



**Town of Clayton
Regular Town Council Meeting Agenda
Monday, January 6, 2020 @ 6:00 PM
Council Chambers**

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. DRAFT Minutes
 - December 16, 2019 - Regular Session
[December 16, 2019 DRAFT Minutes](#)
- b. Student Art Month Proclamation
[Proclamation](#)
- c. Wastewater Allocation Policy
[Wastewater Allocation Score Sheet](#)
- d. PEG Media Interlocal Agreement
[Cover](#)
[PEG Media Interlocal Agreement](#)
- e. Warranty Acceptance
 - Parkview, Phase 14 - FINAL
[Parkview, Phase 14 - FINAL](#)

POTENTIAL ACTION: Adoption of Consent Agenda as Presented

4. ADMINISTRATIVE ITEMS

5. INTRODUCTIONS AND SPECIAL PRESENTATIONS

- a. Student Art Month Proclamation Presented to Susan Johnson - Woman's Club / Student Arts Festival Chair
Presenter: Jody McLeod, Mayor

6. PUBLIC HEARINGS

- a. 2019-40-PDD - Buckhorn Branch Planned Development - Rezoning
Presenter: Planning Department
[Cover](#)
[Application](#)

[Consistency And Reasonable Statement](#)
[Neighborhood Meeting Materials](#)
[TC Adj Property Letter](#)
[Newspaper Ad](#)
[PB Recommendation](#)
[Staff Report](#)
[Staff Report Map](#)
[Motion Form](#)
[Ordinance](#)

POTENTIAL ACTION: Adoption of Ordinance #2020-01-01

b. 2019-39-SD - Buckhorn Branch Preliminary Plat - (Quasi Judicial)

Presenter: Planning Department

[Cover](#)
[Updated Application](#)
[Neighborhood Meeting Materials](#)
[TC Adj Property Letter](#)
[Newspaper Ad](#)
[Final Site Plan](#)
[NCDOT TIA Comments](#)
[TIA Appendix](#)
[TIA Report](#)
[Truck Turn Exhibit](#)
[Staff Report](#)
[Staff Report Map](#)
[Wastewater Allocation Request](#)
[Motion Form](#)
[Resolution - Wastewater](#)

POTENTIAL ACTION: Approval/Denial of 2019-39-SD

POTENTIAL ACTION: Adoption of Resolution #2020-01 (Wastewater Allocation)

c. 2019-183-SUP - Clayton Storage Special Use Permit - (Quasi Judicial)

Presenter: Planning Department

[Cover](#)
[Application](#)
[Owner's Consent](#)
[Neighborhood Meeting Materials](#)
[Neighbor Concerns](#)
[2nd Neighborhood Meeting Materials](#)
[Adjacent Property Letter](#)
[Newspaper Ad](#)
[Site Plan](#)
[Clayton Storage Floodway Letter](#)
[Stormwater Impact Report](#)
[Stormwater Statement](#)
[Staff Report](#)

[Staff Report Map](#)
[Motion Form](#)

POTENTIAL ACTION: Approval/Denial of 2019-183-SUP

- d. 2019-243-OA - Code of Ordinance Amendment - Unified Development Ordinance - §155.400 (Access)
Presenter: Planning Department
[Cover](#)
[Application](#)
[Newspaper Ad](#)
[PB Recommendation](#)
[Consistency Statement](#)
[Updated Final - Strikethrough Copy](#)
[Updated Final - Clean Copy](#)
[TC Staff Report](#)
[Motion Form](#)
[Ordinance](#)

POTENTIAL ACTION: Adoption of Ordinance #2020-01-02

7. OLD BUSINESS

- a. Downtown Mural Guidelines
Presenter: Stacy Beard, Communications Director
[Cover](#)
[Downtown Mural Program Guidelines & Application](#)

POTENTIAL ACTION: Approve Guidelines

8. NEW BUSINESS

- a. Fire Advisory Board (FAB) Recommendations
Presenter: Kimberly Moffett, Town Clerk
- Matt Sutphin - Term Expiration 12/31/2022
 - Karen Patterson - Term Expiration 12/31/2023
- [Cover](#)
[Recommendation Chart](#)
[Applications](#)

POTENTIAL ACTION: Appointments to Fire Advisory Board

- b. Budget Amendments - Capital Budget Projects - Little Creek Outfall & Walnut Creek
Presenter: Robert McKie, Finance Director
[Cover](#)
[Budget Ordinance Little Creek](#)
[Budget Ordinance Walnut Creek](#)

POTENTIAL ACTION: Adoption of Ordinances #2020-01-03 & #2020-01-04

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. CLOSED SESSION

- a. Closed Session Pursuant to NCGS 143.318.11(a)(3) - Attorney Client Privilege

POTENTIAL ACTION: Motion To Go Into Closed Session

12. 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
Regular Town Council Meeting Minutes
Monday, December 16, 2019 @ 6:00 PM
Council Chambers

COUNCIL PRESENT:

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

STAFF PRESENT:

Adam Lindsay, Town Manager
Nancy Medlin, Deputy Town Manager
Katherine Ross, Town Attorney
Heidi Holland, Deputy Town Clerk
Steve Blasko, Public Works Oper. Manager
James Blalock, Utility Maintenance Supervisor
Joy Garretson, Library Director
Blair Myhand, Police Chief
Samantha Wullenwaber, Planning Director
Haley Hogg, Planner
Robert McKie, Finance Director
Rich Cappola, Public Services Director
Ann Game, Customer Service Director

COUNCIL ABSENT:

1 CALL TO ORDER

Pledge of Allegiance and Invocation

- a) Mayor McLeod called the meeting to order at 6:01 p.m. He led everyone in the Pledge of Allegiance and also offered the invocation.

2 ADJUSTMENT OF THE AGENDA

- a) Mr. Lindsay requested Item 8d, Downtown Mural Program Guidelines and Application, be removed and placed on the January 6, 2020 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
 - Lionsgate Subdivision - Phase 6A-6B
 - Highgate Subdivision - Phase II
 - Ashcroft Subdivision - Phases 1 & 3 - FINAL ACCEPTANCE
 - Boling Townhomes, Buildings 47-51 - FINAL ACCEPTANCE
 - Parkview Subdivision, Phase 2B, 3, 5 & 7 - FINAL ACCEPTANCE
- b) Draft Minutes
 - November 18, 2019 - Regular Session
 - December 2, 2019 - Regular Session

- c) Proclamation - Honoring Robert "Bob" Ahlert

ACTION: Adoption of Consent Agenda as Presented

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

4 ADMINISTRATIVE ITEMS

5 INTRODUCTIONS AND SPECIAL PRESENTATIONS

- a) New Employee Introductions

Presenter: Steve Blasko, Public Works Operations Manager

- Julian Holt, Streets Maintenance Worker
- Russell Yolland, Streets Maintenance Worker
- Norman, Nelson, Property Maintenance Worker

Presenter: James Blalock, Utility Maintenance Supervisor

- Jairo Sanchez, Utility Maintenance Mechanic
- Donnie Baker, Utility Maintenance Mechanic

Presenter: Adam Lindsay, Town Manager

- Delicia Barnes, Human Resources Director

Mr. Blasko introduced three new employees. Mr. Yolland thanked Council and Mr. Blasko for the opportunity and stated he looks forward to working in Clayton. Mr. Holt thanked Council for the opportunity and Mr. Nelson stated he felt very privileged to work for the town. Council welcomed everyone.

Mr. Blalock introduced two new employees. He stated Mr. Sanchez is bilingual and came highly recommended while Mr. Baker is a former employee that worked 10 years as the Street Department crew leader. Mr. Sanchez stated he is very grateful and Mr. Baker stated he was glad to be back. Both employees were welcomed by Council.

Mr. Lindsay introduced Ms. Barnes and stated he is thrilled to have her here in Clayton. She stated she is extremely happy to be here and stated she was extremely impressed at the welcome she has received. Council welcomed her.

- b) Special Recognition of Long-time Library Advisory Board Member Belle Allen
Presenter: Joy Garretson, Library Director

Ms. Garretson shared with Council why Ms. Allen deserved this award. She stated she has that spark and is special, it took her about 12 seconds to realize that about Ms. Allen. She is one of the greatest library supporters and has been since 1966, over half a century. She has helped with the expansion of the library, she has guided it from a one room library to the current site. She has been vice-chair and chair of the library advisory board. She's the first to volunteer and the first to tell staff they are appreciated. She's the longest serving member of the board, over 53 years. She stated Ms. Allen wholeheartedly deserves this award. Ms. Allen thanked Joy and Council and

stated she was shocked to receive this award. She stated the library has always been a special part of her life, she thanked everyone. Mayor McLeod thanked her for everything she has done throughout the years.

- c) **Presentation of Proclamation for Robert "Bob" Ahlert**
Presenter: Mayor McLeod

Mayor McLeod read the proclamation honoring Robert "Bob" Ahlert for over 20 years of serving the community. Mr. Ahlert thanked the Council for the recognition and the opportunity to serve all those years.

- d) **Citizen Recognition - Hope Box Blankets**
 - Andrew and Avery Hile*Presenter: Blair Myhand, Police Chief*

Chief Myhand shared the history behind the Hope Box Blankets, which is an organization that collects blankets for children in the winter. He stated this began last year and 51 blankets were collected then. The organizer of Hope Box Blankets came to the Chief again this year to ask for the department's participation. Chief Myhand stated the goal this year was 150 blankets to celebrate Clayton's 150th year.

He stated Officer Tyler was at Harvest Fest where he met Avery and Andrew Hile and the conversation led to the blanket drive. The children stated they were going to start collecting blankets for this event. Over the time span of a few weeks, they collected over 500 blankets. Chief Myhand stated he was blown away by the work these two young children have done. Chief Myhand read and presented Avery and Andrew with a certificate for the work that they have done. As of tonight, a total of 1160 blankets have been collected, 1144 came from the Town and over half of that total were collected by Avery and Andrew. Chief Myhand thanked them and stated this was a fine example of two young children that will grow up to be fine citizens. Mayor McLeod expressed his appreciation to both children.

6 PUBLIC HEARINGS

- a) **2019-229-RZ - JAK Holding Rezoning**
Presenter: Haley Hogg, Planner II

Ms. Hogg stated this request is rezoning from Residential Estate to Highway Business, the lot is just under 1.5 acres and is located on the northwest corner of Shotwell and US Hwy 70. She presented a zoning map and photos of what the intersection looks like now. She stated the proposed rezoning is inconsistent with the Comprehensive Plan but worth pointing out staff is supportive of the rezoning due to consistency with other parcels in the intersection currently being developed for commercial. It also envisioned the intersection will serve as a commercial node for surrounding residential development. Ms. Hogg stated if this is approved, the Future Land Use Map will automatically be updated accordingly and a site plan would have to go through the process. The applicant would have to meet buffer requirements

against the residential properties. Both Staff and the Planning Board recommended approval.

Council Member Grannis questioned the abutting of the properties, Ms. Hogg stated the property is considered abutted even though it's across the right of way. There was detailed discussion on this subject. Ms. Wullenwaber stated the property is considered abutting, and a buffer would be required around any properties that are not zoned similar. Mayor McLeod stated this has been advertised as a public hearing and asked if anyone wished to speak.

Citizen Mr. Powell stated his father owns 1275 Shotwell Road, which will be abutting this development if approved. He stated his father objects to this because they do not want commercial development right next to his house. Mr. Powell stated they would not be able to get out of driveway if this were approved.

The applicant, Ready Roofing, was present and spoke on this matter. He stated the company have run out of room where they are currently located and wish to go across the street to expand their operation. He stated he would be happy to put up any trees to make this happen. He invited Mr. Powell to come over and speak with him about this, he stated he would be happy to have open dialogue.

Council Member Grannis asked the applicant to explain what type of business would be moving to the location. The applicant stated it is Ready Roofing Co., they would have office space and a warehouse and the back of the property would be fenced in. Ms. Hogg stated this hearing is only on the rezoning purpose and she explained to the applicant he would have to go through other processes for fencing and outdoor storage.

Mayor McLeod stated t the Council is only voting on the rezoning tonight. He stated if approved, there are several technical processes the applicant would need to complete before any future development could take place.

Mayor McLeod asked if anyone else wished to speak. With no one further coming forward the item was turned over to Council for discussion.

ACTION: Adoption of Ordinance #2019-12-01

Motion: Council Member Holder

Second: Council Member Bunn

Vote: Motion Passes 4-1 (Everett, Bunn, Holder, Grannis)(Opposed: Thompson)

b) 2019-230-RZ - Grand Plaza Rezoning

Presenter: Samantha Wullenwaber, Planning Director

Ms. Wullenwaber stated this request is to rezone a property located at 13025 US Hwy 70 from a Business Highway Special Use District to Business Highway to remove the Special Use District overlay. The property size is a little over 1

acre. Ms. Wullenwaber stated it is consistent with the Comprehensive Plan and Surrounding Land Uses. Staff and Planning Board recommends approval.

Mayor McLeod announced this as a public hearing and asked if anyone wished to speak. With no one wishing to speak, the item was turned over to Council for discussion.

ACTION: Adoption of Ordinance #2019-12-02

Motion: Council Member Grannis

Second: Council Member Holder

Vote: Unanimous

- c) 2019-183-SUP - Clayton Storage - Special Use Permit (Quasi-Judicial)
Presenter: Haley Hogg, Planner II

ACTION: Continue to January 6, 2020

Motion: Mayor Pro Tem Thompson

Second: Council Member Grannis

Vote: Unanimous

7 OLD BUSINESS

8 NEW BUSINESS

- a) 2020 Clayton Chamber of Commerce Harvest Festival and Shindig Dates
Presenter: Dana Wooten, Clayton Chamber of Commerce President/CEO

Ms. Wooten from the Chamber of Commerce and Dave Brown from the Clayton Mid-Day Rotary requested approval for the festival to be held Oct. 28 – Nov. 1, 2020 The Shindig and large vendor fair would be held on Halloween.

Ms. Wooten stated she has met with town manager, Chief of Police, Fire Dept., and employees from Parks and Rec. to discuss how this event would work on Halloween. She stated they have collaborated and came to a conclusion how this would work.

Council Member Holder asked how the date of Halloween was chosen for these two events. Ms. Wooten went into discussion of the Harvest Festival being changed from September to October two years ago due to the hurricane coming through. The first year the dates were changed it happened to fall on the same day as the Shindig. She stated with leap year in 2020, it pushes everything back a week.

Council Member Bunn asked to elaborate on what has been worked out between the Chamber and the town, she stated the discussions have included increased security, helping the fire dept. in certain ways with water, etc. Council Member Grannis asked what the dates would be in 2021, Ms. Wooten

provided the dates for the next 5 years. There was further discussion on the decisions and the thought process behind the chosen dates.

Council Member Grannis asked if there are any contractual agreements left. Ms. Wooten stated one of the reasons the Harvest Festival can't go beyond November 1 is because the carnival does not book anything past the last weekend in October.

Ms. Wooten stated they have signed the contract with the carnival. Council Member Grannis asked if they had any discussion with the town before doing that, she stated she did not. Council Member Grannis stated he is appreciative for everything she does at the chamber but is disappointed that Clayton was not involved before the contract was signed.

There was further discussion about the potential increase of additional town staffing and the cost of that. Ms. Wooten stated she understands there may be an additional cost to the town. She stated she would love to sit down and crunch numbers to see the difference in having the events together as well as separate. Mayor McLeod stated it's equally important to see how much money this event would bring to the town.

Ms. Wooten stated an economic impact study would be done in the future to show those numbers on this event. Council Member Grannis stated this event is probably the single most important function that Clayton has and he recognizes this. Mayor Pro Tem Thompson stated he thinks the benefit of having these events together outweigh the bad. In his years of experience, he has not seen an increase in calls on Halloween. He stated out of respect for the officers and fire department, it would benefit them to work one night for one big event rather than two separate events.

ACTION: Approval of 2020 Dates for Harvest Festival and Shindig

Motion: Mayor Pro Tem Thompson

Second: Council Member Holder

Vote: Unanimous

b) Budget Amendment

Presenter: Robert McKie, Finance Director

Mr. McKie requested Council approve two budget amendments that provide additional funding for professional services related to construction of the Neuse River Water Reclamation Facility.

ACTION: Adoption of Ordinances #2019-12-04 & #2019-12-05

Motion: Council Member Thompson

Second: Council Member Grannis

Vote: Unanimous

c) Updated Wastewater Allocation Policy

Presenter: Rich Cappola, Public Services Director

Mr. Cappola stated the last update to this policy was in 2010. The new proposed policy is a point based system that will analyze each development that comes forward to determine if certain criteria was met.

He stated currently a developer submits the wastewater allocation, the new policy would also require the submittal of a criteria spreadsheet with a goal of achieving at least 50 points. The new policy maintains that any request over 10,000 will go before Council, under 10,000 will be approved by town manager or his designees. Mr. Cappola went on further to discuss timelines in the policy as well as providing numbers on where we are today with the wastewater.

Council Member Bunn asked the status of the Steeplechase project. The approval was in July 2018, since that time they have submitted minor subdivisions which means their progression is still valid.

Mr. Cappola stated the timing of the new facility will play into this. When there is a firmer timeline on the new facility, the state will allow the town to book new allocations. Council Member Bunn asked if the number Mr. Cappola gave for the allocation was Raleigh and Johnston County combined, he stated it was.

Council Member Grannis thanked Mr. Cappola and his team. He stated he assumed that Economic Development was included in discussions about this, Mr. Cappola stated he was sure there have been allocations for projects in that department. Mayor McLeod thanked Mr. Cappola.

ACTION: Placed on January 6, 2020 Consent Agenda

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

- d) Downtown Mural Program Guidelines & Application
Presenter: Stacy Beard, Public Information Officer

This item was removed from the agenda and will be brought before Council at the January 6, 2020 meeting.

- e) Amendment to By-Laws - Library Advisory Board
Presenter: Heidi Holland, Deputy Town Clerk

Ms. Holland stated on September 19, 2019 the Library Advisory Board members recommended changing the wording in the By-Laws regarding the recorder of the minutes.

ACTION: Adoption of Resolution #2019-49

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

- f) Code of Ordinance Amendments - Chapter 32
Presenter: Heidi Holland, Deputy Town Clerk

Ms. Holland stated due to a recent change in the Recreation Advisory Board By-Laws and the Library Advisory Board By-Laws, it is requested to amend Chapter 32, sections 060 and 117, to reflect these changes.

ACTION: Adoption of Ordinance #2019-12-03

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

9 STAFF REPORTS

- a) Town Manager
- b) Town Attorney
- c) Town Clerk
- d) Other Staff
 - AMI Update

Presenter: Ann Game, Customer Service Director

Ms. Game provided an update on the AMI project. She stated this was a huge project for the town and every department in the town was included. She stated the current metering infrastructure is aging out. Ms. Game gave a brief report on the back history of the prior technology for the metering.

She stated customers would now be able to have information at their fingertips that showed them how their lifestyles affect their bills. Ms. Game stated a lot of citizens are stating their bill is high, the new technology would bring the ability to contact the customer if their meter is running higher than normal. This technology has cut down on high bill complaints because citizens can be proactive.

Ms. Game stated they are on schedule for meter deployment. The meters would be installed in January and the billing worked out long before the citizens are billed to assure everything was working properly. There will be a bill backer starting in January to keep customers informed. Since May, all new construction has the new meters in the ground, and being able to read these will happen very soon after meters are installed.

Council Member Bunn asked what type of tower is being used for the meters and if there was any information regarding safety and any radiation concerns. Ms. Game went into detail of the towers and stated she would get more information out to him. He asked what the life of these meters are, Ms. Game stated the life span is 15 years. Council Member Bunn asked if the \$2 monthly charge will continue the entire 15 year period. Ms. Game stated this would be looked at in the future.

10 OTHER BUSINESS

a) Informal Discussion & Public Comment

Kyle McDermott, of Johnston Health Services and a Chamber of Commerce member, thanked Council for their vote on changing the dates for the Harvest Festival. He also thanked the support law enforcement gives.

He discussed the water main that broke Saturday morning which affected the hospital. He thanked the staff and commended them for how quickly the water was restored. He spoke with Dave DeYoung, Adam Lindsay and Rich Cappola and they were all very quick to react. He stated Rod in utilities is an "A-1" guy and further stated we have a great staff and wanted to offer his thanks. Mayor Pro Tem Thompson thanked Mr. McDermott for everything the hospital does for the town.

b) Council Comments

Council Member Holder stated he wanted to discuss long term plan on development. His concern is the number of high density houses being built, in order for the town to thrive we need more than starter size houses. He feels this is an issue that needs to be looked at. Mayor McLeod stated this is a great topic to add to the Council Retreat. Mr. Lindsay stated this is already being looked at for the retreat.

Mayor McLeod thanked the partners at Rotary Club for an awesome parade and thanked the town and various department in making the parade happen. He wished everyone a Merry Christmas and a Happy New Year.

11 ADJOURNMENT

a) With there being nothing further, the meeting was adjourned at 7:31 p.m.

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

Duly adopted this the 6th day of January, 2020 while in regular session.

Jody L. McLeod
Mayor

ATTEST:

Kimberly A. Moffett, CMC, NCCMC
Town Clerk

December 16, 2019
Minutes

roclamation

Student Art Month

WHEREAS, the arts, in its many forms, constitute an important part of the community and contribute to the development of our youth; and,

WHEREAS, participation in and enjoyment of the arts can take many forms, including the visual arts, fine arts and performing arts; and,

WHEREAS, the Woman's Club of Clayton has sought to promote the involvement of our youth in various art projects to the betterment of their minds and the community as a whole.

NOW, THEREFORE, LET IT BE PROCLAIMED by the Honorable Mayor and Town Council of the Town of Clayton that the month of January each year, be recognized as:

TUDENT RT ONTH

Let it also be proclaimed that all businesses, industries and citizens in the Clayton community are urged to support and encourage the school aged children of Clayton to participate in the arts.

Duly proclaimed by the Clayton Town Council this the 6th day of January 2020, while in regular session.

Jody L. McLeod
Mayor

WATER & WASTEWATER ALLOCATION CRITERIA

TOTAL POINTS = 0 *MINIMUM 50 POINTS REQUIRED*

	Category	Points	Calc.	Notes
DEVELOPMENT TYPE	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 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-Use	30		
	Downtown Redevelopment	30		
	Infill Development	25		Utilities already exist within 300 Feet of property
	<i>All Other categories</i>			<i>Subject to Town discretion</i>
FUTURE TAX STATUS	Exempt	0		
	Residential	5		
	Non-residential	10		
	Industrial	10		
COMMUNITY BENEFIT BONUS POINTS	Cultural Arts/Entertainment for Public	10		
	Sports/Recreation for Public	10		
	Town Electric Customer	20		
	Expansion of existing non-residential use	10		
	Residential Subdivision - Additional amenities included	5 - 15		Pool, Clubhouse, sports courts, etc. - 5 pts per, max 15 pts
	Job Creation - 0 to 25 new jobs	5		
	Job Creation - 26 to 100 new jobs	10		
	Job Creation - 100+ new jobs	15		
	Residential - Multiple-Car Garages provided	5		
	Residential - Overflow Parking provided	5		
	Masonry Elements included in Building Construction	10		
	Sustainable/High Efficiency Products and appliances used	5 - 15		5 pts per, max 15 pts
	Private trail connection to Public Greenway	10		
COMMUNITY IMPACT DEDUCT POINTS	Pump Station Improvements required	-10		
	New Pump Station Required	-20		Subject to Town policy and standards
	Out-of Town Status (After construction)	-10		
	Fee-in-lieu for improvements required	-10		
	Outside Fire District	-5		
	Inconsistent with Comp Plan	-5		



Town Council Agenda Cover Sheet

Meeting Date

January 6, 2020

Agenda Location

Consent Agenda

Item Title

PEG MEDIA INTERLOCAL AGREEMENT

Presenter

Stacy Beard, Communications Director

Summary/Description

In 2012, the Town of Clayton, Knightdale, Wendell, Rolesville, Garner, Archer Lodge and Zebulon formed a partnership (PEG Media Partners) to contract with East Wake Television to jointly operate their public access TV channels.

The seven towns signed an Interlocal Agreement and its now time to update that agreement. A draft version was discussed by the PEG Media Board of Directors in June, reviewed by each town and the board reconvened at its regular meeting in December, voting 6-0 to accept an updated and revised proposal. Each town is now have elected official make a final approval.

This proposed Interlocal Agreement has a three-year term. If a town withdraws from the agreement on its expiration date, then the remaining members can continue by adopting a new agreement. If no town withdraws, the agreement will automatically renew for an additional three years.

Requested Action

Approval

Funding Source (If Applicable):

PEG Channel support funds distributed state tax on cable subscribers

Cost: N/A Yes ☐ No ☒

Additional Documents to be Included in Agenda Packet

Interlocal Agreement

Meeting Timeline

Approve tonight. Once all other town boards have approved the agreement, each town manager of the towns will sign a final copy.

INTERLOCAL AGREEMENT

THIS INTERLOCAL AGREEMENT (the "Agreement") is made and entered into by, between, and among the TOWN OF ARCHER LODGE, a North Carolina municipal corporation ("Archer Lodge"); the TOWN OF CLAYTON, a North Carolina municipal corporation ("Clayton"); the TOWN OF GARNER, a North Carolina municipal corporation ("Garner"); the TOWN OF KNIGHTDALE, a North Carolina municipal corporation ("Knightdale"); the TOWN OF ROLESVILLE, a North Carolina municipal corporation ("Rolesville"); the TOWN OF WENDELL, a North Carolina municipal corporation ("Wendell") and the TOWN OF ZEBULON, a North Carolina municipal corporation ("Zebulon"). Each of Archer Lodge, Clayton, Garner, Knightdale, Rolesville, Wendell and Zebulon shall be referred to herein as a "Member" and collectively shall be known as the "Members."

WITNESSETH

WHEREAS, North Carolina General Statutes § 66-350 *et. seq.*, commonly known as the State Cable Franchise law, requires cable service providers with a State-issued franchise to provide for and transmit public, educational, or governmental access channels ("PEG Channels"); and

WHEREAS, East Wake Television, a North Carolina non-profit corporation, and PEG Media Partnership, a North Carolina non-profit corporation (collectively, "PEG Media") are owned and operated by the Members for the purpose of providing community access television programming on four (4) certified PEG Channels; and

WHEREAS, the Members, through PEG Media, are committed to the delivery of the highest possible level of community access television programming to the citizens of the Members; and

WHEREAS, the Members desire to continue their existing relationship for the joint funding and operations of their PEG Channels; and,

WHEREAS, North Carolina General Statutes § 160A-460 *et. seq.*, commonly known as the Interlocal Cooperation Act, permits the Members to enter into an interlocal agreement to execute any power, function, public enterprise, right, privilege or immunity of local government on behalf of one another.

NOW, THEREFORE, for and in consideration of the mutual promises and covenants contained in this Agreement, the sufficiency of which is hereby acknowledged, the Members agree as follows:

ARTICLE 1. Definitions

For all purposes of this Agreement, unless the context requires otherwise, the following capitalized and underlined terms shall have the following meanings:

"ACT" shall mean Session Law 2006-151 of the State of North Carolina titled "An Act to Promote Consumer Choice in Video Service Providers and to Establish Uniform Taxes for Video Programming Services" as signed into law by Governor Michael F. Easley on or about July 20, 2006 and as subsequently codified at North Carolina General Statutes § 66-350 *et. seq.*, as amended.

"EFFECTIVE DATE" shall mean the latest date of execution by any one of the Members as evidenced from the signature pages of this Agreement.

"EXPIRATION DATE" shall mean 11:59 p.m. Eastern Time on that date marking the end of the Term.

"PEG CHANNELS" shall mean any public, educational, or governmental access channel provided to any or all Members by Spectrum Cable, AT&T, Google, its successors in interest, or other Cable system (as defined by the Act) providing Cable service (as defined by the Act) within the jurisdictions of the Members.

"PEG FUNDS" means the funds received from distributions made pursuant to N.C .G.S . 105-164.44I(a) and supplemental P E G channel support funds distributed pursuant to N.C .G.S. § 105-164.44I(b).

"PERMANENTLY INSTALLED EQUIPMENT" shall mean equipment and cabling fastened to real property where removal would damage the real property.

"STATE" shall mean the State of North Carolina along with any agency of the State of North Carolina charged with administering the provisions of the Act.

"TERM" shall mean collectively the Initial Term plus any Subsequent Term created pursuant to this Agreement.

