures, and major weather events.

- ☐ To account for the impact of existing and/or proposed school traffic, PHFs will be adjusted for:

intersections numbered: \_\_\_\_\_

and access points numbered: \_\_\_\_\_

- ☐ Traffic Forecast Data for TIP: \_\_\_\_\_

- ☒ Roadway/Intersection Configuration & Traffic Control

- ☒ Traffic Signal Phasing & Timing Data

- ☐ Crash Data: \_\_\_\_\_ Period: \_\_\_\_\_

- ☒ Other:

At the intersection of N. O'Neil Street at Atwood Drive, trip generation will be performed for the 150-unit residential development and then assigned to N. O'Neil Street with 60% to/from the south and 40% to/from the north based on previous counts along N. O'Neil Street.

Including future traffic signal at the intersection of N. O'Neil Street at Covered Bridge Road  
 South Site Driveway assumed to align with Steeplechase Site Driveway #2



## NCDOT TIA Scoping Checklist



### ☒ Future Year Conditions

☒ Project Build-Out Year: \_\_\_\_\_ 2030

☐ Future Analysis Year(s): \_\_\_\_\_

☐ Identify below any funded/committed future transportation improvements, as well as any approved but incomplete developments near the site.

| Funded STIP / Local CIP Project | Project Description            |                                                | Year Complete          |
|---------------------------------|--------------------------------|------------------------------------------------|------------------------|
|                                 |                                |                                                |                        |
|                                 |                                |                                                |                        |
|                                 |                                |                                                |                        |
|                                 |                                |                                                |                        |
|                                 |                                |                                                |                        |
| Nearby Approved Development     | Location                       | Future Land Use (exclude any completed phases) | Committed Improvements |
| Barbour Tract                   | S. of Oakdale, E of O'Neil     | 121 single-fam, 150 low-rise                   | None                   |
| Steeplechase                    | S. of Cov. Bridge, W of O'Neil | 134 TH, 526 sen. adult det.                    | Main@ONeil: WBR        |
| Walton Farm                     | N of Cov. Bridge, E of Neuse   | 190 sing.fam, 120 apts.                        |                        |
|                                 |                                |                                                |                        |

☒ Annual Growth Factor: 2 %

Justification/Data Source: Historical AADT information from NCDOT

### ☒ Local Comprehensive Transportation Plan Compliance

☒ Identify Applicable Local Transportation Planning Documents

Johnston County Comprehensive Transportation PlanF (December 2014)

Town of Clayton Comprehensive Plan (October 2015)

☒ Identify Applicable Roadways inside the Study Area

| Road Name           | Classification     | Speed Limit | Proposed Cross-Section | Proposed Right-of-Way | Compliance Requirements | Affect Study Intersection # |
|---------------------|--------------------|-------------|------------------------|-----------------------|-------------------------|-----------------------------|
| O'Neil Street       | Boulevard          | 45          | 4-lane divided         | 110                   | n/a                     |                             |
| Covered Bridge Road | Boulevard          | 55          | 4-lane divided         | 110                   | n/a                     |                             |
| Main Street         | Major Thoroughfare | 25          | no change              | -                     | n/a                     |                             |
| Pritchard Road      | Boulevard          | 55          | 4-lane divided         | 110                   | n/a                     |                             |
| Atwood Drive        | Local              | 25          | no chance              | -                     | n/a                     |                             |



## NCDOT TIA Scoping Checklist



### ☒ Study Method

The traffic analysis shall follow the current [NCDOT Congestion Management Capacity Analysis Guidelines](#), [Policy on Street and Driveway Access to North Carolina Highways](#), and use the current approved version of analysis software (e.g. Synchro/SimTraffic, HCS, Sidra Intersection, TransModeler).

The study shall include the following analysis scenarios for each analysis period.

1. Existing Conditions
2. Future No-Build Conditions (existing + background growth + approved developments + committed or funded improvements)
3. Future Build Conditions (future no-build + site trips)
4. Future Build with Improvements Conditions (future build traffic with improvements to mitigate the proposed development's impacts) and, if applicable:
- ☐ 5. TIP Design Year Analysis \_\_\_\_\_
- ☐ 6. Alternative Access Scenario (without proposed control-of-access or median break / modification)

The following additional analysis/outputs should be provided as warranted:

- ☐ Signal Warrant Analysis for accesses/intersections \_\_\_\_\_
- ☐ Multi-Modal Level of Service Analysis
- ☐ School Loading Zone Traffic Simulation
- ☐ Phasing Analysis (scope separately as needed)
- ☐ Safety/Crash Analysis
- ☐ Control-of-Access Modification Justification
- ☐ Median Break / Modification Justification
- ☐ Other \_\_\_\_\_

### ☒ Submittals

In addition to the hardcopies required below, the TIA Consultant shall provide the District Engineer and, if required, the local government an electronic copy of the study documents, including the latest site plan, figures and appendices, in searchable PDF files and the original traffic analysis files (e.g., Synchro, HCS). To expedite review, the NCDOT electronic submittals shall also be delivered concurrently to:

☐ Div. Traffic Engr ☐ Regional Traffic Engr ☐ Congestion Management ☐ Other \_\_\_\_\_

| Submittals                     | NCDOT      |          | Local Government |          |
|--------------------------------|------------|----------|------------------|----------|
|                                | Electronic | Hardcopy | Electronic       | Hardcopy |
| Trip Generation & Distribution | Required   |          | Please Select    |          |
| Draft TIA Report               | Required   |          |                  |          |
| Final Sealed TIA Report        | Required   |          |                  |          |

☐ **Additional Comments** (municipal TIA requirements, approved variations from NCDOT guidelines)



## NCDOT TIA Scoping Checklist



### Agreement by All Parties

The undersigned agree to the contents and methodology described above for completing the required traffic impact analysis for the proposed development identified herein. Any changes to the above methodology contemplated by the Applicant or the TIA Consultant must be submitted to the District Engineer in writing. If approved by NCDOT, then such changes may be accepted for the TIA report. Subsequent revisions to the development plan (e.g. land use, density, site access, or schedule) may require additional scoping and analysis, and may modify the TIA requirements.

This agreement shall become effective on the date approved by NCDOT, and shall expire \_\_\_\_ months after the effective date or upon significant changes to the roadway network and/or development assumptions, whichever occurs first. Once expired, renewal or re-scoping will be required for subsequent TIA submittals.

### APPLICANT

  
Signature

David DeYoung  
Print Name

7/28/20  
Date

### TIA CONSULTANT

  
Signature

Travis Fluitt  
Print Name

7/24/2020  
Date

### LOCAL GOVERNMENT REPRESENTATIVE (If Applicable)

\_\_\_\_\_  
Signature  
Email concurrence may be used in lieu of the signature.

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Date

### NCDOT DISTRICT REPRESENTATIVE

Reviewed and approved by the NCDOT Division \_\_\_\_ District \_\_\_\_ on \_\_\_\_.

\_\_\_\_\_  
Signature  
Email concurrence may be used in lieu of the signature.

\_\_\_\_\_  
Print Name

| Ashcroft Phase 2                                                        |           |           |               |              |              |              |            |            |              |            |            |
|-------------------------------------------------------------------------|-----------|-----------|---------------|--------------|--------------|--------------|------------|------------|--------------|------------|------------|
| Table 1 - Trip Generation                                               |           |           |               |              |              |              |            |            |              |            |            |
| Land Use                                                                | Intensity |           | Daily         |              |              | AM Peak Hour |            |            | PM Peak Hour |            |            |
|                                                                         |           |           | Total         | In           | Out          | Total        | In         | Out        | Total        | In         | Out        |
| 210 Single Family Detached Housing - Pods D-L                           | 300       | d.u.      | 2,858         | 1,429        | 1,429        | 218          | 55         | 163        | 292          | 184        | 108        |
| 220 Multifamily Housing (Low-Rise) - Pod C                              | 300       | d.u.      | 2,228         | 1,114        | 1,114        | 135          | 31         | 104        | 157          | 99         | 58         |
| 221 Multifamily Housing (Mid-Rise) - Pod B                              | 180       | d.u.      | 980           | 490          | 490          | 61           | 16         | 45         | 78           | 48         | 30         |
| 820 Shopping Center - Pod A                                             | 105,000   | s.f.      | 6,216         | 3,108        | 3,108        | 204          | 126        | 78         | 563          | 270        | 293        |
| <b>Subtotal</b>                                                         |           |           | <b>12,282</b> | <b>6,141</b> | <b>6,141</b> | <b>618</b>   | <b>228</b> | <b>390</b> | <b>1,090</b> | <b>601</b> | <b>489</b> |
| <u>Internal Capture</u>                                                 |           |           |               |              |              |              |            |            |              |            |            |
| 210 Single Family Detached Housing - Pods D-L                           |           |           | 491           | 293          | 198          | 3            | 1          | 2          | 56           | 41         | 15         |
| 220 Multifamily Housing (Low-Rise) - Pod C                              |           |           | 383           | 229          | 154          | 2            | 1          | 1          | 32           | 24         | 8          |
| 221 Multifamily Housing (Mid-Rise) - Pod B                              |           |           | 168           | 100          | 68           | 0            | 0          | 0          | 15           | 11         | 4          |
| 820 Shopping Center - Pod A <sup>1</sup>                                |           |           | 1,042         | 420          | 622          | 5            | 3          | 2          | 103          | 27         | 76         |
| <i>Internal Capture Total</i>                                           |           |           | <i>2,084</i>  | <i>1,042</i> | <i>1,042</i> | <i>10</i>    | <i>5</i>   | <i>5</i>   | <i>206</i>   | <i>103</i> | <i>103</i> |
| <b>Total Driveway Volumes</b>                                           |           |           | <b>10,198</b> | <b>5,099</b> | <b>5,099</b> | <b>608</b>   | <b>223</b> | <b>385</b> | <b>884</b>   | <b>498</b> | <b>386</b> |
| <u>Pass-By Capture</u>                                                  |           |           |               |              |              |              |            |            |              |            |            |
| 820 Shopping Center - Pod A <sup>1</sup><br>10% Adjacent Street Traffic | <u>AM</u> | <u>PM</u> |               |              |              |              |            |            |              |            |            |
|                                                                         | 0%        | 34%       | 1,734         | 867          | 867          | 0            | 0          | 0          | 157          | 83         | 74         |
| <b>Pass-By Capture Total:</b>                                           |           |           | <b>1,500</b>  | <b>750</b>   | <b>750</b>   | <b>0</b>     | <b>0</b>   | <b>0</b>   | <b>150</b>   | <b>75</b>  | <b>75</b>  |
| <b>Total Net New External Trips</b>                                     |           |           | <b>8,698</b>  | <b>4,349</b> | <b>4,349</b> | <b>608</b>   | <b>223</b> | <b>385</b> | <b>734</b>   | <b>423</b> | <b>311</b> |

K:\RAL\_TPTO\_Traffic\014163000 Ashcroft Phase 2\T4 - Analysis\Ashcroft Phase 2 - TIADData.xls\Trip Gen

7/28/20

# Internal Capture Reduction Calculations

Methodology for A.M. Peak Hour and P.M. Peak Hour  
based on the *Trip Generation Handbook*, 3rd Edition, published by the Institute of Transportation Engineers

Methodology for Daily  
based on the average of the Unconstrained Rates for the A.M. Peak Hour and P.M. Peak Hour

## SUMMARY

### GROSS TRIP GENERATION

| INPUT | Land Use             | Daily |       | A.M. Peak Hour |      | P.M. Peak Hour |      |
|-------|----------------------|-------|-------|----------------|------|----------------|------|
|       |                      | Enter | Exit  | Enter          | Exit | Enter          | Exit |
|       | Office               | 0     | 0     | 0              | 0    | 0              | 0    |
|       | Retail               | 3,108 | 3,108 | 126            | 78   | 270            | 293  |
|       | Restaurant           | 0     | 0     | 0              | 0    | 0              | 0    |
|       | Cinema/Entertainment | 0     | 0     | 0              | 0    | 0              | 0    |
|       | Residential          | 3,033 | 3,033 | 102            | 312  | 331            | 196  |
|       | Hotel                | 0     | 0     | 0              | 0    | 0              | 0    |
|       |                      | 6,141 | 6,141 | 228            | 390  | 601            | 489  |

### INTERNAL TRIPS

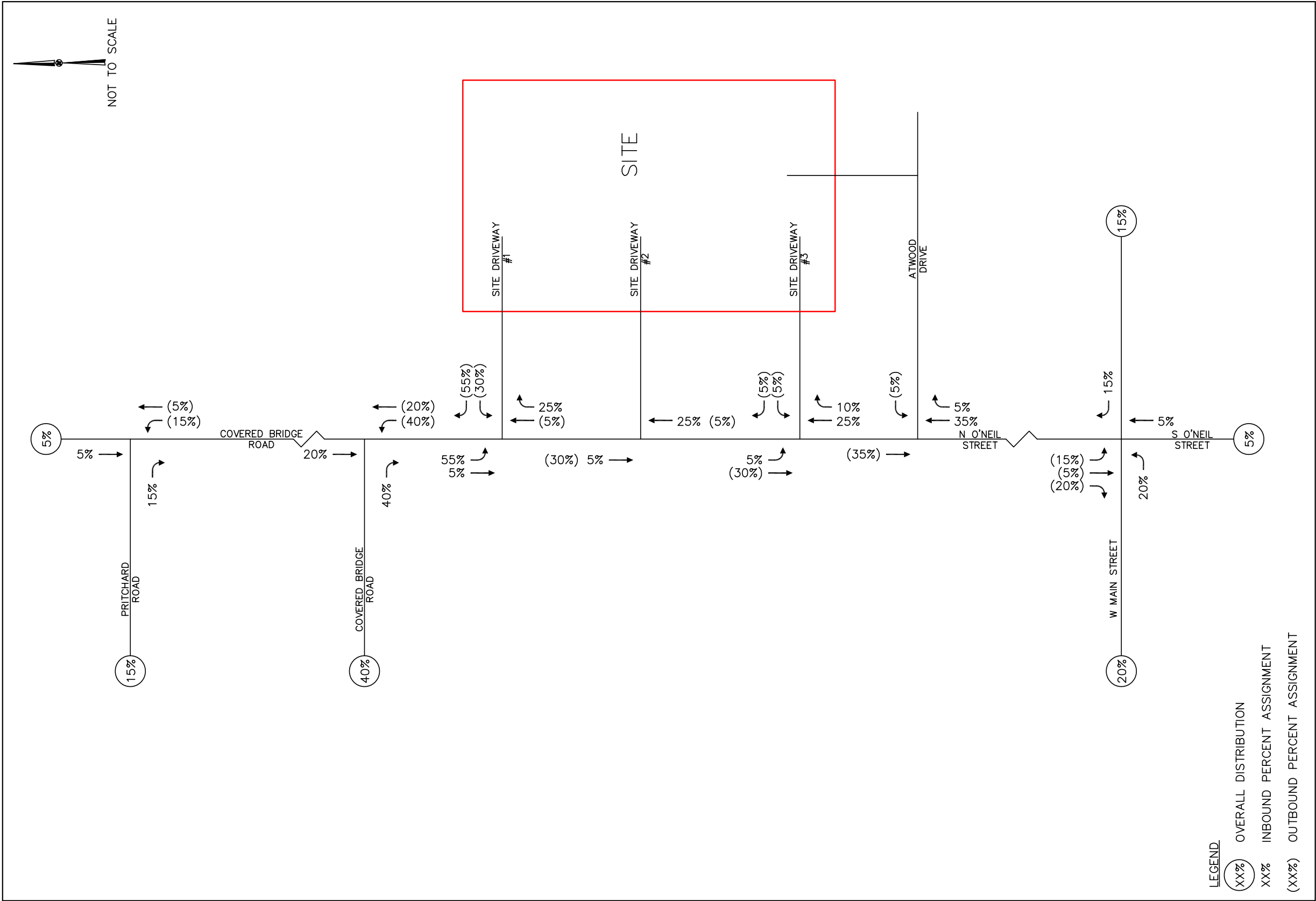
| OUTPUT | Land Use             | Daily |       | A.M. Peak Hour |      | P.M. Peak Hour |      |
|--------|----------------------|-------|-------|----------------|------|----------------|------|
|        |                      | Enter | Exit  | Enter          | Exit | Enter          | Exit |
|        | Office               | 0     | 0     | 0              | 0    | 0              | 0    |
|        | Retail               | 420   | 622   | 3              | 2    | 27             | 76   |
|        | Restaurant           | 0     | 0     | 0              | 0    | 0              | 0    |
|        | Cinema/Entertainment | 0     | 0     | 0              | 0    | 0              | 0    |
|        | Residential          | 622   | 420   | 2              | 3    | 76             | 27   |
|        | Hotel                | 0     | 0     | 0              | 0    | 0              | 0    |
|        |                      | 1,042 | 1,042 | 5              | 5    | 103            | 103  |
|        | % Reduction          | 17.0% |       | 1.6%           |      | 18.9%          |      |

### EXTERNAL TRIPS

| OUTPUT | Land Use             | Daily |       | A.M. Peak Hour |      | P.M. Peak Hour |      |
|--------|----------------------|-------|-------|----------------|------|----------------|------|
|        |                      | Enter | Exit  | Enter          | Exit | Enter          | Exit |
|        | Office               | 0     | 0     | 0              | 0    | 0              | 0    |
|        | Retail               | 2,688 | 2,486 | 123            | 76   | 243            | 217  |
|        | Restaurant           | 0     | 0     | 0              | 0    | 0              | 0    |
|        | Cinema/Entertainment | 0     | 0     | 0              | 0    | 0              | 0    |
|        | Residential          | 2,411 | 2,613 | 100            | 309  | 255            | 169  |
|        | Hotel                | 0     | 0     | 0              | 0    | 0              | 0    |
|        |                      | 5,099 | 5,099 | 223            | 385  | 498            | 386  |



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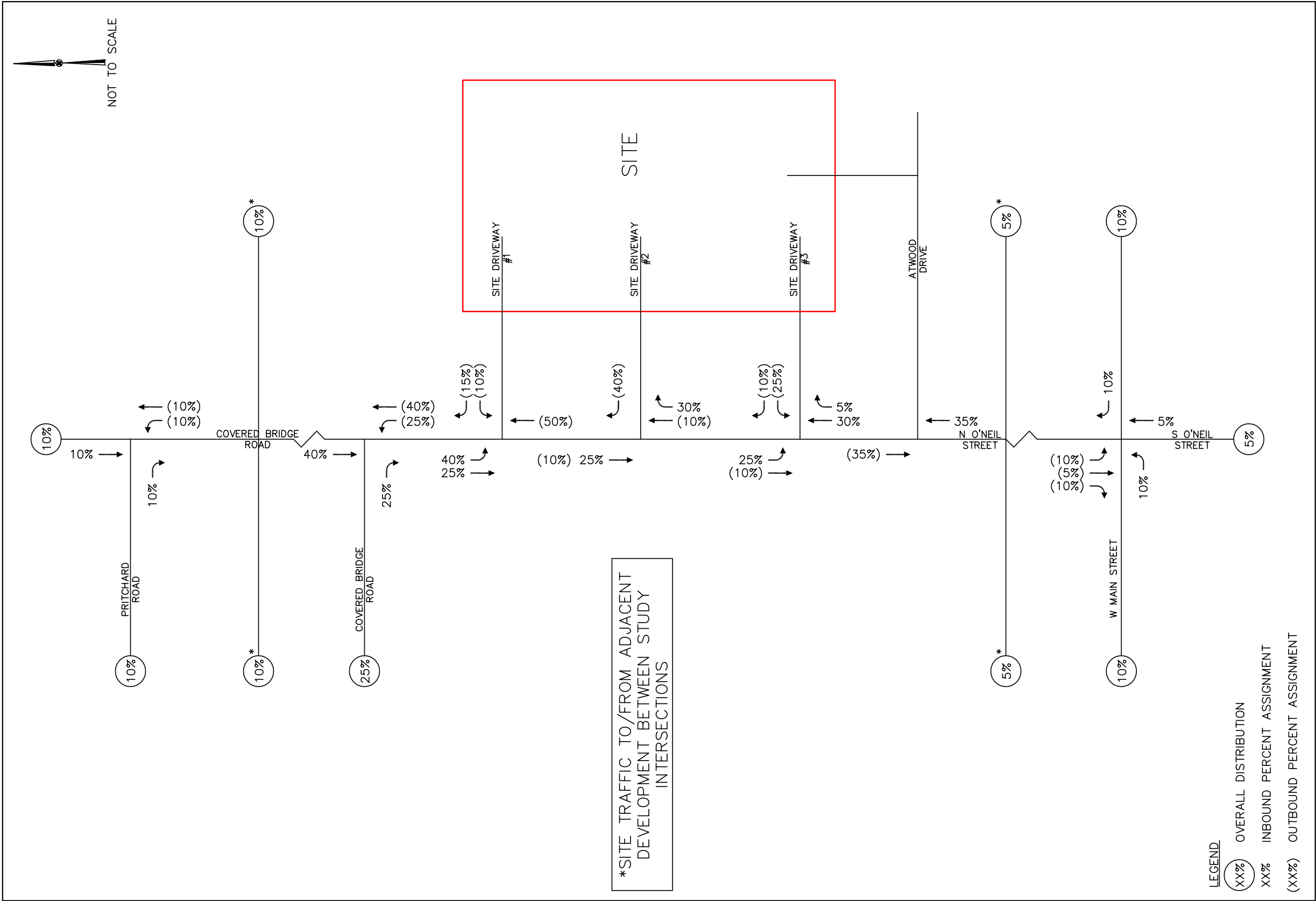
ASHCROFT PHASE 2  
CLAYTON, NC  
TRAFFIC IMPACT ANALYSIS

SITE TRAFFIC DISTRIBUTION AND PERCENT  
ASSIGNMENT – RESIDENTIAL

FIGURE  
4A

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

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ASHCROFT PHASE 2  
CLAYTON, NC  
TRAFFIC IMPACT ANALYSIS

SITE TRAFFIC DISTRIBUTION AND PERCENT  
ASSIGNMENT – RETAIL

FIGURE  
4B

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

## **Appendix B:**

### **Traffic Count Data**



5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
PH: 919 872-5115

File Name : Main Street and O'Neil Street  
Site Code : 00022118  
Start Date : 2/21/2018  
Page No : 1

Groups Printed- Cars & Trucks

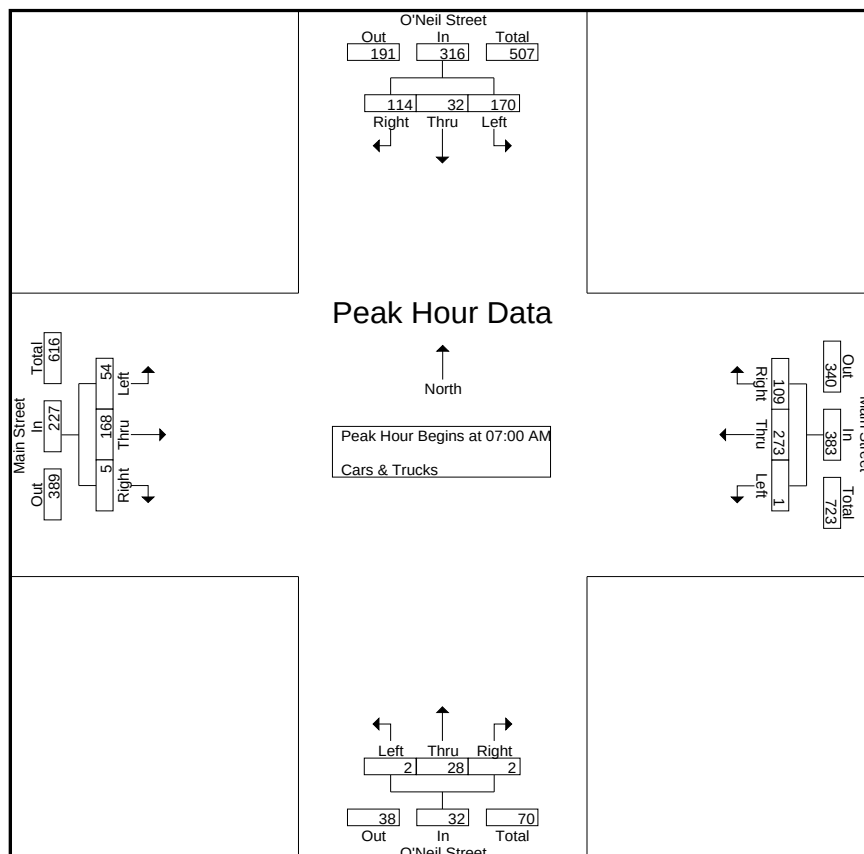
| Start Time    | O'Neil Street<br>From North |      |      |      |            | Main Street<br>From East |      |      |      |            | O'Neil Street<br>From South |      |      |      |            | Main Street<br>From West |      |      |      |            | Exclu. Total | Inclu. Total | Int. Total |
|---------------|-----------------------------|------|------|------|------------|--------------------------|------|------|------|------------|-----------------------------|------|------|------|------------|--------------------------|------|------|------|------------|--------------|--------------|------------|
|               | Right                       | Thru | Left | TRKS | App. Total | Right                    | Thru | Left | TRKS | App. Total | Right                       | Thru | Left | TRKS | App. Total | Right                    | Thru | Left | TRKS | App. Total |              |              |            |
| 06:30 AM      | 26                          | 3    | 29   | 0    | 58         | 12                       | 32   | 0    | 0    | 44         | 0                           | 2    | 0    | 0    | 2          | 1                        | 26   | 6    | 0    | 33         | 0            | 137          | 137        |
| 06:45 AM      | 18                          | 2    | 24   | 1    | 44         | 22                       | 75   | 0    | 0    | 97         | 0                           | 3    | 1    | 0    | 4          | 2                        | 25   | 7    | 0    | 34         | 1            | 179          | 180        |
| Total         | 44                          | 5    | 53   | 1    | 102        | 34                       | 107  | 0    | 0    | 141        | 0                           | 5    | 1    | 0    | 6          | 3                        | 51   | 13   | 0    | 67         | 1            | 316          | 317        |
| 07:00 AM      | 17                          | 8    | 56   | 1    | 81         | 20                       | 61   | 0    | 0    | 81         | 1                           | 9    | 1    | 0    | 11         | 4                        | 49   | 6    | 0    | 59         | 1            | 232          | 233        |
| 07:15 AM      | 15                          | 4    | 34   | 2    | 53         | 28                       | 75   | 1    | 0    | 104        | 1                           | 8    | 0    | 0    | 9          | 1                        | 44   | 20   | 0    | 65         | 2            | 231          | 233        |
| 07:30 AM      | 39                          | 13   | 36   | 0    | 88         | 29                       | 69   | 0    | 0    | 98         | 0                           | 7    | 0    | 0    | 7          | 0                        | 34   | 15   | 0    | 49         | 0            | 242          | 242        |
| 07:45 AM      | 43                          | 7    | 44   | 0    | 94         | 32                       | 68   | 0    | 0    | 100        | 0                           | 4    | 1    | 0    | 5          | 0                        | 41   | 13   | 0    | 54         | 0            | 253          | 253        |
| Total         | 114                         | 32   | 170  | 3    | 316        | 109                      | 273  | 1    | 0    | 383        | 2                           | 28   | 2    | 0    | 32         | 5                        | 168  | 54   | 0    | 227        | 3            | 958          | 961        |
| 08:00 AM      | 17                          | 7    | 44   | 3    | 68         | 14                       | 35   | 0    | 1    | 49         | 0                           | 10   | 2    | 0    | 12         | 0                        | 29   | 12   | 0    | 41         | 4            | 170          | 174        |
| 08:15 AM      | 16                          | 5    | 51   | 0    | 72         | 7                        | 50   | 0    | 0    | 57         | 0                           | 2    | 0    | 0    | 2          | 1                        | 39   | 6    | 0    | 46         | 0            | 177          | 177        |
| 08:30 AM      | 29                          | 11   | 35   | 1    | 75         | 22                       | 40   | 3    | 1    | 65         | 0                           | 5    | 0    | 1    | 5          | 2                        | 32   | 6    | 0    | 40         | 3            | 185          | 188        |
| *** BREAK *** |                             |      |      |      |            |                          |      |      |      |            |                             |      |      |      |            |                          |      |      |      |            |              |              |            |
| Total         | 62                          | 23   | 130  | 4    | 215        | 43                       | 125  | 3    | 2    | 171        | 0                           | 17   | 2    | 1    | 19         | 3                        | 100  | 24   | 0    | 127        | 7            | 532          | 539        |
| *** BREAK *** |                             |      |      |      |            |                          |      |      |      |            |                             |      |      |      |            |                          |      |      |      |            |              |              |            |
| 04:00 PM      | 35                          | 19   | 39   | 2    | 93         | 34                       | 47   | 1    | 0    | 82         | 1                           | 16   | 2    | 0    | 19         | 0                        | 50   | 23   | 0    | 73         | 2            | 267          | 269        |
| 04:15 PM      | 15                          | 12   | 28   | 0    | 55         | 35                       | 51   | 1    | 0    | 87         | 0                           | 16   | 0    | 1    | 16         | 0                        | 54   | 15   | 0    | 69         | 1            | 227          | 228        |
| 04:30 PM      | 21                          | 8    | 40   | 0    | 69         | 33                       | 55   | 3    | 0    | 91         | 0                           | 15   | 2    | 2    | 17         | 2                        | 89   | 20   | 0    | 111        | 2            | 288          | 290        |
| 04:45 PM      | 18                          | 8    | 47   | 2    | 73         | 41                       | 45   | 0    | 0    | 86         | 1                           | 9    | 1    | 0    | 11         | 1                        | 97   | 22   | 0    | 120        | 2            | 290          | 292        |
| Total         | 89                          | 47   | 154  | 4    | 290        | 143                      | 198  | 5    | 0    | 346        | 2                           | 56   | 5    | 3    | 63         | 3                        | 290  | 80   | 0    | 373        | 7            | 1072         | 1079       |
| 05:00 PM      | 13                          | 6    | 25   | 0    | 44         | 47                       | 42   | 0    | 0    | 89         | 0                           | 15   | 1    | 0    | 16         | 1                        | 95   | 21   | 0    | 117        | 0            | 266          | 266        |
| 05:15 PM      | 31                          | 7    | 30   | 0    | 68         | 52                       | 51   | 0    | 0    | 103        | 0                           | 21   | 3    | 2    | 24         | 2                        | 89   | 24   | 0    | 115        | 2            | 310          | 312        |
| 05:30 PM      | 31                          | 5    | 47   | 0    | 83         | 40                       | 37   | 2    | 2    | 79         | 0                           | 15   | 1    | 0    | 16         | 1                        | 93   | 19   | 0    | 113        | 2            | 291          | 293        |
| 05:45 PM      | 21                          | 7    | 35   | 0    | 63         | 34                       | 27   | 0    | 0    | 61         | 1                           | 20   | 0    | 0    | 21         | 1                        | 78   | 18   | 0    | 97         | 0            | 242          | 242        |
| Total         | 96                          | 25   | 137  | 0    | 258        | 173                      | 157  | 2    | 2    | 332        | 1                           | 71   | 5    | 2    | 77         | 5                        | 355  | 82   | 0    | 442        | 4            | 1109         | 1113       |
| 06:00 PM      | 26                          | 12   | 45   | 0    | 83         | 32                       | 39   | 1    | 0    | 72         | 0                           | 14   | 1    | 0    | 15         | 1                        | 96   | 12   | 0    | 109        | 0            | 279          | 279        |
| 06:15 PM      | 40                          | 16   | 40   | 0    | 96         | 57                       | 40   | 3    | 0    | 100        | 0                           | 8    | 2    | 0    | 10         | 6                        | 74   | 19   | 0    | 99         | 0            | 305          | 305        |
| 06:30 PM      | 30                          | 9    | 41   | 0    | 80         | 31                       | 42   | 1    | 0    | 74         | 2                           | 8    | 0    | 0    | 10         | 1                        | 73   | 21   | 1    | 95         | 1            | 259          | 260        |
| 06:45 PM      | 36                          | 4    | 56   | 0    | 96         | 35                       | 55   | 0    | 0    | 90         | 2                           | 9    | 0    | 0    | 11         | 0                        | 41   | 15   | 0    | 56         | 0            | 253          | 253        |
| Total         | 132                         | 41   | 182  | 0    | 355        | 155                      | 176  | 5    | 0    | 336        | 4                           | 39   | 3    | 0    | 46         | 8                        | 284  | 67   | 1    | 359        | 1            | 1096         | 1097       |
| Grand Total   | 537                         | 173  | 826  | 12   | 1536       | 657                      | 1036 | 16   | 4    | 1709       | 9                           | 216  | 18   | 6    | 243        | 27                       | 1248 | 320  | 1    | 1595       | 23           | 5083         | 5106       |
| Apprch %      | 35                          | 11.3 | 53.8 |      |            | 38.4                     | 60.6 | 0.9  |      |            | 3.7                         | 88.9 | 7.4  |      |            | 1.7                      | 78.2 | 20.1 |      |            |              |              |            |
| Total %       | 10.6                        | 3.4  | 16.3 |      | 30.2       | 12.9                     | 20.4 | 0.3  |      | 33.6       | 0.2                         | 4.2  | 0.4  |      | 4.8        | 0.5                      | 24.6 | 6.3  |      | 31.4       | 0.5          | 99.5         |            |



5808 Faringdon Place, Suite 100  
 Raleigh, NC 27609  
 PH: 919 872-5115

File Name : Main Street and O'Neil Street  
 Site Code : 00022118  
 Start Date : 2/21/2018  
 Page No : 2

|                                                            | O'Neil Street<br>From North |      |      |            | Main Street<br>From East |      |      |            | O'Neil Street<br>From South |      |      |            | Main Street<br>From West |      |      |            |            |
|------------------------------------------------------------|-----------------------------|------|------|------------|--------------------------|------|------|------------|-----------------------------|------|------|------------|--------------------------|------|------|------------|------------|
| Start Time                                                 | Right                       | Thru | Left | App. Total | Right                    | Thru | Left | App. Total | Right                       | Thru | Left | App. Total | Right                    | Thru | Left | App. Total | Int. Total |
| Peak Hour Analysis From 06:30 AM to 11:45 AM - Peak 1 of 1 |                             |      |      |            |                          |      |      |            |                             |      |      |            |                          |      |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:00 AM       |                             |      |      |            |                          |      |      |            |                             |      |      |            |                          |      |      |            |            |
| 07:00 AM                                                   | 17                          | 8    | 56   | 81         | 20                       | 61   | 0    | 81         | 1                           | 9    | 1    | 11         | 4                        | 49   | 6    | 59         | 232        |
| 07:15 AM                                                   | 15                          | 4    | 34   | 53         | 28                       | 75   | 1    | 104        | 1                           | 8    | 0    | 9          | 1                        | 44   | 20   | 65         | 231        |
| 07:30 AM                                                   | 39                          | 13   | 36   | 88         | 29                       | 69   | 0    | 98         | 0                           | 7    | 0    | 7          | 0                        | 34   | 15   | 49         | 242        |
| 07:45 AM                                                   | 43                          | 7    | 44   | 94         | 32                       | 68   | 0    | 100        | 0                           | 4    | 1    | 5          | 0                        | 41   | 13   | 54         | 253        |
| Total Volume                                               | 114                         | 32   | 170  | 316        | 109                      | 273  | 1    | 383        | 2                           | 28   | 2    | 32         | 5                        | 168  | 54   | 227        | 958        |
| % App. Total                                               | 36.1                        | 10.1 | 53.8 |            | 28.5                     | 71.3 | 0.3  |            | 6.2                         | 87.5 | 6.2  |            | 2.2                      | 74   | 23.8 |            |            |
| PHF                                                        | .663                        | .615 | .759 | .840       | .852                     | .910 | .250 | .921       | .500                        | .778 | .500 | .727       | .313                     | .857 | .675 | .873       | .947       |

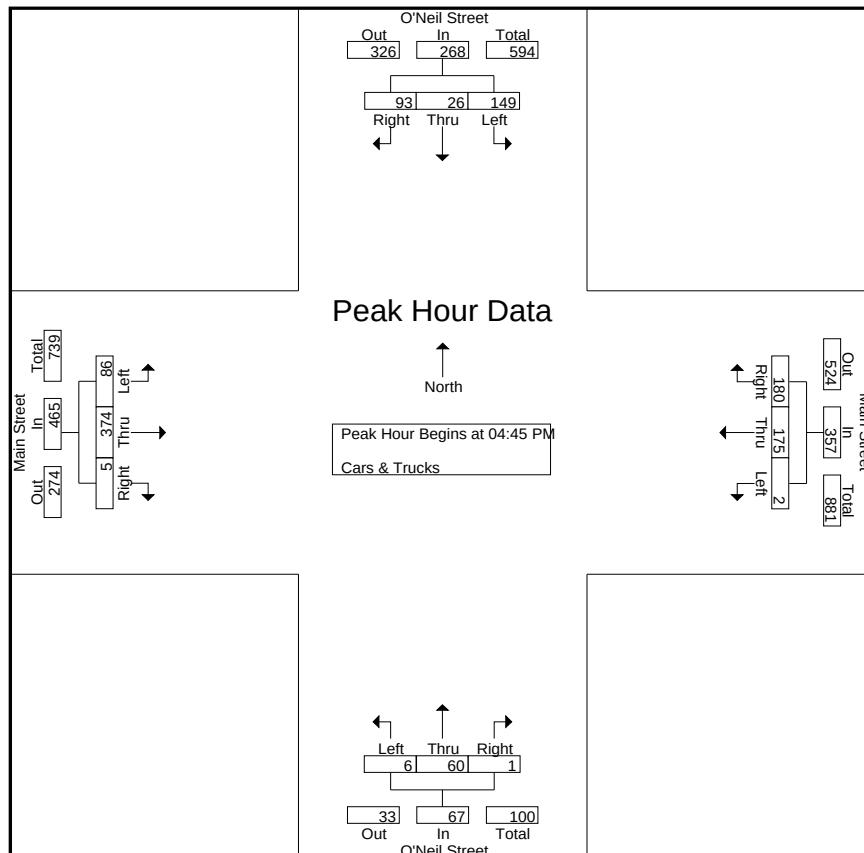




5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
PH: 919 872-5115

File Name : Main Street and O'Neil Street  
Site Code : 00022118  
Start Date : 2/21/2018  
Page No : 3

|                                                            | O'Neil Street<br>From North |      |      |            | Main Street<br>From East |      |      |            | O'Neil Street<br>From South |      |      |            | Main Street<br>From West |      |      |            |            |
|------------------------------------------------------------|-----------------------------|------|------|------------|--------------------------|------|------|------------|-----------------------------|------|------|------------|--------------------------|------|------|------------|------------|
| Start Time                                                 | Right                       | Thru | Left | App. Total | Right                    | Thru | Left | App. Total | Right                       | Thru | Left | App. Total | Right                    | Thru | Left | App. Total | Int. Total |
| Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1 |                             |      |      |            |                          |      |      |            |                             |      |      |            |                          |      |      |            |            |
| Peak Hour for Entire Intersection Begins at 04:45 PM       |                             |      |      |            |                          |      |      |            |                             |      |      |            |                          |      |      |            |            |
| 04:45 PM                                                   | 18                          | 8    | 47   | 73         | 41                       | 45   | 0    | 86         | 1                           | 9    | 1    | 11         | 1                        | 97   | 22   | 120        | 290        |
| 05:00 PM                                                   | 13                          | 6    | 25   | 44         | 47                       | 42   | 0    | 89         | 0                           | 15   | 1    | 16         | 1                        | 95   | 21   | 117        | 266        |
| 05:15 PM                                                   | 31                          | 7    | 30   | 68         | 52                       | 51   | 0    | 103        | 0                           | 21   | 3    | 24         | 2                        | 89   | 24   | 115        | 310        |
| 05:30 PM                                                   | 31                          | 5    | 47   | 83         | 40                       | 37   | 2    | 79         | 0                           | 15   | 1    | 16         | 1                        | 93   | 19   | 113        | 291        |
| Total Volume                                               | 93                          | 26   | 149  | 268        | 180                      | 175  | 2    | 357        | 1                           | 60   | 6    | 67         | 5                        | 374  | 86   | 465        | 1157       |
| % App. Total                                               | 34.7                        | 9.7  | 55.6 |            | 50.4                     | 49   | 0.6  |            | 1.5                         | 89.6 | 9    |            | 1.1                      | 80.4 | 18.5 |            |            |
| PHF                                                        | .750                        | .813 | .793 | .807       | .865                     | .858 | .250 | .867       | .250                        | .714 | .500 | .698       | .625                     | .964 | .896 | .969       | .933       |





# Burns Service Inc.

1202 Langdon Terrace Drive  
Indian Trail, NC, 28079

*We Count because YOU Count*

File Name : Clayton(Covered Bridge and O'Neal)

Site Code :

Start Date : 2/15/2018

Page No : 1

Groups Printed- Cars + - Trucks

|            | Covered Bridge Road<br>Southbound |      |            | O'Neil Street<br>Northbound |      |            | Covered Bridge Road<br>Eastbound |      |            |            |
|------------|-----------------------------------|------|------------|-----------------------------|------|------------|----------------------------------|------|------------|------------|
| Start Time | Right                             | Thru | App. Total | Thru                        | Left | App. Total | Right                            | Left | App. Total | Int. Total |
| 06:00      | 33                                | 20   | 53         | 15                          | 3    | 18         | 0                                | 5    | 5          | 76         |
| 06:15      | 49                                | 22   | 71         | 21                          | 0    | 21         | 1                                | 10   | 11         | 103        |
| 06:30      | 64                                | 32   | 96         | 22                          | 0    | 22         | 2                                | 18   | 20         | 138        |
| 06:45      | 62                                | 57   | 119        | 32                          | 0    | 32         | 2                                | 13   | 15         | 166        |
| Total      | 208                               | 131  | 339        | 90                          | 3    | 93         | 5                                | 46   | 51         | 483        |
| 07:00      | 74                                | 60   | 134        | 47                          | 0    | 47         | 2                                | 19   | 21         | 202        |
| 07:15      | 36                                | 35   | 71         | 19                          | 0    | 19         | 1                                | 12   | 13         | 103        |
| 07:30      | 77                                | 68   | 145        | 80                          | 4    | 84         | 2                                | 36   | 38         | 267        |
| 07:45      | 77                                | 82   | 159        | 67                          | 1    | 68         | 1                                | 39   | 40         | 267        |
| Total      | 264                               | 245  | 509        | 213                         | 5    | 218        | 6                                | 106  | 112        | 839        |
| 08:00      | 69                                | 78   | 147        | 30                          | 1    | 31         | 2                                | 21   | 23         | 201        |
| 08:15      | 46                                | 62   | 108        | 33                          | 0    | 33         | 1                                | 20   | 21         | 162        |
| 08:30      | 75                                | 82   | 157        | 52                          | 1    | 53         | 1                                | 24   | 25         | 235        |
| 08:45      | 60                                | 104  | 164        | 43                          | 1    | 44         | 0                                | 28   | 28         | 236        |
| Total      | 250                               | 326  | 576        | 158                         | 3    | 161        | 4                                | 93   | 97         | 834        |
| 09:00      | 44                                | 74   | 118        | 41                          | 1    | 42         | 3                                | 23   | 26         | 186        |
| 09:15      | 48                                | 53   | 101        | 57                          | 0    | 57         | 1                                | 24   | 25         | 183        |
| 09:30      | 45                                | 33   | 78         | 40                          | 2    | 42         | 1                                | 33   | 34         | 154        |
| 09:45      | 45                                | 45   | 90         | 38                          | 0    | 38         | 2                                | 26   | 28         | 156        |
| Total      | 182                               | 205  | 387        | 176                         | 3    | 179        | 7                                | 106  | 113        | 679        |
| 10:00      | 36                                | 45   | 81         | 35                          | 2    | 37         | 3                                | 26   | 29         | 147        |
| 10:15      | 52                                | 49   | 101        | 27                          | 0    | 27         | 0                                | 24   | 24         | 152        |
| 10:30      | 39                                | 43   | 82         | 43                          | 0    | 43         | 1                                | 22   | 23         | 148        |
| 10:45      | 42                                | 48   | 90         | 38                          | 1    | 39         | 1                                | 23   | 24         | 153        |
| Total      | 169                               | 185  | 354        | 143                         | 3    | 146        | 5                                | 95   | 100        | 600        |
| 11:00      | 39                                | 38   | 77         | 36                          | 1    | 37         | 0                                | 25   | 25         | 139        |
| 11:15      | 47                                | 41   | 88         | 44                          | 1    | 45         | 1                                | 35   | 36         | 169        |
| 11:30      | 37                                | 70   | 107        | 33                          | 1    | 34         | 0                                | 30   | 30         | 171        |
| 11:45      | 37                                | 56   | 93         | 41                          | 2    | 43         | 1                                | 36   | 37         | 173        |
| Total      | 160                               | 205  | 365        | 154                         | 5    | 159        | 2                                | 126  | 128        | 652        |
| 12:00      | 33                                | 51   | 84         | 51                          | 1    | 52         | 2                                | 35   | 37         | 173        |
| 12:15      | 46                                | 48   | 94         | 57                          | 0    | 57         | 2                                | 30   | 32         | 183        |
| 12:30      | 37                                | 50   | 87         | 49                          | 1    | 50         | 1                                | 36   | 37         | 174        |
| 12:45      | 38                                | 66   | 104        | 57                          | 1    | 58         | 2                                | 36   | 38         | 200        |
| Total      | 154                               | 215  | 369        | 214                         | 3    | 217        | 7                                | 137  | 144        | 730        |
| 13:00      | 40                                | 43   | 83         | 68                          | 0    | 68         | 1                                | 54   | 55         | 206        |
| 13:15      | 37                                | 56   | 93         | 72                          | 0    | 72         | 1                                | 51   | 52         | 217        |
| 13:30      | 30                                | 51   | 81         | 54                          | 2    | 56         | 2                                | 36   | 38         | 175        |
| 13:45      | 29                                | 43   | 72         | 51                          | 1    | 52         | 0                                | 45   | 45         | 169        |
| Total      | 136                               | 193  | 329        | 245                         | 3    | 248        | 4                                | 186  | 190        | 767        |
| 14:00      | 26                                | 60   | 86         | 72                          | 5    | 77         | 1                                | 31   | 32         | 195        |
| 14:15      | 36                                | 41   | 77         | 73                          | 1    | 74         | 3                                | 40   | 43         | 194        |
| 14:30      | 41                                | 49   | 90         | 65                          | 1    | 66         | 4                                | 59   | 63         | 219        |
| 14:45      | 48                                | 40   | 88         | 81                          | 1    | 82         | 0                                | 46   | 46         | 216        |
| Total      | 151                               | 190  | 341        | 291                         | 8    | 299        | 8                                | 176  | 184        | 824        |
| 15:00      | 45                                | 61   | 106        | 56                          | 0    | 56         | 2                                | 53   | 55         | 217        |
| 15:15      | 48                                | 77   | 125        | 71                          | 2    | 73         | 0                                | 64   | 64         | 262        |
| 15:30      | 47                                | 85   | 132        | 70                          | 0    | 70         | 1                                | 55   | 56         | 258        |
| 15:45      | 52                                | 68   | 120        | 81                          | 4    | 85         | 2                                | 56   | 58         | 263        |
| Total      | 192                               | 291  | 483        | 278                         | 6    | 284        | 5                                | 228  | 233        | 1000       |

# Burns Service Inc.

1202 Langdon Terrace Drive  
Indian Trail, NC, 28079

*We Count because YOU Count*

File Name : Clayton(Covered Bridge and O'Neal)

Site Code :

Start Date : 2/15/2018

Page No : 2

Groups Printed- Cars + - Trucks

|             | Covered Bridge Road<br>Southbound |      |            | O'Neil Street<br>Northbound |      |            | Covered Bridge Road<br>Eastbound |      |            |            |
|-------------|-----------------------------------|------|------------|-----------------------------|------|------------|----------------------------------|------|------------|------------|
| Start Time  | Right                             | Thru | App. Total | Thru                        | Left | App. Total | Right                            | Left | App. Total | Int. Total |
| 16:00       | 47                                | 69   | 116        | 71                          | 4    | 75         | 5                                | 58   | 63         | 254        |
| 16:15       | 42                                | 65   | 107        | 80                          | 0    | 80         | 0                                | 61   | 61         | 248        |
| 16:30       | 40                                | 62   | 102        | 85                          | 2    | 87         | 1                                | 70   | 71         | 260        |
| 16:45       | 44                                | 57   | 101        | 100                         | 2    | 102        | 0                                | 64   | 64         | 267        |
| Total       | 173                               | 253  | 426        | 336                         | 8    | 344        | 6                                | 253  | 259        | 1029       |
| 17:00       | 46                                | 63   | 109        | 94                          | 1    | 95         | 3                                | 75   | 78         | 282        |
| 17:15       | 41                                | 84   | 125        | 114                         | 2    | 116        | 2                                | 63   | 65         | 306        |
| 17:30       | 38                                | 75   | 113        | 118                         | 2    | 120        | 1                                | 83   | 84         | 317        |
| 17:45       | 55                                | 85   | 140        | 96                          | 0    | 96         | 2                                | 82   | 84         | 320        |
| Total       | 180                               | 307  | 487        | 422                         | 5    | 427        | 8                                | 303  | 311        | 1225       |
| 18:00       | 44                                | 53   | 97         | 101                         | 3    | 104        | 2                                | 80   | 82         | 283        |
| 18:15       | 40                                | 81   | 121        | 72                          | 2    | 74         | 2                                | 64   | 66         | 261        |
| 18:30       | 39                                | 68   | 107        | 96                          | 0    | 96         | 0                                | 58   | 58         | 261        |
| 18:45       | 40                                | 53   | 93         | 69                          | 0    | 69         | 0                                | 47   | 47         | 209        |
| Total       | 163                               | 255  | 418        | 338                         | 5    | 343        | 4                                | 249  | 253        | 1014       |
| Grand Total | 2382                              | 3001 | 5383       | 3058                        | 60   | 3118       | 71                               | 2104 | 2175       | 10676      |
| Apprch %    | 44.3                              | 55.7 |            | 98.1                        | 1.9  |            | 3.3                              | 96.7 |            |            |
| Total %     | 22.3                              | 28.1 | 50.4       | 28.6                        | 0.6  | 29.2       | 0.7                              | 19.7 | 20.4       |            |
| Cars +      | 2365                              | 2997 | 5362       | 3048                        | 60   | 3108       | 71                               | 2091 | 2162       | 10632      |
| % Cars +    | 99.3                              | 99.9 | 99.6       | 99.7                        | 100  | 99.7       | 100                              | 99.4 | 99.4       | 99.6       |
| Trucks      | 17                                | 4    | 21         | 10                          | 0    | 10         | 0                                | 13   | 13         | 44         |
| % Trucks    | 0.7                               | 0.1  | 0.4        | 0.3                         | 0    | 0.3        | 0                                | 0.6  | 0.6        | 0.4        |

# Burns Service Inc.

1202 Langdon Terrace Drive  
Indian Trail, NC, 28079

*We Count because YOU Count*

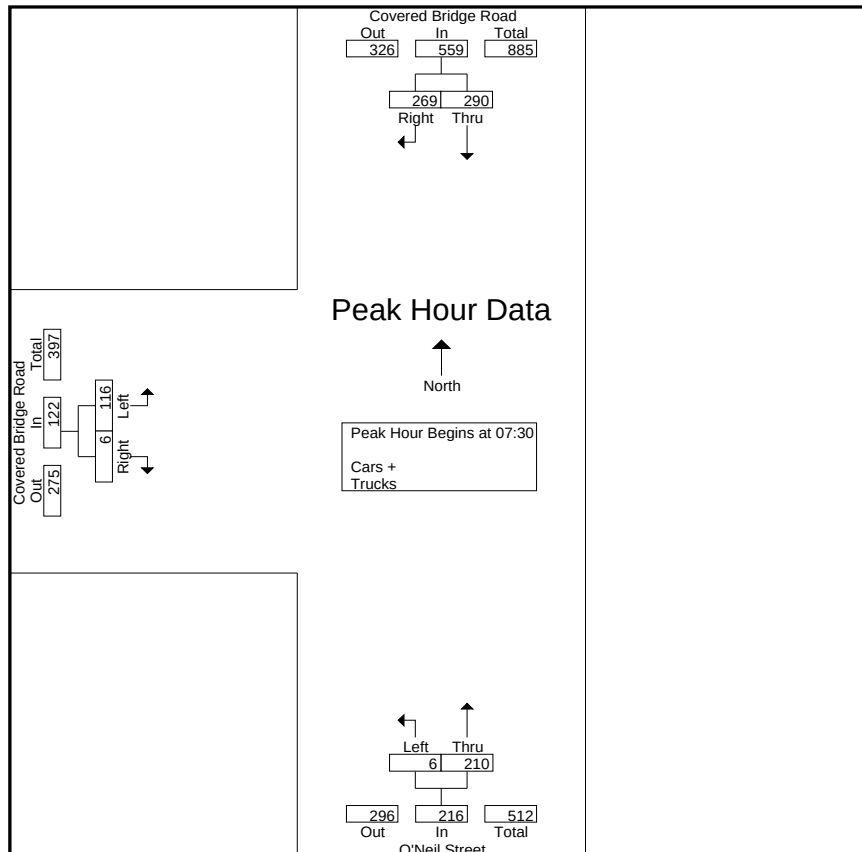
File Name : Clayton(Covered Bridge and O'Neal)

Site Code :

Start Date : 2/15/2018

Page No : 3

|                                                      | Covered Bridge Road<br>Southbound |      |            | O'Neil Street<br>Northbound |      |            | Covered Bridge Road<br>Eastbound |      |            |            |
|------------------------------------------------------|-----------------------------------|------|------------|-----------------------------|------|------------|----------------------------------|------|------------|------------|
| Start Time                                           | Right                             | Thru | App. Total | Thru                        | Left | App. Total | Right                            | Left | App. Total | Int. Total |
| Peak Hour Analysis From 06:30 to 08:45 - Peak 1 of 1 |                                   |      |            |                             |      |            |                                  |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:30    |                                   |      |            |                             |      |            |                                  |      |            |            |
| 07:30                                                | 77                                | 68   | 145        | 80                          | 4    | 84         | 2                                | 36   | 38         | 267        |
| 07:45                                                | 77                                | 82   | 159        | 67                          | 1    | 68         | 1                                | 39   | 40         | 267        |
| 08:00                                                | 69                                | 78   | 147        | 30                          | 1    | 31         | 2                                | 21   | 23         | 201        |
| 08:15                                                | 46                                | 62   | 108        | 33                          | 0    | 33         | 1                                | 20   | 21         | 162        |
| Total Volume                                         | 269                               | 290  | 559        | 210                         | 6    | 216        | 6                                | 116  | 122        | 897        |
| % App. Total                                         | 48.1                              | 51.9 |            | 97.2                        | 2.8  |            | 4.9                              | 95.1 |            |            |
| PHF                                                  | .873                              | .884 | .879       | .656                        | .375 | .643       | .750                             | .744 | .763       | .840       |



# Burns Service Inc.

1202 Langdon Terrace Drive  
Indian Trail, NC, 28079

*We Count because YOU Count*

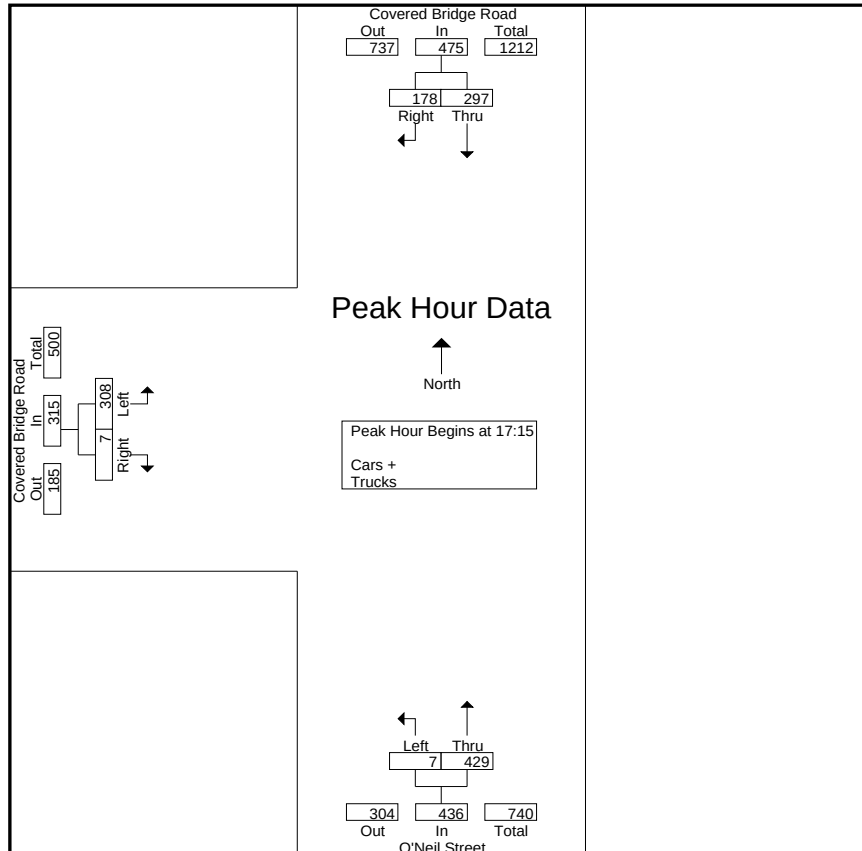
File Name : Clayton(Covered Bridge and O'Neal)

Site Code :

Start Date : 2/15/2018

Page No : 5

|                                                      | Covered Bridge Road<br>Southbound |      |            | O'Neil Street<br>Northbound |      |            | Covered Bridge Road<br>Eastbound |      |            |            |
|------------------------------------------------------|-----------------------------------|------|------------|-----------------------------|------|------------|----------------------------------|------|------------|------------|
| Start Time                                           | Right                             | Thru | App. Total | Thru                        | Left | App. Total | Right                            | Left | App. Total | Int. Total |
| Peak Hour Analysis From 16:00 to 18:45 - Peak 1 of 1 |                                   |      |            |                             |      |            |                                  |      |            |            |
| Peak Hour for Entire Intersection Begins at 17:15    |                                   |      |            |                             |      |            |                                  |      |            |            |
| 17:15                                                | 41                                | 84   | 125        | 114                         | 2    | 116        | 2                                | 63   | 65         | 306        |
| 17:30                                                | 38                                | 75   | 113        | 118                         | 2    | 120        | 1                                | 83   | 84         | 317        |
| 17:45                                                | 55                                | 85   | 140        | 96                          | 0    | 96         | 2                                | 82   | 84         | 320        |
| 18:00                                                | 44                                | 53   | 97         | 101                         | 3    | 104        | 2                                | 80   | 82         | 283        |
| Total Volume                                         | 178                               | 297  | 475        | 429                         | 7    | 436        | 7                                | 308  | 315        | 1226       |
| % App. Total                                         | 37.5                              | 62.5 |            | 98.4                        | 1.6  |            | 2.2                              | 97.8 |            |            |
| PHF                                                  | .809                              | .874 | .848       | .909                        | .583 | .908       | .875                             | .928 | .938       | .958       |

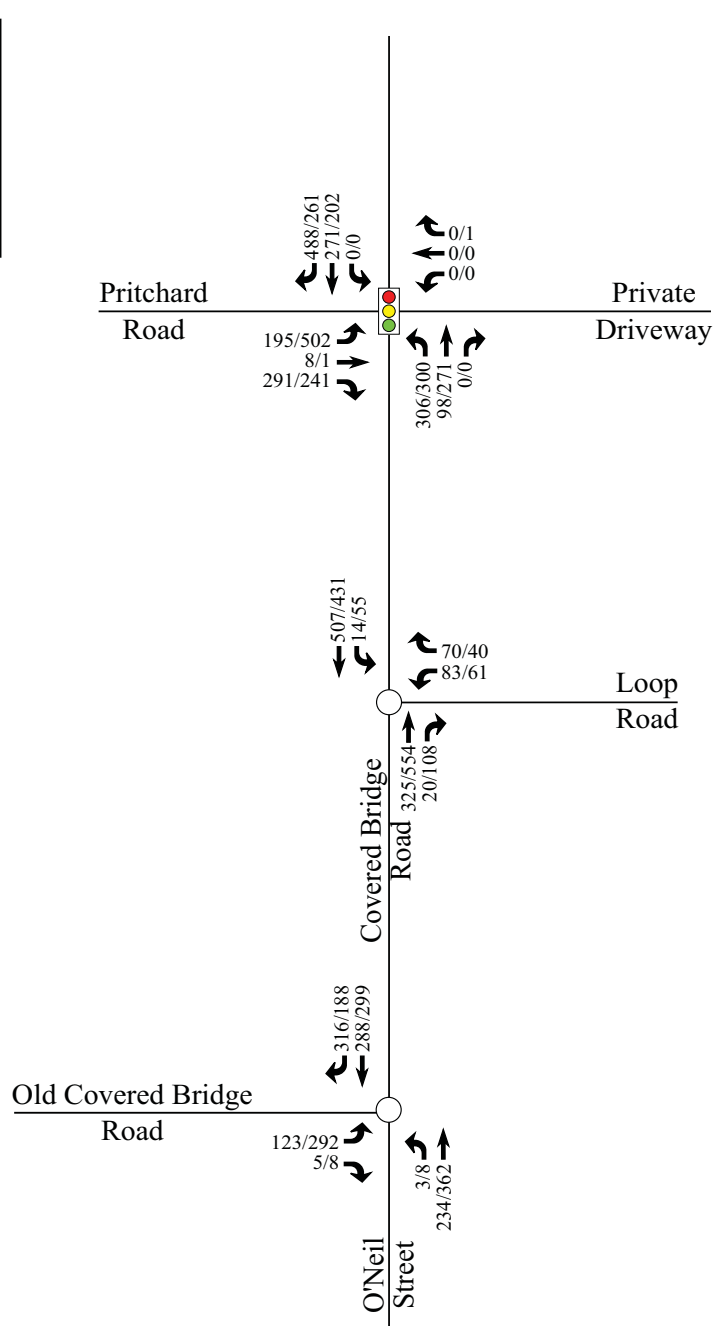


**LEGEND**

○ Unsignalized Intersection

◫ Signalized Intersection

X / Y → AM / PM Peak Hour Traffic



|  |                                                               |                                   |          |
|--|---------------------------------------------------------------|-----------------------------------|----------|
|  | <b>Walton Acres at Riverwood Athletic Club</b><br>Clayton, NC | Existing (2017) Peak Hour Traffic |          |
|  |                                                               | Scale: Not to Scale               | Figure 4 |

**Appendix C:**  
**Ashcroft Phase 1 (Atwood Drive)**  
**Volume Development**

**Ashcroft Phase 2**

**Table A - Existing Atwood Drive Trip Generation**

| Land Use                           | Intensity | Daily | AM Peak Hour |    |     | PM Peak Hour |    |     |
|------------------------------------|-----------|-------|--------------|----|-----|--------------|----|-----|
|                                    |           | Total | Total        | In | Out | Total        | In | Out |
| 210 Single Family Detached Housing | 150 d.u.  | 1,510 | 111          | 28 | 83  | 150          | 95 | 55  |

K:\RAL\_TPTO\_Traffic\014163000 Ashcroft Phase 2\T4 - Analysis\[Ashcroft Phase 2 - TIADData.xls]AshcroftPh1(Atwood)-TripGen

7/30/20



**Appendix D:**  
**Approved Development Data**

# **TRAFFIC IMPACT ANALYSIS**

**FOR**

**Barbour Tract**

**LOCATED**

**IN**

**Clayton, North Carolina**

Prepared For:  
Adams & Hodge Engineering, PC  
314 E. Main Street  
Clayton, NC 27520

Prepared By:  
Ramey Kemp & Associates, Inc.  
5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
License #C-0910

November 2018

RKA Project No. 18395



Prepared By: NAB

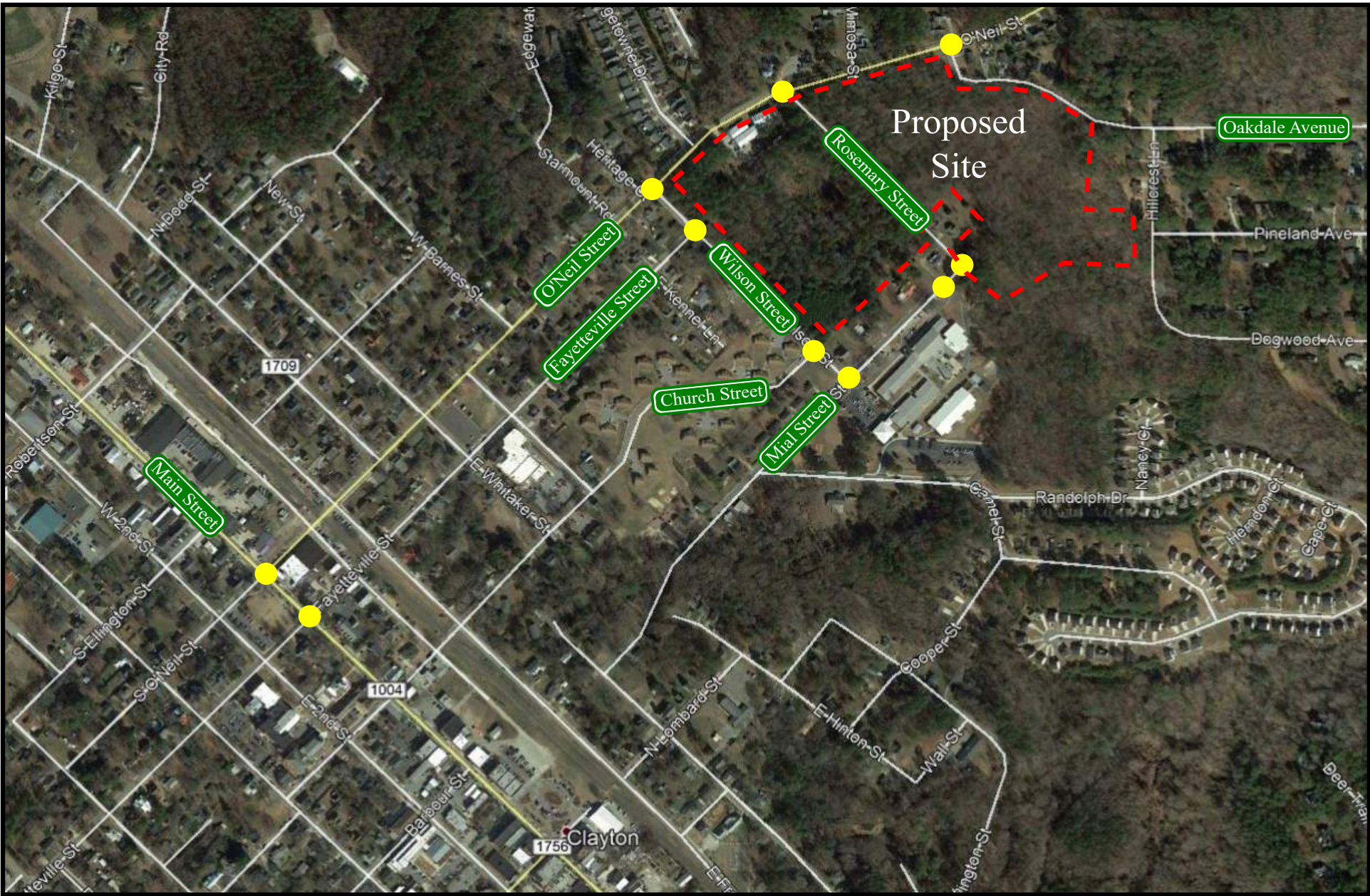
Reviewed By: JTR





**LEGEND**

- Proposed Site Location
- Study Area
- Study Intersection



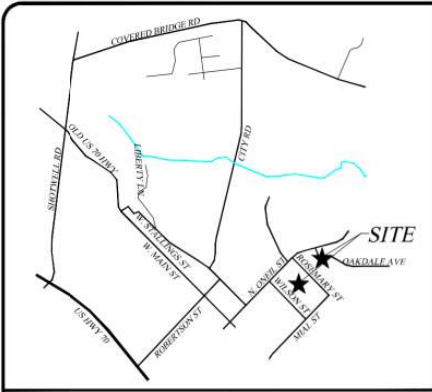
Barbour Tract Residential  
Clayton, NC

Site Location Map

Scale: Not to Scale

Figure 1

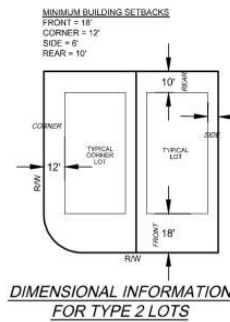
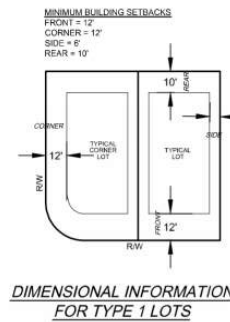




SITE VICINITY MAP  
NOT TO SCALE

PLANNED DEVELOPMENT RESIDENTIAL  
PROPOSED / PERMITTED USES:  
APARTMENTS  
TOWNHOUSE  
SINGLE FAMILY HOUSE

| LEGEND |                                                    |
|--------|----------------------------------------------------|
|        | TYPE 1 HOUSING (ALLEY LOADED) (88 UNITS)           |
|        | TYPE 2 HOUSING (20 UNITS)                          |
|        | TOWNHOMES (TRIPLIX UNITS) (12 UNITS)               |
|        | APARTMENTS (42 - 2 BDRM UNITS & 84 - 1 BDRM UNITS) |
|        | RESOURCE CONSERVATION AREA                         |
|        | WATERSHED OVERLAY DISTRICT                         |
|        | 10' GREENWAY ASPHALT TRAIL                         |



| THE VILLAGE AT PARKVIEW PH 9-16 SITE DATA CHART        |                                                                                                    |                                                   |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------|
| PARCEL OWNER                                           | SAM'S BRANCH II, LLC                                                                               | JOHN BARBOUR                                      |
| PARCEL OWNER ADDRESS                                   | 114 W. MAIN ST, SUITE 102 CLAYTON, NC 27520                                                        | 8013 OLD STAGE RD RALEIGH, NC 27603               |
| PARCEL IDENTIFICATION                                  | 166913-24-0827, 166914-34-7661, 166914-34-7560, 166914-34-7451 & 166914-34-7371                    | 166914-24-5585                                    |
| PROPERTY SIZE (SF)                                     | 2.75 ACS / 119,790 SF                                                                              | 20.27 ACS / 882,982 SF                            |
| PARCEL OWNER                                           | JAMES & RUTH HARRIS                                                                                | Johnston Co. Board of Education                   |
| PARCEL OWNER ADDRESS                                   | 837 BROADHURST RD, SEVEN SPRINGS, NC 78578                                                         | PO BOX 1336, SMITHFIELD, NC 27577                 |
| PARCEL IDENTIFICATION                                  | 166914-24-8945 & 166914-24-9850                                                                    | 166914-34-2175                                    |
| PROPERTY SIZE (SF)                                     | 2.28 ACS / 99,421.24 SF                                                                            | 6.71 AC / 292,163 SF                              |
| PARCEL OWNER                                           | BLONDELL JOHNSON                                                                                   | HARVEY & MILDRED GORDON                           |
| PARCEL OWNER ADDRESS                                   | 706 FERNWOOD DR, CLAYTON, NC 27520                                                                 | 133 PLANTATION CIR S, PONTE VEDRA BEACH, FL 32082 |
| PARCEL IDENTIFICATION                                  | 166913-14-9727                                                                                     | 166909-25-2086                                    |
| PROPERTY SIZE (SF)                                     | 0.36 ACS / 15,057.70 SF                                                                            | 1.17 ACS / 50,817.28 SF                           |
| PARCEL OWNER                                           | ROY & LOIS BARBOUR                                                                                 |                                                   |
| PARCEL OWNER ADDRESS                                   | 124 BOBBITT RD, CLAYTON, NC 27520                                                                  |                                                   |
| PARCEL IDENTIFICATION                                  | 166909-25-2086                                                                                     |                                                   |
| PROPERTY SIZE (SF)                                     | 0.17 ACS / 7,346.85                                                                                |                                                   |
| PROPERTY SIZE (SF) TOTAL                               | 33.71 ACS / 1,468,407.6 SF                                                                         |                                                   |
| PROPERTY LOCATION                                      | TOWN OF CLAYTON/CLAYTON TOWNSHIP                                                                   |                                                   |
| EXISTING/PROPOSED ZONING                               | R-8/PO-R                                                                                           |                                                   |
| EXISTING USE                                           | LIMITED COMMERCIAL ON O'NEIL ST & UNDEVELOPED RESIDENTIAL AND/OR SCHOOL PROPERTY                   |                                                   |
| PROPOSED USE                                           | SINGLE FAMILY RESIDENTIAL, MULTI-FAMILY RESIDENTIAL, RECREATION OPEN SPACE & RESOURCE CONSERVATION |                                                   |
| PROPOSED INTENSITY (GROSS FLOOR AREA IN SF)            | APARTMENTS 0.77 ACS / 33,698 SF TOWNHOMES 0.43 ACS / 18,792 SF SINGLE FAMILY 3.37 ACS / 147,010 SF |                                                   |
| PROPOSED NUMBER OF HOUSING UNITS                       | 118 SINGLE FAMILY HOMES, 12 TOWNHOMES & 126 APARTMENT UNITS (42-2 BDRM UNITS & 84-1 BDRM UNITS)    |                                                   |
| PROPOSED DENSITY (BASED ON BUILDABLE LAND OF 21.57 AC) | 256 UNITS / 21.57 ACS = 11.87 UNITS PER AC (12 UNITS)                                              |                                                   |
| PROPOSED IMPERVIOUS AREA (% OF TOTAL SITE)             | 46%                                                                                                |                                                   |
| PROPOSED IMPERVIOUS AREA PER LOT                       | 75%                                                                                                |                                                   |
| TOTAL RESOURCE CONSERVATION AREA                       | 4.73 ACS / 206,038.8 SF                                                                            |                                                   |
| PROPOSED BUILDING HEIGHT (NUMBER OF STORIES & FEET)    | APARTMENTS 3 STORIES / 44'-6" , TOWNHOMES 1 & 2 STORY / 28'-8"                                     |                                                   |
| ELECTRIC PROVIDER                                      | TOWN OF CLAYTON                                                                                    |                                                   |
| WATER PROVIDER                                         | TOWN OF CLAYTON                                                                                    |                                                   |
| SEWER PROVIDER                                         | TOWN OF CLAYTON                                                                                    |                                                   |

| PARKING CALCULATIONS                              |                        |                        |                                                |                        |
|---------------------------------------------------|------------------------|------------------------|------------------------------------------------|------------------------|
|                                                   | NUMBER OF 1 BDRM UNITS | NUMBER OF 2 BDRM UNITS | PARKING SPACE REQUIREMENTS                     | TOTAL NUMBER OF SPACES |
| PHASES 9-13                                       | 36                     | 18                     | 2 SPACES/ 2 BDRM UNIT<br>1 SPACE / 1 BDRM UNIT | 72                     |
| GUEST PARKING PHASES 1-8                          |                        |                        | 1 SPACE/4 UNITS                                | 14                     |
| REQUIRED ADA PARKING SPACES PHASES 1-8            |                        |                        | 1 SPACE/25 SPACES                              | 4                      |
| TOTAL REQUIRED SPACES INCLUDING ADA               |                        |                        |                                                | 86                     |
| TOTAL PROPOSED SPACES                             |                        |                        |                                                | 87                     |
| REQUIRED BICYCLE PARKING PHASES 9-13              | 6 BLDGS                |                        | 1 RACK/BLDG                                    | 6                      |
| TOTAL PROPOSED SPACES PHASES 17-18, 22-23 & 26-29 | 48                     | 24                     | 2 SPACES/ 2 BDRM UNIT<br>1 SPACE / 1 BDRM UNIT | 96                     |
| GUEST PARKING PHASES 9-16                         |                        |                        | 1 SPACE/4 UNITS                                | 18                     |
| REQUIRED ADA PARKING SPACES PHASES 9-16           |                        |                        | 1 SPACE/25 SPACES                              | 5                      |
| TOTAL REQUIRED SPACES INCLUDING ADA               |                        |                        |                                                | 114                    |
| TOTAL PROPOSED SPACES                             |                        |                        |                                                | 122                    |
| REQUIRED BICYCLE PARKING PHASES 9-13              | 8 BLDGS                |                        | 1 RACK/BLDG                                    | 8                      |
| ALL PHASES TOTAL REQUIRED SPACES                  |                        |                        |                                                | 200                    |
| ALL PHASES TOTAL PROPOSED SPACES                  |                        |                        |                                                | 209                    |

\* NOTE: PARKING CALCULATIONS ARE BASED ON SECTION 155.401, TABLE 4-2 OF THE TOWN OF CLAYTON UNIFIED DEVELOPMENT CODE

| IMPERVIOUS AREA CALCULATIONS*  |                          |                 |                               |                   |
|--------------------------------|--------------------------|-----------------|-------------------------------|-------------------|
|                                | TOTAL AREA (SQUARE FEET) | % OF TOTAL SITE | IMPERVIOUS AREA (SQUARE FEET) | % IMPERVIOUS AREA |
| RESIDENTIAL LOTS               | 692,604                  | 4.75%           | 504,037                       | 72.77%            |
| RIGHT-OF-WAYS**                | 172,498                  | 11.75%          | 128,502                       | 74.49%            |
| RESOURCE CONSERVATION AREAS*** | 206,039                  | 14.03%          | 0                             | 0.00%             |
| TOTAL OPEN SPACE****           | 322,780                  | 21.98%          | 38,713                        | 11.99%            |
| LANDSCAPING BUFFERS            | 24,350                   | 1.66%           | 200                           | 0.82%             |
| TOTAL AREA                     | 1,418,270                | 54.17%          | 671,452                       | 47.34%            |

\*NOTE: AREAS AND CALCULATIONS SHOWN ARE APPROXIMATE AS THIS IS A MASTER PLAN. ACTUAL ACREAGE WILL BE DETERMINED DURING THE MINOR SUBDIVISION/MINOR SITE PLAN APPLICATION SUBMITTAL PROCESS

\*\*NOTE: RIGHTS-OF-WAY INCLUDES STREETS AND SIDEWALKS

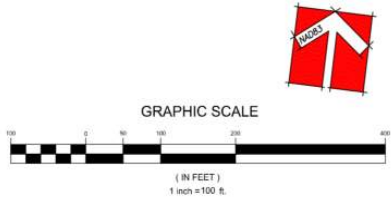
\*\*\*NOTE: RESOURCE CONSERVATION AREAS INCLUDE RIPARIAN BUFFER AREAS, OPEN WATER BODIES AND 100 YEAR FLOOD PLAIN

\*\*\*\*NOTE: OPEN SPACE INCLUDES CLUBHOUSE, AMENITIES, GREENWAYS, INTERNAL SIDEWALKS, FEATURES IN PARKS PARKS, ACTIVE AND PASSIVE SPACES, ETC.

| OPEN SPACE TABLE                                                  |       |
|-------------------------------------------------------------------|-------|
|                                                                   | ACRES |
| NET USEABLE LAND                                                  | 28.98 |
| REQUIRED OPEN SPACE (12.5%)                                       | 3.62  |
| OPEN SPACE PROVIDED                                               | 7.41  |
| IMPROVED RECREATION / OPEN SPACE (REQ'D 25% OF TOTAL OPEN SPACE)  | 1.85  |
| IMPROVED RECREATION/OPEN SPACE PROVIDED (INCLUDES GREENWAY TRAIL) | 3.13  |

\*NOTE: ACREAGE SHOWN IS APPROXIMATE AS THIS IS A MASTER PLAN. ACTUAL ACREAGE WILL BE DETERMINED DURING THE MINOR SUBDIVISION/MINOR SITE PLAN APPLICATION SUBMITTAL PROCESS

NOTE: PER TOWN OF CLAYTON DEVELOPMENT STANDARDS, GREENWAYS MUST HAVE A MINIMUM OF 2'-3" OF CLEARED, GRADED GRASS ON EACH SIDE. THIS AREA DOES NOT COUNT TOWARD ACTIVE RECREATION AREA AND IS NOT IN THE CALCULATIONS ABOVE. IN ACTUALITY, GREENWAYS ARE AN ACTIVE RECREATION LAND USE.



314 EAST MAIN STREET  
CLAYTON, NC 27520  
domie@adamsandhodge.com  
919.755.1111  
FIRM # C-4187

**ADAMS & HODGE**  
ENGINEERING, PC

BARBOUR TRACT  
TOWN OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

MASTER PLAN

DESIGN: DCA/PCE  
DRAWN: ADG  
CHECKED: DCA  
HORIZONTAL SCALE: 1" = 100' (SEE GRAPHIC SCALE)  
VERTICAL SCALE: 1" = 10'  
DATE: 11/25/2018  
JOB NO.: AH-  
SHEET: SD02

#### 4. SITE TRIP GENERATION AND DISTRIBUTION

##### 4.1. Trip Generation

The proposed residential development will consist of approximately 121 single family homes, 15 tri-plex units, and 135 apartment units. For trip generation purposes the tri-plex and apartment land uses were all calculated as multifamily housing. Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the *ITE Trip Generation Manual*, 10th Edition. Refer to Table 2 for a summary of the trip generation potential for the proposed development.

**Table 2: Trip Generation Summary**

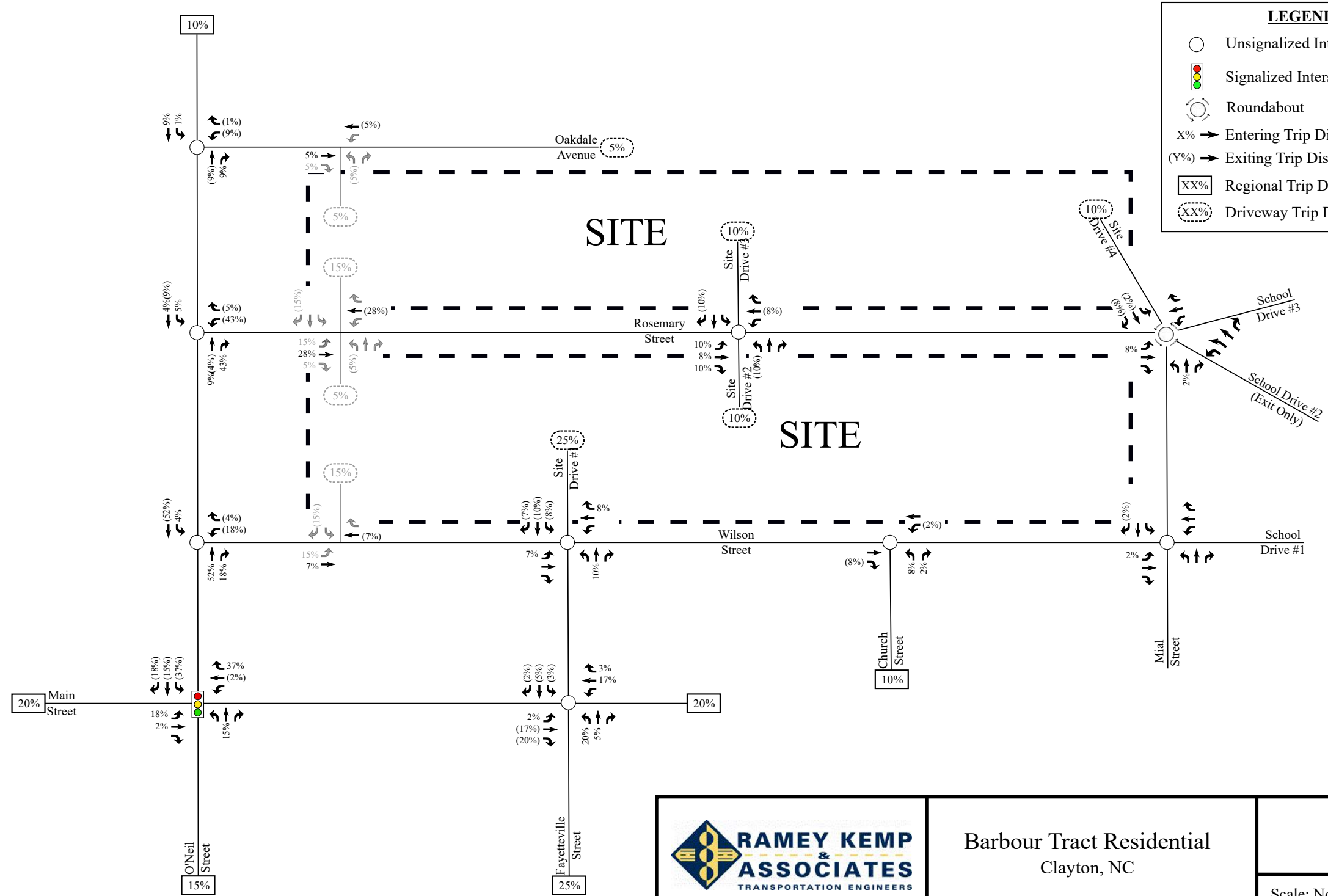
| Land Use<br>(ITE Code)                     | Intensity | Daily<br>Traffic<br>(vpd) | AM Peak Hour Trips<br>(vph) |            |            | PM Peak Hour Trips<br>(vph) |           |            |
|--------------------------------------------|-----------|---------------------------|-----------------------------|------------|------------|-----------------------------|-----------|------------|
|                                            |           |                           | Enter                       | Exit       | Total      | Enter                       | Exit      | Total      |
| Single Family<br>Detached Housing<br>(210) | 121 Units | 1,240                     | 23                          | 68         | <b>91</b>  | 77                          | 45        | <b>122</b> |
| Multifamily<br>(220)                       | 150 Units | 1,100                     | 16                          | 54         | <b>70</b>  | 53                          | 32        | <b>85</b>  |
| <b>Total Site Trips</b>                    |           | <b>2,340</b>              | <b>39</b>                   | <b>122</b> | <b>161</b> | <b>130</b>                  | <b>77</b> | <b>207</b> |

It is estimated that full build-out of the site will generate approximately 2,340 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 161 trips (39 entering and 122 exiting) will occur during the AM peak hour and 207 trips (130 entering and 77 exiting) will occur during the PM peak hour.

##### 4.2. Site Trip Distribution and Assignment

Trip distribution percentages used in assigning site traffic for this development were estimated based on a combination of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. This trip distribution was reviewed and approved by NCDOT in the scoping checklist. It should be noted that due to recent changes to the site plan, the distributions at the intersection of Fayetteville Street and Wilson Street and Church Street and Wilson Street were modified based on modifications to the driveway access. This does not







**RAMEY KEMP & ASSOCIATES**

TRANSPORTATION ENGINEERS

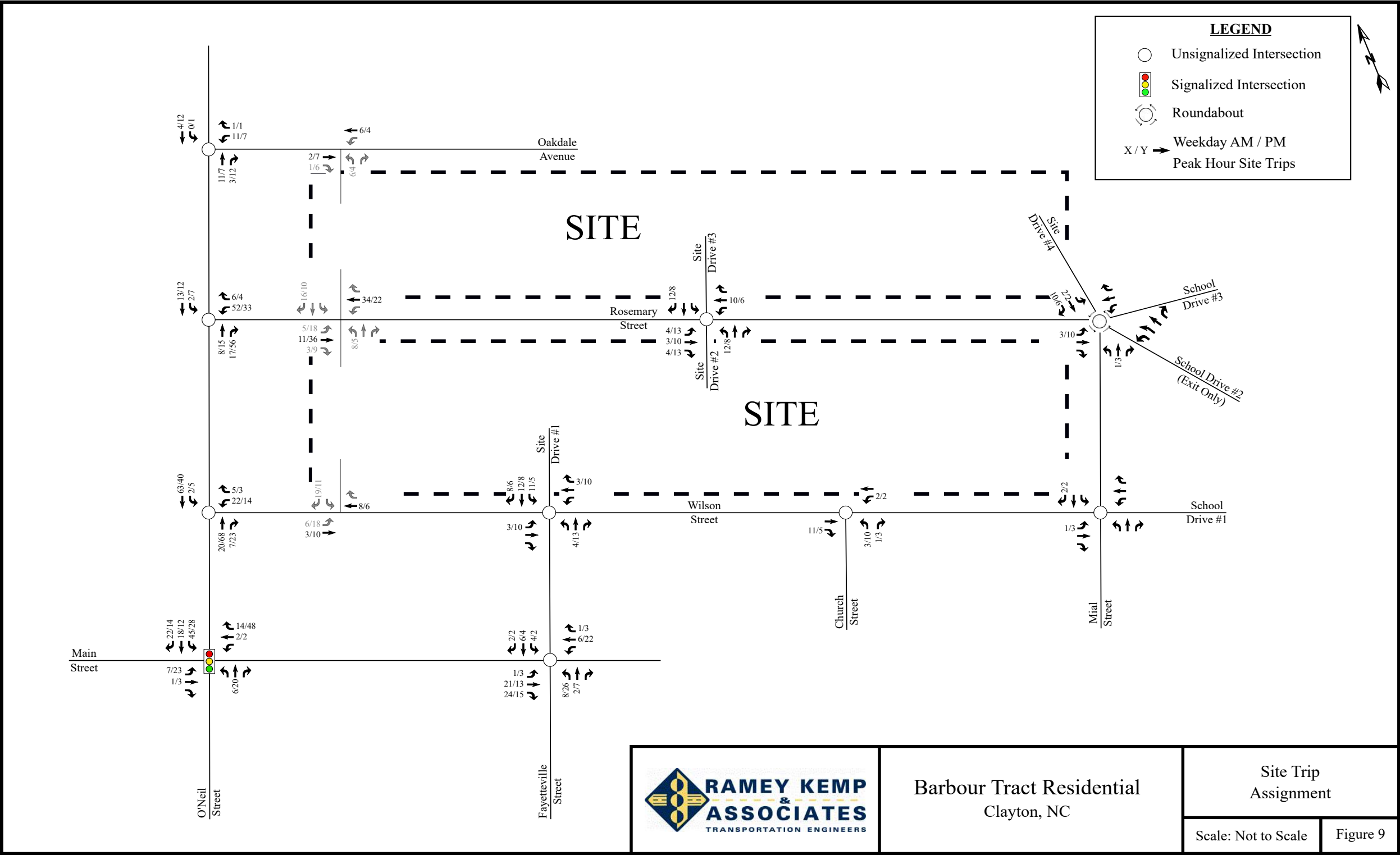
**Barbour Tract Residential**

Clayton, NC

**Site Trip Distribution**

Scale: Not to Scale

Figure 8







STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

JAMES H. TROGDON, III  
SECRETARY

**DELIVERY VIA EMAIL**

January 8, 2019

Samantha L. Wullenwaber, MPA  
Planning Director - Town of Clayton  
PO Box 879  
Clayton, NC 27528

COUNTY: Johnston

SUBJECT: **TIA Review of Barbour Tract on O'Neil Street (SR 1708) and Rosemary Street**

Dear Ms. Wullenwaber,

Highway Division Four (Division) has reviewed the Traffic Impact Analysis (TIA) for the subject development and offers the following comments. These comments are in addition to any requirements that are included in the attached Traffic Impact Analysis Review Report performed by the Congestion Management Section of the Transportation Mobility and Safety Division of NCDOT. All requirements or recommendations included herein are based off current Department policies. This review should not be mistaken for approval of the driveway permit, design/construction plans, or final plat. A driveway permit must be obtained prior to construction. All design aspects of any submitted plans shall comply with current NCDOT Standard Specifications for Roads and Structures and Policy on Street and Driveway Access to North Carolina Highways.

***GENERAL COMMENTS***

- Lane Closures for required improvement construction will only be permitted under restricted hours due to heavy traffic volumes in the vicinity of the proposed development. These restrictions will be determined during the driveway permitting application and approval

***RIGHT-OF-WAY DEDICATION & RESERVATION***

- ROW dedications, typically 15 ft., for installation of right turn lanes to access driveways where identified necessary herein shall be provided

Mailing Address:  
NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS | DIV. 4 DIST 3  
2671 US 70 WEST  
GOLDSBORO, NC 27530

Telephone: (919) 739-5300  
Fax: (919) 731-2017  
Customer Service: 1-877-368-4968  
Website: [www.ncdot.gov](http://www.ncdot.gov)

Location:  
2671 US 70 WEST  
GOLDSBORO, NC 26730

### ***INTERSECTIONS / SITE ACCESSES AND ASSOCIATED IMPROVEMENTS***

The following comments are in addition to individual intersection improvements recommended by the TIA and TIA Review Report and are considered necessary for consistency with local District and Division policy. If an intersection is not listed herein, then the Division concurs with the TIA Review Report recommendations.

#### **SR 1708 and Main Street (SR 1004) Intersection**

- CMU recommended Westbound right turn lane will not be required at this location due to constructability concerns.

#### **SR 1004 and N Fayetteville Street Intersection**

- A new traffic signal at this location may be required if signal warrants are met after the build out of project. A signal warrant study will be required to release the bond for this improvement.

#### **SR 1708 and Wilson Street Intersection**

- Provide a three lane section between Wilson Street and Georgetowne Dr. Design speed of the tapers should be widened to 40 mph for this turn lane.

#### **SR 1708 and Rosemary Street Intersection**

- Provide a Southbound left turn lane with 100' of storage and appropriate tapers. Design speed of the tapers should be 40 mph for this turn lane. If the tapers overlap with the Wilson Street tapers, then a three lane section will be required between both roads.
- Provide a Westbound three lane section with 50' of storage for both left and right egress.

Any roadway improvements and right-of-way dedication necessary to accommodate the road construction shall be the responsibility of the owner/developers. These conditions are based on current traffic volumes and projected growth for the study area. Should the timelines presented for project build-out dates not be met and traffic conditions change due to growth in adjacent areas, these recommendations may not be applicable. Feel free to contact me if you have any additional questions or concerns.

Sincerely,



Sam Lawhorn, PE  
District Engineer

cc: Ronnie Keeter, PE - Division Engineer  
Andy Brown, PE - Division Traffic Engineer  
Jim Dunlop, P.E. - Congestion Management Engineer  
P. Haywood Daughtry III, PE, CPM - Eastern Regional Field Operations Engineer  
Nate Bouquin, EI - Ramey Kemp and Associates  
Amy Stancil - Adams & Hodge Engineering

# **TRAFFIC IMPACT ANALYSIS**

**FOR**

## **STEEPLECHASE**

**LOCATED**

**IN**

## **CLAYTON, NORTH CAROLINA**

Prepared For:  
Shenandoah Homes, LLC  
2840 Plaza Place, Ste. 200  
Raleigh, NC 27612

Prepared By:  
Ramey Kemp & Associates, Inc.  
5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
License #C-0910

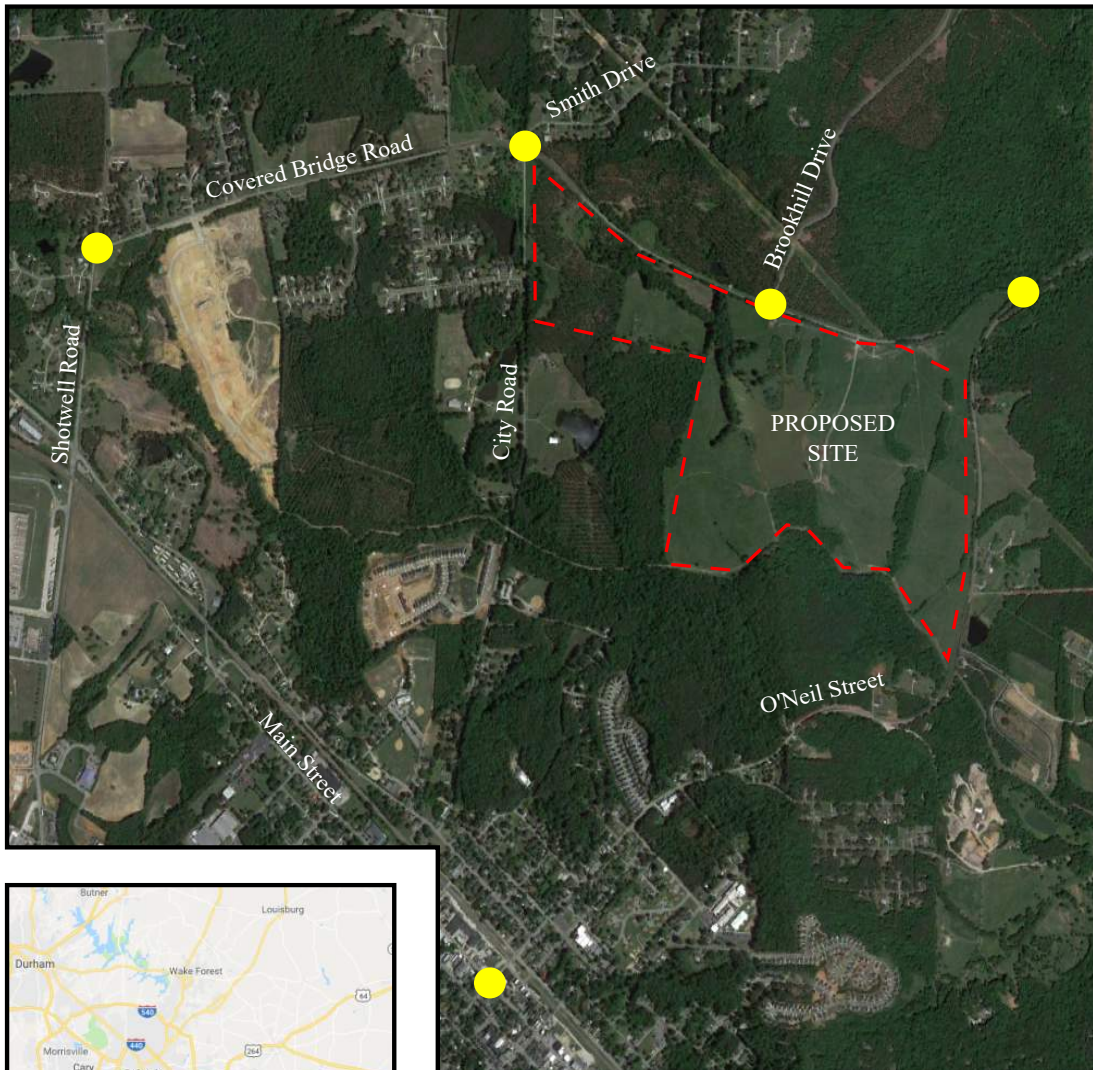
March 2018



RKA Project No. 17173

Prepared By: MPK

Reviewed By: JMM



### LEGEND

- Proposed Site Location
- Study Intersection
- Study Area



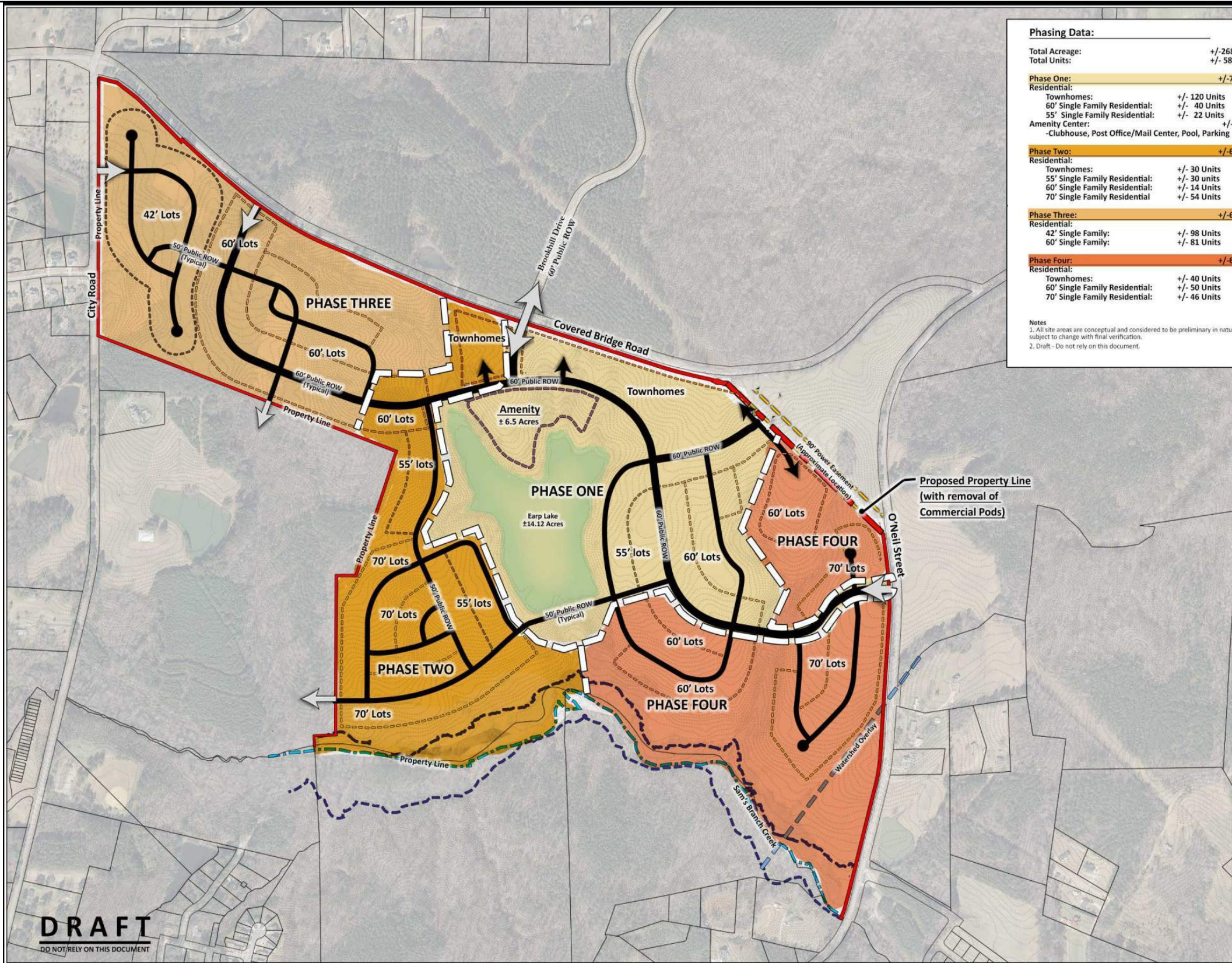
Steeplechase  
Clayton, NC

Site Location Map

Scale: Not to Scale

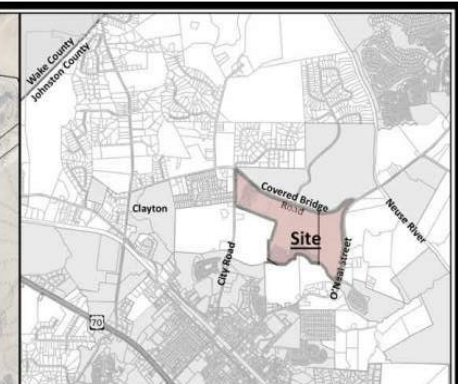
Figure 1





|                                                    |                  |
|----------------------------------------------------|------------------|
| <b>Phasing Data:</b>                               |                  |
| Total Acreage:                                     | +/- 268.01 Acres |
| Total Units:                                       | +/- 585 Units    |
| <b>Phase One: +/- 75.0 Acres</b>                   |                  |
| Residential:                                       |                  |
| Townhomes:                                         | +/- 120 Units    |
| 60' Single Family Residential:                     | +/- 40 Units     |
| 55' Single Family Residential:                     | +/- 22 Units     |
| Amenity Center:                                    | +/- 6.5 Acres    |
| -Clubhouse, Post Office/Mail Center, Pool, Parking |                  |
| <b>Phase Two: +/- 65.0 Acres</b>                   |                  |
| Residential:                                       |                  |
| Townhomes:                                         | +/- 30 Units     |
| 55' Single Family Residential:                     | +/- 30 units     |
| 60' Single Family Residential:                     | +/- 14 Units     |
| 70' Single Family Residential:                     | +/- 54 Units     |
| <b>Phase Three: +/- 61.0 Acres</b>                 |                  |
| Residential:                                       |                  |
| 42' Single Family:                                 | +/- 98 Units     |
| 60' Single Family:                                 | +/- 81 Units     |
| <b>Phase Four: +/- 67.0 Acres</b>                  |                  |
| Residential:                                       |                  |
| Townhomes:                                         | +/- 40 Units     |
| 60' Single Family Residential:                     | +/- 50 Units     |
| 70' Single Family Residential:                     | +/- 46 Units     |

**Notes**  
1. All site areas are conceptual and considered to be preliminary in nature. Layout subject to change with final verification.  
2. Draft - Do not rely on this document.



**Vicinity Map**  
Not To Scale

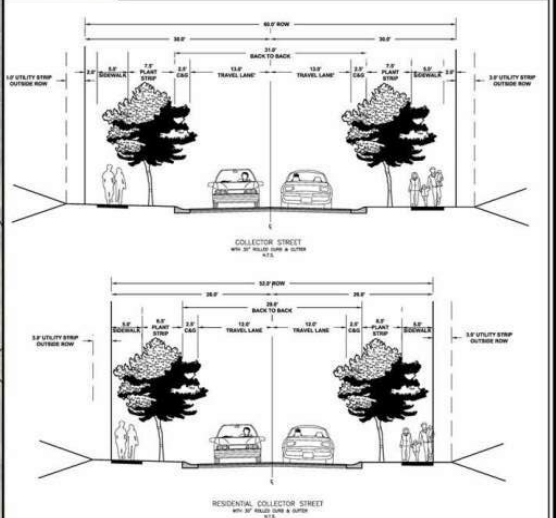
|                        |                      |
|------------------------|----------------------|
| <b>Site Data:</b>      |                      |
| Tax Parcels:           | 166900395182         |
| Total Acreage:         | ± 268.01 Acres       |
| Residential Acreage:   | ± 268.01 Acres       |
| Location:              | Clayton, NC          |
| Zoning:                |                      |
| Existing:              | R-10 (10,000SF)      |
| Proposed:              | PDD-Mixed Use        |
| Open Space:            |                      |
| Required:              | ± 33.5 Acres (12.5%) |
| Proposed:              | ± 33.5 Acres (12.5%) |
| Proposed Amenity Area: | ± 6.5 Acres          |

**General Notes**  
1. Base information provided by Johnston County GIS Data and should be verified for accuracy.  
2. All site plan, zoning, and wetland information utilized in the preparation of this plan is considered to be preliminary in nature and subject to change and final verification.  
3. Draft - Do not rely on this document.

**Floodplain Information**  
Floodplain information obtained from FEMA FIRMS Panels 37201760001 and 37201660001 effective date of study 12/02/2005 and Johnston County GIS.

**Stream/Wetland Information**  
Stream/Wetland information is based on preliminary information provided to ESP by Johnston County GIS data and Spangler Engineering GPS locations. For purposes of preparation of this Preliminary Concept Plan, any potential wetland areas and stream features depicted on the plan are considered to be preliminary in nature and approximate in location. The Preliminary Concept Plan will need to be revised once all agencies approved on-site wetland/stream and appropriate jurisdictional boundaries are surveyed and verified with acceptable levels of accuracy- unit loss may occur.

**Public Information**  
ESP Associates is not responsible for plan deficiencies created by incorrect, incomplete, missing or outdated information derived from public sources such as GIS, Planning and Zoning departments.





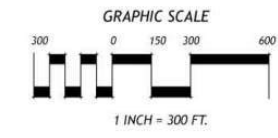
**ESP Associates, P.A.**  
P.O. Box 7030    2200 Gateway Center Blvd.  
Charlotte, NC 28241    Suite 216  
NC - 704.583.4949    Morrisville, NC 27560  
www.espassociates.com    NC - 910.678.1070



## Steeplechase Subdivision

### Preliminary Phasing Plan G

ESP Job # FR51.400    January 11, 2018





#### 4. SITE TRIP GENERATION AND DISTRIBUTION

##### 4.1. Trip Generation

The proposed development was analyzed in two (2) phases. Phase 1 is anticipated to be complete in 2020 and consist of 62 single-family detached homes and 120 townhomes. Full build-out of the proposed development is expected to be complete in 2026 and is expected to add the following land uses to those of Phase 1:

- 373 single-family detached homes
- 70 townhomes

Refer to Table 2A for a summary of the trip generation potential for Phase 1.

**Table 2A: Trip Generation Summary – Phase 1**

| Land Use<br>(ITE Code)                     | Intensity | Daily<br>Traffic<br>(vpd) | AM Peak Hour Trips<br>(vph) |           |            | PM Peak Hour Trips<br>(vph) |           |            |
|--------------------------------------------|-----------|---------------------------|-----------------------------|-----------|------------|-----------------------------|-----------|------------|
|                                            |           |                           | Enter                       | Exit      | Total      | Enter                       | Exit      | Total      |
| Single Family<br>Detached Housing<br>(210) | 62 Units  | 600                       | 12                          | 35        | 47         | 39                          | 23        | 62         |
| Townhouse<br>(230)                         | 120 Units | 700                       | 9                           | 44        | 53         | 42                          | 20        | 62         |
| <b>Total Site Trips</b>                    |           | <b>1,300</b>              | <b>21</b>                   | <b>79</b> | <b>100</b> | <b>81</b>                   | <b>43</b> | <b>124</b> |

It is estimated that Phase 1 of the proposed development will generate approximately 1,300 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 100 trips (21 entering and 79 exiting) will occur during the AM peak hour and 124 trips (81 entering and 43 exiting) will occur during the PM peak hour.

The full development is planned to consist of 435 single-family homes and 190 townhomes. Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 9th Edition. Refer to Table 2B for a summary of the trip generation potential for the site at full build-out.



**Table 2B: Trip Generation Summary – Full Build-Out**

| Land Use<br>(ITE Code)                     | Intensity | Daily<br>Traffic<br>(vpd) | AM Peak Hour Trips<br>(vph) |            |            | PM Peak Hour Trips<br>(vph) |            |            |
|--------------------------------------------|-----------|---------------------------|-----------------------------|------------|------------|-----------------------------|------------|------------|
|                                            |           |                           | Enter                       | Exit       | Total      | Enter                       | Exit       | Total      |
| Single Family<br>Detached Housing<br>(210) | 435 Units | 4,100                     | 81                          | 245        | 326        | 274                         | 161        | 435        |
| Townhouse<br>(230)                         | 190 Units | 1,100                     | 14                          | 70         | 84         | 66                          | 33         | 99         |
| <b>Total Site Trips</b>                    |           | <b>5,200</b>              | <b>95</b>                   | <b>315</b> | <b>410</b> | <b>340</b>                  | <b>194</b> | <b>534</b> |

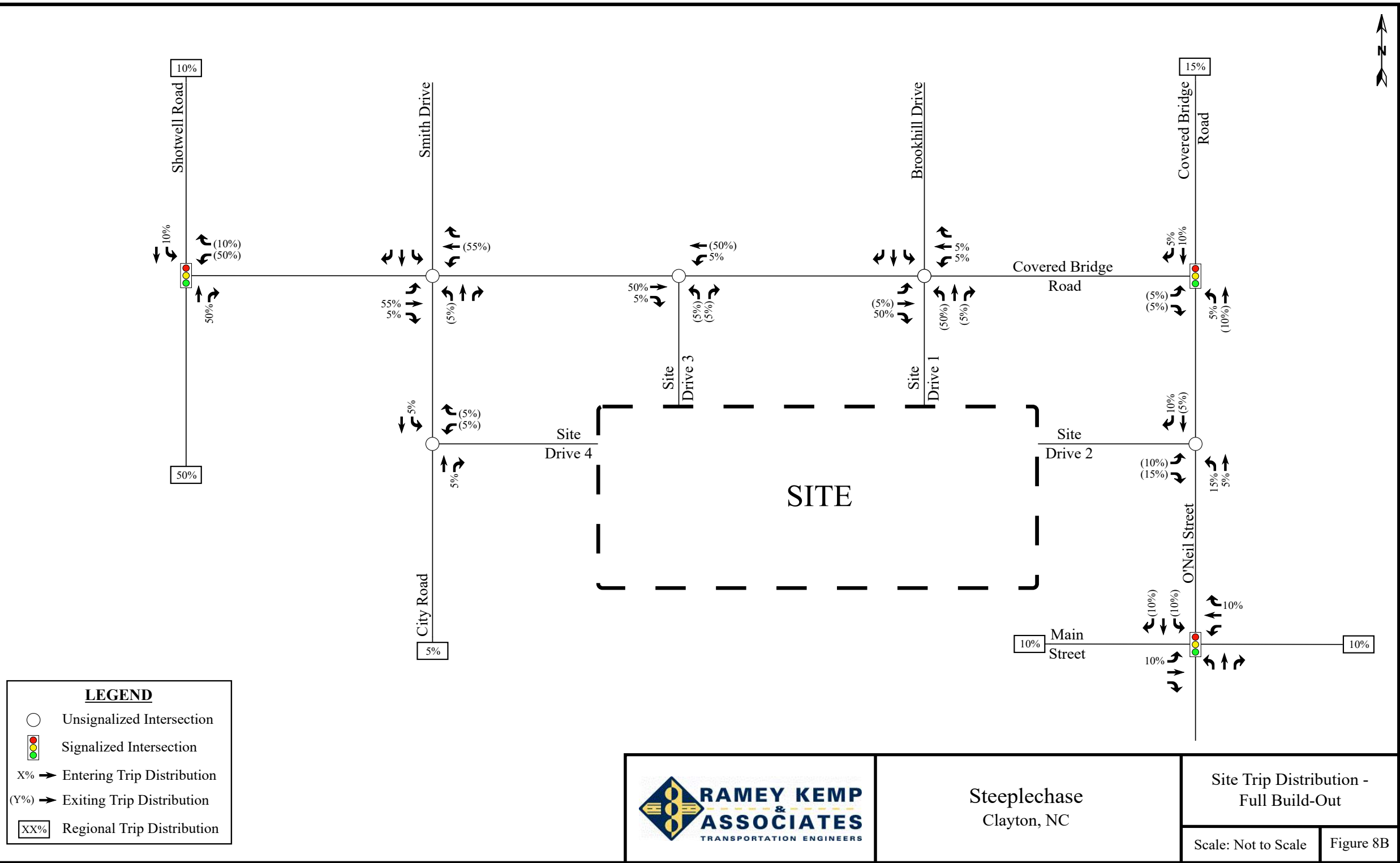
It is estimated that full build-out of the site will generate approximately 5,200 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 410 trips (95 entering and 315 exiting) will occur during the AM peak hour and 534 trips (340 entering and 194 exiting) will occur during the PM peak hour.

#### **4.2. Site Trip Distribution and Assignment**

Trip distribution percentages used in assigning site traffic for this development were estimated based on a combination of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. It is estimated that trips generated by the proposed development will be distributed as follows:

- 10% to/from the east via Main Street
- 10% to/from the west via Main Street
- 15% to/from the north via Covered Bridge Road
- 50% to/from the south via Shotwell Road
- 10% to/from the north via Shotwell Road
- 5% to/from the south via City Road

The site trip distribution is shown in Figures 8A and 8B for Phase 1 and full build-out, respectively. Refer to Figures 9A and 9B for an illustration of the site trip assignments for Phase 1 and full build-out, respectively.



|                                                                                                                                                      |                             |                                         |           |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------|-----------|
|  <b>RAMEY KEMP &amp; ASSOCIATES</b><br>TRANSPORTATION ENGINEERS | Steeplechase<br>Clayton, NC | Site Trip Distribution - Full Build-Out |           |
|                                                                                                                                                      |                             | Scale: Not to Scale                     | Figure 8B |



RAMEY KEMP & ASSOCIATES, INC.  
5808 Faringdon Place  
Raleigh, NC 27609  
Phone: 919-872-5115  
www.rameykemp.com

December 31, 2019

Salman Moazzam, PE  
ESP Associates, Inc.  
2200 Gateway Centre Boulevard, Suite 216  
Morrisville, NC 27560  
Phone: 919-415-2718  
Email: [smoazzam@espassociates.com](mailto:smoazzam@espassociates.com)

Subject: **DRAFT Trip Generation / Phasing Letter** – Steeplechase  
Clayton, North Carolina

Mr. Moazzam,

This letter provides a comparison of the trip generation potential for the proposed Steeplechase development versus the trip generation potential utilized in the most recent Traffic Impact Analysis (TIA) prepared by Ramey Kemp & Associates, Inc. (RKA) in March of 2018, which was reviewed and approved by the North Carolina Department of Transportation (NCDOT) and the Town of Clayton (Town). The proposed development is located south of Covered Bridge Road and west of O'Neil Street near Brookhill Drive in Clayton, North Carolina. The proposed development was previously expected to consist of 435 single-family detached homes and 190 townhomes at full build-out and is now expected to consist of 134 townhomes and 526 (86 duplexes & 440 single-family detached homes) residential units targeted for senior adult housing at full build-out. All site access assumptions utilized in the TIA are assumed to be the same with the change in the type of land uses for the subject development.

### **Trip Generation**

Average daily traffic, weekday AM peak hour, and weekday PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 10th Edition. Refer to Table 1 on the following page for a summary of the trip generation comparison for the proposed Steeplechase development versus the trip generation potential utilized in the most recent TIA prepared by RKA in March of 2018:

Table 1: Trip Generation Summary – Full Build-Out

| Land Use<br>(ITE Code)                               | Intensity | Daily<br>Traffic<br>(vpd) | Weekday AM Peak Hour<br>Trips (vph) |      |       | Weekday PM Peak Hour<br>Trips (vph) |      |       |
|------------------------------------------------------|-----------|---------------------------|-------------------------------------|------|-------|-------------------------------------|------|-------|
|                                                      |           |                           | Enter                               | Exit | Total | Enter                               | Exit | Total |
| Total Site Trips from March<br>2018 Steeplechase TIA |           | 5,200                     | 95                                  | 315  | 410   | 340                                 | 194  | 534   |
| Multifamily Housing<br>– Townhomes<br>(220)          | 134 Units | 1,000                     | 14                                  | 49   | 63    | 49                                  | 28   | 77    |
| Senior Adult Housing<br>– Detached*<br>(251)         | 526 Units | 2,400                     | 48                                  | 96   | 144   | 107                                 | 68   | 175   |
| Total Site Trips                                     |           | 3,400                     | 62                                  | 145  | 207   | 156                                 | 96   | 252   |
| Difference in Site Trips                             |           | -1,800                    | -33                                 | -170 | -203  | -184                                | -98  | -282  |

Trip generation potential from March 2018 Steeplechase TIA is shown in **orange**.

Trip generation potential for the proposed development is shown in **blue**.

\*Note: ITE Code 251 utilized for all senior adult housing residential units to be conservative. See below for an explanation.

As shown in Table 1, based on the ITE *Trip Generation Manual*, 10<sup>th</sup> Edition, it is estimated the proposed development is expected to generate approximately 1,800 fewer weekday daily trips on the roadway network during a typical 24-hour weekday period than what was analyzed in the March 2018 Steeplechase TIA. Of the daily traffic volume, it is anticipated that 203 fewer total trips (-33 entering and -170 exiting) will occur during the weekday AM peak hour and 282 fewer total trips (-184 entering and -98 exiting) will occur during the weekday PM peak hour. It should be noted that this represents a ~35% decrease in weekday daily trips and a ~50% decrease in weekday AM and PM peak hour trips at full build-out.

While there is expected to be a mixture of both attached and detached residential units targeted for senior adult housing (86 duplexes and 440 single-family detached homes), the trip generation results shown in Table 1 utilize the detached senior adult housing land use (ITE Code 251) because it is a higher trip generator than the attached senior adult housing land use (ITE Code 252), thus yielding more conservative results.

### **Development Phasing**

Through coordination with NCDOT and the Town, offsite improvements were identified at the following intersections based on the analysis results presented in the TIA for Steeplechase (March 2018):

- O'Neil Street and Covered Bridge Road
- Covered Bridge Road and Shotwell Road

Based on the reduction in weekday daily and peak hour site trips from the Steeplechase TIA, offsite improvements at the two (2) intersections listed above were evaluated to determine how many residential units could be built prior to improvements being constructed at these intersections. For the purposes of this letter, offsite

improvements at the aforementioned intersections should be further evaluated for cost sharing with other approved developments in the area where the development's (Steeplechase) site traffic constitutes 10% or more of the traffic on any one approach at these intersections. This criterion is consistent with typical municipality requirements for study area boundary and consideration for roadway improvements at the subject intersections.

Background (2026) peak hour traffic volumes (Figure 7B) and the site trip distribution for full build-out (Figure 8B) from the Steeplechase TIA (March 2018) were utilized with the revised trip generation potential for the proposed development (shown in Table 1) to determine what percentage of the total development could be built prior to meeting the 10% rule. A summary of the findings at the subject intersections are as follows:

**O'Neil Street and Covered Bridge Road**

Based on a comparison of distributed site traffic at this intersection utilizing the revised trip generation potential (refer to Table 1) versus the background (2026) peak hour traffic volumes from the Steeplechase TIA, no approaches at this intersection are expected to meet the 10% rule during the weekday AM and PM peak hours at full build-out of the proposed development. This can be attributed to the reduction in weekday daily and peak hour site trips and the relatively low percentage of site traffic that is expected to utilize this intersection.

**Covered Bridge Road and Shotwell Road**

Based on a comparison of distributed site traffic at this intersection utilizing the revised trip generation potential (refer to Table 1) versus the background (2026) peak hour traffic volumes from the Steeplechase TIA, the westbound approach at this intersection is expected to meet the 10% rule at approximately half (50%) of the development's full build-out potential during the weekday PM peak hour. It should be noted that all other approaches at this intersection are not expected to meet the 10% rule during the weekday AM and PM peak hours at full build-out of the proposed development.

**Findings and Summary**

The calculations provided in this letter are estimations of the trip generation potential for the proposed site based on data from the *ITE Trip Generation Manual*, 10<sup>th</sup> Edition. Based on the trip generation results, it is expected that the proposed Steeplechase development will generate ~35% fewer weekday daily trips and ~50% fewer weekday AM and PM peak hour trips at full build-out in comparison to the most recent TIA prepared by RKA in March of 2018.

The westbound approach at the intersection of Covered Bridge Road and Shotwell Road is expected to meet the 10% rule at approximately half (50%) of the development's full build-out potential during the weekday PM peak hour, which warrants consideration of roadway improvements. Therefore, it is recommended that offsite improvements at this intersection and the intersection of O'Neil Street and Covered Bridge Road be further evaluated for cost sharing with other approved developments in the area prior to more than 50% of the total development being built and operational.



If you should have any questions, please feel free to contact me at (919) 872-5115.

Sincerely,

**RAMEY KEMP & ASSOCIATES, INC.**

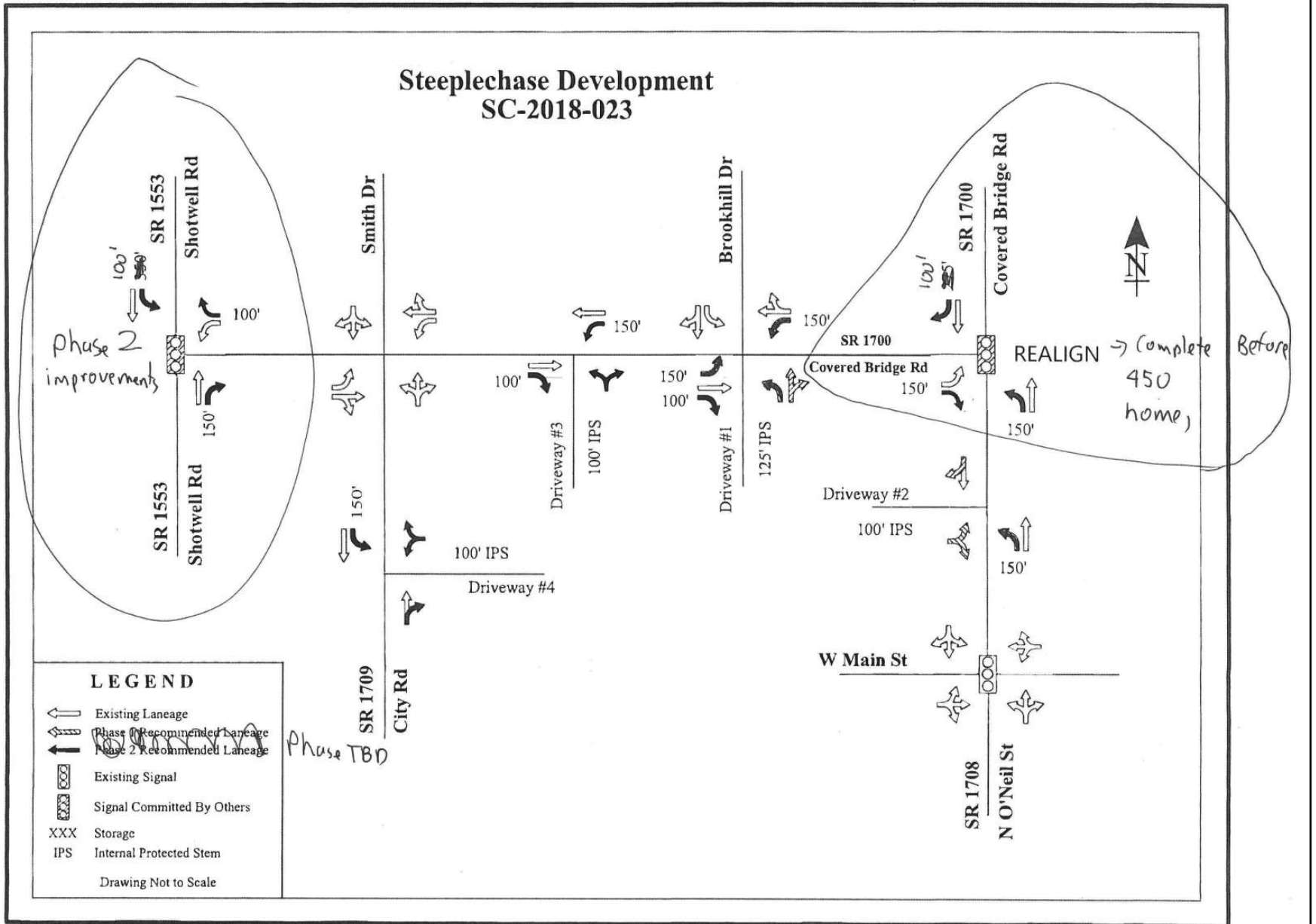
Rynal Stephenson, P.E.  
Regional Manager  
NC Corporate License # C-0910





2/10/20 -Sam Lawhorn

# Steeplechase Development SC-2018-023



# **TRAFFIC IMPACT ANALYSIS UPDATE**

**FOR**

## **WALTON ACRES AT RIVERWOOD ATHLETIC CLUB**

**LOCATED**

**IN**

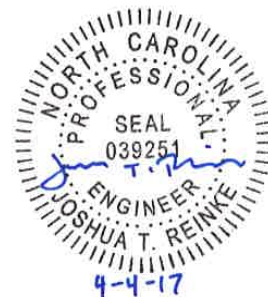
## **CLAYTON, NORTH CAROLINA**

Prepared For:  
Adams & Hodge Engineering, PC  
335 Athletic Club Boulevard  
Clayton, NC 27527

Prepared By:  
Ramey Kemp & Associates, Inc.  
5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
License #C-0910

April 2017

RKA Project No. 17031

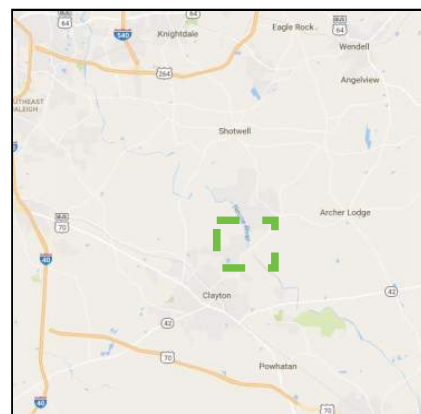


Prepared By: NAB

Reviewed By: JTR



- LEGEND**
- ▬▬▬ Proposed Site Location
  - Study Intersection
  - ▬▬▬ Study Area



Walton Acres at Riverwood  
Athletic Club  
Clayton, NC

Site Location Map

Scale: Not to Scale

Figure 1



## **2. EXISTING (2017) PEAK HOUR CONDITIONS**

### **2.1. Existing (2017) Peak Hour Traffic**

Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in February of 2017 by RKA during a typical weekday AM (6:30 AM – 9:00 AM) and PM (4:00 PM – 7:00 PM) peak periods while schools were in session:

- Covered Bridge Road and Pritchard Road
- Covered Bridge Road and Loop Road
- Covered Bridge Road / O’Neil Street and Old Covered Bridge Road

Refer to Figure 4 for existing (2017) weekday AM and PM peak hour traffic volumes. A copy of the count data is located in Appendix B of this report.

### **2.2. Analysis of Existing (2017) Peak Hour Traffic**

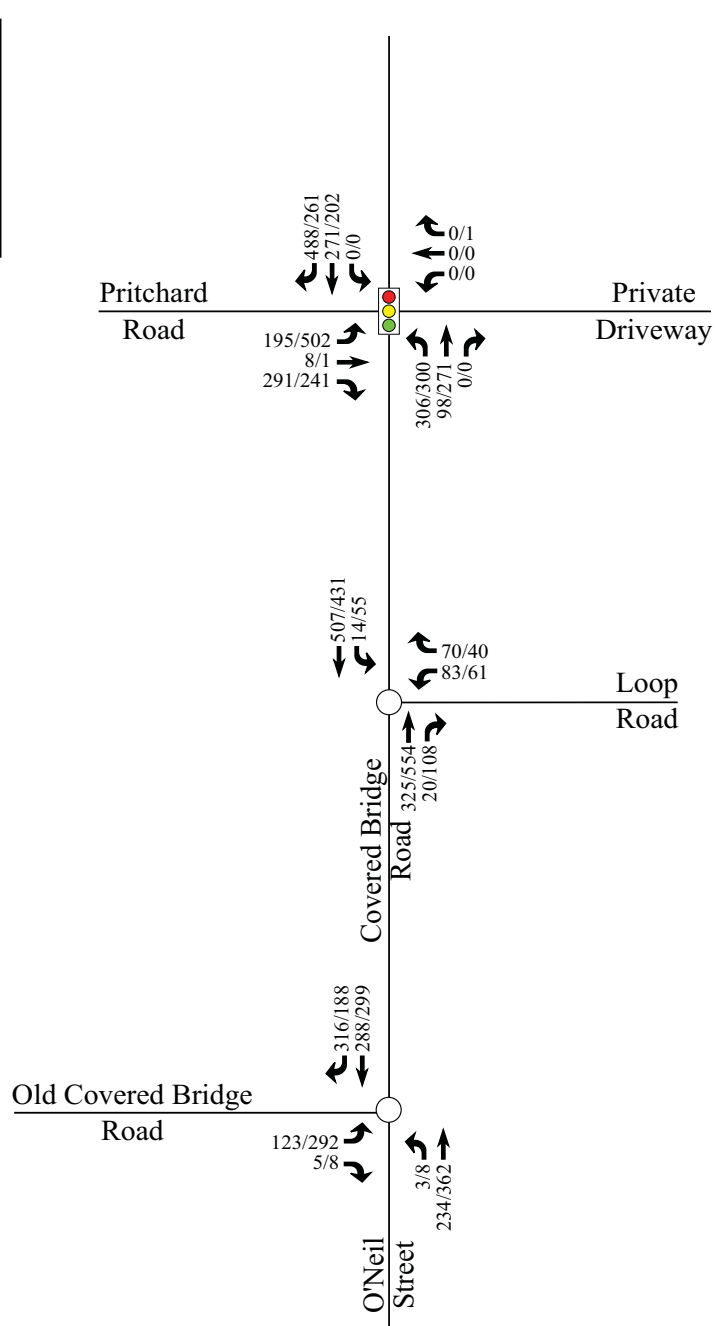
The existing (2017) weekday AM and PM peak hour traffic volumes were analyzed to determine the current levels of service at the study intersections under existing roadway conditions. Signal information was obtained from NCDOT and is included in Appendix C. The results of the analysis are presented in Section 7 of this report.

**LEGEND**

○ Unsignalized Intersection

◫ Signalized Intersection

X / Y → AM / PM Peak Hour Traffic



|  |                                                               |                                   |          |
|--|---------------------------------------------------------------|-----------------------------------|----------|
|  | <b>Walton Acres at Riverwood Athletic Club</b><br>Clayton, NC | Existing (2017) Peak Hour Traffic |          |
|  |                                                               | Scale: Not to Scale               | Figure 4 |



#### 4. SITE TRIP GENERATION AND DISTRIBUTION

##### 4.1. Trip Generation

The proposed development is assumed to consist of approximately 190 single-family homes and 120 apartment units. Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the *ITE Trip Generation Manual*, 9th Edition. Table 1 provides a summary of the trip generation potential for the site.

**Table 1: Trip Generation Summary**

| Land Use<br>(ITE Code)                  | Intensity | Daily<br>Traffic<br>(vpd) | AM Peak Hour<br>Trips (vph) |            | PM Peak Hour<br>Trips (vph) |           |
|-----------------------------------------|-----------|---------------------------|-----------------------------|------------|-----------------------------|-----------|
|                                         |           |                           | Enter                       | Exit       | Enter                       | Exit      |
| Single Family Detached Housing<br>(210) | 190 D.U.  | 1,810                     | 36                          | 107        | 120                         | 70        |
| Apartments (220)                        | 120 D.U.  | 850                       | 13                          | 50         | 55                          | 29        |
| <b>Total Trips</b>                      |           | <b>2,660</b>              | <b>49</b>                   | <b>157</b> | <b>175</b>                  | <b>99</b> |

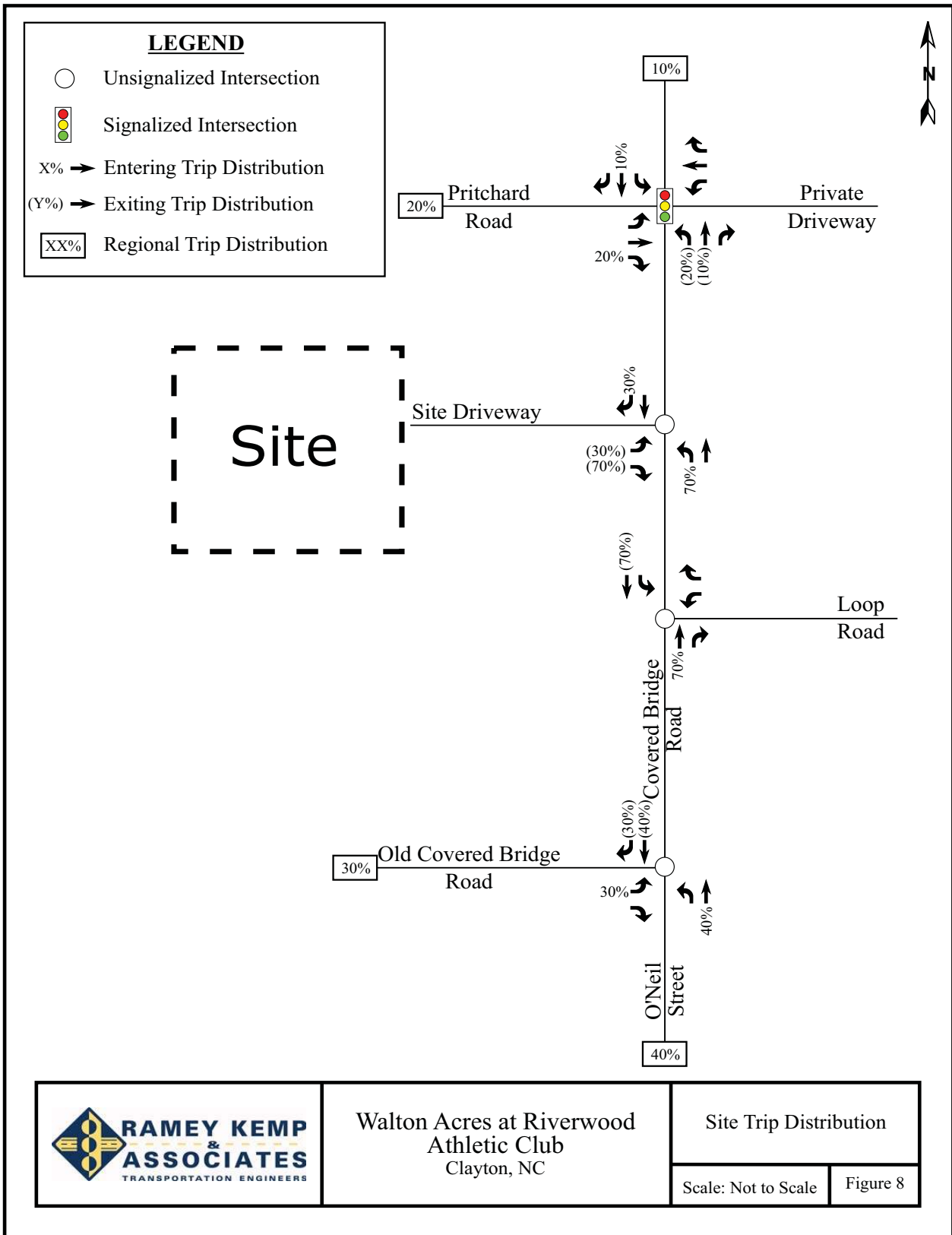
It is estimated that the proposed development will generate approximately 2,660 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 206 total trips (49 entering and 157 exiting) will occur during the AM peak hour and 274 (175 entering and 99 exiting) will occur during the PM peak hour.

##### 4.2. Site Trip Distribution and Assignment

Trip distribution percentages used in assigning site traffic for this development were estimated based on a combination of existing traffic patterns, employment centers adjacent to the study area, and engineering judgment. Per coordination with the Town and NCDOT, it is estimated that trips will be distributed as follows:

- 20% to/from the west via Pritchard Road
- 10% to/from the north via Covered Bridge Road
- 30% to/from the west via Old Covered Bridge Road
- 40% to/from the south via O'Neil Street

The site trip distributions are shown in Figure 8. Refer to Figure 9 for the site trip assignments.

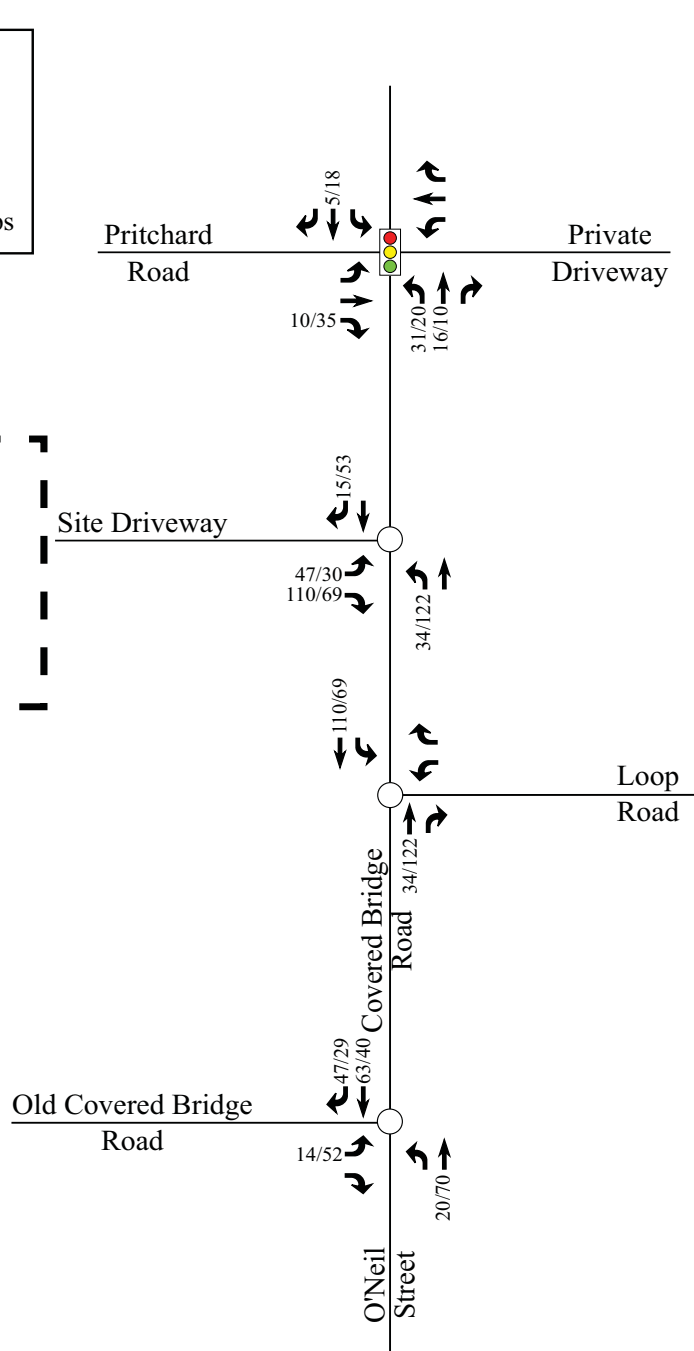


**LEGEND**

○ Unsignalized Intersection

◫ Signalized Intersection

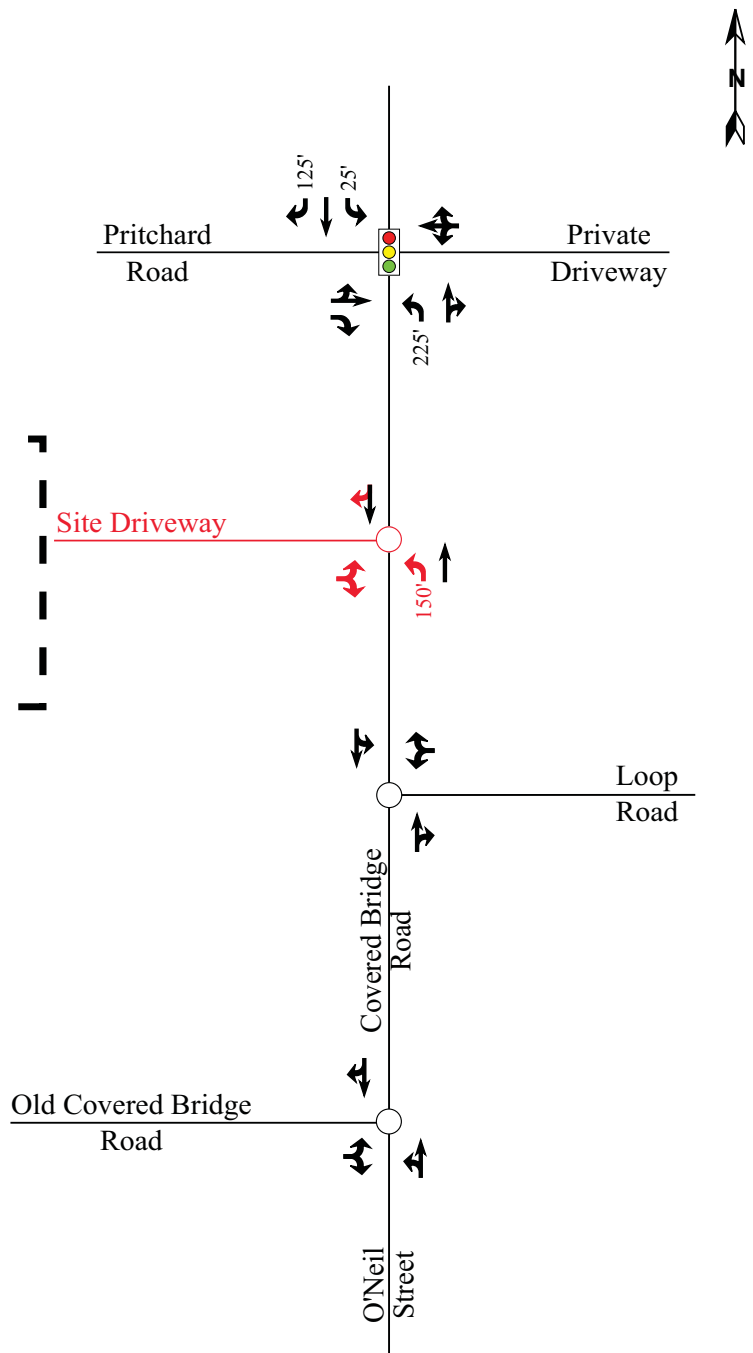
X / Y → AM / PM Peak Hour Site Trips



|  |                                                           |  |                                   |
|--|-----------------------------------------------------------|--|-----------------------------------|
|  | Walton Acres at Riverwood<br>Athletic Club<br>Clayton, NC |  | Site Trip Assignment              |
|  |                                                           |  | Scale: Not to Scale      Figure 9 |

**LEGEND**

- Unsignalized Intersection
- 🚦 Signalized Intersection
- ➡ Existing Lane
- ➡ Improvement by Developer
- X' Storage (In Feet)



|                                                                                                                                                                   |                                                           |                                |           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------|-----------|
|  <b>RAMEY KEMP &amp; ASSOCIATES</b><br><small>TRANSPORTATION ENGINEERS</small> | Walton Acres at Riverwood<br>Athletic Club<br>Clayton, NC | Recommended Lane Configuration |           |
|                                                                                                                                                                   |                                                           | Scale: Not to Scale            | Figure 13 |

## **Appendix E: Trip Generation**

| Ashcroft Phase 2                                                        |           |           |               |              |              |              |            |            |              |            |            |
|-------------------------------------------------------------------------|-----------|-----------|---------------|--------------|--------------|--------------|------------|------------|--------------|------------|------------|
| Table 1 - Trip Generation                                               |           |           |               |              |              |              |            |            |              |            |            |
| Land Use                                                                | Intensity |           | Daily         |              |              | AM Peak Hour |            |            | PM Peak Hour |            |            |
|                                                                         |           |           | Total         | In           | Out          | Total        | In         | Out        | Total        | In         | Out        |
| 210 Single Family Detached Housing - Pods D-L                           | 300       | d.u.      | 2,858         | 1,429        | 1,429        | 218          | 55         | 163        | 292          | 184        | 108        |
| 220 Multifamily Housing (Low-Rise) - Pod C                              | 300       | d.u.      | 2,228         | 1,114        | 1,114        | 135          | 31         | 104        | 157          | 99         | 58         |
| 221 Multifamily Housing (Mid-Rise) - Pod B                              | 180       | d.u.      | 980           | 490          | 490          | 61           | 16         | 45         | 78           | 48         | 30         |
| 820 Shopping Center - Pod A                                             | 105,000   | s.f.      | 6,216         | 3,108        | 3,108        | 204          | 126        | 78         | 563          | 270        | 293        |
| <b>Subtotal</b>                                                         |           |           | <b>12,282</b> | <b>6,141</b> | <b>6,141</b> | <b>618</b>   | <b>228</b> | <b>390</b> | <b>1,090</b> | <b>601</b> | <b>489</b> |
| <u>Internal Capture</u>                                                 |           |           |               |              |              |              |            |            |              |            |            |
| 210 Single Family Detached Housing - Pods D-L                           |           |           | 491           | 293          | 198          | 3            | 1          | 2          | 56           | 41         | 15         |
| 220 Multifamily Housing (Low-Rise) - Pod C                              |           |           | 383           | 229          | 154          | 2            | 1          | 1          | 32           | 24         | 8          |
| 221 Multifamily Housing (Mid-Rise) - Pod B                              |           |           | 168           | 100          | 68           | 0            | 0          | 0          | 15           | 11         | 4          |
| 820 Shopping Center - Pod A <sup>1</sup>                                |           |           | 1,042         | 420          | 622          | 5            | 3          | 2          | 103          | 27         | 76         |
| <i>Internal Capture Total</i>                                           |           |           | <i>2,084</i>  | <i>1,042</i> | <i>1,042</i> | <i>10</i>    | <i>5</i>   | <i>5</i>   | <i>206</i>   | <i>103</i> | <i>103</i> |
| <b>Total Driveway Volumes</b>                                           |           |           | <b>10,198</b> | <b>5,099</b> | <b>5,099</b> | <b>608</b>   | <b>223</b> | <b>385</b> | <b>884</b>   | <b>498</b> | <b>386</b> |
| <u>Pass-By Capture</u>                                                  |           |           |               |              |              |              |            |            |              |            |            |
| 820 Shopping Center - Pod A <sup>1</sup><br>10% Adjacent Street Traffic | <u>AM</u> | <u>PM</u> |               |              |              |              |            |            |              |            |            |
|                                                                         | 0%        | 34%       | 1,734         | 867          | 867          | 0            | 0          | 0          | 157          | 83         | 74         |
| <b>Pass-By Capture Total:</b>                                           |           |           | <b>1,500</b>  | <b>750</b>   | <b>750</b>   | <b>0</b>     | <b>0</b>   | <b>0</b>   | <b>150</b>   | <b>75</b>  | <b>75</b>  |
| <b>Total Net New External Trips</b>                                     |           |           | <b>8,698</b>  | <b>4,349</b> | <b>4,349</b> | <b>608</b>   | <b>223</b> | <b>385</b> | <b>734</b>   | <b>423</b> | <b>311</b> |

K:\RAL\_TPTO\_Traffic\014163000 Ashcroft Phase 2\T4 - Analysis\Ashcroft Phase 2 - TIADData.xls\Trip Gen

7/28/20



# Internal Capture Reduction Calculations

Methodology for A.M. Peak Hour and P.M. Peak Hour  
based on the *Trip Generation Handbook*, 3rd Edition, published by the Institute of Transportation Engineers

Methodology for Daily  
based on the average of the Unconstrained Rates for the A.M. Peak Hour and P.M. Peak Hour

## SUMMARY

### GROSS TRIP GENERATION

| INPUT | Land Use             | Daily |       | A.M. Peak Hour |      | P.M. Peak Hour |      |
|-------|----------------------|-------|-------|----------------|------|----------------|------|
|       |                      | Enter | Exit  | Enter          | Exit | Enter          | Exit |
|       | Office               | 0     | 0     | 0              | 0    | 0              | 0    |
|       | Retail               | 3,108 | 3,108 | 126            | 78   | 270            | 293  |
|       | Restaurant           | 0     | 0     | 0              | 0    | 0              | 0    |
|       | Cinema/Entertainment | 0     | 0     | 0              | 0    | 0              | 0    |
|       | Residential          | 3,033 | 3,033 | 102            | 312  | 331            | 196  |
|       | Hotel                | 0     | 0     | 0              | 0    | 0              | 0    |
|       |                      | 6,141 | 6,141 | 228            | 390  | 601            | 489  |

### INTERNAL TRIPS

| OUTPUT | Land Use             | Daily |       | A.M. Peak Hour |      | P.M. Peak Hour |       |
|--------|----------------------|-------|-------|----------------|------|----------------|-------|
|        |                      | Enter | Exit  | Enter          | Exit | Enter          | Exit  |
|        | Office               | 0     | 0     | 0              | 0    | 0              | 0     |
|        | Retail               | 420   | 622   | 3              | 2    | 27             | 76    |
|        | Restaurant           | 0     | 0     | 0              | 0    | 0              | 0     |
|        | Cinema/Entertainment | 0     | 0     | 0              | 0    | 0              | 0     |
|        | Residential          | 622   | 420   | 2              | 3    | 76             | 27    |
|        | Hotel                | 0     | 0     | 0              | 0    | 0              | 0     |
|        |                      | 1,042 | 1,042 | 5              | 5    | 103            | 103   |
|        | % Reduction          |       | 17.0% |                | 1.6% |                | 18.9% |

### EXTERNAL TRIPS

| OUTPUT | Land Use             | Daily |       | A.M. Peak Hour |      | P.M. Peak Hour |      |
|--------|----------------------|-------|-------|----------------|------|----------------|------|
|        |                      | Enter | Exit  | Enter          | Exit | Enter          | Exit |
|        | Office               | 0     | 0     | 0              | 0    | 0              | 0    |
|        | Retail               | 2,688 | 2,486 | 123            | 76   | 243            | 217  |
|        | Restaurant           | 0     | 0     | 0              | 0    | 0              | 0    |
|        | Cinema/Entertainment | 0     | 0     | 0              | 0    | 0              | 0    |
|        | Residential          | 2,411 | 2,613 | 100            | 309  | 255            | 169  |
|        | Hotel                | 0     | 0     | 0              | 0    | 0              | 0    |
|        |                      | 5,099 | 5,099 | 223            | 385  | 498            | 386  |

## **Appendix F:**

### **Intersection Spreadsheets**

# INTERSECTION ANALYSIS SHEET

|             |                                             |
|-------------|---------------------------------------------|
| Project:    | Ashcroft Phase 2                            |
| Location:   | Clayton, NC                                 |
| Scenario:   | Scenario #1 - No Covered Bridge Realignment |
| Ct. Date    | Feb 2018 (From Steeplechase TIA)            |
| N/S Street: | N. O'Neill Street                           |
| E/W Street: | Main Street                                 |

|       |        |       |        |
|-------|--------|-------|--------|
| AM In | AM Out | PM In | PM Out |
| 123   | 76     | 168   | 142    |
| 0     | 0      | 75    | 75     |

|                            |          |                |      |     |
|----------------------------|----------|----------------|------|-----|
| Retail Net New Trips:      | 100      | 309            | 255  | 169 |
| Retail Pass-By Trips:      | 2.0%     | Existing Year: | 2020 |     |
| Residential Net New Trips: | 0.218994 | Buildout Year: | 2030 |     |

## AM PEAK HOUR AM PHF = 0.95

| Description                   | Main Street<br>Eastbound |         |       | Main Street<br>Westbound |         |       | N. O'Neill Street<br>Northbound |         |       | N. O'Neill Street<br>Southbound |         |       |
|-------------------------------|--------------------------|---------|-------|--------------------------|---------|-------|---------------------------------|---------|-------|---------------------------------|---------|-------|
|                               | Left                     | Through | Right | Left                     | Through | Right | Left                            | Through | Right | Left                            | Through | Right |
| 2018 Traffic Count            | 54                       | 168     | 5     | 1                        | 273     | 109   | 2                               | 28      | 2     | 170                             | 32      | 114   |
| Growth to 2020                | 6                        | 17      | 1     | 0                        | 26      | 11    | 0                               | 3       | 0     | 17                              | 3       | 12    |
| 2020 Existing Traffic         | 60                       | 185     | 6     | 1                        | 301     | 120   | 2                               | 31      | 2     | 187                             | 35      | 126   |
| Growth Factor (0.02 per year) | 0.219                    | 0.219   | 0.219 | 0.219                    | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 |
| 2030 Background Growth        | 13                       | 41      | 1     | 0                        | 66      | 26    | 0                               | 7       | 0     | 41                              | 8       | 28    |
| Committed Projects            |                          |         |       |                          |         |       |                                 |         |       |                                 |         |       |
| Academy Point (Barbour Tract) | 7                        | 1       | 0     | 0                        | 2       | 14    | 0                               | 6       | 0     | 45                              | 18      | 22    |
| Steeple Chase (Senior Adult)  | 6                        | 0       | 0     | 0                        | 0       | 6     | 0                               | 0       | 0     | 15                              | 0       | 15    |
| Walton Acres at Riverwood     | 10                       | 0       | 0     | 0                        | 0       | 8     | 0                               | 3       | 0     | 24                              | 8       | 32    |
| Total Committed Traffic       | 23                       | 1       | 0     | 0                        | 2       | 28    | 0                               | 9       | 0     | 84                              | 26      | 69    |
| 2030 Background Traffic       | 96                       | 227     | 7     | 1                        | 369     | 174   | 2                               | 47      | 2     | 312                             | 69      | 223   |
| Project Traffic               |                          |         |       |                          |         |       |                                 |         |       |                                 |         |       |
| Retail Traffic                |                          |         |       |                          |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 10%                      | 0%      | 0%    | 0%                       | 0%      | 10%   | 0%                              | 5%      | 0%    | 0%                              | 0%      | 0%    |
| Inbound Project Traffic       | 12                       | 0       | 0     | 0                        | 0       | 12    | 0                               | 6       | 0     | 0                               | 0       | 0     |
| Percent Assignment Outbound   | 0%                       | 0%      | 0%    | 0%                       | 0%      | 0%    | 0%                              | 0%      | 0%    | 10%                             | 5%      | 10%   |
| Outbound Project Traffic      | 0                        | 0       | 0     | 0                        | 0       | 0     | 0                               | 0       | 0     | 8                               | 4       | 8     |
| Total Retail Trips            | 12                       | 0       | 0     | 0                        | 0       | 12    | 0                               | 6       | 0     | 8                               | 4       | 8     |
| Residential Traffic           |                          |         |       |                          |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 20%                      | 0%      | 0%    | 0%                       | 0%      | 15%   | 0%                              | 5%      | 0%    | 0%                              | 0%      | 0%    |
| Inbound Project Traffic       | 20                       | 0       | 0     | 0                        | 0       | 15    | 0                               | 5       | 0     | 0                               | 0       | 0     |
| Percent Assignment Outbound   | 0%                       | 0%      | 0%    | 0%                       | 0%      | 0%    | 0%                              | 0%      | 0%    | 15%                             | 5%      | 20%   |
| Outbound Project Traffic      | 0                        | 0       | 0     | 0                        | 0       | 0     | 0                               | 0       | 0     | 46                              | 15      | 62    |
| Total Residential Trips       | 20                       | 0       | 0     | 0                        | 0       | 15    | 0                               | 5       | 0     | 46                              | 15      | 62    |
| Total Project Traffic         | 32                       | 0       | 0     | 0                        | 0       | 27    | 0                               | 11      | 0     | 54                              | 19      | 70    |
| 2030 Buildout Total           | 128                      | 227     | 7     | 1                        | 369     | 201   | 2                               | 58      | 2     | 366                             | 88      | 293   |
| Percent Impact (Approach)     |                          | 8.8%    |       |                          | 4.7%    |       |                                 | 17.7%   |       |                                 | 19.1%   |       |
| Overall Percent Impact        | 12.2%                    |         |       |                          |         |       |                                 |         |       |                                 |         |       |

## PM PEAK HOUR PM PHF = 0.93

| Description                   | Main Street<br>Eastbound |         |       | Main Street<br>Westbound |         |       | N. O'Neill Street<br>Northbound |         |       | N. O'Neill Street<br>Southbound |         |       |
|-------------------------------|--------------------------|---------|-------|--------------------------|---------|-------|---------------------------------|---------|-------|---------------------------------|---------|-------|
|                               | Left                     | Through | Right | Left                     | Through | Right | Left                            | Through | Right | Left                            | Through | Right |
| 2018 Traffic Count            | 86                       | 374     | 5     | 2                        | 175     | 180   | 6                               | 60      | 1     | 149                             | 26      | 93    |
| Growth to 2020                | 9                        | 38      | 1     | 0                        | 18      | 18    | 1                               | 6       | 0     | 15                              | 3       | 10    |
| 2020 Existing Traffic         | 95                       | 412     | 6     | 2                        | 193     | 198   | 7                               | 66      | 1     | 164                             | 29      | 103   |
| Growth Factor (0.02 per year) | 0.219                    | 0.219   | 0.219 | 0.219                    | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 |
| 2030 Background Growth        | 21                       | 90      | 1     | 0                        | 42      | 43    | 2                               | 14      | 0     | 36                              | 6       | 23    |
| Committed Projects            |                          |         |       |                          |         |       |                                 |         |       |                                 |         |       |
| Academy Point (Barbour Tract) | 23                       | 3       | 0     | 0                        | 2       | 48    | 0                               | 20      | 0     | 28                              | 12      | 14    |
| Steeple Chase (Senior Adult)  | 16                       | 0       | 0     | 0                        | 0       | 16    | 0                               | 0       | 0     | 10                              | 0       | 10    |
| Walton Acres at Riverwood     | 35                       | 0       | 0     | 0                        | 0       | 26    | 0                               | 9       | 0     | 15                              | 5       | 20    |
| Total Committed Traffic       | 74                       | 3       | 0     | 0                        | 2       | 90    | 0                               | 29      | 0     | 53                              | 17      | 44    |
| 2030 Background Traffic       | 190                      | 505     | 7     | 2                        | 237     | 331   | 9                               | 109     | 1     | 253                             | 52      | 170   |
| Project Traffic               |                          |         |       |                          |         |       |                                 |         |       |                                 |         |       |
| Retail Traffic                |                          |         |       |                          |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 10%                      | 0%      | 0%    | 0%                       | 0%      | 10%   | 0%                              | 5%      | 0%    | 0%                              | 0%      | 0%    |
| Inbound Project Traffic       | 17                       | 0       | 0     | 0                        | 0       | 17    | 0                               | 8       | 0     | 0                               | 0       | 0     |
| Percent Assignment Outbound   | 0%                       | 0%      | 0%    | 0%                       | 0%      | 0%    | 0%                              | 0%      | 0%    | 10%                             | 5%      | 10%   |
| Outbound Project Traffic      | 0                        | 0       | 0     | 0                        | 0       | 0     | 0                               | 0       | 0     | 14                              | 7       | 14    |
| Total Retail Trips            | 17                       | 0       | 0     | 0                        | 0       | 17    | 0                               | 8       | 0     | 14                              | 7       | 14    |
| Residential Traffic           |                          |         |       |                          |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 20%                      | 0%      | 0%    | 0%                       | 0%      | 15%   | 0%                              | 5%      | 0%    | 0%                              | 0%      | 0%    |
| Inbound Project Traffic       | 51                       | 0       | 0     | 0                        | 0       | 38    | 0                               | 13      | 0     | 0                               | 0       | 0     |
| Percent Assignment Outbound   | 0%                       | 0%      | 0%    | 0%                       | 0%      | 0%    | 0%                              | 0%      | 0%    | 15%                             | 5%      | 20%   |
| Outbound Project Traffic      | 0                        | 0       | 0     | 0                        | 0       | 0     | 0                               | 0       | 0     | 25                              | 8       | 34    |
| Total Residential Trips       | 51                       | 0       | 0     | 0                        | 0       | 38    | 0                               | 13      | 0     | 25                              | 8       | 34    |
| Total Project Traffic         | 68                       | 0       | 0     | 0                        | 0       | 55    | 0                               | 21      | 0     | 39                              | 15      | 48    |
| 2030 Buildout Total           | 258                      | 505     | 7     | 2                        | 237     | 386   | 9                               | 130     | 1     | 292                             | 67      | 218   |
| Percent Impact (Approach)     |                          | 8.8%    |       |                          | 8.8%    |       |                                 | 15.0%   |       |                                 | 17.7%   |       |
| Overall Percent Impact        | 11.6%                    |         |       |                          |         |       |                                 |         |       |                                 |         |       |

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8/2/20

# INTERSECTION ANALYSIS SHEET

Project: Ashcroft Phase 2  
 Location: Clayton, NC  
 Scenario: Scenario #1 - No Covered Bridge Realignment  
 Ct. Date:  
 N/S Street: N. O'Neill Street  
 E/W Street: Atwood Drive

|                           |        |       |        |
|---------------------------|--------|-------|--------|
| AM In                     | AM Out | PM In | PM Out |
| Retail Net New Trips: 123 | 76     | 168   | 142    |
| Retail Pass-By Trips: 0   | 0      | 75    | 75     |

|                                |                     |     |     |
|--------------------------------|---------------------|-----|-----|
| Residential Net New Trips: 100 | 309                 | 255 | 169 |
| Annual Growth Rate: 2.0%       | Existing Year: 2020 |     |     |
| Growth Factor: 0.218994        | Buildout Year: 2030 |     |     |

AM PEAK HOUR  
 AM PHF = 0.90

| Description                     | Atwood Drive<br>Eastbound |         |       | Atwood Drive<br>Westbound |         |       | N. O'Neill Street<br>Northbound |         |       | N. O'Neill Street<br>Southbound |         |       |
|---------------------------------|---------------------------|---------|-------|---------------------------|---------|-------|---------------------------------|---------|-------|---------------------------------|---------|-------|
|                                 | Left                      | Through | Right | Left                      | Through | Right | Left                            | Through | Right | Left                            | Through | Right |
| 2020 Traffic Count              | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 0       | 0     | 0                               | 0       | 0     |
| Ashcroft Ph. 1 Trip Gen&Assign. | 0                         | 0       | 0     | 50                        | 0       | 33    | 0                               | 0       | 17    | 38                              | 0       | 0     |
| Count Balancing                 | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 206     | 0     | 0                               | 289     | 0     |
| 2020 Existing Traffic           | 0                         | 0       | 0     | 50                        | 0       | 33    | 0                               | 206     | 17    | 38                              | 289     | 0     |
| Growth Factor (0.02 per year)   | 0.000                     | 0.000   | 0.000 | 0.000                     | 0.000   | 0.000 | 0.000                           | 0.219   | 0.000 | 0.000                           | 0.219   | 0.000 |
| 2030 Background Growth          | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 45      | 0     | 0                               | 63      | 0     |
| Committed Projects              |                           |         |       |                           |         |       |                                 |         |       |                                 |         |       |
| Academy Point (Barbour Tract)   | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 12      | 0     | 0                               | 4       | 0     |
| Steeple Chase (Senior Adult)    | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 12      | 0     | 0                               | 30      | 0     |
| Walton Acres at Riverwood       | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 20      | 0     | 0                               | 63      | 0     |
| Total Committed Traffic         | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 44      | 0     | 0                               | 97      | 0     |
| 2030 Background Traffic         | 0                         | 0       | 0     | 50                        | 0       | 33    | 0                               | 295     | 17    | 38                              | 449     | 0     |
| Project Traffic                 |                           |         |       |                           |         |       |                                 |         |       |                                 |         |       |
| Retail Traffic                  |                           |         |       |                           |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound      | 0%                        | 0%      | 0%    | 0%                        | 0%      | 0%    | 0%                              | 35%     | 0%    | 0%                              | 0%      | 0%    |
| Inbound Project Traffic         | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 43      | 0     | 0                               | 0       | 0     |
| Percent Assignment Outbound     | 0%                        | 0%      | 0%    | 0%                        | 0%      | 0%    | 0%                              | 0%      | 0%    | 0%                              | 35%     | 0%    |
| Outbound Project Traffic        | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 0       | 0     | 0                               | 27      | 0     |
| Total Retail Trips              | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 43      | 0     | 0                               | 27      | 0     |
| Residential Traffic             |                           |         |       |                           |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound      | 0%                        | 0%      | 0%    | 0%                        | 0%      | 0%    | 0%                              | 35%     | 5%    | 0%                              | 0%      | 0%    |
| Inbound Project Traffic         | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 35      | 5     | 0                               | 0       | 0     |
| Percent Assignment Outbound     | 0%                        | 0%      | 0%    | 5%                        | 0%      | 0%    | 0%                              | 0%      | 0%    | 0%                              | 35%     | 0%    |
| Outbound Project Traffic        | 0                         | 0       | 0     | 15                        | 0       | 0     | 0                               | 0       | 0     | 0                               | 108     | 0     |
| Total Residential Trips         | 0                         | 0       | 0     | 15                        | 0       | 0     | 0                               | 35      | 5     | 0                               | 108     | 0     |
| Total Project Traffic           | 0                         | 0       | 0     | 15                        | 0       | 0     | 0                               | 78      | 5     | 0                               | 135     | 0     |
| 2030 Buildout Total             | 0                         | 0       | 0     | 65                        | 0       | 33    | 0                               | 373     | 22    | 38                              | 584     | 0     |
| Percent Impact (Approach)       | -                         | -       | -     | -                         | 15.3%   | -     | -                               | 21.0%   | -     | -                               | 21.7%   | -     |
| Overall Percent Impact          | 20.9%                     |         |       |                           |         |       |                                 |         |       |                                 |         |       |

PM PEAK HOUR  
 PM PHF = 0.90

| Description                     | Atwood Drive<br>Eastbound |         |       | Atwood Drive<br>Westbound |         |       | N. O'Neill Street<br>Northbound |         |       | N. O'Neill Street<br>Southbound |         |       |
|---------------------------------|---------------------------|---------|-------|---------------------------|---------|-------|---------------------------------|---------|-------|---------------------------------|---------|-------|
|                                 | Left                      | Through | Right | Left                      | Through | Right | Left                            | Through | Right | Left                            | Through | Right |
| 2020 Traffic Count              | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 0       | 0     | 0                               | 0       | 0     |
| Ashcroft Ph. 1 Trip Gen&Assign. | 0                         | 0       | 0     | 33                        | 0       | 22    | 0                               | 0       | 57    | 38                              | 0       | 0     |
| Count Balancing                 | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 459     | 0     | 0                               | 297     | 0     |
| 2020 Existing Traffic           | 0                         | 0       | 0     | 33                        | 0       | 22    | 0                               | 459     | 57    | 38                              | 297     | 0     |
| Growth Factor (0.02 per year)   | 0.000                     | 0.000   | 0.000 | 0.000                     | 0.000   | 0.000 | 0.000                           | 0.219   | 0.000 | 0.000                           | 0.219   | 0.000 |
| 2030 Background Growth          | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 101     | 0     | 0                               | 65      | 0     |
| Committed Projects              |                           |         |       |                           |         |       |                                 |         |       |                                 |         |       |
| Academy Point (Barbour Tract)   | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 8       | 0     | 0                               | 13      | 0     |
| Steeple Chase (Senior Adult)    | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 32      | 0     | 0                               | 20      | 0     |
| Walton Acres at Riverwood       | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 70      | 0     | 0                               | 40      | 0     |
| Total Committed Traffic         | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 110     | 0     | 0                               | 73      | 0     |
| 2030 Background Traffic         | 0                         | 0       | 0     | 33                        | 0       | 22    | 0                               | 670     | 57    | 38                              | 435     | 0     |
| Project Traffic                 |                           |         |       |                           |         |       |                                 |         |       |                                 |         |       |
| Retail Traffic                  |                           |         |       |                           |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound      | 0%                        | 0%      | 0%    | 0%                        | 0%      | 0%    | 0%                              | 35%     | 0%    | 0%                              | 0%      | 0%    |
| Inbound Project Traffic         | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 59      | 0     | 0                               | 0       | 0     |
| Percent Assignment Outbound     | 0%                        | 0%      | 0%    | 0%                        | 0%      | 0%    | 0%                              | 0%      | 0%    | 0%                              | 35%     | 0%    |
| Outbound Project Traffic        | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 0       | 0     | 0                               | 50      | 0     |
| Total Retail Trips              | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 59      | 0     | 0                               | 50      | 0     |
| Residential Traffic             |                           |         |       |                           |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound      | 0%                        | 0%      | 0%    | 0%                        | 0%      | 0%    | 0%                              | 35%     | 5%    | 0%                              | 0%      | 0%    |
| Inbound Project Traffic         | 0                         | 0       | 0     | 0                         | 0       | 0     | 0                               | 89      | 13    | 0                               | 0       | 0     |
| Percent Assignment Outbound     | 0%                        | 0%      | 0%    | 5%                        | 0%      | 0%    | 0%                              | 0%      | 0%    | 0%                              | 35%     | 0%    |
| Outbound Project Traffic        | 0                         | 0       | 0     | 8                         | 0       | 0     | 0                               | 0       | 0     | 0                               | 59      | 0     |
| Total Residential Trips         | 0                         | 0       | 0     | 8                         | 0       | 0     | 0                               | 89      | 13    | 0                               | 59      | 0     |
| Total Project Traffic           | 0                         | 0       | 0     | 8                         | 0       | 0     | 0                               | 148     | 13    | 0                               | 109     | 0     |
| 2030 Buildout Total             | 0                         | 0       | 0     | 41                        | 0       | 22    | 0                               | 818     | 70    | 38                              | 544     | 0     |
| Percent Impact (Approach)       | -                         | -       | -     | -                         | 12.7%   | -     | -                               | 18.1%   | -     | -                               | 18.7%   | -     |
| Overall Percent Impact          | 18.1%                     |         |       |                           |         |       |                                 |         |       |                                 |         |       |

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8/2/20

# INTERSECTION ANALYSIS SHEET

Project: Ashcroft Phase 2  
 Location: Clayton, NC  
 Scenario: Scenario #1 - No Covered Bridge Realignment  
 Ct. Date: Feb 2018 (From Steeplechase TIA)  
 N/S Street: N. O'Neill Street/Covered Bridge Road  
 E/W Street: Covered Bridge Road

|                           |        |       |        |
|---------------------------|--------|-------|--------|
| AM In                     | AM Out | PM In | PM Out |
| Retail Net New Trips: 123 | 76     | 168   | 142    |
| Retail Pass-By Trips: 0   | 0      | 75    | 75     |

|                                |                     |     |     |
|--------------------------------|---------------------|-----|-----|
| Residential Net New Trips: 100 | 309                 | 255 | 169 |
| Annual Growth Rate: 2.0%       | Existing Year: 2020 |     |     |
| Growth Factor: 0.218994        | Buildout Year: 2030 |     |     |

AM PEAK HOUR  
 AM PHF = 0.84

| Description                 |                               | Covered Bridge Road<br>Eastbound |         |       | Covered Bridge Road<br>Westbound |         |       | N. O'Neill Street/Covered Bridge Road<br>Northbound |         |       | N. O'Neill Street/Covered Bridge Road<br>Southbound |         |       |
|-----------------------------|-------------------------------|----------------------------------|---------|-------|----------------------------------|---------|-------|-----------------------------------------------------|---------|-------|-----------------------------------------------------|---------|-------|
|                             |                               | Left                             | Through | Right | Left                             | Through | Right | Left                                                | Through | Right | Left                                                | Through | Right |
| 2018                        | Traffic Count                 | 116                              | 0       | 6     | 0                                | 0       | 0     | 6                                                   | 210     | 0     | 0                                                   | 290     | 269   |
|                             | Growth to 2020                | 12                               | 0       | 1     | 0                                | 0       | 0     | 1                                                   | 22      | 0     | 0                                                   | 30      | 28    |
| 2020                        | Existing Traffic              | 128                              | 0       | 7     | 0                                | 0       | 0     | 7                                                   | 232     | 0     | 0                                                   | 320     | 297   |
|                             | Growth Factor (0.02 per year) | 0.219                            | 0.219   | 0.219 | 0.219                            | 0.219   | 0.219 | 0.219                                               | 0.219   | 0.219 | 0.219                                               | 0.219   | 0.219 |
| 2030                        | Background Growth             | 28                               | 0       | 2     | 0                                | 0       | 0     | 2                                                   | 51      | 0     | 0                                                   | 70      | 65    |
| Committed Projects          |                               |                                  |         |       |                                  |         |       |                                                     |         |       |                                                     |         |       |
|                             | Academy Point (Barbour Tract) | 0                                | 0       | 3     | 0                                | 0       | 0     | 8                                                   | 4       | 0     | 0                                                   | 1       | 0     |
|                             | Steeple Chase (Senior Adult)  | 7                                | 0       | 7     | 0                                | 0       | 0     | 3                                                   | 15      | 0     | 0                                                   | 6       | 3     |
|                             | Walton Acres at Riverwood     | 14                               | 0       | 0     | 0                                | 0       | 0     | 0                                                   | 20      | 0     | 0                                                   | 63      | 47    |
| Total Committed Traffic     |                               | 21                               | 0       | 10    | 0                                | 0       | 0     | 11                                                  | 39      | 0     | 0                                                   | 70      | 50    |
| 2030                        | Background Traffic            | 177                              | 0       | 19    | 0                                | 0       | 0     | 20                                                  | 322     | 0     | 0                                                   | 460     | 412   |
| Project Traffic             |                               |                                  |         |       |                                  |         |       |                                                     |         |       |                                                     |         |       |
| Retail Traffic              |                               |                                  |         |       |                                  |         |       |                                                     |         |       |                                                     |         |       |
| Percent Assignment Inbound  |                               | 0%                               | 0%      | 25%   | 0%                               | 0%      | 0%    | 0%                                                  | 0%      | 0%    | 0%                                                  | 40%     | 0%    |
| Inbound Project Traffic     |                               | 0                                | 0       | 31    | 0                                | 0       | 0     | 0                                                   | 0       | 0     | 0                                                   | 49      | 0     |
| Percent Assignment Outbound |                               | 0%                               | 0%      | 0%    | 0%                               | 0%      | 0%    | 25%                                                 | 40%     | 0%    | 0%                                                  | 0%      | 0%    |
| Outbound Project Traffic    |                               | 0                                | 0       | 0     | 0                                | 0       | 0     | 19                                                  | 30      | 0     | 0                                                   | 0       | 0     |
| Total Retail Trips          |                               | 0                                | 0       | 31    | 0                                | 0       | 0     | 19                                                  | 30      | 0     | 0                                                   | 49      | 0     |
| Residential Traffic         |                               |                                  |         |       |                                  |         |       |                                                     |         |       |                                                     |         |       |
| Percent Assignment Inbound  |                               | 0%                               | 0%      | 40%   | 0%                               | 0%      | 0%    | 0%                                                  | 0%      | 0%    | 0%                                                  | 20%     | 0%    |
| Inbound Project Traffic     |                               | 0                                | 0       | 40    | 0                                | 0       | 0     | 0                                                   | 0       | 0     | 0                                                   | 20      | 0     |
| Percent Assignment Outbound |                               | 0%                               | 0%      | 0%    | 0%                               | 0%      | 0%    | 40%                                                 | 20%     | 0%    | 0%                                                  | 0%      | 0%    |
| Outbound Project Traffic    |                               | 0                                | 0       | 0     | 0                                | 0       | 0     | 124                                                 | 62      | 0     | 0                                                   | 0       | 0     |
| Total Residential Trips     |                               | 0                                | 0       | 40    | 0                                | 0       | 0     | 124                                                 | 62      | 0     | 0                                                   | 20      | 0     |
| Total Project Traffic       |                               | 0                                | 0       | 71    | 0                                | 0       | 0     | 143                                                 | 92      | 0     | 0                                                   | 69      | 0     |
| 2030 Buildout Total         |                               | 177                              | 0       | 90    | 0                                | 0       | 0     | 163                                                 | 414     | 0     | 0                                                   | 529     | 412   |
| Percent Impact (Approach)   |                               | 26.6%                            |         |       | -                                |         |       | 40.7%                                               |         |       | 7.3%                                                |         |       |
| Overall Percent Impact      |                               | 21.0%                            |         |       |                                  |         |       |                                                     |         |       |                                                     |         |       |

PM PEAK HOUR  
 PM PHF = 0.96

| Description                   |                               | Covered Bridge Road |         |       | Covered Bridge Road |         |       | N. O'Neill Street/Covered Bridge Road |         |       | N. O'Neill Street/Covered Bridge Road |         |       |
|-------------------------------|-------------------------------|---------------------|---------|-------|---------------------|---------|-------|---------------------------------------|---------|-------|---------------------------------------|---------|-------|
|                               |                               | Eastbound           |         | Right | Westbound           |         | Right | Northbound                            |         | Right | Southbound                            |         | Right |
| Left                          | Through                       | Left                | Through |       | Left                | Through |       | Left                                  | Through |       | Left                                  | Through |       |
| 2018                          | Traffic Count                 | 308                 | 0       | 7     | 0                   | 0       | 0     | 7                                     | 429     | 0     | 0                                     | 297     | 178   |
|                               | Growth to 2020                | 32                  | 0       | 1     | 0                   | 0       | 0     | 1                                     | 44      | 0     | 0                                     | 30      | 18    |
| 2020                          | Existing Traffic              | 340                 | 0       | 8     | 0                   | 0       | 0     | 8                                     | 473     | 0     | 0                                     | 327     | 196   |
| Growth Factor (0.02 per year) |                               | 0.219               | 0.219   | 0.219 | 0.219               | 0.219   | 0.219 | 0.219                                 | 0.219   | 0.219 | 0.219                                 | 0.219   | 0.219 |
| 2030                          | Background Growth             | 74                  | 0       | 2     | 0                   | 0       | 0     | 2                                     | 104     | 0     | 0                                     | 72      | 43    |
| Committed Projects            |                               |                     |         |       |                     |         |       |                                       |         |       |                                       |         |       |
|                               | Academy Point (Barbour Tract) | 0                   | 0       | 9     | 0                   | 0       | 0     | 5                                     | 3       | 0     | 0                                     | 4       | 0     |
|                               | Steeple Chase (Senior Adult)  | 5                   | 0       | 5     | 0                   | 0       | 0     | 8                                     | 10      | 0     | 0                                     | 16      | 8     |
|                               | Walton Acres at Riverwood     | 52                  | 0       | 0     | 0                   | 0       | 0     | 0                                     | 70      | 0     | 0                                     | 40      | 29    |
| Total Committed Traffic       |                               | 57                  | 0       | 14    | 0                   | 0       | 0     | 13                                    | 83      | 0     | 0                                     | 60      | 37    |
| 2030                          | Background Traffic            | 471                 | 0       | 24    | 0                   | 0       | 0     | 23                                    | 660     | 0     | 0                                     | 459     | 276   |
| Project Traffic               |                               |                     |         |       |                     |         |       |                                       |         |       |                                       |         |       |
| Retail Traffic                |                               |                     |         |       |                     |         |       |                                       |         |       |                                       |         |       |
| Percent Assignment Inbound    |                               | 0%                  | 0%      | 25%   | 0%                  | 0%      | 0%    | 0%                                    | 0%      | 0%    | 0%                                    | 40%     | 0%    |
| Inbound Project Traffic       |                               | 0                   | 0       | 42    | 0                   | 0       | 0     | 0                                     | 0       | 0     | 0                                     | 67      | 0     |
| Percent Assignment Outbound   |                               | 0%                  | 0%      | 0%    | 0%                  | 0%      | 0%    | 25%                                   | 40%     | 0%    | 0%                                    | 0%      | 0%    |
| Outbound Project Traffic      |                               | 0                   | 0       | 0     | 0                   | 0       | 0     | 36                                    | 57      | 0     | 0                                     | 0       | 0     |
| Total Retail Trips            |                               | 0                   | 0       | 42    | 0                   | 0       | 0     | 36                                    | 57      | 0     | 0                                     | 67      | 0     |
| Residential Traffic           |                               |                     |         |       |                     |         |       |                                       |         |       |                                       |         |       |
| Percent Assignment Inbound    |                               | 0%                  | 0%      | 40%   | 0%                  | 0%      | 0%    | 0%                                    | 0%      | 0%    | 0%                                    | 20%     | 0%    |
| Inbound Project Traffic       |                               | 0                   | 0       | 102   | 0                   | 0       | 0     | 0                                     | 0       | 0     | 0                                     | 51      | 0     |
| Percent Assignment Outbound   |                               | 0%                  | 0%      | 0%    | 0%                  | 0%      | 0%    | 40%                                   | 20%     | 0%    | 0%                                    | 0%      | 0%    |
| Outbound Project Traffic      |                               | 0                   | 0       | 0     | 0                   | 0       | 0     | 68                                    | 34      | 0     | 0                                     | 0       | 0     |
| Total Residential Trips       |                               | 0                   | 0       | 102   | 0                   | 0       | 0     | 68                                    | 34      | 0     | 0                                     | 51      | 0     |
| Total Project Traffic         |                               | 0                   | 0       | 144   | 0                   | 0       | 0     | 104                                   | 91      | 0     | 0                                     | 118     | 0     |
| 2030                          | Buildout Total                | 471                 | 0       | 168   | 0                   | 0       | 0     | 127                                   | 751     | 0     | 0                                     | 577     | 276   |
| Percent Impact (Approach)     |                               | 22.5%               |         |       | -                   |         |       | 22.2%                                 |         |       | 13.8%                                 |         |       |
| Overall Percent Impact        |                               | 19.3%               |         |       |                     |         |       |                                       |         |       |                                       |         |       |

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8/2/20

# INTERSECTION ANALYSIS SHEET

Project: Ashcroft Phase 2  
 Location: Clayton, NC  
 Scenario: Scenario #1 - No Covered Bridge Realignment  
 Ct. Date: Feb 2017 (From Walton Acres @ Riverwood)  
 N/S Street: Covered Bridge Road  
 E/W Street: Pritchard Road/Private Driveway

|       |        |       |        |
|-------|--------|-------|--------|
| AM In | AM Out | PM In | PM Out |
| 123   | 76     | 168   | 142    |
| 0     | 0      | 75    | 75     |

|                            |          |                |      |     |
|----------------------------|----------|----------------|------|-----|
| Retail Net New Trips:      | 100      | 309            | 255  | 169 |
| Retail Pass-By Trips:      | 2.0%     | Existing Year: | 2020 |     |
| Residential Net New Trips: | 0.218994 | Buildout Year: | 2030 |     |

AM PEAK HOUR  
 AM PHF = 0.90

| Description                   | Pritchard Road<br>Eastbound |         |       | Private Driveway<br>Westbound |         |       | Covered Bridge Road<br>Northbound |         |       | Covered Bridge Road<br>Southbound |         |       |
|-------------------------------|-----------------------------|---------|-------|-------------------------------|---------|-------|-----------------------------------|---------|-------|-----------------------------------|---------|-------|
|                               | Left                        | Through | Right | Left                          | Through | Right | Left                              | Through | Right | Left                              | Through | Right |
| 2017 Traffic Count            | 195                         | 8       | 291   | 0                             | 0       | 0     | 306                               | 98      | 0     | 0                                 | 271     | 488   |
| Growth to 2020                | 31                          | 1       | 46    | 0                             | 0       | 0     | 48                                | 15      | 0     | 0                                 | 43      | 77    |
| 2020 Existing Traffic         | 226                         | 9       | 337   | 0                             | 0       | 0     | 354                               | 113     | 0     | 0                                 | 314     | 565   |
| Growth Factor (0.02 per year) | 0.219                       | 0.000   | 0.219 | 0.000                         | 0.000   | 0.000 | 0.219                             | 0.219   | 0.000 | 0.000                             | 0.219   | 0.219 |
| 2030 Background Growth        | 49                          | 0       | 74    | 0                             | 0       | 0     | 78                                | 25      | 0     | 0                                 | 69      | 124   |
| Committed Projects            |                             |         |       |                               |         |       |                                   |         |       |                                   |         |       |
| Academy Point (Barbour Tract) | 0                           | 0       | 1     | 0                             | 0       | 0     | 3                                 | 1       | 0     | 0                                 | 0       | 0     |
| Steeple Chase (Senior Adult)  | 0                           | 0       | 7     | 0                             | 0       | 0     | 17                                | 6       | 0     | 0                                 | 2       | 0     |
| Walton Acres at Riverwood     | -14                         | 0       | -32   | 0                             | 0       | 0     | 17                                | 30      | 0     | 0                                 | 10      | -5    |
| Total Committed Traffic       | -14                         | 0       | -24   | 0                             | 0       | 0     | 37                                | 37      | 0     | 0                                 | 12      | -5    |
| 2030 Background Traffic       | 261                         | 9       | 387   | 0                             | 0       | 0     | 469                               | 175     | 0     | 0                                 | 395     | 684   |
| Project Traffic               |                             |         |       |                               |         |       |                                   |         |       |                                   |         |       |
| Retail Traffic                |                             |         |       |                               |         |       |                                   |         |       |                                   |         |       |
| Percent Assignment Inbound    | 0%                          | 0%      | 10%   | 0%                            | 0%      | 0%    | 0%                                | 0%      | 0%    | 0%                                | 10%     | 0%    |
| Inbound Project Traffic       | 0                           | 0       | 12    | 0                             | 0       | 0     | 0                                 | 0       | 0     | 0                                 | 12      | 0     |
| Percent Assignment Outbound   | 0%                          | 0%      | 0%    | 0%                            | 0%      | 0%    | 10%                               | 10%     | 0%    | 0%                                | 0%      | 0%    |
| Outbound Project Traffic      | 0                           | 0       | 0     | 0                             | 0       | 0     | 8                                 | 8       | 0     | 0                                 | 0       | 0     |
| Total Retail Trips            | 0                           | 0       | 12    | 0                             | 0       | 0     | 8                                 | 8       | 0     | 0                                 | 12      | 0     |
| Residential Traffic           |                             |         |       |                               |         |       |                                   |         |       |                                   |         |       |
| Percent Assignment Inbound    | 0%                          | 0%      | 15%   | 0%                            | 0%      | 0%    | 0%                                | 0%      | 0%    | 0%                                | 5%      | 0%    |
| Inbound Project Traffic       | 0                           | 0       | 15    | 0                             | 0       | 0     | 0                                 | 0       | 0     | 0                                 | 5       | 0     |
| Percent Assignment Outbound   | 0%                          | 0%      | 0%    | 0%                            | 0%      | 0%    | 15%                               | 5%      | 0%    | 0%                                | 0%      | 0%    |
| Outbound Project Traffic      | 0                           | 0       | 0     | 0                             | 0       | 0     | 46                                | 15      | 0     | 0                                 | 0       | 0     |
| Total Residential Trips       | 0                           | 0       | 15    | 0                             | 0       | 0     | 46                                | 15      | 0     | 0                                 | 5       | 0     |
| Total Project Traffic         | 0                           | 0       | 27    | 0                             | 0       | 0     | 54                                | 23      | 0     | 0                                 | 17      | 0     |
| 2030 Buildout Total           | 261                         | 9       | 414   | 0                             | 0       | 0     | 523                               | 198     | 0     | 0                                 | 412     | 684   |
| Percent Impact (Approach)     |                             | 3.9%    |       |                               | -       |       |                                   | 10.7%   |       |                                   | 1.6%    |       |
| Overall Percent Impact        | 4.8%                        |         |       |                               |         |       |                                   |         |       |                                   |         |       |

PM PEAK HOUR  
 PM PHF = 0.90

| Description                   | Pritchard Road<br>Eastbound |         |       | Private Driveway<br>Westbound |         |       | Covered Bridge Road<br>Northbound |         |       | Covered Bridge Road<br>Southbound |         |       |
|-------------------------------|-----------------------------|---------|-------|-------------------------------|---------|-------|-----------------------------------|---------|-------|-----------------------------------|---------|-------|
|                               | Left                        | Through | Right | Left                          | Through | Right | Left                              | Through | Right | Left                              | Through | Right |
| 2017 Traffic Count            | 502                         | 1       | 241   | 0                             | 0       | 1     | 300                               | 271     | 0     | 0                                 | 202     | 261   |
| Growth to 2020                | 79                          | 0       | 38    | 0                             | 0       | 0     | 47                                | 43      | 0     | 0                                 | 32      | 41    |
| 2020 Existing Traffic         | 581                         | 1       | 279   | 0                             | 0       | 1     | 347                               | 314     | 0     | 0                                 | 234     | 302   |
| Growth Factor (0.02 per year) | 0.219                       | 0.000   | 0.219 | 0.000                         | 0.000   | 0.000 | 0.219                             | 0.219   | 0.000 | 0.000                             | 0.219   | 0.219 |
| 2030 Background Growth        | 127                         | 0       | 61    | 0                             | 0       | 0     | 76                                | 69      | 0     | 0                                 | 51      | 66    |
| Committed Projects            |                             |         |       |                               |         |       |                                   |         |       |                                   |         |       |
| Academy Point (Barbour Tract) | 0                           | 0       | 3     | 0                             | 0       | 0     | 2                                 | 1       | 0     | 0                                 | 1       | 0     |
| Steeple Chase (Senior Adult)  | 0                           | 0       | 18    | 0                             | 0       | 0     | 11                                | 4       | 0     | 0                                 | 6       | 0     |
| Walton Acres at Riverwood     | -9                          | 0       | 7     | 0                             | 0       | 0     | -27                               | 19      | 0     | 0                                 | 34      | -16   |
| Total Committed Traffic       | -9                          | 0       | 28    | 0                             | 0       | 0     | -14                               | 24      | 0     | 0                                 | 41      | -16   |
| 2030 Background Traffic       | 699                         | 1       | 368   | 0                             | 0       | 1     | 409                               | 407     | 0     | 0                                 | 326     | 352   |
| Project Traffic               |                             |         |       |                               |         |       |                                   |         |       |                                   |         |       |
| Retail Traffic                |                             |         |       |                               |         |       |                                   |         |       |                                   |         |       |
| Percent Assignment Inbound    | 0%                          | 0%      | 10%   | 0%                            | 0%      | 0%    | 0%                                | 0%      | 0%    | 0%                                | 10%     | 0%    |
| Inbound Project Traffic       | 0                           | 0       | 17    | 0                             | 0       | 0     | 0                                 | 0       | 0     | 0                                 | 17      | 0     |
| Percent Assignment Outbound   | 0%                          | 0%      | 0%    | 0%                            | 0%      | 0%    | 10%                               | 10%     | 0%    | 0%                                | 0%      | 0%    |
| Outbound Project Traffic      | 0                           | 0       | 0     | 0                             | 0       | 0     | 14                                | 14      | 0     | 0                                 | 0       | 0     |
| Total Retail Trips            | 0                           | 0       | 17    | 0                             | 0       | 0     | 14                                | 14      | 0     | 0                                 | 17      | 0     |
| Residential Traffic           |                             |         |       |                               |         |       |                                   |         |       |                                   |         |       |
| Percent Assignment Inbound    | 0%                          | 0%      | 15%   | 0%                            | 0%      | 0%    | 0%                                | 0%      | 0%    | 0%                                | 5%      | 0%    |
| Inbound Project Traffic       | 0                           | 0       | 38    | 0                             | 0       | 0     | 0                                 | 0       | 0     | 0                                 | 13      | 0     |
| Percent Assignment Outbound   | 0%                          | 0%      | 0%    | 0%                            | 0%      | 0%    | 15%                               | 5%      | 0%    | 0%                                | 0%      | 0%    |
| Outbound Project Traffic      | 0                           | 0       | 0     | 0                             | 0       | 0     | 25                                | 8       | 0     | 0                                 | 0       | 0     |
| Total Residential Trips       | 0                           | 0       | 38    | 0                             | 0       | 0     | 25                                | 8       | 0     | 0                                 | 13      | 0     |
| Total Project Traffic         | 0                           | 0       | 55    | 0                             | 0       | 0     | 39                                | 22      | 0     | 0                                 | 30      | 0     |
| 2030 Buildout Total           | 699                         | 1       | 423   | 0                             | 0       | 1     | 448                               | 429     | 0     | 0                                 | 356     | 352   |
| Percent Impact (Approach)     |                             | 4.9%    |       |                               | 0.0%    |       |                                   | 7.0%    |       |                                   | 4.2%    |       |
| Overall Percent Impact        | 5.4%                        |         |       |                               |         |       |                                   |         |       |                                   |         |       |

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8/2/20



# INTERSECTION ANALYSIS SHEET

Project: Ashcroft Phase 2  
 Location: Clayton, NC  
 Scenario: Scenario #1 - No Covered Bridge Realignment  
 Ct. Date:  
 N/S Street: N. O'Neill Street  
 E/W Street: Steeplechase Dwy 2/South Full-Mvmt Dwy

|                                |                     |       |        |
|--------------------------------|---------------------|-------|--------|
| AM In                          | AM Out              | PM In | PM Out |
| Retail Net New Trips: 123      | 76                  | 168   | 142    |
| Retail Pass-By Trips: 0        | 0                   | 75    | 75     |
| Residential Net New Trips: 100 | 309                 | 255   | 169    |
| Annual Growth Rate: 2.0%       | Existing Year: 2020 |       |        |
| Growth Factor: 0.218994        | Buildout Year: 2030 |       |        |

AM PEAK HOUR  
 AM PHF = 0.90

|                               | Steeplechase Site Drwy. 2 |         |       | South Site Driveway |         |       | N. O'Neill Street |         |       | N. O'Neill Street |         |       |
|-------------------------------|---------------------------|---------|-------|---------------------|---------|-------|-------------------|---------|-------|-------------------|---------|-------|
| Description                   | Left                      | Through | Right | Left                | Through | Right | Left              | Through | Right | Left              | Through | Right |
| 2020 Traffic Count            | 0                         | 0       | 0     | 0                   | 0       | 0     | 0                 | 0       | 0     | 0                 | 0       | 0     |
| Count Balancing               | 0                         | 0       | 0     | 0                   | 0       | 0     | 0                 | 239     | 0     | 0                 | 327     | 0     |
| 2020 Existing Traffic         | 0                         | 0       | 0     | 0                   | 0       | 0     | 0                 | 239     | 0     | 0                 | 327     | 0     |
| Growth Factor (0.02 per year) | 0.219                     | 0.219   | 0.219 | 0.219               | 0.219   | 0.219 | 0.219             | 0.219   | 0.219 | 0.219             | 0.219   | 0.219 |
| 2030 Background Growth        | 0                         | 0       | 0     | 0                   | 0       | 0     | 0                 | 52      | 0     | 0                 | 72      | 0     |
| Committed Projects            |                           |         |       |                     |         |       |                   |         |       |                   |         |       |
| Academy Point (Barbour Tract) | 0                         | 0       | 0     | 0                   | 0       | 0     | 0                 | 12      | 0     | 0                 | 4       | 0     |
| Steeple Chase (Senior Adult)  | 15                        | 0       | 22    | 0                   | 0       | 0     | 9                 | 3       | 0     | 0                 | 7       | 6     |
| Walton Acres at Riverwood     | 0                         | 0       | 0     | 0                   | 0       | 0     | 0                 | 20      | 0     | 0                 | 63      | 0     |
| Total Committed Traffic       | 15                        | 0       | 22    | 0                   | 0       | 0     | 9                 | 35      | 0     | 0                 | 74      | 6     |
| 2030 Background Traffic       | 15                        | 0       | 22    | 0                   | 0       | 0     | 9                 | 326     | 0     | 0                 | 473     | 6     |
| Project Traffic               |                           |         |       |                     |         |       |                   |         |       |                   |         |       |
| Retail Traffic                |                           |         |       |                     |         |       |                   |         |       |                   |         |       |
| Percent Assignment Inbound    | 0%                        | 0%      | 0%    | 0%                  | 0%      | 0%    | 0%                | 25%     | 10%   | 25%               | 0%      | 0%    |
| Inbound Project Traffic       | 0                         | 0       | 0     | 0                   | 0       | 0     | 0                 | 31      | 12    | 31                | 0       | 0     |
| Percent Assignment Outbound   | 0%                        | 0%      | 0%    | 25%                 | 0%      | 10%   | 0%                | 0%      | 0%    | 0%                | 10%     | 0%    |
| Outbound Project Traffic      | 0                         | 0       | 0     | 19                  | 0       | 8     | 0                 | 0       | 0     | 0                 | 8       | 0     |
| Total Retail Trips            | 0                         | 0       | 0     | 19                  | 0       | 8     | 0                 | 31      | 12    | 31                | 8       | 0     |
|                               |                           |         |       |                     |         |       |                   |         |       |                   |         |       |
| Residential Traffic           |                           |         |       |                     |         |       |                   |         |       |                   |         |       |
| Percent Assignment Inbound    | 0%                        | 0%      | 0%    | 0%                  | 0%      | 0%    | 0%                | 25%     | 10%   | 5%                | 0%      | 0%    |
| Inbound Project Traffic       | 0                         | 0       | 0     | 0                   | 0       | 0     | 0                 | 25      | 10    | 5                 | 0       | 0     |
| Percent Assignment Outbound   | 0%                        | 0%      | 0%    | 5%                  | 0%      | 5%    | 0%                | 0%      | 0%    | 0%                | 30%     | 0%    |
| Outbound Project Traffic      | 0                         | 0       | 0     | 15                  | 0       | 15    | 0                 | 0       | 0     | 0                 | 93      | 0     |
| Total Residential Trips       | 0                         | 0       | 0     | 15                  | 0       | 15    | 0                 | 25      | 10    | 5                 | 93      | 0     |
| Total Project Traffic         | 0                         | 0       | 0     | 34                  | 0       | 23    | 0                 | 56      | 22    | 36                | 101     | 0     |
| 2030 Buildout Total           | 15                        | 0       | 22    | 34                  | 0       | 23    | 9                 | 382     | 22    | 36                | 574     | 6     |
| Percent Impact (Approach)     | 0.0%                      |         |       | 100.0%              |         |       | 18.9%             |         |       | 22.2%             |         |       |

PM PEAK HOUR  
 PM PHF = 0.90

|                               | Steeplechase Site Drwy. 2 |                   |       | South Site Driveway |                   |       | N. O'Neill Street |                    |       | N. O'Neill Street |                    |       |
|-------------------------------|---------------------------|-------------------|-------|---------------------|-------------------|-------|-------------------|--------------------|-------|-------------------|--------------------|-------|
| Description                   | Left                      | Eastbound Through | Right | Left                | Westbound Through | Right | Left              | Northbound Through | Right | Left              | Southbound Through | Right |
| 2020 Traffic Count            | 0                         | 0                 | 0     | 0                   | 0                 | 0     | 0                 | 0                  | 0     | 0                 | 0                  | 0     |
| Count Balancing               | 0                         | 0                 | 0     | 0                   | 0                 | 0     | 0                 | 481                | 0     | 0                 | 335                | 0     |
| 2020 Existing Traffic         | 0                         | 0                 | 0     | 0                   | 0                 | 0     | 0                 | 481                | 0     | 0                 | 335                | 0     |
| Growth Factor (0.02 per year) | 0.219                     | 0.219             | 0.219 | 0.219               | 0.219             | 0.219 | 0.219             | 0.219              | 0.219 | 0.219             | 0.219              | 0.219 |
| 2030 Background Growth        | 0                         | 0                 | 0     | 0                   | 0                 | 0     | 0                 | 105                | 0     | 0                 | 73                 | 0     |
| Committed Projects            |                           |                   |       |                     |                   |       |                   |                    |       |                   |                    |       |
| Academy Point (Barbour Tract) | 0                         | 0                 | 0     | 0                   | 0                 | 0     | 0                 | 8                  | 0     | 0                 | 13                 | 0     |
| Steeple Chase (Senior Adult)  | 10                        | 0                 | 14    | 0                   | 0                 | 0     | 23                | 8                  | 0     | 0                 | 5                  | 16    |
| Walton Acres at Riverwood     | 0                         | 0                 | 0     | 0                   | 0                 | 0     | 0                 | 70                 | 0     | 0                 | 40                 | 0     |
| Total Committed Traffic       | 10                        | 0                 | 14    | 0                   | 0                 | 0     | 23                | 86                 | 0     | 0                 | 58                 | 16    |
| 2030 Background Traffic       | 10                        | 0                 | 14    | 0                   | 0                 | 0     | 23                | 672                | 0     | 0                 | 466                | 16    |
| Project Traffic               |                           |                   |       |                     |                   |       |                   |                    |       |                   |                    |       |
| Retail Traffic                |                           |                   |       |                     |                   |       |                   |                    |       |                   |                    |       |
| Percent Assignment Inbound    | 0%                        | 0%                | 0%    | 0%                  | 0%                | 0%    | 0%                | 25%                | 10%   | 25%               | 0%                 | 0%    |
| Inbound Project Traffic       | 0                         | 0                 | 0     | 0                   | 0                 | 0     | 0                 | 42                 | 17    | 42                | 0                  | 0     |
| Percent Assignment Outbound   | 0%                        | 0%                | 0%    | 25%                 | 0%                | 10%   | 0%                | 0%                 | 0%    | 0%                | 10%                | 0%    |
| Outbound Project Traffic      | 0                         | 0                 | 0     | 36                  | 0                 | 14    | 0                 | 0                  | 0     | 0                 | 14                 | 0     |
| Total External Site Traffic   | 0                         | 0                 | 0     | 36                  | 0                 | 14    | 0                 | 42                 | 17    | 42                | 14                 | 0     |
| Pass-By Capture Reduction     | 0                         | 0                 | 0     | 0                   | 0                 | 0     | 0                 | -41                | 0     | 0                 | -34                | 0     |
| Pass-By Capture Assignment    | 0                         | 0                 | 0     | 11                  | 0                 | 4     | 0                 | 30                 | 11    | 11                | 23                 | 0     |
| Total Pass-By Traffic         | 0                         | 0                 | 0     | 11                  | 0                 | 4     | 0                 | -11                | 11    | 11                | -11                | 0     |
| Total Retail Trips            | 0                         | 0                 | 0     | 47                  | 0                 | 18    | 0                 | 31                 | 28    | 53                | 3                  | 0     |
| Residential Traffic           |                           |                   |       |                     |                   |       |                   |                    |       |                   |                    |       |
| Percent Assignment Inbound    | 0%                        | 0%                | 0%    | 0%                  | 0%                | 0%    | 0%                | 25%                | 10%   | 5%                | 0%                 | 0%    |
| Inbound Project Traffic       | 0                         | 0                 | 0     | 0                   | 0                 | 0     | 0                 | 64                 | 25    | 13                | 0                  | 0     |
| Percent Assignment Outbound   | 0%                        | 0%                | 0%    | 5%                  | 0%                | 5%    | 0%                | 0%                 | 0%    | 0%                | 30%                | 0%    |
| Outbound Project Traffic      | 0                         | 0                 | 0     | 8                   | 0                 | 8     | 0                 | 0                  | 0     | 0                 | 51                 | 0     |
| Total Residential Trips       | 0                         | 0                 | 0     | 8                   | 0                 | 8     | 0                 | 64                 | 25    | 13                | 51                 | 0     |
| Total Project Traffic         | 0                         | 0                 | 0     | 55                  | 0                 | 26    | 0                 | 95                 | 53    | 66                | 54                 | 0     |
| 2030 Buildout Total           | 10                        | 0                 | 14    | 55                  | 0                 | 26    | 23                | 767                | 53    | 66                | 520                | 16    |
| Percent Impact (Approach)     |                           | 0.0%              |       |                     | 100.0%            |       |                   | 17.6%              |       |                   | 19.9%              |       |
| Overall Percent Impact        | 22.5%                     |                   |       |                     |                   |       |                   |                    |       |                   |                    |       |

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8/2/20

# INTERSECTION ANALYSIS SHEET

Project: Ashcroft Phase 2  
 Location: Clayton, NC  
 Scenario: Scenario #1 - No Covered Bridge Realignment  
 Ct. Date:  
 N/S Street: N. O'Neill Street  
 E/W Street: Pod A RI/RO Driveway

|                                |                     |       |        |
|--------------------------------|---------------------|-------|--------|
| AM In                          | AM Out              | PM In | PM Out |
| Retail Net New Trips: 123      | 76                  | 168   | 142    |
| Retail Pass-By Trips: 0        | 0                   | 75    | 75     |
| Residential Net New Trips: 100 | 309                 | 255   | 169    |
| Annual Growth Rate: 2.0%       | Existing Year: 2020 |       |        |
| Growth Factor: 0.218994        | Buildout Year: 2030 |       |        |

AM PEAK HOUR  
 AM PHF = 0.90

| Description                   | Pod A RI/RO Driveway<br>Eastbound |         |       | Pod A RI/RO Driveway<br>Westbound |         |       | N. O'Neill Street<br>Northbound |         |       | N. O'Neill Street<br>Southbound |         |       |
|-------------------------------|-----------------------------------|---------|-------|-----------------------------------|---------|-------|---------------------------------|---------|-------|---------------------------------|---------|-------|
|                               | Left                              | Through | Right | Left                              | Through | Right | Left                            | Through | Right | Left                            | Through | Right |
| 2020 Traffic Count            | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 0       | 0     | 0                               | 0       | 0     |
| Count Balancing               | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 239     | 0     | 0                               | 327     | 0     |
| 2020 Existing Traffic         | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 239     | 0     | 0                               | 327     | 0     |
| Growth Factor (0.02 per year) | 0.219                             | 0.219   | 0.219 | 0.219                             | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 |
| 2030 Background Growth        | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 52      | 0     | 0                               | 72      | 0     |
| Committed Projects            |                                   |         |       |                                   |         |       |                                 |         |       |                                 |         |       |
| Academy Point (Barbour Tract) | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 12      | 0     | 0                               | 4       | 0     |
| Steeple Chase (Senior Adult)  | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 18      | 0     | 0                               | 13      | 0     |
| Walton Acres at Riverwood     | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 20      | 0     | 0                               | 63      | 0     |
| Total Committed Traffic       | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 50      | 0     | 0                               | 80      | 0     |
| 2030 Background Traffic       | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 341     | 0     | 0                               | 479     | 0     |
| Project Traffic               |                                   |         |       |                                   |         |       |                                 |         |       |                                 |         |       |
| Retail Traffic                |                                   |         |       |                                   |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 0%                                | 0%      | 0%    | 0%                                | 0%      | 0%    | 0%                              | 0%      | 25%   | 0%                              | 25%     | 0%    |
| Inbound Project Traffic       | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 0       | 31    | 0                               | 31      | 0     |
| Percent Assignment Outbound   | 0%                                | 0%      | 0%    | 0%                                | 0%      | 40%   | 0%                              | 10%     | 0%    | 0%                              | 10%     | 0%    |
| Outbound Project Traffic      | 0                                 | 0       | 0     | 0                                 | 0       | 30    | 0                               | 8       | 0     | 0                               | 8       | 0     |
| Total Retail Trips            | 0                                 | 0       | 0     | 0                                 | 0       | 30    | 0                               | 8       | 31    | 0                               | 39      | 0     |
| Residential Traffic           |                                   |         |       |                                   |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 0%                                | 0%      | 0%    | 0%                                | 0%      | 0%    | 0%                              | 25%     | 0%    | 0%                              | 5%      | 0%    |
| Inbound Project Traffic       | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 25      | 0     | 0                               | 5       | 0     |
| Percent Assignment Outbound   | 0%                                | 0%      | 0%    | 0%                                | 0%      | 0%    | 0%                              | 5%      | 0%    | 0%                              | 30%     | 0%    |
| Outbound Project Traffic      | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 15      | 0     | 0                               | 93      | 0     |
| Total Residential Trips       | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 40      | 0     | 0                               | 98      | 0     |
| Total Project Traffic         | 0                                 | 0       | 0     | 0                                 | 0       | 30    | 0                               | 48      | 31    | 0                               | 137     | 0     |
| 2030 Buildout Total           | 0                                 | 0       | 0     | 0                                 | 0       | 30    | 0                               | 389     | 31    | 0                               | 616     | 0     |
| Percent Impact (Approach)     | -                                 | -       | -     | -                                 | -       | -     | -                               | 18.8%   | -     | -                               | 22.2%   | -     |
| Overall Percent Impact        | 23.1%                             |         |       |                                   |         |       |                                 |         |       |                                 |         |       |

PM PEAK HOUR  
 PM PHF = 0.90

| Description                   | Pod A RI/RO Driveway<br>Eastbound |         |       | Pod A RI/RO Driveway<br>Westbound |         |       | N. O'Neill Street<br>Northbound |         |       | N. O'Neill Street<br>Southbound |         |       |
|-------------------------------|-----------------------------------|---------|-------|-----------------------------------|---------|-------|---------------------------------|---------|-------|---------------------------------|---------|-------|
|                               | Left                              | Through | Right | Left                              | Through | Right | Left                            | Through | Right | Left                            | Through | Right |
| 2020 Traffic Count            | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 0       | 0     | 0                               | 0       | 0     |
| Count Balancing               | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 481     | 0     | 0                               | 335     | 0     |
| 2020 Existing Traffic         | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 481     | 0     | 0                               | 335     | 0     |
| Growth Factor (0.02 per year) | 0.219                             | 0.219   | 0.219 | 0.219                             | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 |
| 2030 Background Growth        | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 105     | 0     | 0                               | 73      | 0     |
| Committed Projects            |                                   |         |       |                                   |         |       |                                 |         |       |                                 |         |       |
| Academy Point (Barbour Tract) | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 8       | 0     | 0                               | 13      | 0     |
| Steeple Chase (Senior Adult)  | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 18      | 0     | 0                               | 21      | 0     |
| Walton Acres at Riverwood     | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 70      | 0     | 0                               | 40      | 0     |
| Total Committed Traffic       | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 96      | 0     | 0                               | 74      | 0     |
| 2030 Background Traffic       | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 682     | 0     | 0                               | 482     | 0     |
| Project Traffic               |                                   |         |       |                                   |         |       |                                 |         |       |                                 |         |       |
| Retail Traffic                |                                   |         |       |                                   |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 0%                                | 0%      | 0%    | 0%                                | 0%      | 0%    | 0%                              | 0%      | 25%   | 0%                              | 25%     | 0%    |
| Inbound Project Traffic       | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 0       | 42    | 0                               | 42      | 0     |
| Percent Assignment Outbound   | 0%                                | 0%      | 0%    | 0%                                | 0%      | 40%   | 0%                              | 10%     | 0%    | 0%                              | 10%     | 0%    |
| Outbound Project Traffic      | 0                                 | 0       | 0     | 0                                 | 0       | 57    | 0                               | 14      | 0     | 0                               | 14      | 0     |
| Total External Site Traffic   | 0                                 | 0       | 0     | 0                                 | 0       | 57    | 0                               | 14      | 42    | 0                               | 56      | 0     |
| Pass-By Capture Reduction     | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | -41     | 0     | 0                               | -34     | 0     |
| Pass-By Capture Assignment    | 0                                 | 0       | 0     | 0                                 | 0       | 34    | 0                               | 8       | 26    | 0                               | 34      | 0     |
| Total Pass-By Traffic         | 0                                 | 0       | 0     | 0                                 | 0       | 34    | 0                               | -33     | 26    | 0                               | 0       | 0     |
| Total Retail Trips            | 0                                 | 0       | 0     | 0                                 | 0       | 91    | 0                               | -19     | 68    | 0                               | 56      | 0     |
| Residential Traffic           |                                   |         |       |                                   |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 0%                                | 0%      | 0%    | 0%                                | 0%      | 0%    | 0%                              | 25%     | 0%    | 0%                              | 5%      | 0%    |
| Inbound Project Traffic       | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 64      | 0     | 0                               | 13      | 0     |
| Percent Assignment Outbound   | 0%                                | 0%      | 0%    | 0%                                | 0%      | 0%    | 0%                              | 5%      | 0%    | 0%                              | 30%     | 0%    |
| Outbound Project Traffic      | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 8       | 0     | 0                               | 51      | 0     |
| Total Residential Trips       | 0                                 | 0       | 0     | 0                                 | 0       | 0     | 0                               | 72      | 0     | 0                               | 64      | 0     |
| Total Project Traffic         | 0                                 | 0       | 0     | 0                                 | 0       | 91    | 0                               | 53      | 68    | 0                               | 120     | 0     |
| 2030 Buildout Total           | 0                                 | 0       | 0     | 0                                 | 0       | 91    | 0                               | 725     | 68    | 0                               | 602     | 0     |
| Percent Impact (Approach)     | -                                 | -       | -     | -                                 | -       | -     | -                               | 15.1%   | -     | -                               | 19.9%   | -     |
| Overall Percent Impact        | 22.2%                             |         |       |                                   |         |       |                                 |         |       |                                 |         |       |

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8/2/20

# INTERSECTION ANALYSIS SHEET

Project: Ashcroft Phase 2  
 Location: Clayton, NC  
 Scenario: Scenario #1 - No Covered Bridge Realignment  
 Ct. Date:  
 N/S Street: N. O'Neill Street  
 E/W Street: Covered Bridge Road Extension

|                                |                     |       |        |
|--------------------------------|---------------------|-------|--------|
| AM In                          | AM Out              | PM In | PM Out |
| Retail Net New Trips: 123      | 76                  | 168   | 142    |
| Retail Pass-By Trips: 0        | 0                   | 75    | 75     |
| Residential Net New Trips: 100 | 309                 | 255   | 169    |
| Annual Growth Rate: 2.0%       | Existing Year: 2020 |       |        |
| Growth Factor: 0.218994        | Buildout Year: 2030 |       |        |

AM PEAK HOUR  
 AM PHF = 0.90

| Description                   | Covered Bridge Road Extension<br>Eastbound |         |       | Covered Bridge Road Extension<br>Westbound |         |       | N. O'Neill Street<br>Northbound |         |       | N. O'Neill Street<br>Southbound |         |       |
|-------------------------------|--------------------------------------------|---------|-------|--------------------------------------------|---------|-------|---------------------------------|---------|-------|---------------------------------|---------|-------|
|                               | Left                                       | Through | Right | Left                                       | Through | Right | Left                            | Through | Right | Left                            | Through | Right |
| 2020 Traffic Count            | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 0       | 0     | 0                               | 0       | 0     |
| Count Balancing               | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 239     | 0     | 0                               | 327     | 0     |
| 2020 Existing Traffic         | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 239     | 0     | 0                               | 327     | 0     |
| Growth Factor (0.02 per year) | 0.219                                      | 0.219   | 0.219 | 0.219                                      | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 |
| 2030 Background Growth        | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 52      | 0     | 0                               | 72      | 0     |
| Committed Projects            |                                            |         |       |                                            |         |       |                                 |         |       |                                 |         |       |
| Academy Point (Barbour Tract) | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 12      | 0     | 0                               | 4       | 0     |
| Steeple Chase (Senior Adult)  | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 18      | 0     | 0                               | 13      | 0     |
| Walton Acres at Riverwood     | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 20      | 0     | 0                               | 63      | 0     |
| Total Committed Traffic       | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 50      | 0     | 0                               | 80      | 0     |
| 2030 Background Traffic       | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 341     | 0     | 0                               | 479     | 0     |
| Project Traffic               |                                            |         |       |                                            |         |       |                                 |         |       |                                 |         |       |
| Retail Traffic                |                                            |         |       |                                            |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 0%                                         | 0%      | 0%    | 0%                                         | 0%      | 0%    | 0%                              | 0%      | 0%    | 40%                             | 25%     | 0%    |
| Inbound Project Traffic       | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 0       | 0     | 49                              | 31      | 0     |
| Percent Assignment Outbound   | 0%                                         | 0%      | 0%    | 10%                                        | 0%      | 15%   | 0%                              | 50%     | 0%    | 0%                              | 0%      | 0%    |
| Outbound Project Traffic      | 0                                          | 0       | 0     | 8                                          | 0       | 11    | 0                               | 38      | 0     | 0                               | 0       | 0     |
| Total Retail Trips            | 0                                          | 0       | 0     | 8                                          | 0       | 11    | 0                               | 38      | 0     | 49                              | 31      | 0     |
| Residential Traffic           |                                            |         |       |                                            |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 0%                                         | 0%      | 0%    | 0%                                         | 0%      | 0%    | 0%                              | 0%      | 25%   | 55%                             | 5%      | 0%    |
| Inbound Project Traffic       | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 0       | 25    | 55                              | 5       | 0     |
| Percent Assignment Outbound   | 0%                                         | 0%      | 0%    | 30%                                        | 0%      | 55%   | 0%                              | 5%      | 0%    | 0%                              | 0%      | 0%    |
| Outbound Project Traffic      | 0                                          | 0       | 0     | 93                                         | 0       | 171   | 0                               | 15      | 0     | 0                               | 0       | 0     |
| Total Residential Trips       | 0                                          | 0       | 0     | 93                                         | 0       | 171   | 0                               | 15      | 25    | 55                              | 5       | 0     |
| Total Project Traffic         | 0                                          | 0       | 0     | 101                                        | 0       | 182   | 0                               | 53      | 25    | 104                             | 36      | 0     |
| 2030 Buildout Total           | 0                                          | 0       | 0     | 101                                        | 0       | 182   | 0                               | 394     | 25    | 104                             | 515     | 0     |
| Percent Impact (Approach)     | -                                          | -       | -     | -                                          | 100.0%  | -     | -                               | 18.6%   | -     | -                               | 22.6%   | -     |
| Overall Percent Impact        | 37.9%                                      |         |       |                                            |         |       |                                 |         |       |                                 |         |       |

PM PEAK HOUR  
 PM PHF = 0.90

| Description                   | Covered Bridge Road Extension<br>Eastbound |         |       | Covered Bridge Road Extension<br>Westbound |         |       | N. O'Neill Street<br>Northbound |         |       | N. O'Neill Street<br>Southbound |         |       |
|-------------------------------|--------------------------------------------|---------|-------|--------------------------------------------|---------|-------|---------------------------------|---------|-------|---------------------------------|---------|-------|
|                               | Left                                       | Through | Right | Left                                       | Through | Right | Left                            | Through | Right | Left                            | Through | Right |
| 2020 Traffic Count            | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 0       | 0     | 0                               | 0       | 0     |
| Count Balancing               | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 481     | 0     | 0                               | 335     | 0     |
| 2020 Existing Traffic         | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 481     | 0     | 0                               | 335     | 0     |
| Growth Factor (0.02 per year) | 0.219                                      | 0.219   | 0.219 | 0.219                                      | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 | 0.219                           | 0.219   | 0.219 |
| 2030 Background Growth        | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 105     | 0     | 0                               | 73      | 0     |
| Committed Projects            |                                            |         |       |                                            |         |       |                                 |         |       |                                 |         |       |
| Academy Point (Barbour Tract) | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 8       | 0     | 0                               | 13      | 0     |
| Steeple Chase (Senior Adult)  | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 18      | 0     | 0                               | 21      | 0     |
| Walton Acres at Riverwood     | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 70      | 0     | 0                               | 40      | 0     |
| Total Committed Traffic       | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 96      | 0     | 0                               | 74      | 0     |
| 2030 Background Traffic       | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 682     | 0     | 0                               | 482     | 0     |
| Project Traffic               |                                            |         |       |                                            |         |       |                                 |         |       |                                 |         |       |
| Retail Traffic                |                                            |         |       |                                            |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 0%                                         | 0%      | 0%    | 0%                                         | 0%      | 0%    | 0%                              | 0%      | 0%    | 40%                             | 25%     | 0%    |
| Inbound Project Traffic       | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 0       | 0     | 67                              | 42      | 0     |
| Percent Assignment Outbound   | 0%                                         | 0%      | 0%    | 10%                                        | 0%      | 15%   | 0%                              | 50%     | 0%    | 0%                              | 0%      | 0%    |
| Outbound Project Traffic      | 0                                          | 0       | 0     | 14                                         | 0       | 21    | 0                               | 71      | 0     | 0                               | 0       | 0     |
| Total External Site Traffic   | 0                                          | 0       | 0     | 14                                         | 0       | 21    | 0                               | 71      | 0     | 67                              | 42      | 0     |
| Pass-By Capture Reduction     | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | -41     | 0     | 0                               | -34     | 0     |
| Pass-By Capture Assignment    | 0                                          | 0       | 0     | 23                                         | 0       | 3     | 0                               | 38      | 4     | 23                              | 11      | 0     |
| Total Pass-By Traffic         | 0                                          | 0       | 0     | 23                                         | 0       | 3     | 0                               | -3      | 4     | 23                              | -23     | 0     |
| Total Retail Trips            | 0                                          | 0       | 0     | 37                                         | 0       | 24    | 0                               | 68      | 4     | 90                              | 19      | 0     |
| Residential Traffic           |                                            |         |       |                                            |         |       |                                 |         |       |                                 |         |       |
| Percent Assignment Inbound    | 0%                                         | 0%      | 0%    | 0%                                         | 0%      | 0%    | 0%                              | 0%      | 25%   | 55%                             | 5%      | 0%    |
| Inbound Project Traffic       | 0                                          | 0       | 0     | 0                                          | 0       | 0     | 0                               | 0       | 64    | 140                             | 13      | 0     |
| Percent Assignment Outbound   | 0%                                         | 0%      | 0%    | 30%                                        | 0%      | 55%   | 0%                              | 5%      | 0%    | 0%                              | 0%      | 0%    |
| Outbound Project Traffic      | 0                                          | 0       | 0     | 51                                         | 0       | 94    | 0                               | 8       | 0     | 0                               | 0       | 0     |
| Total Residential Trips       | 0                                          | 0       | 0     | 51                                         | 0       | 94    | 0                               | 8       | 64    | 140                             | 13      | 0     |
| Total Project Traffic         | 0                                          | 0       | 0     | 88                                         | 0       | 118   | 0                               | 76      | 68    | 230                             | 32      | 0     |
| 2030 Buildout Total           | 0                                          | 0       | 0     | 88                                         | 0       | 118   | 0                               | 758     | 68    | 230                             | 514     | 0     |
| Percent Impact (Approach)     | -                                          | -       | -     | -                                          | 100.0%  | -     | -                               | 17.4%   | -     | -                               | 35.2%   | -     |
| Overall Percent Impact        | 34.5%                                      |         |       |                                            |         |       |                                 |         |       |                                 |         |       |

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8/2/20

# INTERSECTION ANALYSIS SHEET

Project: Ashcroft Phase 2  
 Location: Clayton, NC  
 Scenario: Scenario #2 (Covered Bridge Realignment)  
 Ct. Date: Feb 2018 (From Steeplechase TIA)  
 N/S Street: N. O'Neill Street/Covered Bridge Road  
 E/W Street: Covered Bridge Rd/Covered Bridge Rd Ext.

|                           |        |       |        |
|---------------------------|--------|-------|--------|
| AM In                     | AM Out | PM In | PM Out |
| Retail Net New Trips: 123 | 76     | 168   | 142    |
| Retail Pass-By Trips: 0   | 0      | 75    | 75     |

|                                |                     |     |     |
|--------------------------------|---------------------|-----|-----|
| Residential Net New Trips: 100 | 309                 | 255 | 169 |
| Annual Growth Rate: 2.0%       | Existing Year: 2020 |     |     |
| Growth Factor: 0.218994        | Buildout Year: 2030 |     |     |

## AM PEAK HOUR AM PHF = 0.84

| Description                   |                               | Covered Bridge Road |         |       | Covered Bridge Road Extension |         |       | N. O'Neil Street |         |       | Covered Bridge Road |         |       |
|-------------------------------|-------------------------------|---------------------|---------|-------|-------------------------------|---------|-------|------------------|---------|-------|---------------------|---------|-------|
|                               |                               | Eastbound           |         |       | Westbound                     |         |       | Northbound       |         |       | Southbound          |         |       |
|                               |                               | Left                | Through | Right | Left                          | Through | Right | Left             | Through | Right | Left                | Through | Right |
| 2018                          | Traffic Count                 | 116                 | 0       | 6     | 0                             | 0       | 0     | 6                | 210     | 0     | 0                   | 290     | 269   |
|                               | Growth to 2020                | 12                  | 0       | 1     | 0                             | 0       | 0     | 1                | 22      | 0     | 0                   | 30      | 28    |
| 2020                          | Existing Traffic              | 128                 | 0       | 7     | 0                             | 0       | 0     | 7                | 232     | 0     | 0                   | 320     | 297   |
| Growth Factor (0.02 per year) |                               | 0.219               | 0.219   | 0.219 | 0.219                         | 0.219   | 0.219 | 0.219            | 0.219   | 0.219 | 0.219               | 0.219   | 0.219 |
| 2030                          | Background Growth             | 28                  | 0       | 2     | 0                             | 0       | 0     | 2                | 51      | 0     | 0                   | 70      | 65    |
| Committed Projects            |                               |                     |         |       |                               |         |       |                  |         |       |                     |         |       |
|                               | Academy Point (Barbour Tract) | 0                   | 0       | 3     | 0                             | 0       | 0     | 8                | 4       | 0     | 0                   | 1       | 0     |
|                               | Steeple Chase (Senior Adult)  | 7                   | 0       | 7     | 0                             | 0       | 0     | 3                | 15      | 0     | 0                   | 6       | 3     |
|                               | Walton Acres at Riverwood     | 14                  | 0       | 0     | 0                             | 0       | 0     | 0                | 20      | 0     | 0                   | 63      | 47    |
| Total Committed Traffic       |                               | 21                  | 0       | 10    | 0                             | 0       | 0     | 11               | 39      | 0     | 0                   | 70      | 50    |
| 2030                          | Background Traffic            | 177                 | 0       | 19    | 0                             | 0       | 0     | 20               | 322     | 0     | 0                   | 460     | 412   |
| Project Traffic               |                               |                     |         |       |                               |         |       |                  |         |       |                     |         |       |
| Retail Traffic                |                               |                     |         |       |                               |         |       |                  |         |       |                     |         |       |
| Percent Assignment Inbound    |                               | 0%                  | 15%     | 10%   | 0%                            | 0%      | 0%    | 0%               | 0%      | 0%    | 25%                 | 15%     | 0%    |
| Inbound Project Traffic       |                               | 0                   | 18      | 12    | 0                             | 0       | 0     | 0                | 0       | 0     | 31                  | 18      | 0     |
| Percent Assignment Outbound   |                               | 0%                  | 0%      | 0%    | 10%                           | 5%      | 10%   | 20%              | 30%     | 0%    | 0%                  | 0%      | 0%    |
| Outbound Project Traffic      |                               | 0                   | 0       | 0     | 8                             | 4       | 8     | 15               | 23      | 0     | 0                   | 0       | 0     |
| Total Retail Trips            |                               | 0                   | 18      | 12    | 8                             | 4       | 8     | 15               | 23      | 0     | 31                  | 18      | 0     |
|                               |                               |                     |         |       |                               |         |       |                  |         |       |                     |         |       |
| Residential Traffic           |                               |                     |         |       |                               |         |       |                  |         |       |                     |         |       |
| Percent Assignment Inbound    |                               | 0%                  | 35%     | 5%    | 0%                            | 0%      | 0%    | 0%               | 0%      | 25%   | 20%                 | 0%      | 0%    |
| Inbound Project Traffic       |                               | 0                   | 35      | 5     | 0                             | 0       | 0     | 0                | 0       | 25    | 20                  | 0       | 0     |
| Percent Assignment Outbound   |                               | 0%                  | 0%      | 0%    | 30%                           | 35%     | 20%   | 5%               | 0%      | 0%    | 0%                  | 0%      | 0%    |
| Outbound Project Traffic      |                               | 0                   | 0       | 0     | 93                            | 108     | 62    | 15               | 0       | 0     | 0                   | 0       | 0     |
| Total Residential Trips       |                               | 0                   | 35      | 5     | 93                            | 108     | 62    | 15               | 0       | 25    | 20                  | 0       | 0     |
| Total Project Traffic         |                               | 0                   | 53      | 17    | 101                           | 112     | 70    | 30               | 23      | 25    | 51                  | 18      | 0     |
| 2030                          | Buildout Total                | 177                 | 53      | 36    | 101                           | 112     | 70    | 50               | 345     | 25    | 51                  | 478     | 412   |
| Percent Impact (Approach)     |                               | 26.3%               |         |       | 100.0%                        |         |       | 18.6%            |         |       | 7.3%                |         |       |
| Overall Percent Impact        |                               | 26.2%               |         |       |                               |         |       |                  |         |       |                     |         |       |

## PM PEAK HOUR PM PHF = 0.96

| Description                   |                               | Covered Bridge Road |         |       | Covered Bridge Road Extension |         |       | N. O'Neil Street |         |       | Covered Bridge Road |         |       |
|-------------------------------|-------------------------------|---------------------|---------|-------|-------------------------------|---------|-------|------------------|---------|-------|---------------------|---------|-------|
|                               |                               | Eastbound           |         | Right | Westbound                     |         | Right | Northbound       |         | Right | Southbound          |         | Right |
| Left                          | Through                       | Left                | Through |       | Left                          | Through |       | Left             | Through |       | Left                | Through |       |
| 2018                          | Traffic Count                 | 308                 | 0       | 7     | 0                             | 0       | 0     | 7                | 429     | 0     | 0                   | 297     | 178   |
|                               | Growth to 2020                | 32                  | 0       | 1     | 0                             | 0       | 0     | 1                | 44      | 0     | 0                   | 30      | 18    |
| 2020                          | Existing Traffic              | 340                 | 0       | 8     | 0                             | 0       | 0     | 8                | 473     | 0     | 0                   | 327     | 196   |
| Growth Factor (0.02 per year) |                               | 0.219               | 0.219   | 0.219 | 0.219                         | 0.219   | 0.219 | 0.219            | 0.219   | 0.219 | 0.219               | 0.219   | 0.219 |
| 2030                          | Background Growth             | 74                  | 0       | 2     | 0                             | 0       | 0     | 2                | 104     | 0     | 0                   | 72      | 43    |
| Committed Projects            |                               |                     |         |       |                               |         |       |                  |         |       |                     |         |       |
|                               | Academy Point (Barbour Tract) | 0                   | 0       | 9     | 0                             | 0       | 0     | 5                | 3       | 0     | 0                   | 4       | 0     |
|                               | Steeple Chase (Senior Adult)  | 5                   | 0       | 5     | 0                             | 0       | 0     | 8                | 10      | 0     | 0                   | 16      | 8     |
|                               | Walton Acres at Riverwood     | 52                  | 0       | 0     | 0                             | 0       | 0     | 0                | 70      | 0     | 0                   | 40      | 29    |
| Total Committed Traffic       |                               | 57                  | 0       | 14    | 0                             | 0       | 0     | 13               | 83      | 0     | 0                   | 60      | 37    |
| 2030                          | Background Traffic            | 471                 | 0       | 24    | 0                             | 0       | 0     | 23               | 660     | 0     | 0                   | 459     | 276   |
| Project Traffic               |                               |                     |         |       |                               |         |       |                  |         |       |                     |         |       |
| Retail Traffic                |                               |                     |         |       |                               |         |       |                  |         |       |                     |         |       |
| Percent Assignment Inbound    |                               | 0%                  | 15%     | 10%   | 0%                            | 0%      | 0%    | 0%               | 0%      | 0%    | 25%                 | 15%     | 0%    |
| Inbound Project Traffic       |                               | 0                   | 25      | 17    | 0                             | 0       | 0     | 0                | 0       | 0     | 42                  | 25      | 0     |
| Percent Assignment Outbound   |                               | 0%                  | 0%      | 0%    | 10%                           | 5%      | 10%   | 20%              | 30%     | 0%    | 0%                  | 0%      | 0%    |
| Outbound Project Traffic      |                               | 0                   | 0       | 0     | 14                            | 7       | 14    | 28               | 43      | 0     | 0                   | 0       | 0     |
| Total Retail Trips            |                               | 0                   | 25      | 17    | 37                            | 7       | 18    | 28               | 40      | 4     | 65                  | 2       | 0     |
| Residential Traffic           |                               |                     |         |       |                               |         |       |                  |         |       |                     |         |       |
| Percent Assignment Inbound    |                               | 0%                  | 35%     | 5%    | 0%                            | 0%      | 0%    | 0%               | 0%      | 25%   | 20%                 | 0%      | 0%    |
| Inbound Project Traffic       |                               | 0                   | 89      | 13    | 0                             | 0       | 0     | 0                | 0       | 64    | 51                  | 0       | 0     |
| Percent Assignment Outbound   |                               | 0%                  | 0%      | 0%    | 30%                           | 35%     | 20%   | 5%               | 0%      | 0%    | 0%                  | 0%      | 0%    |
| Outbound Project Traffic      |                               | 0                   | 0       | 0     | 51                            | 59      | 34    | 8                | 0       | 0     | 0                   | 0       | 0     |
| Total Residential Trips       |                               | 0                   | 89      | 13    | 51                            | 59      | 34    | 8                | 0       | 64    | 51                  | 0       | 0     |
| Total Project Traffic         |                               | 0                   | 114     | 30    | 88                            | 66      | 52    | 36               | 40      | 68    | 116                 | 2       | 0     |
| 2030                          | Buildout Total                | 471                 | 114     | 54    | 88                            | 66      | 52    | 59               | 700     | 68    | 116                 | 461     | 276   |
| Percent Impact (Approach)     |                               | 22.5%               |         |       | 100.0%                        |         |       | 17.4%            |         |       | 13.8%               |         |       |
| Overall Percent Impact        |                               | 24.2%               |         |       |                               |         |       |                  |         |       |                     |         |       |

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8/2/20

**Appendix G:**  
**Synchro Output:**  
**Existing (2020)**

Ashcroft Phase 2  
1: O'Neil Street & Main Street

Existing AM  
08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR  |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |      |
| Traffic Volume (vph)    | 60    | 185   | 6    | 4     | 301   | 120  | 4     | 31    | 4    | 187   | 35    | 126  |
| Future Volume (vph)     | 60    | 185   | 6    | 4     | 301   | 120  | 4     | 31    | 4    | 187   | 35    | 126  |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 10    | 10    | 10   |
| Grade (%)               |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Storage Length (ft)     | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 100   |       | 0    |
| Storage Lanes           | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 100   |       |      |
| Satd. Flow (prot)       | 0     | 1835  | 0    | 0     | 1792  | 0    | 0     | 1829  | 0    | 0     | 1610  | 0    |
| Flt Permitted           |       | 0.827 |      |       | 0.997 |      |       | 0.964 |      |       | 0.809 |      |
| Satd. Flow (perm)       | 0     | 1536  | 0    | 0     | 1787  | 0    | 0     | 1772  | 0    | 0     | 1338  | 0    |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No   |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |      |
| Link Speed (mph)        |       | 25    |      |       | 25    |      |       | 25    |      |       | 25    |      |
| Link Distance (ft)      |       | 1124  |      |       | 1174  |      |       | 1013  |      |       | 1118  |      |
| Travel Time (s)         |       | 30.7  |      |       | 32.0  |      |       | 27.6  |      |       | 30.5  |      |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |      |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |      |
| Lane Group Flow (vph)   | 0     | 280   | 0    | 0     | 471   | 0    | 0     | 42    | 0    | 0     | 387   | 0    |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      |
| Protected Phases        |       | 2     |      |       | 6     |      |       | 8     |      |       | 4     |      |
| Permitted Phases        | 2     |       |      | 6     |       |      | 8     |       |      | 4     |       |      |
| Detector Phase          | 2     | 2     |      | 6     | 6     |      | 8     | 8     |      | 4     | 4     |      |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |      |
| Minimum Initial (s)     | 10.0  | 10.0  |      | 10.0  | 10.0  |      | 7.0   | 7.0   |      | 7.0   | 7.0   |      |
| Minimum Split (s)       | 15.0  | 15.0  |      | 15.0  | 15.0  |      | 12.0  | 12.0  |      | 12.0  | 12.0  |      |
| Total Split (s)         | 30.0  | 30.0  |      | 30.0  | 30.0  |      | 30.0  | 30.0  |      | 30.0  | 30.0  |      |
| Total Split (%)         | 50.0% | 50.0% |      | 50.0% | 50.0% |      | 50.0% | 50.0% |      | 50.0% | 50.0% |      |
| Yellow Time (s)         | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      |
| Lost Time Adjust (s)    |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Lost Time (s)     |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |
| Lead/Lag                |       |       |      |       |       |      |       |       |      |       |       |      |
| Lead-Lag Optimize?      |       |       |      |       |       |      |       |       |      |       |       |      |
| Recall Mode             | Min   | Min   |      | Min   | Min   |      | None  | None  |      | None  | None  |      |
| Act Effect Green (s)    |       | 17.4  |      |       | 17.4  |      |       | 18.1  |      |       | 18.1  |      |
| Actuated g/C Ratio      |       | 0.38  |      |       | 0.38  |      |       | 0.39  |      |       | 0.39  |      |
| v/c Ratio               |       | 0.49  |      |       | 0.70  |      |       | 0.06  |      |       | 0.74  |      |
| Control Delay           |       | 15.1  |      |       | 19.5  |      |       | 10.0  |      |       | 22.9  |      |
| Queue Delay             |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Delay             |       | 15.1  |      |       | 19.5  |      |       | 10.0  |      |       | 22.9  |      |

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Synchro 10 Report



Ashcroft Phase 2  
1: O'Neil Street & Main Street

Existing AM  
08/02/2020

| Lane Group              | EBL | EBT  | EBR | WBL | WBT  | WBR | NBL | NBT  | NBR | SBL | SBT  | SBR |
|-------------------------|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
| LOS                     |     | B    |     |     | B    |     |     | B    |     |     | C    |     |
| Approach Delay          |     | 15.1 |     |     | 19.5 |     |     | 10.0 |     |     | 22.9 |     |
| Approach LOS            |     | B    |     |     | B    |     |     | B    |     |     | C    |     |
| Queue Length 50th (ft)  |     | 54   |     |     | 101  |     |     | 6    |     |     | 81   |     |
| Queue Length 95th (ft)  |     | 126  |     |     | 218  |     |     | 24   |     |     | #213 |     |
| Internal Link Dist (ft) |     | 1044 |     |     | 1094 |     |     | 933  |     |     | 1038 |     |
| Turn Bay Length (ft)    |     |      |     |     |      |     |     |      |     |     |      |     |
| Base Capacity (vph)     |     | 888  |     |     | 1033 |     |     | 1024 |     |     | 773  |     |
| Starvation Cap Reductn  |     | 0    |     |     | 0    |     |     | 0    |     |     | 0    |     |
| Spillback Cap Reductn   |     | 0    |     |     | 0    |     |     | 0    |     |     | 0    |     |
| Storage Cap Reductn     |     | 0    |     |     | 0    |     |     | 0    |     |     | 0    |     |
| Reduced v/c Ratio       |     | 0.32 |     |     | 0.46 |     |     | 0.04 |     |     | 0.50 |     |

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 46.2

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 19.2

Intersection Capacity Utilization 75.9%

Analysis Period (min) 15

Description: 04-0179

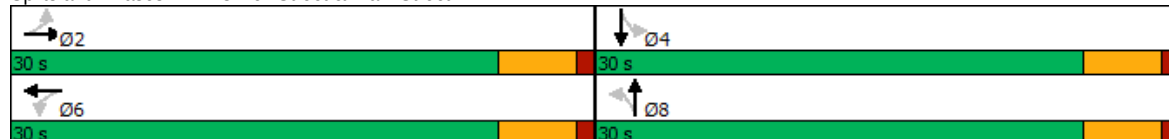
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: B

ICU Level of Service D

Splits and Phases: 1: O'Neil Street & Main Street



Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Existing AM  
08/02/2020

| Lane Group              | WBL   | WBR  | NBT  | NBR  | SBL   | SBT  |
|-------------------------|-------|------|------|------|-------|------|
| Lane Configurations     |       |      |      |      |       |      |
| Traffic Volume (vph)    | 50    | 33   | 206  | 17   | 38    | 289  |
| Future Volume (vph)     | 50    | 33   | 206  | 17   | 38    | 289  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12   | 12    | 12   |
| Grade (%)               | 0%    |      | 0%   |      |       | 0%   |
| Storage Length (ft)     | 0     | 0    |      | 75   | 75    |      |
| Storage Lanes           | 1     | 0    |      | 1    | 1     |      |
| Taper Length (ft)       | 100   |      |      |      | 100   |      |
| Satd. Flow (prot)       | 1711  | 0    | 1863 | 1583 | 1770  | 1863 |
| Flt Permitted           | 0.971 |      |      |      | 0.950 |      |
| Satd. Flow (perm)       | 1711  | 0    | 1863 | 1583 | 1770  | 1863 |
| Link Speed (mph)        | 25    |      | 45   |      |       | 45   |
| Link Distance (ft)      | 1397  |      | 1572 |      |       | 1547 |
| Travel Time (s)         | 38.1  |      | 23.8 |      |       | 23.4 |
| Confl. Peds. (#/hr)     |       |      |      |      |       |      |
| Confl. Bikes (#/hr)     |       |      |      |      |       |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90 | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100% | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%   | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0    | 0     | 0    |
| Parking (#/hr)          |       |      |      |      |       |      |
| Mid-Block Traffic (%)   | 0%    |      | 0%   |      |       | 0%   |
| Shared Lane Traffic (%) |       |      |      |      |       |      |
| Lane Group Flow (vph)   | 93    | 0    | 229  | 19   | 42    | 321  |
| Sign Control            | Stop  |      | Free |      |       | Free |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 29.0% ICU Level of Service A  
Analysis Period (min) 15

Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Existing AM  
08/02/2020

Intersection

Int Delay, s/veh 2.2

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|----------|-----|-----|-----|-----|-----|-----|
|----------|-----|-----|-----|-----|-----|-----|

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 50   | 33   | 206  | 17   | 38   | 289  |
| Future Vol, veh/h        | 50   | 33   | 206  | 17   | 38   | 289  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | 75   | 75   | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 56   | 37   | 229  | 19   | 42   | 321  |

| Major/Minor | Minor1 | Major1 | Major2 |
|-------------|--------|--------|--------|
|-------------|--------|--------|--------|

|                      |       |       |   |   |       |   |
|----------------------|-------|-------|---|---|-------|---|
| Conflicting Flow All | 634   | 229   | 0 | 0 | 248   | 0 |
| Stage 1              | 229   | -     | - | - | -     | - |
| Stage 2              | 405   | -     | - | - | -     | - |
| Critical Hdwy        | 6.42  | 6.22  | - | - | 4.12  | - |
| Critical Hdwy Stg 1  | 5.42  | -     | - | - | -     | - |
| Critical Hdwy Stg 2  | 5.42  | -     | - | - | -     | - |
| Follow-up Hdwy       | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver   | 443   | 810   | - | - | 1318  | - |
| Stage 1              | 809   | -     | - | - | -     | - |
| Stage 2              | 673   | -     | - | - | -     | - |
| Platoon blocked, %   |       |       | - | - |       | - |
| Mov Cap-1 Maneuver   | 429   | 810   | - | - | 1318  | - |
| Mov Cap-2 Maneuver   | 429   | -     | - | - | -     | - |
| Stage 1              | 809   | -     | - | - | -     | - |
| Stage 2              | 651   | -     | - | - | -     | - |

| Approach | WB | NB | SB |
|----------|----|----|----|
|----------|----|----|----|

|                      |      |   |     |
|----------------------|------|---|-----|
| HCM Control Delay, s | 13.3 | 0 | 0.9 |
| HCM LOS              | B    |   |     |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL | SBT |
|-----------------------|-----|----------|-----|-----|
|-----------------------|-----|----------|-----|-----|

|                       |   |   |       |       |
|-----------------------|---|---|-------|-------|
| Capacity (veh/h)      | - | - | 528   | 1318  |
| HCM Lane V/C Ratio    | - | - | 0.175 | 0.032 |
| HCM Control Delay (s) | - | - | 13.3  | 7.8   |
| HCM Lane LOS          | - | - | B     | A     |
| HCM 95th %tile Q(veh) | - | - | 0.6   | 0.1   |

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Synchro 10 Report

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Existing AM  
08/02/2020

| Lane Group              | EBL   | EBR  | NBL  | NBT   | SBT  | SBR  |
|-------------------------|-------|------|------|-------|------|------|
| Lane Configurations     |       |      |      |       |      |      |
| Traffic Volume (vph)    | 128   | 7    | 7    | 232   | 320  | 297  |
| Future Volume (vph)     | 128   | 7    | 7    | 232   | 320  | 297  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12    | 12   | 12   |
| Grade (%)               | 0%    |      |      | 0%    | 0%   |      |
| Storage Length (ft)     | 0     | 0    | 0    |       |      | 0    |
| Storage Lanes           | 1     | 0    | 0    |       |      | 0    |
| Taper Length (ft)       | 100   |      | 100  |       |      |      |
| Satd. Flow (prot)       | 1766  | 0    | 0    | 1859  | 1742 | 0    |
| Flt Permitted           | 0.955 |      |      | 0.998 |      |      |
| Satd. Flow (perm)       | 1766  | 0    | 0    | 1859  | 1742 | 0    |
| Link Speed (mph)        | 55    |      |      | 55    | 55   |      |
| Link Distance (ft)      | 1648  |      |      | 941   | 918  |      |
| Travel Time (s)         | 20.4  |      |      | 11.7  | 11.4 |      |
| Confl. Peds. (#/hr)     |       |      |      |       |      |      |
| Confl. Bikes (#/hr)     |       |      |      |       |      |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90  | 0.90 | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100%  | 100% | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%    | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0     | 0    | 0    |
| Parking (#/hr)          |       |      |      |       |      |      |
| Mid-Block Traffic (%)   | 0%    |      |      | 0%    | 0%   |      |
| Shared Lane Traffic (%) |       |      |      |       |      |      |
| Lane Group Flow (vph)   | 150   | 0    | 0    | 266   | 686  | 0    |
| Sign Control            | Stop  |      |      | Free  | Free |      |

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 49.2%

ICU Level of Service A

Analysis Period (min) 15

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Existing AM  
08/02/2020

Intersection

| Int Delay, s/veh         | 3.1  |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 128  | 7    | 7    | 232  | 320  | 297  |
| Future Vol, veh/h        | 128  | 7    | 7    | 232  | 320  | 297  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 142  | 8    | 8    | 258  | 356  | 330  |

| Major/Minor          | Minor2 | Major1 |       | Major2 |   |
|----------------------|--------|--------|-------|--------|---|
| Conflicting Flow All | 795    | 521    | 686   | 0      | - |
| Stage 1              | 521    | -      | -     | -      | - |
| Stage 2              | 274    | -      | -     | -      | - |
| Critical Hdwy        | 6.42   | 6.22   | 4.12  | -      | - |
| Critical Hdwy Stg 1  | 5.42   | -      | -     | -      | - |
| Critical Hdwy Stg 2  | 5.42   | -      | -     | -      | - |
| Follow-up Hdwy       | 3.518  | 3.318  | 2.218 | -      | - |
| Pot Cap-1 Maneuver   | 357    | 555    | 908   | -      | - |
| Stage 1              | 596    | -      | -     | -      | - |
| Stage 2              | 772    | -      | -     | -      | - |
| Platoon blocked, %   |        |        |       | -      | - |
| Mov Cap-1 Maneuver   | 353    | 555    | 908   | -      | - |
| Mov Cap-2 Maneuver   | 353    | -      | -     | -      | - |
| Stage 1              | 590    | -      | -     | -      | - |
| Stage 2              | 772    | -      | -     | -      | - |

| Approach             | EB | NB  | SB |
|----------------------|----|-----|----|
| HCM Control Delay, s | 22 | 0.3 | 0  |
| HCM LOS              | C  |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 908   | -   | 360   | -   | -   |
| HCM Lane V/C Ratio    | 0.009 | -   | 0.417 | -   | -   |
| HCM Control Delay (s) | 9     | 0   | 22    | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 2     | -   | -   |

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Synchro 10 Report

Ashcroft Phase 2  
4: Covered Bridge Road & Pritchard Road/Private Drwy.