ARTICLE 2. Joint Operations Agreement

Agreement. The Members hereby agree and covenant that they shall jointly fund and operate PEG Media pursuant to the terms of this Agreement.

Term. The initial term of this Agreement shall be for a period of three (3) years commencing on the Effective Date. Unless otherwise terminated as provided for in Article 7, this Agreement shall automatically renew for an additional three (3) year term upon the same terms and conditions provided for herein (the "Subsequent Term").

2.1. Governance. The Board of Directors ("Board") of PEG Media shall consist of the six (6) Town Managers of Clayton, Garner, Knightdale, Rolesville, Wendell and Zebulon, or their designee, and the Town Administrator of Archer Lodge, or its designee (the "Directors"). The Board shall be responsible for establishing the By-laws and policies and procedures for PEG Media. The Board shall:

2.1.1. Insure compliance with the provisions of Article 3 of Chapter 159 of the North Carolina General Statutes, commonly known as The Local Government Budget and Fiscal Control Act, as it relates to Public Authorities; and

2.1.2. Conform programming to the requirements set forth by Article 3 of this Agreement; and

2.1.3. Adopt a budget and monitor the status of receipts from PEG Funds; and

2.1.4. Expend PEG Funds in accordance with restrictions imposed by North Carolina Law; and

2.1.5. Contract with other towns, organizations or companies, for the operation of the PEG Channels; and

2.1.6. Employ appropriate staff, including a Studio Director, who shall manage the daily operations of the PEG Channels, sign documents on behalf of PEG Media, purchase supplies and equipment provided for in the budget, set the programming schedules, hire staff, utilize professional consultants and serve as chief liaison between PEG Media, the Members, the appropriate State agencies charged with administering the provisions of the Act and the cable providers.

Paid employees of PEG Media, if any, shall be considered employees of PEG Media and shall not be considered employees of the individual Members and shall not be eligible for town benefits, including but not limited to, the Local Government Employees Retirement System.

Meetings of PEG Media.

2.2.1. Quarterly Meetings. The Directors shall meet at least quarterly to adopt a budget and to discuss and adopt rules or policies governing the management, operations, programming, maintenance, or funding of PEG Media.

2.2.2. Other Meetings. For any of the purposes expressed by this Agreement and in recognition of the mutual benefits accruing to the Members from the active coordination and cooperation of the Members, in supplement to the quarterly meetings, the Directors agree to meet from time to time (in person or online), as is reasonable and necessary, to coordinate, discuss, decide, adopt, or amend By-laws, rules or policies governing the management, operations, programming, or maintenance of PEG Media.

2.2.3. Voting. The Members hereby designate the Directors as the proper representatives at meetings described by this Section 2.4. The adoption or amendment of the By-laws or any budget, rule, or policy of PEG Media shall require a 4/7 vote of the-Directors. Online voting is authorized with a fixed time period of at least 48 hours to respond.

2.2.4. Ad Hoc Committees. The Board may appoint temporary Ad Hoc Committees, made up of at least three (3) Directors, to study issues and make recommendations to the full Board.

ARTICLE 3. Programming

All programming provided on PEG Channels shall be non-commercial in nature as required by the FCC and N.C .G.S. § 66-357(f).

Video programming shall be provided on the PEG Channels to meet requirements of North Carolina State statutes.

It is anticipated by the Members that the Members may wish to acquire additional PEG Channels during the Term or broadcast additional Cable services. The Members intend that any future-acquired PEG Channels be governed pursuant to this Agreement.

ARTICLE 4. PEG Media Funding

4.1. Source of Funds. For the purpose of ensuring that adequate financial resources are available to accomplish the goals of the Members, hereto, each of the Members hereby commits individually and severally to making all best efforts reasonably necessary to financially support-PEG Media. Without limiting the foregoing, the Members explicitly commit as follows:

4.1.1. Certified PEG Channels. Each of the Members individually shall certify to the State on or before the due date established by the North Carolina Department Revenue each year of the Term the number of qualifying PEG Channels operated by the Member, currently two each.

4.1.2. Grants. At the request of the Studio Director, the Members shall apply, either individually or collectively, as determined by the Studio Director, for any grant monies available to PEG Channels-

4.1.3. PEG Channel Supplemental Support. Funds distributed quarterly to the Members from the North Carolina Department of Revenue for Supplemental PEG Channel Support pursuant to N.C .G.S. §§ 105-164.44I and 105-164.44J shall be transferred immediately to and expended only for the operation and support of the PEG Channels.

4.2. Loss of Funding. If N.C.G.S. § 105-164.44I is repealed or changed such that PEG Media loses all or a significant portion of its State funding (fifty-one percent or more), each Member shall have the right to immediately withdraw from this Agreement. Members withdrawing based on loss of funding shall have the right to keep assets assigned to them for their use (audio and video recording equipment installed in Board room) and shall retain their interest in the equipment, furnishings and other assets of PEG Media.

ARTICLE 5. Title to Property

Title to any Permanently Installed equipment or fixtures acquired during the Term shall be with the fee owner Member of the real property to which the installed equipment or fixtures are affixed.

Title to any real property constructed on previously owned property shall remain with the Member holding title to such property.

ARTICLE 6. Assets

6.1 Sale of Assets. The Studio Director may sell surplus assets of PEG Media as necessary in the reasonable discretion of the Studio Director. Funds received from the sale of surplus-assets shall be used for the operation of PEG Media.

6.2 Termination Right. Should any Member exercise its Termination Right (as defined in Article 7 herein), and the remaining Members agree to continue the operation of PEG Media through a new agreement, all real property, personal property, equipment, and inventories shall remain with PEG Media; the terminating Member shall lose their right to any furniture, equipment or other assets, including proceeds in the event of a future dissolution.

6.3 Planning For Dissolution. The distribution of PEG Media's assets before dissolution shall be made in accordance with the Policy for the Distribution of the Corporation's Assets Before Dissolution, as approved by the Board and as amended from time to time (the "Planning For Dissolution Policy"), which is attached hereto as Exhibit A and incorporated herein by this reference. Notwithstanding anything herein to the contrary, in the event a Member withdraws from this Agreement pursuant to Section 7.2 herein, such Member shall be deemed to be a member of PEG Media on the last day of operation, solely for the purpose of distributing assets in accordance with the Policy on the Distribution of the Corporation's Assets Before Dissolution.

6.4 Dissolution. Upon the dissolution of the organization, assets shall be distributed for one or more exempt purposes within the meaning of Section 501(c)(3) of the Internal Revenue Code, or corresponding section of any future federal tax code, or shall be distributed to the federal government, or to a state or local government, for a public purpose. Any such assets not disposed of shall be disposed of by a court of competent jurisdiction in the county in which the principal office of the organization is then located, exclusively for such purposes or to such organization or organizations, as said Court shall determine, which are organized and operated exclusively for such purposes.

ARTICLE 7. Termination or Withdrawal

7.1 Termination. This Agreement shall not otherwise be terminated prior to the end of its Term except as follows:

7.1.1 Unanimous Vote. This Agreement may be terminated at any time upon the unanimous vote of all the Directors at a duly called meeting. In which event, PEG Media shall be dissolved and the assets shall be distributed in accordance with the policy for the Distribution of the Corporation's Assets Upon Dissolution, as approved by the Board.

7.1.2 90 Days' Notice. This Agreement may be terminated by any Member through written notice to the other Members made no less than ninety (90) days prior to the proposed termination date (the "Termination Right"). Should any Member exercise its Termination Right this Agreement shall terminate upon the Expiration Date. If the remaining Members agree to continue the operation of PEG Media through a new agreement, then the terminating Member shall lose their right to any furniture, equipment or other assets, including proceeds in the event of a future dissolution.

7.2. Withdrawal.

Loss of Funding. In accordance with Section 4.2, each Member shall have the right to immediately withdraw from this Agreement if PEG Media loses all or substantially all its State funding. Members withdrawing from this Agreement based on loss of funding shall have the right to keep assets assigned to them for their use (audio and video recording equipment installed in Board room) and shall retain their interest in the equipment, furnishings and other assets of PEG Media.

Super Majority Vote. This Agreement may be modified by allowing a Member to voluntarily withdraw from this Agreement on an affirmative vote of at least five (5) Directors. In the event a Member withdraws in accordance with this Section, such Member shall have the right to keep assets assigned to them for their use. The Board may allow the Member to retain their interest in the equipment, furnishings and other assets of PEG Media.

ARTICLE 8. Miscellaneous Provisions

Notices. Any notice, demand, consent, agreement, request or other communication required to be given, served, sent or obtained hereunder (a "Notice") must be in writing, and must be either (i) mailed by first-class mail, registered or certified, return-receipt requested, postage prepaid, (ii) hand delivered personally or by nationally recognized courier service, fees prepaid or (iii) transmitted by telecopy, addressed as follows:

If to Archer Lodge:

Town of Archer Lodge c/o Town Administrator
Archer Lodge Town Hall
Archer Lodge Town Hall
14094 Buffalo Road
Archer Lodge, NC 27527

If to Clayton:

Town of Clayton c/o Town Manager
Clayton Town Hall
P.O. Box 879
Clayton, NC 27528

If to Garner:

Town of Garner c/o Town Manager
Garner Town Hall
900 Seventh Ave,
Garner, NC 27529

If to Knightdale:

Town of Knightdale c/o Town Manager
950 Steeple Square Court
Knightdale, NC 27545

If to Rolesville:

Town of Rolesville c/o Town Manager
Rolesville Town Hall
PO Box 250
Rolesville, NC 27571

If to Wendell:

Town of Wendell c/o Town Manager
15 E Fourth St
Wendell, NC 27591

If to Zebulon:

Town of Zebulon c/o Town Manager
Zebulon Town Hall
1003 N. Arendell Avenue
Zebulon, NC 27597

Each party may designate by notice a new address to which any notice thereafter may be given, served, or sent. Each notice that is delivered in the manner described above will be deemed given and received for all purposes at the earlier of such time as it is delivered to the addressee (with the return-receipt, courier delivery receipt or telecopy answer-back confirmation being deemed conclusive evidence of such delivery) or such time as delivery is refused by the addressee upon presentation.

Amendments. No modification or amendment of this Agreement, including the Dissolution Policy attached hereto as Exhibit A, will be valid or binding upon any Member(s) unless in writing and signed by the Member(s) against whom such modification or amendment is asserted.

Entire Agreement. This Agreement constitutes the entire agreement between the Members with respect to an interlocal agreement for the joint funding and operations of PEG Media. All previous undertakings or agreements between the Members with respect to these matters are merged herein and superseded hereby. No representation, promise, or inducement not included herein shall be binding on any Member hereto.

Transferability. No additional Members shall be allowed to participate during the Term. This Agreement shall not be transferred or assigned, either voluntarily or involuntarily. Any purported transfer or assignment of a Member's rights under this Agreement shall be null and void, and shall not transfer any rights, interest or title to the purported transferee.

Interpretation. If there arises any issue regarding the intent of the Members to this Agreement or the interpretation of any provision of this Agreement or any ambiguity arising from this Agreement, no presumption or burden of proof shall arise favoring or disfavoring any Member, and this Agreement shall not be strictly construed against any Member. When the context in which a word is used in this Agreement indicates that such is the intent, a word in the singular number shall include the plural and vice- versa, and a word in the masculine gender shall include the feminine and neuter and vice- versa. Any use in this Agreement of any form of the verb "to include" means the word stated but not limited to. The paragraph headings or titles used in this Agreement are for convenience only, and shall not define, limit, extend or interpret the scope of this Agreement or any particular section, paragraph or provision of this agreement. Any reference in this Agreement to any statute, code, rule or law (collectively or individually, a "Law") shall include any amendments to the Law referred to, any comparable successor Law that replaces the Law referred to, as well as any amendments to any such successor Law.

Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of North Carolina without giving effect to any conflict of law rule or provision thereof that would cause the application of the laws of any other jurisdiction.

Faxed Signatures. Any party to this Agreement transmitting its signature on this Agreement by telecopy shall be deemed to have accepted and adopted such telescoped signature as that party's original signature, and to have accepted that the same is sufficient to bind that party to this Agreement as if that party's original handwritten signature were attached hereto, it being the intention of the Members that a telescoped signature on this Agreement is binding from the time a copy of this Agreement with a party's signature is telescoped to another party hereto, and that any person may rely on the authority thereof for implementing the provisions of this Agreement.

Severability. The Members intend that this Agreement be enforced to the fullest extent permissible under the Law and public policy applied by any jurisdiction in which enforcement is sought. Accordingly, if any provision, sentence, phrase or word of this Agreement, or the application thereof to any person or circumstance, or the enforceability thereof in any jurisdiction, is held invalid, the remainder of this Agreement, or the application of such provision, sentence, phrase or word to persons or circumstances other than those as to which it is held invalid, or the enforceability thereof in other jurisdictions, shall not be affected thereby.

Agreement in Counterparts. This Agreement may be executed in several counterparts, each of which shall be deemed an original, and all of which shall constitute one and the same instrument. In addition, this Agreement may contain more than one counterpart of the signature pages, and this Agreement may be executed by the affixing of the signatures of each of the Members to one of such counterpart signature pages. All of such signature pages shall be read as though one and they shall have the same force and effect as though all of the signers had signed a single signature page.

Other Documents. The Members agree to execute such other documents as may be necessary for the implementation and consummation of this Agreement and the covenants contained herein.

Force Majeure. If either party is delayed or hindered in or prevented from the performance of any act required under this Agreement by reason of strike, lockouts, labor troubles, power failure, riots, insurrection, war, fire, earthquake, flood, explosion, governmental sanctioned embargo, acts of God, inclement weather or other reason beyond such party's control of like or unlike nature or cause, then performance of such act shall be excused for the period of the delay, and the period for the performance of any such act shall be extended for a period equivalent to the period of such delay.

Third-party Beneficiaries. Except as may be otherwise expressly provided herein, this Agreement shall not confer any rights or remedies upon any person or entity other than the Members hereto, and their respective successors and permitted assigns.

Injunctive Relief. The Members acknowledge that any breach or violation of this Agreement will cause irreparable harm to the non-breaching Members for which there is no adequate remedy at Law. Accordingly, in addition to any other remedies available at law or equity, any Party hereto that is aggrieved by a breach or threatened breach of any of the provisions of this Agreement shall be entitled to seek from any court of competent jurisdiction an order for specific performance and/or for temporary and/or permanent injunctive relief to enforce the provisions of this Agreement without the necessity of proving actual damages or posting bond or other security.

[the remainder of this page is intentionally left blank]

IN WITNESS WHEREOF, the Members have caused this Agreement to be ratified by resolution of their governing boards or councils as evidenced by the minutes of their governing boards or councils, and executed by their duly authorized officers as of the date noted below each signature.

THE TOWN OF ARCHER LODGE,
a North Carolina municipal corporation

By: _____

Name: _____ Date: _____

Title: _____

THE TOWN OF CLAYTON,
a North Carolina municipal corporation

Name: _____ Date: _____

Title: _____

THE TOWN OF GARNER,
a North Carolina municipal corporation

Name: _____ Date: _____

Title: _____

THE TOWN OF KNIGHTDALE,
a North Carolina municipal corporation

Name: _____ Date: _____

Title: _____

THE TOWN OF ROLESVILLE,
a North Carolina municipal corporation

Name: _____ Date: _____

Title: _____

THE TOWN OF WENDELL,
a North Carolina municipal corporation

Name: _____ Date: _____

Title: _____

THE TOWN OF ZEBULON,
a North Carolina municipal corporation

Name: _____ Date: _____

Title: _____

Policy on the Distribution of the Corporation's Assets Before Dissolution

The Board, on a positive vote of five (5) Members at a regularly called meeting, shall set a future date for dissolution.

Employees of PEG Media shall immediately be notified of the dissolution date and the last date of their employment.

All personal property, equipment and inventories located in the various town halls and used by the Members to record board meetings or to generate content shall remain there and become property of that Member.

The exclusive use of the Studio building shall revert to the Town of Knightdale the day after dissolution.

Certain equipment located in the Studio and used to broadcast a cable TV signal or generate content may be given to one or more of the Members for their use with approval of the Board. An estimate of the value shall be made for such equipment and the value deducted from the proceed split if any.

All other personal property, equipment and inventories of PEG Media shall be sold online, at auction or any method approved by the Board and consistent with state law. After all payroll, leave, taxes, bills, accounts payable and obligations are paid in full the proceeds shall be split equally among the Members, as it exist on the last day of operation, of PEG Media. These proceeds may only be used by the Members as allowed by state law.

The current Members are currently the towns of Archer Lodge, Clayton, Garner, Knightdale, Rolesville, Wendell and Zebulon.

All other assets shall be distributed according to IRS provisions (Section 6.4).



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

MEMORANDUM

To: Kimberly Moffett, Town Clerk

From: Chris Rowland, Construction Project Administrator 

Copy: Donnie Adams, Adams & Hodge Engineering
Karen Durham, Engineering & Inspections Coordinator

Date: December 13, 2019

Subject: Parkview, Phase 14

Please place a final acceptance request for the subject public water and sewer utilities along with all pertinent easements on the next available agenda. All identified repair items have been addressed. Following acceptance, the Town will assume all operational and maintenance duties relative to public utilities. Item to note: all street sections within this phase are private.



Town Council Agenda Cover Sheet

Meeting Date

January 6, 2020

Agenda Location

Public Hearings

Item Title

2019-40-PDD Buckhorn Branch Planned Development Rezoning

Presenter

Haley Hogg, Planner II

Summary/Description

The applicant is requesting three parcels of land from Residential-Estate (R-E) to Planned Development Residential (PD-R). The properties are just over 83 acres in total combined size. They are located off US HWY 70 BUS, Iris Street, and Wildwood Drive. Running concurrently with this request is a preliminary plat application that is serving as a master plan for the proposed Planned Development (2019-39-SD).

Requested Action

Approval/Denial

Funding Source (If Applicable):

N/A

Cost: N/A Yes ☐ No ☒

Additional Documents to be Included in Agenda Packet

Application
Neighborhood Meeting Materials
Staff Report
Staff Report Map
Adjacent Property Letter
Newspaper Ad
Consistency & Reasonableness Statement
Planning Board Recommendation

Meeting Timeline

November 25, 2019- Planning Board
January 6, 2020- 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: Buckhorn Branch Park **Date:** 3/1/2019
Applicant Name: WithersRavenel, Inc., 137 S. Wilmington St., Suite 200, Raleigh, NC 27601 ATTN: Ryan Fisher, PE

The following checklist to be completed by applicant:

- [☒] Pre-Application Meeting on: 11/7/2018
- [☒] Review Fee
- [☒] Advertisement Fee
- [☒] Completed Application
- [☒] Owner's Consent Form
- [☒] Adjacent Property Owner's List
- [☒] Neighborhood Meeting Notice Letter (1 copy)
- [☒] Set of stamped, addressed, empty envelopes for adjacent property owner notification
- [☒] Signed & Sealed Boundary Survey
- [☒] 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: Buckhorn Branch Park
Acreage of Property: 84.73 Zoning District: R-E
County Tag #: 05H03010, 05H03197D, 05H03009 NC Pin #: 166811-55-8386, 166800-54-8289, 166800-64-8874
Address/Location: 706 Autumn Lane and 2 adjacent unaddressed tracts to west
Existing Zoning District: R-E Proposed Zoning District: PD-R

APPLICANT INFORMATION

Applicant: WithersRavenel, Inc.
Mailing Address: 137 S. Wilmington St., Suite 200, Raleigh, NC 27601
Phone Number: (919) 535-5175 Fax: N/A
Contact Person: Ryan Fisher, PE
Email Address: rfisher@withersravenel.com

PROPERTY OWNER INFORMATION

Name: Concept 8 Holdings, LLC (Developer. Owner Consent Forms attached)
Mailing Address: 307 South Salem St., Suite 200, Apex, NC 27502
Phone Number: (919) 883-4941 Fax: N/A
Email Address: shawn@concepteight.com (Shawn Donovan)

OFFICE USE ONLY

Date Received: _____ Amount Paid: _____ File Number: _____

EXPLANATION OF PROJECT

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

The proposed project is a residential subdivision with a variety of lot sizes and types. The central design item for this development are the two (2) large central green areas that are amenity areas for the future residents. Abutting these greens areas are smaller lot homes that can access this green area for activities.

APPROVAL CRITERIA

All applications for a Rezoning must address the following findings:

1. Consistency with the adopted plans of the Town.
The project is consistent with all of the Town's plans except the Future Land Use Plan. The northern half of the development is located within a Community Center designation and the southern area is designated Low Density Residential. Due to the mix of residential types, we feel we meet the intent of the adopted plans for the Town.
2. Suitability of the subject property for uses permitted by the current vs. the proposed district.
The current zoning district does not allow for variety of residential uses as have been proposed with this Planned Development Rezoning. The existing and proposed zoning are both residential zonings.
3. Whether the proposed change tends to improve the balance of uses, or meets specific demand in the Town.
The proposed change will extend the single-family development of the Town to the east towards Grifols and Novo Nordisk. The subdivision plan will provide for ample outdoor amenity areas with small lot homes that have been more popular with younger families.
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.
Based on discussions with Town staff, schools, roads, recreation facilities, wastewater treatment, water supply and stormwater drainage are available for this project. Capacity is available to support this development based on our discussions.
5. It has been determined that the legal purposes for which zoning exists are not violated.
No zoning violations are proposed.
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.
No adverse effects are proposed with this plan. The adjacent property owners will benefit with public infrastructure being extended to their adjoining property lines for future connections.

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.

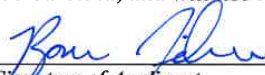
No sole property owner or small group will benefit from the zoning change and the general public will not see it as a detriment.

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.

Ryan Fisher

Print Name


Signature of Applicant

2/28/2019

Date



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: Buckhorn Branch Park **Address or PIN #:** 166800-64-8874

AGENT/APPLICANT INFORMATION:

Ryan Fisher, PE (WithersRavenel, Inc.)
(Name - type, print clearly)

137 S. Wilmington St., Suite 200
(Address)
Raleigh, NC 27601
(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*):

Planned Development Rezoning Major Subdivision Plan

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:

STAWN DENEVAN
(Name - type, print clearly)

[Signature]
(Owner's Signature)

307 S. SMITH ST. #200
(Address)

APEX, NC 27502
(City, State, Zip)

STATE OF NC
COUNTY OF LEE

Sworn and subscribed before me AMANDA MIX, a Notary Public for the above State and County, this the 19 day of FEBRUARY, 2019.

SEAL



AMANDA MIX
Notary Public
North Carolina
Lee County

[Signature]
Notary Public

My Commission Expires:

2/1/20

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: Buckhorn Branch Park **Address or PIN #:** 166811-55-8386

AGENT/APPLICANT INFORMATION:

Ryan Fisher (WithersRavenel, Inc.) 137 S. Wilmington St., Suite 200
(Name - type, print clearly) (Address)
Raleigh, NC 27601
(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*):

Planned Development Rezoning Major Subdivision Plan

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:

STAWN DONOVAN 307 S. SILEM ST #200
(Name - type, print clearly) (Address)
Stawn Donovan ASPEX, NC 27502
(Owner's Signature) (City, State, Zip)

STATE OF NC
COUNTY OF LEE

Sworn and subscribed before me AMANDA MIX, a Notary Public for the above State and County, this the 19 day of FEBRUARY, 2019.

SEAL



AMANDA MIX
Notary Public
North Carolina
Lee County

Amanda Mix
Notary Public

My Commission Expires: 2/1/20

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: Buckhorn Branch Park **Address or PIN #:** 166800-54-8289

AGENT/APPLICANT INFORMATION:

Ryan Fisher (WithersRavenel, Inc.)
(Name - type, print clearly)

137 S. Wilmington St., Suite 200
(Address)
Raleigh, NC 27601
(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*):

Planned Development Rezoning Major Subdivision Plan

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:

SHAWN DONOVAN
(Name - type, print clearly)

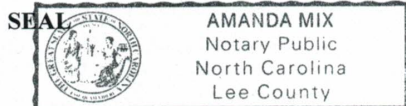
307 S. SALEM ST # 200
(Address)

[Signature]
(Owner's Signature)

RAPEX, NC 27502
(City, State, Zip)

STATE OF NC
COUNTY OF LEE

Sworn and subscribed before me AMANDA MIX, a Notary Public for the above State and County, this the 19 day of FEBRUARY, 20 19.



[Signature]
Notary Public

My Commission Expires: 2/1/20

TOWN OF CLAYTON
ZONING AMENDMENT

CONSISTENCY AND REASONABLENESS STATEMENT

2019-40-PDD Buckhorn Branch 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 – Change two of the parcels (05H03009 and 05H03197D) from the designation from “Low Density Residential” to “Medium Density Residential/Community Center”.**

The proposed Planned Development Rezoning from Residential-Estate (R-E) to Highway-Business (B-3) is inconsistent with the Future Land Use Map's current designation of “Low Density Residential” for two of the three subject properties (noted above). This is due to the associated Master Plan proposing 3.81 dwelling units per acre. The designation of Low Density Residential only allows up to 3 dwelling units per acre. The third parcel included within this rezoning request (05H03197D) is designated currently as “Medium Density Residential/Community Center” and is consistent with the rezoning request and associated master plan.

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 subject properties are located off a major thoroughfare and are located near higher density residential development, as well as non-residential development. One of the three parcels included within the rezoning request is already designated as Medium Density Residential with Community Center overlay. The proposed rezoning would be consistent with the current development pattern in this general area. The associated master plan that this rezoning is tied to is also only .81 units per acre over the typical maximum of 3 dwelling units per acre for low-density residential. Modifying the Future Land Use Map to for the two above referenced parcels to medium density residential with the community center overlay would be consistent with the designations to the west and would allow for maximum of 7 dwelling units/acre with a Planned Development.

the above referenced zoning amendment is reasonable and in the public interest.



Received By:
Town of Clayton
4/1/19

March 27, 2019

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 land use change or 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.

Meeting Date: April 11, 2019

Meeting Time: 6:00 pm

Meeting Location: Generation Church, NC 195 Highway 42 East, Clayton, NC 27527

Type of Application: Planned Development Rezoning & Major Subdivision Plan **Buckhorn Branch**
Project/proposal property address: Autumn Lane/Wildwood Drive
Description of project/proposal: Residential Subdivision

Upcoming public meetings for this application (Planning Board and/or Town Council): April 22nd (Tentative)

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

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

A map is enclosed with this letter showing the location of the property that is subject to this application for land use change and/or development proposal.

If you have any questions prior to or after this meeting, you may contact us at 919-469-3340. You may also contact the Planning Department at 919-553-5002.

Sincerely,
WithersRavenel

Ryan Fisher, PE
Project Manager

cc: Town of Clayton Planning Department

137 South Wilmington Street, Suite 200 | Raleigh, NC 27601
t: 919.469.3340 | f: 919.467.6008 | www.withersravenel.com | License No. C-0832
Asheville | Cary | Greensboro | Pittsboro | Raleigh | Wilmington



Received By:
Town of Clayton
10/1/19

May 7, 2019

Ms. Haley Hogg, CZO
Planner – Town of Clayton
111 E. Second St.
Clayton, NC 27528

RE: BUCKHORN BRANCH PARK REZONING AND MASTER PLAN
Clayton Project: 2019-39-SD

Haley:

This letter serves as a summary of a Neighbor Notice Meeting for the above-referenced project located at US Highway 70 Business. The meeting was held in the lobby of Generation Church in Clayton at 6:00 PM on April 11, 2019. The meeting was attended by seven of the invitees shown on the attached sign-in sheet (not-including WithersRavenel staff). Ryan Fisher opened the meeting at 6:00 PM and introduced the project and the WithersRavenel team. Next, WithersRavenel (WR) staff outlined the nature of the subdivision plan and presented an aerial master subdivision map illustrating the proposed project. WR staff noted that in addition to the subdivision plan request, there is a rezoning request for the subject properties.

At the end of the overview presentation, WR staff answered questions posed by the attendees relating to the subdivision plan. The following items/concerns were discussed in the Q&A session:

1. Ms. Fine wanted confirmation that Iris Street is going to be paved and had concerns that there is not enough right-of-way to provide 20' of asphalt.
2. Mike and April Williams had concerns about residents of the new subdivision trespassing on their property to the west across the stream and inquired about whether a fence will be provided along the western boundary. Especially underneath the transmission line.
3. Mr. & Mrs. Williams also had concerns about people currently shooting guns in the area that may continue even after this development was built.
4. The attendees had questions about what types of housing units and what the look the neighborhood would be.
5. Questions were posed to whether additional traffic on Wildwood Dr. would result of this development. The consensus was that traffic would prefer a paved road over a dirt road and traffic would decrease as most people would use the new streets.
6. Questions were also posed as to how stormwater on Wildwood Dr. would be handled.
7. Questions were posed on what Lot 332 (adjacent to new entrance on US 70) would have built on it, but WR stated that it is currently proposed as open space to provide a buffer between the highway and houses.
8. The price of the homes was discussed, but without a known homebuilder, the price is not determined at the moment.
9. The timeline was also discussed and it was determined that construction would probably not start until late 2019 or early 2020 with a multiple year build-out.

The meeting was adjourned about 6:45 PM. Please contact me at rfisher@withersravenel.com or (919) 535-5175 if you have any questions, or if we can provide any additional information.

Sincerely,

WithersRavenel



Ryan Fisher, PE
Project Manager



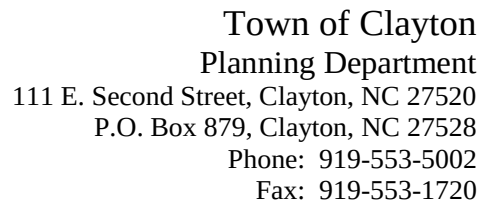
Date: April 11, 2019

Time: 6:00 PMPhone

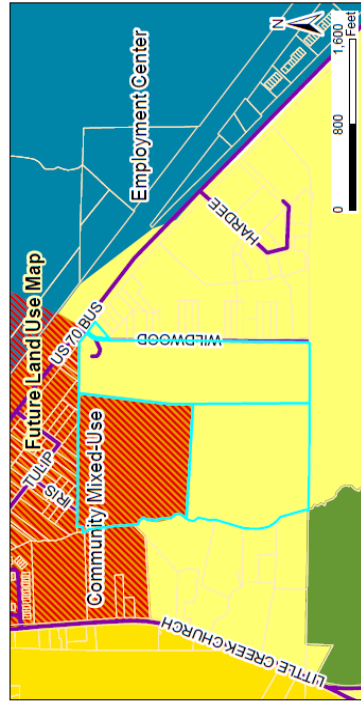
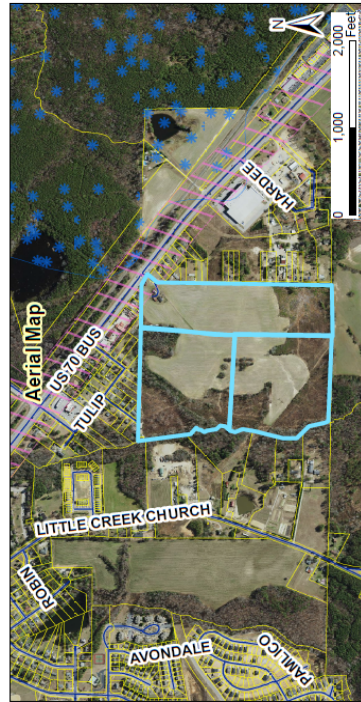
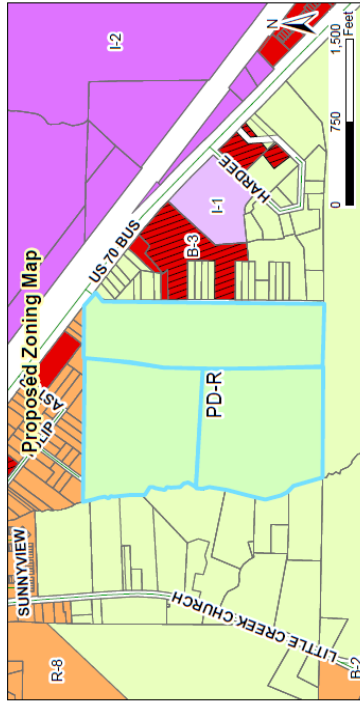
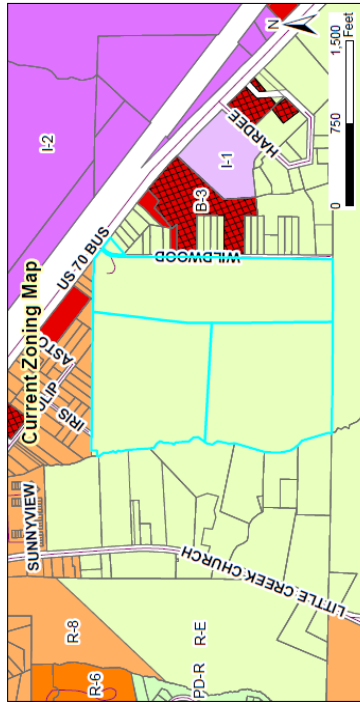
gail.lee@comcast.net

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ParcelID	Name1	Name2	Address1	Address2	CityStateZip
5001001	CONDON, GERALE J		206 FOXWOOD DRIVE		GOLDSBORO, NC 27530-0000
5001002	JUSTIN D COLVIN TRUST	CONDON, GERALE J TRUSTEE	206 FOXWOOD DR		GOLDSBORO, NC 27530-9211
5001003	LEE, GAIL P	WALL, MARILYN P	6018 LITTLE CREEK CHURCH RD		CLAYTON, NC 27520-6129
5001004	G&M POUNDS PROPERTIES LLC		6018 LITTLE CREEK CHURCH RD		CLAYTON, NC 27520-0000
5001005	HARROLD, JAMES TED	HARROLD, LIBBY	5204 TOMAHAWK TRAIL		RALEIGH, NC 27610-0000
5001006	LEE, GEORGE		2241 SHOTWELL RD		CLAYTON, NC 27520-8224
5001007	TYREE, KEVIN W	BENSINGER, EMMYLEE D	711 ASTOR ST		CLAYTON, NC 27520-2017
5001008	OVERBEE, LOUISE BARBEE		1024 RIDGE DR		CLAYTON, NC 27520-9667
5001009	SOUTH FAYETTEVILLE STREET LLC		603 SOUTH FAYETTEVILLE STREET		CLAYTON, NC 27520-0000
5001010	LEE, HUBERT L	LEE, BONNIE Y	2236 SHOTWELL RD		CLAYTON, NC 27520-0000
5001011	SIGRIST, RODNEY L		1405 TULIP ST		CLAYTON, NC 27520-2035
5001013	FINE, LISA W		805 IRIS STREET		CLAYTON, NC 27520-0000
5001014	EDWARDS, MARY HILL		807 IRIS ST		CLAYTON, NC 27520-0000
5001015	SANDERS, DOUGLAS C		809 IRIS ST		CLAYTON, NC 27520-0000
5001016	LEE, JONATHAN D		427 W MAIN STREET		CLAYTON, NC 27520-0000
5001053	ROGERS, CARRIE E		810 IRIS ST		CLAYTON, NC 27520
5001058	JUSTIN D COLVIN TRUST	CONDON, GERALE J TRUSTEE	206 FOXWOOD DR		GOLDSBORO, NC 27530-9211
05A01001	NEWLIN, RICHARD M	NEWLIN, JESSICA M	484 WOODLAND CHURCH RD		DUDLEY, NC 28333-5412
05A01002	COLAVITO, JOSEPH DANIEL	COLAVITO, JASON DEAN	86 REGULATOR DR		CLAYTON, NC 27520-8717
05A01008	WHEELER, JEAN JONES		P O BOX 291		CLAYTON, NC 27528-0291
05A01008A	WHEELER, JEAN JONES		P O BOX 291		CLAYTON, NC 27528-0291
05A01009	CARROLL, TONY RAY		2301 TWIN ACRES RD		CLAYTON, NC 27520-9444
05A01009A	CARROLL, TONY RAY		2301 TWIN ACRES RD		CLAYTON, NC 27520-9444
05A01011	ADAMS, CHERYL M.		721 WILDWOOD DR		CLAYTON, NC 27520-2037
05A01012	ADAMS, CHARLES EVANS JR.		721 WILDWOOD DR		CLAYTON, NC 27520-2037
05A01013	LITTLE CREEK ELEVEN LLC		1255 CREEKSHIRE WAY		WINSTON SALEM, NC 27103-0000
05A01016	HARDEE, BOBBY HINTON		2019 HARDEE LANE		CLAYTON, NC 27520-9822
05A01018	HARDEE, BOBBY H	HARDEE, NANCY O	2019 HARDEE LANE		CLAYTON, NC 27520-9822
05A01019	HARDEE, BOBBY H	HARDEE, NANCY O	2019 HARDEE LANE		CLAYTON, NC 27520-9822
05A01020	PATINO, JOSE CARMEN		1985 GOVERNMENT RD		CLAYTON, NC 27520-0000
05A01020A	BOUGHTON, LAYCEE SHAYNE	BOUGHTON, CORY MICHAEL	2016 HARDEE LN		CLAYTON, NC 27520-9618
05A01021	CHAVEZ, RAFAEL	FRANCISCO, IRMA	807 WILDWOOD DRIVE		CLAYTON, NC 27520-0000
05A01021A	MACIAS, ARMANDO P		805 WILDWOOD DRIVE		CLAYTON, NC 27520-0000
05A01023	HARDEE, BOBBY HINTON	HARDEE, NANCY O	2019 HARDEE LANE		CLAYTON, NC 27520-9822
05A01029E	HARDEE, BOBBY HINTON		2019 HARDEE LANE		CLAYTON, NC 27520-9822
05E99001P	ADAMS, CHARLES EVANS JR.		721 WILDWOOD DR		CLAYTON, NC 27520-2037
05E99025C	LEE, SAM S	LEE, BRENDA POUNDS	6018 LITTLE CREEK CHURCH RD		CLAYTON, NC 27520-0000
05E99199B	POOLE, TRINA		405 ALEXANDER LANE		SMITHFIELD, NC 27577-0000
05H03009	CARROLL, TONY RAY		2301 TWIN ACRES RD		CLAYTON, NC 27520-9444
05H03010A	TOWN OF CLAYTON		PO BOX 777		CLAYTON, NC 27528-0777
05H03011A	DURHAM, MARILYN P		6026 LITTLE CREEK CHURCH RD		CLAYTON, NC 27520-0000
05H03011H	LEE, BRENDA GAIL POUNDS		6018 LITTLE CREEK CH RD		CLAYTON, NC 27520-6129
05H03011K	LEE, GAIL POUNDS	LEE, SAM S	6018 LITTLE CREEK CHURCH ROAD		CLAYTON, NC 27520-0000
05H03011X	POUNDS, REVIS BRIAN		6082 LITTLE CREEK CHURCH RD		CLAYTON, NC 27520-1211
05H03011Z	WALL, MARILYN P	WALL, HARRY D JR	6026 LITTLE CREEK CHURCH ROAD		CLAYTON, NC 27520-0000
05H04032F	COX, JIMMY R	COX, JUDY G	8851 US 70 BUS HWY W		CLAYTON, NC 27520-9296
05H04046H	TOWN OF CLAYTON		PO BOX 879		CLAYTON, NC 27528-0879
05H04002C	GRIFOLS THERAPEUTICS INC		79 TWALEXANDER DR	4101 RESEARCH COMMONS	DURHAM, NC 27709



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2019-40-PDD Buckhorn Branch Rezoning
Request: Rezone from R-E to PD-R
2019-39-SD Buckhorn Branch Preliminary Plat
Request: Residential subdivision

Applicant: Withers Ravenel
 Property Owner: Concept 8 Holdings, LLC
 Tag #: 05H03010, 05H03197D, 05H03009

Staff Report Map



10/01/19
 Produced by: TDC Planning
 Disclaimer: Town of Council assumes no legal responsibility for the information presented here.

Document Path: C:\PLANNING\SUBDIVISIONS\2019\19-39-SD - Buckhorn Branch Preliminary Plat Staff Report Map - 2019-39-SD Buckhorn Branch SD.pdf

Legend

- Site
- 100-yr Flood Zone
- Thoroughfare Overlay
- Watershed Protection Overlay

PUBLIC NOTICE

In accordance with NC GS 160A-364 and NC GS 160A-384 the Clayton Town Council will hold an evidentiary and public hearing on Monday, January 6, 2020, at 6:00 PM at Town Hall, 111 East Second Street, to consider the following requests for three parcels (84.73 acres) located off US HWY 70; TAG #s: 05H03010, 05H03197D, 05H03009:

- 2019-40-PDD Buckhorn Branch Planned Development Rezoning; request to rezone properties from Residential-Estate (R-E) to Planned Development Residential (PD-R).
- 2019-39-SD Buckhorn Branch Preliminary Plat (Master Plan); request to develop 324 lots including single-family and townhomes.

For a rezoning request, 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 a Preliminary Plat, the Town Council will hold an evidentiary hearing and 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.

Haley Hogg, Planner
919-553-5002

The Johnsonian Newspaper

Please advertise on the following dates:
December 25, 2019
January 1, 2020

Affidavit of publication required.

--

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

2019-40-PDD Buckhorn Branch Planned Development Rezoning

On November 25, 2019 the Planning Board heard the above-referenced request and made the following vote:

Recommendation to the Town Council to

☒ approve the request, ~~with the conditions presented by staff,~~

☐ approve the request with the following modified or added conditions:

☐ deny the request.

Recommendation(s) made this 25th day of November 2019 while in regular session.

Signed:


Robert J. Ahlert, Planning Board Chair



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

Planning Board, November 25, 2019

STAFF REPORT

Application Number: 2019-40- PDD

Project Name: Buckhorn Branch Planned Development Rezoning

Tag #: 05H03010, 05H03197D, 05H03009

Location: Off US HWY 70 BUS, Iris Street, and Wildwood Drive

Overlay: Thoroughfare Overlay District

Applicant: Withers Ravenel

Owner: Concept 8 Holdings LLC

Project Planner: Haley Hogg, Planner II

Public Noticing Dates:

- **Neighborhood Meeting:** April 11, 2019
- **Sign Posted:** November 15, 2019
- **Letters Mailed:** November 15, 2019

REQUEST: Request to rezone from Residential-Estate (R-E) to Planned Development Residential (PD-R).

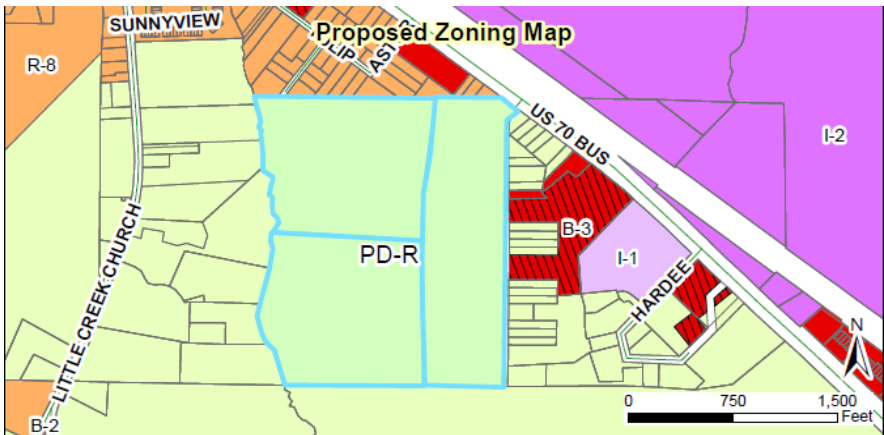


SITE DATA:

Acreage: 84.73 acres
Existing Use: Vacant

ADJACENT ZONING AND LAND USES:

Direction	Zoning	Existing Use
North	Residential-8 (R-8)	Single-family residential
South	Residential-Estate (R-E)	Single-family residential, agriculture
East	Highway Business SUD (B-3 SUD), Residential-Estate (R-E)	Single-family residential
West	Residential-Estate (R-E)	Single-family residential



STAFF ANALYSIS AND COMMENTARY:

Overview

The applicant is requesting to rezone the subject properties from Residential-Estate (R-E) to Planned Development-Residential (PD-R). This application is running concurrently with a preliminary plat application, 2019-39-SD, which will serve as the master plan for the proposed 324 lot residential subdivision. The properties are located off US HWY 70 BUS, with access also via Iris Street and Wildwood Drive. To the north of the development are single-family residences as well as the Sheetz at the intersection with NC HWY 42 E. Per UDC requirements, the Planning Board shall make a recommendation to Town Council regarding all rezoning requests, including Planned Development districts. However, the Planning Board does not review or make recommendations on preliminary plats, even those acting as a master plan associated with a Planned Development designation. An overall master plan sheet has been attached to this staff report to provide the board an overview of the proposal.

Consistency with the Comprehensive Plan 2040

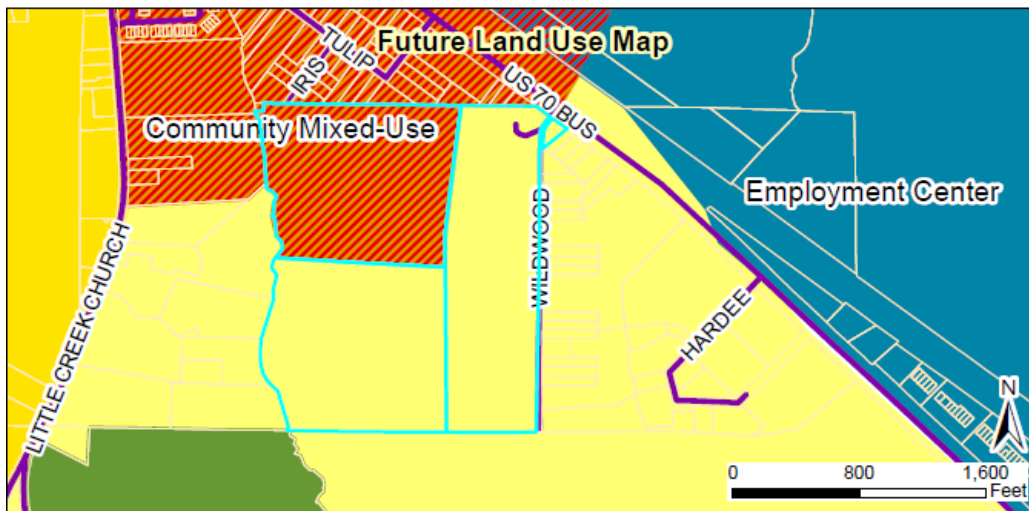
The Comprehensive Plan's Future Land Use Map designates these properties as a Medium Density Residential/Community Center ("Community Mixed Use") and Low Density Residential. Medium Density Residential allows up to 7 dwelling units/acre for Planned Development districts and Low Density Residential typically allows up to 3 units/acre. While not entirely consistent with the Future Land Use Map of the Comprehensive Plan, staff does feel that due to the location of the property off of a major road (US HWY 70 BUS) the requested rezoning would be acceptable with the plan. One of the parcels is already designated as Community Mixed Use. The density of a development is set via the Planned Development master plan. They are proposing 3.81 units per acre outlined in the master plan. It's worth noting that this is just over the maximum permitted in the Low Density Residential designation of the land use map. Town Council may approve rezoning requests that are not consistent with the Future Land Use Map, and if that occurs the land use map is automatically updated accordingly.

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.



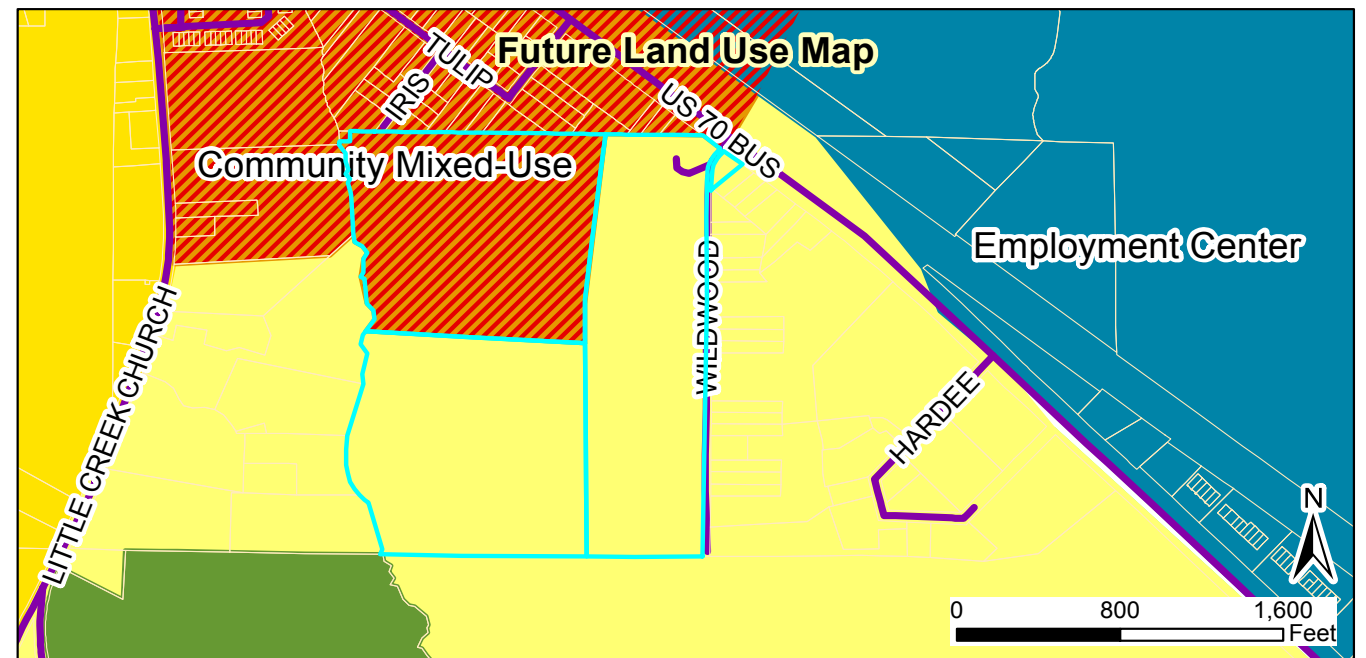
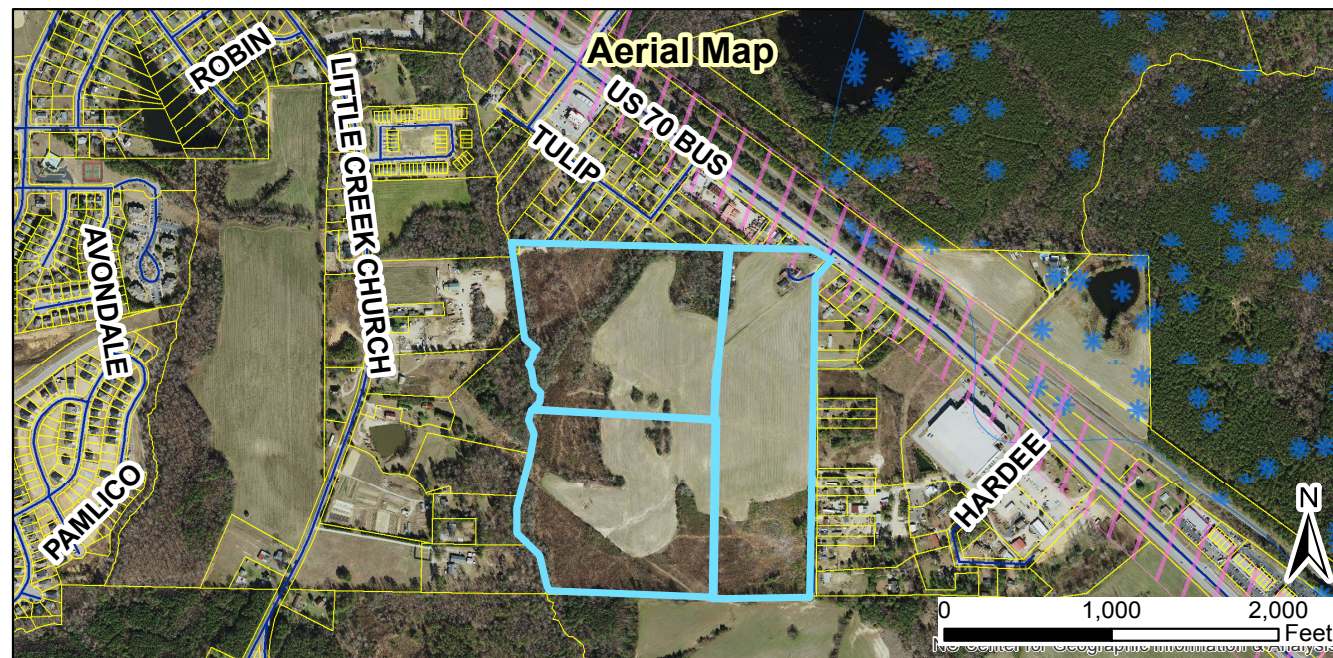
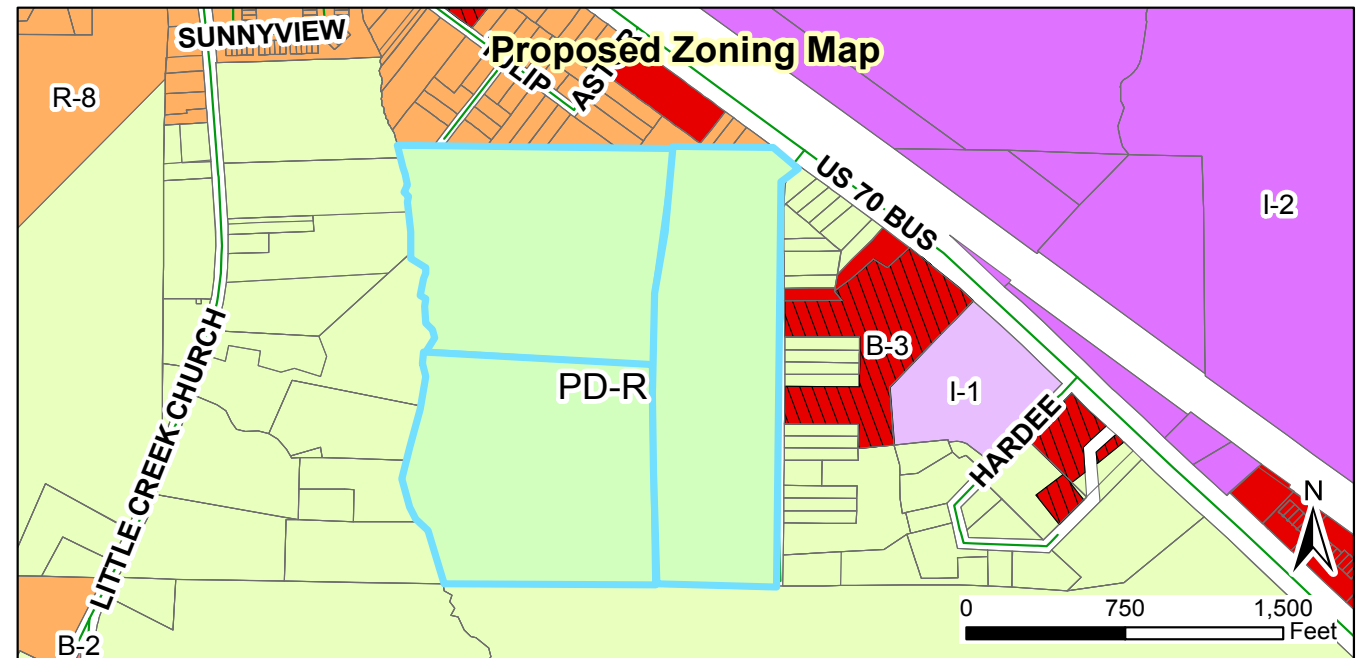
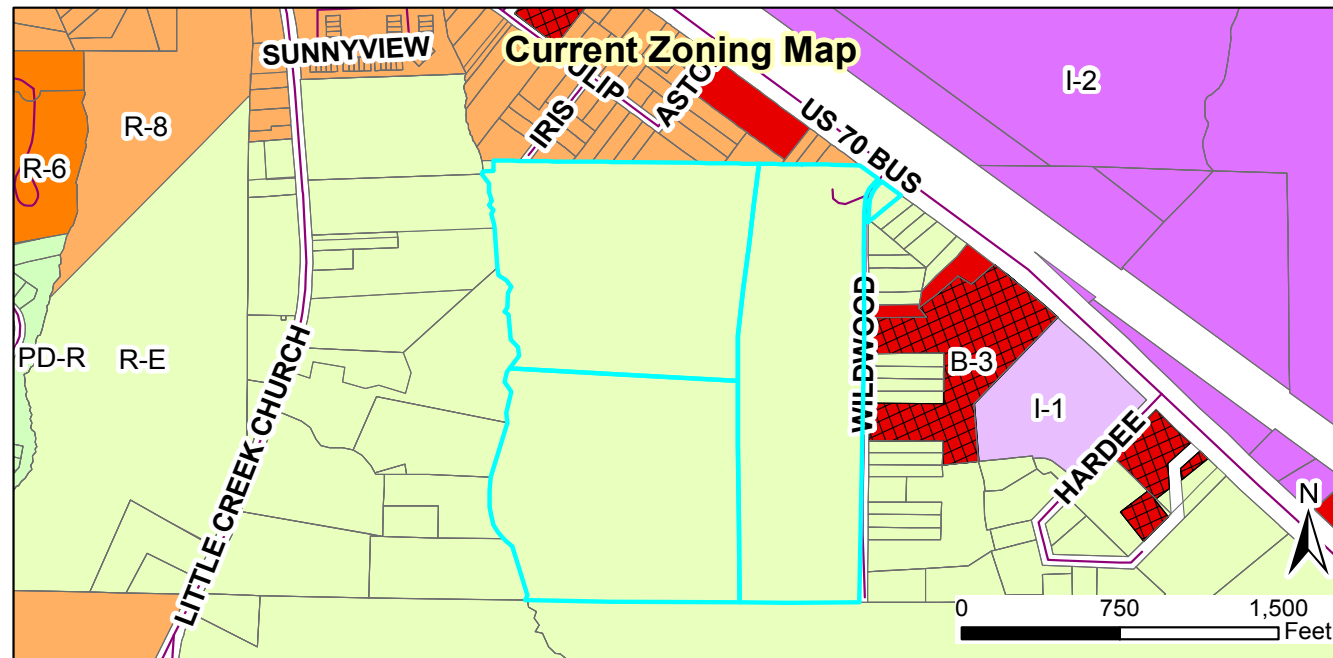
CONSIDERATIONS:

- Rezoning is decided by the Town Council. The Planning Board shall make a recommendation to the Town Council.
- The Planning Board shall only make a recommendation on this rezoning; the associated master plan (preliminary plat) is quasi-judicial and does not receive a Planning Board recommendation.