Existing AM  
08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |       |
| Traffic Volume (vph)    | 226   | 9     | 337  | 4     | 4     | 4    | 354   | 113   | 4    | 4     | 314   | 565   |
| Future Volume (vph)     | 226   | 9     | 337  | 4     | 4     | 4    | 354   | 113   | 4    | 4     | 314   | 565   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    |
| Grade (%)               |       | -3%   |      |       | -2%   |      |       | 4%    |      |       | -2%   |       |
| Storage Length (ft)     | 300   |       | 0    | 0     |       | 0    | 200   |       | 0    | 25    |       | 125   |
| Storage Lanes           | 1     |       | 0    | 0     |       | 0    | 1     |       | 0    | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 75    |       |       |
| Satd. Flow (prot)       | 1796  | 1615  | 0    | 0     | 1768  | 0    | 1734  | 1816  | 0    | 1787  | 1881  | 1599  |
| Flt Permitted           | 0.750 |       |      |       | 0.899 |      | 0.395 |       |      | 0.674 |       |       |
| Satd. Flow (perm)       | 1418  | 1615  | 0    | 0     | 1615  | 0    | 721   | 1816  | 0    | 1268  | 1881  | 1599  |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No    |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |       |
| Link Speed (mph)        |       | 45    |      |       | 20    |      |       | 45    |      |       | 45    |       |
| Link Distance (ft)      |       | 1601  |      |       | 259   |      |       | 1187  |      |       | 1614  |       |
| Travel Time (s)         |       | 24.3  |      |       | 8.8   |      |       | 18.0  |      |       | 24.5  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |       |
| Lane Group Flow (vph)   | 251   | 384   | 0    | 0     | 12    | 0    | 393   | 130   | 0    | 4     | 349   | 628   |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | pm+pt | NA    |      | Perm  | NA    | Perm  |
| Protected Phases        |       | 4     |      |       | 8     |      | 5     | 2     |      |       | 6     |       |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       |      | 6     |       | 6     |
| Detector Phase          | 4     | 4     |      | 8     | 8     |      | 5     | 2     |      | 6     | 6     | 6     |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 12.0  |      | 12.0  | 12.0  | 12.0  |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 19.0  |      | 19.0  | 19.0  | 19.0  |
| Total Split (s)         | 30.0  | 30.0  |      | 30.0  | 30.0  |      | 15.0  | 60.0  |      | 45.0  | 45.0  | 45.0  |
| Total Split (%)         | 33.3% | 33.3% |      | 33.3% | 33.3% |      | 16.7% | 66.7% |      | 50.0% | 50.0% | 50.0% |
| Yellow Time (s)         | 4.8   | 4.8   |      | 3.0   | 3.0   |      | 3.0   | 4.2   |      | 4.7   | 4.7   | 4.7   |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.9   | 1.9   |      | 2.1   | 1.0   |      | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s)    | -0.8  | -0.8  |      |       | 0.1   |      | -0.1  | -0.2  |      | -0.7  | -0.7  | -0.7  |
| Total Lost Time (s)     | 5.0   | 5.0   |      |       | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       |       |      |       |       |      | Lead  |       |      | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?      |       |       |      |       |       |      | Yes   |       |      | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   |      | Min   | Min   | Min   |
| Act Effect Green (s)    | 23.2  | 23.2  |      |       | 23.2  |      | 51.2  | 51.2  |      | 36.0  | 36.0  | 36.0  |
| Actuated g/C Ratio      | 0.27  | 0.27  |      |       | 0.27  |      | 0.61  | 0.61  |      | 0.43  | 0.43  | 0.43  |
| v/c Ratio               | 0.65  | 0.87  |      |       | 0.03  |      | 0.70  | 0.12  |      | 0.01  | 0.44  | 0.92  |
| Control Delay           | 36.8  | 51.3  |      |       | 24.0  |      | 17.2  | 7.6   |      | 14.0  | 19.2  | 44.5  |
| Queue Delay             | 0.0   | 0.0   |      |       | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   |
| Total Delay             | 36.8  | 51.3  |      |       | 24.0  |      | 17.2  | 7.6   |      | 14.0  | 19.2  | 44.5  |

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Synchro 10 Report



Ashcroft Phase 2  
4: Covered Bridge Road & Pritchard Road/Private Drwy.

Existing AM  
08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL | WBT  | WBR | NBL  | NBT  | NBR | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|-----|------|-----|------|------|-----|------|------|------|
| LOS                     | D    | D    |     |     | C    |     | B    | A    |     | B    | B    | D    |
| Approach Delay          |      | 45.6 |     |     | 24.0 |     |      | 14.8 |     |      | 35.4 |      |
| Approach LOS            |      | D    |     |     | C    |     |      | B    |     |      | D    |      |
| Queue Length 50th (ft)  | 125  | 206  |     |     | 5    |     | 103  | 28   |     | 1    | 131  | 316  |
| Queue Length 95th (ft)  | 208  | #364 |     |     | 18   |     | 157  | 52   |     | 7    | 202  | #531 |
| Internal Link Dist (ft) |      | 1521 |     |     | 179  |     |      | 1107 |     |      | 1534 |      |
| Turn Bay Length (ft)    | 300  |      |     |     |      |     | 200  |      |     | 25   |      | 125  |
| Base Capacity (vph)     | 424  | 483  |     |     | 483  |     | 558  | 1197 |     | 607  | 902  | 766  |
| Starvation Cap Reductn  | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.59 | 0.80 |     |     | 0.02 |     | 0.70 | 0.11 |     | 0.01 | 0.39 | 0.82 |

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 84.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 33.3

Intersection Capacity Utilization 72.9%

Analysis Period (min) 15

Description: 04-1302

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: C

ICU Level of Service C

Splits and Phases: 4: Covered Bridge Road & Pritchard Road/Private Drwy.



Ashcroft Phase 2  
1: O'Neil Street & Main Street

Existing PM  
08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR  |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |      |
| Traffic Volume (vph)    | 95    | 412   | 6    | 4     | 193   | 198  | 7     | 66    | 4    | 164   | 29    | 103  |
| Future Volume (vph)     | 95    | 412   | 6    | 4     | 193   | 198  | 7     | 66    | 4    | 164   | 29    | 103  |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 10    | 10    | 10   |
| Grade (%)               |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Storage Length (ft)     | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 100   |       | 0    |
| Storage Lanes           | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 100   |       |      |
| Satd. Flow (prot)       | 0     | 1842  | 0    | 0     | 1736  | 0    | 0     | 1842  | 0    | 0     | 1612  | 0    |
| Flt Permitted           |       | 0.858 |      |       | 0.995 |      |       | 0.960 |      |       | 0.781 |      |
| Satd. Flow (perm)       | 0     | 1595  | 0    | 0     | 1727  | 0    | 0     | 1778  | 0    | 0     | 1294  | 0    |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No   |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |      |
| Link Speed (mph)        |       | 25    |      |       | 25    |      |       | 25    |      |       | 25    |      |
| Link Distance (ft)      |       | 1124  |      |       | 1174  |      |       | 1013  |      |       | 1118  |      |
| Travel Time (s)         |       | 30.7  |      |       | 32.0  |      |       | 27.6  |      |       | 30.5  |      |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |      |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |      |
| Lane Group Flow (vph)   | 0     | 571   | 0    | 0     | 438   | 0    | 0     | 85    | 0    | 0     | 328   | 0    |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      |
| Protected Phases        |       | 2     |      |       | 6     |      |       | 8     |      |       | 4     |      |
| Permitted Phases        | 2     |       |      | 6     |       |      | 8     |       |      | 4     |       |      |
| Detector Phase          | 2     | 2     |      | 6     | 6     |      | 8     | 8     |      | 4     | 4     |      |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |      |
| Minimum Initial (s)     | 10.0  | 10.0  |      | 10.0  | 10.0  |      | 7.0   | 7.0   |      | 7.0   | 7.0   |      |
| Minimum Split (s)       | 15.0  | 15.0  |      | 15.0  | 15.0  |      | 12.0  | 12.0  |      | 12.0  | 12.0  |      |
| Total Split (s)         | 35.0  | 35.0  |      | 35.0  | 35.0  |      | 25.0  | 25.0  |      | 25.0  | 25.0  |      |
| Total Split (%)         | 58.3% | 58.3% |      | 58.3% | 58.3% |      | 41.7% | 41.7% |      | 41.7% | 41.7% |      |
| Yellow Time (s)         | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      |
| Lost Time Adjust (s)    |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Lost Time (s)     |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |
| Lead/Lag                |       |       |      |       |       |      |       |       |      |       |       |      |
| Lead-Lag Optimize?      |       |       |      |       |       |      |       |       |      |       |       |      |
| Recall Mode             | Min   | Min   |      | Min   | Min   |      | None  | None  |      | None  | None  |      |
| Act Effect Green (s)    |       | 22.2  |      |       | 22.2  |      |       | 16.6  |      |       | 16.6  |      |
| Actuated g/C Ratio      |       | 0.45  |      |       | 0.45  |      |       | 0.34  |      |       | 0.34  |      |
| v/c Ratio               |       | 0.80  |      |       | 0.56  |      |       | 0.14  |      |       | 0.75  |      |
| Control Delay           |       | 21.6  |      |       | 13.5  |      |       | 13.8  |      |       | 29.9  |      |
| Queue Delay             |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Delay             |       | 21.6  |      |       | 13.5  |      |       | 13.8  |      |       | 29.9  |      |

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Kimley-Horn

Synchro 10 Report

Ashcroft Phase 2  
1: O'Neil Street & Main Street

Existing PM  
08/02/2020

| Lane Group              | EBL | EBT  | EBR | WBL | WBT  | WBR | NBL | NBT  | NBR | SBL | SBT  | SBR |
|-------------------------|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
| LOS                     |     | C    |     |     | B    |     |     | B    |     |     | C    |     |
| Approach Delay          |     | 21.6 |     |     | 13.5 |     |     | 13.8 |     |     | 29.9 |     |
| Approach LOS            |     | C    |     |     | B    |     |     | B    |     |     | C    |     |
| Queue Length 50th (ft)  |     | 143  |     |     | 94   |     |     | 17   |     |     | 85   |     |
| Queue Length 95th (ft)  |     | 260  |     |     | 167  |     |     | 48   |     |     | #224 |     |
| Internal Link Dist (ft) |     | 1044 |     |     | 1094 |     |     | 933  |     |     | 1038 |     |
| Turn Bay Length (ft)    |     |      |     |     |      |     |     |      |     |     |      |     |
| Base Capacity (vph)     |     | 1023 |     |     | 1108 |     |     | 760  |     |     | 553  |     |
| Starvation Cap Reductn  |     | 0    |     |     | 0    |     |     | 0    |     |     | 0    |     |
| Spillback Cap Reductn   |     | 0    |     |     | 0    |     |     | 0    |     |     | 0    |     |
| Storage Cap Reductn     |     | 0    |     |     | 0    |     |     | 0    |     |     | 0    |     |
| Reduced v/c Ratio       |     | 0.56 |     |     | 0.40 |     |     | 0.11 |     |     | 0.59 |     |

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 49.4

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 20.5

Intersection Capacity Utilization 85.9%

Analysis Period (min) 15

Description: 04-0179

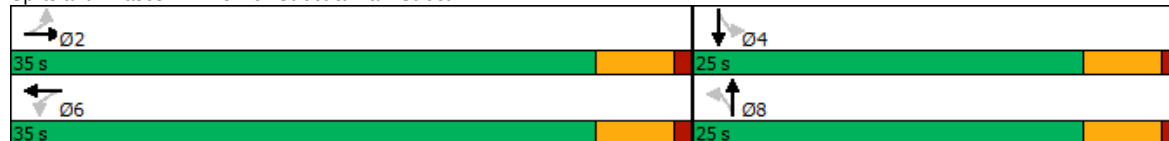
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: C

ICU Level of Service E

Splits and Phases: 1: O'Neil Street & Main Street



Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Existing PM  
08/02/2020

| Lane Group              | WBL   | WBR  | NBT  | NBR  | SBL   | SBT  |
|-------------------------|-------|------|------|------|-------|------|
| Lane Configurations     |       |      |      |      |       |      |
| Traffic Volume (vph)    | 33    | 22   | 459  | 57   | 38    | 297  |
| Future Volume (vph)     | 33    | 22   | 459  | 57   | 38    | 297  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12   | 12    | 12   |
| Grade (%)               | 0%    |      | 0%   |      |       | 0%   |
| Storage Length (ft)     | 0     | 0    |      | 75   | 75    |      |
| Storage Lanes           | 1     | 0    |      | 1    | 1     |      |
| Taper Length (ft)       | 100   |      |      |      | 100   |      |
| Satd. Flow (prot)       | 1713  | 0    | 1863 | 1583 | 1770  | 1863 |
| Flt Permitted           | 0.971 |      |      |      | 0.950 |      |
| Satd. Flow (perm)       | 1713  | 0    | 1863 | 1583 | 1770  | 1863 |
| Link Speed (mph)        | 25    |      | 45   |      |       | 45   |
| Link Distance (ft)      | 1397  |      | 1572 |      |       | 1547 |
| Travel Time (s)         | 38.1  |      | 23.8 |      |       | 23.4 |
| Confl. Peds. (#/hr)     |       |      |      |      |       |      |
| Confl. Bikes (#/hr)     |       |      |      |      |       |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90 | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100% | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%   | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0    | 0     | 0    |
| Parking (#/hr)          |       |      |      |      |       |      |
| Mid-Block Traffic (%)   | 0%    |      | 0%   |      |       | 0%   |
| Shared Lane Traffic (%) |       |      |      |      |       |      |
| Lane Group Flow (vph)   | 61    | 0    | 510  | 63   | 42    | 330  |
| Sign Control            | Stop  |      | Free |      |       | Free |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 40.8% ICU Level of Service A  
Analysis Period (min) 15

Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Existing PM  
08/02/2020

Intersection

Int Delay, s/veh 1.4

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 33   | 22   | 459  | 57   | 38   | 297  |
| Future Vol, veh/h        | 33   | 22   | 459  | 57   | 38   | 297  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | 75   | 75   | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 37   | 24   | 510  | 63   | 42   | 330  |

Major/Minor Minor1 Major1 Major2

|                      |       |       |   |   |       |   |
|----------------------|-------|-------|---|---|-------|---|
| Conflicting Flow All | 924   | 510   | 0 | 0 | 573   | 0 |
| Stage 1              | 510   | -     | - | - | -     | - |
| Stage 2              | 414   | -     | - | - | -     | - |
| Critical Hdwy        | 6.42  | 6.22  | - | - | 4.12  | - |
| Critical Hdwy Stg 1  | 5.42  | -     | - | - | -     | - |
| Critical Hdwy Stg 2  | 5.42  | -     | - | - | -     | - |
| Follow-up Hdwy       | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver   | 299   | 563   | - | - | 1000  | - |
| Stage 1              | 603   | -     | - | - | -     | - |
| Stage 2              | 667   | -     | - | - | -     | - |
| Platoon blocked, %   |       |       | - | - |       | - |
| Mov Cap-1 Maneuver   | 286   | 563   | - | - | 1000  | - |
| Mov Cap-2 Maneuver   | 286   | -     | - | - | -     | - |
| Stage 1              | 603   | -     | - | - | -     | - |
| Stage 2              | 639   | -     | - | - | -     | - |

Approach WB NB SB

|                      |      |   |   |
|----------------------|------|---|---|
| HCM Control Delay, s | 17.2 | 0 | 1 |
| HCM LOS              | C    |   |   |

Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT

|                       |   |   |       |       |   |
|-----------------------|---|---|-------|-------|---|
| Capacity (veh/h)      | - | - | 356   | 1000  | - |
| HCM Lane V/C Ratio    | - | - | 0.172 | 0.042 | - |
| HCM Control Delay (s) | - | - | 17.2  | 8.8   | - |
| HCM Lane LOS          | - | - | C     | A     | - |
| HCM 95th %tile Q(veh) | - | - | 0.6   | 0.1   | - |

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Synchro 10 Report

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Existing PM  
08/02/2020

| Lane Group              | EBL   | EBR  | NBL  | NBT   | SBT  | SBR  |
|-------------------------|-------|------|------|-------|------|------|
| Lane Configurations     |       |      |      |       |      |      |
| Traffic Volume (vph)    | 340   | 8    | 8    | 473   | 327  | 196  |
| Future Volume (vph)     | 340   | 8    | 8    | 473   | 327  | 196  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12    | 12   | 12   |
| Grade (%)               | 0%    |      |      | 0%    | 0%   |      |
| Storage Length (ft)     | 0     | 0    | 0    |       |      | 0    |
| Storage Lanes           | 1     | 0    | 0    |       |      | 0    |
| Taper Length (ft)       | 100   |      | 100  |       |      |      |
| Satd. Flow (prot)       | 1770  | 0    | 0    | 1861  | 1768 | 0    |
| Flt Permitted           | 0.953 |      |      | 0.999 |      |      |
| Satd. Flow (perm)       | 1770  | 0    | 0    | 1861  | 1768 | 0    |
| Link Speed (mph)        | 55    |      |      | 55    | 55   |      |
| Link Distance (ft)      | 1648  |      |      | 941   | 918  |      |
| Travel Time (s)         | 20.4  |      |      | 11.7  | 11.4 |      |
| Confl. Peds. (#/hr)     |       |      |      |       |      |      |
| Confl. Bikes (#/hr)     |       |      |      |       |      |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90  | 0.90 | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100%  | 100% | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%    | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0     | 0    | 0    |
| Parking (#/hr)          |       |      |      |       |      |      |
| Mid-Block Traffic (%)   | 0%    |      |      | 0%    | 0%   |      |
| Shared Lane Traffic (%) |       |      |      |       |      |      |
| Lane Group Flow (vph)   | 387   | 0    | 0    | 535   | 581  | 0    |
| Sign Control            | Stop  |      |      | Free  | Free |      |

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.3%

ICU Level of Service B

Analysis Period (min) 15

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Existing PM  
08/02/2020

Intersection

Int Delay, s/veh 68.1

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 340  | 8    | 8    | 473  | 327  | 196  |
| Future Vol, veh/h        | 340  | 8    | 8    | 473  | 327  | 196  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 378  | 9    | 9    | 526  | 363  | 218  |

Major/Minor Minor2 Major1 Major2

|                      |       |       |       |   |   |   |
|----------------------|-------|-------|-------|---|---|---|
| Conflicting Flow All | 1016  | 472   | 581   | 0 | - | 0 |
| Stage 1              | 472   | -     | -     | - | - | - |
| Stage 2              | 544   | -     | -     | - | - | - |
| Critical Hdwy        | 6.42  | 6.22  | 4.12  | - | - | - |
| Critical Hdwy Stg 1  | 5.42  | -     | -     | - | - | - |
| Critical Hdwy Stg 2  | 5.42  | -     | -     | - | - | - |
| Follow-up Hdwy       | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver   | ~ 264 | 592   | 993   | - | - | - |
| Stage 1              | 628   | -     | -     | - | - | - |
| Stage 2              | 582   | -     | -     | - | - | - |
| Platoon blocked, %   |       |       |       | - | - | - |
| Mov Cap-1 Maneuver   | ~ 261 | 592   | 993   | - | - | - |
| Mov Cap-2 Maneuver   | ~ 261 | -     | -     | - | - | - |
| Stage 1              | 620   | -     | -     | - | - | - |
| Stage 2              | 582   | -     | -     | - | - | - |

Approach EB NB SB

|                      |       |     |   |
|----------------------|-------|-----|---|
| HCM Control Delay, s | 264.3 | 0.1 | 0 |
| HCM LOS              | F     |     |   |

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

|                       |       |   |       |   |   |
|-----------------------|-------|---|-------|---|---|
| Capacity (veh/h)      | 993   | - | 264   | - | - |
| HCM Lane V/C Ratio    | 0.009 | - | 1.465 | - | - |
| HCM Control Delay (s) | 8.7   | 0 | 264.3 | - | - |
| HCM Lane LOS          | A     | A | F     | - | - |
| HCM 95th %tile Q(veh) | 0     | - | 21.9  | - | - |

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined \*: All major volume in platoon

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Synchro 10 Report



## Ashcroft Phase 2

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

Existing PM

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |       |
| Traffic Volume (vph)    | 581   | 4     | 279  | 4     | 4     | 4    | 347   | 314   | 4    | 4     | 234   | 302   |
| Future Volume (vph)     | 581   | 4     | 279  | 4     | 4     | 4    | 347   | 314   | 4    | 4     | 234   | 302   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    |
| Grade (%)               |       | -3%   |      |       | -2%   |      |       | 4%    |      |       | -2%   |       |
| Storage Length (ft)     | 300   |       | 0    | 0     |       | 0    | 200   |       | 0    | 25    |       | 125   |
| Storage Lanes           | 1     |       | 0    | 0     |       | 0    | 1     |       | 0    | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 75    |       |       |
| Satd. Flow (prot)       | 1796  | 1611  | 0    | 0     | 1768  | 0    | 1734  | 1822  | 0    | 1787  | 1881  | 1599  |
| Flt Permitted           | 0.750 |       |      |       | 0.930 |      | 0.351 |       |      | 0.550 |       |       |
| Satd. Flow (perm)       | 1418  | 1611  | 0    | 0     | 1671  | 0    | 641   | 1822  | 0    | 1035  | 1881  | 1599  |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No    |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |       |
| Link Speed (mph)        |       | 45    |      |       | 20    |      |       | 45    |      |       | 45    |       |
| Link Distance (ft)      |       | 1601  |      |       | 259   |      |       | 1187  |      |       | 1614  |       |
| Travel Time (s)         |       | 24.3  |      |       | 8.8   |      |       | 18.0  |      |       | 24.5  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |       |
| Lane Group Flow (vph)   | 646   | 314   | 0    | 0     | 12    | 0    | 386   | 353   | 0    | 4     | 260   | 336   |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | pm+pt | NA    |      | Perm  | NA    | Perm  |
| Protected Phases        |       | 4     |      |       | 8     |      | 5     | 2     |      |       | 6     |       |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       |      | 6     |       | 6     |
| Detector Phase          | 4     | 4     |      | 8     | 8     |      | 5     | 2     |      | 6     | 6     | 6     |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 12.0  |      | 12.0  | 12.0  | 12.0  |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 19.0  |      | 19.0  | 19.0  | 19.0  |
| Total Split (s)         | 45.0  | 45.0  |      | 45.0  | 45.0  |      | 15.0  | 45.0  |      | 30.0  | 30.0  | 30.0  |
| Total Split (%)         | 50.0% | 50.0% |      | 50.0% | 50.0% |      | 16.7% | 50.0% |      | 33.3% | 33.3% | 33.3% |
| Yellow Time (s)         | 4.8   | 4.8   |      | 3.0   | 3.0   |      | 3.0   | 4.2   |      | 4.7   | 4.7   | 4.7   |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.9   | 1.9   |      | 2.1   | 1.0   |      | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s)    | -0.8  | -0.8  |      |       | 0.1   |      | -0.1  | -0.2  |      | -0.7  | -0.7  | -0.7  |
| Total Lost Time (s)     | 5.0   | 5.0   |      |       | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       |       |      |       |       |      | Lead  |       |      | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?      |       |       |      |       |       |      | Yes   |       |      | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   |      | Min   | Min   | Min   |
| Act Effect Green (s)    | 40.1  | 40.1  |      |       | 40.1  |      | 36.8  | 36.8  |      | 21.7  | 21.7  | 21.7  |
| Actuated g/C Ratio      | 0.46  | 0.46  |      |       | 0.46  |      | 0.42  | 0.42  |      | 0.25  | 0.25  | 0.25  |
| v/c Ratio               | 0.99  | 0.42  |      |       | 0.02  |      | 0.97  | 0.46  |      | 0.02  | 0.55  | 0.84  |
| Control Delay           | 58.5  | 18.6  |      |       | 14.2  |      | 62.3  | 20.0  |      | 24.0  | 33.0  | 50.5  |
| Queue Delay             | 0.0   | 0.0   |      |       | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   |
| Total Delay             | 58.5  | 18.6  |      |       | 14.2  |      | 62.3  | 20.0  |      | 24.0  | 33.0  | 50.5  |

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Synchro 10 Report

Ashcroft Phase 2  
4: Covered Bridge Road & Pritchard Road/Private Drwy.

Existing PM  
08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL | WBT  | WBR | NBL  | NBT  | NBR | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|-----|------|-----|------|------|-----|------|------|------|
| LOS                     | E    | B    |     |     | B    |     | E    | C    |     | C    | C    | D    |
| Approach Delay          |      | 45.5 |     |     | 14.2 |     |      | 42.1 |     |      | 42.8 |      |
| Approach LOS            |      | D    |     |     | B    |     |      | D    |     |      | D    |      |
| Queue Length 50th (ft)  | ~371 | 118  |     |     | 4    |     | 152  | 134  |     | 2    | 124  | 174  |
| Queue Length 95th (ft)  | #602 | 190  |     |     | 14   |     | #333 | 207  |     | 10   | 199  | #301 |
| Internal Link Dist (ft) |      | 1521 |     |     | 179  |     |      | 1107 |     |      | 1534 |      |
| Turn Bay Length (ft)    | 300  |      |     |     |      |     | 200  |      |     | 25   |      | 125  |
| Base Capacity (vph)     | 654  | 743  |     |     | 771  |     | 397  | 841  |     | 298  | 542  | 461  |
| Starvation Cap Reductn  | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.99 | 0.42 |     |     | 0.02 |     | 0.97 | 0.42 |     | 0.01 | 0.48 | 0.73 |

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 86.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 43.5

Intersection Capacity Utilization 82.9%

Analysis Period (min) 15

Description: 04-1302

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

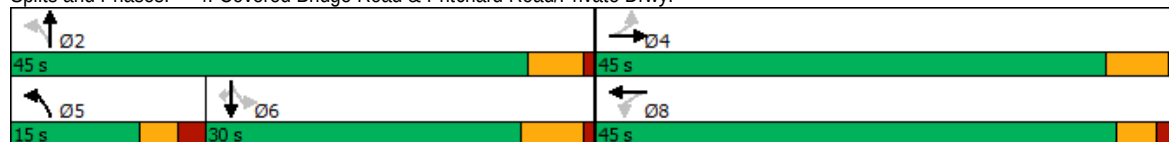
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: D

ICU Level of Service E

Splits and Phases: 4: Covered Bridge Road & Pritchard Road/Private Drwy.



**Appendix H:**  
**Synchro Output:**  
**Background (2030) – Scenario #1**

Ashcroft Phase 2  
1: O'Neil Street & Main Street

Background AM - Scenario #1  
08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR  |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |      |
| Traffic Volume (vph)    | 96    | 227   | 7    | 4     | 369   | 174  | 4     | 47    | 4    | 312   | 69    | 223  |
| Future Volume (vph)     | 96    | 227   | 7    | 4     | 369   | 174  | 4     | 47    | 4    | 312   | 69    | 223  |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 10    | 10    | 10   |
| Grade (%)               |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Storage Length (ft)     | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 100   |       | 0    |
| Storage Lanes           | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 100   |       |      |
| Satd. Flow (prot)       | 0     | 1831  | 0    | 0     | 1783  | 0    | 0     | 1840  | 0    | 0     | 1610  | 0    |
| Flt Permitted           |       | 0.542 |      |       | 0.997 |      |       | 0.967 |      |       | 0.806 |      |
| Satd. Flow (perm)       | 0     | 1007  | 0    | 0     | 1777  | 0    | 0     | 1785  | 0    | 0     | 1331  | 0    |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No   |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |      |
| Link Speed (mph)        |       | 25    |      |       | 25    |      |       | 25    |      |       | 25    |      |
| Link Distance (ft)      |       | 1124  |      |       | 1174  |      |       | 1013  |      |       | 1118  |      |
| Travel Time (s)         |       | 30.7  |      |       | 32.0  |      |       | 27.6  |      |       | 30.5  |      |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |      |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |      |
| Lane Group Flow (vph)   | 0     | 367   | 0    | 0     | 607   | 0    | 0     | 60    | 0    | 0     | 672   | 0    |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      |
| Protected Phases        |       | 2     |      |       | 6     |      |       | 8     |      |       | 4     |      |
| Permitted Phases        | 2     |       |      | 6     |       |      | 8     |       |      | 4     |       |      |
| Detector Phase          | 2     | 2     |      | 6     | 6     |      | 8     | 8     |      | 4     | 4     |      |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |      |
| Minimum Initial (s)     | 10.0  | 10.0  |      | 10.0  | 10.0  |      | 7.0   | 7.0   |      | 7.0   | 7.0   |      |
| Minimum Split (s)       | 15.0  | 15.0  |      | 15.0  | 15.0  |      | 12.0  | 12.0  |      | 12.0  | 12.0  |      |
| Total Split (s)         | 26.0  | 26.0  |      | 26.0  | 26.0  |      | 34.0  | 34.0  |      | 34.0  | 34.0  |      |
| Total Split (%)         | 43.3% | 43.3% |      | 43.3% | 43.3% |      | 56.7% | 56.7% |      | 56.7% | 56.7% |      |
| Yellow Time (s)         | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      |
| Lost Time Adjust (s)    |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Lost Time (s)     |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |
| Lead/Lag                |       |       |      |       |       |      |       |       |      |       |       |      |
| Lead-Lag Optimize?      |       |       |      |       |       |      |       |       |      |       |       |      |
| Recall Mode             | Min   | Min   |      | Min   | Min   |      | None  | None  |      | None  | None  |      |
| Act Effect Green (s)    |       | 21.0  |      |       | 21.0  |      |       | 29.0  |      |       | 29.0  |      |
| Actuated g/C Ratio      |       | 0.35  |      |       | 0.35  |      |       | 0.48  |      |       | 0.48  |      |
| v/c Ratio               |       | 1.04  |      |       | 0.98  |      |       | 0.07  |      |       | 1.05  |      |
| Control Delay           |       | 84.2  |      |       | 53.9  |      |       | 8.6   |      |       | 67.6  |      |
| Queue Delay             |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Delay             |       | 84.2  |      |       | 53.9  |      |       | 8.6   |      |       | 67.6  |      |

Ashcroft Phase 2 11/05/2018 Background AM - Scenario #1  
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Synchro 10 Report

Ashcroft Phase 2  
1: O'Neil Street & Main Street

Background AM - Scenario #1  
08/02/2020

| Lane Group              | EBL | EBT  | EBR | WBL | WBT  | WBR | NBL | NBT  | NBR | SBL | SBT  | SBR |
|-------------------------|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
| LOS                     |     | F    |     |     | D    |     |     | A    |     |     | E    |     |
| Approach Delay          |     | 84.2 |     |     | 53.9 |     |     | 8.6  |     |     | 67.6 |     |
| Approach LOS            |     | F    |     |     | D    |     |     | A    |     |     | E    |     |
| Queue Length 50th (ft)  |     | ~149 |     |     | 211  |     |     | 11   |     |     | ~273 |     |
| Queue Length 95th (ft)  |     | #291 |     |     | #403 |     |     | 27   |     |     | #452 |     |
| Internal Link Dist (ft) |     | 1044 |     |     | 1094 |     |     | 933  |     |     | 1038 |     |
| Turn Bay Length (ft)    |     |      |     |     |      |     |     |      |     |     |      |     |
| Base Capacity (vph)     |     | 352  |     |     | 621  |     |     | 862  |     |     | 643  |     |
| Starvation Cap Reductn  |     | 0    |     |     | 0    |     |     | 0    |     |     | 0    |     |
| Spillback Cap Reductn   |     | 0    |     |     | 0    |     |     | 0    |     |     | 0    |     |
| Storage Cap Reductn     |     | 0    |     |     | 0    |     |     | 0    |     |     | 0    |     |
| Reduced v/c Ratio       |     | 1.04 |     |     | 0.98 |     |     | 0.07 |     |     | 1.05 |     |

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 64.2

Intersection Capacity Utilization 101.6%

Analysis Period (min) 15

Description: 04-0179

Intersection LOS: E

ICU Level of Service G

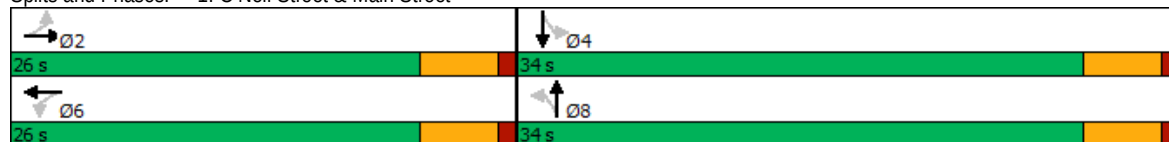
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: O'Neil Street & Main Street



Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Background AM - Scenario #1  
08/02/2020

| Lane Group              | WBL   | WBR  | NBT  | NBR  | SBL   | SBT  |
|-------------------------|-------|------|------|------|-------|------|
| Lane Configurations     |       |      |      |      |       |      |
| Traffic Volume (vph)    | 50    | 33   | 295  | 17   | 38    | 449  |
| Future Volume (vph)     | 50    | 33   | 295  | 17   | 38    | 449  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12   | 12    | 12   |
| Grade (%)               | 0%    |      | 0%   |      |       | 0%   |
| Storage Length (ft)     | 0     | 0    |      | 75   | 75    |      |
| Storage Lanes           | 1     | 0    |      | 1    | 1     |      |
| Taper Length (ft)       | 100   |      |      |      | 100   |      |
| Satd. Flow (prot)       | 1711  | 0    | 1863 | 1583 | 1770  | 1863 |
| Flt Permitted           | 0.971 |      |      |      | 0.950 |      |
| Satd. Flow (perm)       | 1711  | 0    | 1863 | 1583 | 1770  | 1863 |
| Link Speed (mph)        | 25    |      | 45   |      |       | 45   |
| Link Distance (ft)      | 1397  |      | 1572 |      |       | 1790 |
| Travel Time (s)         | 38.1  |      | 23.8 |      |       | 27.1 |
| Confl. Peds. (#/hr)     |       |      |      |      |       |      |
| Confl. Bikes (#/hr)     |       |      |      |      |       |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90 | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100% | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%   | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0    | 0     | 0    |
| Parking (#/hr)          |       |      |      |      |       |      |
| Mid-Block Traffic (%)   | 0%    |      | 0%   |      |       | 0%   |
| Shared Lane Traffic (%) |       |      |      |      |       |      |
| Lane Group Flow (vph)   | 93    | 0    | 328  | 19   | 42    | 499  |
| Sign Control            | Stop  |      | Free |      |       | Free |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 35.1%  
Analysis Period (min) 15

ICU Level of Service A

Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Background AM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh

2

| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 50   | 33   | 295  | 17   | 38   | 449  |
| Future Vol, veh/h        | 50   | 33   | 295  | 17   | 38   | 449  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | 75   | 75   | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 56   | 37   | 328  | 19   | 42   | 499  |

Major/Minor Minor1 Major1 Major2

|                      |       |       |   |   |       |   |
|----------------------|-------|-------|---|---|-------|---|
| Conflicting Flow All | 911   | 328   | 0 | 0 | 347   | 0 |
| Stage 1              | 328   | -     | - | - | -     | - |
| Stage 2              | 583   | -     | - | - | -     | - |
| Critical Hdwy        | 6.42  | 6.22  | - | - | 4.12  | - |
| Critical Hdwy Stg 1  | 5.42  | -     | - | - | -     | - |
| Critical Hdwy Stg 2  | 5.42  | -     | - | - | -     | - |
| Follow-up Hdwy       | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver   | 304   | 713   | - | - | 1212  | - |
| Stage 1              | 730   | -     | - | - | -     | - |
| Stage 2              | 558   | -     | - | - | -     | - |
| Platoon blocked, %   |       |       | - | - |       | - |
| Mov Cap-1 Maneuver   | 293   | 713   | - | - | 1212  | - |
| Mov Cap-2 Maneuver   | 293   | -     | - | - | -     | - |
| Stage 1              | 730   | -     | - | - | -     | - |
| Stage 2              | 538   | -     | - | - | -     | - |

| Approach             | WB   | NB | SB  |
|----------------------|------|----|-----|
| HCM Control Delay, s | 17.4 | 0  | 0.6 |
| HCM LOS              | C    |    |     |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL   | SBT   |
|-----------------------|-----|----------|-------|-------|
| Capacity (veh/h)      | -   | -        | 383   | 1212  |
| HCM Lane V/C Ratio    | -   | -        | 0.241 | 0.035 |
| HCM Control Delay (s) | -   | -        | 17.4  | 8.1   |
| HCM Lane LOS          | -   | -        | C     | A     |
| HCM 95th %tile Q(veh) | -   | -        | 0.9   | 0.1   |



Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Background AM - Scenario #1  
08/02/2020

| Lane Group              | EBL   | EBR  | NBL  | NBT   | SBT  | SBR  |
|-------------------------|-------|------|------|-------|------|------|
| Lane Configurations     |       |      |      |       |      |      |
| Traffic Volume (vph)    | 177   | 19   | 20   | 322   | 460  | 412  |
| Future Volume (vph)     | 177   | 19   | 20   | 322   | 460  | 412  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12    | 12   | 12   |
| Grade (%)               | 0%    |      |      | 0%    | 0%   |      |
| Storage Length (ft)     | 0     | 0    | 0    |       |      | 0    |
| Storage Lanes           | 1     | 0    | 0    |       |      | 0    |
| Taper Length (ft)       | 100   |      | 100  |       |      |      |
| Satd. Flow (prot)       | 1759  | 0    | 0    | 1857  | 1744 | 0    |
| Flt Permitted           | 0.957 |      |      | 0.997 |      |      |
| Satd. Flow (perm)       | 1759  | 0    | 0    | 1857  | 1744 | 0    |
| Link Speed (mph)        | 55    |      |      | 55    | 55   |      |
| Link Distance (ft)      | 1648  |      |      | 941   | 918  |      |
| Travel Time (s)         | 20.4  |      |      | 11.7  | 11.4 |      |
| Confl. Peds. (#/hr)     |       |      |      |       |      |      |
| Confl. Bikes (#/hr)     |       |      |      |       |      |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90  | 0.90 | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100%  | 100% | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%    | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0     | 0    | 0    |
| Parking (#/hr)          |       |      |      |       |      |      |
| Mid-Block Traffic (%)   | 0%    |      |      | 0%    | 0%   |      |
| Shared Lane Traffic (%) |       |      |      |       |      |      |
| Lane Group Flow (vph)   | 218   | 0    | 0    | 380   | 969  | 0    |
| Sign Control            | Stop  |      |      | Free  | Free |      |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 67.0% ICU Level of Service C  
Analysis Period (min) 15

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Background AM - Scenario #1  
08/02/2020

| Intersection             |        |        |       |        |      |      |
|--------------------------|--------|--------|-------|--------|------|------|
| Int Delay, s/veh         | 13.9   |        |       |        |      |      |
| Movement                 | EBL    | EBR    | NBL   | NBT    | SBT  | SBR  |
| Lane Configurations      |        |        |       |        |      |      |
| Traffic Vol, veh/h       | 177    | 19     | 20    | 322    | 460  | 412  |
| Future Vol, veh/h        | 177    | 19     | 20    | 322    | 460  | 412  |
| Conflicting Peds, #/hr   | 0      | 0      | 0     | 0      | 0    | 0    |
| Sign Control             | Stop   | Stop   | Free  | Free   | Free | Free |
| RT Channelized           | -      | None   | -     | None   | -    | None |
| Storage Length           | 0      | -      | -     | -      | -    | -    |
| Veh in Median Storage, # | 0      | -      | -     | 0      | 0    | -    |
| Grade, %                 | 0      | -      | -     | 0      | 0    | -    |
| Peak Hour Factor         | 90     | 90     | 90    | 90     | 90   | 90   |
| Heavy Vehicles, %        | 2      | 2      | 2     | 2      | 2    | 2    |
| Mvmt Flow                | 197    | 21     | 22    | 358    | 511  | 458  |
|                          |        |        |       |        |      |      |
| Major/Minor              | Minor2 | Major1 |       | Major2 |      |      |
| Conflicting Flow All     | 1142   | 740    | 969   | 0      | -    | 0    |
| Stage 1                  | 740    | -      | -     | -      | -    | -    |
| Stage 2                  | 402    | -      | -     | -      | -    | -    |
| Critical Hdwy            | 6.42   | 6.22   | 4.12  | -      | -    | -    |
| Critical Hdwy Stg 1      | 5.42   | -      | -     | -      | -    | -    |
| Critical Hdwy Stg 2      | 5.42   | -      | -     | -      | -    | -    |
| Follow-up Hdwy           | 3.518  | 3.318  | 2.218 | -      | -    | -    |
| Pot Cap-1 Maneuver       | 222    | 417    | 711   | -      | -    | -    |
| Stage 1                  | 472    | -      | -     | -      | -    | -    |
| Stage 2                  | 676    | -      | -     | -      | -    | -    |
| Platoon blocked, %       |        |        |       | -      | -    | -    |
| Mov Cap-1 Maneuver       | 213    | 417    | 711   | -      | -    | -    |
| Mov Cap-2 Maneuver       | 213    | -      | -     | -      | -    | -    |
| Stage 1                  | 454    | -      | -     | -      | -    | -    |
| Stage 2                  | 676    | -      | -     | -      | -    | -    |
|                          |        |        |       |        |      |      |
| Approach                 | EB     | NB     |       | SB     |      |      |
| HCM Control Delay, s     | 98.9   | 0.6    |       | 0      |      |      |
| HCM LOS                  | F      |        |       |        |      |      |
|                          |        |        |       |        |      |      |
| Minor Lane/Major Mvmt    |        | NBL    | NBT   | EBLn1  | SBT  | SBR  |
| Capacity (veh/h)         |        | 711    | -     | 224    | -    | -    |
| HCM Lane V/C Ratio       |        | 0.031  | -     | 0.972  | -    | -    |
| HCM Control Delay (s)    |        | 10.2   | 0     | 98.9   | -    | -    |
| HCM Lane LOS             |        | B      | A     | F      | -    | -    |
| HCM 95th %tile Q(veh)    |        | 0.1    | -     | 8.7    | -    | -    |

## Ashcroft Phase 2

## Background AM - Scenario #1

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |       |
| Traffic Volume (vph)    | 261   | 9     | 387  | 4     | 4     | 4    | 469   | 175   | 4    | 4     | 395   | 684   |
| Future Volume (vph)     | 261   | 9     | 387  | 4     | 4     | 4    | 469   | 175   | 4    | 4     | 395   | 684   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    |
| Grade (%)               |       | -3%   |      |       | -2%   |      |       | 4%    |      |       | -2%   |       |
| Storage Length (ft)     | 300   |       | 0    | 0     |       | 0    | 200   |       | 0    | 25    |       | 125   |
| Storage Lanes           | 1     |       | 0    | 0     |       | 0    | 1     |       | 0    | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 75    |       |       |
| Satd. Flow (prot)       | 1796  | 1613  | 0    | 0     | 1768  | 0    | 1734  | 1820  | 0    | 1787  | 1881  | 1599  |
| Flt Permitted           | 0.750 |       |      |       | 0.801 |      | 0.325 |       |      | 0.633 |       |       |
| Satd. Flow (perm)       | 1418  | 1613  | 0    | 0     | 1439  | 0    | 593   | 1820  | 0    | 1191  | 1881  | 1599  |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No    |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |       |
| Link Speed (mph)        |       | 45    |      |       | 20    |      |       | 45    |      |       | 45    |       |
| Link Distance (ft)      |       | 1601  |      |       | 259   |      |       | 1187  |      |       | 1614  |       |
| Travel Time (s)         |       | 24.3  |      |       | 8.8   |      |       | 18.0  |      |       | 24.5  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |       |
| Lane Group Flow (vph)   | 290   | 440   | 0    | 0     | 12    | 0    | 521   | 198   | 0    | 4     | 439   | 760   |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | pm+pt | NA    |      | Perm  | NA    | Perm  |
| Protected Phases        |       | 4     |      |       | 8     |      | 5     | 2     |      |       | 6     |       |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       |      | 6     |       | 6     |
| Detector Phase          | 4     | 4     |      | 8     | 8     |      | 5     | 2     |      | 6     | 6     | 6     |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 12.0  |      | 12.0  | 12.0  | 12.0  |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 19.0  |      | 19.0  | 19.0  | 19.0  |
| Total Split (s)         | 28.0  | 28.0  |      | 28.0  | 28.0  |      | 17.0  | 62.0  |      | 45.0  | 45.0  | 45.0  |
| Total Split (%)         | 31.1% | 31.1% |      | 31.1% | 31.1% |      | 18.9% | 68.9% |      | 50.0% | 50.0% | 50.0% |
| Yellow Time (s)         | 4.8   | 4.8   |      | 3.0   | 3.0   |      | 3.0   | 4.2   |      | 4.7   | 4.7   | 4.7   |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.9   | 1.9   |      | 2.1   | 1.0   |      | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s)    | -0.8  | -0.8  |      |       | 0.1   |      | -0.1  | -0.2  |      | -0.7  | -0.7  | -0.7  |
| Total Lost Time (s)     | 5.0   | 5.0   |      |       | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       |       |      |       |       |      | Lead  |       |      | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?      |       |       |      |       |       |      | Yes   |       |      | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   |      | Min   | Min   | Min   |
| Act Effect Green (s)    | 23.0  | 23.0  |      |       | 23.0  |      | 57.0  | 57.0  |      | 40.0  | 40.0  | 40.0  |
| Actuated g/C Ratio      | 0.26  | 0.26  |      |       | 0.26  |      | 0.63  | 0.63  |      | 0.44  | 0.44  | 0.44  |
| v/c Ratio               | 0.80  | 1.07  |      |       | 0.03  |      | 0.99  | 0.17  |      | 0.01  | 0.53  | 1.07  |
| Control Delay           | 49.8  | 98.0  |      |       | 25.6  |      | 50.5  | 7.2   |      | 14.0  | 21.0  | 80.8  |
| Queue Delay             | 0.0   | 0.0   |      |       | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   |
| Total Delay             | 49.8  | 98.0  |      |       | 25.6  |      | 50.5  | 7.2   |      | 14.0  | 21.0  | 80.8  |

Ashcroft Phase 2 11/05/2018 Background AM - Scenario #1  
Kimley-Horn

Synchro 10 Report

## Ashcroft Phase 2

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

## Background AM - Scenario #1

08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL | WBT  | WBR | NBL  | NBT  | NBR | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|-----|------|-----|------|------|-----|------|------|------|
| LOS                     | D    | F    |     |     | C    |     | D    | A    |     | B    | C    | F    |
| Approach Delay          |      | 78.9 |     |     | 25.6 |     |      | 38.6 |     |      | 58.8 |      |
| Approach LOS            |      | E    |     |     | C    |     |      | D    |     |      | E    |      |
| Queue Length 50th (ft)  | 155  | ~280 |     |     | 5    |     | 140  | 42   |     | 1    | 175  | ~484 |
| Queue Length 95th (ft)  | #285 | #461 |     |     | 19   |     | #341 | 70   |     | 7    | 264  | #701 |
| Internal Link Dist (ft) |      | 1521 |     |     | 179  |     |      | 1107 |     |      | 1534 |      |
| Turn Bay Length (ft)    | 300  |      |     |     |      |     | 200  |      |     | 25   |      | 125  |
| Base Capacity (vph)     | 362  | 412  |     |     | 367  |     | 527  | 1152 |     | 529  | 836  | 710  |
| Starvation Cap Reductn  | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.80 | 1.07 |     |     | 0.03 |     | 0.99 | 0.17 |     | 0.01 | 0.53 | 1.07 |

## Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 58.7

Intersection Capacity Utilization 86.7%

Analysis Period (min) 15

Description: 04-1302

Intersection LOS: E

ICU Level of Service E

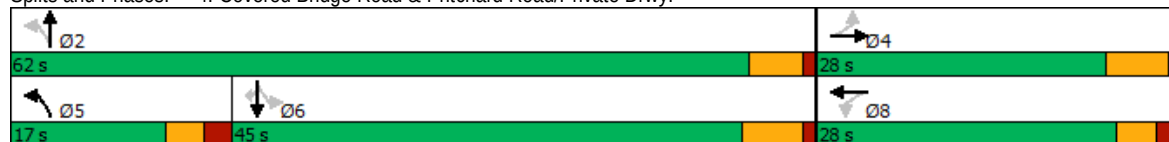
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.



Ashcroft Phase 2  
5: N. O'Neil Street & Steeplechase Drwy. 2

Background AM - Scenario #1  
08/02/2020

| Lane Group              | EBL   | EBR  | NBL   | NBT  | SBT  | SBR  |
|-------------------------|-------|------|-------|------|------|------|
| Lane Configurations     |       |      |       |      |      |      |
| Traffic Volume (vph)    | 15    | 22   | 9     | 326  | 473  | 6    |
| Future Volume (vph)     | 15    | 22   | 9     | 326  | 473  | 6    |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900  | 1900 | 1900 | 1900 |
| Lane Width (ft)         | 12    | 12   | 12    | 12   | 12   | 12   |
| Grade (%)               | 0%    |      |       | 0%   | 0%   |      |
| Storage Length (ft)     | 0     | 0    | 150   |      |      | 0    |
| Storage Lanes           | 1     | 0    | 1     |      |      | 0    |
| Taper Length (ft)       | 100   |      | 100   |      |      |      |
| Satd. Flow (prot)       | 1681  | 0    | 1770  | 1863 | 1859 | 0    |
| Flt Permitted           | 0.980 |      | 0.950 |      |      |      |
| Satd. Flow (perm)       | 1681  | 0    | 1770  | 1863 | 1859 | 0    |
| Link Speed (mph)        | 25    |      |       | 55   | 55   |      |
| Link Distance (ft)      | 795   |      |       | 1790 | 1321 |      |
| Travel Time (s)         | 21.7  |      |       | 22.2 | 16.4 |      |
| Confl. Peds. (#/hr)     |       |      |       |      |      |      |
| Confl. Bikes (#/hr)     |       |      |       |      |      |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90  | 0.90 | 0.90 | 0.90 |
| Growth Factor           | 100%  | 100% | 100%  | 100% | 100% | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%    | 2%   | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0     | 0    | 0    | 0    |
| Parking (#/hr)          |       |      |       |      |      |      |
| Mid-Block Traffic (%)   | 0%    |      |       | 0%   | 0%   |      |
| Shared Lane Traffic (%) |       |      |       |      |      |      |
| Lane Group Flow (vph)   | 41    | 0    | 10    | 362  | 533  | 0    |
| Sign Control            | Stop  |      |       | Free | Free |      |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 35.3%  
Analysis Period (min) 15

ICU Level of Service A

Ashcroft Phase 2  
5: N. O'Neil Street & Steeplechase Drwy. 2

Background AM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh 0.7

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 15   | 22   | 9    | 326  | 473  | 6    |
| Future Vol, veh/h        | 15   | 22   | 9    | 326  | 473  | 6    |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | 150  | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 17   | 24   | 10   | 362  | 526  | 7    |

Major/Minor Minor2 Major1 Major2

|                      |       |       |       |   |   |   |
|----------------------|-------|-------|-------|---|---|---|
| Conflicting Flow All | 912   | 530   | 533   | 0 | - | 0 |
| Stage 1              | 530   | -     | -     | - | - | - |
| Stage 2              | 382   | -     | -     | - | - | - |
| Critical Hdwy        | 6.42  | 6.22  | 4.12  | - | - | - |
| Critical Hdwy Stg 1  | 5.42  | -     | -     | - | - | - |
| Critical Hdwy Stg 2  | 5.42  | -     | -     | - | - | - |
| Follow-up Hdwy       | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver   | 304   | 549   | 1035  | - | - | - |
| Stage 1              | 590   | -     | -     | - | - | - |
| Stage 2              | 690   | -     | -     | - | - | - |
| Platoon blocked, %   |       |       |       | - | - | - |
| Mov Cap-1 Maneuver   | 301   | 549   | 1035  | - | - | - |
| Mov Cap-2 Maneuver   | 301   | -     | -     | - | - | - |
| Stage 1              | 584   | -     | -     | - | - | - |
| Stage 2              | 690   | -     | -     | - | - | - |

Approach EB NB SB

|                      |      |     |   |
|----------------------|------|-----|---|
| HCM Control Delay, s | 14.7 | 0.2 | 0 |
| HCM LOS              | B    |     |   |

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

|                       |      |   |      |   |   |
|-----------------------|------|---|------|---|---|
| Capacity (veh/h)      | 1035 | - | 412  | - | - |
| HCM Lane V/C Ratio    | 0.01 | - | 0.1  | - | - |
| HCM Control Delay (s) | 8.5  | - | 14.7 | - | - |
| HCM Lane LOS          | A    | - | B    | - | - |
| HCM 95th %tile Q(veh) | 0    | - | 0.3  | - | - |

Ashcroft Phase 2  
1: O'Neil Street & Main Street

Background PM - Scenario #1  
08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR  |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |      |
| Traffic Volume (vph)    | 189   | 505   | 7    | 4     | 237   | 331  | 9     | 109   | 4    | 253   | 52    | 170  |
| Future Volume (vph)     | 189   | 505   | 7    | 4     | 237   | 331  | 9     | 109   | 4    | 253   | 52    | 170  |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 10    | 10    | 10   |
| Grade (%)               |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Storage Length (ft)     | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 100   |       | 0    |
| Storage Lanes           | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 100   |       |      |
| Satd. Flow (prot)       | 0     | 1837  | 0    | 0     | 1717  | 0    | 0     | 1848  | 0    | 0     | 1612  | 0    |
| Flt Permitted           |       | 0.656 |      |       | 0.996 |      |       | 0.965 |      |       | 0.795 |      |
| Satd. Flow (perm)       | 0     | 1221  | 0    | 0     | 1711  | 0    | 0     | 1790  | 0    | 0     | 1316  | 0    |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No   |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |      |
| Link Speed (mph)        |       | 25    |      |       | 25    |      |       | 25    |      |       | 25    |      |
| Link Distance (ft)      |       | 1124  |      |       | 1174  |      |       | 1013  |      |       | 1118  |      |
| Travel Time (s)         |       | 30.7  |      |       | 32.0  |      |       | 27.6  |      |       | 30.5  |      |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |      |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |      |
| Lane Group Flow (vph)   | 0     | 779   | 0    | 0     | 635   | 0    | 0     | 135   | 0    | 0     | 528   | 0    |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      |
| Protected Phases        |       | 2     |      |       | 6     |      |       | 8     |      |       | 4     |      |
| Permitted Phases        | 2     |       |      | 6     |       |      | 8     |       |      | 4     |       |      |
| Detector Phase          | 2     | 2     |      | 6     | 6     |      | 8     | 8     |      | 4     | 4     |      |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |      |
| Minimum Initial (s)     | 10.0  | 10.0  |      | 10.0  | 10.0  |      | 7.0   | 7.0   |      | 7.0   | 7.0   |      |
| Minimum Split (s)       | 15.0  | 15.0  |      | 15.0  | 15.0  |      | 12.0  | 12.0  |      | 12.0  | 12.0  |      |
| Total Split (s)         | 37.0  | 37.0  |      | 37.0  | 37.0  |      | 23.0  | 23.0  |      | 23.0  | 23.0  |      |
| Total Split (%)         | 61.7% | 61.7% |      | 61.7% | 61.7% |      | 38.3% | 38.3% |      | 38.3% | 38.3% |      |
| Yellow Time (s)         | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      |
| Lost Time Adjust (s)    |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Lost Time (s)     |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |
| Lead/Lag                |       |       |      |       |       |      |       |       |      |       |       |      |
| Lead-Lag Optimize?      |       |       |      |       |       |      |       |       |      |       |       |      |
| Recall Mode             | Min   | Min   |      | Min   | Min   |      | None  | None  |      | None  | None  |      |
| Act Effect Green (s)    |       | 32.0  |      |       | 32.0  |      |       | 18.0  |      |       | 18.0  |      |
| Actuated g/C Ratio      |       | 0.53  |      |       | 0.53  |      |       | 0.30  |      |       | 0.30  |      |
| v/c Ratio               |       | 1.20  |      |       | 0.70  |      |       | 0.25  |      |       | 1.34  |      |
| Control Delay           |       | 122.1 |      |       | 15.5  |      |       | 17.5  |      |       | 193.2 |      |
| Queue Delay             |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Delay             |       | 122.1 |      |       | 15.5  |      |       | 17.5  |      |       | 193.2 |      |

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Synchro 10 Report



Ashcroft Phase 2  
1: O'Neil Street & Main Street

Background PM - Scenario #1  
08/02/2020

| Lane Group              | EBL | EBT   | EBR | WBL | WBT  | WBR | NBL | NBT  | NBR | SBL | SBT   | SBR |
|-------------------------|-----|-------|-----|-----|------|-----|-----|------|-----|-----|-------|-----|
| LOS                     |     | F     |     |     | B    |     |     | B    |     |     | F     |     |
| Approach Delay          |     | 122.1 |     |     | 15.5 |     |     | 17.5 |     |     | 193.2 |     |
| Approach LOS            |     | F     |     |     | B    |     |     | B    |     |     | F     |     |
| Queue Length 50th (ft)  |     | ~353  |     |     | 155  |     |     | 37   |     |     | ~257  |     |
| Queue Length 95th (ft)  |     | #542  |     |     | 264  |     |     | 74   |     |     | #422  |     |
| Internal Link Dist (ft) |     | 1044  |     |     | 1094 |     |     | 933  |     |     | 1038  |     |
| Turn Bay Length (ft)    |     |       |     |     |      |     |     |      |     |     |       |     |
| Base Capacity (vph)     |     | 651   |     |     | 912  |     |     | 537  |     |     | 394   |     |
| Starvation Cap Reductn  |     | 0     |     |     | 0    |     |     | 0    |     |     | 0     |     |
| Spillback Cap Reductn   |     | 0     |     |     | 0    |     |     | 0    |     |     | 0     |     |
| Storage Cap Reductn     |     | 0     |     |     | 0    |     |     | 0    |     |     | 0     |     |
| Reduced v/c Ratio       |     | 1.20  |     |     | 0.70 |     |     | 0.25 |     |     | 1.34  |     |

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.34

Intersection Signal Delay: 100.8

Intersection Capacity Utilization 116.7%

Analysis Period (min) 15

Description: 04-0179

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

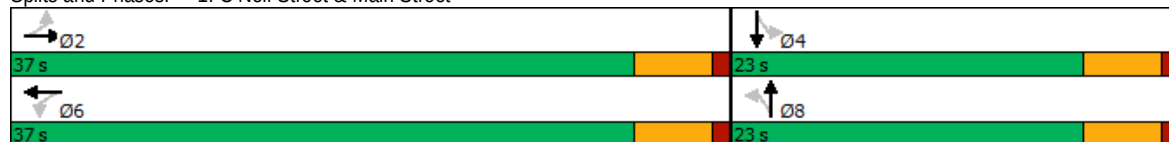
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: F

ICU Level of Service H

Splits and Phases: 1: O'Neil Street & Main Street



Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Background PM - Scenario #1  
08/02/2020

| Lane Group              | WBL   | WBR  | NBT  | NBR  | SBL   | SBT  |
|-------------------------|-------|------|------|------|-------|------|
| Lane Configurations     |       |      |      |      |       |      |
| Traffic Volume (vph)    | 33    | 22   | 605  | 670  | 38    | 435  |
| Future Volume (vph)     | 33    | 22   | 605  | 670  | 38    | 435  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12   | 12    | 12   |
| Grade (%)               | 0%    |      | 0%   |      |       | 0%   |
| Storage Length (ft)     | 0     | 0    |      | 75   | 75    |      |
| Storage Lanes           | 1     | 0    |      | 1    | 1     |      |
| Taper Length (ft)       | 100   |      |      |      | 100   |      |
| Satd. Flow (prot)       | 1713  | 0    | 1863 | 1583 | 1770  | 1863 |
| Flt Permitted           | 0.971 |      |      |      | 0.950 |      |
| Satd. Flow (perm)       | 1713  | 0    | 1863 | 1583 | 1770  | 1863 |
| Link Speed (mph)        | 25    |      | 45   |      |       | 45   |
| Link Distance (ft)      | 1397  |      | 1572 |      |       | 1790 |
| Travel Time (s)         | 38.1  |      | 23.8 |      |       | 27.1 |
| Confl. Peds. (#/hr)     |       |      |      |      |       |      |
| Confl. Bikes (#/hr)     |       |      |      |      |       |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90 | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100% | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%   | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0    | 0     | 0    |
| Parking (#/hr)          |       |      |      |      |       |      |
| Mid-Block Traffic (%)   | 0%    |      | 0%   |      |       | 0%   |
| Shared Lane Traffic (%) |       |      |      |      |       |      |
| Lane Group Flow (vph)   | 61    | 0    | 672  | 744  | 42    | 483  |
| Sign Control            | Stop  |      | Free |      |       | Free |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 51.5%  
Analysis Period (min) 15

ICU Level of Service A

Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Background PM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh 1.1

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 33   | 22   | 605  | 670  | 38   | 435  |
| Future Vol, veh/h        | 33   | 22   | 605  | 670  | 38   | 435  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | 75   | 75   | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 37   | 24   | 672  | 744  | 42   | 483  |

Major/Minor Minor1 Major1 Major2

|                      |       |       |   |   |       |   |
|----------------------|-------|-------|---|---|-------|---|
| Conflicting Flow All | 1239  | 672   | 0 | 0 | 1416  | 0 |
| Stage 1              | 672   | -     | - | - | -     | - |
| Stage 2              | 567   | -     | - | - | -     | - |
| Critical Hdwy        | 6.42  | 6.22  | - | - | 4.12  | - |
| Critical Hdwy Stg 1  | 5.42  | -     | - | - | -     | - |
| Critical Hdwy Stg 2  | 5.42  | -     | - | - | -     | - |
| Follow-up Hdwy       | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver   | 194   | 456   | - | - | 481   | - |
| Stage 1              | 508   | -     | - | - | -     | - |
| Stage 2              | 568   | -     | - | - | -     | - |
| Platoon blocked, %   |       |       | - | - |       | - |
| Mov Cap-1 Maneuver   | 177   | 456   | - | - | 481   | - |
| Mov Cap-2 Maneuver   | 177   | -     | - | - | -     | - |
| Stage 1              | 508   | -     | - | - | -     | - |
| Stage 2              | 519   | -     | - | - | -     | - |

Approach WB NB SB

|                      |      |   |     |
|----------------------|------|---|-----|
| HCM Control Delay, s | 25.7 | 0 | 1.1 |
| HCM LOS              | D    |   |     |

Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT

|                       |   |   |       |       |   |
|-----------------------|---|---|-------|-------|---|
| Capacity (veh/h)      | - | - | 234   | 481   | - |
| HCM Lane V/C Ratio    | - | - | 0.261 | 0.088 | - |
| HCM Control Delay (s) | - | - | 25.7  | 13.2  | - |
| HCM Lane LOS          | - | - | D     | B     | - |
| HCM 95th %tile Q(veh) | - | - | 1     | 0.3   | - |

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Kimley-Horn

Synchro 10 Report

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Background PM - Scenario #1  
08/02/2020

| Lane Group              | EBL   | EBR  | NBL  | NBT   | SBT  | SBR  |
|-------------------------|-------|------|------|-------|------|------|
| Lane Configurations     |       |      |      |       |      |      |
| Traffic Volume (vph)    | 471   | 24   | 23   | 660   | 459  | 276  |
| Future Volume (vph)     | 471   | 24   | 23   | 660   | 459  | 276  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12    | 12   | 12   |
| Grade (%)               | 0%    |      |      | 0%    | 0%   |      |
| Storage Length (ft)     | 0     | 0    | 0    |       |      | 0    |
| Storage Lanes           | 1     | 0    | 0    |       |      | 0    |
| Taper Length (ft)       | 100   |      | 100  |       |      |      |
| Satd. Flow (prot)       | 1766  | 0    | 0    | 1859  | 1768 | 0    |
| Flt Permitted           | 0.955 |      |      | 0.998 |      |      |
| Satd. Flow (perm)       | 1766  | 0    | 0    | 1859  | 1768 | 0    |
| Link Speed (mph)        | 55    |      |      | 55    | 55   |      |
| Link Distance (ft)      | 1648  |      |      | 941   | 918  |      |
| Travel Time (s)         | 20.4  |      |      | 11.7  | 11.4 |      |
| Confl. Peds. (#/hr)     |       |      |      |       |      |      |
| Confl. Bikes (#/hr)     |       |      |      |       |      |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90  | 0.90 | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100%  | 100% | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%    | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0     | 0    | 0    |
| Parking (#/hr)          |       |      |      |       |      |      |
| Mid-Block Traffic (%)   | 0%    |      |      | 0%    | 0%   |      |
| Shared Lane Traffic (%) |       |      |      |       |      |      |
| Lane Group Flow (vph)   | 550   | 0    | 0    | 759   | 817  | 0    |
| Sign Control            | Stop  |      |      | Free  | Free |      |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 87.5%  
Analysis Period (min) 15

ICU Level of Service E

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Background PM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh 354.4

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|----------|-----|-----|-----|-----|-----|-----|
|----------|-----|-----|-----|-----|-----|-----|

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 471  | 24   | 23   | 660  | 459  | 276  |
| Future Vol, veh/h        | 471  | 24   | 23   | 660  | 459  | 276  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 523  | 27   | 26   | 733  | 510  | 307  |

| Major/Minor | Minor2 | Major1 | Major2 |
|-------------|--------|--------|--------|
|-------------|--------|--------|--------|

|                      |       |       |       |   |   |   |
|----------------------|-------|-------|-------|---|---|---|
| Conflicting Flow All | 1449  | 664   | 817   | 0 | - | 0 |
| Stage 1              | 664   | -     | -     | - | - | - |
| Stage 2              | 785   | -     | -     | - | - | - |
| Critical Hdwy        | 6.42  | 6.22  | 4.12  | - | - | - |
| Critical Hdwy Stg 1  | 5.42  | -     | -     | - | - | - |
| Critical Hdwy Stg 2  | 5.42  | -     | -     | - | - | - |
| Follow-up Hdwy       | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver   | ~ 144 | 461   | 811   | - | - | - |
| Stage 1              | ~ 512 | -     | -     | - | - | - |
| Stage 2              | ~ 449 | -     | -     | - | - | - |
| Platoon blocked, %   |       |       |       | - | - | - |
| Mov Cap-1 Maneuver   | ~ 136 | 461   | 811   | - | - | - |
| Mov Cap-2 Maneuver   | ~ 136 | -     | -     | - | - | - |
| Stage 1              | ~ 484 | -     | -     | - | - | - |
| Stage 2              | ~ 449 | -     | -     | - | - | - |

| Approach | EB | NB | SB |
|----------|----|----|----|
|----------|----|----|----|

|                      |        |     |   |
|----------------------|--------|-----|---|
| HCM Control Delay, s | 1369.3 | 0.3 | 0 |
| HCM LOS              | F      |     |   |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-----|-----|-------|-----|-----|
|-----------------------|-----|-----|-------|-----|-----|

|                       |       |   |        |   |   |
|-----------------------|-------|---|--------|---|---|
| Capacity (veh/h)      | 811   | - | 141    | - | - |
| HCM Lane V/C Ratio    | 0.032 | - | 3.901  | - | - |
| HCM Control Delay (s) | 9.6   |   | 1369.3 | - | - |
| HCM Lane LOS          | A     | A | F      | - | - |
| HCM 95th %tile Q(veh) | 0.1   | - | 54.9   | - | - |

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

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Synchro 10 Report

## Ashcroft Phase 2

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

## Background PM - Scenario #1

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |       |
| Traffic Volume (vph)    | 699   | 4     | 368  | 4     | 4     | 4    | 409   | 407   | 4    | 4     | 326   | 352   |
| Future Volume (vph)     | 699   | 4     | 368  | 4     | 4     | 4    | 409   | 407   | 4    | 4     | 326   | 352   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    |
| Grade (%)               |       | -3%   |      |       | -2%   |      |       | 4%    |      |       | -2%   |       |
| Storage Length (ft)     | 300   |       | 0    | 0     |       | 0    | 200   |       | 0    | 25    |       | 125   |
| Storage Lanes           | 1     |       | 0    | 0     |       | 0    | 1     |       | 0    | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 75    |       |       |
| Satd. Flow (prot)       | 1796  | 1609  | 0    | 0     | 1768  | 0    | 1734  | 1824  | 0    | 1787  | 1881  | 1599  |
| Flt Permitted           | 0.750 |       |      |       | 0.918 |      | 0.235 |       |      | 0.500 |       |       |
| Satd. Flow (perm)       | 1418  | 1609  | 0    | 0     | 1649  | 0    | 429   | 1824  | 0    | 941   | 1881  | 1599  |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No    |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |       |
| Link Speed (mph)        |       | 45    |      |       | 20    |      |       | 45    |      |       | 45    |       |
| Link Distance (ft)      |       | 1601  |      |       | 259   |      |       | 1187  |      |       | 1614  |       |
| Travel Time (s)         |       | 24.3  |      |       | 8.8   |      |       | 18.0  |      |       | 24.5  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |       |
| Lane Group Flow (vph)   | 777   | 413   | 0    | 0     | 12    | 0    | 454   | 456   | 0    | 4     | 362   | 391   |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | pm+pt | NA    |      | Perm  | NA    | Perm  |
| Protected Phases        |       | 4     |      |       | 8     |      | 5     | 2     |      |       | 6     |       |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       |      | 6     |       | 6     |
| Detector Phase          | 4     | 4     |      | 8     | 8     |      | 5     | 2     |      | 6     | 6     | 6     |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 12.0  |      | 12.0  | 12.0  | 12.0  |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 19.0  |      | 19.0  | 19.0  | 19.0  |
| Total Split (s)         | 45.0  | 45.0  |      | 45.0  | 45.0  |      | 15.0  | 45.0  |      | 30.0  | 30.0  | 30.0  |
| Total Split (%)         | 50.0% | 50.0% |      | 50.0% | 50.0% |      | 16.7% | 50.0% |      | 33.3% | 33.3% | 33.3% |
| Yellow Time (s)         | 4.8   | 4.8   |      | 3.0   | 3.0   |      | 3.0   | 4.2   |      | 4.7   | 4.7   | 4.7   |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.9   | 1.9   |      | 2.1   | 1.0   |      | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s)    | -0.8  | -0.8  |      |       | 0.1   |      | -0.1  | -0.2  |      | -0.7  | -0.7  | -0.7  |
| Total Lost Time (s)     | 5.0   | 5.0   |      |       | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       |       |      |       |       |      | Lead  |       |      | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?      |       |       |      |       |       |      | Yes   |       |      | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   |      | Min   | Min   | Min   |
| Act Effect Green (s)    | 40.0  | 40.0  |      |       | 40.0  |      | 38.9  | 38.9  |      | 23.9  | 23.9  | 23.9  |
| Actuated g/C Ratio      | 0.45  | 0.45  |      |       | 0.45  |      | 0.44  | 0.44  |      | 0.27  | 0.27  | 0.27  |
| v/c Ratio               | 1.22  | 0.57  |      |       | 0.02  |      | 1.36  | 0.57  |      | 0.02  | 0.72  | 0.91  |
| Control Delay           | 138.0 | 22.3  |      |       | 14.2  |      | 202.6 | 22.2  |      | 24.0  | 38.4  | 58.9  |
| Queue Delay             | 0.0   | 0.0   |      |       | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   |
| Total Delay             | 138.0 | 22.3  |      |       | 14.2  |      | 202.6 | 22.2  |      | 24.0  | 38.4  | 58.9  |

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Synchro 10 Report

# Ashcroft Phase 2

## 4: Covered Bridge Road & Pritchard Road/Private Drwy.

Background PM - Scenario #1

08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL | WBT  | WBR | NBL  | NBT   | NBR | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|-----|------|-----|------|-------|-----|------|------|------|
| LOS                     | F    | C    |     |     | B    |     | F    | C     |     | C    | D    | E    |
| Approach Delay          |      | 97.9 |     |     | 14.2 |     |      | 112.2 |     |      | 48.9 |      |
| Approach LOS            |      | F    |     |     | B    |     |      | F     |     |      | D    |      |
| Queue Length 50th (ft)  | ~552 | 170  |     |     | 4    |     | ~256 | 186   |     | 2    | 184  | 212  |
| Queue Length 95th (ft)  | #771 | 264  |     |     | 14   |     | #444 | 280   |     | 10   | 282  | #376 |
| Internal Link Dist (ft) |      | 1521 |     |     | 179  |     |      | 1107  |     |      | 1534 |      |
| Turn Bay Length (ft)    | 300  |      |     |     |      |     | 200  |       |     | 25   |      | 125  |
| Base Capacity (vph)     | 638  | 724  |     |     | 741  |     | 334  | 820   |     | 264  | 529  | 449  |
| Starvation Cap Reductn  | 0    | 0    |     |     | 0    |     | 0    | 0     |     | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     |     | 0    |     | 0    | 0     |     | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     |     | 0    |     | 0    | 0     |     | 0    | 0    | 0    |
| Reduced v/c Ratio       | 1.22 | 0.57 |     |     | 0.02 |     | 1.36 | 0.56  |     | 0.02 | 0.68 | 0.87 |

### Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 88.9

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.36

Intersection Signal Delay: 89.1

Intersection Capacity Utilization 97.7%

Analysis Period (min) 15

Description: 04-1302

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

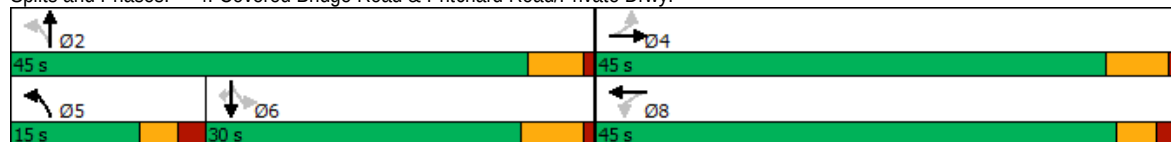
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: F

ICU Level of Service F

Splits and Phases: 4: Covered Bridge Road & Pritchard Road/Private Drwy.





Ashcroft Phase 2  
5: N. O'Neil Street & Steeplechase Drwy. 2

Background PM - Scenario #1  
08/02/2020

| Lane Group              | EBL   | EBR  | NBL   | NBT  | SBT  | SBR  |
|-------------------------|-------|------|-------|------|------|------|
| Lane Configurations     |       |      |       |      |      |      |
| Traffic Volume (vph)    | 10    | 14   | 23    | 672  | 466  | 16   |
| Future Volume (vph)     | 10    | 14   | 23    | 672  | 466  | 16   |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900  | 1900 | 1900 | 1900 |
| Lane Width (ft)         | 12    | 12   | 12    | 12   | 12   | 12   |
| Grade (%)               | 0%    |      |       | 0%   | 0%   |      |
| Storage Length (ft)     | 0     | 0    | 150   |      |      | 0    |
| Storage Lanes           | 1     | 0    | 1     |      |      | 0    |
| Taper Length (ft)       | 100   |      | 100   |      |      |      |
| Satd. Flow (prot)       | 1679  | 0    | 1770  | 1863 | 1853 | 0    |
| Flt Permitted           | 0.980 |      | 0.950 |      |      |      |
| Satd. Flow (perm)       | 1679  | 0    | 1770  | 1863 | 1853 | 0    |
| Link Speed (mph)        | 25    |      |       | 55   | 55   |      |
| Link Distance (ft)      | 795   |      |       | 1790 | 1321 |      |
| Travel Time (s)         | 21.7  |      |       | 22.2 | 16.4 |      |
| Confl. Peds. (#/hr)     |       |      |       |      |      |      |
| Confl. Bikes (#/hr)     |       |      |       |      |      |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90  | 0.90 | 0.90 | 0.90 |
| Growth Factor           | 100%  | 100% | 100%  | 100% | 100% | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%    | 2%   | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0     | 0    | 0    | 0    |
| Parking (#/hr)          |       |      |       |      |      |      |
| Mid-Block Traffic (%)   | 0%    |      |       | 0%   | 0%   |      |
| Shared Lane Traffic (%) |       |      |       |      |      |      |
| Lane Group Flow (vph)   | 27    | 0    | 26    | 747  | 536  | 0    |
| Sign Control            | Stop  |      |       | Free | Free |      |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 45.4%  
Analysis Period (min) 15

ICU Level of Service A

Ashcroft Phase 2  
5: N. O'Neil Street & Steeplechase Drwy. 2

Background PM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh 0.6

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|----------|-----|-----|-----|-----|-----|-----|
|----------|-----|-----|-----|-----|-----|-----|

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 10   | 14   | 23   | 672  | 466  | 16   |
| Future Vol, veh/h        | 10   | 14   | 23   | 672  | 466  | 16   |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | 150  | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 11   | 16   | 26   | 747  | 518  | 18   |

| Major/Minor | Minor2 | Major1 | Major2 |
|-------------|--------|--------|--------|
|-------------|--------|--------|--------|

|                      |       |       |       |   |   |   |
|----------------------|-------|-------|-------|---|---|---|
| Conflicting Flow All | 1326  | 527   | 536   | 0 | - | 0 |
| Stage 1              | 527   | -     | -     | - | - | - |
| Stage 2              | 799   | -     | -     | - | - | - |
| Critical Hdwy        | 6.42  | 6.22  | 4.12  | - | - | - |
| Critical Hdwy Stg 1  | 5.42  | -     | -     | - | - | - |
| Critical Hdwy Stg 2  | 5.42  | -     | -     | - | - | - |
| Follow-up Hdwy       | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver   | 172   | 551   | 1032  | - | - | - |
| Stage 1              | 592   | -     | -     | - | - | - |
| Stage 2              | 443   | -     | -     | - | - | - |
| Platoon blocked, %   |       |       |       | - | - | - |
| Mov Cap-1 Maneuver   | 168   | 551   | 1032  | - | - | - |
| Mov Cap-2 Maneuver   | 168   | -     | -     | - | - | - |
| Stage 1              | 577   | -     | -     | - | - | - |
| Stage 2              | 443   | -     | -     | - | - | - |

| Approach | EB | NB | SB |
|----------|----|----|----|
|----------|----|----|----|

|                      |    |     |   |
|----------------------|----|-----|---|
| HCM Control Delay, s | 19 | 0.3 | 0 |
| HCM LOS              | C  |     |   |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-----|-----|-------|-----|-----|
|-----------------------|-----|-----|-------|-----|-----|

|                       |       |   |       |   |   |
|-----------------------|-------|---|-------|---|---|
| Capacity (veh/h)      | 1032  | - | 283   | - | - |
| HCM Lane V/C Ratio    | 0.025 | - | 0.094 | - | - |
| HCM Control Delay (s) | 8.6   | - | 19    | - | - |
| HCM Lane LOS          | A     | - | C     | - | - |
| HCM 95th %tile Q(veh) | 0.1   | - | 0.3   | - | - |

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Synchro 10 Report

## Ashcroft Phase 2

## Background AM - Scenario #1 Alt. Analysis

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |       |
| Traffic Volume (vph)    | 261   | 9     | 387  | 4     | 4     | 4    | 469   | 175   | 4    | 4     | 395   | 684   |
| Future Volume (vph)     | 261   | 9     | 387  | 4     | 4     | 4    | 469   | 175   | 4    | 4     | 395   | 684   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    |
| Grade (%)               |       | -3%   |      |       | -2%   |      |       | 4%    |      |       | -2%   |       |
| Storage Length (ft)     | 300   |       | 0    | 0     |       | 0    | 200   |       | 0    | 25    |       | 125   |
| Storage Lanes           | 1     |       | 0    | 0     |       | 0    | 1     |       | 0    | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 75    |       |       |
| Satd. Flow (prot)       | 1796  | 1613  | 0    | 0     | 1768  | 0    | 1734  | 1820  | 0    | 1787  | 1881  | 1599  |
| Flt Permitted           | 0.750 |       |      |       | 0.753 |      | 0.199 |       |      | 0.633 |       |       |
| Satd. Flow (perm)       | 1418  | 1613  | 0    | 0     | 1353  | 0    | 363   | 1820  | 0    | 1191  | 1881  | 1599  |
| Right Turn on Red       |       |       | Yes  |       |       | Yes  |       |       | Yes  |       |       | Yes   |
| Satd. Flow (RTOR)       |       | 430   |      |       | 4     |      |       | 2     |      |       |       | 588   |
| Link Speed (mph)        |       | 45    |      |       | 20    |      |       | 45    |      |       | 45    |       |
| Link Distance (ft)      |       | 1601  |      |       | 259   |      |       | 1187  |      |       | 1614  |       |
| Travel Time (s)         |       | 24.3  |      |       | 8.8   |      |       | 18.0  |      |       | 24.5  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |       |
| Lane Group Flow (vph)   | 290   | 440   | 0    | 0     | 12    | 0    | 521   | 198   | 0    | 4     | 439   | 760   |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | pm+pt | NA    |      | Perm  | NA    | Perm  |
| Protected Phases        |       | 4     |      |       | 8     |      | 5     | 2     |      |       | 6     |       |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       |      | 6     |       | 6     |
| Detector Phase          | 4     | 4     |      | 8     | 8     |      | 5     | 2     |      | 6     | 6     | 6     |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 12.0  |      | 12.0  | 12.0  | 12.0  |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 19.0  |      | 19.0  | 19.0  | 19.0  |
| Total Split (s)         | 27.0  | 27.0  |      | 27.0  | 27.0  |      | 28.0  | 63.0  |      | 35.0  | 35.0  | 35.0  |
| Total Split (%)         | 30.0% | 30.0% |      | 30.0% | 30.0% |      | 31.1% | 70.0% |      | 38.9% | 38.9% | 38.9% |
| Yellow Time (s)         | 4.8   | 4.8   |      | 3.0   | 3.0   |      | 3.0   | 4.2   |      | 4.7   | 4.7   | 4.7   |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.9   | 1.9   |      | 2.1   | 1.0   |      | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s)    | -0.8  | -0.8  |      |       | 0.1   |      | -0.1  | -0.2  |      | -0.7  | -0.7  | -0.7  |
| Total Lost Time (s)     | 5.0   | 5.0   |      |       | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       |       |      |       |       |      | Lead  |       |      | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?      |       |       |      |       |       |      | Yes   |       |      | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   |      | Min   | Min   | Min   |
| Act Effect Green (s)    | 20.1  | 20.1  |      |       | 20.1  |      | 52.7  | 52.7  |      | 25.4  | 25.4  | 25.4  |
| Actuated g/C Ratio      | 0.24  | 0.24  |      |       | 0.24  |      | 0.64  | 0.64  |      | 0.31  | 0.31  | 0.31  |
| v/c Ratio               | 0.85  | 0.61  |      |       | 0.04  |      | 0.87  | 0.17  |      | 0.01  | 0.76  | 0.85  |
| Control Delay           | 54.8  | 7.6   |      |       | 22.1  |      | 33.5  | 6.7   |      | 20.5  | 36.0  | 16.8  |
| Queue Delay             | 0.0   | 0.0   |      |       | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   |
| Total Delay             | 54.8  | 7.6   |      |       | 22.1  |      | 33.5  | 6.7   |      | 20.5  | 36.0  | 16.8  |

Ashcroft Phase 2 11/05/2018 Background AM - Scenario #1 Alt. Analysis  
Kimley-Horn

Synchro 10 Report

## Ashcroft Phase 2

## Background AM - Scenario #1 Alt. Analysis

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL | WBT  | WBR | NBL  | NBT  | NBR | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|-----|------|-----|------|------|-----|------|------|------|
| LOS                     | D    | A    |     |     | C    |     | C    | A    |     | C    | D    | B    |
| Approach Delay          |      | 26.3 |     |     | 22.1 |     |      | 26.1 |     |      | 23.8 |      |
| Approach LOS            |      | C    |     |     | C    |     |      | C    |     |      | C    |      |
| Queue Length 50th (ft)  | 149  | 4    |     |     | 3    |     | 184  | 40   |     | 2    | 215  | 77   |
| Queue Length 95th (ft)  | #295 | 82   |     |     | 17   |     | #380 | 67   |     | 9    | 323  | #291 |
| Internal Link Dist (ft) |      | 1521 |     |     | 179  |     |      | 1107 |     |      | 1534 |      |
| Turn Bay Length (ft)    | 300  |      |     |     |      |     | 200  |      |     | 25   |      | 125  |
| Base Capacity (vph)     | 382  | 749  |     |     | 367  |     | 617  | 1294 |     | 438  | 692  | 960  |
| Starvation Cap Reductn  | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.76 | 0.59 |     |     | 0.03 |     | 0.84 | 0.15 |     | 0.01 | 0.63 | 0.79 |

## Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 82.9

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 25.1

Intersection Capacity Utilization 86.7%

Analysis Period (min) 15

Description: 04-1302

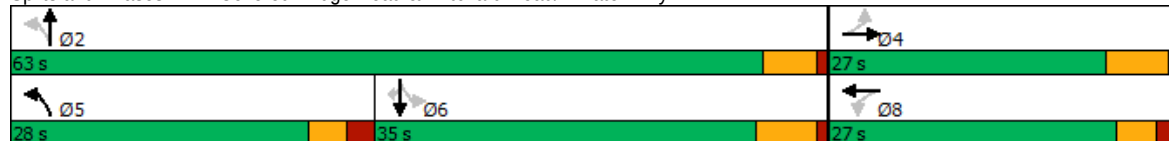
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: C

ICU Level of Service E

Splits and Phases: 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.



## Ashcroft Phase 2

## Background PM - Scenario #1 Alt. Analysis

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |       |
| Traffic Volume (vph)    | 699   | 4     | 368  | 4     | 4     | 4    | 409   | 407   | 4    | 4     | 326   | 352   |
| Future Volume (vph)     | 699   | 4     | 368  | 4     | 4     | 4    | 409   | 407   | 4    | 4     | 326   | 352   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    |
| Grade (%)               |       | -3%   |      |       | -2%   |      |       | 4%    |      |       | -2%   |       |
| Storage Length (ft)     | 300   |       | 0    | 0     |       | 0    | 200   |       | 0    | 25    |       | 125   |
| Storage Lanes           | 1     |       | 0    | 0     |       | 0    | 1     |       | 0    | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 75    |       |       |
| Satd. Flow (prot)       | 1796  | 1609  | 0    | 0     | 1768  | 0    | 1734  | 1824  | 0    | 1787  | 1881  | 1599  |
| Flt Permitted           | 0.750 |       |      |       | 0.918 |      | 0.165 |       |      | 0.500 |       |       |
| Satd. Flow (perm)       | 1418  | 1609  | 0    | 0     | 1649  | 0    | 301   | 1824  | 0    | 941   | 1881  | 1599  |
| Right Turn on Red       |       |       | Yes  |       |       | Yes  |       |       | Yes  |       |       | Yes   |
| Satd. Flow (RTOR)       |       | 409   |      |       | 4     |      |       | 1     |      |       |       | 333   |
| Link Speed (mph)        |       | 45    |      |       | 20    |      |       | 45    |      |       | 45    |       |
| Link Distance (ft)      |       | 1601  |      |       | 259   |      |       | 1187  |      |       | 1614  |       |
| Travel Time (s)         |       | 24.3  |      |       | 8.8   |      |       | 18.0  |      |       | 24.5  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |       |
| Lane Group Flow (vph)   | 777   | 413   | 0    | 0     | 12    | 0    | 454   | 456   | 0    | 4     | 362   | 391   |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | pm+pt | NA    |      | Perm  | NA    | Perm  |
| Protected Phases        |       | 4     |      |       | 8     |      | 5     | 2     |      |       | 6     |       |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       |      | 6     |       | 6     |
| Detector Phase          | 4     | 4     |      | 8     | 8     |      | 5     | 2     |      | 6     | 6     | 6     |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 12.0  |      | 12.0  | 12.0  | 12.0  |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 19.0  |      | 19.0  | 19.0  | 19.0  |
| Total Split (s)         | 45.0  | 45.0  |      | 45.0  | 45.0  |      | 20.0  | 45.0  |      | 25.0  | 25.0  | 25.0  |
| Total Split (%)         | 50.0% | 50.0% |      | 50.0% | 50.0% |      | 22.2% | 50.0% |      | 27.8% | 27.8% | 27.8% |
| Yellow Time (s)         | 4.8   | 4.8   |      | 3.0   | 3.0   |      | 3.0   | 4.2   |      | 4.7   | 4.7   | 4.7   |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.9   | 1.9   |      | 2.1   | 1.0   |      | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s)    | -0.8  | -0.8  |      |       | 0.1   |      | -0.1  | -0.2  |      | -0.7  | -0.7  | -0.7  |
| Total Lost Time (s)     | 5.0   | 5.0   |      |       | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       |       |      |       |       |      | Lead  |       |      | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?      |       |       |      |       |       |      | Yes   |       |      | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   |      | Min   | Min   | Min   |
| Act Effect Green (s)    | 40.0  | 40.0  |      |       | 40.0  |      | 39.3  | 39.3  |      | 19.3  | 19.3  | 19.3  |
| Actuated g/C Ratio      | 0.45  | 0.45  |      |       | 0.45  |      | 0.44  | 0.44  |      | 0.22  | 0.22  | 0.22  |
| v/c Ratio               | 1.22  | 0.44  |      |       | 0.02  |      | 1.22  | 0.57  |      | 0.02  | 0.89  | 0.65  |
| Control Delay           | 140.3 | 3.3   |      |       | 11.9  |      | 144.6 | 22.0  |      | 27.8  | 59.6  | 11.7  |
| Queue Delay             | 0.0   | 0.0   |      |       | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   |
| Total Delay             | 140.3 | 3.3   |      |       | 11.9  |      | 144.6 | 22.0  |      | 27.8  | 59.6  | 11.7  |

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Synchro 10 Report

# Ashcroft Phase 2

# Background PM - Scenario #1 Alt. Analysis

## 4: Covered Bridge Road & Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL | WBT  | WBR | NBL  | NBT  | NBR | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|-----|------|-----|------|------|-----|------|------|------|
| LOS                     | F    | A    |     |     | B    |     | F    | C    |     | C    | E    | B    |
| Approach Delay          |      | 92.8 |     |     | 11.9 |     |      | 83.2 |     |      | 34.7 |      |
| Approach LOS            |      | F    |     |     | B    |     |      | F    |     |      | C    |      |
| Queue Length 50th (ft)  | ~552 | 1    |     |     | 3    |     | ~270 | 185  |     | 2    | 199  | 27   |
| Queue Length 95th (ft)  | #771 | 52   |     |     | 12   |     | #458 | 280  |     | 11   | #353 | 116  |
| Internal Link Dist (ft) |      | 1521 |     |     | 179  |     |      | 1107 |     |      | 1534 |      |
| Turn Bay Length (ft)    | 300  |      |     |     |      |     | 200  |      |     | 25   |      | 125  |
| Base Capacity (vph)     | 635  | 946  |     |     | 741  |     | 373  | 817  |     | 211  | 421  | 616  |
| Starvation Cap Reductn  | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Reduced v/c Ratio       | 1.22 | 0.44 |     |     | 0.02 |     | 1.22 | 0.56 |     | 0.02 | 0.86 | 0.63 |

### Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 89.3

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.22

Intersection Signal Delay: 74.1

Intersection Capacity Utilization 97.7%

Analysis Period (min) 15

Description: 04-1302

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

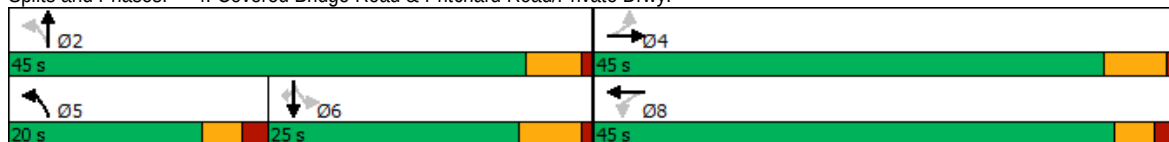
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: E

ICU Level of Service F

Splits and Phases: 4: Covered Bridge Road & Pritchard Road/Private Drwy.



**Appendix I:**  
**Synchro Output:**  
**Build-out (2030) – Scenario #1**



Ashcroft Phase 2  
1: O'Neil Street & Main Street

Build-out AM - Scenario #1  
08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR  |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |      |
| Traffic Volume (vph)    | 128   | 227   | 7    | 4     | 369   | 201  | 4     | 58    | 4    | 366   | 88    | 293  |
| Future Volume (vph)     | 128   | 227   | 7    | 4     | 369   | 201  | 4     | 58    | 4    | 366   | 88    | 293  |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 10    | 10    | 10   |
| Grade (%)               |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Storage Length (ft)     | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 100   |       | 0    |
| Storage Lanes           | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 100   |       |      |
| Satd. Flow (prot)       | 0     | 1826  | 0    | 0     | 1775  | 0    | 0     | 1842  | 0    | 0     | 1607  | 0    |
| Flt Permitted           |       | 0.482 |      |       | 0.998 |      |       | 0.964 |      |       | 0.808 |      |
| Satd. Flow (perm)       | 0     | 895   | 0    | 0     | 1772  | 0    | 0     | 1781  | 0    | 0     | 1330  | 0    |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No   |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |      |
| Link Speed (mph)        |       | 25    |      |       | 25    |      |       | 25    |      |       | 25    |      |
| Link Distance (ft)      |       | 1124  |      |       | 1174  |      |       | 1013  |      |       | 1118  |      |
| Travel Time (s)         |       | 30.7  |      |       | 32.0  |      |       | 27.6  |      |       | 30.5  |      |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |      |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |      |
| Lane Group Flow (vph)   | 0     | 402   | 0    | 0     | 637   | 0    | 0     | 72    | 0    | 0     | 831   | 0    |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      |
| Protected Phases        |       | 2     |      |       | 6     |      |       | 8     |      |       | 4     |      |
| Permitted Phases        | 2     |       |      | 6     |       |      | 8     |       |      | 4     |       |      |
| Detector Phase          | 2     | 2     |      | 6     | 6     |      | 8     | 8     |      | 4     | 4     |      |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |      |
| Minimum Initial (s)     | 10.0  | 10.0  |      | 10.0  | 10.0  |      | 7.0   | 7.0   |      | 7.0   | 7.0   |      |
| Minimum Split (s)       | 15.0  | 15.0  |      | 15.0  | 15.0  |      | 12.0  | 12.0  |      | 12.0  | 12.0  |      |
| Total Split (s)         | 28.0  | 28.0  |      | 28.0  | 28.0  |      | 32.0  | 32.0  |      | 32.0  | 32.0  |      |
| Total Split (%)         | 46.7% | 46.7% |      | 46.7% | 46.7% |      | 53.3% | 53.3% |      | 53.3% | 53.3% |      |
| Yellow Time (s)         | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      |
| Lost Time Adjust (s)    |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Lost Time (s)     |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |
| Lead/Lag                |       |       |      |       |       |      |       |       |      |       |       |      |
| Lead-Lag Optimize?      |       |       |      |       |       |      |       |       |      |       |       |      |
| Recall Mode             | Min   | Min   |      | Min   | Min   |      | None  | None  |      | None  | None  |      |
| Act Effect Green (s)    |       | 23.0  |      |       | 23.0  |      |       | 27.0  |      |       | 27.0  |      |
| Actuated g/C Ratio      |       | 0.38  |      |       | 0.38  |      |       | 0.45  |      |       | 0.45  |      |
| v/c Ratio               |       | 1.17  |      |       | 0.94  |      |       | 0.09  |      |       | 1.39  |      |
| Control Delay           |       | 127.4 |      |       | 43.3  |      |       | 9.9   |      |       | 206.4 |      |
| Queue Delay             |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Delay             |       | 127.4 |      |       | 43.3  |      |       | 9.9   |      |       | 206.4 |      |

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Synchro 10 Report

Ashcroft Phase 2  
1: O'Neil Street & Main Street

Build-out AM - Scenario #1  
08/02/2020

| Lane Group              | EBL | EBT   | EBR | WBL | WBT  | WBR | NBL | NBT  | NBR | SBL | SBT   | SBR |
|-------------------------|-----|-------|-----|-----|------|-----|-----|------|-----|-----|-------|-----|
| LOS                     |     | F     |     |     | D    |     |     | A    |     |     | F     |     |
| Approach Delay          |     | 127.4 |     |     | 43.3 |     |     | 9.9  |     |     | 206.4 |     |
| Approach LOS            |     | F     |     |     | D    |     |     | A    |     |     | F     |     |
| Queue Length 50th (ft)  |     | ~179  |     |     | 214  |     |     | 14   |     |     | ~414  |     |
| Queue Length 95th (ft)  |     | #327  |     |     | #407 |     |     | 33   |     |     | #606  |     |
| Internal Link Dist (ft) |     | 1044  |     |     | 1094 |     |     | 933  |     |     | 1038  |     |
| Turn Bay Length (ft)    |     |       |     |     |      |     |     |      |     |     |       |     |
| Base Capacity (vph)     |     | 343   |     |     | 679  |     |     | 801  |     |     | 598   |     |
| Starvation Cap Reductn  |     | 0     |     |     | 0    |     |     | 0    |     |     | 0     |     |
| Spillback Cap Reductn   |     | 0     |     |     | 0    |     |     | 0    |     |     | 0     |     |
| Storage Cap Reductn     |     | 0     |     |     | 0    |     |     | 0    |     |     | 0     |     |
| Reduced v/c Ratio       |     | 1.17  |     |     | 0.94 |     |     | 0.09 |     |     | 1.39  |     |

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.39

Intersection Signal Delay: 129.3

Intersection Capacity Utilization 113.3%

Analysis Period (min) 15

Description: 04-0179

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

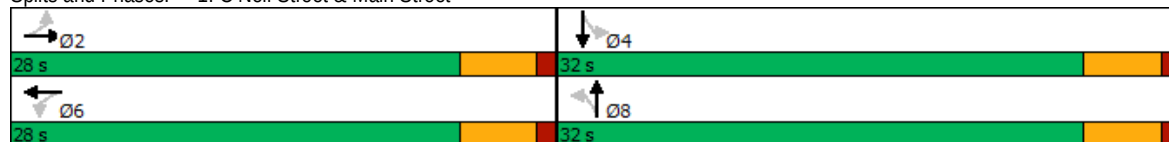
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: F

ICU Level of Service H

Splits and Phases: 1: O'Neil Street & Main Street



Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Build-out AM - Scenario #1  
08/02/2020

| Lane Group              | WBL   | WBR  | NBT  | NBR  | SBL   | SBT  |
|-------------------------|-------|------|------|------|-------|------|
| Lane Configurations     |       |      |      |      |       |      |
| Traffic Volume (vph)    | 65    | 33   | 373  | 22   | 38    | 584  |
| Future Volume (vph)     | 65    | 33   | 373  | 22   | 38    | 584  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12   | 12    | 12   |
| Grade (%)               | 0%    |      | 0%   |      |       | 0%   |
| Storage Length (ft)     | 0     | 0    |      | 75   | 75    |      |
| Storage Lanes           | 1     | 0    |      | 1    | 1     |      |
| Taper Length (ft)       | 100   |      |      |      | 100   |      |
| Satd. Flow (prot)       | 1720  | 0    | 1863 | 1583 | 1770  | 1863 |
| Flt Permitted           | 0.968 |      |      |      | 0.950 |      |
| Satd. Flow (perm)       | 1720  | 0    | 1863 | 1583 | 1770  | 1863 |
| Link Speed (mph)        | 25    |      | 45   |      |       | 45   |
| Link Distance (ft)      | 1397  |      | 1572 |      |       | 1790 |
| Travel Time (s)         | 38.1  |      | 23.8 |      |       | 27.1 |
| Confl. Peds. (#/hr)     |       |      |      |      |       |      |
| Confl. Bikes (#/hr)     |       |      |      |      |       |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90 | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100% | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%   | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0    | 0     | 0    |
| Parking (#/hr)          |       |      |      |      |       |      |
| Mid-Block Traffic (%)   | 0%    |      | 0%   |      |       | 0%   |
| Shared Lane Traffic (%) |       |      |      |      |       |      |
| Lane Group Flow (vph)   | 109   | 0    | 414  | 24   | 42    | 649  |
| Sign Control            | Stop  |      | Free |      |       | Free |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 43.0% ICU Level of Service A  
Analysis Period (min) 15

Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Build-out AM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh 2.6

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 65   | 33   | 373  | 22   | 38   | 584  |
| Future Vol, veh/h        | 65   | 33   | 373  | 22   | 38   | 584  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | 75   | 75   | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 72   | 37   | 414  | 24   | 42   | 649  |

Major/Minor Minor1 Major1 Major2

|                      |       |       |   |   |       |   |
|----------------------|-------|-------|---|---|-------|---|
| Conflicting Flow All | 1147  | 414   | 0 | 0 | 438   | 0 |
| Stage 1              | 414   | -     | - | - | -     | - |
| Stage 2              | 733   | -     | - | - | -     | - |
| Critical Hdwy        | 6.42  | 6.22  | - | - | 4.12  | - |
| Critical Hdwy Stg 1  | 5.42  | -     | - | - | -     | - |
| Critical Hdwy Stg 2  | 5.42  | -     | - | - | -     | - |
| Follow-up Hdwy       | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver   | 220   | 638   | - | - | 1122  | - |
| Stage 1              | 667   | -     | - | - | -     | - |
| Stage 2              | 475   | -     | - | - | -     | - |
| Platoon blocked, %   |       |       | - | - |       | - |
| Mov Cap-1 Maneuver   | 212   | 638   | - | - | 1122  | - |
| Mov Cap-2 Maneuver   | 212   | -     | - | - | -     | - |
| Stage 1              | 667   | -     | - | - | -     | - |
| Stage 2              | 457   | -     | - | - | -     | - |

Approach WB NB SB

|                      |      |   |     |
|----------------------|------|---|-----|
| HCM Control Delay, s | 26.7 | 0 | 0.5 |
| HCM LOS              | D    |   |     |

Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT

|                       |   |   |       |       |   |
|-----------------------|---|---|-------|-------|---|
| Capacity (veh/h)      | - | - | 273   | 1122  | - |
| HCM Lane V/C Ratio    | - | - | 0.399 | 0.038 | - |
| HCM Control Delay (s) | - | - | 26.7  | 8.3   | - |
| HCM Lane LOS          | - | - | D     | A     | - |
| HCM 95th %tile Q(veh) | - | - | 1.8   | 0.1   | - |

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Synchro 10 Report

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Build-out AM - Scenario #1  
08/02/2020

| Lane Group              | EBL   | EBR  | NBL  | NBT   | SBT  | SBR  |
|-------------------------|-------|------|------|-------|------|------|
| Lane Configurations     |       |      |      |       |      |      |
| Traffic Volume (vph)    | 177   | 90   | 163  | 414   | 529  | 412  |
| Future Volume (vph)     | 177   | 90   | 163  | 414   | 529  | 412  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12    | 12   | 12   |
| Grade (%)               | 0%    |      |      | 0%    | 0%   |      |
| Storage Length (ft)     | 0     | 0    | 0    |       |      | 0    |
| Storage Lanes           | 1     | 0    | 0    |       |      | 0    |
| Taper Length (ft)       | 100   |      | 100  |       |      |      |
| Satd. Flow (prot)       | 1722  | 0    | 0    | 1837  | 1753 | 0    |
| Flt Permitted           | 0.968 |      |      | 0.986 |      |      |
| Satd. Flow (perm)       | 1722  | 0    | 0    | 1837  | 1753 | 0    |
| Link Speed (mph)        | 55    |      |      | 55    | 55   |      |
| Link Distance (ft)      | 1648  |      |      | 941   | 918  |      |
| Travel Time (s)         | 20.4  |      |      | 11.7  | 11.4 |      |
| Confl. Peds. (#/hr)     |       |      |      |       |      |      |
| Confl. Bikes (#/hr)     |       |      |      |       |      |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90  | 0.90 | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100%  | 100% | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%    | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0     | 0    | 0    |
| Parking (#/hr)          |       |      |      |       |      |      |
| Mid-Block Traffic (%)   | 0%    |      |      | 0%    | 0%   |      |
| Shared Lane Traffic (%) |       |      |      |       |      |      |
| Lane Group Flow (vph)   | 297   | 0    | 0    | 641   | 1046 | 0    |
| Sign Control            | Stop  |      |      | Free  | Free |      |

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 109.1%

ICU Level of Service H

Analysis Period (min) 15

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Build-out AM - Scenario #1  
08/02/2020

Intersection

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 156  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 177  | 90   | 163  | 414  | 529  | 412  |
| Future Vol, veh/h        | 177  | 90   | 163  | 414  | 529  | 412  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 197  | 100  | 181  | 460  | 588  | 458  |

|                      |        |        |       |        |   |
|----------------------|--------|--------|-------|--------|---|
| Major/Minor          | Minor2 | Major1 |       | Major2 |   |
| Conflicting Flow All | 1639   | 817    | 1046  | 0      | 0 |
| Stage 1              | 817    | -      | -     | -      | - |
| Stage 2              | 822    | -      | -     | -      | - |
| Critical Hdwy        | 6.42   | 6.22   | 4.12  | -      | - |
| Critical Hdwy Stg 1  | 5.42   | -      | -     | -      | - |
| Critical Hdwy Stg 2  | 5.42   | -      | -     | -      | - |
| Follow-up Hdwy       | 3.518  | 3.318  | 2.218 | -      | - |
| Pot Cap-1 Maneuver   | ~ 110  | 376    | 665   | -      | - |
| Stage 1              | 434    | -      | -     | -      | - |
| Stage 2              | 432    | -      | -     | -      | - |
| Platoon blocked, %   |        |        |       | -      | - |
| Mov Cap-1 Maneuver   | ~ 70   | 376    | 665   | -      | - |
| Mov Cap-2 Maneuver   | ~ 70   | -      | -     | -      | - |
| Stage 1              | 275    | -      | -     | -      | - |
| Stage 2              | 432    | -      | -     | -      | - |

|                             |    |     |    |
|-----------------------------|----|-----|----|
| Approach                    | EB | NB  | SB |
| HCM Control Delay, \$1035.6 |    | 3.5 | 0  |
| HCM LOS                     | F  |     |    |

|                       |       |          |       |     |     |
|-----------------------|-------|----------|-------|-----|-----|
| Minor Lane/Major Mvmt | NBL   | NBT      | EBLn1 | SBT | SBR |
| Capacity (veh/h)      | 665   | -        | 96    | -   | -   |
| HCM Lane V/C Ratio    | 0.272 | -        | 3.09  | -   | -   |
| HCM Control Delay (s) | 12.4  | \$1035.6 |       | -   | -   |
| HCM Lane LOS          | B     | A        | F     | -   | -   |
| HCM 95th %tile Q(veh) | 1.1   | -        | 28.9  | -   | -   |

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

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Synchro 10 Report

## Ashcroft Phase 2

## Build-out AM - Scenario #1

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |       |
| Traffic Volume (vph)    | 261   | 9     | 414  | 4     | 4     | 4    | 523   | 198   | 4    | 4     | 412   | 684   |
| Future Volume (vph)     | 261   | 9     | 414  | 4     | 4     | 4    | 523   | 198   | 4    | 4     | 412   | 684   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    |
| Grade (%)               |       | -3%   |      |       | -2%   |      |       | 4%    |      |       | -2%   |       |
| Storage Length (ft)     | 300   |       | 0    | 0     |       | 0    | 200   |       | 0    | 25    |       | 125   |
| Storage Lanes           | 1     |       | 0    | 0     |       | 0    | 1     |       | 0    | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 75    |       |       |
| Satd. Flow (prot)       | 1796  | 1613  | 0    | 0     | 1768  | 0    | 1734  | 1820  | 0    | 1787  | 1881  | 1599  |
| Flt Permitted           | 0.750 |       |      |       | 0.689 |      | 0.309 |       |      | 0.619 |       |       |
| Satd. Flow (perm)       | 1418  | 1613  | 0    | 0     | 1238  | 0    | 564   | 1820  | 0    | 1165  | 1881  | 1599  |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No    |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |       |
| Link Speed (mph)        |       | 45    |      |       | 20    |      |       | 45    |      |       | 45    |       |
| Link Distance (ft)      |       | 1601  |      |       | 259   |      |       | 1187  |      |       | 1614  |       |
| Travel Time (s)         |       | 24.3  |      |       | 8.8   |      |       | 18.0  |      |       | 24.5  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |       |
| Lane Group Flow (vph)   | 290   | 470   | 0    | 0     | 12    | 0    | 581   | 224   | 0    | 4     | 458   | 760   |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | pm+pt | NA    |      | Perm  | NA    | Perm  |
| Protected Phases        |       | 4     |      |       | 8     |      | 5     | 2     |      |       | 6     |       |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       |      | 6     |       | 6     |
| Detector Phase          | 4     | 4     |      | 8     | 8     |      | 5     | 2     |      | 6     | 6     | 6     |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 12.0  |      | 12.0  | 12.0  | 12.0  |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 19.0  |      | 19.0  | 19.0  | 19.0  |
| Total Split (s)         | 27.0  | 27.0  |      | 27.0  | 27.0  |      | 18.0  | 63.0  |      | 45.0  | 45.0  | 45.0  |
| Total Split (%)         | 30.0% | 30.0% |      | 30.0% | 30.0% |      | 20.0% | 70.0% |      | 50.0% | 50.0% | 50.0% |
| Yellow Time (s)         | 4.8   | 4.8   |      | 3.0   | 3.0   |      | 3.0   | 4.2   |      | 4.7   | 4.7   | 4.7   |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.9   | 1.9   |      | 2.1   | 1.0   |      | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s)    | -0.8  | -0.8  |      |       | 0.1   |      | -0.1  | -0.2  |      | -0.7  | -0.7  | -0.7  |
| Total Lost Time (s)     | 5.0   | 5.0   |      |       | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       |       |      |       |       |      | Lead  |       |      | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?      |       |       |      |       |       |      | Yes   |       |      | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   |      | Min   | Min   | Min   |
| Act Effect Green (s)    | 22.0  | 22.0  |      |       | 22.0  |      | 58.0  | 58.0  |      | 40.0  | 40.0  | 40.0  |
| Actuated g/C Ratio      | 0.24  | 0.24  |      |       | 0.24  |      | 0.64  | 0.64  |      | 0.44  | 0.44  | 0.44  |
| v/c Ratio               | 0.84  | 1.19  |      |       | 0.04  |      | 1.09  | 0.19  |      | 0.01  | 0.55  | 1.07  |
| Control Delay           | 55.0  | 141.9 |      |       | 26.5  |      | 81.0  | 7.0   |      | 14.0  | 21.5  | 80.8  |
| Queue Delay             | 0.0   | 0.0   |      |       | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   |
| Total Delay             | 55.0  | 141.9 |      |       | 26.5  |      | 81.0  | 7.0   |      | 14.0  | 21.5  | 80.8  |

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Synchro 10 Report



## Ashcroft Phase 2

## Build-out AM - Scenario #1

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL  | EBT   | EBR | WBL | WBT  | WBR | NBL  | NBT  | NBR | SBL  | SBT  | SBR  |
|-------------------------|------|-------|-----|-----|------|-----|------|------|-----|------|------|------|
| LOS                     | D    | F     |     |     | C    |     | F    | A    |     | B    | C    | F    |
| Approach Delay          |      | 108.7 |     |     | 26.5 |     |      | 60.4 |     |      | 58.4 |      |
| Approach LOS            |      | F     |     |     | C    |     |      | E    |     |      | E    |      |
| Queue Length 50th (ft)  | 157  | ~326  |     |     | 5    |     | ~195 | 46   |     | 1    | 185  | ~484 |
| Queue Length 95th (ft)  | #295 | #513  |     |     | 19   |     | #432 | 76   |     | 7    | 278  | #701 |
| Internal Link Dist (ft) |      | 1521  |     |     | 179  |     |      | 1107 |     |      | 1534 |      |
| Turn Bay Length (ft)    | 300  |       |     |     |      |     | 200  |      |     | 25   |      | 125  |
| Base Capacity (vph)     | 346  | 394   |     |     | 302  |     | 532  | 1172 |     | 517  | 836  | 710  |
| Starvation Cap Reductn  | 0    | 0     |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0     |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0     |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.84 | 1.19  |     |     | 0.04 |     | 1.09 | 0.19 |     | 0.01 | 0.55 | 1.07 |

## Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 72.5

Intersection Capacity Utilization 89.7%

Analysis Period (min) 15

Description: 04-1302

Intersection LOS: E

ICU Level of Service E

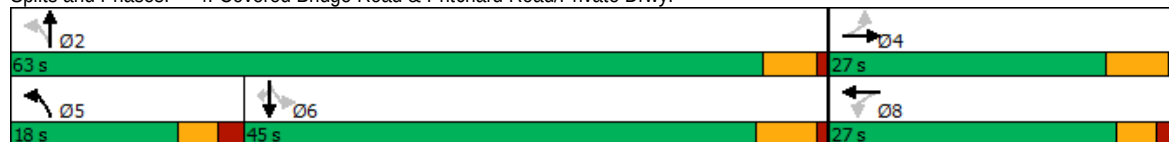
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.



## Ashcroft Phase 2

## Build-out AM - Scenario #1

5: N. O'Neil Street &amp; Steeplechase Drwy. 2/South Full-Mvmt. Drwy.

08/02/2020

| Lane Group              | EBL  | EBT   | EBR  | WBL   | WBT  | WBR  | NBL   | NBT  | NBR  | SBL   | SBT  | SBR  |
|-------------------------|------|-------|------|-------|------|------|-------|------|------|-------|------|------|
| Lane Configurations     |      |       |      |       |      |      |       |      |      |       |      |      |
| Traffic Volume (vph)    | 15   | 4     | 22   | 34    | 4    | 23   | 9     | 382  | 22   | 36    | 574  | 6    |
| Future Volume (vph)     | 15   | 4     | 22   | 34    | 4    | 23   | 9     | 382  | 22   | 36    | 574  | 6    |
| Ideal Flow (vphpl)      | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Lane Width (ft)         | 12   | 12    | 12   | 12    | 12   | 12   | 12    | 12   | 12   | 12    | 12   | 12   |
| Grade (%)               |      | 0%    |      |       | 0%   |      |       | 0%   |      |       | 0%   |      |
| Storage Length (ft)     | 0    |       | 0    | 125   |      | 0    | 150   |      | 75   | 75    |      | 0    |
| Storage Lanes           | 0    |       | 0    | 1     |      | 0    | 1     |      | 1    | 1     |      | 0    |
| Taper Length (ft)       | 100  |       |      | 100   |      |      | 100   |      |      | 100   |      |      |
| Satd. Flow (prot)       | 0    | 1696  | 0    | 1770  | 1621 | 0    | 1770  | 1863 | 1583 | 1770  | 1859 | 0    |
| Flt Permitted           |      | 0.981 |      | 0.950 |      |      | 0.950 |      |      | 0.950 |      |      |
| Satd. Flow (perm)       | 0    | 1696  | 0    | 1770  | 1621 | 0    | 1770  | 1863 | 1583 | 1770  | 1859 | 0    |
| Link Speed (mph)        |      | 25    |      |       | 25   |      |       | 55   |      |       | 55   |      |
| Link Distance (ft)      |      | 795   |      |       | 555  |      |       | 1790 |      |       | 638  |      |
| Travel Time (s)         |      | 21.7  |      |       | 15.1 |      |       | 22.2 |      |       | 7.9  |      |
| Confl. Peds. (#/hr)     |      |       |      |       |      |      |       |      |      |       |      |      |
| Confl. Bikes (#/hr)     |      |       |      |       |      |      |       |      |      |       |      |      |
| Peak Hour Factor        | 0.90 | 0.90  | 0.90 | 0.90  | 0.90 | 0.90 | 0.90  | 0.90 | 0.90 | 0.90  | 0.90 | 0.90 |
| Growth Factor           | 100% | 100%  | 100% | 100%  | 100% | 100% | 100%  | 100% | 100% | 100%  | 100% | 100% |
| Heavy Vehicles (%)      | 2%   | 2%    | 2%   | 2%    | 2%   | 2%   | 2%    | 2%   | 2%   | 2%    | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0    | 0     | 0    | 0     | 0    | 0    | 0     | 0    | 0    | 0     | 0    | 0    |
| Parking (#/hr)          |      |       |      |       |      |      |       |      |      |       |      |      |
| Mid-Block Traffic (%)   |      | 0%    |      |       | 0%   |      |       | 0%   |      |       | 0%   |      |
| Shared Lane Traffic (%) |      |       |      |       |      |      |       |      |      |       |      |      |
| Lane Group Flow (vph)   | 0    | 45    | 0    | 38    | 30   | 0    | 10    | 424  | 24   | 40    | 645  | 0    |
| Sign Control            |      | Stop  |      |       | Stop |      |       | Free |      |       | Free |      |

## Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 46.3%

ICU Level of Service A

Analysis Period (min) 15

Ashcroft Phase 2

Build-out AM - Scenario #1

5: N. O'Neil Street & Steeplechase Drwy. 2/South Full-Mvmt. Drwy.

08/02/2020

Intersection

Int Delay, s/veh 2.6

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

Lane Configurations

|                          |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 15   | 4    | 22   | 34   | 4    | 23   | 9    | 382  | 22   | 36   | 574  | 6    |
| Future Vol, veh/h        | 15   | 4    | 22   | 34   | 4    | 23   | 9    | 382  | 22   | 36   | 574  | 6    |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized           | -    | -    | None | -    | -    | None | -    | -    | None | -    | -    | None |
| Storage Length           | -    | -    | -    | 125  | -    | -    | 150  | -    | 75   | 75   | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 17   | 4    | 24   | 38   | 4    | 26   | 10   | 424  | 24   | 40   | 638  | 7    |

| Major/Minor          | Minor2 | Minor1 | Major1 | Major2 |
|----------------------|--------|--------|--------|--------|
| Conflicting Flow All | 1193   | 1190   | 642    | 1180   |
| Stage 1              | 722    | 722    | -      | 444    |
| Stage 2              | 471    | 468    | -      | 736    |
| Critical Hdwy        | 7.12   | 6.52   | 6.22   | 7.12   |
| Critical Hdwy Stg 1  | 6.12   | 5.52   | -      | 6.12   |
| Critical Hdwy Stg 2  | 6.12   | 5.52   | -      | 6.12   |
| Follow-up Hdwy       | 3.518  | 4.018  | 3.318  | 3.518  |
| Pot Cap-1 Maneuver   | 164    | 188    | 474    | 167    |
| Stage 1              | 418    | 431    | -      | 593    |
| Stage 2              | 573    | 561    | -      | 411    |
| Platoon blocked, %   |        |        |        |        |
| Mov Cap-1 Maneuver   | 149    | 179    | 474    | 150    |
| Mov Cap-2 Maneuver   | 149    | 179    | -      | 150    |
| Stage 1              | 413    | 415    | -      | 586    |
| Stage 2              | 540    | 555    | -      | 372    |

| Approach             | EB   | WB   | NB  | SB  |
|----------------------|------|------|-----|-----|
| HCM Control Delay, s | 23.3 | 26.5 | 0.2 | 0.5 |
| HCM LOS              | C    | D    |     |     |

| Minor Lane/Major Mvmt | NBL   | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL   | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h)      | 940   | -   | -   | 242   | 150   | 464   | 1112  | -   | -   |
| HCM Lane V/C Ratio    | 0.011 | -   | -   | 0.188 | 0.252 | 0.065 | 0.036 | -   | -   |
| HCM Control Delay (s) | 8.9   | -   | -   | 23.3  | 36.9  | 13.3  | 8.4   | -   | -   |
| HCM Lane LOS          | A     | -   | -   | C     | E     | B     | A     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | -   | 0.7   | 0.9   | 0.2   | 0.1   | -   | -   |

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Synchro 10 Report

Ashcroft Phase 2  
6: N. O'Neil Street & RI/RO Site Drwy.

Build-out AM - Scenario #1  
08/02/2020

| Lane Group              | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations     |      |      |      |      |      |      |
| Traffic Volume (vph)    | 0    | 30   | 389  | 31   | 0    | 616  |
| Future Volume (vph)     | 0    | 30   | 389  | 31   | 0    | 616  |
| Ideal Flow (vphpl)      | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft)         | 12   | 12   | 12   | 12   | 12   | 12   |
| Grade (%)               | 0%   |      | 0%   |      |      | 0%   |
| Storage Length (ft)     | 0    | 0    |      | 100  | 0    |      |
| Storage Lanes           | 0    | 1    |      | 1    | 0    |      |
| Taper Length (ft)       | 100  |      |      |      | 100  |      |
| Satd. Flow (prot)       | 0    | 1611 | 1863 | 1583 | 0    | 1863 |
| Flt Permitted           |      |      |      |      |      |      |
| Satd. Flow (perm)       | 0    | 1611 | 1863 | 1583 | 0    | 1863 |
| Link Speed (mph)        | 25   |      | 55   |      |      | 55   |
| Link Distance (ft)      | 808  |      | 638  |      |      | 676  |
| Travel Time (s)         | 22.0 |      | 7.9  |      |      | 8.4  |
| Confl. Peds. (#/hr)     |      |      |      |      |      |      |
| Confl. Bikes (#/hr)     |      |      |      |      |      |      |
| Peak Hour Factor        | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Growth Factor           | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%)      | 2%   | 2%   | 2%   | 2%   | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0    | 0    | 0    | 0    | 0    | 0    |
| Parking (#/hr)          |      |      |      |      |      |      |
| Mid-Block Traffic (%)   | 0%   |      | 0%   |      |      | 0%   |
| Shared Lane Traffic (%) |      |      |      |      |      |      |
| Lane Group Flow (vph)   | 0    | 33   | 432  | 34   | 0    | 684  |
| Sign Control            | Stop |      | Free |      |      | Free |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 35.8%  
Analysis Period (min) 15

ICU Level of Service A

Ashcroft Phase 2  
6: N. O'Neil Street & RI/RO Site Drwy.

Build-out AM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh 0.3

| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 0    | 30   | 389  | 31   | 0    | 616  |
| Future Vol, veh/h        | 0    | 30   | 389  | 31   | 0    | 616  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | 0    | -    | 100  | -    | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 0    | 33   | 432  | 34   | 0    | 684  |

Major/Minor Minor1 Major1 Major2

|                      |   |       |   |   |   |   |
|----------------------|---|-------|---|---|---|---|
| Conflicting Flow All | - | 432   | 0 | 0 | - | - |
| Stage 1              | - | -     | - | - | - | - |
| Stage 2              | - | -     | - | - | - | - |
| Critical Hdwy        | - | 6.22  | - | - | - | - |
| Critical Hdwy Stg 1  | - | -     | - | - | - | - |
| Critical Hdwy Stg 2  | - | -     | - | - | - | - |
| Follow-up Hdwy       | - | 3.318 | - | - | - | - |
| Pot Cap-1 Maneuver   | 0 | 624   | - | - | 0 | - |
| Stage 1              | 0 | -     | - | - | 0 | - |
| Stage 2              | 0 | -     | - | - | 0 | - |
| Platoon blocked, %   | - | -     | - | - | - | - |
| Mov Cap-1 Maneuver   | - | 624   | - | - | - | - |
| Mov Cap-2 Maneuver   | - | -     | - | - | - | - |
| Stage 1              | - | -     | - | - | - | - |
| Stage 2              | - | -     | - | - | - | - |

Approach WB NB SB

|                      |      |   |   |
|----------------------|------|---|---|
| HCM Control Delay, s | 11.1 | 0 | 0 |
| HCM LOS              | B    |   |   |

Minor Lane/Major Mvmt NBT NBRWBLn1 SBT

|                       |   |   |       |   |
|-----------------------|---|---|-------|---|
| Capacity (veh/h)      | - | - | 624   | - |
| HCM Lane V/C Ratio    | - | - | 0.053 | - |
| HCM Control Delay (s) | - | - | 11.1  | - |
| HCM Lane LOS          | - | - | B     | - |
| HCM 95th %tile Q(veh) | - | - | 0.2   | - |

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Synchro 10 Report

Ashcroft Phase 2  
7: N. O'Neil Street & Covered Bridge Rd. Ext.

Build-out AM - Scenario #1  
08/02/2020

| Lane Group              | WBL   | WBR  | NBT  | NBR  | SBL   | SBT  |
|-------------------------|-------|------|------|------|-------|------|
| Lane Configurations     |       |      |      |      |       |      |
| Traffic Volume (vph)    | 101   | 182  | 394  | 25   | 104   | 515  |
| Future Volume (vph)     | 101   | 182  | 394  | 25   | 104   | 515  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12   | 12    | 12   |
| Grade (%)               | 0%    |      | 0%   |      |       | 0%   |
| Storage Length (ft)     | 150   | 0    |      | 100  | 225   |      |
| Storage Lanes           | 1     | 1    |      | 1    | 1     |      |
| Taper Length (ft)       | 100   |      |      |      | 100   |      |
| Satd. Flow (prot)       | 1770  | 1583 | 1863 | 1583 | 1770  | 1863 |
| Flt Permitted           | 0.950 |      |      |      | 0.950 |      |
| Satd. Flow (perm)       | 1770  | 1583 | 1863 | 1583 | 1770  | 1863 |
| Link Speed (mph)        | 25    |      | 55   |      |       | 55   |
| Link Distance (ft)      | 895   |      | 676  |      |       | 941  |
| Travel Time (s)         | 24.4  |      | 8.4  |      |       | 11.7 |
| Confl. Peds. (#/hr)     |       |      |      |      |       |      |
| Confl. Bikes (#/hr)     |       |      |      |      |       |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90 | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100% | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%   | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0    | 0     | 0    |
| Parking (#/hr)          |       |      |      |      |       |      |
| Mid-Block Traffic (%)   | 0%    |      | 0%   |      |       | 0%   |
| Shared Lane Traffic (%) |       |      |      |      |       |      |
| Lane Group Flow (vph)   | 112   | 202  | 438  | 28   | 116   | 572  |
| Sign Control            | Stop  |      | Free |      |       | Free |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 42.1%  
Analysis Period (min) 15

ICU Level of Service A

Ashcroft Phase 2  
7: N. O'Neil Street & Covered Bridge Rd. Ext.

Build-out AM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh

7

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|----------|-----|-----|-----|-----|-----|-----|
|----------|-----|-----|-----|-----|-----|-----|

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 101  | 182  | 394  | 25   | 104  | 515  |
| Future Vol, veh/h        | 101  | 182  | 394  | 25   | 104  | 515  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 150  | 0    | -    | 100  | 225  | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 112  | 202  | 438  | 28   | 116  | 572  |

| Major/Minor | Minor1 | Major1 | Major2 |
|-------------|--------|--------|--------|
|-------------|--------|--------|--------|

|                      |       |       |   |
|----------------------|-------|-------|---|
| Conflicting Flow All | 1242  | 438   | 0 |
| Stage 1              | 438   | -     | - |
| Stage 2              | 804   | -     | - |
| Critical Hdwy        | 6.42  | 6.22  | - |
| Critical Hdwy Stg 1  | 5.42  | -     | - |
| Critical Hdwy Stg 2  | 5.42  | -     | - |
| Follow-up Hdwy       | 3.518 | 3.318 | - |
| Pot Cap-1 Maneuver   | 193   | 619   | - |
| Stage 1              | 651   | -     | - |
| Stage 2              | 440   | -     | - |
| Platoon blocked, %   |       |       | - |
| Mov Cap-1 Maneuver   | 173   | 619   | - |
| Mov Cap-2 Maneuver   | 173   | -     | - |
| Stage 1              | 651   | -     | - |
| Stage 2              | 393   | -     | - |

| Approach | WB | NB | SB |
|----------|----|----|----|
|----------|----|----|----|

|                      |      |   |     |
|----------------------|------|---|-----|
| HCM Control Delay, s | 29.4 | 0 | 1.5 |
| HCM LOS              | D    |   |     |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1WBLn2 | SBL | SBT |
|-----------------------|-----|---------------|-----|-----|
|-----------------------|-----|---------------|-----|-----|

|                       |   |   |       |       |
|-----------------------|---|---|-------|-------|
| Capacity (veh/h)      | - | - | 173   | 619   |
| HCM Lane V/C Ratio    | - | - | 0.649 | 0.327 |
| HCM Control Delay (s) | - | - | 57.8  | 13.6  |
| HCM Lane LOS          | - | - | F     | B     |
| HCM 95th %tile Q(veh) | - | - | 3.7   | 1.4   |

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Synchro 10 Report

Ashcroft Phase 2  
1: O'Neil Street & Main Street

Build-out PM - Scenario #1  
08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR  |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |      |
| Traffic Volume (vph)    | 258   | 505   | 7    | 4     | 237   | 386  | 9     | 130   | 4    | 292   | 67    | 218  |
| Future Volume (vph)     | 258   | 505   | 7    | 4     | 237   | 386  | 9     | 130   | 4    | 292   | 67    | 218  |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 10    | 10    | 10   |
| Grade (%)               |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Storage Length (ft)     | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 100   |       | 0    |
| Storage Lanes           | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    | 0     |       | 0    |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 100   |       |      |
| Satd. Flow (prot)       | 0     | 1831  | 0    | 0     | 1708  | 0    | 0     | 1852  | 0    | 0     | 1609  | 0    |
| Flt Permitted           |       | 0.576 |      |       | 0.996 |      |       | 0.969 |      |       | 0.785 |      |
| Satd. Flow (perm)       | 0     | 1072  | 0    | 0     | 1701  | 0    | 0     | 1800  | 0    | 0     | 1295  | 0    |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No   |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |      |
| Link Speed (mph)        |       | 25    |      |       | 25    |      |       | 25    |      |       | 25    |      |
| Link Distance (ft)      |       | 1124  |      |       | 1174  |      |       | 1013  |      |       | 1118  |      |
| Travel Time (s)         |       | 30.7  |      |       | 32.0  |      |       | 27.6  |      |       | 30.5  |      |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |      |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |      |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |      |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |      |
| Lane Group Flow (vph)   | 0     | 856   | 0    | 0     | 696   | 0    | 0     | 158   | 0    | 0     | 640   | 0    |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      | Perm  | NA    |      |
| Protected Phases        |       | 2     |      |       | 6     |      |       | 8     |      |       | 4     |      |
| Permitted Phases        | 2     |       |      | 6     |       |      | 8     |       |      | 4     |       |      |
| Detector Phase          | 2     | 2     |      | 6     | 6     |      | 8     | 8     |      | 4     | 4     |      |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |      |
| Minimum Initial (s)     | 10.0  | 10.0  |      | 10.0  | 10.0  |      | 7.0   | 7.0   |      | 7.0   | 7.0   |      |
| Minimum Split (s)       | 15.0  | 15.0  |      | 15.0  | 15.0  |      | 12.0  | 12.0  |      | 12.0  | 12.0  |      |
| Total Split (s)         | 37.0  | 37.0  |      | 37.0  | 37.0  |      | 23.0  | 23.0  |      | 23.0  | 23.0  |      |
| Total Split (%)         | 61.7% | 61.7% |      | 61.7% | 61.7% |      | 38.3% | 38.3% |      | 38.3% | 38.3% |      |
| Yellow Time (s)         | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      | 4.0   | 4.0   |      |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      | 1.0   | 1.0   |      |
| Lost Time Adjust (s)    |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Lost Time (s)     |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |       | 5.0   |      |
| Lead/Lag                |       |       |      |       |       |      |       |       |      |       |       |      |
| Lead-Lag Optimize?      |       |       |      |       |       |      |       |       |      |       |       |      |
| Recall Mode             | Min   | Min   |      | Min   | Min   |      | None  | None  |      | None  | None  |      |
| Act Effect Green (s)    |       | 32.0  |      |       | 32.0  |      |       | 18.0  |      |       | 18.0  |      |
| Actuated g/C Ratio      |       | 0.53  |      |       | 0.53  |      |       | 0.30  |      |       | 0.30  |      |
| v/c Ratio               |       | 1.50  |      |       | 0.77  |      |       | 0.29  |      |       | 1.65  |      |
| Control Delay           |       | 253.3 |      |       | 18.5  |      |       | 18.0  |      |       | 325.6 |      |
| Queue Delay             |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |       | 0.0   |      |
| Total Delay             |       | 253.3 |      |       | 18.5  |      |       | 18.0  |      |       | 325.6 |      |

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Synchro 10 Report



Ashcroft Phase 2  
1: O'Neil Street & Main Street

Build-out PM - Scenario #1  
08/02/2020

| Lane Group              | EBL | EBT   | EBR | WBL | WBT  | WBR | NBL | NBT  | NBR | SBL | SBT   | SBR |
|-------------------------|-----|-------|-----|-----|------|-----|-----|------|-----|-----|-------|-----|
| LOS                     |     | F     |     |     | B    |     |     | B    |     |     | F     |     |
| Approach Delay          |     | 253.3 |     |     | 18.5 |     |     | 18.0 |     |     | 325.6 |     |
| Approach LOS            |     | F     |     |     | B    |     |     | B    |     |     | F     |     |
| Queue Length 50th (ft)  |     | ~444  |     |     | 180  |     |     | 43   |     |     | ~347  |     |
| Queue Length 95th (ft)  |     | #639  |     |     | #330 |     |     | 85   |     |     | #523  |     |
| Internal Link Dist (ft) |     | 1044  |     |     | 1094 |     |     | 933  |     |     | 1038  |     |
| Turn Bay Length (ft)    |     |       |     |     |      |     |     |      |     |     |       |     |
| Base Capacity (vph)     |     | 571   |     |     | 907  |     |     | 540  |     |     | 388   |     |
| Starvation Cap Reductn  |     | 0     |     |     | 0    |     |     | 0    |     |     | 0     |     |
| Spillback Cap Reductn   |     | 0     |     |     | 0    |     |     | 0    |     |     | 0     |     |
| Storage Cap Reductn     |     | 0     |     |     | 0    |     |     | 0    |     |     | 0     |     |
| Reduced v/c Ratio       |     | 1.50  |     |     | 0.77 |     |     | 0.29 |     |     | 1.65  |     |

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.65

Intersection Signal Delay: 187.6

Intersection Capacity Utilization 134.9%

Analysis Period (min) 15

Description: 04-0179

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

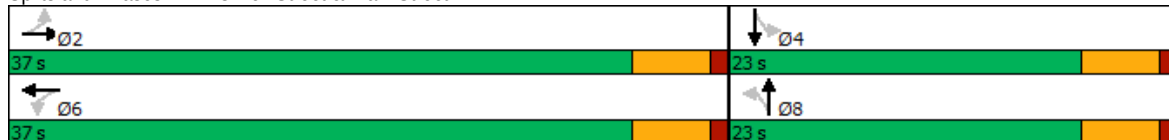
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: F

ICU Level of Service H

Splits and Phases: 1: O'Neil Street & Main Street



Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Build-out PM - Scenario #1  
08/02/2020

| Lane Group              | WBL   | WBR  | NBT  | NBR  | SBL   | SBT  |
|-------------------------|-------|------|------|------|-------|------|
| Lane Configurations     |       |      |      |      |       |      |
| Traffic Volume (vph)    | 41    | 22   | 818  | 70   | 38    | 544  |
| Future Volume (vph)     | 41    | 22   | 818  | 70   | 38    | 544  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12   | 12    | 12   |
| Grade (%)               | 0%    |      | 0%   |      |       | 0%   |
| Storage Length (ft)     | 0     | 0    |      | 75   | 75    |      |
| Storage Lanes           | 1     | 0    |      | 1    | 1     |      |
| Taper Length (ft)       | 100   |      |      |      | 100   |      |
| Satd. Flow (prot)       | 1720  | 0    | 1863 | 1583 | 1770  | 1863 |
| Flt Permitted           | 0.968 |      |      |      | 0.950 |      |
| Satd. Flow (perm)       | 1720  | 0    | 1863 | 1583 | 1770  | 1863 |
| Link Speed (mph)        | 25    |      | 45   |      |       | 45   |
| Link Distance (ft)      | 1397  |      | 1572 |      |       | 1790 |
| Travel Time (s)         | 38.1  |      | 23.8 |      |       | 27.1 |
| Confl. Peds. (#/hr)     |       |      |      |      |       |      |
| Confl. Bikes (#/hr)     |       |      |      |      |       |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90 | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100% | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%   | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0    | 0     | 0    |
| Parking (#/hr)          |       |      |      |      |       |      |
| Mid-Block Traffic (%)   | 0%    |      | 0%   |      |       | 0%   |
| Shared Lane Traffic (%) |       |      |      |      |       |      |
| Lane Group Flow (vph)   | 70    | 0    | 909  | 78   | 42    | 604  |
| Sign Control            | Stop  |      | Free |      |       | Free |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 53.3% ICU Level of Service A  
Analysis Period (min) 15

Ashcroft Phase 2  
2: N. O'Neil Street & Atwood Drive

Build-out PM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh 2.4

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 41   | 22   | 818  | 70   | 38   | 544  |
| Future Vol, veh/h        | 41   | 22   | 818  | 70   | 38   | 544  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | 75   | 75   | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 46   | 24   | 909  | 78   | 42   | 604  |

Major/Minor Minor1 Major1 Major2

|                      |       |       |   |   |       |   |
|----------------------|-------|-------|---|---|-------|---|
| Conflicting Flow All | 1597  | 909   | 0 | 0 | 987   | 0 |
| Stage 1              | 909   | -     | - | - | -     | - |
| Stage 2              | 688   | -     | - | - | -     | - |
| Critical Hdwy        | 6.42  | 6.22  | - | - | 4.12  | - |
| Critical Hdwy Stg 1  | 5.42  | -     | - | - | -     | - |
| Critical Hdwy Stg 2  | 5.42  | -     | - | - | -     | - |
| Follow-up Hdwy       | 3.518 | 3.318 | - | - | 2.218 | - |
| Pot Cap-1 Maneuver   | 117   | 333   | - | - | 700   | - |
| Stage 1              | 393   | -     | - | - | -     | - |
| Stage 2              | 499   | -     | - | - | -     | - |
| Platoon blocked, %   |       |       | - | - |       | - |
| Mov Cap-1 Maneuver   | 110   | 333   | - | - | 700   | - |
| Mov Cap-2 Maneuver   | 110   | -     | - | - | -     | - |
| Stage 1              | 393   | -     | - | - | -     | - |
| Stage 2              | 469   | -     | - | - | -     | - |

Approach WB NB SB

|                      |      |   |     |
|----------------------|------|---|-----|
| HCM Control Delay, s | 51.6 | 0 | 0.7 |
| HCM LOS              | F    |   |     |

Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT

|                       |   |   |       |      |   |
|-----------------------|---|---|-------|------|---|
| Capacity (veh/h)      | - | - | 144   | 700  | - |
| HCM Lane V/C Ratio    | - | - | 0.486 | 0.06 | - |
| HCM Control Delay (s) | - | - | 51.6  | 10.5 | - |
| HCM Lane LOS          | - | - | F     | B    | - |
| HCM 95th %tile Q(veh) | - | - | 2.3   | 0.2  | - |

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Synchro 10 Report

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Build-out PM - Scenario #1  
08/02/2020

| Lane Group              | EBL   | EBR  | NBL  | NBT   | SBT  | SBR  |
|-------------------------|-------|------|------|-------|------|------|
| Lane Configurations     |       |      |      |       |      |      |
| Traffic Volume (vph)    | 471   | 168  | 127  | 751   | 577  | 276  |
| Future Volume (vph)     | 471   | 168  | 127  | 751   | 577  | 276  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12    | 12   | 12   |
| Grade (%)               | 0%    |      |      | 0%    | 0%   |      |
| Storage Length (ft)     | 0     | 0    | 0    |       |      | 0    |
| Storage Lanes           | 1     | 0    | 0    |       |      | 0    |
| Taper Length (ft)       | 100   |      | 100  |       |      |      |
| Satd. Flow (prot)       | 1731  | 0    | 0    | 1850  | 1781 | 0    |
| Flt Permitted           | 0.964 |      |      | 0.993 |      |      |
| Satd. Flow (perm)       | 1731  | 0    | 0    | 1850  | 1781 | 0    |
| Link Speed (mph)        | 55    |      |      | 55    | 55   |      |
| Link Distance (ft)      | 1648  |      |      | 941   | 918  |      |
| Travel Time (s)         | 20.4  |      |      | 11.7  | 11.4 |      |
| Confl. Peds. (#/hr)     |       |      |      |       |      |      |
| Confl. Bikes (#/hr)     |       |      |      |       |      |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90  | 0.90 | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100%  | 100% | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%    | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0     | 0    | 0    |
| Parking (#/hr)          |       |      |      |       |      |      |
| Mid-Block Traffic (%)   | 0%    |      |      | 0%    | 0%   |      |
| Shared Lane Traffic (%) |       |      |      |       |      |      |
| Lane Group Flow (vph)   | 710   | 0    | 0    | 975   | 948  | 0    |
| Sign Control            | Stop  |      |      | Free  | Free |      |

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 140.1%

ICU Level of Service H

Analysis Period (min) 15

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Road

Build-out PM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh 1302.6

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|----------|-----|-----|-----|-----|-----|-----|
|----------|-----|-----|-----|-----|-----|-----|

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 471  | 168  | 127  | 751  | 577  | 276  |
| Future Vol, veh/h        | 471  | 168  | 127  | 751  | 577  | 276  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 523  | 187  | 141  | 834  | 641  | 307  |

| Major/Minor | Minor2 | Major1 | Major2 |
|-------------|--------|--------|--------|
|-------------|--------|--------|--------|

|                      |       |       |       |   |   |   |
|----------------------|-------|-------|-------|---|---|---|
| Conflicting Flow All | 1911  | 795   | 948   | 0 | - | 0 |
| Stage 1              | 795   | -     | -     | - | - | - |
| Stage 2              | 1116  | -     | -     | - | - | - |
| Critical Hdwy        | 6.42  | 6.22  | 4.12  | - | - | - |
| Critical Hdwy Stg 1  | 5.42  | -     | -     | - | - | - |
| Critical Hdwy Stg 2  | 5.42  | -     | -     | - | - | - |
| Follow-up Hdwy       | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver   | ~ 75  | 388   | 724   | - | - | - |
| Stage 1              | ~ 445 | -     | -     | - | - | - |
| Stage 2              | ~ 313 | -     | -     | - | - | - |
| Platoon blocked, %   |       |       |       | - | - | - |
| Mov Cap-1 Maneuver   | ~ 48  | 388   | 724   | - | - | - |
| Mov Cap-2 Maneuver   | ~ 48  | -     | -     | - | - | - |
| Stage 1              | ~ 283 | -     | -     | - | - | - |
| Stage 2              | ~ 313 | -     | -     | - | - | - |

| Approach | EB | NB | SB |
|----------|----|----|----|
|----------|----|----|----|

|                      |        |     |   |
|----------------------|--------|-----|---|
| HCM Control Delay, s | 4829.1 | 1.6 | 0 |
| HCM LOS              | F      |     |   |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-----|-----|-------|-----|-----|
|-----------------------|-----|-----|-------|-----|-----|

|                       |       |   |        |   |   |
|-----------------------|-------|---|--------|---|---|
| Capacity (veh/h)      | 724   | - | 62     | - | - |
| HCM Lane V/C Ratio    | 0.195 | - | 11.452 | - | - |
| HCM Control Delay (s) | 11.2  |   | 4829.1 | - | - |
| HCM Lane LOS          | B     | A | F      | - | - |
| HCM 95th %tile Q(veh) | 0.7   | - | 84.2   | - | - |

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

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Synchro 10 Report

## Ashcroft Phase 2

## Build-out PM - Scenario #1

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |       |
| Traffic Volume (vph)    | 699   | 4     | 423  | 4     | 4     | 4    | 448   | 429   | 4    | 4     | 356   | 352   |
| Future Volume (vph)     | 699   | 4     | 423  | 4     | 4     | 4    | 448   | 429   | 4    | 4     | 356   | 352   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    |
| Grade (%)               |       | -3%   |      |       | -2%   |      |       | 4%    |      |       | -2%   |       |
| Storage Length (ft)     | 300   |       | 0    | 0     |       | 0    | 200   |       | 0    | 25    |       | 125   |
| Storage Lanes           | 1     |       | 0    | 0     |       | 0    | 1     |       | 0    | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 75    |       |       |
| Satd. Flow (prot)       | 1796  | 1609  | 0    | 0     | 1768  | 0    | 1734  | 1824  | 0    | 1787  | 1881  | 1599  |
| Flt Permitted           | 0.750 |       |      |       | 0.910 |      | 0.161 |       |      | 0.489 |       |       |
| Satd. Flow (perm)       | 1418  | 1609  | 0    | 0     | 1635  | 0    | 294   | 1824  | 0    | 920   | 1881  | 1599  |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No   |       |       | No    |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |      |       |       |       |
| Link Speed (mph)        |       | 45    |      |       | 20    |      |       | 45    |      |       | 45    |       |
| Link Distance (ft)      |       | 1601  |      |       | 259   |      |       | 1187  |      |       | 1614  |       |
| Travel Time (s)         |       | 24.3  |      |       | 8.8   |      |       | 18.0  |      |       | 24.5  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |       |
| Lane Group Flow (vph)   | 777   | 474   | 0    | 0     | 12    | 0    | 498   | 481   | 0    | 4     | 396   | 391   |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | pm+pt | NA    |      | Perm  | NA    | Perm  |
| Protected Phases        |       | 4     |      |       | 8     |      | 5     | 2     |      |       | 6     |       |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       |      | 6     |       | 6     |
| Detector Phase          | 4     | 4     |      | 8     | 8     |      | 5     | 2     |      | 6     | 6     | 6     |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 12.0  |      | 12.0  | 12.0  | 12.0  |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 19.0  |      | 19.0  | 19.0  | 19.0  |
| Total Split (s)         | 45.0  | 45.0  |      | 45.0  | 45.0  |      | 20.0  | 45.0  |      | 25.0  | 25.0  | 25.0  |
| Total Split (%)         | 50.0% | 50.0% |      | 50.0% | 50.0% |      | 22.2% | 50.0% |      | 27.8% | 27.8% | 27.8% |
| Yellow Time (s)         | 4.8   | 4.8   |      | 3.0   | 3.0   |      | 3.0   | 4.2   |      | 4.7   | 4.7   | 4.7   |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.9   | 1.9   |      | 2.1   | 1.0   |      | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s)    | -0.8  | -0.8  |      |       | 0.1   |      | -0.1  | -0.2  |      | -0.7  | -0.7  | -0.7  |
| Total Lost Time (s)     | 5.0   | 5.0   |      |       | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       |       |      |       |       |      | Lead  |       |      | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?      |       |       |      |       |       |      | Yes   |       |      | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   |      | Min   | Min   | Min   |
| Act Effect Green (s)    | 40.0  | 40.0  |      |       | 40.0  |      | 40.0  | 40.0  |      | 20.0  | 20.0  | 20.0  |
| Actuated g/C Ratio      | 0.44  | 0.44  |      |       | 0.44  |      | 0.44  | 0.44  |      | 0.22  | 0.22  | 0.22  |
| v/c Ratio               | 1.23  | 0.66  |      |       | 0.02  |      | 1.35  | 0.59  |      | 0.02  | 0.95  | 1.10  |
| Control Delay           | 144.3 | 25.2  |      |       | 14.2  |      | 196.6 | 22.6  |      | 27.8  | 69.0  | 113.1 |
| Queue Delay             | 0.0   | 0.0   |      |       | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   |
| Total Delay             | 144.3 | 25.2  |      |       | 14.2  |      | 196.6 | 22.6  |      | 27.8  | 69.0  | 113.1 |

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Synchro 10 Report

## Ashcroft Phase 2

## Build-out PM - Scenario #1

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL | WBT  | WBR | NBL  | NBT   | NBR | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|-----|------|-----|------|-------|-----|------|------|------|
| LOS                     | F    | C    |     |     | B    |     | F    | C     |     | C    | E    | F    |
| Approach Delay          |      | 99.2 |     |     | 14.2 |     |      | 111.1 |     |      | 90.6 |      |
| Approach LOS            |      | F    |     |     | B    |     |      | F     |     |      | F    |      |
| Queue Length 50th (ft)  | ~552 | 205  |     |     | 4    |     | ~326 | 200   |     | 2    | 223  | ~255 |
| Queue Length 95th (ft)  | #771 | 317  |     |     | 14   |     | #521 | 300   |     | 11   | #399 | #430 |
| Internal Link Dist (ft) |      | 1521 |     |     | 179  |     |      | 1107  |     |      | 1534 |      |
| Turn Bay Length (ft)    | 300  |      |     |     |      |     | 200  |       |     | 25   |      | 125  |
| Base Capacity (vph)     | 630  | 715  |     |     | 726  |     | 370  | 810   |     | 204  | 418  | 355  |
| Starvation Cap Reductn  | 0    | 0    |     |     | 0    |     | 0    | 0     |     | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     |     | 0    |     | 0    | 0     |     | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     |     | 0    |     | 0    | 0     |     | 0    | 0    | 0    |
| Reduced v/c Ratio       | 1.23 | 0.66 |     |     | 0.02 |     | 1.35 | 0.59  |     | 0.02 | 0.95 | 1.10 |

## Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.35

Intersection Signal Delay: 100.5

Intersection Capacity Utilization 101.4%

Analysis Period (min) 15

Description: 04-1302

Intersection LOS: F

ICU Level of Service G

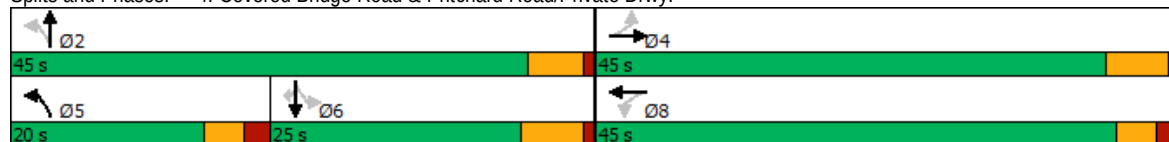
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Splits and Phases: 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.



## Ashcroft Phase 2

## Build-out PM - Scenario #1

5: N. O'Neil Street &amp; Steeplechase Drwy. 2/South Full-Mvmt. Drwy.

08/02/2020

| Lane Group              | EBL  | EBT   | EBR  | WBL   | WBT  | WBR  | NBL   | NBT  | NBR  | SBL   | SBT  | SBR  |
|-------------------------|------|-------|------|-------|------|------|-------|------|------|-------|------|------|
| Lane Configurations     |      |       |      |       |      |      |       |      |      |       |      |      |
| Traffic Volume (vph)    | 10   | 4     | 14   | 55    | 4    | 26   | 23    | 767  | 53   | 66    | 520  | 16   |
| Future Volume (vph)     | 10   | 4     | 14   | 55    | 4    | 26   | 23    | 767  | 53   | 66    | 520  | 16   |
| Ideal Flow (vphpl)      | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Lane Width (ft)         | 12   | 12    | 12   | 12    | 12   | 12   | 12    | 12   | 12   | 12    | 12   | 12   |
| Grade (%)               |      | 0%    |      |       | 0%   |      |       | 0%   |      |       | 0%   |      |
| Storage Length (ft)     | 0    |       | 0    | 125   |      | 0    | 150   |      | 75   | 75    |      | 0    |
| Storage Lanes           | 0    |       | 0    | 1     |      | 0    | 1     |      | 1    | 1     |      | 0    |
| Taper Length (ft)       | 100  |       |      | 100   |      |      | 100   |      |      | 100   |      |      |
| Satd. Flow (prot)       | 0    | 1703  | 0    | 1770  | 1617 | 0    | 1770  | 1863 | 1583 | 1770  | 1853 | 0    |
| Flt Permitted           |      | 0.983 |      | 0.950 |      |      | 0.950 |      |      | 0.950 |      |      |
| Satd. Flow (perm)       | 0    | 1703  | 0    | 1770  | 1617 | 0    | 1770  | 1863 | 1583 | 1770  | 1853 | 0    |
| Link Speed (mph)        |      | 25    |      |       | 25   |      |       | 55   |      |       | 55   |      |
| Link Distance (ft)      |      | 795   |      |       | 555  |      |       | 1790 |      |       | 638  |      |
| Travel Time (s)         |      | 21.7  |      |       | 15.1 |      |       | 22.2 |      |       | 7.9  |      |
| Confl. Peds. (#/hr)     |      |       |      |       |      |      |       |      |      |       |      |      |
| Confl. Bikes (#/hr)     |      |       |      |       |      |      |       |      |      |       |      |      |
| Peak Hour Factor        | 0.90 | 0.90  | 0.90 | 0.90  | 0.90 | 0.90 | 0.90  | 0.90 | 0.90 | 0.90  | 0.90 | 0.90 |
| Growth Factor           | 100% | 100%  | 100% | 100%  | 100% | 100% | 100%  | 100% | 100% | 100%  | 100% | 100% |
| Heavy Vehicles (%)      | 2%   | 2%    | 2%   | 2%    | 2%   | 2%   | 2%    | 2%   | 2%   | 2%    | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0    | 0     | 0    | 0     | 0    | 0    | 0     | 0    | 0    | 0     | 0    | 0    |
| Parking (#/hr)          |      |       |      |       |      |      |       |      |      |       |      |      |
| Mid-Block Traffic (%)   |      | 0%    |      |       | 0%   |      |       | 0%   |      |       | 0%   |      |
| Shared Lane Traffic (%) |      |       |      |       |      |      |       |      |      |       |      |      |
| Lane Group Flow (vph)   | 0    | 31    | 0    | 61    | 33   | 0    | 26    | 852  | 59   | 73    | 596  | 0    |
| Sign Control            |      | Stop  |      |       | Stop |      |       | Free |      |       | Free |      |

## Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 62.3%

ICU Level of Service B

Analysis Period (min) 15



Ashcroft Phase 2

Build-out PM - Scenario #1

5: N. O'Neil Street & Steeplechase Drwy. 2/South Full-Mvmt. Drwy.

08/02/2020

Intersection

Int Delay, s/veh 8.5

| Movement                 | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations      |      |      |      |      |      |      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 10   | 4    | 14   | 55   | 4    | 26   | 23   | 767  | 53   | 66   | 520  | 16   |
| Future Vol, veh/h        | 10   | 4    | 14   | 55   | 4    | 26   | 23   | 767  | 53   | 66   | 520  | 16   |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized           | -    | -    | None | -    | -    | None | -    | -    | None | -    | -    | None |
| Storage Length           | -    | -    | -    | 125  | -    | -    | 150  | -    | 75   | 75   | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 11   | 4    | 16   | 61   | 4    | 29   | 26   | 852  | 59   | 73   | 578  | 18   |

| Major/Minor          | Minor2 | Minor1 | Major1 | Major2 |       |       |       |   |   |       |   |   |
|----------------------|--------|--------|--------|--------|-------|-------|-------|---|---|-------|---|---|
| Conflicting Flow All | 1683   | 1696   | 587    | 1647   | 1646  | 852   | 596   | 0 | 0 | 911   | 0 | 0 |
| Stage 1              | 733    | 733    | -      | 904    | 904   | -     | -     | - | - | -     | - | - |
| Stage 2              | 950    | 963    | -      | 743    | 742   | -     | -     | - | - | -     | - | - |
| Critical Hdwy        | 7.12   | 6.52   | 6.22   | 7.12   | 6.52  | 6.22  | 4.12  | - | - | 4.12  | - | - |
| Critical Hdwy Stg 1  | 6.12   | 5.52   | -      | 6.12   | 5.52  | -     | -     | - | - | -     | - | - |
| Critical Hdwy Stg 2  | 6.12   | 5.52   | -      | 6.12   | 5.52  | -     | -     | - | - | -     | - | - |
| Follow-up Hdwy       | 3.518  | 4.018  | 3.318  | 3.518  | 4.018 | 3.318 | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver   | 75     | 93     | 510    | 79     | 99    | 359   | 980   | - | - | 748   | - | - |
| Stage 1              | 412    | 426    | -      | 331    | 356   | -     | -     | - | - | -     | - | - |
| Stage 2              | 312    | 334    | -      | 407    | 422   | -     | -     | - | - | -     | - | - |
| Platoon blocked, %   |        |        |        |        |       |       |       | - | - | -     | - | - |
| Mov Cap-1 Maneuver   | 60     | 82     | 510    | 67     | 87    | 359   | 980   | - | - | 748   | - | - |
| Mov Cap-2 Maneuver   | 60     | 82     | -      | 67     | 87    | -     | -     | - | - | -     | - | - |
| Stage 1              | 401    | 384    | -      | 322    | 346   | -     | -     | - | - | -     | - | - |
| Stage 2              | 276    | 325    | -      | 352    | 381   | -     | -     | - | - | -     | - | - |

| Approach             | EB   | WB    | NB  | SB  |
|----------------------|------|-------|-----|-----|
| HCM Control Delay, s | 47.5 | 129.7 | 0.2 | 1.1 |
| HCM LOS              | E    | F     |     |     |

| Minor Lane/Major Mvmt | NBL   | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL   | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h)      | 980   | -   | -   | 115   | 67    | 253   | 748   | -   | -   |
| HCM Lane V/C Ratio    | 0.026 | -   | -   | 0.271 | 0.912 | 0.132 | 0.098 | -   | -   |
| HCM Control Delay (s) | 8.8   | -   | -   | 47.5  | 188.8 | 21.4  | 10.3  | -   | -   |
| HCM Lane LOS          | A     | -   | -   | E     | F     | C     | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | -   | 1     | 4.4   | 0.4   | 0.3   | -   | -   |

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Synchro 10 Report

Ashcroft Phase 2  
6: N. O'Neil Street & RI/RO Site Drwy.

Build-out PM - Scenario #1  
08/02/2020

| Lane Group              | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
|-------------------------|------|------|------|------|------|------|
| Lane Configurations     |      |      |      |      |      |      |
| Traffic Volume (vph)    | 0    | 91   | 735  | 68   | 0    | 602  |
| Future Volume (vph)     | 0    | 91   | 735  | 68   | 0    | 602  |
| Ideal Flow (vphpl)      | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (ft)         | 12   | 12   | 12   | 12   | 12   | 12   |
| Grade (%)               | 0%   |      | 0%   |      |      | 0%   |
| Storage Length (ft)     | 0    | 0    |      | 100  | 0    |      |
| Storage Lanes           | 0    | 1    |      | 1    | 0    |      |
| Taper Length (ft)       | 100  |      |      |      | 100  |      |
| Satd. Flow (prot)       | 0    | 1611 | 1863 | 1583 | 0    | 1863 |
| Flt Permitted           |      |      |      |      |      |      |
| Satd. Flow (perm)       | 0    | 1611 | 1863 | 1583 | 0    | 1863 |
| Link Speed (mph)        | 25   |      | 55   |      |      | 55   |
| Link Distance (ft)      | 808  |      | 638  |      |      | 676  |
| Travel Time (s)         | 22.0 |      | 7.9  |      |      | 8.4  |
| Confl. Peds. (#/hr)     |      |      |      |      |      |      |
| Confl. Bikes (#/hr)     |      |      |      |      |      |      |
| Peak Hour Factor        | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Growth Factor           | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%)      | 2%   | 2%   | 2%   | 2%   | 2%   | 2%   |
| Bus Blockages (#/hr)    | 0    | 0    | 0    | 0    | 0    | 0    |
| Parking (#/hr)          |      |      |      |      |      |      |
| Mid-Block Traffic (%)   | 0%   |      | 0%   |      |      | 0%   |
| Shared Lane Traffic (%) |      |      |      |      |      |      |
| Lane Group Flow (vph)   | 0    | 101  | 817  | 76   | 0    | 669  |
| Sign Control            | Stop |      | Free |      |      | Free |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 51.0% ICU Level of Service A  
Analysis Period (min) 15

Ashcroft Phase 2  
6: N. O'Neil Street & RI/RO Site Drwy.

Build-out PM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh 1.1

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 0    | 91   | 735  | 68   | 0    | 602  |
| Future Vol, veh/h        | 0    | 91   | 735  | 68   | 0    | 602  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | 0    | -    | 100  | -    | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 0    | 101  | 817  | 76   | 0    | 669  |

Major/Minor Minor1 Major1 Major2

|                      |   |       |   |   |   |   |
|----------------------|---|-------|---|---|---|---|
| Conflicting Flow All | - | 817   | 0 | 0 | - | - |
| Stage 1              | - | -     | - | - | - | - |
| Stage 2              | - | -     | - | - | - | - |
| Critical Hdwy        | - | 6.22  | - | - | - | - |
| Critical Hdwy Stg 1  | - | -     | - | - | - | - |
| Critical Hdwy Stg 2  | - | -     | - | - | - | - |
| Follow-up Hdwy       | - | 3.318 | - | - | - | - |
| Pot Cap-1 Maneuver   | 0 | 376   | - | - | 0 | - |
| Stage 1              | 0 | -     | - | - | 0 | - |
| Stage 2              | 0 | -     | - | - | 0 | - |
| Platoon blocked, %   | - | -     | - | - | - | - |
| Mov Cap-1 Maneuver   | - | 376   | - | - | - | - |
| Mov Cap-2 Maneuver   | - | -     | - | - | - | - |
| Stage 1              | - | -     | - | - | - | - |
| Stage 2              | - | -     | - | - | - | - |

Approach WB NB SB

|                      |      |   |   |
|----------------------|------|---|---|
| HCM Control Delay, s | 18.1 | 0 | 0 |
| HCM LOS              | C    |   |   |

Minor Lane/Major Mvmt NBT NBRWBLn1 SBT

|                       |   |   |       |   |
|-----------------------|---|---|-------|---|
| Capacity (veh/h)      | - | - | 376   | - |
| HCM Lane V/C Ratio    | - | - | 0.269 | - |
| HCM Control Delay (s) | - | - | 18.1  | - |
| HCM Lane LOS          | - | - | C     | - |
| HCM 95th %tile Q(veh) | - | - | 1.1   | - |

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Synchro 10 Report

Ashcroft Phase 2  
7: N. O'Neil Street & Covered Bridge Rd. Ext.

Build-out PM - Scenario #1  
08/02/2020

| Lane Group              | WBL   | WBR  | NBT  | NBR  | SBL   | SBT  |
|-------------------------|-------|------|------|------|-------|------|
| Lane Configurations     |       |      |      |      |       |      |
| Traffic Volume (vph)    | 88    | 118  | 758  | 68   | 230   | 514  |
| Future Volume (vph)     | 88    | 118  | 758  | 68   | 230   | 514  |
| Ideal Flow (vphpl)      | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Lane Width (ft)         | 12    | 12   | 12   | 12   | 12    | 12   |
| Grade (%)               | 0%    |      | 0%   |      |       | 0%   |
| Storage Length (ft)     | 150   | 0    |      | 100  | 225   |      |
| Storage Lanes           | 1     | 1    |      | 1    | 1     |      |
| Taper Length (ft)       | 100   |      |      |      | 100   |      |
| Satd. Flow (prot)       | 1770  | 1583 | 1863 | 1583 | 1770  | 1863 |
| Flt Permitted           | 0.950 |      |      |      | 0.950 |      |
| Satd. Flow (perm)       | 1770  | 1583 | 1863 | 1583 | 1770  | 1863 |
| Link Speed (mph)        | 25    |      | 55   |      |       | 55   |
| Link Distance (ft)      | 895   |      | 676  |      |       | 941  |
| Travel Time (s)         | 24.4  |      | 8.4  |      |       | 11.7 |
| Confl. Peds. (#/hr)     |       |      |      |      |       |      |
| Confl. Bikes (#/hr)     |       |      |      |      |       |      |
| Peak Hour Factor        | 0.90  | 0.90 | 0.90 | 0.90 | 0.90  | 0.90 |
| Growth Factor           | 100%  | 100% | 100% | 100% | 100%  | 100% |
| Heavy Vehicles (%)      | 2%    | 2%   | 2%   | 2%   | 2%    | 2%   |
| Bus Blockages (#/hr)    | 0     | 0    | 0    | 0    | 0     | 0    |
| Parking (#/hr)          |       |      |      |      |       |      |
| Mid-Block Traffic (%)   | 0%    |      | 0%   |      |       | 0%   |
| Shared Lane Traffic (%) |       |      |      |      |       |      |
| Lane Group Flow (vph)   | 98    | 131  | 842  | 76   | 256   | 571  |
| Sign Control            | Stop  |      | Free |      |       | Free |

Intersection Summary

Area Type: Other  
Control Type: Unsignalized  
Intersection Capacity Utilization 67.5% ICU Level of Service C  
Analysis Period (min) 15

Ashcroft Phase 2  
7: N. O'Neil Street & Covered Bridge Rd. Ext.

Build-out PM - Scenario #1  
08/02/2020

Intersection

Int Delay, s/veh 35.9

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|----------|-----|-----|-----|-----|-----|-----|
|----------|-----|-----|-----|-----|-----|-----|

Lane Configurations

|                          |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Traffic Vol, veh/h       | 88   | 118  | 758  | 68   | 230  | 514  |
| Future Vol, veh/h        | 88   | 118  | 758  | 68   | 230  | 514  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 150  | 0    | -    | 100  | 225  | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow                | 98   | 131  | 842  | 76   | 256  | 571  |

| Major/Minor | Minor1 | Major1 | Major2 |
|-------------|--------|--------|--------|
|-------------|--------|--------|--------|

|                      |       |       |   |
|----------------------|-------|-------|---|
| Conflicting Flow All | 1925  | 842   | 0 |
| Stage 1              | 842   | -     | - |
| Stage 2              | 1083  | -     | - |
| Critical Hdwy        | 6.42  | 6.22  | - |
| Critical Hdwy Stg 1  | 5.42  | -     | - |
| Critical Hdwy Stg 2  | 5.42  | -     | - |
| Follow-up Hdwy       | 3.518 | 3.318 | - |
| Pot Cap-1 Maneuver   | ~ 73  | 364   | - |
| Stage 1              | 423   | -     | - |
| Stage 2              | 325   | -     | - |
| Platoon blocked, %   |       |       | - |
| Mov Cap-1 Maneuver   | ~ 48  | 364   | - |
| Mov Cap-2 Maneuver   | ~ 48  | -     | - |
| Stage 1              | 423   | -     | - |
| Stage 2              | 213   | -     | - |

| Approach | WB | NB | SB |
|----------|----|----|----|
|----------|----|----|----|

|                      |       |   |     |
|----------------------|-------|---|-----|
| HCM Control Delay, s | 295.5 | 0 | 3.8 |
| HCM LOS              | F     |   |     |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1WBLn2 | SBL | SBT |
|-----------------------|-----|---------------|-----|-----|
|-----------------------|-----|---------------|-----|-----|

|                       |   |            |      |       |
|-----------------------|---|------------|------|-------|
| Capacity (veh/h)      | - | - 48       | 364  | 743   |
| HCM Lane V/C Ratio    | - | - 2.037    | 0.36 | 0.344 |
| HCM Control Delay (s) | - | - \$ 664.3 | 20.4 | 12.4  |
| HCM Lane LOS          | - | - F        | C    | B     |
| HCM 95th %tile Q(veh) | - | - 9.9      | 1.6  | 1.5   |

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

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Kimley-Horn

Synchro 10 Report

## Ashcroft Phase 2

## Build-out AM - Scenario #1 Alt. Analysis

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |       |
| Traffic Volume (vph)    | 261   | 9     | 414  | 4     | 4     | 4    | 523   | 198   | 4    | 4     | 412   | 684   |
| Future Volume (vph)     | 261   | 9     | 414  | 4     | 4     | 4    | 523   | 198   | 4    | 4     | 412   | 684   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    |
| Grade (%)               |       | -3%   |      |       | -2%   |      |       | 4%    |      |       | -2%   |       |
| Storage Length (ft)     | 300   |       | 0    | 0     |       | 0    | 200   |       | 0    | 25    |       | 125   |
| Storage Lanes           | 1     |       | 0    | 0     |       | 0    | 1     |       | 0    | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 75    |       |       |
| Satd. Flow (prot)       | 1796  | 1613  | 0    | 0     | 1768  | 0    | 1734  | 1820  | 0    | 1787  | 1881  | 1599  |
| Flt Permitted           | 0.750 |       |      |       | 0.609 |      | 0.174 |       |      | 0.619 |       |       |
| Satd. Flow (perm)       | 1418  | 1613  | 0    | 0     | 1094  | 0    | 318   | 1820  | 0    | 1165  | 1881  | 1599  |
| Right Turn on Red       |       |       | Yes  |       |       | Yes  |       |       | Yes  |       |       | Yes   |
| Satd. Flow (RTOR)       |       | 460   |      |       | 4     |      |       | 2     |      |       |       | 533   |
| Link Speed (mph)        |       | 45    |      |       | 20    |      |       | 45    |      |       | 45    |       |
| Link Distance (ft)      |       | 1601  |      |       | 259   |      |       | 1187  |      |       | 1614  |       |
| Travel Time (s)         |       | 24.3  |      |       | 8.8   |      |       | 18.0  |      |       | 24.5  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |       |
| Lane Group Flow (vph)   | 290   | 470   | 0    | 0     | 12    | 0    | 581   | 224   | 0    | 4     | 458   | 760   |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | pm+pt | NA    |      | Perm  | NA    | Perm  |
| Protected Phases        |       | 4     |      |       | 8     |      | 5     | 2     |      |       | 6     |       |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       |      | 6     |       | 6     |
| Detector Phase          | 4     | 4     |      | 8     | 8     |      | 5     | 2     |      | 6     | 6     | 6     |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 12.0  |      | 12.0  | 12.0  | 12.0  |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 19.0  |      | 19.0  | 19.0  | 19.0  |
| Total Split (s)         | 25.0  | 25.0  |      | 25.0  | 25.0  |      | 30.0  | 65.0  |      | 35.0  | 35.0  | 35.0  |
| Total Split (%)         | 27.8% | 27.8% |      | 27.8% | 27.8% |      | 33.3% | 72.2% |      | 38.9% | 38.9% | 38.9% |
| Yellow Time (s)         | 4.8   | 4.8   |      | 3.0   | 3.0   |      | 3.0   | 4.2   |      | 4.7   | 4.7   | 4.7   |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.9   | 1.9   |      | 2.1   | 1.0   |      | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s)    | -0.8  | -0.8  |      |       | 0.1   |      | -0.1  | -0.2  |      | -0.7  | -0.7  | -0.7  |
| Total Lost Time (s)     | 5.0   | 5.0   |      |       | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       |       |      |       |       |      | Lead  |       |      | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?      |       |       |      |       |       |      | Yes   |       |      | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   |      | Min   | Min   | Min   |
| Act Effect Green (s)    | 19.4  | 19.4  |      |       | 19.4  |      | 56.3  | 56.3  |      | 26.3  | 26.3  | 26.3  |
| Actuated g/C Ratio      | 0.23  | 0.23  |      |       | 0.23  |      | 0.66  | 0.66  |      | 0.31  | 0.31  | 0.31  |
| v/c Ratio               | 0.90  | 0.65  |      |       | 0.05  |      | 0.94  | 0.19  |      | 0.01  | 0.80  | 0.88  |
| Control Delay           | 66.2  | 8.3   |      |       | 23.7  |      | 44.1  | 6.2   |      | 20.2  | 38.6  | 22.0  |
| Queue Delay             | 0.0   | 0.0   |      |       | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   |
| Total Delay             | 66.2  | 8.3   |      |       | 23.7  |      | 44.1  | 6.2   |      | 20.2  | 38.6  | 22.0  |

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Synchro 10 Report

# Ashcroft Phase 2

# Build-out AM - Scenario #1 Alt. Analysis

## 4: Covered Bridge Road & Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL | WBT  | WBR | NBL  | NBT  | NBR | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|-----|------|-----|------|------|-----|------|------|------|
| LOS                     | E    | A    |     |     | C    |     | D    | A    |     | C    | D    | C    |
| Approach Delay          |      | 30.4 |     |     | 23.7 |     |      | 33.5 |     |      | 28.2 |      |
| Approach LOS            |      | C    |     |     | C    |     |      | C    |     |      | C    |      |
| Queue Length 50th (ft)  | 157  | 4    |     |     | 4    |     | 237  | 42   |     | 2    | 227  | 120  |
| Queue Length 95th (ft)  | #314 | 90   |     |     | 18   |     | #460 | 70   |     | 9    | 341  | #374 |
| Internal Link Dist (ft) |      | 1521 |     |     | 179  |     |      | 1107 |     |      | 1534 |      |
| Turn Bay Length (ft)    | 300  |      |     |     |      |     | 200  |      |     | 25   |      | 125  |
| Base Capacity (vph)     | 331  | 730  |     |     | 259  |     | 623  | 1278 |     | 409  | 660  | 907  |
| Starvation Cap Reductn  | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     |     | 0    |     | 0    | 0    |     | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.88 | 0.64 |     |     | 0.05 |     | 0.93 | 0.18 |     | 0.01 | 0.69 | 0.84 |

### Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 85.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 30.3

Intersection Capacity Utilization 89.7%

Analysis Period (min) 15

Description: 04-1302

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: C

ICU Level of Service E

Splits and Phases: 4: Covered Bridge Road & Pritchard Road/Private Drwy.



## Ashcroft Phase 2

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

## Build-out PM - Alt. Scenario

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |      |       |       |       |
| Traffic Volume (vph)    | 699   | 4     | 423  | 4     | 4     | 4    | 448   | 429   | 4    | 4     | 356   | 352   |
| Future Volume (vph)     | 699   | 4     | 423  | 4     | 4     | 4    | 448   | 429   | 4    | 4     | 356   | 352   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    |
| Grade (%)               |       | -3%   |      |       | -2%   |      |       | 4%    |      |       | -2%   |       |
| Storage Length (ft)     | 300   |       | 0    | 0     |       | 0    | 200   |       | 0    | 25    |       | 125   |
| Storage Lanes           | 1     |       | 0    | 0     |       | 0    | 1     |       | 0    | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |      | 75    |       |       |
| Satd. Flow (prot)       | 1796  | 1609  | 0    | 0     | 1768  | 0    | 1734  | 1824  | 0    | 1787  | 1881  | 1599  |
| Flt Permitted           | 0.750 |       |      |       | 0.910 |      | 0.161 |       |      | 0.489 |       |       |
| Satd. Flow (perm)       | 1418  | 1609  | 0    | 0     | 1635  | 0    | 294   | 1824  | 0    | 920   | 1881  | 1599  |
| Right Turn on Red       |       |       | Yes  |       |       | Yes  |       |       | Yes  |       |       | Yes   |
| Satd. Flow (RTOR)       |       | 470   |      |       | 4     |      |       | 1     |      |       |       | 305   |
| Link Speed (mph)        |       | 45    |      |       | 20    |      |       | 45    |      |       | 45    |       |
| Link Distance (ft)      |       | 1601  |      |       | 259   |      |       | 1187  |      |       | 1614  |       |
| Travel Time (s)         |       | 24.3  |      |       | 8.8   |      |       | 18.0  |      |       | 24.5  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |      |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |      |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |      |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |      |       |       |       |
| Lane Group Flow (vph)   | 777   | 474   | 0    | 0     | 12    | 0    | 498   | 481   | 0    | 4     | 396   | 391   |
| Turn Type               | Perm  | NA    |      | Perm  | NA    |      | pm+pt | NA    |      | Perm  | NA    | Perm  |
| Protected Phases        |       | 4     |      |       | 8     |      | 5     | 2     |      |       | 6     |       |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       |      | 6     |       | 6     |
| Detector Phase          | 4     | 4     |      | 8     | 8     |      | 5     | 2     |      | 6     | 6     | 6     |
| Switch Phase            |       |       |      |       |       |      |       |       |      |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 12.0  |      | 12.0  | 12.0  | 12.0  |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 19.0  |      | 19.0  | 19.0  | 19.0  |
| Total Split (s)         | 45.0  | 45.0  |      | 45.0  | 45.0  |      | 20.0  | 45.0  |      | 25.0  | 25.0  | 25.0  |
| Total Split (%)         | 50.0% | 50.0% |      | 50.0% | 50.0% |      | 22.2% | 50.0% |      | 27.8% | 27.8% | 27.8% |
| Yellow Time (s)         | 4.8   | 4.8   |      | 3.0   | 3.0   |      | 3.0   | 4.2   |      | 4.7   | 4.7   | 4.7   |
| All-Red Time (s)        | 1.0   | 1.0   |      | 1.9   | 1.9   |      | 2.1   | 1.0   |      | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s)    | -0.8  | -0.8  |      |       | 0.1   |      | -0.1  | -0.2  |      | -0.7  | -0.7  | -0.7  |
| Total Lost Time (s)     | 5.0   | 5.0   |      |       | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       |       |      |       |       |      | Lead  |       |      | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?      |       |       |      |       |       |      | Yes   |       |      | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   |      | Min   | Min   | Min   |
| Act Effect Green (s)    | 40.0  | 40.0  |      |       | 40.0  |      | 40.0  | 40.0  |      | 20.0  | 20.0  | 20.0  |
| Actuated g/C Ratio      | 0.44  | 0.44  |      |       | 0.44  |      | 0.44  | 0.44  |      | 0.22  | 0.22  | 0.22  |
| v/c Ratio               | 1.23  | 0.49  |      |       | 0.02  |      | 1.35  | 0.59  |      | 0.02  | 0.95  | 0.66  |
| Control Delay           | 144.3 | 3.5   |      |       | 11.9  |      | 196.6 | 22.6  |      | 27.8  | 69.0  | 13.9  |
| Queue Delay             | 0.0   | 0.0   |      |       | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   |
| Total Delay             | 144.3 | 3.5   |      |       | 11.9  |      | 196.6 | 22.6  |      | 27.8  | 69.0  | 13.9  |

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Kimley-Horn

Synchro 10 Report



## Ashcroft Phase 2

## Build-out PM - Alt. Scenario

## 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.

08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL | WBT  | WBR | NBL  | NBT   | NBR | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|-----|------|-----|------|-------|-----|------|------|------|
| LOS                     | F    | A    |     |     | B    |     | F    | C     |     | C    | E    | B    |
| Approach Delay          |      | 91.0 |     |     | 11.9 |     |      | 111.1 |     |      | 41.6 |      |
| Approach LOS            |      | F    |     |     | B    |     |      | F     |     |      | D    |      |
| Queue Length 50th (ft)  | ~552 | 1    |     |     | 3    |     | ~326 | 199   |     | 2    | 223  | 40   |
| Queue Length 95th (ft)  | #771 | 55   |     |     | 12   |     | #521 | 299   |     | 11   | #399 | 136  |
| Internal Link Dist (ft) |      | 1521 |     |     | 179  |     |      | 1107  |     |      | 1534 |      |
| Turn Bay Length (ft)    | 300  |      |     |     |      |     | 200  |       |     | 25   |      | 125  |
| Base Capacity (vph)     | 630  | 976  |     |     | 728  |     | 370  | 811   |     | 204  | 418  | 592  |
| Starvation Cap Reductn  | 0    | 0    |     |     | 0    |     | 0    | 0     |     | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     |     | 0    |     | 0    | 0     |     | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     |     | 0    |     | 0    | 0     |     | 0    | 0    | 0    |
| Reduced v/c Ratio       | 1.23 | 0.49 |     |     | 0.02 |     | 1.35 | 0.59  |     | 0.02 | 0.95 | 0.66 |

## Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.35

Intersection Signal Delay: 84.3

Intersection Capacity Utilization 101.4%

Analysis Period (min) 15

Description: 04-1302

Intersection LOS: F

ICU Level of Service G

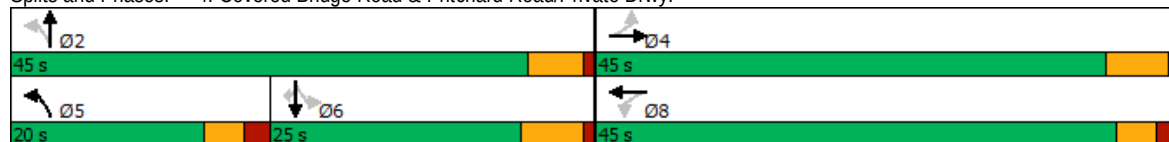
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Splits and Phases: 4: Covered Bridge Road &amp; Pritchard Road/Private Drwy.



**Appendix J:**  
**Synchro Output:**  
**Background (2030) – Scenario #2**

Ashcroft Phase 2  
3: N. O'Neil Street & Realigned Covered Bridge Road

Background AM - Scenario #2  
08/02/2020

| Lane Group              | EBL   | EBR   | NBL   | NBT   | SBT   | SBR   |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations     |       |       |       |       |       |       |
| Traffic Volume (vph)    | 177   | 19    | 20    | 322   | 460   | 412   |
| Future Volume (vph)     | 177   | 19    | 20    | 322   | 460   | 412   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12    | 12    | 12    | 12    |
| Grade (%)               | 0%    |       |       | 0%    | 0%    |       |
| Storage Length (ft)     | 0     | 150   | 150   |       |       | 100   |
| Storage Lanes           | 1     | 1     | 1     |       |       | 1     |
| Taper Length (ft)       | 100   |       | 100   |       |       |       |
| Satd. Flow (prot)       | 1770  | 1583  | 1770  | 1863  | 1863  | 1583  |
| Flt Permitted           | 0.950 |       | 0.950 |       |       |       |
| Satd. Flow (perm)       | 1770  | 1583  | 1770  | 1863  | 1863  | 1583  |
| Right Turn on Red       |       | No    |       |       |       | No    |
| Satd. Flow (RTOR)       |       |       |       |       |       |       |
| Link Speed (mph)        | 55    |       |       | 55    | 55    |       |
| Link Distance (ft)      | 735   |       |       | 1321  | 941   |       |
| Travel Time (s)         | 9.1   |       |       | 16.4  | 11.7  |       |
| Confl. Peds. (#/hr)     |       |       |       |       |       |       |
| Confl. Bikes (#/hr)     |       |       |       |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100%  | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%    | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0     | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |       |       |       |       |
| Mid-Block Traffic (%)   | 0%    |       |       | 0%    | 0%    |       |
| Shared Lane Traffic (%) |       |       |       |       |       |       |
| Lane Group Flow (vph)   | 197   | 21    | 22    | 358   | 511   | 458   |
| Turn Type               | Prot  | pm+ov | Prot  | NA    | NA    | pm+ov |
| Protected Phases        | 4     | 5     | 5     | 2     | 6     | 4     |
| Permitted Phases        |       | 4     |       |       |       | 6     |
| Detector Phase          | 4     | 5     | 5     | 2     | 6     | 4     |
| Switch Phase            |       |       |       |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   | 7.0   | 14.0  | 14.0  | 7.0   |
| Minimum Split (s)       | 14.0  | 14.0  | 14.0  | 21.0  | 21.0  | 14.0  |
| Total Split (s)         | 26.0  | 14.0  | 14.0  | 64.0  | 50.0  | 26.0  |
| Total Split (%)         | 28.9% | 15.6% | 15.6% | 71.1% | 55.6% | 28.9% |
| Yellow Time (s)         | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All-Red Time (s)        | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s)    | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  |
| Total Lost Time (s)     | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       | Lead  | Lead  |       | Lag   |       |
| Lead-Lag Optimize?      |       | Yes   | Yes   |       | Yes   |       |
| Recall Mode             | None  | None  | None  | Min   | Min   | None  |
| Act Effect Green (s)    | 14.5  | 30.1  | 10.0  | 30.2  | 23.4  | 46.6  |
| Actuated g/C Ratio      | 0.26  | 0.54  | 0.18  | 0.54  | 0.42  | 0.83  |
| v/c Ratio               | 0.43  | 0.02  | 0.07  | 0.36  | 0.66  | 0.35  |
| Control Delay           | 23.9  | 11.4  | 29.0  | 8.1   | 19.9  | 3.7   |
| Queue Delay             | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             | 23.9  | 11.4  | 29.0  | 8.1   | 19.9  | 3.7   |

Ashcroft Phase 2 11/05/2018 Background AM - Scenario #2  
Kimley-Horn

Synchro 10 Report

Ashcroft Phase 2  
3: N. O'Neil Street & Realigned Covered Bridge Road

Background AM - Scenario #2  
08/02/2020

| Lane Group              | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
|-------------------------|------|------|------|------|------|------|
| LOS                     | C    | B    | C    | A    | B    | A    |
| Approach Delay          | 22.7 |      |      | 9.3  | 12.3 |      |
| Approach LOS            | C    |      |      | A    | B    |      |
| Queue Length 50th (ft)  | 62   | 4    | 7    | 56   | 157  | 58   |
| Queue Length 95th (ft)  | 141  | 18   | 31   | 122  | 294  | 94   |
| Internal Link Dist (ft) | 655  |      |      | 1241 | 861  |      |
| Turn Bay Length (ft)    |      | 150  | 150  |      |      | 100  |
| Base Capacity (vph)     | 740  | 853  | 317  | 1708 | 1480 | 1373 |
| Starvation Cap Reductn  | 0    | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.27 | 0.02 | 0.07 | 0.21 | 0.35 | 0.33 |

Intersection Summary

Area Type: Other  
Cycle Length: 90  
Actuated Cycle Length: 55.9  
Natural Cycle: 60  
Control Type: Actuated-Uncoordinated  
Maximum v/c Ratio: 0.66  
Intersection Signal Delay: 13.0  
Intersection Capacity Utilization 42.3%  
Analysis Period (min) 15

Intersection LOS: B  
ICU Level of Service A

Splits and Phases: 3: N. O'Neil Street & Realigned Covered Bridge Road



Ashcroft Phase 2  
3: N. O'Neil Street & Realigned Covered Bridge Road

Background PM - Scenario #2  
08/02/2020

| Lane Group              | EBL   | EBR   | NBL   | NBT   | SBT   | SBR   |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations     |       |       |       |       |       |       |
| Traffic Volume (vph)    | 471   | 24    | 23    | 660   | 459   | 276   |
| Future Volume (vph)     | 471   | 24    | 23    | 660   | 459   | 276   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12    | 12    | 12    | 12    |
| Grade (%)               | 0%    |       |       | 0%    | 0%    |       |
| Storage Length (ft)     | 0     | 150   | 150   |       |       | 100   |
| Storage Lanes           | 1     | 1     | 1     |       |       | 1     |
| Taper Length (ft)       | 100   |       | 100   |       |       |       |
| Satd. Flow (prot)       | 1770  | 1583  | 1770  | 1863  | 1863  | 1583  |
| Flt Permitted           | 0.950 |       | 0.950 |       |       |       |
| Satd. Flow (perm)       | 1770  | 1583  | 1770  | 1863  | 1863  | 1583  |
| Right Turn on Red       |       | No    |       |       |       | No    |
| Satd. Flow (RTOR)       |       |       |       |       |       |       |
| Link Speed (mph)        | 55    |       |       | 55    | 55    |       |
| Link Distance (ft)      | 735   |       |       | 1321  | 941   |       |
| Travel Time (s)         | 9.1   |       |       | 16.4  | 11.7  |       |
| Confl. Peds. (#/hr)     |       |       |       |       |       |       |
| Confl. Bikes (#/hr)     |       |       |       |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100%  | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%    | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0     | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |       |       |       |       |
| Mid-Block Traffic (%)   | 0%    |       |       | 0%    | 0%    |       |
| Shared Lane Traffic (%) |       |       |       |       |       |       |
| Lane Group Flow (vph)   | 523   | 27    | 26    | 733   | 510   | 307   |
| Turn Type               | Prot  | pm+ov | Prot  | NA    | NA    | pm+ov |
| Protected Phases        | 4     | 5     | 5     | 2     | 6     | 4     |
| Permitted Phases        |       | 4     |       |       |       | 6     |
| Detector Phase          | 4     | 5     | 5     | 2     | 6     | 4     |
| Switch Phase            |       |       |       |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   | 7.0   | 14.0  | 14.0  | 7.0   |
| Minimum Split (s)       | 14.0  | 14.0  | 14.0  | 21.0  | 21.0  | 14.0  |
| Total Split (s)         | 35.0  | 15.0  | 15.0  | 55.0  | 40.0  | 35.0  |
| Total Split (%)         | 38.9% | 16.7% | 16.7% | 61.1% | 44.4% | 38.9% |
| Yellow Time (s)         | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All-Red Time (s)        | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s)    | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  |
| Total Lost Time (s)     | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       | Lead  | Lead  |       | Lag   |       |
| Lead-Lag Optimize?      |       | Yes   | Yes   |       | Yes   |       |
| Recall Mode             | None  | None  | None  | Min   | Min   | None  |
| Act Effect Green (s)    | 27.0  | 42.0  | 9.7   | 36.4  | 28.9  | 63.8  |
| Actuated g/C Ratio      | 0.37  | 0.57  | 0.13  | 0.49  | 0.39  | 0.86  |
| v/c Ratio               | 0.81  | 0.03  | 0.11  | 0.80  | 0.70  | 0.22  |
| Control Delay           | 35.4  | 10.5  | 36.0  | 23.1  | 27.3  | 2.6   |
| Queue Delay             | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             | 35.4  | 10.5  | 36.0  | 23.1  | 27.3  | 2.6   |

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Kimley-Horn Synchro 10 Report

Ashcroft Phase 2  
3: N. O'Neil Street & Realigned Covered Bridge Road

Background PM - Scenario #2  
08/02/2020

| Lane Group              | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
|-------------------------|------|------|------|------|------|------|
| LOS                     | D    | B    | D    | C    | C    | A    |
| Approach Delay          | 34.2 |      |      | 23.6 | 18.0 |      |
| Approach LOS            | C    |      |      | C    | B    |      |
| Queue Length 50th (ft)  | 232  | 6    | 12   | 285  | 234  | 34   |
| Queue Length 95th (ft)  | #466 | 21   | 38   | 424  | 357  | 59   |
| Internal Link Dist (ft) | 655  |      |      | 1241 | 861  |      |
| Turn Bay Length (ft)    |      | 150  | 150  |      |      | 100  |
| Base Capacity (vph)     | 757  | 916  | 252  | 1319 | 930  | 1367 |
| Starvation Cap Reductn  | 0    | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.69 | 0.03 | 0.10 | 0.56 | 0.55 | 0.22 |

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 73.9

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 24.2

Intersection LOS: C

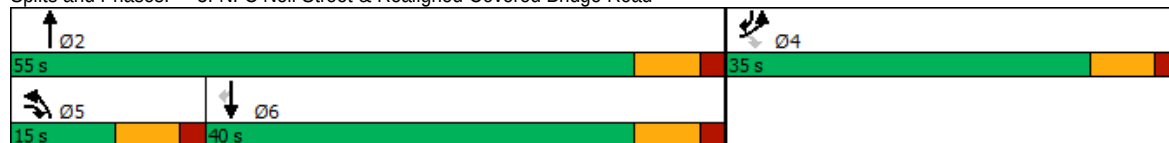
Intersection Capacity Utilization 69.2%

ICU Level of Service C

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

Splits and Phases: 3: N. O'Neil Street & Realigned Covered Bridge Road



## Ashcroft Phase 2

## Background AM - Scenario #2 Alt. Analysis

## 3: N. O'Neil Street &amp; Realigned Covered Bridge Road

08/02/2020

| Lane Group              | EBL   | EBR   | NBL   | NBT   | SBT   | SBR   |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations     |       |       |       |       |       |       |
| Traffic Volume (vph)    | 177   | 19    | 20    | 322   | 460   | 412   |
| Future Volume (vph)     | 177   | 19    | 20    | 322   | 460   | 412   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12    | 12    | 12    | 12    |
| Grade (%)               | 0%    |       |       | 0%    | 0%    |       |
| Storage Length (ft)     | 0     | 150   | 150   |       |       | 100   |
| Storage Lanes           | 1     | 1     | 1     |       |       | 1     |
| Taper Length (ft)       | 100   |       | 100   |       |       |       |
| Satd. Flow (prot)       | 1770  | 1583  | 1770  | 1863  | 1863  | 1583  |
| Flt Permitted           | 0.950 |       | 0.242 |       |       |       |
| Satd. Flow (perm)       | 1770  | 1583  | 451   | 1863  | 1863  | 1583  |
| Right Turn on Red       |       | Yes   |       |       |       | Yes   |
| Satd. Flow (RTOR)       |       | 21    |       |       |       | 458   |
| Link Speed (mph)        | 55    |       |       | 55    | 55    |       |
| Link Distance (ft)      | 735   |       |       | 1321  | 941   |       |
| Travel Time (s)         | 9.1   |       |       | 16.4  | 11.7  |       |
| Confl. Peds. (#/hr)     |       |       |       |       |       |       |
| Confl. Bikes (#/hr)     |       |       |       |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100%  | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%    | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0     | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |       |       |       |       |
| Mid-Block Traffic (%)   | 0%    |       |       | 0%    | 0%    |       |
| Shared Lane Traffic (%) |       |       |       |       |       |       |
| Lane Group Flow (vph)   | 197   | 21    | 22    | 358   | 511   | 458   |
| Turn Type               | Prot  | pm+ov | pm+pt | NA    | NA    | pm+ov |
| Protected Phases        | 4     | 5     | 5     | 2     | 6     | 4     |
| Permitted Phases        |       | 4     | 2     |       |       | 6     |
| Detector Phase          | 4     | 5     | 5     | 2     | 6     | 4     |
| Switch Phase            |       |       |       |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   | 7.0   | 14.0  | 14.0  | 7.0   |
| Minimum Split (s)       | 14.0  | 14.0  | 14.0  | 21.0  | 21.0  | 14.0  |
| Total Split (s)         | 25.0  | 15.0  | 15.0  | 65.0  | 50.0  | 25.0  |
| Total Split (%)         | 27.8% | 16.7% | 16.7% | 72.2% | 55.6% | 27.8% |
| Yellow Time (s)         | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All-Red Time (s)        | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s)    | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  |
| Total Lost Time (s)     | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       | Lead  | Lead  |       | Lag   |       |
| Lead-Lag Optimize?      |       | Yes   | Yes   |       | Yes   |       |
| Recall Mode             | None  | None  | None  | Min   | Min   | None  |
| Act Effect Green (s)    | 14.4  | 30.0  | 30.2  | 30.2  | 23.3  | 46.3  |
| Actuated g/C Ratio      | 0.26  | 0.54  | 0.54  | 0.54  | 0.42  | 0.83  |
| v/c Ratio               | 0.43  | 0.02  | 0.05  | 0.35  | 0.66  | 0.33  |
| Control Delay           | 24.1  | 5.7   | 5.8   | 7.9   | 19.9  | 1.0   |
| Queue Delay             | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             | 24.1  | 5.7   | 5.8   | 7.9   | 19.9  | 1.0   |

Ashcroft Phase 2 11/05/2018 Background AM - Scenario #2 Alt. Analysis  
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Synchro 10 Report

# Ashcroft Phase 2

# Background AM - Scenario #2 Alt. Analysis

## 3: N. O'Neil Street & Realigned Covered Bridge Road

08/02/2020

| Lane Group              | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
|-------------------------|------|------|------|------|------|------|
| LOS                     | C    | A    | A    | A    | B    | A    |
| Approach Delay          | 22.3 |      |      | 7.8  | 11.0 |      |
| Approach LOS            | C    |      |      | A    | B    |      |
| Queue Length 50th (ft)  | 62   | 0    | 3    | 56   | 157  | 0    |
| Queue Length 95th (ft)  | 141  | 12   | 12   | 118  | 292  | 18   |
| Internal Link Dist (ft) | 655  |      |      | 1241 | 861  |      |
| Turn Bay Length (ft)    |      | 150  | 150  |      |      | 100  |
| Base Capacity (vph)     | 706  | 891  | 508  | 1728 | 1482 | 1424 |
| Starvation Cap Reductn  | 0    | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.28 | 0.02 | 0.04 | 0.21 | 0.34 | 0.32 |

### Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 55.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 11.8

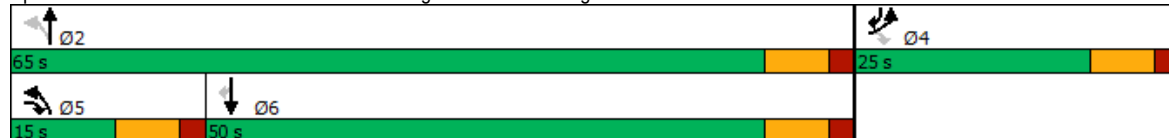
Intersection Capacity Utilization 42.3%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service A

Splits and Phases: 3: N. O'Neil Street & Realigned Covered Bridge Road





## Ashcroft Phase 2

## Background PM - Scenario #2 Alt. Analysis

## 3: N. O'Neil Street &amp; Realigned Covered Bridge Road

08/02/2020

| Lane Group              | EBL   | EBR   | NBL   | NBT   | SBT   | SBR   |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations     |       |       |       |       |       |       |
| Traffic Volume (vph)    | 471   | 24    | 23    | 660   | 459   | 276   |
| Future Volume (vph)     | 471   | 24    | 23    | 660   | 459   | 276   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12    | 12    | 12    | 12    |
| Grade (%)               | 0%    |       |       | 0%    | 0%    |       |
| Storage Length (ft)     | 0     | 150   | 150   |       |       | 100   |
| Storage Lanes           | 1     | 1     | 1     |       |       | 1     |
| Taper Length (ft)       | 100   |       | 100   |       |       |       |
| Satd. Flow (prot)       | 1770  | 1583  | 1770  | 1863  | 1863  | 1583  |
| Flt Permitted           | 0.950 |       | 0.212 |       |       |       |
| Satd. Flow (perm)       | 1770  | 1583  | 395   | 1863  | 1863  | 1583  |
| Right Turn on Red       |       | Yes   |       |       |       | Yes   |
| Satd. Flow (RTOR)       |       | 27    |       |       |       | 307   |
| Link Speed (mph)        | 55    |       |       | 55    | 55    |       |
| Link Distance (ft)      | 735   |       |       | 1321  | 941   |       |
| Travel Time (s)         | 9.1   |       |       | 16.4  | 11.7  |       |
| Confl. Peds. (#/hr)     |       |       |       |       |       |       |
| Confl. Bikes (#/hr)     |       |       |       |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100%  | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%    | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0     | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |       |       |       |       |
| Mid-Block Traffic (%)   | 0%    |       |       | 0%    | 0%    |       |
| Shared Lane Traffic (%) |       |       |       |       |       |       |
| Lane Group Flow (vph)   | 523   | 27    | 26    | 733   | 510   | 307   |
| Turn Type               | Prot  | pm+ov | pm+pt | NA    | NA    | pm+ov |
| Protected Phases        | 4     | 5     | 5     | 2     | 6     | 4     |
| Permitted Phases        |       | 4     | 2     |       |       | 6     |
| Detector Phase          | 4     | 5     | 5     | 2     | 6     | 4     |
| Switch Phase            |       |       |       |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   | 7.0   | 14.0  | 14.0  | 7.0   |
| Minimum Split (s)       | 14.0  | 14.0  | 14.0  | 21.0  | 21.0  | 14.0  |
| Total Split (s)         | 35.0  | 15.0  | 15.0  | 55.0  | 40.0  | 35.0  |
| Total Split (%)         | 38.9% | 16.7% | 16.7% | 61.1% | 44.4% | 38.9% |
| Yellow Time (s)         | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All-Red Time (s)        | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s)    | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  |
| Total Lost Time (s)     | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Lead/Lag                |       | Lead  | Lead  |       | Lag   |       |
| Lead-Lag Optimize?      |       | Yes   | Yes   |       | Yes   |       |
| Recall Mode             | None  | None  | None  | Min   | Min   | None  |
| Act Effect Green (s)    | 27.0  | 41.7  | 36.2  | 36.2  | 29.0  | 63.9  |
| Actuated g/C Ratio      | 0.37  | 0.57  | 0.49  | 0.49  | 0.39  | 0.87  |
| v/c Ratio               | 0.81  | 0.03  | 0.07  | 0.80  | 0.70  | 0.22  |
| Control Delay           | 35.2  | 4.8   | 9.8   | 23.2  | 26.8  | 0.7   |
| Queue Delay             | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             | 35.2  | 4.8   | 9.8   | 23.2  | 26.8  | 0.7   |

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Kimley-Horn Synchro 10 Report

# Ashcroft Phase 2

# Background PM - Scenario #2 Alt. Analysis

## 3: N. O'Neil Street & Realigned Covered Bridge Road

08/02/2020

| Lane Group              | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
|-------------------------|------|------|------|------|------|------|
| LOS                     | D    | A    | A    | C    | C    | A    |
| Approach Delay          | 33.7 |      |      | 22.8 | 17.0 |      |
| Approach LOS            | C    |      |      | C    | B    |      |
| Queue Length 50th (ft)  | 232  | 0    | 6    | 285  | 234  | 0    |
| Queue Length 95th (ft)  | #466 | 13   | 18   | 424  | 350  | 13   |
| Internal Link Dist (ft) | 655  |      |      | 1241 | 861  |      |
| Turn Bay Length (ft)    |      | 150  | 150  |      |      | 100  |
| Base Capacity (vph)     | 758  | 929  | 390  | 1321 | 935  | 1412 |
| Starvation Cap Reductn  | 0    | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.69 | 0.03 | 0.07 | 0.55 | 0.55 | 0.22 |

### Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 73.7

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 23.4

Intersection LOS: C

Intersection Capacity Utilization 69.2%

ICU Level of Service C

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: N. O'Neil Street & Realigned Covered Bridge Road



**Appendix K:**  
**Synchro Output:**  
**Build-out (2030) – Scenario #2**

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Rd. Ext.

Build-out AM - Scenario #2  
08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR   | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |       |       |       |       |
| Traffic Volume (vph)    | 177   | 53    | 36   | 101   | 112   | 70   | 50    | 345   | 25    | 51    | 478   | 412   |
| Future Volume (vph)     | 177   | 53    | 36   | 101   | 112   | 70   | 50    | 345   | 25    | 51    | 478   | 412   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    | 12    | 12    | 12    |
| Grade (%)               |       | 0%    |      |       | 0%    |      |       | 0%    |       |       | 0%    |       |
| Storage Length (ft)     | 0     |       | 150  | 150   |       | 0    | 150   |       | 100   | 225   |       | 100   |
| Storage Lanes           | 1     |       | 1    | 1     |       | 0    | 1     |       | 1     | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |       | 100   |       |       |
| Satd. Flow (prot)       | 1770  | 1749  | 0    | 1770  | 1755  | 0    | 1770  | 1863  | 1583  | 1770  | 1863  | 1583  |
| Flt Permitted           | 0.950 |       |      | 0.950 |       |      | 0.950 |       |       | 0.950 |       |       |
| Satd. Flow (perm)       | 1770  | 1749  | 0    | 1770  | 1755  | 0    | 1770  | 1863  | 1583  | 1770  | 1863  | 1583  |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No    |       |       | No    |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |       |       |       |       |
| Link Speed (mph)        |       | 55    |      |       | 45    |      |       | 55    |       |       | 55    |       |
| Link Distance (ft)      |       | 676   |      |       | 895   |      |       | 676   |       |       | 941   |       |
| Travel Time (s)         |       | 8.4   |      |       | 13.6  |      |       | 8.4   |       |       | 11.7  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |       |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |       |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |       |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |       |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |       |       |       |       |
| Lane Group Flow (vph)   | 197   | 99    | 0    | 112   | 202   | 0    | 56    | 383   | 28    | 57    | 531   | 458   |
| Turn Type               | Prot  | NA    |      | Prot  | NA    |      | Prot  | NA    | pm+ov | Prot  | NA    | pm+ov |
| Protected Phases        | 7     | 4     |      | 3     | 8     |      | 5     | 2     | 3     | 1     | 6     | 7     |
| Permitted Phases        |       |       |      |       |       |      |       |       | 2     |       |       | 6     |
| Detector Phase          | 7     | 4     |      | 3     | 8     |      | 5     | 2     | 3     | 1     | 6     | 7     |
| Switch Phase            |       |       |      |       |       |      |       |       |       |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 14.0  | 7.0   | 7.0   | 14.0  | 7.0   |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 21.0  | 14.0  | 14.0  | 21.0  | 14.0  |
| Total Split (s)         | 30.0  | 35.0  |      | 20.0  | 25.0  |      | 15.0  | 50.0  | 20.0  | 15.0  | 50.0  | 30.0  |
| Total Split (%)         | 25.0% | 29.2% |      | 16.7% | 20.8% |      | 12.5% | 41.7% | 16.7% | 12.5% | 41.7% | 25.0% |
| Yellow Time (s)         | 5.0   | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All-Red Time (s)        | 2.0   | 2.0   |      | 2.0   | 2.0   |      | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s)    | -2.0  | -2.0  |      | -2.0  | -2.0  |      | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  |
| Total Lost Time (s)     | 5.0   | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Lead/Lag                | Lead  | Lag   |      | Lead  | Lag   |      | Lead  | Lag   | Lead  | Lead  | Lag   | Lead  |
| Lead-Lag Optimize?      | Yes   | Yes   |      | Yes   | Yes   |      | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   | None  | None  | Min   | None  |
| Act Effect Green (s)    | 18.7  | 28.2  |      | 13.3  | 17.7  |      | 10.4  | 32.7  | 51.4  | 10.4  | 32.7  | 56.9  |
| Actuated g/C Ratio      | 0.19  | 0.29  |      | 0.14  | 0.18  |      | 0.11  | 0.34  | 0.53  | 0.11  | 0.34  | 0.59  |
| v/c Ratio               | 0.57  | 0.19  |      | 0.46  | 0.63  |      | 0.29  | 0.61  | 0.03  | 0.30  | 0.84  | 0.49  |
| Control Delay           | 46.4  | 35.1  |      | 51.7  | 50.9  |      | 52.6  | 32.5  | 12.7  | 52.6  | 43.9  | 14.1  |
| Queue Delay             | 0.0   | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             | 46.4  | 35.1  |      | 51.7  | 50.9  |      | 52.6  | 32.5  | 12.7  | 52.6  | 43.9  | 14.1  |

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Synchro 10 Report

Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Rd. Ext.

Build-out AM - Scenario #2  
08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL  | WBT  | WBR | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|------|------|-----|------|------|------|------|------|------|
| LOS                     | D    | D    |     | D    | D    |     | D    | C    | B    | D    | D    | B    |
| Approach Delay          |      | 42.6 |     |      | 51.2 |     |      | 33.7 |      |      | 31.4 |      |
| Approach LOS            |      | D    |     |      | D    |     |      | C    |      |      | C    |      |
| Queue Length 50th (ft)  | 120  | 53   |     | 69   | 123  |     | 35   | 209  | 9    | 36   | 322  | 173  |
| Queue Length 95th (ft)  | 215  | 110  |     | 143  | #238 |     | 86   | 330  | 24   | 87   | 496  | 252  |
| Internal Link Dist (ft) |      | 596  |     |      | 815  |     |      | 596  |      |      | 861  |      |
| Turn Bay Length (ft)    |      |      |     | 150  |      |     | 150  |      | 100  | 225  |      | 100  |
| Base Capacity (vph)     | 500  | 594  |     | 300  | 397  |     | 200  | 949  | 895  | 200  | 949  | 1075 |
| Starvation Cap Reductn  | 0    | 0    |     | 0    | 0    |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     | 0    | 0    |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     | 0    | 0    |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.39 | 0.17 |     | 0.37 | 0.51 |     | 0.28 | 0.40 | 0.03 | 0.28 | 0.56 | 0.43 |

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 96.2

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 36.4

Intersection Capacity Utilization 67.6%

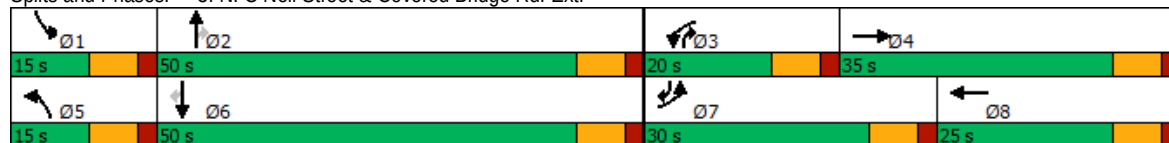
Analysis Period (min) 15

Intersection LOS: D

ICU Level of Service C

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

Splits and Phases: 3: N. O'Neil Street & Covered Bridge Rd. Ext.



## Ashcroft Phase 2

## Build-out PM - Scenario #2

7: N. O'Neil Street &amp; Realigned Covered Bridge Road/Covered Bridge Rd. Ext.