- 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.
-

ATTACHMENTS:

- 1) Application
- 2) Staff Report Maps
- 3) Neighborhood Meeting Materials
- 4) Survey
- 5) Master Plan Sheet
- 6) PB Adjacent Property Letter



2019-40-PDD Buckhorn Branch Rezoning
Request: Rezone from R-E to PD-R
2019-39-SD Buckhorn Branch Preliminary Plat
Request: Residential subdivision

Applicant: Withers Ravenel
 Property Owner: Concept 8 Holdings, LLC
 Tag #: 05H03010, 05H03197D, 05H03009

Staff Report Map



Document Path: O:\PLANNING\SUBDIVISIONS\MAJOR SUBDIVISIONS\2019\2019-39-SD - Buckhorn Branch Park\Staff Report Maps\Staff Report Map - 2019-39-SD- Buckhorn Branch SD.mxd

Legend

- Site
- 100-yr Flood Zone
- Thoroughfare Overlay
- Watershed Protection Overlay

10/01/19

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

**Town of Clayton
Town Council
Zoning Ordinance Amendment Motion Sheet
(Rezoning)**

After considering the recommendations of the Planning Board and Planning Director, I move to **[approve OR deny] Case # 2019-40-PDD – Buckhorn Planned Development**

[IF APPROVING]

and to approve the Statement of Consistency and Reasonableness included in the Agenda packet [with the following modifications: STATE MODIFICATIONS, IF ANY].

**MOTION FORM
Item 6a
2019-40-PDD
Buckhorn Planned Development**

**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 Residential (PDR) zone the property described below, said property formerly being zoned Residential-Estate (R-E) and

WHEREAS said property is owned by Concept 8 Holdings, 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 January 6, 2020 wherein 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 Residential (PDR) zone the following described property:

General Description:

706 Autumn Lane and 2 adjacent unaddressed tracts to the west

Specific Description:

NC Parcel Identification Numbers: 166811-55-8386; 1666800-54-8289; 166800-64-8874

SECTION 2. That the official Town of Clayton Zoning Map is hereby amended to include in the Planned Development Residential (PDR) 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 6th day of January, 2020 while in regular session.

Jody McLeod
Mayor

ATTEST:

Kimberly A. Moffett, CMC, NCCMC
Town Clerk



Town Council Agenda Cover Sheet

Meeting Date

January 6, 2020

Agenda Location

Public Hearings

Item Title

2019-39-SD Buckhorn Branch Preliminary Plat (Master Plan)

Presenter

Haley Hogg, Planner II

Summary/Description

The applicant is requesting preliminary plat approval to develop 324 residential lots. The lots would consist of single-family residences as well as townhomes. This preliminary plat would serve as a master plan for the development and each individual phase would be reviewed as a Minor Site Plan or Minor Subdivision Plan by the Technical Review Committee. The subject parcels are just over 83 acres in total combined size. They are located off US HWY 70 BUS, Iris Street, and Wildwood Drive. Running concurrently with this request is a rezoning application (2019-40-PDD) to rezone the properties from Residential-Estate (R-E) to Planned Development Residential (PD-R).

Requested Action

Approval/Denial

Funding Source (If Applicable):

N/A

Cost: N/A Yes ☐ No ☒

Additional Documents to be Included in Agenda Packet

Application
Neighborhood Meeting Materials
Staff Report
Staff Report Map
Adjacent Property Letter
Newspaper Ad
Traffic Impact Analysis- Report
Traffic Impact Analysis- Appendix
Traffic Impact Analysis- NCDOT Congestion Management Review/Comments
Truck Turn Exhibit
Wastewater Allocation Request

Meeting Timeline

January 6, 2020- 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 (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: Buckhorn Branch Park **Acreage of Property:** 84.22
Tag #: 05H03010, 05H03197D, 05H03009 **NC Pin #:** 166811-55-8386, 166800-54-8289, 166800-64-8874
Location: Autumn Lane/Wildwood Drive/Iris Street
Number of lots (Existing): 3 **(Proposed):** 324 **Min. Lot Size:** 2,000 sq. ft.
Zoning District: PD-R (Proposed) **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: WithersRavenel, Inc.
Mailing Address: 137 S. Wilmington St., Suite 200, Raleigh, NC 27601
Phone Number: (919) 535-5175 **Fax:** N/A
Contact Person: Ryan Fisher, PE
Email Address: rfisher@withersravenel.com

OFFICE USE ONLY

Date Received: _____ **Amount Paid:** _____ **File Number:** _____

PROPERTY OWNER INFORMATION

Name: Concept 8 Holdings, LLC (Developer. Owner Consent Forms attached)

Mailing Address: 307 South Salem St., Suite 200, Apex, NC 27502

Phone Number: (919) 883-4941 **Fax:** N/A

Email Address: shawn@concepteight.com (Shawn Donovan)

EXPLANATION OF PROJECT

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

The proposed project is a planned development residential subdivision located south of US Highway 70 Business. More specifically, the project consists of 202 single-family lots and 114 townhome lots with an associated neighborhood amenity center. The site is comprised of three (3) parcels that are a total of ±84 acres south of US Highway 70 Business and southeast of the intersection of US 70 Business with NC Highway 42. The project's primary access is a new road connection to US 70 Business with a secondary access to Iris Street associated with the Peele Subdivision. Future accesses are proposed to Wildwood Drive to the east with future road extensions to the south and east. The proposed subdivision will be served by Town of Clayton water, sewer, and electricity after annexation. Sanitary sewer will be served by a new pump station located in the southwest corner of the project. This new station will accept wastewater that is currently going to the Town's existing Peele pump station. That pump station will be decommissioned with this project. The proposed pump station to be constructed with this project will be designed to Town of Clayton standards.

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.

The project meets all required specifications of the town Subdivision Regulations. The UDO was referenced during design and used as a guide in designing the subdivision. The purpose of this subdivision is to allow for a variety of home types with an ample amount of active open space for use by the residents. The main design principle is to provide two (2) large open grassed areas for community events and activities.

*Disregard
See Findings
below*

- (2) The subdivision meets all required specifications of this chapter.

The proposed subdivision meets all of the required specifications of chapter 155.706 of the Town's UDO.

- (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.

The proposed subdivision will not be detrimental to the orderly development of other properties in the surrounding area. The project will provide future road stubs and utility extensions that will allow for future development of adjoining properties.

- (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.

The project is designed with two (2) immediate access points for traffic distribution. The main entrance will be located on US Highway 70 and will allow for right-in/right-out. The secondary entrance is through Iris Street to the west. As the project is phased, additional future road connections to Wildwood Drive and the adjacent property to the south will be constructed to the property line.

****Planned developments must also meet the Master Plan Approval Criteria in Section 155.705(J)****

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.**

SURVEY

Provided		
Yes	N/A	
☒		A signed and sealed boundary survey (not more than a year old unless otherwise approved by the Planning Department) 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	
☒		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.
☒		The existing streets and roadway improvements (medians, landscaping, signage, driveways, etc.) within 100 feet of project boundary.
☒		The existing structures located on the subject property.
☒		The existing structures within 100 feet of project boundary.
☒		The existing utilities (including inverts of pipes, rim elevations, wells and septic tanks, etc.) within 100 feet of project site.
☒		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	
☒		Site data table in tabular form
☒		Name of project (AKA names if applicable)
☒		Parcel identification number (and/or Tag number)
☒		Property size (acres and square feet)
☒		Property location (Town limits or ETJ)
☒		Existing zoning district
☒	☐	Proposed zoning district (if applicable)
☐	☒	Overlay (if applicable)

Provided		
Yes	N/A	
☒	☐	Provide boundaries of Resource Conservation Areas (see UDC Section 155.500).
☒	☐	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.
☐	☒	Provide queuing details for drive-up/drive-thru facilities (if applicable).
☒	☐	Provide the locations and dimensions of existing and proposed sidewalks and accessible routes.
☒	☐	Provide the location and details of refuse collection areas.
☒	☐	Provide the location, size and orientation of freestanding signs.
☒	☐	Identify proposed phasing (phasing lines) of construction on Phasing Plan sheet.
☒	☐	Cul-de-sacs must be dimensioned and meet Town of Clayton minimum design criteria.
☒	☐	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	
☒	☐	Identify proposed streets and roadways (public and private) with dimensions and cross sections.
☒	☐	Identify the curve radii for all internal and external vehicular use areas.
☒	☐	Identify all access points to the project.
☒	☐	Identify existing conditions and proposed grading plans.
☒	☐	Identify Tree Conservation Areas shown on grading plan.
☒	☐	Show proposed flow of traffic.
☒	☐	Identify proposed traffic control signs and striping.
☒	☐	Identify the proposed water distribution system (including size) with location of fire hydrants and point of connection(s).
☒	☐	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.
☒	☐	Provide preliminary wastewater allocation calculation.

LANDSCAPE PLAN

Provided		
Yes	N/A	
☒		Provide a landscape plan identifying the location of all proposed landscaping (must be prepared by a landscape architect registered in North Carolina).
☒		Indicate the location, width and type of all required buffers.
☒		Indicate the location, width and type of landscaping within vehicular use areas.
☒		Indicate the location, width and type of landscaping used to screen drive-thru areas, service areas, loading areas, mechanical equipment and above ground utilities.
☒		Provide a plant list summary table which includes: 1. A planting key identifying the various planting elements 2. The quantity of each type of plant material proposed 3. The size, height, caliper and spacing of plant material proposed 4. The Botanical and common names of plant material proposed
☒		Verify/identify clear sight distances and safe-sight-triangles at project ingress/egress points.
☒		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).
☒		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".
☒		Identify and list any existing plant material which will be used to satisfy landscape requirements.

LIGHTING PLAN

Provided		
Yes	N/A	
☐	☒	Conceptual Lighting Plan - any common lighting should not spill over to other properties.
☐	☒	Identify the light source and provide a detail of the fixture.
☐		Identify the proposed height of fixtures.



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: Buckhorn Branch Park **Address or PIN #:** 166800-64-8874

AGENT/APPLICANT INFORMATION:

Ryan Fisher, PE (WithersRavenel, Inc.)
(Name - type, print clearly)

137 S. Wilmington St., Suite 200
(Address)
Raleigh, NC 27601
(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*):

Planned Development Rezoning

Major Subdivision Plan

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:

STAWN DONOVAN
(Name - type, print clearly)

[Signature]
(Owner's Signature)

307 S. SMITH ST. #200
(Address)

APEX, NC 27502
(City, State, Zip)

STATE OF NC
COUNTY OF LEE

Sworn and subscribed before me AMANDA MIX, a Notary Public for the above State and County, this the 19 day of FEBRUARY, 2019.

SEAL



AMANDA MIX
Notary Public
North Carolina
Lee County

[Signature]
Notary Public

My Commission Expires: 2/1/20

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: Buckhorn Branch Park Address or PIN #: 166800-54-8289

AGENT/APPLICANT INFORMATION:

Ryan Fisher (WithersRavenel, Inc.)
(Name - type, print clearly)

137 S. Wilmington St., Suite 200
(Address)
Raleigh, NC 27601
(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*):

Planned Development Rezoning Major Subdivision Plan

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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:

SHAWN DONOVAN
(Name - type, print clearly)

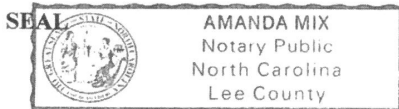
[Signature]
(Owner's Signature)

307 S. SALEM ST # 200
(Address)

APEX, NC 27502
(City, State, Zip)

STATE OF NC
COUNTY OF LEE

Sworn and subscribed before me AMANDA MIX, a Notary Public for the above State and County, this the 19 day of FEBRUARY, 2019.



[Signature]
Notary Public

My Commission Expires: 2/1/20

July 2018



Received By:
Town of Clayton
4/1/19

March 27, 2019

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 land use change or 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.

Meeting Date: April 11, 2019

Meeting Time: 6:00 pm

Meeting Location: Generation Church, NC 195 Highway 42 East, Clayton, NC 27527

Type of Application: Planned Development Rezoning & Major Subdivision Plan **Buckhorn Branch**
Project/proposal property address: Autumn Lane/Wildwood Drive
Description of project/proposal: Residential Subdivision

Upcoming public meetings for this application (Planning Board and/or Town Council): April 22nd (Tentative)

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

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

A map is enclosed with this letter showing the location of the property that is subject to this application for land use change and/or development proposal.

If you have any questions prior to or after this meeting, you may contact us at 919-469-3340. You may also contact the Planning Department at 919-553-5002.

Sincerely,
WithersRavenel

Ryan Fisher, PE
Project Manager

cc: Town of Clayton Planning Department

137 South Wilmington Street, Suite 200 | Raleigh, NC 27601
t: 919.469.3340 | f: 919.467.6008 | www.withersravenel.com | License No. C-0832
Asheville | Cary | Greensboro | Pittsboro | Raleigh | Wilmington



Received By:
Town of Clayton
10/1/19

May 7, 2019

Ms. Haley Hogg, CZO
Planner – Town of Clayton
111 E. Second St.
Clayton, NC 27528

RE: BUCKHORN BRANCH PARK REZONING AND MASTER PLAN
Clayton Project: 2019-39-SD

Haley:

This letter serves as a summary of a Neighbor Notice Meeting for the above-referenced project located at US Highway 70 Business. The meeting was held in the lobby of Generation Church in Clayton at 6:00 PM on April 11, 2019. The meeting was attended by seven of the invitees shown on the attached sign-in sheet (not-including WithersRavenel staff). Ryan Fisher opened the meeting at 6:00 PM and introduced the project and the WithersRavenel team. Next, WithersRavenel (WR) staff outlined the nature of the subdivision plan and presented an aerial master subdivision map illustrating the proposed project. WR staff noted that in addition to the subdivision plan request, there is a rezoning request for the subject properties.

At the end of the overview presentation, WR staff answered questions posed by the attendees relating to the subdivision plan. The following items/concerns were discussed in the Q&A session:

1. Ms. Fine wanted confirmation that Iris Street is going to be paved and had concerns that there is not enough right-of-way to provide 20' of asphalt.
2. Mike and April Williams had concerns about residents of the new subdivision trespassing on their property to the west across the stream and inquired about whether a fence will be provided along the western boundary. Especially underneath the transmission line.
3. Mr. & Mrs. Williams also had concerns about people currently shooting guns in the area that may continue even after this development was built.
4. The attendees had questions about what types of housing units and what the look the neighborhood would be.
5. Questions were posed to whether additional traffic on Wildwood Dr. would result of this development. The consensus was that traffic would prefer a paved road over a dirt road and traffic would decrease as most people would use the new streets.
6. Questions were also posed as to how stormwater on Wildwood Dr. would be handled.
7. Questions were posed on what Lot 332 (adjacent to new entrance on US 70) would have built on it, but WR stated that it is currently proposed as open space to provide a buffer between the highway and houses.
8. The price of the homes was discussed, but without a known homebuilder, the price is not determined at the moment.
9. The timeline was also discussed and it was determined that construction would probably not start until late 2019 or early 2020 with a multiple year build-out.

The meeting was adjourned about 6:45 PM. Please contact me at rfisher@withersravenel.com or (919) 535-5175 if you have any questions, or if we can provide any additional information.

Sincerely,

WithersRavenel



Ryan Fisher, PE
Project Manager



Date: April 11, 2019

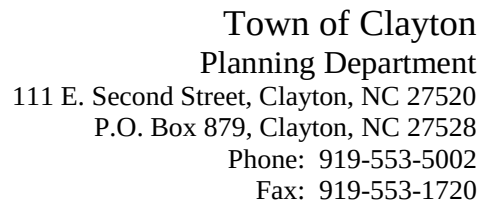
Time: 6:00 PM

Phone

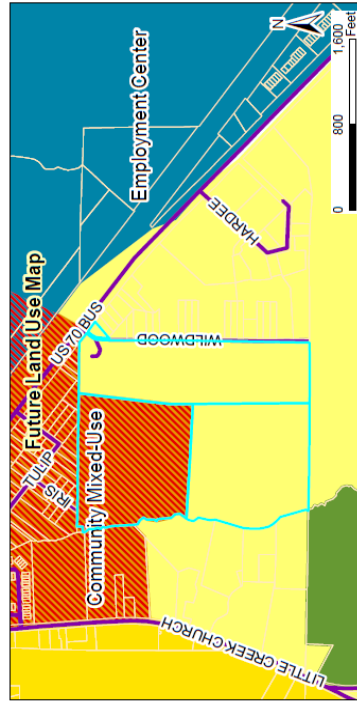
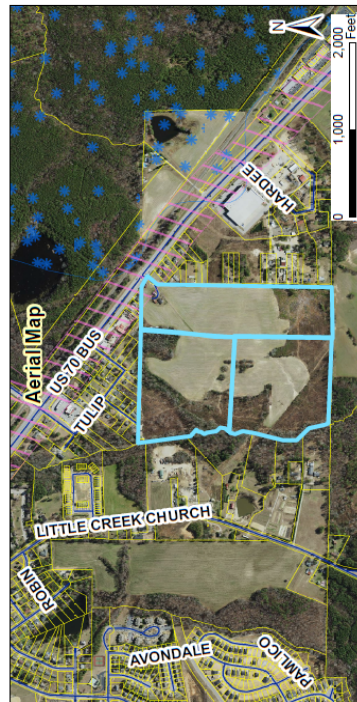
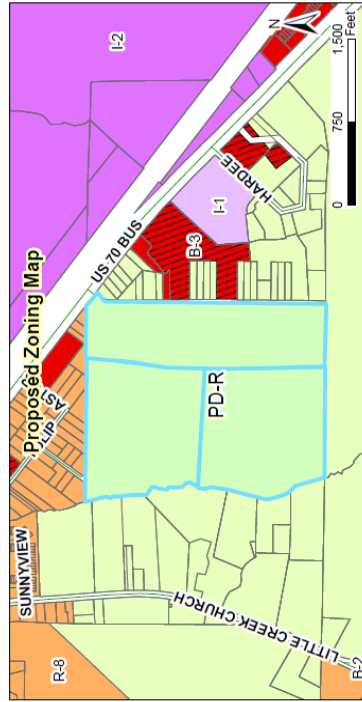
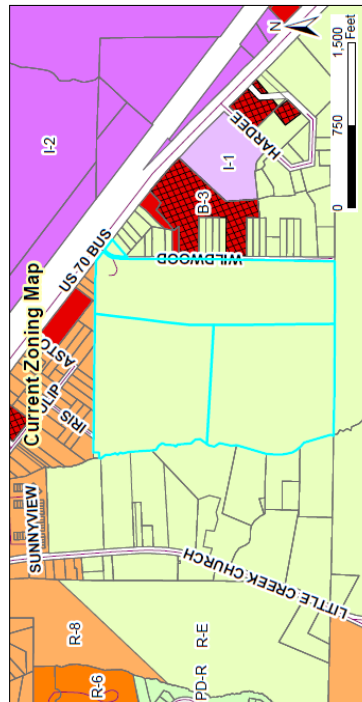
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ParcelID	Name1	Name2	Address1	Address2	CityStateZip
5001001	CONDON, GERALE J		206 FOXWOOD DRIVE		GOLDSBORO, NC 27530-0000
5001002	JUSTIN D COLVIN TRUST	CONDON, GERALE J TRUSTEE	206 FOXWOOD DR		GOLDSBORO, NC 27530-9211
5001003	LEE, GAIL P	WALL, MARILYN P	6018 LITTLE CREEK CHURCH RD		CLAYTON, NC 27520-6129
5001004	G&M POUNDS PROPERTIES LLC		6018 LITTLE CREEK CHURCH RD		CLAYTON, NC 27520-0000
5001005	HARROLD, JAMES TED	HARROLD, LIBBY	5204 TOMAHAWK TRAIL		RALEIGH, NC 27610-0000
5001006	LEE, GEORGE		2241 SHOTWELL RD		CLAYTON, NC 27520-8224
5001007	TYREE, KEVIN W	BENSINGER, EMMYLEE D	711 ASTOR ST		CLAYTON, NC 27520-2017
5001008	OVERBEE, LOUISE BARBEE		1024 RIDGE DR		CLAYTON, NC 27520-9667
5001009	SOUTH FAYETTEVILLE STREET LLC		603 SOUTH FAYETTEVILLE STREET		CLAYTON, NC 27520-0000
5001010	LEE, HUBERT L	LEE, BONNIE Y	2236 SHOTWELL RD		CLAYTON, NC 27520-0000
5001011	SIGRIST, RODNEY L		1405 TULIP ST		CLAYTON, NC 27520-2035
5001013	FINE, LISA W		805 IRIS STREET		CLAYTON, NC 27520-0000
5001014	EDWARDS, MARY HILL		807 IRIS ST		CLAYTON, NC 27520-0000
5001015	SANDERS, DOUGLAS C		809 IRIS ST		CLAYTON, NC 27520-0000
5001016	LEE, JONATHAN D		427 W MAIN STREET		CLAYTON, NC 27520-0000
5001053	ROGERS, CARRIE E		810 IRIS ST		CLAYTON, NC 27520
5001058	JUSTIN D COLVIN TRUST	CONDON, GERALE J TRUSTEE	206 FOXWOOD DR		GOLDSBORO, NC 27530-9211
05A01001	NEWLIN, RICHARD M	NEWLIN, JESSICA M	484 WOODLAND CHURCH RD		DUDLEY, NC 28333-5412
05A01002	COLAVITO, JOSEPH DANIEL	COLAVITO, JASON DEAN	86 REGULATOR DR		CLAYTON, NC 27520-8717
05A01008	WHEELER, JEAN JONES		P O BOX 291		CLAYTON, NC 27528-0291
05A01008A	WHEELER, JEAN JONES		P O BOX 291		CLAYTON, NC 27528-0291
05A01009	CARROLL, TONY RAY		2301 TWIN ACRES RD		CLAYTON, NC 27520-9444
05A01009A	CARROLL, TONY RAY		2301 TWIN ACRES RD		CLAYTON, NC 27520-9444
05A01011	ADAMS, CHERYL M.		721 WILDWOOD DR		CLAYTON, NC 27520-2037
05A01012	ADAMS, CHARLES EVANS JR.		721 WILDWOOD DR		CLAYTON, NC 27520-2037
05A01013	LITTLE CREEK ELEVEN LLC		1255 CREEKSHIRE WAY		WINSTON SALEM, NC 27103-0000
05A01016	HARDEE, BOBBY HINTON		2019 HARDEE LANE		CLAYTON, NC 27520-9822
05A01018	HARDEE, BOBBY H	HARDEE, NANCY O	2019 HARDEE LANE		CLAYTON, NC 27520-9822
05A01019	HARDEE, BOBBY H	HARDEE, NANCY O	2019 HARDEE LANE		CLAYTON, NC 27520-9822
05A01020	PATINO, JOSE CARMEN		1985 GOVERNMENT RD		CLAYTON, NC 27520-0000
05A01020A	BOUGHTON, LAYCEE SHAYNE	BOUGHTON, CORY MICHAEL	2016 HARDEE LN		CLAYTON, NC 27520-9618
05A01021	CHAVEZ, RAFAEL	FRANCISCO, IRMA	807 WILDWOOD DRIVE		CLAYTON, NC 27520-0000
05A01021A	MACIAS, ARMANDO P		805 WILDWOOD DRIVE		CLAYTON, NC 27520-0000
05A01023	HARDEE, BOBBY HINTON	HARDEE, NANCY O	2019 HARDEE LANE		CLAYTON, NC 27520-9822
05A01029E	HARDEE, BOBBY HINTON		2019 HARDEE LANE		CLAYTON, NC 27520-9822
05E99001P	ADAMS, CHARLES EVANS JR.		721 WILDWOOD DR		CLAYTON, NC 27520-2037
05E99025C	LEE, SAM S	LEE, BRENDA POUNDS	6018 LITTLE CREEK CHURCH RD		CLAYTON, NC 27520-0000
05E99199B	POOLE, TRINA		405 ALEXANDER LANE		SMITHFIELD, NC 27577-0000
05H03009	CARROLL, TONY RAY		2301 TWIN ACRES RD		CLAYTON, NC 27520-9444
05H03010A	TOWN OF CLAYTON		PO BOX 777		CLAYTON, NC 27528-0777
05H03011A	DURHAM, MARILYN P		6026 LITTLE CREEK CHURCH RD		CLAYTON, NC 27520-0000
05H03011H	LEE, BRENDA GAIL POUNDS		6018 LITTLE CREEK CH RD		CLAYTON, NC 27520-6129
05H03011K	LEE, GAIL POUNDS	LEE, SAM S	6018 LITTLE CREEK CHURCH ROAD		CLAYTON, NC 27520-0000
05H03011X	POUNDS, REVIS BRIAN		6082 LITTLE CREEK CHURCH RD		CLAYTON, NC 27520-1211
05H03011Z	WALL, MARILYN P	WALL, HARRY D JR	6026 LITTLE CREEK CHURCH ROAD		CLAYTON, NC 27520-0000
05H04032F	COX, JIMMY R	COX, JUDY G	8851 US 70 BUS HWY W		CLAYTON, NC 27520-9296
05H04046H	TOWN OF CLAYTON		PO BOX 879		CLAYTON, NC 27528-0879
05H04002C	GRIFOLS THERAPEUTICS INC		79 TWALEXANDER DR	4101 RESEARCH COMMONS	DURHAM, NC 27709



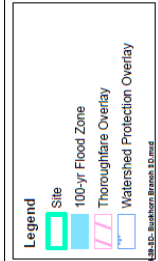
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2019-40-PDD Buckhorn Branch Rezoning
Request: Rezone from R-E to PD-R
2019-39-SD Buckhorn Branch Preliminary Plat
Request: Residential subdivision

Applicant: Withers Ravenel
 Property Owner: Concept 8 Holdings, LLC
 Tag #: 05H03010, 05H03197D, 05H03009

Staff Report Map



10/01/19
 Prepared by: TDC Planning
 Disclaimer: Town of Cotton assumes no legal responsibility for the information presented here.
 Document Path: C:\P\PLANNING\SUBDIVISIONS\2019\19-39-SD - Buckhorn Branch Preliminary Plat Staff Report Map - 2019-39-SD Buckhorn Branch SD.pdf

PUBLIC NOTICE

In accordance with NC GS 160A-364 and NC GS 160A-384 the Clayton Town Council will hold an evidentiary and public hearing on Monday, January 6, 2020, at 6:00 PM at Town Hall, 111 East Second Street, to consider the following requests for three parcels (84.73 acres) located off US HWY 70; TAG #s: 05H03010, 05H03197D, 05H03009:

- 2019-40-PDD Buckhorn Branch Planned Development Rezoning; request to rezone properties from Residential-Estate (R-E) to Planned Development Residential (PD-R).
- 2019-39-SD Buckhorn Branch Preliminary Plat (Master Plan); request to develop 324 lots including single-family and townhomes.

For a rezoning request, 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 a Preliminary Plat, the Town Council will hold an evidentiary hearing and 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.

Haley Hogg, Planner
919-553-5002

The Johnsonian Newspaper

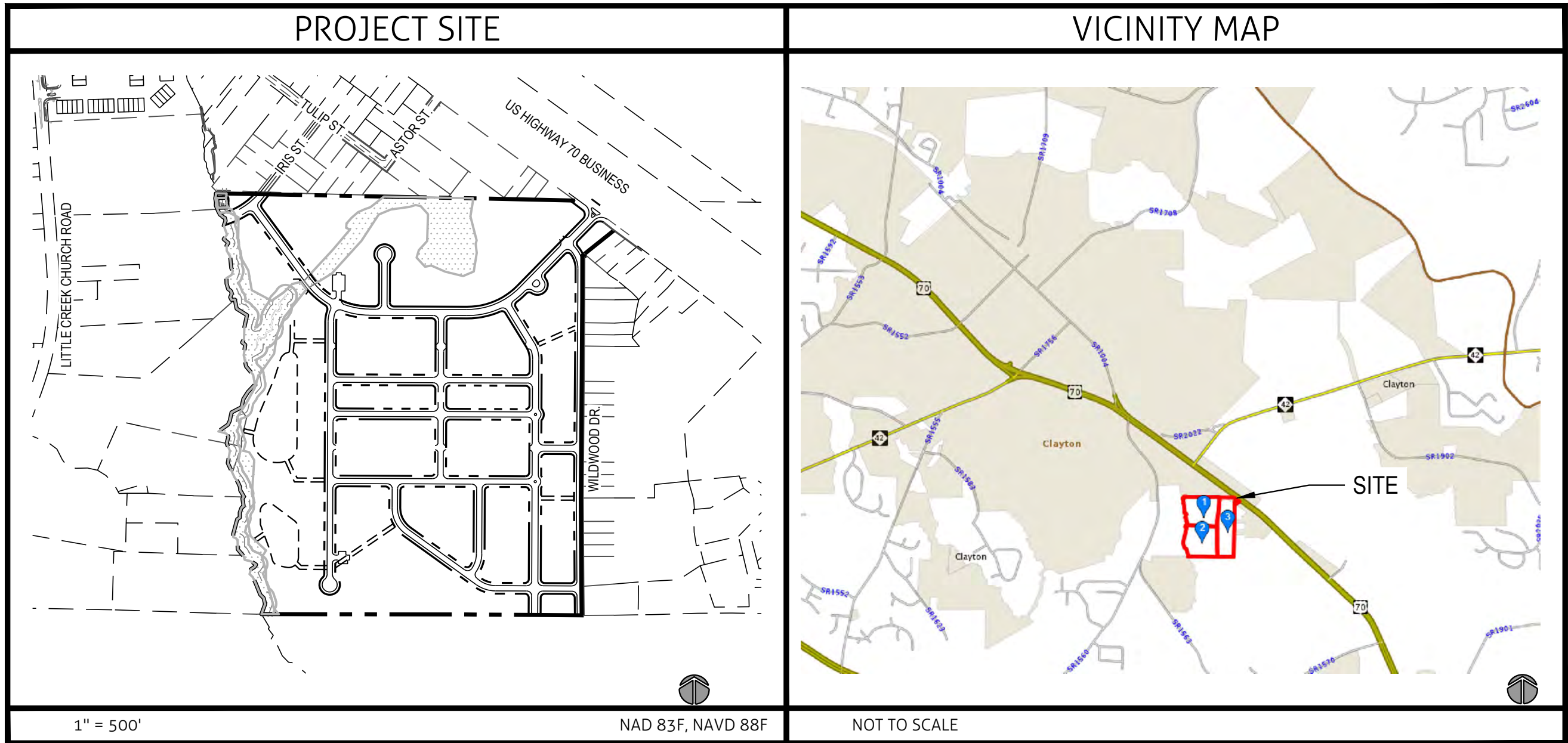
Please advertise on the following dates:
December 25, 2019
January 1, 2020

Affidavit of publication required.

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APPROVAL NOTES
1. PRIOR TO RECORDING 30 LOTS, IRIS STREET SHALL BE DEDICATED AS PUBLIC RIGHT-OF-WAY WITH A WIDTH OF 40 LF TO THE TOWN OF CLAYTON.

2019-39-SD
Planned Development/Major Subdivision Plans for
BUCKHORN BRANCH PARK
US HIGHWAY 70 BUSINESS, CLAYTON, NC
Date: December 10, 2019



OWNERS		
TRACT 1	TRACT 2	TRACT 3
CONCEPT 8 HOLDINGS, LLC 307 S. SALEM ST. SUITE 200 APEX, NC 27502-1845 NCPIN: 16681-55-8386 PROPERTY TAG: 05H03010 DEEDED ACREAGE: 27.985	CONCEPT 8 HOLDINGS, LLC 307 S. SALEM ST. SUITE 200 APEX, NC 27502-1845 NCPIN: 166800-54-8289 PROPERTY TAG: 05H03197D DEEDED ACREAGE: 27.98	TONY RAY CARROLL SITE ADDRESS: 706 AUTUMN LN. CLAYTON, NC 27520 MAIL ADDRESS: 2301 TWIN ACRES RD. CLAYTON, NC 27520 NCPIN: 166800-64-8874 PROPERTY TAG: 05H03009 DEEDED ACREAGE: 28.3

CIVIL ENGINEER/SURVEYOR

Engineers | Planners

137 S. Wilmington Street | Suite 200 | Raleigh, NC 27601 | t: 919.469.3340 | license #: C-0832
www.withersravenel.com

LANDSCAPE ARCHITECT: DAVID BROWN, PLA DBROWN@WITHERSRAVENEL.COM	CIVIL ENGINEER : RYAN FISHER, PE RFISHER@WITHERSRAVENEL.COM	SURVEYOR: BENJAMIN DAYTON, PLS BDAYTON@WITHERSRAVENEL.COM
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DEVELOPER

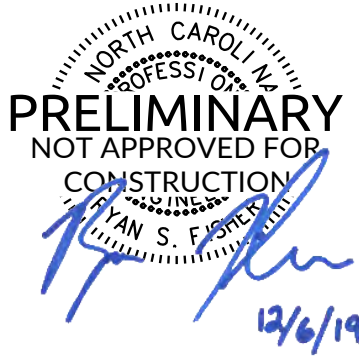
CONCEPT 8 HOLDINGS, LLC
307 S. SALEM ST., SUITE 200
APEX, NC 27502
PHONE: 919-601-5078
CONTACT: SHAWN DONOVAN
EMAIL: SHAWN@CONCEPTEIGHT.COM



SHEET LIST TABLE	
SHEET #	SHEET TITLE
C0.0	Cover
--	Boundary Survey
C1.0	Existing Conditions
C2.0	Overall Subdivision Plan
C2.1	Enlarged Subdivision Plan
C2.2	Enlarged Subdivision Plan
C2.3	Enlarged Subdivision Plan
C2.4	Enlarged Subdivision Plan
C2.5	Enlarged Subdivision Plan
C2.6	Enlarged Subdivision Plan
C2.7	Phasing Plan
C2.8	Open Space Plan
C2.9	Fire Department Plan
C2.10	Offsite Street Improvements
C3.0	Overall Utility Plan
C3.1	Enlarged Utility Plan
C3.2	Enlarged Utility Plan
C3.3	Enlarged Utility Plan
C3.4	Enlarged Utility Plan
C3.5	Enlarged Utility Plan
C3.6	Enlarged Utility Plan
C3.7	Force Main Plan
C3.8	Force Main Plan
C3.9	Force Main Plan
C4.0	Overall Grading & Drainage Plan
C4.1	Enlarged Grading & Drainage Plan
C4.2	Enlarged Grading & Drainage Plan
C4.3	Enlarged Grading & Drainage Plan
C4.4	Enlarged Grading & Drainage Plan
C4.5	Enlarged Grading & Drainage Plan
C4.6	Enlarged Grading & Drainage Plan
C5.0	Lot and Street Details
L1.0	Overall Landscape Plan
L1.1	Enlarged Landscape Plan
L1.2	Enlarged Landscape Plan
L1.3	Enlarged Landscape Plan
L1.4	Enlarged Landscape Plan
L1.5	Enlarged Landscape Plan
L1.6	Enlarged Landscape Plan
A1.0	Architectural Elevations (Townhomes)
A1.1	Architectural Elevations (Amenity Center)

GENERAL NOTES
1. PROPERTY BOUNDARY SHOWN AS PROVIDED BY WITHERSRAVENEL, INC., DATED JANUARY 2019 AND REVISED NOVEMBER 2019.
2. TOPOGRAPHIC SURVEY SHOWN AS PROVIDED BY WITHERSRAVENEL, INC., DATED JANUARY 2019.
3. PROPERTY DOES NOT FALL WITHIN FEMA FLOODPLAIN PER FEMA FIRM 3720166800K, EFFECTIVE DATE JUNE 20, 2018.
4. WETLAND AND STREAM DELINEATIONS BASED ON FIELD INVESTIGATIONS BY WITHERSRAVENEL, INC. DURING 2018 WITH CONCURRENCE BY NCDWR AND USACE.
5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL JOB-SITE SAFETY, INCLUDING BUT NOT LIMITED TO TRENCH SAFETY, DURING ALL PHASES OF CONSTRUCTION. ALL WORK SHALL COMPLY WITH ALL MUNICIPAL, COUNTY, AND STATE REGULATIONS AND CODES AND O.S.H.A. STANDARDS.
6. WORK ON THIS PROJECT SHALL CONFORM TO THESE PLANS, THE LATEST EDITIONS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) ROAD AND BRIDGE SPECIFICATIONS, THE NCDOT ROAD AND BRIDGE STANDARDS, THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL HANDBOOK, THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL REGULATIONS, TOWN OF CLAYTON STANDARDS AND SPECIFICATIONS, JOHNSTON COUNTY STANDARDS AND SPECIFICATIONS, THE FINAL GEOTECHNICAL REPORT, AND GENERAL DESIGN STANDARDS. IN THE EVENT OF CONFLICT BETWEEN ANY OF THESE STANDARDS, SPECIFICATIONS, OR PLANS, THE MOST STRINGENT SHALL GOVERN UNLESS OTHERWISE NOTED IN THESE PLANS.
7. ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND SPECIFICATIONS AND SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES IN DRAWINGS OR SPECIFICATIONS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER, IN WRITING, WHO SHALL PROMPTLY ADDRESS SUCH INCONSISTENCIES OR AMBIGUITIES. WORK DONE BY THE CONTRACTOR AFTER THE DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES, OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
8. THE CONTRACTOR SHALL PROTECT ALL SIGNS, MANHOLES, TELEPHONE RISERS, WATER VALVES, ETC. DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL REPAIR, AT THEIR OWN EXPENSE, ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
9. TRAFFIC CONTROL ON PUBLIC STREETS IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IN CONFORMANCE WITH THESE PLANS, THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AND AS FURTHER DIRECTED BY THE TOWN OF CLAYTON AND NCDOT.
10. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING OR OBTAINING ALL REQUIRED PERMITS AND APPROVALS PRIOR TO COMMENCING CONSTRUCTION.

LEGEND	
EXISTING	PROPOSED
FIRE HYDRANT	
POWER POLE	
IRON PIPE SET	
IRON PIPE FOUND	
CALCULATED POINT	
WATER VALVE	
CATCH BASIN	
SANITARY MANHOLE	
BLOW OFF VALVE	
PROJECT BOUNDARY LINE	
ADJACENT PROPERTY LINE	
RIGHT OF WAY	
OVERHEAD ELECTRIC LINE	
SANITARY SEWER LINE	
STORM DRAINAGE LINE	
WATER LINE	
MAJOR CONTOUR LINE	
MINOR CONTOUR LINE	



NOTE: TOC-ELECTRIC WILL DESIGN LIGHTING PLAN FOR THIS SUBDIVISION / SITE.

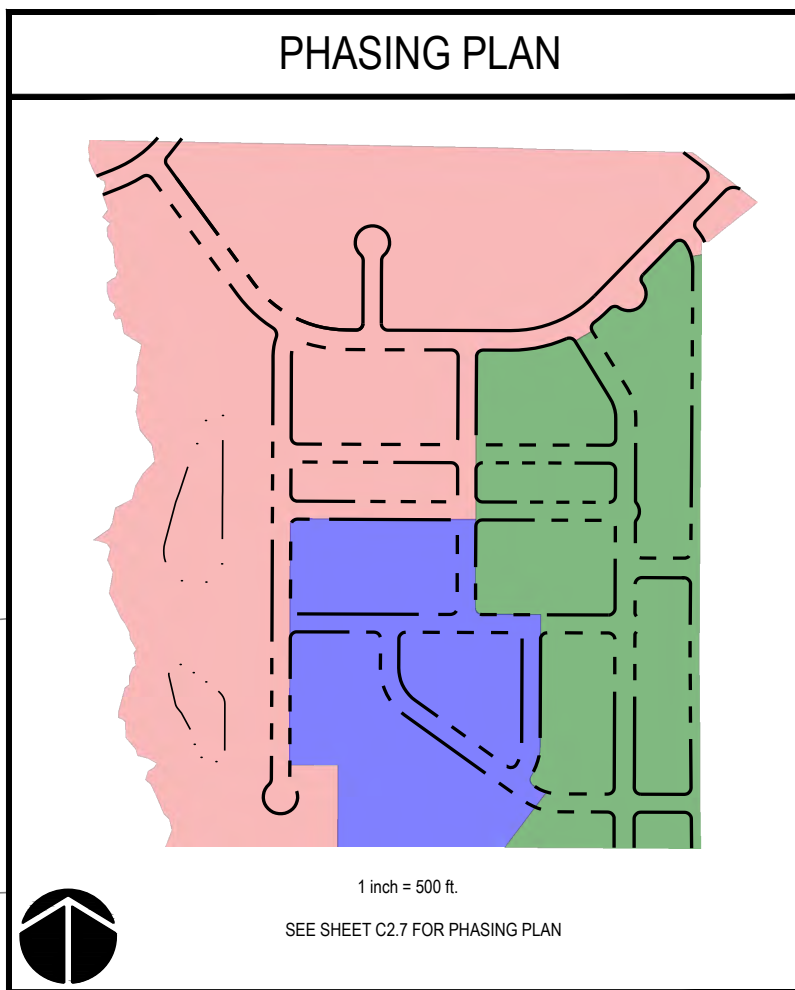


NOTES:
1. EXISTING PROJECT BOUNDARY INFORMATION SHOWN IS FROM FIELD SURVEY BY WITHERSRAVEL, INC.
2. EXISTING ADJACENT PARCELS SHOWN ARE FROM JOHNSTON COUNTY GIS AND ARE THEREFORE APPROXIMATE IN NATURE.
3. STREETS SHOWN WITH RIGHT OF WAY SHALL BE PUBLIC. PROPOSED ALLEYS ARE TO BE PRIVATE AND SHALL BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION. NO TOWN MAINTENANCE OR PRIVATE STREET TALLY.
4. THIS PLAN IS ILLUSTRATIVE IN NATURE AND IS SUBJECT TO MODIFICATION DURING THE CONSTRUCTION DRAWING APPROVAL PROCESS.
5. HOMEOWNERS ASSOCIATION SHALL BE RESPONSIBLE FOR MAINTENANCE OF OPEN SPACE COMMON AREAS AND THE 50 FOOT RIPARIAN BUFFER AND ALL RESOURCE CONSERVATION AREAS SHALL REMAIN UNDISTURBED IN ACCORDANCE WITH ARTICLE 5 OF THE UNIFIED DEVELOPMENT CODE.
6. ORANGE FENCING SHALL BE REQUIRED ALONG THE PERIMETER OF THE 50 FOOT RIPARIAN BUFFER AND ANY OTHER RESOURCE CONSERVATION AREAS TO ENSURE IT IS NOT ENCLOSED UPON DURING CONSTRUCTION.
7. ALL PROPOSED PUBLIC EASEMENTS SHALL BE DEDICATED TO THE TOWN OF CLAYTON.
8. THE RESOURCE CONSERVATION AREA SHOWN HEREON IS PROVIDED PER THE REQUIREMENTS OF ARTICLE 5 OF THE TOWN OF CLAYTON UNIFIED DEVELOPMENT CODE. THIS RESOURCE CONSERVATION AREA MUST BE PRESERVED IN PERPETUITY PER THE STANDARDS OF THE UNIFIED DEVELOPMENT CODE.
9. SITE SOLID WASTE MANAGEMENT HANDLED BY ROLL-OUT SERVICE FOR AMENITY CENTER AND EVERY UNIT AS LONG AS PARKING IS NOT ALLOWED IN ALLEYS.
10. ANIGATION FETTER IS REQUIRED FOR PROPERTIES THAT WILL RECEIVE TOWN SERVICES.
11. TOO-ELECTRIC WILL DESIGN LIGHTING PLAN FOR THIS SUBDIVISION. SITE
12. LINE CLOSURES FOR REQUIRED IMPROVEMENT CONSTRUCTION WILL ONLY BE PERMITTED UNDER RESTRICTED HOURS DUE TO HEAVY TRAFFIC VOLUMES IN THE VICINITY OF THE DEVELOPMENT. PER NC DOT REQUEST.

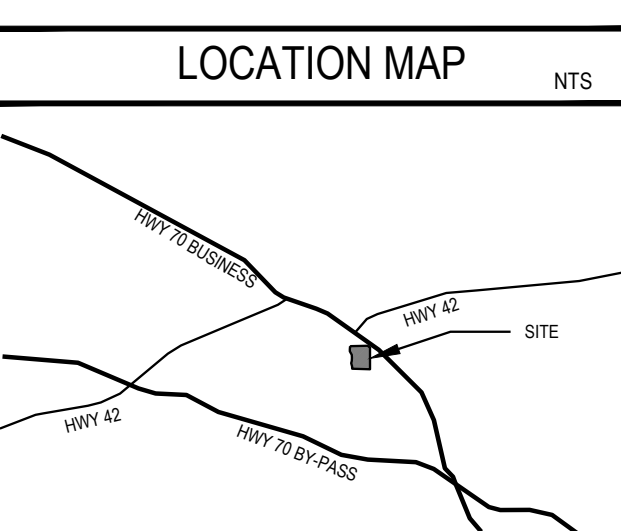
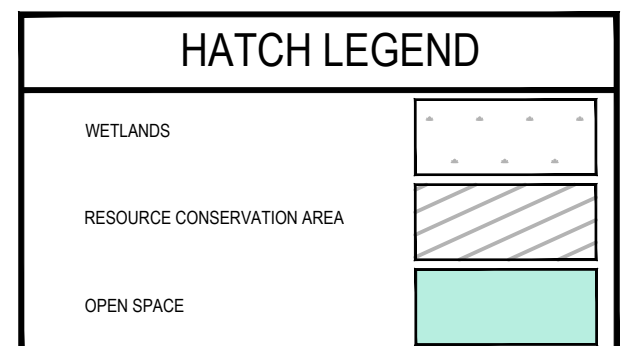
LINE	BEARING	DISTANCE
L1	S38°40'56"E	488.89'
L2	S89°48'18"E	490.83'
L3	N43°44'38"E	531.66'
L4	N88°12'56"E	154.84'
L5	N37°20'01"E	486.96'
L6	N0°13'42"E	297.88'
L7	S29°32'10"W	24.39'
L8	S0°13'42"W	1351.64'
L9	S30°58'16"E	867.50'
L10	S30°58'16"E	250.79'
L11	S0°13'42"W	1314.25'
L12	S89°48'18"E	1028.70'
L13	S89°48'18"E	1028.70'
L14	S89°48'18"E	1028.70'
L15	S0°13'42"W	127.82'
L16	S53°38'17"E	441.91'
L18	S0°13'42"W	371.91'
L19	S30°21'43"W	33.86'
L20	S89°48'18"E	230.07'

CURVE	RADIUS	LENGTH	CHORD	BEARING
C1	375.00'	384.01'	341.01'	S62°43'37"E
C2	375.00'	384.24'	295.97'	N66°59'10"E
C3	375.00'	202.12'	196.68'	N52°46'28"E
C4	150.00'	68.87'	68.27'	S13°22'56"W
C5	150.00'	61.55'	80.55'	S15°20'47"E
C6	150.00'	141.02'	135.89'	S28°42'17"E
C7	150.00'	94.60'	93.04'	S71°42'17"E
C8	150.00'	94.60'	93.04'	S18°17'43"W

NAME	TYPE	R/W WIDTH (FT)	BOC-BOC WIDTH (FT)
STREET A	Residential Collector	60	31
STREET B	Residential Street	55	27
STREET C	Residential Street	55	27
STREET D	Residential Street	55	27
STREET E	Residential Street	55	27
STREET F	Residential Collector	60	31
STREET G	Residential Street	55	27
STREET H	Residential Street	55	27
STREET I	Residential Street	55	27
STREET J	Residential Street	55	27
STREET K	Residential Street	55	27
IRS STREET EXTENSION	Residential Collector	60	31
IRS STREET OFFSITE	Residential Collector	40	27



SITE DATA TABLE	
PROJECT NAME:	BUCKHORN BRANCH PARK
PROJECT AREA:	3,690.854 SQ. FT. (84.73 AC)
PIN:	166811-55-8386 (TRACT 1) 166800-54-8289 (TRACT 2) 166800-54-8289 (TRACT 3) CONCEPT 8 HOLDINGS, LLC 307 S. SALEM ST. STE 200 APEX, NC 27502-1845
OWNERS:	TRACT 1 - TRACT 2 - TRACT 3
CURRENT ZONING:	R-E PD-4
PROPOSED ZONING:	R-E PD-4
EXISTING DENSITY:	+/- 0 UNITS / AC
PROPOSED TOTAL NUMBER OF UNITS:	324 UNITS
DENSITY:	+/- 3.81 UNITS / AC
OVERALL OPEN SPACE:	REQUIRED - 12.5% OF TRACT (84.73 AC) = 10.59 AC PROVIDED = 15.55 AC (DOES NOT INCLUDE RCA)
IMPROVED/ACTIVE OPEN SPACE:	REQUIRED = 25% OF REQ'D OPEN SPACE = 2.65 AC PROVIDED = 4.43 AC
RESOURCE CONSERVATION AREA (RCA):	= 8.42 AC
SITE NOT WITHIN FEMA DESIGNATED FLOOD PLAIN (PER PANEL 3720166800K EFFECTIVE 6/20/2018)	
ELECTRICAL PROVIDER:	TOWN OF CLAYTON
WATER PROVIDER:	TOWN OF CLAYTON
SEWER PROVIDER:	TOWN OF CLAYTON
BUILDING UNIT TYPES:	TOWNHOMES SINGLE FAMILY FRONT LOADED SINGLE FAMILY REAR LOADED
TOWNHOMES:	121
SINGLE FAMILY FRONT LOADED:	94
SINGLE FAMILY REAR LOADED:	109
IMPERVIOUS LIMITS:	EXISTING SITE IMPERVIOUS: 8,359 SQ. FT. (0.19 AC) PROPOSED IMPERVIOUS LIMITS: MAIL KIOSK SITES: 11,170 SQ. FT. (0.26 AC) CLUBHOUSE LOT: 3,573 SQ. FT. (0.31 AC) OFFSITE: 9 SQ. FT. (0.00 AC) SIDEWALK/GREENWAY: 129,087 SQ. FT. (2.96 AC) ROADWAY: 434,525 SQ. FT. (9.98 AC) TOTAL: 1,521,659 SQ. FT. (34.94 AC) 41.2% OF SITE
MAXIMUM IMPERVIOUS LIMITS PER LOT:	REFER TO LOT DATA TABLE, THIS SHEET. NOTE THAT INDIVIDUAL LOT IMPERVIOUS LIMIT INCLUDES PRIVATE DRIVEWAY/ SIDEWALK EXTENSION INTO PUBLIC RIGHT-OF-WAY.
EXISTING USE:	VACANT / SINGLE-FAMILY RESIDENTIAL SUBDIVISION
PROPOSED USE:	TOTAL = 116,996 GPD (SEE SHEET C3.0 FOR CALCULATIONS)
REQUESTED WASTEWATER ALLOCATION:	
REQUIRED PARKING:	RESIDENTIAL: SINGLE-FAMILY 2 SP / UNIT 203 x 2 = 406 SPACES TOWNHOMES 2 SP / UNIT 121 x 2 = 242 SPACES TOTAL = 648 SPACES
BICYCLE PARKING REQUIRED:	NONE
PROVIDED PARKING:	RESIDENTIAL: SINGLE-FAMILY (13 EA) = 609 SPACES TOWNHOMES (2 EA) = 242 SPACES CLUSTERED MAILBOX UNIT #1 = 17 SPACES (1 H/C) CLUSTERED MAILBOX UNIT #3 = 8 SPACES (1 H/C) TOTAL = 876 SPACES (2 H/C)
LENGTH OF CURB-DE-SAC:	STREET B = 361 FT. STREET G = 534 FT.