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR   | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |       |       |       |       |
| Traffic Volume (vph)    | 471   | 114   | 54   | 88    | 66    | 52   | 59    | 700   | 68    | 116   | 461   | 276   |
| Future Volume (vph)     | 471   | 114   | 54   | 88    | 66    | 52   | 59    | 700   | 68    | 116   | 461   | 276   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    | 12    | 12    | 12    |
| Grade (%)               |       | 0%    |      |       | 0%    |      |       | 0%    |       |       | 0%    |       |
| Storage Length (ft)     | 0     |       | 150  | 150   |       | 0    | 150   |       | 100   | 225   |       | 100   |
| Storage Lanes           | 1     |       | 1    | 1     |       | 0    | 1     |       | 1     | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |       | 100   |       |       |
| Satd. Flow (prot)       | 1770  | 1773  | 0    | 1770  | 1740  | 0    | 1770  | 1863  | 1583  | 1770  | 1863  | 1583  |
| Flt Permitted           | 0.950 |       |      | 0.950 |       |      | 0.950 |       |       | 0.950 |       |       |
| Satd. Flow (perm)       | 1770  | 1773  | 0    | 1770  | 1740  | 0    | 1770  | 1863  | 1583  | 1770  | 1863  | 1583  |
| Right Turn on Red       |       |       | No   |       |       | No   |       |       | No    |       |       | No    |
| Satd. Flow (RTOR)       |       |       |      |       |       |      |       |       |       |       |       |       |
| Link Speed (mph)        |       | 55    |      |       | 45    |      |       | 55    |       |       | 55    |       |
| Link Distance (ft)      |       | 574   |      |       | 895   |      |       | 676   |       |       | 941   |       |
| Travel Time (s)         |       | 7.1   |      |       | 13.6  |      |       | 8.4   |       |       | 11.7  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |       |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |       |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |       |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |       |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |       |       |       |       |
| Lane Group Flow (vph)   | 523   | 187   | 0    | 98    | 131   | 0    | 66    | 778   | 76    | 129   | 512   | 307   |
| Turn Type               | Prot  | NA    |      | Prot  | NA    |      | Prot  | NA    | pm+ov | Prot  | NA    | pm+ov |
| Protected Phases        | 7     | 4     |      | 3     | 8     |      | 5     | 2     | 3     | 1     | 6     | 7     |
| Permitted Phases        |       |       |      |       |       |      |       |       | 2     |       |       | 6     |
| Detector Phase          | 7     | 4     |      | 3     | 8     |      | 5     | 2     | 3     | 1     | 6     | 7     |
| Switch Phase            |       |       |      |       |       |      |       |       |       |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 14.0  | 7.0   | 7.0   | 14.0  | 7.0   |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 21.0  | 14.0  | 14.0  | 21.0  | 14.0  |
| Total Split (s)         | 39.0  | 35.0  |      | 18.0  | 14.0  |      | 15.0  | 53.0  | 18.0  | 14.0  | 52.0  | 39.0  |
| Total Split (%)         | 32.5% | 29.2% |      | 15.0% | 11.7% |      | 12.5% | 44.2% | 15.0% | 11.7% | 43.3% | 32.5% |
| Yellow Time (s)         | 5.0   | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All-Red Time (s)        | 2.0   | 2.0   |      | 2.0   | 2.0   |      | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s)    | -2.0  | -2.0  |      | -2.0  | -2.0  |      | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  |
| Total Lost Time (s)     | 5.0   | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Lead/Lag                | Lead  | Lag   |      | Lead  | Lag   |      | Lead  | Lag   | Lead  | Lead  | Lag   | Lead  |
| Lead-Lag Optimize?      | Yes   | Yes   |      | Yes   | Yes   |      | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   | None  | None  | Min   | None  |
| Act Effect Green (s)    | 34.0  | 30.9  |      | 12.1  | 9.0   |      | 9.8   | 48.0  | 65.1  | 9.0   | 50.0  | 89.0  |
| Actuated g/C Ratio      | 0.28  | 0.26  |      | 0.10  | 0.08  |      | 0.08  | 0.40  | 0.54  | 0.08  | 0.42  | 0.74  |
| v/c Ratio               | 1.04  | 0.41  |      | 0.55  | 1.01  |      | 0.46  | 1.04  | 0.09  | 0.98  | 0.66  | 0.26  |
| Control Delay           | 94.3  | 40.6  |      | 63.3  | 136.5 |      | 63.3  | 80.9  | 13.3  | 128.3 | 34.3  | 6.2   |
| Queue Delay             | 0.0   | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             | 94.3  | 40.6  |      | 63.3  | 136.5 |      | 63.3  | 80.9  | 13.3  | 128.3 | 34.3  | 6.2   |

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# Ashcroft Phase 2

# Build-out PM - Scenario #2

7: N. O'Neil Street & Realigned Covered Bridge Road/Covered Bridge Rd. Ext.

08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL  | WBT   | WBR | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|------|-------|-----|------|------|------|------|------|------|
| LOS                     | F    | D    |     | E    | F     |     | E    | F    | B    | F    | C    | A    |
| Approach Delay          |      | 80.2 |     |      | 105.2 |     |      | 74.0 |      |      | 38.0 |      |
| Approach LOS            |      | F    |     |      | F     |     |      | E    |      |      | D    |      |
| Queue Length 50th (ft)  | ~439 | 122  |     | 73   | ~104  |     | 50   | ~653 | 27   | 101  | 328  | 74   |
| Queue Length 95th (ft)  | #653 | 193  |     | 130  | #235  |     | 97   | #892 | 51   | #228 | 458  | 111  |
| Internal Link Dist (ft) |      | 494  |     |      | 815   |     |      | 596  |      |      | 861  |      |
| Turn Bay Length (ft)    |      |      |     | 150  |       |     | 150  |      | 100  | 225  |      | 100  |
| Base Capacity (vph)     | 501  | 456  |     | 191  | 130   |     | 147  | 745  | 870  | 132  | 776  | 1174 |
| Starvation Cap Reductn  | 0    | 0    |     | 0    | 0     |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     | 0    | 0     |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     | 0    | 0     |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 1.04 | 0.41 |     | 0.51 | 1.01  |     | 0.45 | 1.04 | 0.09 | 0.98 | 0.66 | 0.26 |

## Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 66.0

Intersection Capacity Utilization 92.7%

Analysis Period (min) 15

Intersection LOS: E

ICU Level of Service F

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7: N. O'Neil Street & Realigned Covered Bridge Road/Covered Bridge Rd. Ext.



Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Rd. Ext.

Build-out AM - Scenario #2 Alt. Analysis  
08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR   | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |       |       |       |       |
| Traffic Volume (vph)    | 177   | 53    | 36   | 101   | 112   | 70   | 50    | 345   | 25    | 51    | 478   | 412   |
| Future Volume (vph)     | 177   | 53    | 36   | 101   | 112   | 70   | 50    | 345   | 25    | 51    | 478   | 412   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    | 12    | 12    | 12    |
| Grade (%)               |       | 0%    |      |       | 0%    |      |       | 0%    |       |       | 0%    |       |
| Storage Length (ft)     | 0     |       | 150  | 150   |       | 0    | 150   |       | 100   | 225   |       | 100   |
| Storage Lanes           | 1     |       | 1    | 1     |       | 0    | 1     |       | 1     | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |       | 100   |       |       |
| Satd. Flow (prot)       | 1770  | 1749  | 0    | 1770  | 1755  | 0    | 1770  | 1863  | 1583  | 1770  | 1863  | 1583  |
| Flt Permitted           | 0.478 |       |      | 0.693 |       |      | 0.162 |       |       | 0.341 |       |       |
| Satd. Flow (perm)       | 890   | 1749  | 0    | 1291  | 1755  | 0    | 302   | 1863  | 1583  | 635   | 1863  | 1583  |
| Right Turn on Red       |       |       | Yes  |       |       | Yes  |       |       | Yes   |       |       | Yes   |
| Satd. Flow (RTOR)       |       | 26    |      |       | 22    |      |       |       | 164   |       |       | 388   |
| Link Speed (mph)        |       | 30    |      |       | 25    |      |       | 55    |       |       | 55    |       |
| Link Distance (ft)      |       | 676   |      |       | 895   |      |       | 676   |       |       | 941   |       |
| Travel Time (s)         |       | 15.4  |      |       | 24.4  |      |       | 8.4   |       |       | 11.7  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |       |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |       |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |       |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |       |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |       |       |       |       |
| Lane Group Flow (vph)   | 197   | 99    | 0    | 112   | 202   | 0    | 56    | 383   | 28    | 57    | 531   | 458   |
| Turn Type               | D.P+P | NA    |      | D.P+P | NA    |      | D.P+P | NA    | pm+ov | D.P+P | NA    | pm+ov |
| Protected Phases        | 7     | 4     |      | 3     | 8     |      | 5     | 2     | 3     | 1     | 6     | 7     |
| Permitted Phases        | 8     |       |      | 4     |       |      | 6     |       | 2     | 2     |       | 6     |
| Detector Phase          | 7     | 4     |      | 3     | 8     |      | 5     | 2     | 3     | 1     | 6     | 7     |
| Switch Phase            |       |       |      |       |       |      |       |       |       |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 14.0  | 7.0   | 7.0   | 14.0  | 7.0   |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 21.0  | 14.0  | 14.0  | 21.0  | 14.0  |
| Total Split (s)         | 25.0  | 30.0  |      | 15.0  | 20.0  |      | 15.0  | 60.0  | 15.0  | 15.0  | 60.0  | 25.0  |
| Total Split (%)         | 20.8% | 25.0% |      | 12.5% | 16.7% |      | 12.5% | 50.0% | 12.5% | 12.5% | 50.0% | 20.8% |
| Yellow Time (s)         | 5.0   | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All-Red Time (s)        | 2.0   | 2.0   |      | 2.0   | 2.0   |      | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s)    | -2.0  | -2.0  |      | -2.0  | -2.0  |      | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  |
| Total Lost Time (s)     | 5.0   | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Lead/Lag                | Lead  | Lag   |      | Lead  | Lag   |      | Lead  | Lag   | Lead  | Lead  | Lag   | Lead  |
| Lead-Lag Optimize?      | Yes   | Yes   |      | Yes   | Yes   |      | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   | None  | None  | Min   | None  |
| Act Effect Green (s)    | 29.8  | 24.2  |      | 31.5  | 14.9  |      | 37.3  | 30.4  | 46.1  | 37.3  | 30.4  | 50.6  |
| Actuated g/C Ratio      | 0.34  | 0.28  |      | 0.36  | 0.17  |      | 0.43  | 0.35  | 0.53  | 0.43  | 0.35  | 0.58  |
| v/c Ratio               | 0.43  | 0.20  |      | 0.21  | 0.63  |      | 0.19  | 0.59  | 0.03  | 0.14  | 0.81  | 0.42  |
| Control Delay           | 24.6  | 25.9  |      | 22.2  | 44.8  |      | 13.4  | 28.0  | 0.1   | 12.7  | 37.6  | 3.0   |
| Queue Delay             | 0.0   | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             | 24.6  | 25.9  |      | 22.2  | 44.8  |      | 13.4  | 28.0  | 0.1   | 12.7  | 37.6  | 3.0   |

K:\RAL\_TPTO\Traffic\014163000 Ashcroft Phase 2\T4 - Analysis\Synchro\With Realigned Covered Bridge\17-Build AM-Scenario#2Alt.syn  
Kimley-Horn  
Synchro 10 Report



Ashcroft Phase 2  
3: N. O'Neil Street & Covered Bridge Rd. Ext.

Build-out AM - Scenario #2 Alt. Analysis  
08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL  | WBT  | WBR | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|------|------|-----|------|------|------|------|------|------|
| LOS                     | C    | C    |     | C    | D    |     | B    | C    | A    | B    | D    | A    |
| Approach Delay          |      | 25.0 |     |      | 36.8 |     |      | 24.6 |      |      | 21.1 |      |
| Approach LOS            |      | C    |     |      | D    |     |      | C    |      |      | C    |      |
| Queue Length 50th (ft)  | 75   | 34   |     | 41   | 97   |     | 16   | 179  | 0    | 16   | 275  | 17   |
| Queue Length 95th (ft)  | 160  | 90   |     | 96   | #246 |     | 37   | 287  | 0    | 38   | 431  | 55   |
| Internal Link Dist (ft) |      | 596  |     |      | 815  |     |      | 596  |      |      | 861  |      |
| Turn Bay Length (ft)    |      |      |     | 150  |      |     | 150  |      | 100  | 225  |      | 100  |
| Base Capacity (vph)     | 563  | 561  |     | 527  | 342  |     | 312  | 1240 | 923  | 416  | 1240 | 1175 |
| Starvation Cap Reductn  | 0    | 0    |     | 0    | 0    |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     | 0    | 0    |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     | 0    | 0    |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.35 | 0.18 |     | 0.21 | 0.59 |     | 0.18 | 0.31 | 0.03 | 0.14 | 0.43 | 0.39 |

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 86.9

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 24.7

Intersection Capacity Utilization 67.6%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service C

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

Splits and Phases: 3: N. O'Neil Street & Covered Bridge Rd. Ext.

|                                                                                        |                                                                                        |                                                                                         |                                                                                          |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|  Ø1 |  Ø2 |  Ø3 |  Ø4 |
| 15 s                                                                                   | 60 s                                                                                   | 15 s                                                                                    | 30 s                                                                                     |
|  Ø5 |  Ø6 |  Ø7 |  Ø8 |
| 15 s                                                                                   | 60 s                                                                                   | 25 s                                                                                    | 20 s                                                                                     |

## Ashcroft Phase 2

## Build-out PM - Scenario #2 Alt. Analysis

7: N. O'Neil Street &amp; Realigned Covered Bridge Road/Covered Bridge Rd. Ext.

08/02/2020

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR   | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| Lane Configurations     |       |       |      |       |       |      |       |       |       |       |       |       |
| Traffic Volume (vph)    | 471   | 114   | 54   | 88    | 66    | 52   | 59    | 700   | 68    | 116   | 461   | 276   |
| Future Volume (vph)     | 471   | 114   | 54   | 88    | 66    | 52   | 59    | 700   | 68    | 116   | 461   | 276   |
| Ideal Flow (vphpl)      | 1900  | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  |
| Lane Width (ft)         | 12    | 12    | 12   | 12    | 12    | 12   | 12    | 12    | 12    | 12    | 12    | 12    |
| Grade (%)               |       | 0%    |      |       | 0%    |      |       | 0%    |       |       | 0%    |       |
| Storage Length (ft)     | 0     |       | 150  | 150   |       | 0    | 150   |       | 100   | 225   |       | 100   |
| Storage Lanes           | 1     |       | 1    | 1     |       | 0    | 1     |       | 1     | 1     |       | 1     |
| Taper Length (ft)       | 100   |       |      | 100   |       |      | 100   |       |       | 100   |       |       |
| Satd. Flow (prot)       | 1770  | 1773  | 0    | 1770  | 1740  | 0    | 1770  | 1863  | 1583  | 1770  | 1863  | 1583  |
| Flt Permitted           | 0.286 |       |      | 0.640 |       |      | 0.289 |       |       | 0.074 |       |       |
| Satd. Flow (perm)       | 533   | 1773  | 0    | 1192  | 1740  | 0    | 538   | 1863  | 1583  | 138   | 1863  | 1583  |
| Right Turn on Red       |       |       | Yes  |       |       | Yes  |       |       | Yes   |       |       | Yes   |
| Satd. Flow (RTOR)       |       | 19    |      |       | 26    |      |       |       | 164   |       |       | 307   |
| Link Speed (mph)        |       | 55    |      |       | 25    |      |       | 55    |       |       | 55    |       |
| Link Distance (ft)      |       | 574   |      |       | 895   |      |       | 676   |       |       | 941   |       |
| Travel Time (s)         |       | 7.1   |      |       | 24.4  |      |       | 8.4   |       |       | 11.7  |       |
| Confl. Peds. (#/hr)     |       |       |      |       |       |      |       |       |       |       |       |       |
| Confl. Bikes (#/hr)     |       |       |      |       |       |      |       |       |       |       |       |       |
| Peak Hour Factor        | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  | 0.90  |
| Growth Factor           | 100%  | 100%  | 100% | 100%  | 100%  | 100% | 100%  | 100%  | 100%  | 100%  | 100%  | 100%  |
| Heavy Vehicles (%)      | 2%    | 2%    | 2%   | 2%    | 2%    | 2%   | 2%    | 2%    | 2%    | 2%    | 2%    | 2%    |
| Bus Blockages (#/hr)    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0     | 0     | 0     | 0     |
| Parking (#/hr)          |       |       |      |       |       |      |       |       |       |       |       |       |
| Mid-Block Traffic (%)   |       | 0%    |      |       | 0%    |      |       | 0%    |       |       | 0%    |       |
| Shared Lane Traffic (%) |       |       |      |       |       |      |       |       |       |       |       |       |
| Lane Group Flow (vph)   | 523   | 187   | 0    | 98    | 131   | 0    | 66    | 778   | 76    | 129   | 512   | 307   |
| Turn Type               | pm+pt | NA    |      | pm+pt | NA    |      | pm+pt | NA    | pm+ov | pm+pt | NA    | pm+ov |
| Protected Phases        | 7     | 4     |      | 3     | 8     |      | 5     | 2     | 3     | 1     | 6     | 7     |
| Permitted Phases        | 4     |       |      | 8     |       |      | 2     |       | 2     | 6     |       | 6     |
| Detector Phase          | 7     | 4     |      | 3     | 8     |      | 5     | 2     | 3     | 1     | 6     | 7     |
| Switch Phase            |       |       |      |       |       |      |       |       |       |       |       |       |
| Minimum Initial (s)     | 7.0   | 7.0   |      | 7.0   | 7.0   |      | 7.0   | 14.0  | 7.0   | 7.0   | 14.0  | 7.0   |
| Minimum Split (s)       | 14.0  | 14.0  |      | 14.0  | 14.0  |      | 14.0  | 21.0  | 14.0  | 14.0  | 21.0  | 14.0  |
| Total Split (s)         | 36.0  | 36.0  |      | 14.0  | 14.0  |      | 14.0  | 56.0  | 14.0  | 14.0  | 56.0  | 36.0  |
| Total Split (%)         | 30.0% | 30.0% |      | 11.7% | 11.7% |      | 11.7% | 46.7% | 11.7% | 11.7% | 46.7% | 30.0% |
| Yellow Time (s)         | 5.0   | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All-Red Time (s)        | 2.0   | 2.0   |      | 2.0   | 2.0   |      | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s)    | -2.0  | -2.0  |      | -2.0  | -2.0  |      | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  |
| Total Lost Time (s)     | 5.0   | 5.0   |      | 5.0   | 5.0   |      | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Lead/Lag                | Lead  | Lag   |      | Lead  | Lag   |      | Lead  | Lag   | Lead  | Lead  | Lag   | Lead  |
| Lead-Lag Optimize?      | Yes   | Yes   |      | Yes   | Yes   |      | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode             | None  | None  |      | None  | None  |      | None  | Min   | None  | None  | Min   | None  |
| Act Effect Green (s)    | 45.0  | 31.0  |      | 18.0  | 9.0   |      | 60.0  | 51.0  | 65.0  | 61.0  | 53.8  | 89.8  |
| Actuated g/C Ratio      | 0.38  | 0.26  |      | 0.15  | 0.08  |      | 0.50  | 0.42  | 0.54  | 0.51  | 0.45  | 0.75  |
| v/c Ratio               | 1.01  | 0.40  |      | 0.44  | 0.85  |      | 0.18  | 0.98  | 0.08  | 0.67  | 0.61  | 0.24  |
| Control Delay           | 76.0  | 35.8  |      | 34.8  | 85.7  |      | 14.5  | 62.9  | 0.2   | 39.7  | 30.1  | 1.0   |
| Queue Delay             | 0.0   | 0.0   |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             | 76.0  | 35.8  |      | 34.8  | 85.7  |      | 14.5  | 62.9  | 0.2   | 39.7  | 30.1  | 1.0   |

K:\RAL\_TPTO\\_Traffic\014163000 Ashcroft Phase 2\T4 - Analysis\Synchro\With Realigned Covered Bridge\18-Build PM-Scenario#2Alt.syn  
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 Synchro 10 Report

# Ashcroft Phase 2

# Build-out PM - Scenario #2 Alt. Analysis

7: N. O'Neil Street & Realigned Covered Bridge Road/Covered Bridge Rd. Ext.

08/02/2020

| Lane Group              | EBL  | EBT  | EBR | WBL  | WBT  | WBR | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-------------------------|------|------|-----|------|------|-----|------|------|------|------|------|------|
| LOS                     | E    | D    |     | C    | F    |     | B    | E    | A    | D    | C    | A    |
| Approach Delay          |      | 65.4 |     |      | 63.9 |     |      | 54.3 |      |      | 22.0 |      |
| Approach LOS            |      | E    |     |      | E    |     |      | D    |      |      | C    |      |
| Queue Length 50th (ft)  | ~359 | 107  |     | 50   | 82   |     | 23   | 585  | 0    | 49   | 309  | 0    |
| Queue Length 95th (ft)  | #591 | 177  |     | 89   | #197 |     | 46   | #854 | 0    | #133 | 431  | 23   |
| Internal Link Dist (ft) |      | 494  |     |      | 815  |     |      | 596  |      |      | 861  |      |
| Turn Bay Length (ft)    |      |      |     | 150  |      |     | 150  |      | 100  | 225  |      | 100  |
| Base Capacity (vph)     | 519  | 472  |     | 222  | 154  |     | 361  | 791  | 932  | 192  | 835  | 1262 |
| Starvation Cap Reductn  | 0    | 0    |     | 0    | 0    |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    |     | 0    | 0    |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    |     | 0    | 0    |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 1.01 | 0.40 |     | 0.44 | 0.85 |     | 0.18 | 0.98 | 0.08 | 0.67 | 0.61 | 0.24 |

## Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 47.0

Intersection Capacity Utilization 92.7%

Analysis Period (min) 15

Intersection LOS: D

ICU Level of Service F

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

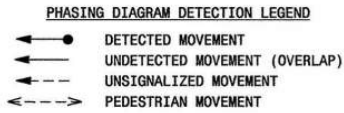
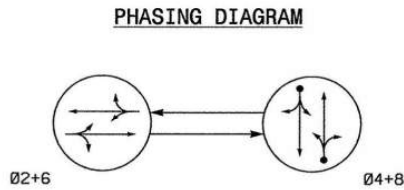
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7: N. O'Neil Street & Realigned Covered Bridge Road/Covered Bridge Rd. Ext.



## **Appendix L: Signal Plans**



| SIGNAL FACE | PHASE |       |       |
|-------------|-------|-------|-------|
|             | Ø 2+6 | Ø 4+8 | Ø 4+8 |
| 2l, 22      | G     | R     | Y     |
| 4l, 42      | R     | G     | R     |
| 6l, 62      | G     | R     | Y     |
| 8l, 82      | R     | G     | R     |

SIGNAL FACE I.D.

Denotes L.E.D.

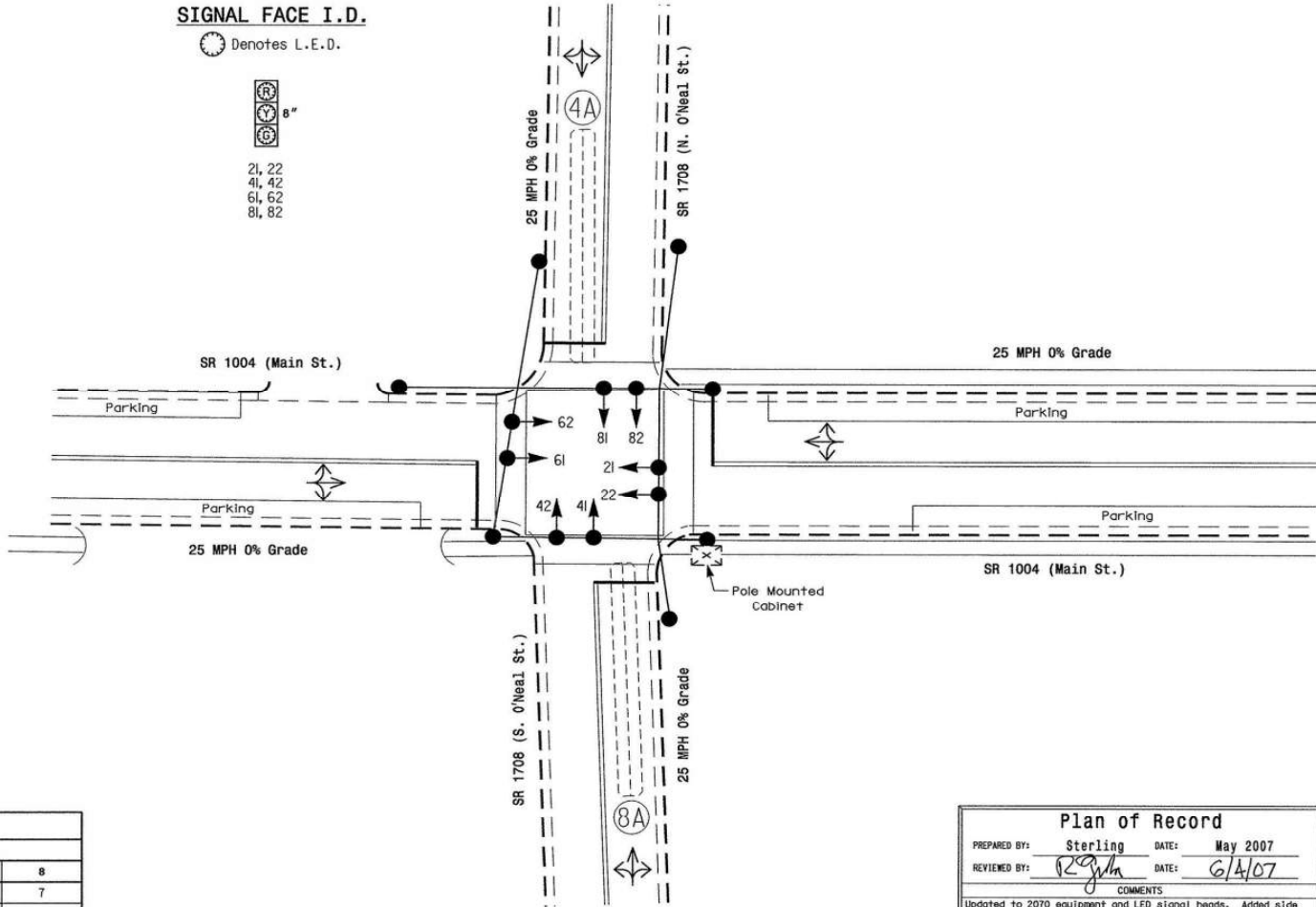
8"  
2l, 22  
4l, 42  
6l, 62  
8l, 82

| 2070L LOOP & DETECTOR INSTALLATION |           |                            |       |          |                      |         |           |                 |              |            |             |          |
|------------------------------------|-----------|----------------------------|-------|----------|----------------------|---------|-----------|-----------------|--------------|------------|-------------|----------|
| INDUCTIVE LOOPS                    |           |                            |       |          | DETECTOR PROGRAMMING |         |           |                 |              |            |             |          |
| LOOP                               | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | PHASE                | CALLING | EXTENSION | PULL TIME DELAY | STRETCH TIME | DELAY TIME | SYSTEM LOOP | NEW CARD |
| 4A                                 | 6X60      | +5                         | 2-4-2 | -        | 4                    | Y       | Y         | -               | -            | -          | -           | -        |
| 8A                                 | 6X60      | +5                         | 2-4-2 | -        | 8                    | Y       | Y         | -               | -            | -          | -           | -        |

2 Phase  
Semi-Actuated  
(Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Pavement markings are existing.



| FEATURE                 | PHASE      |     |            |     |
|-------------------------|------------|-----|------------|-----|
|                         | 2          | 4   | 6          | 8   |
| Min Green 1 *           | 10         | 7   | 10         | 7   |
| Extension 1 *           | 0.0        | 2.0 | 0.0        | 2.0 |
| Max Green 1 *           | 30         | 20  | 30         | 20  |
| Yellow Clearance        | 4.0        | 4.0 | 4.0        | 4.0 |
| Red Clearance           | 1.0        | 1.0 | 1.0        | 1.0 |
| Walk 1 *                | -          | -   | -          | -   |
| Don't Walk 1            | -          | -   | -          | -   |
| Seconds Per Actuation * | -          | -   | -          | -   |
| Max Variable Initial *  | -          | -   | -          | -   |
| Time Before Reduction * | -          | -   | -          | -   |
| Time To Reduce *        | -          | -   | -          | -   |
| Minimum Gap             | -          | -   | -          | -   |
| Recall Mode             | MAX RECALL | -   | MAX RECALL | -   |
| Vehicle Call Memory     | -          | -   | -          | -   |
| Dual Entry              | -          | ON  | -          | ON  |
| Simultaneous Gap        | ON         | ON  | ON         | ON  |

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

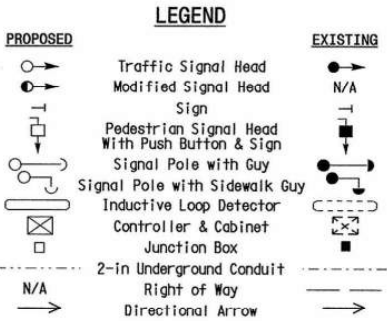
Plan of Record

PREPARED BY: Sterling DATE: May 2007

REVIEWED BY: [Signature] DATE: 6/4/07

COMMENTS: Updated to 2070 equipment and LED signal heads. Added side street loads.

This plan of record reflects existing field conditions as submitted by field personnel. This plan may have been modified from its original state.



Plan of Record

Prepared in the Office of:

122 N. McDowell St., Raleigh, NC 27603

SR 1004 (Main Street)  
at  
SR 1708 (O'Neal Street)

Division 4 Johnston County Clayton

PLAN DATE: 7-4-68 PREPARED BY: VSJ REVIEWED BY:

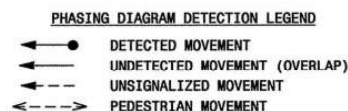
REVISIONS

| INIT. | DATE |
|-------|------|
|       |      |
|       |      |
|       |      |

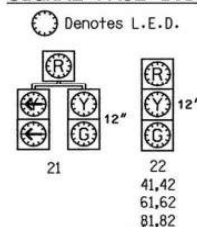
Not a certified document. This document originally issued and reviewed on 7/19/68. This document shall not be considered a certified document.

SIG. INVENTORY NO. 04-0179





SIGNAL FACE I.D.



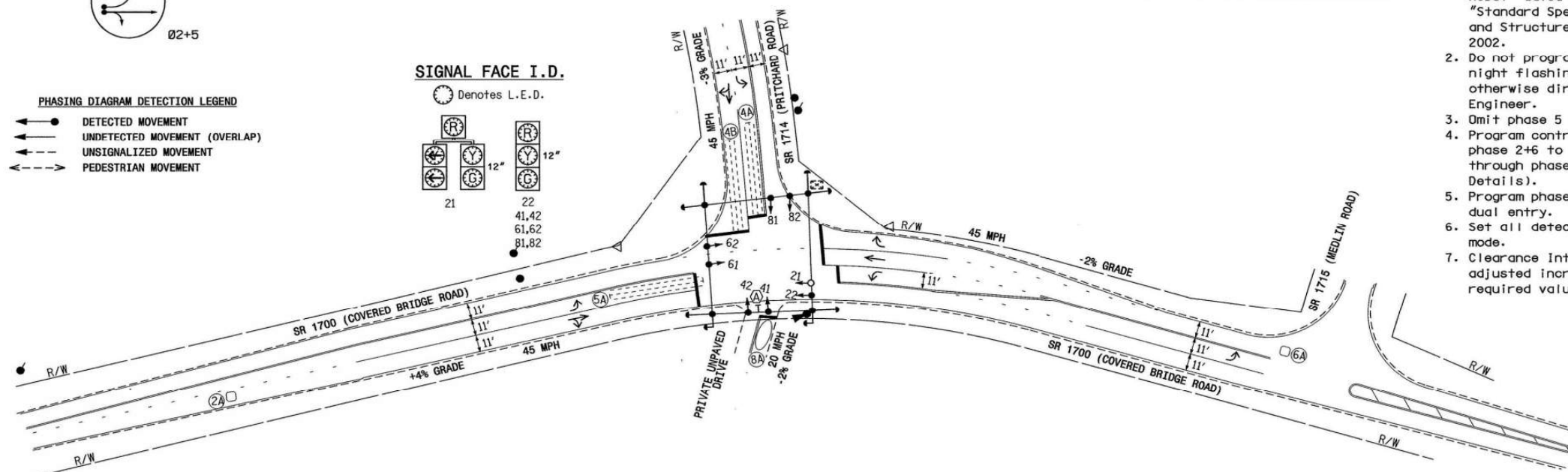
| PLAN QUANTITIES |      |
|-----------------|------|
| Pay Item        | Feet |
| Signal Cable    | 100  |
| Messenger Cable | -    |
| Lead-in Cable   | -    |

| 2070L LOOP & DETECTOR INSTALLATION |              |                                     |       |          |       |                      |           |                 |                 |               |                         |
|------------------------------------|--------------|-------------------------------------|-------|----------|-------|----------------------|-----------|-----------------|-----------------|---------------|-------------------------|
| INDUCTIVE LOOPS                    |              |                                     |       |          |       | DETECTOR PROGRAMMING |           |                 |                 |               |                         |
| LOOP                               | SIZE<br>(FT) | DISTANCE<br>FROM<br>STOPBAR<br>(FT) | TURNS | NEW LOOP | PHASE | CALLING              | EXTENSION | FULL TIME DELAY | STRETCH<br>TIME | DELAY<br>TIME | SYSTEM LOOP<br>NEW CARD |
| 2A                                 | 6X6          | 300                                 | 6     | Y        | 2     | Y                    | Y         | -               | -               | -             | -                       |
| 4A                                 | 6X60         | 0                                   | 2-4-2 | -        | 4     | Y                    | Y         | -               | -               | 3             | -                       |
| 4B                                 | 6X60         | 0                                   | 2-4-2 | -        | 4     | Y                    | Y         | -               | -               | 10            | -                       |
| 5A                                 | 6X60         | +5                                  | 2-4-2 | -        | 2     | Y                    | Y         | Y               | -               | 3             | -                       |
|                                    |              |                                     |       |          | 5     | Y                    | Y         | Y               | -               | 15            | -                       |
| 6A                                 | 6X6          | 300                                 | 5     | Y        | 6     | Y                    | Y         | -               | -               | -             | -                       |
| 8A                                 | *            | 0                                   | *     | -        | 8     | Y                    | Y         | -               | -               | 15            | -                       |

3-PHASE  
FULLY ACTUATED  
(ISOLATED)

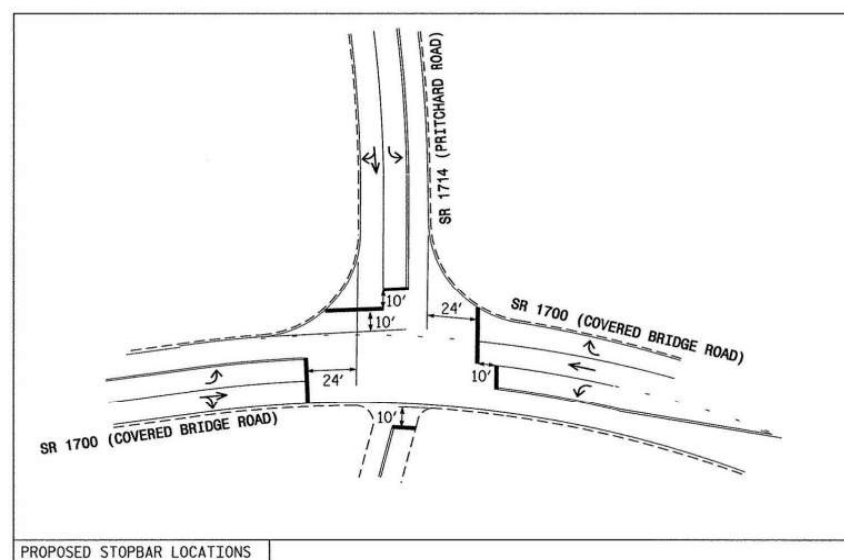
## NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2002 and "Standard Specifications for Roads and Structures" dated January 2002.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Omit phase 5 during phase 6 on.
4. Program controller to clear from phase 2+6 to phase 2+5 by progressing through phase 4+8. (see Electrical Details).
5. Program phase 4 and phase 8 for dual entry.
6. Set all detector units to presence mode.
7. Clearance Interval timings may be adjusted incrementally until required values are reached.



| 2070L TIMING CHART      |            |     |     |            |     |
|-------------------------|------------|-----|-----|------------|-----|
| FEATURE                 | PHASE      |     |     |            |     |
|                         | 2          | 4   | 5   | 6          | 8   |
| Min Green 1 *           | 12         | 7   | 7   | 12         | 7   |
| Extension 1 *           | 6          | 3   | 1   | 6          | 3   |
| Max Green 1 *           | 45         | 20  | 15  | 45         | 20  |
| Yellow Clearance        | 4.2        | 4.8 | 3.0 | 4.7        | 3.0 |
| Red Clearance           | 1.0        | 1.0 | 2.1 | 1.0        | 1.9 |
| Walk 1 *                | -          | -   | -   | -          | -   |
| Don't Walk 1            | -          | -   | -   | -          | -   |
| Seconds Per Actuation * | 2.5        | -   | -   | 2.5        | -   |
| Max Variable Initial *  | 34         | -   | -   | 34         | -   |
| Time Before Reduction * | 15         | -   | -   | 15         | -   |
| Time To Reduce *        | 30         | -   | -   | 30         | -   |
| Minimum Gap             | 3.4        | -   | -   | 3.4        | -   |
| Recall Mode             | MIN RECALL | -   | -   | MIN RECALL | -   |
| Vehicle Call Memory     | YELLOW     | -   | -   | YELLOW     | -   |
| Dual Entry              | -          | ON  | -   | -          | ON  |
| Simultaneous Gap        | ON         | ON  | ON  | ON         | ON  |

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



### LEGEND

| PROPOSED | EXISTING |
|----------|----------|
|          |          |
|          | N/A      |
|          | N/A      |
|          |          |
|          |          |
|          |          |
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|          |          |

## Signal Upgrade

| <p>Prepared in the Offices of:</p>  <p>THE STATE OF NORTH CAROLINA<br/>DEPARTMENT OF TRANSPORTATION<br/>SPECIAL AND GEOMETRIC SECTION</p> <p>122 N. McDowell St., Raleigh, NC 27603</p> | <p>SR 1700 (COVERED BRIDGE ROAD)<br/>AT<br/>SR 1714 (PRITCHARD ROAD)</p> |                                                                                                                                                                                                                                                                                                                                                                                                      | <p>SEAL</p>  |       |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                                                                                                                                                                                                                                                                              | <p>DIVISION 04      JOHNSTON COUNTY      CLAYTON</p>                     |                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                   |       |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                              | <p>PLAN DATE: November 2005</p>                                          | <p>REVIEWED BY: <i>K. S. S. 12/20/05</i></p>                                                                                                                                                                                                                                                                                                                                                         |                                                                                                   |       |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                              | <p>PREPARED BY: <u>DLOWERY/NBitting</u>      REVIEWED BY:</p>            |                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                   |       |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <p>SCALE</p> <p>0      40</p> <p>1" = 40'</p>                                                                                                                                                                                                                                |                                                                          | <p>REVISIONS</p> <table border="1"> <thead> <tr> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table> |                                                                                                   | INIT. | DATE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| INIT.                                                                                                                                                                                                                                                                        | DATE                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                   |       |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|                                                                                                                                                                                                                                                                              |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                   |       |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|                                                                                                                                                                                                                                                                              |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                   |       |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|                                                                                                                                                                                                                                                                              |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                   |       |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                         | <p>SIG. INVENTORY NO. 04-130</p>                                         |                                                                                                                                                                                                                                                                                                                                                                                                      | <p><i>Madhubalakrishnan</i> 12/20/05<br/>SIGNATURE DATE</p>                                       |       |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

**DELIVERY VIA EMAIL**

August 27, 2020

Samantha L. Wullenwaber, MPA  
Planning Director - Town of Clayton  
PO Box 879  
Clayton, NC 27528

COUNTY: Johnston

SUBJECT: **TIA Review of Proposed Ashcroft Phase 2**

Dear Ms. Wullenwaber,

Highway Division Four (Division) has reviewed the Traffic Impact Analysis (TIA) for the subject development. Please accept this letter as concurrence with the TIA and the attached TIA Review Report performed by the Congestion Management Section of the Transportation Mobility and Safety Division of NCDOT. Any comments below are in addition to the requirements that are included in the actual TIA or Traffic Impact Analysis Review. All requirements or recommendations included herein are based off current Department and Division policies. This review should not be mistaken for approval of the driveway permit, design/construction plans, final plat, site plans, or access locations. A driveway permit must be obtained prior to construction and NCDOT will approve site plan and access locations during this review. All design aspects of any submitted plans shall comply with current NCDOT Standard Specifications for Roads and Structures and Policy on Street and Driveway Access to North Carolina Highways.

**GENERAL COMMENTS**

- If the realignment of Covered Bridge Road is not completed prior to the build out of this development, then all improvements from Scenario #1 will be required. If the realignment is completed prior to the build out of this development, then all improvements from Scenario #2 will be required.
- Any roadway improvements and right-of-way (ROW) dedication necessary to accommodate the road construction shall be the responsibility of the owner/developers. All required ROW shall be dedicated as public ROW in the final plat. Installation of right turn lanes will typically require at least 15' of dedication.
- Lane Closures for required improvement construction will only be permitted under restricted hours due to heavy traffic volumes in the vicinity of the proposed development. These restrictions will be determined during the driveway permitting application and approval.

Mailing Address:  
NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS | DIV. 4 DIST. 3  
2671 US 70 WEST  
GOLDSBORO, NC 27530

Telephone: (919) 739-5300  
Fax: (919) 731-2017  
Customer Service: 1-877-368-4968  
Website: [www.ncdot.gov](http://www.ncdot.gov)

Location:  
2671 US 70 WEST  
GOLDSBORO, NC 26730

- These conditions are based on current traffic volumes and projected growth for the study area. If the proposed build out year for this development, as stated in the TIA, varies more than one year an addendum or revised TIA may be required.
- The installation of any improvements being identified by a TIA for an adjacent development does not dismiss or release this development from installation and/or participation of these improvements provided the other development does not move forward as intended. It is recommended that the Developers coordinate this installation with other committed developments. The Department will not participate in determining the value of each individual contribution to this roadway improvement.

#### **Additional Requirements**

- All driveways for this site on NCDOT ROW must be spaced 500' apart measuring the distance between the radiuses of both driveways. The updated site plan has a different driveway layout than the site plan provided for the TIA. These additional driveways will not be allowed on O'Neal street.
- Any additional improvements that are constructed by others and not shown on this TIA or review must be maintained, while constructing the improvements required by this letter. Additional improvements are required by others at the Covered Bridge Road intersections and if they are installed, they must be maintained while constructing the improvements required by this letter.
- Before the proposed signal is designed or constructed the developer will need to provide a signal warrants study showing the current traffic meets MUTCD signal warrants. No signal will be installed based on future trip generation by the proposed development. The proposed signal requirement can be included at a later phase or bonded until installed.
- All left turns installed on NCDOT ROW at will required a minimum of 150' of storage if located at a site driveway. If any left turn lane taper overlaps with any existing or proposed middle turn lane or taper, the entire section will need to be widened to three lanes.
- Driveways shown on the attached report as being right-in/right only will require channelization with a 4' concrete median and associated widening in the middle of the NCDOT roadway the driveway is accessing.

Feel free to contact me if you have any additional questions or concerns.

Sincerely,



Sam Lawhorn, PE  
District Engineer

cc: Kevin Bowen, PE - Division Engineer  
Andy Brown, PE - Division Traffic Engineer  
Jim Dunlop, PE – Congestion Management Engineer  
Travis Fluitt, P.E. – Kimley-Horn  
Driveway Permit File





STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

DEPARTMENT OF TRANSPORTATION  
TRANSPORTATION MOBILITY AND SAFETY DIVISION  
TRAFFIC MANAGEMENT UNIT  
CONGESTION MANAGEMENT SECTION

August 25, 2020

**Traffic Impact Analysis Review Report**  
**Ashcroft Phase 2**

**TIA Project:** SC-2020-140  
**Division:** 4  
**County:** Johnston  
**Description:** Ashcroft Phase 2 on S. O'Neil Street



*James H. Dunlop 25 Aug 2020*

**James H. Dunlop, P. E.**  
**Congestion Management Engineer**

**Charles Sorrell**  
**Congestion Management Project Design Engineer**

**MAILING ADDRESS:**  
1561 Mail Service Center  
Raleigh, North Carolina 27699-1561

Telephone: 919-814-5000

**LOCATION:**  
750 North Greenfield Parkway  
Garner, North Carolina 27529

Website: [WWW.NCDOT.ORG/DOH/Preconstruct/Traffic/Congestion/CM/](http://WWW.NCDOT.ORG/DOH/Preconstruct/Traffic/Congestion/CM/)



## Ashcroft Phase 2 TIA

**SC-2020-140**

**Johnston County**

Per your request, the Congestion Management Section (CMS) of the Transportation Mobility and Safety Division has completed a review of the subject site. The comments and recommendations contained in this review are based on data for background conditions presented in the sealed Traffic Impact Analysis (TIA) and are subject to the approval of the local District Engineer's Office and appropriate local authorities.

| Key Dates                                           |         |
|-----------------------------------------------------|---------|
| Initially Received by CMS                           | 8/5/20  |
| Complete Information Received by CMS                | 8/18/20 |
| Date of Preliminary Review Accepting TIA for Review | 8/25/20 |
| Sealed TIA Prepared by Kimley-Horn                  | 8/3/20  |
| Site Plan Prepared by STEWART                       | 8/3/20  |

### Proposed Development

According to the TIA, the proposed Ashcroft Phase 2 is to be located on S O'Neil Street in Johnston County. The TIA states the development is to be constructed by 2030 and is to consist of the following:

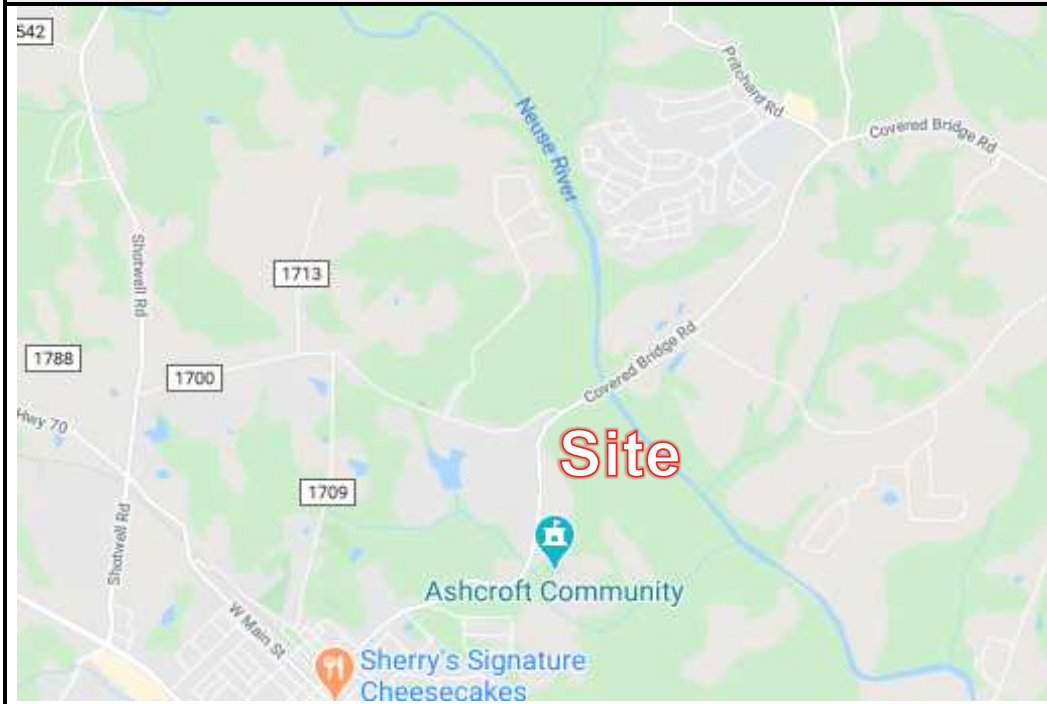
| Land Use                       | Land Use Code | Size         |
|--------------------------------|---------------|--------------|
| Single Family Detached Housing | 210           | 300 units    |
| Multifamily Housing (Low-Rise) | 220           | 300 units    |
| Multifamily Housing (Mid-Rise) | 221           | 180 units    |
| Shopping Center                | 820           | 105,000 s.f. |

| Trip Generation - Unadjusted Volumes During a Typical Weekday<br>Based on appropriate methodology outlined in the <i>ITE Trip Generation Manual, 10<sup>th</sup> Ed.</i> |     |     |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--------|
|                                                                                                                                                                          | IN  | OUT | TOTAL  |
| AM Peak Hour                                                                                                                                                             | 228 | 390 | 618    |
| PM Peak Hour                                                                                                                                                             | 601 | 489 | 1,090  |
| Daily Trips                                                                                                                                                              |     |     | 12,282 |



## Study Area

Study Area and Proposed Site Location - ↑ N



### TIP Projects in Study Area

None in Area

## TIA Comments

### The following items vary from our recommended practices:

- The Synchro files were not labeled in a clear manner and the TIA did not explain what the differences were in the files.
- Recommendation Diagram does not show the Thru movement for South Site Driveway
- The TIA did not identify all mitigation improvements to the roadway network, as required by the Driveway Manual.



## General Reference

For reference to various documents applicable to this review please reference the following links: <https://connect.ncdot.gov/resources/safety/Pages/Congestion-Management.aspx> and [https://connect.ncdot.gov/resources/safety/Teppl/Pages/Teppl-Topic.aspx?Topic\\_List=C37](https://connect.ncdot.gov/resources/safety/Teppl/Pages/Teppl-Topic.aspx?Topic_List=C37).

Once the driveway permit has been approved and issued, a copy of the final driveway permit requirements should be forwarded to this office. If we can provide further assistance, please contact the Congestion Management Section at (919) 814-5000.

## Recommendations

### Legend

- |   |                                                                              |
|---|------------------------------------------------------------------------------|
| ❶ | Improvement by Developer. Congestion Management concurs with recommendation. |
| ❷ | Improvement by Developer. Additional or modified recommendation.             |
| ❸ | Committed improvement by SteepleChase                                        |

### Improvements By Others

The analysis includes background improvements by others. If these improvements are not in place at the time of construction, the site should provide these improvements or analysis demonstrating mitigation is not necessary.

## Scenario #1

### Pritchard Road and Covered Bridge Road

No improvements are recommended for site traffic.

### S. O'Neal Street and Covered Bridge Road

- NB S. O'Neal Street
  - o 250' Left-Turn Lane ❷
- EB S. Covered Bridge Road
  - o 100' Right-Turn Lane ❷

### S. O'Neal Street and Covered Bridge Road Extension

Monitor for Signal Warrants ❶

- SB S. O'Neal Street
  - o 225' Left-Turn Lane ❶



- **NB S. O'Neal Street**
  - o 100' Right-Turn Lane ❶
- **EB Covered Bridge Road Extension**
  - o Three-lane cross-section: one ingress, two egress ❶
  - o Egress: 250' Left-Turn Lane ❷ and Right-Turn Lane ❶
  - o 250' Internal Protected Stem ❷

### **S. O'Neal Street and RIRO Driveway**

---

- **NB S. O'Neal Street**
  - o 100' Right-Turn Lane ❶
- **WB RIRO Driveway**
  - o Two-lane cross-section: one ingress, one egress ❶
  - o Egress: Right-Turn Lane ❶
  - o 100' Internal Protected Stem ❷

### **S. O'Neal Street and Steeplechase Site Driveway #2/South Site Driveway**

---

- **SB S. O'Neal Street**
  - o 100' Left-Turn Lane ❷
- **NB S. O'Neal Street**
  - o 100' Right-Turn Lane ❷
  - o 150' Left-Turn Lane ❸
- **EB Steeplechase Site Drive #2**
  - o Two-lane cross-section: one ingress, one egress ❸
  - o Egress: Left/Thru/Right-Turn Lane ❸
- **WB South Site Driveway**
  - o Three-lane cross-section: one ingress, two egress ❶
  - o Egress: 125' Left-Turn Lane and Thru/Right-Turn Lane ❶
  - o 125' Internal Protected Stem ❷

### **S. O'Neal Street and Atwood Drive**

---

No improvements are recommended for site traffic.



## **S. O'Neal Street and W Main Street**

---

- **WB W Main Street**
  - Restripe Existing Parking to Full Right-Turn Lane ②

## **Scenario #2**

### **Pritchard Road and Covered Bridge Road**

---

No improvements are recommended for site traffic.

### **S. O'Neal Street and Covered Bridge Road/ Covered Bridge Road Extension**

---

New Signal ②

- **NB S. O'Neal Street**
  - 150' Left-Turn Lane ③
  - 100' Right-Turn Lane ①
- **SB S. O'Neal Street**
  - 225' Left-Turn Lane ①
  - 100' Right-Turn Lane ③
  - Additional northbound receiving Lane, beginning at Covered Bridge Road and ending 1200' north of Covered Bridge Road with an appropriate taper. ②
- **EB Covered Bridge Road Extension**
  - Four-lane cross-section: one ingress, three egress ②
  - Egress: 150' Left-Turn Lane ①, Thru Lane ② and 100' Right-Turn Lane ②
  - 150' Internal Protected Stem ②
- **EB Covered Bridge Road**
  - Four-lane cross-section: one ingress, three egress ②
  - Egress: Dual Left-Turn Lanes (One full, one 300') ② and 150' Thru/Right-Turn Lane ③



### **S. O'Neal Street and RIRO Driveway**

---

- **NB S. O'Neal Street**
  - o 100' Right-Turn Lane ❶
- **WB RIRO Driveway**
  - o Two-lane cross-section: one ingress, one egress ❶
  - o Egress: Right-Turn Lane ❶
  - o 100' Internal Protected Stem ❷

### **S. O'Neal Street and Steeplechase Site Driveway #2/South Site Driveway**

---

- **SB S. O'Neal Street**
  - o 100' Left-Turn Lane ❷
- **NB S. O'Neal Street**
  - o 100' Right-Turn Lane ❷
  - o 150' Left-Turn Lane ❸
- **EB Steeplechase Site Drive #2**
  - o Two-lane cross-section: one ingress, one egress ❸
  - o Egress: Left/Thru/Right-Turn Lane ❸
- **WB South Site Driveway**
  - o Three-lane cross-section: one ingress, two egress ❶
  - o Egress: 125' Left-Turn Lane and Thru/Right-Turn Lane ❶
  - o 125' Internal Protected Stem ❷

### **S. O'Neal Street and Atwood Drive**

---

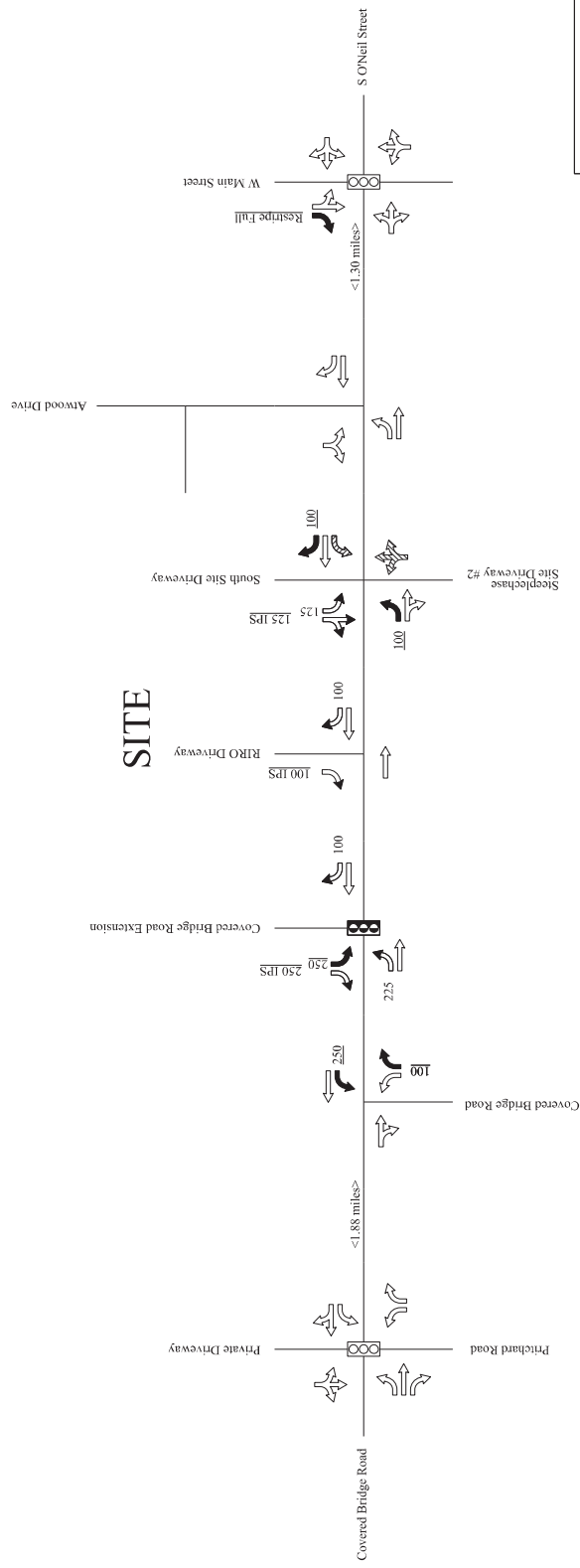
No improvements are recommended for site traffic.

### **S. O'Neal Street and W Main Street**

---

- **WB W Main Street**
  - o Restripe Existing Parking to Full Right-Turn Lane ❷

# Scenario #1

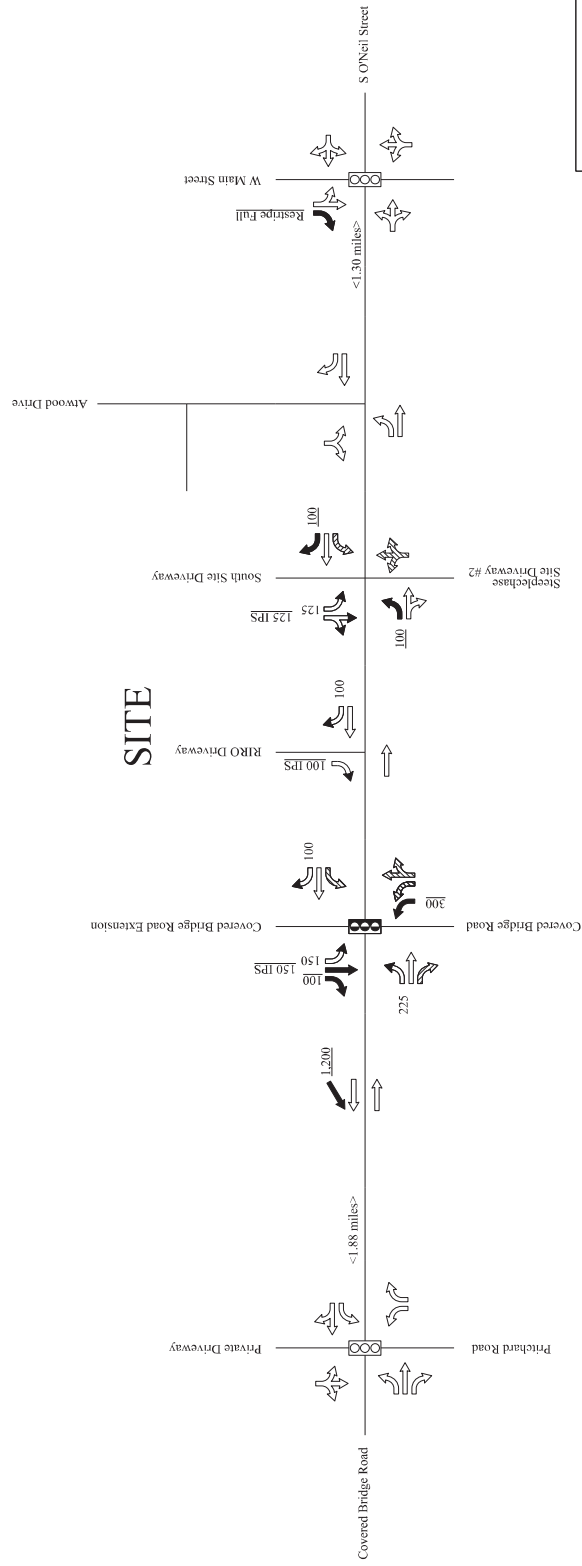


|                                 |                       |
|---------------------------------|-----------------------|
| Ashcroft Phase 2<br>SC-2020-140 |                       |
| Existing Laneage                | ←                     |
| Recommended Laneage             | →                     |
| Laneage Built By Steeplechase   | →                     |
| NCDOT Recommendation            | →                     |
| Existing Signal                 | ⊞                     |
| Monitor for Signal              | ⊞                     |
| Developer Proposed Signal       | ⊞                     |
| Storage                         | XXX                   |
| NCDOT Recommended Storage       | XXX                   |
| Distance Between Intersections  | <XXX>                 |
| IPS                             | IPS                   |
| Internal Protected Stem         | All Distances in Feet |
| Drawing Not to Scale            |                       |

Charles Sorrell 8/18/20



# Scenario #2



Ashcroft Phase 2  
SC-2020-140

|  |                                |
|--|--------------------------------|
|  | Existing Laneage               |
|  | Recommended Laneage            |
|  | Laneage Built By Steeplechase  |
|  | NCDOT Recommendation           |
|  | Existing Signal                |
|  | Monitor for Signal             |
|  | Developer Proposed Signal      |
|  | Storage                        |
|  | NCDOT Recommended Storage      |
|  | Distance Between Intersections |
|  | Internal Protected Stem        |
|  | All Distances in Feet          |
|  | Drawing Not to Scale           |

Charles Sorrell 8/18/20

# **Stormwater Impact Analysis Master Plan Submittal**

For the proposed  
**Ashcroft Section 2**  
Clayton, North Carolina

**Prepared By**  
Stewart Inc.



# STEWART

August 3, 2020  
Revised October 5, 2020

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  - a. Constructed Wetland Sizing Calculations**
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  - c. Time of Concentration Calculations**
  - d. Peak Flow Hydrographs**
- 4. Plan Sheets**
  - a. SW 1.0 – Pre-Development 1- Year Drainage Area Map**
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  - d. SW 1.3 – Post Development 2/10/25-Year Drainage Area Map**

## STORMWATER NARRATIVE

### ASHCROFT SECTION 2 CLAYTON, NORTH CAROLINA

#### Site Development History

This project represents the first disturbance onsite since the baseline date of July 6, 2012.

#### Project Description

This stormwater analysis will address the various quality and quantity control standards per the Town of Clayton requirements and proposed changes in impervious surfaces on the subject property. The project area is 256.15 acres located in the Neuse River Basin. A portion of the site is located within the WS-IV Protected Area Water Supply Watershed. The site is composed of primarily Hydrologic Soils Group 'B' soil. The subject property is currently wooded with grass open space area and a few small residential houses. The proposed project involves the construction of residential homes, townhomes, commercial and apartments. Please see Figure 1.0 below for the location of the project parcel.

**Figure 1.0** – Vicinity Map for Ashcroft Section 2



#### Quantity Measures

The proposed project includes construction of single and multi-family residential, commercial, and apartments. These improvements yield an increase of impervious surface area of 70.38 AC.

Stormwater management will be provided if the development increases peak flow rates for 1-year storm, 2-year, 10-year and 25-year storms.

Much of the water onsite flows into the stream along the north side of the property into the Neuse River Basin. We've analyzed 12 points on the 50' buffer line along the stream, see SW1.0 for pre-development drainage areas. These are denoted as 1-year analysis points. The 2/10/25-Year

analysis points were negligible for the all analysis points that outlet north into the Neuse River because the drainage area in the Neuse River is so vast. Peak flow will not be affected for 2/10/25-year storms. The analysis points consist of mostly woods and open space, there is little residential housing and driveway. A composite CN value and time of concentration was found for all 12 analysis points in pre and post development.

In order to meet peak flow requirement at each analysis point, SCMs are proposed throughout the site. The drainage areas include roof, streets, and sidewalk. These SCMs are modeled as constructed wetlands for reference in this SIA. The types of SCMs utilized and size will be determined when each individual phase is permitted. TR-55 method was used to calculate Time of Concentration for pre and post development.

Table 1.0 below summarizes the peak flows determined with Hydraflow Hydrographs. The SCS method was used in Hydraflow to populate the hydrographs. These results show peak flow rates decreasing at the analysis point throughout 1, 2, 10 and 25-year storms.

**Table 1.0** – Pre and Post Peak Flow Rates: 1, 2, 10 and 25-Year Analysis

| Sub-Basin #     | Pre-Development (cfs) | Post Development: No Detention (cfs) | Post Development: With Detention (cfs) |
|-----------------|-----------------------|--------------------------------------|----------------------------------------|
| 1 Year - AP 1   | 0.104                 | 6.49                                 | 0.103                                  |
| 1 Year - AP 2   | .135                  | 50.16                                | 0.129                                  |
| 1 Year - AP 3   | 0.343                 | 16.01                                | 0.216                                  |
| 1 Year - AP 4   | 0.099                 | 26.74                                | 0.090                                  |
| 1 Year - AP 5   | 0.360                 | 34.56                                | 0.284                                  |
| 1 Year - AP 6   | 0.096                 | 17.50                                | 0.087                                  |
| 1 Year - AP 7   | 0.069                 | 11.56                                | 0.067                                  |
| 1 Year - AP 8   | 0.135                 | 18.05                                | 0.108                                  |
| 1 Year - AP 9   | 0.804                 | 51.25                                | 0.207                                  |
| 1 Year - AP 10  | 0.225                 | 13.45                                | 0.089                                  |
| 1 Year - AP 11  | 0.335                 | 17.05                                | 0.297                                  |
| 1 Year - AP 12  | 3.499                 | 6.032                                | 0.337                                  |
| 2 Year - AP 13  | 4.418                 | 48.66                                | 2.910                                  |
| 10 Year - AP 13 | 19.96                 | 93.04                                | 9.772                                  |
| 25 Year - AP 13 | 31.66                 | 119.50                               | 29.69                                  |
| 2 Year - AP 14  | 7.901                 | 10.12                                | 1.615                                  |
| 10 Year - AP 14 | 25.75                 | 20.87                                | 4.66                                   |
| 25 Year - AP 14 | 37.64                 | 27.41                                | 14.88                                  |

### Methodology and Procedures

Drainage patterns for the subject site were based upon topographic data and imagery from a field survey, Johnston County GIS, and Google Maps. Area calculations for all drainage basins were determined using 2019 AutoCAD Civil 3D. The NRCS TR-55 Method was used to calculate runoff for the 1, 2, 10 and 25-year storm events. The TR-55 Method was used to determine time of concentrations to the various analysis points throughout the site. A minimum 5-minute time of concentration (Tc) was used where calculations yielded a shorter Tc. Composite curve numbers (CN) were calculated using curve numbers for wooded, grassed, and impervious surfaces.

### Conclusion

The proposed development plan for Ashcroft Section 2 will utilize twelve SCMs to meet onsite water quality requirements and attenuate peak flow. Post development flow rates for the 1, 2, 10 and 25-year storms are attenuated to below pre-development levels. All new impervious surfaces as reasonably practical from the site will drain to the proposed SCMs and will be designed per NCDEQ and Town of Clayton requirements.

The proposed SCMs are also being utilized to meet the requirements of the WS-IV Protected Area Water Supply Watershed. The built upon area of the development is greater than 24% and will be considered a high-density development. The SCMs will be designed and constructed so the project achieves run-off treatment. All SCMs will meet the relevant MDC requirements and outlets will be deigned to not erode from a 10-year storm event. Detailed design and calculations will be provided to show the project is meeting these requirements during the site plan review process.

Submitted 5th day of October 2020 by **STEWART**



Ashley Abbott



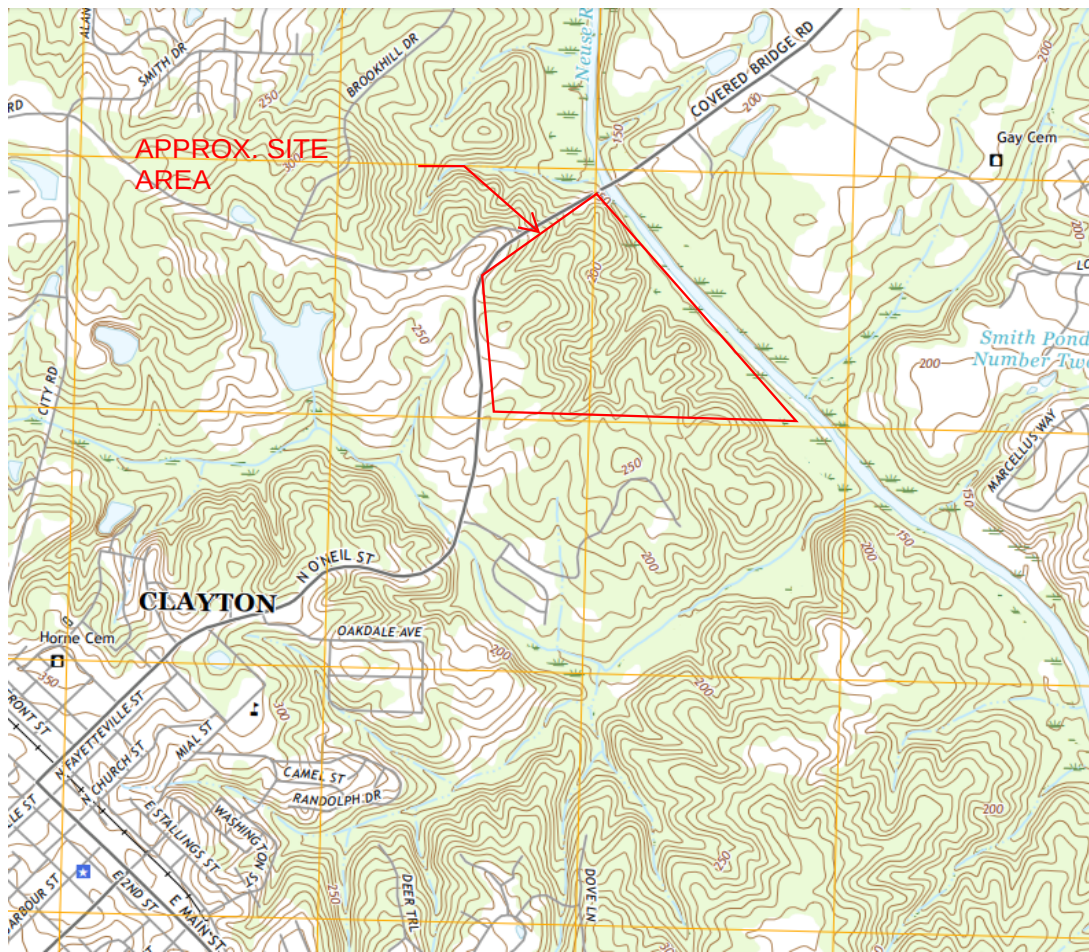
Tim Summerville, PE



## **Appendix 2**

### **Site Information**

- a. USGS 7.5 Min. Quad Map**
- b. FEMA Map**
- c. USDA Web Soil Survey Map**

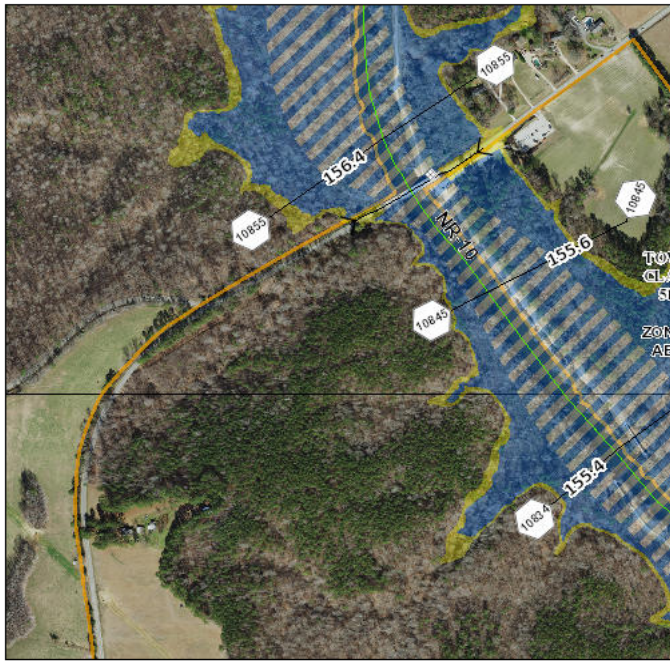






Northings: = 702.065, Easting = 2.165.390

Northings: = 702.065, Easting = 2.166.848



Northings: = 698.596, Easting = 2.165.390

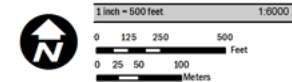
Northings: = 698.596, Easting = 2.166.848

This is an official copy of a portion of the above referenced flood map. This map incorporates changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov).

Save PDF



North Carolina State Plane Projection Feet (Zone 3200)  
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)



FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM  
FLOOD INSURANCE RATE MAP  
**NORTH CAROLINA**  
Panel(s):1760,1669

CONTAINS:

COMMUNITY CID  
TOWN OF CLAYTON 370139

Notice to User: The Map Number(s) shown below should be used when placing map orders; the Community Number(s) shown above should be used on insurance applications for the subject community.

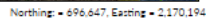
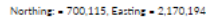
SELECTED PANELS:

MAP NUMBER EFFECTIVE DATE

3720176000K 6/20/2018

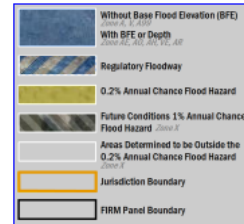
3720166900K 6/20/2018



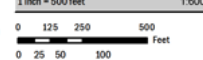


This is an official copy of a portion of the above referenced flood map. This map incorporates changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.mtc.fema.gov](http://www.mtc.fema.gov).

Save PDF



North Carolina State Plane Projection Feet (Zone 3200)  
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)



**FEMA National Flood Insurance Program**

NATIONAL FLOOD INSURANCE PROGRAM  
FLOOD INSURANCE RATE MAP

## NORTH CAROLINA

Panel(s):1760,1770,1669,1679

**CONTAINS:**

| COMMUNITY       | CID    |
|-----------------|--------|
| TOWN OF CLAYTON | 370139 |

**Notice to User:** The Map Number(s) shown below should be used when placing map orders; the Community Number(s) shown above should be used on insurance applications for the subject community.

**SELECTED PANELS:**

MAP NUMBER EFFECTIVE DATE

3720176000K 6/20/2018

3720177000K 6/20/2018

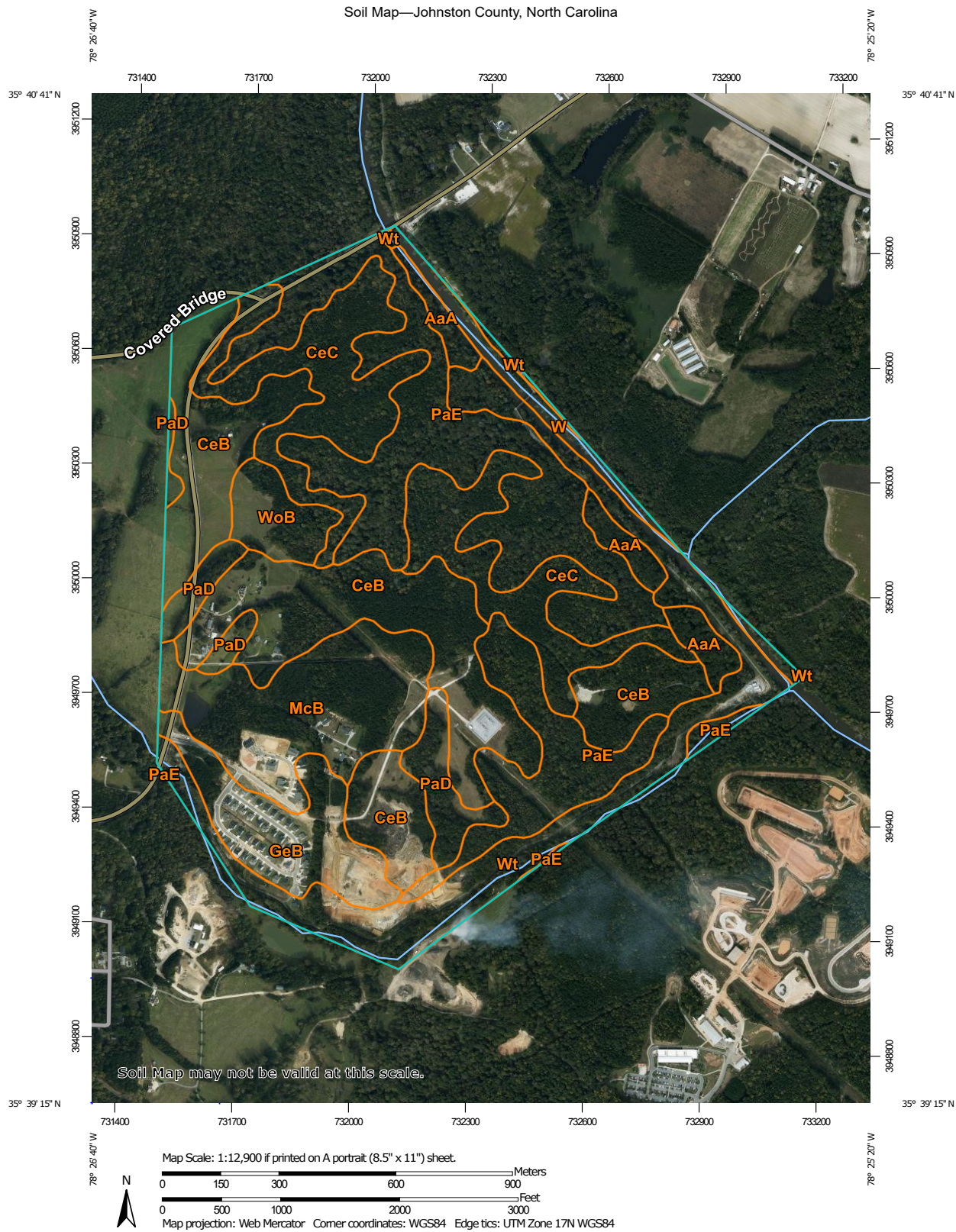
3720166900K 6/20/2018

3720167900K 6/20/2018





# Soil Map—Johnston County, North Carolina



Natural Resources  
Conservation Service

Web Soil Survey  
National Cooperative Soil Survey

7/26/2020  
Page 1 of 3

### MAP LEGEND

|                                                                                                          |  |                                                                                                         |
|----------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------|
| <b>Area of Interest (AOI)</b>                                                                            |  |  Spoil Area            |
|  Area of Interest (AOI) |  |  Stony Spot            |
| <b>Soils</b>                                                                                             |  |  Very Stony Spot       |
|  Soil Map Unit Polygons |  |  Wet Spot              |
|  Soil Map Unit Lines    |  |  Other                 |
|  Soil Map Unit Points   |  |  Special Line Features |
| <b>Special Point Features</b>                                                                            |  | <b>Water Features</b>                                                                                   |
|  Blowout                |  |  Streams and Canals    |
|  Borrow Pit             |  | <b>Transportation</b>                                                                                   |
|  Clay Spot              |  |  Rails                 |
|  Closed Depression      |  |  Interstate Highways   |
|  Gravel Pit             |  |  US Routes             |
|  Gravelly Spot          |  |  Major Roads           |
|  Landfill               |  |  Local Roads           |
|  Lava Flow              |  | <b>Background</b>                                                                                       |
|  Marsh or swamp         |  |  Aerial Photography    |
|  Mine or Quarry         |  |                                                                                                         |
|  Miscellaneous Water    |  |                                                                                                         |
|  Perennial Water        |  |                                                                                                         |
|  Rock Outcrop          |  |                                                                                                         |
|  Saline Spot          |  |                                                                                                         |
|  Sandy Spot           |  |                                                                                                         |
|  Severely Eroded Spot |  |                                                                                                         |
|  Sinkhole             |  |                                                                                                         |
|  Slide or Slip        |  |                                                                                                         |
|  Sodic Spot           |  |                                                                                                         |

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Johnston County, North Carolina  
Survey Area Data: Version 24, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 22, 2018—Oct 25, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



## Map Unit Legend

| Map Unit Symbol                    | Map Unit Name                                                          | Acres in AOI | Percent of AOI |
|------------------------------------|------------------------------------------------------------------------|--------------|----------------|
| AaA                                | Altavista fine sandy loam, 0 to 2 percent slopes, occasionally flooded | 14.1         | 2.9%           |
| CeB                                | Cecil loam, 2 to 6 percent slopes                                      | 112.1        | 23.0%          |
| CeC                                | Cecil loam, 6 to 10 percent slopes                                     | 71.2         | 14.6%          |
| GeB                                | Gilead sandy loam, 2 to 8 percent slopes                               | 29.5         | 6.0%           |
| McB                                | Marlboro-Cecil complex, 2 to 8 percent slopes                          | 49.8         | 10.2%          |
| PaD                                | Pacolet loam, 10 to 15 percent slopes                                  | 19.7         | 4.0%           |
| PaE                                | Pacolet loam, 15 to 25 percent slopes                                  | 108.7        | 22.2%          |
| W                                  | Water                                                                  | 10.5         | 2.2%           |
| WoB                                | Wedowee sandy loam, 2 to 8 percent slopes                              | 12.0         | 2.5%           |
| Wt                                 | Wehadkee loam, 0 to 2 percent slopes, frequently flooded               | 60.8         | 12.4%          |
| <b>Totals for Area of Interest</b> |                                                                        | <b>488.4</b> | <b>100.0%</b>  |

## **Appendix 3**

### **Peak Flow and Water Quality Analysis**

- a. Constructed Wetland Sizing Calculations**
- b. Composite CN Calculations**
- c. Time of Concentration Calculations**
- d. Peak Flow Hydrographs**



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 9.29.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 1

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 277,503 |
| On-site Drainage Area (sf)  | 277,503 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |               |
|-----------------------------------|---------------|
| On-site Buildings/Lots (sf)       | 6,510         |
| On-site Streets (sf)              | 36,837        |
| On-site Driveways (sf)            | 0             |
| On-site Sidewalks (sf)            | 8,684         |
| Other On-site (sf)                | 0             |
| Future (sf)                       | 0             |
| Off-site (sf)                     | 0             |
| Existing BUA* (sf)                | 0             |
| <b>Total Impervious Area (sf)</b> | <b>52,031</b> |

| Pervious Surface Area      |         |
|----------------------------|---------|
| Managed Pervious Area (sf) | 0       |
| Land Taken by BMP(sf)      | 0       |
| Forest (sf)                | 0       |
| Total Pervious Area (sf)   | 225,472 |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                | Required Storage for 1st inch of runoff |  |
|--------------------------------|----------------|-----------------------------------------|--|
| Total Drainage Area =          | 6.37 ac        | Simple Method                           |  |
| Total Impervious Area =        | 1.19 ac        | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 18.75%         | I = % impervious = 19%                  |  |
| Design Rainfall Depth =        | 1 in           | Rv = 0.22 in                            |  |
| Allowed Ponding Depth =        | 15 in          | <b>Required Volume = 5059 cf</b>        |  |
| <b>Required Surface Area =</b> | <b>4047 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 4047 SF                    |            |                            |            |
| Provided Surface Area =         |                                 | 7061 SF                    |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 706                        | 18-36"     | 706                        | 10.0%      |
| Shallow Water                   | 40%                             | 2,824                      | 3-6"       | 2,824                      | 40.0%      |
| Shallow Land                    | 40%                             | 2,824                      | 12"        | 2,824                      | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 706                        | 18-36"     | 706                        | 10.0%      |
| 7,061                           |                                 |                            |            |                            |            |





# STEWART

**Project:** Ashcroft 2  
**Project No:** L19017

**Date:** 9.29.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area: AP 1**

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 6.37 ac           | Wetland Invert = 98.00 ft         |
| Total Impervious Area = 1.19 ac         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 19%                | Next available Outlet = 101.00 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 1.00 ft           |
| $I = \% \text{ impervious} = 19\%$      | Driving Head (H/3) = 0.33 ft      |
| $R_v = 0.22 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>5059 cf</b>       |                                   |

Temporary Storage Volume = **7582 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0439 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.01578 ft <sup>2</sup>                                                 |
| 2.27284 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 1.70 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0117 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.00421 ft <sup>2</sup>                                                 |
| 0.60656 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 0.88 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 1.25 " dia</b>            |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 7582 cf                 |
| Pipe Size = 1.25 "dia            |
| Area = 0.00852 ft <sup>2</sup>   |
| Flow Rate = 0.02369 cfs          |
| <b>Drawdown Time = 3.70 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 7.31.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 2

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 895,820 |
| On-site Drainage Area (sf)  | 895,820 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |                |
|-----------------------------------|----------------|
| On-site Buildings/Lots (sf)       | 340,000        |
| On-site Streets (sf)              | 146,057        |
| On-site Driveways (sf)            | 0              |
| On-site Sidewalks (sf)            | 44,299         |
| Other On-site (sf)                | 0              |
| Future (sf)                       | 0              |
| Off-site (sf)                     | 0              |
| Existing BUA* (sf)                | 0              |
| <b>Total Impervious Area (sf)</b> | <b>530,356</b> |

| Pervious Surface Area      |         |
|----------------------------|---------|
| Managed Pervious Area (sf) | 0       |
| Land Taken by BMP(sf)      | 0       |
| Forest (sf)                | 0       |
| Total Pervious Area (sf)   | 365,464 |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                 | Required Storage for 1st inch of runoff |  |
|--------------------------------|-----------------|-----------------------------------------|--|
| Total Drainage Area =          | 20.57 ac        | Simple Method                           |  |
| Total Impervious Area =        | 12.18 ac        | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 59.20%          | I = % impervious = 59%                  |  |
| Design Rainfall Depth =        | 1 in            | Rv = 0.58 in                            |  |
| Allowed Ponding Depth =        | 15 in           | <b>Required Volume = 43509 cf</b>       |  |
| <b>Required Surface Area =</b> | <b>34807 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 34807 SF                   |            |                            |            |
| Provided Surface Area =         |                                 | 34838 SF                   |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 3,484                      | 18-36"     | 3,484                      | 10.0%      |
| Shallow Water                   | 40%                             | 13,935                     | 3-6"       | 13,935                     | 40.0%      |
| Shallow Land                    | 40%                             | 13,935                     | 12"        | 13,935                     | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 3,484                      | 18-36"     | 3,484                      | 10.0%      |
| 34,838                          |                                 |                            |            |                            |            |



# STEWART

**Project:**  
**Project No:**

Ashcroft 2  
L19017

**Date:** 7.31.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area: AP 2**

| Storage Volume Required (Simple Method)                                                  | Basin Characteristics             |
|------------------------------------------------------------------------------------------|-----------------------------------|
| Total Drainage Area = 20.57 ac                                                           | Wetland Invert = 99.00 ft         |
| Total Impervious Area = 12.18 ac                                                         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 59%                                                                 | Next available Outlet = 104.00 ft |
|                                                                                          | Storage Depth = 4.00 ft           |
|                                                                                          | Driving Head (H/3) = 1.33 ft      |
| $R_v = 0.05 + 0.009(I)$<br>$I = \% \text{ impervious} = 59\%$<br>$R_v = 0.58 \text{ in}$ |                                   |
| Runoff Vol. Req' = <b>43509 cf</b>                                                       |                                   |

Temporary Storage Volume = **36008 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.2084 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.03748 ft <sup>2</sup>                                                 |
| 5.39702 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 2.62 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.1007 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.01811 ft <sup>2</sup>                                                 |
| 2.60854 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 1.82 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 1.75 " dia</b>            |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 36008 cf                |
| Pipe Size = 1.75 "dia            |
| Area = 0.0167 ft <sup>2</sup>    |
| Flow Rate = 0.09287 cfs          |
| <b>Drawdown Time = 4.49 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 7.31.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 3

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 326,541 |
| On-site Drainage Area (sf)  | 326,541 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |                |
|-----------------------------------|----------------|
| On-site Buildings/Lots (sf)       | 100,300        |
| On-site Streets (sf)              | 47,833         |
| On-site Driveways (sf)            |                |
| On-site Sidewalks (sf)            | 15,348         |
| Other On-site (sf)                | 0              |
| Future (sf)                       | 0              |
| Off-site (sf)                     | 0              |
| Existing BUA* (sf)                | 0              |
| <b>Total Impervious Area (sf)</b> | <b>163,481</b> |

| Pervious Surface Area      |         |
|----------------------------|---------|
| Managed Pervious Area (sf) | 0       |
| Land Taken by BMP(sf)      | 0       |
| Forest (sf)                | 0       |
| Total Pervious Area (sf)   | 163,060 |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area                   | Required Storage for 1st inch of runoff |
|-----------------------------------------|-----------------------------------------|
| Total Drainage Area = 7.50 ac           | Simple Method                           |
| Total Impervious Area = 3.75 ac         | $R_v = 0.05 + 0.009(I)$                 |
| Percent Impervious = 50.06%             | $I = \% \text{ impervious} = 50\%$      |
| Design Rainfall Depth = 1 in            | $R_v = 0.50 \text{ in}$                 |
| Allowed Ponding Depth = 15 in           |                                         |
| <b>Required Surface Area = 10897 sf</b> | <b>Required Volume = 13622 cf</b>       |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 10897 SF                   |            |                            |            |
| Provided Surface Area =         |                                 | 11210 SF                   |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 1,121                      | 18-36"     | 1,121                      | 10.0%      |
| Shallow Water                   | 40%                             | 4,484                      | 3-6"       | 4,484                      | 40.0%      |
| Shallow Land                    | 40%                             | 4,484                      | 12"        | 4,484                      | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 1,121                      | 18-36"     | 1,121                      | 10.0%      |
| 11,210                          |                                 |                            |            |                            |            |



# STEWART

**Project:** Ashcroft 2  
**Project No:** L19017

**Date:** 7.31.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area: AP 3**

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 7.50 ac           | Wetland Invert = 99.00 ft         |
| Total Impervious Area = 3.75 ac         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 50%                | Next available Outlet = 101.00 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 1.00 ft           |
| $I = \% \text{ impervious} = 50\%$      | Driving Head (H/3) = 0.33 ft      |
| $R_v = 0.50 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>13622 cf</b>      |                                   |

Temporary Storage Volume = **11841 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0685 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.02465 ft <sup>2</sup>                                                 |
| 3.54955 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 2.13 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0315 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.01134 ft <sup>2</sup>                                                 |
| 1.63334 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 1.44 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 1.75 " dia</b>            |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 11841 cf                |
| Pipe Size = 1.75 "dia            |
| Area = 0.0167 ft <sup>2</sup>    |
| Flow Rate = 0.04643 cfs          |
| <b>Drawdown Time = 2.95 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 7.31.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 4

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 606,275 |
| On-site Drainage Area (sf)  | 606,275 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |                |
|-----------------------------------|----------------|
| On-site Buildings/Lots (sf)       | 200,000        |
| On-site Streets (sf)              | 56,873         |
| On-site Driveways (sf)            | 0              |
| On-site Sidewalks (sf)            | 18,526         |
| Other On-site (sf)                | 0              |
| Future (sf)                       | 0              |
| Off-site (sf)                     | 0              |
| Existing BUA* (sf)                | 0              |
| <b>Total Impervious Area (sf)</b> | <b>275,399</b> |

| Pervious Surface Area      |         |
|----------------------------|---------|
| Managed Pervious Area (sf) | 0       |
| Land Taken by BMP(sf)      | 0       |
| Forest (sf)                | 0       |
| Total Pervious Area (sf)   | 330,876 |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                 | Required Storage for 1st inch of runoff |  |
|--------------------------------|-----------------|-----------------------------------------|--|
| Total Drainage Area =          | 13.92 ac        | Simple Method                           |  |
| Total Impervious Area =        | 6.32 ac         | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 45.42%          | I = % impervious = 45%                  |  |
| Design Rainfall Depth =        | 1 in            | Rv = 0.46 in                            |  |
| Allowed Ponding Depth =        | 15 in           | <b>Required Volume = 23181 cf</b>       |  |
| <b>Required Surface Area =</b> | <b>18545 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 18545 SF                   |            |                            |            |
| Provided Surface Area =         |                                 | 18899 SF                   |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 1,890                      | 18-36"     | 1,890                      | 10.0%      |
| Shallow Water                   | 40%                             | 7,560                      | 3-6"       | 7,560                      | 40.0%      |
| Shallow Land                    | 40%                             | 7,560                      | 12"        | 7,560                      | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 1,890                      | 18-36"     | 1,890                      | 10.0%      |
| 18,899                          |                                 |                            |            |                            |            |



# STEWART

**Project:**  
**Project No:**

Ashcroft 2  
L19017

**Date:** 7.31.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area: AP 4**

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 13.92 ac          | Wetland Invert = 99.00 ft         |
| Total Impervious Area = 6.32 ac         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 45%                | Next available Outlet = 102.50 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 2.50 ft           |
| $I = \% \text{ impervious} = 45\%$      | Driving Head (H/3) = 0.83 ft      |
| $R_v = 0.46 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>23181 cf</b>      |                                   |

Temporary Storage Volume = **19747 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.1143 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.02600 ft <sup>2</sup>                                                 |
| 3.74383 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 2.18 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0537 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.01221 ft <sup>2</sup>                                                 |
| 1.75796 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 1.50 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 1.5 " dia</b>             |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 19747 cf                |
| Pipe Size = 1.5 "dia             |
| Area = 0.01227 ft <sup>2</sup>   |
| Flow Rate = 0.05394 cfs          |
| <b>Drawdown Time = 4.24 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 9.29.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 5

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 742,830 |
| On-site Drainage Area (sf)  | 742,830 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |                |
|-----------------------------------|----------------|
| On-site Buildings/Lots (sf)       | 216,300        |
| On-site Streets (sf)              | 112,661        |
| On-site Driveways (sf)            | 0              |
| On-site Sidewalks (sf)            | 36,664         |
| Other On-site (sf)                | 0              |
| Future (sf)                       | 0              |
| Off-site (sf)                     | 0              |
| Existing BUA* (sf)                | 0              |
| <b>Total Impervious Area (sf)</b> | <b>365,625</b> |

| Pervious Surface Area      |         |
|----------------------------|---------|
| Managed Pervious Area (sf) | 0       |
| Land Taken by BMP(sf)      | 0       |
| Forest (sf)                | 0       |
| Total Pervious Area (sf)   | 377,205 |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                 | Required Storage for 1st inch of runoff |  |
|--------------------------------|-----------------|-----------------------------------------|--|
| Total Drainage Area =          | 17.05 ac        | Simple Method                           |  |
| Total Impervious Area =        | 8.39 ac         | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 49.22%          | I = % impervious = 49%                  |  |
| Design Rainfall Depth =        | 1 in            | Rv = 0.49 in                            |  |
| Allowed Ponding Depth =        | 15 in           | <b>Required Volume = 30517 cf</b>       |  |
| <b>Required Surface Area =</b> | <b>24414 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 24414 SF                   |            |                            |            |
| Provided Surface Area =         |                                 | 24957 SF                   |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 2,496                      | 18-36"     | 2,496                      | 10.0%      |
| Shallow Water                   | 40%                             | 9,983                      | 3-6"       | 9,983                      | 40.0%      |
| Shallow Land                    | 40%                             | 9,983                      | 12"        | 9,983                      | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 2,496                      | 18-36"     | 2,496                      | 10.0%      |
| 24,957                          |                                 |                            |            |                            |            |





# STEWART

**Project:** Ashcroft 2  
**Project No:** L19017

**Date:** 9.29.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area: AP 5**

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 17.05 ac          | Wetland Invert = 99.00 ft         |
| Total Impervious Area = 8.39 ac         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 49%                | Next available Outlet = 101.00 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 1.00 ft           |
| $I = \% \text{ impervious} = 49\%$      | Driving Head (H/3) = 0.33 ft      |
| $R_v = 0.49 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>30517 cf</b>      |                                   |

Temporary Storage Volume = **22242 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.1287 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.04630 ft <sup>2</sup>                                                 |
| 6.66744 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 2.91 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0706 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.02541 ft <sup>2</sup>                                                 |
| 3.65921 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 2.16 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 2.25 " dia</b>            |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 22242 cf                |
| Pipe Size = 2.25 "dia            |
| Area = 0.02761 ft <sup>2</sup>   |
| Flow Rate = 0.07676 cfs          |
| <b>Drawdown Time = 3.35 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 9.29.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 6

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 358,920 |
| On-site Drainage Area (sf)  | 358,920 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |                |
|-----------------------------------|----------------|
| On-site Buildings/Lots (sf)       | 110,000        |
| On-site Streets (sf)              | 54,117         |
| On-site Driveways (sf)            | 0              |
| On-site Sidewalks (sf)            | 18,612         |
| Other On-site (sf)                | 0              |
| Future (sf)                       | 0              |
| Off-site (sf)                     | 0              |
| Existing BUA* (sf)                | 0              |
| <b>Total Impervious Area (sf)</b> | <b>182,729</b> |

| Pervious Surface Area      |         |
|----------------------------|---------|
| Managed Pervious Area (sf) | 0       |
| Land Taken by BMP(sf)      | 0       |
| Forest (sf)                | 0       |
| Total Pervious Area (sf)   | 176,191 |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                 | Required Storage for 1st inch of runoff |  |
|--------------------------------|-----------------|-----------------------------------------|--|
| Total Drainage Area =          | 8.24 ac         | Simple Method                           |  |
| Total Impervious Area =        | 4.19 ac         | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 50.91%          | I = % impervious = 51%                  |  |
| Design Rainfall Depth =        | 1 in            | Rv = 0.51 in                            |  |
| Allowed Ponding Depth =        | 15 in           | <b>Required Volume = 15200 cf</b>       |  |
| <b>Required Surface Area =</b> | <b>12160 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 12160 SF                   |            |                            |            |
| Provided Surface Area =         |                                 | 12824 SF                   |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 1,282                      | 18-36"     | 1,282                      | 10.0%      |
| Shallow Water                   | 40%                             | 5,130                      | 3-6"       | 5,130                      | 40.0%      |
| Shallow Land                    | 40%                             | 5,130                      | 12"        | 5,130                      | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 1,282                      | 18-36"     | 1,282                      | 10.0%      |
| 12,824                          |                                 |                            |            |                            |            |



# STEWART

**Project:**  
**Project No:**

Ashcroft 2  
L19017

**Date:** 9.29.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area: AP 6**

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 8.24 ac           | Wetland Invert = 99.00 ft         |
| Total Impervious Area = 4.19 ac         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 51%                | Next available Outlet = 101.00 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 1.00 ft           |
| $I = \% \text{ impervious} = 51\%$      | Driving Head (H/3) = 0.33 ft      |
| $R_v = 0.51 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>15200 cf</b>      |                                   |

Temporary Storage Volume = **6379 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0369 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.01328 ft <sup>2</sup>                                                 |
| 1.91222 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 1.56 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0352 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.01266 ft <sup>2</sup>                                                 |
| 1.82261 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 1.52 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 1.25 " dia</b>            |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 6379 cf                 |
| Pipe Size = 1.25 "dia            |
| Area = 0.00852 ft <sup>2</sup>   |
| Flow Rate = 0.02369 cfs          |
| <b>Drawdown Time = 3.12 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 9.29.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 7

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 159,917 |
| On-site Drainage Area (sf)  | 159,917 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |                |
|-----------------------------------|----------------|
| On-site Buildings/Lots (sf)       | 77,200         |
| On-site Streets (sf)              | 34,902         |
| On-site Driveways (sf)            | 0              |
| On-site Sidewalks (sf)            | 9,983          |
| Other On-site (sf)                | 0              |
| Future (sf)                       | 0              |
| Off-site (sf)                     | 0              |
| Existing BUA* (sf)                | 0              |
| <b>Total Impervious Area (sf)</b> | <b>122,085</b> |

| Pervious Surface Area           |               |
|---------------------------------|---------------|
| Managed Pervious Area (sf)      | 0             |
| Land Taken by BMP(sf)           | 0             |
| Forest (sf)                     | 0             |
| <b>Total Pervious Area (sf)</b> | <b>37,832</b> |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                | Required Storage for 1st inch of runoff |  |
|--------------------------------|----------------|-----------------------------------------|--|
| Total Drainage Area =          | 3.67 ac        | Simple Method                           |  |
| Total Impervious Area =        | 2.80 ac        | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 76.34%         | I = % impervious = 76%                  |  |
| Design Rainfall Depth =        | 1 in           | Rv = 0.74 in                            |  |
| Allowed Ponding Depth =        | 15 in          | <b>Required Volume = 9823 cf</b>        |  |
| <b>Required Surface Area =</b> | <b>7858 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 7858 SF                    |            |                            |            |
| Provided Surface Area =         |                                 | 9007 SF                    |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 901                        | 18-36"     | 901                        | 10.0%      |
| Shallow Water                   | 40%                             | 3,603                      | 3-6"       | 3,603                      | 40.0%      |
| Shallow Land                    | 40%                             | 3,603                      | 12"        | 3,603                      | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 901                        | 18-36"     | 901                        | 10.0%      |
| 9,007                           |                                 |                            |            |                            |            |



# STEWART

**Project:**  
**Project No:**

Ashcroft 2  
L19017

**Date:** 9.29.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area: AP 7**

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 3.67 ac           | Wetland Invert = 99.00 ft         |
| Total Impervious Area = 2.80 ac         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 76%                | Next available Outlet = 101.00 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 1.00 ft           |
| $I = \% \text{ impervious} = 76\%$      | Driving Head (H/3) = 0.33 ft      |
| $R_v = 0.74 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>9823 cf</b>       |                                   |

Temporary Storage Volume = **9628 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0557 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.02004 ft <sup>2</sup>                                                 |
| 2.88617 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 1.92 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0227 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.00818 ft <sup>2</sup>                                                 |
| 1.17781 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 1.22 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 1.25 " dia</b>            |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 9628 cf                 |
| Pipe Size = 1.25 "dia            |
| Area = 0.00852 ft <sup>2</sup>   |
| Flow Rate = 0.02369 cfs          |
| <b>Drawdown Time = 4.70 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 9.29.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 8

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 431,190 |
| On-site Drainage Area (sf)  | 431,190 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |                |
|-----------------------------------|----------------|
| On-site Buildings/Lots (sf)       | 111,300        |
| On-site Streets (sf)              | 58,721         |
| On-site Driveways (sf)            | 0              |
| On-site Sidewalks (sf)            | 18,866         |
| Other On-site (sf)                | 0              |
| Future (sf)                       | 0              |
| Off-site (sf)                     | 0              |
| Existing BUA* (sf)                | 0              |
| <b>Total Impervious Area (sf)</b> | <b>188,887</b> |

| Pervious Surface Area      |         |
|----------------------------|---------|
| Managed Pervious Area (sf) | 0       |
| Land Taken by BMP(sf)      | 0       |
| Forest (sf)                | 0       |
| Total Pervious Area (sf)   | 242,303 |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                 | Required Storage for 1st inch of runoff |  |
|--------------------------------|-----------------|-----------------------------------------|--|
| Total Drainage Area =          | 9.90 ac         | Simple Method                           |  |
| Total Impervious Area =        | 4.34 ac         | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 43.81%          | I = % impervious = 44%                  |  |
| Design Rainfall Depth =        | 1 in            | Rv = 0.44 in                            |  |
| Allowed Ponding Depth =        | 15 in           | <b>Required Volume = 15963 cf</b>       |  |
| <b>Required Surface Area =</b> | <b>12771 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 12771 SF                   |            |                            |            |
| Provided Surface Area =         |                                 | 15602 SF                   |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 1,560                      | 18-36"     | 1,560                      | 10.0%      |
| Shallow Water                   | 40%                             | 6,241                      | 3-6"       | 6,241                      | 40.0%      |
| Shallow Land                    | 40%                             | 6,241                      | 12"        | 6,241                      | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 1,560                      | 18-36"     | 1,560                      | 10.0%      |
| 15,602                          |                                 |                            |            |                            |            |



# STEWART

**Project:** Ashcroft 2  
**Project No:** L19017

**Date:** 9.29.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area: AP 8**

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 9.90 ac           | Wetland Invert = 98.00 ft         |
| Total Impervious Area = 4.34 ac         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 44%                | Next available Outlet = 102.00 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 2.00 ft           |
| $I = \% \text{ impervious} = 44\%$      | Driving Head (H/3) = 0.67 ft      |
| $R_v = 0.44 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>15963 cf</b>      |                                   |

Temporary Storage Volume = **16332 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0945 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.02404 ft <sup>2</sup>                                                 |
| 3.46186 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 2.10 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0370 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.00940 ft <sup>2</sup>                                                 |
| 1.35347 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 1.31 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 1.75 " dia</b>            |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 16332 cf                |
| Pipe Size = 1.75 "dia            |
| Area = 0.0167 ft <sup>2</sup>    |
| Flow Rate = 0.06567 cfs          |
| <b>Drawdown Time = 2.88 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 9.29.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 9

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 800,070 |
| On-site Drainage Area (sf)  | 800,070 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |                |
|-----------------------------------|----------------|
| On-site Buildings/Lots (sf)       | 173,975        |
| On-site Streets (sf)              | 367,653        |
| On-site Driveways (sf)            | 0              |
| On-site Sidewalks (sf)            | 9,171          |
| Other On-site (sf)                | 0              |
| Future (sf)                       | 0              |
| Off-site (sf)                     | 0              |
| Existing BUA* (sf)                | 0              |
| <b>Total Impervious Area (sf)</b> | <b>550,799</b> |

| Pervious Surface Area           |                |
|---------------------------------|----------------|
| Managed Pervious Area (sf)      | 0              |
| Land Taken by BMP(sf)           | 0              |
| Forest (sf)                     | 0              |
| <b>Total Pervious Area (sf)</b> | <b>249,271</b> |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                 | Required Storage for 1st inch of runoff |  |
|--------------------------------|-----------------|-----------------------------------------|--|
| Total Drainage Area =          | 18.37 ac        | Simple Method                           |  |
| Total Impervious Area =        | 12.64 ac        | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 68.84%          | I = % impervious = 69%                  |  |
| Design Rainfall Depth =        | 1 in            | Rv = 0.67 in                            |  |
| Allowed Ponding Depth =        | 15 in           | <b>Required Volume = 44644 cf</b>       |  |
| <b>Required Surface Area =</b> | <b>35715 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 35715 SF                   |            |                            |            |
| Provided Surface Area =         |                                 | 35848 SF                   |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 3,585                      | 18-36"     | 3,810                      | 10.6%      |
| Shallow Water                   | 40%                             | 14,339                     | 3-6"       | 15,239                     | 42.5%      |
| Shallow Land                    | 40%                             | 14,339                     | 12"        | 15,239                     | 42.5%      |
| Deep Water (non-Forebay)        | 10%                             | 3,585                      | 18-36"     | 3,810                      | 10.6%      |
| 35,848                          |                                 |                            |            |                            |            |





# STEWART

**Project:** Ashcroft 2  
**Project No:** L19017

**Date:** 9.29.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area:** AP 9

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 18.37 ac          | Wetland Invert = 99.00 ft         |
| Total Impervious Area = 12.64 ac        | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 69%                | Next available Outlet = 102.00 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 2.00 ft           |
| $I = \% \text{ impervious} = 69\%$      | Driving Head (H/3) = 0.67 ft      |
| $R_v = 0.67 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>44644 cf</b>      |                                   |

Temporary Storage Volume = **34297 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.1985 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.05049 ft <sup>2</sup>                                                 |
| 7.26986 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 3.04 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.1033 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.02629 ft <sup>2</sup>                                                 |
| 3.78520 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 2.20 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 2.25 " dia</b>            |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 34297 cf                |
| Pipe Size = 2.25 "dia            |
| Area = 0.02761 ft <sup>2</sup>   |
| Flow Rate = 0.10855 cfs          |
| <b>Drawdown Time = 3.66 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 7.31.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 10

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 380,565 |
| On-site Drainage Area (sf)  | 380,565 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |                |
|-----------------------------------|----------------|
| On-site Buildings/Lots (sf)       | 90,000         |
| On-site Streets (sf)              | 35,828         |
| On-site Driveways (sf)            | 0              |
| On-site Sidewalks (sf)            | 9,925          |
| Other On-site (sf)                | 0              |
| Future (sf)                       | 0              |
| Off-site (sf)                     | 0              |
| Existing BUA* (sf)                | 0              |
| <b>Total Impervious Area (sf)</b> | <b>135,753</b> |

| Pervious Surface Area      |         |
|----------------------------|---------|
| Managed Pervious Area (sf) | 0       |
| Land Taken by BMP(sf)      | 0       |
| Forest (sf)                | 0       |
| Total Pervious Area (sf)   | 244,812 |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                | Required Storage for 1st inch of runoff |  |
|--------------------------------|----------------|-----------------------------------------|--|
| Total Drainage Area =          | 8.74 ac        | Simple Method                           |  |
| Total Impervious Area =        | 3.12 ac        | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 35.67%         | I = % impervious = 36%                  |  |
| Design Rainfall Depth =        | 1 in           | Rv = 0.37 in                            |  |
| Allowed Ponding Depth =        | 15 in          | <b>Required Volume = 11767 cf</b>       |  |
| <b>Required Surface Area =</b> | <b>9414 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 9414 SF                    |            |                            |            |
| Provided Surface Area =         |                                 | 10490 SF                   |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 1,049                      | 18-36"     | 1,049                      | 10.0%      |
| Shallow Water                   | 40%                             | 4,196                      | 3-6"       | 4,196                      | 40.0%      |
| Shallow Land                    | 40%                             | 4,196                      | 12"        | 4,196                      | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 1,049                      | 18-36"     | 1,049                      | 10.0%      |
| 10,490                          |                                 |                            |            |                            |            |



# STEWART

**Project:** Ashcroft 2  
**Project No:** L19017

**Date:** 7.31.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area:** AP 10

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 8.74 ac           | Wetland Invert = 98.00 ft         |
| Total Impervious Area = 3.12 ac         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 36%                | Next available Outlet = 101.00 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 1.00 ft           |
| $I = \% \text{ impervious} = 36\%$      | Driving Head (H/3) = 0.33 ft      |
| $R_v = 0.37 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>11767 cf</b>      |                                   |

Temporary Storage Volume = **11089 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0642 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.02308 ft <sup>2</sup>                                                 |
| 3.32413 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 2.06 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0272 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.00980 ft <sup>2</sup>                                                 |
| 1.41097 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 1.34 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 1.5 " dia</b>             |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 11089 cf                |
| Pipe Size = 1.5 "dia             |
| Area = 0.01227 ft <sup>2</sup>   |
| Flow Rate = 0.03411 cfs          |
| <b>Drawdown Time = 3.76 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 7.31.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 11

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 370,679 |
| On-site Drainage Area (sf)  | 370,679 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |                |
|-----------------------------------|----------------|
| On-site Buildings/Lots (sf)       | 90,000         |
| On-site Streets (sf)              | 35,318         |
| On-site Driveways (sf)            | 0              |
| On-site Sidewalks (sf)            | 8,163          |
| Other On-site (sf)                | 0              |
| Future (sf)                       | 0              |
| Off-site (sf)                     | 0              |
| Existing BUA* (sf)                | 0              |
| <b>Total Impervious Area (sf)</b> | <b>133,481</b> |

| Pervious Surface Area      |         |
|----------------------------|---------|
| Managed Pervious Area (sf) | 0       |
| Land Taken by BMP(sf)      | 0       |
| Forest (sf)                | 0       |
| Total Pervious Area (sf)   | 237,198 |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                | Required Storage for 1st inch of runoff |  |
|--------------------------------|----------------|-----------------------------------------|--|
| Total Drainage Area =          | 8.51 ac        | Simple Method                           |  |
| Total Impervious Area =        | 3.06 ac        | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 36.01%         | I = % impervious = 36%                  |  |
| Design Rainfall Depth =        | 1 in           | Rv = 0.37 in                            |  |
| Allowed Ponding Depth =        | 15 in          | <b>Required Volume = 11556 cf</b>       |  |
| <b>Required Surface Area =</b> | <b>9244 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 9244 SF                    |            |                            |            |
| Provided Surface Area =         |                                 | 10732 SF                   |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 1,073                      | 18-36"     | 1,073                      | 10.0%      |
| Shallow Water                   | 40%                             | 4,293                      | 3-6"       | 4,293                      | 40.0%      |
| Shallow Land                    | 40%                             | 4,293                      | 12"        | 4,293                      | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 1,073                      | 18-36"     | 1,073                      | 10.0%      |
| 10,732                          |                                 |                            |            |                            |            |



# STEWART

**Project:** Ashcroft 2  
**Project No:** L19017

**Date:** 7.31.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area: AP 11**

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 8.51 ac           | Wetland Invert = 99.00 ft         |
| Total Impervious Area = 3.06 ac         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 36%                | Next available Outlet = 101.00 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 1.00 ft           |
| $I = \% \text{ impervious} = 36\%$      | Driving Head (H/3) = 0.33 ft      |
| $R_v = 0.37 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>11556 cf</b>      |                                   |

Temporary Storage Volume = **11397 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0660 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.02373 ft <sup>2</sup>                                                 |
| 3.41646 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 2.09 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0267 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.00962 ft <sup>2</sup>                                                 |
| 1.38560 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 1.33 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 1.5 " dia</b>             |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 11397 cf                |
| Pipe Size = 1.5 "dia             |
| Area = 0.01227 ft <sup>2</sup>   |
| Flow Rate = 0.03411 cfs          |
| <b>Drawdown Time = 3.87 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 7.31.2020  
By: ACA

Revision -

## Constructed Wetland Sizing Calculations

Input values in red

Drainage Area: AP 12

| Drainage Area               |         |
|-----------------------------|---------|
| Total Drainage Area (sf)    | 155,420 |
| On-site Drainage Area (sf)  | 155,420 |
| Off-site Drainage Area (sf) | 0       |

| Impervious Surface Area           |               |
|-----------------------------------|---------------|
| On-site Buildings/Lots (sf)       | 39,000        |
| On-site Streets (sf)              | 16,724        |
| On-site Driveways (sf)            | 0             |
| On-site Sidewalks (sf)            | 5,976         |
| Other On-site (sf)                | 0             |
| Future (sf)                       | 0             |
| Off-site (sf)                     | 0             |
| Existing BUA* (sf)                | 0             |
| <b>Total Impervious Area (sf)</b> | <b>61,700</b> |

| Pervious Surface Area           |               |
|---------------------------------|---------------|
| Managed Pervious Area (sf)      | 0             |
| Land Taken by BMP(sf)           | 0             |
| Forest (sf)                     | 0             |
| <b>Total Pervious Area (sf)</b> | <b>93,720</b> |

\* = Report only amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA

| Required Surface Area          |                | Required Storage for 1st inch of runoff |  |
|--------------------------------|----------------|-----------------------------------------|--|
| Total Drainage Area =          | 3.57 ac        | Simple Method                           |  |
| Total Impervious Area =        | 1.42 ac        | Rv = 0.05 + 0.009(I)                    |  |
| Percent Impervious =           | 39.70%         | I = % impervious = 40%                  |  |
| Design Rainfall Depth =        | 1 in           | Rv = 0.41 in                            |  |
| Allowed Ponding Depth =        | 15 in          | <b>Required Volume = 5275 cf</b>        |  |
| <b>Required Surface Area =</b> | <b>4220 sf</b> |                                         |  |

| Required Surface Area Breakdown |                                 |                            |            |                            |            |
|---------------------------------|---------------------------------|----------------------------|------------|----------------------------|------------|
| Required Storage Area =         |                                 | 4220 SF                    |            |                            |            |
| Provided Surface Area =         |                                 | 4396 SF                    |            |                            |            |
| Wetland Zone Type               | % of Total Wetland Surface Area | Surface Area Required (sf) | Zone Depth | Surface Area Provided (sf) | % of Total |
| Deep Water (Forebay)            | 10%                             | 440                        | 18-36"     | 440                        | 10.0%      |
| Shallow Water                   | 40%                             | 1,758                      | 3-6"       | 1,758                      | 40.0%      |
| Shallow Land                    | 40%                             | 1,758                      | 12"        | 1,758                      | 40.0%      |
| Deep Water (non-Forebay)        | 10%                             | 440                        | 18-36"     | 440                        | 10.0%      |
| 4,396                           |                                 |                            |            |                            |            |



# STEWART

**Project:**  
**Project No:**

Ashcroft 2  
L19017

**Date:** 7.31.2020  
**By:** ACA

**Revision -**

## Water Quality Drawdown Calculations

*Input values in red*

**Drainage Area: AP 12**

| Storage Volume Required (Simple Method) | Basin Characteristics             |
|-----------------------------------------|-----------------------------------|
| Total Drainage Area = 3.57 ac           | Wetland Invert = 99.00 ft         |
| Total Impervious Area = 1.42 ac         | Normal Pool Elevation = 100.00 ft |
| Percent Impervious = 40%                | Next available Outlet = 101.00 ft |
| $R_v = 0.05 + 0.009(I)$                 | Storage Depth = 1.00 ft           |
| $I = \% \text{ impervious} = 40\%$      | Driving Head (H/3) = 0.33 ft      |
| $R_v = 0.41 \text{ in}$                 |                                   |
| Runoff Vol. Req' = <b>5275 cf</b>       |                                   |

Temporary Storage Volume = **4784 cf**

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 2-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0277 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.00996 ft <sup>2</sup>                                                 |
| 1.43409 in <sup>2</sup>                                                     |
| Orifice Size (2 day) = 1.35 in (dia)                                        |

|                                                                             |
|-----------------------------------------------------------------------------|
| Find orifice size for 5-day drawdown time                                   |
| Flow Rate = Volume (cf) / Time (sec)                                        |
| = 0.0122 cfs                                                                |
| $Q = C_D * A * (2 * g * h)^{(1/2)}$ (Orifice Equation - solve for A (area)) |
| A = 0.00439 ft <sup>2</sup>                                                 |
| 0.63252 in <sup>2</sup>                                                     |
| Orifice Size (5 day) = 0.90 in (dia)                                        |

|                                              |
|----------------------------------------------|
| Select orifice size between 2 and 5 day size |
| <b>Size selected = 1 " dia</b>               |

|                                  |
|----------------------------------|
| Actual Drawdown Time             |
| Volume = 4784 cf                 |
| Pipe Size = 1 "dia               |
| Area = 0.00545 ft <sup>2</sup>   |
| Flow Rate = 0.01516 cfs          |
| <b>Drawdown Time = 3.65 days</b> |



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 9.29.2020  
By: AA

## Pre Development Composite CN Values - 1 Year Drainage Areas

| Pond AP 1                 |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 0.00      | assume good condition |
| Open Space                | 61     | 0.00      | assume good condition |
| Wooded                    | 55     | 1.49      | assume good condition |
| => Total Area             |        | 1.49      | ac                    |
| => Composite SCS CN Value |        | 55        |                       |

| AP 2                      |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 0.00      | assume good condition |
| Open Space                | 61     | 0.00      | assume good condition |
| Wooded                    | 55     | 1.66      | assume good condition |
| => Total Area             |        | 1.66      | ac                    |
| => Composite SCS CN Value |        | 55        |                       |

| AP 3                      |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 0.00      | assume good condition |
| Open Space                | 61     | 0.00      | assume good condition |
| Wooded                    | 55     | 4.23      | assume good condition |
| => Total Area             |        | 4.23      | ac                    |
| => Composite SCS CN Value |        | 55        |                       |

| AP 4                      |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 0.00      | assume good condition |
| Open Space                | 61     | 0.00      | assume good condition |
| Wooded                    | 55     | 0.22      | assume good condition |
| => Total Area             |        | 0.22      | ac                    |
| => Composite SCS CN Value |        | 55        |                       |

| AP 5                      |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 0.00      | assume good condition |
| Open Space                | 61     | 0.00      | assume good condition |
| Wooded                    | 55     | 5.16      | assume good condition |
| => Total Area             |        | 5.16      | ac                    |
| => Composite SCS CN Value |        | 55        |                       |

| AP 6                      |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 0.00      | assume good condition |
| Open Space                | 61     | 0.15      | assume good condition |
| Wooded                    | 55     | 0.84      | assume good condition |
| => Total Area             |        | 0.99      | ac                    |
| => Composite SCS CN Value |        | 56        |                       |

\*Assume Hyrdologic Soil Group B



| AP 7       |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 0.00      | assume good condition |
| Open Space | 61     | 0.00      | assume good condition |
| Wooded     | 55     | 0.99      | assume good condition |

=> Total Area 0.99 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 55 |
|---------------------------|----|

| AP 8       |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 0.00      | assume good condition |
| Open Space | 61     | 0.20      | assume good condition |
| Wooded     | 55     | 1.62      | assume good condition |

=> Total Area 1.82 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 56 |
|---------------------------|----|

| AP 9       |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 0.04      | assume good condition |
| Open Space | 61     | 0.49      | assume good condition |
| Wooded     | 55     | 7.75      | assume good condition |

=> Total Area 8.28 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 56 |
|---------------------------|----|

| AP 10      |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 0.00      | assume good condition |
| Open Space | 61     | 0.00      | assume good condition |
| Wooded     | 55     | 2.78      | assume good condition |

=> Total Area 2.78 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 55 |
|---------------------------|----|

| AP 11      |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 0.00      | assume good condition |
| Open Space | 61     | 0.00      | assume good condition |
| Wooded     | 55     | 5.23      | assume good condition |

=> Total Area 5.23 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 55 |
|---------------------------|----|

| AP 12      |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 0.76      | assume good condition |
| Open Space | 61     | 6.04      | assume good condition |
| Wooded     | 55     | 5.43      | assume good condition |

=> Total Area 12.23 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 61 |
|---------------------------|----|

#### Pre Development Composite CN Values - 2/10/25 Year Drainage Areas

| AP 13      |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 0.17      | assume good condition |
| Open Space | 61     | 3.44      | assume good condition |
| Wooded     | 55     | 19.17     | assume good condition |

=> Total Area 22.78 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 56 |
|---------------------------|----|

| AP 14      |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 0.76      | assume good condition |
| Open Space | 61     | 7.50      | assume good condition |
| Wooded     | 55     | 7.97      | assume good condition |

=> Total Area 16.23 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 60 |
|---------------------------|----|



# STEWART

Project: Ashcroft 2  
Project No: L20017

Date: 9.29.2020  
By: AA

## Post Development Composite CN Values - 1 Year Drainage Areas

| Pond AP 1                 |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 1.19      | assume good condition |
| Open Space                | 61     | 5.18      | assume good condition |
| Wooded                    | 55     | 0.00      | assume good condition |
| => Total Area             |        | 6.37      | ac                    |
| => Composite SCS CN Value |        | 68        |                       |

| AP 1 Bypass               |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 0.00      | assume good condition |
| Open Space                | 61     | 0.17      | assume good condition |
| Wooded                    | 55     | 0.17      | assume good condition |
| => Total Area             |        | 0.33      | ac                    |
| => Composite SCS CN Value |        | 58        |                       |

| Pond AP 2                 |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 12.18     | assume good condition |
| Open Space                | 61     | 8.39      | assume good condition |
| Wooded                    | 55     | 0.00      | assume good condition |
| => Total Area             |        | 20.57     | ac                    |
| => Composite SCS CN Value |        | 83        |                       |

| AP 2 Bypass               |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 0.00      | assume good condition |
| Open Space                | 61     | 0.00      | assume good condition |
| Wooded                    | 55     | 0.31      | assume good condition |
| => Total Area             |        | 0.31      | ac                    |
| => Composite SCS CN Value |        | 55        |                       |

| Pond AP 3                 |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 3.75      | assume good condition |
| Open Space                | 61     | 3.74      | assume good condition |
| Wooded                    | 55     | 0.00      | assume good condition |
| => Total Area             |        | 7.49      | ac                    |
| => Composite SCS CN Value |        | 80        |                       |

| AP3 Bypass                |        |           |                       |
|---------------------------|--------|-----------|-----------------------|
| Surface                   | SCS CN | Area (ac) | Comments              |
| Impervious                | 98     | 0.00      | assume good condition |
| Open Space                | 61     | 0.34      | assume good condition |
| Wooded                    | 55     | 0.00      | assume good condition |
| => Total Area             |        | 0.34      | ac                    |
| => Composite SCS CN Value |        | 61        |                       |

\*Assume Hyrdologic Soil Group B

| Pond AP 4     |        |           |                       |
|---------------|--------|-----------|-----------------------|
| Surface       | SCS CN | Area (ac) | Comments              |
| Impervious    | 98     | 6.32      | assume good condition |
| Open Space    | 61     | 7.60      | assume good condition |
| Wooded        | 55     | 0.00      | assume good condition |
| => Total Area |        | 13.92     | ac                    |

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 78 |
|---------------------------|----|

| AP 4 Bypass   |        |           |                       |
|---------------|--------|-----------|-----------------------|
| Surface       | SCS CN | Area (ac) | Comments              |
| Impervious    | 98     | 0.00      | assume good condition |
| Open Space    | 61     | 0.06      | assume good condition |
| Wooded        | 55     | 0.00      | assume good condition |
| => Total Area |        | 0.06      | ac                    |

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 61 |
|---------------------------|----|

| Pond AP 5     |        |           |                       |
|---------------|--------|-----------|-----------------------|
| Surface       | SCS CN | Area (ac) | Comments              |
| Impervious    | 98     | 8.39      | assume good condition |
| Open Space    | 61     | 8.66      | assume good condition |
| Wooded        | 55     | 0.00      | assume good condition |
| => Total Area |        | 17.05     | ac                    |

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 79 |
|---------------------------|----|

| AP 5 Bypass   |        |           |                       |
|---------------|--------|-----------|-----------------------|
| Surface       | SCS CN | Area (ac) | Comments              |
| Impervious    | 98     | 0.00      | assume good condition |
| Open Space    | 61     | 0.34      | assume good condition |
| Wooded        | 55     | 0.34      | assume good condition |
| => Total Area |        | 0.67      | ac                    |

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 58 |
|---------------------------|----|

| Pond AP 6     |        |           |                       |
|---------------|--------|-----------|-----------------------|
| Surface       | SCS CN | Area (ac) | Comments              |
| Impervious    | 98     | 4.19      | assume good condition |
| Open Space    | 61     | 4.04      | assume good condition |
| Wooded        | 55     | 0.00      | assume good condition |
| => Total Area |        | 8.23      | ac                    |

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 80 |
|---------------------------|----|

| AP 6 Bypass   |        |           |                       |
|---------------|--------|-----------|-----------------------|
| Surface       | SCS CN | Area (ac) | Comments              |
| Impervious    | 98     | 0.00      | assume good condition |
| Open Space    | 61     | 0.10      | assume good condition |
| Wooded        | 55     | 0.10      | assume good condition |
| => Total Area |        | 0.20      | ac                    |

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 58 |
|---------------------------|----|

| Pond AP 7     |        |           |                       |
|---------------|--------|-----------|-----------------------|
| Surface       | SCS CN | Area (ac) | Comments              |
| Impervious    | 98     | 2.80      | assume good condition |
| Open Space    | 61     | 0.87      | assume good condition |
| Wooded        | 55     | 0.00      | assume good condition |
| => Total Area |        | 3.67      | ac                    |

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 89 |
|---------------------------|----|

| AP 7 Bypass   |        |           |                       |
|---------------|--------|-----------|-----------------------|
| Surface       | SCS CN | Area (ac) | Comments              |
| Impervious    | 98     | 0.00      | assume good condition |
| Open Space    | 61     | 0.00      | assume good condition |
| Wooded        | 55     | 0.20      | assume good condition |
| => Total Area |        | 0.20      | ac                    |

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 55 |
|---------------------------|----|

\*Assume Hyrdologic Soild Group B

| Pond AP 8  |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 4.34      | assume good condition |
| Open Space | 61     | 5.56      | assume good condition |
| Wooded     | 55     | 0.00      | assume good condition |

=> Total Area 9.90 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 77 |
|---------------------------|----|

| AP 8 Bypass |        |           |                       |
|-------------|--------|-----------|-----------------------|
| Surface     | SCS CN | Area (ac) | Comments              |
| Impervious  | 98     | 0.00      | assume good condition |
| Open Space  | 61     | 0.02      | assume good condition |
| Wooded      | 55     | 0.02      | assume good condition |

=> Total Area 0.04 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 58 |
|---------------------------|----|

| Pond AP 9  |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 12.64     | assume good condition |
| Open Space | 61     | 5.72      | assume good condition |
| Wooded     | 55     | 0.00      | assume good condition |

=> Total Area 18.36 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 86 |
|---------------------------|----|

| AP 9 Bypass |        |           |                       |
|-------------|--------|-----------|-----------------------|
| Surface     | SCS CN | Area (ac) | Comments              |
| Impervious  | 98     | 0.00      | assume good condition |
| Open Space  | 61     | 0.13      | assume good condition |
| Wooded      | 55     | 0.00      | assume good condition |

=> Total Area 0.13 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 61 |
|---------------------------|----|

| Pond AP 10 |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 3.12      | assume good condition |
| Open Space | 61     | 5.62      | assume good condition |
| Wooded     | 55     | 0.00      | assume good condition |

=> Total Area 8.74 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 74 |
|---------------------------|----|

| AP 10 Bypass |        |           |                       |
|--------------|--------|-----------|-----------------------|
| Surface      | SCS CN | Area (ac) | Comments              |
| Impervious   | 98     | 0.00      | assume good condition |
| Open Space   | 61     | 0.04      | assume good condition |
| Wooded       | 55     | 0.00      | assume good condition |

=> Total Area 0.04 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 61 |
|---------------------------|----|

| Pond AP 11 |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 3.06      | assume good condition |
| Open Space | 61     | 13.71     | assume good condition |
| Wooded     | 55     | 0.00      | assume good condition |

=> Total Area 16.77 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 68 |
|---------------------------|----|

| AP 11 Bypass |        |           |                       |
|--------------|--------|-----------|-----------------------|
| Surface      | SCS CN | Area (ac) | Comments              |
| Impervious   | 98     | 0.00      | assume good condition |
| Open Space   | 61     | 0.62      | assume good condition |
| Wooded       | 55     | 1.00      | assume good condition |

=> Total Area 1.62 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 57 |
|---------------------------|----|

\*Assume Hyrdologic Soil Group B

| Pond AP 12 |        |           |                       |
|------------|--------|-----------|-----------------------|
| Surface    | SCS CN | Area (ac) | Comments              |
| Impervious | 98     | 1.41      | assume good condition |
| Open Space | 61     | 1.76      | assume good condition |
| Wooded     | 55     | 0.00      | assume good condition |

=> Total Area 3.17 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 77 |
|---------------------------|----|

| AP 12 Bypass |        |           |                       |
|--------------|--------|-----------|-----------------------|
| Surface      | SCS CN | Area (ac) | Comments              |
| Impervious   | 98     | 0.00      | assume good condition |
| Open Space   | 61     | 0.79      | assume good condition |
| Wooded       | 55     | 0.00      | assume good condition |

=> Total Area 0.79 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 61 |
|---------------------------|----|

#### Post Development Composite CN Values - 2/10/25 Year Drainage Areas

| AP 13 Bypass |        |           |                       |
|--------------|--------|-----------|-----------------------|
| Surface      | SCS CN | Area (ac) | Comments              |
| Impervious   | 98     | 0.00      | assume good condition |
| Open Space   | 61     | 3.32      | assume good condition |
| Wooded       | 55     | 2.21      | assume good condition |

=> Total Area 5.53 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 59 |
|---------------------------|----|

| AP 14 Bypass |        |           |                       |
|--------------|--------|-----------|-----------------------|
| Surface      | SCS CN | Area (ac) | Comments              |
| Impervious   | 98     | 0.00      | assume good condition |
| Open Space   | 61     | 2.35      | assume good condition |
| Wooded       | 55     | 0.00      | assume good condition |

=> Total Area 2.35 ac

|                           |    |
|---------------------------|----|
| => Composite SCS CN Value | 61 |
|---------------------------|----|

\*Assume Hyrdologic Soil Group B



STEWART

# TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

## Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 1 Year - Analysis Point 1 |  |  |  |  |  |  |  |  |  |  |          |
|-------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                         |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                       |  |  |  |  |  |  |  |  |  |  |          |
| 75                                        |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.026                                     |  |  |  |  |  |  |  |  |  |  |          |
| 0.245                                     |  |  |  |  |  |  |  |  |  |  | 0.245    |

## Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |         |         |  |  |  |  |  |  |  |       |
|---------|---------|---------|---------|--|--|--|--|--|--|--|-------|
| 2       | 3       | 4       | 5       |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved | Unpaved | Unpaved |  |  |  |  |  |  |  |       |
| 116     | 231     | 101     | 108     |  |  |  |  |  |  |  |       |
| 0.043   | 0.099   | 0.099   | 0.17    |  |  |  |  |  |  |  |       |
| 3.3     | 5.5     | 5.5     | 6.2     |  |  |  |  |  |  |  |       |
| 0.010   | 0.012   | 0.005   | 0.005   |  |  |  |  |  |  |  | 0.031 |

## Channel Flow

- 12 Cross Sectional flow area, a in ft^2
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.276 |
|  |  |  |  |  |  |  |  |  |  |  | 16.6  |



STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- Segment ID 1
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Post Development 1 Year - Analysis Point 1 Bypass |              |  |  |  |  |  |  |  |  |  |          |
|---------------------------------------------------|--------------|--|--|--|--|--|--|--|--|--|----------|
| 1                                                 | Woods, Light |  |  |  |  |  |  |  |  |  | Subtotal |
| 2                                                 | 0.4          |  |  |  |  |  |  |  |  |  |          |
| 3                                                 | 75           |  |  |  |  |  |  |  |  |  |          |
| 4                                                 | 3.5          |  |  |  |  |  |  |  |  |  |          |
| 5                                                 | 0.100        |  |  |  |  |  |  |  |  |  |          |
| 6                                                 | 0.143        |  |  |  |  |  |  |  |  |  | 0.143    |

### Shallow Concentrated Flow

- Segment ID 2
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|    |         |  |  |  |  |  |  |  |  |  |       |
|----|---------|--|--|--|--|--|--|--|--|--|-------|
| 2  | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 8  | 104     |  |  |  |  |  |  |  |  |  |       |
| 9  | 0.19    |  |  |  |  |  |  |  |  |  |       |
| 10 | 7       |  |  |  |  |  |  |  |  |  |       |
| 11 | 0.004   |  |  |  |  |  |  |  |  |  | 0.004 |

### Channel Flow

- Segment ID
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.147 |
|  |  |  |  |  |  |  |  |  |  |  | 8.8   |

Post-AP 1 Bypass

L:\Projects\2020\L20017 - Ashcroft 2\CALCS AND DATA\Stormwater\Spreadsheets\L20017\_ Time of Concentration.xls



STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 1 Year - Analysis Point 2 |  |  |  |  |  |  |  |  |  |  |          |
|-------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                         |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                       |  |  |  |  |  |  |  |  |  |  |          |
| 75                                        |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.053                                     |  |  |  |  |  |  |  |  |  |  |          |
| 0.184                                     |  |  |  |  |  |  |  |  |  |  | 0.184    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |         |  |  |  |  |  |  |  |  |       |
|---------|---------|---------|--|--|--|--|--|--|--|--|-------|
| 2       | 3       | 4       |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved | Unpaved |  |  |  |  |  |  |  |  |       |
| 242     | 246     | 176     |  |  |  |  |  |  |  |  |       |
| 0.066   | 0.101   | 0.142   |  |  |  |  |  |  |  |  |       |
| 4       | 5.1     | 6.1     |  |  |  |  |  |  |  |  |       |
| 0.017   | 0.013   | 0.008   |  |  |  |  |  |  |  |  | 0.038 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.222 |
|  |  |  |  |  |  |  |  |  |  |  | 13.3  |





STEWART

# TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

## Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Post Development 1 Year - Analysis Point 2 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|---------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                 |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                      |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                               |  |  |  |  |  |  |  |  |  |  |          |
| 75                                                |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                               |  |  |  |  |  |  |  |  |  |  |          |
| 0.080                                             |  |  |  |  |  |  |  |  |  |  |          |
| 0.156                                             |  |  |  |  |  |  |  |  |  |  | 0.156    |

## Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |  |  |  |  |  |  |  |  |  |       |
|---------|---------|--|--|--|--|--|--|--|--|--|-------|
| 2       | 3       |  |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 61      | 151     |  |  |  |  |  |  |  |  |  |       |
| 0.082   | 0.166   |  |  |  |  |  |  |  |  |  |       |
| 4.2     | 6.3     |  |  |  |  |  |  |  |  |  |       |
| 0.004   | 0.007   |  |  |  |  |  |  |  |  |  | 0.011 |

## Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.167 |
|  |  |  |  |  |  |  |  |  |  |  | 10.0  |

Post-AP 2 Bypass

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STEWART

# TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

## Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 1 Year - Analysis Point 3 |  |  |  |  |  |  |  |  |  |  |          |
|-------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                         |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                       |  |  |  |  |  |  |  |  |  |  |          |
| 75                                        |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.080                                     |  |  |  |  |  |  |  |  |  |  |          |
| 0.156                                     |  |  |  |  |  |  |  |  |  |  | 0.156    |

## Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |  |  |  |  |  |  |  |  |  |       |
|---------|---------|--|--|--|--|--|--|--|--|--|-------|
| 2       | 3       |  |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 309     | 446     |  |  |  |  |  |  |  |  |  |       |
| 0.11    | 0.063   |  |  |  |  |  |  |  |  |  |       |
| 5.8     | 4.2     |  |  |  |  |  |  |  |  |  |       |
| 0.015   | 0.029   |  |  |  |  |  |  |  |  |  | 0.044 |

## Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|       |       |  |  |  |  |  |  |  |  |  |       |
|-------|-------|--|--|--|--|--|--|--|--|--|-------|
| 4     | 5     |  |  |  |  |  |  |  |  |  |       |
| 32.50 | 37.50 |  |  |  |  |  |  |  |  |  |       |
| 44.09 | 61.04 |  |  |  |  |  |  |  |  |  |       |
| 0.74  | 0.61  |  |  |  |  |  |  |  |  |  |       |
| 0.089 | 0.069 |  |  |  |  |  |  |  |  |  |       |
| 0.015 | 0.015 |  |  |  |  |  |  |  |  |  |       |
| 24.18 | 18.85 |  |  |  |  |  |  |  |  |  |       |
| 236   | 144   |  |  |  |  |  |  |  |  |  |       |
| 0.003 | 0.002 |  |  |  |  |  |  |  |  |  | 0.005 |
|       |       |  |  |  |  |  |  |  |  |  | 0.205 |
|       |       |  |  |  |  |  |  |  |  |  | 12.3  |



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## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Post Development 1 Year - Analysis Point 3 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|---------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                 |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                      |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                               |  |  |  |  |  |  |  |  |  |  |          |
| 75                                                |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                               |  |  |  |  |  |  |  |  |  |  |          |
| 0.133                                             |  |  |  |  |  |  |  |  |  |  |          |
| 0.127                                             |  |  |  |  |  |  |  |  |  |  | 0.127    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |  |  |  |  |  |  |  |  |  |  |       |
|---------|--|--|--|--|--|--|--|--|--|--|-------|
| 2       |  |  |  |  |  |  |  |  |  |  |       |
| Unpaved |  |  |  |  |  |  |  |  |  |  |       |
| 54      |  |  |  |  |  |  |  |  |  |  |       |
| 0.277   |  |  |  |  |  |  |  |  |  |  |       |
| 9       |  |  |  |  |  |  |  |  |  |  |       |
| 0.002   |  |  |  |  |  |  |  |  |  |  | 0.002 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.129 |
|  |  |  |  |  |  |  |  |  |  |  | 7.7   |

Post-AP 3 Bypass

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STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 1 Year - Analysis Point 4 |  |  |  |  |  |  |  |  |  |  |          |
|-------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                         |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                       |  |  |  |  |  |  |  |  |  |  |          |
| 75                                        |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.066                                     |  |  |  |  |  |  |  |  |  |  |          |
| 0.169                                     |  |  |  |  |  |  |  |  |  |  | 0.169    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |  |  |  |  |  |  |  |  |  |       |
|---------|---------|--|--|--|--|--|--|--|--|--|-------|
| 2       | 3       |  |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 52      | 88      |  |  |  |  |  |  |  |  |  |       |
| 0.096   | 0.375   |  |  |  |  |  |  |  |  |  |       |
| 3.6     | 10      |  |  |  |  |  |  |  |  |  |       |
| 0.004   | 0.002   |  |  |  |  |  |  |  |  |  | 0.006 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.175 |
|  |  |  |  |  |  |  |  |  |  |  | 10.5  |



STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- Segment ID
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Post Development 1 Year - Analysis Point 4 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|---------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                 |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                      |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                               |  |  |  |  |  |  |  |  |  |  |          |
| 42                                                |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                               |  |  |  |  |  |  |  |  |  |  |          |
| 0.476                                             |  |  |  |  |  |  |  |  |  |  |          |
| 0.048                                             |  |  |  |  |  |  |  |  |  |  | 0.048    |

### Shallow Concentrated Flow

- Segment ID
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |

### Channel Flow

- Segment ID
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.048 |
|  |  |  |  |  |  |  |  |  |  |  | 2.9   |

Post-AP 4 Bypass

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STEWART

# TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

## Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 1 Year - Analysis Point 5 |  |  |  |  |  |  |  |  |  |  |          |
|-------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                         |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                       |  |  |  |  |  |  |  |  |  |  |          |
| 75                                        |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.033                                     |  |  |  |  |  |  |  |  |  |  |          |
| 0.223                                     |  |  |  |  |  |  |  |  |  |  | 0.223    |

## Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |  |  |  |  |  |  |  |  |  |  |       |
|---------|--|--|--|--|--|--|--|--|--|--|-------|
| 2       |  |  |  |  |  |  |  |  |  |  |       |
| Unpaved |  |  |  |  |  |  |  |  |  |  |       |
| 307     |  |  |  |  |  |  |  |  |  |  |       |
| 0.039   |  |  |  |  |  |  |  |  |  |  |       |
| 3.2     |  |  |  |  |  |  |  |  |  |  |       |
| 0.027   |  |  |  |  |  |  |  |  |  |  | 0.027 |

## Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|       |       |       |  |  |  |  |  |  |  |  |       |
|-------|-------|-------|--|--|--|--|--|--|--|--|-------|
| 3     | 4     | 5     |  |  |  |  |  |  |  |  |       |
| 28.00 | 21.50 | 25.50 |  |  |  |  |  |  |  |  |       |
| 46.05 | 32.09 | 40.06 |  |  |  |  |  |  |  |  |       |
| 0.61  | 0.67  | 0.64  |  |  |  |  |  |  |  |  |       |
| 0.076 | 0.128 | 0.134 |  |  |  |  |  |  |  |  |       |
| 0.015 | 0.015 | 0.015 |  |  |  |  |  |  |  |  |       |
| 19.65 | 27.21 | 26.90 |  |  |  |  |  |  |  |  |       |
| 183   | 210   | 186   |  |  |  |  |  |  |  |  |       |
| 0.003 | 0.002 | 0.002 |  |  |  |  |  |  |  |  | 0.007 |
|       |       |       |  |  |  |  |  |  |  |  | 0.256 |
|       |       |       |  |  |  |  |  |  |  |  | 15.3  |



STEWART

## TR 55 Time of Concentration Worksheet

**Project** Ashcroft 2  
**Location** Clayton, NC

**Calculated By**  
**Checked By**

**Date** 9/29/2020  
**Revised**

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Post Development 1 Year - Analysis Point 5 Bypass |  |  |  |  |  |  |  |  |  |  |  |          |
|---------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                 |  |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                      |  |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                               |  |  |  |  |  |  |  |  |  |  |  |          |
| 75                                                |  |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                               |  |  |  |  |  |  |  |  |  |  |  |          |
| 0.120                                             |  |  |  |  |  |  |  |  |  |  |  |          |
| 0.133                                             |  |  |  |  |  |  |  |  |  |  |  | 0.133    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |  |  |  |  |  |  |  |  |  |  |  |       |
|---------|--|--|--|--|--|--|--|--|--|--|--|-------|
| 2       |  |  |  |  |  |  |  |  |  |  |  |       |
| Unpaved |  |  |  |  |  |  |  |  |  |  |  |       |
| 58      |  |  |  |  |  |  |  |  |  |  |  |       |
| 0.31    |  |  |  |  |  |  |  |  |  |  |  |       |
| 7.5     |  |  |  |  |  |  |  |  |  |  |  |       |
| 0.002   |  |  |  |  |  |  |  |  |  |  |  | 0.002 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|       |  |  |  |  |  |  |  |  |  |  |  |       |
|-------|--|--|--|--|--|--|--|--|--|--|--|-------|
| 3     |  |  |  |  |  |  |  |  |  |  |  |       |
| 6.50  |  |  |  |  |  |  |  |  |  |  |  |       |
| 8.61  |  |  |  |  |  |  |  |  |  |  |  |       |
| 0.75  |  |  |  |  |  |  |  |  |  |  |  |       |
| 0.100 |  |  |  |  |  |  |  |  |  |  |  |       |
| 0.015 |  |  |  |  |  |  |  |  |  |  |  |       |
| 26.04 |  |  |  |  |  |  |  |  |  |  |  |       |
| 50    |  |  |  |  |  |  |  |  |  |  |  |       |
| 0.001 |  |  |  |  |  |  |  |  |  |  |  | 0.001 |
|       |  |  |  |  |  |  |  |  |  |  |  | 0.135 |
|       |  |  |  |  |  |  |  |  |  |  |  | 8.1   |

Post-AP 5 Bypass

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STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 1 Year - Analysis Point 6 |  |  |  |  |  |  |  |  |  |  |          |
|-------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                         |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                       |  |  |  |  |  |  |  |  |  |  |          |
| 75                                        |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.033                                     |  |  |  |  |  |  |  |  |  |  |          |
| 0.223                                     |  |  |  |  |  |  |  |  |  |  | 0.223    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |  |  |  |  |  |  |  |  |  |       |
|---------|---------|--|--|--|--|--|--|--|--|--|-------|
| 2       | 3       |  |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 222     | 168     |  |  |  |  |  |  |  |  |  |       |
| 0.041   | 0.071   |  |  |  |  |  |  |  |  |  |       |
| 3.2     | 4.2     |  |  |  |  |  |  |  |  |  |       |
| 0.019   | 0.011   |  |  |  |  |  |  |  |  |  | 0.030 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.253 |
|  |  |  |  |  |  |  |  |  |  |  | 15.2  |





STEWART

## TR 55 Time of Concentration Worksheet

**Project** Ashcroft 2  
**Location** Clayton, NC

**Calculated By**  
**Checked By**

**Date** 9/29/2020  
**Revised**

### Sheet Flow

- Segment ID
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Post Development 1 Year - Analysis Point 6 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|---------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                 |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                      |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                               |  |  |  |  |  |  |  |  |  |  |          |
| 75                                                |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                               |  |  |  |  |  |  |  |  |  |  |          |
| 0.106                                             |  |  |  |  |  |  |  |  |  |  |          |
| 0.140                                             |  |  |  |  |  |  |  |  |  |  | 0.140    |

### Shallow Concentrated Flow

- Segment ID
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|         |  |  |  |  |  |  |  |  |  |  |       |
|---------|--|--|--|--|--|--|--|--|--|--|-------|
| 2       |  |  |  |  |  |  |  |  |  |  |       |
| Unpaved |  |  |  |  |  |  |  |  |  |  |       |
| 17      |  |  |  |  |  |  |  |  |  |  |       |
| 0.118   |  |  |  |  |  |  |  |  |  |  |       |
| 5.8     |  |  |  |  |  |  |  |  |  |  |       |
| 0.001   |  |  |  |  |  |  |  |  |  |  | 0.001 |

### Channel Flow

- Segment ID
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.140 |
|  |  |  |  |  |  |  |  |  |  |  | 8.4   |

Post-AP 6 Bypass

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STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 1 Year - Analysis Point 7 |  |  |  |  |  |  |  |  |  |  |          |
|-------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                         |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                       |  |  |  |  |  |  |  |  |  |  |          |
| 75                                        |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.040                                     |  |  |  |  |  |  |  |  |  |  |          |
| 0.206                                     |  |  |  |  |  |  |  |  |  |  | 0.206    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |  |  |  |  |  |  |  |  |  |       |
|---------|---------|--|--|--|--|--|--|--|--|--|-------|
| 2       | 3       |  |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 130     | 250     |  |  |  |  |  |  |  |  |  |       |
| 0.054   | 0.116   |  |  |  |  |  |  |  |  |  |       |
| 3.7     | 5.8     |  |  |  |  |  |  |  |  |  |       |
| 0.010   | 0.012   |  |  |  |  |  |  |  |  |  | 0.022 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.228 |
|  |  |  |  |  |  |  |  |  |  |  | 13.7  |



STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- Segment ID
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Post Development 1 Year - Analysis Point 7 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|---------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                 |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                      |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                               |  |  |  |  |  |  |  |  |  |  |          |
| 75                                                |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                               |  |  |  |  |  |  |  |  |  |  |          |
| 0.040                                             |  |  |  |  |  |  |  |  |  |  |          |
| 0.206                                             |  |  |  |  |  |  |  |  |  |  | 0.206    |

### Shallow Concentrated Flow

- Segment ID
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|         |         |  |  |  |  |  |  |  |  |  |       |
|---------|---------|--|--|--|--|--|--|--|--|--|-------|
| 2       | 3       |  |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 130     | 250     |  |  |  |  |  |  |  |  |  |       |
| 0.054   | 0.116   |  |  |  |  |  |  |  |  |  |       |
| 3.7     | 5.8     |  |  |  |  |  |  |  |  |  |       |
| 0.010   | 0.012   |  |  |  |  |  |  |  |  |  | 0.022 |

### Channel Flow

- Segment ID
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.228 |
|  |  |  |  |  |  |  |  |  |  |  | 13.7  |

Post-AP 7 Bypass

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STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 1 Year - Analysis Point 8 |  |  |  |  |  |  |  |  |  |  |          |
|-------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                         |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                       |  |  |  |  |  |  |  |  |  |  |          |
| 75                                        |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.013                                     |  |  |  |  |  |  |  |  |  |  |          |
| 0.323                                     |  |  |  |  |  |  |  |  |  |  | 0.323    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |         |         |  |  |  |  |  |  |  |       |
|---------|---------|---------|---------|--|--|--|--|--|--|--|-------|
| 2       | 3       | 4       | 5       |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved | Unpaved | Unpaved |  |  |  |  |  |  |  |       |
| 196     | 240     | 191     | 270     |  |  |  |  |  |  |  |       |
| 0.041   | 0.054   | 0.026   | 0.07    |  |  |  |  |  |  |  |       |
| 3.2     | 3.7     | 2.6     | 4.1     |  |  |  |  |  |  |  |       |
| 0.017   | 0.018   | 0.020   | 0.018   |  |  |  |  |  |  |  | 0.074 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.397 |
|  |  |  |  |  |  |  |  |  |  |  | 23.8  |



STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- Segment ID
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Post Development 1 Year - Analysis Point 8 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|---------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                 |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                      |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                               |  |  |  |  |  |  |  |  |  |  |          |
| 20                                                |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                               |  |  |  |  |  |  |  |  |  |  |          |
| 0.100                                             |  |  |  |  |  |  |  |  |  |  |          |
| 0.050                                             |  |  |  |  |  |  |  |  |  |  | 0.050    |

### Shallow Concentrated Flow

- Segment ID
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |

### Channel Flow

- Segment ID
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.050 |
|  |  |  |  |  |  |  |  |  |  |  | 3.0   |

\*assuming minimum 5 mins time of concentration



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## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 1 Year - Analysis Point 9 |  |  |  |  |  |  |  |  |  |  |          |
|-------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                         |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                       |  |  |  |  |  |  |  |  |  |  |          |
| 75                                        |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.040                                     |  |  |  |  |  |  |  |  |  |  |          |
| 0.206                                     |  |  |  |  |  |  |  |  |  |  | 0.206    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |  |  |  |  |  |  |  |  |  |       |
|---------|---------|--|--|--|--|--|--|--|--|--|-------|
| 2       | 3       |  |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 229     | 226     |  |  |  |  |  |  |  |  |  |       |
| 0.116   | 0.155   |  |  |  |  |  |  |  |  |  |       |
| 5.8     | 6.2     |  |  |  |  |  |  |  |  |  |       |
| 0.011   | 0.010   |  |  |  |  |  |  |  |  |  | 0.021 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|       |  |  |  |  |  |  |  |  |  |  |       |
|-------|--|--|--|--|--|--|--|--|--|--|-------|
| 4     |  |  |  |  |  |  |  |  |  |  |       |
| 27.50 |  |  |  |  |  |  |  |  |  |  |       |
| 34.15 |  |  |  |  |  |  |  |  |  |  |       |
| 0.81  |  |  |  |  |  |  |  |  |  |  |       |
| 0.182 |  |  |  |  |  |  |  |  |  |  |       |
| 0.015 |  |  |  |  |  |  |  |  |  |  |       |
| 36.68 |  |  |  |  |  |  |  |  |  |  |       |
| 137   |  |  |  |  |  |  |  |  |  |  |       |
| 0.001 |  |  |  |  |  |  |  |  |  |  | 0.001 |
|       |  |  |  |  |  |  |  |  |  |  | 0.228 |
|       |  |  |  |  |  |  |  |  |  |  | 13.7  |



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## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- Segment ID
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Post Development 1 Year - Analysis Point 9 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|---------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                 |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                      |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                               |  |  |  |  |  |  |  |  |  |  |          |
| 75                                                |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                               |  |  |  |  |  |  |  |  |  |  |          |
| 0.093                                             |  |  |  |  |  |  |  |  |  |  |          |
| 0.147                                             |  |  |  |  |  |  |  |  |  |  | 0.147    |

### Shallow Concentrated Flow

- Segment ID
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|         |  |  |  |  |  |  |  |  |  |  |       |
|---------|--|--|--|--|--|--|--|--|--|--|-------|
| 2       |  |  |  |  |  |  |  |  |  |  |       |
| Unpaved |  |  |  |  |  |  |  |  |  |  |       |
| 76      |  |  |  |  |  |  |  |  |  |  |       |
| 0.145   |  |  |  |  |  |  |  |  |  |  |       |
| 6.2     |  |  |  |  |  |  |  |  |  |  |       |
| 0.003   |  |  |  |  |  |  |  |  |  |  | 0.003 |

### Channel Flow

- Segment ID
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.150 |
|  |  |  |  |  |  |  |  |  |  |  | 9.0   |

Post-AP 9 Bypass

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STEWART

# TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

## Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 1 Year - Analysis Point 10 |  |  |  |  |  |  |  |  |  |  |  |          |
|--------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                          |  |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                               |  |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                        |  |  |  |  |  |  |  |  |  |  |  |          |
| 75                                         |  |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                        |  |  |  |  |  |  |  |  |  |  |  |          |
| 0.060                                      |  |  |  |  |  |  |  |  |  |  |  |          |
| 0.175                                      |  |  |  |  |  |  |  |  |  |  |  | 0.175    |

## Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |  |  |  |  |  |  |  |  |  |  |  |       |
|---------|--|--|--|--|--|--|--|--|--|--|--|-------|
| 2       |  |  |  |  |  |  |  |  |  |  |  |       |
| Unpaved |  |  |  |  |  |  |  |  |  |  |  |       |
| 130     |  |  |  |  |  |  |  |  |  |  |  |       |
| 0.154   |  |  |  |  |  |  |  |  |  |  |  |       |
| 6.2     |  |  |  |  |  |  |  |  |  |  |  |       |
| 0.006   |  |  |  |  |  |  |  |  |  |  |  | 0.006 |

## Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|       |       |  |  |  |  |  |  |  |  |  |  |       |
|-------|-------|--|--|--|--|--|--|--|--|--|--|-------|
| 3     | 4     |  |  |  |  |  |  |  |  |  |  |       |
| 43.50 | 37.00 |  |  |  |  |  |  |  |  |  |  |       |
| 59.06 | 54.06 |  |  |  |  |  |  |  |  |  |  |       |
| 0.74  | 0.68  |  |  |  |  |  |  |  |  |  |  |       |
| 0.104 | 0.182 |  |  |  |  |  |  |  |  |  |  |       |
| 0.015 | 0.092 |  |  |  |  |  |  |  |  |  |  |       |
| 26.12 | 5.37  |  |  |  |  |  |  |  |  |  |  |       |
| 125   | 185   |  |  |  |  |  |  |  |  |  |  |       |
| 0.001 | 0.010 |  |  |  |  |  |  |  |  |  |  | 0.011 |
|       |       |  |  |  |  |  |  |  |  |  |  | 0.192 |
|       |       |  |  |  |  |  |  |  |  |  |  | 11.5  |





STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- Segment ID
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Post Development 1 Year - Analysis Point 10 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|----------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                  |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                                |  |  |  |  |  |  |  |  |  |  |          |
| 52                                                 |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                                |  |  |  |  |  |  |  |  |  |  |          |
| 0.115                                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.101                                              |  |  |  |  |  |  |  |  |  |  | 0.101    |

### Shallow Concentrated Flow

- Segment ID
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |

### Channel Flow

- Segment ID
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.101 |
|  |  |  |  |  |  |  |  |  |  |  | 6.0   |

Post-AP 10 Bypass

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STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- Segment ID
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Pre Development 1 Year - Analysis Point 11 |  |  |  |  |  |  |  |  |  |  |          |
|--------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                          |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                               |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                        |  |  |  |  |  |  |  |  |  |  |          |
| 75                                         |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                        |  |  |  |  |  |  |  |  |  |  |          |
| 0.017                                      |  |  |  |  |  |  |  |  |  |  |          |
| 0.290                                      |  |  |  |  |  |  |  |  |  |  | 0.290    |

### Shallow Concentrated Flow

- Segment ID
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|         |         |         |  |  |  |  |  |  |  |  |       |
|---------|---------|---------|--|--|--|--|--|--|--|--|-------|
| 2       | 3       | 4       |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved | Unpaved |  |  |  |  |  |  |  |  |       |
| 101     | 139     | 193     |  |  |  |  |  |  |  |  |       |
| 0.039   | 0.14    | 0.168   |  |  |  |  |  |  |  |  |       |
| 3.2     | 6       | 6.3     |  |  |  |  |  |  |  |  |       |
| 0.009   | 0.006   | 0.009   |  |  |  |  |  |  |  |  | 0.024 |

### Channel Flow

- Segment ID
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.314 |
|  |  |  |  |  |  |  |  |  |  |  | 18.8  |



STEWART

# TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

## Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Post Development 1 Year - Analysis Point 11 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|----------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                  |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                                |  |  |  |  |  |  |  |  |  |  |          |
| 75                                                 |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                                |  |  |  |  |  |  |  |  |  |  |          |
| 0.040                                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.206                                              |  |  |  |  |  |  |  |  |  |  | 0.206    |

## Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |  |  |  |  |  |  |  |  |  |       |
|---------|---------|--|--|--|--|--|--|--|--|--|-------|
| 2       | 3       |  |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 254     | 75      |  |  |  |  |  |  |  |  |  |       |
| 0.18    | 0.133   |  |  |  |  |  |  |  |  |  |       |
| 6.2     | 5.9     |  |  |  |  |  |  |  |  |  |       |
| 0.011   | 0.004   |  |  |  |  |  |  |  |  |  | 0.015 |

## Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.221 |
|  |  |  |  |  |  |  |  |  |  |  | 13.3  |

Post-AP 11 Bypass

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STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- Segment ID 1
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Pre Development 1 Year - Analysis Point 12 |              |  |  |  |  |  |  |  |  |  |          |
|--------------------------------------------|--------------|--|--|--|--|--|--|--|--|--|----------|
| 1                                          | Woods, Light |  |  |  |  |  |  |  |  |  | Subtotal |
| 2                                          | 0.4          |  |  |  |  |  |  |  |  |  |          |
| 3                                          | 75           |  |  |  |  |  |  |  |  |  |          |
| 4                                          | 3.5          |  |  |  |  |  |  |  |  |  |          |
| 5                                          | 0.032        |  |  |  |  |  |  |  |  |  |          |
| 6                                          | 0.225        |  |  |  |  |  |  |  |  |  | 0.225    |

### Shallow Concentrated Flow

- Segment ID 2
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|    |         |  |  |  |  |  |  |  |  |  |       |
|----|---------|--|--|--|--|--|--|--|--|--|-------|
| 2  | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 8  | 299     |  |  |  |  |  |  |  |  |  |       |
| 9  | 0.07    |  |  |  |  |  |  |  |  |  |       |
| 10 | 4.2     |  |  |  |  |  |  |  |  |  |       |
| 11 | 0.020   |  |  |  |  |  |  |  |  |  | 0.020 |

### Channel Flow

- Segment ID 3
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|    |        |        |        |  |  |  |  |  |  |  |       |
|----|--------|--------|--------|--|--|--|--|--|--|--|-------|
| 3  | 4      | 5      |        |  |  |  |  |  |  |  |       |
| 12 | 67.50  | 87.00  | 116.50 |  |  |  |  |  |  |  |       |
| 13 | 112.02 | 138.02 | 154.03 |  |  |  |  |  |  |  |       |
| 14 | 0.60   | 0.63   | 0.76   |  |  |  |  |  |  |  |       |
| 15 | 0.044  | 0.046  | 0.033  |  |  |  |  |  |  |  |       |
| 16 | 0.015  | 0.015  | 0.015  |  |  |  |  |  |  |  |       |
| 17 | 14.86  | 15.66  | 14.98  |  |  |  |  |  |  |  |       |
| 18 | 272    | 218    | 390    |  |  |  |  |  |  |  |       |
| 19 | 0.005  | 0.004  | 0.007  |  |  |  |  |  |  |  | 0.016 |
| 20 |        |        |        |  |  |  |  |  |  |  | 0.261 |
| 21 |        |        |        |  |  |  |  |  |  |  | 15.7  |



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## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- Segment ID
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Post Development 1 Year - Analysis Point 12 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|----------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                  |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                       |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                                |  |  |  |  |  |  |  |  |  |  |          |
| 75                                                 |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                                |  |  |  |  |  |  |  |  |  |  |          |
| 0.110                                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.137                                              |  |  |  |  |  |  |  |  |  |  | 0.137    |

### Shallow Concentrated Flow

- Segment ID
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
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|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |

### Channel Flow

- Segment ID
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|        |  |  |  |  |  |  |  |  |  |  |       |
|--------|--|--|--|--|--|--|--|--|--|--|-------|
| 2      |  |  |  |  |  |  |  |  |  |  |       |
| 116.50 |  |  |  |  |  |  |  |  |  |  |       |
| 154.03 |  |  |  |  |  |  |  |  |  |  |       |
| 0.76   |  |  |  |  |  |  |  |  |  |  |       |
| 0.110  |  |  |  |  |  |  |  |  |  |  |       |
| 0.015  |  |  |  |  |  |  |  |  |  |  |       |
| 27.35  |  |  |  |  |  |  |  |  |  |  |       |
| 75     |  |  |  |  |  |  |  |  |  |  |       |
| 0.001  |  |  |  |  |  |  |  |  |  |  | 0.001 |
|        |  |  |  |  |  |  |  |  |  |  | 0.138 |
|        |  |  |  |  |  |  |  |  |  |  | 8.3   |

Post-AP 12 Bypass

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STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Pre Development 2/10/25 Year - Analysis Point 13 |  |  |  |  |  |  |  |  |  |  |          |
|--------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                     |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                              |  |  |  |  |  |  |  |  |  |  |          |
| 75                                               |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                              |  |  |  |  |  |  |  |  |  |  |          |
| 0.013                                            |  |  |  |  |  |  |  |  |  |  |          |
| 0.323                                            |  |  |  |  |  |  |  |  |  |  | 0.323    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |         |         |  |  |  |  |  |  |  |       |
|---------|---------|---------|---------|--|--|--|--|--|--|--|-------|
| 2       | 3       | 4       | 5       |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved | Unpaved | Unpaved |  |  |  |  |  |  |  |       |
| 196     | 240     | 191     | 270     |  |  |  |  |  |  |  |       |
| 0.041   | 0.054   | 0.026   | 0.07    |  |  |  |  |  |  |  |       |
| 3.2     | 3.7     | 2.6     | 4.2     |  |  |  |  |  |  |  |       |
| 0.017   | 0.018   | 0.020   | 0.018   |  |  |  |  |  |  |  | 0.073 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius, r=a/pw in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|        |  |  |  |  |  |  |  |  |  |  |       |
|--------|--|--|--|--|--|--|--|--|--|--|-------|
| 6      |  |  |  |  |  |  |  |  |  |  |       |
| 106.00 |  |  |  |  |  |  |  |  |  |  |       |
| 155.02 |  |  |  |  |  |  |  |  |  |  |       |
| 0.68   |  |  |  |  |  |  |  |  |  |  |       |
| 0.030  |  |  |  |  |  |  |  |  |  |  |       |
| 0.015  |  |  |  |  |  |  |  |  |  |  |       |
| 13.35  |  |  |  |  |  |  |  |  |  |  |       |
| 430    |  |  |  |  |  |  |  |  |  |  |       |
| 0.009  |  |  |  |  |  |  |  |  |  |  | 0.009 |
|        |  |  |  |  |  |  |  |  |  |  | 0.405 |
|        |  |  |  |  |  |  |  |  |  |  | 24.3  |



STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Post Development 2/10/25 Year - Analysis Point 13 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|----------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                        |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                             |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                                      |  |  |  |  |  |  |  |  |  |  |          |
| 75                                                       |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                                      |  |  |  |  |  |  |  |  |  |  |          |
| 0.060                                                    |  |  |  |  |  |  |  |  |  |  |          |
| 0.175                                                    |  |  |  |  |  |  |  |  |  |  | 0.175    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|         |         |  |  |  |  |  |  |  |  |  |       |
|---------|---------|--|--|--|--|--|--|--|--|--|-------|
| 2       | 3       |  |  |  |  |  |  |  |  |  |       |
| Unpaved | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 111     | 257     |  |  |  |  |  |  |  |  |  |       |
| 0.081   | 0.074   |  |  |  |  |  |  |  |  |  |       |
| 4.4     | 4.2     |  |  |  |  |  |  |  |  |  |       |
| 0.007   | 0.017   |  |  |  |  |  |  |  |  |  | 0.024 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |
|  |  |  |  |  |  |  |  |  |  |  | 0.199 |
|  |  |  |  |  |  |  |  |  |  |  | 12.0  |

Post-AP 13 Bypass

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STEWART

## TR 55 Time of Concentration Worksheet

Project Ashcroft 2  
Location Clayton, NC

Calculated By  
Checked By

Date 9/29/2020  
Revised

### Sheet Flow

- Segment ID 1
- 1 Surface Description
  - 2 Mannings Roughness, n
  - 3 Flow Length, L in ft (max 300')
  - 4 Two-year 24-hr rainfall, P2 in inches
  - 5 Land Slope, s in ft/ft
  - 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

| Pre Development 2/10/25 Year - Analysis Point 14 |              |  |  |  |  |  |  |  |  |  |          |
|--------------------------------------------------|--------------|--|--|--|--|--|--|--|--|--|----------|
| 1                                                | Woods, Light |  |  |  |  |  |  |  |  |  | Subtotal |
| 2                                                | 0.4          |  |  |  |  |  |  |  |  |  |          |
| 3                                                | 75           |  |  |  |  |  |  |  |  |  |          |
| 4                                                | 3.5          |  |  |  |  |  |  |  |  |  |          |
| 5                                                | 0.032        |  |  |  |  |  |  |  |  |  |          |
| 6                                                | 0.225        |  |  |  |  |  |  |  |  |  | 0.225    |

### Shallow Concentrated Flow

- Segment ID 2
- 7 Surface description (paved or unpaved)
  - 8 Flow length, L in ft
  - 9 Watercourse slope, s in ft/ft
  - 10 Average velocity, V in ft/s (figure 3-1)
  - 11  $T_t = L/3600V$  in hr

|    |         |  |  |  |  |  |  |  |  |  |       |
|----|---------|--|--|--|--|--|--|--|--|--|-------|
| 2  | Unpaved |  |  |  |  |  |  |  |  |  |       |
| 8  | 299     |  |  |  |  |  |  |  |  |  |       |
| 9  | 0.07    |  |  |  |  |  |  |  |  |  |       |
| 10 | 4.2     |  |  |  |  |  |  |  |  |  |       |
| 11 | 0.020   |  |  |  |  |  |  |  |  |  | 0.020 |

### Channel Flow

- Segment ID 3
- 12 Cross Sectional flow area, a in ft<sup>2</sup>
  - 13 Wetted perimeter, pw in ft
  - 14 Hydraulic radius,  $r = a/pw$  in ft
  - 15 Channel slope, s in ft/ft
  - 16 Manning's roughness, n
  - 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
  - 18 Flow length, L in ft
  - 19  $T_t = L/3600V$ , in hr
  - 20 Watershed total Tc in hours
  - 21 Watershed total Tc in minutes

|    |        |        |        |        |  |  |  |  |  |  |       |
|----|--------|--------|--------|--------|--|--|--|--|--|--|-------|
| 3  | 4      | 5      | 5      |        |  |  |  |  |  |  |       |
| 12 | 67.50  | 87.00  | 116.50 | 77.50  |  |  |  |  |  |  |       |
| 13 | 112.02 | 138.02 | 154.03 | 116.03 |  |  |  |  |  |  |       |
| 14 | 0.60   | 0.63   | 0.76   | 0.67   |  |  |  |  |  |  |       |
| 15 | 0.044  | 0.046  | 0.033  | 0.040  |  |  |  |  |  |  |       |
| 16 | 0.015  | 0.015  | 0.015  | 0.015  |  |  |  |  |  |  |       |
| 17 | 14.86  | 15.66  | 14.98  | 15.18  |  |  |  |  |  |  |       |
| 18 | 272    | 218    | 390    | 371    |  |  |  |  |  |  |       |
| 19 | 0.005  | 0.004  | 0.007  | 0.007  |  |  |  |  |  |  | 0.023 |
| 20 |        |        |        |        |  |  |  |  |  |  | 0.268 |
| 21 |        |        |        |        |  |  |  |  |  |  | 16.1  |





STEWART

## TR 55 Time of Concentration Worksheet

**Project** Ashcroft 2  
**Location** Clayton, NC

**Calculated By**  
**Checked By**

**Date** 9/29/2020  
**Revised**

### Sheet Flow

- 1 Surface Description
- 2 Mannings Roughness, n
- 3 Flow Length, L in ft (max 300')
- 4 Two-year 24-hr rainfall, P2 in inches
- 5 Land Slope, s in ft/ft
- 6  $T_t = 0.007x(nL)^{0.8}/(P2^{0.5}xs^{0.4})$  in hr

Segment ID

| Post Development 2/10/25 Year - Analysis Point 14 Bypass |  |  |  |  |  |  |  |  |  |  |          |
|----------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|----------|
| 1                                                        |  |  |  |  |  |  |  |  |  |  | Subtotal |
| Woods, Light                                             |  |  |  |  |  |  |  |  |  |  |          |
| 0.4                                                      |  |  |  |  |  |  |  |  |  |  |          |
| 75                                                       |  |  |  |  |  |  |  |  |  |  |          |
| 3.5                                                      |  |  |  |  |  |  |  |  |  |  |          |
| 0.110                                                    |  |  |  |  |  |  |  |  |  |  |          |
| 0.137                                                    |  |  |  |  |  |  |  |  |  |  | 0.137    |

### Shallow Concentrated Flow

- 7 Surface description (paved or unpaved)
- 8 Flow length, L in ft
- 9 Watercourse slope, s in ft/ft
- 10 Average velocity, V in ft/s (figure 3-1)
- 11  $T_t = L/3600V$  in hr

Segment ID

|  |  |  |  |  |  |  |  |  |  |  |       |
|--|--|--|--|--|--|--|--|--|--|--|-------|
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  |       |
|  |  |  |  |  |  |  |  |  |  |  | 0.000 |

### Channel Flow

- 12 Cross Sectional flow area, a in ft<sup>2</sup>
- 13 Wetted perimeter, pw in ft
- 14 Hydraulic radius,  $r = a/pw$  in ft
- 15 Channel slope, s in ft/ft
- 16 Manning's roughness, n
- 17  $V = 1.49xr^{0.667}xs^{0.5}/n$  in ft/s
- 18 Flow length, L in ft
- 19  $T_t = L/3600V$ , in hr
- 20 Watershed total Tc in hours
- 21 Watershed total Tc in minutes

Segment ID

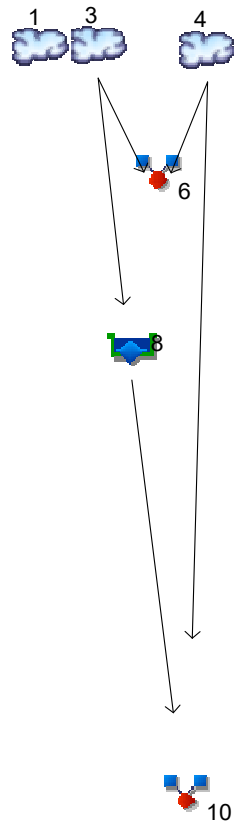
|        |        |  |  |  |  |  |  |  |  |  |       |
|--------|--------|--|--|--|--|--|--|--|--|--|-------|
| 2      | 3      |  |  |  |  |  |  |  |  |  |       |
| 116.50 | 77.50  |  |  |  |  |  |  |  |  |  |       |
| 154.03 | 116.03 |  |  |  |  |  |  |  |  |  |       |
| 0.76   | 0.67   |  |  |  |  |  |  |  |  |  |       |
| 0.110  | 0.040  |  |  |  |  |  |  |  |  |  |       |
| 0.015  | 0.015  |  |  |  |  |  |  |  |  |  |       |
| 27.35  | 15.18  |  |  |  |  |  |  |  |  |  |       |
| 75     | 371    |  |  |  |  |  |  |  |  |  |       |
| 0.001  | 0.007  |  |  |  |  |  |  |  |  |  | 0.008 |
|        |        |  |  |  |  |  |  |  |  |  | 0.145 |
|        |        |  |  |  |  |  |  |  |  |  | 8.7   |

Post-AP 14 Bypass

L:\Projects\2020\L20017 - Ashcroft 2\CALCS AND DATA\Stormwater\Spreadsheets\L20017\_ Time of Concentration.xls

# Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020



## **Analysis Point 1**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                  | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|---------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                         | SCS Runoff               | 0.104           | 2                   | 728                | 1,024                 | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 1           |
| 3                         | SCS Runoff               | 6.440           | 2                   | 718                | 13,582                | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP1   |
| 4                         | SCS Runoff               | 0.075           | 2                   | 722                | 328                   | -----         | -----                  | -----                   | Post-Development 1-Yr AP 1 Bypass   |
| 6                         | Combine                  | 6.490           | 2                   | 718                | 13,909                | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP1 - No Det  |
| 8                         | Reservoir                | 0.053           | 2                   | 1444               | 11,280                | 3             | 101.46                 | 11,532                  | Pond AP 1                           |
| 10                        | Combine                  | 0.103           | 2                   | 722                | 11,608                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 1 - With D |
| L20017_Peak Flow AP 1.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |

# Pond Report

7

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Pond No. 1 - Pond AP 1

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 7,061               | 0                    | 0                    |
| 1.00       | 101.00         | 8,103               | 7,582                | 7,582                |
| 2.00       | 102.00         | 9,202               | 8,653                | 16,235               |
| 3.00       | 103.00         | 10,357              | 9,780                | 26,014               |
| 4.00       | 104.00         | 11,569              | 10,963               | 36,977               |
| 5.00       | 105.00         | 12,838              | 12,204               | 49,181               |
| 6.00       | 106.00         | 14,162              | 13,500               | 62,681               |
| 7.00       | 107.00         | 15,544              | 14,853               | 77,534               |

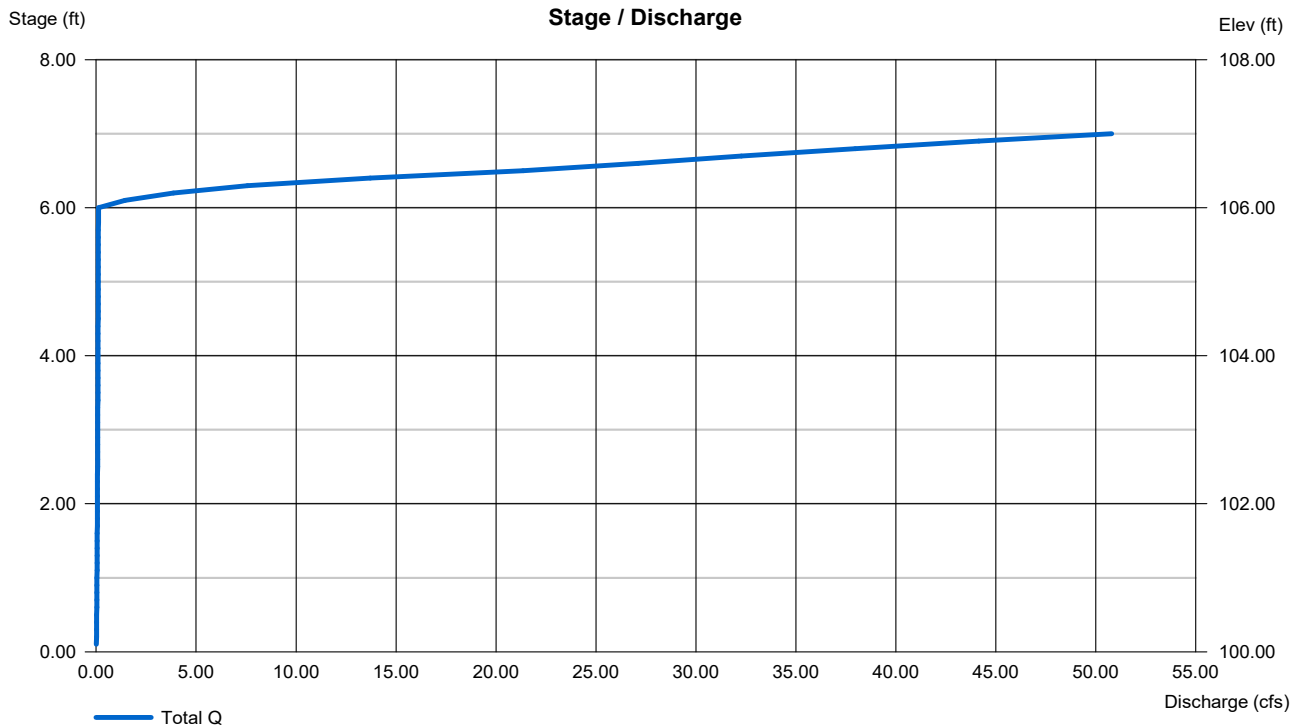
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 15.00 | 1.25   | 0.50   | 0.00     |
| Span (in)       | = 15.00 | 1.25   | 0.50   | 0.00     |
| No. Barrels     | = 1     | 1      | 1      | 0        |
| Invert El. (ft) | = 98.00 | 100.00 | 101.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | Yes    | Yes    | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 20.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 106.00              | 106.25 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

2

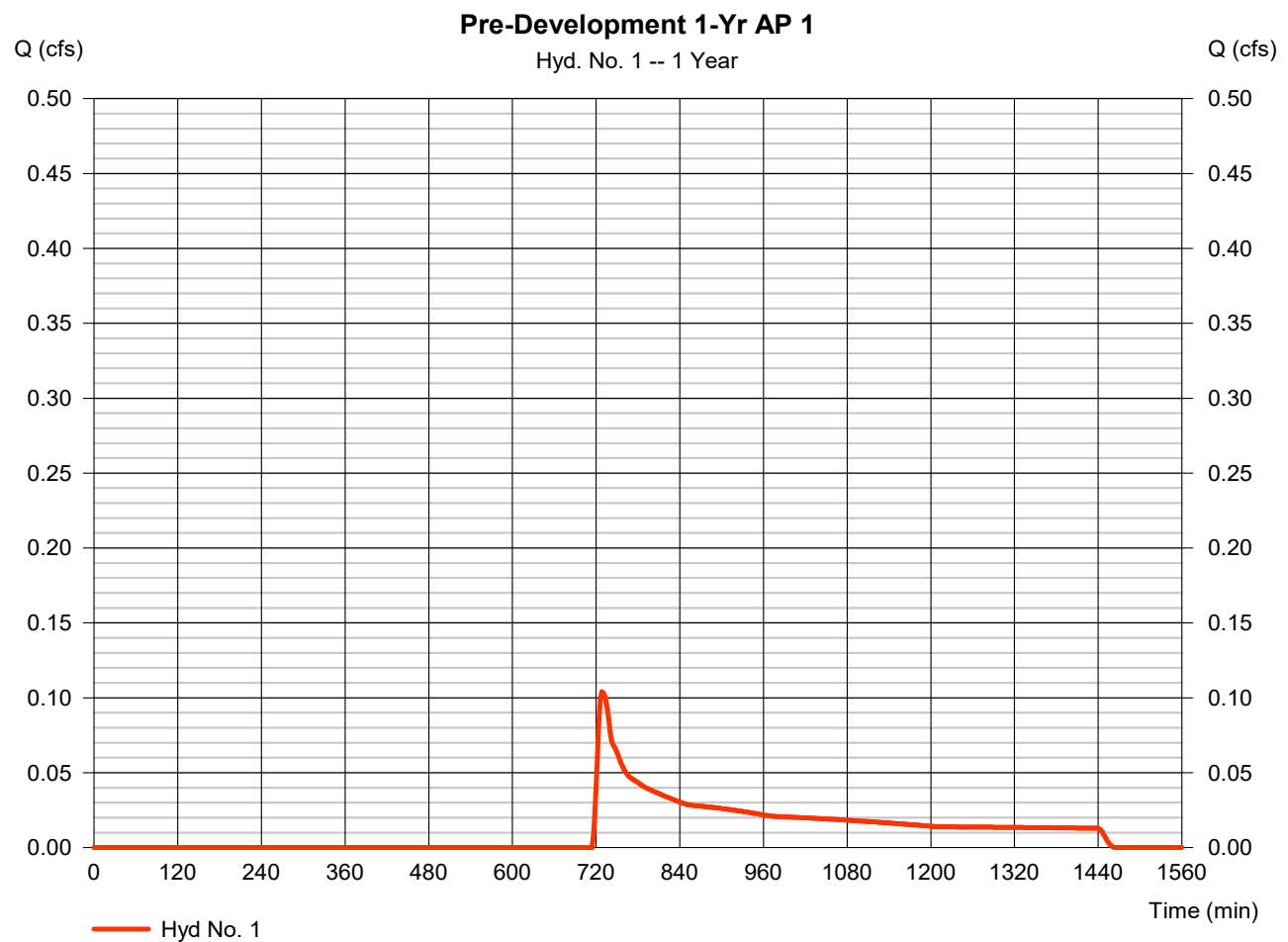
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 1

|                 |   |            |                    |   |            |
|-----------------|---|------------|--------------------|---|------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.104 cfs  |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 728 min    |
| Time interval   | = | 2 min      | Hyd. volume        | = | 1,024 cuft |
| Drainage area   | = | 1.490 ac   | Curve number       | = | 55         |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft       |
| Tc method       | = | User       | Time of conc. (Tc) | = | 16.60 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II    |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484        |



# Hydrograph Report

3

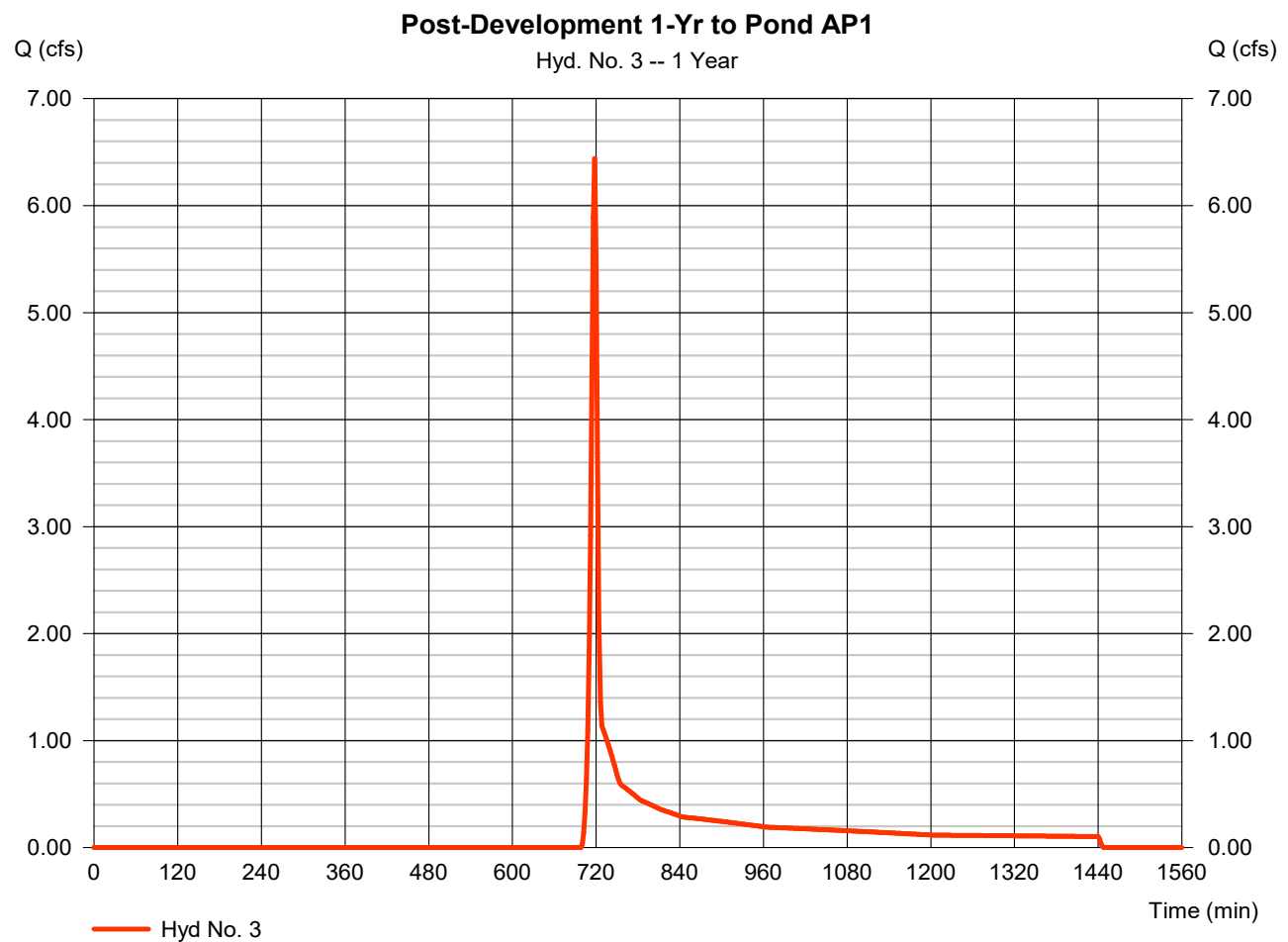
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 3

### Post-Development 1-Yr to Pond AP1

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 6.440 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 718 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 13,582 cuft |
| Drainage area   | = 6.370 ac   | Curve number       | = 68          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 3.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

4

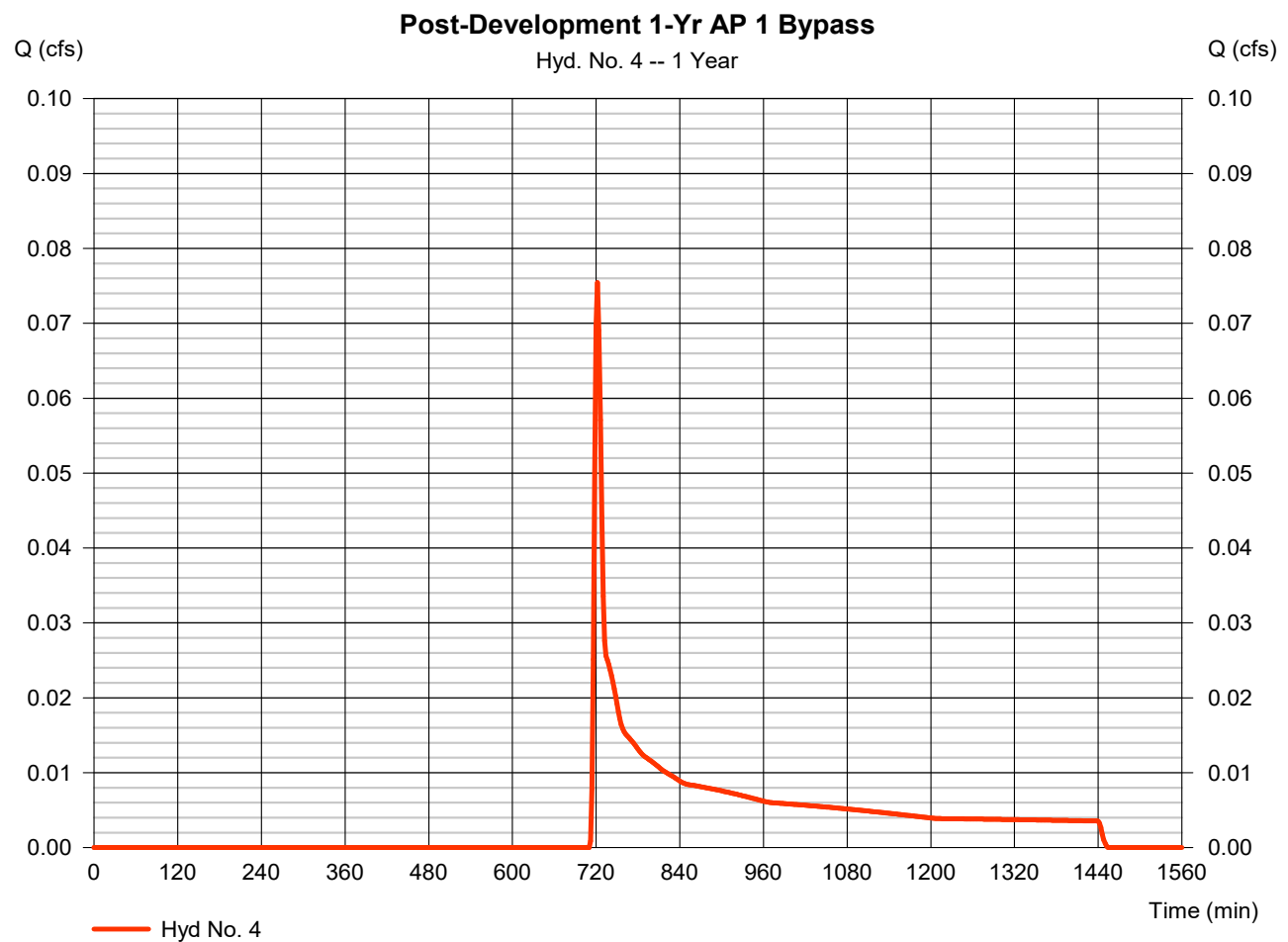
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 1 Bypass

|                 |              |                    |             |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.075 cfs |
| Storm frequency | = 1 yrs      | Time to peak       | = 722 min   |
| Time interval   | = 2 min      | Hyd. volume        | = 328 cuft  |
| Drainage area   | = 0.330 ac   | Curve number       | = 58        |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft      |
| Tc method       | = User       | Time of conc. (Tc) | = 8.80 min  |
| Total precip.   | = 3.00 in    | Distribution       | = Type II   |
| Storm duration  | = 24 hrs     | Shape factor       | = 484       |





# Hydrograph Report

5

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

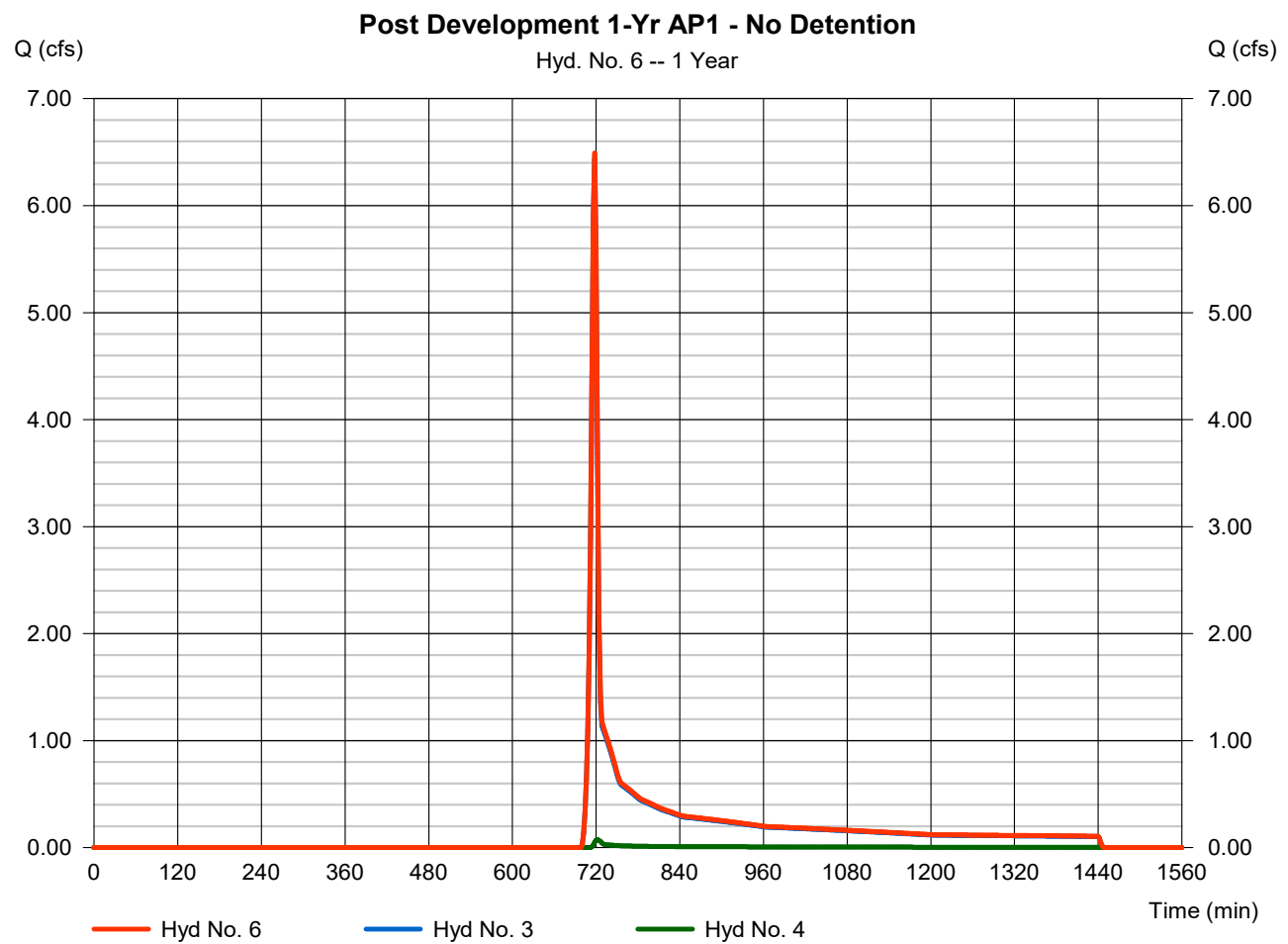
Tuesday, 09 / 29 / 2020

## Hyd. No. 6

Post Development 1-Yr AP1 - No Detention

Hydrograph type = Combine  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyds. = 3, 4

Peak discharge = 6.490 cfs  
Time to peak = 718 min  
Hyd. volume = 13,909 cuft  
Contrib. drain. area = 6.700 ac



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

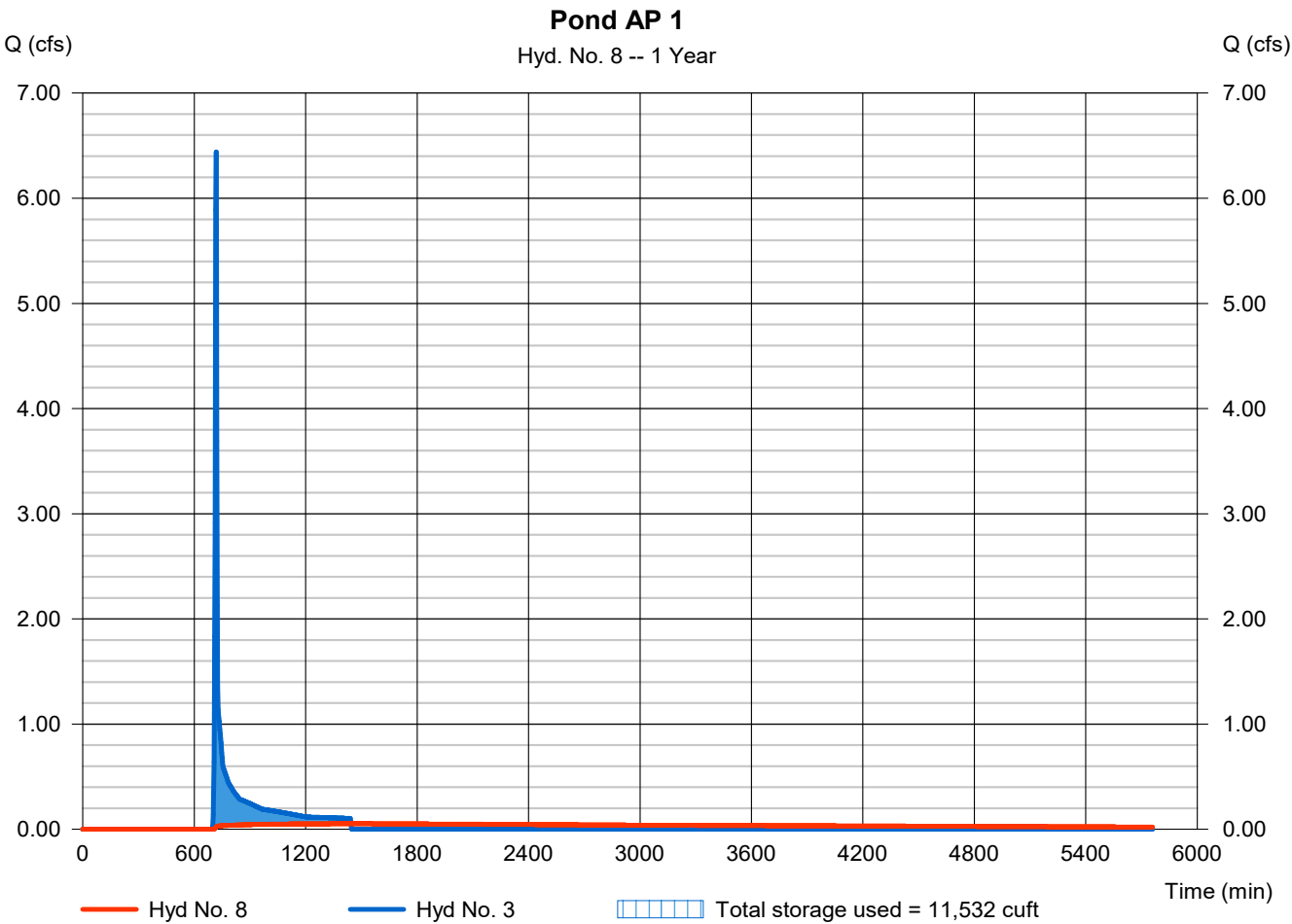
Tuesday, 09 / 29 / 2020

## Hyd. No. 8

Pond AP 1

|                 |                                          |                |               |
|-----------------|------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                              | Peak discharge | = 0.053 cfs   |
| Storm frequency | = 1 yrs                                  | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                  | Hyd. volume    | = 11,280 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Road AP 1 | Max. Elevation | = 101.46 ft   |
| Reservoir name  | = Pond AP 1                              | Max. Storage   | = 11,532 cuft |

Storage Indication method used.



# Hydrograph Report

8

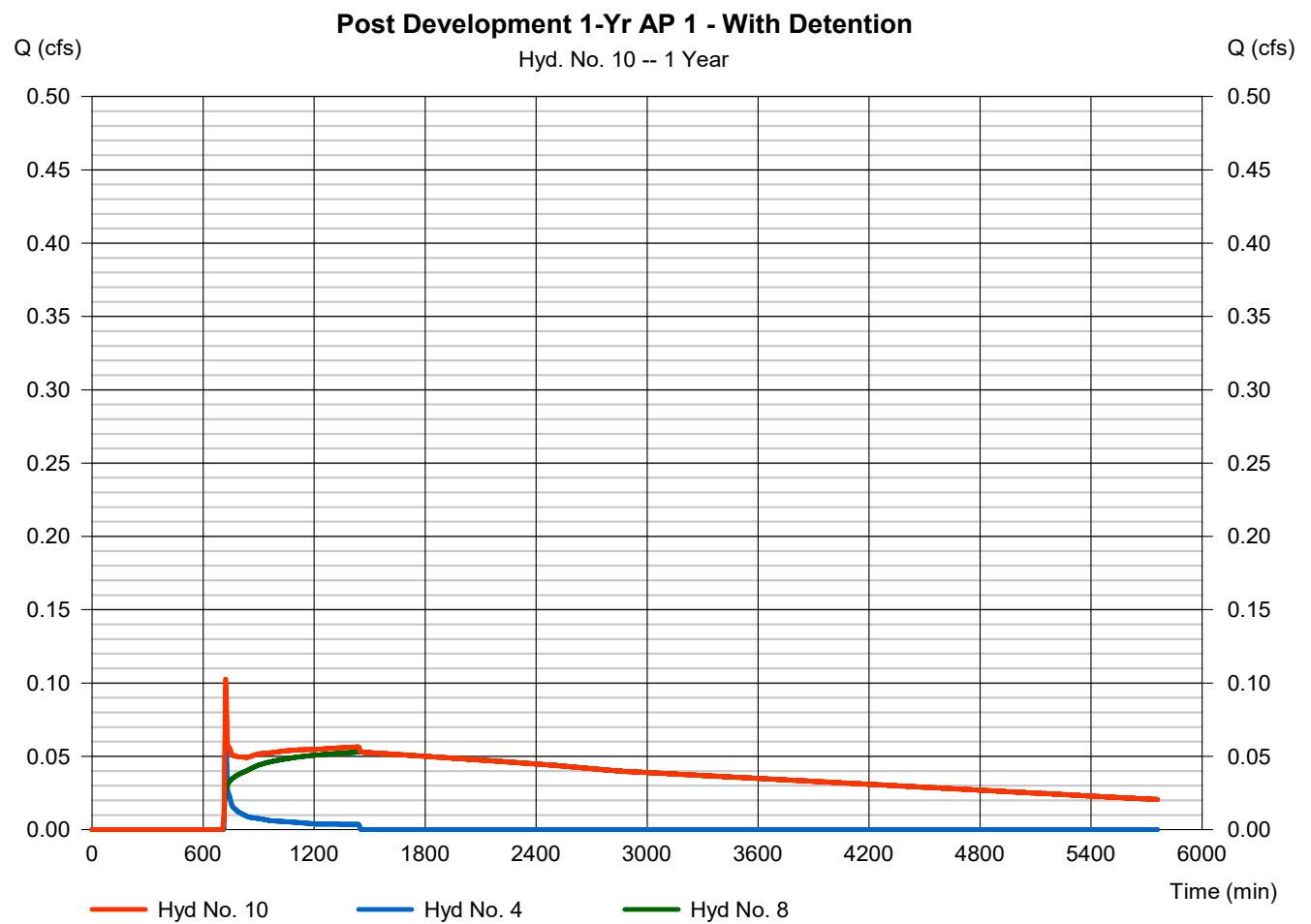
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 10

Post Development 1-Yr AP 1 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.103 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 722 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 11,608 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 0.330 ac    |



## **Analysis Point 2**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                  | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|---------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                         | SCS Runoff               | 0.135           | 2                   | 726                | 1,207                 | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 2           |
| 3                         | SCS Runoff               | 50.16           | 2                   | 716                | 101,263               | -----         | -----                  | -----                   | Post-Development to Pond AP 2       |
| 4                         | SCS Runoff               | 0.025           | 2                   | 726                | 225                   | -----         | -----                  | -----                   | Post-Development 1-Yr AP 2 Bypass   |
| 6                         | Combine                  | 50.16           | 2                   | 716                | 101,488               | 3, 4,         | -----                  | -----                   | Post Development AP 2 - No Detentio |
| 8                         | Reservoir                | 0.126           | 2                   | 1446               | 35,175                | 3             | 102.53                 | 96,055                  | Pond AP 2                           |
| 10                        | Combine                  | 0.129           | 2                   | 1440               | 35,401                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 2 - With D |
| L20017_Peak Flow AP 2.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Friday, 07 / 31 / 2020  |                                     |

# Pond Report

8

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Pond No. 2 - Pond AP 2

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 34,838              | 0                    | 0                    |
| 1.00       | 101.00         | 37,178              | 36,008               | 36,008               |
| 2.00       | 102.00         | 39,574              | 38,376               | 74,384               |
| 3.00       | 103.00         | 42,027              | 40,801               | 115,185              |
| 4.00       | 104.00         | 44,536              | 43,282               | 158,466              |
| 5.00       | 105.00         | 47,102              | 45,819               | 204,285              |

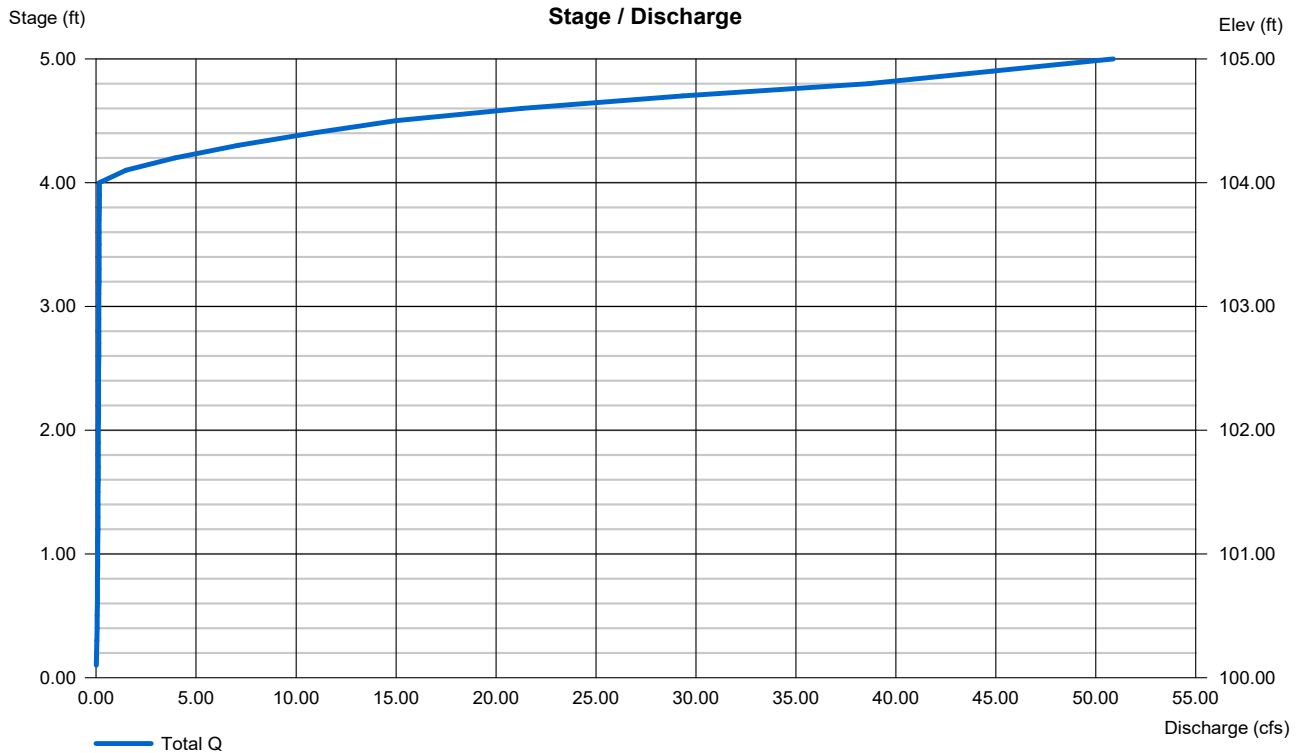
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 24.00 | 1.75   | 1.00   | 0.00     |
| Span (in)       | = 24.00 | 1.75   | 1.00   | 0.00     |
| No. Barrels     | = 1     | 1      | 3      | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 104.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | Yes    | Yes    | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 20.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 104.00              | 104.50 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

3

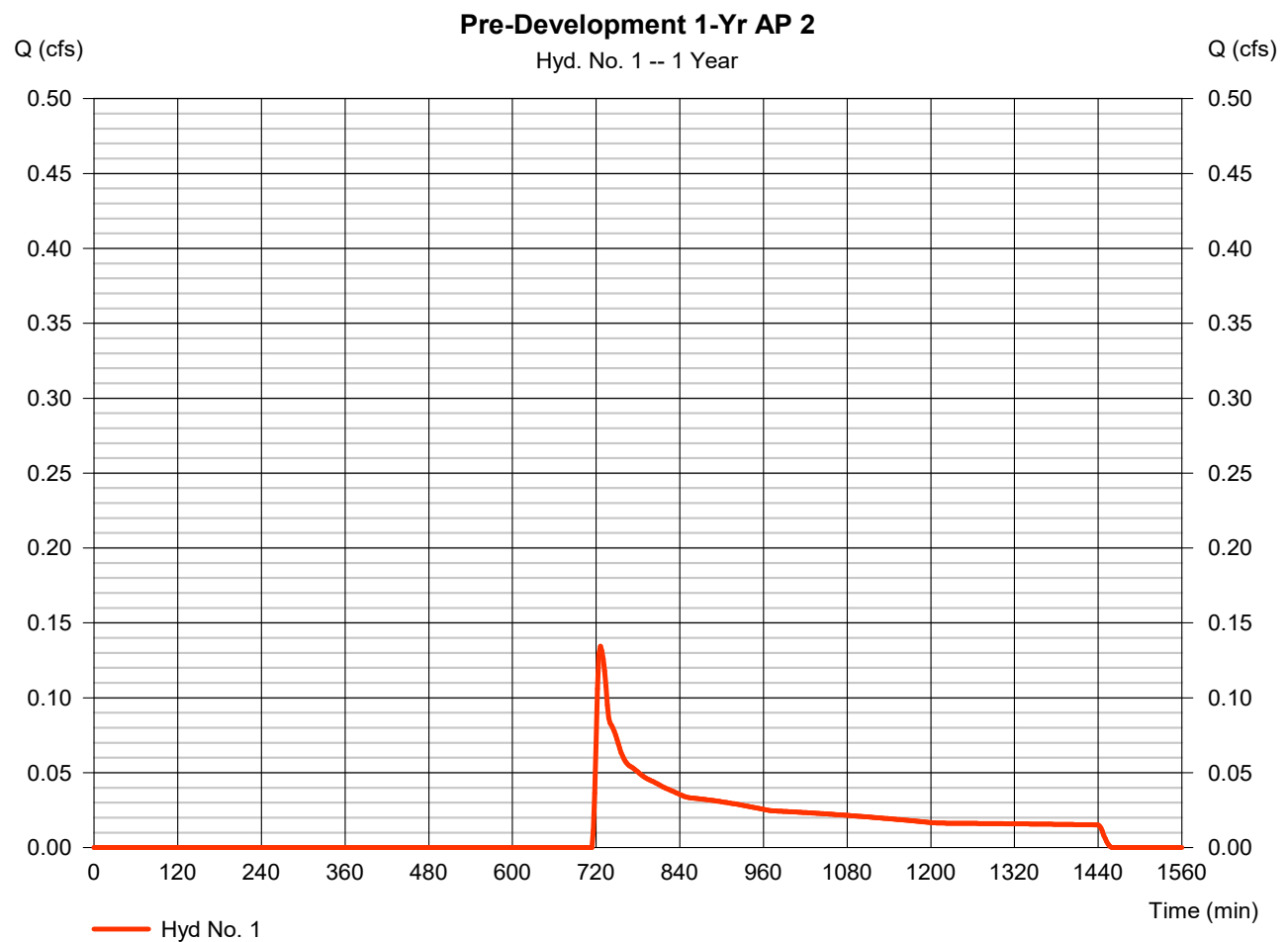
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 2

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.135 cfs  |
| Storm frequency | = 1 yrs      | Time to peak       | = 726 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 1,207 cuft |
| Drainage area   | = 1.660 ac   | Curve number       | = 55         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 13.30 min  |
| Total precip.   | = 3.00 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |



# Hydrograph Report

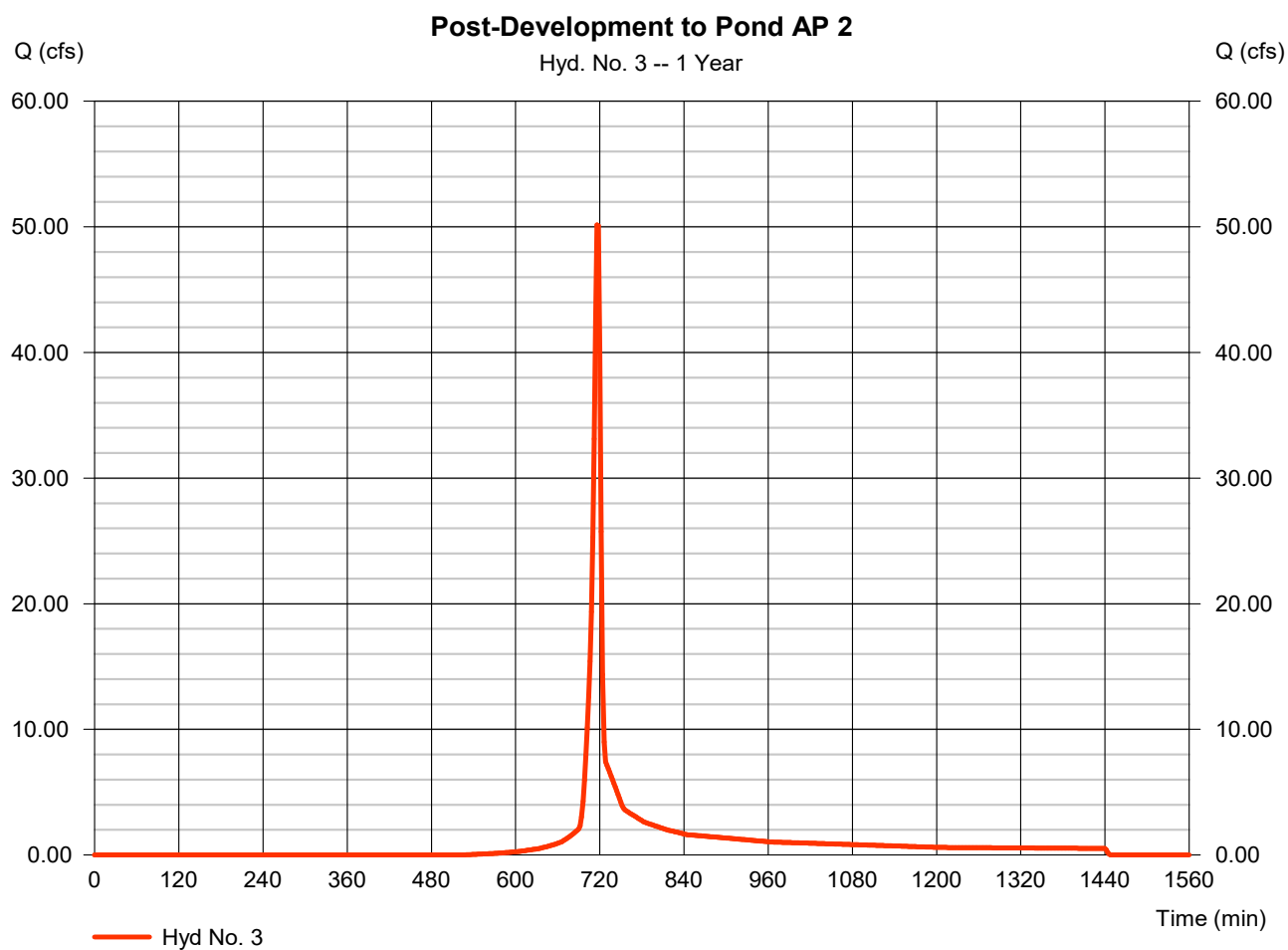
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 3

### Post-Development to Pond AP 2

|                 |              |                    |                |
|-----------------|--------------|--------------------|----------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 50.16 cfs    |
| Storm frequency | = 1 yrs      | Time to peak       | = 716 min      |
| Time interval   | = 2 min      | Hyd. volume        | = 101,263 cuft |
| Drainage area   | = 20.570 ac  | Curve number       | = 83           |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft         |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min     |
| Total precip.   | = 3.00 in    | Distribution       | = Type II      |
| Storm duration  | = 24 hrs     | Shape factor       | = 484          |





# Hydrograph Report

5

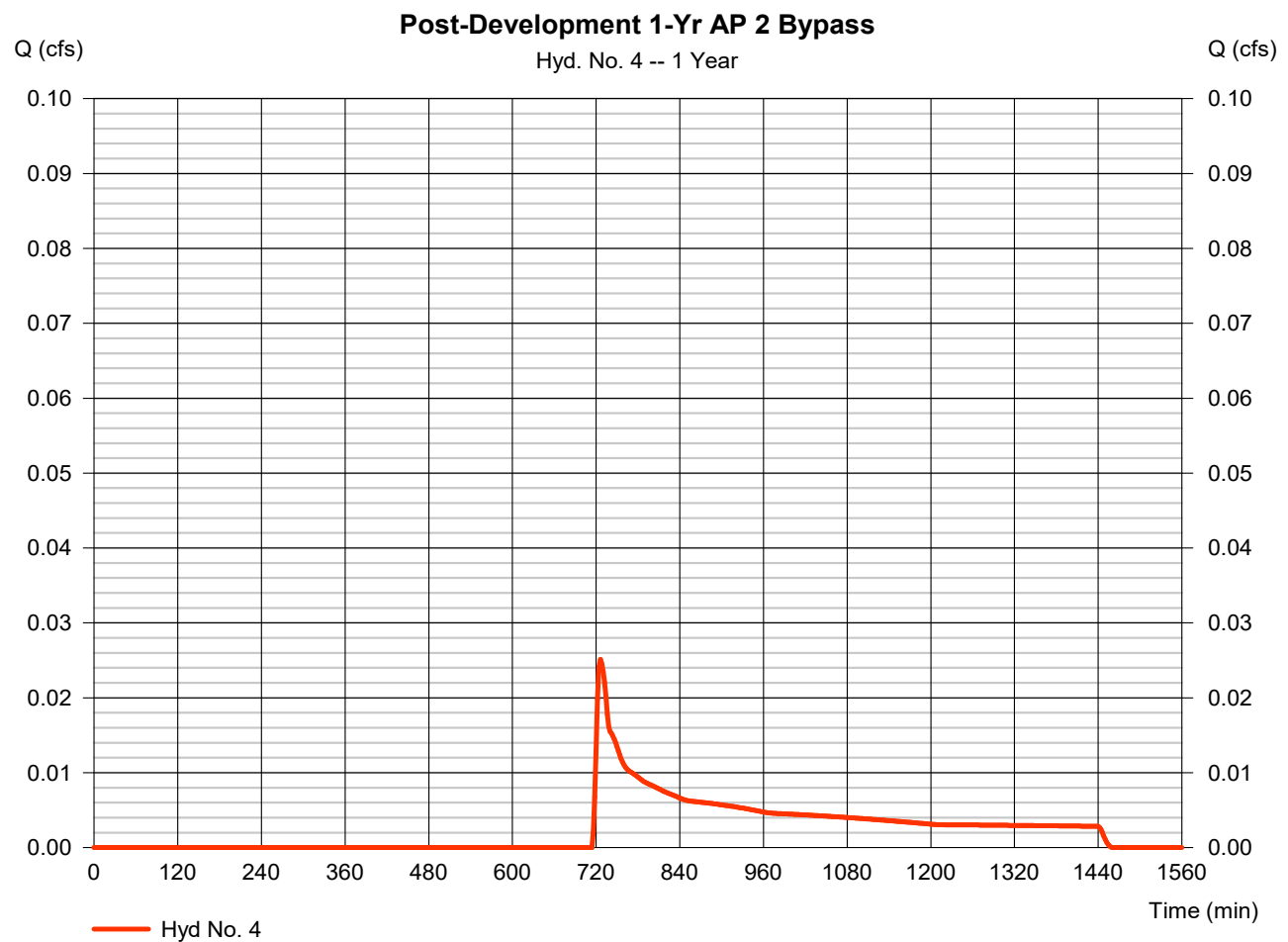
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 2 Bypass

|                 |   |            |                    |   |           |
|-----------------|---|------------|--------------------|---|-----------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.025 cfs |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 726 min   |
| Time interval   | = | 2 min      | Hyd. volume        | = | 225 cuft  |
| Drainage area   | = | 0.310 ac   | Curve number       | = | 55        |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft      |
| Tc method       | = | User       | Time of conc. (Tc) | = | 10.00 min |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II   |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484       |



# Hydrograph Report

6

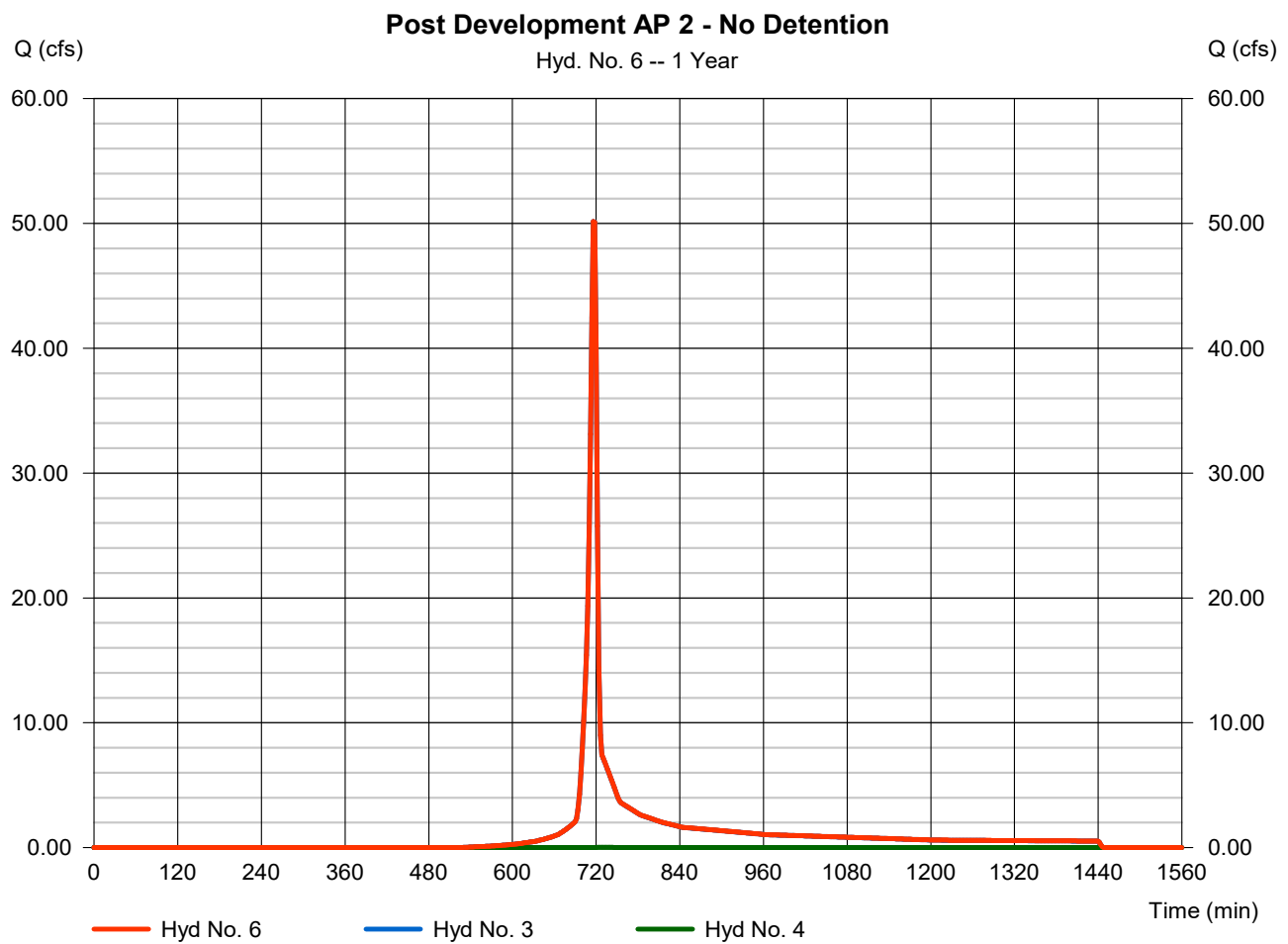
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 6

Post Development AP 2 - No Detention

|                 |           |                      |                |
|-----------------|-----------|----------------------|----------------|
| Hydrograph type | = Combine | Peak discharge       | = 50.16 cfs    |
| Storm frequency | = 1 yrs   | Time to peak         | = 716 min      |
| Time interval   | = 2 min   | Hyd. volume          | = 101,488 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 20.880 ac    |



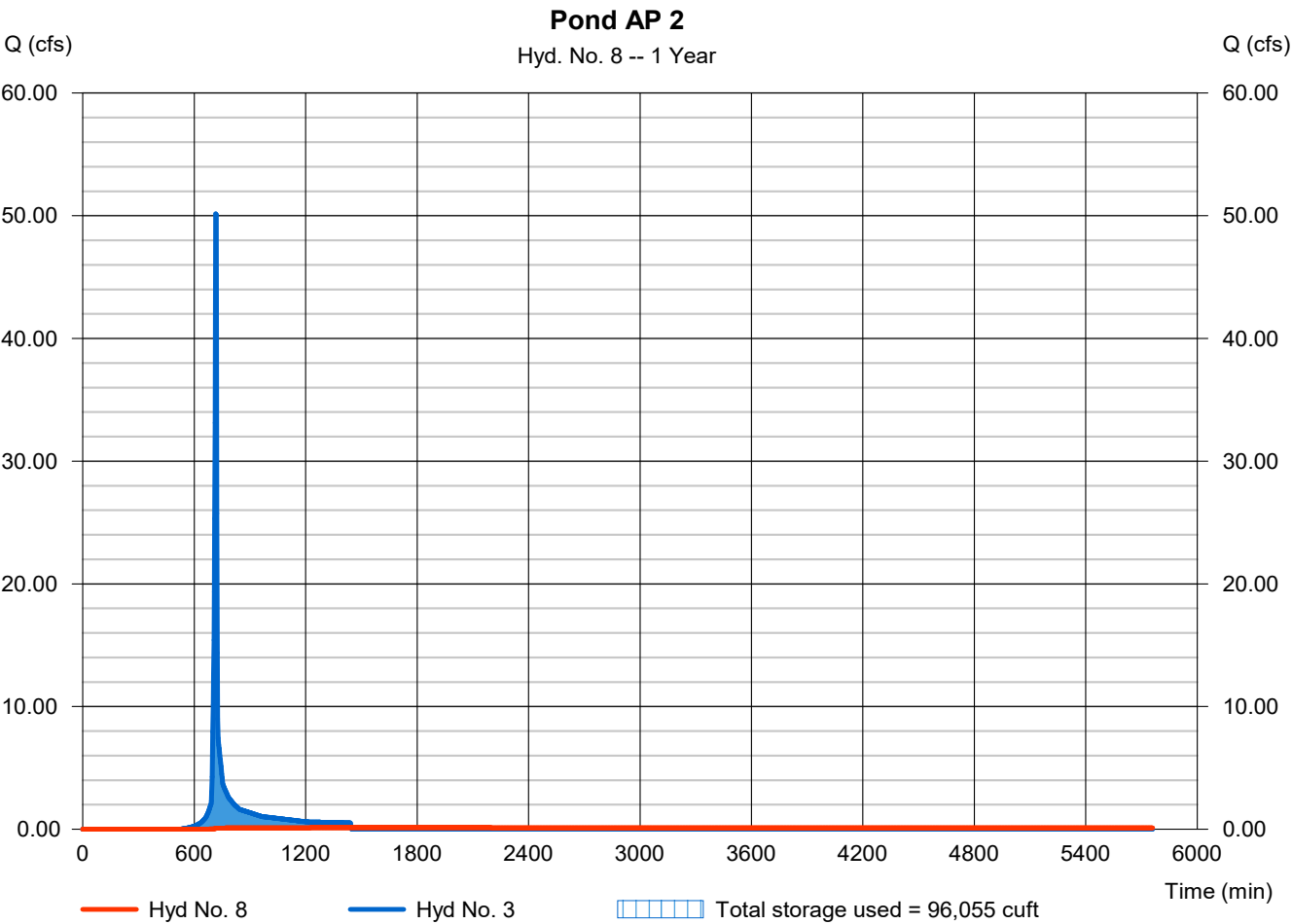
# Hydrograph Report

## Hyd. No. 8

Pond AP 2

|                 |                                     |                |               |
|-----------------|-------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                         | Peak discharge | = 0.126 cfs   |
| Storm frequency | = 1 yrs                             | Time to peak   | = 1446 min    |
| Time interval   | = 2 min                             | Hyd. volume    | = 35,175 cuft |
| Inflow hyd. No. | = 3 - Post-Development to Pond AP 2 | Max Elevation  | = 102.53 ft   |
| Reservoir name  | = Pond AP 2                         | Max. Storage   | = 96,055 cuft |

Storage Indication method used.



# Hydrograph Report

9

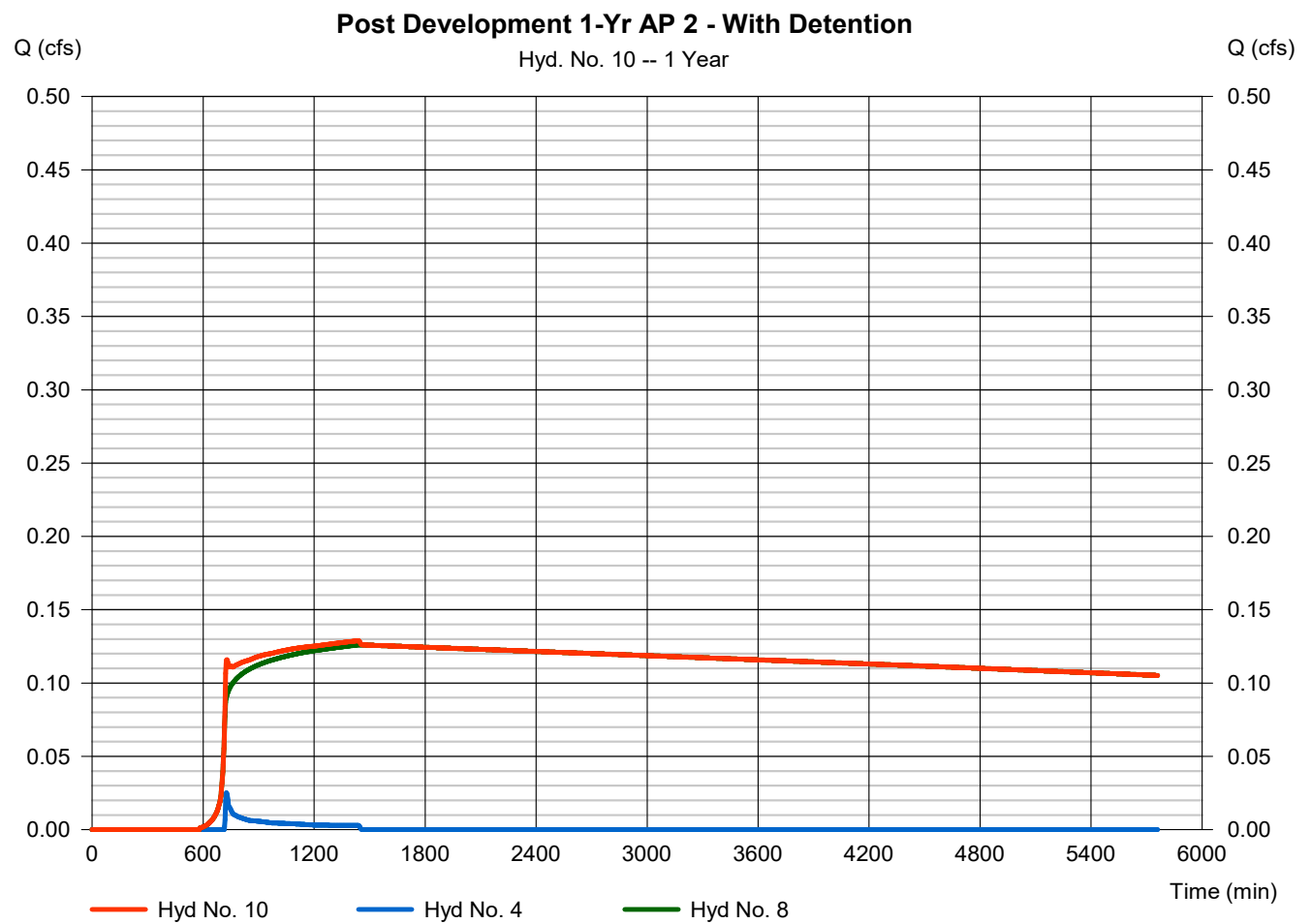
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Friday, 07 / 31 / 2020

## Hyd. No. 10

### Post Development 1-Yr AP 2 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.129 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 1440 min    |
| Time interval   | = 2 min   | Hyd. volume          | = 35,401 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 0.310 ac    |



## **Analysis Point 3**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                  | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|---------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                         | SCS Runoff               | 0.343           | 2                   | 726                | 3,076                 | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 3           |
| 3                         | SCS Runoff               | 15.90           | 2                   | 718                | 31,862                | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP 3  |
| 4                         | SCS Runoff               | 0.134           | 2                   | 722                | 451                   | -----         | -----                  | -----                   | Post-Development 1-Yr AP 3 Bypass   |
| 6                         | Combine                  | 16.01           | 2                   | 718                | 32,312                | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP 3 - No Det |
| 8                         | Reservoir                | 0.116           | 2                   | 1442               | 26,487                | 3             | 102.14                 | 27,041                  | Pond AP 3                           |
| 10                        | Combine                  | 0.216           | 2                   | 722                | 26,938                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 3 - With D |
| L20017_Peak Flow AP 3.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Friday, 07 / 31 / 2020  |                                     |

# Pond Report

8

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Pond No. 3 - Pond AP 3

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Begning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 11,210              | 0                    | 0                    |
| 1.00       | 101.00         | 12,472              | 11,841               | 11,841               |
| 2.00       | 102.00         | 13,792              | 13,132               | 24,973               |
| 3.00       | 103.00         | 15,168              | 14,480               | 39,453               |
| 4.00       | 104.00         | 16,600              | 15,884               | 55,337               |
| 5.00       | 105.00         | 18,089              | 17,345               | 72,682               |
| 6.00       | 106.00         | 19,635              | 18,862               | 91,544               |

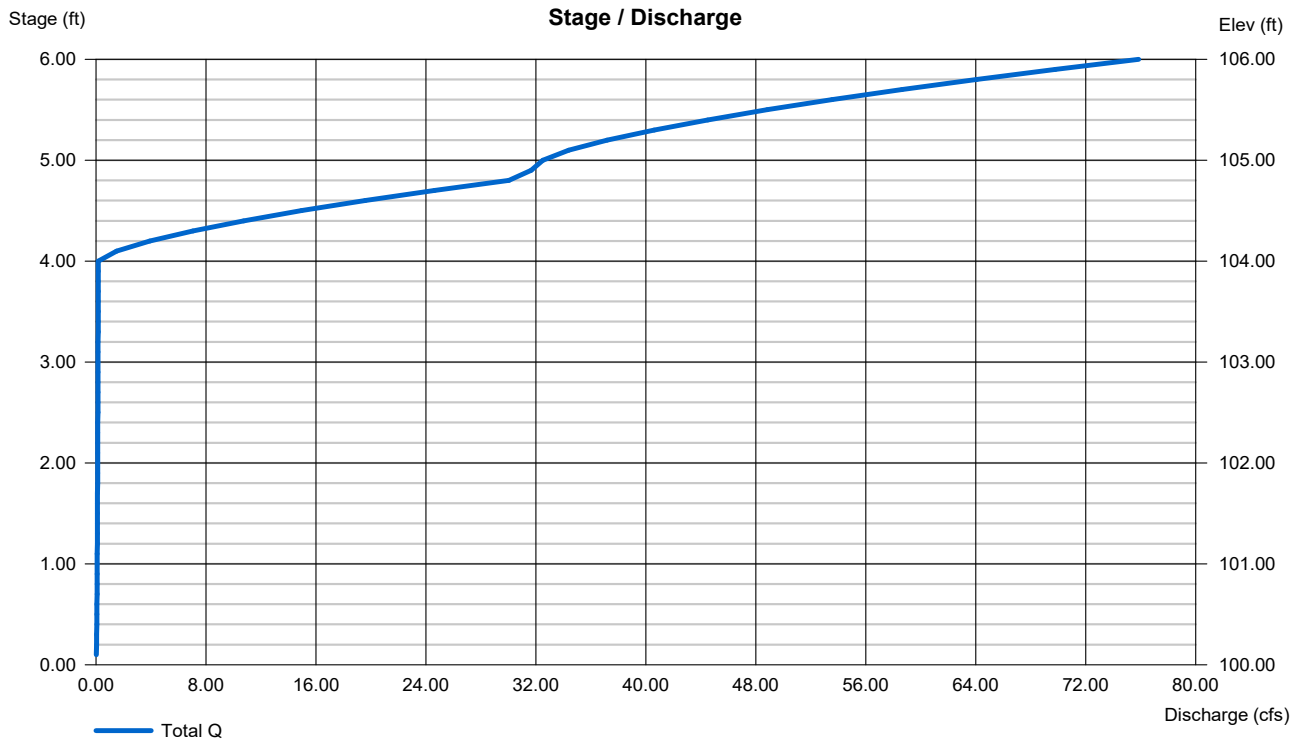
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]      | [PrfRsr] |
|-----------------|---------|--------|----------|----------|
| Rise (in)       | = 24.00 | 1.75   | Inactive | Inactive |
| Span (in)       | = 24.00 | 1.75   | 0.00     | 0.00     |
| No. Barrels     | = 1     | 1      | 1        | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 0.00     | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00     | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00     | n/a      |
| N-Value         | = .013  | .013   | .013     | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60     | 0.60     |
| Multi-Stage     | = n/a   | Yes    | Yes      | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]      | [D]      |
|----------------|-----------------------|--------|----------|----------|
| Crest Len (ft) | = 12.57               | 15.00  | Inactive | Inactive |
| Crest El. (ft) | = 104.00              | 105.00 | 0.00     | 0.00     |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33     | 3.33     |
| Weir Type      | = 1                   | Broad  | ---      | ---      |
| Multi-Stage    | = Yes                 | No     | No       | No       |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |          |          |
| TW Elev. (ft)  | = 0.00                |        |          |          |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

3

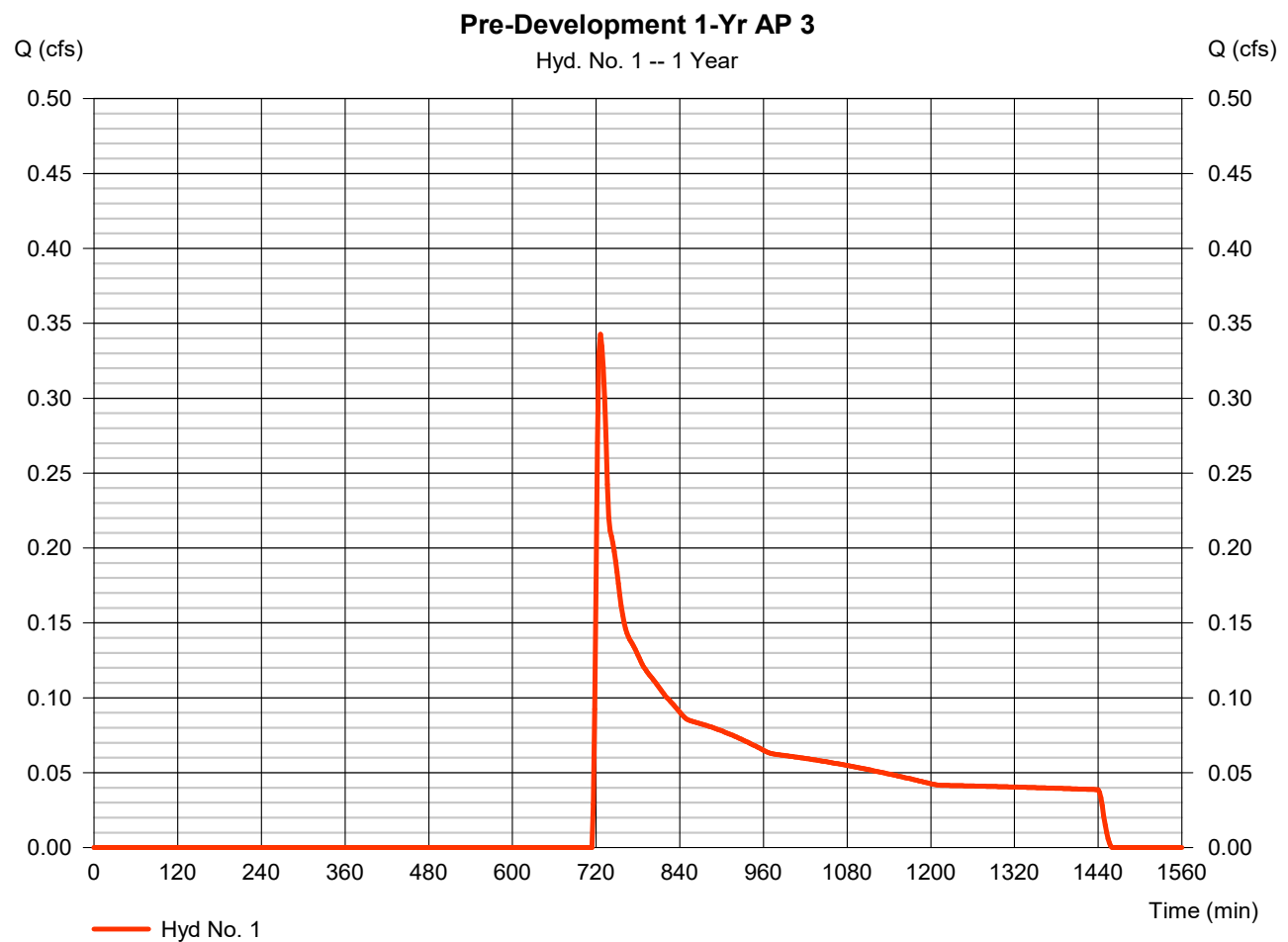
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Friday, 07 / 31 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 3

|                 |   |            |                    |   |            |
|-----------------|---|------------|--------------------|---|------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.343 cfs  |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 726 min    |
| Time interval   | = | 2 min      | Hyd. volume        | = | 3,076 cuft |
| Drainage area   | = | 4.230 ac   | Curve number       | = | 55         |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft       |
| Tc method       | = | User       | Time of conc. (Tc) | = | 12.30 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II    |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484        |





# Hydrograph Report

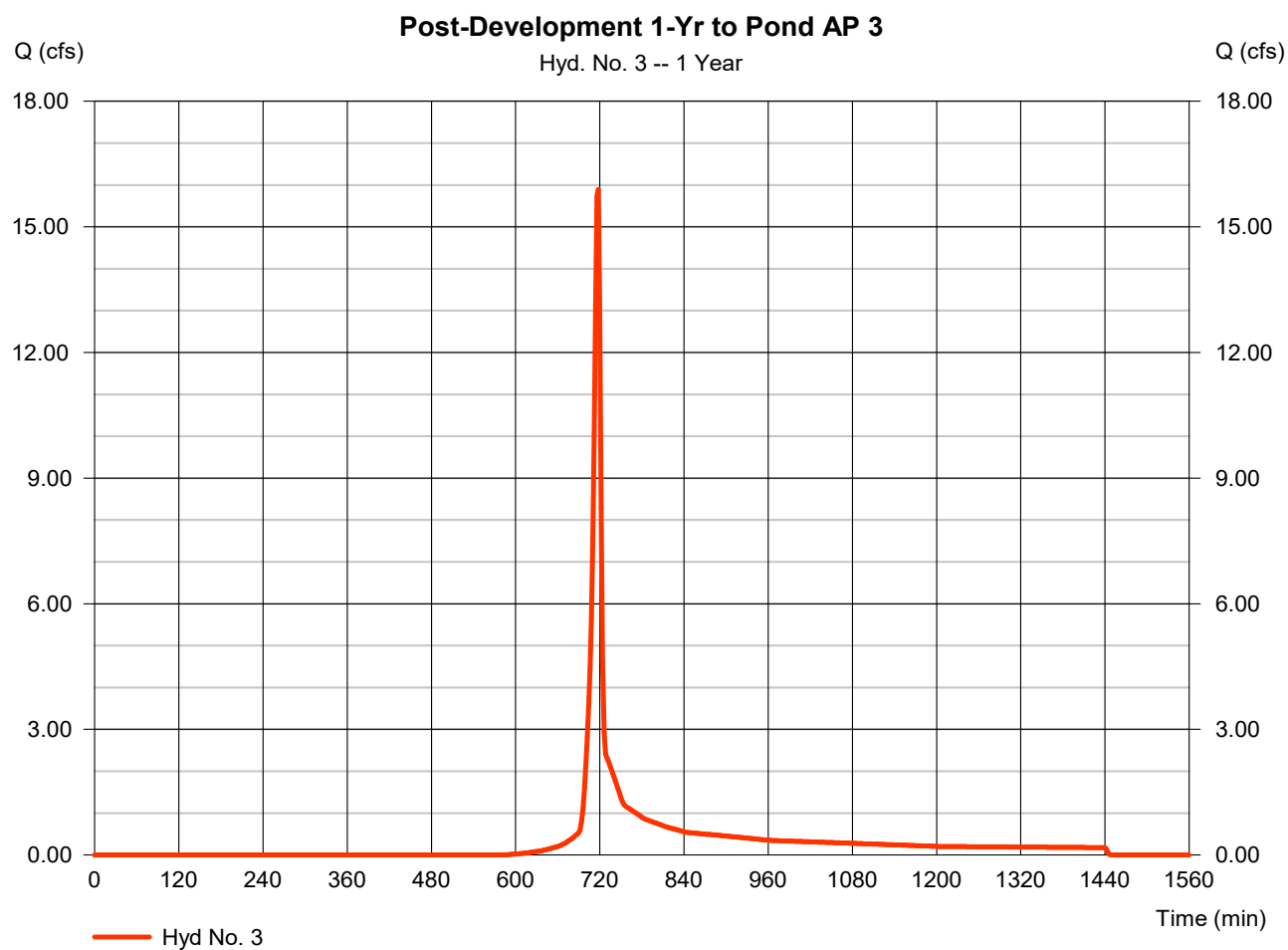
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 3

Post-Development 1-Yr to Pond AP 3

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 15.90 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 718 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 31,862 cuft |
| Drainage area   | = 7.490 ac   | Curve number       | = 80          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 3.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

5

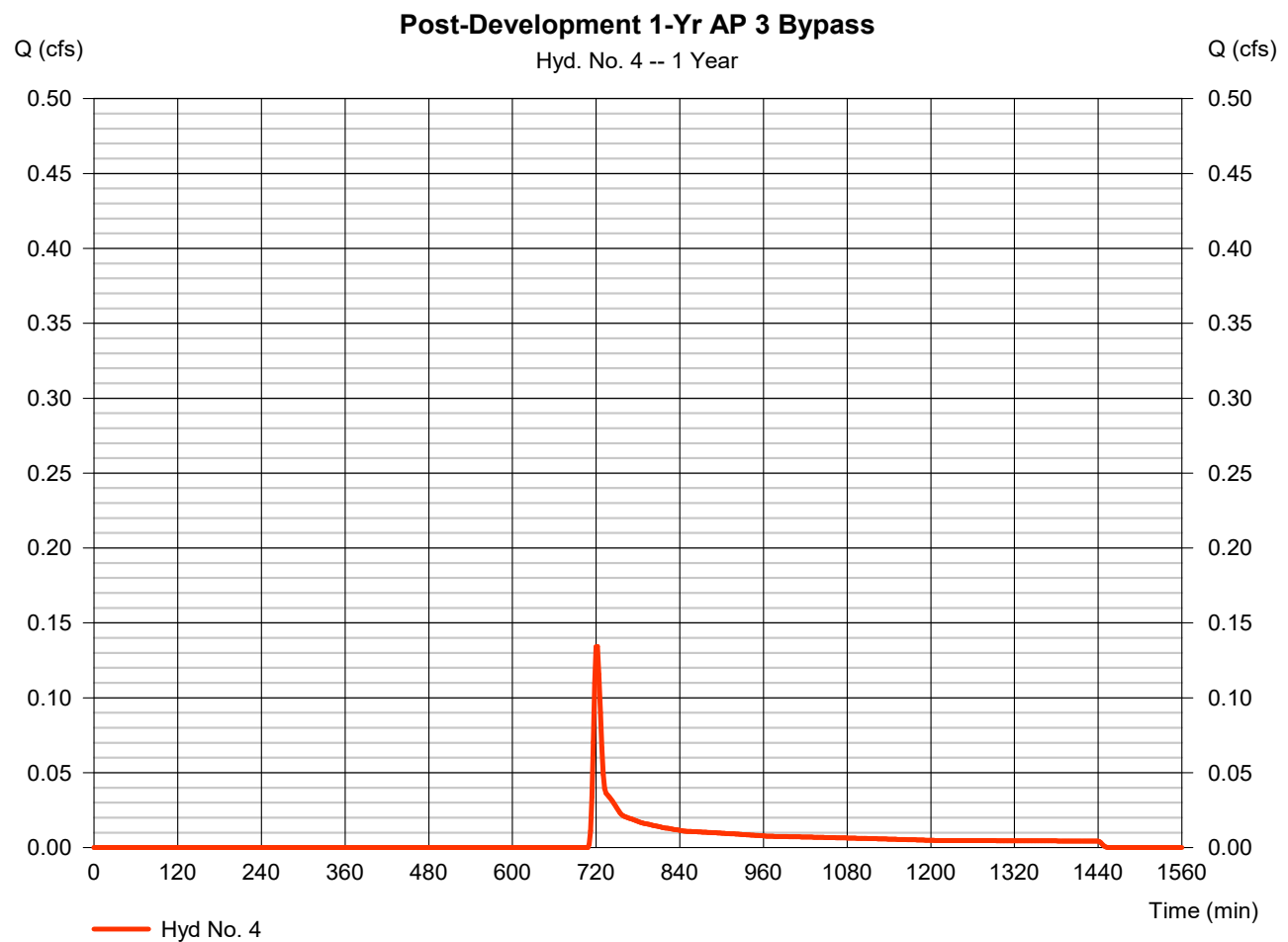
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 3 Bypass

|                 |   |            |                    |   |           |
|-----------------|---|------------|--------------------|---|-----------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.134 cfs |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 722 min   |
| Time interval   | = | 2 min      | Hyd. volume        | = | 451 cuft  |
| Drainage area   | = | 0.340 ac   | Curve number       | = | 61        |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft      |
| Tc method       | = | User       | Time of conc. (Tc) | = | 7.70 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II   |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484       |



# Hydrograph Report

6

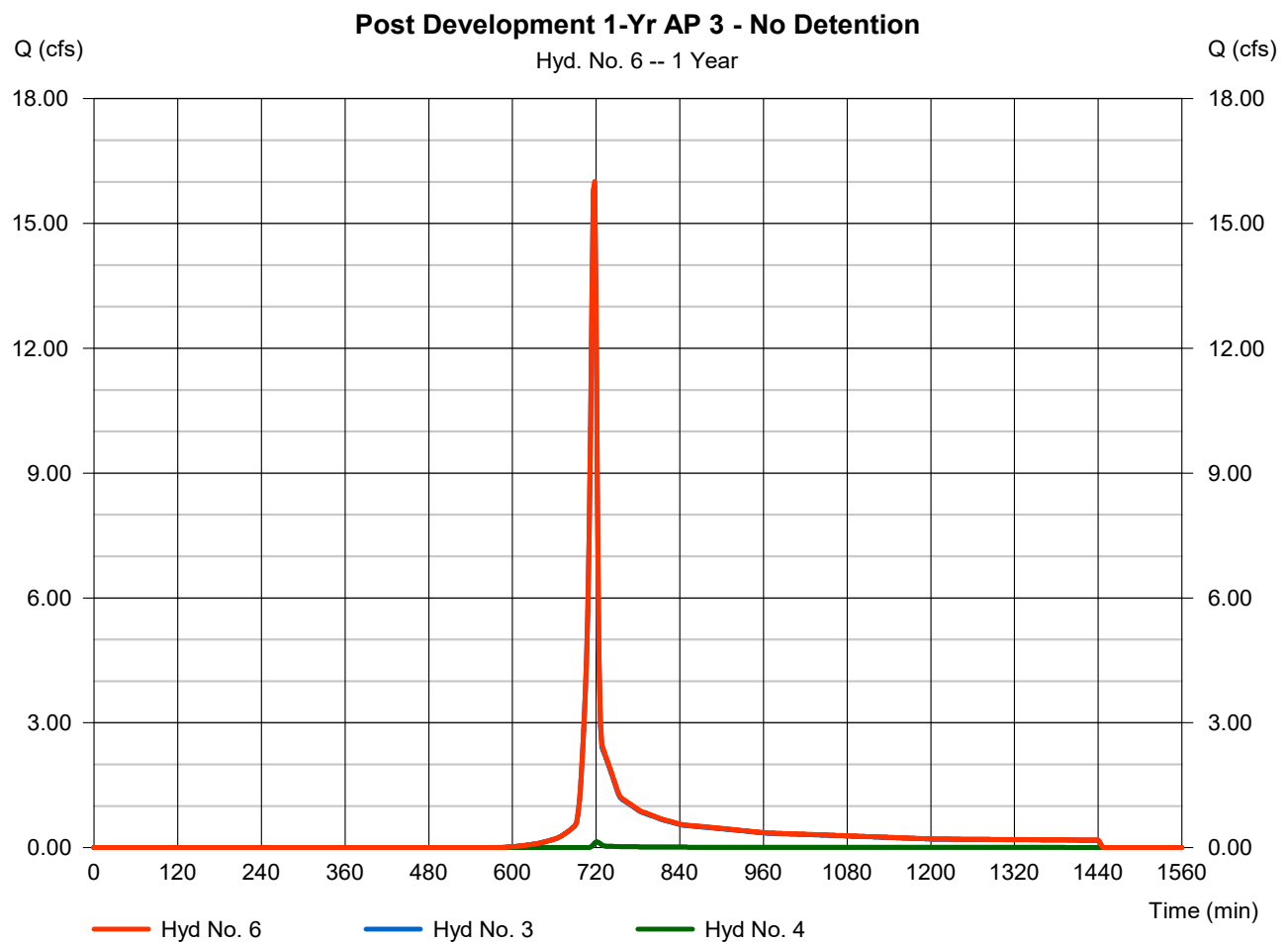
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 6

Post Development 1-Yr AP 3 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 16.01 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 32,312 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 7.830 ac    |



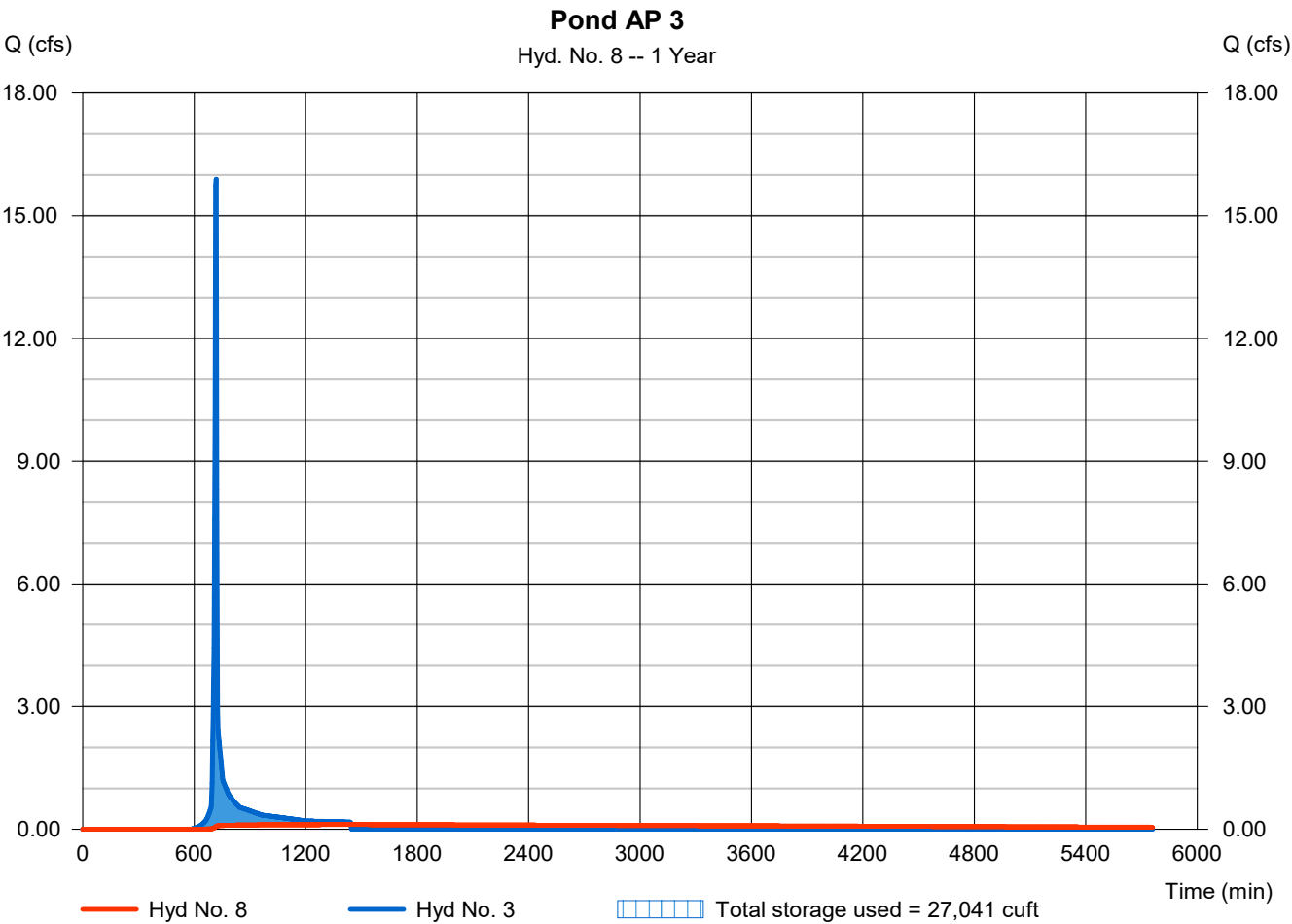
# Hydrograph Report

## Hyd. No. 8

Pond AP 3

|                 |                                          |                |               |
|-----------------|------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                              | Peak discharge | = 0.116 cfs   |
| Storm frequency | = 1 yrs                                  | Time to peak   | = 1442 min    |
| Time interval   | = 2 min                                  | Hyd. volume    | = 26,487 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Pond AP 3 | Max. Elevation | = 102.14 ft   |
| Reservoir name  | = Pond AP 3                              | Max. Storage   | = 27,041 cuft |

Storage Indication method used.

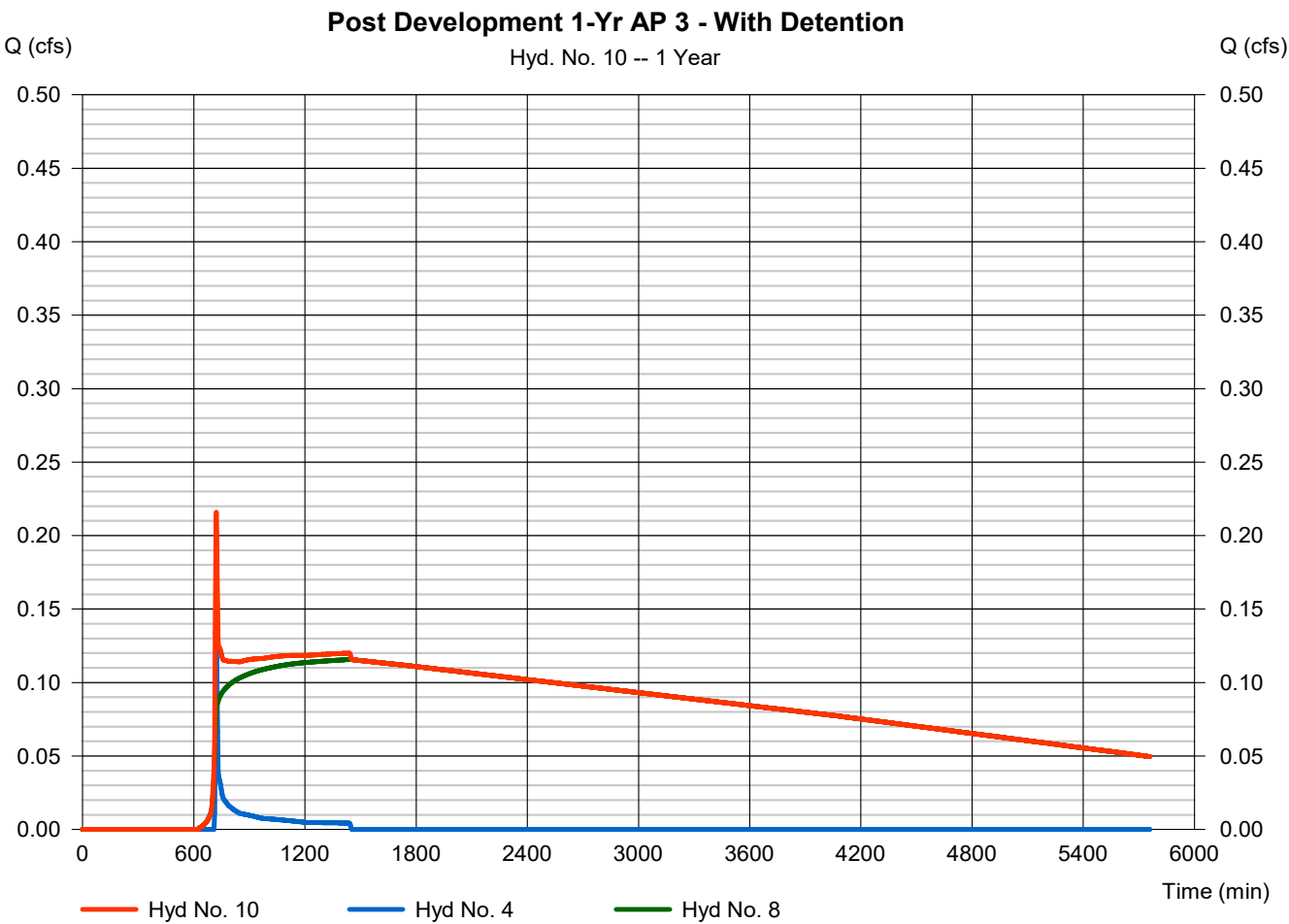


# Hydrograph Report

## Hyd. No. 10

Post Development 1-Yr AP 3 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.216 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 722 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 26,938 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 0.340 ac    |



## **Analysis Point 4**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                  | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|---------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                         | SCS Runoff               | 0.099           | 2                   | 726                | 887                   | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 4           |
| 3                         | SCS Runoff               | 26.74           | 2                   | 718                | 53,474                | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP 4  |
| 4                         | SCS Runoff               | 0.007           | 2                   | 720                | 40                    | -----         | -----                  | -----                   | Post-Development 1-Yr AP 4 Bypass   |
| 6                         | Combine                  | 26.74           | 2                   | 718                | 53,514                | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP 4 - No Det |
| 8                         | Reservoir                | 0.090           | 2                   | 1444               | 24,287                | 3             | 102.37                 | 49,828                  | Pond AP 4                           |
| 10                        | Combine                  | 0.090           | 2                   | 1440               | 24,326                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 4 - With D |
| L20017_Peak Flow AP 4.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Friday, 07 / 31 / 2020  |                                     |

# Pond Report

8

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Pond No. 4 - Pond AP 4

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 18,899              | 0                    | 0                    |
| 1.00       | 101.00         | 20,595              | 19,747               | 19,747               |
| 2.00       | 102.00         | 22,346              | 21,471               | 41,218               |
| 3.00       | 103.00         | 24,154              | 23,250               | 64,468               |
| 4.00       | 104.00         | 26,019              | 25,087               | 89,554               |
| 5.00       | 105.00         | 27,940              | 26,980               | 116,534              |
| 6.00       | 106.00         | 29,918              | 28,929               | 145,463              |

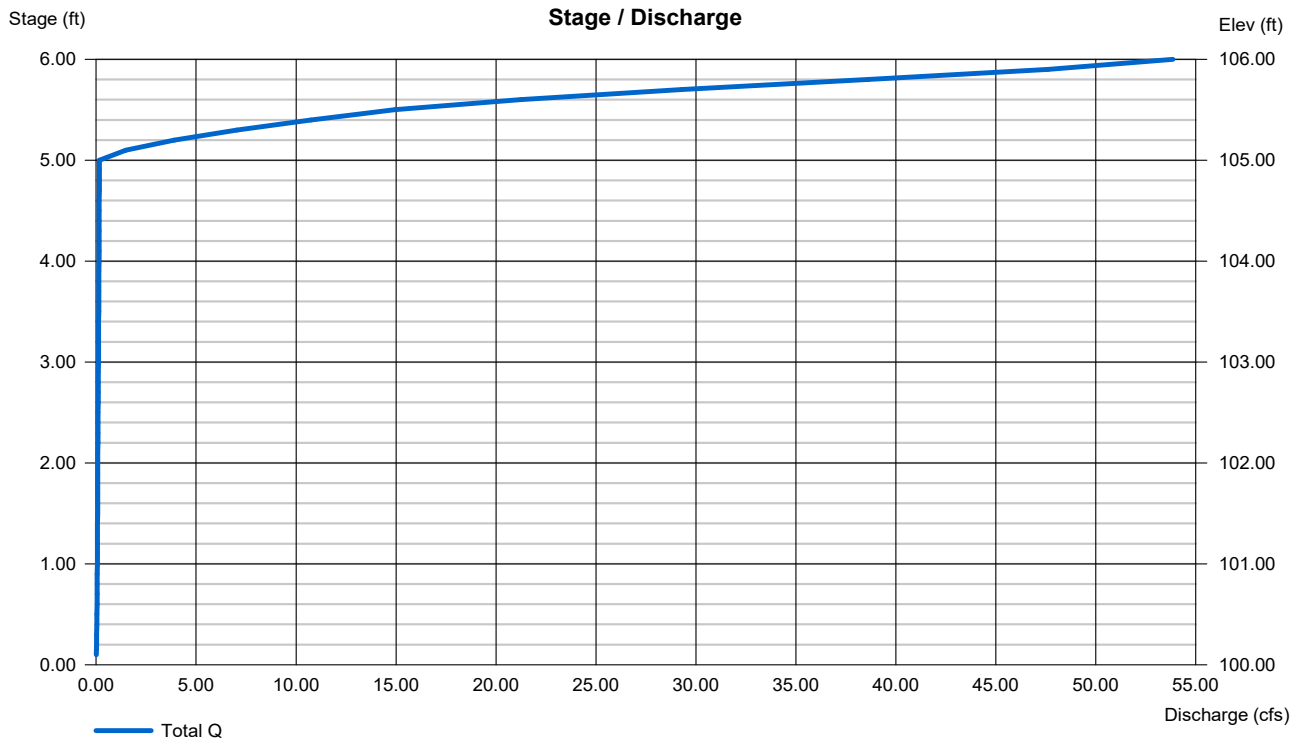
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 24.00 | 1.50   | 0.50   | Inactive |
| Span (in)       | = 24.00 | 1.50   | 0.50   | 0.00     |
| No. Barrels     | = 1     | 1      | 3      | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 102.50 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | Yes    | Yes    | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 20.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 105.00              | 105.50 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).





# Hydrograph Report

3

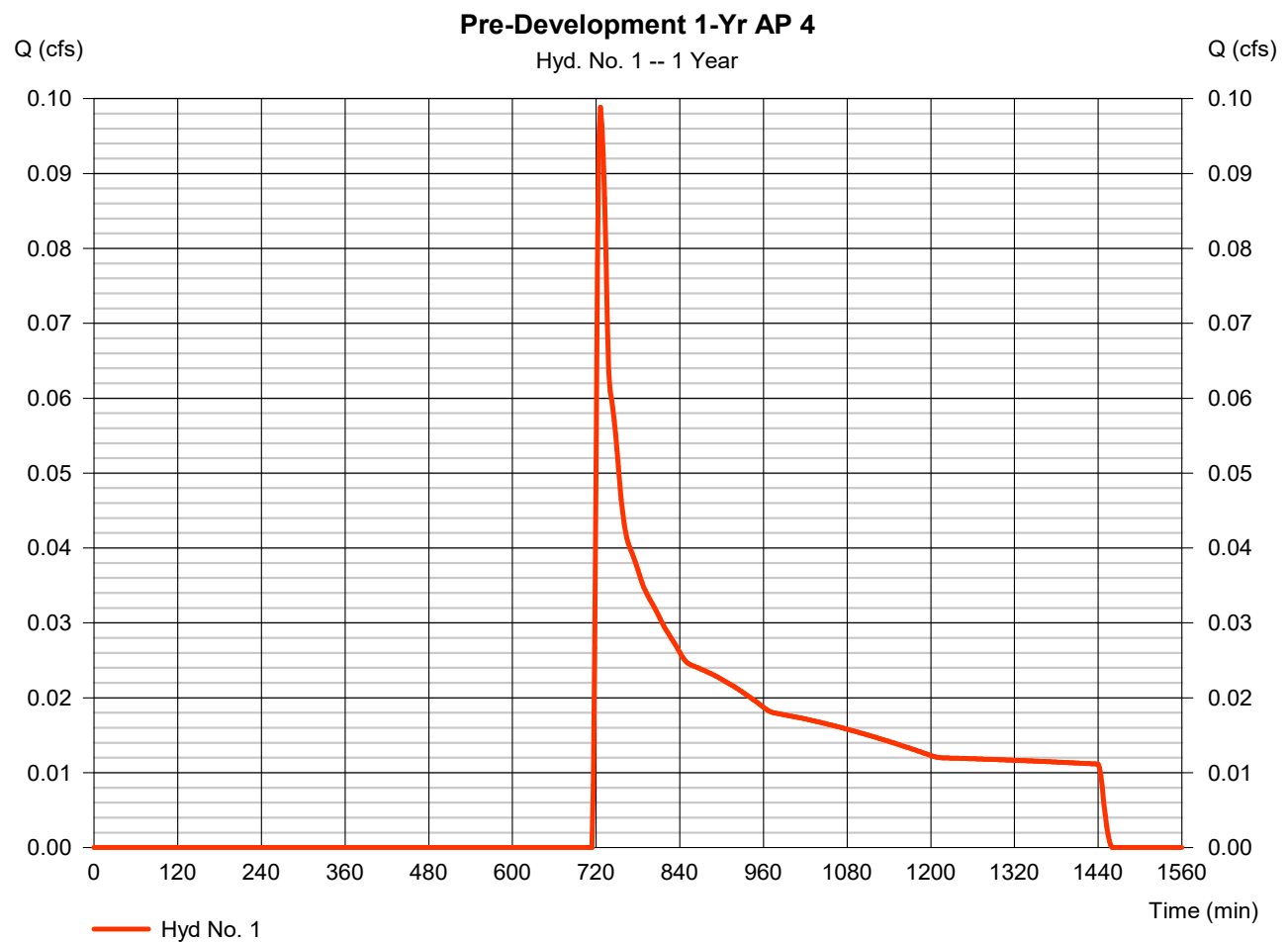
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 4

|                 |              |                    |             |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.099 cfs |
| Storm frequency | = 1 yrs      | Time to peak       | = 726 min   |
| Time interval   | = 2 min      | Hyd. volume        | = 887 cuft  |
| Drainage area   | = 1.220 ac   | Curve number       | = 55        |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft      |
| Tc method       | = User       | Time of conc. (Tc) | = 10.50 min |
| Total precip.   | = 3.00 in    | Distribution       | = Type II   |
| Storm duration  | = 24 hrs     | Shape factor       | = 484       |



# Hydrograph Report

4

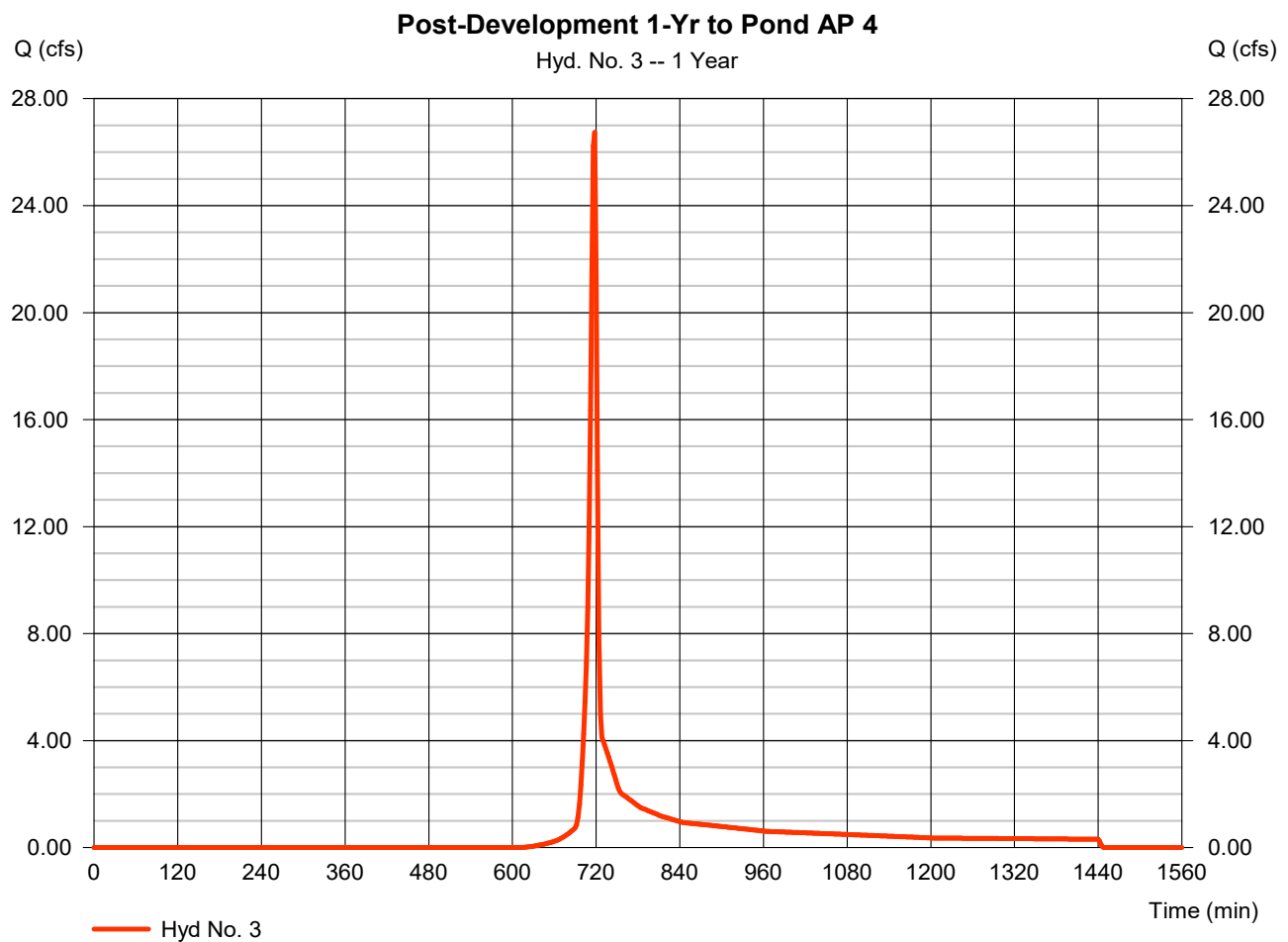
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 3

Post-Development 1-Yr to Pond AP 4

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 26.74 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 718 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 53,474 cuft |
| Drainage area   | = 13.920 ac  | Curve number       | = 78          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 3.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

5

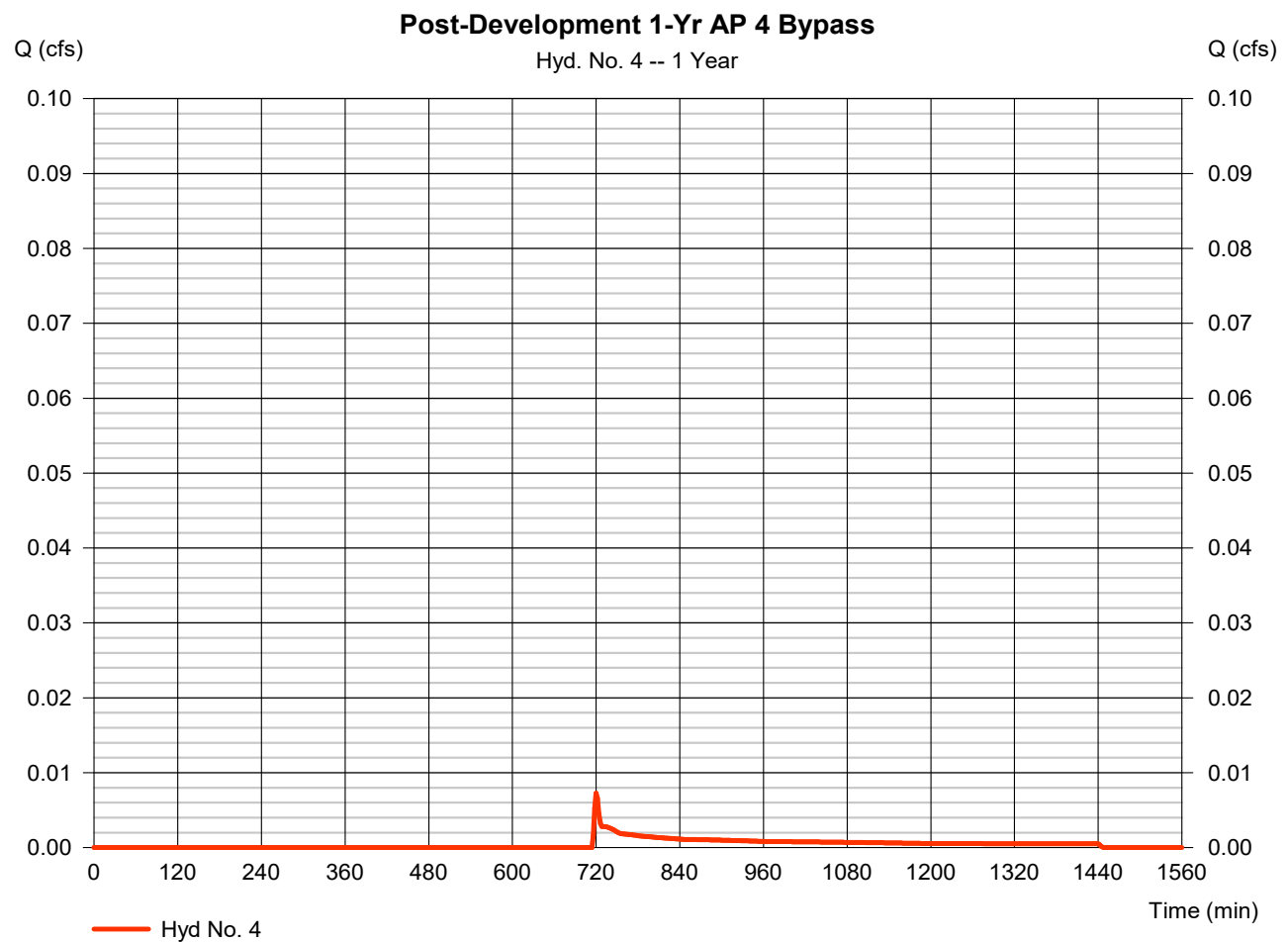
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 4 Bypass

|                 |              |                    |             |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.007 cfs |
| Storm frequency | = 1 yrs      | Time to peak       | = 720 min   |
| Time interval   | = 2 min      | Hyd. volume        | = 40 cuft   |
| Drainage area   | = 0.060 ac   | Curve number       | = 55        |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft      |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min  |
| Total precip.   | = 3.00 in    | Distribution       | = Type II   |
| Storm duration  | = 24 hrs     | Shape factor       | = 484       |



# Hydrograph Report

6

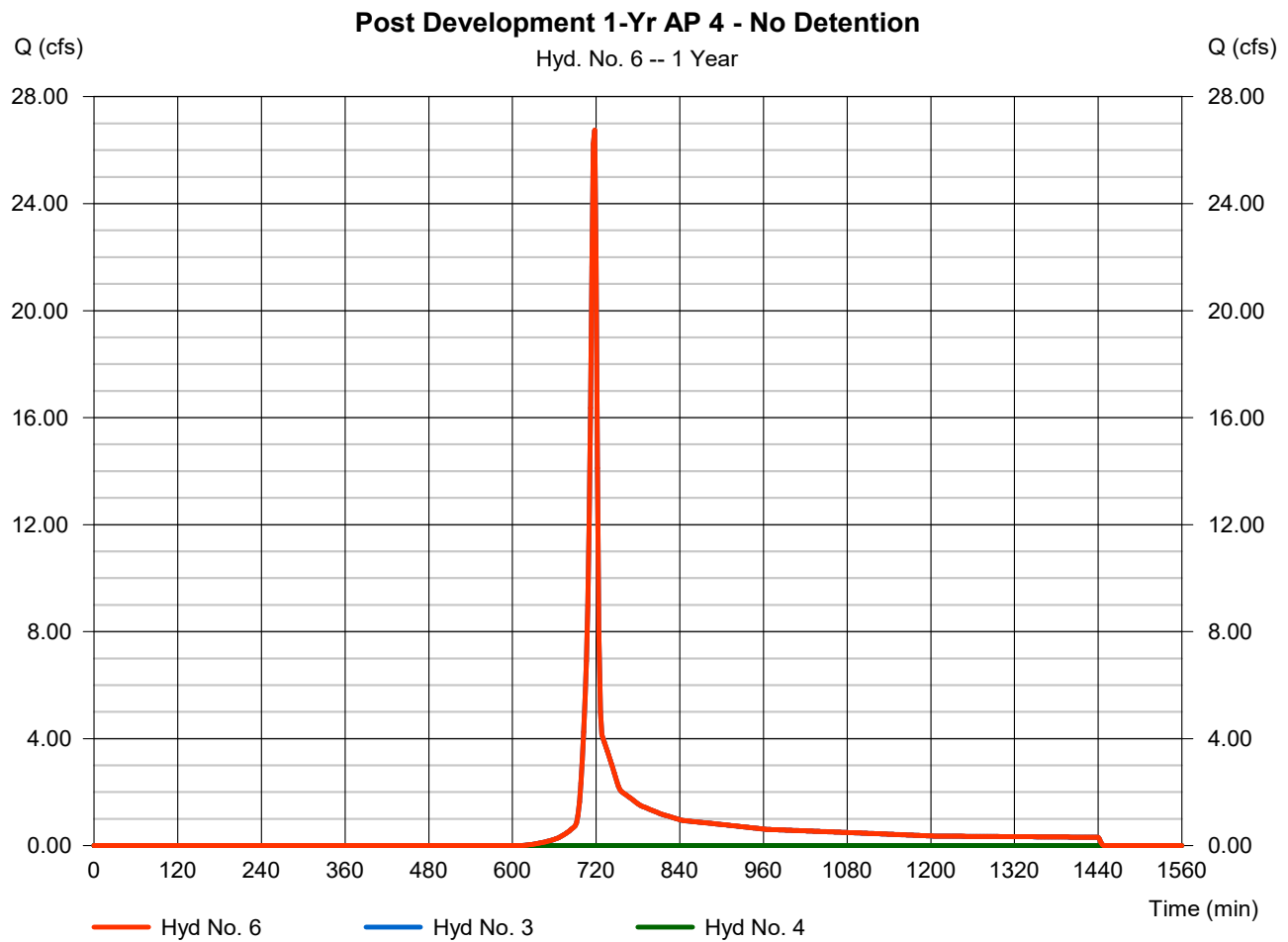
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 6

Post Development 1-Yr AP 4 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 26.74 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 53,514 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 13.980 ac   |



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

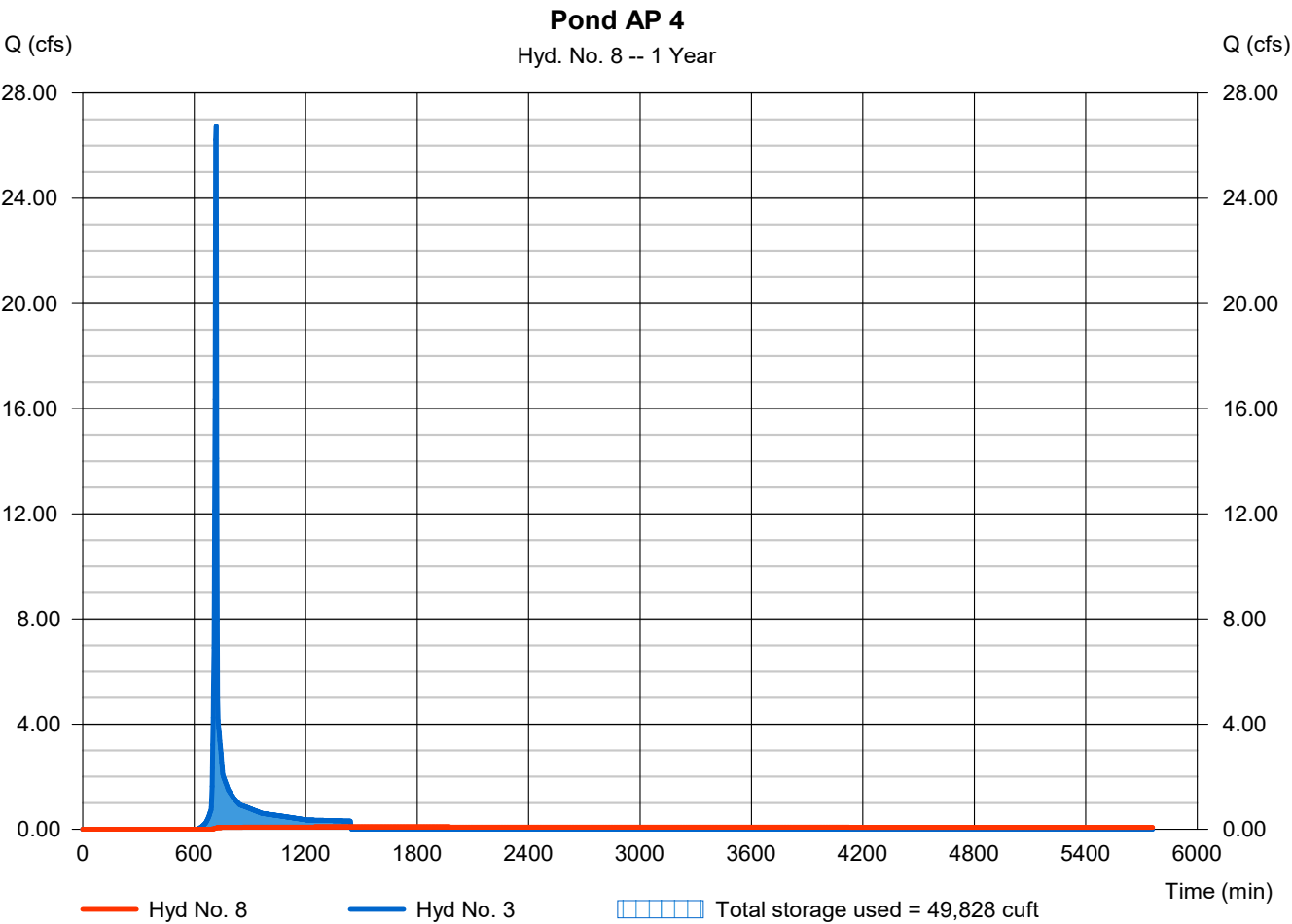
Friday, 07 / 31 / 2020

## Hyd. No. 8

Pond AP 4

|                 |                                          |                |               |
|-----------------|------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                              | Peak discharge | = 0.090 cfs   |
| Storm frequency | = 1 yrs                                  | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                  | Hyd. volume    | = 24,287 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Road AP 4 | Max. Elevation | = 102.37 ft   |
| Reservoir name  | = Pond AP 4                              | Max. Storage   | = 49,828 cuft |

Storage Indication method used.



# Hydrograph Report

9

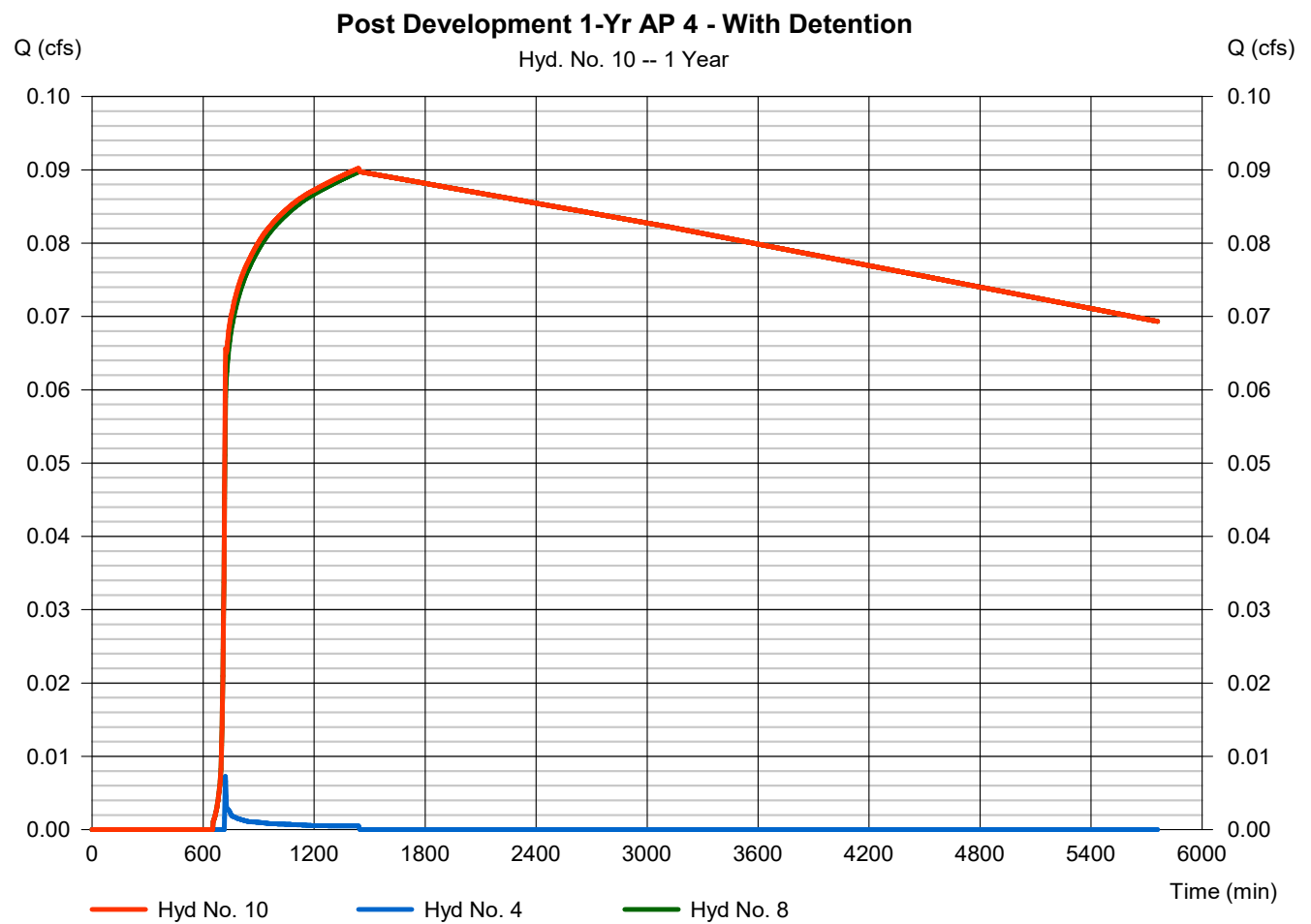
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 10

Post Development 1-Yr AP 4 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.090 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 1440 min    |
| Time interval   | = 2 min   | Hyd. volume          | = 24,326 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 0.060 ac    |



## **Analysis Point 5**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                  | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|---------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                         | SCS Runoff               | 0.360           | 2                   | 728                | 3,548                 | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 5           |
| 3                         | SCS Runoff               | 34.46           | 2                   | 718                | 68,959                | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP 5  |
| 4                         | SCS Runoff               | 0.153           | 2                   | 722                | 665                   | -----         | -----                  | -----                   | Post-Development 1-Yr AP 5 Bypass   |
| 6                         | Combine                  | 34.56           | 2                   | 718                | 69,624                | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP 5 - No Det |
| 8                         | Reservoir                | 0.187           | 2                   | 1444               | 47,109                | 3             | 102.07                 | 61,260                  | Pond AP 5                           |
| 10                        | Combine                  | 0.284           | 2                   | 722                | 47,774                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 5 - With D |
| L20017_Peak Flow AP 5.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |



# Pond Report

7

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Pond No. 5 - Pond AP 5

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 24,956              | 0                    | 0                    |
| 1.00       | 101.00         | 26,842              | 25,899               | 25,899               |
| 2.00       | 102.00         | 38,783              | 32,813               | 58,712               |
| 3.00       | 103.00         | 30,781              | 34,782               | 93,494               |
| 4.00       | 104.00         | 32,836              | 31,809               | 125,302              |
| 5.00       | 105.00         | 34,947              | 33,892               | 159,194              |

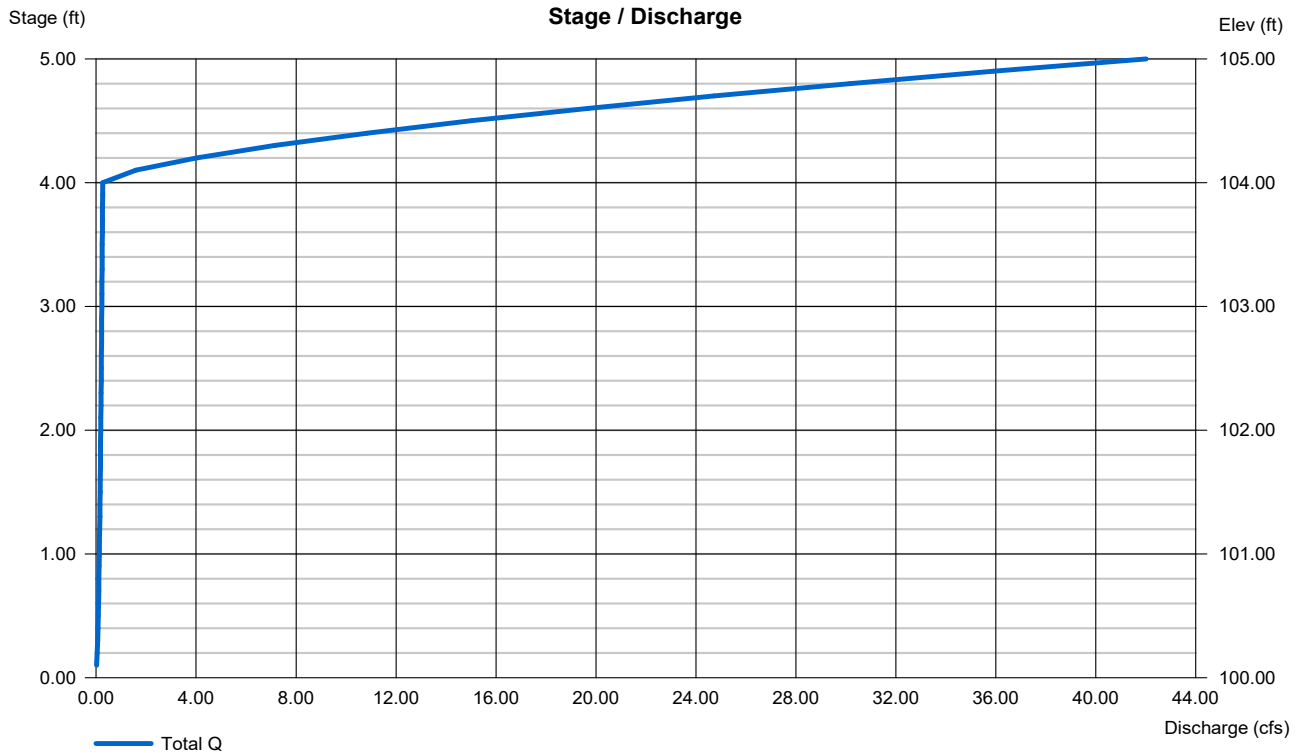
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]  | [PrfRsr] |
|-----------------|---------|--------|------|----------|
| Rise (in)       | = 30.00 | 2.25   | 0.00 | 0.00     |
| Span (in)       | = 30.00 | 2.25   | 0.00 | 0.00     |
| No. Barrels     | = 1     | 1      | 1    | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 0.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00 | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00 | n/a      |
| N-Value         | = .013  | .013   | .013 | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60 | 0.60     |
| Multi-Stage     | = n/a   | Yes    | No   | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 20.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 104.00              | 105.00 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

2

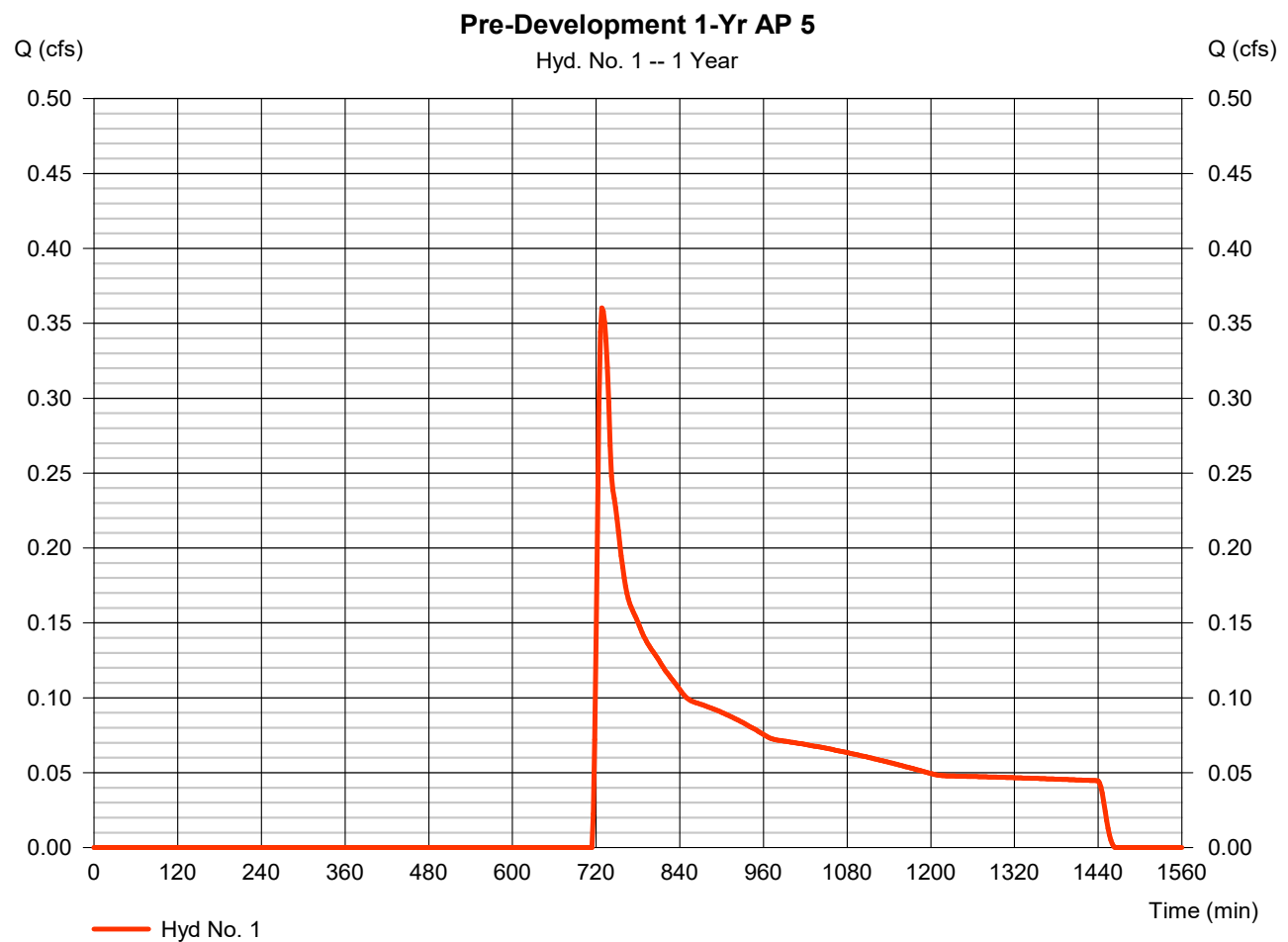
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 5

|                 |   |            |                    |   |            |
|-----------------|---|------------|--------------------|---|------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.360 cfs  |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 728 min    |
| Time interval   | = | 2 min      | Hyd. volume        | = | 3,548 cuft |
| Drainage area   | = | 5.160 ac   | Curve number       | = | 55         |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft       |
| Tc method       | = | User       | Time of conc. (Tc) | = | 15.30 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II    |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484        |



# Hydrograph Report

3

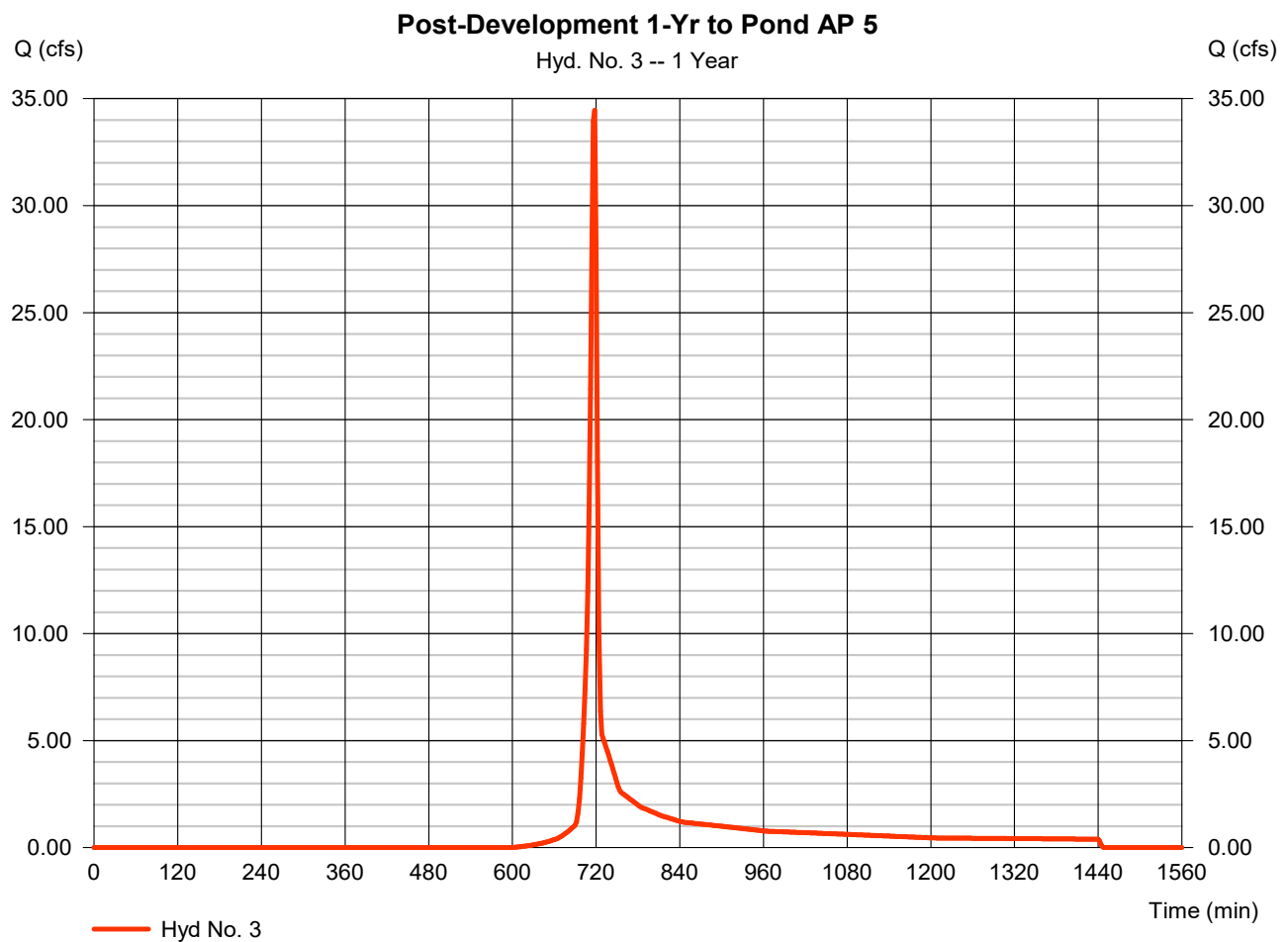
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 3

Post-Development 1-Yr to Pond AP 5

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 34.46 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 718 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 68,959 cuft |
| Drainage area   | = 17.050 ac  | Curve number       | = 79          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 3.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

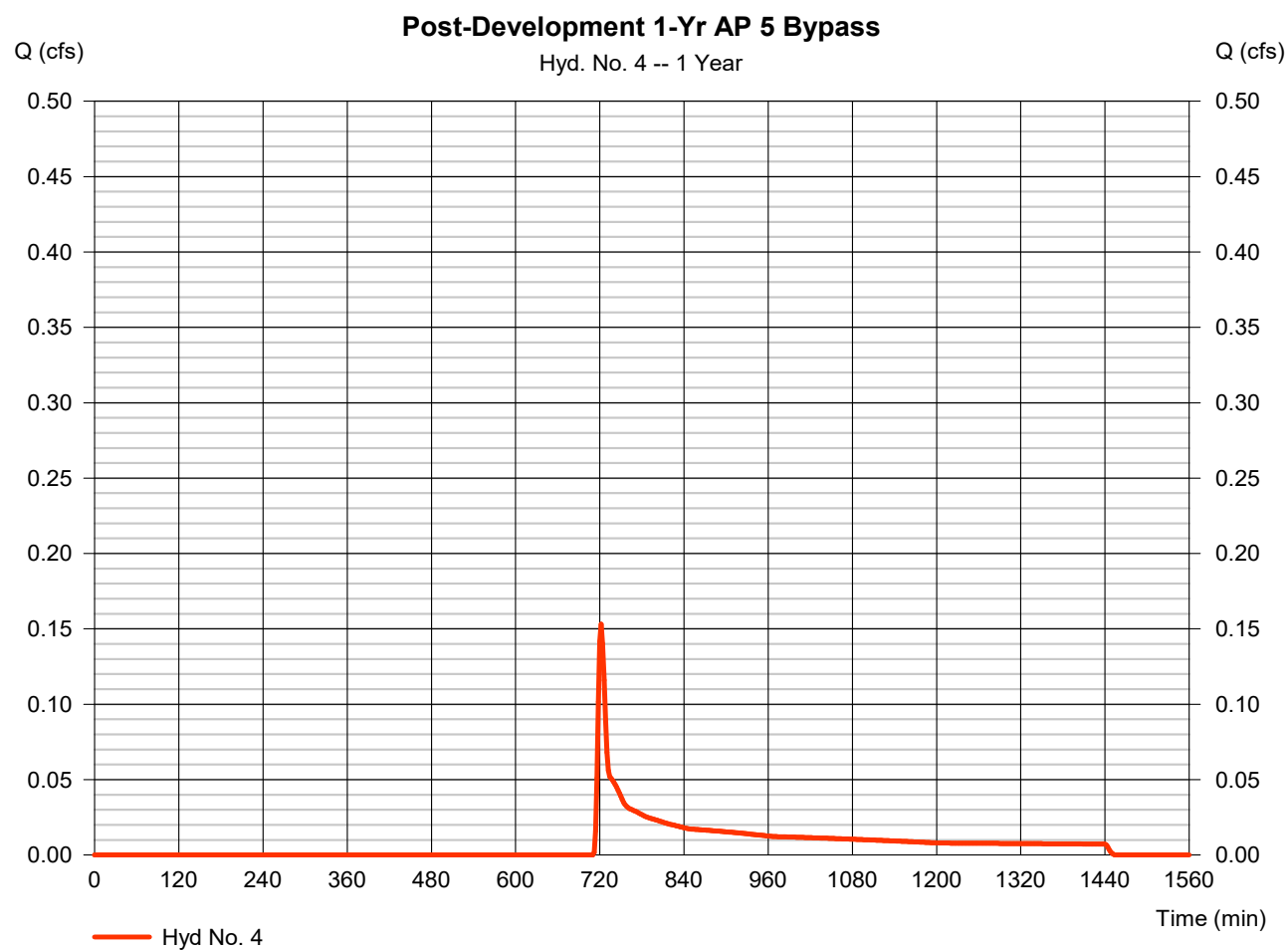
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 5 Bypass

|                 |              |                    |             |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.153 cfs |
| Storm frequency | = 1 yrs      | Time to peak       | = 722 min   |
| Time interval   | = 2 min      | Hyd. volume        | = 665 cuft  |
| Drainage area   | = 0.670 ac   | Curve number       | = 58        |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft      |
| Tc method       | = User       | Time of conc. (Tc) | = 8.10 min  |
| Total precip.   | = 3.00 in    | Distribution       | = Type II   |
| Storm duration  | = 24 hrs     | Shape factor       | = 484       |

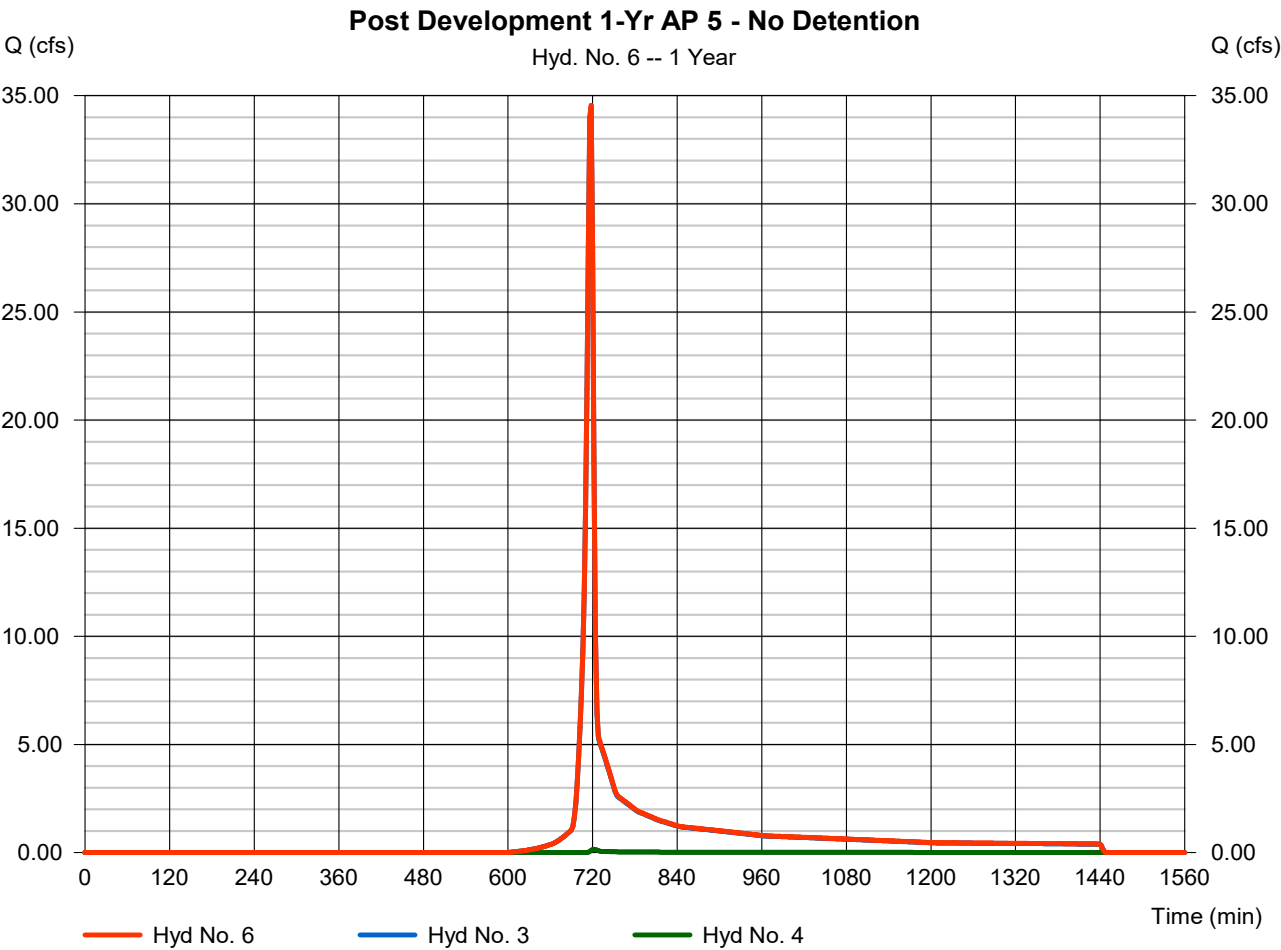


# Hydrograph Report

## Hyd. No. 6

Post Development 1-Yr AP 5 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 34.56 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 69,624 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 17.720 ac   |



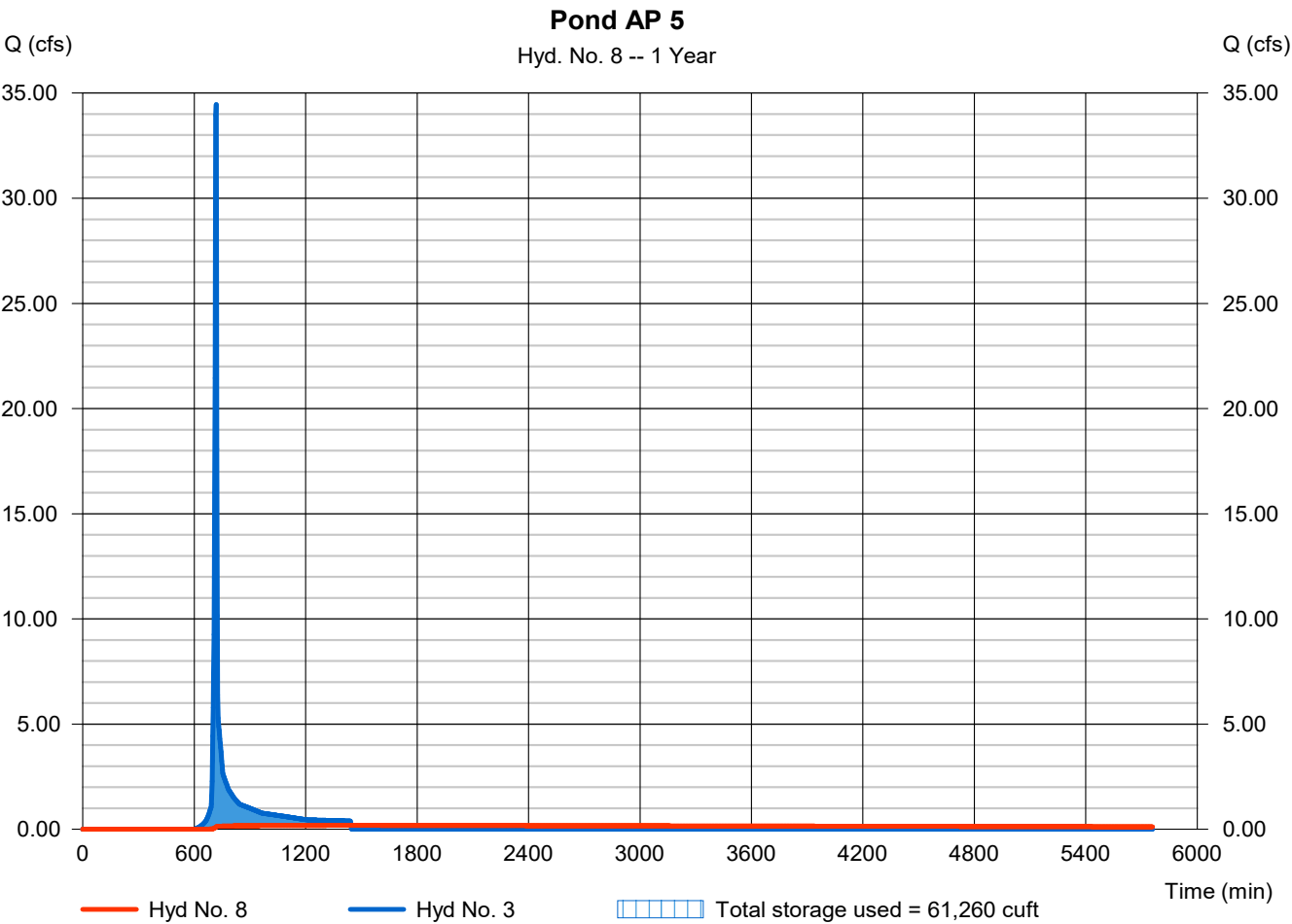
# Hydrograph Report

## Hyd. No. 8

Pond AP 5

|                 |                                          |                |               |
|-----------------|------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                              | Peak discharge | = 0.187 cfs   |
| Storm frequency | = 1 yrs                                  | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                  | Hyd. volume    | = 47,109 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Pond AP 5 | Max. Elevation | = 102.07 ft   |
| Reservoir name  | = Pond AP 5                              | Max. Storage   | = 61,260 cuft |

Storage Indication method used.



# Hydrograph Report

8

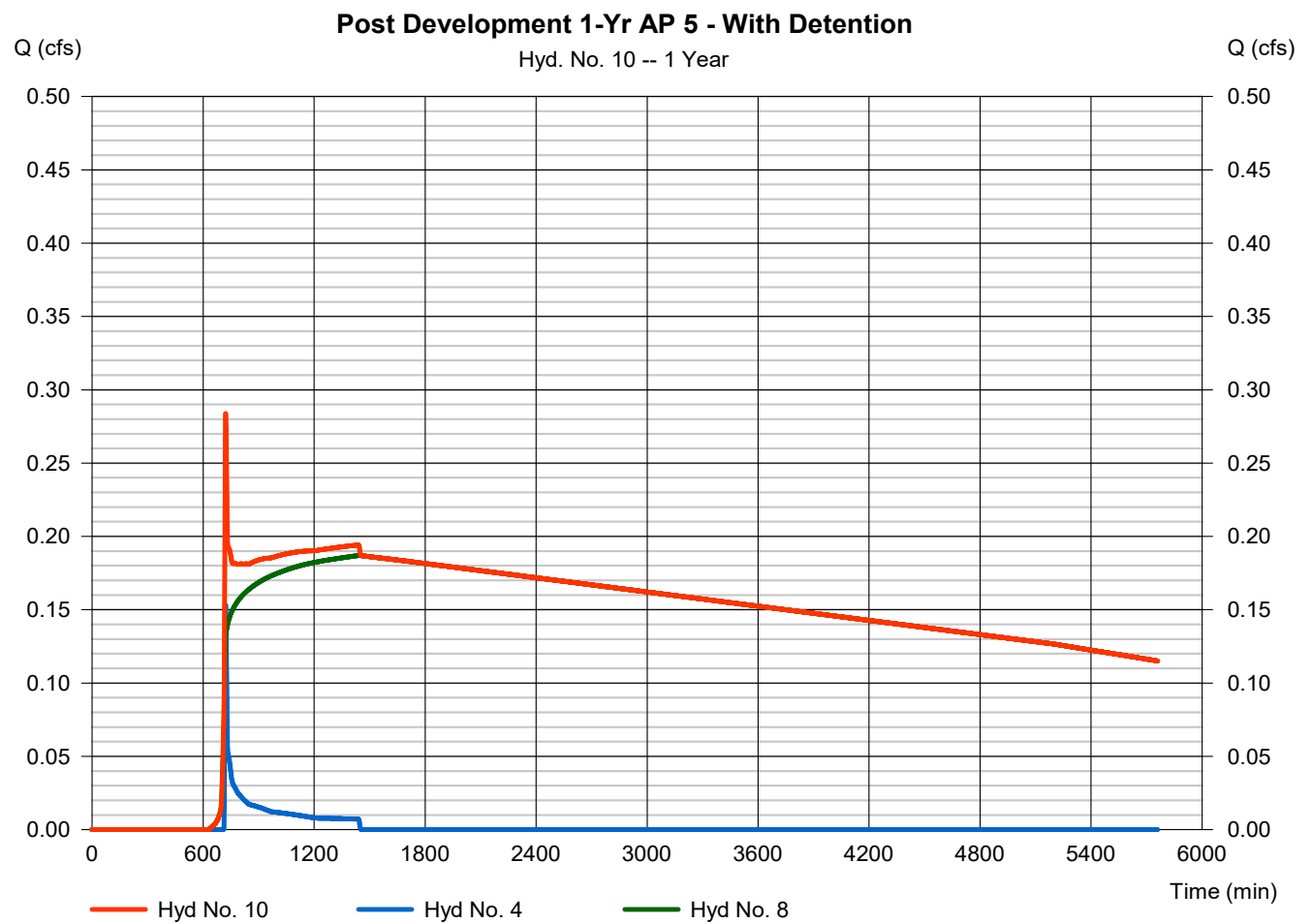
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Tuesday, 09 / 29 / 2020

## Hyd. No. 10

Post Development 1-Yr AP 5 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.284 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 722 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 47,774 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 0.670 ac    |



## **Analysis Point 6**



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                  | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|---------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                         | SCS Runoff               | 0.096           | 2                   | 728                | 770                   | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 6           |
| 3                         | SCS Runoff               | 17.47           | 2                   | 718                | 35,010                | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP 6  |
| 4                         | SCS Runoff               | 0.046           | 2                   | 722                | 199                   | -----         | -----                  | -----                   | Post-Development 1-Yr AP 6 Bypass   |
| 6                         | Combine                  | 17.50           | 2                   | 718                | 35,208                | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP 6 - No Det |
| 8                         | Reservoir                | 0.064           | 2                   | 1444               | 16,504                | 3             | 102.23                 | 32,476                  | Pond AP 6                           |
| 10                        | Combine                  | 0.087           | 2                   | 722                | 16,703                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 6 - With D |
| L20017_Peak Flow AP 6.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |

# Pond Report

7

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Pond No. 6 - Pond AP 6

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 12,824              | 0                    | 0                    |
| 1.00       | 101.00         | 14,305              | 13,565               | 13,565               |
| 2.00       | 102.00         | 15,842              | 15,074               | 28,638               |
| 3.00       | 103.00         | 17,345              | 16,594               | 45,232               |
| 4.00       | 104.00         | 19,086              | 18,216               | 63,447               |
| 5.00       | 105.00         | 20,793              | 19,940               | 83,387               |

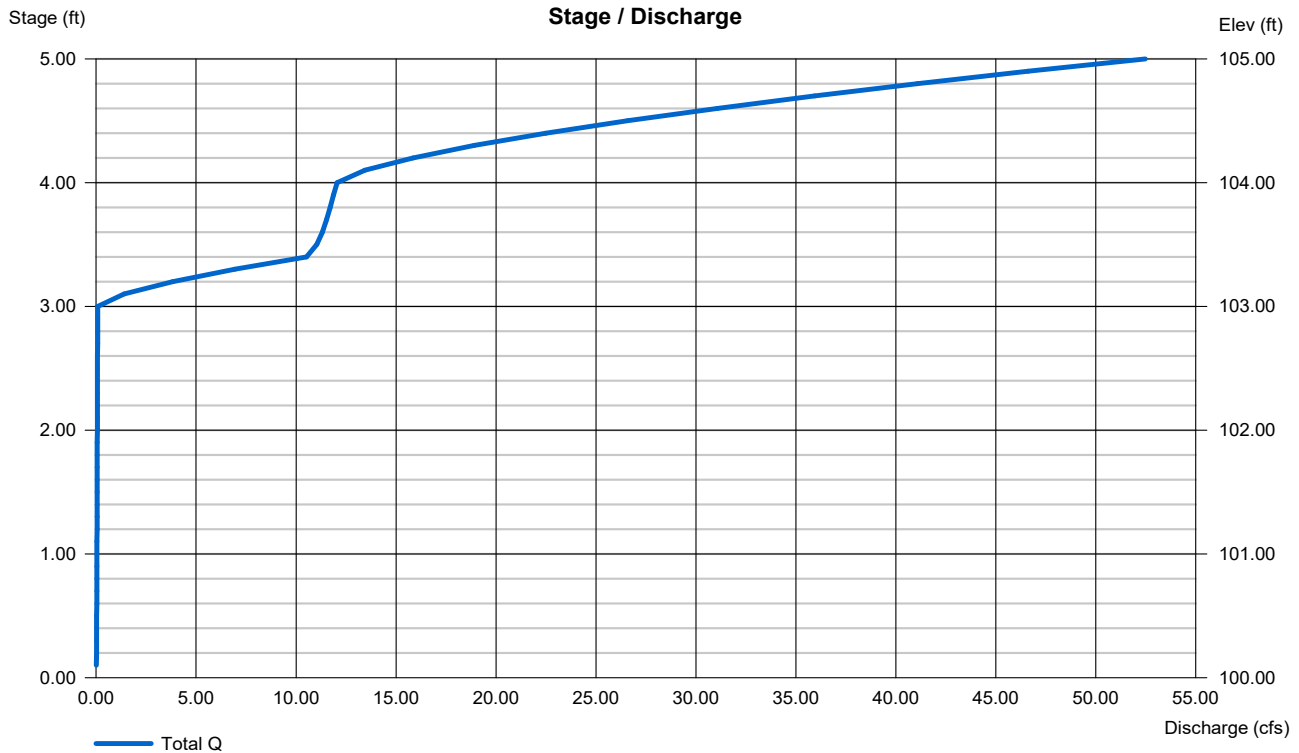
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 15.00 | 1.25   | 0.50   | 0.00     |
| Span (in)       | = 15.00 | 1.25   | 0.50   | 0.00     |
| No. Barrels     | = 1     | 1      | 1      | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 102.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | Yes    | Yes    | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 15.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 103.00              | 104.00 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

2

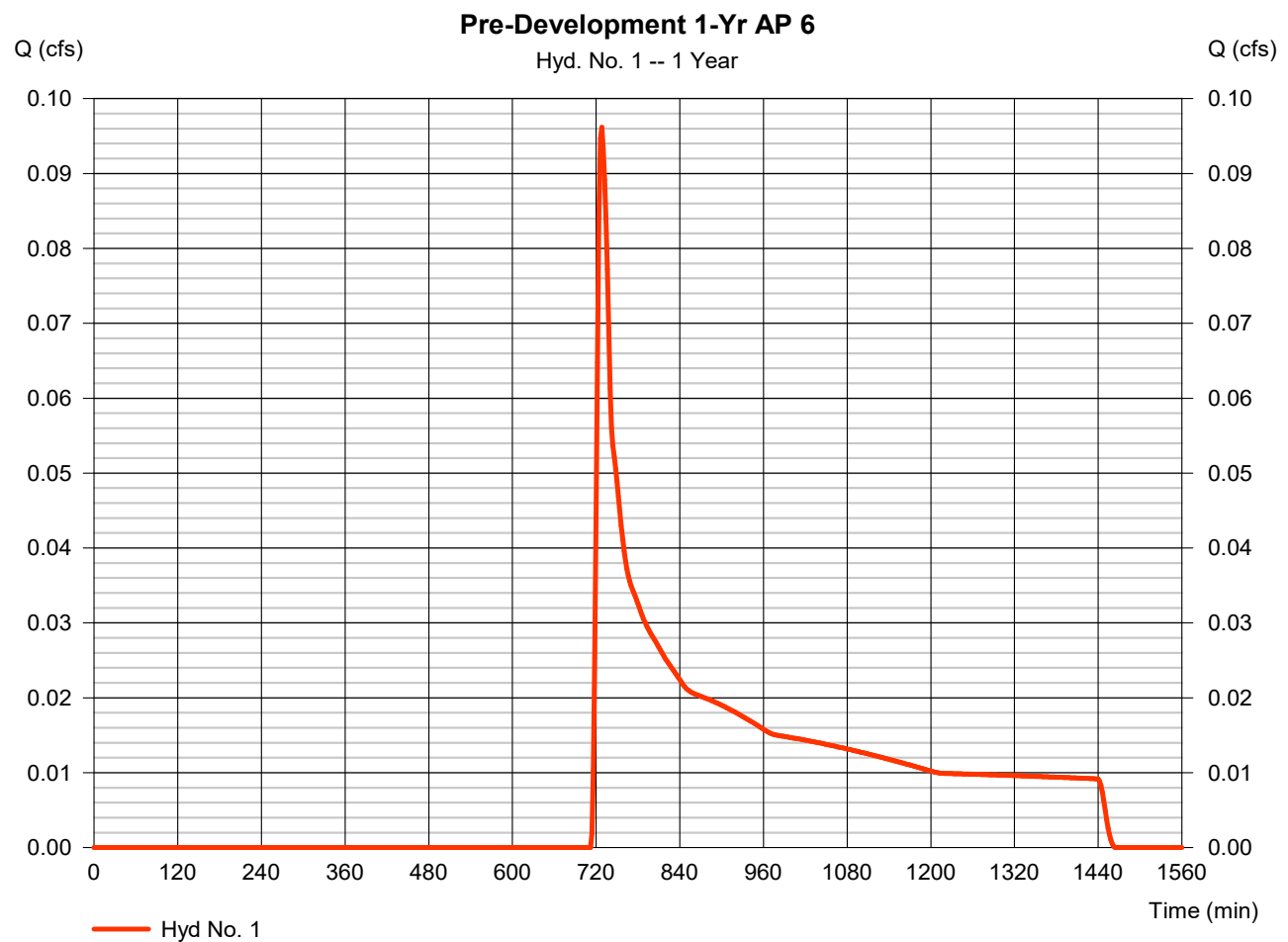
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Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 6

|                 |   |            |                    |   |           |
|-----------------|---|------------|--------------------|---|-----------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.096 cfs |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 728 min   |
| Time interval   | = | 2 min      | Hyd. volume        | = | 770 cuft  |
| Drainage area   | = | 0.990 ac   | Curve number       | = | 56        |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft      |
| Tc method       | = | User       | Time of conc. (Tc) | = | 15.20 min |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II   |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484       |



# Hydrograph Report

3

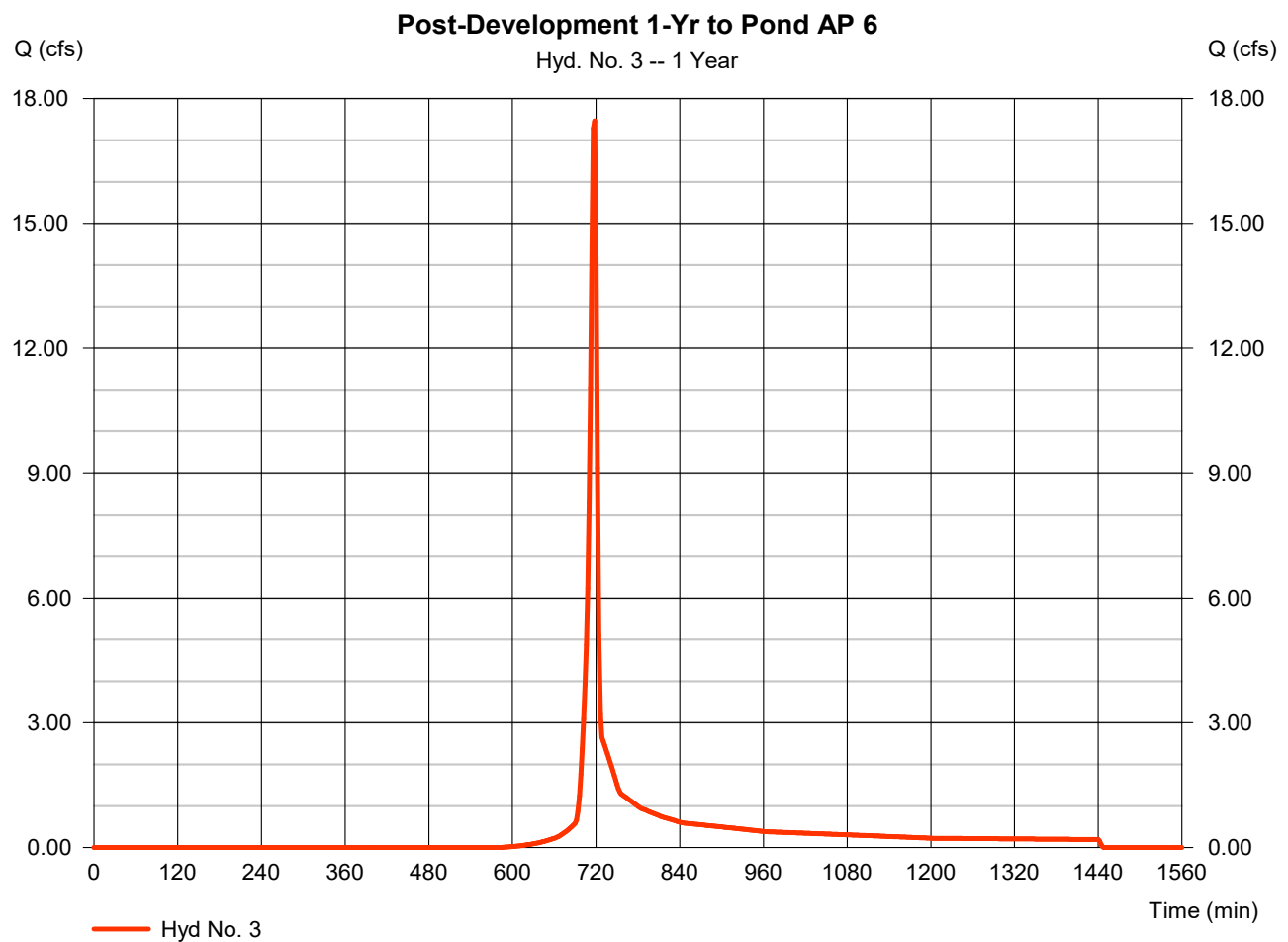
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

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## Hyd. No. 3

Post-Development 1-Yr to Pond AP 6

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 17.47 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 718 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 35,010 cuft |
| Drainage area   | = 8.230 ac   | Curve number       | = 80          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 3.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

4

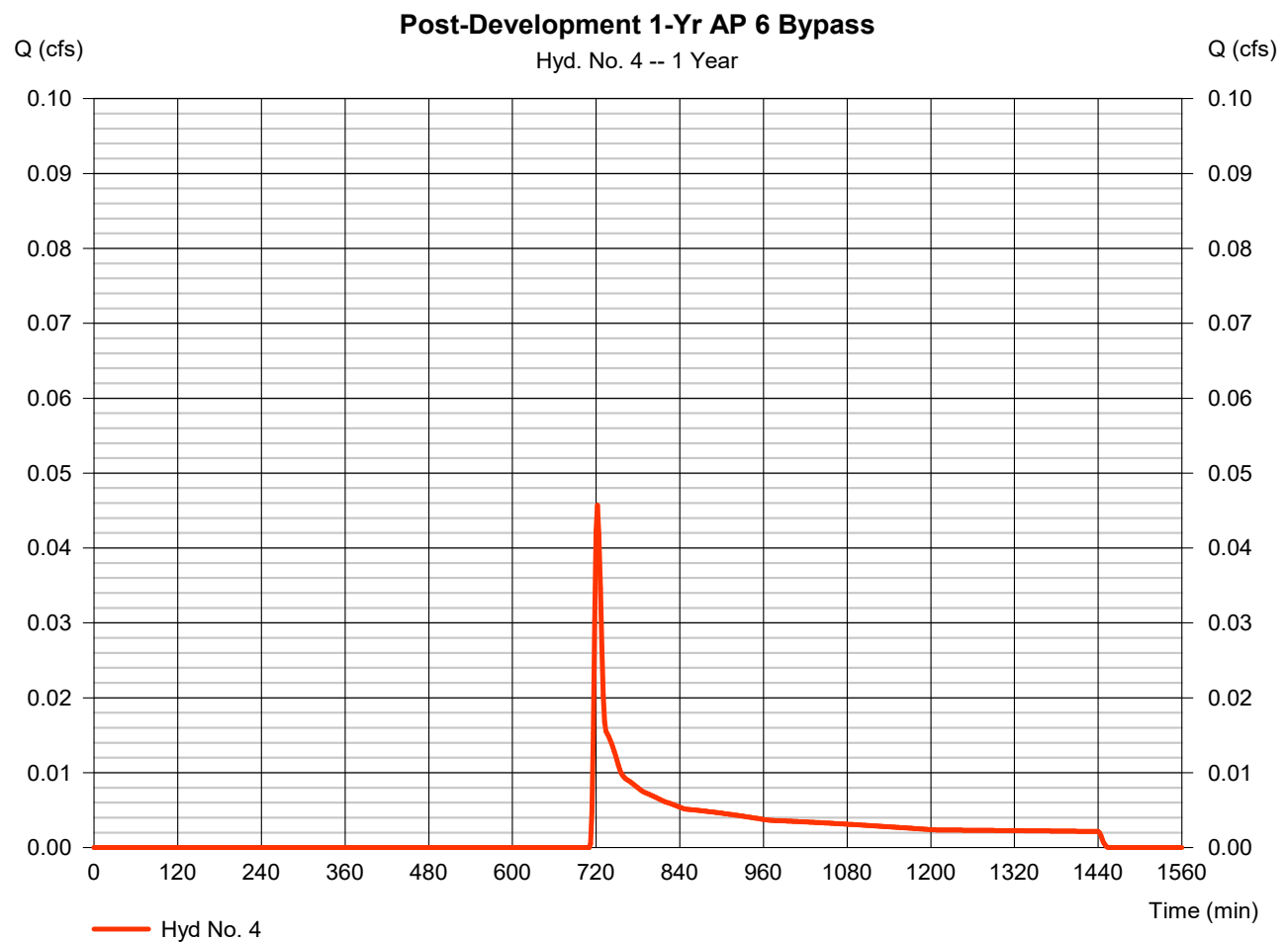
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 6 Bypass

|                 |   |            |                    |   |           |
|-----------------|---|------------|--------------------|---|-----------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.046 cfs |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 722 min   |
| Time interval   | = | 2 min      | Hyd. volume        | = | 199 cuft  |
| Drainage area   | = | 0.200 ac   | Curve number       | = | 58        |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft      |
| Tc method       | = | User       | Time of conc. (Tc) | = | 8.40 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II   |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484       |

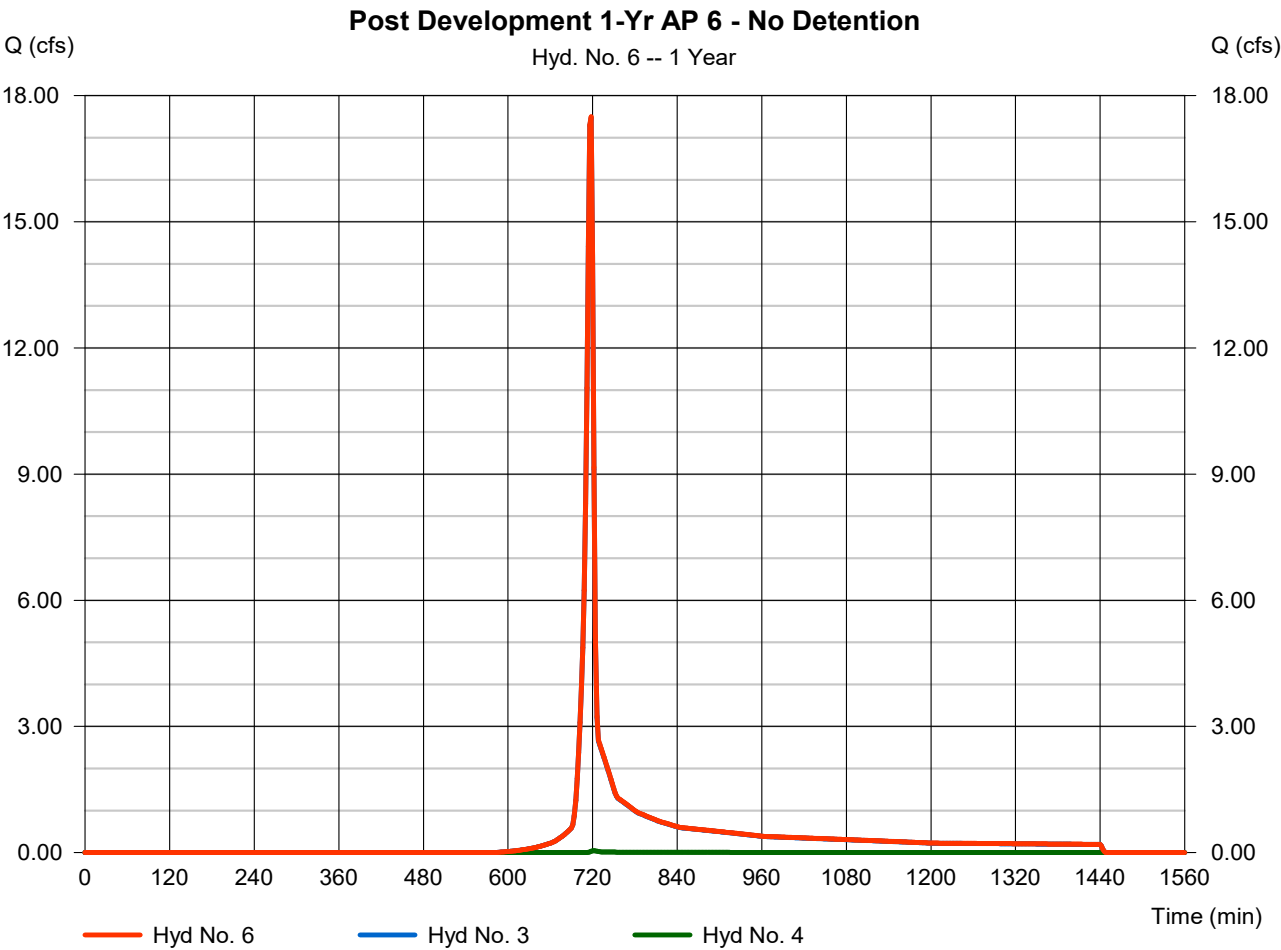


# Hydrograph Report

## Hyd. No. 6

Post Development 1-Yr AP 6 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 17.50 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 35,208 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 8.430 ac    |



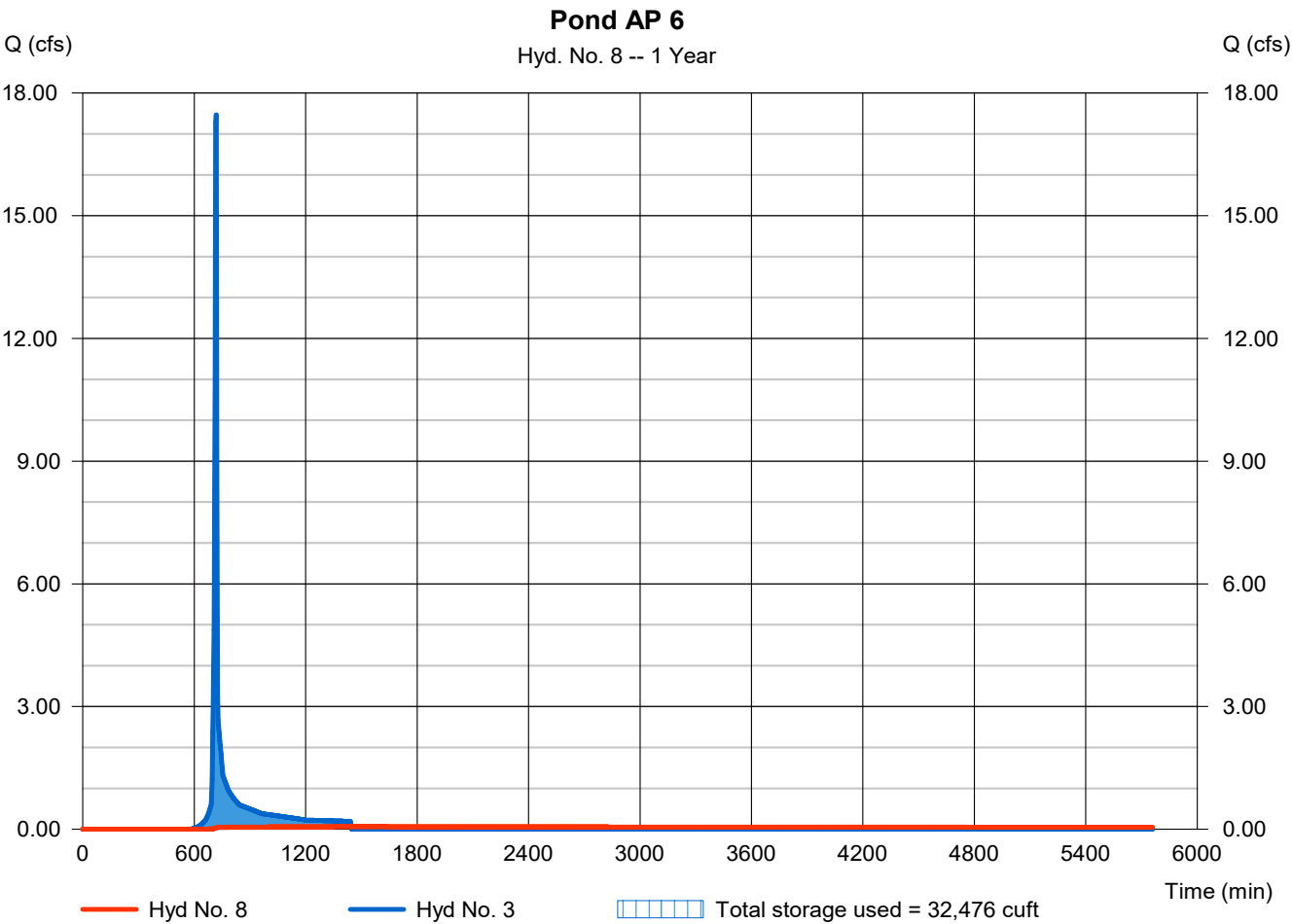
# Hydrograph Report

## Hyd. No. 8

Pond AP 6

|                 |                                          |                |               |
|-----------------|------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                              | Peak discharge | = 0.064 cfs   |
| Storm frequency | = 1 yrs                                  | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                  | Hyd. volume    | = 16,504 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Road AP 6 | Max. Elevation | = 102.23 ft   |
| Reservoir name  | = Pond AP 6                              | Max. Storage   | = 32,476 cuft |

Storage Indication method used.

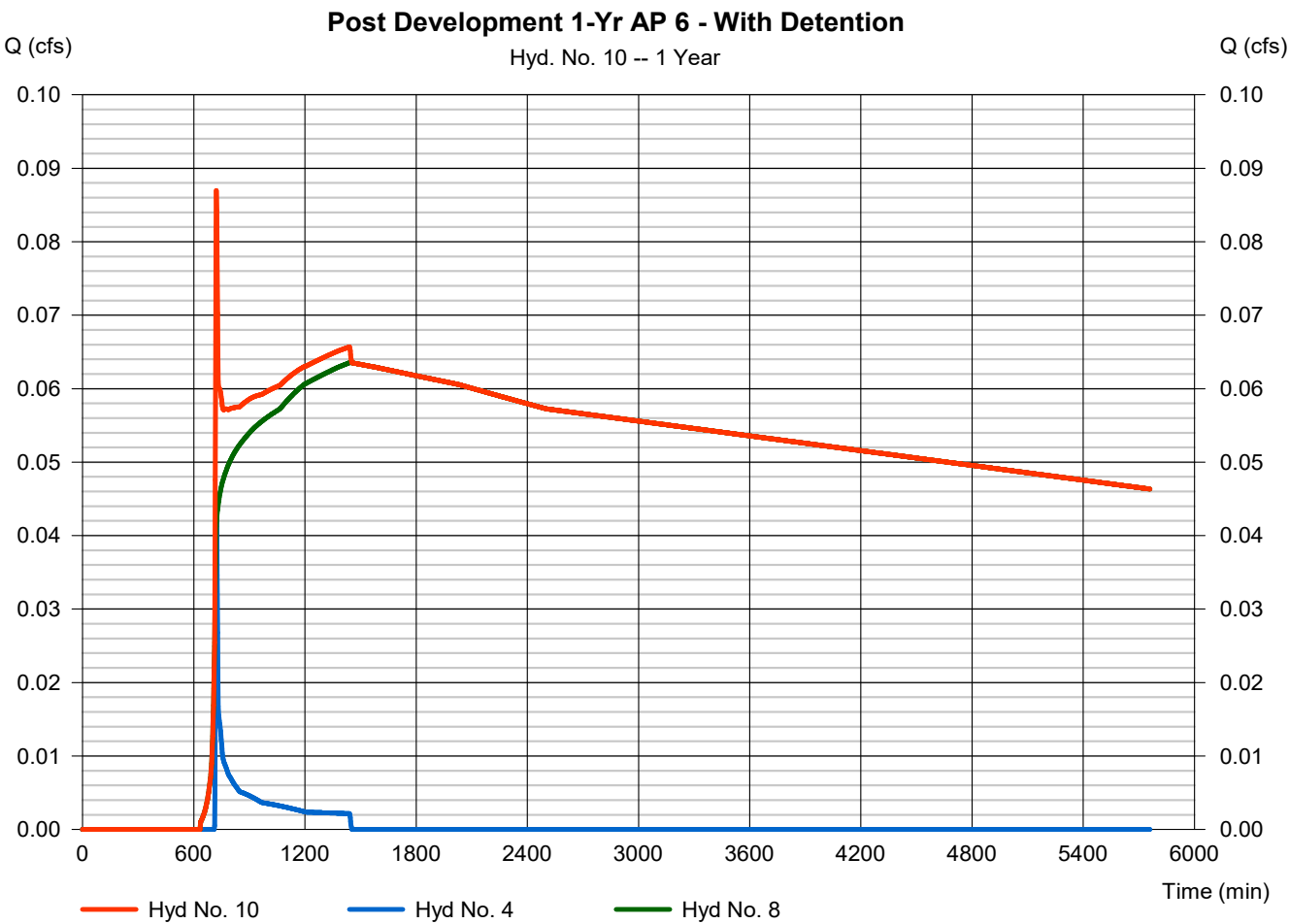


# Hydrograph Report

## Hyd. No. 10

Post Development 1-Yr AP 6 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.087 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 722 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 16,703 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 0.200 ac    |





## **Analysis Point 7**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                  | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|---------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                         | SCS Runoff               | 0.069           | 2                   | 728                | 681                   | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 7           |
| 3                         | SCS Runoff               | 11.55           | 2                   | 716                | 23,728                | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP 7  |
| 4                         | SCS Runoff               | 0.024           | 2                   | 720                | 132                   | -----         | -----                  | -----                   | Post-Development 1-Yr AP 7 Bypass   |
| 6                         | Combine                  | 11.56           | 2                   | 716                | 23,860                | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP 7 - No Det |
| 8                         | Reservoir                | 0.058           | 2                   | 1444               | 14,998                | 3             | 102.05                 | 21,197                  | Pond AP 7                           |
| 10                        | Combine                  | 0.067           | 2                   | 720                | 15,130                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 7 - With D |
| L20017_Peak Flow AP 7.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |

# Pond Report

7

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

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## Pond No. 7 - Pond AP 7

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 9,007               | 0                    | 0                    |
| 1.00       | 101.00         | 10,248              | 9,628                | 9,628                |
| 2.00       | 102.00         | 11,547              | 10,898               | 20,525               |
| 3.00       | 103.00         | 12,902              | 12,225               | 32,750               |
| 4.00       | 104.00         | 14,313              | 13,608               | 46,357               |
| 5.00       | 105.00         | 15,782              | 15,048               | 61,405               |

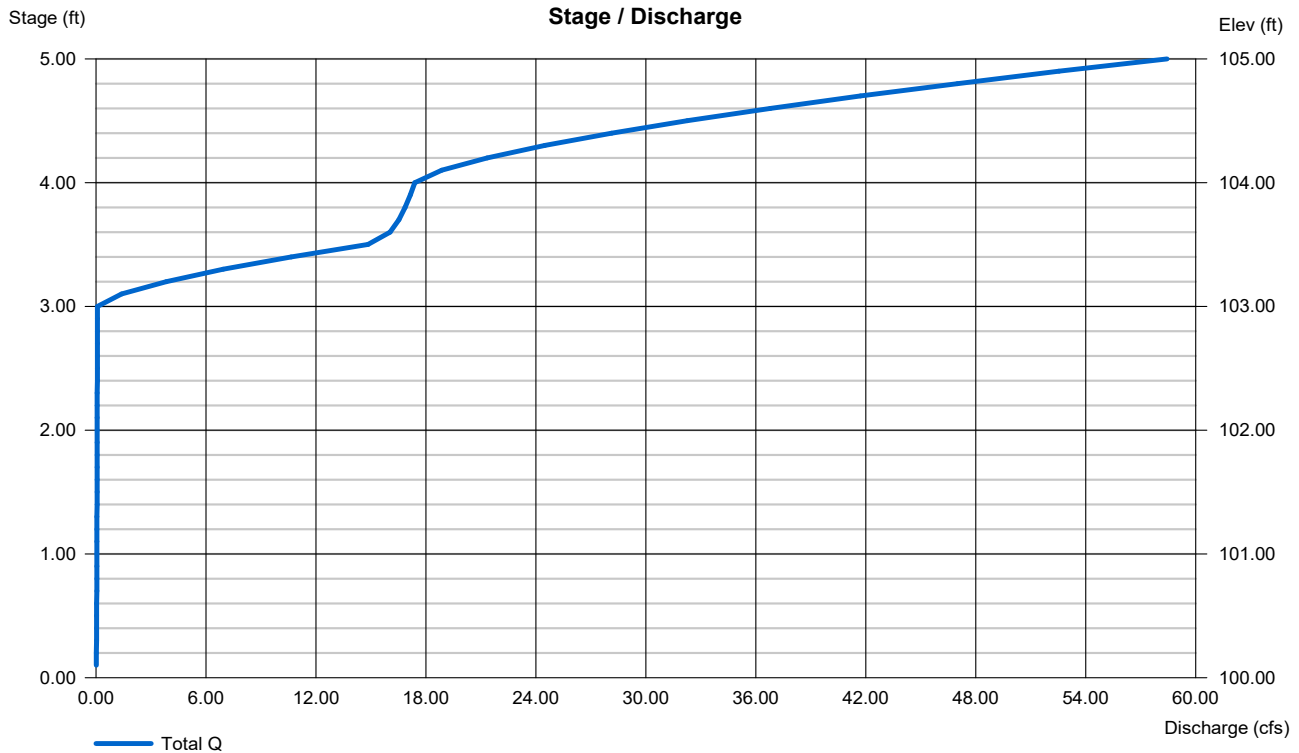
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]      | [PrfRsr] |
|-----------------|---------|--------|----------|----------|
| Rise (in)       | = 18.00 | 1.25   | Inactive | 0.00     |
| Span (in)       | = 18.00 | 1.25   | 0.00     | 0.00     |
| No. Barrels     | = 1     | 1      | 1        | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 0.00     | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00     | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00     | n/a      |
| N-Value         | = .013  | .013   | .013     | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60     | 0.60     |
| Multi-Stage     | = n/a   | Yes    | No       | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 15.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 103.00              | 104.00 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

2

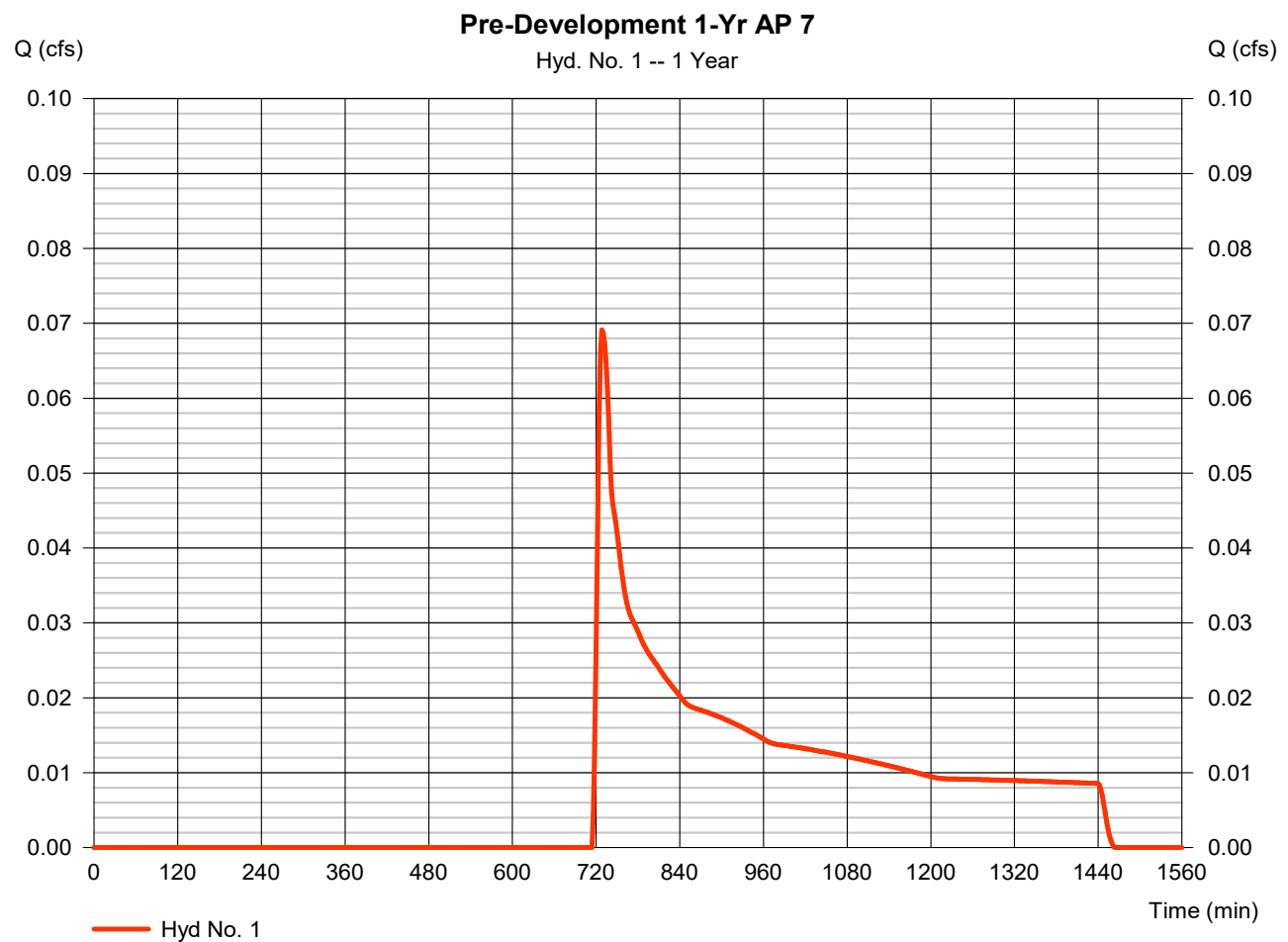
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Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 7

|                 |              |                    |             |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.069 cfs |
| Storm frequency | = 1 yrs      | Time to peak       | = 728 min   |
| Time interval   | = 2 min      | Hyd. volume        | = 681 cuft  |
| Drainage area   | = 0.990 ac   | Curve number       | = 55        |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft      |
| Tc method       | = User       | Time of conc. (Tc) | = 13.70 min |
| Total precip.   | = 3.00 in    | Distribution       | = Type II   |
| Storm duration  | = 24 hrs     | Shape factor       | = 484       |



# Hydrograph Report

3

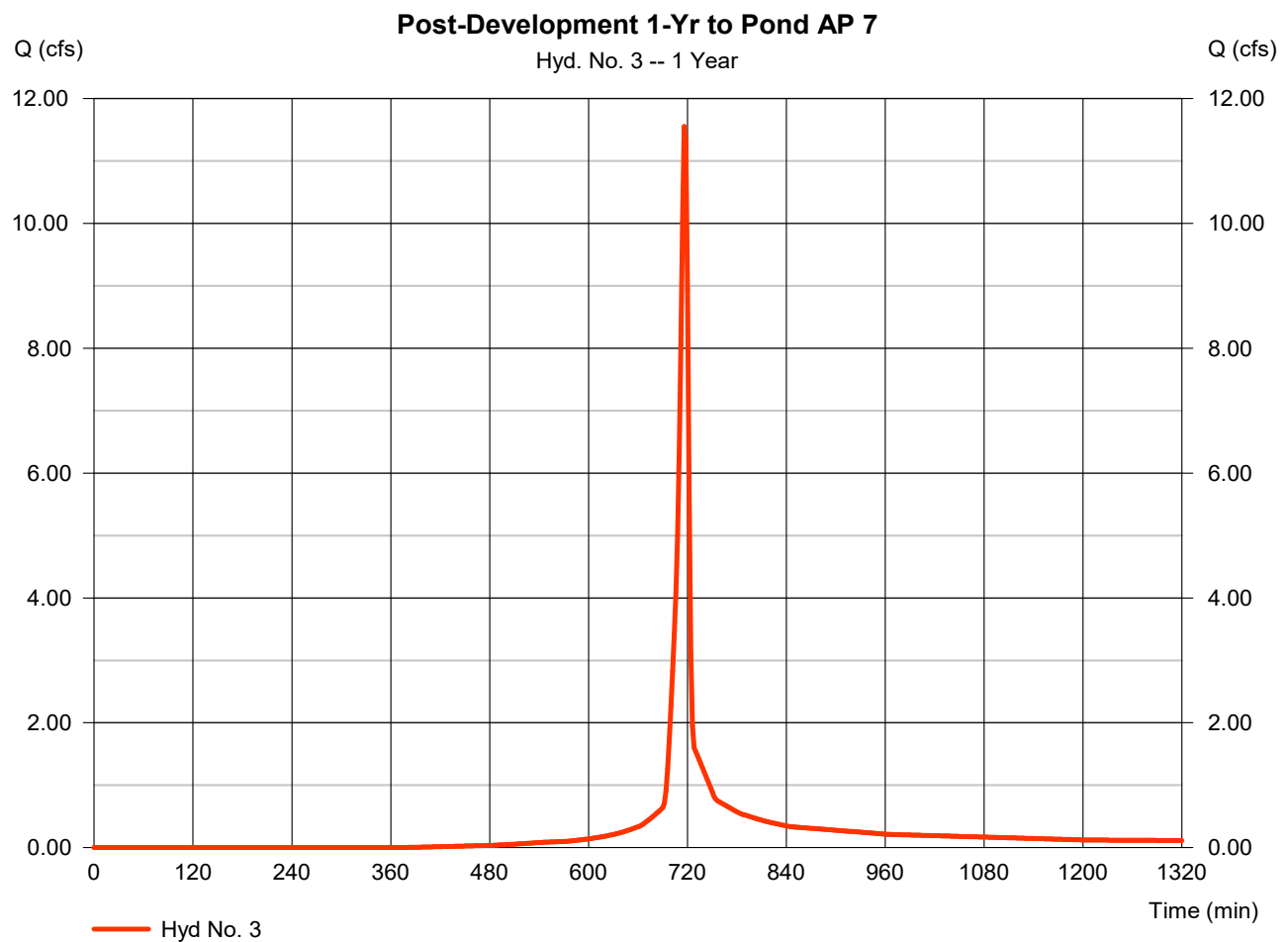
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 3

### Post-Development 1-Yr to Pond AP 7

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 11.55 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 716 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 23,728 cuft |
| Drainage area   | = 3.670 ac   | Curve number       | = 89          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 3.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

4

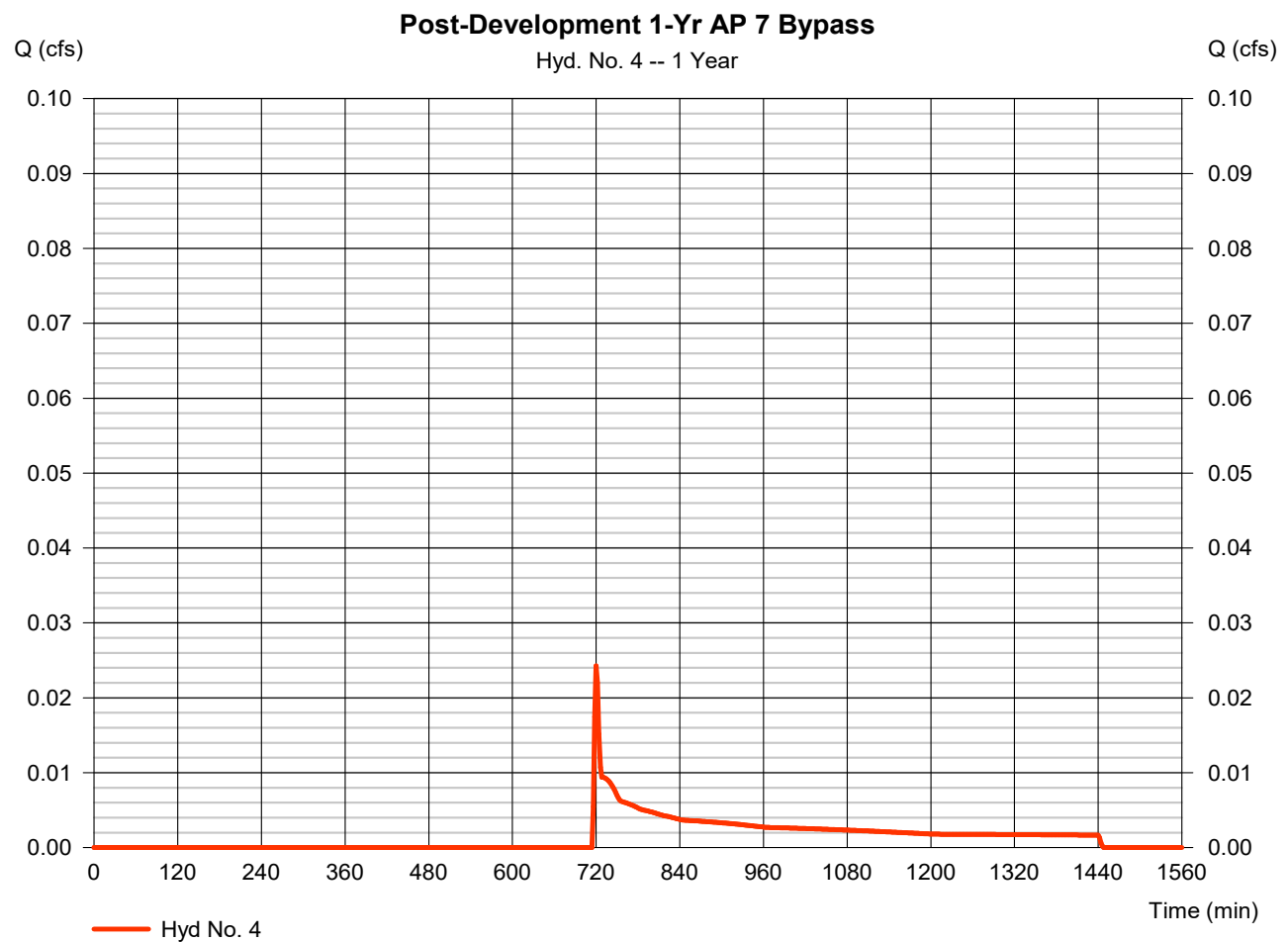
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 7 Bypass

|                 |   |            |                    |   |           |
|-----------------|---|------------|--------------------|---|-----------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.024 cfs |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 720 min   |
| Time interval   | = | 2 min      | Hyd. volume        | = | 132 cuft  |
| Drainage area   | = | 0.200 ac   | Curve number       | = | 55        |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft      |
| Tc method       | = | User       | Time of conc. (Tc) | = | 5.00 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II   |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484       |



# Hydrograph Report

5

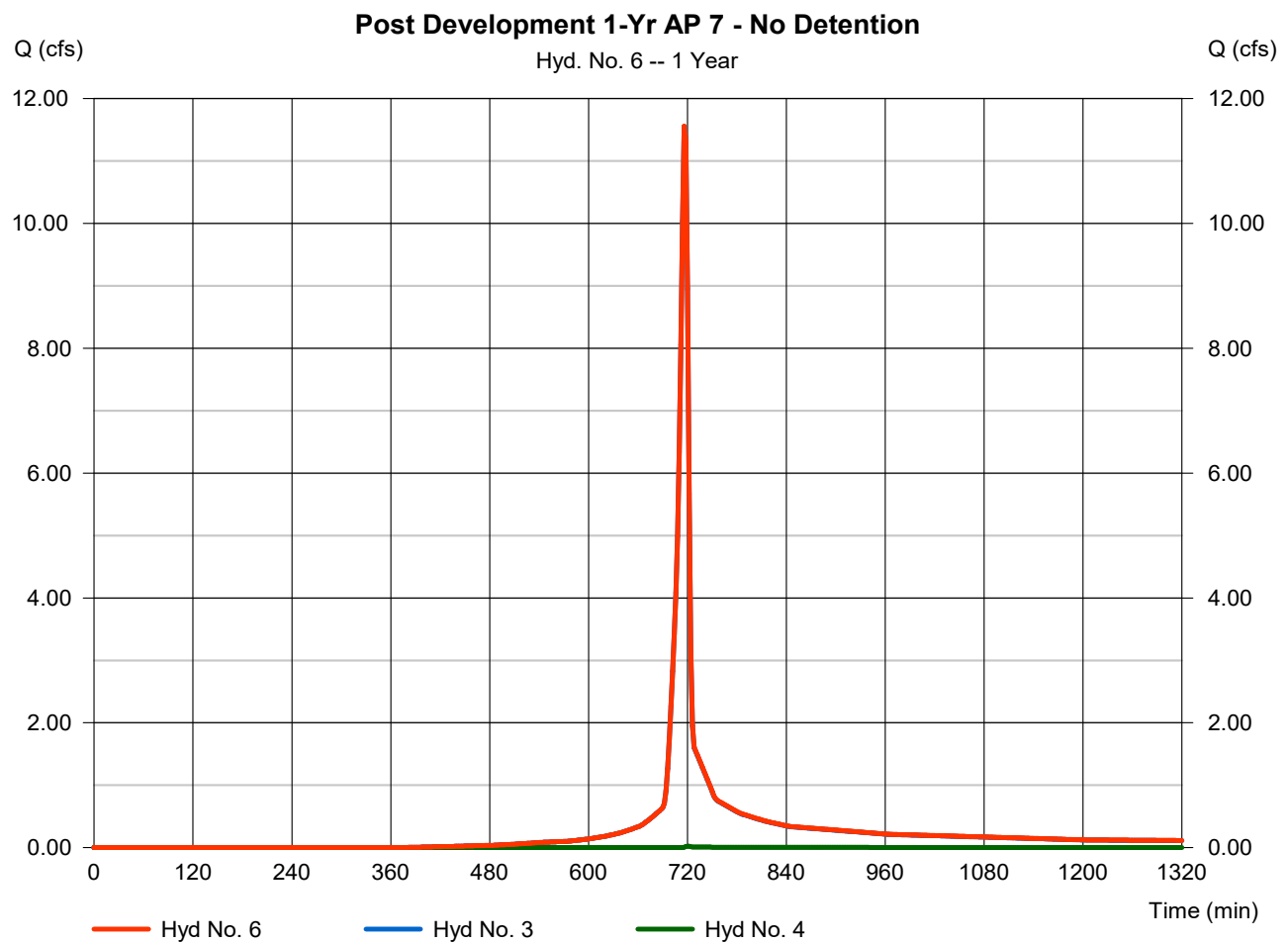
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Tuesday, 09 / 29 / 2020

## Hyd. No. 6

Post Development 1-Yr AP 7 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 11.56 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 716 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 23,860 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 3.870 ac    |



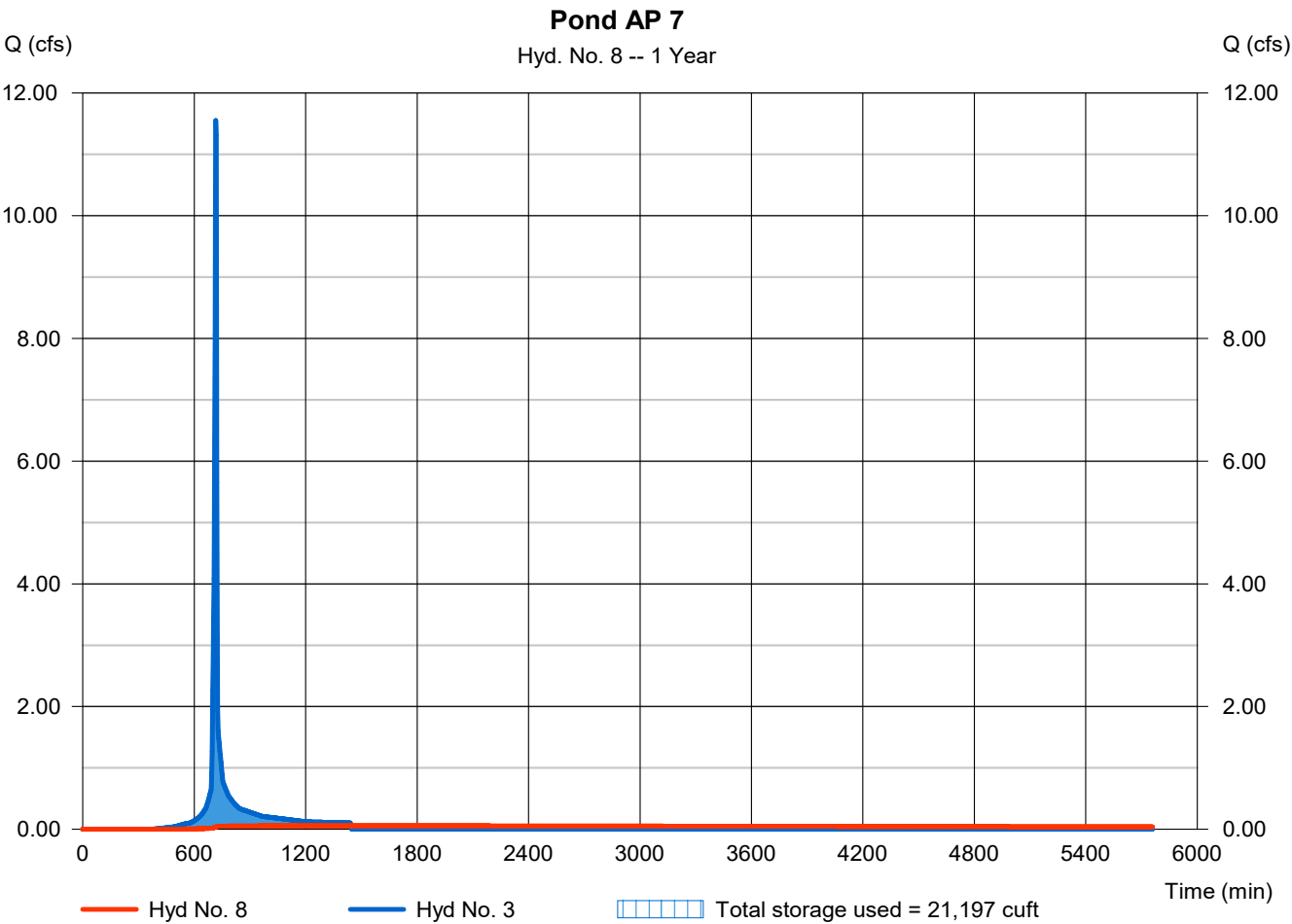
# Hydrograph Report

## Hyd. No. 8

Pond AP 7

|                 |                                          |                |               |
|-----------------|------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                              | Peak discharge | = 0.058 cfs   |
| Storm frequency | = 1 yrs                                  | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                  | Hyd. volume    | = 14,998 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Pond AP 7 | Max. Elevation | = 102.05 ft   |
| Reservoir name  | = Pond AP 7                              | Max. Storage   | = 21,197 cuft |

Storage Indication method used.





# Hydrograph Report

8

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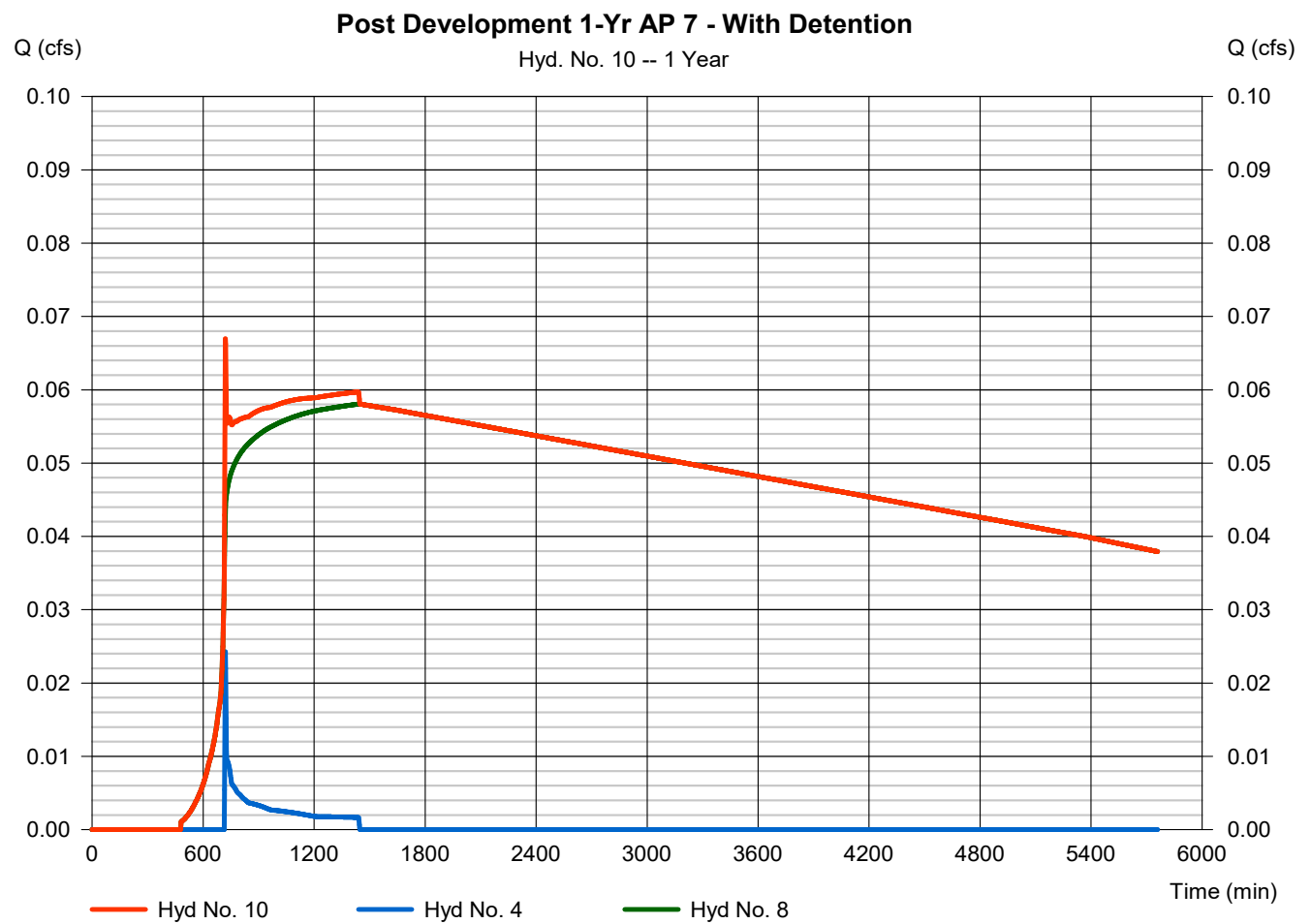
Tuesday, 09 / 29 / 2020

## Hyd. No. 10

Post Development 1-Yr AP 7 - With Detention

Hydrograph type = Combine  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyds. = 4, 8

Peak discharge = 0.067 cfs  
Time to peak = 720 min  
Hyd. volume = 15,130 cuft  
Contrib. drain. area = 0.200 ac



## **Analysis Point 8**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                  | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|---------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                         | SCS Runoff               | 0.135           | 2                   | 738                | 1,429                 | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 8           |
| 3                         | SCS Runoff               | 18.04           | 2                   | 718                | 36,084                | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP 8  |
| 4                         | SCS Runoff               | 0.011           | 2                   | 720                | 37                    | -----         | -----                  | -----                   | Post-Development 1-Yr AP 8 Bypass   |
| 6                         | Combine                  | 18.05           | 2                   | 718                | 36,121                | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP 8 - No Det |
| 8                         | Reservoir                | 0.108           | 2                   | 1444               | 26,079                | 3             | 101.86                 | 31,704                  | Pond AP 8                           |
| 10                        | Combine                  | 0.108           | 2                   | 1440               | 26,117                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 8 - With D |
| L20017_Peak Flow AP 8.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |

# Pond Report

7

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Pond No. 8 - Pond AP 8

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 15,602              | 0                    | 0                    |
| 1.00       | 101.00         | 17,062              | 16,332               | 16,332               |
| 2.00       | 102.00         | 18,577              | 17,820               | 34,152               |
| 3.00       | 103.00         | 20,150              | 19,364               | 53,515               |
| 4.00       | 104.00         | 21,779              | 20,965               | 74,480               |
| 5.00       | 105.00         | 23,465              | 22,622               | 97,102               |

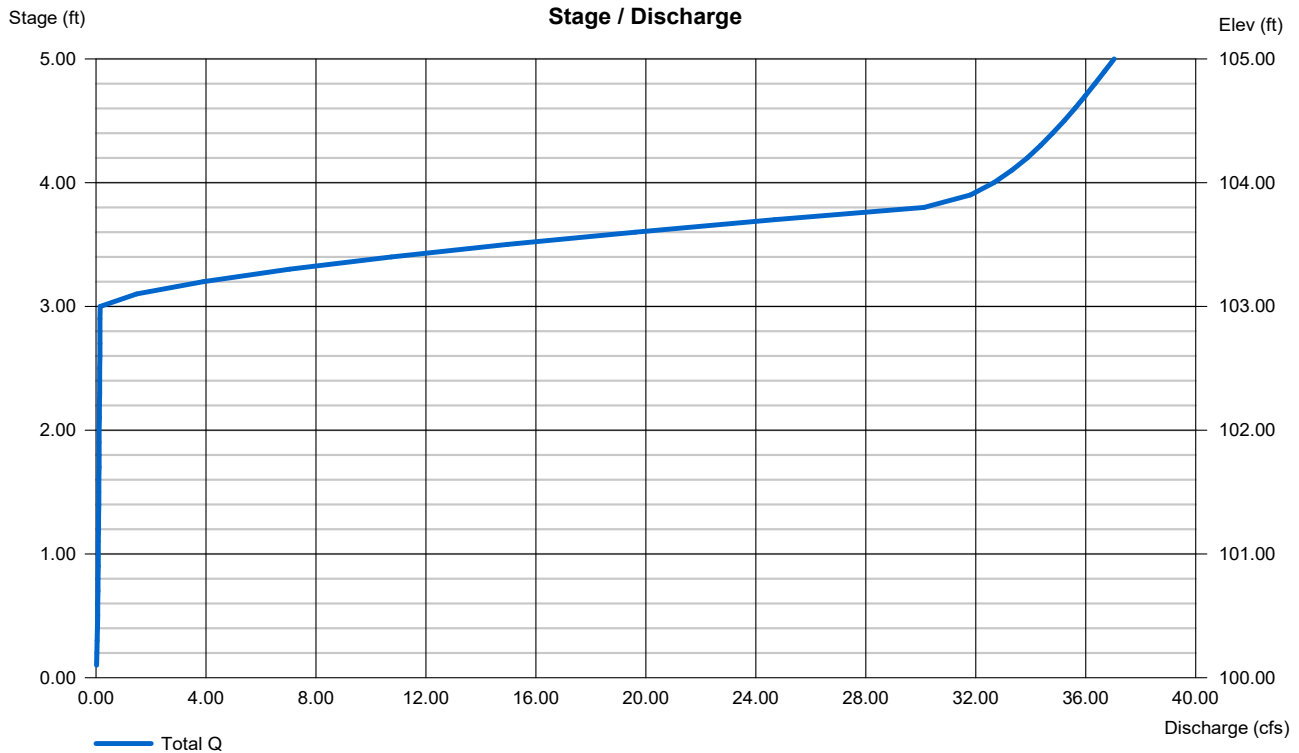
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 24.00 | 1.75   | 0.50   | 0.00     |
| Span (in)       | = 24.00 | 1.75   | 0.50   | 0.00     |
| No. Barrels     | = 1     | 1      | 1      | 0        |
| Invert El. (ft) | = 98.00 | 100.00 | 102.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | No     | No     | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 0.00   | 0.00 | 0.00 |
| Crest El. (ft) | = 103.00              | 104.00 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

2

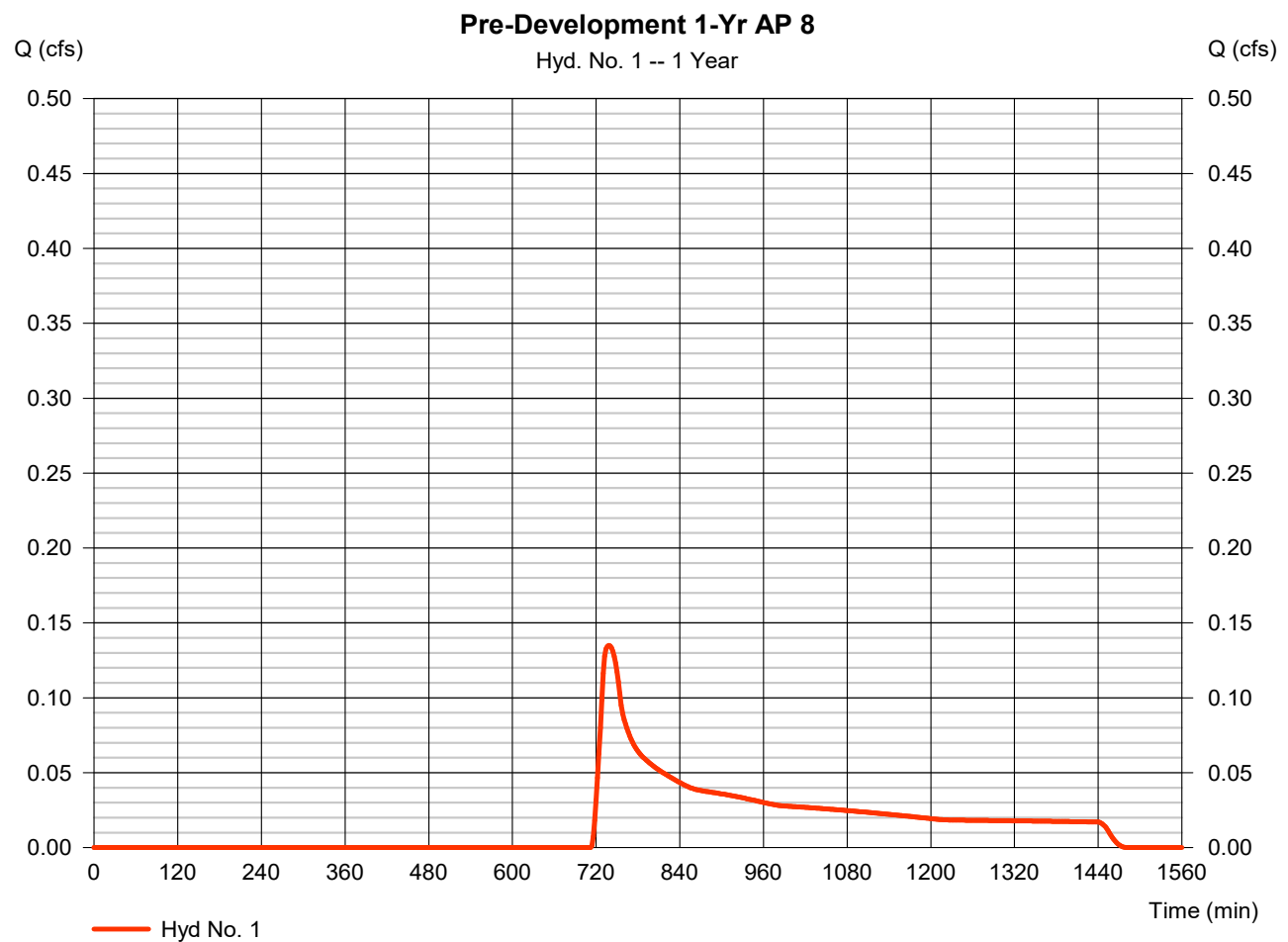
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Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 8

|                 |   |            |                    |   |            |
|-----------------|---|------------|--------------------|---|------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.135 cfs  |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 738 min    |
| Time interval   | = | 2 min      | Hyd. volume        | = | 1,429 cuft |
| Drainage area   | = | 1.820 ac   | Curve number       | = | 56         |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft       |
| Tc method       | = | User       | Time of conc. (Tc) | = | 23.80 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II    |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484        |



# Hydrograph Report

3

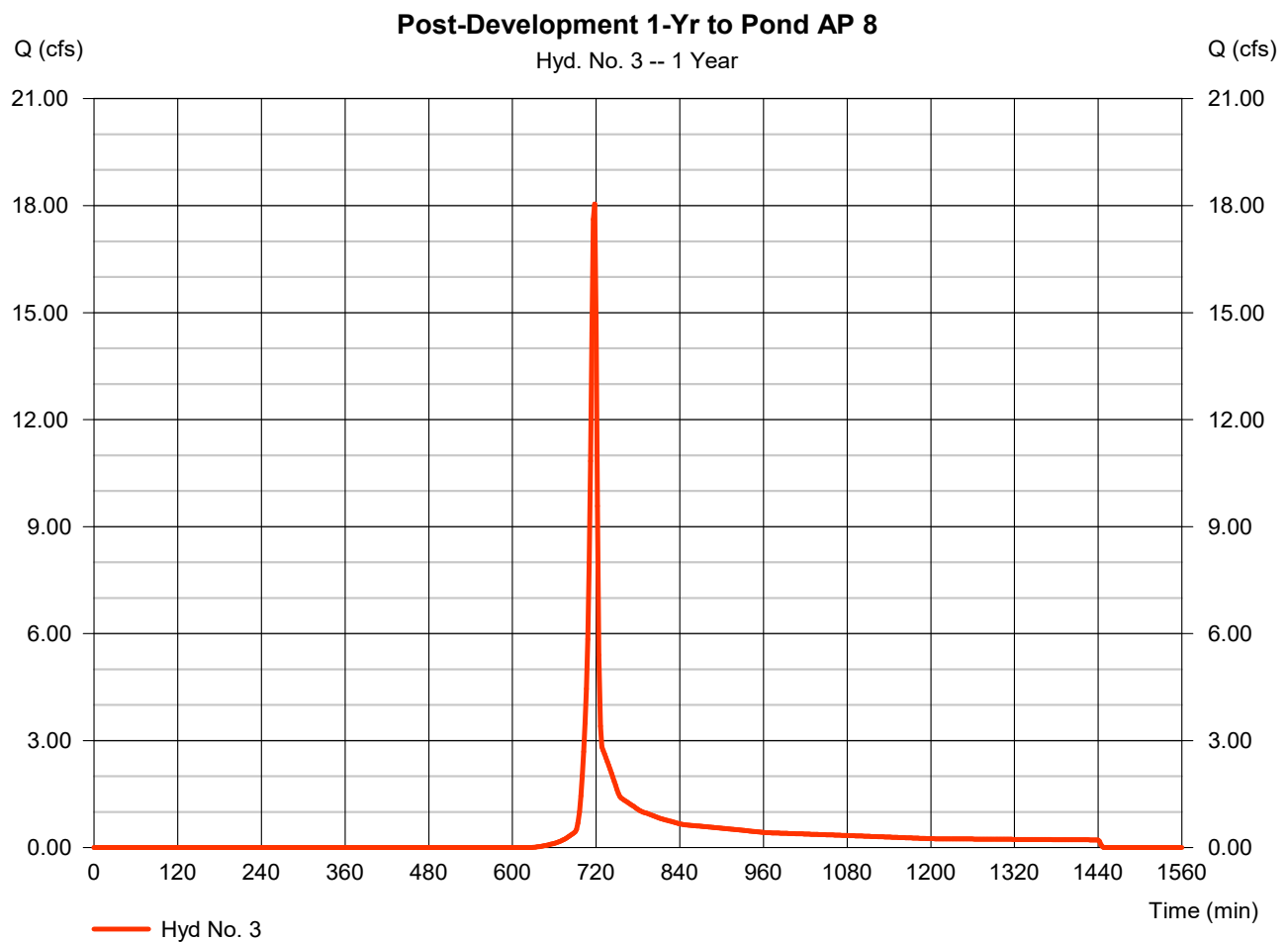
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Tuesday, 09 / 29 / 2020

## Hyd. No. 3

### Post-Development 1-Yr to Pond AP 8

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 18.04 cfs   |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 718 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 36,084 cuft |
| Drainage area   | = | 9.900 ac   | Curve number       | = | 77          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 5.00 min    |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



# Hydrograph Report

4

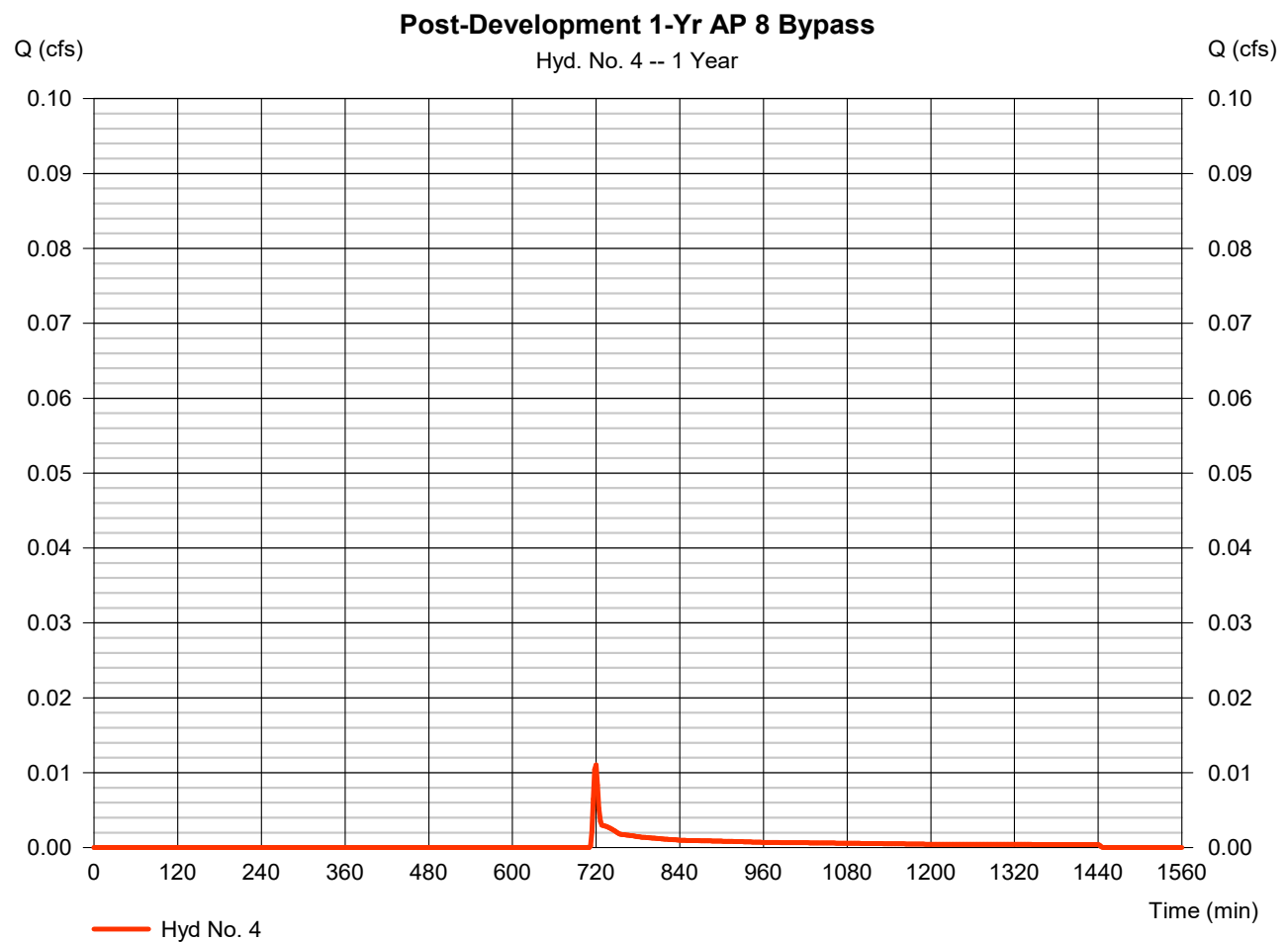
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Tuesday, 09 / 29 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 8 Bypass

|                 |   |            |                    |   |           |
|-----------------|---|------------|--------------------|---|-----------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.011 cfs |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 720 min   |
| Time interval   | = | 2 min      | Hyd. volume        | = | 37 cuft   |
| Drainage area   | = | 0.040 ac   | Curve number       | = | 58        |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft      |
| Tc method       | = | User       | Time of conc. (Tc) | = | 5.00 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II   |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484       |



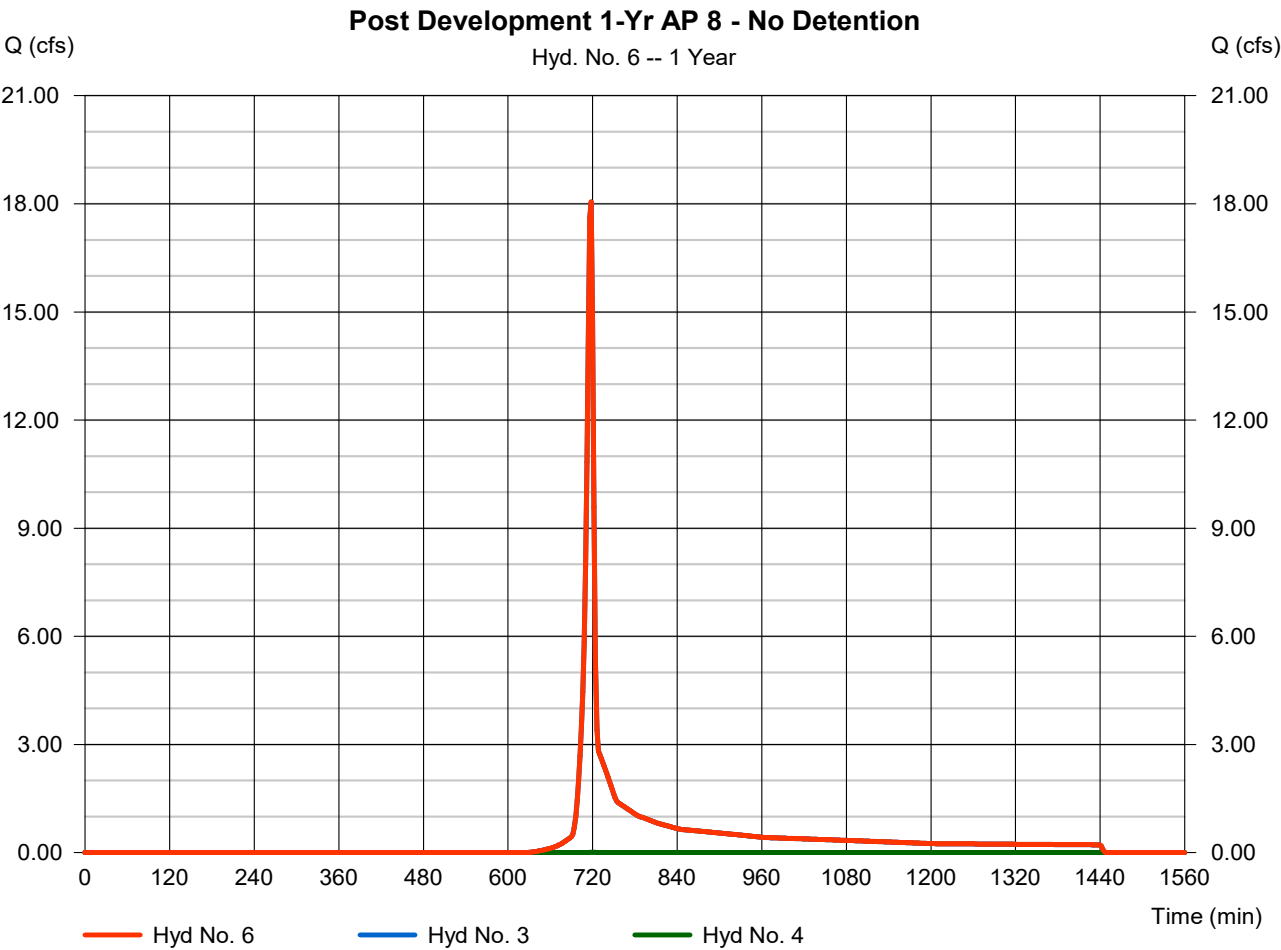
# Hydrograph Report

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## Hyd. No. 6

Post Development 1-Yr AP 8 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 18.05 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 36,121 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 9.940 ac    |





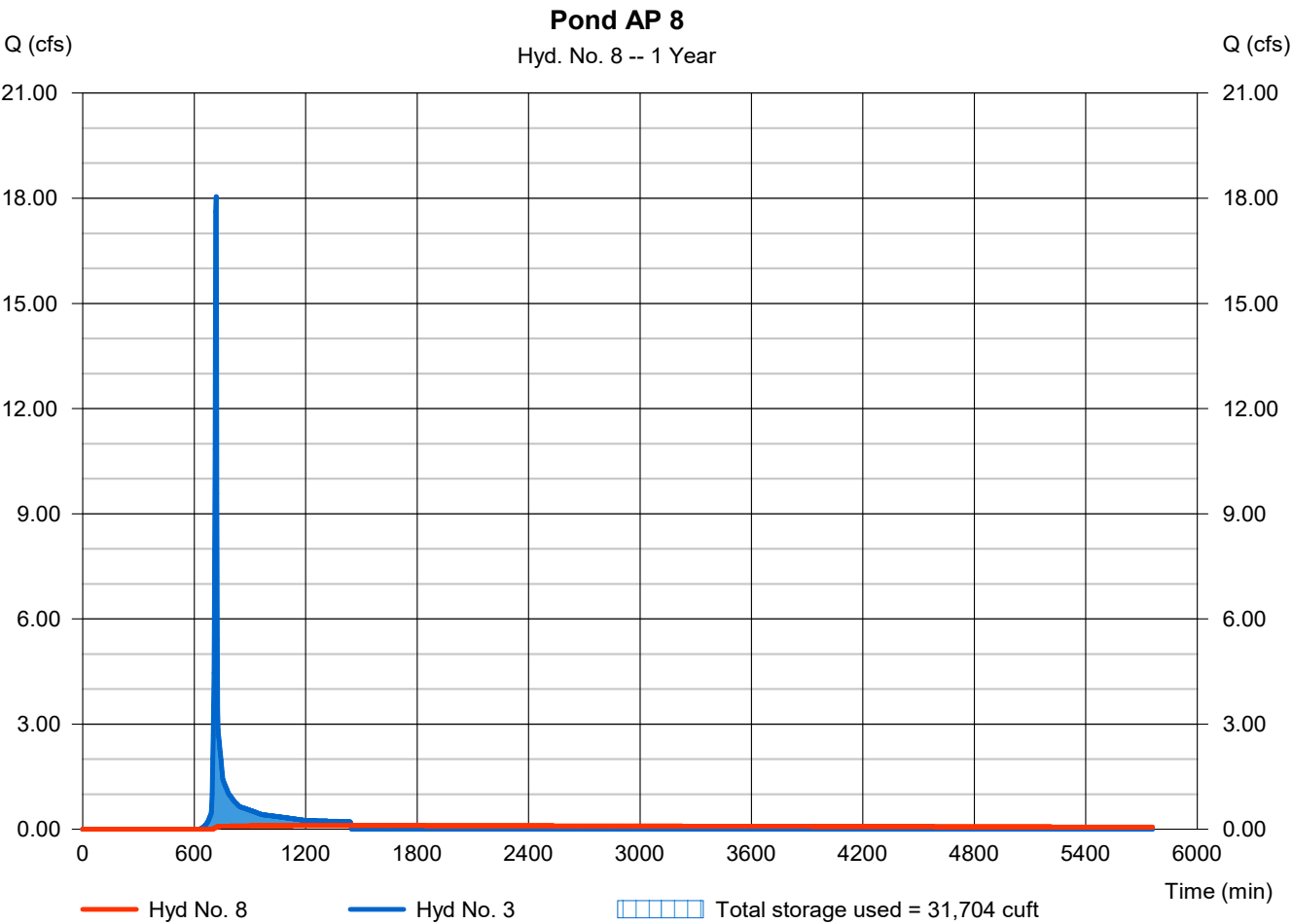
# Hydrograph Report

## Hyd. No. 8

Pond AP 8

|                 |                                          |                |               |
|-----------------|------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                              | Peak discharge | = 0.108 cfs   |
| Storm frequency | = 1 yrs                                  | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                  | Hyd. volume    | = 26,079 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Pond AP 8 | Max. Elevation | = 101.86 ft   |
| Reservoir name  | = Pond AP 8                              | Max. Storage   | = 31,704 cuft |

Storage Indication method used.

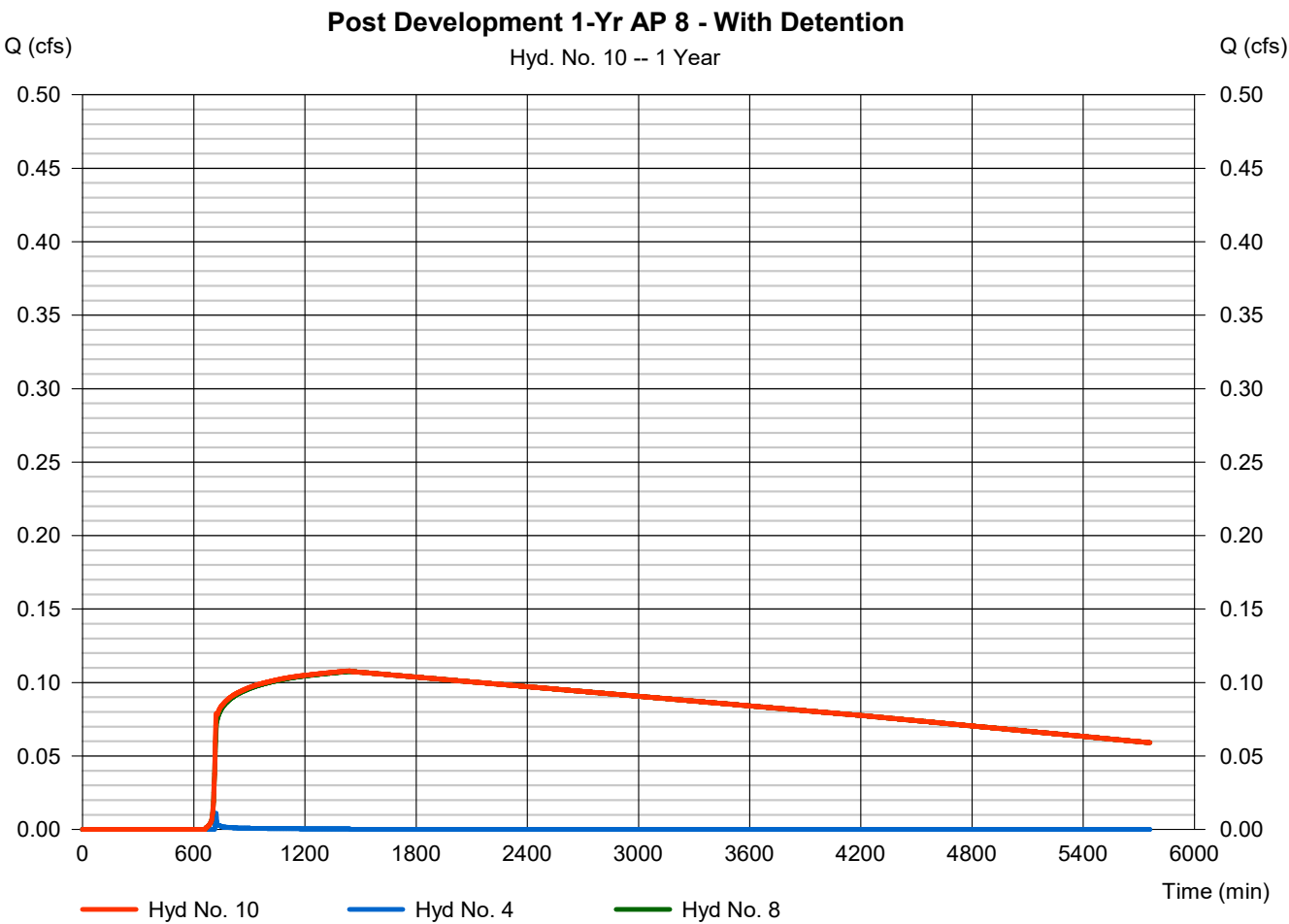


# Hydrograph Report

## Hyd. No. 10

Post Development 1-Yr AP 8 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.108 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 1440 min    |
| Time interval   | = 2 min   | Hyd. volume          | = 26,117 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 0.040 ac    |



## **Analysis Point 9**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                  | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|---------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                         | SCS Runoff               | 0.804           | 2                   | 728                | 6,438                 | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 9           |
| 3                         | SCS Runoff               | 51.22           | 2                   | 716                | 103,874               | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP 9  |
| 4                         | SCS Runoff               | 0.051           | 2                   | 722                | 172                   | -----         | -----                  | -----                   | Post-Development 1-Yr AP 9 Bypass   |
| 6                         | Combine                  | 51.25           | 2                   | 716                | 104,046               | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP 9 - No Det |
| 8                         | Reservoir                | 0.205           | 2                   | 1444               | 53,894                | 3             | 102.39                 | 95,301                  | Pond AP 9                           |
| 10                        | Combine                  | 0.207           | 2                   | 1440               | 54,066                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 9 - With D |
| L20017_Peak Flow AP 9.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |

# Hydrograph Report

2

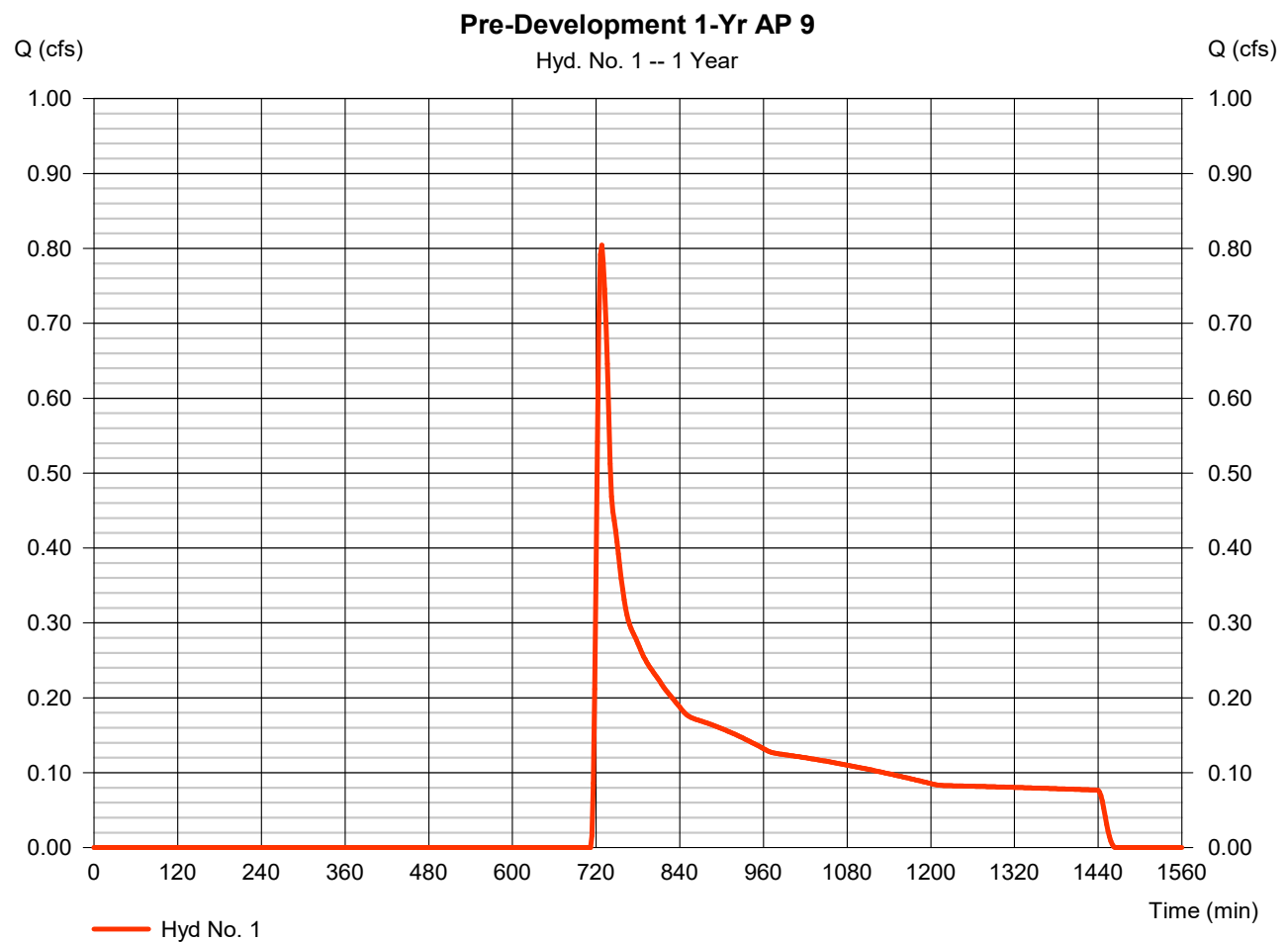
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 9

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.804 cfs  |
| Storm frequency | = 1 yrs      | Time to peak       | = 728 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 6,438 cuft |
| Drainage area   | = 8.280 ac   | Curve number       | = 56         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 13.70 min  |
| Total precip.   | = 3.00 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |



# Hydrograph Report

3

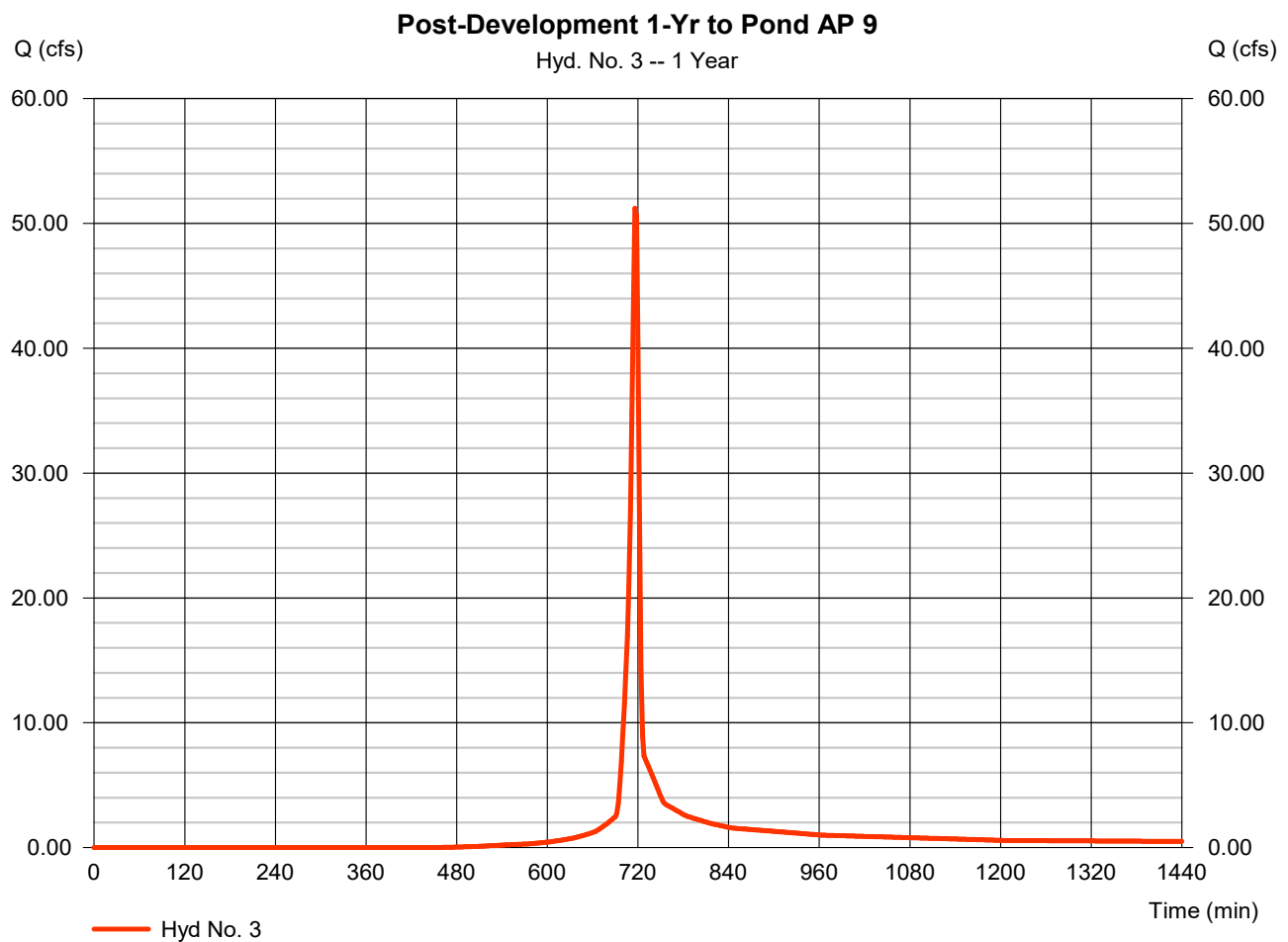
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Tuesday, 09 / 29 / 2020

## Hyd. No. 3

Post-Development 1-Yr to Pond AP 9

|                 |              |                    |                |
|-----------------|--------------|--------------------|----------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 51.22 cfs    |
| Storm frequency | = 1 yrs      | Time to peak       | = 716 min      |
| Time interval   | = 2 min      | Hyd. volume        | = 103,874 cuft |
| Drainage area   | = 18.360 ac  | Curve number       | = 86           |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft         |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min     |
| Total precip.   | = 3.00 in    | Distribution       | = Type II      |
| Storm duration  | = 24 hrs     | Shape factor       | = 484          |



# Hydrograph Report

4

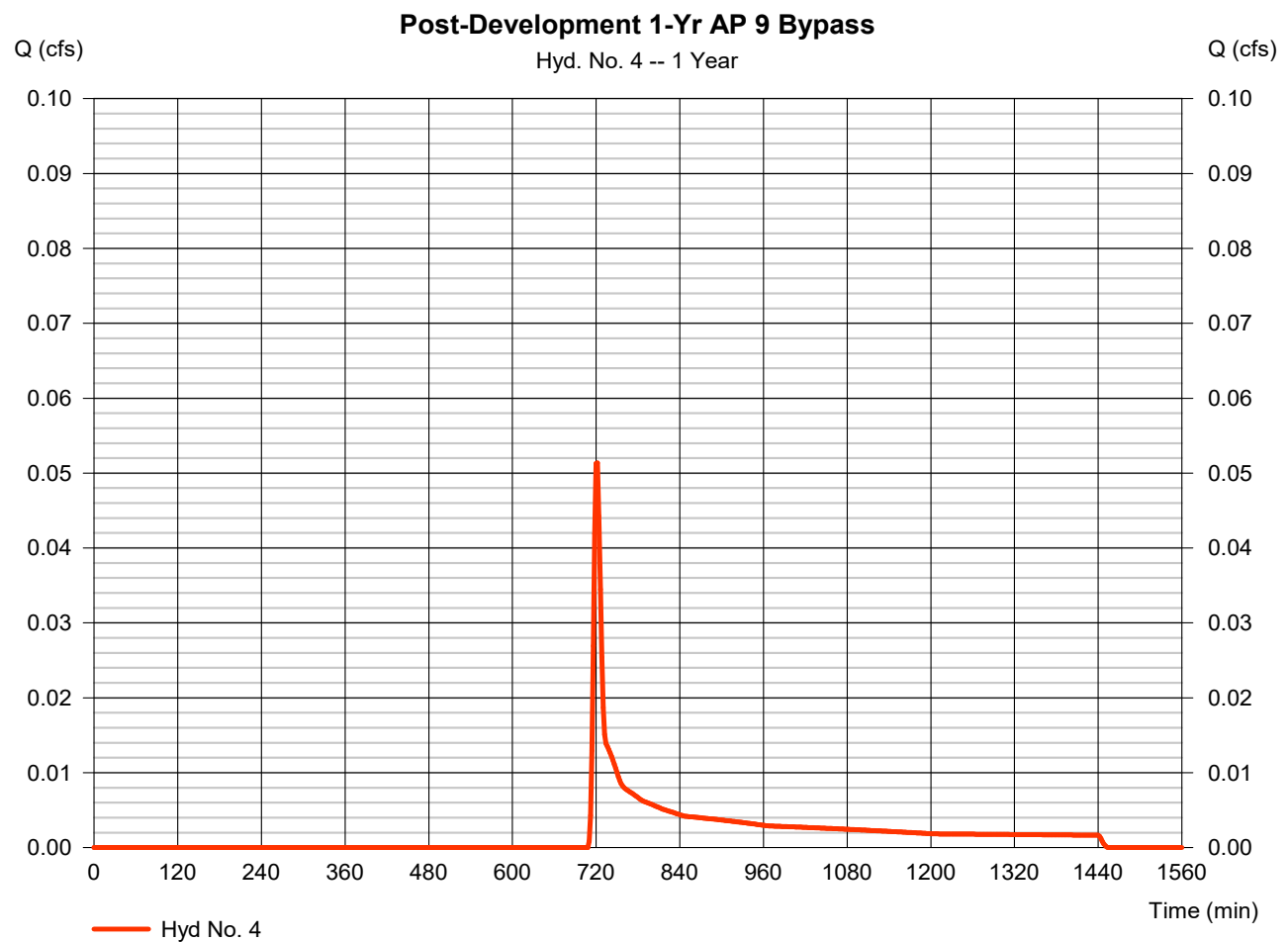
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Tuesday, 09 / 29 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 9 Bypass

|                 |   |            |                    |   |           |
|-----------------|---|------------|--------------------|---|-----------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.051 cfs |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 722 min   |
| Time interval   | = | 2 min      | Hyd. volume        | = | 172 cuft  |
| Drainage area   | = | 0.130 ac   | Curve number       | = | 61        |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft      |
| Tc method       | = | User       | Time of conc. (Tc) | = | 9.00 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II   |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484       |



# Hydrograph Report

5

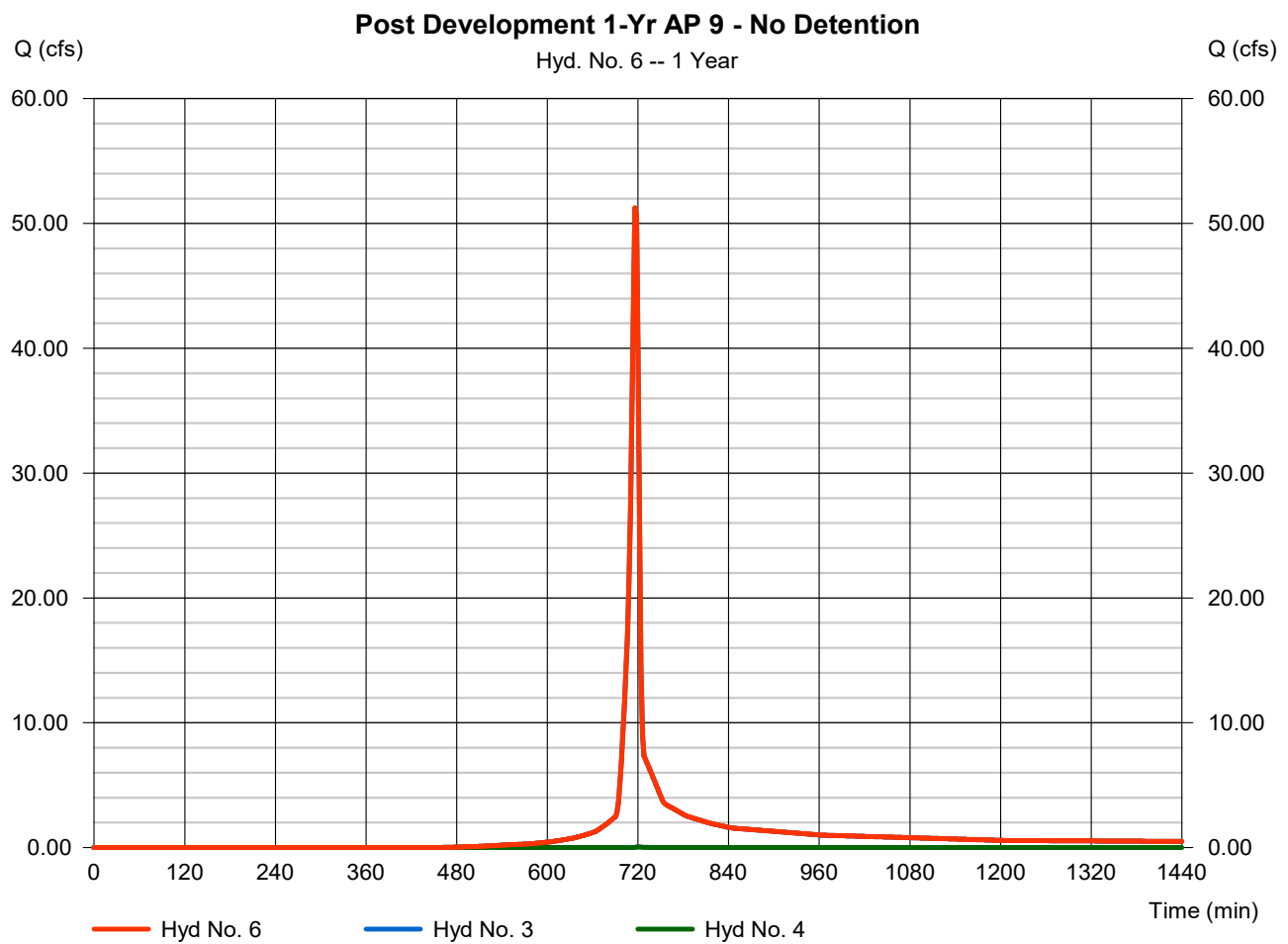
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Tuesday, 09 / 29 / 2020

## Hyd. No. 6

Post Development 1-Yr AP 9 - No Detention

|                 |           |                      |                |
|-----------------|-----------|----------------------|----------------|
| Hydrograph type | = Combine | Peak discharge       | = 51.25 cfs    |
| Storm frequency | = 1 yrs   | Time to peak         | = 716 min      |
| Time interval   | = 2 min   | Hyd. volume          | = 104,046 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 18.490 ac    |





# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

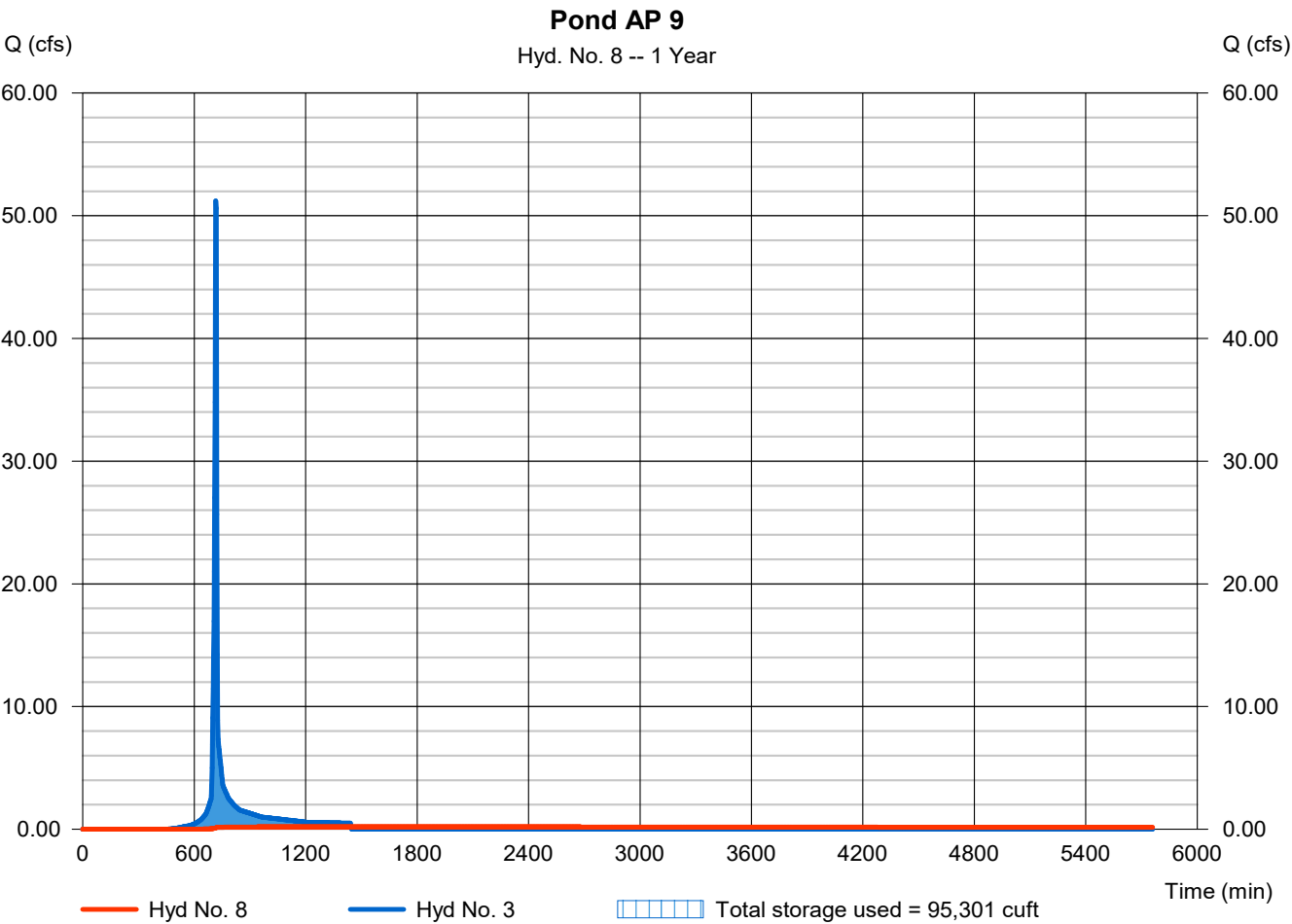
Tuesday, 09 / 29 / 2020

## Hyd. No. 8

Pond AP 9

|                 |                                          |                |               |
|-----------------|------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                              | Peak discharge | = 0.205 cfs   |
| Storm frequency | = 1 yrs                                  | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                  | Hyd. volume    | = 53,894 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Pond AP 9 | Max. Elevation | = 102.39 ft   |
| Reservoir name  | = Pond AP 9                              | Max. Storage   | = 95,301 cuft |

Storage Indication method used.



# Pond Report

7

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

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## Pond No. 9 - Pond AP 9

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 35,848              | 0                    | 0                    |
| 1.00       | 101.00         | 38,890              | 37,369               | 37,369               |
| 2.00       | 102.00         | 42,988              | 40,939               | 78,308               |
| 3.00       | 103.00         | 45,143              | 44,066               | 122,374              |
| 4.00       | 104.00         | 48,355              | 46,749               | 169,123              |
| 5.00       | 105.00         | 51,623              | 49,989               | 219,112              |

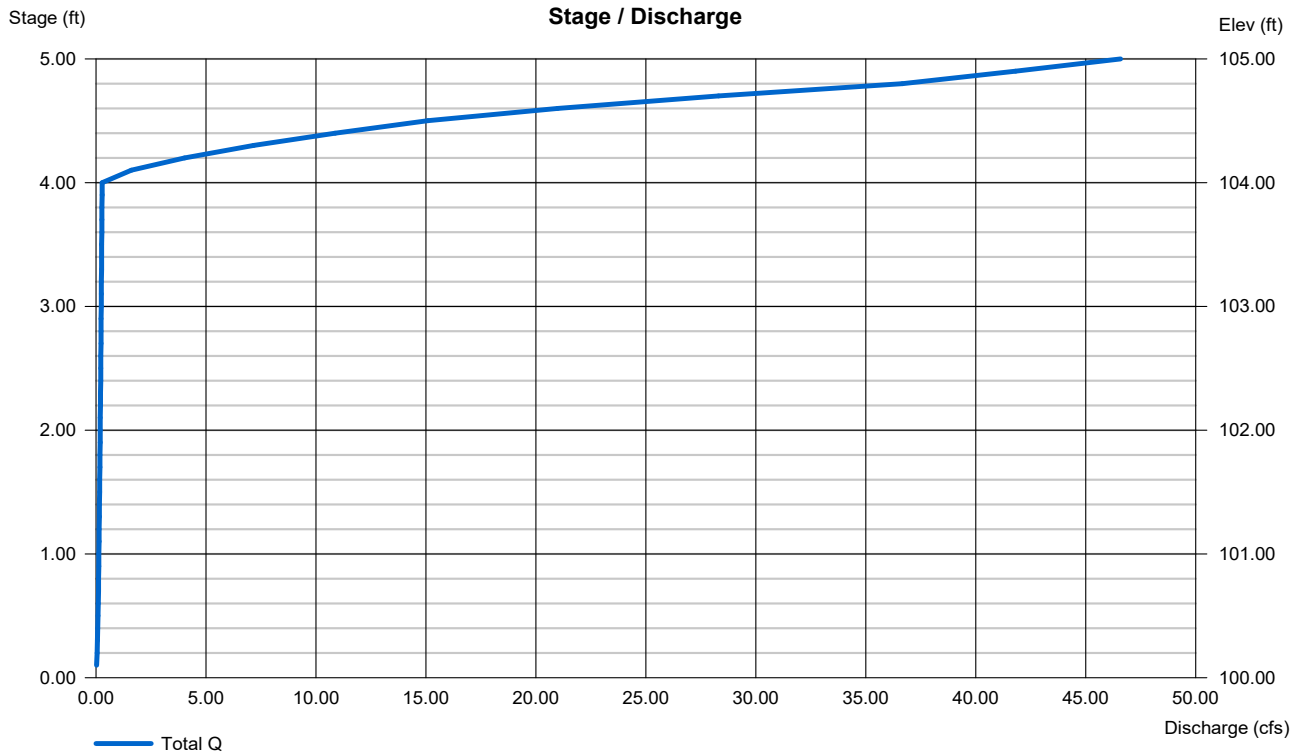
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 24.00 | 2.25   | 0.50   | 0.00     |
| Span (in)       | = 24.00 | 2.25   | 0.50   | 0.00     |
| No. Barrels     | = 1     | 1      | 1      | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 102.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | No     | No     | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 15.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 104.00              | 104.50 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

8

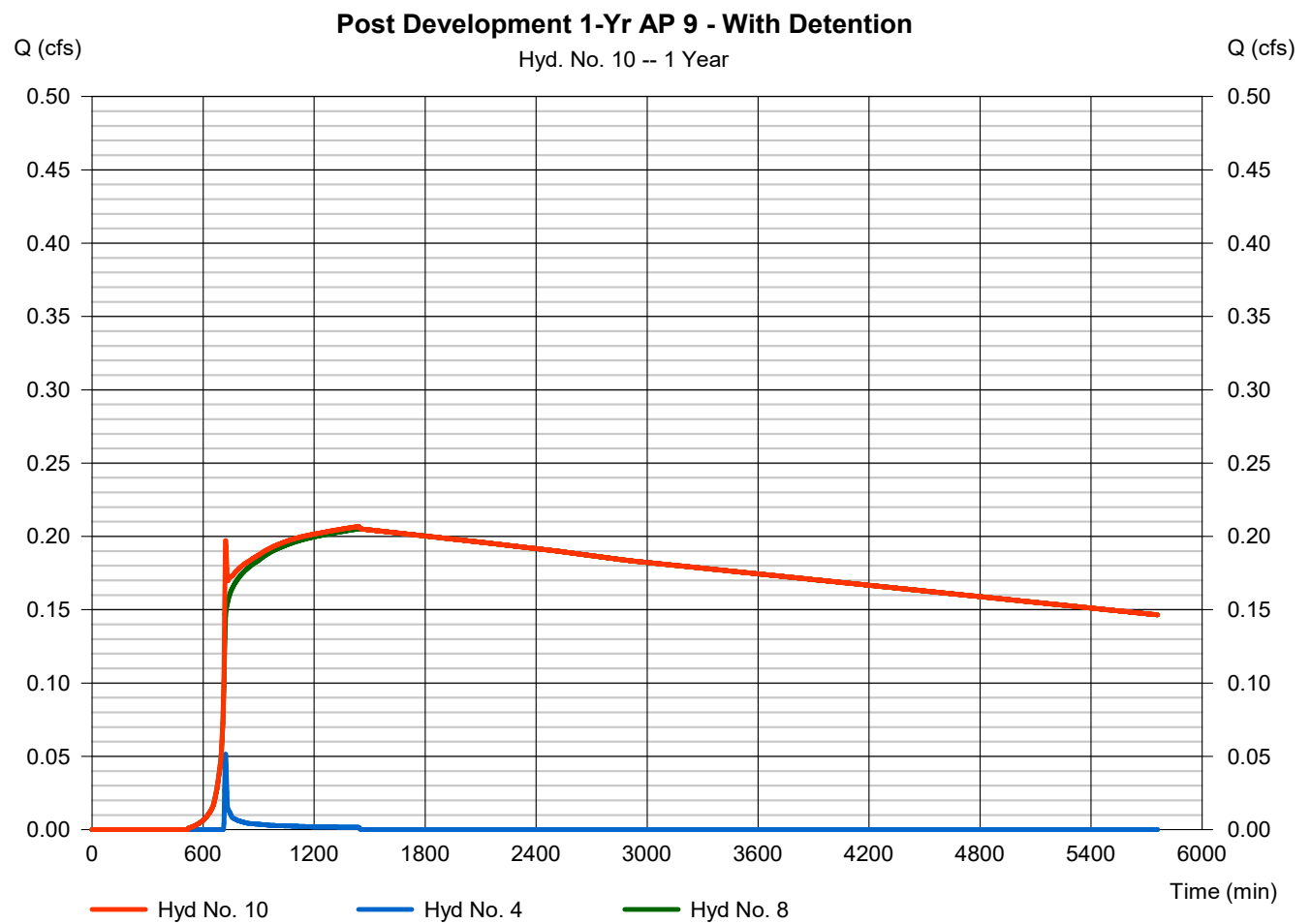
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## Hyd. No. 10

Post Development 1-Yr AP 9 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.207 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 1440 min    |
| Time interval   | = 2 min   | Hyd. volume          | = 54,066 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 0.130 ac    |



## **Analysis Point 10**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                   | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description             |
|----------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|------------------------------------|
| 1                          | SCS Runoff               | 0.225           | 2                   | 726                | 2,022                 | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 10         |
| 3                          | SCS Runoff               | 13.43           | 2                   | 718                | 27,014                | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP 1 |
| 4                          | SCS Runoff               | 0.019           | 2                   | 718                | 50                    | -----         | -----                  | -----                   | Post-Development 1-Yr AP 10 Bypas  |
| 6                          | Combine                  | 13.45           | 2                   | 718                | 27,064                | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP 10 - No D |
| 8                          | Reservoir                | 0.089           | 2                   | 1444               | 20,481                | 3             | 102.00                 | 23,453                  | Pond AP 10                         |
| 10                         | Combine                  | 0.089           | 2                   | 1440               | 20,531                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 10 - With |
| L20017_Peak Flow AP 10.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Friday, 07 / 31 / 2020  |                                    |

# Pond Report

8

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Pond No. 10 - Pond AP 10

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 10,490              | 0                    | 0                    |
| 1.00       | 101.00         | 11,687              | 11,089               | 11,089               |
| 2.00       | 102.00         | 12,941              | 12,314               | 23,403               |
| 3.00       | 103.00         | 14,251              | 13,596               | 36,999               |
| 4.00       | 104.00         | 15,618              | 14,935               | 51,933               |
| 5.00       | 105.00         | 17,042              | 16,330               | 68,263               |

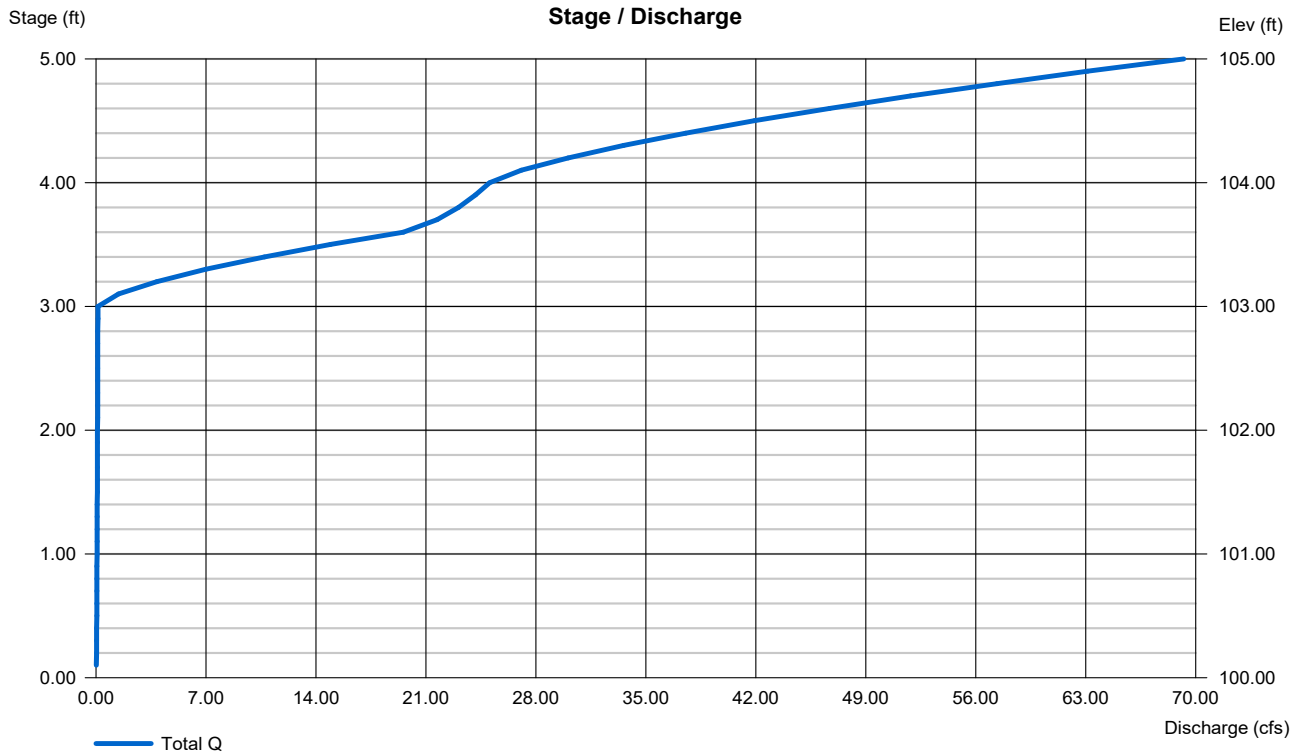
### Culvert / Orifice Structures

|                 | [A]      | [B]    | [C]    | [PrfRsr] |
|-----------------|----------|--------|--------|----------|
| Rise (in)       | = 24.00  | 1.50   | 0.50   | 0.00     |
| Span (in)       | = 24.00  | 1.50   | 0.50   | 0.00     |
| No. Barrels     | = 1      | 1      | 1      | 0        |
| Invert El. (ft) | = 100.00 | 100.00 | 101.00 | 0.00     |
| Length (ft)     | = 50.00  | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50   | 0.00   | 0.00   | n/a      |
| N-Value         | = .013   | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60   | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a    | No     | No     | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 15.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 103.00              | 104.00 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

3

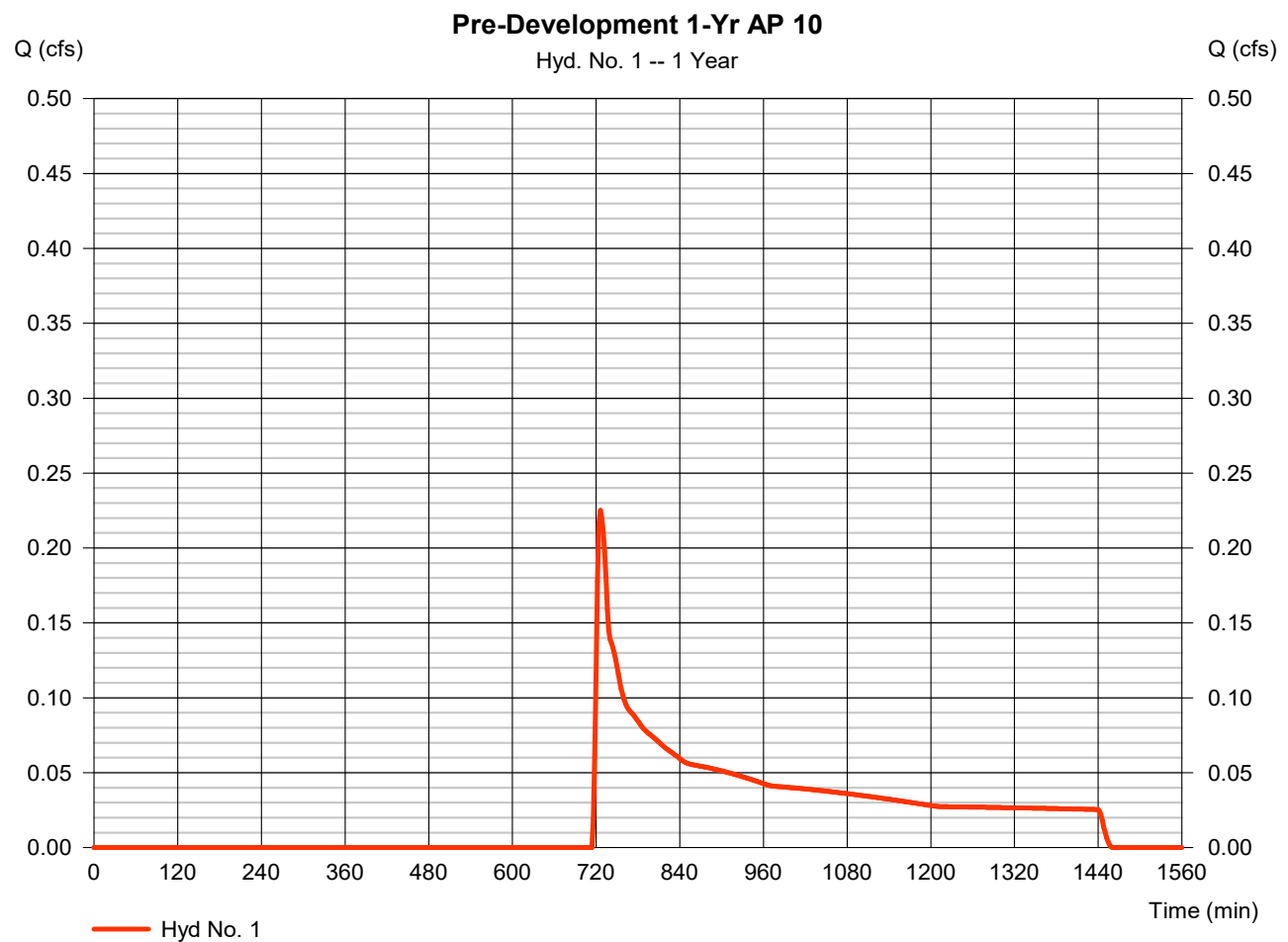
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 10

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.225 cfs  |
| Storm frequency | = 1 yrs      | Time to peak       | = 726 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 2,022 cuft |
| Drainage area   | = 2.780 ac   | Curve number       | = 55         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 11.50 min  |
| Total precip.   | = 3.00 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |



# Hydrograph Report

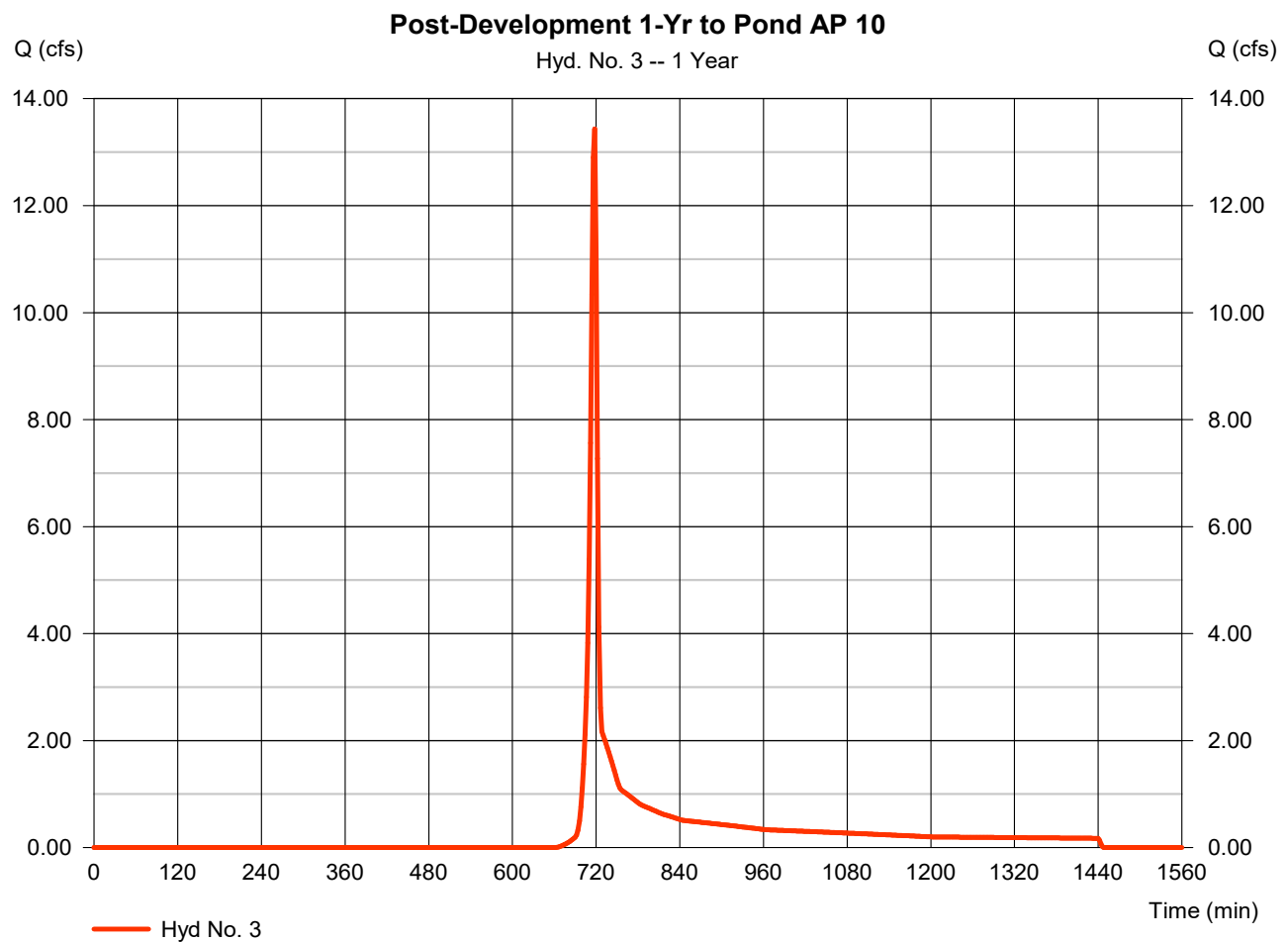
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 3

Post-Development 1-Yr to Pond AP 10

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 13.43 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 718 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 27,014 cuft |
| Drainage area   | = 8.740 ac   | Curve number       | = 74          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 3.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |





# Hydrograph Report

5

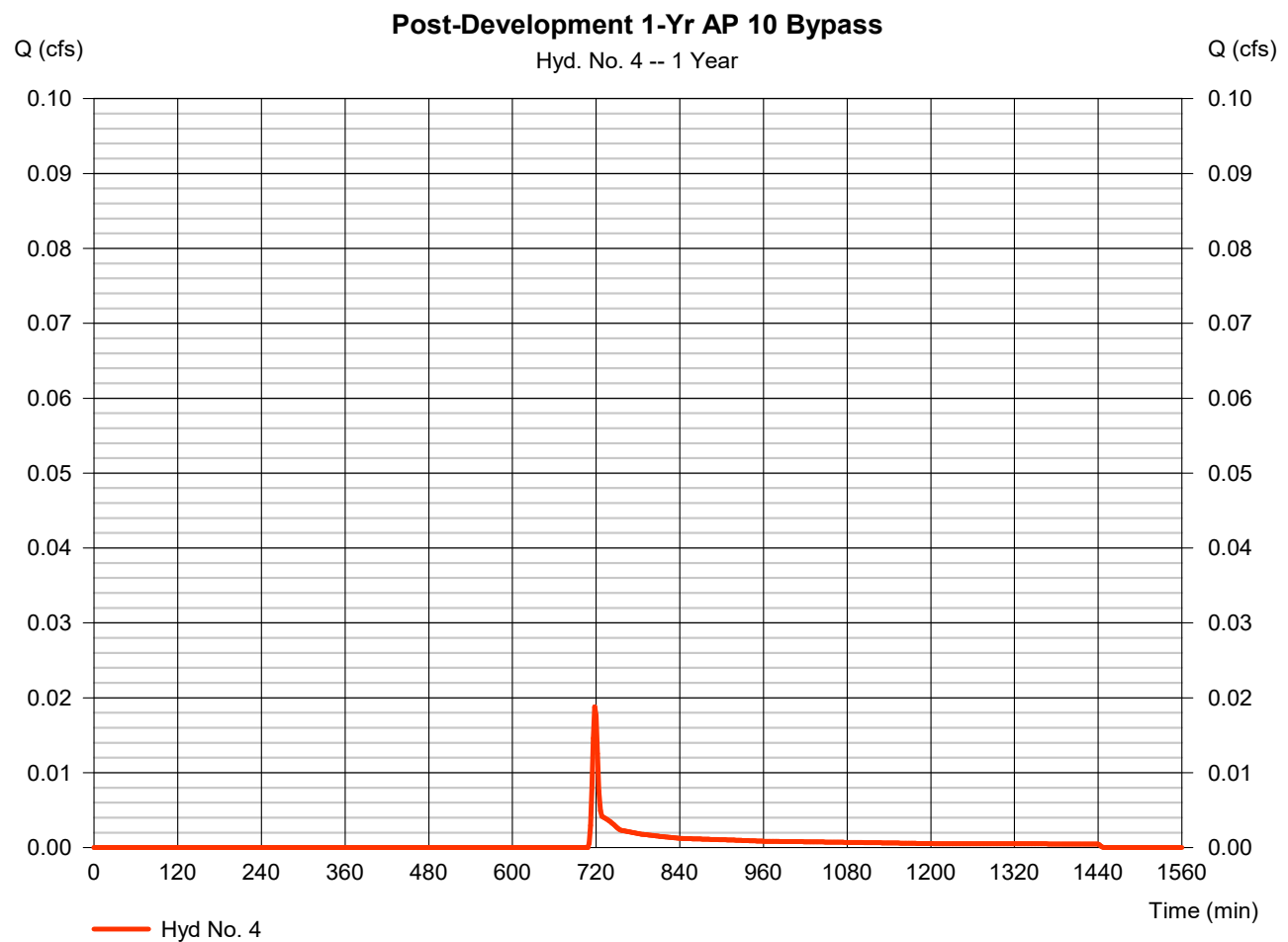
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 10 Bypass

|                 |   |            |                    |   |           |
|-----------------|---|------------|--------------------|---|-----------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.019 cfs |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 718 min   |
| Time interval   | = | 2 min      | Hyd. volume        | = | 50 cuft   |
| Drainage area   | = | 0.040 ac   | Curve number       | = | 61        |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft      |
| Tc method       | = | User       | Time of conc. (Tc) | = | 6.00 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II   |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484       |



# Hydrograph Report

6

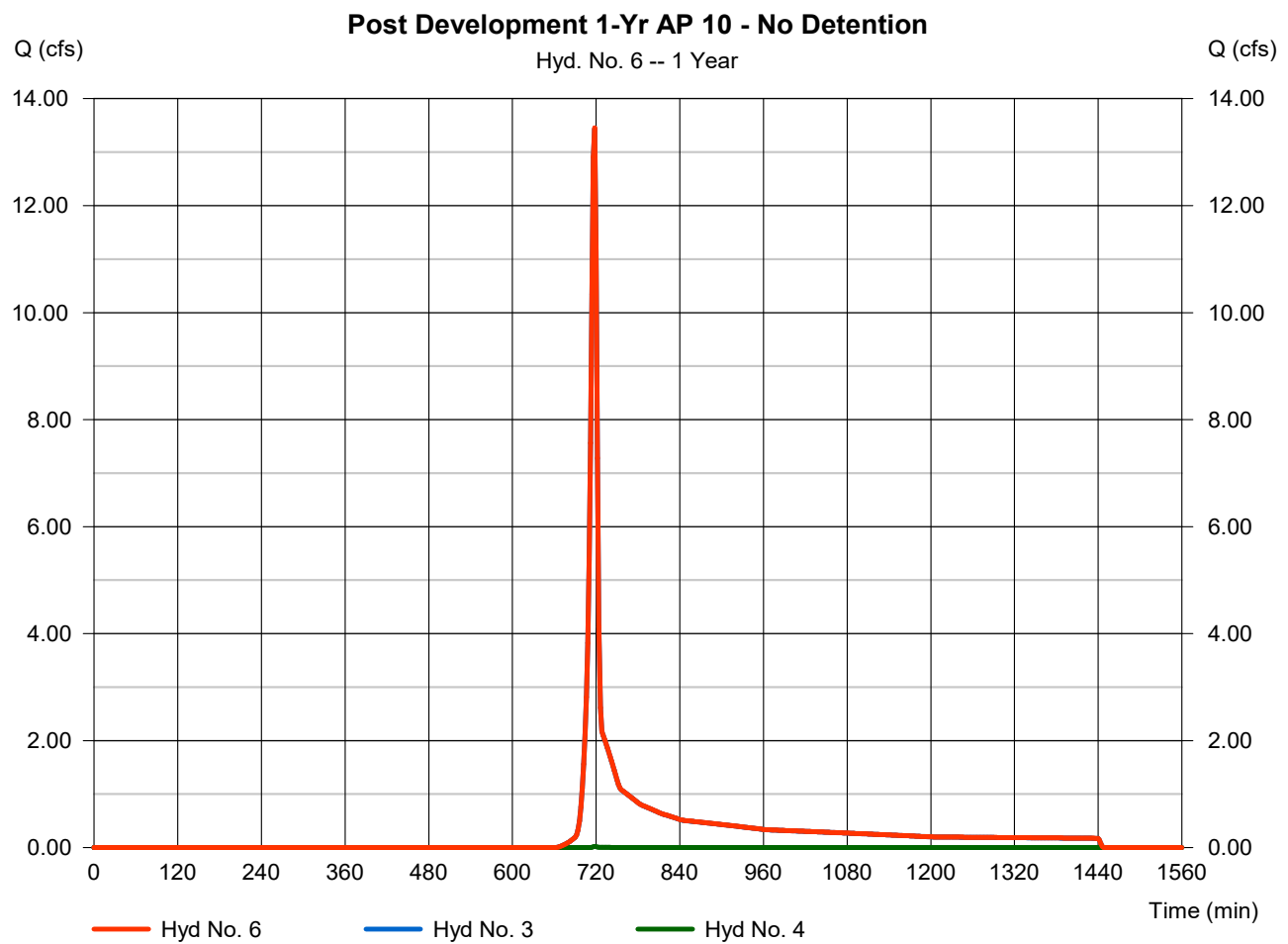
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 6

Post Development 1-Yr AP 10 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 13.45 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 27,064 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 8.780 ac    |



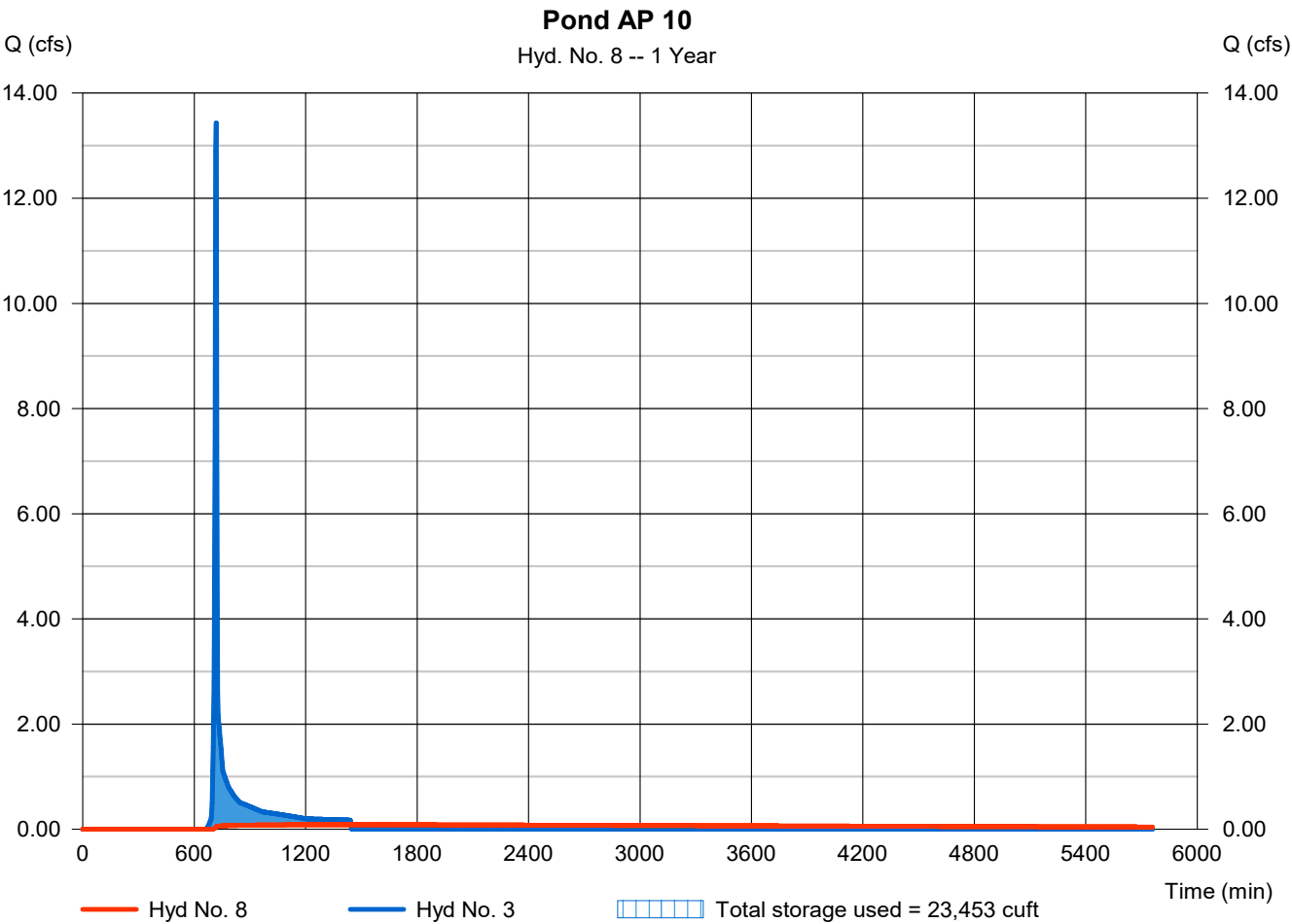
# Hydrograph Report

## Hyd. No. 8

Pond AP 10

|                 |                                           |                |               |
|-----------------|-------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                               | Peak discharge | = 0.089 cfs   |
| Storm frequency | = 1 yrs                                   | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                   | Hyd. volume    | = 20,481 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Pond AP 10 | Max. Elevation | = 102.00 ft   |
| Reservoir name  | = Pond AP 10                              | Max. Storage   | = 23,453 cuft |

Storage Indication method used.