WithersRavenel
Engineers | Planners

Planned Development/
Major Subdivision Plan for
BUCKHORN BRANCH PARK

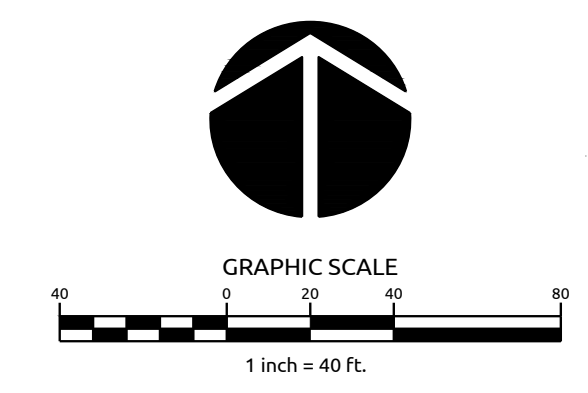
OVERALL SUBDIVISION
PLAN

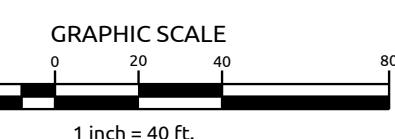
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Date 12/10/2015
Drawn By VR
Designer VR

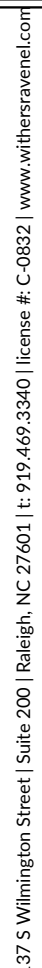
PRELIMINARY
NOT APPROVED FOR
CONSTRUCTION
4/6/19

Revisions

Sheet No.
C2.0

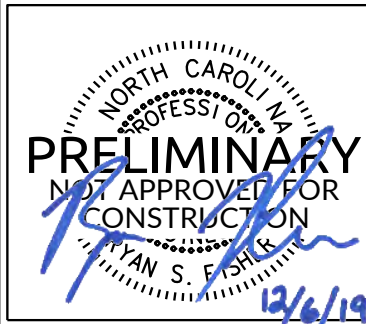






Town of Clayton, North Carolina

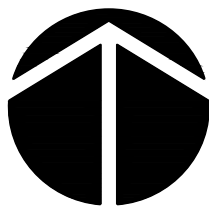
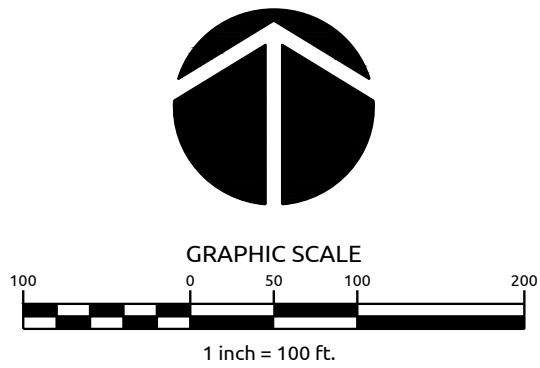
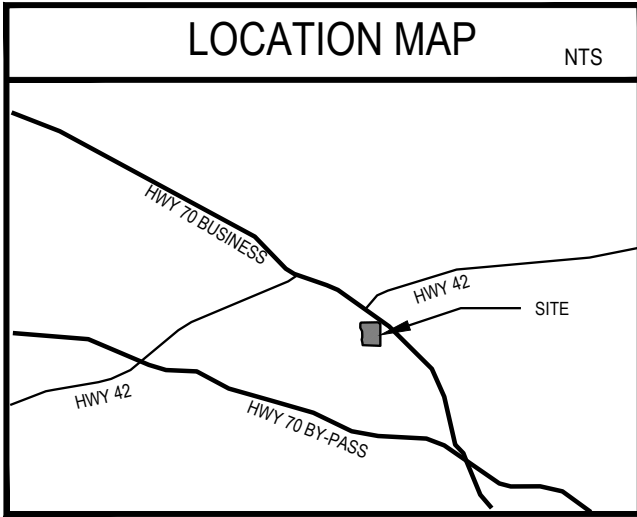
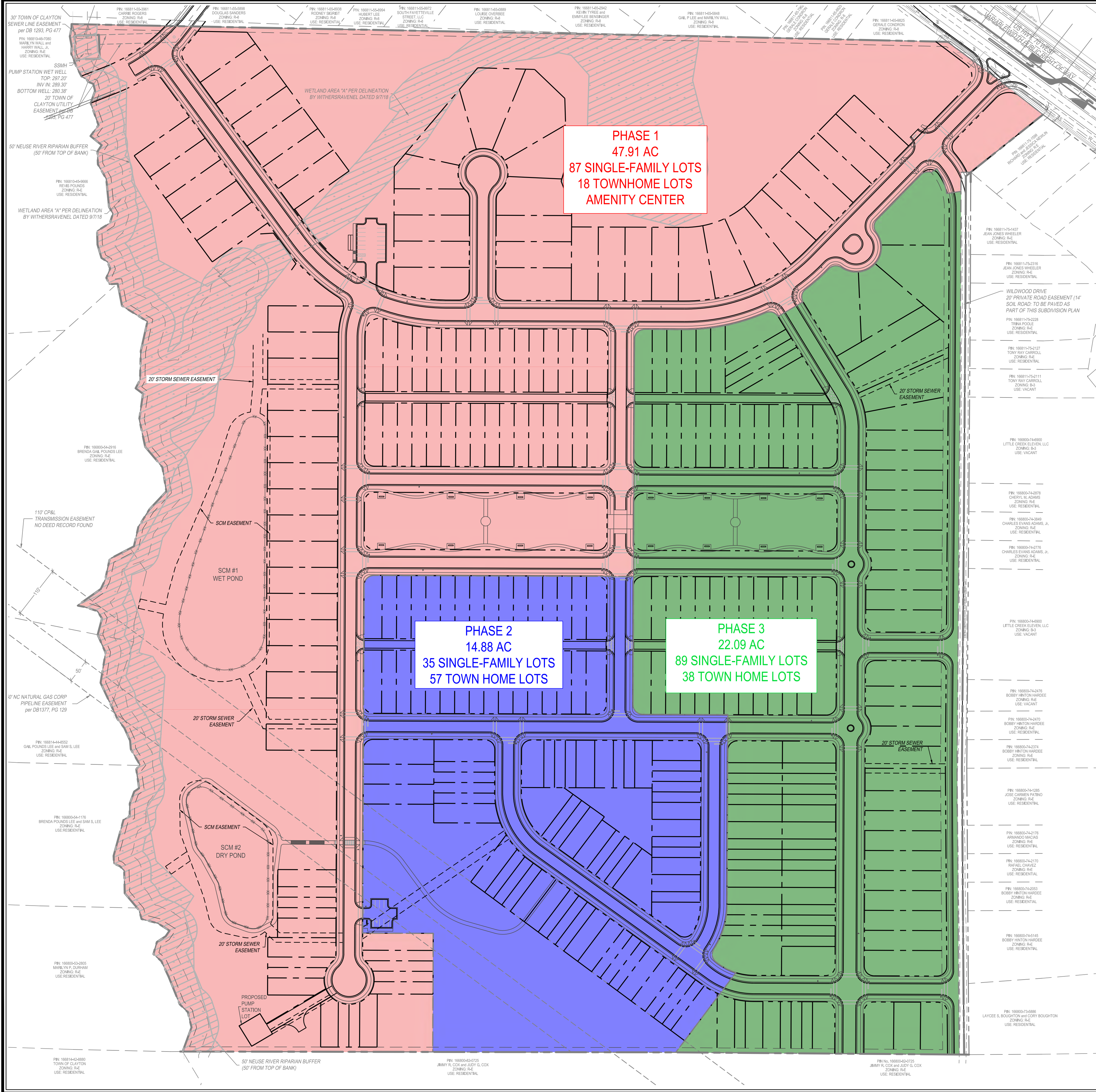
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Date	12/10/2019	Designer	WR

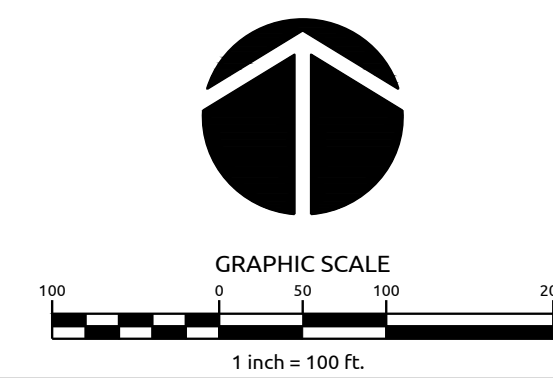
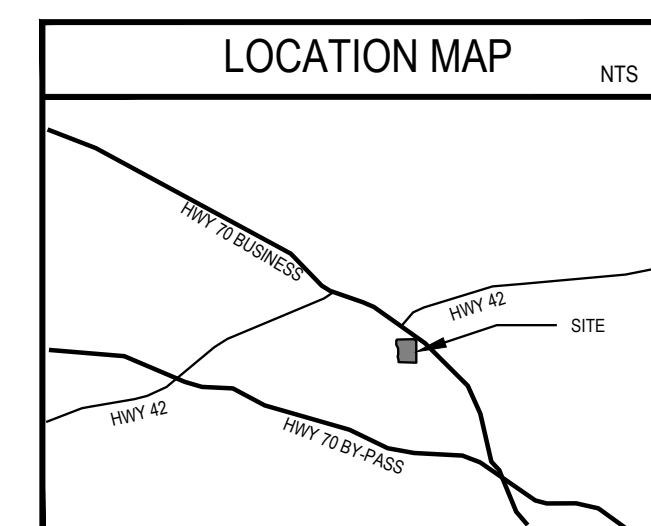
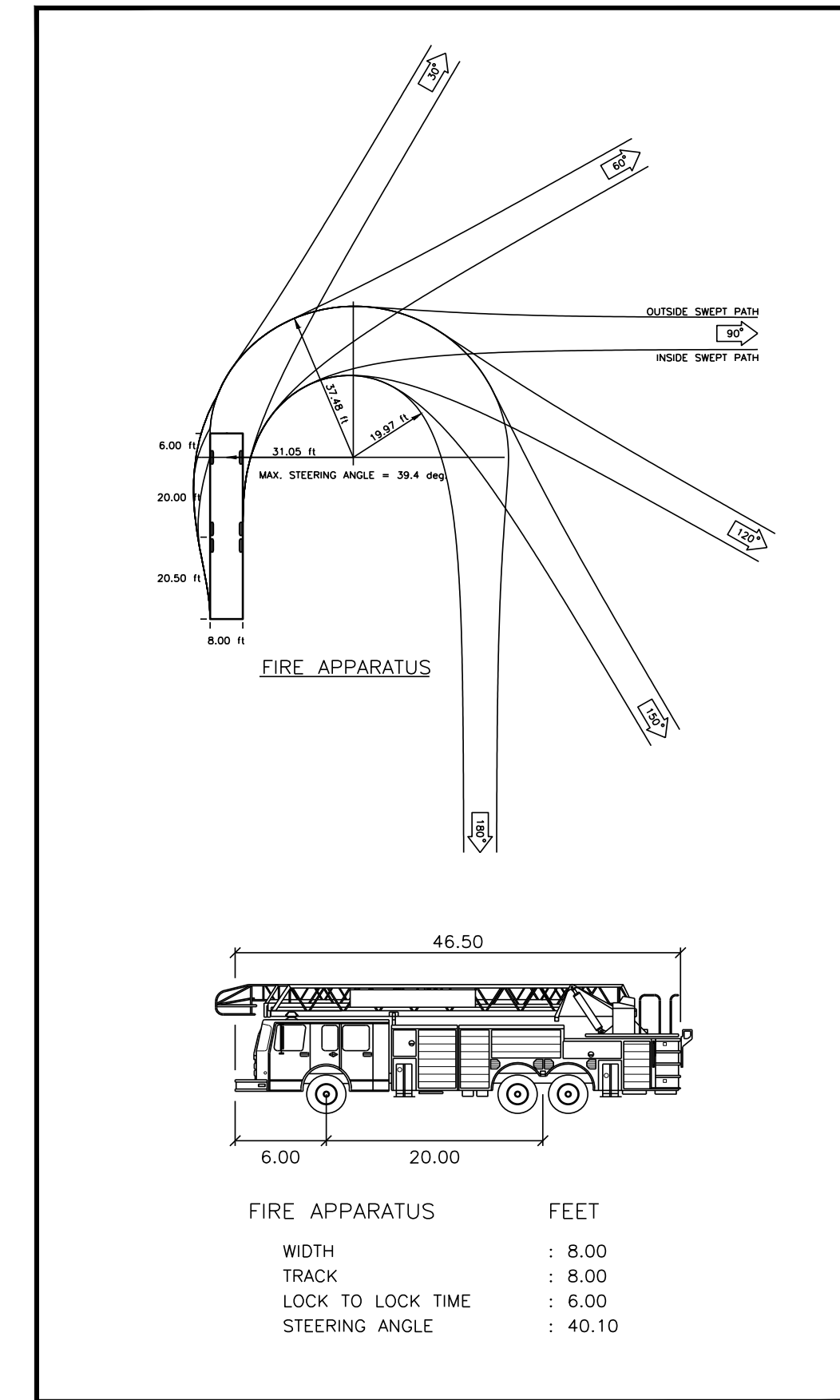


Revisions

Sheet No.

C2.6





WithersRavenel
Engineers | Planners

Planned Development/
Major Subdivision Plan for
BUCKHORN BRANCH PARK
Town of Clayton, North Carolina

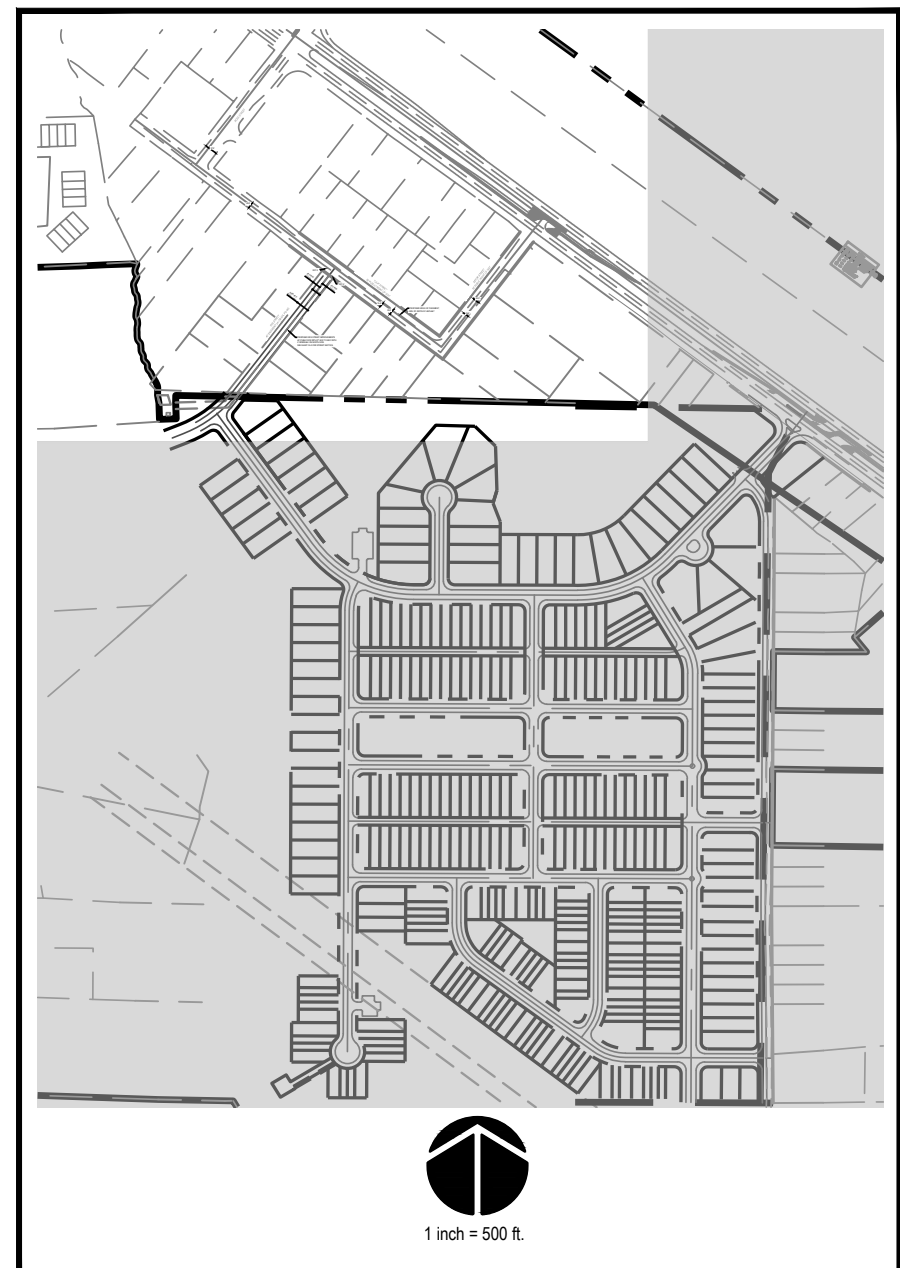
FIRE DEPARTMENT PLAN

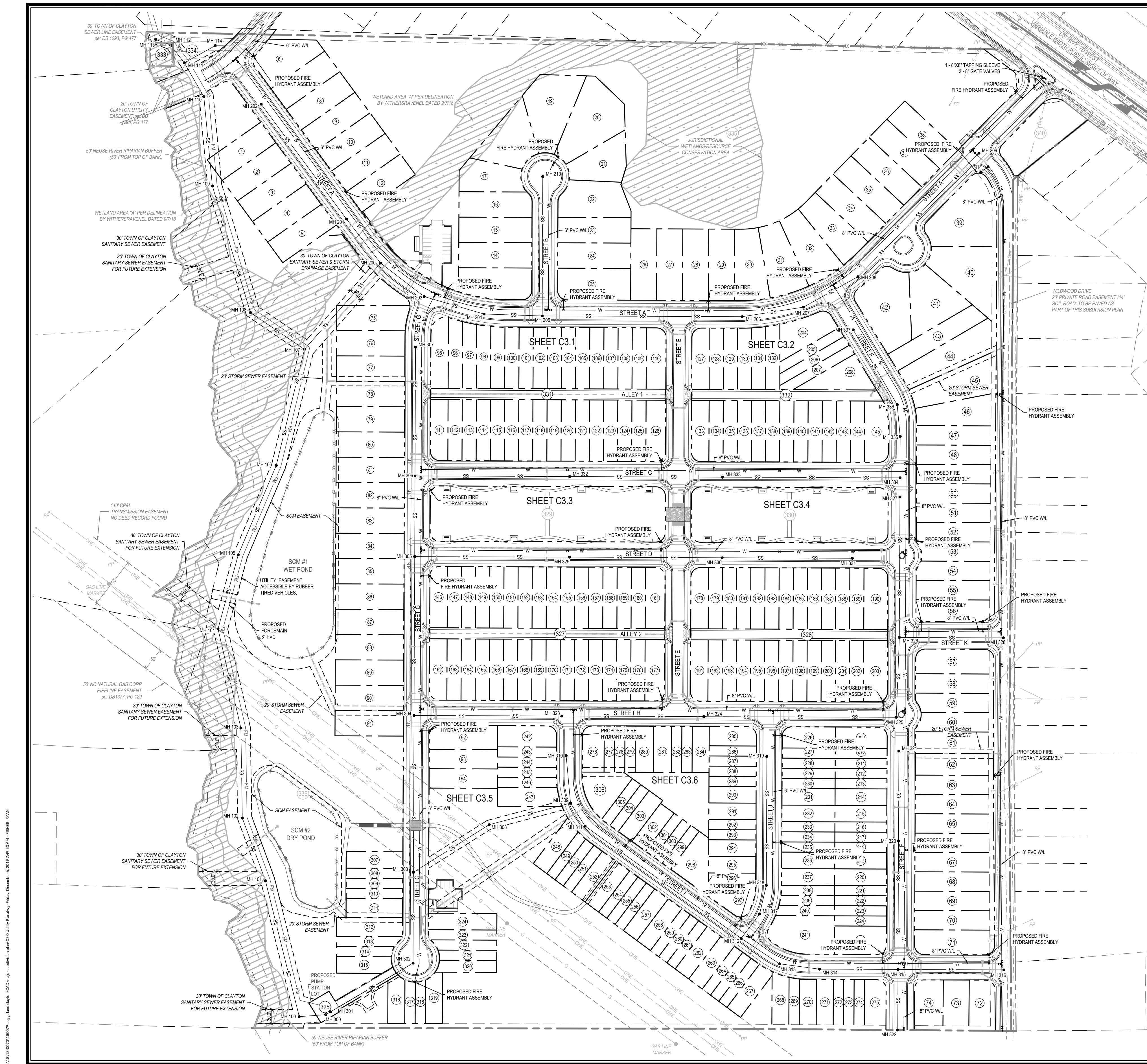
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Date	12/10/2019	Designer	WR

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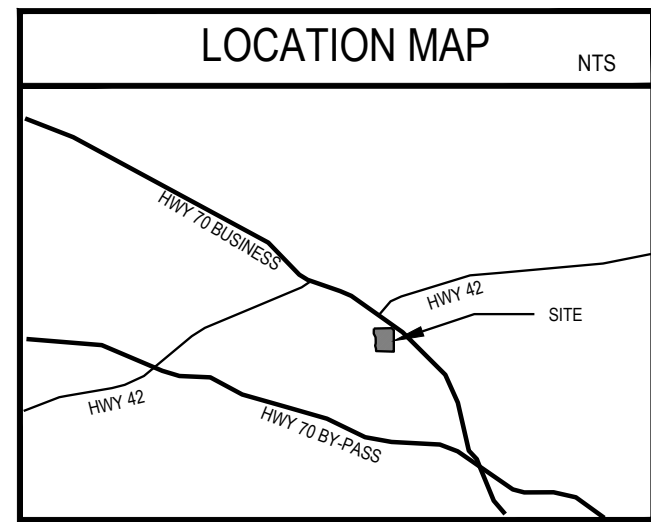
Sheet No.

C2.9





- NOTES:
1. WATER AND SEWER UTILITIES SHALL BE OWNED AND OPERATED BY TOWN OF CLAYTON.
 2. THIS PLAN IS ILLUSTRATIVE IN NATURE AND IS SUBJECT TO MODIFICATION DURING THE CONSTRUCTION DRAWING APPROVAL PROCESS.
 3. ALL PVC USED FOR SANITARY SEWER TO BE SDR-35.
 4. ALL PVC USED FOR PUBLIC WATER TO BE C900.
 5. ALL 5' DIAMETER MANHOLES TO HAVE EXTENDED BASES.



UTILITY DATA

WATER:	
8" PVC C900	7,672 LF
6" PVC C900	3,287 LF
SEWER:	
12" PVC SDR-35	2,561 LF
8" PVC SDR-35	10,527 LF
6" PVC C900 FORCEMAIN	4,698 LF

WASTEWATER ALLOCATION:
SINGLE FAMILY LOTS (128 GPD / BEDROOM)
203 LOTS x 3 BEDROOMS = 609 BEDROOMS
609 BEDROOMS x 120 GPD = 73,080 GPD
TOWNHOME LOTS (120 GPD / BEDROOM)
121 UNITS x 3 BEDROOMS = 363 BEDROOMS
363 BEDROOMS x 120 GPD = 43,560 GPD
CLUBHOUSE (356 GPD - ASSUMED)
TOTAL = 116,996 GPD

WithersRavenel
Engineers | Planners

Planned Development/
Major Subdivision Plan for
BUCKHORN BRANCH PARK
Town of Clayton, North Carolina

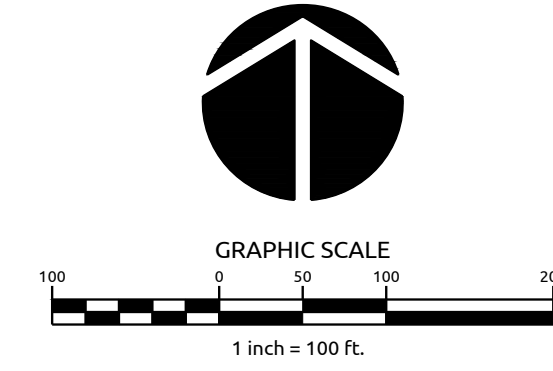
OVERALL UTILITY PLAN

Job No. 02180079.00 Drawn By VR
Date 12/10/2015 Designer VR



Revisions

Sheet No.
C3.0





Planned Development/
Major Subdivision Plan for
BUCKHORN BRANCH PARK

Town of Clayton, North Carolina

ENLARGED UTILITY PLAN

Job No. 02180079.00
Date 12/10/2015
Drawn By VWR
Designed By VWR



Revisions

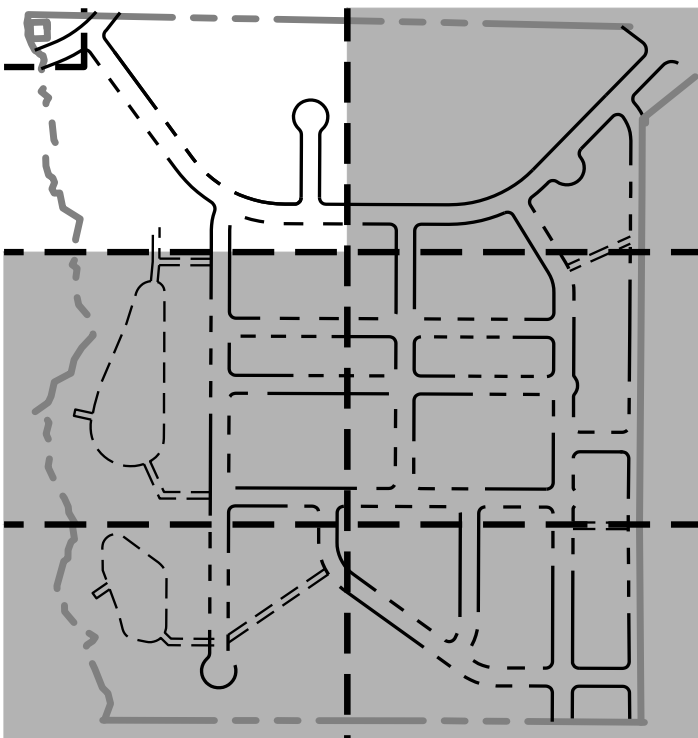
Sheet No.
C3.1

137 S. Wilmington Street | Suite 200 | Raleigh, NC 27601 | 919.469.3340 | License # C-08321 | www.withersravenel.com



SHEET KEY MAP

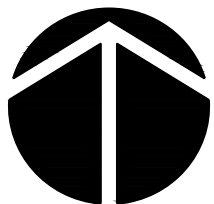
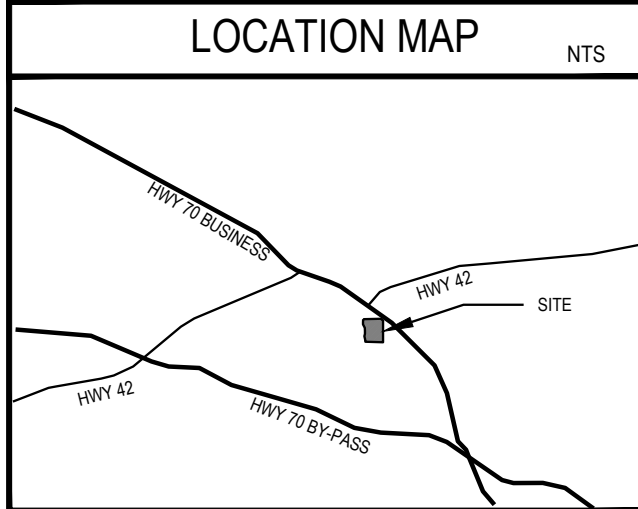
1 inch = 500 ft.



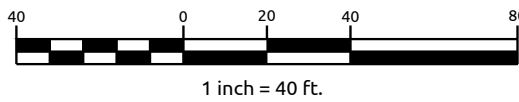
SEE SHEET C2.7 FOR PHASING PLAN

LOCATION MAP

NTS

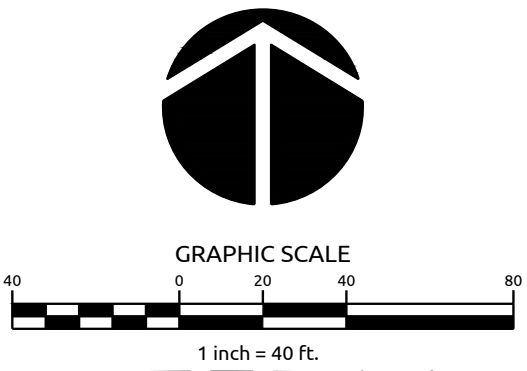


GRAPHIC SCALE



1 inch = 40 ft.