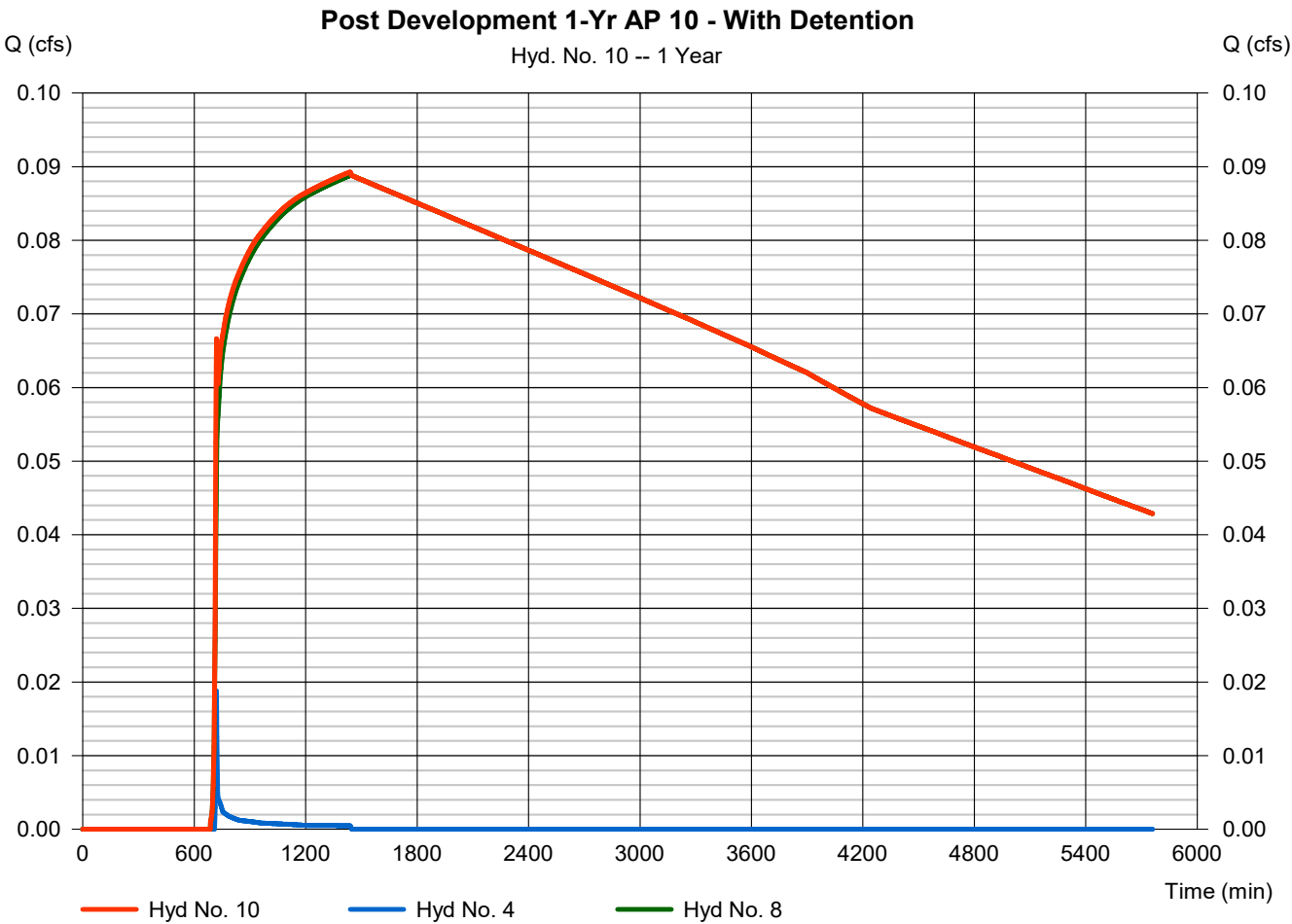


# Hydrograph Report

## Hyd. No. 10

Post Development 1-Yr AP 10 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.089 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 1440 min    |
| Time interval   | = 2 min   | Hyd. volume          | = 20,531 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 0.040 ac    |



## **Analysis Point 11**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                   | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description             |
|----------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|------------------------------------|
| 1                          | SCS Runoff               | 0.335           | 2                   | 734                | 3,688                 | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 11         |
| 3                          | SCS Runoff               | 16.96           | 2                   | 718                | 35,756                | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP 1 |
| 4                          | SCS Runoff               | 0.242           | 2                   | 724                | 1,492                 | -----         | -----                  | -----                   | Post-Development 1-Yr AP 11 Bypas  |
| 6                          | Combine                  | 17.05           | 2                   | 718                | 37,247                | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP 11 - No D |
| 8                          | Reservoir                | 0.101           | 2                   | 1444               | 24,650                | 3             | 102.54                 | 31,794                  | Pond AP 11                         |
| 10                         | Combine                  | 0.297           | 2                   | 724                | 26,142                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 11 - With |
| L20017_Peak Flow AP 11.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Friday, 07 / 31 / 2020  |                                    |

# Pond Report

8

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Pond No. 11 - Pond AP 11

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 10,732              | 0                    | 0                    |
| 1.00       | 101.00         | 12,061              | 11,397               | 11,397               |
| 2.00       | 102.00         | 13,447              | 12,754               | 24,151               |
| 3.00       | 103.00         | 14,889              | 14,168               | 38,319               |
| 4.00       | 104.00         | 16,388              | 15,639               | 53,957               |
| 5.00       | 105.00         | 17,943              | 17,166               | 71,123               |

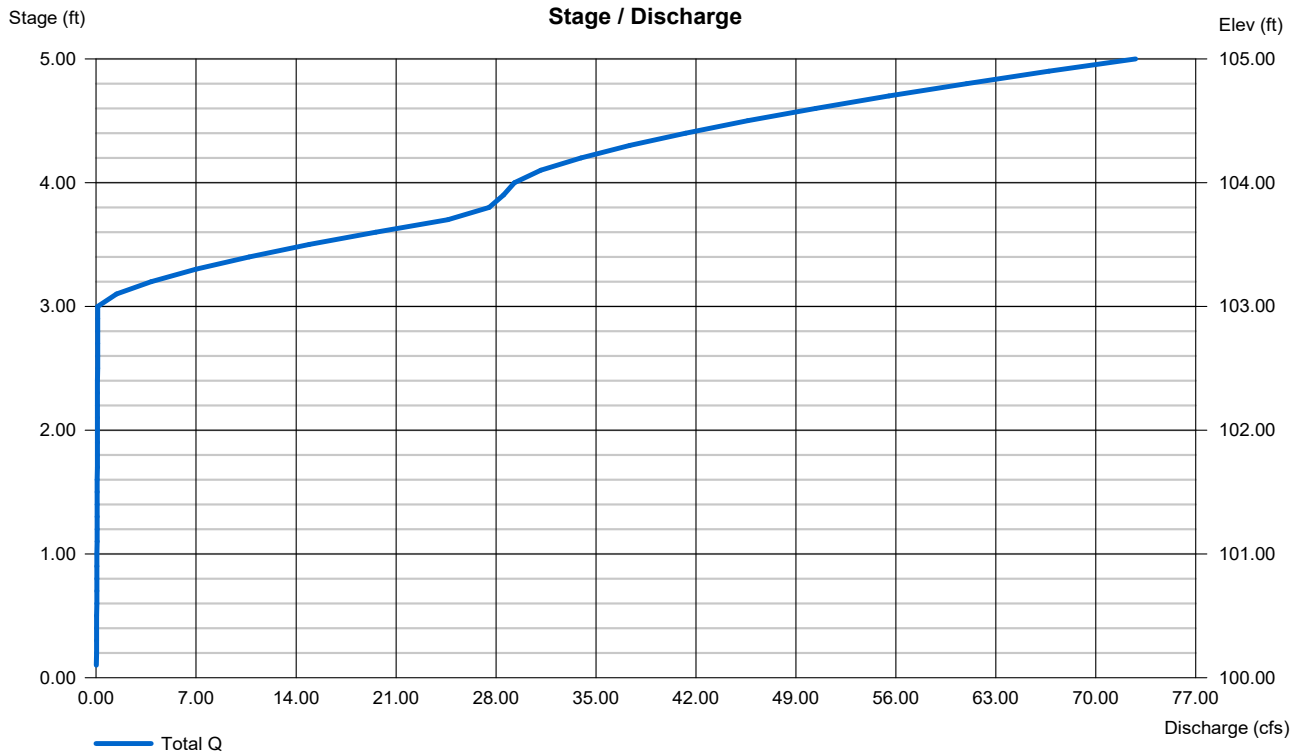
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 24.00 | 1.50   | 0.50   | 0.00     |
| Span (in)       | = 24.00 | 1.50   | 0.50   | 0.00     |
| No. Barrels     | = 1     | 1      | 1      | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 101.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | No     | No     | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 15.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 103.00              | 104.00 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

3

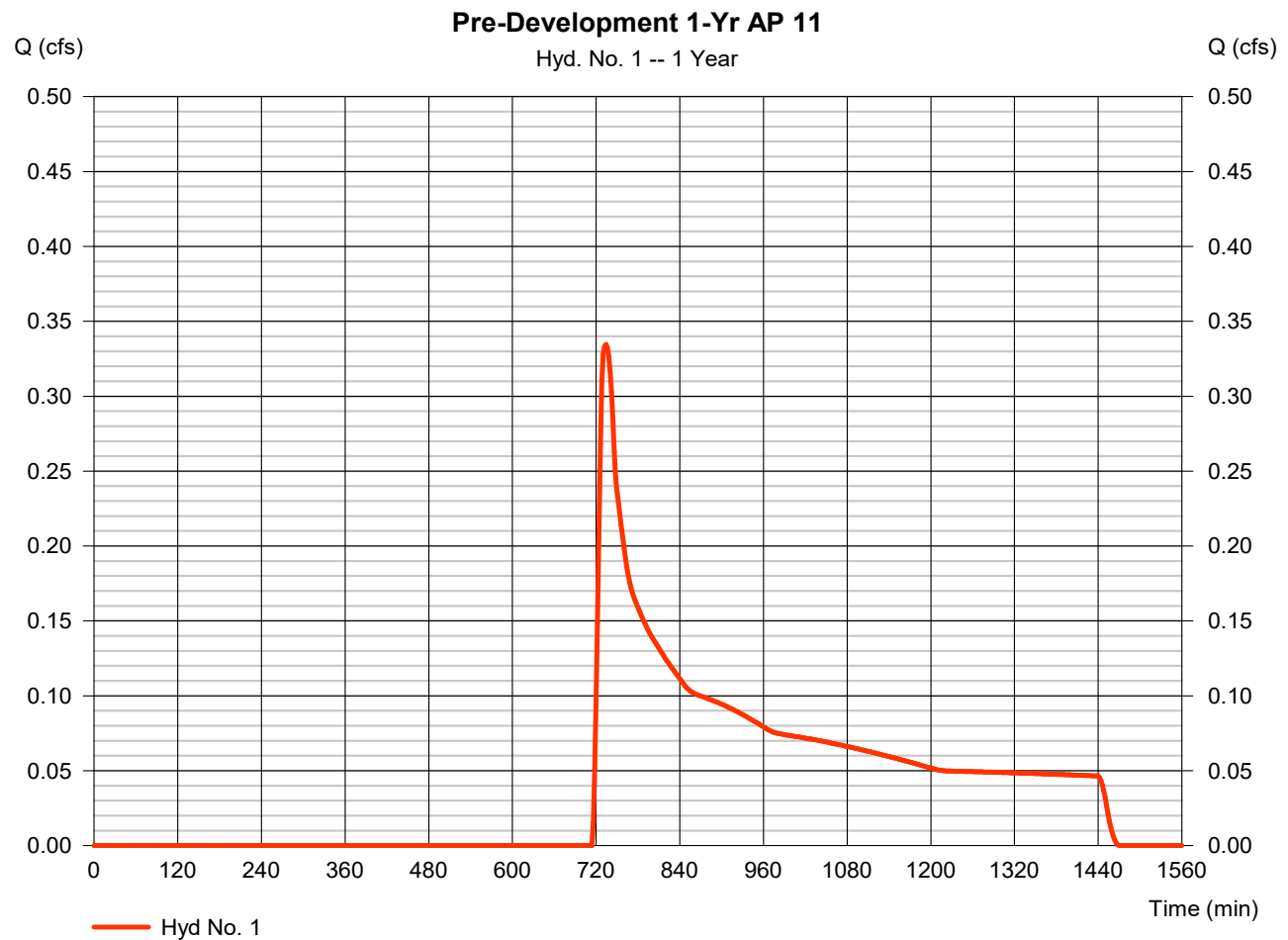
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 11

|                 |   |            |                    |   |            |
|-----------------|---|------------|--------------------|---|------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 0.335 cfs  |
| Storm frequency | = | 1 yrs      | Time to peak       | = | 734 min    |
| Time interval   | = | 2 min      | Hyd. volume        | = | 3,688 cuft |
| Drainage area   | = | 5.230 ac   | Curve number       | = | 55         |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft       |
| Tc method       | = | User       | Time of conc. (Tc) | = | 18.80 min  |
| Total precip.   | = | 3.00 in    | Distribution       | = | Type II    |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484        |





# Hydrograph Report

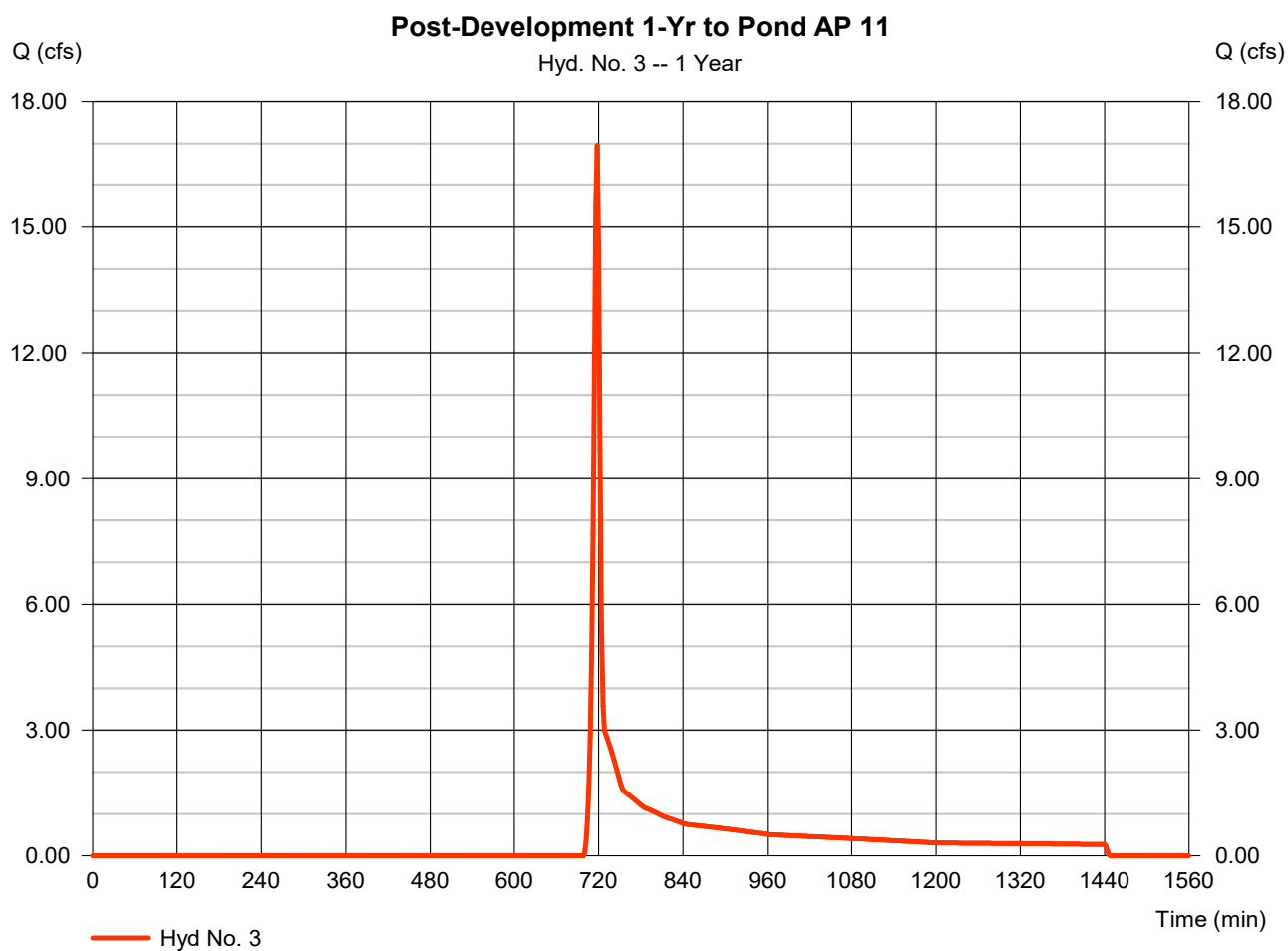
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 3

Post-Development 1-Yr to Pond AP 11

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 16.96 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 718 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 35,756 cuft |
| Drainage area   | = 16.770 ac  | Curve number       | = 68          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 3.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

5

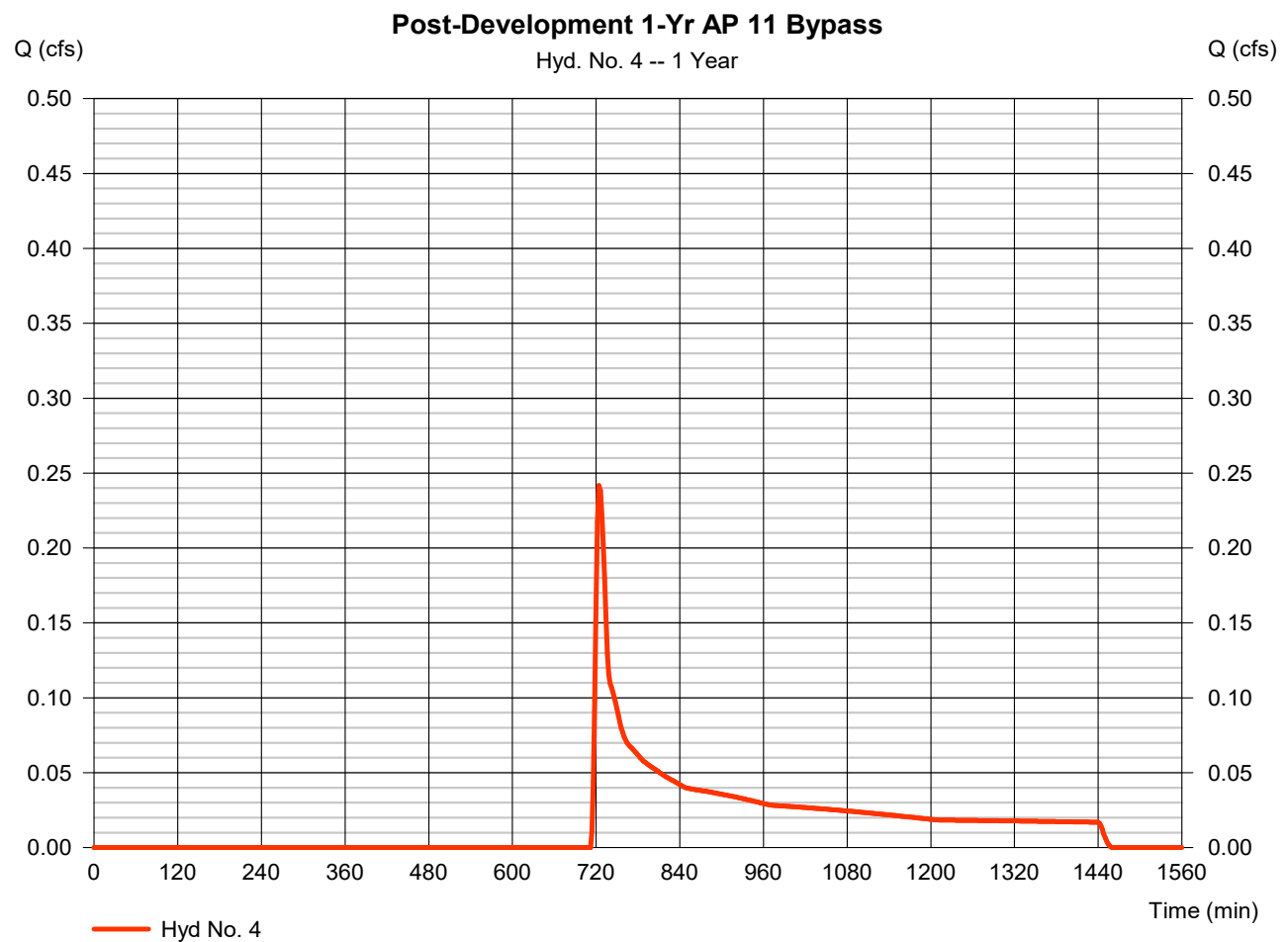
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 11 Bypass

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.242 cfs  |
| Storm frequency | = 1 yrs      | Time to peak       | = 724 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 1,492 cuft |
| Drainage area   | = 1.620 ac   | Curve number       | = 57         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 13.30 min  |
| Total precip.   | = 3.00 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |



# Hydrograph Report

6

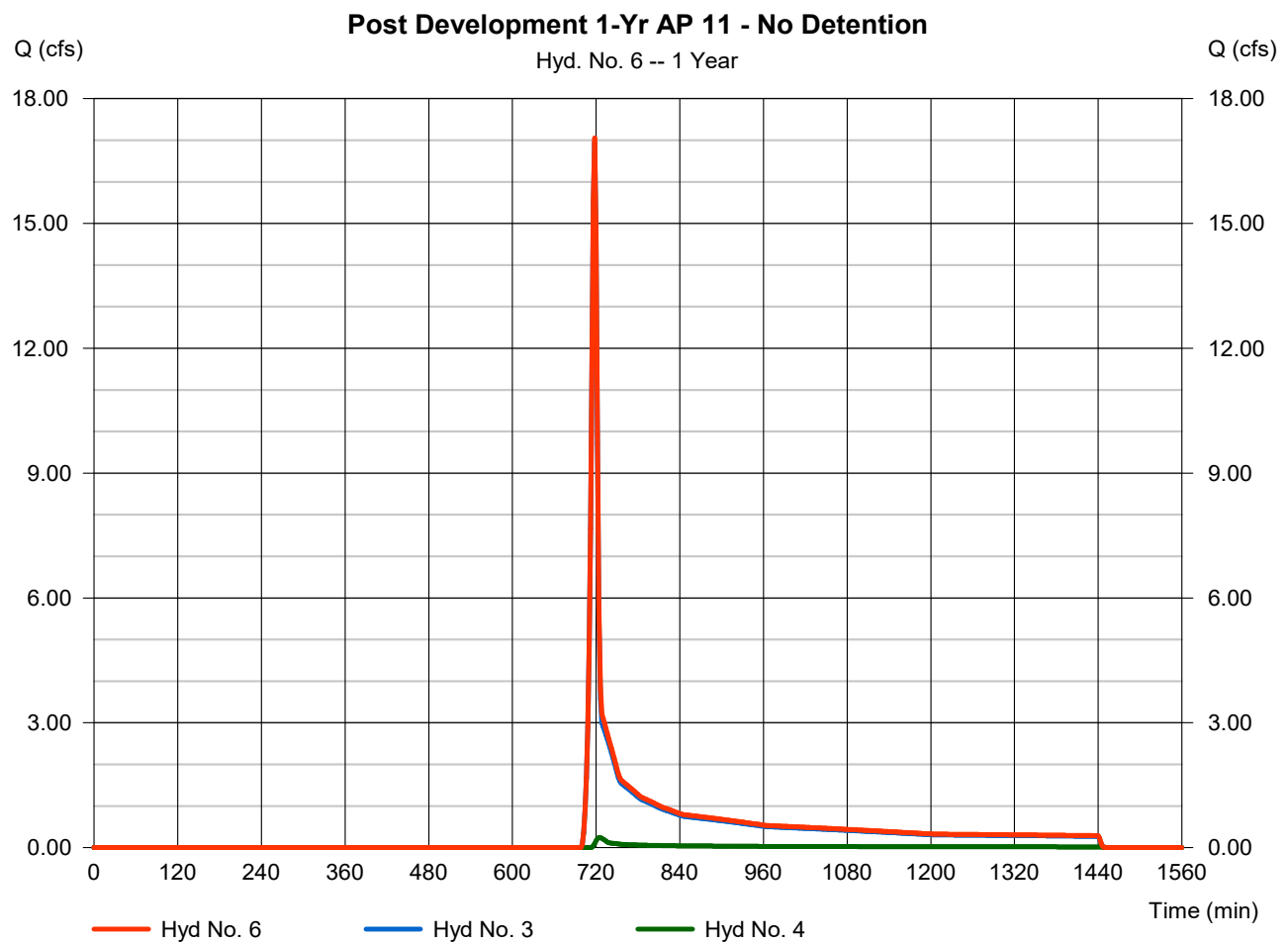
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 07 / 31 / 2020

## Hyd. No. 6

Post Development 1-Yr AP 11 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 17.05 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 37,247 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 18.390 ac   |



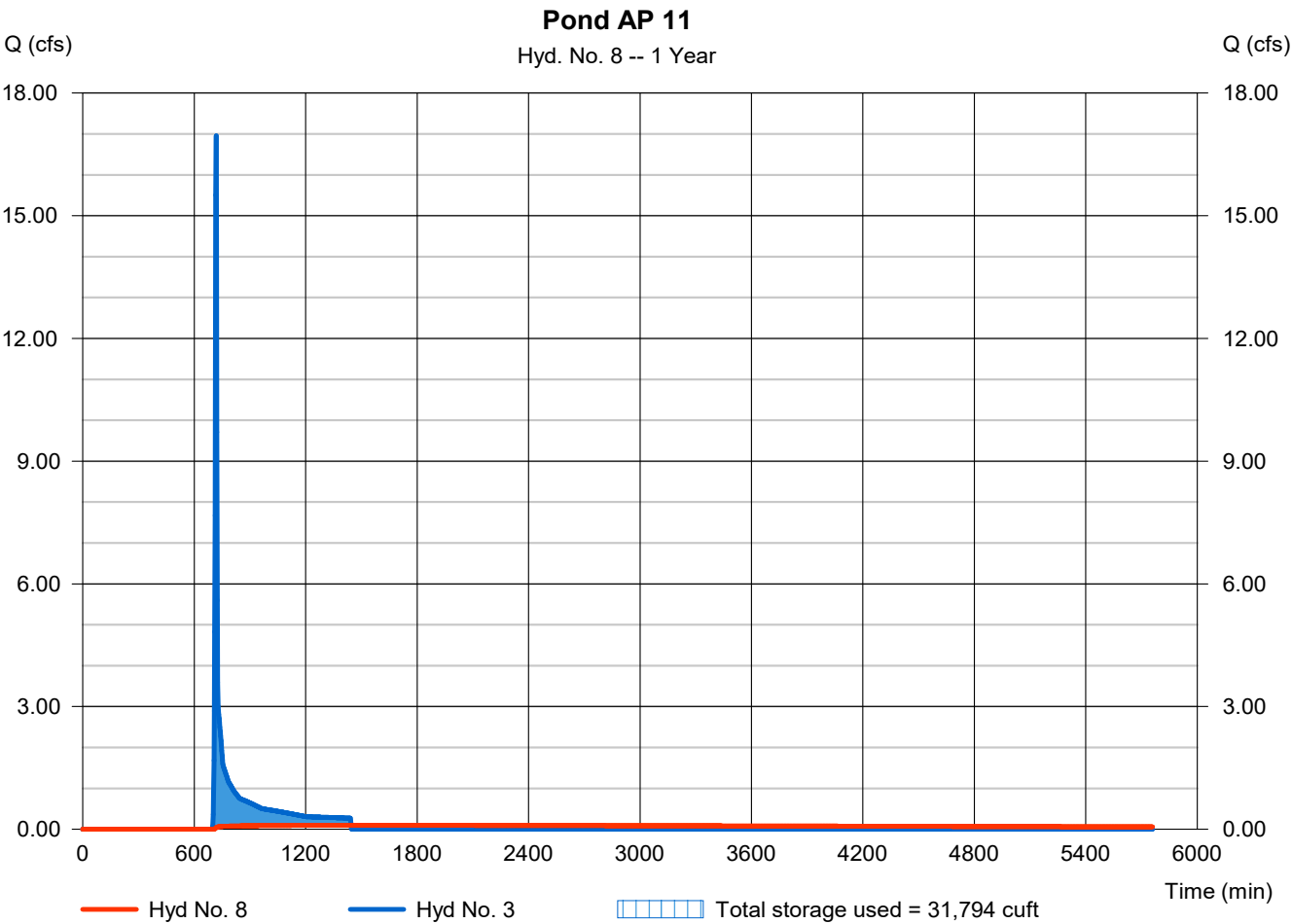
# Hydrograph Report

## Hyd. No. 8

Pond AP 11

|                 |                                           |                |               |
|-----------------|-------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                               | Peak discharge | = 0.101 cfs   |
| Storm frequency | = 1 yrs                                   | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                   | Hyd. volume    | = 24,650 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Road AP 11 | Max. Elevation | = 102.54 ft   |
| Reservoir name  | = Pond AP 11                              | Max. Storage   | = 31,794 cuft |

Storage Indication method used.

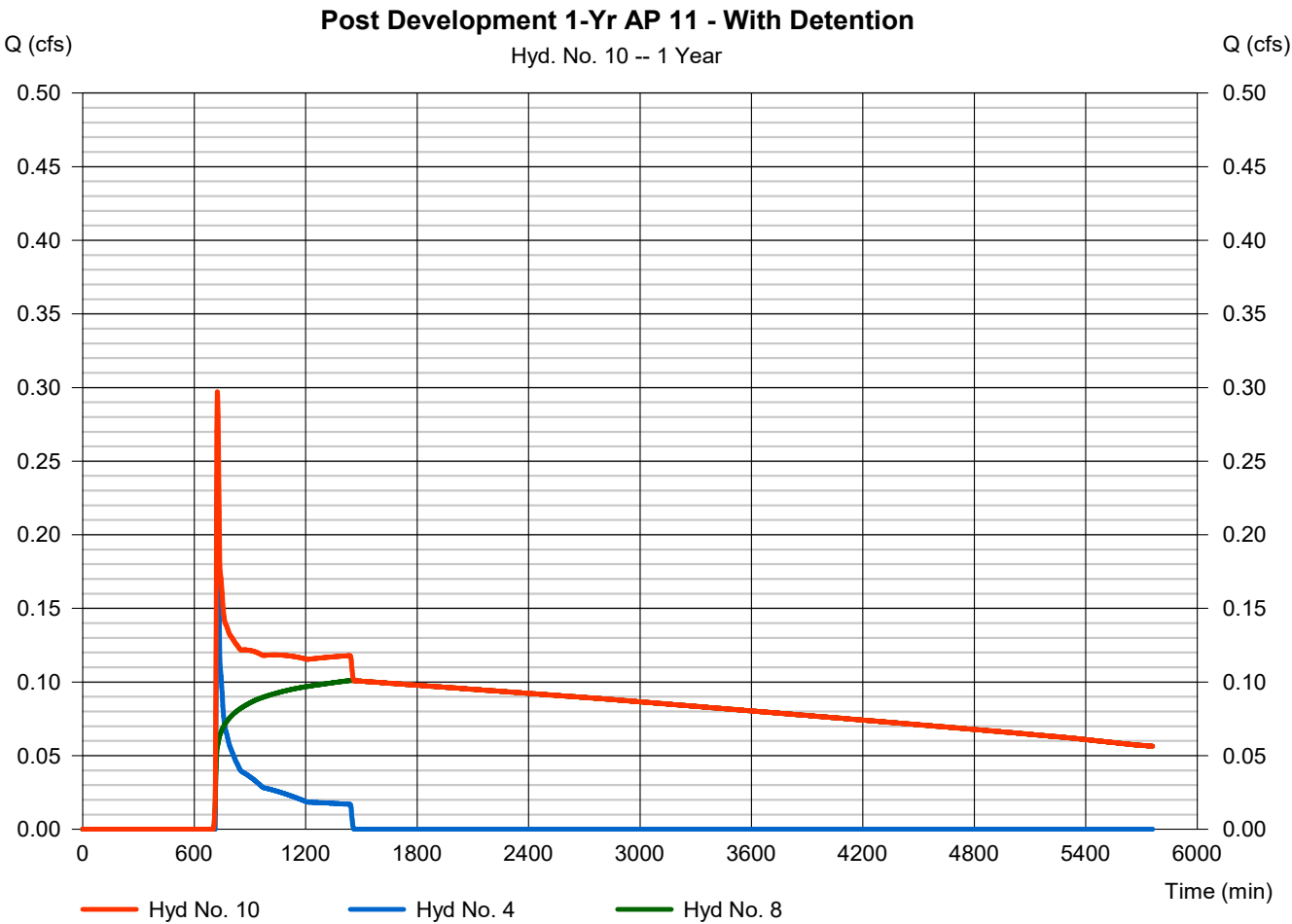


# Hydrograph Report

## Hyd. No. 10

Post Development 1-Yr AP 11 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.297 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 724 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 26,142 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 1.620 ac    |



## **Analysis Point 12**

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                   | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description             |
|----------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|------------------------------------|
| 1                          | SCS Runoff               | 3.499           | 2                   | 726                | 15,803                | -----         | -----                  | -----                   | Pre-Development 1-Yr AP 12         |
| 3                          | SCS Runoff               | 5.777           | 2                   | 718                | 11,554                | -----         | -----                  | -----                   | Post-Development 1-Yr to Pond AP 1 |
| 4                          | SCS Runoff               | 0.312           | 2                   | 722                | 1,047                 | -----         | -----                  | -----                   | Post-Development 1-Yr AP 12 Bypas  |
| 6                          | Combine                  | 6.032           | 2                   | 718                | 12,601                | 3, 4,         | -----                  | -----                   | Post Development 1-Yr AP 12 - No D |
| 8                          | Reservoir                | 0.042           | 2                   | 1442               | 9,196                 | 3             | 101.91                 | 9,849                   | Pond AP 12                         |
| 10                         | Combine                  | 0.337           | 2                   | 722                | 10,243                | 4, 8,         | -----                  | -----                   | Post Development 1-Yr AP 12 - With |
| L20017_Peak Flow AP 12.gpw |                          |                 |                     |                    | Return Period: 1 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                    |

# Pond Report

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Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Pond No. 12 - Pond AP 12

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 4,396               | 0                    | 0                    |
| 1.00       | 101.00         | 5,172               | 4,784                | 4,784                |
| 2.00       | 102.00         | 6,005               | 5,589                | 10,373               |
| 3.00       | 103.00         | 6,894               | 6,450                | 16,822               |
| 4.00       | 104.00         | 7,840               | 7,367                | 24,189               |
| 5.00       | 105.00         | 8,843               | 8,342                | 32,531               |

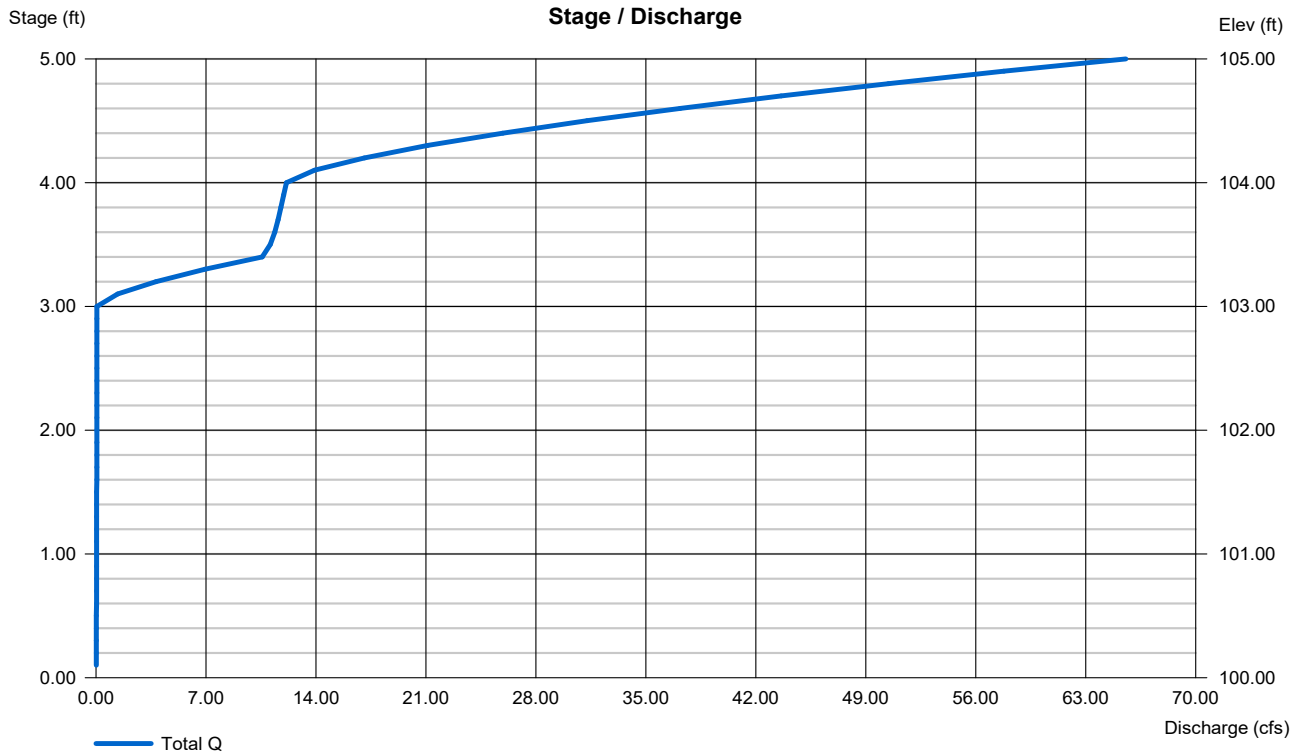
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 15.00 | 1.00   | 0.50   | 0.00     |
| Span (in)       | = 15.00 | 1.00   | 0.50   | 0.00     |
| No. Barrels     | = 1     | 1      | 1      | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 101.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | No     | No     | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 20.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 103.00              | 104.00 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).





# Hydrograph Report

2

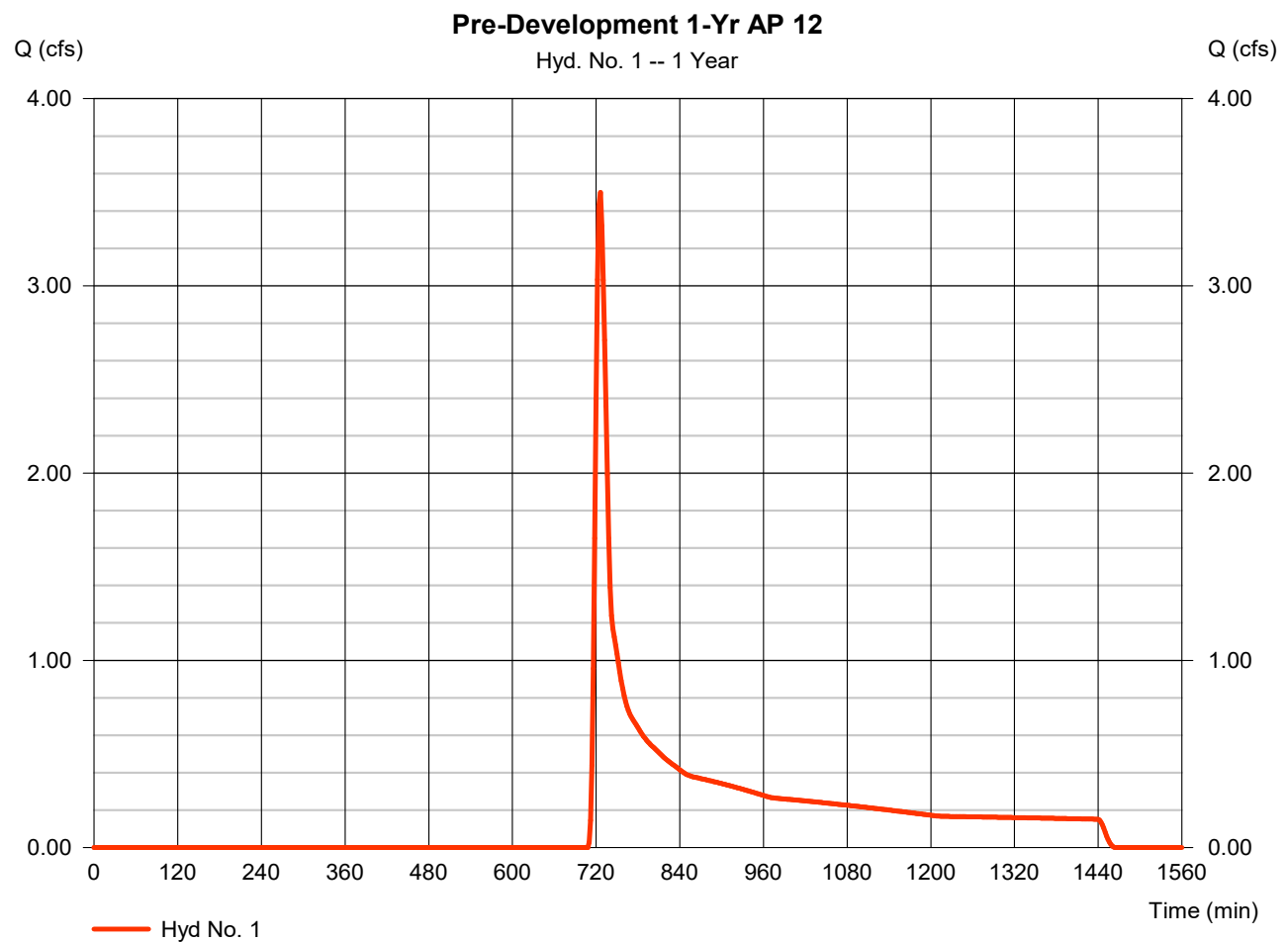
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 1-Yr AP 12

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 3.499 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 726 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 15,803 cuft |
| Drainage area   | = 12.230 ac  | Curve number       | = 61          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 15.70 min   |
| Total precip.   | = 3.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

3

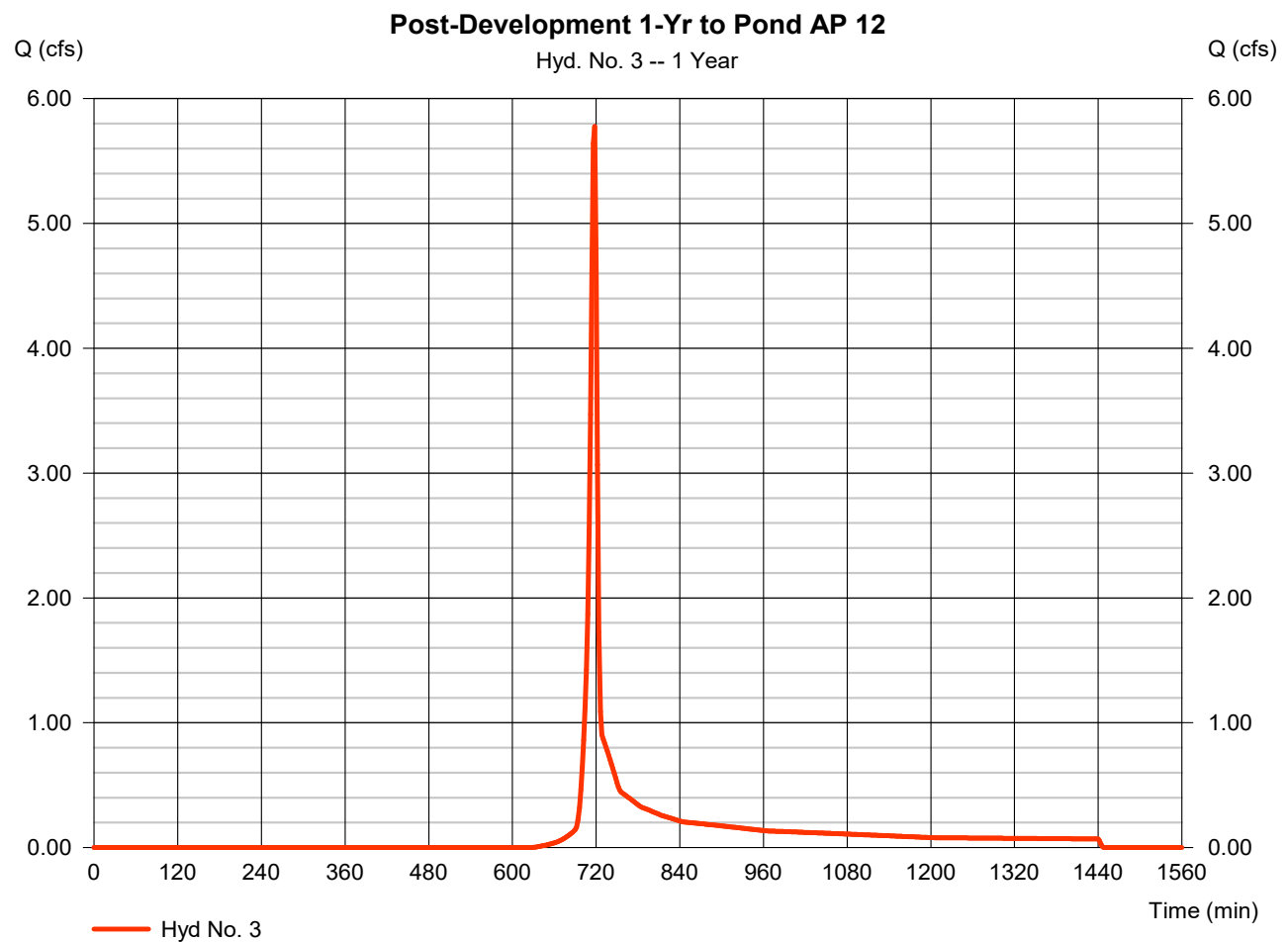
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Tuesday, 09 / 29 / 2020

## Hyd. No. 3

Post-Development 1-Yr to Pond AP 12

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 5.777 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 718 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 11,554 cuft |
| Drainage area   | = 3.170 ac   | Curve number       | = 77          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 3.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

4

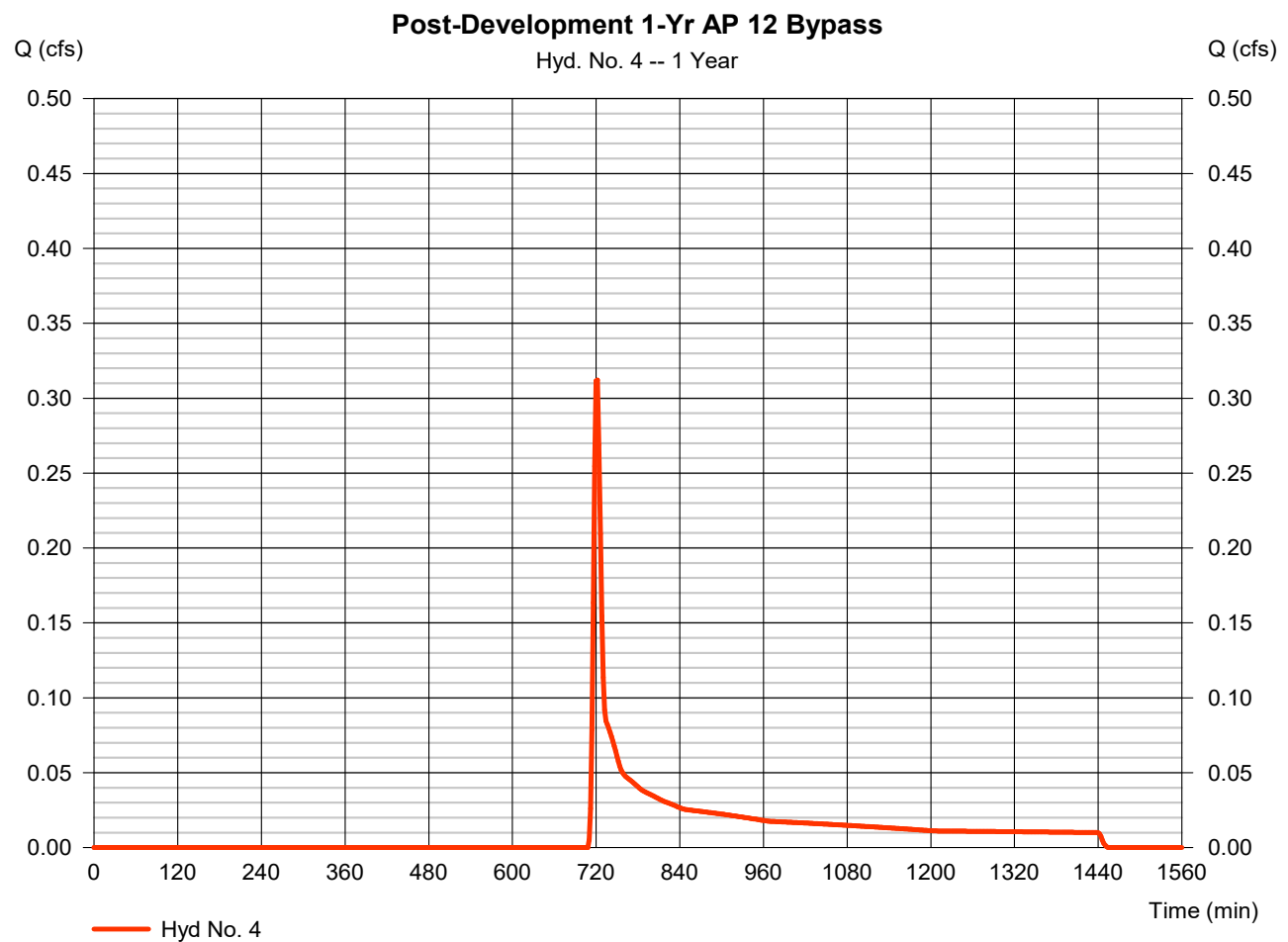
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 4

### Post-Development 1-Yr AP 12 Bypass

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.312 cfs  |
| Storm frequency | = 1 yrs      | Time to peak       | = 722 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 1,047 cuft |
| Drainage area   | = 0.790 ac   | Curve number       | = 61         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 8.30 min   |
| Total precip.   | = 3.00 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |



# Hydrograph Report

5

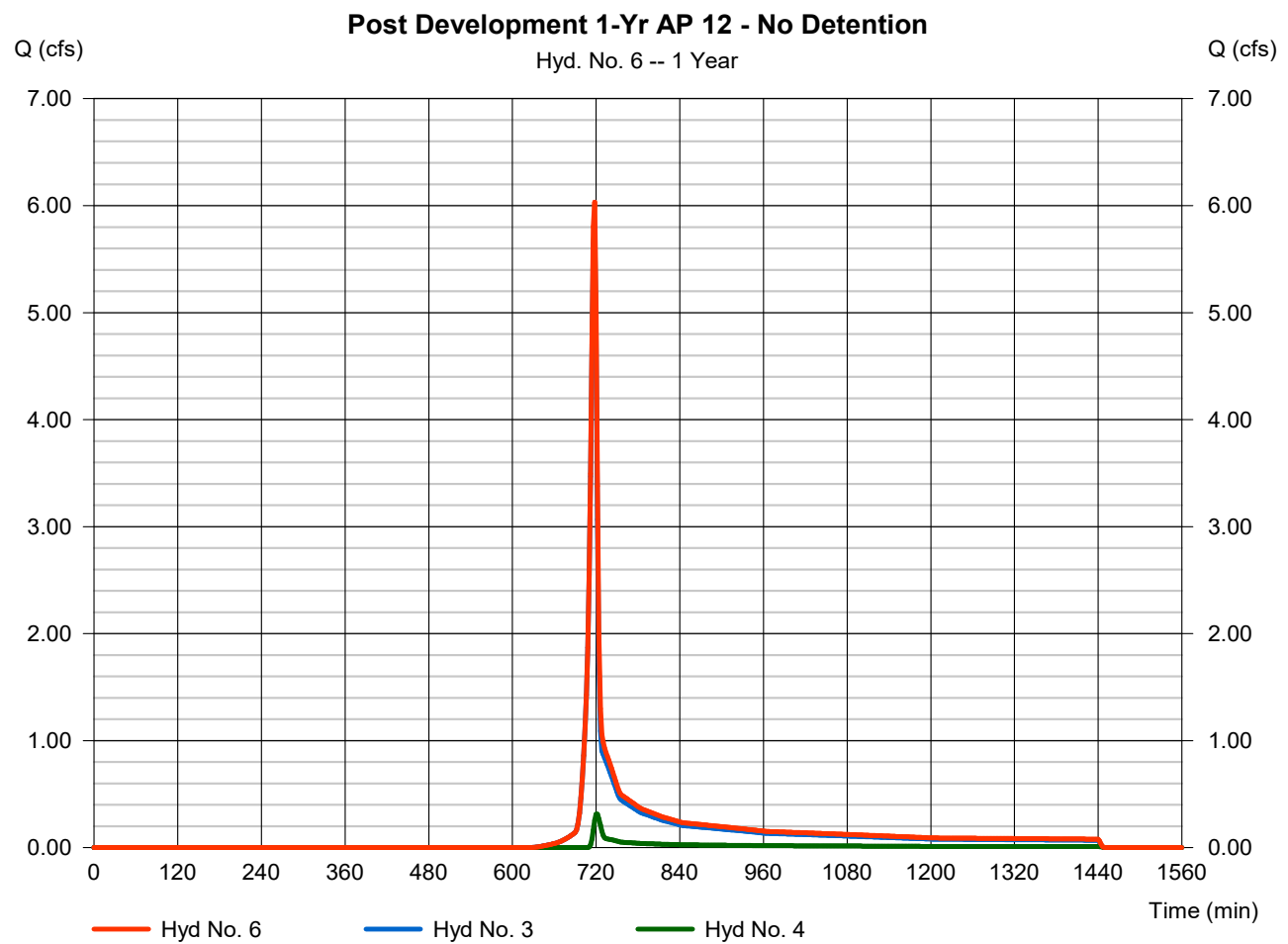
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

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## Hyd. No. 6

Post Development 1-Yr AP 12 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 6.032 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 12,601 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 3.960 ac    |



# Hydrograph Report

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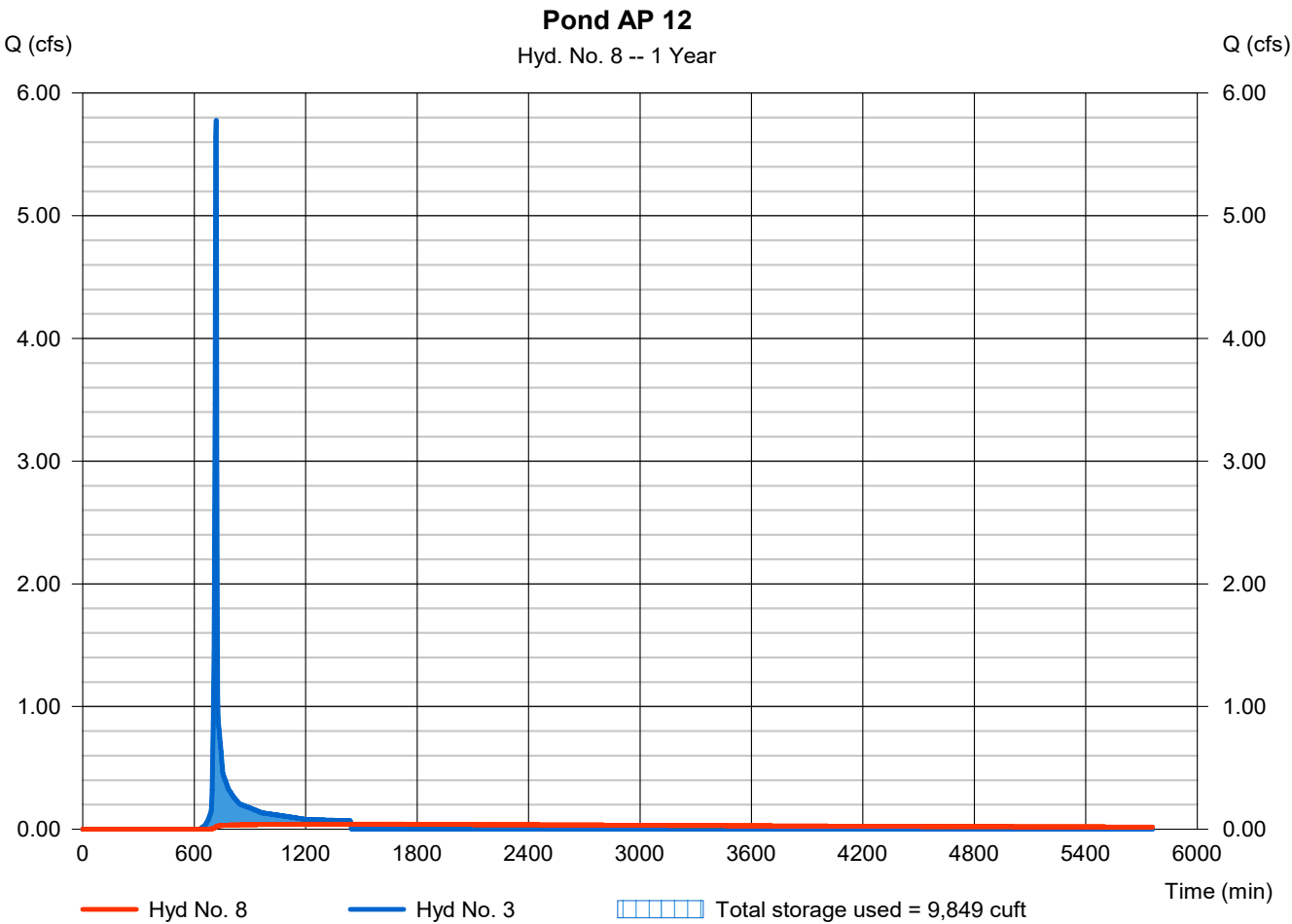
Tuesday, 09 / 29 / 2020

## Hyd. No. 8

Pond AP 12

|                 |                                           |                |              |
|-----------------|-------------------------------------------|----------------|--------------|
| Hydrograph type | = Reservoir                               | Peak discharge | = 0.042 cfs  |
| Storm frequency | = 1 yrs                                   | Time to peak   | = 1442 min   |
| Time interval   | = 2 min                                   | Hyd. volume    | = 9,196 cuft |
| Inflow hyd. No. | = 3 - Post-Development 1-Yr to Pond AP 12 | Max. Elevation | = 101.91 ft  |
| Reservoir name  | = Pond AP 12                              | Max. Storage   | = 9,849 cuft |

Storage Indication method used.



# Hydrograph Report

8

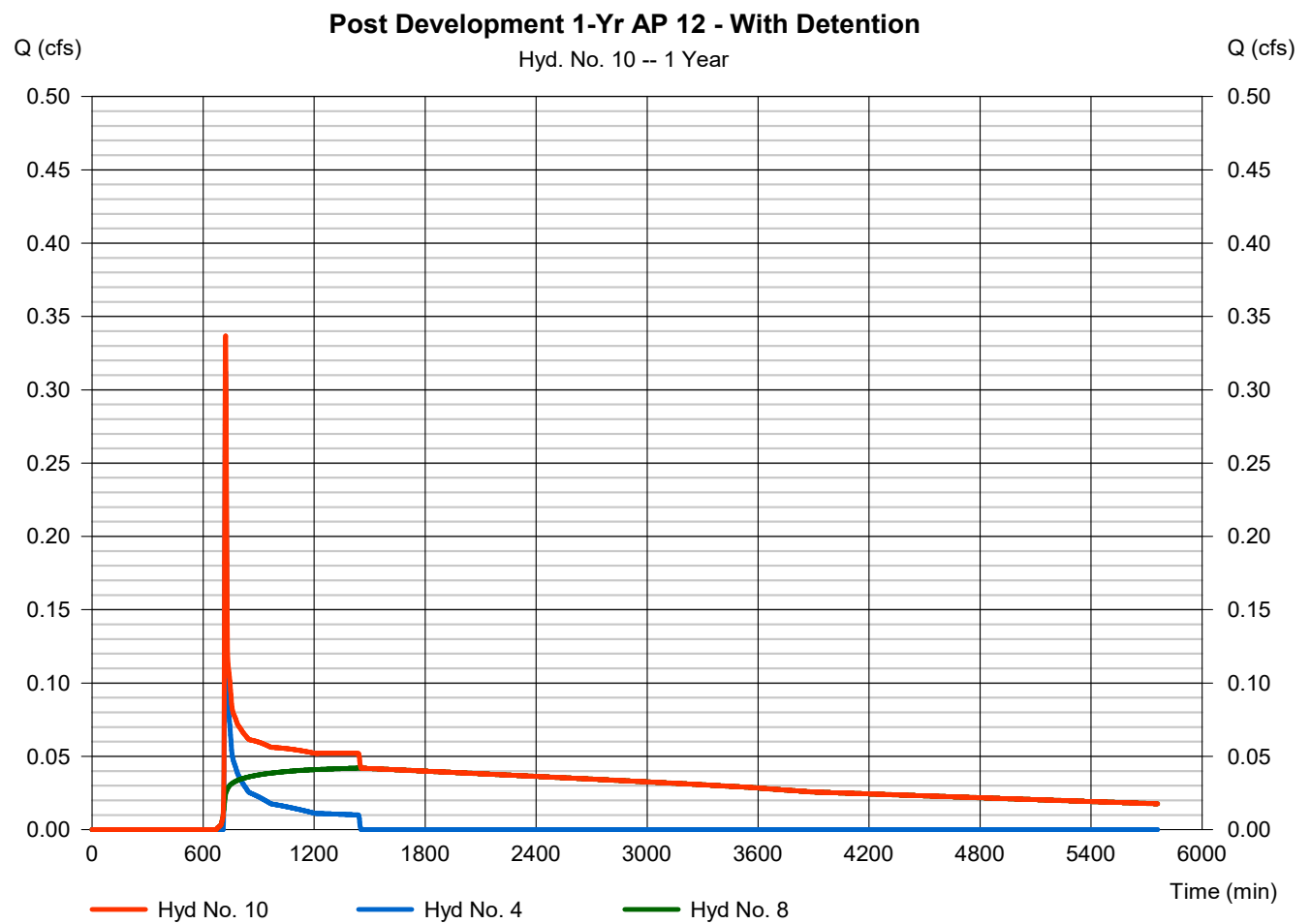
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

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## Hyd. No. 10

Post Development 1-Yr AP 12 - With Detention

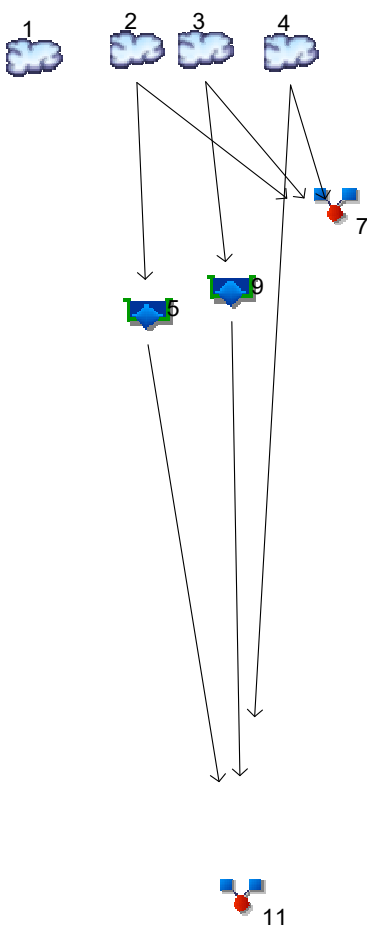
|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 0.337 cfs   |
| Storm frequency | = 1 yrs   | Time to peak         | = 722 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 10,243 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 0.790 ac    |



## **Analysis Point 13**

# Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020



## Legend

| Hyd. | Origin     | Description                                        |
|------|------------|----------------------------------------------------|
| 1    | SCS Runoff | Pre-Development 2/10/25-Yr AP 13                   |
| 2    | SCS Runoff | Post-Development 2/10/25-Yr to Pond AP 8           |
| 3    | SCS Runoff | Post-Development 2/10/25-Yr to Pond AP 6           |
| 4    | SCS Runoff | Post-Development 2/10/25-Yr AP 13 Bypass           |
| 5    | Reservoir  | Pond AP 8                                          |
| 7    | Combine    | Post Development 2/10/25-Yr AP 13 - No Detention   |
| 9    | Reservoir  | Pond AP 6                                          |
| 11   | Combine    | Post Development 2/10/25-Yr AP 13 - With Detention |

Project: L20017\_Peak Flow AP 13.gpw

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# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                   | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|----------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                          | SCS Runoff               | 4.418           | 2                   | 732                | 30,896                | -----         | -----                  | -----                   | Pre-Development 2/10/25-Yr AP 13    |
| 2                          | SCS Runoff               | 24.06           | 2                   | 718                | 48,195                | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr to Pon  |
| 3                          | SCS Runoff               | 22.73           | 2                   | 718                | 45,831                | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr to Pon  |
| 4                          | SCS Runoff               | 2.773           | 2                   | 724                | 10,175                | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr AP 13   |
| 5                          | Reservoir                | 0.128           | 2                   | 1444               | 31,648                | 2             | 102.46                 | 42,970                  | Pond AP 8                           |
| 7                          | Combine                  | 48.66           | 2                   | 718                | 104,200               | 2, 3, 4,      | -----                  | -----                   | Post Development 2/10/25-Yr AP 13 - |
| 9                          | Reservoir                | 0.075           | 2                   | 1444               | 19,802                | 3             | 102.85                 | 42,788                  | Pond AP 6                           |
| 11                         | Combine                  | 2.910           | 2                   | 724                | 61,625                | 4, 5, 9,      | -----                  | -----                   | Post Development 2/10/25-Yr AP 13 - |
| L20017_Peak Flow AP 13.gpw |                          |                 |                     |                    | Return Period: 2 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |

# Pond Report

11

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## Pond No. 6 - Pond AP 6

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 12,824              | 0                    | 0                    |
| 1.00       | 101.00         | 14,305              | 13,565               | 13,565               |
| 2.00       | 102.00         | 15,842              | 15,074               | 28,638               |
| 3.00       | 103.00         | 17,345              | 16,594               | 45,232               |
| 4.00       | 104.00         | 19,086              | 18,216               | 63,447               |
| 5.00       | 105.00         | 20,793              | 19,940               | 83,387               |

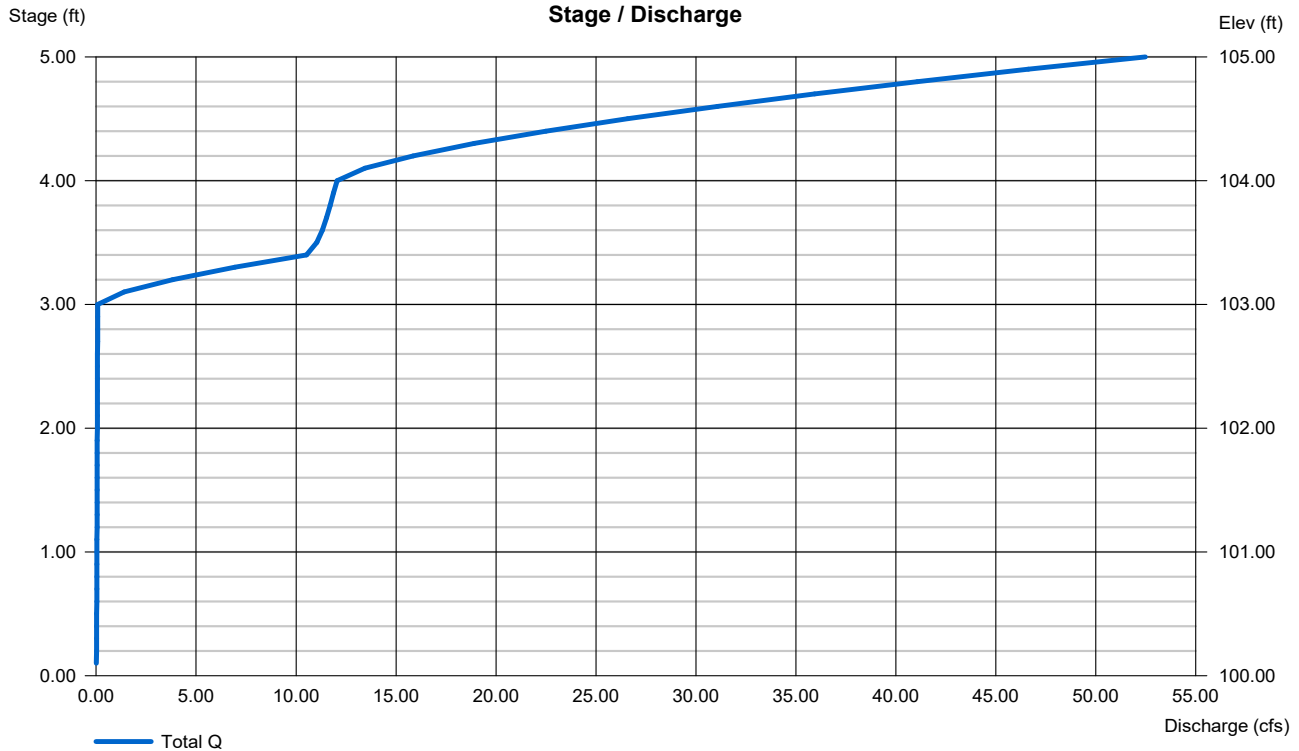
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 15.00 | 1.25   | 0.50   | 0.00     |
| Span (in)       | = 15.00 | 1.25   | 0.50   | 0.00     |
| No. Barrels     | = 1     | 1      | 1      | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 102.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | Yes    | Yes    | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 15.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 103.00              | 104.00 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Pond Report

8

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Tuesday, 09 / 29 / 2020

## Pond No. 8 - Pond AP 8

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 15,602              | 0                    | 0                    |
| 1.00       | 101.00         | 17,062              | 16,332               | 16,332               |
| 2.00       | 102.00         | 18,577              | 17,820               | 34,152               |
| 3.00       | 103.00         | 20,150              | 19,364               | 53,515               |
| 4.00       | 104.00         | 21,779              | 20,965               | 74,480               |
| 5.00       | 105.00         | 23,465              | 22,622               | 97,102               |

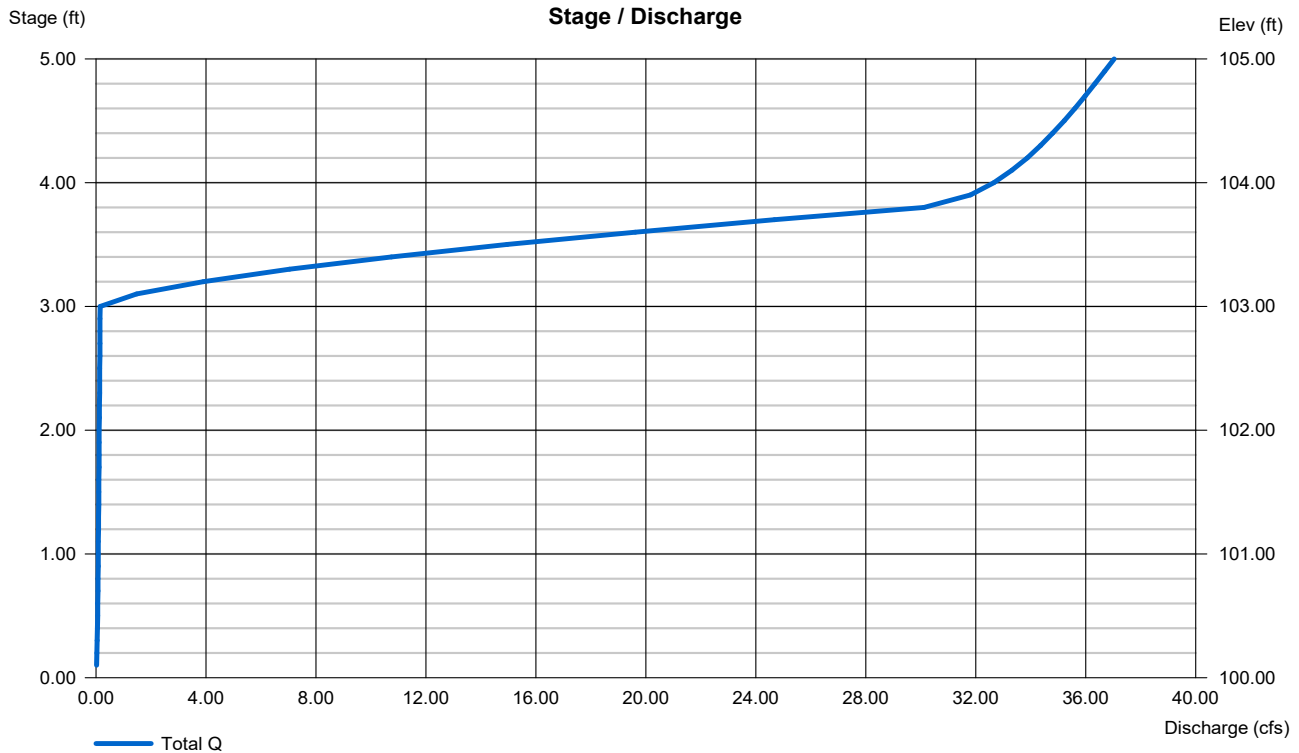
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 24.00 | 1.75   | 0.50   | 0.00     |
| Span (in)       | = 24.00 | 1.75   | 0.50   | 0.00     |
| No. Barrels     | = 1     | 1      | 1      | 0        |
| Invert El. (ft) | = 98.00 | 100.00 | 102.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | No     | No     | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 0.00   | 0.00 | 0.00 |
| Crest El. (ft) | = 103.00              | 104.00 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

3

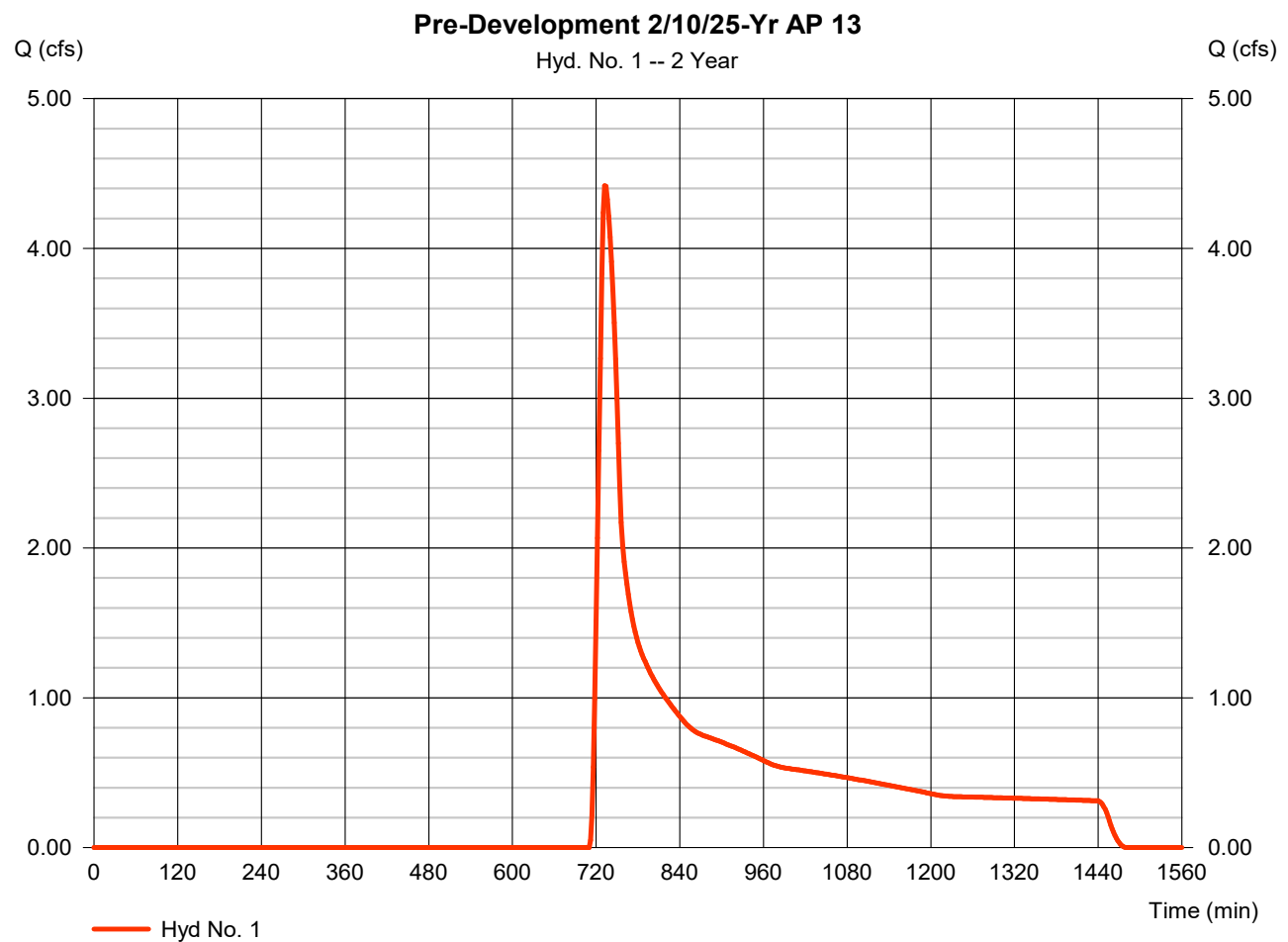
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Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 2/10/25-Yr AP 13

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 4.418 cfs   |
| Storm frequency | = | 2 yrs      | Time to peak       | = | 732 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 30,896 cuft |
| Drainage area   | = | 22.780 ac  | Curve number       | = | 56          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 24.30 min   |
| Total precip.   | = | 3.50 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



# Hydrograph Report

4

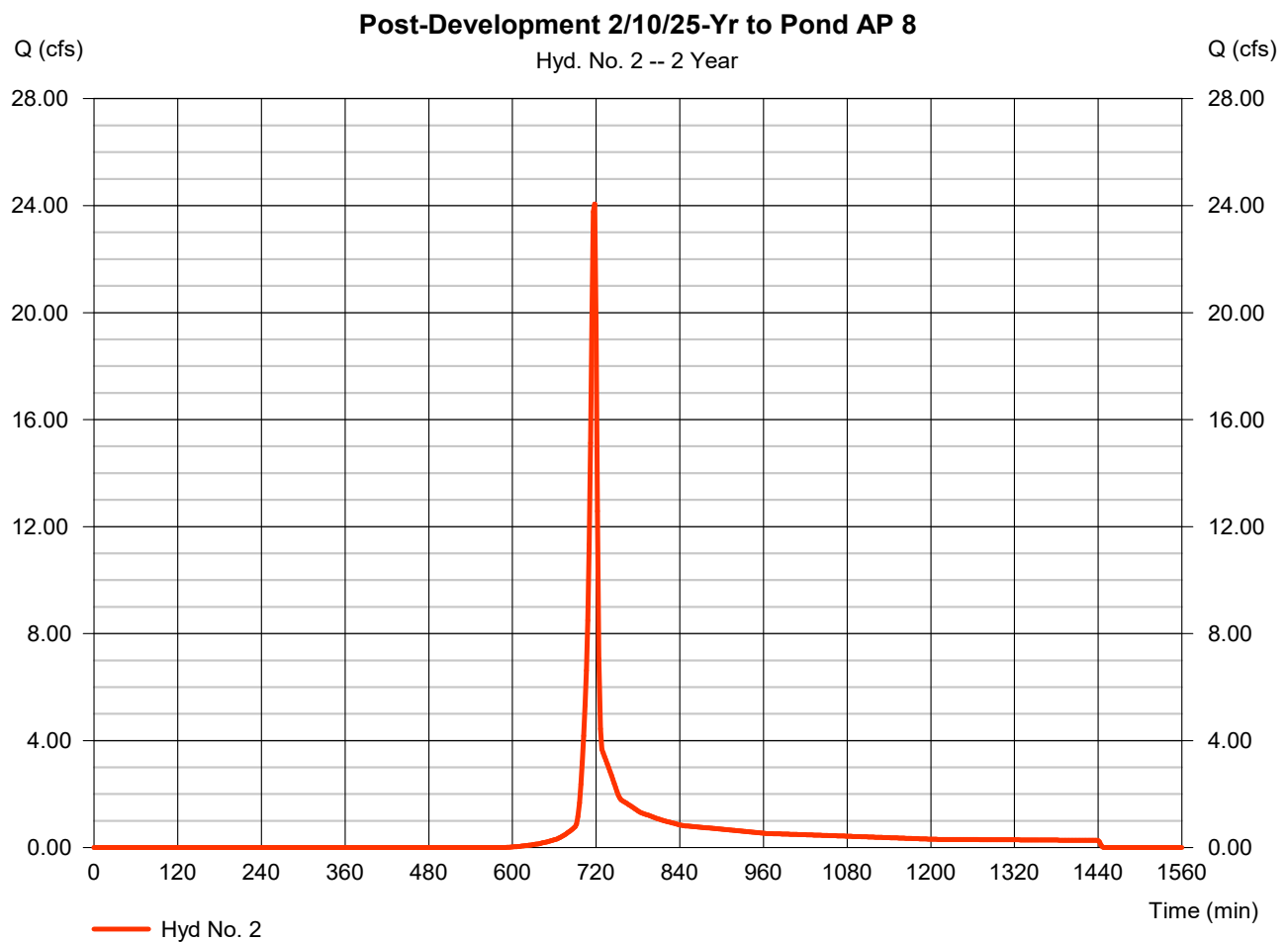
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 2

Post-Development 2/10/25-Yr to Pond AP 8

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 24.06 cfs   |
| Storm frequency | = | 2 yrs      | Time to peak       | = | 718 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 48,195 cuft |
| Drainage area   | = | 9.900 ac   | Curve number       | = | 77          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 5.00 min    |
| Total precip.   | = | 3.50 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



# Hydrograph Report

5

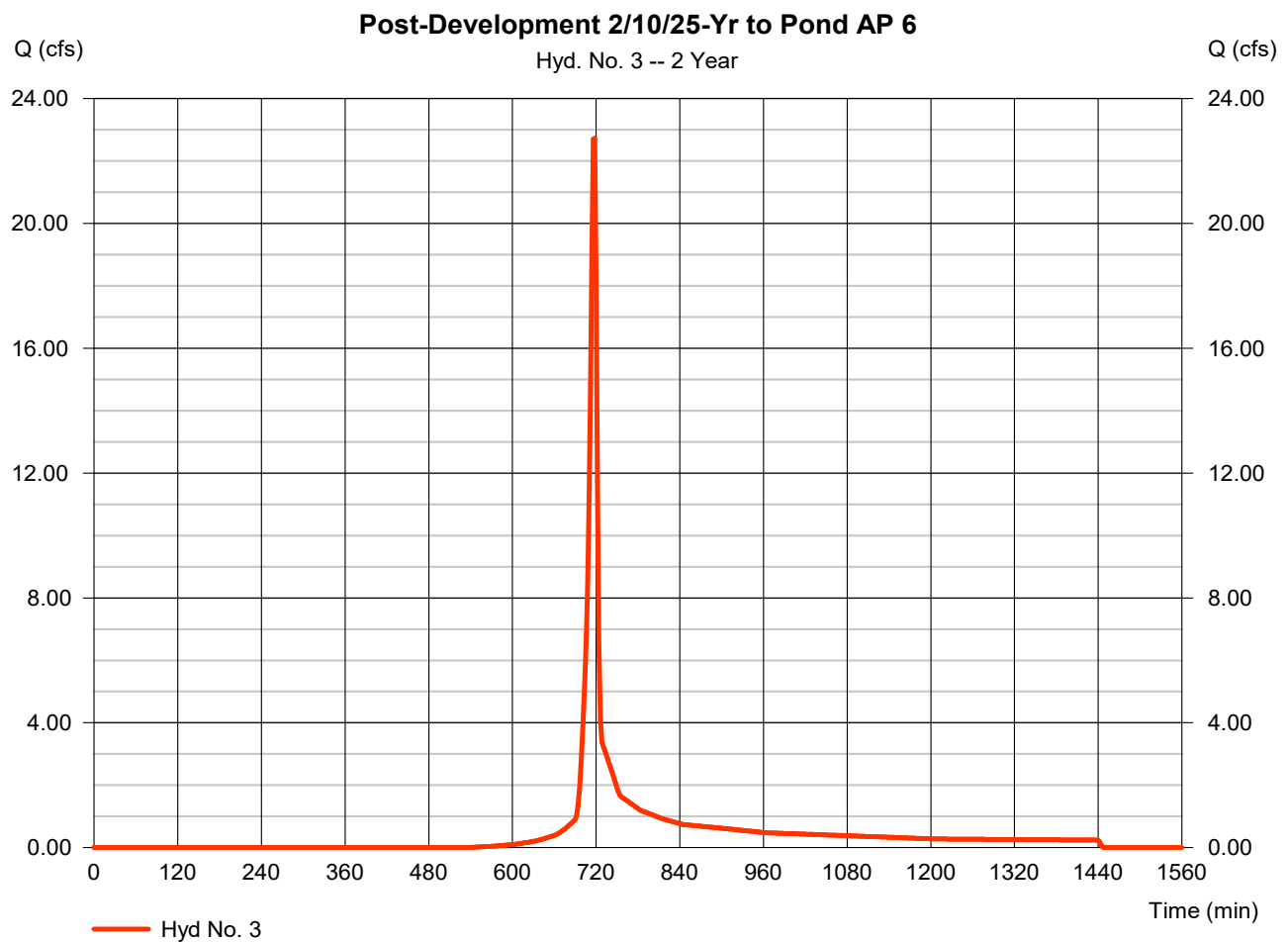
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## Hyd. No. 3

Post-Development 2/10/25-Yr to Pond AP 6

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 22.73 cfs   |
| Storm frequency | = | 2 yrs      | Time to peak       | = | 718 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 45,831 cuft |
| Drainage area   | = | 8.230 ac   | Curve number       | = | 80          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 5.00 min    |
| Total precip.   | = | 3.50 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



# Hydrograph Report

6

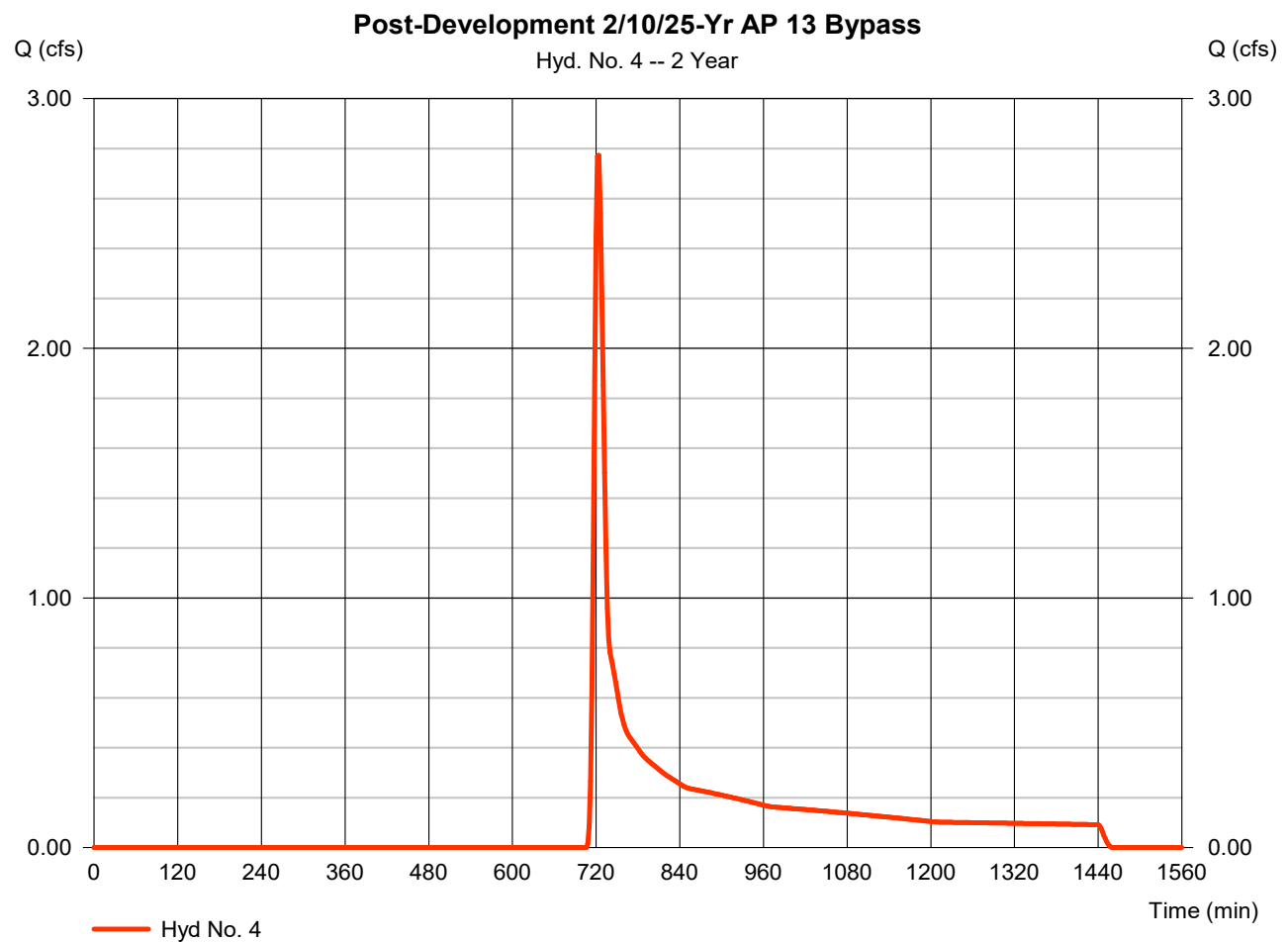
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 4

Post-Development 2/10/25-Yr AP 13 Bypass

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 2.773 cfs   |
| Storm frequency | = 2 yrs      | Time to peak       | = 724 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 10,175 cuft |
| Drainage area   | = 5.530 ac   | Curve number       | = 59          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 12.00 min   |
| Total precip.   | = 3.50 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



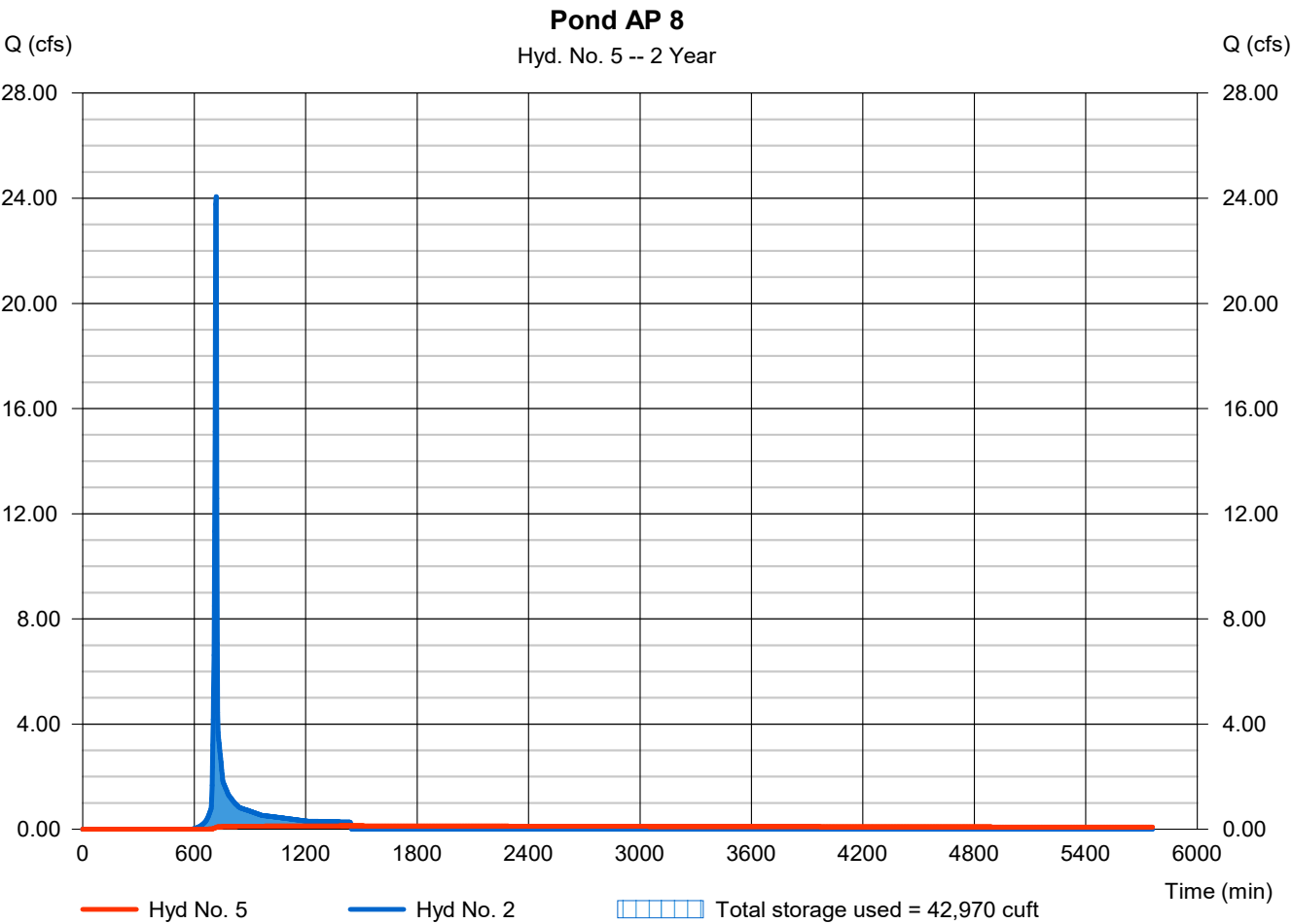
# Hydrograph Report

## Hyd. No. 5

Pond AP 8

|                 |                                             |                |               |
|-----------------|---------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                                 | Peak discharge | = 0.128 cfs   |
| Storm frequency | = 2 yrs                                     | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                     | Hyd. volume    | = 31,648 cuft |
| Inflow hyd. No. | = 2 - Post-Development 2/10/25-Max Elev 108 | Max. Storage   | = 42,970 cuft |
| Reservoir name  | = Pond AP 8                                 |                |               |

Storage Indication method used.





# Hydrograph Report

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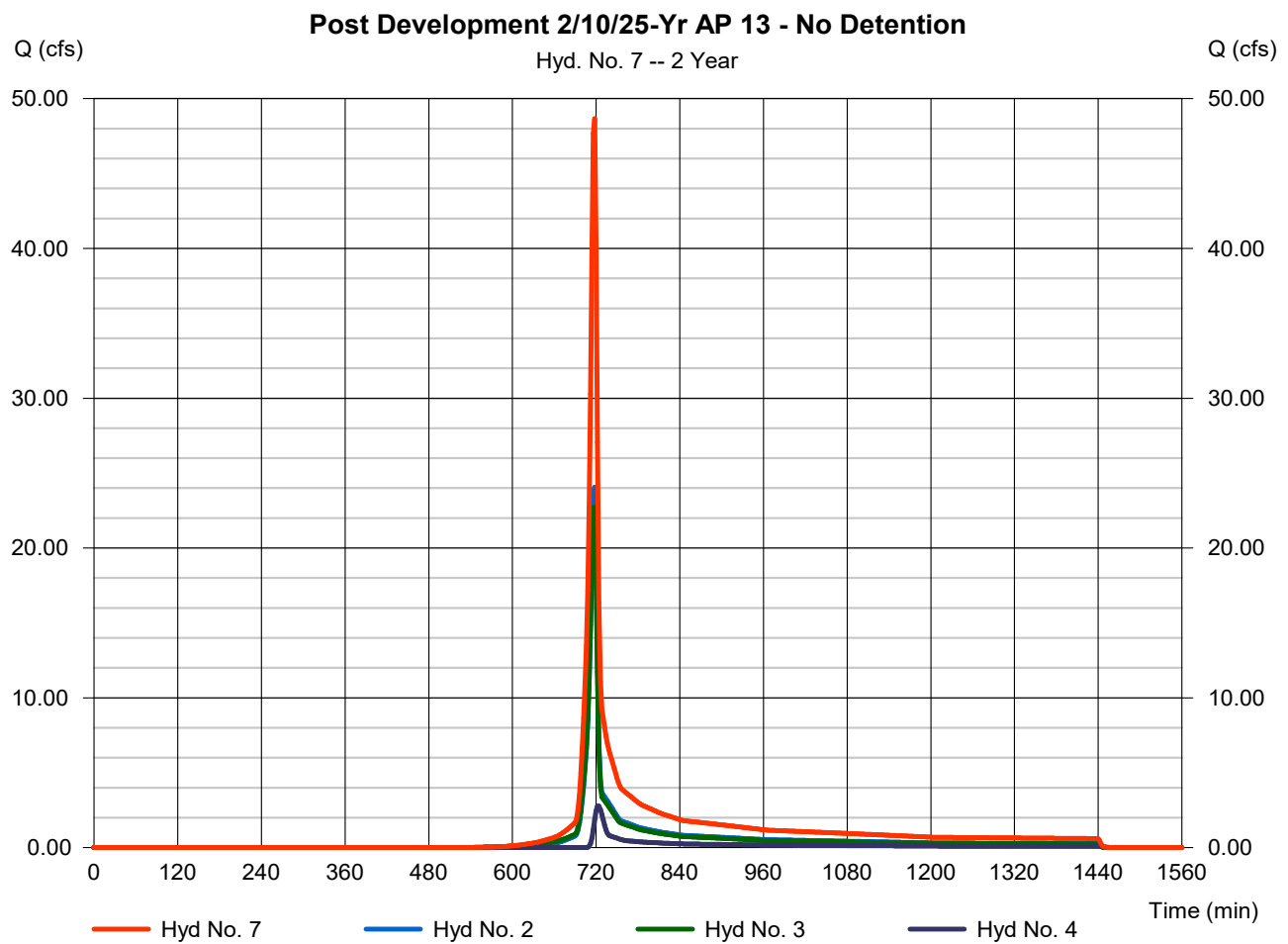
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

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## Hyd. No. 7

Post Development 2/10/25-Yr AP 13 - No Detention

|                 |           |                      |                |
|-----------------|-----------|----------------------|----------------|
| Hydrograph type | = Combine | Peak discharge       | = 48.66 cfs    |
| Storm frequency | = 2 yrs   | Time to peak         | = 718 min      |
| Time interval   | = 2 min   | Hyd. volume          | = 104,200 cuft |
| Inflow hyds.    | = 2, 3, 4 | Contrib. drain. area | = 23.660 ac    |



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

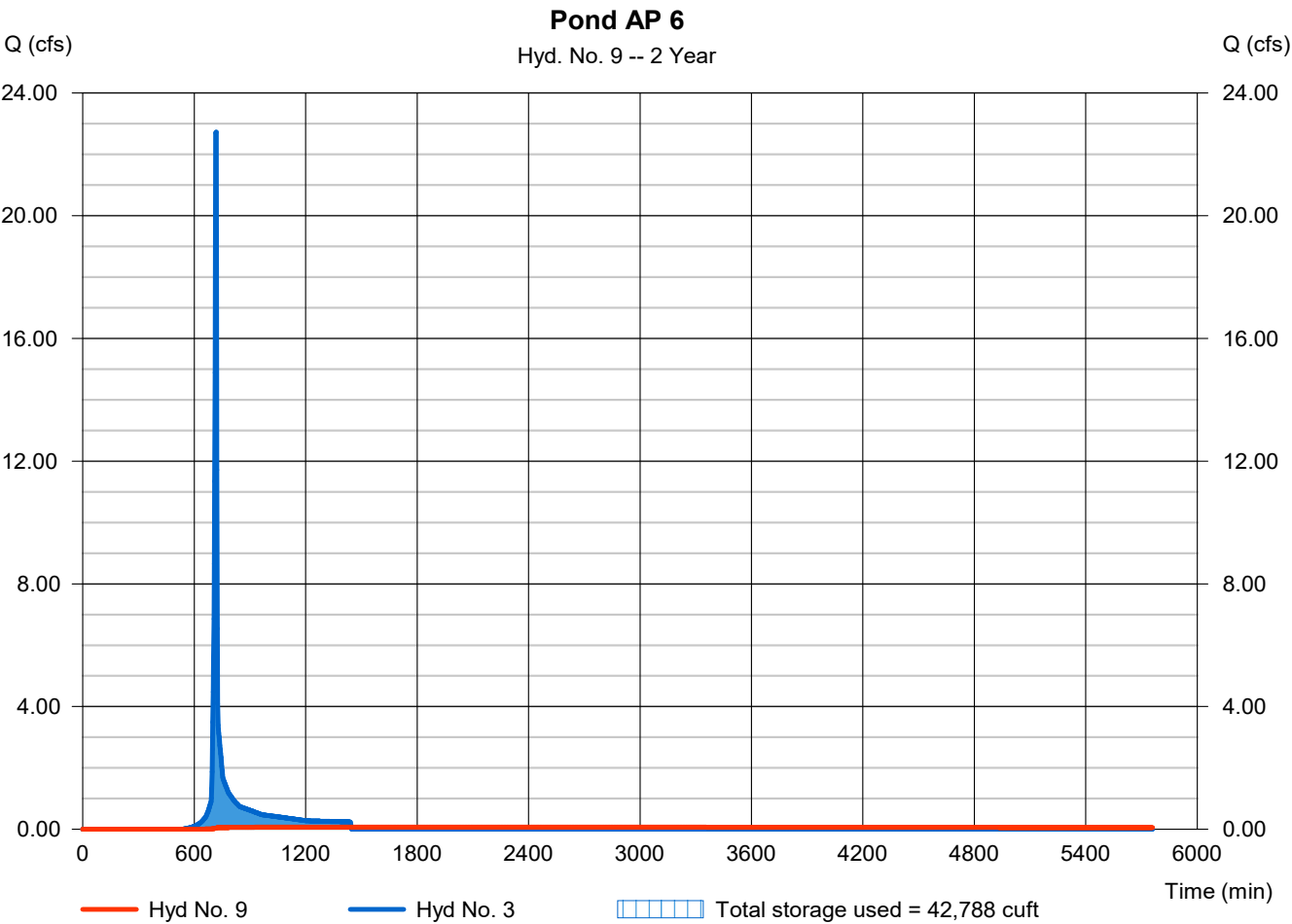
Tuesday, 09 / 29 / 2020

## Hyd. No. 9

Pond AP 6

|                 |                                              |                |               |
|-----------------|----------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                                  | Peak discharge | = 0.075 cfs   |
| Storm frequency | = 2 yrs                                      | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                      | Hyd. volume    | = 19,802 cuft |
| Inflow hyd. No. | = 3 - Post-Development 2/10/25-Max Elev AP 6 | Max. Storage   | = 42,788 cuft |
| Reservoir name  | = Pond AP 6                                  |                |               |

Storage Indication method used.



# Hydrograph Report

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Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

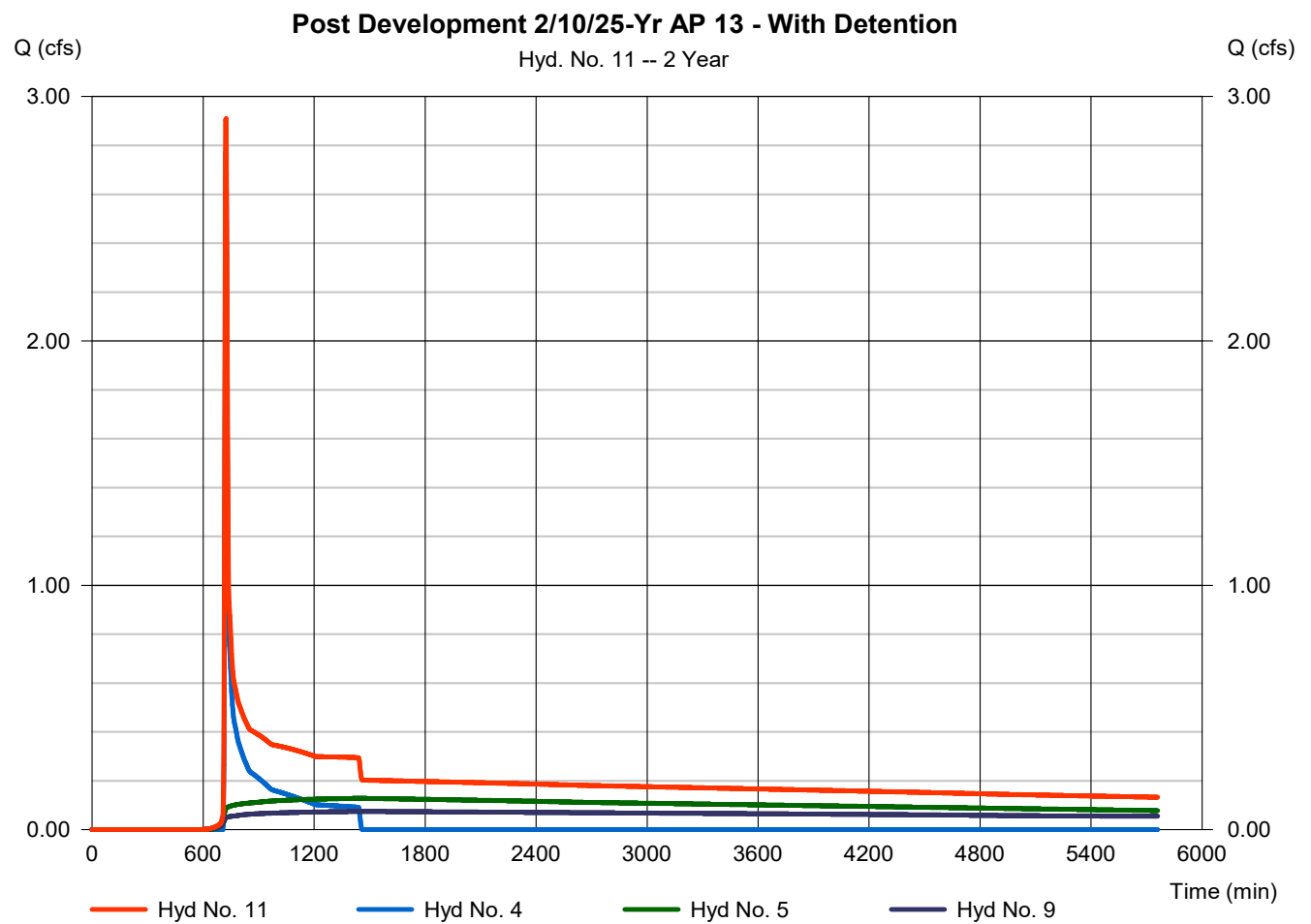
Tuesday, 09 / 29 / 2020

## Hyd. No. 11

Post Development 2/10/25-Yr AP 13 - With Detention

Hydrograph type = Combine  
Storm frequency = 2 yrs  
Time interval = 2 min  
Inflow hyds. = 4, 5, 9

Peak discharge = 2.910 cfs  
Time to peak = 724 min  
Hyd. volume = 61,625 cuft  
Contrib. drain. area = 5.530 ac



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                   | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)     | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|----------------------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                          | SCS Runoff               | 19.96           | 2                   | 730                | 89,014                 | -----         | -----                  | -----                   | Pre-Development 2/10/25-Yr AP 13    |
| 2                          | SCS Runoff               | 45.07           | 2                   | 716                | 91,197                 | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr to Pon  |
| 3                          | SCS Runoff               | 41.00           | 2                   | 716                | 83,471                 | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr to Pon  |
| 4                          | SCS Runoff               | 9.571           | 2                   | 722                | 26,733                 | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr AP 13   |
| 5                          | Reservoir                | 2.159           | 2                   | 790                | 67,923                 | 2             | 103.13                 | 56,207                  | Pond AP 8                           |
| 7                          | Combine                  | 93.04           | 2                   | 718                | 201,401                | 2, 3, 4,      | -----                  | -----                   | Post Development 2/10/25-Yr AP 13 - |
| 9                          | Reservoir                | 3.014           | 2                   | 752                | 55,533                 | 3             | 103.17                 | 48,267                  | Pond AP 6                           |
| 11                         | Combine                  | 9.772           | 2                   | 722                | 150,190                | 4, 5, 9,      | -----                  | -----                   | Post Development 2/10/25-Yr AP 13 - |
| L20017_Peak Flow AP 13.gpw |                          |                 |                     |                    | Return Period: 10 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |

# Hydrograph Report

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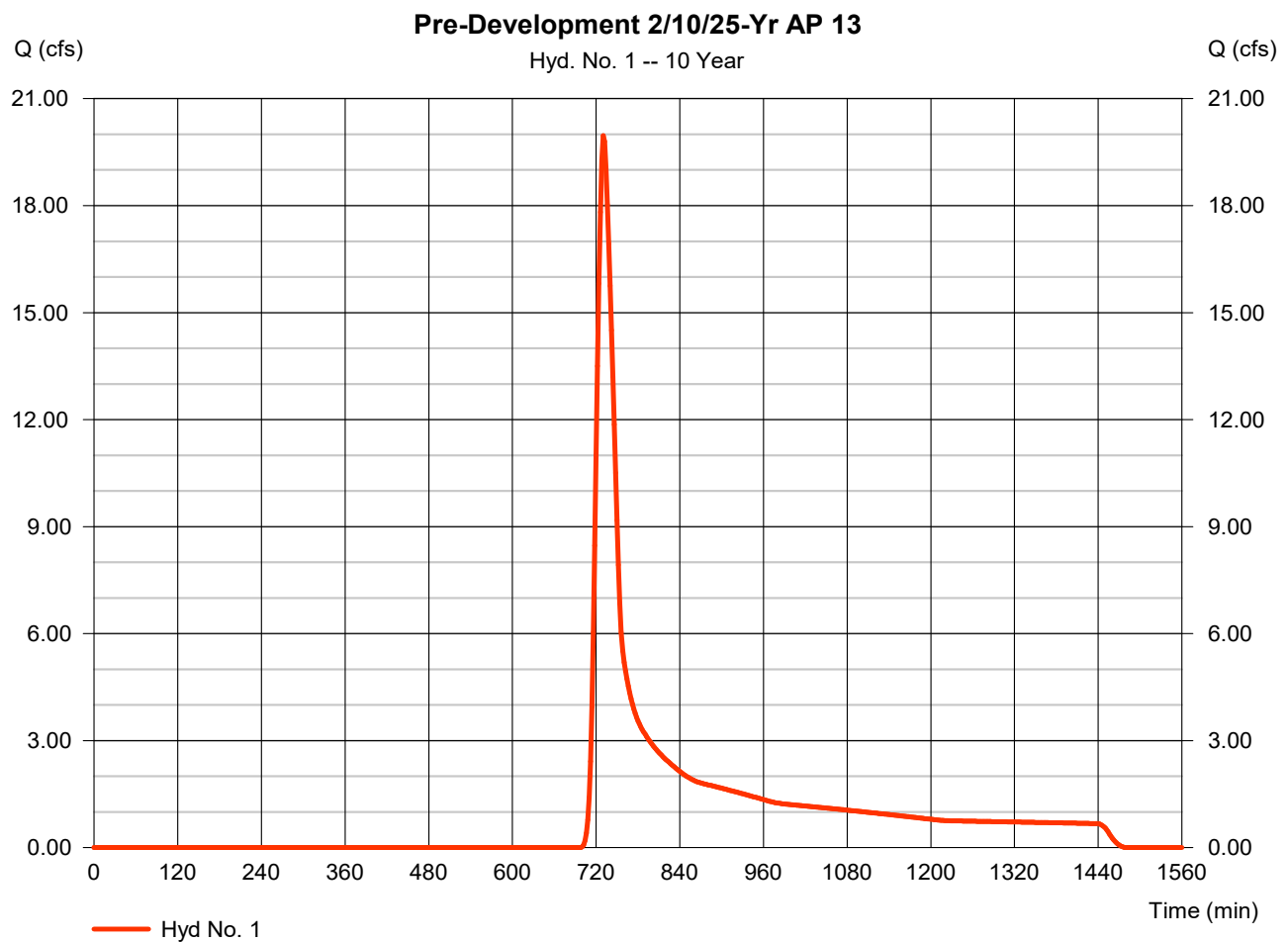
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Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 2/10/25-Yr AP 13

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 19.96 cfs   |
| Storm frequency | = | 10 yrs     | Time to peak       | = | 730 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 89,014 cuft |
| Drainage area   | = | 22.780 ac  | Curve number       | = | 56          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 24.30 min   |
| Total precip.   | = | 5.10 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



# Hydrograph Report

15

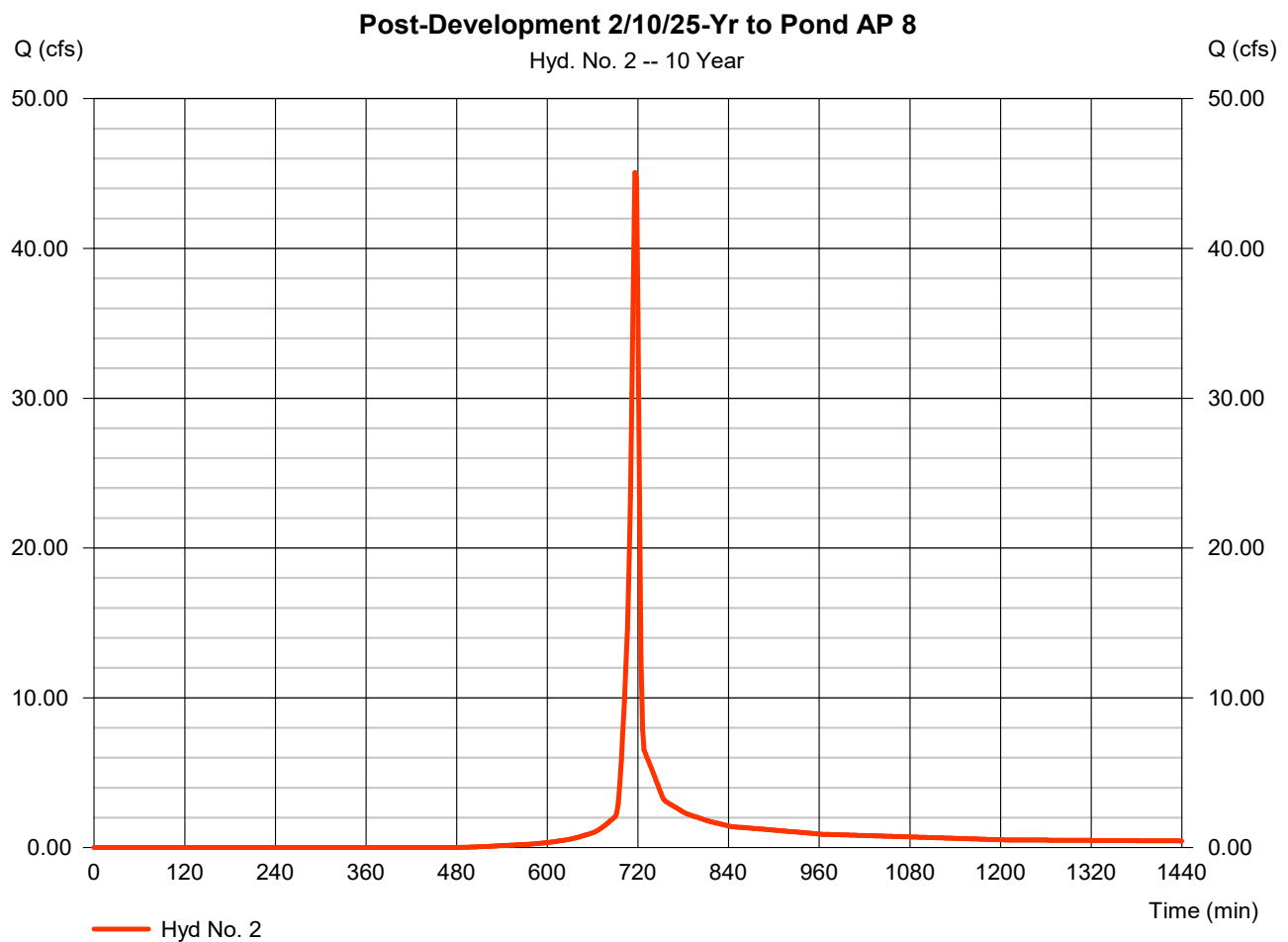
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 2

Post-Development 2/10/25-Yr to Pond AP 8

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 45.07 cfs   |
| Storm frequency | = | 10 yrs     | Time to peak       | = | 716 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 91,197 cuft |
| Drainage area   | = | 9.900 ac   | Curve number       | = | 77          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 5.00 min    |
| Total precip.   | = | 5.10 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



# Hydrograph Report

16

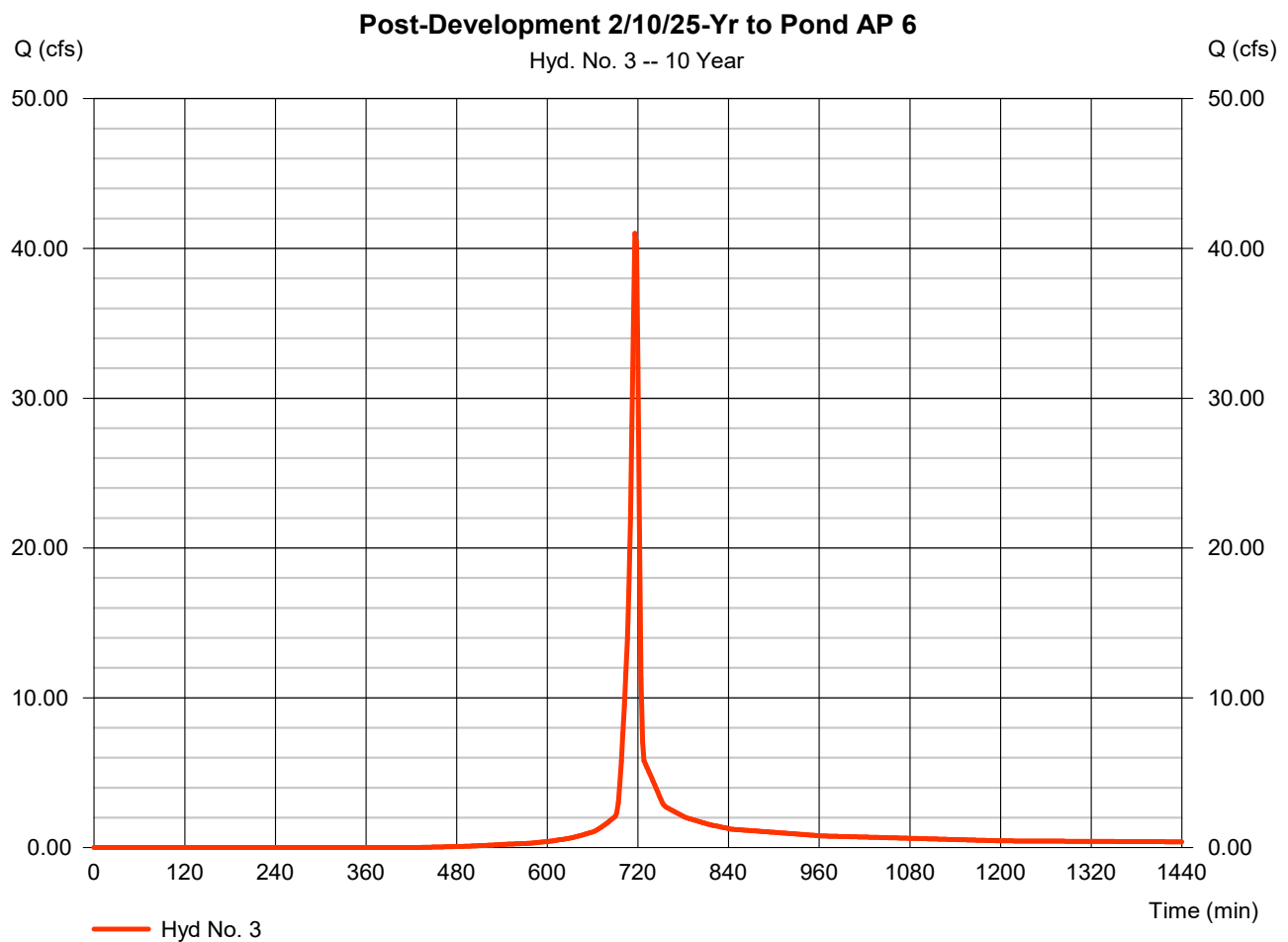
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Tuesday, 09 / 29 / 2020

## Hyd. No. 3

Post-Development 2/10/25-Yr to Pond AP 6

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 41.00 cfs   |
| Storm frequency | = | 10 yrs     | Time to peak       | = | 716 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 83,471 cuft |
| Drainage area   | = | 8.230 ac   | Curve number       | = | 80          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 5.00 min    |
| Total precip.   | = | 5.10 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



# Hydrograph Report

17

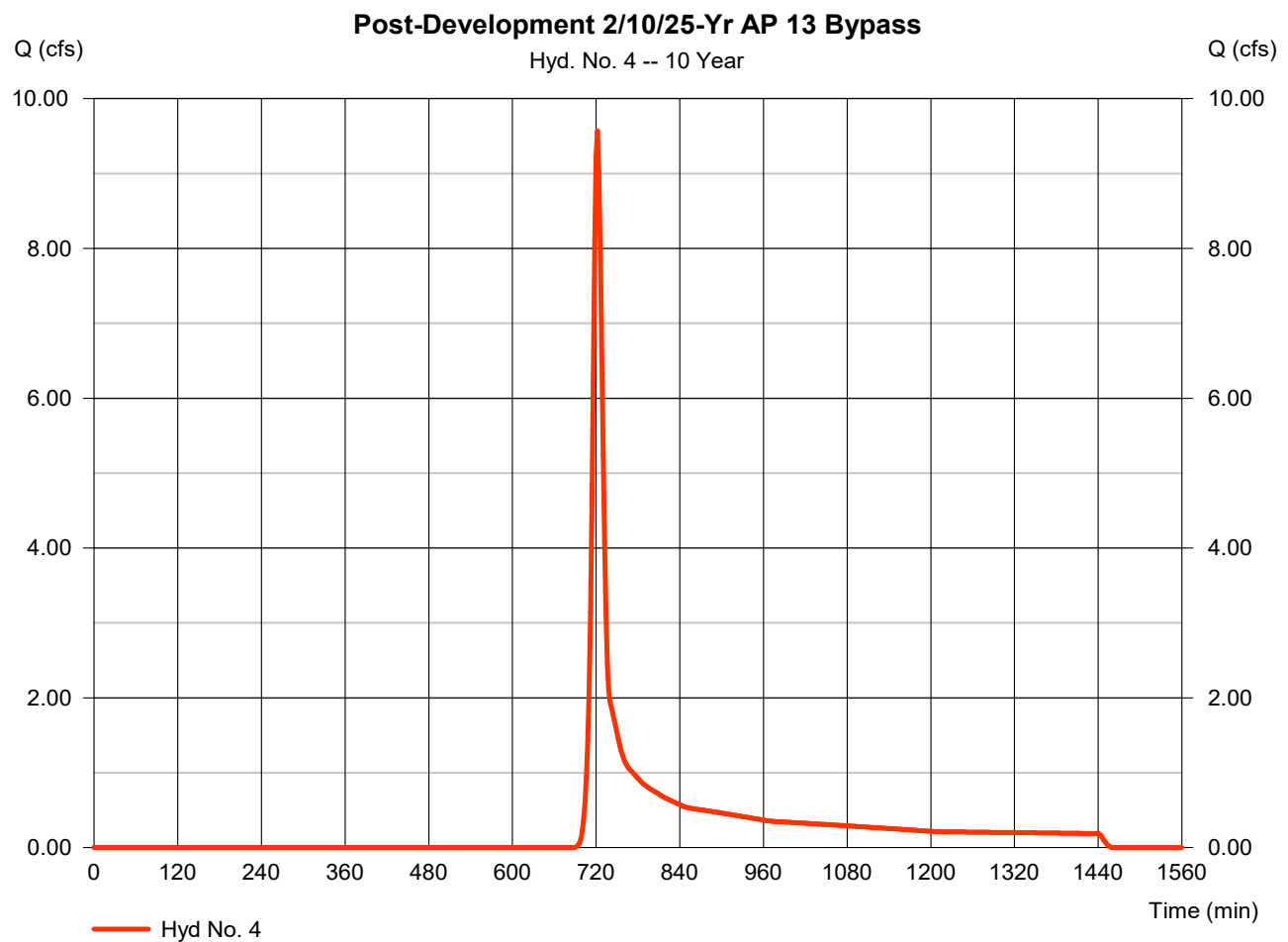
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## Hyd. No. 4

Post-Development 2/10/25-Yr AP 13 Bypass

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 9.571 cfs   |
| Storm frequency | = | 10 yrs     | Time to peak       | = | 722 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 26,733 cuft |
| Drainage area   | = | 5.530 ac   | Curve number       | = | 59          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 12.00 min   |
| Total precip.   | = | 5.10 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |





# Hydrograph Report

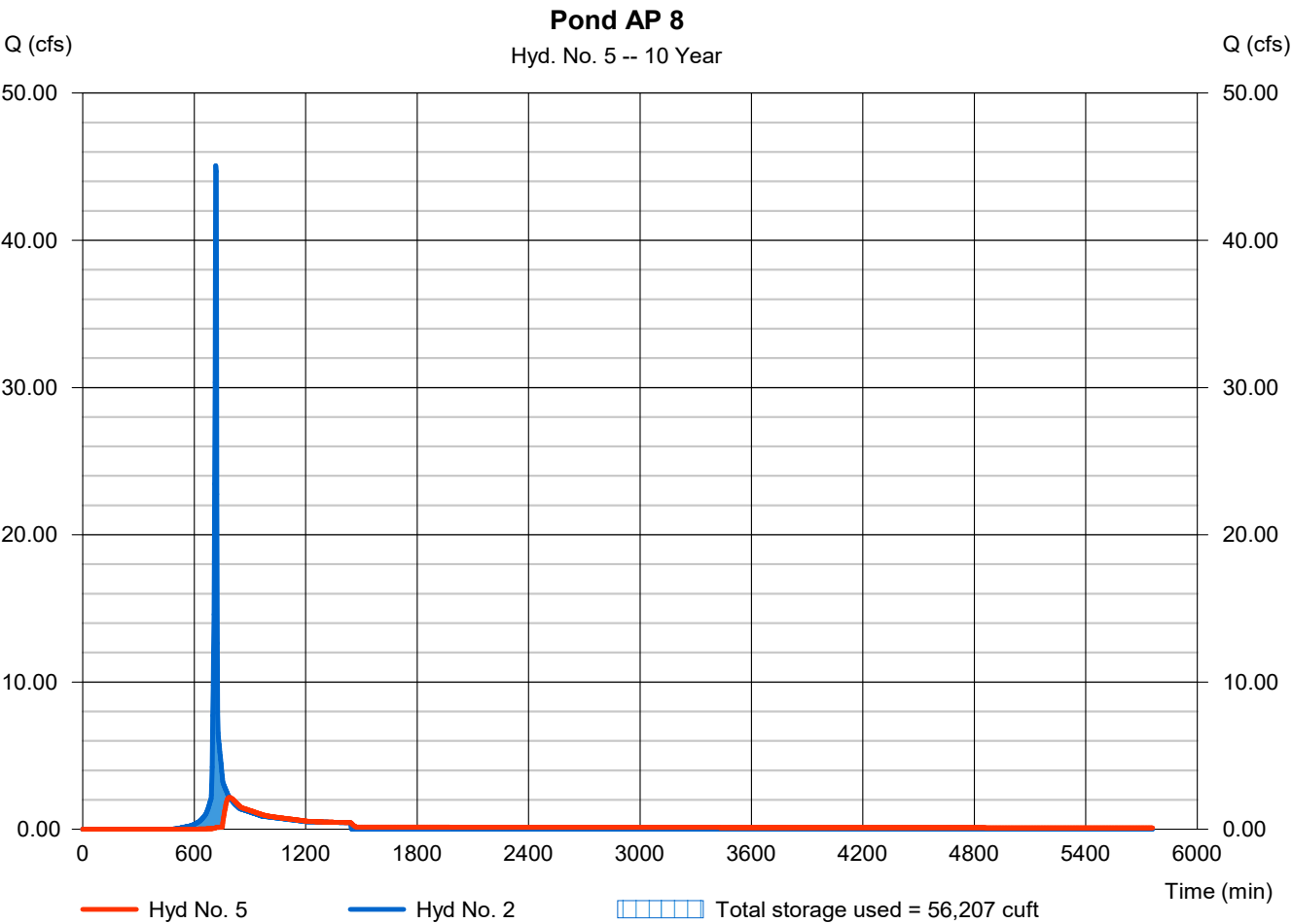
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## Hyd. No. 5

Pond AP 8

|                 |                                               |                |               |
|-----------------|-----------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                                   | Peak discharge | = 2.159 cfs   |
| Storm frequency | = 10 yrs                                      | Time to peak   | = 790 min     |
| Time interval   | = 2 min                                       | Hyd. volume    | = 67,923 cuft |
| Inflow hyd. No. | = 2 - Post-Development 2/10/25-Max Elev. AP 8 | Max. Storage   | = 103.13 ft   |
| Reservoir name  | = Pond AP 8                                   |                | = 56,207 cuft |

Storage Indication method used.



# Hydrograph Report

19

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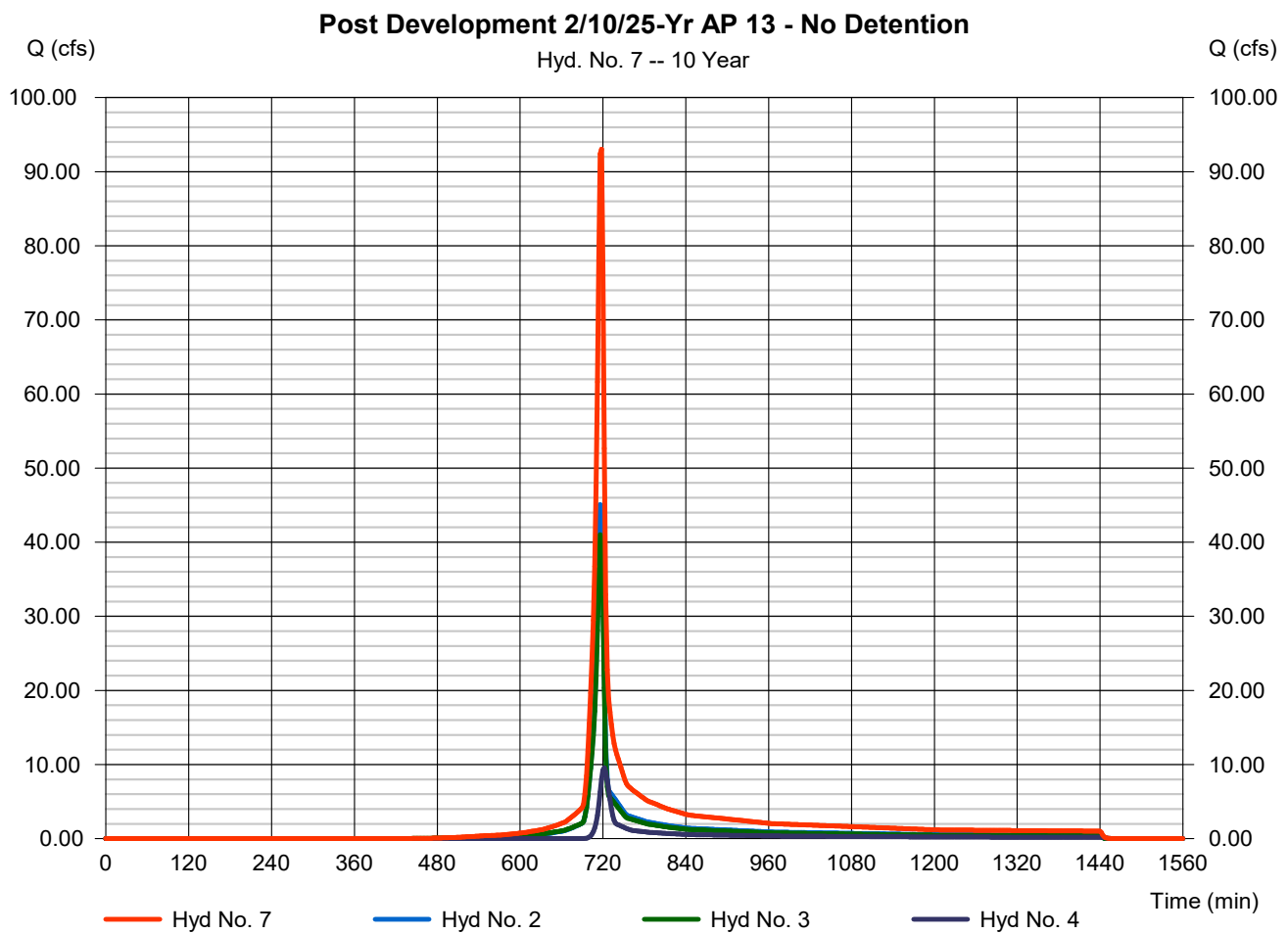
Tuesday, 09 / 29 / 2020

## Hyd. No. 7

Post Development 2/10/25-Yr AP 13 - No Detention

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 2, 3, 4

Peak discharge = 93.04 cfs  
Time to peak = 718 min  
Hyd. volume = 201,401 cuft  
Contrib. drain. area = 23.660 ac



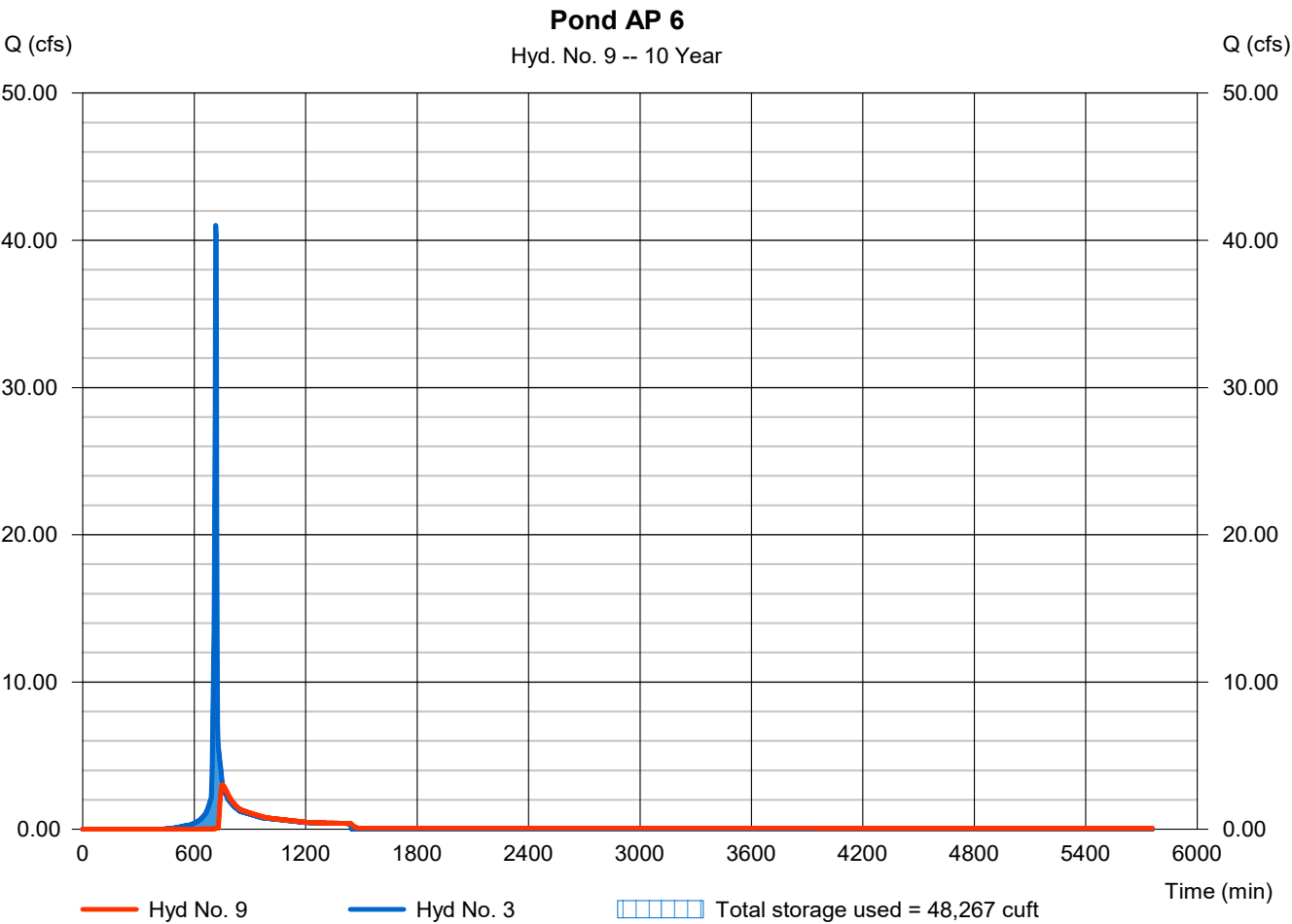
# Hydrograph Report

## Hyd. No. 9

Pond AP 6

|                 |                                             |                |               |
|-----------------|---------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                                 | Peak discharge | = 3.014 cfs   |
| Storm frequency | = 10 yrs                                    | Time to peak   | = 752 min     |
| Time interval   | = 2 min                                     | Hyd. volume    | = 55,533 cuft |
| Inflow hyd. No. | = 3 - Post-Development 2/10/25-Mat Elev 106 | Max. Storage   | = 48,267 cuft |
| Reservoir name  | = Pond AP 6                                 |                |               |

Storage Indication method used.



# Hydrograph Report

21

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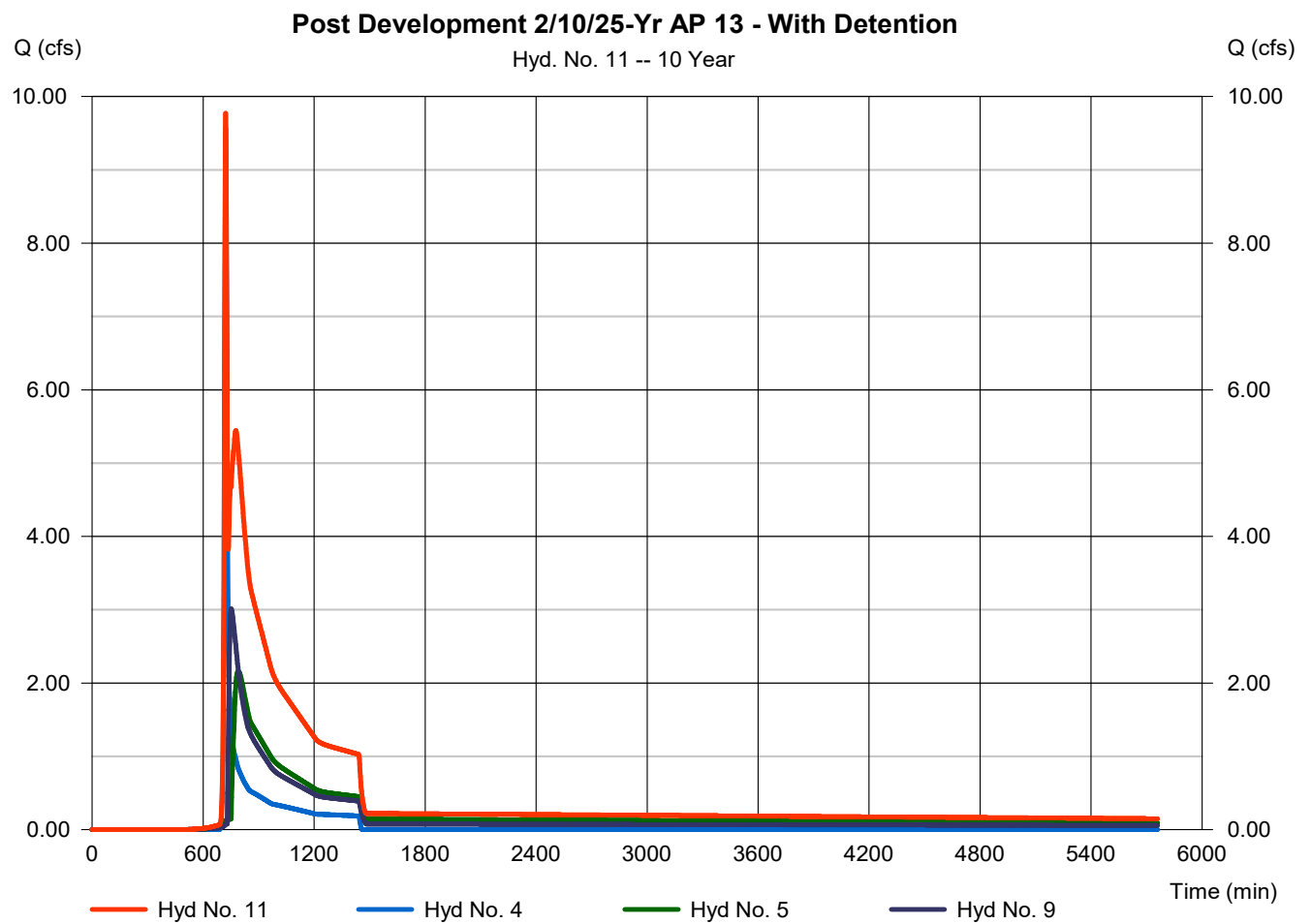
Tuesday, 09 / 29 / 2020

## Hyd. No. 11

Post Development 2/10/25-Yr AP 13 - With Detention

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 4, 5, 9

Peak discharge = 9.772 cfs  
Time to peak = 722 min  
Hyd. volume = 150,190 cuft  
Contrib. drain. area = 5.530 ac



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                   | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)     | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|----------------------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                          | SCS Runoff               | 31.66           | 2                   | 730                | 129,941                | -----         | -----                  | -----                   | Pre-Development 2/10/25-Yr AP 13    |
| 2                          | SCS Runoff               | 57.61           | 2                   | 716                | 117,213                | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr to Pon  |
| 3                          | SCS Runoff               | 51.60           | 2                   | 716                | 105,904                | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr to Pon  |
| 4                          | SCS Runoff               | 14.13           | 2                   | 722                | 38,062                 | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr AP 13   |
| 5                          | Reservoir                | 7.474           | 2                   | 732                | 93,910                 | 2             | 103.31                 | 60,055                  | Pond AP 8                           |
| 7                          | Combine                  | 119.50          | 2                   | 718                | 261,180                | 2, 3, 4,      | -----                  | -----                   | Post Development 2/10/25-Yr AP 13 - |
| 9                          | Reservoir                | 10.83           | 2                   | 726                | 77,952                 | 3             | 103.46                 | 53,588                  | Pond AP 6                           |
| 11                         | Combine                  | 29.69           | 2                   | 724                | 209,924                | 4, 5, 9,      | -----                  | -----                   | Post Development 2/10/25-Yr AP 13 - |
| L20017_Peak Flow AP 13.gpw |                          |                 |                     |                    | Return Period: 25 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |

# Hydrograph Report

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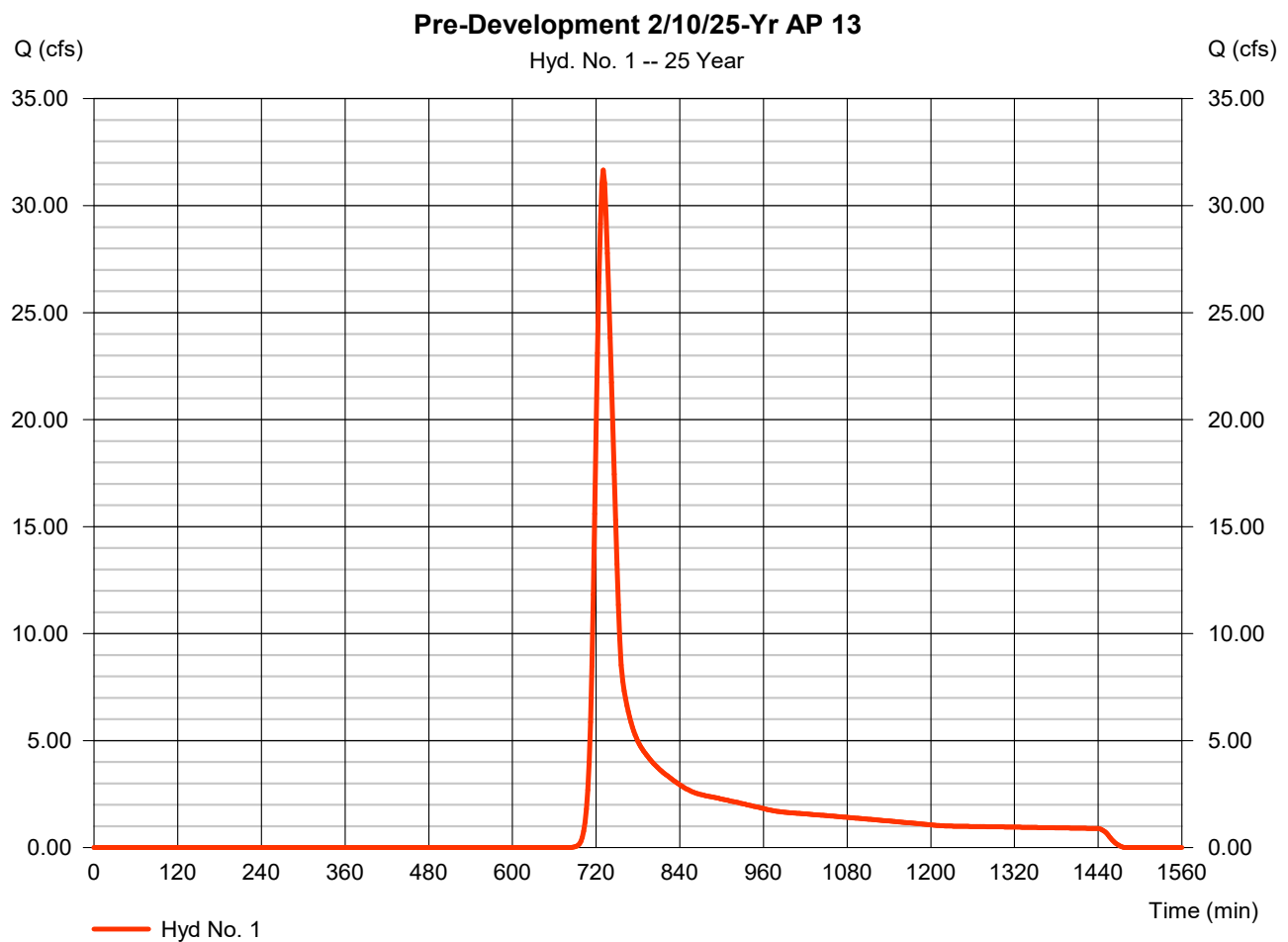
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Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 2/10/25-Yr AP 13

|                 |   |            |                    |   |              |
|-----------------|---|------------|--------------------|---|--------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 31.66 cfs    |
| Storm frequency | = | 25 yrs     | Time to peak       | = | 730 min      |
| Time interval   | = | 2 min      | Hyd. volume        | = | 129,941 cuft |
| Drainage area   | = | 22.780 ac  | Curve number       | = | 56           |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft         |
| Tc method       | = | User       | Time of conc. (Tc) | = | 24.30 min    |
| Total precip.   | = | 6.00 in    | Distribution       | = | Type II      |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484          |



# Hydrograph Report

24

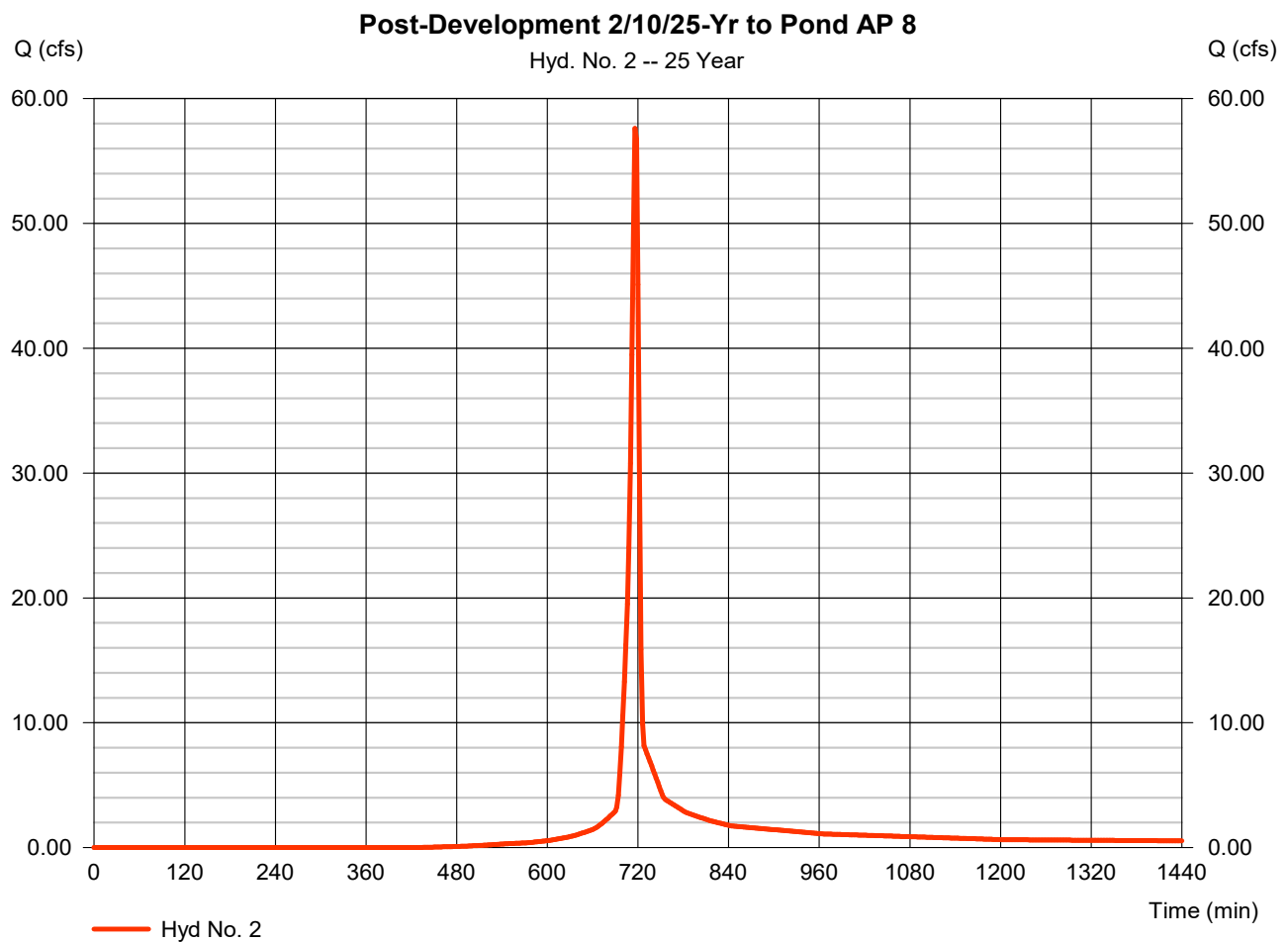
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 2

Post-Development 2/10/25-Yr to Pond AP 8

|                 |   |            |                    |   |              |
|-----------------|---|------------|--------------------|---|--------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 57.61 cfs    |
| Storm frequency | = | 25 yrs     | Time to peak       | = | 716 min      |
| Time interval   | = | 2 min      | Hyd. volume        | = | 117,213 cuft |
| Drainage area   | = | 9.900 ac   | Curve number       | = | 77           |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft         |
| Tc method       | = | User       | Time of conc. (Tc) | = | 5.00 min     |
| Total precip.   | = | 6.00 in    | Distribution       | = | Type II      |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484          |



# Hydrograph Report

25

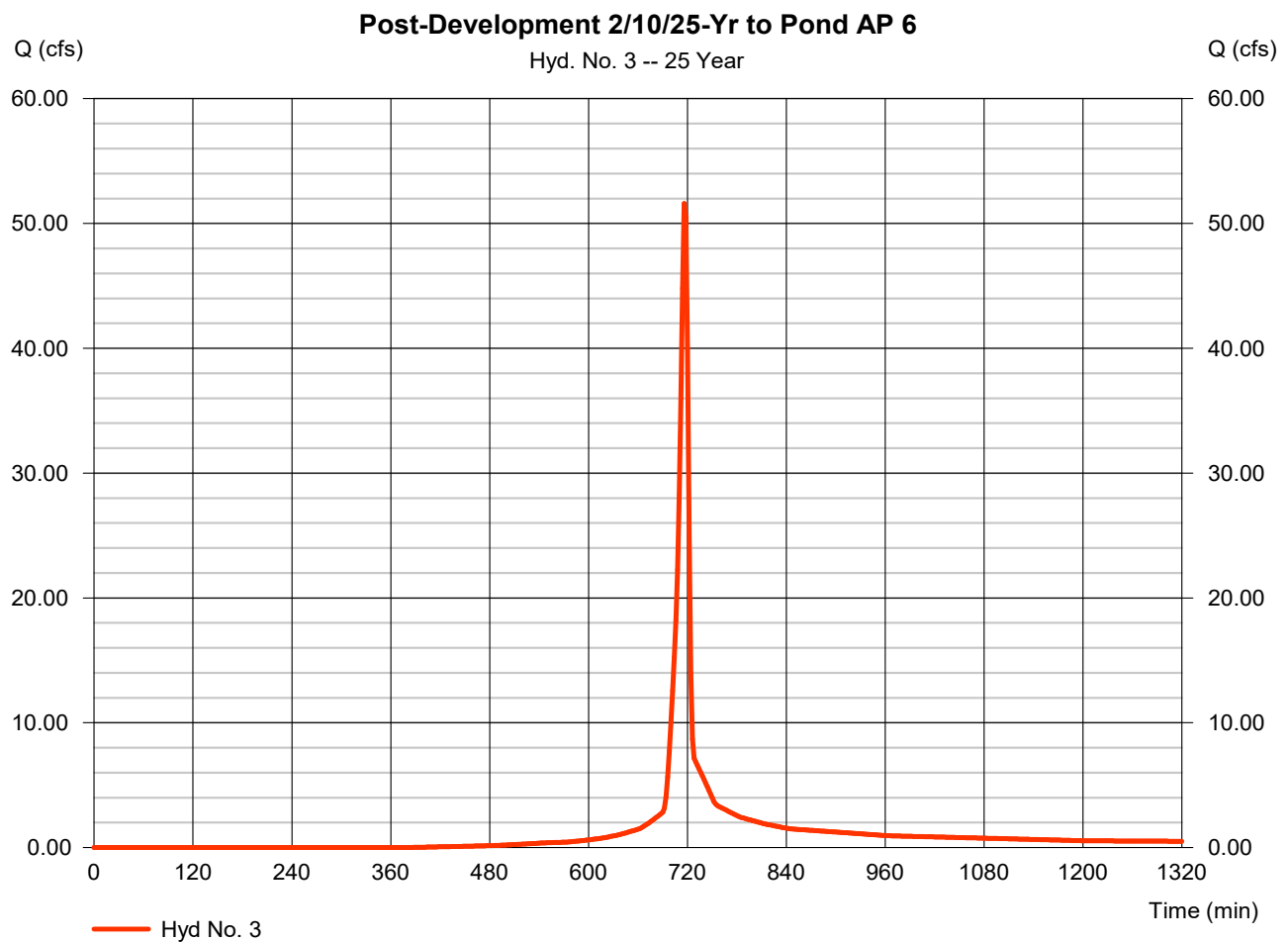
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 3

Post-Development 2/10/25-Yr to Pond AP 6

|                 |   |            |                    |   |              |
|-----------------|---|------------|--------------------|---|--------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 51.60 cfs    |
| Storm frequency | = | 25 yrs     | Time to peak       | = | 716 min      |
| Time interval   | = | 2 min      | Hyd. volume        | = | 105,904 cuft |
| Drainage area   | = | 8.230 ac   | Curve number       | = | 80           |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft         |
| Tc method       | = | User       | Time of conc. (Tc) | = | 5.00 min     |
| Total precip.   | = | 6.00 in    | Distribution       | = | Type II      |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484          |





# Hydrograph Report

26

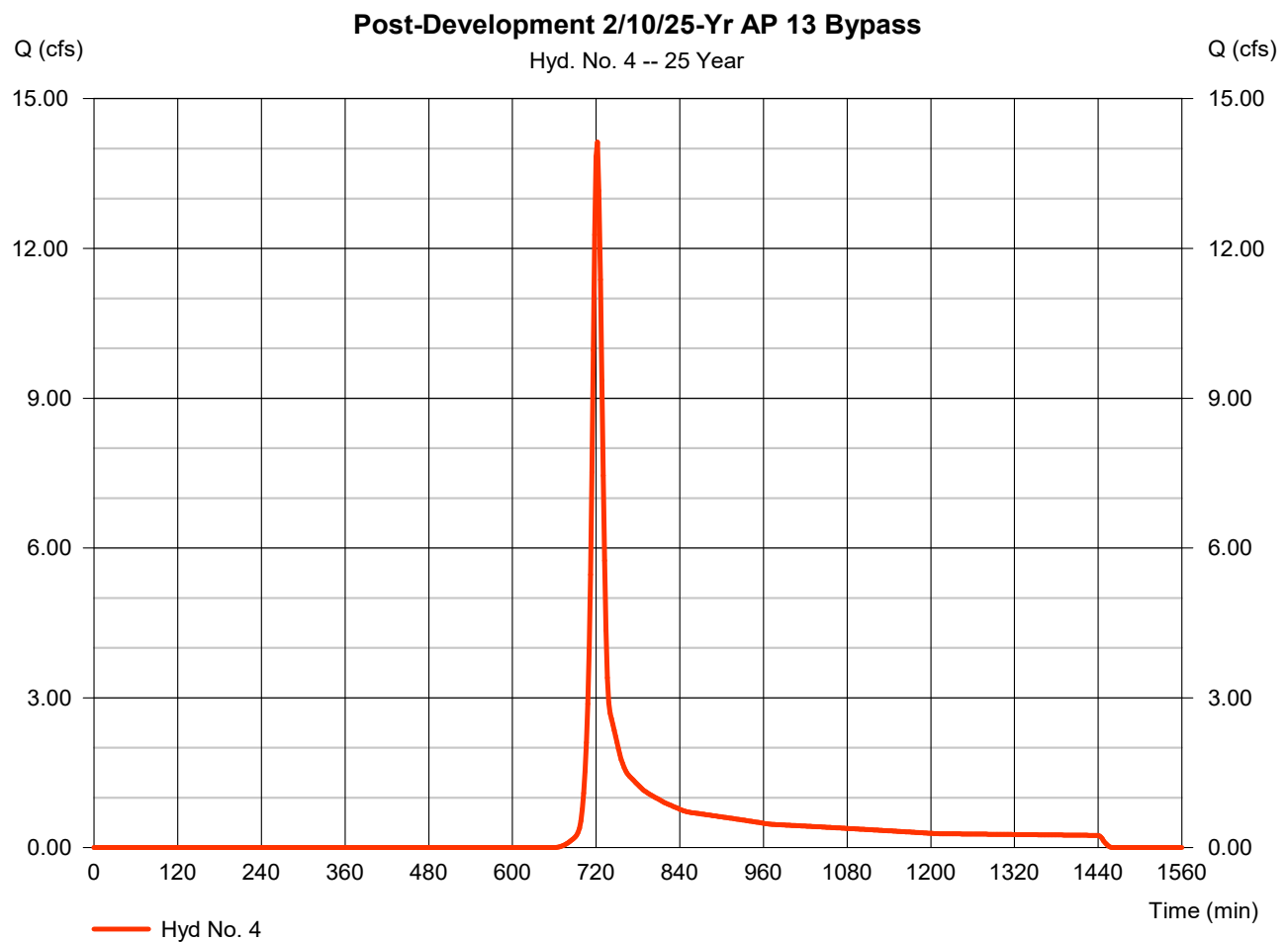
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## Hyd. No. 4

Post-Development 2/10/25-Yr AP 13 Bypass

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 14.13 cfs   |
| Storm frequency | = | 25 yrs     | Time to peak       | = | 722 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 38,062 cuft |
| Drainage area   | = | 5.530 ac   | Curve number       | = | 59          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 12.00 min   |
| Total precip.   | = | 6.00 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



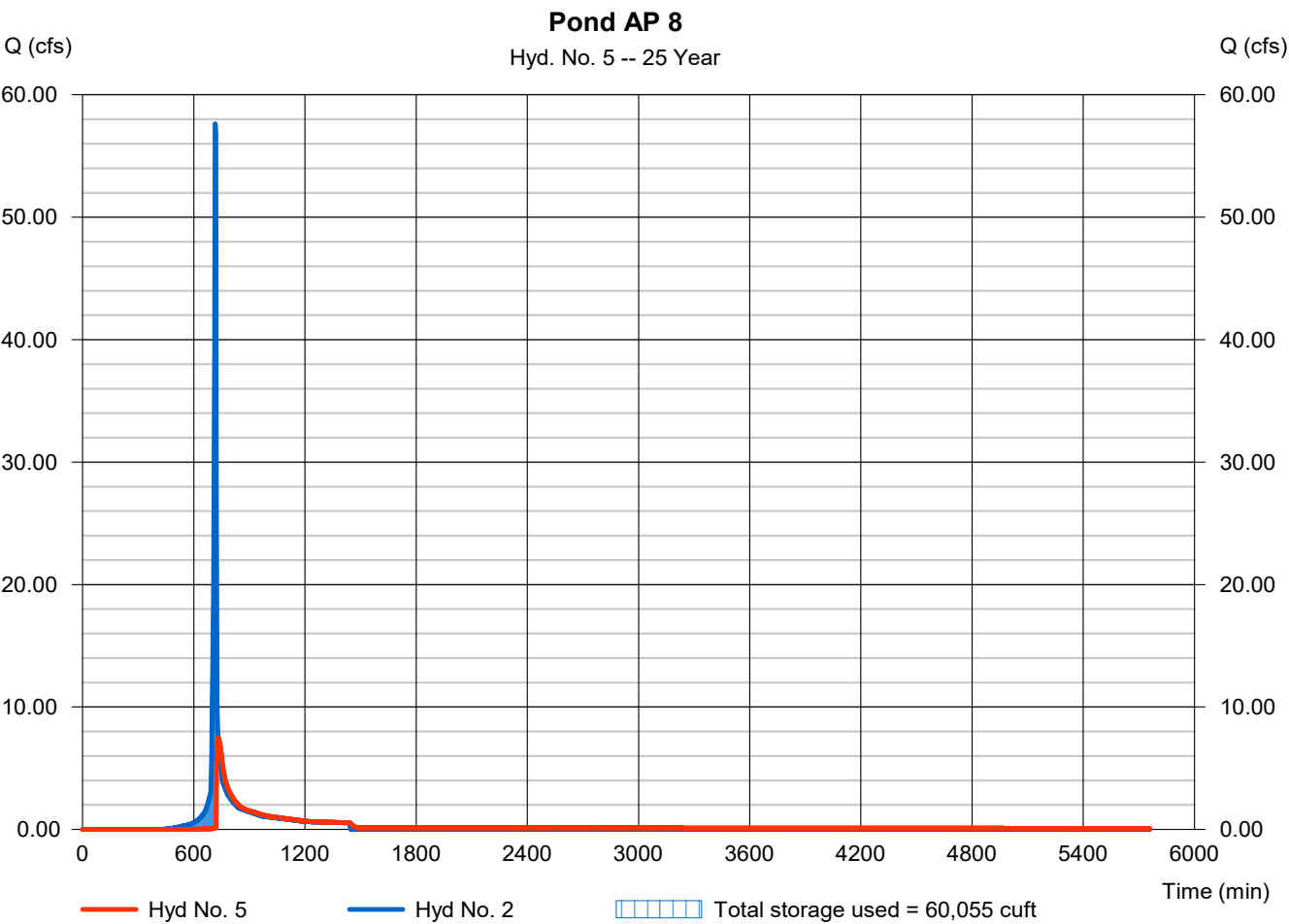
# Hydrograph Report

## Hyd. No. 5

Pond AP 8

|                 |                                              |                |               |
|-----------------|----------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                                  | Peak discharge | = 7.474 cfs   |
| Storm frequency | = 25 yrs                                     | Time to peak   | = 732 min     |
| Time interval   | = 2 min                                      | Hyd. volume    | = 93,910 cuft |
| Inflow hyd. No. | = 2 - Post-Development 2/10/25-Max Elev AP 8 | Max. Storage   | = 103.31 ft   |
| Reservoir name  | = Pond AP 8                                  |                | = 60,055 cuft |

Storage Indication method used.



# Hydrograph Report

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Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

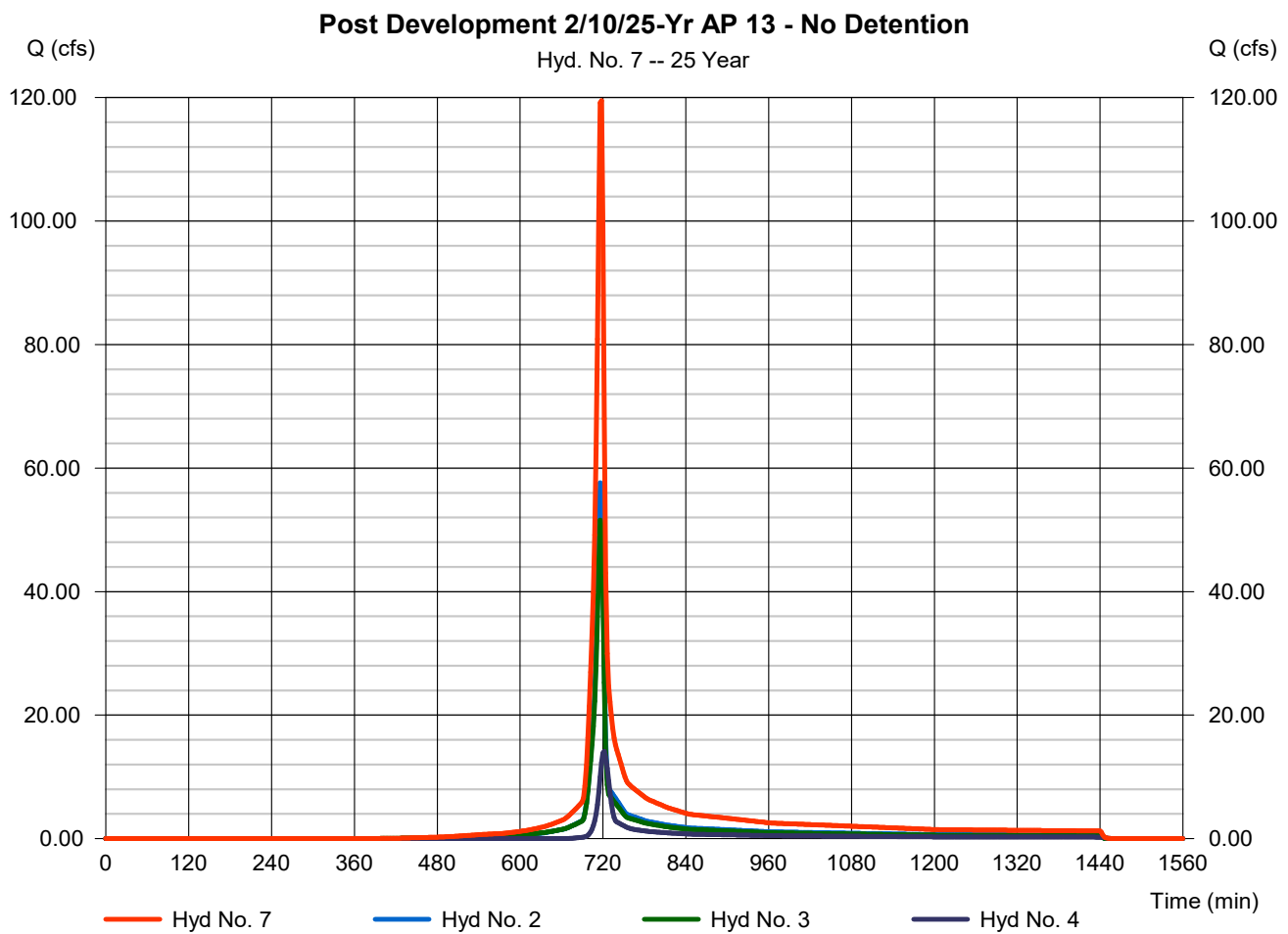
Tuesday, 09 / 29 / 2020

## Hyd. No. 7

Post Development 2/10/25-Yr AP 13 - No Detention

Hydrograph type = Combine  
Storm frequency = 25 yrs  
Time interval = 2 min  
Inflow hyds. = 2, 3, 4

Peak discharge = 119.50 cfs  
Time to peak = 718 min  
Hyd. volume = 261,180 cuft  
Contrib. drain. area = 23.660 ac



# Hydrograph Report

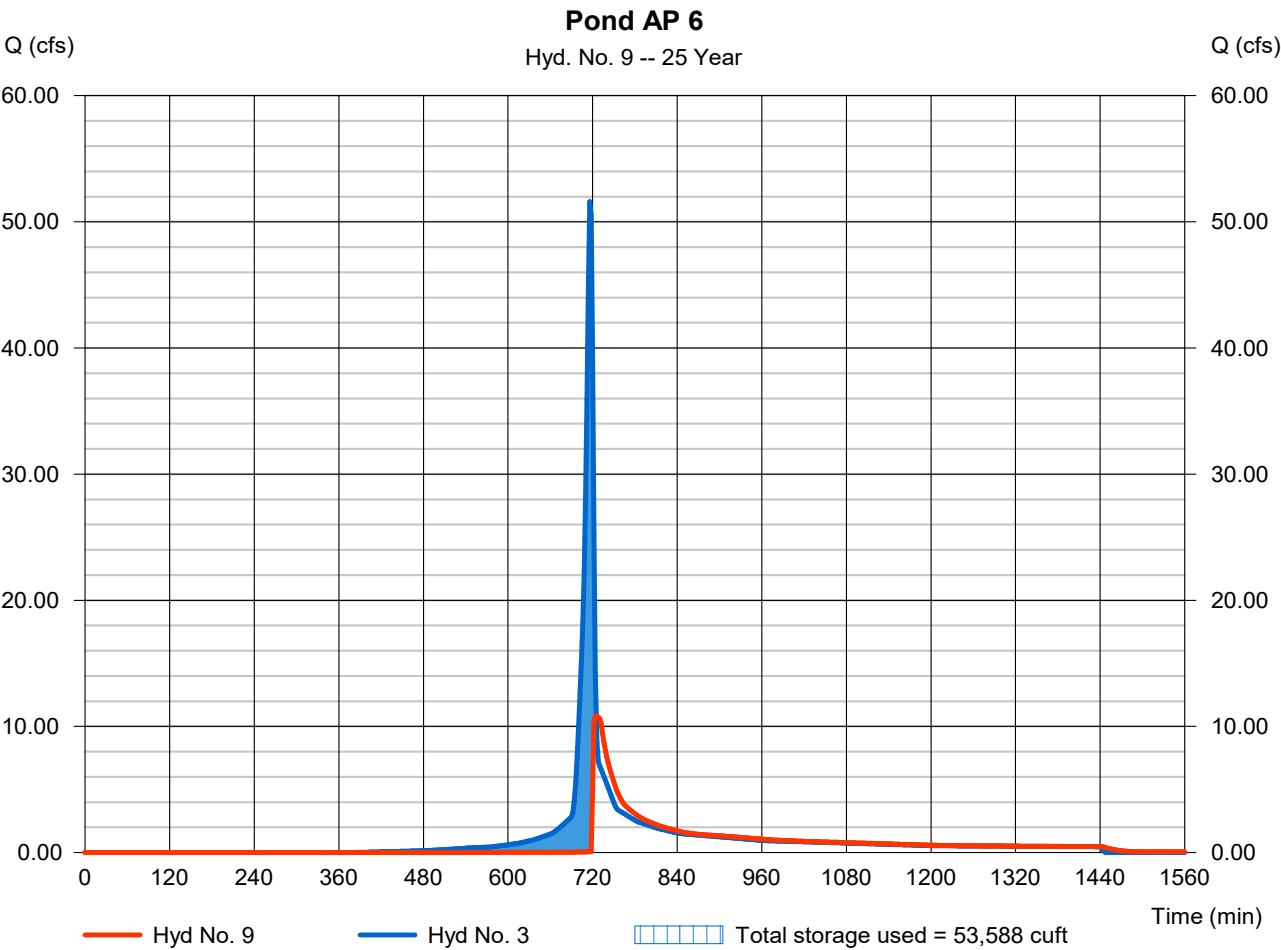
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 09 / 29 / 2020

## Hyd. No. 9

Pond AP 6

|                 |                                              |                |               |
|-----------------|----------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                                  | Peak discharge | = 10.83 cfs   |
| Storm frequency | = 25 yrs                                     | Time to peak   | = 726 min     |
| Time interval   | = 2 min                                      | Hyd. volume    | = 77,952 cuft |
| Inflow hyd. No. | = 3 - Post-Development 2/10/25-Max Elev AP 6 | Max. Elev AP 6 | = 103.46 ft   |
| Reservoir name  | = Pond AP 6                                  | Max. Storage   | = 53,588 cuft |

Storage Indication method used.



# Hydrograph Report

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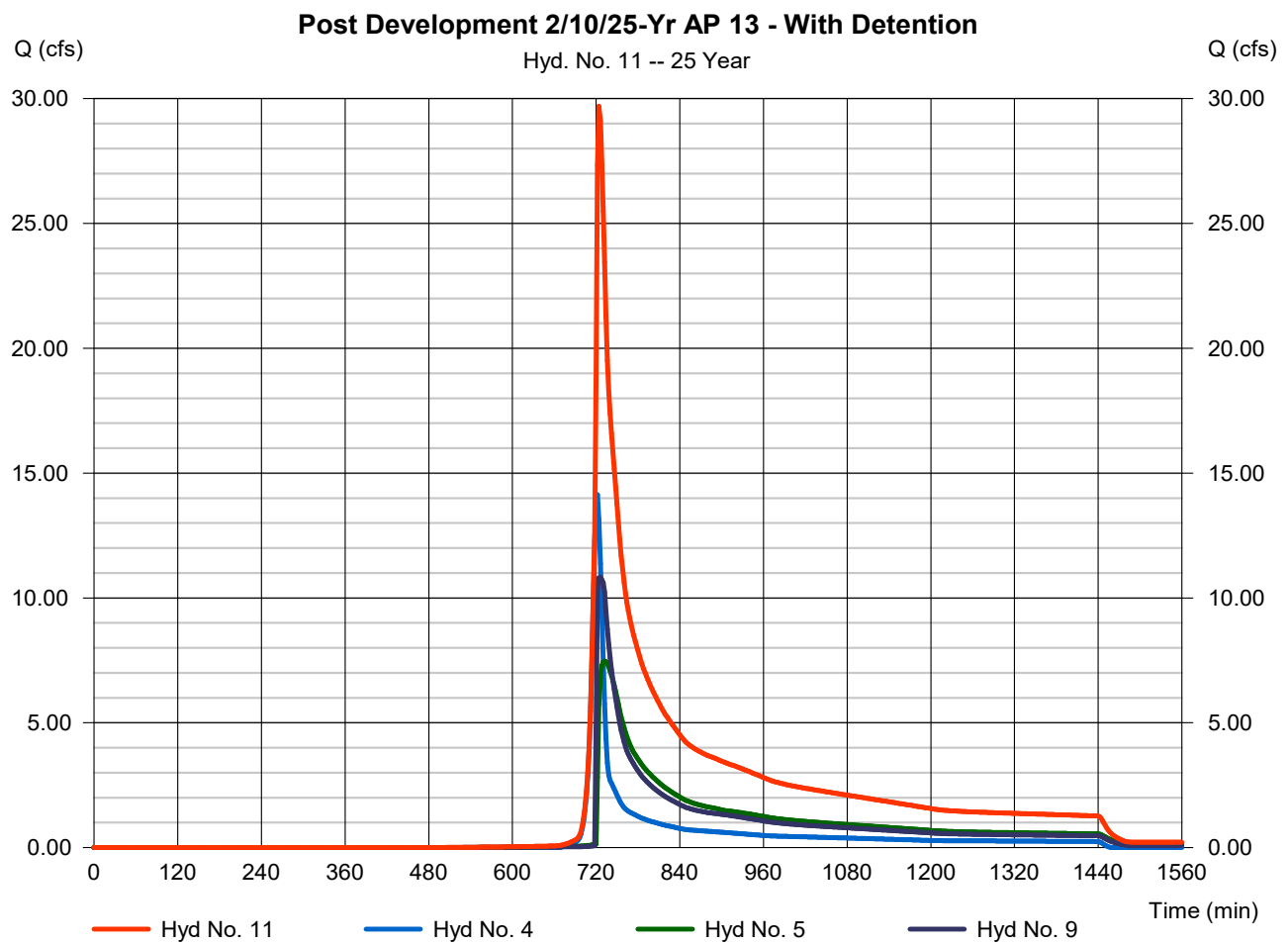
Tuesday, 09 / 29 / 2020

## Hyd. No. 11

Post Development 2/10/25-Yr AP 13 - With Detention

Hydrograph type = Combine  
Storm frequency = 25 yrs  
Time interval = 2 min  
Inflow hyds. = 4, 5, 9

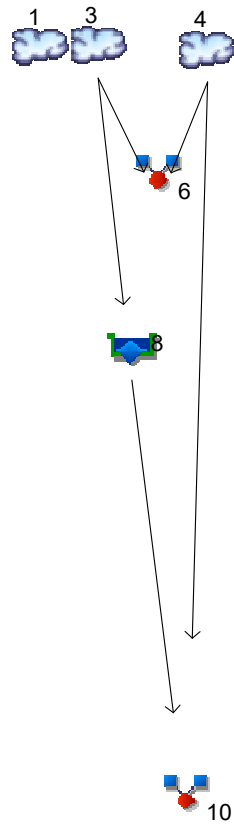
Peak discharge = 29.69 cfs  
Time to peak = 724 min  
Hyd. volume = 209,924 cuft  
Contrib. drain. area = 5.530 ac



## **Analysis Point 14**

# Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020



## Legend

| Hyd. Origin  | Description                                        |
|--------------|----------------------------------------------------|
| 1 SCS Runoff | Pre-Development 2/10/25-Yr AP 14                   |
| 3 SCS Runoff | Post-Development 2/10/25-Yr to Pond AP 12          |
| 4 SCS Runoff | Post-Development 2/10/25-Yr AP 14 Bypass           |
| 6 Combine    | Post Development 2/10/25-Yr AP 14 - No Detention   |
| 8 Reservoir  | Pond AP 12                                         |
| 10 Combine   | Post Development 2/10/25-Yr AP 14 - With Detention |

Project: L20017\_Peak Flow AP 14.gpw

Tuesday, 09 / 29 / 2020

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                   | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)    | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|----------------------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                          | SCS Runoff               | 7.901           | 2                   | 724                | 30,524                | -----         | -----                  | -----                   | Pre-Development 2/10/25-Yr AP 14    |
| 3                          | SCS Runoff               | 7.705           | 2                   | 718                | 15,432                | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr to Pon  |
| 4                          | SCS Runoff               | 1.780           | 2                   | 720                | 4,884                 | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr AP 14   |
| 6                          | Combine                  | 9.290           | 2                   | 718                | 20,316                | 3, 4,         | -----                  | -----                   | Post Development 2/10/25-Yr AP 14 - |
| 8                          | Reservoir                | 0.052           | 2                   | 1444               | 12,550                | 3             | 102.76                 | 15,285                  | Pond AP 12                          |
| 10                         | Combine                  | 1.812           | 2                   | 720                | 17,434                | 4, 8,         | -----                  | -----                   | Post Development 2/10/25-Yr AP 14 - |
| L20017_Peak Flow AP 14.gpw |                          |                 |                     |                    | Return Period: 2 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |



# Pond Report

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## Pond No. 12 - Pond AP 12

### Pond Data

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 100.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 100.00         | 4,396               | 0                    | 0                    |
| 1.00       | 101.00         | 5,172               | 4,784                | 4,784                |
| 2.00       | 102.00         | 6,005               | 5,589                | 10,373               |
| 3.00       | 103.00         | 6,894               | 6,450                | 16,822               |
| 4.00       | 104.00         | 7,840               | 7,367                | 24,189               |
| 5.00       | 105.00         | 8,843               | 8,342                | 32,531               |

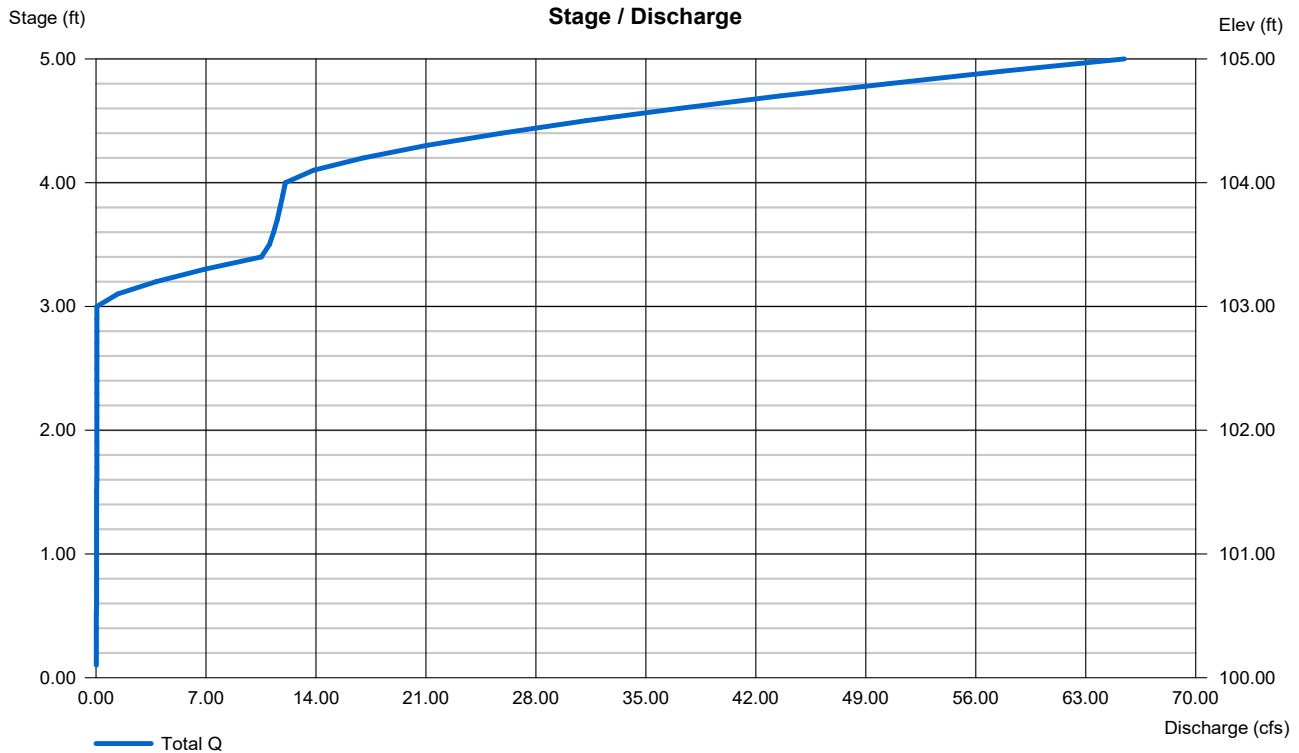
### Culvert / Orifice Structures

|                 | [A]     | [B]    | [C]    | [PrfRsr] |
|-----------------|---------|--------|--------|----------|
| Rise (in)       | = 15.00 | 1.00   | 0.50   | 0.00     |
| Span (in)       | = 15.00 | 1.00   | 0.50   | 0.00     |
| No. Barrels     | = 1     | 1      | 1      | 0        |
| Invert El. (ft) | = 99.00 | 100.00 | 101.00 | 0.00     |
| Length (ft)     | = 50.00 | 0.00   | 0.00   | 0.00     |
| Slope (%)       | = 0.50  | 0.00   | 0.00   | n/a      |
| N-Value         | = .013  | .013   | .013   | n/a      |
| Orifice Coeff.  | = 0.60  | 0.60   | 0.60   | 0.60     |
| Multi-Stage     | = n/a   | Yes    | Yes    | No       |

### Weir Structures

|                | [A]                   | [B]    | [C]  | [D]  |
|----------------|-----------------------|--------|------|------|
| Crest Len (ft) | = 12.57               | 20.00  | 0.00 | 0.00 |
| Crest El. (ft) | = 103.00              | 104.00 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60   | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad  | ---  | ---  |
| Multi-Stage    | = Yes                 | No     | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |        |      |      |
| TW Elev. (ft)  | = 0.00                |        |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

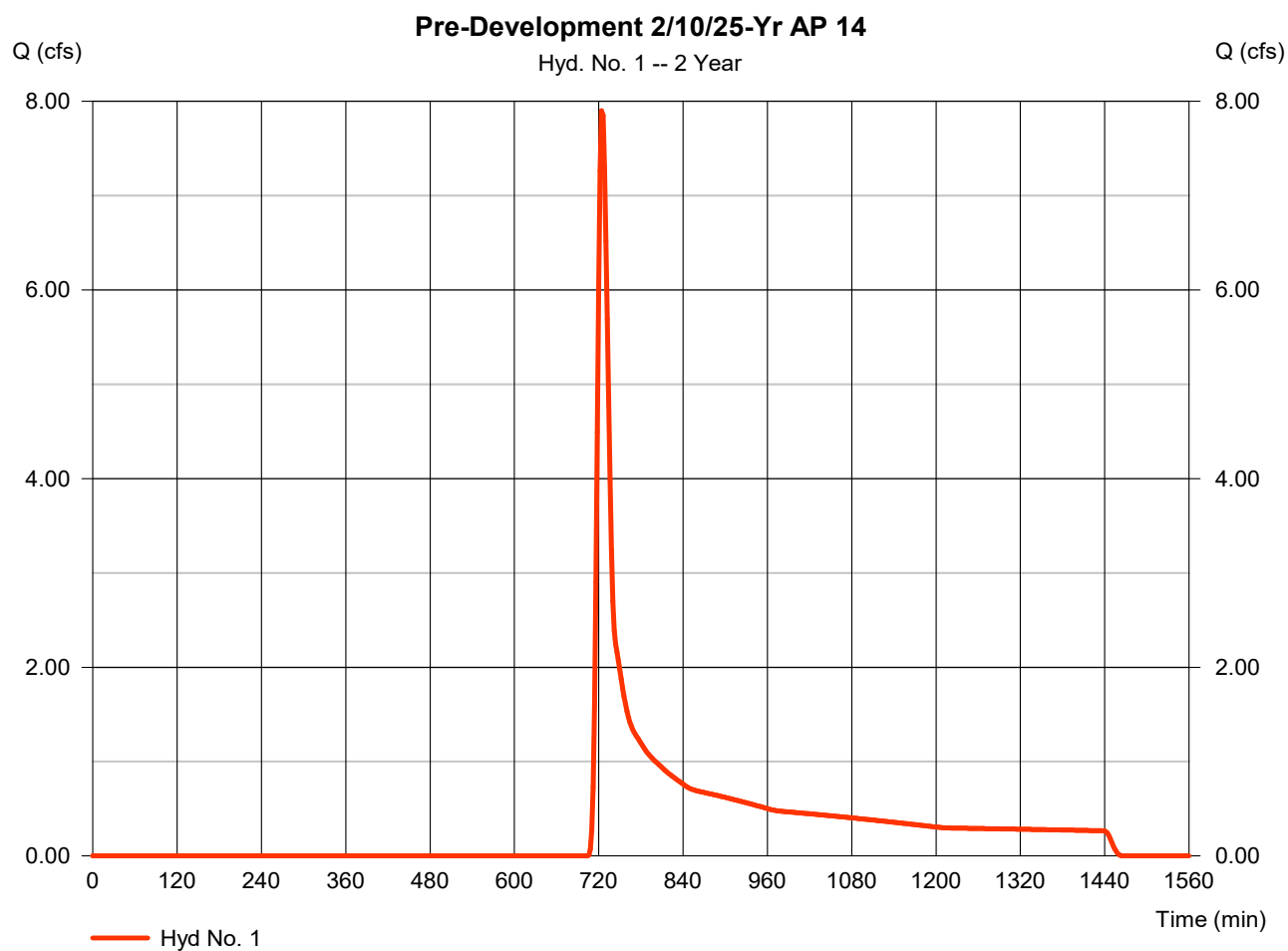
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Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 2/10/25-Yr AP 14

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 7.901 cfs   |
| Storm frequency | = 2 yrs      | Time to peak       | = 724 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 30,524 cuft |
| Drainage area   | = 16.230 ac  | Curve number       | = 60          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 16.10 min   |
| Total precip.   | = 3.50 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

4

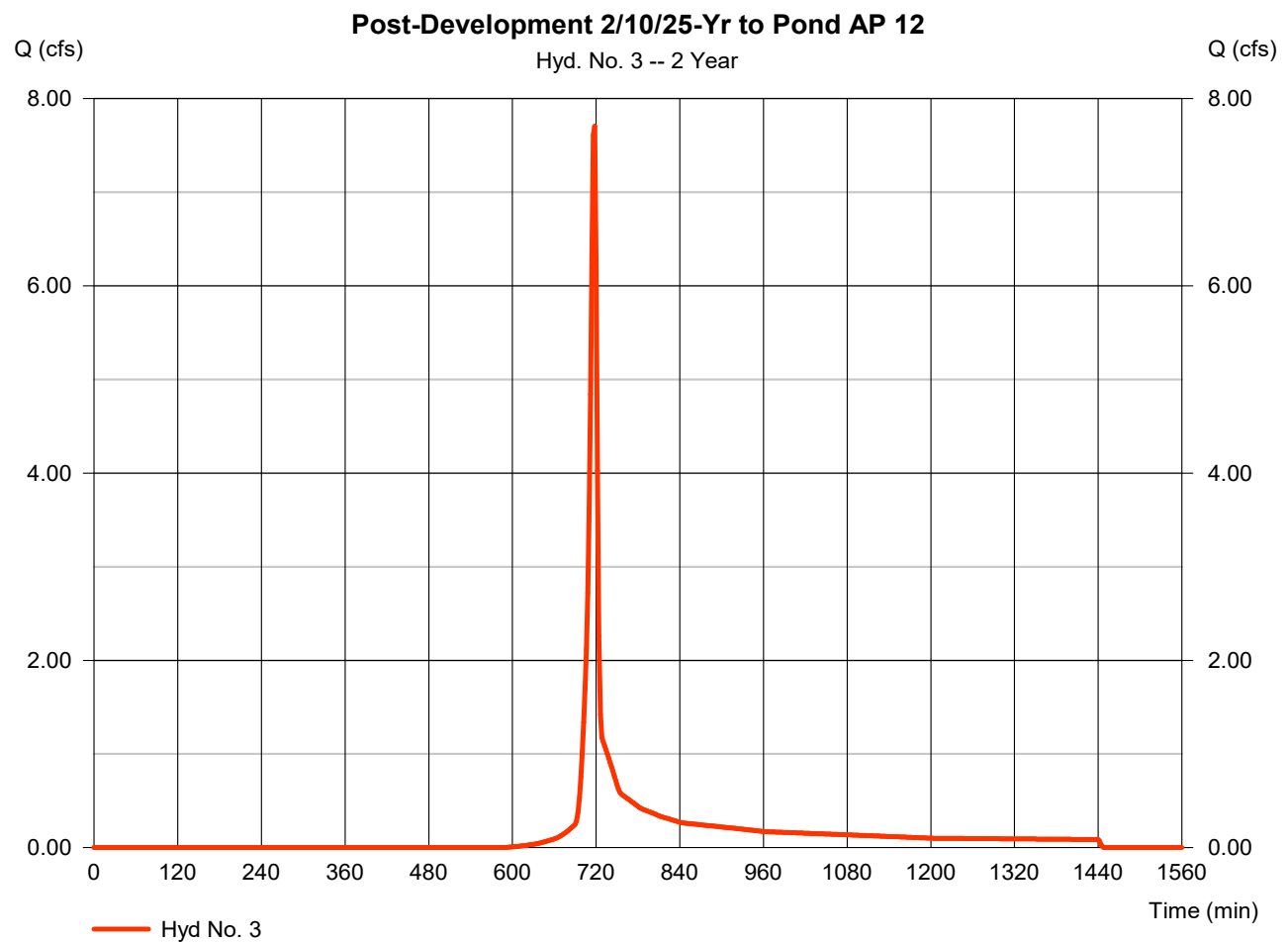
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Tuesday, 09 / 29 / 2020

## Hyd. No. 3

Post-Development 2/10/25-Yr to Pond AP 12

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 7.705 cfs   |
| Storm frequency | = 2 yrs      | Time to peak       | = 718 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 15,432 cuft |
| Drainage area   | = 3.170 ac   | Curve number       | = 77          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 3.50 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

5

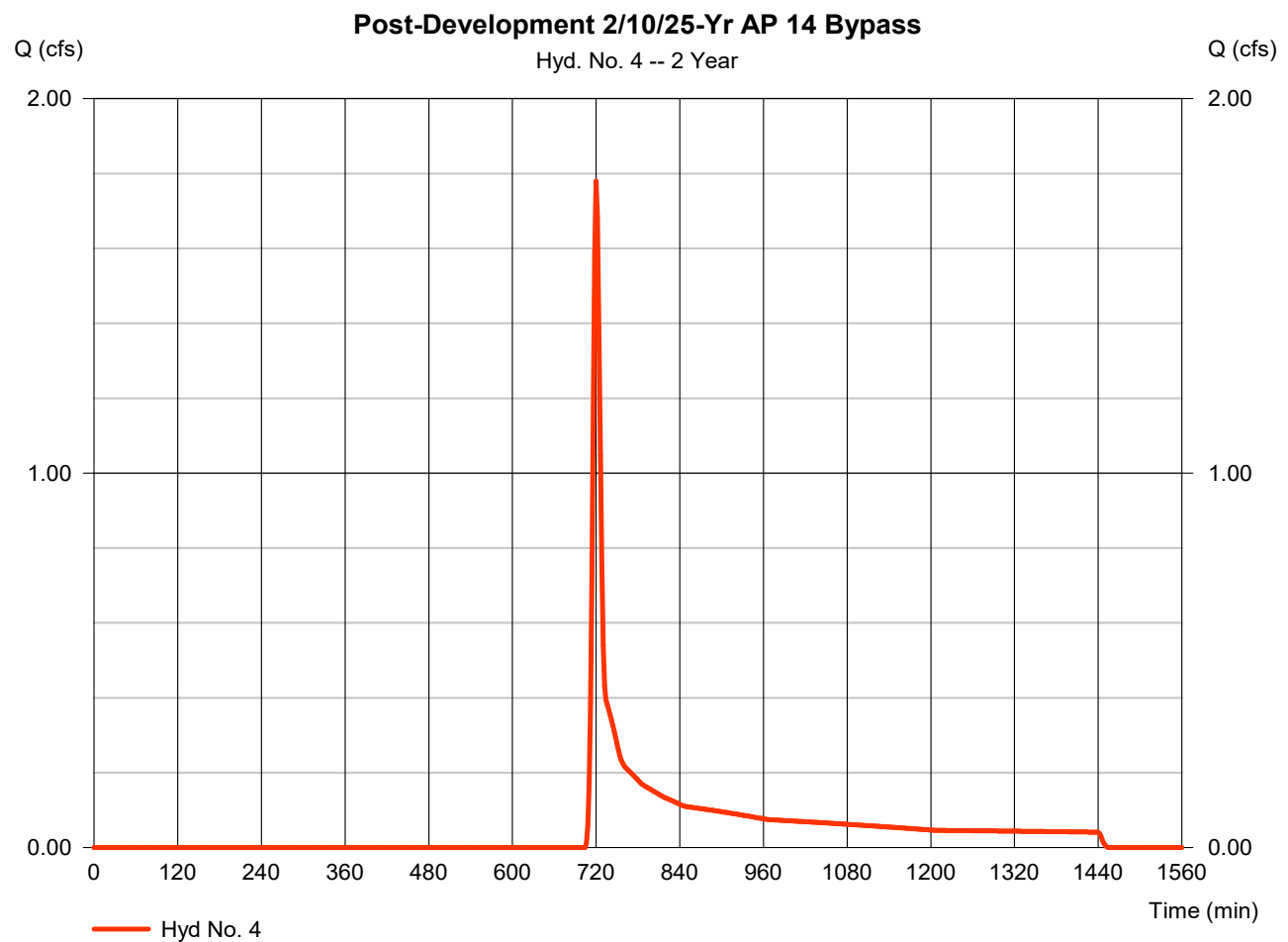
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 4

Post-Development 2/10/25-Yr AP 14 Bypass

|                 |   |            |                    |   |            |
|-----------------|---|------------|--------------------|---|------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 1.780 cfs  |
| Storm frequency | = | 2 yrs      | Time to peak       | = | 720 min    |
| Time interval   | = | 2 min      | Hyd. volume        | = | 4,884 cuft |
| Drainage area   | = | 2.350 ac   | Curve number       | = | 61         |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft       |
| Tc method       | = | User       | Time of conc. (Tc) | = | 8.70 min   |
| Total precip.   | = | 3.50 in    | Distribution       | = | Type II    |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484        |



# Hydrograph Report

6

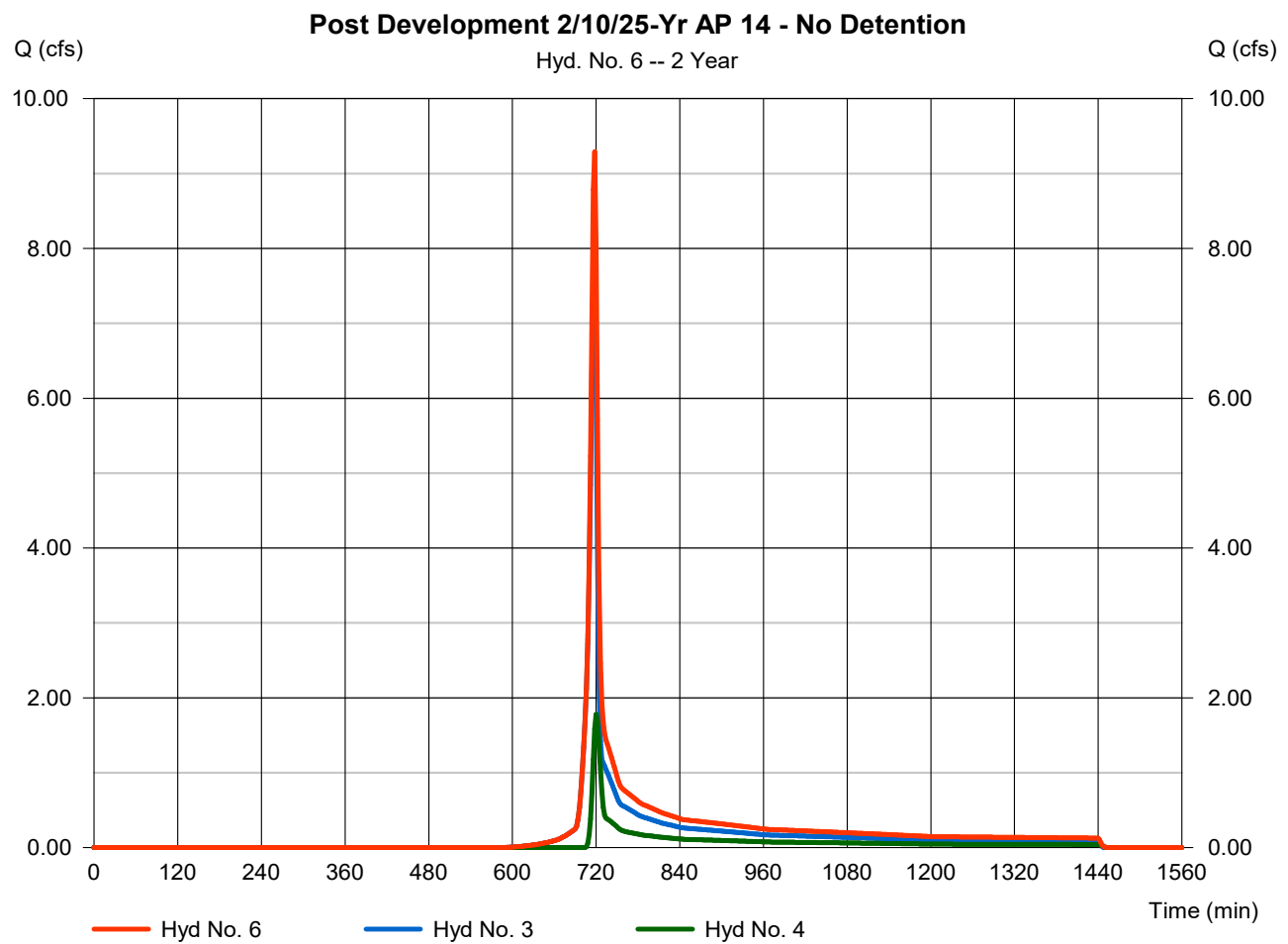
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 6

Post Development 2/10/25-Yr AP 14 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 9.290 cfs   |
| Storm frequency | = 2 yrs   | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 20,316 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 5.520 ac    |



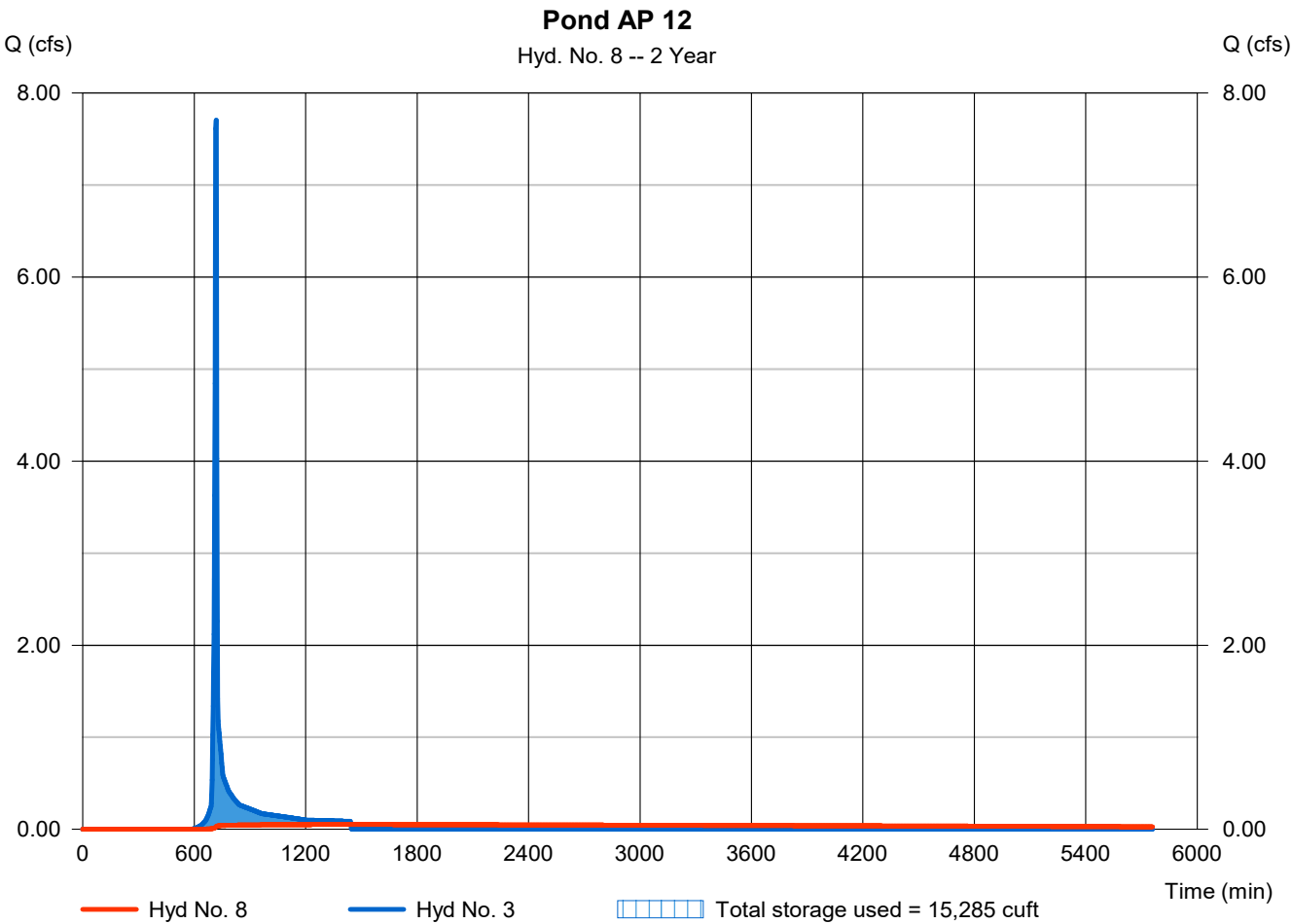
# Hydrograph Report

## Hyd. No. 8

Pond AP 12

|                 |                                                  |                |               |
|-----------------|--------------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                                      | Peak discharge | = 0.052 cfs   |
| Storm frequency | = 2 yrs                                          | Time to peak   | = 1444 min    |
| Time interval   | = 2 min                                          | Hyd. volume    | = 12,550 cuft |
| Inflow hyd. No. | = 3 - Post-Development 2/10/25-Max Elev at AP 12 | Max. Storage   | = 15,285 cuft |
| Reservoir name  | = Pond AP 12                                     |                |               |

Storage Indication method used.



# Hydrograph Report

9

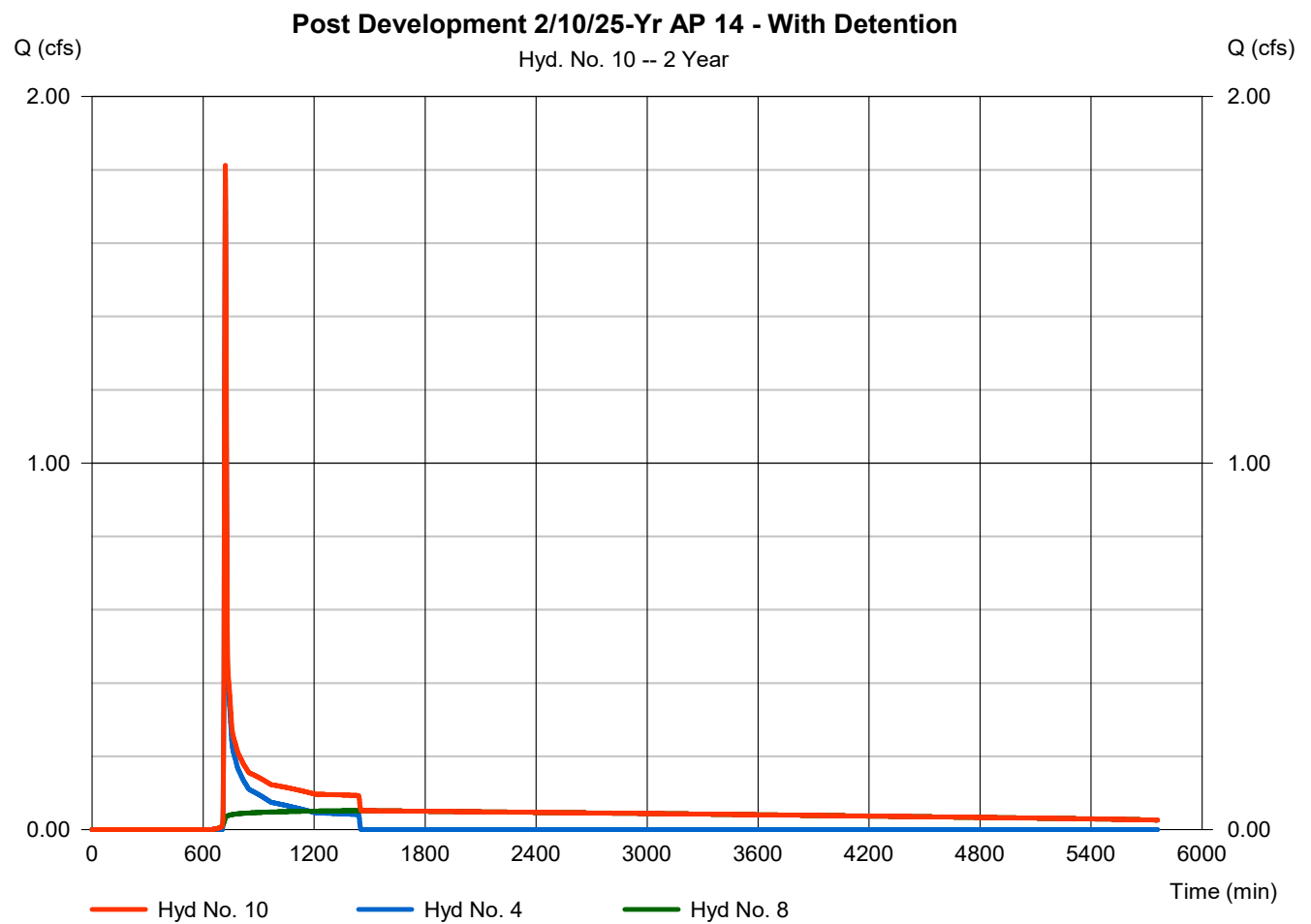
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 10

Post Development 2/10/25-Yr AP 14 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 1.812 cfs   |
| Storm frequency | = 2 yrs   | Time to peak         | = 720 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 17,434 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 2.350 ac    |



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                   | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)     | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|----------------------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                          | SCS Runoff               | 25.75           | 2                   | 724                | 78,113                 | -----         | -----                  | -----                   | Pre-Development 2/10/25-Yr AP 14    |
| 3                          | SCS Runoff               | 14.43           | 2                   | 716                | 29,201                 | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr to Pon  |
| 4                          | SCS Runoff               | 5.184           | 2                   | 720                | 12,195                 | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr AP 14   |
| 6                          | Combine                  | 19.30           | 2                   | 718                | 41,396                 | 3, 4,         | -----                  | -----                   | Post Development 2/10/25-Yr AP 14 - |
| 8                          | Reservoir                | 1.689           | 2                   | 744                | 27,702                 | 3             | 103.11                 | 17,653                  | Pond AP 12                          |
| 10                         | Combine                  | 5.234           | 2                   | 720                | 39,897                 | 4, 8,         | -----                  | -----                   | Post Development 2/10/25-Yr AP 14 - |
| L20017_Peak Flow AP 14.gpw |                          |                 |                     |                    | Return Period: 10 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |



# Hydrograph Report

11

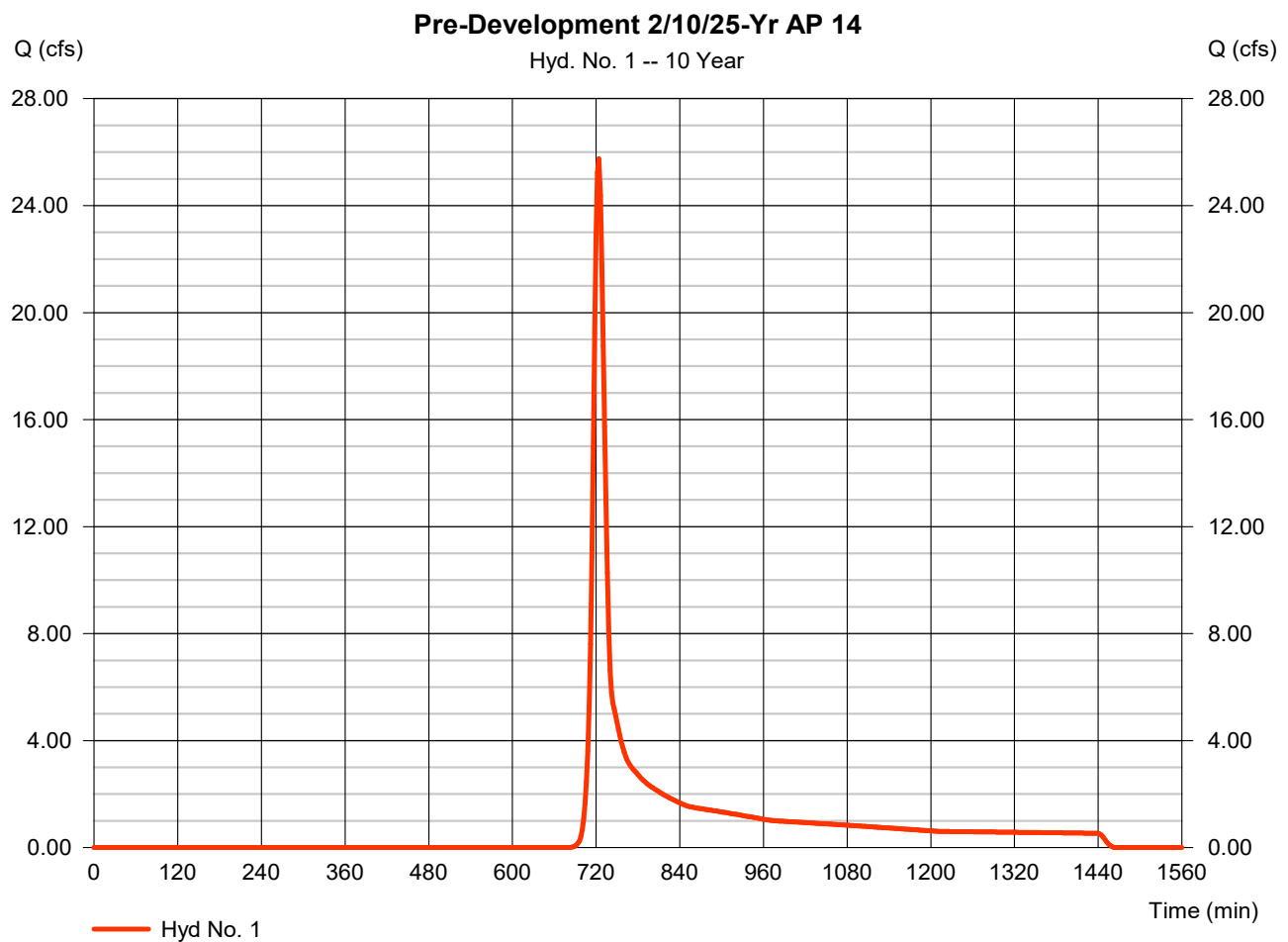
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 2/10/25-Yr AP 14

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 25.75 cfs   |
| Storm frequency | = 10 yrs     | Time to peak       | = 724 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 78,113 cuft |
| Drainage area   | = 16.230 ac  | Curve number       | = 60          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 16.10 min   |
| Total precip.   | = 5.10 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

12

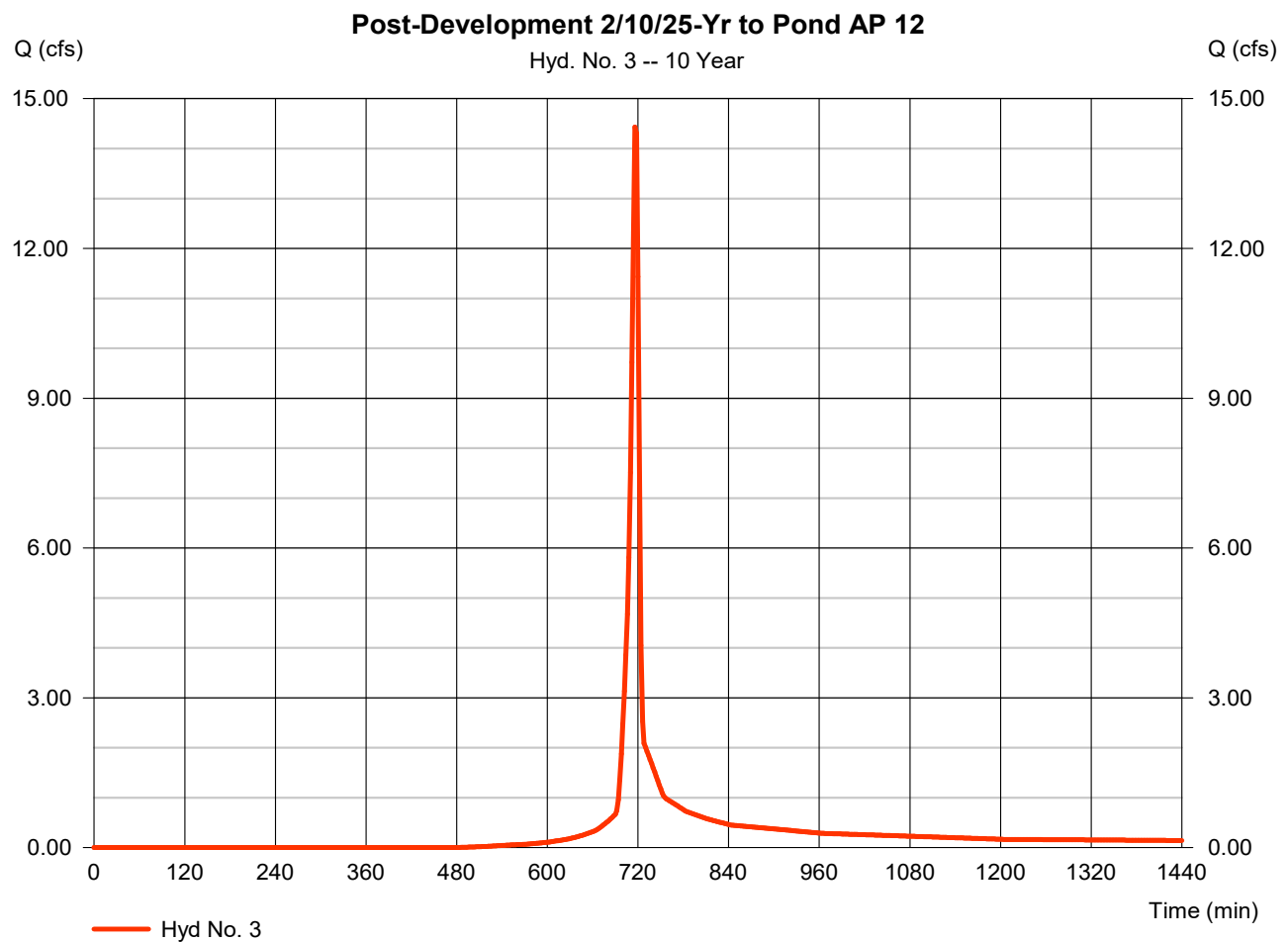
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 3

Post-Development 2/10/25-Yr to Pond AP 12

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 14.43 cfs   |
| Storm frequency | = | 10 yrs     | Time to peak       | = | 716 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 29,201 cuft |
| Drainage area   | = | 3.170 ac   | Curve number       | = | 77          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 5.00 min    |
| Total precip.   | = | 5.10 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



# Hydrograph Report

13

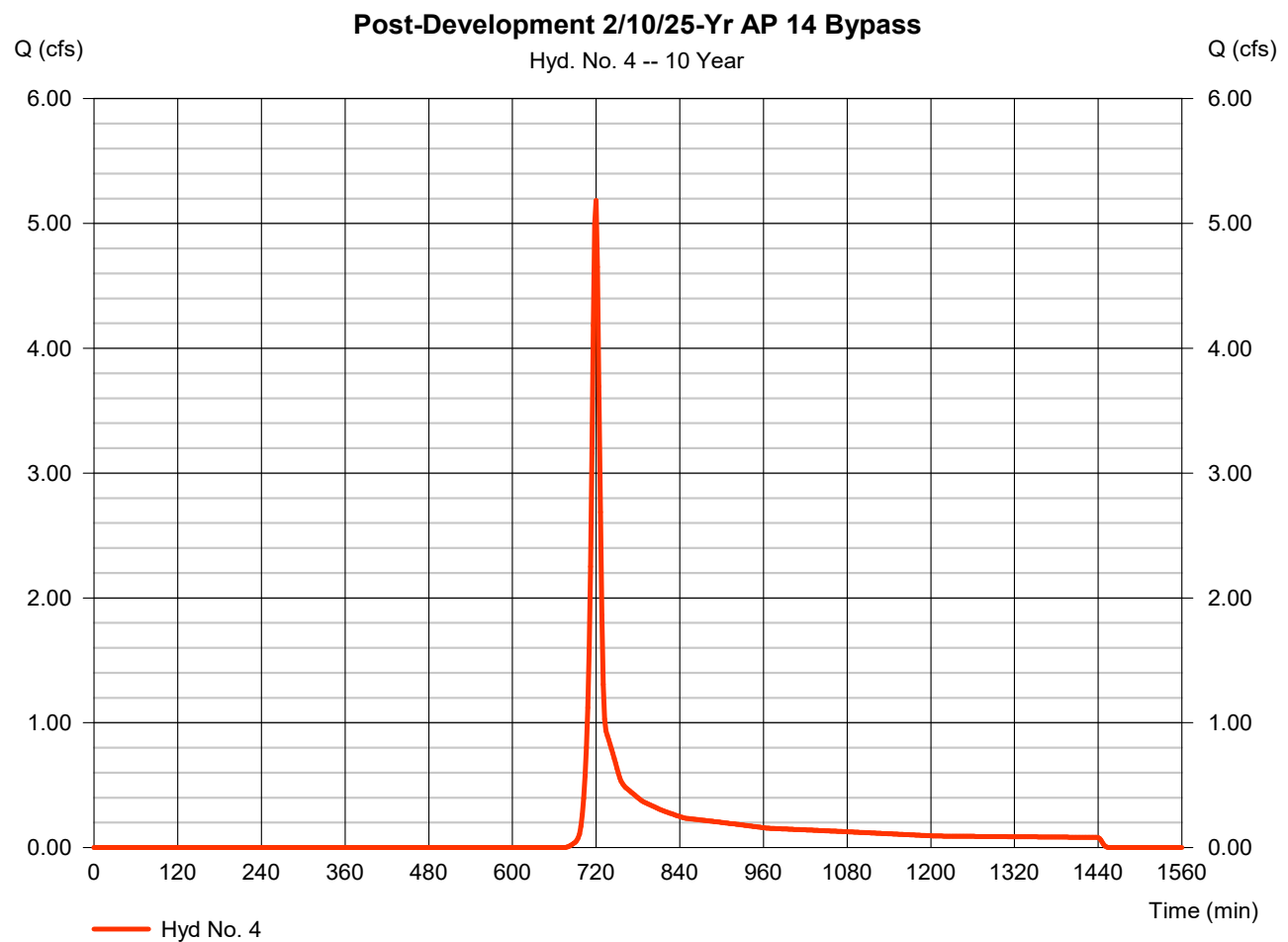
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 4

Post-Development 2/10/25-Yr AP 14 Bypass

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 5.184 cfs   |
| Storm frequency | = | 10 yrs     | Time to peak       | = | 720 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 12,195 cuft |
| Drainage area   | = | 2.350 ac   | Curve number       | = | 61          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 8.70 min    |
| Total precip.   | = | 5.10 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



# Hydrograph Report

14

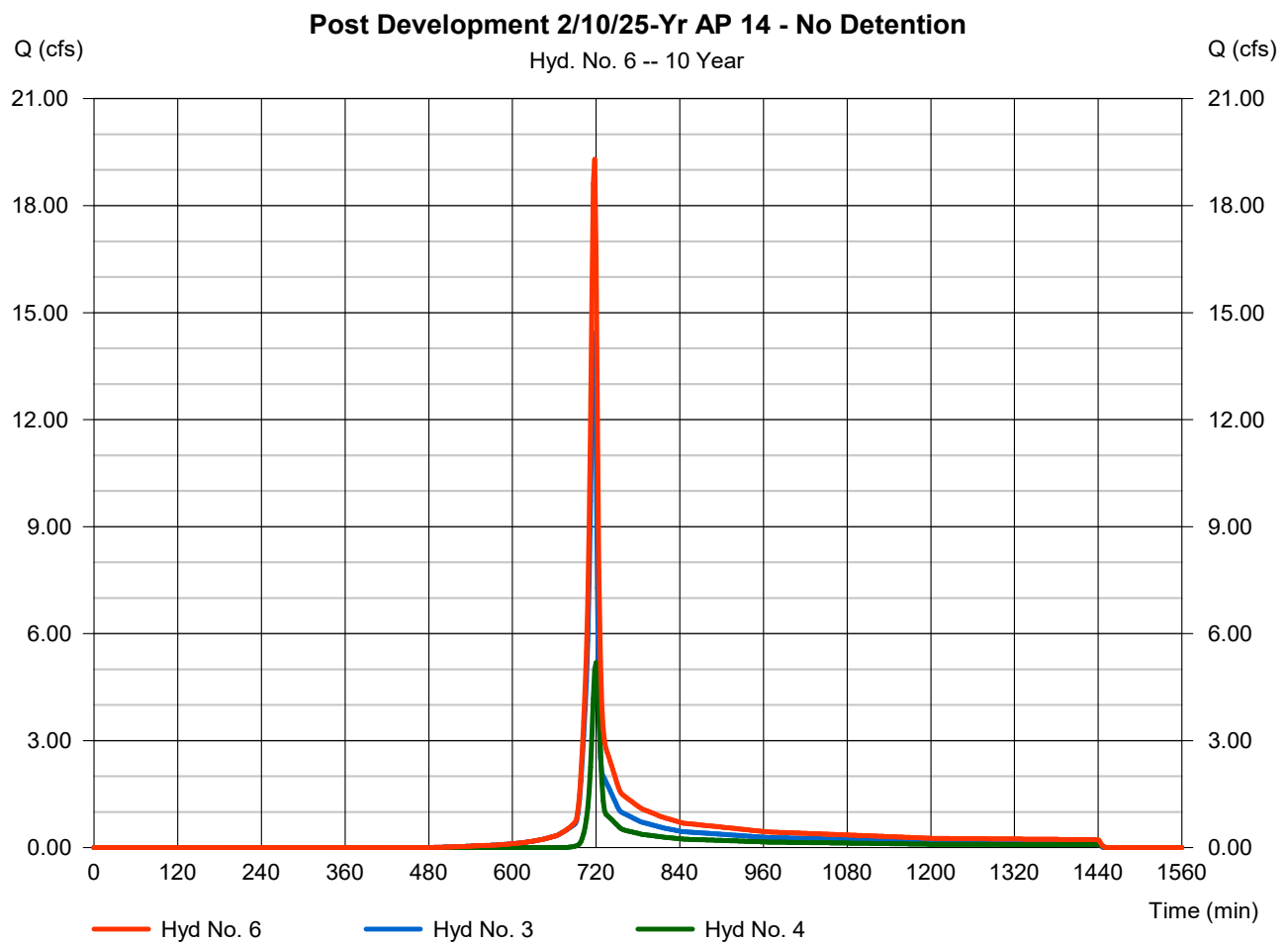
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 6

Post Development 2/10/25-Yr AP 14 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 19.30 cfs   |
| Storm frequency | = 10 yrs  | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 41,396 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 5.520 ac    |



# Hydrograph Report

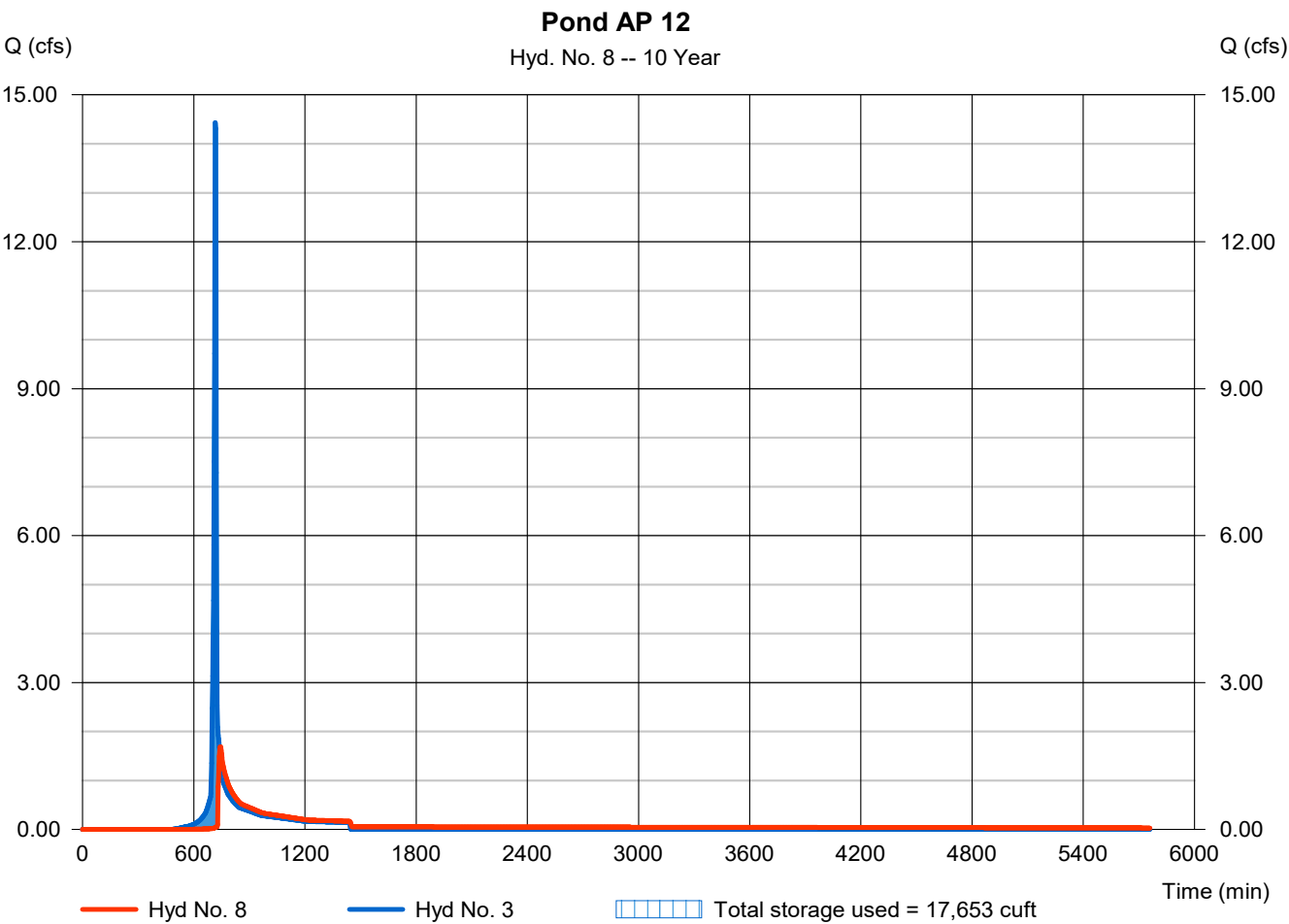
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 09 / 29 / 2020

## Hyd. No. 8

Pond AP 12

|                 |                                                  |                |               |
|-----------------|--------------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                                      | Peak discharge | = 1.689 cfs   |
| Storm frequency | = 10 yrs                                         | Time to peak   | = 744 min     |
| Time interval   | = 2 min                                          | Hyd. volume    | = 27,702 cuft |
| Inflow hyd. No. | = 3 - Post-Development 2/10/25-Max Elev at AP 12 | Max. Storage   | = 103.11 ft   |
| Reservoir name  | = Pond AP 12                                     |                |               |

Storage Indication method used.