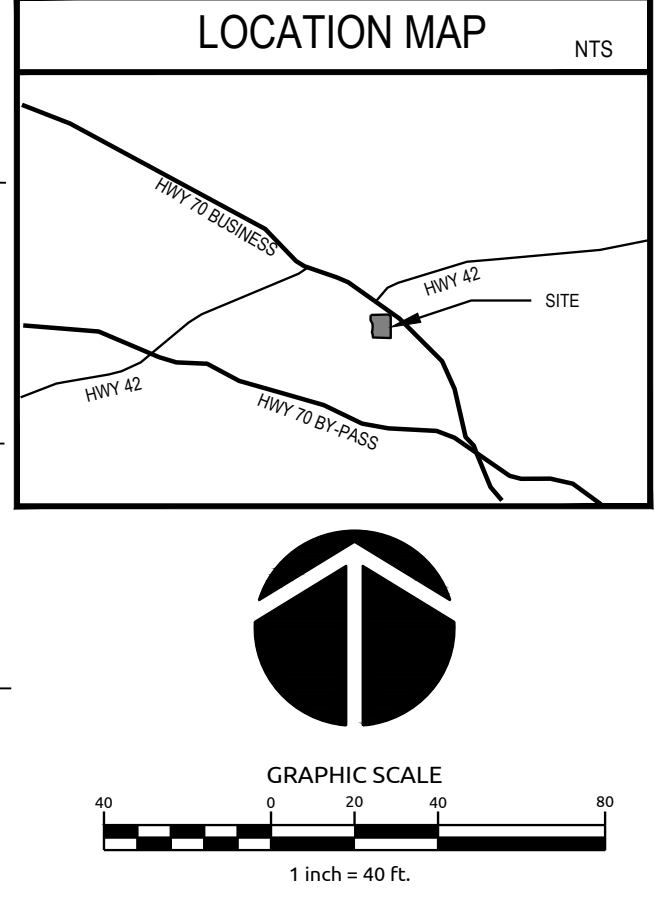
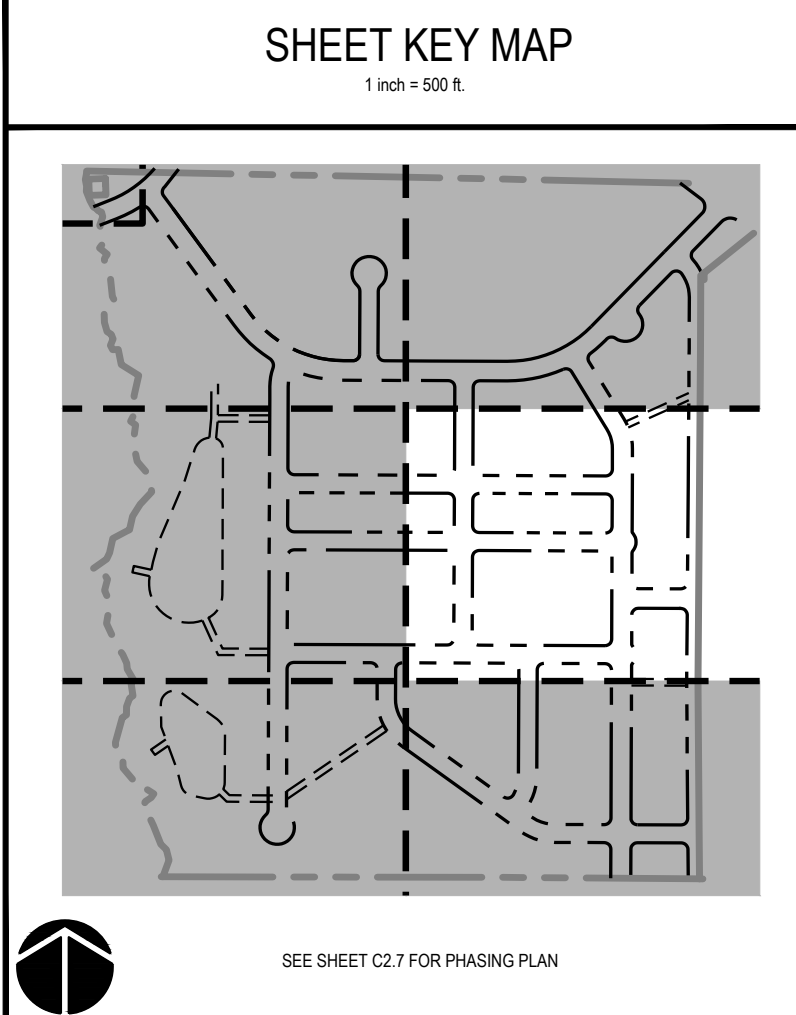
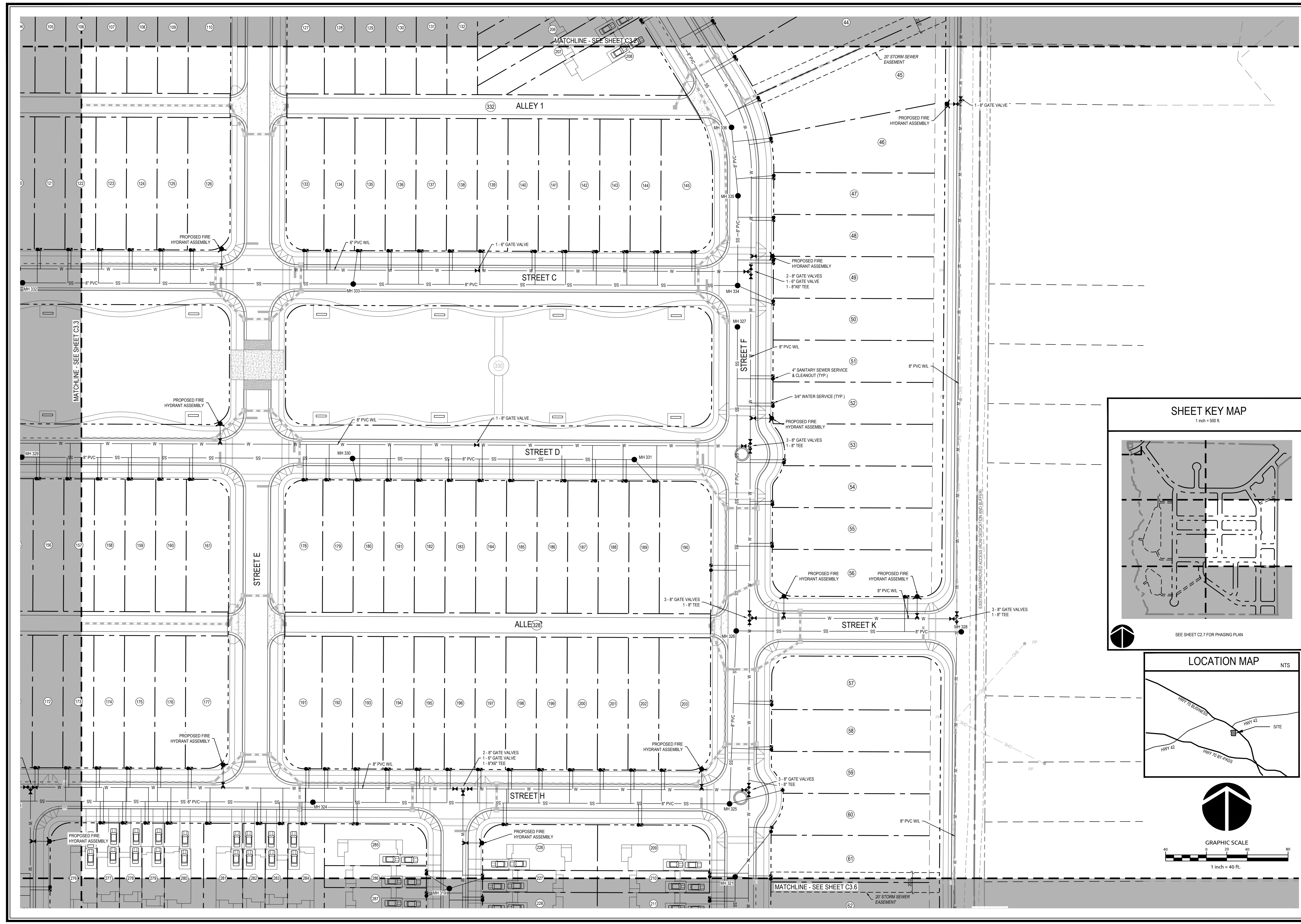
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Planned Development/
Major Subdivision Plan for
BUCKHORN BRANCH PARK

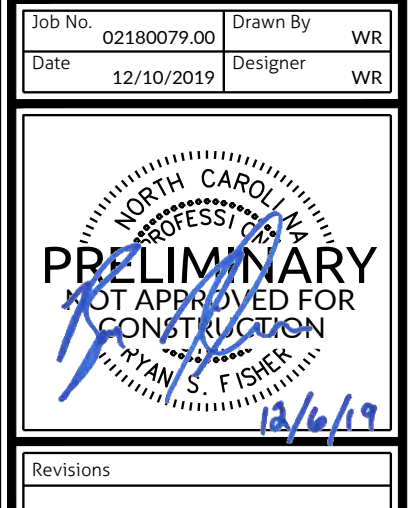
Town of Clayton, North Carolina

ENLARGED UTILITY PLAN

Job No.	02180079.00	Drawn By	WR
Date	12/10/2015	Designer	WR

Revisions

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Planned Development/
Major Subdivision Plan for
BUCKHORN BRANCH PARK
Town of Clayton, North Carolina

ENLARGED UTILITY PLAN

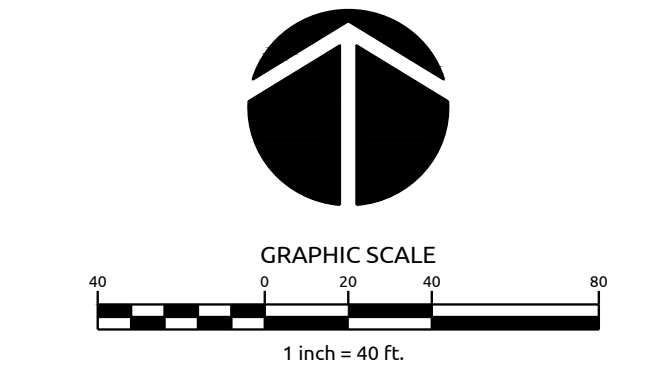
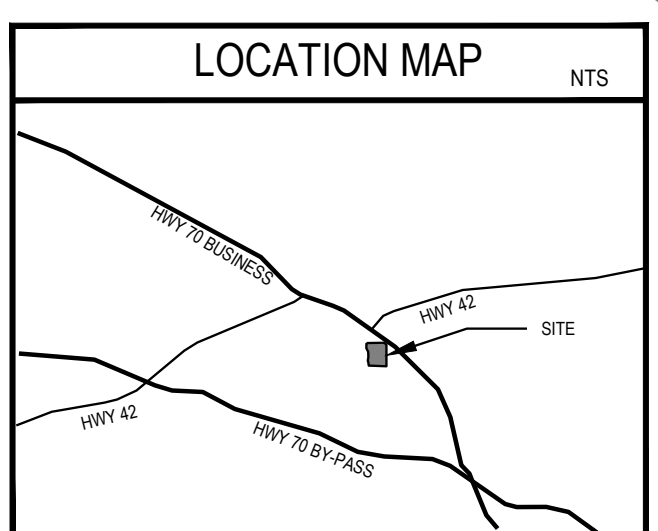
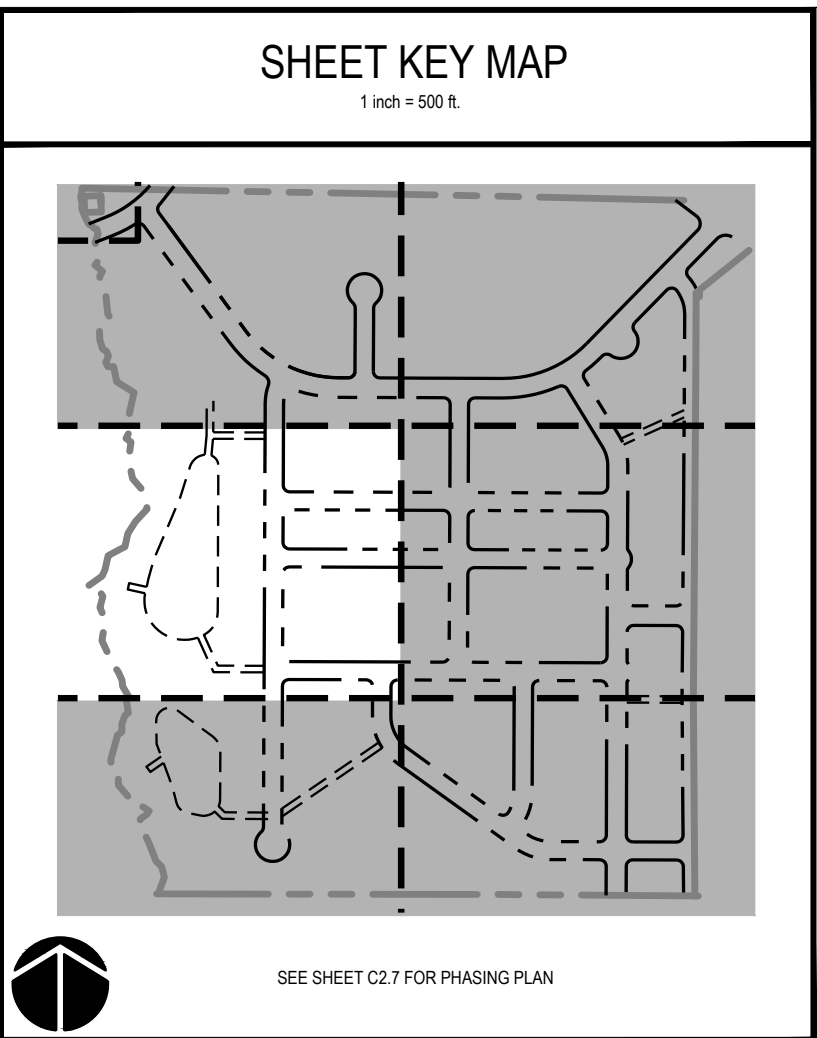
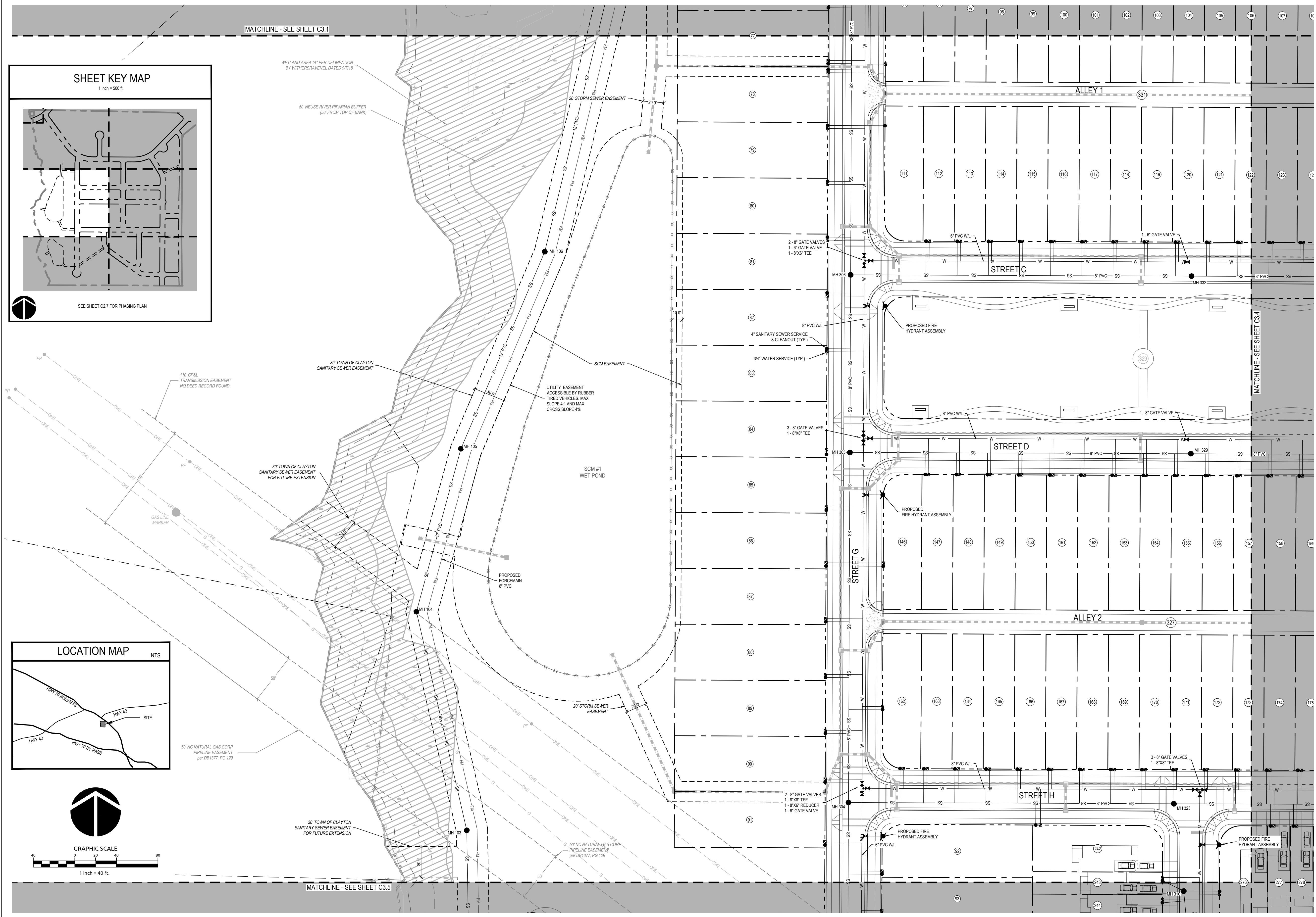
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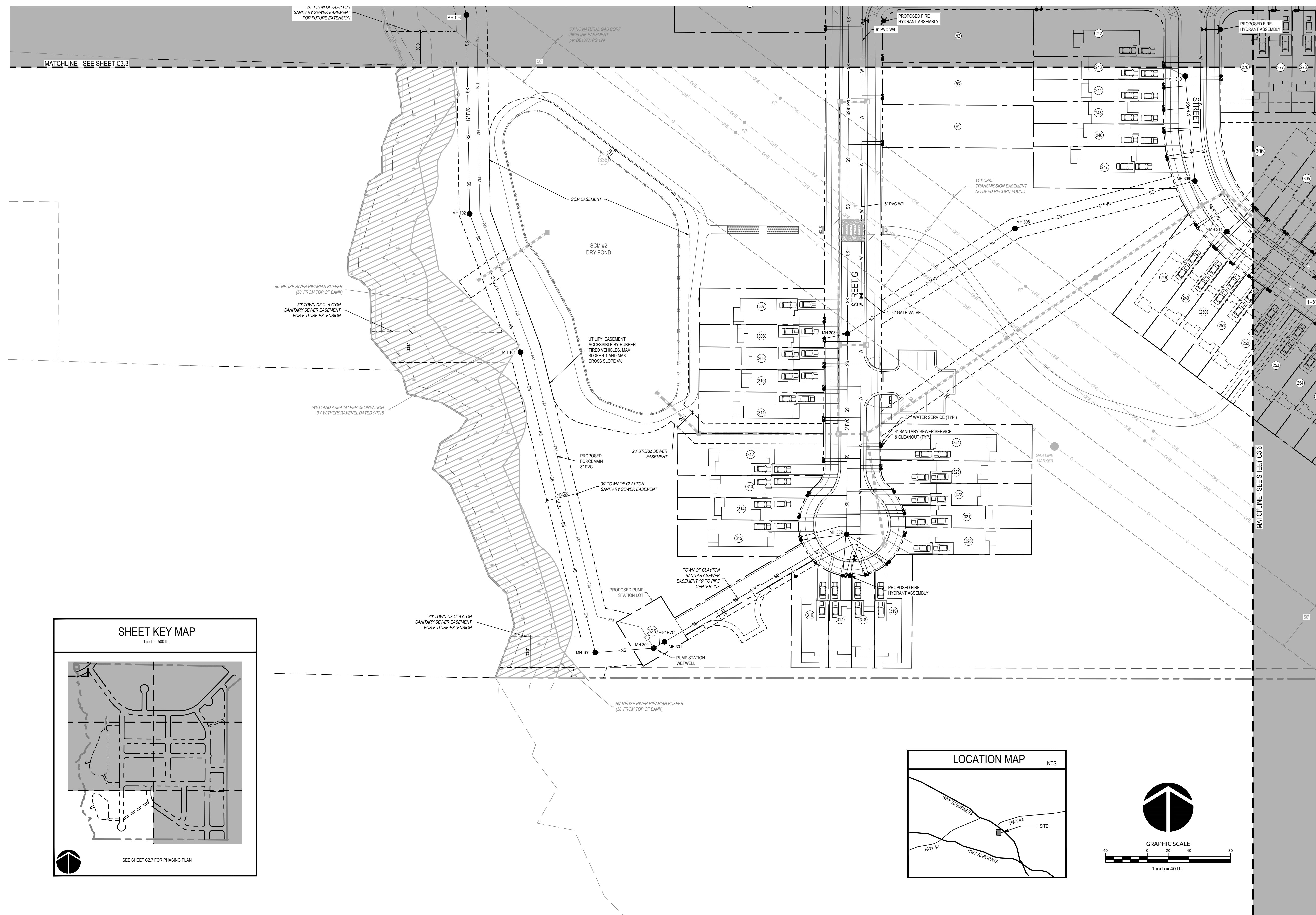
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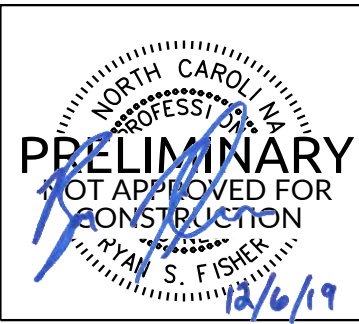


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ENLARGED UTILITY PLAN

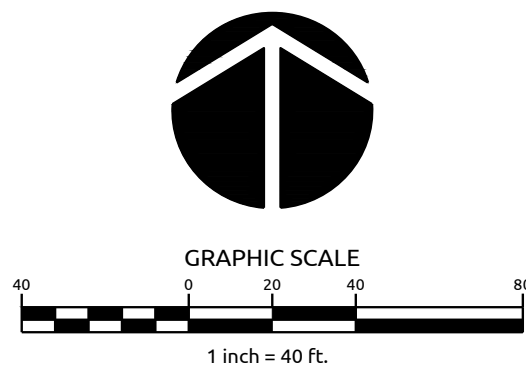
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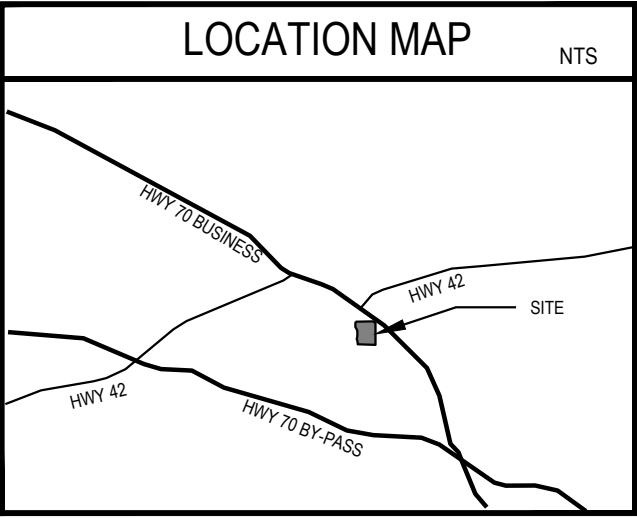
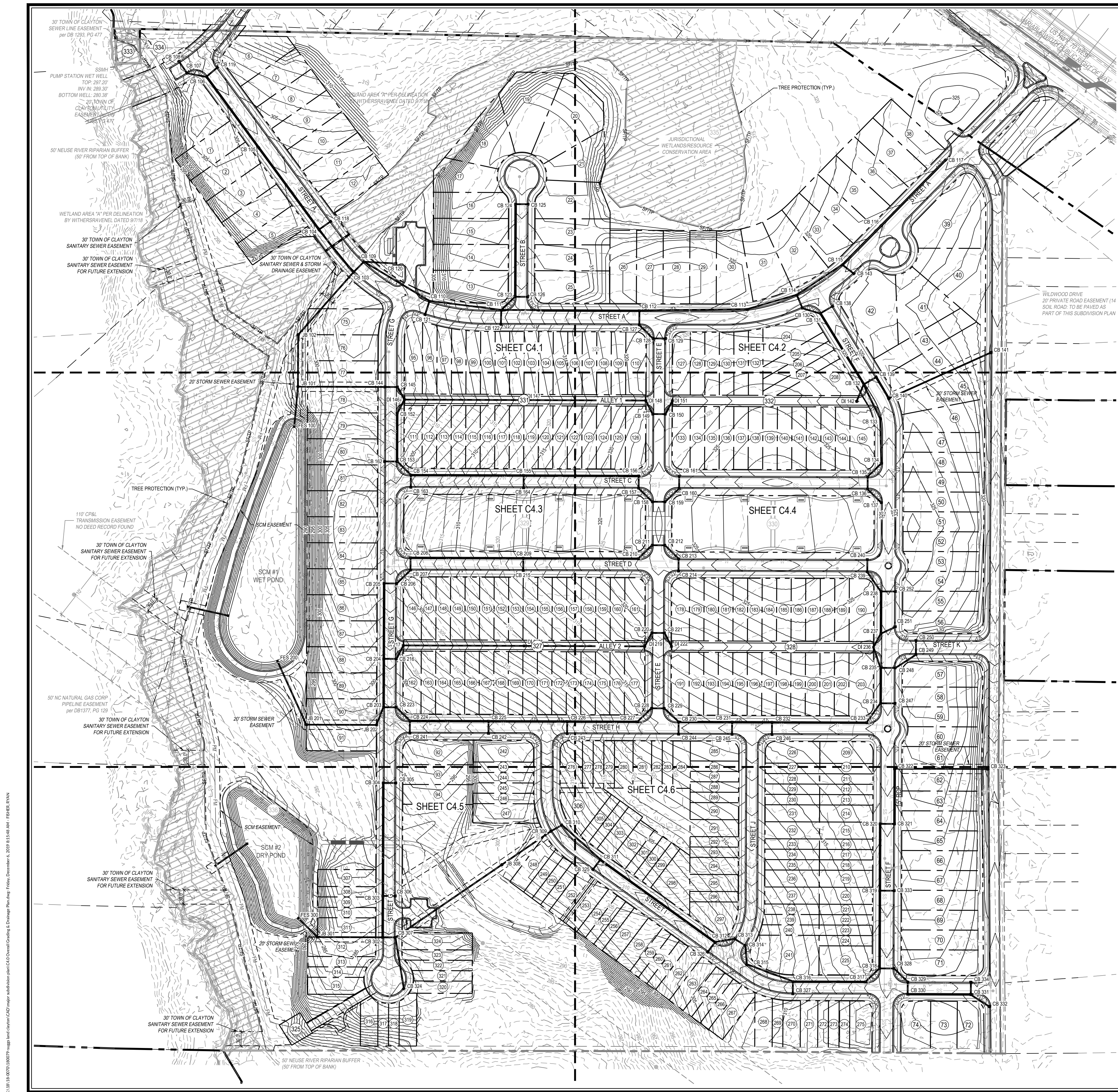
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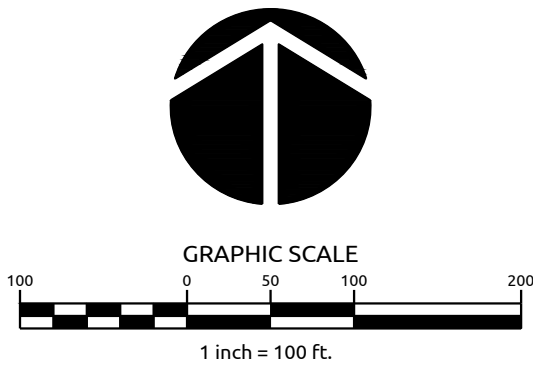


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- CONSTRUCTION NOTES:**
1. THE CONTRACTOR SHALL CONDUCT THE WORK IN A SAFE MANNER AND WITHIN A MINIMUM AMOUNT OF 'INCONVENIENCE TO TRAFFIC'.
 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SHALL ADHERE TO THE PROVISIONS OF THE MUTCD (MOST CURRENT EDITION).
 3. NO WORK ON OR BLOCKAGE OF EXISTING THROUGH TRAFFIC LANES SHALL OCCUR DURING THE PEAK TRAFFIC HOURS OF TUESDAY AND WEDNESDAY MORNING THROUGH FRIDAY. THE CONTRACTOR MUST OBTAIN A LANE CLOSURE PERMIT FOR ANY WORK WHICH REQUIRES THE CLOSURE OF A TRAVEL LANE. PLEASE CONTACT THE CITY PUBLIC WORKS DEPT. TRANSPORTATION OPERATIONS DIVISION AT (919)996-3030 FOR LANE CLOSURES AT LEAST 48 HOURS IN ADVANCE AND FOR STREET CLOSURES, AT LEAST 2 WEEKS IN ADVANCE. PROVIDE EXACT LOCATION, CROSS STREET, DATES FOR LANE CLOSURE, CONTACT PERSON AND FAX NUMBER.
 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE INSPECTIONS DEPARTMENT AT 919-516-2465 TO OBTAIN A STREET CUT PERMIT.
 5. PRIOR TO CONSTRUCTION BEGINNING, ALL SIGNAGE AND TRAFFIC CONTROL SHALL BE IN PLACE.
 6. THE CONTRACTOR SHALL HAVE A COMPLETE SET OF CONTRACT DOCUMENTS AS WELL AS ALL APPROVALS AND EASEMENTS ON THE JOB SITE AT ALL TIMES.
 7. THE CONTRACTOR SHALL REPAIR ALL DRIVEWAYS, DRIVEWAY PIPES, CURB & GUTTER, SIDEWALKS & STREETS TO EXISTING CONDITION OR BETTER.
 8. IF THE EXISTING ROADWAY WIDTH IS REDUCED TO LESS THAN 20 FEET OF TRAVELWAY AT ANY TIME, A LANE CLOSURE WILL BE REQUIRED PER THE MUTCD.
- STORM DRAINAGE NOTES:**
1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF CLAYTON STANDARD SPECIFICATIONS & DETAILS.
 2. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS IS BASED ON THE BEST AVAILABLE INFORMATION, BUT CAN BE CONSIDERED ONLY AS APPROXIMATE.
 3. ALL STORM DRAINAGE PIPE SHALL HAVE A MINIMUM COVER OF 2 FEET TO THE PIPE CROWN IN TRAFFIC, UNLESS APPROVED BY THE TOWN OF CLAYTON.
 4. ALL STORM DRAINAGE PIPE SHALL HAVE A MINIMUM COVER OF 1 FOOT TO THE PIPE CROWN IN NON-TRAFFIC AREAS.
 5. MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATERMAN & RCP STORM DRAIN CROSSINGS; MAINTAIN 24" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER & RCP STORM DRAIN CROSSINGS, WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY TOP MATERIALS & A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE.
 6. MAINTAIN 12" VERTICAL SEPARATION AT ALL RCP STORM AND RCP STORM CROSSING.
 7. STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP) CONFORMING TO ASTM C76, TABLE II OR TABLE IV. JOINTS SHALL BE SEALED WITH A PLASTIC CEMENT PUTTY MEETING FEDERAL SPECIFICATIONS SS-S-00210, SUCH AS RAM-NEK OR BUTYL RUBBER SEALANT.
 8. STORM SEWER PIPE ENDS SHALL BE FURNISHED WITH REINFORCED CONCRETE HEAD WALLS UNLESS OTHERWISE SPECIFIED ON PLANS.
 9. EACH DRAINAGE STRUCTURE SHALL HAVE A SHAPED INVERT CONSTRUCTED FROM CONCRETE, AND A BENCH WITH A MAXIMUM 5:1 SLOPE. THE BENCH SHALL BEGIN AT A HEIGHT OF ONE-HALF THE PIPE DIAMETER FOR 12 TO 24 INCH PIPE. ONE-THIRD THE PIPE DIAMETER FOR 30-48 INCH PIPE, AND ONE-FOURTH THE DIAMETER FOR PIPE GREATER THAN 48 INCHES.
 10. ENERGY DISSIPATORS SHALL BE INSTALLED AT ALL STORM SEWER DISCHARGE POINTS. A FABRIC OR WASHED STONE BARRIER SHALL BE INSTALLED BETWEEN THE DISSIPATION PAD AND THE NATURAL GROUND.
 11. ALL STORM DRAINAGE EASEMENTS SHALL BE "PRIVATE" UNLESS OTHERWISE SPECIFIED.
 12. THE CONTRACTOR SHALL NOTIFY THE TOWN OF CLAYTON ENGINEERING DEPARTMENT TO SCHEDULE CONSTRUCTION INSPECTIONS.
 13. STORM PIPE TRENCH EXCAVATION AND BACKFILLING SHALL BE PERFORMED IN ACCORDANCE WITH TOWN OF CLAYTON STANDARD SPECIFICATIONS AND DETAILS.