# Hydrograph Report

16

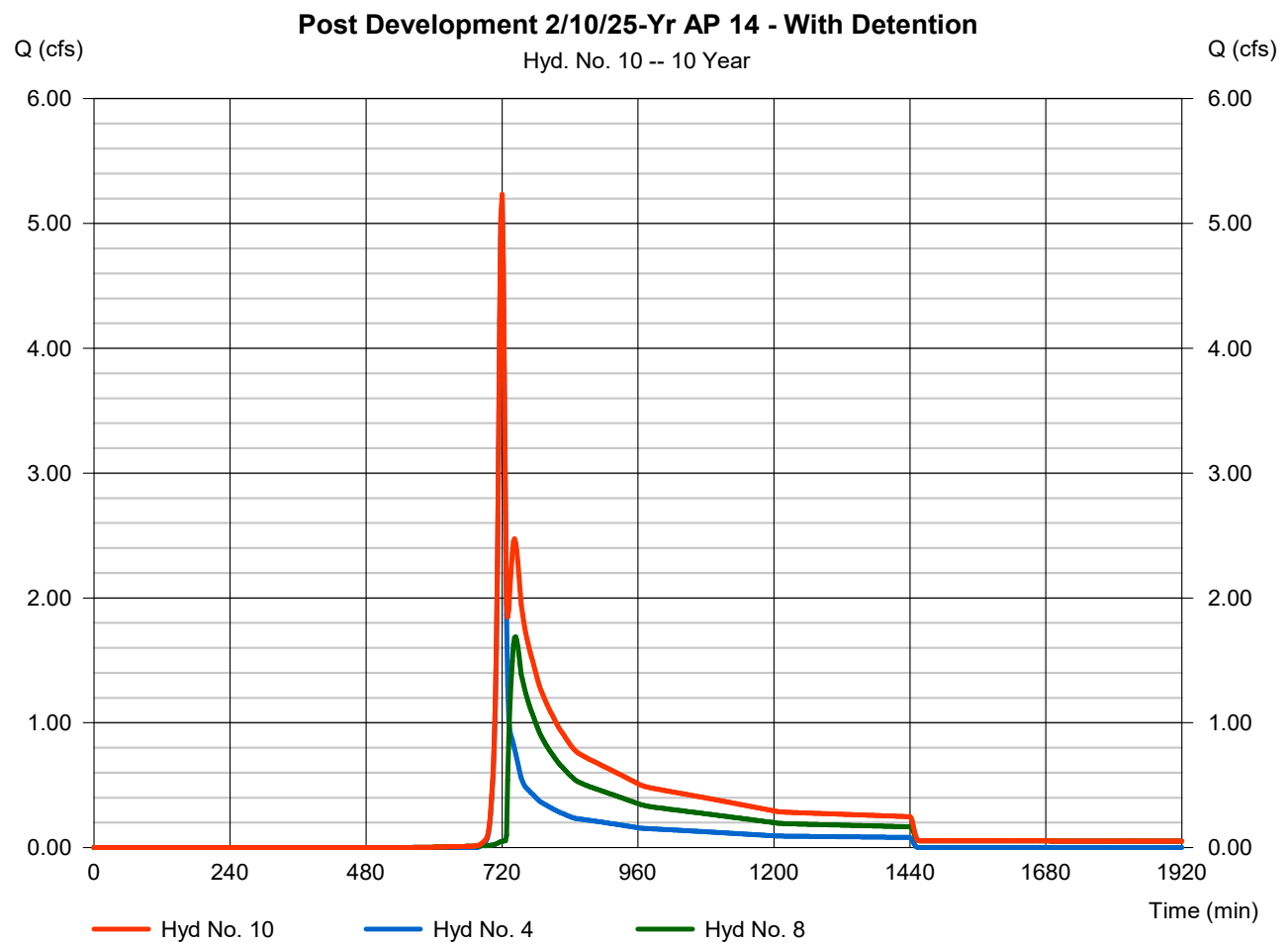
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 10

Post Development 2/10/25-Yr AP 14 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 5.234 cfs   |
| Storm frequency | = 10 yrs  | Time to peak         | = 720 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 39,897 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 2.350 ac    |



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

| Hyd. No.                   | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft)     | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description              |
|----------------------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|-------------------------------------|
| 1                          | SCS Runoff               | 37.64           | 2                   | 724                | 110,379                | -----         | -----                  | -----                   | Pre-Development 2/10/25-Yr AP 14    |
| 3                          | SCS Runoff               | 18.45           | 2                   | 716                | 37,532                 | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr to Pon  |
| 4                          | SCS Runoff               | 7.410           | 2                   | 720                | 17,108                 | -----         | -----                  | -----                   | Post-Development 2/10/25-Yr AP 14   |
| 6                          | Combine                  | 25.41           | 2                   | 718                | 54,640                 | 3, 4,         | -----                  | -----                   | Post Development 2/10/25-Yr AP 14 - |
| 8                          | Reservoir                | 9.028           | 2                   | 722                | 37,423                 | 3             | 103.36                 | 19,462                  | Pond AP 12                          |
| 10                         | Combine                  | 15.61           | 2                   | 722                | 54,531                 | 4, 8,         | -----                  | -----                   | Post Development 2/10/25-Yr AP 14 - |
| L20017_Peak Flow AP 14.gpw |                          |                 |                     |                    | Return Period: 25 Year |               |                        | Tuesday, 09 / 29 / 2020 |                                     |

# Hydrograph Report

18

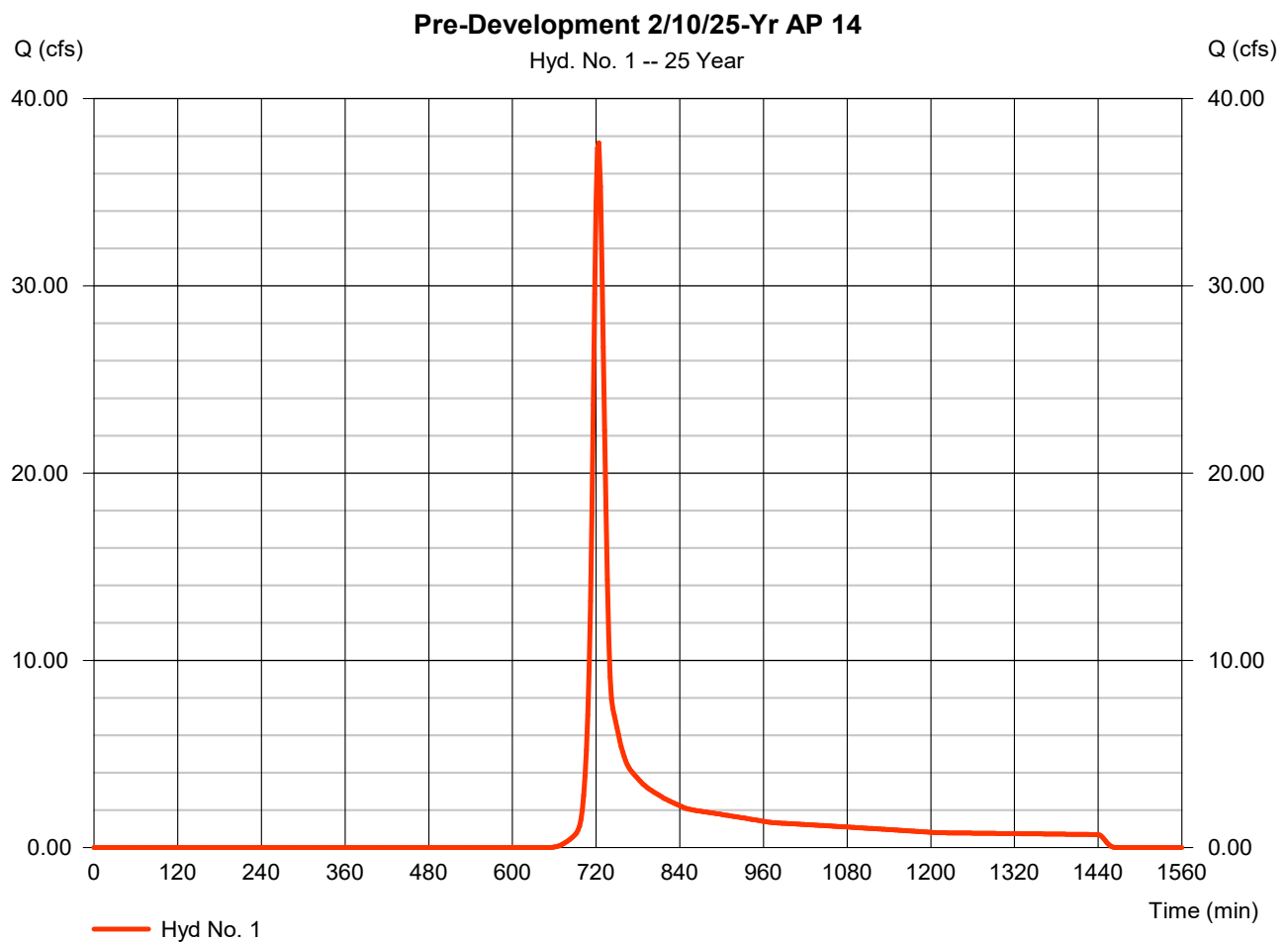
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 1

Pre-Development 2/10/25-Yr AP 14

|                 |   |            |                    |   |              |
|-----------------|---|------------|--------------------|---|--------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 37.64 cfs    |
| Storm frequency | = | 25 yrs     | Time to peak       | = | 724 min      |
| Time interval   | = | 2 min      | Hyd. volume        | = | 110,379 cuft |
| Drainage area   | = | 16.230 ac  | Curve number       | = | 60           |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft         |
| Tc method       | = | User       | Time of conc. (Tc) | = | 16.10 min    |
| Total precip.   | = | 6.00 in    | Distribution       | = | Type II      |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484          |





# Hydrograph Report

19

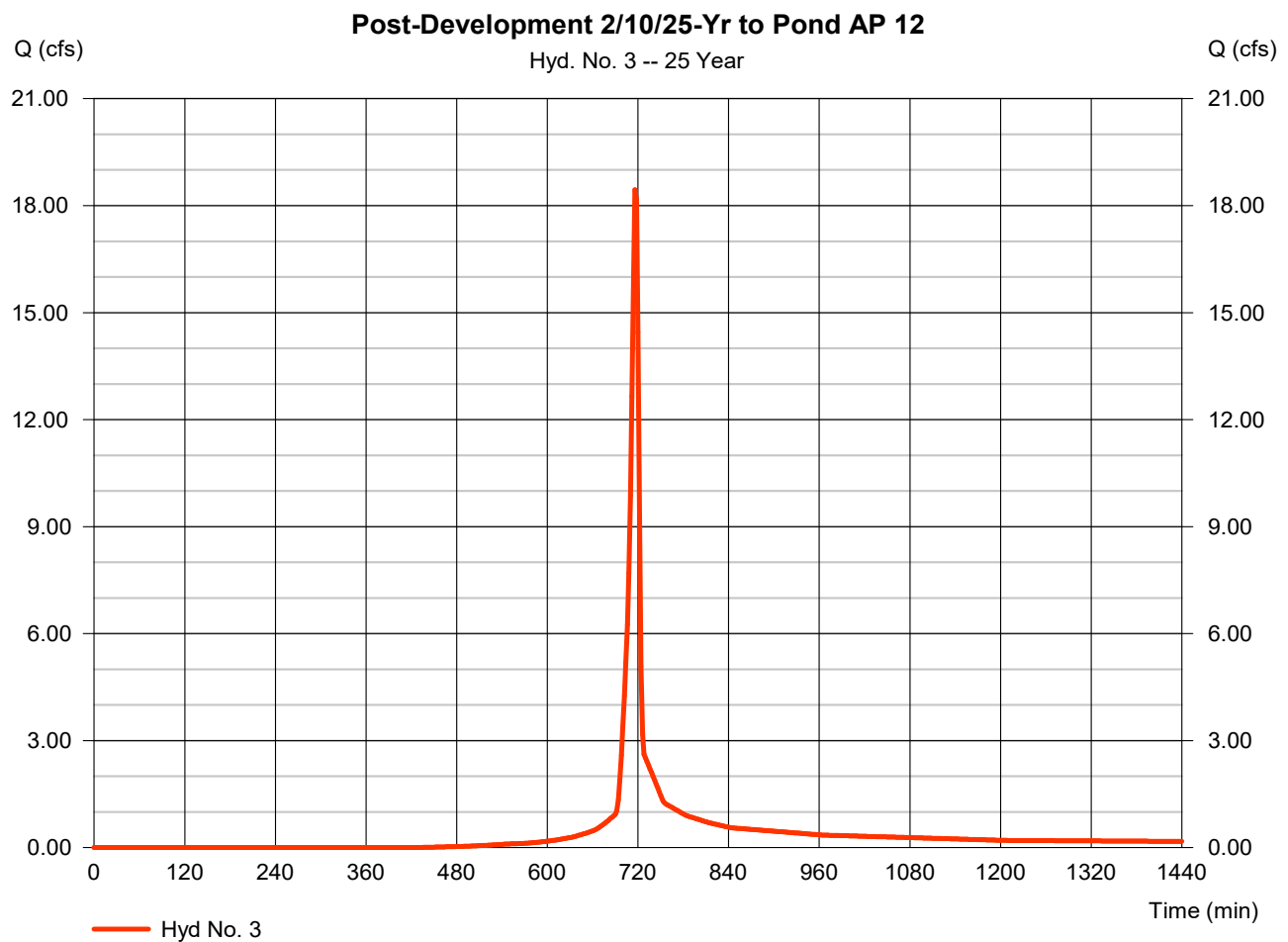
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 3

Post-Development 2/10/25-Yr to Pond AP 12

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 18.45 cfs   |
| Storm frequency | = 25 yrs     | Time to peak       | = 716 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 37,532 cuft |
| Drainage area   | = 3.170 ac   | Curve number       | = 77          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 5.00 min    |
| Total precip.   | = 6.00 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



# Hydrograph Report

20

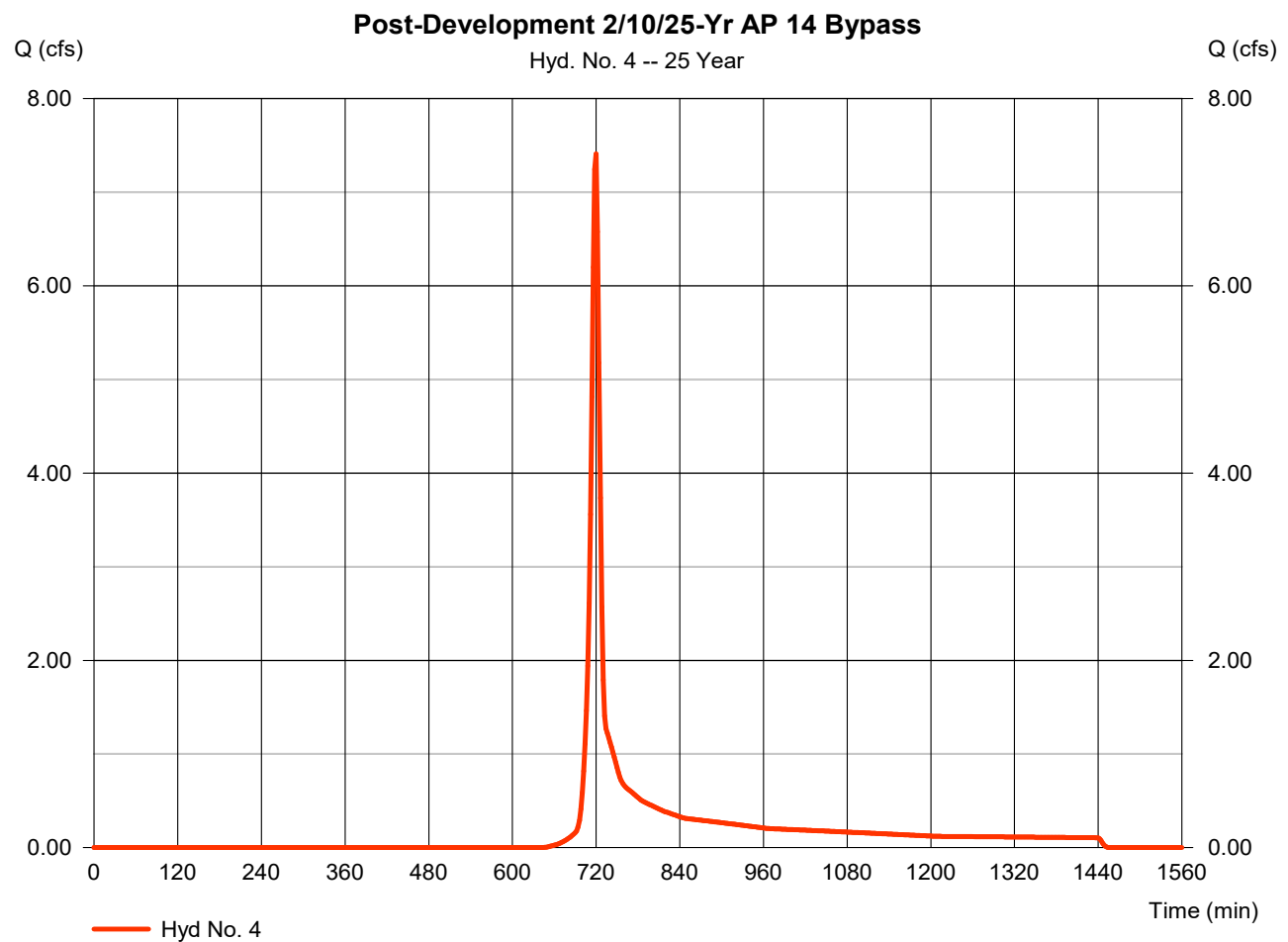
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 4

Post-Development 2/10/25-Yr AP 14 Bypass

|                 |   |            |                    |   |             |
|-----------------|---|------------|--------------------|---|-------------|
| Hydrograph type | = | SCS Runoff | Peak discharge     | = | 7.410 cfs   |
| Storm frequency | = | 25 yrs     | Time to peak       | = | 720 min     |
| Time interval   | = | 2 min      | Hyd. volume        | = | 17,108 cuft |
| Drainage area   | = | 2.350 ac   | Curve number       | = | 61          |
| Basin Slope     | = | 0.0 %      | Hydraulic length   | = | 0 ft        |
| Tc method       | = | User       | Time of conc. (Tc) | = | 8.70 min    |
| Total precip.   | = | 6.00 in    | Distribution       | = | Type II     |
| Storm duration  | = | 24 hrs     | Shape factor       | = | 484         |



# Hydrograph Report

21

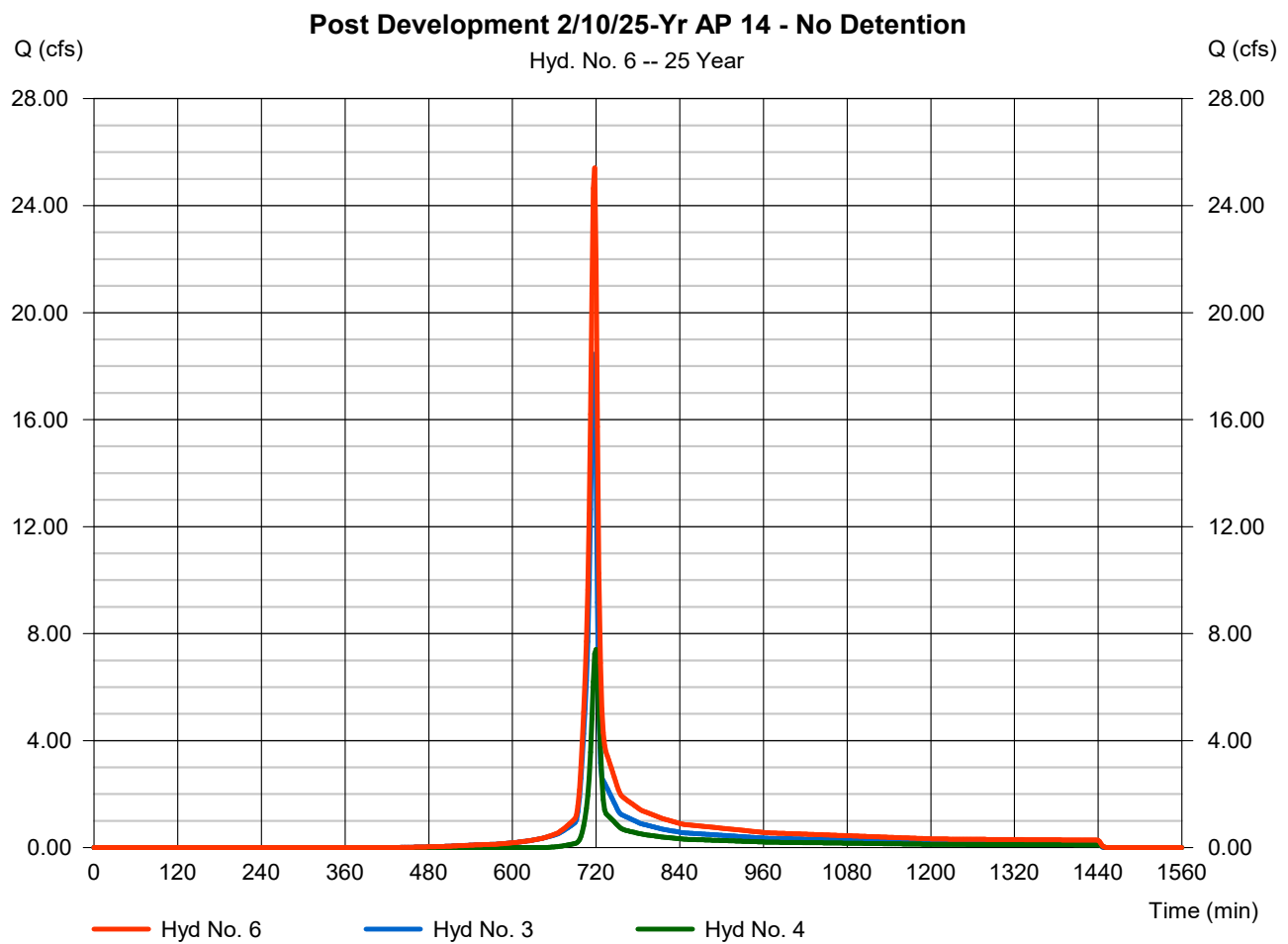
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 6

Post Development 2/10/25-Yr AP 14 - No Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 25.41 cfs   |
| Storm frequency | = 25 yrs  | Time to peak         | = 718 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 54,640 cuft |
| Inflow hyds.    | = 3, 4    | Contrib. drain. area | = 5.520 ac    |



# Hydrograph Report

22

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

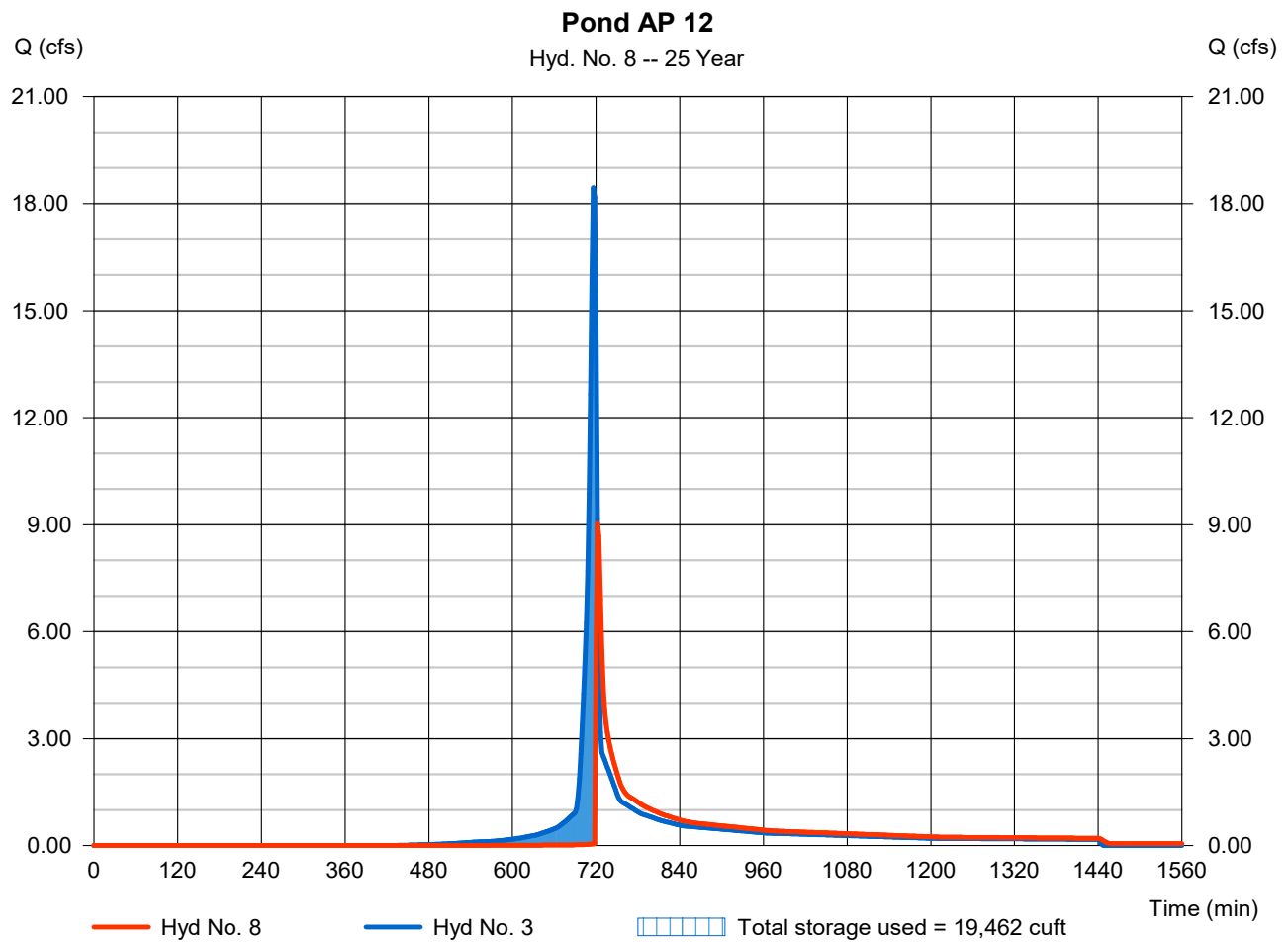
Tuesday, 09 / 29 / 2020

## Hyd. No. 8

Pond AP 12

|                 |                                               |                |               |
|-----------------|-----------------------------------------------|----------------|---------------|
| Hydrograph type | = Reservoir                                   | Peak discharge | = 9.028 cfs   |
| Storm frequency | = 25 yrs                                      | Time to peak   | = 722 min     |
| Time interval   | = 2 min                                       | Hyd. volume    | = 37,423 cuft |
| Inflow hyd. No. | = 3 - Post-Development 2/10/25-Max Elev AP 12 | Max. Storage   | = 19,462 cuft |
| Reservoir name  | = Pond AP 12                                  |                |               |

Storage Indication method used.



# Hydrograph Report

23

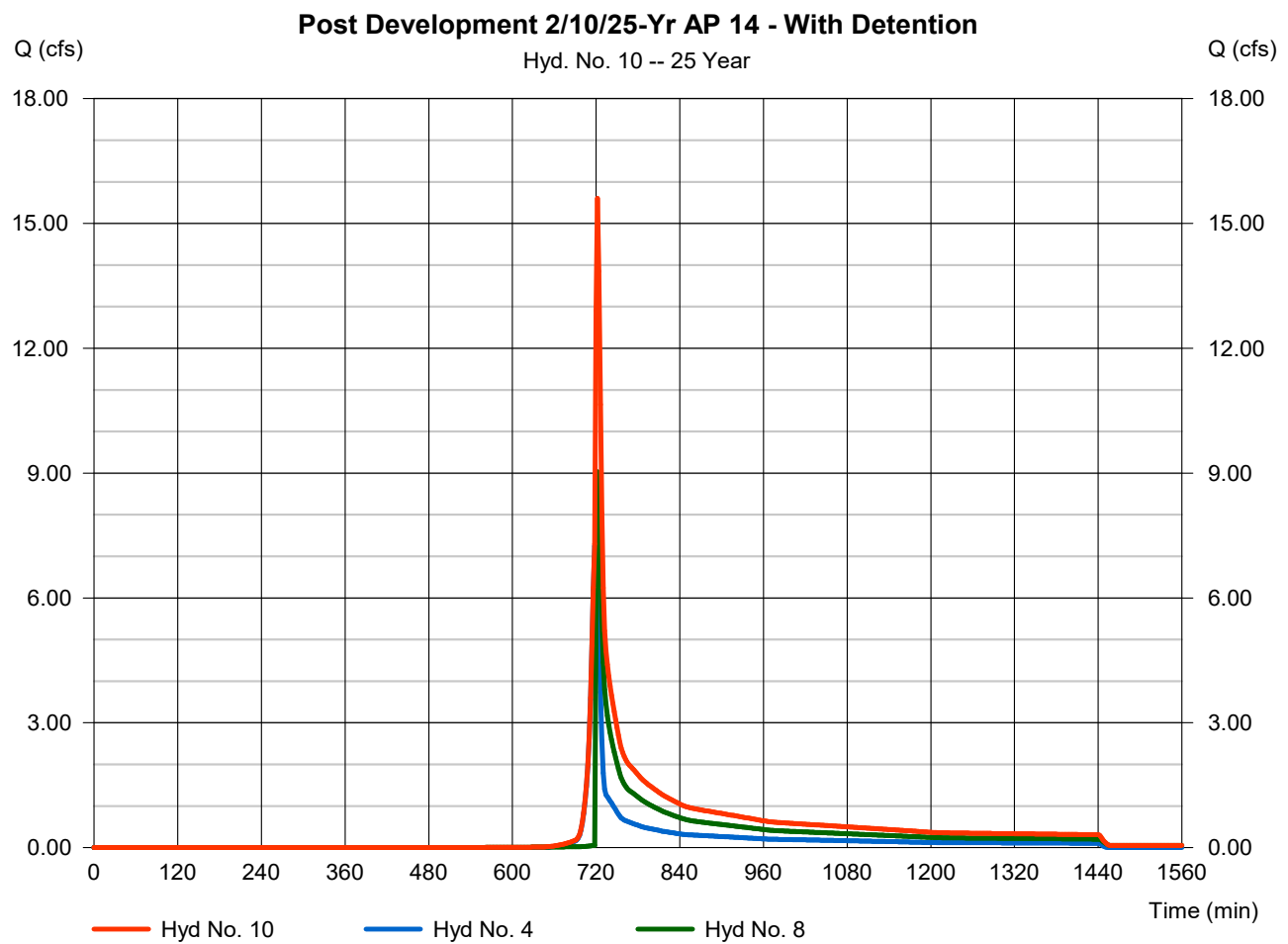
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Tuesday, 09 / 29 / 2020

## Hyd. No. 10

Post Development 2/10/25-Yr AP 14 - With Detention

|                 |           |                      |               |
|-----------------|-----------|----------------------|---------------|
| Hydrograph type | = Combine | Peak discharge       | = 15.61 cfs   |
| Storm frequency | = 25 yrs  | Time to peak         | = 722 min     |
| Time interval   | = 2 min   | Hyd. volume          | = 54,531 cuft |
| Inflow hyds.    | = 4, 8    | Contrib. drain. area | = 2.350 ac    |



## **Appendix 4**

### **Plan Sheets**

- a. SW 1.0 – Pre-Development 1- Year Drainage Area Map**
- b. SW 1.1 – Pre Development 2/10/25-Year Drainage Area Map**
- c. SW 1.2 – Post Development 1-Year Drainage Area Map**
- d. SW 1.3 – Post Development 2/10/25-Year Drainage Area Map**







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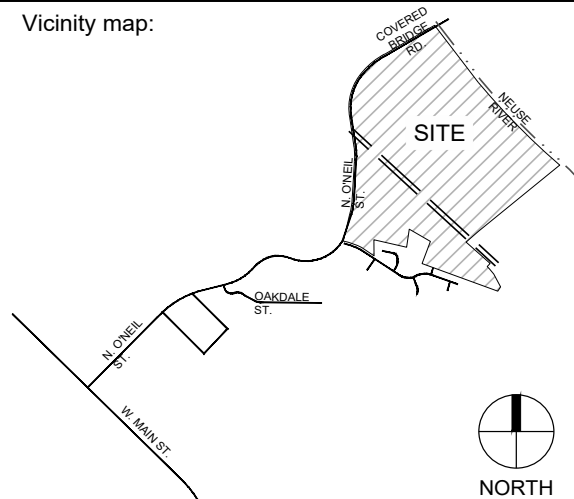
**STEWART**  
101 WEST MAIN ST.  
DURHAM, NC 27701  
T 919.380.8750  
FIRM LICENSE #: C-1051  
www.stewartinc.com  
PROJECT #: C201111

Client:  
RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:  
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

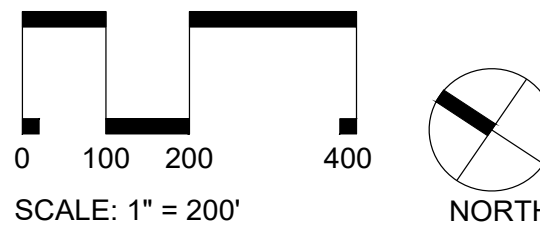
KIMLEY HORN  
421 FAYETTEVILLE ST SUITE 600  
RALEIGH, NC 27601

Vicinity map:



Seal:

PRELIMINARY - DO NOT  
USE FOR CONSTRUCTION



Project:

**ASHCROFT  
SECTION 2**

Issued for:

**MASTER PLAN**

| No. | Date | Description |
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Title:

**PRE DEVELOPMENT  
2/10/25-YEAR DRAINAGE  
AREA MAP**

Project number: L20017 Sheet #:  
Issued Date: 10.02.2020  
Drawn by: AA  
Approved by: TS

**SW1.0**



C:\3D\Temp\AcPublish\_124681\20017-Post DAs.dwg Sep 29, 2020 - 11:49am



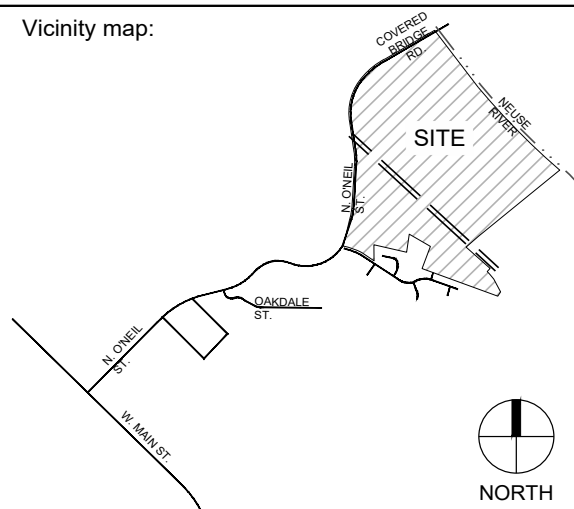
**STEWART**  
101 WEST MAIN ST.  
DURHAM, NC 27701  
T 919.380.8750  
FIRM LICENSE #: C-1051  
www.stewartinc.com  
PROJECT #: C2017001

Client:  
RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:  
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

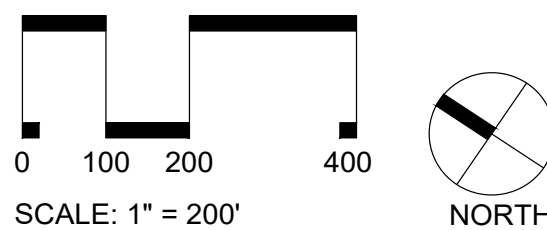
KIMLEY HORN  
421 FAYETTEVILLE ST SUITE 600  
RALEIGH, NC 27601

Vicinity map:



Seal:

PRELIMINARY - DO NOT  
USE FOR CONSTRUCTION



Project:

**ASHCROFT  
SECTION 2**

Issued for:

**MASTER PLAN**

| No. | Date | Description |
|-----|------|-------------|
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Title:

**POST DEVELOPMENT  
1-YR DRAINAGE AREA  
MAP**

Project number: L20017 Sheet #:  
Issued Date: 10.02.2020  
Drawn by: AA  
Approved by: TS

**SW1.2**









| WATER & WASTEWATER ALLOCATION CRITERIA                                       |                                                                          |                                                                                                                                                                                               |       |                                                                      |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------|
| TOTAL POINTS = 105 MINIMUM 50 POINTS REQUIRED                                |                                                                          |                                                                                                                                                                                               |       |                                                                      |
|                                                                              | Category                                                                 | Points                                                                                                                                                                                        | Calc. | Notes                                                                |
| DEVELOPMENT TYPE <sup>1</sup><br>(Choose 1 from this category)               | Government/Public Admin./Public Safety                                   | 50                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Non-residential (Commercial) - Retail & Restaurant                       | 30                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Non-residential (Commercial) - Office                                    | 20                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Non-residential (Commercial) - Warehouse                                 | 15                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Non-residential (Commercial) - Medical                                   | 25                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Non-residential (Commercial) - Hotel/Motel                               | 35                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Industrial/Manufacturing                                                 | 30                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Institutional                                                            | 15                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Residential Existing Lot- Single Family Detached                         | 40                                                                                                                                                                                            |       | Individual Existing Lot construction                                 |
|                                                                              | Residential Subdivision - Single Family Detached ( > 0.25 Acre Lots)     | 20                                                                                                                                                                                            |       | Single Family Homes on Individual Lots greater than 0.25 acres       |
|                                                                              | Residential Subdivision - Single Family Detached ( < 0.25 Acre Lots)     | 15                                                                                                                                                                                            |       | Single Family Homes on Individual Lots less than 0.25 Acres          |
|                                                                              | Residential Subd.- Single Family Attached ( > 1,500 SF Heated Space)     | 10                                                                                                                                                                                            |       | Townhomes with heated square-footage greater than 1,500 SF           |
|                                                                              | Residential Subd.- Single Family Attached ( < 1,500 SF Heated Space)     | 5                                                                                                                                                                                             |       | Townhomes with heated square-footage less than 1,500 SF              |
|                                                                              | Residential - Multifamily (Apartments)                                   | 10                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Mixed-Residential                                                        | 25                                                                                                                                                                                            |       | Mix of various lot sizes of Single-family, Townhomes, and Apartments |
|                                                                              | Mixed-Use Commercial & Residential                                       | 30                                                                                                                                                                                            | 30    | Mix of Residential and Non-residential (Commercial) uses             |
|                                                                              | Downtown Redevelopment                                                   | 30                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Infill Development                                                       | 25                                                                                                                                                                                            |       | Utilities already exist within 300 Feet of property                  |
| FUTURE TAX STATUS<br>(Choose 1 from this category)                           | Exempt                                                                   | 0                                                                                                                                                                                             |       |                                                                      |
|                                                                              | Residential                                                              | 5                                                                                                                                                                                             | 5     |                                                                      |
|                                                                              | Non-residential                                                          | 10                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Industrial                                                               | 10                                                                                                                                                                                            |       |                                                                      |
|                                                                              |                                                                          |                                                                                                                                                                                               |       |                                                                      |
| COMMUNITY BENEFIT BONUS POINTS<br>(Choose All that apply from this category) | Cultural Arts/Entertainment for Public                                   | 10                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Sports/Recreation for Public                                             | 10                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Town Electric Customer                                                   | 20                                                                                                                                                                                            | 20    |                                                                      |
|                                                                              | Expansion of existing non-residential use                                | 10                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Re-development of an existing property                                   | 5                                                                                                                                                                                             |       | Must result in increased property value                              |
|                                                                              | Residential Subdivision - Additional amenities included                  | 5 - 15                                                                                                                                                                                        | 15    | Pool, Clubhouse, sports courts, etc. - 5 pts per, max 15 pts         |
|                                                                              | Job Creation - 10 to 25 new jobs                                         | 5                                                                                                                                                                                             |       |                                                                      |
|                                                                              | Job Creation - 26 to 100 new jobs                                        | 10                                                                                                                                                                                            | 10    |                                                                      |
|                                                                              | Job Creation - 100+ new jobs                                             | 15                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Job creation - Jobs created will have salaries at or above median income | 5                                                                                                                                                                                             |       | Must be greater than 50% of jobs added with documentation to confirm |
|                                                                              | Residential - Multiple-Car Garages provided                              | 5                                                                                                                                                                                             | 5     |                                                                      |
|                                                                              | Residential - Overflow Parking provided                                  | 5                                                                                                                                                                                             |       | Subject to Planning and Engineering support                          |
|                                                                              | Masonry Elements included in Building Construction                       | 10                                                                                                                                                                                            | 10    |                                                                      |
|                                                                              | Sustainable/High Efficiency Products and appliances used                 | 5 - 15                                                                                                                                                                                        |       | 5 pts per, max 15 pts                                                |
|                                                                              | Private trail connection to Public Greenway                              | 10                                                                                                                                                                                            | 10    |                                                                      |
| COMMUNITY IMPACT DEDUCT POINTS<br>(Choose All that apply from this category) | Pump Station Improvements required <sup>2</sup>                          | -10                                                                                                                                                                                           |       | Subject to Town policy and standards                                 |
|                                                                              | New Pump Station Required <sup>2</sup>                                   | -20                                                                                                                                                                                           |       | Subject to Town policy and standards                                 |
|                                                                              | Out-of Town Status (After construction)                                  | -10                                                                                                                                                                                           |       |                                                                      |
|                                                                              | Outside Fire District                                                    | -5                                                                                                                                                                                            |       |                                                                      |
|                                                                              | Inconsistent with Comp Plan                                              | -5                                                                                                                                                                                            |       |                                                                      |
| CLARIFICATIONS                                                               | 1                                                                        | Any Development Type Category not listed is subject to Town Council discretion with staff recommendation.                                                                                     |       |                                                                      |
|                                                                              | 2                                                                        | The Town Engineer may waive these deductions if the improvements are consistent with Future utility service plans, replace/offline an aging station, or are in the best interest of the Town. |       |                                                                      |



**TOWN OF CLAYTON**  
Engineering & Inspections Department  
111 E. Second Street, Clayton, NC 27520  
P.O. Box 879, Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## WASTEWATER ALLOCATION REQUEST

The Town of Clayton, in an effort to manage and maintain the sewer and water capacity for the Town, requires that this application be completed and submitted to the Town for consideration of a utility allocation. Review fee is due upon submittal of request.

**Wastewater Allocation Request Review Fee: \$50**

**Application MUST be completed and sealed by a registered engineer unless otherwise approved by staff.**

### SITE INFORMATION

**Name of Project:** Ashcroft Section 2 **Acreage of Property:** 256.15  
**County Tag Number:** See attached **NC PIN:** See attached  
**Address/Location:** 1500 North O'Neil Street  
**Zoning District:** Residential Estate  
**Town Limits / ETJ:** ☐ Town Limits ☒ ETJ (Extra-Territorial Jurisdiction)

### APPLICANT INFORMATION – Applicant must be a registered engineer unless otherwise approved by Town Engineer

**Applicant:** Stewart  
**Mailing Address:** 101 West Main St. Durham, NC 27701  
**Phone Number:** 919.866.4794 **Fax:**  
**Contact Person:** Tim Summerville  
**Email Address:** tsummerville@stewartinc.com

### PROPERTY OWNER INFORMATION

**Name:** See attached  
**Mailing Address:**  
**Phone Number:** **Fax:**  
**Email Address:**

### FOR OFFICE USE ONLY

**Date Received:** **File Number:** **Associated Project Number:**

## PROJECT INFORMATION

Use: ☒ New ☐ Expanded ☐ Change

Use Type: ☒ Residential ☐ Non-Residential

Proposed Use(s): Residential/Commercial Existing Use(s): Vacant

Invoice shall be mailed to the following:

Developer Name: RiverWild

Mailing Address: 114 W. Main Street Clayton, NC 27520

Phone Number: 919.901.3178 Fax Number:

Email Address: david@riverwildteam.com

## ALLOCATION REQUEST

The following is required:

- For non-residential construction, submit a floor plan of proposed building.
- Use additional sheets if necessary.
- Provide any documentation supporting/justifying the request as an attachment (using a comparable use is recommended).
- If a phasing / take-down schedule is proposed, include as an attachment.

Residential:

Gross Acreage: 172.6

| Single Family     | # of Units | GPD per Unit | Total Requested GPD |
|-------------------|------------|--------------|---------------------|
| 1-2 Bedroom Units |            |              |                     |
| 3 Bedroom Units   |            |              |                     |
| >3 Bedroom Units  | 293        | 250          | 73,250              |
| <b>Total</b>      | 293        | -----        | 73,250              |

| Multi-Family      | # of Units | GPD per Unit | Total Requested GPD |
|-------------------|------------|--------------|---------------------|
| 1-2 Bedroom Units | 180        | 240          | 43,200              |
| 3 Bedroom Units   | 299        | 250          | 74,750              |
| >3 Bedroom Units  |            |              |                     |
| <b>Total</b>      | 479        | -----        | 117,950             |

Non-Residential: (Design Flow Guideline provided as Appendix A)\*

*\*If design flow deviates from the flow rates presented in Appendix A, provide supporting documentation/justification as an attachment in the form of 12 months of water bills demonstrating gallons per day utilized.*

Gross Acreage: 13.7

| Use          | Measurement Unit | # of Units | GPD per Unit | Total Requested GPD |
|--------------|------------------|------------|--------------|---------------------|
| Retail       | 1,000 sf         | 67         | 100          | 6,700               |
| Restaurant   | seat             | 1,233      | 40           | 49,320              |
| Office       | employees/shift  | 150        | 25           | 3,750               |
| <b>Total</b> |                  | 1450       | -----        | 59,750              |

TOTAL REQUESTED GALLONS PER DAY: 250,950

**NOTE TO APPLICANT:**

**Invoicing:**

Invoices are generated on the following schedule:

**Non-Residential:**

Generated with the application for a Zoning Compliance Permit.

**Residential:**

**Multi-Family / Apartments:**

Generated with the application for a Zoning Compliance Permit.

**Subdivision / Subdivided Lots:**

Generated at Final Plat submittal.

**Fee Development:**

Development Fees are calculated and invoiced based on the Town of Clayton adopted Comprehensive List of Fees and Charges. Invoiced fees include acreage fees, capacity fees, nutrient offset fees, recreation fees, fees-in-lieu, and electric department lot deposit. Please speak with Town staff with questions.

**Approval:**

Requests over 10,000 GPD are approved by the Town Council, by resolution. All other requests are approved by the Town Manager.

**APPLICANT AFFIDAVIT**

*I/We, the undersigned, do hereby make application and petition to the Town of Clayton to approve the subject Wastewater Allocation. I hereby certify that I have full legal right to request such action and that the statements or information made in any paper or plans submitted herewith are true and correct to the best of my knowledge. I understand this application, related material and all attachments become official records of the Planning Department of the Town of Clayton, North Carolina, and will not be returned.*

**Tim Summerville**

*Print Name*

  
\_\_\_\_\_  
*Signature of Applicant*

**10.05.2020**

*Date*

**Engineer Seal:**



### **PUBLIC NOTICE**

In accordance with NC GS 160A-364 the Clayton Town Council will hold a public hearing and evidentiary hearing on Monday, February 1, 2021, at 6 PM at Town Hall, 111 East Second Street, to consider the following requests:

- 2020-113-PDD Ashcroft 2 Planned Development Rezoning; request to rezone 241 acres from Residential-Estate (R-E) and Planned Development Residential (PD-R) to Planned Development Mixed Use (PD-MU). The properties are located off O'Neil Street, south of Neuse River and north of the existing Ashcroft subdivision. TAG#s: 05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of 05H02200B, 05H02015
- 2020-114-SD Ashcroft 2 Preliminary Plat Master Plan; request for a master plan develop 241 acres of land for commercial and residential uses. The plan includes up to 105,000 SF of commercial and up to 772 residential units. The properties are located off O'Neil Street, south of the Neuse River and north of the existing Ashcroft subdivision. TAG #s: 05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of 05H02200B, 05H02015

For the Rezoning the Town Council will hold a public hearing. The Clayton Town Council reserves the right to approve the request as presented or any portion of the request without necessity of withdrawal or modification of the application or additional public hearing on the matter. Likewise, the Town Council may designate approval to the district requested or another district or districts without modification of the request or additional public hearing.

For the Preliminary Plat (Master Plan) the Council will hold an evidentiary hearing. During an evidentiary hearing, the Clayton Town Council must make findings of fact based upon sworn testimony and other credible evidence. Citizens may give testimony in an evidentiary hearing after they have taken an oath.

This is an open meeting and the public is invited to attend.

**Samantha Wullenwaber, Planning Director**  
**919-553-5002**

---

**The Johnstonian Newspaper**

**Please advertise on the following dates:**

**Wednesday, January 20, 2021**

**Wednesday, January 27, 2021**

**Affidavit of publication required.**





Town of Clayton  
Planning Department  
111 E. Second Street, Clayton, NC 27520  
P.O. Box 879, Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

January 20, 2021

**NOTICE**

**SUBJECT:**      **Project:**      2020-113-PDD Ashcroft 2 Planned Development District Rezoning  
2020-114-SD Ashcroft 2 Preliminary Plat Master Plan  
2020-114-SD Ashcroft 2 Development Agreement  
**Address:**      Located off N O'Neil Street, South of the Neuse River  
**TAG #(s):**      05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of  
05H02200B, 05H02015  
**Applicant:**      Ashcroft Partners, LLC

Dear Clayton Area Property Owner:

Notice is hereby given that the Clayton Town Council will hold an evidentiary hearing on **Monday, February 1, 2021 at 6:00 PM**, to make a decision on the above referenced project. The subject parcels total 241.21 acres in size. They are located off N O'Neil Street, south of the Neuse River. See the map on the back of this letter.

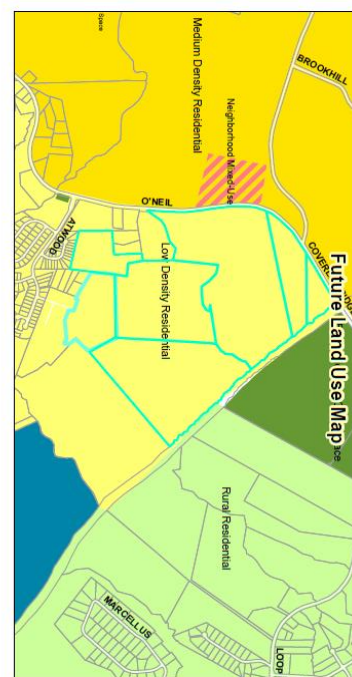
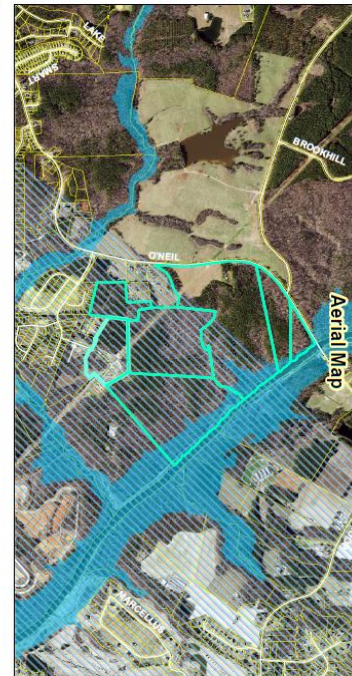
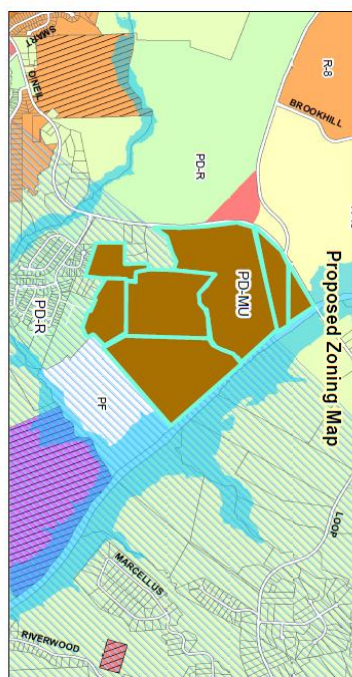
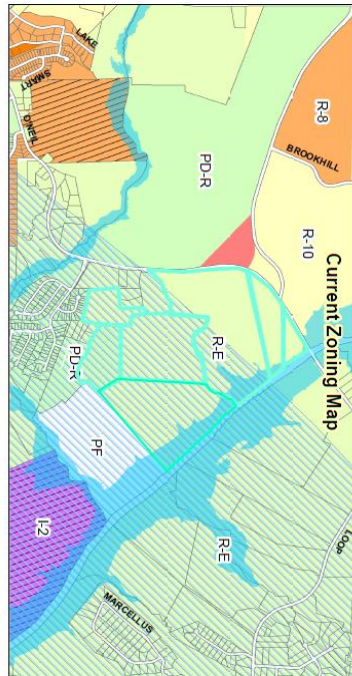
The Town Council will hold a public hearing to consider the above referenced rezoning application and development agreement. The applicant is proposing to rezone the subject parcels from Residential-Estate (R-E) and a portion of a parcel from Planned Development Residential (PD-R) to Planned Development Mixed Use (PD-MU). The Town Council will hold an evidentiary hearing to consider the above referenced Preliminary Plat Master Plan application. The applicant is requesting master plan approval for a mixed use development on the subject parcels that will include up to 105,000 SF of commercial development and 772 residential units, comprising of a mixture of single-family, townhome, and apartment units.

During a public hearing, the Council reserves the right to approve the request as presented or any portion of the request without necessity of withdrawal or modification of the application or additional public hearing on the matter. Likewise, the Town Council may designate approval to the district requested or another district or districts without modification of the request or additional public hearing. During an evidentiary hearing, the Clayton Town Council must make findings of fact based upon sworn testimony and other credible evidence. Citizens may give testimony in an evidentiary hearing after they have taken an oath. Based upon records in the Johnston County Tax Office, you are the owner of property that is within 100 feet of this proposed rezoning request. You are invited to join this meeting and express your opinions on this request to the Town Council.

If you should need additional assistance or information, please contact the Planning Department at (919) 553-5002 or email at [hhogg@townofclaytonnc.org](mailto:hhogg@townofclaytonnc.org).

Sincerely,

Haley Hogg, ACIP, CZO  
Senior Planner



**Ashcroft 2 Planned Development Rezoning, 2020-113-PDD 0**  
**Ashcroft 2 Preliminary Plat Master Plan, 2020-114-SD**

Applicant: Ashcroft Partners, LLC  
 Property Owners: Ashcroft Partners, LLC  
 Design #: 05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of 05H022006, 05H02015

**Staff Report Map**  
 Prepared by: TOC Planning Department  
 August 31, 2020

Disclaimer: Town of Clayton assumes no legal responsibility for the quality to the data represented here.

Document Path: O:\PLANNING\2020\113-PDD-Ashcroft 2\Staff Report Maps\Ashcroft 2 Map.mxd



# ASHCROFT SECTION 2

APPLICANT / OWNER:

ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP  
PH: 919.901.3178  
EMAIL: david@theriverwild.com



CONSULTANTS:



SURVEY: DUSTIN McCARTY  
djmccarty@stewartinc.com  
919.866.4724  
GEOTECH: DON BROWN  
dbrown@stewartinc.com  
919.866.4842  
LAND. ARCH: MIKE TARRANT  
mtarrant@stewartinc.com  
919.866.4789  
CIVIL ENG.: TIM SUMMERVILLE  
tsummerville@stewartinc.com  
919.866.4794



ENVIRONMENTAL  
KEVIN MARTIN  
PH: 919.720.7941  
EMAIL: kmartin@sandec.com



TRAFFIC ENGINEERING  
TRAVIS FLUITT  
PH: 919.649.0759  
EMAIL: travis.fluitt@kimley-horn.com

## PROPOSED MIXED USE DEVELOPMENT

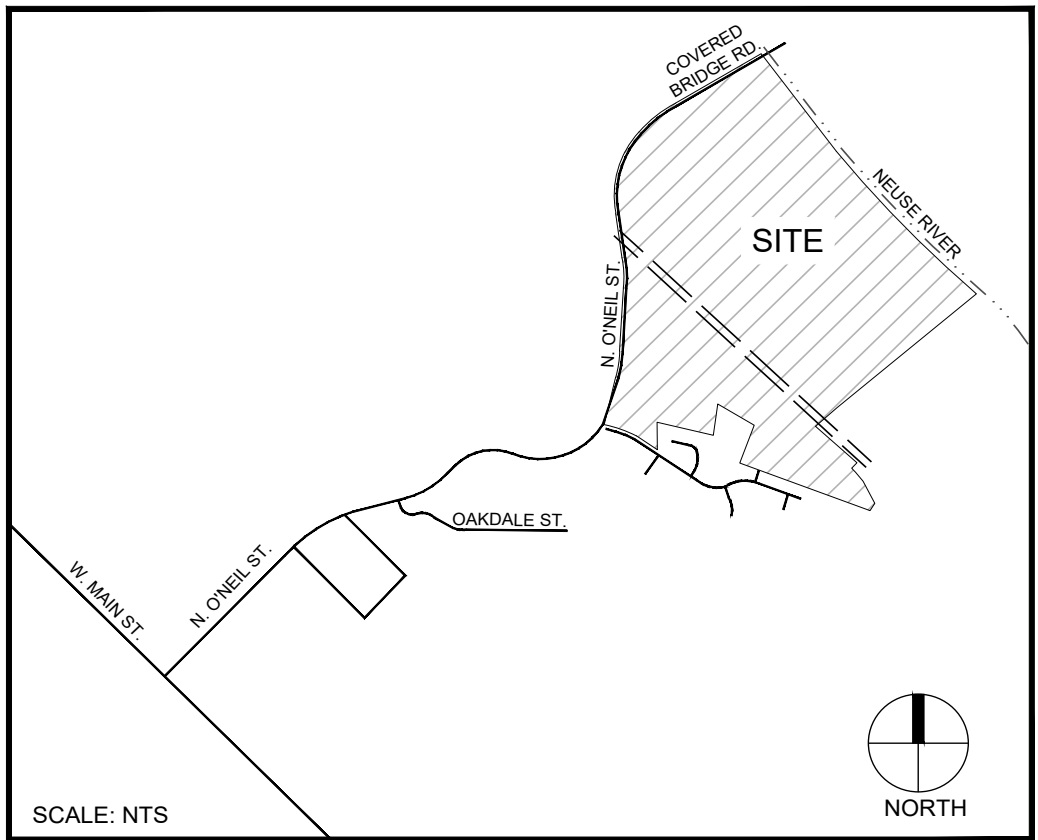
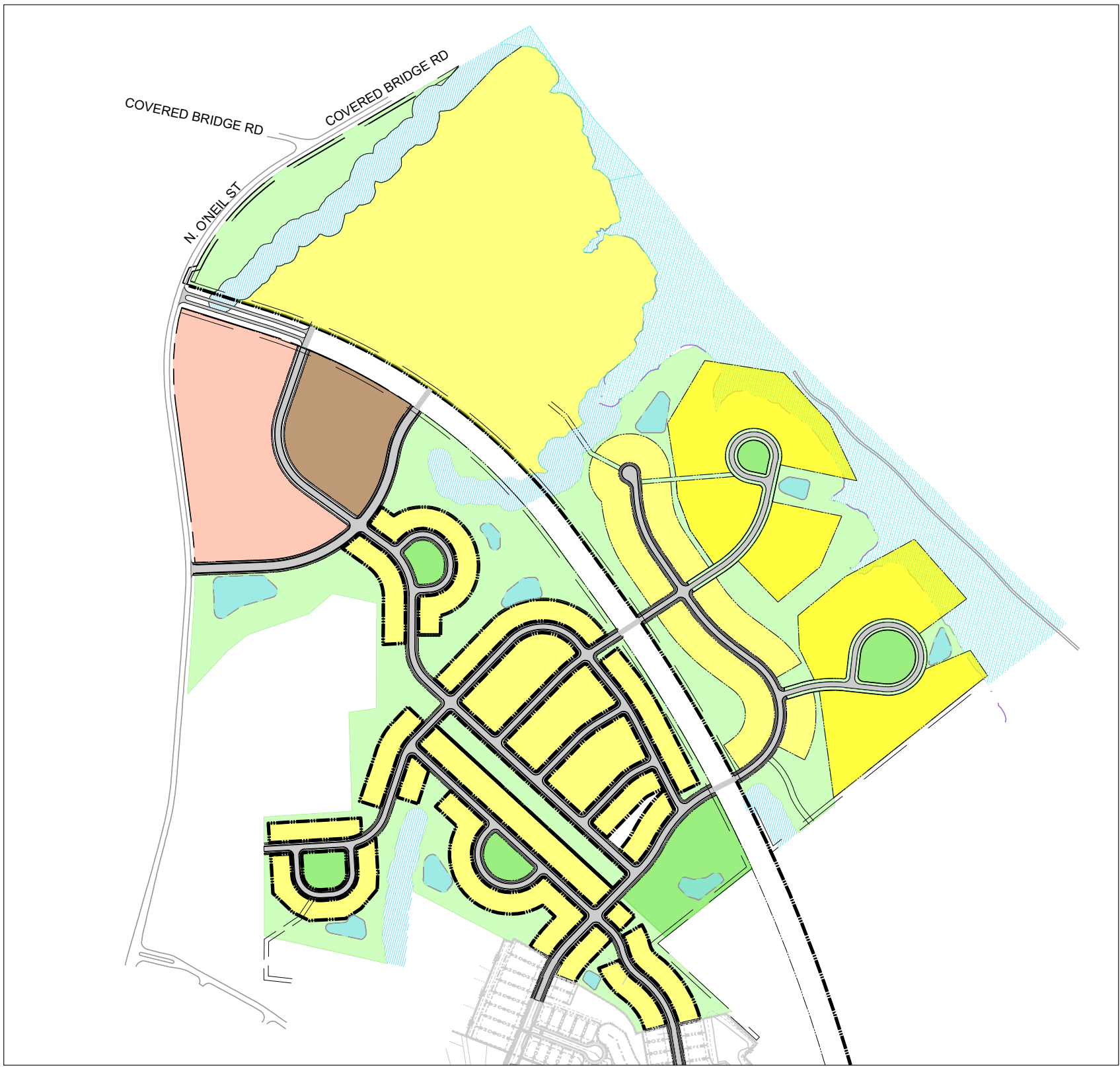
CLAYTON, NORTH CAROLINA

### MASTER PLAN

CASE # 2020-114-SD  
PDD # 2020-113-PDD  
SUBMITTED ON AUGUST 03, 2020

#### REVISIONS

- 1.....October 05, 2020.....PER TOWN COMMENTS
- 2.....November 17, 2020.....PER TOWN COMMENTS
- 3.....December 16, 2020.....PER TOWN COMMENTS



VICINITY MAP

| INDEX OF DRAWINGS |                                        |
|-------------------|----------------------------------------|
| SHEET NO.         | SHEET NAME                             |
| 0.0               | COVER SHEET                            |
| 1.0               | SURVEY                                 |
| 2.0               | EXISTING CONDITIONS PLAN               |
| 3.0               | SITE PLAN                              |
| 4.0               | LANDSCAPE PLAN                         |
| 5.0               | PHASING PLAN                           |
| 5.1               | ACCESS PHASING PLAN                    |
| 6.0               | VEHICULAR CIRCULATION PLAN             |
| 7.0               | TIA ROAD IMPROVEMENTS PLAN             |
| 8.0               | PEDESTRIAN CIRCULATION PLAN            |
| 9.0               | PRELIMINARY UTILITY PLAN               |
| 10.0              | PRELIMINARY GRADING & DRAINAGE PLAN    |
| 11.0              | OPEN SPACE PLAN                        |
| 12.0              | SINGLE FAMILY REGULATING PLAN          |
| 13.0              | TOWNHOME REGULATING PLAN               |
| 14.0              | APARTMENT & COMMERCIAL REGULATING PLAN |
| 15.0              | AMENITY CENTER REGULATING PLAN         |
| 16.0              | RCA OVERLAY                            |









**STEWART**

101 WEST MAIN ST.  
DURHAM, NC 27701  
T 919-380-8750

FIRM LICENSE #: C-1051  
www.stewartinc.com  
PROJECT #: L20017

Client:

ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:

SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

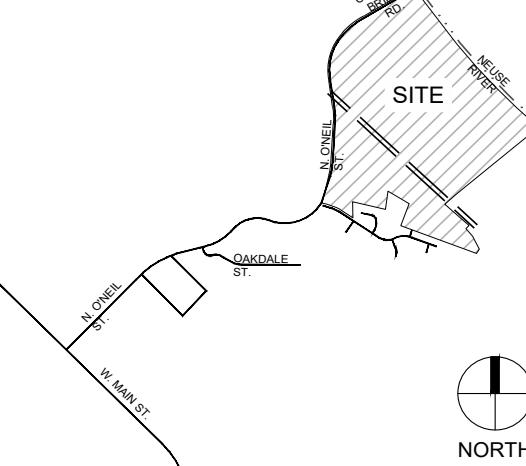
Kimley Horn

421 FAYETTEVILLE ST SUITE 600  
RALEIGH, NC 27601

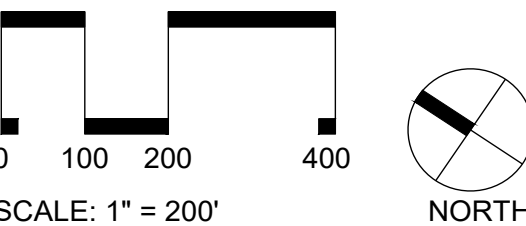
Agent:

RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

Vicinity map:



Seal:



Project:

## ASHCROFT SECTION 2

Issued for:

## MASTER PLAN

| No. | Date       | Description              |
|-----|------------|--------------------------|
| 1   | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 2   | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 3   | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 4   | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 5   | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 6   | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 7   | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 8   | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 9   | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 10  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 11  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 12  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 13  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 14  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 15  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 16  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 17  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 18  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 19  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 20  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 21  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 22  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 23  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 24  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 25  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 26  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 27  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 28  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 29  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 30  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 31  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 32  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 33  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 34  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 35  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 36  | 08.03.2020 | EXISTING CONDITIONS PLAN |
| 37  | 08.03.2020 | EXISTING CONDITIONS PLAN |

Title:

## EXISTING CONDITIONS PLAN

Project number: L20017 Sheet #:

Issued Date: 08.03.2020

Drawn by: HNJ

Approved by: MT

**2.0**

### PROPERTY OWNERS:

| LETTER | PARCEL ID | OWNER                             | OWNER ADDRESS           | OWNER ADDRESS 2           | ACREAGE | ZONING |
|--------|-----------|-----------------------------------|-------------------------|---------------------------|---------|--------|
| A      | 05H02013A | MASSEY, JOHN WESLEY               | 8041 ST ANDREWS DR      | LAURINBURG, NC 28352-0000 | 5.314   | R-E    |
| B      | 05H02008A | RAYMOND E EARP JR REVOCABLE TRUST | 7230 NC HIGHWAY 42 E    | SELMA, NC 27576-6005      | 16.013  | R-E    |
| C      | 05H02010A | SMITH, JAMES D                    | 1814 N ONEIL STREET EXT | CLAYTON, NC 27520-6236    | 80.865  | R-E    |
| D      | 05H02012  | MASSEY, JOHN WESLEY               | 8041 ST ANDREWS DR      | LAURINBURG, NC 28352-0000 | 44.910  | R-E    |
| E      | 05H02015  | ASHCROFT PARTNERS, LLC            | 114 W MAIN ST STE 102   | CLAYTON, NC 27520-2397    | 61.460  | R-E    |
| F      | 05H02008B | ASHCROFT PARTNERS, LLC            | 114 W MAIN ST STE 102   | CLAYTON, NC 27520-2397    | 35.121  | R-E    |
| G      | 05H02013  | MASSEY, JOHN WESLEY               | 8041 ST ANDREWS DR      | LAURINBURG, NC 28352-0000 | 12.463  | R-E    |

### ADJACENT OWNERS:

| NO. | PARCEL ID | OWNER                               | OWNER ADDRESS               | OWNER ADDRESS 2             | ACREAGE | ZONING        |
|-----|-----------|-------------------------------------|-----------------------------|-----------------------------|---------|---------------|
| 1   | 05H02013A | ASHCROFT PARTNERS, LLC              | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 16.69   | PD-R          |
| 2   | 05H02021Q | ASHCROFT PARTNERS, LLC              | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 1.45    | PD-R          |
| 3   | 05H02021R | WEAVER HOMES, INC                   | 350 WAGONER DR              | FAYETTEVILLE, NC 28303-4647 | 0.15    | PD-R          |
| 4   | 05H02021S | WEAVER HOMES, INC                   | 350 WAGONER DR              | FAYETTEVILLE, NC 28303-4647 | 0.15    | PD-R          |
| 5   | 05H02021T | RMS INVESTMENTS, LLC                | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.15    | PD-R          |
| 6   | 05H02021U | WEAVER HOMES, INC                   | 350 WAGONER DR              | FAYETTEVILLE, NC 28303-4647 | 0.15    | PD-R          |
| 7   | 05H02021V | RMS INVESTMENTS, LLC                | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.16    | PD-R          |
| 8   | 05H02021W | WESTAN CONSTRUCTION, LLC            | 283 GLEN RD STE A           | GARNER, NC 27529-6240       | 0.16    | PD-R          |
| 9   | 05H02021X | RMS INVESTMENTS, LLC                | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.16    | PD-R          |
| 10  | 05H02021Y | WEAVER HOMES, INC                   | 350 WAGONER DR              | FAYETTEVILLE, NC 28303-4647 | 0.16    | PD-R          |
| 11  | 05H02021Z | RMS INVESTMENTS, LLC                | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.25    | PD-R          |
| 12  | 05H02022  | RMS INVESTMENTS, LLC                | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.26    | PD-R          |
| 13  | 05H02022E | ASHCROFT PARTNERS, LLC              | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.99    | PD-R          |
| 14  | 05H02014A | WALL, STEVE GLENN & WALL JACKIE     | 1376 NORTH ONEIL STREET EXT | CLAYTON, NC 27520-0000      | 1.03    | PD-R          |
| 15  | 05H02014B | BENSON, ANTHONY MARK                | 1378 B N ONEIL ST EXT       | CLAYTON, NC 27520-0000      | 1.01    | PD-R          |
| 16  | 05H02014C | BENSON, ANTHONY MARK                | 1378 B NORTH ONEAL EXT      | CLAYTON, NC 27520-0000      | 0.78    | PD-R          |
| 17  | 05H02014E | BENSON, AMANDA LEIGH                | 1380 N ONEALS ST            | CLAYTON, NC 27520           | 0.99    | R-E           |
| 18  | 05H02014D | BENSON, BRANDON MARK                | 1382 N ONEIL STREET EXT     | CLAYTON, NC 27520-6238      | 0.95    | R-E           |
| 19  | 05H02018H | SHARON HOUTMAN FAMILY TRUST         | 96 HIGHMEADOW LN            | CLAYTON, NC 27520-5712      | 0.32    | PD-R          |
| 20  | 05H02019C | JERRY AND FAITH LAYTON LIVING TRUST | 106 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.2     | PD-R          |
| 21  | 05H02018I | BRIAN E PRUSANK LIVING TRUST        | 116 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.165   | PD-R          |
| 22  | 05H02019D | O'FELT, MAY                         | 128 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.16    | PD-R          |
| 23  | 05H02018L | BARRETT, SANDRA LIFE ESTATE         | 142 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.15    | PD-R          |
| 24  | 05H02018M | RAFFEL, MARY                        | 156 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.16    | PD-R          |
| 25  | 05H02018N | CAPERS, ANJOLINA WASHINGTON         | 170 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.14    | PD-R          |
| 26  | 05H02018O | MITCHELL, CHRIS D.                  | 180 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.15    | PD-R          |
| 27  | 05H02018P | DUDLEY, BLAINE T.                   | 1307 LAKE WENDELL RD        | WENDELL, NC 27591-7158      | 0.31    | PD-R          |
| 28  | 05H02011  | JONES, TRACY L.                     | 1504 N ONEIL STREET EXT     | CLAYTON, NC 27520-6959      | 9.84    | R-E           |
| 29  | 05H02013D | WOODS, PAMELA POOLE                 | 9728 CYPRESS FARM DR        | ZEULON, NC 27597-6700       | 1.91    | R-E           |
| 30  | 05H02013C | HICKERSON, PATSY POOLE              | 1039 CROCKER RD             | SMITHFIELD, NC 27577-9033   | 3.09    | R-E           |
| 31  | 05H02011B | JONES, TRACY L                      | 1538 NORTH ONEIL STREET EXT | CLAYTON, NC 27520-0000      | 8.54    | R-E           |
| 32  | 05H02009  | RAYMOND ELMORE EARP JR FAMILY TRUST | 7020 NC HIGHWAY 42 E        | SELMA, NC 27576-6128        | 631.23  | PD-R/B-2/R-10 |
| 33  | 16103029  | TOWN OF CLAYTON                     |                             | CLAYTON, NC 27528-0000      | 80.58   | R-E           |
| 34  | 16103028  | BOYETTE, BONNIE S                   | 1387 LOOP RD                | CLAYTON, NC 27527-6230      | 49.17   | PF            |
| 35  | 16103028A | BOYETTE, DONNIE LUCAS               | 1353 LOOP RD                | CLAYTON, NC 27527-6233      | 40.67   | PF            |
| 36  | 16103024E | BOYETTE, LARRY S                    | 611 LOOP RD                 | CLAYTON, NC 27527-0000      | 40.88   | PF            |
| 37  | 05H02199W | TOWN OF CLAYTON                     |                             | CLAYTON, NC 27528-0000      | 78.54   | PF            |

### SURVEY LEGEND:

|       |                                |
|-------|--------------------------------|
| △     | SURVEY CONTROL POINT           |
| ○ EIP | EXISTING IRON PIPE             |
| □ ECM | EXISTING CONCRETE MONUMENT     |
| ●     | COMPUTED POINT                 |
| ⊙     | STORM DRAIN MANHOLE            |
| ⊞     | STORM DRAIN CURB INLET         |
| ⊕     | SANITARY SEWER MANHOLE         |
| ⊖     | SANITARY SEWER CLEANOUT        |
| ⊗     | SANITARY FORCEMAIN VALVE       |
| ⊘     | HYDRANT                        |
| ⊙     | WATER VALVE                    |
| ⊙     | WATER METER                    |
| ⊙     | WATER MANHOLE                  |
| ⊙     | WATER VAULT                    |
| ⊙     | WELL                           |
| ⊙     | GAS VALVE                      |
| ⊙     | GAS METER                      |
| ⊙     | TELEPHONE MANHOLE              |
| ⊙     | TELEPHONE PEDESTAL             |
| ⊙     | TV MANHOLE                     |
| ⊙     | TV PEDESTAL                    |
| ⊙     | FIBER OPTIC WITNESS POST       |
| ⊙     | FIBER OPTIC BOX                |
| ⊙     | ELECTRIC MANHOLE               |
| ⊙     | ELECTRIC METER                 |
| ⊙     | ELECTRIC BOX                   |
| ⊙     | UTILITY POLE                   |
| ⊙     | GUY POLE                       |
| ⊙     | GUY WIRE                       |
| ⊙     | LIGHT POLE                     |
| ⊙     | MANHOLE                        |
| ⊙     | TRAFFIC SIGNAL BOX             |
| ⊙     | TRAFFIC SIGNAL POST            |
| ⊙     | MONITORING WELL                |
| ⊙     | BORING LOCATION                |
| ⊙     | BOLLARD                        |
| ⊙     | SIGN                           |
| ⊙     | FINISHED FLOOR ELEVATION       |
| ⊙     | DECIDUOUS TREE                 |
| ⊙     | EVERGREEN TREE                 |
| ⊙     | BUSH                           |
| ⊙     | WIRE FENCE                     |
| ⊙     | CHAIN LINK FENCE               |
| ⊙     | UNDERGROUND TELEPHONE LINE     |
| ⊙     | UNDERGROUND FIBER OPTIC LINE   |
| ⊙     | UNDERGROUND GAS LINE           |
| ⊙     | UNDERGROUND ELECTRIC LINE      |
| ⊙     | UNDERGROUND WATER LINE         |
| ⊙     | SANITARY SEWER LINE            |
| ⊙     | STORM DRAIN LINE               |
| ⊙     | OVERHEAD WIRES                 |
| ⊙     | UNIDENTIFIED LINE              |
| ⊙     | UNKNOWN DESTINATION            |
| ⊙     | CONCRETE SURFACE               |
| ⊙     | DUCTILE IRON PIPE              |
| ⊙     | POLYVINYL CHLORIDE PIPE        |
| ⊙     | HIGH-DENSITY POLYETHYLENE PIPE |
| ⊙     | REINFORCED CONCRETE PIPE       |
| ⊙     | CORRUGATED METAL PIPE          |
| ⊙     | CATCH BASIN                    |

### GENERAL NOTES

- THIS SURVEY MAP IS INTENDED TO REPRESENT THE EXISTING CONDITIONS/TOPOGRAPHY ON THE PROPERTIES SHOWN HEREON AND IS NOT A BOUNDARY SURVEY. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT AND THEREFORE ALL ENCUMBRANCES UPON THE PROPERTY MAY NOT BE SHOWN.
- THE PROPERTY LINES SHOWN HEREON HAVE BEEN CONFIRMED FROM A SURVEY BY STEWART INC. PROPERTY LINES SHOWN TAKEN FROM REFERENCES SHOWN HEREON.
- HORIZONTAL DATUM IS NAD 83 (2011) AND VERTICAL DATUM IS NAVD83. BASED ON GPS METHODS USING REAL-TIME KINEMATIC SOLUTIONS FOR THE SURVEY CONTROL POINTS SHOWN HEREON AND TIED TO NORTH CAROLINA GEODETIC SURVEY MONUMENT "MORAH RESET Z".  
"MORAH RESET Z"  
N 701.370.11"  
E 2,146.838.92"  
EL 360.75'
- THE INITIAL STATE PLANE POSITIONS FOR THIS SURVEY WERE SCALED FROM GRID TO GROUND FROM A PROJECT LOCATION TRAV 2 1688550.13 E 2169503.96, AN ELEVATION OF 255.30, USING A CORRECTION FACTOR OF 0.9998879.
- THIS DRAWING DOES NOT CONFORM TO N.C. GS47-30 AND THEREFORE IS NOT FOR RECORDATION.
- UTILITIES SHOWN HEREON ARE BASED ON ABOVE-GROUND VISIBLE EVIDENCE AND UTILITY DESIGNATION/MARKING SERVICES PERFORMED BY STEWART INC. AS A PART OF THIS SURVEY. CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL UTILITIES BEFORE COMMENCING CONSTRUCTION.
- TREES SHOWN HEREON MAY NOT REPRESENT ALL VEGETATION ON THE SUBJECT PROPERTY.
- THE SUBJECT PROPERTIES ARE ZONED "PD-R" & "RE" PER JOHNSTON COUNTY GIS. PROPERTIES ARE ZONED "PLANNED DEVELOPMENT RESIDENTIAL" & "RESIDENTIAL ESTATE" PER TOWN OF CLAYTON DEVELOPMENT MAP.
- THE SUBJECT PROPERTY LIES IN ZONES X (AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE AND FUTURE CONDITIONS 1% ANNUAL CHANCE FLOODPLAIN) X (SHADED) AREA OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF FUTURE CONDITIONS 1% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS OF LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD; AE (AREA DETERMINED TO BE INSIDE THE 1% ANNUAL CHANCE FLOOD, BASE FLOOD ELEVATIONS DETERMINED), AND FLOODWAY (DELINEATED FLOODWAY OF A STREAM), BASED ON THE FLOOD INSURANCE RATE MAP COMMUNITY MAP NUMBER 372017600K DATED 06/20/18 AND MAP NUMBER 372016890K DATED 06/20/18, FLOOD HAZARD LINES SHOWN HEREON ARE FROM FRIS NC 020V.
- WETLAND DELINEATION PERFORMED BY SOIL & ENVIRONMENTS CONSULTANTS, PA PER PROJECT NO. 14016.W1.
- AREAS COMPUTED BY COORDINATE GEOMETRY.







LEGEND:

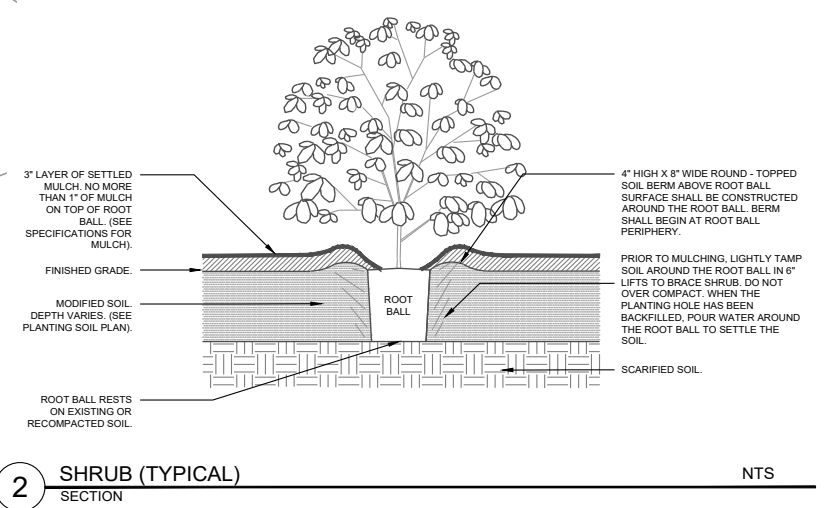
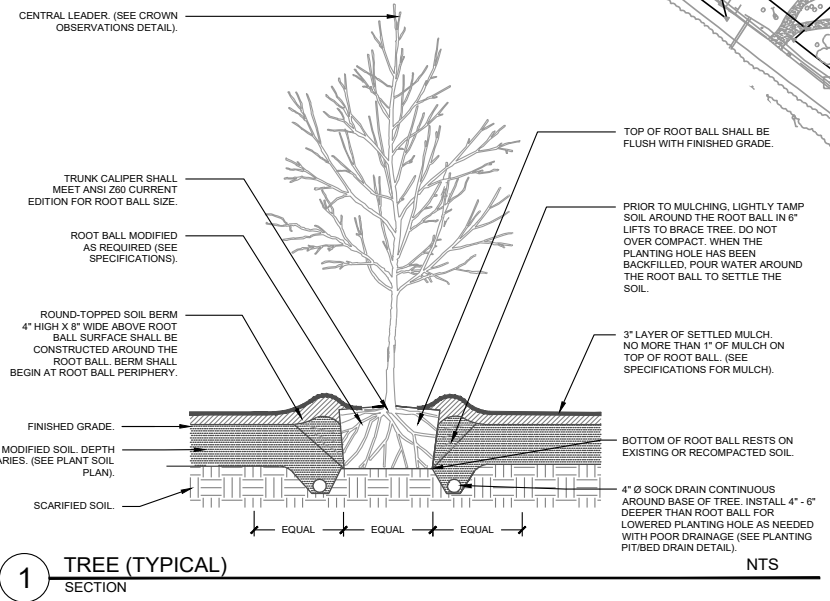
- 100 YEAR FLOODPLAIN (RCA)
- STREAM BUFFER (RCA)
- STREAM CENTERLINE
- PROJECT BOUNDARY BUFFER CLASS C
- STREET BUFFER CLASS C
- NATURAL BUFFER
- IMPROVED LANDSCAPE AREA
- LANDSCAPED AREA (RECREATION AND OPEN SPACE, ETC.)
- PROPOSED PARCEL AREA



CANDIDATE PLANT SCHEDULE

|  |                                                                                                                                                                                                                                                                                                                                                                                            |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | STREET YARD CANOPY TREE (2.5' CAL, 8' HGT)<br>POSSIBLE SPECIES INCLUDE:<br>ACER BURGERSIANUM / 'BRASS' TM / VALYNOR TRIDENT MAPLE<br>CARPINUS BETULUS / 'EMERALD AVENUE' TM / EUROPEAN HORNBEAM<br>FAGUS GRANDIFOLIA / AMERICAN BEECH<br>GLEADITSA TRIACANTHOS / 'SKYLINE' / SKYLINE HONEY LOCUST<br>NYSSA SYLVATICA / 'GREEN GABLE' TM / BLACK GUM<br>QUERCUS SHUMARDII / SHUMARD RED OAK |
|  | BUFFER CANOPY TREE (2.5' CAL, 8' HGT)<br>QUANTITIES MAY VARY. SEE BUFFER NOTES<br>POSSIBLE SPECIES INCLUDE:<br>JUNIPERUS VIRGINIANA / EASTERN RED CEDAR<br>LIQUIDAMBAR STYRACIFLUA / AMERICAN SWEET GUM<br>LIRIODENDRON TULIPIFERA / TULIP TREE<br>NYSSA SYLVATICA / 'GREEN GABLE' TM / BLACK GUM<br>PINUS TAEDA / LOBLOLLY PINE                                                           |
|  | BUFFER UNDERSTORY (2" CAL, 8' HGT)<br>QUANTITIES MAY VARY. SEE BUFFER NOTES<br>POSSIBLE SPECIES INCLUDE:<br>CERCIS CANADENSIS / EASTERN REDBUD<br>ILEX OPACA / AMERICAN HOLLY<br>OXYDENDRUM ARBOREUM / SOURWOOD TREE                                                                                                                                                                       |
|  | BUFFER SHRUB (24" HGT)<br>QUANTITIES MAY VARY. SEE BUFFER NOTES<br>POSSIBLE SPECIES INCLUDE:<br>CLEYERA JAPONICA / 'LEANN' TM / LEANN CLEYERA<br>ILEX VOMITORIA / 'VAUPON HOLLY'<br>MYRTICA CERIFERA / WAX MYRTLE                                                                                                                                                                          |

NOTE: PLANT SPECIES ARE RECOMMENDATIONS ONLY. SPECIES WILL BE FINALIZED AT MINOR SITE/SUBDIVISION REVIEW.



- NOTES:
- "WHERE NON-NATIVE OR NON-DROUGHT TOLERANT NATIVE VEGETATION IS INCORPORATED AN IRRIGATION SYSTEM SHALL BE REQUIRED." (UDO 155.402.5.(H)(2)(b).5)
  - "ALL LANDSCAPED AREAS SHALL BE PROVIDED WITH AN AUTOMATICALLY OPERATED IRRIGATION SYSTEM THAT WILL ADEQUATELY COVER ALL LIVING PLANT MATERIAL. SUCH SYSTEM SHALL INCLUDE A RAIN SENSOR." (IF IRRIGATION WILL NOT BE UTILIZED, DROUGHT TOLERANT SPECIES MUST BE USED.)
  - "ALL LANDSCAPED AREAS SHALL BE MAINTAINED IN AN ATTRACTIVE AND HEALTHY CONDITION. DEAD OR DISEASED PLANTINGS SHALL BE REMOVED AND REPLACED IN A TIMELY FASHION"
  - ALL MECHANICAL EQUIPMENT, INCLUDING HVAC SHALL BE SCREENED PER THE UDC.

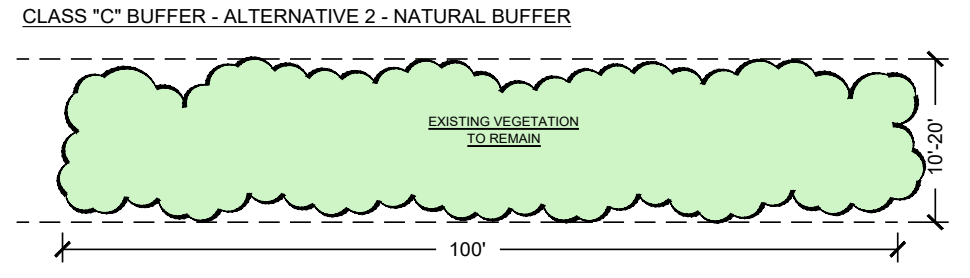
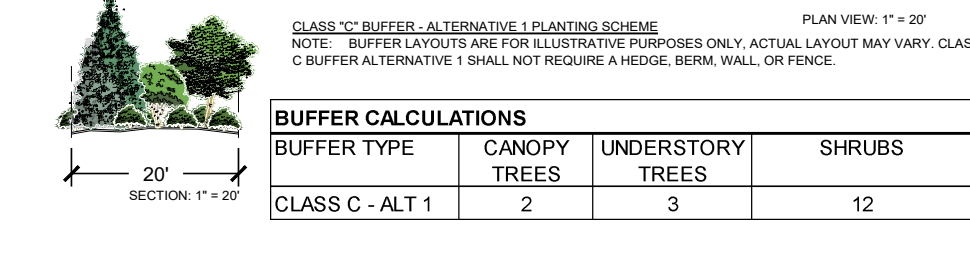
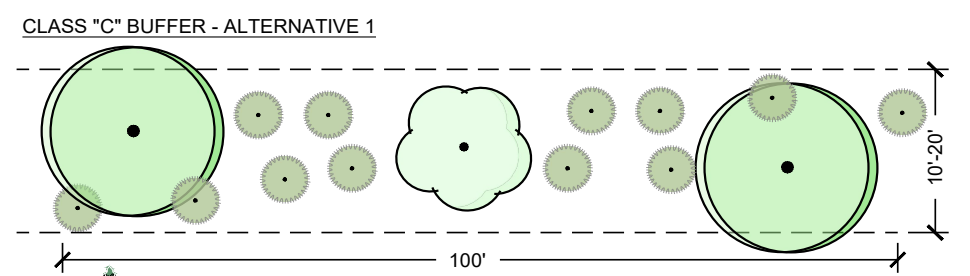
- SITE INTERIOR LANDSCAPE REQUIREMENTS:
- "TWENTY PERCENT OF THE TOTAL LOT AREA SHALL BE LANDSCAPED. ONE CANOPY TREE, ONE UNDERSTORY TREE, AND TWO SHRUBS SHALL BE PLANTED FOR EACH 1,000 SQUARE FEET OF LANDSCAPE AREA REQUIRED. TREES NEED TO BE EVENLY PLANTED THROUGHOUT THE LANDSCAPED AREA, BUT MAY BE STAGGERED OR CLUSTERED AS NECESSARY TO MAXIMIZE VISUAL AND SCREENING OBJECTIVES, AND TO MEET THE NEEDS OF THE PARTICULAR SPECIES OF PLANTS FOR ROOT SPACE, WATER, LIGHT, AND AIR CIRCULATION." (UDO 155.402, PART 1)
  - "ALL SITE PLANS REQUIRING LANDSCAPING IN ACCORDANCE WITH THIS SECTION SHALL PROVIDE SITE INTERIOR LANDSCAPING, PERIMETER BUFFER REQUIREMENTS SET FORTH IN PART 2 AND STREET YARD TREES SET FORTH IN PART 3 OF THIS SECTION SHALL BE PROVIDED COMPLETELY, AS REQUIRED, IN ADDITION TO THESE REQUIREMENTS."
  - "RESOURCE CONSERVATION AREAS (SEE § 155.500) MAY BE USED TO SATISFY A MAXIMUM OF 40% OF THE TOTAL REQUIRED LANDSCAPED AREA."

- STREET TREE YARD REQUIREMENTS:
- "STREET YARD TREES SHALL BE REQUIRED ALONG ALL RIGHTS OF WAY AT THE RATE OF ONE CANOPY TREE PER LOT OR ONE CANOPY TREE FOR EVERY 40 LINEAR FEET (SPACED A MAXIMUM OF 50 FEET APART)." (UDO 155.402, PART 3)
- STREET TREE LOCATIONS SHOWN IN LANDSCAPE PLAN ARE CONCEPTUAL IN NATURE. ACTUAL LOCATIONS TO BE DETERMINED AT FINAL ENGINEERING AND PERMITTING.

STREET YARD TREE CALCULATIONS

| ROAD NAME | LF OF ROW SIDE A | LF OF ROW SIDE B | TREES REQUIRED (TOTAL ROW/40 LF) |
|-----------|------------------|------------------|----------------------------------|
| ROAD 1*   | 2557             | 2653             | 130                              |
| ROAD 2    | 1536             | 1700             | 81                               |
| ROAD 3*   | 1994             | 1745             | 93                               |
| ROAD 4*   | 2743             | 2428             | 129                              |
| ROAD 5    | 3819             | 486              | 108                              |
| ROAD 6    | 492              | 478              | 24                               |
| ROAD 7    | 400              | 381              | 20                               |
| ROAD 8    | 646              | 469              | 28                               |
| ROAD 9*   | 612              | 439              | 26                               |
| ROAD 10   | 656              | 445              | 27                               |
| ROAD 11   | 1690             | 822              | 63                               |
| ROAD 12   | 1715             | 1836             | 89                               |
| ROAD 13*  | 2595             | 2347             | 124                              |
| ROAD 14   | 1023             | 1017             | 51                               |
| ROAD 15   | 1460             | 1116             | 64                               |
| ROAD 16   | 828              | 503              | 33                               |

- PERIMETER BUFFER REQUIREMENTS:
- NOTES:
- MAINTAIN EXISTING VEGETATION WHEREVER POSSIBLE TO SATISFY BUFFER REQUIREMENTS.
  - CONTRACTOR TO FIELD VERIFY EXISTING VEGETATION WITH TOWN PRIOR TO PROCURING PLANT MATERIAL.
  - AT A MINIMUM A CLASS A BUFFER SHALL BE PROVIDED AS SHOWN ON PLAN.
  - BUFFERS WILL NOT BE REQUIRED WHERE BRIDGES EXIST ALONG PROPOSED NORTH CONNECTOR ROAD. ROAD DESIGN BY OTHERS AND BRIDGE LOCATIONS TBD.
  - WHEREVER EXISTING VEGETATION IN THE BUFFER IS REMOVED IT SHALL BE REPLACED AND MEET THE BUFFER REQUIREMENTS.
  - BUFFER DIAGRAMS BELOW ARE FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL LAYOUT MAY VARY.
  - DETAILED SPECIES AND QUANTITIES IN COMPLIANCE WITH THE UDC SHALL BE PROVIDED DURING PRELIMINARY PLAN REVIEW.



**STEWART**  
101 WEST MAIN ST.  
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T 919.380.8750

FIRM LICENSE #: C-1051  
www.stewartinc.com  
PROJECT #: L20017

Client:

ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:

SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

KIMLEY HORN  
421 FAYETTEVILLE ST SUITE 600  
RALEIGH, NC 27601

Agent:

RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

Vicinity map:

Seal:

Scale:

0 100 200 400  
SCALE: 1" = 200'

North arrow pointing up.

Project:

**ASHCROFT SECTION 2**

Issued for:

**MASTER PLAN**

| No. | Date | Description |
|-----|------|-------------|
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Title:

**LANDSCAPE PLAN**

Project number: L20017 Sheet #:

Issued Date: 08.03.2020

Drawn by: ELL

Approved by: MPT

**4.0**



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| SITE DATA:                  |           |
|-----------------------------|-----------|
| TOTAL SITE AC.:             | 254.85    |
| PROJECT AC.:                | 241.21    |
| RESOURCE CONSERVATION AREA: | 34.53     |
| NET PROJECT AC.:            | 206.67    |
| TOTAL UNITS:                | 772 UNITS |

| PHASE 1-1A          |         |
|---------------------|---------|
| SINGLE FAMILY LOTS: | +/- 115 |
| TOWNHOME LOTS:      | 0       |
| APARTMENT UNITS:    | 0       |

| PHASE 2             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 55 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 3             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 65 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 4             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | 0      |
| TOWNHOME LOTS:      | +/- 40 |
| APARTMENT UNITS:    | 0      |

| PHASE 5             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 32 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 6             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 26 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 7             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | 0      |
| TOWNHOME LOTS:      | +/- 94 |
| APARTMENT UNITS:    | 0      |

| PHASE 8             |         |
|---------------------|---------|
| SINGLE FAMILY LOTS: | 0       |
| TOWNHOME LOTS:      | +/- 165 |
| APARTMENT UNITS:    | 0       |

| PHASE 9         |             |
|-----------------|-------------|
| COMMERCIAL (SF) | +/- 105,000 |

| PHASE 10            |         |
|---------------------|---------|
| SINGLE FAMILY LOTS: | 0       |
| TOWNHOME LOTS:      | 0       |
| APARTMENT UNITS:    | +/- 180 |

LEGEND:

PHASE 1

PHASE 1A

PHASE 2

PHASE 3

PHASE 4

PHASE 5

PHASE 6

PHASE 7

PHASE 8

PHASE 9

PHASE 10

→

↗

FULL MOVEMENT ACCESS POINT

RIGHT-IN/ RIGHT-OUT ACCESS POINT

NOTES:

1. PHASES DEPICTED ON PLAN DO NOT REPRESENT SEQUENCE OF DEVELOPMENT. APPLICANT RESERVES THE RIGHT TO DEVELOP SITE IMPROVEMENTS AND OBTAIN CERTIFICATES OF OCCUPANCY FOR EACH PROJECT AREA INDEPENDENTLY AND ACCORDING TO THE PROJECT SCHEDULE DETERMINED TO BEST MEET THE NEEDS AND FUNCTIONALITY OF THE COMMUNITY DURING CONSTRUCTION.

2. EACH PRIMARY PHASE MUST BE SELF SUFFICIENT AND STAND ALONE AS IT RELATES TO MEETING APPLICABLE UDC REQUIREMENTS.

3. NUMBER OF LOTS AND PRODUCT TYPE IN EACH PHASE ARE SCHEMATIC IN NATURE AND SUBJECT TO CHANGE AT FINAL ENGINEERING AND PERMITTING.

4. AMENITY AREA (PHASE 1A) TO BE CONSTRUCTED UPON COMPLETION OF PHASE 1.

5. ACCESS POINTS FOR PHASE 9 TO BE DETERMINED IN CONJUNCTION WITH MAJOR SITE PLAN, PER UDC REQUIREMENTS.

6. BOUNDARIES OF PHASES 7 & 8 SUBJECT TO CHANGE. NO MORE THAN 30 UNITS SHALL BE BUILT WITHIN THESE PHASES PRIOR TO PROVISION OF A SECOND ACCESS POINT.

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FIRM LICENSE #: C-1051  
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PROJECT #: L20017

Client:  
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114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:  
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
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Agent:  
RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

Vicinity map:

Seal:

Project:  
**ASHCROFT  
SECTION 2**

Issued for:

| MASTER PLAN |      |             |
|-------------|------|-------------|
| No.         | Date | Description |
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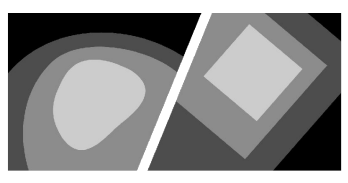
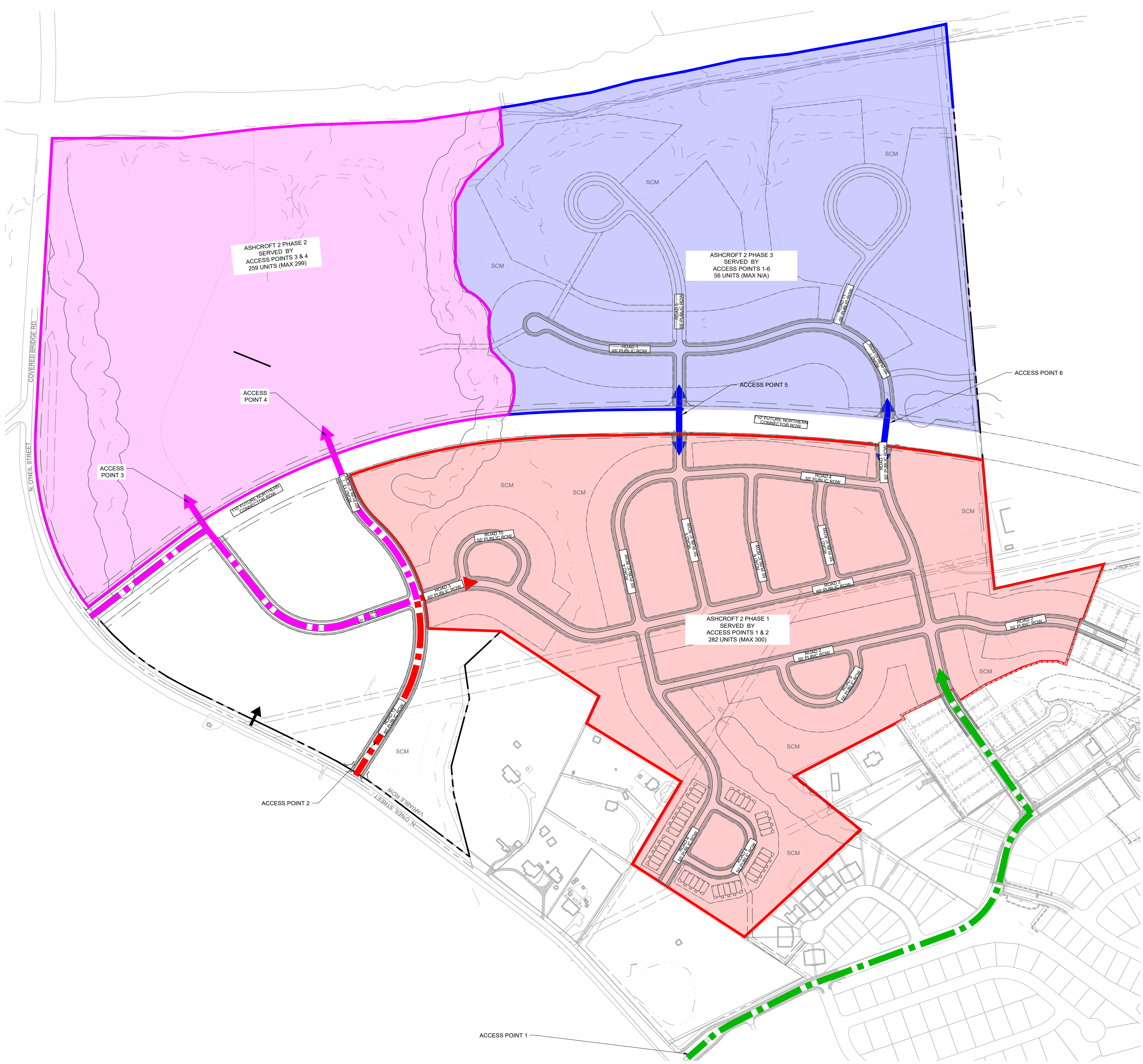
Title:  
**PHASING PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: MT **5.0**

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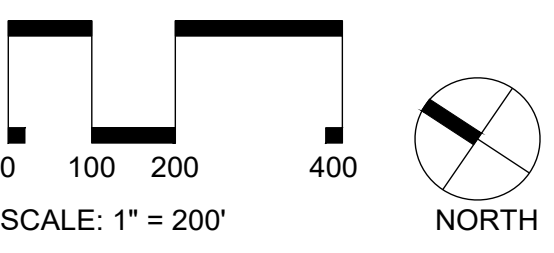
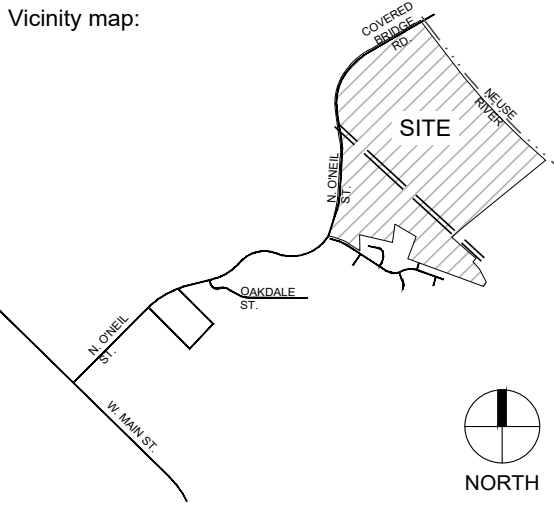


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PROJECT #: L20017

**Client:**  
ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520

**Consultants:**  
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
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RALEIGH, NC 27615  
  
KIMLEY HORN  
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RALEIGH, NC 27601

**Agent:**  
RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP



Project:

**ASHCROFT  
SECTION 2**

Issued for:

**MASTER PLAN**

| No. | Date | Description |
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Title:

**ACCESS PHASING PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: MT **5.1**

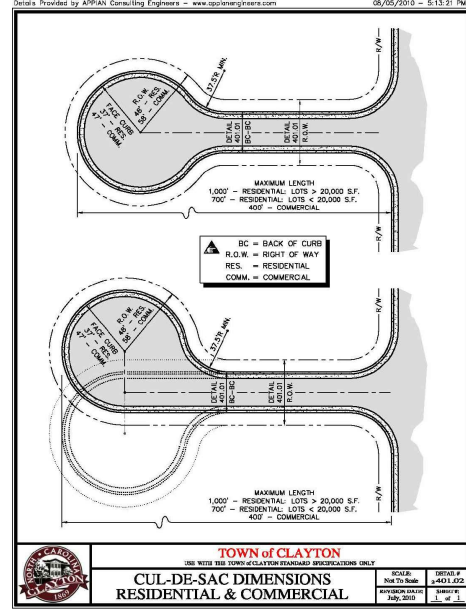


NOTES:

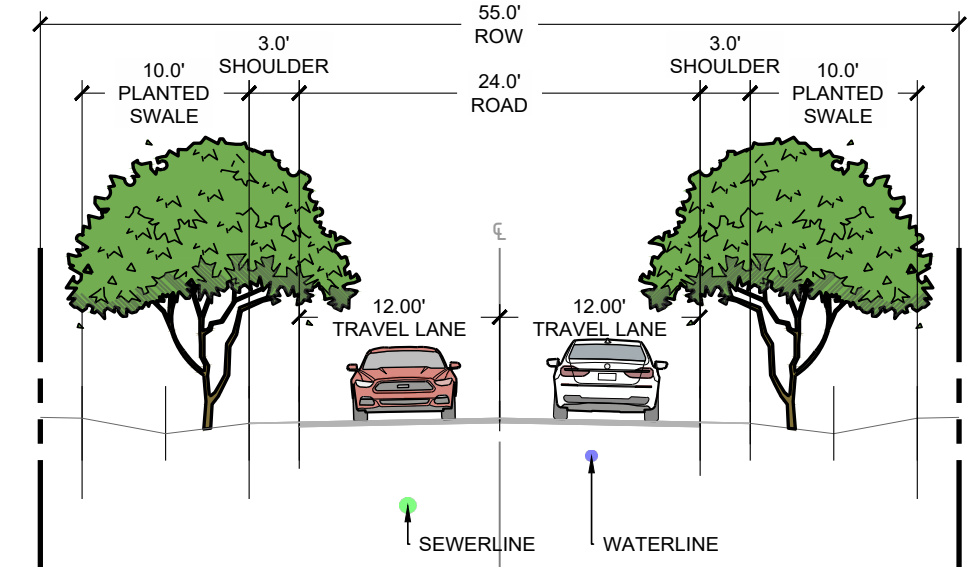
1. ALL ROAD IMPROVEMENTS TO N ONEIL ST. SHALL BE ACCORDING TO THE RECOMMENDATIONS OF THE TRAFFIC IMPACT ANALYSIS (TIA), PROVIDED BY KHA DATED, JULY 31, 2020 AND THE REQUIREMENTS OF NCDOT CONGESTION MANAGEMENT AND THE TOWN OF CLAYTON.
2. ALL INTERNAL STREETS, WITH THE EXCEPTION OF TYPE 1 STREETS, SHALL HAVE 5'-WIDE PUBLIC SIDEWALK ON BOTH SIDES OF THE STREET TO PROVIDE PEDESTRIAN ACCESS TO ADJACENT EXISTING DEVELOPMENT, AMENITIES, INTERNAL TRAIL NETWORKS, AND THE CLAYTON RIVER WALK ON THE NEUSE.
3. ALL STREETS WITH THE EXCEPTION OF ROAD 8 AND 11 WILL HAVE ROLLED OR VALLEY CURB AND GUTTER.
4. A PLANTING STRIP SHALL BE PROVIDED AS PER THE CROSS SECTION ASSOCIATED WITH EACH STREET TYPOLOGY TO ALLOW FOR STREET TREES AND STREET LIGHTING.
5. PUBLIC UTILITIES SUCH AS SANITARY SEWER AND PUBLIC WATER SHALL BE LOCATED WITHIN THE STREET PAVEMENT SECTIONS AND SHALL COMPLY WITH ALL TOWN OF CLAYTON STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED HEREIN.
6. ALL IMPROVEMENTS WITHIN STREET RIGHT-OF-WAY SHALL COMPLY WITH ALL TOWN OF CLAYTON STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED HEREIN.
7. INTERNAL STREETS SHALL MEET THE VERTICAL AND HORIZONTAL DESIGN REQUIREMENTS FOR STREETS WITH DESIGN SPEED OF 35MPH.
8. WITH THE EXCEPTION OF CUL-DE-SACS PREVIOUSLY APPROVED WITH ASHCROFT 1 THAT CONNECT TO ROAD 2, ALL CUL-DE-SAC LENGTHS SHALL MEET THE MAXIMUM LENGTH PER THE UDC.
9. THE VISION FOR THESE LOTS IS INTENDED TO BE AN ESTATE AESTHETIC WITH A NEIGHBORHOOD CHARACTER AKIN TO RURAL SUBDIVISIONS RATHER THAN TYPICAL SUBURBAN NEIGHBORHOODS. THIS HAS BEEN DONE SUCCESSFULLY IN MANY MIXED INCOME NEIGHBORHOODS AS WELL AS VERY HIGH END NEIGHBORHOODS THROUGHOUT THE TRIANGLE. THE HOMES WILL BE SITED MUCH FARTHER FROM THE STREET THAN THE REQUIRED MINIMUM SETBACK IN ORDER TO OPTIMIZE VIEWS OF THE RIVER AND PRESERVE A SERENE AND SECLUDED POCKET OF HOMES WITHIN A DENSE NEIGHBORHOOD. A MODIFIED STREET SECTIONS DOES NOT LIMIT ACCESS TO AMENITIES AS A TRAIL SYSTEM WILL PROVIDE PEDESTRIAN ACCESS TO PUBLIC SIDEWALKS AND AMENITY AREAS THROUGHOUT ASHCROFT SECTION 2.
10. ALL DRY UTILITIES INCLUDING GAS, ELECTRIC AND COMMUNICATION LINES SHALL BE LOCATED IN EASEMENTS OUTSIDE OF PUBLIC RIGHT OF WAY.

ALTERNATIVE STREET SECTION DESIGN WAIVER

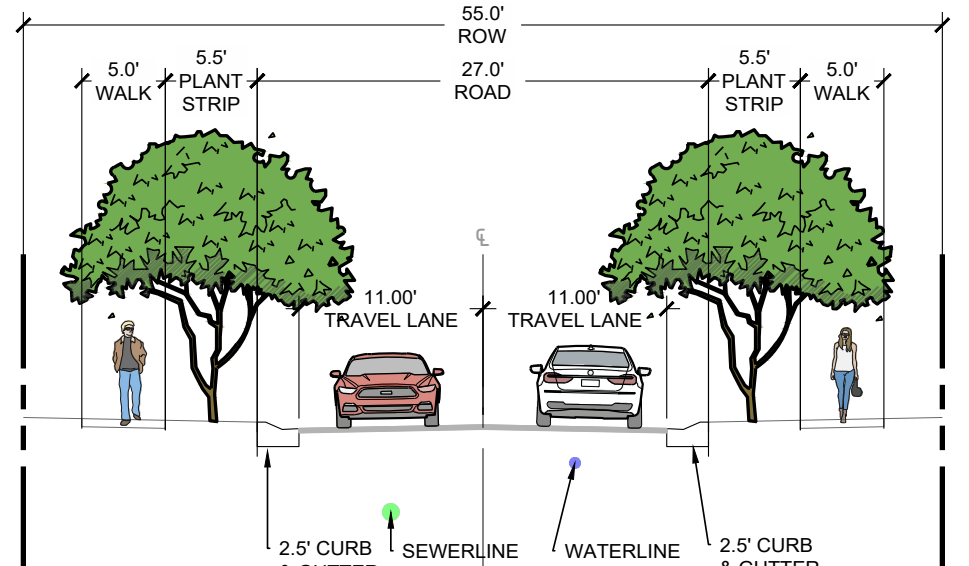
THE TOWN OF CLAYTON TYPICAL STREET SECTIONS REQUIRE THAT CURB AND GUTTER BE PROVIDED ALONG ALL STREETS. WAIVER REQUEST:  
FOR ALL 25' WIDE STREETS WITHIN ASHCROFT SECTION 2, SWALES SHALL BE PROVIDED ALONG BOTH SIDES OF THE STREET IN LIEU OF CURB AND GUTTER. JUSTIFICATION FOR WAIVER REQUEST:  
THE ENVIRONMENTALLY SENSITIVE AREAS ADJACENT TO THESE ROAD TYPES WOULD BENEFIT FROM THE INFILTRATION AND SLOWER CONVEYANCE OF STORMWATER PROVIDED BY VEGETATIVE SWALES IN CONTRAST TO THE STANDARD STORMWATER PIPES FED BY CURB AND GUTTER SYSTEMS.



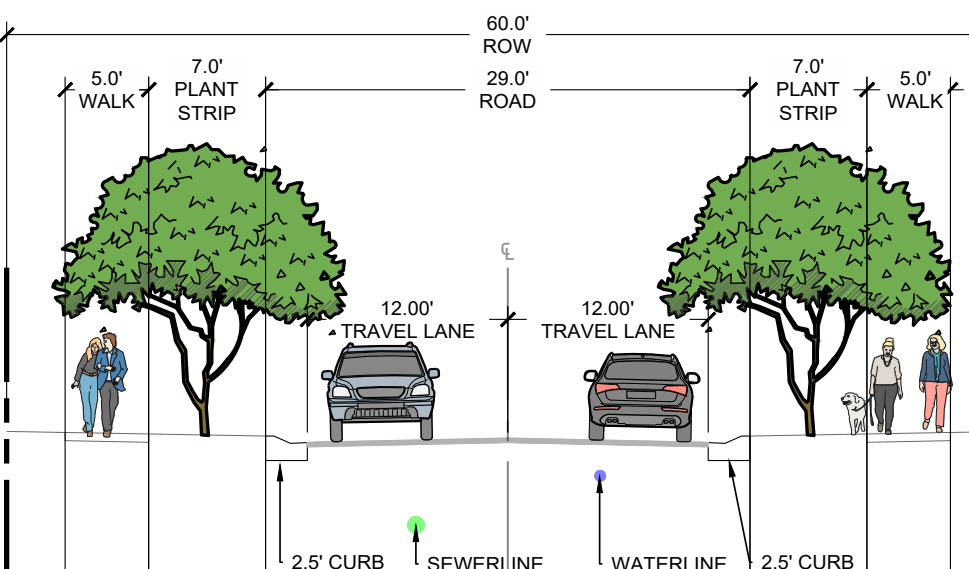
- LEGEND:
- 25' WIDE ROAD IN 55' ROW
  - 27' WIDE ROAD IN 55' ROW
  - 30' WIDE ROAD IN 60' ROW
  - 41' WIDE ROAD IN 60' ROW
  - COMMERCIAL SHARED DRIVE



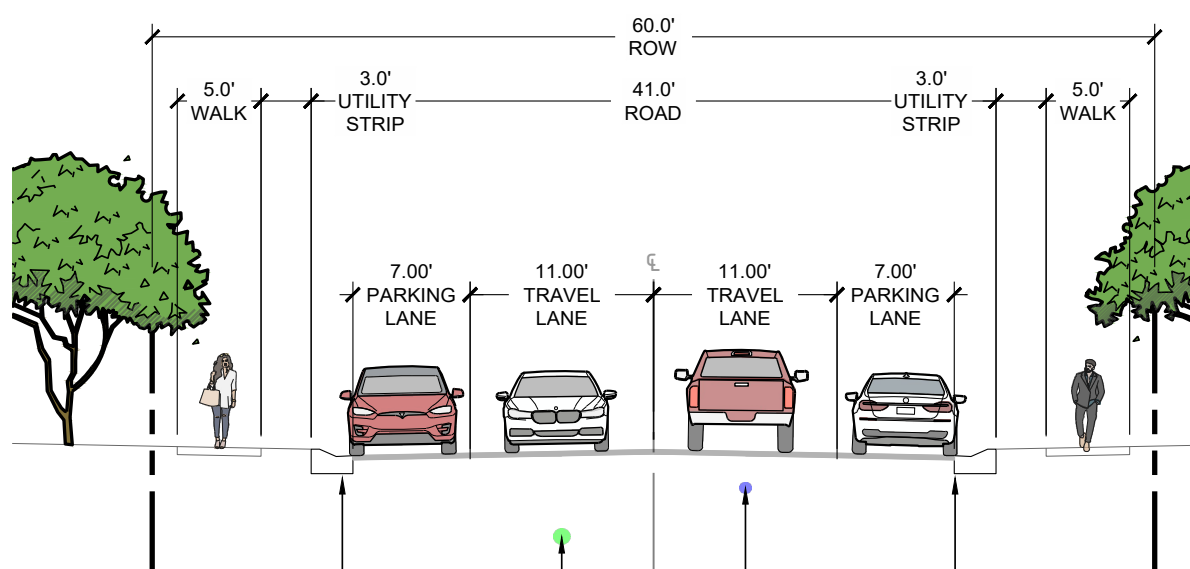
1 24' ROAD IN 55' ROW SECTION



2 27' ROAD IN 55' ROW SECTION



3 30' ROAD IN 60' ROW SECTION



4 41' ROAD IN 60' ROW SECTION



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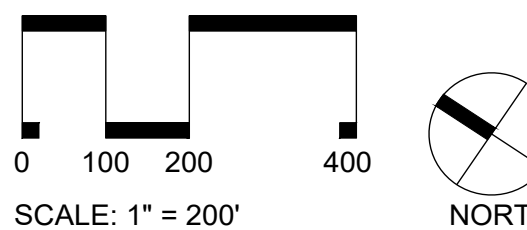
Agent:

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RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

Vicinity map:



Seal:



Project:

**ASHCROFT  
SECTION 2**

Issued for:

**MASTER PLAN**

| No. | Date | Description |
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Title:

**VEHICULAR  
CIRCULATION PLAN**

Project number: L20017 Sheet #:   
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: MT

**6.0**



The image displays two proposed intersection diagrams, labeled SCENARIO #1 and SCENARIO #2, showing the intersection of Covered Bridge Road and Oneil Street.

**SCENARIO #1:** This diagram shows a T-intersection where Covered Bridge Road (100' ROW) terminates at Oneil Street (100' ROW). The intersection is marked with a red 'X' indicating a conflict point. Dimensions include 130.00' storage for Covered Bridge Road and 20.00' storage for Oneil Street. The intersection is labeled "COVERED BRIDGE ROAD" and "ONEIL STREET".

**SCENARIO #2:** This diagram shows a T-intersection where Covered Bridge Road (100' ROW) terminates at Oneil Street (100' ROW). The intersection is marked with a red 'X' indicating a conflict point. Dimensions include 130.00' storage for Covered Bridge Road and 20.00' storage for Oneil Street. The intersection is labeled "COVERED BRIDGE ROAD" and "ONEIL STREET".

| 1                                                                                                                                                                                                                        | 2                                                                                                                                                                                                                                                                                                                                                                                            | 3                                                                                                                                              | 4                                                                                                                                                                                                                                                                                                                                                                      | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>N. O'NEIL STREET IMPROVEMENTS AT COVERED BRIDGE ROAD</b><br><u>RECOMMENDED LANEAGE IMPROVEMENTS</u><br>1. 250' NORTHBOUND LEFT-TURN LANE ON O'NEIL STREET<br>2. 100' EASTBOUND RIGHT-TURN LANE ON COVERED BRIDGE ROAD | <b>N. O'NEIL STREET IMPROVEMENTS AT COVERED BRIDGE ROAD EXTENSION/ NORTHERN CONNECTOR</b><br><u>RECOMMENDED LANEAGE IMPROVEMENTS</u><br>1. 225' SOUTHBOUND LEFT-TURN LANE ON O'NEIL STREET<br>2. 100' NORTHBOUND RIGHT-TURN LANE ON O'NEIL STREET<br>3. 250' WESTBOUND LEFT-TURN LANE ON COVERED BRIDGE ROAD EXTENSION<br>4. 250' WESTBOUND RIGHT-TURN LANE ON COVERED BRIDGE ROAD EXTENSION | <b>N. O'NEIL STREET IMPROVEMENTS AT RIRO</b><br><u>RECOMMENDED LANEAGE IMPROVEMENTS</u><br>1. 100' NORTHBOUND RIGHT-TURN LANE ON O'NEIL STREET | <b>N. O'NEIL STREET IMPROVEMENTS AT SOUTH SITE DRIVEWAY AND STEEPLECHASE SITE DRIVEWAY #2</b><br><u>RECOMMENDED LANEAGE IMPROVEMENTS</u><br>1. 100' SOUTHBOUND LEFT-TURN LANE ON O'NEIL STREET<br>2. 100' NORTHBOUND RIGHT-TURN LANE ON O'NEIL STREET<br>3. 150' NORTHBOUND LEFT-TURN LANE ON O'NEIL STREET<br>4. 125' WESTBOUND LEFT-TURN LANE ON SOUTH SITE DRIVEWAY | <b>N. O'NEIL STREET IMPROVEMENTS AT COVERED BRIDGE ROAD/ COVERED BRIDGE ROAD EXTENSION</b><br><u>RECOMMENDED LANEAGE IMPROVEMENTS</u><br>1. 150' NORTHBOUND LEFT-TURN LANE ON O'NEIL STREET<br>2. 100' NORTHBOUND RIGHT-TURN LANE ON O'NEIL STREET<br>3. 225' SOUTHBOUND LEFT-TURN LANE ON O'NEIL STREET<br>4. 100' SOUTHBOUND RIGHT-TURN LANE ON O'NEIL STREET<br>5. 1200' NORTHBOUND RECEIVING LANE ON O'NEIL STREET BEGINNING AT COVERED BRIDGE ROAD<br>6. 150' LEFT-TURN LANE WESTBOUND ON COVERED BRIDGE ROAD EXTENSION<br>7. 100' WESTBOUND RIGHT-TURN LANE ON COVERED BRIDGE ROAD EXTENSION<br>8. DUAL EASTBOUND LEFT-TURN LANES ON COVERED BRIDGE ROAD (ONE FULL, ONE 300')<br>9. 150' EASTBOUND RIGHT-TURN LANE ON COVERED BRIDGE ROAD |

RIGHT-IN/RIGHT-OUT

RIGHT-IN/RIGHT-OUT WITH DEDICATED DECELERATION/RIGHT TURN LANE

FULL MOVEMENT WITH DEDICATED DECELERATION/LEFT TURN LANE

FULL MOVEMENT LEFT-OVER WITH DEDICATED DECELERATION/LEFT TURN LANE

FULL MOVEMENT LEFT-OVER WITH DEDICATED DECELERATION/LEFT TURN LANE AND DEDICATED DECELERATION/RIGHT TURN LANE

8. DUAL EASTBOUND LEFT-TURN LANES ON COVERED ROAD (ONE FULL, ONE 300')

9. 150' EASTBOUND RIGHT-TURN LANE ON COVERED BRIDGE ROAD

COVERED BRIDGE ROAD

N. CLEVER ST.

COVERED BRIDGE ROAD EXTENSION/NORTHERN ROAD

COVERED BRIDGE ROAD REALIGNMENT

SOUTHSIDE DRIVE

ST. LOUIS COUNTY COURTHOUSE

1

2

3

4

5

N. CLEVER ST.

[illegible]









**LEGEND:**

- PROPOSED SEWER MAIN
- PROPOSED MANHOLE
- PROPOSED FORCE MAIN
- PROPOSED FIRE HYDRANT
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER EASEMENT
- EXISTING SEWER MAIN
- EXISTING MANHOLE
- EXISTING WATER MAIN

- NOTES:**
1. A PRECONSTRUCTION MEETING WILL BE REQUIRED BEFORE WORK BEGINS ON ANY PROJECT. THE MEETING WILL CONSIST OF, AT MINIMUM, THE DEVELOPER'S ENGINEER, THE CONTRACTOR, AND A REPRESENTATIVE OF UTILITY. OTHER ATTENDEES CAN BE REQUIRED BY UTILITY AS NEEDED, INCLUDING ANY SUBCONTRACTORS AND REGULATORS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT ANY LOCAL AND STATE REGULATORS TO SEE IF THEIR PRESENCE IS REQUIRED AT THE PRECONSTRUCTION MEETING.
  2. TOWN OF CLAYTON SHALL BE NOTIFIED 48 HOURS BEFORE CONSTRUCTION IS TO BEGIN.
  3. TOWN OF CLAYTON SHALL BE NOTIFIED 48 HOURS BEFORE ANY CONSTRUCTION IS BURIED.
  4. A MINIMUM HORIZONTAL SEPARATION OF TEN FEET, OUTSIDE OF PIPE TO OUTSIDE OF PIPE, SHALL BE MAINTAINED BETWEEN POTABLE WATER PIPING AND DOMESTIC WASTEWATER GRAVITY PIPING OR STORM WATER PIPING.
  5. A MINIMUM VERTICAL SEPARATION OF 18 INCHES, OUTSIDE OF PIPE TO OUTSIDE OF PIPE, SHALL BE MAINTAINED BETWEEN POTABLE WATER PIPING, WASTEWATER GRAVITY PIPING, STORM SEWER PIPING OR RECLAIMED WATER PIPING. A 24 INCH SEPARATION SHALL BE PROVIDED BETWEEN STORM SEWER AND SANITARY SEWER LINES.
  6. WHERE THE 18 INCHES OF NET VERTICAL CLEARANCE BETWEEN POTABLE WATER PIPE AND THE WASTEWATER GRAVITY PIPE CANNOT BE MAINTAINED, THE WASTEWATER GRAVITY PIPE SHALL BE DUCTILE IRON PIPE AND SHALL BE HYDROSTATICALLY PRESSURE TESTED WITH WATER TO ENSURE JOINT TIGHTNESS. PIPES SHALL BE LOCATED SO THAT THE POINTS ARE AS FAR AS POSSIBLE FROM EACH OTHER.
  7. ALL CONSTRUCTION SHALL CONFORM TO TOWN OF CLAYTON STANDARDS, SPECIFICATIONS, AND DETAILS.
  8. UTILITIES FOR MIXED-USE AND COMMERCIAL POD WILL BE DESIGNED VIA A FUTURE MAJOR SITE PLAN SUBMITTAL.

**WATER AND SEWER**

NOTE: WATER AND SEWER DESIGN AND UTILITY EASEMENTS REPRESENTED ON THIS SHEET ARE FOR CONCEPT PURPOSES ONLY.

DRY UTILITIES SUCH AS POWER, TELECOM, GAS, ETC. WILL BE LOCATED IN THE PUBLIC UTILITY EASEMENT LOCATED OUTSIDE OF THE STREET RIGHT-OF-WAY. PUBLIC UTILITY EASEMENT IS PROVIDED ON BOTH SIDES OF THE STREET RIGHT-OF-WAY.

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CONTACT: DAVID DEYOUNG, AICP

**Vicinity map:**

**Seal:**

**Scale:**

**Project:**

**ASHCROFT SECTION 2**

**Issued for:**

**MASTER PLAN**

| No. | Date | Description |
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**Title:**

**PRELIMINARY UTILITY PLAN**

**Project number:** L20017 **Sheet #:**

**Issued Date:** 08.03.2020

**Drawn by:** SM

**Approved by:** TS

**9.0**





GRADING LEGEND:

| SYMBOL | DESCRIPTION             |
|--------|-------------------------|
|        | PROPOSED MAJOR CONTOUR  |
|        | PROPOSED MINOR CONTOUR  |
|        | EXISTING MAJOR CONTOUR  |
|        | EXISTING MINOR CONTOUR  |
|        | PROPOSED STORM DRAINAGE |
|        | PROPOSED JUNCTION BOX   |
|        | PROPOSED CATCH BASIN    |
|        | PROPOSED AREA DRAIN     |

NOTES:

- PRIOR TO THE APPROVAL OF THE FINAL PLAT, THE FOLLOWING SHALL BE PROVIDED AS APPLICABLE
  - JOHNSTON COUNTY STORMWATER MANAGEMENT APPLICATION
  - NUTRIENT CALCULATIONS, SEALED BY A LICENSED PROFESSIONAL
  - STORMWATER NARRATIVE, CALCULATIONS, NCDENR SUPPLEMENT WORKSHEETS AND ESDN SPECIFICATIONS FOR EACH STORMWATER SCM, INDICATING PEAK FLOW AND NUTRIENT LOADING CALCULATIONS
  - OPERATION AND MAINTENANCE PLAN AND LEGAL AGREEMENT FOR EACH SCM
- GRADING AND DRAINAGE FOR NORTH CONNECTOR BY OTHERS
- CONTOUR INTERVAL FOR PROPOSED GRADING IS 2 FEET

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CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

Vicinity map:

Seal:

Scale:

SCALE: 1" = 200'

Project:

ASHCROFT  
SECTION 2

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Title:

PRELIMINARY GRADING  
& DRAINAGE PLAN

Project number:

L20017

Sheet #:

10.0

Issued Date:

08.03.2020

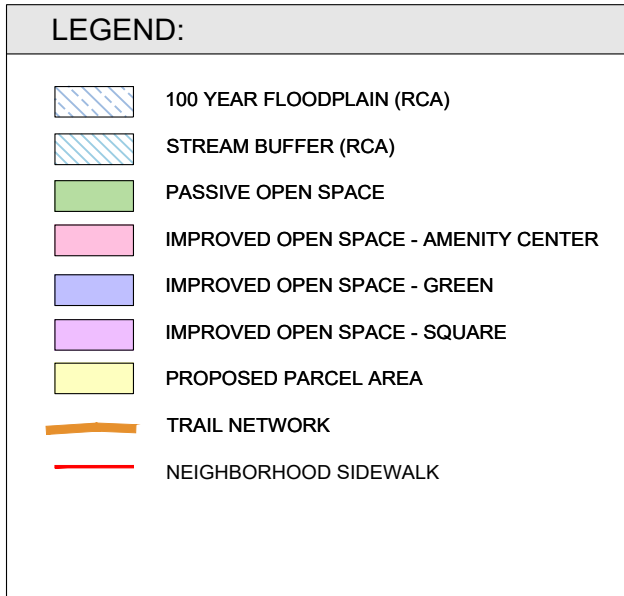
Drawn by:

SM

Approved by:

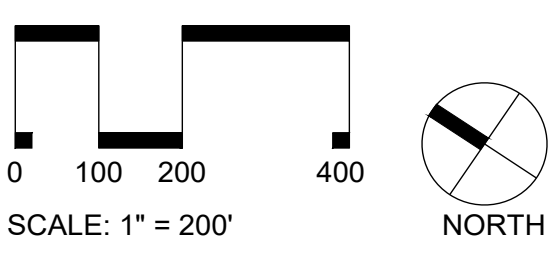
TS





- ### OPEN SPACE CALCULATIONS:
- |                                             |        |
|---------------------------------------------|--------|
| RESOURCE CONSERVATION                       | AC     |
| 100 YR FLOODPLAIN                           | 23.11  |
| STREAM BUFFERS                              | 11.43  |
| NET PROJECT AREA                            | 208.68 |
| AC OPEN SPACE REQ'D (12.5%)                 | 25.83  |
| IMPROVED OPEN SPACE REQ'D (25%)             | 6.46   |
| IMPROVED OPEN SPACE PROPOSED                | AC     |
| ASHFORTH ATHLETIC CLUB                      | 4.30   |
| GREEN                                       | 2.20   |
| SQUARE                                      | 0.69   |
| TOTAL                                       | 7.19   |
| OPEN SPACE PROPOSED                         | AC     |
| IMPROVED OPEN SPACE PROPOSED                | 7.19   |
| PASSIVE OPEN SPACE PROPOSED (EXCLUDING RCA) | 64.87  |
| TOTAL OPEN SPACE PROPOSED                   | 72.06  |
- NOTE: OPEN SPACE AREAS ARE APPROXIMATE AND SUBJECT TO MODIFICATION. OPEN SPACE WILL BE PROVIDED IN COMPLIANCE WITH UDC.

| IMPROVED OPEN SPACE PROGRAM ELEMENTS: |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------|--------------------------|------------|------------------|--------------|--------------|-----------------|
|                                       | <table><tr><th>ASHCROFT AMENITY CENTER (3 USES MIN)</th></tr><tr><td>FITNESS ROOM</td></tr><tr><td>BUSINESS CENTER</td></tr><tr><td>POOL</td></tr><tr><td>COMMUNITY LOUNGE</td></tr><tr><td>BOUCE COURTS</td></tr><tr><td>PLAYGROUND</td></tr></table>                             | ASHCROFT AMENITY CENTER (3 USES MIN) | FITNESS ROOM      | BUSINESS CENTER          | POOL       | COMMUNITY LOUNGE | BOUCE COURTS | PLAYGROUND   |                 |
| ASHCROFT AMENITY CENTER (3 USES MIN)  |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| FITNESS ROOM                          |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| BUSINESS CENTER                       |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| POOL                                  |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| COMMUNITY LOUNGE                      |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| BOUCE COURTS                          |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| PLAYGROUND                            |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
|                                       | <table><tr><th>GREEN (1 USE MIN)</th></tr><tr><td>DOG WASTE STATION</td></tr><tr><td>NATURAL PLANTINGS</td></tr><tr><td>MALL KIOSK</td></tr><tr><td>BENCHES</td></tr><tr><td>WALKING PATH</td></tr></table>                                                                        | GREEN (1 USE MIN)                    | DOG WASTE STATION | NATURAL PLANTINGS        | MALL KIOSK | BENCHES          | WALKING PATH |              |                 |
| GREEN (1 USE MIN)                     |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| DOG WASTE STATION                     |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| NATURAL PLANTINGS                     |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| MALL KIOSK                            |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| BENCHES                               |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| WALKING PATH                          |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
|                                       | <table><tr><th>SQUARE (2 USES MIN)</th></tr><tr><td>TABLE + SEATING</td></tr><tr><td>DOG PARK / WASTE STATION</td></tr><tr><td>TOT LOT</td></tr><tr><td>EXERCISE STATION</td></tr><tr><td>BENCHES</td></tr><tr><td>WALKING PATH</td></tr><tr><td>SHADE STRUCTURE</td></tr></table> | SQUARE (2 USES MIN)                  | TABLE + SEATING   | DOG PARK / WASTE STATION | TOT LOT    | EXERCISE STATION | BENCHES      | WALKING PATH | SHADE STRUCTURE |
| SQUARE (2 USES MIN)                   |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| TABLE + SEATING                       |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| DOG PARK / WASTE STATION              |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| TOT LOT                               |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| EXERCISE STATION                      |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| BENCHES                               |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| WALKING PATH                          |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |
| SHADE STRUCTURE                       |                                                                                                                                                                                                                                                                                    |                                      |                   |                          |            |                  |              |              |                 |



Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: MT





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FIRM LICENSE #: C-1051  
www.stewartinc.com  
PROJECT #: L20017

Client:

ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27620

Consultants:

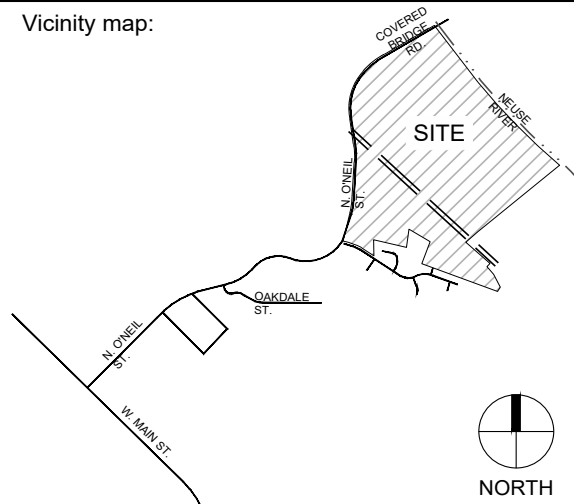
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

KIMLEY HORN  
421 FAYETTEVILLE ST SUITE 600  
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Agent:

RIVERWILD  
114 W. MAIN STREET  
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CONTACT: DAVID DEYOUNG, AICP

Vicinity map:



Seal:



Project:

**ASHCROFT  
SECTION 2**

Issued for:

**MASTER PLAN**

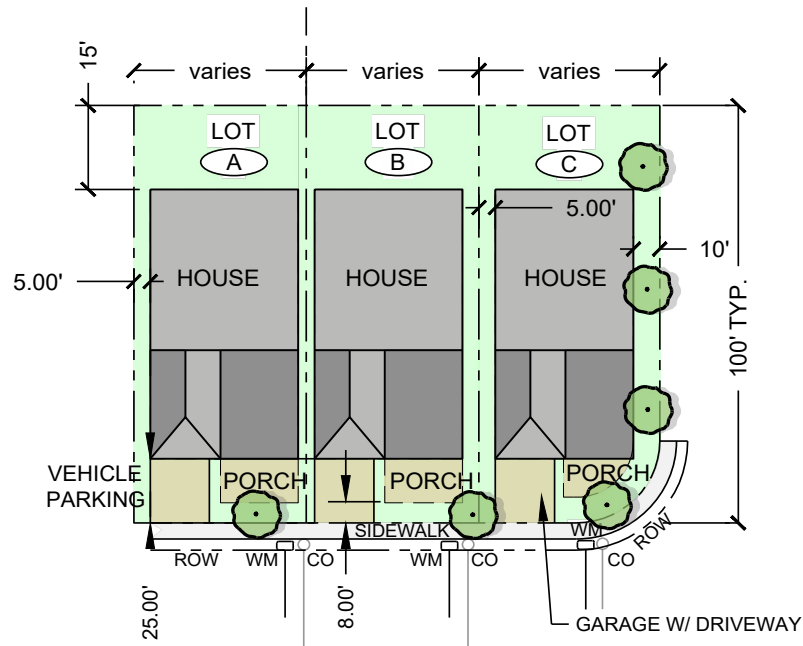
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Title:

**SINGLE FAMILY  
REGULATING PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: HNJ  
Approved by: MT

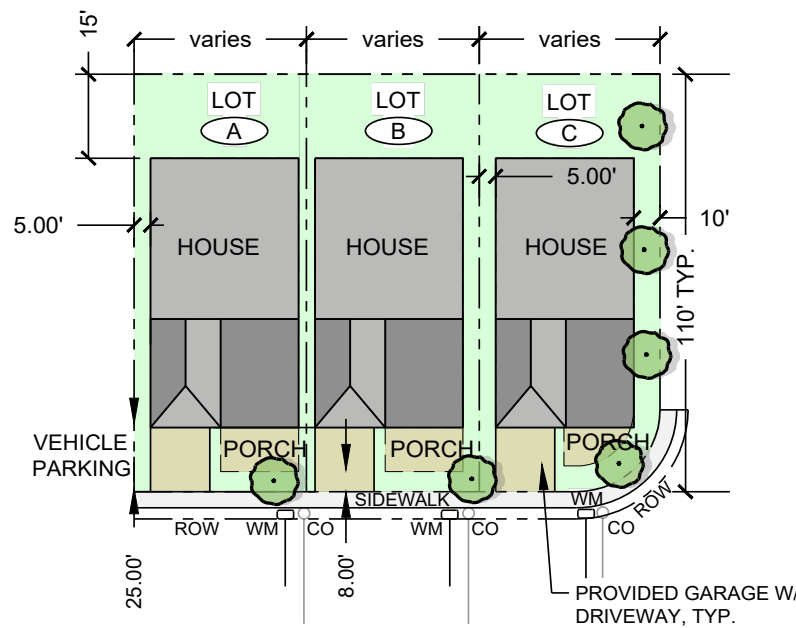
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LOT TYPE A

| LOTS STANDARD TABLE            |                       |
|--------------------------------|-----------------------|
|                                | 4200 SF SINGLE FAMILY |
| MINIMUM LOT WIDTH/DEPTH        | 42' X 98'             |
| TYPICAL LOT WIDTH/DEPTH        | 42' X 100'            |
| MINIMUM LOT SIZE (SF)          | 4,100                 |
| MAXIMUM IMPERVIOUS AREA        | 60%                   |
| MAXIMUM BUILDING COVERAGE      | 50%                   |
| BUILDING SETBACKS              |                       |
| FRONT STREET (FROM SIDEWALK)   | 10'                   |
| SIDE STREET (FROM SIDEWALK)    | 10'                   |
| SIDE                           | 5'                    |
| REAR                           | 15'                   |
| GARAGE (FROM SIDEWALK)         | 25'                   |
| DRIVEWAY (FROM SIDE LOT LINE)* | 3.5'                  |

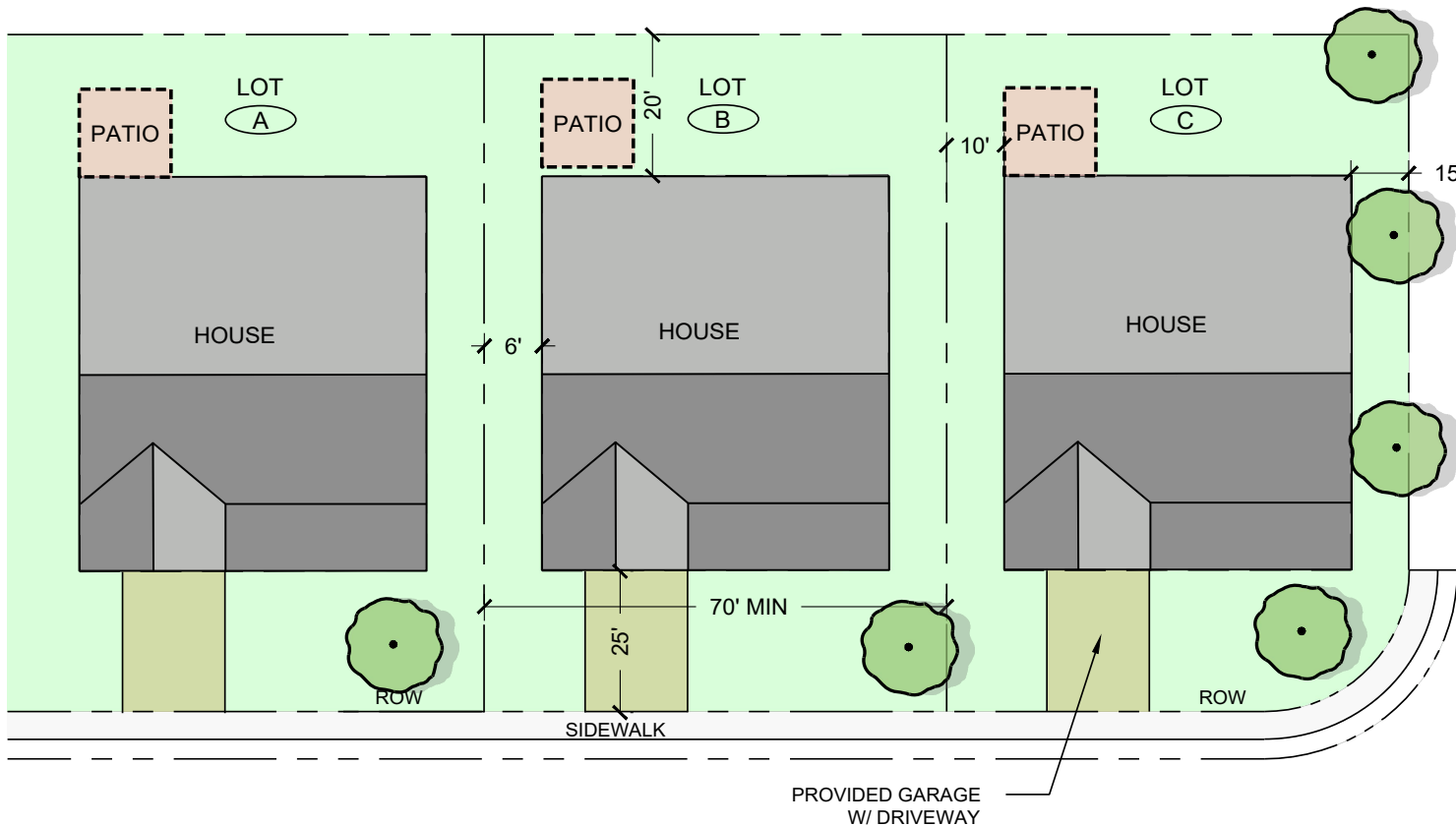
\*SEE NOTE 10



LOT TYPE B

| LOTS STANDARD TABLE            |                       |
|--------------------------------|-----------------------|
|                                | 5000 SF SINGLE FAMILY |
| MINIMUM LOT WIDTH/DEPTH        | 42' X 118'            |
| TYPICAL LOT WIDTH/DEPTH        | 42' X 118'            |
| MINIMUM LOT SIZE (SF)          | 4,925                 |
| MAXIMUM IMPERVIOUS AREA        | 60%                   |
| MAXIMUM BUILDING COVERAGE      | 50%                   |
| BUILDING SETBACKS              |                       |
| FRONT STREET (FROM SIDEWALK)   | 10'                   |
| SIDE STREET (FROM SIDEWALK)    | 10'                   |
| SIDE                           | 5'                    |
| REAR                           | 15'                   |
| GARAGE (FROM SIDEWALK)         | 25'                   |
| DRIVEWAY (FROM SIDE LOT LINE)* | 3.5'                  |

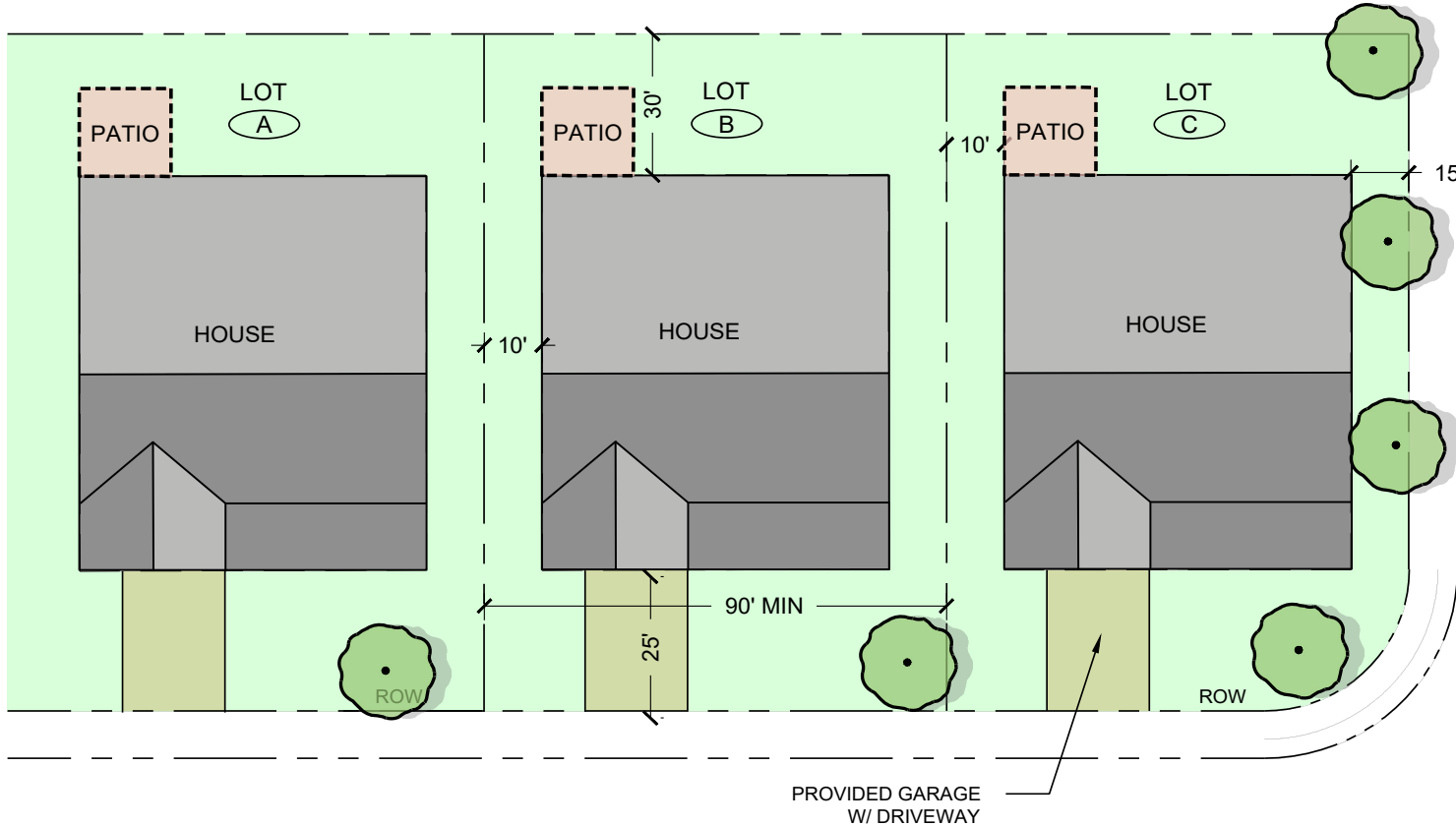
\*SEE NOTE 10



LOT TYPE C

| LOTS STANDARD TABLE            |                         |
|--------------------------------|-------------------------|
|                                | 10,000 SF SINGLE FAMILY |
| MINIMUM LOT WIDTH/DEPTH        | 70' X 130'              |
| TYPICAL LOT WIDTH/DEPTH        | 74' X 135'              |
| MINIMUM LOT SIZE (SF)          | 9,000 SF                |
| MAXIMUM IMPERVIOUS AREA        | 40%                     |
| MAXIMUM BUILDING COVER         | 25%                     |
| BUILDING SETBACKS              |                         |
| FRONT STREET (FROM SIDEWALK)   | 10'                     |
| SIDE STREET (FROM SIDEWALK)    | 15'                     |
| SIDE                           | 6'                      |
| REAR                           | 20'                     |
| GARAGE (FROM SIDEWALK)         | 25'                     |
| DRIVEWAY (FROM SIDE LOT LINE)* | 3.5'                    |

\*SEE NOTE 10



LOT TYPE D

| LOTS STANDARD TABLE            |               |
|--------------------------------|---------------|
|                                | 1/2 ACRE MIN. |
| MINIMUM LOT WIDTH/DEPTH        | 90' X 120'    |
| TYPICAL LOT WIDTH/DEPTH        | 100' X 132'   |
| MINIMUM LOT SIZE (SF)          | 21,790 SF     |
| MAXIMUM IMPERVIOUS AREA        | 40%           |
| MAXIMUM BUILDING COVERAGE      | 20%           |
| BUILDING SETBACKS              |               |
| FRONT STREET (FROM ROW)        | 15'           |
| SIDE STREET (FROM ROW)         | 15'           |
| SIDE                           | 10'           |
| REAR                           | 30'           |
| GARAGE (FROM ROW)              | 25'           |
| DRIVEWAY (FROM SIDE LOT LINE)* | 10'           |

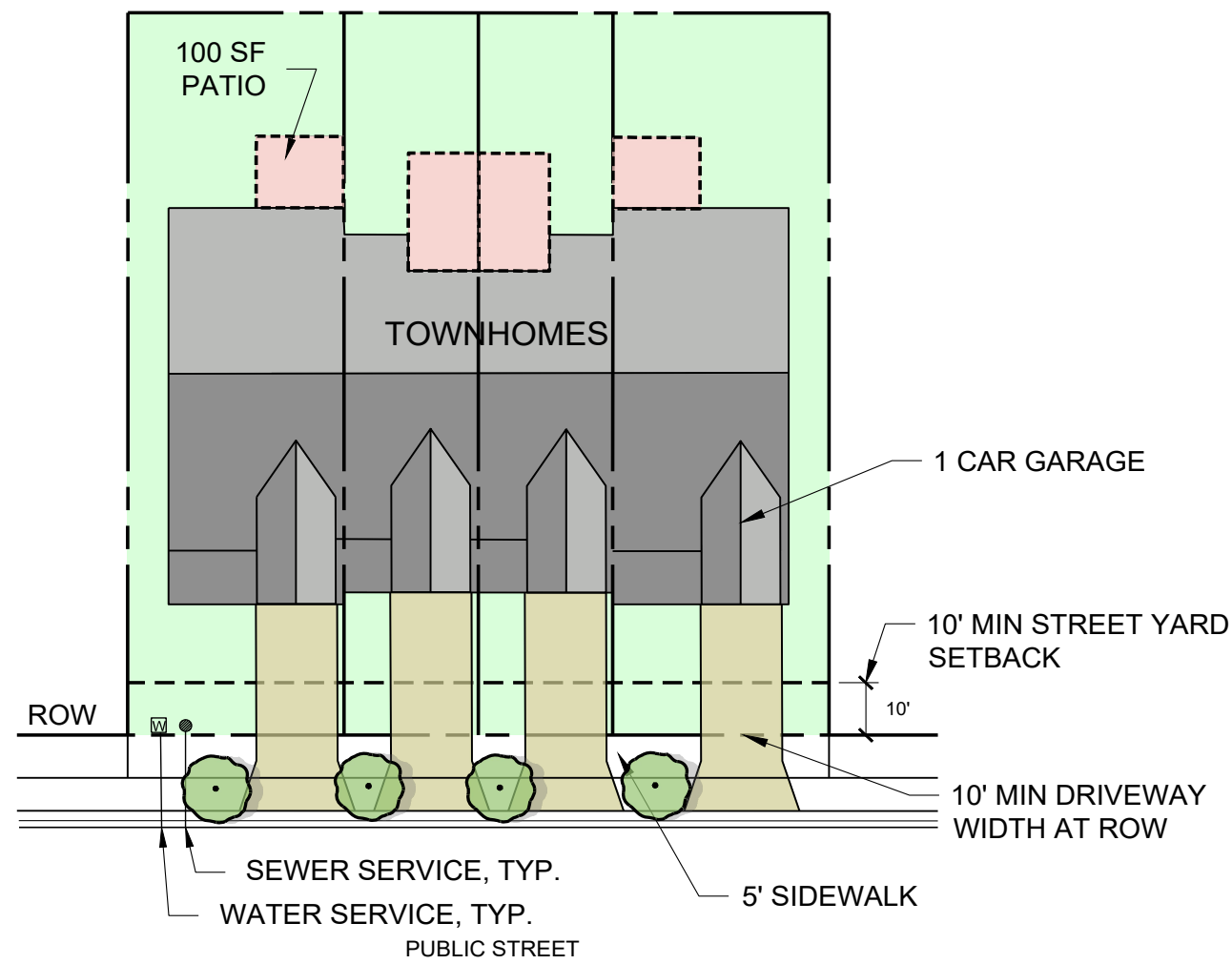
\*SEE NOTE 10

NOTES:

**SINGLE FAMILY RESIDENTIAL:**

1. LOT WIDTH SHALL BE MEASURED AT THE FRONT SETBACK LINE.
2. THE BUILDABLE ZONE IS DEFINED AS ALL AREAS OF THE LOT BOUNDED BY THE SETBACK FROM THE PROPERTY LINES AND THE STREET RIGHT-OF-WAY.
3. THE PEDESTRIAN ZONE IS DEFINED AS THE AREA FROM THE PUBLIC RIGHT-OF-WAY TO THE BACK OF CURB AND MAY INCLUDE 5' WIDE PUBLIC SIDEWALK, PLANTING STRIP WITH STREET TREES AND STREET LIGHTS.
4. STREET TREES SHALL BE PLANTED WITHIN THE PLANTING STRIP BETWEEN THE BACK OF CURB AND THE SIDEWALK. TREES SHALL BE PLANTED AT A RATE TO MEET UDC REQUIREMENTS.
5. ALL SINGLE-FAMILY HOMES SHALL HAVE A 1 OR 2-CAR GARAGE WITH DRIVEWAY TO ACCOMMODATE A MINIMUM OF 2 VEHICLES ON THE LOT WITH A MINIMUM DEPTH OF 25' FROM THE BACK OF SIDEWALK TO THE GARAGE DOOR.
6. EACH HOME SHALL HAVE A FRONT ENTRY THAT MAY SHALL INCLUDE A PORCH, STOOP OR COVERED AREA.
7. FENCING SHALL BE PERMITTED FROM THE MIDPOINT OF THE PRINCIPAL RESIDENCE AND MAY BE LOCATED WITH A ZERO SETBACK ALONG THE PROPERTY LINE.
8. NO FENCING SHALL BE PERMITTED IN ANY PUBLIC UTILITY EASEMENT. FENCE SETBACK ON CORNER LOTS SHALL BE A MINIMUM OF 5' OFF THE SIDEWALK.
9. MAXIMUM BUILDING HEIGHT SHALL BE 35' AS MEASURED FROM THE FINISHED GRADE AT FRONT DOOR.
10. SINGLE FAMILY DRIVEWAYS SHALL BE A MINIMUM OF 3.5' FROM ANY LOT LINE AND A MAX OF 24' IN WIDTH, EXCEPT WHERE TWO DRIVEWAYS COINCIDE ALONG THE SAME LOT LINE.
11. ALL HVAC AND MECHANICAL EQUIPMENT SHALL BE LOCATED IN THE REAR OR IN THE SIDE YARDS SCREENED FROM THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH UDC REQUIREMENTS.





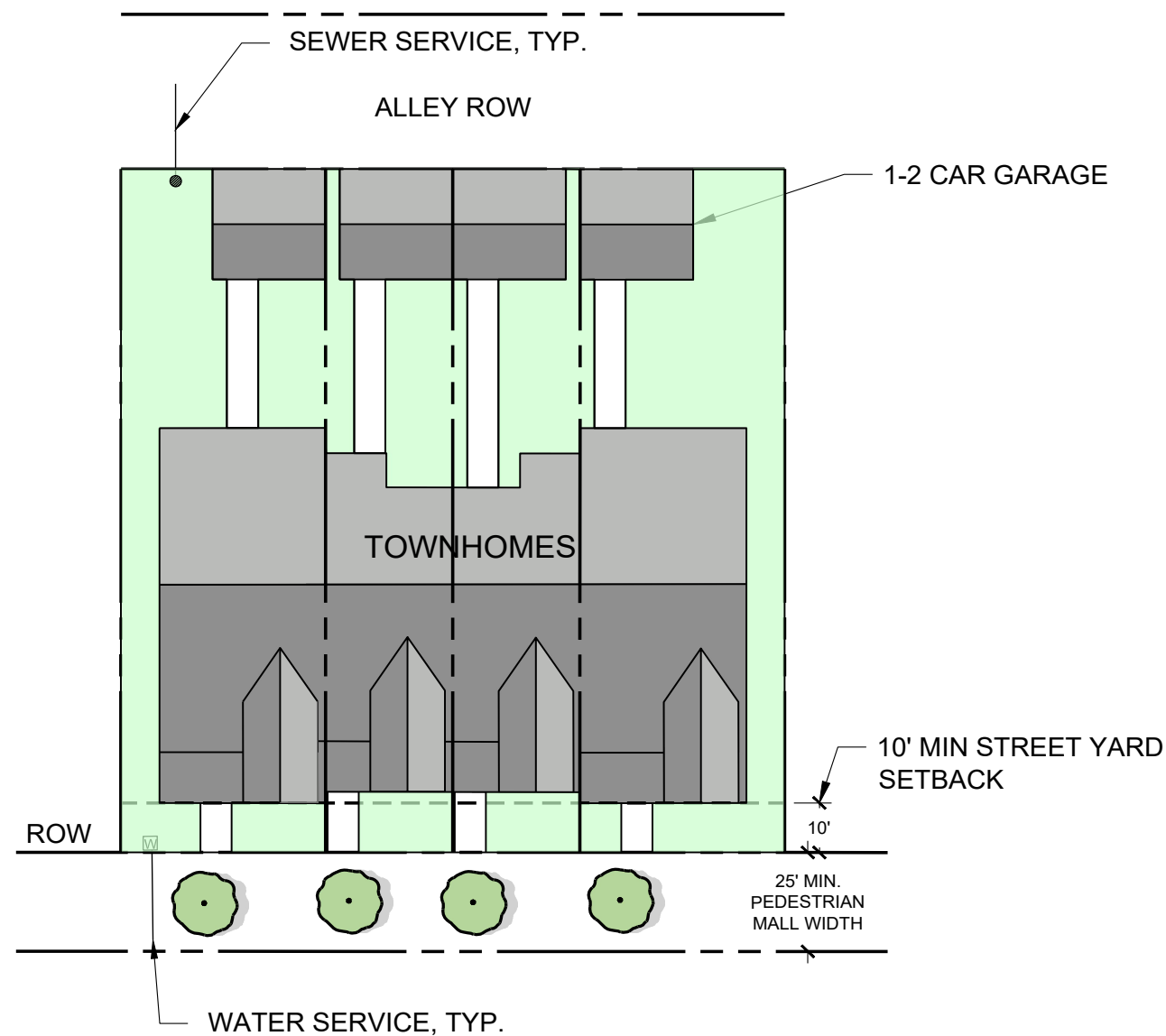
LOT TYPE E (DRIVEWAY)

| LOTS STANDARD TABLE                          |                 |
|----------------------------------------------|-----------------|
|                                              | TOWNHOMES       |
| MINIMUM LOT WIDTH/ DEPTH                     | 22' X 90'       |
| MINIMUM LOT SIZE (SF)                        | 2,000           |
| MAXIMUM IMPERVIOUS AREA                      | 95%             |
| MAXIMUM BUILDING COVERAGE                    | 90%             |
| BUILDING SETBACKS                            |                 |
| FRONT STREET (FROM BACK OF SIDEWALK)         | 10'             |
| SIDE STREET (FROM BACK OF SIDEWALK)          | 15'             |
| PEDESTRIAN MALL (FROM PROPERTY LINE)         | 5'              |
| SIDE                                         | 0'              |
| REAR                                         | 20'             |
| STREET FACING GARAGE (FROM BACK OF SIDEWALK) | 25'             |
| ALLEY ACCESSED GARAGE (FROM PROPERTY LINE)   | 6'              |
| DRIVEWAY (FROM SIDE LOT LINE)*               | 3.5'            |
| HEIGHT                                       | 3 STORIES / 50' |

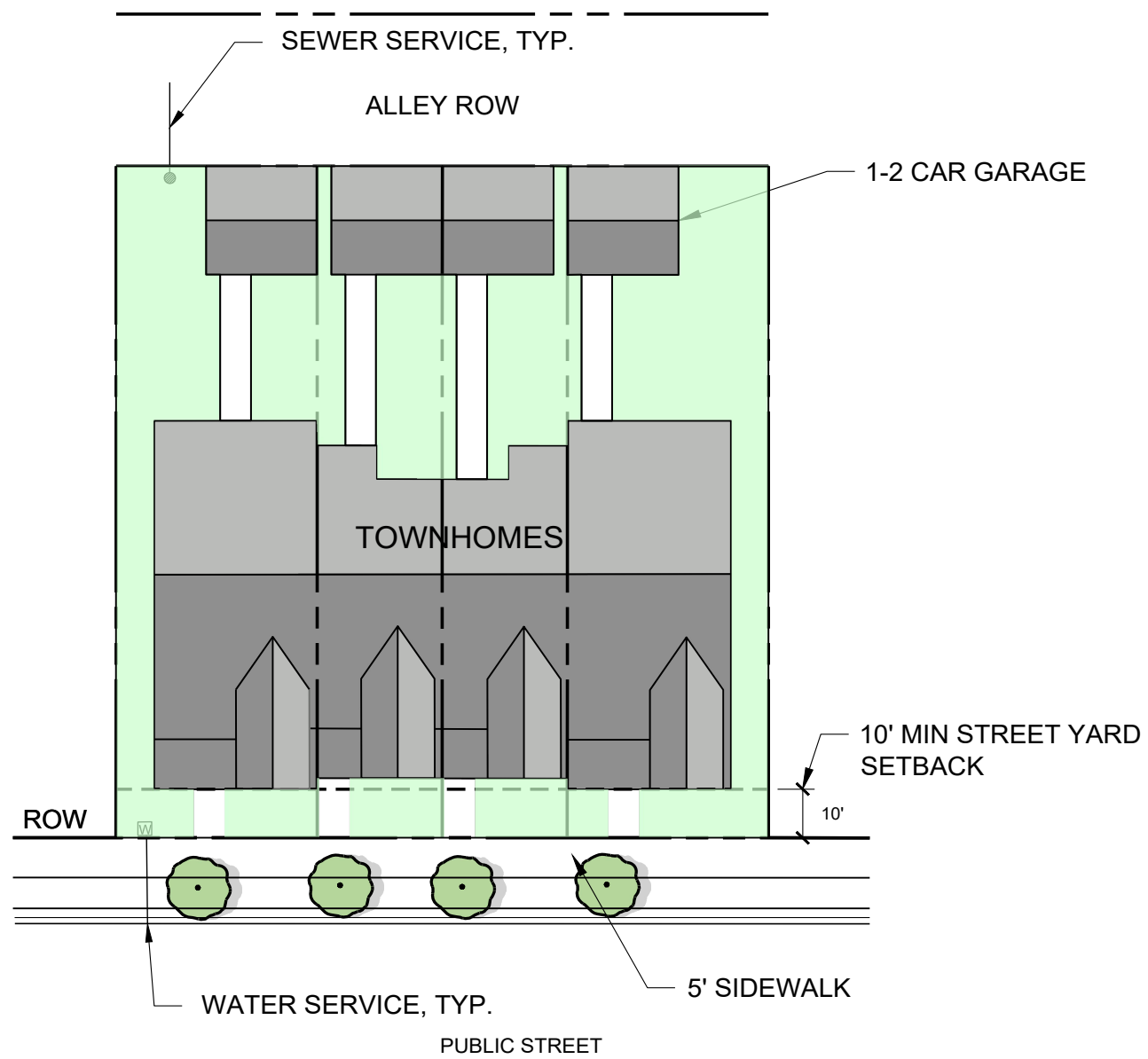
\*ONLY APPLIES WHERE DRIVEWAYS DON'T SHARE A LOT LINE

NOTES:

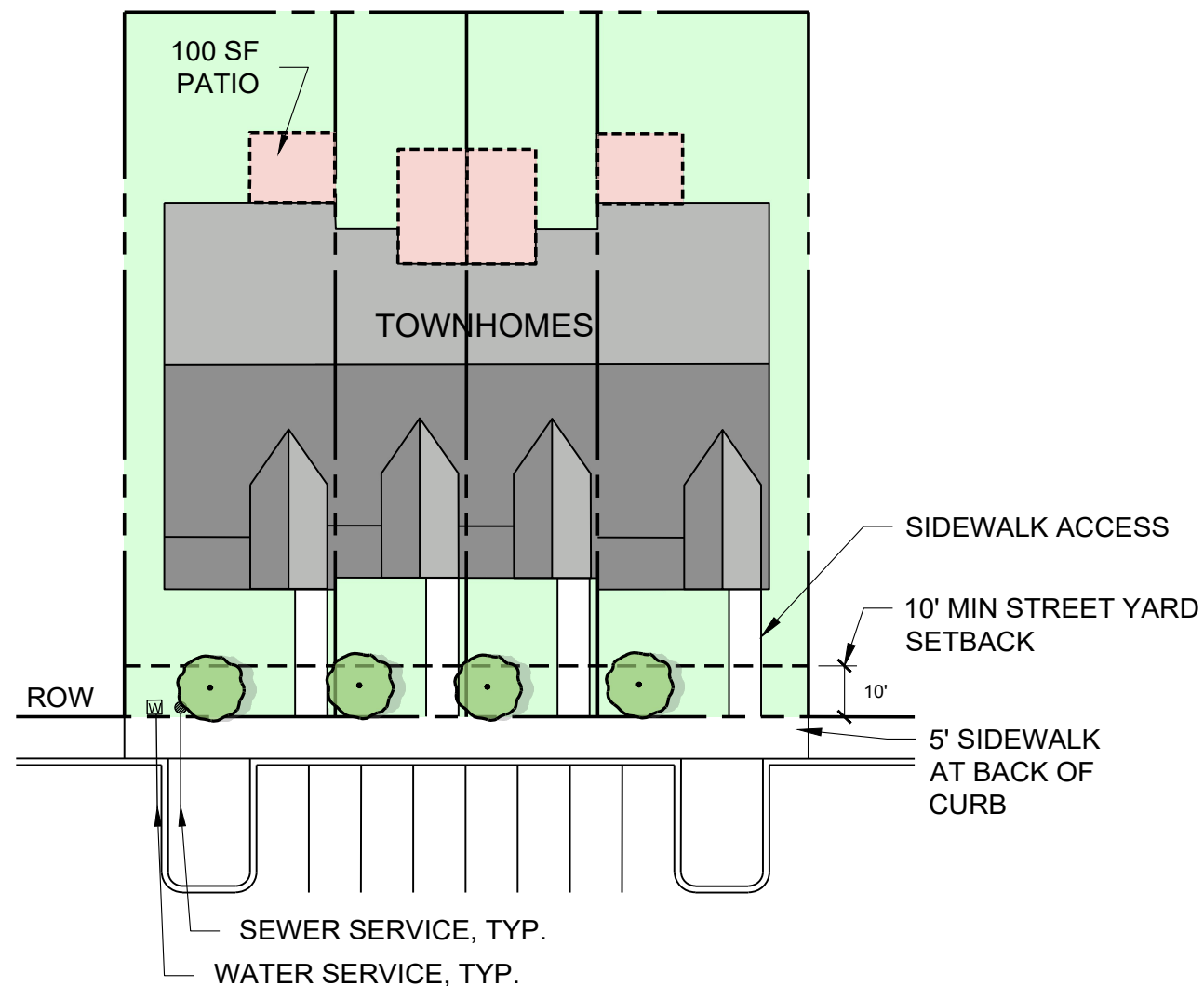
- TOWNHOME SITE DESIGN STANDARDS**
- ANY ON-STREET PARKING AREAS SHALL COMPLY WITH TOWN OF CLAYTON UDC REQUIREMENTS FOR PARKING LOTS AND ISLANDS.
  - ALL HVAC AND MECHANICAL EQUIPMENT SHALL BE LOCATED AT THE REAR OF EACH UNIT AND SCREENED FROM THE PUBLIC ROW IN ACCORDANCE WITH TOWN OF CLAYTON UDC REQUIREMENTS.
  - TRASH AND RECYCLING COLLECTION SHALL BE THROUGH CURB SIDE PICK UP OR DUMPSTER AREAS.
  - ALL COMMON AREAS SHALL MEET THE SITE INTERIOR LANDSCAPING REQUIREMENTS AS PER TOWN OF CLAYTON UDC (155.102(D)).
  - ALL COMMON AREAS SHALL BE MAINTAINED BY THE ASHCROFT SECTION 2 HOA.
  - DWELLING UNITS WILL BE LOCATED ON INDIVIDUALLY OWNED LOTS.
  - BUILDINGS SHALL NOT CONTAIN MORE THAN 8 UNITS.
  - TOWNHOMES MAY FRONT ON A PUBLIC STREET OR PARKING LOT.
- TOWNHOME DESIGN STANDARDS**
- ALL UNITS WILL BE A MAXIMUM OF THREE (3) STORIES IN HEIGHT AND WILL UTILIZE EITHER GARAGES WITH DRIVEWAYS, ALLEYS, PARKING LOTS, OR ON-STREET PARKING. WHERE ON-STREET PARKING IS UTILIZED IT WILL BE SUBJECT TO REVIEW AND APPROVAL OF TOWN ENGINEERING AND PLANNING TO ENSURE ADEQUATE ROW WIDTH TO ACCOMMODATE ON-STREET PARKING.
  - THE PRIMARY EXTERIOR SIDING MATERIALS SHALL CONSIST OF MASONRY (BRICK AND/OR CULTURED STONE OR REAL STONE) OR VINYL OR CEMENT-FIBER PLANK SIDING.
  - COLOR PALETTE SHALL INCLUDE A MINIMUM OF TWO COLORS PER STRIP OF UNITS.
  - MASONRY ACCENTS OF EITHER BRICK OR CULTURED STONE SHALL BE USED TO AVOID MONOTONOUS AND CONTINUOUS BUILDING FACADES.
  - ARCHITECTURAL BUILDING STYLES FOR TOWNHOMES MAY INCLUDE: CRAFTSMAN, FARMHOUSE, LOW COUNTRY, TRADITIONAL, BUNGALOW, RANCHES, OPEN LIVING.
  - VARIED STREETScape IN ARCHITECTURAL DETAIL AND COLORS TO PREVENT MONOTONY.
  - FRONT DOOR ENTRIES TO BE COVERED.
  - ROOF LINES TO MATCH ARCHITECTURAL BUILDING STYLE AND WILL HAVE ASPHALT SHINGLES.
  - ANY EXTERIOR WALL OF THE HOME VISIBLE FROM THE PUBLIC STREET SHALL CONTAIN AT LEAST TWO DECORATIVE ELEMENTS SUCH AS, BUT NOT LIMITED TO THE FOLLOWING ELEMENTS: PORCH, DECORATIVE TRIM, DECORATIVE GABLE, COLUMN
  - ALL ARCHITECTURAL ELEMENTS TO BE CONSISTENT WITH THE BUILDING STYLE OF THE TOWNHOME.
  - WHERE TOWNHOMES ARE CONSTRUCTED WITH GARAGES BEING ACCESSED FROM STREETS, THE GARAGE DOOR SHALL BE RECESSED 1' FROM STREET FACING FACADE. THIS SETBACK SHALL NOT APPLY WHERE GARAGES ARE ACCESSED VIA ALLEYS.



LOT TYPE E (PEDESTRIAN MALL)



LOT TYPE E (ALLEY LOADED)



LOT TYPE E (PARKING LOT)



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PROJECT #: L20017

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114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:

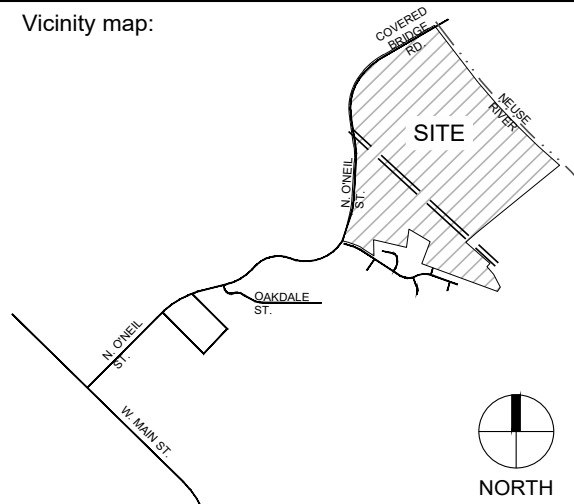
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RIVERWILD  
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CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

Vicinity map:



Seal:



Project:

**ASHCROFT  
SECTION 2**

Issued for:

**MASTER PLAN**

| No. | Date | Description |
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Title:

**TOWNHOME  
REGULATING PLAN**

Project number: L20017 Sheet #:

Issued Date: 08.03.2020

Drawn by: MT

Approved by: KH

**13.0**



- UPPER-STORY RESIDENCE
- ASSEMBLY
- CHURCH/PLACE OF WORSHIP
- DAY CARE FACILITY
- GOVERNMENT SERVICE
- HOSPITAL/MEDICAL CENTER
- SCHOOL
- ENTERTAINMENT (INDOOR)
- ENTERTAINMENT (OUTDOOR)
- FITNESS/RECREATION CENTER
- CAR/WASH/UT DETAILING
- CONVENIENCE STORE WITH GAS SALES
- FINANCIAL INSTITUTION
- HOTEL/MOTEL
- KENNEL
- LAUNDRY SERVICES
- COCKTAIL LOUNGE
- MICROBREWERY
- PUBLISHER
- OFFICE/GENERAL
- OFFICE/MEDICAL
- OUTDOOR SEATING/SIDEWALK CAFE
- MEDIA/RECORDING STUDIO
- RESTAURANT
- RETAIL SALES
- SERVICE
- VEHICLE REPAIR/SERVICE
- VETERINARY CLINIC
- TELECOMMUNICATION FACILITY
- UTILITY/MINOR
- FOOD TRUCK
- DAY CARE FACILITY
- OUTDOOR DISPLAYS/SALES
- OUTDOOR DINING

| DEVELOPMENT STANDARD TABLE    |                        |
|-------------------------------|------------------------|
| DEVELOPMENT PERIMETER SETBACK | 20'                    |
| INTERNAL SETBACKS             | 0                      |
| MINIMUM BUILDING SEPARATION   | 20'                    |
| MAXIMUM BUILDING COVERAGE     | 50%                    |
| MAXIMUM IMPERVIOUS<br>HEIGHT  | 85%<br>3 STORIES / 50' |
| COMMERCIAL INTENSITY          | 105,000 SF MAX         |
| APARTMENT DENSITY             | 180 UNITS              |

- CEMETERY
- GUN RANGE
- NURSERY
- SELF-STORAGE
- TOWING SERVICE/STORAGE
- VEHICLE SALES/RENTAL
- WAREHOUSE/FREIGHT MOVEMENT
- OUTDOOR STORAGE/LIMITED

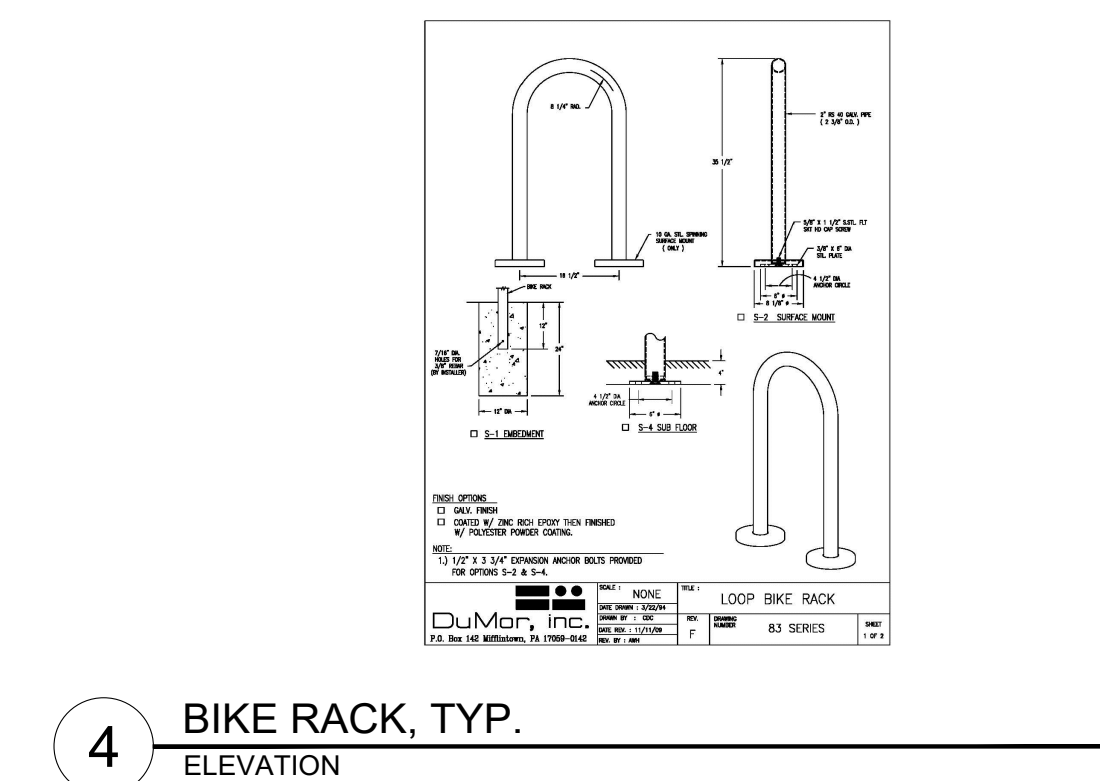
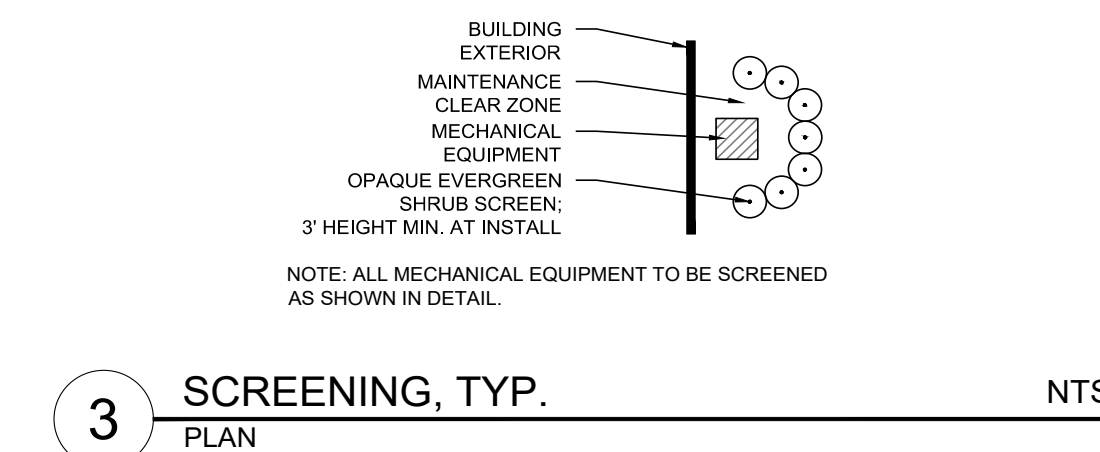
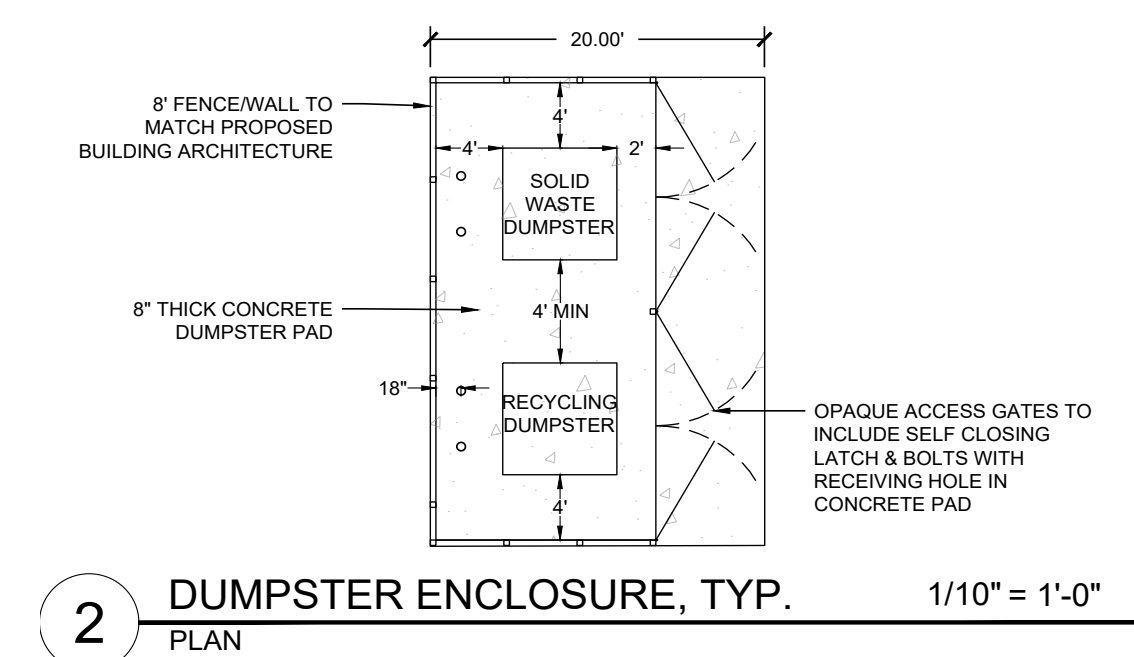
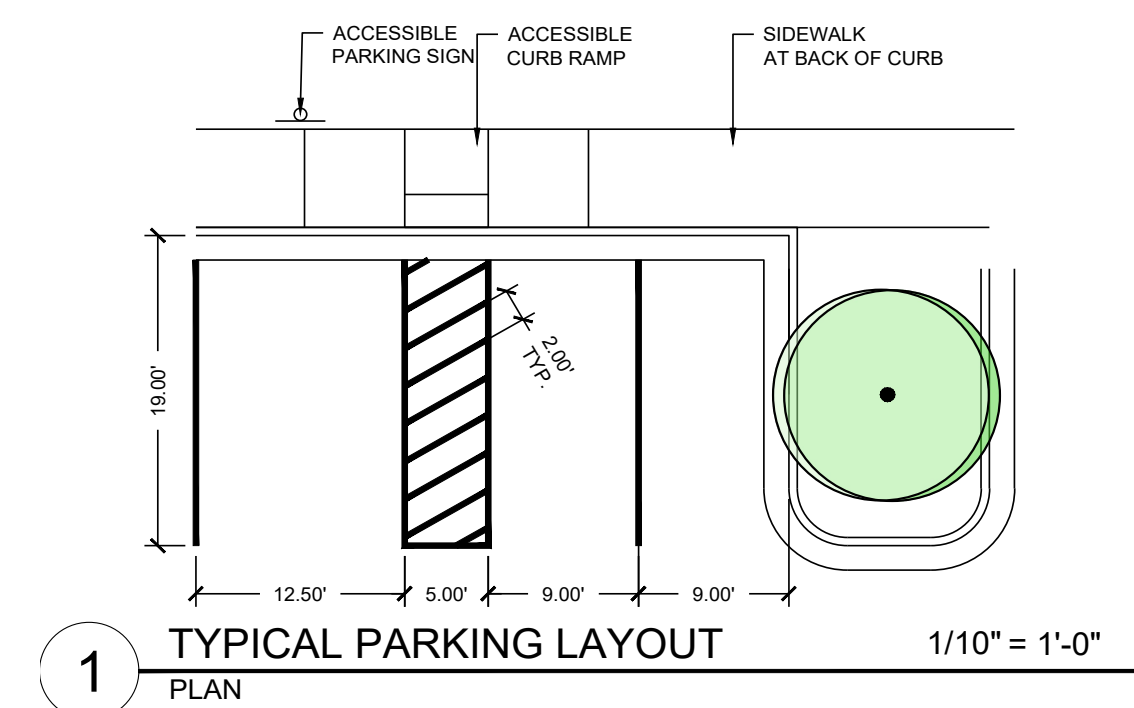
- APARTMENTS
- NURSING HOME



\\Projects\2020\20017 - Ashcroft 2\DWGS\1-Site Plan\3-Sheets\20017-C7.0 Typical Housing Types.dwg Jan 21, 2021 - 3:52pm

1. WHEN BUILDINGS ARE THREE OR MORE STORIES IN HEIGHT, VARIATIONS IN MASSING AND/OR SETBACKS SHALL BE PROVIDED ON THE TOP FLOOR TO DIFFERENTIATE THE TOP FLOOR FROM LOWER FLOORS.
2. ALL SIDES OF A BUILDING SHALL INCLUDE ARCHITECTURAL DETAILING.
3. EACH BUILDING FAÇADE SHALL INCLUDE NOT LESS THAN TWO DIFFERENT COLORS / MATERIALS.
4. THE PRIMARY EXTERIOR SIDING MATERIALS MAY CONSIST OF WOOD, VINYL, FIBER-CEMENT, MASONRY BRICK, MASONRY STONE, STONE VENEER, OR SYNTHETIC STONE.
5. MASONRY ACCENTS OF EITHER BRICK OR CULTURE STONE SHALL BE USED, ON ALL BUILDING SIDES, TO AVOID MONOTONOUS AND CONTINUOUS BUILDING FAÇADES.
6. REFUSE CONTAINERS AND GROUND-LEVEL EQUIPMENT SHOULD BE SCREENED FROM VIEW ON AT LEAST THREE SIDES AND BE ARCHITECTURALLY COMPATIBLE WITH SURROUNDING STRUCTURES. THEY SHOULD BE LOCATED AND DESIGNED TO BE INCONSPICUOUS TO THE EXTENT PRACTICAL.
7. ROOF LINES TO MATCH ARCHITECTURAL BUILDING STYLE AND WILL HAVE ASPHALT SHINGLES ON ANGLED ROOFS.
8. MULTI-FAMILY BUILDINGS SHALL INCLUDE TWO OR MORE OF THE FOLLOWING ARCHITECTURAL DESIGN FEATURES:
  - a. DECORATIVE MOLDINGS
  - b. SHUTTERS
  - c. CANOPIES
  - d. AWNINGS
  - e. PORCHES
  - f. COLUMNS
  - g. DECORATIVE DOORS AND WINDOWS
  - h. ROOF OVERHANGS
  - i. WOOD OR METAL ACCENTS
  - j. DECORATIVE LIGHTINGS
  - k. LEDGES
  - l. ARCHED WINDOWS

1. EXTERIOR MATERIALS SHALL INCLUDE BRICK, GLASS, STONE, MARBLE, GRANITE, MASONRY, PRE-CAST OR POURED CONCRETE OR SIMILAR DURABLE MATERIALS.
2. ROOFTOP MECHANICAL EQUIPMENT SHALL BE SCREENED FROM VIEW.
3. SITE ACCESS, PARKING AND CIRCULATION SHALL BE ARRANGED IN A LOGICAL AND SAFE MANNER FOR PEDESTRIANS AND VEHICLES AND IN COMPLIANCE WITH THE UDC.
4. SPACES FOR OUTSIDE EQUIPMENT, TRASH RECEPTACLES, STORAGE, AND LOADING AREAS WILL LOCATED AND SCREENED IN COMPLIANCE WITH THE UDC.
5. INDIVIDUAL SITE AMENITIES WITHIN THE COMMERCIAL SETTING SHALL HAVE COMMON FEATURES, SUCH AS COLOR, MATERIAL, AND DESIGN TO PROVIDE A COHESIVE ENVIRONMENT AND A MORE IDENTIFIABLE CHARACTER.
6. ENTRY FEATURES SHOULD BE CLEARLY VISIBLE TO PEDESTRIANS, APPROACHING FROM STREET AND SIDEWALK.
7. SECONDARY ENTRIES MAY BE LOCATED AT THE SIDE OR REAR OF THE BUILDING TO PROVIDE ACCESS FROM PARKING AREAS.
8. CANOPIES, AWNINGS, ARCADES, AND OVERHANGS MAY BE UTILIZED ON THE GROUND FLOOR OF COMMERCIAL BUILDINGS.
9. THE USE OF SILLS, HEADERS, REVEALS, PILASTERS, WINDOW BAYS OR SIMILAR FEATURES SHALL BE UTILIZED TO BREAK UP BUILDING FORMS AND WALL SURFACES.



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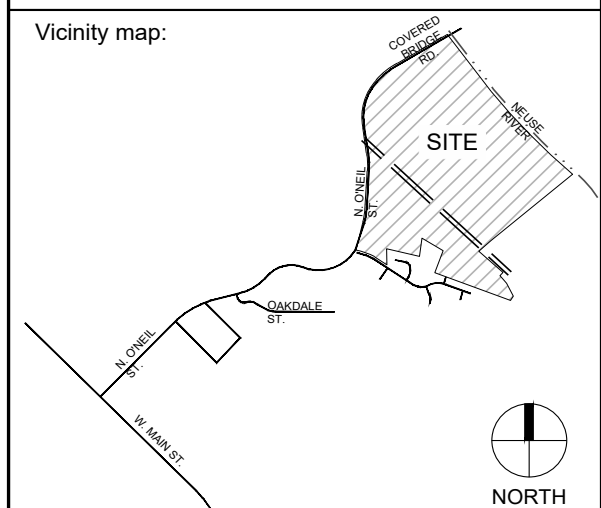
Client: ASHCROFT PARTNERS, LLC  
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CONTACT: DAVID DEYOUNG, AICP

Vicinity map:



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ASHCROFT  
SECTION 2

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|-------------|--|
| Issued for: |  |
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## MASTER PLAN

[illegible]

Title:

APARTMENT &  
COMMERCIAL  
REGULATING PLAN

Project number: L20017 Sheet #: 14  
 Issued Date: 08.03.2020  
 Drawn by: MT  
 Approved by: KH





AMENITY CENTER CONCEPT SKETCH  
FOR ILLUSTRATIVE PURPOSES ONLY.  
AMENITY ARCHITECTURAL ELEVATIONS AND MINOR SITE PLAN APPLICATION SHALL BE SUBMITTED TO THE TOWN OF CLAYTON FOR SITE PLAN APPROVAL IN ACCORDANCE WITH THE UNIFIED DEVELOPMENT CODE.

- Amenity Center Design Standards**
1. Amenity Center Pod shall be a minimum of 3 acres in size.
  2. Any parking areas shall comply with Town of Clayton UDC requirements for parking lots and islands.
  3. All HVAC and mechanical equipment shall be screened from the public ROW in accordance with Town of Clayton UDC requirements.
  4. All architectural elements including color palette to be consistent with the Amenity Center building style.
  5. All recreation and open space shall be maintained by the HOA.
  6. Materials:
    - a. Siding - Fiber siding, shake, brick, board/batten or combination
    - b. Roof - Asphalt shingles/masonry-stone
    - c. Additional Trim Details - Columns, Stone, or Brick
  7. Amenity Center Building shall be a minimum of 4,000 sf with a pool area that is a minimum of 7,500 sf.

| DIMENSIONAL STANDARDS TABLE  |      |
|------------------------------|------|
| MINIMUM LOT SIZE (SF)        | 3 AC |
| MAXIMUM IMPERVIOUS AREA      | 85%  |
| MAXIMUM BUILDING COVERAGE    | 25%  |
| BUILDING SETBACKS            |      |
| FRONT STREET (FROM SIDEWALK) | 20'  |
| SIDE STREET (FROM SIDEWALK)  | 15'  |
| SIDE                         | 15'  |
| REAR                         | 20'  |

| ASHCROFT ATHLETIC CLUB (3 USES MIN) |  |
|-------------------------------------|--|
| FITNESS ROOM                        |  |
| BUSINESS CENTER                     |  |
| MAIL ROOM                           |  |
| POOL                                |  |
| LAZY RIVER                          |  |
| COMMUNITY LOUNGE                    |  |
| BOCCO COURTS                        |  |
| PLAYGROUND                          |  |

**ADDITIONAL AMENITY RESOURCES**

**RIVERWOOD ATHLETIC CLUB**

OUTDOOR POOLS  
INDOOR POOL  
WORKOUT FACILITY  
WALKING TRAILS

**LIONSGATE ATHLETIC CLUB**

OUTDOOR POOLS  
WORKOUT FACILITY

**RIVERWOOD GOLF CLUB**

GOLF COURSE AND DRIVING RANGE

**EAGLE RIDGE GOLF CLUB**

GOLF COURSE AND DRIVING RANGE

**OLD LIBERTY GOLF CLUB**

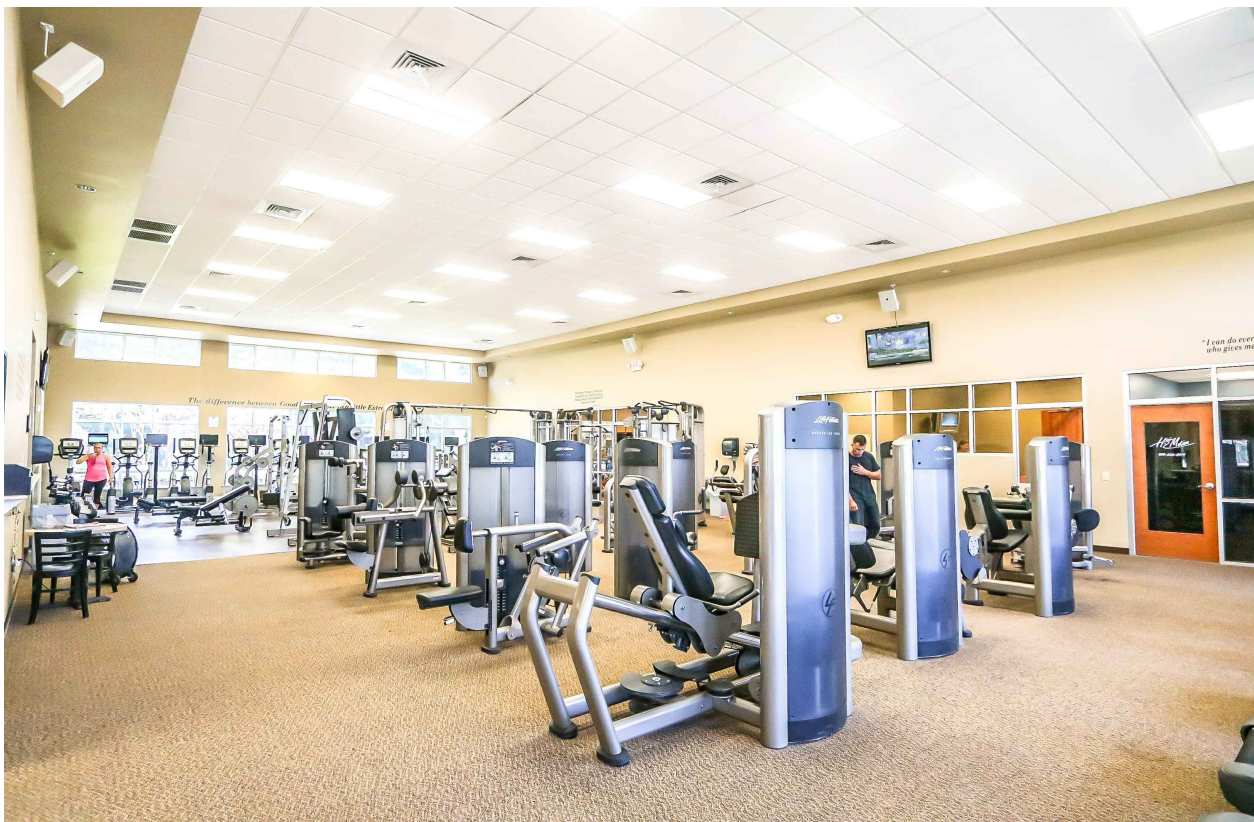
GOLF COURSE AND DRIVING RANGE

**HEDDINGHAM GOLF CLUB**

GOLF COURSE AND DRIVING RANGE

**TRALEE ATHLETIC CLUB**

OUTDOOR POOLS



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CLAYTON, NC 27520

**Consultants:**

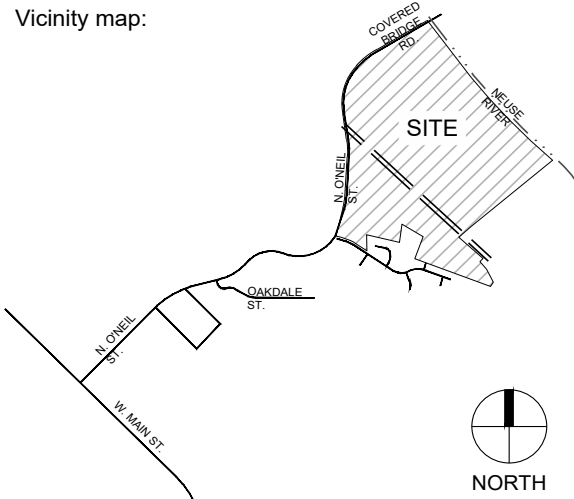
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

KIMLEY HORN  
421 FAYETTEVILLE ST SUITE 600  
RALEIGH, NC 27601

**Agent:**

RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

**Vicinity map:**



**Seal:**



**Project:**

**ASHCROFT  
SECTION 2**

**Issued for:**

**MASTER PLAN**

| No. | Date | Description |
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**Title:**

**AMENITY CENTER  
REGULATING PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: MT  
Approved by: EL

**15.0**





**LEGEND:**

- 100 YEAR FLOODPLAIN (RCA)
- STREAM BUFFER (RCA)
- STREAM CENTERLINE
- PASSIVE OPEN SPACE
- IMPROVED OPEN SPACE
- APARTMENTS
- COMMERCIAL
- LOT TYPE A (4,200 SF)
- LOT TYPE B (5,000 SF)
- LOT TYPE C (10,000 SF)
- LOT TYPE D (1 AC)
- TOWNES
- MAILBOX CENTER
- TRAIL NETWORK
- STEEP SLOPES (RCA PER UDC NOT PROTECTED UNDER WAIVER)
- STEEP SLOPES (RCA PROTECTED UNDER WAIVER - UP TO 15% OF THIS AREA MAY BE IMPACTED)

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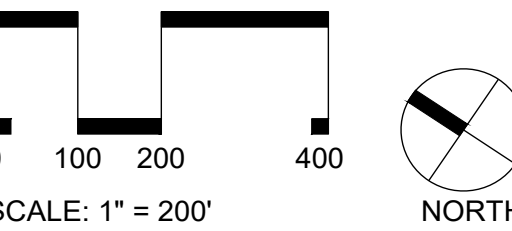
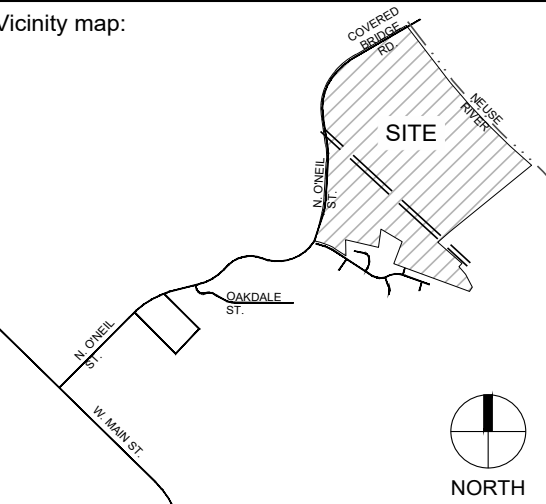
**STEWART**  
101 WEST MAIN ST.  
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T 919.380.8750  
FIRM LICENSE #: C-1051  
www.stewartinc.com  
PROJECT #: L20017

Client:  
ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:  
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

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Agent:  
RIVERWILD  
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CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP



Project:  
**ASHCROFT  
SECTION 2**

Issued for:  
**MASTER PLAN**

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Title:  
**RCA OVERLAY**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: CS **16.0**



PERMITTED USES IN ASHCROFT SECTION 2  
COMMERCIAL POD:

- UPPER-STORY RESIDENCE
- ASSEMBLY
- CHURCH/PLACE OF WORSHIP
- DAY CARE FACILITY
- GOVERNMENT SERVICE
- HOSPITAL/MEDICAL CENTER
- SCHOOL
- ENTERTAINMENT (INDOOR)
- ENTERTAINMENT (OUTDOOR)
- FITNESS/RECREATION CENTER
- CAR WASH/AUTO DETAILING
- CONVENIENCE STORE WITH GAS SALES
- FINANCIAL INSTITUTION
- HOTEL/MOTEL
- KENNEL
- LAUNDRY SERVICES
- COCKTAIL LOUNGE
- MICROBREWERY
- PUBLISHER
- OFFICE/GENERAL
- OFFICE/MEDICAL
- OUTDOOR SEATING/SIDEWALK CAFE
- RADIO/TELEVISION/MEDIA/RECORDING STUDIO
- RESTAURANT
- RETAIL SALES
- SERVICE
- VEHICLE REPAIR/SERVICE
- VETERINARY CLINIC
- TELECOMMUNICATION FACILITY
- UTILITY/MINOR
- FOOD TRUCK
- DAY CARE FACILITY
- OUTDOOR DISPLAYS/SALES
- OUTDOOR DINING

PERMITTED USES IN ASHCROFT  
SECTION 2 APARTMENT POD:

- APARTMENTS
- NURSING HOME

PERMITTED BUILDING TYPE  
IN ASHCROFT SECTION 2  
APARTMENT POD:

- APARTMENTS

| DEVELOPMENT STANDARD TABLE    |                 |
|-------------------------------|-----------------|
| DEVELOPMENT PERIMETER SETBACK | 20'             |
| INTERNAL SETBACKS             | 0               |
| MINIMUM BUILDING SEPARATION   | 20'             |
| MAXIMUM BUILDING COVERAGE     | 50%             |
| MAXIMUM IMPERVIOUS            | 85%             |
| HEIGHT                        | 3 STORIES / 50' |
| COMMERCIAL INTENSITY          | 105,000 SF MAX  |
| APARTMENT DENSITY             | 180 UNITS       |

APARTMENT BUILDING DESIGN STANDARDS:

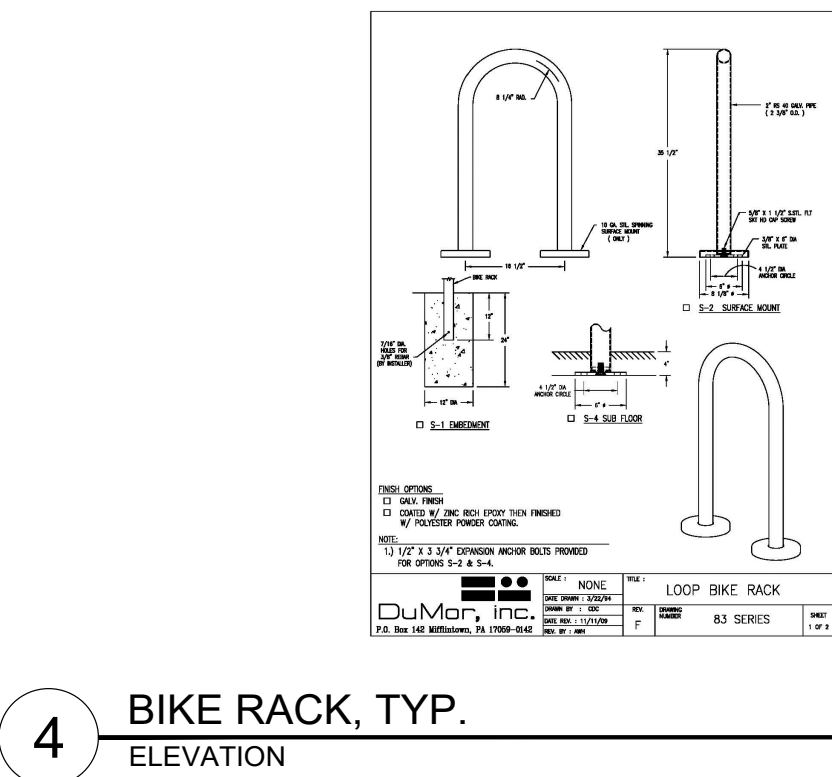
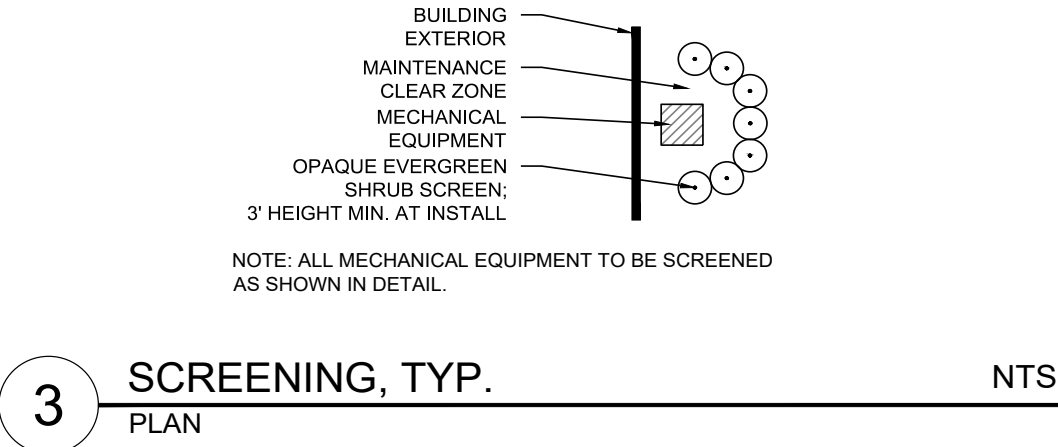
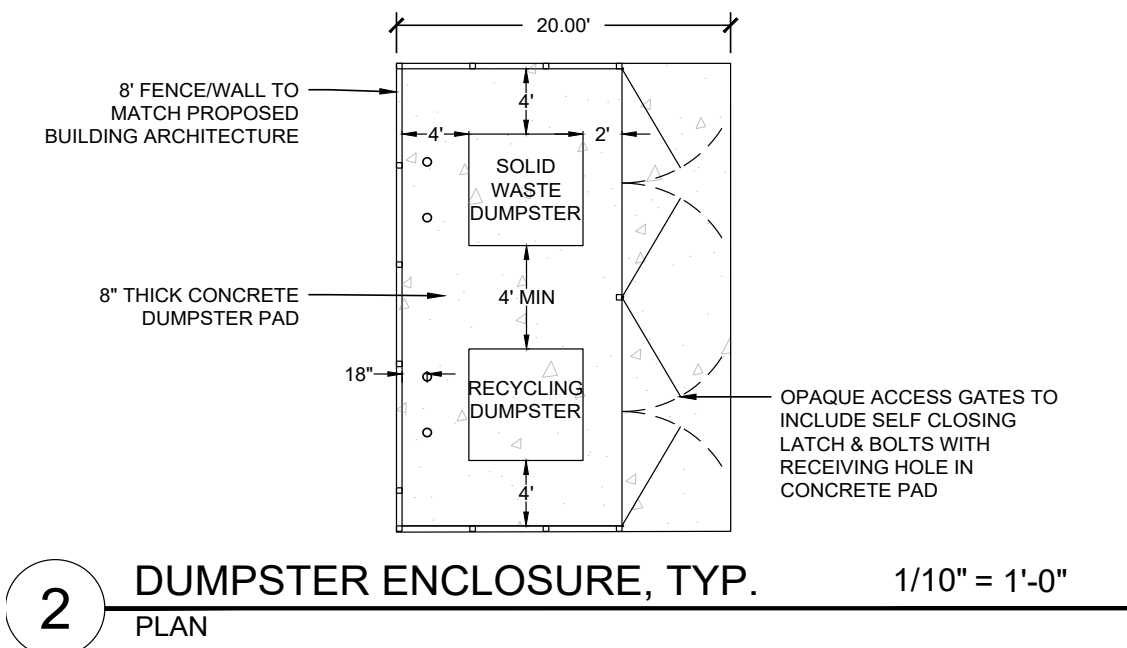
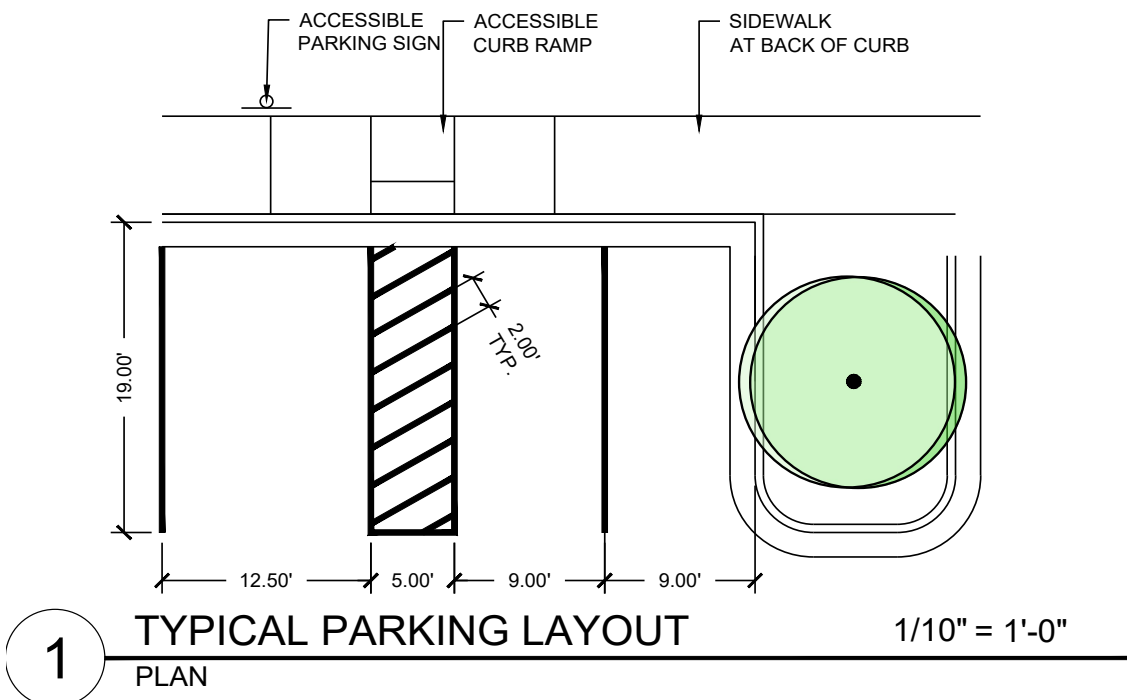
1. WHEN BUILDINGS ARE THREE OR MORE STORIES IN HEIGHT, VARIATIONS IN MASSING AND/OR SETBACKS SHALL BE PROVIDED ON THE TOP FLOOR TO DIFFERENTIATE THE TOP FLOOR FROM LOWER FLOORS.
2. ALL SIDES OF A BUILDING SHALL INCLUDE ARCHITECTURAL DETAILING.
3. EACH BUILDING FAÇADE SHALL INCLUDE NOT LESS THAN TWO DIFFERENT COLORS / MATERIALS.
4. THE PRIMARY EXTERIOR SIDING MATERIALS MAY CONSIST OF WOOD, VINYL, FIBER-CEMENT, MASONRY BRICK, MASONRY STONE, STONE VENEER, OR SYNTHETIC STONE.
5. MASONRY ACCENTS OF EITHER BRICK OR CULTURE STONE SHALL BE USED, ON ALL BUILDING SIDES, TO AVOID MONOTONOUS AND CONTINUOUS BUILDING FAÇADES.
6. REFUSE CONTAINERS AND GROUND-LEVEL EQUIPMENT SHOULD BE SCREENED FROM VIEW ON AT LEAST THREE SIDES AND BE ARCHITECTURALLY COMPATIBLE WITH SURROUNDING STRUCTURES. THEY SHOULD BE LOCATED AND DESIGNED TO BE INCONSPICUOUS TO THE EXTENT PRACTICAL.
7. ROOF LINES TO MATCH ARCHITECTURAL BUILDING STYLE AND WILL HAVE ASPHALT SHINGLES ON ANGLED ROOFS.
8. MULTI-FAMILY BUILDINGS SHALL INCLUDE TWO OR MORE OF THE FOLLOWING ARCHITECTURAL DESIGN FEATURES:
  - a. DECORATIVE MOLDINGS
  - b. SHUTTERS
  - c. CANOPIES
  - d. AWNINGS
  - e. PORCHES
  - f. COLUMNS
  - g. DECORATIVE DOORS AND WINDOWS
  - h. ROOF OVERHANGS
  - i. WOOD OR METAL ACCENTS
  - j. DECORATIVE LIGHTINGS
  - k. LEDGES
  - l. ARCHED WINDOWS

COMMERCIAL BUILDING DESIGN STANDARDS:

1. EXTERIOR MATERIALS SHALL INCLUDE BRICK, GLASS, STONE, MARBLE, GRANITE, MASONRY, PRE-CAST OR POURED CONCRETE OR SIMILAR DURABLE MATERIALS.
2. ROOFTOP MECHANICAL EQUIPMENT SHALL BE SCREENED FROM VIEW.
3. SITE ACCESS, PARKING AND CIRCULATION SHALL BE ARRANGED IN A LOGICAL AND SAFE MANNER FOR PEDESTRIANS AND VEHICLES AND IN COMPLIANCE WITH THE UDC.
4. SPACES FOR OUTSIDE EQUIPMENT, TRASH RECEPTACLES, STORAGE, AND LOADING AREAS WILL LOCATED AND SCREENED IN COMPLIANCE WITH THE UDC.
5. INDIVIDUAL SITE AMENITIES WITHIN THE COMMERCIAL SETTING SHALL HAVE COMMON FEATURES, SUCH AS COLOR, MATERIAL, AND DESIGN TO PROVIDE A COHESIVE ENVIRONMENT AND A MORE IDENTIFIABLE CHARACTER.
6. ENTRY FEATURES SHOULD BE CLEARLY VISIBLE TO PEDESTRIANS, APPROACHING FROM STREET AND SIDEWALK.
7. SECONDARY ENTRIES MAY BE LOCATED AT THE SIDE OR REAR OF THE BUILDING TO PROVIDE ACCESS FROM PARKING AREAS.
8. CANOPIES, AWNINGS, ARCADES, AND OVERHANGS MAY BE UTILIZED ON THE GROUND FLOOR OF COMMERCIAL BUILDINGS.
9. THE USE OF SILLS, HEADERS, REVEALS, PILASTERS, WINDOW BAYS OR SIMILAR FEATURES SHALL BE UTILIZED TO BREAK UP BUILDING FORMS AND WALL SURFACES.



MULTIFAMILY & COMMERCIAL DEVELOPMENT CONCEPT SKETCH  
FOR ILLUSTRATIVE PURPOSES ONLY.



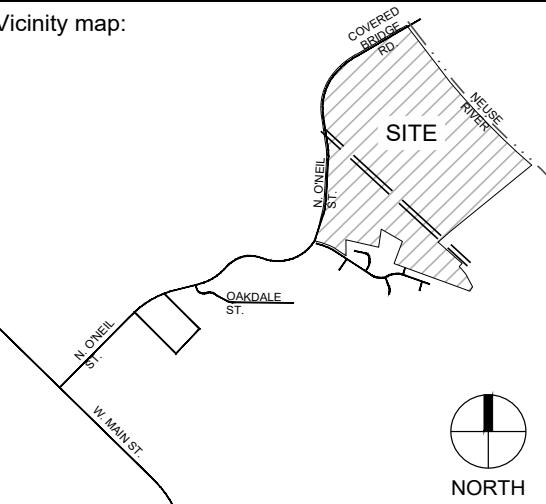
**STEWART**  
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T 919-380-8750  
FIRM LICENSE #: C-1051  
www.stewartinc.com  
PROJECT #: L20017

Client:  
ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:  
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
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RALEIGH, NC 27601

Agent:  
RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP



Project:  
**ASHCROFT  
SECTION 2**

Issued for:  
**MASTER PLAN**

| No. | Date | Description |
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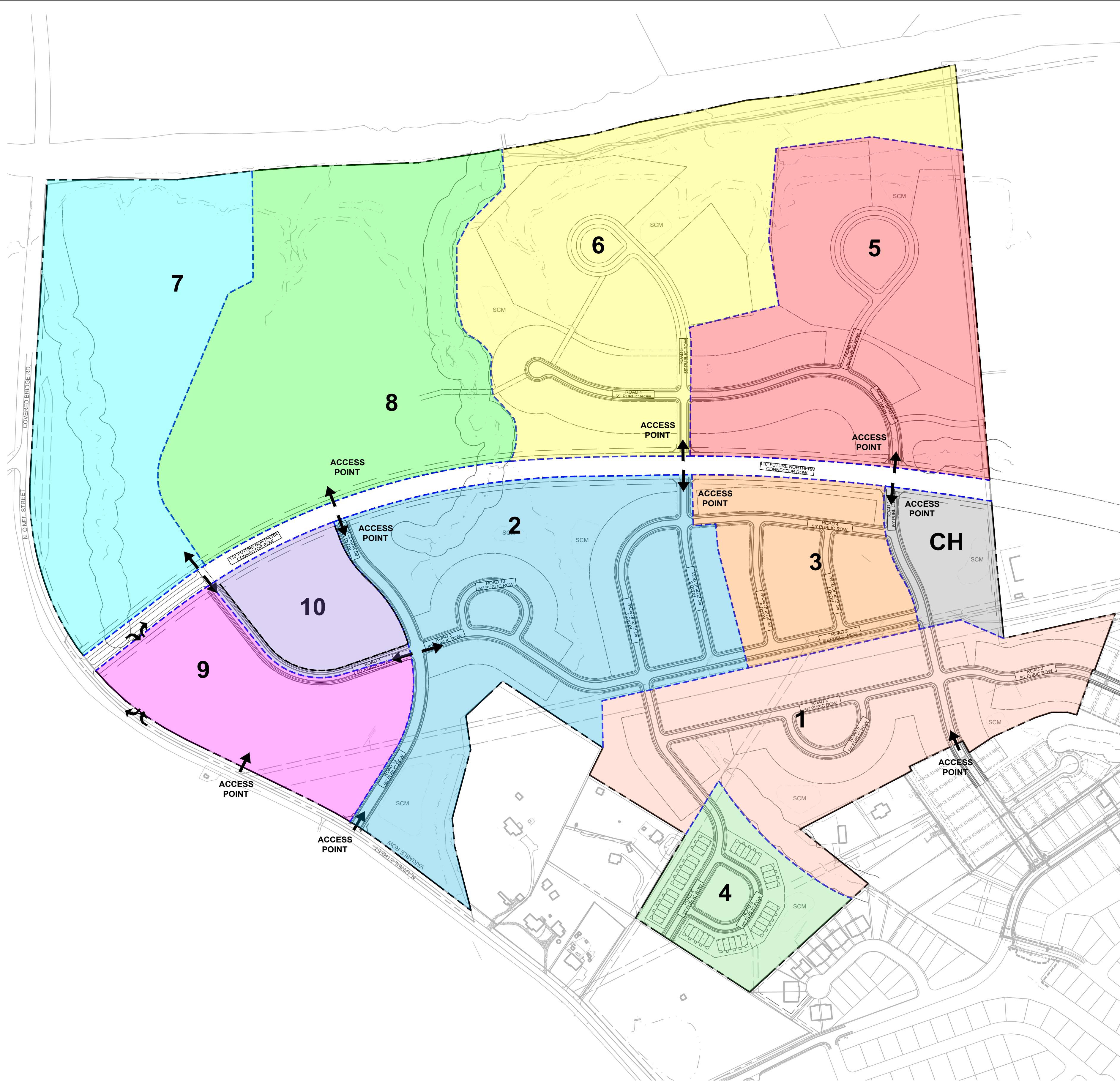
Title:  
**APARTMENT &  
COMMERCIAL  
REGULATING PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: MT  
Approved by: KH

**14.0**



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| SITE DATA:                  |           |
|-----------------------------|-----------|
| TOTAL SITE AC.:             | 254.85    |
| PROJECT AC.:                | 241.21    |
| RESOURCE CONSERVATION AREA: | 34.53     |
| NET PROJECT AC.:            | 206.67    |
| TOTAL UNITS:                | 772 UNITS |

| PHASE 1             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 91 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 2             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 80 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 3             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 64 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 4             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | 0      |
| TOWNHOME LOTS:      | +/- 40 |
| APARTMENT UNITS:    | 0      |

| PHASE 5             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 32 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 6             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 26 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 7             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | 0      |
| TOWNHOME LOTS:      | +/- 94 |
| APARTMENT UNITS:    | 0      |

| PHASE 8             |         |
|---------------------|---------|
| SINGLE FAMILY LOTS: | 0       |
| TOWNHOME LOTS:      | +/- 165 |
| APARTMENT UNITS:    | 0       |

| PHASE 9         |             |
|-----------------|-------------|
| COMMERCIAL (SF) | +/- 105,000 |

| PHASE 10            |         |
|---------------------|---------|
| SINGLE FAMILY LOTS: | 0       |
| TOWNHOME LOTS:      | 0       |
| APARTMENT UNITS:    | +/- 180 |

| LEGEND: |                                  |
|---------|----------------------------------|
|         | PHASE 1                          |
|         | CLUBHOUSE                        |
|         | PHASE 2                          |
|         | PHASE 3                          |
|         | PHASE 4                          |
|         | PHASE 5                          |
|         | PHASE 6                          |
|         | PHASE 7                          |
|         | PHASE 8                          |
|         | PHASE 9                          |
|         | PHASE 10                         |
|         | FULL MOVEMENT ACCESS POINT       |
|         | RIGHT-IN/ RIGHT-OUT ACCESS POINT |

- NOTES:
- PHASES DEPICTED ON PLAN DO NOT REPRESENT SEQUENCE OF DEVELOPMENT. APPLICANT RESERVES THE RIGHT TO DEVELOP SITE IMPROVEMENTS AND OBTAIN CERTIFICATES OF OCCUPANCY FOR EACH PROJECT AREA INDEPENDENTLY AND ACCORDING TO THE PROJECT SCHEDULE DETERMINED TO BEST MEET THE NEEDS AND FUNCTIONALITY OF THE COMMUNITY DURING CONSTRUCTION.
  - EACH PRIMARY PHASE MUST BE SELF SUFFICIENT AND STAND ALONE AS IT RELATES TO MEETING APPLICABLE UDC REQUIREMENTS.
  - NUMBER OF LOTS AND PRODUCT TYPE IN EACH PHASE ARE SCHEMATIC IN NATURE AND SUBJECT TO CHANGE AT FINAL ENGINEERING AND PERMITTING.
  - AMENITY AREA (PHASE 1A) TO BE CONSTRUCTED UPON COMPLETION OF PHASE 1.
  - ACCESS POINTS FOR PHASE 9 TO BE DETERMINED IN CONJUNCTION WITH MAJOR SITE PLAN, PER UDC REQUIREMENTS.
  - BOUNDARIES OF PHASES 7 & 8 SUBJECT TO CHANGE. NO MORE THAN 30 UNITS SHALL BE BUILT WITHIN THESE PHASES PRIOR TO PROVISION OF A SECOND ACCESS POINT.



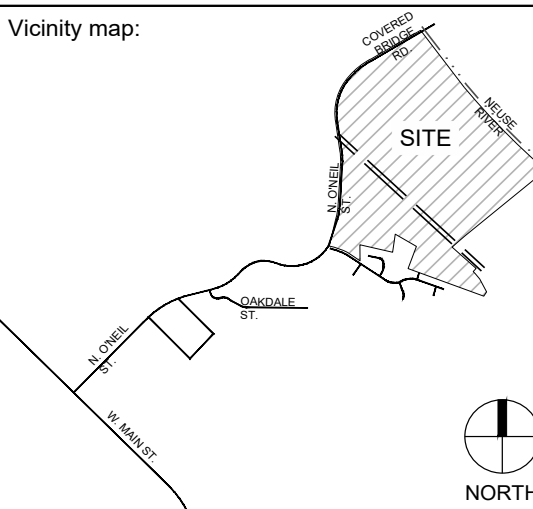
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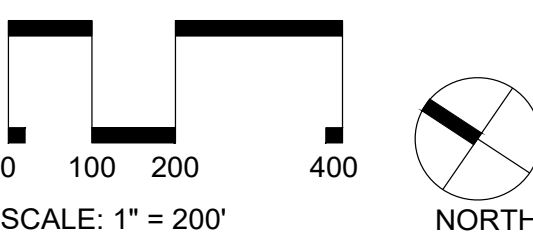
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CONTACT: DAVID DEYOUNG, AICP



Seal:



Project:  
**ASHCROFT  
SECTION 2**

Issued for:  
**MASTER PLAN**

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Title:  
**PHASING PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: MT **5.0**



**Town of Clayton  
Town Council  
Preliminary Subdivision Plat Motion Sheet**

After considering the competent, material, and substantial evidence presented, including the application and materials of record, I move to **(PICK ONE)**:

- ☐ Approve
- ☐ Deny
- ☐ Approve with Conditions

Preliminary Subdivision Plat Application Number 2021-114-SD – Ashcroft 2

This motion is based on the following findings:

1. The preliminary subdivision plat **IS** consistent with the adopted plans and policies of the town.

**OR**

The preliminary subdivision plat **IS NOT** consistent with the adopted plans and policies of the town. (State evidence supporting finding.)

\*\*\*\*\*

2. The subdivision **MEETS** all required specifications of the Town of Clayton Unified Development Code.

**OR**

The subdivision **DOES NOT MEET** all required specifications of the Town of Clayton Unified Development Code. (State evidence supporting finding.)

\*\*\*\*\*

3. The subdivision **WILL NOT** be detrimental to the use or orderly development of other properties in the surrounding area and **WILL NOT** violate the character of existing standards for development of properties in the surrounding area.

**OR**

The subdivision **WILL** be detrimental to the use or orderly development of other properties in the surrounding area and **WILL** violate the character of existing standards for development of properties in the surrounding area. (State evidence supporting finding).

MOTION FORM  
Item 6b  
2020-114-SD  
Ashcroft 2



\*\*\*\*\*

4. The subdivision design **WILL** provide for the distribution of traffic in a manner that will avoid or mitigate congestion within the immediate area, **WILL** provide for the unified and orderly use of or extension of public infrastructure, and **WILL NOT** materially endanger the environment, public health, safety, or the general welfare.

**OR**

The subdivision design **WILL NOT** provide for the distribution of traffic in a manner that will avoid or mitigate congestion within the immediate area, **WILL NOT** provide for the unified and orderly use of or extension of public infrastructure, and **WILL** materially endanger the environment, public health, safety, or the general welfare. (State evidence supporting finding).

\*\*\*\*\*

**[If approved with conditions]** The applicant meets this finding subject to the following conditions:

MOTION FORM  
Item 6b  
2020-114-SD  
Ashcroft 2

TOWN OF CLAYTON  
SUBDIVISION APPROVAL 2021-114-SD  
ASHCROFT 2  
PRELIMINARY PLAT (MASTER PLAN) MODIFICATION

GRANTED

On the date listed below, the Town Council for the Town of Clayton met and held an evidentiary hearing to consider the following application:

|                              |                                                                                                                                       |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Applicant:                   | Ashcroft Partners, LLC                                                                                                                |
| Property Location:           | N. O'Neil Street, North of Ashcroft Subdivision                                                                                       |
| Tax Parcel Number:           | 05H02013A, 05H02012, 05H02013, 05H02009A<br>05H02010A, Portion of 05H02200B, 05H02015                                                 |
| Proposed Use<br>of Property: | Up to 105,000 SF commercial and 772 residential units;<br>includes townhomes (299), single family lots (293), and<br>apartments (180) |
| Meeting Date:                | March 1, 2021                                                                                                                         |

Having heard all the evidence and argument presented at the hearing, the Town Council finds that the application is complete, that the application complies with all of the applicable requirements of the Clayton Zoning Ordinance for the subdivision proposed,

and that, therefore, the application to subdivide the above-described property for the purpose indicated is hereby approved, subject to all applicable provisions of the Zoning Ordinance and the following conditions:

(1) The applicant shall complete the subdivision strictly in accordance with the plans submitted to and approved by this Board, a copy of which is filed in the Planning Department office.

(2) If any of the conditions affixed hereto or any part thereof shall be held invalid or void, then this approval shall be void and of no effect.

The Town Council imposed the following **additional conditions** of the Subdivision Approval:

**General:**

1. Following Board approvals, three copies of the Planned Development Master Plan meeting the Conditions of Approval shall be submitted to Planning Department for final approval. The Conditions of Approval for the master plan shall be recorded on the cover sheet and shall be binding upon the master preliminary plat and upon the planned development rezoning.
2. All decorative traffic related signage shall be maintained solely by the developer or Homeowner's Association.
3. All phases of the development shall consist of complete street sections; no mid-block phasing shall be permitted.
4. Each phase of the development shall submit a minor site plan or subdivision plan for final review and approval by the Town Technical Review Committee.
5. Each individual phase, park, greenway section, or amenity area shall be reviewed as a part of either a minor preliminary plat or minor site plan, prior to plat recordation of the phase in which it is located.

**Recreation/Amenities/Landscaping**

1. Each individual phase, park, greenway section, or amenity area shall be reviewed as a part of either a minor preliminary plat or minor site plan, prior to associated plat recordation.
2. The commencement of the amenity center shall occur prior to the latter of the issuance of the 130th building permit, or the Town's written notice of completion of the new Wastewater Treatment Facility
3. Prior to site grading and construction activities, tree protection fencing shall be installed around all Resource Conservation Areas and other areas of protected vegetation.

4. All required landscaping buffers or plantings shall be installed or bonded prior to the platting of the phase in which they occur.

5. The greenway located along the frontage of the commercial pod (Phase 9) on N O'Neil Street shall be constructed and accepted by the Town prior to issuance of a Certificate of Occupancy for this phase. Fee-in-lieu for sidewalk shall be paid to the Town for the remainder of the development's frontage along N O'Neil Street prior to plat recordation of the associated phase.

#### **Access/Traffic**

1. No more than 30 residential building permits shall be issued within the subdivision until the Town's construction access to the Wastewater Treatment Plant has been installed. This access easement will be limited to construction traffic for the Wastewater Treatment Plant and emergency access only, but will serve as the secondary required access for the development. The connection to the existing Ashcroft 1 subdivision shall count towards the first required access point for this development.

2. Specific Northern Connector cross-section and lane configuration for sections required for access by the development are to be determined at minor site plan and dependent on adjacent development timelines. All sections are subject to Engineering Department review and approval. At a minimum, the developer will be responsible for grading out the entire ROW and cross section components (asphalt, curb and gutter, storm drain, pedestrian facilities, etc.) required in a standard Town collector street.

3. Cul-de-sac design and other elements related to access for emergency services shall be subject to Fire Department review and approval during the minor subdivision and site plan reviews.

4. The developer shall be responsible for designing and installing all TIA Road Improvements as reflected in the Master Plan. All off-site traffic improvements required by the North Carolina Department of Transportation Congestion Management Analysis shall be installed or financially guaranteed prior to the issuance of 400 building permits, unless otherwise approved by NCDOT.

5. All traffic improvements are based on current traffic volumes and projected growth for the study area. If the build out year for this development, as stated in the TIA, varies more than one year an addendum or revised TIA may be required subject to review by Town Planning and Engineering departments as well as NCDOT.

6. If the realignment of Covered Bridge Road is not completed prior to the build out of this development, then all improvements from Scenario #1 in NCDOT's Congestion Management Analysis will be required. If the realignment is completed prior to the build out of this development, then all of the improvements from Scenario #2 will be required.

7. Any roadway improvements and right-of-way dedication necessary to accommodate the road construction shall be the responsibility of the owner/developers. All required ROW shall be dedicated as public ROW in the final plat.

8. All driveways for the development along O'Neil Street shall be a minimum of 500' apart measuring the distance between the radiuses of both driveways.

IN WITNESS WHEREOF, the Town has caused this approval to be issued in its name.

TOWN OF CLAYTON

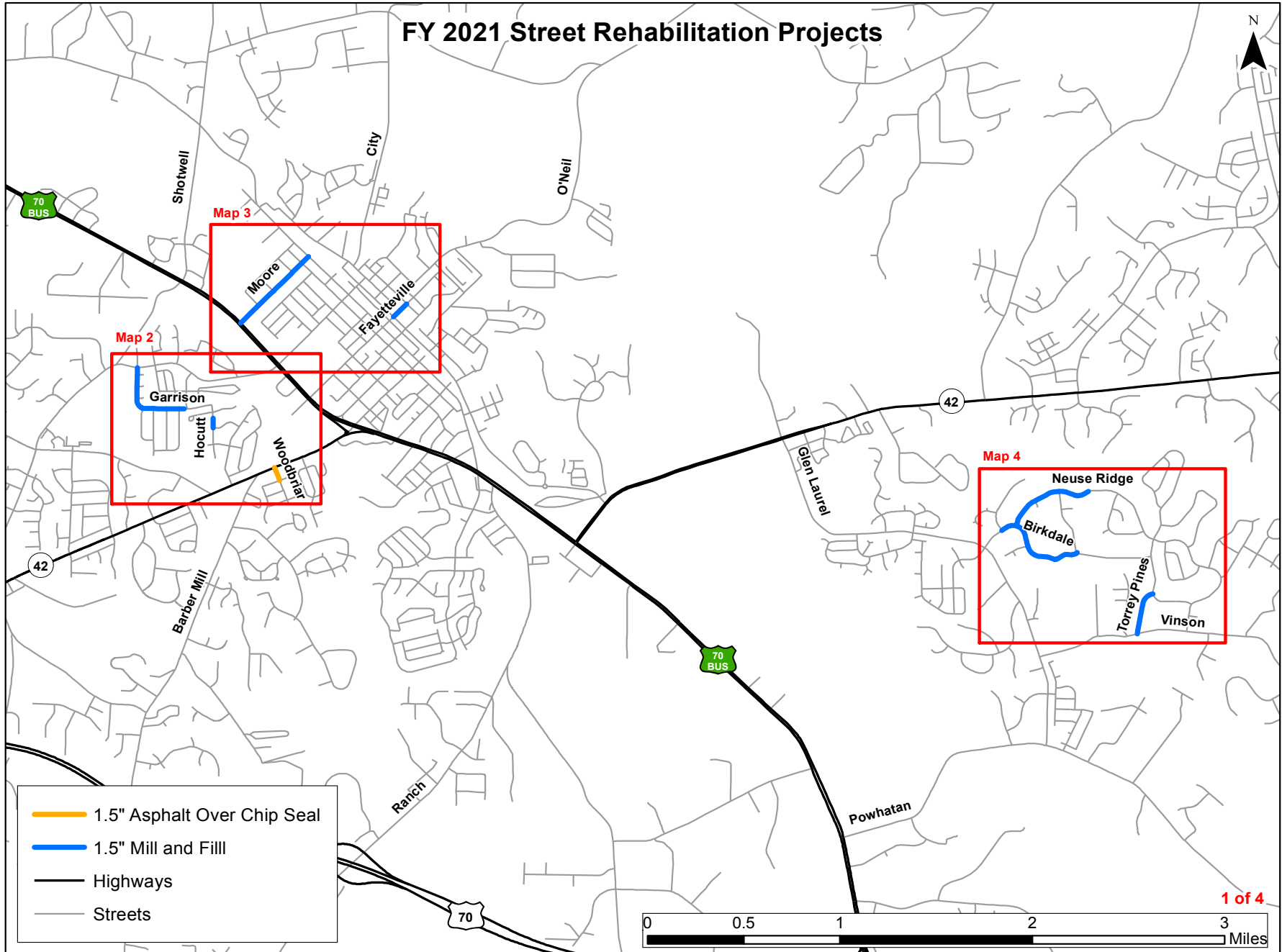
BY: \_\_\_\_\_  
Jody L. McLeod  
Mayor

\_\_\_\_\_  
Dated

ATTEST:

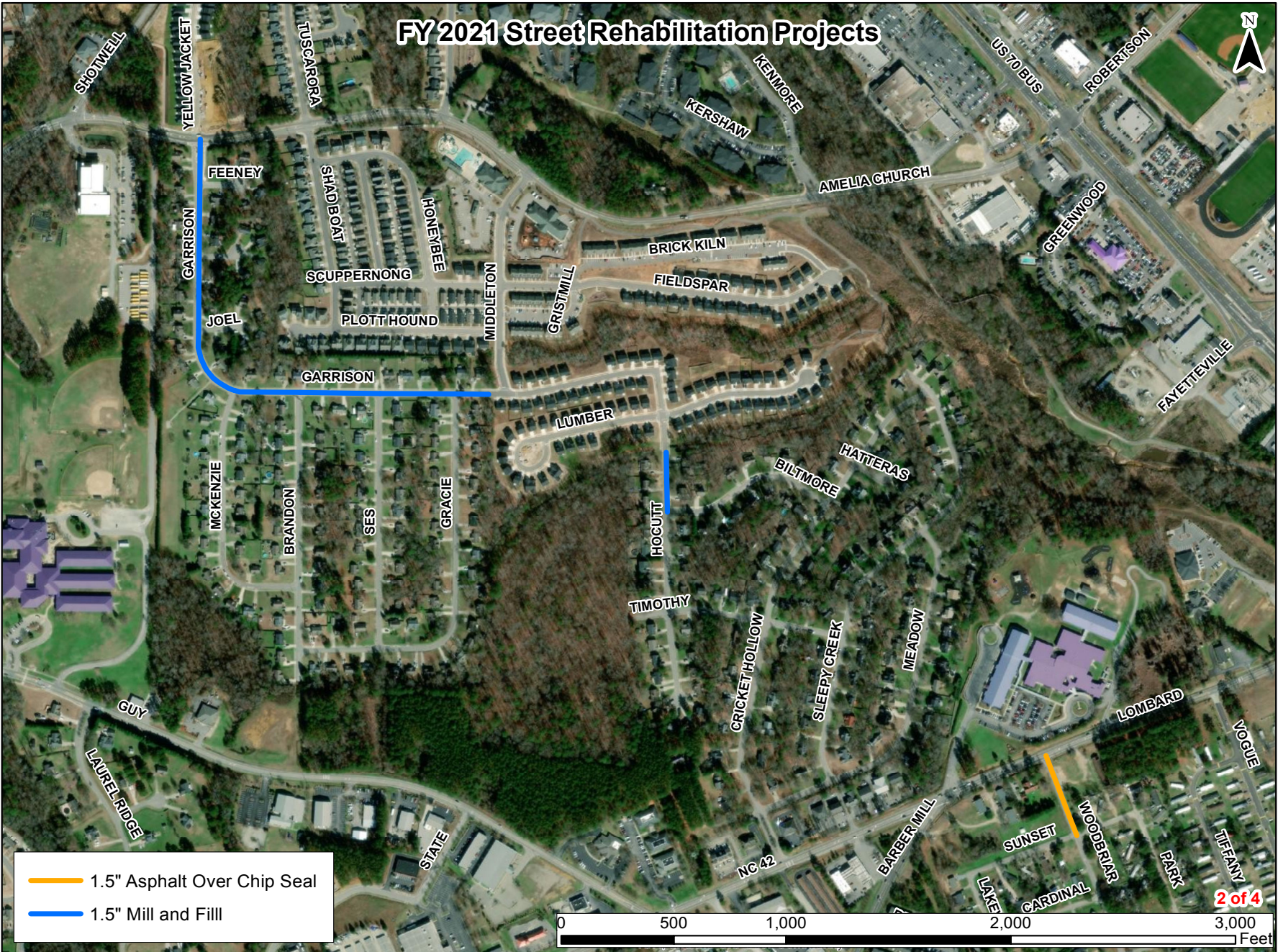
\_\_\_\_\_(SEAL)  
Kimberly A. Moffett, CMC, NCCMC  
Town Clerk

# FY 2021 Street Rehabilitation Projects



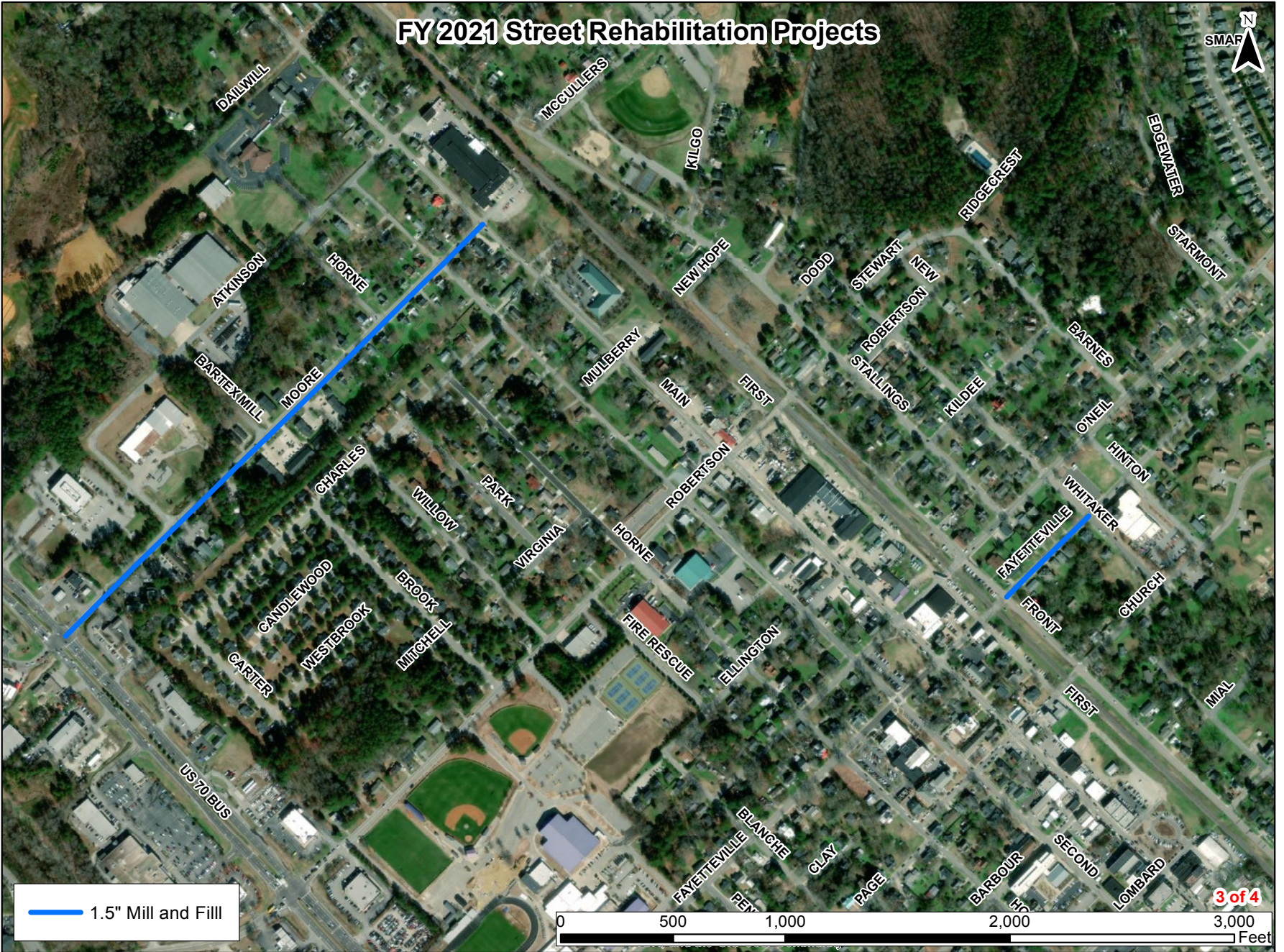


# FY 2021 Street Rehabilitation Projects

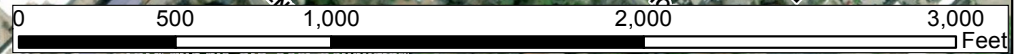




# FY 2021 Street Rehabilitation Projects

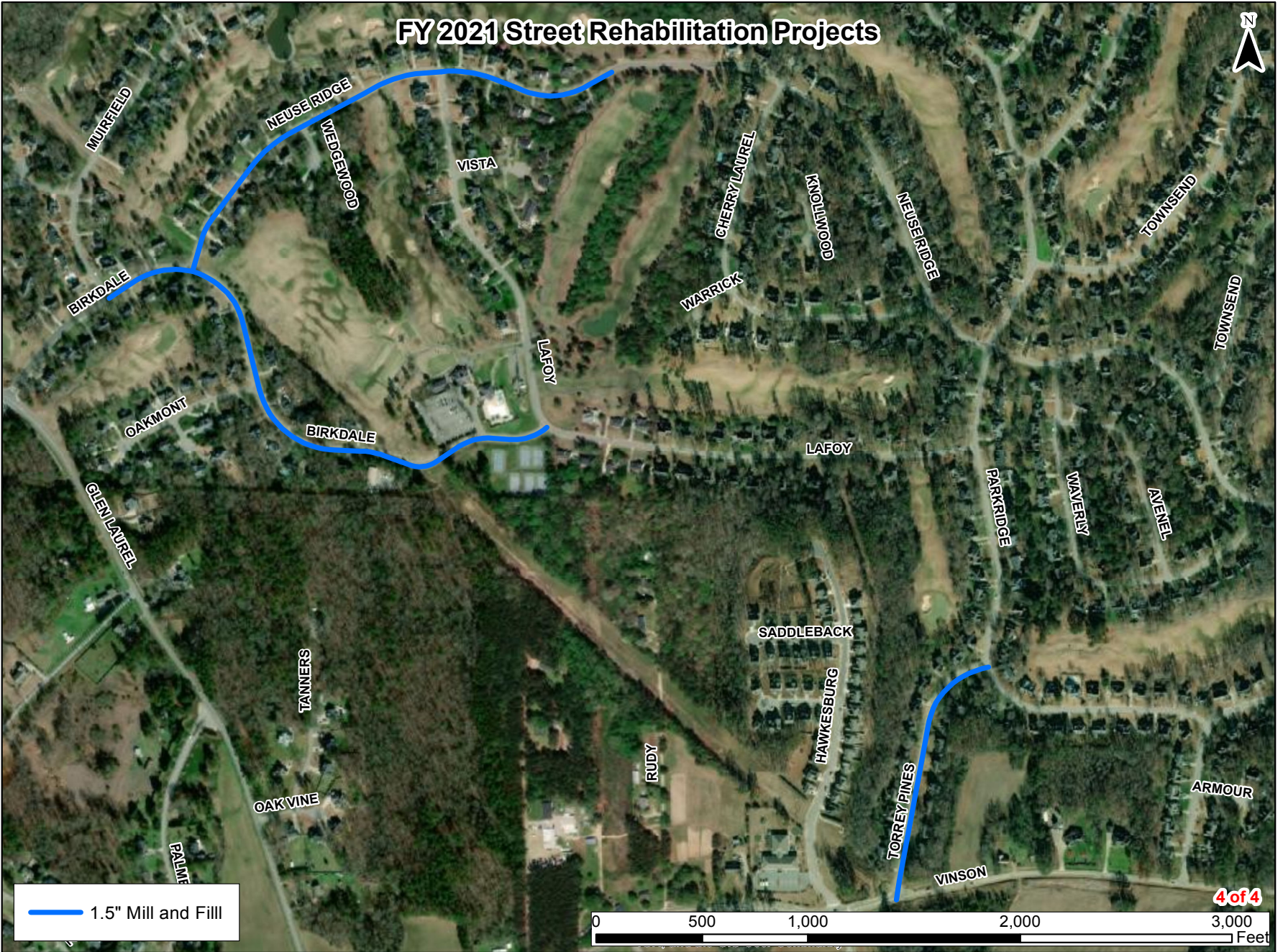


3 of 4

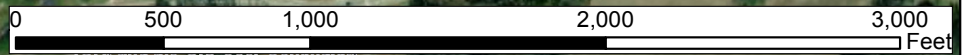




# FY 2021 Street Rehabilitation Projects



1.5" Mill and Fill



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### **PUBLIC NOTICE**

In accordance with NC GS 160A-364, the Clayton Town Council will hold a public hearing on Monday, February 1, 2021, at 6 PM in the Council Chambers at the Clayton Center, 111 E Second Street, to consider a Development Agreement with Ashcroft Partners LLC pertaining to the development of a new preliminary plat (master plan) project (Ashcroft 2, 2020-114-SD) located off O'Neil Street, south of the Neuse River and north of the existing Ashcroft subdivision. The development will include up to 105,000 SF of commercial uses and up to 772 residential units. TAG #s: 05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of 05H02200B, 05H02015.

Copies of the proposed development agreement are available in the Planning office and Town Clerk's office for review by the public.

The public is invited to attend.

Samantha Wullenwaber, Planning Director  
919-553-5002

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The Johnstonian

Please advertise on the following dates:

Wednesday, January 20, 2021

Wednesday, January 27, 2021

Affidavit of publication required.



Town of Clayton  
Planning Department  
111 E. Second Street, Clayton, NC 27520  
P.O. Box 879, Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

January 20, 2021

**NOTICE**

**SUBJECT:**      **Project:**      2020-113-PDD Ashcroft 2 Planned Development District Rezoning  
2020-114-SD Ashcroft 2 Preliminary Plat Master Plan  
2020-114-SD Ashcroft 2 Development Agreement  
**Address:**      Located off N O'Neil Street, South of the Neuse River  
**TAG #(s):**      05H02013A, 05H02012, 05H02013, 05H02009A, 05H02010A, portion of  
05H02200B, 05H02015  
**Applicant:**      Ashcroft Partners, LLC

Dear Clayton Area Property Owner:

Notice is hereby given that the Clayton Town Council will hold an evidentiary hearing on **Monday, February 1, 2021 at 6:00 PM**, to make a decision on the above referenced project. The subject parcels total 241.21 acres in size. They are located off N O'Neil Street, south of the Neuse River. See the map on the back of this letter.

The Town Council will hold a public hearing to consider the above referenced rezoning application and development agreement. The applicant is proposing to rezone the subject parcels from Residential-Estate (R-E) and a portion of a parcel from Planned Development Residential (PD-R) to Planned Development Mixed Use (PD-MU). The Town Council will hold an evidentiary hearing to consider the above referenced Preliminary Plat Master Plan application. The applicant is requesting master plan approval for a mixed use development on the subject parcels that will include up to 105,000 SF of commercial development and 772 residential units, comprising of a mixture of single-family, townhome, and apartment units.

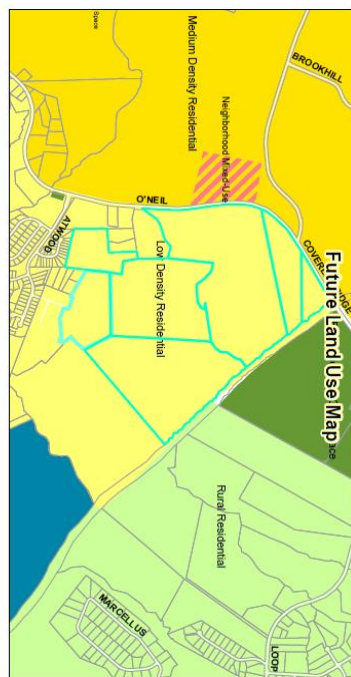
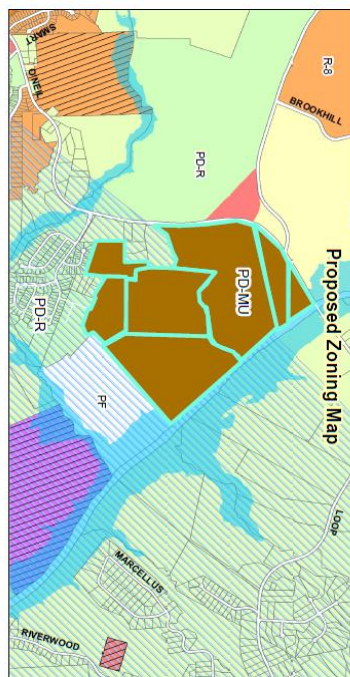
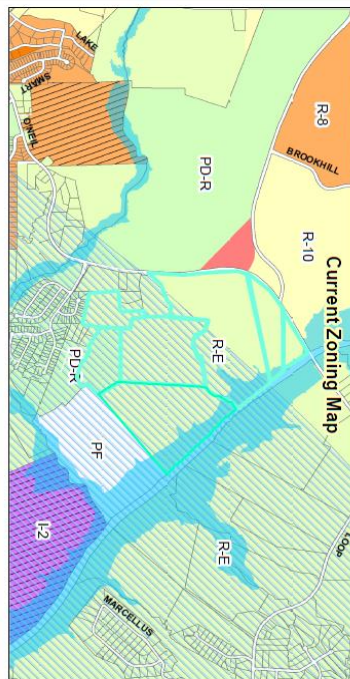
During a public hearing, the Council reserves the right to approve the request as presented or any portion of the request without necessity of withdrawal or modification of the application or additional public hearing on the matter. Likewise, the Town Council may designate approval to the district requested or another district or districts without modification of the request or additional public hearing. During an evidentiary hearing, the Clayton Town Council must make findings of fact based upon sworn testimony and other credible evidence. Citizens may give testimony in an evidentiary hearing after they have taken an oath. Based upon records in the Johnston County Tax Office, you are the owner of property that is within 100 feet of this proposed rezoning request. You are invited to join this meeting and express your opinions on this request to the Town Council.

If you should need additional assistance or information, please contact the Planning Department at (919) 553-5002 or email at [hhogg@townofclaytonnc.org](mailto:hhogg@townofclaytonnc.org).

Sincerely,

Haley Hogg, ACIP, CZO  
Senior Planner





**Ashcroft 2 Planned Development Rezoning, 2020-113  
Ashcroft 2 Preliminary Plat Master Plan, 2020-114-SD**

0 2,650 5,300 Fee



**Staff Report Map**  
**Prepared by: TOC Planning Department**

- Z

Applicant: Ashcroft Partners, LLC  
Property Owners: John Massey, Raymond E. Earp Jr., James Smith,  
Ashcroft Partners, LLC  
Tag #(s): 05H02013A, 05H02012, 05H02013, 05H02009A,  
05H02010A, portion of 05H02200B, 05H02015

Document Path: O:\PLANNING\REZONING\Planned Development\2020\2020-113-PDD Ashcroft Section 2\Staff Report Maps\Ashcroft 2 Map.mxd



**DEVELOPMENT AGREEMENT**

**BY AND BETWEEN**

**ASHCROFT PARTNERS, LLC**

**JOHN W. MASSEY**

**NANCY CREWS EARP, Successor Trustee, RAYMOND ELMORE EARP, JR.  
REVOCABLE TRUST**

**JAMES DANIEL SMITH, STEPHEN R. SMITH AND JEAN K. SMITH TRUST**

**AND**

**THE TOWN OF CLAYTON, NORTH CAROLINA**

**Effective Date: March \_\_, 2021**

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**STATE OF NORTH CAROLINA**

**DEVELOPMENT AGREEMENT**

**COUNTY OF JOHNSTON**

This Development Agreement (hereinafter the "Agreement") is made and entered into as of the \_\_\_\_ day of March, 2020 by and among Ashcroft Partners, LLC, a North Carolina limited liability company, John W. Massey, Nancy Crews Earp, as successor trustee of the Raymond Elmore Earp, Jr. Revocable Trust, James Daniel Smith, Stephen R. Smith, Jean K. Smith Trust and the Town of Clayton, North Carolina ("Town"), a municipal corporation of the State of North Carolina.

**ARTICLE 1. LEGAL FRAMEWORK**

- 1.1 North Carolina General Statutes (hereinafter "G.S.") 160D-1001(a)(1) provides that "[d]evelopment projects often occur in multiple phases over several years, requiring a long-term commitment of both public and private resources."
- 1.2 G.S. 160D-1001(a)(3) provides that "because of their scale and duration, such projects often require careful coordination of public capital facilities planning, financing, and construction schedules and the phasing of the private development."
- 1.3 G.S. 160D-1001(a)(4) provides that "[s]uch projects involve substantial commitments of private capital, which developers are usually unwilling to risk without sufficient assurances that development standards will remain stable through the extended period of the development."
- 1.4 G.S. 160D-1001(a)(5) provides that "[s]uch developments often permit communities and developers to experiment with different or nontraditional types of development concepts and standards, while still managing impacts on the surrounding areas."
- 1.5 G.S. 160D-1001(a)(6) provides that "[t]o better structure and manage development approvals for such developments and ensure their proper integration into local capital facilities programs, local governments need flexibility to negotiate such developments."
- 1.6 In view of the foregoing, G.S. 160D-1001(b) and 160D-1003 expressly authorize local governments and agencies to enter into development agreements with developers pursuant to the procedures and requirements of G.S. 160D-1001 through 160D-1012, which procedures and requirements include approval of the development agreement by the governing body of the local government after a duly noticed public hearing.
- 1.7 G.S. 160D-1004 provides that "a local government may enter into a development agreement with a developer for the development of property as provided in this Article for developable property of any size ..." and that "[d]evelopment agreements shall be of a reasonable term specified in the agreement."
- 1.8 In addition to any force of law conferred upon this Agreement by North Carolina law related to local governments, the terms of this Agreement are also contractual in nature, are a significant inducement and consideration to enter into this Agreement, and may be enforced by either Party as contractual terms.

## ARTICLE 2. DEFINITIONS

In the construction of this Agreement and its incorporated Exhibits, the following capitalized terms shall have the respective meanings set forth below wherever they appear in this Agreement. Except as otherwise provided in this Agreement, terms used in the relevant portions of the North Carolina General Statutes and the Town of Clayton Unified Development Code ("UDC") shall have the same meanings as employed in those statutes and ordinances..

- 2.1 *After-Adopted Regulation.* The term "After-Adopted Regulation" shall mean a development regulation adopted by the Town after the Effective Date, and as described in Section 4.4b.
- 2.2 *Agreement.* The term "Agreement" shall mean this Development Agreement.
- 2.3 *Intentionally Deleted.*
- 2.4 *Council.* The term "Council" or "Town Council," shall mean the legislative body of the Town of Clayton, which together with the Mayor of the Town constitutes the governing body of the Town.
- 2.5 *Developer.* The term "Developer" shall mean Ashcroft Partners, LLC, and any successor in title who acquires a Parcel in fee simple from the Developer and to whom the transferring Developer, with respect to that Parcel, expressly assigns all of its then existing rights and obligations as Developer under this Agreement to the Person acquiring the Parcel from the Developer, which assignment shall be recorded in the Registry. Any other Person who acquires a Parcel in fee simple title from the Developer shall be a "Parcel Owner" and not a "Developer." On the Effective Date of this Agreement, Ashcroft Partners, LLC is the Developer.
- 2.6 *Development or Develop.* The term "Development" or "Develop" shall mean any activity on the Property involving, requiring, or consisting of: (i) the construction of a new building; (ii) the construction or installation of structures or facilities such as, but not limited to, roads, greenways, paved trails, sidewalks, parking lots, stormwater facilities and utility infrastructures; (iii) the clearing or alteration of land as an adjunct of such construction; or (iv) the expansion of an existing building; or (v) the division of land into two or more Parcels or the recombination of Parcels.
- 2.7 *Effective Date.* The term "Effective Date" shall mean the effective date of this Agreement, which is \_\_\_\_\_, 2021.
- 2.8 *Existing Owners.* The term "Existing Owners" shall mean Ashcroft Partners, LLC, John W. Massey, Nancy Crews Earp, as successor trustee of the Raymond Elmore Earp, Jr. Revocable Trust, James Daniel Smith, Stephen R. Smith and Jean K. Smith Trust.
- 2.9 *Manager.* The terms "Manager" or "Town Manager" shall mean the Town Manager of the Town of Clayton, or his/her designee.
- 2.10 *Master Plan.* The term "Master Plan" shall mean the Plan developed by the Developer and submitted to the Town, and attached as Exhibit C to this Agreement, which is subject to the Conditions on Master Plan attached as Exhibit D to this Agreement. In the event of any conflict between the Master Plan or Conditions on Master Plan and the body of this Agreement, the requirements that are more stringent as to the Developer shall control.

- 2.11 *NCDOT*. The term “NCDOT” shall mean the North Carolina Department of Transportation.
- 2.12 *Parcel*. The term “Parcel” shall mean each separate tract of the Property as the same may be constituted from time to time, including a tract as acquired by the Developer, a tract that has been subdivided out of another tract, or a tract that results from the recombination of two or more tracts. Each separate portion of a tract remaining after dedication of road right of way from that tract also constitutes a Parcel for the purposes of this definition.
- 2.13 *Parcel Owner*. The term “Parcel Owner” shall mean each Person, other than the Developer, who owns a fee simple title interest in a Parcel, including the Existing Owners.
- 2.14 *Participant or Participants*. The term “Participants” shall mean the Town, the Developer, and the Parcel Owners.
- 2.15 *Party or Parties*. The terms “Party” or “Parties” shall mean the Town, the Developer or any Parcel Owner.
- 2.16 *Intentionally Deleted*.
- 2.17 *Person*. The term “Person” shall mean a natural person or persons, a corporation, a limited liability company, a partnership, a joint venture, a trust, or any other legal entity.
- 2.18 *Property*. The term “Property” shall mean the land described in Exhibit A attached hereto and shown on the survey attached hereto as Exhibit B. The Property also includes any public street rights-of-way and private streets that may be located within the Property.
- 2.19 *Registry*. The term “Registry” shall mean the Johnston County Register of Deeds.
- 2.20 *Representative*. The term “Representative” shall mean a Person designated by the Developer to act for and on behalf of the Developer and Parcel Owners wherever indicated and subject to the terms of this Agreement. As of the Effective Date, the Representative is Reid Smith. At any time and from time to time the Developer may designate a successor or replacement Representative and shall notify the Town of any change in the Representative.
- 2.21 *State*. The term “State” shall mean the State of North Carolina.
- 2.22 *Intentionally Deleted*.
- 2.23 *Town*. The terms “Town” or “the Town” shall mean the Town of Clayton in the County of Johnston and the State of North Carolina and its successors in interest.
- 2.24 *Intentionally Deleted*.
- 2.25 *Town Clerk*. The term “Town Clerk” shall mean the clerk for the Town.
- 2.26 *Town Planning Director or Planning Director*. The terms “Town Planning Director” and “Planning Director” shall mean the planning director for the Town.
- 2.27 *Town Regulations*. The term “Town Regulations” shall mean any ordinance, regulation, resolution, technical or design manual, or policy officially adopted by the Town.

- 2.28 *Unified Development Code*. The term “Unified Development Code” or “UDC” shall mean the development ordinances in effect as of the Effective Date
- 2.29 *Water Reclamation Facility Site*. The term “Water Reclamation Facility Site” or “WRF Site” shall mean the property owned by the Town, and identified as parcel number 05H02199W, and on which the Town is constructing a water reclamation facility.

### ARTICLE 3. RECITALS

- 3.1 The Developer and the Existing Owners are the fee simple owners of the Property on the Effective Date. The Property is located within the corporate limits of the Town.
- 3.2 On [REDACTED], 2021, the Town Council approved the Developer’s rezoning request to amend the zoning map of the Town to rezone the Property from residential-estate (R-E) to planned development mixed use (PD-MU) and approved the Master Plan acting as a preliminary plat submitted with Developer’s rezoning request.
- 3.3 The Developer estimates that the appraised value of the Development of the Property at build out to exceed \$ [REDACTED].
- 3.4 The purpose of this Agreement is to facilitate the Development of the Property in a way that best realizes the public benefits to the Parties. The Development of the Property requires a major investment by the Developer and/or Parcel Owners in infrastructure, substantial initial investment in on-site and off-site improvements and substantial commitment of resources to achieve the benefits of the Development for the Parties. The Developer will be unable to make and realize the benefits from such commitments without the assurances of the Town as provided by this Agreement.
- 3.5 The general benefits to be received by the Town from Development of the Property include, without limitation:
- a) Implementation of the Master Plan and furthering the goals of securing needed additional housing stock in the Town;
  - b) Protection of natural resources and environmentally sensitive property within the Property, minimization of adverse off-site impacts, and additional recreation opportunities;
  - c) Provision of an efficient, effective, and practical overall plan for addressing the Development of the Property, including the protection of natural resources, the provision of open space and recreation uses, and commitments with respect to mobility, including sidewalks and road improvements;
  - d) Coordination of construction activity to alleviate impact to the Town’s construction and operation of a new wastewater reclamation facility on adjacent property;
  - e) Substantial commitments to public infrastructure, including the dedication of easements, water and sewer infrastructure, and right-of-way for the Future Northern Connector as a result of Development of the Property;
  - f) Increase tax base and resident population; and
  - g) Increase the diversity of housing stock within the community.



- 3.6 The general benefits to be received by the Developer and Parcel Owners from Development of the Property include without limitation:
- a) Obtaining sufficient certainty, timeliness, and predictability in the Town's development review and approval process to justify the required substantial initial capital investment for Development projects in the Property that will require multiple years to complete;
  - b) Realization of the opportunity to implement the Master Plan for a mix of residential and commercial Development that is consistent with Parties' goals and needs;
  - c) Coordination with the Town to achieve the public benefits necessary for the Development; and
  - d) The extension of water, sewer, and electric infrastructure to the Property, subject to the terms of this Agreement.
- 3.7 In exchange for providing these benefits to the Town, the Developer, for itself and future Parcel Owners, desires to receive the assurance that Development projects in the Property may proceed in accordance with this Agreement, the UDC, and the current zoning of the Property as it exists on the Effective Date.
- 3.8 The Parties agree that nothing in this Agreement obligates or requires the Existing Owners and Parcel Owners to develop the Property in the event that the Developer does not purchase all of the Parcels.
- 3.9 The terms and conditions of this Agreement have undergone extensive review by the Town's staff, the Town's outside legal counsel, and the Town Council and have been determined to be fair, just and reasonable. After careful review and deliberation, the Town Council has determined and concluded that the Agreement meets the goals and needs of the Parties and complies with all statutory requirements and Town Regulations.
- 3.10 The Town, by electing to enter into this Agreement in accordance with statutory procedures and Town Regulations, acknowledges that the obligations of the Town shall survive beyond the term or terms of the present Town Council and that such action will serve to bind the Town and future Town Councils to the obligations thereby undertaken. By approving this Agreement, the Town Council has elected to exercise certain governmental powers at the time of entering into this Agreement rather than deferring its actions to some undetermined future date.
- 3.11 Pursuant to G.S. 160D-1005, the Town Council conducted a public hearing on this Agreement on February 15, 2021. The notice of public hearing specified, among other things, the location of the Property subject to this Agreement, the development uses proposed on the Property in accordance with the Master Plan, and a place where a copy of the proposed Agreement could be obtained.
- 3.12 On [REDACTED], 2021 the Town Council approved this Agreement and authorized the Town's execution of the same. The approval of this Agreement constitutes a legislative act of the Town Council.

## ARTICLE 4. TERMS

NOW, THEREFORE, based upon the terms and conditions set forth herein and in consideration of the mutual promises and assurances provided herein, the Parties' hereby agree as follows:

- 4.1 Recitals. The Parties agree that the foregoing Recitals in Article 3 are true and correct and are incorporated herein by reference.
- 4.2 Agreement Term. The period of duration of this Agreement (the "Agreement Term") shall commence upon the Effective Date and it shall expire after ten (10) years from the Effective Date, unless sooner terminated in accordance with the provisions of this Agreement. The Agreement Term has been established by the Parties as a reasonable estimate of the time required to complete most, if not all, of the Development projects on the Property subject to this Agreement and to obtain the public benefits of such Development projects. The Town finds that the Agreement Term is reasonably necessary to assure the Town of the realization of the public benefits from the various Development projects in the Property. Expiration of the Agreement Term shall not terminate mutually agreed to obligations and commitments included within this Agreement that are expressly specified to extend beyond the Agreement Term. The Agreement Term may be extended as provided in Section 4.9.
- 4.3 Land Subject to Agreement. The land subject to this Agreement includes all of the Property.
- 4.4 Vesting.
  - a) Except as provided in G.S. 160D-1007, G.S. 160D-1010(b), the Master Plan, and this Agreement, the Town may not apply subsequently adopted Town Regulations to the Property during the Agreement Term without the written consent of the Developer. The consent of Parcel Owners shall not be required unless the Parcel owned by the Parcel Owner is directly affected by such subsequently adopted Town Regulations, in which case the affected Parcel Owner must also provide written consent under this Section of this Agreement for such subsequently adopted Town Regulations to be effective with respect to that Parcel. During the Agreement Term, the Developer and Parcel Owners shall have a vested right to Develop their respective portions of the Property in accordance with (i) this Agreement, (ii) the Master Plan, (iii) the UDC, (iv) Town Regulations, and (v) any other applicable laws (except to the extent modified by the Master Plan), all of the foregoing (i) through (v) as they exist as of Effective Date. In accordance with G.S. 160D-1006(a)(6), the Participants agree, intend, and understand that all conditions, terms, restrictions, or other requirements applicable to the Development and determined to be necessary by the Town for the public health, safety, or welfare of its citizens, are provided for by the foregoing (i) through (v) as they exist as of Effective Date. This Agreement does not abrogate any rights that may vest pursuant to statutory or common law or otherwise in the absence of this Agreement. The Participants agree, intend, and understand that the obligations imposed by this Agreement are only such as are consistent with state and federal law. In accordance with G.S. 160D-1007(c), in the event State or federal law is changed after the Effective Date and the change prevents or precludes compliance with one or more provisions of this Agreement, the Town may modify the affected provisions with the written consent of the Developer, upon a finding that the change in State or federal law has a fundamental effect on the Agreement, by ordinance

after notice and a hearing and upon such modification the Town shall record the modification in the Registry. If the Developer fails to consent, the Developer may terminate this Agreement (with the Developer and any Parcel Owners retaining any rights with respect to any Parcel obtained prior to termination) and said termination will be recorded in the Registry.

- b) In the event that Town adopts new, different, or amended development regulations that Developer views as more favorable to the Development than the regulations in effect at the time of adoption of this Agreement, Developer may elect to be bound by the new regulations or ordinance (the "After-Adopted Regulation") without any further agreement from the Town. In the event that Developer elects to be bound by the After-Adopted Regulation, Developer will communicate that fact to the Planning Director in writing and note such change on any future permit applications affected by the change.

**4.5 Development Uses.** In accordance with G.S. 160D-1006(a)(3), a range of residential land uses are authorized and provided for in the Master Plan. Up to 772 residential units and up to 105,000 square feet of commercial uses (as further described on the Master Plan) are allowed by the Master Plan. A minimum of 50,000 square feet of commercial uses shall be developed within the area designated "Commercial" on the Master Plan. Residential and commercial uses will be located generally as depicted in the Master Plan and more specifically as provided in subsequent site and subdivision plans approved by the Town. Permitted building types include single family detached dwellings, townhomes and apartments. Architectural styles and designs will vary but will be context oriented and designed in accordance with the architectural elements further described on the Master Plan. Commercial and residential uses may be mixed within the same structure within the area designated "Commercial" on the Master Plan. Commercial uses allowed are: Upper-Story Residential, Assembly, Church/Place of Worship, Day Care Facility, Government Service, Hospital/Medical Center, School, Entertainment (Indoor), Entertainment (Outdoor), Fitness/Recreation Center, Car Wash/Auto Detailing, Convenience Store with Gas Sales, Financial Institution, Hotel/Motel, Kennel, Laundry Services, Cocktail Lounge, Microbrewery, Publisher, Office/General, Office/Medical, Outdoor Seating/Sidewalk Café, Radio/Television/Media/Recording Studio, Restaurant, Retail Sales, Service, Vehicle Repair/Service (Outdoor Storage prohibited), Veterinary Clinic, Telecommunication Facility, Utility/Minor, Food Truck, Outdoor Display/Sales, and Outdoor Dining. Commercial uses prohibited include: Cemetery, Gun Range, Nursery, Self-Storage, Towing Service/Storage, Vehicle Sales/Rental, Warehouse/Freight Movement, Outdoor Storage/Limited. Any proposed commercial use not specified or contemplated by this section will be subject to review by the Planning Director for a determination of consistency. If said use is deemed consistent with the allowed uses, the Planning Director may authorize the new use without requiring a modification of the Agreement.

#### **4.6 Public Facilities.**

- a) In accordance with G.S. 160D-1006(a)(4), the public facilities that will serve the various Development projects on the Property, the responsibility for provision of such public facilities, and the timing of the provision of such public facilities are described in Exhibit E and this Agreement. Exhibit E addresses all of the following public facilities:
  - 1) Sanitary Sewer and Water Infrastructure.
  - 2) Electric Utility Infrastructure.
  - 3) Streets, Curb, Gutter and Sidewalks.

- 4) Stormwater Facilities.
- 5) Park and Recreation Facilities.

- b) Construction of streets with curb and gutter (excluding Roads 5 & 11 as shown on the Master Plan) on the Property will be provided by the Developer as necessary to serve the Development on the Property, as reflected in the Master Plan and described in this Agreement.
- c) Stormwater facilities serving the Property will be private facilities under management by the Developer or a property owners association established for the Property. However, stormwater pipes and drains located in publicly dedicated street rights of way will be public facilities owned and maintained by the Town.
- d) Applicable public facilities that are to serve the Development and each Parcel will be provided, or payments-in-lieu of such public facilities will be made, prior to the platting of each Phase or the issuance of a certificate of occupancy for the first building on a Parcel, as reflected in the Master Plan and described in this Agreement.
- e) The Master Plan calls for 300 or more lots and is required under the UDC to provide at least three separate and construction access points. The Master Plan further demonstrates that the subdivision phasing and design will provide the required number of access points and connections as required by the UDC upon full build-out. Therefore, pursuant to UDC Section 155.400(E)(2)(b), the Town Council hereby waives the requirement for immediate construction of more than two access points. For the purposes of beginning construction of Phase 1-1A, 4, 7 and 8, the Developer may use, for access of emergency vehicles only, any access road within the Town's access easements on the Property created by the Deeds of Easements attached hereto as Exhibit H; provided that, any road that Developer connects to an access road within the Town's access easements shall be designed and built to Town standards.

4.7 Dedication or Reservation of Land for Public Purposes. In accordance with G.S. 160D-1006(a)(5), a description of certain land to be reserved and/or dedicated for public purposes is provided for in Exhibit F. No compensation shall be paid to the Developer or any Parcel Owner for the dedication or reservation of land for public purposes outlined in Exhibit F.

4.8 Development Compliance. In accordance with G.S. 160D-1001(d), the development authorized by this Agreement shall comply with all applicable laws, including all ordinances, resolutions, regulations, permits, policies, and laws affecting the development of the Property, including laws governing permitted uses of the Property, density, intensity, design, and improvements.

4.9 Amendment; Modification; Termination; or Extension of the Agreement Term. This Agreement may be amended or terminated, or the Agreement Term extended, by the mutual consent of the Parties. Modification of this Agreement or extension of the Agreement Term shall not require the consent of any Parcel Owner. Either Town or Developer may propose a proposed modification to this Agreement. Within fifteen (15) days after receipt of a proposed modification of this Agreement, the Town Planning Director shall determine whether it is a major modification or a minor modification and shall notify the Developer of that determination. All proposed modifications to this Agreement

or the Master Plan shall be considered a major modification except for the following proposed modifications, which shall be considered minor:

- a) An increase in single-family unit types or a decrease in townhome or apartment unit types so long as the total maximum units permitted by the Master Plan is not exceeded.
- b) A change in the mixture of residential unit types that is less than 10% of the overall unit count allowed by the Master Plan. Developer shall not be allowed to request multiple modifications that would cumulatively exceed 10% of the overall unit count allowed by the Master Plan.
- c) All landscaping modifications including buffering.
- d) Any architectural modifications.
- e) Any increase in the allowed commercial square footage that does not increase the permitted commercial square footage by more than ten (10) percent so long as an updated trip generation is provided to the Town. Developer shall not be allowed to request multiple increases to the permitted commercial square footage that would cumulatively exceed 10% of the commercial square footage allowed by the Master Plan.
- f) Modifications of amenities in open space areas so long as the minimum required open space under the UDC is satisfied.
- g) Modifications or adjustments to the phasing of the Master Plan.
- h) Modifications related to the realignment of internal roadways, signage or lighting.
- i) Modifications or adjustments to main vehicular entrances necessary to accommodate spacing requirements of the Town or NCDOT.

A major modification of this Agreement shall be anything that is not outlined above as a minor modification and shall include, but not be limited to, the addition of land to the Master Plan, modifications to the approved mixture of uses that exceeds ten (10) percent, the deletion of main vehicular entrances and any proposed revisions or modifications that the Planning Director determines to be inconsistent with this Agreement and the adopted plans and policies of the Town as they exist on the Effective Date. Major modifications shall follow the same procedures as required by North Carolina law for the adoption of a development agreement, and shall follow any applicable provisions of the UDC. The Developer shall file an application for approval of a major modification on the applicable Town form, if any. A minor modification may be approved by the Town Planning Director without following the same procedures as required by North Carolina law for the adoption of a proposed development agreement. Approval or disapproval of a minor modification by the Town Planning Director shall be memorialized by letter from the Town Planning Director to the Developer and shall include written findings by the Town Planning Director that the proposed minor modification would be consistent with this Agreement and would comply with the UDC. The Town may modify or suspend the provisions of this Agreement if the Town determines that the failure to do so would place the residents of the Property subject to this Agreement, or residents of the Town, or both, in a condition dangerous to their health or safety, or both. A copy of each minor modification approved by the Town Planning Director shall be maintained on file by the Town Clerk.

4.10 Recordation/Binding Effect. Within fourteen (14) days after the Town enters into this Agreement, the Developer shall record this Agreement in the Registry. Within fourteen (14) days after the Town provides the Developer with a document in a form acceptable for recording in the Registry evidencing approval of a major modification of this Agreement, the Developer shall record such document in the Registry. The burdens of this Agreement shall be binding upon, and the benefits of this Agreement shall inure to the Town and its successors in interest, to the Developer and its assignees to whom such burdens and/or benefits are assigned in accordance with this Agreement, and, to the extent provided in this Agreement, to the Parcel Owners and their successors and assigns, including successors in title. All of the provisions of this Agreement shall be enforceable during the Agreement Term as equitable servitudes and constitute covenants running with the land pursuant to applicable law.

4.11 Review and Enforcement.

- a) Right to Periodic Review. The Town Planning Director shall have the right, but not the obligation, to conduct a periodic compliance reviews, at which time the Developer, or the Representative on behalf of the Developer, shall be required to demonstrate good faith compliance with the terms of this Agreement. Developer shall provide a written summary on the status of Development, in a form satisfactory to the Town Planning Director, for review. Town Planning Director shall promptly report the results of this review to the Developer, the Town Manager and Town Council.
- b) Material Breach. If the Town Council finds and determines that the Developer has committed a material breach the Agreement, the Town shall serve notice in writing to the Developer (the "Notice") setting forth with reasonable particularity the nature of the material breach and the evidence supporting the finding and determination. A material breach by a Parcel Owner shall not be deemed or considered a material breach by the Developer.
- c) Right to Cure. After such notice of material breach has been served, the Developer shall have a reasonable time in which to cure the material breach (the "Cure"), but in no event shall the Developer have less than thirty (30) days from actual receipt by the Developer of such notice of material breach for the Cure. Notwithstanding the foregoing, the Developer shall be afforded an additional reasonable period of time to cure the material breach if cure is commenced within the applicable time period and thereafter diligently pursued but cannot be completed within said time period.
- d) Termination or Modification by the Town. If the Developer fails to timely cure its material breach of this Agreement, then the Town Council may elect to terminate or modify this Agreement after following mediation requirements in Section 4.12 of this Agreement. If the material breach issue cannot be resolved through mediation, the Town may elect to terminate or modify this Agreement by giving the Developer notice of its election to terminate or modify this Agreement. The notice shall contain the effective date of the termination or proposed modification, which shall not be less than thirty (30) days immediately following Developer's receipt of the notice. If the election is to modify this Agreement, the notice shall describe the proposed modifications. Within thirty (30) days after receiving notice of termination or modification, the Developer, may appeal the termination or proposed modification to the Town's Board of Adjustment in the manner provided by G.S. 160D-405(a). An appeal stays all proceedings in furtherance of the action



appealed from unless the Town Planning Director, Town Manager, or designee of the Town Planning Director or Town Manager, certifies to the Town's Board of Adjustment, after notice of appeal has been filed, that delay in the termination or proposed modification of this Agreement would cause imminent peril to life or property. An appeal to the Town's Board of Adjustment shall not constitute a waiver or election of any other rights or remedies in law or in equity available to the Developer with respect to the termination or proposed modification of this Agreement. In addition to the foregoing, rather than accede to a proposed modification of this Agreement or a proposed modification of this Agreement that has been affirmed in whole or in part by the Town's Board of Adjustment, within thirty (30) days after receipt of notice of the Town's proposed modification of this Agreement or receipt of notice of the affirmation of the proposed modification in whole or in part by the Town's Board of Adjustment, the Developer may terminate this Agreement by giving notice of termination to the Town. If the Developer so elects to terminate this Agreement, Section 4.26 of this Agreement shall apply and the Developer shall have the right to file a termination of this Agreement in the Registry.

4.12 Mediation. In the event any Participant believes another Participant is in default under this Agreement, the applicable Participants shall make a good faith effort to negotiate and informally resolve the issues in dispute prior to terminating or modifying this Agreement. In the event of an impasse between the Participants in reaching any mutual agreement under this Agreement, the Participants shall make good faith efforts to negotiate and informally resolve the issue in dispute (the "Claim"). If the Participants do not resolve the Claim through negotiation within thirty (30) days of the date of the notice of default, the Participants agree to submit the claim to mediation pursuant to the following process:

- a) The non-defaulting Participant (the "Claimant") shall have thirty (30) additional days within which to submit the Claim to mediation under the auspices of any dispute resolution center or other such independent agency or certified mediator upon which the Participants may mutually agree. Any mediation pursuant to this section shall take place in Johnston County.
- b) If Claimant does not submit the claim to mediation within sixty (60) days after notice of default, Claimant shall be deemed to have waived the claim, and the defaulting Participant (the "Respondent") shall be released and discharged from any and all liability to Claimant on account of such Claim; provided, nothing herein shall release or discharge Respondent from any liability to Persons other than a Participant.
- c) If the Participants do not settle the Claim within thirty (30) days after submission of the matter to the mediation process, or within such time as determined reasonable or appropriate by the mediator, the mediator shall issue a notice of termination of the mediation proceedings. Such notice shall set forth when and where the Participants met, that the Participants are at an impasse, and the date that mediation was terminated.
- d) If settlement does not occur and mediation is terminated, the Participants may pursue any and all actions at law and equity permitted under this Agreement subject to any applicable right to notice and cure provided for in this Agreement.
- e) The costs of the mediation shall be paid in equal shares by the Town, Developer, and any other Participant who actually participates in the mediation; provided,

however, a Participant who abandons mediation after having agreed to it may be assessed the entire costs of the mediation.

- 4.13 Development Timing and Moratoria. The Developer and Parcel Owners shall be obligated to develop the Property pursuant to this Agreement. The Development shall be done in such order and sequence as the Developer or Parcel Owner, as applicable, have agreed as shown on Exhibit F. The proposed development schedule for phasing of the Development is shown on Exhibit G attached hereto and incorporated by reference. Phasing of the Development shall be based on sound engineering practices as determined by the Developer's engineers to ensure functional and safe street circulation and utility systems at all times. Phasing shall be based in such a way that all infrastructure improvements to be constructed within the Property will be provided when or before they are necessary for that phase of the Development.
- a) The Developer and Parcel Owners acknowledge that the Town of Clayton is undertaking the construction of a new wastewater reclamation facility (the "WRF") that is vital to the continued growth of the Town, including to provide services to this Development. Furthermore, Developer and Parcel Owners acknowledge that uninterrupted access to the WRF site is critical for the timely construction of the WRF and expressly agree to not, in any way, interrupt access to the WRF site during construction of the WRF.
  - b) Developer and Town have entered into or will enter into Deeds of Easement for access and installation of public infrastructure, which encumber the Property and set forth the rights and obligations of the Town and Developer, which are attached hereto and as Exhibit H (the "Easements"). Developer and Parcel Owners shall execute copies of the Easements simultaneously with the execution of this Agreement and the Easement shall be held in escrow by Developer until such time as the Town has executed this Agreement. Once the Development Agreement is fully executed, the Easements shall immediately be released to the Town for recordation.
- 4.14 Default. The failure of any Participant to comply with the terms of this Agreement shall constitute a default, entitling the non-defaulting Participant or Participants to pursue such remedies as allowed under applicable law against the defaulting Participant, after following mediation requirements in Section 4.12 of this Agreement, provided, however, that no termination of this Agreement may be declared by a Party prior to the notice and opportunity to cure process set out in Section 4.11 of this Agreement. Notwithstanding the foregoing, a Parcel Owner shall not have the right to terminate this Agreement. A Participant believing another Participant to be in default shall provide written notice of that default to the other Participant within fifteen (15) days of the date that the non-defaulting Participant first has knowledge of such default, and shall provide the defaulting Participant and the Developer on behalf of the defaulting Participant, if a Parcel Owner, an opportunity to cure any default as provided in the manner for providing for cure in Section 4.11 of this Agreement.
- 4.15 Force Majeure. In addition to specific provisions of this Agreement, no Participant shall be responsible for any default, delay or failure to perform if such default, delay or failure to perform is due to causes beyond such Participant's reasonable control, including, but not limited to, strikes, lockouts, actions or inactions of governmental authorities, a widespread pandemic or epidemic, wars, embargoes, fires, hurricanes, adverse weather, acts of God, lawful work stoppages ordered by a governmental entity, interference duly caused by any other Participant, or the default of a common carrier. In the event of a

default, delay or failure to perform due to causes beyond such Participant's reasonable control or due to interference by another Participant, any date or times by which the Participants are otherwise scheduled to perform, if any, shall be extended automatically for a period of time equal in duration to the time lost by reason of the cause beyond the reasonable control of such Participant. The mere existence or occurrence of a widespread pandemic or epidemic shall not automatically be considered a force majeure event and any Party seeking to demonstrate delay caused by a widespread pandemic or epidemic must demonstrate such event actually caused delay as a result of governmental or industry shut-downs, closures, laws or orders arising from such widespread pandemic or epidemic. If written notice of such delay is given to the other Participant after the commencement of such delay, an extension of time for such cause shall be deemed granted for the period of the enforced delay, or longer as may be mutually agreed to by the Participants.

- 4.16 Disclaimer of Joint Venture, Partnership and Agency. This Agreement shall not be interpreted or construed to create an association, joint venture, or partnership between or among the Participants, or to impose any partnership obligation or liability upon such Participants.
- 4.17 No Third Party Beneficiaries. The Agreement is not intended to and does not confer any right or benefit on any third party that is not a Participant.
- 4.18 Legal Actions. In addition to any other rights or remedies, and subject to the mediation requirements in Section 4.12 of this Agreement, and further subject to the notice and right to cure provisions in Section 4.11 of this Agreement, any Party may institute legal action against a defaulting Party or a defaulting Parcel Owner to cure, correct, or remedy any default or breach, to specifically enforce any covenants or agreements set forth in the Agreement or to enjoin any threatened or attempted violation of the Agreement, or to obtain any remedies consistent with the purposes of the Agreement. Legal actions shall exclusively be instituted in the Superior Court of the County of Johnston, State of North Carolina, and the Parties submit to the personal jurisdiction of such court without application of any conflicts of laws provisions of any jurisdiction.
- 4.19 Notices. Unless specifically provided otherwise by this Agreement, any notice, demand, request, consent, approval or communication which a Participant is required to or may give to another Participant hereunder shall be in writing and shall be delivered or addressed to other applicable Participants at the address below set forth or to such other address as such Participant may from time to time direct by written notice given in the manner herein prescribed. Such notice or communication shall be deemed to have been given or made when communicated by personal delivery or by independent courier service or by facsimile or by email with a hard copy to be delivered by independent courier service by the next business day. Unless a Parcel Owner gives notice of a change of address in the manner required herein for giving notices, notice to a Parcel Owner shall be to the address for the Parcel Owner in the records of the Johnston County Tax Administrator.

All notices, demands, requests, consents, approvals or communications to the Town shall be addressed to:

Town Manager  
PO Box 879  
Clayton, NC 27528

All notices, demands, requests, consents, approvals or communications to the Developer or Existing Owners shall be addressed to:

Reid Smith  
114 W. Main Street  
Clayton, NC 27520

- 4.20 Entire Agreement. This Agreement sets forth and incorporates by reference all of the agreements, conditions and understandings between the Participants relative to this Agreement and the Property. There are no promises, agreements, conditions or understandings, oral or written, expressed or implied, among the Participants relative to the matters addressed herein other than as set forth or as referred to in this Agreement or as contained in the UDC or the Master Plan as of the Effective Date.
- 4.21 Construction. All Participants agree that, in the interpretation of this Agreement, any amendments to this Agreement, or any Exhibits to this Agreement, there shall be no presumptions, preferences, or resolution of ambiguities in favor of or against any Party with respect to any part of this Agreement drafted by legal counsel of that Party.
- 4.22 Assignment. The Developer, or a Parcel Owner may at any time and from time to time assign such Person's respective rights and responsibilities hereunder, which assignee and subsequent assignees will also retain the right to assign their respective rights and/or responsibilities hereunder or any part of all or any portion of the Property as Developer or Parcel Owner. A written assignment of rights and responsibilities shall be executed by the Developer and the assignee and recorded in the Registry. A deed from a Parcel Owner to a subsequent Parcel Owner shall be deemed to assign the conveying Parcel Owner's rights and obligations under this Agreement to the subsequent Parcel Owner. Without the written consent of the Town, no assignment as to a portion of the Property will relieve the assigning Developer or Parcel Owner of responsibility with respect to the remaining portion of the Property owned by the assigning Developer or Parcel Owner or, with respect to the portion of the Property subject to the assignment, for the period prior to the assignment. However, the assigning Developer or Parcel Owner will be relieved of any further obligations or responsibilities hereunder for the portion of the Property subject to the assignment for the period after the assignment. Any violation of the terms and conditions of this Agreement occurring after such an assignment will be the responsibility of the then current Developer or Parcel Owner in violation.
- 4.23 Governing Law. This Agreement shall be governed by the laws of the State of North Carolina. Any reference in this Agreement to a North Carolina General Statute ("G.S.") shall be deemed to include any successor or replacement statute as to the same matters subject to the statute that has been succeeded or replaced.
- 4.24 Counterparts. This Agreement may be executed in several counterparts, each of which shall be deemed an original and such counterparts shall constitute one and the same instrument.
- 4.25 Agreement to Cooperate. In the event of any legal action instituted by a third party or other governmental entity or official challenging the validity of any provision of this Agreement, the applicable Participants hereby agree to cooperate in defending such action; provided, however, each Participant shall retain the right to pursue its own independent legal defense.

4.26 Termination. Unless the Agreement Term is extended by the Town and Developer, this Agreement shall terminate on the earlier of the expiration of the Agreement Term specified in Section 4.2 of this Agreement or a specific termination made by operation of the provisions of this Agreement, or by agreement of the Parties. Notwithstanding the foregoing, the Developer shall have the unilateral right to terminate this Agreement upon any change in the Developer's plan for Development that renders this Agreement inapplicable. However, in that event, Developer shall owe the Town the amount of public funds expended to deliver public infrastructure to any part of the Development that has not been completed and certificates of occupancy issued. The intent of this provision is to make the Town whole in the event the Developer abandons a portion of the Development after the Town has expended funds to provide infrastructure pursuant to this Agreement. Any termination other than by expiration of the Agreement Term shall be recorded in the Registry. Termination of this Agreement as to the Developer and Parcel Owners shall not affect any of the following:

- a) any requirements to comply with the applicable terms and conditions of the UDC, approval and acceptance of infrastructure improvements, and any applicable permits;
- b) the Deeds of Easement in Exhibit H;
- c) any land dedicated to the Town;
- d) any requirements for amenities required to be constructed at the phase of development at termination but for which construction has not been started or completed prior to termination or expiration of the Agreement Term; or
- e) rights under this Agreement with respect to which a permit has been issued by the Town prior to the termination or expiration but for which construction is not completed by the expiration of the Agreement Term or not completed prior to termination.

In the event consideration is given to termination of this Agreement, the Parties agree that each will identify appropriate representatives to meet and participate in good faith negotiations and mediation as provided in Section 4.12 of this Agreement, aimed at resolving the issues prompting that consideration.

4.27 No Deemed Waiver. Except as provided in Section 4.12(b), failure of a Participant to exercise any right under this Agreement shall not be deemed a waiver of any such right and shall not affect the right of such Participant to exercise at some future time said right or any other right it may have hereunder.

4.28 Severability. If any term or provision herein shall be judicially determined to be void or of no effect, such determination shall not affect the validity of the remaining terms and provisions. The Participants agree that if any provision of this Agreement is judicially determined to be invalid because it is inconsistent with a provision of state or federal law, this Agreement shall be amended to the extent necessary to make it consistent with state or federal law and the balance of the Agreement shall remain in full force and effect.

4.29 Authority. Each Party and Existing Parcel Owner represents that it has undertaken all actions necessary for approval of this Agreement, and that the person signing this Agreement on behalf of such Party or Existing Parcel Owner has the authority to bind that Party or Existing Parcel Owner.

- 4.30 Estoppel. Each Participant agrees, from time to time, within thirty (30) days after request of another Participant, to deliver to the requesting Participant or such Participant's designee, an estoppel certificate stating that this Agreement is in full force and effect, the unexpired term of this Agreement, and whether or not, to such Participant's knowledge, there are any existing defaults or matters which, with the passage of time, would become defaults under this Agreement. It is understood and agreed that the Participants' obligations to furnish such estoppel certificates in a timely fashion is a material inducement for execution of this Agreement.
- 4.31 Parcels and Parcel Owners. This Agreement shall apply to the Property and to all Parcels and Parcel Owners, and by acceptance of a deed of conveyance, each subsequent Developer and Parcel Owner agrees to be bound by and abide by the terms and conditions of this Agreement as a Developer or Parcel Owner, as applicable to such Person's respective Parcel.
- 4.32 Representations and Warranties of the Developer. The Developer represents and warrants to the Town that:
- a) it is an entity duly organized, existing, and in good standing under the laws of the State of North Carolina; and
  - b) it has the full right, power, and authority to enter into this Agreement and to perform its obligations hereunder.
- 4.33 Indemnification. Developer and each Parcel Owner agrees to indemnify, defend, and hold harmless the Town and its authorized agents from liability for injury or death to any Person, or damage to any property, that arises out of or results from the direct or indirect acts or omissions of the indemnifying Developer or Parcel Owner, as applicable, in connection with any one or more of the following: (i) Development by the applicable Developer or Parcel Owner on the Property; and (ii) operation of any portion of the Property owned by the applicable Developer or Parcel Owner.

(End of Page; Execution Pages Follow)



IN WITNESS WHEREOF, the Parties hereby set their hands and seals, effective the date first above written.

Town of Clayton

By: \_\_\_\_\_  
Title: \_\_\_\_\_

=====

State of North Carolina

County of Johnston

I, the undersigned, a Notary Public of the County and State aforesaid, do hereby certify that \_\_\_\_\_ personally came before me this day and acknowledged that he or she is \_\_\_\_\_ of the Town of Clayton and acknowledged, on behalf of the Town of Clayton, the due execution of the foregoing instrument. Witness my hand and official stamp or seal, this the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_

This Instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Town of Clayton

By: \_\_\_\_\_  
Title: Finance Director

IN WITNESS WHEREOF, the Parties hereby set their hands and seals, effective the date first above written.

ASHCROFT PARTNERS, LLC

By: \_\_\_\_\_  
Title:

=====  
State of North Carolina

County of Johnston

I, the undersigned, a Notary Public of the County and State aforesaid, do hereby certify that \_\_\_\_\_ personally came before me this day and acknowledged that he or she is a \_\_\_\_\_ of Prestige Development Company and acknowledged, on behalf of Prestige Development Company, the due execution of the foregoing instrument. Witness my hand and official stamp or seal, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_

IN WITNESS WHEREOF, the Parties hereby set their hands and seals, effective the date first above written.

JOHN W. MASSEY

By: \_\_\_\_\_

=====  
State of North Carolina

County of Johnston

I, the undersigned, a Notary Public of the County and State aforesaid, do hereby certify that John W. Massey personally came before me this day and acknowledged the due execution of the foregoing instrument. Witness my hand and official stamp or seal, this the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_

IN WITNESS WHEREOF, the Parties hereby set their hands and seals, effective the date first above written.

NANCY CREWS EARP, Successor  
Trustee, RAYMOND ELMORE EARP, JR.  
REVOCABLE TRUST

By: \_\_\_\_\_

=====

State of North Carolina

County of Johnston

I, the undersigned, a Notary Public of the County and State aforesaid, do hereby certify that \_\_\_\_\_ personally came before me this day and acknowledged that he or she is the Successor Trustee of the Raymond Elmore Earp, Jr. Revocable Trust and acknowledged, on behalf of the Raymond Elmore Earp, Jr. Revocable Trust, the due execution of the foregoing instrument. Witness my hand and official stamp or seal, this the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_

IN WITNESS WHEREOF, the Parties hereby set their hands and seals, effective the date first above written.

JAMES DANIEL SMITH

By: \_\_\_\_\_

=====

State of North Carolina

County of Johnston

I, the undersigned, a Notary Public of the County and State aforesaid, do hereby certify that James Daniel Smith personally came before me this day and acknowledged the due execution of the foregoing instrument. Witness my hand and official stamp or seal, this the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_



IN WITNESS WHEREOF, the Parties hereby set their hands and seals, effective the date first above written.

STEPHEN R. SMITH

By: \_\_\_\_\_

=====

State of North Carolina

County of Johnston

I, the undersigned, a Notary Public of the County and State aforesaid, do hereby certify that Stephen R. Smith personally came before me this day and acknowledged the due execution of the foregoing instrument. Witness my hand and official stamp or seal, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_

IN WITNESS WHEREOF, the Parties hereby set their hands and seals, effective the date first above written.

JEAN K. SMITH TRUST

By: \_\_\_\_\_  
Title: Trustee

=====

State of North Carolina

County of Johnston

I, the undersigned, a Notary Public of the County and State aforesaid, do hereby certify that \_\_\_\_\_ personally came before me this day and acknowledged that he or she is the Trustee of the Jean K. Smith Trust and acknowledged, on behalf of the Jean K. Smith Trust, the due execution of the foregoing instrument. Witness my hand and official stamp or seal, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_

#### **EXHIBITS INCORPORATED BY REFERENCE**

|             |                                      |
|-------------|--------------------------------------|
| EXHIBIT A   | Description of the Property          |
| EXHIBIT B   | Survey of the Property               |
| EXHIBIT C   | Master Plan                          |
| EXHIBIT D   | Conditions on Master Plan            |
| EXHIBIT E   | Public Facilities Plan               |
| EXHIBIT E-1 | Ashcroft Phase 7 Water Network       |
| EXHIBIT E-2 | NCDOT Congestion Management Analysis |
| EXHIBIT F   | Land Dedication                      |
| EXHIBIT G   | Development Schedule (Phasing)       |
| EXHIBIT H   | Deeds of Easement                    |

**EXHIBIT A**

**Description of the Property**

An approximately 254.85 acre assemblage of parcel numbers 176000-70-3713; 176000-60-9362; 166900-79-1467; 166900-88-7300 166900-78-4101; 166900-76-7649; and 166900-76-7638.

**EXHIBIT B**

**Survey of the Property**







**EXHIBIT C**

**Master Plan**

# ASHCROFT SECTION 2

APPLICANT / OWNER:

ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP  
PH: 919.901.3178  
EMAIL: david@theriverwild.com



CONSULTANTS:



SURVEY: DUSTIN McCARTY  
djmccarty@stewartinc.com  
919.866.4724  
GEOTECH: DON BROWN  
dbrown@stewartinc.com  
919.866.4842  
LAND. ARCH: MIKE TARRANT  
mtarrant@stewartinc.com  
919.866.4789  
CIVIL ENG.: TIM SUMMERVILLE  
tsummerville@stewartinc.com  
919.866.4794



ENVIRONMENTAL  
KEVIN MARTIN  
PH: 919.720.7941  
EMAIL: kmartin@sandec.com



TRAFFIC ENGINEERING  
TRAVIS FLUITT  
PH: 919.649.0759  
EMAIL: travis.fluitt@kimley-horn.com

## PROPOSED MIXED USE DEVELOPMENT

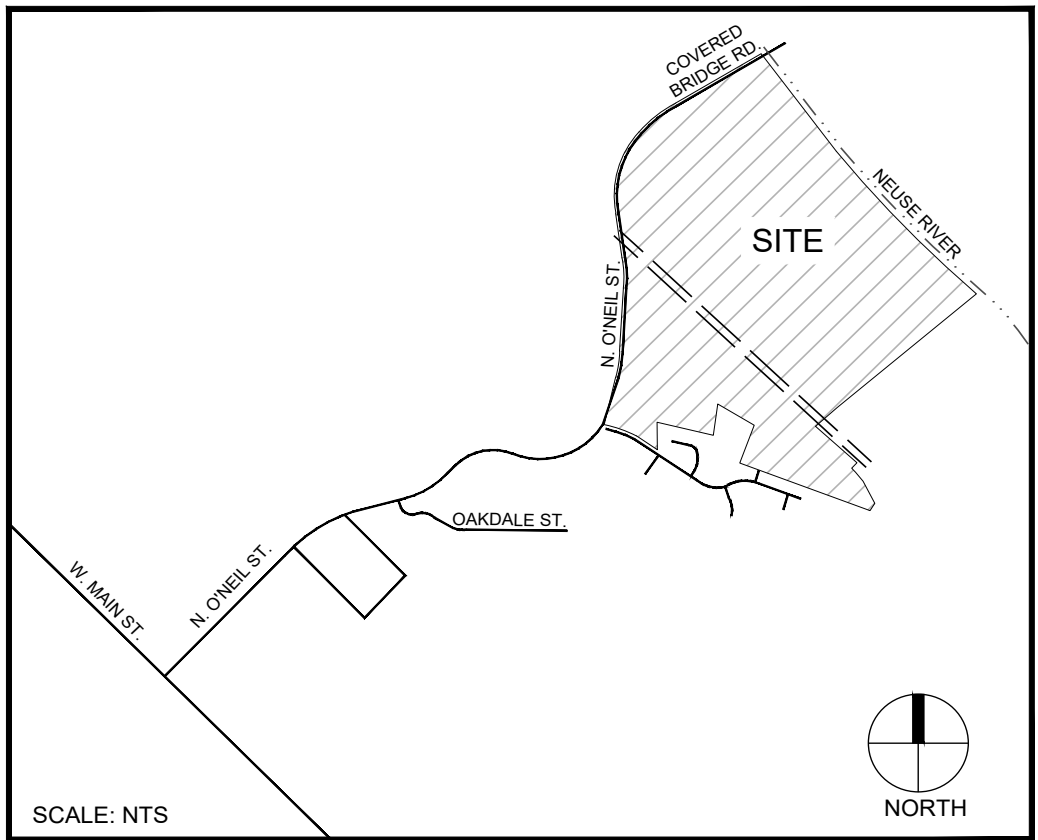
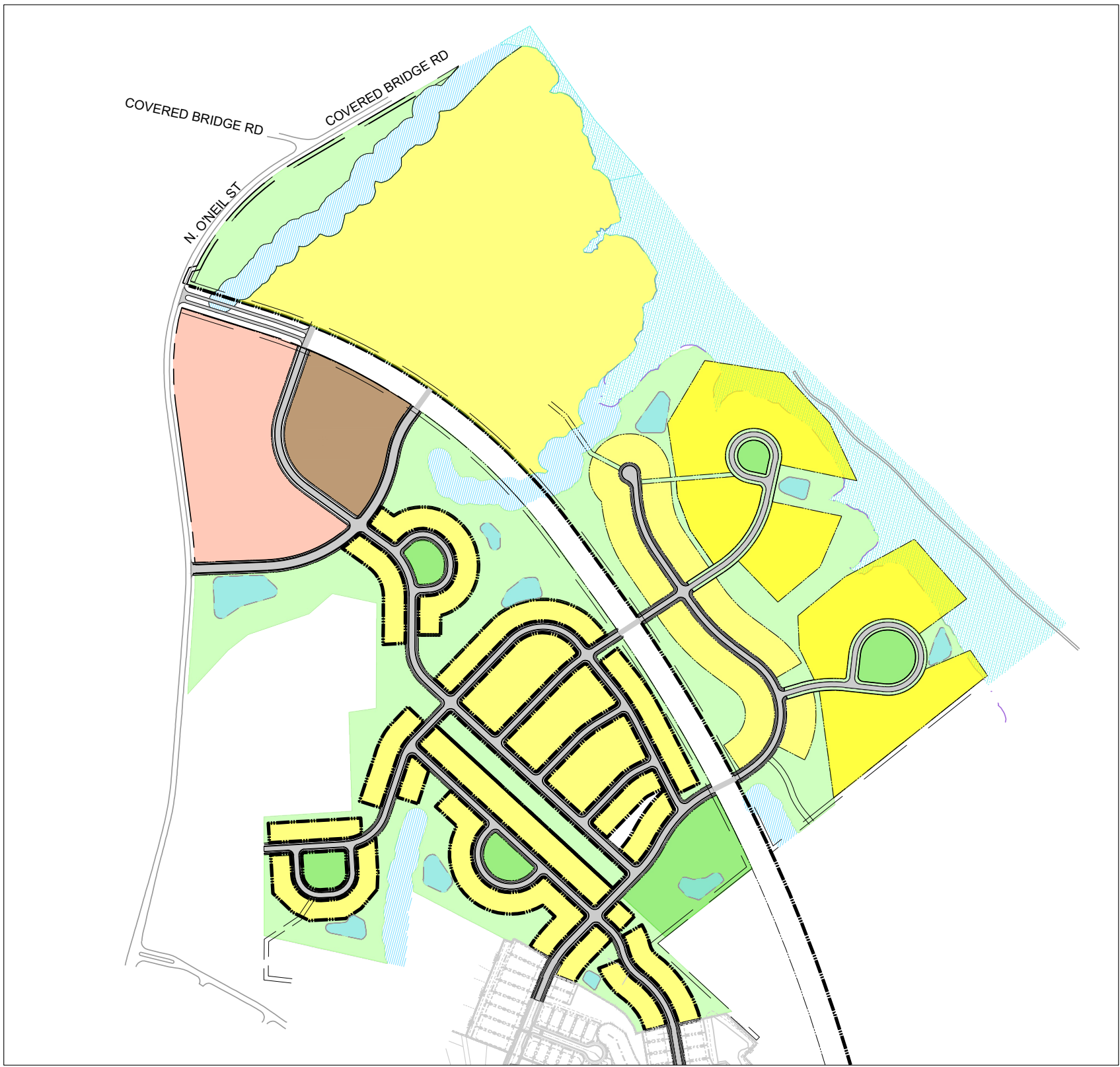
CLAYTON, NORTH CAROLINA

### MASTER PLAN

CASE # 2020-114-SD  
PDD # 2020-113-PDD  
SUBMITTED ON AUGUST 03, 2020

#### REVISIONS

- 1.....October 05, 2020.....PER TOWN COMMENTS
- 2.....November 17, 2020.....PER TOWN COMMENTS
- 3.....December 16, 2020.....PER TOWN COMMENTS



VICINITY MAP

| INDEX OF DRAWINGS |                                        |
|-------------------|----------------------------------------|
| SHEET NO.         | SHEET NAME                             |
| 0.0               | COVER SHEET                            |
| 1.0               | SURVEY                                 |
| 2.0               | EXISTING CONDITIONS PLAN               |
| 3.0               | SITE PLAN                              |
| 4.0               | LANDSCAPE PLAN                         |
| 5.0               | PHASING PLAN                           |
| 5.1               | ACCESS PHASING PLAN                    |
| 6.0               | VEHICULAR CIRCULATION PLAN             |
| 7.0               | TIA ROAD IMPROVEMENTS PLAN             |
| 8.0               | PEDESTRIAN CIRCULATION PLAN            |
| 9.0               | PRELIMINARY UTILITY PLAN               |
| 10.0              | PRELIMINARY GRADING & DRAINAGE PLAN    |
| 11.0              | OPEN SPACE PLAN                        |
| 12.0              | SINGLE FAMILY REGULATING PLAN          |
| 13.0              | TOWNHOME REGULATING PLAN               |
| 14.0              | APARTMENT & COMMERCIAL REGULATING PLAN |
| 15.0              | AMENITY CENTER REGULATING PLAN         |
| 16.0              | RCA OVERLAY                            |









**STEWART**

101 WEST MAIN ST.  
DURHAM, NC 27701  
T 919-380-8750

FIRM LICENSE #: C-1051  
www.stewartinc.com  
PROJECT #: L20017

Client:

ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:

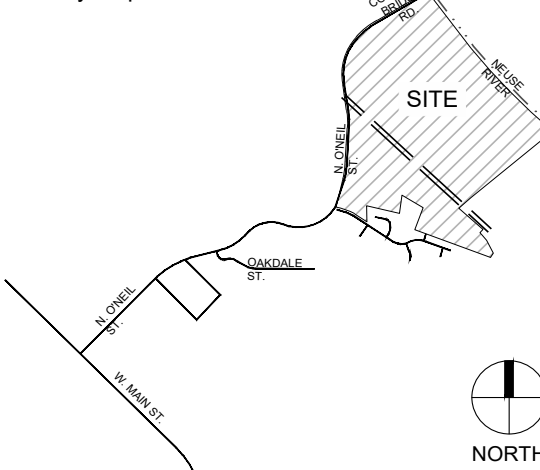
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

KIMLEY HORN  
421 FAYETTEVILLE ST SUITE 600  
RALEIGH, NC 27601

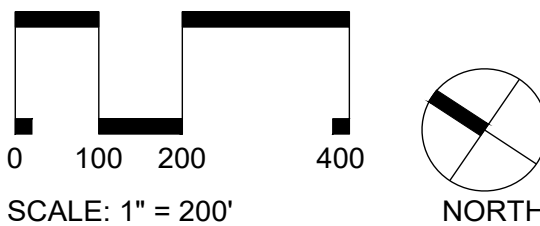
Agent:

RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

Vicinity map:



Seal:



Project:

## ASHCROFT SECTION 2

Issued for:

## MASTER PLAN

| No. | Date       | Description        |
|-----|------------|--------------------|
| 1   | 08.03.2020 | 114 W. MAIN STREET |
| 2   | 08.03.2020 | 114 W. MAIN STREET |
| 3   | 08.03.2020 | 114 W. MAIN STREET |
| 4   | 08.03.2020 | 114 W. MAIN STREET |
| 5   | 08.03.2020 | 114 W. MAIN STREET |
| 6   | 08.03.2020 | 114 W. MAIN STREET |
| 7   | 08.03.2020 | 114 W. MAIN STREET |
| 8   | 08.03.2020 | 114 W. MAIN STREET |
| 9   | 08.03.2020 | 114 W. MAIN STREET |
| 10  | 08.03.2020 | 114 W. MAIN STREET |
| 11  | 08.03.2020 | 114 W. MAIN STREET |
| 12  | 08.03.2020 | 114 W. MAIN STREET |
| 13  | 08.03.2020 | 114 W. MAIN STREET |
| 14  | 08.03.2020 | 114 W. MAIN STREET |
| 15  | 08.03.2020 | 114 W. MAIN STREET |
| 16  | 08.03.2020 | 114 W. MAIN STREET |
| 17  | 08.03.2020 | 114 W. MAIN STREET |
| 18  | 08.03.2020 | 114 W. MAIN STREET |
| 19  | 08.03.2020 | 114 W. MAIN STREET |
| 20  | 08.03.2020 | 114 W. MAIN STREET |
| 21  | 08.03.2020 | 114 W. MAIN STREET |
| 22  | 08.03.2020 | 114 W. MAIN STREET |
| 23  | 08.03.2020 | 114 W. MAIN STREET |
| 24  | 08.03.2020 | 114 W. MAIN STREET |
| 25  | 08.03.2020 | 114 W. MAIN STREET |
| 26  | 08.03.2020 | 114 W. MAIN STREET |
| 27  | 08.03.2020 | 114 W. MAIN STREET |
| 28  | 08.03.2020 | 114 W. MAIN STREET |
| 29  | 08.03.2020 | 114 W. MAIN STREET |
| 30  | 08.03.2020 | 114 W. MAIN STREET |
| 31  | 08.03.2020 | 114 W. MAIN STREET |
| 32  | 08.03.2020 | 114 W. MAIN STREET |
| 33  | 08.03.2020 | 114 W. MAIN STREET |
| 34  | 08.03.2020 | 114 W. MAIN STREET |
| 35  | 08.03.2020 | 114 W. MAIN STREET |
| 36  | 08.03.2020 | 114 W. MAIN STREET |
| 37  | 08.03.2020 | 114 W. MAIN STREET |

Title:

## EXISTING CONDITIONS PLAN

Project number: L20017 Sheet #: 2.0  
Issued Date: 08.03.2020  
Drawn by: HNJ  
Approved by: MT

### PROPERTY OWNERS:

| LETTER | PARCEL ID | OWNER                             | OWNER ADDRESS           | OWNER ADDRESS 2           | ACREAGE | ZONING |
|--------|-----------|-----------------------------------|-------------------------|---------------------------|---------|--------|
| A      | 05H02013A | MASSEY, JOHN WESLEY               | 8041 ST ANDREWS DR      | LAURINBURG, NC 28352-0000 | 5.314   | R-E    |
| B      | 05H02008A | RAYMOND E EARP JR REVOCABLE TRUST | 7230 NC HIGHWAY 42 E    | SELMA, NC 27576-6005      | 16.013  | R-E    |
| C      | 05H02010A | SMITH, JAMES D                    | 1814 N ONEIL STREET EXT | CLAYTON, NC 27520-6236    | 80.865  | R-E    |
| D      | 05H02012  | MASSEY, JOHN WESLEY               | 8041 ST ANDREWS DR      | LAURINBURG, NC 28352-0000 | 44.910  | R-E    |
| E      | 05H02015  | ASHCROFT PARTNERS, LLC            | 114 W MAIN ST STE 102   | CLAYTON, NC 27520-2397    | 61.460  | R-E    |
| F      | 05H02008B | ASHCROFT PARTNERS, LLC            | 114 W MAIN ST STE 102   | CLAYTON, NC 27520-2397    | 35.121  | R-E    |
| G      | 05H02013  | MASSEY, JOHN WESLEY               | 8041 ST ANDREWS DR      | LAURINBURG, NC 28352-0000 | 12.463  | R-E    |

### ADJACENT OWNERS:

| NO. | PARCEL ID | OWNER                               | OWNER ADDRESS               | OWNER ADDRESS 2             | ACREAGE | ZONING        |
|-----|-----------|-------------------------------------|-----------------------------|-----------------------------|---------|---------------|
| 1   | 05H02013A | ASHCROFT PARTNERS, LLC              | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 16.69   | PD-R          |
| 2   | 05H02021Q | ASHCROFT PARTNERS, LLC              | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 1.45    | PD-R          |
| 3   | 05H02021R | WEAVER HOMES, INC                   | 350 WAGONER DR              | FAYETTEVILLE, NC 28303-4647 | 0.15    | PD-R          |
| 4   | 05H02021S | WEAVER HOMES, INC                   | 350 WAGONER DR              | FAYETTEVILLE, NC 28303-4647 | 0.15    | PD-R          |
| 5   | 05H02021T | RMS INVESTMENTS, LLC                | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.15    | PD-R          |
| 6   | 05H02021U | WEAVER HOMES, INC                   | 350 WAGONER DR              | FAYETTEVILLE, NC 28303-4647 | 0.15    | PD-R          |
| 7   | 05H02021V | RMS INVESTMENTS, LLC                | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.16    | PD-R          |
| 8   | 05H02021W | WESTAN CONSTRUCTION, LLC            | 283 GLEN RD STE A           | GARNER, NC 27529-6340       | 0.16    | PD-R          |
| 9   | 05H02021X | RMS INVESTMENTS, LLC                | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.16    | PD-R          |
| 10  | 05H02021Y | WEAVER HOMES, INC                   | 350 WAGONER DR              | FAYETTEVILLE, NC 28303-4647 | 0.16    | PD-R          |
| 11  | 05H02021Z | RMS INVESTMENTS, LLC                | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.25    | PD-R          |
| 12  | 05H02022  | RMS INVESTMENTS, LLC                | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.26    | PD-R          |
| 13  | 05H02022E | ASHCROFT PARTNERS, LLC              | 114 W MAIN ST STE 102       | CLAYTON, NC 27520-2397      | 0.99    | PD-R          |
| 14  | 05H02014A | WALL, STEVE GLENN & WALL JACKIE     | 1376 NORTH ONEIL STREET EXT | CLAYTON, NC 27520-0000      | 1.03    | PD-R          |
| 15  | 05H02014B | BENSON, ANTHONY MARK                | 1378 B N ONEIL ST EXT       | CLAYTON, NC 27520-0000      | 1.01    | PD-R          |
| 16  | 05H02014C | BENSON, ANTHONY MARK                | 1378 B NORTH O'NEAL EXT     | CLAYTON, NC 27520-0000      | 0.78    | PD-R          |
| 17  | 05H02014E | BENSON, AMANDA LEIGH                | 1380 N ONEALS ST            | CLAYTON, NC 27520           | 0.99    | R-E           |
| 18  | 05H02014D | BENSON, BRANDON MARK                | 1382 N ONEIL STREET EXT     | CLAYTON, NC 27520-6238      | 0.95    | R-E           |
| 19  | 05H02018H | SHARON HOUTMAN FAMILY TRUST         | 96 HIGHMEADOW LN            | CLAYTON, NC 27520-5712      | 0.32    | PD-R          |
| 20  | 05H02019C | JERRY AND FAITH LAYTON LIVING TRUST | 106 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.2     | PD-R          |
| 21  | 05H02018I | BRIAN E PRUSANK LIVING TRUST        | 116 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.165   | PD-R          |
| 22  | 05H02019D | O'FELT, MAY                         | 128 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.16    | PD-R          |
| 23  | 05H02018L | BARRETT, SANDRA LIFE ESTATE         | 142 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.15    | PD-R          |
| 24  | 05H02018M | RAFFEL, MARY                        | 156 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.16    | PD-R          |
| 25  | 05H02018N | CAPERS, ANJOLINA WASHINGTON         | 170 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.14    | PD-R          |
| 26  | 05H02018O | MITCHELL, CHRIS D.                  | 180 HIGHMEADOW LN           | CLAYTON, NC 27520-5713      | 0.15    | PD-R          |
| 27  | 05H02018P | DUDLEY, BLAINE T.                   | 1307 LAKE WENDELL RD        | WENDELL, NC 27591-7158      | 0.31    | PD-R          |
| 28  | 05H02011  | JONES, TRACY L.                     | 1504 N ONEIL STREET EXT     | CLAYTON, NC 27520-6959      | 9.84    | R-E           |
| 29  | 05H02013D | WOODS, PAMELA POOLE                 | 9728 CYPRESS FARM DR        | ZEHLUN, NC 27597-6700       | 1.91    | R-E           |
| 30  | 05H02013C | HICKERSON, PATSY POOLE              | 1039 CROCKER RD             | SMITHFIELD, NC 27577-9033   | 3.09    | R-E           |
| 31  | 05H02011B | JONES, TRACY L                      | 1538 NORTH ONEIL STREET EXT | CLAYTON, NC 27520-0000      | 8.54    | R-E           |
| 32  | 05H02009  | RAYMOND ELMORE EARP JR FAMILY TRUST | 7020 NC HIGHWAY 42 E        | SELMA, NC 27576-6128        | 631.23  | PD-R/B-2/R-10 |
| 33  | 16103029  | TOWN OF CLAYTON                     |                             | CLAYTON, NC 27528-0000      | 80.58   | R-E           |
| 34  | 16103028  | BOYETTE, BONNIE S                   | 1387 LOOP RD                | CLAYTON, NC 27527-6230      | 49.17   | PF            |
| 35  | 16103028A | BOYETTE, DONNIE LUCAS               | 1353 LOOP RD                | CLAYTON, NC 27527-6233      | 40.67   | PF            |
| 36  | 16103024E | BOYETTE, LARRY S                    | 611 LOOP RD                 | CLAYTON, NC 27527-0000      | 40.88   | PF            |
| 37  | 05H02199W | TOWN OF CLAYTON                     |                             | CLAYTON, NC 27528-0000      | 78.54   | PF            |

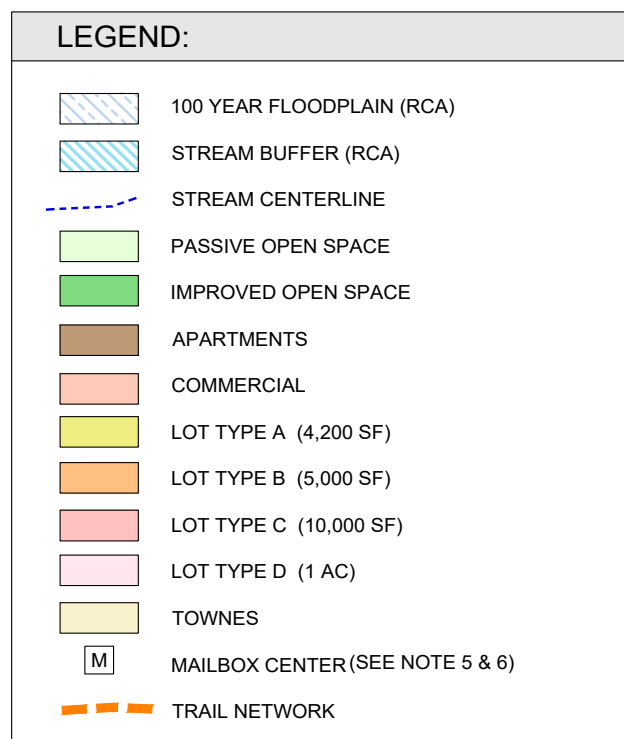
### SURVEY LEGEND:

|       |                                |
|-------|--------------------------------|
| △     | SURVEY CONTROL POINT           |
| ○ EIP | EXISTING IRON PIPE             |
| □ ECM | EXISTING CONCRETE MONUMENT     |
| ●     | COMPUTED POINT                 |
| ⊙     | STORM DRAIN MANHOLE            |
| ⊞     | STORM DRAIN CURB INLET         |
| ⊕     | SANITARY SEWER MANHOLE         |
| ⊖     | SANITARY SEWER CLEANOUT        |
| ⊗     | SANITARY FORCEMAIN VALVE       |
| ⊘     | HYDRANT                        |
| ⊙     | WATER VALVE                    |
| ⊙     | WATER METER                    |
| ⊙     | WATER MANHOLE                  |
| ⊙     | WATER VAULT                    |
| ⊙     | WELL                           |
| ⊙     | GAS VALVE                      |
| ⊙     | GAS METER                      |
| ⊙     | TELEPHONE MANHOLE              |
| ⊙     | TELEPHONE PEDESTAL             |
| ⊙     | TV MANHOLE                     |
| ⊙     | TV PEDESTAL                    |
| ⊙     | FIBER OPTIC WITNESS POST       |
| ⊙     | FIBER OPTIC BOX                |
| ⊙     | ELECTRIC MANHOLE               |
| ⊙     | ELECTRIC METER                 |
| ⊙     | ELECTRIC BOX                   |
| ⊙     | UTILITY POLE                   |
| ⊙     | GUY POLE                       |
| ⊙     | GUY WIRE                       |
| ⊙     | LIGHT POLE                     |
| ⊙     | MANHOLE                        |
| ⊙     | TRAFFIC SIGNAL BOX             |
| ⊙     | TRAFFIC SIGNAL POST            |
| ⊙     | MONITORING WELL                |
| ⊙     | BORING LOCATION                |
| ⊙     | BOLLARD                        |
| ⊙     | SIGN                           |
| ⊙     | FINISHED FLOOR ELEVATION       |
| ⊙     | DECIDUOUS TREE                 |
| ⊙     | EVERGREEN TREE                 |
| ⊙     | BUSH                           |
| ⊙     | WIRE FENCE                     |
| ⊙     | CHAIN LINK FENCE               |
| ⊙     | UNDERGROUND TELEPHONE LINE     |
| ⊙     | UNDERGROUND FIBER OPTIC LINE   |
| ⊙     | UNDERGROUND GAS LINE           |
| ⊙     | UNDERGROUND ELECTRIC LINE      |
| ⊙     | UNDERGROUND WATER LINE         |
| ⊙     | SANITARY SEWER LINE            |
| ⊙     | STORM DRAIN LINE               |
| ⊙     | OVERHEAD WIRES                 |
| ⊙     | UNIDENTIFIED LINE              |
| ⊙     | UNKNOWN DESTINATION            |
| ⊙     | CONCRETE SURFACE               |
| ⊙     | DUCTILE IRON PIPE              |
| ⊙     | POLYVINYL CHLORIDE PIPE        |
| ⊙     | HIGH-DENSITY POLYETHYLENE PIPE |
| ⊙     | REINFORCED CONCRETE PIPE       |
| ⊙     | CORRUGATED METAL PIPE          |
| ⊙     | CATCH BASIN                    |

### GENERAL NOTES

- THIS SURVEY MAP IS INTENDED TO REPRESENT THE EXISTING CONDITIONS/TOPOGRAPHY ON THE PROPERTIES SHOWN HEREON AND IS NOT A BOUNDARY SURVEY. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT AND THEREFORE ALL ENCUMBRANCES UPON THE PROPERTY MAY NOT BE SHOWN.
- THE PROPERTY LINES SHOWN HEREON HAVE BEEN CONFIRMED FROM A SURVEY BY STEWART INC. PROPERTY LINES SHOWN TAKEN FROM REFERENCES SHOWN HEREON.
- HORIZONTAL DATUM IS NAD 83 (2011) AND VERTICAL DATUM IS NAVD83. BASED ON GPS METHODS USING REAL-TIME KINEMATIC SOLUTIONS FOR THE SURVEY CONTROL POINTS SHOWN HEREON AND TIED TO NORTH CAROLINA GEODETIC SURVEY MONUMENT "MORAH RESET Z".  
"MORAH RESET Z"  
N 701.370.11"  
E 2,146.838.92"  
EL 360.75'
- THE INITIAL STATE PLANE POSITIONS FOR THIS SURVEY WERE SCALED FROM GRID TO GROUND FROM A PROJECT LOCATION TRAV 2 168550.13 E 2165903.96, AN ELEVATION OF 255.30, USING A CORRECTION FACTOR OF 0.9998879.
- THIS DRAWING DOES NOT CONFORM TO N.C. GS47-30 AND THEREFORE IS NOT FOR RECORDATION.
- UTILITIES SHOWN HEREON ARE BASED ON ABOVE-GROUND VISIBLE EVIDENCE AND UTILITY DESIGNATION/MARKING SERVICES PERFORMED BY STEWART INC. AS A PART OF THIS SURVEY. CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL UTILITIES BEFORE COMMENCING CONSTRUCTION.
- TREES SHOWN HEREON MAY NOT REPRESENT ALL VEGETATION ON THE SUBJECT PROPERTY.
- THE SUBJECT PROPERTIES ARE ZONED "PD-R" & "RE" PER JOHNSTON COUNTY GIS. PROPERTIES ARE ZONED "PLANNED DEVELOPMENT RESIDENTIAL" & "RESIDENTIAL ESTATE" PER TOWN OF CLAYTON DEVELOPMENT MAP.
- THE SUBJECT PROPERTY LIES IN ZONES X (AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE AND FUTURE CONDITIONS 1% ANNUAL CHANCE FLOODPLAIN) X (SHADED) AREA OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF FUTURE CONDITIONS 1% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS OF LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD; AE (AREA DETERMINED TO BE INSIDE THE 1% ANNUAL CHANCE FLOOD, BASE FLOOD ELEVATIONS DETERMINED), AND FLOODWAY (DELINEATED FLOODWAY OF A STREAM), BASED ON THE FLOOD INSURANCE RATE MAP COMMUNITY MAP NUMBER 372017600K DATED 06/20/18 AND MAP NUMBER 372016890K DATED 06/20/18, FLOOD HAZARD LINES SHOWN HEREON ARE FROM FRIS NC 020V.
- WETLAND DELINEATION PERFORMED BY SOIL & ENVIRONMENTS CONSULTANTS, PA PER PROJECT NO. 14016.W1.
- AREAS COMPUTED BY COORDINATE GEOMETRY.





\*MINIMUM LOT SIZE DOES NOT INCLUDE RESOURCE CONSERVATION AREAS  
 \*\*WHERE NO SIDEWALK IS PROPOSED, SETBACK SHALL BE FROM RIGHT OF WAY.

**DEVELOPMENT POD STANDARDS TABLE:**

\*MINIMUM SETBACKS SHALL ONLY APPLY ALONG PERIMETER STREETS. NO SETBACK SHALL APPLY TO INTERNAL STREETS WITHIN DEVELOPMENT PODS.

## NOTES:

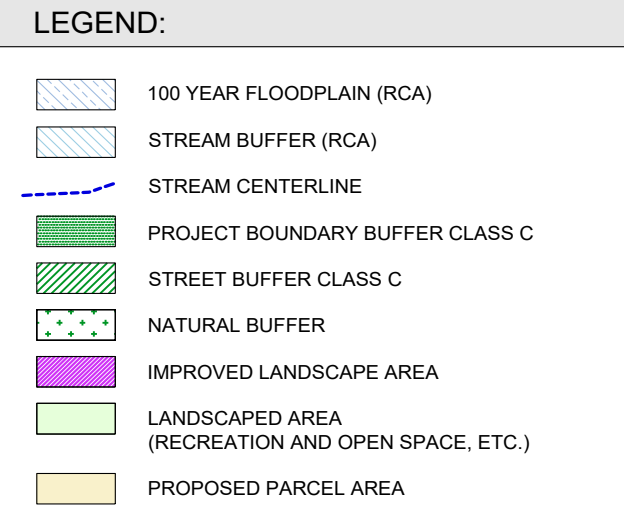
- 1. SEE SHEET C1.0 FOR ADJACENT PROPERTY OWNER INFORMATION
- 2. HOUSHALLS MAINTAIN ALL COMMON OPEN SPACE AREAS INCLUDING LANDSCAPED MEDIAN, SIDEWALKS AND DRIVEWAYS. ALL OFFERS FOR REVERTED RESIDENTIAL USES INCLUDE THE FOLLOWING:
  - APARTMENTS
  - TOWNHOUSES
  - SINGLE FAMILY LOTS
- 3. COMMERCIAL REGULATING PLAN FOR PERMITTED COMMERCIAL USES AND DIMENSIONAL REQUIREMENTS
- 4. MAILBOX NUMBER AND LOCATION ARE CONCEPTUAL AND TO BE CONFIRMED AT PRELIMINARY PLAT REVIEW AND UPON REVIEW BY U.S. POSTAL SERVICE
- 5. MAILBOXES TO BE LOCATED ON THE ADJACENT PROPERTY
- 6. MAILBOX KIOSK / PUBLIC AREA SHALL BE ACCESSIBLE PER ADA REQUIREMENT
- 7. ALL PHASES OF THE DEVELOPMENT SHALL BE SUBMITTED AND REVIEWED AS SEPARATE SUBMITTALS FOR PLANS AND SUBDIVISION PLANS.
- 8. MEDAINS WITHIN THE CUL-DE-SACS MAY BE PERMITTED WHERE THE CUL-DE-SAC RADIUS IS INCREASED TO ACCOMMODATE FIRE AND SANITATION TRUCKS. REQUESTS ARE TO BE COORDINATED WITH FIRE DEPARTMENT AND ENGINEERING. THESE LANDSCAPE MEDAINS WILL BE PRIVATELY MAINTAINED AND ARE NOT TO BE USED FOR PARKING OR STORAGE.
- 9. AMENITY CENTER BUILDING SHALL BE 4,000 SF MINIMUM. POOL AND POOL DECK SHALL BE A MINIMUM OF 7,500 SF. ALL IMPROVEMENTS ASSOCIATED WITH THE AMENITIES SHALL BE CONSIDERED AS PART OF THE DEVELOPMENT.
- 10. QUANTITY OF EACH UNIT TYPE MAY BE ADJUSTED +/-10%, SO LONG AS THE TOTAL QUANTITY FOR THE DEVELOPMENT IS NOT INCREASED
- 11. CUL-DE-SAC SHALL BE 75' WIDE TO 700' LONG. LESS THAN 20,000 SF IN SIZE AND 1100 LF FOR LOTS GREATER THAN 20,000 SF.
- 12. SLOPES GREATER THAN 25% STEEP AND 5,000 SF IN AREA WITHIN 200' OF A CUL-DE-SAC STREAM OR WITHIN 10' OF FLOODWAY OR 50' OF UNBURIED STREAMS SHALL BE CONSIDERED STEEP SLOPES. NO MORE THAN 15% OF THE STEEP SLOPES ON THE SITE SHALL BE DISTURBED.
- 13. AN EXCEPTION PETITION SHALL BE SUBMITTED TO THE BOARD OF PLANNING CONCURRENTLY WITH CONSTRUCTION DOCUMENTS.



**STEWART**  
101 WEST MAIN ST.  
DURHAM, NC 27701  
T 919.380.8750

FIRM LICENSE #: C-10517  
[www.stewartinc.com](http://www.stewartinc.com)  
PROJECT #: L20017





**NOTES:**

1. "WHERE NON-NATIVE OR NON-DROUGHT TOLERANT NATIVE VEGETATION IS INCORPORATED AN IRRIGATION SYSTEM SHALL BE REQUIRED;" (UDC 155.402.5 (H) (2) (b) 5)
2. "ALL LANDSCAPED AREAS SHALL BE PROVIDED WITH AN AUTOMATICALLY OPERATED IRRIGATION SYSTEM THAT WILL ADEQUATELY COVER ALL LIVING PLANT MATERIAL, SUCH AS TREES, SHRUBS, AND PERENNIALS. IF IRRIGATION WILL NOT BE UTILIZED, DROUGHT TOLERANT SPECIES MUST BE USED."
3. "ALL LANDSCAPED AREAS SHALL BE MAINTAINED IN AN ATTRACTIVE AND HEALTHY CONDITION. DEAD OR DISEASED PLANTINGS SHALL BE REMOVED AND REPLACED IN A TIMELY FASHION"
4. ALL MECHANICAL EQUIPMENT, INCLUDING HVAC SHALL BE SCREENED PER THE UDC.

## SITE INTERIOR LANDSCAPE REQUIREMENTS:

- \* "TWENTY PERCENT OF THE TOTAL LOT AREA SHALL BE LANDSCAPED, ONE CANOPY TREE, ONE UNDERSTORY TREE, AND TWO SHRUBS SHALL BE PLANTED FOR EACH SIDEWALK MEETING THE STREET. PLANTINGS SHALL BE PLANTED TO BE EVENLY PLANTED THROUGHOUT THE LANDSCAPED AREA, BUT MAY BE STAGGERED OR CLUSTERED AS NECESSARY TO MAXIMIZE VISUAL AND SCREENING OBJECTIVES, AND TO MEET THE NEEDS FOR PLANTING SPECIES, SOILS, CLIMATE, LIGHT, AND WATER, LIGHT, AND AIR CIRCULATION." (UDO 155.402, PART 1)
- \* "ALL SITE PLANS REQUIRING LANDSCAPING IN ACCORDANCE WITH THIS SECTION SHALL PROVIDE SITE INTERIOR LANDSCAPING, PERIMETER BUFFER REQUIREMENTS SET FORTH IN PART 2 AND STREET YARD TREES SET FORTH IN PART 3 OF THIS SECTION SHALL BE PROVIDED COMPLETELY, AS REQUIRED, IN ADDITION TO THESE REQUIREMENTS."
- \* "RESOURCE CONSERVATION AREAS (SEE § 155.500) MAY BE USED TO SATISFY A MAXIMUM OF 40% OF THE TOTAL REQUIRED LANDSCAPE AREA."

**STREET TREE YARD REQUIREMENTS:**

"STREET YARD TREES SHALL BE REQUIRED ALONG ALL RIGHTS OF WAY AT THE RATE OF ONE CANOPY TREE PER LOT **OR** ONE CANOPY TREE FOR EVERY 40 LINEAR FEET (**SPACED A MAXIMUM OF 50 FEET APART**)."

(UDC 155.402, PART 3)

STREET TREE LOCATIONS SHOWN IN LANDSCAPE PLAN ARE CONCEPTUAL. IN NATURE, ACTUAL LOCATIONS ARE TO BE DETERMINED AT FINAL ENGINEERING AND PERMITTING.

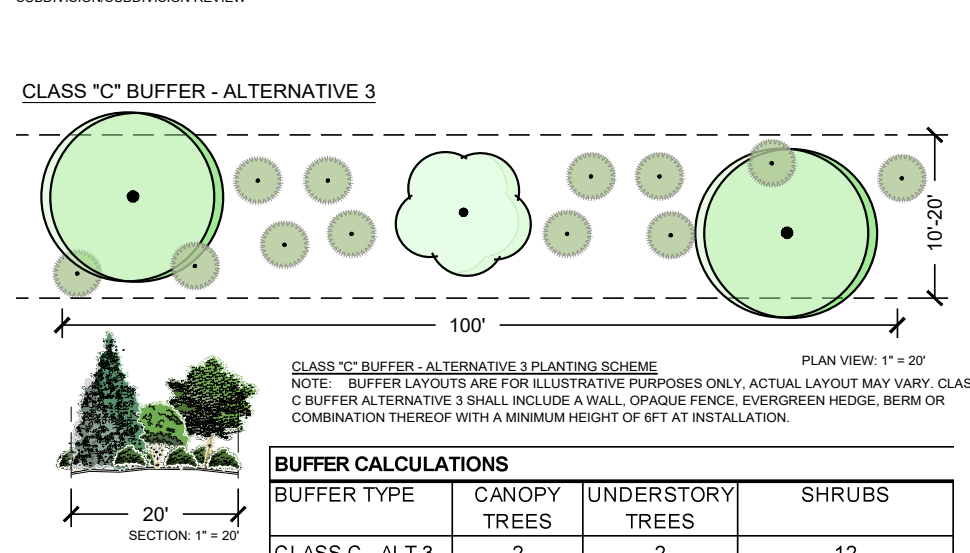
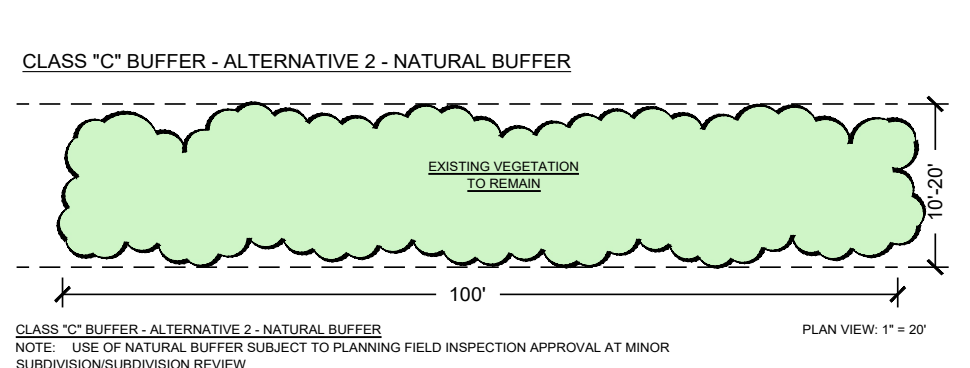
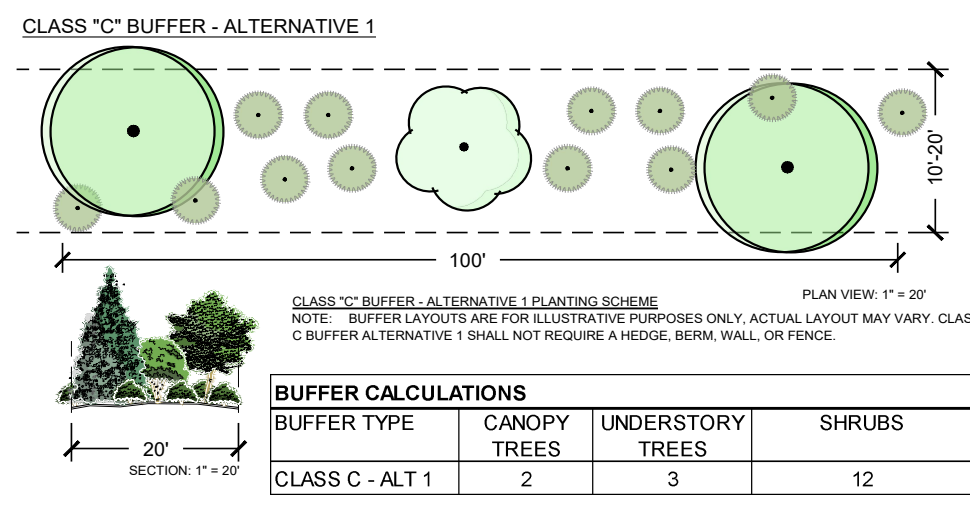
| STREET YARD TREE CALCULATIONS |                     |                     |                                     |
|-------------------------------|---------------------|---------------------|-------------------------------------|
| ROAD NAME                     | LF OF ROW<br>SIDE A | LF OF ROW<br>SIDE B | TREES<br>REQUIRED<br>(TOTAL ROW/LF) |
| ROAD 1*                       | 2557                | 2653                | 130                                 |
| ROAD 2                        | 1536                | 1700                | 81                                  |
| ROAD 3*                       | 1994                | 1745                | 93                                  |
| ROAD 4*                       | 2743                | 2428                | 129                                 |
| ROAD 5                        | 3819                | 496                 | 108                                 |
| ROAD 6                        | 462                 | 478                 | 24                                  |
| ROAD 7                        | 400                 | 381                 | 20                                  |
| ROAD 8                        | 646                 | 469                 | 28                                  |
| ROAD 9*                       | 612                 | 439                 | 26                                  |
| ROAD 10                       | 656                 | 445                 | 27                                  |
| ROAD 11                       | 1690                | 822                 | 63                                  |
| ROAD 12                       | 1715                | 1836                | 89                                  |
| ROAD 13*                      | 2595                | 2347                | 124                                 |
| ROAD 14                       | 1023                | 1017                | 51                                  |
| ROAD 15                       | 1460                | 1116                | 64                                  |
| ROAD 16                       | 828                 | 553                 | 33                                  |

\*ALWAYS STREET TREES TO BE PLANTED ON CURBSIDE AND IN LANDSCAPE WITH GRASS.

**PERIMETER BUFFER REQUIREMENTS:**

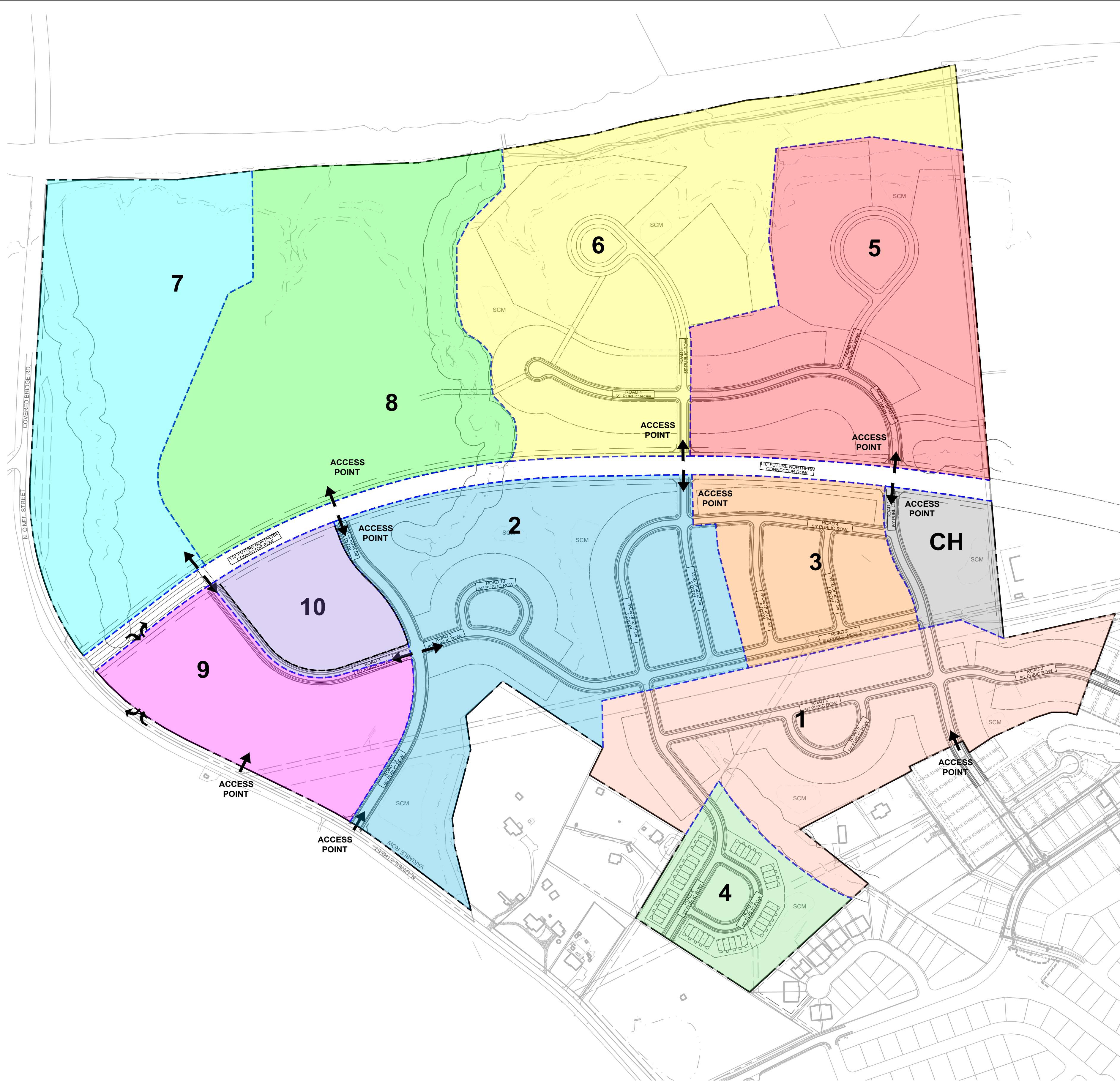
**NOTES:**

- MAINTAIN EXISTING VEGETATION WHEREVER POSSIBLE TO SATISFY BUFFER REQUIREMENTS
- CONTRACTOR TO FIELD VERIFY EXISTING VEGETATION WITH TOWN PRIOR TO PROCURING PLANT MATERIAL
- AT A MINIMUM, A CLASS A BUFFER SHALL BE PROVIDED AS SHOWN ON PLAN
- BRIDGES WILL NOT BE REQUIRED WHERE BRIDGES EXIST ALONG PROPOSED TOWN CONNECTOR ROAD. ROAD DESIGN BY OTHERS AND BRIDGE LOCATIONS TBD
- WHERE EXISTING VEGETATION IN THE BUFFER IS REMOVED IT SHALL BE REPLACED AND MEET THE BUFFER REQUIREMENTS
- BUFFER DIAGRAMS BELOW ARE FOR ILLUSTRATIVE PURPOSES ONLY, ACTUAL LAYOUT MAY VARY
- DETAILED SPECIES AND QUANTITIES IN COMPLIANCE WITH THE UDC SHALL BE PROVIDED DURING PRELIMINARY PLAN REVIEW.





L:\Projects\2020\20017 - Ashcroft\2\DWGS\1-Site Plan\3-Sheets\L20017-C2-1-Phasing Plan.dwg Feb 23, 2021 - 11:00am



| SITE DATA:                  |           |
|-----------------------------|-----------|
| TOTAL SITE AC.:             | 254.85    |
| PROJECT AC.:                | 241.21    |
| RESOURCE CONSERVATION AREA: | 34.53     |
| NET PROJECT AC.:            | 206.67    |
| TOTAL UNITS:                | 772 UNITS |

| PHASE 1             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 91 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 2             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 80 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 3             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 64 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 4             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | 0      |
| TOWNHOME LOTS:      | +/- 40 |
| APARTMENT UNITS:    | 0      |

| PHASE 5             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 32 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 6             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | +/- 26 |
| TOWNHOME LOTS:      | 0      |
| APARTMENT UNITS:    | 0      |

| PHASE 7             |        |
|---------------------|--------|
| SINGLE FAMILY LOTS: | 0      |
| TOWNHOME LOTS:      | +/- 94 |
| APARTMENT UNITS:    | 0      |

| PHASE 8             |         |
|---------------------|---------|
| SINGLE FAMILY LOTS: | 0       |
| TOWNHOME LOTS:      | +/- 165 |
| APARTMENT UNITS:    | 0       |

| PHASE 9         |             |
|-----------------|-------------|
| COMMERCIAL (SF) | +/- 105,000 |

| PHASE 10            |         |
|---------------------|---------|
| SINGLE FAMILY LOTS: | 0       |
| TOWNHOME LOTS:      | 0       |
| APARTMENT UNITS:    | +/- 180 |

| LEGEND: |                                  |
|---------|----------------------------------|
|         | PHASE 1                          |
|         | CLUBHOUSE                        |
|         | PHASE 2                          |
|         | PHASE 3                          |
|         | PHASE 4                          |
|         | PHASE 5                          |
|         | PHASE 6                          |
|         | PHASE 7                          |
|         | PHASE 8                          |
|         | PHASE 9                          |
|         | PHASE 10                         |
|         | FULL MOVEMENT ACCESS POINT       |
|         | RIGHT-IN/ RIGHT-OUT ACCESS POINT |

- NOTES:
- PHASES DEPICTED ON PLAN DO NOT REPRESENT SEQUENCE OF DEVELOPMENT. APPLICANT RESERVES THE RIGHT TO DEVELOP SITE IMPROVEMENTS AND OBTAIN CERTIFICATES OF OCCUPANCY FOR EACH PROJECT AREA INDEPENDENTLY AND ACCORDING TO THE PROJECT SCHEDULE DETERMINED TO BEST MEET THE NEEDS AND FUNCTIONALITY OF THE COMMUNITY DURING CONSTRUCTION.
  - EACH PRIMARY PHASE MUST BE SELF SUFFICIENT AND STAND ALONE AS IT RELATES TO MEETING APPLICABLE UDC REQUIREMENTS.
  - NUMBER OF LOTS AND PRODUCT TYPE IN EACH PHASE ARE SCHEMATIC IN NATURE AND SUBJECT TO CHANGE AT FINAL ENGINEERING AND PERMITTING.
  - AMENITY AREA (PHASE 1A) TO BE CONSTRUCTED UPON COMPLETION OF PHASE 1.
  - ACCESS POINTS FOR PHASE 9 TO BE DETERMINED IN CONJUNCTION WITH MAJOR SITE PLAN, PER UDC REQUIREMENTS.
  - BOUNDARIES OF PHASES 7 & 8 SUBJECT TO CHANGE. NO MORE THAN 30 UNITS SHALL BE BUILT WITHIN THESE PHASES PRIOR TO PROVISION OF A SECOND ACCESS POINT.



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Client:

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CLAYTON, NC 27520

Consultants:

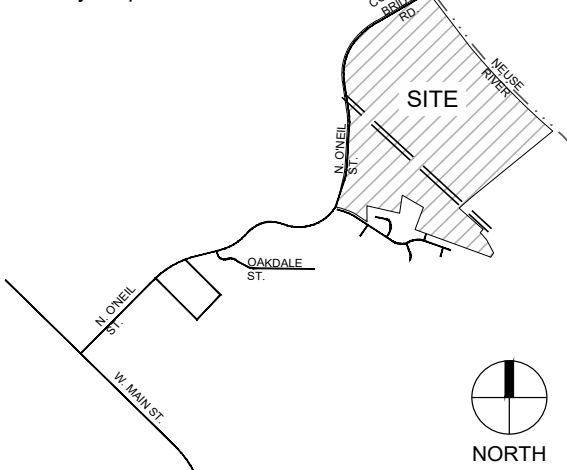
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RALEIGH, NC 27615

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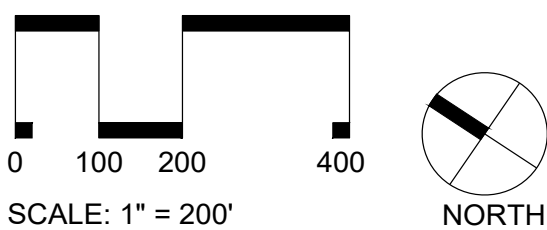
Agent:

RIVERWILD  
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CONTACT: DAVID DEYOUNG, AICP

Vicinity map:



Seal:



Project:

**ASHCROFT  
SECTION 2**

Issued for:

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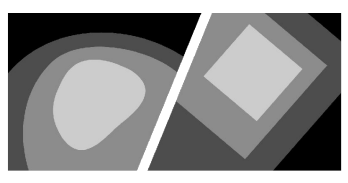
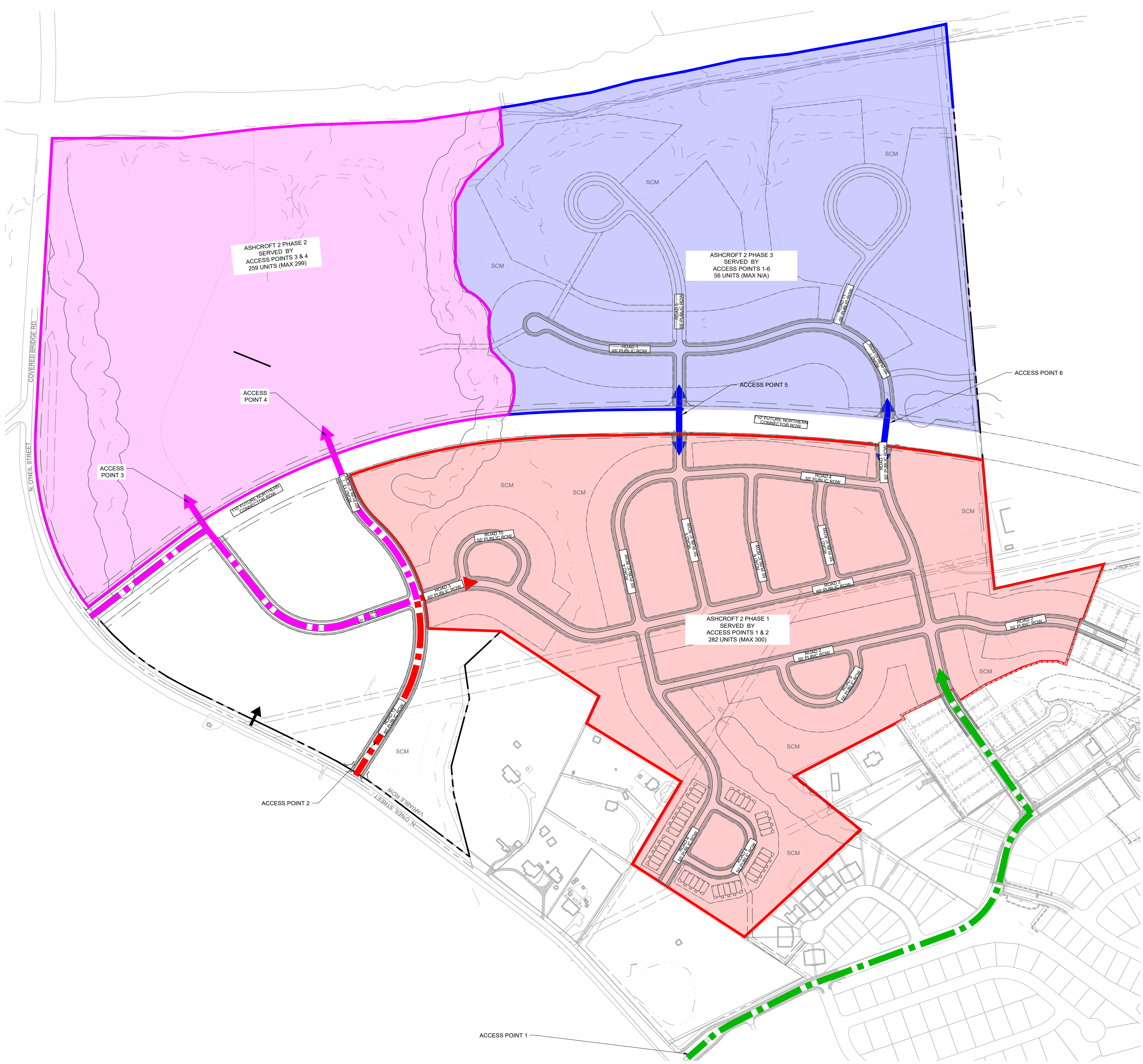
**PHASING PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: MT

**5.0**



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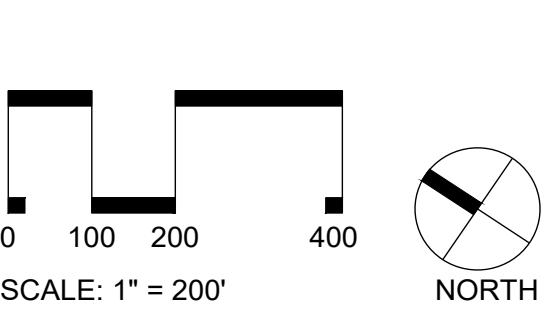
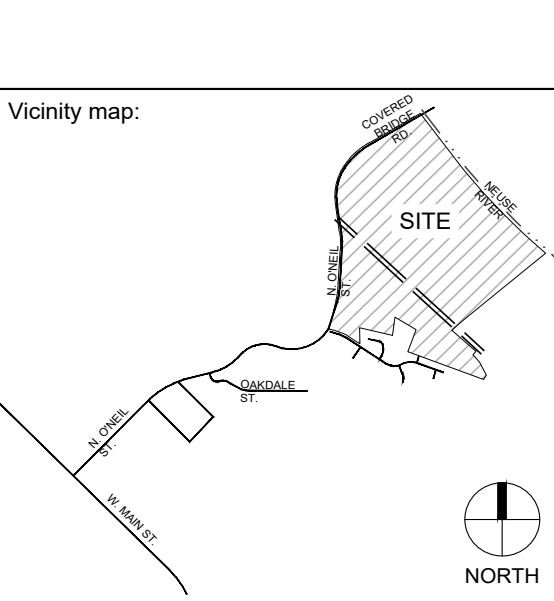
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**Vicinity map:**



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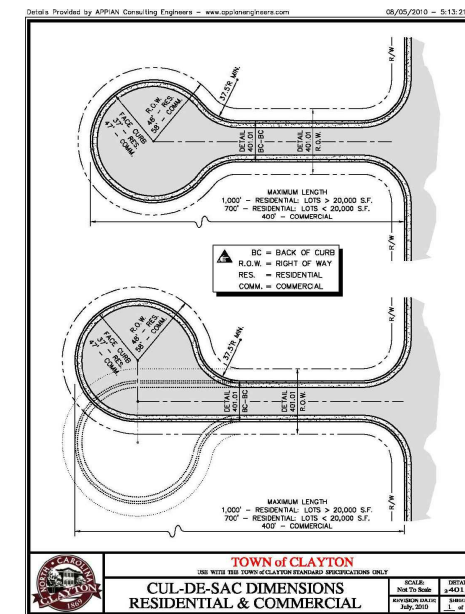
**Title:**  
  
**ACCESS PHASING PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: MT **5.1**

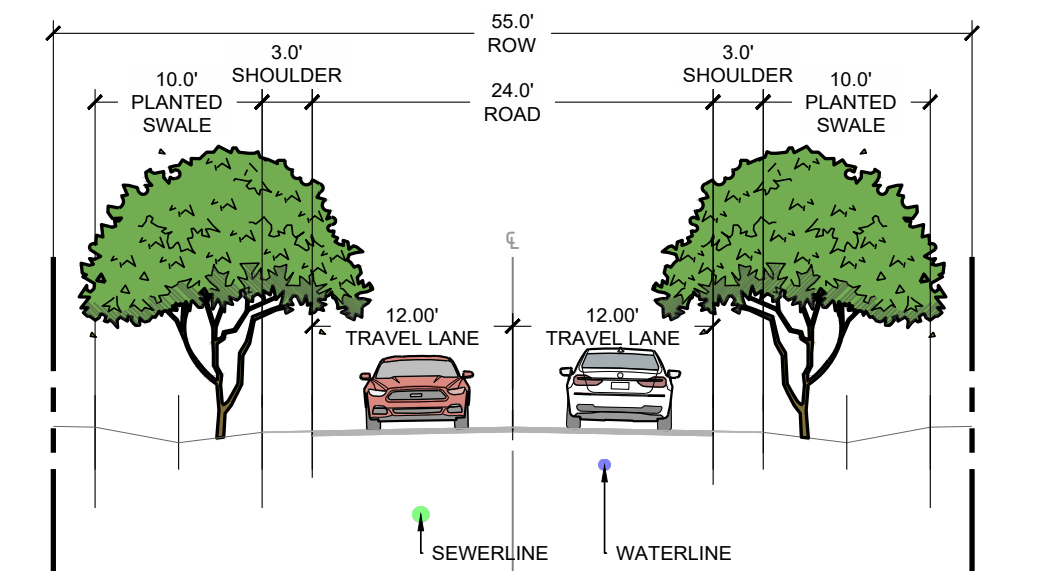


1. ALL ROAD IMPROVEMENTS TO O'NEIL ST. SHALL BE ACCORDING TO THE RECOMMENDATIONS OF THE TRAFFIC IMPACT ANALYSIS (TIA), PROVIDED BY KHA DATED JULY 31, 2020 AND THE REQUIREMENTS OF NCDOT CONGESTION MANAGEMENT AND THE TOWN OF CLAYTON.
2. ALL INTERNAL STREETS, WITH THE EXCEPTION OF TYPE 1 STREETS, SHALL HAVE 6-8' WIDE PUBLIC SIDEWALK ON BOTH SIDES OF THE STREET TO PROVIDE PEDESTRIAN ACCESS. ALL CLAYTON RIVER WALKWAY SHALL BE CONSIDERED A PUBLIC SIDEWALK.
3. ALL STREETS WITH THE EXCEPTION OF ROAD 6 AND I WAY HAVE ROLLED OR VALLEY CURB AND GUTTER.
4. A GRASS STRIP SHALL BE PROVIDED AS PER THE CROSS SECTION ASSOCIATED WITH EACH STREET TYPOLOGY TO ALLOW FOR STREET TREES AND STREET LIGHTING.
5. PUBLIC UTILITIES SUCH AS SANITARY SEWER AND PUBLIC WATER SHALL BE LOCATED WITHIN THE STREET PAVEMENT SECTIONS AND SHALL COMPLY WITH ALL CITY OF CLAYTON STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED HEREIN.
6. ALL IMPROVEMENTS WITHIN STREET RIGHT-OF-WAY SHALL COMPLY WITH ALL TOWN OF CLAYTON STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED HEREIN.
7. INTERNAL STREETS SHALL MEET THE VERTICAL AND HORIZONTAL DESIGN REQUIREMENTS FOR STREETS WITH DESIGN SPEED OF 35MPH.
8. WITH THE EXCEPTION OF CUL-DE-SACS PREVIOUSLY APPROVED WITH ASHPOFT 1 THAT CONNECT TO ROAD 2, ALL CUL-DE-SAC LENGTHS SHALL MEET THE TOWN OF CLAYTON DESIGN REQUIREMENTS.
9. THE VISION FOR THESE LOTS IS INTENDED TO BE AN ESTATE AESTHETIC WITH A NEIGHBORHOOD CHARACTER KIM TO RURAL SUBDIVISIONS RATHER THAN TYPICAL SUBURBAN NEIGHBORHOODS. THIS HAS BEEN DONE SUCCESSFULLY IN MANY MIXED INCOME NEIGHBORHOODS AS WELL AS VERY HIGH END NEIGHBORHOODS THROUGHOUT THE TRIANGLE. THE DESIGN OF THESE LOTS IS INTENDED TO BE A RURAL ESTATE CHARACTER WITH A MODIFIED DESIGN TO OPTIMIZE VIEWS OF THE RIVER AND PRESERVE A SERENE AND SECLUDED QUALITY OF HOMES WITHIN A DENSE NEIGHBORHOOD. A MODIFIED STREET SECTION DOES NOT LIMIT ACCESS TO AMENITIES AS A TRAIL SYSTEM WILL PROVIDE PEDESTRIAN ACCESS TO PUBLIC SIDEWALKS AND AMENITY LOCATIONS NEARBY.
10. ALL DRY UTILITIES INCLUDING GAS, ELECTRIC AND COMMUNICATION LINES SHALL BE LOCATED IN EASEMENTS OUTSIDE OF PUBLIC RIGHT OF WAY.

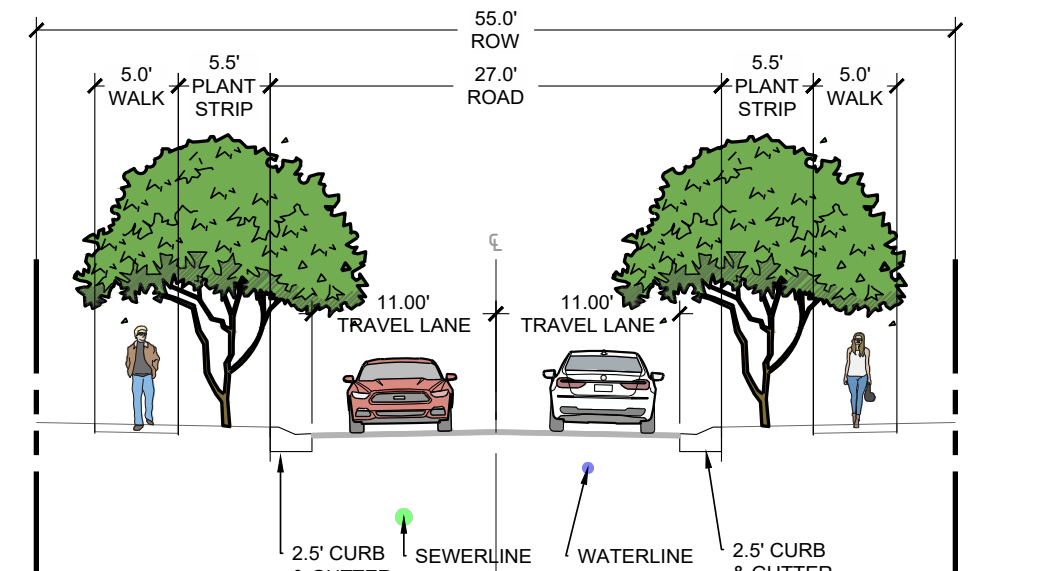
THE TOWN OF CLAYTON TYPICAL STREET SECTIONS REQUIRE THAT CURB AND GUTTER BE PROVIDED ALONG ALL STREETS.  
 WAIVER REQUEST:  
 FOR ALL 25' WIDE STREETS WITHIN ASHCROFT SECTION 2, SWALES SHALL BE PROVIDED ALONG BOTH SIDES OF THE STREET IN LIEU OF CURB AND GUTTER.  
 JUSTIFICATION FOR WAIVER REQUEST:  
 THE ENVIRONMENTALLY SENSITIVE AREAS ADJACENT TO THESE ROAD TYPES WOULD BENEFIT FROM THE INFILTRATION AND SLOWER CONVEYANCE OF STORMWATER PROVIDED BY VEGETATIVE SWALES IN CONTRAST TO THE STANDARD STORMWATER PIPES FED BY CURB AND GUTTER SYSTEMS.



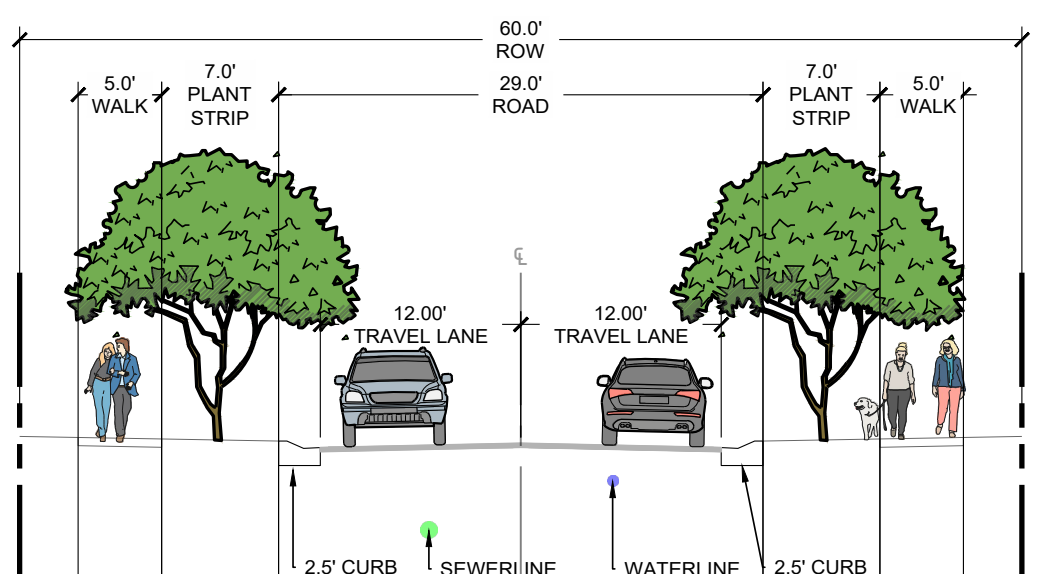
| LEGEND:                                                                             |                          |
|-------------------------------------------------------------------------------------|--------------------------|
|  | 25' WIDE ROAD IN 55' ROW |
|  | 27' WIDE ROAD IN 55' ROW |
|  | 30' WIDE ROAD IN 60' ROW |
|  | 41' WIDE ROAD IN 60' ROW |
|  | COMMERCIAL SHARED DRIVE  |



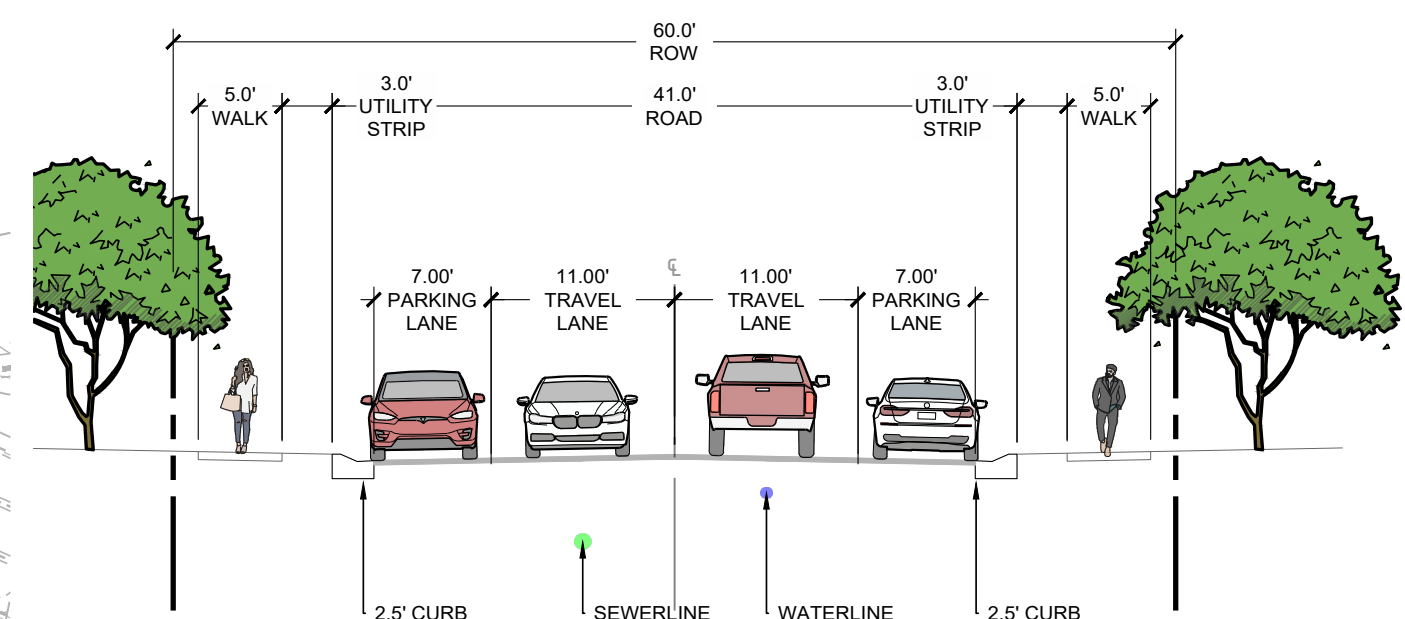
1 24' ROAD IN 55' ROW 1" = 10'-0"



27' ROAD IN 55' ROW 1" = 10'-0"



3 30' ROAD IN 60' ROW 1" = 10'-0"



4 41' ROAD IN 60' ROW 1" = 10'-0"



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CLAYTON, NC 27520

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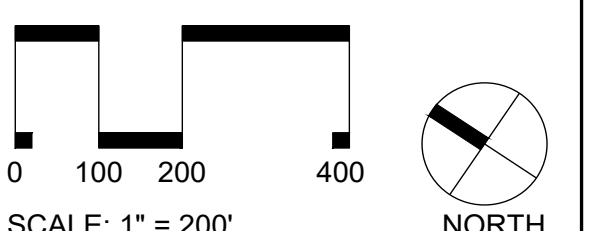
Agent:

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CONTACT: DAVID DEYOUNG, AICP

Vicinity map:



Seal:



Project:

## ASHCROFT SECTION 2

Issued for:

## MASTER PLAN

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Title:

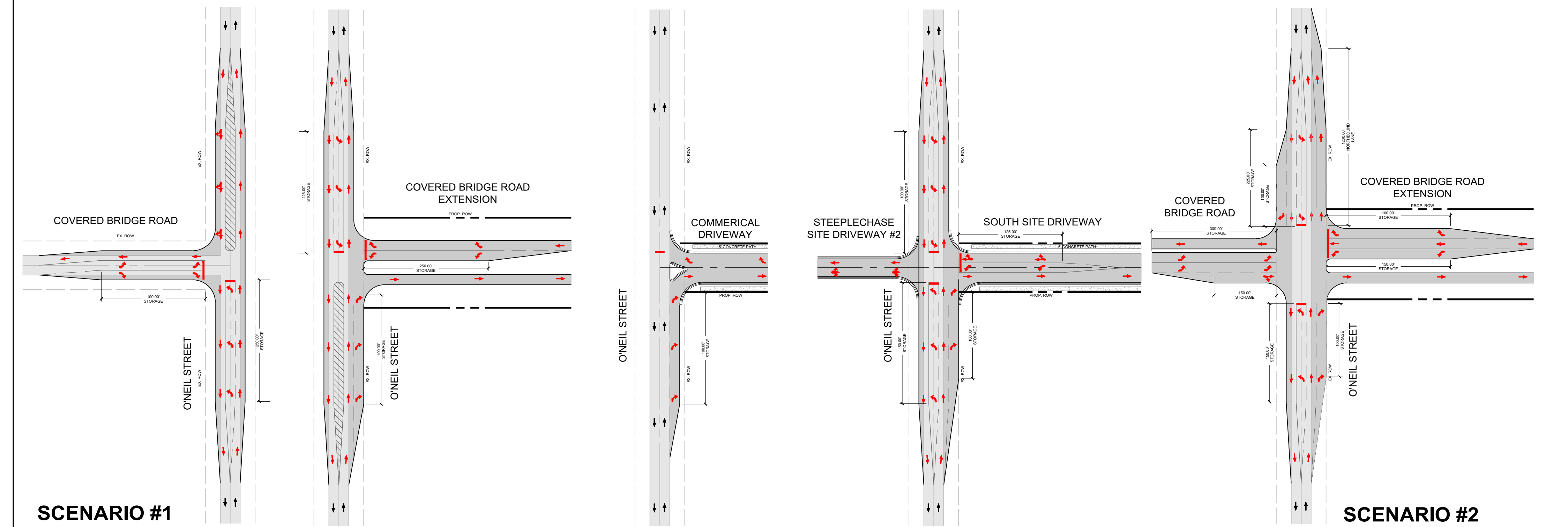
## VEHICULAR CIRCULATION PLAN

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: MT

## 6.0



PROPOSED IMPROVEMENTS



**LEGEND:**

- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- EXISTING LANEAGE
- PROPOSED THROUGH LANE
- PROPOSED LEFT-TURN LANE
- PROPOSED RIGHT-TURN LANE
- PROPOSED RIGHT AND THROUGH LANE
- PROPOSED RIGHT AND LEFT TURNING LANE
- PROPOSED RIGHT, LEFT, AND THROUGH LANE

**NOTES:**

- IF THE REALIGNMENT OF COVERED BRIDGE ROAD IS NOT COMPLETED PRIOR TO THE BUILD OUT OF THIS DEVELOPMENT, THEN ALL IMPROVEMENTS FROM SCENARIO #1 WILL BE REQUIRED.
- IF THE REALIGNMENT IS COMPLETED PRIOR TO THE BUILD OUT OF THIS DEVELOPMENT, THEN ALL IMPROVEMENTS FROM SCENARIO #2 WILL BE REQUIRED.
- THESE CONDITIONS ARE BASED ON CURRENT TRAFFIC VOLUMES AND PROJECTED GROWTH FOR THE STUDY AREA. IF THE PROPOSED BUILD OUT YEAR FOR THIS DEVELOPMENT, AS STATED IN THE TIA, VARIES MORE THAN ONE AN ADDENDUM OR REVISED TIA MAY BE REQUIRED.

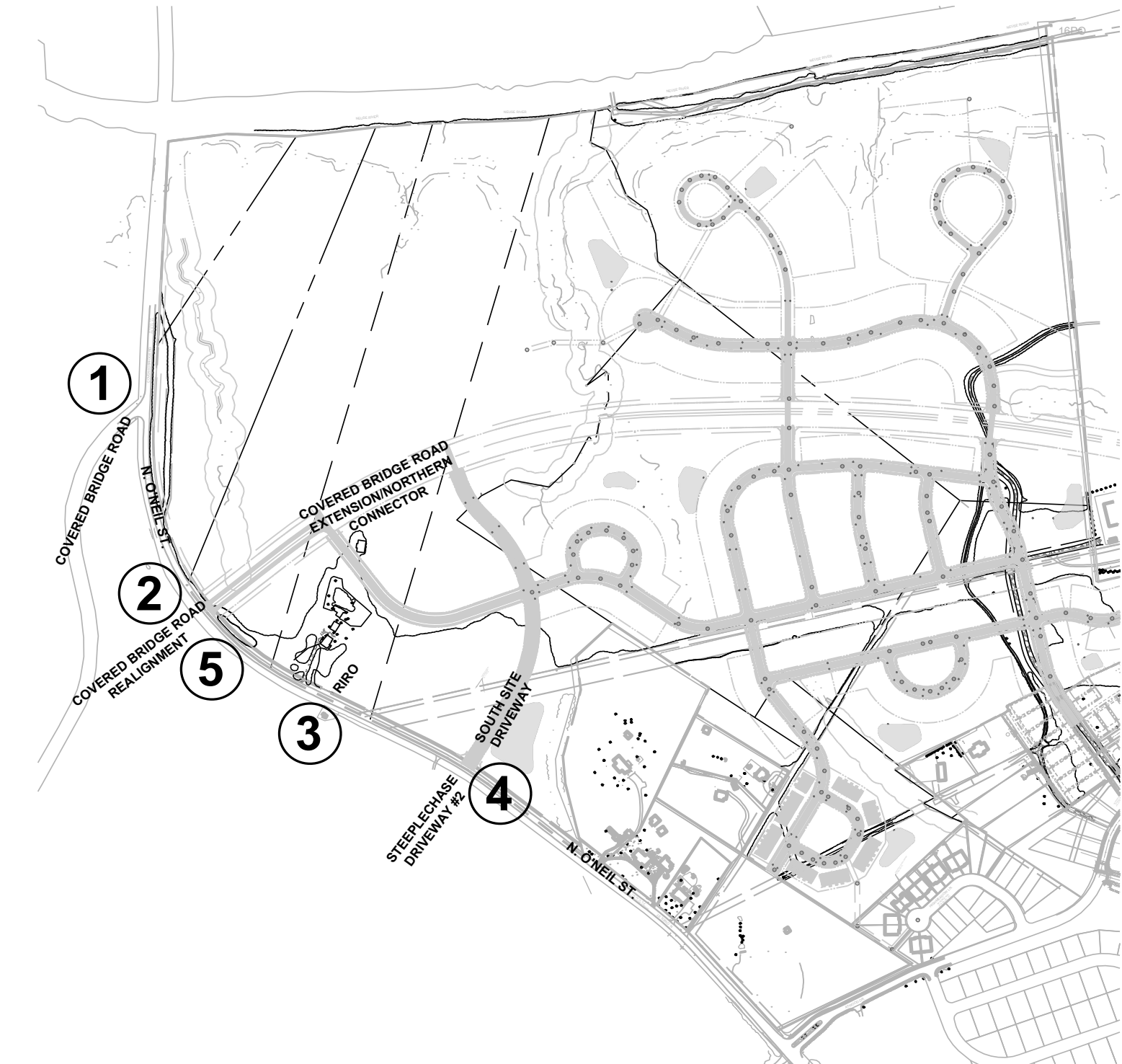
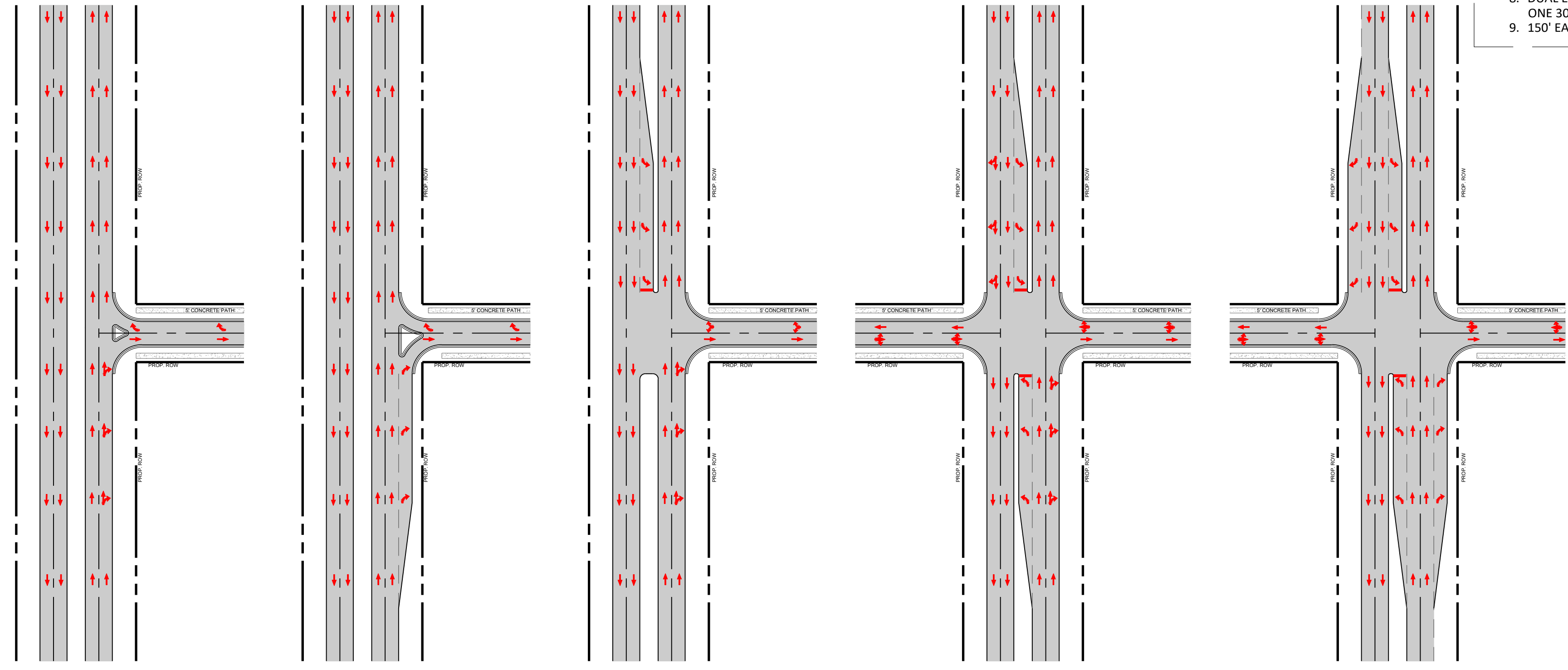
SCENARIO #1

- 1 N. O'NEIL STREET IMPROVEMENTS AT COVERED BRIDGE ROAD**
- RECOMMENDED LANEAGE IMPROVEMENTS**
- 250' NORTHBOUND LEFT-TURN LANE ON O'NEIL STREET
  - 100' EASTBOUND RIGHT-TURN LANE ON COVERED BRIDGE ROAD
- 2 N. O'NEIL STREET IMPROVEMENTS AT COVERED BRIDGE ROAD EXTENSION/ NORTHERN CONNECTOR**
- RECOMMENDED LANEAGE IMPROVEMENTS**
- 225' SOUTHBOUND LEFT-TURN LANE ON O'NEIL STREET
  - 100' NORTHBOUND RIGHT-TURN LANE ON O'NEIL STREET
  - 250' WESTBOUND LEFT-TURN LANE ON COVERED BRIDGE ROAD EXTENSION
  - 250' WESTBOUND RIGHT-TURN LANE ON COVERED BRIDGE ROAD EXTENSION

- 3 N. O'NEIL STREET IMPROVEMENTS AT RIRO**
- RECOMMENDED LANEAGE IMPROVEMENTS**
- 100' NORTHBOUND RIGHT-TURN LANE ON O'NEIL STREET
- 4 N. O'NEIL STREET IMPROVEMENTS AT SOUTH SITE DRIVEWAY AND STEEPLCHASE SITE DRIVEWAY #2**
- RECOMMENDED LANEAGE IMPROVEMENTS**
- 100' SOUTHBOUND LEFT-TURN LANE ON O'NEIL STREET
  - 100' NORTHBOUND RIGHT-TURN LANE ON O'NEIL STREET
  - 150' NORTHBOUND LEFT-TURN LANE ON O'NEIL STREET
  - 125' WESTBOUND LEFT-TURN LANE ON SOUTH SITE DRIVEWAY

- 5 N. O'NEIL STREET IMPROVEMENTS AT COVERED BRIDGE ROAD/ COVERED BRIDGE ROAD EXTENSION**
- RECOMMENDED LANEAGE IMPROVEMENTS**
- 150' NORTHBOUND LEFT-TURN LANE ON O'NEIL STREET
  - 100' NORTHBOUND RIGHT-TURN LANE ON O'NEIL STREET
  - 225' SOUTHBOUND LEFT-TURN LANE ON O'NEIL STREET
  - 100' SOUTHBOUND RIGHT-TURN LANE ON O'NEIL STREET
  - 1200' NORTHBOUND RECEIVING LANE ON O'NEIL STREET BEGINNING AT COVERED BRIDGE ROAD
  - 150' LEFT-TURN LANE WESTBOUND ON COVERED BRIDGE ROAD EXTENSION
  - 100' WESTBOUND RIGHT-TURN LANE ON COVERED BRIDGE ROAD EXTENSION
  - DUAL EASTBOUND LEFT-TURN LANES ON COVERED BRIDGE ROAD (ONE FULL, ONE 300')
  - 150' EASTBOUND RIGHT-TURN LANE ON COVERED BRIDGE ROAD

TYPICAL INTERSECTION DIAGRAMS



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Agent:

RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

Vicinity map:

Seal:

Scale:

SCALE: 1" = 500'

Project:

**ASHCROFT SECTION 2**

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Title:

**TIA ROAD IMPROVEMENTS PLAN**

Project number: L20017 Sheet #:

Issued Date: 08.03.2020

Drawn by: SM

Approved by: TS

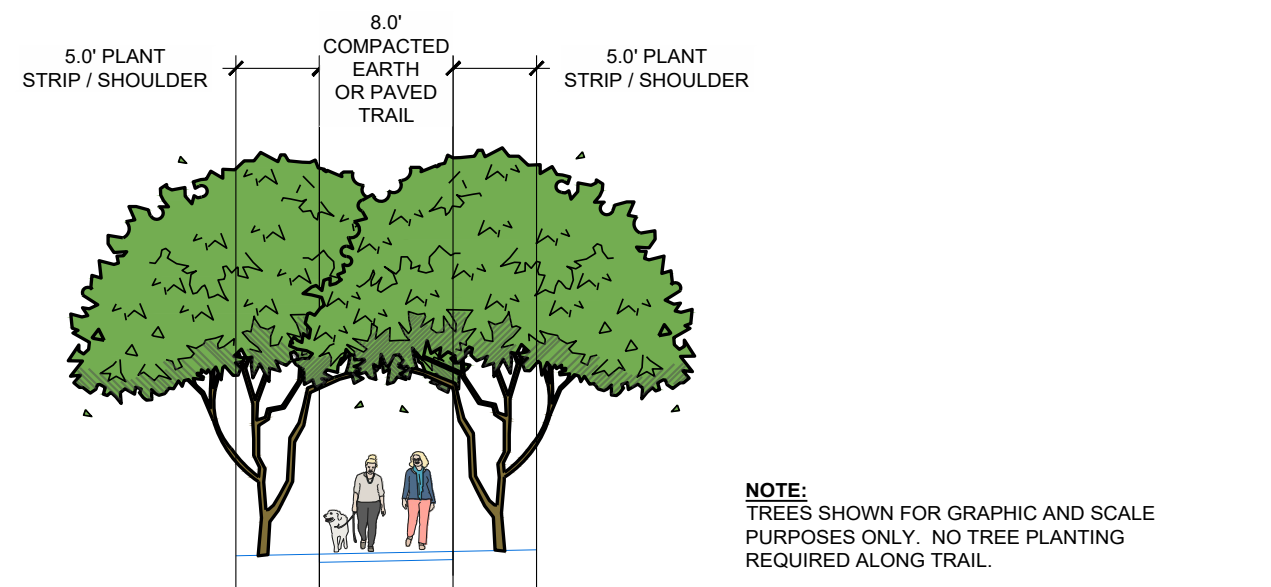
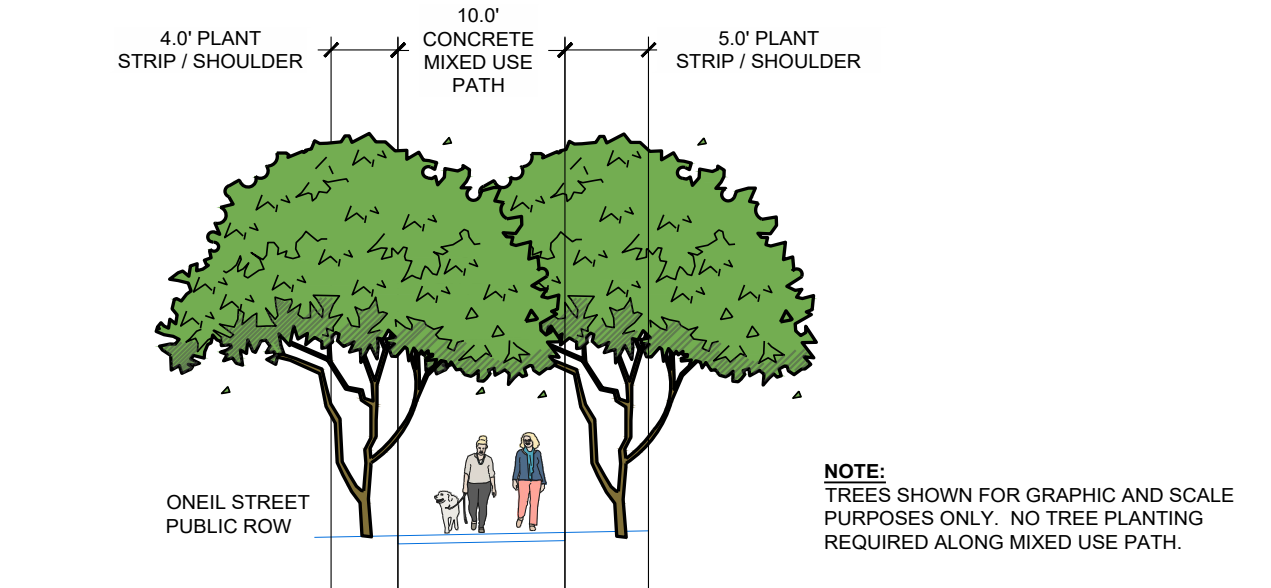
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**LEGEND:**

- ASHCROFT SIDEWALKS
- MOUNTAINS TO SEA TRAIL (EXISTING)
- MULTI-PURPOSE PATH (PUBLIC)
- NEIGHBORHOOD TRAILS (PRIVATE)



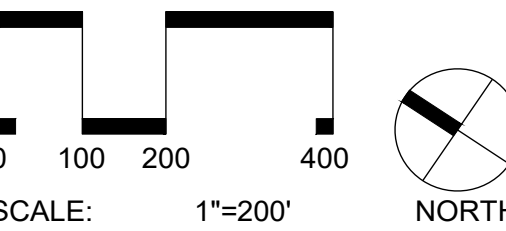
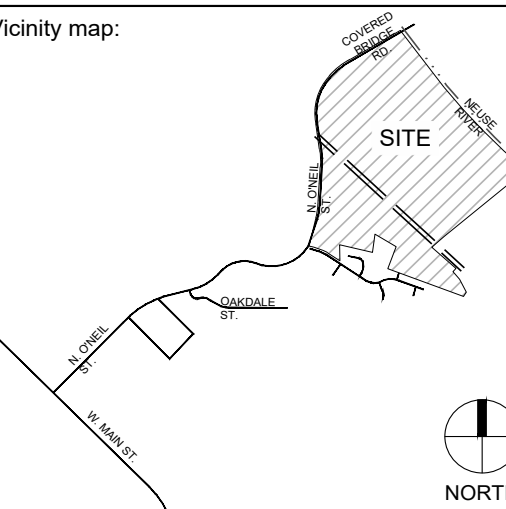
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**ASHCROFT SECTION 2**

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**Title:**  
**PEDESTRIAN CIRCULATION PLAN**

**Project number:** L20017 **Sheet #:**  
**Issued Date:** 08.03.2020  
**Drawn by:** KH  
**Approved by:** MT **8.0**





**LEGEND:**

- PROPOSED SEWER MAIN
- PROPOSED MANHOLE
- PROPOSED FORCE MAIN
- PROPOSED FIRE HYDRANT
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER EASEMENT
- EXISTING SEWER MAIN
- EXISTING MANHOLE
- EXISTING WATER MAIN

- NOTES:**
1. A PRECONSTRUCTION MEETING WILL BE REQUIRED BEFORE WORK BEGINS ON ANY PROJECT. THE MEETING WILL CONSIST OF, AT MINIMUM, THE DEVELOPER'S ENGINEER, THE CONTRACTOR, AND A REPRESENTATIVE OF UTILITY. OTHER ATTENDEES CAN BE REQUIRED BY UTILITY AS NEEDED, INCLUDING ANY SUBCONTRACTORS AND REGULATORS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT ANY LOCAL AND STATE REGULATORS TO SEE IF THEIR PRESENCE IS REQUIRED AT THE PRECONSTRUCTION MEETING.
  2. TOWN OF CLAYTON SHALL BE NOTIFIED 48 HOURS BEFORE CONSTRUCTION IS TO BEGIN.
  3. TOWN OF CLAYTON SHALL BE NOTIFIED 48 HOURS BEFORE ANY CONSTRUCTION IS BURIED.
  4. A MINIMUM HORIZONTAL SEPARATION OF TEN FEET, OUTSIDE OF PIPE TO OUTSIDE OF PIPE, SHALL BE MAINTAINED BETWEEN POTABLE WATER PIPING AND DOMESTIC WASTEWATER GRAVITY PIPING OR STORM WATER PIPING.
  5. A MINIMUM VERTICAL SEPARATION OF 18 INCHES, OUTSIDE OF PIPE TO OUTSIDE OF PIPE, SHALL BE MAINTAINED BETWEEN POTABLE WATER PIPING, WASTEWATER GRAVITY PIPING, STORM SEWER PIPING OR RECLAIMED WATER PIPING. A 24 INCH SEPARATION SHALL BE PROVIDED BETWEEN STORM SEWER AND SANITARY SEWER LINES.
  6. WHERE THE 18 INCHES OF NET VERTICAL CLEARANCE BETWEEN POTABLE WATER PIPE AND THE WASTEWATER GRAVITY PIPE CANNOT BE MAINTAINED, THE WASTEWATER GRAVITY PIPE SHALL BE DUCTILE IRON PIPE AND SHALL BE HYDROSTATICALLY PRESSURE TESTED WITH WATER TO ENSURE JOINT TIGHTNESS. PIPES SHALL BE LOCATED SO THAT THE POINTS ARE AS FAR AS POSSIBLE FROM EACH OTHER.
  7. ALL CONSTRUCTION SHALL CONFORM TO TOWN OF CLAYTON STANDARDS, SPECIFICATIONS, AND DETAILS.
  8. UTILITIES FOR MIXED-USE AND COMMERCIAL POD WILL BE DESIGNED VIA A FUTURE MAJOR SITE PLAN SUBMITTAL.

**WATER AND SEWER**

NOTE: WATER AND SEWER DESIGN AND UTILITY EASEMENTS REPRESENTED ON THIS SHEET ARE FOR CONCEPT PURPOSES ONLY.

DRY UTILITIES SUCH AS POWER, TELECOM, GAS, ETC. WILL BE LOCATED IN THE PUBLIC UTILITY EASEMENT LOCATED OUTSIDE OF THE STREET RIGHT-OF-WAY. PUBLIC UTILITY EASEMENT IS PROVIDED ON BOTH SIDES OF THE STREET RIGHT-OF-WAY.

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CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

Vicinity map:

Seal:

Scale:

Project:

**ASHCROFT SECTION 2**

Issued for:

**MASTER PLAN**

| No. | Date | Description |
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Title:

**PRELIMINARY UTILITY PLAN**

Project number: L20017 Sheet #:

Issued Date: 08.03.2020

Drawn by: SM

Approved by: TS

**9.0**





GRADING LEGEND:

| SYMBOL | DESCRIPTION             |
|--------|-------------------------|
|        | PROPOSED MAJOR CONTOUR  |
|        | PROPOSED MINOR CONTOUR  |
|        | EXISTING MAJOR CONTOUR  |
|        | EXISTING MINOR CONTOUR  |
|        | PROPOSED STORM DRAINAGE |
|        | PROPOSED JUNCTION BOX   |
|        | PROPOSED CATCH BASIN    |
|        | PROPOSED AREA DRAIN     |

NOTES:

- PRIOR TO THE APPROVAL OF THE FINAL PLAT, THE FOLLOWING SHALL BE PROVIDED AS APPLICABLE
  - JOHNSTON COUNTY STORMWATER MANAGEMENT APPLICATION
  - NUTRIENT CALCULATIONS, SEALED BY A LICENSED PROFESSIONAL
  - STORMWATER NARRATIVE, CALCULATIONS, NCDENR SUPPLEMENT WORKSHEETS AND ESDN SPECIFICATIONS FOR EACH STORMWATER SCM, INDICATING PEAK FLOW AND NUTRIENT LOADING CALCULATIONS
  - OPERATION AND MAINTENANCE PLAN AND LEGAL AGREEMENT FOR EACH SCM
- GRADING AND DRAINAGE FOR NORTH CONNECTOR BY OTHERS
- CONTOUR INTERVAL FOR PROPOSED GRADING IS 2 FEET

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FIRM LICENSE #: C-1051  
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PROJECT #: L20017

Client:

ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520

Consultants:

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CONTACT: DAVID DEYOUNG, AICP

Vicinity map:

Seal:

SCALE: 1" = 200'

Project:

ASHCROFT  
SECTION 2

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Title:

PRELIMINARY GRADING  
& DRAINAGE PLAN

Project number: L20017 Sheet #:

Issued Date: 08.03.2020

Drawn by: SM

Approved by: TS

10.0

L:\Projects\2020\L20017 - Ashcroft\2\DWGS\1-Site Plan\3-Sheets\L20017-05.0 Preliminary Drainage Plan.dwg Jan 21, 2021 - 3:50pm



L:\Projects\2020\L20017 - Ashcroft\2\DWGS\1-Site Plan\3-Sheets\L20017-06 L-Open Space Plan.dwg Jan 21, 2021 - 3:51 pm



| LEGEND: |                                      |
|---------|--------------------------------------|
|         | 100 YEAR FLOODPLAIN (RCA)            |
|         | STREAM BUFFER (RCA)                  |
|         | PASSIVE OPEN SPACE                   |
|         | IMPROVED OPEN SPACE - AMENITY CENTER |
|         | IMPROVED OPEN SPACE - GREEN          |
|         | IMPROVED OPEN SPACE - SQUARE         |
|         | PROPOSED PARCEL AREA                 |
|         | TRAIL NETWORK                        |
|         | NEIGHBORHOOD SIDEWALK                |

- NOTES:
- ALL RESOURCE CONSERVATION AREAS SHALL REMAIN UNDISTURBED PER THE REQUIREMENTS OF ARTICLE 5 OF THE UNIFIED DEVELOPMENT CODE.
  - ALL AREAS THAT WILL BE PRESERVED SHALL BE DELINEATED BY ORANGE TEMPORARY FENCING DURING GRADING AND CONSTRUCTION.
  - ALL OPEN SPACE AREAS AND THE AMENITY CENTER SHALL BE SUBMITTED AS MINOR SITE PLANS.
  - ALL IMPROVED OPEN SPACE SHALL BE MAINTAINED BY THE HOA.
  - MAILBOX KIOSK LOCATIONS ARE ILLUSTRATIVE IN NUMBER AND LOCATION AND SUBJECT TO CHANGE DURING PRELIMINARY PLAT REVIEW AND UPON REVIEW BY U.S. POSTAL SERVICE.
  - MAILBOX KIOSK / PUBLIC AREAS SHALL BE ACCESSIBLE PER ADA REQUIREMENT.
  - PROGRAM OF ELEMENTS IDENTIFIED IN RECREATION AND OPEN SPACE TYPES BELOW INDICATE A SAMPLING OF ELEMENTS THAT MAY BE PROVIDED. THE APPLICANT SHALL NOT BE REQUIRED TO PROVIDE ALL OF THE LISTED ELEMENTS. FINAL PROGRAMMING WILL BE PROVIDED AND APPROVED AT MINOR SITE PLAN REVIEW.
  - AMENITY CENTER BUILDING WILL BE NO SMALLER THAN 4,000 SF AND WILL MEET THE REQUIREMENTS OF THE UDC AT THE TIME OF SITE PLAN SUBDIVISION PLAN APPROVAL.
  - POOL AREA SHALL BE NO SMALLER THAN 7,500 SF AND WILL MEET THE REQUIREMENTS OF THE UDC AT THE TIME OF SITE PLAN SUBDIVISION PLAN APPROVAL.
  - LANDSCAPE MEDIANS/ISLANDS WITHIN PROPOSED STREETS WILL BE PRIVATELY MAINTAINED BY HOA.

| OPEN SPACE CALCULATIONS:                    |        |
|---------------------------------------------|--------|
| RESOURCE CONSERVATION                       | AC     |
| 100 YR FLOODPLAIN                           | 23.11  |
| STREAM BUFFERS                              | 11.43  |
| NET PROJECT AREA                            | 206.66 |
| AC OPEN SPACE REQ'D (12.5%)                 | 25.83  |
| IMPROVED OPEN SPACE REQ'D (25%)             | 6.40   |
| IMPROVED OPEN SPACE PROPOSED                |        |
| ASHCROFT ATHLETIC CLUB                      | 4.30   |
| GREEN                                       | 2.20   |
| SQUARE                                      | 0.69   |
| TOTAL                                       | 7.19   |
| OPEN SPACE PROPOSED                         |        |
| IMPROVED OPEN SPACE PROPOSED                | 7.19   |
| PASSIVE OPEN SPACE PROPOSED (EXCLUDING RCA) | 64.87  |
| TOTAL OPEN SPACE PROPOSED                   | 72.06  |

NOTE: OPEN SPACE AREAS ARE APPROXIMATE AND SUBJECT TO MODIFICATION. OPEN SPACE WILL BE PROVIDED IN COMPLIANCE WITH UDC.

IMPROVED OPEN SPACE PROGRAM ELEMENTS:

| ASHCROFT AMENITY CENTER (3 USES MIN) |                          |
|--------------------------------------|--------------------------|
| <input type="checkbox"/>             | FITNESS ROOM             |
| <input type="checkbox"/>             | BUSINESS CENTER          |
| <input type="checkbox"/>             | POOL                     |
| <input type="checkbox"/>             | COMMUNITY LOUNGE         |
| <input type="checkbox"/>             | BOCCO COURTS             |
| <input type="checkbox"/>             | PLAYGROUND               |
| GREEN (1 USE MIN)                    |                          |
| <input type="checkbox"/>             | DOG WASTE STATION        |
| <input type="checkbox"/>             | NATURAL PLANTINGS        |
| <input type="checkbox"/>             | MAIL KIOSK               |
| <input type="checkbox"/>             | BENCHES                  |
| <input type="checkbox"/>             | WALKING PATH             |
| SQUARE (2 USES MIN)                  |                          |
| <input type="checkbox"/>             | TABLE + SEATING          |
| <input type="checkbox"/>             | DOG PARK / WASTE STATION |
| <input type="checkbox"/>             | TOT LOT                  |
| <input type="checkbox"/>             | EXERCISE STATION         |
| <input type="checkbox"/>             | BENCHES                  |
| <input type="checkbox"/>             | WALKING PATH             |
| <input type="checkbox"/>             | SHADE STRUCTURE          |



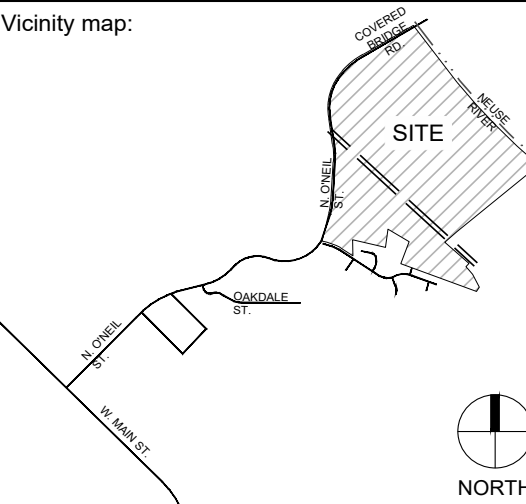
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CLAYTON, NC 27520

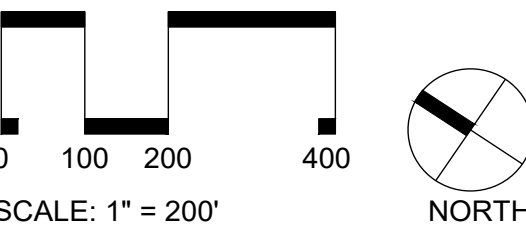
Consultants:  
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Agent:  
RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP



Seal:



Project:

**ASHCROFT  
SECTION 2**

Issued for:  
**MASTER PLAN**

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Title:

**OPEN SPACE PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: KH  
Approved by: MT

**11.0**





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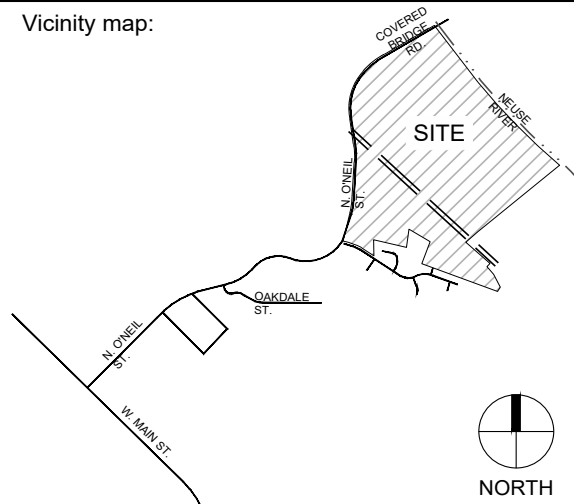
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Title:

SINGLE FAMILY  
REGULATING PLAN

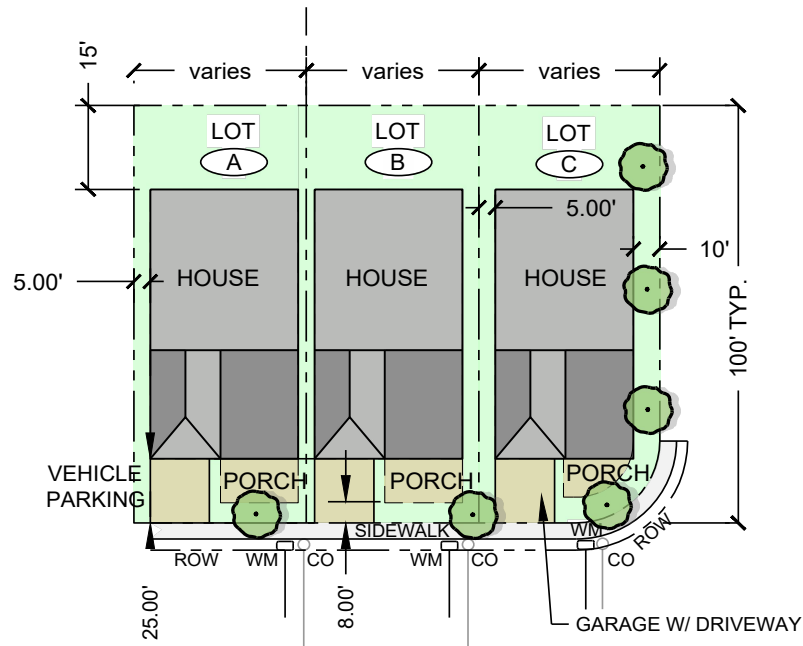
Project number: L20017 Sheet #:

Issued Date: 08.03.2020

Drawn by: HNJ

Approved by: MT

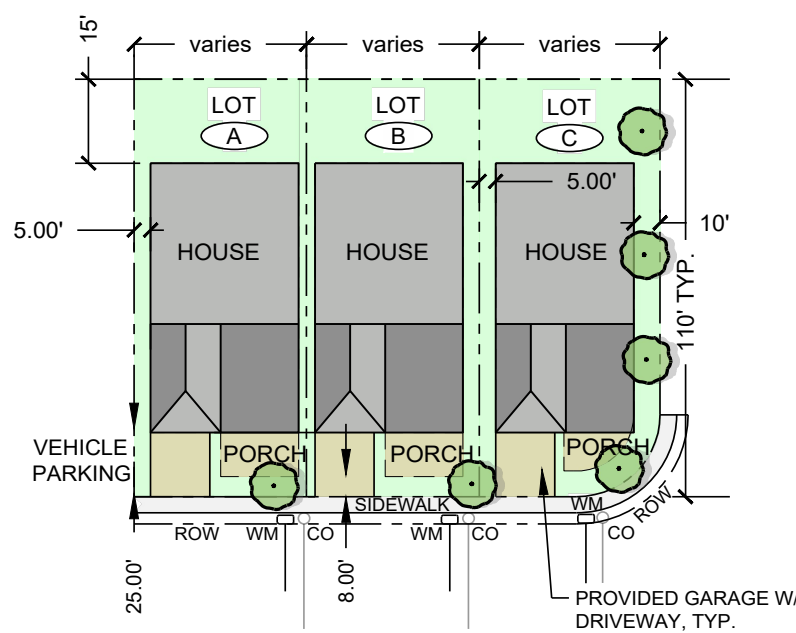
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LOT TYPE A

| LOTS STANDARD TABLE            |                       |
|--------------------------------|-----------------------|
|                                | 4200 SF SINGLE FAMILY |
| MINIMUM LOT WIDTH/DEPTH        | 42' X 98'             |
| TYPICAL LOT WIDTH/DEPTH        | 42' X 100'            |
| MINIMUM LOT SIZE (SF)          | 4,100                 |
| MAXIMUM IMPERVIOUS AREA        | 60%                   |
| MAXIMUM BUILDING COVERAGE      | 50%                   |
| BUILDING SETBACKS              |                       |
| FRONT STREET (FROM SIDEWALK)   | 10'                   |
| SIDE STREET (FROM SIDEWALK)    | 10'                   |
| SIDE                           | 5'                    |
| REAR                           | 15'                   |
| GARAGE (FROM SIDEWALK)         | 25'                   |
| DRIVEWAY (FROM SIDE LOT LINE)* | 3.5'                  |

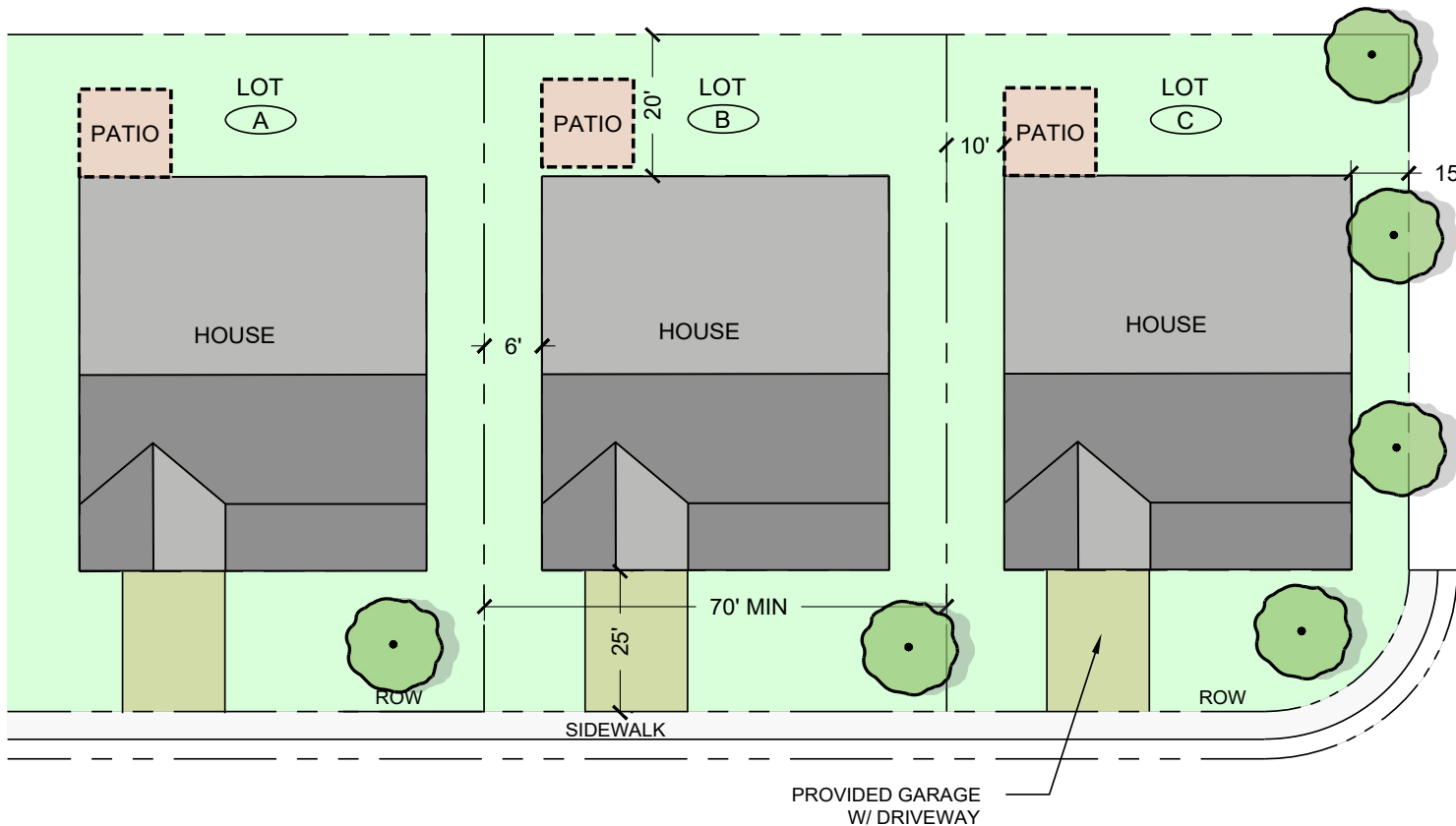
\*SEE NOTE 10



LOT TYPE B

| LOTS STANDARD TABLE            |                       |
|--------------------------------|-----------------------|
|                                | 5000 SF SINGLE FAMILY |
| MINIMUM LOT WIDTH/DEPTH        | 42' X 118'            |
| TYPICAL LOT WIDTH/DEPTH        | 42' X 118'            |
| MINIMUM LOT SIZE (SF)          | 4,925                 |
| MAXIMUM IMPERVIOUS AREA        | 60%                   |
| MAXIMUM BUILDING COVERAGE      | 50%                   |
| BUILDING SETBACKS              |                       |
| FRONT STREET (FROM SIDEWALK)   | 10'                   |
| SIDE STREET (FROM SIDEWALK)    | 10'                   |
| SIDE                           | 5'                    |
| REAR                           | 15'                   |
| GARAGE (FROM SIDEWALK)         | 25'                   |
| DRIVEWAY (FROM SIDE LOT LINE)* | 3.5'                  |

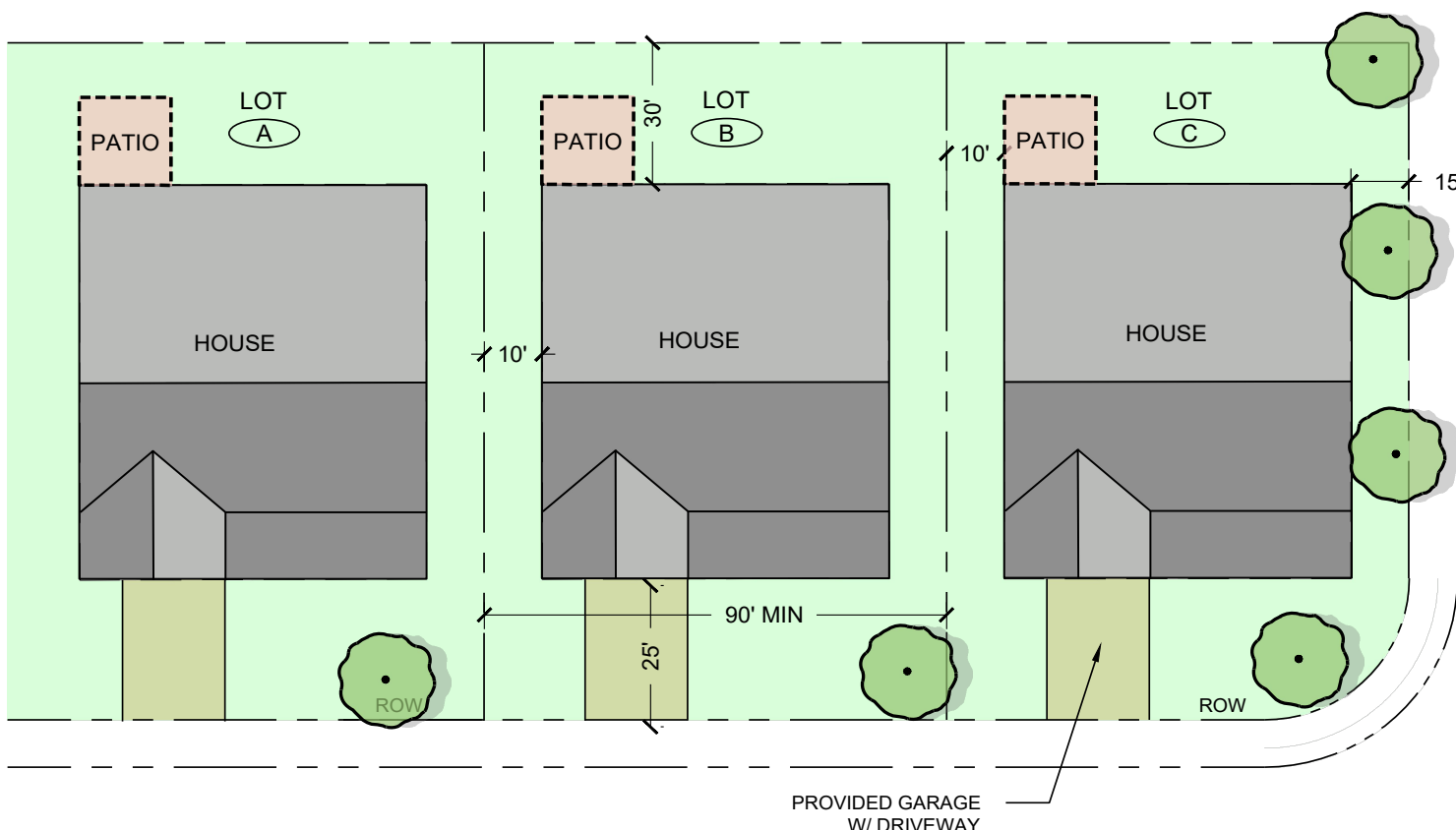
\*SEE NOTE 10



LOT TYPE C

| LOTS STANDARD TABLE            |                         |
|--------------------------------|-------------------------|
|                                | 10,000 SF SINGLE FAMILY |
| MINIMUM LOT WIDTH/DEPTH        | 70' X 130'              |
| TYPICAL LOT WIDTH/DEPTH        | 74' X 135'              |
| MINIMUM LOT SIZE (SF)          | 9,000 SF                |
| MAXIMUM IMPERVIOUS AREA        | 40%                     |
| MAXIMUM BUILDING COVER         | 25%                     |
| BUILDING SETBACKS              |                         |
| FRONT STREET (FROM SIDEWALK)   | 10'                     |
| SIDE STREET (FROM SIDEWALK)    | 15'                     |
| SIDE                           | 6'                      |
| REAR                           | 20'                     |
| GARAGE (FROM SIDEWALK)         | 25'                     |
| DRIVEWAY (FROM SIDE LOT LINE)* | 3.5'                    |

\*SEE NOTE 10



LOT TYPE D

| LOTS STANDARD TABLE            |               |
|--------------------------------|---------------|
|                                | 1/2 ACRE MIN. |
| MINIMUM LOT WIDTH/DEPTH        | 90' X 120'    |
| TYPICAL LOT WIDTH/DEPTH        | 100' X 132'   |
| MINIMUM LOT SIZE (SF)          | 21,790 SF     |
| MAXIMUM IMPERVIOUS AREA        | 40%           |
| MAXIMUM BUILDING COVERAGE      | 20%           |
| BUILDING SETBACKS              |               |
| FRONT STREET (FROM ROW)        | 15'           |
| SIDE STREET (FROM ROW)         | 15'           |
| SIDE                           | 10'           |
| REAR                           | 30'           |
| GARAGE (FROM ROW)              | 25'           |
| DRIVEWAY (FROM SIDE LOT LINE)* | 10'           |

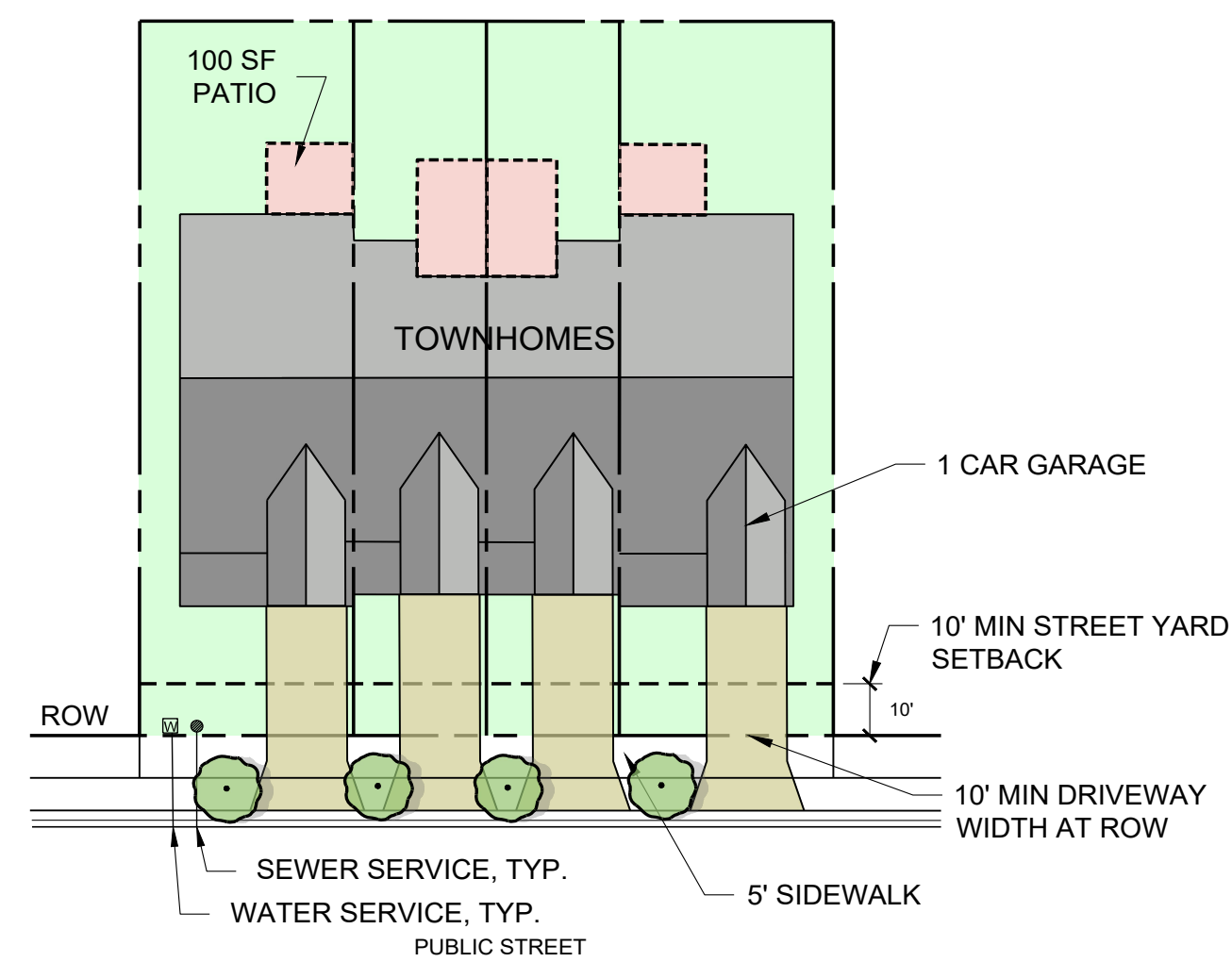
\*SEE NOTE 10

NOTES:

SINGLE FAMILY RESIDENTIAL:

- LOT WIDTH SHALL BE MEASURED AT THE FRONT SETBACK LINE.
- THE BUILDABLE ZONE IS DEFINED AS ALL AREAS OF THE LOT BOUNDED BY THE SETBACK FROM THE PROPERTY LINES AND THE STREET RIGHT-OF-WAY.
- THE PEDESTRIAN ZONE IS DEFINED AS THE AREA FROM THE PUBLIC RIGHT-OF-WAY TO THE BACK OF CURB AND MAY INCLUDE 5' WIDE PUBLIC SIDEWALK, PLANTING STRIP WITH STREET TREES AND STREET LIGHTS.
- STREET TREES SHALL BE PLANTED WITHIN THE PLANTING STRIP BETWEEN THE BACK OF CURB AND THE SIDEWALK. TREES SHALL BE PLANTED AT A RATE TO MEET UDC REQUIREMENTS.
- ALL SINGLE-FAMILY HOMES SHALL HAVE A 1 OR 2-CAR GARAGE WITH DRIVEWAY TO ACCOMMODATE A MINIMUM OF 2 VEHICLES ON THE LOT WITH A MINIMUM DEPTH OF 25' FROM THE BACK OF SIDEWALK TO THE GARAGE DOOR.
- EACH HOME SHALL HAVE A FRONT ENTRY THAT MAY SHALL INCLUDE A PORCH, STOOP OR COVERED AREA.
- FENCING SHALL BE PERMITTED FROM THE MIDPOINT OF THE PRINCIPAL RESIDENCE AND MAY BE LOCATED WITH A ZERO SETBACK ALONG THE PROPERTY LINE.
- NO FENCING SHALL BE PERMITTED IN ANY PUBLIC UTILITY EASEMENT. FENCE SETBACK ON CORNER LOTS SHALL BE A MINIMUM OF 5' OFF THE SIDEWALK.
- MAXIMUM BUILDING HEIGHT SHALL BE 35' AS MEASURED FROM THE FINISHED GRADE AT FRONT DOOR.
- SINGLE FAMILY DRIVEWAYS SHALL BE A MINIMUM OF 3.5' FROM ANY LOT LINE AND A MAX OF 24' IN WIDTH, EXCEPT WHERE TWO DRIVEWAYS COINCIDE ALONG THE SAME LOT LINE.
- ALL HVAC AND MECHANICAL EQUIPMENT SHALL BE LOCATED IN THE REAR OR IN THE SIDE YARDS SCREENED FROM THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH UDC REQUIREMENTS.





| LOTS STANDARD TABLE                          |                 |
|----------------------------------------------|-----------------|
|                                              | TOWNHOMES       |
| MINIMUM LOT WIDTH/ DEPTH                     | 22' X 90'       |
| MINIMUM LOT SIZE (SF)                        | 2,000           |
| MAXIMUM IMPERVIOUS AREA                      | 95%             |
| MAXIMUM BUILDING COVERAGE                    | 90%             |
| BUILDING SETBACKS                            |                 |
| FRONT STREET (FROM BACK OF SIDEWALK)         | 10'             |
| SIDE STREET (FROM BACK OF SIDEWALK)          | 15'             |
| PEDESTRIAN MALL (FROM PROPERTY LINE)         | 5'              |
| SIDE                                         | 0'              |
| REAR                                         | 20'             |
| STREET FACING GARAGE (FROM BACK OF SIDEWALK) | 25'             |
| ALLEY ACCESSED GARAGE (FROM PROPERTY LINE)   | 6"              |
| DRIVEWAY (FROM SIDE LOT LINE)*               | 3.5'            |
| HEIGHT                                       | 3 STORIES / 50' |

\*ONLY APPLIES WHERE DRIVEWAYS DON'T SHARE A LOT LINE

NOTES:

## **TOWNHOME SITE DESIGN STANDARDS**

1. ANY ON-STREET PARKING AREAS SHALL COMPLY WITH TOWN OF CLAYTON UDC REQUIREMENTS FOR PARKING LOTS AND ISLANDS.
2. ALL HVAC AND MECHANICAL EQUIPMENT SHALL BE LOCATED AT THE REAR OF EACH UNIT AND SCREENED FROM THE PUBLIC ROW IN ACCORDANCE WITH TOWN OF CLAYTON UDC REQUIREMENTS.
3. TRASH AND RECYCLING COLLECTION SHALL BE THROUGH CURB SIDE PICK UP OR DUMPSTER AREAS.
4. ALL COMMON AREAS SHALL MEET THE SITE INTERIOR LANDSCAPING REQUIREMENTS AS PER TOWN OF CLAYTON UDC (155.102(D)).
5. ALL COMMON AREAS SHALL BE MAINTAINED BY THE ASHCROFT SECTION 2 HOA.
6. DWELLING UNITS WILL BE LOCATED ON INDIVIDUALLY OWNED LOTS.
7. BUILDINGS SHALL NOT CONTAIN MORE THAN 8 UNITS.
8. TOWNHOMES MAY FRONT ON A PUBLIC STREET OR PARKING LOT.

## TOWNHOME DESIGN STANDARDS

9. ALL UNITS WILL BE A MAXIMUM OF THREE (3) STORIES IN HEIGHT AND WILL UTILIZE EITHER GARAGES WITH DRIVEWAYS, ALLEYS, PARKING LOTS, OR ON-STREET PARKING. WHERE ON-STREET PARKING IS UTILIZED IT WILL BE SUBJECT TO REVIEW AND APPROVAL OF TOWN ENGINEERING AND PLANNING TO ENSURE ADEQUATE ROW WIDTH TO ACCOMMODATE ON-STREET PARKING.
10. THE PRIMARY EXTERIOR SIDING MATERIALS SHALL CONSIST OF MASONRY (BRICK AND/OR CULTURED STONE OR REAL STONE) OR VINYL OR CEMENT-FIBER PLANK SIDING.
11. COLOR PALETTE SHALL INCLUDE A MINIMUM OF TWO COLORS PER STRIP OF UNITS.
12. MASONRY ACCENTS OF EITHER BRICK OR CULTURED STONE SHALL BE USED TO AVOID MONOTONOUS AND CONTINUOUS BUILDING FACADES.
13. ARCHITECTURAL BUILDING STYLES FOR TOWNHOMES MAY INCLUDE: CRAFTSMAN, FARMHOUSE, LOW COUNTRY, TRADITIONAL, BUNGALOW, RANCHES, OPEN LIVING.
14. VARIOUS STREETSCAPE IN ARCHITECTURAL DETAIL AND COLORS TO PREVENT MONOTONY.
15. FRONT DOOR ENTRIES TO BE COVERED.
16. ROOF LINES TO MATCH ARCHITECTURAL BUILDING STYLE AND WILL HAVE ASPHALT SHINGLES.
17. ANY EXTERIOR WALL OF THE HOME VISIBLE FROM THE PUBLIC STREET SHALL CONTAIN AT LEAST TWO DECORATIVE ELEMENTS SUCH AS, BUT NOT LIMITED TO THE FOLLOWING ELEMENTS: PORCH, DECORATIVE TRIM, DECORATIVE GABLE, COLUMN.
18. EXTERIOR LIGHTING SHALL BE COORDINATE WITH THE BUILDING STYLE OF THE TOWNHOME.
19. WHERE TOWNHOMES ARE CONSTRUCTED WITH GARAGES BEING ACCESSED FROM STREETS, THE GARAGE DOOR SHALL BE RECESSED 1' FROM STREET FACING FACADE. THIS SETBACK SHALL NOT APPLY WHERE GARAGES ARE ACCESSED VIA ALLEYS.



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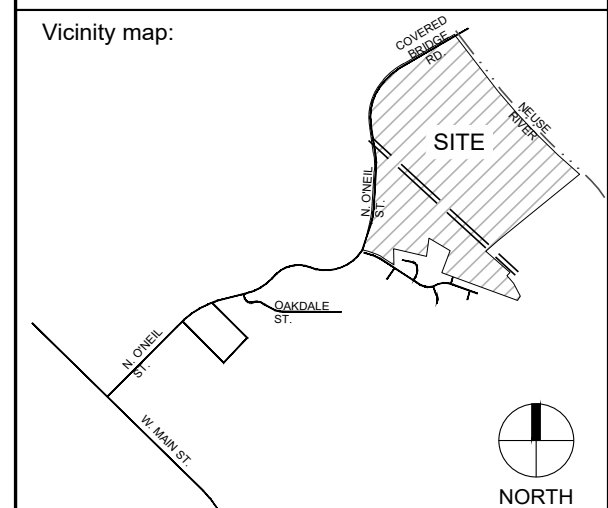
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ASHCROFT  
SECTION 2

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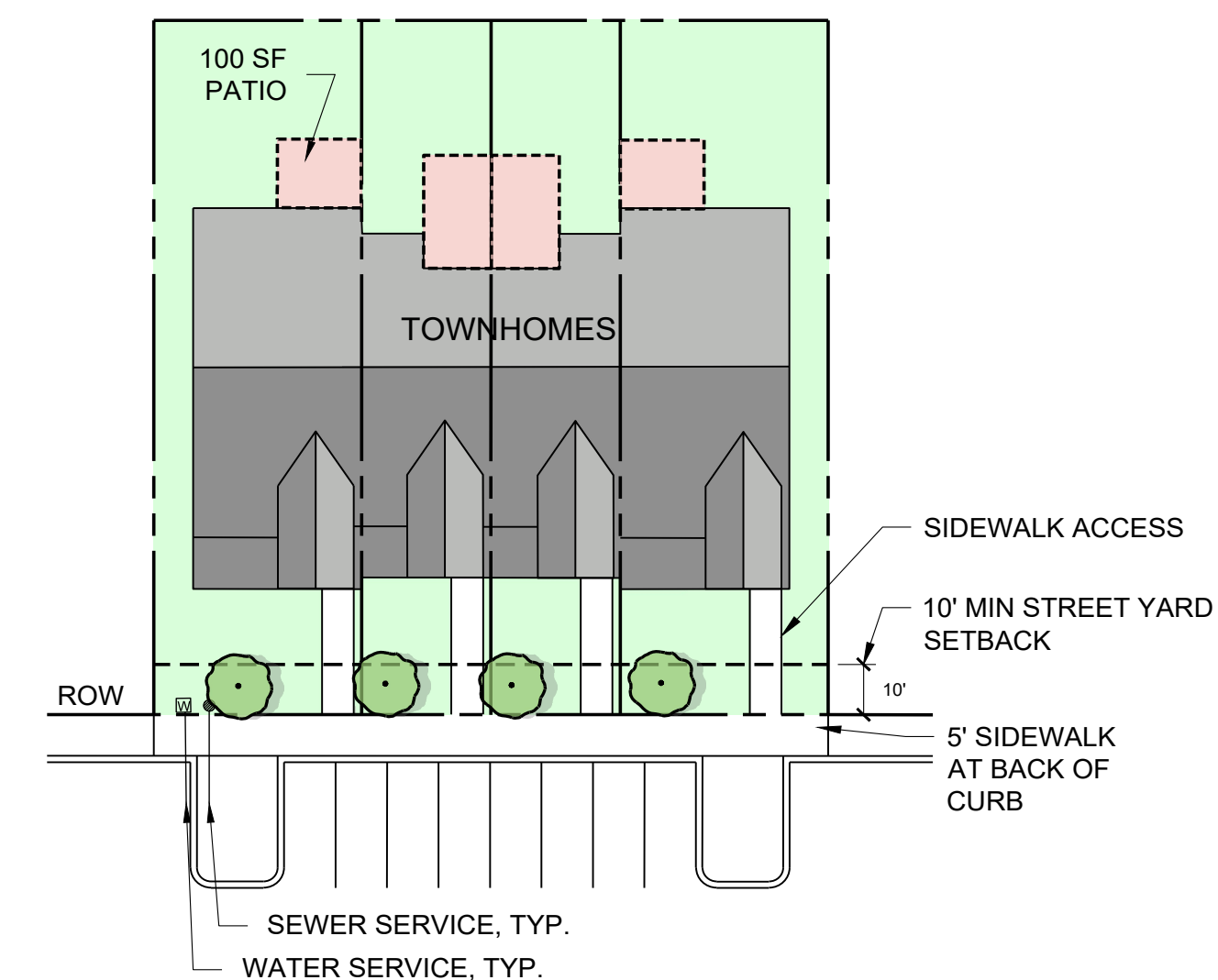
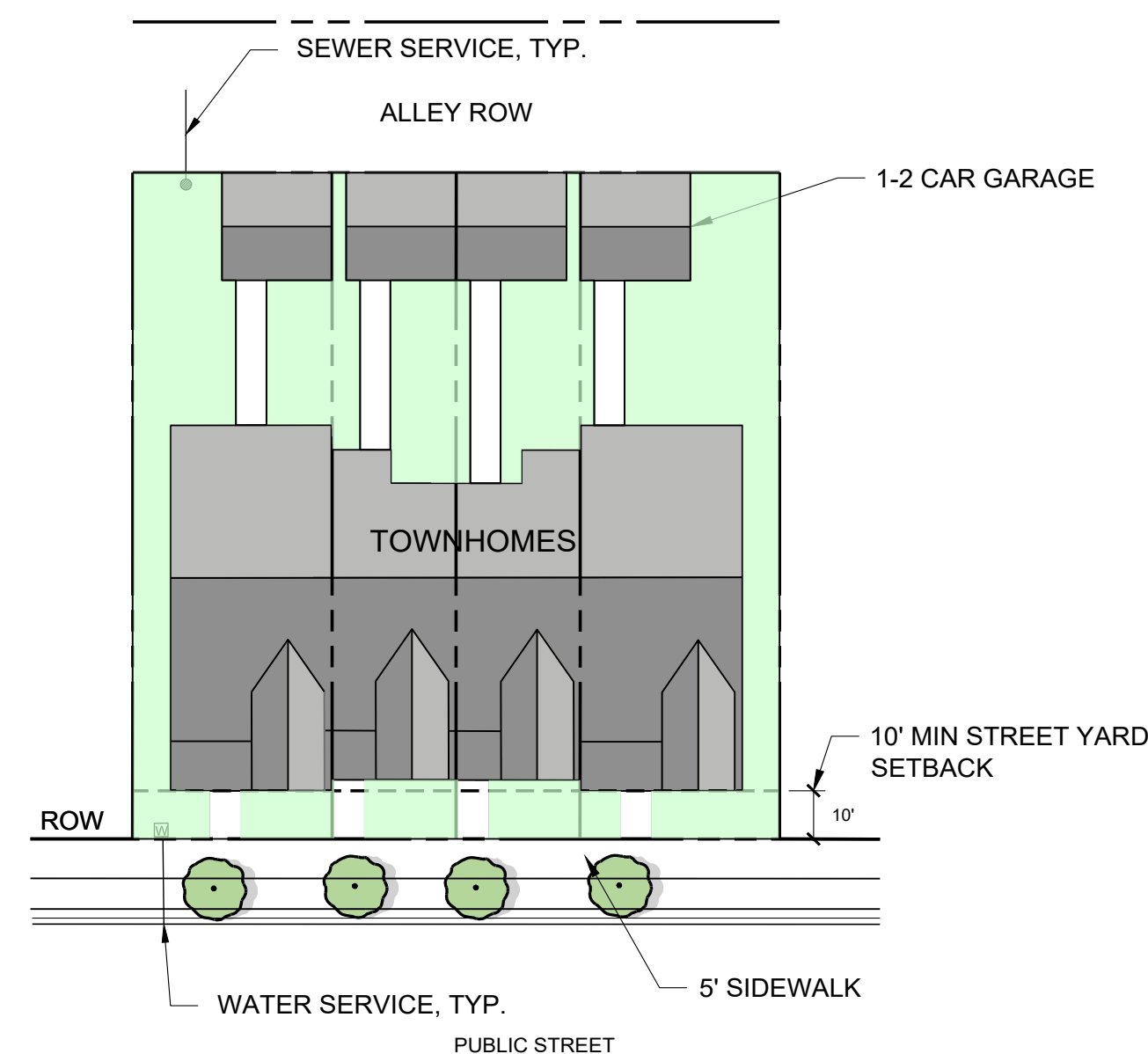
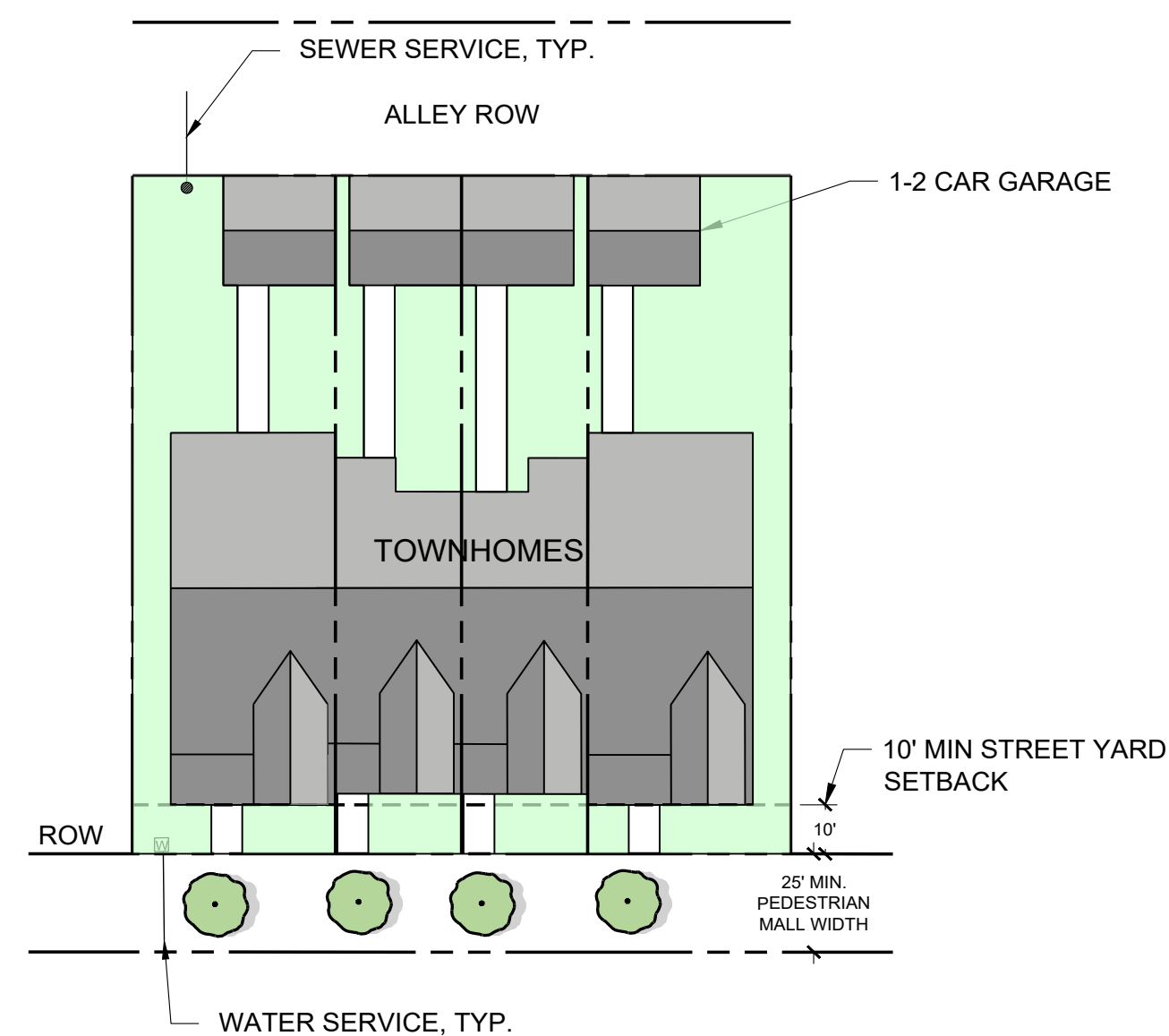
## MASTER PLAN

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Title:

# TOWNHOME REGULATING PLAN

Project number: L20017 Sheet #: 13  
Issued Date: 08.03.2020  
Drawn by: MT  
Approved by: KH





- UPPER-STORY RESIDENCE
- ASSEMBLY
- CHURCH/PLACE OF WORSHIP
- DAY CARE FACILITY
- GOVERNMENT SERVICE
- HOSPITAL/MEDICAL CENTER
- SCHOOL
- ENTERTAINMENT (INDOOR)
- ENTERTAINMENT (OUTDOOR)
- FITNESS/RECREATION CENTER
- CAR/WASH/UT DETAILING
- CONVENIENCE STORE WITH GAS SALES
- FINANCIAL INSTITUTION
- HOTEL/MOTEL
- KENNEL
- LAUNDRY SERVICES
- COCKTAIL LOUNGE
- MICROBREWERY
- PUBLISHER
- OFFICE/GENERAL
- OFFICE/MEDICAL
- OUTDOOR SEATING/SIDEWALK CAFE
- MEDIA/RECORDING STUDIO
- RESTAURANT
- RETAIL SALES
- SERVICE
- VEHICLE REPAIR/SERVICE
- VETERINARY CLINIC
- TELECOMMUNICATION FACILITY
- UTILITY/MINOR
- FOOD TRUCK
- DAY CARE FACILITY
- OUTDOOR DISPLAYS/SALES
- OUTDOOR DINING

| DEVELOPMENT STANDARD TABLE    |                 |
|-------------------------------|-----------------|
| DEVELOPMENT PERIMETER SETBACK | 20'             |
| INTERNAL SETBACKS             | 0               |
| MINIMUM BUILDING SEPARATION   | 20'             |
| MAXIMUM BUILDING COVERAGE     | 50%             |
| MAXIMUM IMPERVIOUS            | 85%             |
| HEIGHT                        | 3 STORIES / 50' |
| COMMERCIAL INTENSITY          | 105,000 SF MAX  |
| APARTMENT DENSITY             | 180 UNITS       |

- CEMETERY
- GUN RANGE
- NURSERY
- SELF-STORAGE
- TOWING SERVICE/STORAGE
- VEHICLE SALES/RENTAL
- WAREHOUSE/FREIGHT MOVEMENT
- OUTDOOR STORAGE/LIMITED

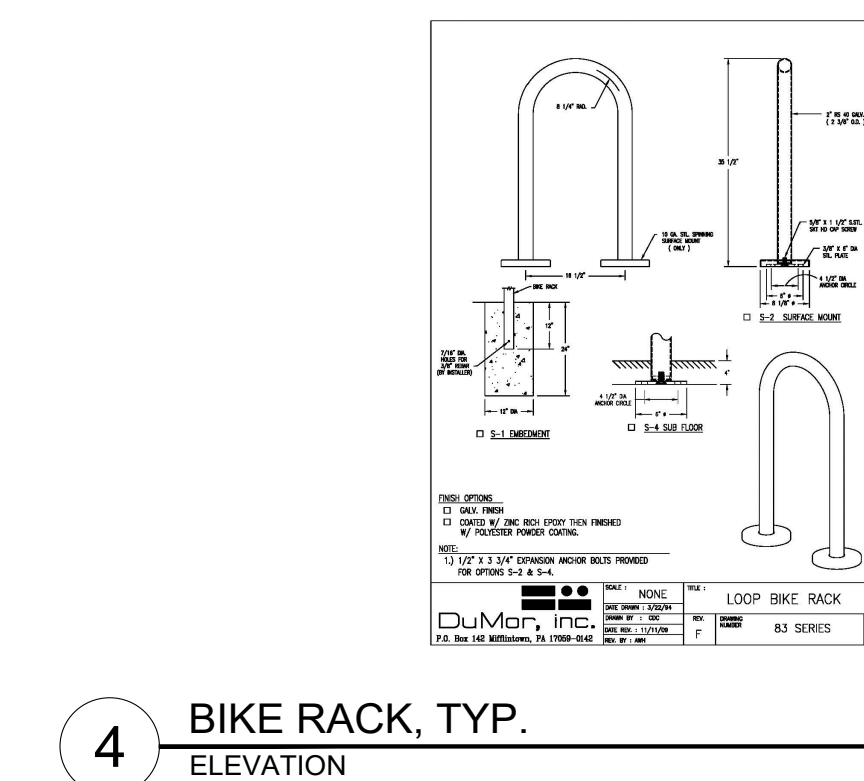
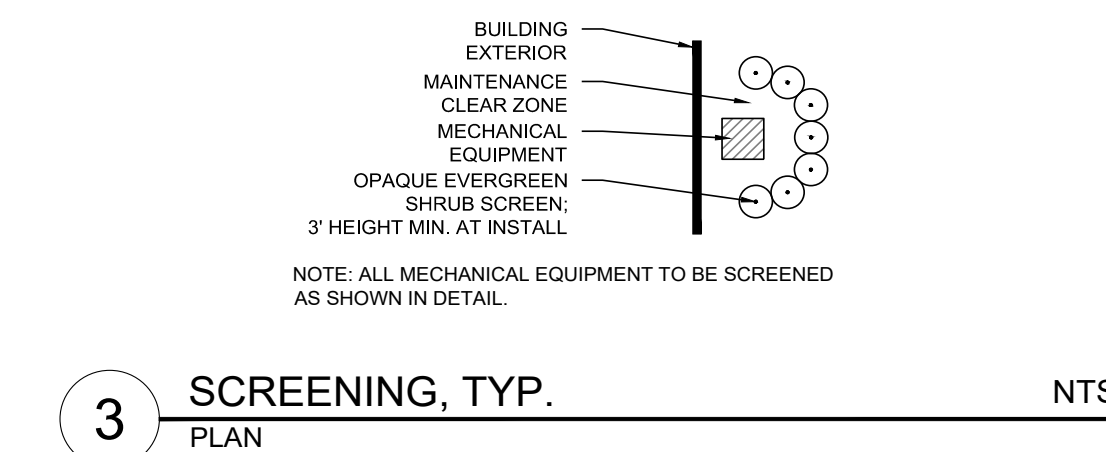
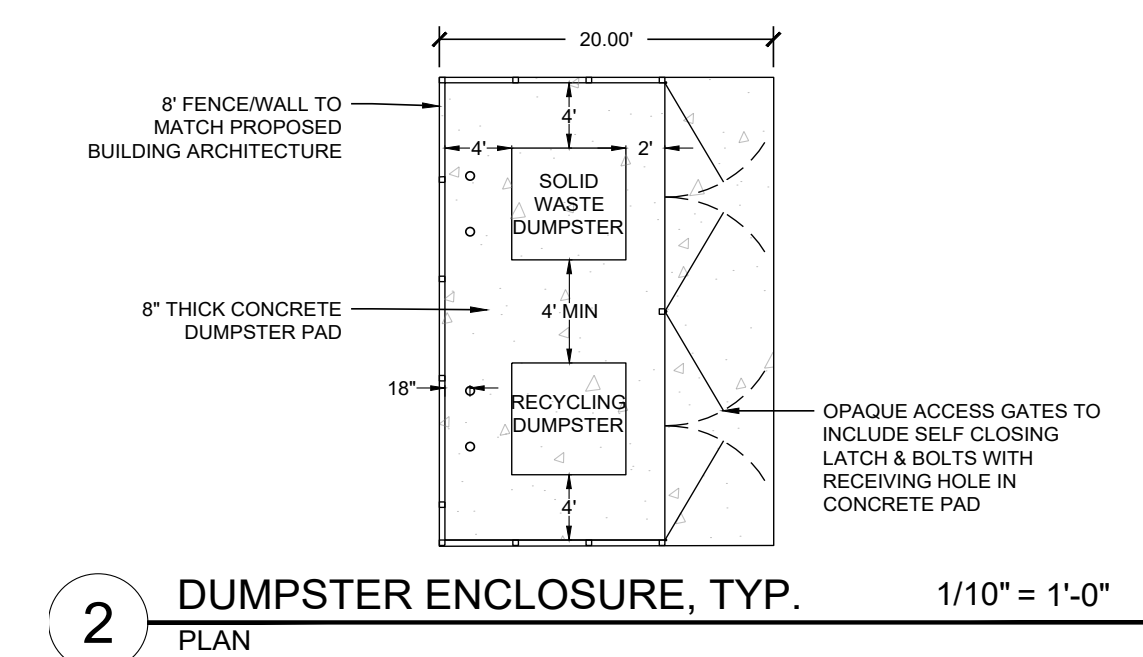
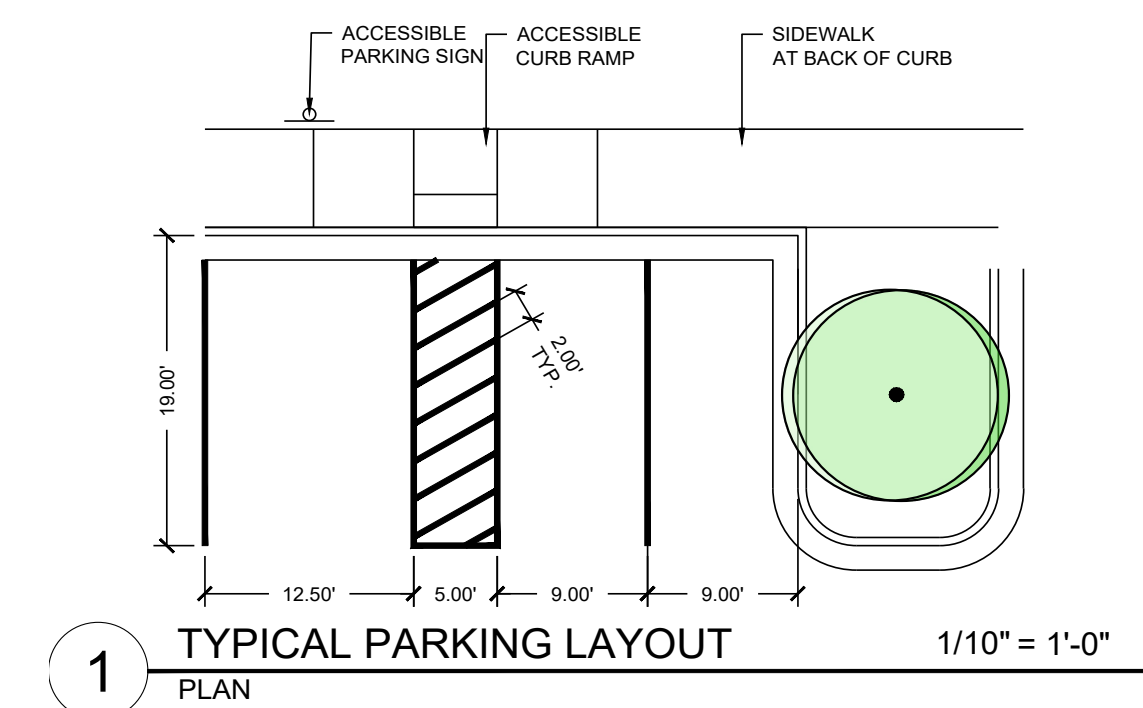
- APARTMENTS
- NURSING HOME



\\Projects\2020\20017 - Ashcroft 2\DWGS\1-Site Plan\3-Sheets\20017-C7.0 Typical Housing Types.dwg Jan 21, 2021 - 3:52pm

1. WHEN BUILDINGS ARE THREE OR MORE STORIES IN HEIGHT, VARIATIONS IN MASSING AND/OR SETBACKS SHALL BE PROVIDED ON THE TOP FLOOR TO DIFFERENTIATE THE TOP FLOOR FROM LOWER FLOORS.
2. ALL SIDES OF A BUILDING SHALL INCLUDE ARCHITECTURAL DETAILING.
3. EACH BUILDING FAÇADE SHALL INCLUDE NOT LESS THAN TWO DIFFERENT COLORS / MATERIALS.
4. THE PRIMARY EXTERIOR SIDING MATERIALS MAY CONSIST OF WOOD, VINYL, FIBER-CEMENT, MASONRY BRICK, MASONRY STONE, STONE VENEER, OR SYNTHETIC STONE.
5. MASONRY ACCENTS OF EITHER BRICK OR CULTURE STONE SHALL BE USED, ON ALL BUILDING SIDES, TO AVOID MONOTONOUS AND CONTINUOUS BUILDING FAÇADES.
6. REFUSE CONTAINERS AND GROUND-LEVEL EQUIPMENT SHOULD BE SCREENED FROM VIEW ON AT LEAST THREE SIDES AND BE ARCHITECTURALLY COMPATIBLE WITH SURROUNDING STRUCTURES. THEY SHOULD BE LOCATED AND DESIGNED TO BE INCONSPICUOUS TO THE EXTENT PRACTICAL.
7. ROOF LINES TO MATCH ARCHITECTURAL BUILDING STYLE AND WILL HAVE ASPHALT SHINGLES ON ANGLED ROOFS.
8. MULTI-FAMILY BUILDINGS SHALL INCLUDE TWO OR MORE OF THE FOLLOWING ARCHITECTURAL DESIGN FEATURES:
  - a. DECORATIVE MOLDINGS
  - b. SHUTTERS
  - c. CANOPIES
  - d. AWNINGS
  - e. PORCHES
  - f. COLUMNS
  - g. DECORATIVE DOORS AND WINDOWS
  - h. ROOF OVERHANGS
  - i. WOOD OR METAL ACCENTS
  - j. DECORATIVE LIGHTINGS
  - k. LEDGES
  - l. ARCHED WINDOWS

1. EXTERIOR MATERIALS SHALL INCLUDE BRICK, GLASS, STONE, MARBLE, GRANITE, MASONRY, PRE-CAST OR POURED CONCRETE OR SIMILAR DURABLE MATERIALS.
2. ROOFTOP MECHANICAL EQUIPMENT SHALL BE SCREENED FROM VIEW.
3. SITE ACCESS, PARKING AND CIRCULATION SHALL BE ARRANGED IN A LOGICAL AND SAFE MANNER FOR PEDESTRIANS AND VEHICLES AND IN COMPLIANCE WITH THE UDC.
4. SPACES FOR OUTSIDE EQUIPMENT, TRASH RECEPTACLES, STORAGE, AND LOADING AREAS WILL LOCATED AND SCREENED IN COMPLIANCE WITH THE UDC.
5. INDIVIDUAL SITE AMENITIES WITHIN THE COMMERCIAL SETTING SHALL HAVE COMMON FEATURES, SUCH AS COLOR, MATERIAL, AND DESIGN TO PROVIDE A COHESIVE ENVIRONMENT AND A MORE IDENTIFIABLE CHARACTER.
6. ENTRY FEATURES SHOULD BE CLEARLY VISIBLE TO PEDESTRIANS, APPROACHING FROM STREET AND SIDEWALK.
7. SECONDARY ENTRIES MAY BE LOCATED AT THE SIDE OR REAR OF THE BUILDING TO PROVIDE ACCESS FROM PARKING AREAS.
8. CANOPIES, AWNINGS, ARCADES, AND OVERHANGS MAY BE UTILIZED ON THE GROUND FLOOR OF COMMERCIAL BUILDINGS.
9. THE USE OF SILLS, HEADERS, REVEALS, PILASTERS, WINDOW BAYS OR SIMILAR FEATURES SHALL BE UTILIZED TO BREAK UP BUILDING FORMS AND WALL SURFACES.



ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520

SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

KIMLEY HORN  
421 FAYETTEVILLE ST SUITE 600  
RALEIGH, NC 27601

RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP



ASHCROFT  
SECTION 2

## MASTER PLAN

[illegible]

APARTMENT &  
COMMERCIAL  
REGULATING PLAN

Project number: L20017 Sheet #: 14  
Issued Date: 08.03.2020  
Drawn by: MT  
Approved by: KH





AMENITY CENTER CONCEPT SKETCH  
FOR ILLUSTRATIVE PURPOSES ONLY.  
AMENITY ARCHITECTURAL ELEVATIONS AND MINOR SITE PLAN APPLICATION SHALL BE SUBMITTED TO THE TOWN OF CLAYTON FOR SITE PLAN APPROVAL IN ACCORDANCE WITH THE UNIFIED DEVELOPMENT CODE.

- Amenity Center Design Standards**
1. Amenity Center Pod shall be a minimum of 3 acres in size.
  2. Any parking areas shall comply with Town of Clayton UDC requirements for parking lots and islands.
  3. All HVAC and mechanical equipment shall be screened from the public ROW in accordance with Town of Clayton UDC requirements.
  4. All architectural elements including color palette to be consistent with the Amenity Center building style.
  5. All recreation and open space shall be maintained by the HOA.
  6. Materials:
    - a. Siding - Fiber siding, shake, brick, board/batten or combination
    - b. Roof - Asphalt shingles/masonry-stone
    - c. Additional Trim Details - Columns, Stone, or Brick
  7. Amenity Center Building shall be a minimum of 4,000 sf with a pool area that is a minimum of 7,500 sf.

| DIMENSIONAL STANDARDS TABLE  |      |
|------------------------------|------|
| MINIMUM LOT SIZE (SF)        | 3 AC |
| MAXIMUM IMPERVIOUS AREA      | 85%  |
| MAXIMUM BUILDING COVERAGE    | 25%  |
| BUILDING SETBACKS            |      |
| FRONT STREET (FROM SIDEWALK) | 20'  |
| SIDE STREET (FROM SIDEWALK)  | 15'  |
| SIDE                         | 15'  |
| REAR                         | 20'  |

| ASHCROFT ATHLETIC CLUB (3 USES MIN) |  |
|-------------------------------------|--|
| FITNESS ROOM                        |  |
| BUSINESS CENTER                     |  |
| MAIL ROOM                           |  |
| POOL                                |  |
| LAZY RIVER                          |  |
| COMMUNITY LOUNGE                    |  |
| BOCCO COURTS                        |  |
| PLAYGROUND                          |  |

**ADDITIONAL AMENITY RESOURCES**

**RIVERWOOD ATHLETIC CLUB**

OUTDOOR POOLS  
INDOOR POOL  
WORKOUT FACILITY  
WALKING TRAILS

**LIONSGATE ATHLETIC CLUB**

OUTDOOR POOLS  
WORKOUT FACILITY

**RIVERWOOD GOLF CLUB**

GOLF COURSE AND DRIVING RANGE

**EAGLE RIDGE GOLF CLUB**

GOLF COURSE AND DRIVING RANGE

**OLD LIBERTY GOLF CLUB**

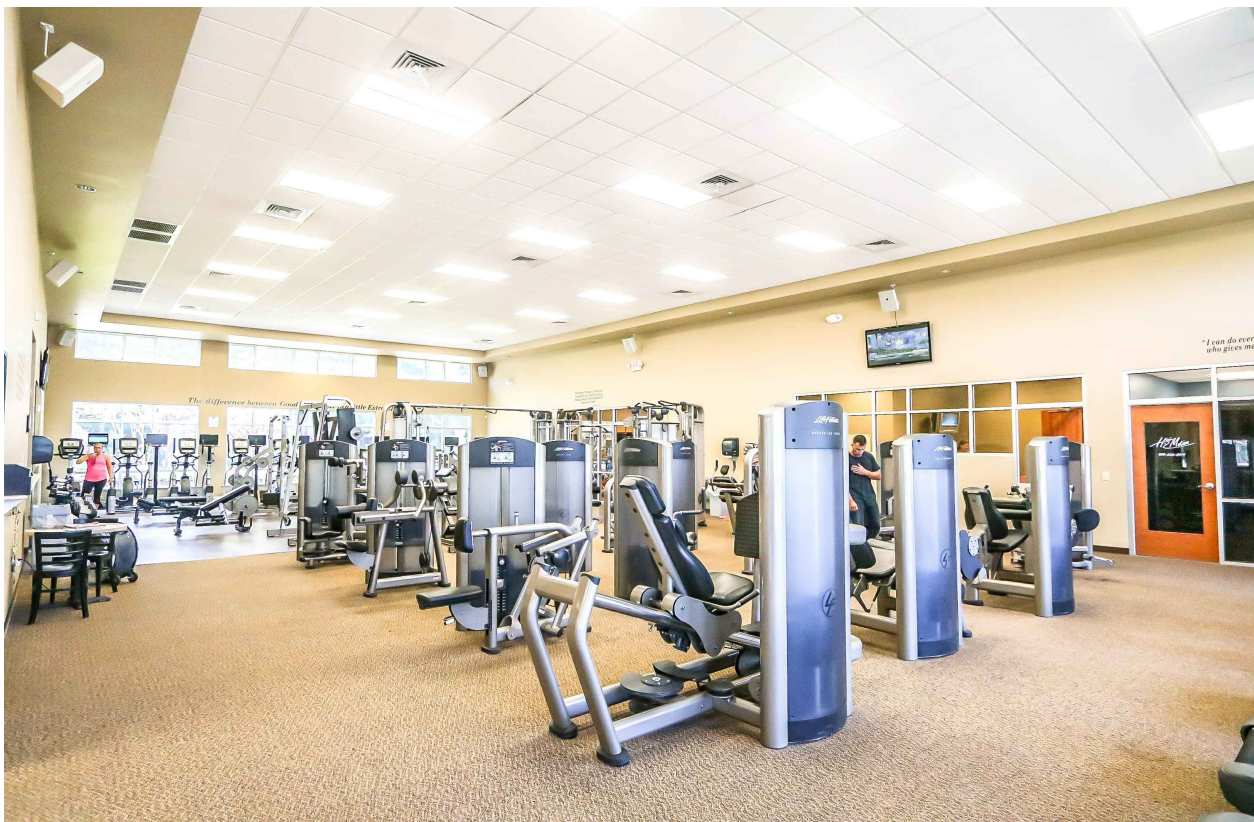
GOLF COURSE AND DRIVING RANGE

**HEDDINGHAM GOLF CLUB**

GOLF COURSE AND DRIVING RANGE

**TRALEE ATHLETIC CLUB**

OUTDOOR POOLS



**STEWART**

101 WEST MAIN ST.  
DURHAM, NC 27701  
T 919.380.8750

FIRM LICENSE #: C-1051  
www.stewartinc.com  
PROJECT #: L20017

**Client:**

ASHCROFT PARTNERS, LLC  
114 W. MAIN STREET  
CLAYTON, NC 27520

**Consultants:**

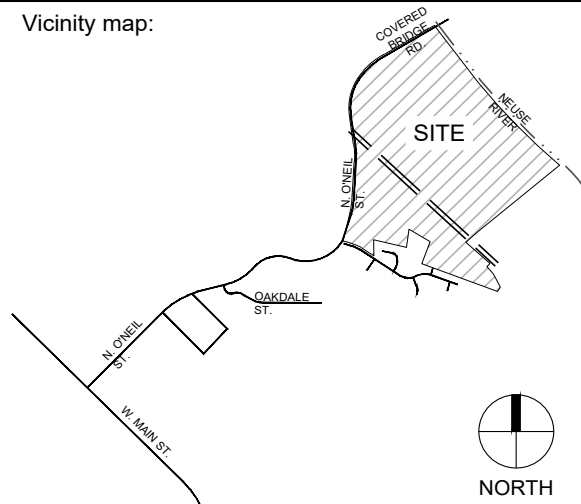
SOIL & ENVIRONMENTAL CONSULTANTS, PA  
NORTH QUARTER OFFICE PARK  
RALEIGH, NC 27615

KIMLEY HORN  
421 FAYETTEVILLE ST SUITE 600  
RALEIGH, NC 27601

**Agent:**

RIVERWILD  
114 W. MAIN STREET  
CLAYTON, NC 27520  
CONTACT: DAVID DEYOUNG, AICP

**Vicinity map:**



**Seal:**



**Project:**

**ASHCROFT  
SECTION 2**

**Issued for:**

**MASTER PLAN**

| No. | Date | Description |
|-----|------|-------------|
|     |      |             |
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|     |      |             |
|     |      |             |

**Title:**

**AMENITY CENTER  
REGULATING PLAN**

Project number: L20017 Sheet #:  
Issued Date: 08.03.2020  
Drawn by: MT  
Approved by: EL

**15.0**







**EXHIBIT D**

**Conditions on Master Plan**



Town of Clayton  
Planning Department  
111 E. Second Street, Clayton, NC 27520  
P.O. Box 879, Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

---

January 21, 2021

David DeYoung  
RiverWild- on behalf of Ashcroft Partners, LLC  
114 W Main Street  
Clayton, NC 27520  
[david@theriverwildteam.com](mailto:david@theriverwildteam.com)

**Re:** 2020-114-SD Ashcroft 2 Preliminary Plat Master Plan

To Whom It May Concern,

The Town of Clayton Planning staff is recommending to the Town Council that conditions of approval be placed upon the above referenced application, which proceeds to Town Council on Monday, March 1, 2021. These recommended conditions of approval are outlined below.

Please read through these potential conditions of approval, and sign below if you are in agreement with the conditions as proposed. If you are not in agreement please respond accordingly in writing. This will be included within the agenda packet for Council review.

---

**Recommend Conditions of Approval (2020-114-SD Ashcroft 2 Preliminary Plat Master Plan)**

General

1. Following Board approvals, three copies of the Planned Development Master Plan meeting the Conditions of Approval shall be submitted to Planning Department for final approval. The Conditions of Approval for the master plan shall be recorded on the cover sheet and shall be binding upon the master preliminary plat and upon the planned development rezoning.
2. All decorative traffic related signage shall be maintained solely by the developer or Homeowner's Association.
3. All phases of the development shall consist of complete street sections; no mid-block phasing shall be permitted.



4. Each phase of the development shall submit a minor site plan or subdivision plan for final review and approval by the Town Technical Review Committee.
5. Each individual phase, park, greenway section, or amenity area shall be reviewed as a part of either a minor preliminary plat or minor site plan, prior to plat recordation of the phase in which it is located.

#### Recreation/Amenities/Landscaping

1. Each individual phase, park, greenway section, or amenity area shall be reviewed as a part of either a minor preliminary plat or minor site plan, prior to associated plat recordation.
2. The commencement of the amenity center shall occur prior to the latter of the issuance of the 130th building permit, or the Town's written notice of completion of the new Wastewater Treatment Facility
3. Prior to site grading and construction activities, tree protection fencing shall be installed around all Resource Conservation Areas and other areas of protected vegetation.
4. All required landscaping buffers or plantings shall be installed or bonded prior to the platting of the phase in which they occur.
5. The greenway located along the frontage of the commercial pod (Phase 9) on N O'Neil Street shall be constructed and accepted by the Town prior to issuance of a Certificate of Occupancy for this phase. Fee-in-lieu for sidewalk shall be paid to the Town for the remainder of the development's frontage along N O'Neil Street prior to plat recordation of the associated phase.

#### Access/Traffic

1. No more than 30 residential building permits shall be issued within the subdivision until the Town's construction access to the Wastewater Treatment Plant has been installed. This access easement will be limited to construction traffic for the Wastewater Treatment Plant and emergency access only, but will serve as the secondary required access for the development. The connection to the existing Ashcroft 1 subdivision shall count towards the first required access point for this development.
2. Specific Northern Connector cross-section and lane configuration for sections required for access by the development are to be determined at minor site plan and dependent on adjacent development timelines. All sections are subject to Engineering Department review and approval. At a minimum, the developer will be responsible for grading out the entire ROW and cross section components (asphalt, curb and gutter, storm drain, pedestrian facilities, etc.) required in a standard Town collector street.
3. Cul-de-sac design and other elements related to access for emergency services shall be subject to Fire Department review and approval during the minor subdivision and site plan reviews.
4. The developer shall be responsible for designing and installing all TIA Road Improvements as reflected in the Master Plan. All off-site traffic improvements required by the North Carolina Department of Transportation Congestion Management Analysis shall be installed or financially guaranteed prior to the issuance of 400 building permits, unless otherwise approved by NCDOT.
5. All traffic improvements are based on current traffic volumes and projected growth for the study area. If the build out year for this development, as stated in the TIA, varies more than one year an addendum or revised TIA may be required subject to review by Town Planning and Engineering departments as well as NCDOT.

6. If the realignment of Covered Bridge Road is not completed prior to the build out of this development, then all improvements from Scenario #1 in NCDOT's Congestion Management Analysis will be required. If the realignment is completed prior to the build out of this development, then all of the improvements from Scenario #2 will be required.
7. Any roadway improvements and right-of-way dedication necessary to accommodate the road construction shall be the responsibility of the owner/developers. All required ROW shall be dedicated as public ROW in the final plat.
8. All driveways for the development along O'Neil Street shall be a minimum of 500' apart measuring the distance between the radiuses of both driveways.

#### **APPLICANT AFFIDAVIT**

*I/We, the undersigned, do hereby certify that I have reviewed the recommended conditions of approval and am in agreement with the conditions as they are outlined within this letter.*

\_\_\_\_\_  
*Print Name*

\_\_\_\_\_  
*Signature of Applicant*

\_\_\_\_\_  
*Date*

## **EXHIBIT E**

### **Public Facilities Infrastructure**

#### **1. Sanitary Sewer and Water Infrastructure**

Developer shall be responsible for any and all costs for design and construction of sanitary sewer and water infrastructure for the Development. The Developer shall have no cost responsibility for the twelve inch (12") watermain the Town is installing in the Easements acquired through the Easements attached as Exhibit H. The Town and the Developer may agree, pursuant to authority in G.S. 160A-320, G.S. 160A-499, and G.S. 160A-20.1, to enter into a Municipal Infrastructure Reimbursement Agreement such that water, sewer, electric and stormwater facility installation may be coordinated in the most effective and financially efficient manner. Developer shall be responsible for taps and service lines for each and every service connection. Developer shall dedicate to the Town all infrastructure up to and including the meter, such that only the service line from the meter to the dwelling is private property.

No residential services shall be allowed off the twelve inch (12") Town watermain installed within the Easements attached as Exhibit H hereto. Any shutdown of this twelve inch (12") watermain shall be coordinated through the Town Engineer at least 10 working days in advance. The existing Ashcroft Phase 7 water network as shown on Exhibit E-1 attached hereto shall be connected to the twelve inch (12") watermain and fully accepted prior to the first plat for Ashcroft 2 being approved by the Town.

Wastewater capacity shall be allocated and available to the Developer for this Development based on the Developer provided phasing schedule and anticipated build out date (see Exhibit G): Sewer permits and flow tracking for sewer extension ("FTSE") forms may not be submitted prior to the date shown in the chart below for the specified phase. Wastewater allocation is subject to availability of capacity for treatment of sanitary sewer. The Town Engineer may increase amounts by up to 5% in the event more wastewater is needed to complete a sub portion of phase. Requests must be submitting in writing.



All driveways for the Development along North O'Neil Street shall be a minimum of five hundred feet (500') apart, measuring the distance between the radiuses of both driveways.

Developer shall be responsible for designing and installing all TIA Road Improvements as reflected on Sheets 7.0 of the Master Plan. Developer may obtain up to 400 building permits for the Development prior to installation of off-site traffic improvements required by the NCDOT Congestion Management Analysis (the "Off Site Improvements"), which is attached here to as Exhibit E-2. Developer may secure all building permits for the Development above and beyond the 400-permit threshold stated herein by (i) installing the Off Site Improvements, (ii) financially guaranteeing such Off Site Improvements (such guarantee subject to NCDOT and Town approval), or (iii) obtaining approval from NCDOT and Town to proceed with some or all construction prior to installation of the Off Site Improvements.

All traffic improvements are based on current traffic volumes and projected growth for the study area. If the build out year for Development, as stated in the TIA, varies more than one year an addendum or revised TIA may be required, at the discretion of the Town and NCDOT, and such addendum shall be subject to review by Town Planning and Engineering departments and NCDOT. If the realignment of Covered Bridge Road is not completed prior to the build out of Development, then all improvements from Scenario #1 in NCDOT's Congestion Management Analysis will be required. If the realignment is completed prior to the build out of Development, then all of the improvements from Scenario #2 will be required.

The Developer intends to connect Road 3 to a portion of the Property that will be dedicated to the Town as a right of way (see Exhibit F, enumerated item 2), as reflected on the Vehicular Circulation Plan, Sheet 6.0 of the Master Plan (the "Future Northern Connector"). Developer will complete the street section of the Future Northern Connector from North O'Neil Street to Road 3 (the "Road 3 Connection") to the requirements and standards of the NCDOT, and Developer will be responsible for grading and cross section components (asphalt, curb and gutter, storm drain, pedestrian facilities, etc.) required in a standard Town collector street. For all portions of the Future Northern Connector outside the Road 3 Connection, the developer shall be obligated to construct only those improvements to the Future Northern Connector identified in the NCDOT Congestion Management Analysis (the Future Northern Connector is referred to in the NCDOT Congestion Management Analysis as the Covered Bridge Road Extension), and to grade the area in a manner which will accommodate connection of all planned streets into the Future Northern Connector to the Town and NCDOT's standards. Specific Future Northern Connector cross-section and lane configuration for sections required for access are to be determined at minor site plan and depending upon development timelines. All sections are subject to review and approval by the Town's Engineering Department.

Developer agrees that for any phase of the development that abuts the future Northern Connector right of way, no grading, construction or other activities will be conducted that might impede or impair the future construction of the Northern Connector.

#### 4. Stormwater Facilities

Developer shall be responsible for designing and installing all stormwater infrastructure for the Project in compliance with local, state and federal laws, rules and regulations. Private stormwater facilities shall remain the private property of the Developer or any assignee, such as a lawfully created and existing homeowners association. Stormwater pipes and drains located in publicly dedicated street rights of way will be public facilities



owned and maintained by the Town, except for any roads approved as ditch and shoulder section, which will be maintained by the Developer or Home Owners' Association as set forth in Section 3 above.

5. Park and Recreation Facilities

The multi-use path located along the frontage of North O'Neil Street, associated with the proposed commercial pod in Phase 9, as reflected on the Pedestrian Circulation Plan, Sheet 8.0 of the Master Plan, shall be constructed by the Developer and accepted by the Town prior to issuance of a Certificate of Occupancy for Phase 9. Fee-in-lieu for sidewalk shall be paid to the Town for the remainder of the Development's proportional frontage along North O'Neil Street prior to plat recordation of the associated phase.

6. All public facilities, upon completion, inspection and approval as to meeting Town Standards will be offered for dedication to the Town and accepted by the Town for public maintenance.

**EXHIBIT E-1**

**Ashcroft Phase 7 Water Network**







**EXHIBIT E-2**  
**NCDOT Congestion Management Analysis**



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

**DELIVERY VIA EMAIL**

August 27, 2020

Samantha L. Wullenwaber, MPA  
Planning Director - Town of Clayton  
PO Box 879  
Clayton, NC 27528

COUNTY: Johnston

SUBJECT: **TIA Review of Proposed Ashcroft Phase 2**

Dear Ms. Wullenwaber,

Highway Division Four (Division) has reviewed the Traffic Impact Analysis (TIA) for the subject development. Please accept this letter as concurrence with the TIA and the attached TIA Review Report performed by the Congestion Management Section of the Transportation Mobility and Safety Division of NCDOT. Any comments below are in addition to the requirements that are included in the actual TIA or Traffic Impact Analysis Review. All requirements or recommendations included herein are based off current Department and Division policies. This review should not be mistaken for approval of the driveway permit, design/construction plans, final plat, site plans, or access locations. A driveway permit must be obtained prior to construction and NCDOT will approve site plan and access locations during this review. All design aspects of any submitted plans shall comply with current NCDOT Standard Specifications for Roads and Structures and Policy on Street and Driveway Access to North Carolina Highways.

**GENERAL COMMENTS**

- If the realignment of Covered Bridge Road is not completed prior to the build out of this development, then all improvements from Scenario #1 will be required. If the realignment is completed prior to the build out of this development, then all improvements from Scenario #2 will be required.
- Any roadway improvements and right-of-way (ROW) dedication necessary to accommodate the road construction shall be the responsibility of the owner/developers. All required ROW shall be dedicated as public ROW in the final plat. Installation of right turn lanes will typically require at least 15' of dedication.
- Lane Closures for required improvement construction will only be permitted under restricted hours due to heavy traffic volumes in the vicinity of the proposed development. These restrictions will be determined during the driveway permitting application and approval.

Mailing Address:  
NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS | DIV. 4 DIST. 3  
2671 US 70 WEST  
GOLDSBORO, NC 27530

Telephone: (919) 739-5300  
Fax: (919) 731-2017  
Customer Service: 1-877-368-4968  
Website: [www.ncdot.gov](http://www.ncdot.gov)

Location:  
2671 US 70 WEST  
GOLDSBORO, NC 26730



- These conditions are based on current traffic volumes and projected growth for the study area. If the proposed build out year for this development, as stated in the TIA, varies more than one year an addendum or revised TIA may be required.
- The installation of any improvements being identified by a TIA for an adjacent development does not dismiss or release this development from installation and/or participation of these improvements provided the other development does not move forward as intended. It is recommended that the Developers coordinate this installation with other committed developments. The Department will not participate in determining the value of each individual contribution to this roadway improvement.

#### **Additional Requirements**

- All driveways for this site on NCDOT ROW must be spaced 500' apart measuring the distance between the radiuses of both driveways. The updated site plan has a different driveway layout than the site plan provided for the TIA. These additional driveways will not be allowed on O'Neal street.
- Any additional improvements that are constructed by others and not shown on this TIA or review must be maintained, while constructing the improvements required by this letter. Additional improvements are required by others at the Covered Bridge Road intersections and if they are installed, they must be maintained while constructing the improvements required by this letter.
- Before the proposed signal is designed or constructed the developer will need to provide a signal warrants study showing the current traffic meets MUTCD signal warrants. No signal will be installed based on future trip generation by the proposed development. The proposed signal requirement can be included at a later phase or bonded until installed.
- All left turns installed on NCDOT ROW at will required a minimum of 150' of storage if located at a site driveway. If any left turn lane taper overlaps with any existing or proposed middle turn lane or taper, the entire section will need to be widened to three lanes.
- Driveways shown on the attached report as being right-in/right only will require channelization with a 4' concrete median and associated widening in the middle of the NCDOT roadway the driveway is accessing.

Feel free to contact me if you have any additional questions or concerns.

Sincerely,



Sam Lawhorn, PE  
District Engineer

cc: Kevin Bowen, PE - Division Engineer  
Andy Brown, PE - Division Traffic Engineer  
Jim Dunlop, PE – Congestion Management Engineer  
Travis Fluitt, P.E. – Kimley-Horn  
Driveway Permit File



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

DEPARTMENT OF TRANSPORTATION  
TRANSPORTATION MOBILITY AND SAFETY DIVISION  
TRAFFIC MANAGEMENT UNIT  
CONGESTION MANAGEMENT SECTION

August 25, 2020

**Traffic Impact Analysis Review Report**  
**Ashcroft Phase 2**

**TIA Project:** SC-2020-140  
**Division:** 4  
**County:** Johnston  
**Description:** Ashcroft Phase 2 on S. O'Neil Street



*James H. Dunlop 25 Aug 2020*

**James H. Dunlop, P. E.**  
**Congestion Management Engineer**

**Charles Sorrell**  
**Congestion Management Project Design Engineer**

**MAILING ADDRESS:**  
1561 Mail Service Center  
Raleigh, North Carolina 27699-1561

Telephone: 919-814-5000

**LOCATION:**  
750 North Greenfield Parkway  
Garner, North Carolina 27529

Website: [WWW.NCDOT.ORG/DOH/Preconstruct/Traffic/Congestion/CM/](http://WWW.NCDOT.ORG/DOH/Preconstruct/Traffic/Congestion/CM/)



## Ashcroft Phase 2 TIA

**SC-2020-140**

**Johnston County**

Per your request, the Congestion Management Section (CMS) of the Transportation Mobility and Safety Division has completed a review of the subject site. The comments and recommendations contained in this review are based on data for background conditions presented in the sealed Traffic Impact Analysis (TIA) and are subject to the approval of the local District Engineer's Office and appropriate local authorities.

| Key Dates                                           |         |
|-----------------------------------------------------|---------|
| Initially Received by CMS                           | 8/5/20  |
| Complete Information Received by CMS                | 8/18/20 |
| Date of Preliminary Review Accepting TIA for Review | 8/25/20 |
| Sealed TIA Prepared by Kimley-Horn                  | 8/3/20  |
| Site Plan Prepared by STEWART                       | 8/3/20  |

### Proposed Development

According to the TIA, the proposed Ashcroft Phase 2 is to be located on S O'Neil Street in Johnston County. The TIA states the development is to be constructed by 2030 and is to consist of the following:

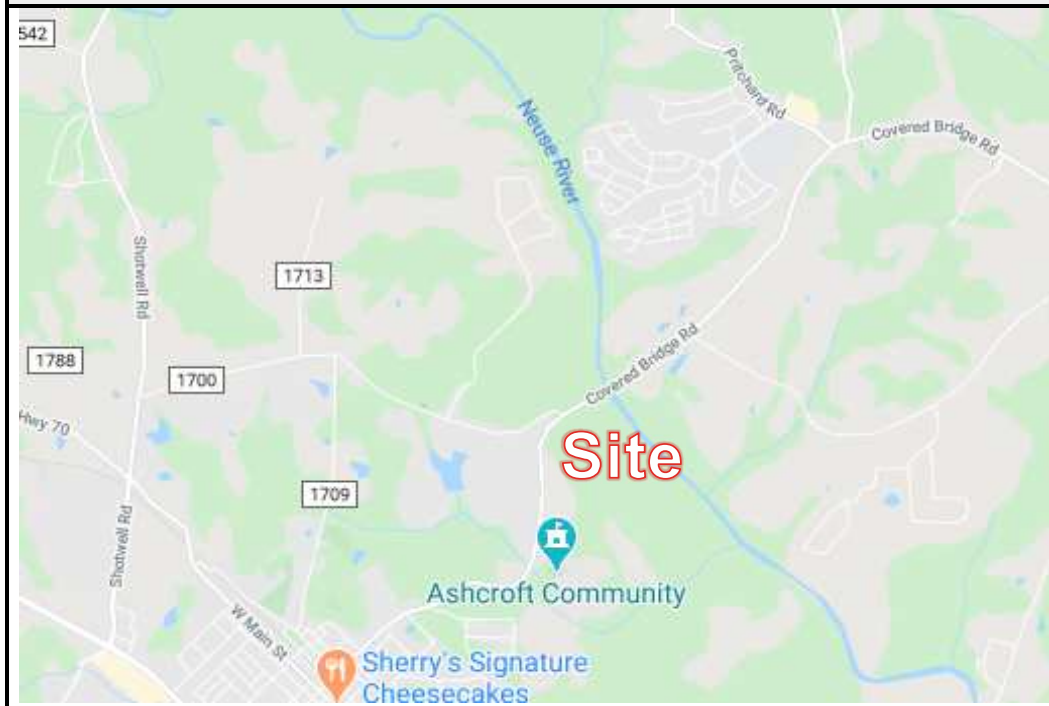
| Land Use                       | Land Use Code | Size         |
|--------------------------------|---------------|--------------|
| Single Family Detached Housing | 210           | 300 units    |
| Multifamily Housing (Low-Rise) | 220           | 300 units    |
| Multifamily Housing (Mid-Rise) | 221           | 180 units    |
| Shopping Center                | 820           | 105,000 s.f. |

| Trip Generation - Unadjusted Volumes During a Typical Weekday<br>Based on appropriate methodology outlined in the <i>ITE Trip Generation Manual, 10<sup>th</sup> Ed.</i> |     |     |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--------|
|                                                                                                                                                                          | IN  | OUT | TOTAL  |
| AM Peak Hour                                                                                                                                                             | 228 | 390 | 618    |
| PM Peak Hour                                                                                                                                                             | 601 | 489 | 1,090  |
| Daily Trips                                                                                                                                                              |     |     | 12,282 |



## Study Area

Study Area and Proposed Site Location - ↑ N



### TIP Projects in Study Area

None in Area

## TIA Comments

### The following items vary from our recommended practices:

- The Synchro files were not labeled in a clear manner and the TIA did not explain what the differences were in the files.
- Recommendation Diagram does not show the Thru movement for South Site Driveway
- The TIA did not identify all mitigation improvements to the roadway network, as required by the Driveway Manual.





## General Reference

For reference to various documents applicable to this review please reference the following links: <https://connect.ncdot.gov/resources/safety/Pages/Congestion-Management.aspx> and [https://connect.ncdot.gov/resources/safety/Teppl/Pages/Teppl-Topic.aspx?Topic\\_List=C37](https://connect.ncdot.gov/resources/safety/Teppl/Pages/Teppl-Topic.aspx?Topic_List=C37).

Once the driveway permit has been approved and issued, a copy of the final driveway permit requirements should be forwarded to this office. If we can provide further assistance, please contact the Congestion Management Section at (919) 814-5000.

## Recommendations

### Legend

- |   |                                                                              |
|---|------------------------------------------------------------------------------|
| ❶ | Improvement by Developer. Congestion Management concurs with recommendation. |
| ❷ | Improvement by Developer. Additional or modified recommendation.             |
| ❸ | Committed improvement by SteepleChase                                        |

### Improvements By Others

The analysis includes background improvements by others. If these improvements are not in place at the time of construction, the site should provide these improvements or analysis demonstrating mitigation is not necessary.

## Scenario #1

### Pritchard Road and Covered Bridge Road

No improvements are recommended for site traffic.

### S. O'Neal Street and Covered Bridge Road

- NB S. O'Neal Street
  - o 250' Left-Turn Lane ❷
- EB S. Covered Bridge Road
  - o 100' Right-Turn Lane ❷

### S. O'Neal Street and Covered Bridge Road Extension

Monitor for Signal Warrants❶

- SB S. O'Neal Street
  - o 225' Left-Turn Lane ❶



- **NB S. O'Neal Street**
  - o 100' Right-Turn Lane ❶
- **EB Covered Bridge Road Extension**
  - o Three-lane cross-section: one ingress, two egress ❶
  - o Egress: 250' Left-Turn Lane ❷ and Right-Turn Lane ❶
  - o 250' Internal Protected Stem ❷

### **S. O'Neal Street and RIRO Driveway**

---

- **NB S. O'Neal Street**
  - o 100' Right-Turn Lane ❶
- **WB RIRO Driveway**
  - o Two-lane cross-section: one ingress, one egress ❶
  - o Egress: Right-Turn Lane ❶
  - o 100' Internal Protected Stem ❷

### **S. O'Neal Street and Steeplechase Site Driveway #2/South Site Driveway**

---

- **SB S. O'Neal Street**
  - o 100' Left-Turn Lane ❷
- **NB S. O'Neal Street**
  - o 100' Right-Turn Lane ❷
  - o 150' Left-Turn Lane ❸
- **EB Steeplechase Site Drive #2**
  - o Two-lane cross-section: one ingress, one egress ❸
  - o Egress: Left/Thru/Right-Turn Lane ❸
- **WB South Site Driveway**
  - o Three-lane cross-section: one ingress, two egress ❶
  - o Egress: 125' Left-Turn Lane and Thru/Right-Turn Lane ❶
  - o 125' Internal Protected Stem ❷

### **S. O'Neal Street and Atwood Drive**

---

No improvements are recommended for site traffic.



## **S. O'Neal Street and W Main Street**

---

- **WB W Main Street**
  - Restripe Existing Parking to Full Right-Turn Lane ②

## **Scenario #2**

### **Pritchard Road and Covered Bridge Road**

---

No improvements are recommended for site traffic.

### **S. O'Neal Street and Covered Bridge Road/ Covered Bridge Road Extension**

---

New Signal ②

- **NB S. O'Neal Street**
  - 150' Left-Turn Lane ③
  - 100' Right-Turn Lane ①
- **SB S. O'Neal Street**
  - 225' Left-Turn Lane ①
  - 100' Right-Turn Lane ③
  - Additional northbound receiving Lane, beginning at Covered Bridge Road and ending 1200' north of Covered Bridge Road with an appropriate taper. ②
- **EB Covered Bridge Road Extension**
  - Four-lane cross-section: one ingress, three egress ②
  - Egress: 150' Left-Turn Lane ①, Thru Lane ② and 100' Right-Turn Lane ②
  - 150' Internal Protected Stem ②
- **EB Covered Bridge Road**
  - Four-lane cross-section: one ingress, three egress ②
  - Egress: Dual Left-Turn Lanes (One full, one 300') ② and 150' Thru/Right-Turn Lane ③



### **S. O'Neal Street and RIRO Driveway**

---

- **NB S. O'Neal Street**
  - o 100' Right-Turn Lane ❶
- **WB RIRO Driveway**
  - o Two-lane cross-section: one ingress, one egress ❶
  - o Egress: Right-Turn Lane ❶
  - o 100' Internal Protected Stem ❷

### **S. O'Neal Street and Steeplechase Site Driveway #2/South Site Driveway**

---

- **SB S. O'Neal Street**
  - o 100' Left-Turn Lane ❷
- **NB S. O'Neal Street**
  - o 100' Right-Turn Lane ❷
  - o 150' Left-Turn Lane ❸
- **EB Steeplechase Site Drive #2**
  - o Two-lane cross-section: one ingress, one egress ❸
  - o Egress: Left/Thru/Right-Turn Lane ❸
- **WB South Site Driveway**
  - o Three-lane cross-section: one ingress, two egress ❶
  - o Egress: 125' Left-Turn Lane and Thru/Right-Turn Lane ❶
  - o 125' Internal Protected Stem ❷

### **S. O'Neal Street and Atwood Drive**

---

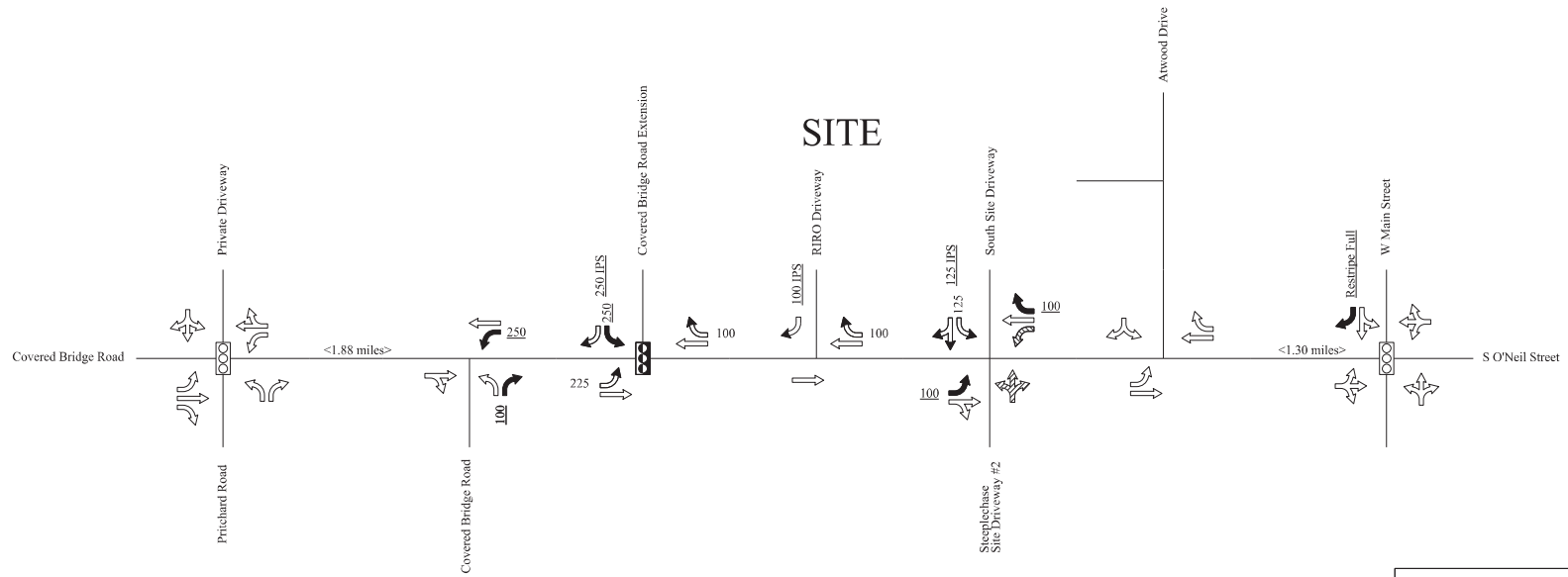
No improvements are recommended for site traffic.

### **S. O'Neal Street and W Main Street**

---

- **WB W Main Street**
  - o Restripe Existing Parking to Full Right-Turn Lane ❷

## Scenario #1



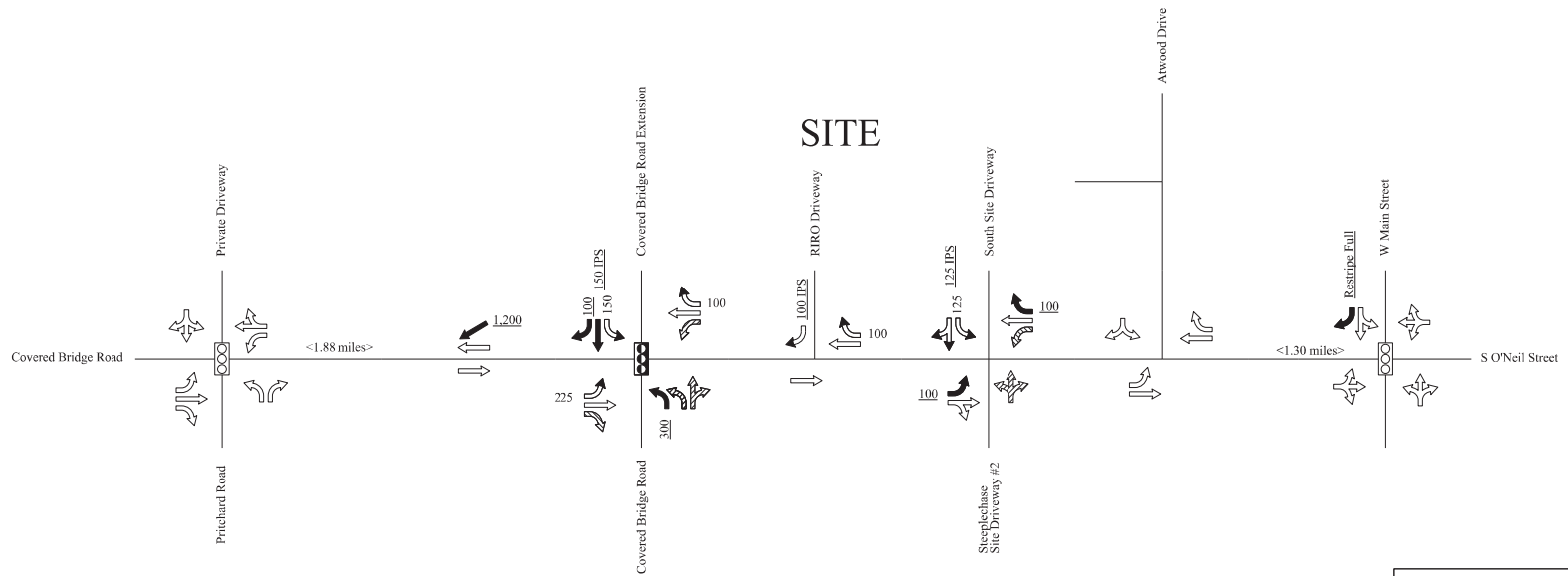
Charles Sorrell 8/18/20



| Ashcroft Phase 2<br>SC-2020-140 |                                |
|---------------------------------|--------------------------------|
|                                 | Existing Laneage               |
|                                 | Recommended Laneage            |
|                                 | Laneage Built By Steepchase    |
|                                 | NCDOT Recommendation           |
|                                 | Existing Signal                |
|                                 | Monitor for Signal             |
|                                 | Developer Proposed Signal      |
| XXX                             | Storage                        |
| XXX                             | NCDOT Recommended Storage      |
| <XXX>                           | Distance Between Intersections |
| IPS                             | Internal Protected Stem        |
| All Distances in Feet           |                                |
| Drawing Not to Scale            |                                |



## Scenario #2



| Ashcroft Phase 2<br>SC-2020-140 |                                |
|---------------------------------|--------------------------------|
|                                 | Existing Laneage               |
|                                 | Recommended Laneage            |
|                                 | Laneage Built By Steeplechase  |
|                                 | NCDOT Recommendation           |
|                                 | Existing Signal                |
|                                 | Monitor for Signal             |
|                                 | Developer Proposed Signal      |
| XXX                             | Storage                        |
| XXX                             | NCDOT Recommended Storage      |
| <XXX>                           | Distance Between Intersections |
| IPS                             | Internal Protected Stem        |
| All Distances in Feet           |                                |
| Drawing Not to Scale            |                                |

Charles Sorrell 8/18/20



## **EXHIBIT F**

### **Land Dedication**

1. A 30-foot easement along the Neuse River to covered Bridge Road for future use by the Town, including but not limited to greenway and utility extension, shall be dedicated in the platting of Phases 6, 7, and 8, or by execution of a Deed of Easement in form satisfactory to the Town with in fifteen (15) days of a written request from the Town.
2. A 110 foot right of way and mutually agreed upon construction and slope easements for the proposed Northern Connector shall be dedicated by the earlier of the platting of Phase 2 or at such time as may be requested by the Town or NCDOT in order to commence construction of the Northern Connector.
3. A 55 foot right-of-way, measured from the existing centerline of North O'Neil Street, shall be dedicated in Phase 1 for the widening of N. O'Neil Street

## **EXHIBIT G**

### **Development Schedule (Phasing)**

- Phase 1-1A shall commence on or after June 2021.
- Phase 2 shall commence on or after January 2024.
- Phase 3 shall commence on or after January 2024.
- Phase 4 shall commence on or after June 2021.
- Phase 5 shall commence on or after January 2024.
- Phase 6 shall commence on or after January 2024.
- Phase 7 shall commence on or after January 2022.
- Phase 8 shall commence on or after January 2022.
- Phase 9 shall commence on or after June 2023.
- Phase 10 shall commence on or after June 2023.

The Phasing schedule outlined in this Exhibit G remains subject to wastewater availability and allocations as shown in the chart outlined in Exhibit E. Wastewater allocation is subject to availability of capacity for treatment of sanitary sewer.

**EXHIBIT H**

**Deeds of Easement**

Excise Tax: None

Prepared by: Poyner Spruill LLP  
PO Box 1801  
Raleigh, NC 27602

After Recording Mail To: Town of Clayton

Brief Description for Index: Access and Public Utility Easement on portion of 35.23 acre parcel, and on portion of 60.6 acre parcel, O'Neil Street Extension; Temporary construction easement on portion of 16.69 acre parcel

Parcel Identifier: 05H02200B (NC PIN: 166900-76-7649)  
05H02015 (NC PIN: 166900-88-7300) and  
05H02015A (NC PIN: 166900-74-2974)

---

**STATE OF NORTH CAROLINA                      DEED OF EASEMENT**  
**COUNTY OF JOHNSTON**

THIS DEED OF EASEMENT, made and executed this \_\_\_\_\_ day of \_\_\_\_\_, 2021  
(the "Effective Date"), by and between

| GRANTOR                                                                                                                         | GRANTEE                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| ASHCROFT PARTNERS, LLC,<br>a North Carolina limited liability company<br>114 West Main Street<br>Suite 102<br>Clayton, NC 27520 | TOWN OF CLAYTON,<br>a municipal corporation of the State of<br>North Carolina<br>111 E. Second Street, Clayton, NC 27520<br>PO Box 879, Clayton, NC 27528 |

The designation Grantor and Grantee as used herein shall include said parties, their successors, and assigns and shall include the singular, plural, masculine, feminine or neuter as required by context.

**WITNESSETH:**

WHEREAS, Grantor is the owner of that certain tract of land, consisting of approximately 35.23 acres, and which is designated as Parcel Identifier: 05H02200B by the Johnston County Revenue Department, and that certain tract of land, consisting of approximately 60.6 acres, and which is

PPAB 5806998v4.docx



designated as Parcel Identifier: 05H02015 by the Johnston County Revenue Department, and which are more particularly described in that certain deed recorded in Deed Book 5318, Page 64, Johnston County Register of Deeds (the "Registry"), and that certain tract of land, consisting of approximately 16.69 acres, and which is designated as Parcel Identifier: 05H02015A by the Johnston County Revenue Department, and which was acquired by Grantor in that certain deed recorded in Deed Book 4969, Page 742 of the Registry (collectively, the "Grantor's Lands"), and Grantor has agreed to convey to Grantee, according to the terms set forth below, certain easements upon and through Grantor's Lands which easements are hereinafter described;

WHEREAS, Grantee is the owner of that certain tract of land, consisting of approximately 78.54 acres, and which is designated as Parcel Identifier: 05H02199W by the Johnston County Revenue Department which was acquired by Grantee in Deeds recorded at Book 4697, Page 849 and Book 714, Page 278 ("Grantee's Land"); and

WHEREAS, Grantor has agreed pursuant to the terms and conditions of this Deed of Easement to dedicate, convey and set over the Easements hereinafter described to Grantee for the benefit of Grantee's Land.

NOW THEREFORE, Grantor, in consideration of mutual covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which are acknowledged, hereby dedicates, conveys and sets over to Grantee, its successors and assigns, the following easement rights upon, over, under, across and through Grantor's Lands:

I. A perpetual, variable width access and public utility easement (collectively, the "Permanent Easement"), in those locations more particularly shown and described as the "PROPOSED ACCESS & PUBLIC UTILITY EASEMENT, 67,133 S.F., 1.541 ACRES," and the "PROPOSED ACCESS & PUBLIC UTILITY EASEMENT, 42,109 S.F., 0.967 ACRES," on those certain surveys entitled, "EASEMENT EXHIBIT FOR TOWN OF CLAYTON, PROPERTY OF ASHCROFT PARTNERS, LLC," and "EASEMENT EXHIBIT FOR TOWN OF CLAYTON, PROPERTY OF ASHCROFT PARTNERS, LLC" as prepared by WithersRavenel, Engineers | Planners | Surveyors, said surveys being attached hereto as Exhibit A, and made part hereof (the "Surveys"), and described as the "PROPOSED ACCESS & PUBLIC UTILITY EASEMENT, 67,133 S.F., 1.541 ACRES," and the "PROPOSED ACCESS & PUBLIC UTILITY EASEMENT, 42,109 S.F., 0.967 ACRES," by metes and bounds on Exhibit B attached hereto and made a part hereof (said portions of Grantor's Lands being the "Permanent Easement Area"), for the following purposes, together with any and all uses incidental to such purposes: (a) to construct, install, operate, maintain, repair, reconstruct, replace and/or remove a gravel and/or paved access road (the "Access Road"); (b) for vehicular and pedestrian passage, access, ingress, egress and regress within, upon, over and across the Easement Area; (c) to construct, install, operate, maintain, repair, reconstruct, replace, and/or remove such overhead and/or underground facilities, fixtures, equipment, markers, water and sewer lines, fibers, wires, cables, conduits, pipes, and appurtenances (collectively, the "Facilities") as may be necessary or desirable for utility purposes, including: underground water transmission, reclamation, and distribution; underground sanitary sewer collection, reclamation, and transmission; underground stormwater collection, transmission, and mitigation; overhead and/or underground electric transmission and distribution; overhead and/or underground

communications and/or data transmission (collectively “Utility Purposes”); and (d) for greenway, trail, bicycle, and pedestrian use.

II. A temporary, exclusive variable width temporary construction easement (the “Temporary Easement”, and together with the Permanent Easement, the “Easements”), in those locations more particularly shown and described as the “PROPOSED TEMPORARY EASEMENT 2464 SF” and “PROPOSED TEMPORARY EASEMENT 1116 SF,” on that certain survey entitled, “SEWER OUTFALL EASEMENTS, PROPERTY OF ASHCROFT PARTNERS, LLC” as prepared by WithersRavenel, Engineers | Planners | Surveyors, said survey being attached hereto as Exhibit C, and made part hereof, (said portions of Grantor’s Lands being the “Temporary Easement Area”, and together with the Permanent Easement Area, the “Easement Areas”), for the purposes of constructing, installing, operating, maintaining, repairing, reconstructing, replacing, and/or removing such Facilities as may be necessary or desirable for Utility Purposes, together with any and all uses incidental to such purposes. Unless otherwise provided in writing between Grantor and Grantee, this Temporary Easement shall automatically expire three (3) years from the Effective Date of this Agreement.

**TO HAVE AND TO HOLD** the Easements unto Grantee and its successors and assigns in accordance with the following terms and conditions:

1. Grantee and Grantee’s officers, agents, employees and contractors shall have the right to go to and from the Easement Areas at any time over that portion of the Grantor’s Lands as agreed to by Grantor, with materials, supplies, machinery and/or equipment, as may be necessary or convenient to accomplish such purposes aforesaid.
2. Grantee shall have the right to cut and/or clear any or all vegetation and debris from the Easement Areas and to change the grade and drainage of the land in such Easement Areas as Grantee deems reasonably necessary in exercising the rights granted in this Deed of Easement.
3. Grantee shall obtain and pay for all building permits and/or other required governmental licenses or permits necessary for the use of the Easements and Facilities and shall pay for the construction of the Access Road.
4. Grantee shall construct and install the Access Road and Facilities in in a good and workmanlike manner and in accordance with all applicable laws, statutes, ordinances, regulations, and orders of all applicable governmental authority(ies).
5. Until Grantee completes construction of its water reclamation facility on Grantee’s Land and gives Grantor written notice of such completion (the “Completion Date”), which is currently anticipated to be December 31, 2023, Grantor shall have no right to use the Easement Areas without Grantee’s prior written consent, except that the Access Road will be available for secondary emergency access only for emergency vehicles to access the Grantor's Lands. Grantee may install a gate or such other mechanisms as it deems necessary to coordinate traffic flow within the Permanent Easement Area prior to the Completion Date.

6. Prior to the Completion Date, Grantor shall not erect improvements in the Easement Areas or take any other actions that interfere with the rights granted herein or block the access rights provided herein.
7. From and after the Completion Date, Grantor shall have the following rights with respect to the Easement Areas:
  - a. Grantor may (a) construct, maintain, and use the Permanent Easement Area for paved or unpaved drives and parking areas; and (b) plant and maintain shallow-rooted ground cover material within the Permanent Easement Area, all subject to applicable laws and regulations and in accordance with approved plans for development of Grantor's Lands. Nothing set forth herein shall be deemed to inhibit the Grantor's ability to use or develop the Easement Areas or any other portion of the Grantor's Lands after the Completion Date, so long as such use or development does not unreasonably interfere with the use and enjoyment of the easement rights created in this Deed of Easement.
  - b. Grantor may remove or relocate the Access Road at Grantor's expense, provided any such removal or relocation continues to provide the Grantee with substantially equal access to the Easement Areas and Grantee's Land.
  - c. Grantee shall not alter, remove, replace, or otherwise reconstruct paved or unpaved drives and parking areas constructed and maintained on Grantor's Land by the Grantor or Grantor's agents, tenants, or licensees.
  - d. Grantor shall have the right to close any portion of the Easement Areas for a reasonable period of time, not to exceed ten (10) days, for the limited purpose of improving, repairing and/or maintaining the Easement Areas;
  - e. Grantor shall have the right to close any portion of the Grantor's Lands for a reasonable period of time to the extent required by law, for the limited purpose of preventing prescriptive rights from accruing to any third party as to the Grantor's Lands.
  - f. Grantor's rights under this Section 7 must be exercised in a manner that does not materially interfere with Grantee's use of the Easement Areas as permitted by this Deed of Easement.
  - g. In the event permanent roads are not constructed in the Permanent Easement Area, Grantee will restore the Permanent Easement Area to a substantially similar condition as existed prior to the construction of the Access Road, subject to the Grantee's rights to continue using the Easement Areas for the purposes contemplated herein, including the presence of Facilities.
8. The Easements run with the title of Grantor's Lands for the benefit of Grantee's Land, however Grantor's Lands or Grantee's Land may be further subdivided or reconfigured, and shall be binding upon Grantor and Grantee and their respective successors and assigns.

9. The conveyance of the Easement is expressly subject to those certain easements shown on the Surveys as the "90' Duke Energy Progress Easement," the "Existing 20' Permanent Sanitary Sewer Easement," the "Existing 30' Utility Easement," the "Existing 50' Access & Utility Easement," and "Existing 30' Access, Utility & Landscape Easement," to the extent such easements overlap with the Easement Areas. To the extent of any conflict between this Deed of Easement and any other easements in favor of the Town, any conflict shall be construed in favor of the Town.
10. To the extent permitted by law, Grantee agrees to indemnify, defend, and save harmless the Grantor, its, officers, servants, assigns, representatives, attorneys and any and all other persons, parties or entities that might be in privity with the Grantor, from all liabilities, costs, claims, demands, damages, losses, causes of action and suits (including, but not limited to, attorneys' fees and other costs of defending any such claims) asserted against the Grantor arising out of Grantee's use of the Easement Area or breach of this Deed of Easement. Grantor agrees to indemnify, defend, and save harmless the Grantee, its officers, servants, assigns, representatives, attorneys and any and all other persons, parties or entities that might be in privity with the Grantee, from all liabilities, costs, claims, demands, damages, losses, causes of action and suits (including, but not limited to, attorneys' fees and other costs of defending any such claims) asserted against the Grantee arising out of Grantor's use of the Easement Areas or breach of this Deed of Easement.
11. The Easements may not be amended or modified except by a writing executed by Grantee and Grantor, or their successors or assigns, and recorded in the Registry.
12. All notices required or permitted to be given hereunder shall be in writing and the same shall be given and be deemed to have been served, given and received (i) if delivered by hand, when delivered in person, (ii) if sent by reputable overnight courier (such as Federal Express or UPS), on the next business day following the date on which the notice was sent, or (iii) if mailed, three (3) days after placed in the United States mail, postage pre-paid, by certified mail, return receipt requested, addressed to either Grantor or Grantee at the address hereafter specified:

To Grantor:                   Ashcroft Partners, LLC  
                                      114 West Main Street  
                                      Suite 102  
                                      Clayton, NC 27520

To Grantee:                   Town of Clayton  
                                      PO Box 879  
                                      Clayton, NC 27520  
                                      Attention: Town Manager

13. This Deed of Easement shall be governed by, and construed in accordance with, the laws of the State of North Carolina.

Grantor represents, warrants, and covenants that Grantor is seized of the Grantor's Lands in fee simple, Grantor has the right and authority to convey the Easements to Grantee, and Grantor will defend Grantee's title to the Easements against all lawful third party claims.

**[SIGNATURES AND NOTARY ACKNOWLEDGMENTS  
APPEAR ON FOLLOWING PAGES.]**



IN WITNESS WHEREOF, the Grantor has hereunto set his/her/its hand and seal as the day and year first above written.

GRANTOR:

Ashcroft Partners, LLC,  
a North Carolina limited liability company

By: \_\_\_\_\_(SEAL)

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he/she voluntarily signed the foregoing Deed of Easement for the purposes stated therein and in the capacity indicated:

\_\_\_\_\_  
(print name of individual signatory)

Date: \_\_\_\_\_

By: \_\_\_\_\_

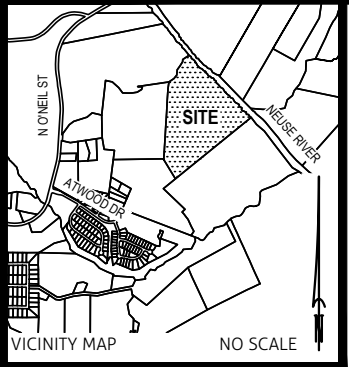
Print Name: \_\_\_\_\_

Notary Public

My Commission Expires: \_\_\_\_\_

[SEAL OR STAMP]

**EXHIBIT A**  
(ATTACHED HERETO)



- SURVEY NOTES:**
1. AREAS COMPUTED BY COORDINATE METHOD.
  2. BASIS OF BEARINGS: NC GRID (NAD 83-2011). THERE IS NO NC GRID MONUMENT WITHIN 2000'.
  3. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND MAY BE SUBJECT TO ANY MATTERS THAT A FULL TITLE SEARCH WOULD DISCLOSE.
  4. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES.
  5. SUBJECT PROPERTY IS LOCATED WITHIN A FLOOD HAZARD AREA ACCORDING TO FLOOD INSURANCE RATE MAP 3720166900K DATED JUNE 20, 2018.

GLOBAL POSITIONING SYSTEM (GPS) COORDINATES WERE USED FOR BASIS OF BEARINGS ON THIS PLAT. THE FOLLOWING INFORMATION WAS USED TO PERFORM THE GPS GNSS SURVEY:

CLASS OF SURVEY: CLASS A  
POSITIONAL ACCURACY 0.02(+/-)  
TYPE OF GPS FIELD PROCEDURE: RTK, NCGRS REAL-TIME NETWORK  
DATES OF SURVEY: NOVEMBER 11, 2019  
DATUM/EPOCH: NAD 83/2011  
PUBLISHED/FIXED-CONTROL USE: LOCALIZED AROUND SITE  
CONTROL - WITHERSRAVENEL CONTROL POINT #22  
GEOID MODEL: GEOID 12B  
COMBINED GRID FACTOR: 0.99989700  
UNITS: US SURVEY FEET

**LEGEND (UNLESS OTHERWISE NOTED)**

- IPF - IRON PIPE FOUND  
PP - UTILITY POLE  
RBF - REBAR FOUND  
R/W - RIGHT OF WAY
- ADJOINER \_\_\_\_\_  
BOUNDARY SURVEYED \_\_\_\_\_  
BOUNDARY NOT SURVEYED \_\_\_\_\_  
EASEMENT \_\_\_\_\_  
FLOOD ZONE \_\_\_\_\_  
R/W \_\_\_\_\_  
OVERHEAD POWER LINE \_\_\_\_\_ OHE \_\_\_\_\_
- PROPOSED EASEMENT \_\_\_\_\_

| LINE TABLE |               |          |
|------------|---------------|----------|
| LINE       | BEARING       | DISTANCE |
| L1         | N 23°13'57" E | 145.66'  |
| L2         | S 56°34'38" E | 255.88'  |
| L3         | S 39°42'00" E | 97.54'   |
| L4         | N 42°27'17" W | 145.99'  |
| L5         | N 55°24'47" W | 226.62'  |
| L6         | N 64°36'27" W | 36.20'   |
| L7         | N 79°33'07" W | 31.67'   |
| L8         | S 73°32'54" W | 43.03'   |
| L9         | S 47°04'28" W | 31.20'   |
| L10        | S 25°44'33" W | 142.90'  |
| L11        | S 23°39'38" W | 109.11'  |
| L12        | S 39°05'15" W | 127.83'  |
| L13        | S 45°25'58" W | 99.03'   |
| L14        | S 52°24'04" W | 19.74'   |

THIS MAP IS NOT A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH REQUIREMENTS FOR PLATS.

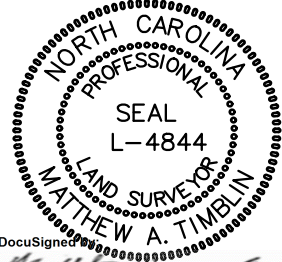
**TYPE OF PLAT**

I, MATTHEW A. TIMBLIN, PROFESSIONAL LAND SURVEYOR NO. L-4844, CERTIFY TO ONE OR MORE OF THE FOLLOWING CHECKED BELOW:

- ☒ C. ANY OF THE FOLLOWING  
iv. THAT THE SURVEY IS OF A PROPOSED EASEMENT FOR A PUBLIC UTILITY AS DEFINED IN NC GENERAL STATUTES 62-3

DocuSigned by: 12/9/2020  
MATTHEW A. TIMBLIN, PROFESSIONAL LAND SURVEYOR NO. L-4844  
FCD9994196F54F9...

DocuSigned by: 12/9/2020  
MATTHEW A. TIMBLIN, PROFESSIONAL LAND SURVEYOR NO. L-4844  
FCD9994196F54F9...



WITHERSRAVENEL  
GPS CONTROL POINT #22  
NAD 83(2011)  
NC GRID/GROUND  
COORDINATES  
N: 697,494.47'  
E: 2,170,441.69'  
NAVD 88 ELEV: 144.87'

NOW OR FORMERLY  
JOHN WESLEY MASSEY  
D.B. 967, PG. 243  
NC P.I.N. 166900-78-4101

NOW OR FORMERLY  
ASHCROFT  
PARTNERS, LLC  
D.B. 5318, PG. 64  
P.B. 70, PG. 403  
NC P.I.N. 166900-76-7649

CONTROL CORNER  
EXISTING IRON PIPE  
NC GRID COORS  
NAD 83(2011)  
N: 696757.34'  
E: 2168002.26'

N 05°00'22" E 1,494.92'

EXISTING 50' ACCESS &  
UTILITY EASEMENT  
D.B. 4801, PG. 109  
P.B. 83, PG. 229

PROPOSED ACCESS &  
PUBLIC UTILITY EASEMENT  
AREA:  
67,133 S.F.  
1.541 ACRES

NOW OR FORMERLY  
ASHCROFT PARTNERS, LLC.  
D.B. 5318, PG. 64  
P.B. 76, PG. 44  
NC P.I.N. 166900-88-7300

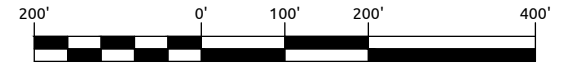
EXISTING 30' ACCESS,  
UTILITY & LANDSCAPE  
EASEMENT  
D.B. 4801, PG. 109  
P.B. 83, PG. 229

NOW OR FORMERLY  
TOWN OF CLAYTON  
D.B. 4697, PG. 849  
D.B. 714, PG. 278  
P.B. 82, PG. 140  
NC P.I.N. 166900-96-3977

| CURVE TABLE |            |         |             |               |
|-------------|------------|---------|-------------|---------------|
| CURVE       | ARC LENGTH | RADIUS  | DELTA ANGLE | CHORD BEARING |
| C1          | 310.13'    | 662.50' | 27°13'55"   | N 36°50'55" E |
| C2          | 237.82'    | 136.00' | 100°11'24"  | N 73°19'39" E |
| C3          | 67.75'     | 230.00' | 16°52'39"   | S 48°08'19" E |

90° DUKE ENERGY PROGRESS  
EASEMENT  
(MILBURNIE-LEE TRANSMISSION LINE)  
P.B. 82, PG. 140  
P.B. 70, PG. 403  
P.B. 72, PG. 424  
(EASEMENT DEED NOT FOUND)  
(90° WIDTH NOT VERIFIED)

**GRAPHIC SCALE**



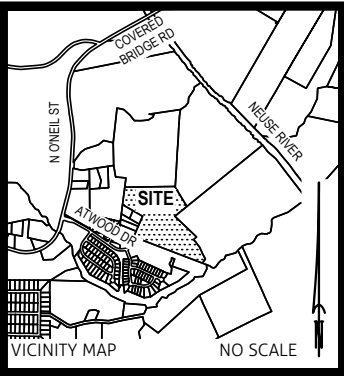
1 inch = 200 ft.

DATE: 12-09-2020  
SCALE: 1"=200'  
SURVEYED BY: AM  
DRAWN BY: MT  
CHECK & CLOSURE BY: MT  
CAD FILE: CLAYTON ASHCROFT1 EXH  
PROJECT NO: 02190247

EASEMENT EXHIBIT FOR  
TOWN OF CLAYTON  
PROPERTY OF  
ASHCROFT PARTNERS, LLC

|                        |                  |           |
|------------------------|------------------|-----------|
| TOWNSHIP: CLAYTON      | COUNTY: JOHNSTON | STATE: NC |
| P.I.N.: 166900-88-7300 | SHEET: 1 of 1    |           |

**WithersRavenel**  
Engineers | Planners | Surveyors  
115 MacKenan Drive | Cary, NC 27511  
t: 919.469.3340 | license #: C-0832  
www.withersravenel.com



VICINITY MAP  
NO SCALE

LEGEND (UNLESS OTHERWISE NOTED)

IPF - IRON PIPE FOUND  
PP - UTILITY POLE  
RBF - REBAR FOUND  
R/W - RIGHT OF WAY

|                       |           |
|-----------------------|-----------|
| ADJOINER              | _____     |
| BOUNDARY SURVEYED     | =====     |
| BOUNDARY NOT SURVEYED | -----     |
| EASEMENT              | - - - - - |
| FLOOD ZONE            | ~~~~~     |
| R/W                   | =====     |
| OVERHEAD POWER LINE   | —OHE—     |
| PROPOSED EASEMENT     | =====     |

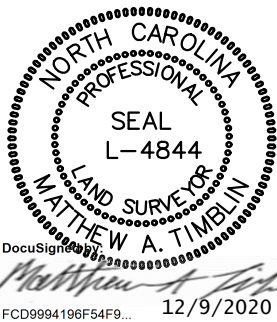
- SURVEY NOTES:**
1. AREAS COMPUTED BY COORDINATE METHOD.
  2. BASIS OF BEARINGS: NC GRID (NAD 83-2011). THERE IS NO NC GRID MONUMENT WITHIN 2000'.
  3. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND MAY BE SUBJECT TO ANY MATTERS THAT A FULL TITLE SEARCH WOULD DISCLOSE.
  4. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES.
  5. SUBJECT PROPERTY IS NOT LOCATED WITHIN A FLOOD HAZARD AREA ACCORDING TO FLOOD INSURANCE RATE MAP 3720166900K DATED JUNE 20, 2018.

GLOBAL POSITIONING SYSTEM (GPS) COORDINATES WERE USED FOR BASIS OF BEARINGS ON THIS PLAT. THE FOLLOWING INFORMATION WAS USED TO PERFORM THE GPS GNSS SURVEY:

CLASS OF SURVEY: CLASS A  
POSITIONAL ACCURACY 0.02(+/-)  
TYPE OF GPS FIELD PROCEDURE: RTK, NCGRS REAL-TIME NETWORK  
DATES OF SURVEY: NOVEMBER 11, 2019  
DATUM/EPOCH: NAD 83/2011  
PUBLISHED/FIXED-CONTROL USE: LOCALIZED AROUND SITE  
CONTROL - WITHERSRAVENEL CONTROL POINT #22  
GEOID MODEL: GEOID 12B  
COMBINED GRID FACTOR: 0.99989700  
UNITS: US SURVEY FEET

| LINE | BEARING       | DISTANCE |
|------|---------------|----------|
| L1   | S 46°39'54" E | 348.32'  |
| L2   | N 54°52'42" E | 110.06'  |
| L3   | S 52°24'04" W | 164.39'  |
| L4   | S 68°24'59" W | 55.05'   |
| L5   | N 87°54'02" W | 60.33'   |
| L6   | N 56°31'45" W | 57.79'   |
| L7   | N 46°40'48" W | 413.25'  |

THIS MAP IS NOT A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH REQUIREMENTS FOR PLATS.



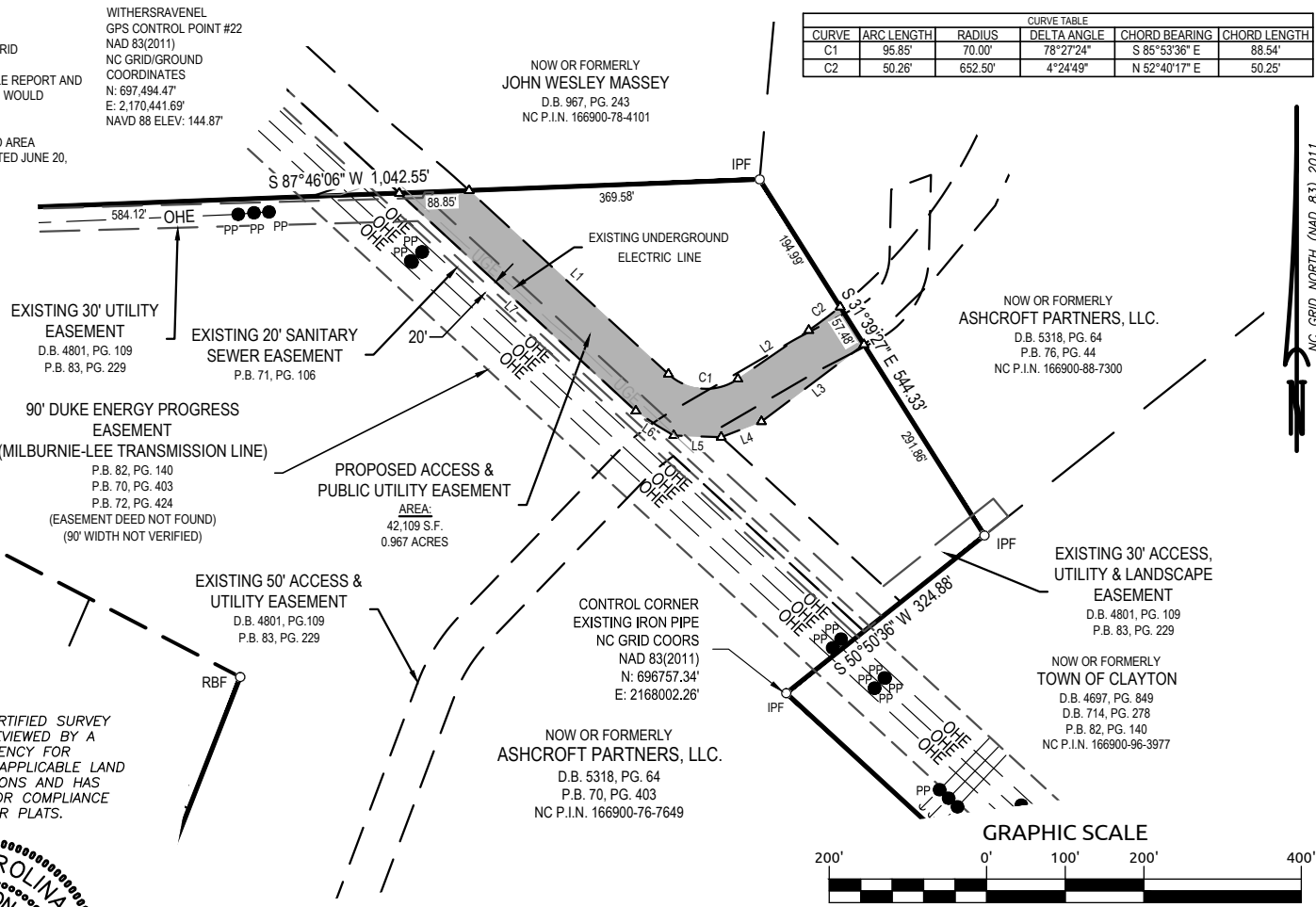
**TYPE OF PLAT**

I, MATTHEW A. TIMBLIN, PROFESSIONAL LAND SURVEYOR NO. L-4844, CERTIFY TO ONE OR MORE OF THE FOLLOWING CHECKED BELOW:

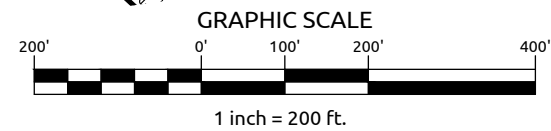
- ☒ C. ANY OF THE FOLLOWING
- iv. THAT THE SURVEY IS OF A PROPOSED EASEMENT FOR A PUBLIC UTILITY AS DEFINED IN NC GENERAL STATUTES 62-3

DocuSigned by:  
*Matthew A. Timblin* 12/9/2020  
MATTHEW A. TIMBLIN, PROFESSIONAL LAND SURVEYOR NO. L-4844  
FCD9994196F54F9...

DocuSigned by:  
*Matthew A. Timblin* 12/9/2020  
FCD9994196F54F9...



| CURVE | ARC LENGTH | RADIUS  | DELTA ANGLE | CHORD BEARING | CHORD LENGTH |
|-------|------------|---------|-------------|---------------|--------------|
| C1    | 95.85'     | 70.00'  | 78°27'24"   | S 85°53'36" E | 88.54'       |
| C2    | 50.26'     | 652.50' | 4°24'49"    | N 52°40'17" E | 50.25'       |



|                                 |                        |                  |               |
|---------------------------------|------------------------|------------------|---------------|
| DATE: 12-09-2020                | EASEMENT EXHIBIT FOR   |                  |               |
| SCALE: 1"=200'                  | TOWN OF CLAYTON        |                  |               |
| SURVEYED BY: AM                 | PROPERTY OF            |                  |               |
| DRAWN BY: MT                    | AHSCROFT PARTNERS, LLC |                  |               |
| CHECK & CLOSURE BY: MT          |                        |                  |               |
| CAD FILE: CLAYTON AHSCROFT2 EXH | TOWNSHIP: CLAYTON      | COUNTY: JOHNSTON | STATE: NC     |
| PROJECT NO: 02190247            | P.I.N.: 166900-76-7649 |                  | SHEET: 1 of 1 |

**WithersRavenel**  
Engineers | Planners | Surveyors  
115 MacKenan Drive | Cary, NC 27511  
t: 919.469.3340 | license #: C-0832  
www.withersravenel.com

**EXHIBIT B**

PROPOSED ACCESS & PUBLIC UTILITY EASEMENT, 67,133 S.F., 1.541 ACRES

BEGINNING AT A POINT ON THE SOUTHWESTERN BOUNDARY OF THE ASHCROFT PARTNERS, LLC PROPERTY, SAID POINT BEING NORTH 50°50'36" EAST 324.88 FEET (GROUND DISTANCE) THENCE NORTH 31°39'27" WEST 291.86 FEET FROM AN IRON PIPE CONTROL CORNER, SAID CORNER HAVING NC GRID COORDINATES (NAD 83 – 2011) N=696,757.34', E=2,168,002.26'; THENCE NORTH 31°39'27" WEST 57.48 FEET TO A POINT; THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 652.50 FEET, AN ARC LENGTH OF 310.13 FEET, AND A CHORD BEARING AND DISTANCE OF NORTH 36°50'55" EAST 307.21 FEET TO A POINT; THENCE NORTH 23°13'57" EAST 145.66 FEET TO A POINT; THENCE ALONG A CURVE TO THE RIGHT HAVING A RADIUS OF 136.00 FEET, AN ARC LENGTH OF 237.82 FEET, AND A CHORD BEARING AND DISTANCE OF NORTH 73°19'39" EAST 208.65 FEET TO A POINT; THENCE SOUTH 56°34'38" EAST 255.88 FEET TO A POINT; THENCE ALONG A CURVE TO THE RIGHT HAVING A RADIUS OF 230.00 FEET, AN ARC LENGTH OF 67.75 FEET, AND A CHORD BEARING AND DISTANCE OF SOUTH 48°08'19" EAST 67.51 FEET TO A POINT; THENCE SOUTH 39°42'00" EAST 97.54 FEET TO A POINT; THENCE SOUTH 50°50'36" WEST 66.85 FEET TO A POINT; THENCE NORTH 42°27'17" WEST 145.99 FEET TO A POINT; THENCE NORTH 55°24'47" WEST 226.62 FEET TO A POINT; THENCE NORTH 64°36'27" WEST 36.20 FEET TO A POINT; THENCE NORTH 79°33'07" WEST 31.67 FEET TO A POINT; THENCE SOUTH 73°32'54" WEST 43.03 FEET TO A POINT; THENCE SOUTH 47°04'28" WEST 31.20 FEET TO A POINT; THENCE SOUTH 25°44'33" WEST 142.90 FEET TO A POINT; THENCE SOUTH 23°39'38" WEST 109.11 FEET TO A POINT; THENCE SOUTH 39°05'15" WEST 127.83 FEET TO A POINT; THENCE SOUTH 45°25'58" WEST 99.03 FEET TO A POINT; THENCE SOUTH 52°24'04" WEST 19.74 FEET TO THE POINT AND PLACE OF BEGINNING CONTAINING 67,133 SQ. FT., 1.541 ACRES MORE OR LESS.

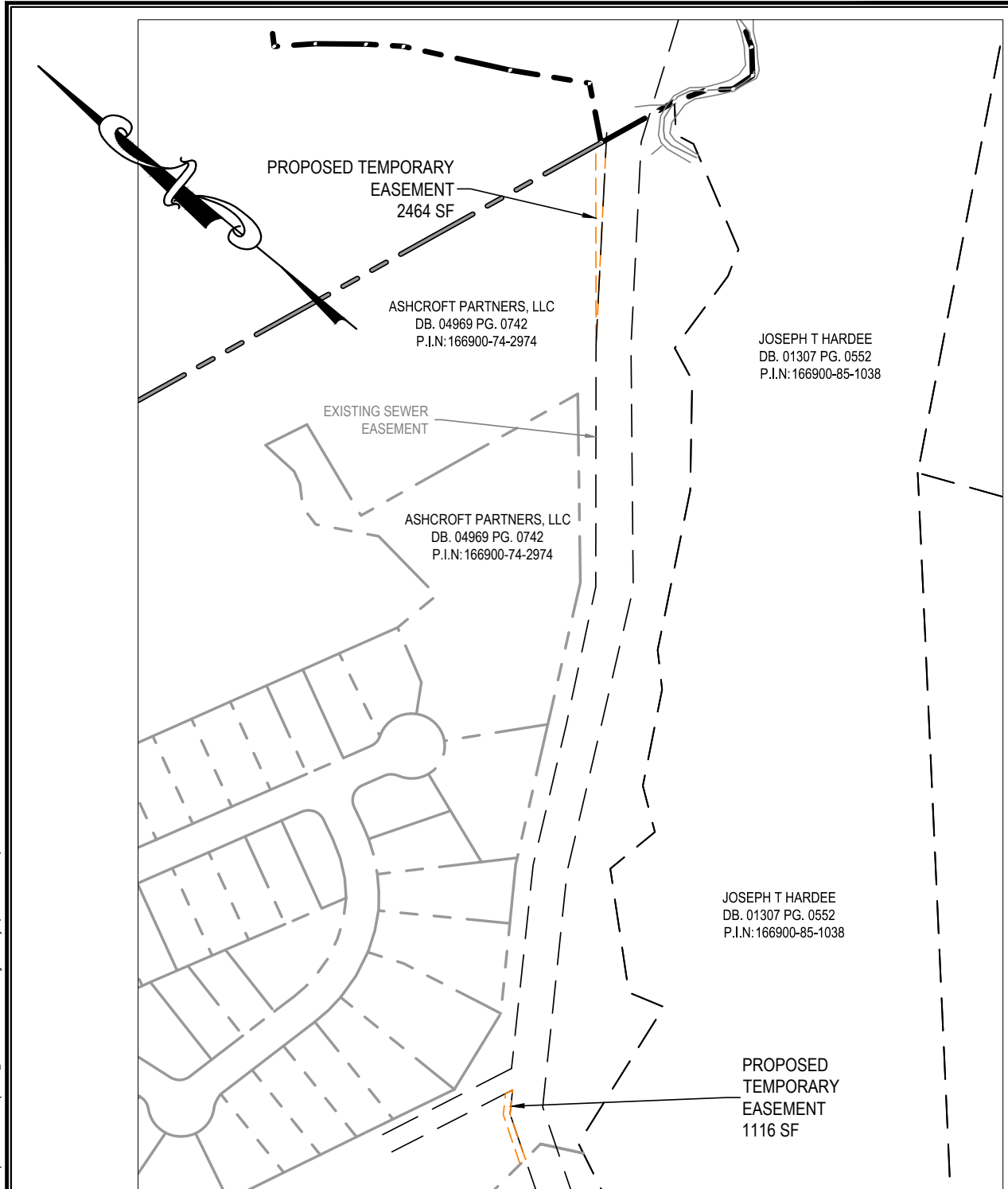
PROPOSED ACCESS & PUBLIC UTILITY EASEMENT, 42,109 S.F., 0.967 ACRES

BEGINNING AT A POINT ON THE NORTHEASTERN BOUNDARY OF THE ASHCROFT PARTNERS, LLC PROPERTY, SAID POINT BEING NORTH 50°50'36" EAST 324.88 FEET (GROUND DISTANCE) THENCE NORTH 31°39'27" WEST 291.86 FEET FROM AN IRON PIPE CONTROL CORNER, SAID CORNER HAVING NC GRID COORDINATES (NAD 83 – 2011) N=696,757.34', E=2,168,002.26'; THENCE SOUTH 52°24'04" WEST 164.39 FEET TO A POINT; THENCE SOUTH 68°24'59" WEST 55.05 FEET TO A POINT; THENCE NORTH 87°54'02" WEST 60.33 FEET TO A POINT; THENCE NORTH 56°31'45" WEST 57.79 FEET TO A POINT; THENCE NORTH 46°40'48" WEST 413.25 FEET TO A POINT; THENCE NORTH 87°46'06" EAST 88.85 FEET TO A POINT; THENCE SOUTH 46°39'54" EAST 348.32 FEET TO A POINT; THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 70.00 FEET, AN ARC LENGTH OF 95.85 FEET, AND A CHORD BEARING AND DISTANCE OF SOUTH 85°53'36" EAST 88.54 FEET TO A POINT; THENCE NORTH 54°52'42" EAST 110.06 FEET TO A POINT; THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 652.50 FEET, AN ARC LENGTH OF 50.26 FEET, AND A CHORD

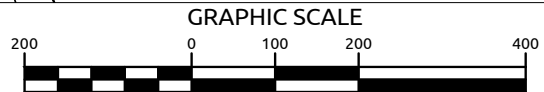


BEARING AND DISTANCE OF NORTH 52°40'17" EAST 50.25 FEET TO THE POINT AND  
PLACE OF BEGINNING CONTAINING 42,109 SQ. FT., 0.967 ACRES MORE OR LESS.

**EXHIBIT C**  
(ATTACHED HERETO)



THIS MAP IS NOT A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED  
 BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH  
 ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED  
 FOR COMPLIANCE WITH REQUIREMENTS FOR PLATS.



**SEWER OUTFALL EASEMENTS**

TOWN OF CLAYTON JOHNSTON COUNTY NORTH CAROLINA

**PROPERTY OF  
 ASHCROFT PARTNERS, LLC**



**WithersRavenel**

Engineers | Planners | Surveyors

115 MacKenan Drive | Cary, NC 27511

t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

K:\19\19-0240\190247-02.dwg WWP\CAD\Exhibits\Easement Exhibit\190247\_Easement Exhibit ALL.dwg - January 6, 2021 - MOLDER, ERIC

Excise Tax: None

Prepared by: Poyner Spruill LLP  
PO Box 1801  
Raleigh, NC 27602

After Recording Mail To: Town of Clayton

Brief Description for Index: Easements on portion of approximately 46.7 acre parcel

Parcel Identifier: 05H02012 (NC PIN: 166900-78-4101)

**STATE OF NORTH CAROLINA**

**DEED OF EASEMENT**

**COUNTY OF JOHNSTON**

THIS DEED OF EASEMENT, made and executed this \_\_\_\_\_ day of \_\_\_\_\_, 2021  
(the "Effective Date"), by and between

| GRANTOR                                                                                             | GRANTEE                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| JOHN WESLEY MASSEY,<br>and spouse, Lynn R. Massey<br>8041 St. Andrews Drive<br>Laurinburg, NC 28352 | TOWN OF CLAYTON,<br>a municipal corporation of the State of<br>North Carolina<br>111 E. Second Street, Clayton, NC 27520<br>PO Box 879, Clayton, NC 27528 |

The designation Grantor and Grantee as used herein shall include said parties, their successors, and assigns and shall include the singular, plural, masculine, feminine or neuter as required by context.

**WITNESSETH:**

WHEREAS, Grantor is the owner of that certain tract of land, consisting of approximately 46.7 acres, and which is designated as Parcel Identifier: 05H02012 by the Johnston County Revenue Department, and which was acquired by Grantor in those certain deeds recorded in Deed Book 967, Page 243, Book 1011, Page 232, and Book 1001, Page 350, Johnston County Register of Deeds (the "Registry") (collectively, the "Grantor's Lands"), and Grantor has agreed to convey

to Grantee, according to the terms set forth below, certain easements upon and through Grantor's Lands which easements are hereinafter described;

WHEREAS, Grantee is the owner of that certain tract of land, consisting of approximately 78.54 acres, and which is designated as Parcel Identifier: 05H02199W by the Johnston County Revenue Department which was acquired by Grantee in Deeds recorded at Book 4697, Page 849 and Book 714, Page 278 ("Grantee's Land"); and

WHEREAS, Grantor has agreed pursuant to the terms and conditions of this Deed of Easement to dedicate, convey and set over the Easements hereinafter described to Grantee for the benefit of Grantee's Land.

NOW THEREFORE, Grantor, in consideration of mutual covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which are acknowledged, hereby dedicates, conveys and sets over to Grantee, its successors and assigns, the following easement rights upon, over, under, across and through Grantor's Lands:

I. A perpetual, variable width access and public utility easement (the "Access and Utility Easement"), in those locations more particularly shown and described as the "PROPOSED ACCESS & PUBLIC UTILITY EASEMENT, AREA: 66,644 S.F., 1.530 ACRES," on that certain survey entitled, "EASEMENT EXHIBIT FOR TOWN OF CLAYTON, PROPERTY OF JOHN WESLEY MASSEY," as prepared by WithersRavenel, Engineers | Planners | Surveyors, said survey being attached hereto as Exhibit A, and made part hereof (the "Survey"), and described by metes and bounds on Exhibit B attached hereto and made a part hereof (said portions of Grantor's Lands being the "Access and Utility Easement Area"), for the following purposes, together with any and all uses incidental to such purposes: (a) to construct, install, operate, maintain, repair, reconstruct, replace and/or remove a gravel and/or paved access road (the "Access Road"); (b) for vehicular and pedestrian passage, access, ingress, egress and regress within, upon, over and across the Easement Area; (c) to construct, install, operate, maintain, repair, reconstruct, replace, and/or remove such overhead and/or underground facilities, fixtures, equipment, markers, water and sewer lines, fibers, wires, cables, conduits, pipes, and appurtenances (collectively, the "Facilities") as may be necessary or desirable for utility purposes, including: underground water transmission, reclamation, and distribution; underground sanitary sewer collection, reclamation, and transmission; underground stormwater collection, transmission, and mitigation; overhead and/or underground electric transmission and distribution; overhead and/or underground communications and/or data transmission; and (d) for greenway, trail, bicycle, and pedestrian use.

II. A perpetual, variable width public utility easement (the "Utility Easement"), in the location more particularly shown and described as the "PROPOSED PUBLIC UTILITY EASEMENT, AREA: 1,367 S.F., 0.031 ACRES," on that certain survey entitled, "EASEMENT EXHIBIT FOR TOWN OF CLAYTON, PROPERTY OF JOHN WESLEY MASSEY," as prepared by WithersRavenel, Engineers | Planners | Surveyors, said survey being attached hereto as Exhibit A, and made part hereof, and described by metes and bounds on Exhibit B attached hereto and made a part hereof (said portions of Grantor's Lands being the "Utility Easement Area"), for the purposes of constructing, installing, operating, maintaining, repairing,



reconstructing, replacing, and/or removing such Facilities as may be necessary or desirable for Utility Purposes, together with any and all uses incidental to such purposes.

III. A temporary, exclusive variable width slope easement (the "Slope Easement", and together with the Access and Utility Easement and the Utility Easement, the "Easements"), in the location more particularly shown and described as the "PROPOSED TEMPORARY SLOPE EASEMENT, AREA: 1,386 S.F., 0.032 ACRES," on that certain survey entitled, "EASEMENT EXHIBIT FOR TOWN OF CLAYTON, PROPERTY OF JOHN WESLEY MASSEY," as prepared by WithersRavenel, Engineers | Planners | Surveyors, said survey being attached hereto as Exhibit A, and made part hereof, and described by metes and bounds on Exhibit B attached hereto and made a part hereof (said portions of Grantor's Lands being the "Slope Easement Area", and together with the Access and Utility Easement Area and the Utility Easement Area, the "Easement Areas"), for the purposes of excavating, sloping, cutting, filling, the installation of storm water drain pipes or other drainage facilities, grading or otherwise changing the natural contours of the Slope Easement Area in order to support and accommodate the adjacent right of way, together with any and all uses incidental to such purposes. Unless otherwise provided in writing between Grantor and Grantee, this Slope Easement shall automatically expire three (3) years from the Effective Date of this Agreement.

**TO HAVE AND TO HOLD** the Easements unto Grantee and its successors and assigns in accordance with the following terms and conditions:

1. Grantee and Grantee's officers, agents, employees and contractors shall have the right to go to and from the Easement Areas at any time over that portion of the Grantor's Lands as agreed to by Grantor with materials, supplies, machinery and/or equipment, as may be necessary or convenient to accomplish such purposes aforesaid.
2. Grantee shall have the right to cut and/or clear any or all vegetation and debris from the Easement Areas which unreasonably interfere with the Grantee's ability to use the Easement Areas and to change the grade and drainage of the land in such Easement Areas as Grantee deems reasonably necessary in exercising the rights granted in this Deed of Easement.
3. Grantee shall obtain and pay for all building permits and/or other required governmental licenses or permits necessary for the use of the Easements and Facilities and shall pay for the construction of the Access Road.
4. Grantee shall construct and install the Access Road and Facilities in in a good and workmanlike manner and in accordance with all applicable laws, statutes, ordinances, regulations, and orders of all applicable governmental authority(ies).
5. Until Grantee completes construction of its water reclamation facility on Grantee's Land and gives Grantor written notice of such completion (the "Completion Date"), which is currently anticipated to be December 31, 2023, Grantor shall have no right to use the Easement Areas without Grantee's prior written consent, except that: (a) so long as Grantor's Lands are being used for their current purposes, Grantor may intermittently cross over the Easement Areas at a controlled crossing point to be established by Grantee, provided such crossing does not unreasonably interfere with Grantor's use of the

Easement Areas and Grantor expressly assumes the risk of entering the Easement Areas prior to the Completion Date and releases Grantee from any liability or claims that may arise out of such use of the Easement Areas; and (b) the Access Road will be available for secondary emergency access only for emergency vehicles to access the Grantor's Lands. Grantee may install a gate or such other mechanisms as it deems necessary to coordinate traffic flow within the Easement Areas prior to the Completion Date.

6. Prior to the Completion Date, Grantor shall not erect improvements in the Easement Areas or take any other actions that interfere with the rights granted herein or block the access rights provided herein.
7. From and after the Completion Date, Grantor shall have the following rights with respect to the Easement Areas:
  - a. Grantor may (a) construct, maintain, and use the Easement Areas for paved or unpaved drives and parking areas; and (b) plant and maintain shallow-rooted ground cover material within the Easement Areas, all subject to applicable laws and regulations and in accordance with approved plans for development of Grantor's Lands. Nothing set forth herein shall be deemed to inhibit the Grantor's ability to use or develop the Easement Areas or any other portion of the Grantor's Lands after the Completion Date, so long as such use or development does not unreasonably interfere with the use and enjoyment of the easement rights created in this Deed of Easement.
  - b. Grantor may remove or relocate the Access Road at Grantor's expense, provided any such removal or relocation continues to provide the Grantee with substantially equal access to the Easement Areas and Grantee's Land.
  - c. Grantee shall not alter, remove, replace, or otherwise reconstruct paved or unpaved drives and parking areas constructed and maintained on Grantor's Land by the Grantor or Grantor's agents, tenants, or licensees.
  - d. Grantor shall have the right to close any portion of the Easement Areas for a reasonable period of time, not to exceed ten (10) days, for the limited purpose of improving, repairing and/or maintaining the Easement Areas;
  - e. Grantor shall have the right to close any portion of the Grantor's Lands for a reasonable period of time to the extent required by law, for the limited purpose of preventing prescriptive rights from accruing to any third party as to the Grantor's Lands.
  - f. Grantor's rights under this Section 7 must be exercised in a manner that does not materially interfere with Grantee's use of the Easement Areas as permitted by this Deed of Easement.
  - g. In the event permanent roads are not constructed in the Easement Areas, Grantee will restore the Easement Areas to a substantially similar condition as existed prior to the construction of the Access Road, subject to the Grantee's rights to

continue using the Easement Areas for the purposes contemplated herein, including the presence of Facilities.

8. The Easements run with the title of Grantor's Lands for the benefit of Grantee's Land, however Grantor's Lands or Grantee's Land may be further subdivided or reconfigured, and shall be binding upon Grantor and Grantee and their respective successors and assigns.
9. The conveyance of the Easements is expressly subject to those certain easements shown on the Survey as the "90' Duke Energy Progress Easement" and the "Existing 20' Permanent Sanitary Sewer Easement", to the extent such easements overlap with the Easement Areas. To the extent of any conflict between this Deed of Easement and any other easements in favor of the Town, any conflict shall be construed in favor of the Town.
10. To the extent permitted by law, Grantee agrees to indemnify, defend, and save harmless the Grantor, its, officers, servants, assigns, representatives, attorneys and any and all other persons, parties or entities that might be in privity with the Grantor, from all liabilities, costs, claims, demands, damages, losses, causes of action and suits (including, but not limited to, attorneys' fees and other costs of defending any such claims) asserted against the Grantor arising out of Grantee's use of the Easement Areas or breach of this Deed of Easement. Grantor agrees to indemnify, defend, and save harmless the Grantee, its officers, servants, assigns, representatives, attorneys and any and all other persons, parties or entities that might be in privity with the Grantee, from all liabilities, costs, claims, demands, damages, losses, causes of action and suits (including, but not limited to, attorneys' fees and other costs of defending any such claims) asserted against the Grantee arising out of Grantor's use of the Easement Areas or breach of this Deed of Easement.
11. The Easements may not be amended or modified except by a writing executed by Grantee and Grantor, or their successors or assigns, and recorded in the Registry.
12. All notices required or permitted to be given hereunder shall be in writing and the same shall be given and be deemed to have been served, given and received (i) if delivered by hand, when delivered in person, (ii) if sent by reputable overnight courier (such as Federal Express or UPS), on the next business day following the date on which the notice was sent, or (iii) if mailed, three (3) days after placed in the United States mail, postage pre-paid, by certified mail, return receipt requested, addressed to either Grantor or Grantee at the address hereafter specified:

To Grantor:                    John Wesley Massey  
                                      Lynn R. Massey  
                                      8041 St. Andrews Drive  
                                      Laurinburg, NC 28352

To Grantee:                    Town of Clayton  
                                      PO Box 879

Clayton, NC 27520  
Attention: Town Manager

13. This Deed of Easement shall be governed by, and construed in accordance with, the laws of the State of North Carolina.

Grantor represents, warrants, and covenants that Grantor is seized of the Grantor's Lands in fee simple, Grantor has the right and authority to convey the Easements to Grantee, and Grantor will defend Grantee's title to the Easements against all lawful third party claims.

**[SIGNATURES AND NOTARY ACKNOWLEDGMENTS  
APPEAR ON FOLLOWING PAGES.]**

IN WITNESS WHEREOF, the Grantor has hereunto set his/her/its hand and seal as the day and year first above written.

GRANTOR:

\_\_\_\_\_(SEAL)  
John Wesley Massey

\_\_\_\_\_(SEAL)  
Lynn R. Massey

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he/she voluntarily signed the foregoing Deed of Easement for the purposes stated therein and in the capacity indicated: John Wesley Massey and Lynn R. Massey

Date: \_\_\_\_\_

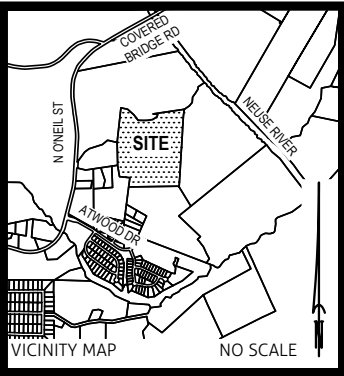
By: \_\_\_\_\_  
Print Name: \_\_\_\_\_

[SEAL OR STAMP]

Notary Public  
My Commission Expires: \_\_\_\_\_



**EXHIBIT A**  
(ATTACHED HERETO)



VICINITY MAP  
NO SCALE

LEGEND (UNLESS OTHERWISE NOTED)

IPF - IRON PIPE FOUND  
PP - UTILITY POLE  
RBF - REBAR FOUND  
R/W - RIGHT OF WAY

ADJOINER \_\_\_\_\_  
BOUNDARY SURVEYED \_\_\_\_\_  
BOUNDARY NOT SURVEYED \_\_\_\_\_  
EASEMENT \_\_\_\_\_  
FLOOD ZONE \_\_\_\_\_  
R/W \_\_\_\_\_  
OVERHEAD POWER LINE \_\_\_\_\_ OHE \_\_\_\_\_

PROPOSED EASEMENT \_\_\_\_\_  
PROPOSED SLOPE EASEMENT \_\_\_\_\_

TYPE OF PLAT

I, MATTHEW A. TIMBLIN, PROFESSIONAL LAND SURVEYOR NO. L-4844,  
CERTIFY TO ONE OR MORE OF THE FOLLOWING CHECKED BELOW:

- ☒ C. ANY OF THE FOLLOWING  
iv. THAT THE SURVEY IS OF A PROPOSED EASEMENT  
FOR A PUBLIC UTILITY AS DEFINED IN NC GENERAL  
STATUTES 62-3

DocuSigned by:  
*Matthew A. Timblin* 12/9/2020  
MATTHEW A. TIMBLIN, PROFESSIONAL LAND SURVEYOR NO. L-4844  
FCD9994196F54F9...

SURVEY NOTES:

1. AREAS COMPUTED BY COORDINATE METHOD.
2. BASIS OF BEARINGS: NC GRID (NAD 83-2011). THERE IS NO NC GRID MONUMENT WITHIN 2000'.
3. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND MAY BE SUBJECT TO ANY MATTERS THAT A FULL TITLE SEARCH WOULD DISCLOSE.
4. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES.
5. SUBJECT PROPERTY IS NOT LOCATED WITHIN A FLOOD HAZARD AREA ACCORDING TO FLOOD INSURANCE RATE MAP 3720166900K DATED JUNE 20, 2018.

GLOBAL POSITIONING SYSTEM (GPS) COORDINATES WERE USED FOR BASIS OF BEARINGS ON THIS PLAT. THE FOLLOWING INFORMATION WAS USED TO PERFORM THE GPS GNSS SURVEY:

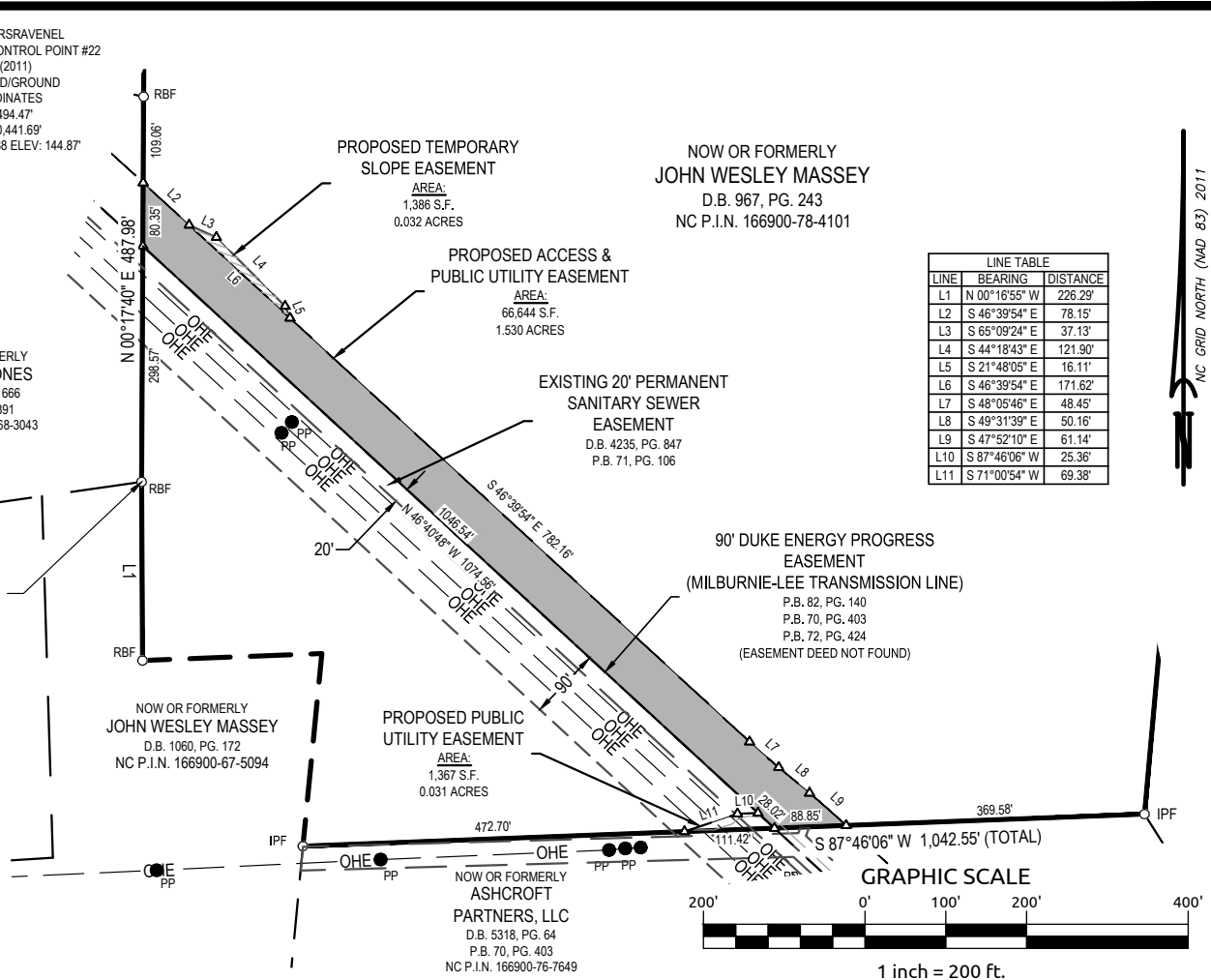
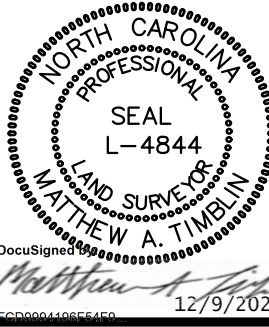
CLASS OF SURVEY: CLASS A  
POSITIONAL ACCURACY 0.02(+/-)  
TYPE OF GPS FIELD PROCEDURE: RTK, NCGS REAL-TIME NETWORK  
DATES OF SURVEY: NOVEMBER 11, 2019  
DATUM/EPOCH: NAD 83/2011  
PUBLISHED/FIXED-CONTROL USE: LOCALIZED AROUND SITE  
CONTROL - WITHERSRAVENEL CONTROL POINT #22  
GEOID MODEL: GEOID 12B  
COMBINED GRID FACTOR: 0.99989700  
UNITS: US SURVEY FEET

WITHERSRAVENEL  
GPS CONTROL POINT #22  
NAD 83(2011)  
NC GRID/GROUND  
COORDINATES  
N: 697,494.47'  
E: 2,170,441.69'  
NAVD 88 ELEV: 144.87'

NOW OR FORMERLY  
TRACY L. JONES  
D.B. 3379, PG. 666  
P.B. 70, PG. 391  
NC P.I.N. 166900-68-3043

CONTROL CORNER  
EXISTING REBAR  
NC GRID COORS  
NAD 83(2011)  
N: 697,846.51'  
E: 2,166,727.24'

THIS MAP IS NOT A CERTIFIED SURVEY  
AND HAS NOT BEEN REVIEWED BY A  
LOCAL GOVERNMENT AGENCY FOR  
COMPLIANCE WITH ANY APPLICABLE LAND  
DEVELOPMENT REGULATIONS AND HAS  
NOT BEEN REVIEWED FOR COMPLIANCE  
WITH REQUIREMENTS FOR PLATS.



| LINE TABLE |               |          |
|------------|---------------|----------|
| LINE       | BEARING       | DISTANCE |
| L1         | N 00°16'55" W | 226.29'  |
| L2         | S 46°39'54" E | 78.15'   |
| L3         | S 65°09'24" E | 37.13'   |
| L4         | S 44°18'43" E | 121.90'  |
| L5         | S 21°48'05" E | 16.11'   |
| L6         | S 46°39'54" E | 171.62'  |
| L7         | S 48°05'46" E | 48.45'   |
| L8         | S 49°31'39" E | 50.16'   |
| L9         | S 47°52'10" E | 61.14'   |
| L10        | S 87°46'06" W | 25.36'   |
| L11        | S 71°00'54" W | 69.38'   |

DATE: 12-09-2020  
SCALE: 1"=200'  
SURVEYED BY: AM  
DRAWN BY: MT  
CHECK & CLOSURE BY: MT  
CAD FILE: CLAYTON MASSEY EXHIBIT  
PROJECT NO: 02190247

EASEMENT EXHIBIT FOR  
TOWN OF CLAYTON  
PROPERTY OF  
JOHN WESLEY MASSEY

|                        |                  |           |
|------------------------|------------------|-----------|
| TOWNSHIP: CLAYTON      | COUNTY: JOHNSTON | STATE: NC |
| P.I.N.: 166900-78-4101 | SHEET: 1 of 1    |           |

**WithersRavenel**  
Engineers | Planners | Surveyors  
115 MacKenan Drive | Cary, NC 27511  
t: 919.469.3340 | license #: C-0832  
www.withersravenel.com

## **EXHIBIT B**

### **PROPOSED ACCESS & PUBLIC UTILITY EASEMENT**

BEGINNING AT A POINT ON THE WESTERN BOUNDARY OF THE JOHN WESLEY MASSEY PROPERTY, SAID POINT BEING NORTH 00°17'40" EAST 298.57 FEET (GROUND DISTANCE) FROM AN EXISTING REBAR CONTROL CORNER, SAID CORNER HAVING NC GRID COORDINATES (NAD 83 – 2011) N=697,846.51', E=2,166,727.24'; THENCE NORTH 00°17'40" EAST 80.35 FEET TO A POINT; THENCE SOUTH 46°39'54" EAST 1,031.93 FEET TO A POINT; THENCE SOUTH 48°05'46" EAST 48.45 FEET TO A POINT; THENCE SOUTH 49°31'39" EAST 50.16 FEET TO A POINT; THENCE SOUTH 47°52'10" EAST 61.14 FEET TO A POINT; THENCE SOUTH 87°46'06" WEST 88.85 FEET TO A POINT; THENCE NORTH 46°40'48" WEST 1,074.56 FEET TO THE POINT AND PLACE OF BEGINNING CONTAINING 66,644 SQ. FT., 1.530 ACRES MORE OR LESS.

### **PROPOSED TEMPORARY SLOPE EASEMENT**

BEGINNING AT A POINT, SAID POINT BEING NORTH 00°17'40" EAST 378.92 FEET (GROUND DISTANCE), THENCE SOUTH 46°39'54" EAST 78.15 FEET FROM AN EXISTING REBAR CONTROL CORNER, SAID CORNER HAVING NC GRID COORDINATES (NAD 83 – 2011) N=697,846.51', E=2,166,727.24'; THENCE SOUTH 65°09'24" EAST 37.13 FEET TO A POINT; THENCE SOUTH 44°18'43" EAST 121.90 FEET TO A POINT; THENCE SOUTH 21°48'05" EAST 16.11 FEET TO A POINT; THENCE NORTH 46°39'54" WEST 171.62 FEET TO THE POINT AND PLACE OF BEGINNING CONTAINING 1,386 SQ. FT., 0.032 ACRES MORE OR LESS.

### **PROPOSED PUBLIC UTILITY EASEMENT**

BEGINNING AT A POINT, SAID POINT BEING NORTH 00°17'40" EAST 298.57 FEET (GROUND DISTANCE), THENCE SOUTH 46°40'48" EAST 1,046.54 FEET FROM AN EXISTING REBAR CONTROL CORNER, SAID CORNER HAVING NC GRID COORDINATES (NAD 83 – 2011) N=697,846.51', E=2,166,727.24'; THENCE SOUTH 46°40'48" EAST 28.02 FEET TO A POINT; THENCE SOUTH 87°46'06" WEST 111.42 FEET TO A POINT; THENCE NORTH 71°00'54" EAST 69.38 FEET TO A POINT; THENCE NORTH 87°46'06" EAST 25.36 FEET TO THE POINT AND PLACE OF BEGINNING CONTAINING 1,367 SQ. FT., 0.031 ACRES MORE OR LESS.

Excise Tax: None

Prepared by: Poyner Spruill LLP  
PO Box 1801  
Raleigh, NC 27602

After Recording Mail To: Town of Clayton

Brief Description for Index: Access and Public Utility Easement on portion of approximately 80.93 acre parcel

Parcel Identifier: 05H02010A (NC PIN: 166900-79-1467)

---

**STATE OF NORTH CAROLINA                      DEED OF EASEMENT**  
**COUNTY OF JOHNSTON**

THIS DEED OF EASEMENT, made and executed this \_\_\_\_\_ day of \_\_\_\_\_, 2021,  
by and between

| GRANTOR                                                                                                                                                                                                                                                                                                                                                                                      | GRANTEE                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| JAMES DANIEL SMITH, <b>single [CONFIRM MARITAL STATUS]</b> (a 3/8 undivided interest);<br>STEPHEN RAY SMITH, <b>[CONFIRM MARITAL STATUS]</b> (a 1/8 undivided interest); and<br>JAMES DANIEL SMITH and DANIEL G. SMITH, successor co-Trustees of the JEAN K. SMITH REVOCABLE TRUST dated April 6, 1998 (a 1/2 undivided interest)<br>1814 North O'Neil Street Extension<br>Clayton, NC 27520 | TOWN OF CLAYTON,<br>a municipal corporation of the State of North Carolina<br>111 E. Second Street, Clayton, NC 27520<br>PO Box 879, Clayton, NC 27528 |

The designation Grantor and Grantee as used herein shall include said parties, their successors, and assigns and shall include the singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH:

PPAB 5806998v4.docx

WHEREAS, Grantor is the owner of that certain tract of land, consisting of approximately 80.93 acres, and which is designated as Parcel Identifier: 05H02010A by the Johnston County Revenue Department, and which is more particularly described in that certain deed recorded in Deed Book 5393, Page 122, Johnston County Register of Deeds (the "Registry") (collectively, the "Grantor's Lands"), and Grantor has agreed to convey to Grantee, according to the terms set forth below, an easement upon and through Grantor's Lands which easement is hereinafter described;

WHEREAS, Grantee is the owner of that certain tract of land, consisting of approximately 78.54 acres, and which is designated as Parcel Identifier: 05H02199W by the Johnston County Revenue Department which was acquired by Grantee in Deeds recorded at Book 4697, Page 849 and Book 714, Page 278 ("Grantee's Land"); and

WHEREAS, Grantor has agreed pursuant to the terms and conditions of this Deed of Easement to dedicate, convey and set over the Easement hereinafter described to Grantee for the benefit of Grantee's Land.

NOW THEREFORE, Grantor, in consideration of mutual covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which are acknowledged, hereby dedicates, conveys and sets over to Grantee, its successors and assigns, the following easement rights upon, over, under, across and through Grantor's Lands:

A perpetual, variable width access and public utility easement (the "Easement"), in those locations more particularly shown and described as the "PROPOSED ACCESS & PUBLIC UTILITY EASEMENT, AREA: 64,687 S.F., 1.485 ACRES," on that certain survey entitled, "EASEMENT EXHIBIT FOR TOWN OF CLAYTON, PROPERTY OF STEPHEN RAY SMITH," as prepared by WithersRavenel, Engineers | Planners | Surveyors, said survey being attached hereto as Exhibit A, and made part hereof (the "Survey"), and described by metes and bounds on Exhibit B attached hereto and made a part hereof (said portions of Grantor's Lands being the "Easement Area"), for the following purposes, together with any and all uses incidental to such purposes: (a) to construct, install, operate, maintain, repair, reconstruct, replace and/or remove a gravel and/or paved access road (the "Access Road"); (b) for vehicular and pedestrian passage, access, ingress, egress and regress within, upon, over and across the Easement Area; (c) to construct, install, operate, maintain, repair, reconstruct, replace, and/or remove such overhead and/or underground facilities, fixtures, equipment, markers, water and sewer lines, fibers, wires, cables, conduits, pipes, and appurtenances (collectively, the "Facilities") as may be necessary or desirable for utility purposes, including: underground water transmission, reclamation, and distribution; underground sanitary sewer collection, reclamation, and transmission; underground stormwater collection, transmission, and mitigation; overhead and/or underground electric transmission and distribution; overhead and/or underground communications and/or data transmission; (d) for greenway, trail, bicycle, and pedestrian use; and (e) to cut and/or clear any or all vegetation and debris from the Easement Area which unreasonably interfere with the Grantee's ability to use the Easement Area and to change the grade and drainage of the land in such Easement Area as Grantee deems reasonably necessary in exercising the rights granted in this Deed of Easement.



**TO HAVE AND TO HOLD** the Easement unto Grantee and its successors and assigns in accordance with the following terms and conditions:

1. Grantee and Grantee's officers, agents, employees and contractors shall have the right to go to and from the Easement Area at any time, with materials, supplies, machinery and/or equipment, as may be necessary or convenient to accomplish such purposes aforesaid.
2. Grantee shall obtain and pay for all building permits and/or other required governmental licenses or permits necessary for the use of the Easement and Facilities and shall pay for the construction of the Access Road.
3. Grantee shall construct and install the Access Road and Facilities in in a good and workmanlike manner and in accordance with all applicable laws, statutes, ordinances, regulations, and orders of all applicable governmental authority(ies).
4. Until Grantee completes construction of its water reclamation facility on Grantee's Land and gives Grantor written notice of such completion (the "Completion Date"), which is currently anticipated to be December 31, 2023, Grantor shall have no right to use the Easement Area without Grantee's prior written consent, except that: (a) so long as Grantor's Lands are being used for their current purposes, Grantor may intermittently cross over the Easement Area at a controlled crossing point to be established by Grantee, provided such crossing does not unreasonably interfere with Grantor's use of the Easement Area and Grantor expressly assumes the risk of entering the Easement Area prior to the Completion Date and releases Grantee from any liability or claims that may arise out of such use of the Easement Area; and (b) the Access Road will be available for secondary emergency access only for emergency vehicles to access the Grantor's Lands. Grantee may install a gate or such other mechanisms as it deems necessary to coordinate traffic flow within the Easement Area prior to the Completion Date.
5. Prior to the Completion Date, Grantor shall not erect improvements in the Easement Area or take any other actions that interfere with the rights granted herein or block the access rights provided herein.
6. From and after the Completion Date, Grantor shall have the following rights with respect to the Easement Area:
  - a. Grantor may (a) construct, maintain, and use the Easement Area for paved or unpaved drives and parking areas; and (b) plant and maintain shallow-rooted ground cover material within the Easement Area, all subject to applicable laws and regulations and in accordance with approved plans for development of Grantor's Lands. Nothing set forth herein shall be deemed to inhibit the Grantor's ability to use or develop the Easement Area or any other portion of the Grantor's Lands after the Completion Date, so long as such use or development does not unreasonably interfere with the use and enjoyment of the easement rights created in this Deed of Easement.

- b. Grantor may remove or relocate the Access Road at Grantor's expense, provided any such removal or relocation continues to provide the Grantee with substantially equal access to the Easement Area and Grantee's Land.
  - c. Grantee shall not alter, remove, replace, or otherwise reconstruct paved or unpaved drives and parking areas constructed and maintained on Grantor's Land by the Grantor or Grantor's agents, tenants, or licensees.
  - d. Grantor shall have the right to close any portion of the Easement Area for a reasonable period of time, not to exceed ten (10) days, for the limited purpose of improving, repairing and/or maintaining the Easement Area;
  - e. Grantor shall have the right to close any portion of the Grantor's Lands for a reasonable period of time to the extent required by law, for the limited purpose of preventing prescriptive rights from accruing to any third party as to the Grantor's Lands.
  - f. Grantor's rights under this Section 6 must be exercised in a manner that does not materially interfere with Grantee's use of the Easement Area as permitted by this Deed of Easement.
  - g. In the event permanent roads are not constructed in the Easement Area, Grantee will restore the Easement Area to a substantially similar condition as existed prior to the construction of the Access Road, subject to the Grantee's rights to continue using the Easement Area for the purposes contemplated herein, including the presence of Facilities.
7. The Easement runs with the title of Grantor's Lands for the benefit of Grantee's Land, however Grantor's Lands or Grantee's Land may be further subdivided or reconfigured, and shall be binding upon Grantor and Grantee and their respective successors and assigns.
8. The conveyance of the Easement is expressly subject to those certain easements shown on the Survey as the "90' Duke Energy Progress Easement" and the "Existing 20' Permanent Sanitary Sewer Easement", to the extent such easements overlap with the Easement Area. To the extent of any conflict between this Deed of Easement and any other easements in favor of the Town, any conflict shall be construed in favor of the Town.
9. To the extent permitted by law, Grantee agrees to indemnify, defend, and save harmless the Grantor, its, officers, servants, assigns, representatives, attorneys and any and all other persons, parties or entities that might be in privity with the Grantor, from all liabilities, costs, claims, demands, damages, losses, causes of action and suits (including, but not limited to, attorneys' fees and other costs of defending any such claims) asserted against the Grantor arising out of Grantee's use of the Easement Area or breach of this Deed of Easement. Grantor agrees to indemnify, defend, and save harmless the Grantee, its officers, servants, assigns, representatives, attorneys and any and all other persons, parties or entities that might be in privity with the Grantee, from all liabilities, costs,

claims, demands, damages, losses, causes of action and suits (including, but not limited to, attorneys' fees and other costs of defending any such claims) asserted against the Grantee arising out of Grantor's use of the Easement Area or breach of this Deed of Easement.

10. The Easement may not be amended or modified except by a writing executed by Grantee and Grantor, or their successors or assigns, and recorded in the Registry.
11. All notices required or permitted to be given hereunder shall be in writing and the same shall be given and be deemed to have been served, given and received (i) if delivered by hand, when delivered in person, (ii) if sent by reputable overnight courier (such as Federal Express or UPS), on the next business day following the date on which the notice was sent, or (iii) if mailed, three (3) days after placed in the United States mail, postage pre-paid, by certified mail, return receipt requested, addressed to either Grantor or Grantee at the address hereafter specified:

To Grantor:                Stephen Ray Smith  
                                 James Daniel Smith  
                                 Jean K. Smith Trust  
                                 1814 North O'Neil St. Ext.  
                                 Clayton, NC 27520

To Grantee:                Town of Clayton  
                                 PO Box 879  
                                 Clayton, NC 27520  
                                 Attention: Town Manager

12. This Deed of Easement shall be governed by, and construed in accordance with, the laws of the State of North Carolina.

Grantor represents, warrants, and covenants that Grantor is seized of the Grantor's Lands in fee simple, Grantor has the right and authority to convey the Easement to Grantee, and Grantor will defend Grantee's title to the Easement against all lawful third party claims.

**[SIGNATURES AND NOTARY ACKNOWLEDGMENTS  
APPEAR ON FOLLOWING PAGES.]**

IN WITNESS WHEREOF, the Grantor has hereunto set his/her/its hand and seal as the day and year first above written.

GRANTOR:

\_\_\_\_\_(SEAL)  
James Daniel Smith

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

I certify that the following person personally appeared before me this day, acknowledging to me that he voluntarily signed the foregoing Deed of Easement for the purpose stated therein and in the capacity indicated: James Daniel Smith.

Date: \_\_\_\_\_

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Notary Public

My Commission Expires: \_\_\_\_\_

[SEAL OR STAMP]

IN WITNESS WHEREOF, the Grantor has hereunto set his/her/its hand and seal as the day and year first above written.

GRANTOR:

\_\_\_\_\_(SEAL)  
Stephen Ray Smith

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

I certify that the following person personally appeared before me this day, acknowledging to me that he voluntarily signed the foregoing Deed of Easement for the purpose stated therein and in the capacity indicated: Stephen Ray Smith.

Date: \_\_\_\_\_

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Notary Public

My Commission Expires: \_\_\_\_\_

[SEAL OR STAMP]



IN WITNESS WHEREOF, the Grantor has hereunto set his/her/its hand and seal as the day and year first above written.

GRANTOR:

JEAN K. SMITH REVOCABLE TRUST  
dated April 6, 1998

By: \_\_\_\_\_ (SEAL)  
JAMES DANIEL SMITH,  
successor co-Trustee

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

I certify that the following person personally appeared before me this day, acknowledging to me that he signed the foregoing Deed of Easement under seal: James Daniel Smith, successor co-Trustee of the JEAN K. SMITH REVOCABLE TRUST dated April 6, 1998.

Date: \_\_\_\_\_

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Notary Public

My Commission Expires: \_\_\_\_\_

[SEAL OR STAMP]

IN WITNESS WHEREOF, the Grantor has hereunto set his/her/its hand and seal as the day and year first above written.

GRANTOR:

JEAN K. SMITH REVOCABLE TRUST  
dated April 6, 1998

By: \_\_\_\_\_ (SEAL)  
DANIEL G. SMITH,  
successor co-Trustee

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

I certify that the following person personally appeared before me this day, acknowledging to me that he signed the foregoing Deed of Easement under seal: Daniel G. Smith, successor co-Trustee of the JEAN K. SMITH REVOCABLE TRUST dated April 6, 1998.

Date: \_\_\_\_\_

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

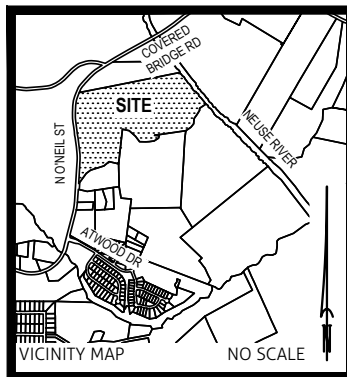
Notary Public

My Commission Expires: \_\_\_\_\_

[SEAL OR STAMP]

**EXHIBIT A**

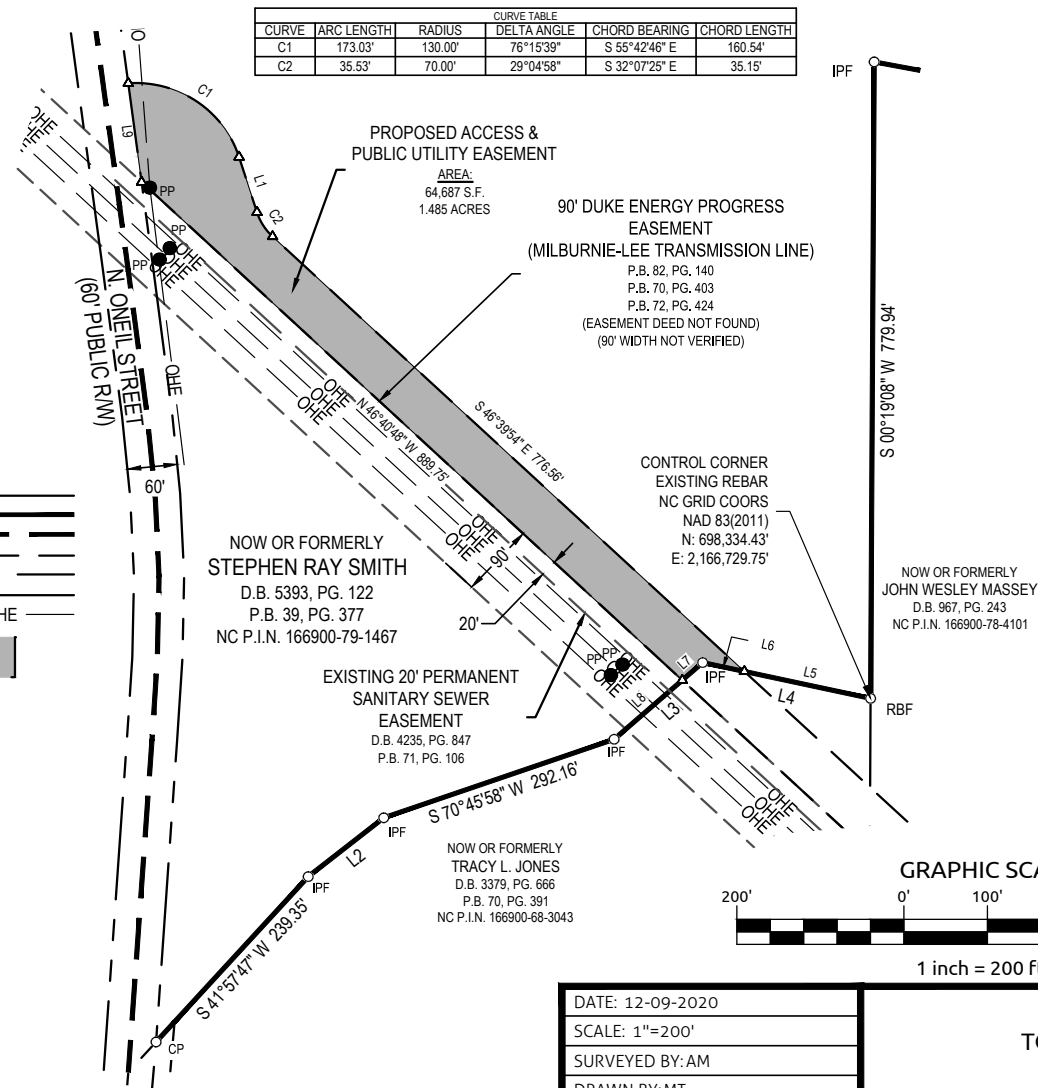
(ATTACHED HERETO)



LEGEND (UNLESS OTHERWISE NOTED)

ADJOINER \_\_\_\_\_  
BOUNDARY SURVEYED \_\_\_\_\_  
BOUNDARY NOT SURVEYED \_\_\_\_\_  
EASEMENT \_\_\_\_\_  
FLOOD ZONE \_\_\_\_\_  
R/W \_\_\_\_\_  
OVERHEAD POWER LINE \_\_\_\_\_ OHE \_\_\_\_\_  
PROPOSED EASEMENT \_\_\_\_\_

| LINE TABLE |               |          |
|------------|---------------|----------|
| LINE       | BEARING       | DISTANCE |
| L1         | S 17°34'56" E | 70.98'   |
| L2         | S 51°25'49" W | 115.59'  |
| L3         | S 48°25'36" W | 141.63'  |
| L4         | N 77°40'44" W | 205.80'  |
| L5         | N 77°40'44" W | 154.70'  |
| L6         | N 77°40'44" W | 51.10'   |
| L7         | S 48°25'36" W | 32.61'   |
| L8         | S 48°25'36" W | 109.02'  |
| L9         | N 07°30'46" W | 122.14'  |



- SURVEY NOTES:**

GLOBAL POSITIONING SYSTEM (GPS) COORDINATES WERE USED FOR BASIS OF BEARINGS ON THIS PLAT. THE FOLLOWING INFORMATION WAS USED TO PERFORM THE GPS GNSS SURVEY:

CLASS OF SURVEY: CLASS A  
POSITIONAL ACCURACY 0.02(+/-)  
TYPE OF GPS FIELD PROCEDURE: RTK, NCGS REAL-TIME NETWORK  
DATES OF SURVEY: NOVEMBER 11, 2019  
DATUM/EPOCH: NAD 83/2011  
PUBLISHED/FIXED-CONTROL USE: LOCALIZED AROUND SITE  
CONTROL - WITHERSRAVENEL CONTROL POINT #22  
GEOID MODEL: GEOID 12B  
COMBINED GRID FACTOR: 0.99989700  
UNITS: US SURVEY FEET

WITHERSRAVENEL  
GPS CONTROL POINT #22  
NAD 83(2011)  
NC GRID/GROUND  
COORDINATES  
N: 697,494.47'  
E: 2,170,441.69'  
NAVD 88 ELEV: 144.87'

TYPE OF PLAT

- ☒ C. ANY OF THE FOLLOWING
- iv. THAT THE SURVEY IS OF A PROPOSED EASEMENT  
FOR A PUBLIC UTILITY AS DEFINED IN NC GENERAL  
STATUTES 62-3

DocuSigned by:

*Matthew A. Timblin* 12/9/2020  
MATTHEW A. TIMBLIN, PROFESSIONAL LAND SURVEYOR NO. L-4844  
FCD9994196F54F9...

THIS MAP IS NOT A CERTIFIED  
SURVEY AND HAS NOT BEEN  
REVIEWED BY A LOCAL GOVERNMENT  
AGENCY FOR COMPLIANCE WITH ANY  
APPLICABLE LAND DEVELOPMENT  
REGULATIONS AND HAS NOT BEEN  
REVIEWED FOR COMPLIANCE WITH  
REQUIREMENTS FOR PLATS.

DocuSigned by:

FCD9994196F54F9... 12/9/2020



|                                 |                                                                                           |                  |               |
|---------------------------------|-------------------------------------------------------------------------------------------|------------------|---------------|
| DATE: 12-09-2020                | EASEMENT EXHIBIT FOR<br><b>TOWN OF CLAYTON</b><br>PROPERTY OF<br><b>STEPHEN RAY SMITH</b> |                  |               |
| SCALE: 1"=200'                  |                                                                                           |                  |               |
| SURVEYED BY: AM                 |                                                                                           |                  |               |
| DRAWN BY: MT                    |                                                                                           |                  |               |
| CHECK & CLOSURE BY: MT          |                                                                                           |                  |               |
| CAD FILE: CLAYTON SMITH EXHIBIT | TOWNSHIP: CLAYTON                                                                         | COUNTY: JOHNSTON | STATE: NC     |
| PROJECT NO:02190247             | P.I.N.: 166900-79-1467                                                                    |                  | SHEET: 1 of 1 |



**WithersRavenel**  
Engineers | Planners | Surveyors

115 MacKenan Drive | Cary, NC 27511  
t: 919.469.3340 | license #: C-0832  
www.withersravenel.com

**EXHIBIT B**

PROPOSED ACCESS & PUBLIC UTILITY EASEMENT

BEGINNING AT A POINT ON THE SOUTHEASTERN BOUNDARY OF THE STEPHEN RAY SMITH PROPERTY, SAID POINT BEING NORTH 77°40'44" WEST 154.70 FEET (GROUND DISTANCE) FROM AN EXISTING REBAR CONTROL CORNER, SAID CORNER HAVING NC GRID COORDINATES (NAD 83 – 2011) N=698,334.43', E=2,166,729.75'; THENCE NORTH 77°40'44" WEST 51.10 FEET TO AN EXISTING IRON PIPE; THENCE SOUTH 48°25'36" WEST 32.61 FEET TO A POINT; THENCE NORTH 46°40'48" WEST 889.75 FEET TO A POINT ON THE EASTERN RIGHT OF WAY OF ONEIL STREET; THENCE ALONG THE RIGHT OF WAY NORTH 07°30'46" WEST 122.14 FEET TO A POINT; THENCE LEAVING SAID RIGHT OF WAY ALONG A CURVE TO THE RIGHT HAVING A RADIUS OF 130.00 FEET, AN ARC LENGTH OF 173.03 FEET, AND A CHORD BEARING AND DISTANCE OF SOUTH 55°42'46" EAST 160.54 FEET TO A POINT; THENCE SOUTH 17°34'56" EAST 70.98 FEET TO A POINT; THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 70.00 FEET, AN ARC LENGTH OF 35.53 FEET, AND A CHORD BEARING AND DISTANCE OF SOUTH 32°07'25" EAST 35.15 FEET TO A POINT; THENCE SOUTH 46°39'54" EAST 776.56 FEET TO THE POINT AND PLACE OF BEGINNING CONTAINING 64,687 SQ. FT., 1.485 ACRES MORE OR LESS.



AN ORDINANCE TO ADOPT THE DEVELOPMENT AGREEMENT BETWEEN THE TOWN OF CLAYTON AND **ASHCROFT PARTNERS, LLC , JOHN W. MASSEY, NANCY CREWS EARP, Successor Trustee, RAYMOND ELMORE EARP, JR. REVOCABLE TRUST , JAMES DANIEL SMITH, STEPHEN R. SMITH AND JEAN K. SMITH TRUST**

**WHEREAS**, Article 10 of Chapter 160D of the North Carolina General Statutes, authorizes municipalities to enter into development agreements with developers under the terms and conditions stated in the statutes, and

**WHEREAS**, the Town of Clayton ("Town") and Ashcroft Partners, LLC ("Developer") and John W. Massey, Nancy Crews Earp, Successor Trustee, Raymond Elmore Earp, Jr. Revocable Trust, James Daniel Smith, Stephen R. Smith and Jean K. Smith Trust ("Existing Owners") have negotiated an agreement in accord with and under the authority of the cited statutes, and

**WHEREAS**, a public hearing was held on \_\_\_\_\_, \_\_\_, 2021 as set forth in N.C.G.S. §160D-1005 providing public review of the Development Agreement, as defined below; and

**WHEREAS**, the Town finds that the Development Agreement is consistent with State law, the Town Comprehensive Plan, and the Current Regulations, as defined in the Development Agreement:

**NOW, THEREFORE, BE IT ORDAINED**, by the Clayton Town Council that:

1. Pursuant to the authority granted to the Town by Article 11 of Chapter 160D of the North Carolina General Statutes, the Town hereby adopts the Development Agreement by and between Town, Developer and Existing Owners, dated \_\_\_\_\_, \_\_\_, 2021 and attached hereto (the "Development Agreement"), and authorizes the Mayor to execute the document.
2. This ordinance is effective upon adoption.

Adopted this \_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Mayor Jody McLeod  
Town of Clayton

ATTEST:

\_\_\_\_\_  
Kimberly Moffett  
Clayton Town Clerk

**AN ORDINANCE TO ADOPT THE DEVELOPMENT AGREEMENT BETWEEN THE TOWN OF CLAYTON AND ASHCROFT PARTNERS, LLC, JOHN W. MASSEY, NANCY CREWS EARP, Successor Trustee, RAYMOND ELMORE EARP, JR. REVOCABLE TRUST, JAMES DANIEL SMITH, STEPHEN R. SMITH AND JEAN K. SMITH TRUST**

**WHEREAS**, Article 10 of Chapter 160D of the North Carolina General Statutes, authorizes municipalities to enter into development agreements with developers under the terms and conditions stated in the statutes, and

**WHEREAS**, the Town of Clayton ("Town") and Ashcroft Partners, LLC ("Developer") and John W. Massey, Nancy Crews Earp, Successor Trustee, Raymond Elmore Earp, Jr. Revocable Trust, James Daniel Smith, Stephen R. Smith and Jean K. Smith Trust ("Existing Owners") have negotiated an agreement in accord with and under the authority of the cited statutes, and

**WHEREAS**, a public hearing was held on \_\_\_\_\_, \_\_, 2021 as set forth in N.C.G.S. §160D-1005 providing public review of the Development Agreement, as defined below; And

**WHEREAS**, the Town finds that the Development Agreement is consistent with State law, the Town Comprehensive Plan, and the Current Regulations, as defined in the Development Agreement:

**NOW, THEREFORE, BE IT ORDAINED**, by the Clayton Town Council that:

1. Pursuant to the authority granted to the Town by Article 11 of Chapter 160D of the North Carolina General Statutes, the Town hereby adopts the Development Agreement by and between Town, Developer and Existing Owners, dated \_\_\_\_\_, \_\_, 2021 and attached hereto (the "Development Agreement"), and authorizes the Mayor to execute the document.
2. This ordinance is effective upon adoption.

Duly adopted this the 1<sup>st</sup> day of March, 2021 while in regular session.

\_\_\_\_\_  
Jody McLeod  
Mayor  
Town of Clayton

ATTEST:

\_\_\_\_\_  
Kimberly A. Moffett, CMC, NCCMC  
Town Clerk  
Town of Clayton

**TOWN OF CLAYTON  
RESOLUTION GRANTING WASTEWATER TREATMENT CAPACITY  
FOR ASHCROFT 2**

**WHEREAS**, the Town of Clayton operates a wastewater treatment plant known and permitted as the "Little Creek Water Reclamation Facility"; and,

**WHEREAS**, said facility is permitted to treat a maximum average of 2.5 million gallons daily; and,

**WHEREAS**, the Town of Clayton holds several interlocal agreements which secure additional wastewater treatment capacity from other available sources; and,

**WHEREAS**, the North Carolina Department of Environment and Natural Resources (NCDENR) regulates, reviews, and permits flow tributary to newly extended or installed wastewater treatment collection facilities tributary to the Town of Clayton system; and,

**WHEREAS**, flow from sanitary sewer customers tributary to existing lines owned and operated as part of the Town of Clayton is bound to abide by the permitted average daily flow at the Little Creek Water Reclamation Facility in conjunction with other available sources and consistent with interlocal agreements regarding wastewater treatment.

**NOW, THEREFORE, BE IT HEREBY RESOLVED BY THE TOWN COUNCIL FOR THE TOWN OF CLAYTON** that the following is found:

1. The Town of Clayton has, according to the most recent accounting, sufficient excess and unallocated treatment capacity to approve additional allocation.
2. Such available capacity may be made available to users in accordance with regulatory and legal parameters established to ensure satisfactory treatment plant operation.
3. An allocation for wastewater treatment capacity is granted for a total amount of 252,970 GPD to Ashcroft 2. Allocation will be allotted during phasing as shown below and outlined in Developers Agreement; **herewith attached**.





## Town Council Agenda Cover Sheet

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**Meeting Date**

March 1, 2021

**Agenda Location**

Public Hearings

**Item Title**

2020-142-ANX Buckhorn Branch Annexation

**Presenter**

Planning Department

**Summary/Description**

Request to annex three parcels that total 83.437 acres of land. The parcels are currently located in the Town's ETJ and are zoned Planned Development Residential (PD-R).

**Requested Action**

Place on Consent Agenda

**Funding Source (If Applicable):**

N/A

**Cost:** N/A    Yes ☐    No ☒

**Additional Documents to be Included in Agenda Packet**

Application  
Aerial Map  
Town Limits Map  
Legal Description  
Survey  
Resolution

**Meeting Timeline**

2/1 – Town Council (Adoption of Resolution directing clerk to certify sufficiency of petition)  
2/15 – Town Council (Certification of sufficiency by clerk and resolution to set public hearing date)  
3/1 – Town Council (Public Hearing/Decision)





**TOWN OF CLAYTON**  
Planning Department  
111 E. Second St., P.O. Box 879  
Clayton, NC 27528  
Phone: 919-553-5002  
Fax: 919-553-1720

## PETITION FOR VOLUNTARY ANNEXATION

**VOLUNTARY ANNEXATION:** Upon receipt of a valid petition signed by all of the owners of real property in the area described therein, the Town may annex an area either contiguous or not contiguous to its primary corporate limits when the area meets the standards set out under North Carolina General Statutes 160A-31 and 160A-58.1.

Applications are due by 5pm on the first working day of each month.

### REQUEST INFORMATION

☒ **Contiguous Annexation**

☐ **Non-Contiguous Annexation**

The following items must accompany an annexation petition:

| To be completed by the applicant:                                                                                              | Included?                           |                          |
|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|
|                                                                                                                                | Yes                                 | No                       |
| 1. Petition for Annexation with original signatures                                                                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. A boundary plat of the area to be annexed meeting requirements of the Plat Checklist (included in this application packet). | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Legal Description (metes and bounds)                                                                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### PROCESS:

**Review by Staff:** The Planning, Engineering and Public Works Departments review the annexation submission. Comments will be sent to the applicant.

**Annexation Plat Submission:** After the map and legal description are deemed sufficient by the Town, the applicant is required to submit two (2) Mylar annexation plats to the Planning Department.

**Town Council Meeting:** The Town Council will pass a resolution directing the Town Clerk to investigate the annexation petition. The Town Clerk will present to the Town Council a Certificate of Sufficiency indicating that the annexation petition is complete. A resolution setting the date of the public hearing is then approved.

**Legal Advertisement:** A legal advertisement will be published no more than 25 days and no less than 10 days prior to the date of the public hearing.

**Public Hearing/Town Council Meeting:** The Town Council will either adopt or deny an ordinance to extend the corporate limits of the Town of Clayton.

**Recordation:** If the annexation is approved by the Town Council, the Annexation Plats shall be recorded at the appropriate county Register of Deeds.

**PETITION FOR VOLUNTARY ANNEXATION APPLICATION – PROPERTY INFORMATION  
COMPLETE IF A LIMITED LIABILITY COMPANY:**

Submittal Date: \_\_\_\_\_

Petition No.: \_\_\_\_\_

**To the Town Council of the Town of Clayton, North Carolina:**

1. I/We the undersigned owner(s)\* of real property respectfully request that the area described in Paragraph 2 below be annexed to the Town of Clayton, North Carolina.

\*If the owner of real property is a corporation or religious entity, attach a copy of the articles of incorporation describing who is/are authorized to sign with the petition.

2. The area to be annexed is X contiguous, \_\_\_\_\_ non-contiguous to the Town of Clayton, North Carolina and the boundaries of such territory are as provided in the boundary plat attached hereto.
3. If contiguous, this annexation will include all intervening rights-of-way for streets, railroads, and other areas as stated in G.S. 160A-31(f), unless otherwise stated in the annexation amendment.
4. Attached is a statement of the schedule for full development of the property to be annexed, which includes the type, number, and estimated value of planned improvements, if applicable.

|                                      |                                     |                                    |
|--------------------------------------|-------------------------------------|------------------------------------|
| Total acreage to be annexed:         | <u>83.443</u>                       |                                    |
| Existing housing units:              | <u>2</u>                            |                                    |
| Population of acreage to be annexed: | <u>0</u>                            |                                    |
| Existing Zoning District*:           | <u>PUD</u>                          |                                    |
| Proposed Town Zoning District*:      | <u>PD-R</u>                         | Fire District: <u>Claytex CTD3</u> |
| Reason for petitioner to annex:      | <u>X</u> Receive Town Services      |                                    |
|                                      | _____ Other (please specify): _____ |                                    |

5. I/We acknowledge that any zoning vested rights acquired pursuant to G.S. 160A-385.1 or G.S. 153A-344.1 must be declared and identified on this petition. I/We further acknowledge that failure to declare such rights on this petition shall result in a termination of vested rights previously acquired for the property. (If zoning vested rights are claimed, indicate below and attach proof.)

In witness whereof, Buckhorn Branch Park Developers, LLC, a limited liability company, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this 5th day of JANUARY, 2021.

Name of Limited Liability Company:

Buckhorn Branch Park Developers, LLC

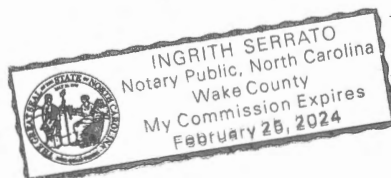
By:

[Signature]  
Signature of Member/Manager

**STATE OF NORTH CAROLINA  
COUNTY OF JOHNSTON**

Sworn and subscribed before me, Ingrith Serrato, a Notary Public for the above State and County, this 5th day of January, 2021.

SEAL



[Signature]  
Notary Public

My Commission Expires: 02/25/2024

## Voluntary Annexation Plat Checklist

| #   | Required Plat Items                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | Fully dimensioned by metes and bounds, and the location of intersecting boundary lines of the existing town limits, labeled and distinctly marked. Include full right-of-way if the area on both sides is or will be in the corporate limits.                                                                                                                                                                                                                                       |
| 2.  | Any utility easements with metes and bounds.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3.  | Accurate locations and descriptions of all monuments, markers and control points.                                                                                                                                                                                                                                                                                                                                                                                                   |
| 4.  | Ultimate right-of-way widths on all streets.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5.  | Entitle "ANNEXATION MAP FOR THE TOWN OF CLAYTON" OR "SATELLITE ANNEXATION MAP FOR THE TOWN OF CLAYTON," as appropriate.                                                                                                                                                                                                                                                                                                                                                             |
| 6.  | Name of property owner(s).                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7.  | Name, seal, and registration of Professionally Licensed Surveyor (PLS).                                                                                                                                                                                                                                                                                                                                                                                                             |
| 8.  | Date of the survey and map preparation; a north arrow indicating whether the index is true magnetic North Carolina grid (NAD 83 or NAD 27) or deed; graphic scale; and declination.                                                                                                                                                                                                                                                                                                 |
| 9.  | Names of the township, county, and state.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 10. | A detailed vicinity map.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 11. | Include address of property if assigned.                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 12. | Show all contiguous or non-contiguous town limits.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 13. | <p>The following certification must be placed on the map near a border to allow the map to be sealed:</p> <p>Annexation # _____</p> <p>I, Samantha Wullenwaber, MPA, Planning Director, Clayton, North Carolina certify this is a true and exact map of annexation adopted the _____ day of _____, _____, by the Town Council. I set my hand and seal to the Town of Clayton, _____.</p> <p>Day/Month/Year</p> <p style="text-align: right;">_____<br/>Samantha Wullenwaber MPA</p> |
| 14. | Leave 2 inch by 2 inch space for the county Register of Deeds stamp on the plat. All final plats must be stamped and signed before they can be accepted by the Town.                                                                                                                                                                                                                                                                                                                |





### Annexation Map

Applicant(s): Jones & Cnossen Engineering, PLLC  
 Property Owner(s): Buckhorn Branch Park Developers, LLC  
 Parcel Number(s): 166800-64-8874, 166811-55-8386, and 166800-54-8289  
 File Number(s): 2020-142-ANX



0 180 360 720  
 Feet

**Legend**

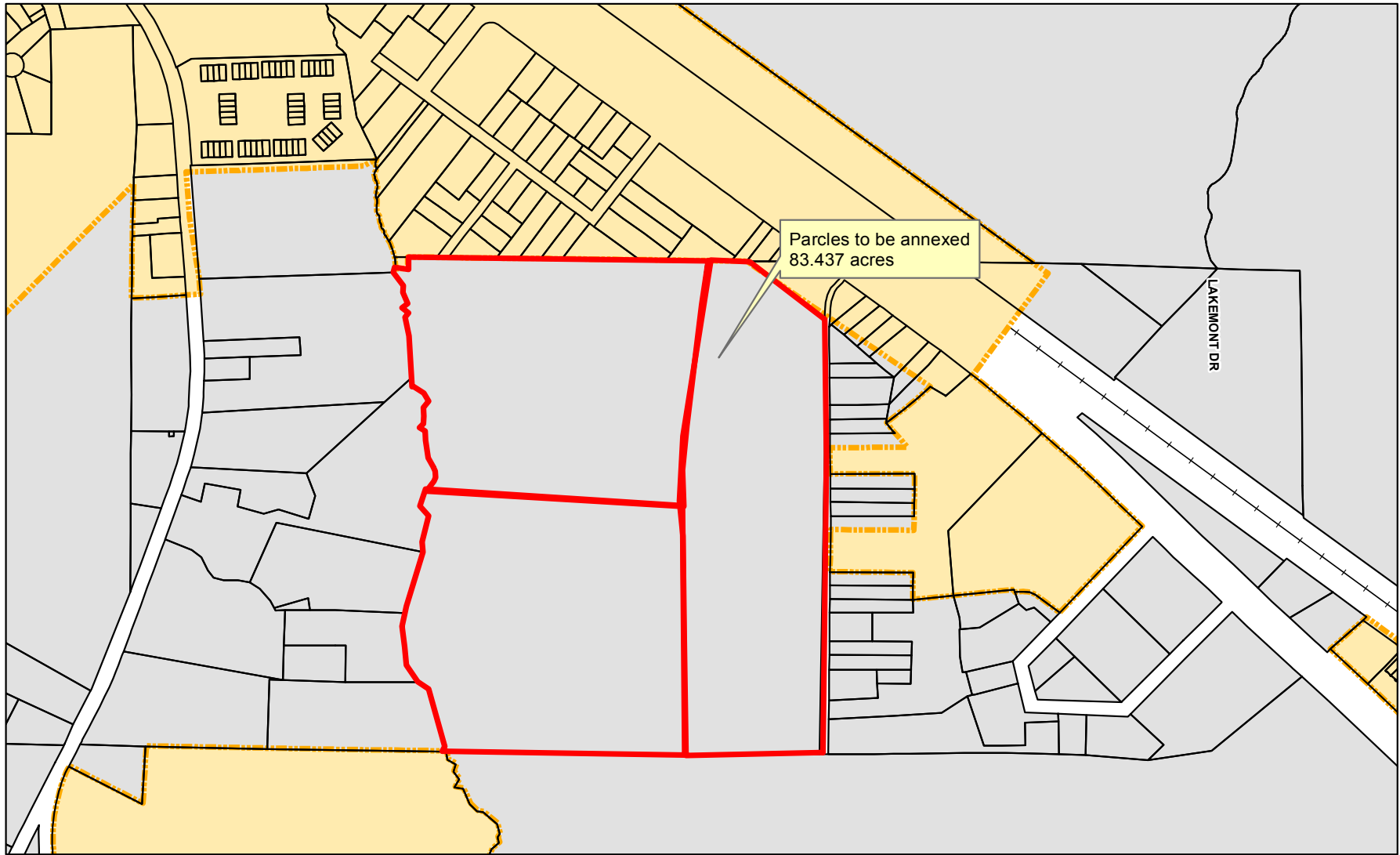
Parcels selection

Parcels

Produced by: TOC Planning  
 January 4, 2021

Disclaimer: Town of Clayton assumes no legal responsibility for the information represented here.





#### Legend

- Parcels selection
- Parcels
- Clayton Town Limits

Produced by: TOC Planning  
January 4, 2021

#### Annexation Map

Applicant(s): Jones & Cnossen Engineering, PLLC  
Property Owner(s): Buckhorn Branch Park Developers, LLC  
Parcel Number(s): 166800-54-8289, 166811-55-8386, and 166800-64-8874  
File Number(s): 2020-142-ANX



0 200 400 800  
Feet

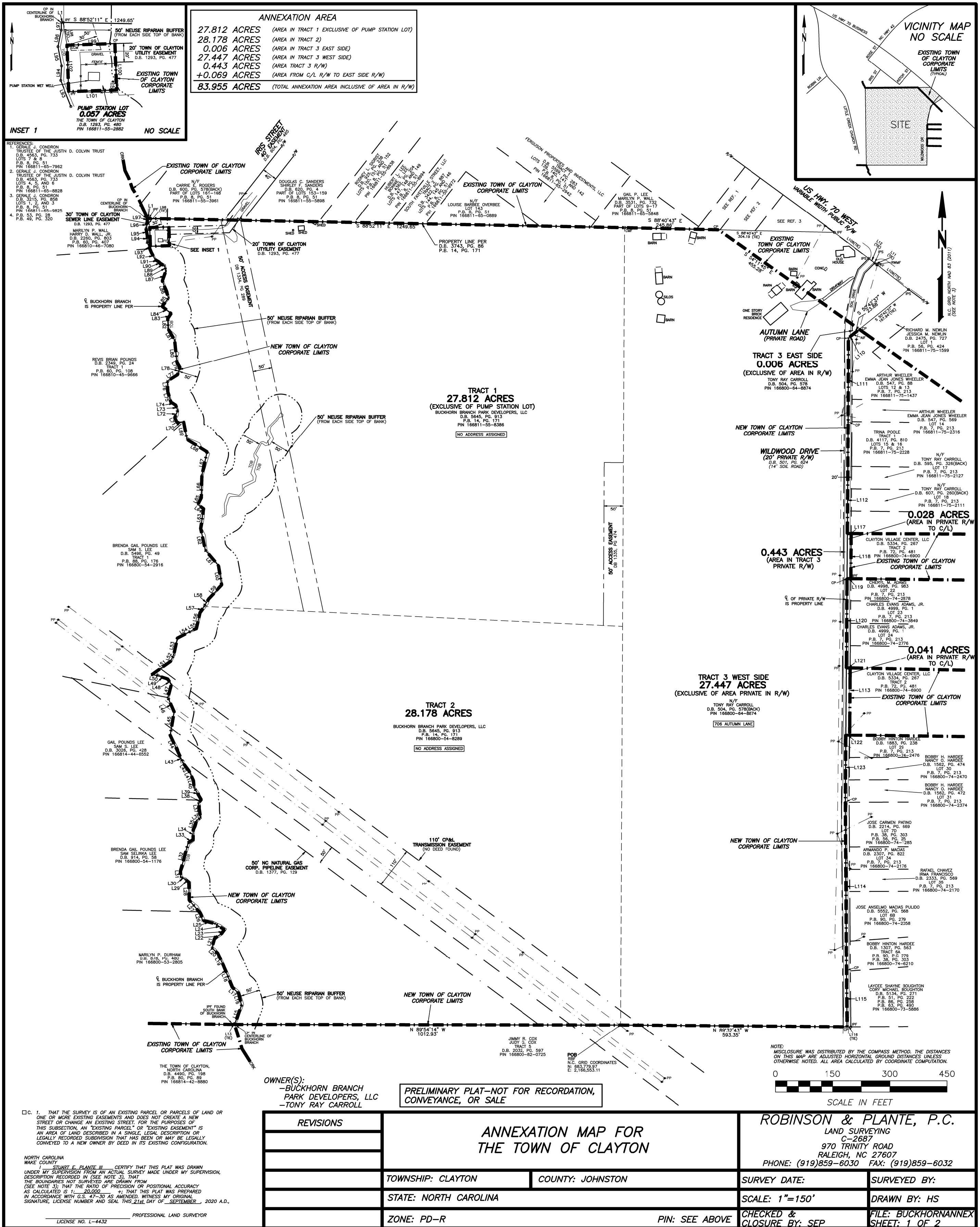
Disclaimer: Town of Clayton assumes no legal responsibility for the information represented here.



## ANNEXATION MAP FOR THE TOWN OF CLAYTON

Beginning at an existing rebar at the southeast corner of Buckhorn Branch Park Developers, LLC property, said rebar having N.C. Grid Coordinates (NAD83/2011) of N=683,779.97, E=2,116,553.11, thence from said beginning point North 89°54'14" West 1,012.93' to a point in the centerline of Buckhorn Branch, thence along the centerline of Buckhorn Branch North 19°42'50" East 54.10' to a point, thence North 13°21'28" West 32.84' to a point, thence North 45°04'55" West 23.58' to a point, thence North 21°27'56" West 62.48' to a point, thence North 24°28'58" West 35.69' to a point, thence North 47°45'54" West 22.14' to a point, thence North 15°39'48" East 26.48' to a point, thence North 56°10'35" East 21.78' to a point, thence North 33°54'32" East 14.11' to a point, thence North 57°05'03" West 28.99' to a point, thence North 75°23'03" West 34.22' to a point, thence North 14°52'43" West 19.05' to a point, thence North 39°31'39" West 46.69' to a point, thence North 01°18'29" West 47.63' to a point, thence North 44°07'13" West 12.78' to a point, thence North 66°46'26" West 13.23' to a point, thence North 02°34'32" West 16.59' to a point, thence North 15°00'02" East 78.15' to a point, thence North 55°18'53" East 15.48' to a point, thence North 00°41'35" East 25.75' to a point, thence North 19°49'51" East 26.88' to a point, thence North 54°55'40" East 12.22' to a point, thence North 08°17'49" West 40.20' to a point, thence North 38°44'57" East 12.03' to a point, thence North 29°42'01" West 37.74' to a point, thence North 04°58'59" West 18.28' to a point, thence North 23°58'30" West 28.87' to a point, thence North 36°33'25" West 23.73' to a point, thence North 24°31'56" West 29.65' to a point, thence North 24°31'56" West 54.05' to a point, thence North 09°09'37" East 64.35' to a point, thence North 23°15'45" West 40.99' to a point, thence North 14°30'07" East 35.35' to a point, thence North 31°07'51" West 18.01' to a point, thence North 71°37'03" West 28.51' to a point, thence North 79°11'34" West 14.53' to a point, thence North 54°03'50" East 59.67' to a point, thence North 24°44'08" East 20.94' to a point, thence North 12°03'36" East 45.01' to a point, thence North 61°53'12" East 47.90' to a point, thence North 61°53'12" East 8.61' to a point, thence North 12°33'42" East 42.28' to a point, thence North 31°50'52" East 19.81' to a point, thence North 31°50'52" East 23.76' to a point, thence North 42°38'09" East 50.82' to a point, thence North 09°05'08" West 51.42' to a point, thence North 39°25'52" West 55.65' to a point, thence North 11°50'48" West 59.37' to a point, thence North 08°06'09" East 53.98' to a point, thence North 52°43'32" West 19.02' to a point, thence North 27°05'10" East 19.93' to a point, thence North 01°29'47" East 60.38' to a point, thence North 12°16'45" East 63.80' to a point, thence North 57°24'36" West 61.91' to a point, thence North 10°54'45" West 47.08' to a point, thence South 86°34'10" West 17.01' to a point, thence North 25°19'41" West 14.81' to a point, thence North 22°07'02" East 20.87' to a point, thence North 20°40'28" West 15.29' to a point, thence North 56°19'45" West 14.98' to a point, thence North 16°11'00" West 29.06' to a point, thence North 01°59'21" West 28.55' to a point, thence North 57°19'09" East 31.15' to a point, thence North 17°51'17" East 21.04' to a point, thence North 29°30'34" West 16.21' to a point, thence North 05°36'01" West 59.46' to a point, thence North 29°25'21" West 34.69' to a point, thence North 02°05'54" West 27.23' to a point, thence North 33°08'28" East 15.95' to a point, thence North 50°15'37" West 29.92' to a point, thence North 35°26'52" East 28.32' to a point, thence North 19°14'11" West 48.90' to a point, thence North 19°06'20" East 27.48' to a point, thence North 14°02'58" West 14.99' to a

point, thence North 67°56'08" West 11.15' to a point, thence North 32°54'22" West 6.33' to a point, thence North 59°17'43" West 11.88' to a point, thence North 27°22'09" West 22.54' to a point, thence North 21°26'49" West 29.89' to a point, thence North 03°14'28" East 15.48' to a point, thence North 10°09'09" West 21.33' to a point, thence North 10°58'52" East 18.01' to a point, thence North 01°06'31" East 8.29' to a point, thence leaving said centerline of Buckhorn Branch South 88°52'11" East 2.13' to an existing iron pipe, thence South 88°52'11" East 1,249.65' to an existing concrete monument, thence South 88°40'43" East 245.86' to a point, thence South 54°11'45" East 455.28' to a point crossing Wildwood Drive (20' Private Right of Way), thence South 50°42'37" West 23.88' to an existing angle iron on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence leaving said right of way South 50°42'37" West 12.95' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°09'36" West 224.74' to a point, thence South 00°23'40" West 300.29' to a point, thence leaving said centerline South 89°36'20" East 10.00' to a point on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence with said right of way South 00°23'40" West 120.81' to an existing iron pipe, thence leaving said right of way North 89°35'14" West 10.00' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°25'51" West 239.83' to a point, thence leaving said centerline South 89°34'09" East 10.00' to a point on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence with said right of way South 00°25'51" West 179.83' to a point, thence leaving said right of way North 89°34'09" West 10.00' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°25'51" West 180.26' to a point, thence South 00°23'32" East 453.12' to a point, thence South 00°32'36" East 149.50' to a point, thence leaving said centerline and crossing the western right of way of Wildwood Drive (20' Private Right of Way) North 89°32'43" West 593.35' to the point and place of Beginning containing 83.955 Acres more or less.



ANNEXATION # \_\_\_\_\_

I, SAMANTHA L. WULLENWABER, MPA, PLANNING DIRECTOR, CLAYTON, NORTH CAROLINA, CERTIFY THIS IS A TRUE AND EXACT MAP OF ANNEXATION ADOPTED THE \_\_\_\_\_ DAY OF \_\_\_\_\_, \_\_\_\_\_, BY THE TOWN COUNCIL. I SET MY HAND AND SEAL TO THE TOWN OF CLAYTON.

SAMANTHA L. WULLENWABER, MPA

□.C. 1. THAT THE SURVEY IS OF AN EXISTING PARCEL OR PARCELS OF LAND OR ONE OR MORE EXISTING EASEMENTS AND DOES NOT CREATE A NEW STREET OR CHANGE AN EXISTING STREET, FOR THE PURPOSES OF THIS SUBSECTION, AN "EXISTING EASEMENT" OR "EXISTING EASEMENT" IS AN AREA OF LAND DESCRIBED IN A SINGLE LEGAL DESCRIPTION OR LEGALLY RECORDED SUBDIVISION THAT HAS BEEN OR MAY BE LEGALLY CONVEYED TO A NEW OWNER BY DEED IN ITS EXISTING CONFIGURATION.

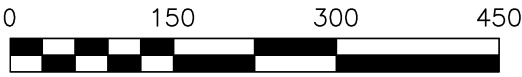
NORTH CAROLINA  
WAKE COUNTY  
STUART F. PLANTE III, \_\_\_\_\_, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION, DESCRIPTION RECORDED IN (SEE NOTE 3), THAT THE BOUNDARIES NOT SURVEYED ARE DRAWN FROM (SEE NOTE 3); THAT THE RATIO OF PRECISION OR POSITIONAL ACCURACY AS CALCULATED IS 1: \_\_\_\_\_, 20.000, THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED, WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 21st DAY OF \_\_\_\_\_, SEPTEMBER, 2020 A.D.,

\_\_\_\_\_  
PROFESSIONAL LAND SURVEYOR  
LICENSE NO. L-4432

PRELIMINARY PLAT--NOT FOR RECORDATION,  
CONVEYANCE, OR SALE

- NOTES:
- PROPERTY IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD. NO TITLE EXAMINATION HAS BEEN DONE BY ROBINSON & PLANTE, P.C.
  - THE PROPERTY IS IN ZONE X, NOT IN A SPECIAL FLOOD HAZARD AREA, BY FEMA FIRM MAP NO. 5720168800K PANEL 1668, MAP REVISED JUNE 20, 2018.
  - PROPERTY BOUNDARY HAS NOT BEEN SURVEYED BY ROBINSON & PLANTE, P.C. AT THIS TIME. BOUNDARY, EASEMENTS, RESTRICTIONS, PROPERTY CORNER DESCRIPTIONS, N.C. GRID NORTH NAD83(2011) AND ALL UTILITIES/STRUCTURES SHOWN WERE TAKEN FROM A SURVEY BY WITHERS RAVENEL ENTITLED "BOUNDARY SURVEY FOR CONCEPT 8 HOLDINGS, LLC, PROPERTY OF FLORENCE H. GRANTHAM, JOHN R. SUGGS REVOCABLE TRUST, PANTHERIA H. SUGGS REVOCABLE TRUST, TONY RAY CARROLL," DATED 1/21/19 AND LAST REVISED 11/20/19. EXISTING CORPORATE LIMIT LINES TAKEN FROM TOWN OF CLAYTON OFFICIAL TOWN LIMIT AND ETH MAP WITH TOWN LIMITS EFFECTIVE AS OF APRIL 2, 2018 AND AS SHOWN ON JOHNSTON COUNTY GIS. THE SOLE PURPOSE OF THIS MAP IS FOR ANNEXATION INTO THE TOWN OF CLAYTON CORPORATE LIMITS.
  - C/L BUCKHORN BRANCH PROPERTY LINE CORNERS ARE ALL CALCULATED POINTS UNLESS OTHERWISE NOTED.

NOTE:  
MISCLURE WAS DISTRIBUTED BY THE COMPASS METHOD. THE DISTANCES ON THIS MAP ARE ADJUSTED HORIZONTAL GROUND DISTANCES UNLESS OTHERWISE NOTED. ALL AREA CALCULATED BY COORDINATE COMPUTATION.



SCALE IN FEET

OWNER(S):  
-BUCKHORN BRANCH  
PARK DEVELOPERS, LLC  
-TONY RAY CARROLL

|           |                                           |                  |                                                                                                                                         |                                      |
|-----------|-------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| REVISIONS | ANNEXATION MAP FOR<br>THE TOWN OF CLAYTON |                  | ROBINSON & PLANTE, P.C.<br>LAND SURVEYING<br>C-2687<br>970 TRINITY ROAD<br>RALEIGH, NC 27607<br>PHONE: (919)859-6030 FAX: (919)859-6032 |                                      |
|           |                                           |                  |                                                                                                                                         |                                      |
|           |                                           |                  |                                                                                                                                         |                                      |
|           | TOWNSHIP: CLAYTON                         | COUNTY: JOHNSTON | SURVEY DATE: 5-22-2020                                                                                                                  | SURVEYED BY: KS                      |
|           | STATE: NORTH CAROLINA                     |                  |                                                                                                                                         | DRAWN BY: HS                         |
|           | ZONE: PD-R                                |                  | CHECKED &<br>CLOSURE BY: SEP                                                                                                            | FILE: BUCKHORNANNEX<br>SHEET: 2 OF 2 |

| LINE TABLE |               |          |
|------------|---------------|----------|
| LINE       | BEARING       | DISTANCE |
| L1         | S 88°52'11" E | 2.13'    |
| L11        | S 52°21'57" E | 7.02'    |
| L12        | S 52°21'57" E | 20.14'   |
| L13        | N 89°54'14" W | 5.09'    |
| L15        | N 19°42'50" E | 54.10'   |
| L16        | N 13°21'28" W | 32.84'   |
| L17        | N 45°04'55" W | 23.58'   |
| L18        | N 21°22'55" W | 62.48'   |
| L19        | N 24°28'58" W | 35.69'   |
| L20        | N 47°45'54" W | 22.14'   |
| L21        | N 15°39'48" E | 26.48'   |
| L22        | N 56°10'35" E | 21.78'   |
| L23        | N 33°54'33" E | 14.11'   |
| L24        | N 57°05'03" W | 28.99'   |
| L25        | N 75°23'03" W | 34.22'   |
| L26        | N 14°52'43" W | 19.05'   |
| L27        | N 39°31'39" W | 46.69'   |
| L28        | N 01°18'29" W | 47.63'   |
| L29        | N 44°07'13" W | 12.78'   |
| L30        | N 66°46'26" W | 13.23'   |
| L31        | N 02°34'33" W | 16.59'   |
| L32        | N 19°00'02" E | 78.15'   |
| L33        | N 55°18'53" E | 15.48'   |
| L34        | N 00°41'36" E | 25.75'   |
| L35        | N 19°49'51" E | 26.88'   |
| L36        | N 54°55'40" E | 12.22'   |
| L37        | N 08°17'49" W | 40.20'   |
| L38        | N 38°44'57" E | 12.03'   |
| L39        | N 29°42'01" W | 37.74'   |
| L40        | N 04°58'59" W | 18.28'   |
| L41        | N 23°58'39" W | 28.87'   |
| L42        | N 36°33'25" W | 23.73'   |
| L43        | N 24°31'56" W | 29.65'   |
| L44        | N 24°31'56" W | 54.05'   |
| L45        | N 09°09'37" E | 64.35'   |
| L46        | N 23°15'45" W | 40.99'   |
| L47        | N 14°30'07" E | 35.35'   |
| L48        | N 31°07'51" W | 18.01'   |
| L49        | N 71°37'03" W | 28.51'   |
| L50        | N 78°11'34" W | 14.53'   |
| L51        | N 54°03'50" E | 59.67'   |
| L52        | N 24°44'08" E | 20.94'   |
| L53        | N 12°03'36" E | 45.01'   |
| L54        | N 61°53'12" E | 47.90'   |
| L55        | N 61°53'12" E | 8.61'    |
| L56        | N 12°33'42" E | 42.28'   |
| L57        | N 31°50'52" E | 19.81'   |
| L58        | N 31°50'52" E | 23.76'   |
| L59        | N 42°38'09" E | 50.82'   |
| L60        | N 09°05'08" W | 51.42'   |
| L61        | N 39°25'52" W | 55.65'   |
| L62        | N 11°50'48" W | 59.37'   |
| L63        | N 08°05'09" E | 53.98'   |
| L64        | N 62°44'32" W | 19.02'   |
| L65        | N 27°05'10" E | 19.93'   |
| L66        | N 01°29'47" E | 60.38'   |
| L67        | N 12°16'45" E | 63.80'   |
| L68        | N 57°24'36" W | 61.91'   |
| L69        | N 10°54'45" W | 47.08'   |
| L70        | S 86°34'10" W | 17.01'   |
| L71        | N 25°19'41" W | 14.81'   |
| L72        | N 22°07'02" E | 20.87'   |
| L73        | N 20°40'28" W | 15.29'   |
| L74        | N 56°19'45" W | 14.98'   |
| L75        | N 16°11'00" W | 29.06'   |
| L76        | N 01°59'21" W | 28.55'   |
| L77        | N 57°19'09" E | 31.15'   |
| L78        | N 17°51'17" E | 21.04'   |
| L79        | N 29°30'34" W | 16.21'   |
| L80        | N 05°36'01" W | 59.46'   |
| L81        | N 29°25'21" W | 34.69'   |
| L82        | N 02°05'54" W | 27.23'   |
| L83        | N 33°08'28" E | 15.95'   |
| L84        | N 50°15'37" W | 29.92'   |
| L85        | N 35°26'52" E | 28.32'   |
| L86        | N 19°14'11" W | 48.90'   |
| L87        | N 19°06'20" E | 27.48'   |
| L88        | N 14°02'58" W | 14.99'   |
| L89        | N 67°56'08" W | 11.15'   |
| L90        | N 32°54'22" W | 6.33'    |
| L91        | N 59°17'43" W | 11.88'   |
| L92        | N 27°22'09" W | 22.54'   |
| L93        | N 21°26'49" W | 29.89'   |
| L94        | N 03°14'28" E | 15.48'   |
| L95        | N 10°09'09" W | 21.33'   |
| L96        | N 10°58'52" E | 18.01'   |
| L97        | N 01°06'31" E | 8.29'    |
| L98        | S 09°27'07" E | 24.72'   |
| L99        | N 89°01'34" E | 50.00'   |
| L100       | S 02°00'12" E | 50.00'   |
| L101       | S 87°59'48" W | 50.00'   |
| L102       | N 02°00'12" W | 50.03'   |
| L103       | S 34°03'19" E | 59.57'   |
| L104       | S 13°12'56" W | 111.76'  |
| L105       | S 01°19'49" W | 39.04'   |
| L106       | N 78°22'00" W | 75.39'   |
| L107       | S 18°35'27" W | 142.59'  |
| L108       | S 32°21'57" E | 113.65'  |
| L109       | S 51°17'26" E | 107.14'  |
| L110       | S 50°42'57" W | 12.95'   |
| L111       | S 00°09'36" W | 224.74'  |
| L112       | S 00°23'40" W | 300.29'  |
| L113       | S 00°25'51" W | 179.83'  |
| L114       | S 00°23'32" E | 453.12'  |
| L115       | S 00°32'36" E | 149.50'  |
| L116       | S 89°32'43" E | 10.00'   |
| L117       | S 89°36'20" E | 10.00'   |
| L118       | S 00°23'40" W | 120.81'  |
| L119       | N 89°35'14" W | 10.00'   |
| L120       | S 00°25'51" W | 239.83'  |
| L121       | S 89°34'09" E | 10.00'   |
| L122       | N 89°34'09" W | 10.00'   |
| L123       | S 00°25'51" W | 180.26'  |

LEGEND  
(IPF)—IRON PIPE FOUND  
(IPS)—IRON PIPE SET  
(RWF)—RIGHT OF WAY MONUMENT FOUND  
(CP & L)—CALCULATED POINT  
(RBF)—REBAR FOUND  
(CMF)—CONCRETE MONUMENT FOUND  
(AIP)—ANGLE IRON FOUND  
(R/W)—RIGHT OF WAY  
(C/L)—CENTERLINE  
(EOP)—EDGE OF PAVEMENT  
(PP)—POWER POLE  
(TOB)—TOP OF BANK  
(CONC)—CONCRETE  
(CP&L)—CAROLINA POWER & LIGHT COMPANY

**ANNEXATION PETITION 2020-142-ANX**

**Buckhorn Branch**

**Parcel:** 166800-64-8874, 166811-55-8386, and 166800-54-8289

**Owners:** Buckhorn Branch Developers, LLC

**Contiguous;** 83.433 +/- acres

**TOWN OF CLAYTON  
RESOLUTION DIRECTING THE CLERK TO INVESTIGATE  
A PETITION RECEIVED UNDER G.S. 160A-31**

**WHEREAS**, a petition requesting annexation of an area described in said petition was received on January 5, 2021 by the Town of Clayton; and

**WHEREAS**, G.S. 160A-31 provides that the sufficiency of the petition shall be investigated by the Town Clerk before further annexation proceedings may take place; and

**WHEREAS**, the Town Council of the Town of Clayton deems it advisable to proceed in response to this request for annexation:

**NOW, THEREFORE, BE IT RESOLVED** by the Town Council of the Town of Clayton that:

The Town Clerk is hereby directed to investigate the sufficiency of the above-described petition and to certify as soon as possible to the Town Council the results of her investigation.

Duly adopted this 1<sup>st</sup> day of February, 2021 while in regular session.

\_\_\_\_\_  
Jody L. McLeod,  
Mayor

ATTEST:

\_\_\_\_\_  
Kimberly A. Moffett, CMC, NCCMC  
Town Clerk



## PUBLIC NOTICE

The Clayton Town Council has called a public hearing at 6:00 PM on Monday, March 1, 2021, at Town Hall, 111 E. Second Street, on the question of annexing the following described contiguous area, requested by annexation petition 2020-142-ANX filed pursuant to G.S. 160A-31:

The area proposed for annexation is described as the following: Lying and being in Clayton Township, Johnston County, North Carolina and being more particularly described as follows:

Beginning at an existing rebar at the southeast corner of Buckhorn Branch Park Developers, LLC property, said rebar having N.C. Grid Coordinates (NAD83/2011) of N=683,779.97, E=2,116,553.11, thence from said beginning point North 89°54'14" West 1,012.93' to a point in the centerline of Buckhorn Branch, thence along the centerline of Buckhorn Branch North 19°42'50" East 54.10' to a point, thence North 13°21'28" West 32.84' to a point, thence North 45°04'55" West 23.58' to a point, thence North 21°27'56" West 62.48' to a point, thence North 24°28'58" West 35.69' to a point, thence North 47°45'54" West 22.14' to a point, thence North 15°39'48" East 26.48' to a point, thence North 56°10'35" East 21.78' to a point, thence North 33°54'32" East 14.11' to a point, thence North 57°05'03" West 28.99' to a point, thence North 75°23'03" West 34.22' to a point, thence North 14°52'43" West 19.05' to a point, thence North 39°31'39" West 46.69' to a point, thence North 01°18'29" West 47.63' to a point, thence North 44°07'13" West 12.78' to a point, thence North 66°46'26" West 13.23' to a point, thence North 02°34'32" West 16.59' to a point, thence North 15°00'02" East 78.15' to a point, thence North 55°18'53" East 15.48' to a point, thence North 00°41'35" East 25.75' to a point, thence North 19°49'51" East 26.88' to a point, thence North 54°55'40" East 12.22' to a point, thence North 08°17'49" West 40.20' to a point, thence North 38°44'57" East 12.03' to a point, thence North 29°42'01" West 37.74' to a point, thence North 04°58'59" West 18.28' to a point, thence North 23°58'30" West 28.87' to a point, thence North 36°33'25" West 23.73' to a point, thence North 24°31'56" West 29.65' to a point, thence North 24°31'56" West 54.05' to a point, thence North 09°09'37" East 64.35' to a point, thence North 23°15'45" West 40.99' to a point, thence North 14°30'07" East 35.35' to a point, thence North 31°07'51" West 18.01' to a point, thence North 71°37'03" West 28.51' to a point, thence North 79°11'34" West 14.53' to a point, thence North 54°03'50" East 59.67' to a point, thence North 24°44'08" East 20.94' to a point, thence North 12°03'36" East 45.01' to a point, thence North 61°53'12" East 47.90' to a point, thence North 61°53'12" East 8.61' to a point, thence North 12°33'42" East 42.28' to a point, thence North 31°50'52" East 19.81' to a point, thence North 31°50'52" East 23.76' to a point, thence North 42°38'09" East 50.82' to a point, thence North 09°05'08" West 51.42' to a point, thence North 39°25'52" West 55.65' to a point, thence North 11°50'48" West 59.37' to a point, thence North 08°06'09" East 53.98' to a point, thence North 52°43'32" West 19.02' to a point, thence North 27°05'10" East 19.93' to a point, thence North 01°29'47" East 60.38' to a point, thence North 12°16'45" East 63.80' to a point, thence North 57°24'36" West 61.91' to a point, thence North 10°54'45" West 47.08' to a point, thence South 86°34'10" West 17.01' to a point, thence North 25°19'41" West 14.81' to a point, thence North 22°07'02" East 20.87' to a point, thence North 20°40'28" West 15.29' to a point, thence North 56°19'45" West 14.98' to a point, thence North 16°11'00" West 29.06' to a point, thence North 01°59'21" West 28.55' to a point, thence North 57°19'09" East 31.15' to a point, thence North 17°51'17" East 21.04' to a point, thence North 29°30'34" West 16.21' to a point, thence North 05°36'01" West 59.46' to a point, thence North

29°25'21" West 34.69' to a point, thence North 02°05'54" West 27.23' to a point, thence North 33°08'28" East 15.95' to a point, thence North 50°15'37" West 29.92' to a point, thence North 35°26'52" East 28.32' to a point, thence North 19°14'11" West 48.90' to a point, thence North 19°06'20" East 27.48' to a point, thence North 14°02'58" West 14.99' to a point, thence North 67°56'08" West 11.15' to a point, thence North 32°54'22" West 6.33' to a point, thence North 59°17'43" West 11.88' to a point, thence North 27°22'09" West 22.54' to a point, thence North 21°26'49" West 29.89' to a point, thence North 03°14'28" East 15.48' to a point, thence North 10°09'09" West 21.33' to a point, thence North 10°58'52" East 18.01' to a point, thence North 01°06'31" East 8.29' to a point, thence leaving said centerline of Buckhorn Branch South 88°52'11" East 2.13' to an existing iron pipe, thence South 88°52'11" East 1,249.65' to an existing concrete monument, thence South 88°40'43" East 245.86' to a point, thence South 54°11'45" East 455.28' to a point crossing Wildwood Drive (20' Private Right of Way), thence South 50°42'37" West 23.88' to an existing angle iron on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence leaving said right of way South 50°42'37" West 12.95' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°09'36" West 224.74' to a point, thence South 00°23'40" West 300.29' to a point, thence leaving said centerline South 89°36'20" East 10.00' to a point on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence with said right of way South 00°23'40" West 120.81' to an existing iron pipe, thence leaving said right of way North 89°35'14" West 10.00' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°25'51" West 239.83' to a point, thence leaving said centerline South 89°34'09" East 10.00' to a point on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence with said right of way South 00°25'51" West 179.83' to a point, thence leaving said right of way North 89°34'09" West 10.00' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°25'51" West 180.26' to a point, thence South 00°23'32" East 453.12' to a point, thence South 00°32'36" East 149.50' to a point, thence leaving said centerline and crossing the western right of way of Wildwood Drive (20' Private Right of Way) North 89°32'43" West 593.35' to the point and place of Beginning containing 83.955 Acres more or less.

This is an open meeting and the public is invited to attend.

Kimberly A. Moffett, CMC, NCCMC  
Town Clerk  
Town of Clayton  
919-553-5002 ext. 5004

**ANNEXATION PETITION 2020-142-ANX**

**Buckhorn Branch**

**Parcel:** 166800-64-8874, 166811-55-8386, and 166800-54-8289

**Owners:** Buckhorn Branch Developers, LLC

**Contiguous;** 83.433 +/- acres

**CERTIFICATE OF SUFFICIENCY**

To the Town Council of the Town of Clayton, North Carolina:

I, Kimberly A. Moffett, Town Clerk, do hereby certify that I have investigated the petition attached hereto and have found as a fact that said petition is signed by all owners of real property lying in the area described therein, in accordance with G.S. 160A-58.1.

In witness whereof, I have hereunto set my hand and affixed the seal of the Town of Clayton, this the 15<sup>th</sup> day of February, 2021 while in regular session.

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Kimberly A. Moffett, CMC, NCCMC  
Town Clerk

**ANNEXATION PETITION 2020-142-ANX**

**Buckhorn Branch**

**Parcel:** 166800-64-8874, 166811-55-8386, and 166800-54-8289

**Owners:** Buckhorn Branch Developers, LLC

**Contiguous;** 83.433 +/- acres

**TOWN OF CLAYTON  
RESOLUTION FIXING DATE OF PUBLIC HEARING ON QUESTION  
OF ANNEXATION PURSUANT TO G. S.160A-31**

**WHEREAS**, a petition requesting annexation of the contiguous area described herein has been received; and

**WHEREAS**, the Town Council has by resolution directed the Town Clerk to investigate the sufficiency of the petition; and

**WHEREAS**, certification by the Town Clerk as to the sufficiency of the petition has been made;

**NOW, THEREFORE, BE IT RESOLVED**, by the Town Council of the Town of Clayton, North Carolina that:

**Section 1.** A public hearing on the question of annexation of the contiguous area described herein will be held at Town Hall at 6:00 PM on Monday, March 1, 2021.

**Section 2.** Lying and being in Clayton Township, Johnston County, North Carolina and being more particularly described as follows:

Beginning at an existing rebar at the southeast corner of Buckhorn Branch Park Developers, LLC property, said rebar having N.C. Grid Coordinates (NAD83/2011) of N=683,779.97, E=2,116,553.11, thence from said beginning point North 89°54'14" West 1,012.93' to a point in the centerline of Buckhorn Branch, thence along the centerline of Buckhorn Branch North 19°42'50" East 54.10' to a point, thence North 13°21'28" West 32.84' to a point, thence North 45°04'55" West 23.58' to a point, thence North 21°27'56" West 62.48' to a point, thence North 24°28'58" West 35.69' to a point, thence North 47°45'54" West 22.14' to a point, thence North 15°39'48" East 26.48' to a point, thence North 56°10'35" East 21.78' to a point, thence North 33°54'32" East 14.11' to a point, thence North 57°05'03" West 28.99' to a point, thence North 75°23'03" West 34.22' to a point, thence North 14°52'43" West 19.05' to a point, thence North 39°31'39" West 46.69' to a point, thence North 01°18'29" West 47.63' to a point, thence North 44°07'13" West 12.78' to a point, thence North 66°46'26" West 13.23' to a point, thence North 02°34'32" West 16.59' to a point, thence North 15°00'02" East 78.15' to a point, thence North 55°18'53" East 15.48' to a point, thence North 00°41'35" East 25.75' to a point, thence North 19°49'51" East 26.88' to a point, thence North 54°55'40" East 12.22' to a point, thence North 08°17'49" West 40.20' to a point, thence North 38°44'57" East 12.03' to a point, thence North 29°42'01" West 37.74' to a point, thence North 04°58'59" West 18.28' to a point, thence North 23°58'30" West 28.87' to a point, thence North 36°33'25" West 23.73' to a point, thence North 24°31'56" West 29.65' to a point, thence North 24°31'56" West 54.05' to a point, thence North 09°09'37" East 64.35' to a point, thence North 23°15'45" West 40.99' to a point, thence North 14°30'07" East 35.35' to a point, thence North 31°07'51" West 18.01' to a point, thence North 71°37'03" West 28.51' to a point, thence North 79°11'34" West 14.53' to a point, thence North 54°03'50" East 59.67' to a point, thence North 24°44'08" East 20.94' to a point, thence North 12°03'36" East 45.01' to a point, thence North 61°53'12" East 47.90' to a point, thence North 61°53'12" East 8.61' to a point, thence North 12°33'42" East 42.28' to a point, thence North

31°50'52" East 19.81' to a point, thence North 31°50'52" East 23.76' to a point, thence North 42°38'09" East 50.82' to a point, thence North 09°05'08" West 51.42' to a point, thence North 39°25'52" West 55.65' to a point, thence North 11°50'48" West 59.37' to a point, thence North 08°06'09" East 53.98' to a point, thence North 52°43'32" West 19.02' to a point, thence North 27°05'10" East 19.93' to a point, thence North 01°29'47" East 60.38' to a point, thence North 12°16'45" East 63.80' to a point, thence North 57°24'36" West 61.91' to a point, thence North 10°54'45" West 47.08' to a point, thence South 86°34'10" West 17.01' to a point, thence North 25°19'41" West 14.81' to a point, thence North 22°07'02" East 20.87' to a point, thence North 20°40'28" West 15.29' to a point, thence North 56°19'45" West 14.98' to a point, thence North 16°11'00" West 29.06' to a point, thence North 01°59'21" West 28.55' to a point, thence North 57°19'09" East 31.15' to a point, thence North 17°51'17" East 21.04' to a point, thence North 29°30'34" West 16.21' to a point, thence North 05°36'01" West 59.46' to a point, thence North 29°25'21" West 34.69' to a point, thence North 02°05'54" West 27.23' to a point, thence North 33°08'28" East 15.95' to a point, thence North 50°15'37" West 29.92' to a point, thence North 35°26'52" East 28.32' to a point, thence North 19°14'11" West 48.90' to a point, thence North 19°06'20" East 27.48' to a point, thence North 14°02'58" West 14.99' to a point, thence North 67°56'08" West 11.15' to a point, thence North 32°54'22" West 6.33' to a point, thence North 59°17'43" West 11.88' to a point, thence North 27°22'09" West 22.54' to a point, thence North 21°26'49" West 29.89' to a point, thence North 03°14'28" East 15.48' to a point, thence North 10°09'09" West 21.33' to a point, thence North 10°58'52" East 18.01' to a point, thence North 01°06'31" East 8.29' to a point, thence leaving said centerline of Buckhorn Branch South 88°52'11" East 1,249.65' to an existing concrete monument, thence South 88°40'43" East 245.86' to a point, thence South 54°11'45" East 455.28' to a point crossing Wildwood Drive (20' Private Right of Way), thence South 50°42'37" West 23.88' to an existing angle iron on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence leaving said right of way South 50°42'37" West 12.95' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°09'36" West 224.74' to a point, thence South 00°23'40" West 300.29' to a point, thence leaving said centerline South 89°36'20" East 10.00' to a point on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence with said right of way South 00°23'40" West 120.81' to an existing iron pipe, thence leaving said right of way North 89°35'14" West 10.00' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°25'51" West 239.83' to a point, thence leaving said centerline South 89°34'09" East 10.00' to a point on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence with said right of way South 00°25'51" West 179.83' to a point, thence leaving said right of way North 89°34'09" West 10.00' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°25'51" West 180.26' to a point, thence South 00°23'32" East 453.12' to a point, thence South 00°32'36" East 149.50' to a point, thence leaving said centerline and crossing the western right of way of Wildwood Drive (20' Private Right of Way) North 89°32'43" West 593.35' to the point and place of Beginning containing 83.955 Acres more or less

**Section 3.** Notice of the public hearing shall be published once in The Johnstonian Newspaper, a newspaper having general circulation in the Town of Clayton, at least ten days prior to the date of the public hearing.

Duly adopted this the 15<sup>th</sup> day of February, 2021 while in regular session.

\_\_\_\_\_  
Jody L. McLeod  
Mayor

ATTEST:

\_\_\_\_\_  
Kimberly A. Moffett, CMC  
Town Clerk



Ordinance #2021-03-02

**ANNEXATION PETITION 2020-142-ANX**  
**Buckhorn Branch**  
**Parcel:** 166800-64-8874, 166811-55-8386, and 166800-54-8289  
**Owners:** Buckhorn Branch Developers, LLC  
**Contiguous; 83.433 +/- acres**

**AN ORDINANCE TO EXTEND THE CORPORATE LIMITS OF THE TOWN  
OF CLAYTON, NORTH CAROLINA**

WHEREAS, the Town of Clayton has been petitioned under G.S. 160A-31 to annex the area described below; and

WHEREAS, the Town of Clayton has by resolution directed the Town Clerk to investigate the sufficiency of the petition; and

WHEREAS, the Town Clerk has certified the sufficiency of the petition and a public hearing on the question of this annexation was held at Town Hall at 6:00 PM on March 1, 2021 due notice of publication on February 17, 2021.

WHEREAS, the Town of Clayton finds that the petition meets the requirements of G.S. 160A-31;

NOW, THEREFORE, BE IT ORDAINED by the Town Council of Clayton, North Carolina that;

**Section 1.** By virtue of the authority granted by G.S. 160A-31, the following described territory is hereby annexed and made part of the Town of Clayton as of March 1, 2021:

Beginning at an existing rebar at the southeast corner of Buckhorn Branch Park Developers, LLC

property, said rebar having N.C. Grid Coordinates (NAD83/2011) of N=683,779.97, E=2,116,553.11, thence from said beginning point North 89°54'14" West 1,012.93' to a point in the centerline of Buckhorn Branch, thence along the centerline of Buckhorn Branch North 19°42'50" East 54.10' to a point, thence North 13°21'28" West 32.84' to a point, thence North 45°04'55" West 23.58' to a point, thence North 21°27'56" West 62.48' to a point, thence North 24°28'58" West 35.69' to a point, thence North 47°45'54" West 22.14' to a point, thence North 15°39'48" East 26.48' to a point, thence North 56°10'35" East 21.78' to a point, thence North 33°54'32" East 14.11' to a point, thence North 57°05'03" West 28.99' to a point, thence North 75°23'03" West 34.22' to a point, thence North 14°52'43" West 19.05' to a point, thence North 39°31'39" West 46.69' to a point, thence North 01°18'29" West 47.63' to a point, thence North 44°07'13" West 12.78' to a point, thence North 66°46'26" West 13.23' to a point, thence North 02°34'32" West 16.59' to a point, thence North 15°00'02" East 78.15' to a point, thence North 55°18'53" East 15.48' to a point, thence North 00°41'35" East 25.75' to a point, thence North 19°49'51" East 26.88' to a point, thence North 54°55'40" East 12.22' to a point, thence North 08°17'49" West 40.20' to a point, thence North 38°44'57" East 12.03' to a point, thence North 29°42'01" West 37.74' to a point, thence North 04°58'59" West 18.28' to a point, thence North 23°58'30" West 28.87' to a point, thence North 36°33'25" West 23.73' to a point, thence North 24°31'56" West 29.65' to a point, thence North 24°31'56" West 54.05' to a point, thence North 09°09'37" East 64.35' to a point, thence North 23°15'45" West 40.99' to a point, thence North 14°30'07" East 35.35' to a point, thence North 31°07'51" West 18.01' to a point, thence North 71°37'03" West 28.51' to a point, thence North 79°11'34" West 14.53' to a point, thence North 54°03'50" East 59.67' to a point, thence North 24°44'08" East 20.94' to a point, thence North 12°03'36" East 45.01' to a point, thence North 61°53'12" East 47.90' to a point, thence North 61°53'12" East 8.61' to a point, thence North 12°33'42" East 42.28' to a point, thence North 31°50'52" East 19.81' to a point, thence North 31°50'52" East 23.76' to a point, thence North 42°38'09" East 50.82' to a point, thence North 09°05'08" West 51.42' to a point, thence North 39°25'52" West 55.65' to a point, thence North 11°50'48" West 59.37' to a point, thence North 08°06'09" East 53.98' to a point, thence North 52°43'32" West 19.02' to a point, thence North 27°05'10" East 19.93' to a point, thence North 01°29'47" East 60.38' to a point, thence North 12°16'45" East 63.80' to a point, thence North 57°24'36" West 61.91' to a point, thence North 10°54'45" West 47.08' to a point, thence South 86°34'10" West 17.01' to a point, thence North 25°19'41" West 14.81' to a point, thence North 22°07'02" East 20.87' to a point, thence North 20°40'28" West 15.29' to a point, thence North 56°19'45" West 14.98' to a point, thence North 16°11'00" West 29.06' to a point, thence North 01°59'21" West 28.55' to a point, thence North 57°19'09" East 31.15' to a point, thence North 17°51'17" East 21.04' to a point, thence North 29°30'34" West 16.21' to a point, thence North 05°36'01" West 59.46' to a point, thence North 29°25'21" West 34.69' to a point, thence North 02°05'54" West 27.23' to a point, thence North 33°08'28" East 15.95' to a point, thence North 50°15'37" West 29.92' to a point, thence North 35°26'52" East 28.32' to a point, thence North 19°14'11" West 48.90' to a point, thence North 19°06'20" East 27.48' to a point, thence North 14°02'58" West 14.99' to a point, thence North 67°56'08" West 11.15' to a point, thence North 32°54'22" West 6.33' to a point, thence North 59°17'43" West 11.88' to a point, thence North 27°22'09" West 22.54' to a point, thence North 21°26'49" West 29.89' to a point, thence North 03°14'28" East 15.48' to a point, thence North 10°09'09" West 21.33' to a point, thence North 10°58'52" East 18.01' to a point, thence North 01°06'31" East 8.29' to a point, thence leaving said centerline of Buckhorn Branch South 88°52'11" East 2.13' to an existing iron pipe, thence South 88°52'11" East 1,249.65' to an existing concrete monument, thence South 88°40'43" East 245.86' to a point, thence South 54°11'45" East 455.28' to a point crossing Wildwood Drive (20' Private Right of Way), thence South 50°42'37" West 23.88' to an existing angle iron on the eastern right of way of

Wildwood Drive (20' Private Right of Way), thence leaving said right of way South 50°42'37" West 12.95' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°09'36" West 224.74' to a point, thence South 00°23'40" West 300.29' to a point, thence leaving said centerline South 89°36'20" East 10.00' to a point on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence with said right of way South 00°23'40" West 120.81' to an existing iron pipe, thence leaving said right of way North 89°35'14" West 10.00' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°25'51" West 239.83' to a point, thence leaving said centerline South 89°34'09" East 10.00' to a point on the eastern right of way of Wildwood Drive (20' Private Right of Way), thence with said right of way South 00°25'51" West 179.83' to a point, thence leaving said right of way North 89°34'09" West 10.00' to a point in the centerline of Wildwood Drive (20' Private Right of Way), thence with said centerline South 00°25'51" West 180.26' to a point, thence South 00°23'32" East 453.12' to a point, thence South 00°32'36" East 149.50' to a point, thence leaving said centerline and crossing the western right of way of Wildwood Drive (20' Private Right of Way) North 89°32'43" West 593.35' to the point and place of Beginning containing 83.955 Acres more or less.

**Section 2:** Upon and after March 1, 2021, the above described territory and its citizens and property shall be subject to all debts, laws, ordinances and regulations in force in the Town of Clayton and shall be entitled to the same privileges and benefits as other parts of the Town of Clayton. Said territory shall be subject to municipal taxes according to G.S. 160A-58.10.

**Section 3.** The Mayor of the Town of Clayton shall cause to be recorded in the office of the Register of Deeds of Johnston County, and in the office of the Secretary of State at Raleigh, North Carolina, an accurate map of the annexed territory, described in Section 1 above, together with a duly certified copy of this ordinance. Such a map shall also be delivered to the County Board of Elections, as required by G.S. 163-288.1.

Duly adopted this the 1<sup>st</sup> day of March, 2021 while in regular session.

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Jody McLeod  
Mayor

ATTEST:

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Kimberly A. Moffett, CMC, NCCMC  
Town Clerk

**NORTH CAROLINA  
JOHNSTON COUNTY**

This the \_\_\_\_\_ day of \_\_\_\_\_, 2020  personally appeared before me, Kimberly A. Moffett, Clerk of the Town of Clayton, who, being duly sworn by me, says that she knows the common seal of the Town of Clayton and is acquainted with Michael Grannis, who is the Mayor Pro Tem and presiding member of said municipal corporation; and that she saw the said Mayor Pro Tem sign the foregoing instrument and saw the said common seal of said municipal corporation affixed to said instrument, and that she, the said Kimberly A. Moffett, signed her name in attestation of said instrument in the presence of said Mayor Pro Tem.

Witness my hand and notarial seal, this the day and year first above written.

\_\_\_\_\_  
Notary Public - Signature

(SEAL)

\_\_\_\_\_  
Notary Public – Printed Name

Commission Expires: \_\_\_\_\_

County of Commission: \_\_\_\_\_



# Town Council Agenda Cover Sheet

**Meeting Date**

March 1, 2021

**Agenda Location**

Old Business

**Item Title**

LAPP Grant Update

**Presenter**

Joshua Baird, Town Engineer

**Summary/Description**

The Local Administered Project Program (LAPP) is an annual competitive grant program administered by the Capital Area Metropolitan Planning Organization (CAMPO) to distribute various transportation dollars to local projects in the areas of roadway, bike/ped, and transit.

Member jurisdictions are required to provide at least a minimum 20% match of local funds to qualify. High priority is placed on projects applying for multiple phases (design, right-of-way, and construction), with extra emphasis on those applying for construction funds. To qualify projects must be ready to begin the construction phases by the end of the federal fiscal year, in this case FFY2022 (October 1, 2021 – September 30, 2022).

Pending final approval, this round of projects will fund \$16 million in roadway projects, \$7.47 million in bike/ped projects, and \$1.53 million in transit projects. The total program size is \$25 million for FY2022.

Town staff submitted two projects for consideration, per Town Council approval:

- Northern Connector (roadway) – Design: \$3.2 million grant request
- NC 42 E MTS Greenway Extension (bike/ped) – Design: \$1.8 million grant request

Unfortunately, neither project scored high enough to qualify for funding this round. Both projects' scores suffered significantly because they only requested one phase – design. Upon follow up with CAMPO staff, the Greenway Extension would have scored well if the Town would have applied for additional phases; however, the Northern Connector project may continue to score poorly because of the total cost of the project (\$37.5 million) compared to the total size of the LAPP program.

**Requested Action**

Informational Only

**Funding Source (If Applicable):**

N/A

**Cost:** N/A   Yes ☐   No ☒

**Additional Documents to be Included in Agenda Packet**

LAPP-FFY22-Investment-Program-Package-Revised.pdf

**Meeting Timeline**

Click or tap here to enter text.



# ROADWAY

| Project Name                                               | Sponsoring Agency | Total Cost   | Local Match % | CAMPO Cost    | Amount Funded | Total Score | Rank (Roadway) Total 14 | Rank (Overall) Total 30 |
|------------------------------------------------------------|-------------------|--------------|---------------|---------------|---------------|-------------|-------------------------|-------------------------|
| 14 Airport Boulevard Extension                             | Morrisville       | \$7,074,358  | 40%           | \$ 4,244,615  | \$ 4,244,615  | 58.38       | 1                       | 3                       |
| 8 Add left turn lanes at SR-2233 (South Smithfield Road) a | Division5         | \$2,102,500  | 24%           | \$ 1,597,500  | \$ 1,597,500  | 55.38       | 2                       | 7                       |
| 1 Sunset Lake Road Widening Phase II                       | Fuquay-Varina     | \$1,640,259  | 20%           | \$ 1,312,207  | \$ 1,312,207  | 47.92       | 3                       | 14                      |
| 13 West Street Extension                                   | Raleigh           | \$2,387,000  | 30%           | \$ 1,670,900  | \$ 1,670,900  | 46.69       | 4                       | 15                      |
| 9 Carpenter Fire Station Rd Widening - Construction        | Cary              | \$14,830,000 | 55%           | \$ 3,645,000  | \$ 3,645,000  | 46.46       | 5                       | 16                      |
| 5 Holly Springs Road/Main Street Intersection Improveme    | HollySprings      | \$1,200,000  | 35%           | \$ 780,000    | \$ 780,000    | 44.38       | 6                       | 17                      |
| 12 Lake Boone Trail Safety Improvements                    | Raleigh           | \$1,272,000  | 20%           | \$ 1,017,600  | \$ 1,017,600  | 42.54       | 7                       | 19                      |
| 7 Jones Sausage Road - Phase 1 (North)                     | Garner            | \$4,895,909  | 70%           | \$ 300,300    |               | 41.62       | 8                       | 20                      |
| 2 Highway 401/Mill Creek Rd Intersection Operational Im    | Fuquay-Varina     | \$1,536,438  | 20%           | \$ 1,229,151  | \$ 1,229,151  | 39.08       | 9                       | 21                      |
| 4 NC 55 Widening                                           | HollySprings      | \$1,500,000  | 50%           | \$ 750,000    | \$ 508,305    | 38.92       | 10                      | 22                      |
| 10 US 1 & Wake Union Church Road Superstreet               | Division5         | \$2,585,000  | 20%           | \$ 2,068,000  |               | 38.23       | 11                      | 23                      |
| 6 Dillard Drive Turn lanes                                 | Division5         | \$1,272,500  | 37%           | \$ 802,500    |               | 32.62       | 12                      | 24                      |
| 3 Johnson Pond/Whitted Road Round-about                    | Fuquay-Varina     | \$638,530    | 20%           | \$ 510,824    |               | 28.69       | 13                      | 26                      |
| 11 Northern Connector                                      | Clayton           | \$37,500,000 | 20%           | \$ 3,200,000  |               | 18.42       | 14                      | 29                      |
| Total                                                      |                   | \$80,434,494 |               | \$ 23,128,597 | \$ 16,005,278 |             |                         |                         |
| Target Modal Investment                                    |                   |              |               |               | \$ 16,250,000 |             |                         |                         |

Bike/Ped

| Project Name                                             | Sponsoring Agency | Requested Phase<br>(Design, ROW,<br>Const) | Total Cost   | Local Match<br>% | CAMPO Cost                 | Recommend<br>ed Funding | Total Score | Rank<br>(Bike/Ped)<br>Total 11 | Rank<br>(Overall)<br>Total 30 |
|----------------------------------------------------------|-------------------|--------------------------------------------|--------------|------------------|----------------------------|-------------------------|-------------|--------------------------------|-------------------------------|
| 11 Crabtree Creek Greenway Trail Gap                     | Raleigh           | No/No/Yes                                  | \$1,689,000  | 47%              | \$ 895,170 \$ 895,170      | Y                       | 61.83       | 1                              | 1                             |
| 7 Old Apex Road Sidewalk Gap                             | Cary              | No/No/Yes                                  | \$1,950,000  | 45%              | \$ 1,014,000 \$ 1,014,000  | N                       | 60.00       | 2                              | 2                             |
| 5 Holly Ridge Schools Pedestrian Safety                  | HollySprings      | No/No/Yes                                  | \$1,115,000  | 50%              | \$ 557,500 \$ 557,500      | Y                       | 57.00       | 3                              | 5                             |
| 1 Downtown Varina Pedestrian Improvements                | Fuquay-Varina     | Yes/Yes/Yes                                | \$1,457,490  | 20%              | \$ 1,165,992 \$ 1,165,992  | Y                       | 56.00       | 4                              | 6                             |
| 9 Louis Stephens Dr./O'Kelly Chapel Rd. Trail Connection | RTP               | Yes/No/Yes                                 | \$1,461,644  | 30%              | \$ 1,176,661 \$ 1,176,661  | Y                       | 54.00       | 5                              | 9                             |
| 8 Connecting Sidewalks for Bus Stop Improvements: Rona   | GoRaleigh         | Yes/No/Yes                                 | \$1,489,000  | 20%              | \$ 1,191,200 \$ 1,191,200  | Y                       | 52.00       | 6                              | 11                            |
| 6 NW Cary Parkway Sidewalk                               | Cary              | No/Yes/Yes                                 | \$4,965,000  | 55%              | \$ 2,482,500 \$ 2,482,500  | Y                       | 43.00       | 7                              | 18                            |
| 2 Alston Ridge/Bass Lake Greenway Trail                  | Fuquay-Varina     | Yes/Yes/Yes                                | \$1,368,294  | 20%              | \$ 1,094,635               | N                       | 30.00       | 8                              | 25                            |
| 4 "Rails to Trails"                                      | FranklinCounty    | Yes/No/No                                  | \$2,278,000  | 20%              | \$ 560,800                 | N                       | 28.60       | 9                              | 27                            |
| 10 NC 42 E MTS Greenway Extension                        | Clayton           | Yes/No/No                                  | \$2,250,000  | 20%              | \$ 1,800,000               | N                       | 23.10       | 10                             | 28                            |
| 3 Hidden Valley Greenway                                 | Fuquay-Varina     | Yes/Yes/Yes                                | \$2,087,944  | 20%              | \$ 1,670,355               | N                       | 16.00       | 11                             | 30                            |
| Total                                                    |                   |                                            | \$22,111,372 |                  | \$ 13,608,813 \$ 7,469,023 |                         |             |                                |                               |
| Target Modal Investment                                  |                   |                                            |              |                  | \$ 6,750,000               |                         |             |                                |                               |

Transit

| Project Name                                             | Sponsoring Agency | Total Cost  | Local Match % | CAMPO Cost   |              | Total Score | Rank (Transit) Total 5 | Rank (Overall) Total 30 |
|----------------------------------------------------------|-------------------|-------------|---------------|--------------|--------------|-------------|------------------------|-------------------------|
| 3 Downtown Apex Transfer Point Improvements              | GoTriangle        | \$333,000   | 50%           | \$ 166,500   | \$ 166,500   | 58.00       | 1                      | 4                       |
| 4 Improvements at Existing Bus Stops (Amenities)         | GoTriangle        | \$671,000   | 50%           | \$ 335,500   | \$ 335,500   | 54.50       | 2                      | 8                       |
| 2 Bundled Enhanced Transfer Points (ETPs)                | GoRaleigh         | \$984,000   | 20%           | \$ 787,200   | \$ 787,200   | 53.50       | 3                      | 10                      |
| 5 Improvements at Existing Bus Stops (Accessibility)     | GoTriangle        | \$473,000   | 50%           | \$ 236,500   | \$ 236,500   | 52.00       | 4                      | 11                      |
| 1 Bus Stop Improvements for Current and Existing Stops v | GoRaleigh         | \$2,500,000 | 20%           | \$ 2,000,000 |              | 48.00       | 5                      | 13                      |
| Total                                                    |                   | \$4,961,000 |               | \$ 3,525,700 | \$ 1,525,700 |             |                        |                         |
| Target Modal Investment                                  |                   |             |               |              | \$ 2,000,000 |             |                        |                         |
| Total Programming                                        |                   |             |               | \$           | 25,000,000   |             |                        |                         |
| Target Programming Amount                                |                   |             |               | \$           | 25,000,000   |             |                        |                         |
| Over/Underprogramming                                    |                   |             |               | \$           | (0)          |             |                        |                         |

## **December 9 & 14, 2020 LAPP Selection Panel Meeting Overview**

### **Attendees:**

John Hodges-Copple, Regional Planning Director, TJ COG  
Joey Hopkins, Chief Engineer, NC DOT Division 5  
Kai Monast, Director, Public Transportation Group, ITRE  
Leta Huntsinger, Director of Research, Systems Planning and Analysis, ITRE  
Joe Milazzo, Executive Director, RTA  
Chris Lukasina, Executive Director, CAMPO  
Shelby Powell, Deputy Director, CAMPO  
Gretchen Vetter, LAPP Program Manager, CAMPO  
Alex Rickard, Deputy Director, CAMPO  
Mike Bruff, Transportation Modeling Engineer, CAMPO

### **Discussion:**

The Selection Panel began by reviewing the LAPP Program: underlying goals, funding restraints, and the target modal investment mix. The Panel then went over how LAPP projects are scored and the criteria used for each mode of transportation. The Panel was reminded of the options they have when providing a recommendation for a LAPP Investment Program. Those options are:

- Recommend projects based on raw scoring
- Recommend projects based on other documented considerations
- Use raw scores until modal target budgets are met
- Recommend modifying modal mix targets and allow for additional budget in a specific mode
- Institute 50 percent of modal top score rule- not recommending funding for a project that scores less than 50 percent of the highest-scoring project in the mode

### **Roadway Projects:**

With these options in mind, the Selection Panel began their review of the roadway projects submitted. The target modal investment for roadway was \$16,250,000. The Selection Panel reviewed the top nine roadway projects, the total number of projects that could be fully funded within the confines of the modal investment target for roadway. After receiving some clarification from two of the projects, the Panel agreed that these projects were valuable and should be recommended for funding. The Panel noted that the tenth and eleventh scoring projects, the NC 55 widening and Dillard Drive Turn Lanes, were strong projects and within one point of the ninth ranked project; however, after comparing projects amongst the other competing modes, the Panel did not recommend offering partial funding to these projects or exceeding the target modal investment for roadway. A few weeks after the finalized recommendation of projects from the Selection Panel, the Town of Garner indicated to CAMPO that the Town wished to complete their Jones Sausage Road submitted project 100% locally, as to expedite the project; thus returning the \$300,300 recommended for funding. CAMPO offered this returned funding, along with the remaining funding in the FFY2022 programming allotment of \$25m as partial funding to the Town of Holly Springs for their NC 55 bypass widening project. The Town accepted partial funding in the amount of \$508,305.

The funding recommended for roadway fully-funds the top ten projects, minus the rescinded eight project, totaling \$16,005,278.

**Bicycle and Pedestrian Projects:**

The Selection Panel then reviewed bicycle and pedestrian projects. The target modal investment for the bicycle and pedestrian mode was \$6,750,000. The Selection Panel reviewed the top six projects and noted concern about the timing of the second-highest scoring project. This project, Cary's Old Apex Road sidewalk includes a railroad crossing, and the Selection Panel was unsure if the project would be able to meet the timing requirements of LAPP with the added complexities of negotiating with the railroad. The Selection Panel then reviewed the seventh-scoring project in the mode, which could not be fully funded if adhering to the target modal investment for bike/ped. This project, the NW Cary Parkway Sidewalk was noted to be an important project due to safety concerns, but very expensive because of significant utility relocation and bridge components. The Selection Panel, after being comfortable with the roadway and transit recommendations, reached out to the Town of Cary to consider three options. 1) if the Town feels comfortable with the timeline of the Old Apex Sidewalk project, submit justification that the Town can reach the required deadlines, 2) would the Town be able to accept partial funding for NW Cary Parkway Sidewalk, or 3) if the Town does not feel comfortable with the timeline for Old Apex Sidewalk or the Town would prefer to prioritize NW Cary Parkway, the Town could rescind their request for Old Apex Sidewalk and fully-fund NW Cary Parkway Sidewalk. The Town of Cary ultimately decided to choose option three and rescinded their application for Old Apex Sidewalk to fully-fund NW Cary Parkway. The Selection Panel accepted this choice and recommended fully funding the top seven bike/ped projects, minus the Cary Old Apex Sidewalk Project, which would exceed the target modal investment by \$719,023. This recommendation was justified by the acknowledgement that there is a significant gap in bike/ped funding through other funding avenues at the state and federal level. Also, one project, the GoRaleigh Connecting Sidewalks for Bus Stop Improvements, has a positive impact to the transit network in addition to a bike/ped benefit.

The funding recommended for bicycle and pedestrian fully funds the top seven projects, minus the rescinded Old Apex Sidewalk Project, totaling \$7,469,023.

**Transit Projects:**

The Selection Panel reviewed the transit projects last. The target modal investment for transit is \$2,000,000. The Selection Panel reviewed all five submitted transit projects, noting some challenges in comparing projects that are bundled without locations specified. Regardless, the Selection Panel acknowledged that bundled projects can significantly impact many transit riders and supported all the transit projects submitted. The top four projects in the mode totaled \$1,525,700, while the final project in the mode totaled \$2,000,000. The Selection Panel recommended fully funding the top four projects in the mode and offering the remaining funding from the target modal investment to the bike/ped mode. This decision was based on the fact that the final project in the mode was too large to be fully funded, the aforementioned gap in bike/ped funding, and that a recommended bike/ped project submitted by GoRaleigh will have a direct impact to transit as well.

The LAPP Selection Panel recommended fully funding the top four transit projects totaling \$1,525,700.

**All Projects:**

The total amount of funding the Selection Panel recommends programming for FFY22 is \$25,000,000. The Selection Panel ultimately recommended fully funding nine roadway projects, totaling \$16,005,278. The bicycle and pedestrian mode is recommended to fully-fund six projects, totaling \$7,469,023. The transit mode is recommended to fully-fund four projects and one partial project, totaling \$1,525,700.



The recommended LAPP Investment mix is 64% roadway, 30% bicycle and pedestrian, and 6% transit. The Target Modal Investment Mix was 65% roadway, 27% bicycle and pedestrian, and 8% transit.

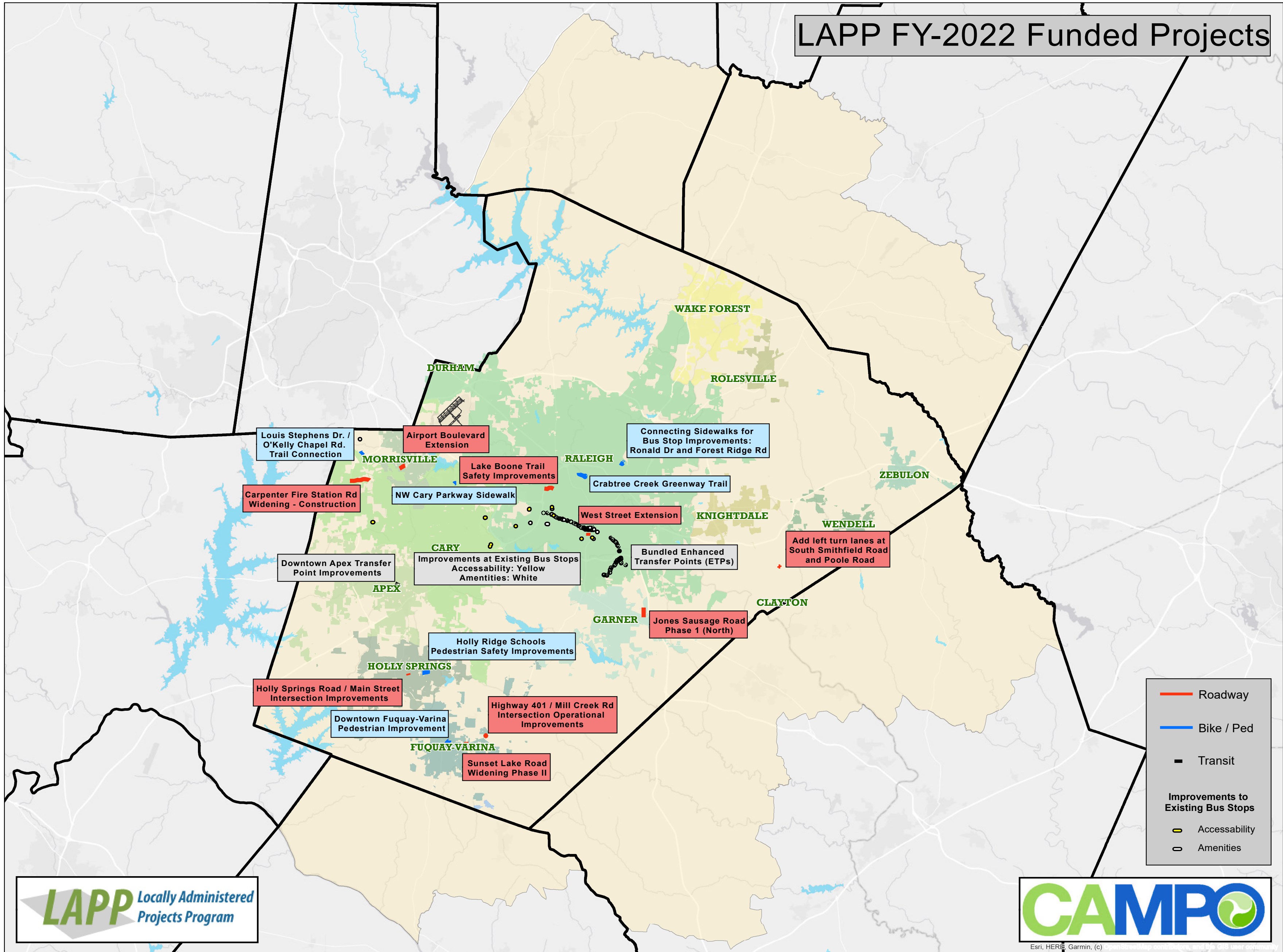
#### **Policy Items for Consideration**

In addition to the FFY2022 funding recommendation, the Selection Panel also discussed and is recommending further consideration of multiple policy items that came up during discussions of this year's program. The Selection Panel requests these subjects be discussed during the next LAPP development process to improve the existing Locally Administered Projects Program.

- **Logical Termini:** There have been occasions when a project submitted to LAPP is associated with or a part of a larger project to address the transportation needs of an impacted area. In reviewing these types of projects, concerns remain on whether the intended transportation benefit could be achieved without completing *all* phases of a project. The Selection Panel suggests this issue could be mitigated by greater scrutiny in determining if a stand-alone project submitted to LAPP produces an independent utility and is a justified logical terminus to produce a transportation benefit.
- **Conscious Development:** The CAMPO region is experiencing new growth and development that, along with many benefits, results in negative impacts to our transportation network. Local jurisdictions faced with these traffic impacts and can negotiate with developers beforehand (by way of conditional approvals, etc.) to have developers build or fund solutions for the transportation needs brought on by their developments. In scenarios where this does not occur, or the local jurisdiction may offer to provide transportation incentives for the development to come without addressing other clear impacts, the use of regional public funding to alleviate issues caused by a specific development is viewed as problematic by some of the Selection Panel. While the Selection Panel has mixed opinions on how involved the Locally Administered Projects Program should be in this issue, especially since it is challenging to determine if a single development is causing the transportation issues in a specific location, the Panel would like to stress the importance of including necessary transportation projects in negotiations with potential development.
- **Accessibility and Environmental Justice in Transit Scoring:** The current criteria used to score transit projects does not have a specific measure that accounts for accessibility or providing transit access to underserved areas. The Selection Panel recommends considering adding components of these items to future scoring criteria, to incentivize or give advantage to projects that can serve those areas.
- **Inclusion of Dedicated Access to Transit Funds in Wake County Transit Plan:** currently, there is not a line-item in the Wake County Transit Plan that designates specific funds to transit access improvement projects, specifically sidewalks; however, there have been discussions of adding them in the past. The LAPP Selection Panel has indicated support of this inclusion, since access improvements are a major component of transit ridership, safety, and equity.
- **Location Requirement in Transit Bundling Projects:** Historically, transit agencies have submitted bundled projects that include bus stop improvements at multiple locations. The locations of the bus stops have not been required as part of the application process. While bundling projects has been shown as an effective method to complete improvements in a cost-effective manner that impacts many people/locations, it is challenging to measure the value and track these

projects when locations are not submitted. The Selection Panel recommends requiring location requirements in future LAPP applications, so projects can be further evaluated and tracked if funded.

# LAPP FY-2022 Funded Projects



Draft as of: 12/30/2020



## Town Council Agenda Cover Sheet

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**Meeting Date**

March 1, 2021

**Agenda Location**

New Business

**Item Title**

SAFER Grant

**Presenter**

Liz Jernigan

**Summary/Description**

FEMA has opened up the SAFER 2020 (hiring grant) application period through March 12, 2021. We are requesting Council approval to apply for 9 additional firefighters to staff the new ladder truck planned for delivery this summer.

**Requested Action**

Approval

**Funding Source (If Applicable):**

N/A

**Cost:** N/A   Yes ☐   No ☒

**Additional Documents to be Included in Agenda Packet****Meeting Timeline**

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