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**Planned Development/
Major Subdivision Plan for
BUCKHORN BRANCH PARK**

Town of Clayton, North Carolina

**OVERALL GRADING
& DRAINAGE PLAN**

Job No. 02180079.00 Drawn By WR
Date 12/10/2015 Designer WR

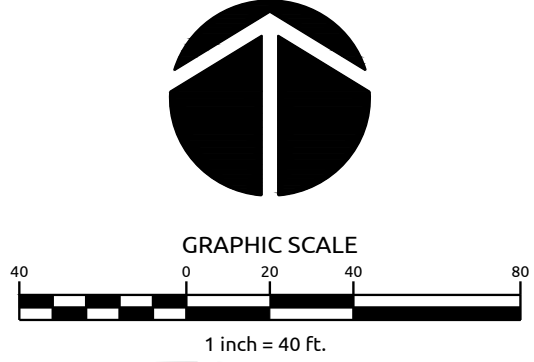
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Revisions

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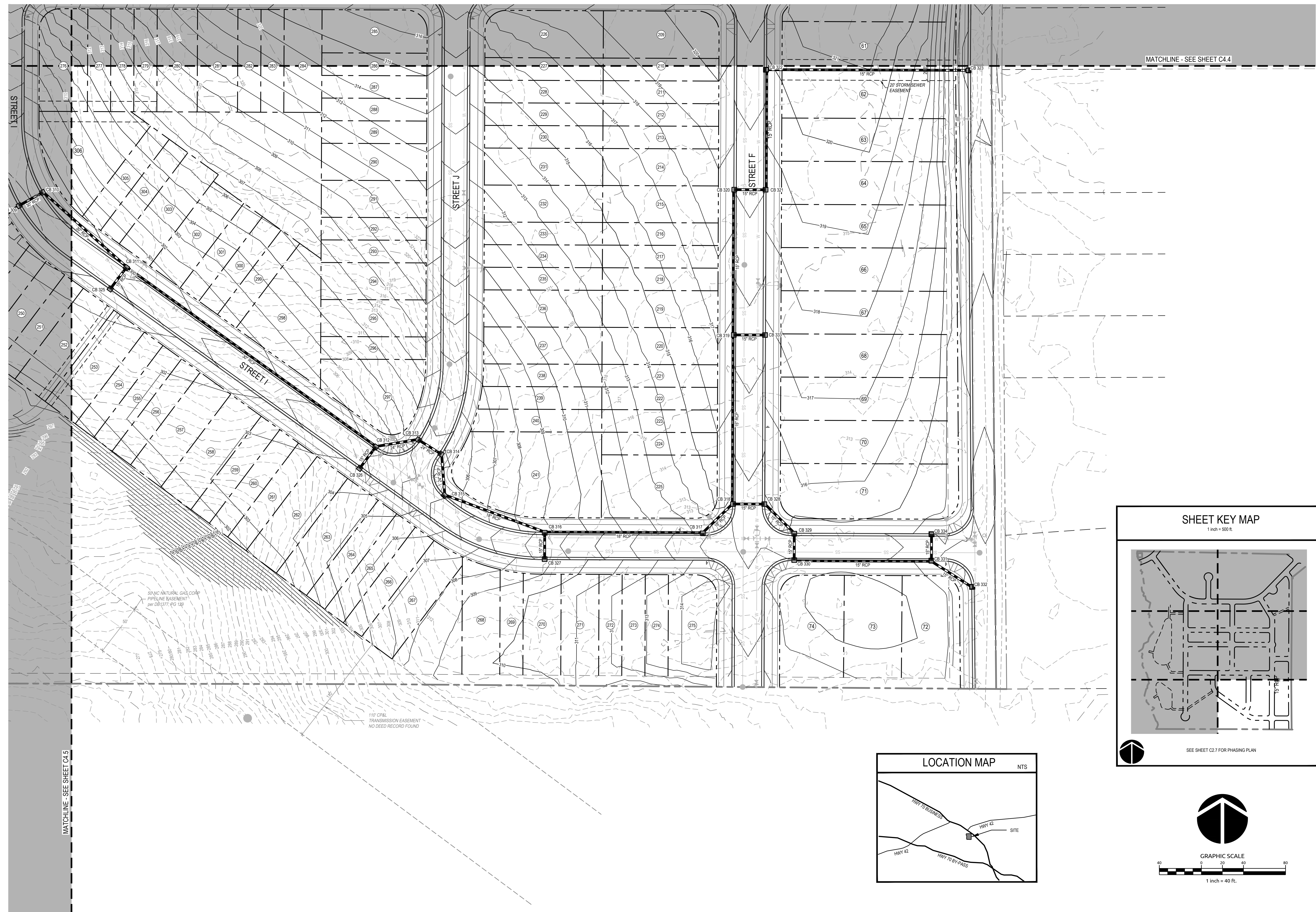


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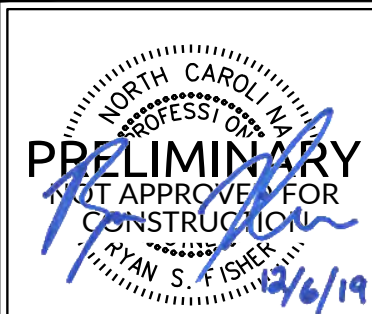


Planned Development/
Major Subdivision Plan for
BUCKHORN BRANCH PARK

Town of Clayton, North Carolina

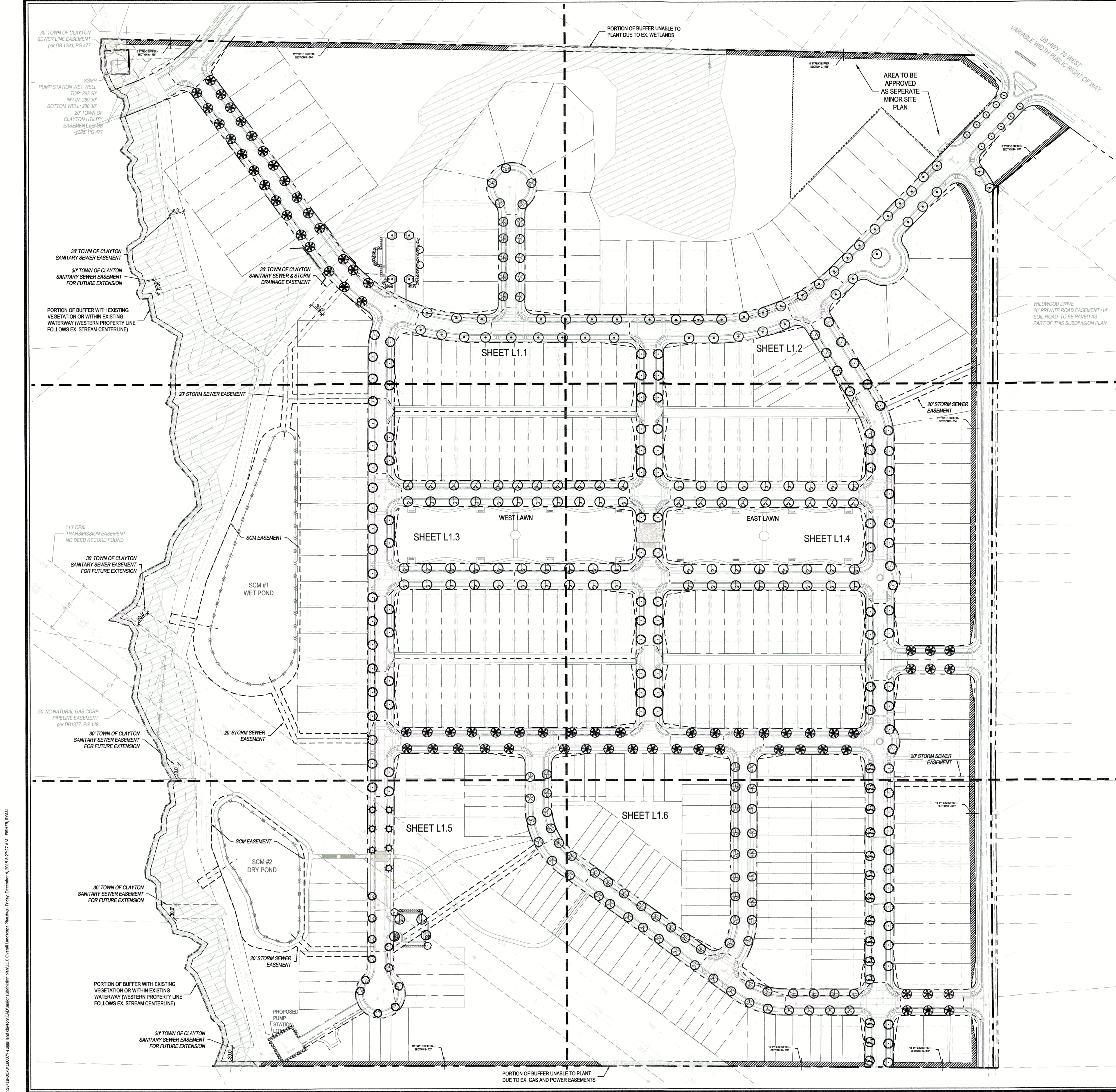
ENLARGED GRADING & DRAINAGE PLAN

Job No.	02180079.00	Drawn By	WR
Date	12/10/2019	Designer	WR



Revisions

Sheet No.
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LANDSCAPING NOTES:

1. CANOPY TREES SHALL HAVE A 2.5" CALIPER AND BE 8' TALL FOLLOWING INSTALLATION.
2. UNDERSTORY TREES SHALL HAVE A 2" CALIPER AND BE 6' TALL FOLLOWING INSTALLATION.
3. SHRUBS NOT USED FOR SCREENING SHALL BE A MINIMUM HEIGHT OF 12" FOLLOWING INSTALLATION. SHRUBS EXPLICITLY USED FOR SCREENING SHALL BE A MINIMUM HEIGHT OF 24" FOLLOWING INSTALLATION.
4. PLANT MATERIAL SHALL BE CHOSEN FROM THE LIST OF RECOMMENDED PLANT SPECIES CONTAINED IN THE CLAYTON GENERAL DESIGN GUIDELINES. PLANT MATERIALS THAT VARY FROM THIS LIST MAY BE USED WITH THE APPROVAL OF THE PLANNING DIRECTOR OR STAFF PROVIDED THEY MEET THE GENERAL SIZE REQUIREMENTS AND GROWTH HABITS OF THE EXISTING LIST OF RECOMMENDED PLANT SPECIES.
5. SELECTED PLANTS SHOULD BE PREDOMINANTLY HARDY SPECIES THAT ARE NATIVE TO NORTH CAROLINA.
- 5.1. PLANTINGS SHALL BE COLD HARDY FOR THE SPECIFIC LOCATION WHERE THEY ARE TO BE PLANTED.
- 5.2. TREES AND SHRUBS SHALL BE SALT TOLERANT AND DROUGHT TOLERANT AND ABLE TO SURVIVE ON NATURAL RAINFALL ONCE ESTABLISHED WITH NO LOSS OF HEALTH.
- 5.3. PLANTING AREAS SHALL HAVE UNCOMPACTED COARSE LOAM THAT IS A MINIMUM OF 12" DEEP. SOILS SHALL BE APPRECIABLY FREE OF GRAVEL, STONES, RUBBLE OR TRASH. ALL COMPACTED SOIL, CONTAMINATED SOIL OR ROAD BASE FILL SHALL BE REMOVED.
- 5.4. THE CODE ENFORCEMENT OFFICER MAY NOT ISSUE A PERMANENT CERTIFICATE OF OCCUPANCY FOR AN APPROVED SITE PLAN OR PART THEREOF, UNTIL ALL SEEDING, TREES AND PLANT MATERIAL HAVE BEEN PLACED IN ACCORDANCE WITH THE APPROVED SITE PLAN AND REQUIREMENTS OF THIS SECTION. A TEMPORARY CERTIFICATE OF OCCUPANCY MAY BE ISSUED FOR A PERIOD OF 30 DAYS UNDER CIRCUMSTANCES THAT WOULD AFFECT THE SEEDING AND PLANTING OF THE SITE OR UNTIL THE PROPER PLANTING SEASON IS REACHED TO COMPLETE THE LANDSCAPING REQUIREMENTS, AND MAY BE EXTENDED UP TO 90 DAYS UPON REQUEST TO THE CODE ENFORCEMENT OFFICER.
6. BUFFER AREAS NOT RETAINED IN NATIVE HABITAT SHALL BE SEEDED OR SOODED WITH LAWN ESTABLISHED WITH GROUND COVER OR MULCHED WITH ORGANIC MULCH. NO TURF GRASS SHALL BE PLANTED UNDER THE CHIP LINE OF TREES. INORGANIC GROUND COVER SHALL NOT EXCEED 20% OF THE TOTAL REQUIRED AREA OF THE BUFFER.

MAINTAINING PLANTED AREAS

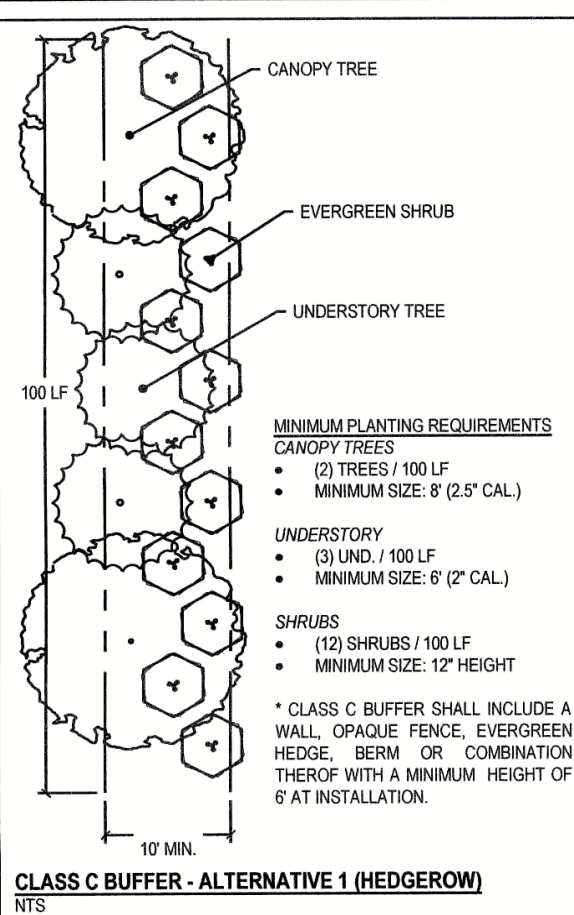
1. THE RESPONSIBILITY FOR MAINTENANCE OF A PLANTED AREA SHALL REMAIN WITH THE OWNER, HIS OR HER SUCCESSORS, HEIRS, ASSIGNEES OR ANY CONSENTING GRANTEE. MAINTENANCE IS REQUIRED IN ORDER TO ENSURE PROPER FUNCTIONING OF A PLANTED AREA.
2. ALL PLANTINGS SHALL BE MAINTAINED IN AN ATTRACTIVE AND HEALTHY CONDITION. MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO, WATERING, MULCHING, FERTILIZING AND PEST MANAGEMENT, MOWING, WEEDING, REMOVAL OF LITTER AND DEAD PLANT MATERIAL, AND NECESSARY PRUNING AND TRIMMING.
3. NECESSARY PRUNING AND TRIMMING SHALL BE IN ACCORDANCE WITH THE AMERICAN NATIONAL STANDARDS FOR TREE CARE OPERATIONS. TREE SHRUB AND OTHER WOODY PLANT MAINTENANCE - STANDARD PRACTICES (PRUNING) AND SHALL NOT BE INTERPRETED TO INCLUDE TOPPING OF TREES THROUGH REMOVAL OF CROWN MATERIAL OR THE CENTRAL LEADER, OR ANY OTHER SIMILARLY SEVERE PROCEDURES SUCH AS LOLLPOPING OR HEAVYBALLING THAT CAUSE IRREPARABLE HARM TO THE NATURAL FORM OF THE TREE. EXCEPT WHERE SUCH PRUNING IS NECESSARY TO MAINTAIN PUBLIC OVERHEAD UTILITIES, ANY SUCH ACTIVITY SHALL BE A VIOLATION OF THE TOWN OF CLAYTONS UNIFIED DEVELOPMENT CODE (UDC). ADDITIONAL PLANT MATERIAL SHALL BE REQUIRED TO REPLACE OR SUPPLEMENT THE DAMAGED PLANT MATERIAL.
4. DEAD OR DISEASED PLANTINGS SHALL BE REMOVED. REPLACEMENT PLANTINGS SHALL BE PROVIDED FOR ANY REQUIRED PLANTS WHICH DIE OR ARE REMOVED FOR ANY REASON AND SHALL MEET ALL MINIMUM STANDARDS AND CONFORM TO THESE REGULATIONS.
5. NATURAL WATER COURSES SHALL BE MAINTAINED IN A NATURAL CONDITION.
6. A WATER SOURCE SHALL BE SUPPLIED WITHIN 50' OF ANY PLANTING REQUIRING CONTINUING WATERING. WHERE NONNATIVE OR NON DROUGHT TOLERANT NATIVE VEGETATION IS INCORPORATED, AN IRRIGATION SYSTEM SHALL BE REQUIRED. IRRIGATION SYSTEMS SHALL MEET THE STANDARDS OF THE TOWN.
7. LANDSCAPE STRUCTURAL FEATURES SUCH AS WALLS, FENCES, BERMS OR WATER FEATURES SHALL BE MAINTAINED IN A STRUCTURALLY SAFE AND ATTRACTIVE CONDITION.
8. WHERE THERE ARE OTHER USES, INCLUDING PEDESTRIAN, BIKE OR OTHER TRAILS, THOSE SHALL BE MAINTAINED TO PROVIDE FOR THEIR SAFE USE.
9. IN THE EVENT THAT ANY OWNER OF A PLANTED AREA FAILS TO MAINTAIN THE PLANTED AREA ACCORDING TO THE STANDARDS OF THE UDC, THE TOWN SHALL HAVE THE RIGHT TO RECOVER THE COST OF ENFORCEMENT, INCLUDING REASONABLE NOTICE AND A DEMAND THAT DEFICIENCY OF MAINTENANCE SHALL BE CHARGED TO THE PARTY HAVING THE PRIMARY RESPONSIBILITY FOR MAINTENANCE OF THE PLANTED AREA.

PLANT SCHEDULE

QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	HEIGHT	NOTES
CANOPY TREES							
8	Q1Y	Quercus lyrata	Overcup Oak	B&B	2.5" CAL. MIN.	8' HT. MIN.	MATCHED
108	Q81	Quercus bicolor	Swamp White Oak	B&B	2.5" CAL. MIN.	8' HT. MIN.	MATCHED
45	U1A	Ulmus parvifolia 'Boisep'	Boisep Chinese Elm	B&B	2.5" CAL. MIN.	8' HT. MIN.	MATCHED
14	G01	Gymnocladus dioica	Kentucky Coffeetree	B&B	2.5" CAL. MIN.	8' HT. MIN.	MATCHED
80	PAC	Platanus x acerifolia	London Plane Tree	B&B	2.5" CAL. MIN.	8' HT. MIN.	MATCHED
75	T01	Taxodium distichum	Bald Cypress	B&B	2.5" CAL. MIN.	8' HT. MIN.	MATCHED
74	QAC	Quercus acutissima	Sawtooth Oak	B&B	2.5" CAL. MIN.	8' HT. MIN.	MATCHED
UNDERSTORY TREES							
10	ABU	Acer buergerianum	Tsident Maple	B&B	2" CAL. MIN.	6' HT. MIN.	MATCHED
11	ALA	Aralia nudicaulis 'Autumn Brilliance'	Autumn Brilliance Serviceberry	B&B	2" CAL. MIN.	6' HT. MIN.	MATCHED
4	CCA	Cercis canadensis var. texensis	Tex or Redbud	B&B	2" CAL. MIN.	6' HT. MIN.	MATCHED
7	VAN	Viburnum acerifolium	Blue Choke Tree	B&B	2" CAL. MIN.	6' HT. MIN.	MATCHED
SHRUBS							
56	DB	Desfontainia 'Cinnamon Girl'	Desfontainia	CONT.		24" HT. MIN.	MATCHED
61	HDE	Hypoxis distans	Dense Hyacinth	CONT.		24" HT. MIN.	MATCHED
11	CFL	Calycanthus floridus	Carolina Allspice	CONT.		24" HT. MIN.	MATCHED

BUFFER / STREETSCAPE CALCULATIONS:

TYPE 'C' BUFFER - SEGMENT 'A': (138 LF) 2 TREES / 100 LF 3 UNDERSTORY / 100 LF 12 SHRUBS / 100 LF 2.8 TREES REQUIRED 3 TREES PROVIDED 4.1 UNDERSTORY REQUIRED 5 UNDERSTORY PROVIDED 16.6 SHRUBS REQUIRED 17 SHRUBS PROVIDED	TYPE 'C' BUFFER - SEGMENT 'B': (108 LF) 2 TREES / 100 LF 3 UNDERSTORY / 100 LF 12 SHRUBS / 100 LF 13.2 TREES REQUIRED 14 TREES PROVIDED 19.7 UNDERSTORY REQUIRED 20 UNDERSTORY PROVIDED 79.0 SHRUBS REQUIRED 79 SHRUBS PROVIDED	TYPE 'C' BUFFER - SEGMENT 'C': (108 LF) 2 TREES / 100 LF 3 UNDERSTORY / 100 LF 12 SHRUBS / 100 LF 13.2 TREES REQUIRED 14 TREES PROVIDED 19.7 UNDERSTORY REQUIRED 20 UNDERSTORY PROVIDED 79.0 SHRUBS REQUIRED 79 SHRUBS PROVIDED	TYPE 'C' BUFFER - SEGMENT 'D': (108 LF) 2 TREES / 100 LF 3 UNDERSTORY / 100 LF 12 SHRUBS / 100 LF 13.2 TREES REQUIRED 14 TREES PROVIDED 19.7 UNDERSTORY REQUIRED 20 UNDERSTORY PROVIDED 79.0 SHRUBS REQUIRED 79 SHRUBS PROVIDED	TYPE 'C' BUFFER - SEGMENT 'E': (108 LF) 2 TREES / 100 LF 3 UNDERSTORY / 100 LF 12 SHRUBS / 100 LF 13.2 TREES REQUIRED 14 TREES PROVIDED 19.7 UNDERSTORY REQUIRED 20 UNDERSTORY PROVIDED 79.0 SHRUBS REQUIRED 79 SHRUBS PROVIDED	TYPE 'C' BUFFER - SEGMENT 'F': (108 LF) 2 TREES / 100 LF 3 UNDERSTORY / 100 LF 12 SHRUBS / 100 LF 13.2 TREES REQUIRED 14 TREES PROVIDED 19.7 UNDERSTORY REQUIRED 20 UNDERSTORY PROVIDED 79.0 SHRUBS REQUIRED 79 SHRUBS PROVIDED
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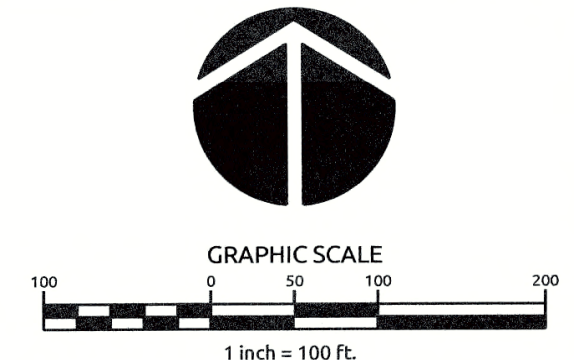
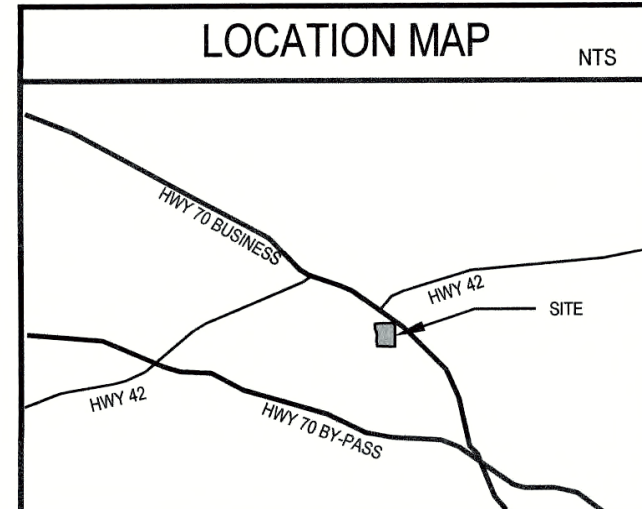
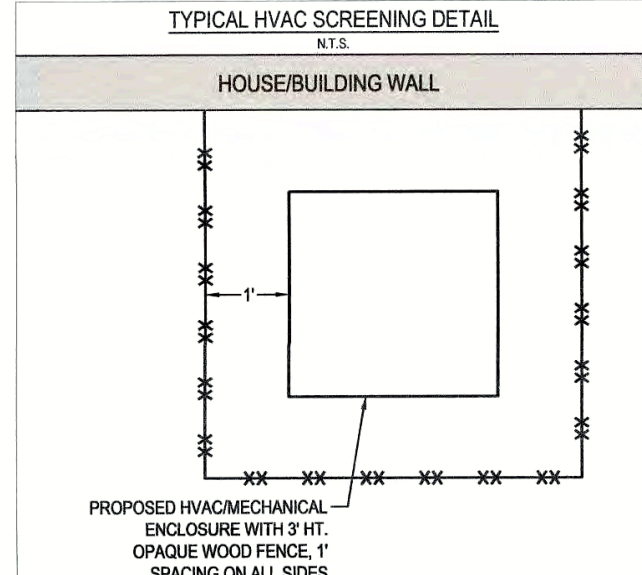


LANDSCAPE CALCULATIONS:

- STREET YARD TREES:
- 1 CANOPY / LOT OR
 - 1 CANOPY / 40 LF OF PUBLIC ROW
 - MAX. 50' O.C. SPACING
 - 324 LOTS = 324 STREET YARD TREES REQUIRED
 - 424 TREES PROVIDED

GENERAL NOTES:

1. TOC-ELECTRIC WILL DESIGN LIGHTING PLAN FOR THIS SUBDIVISION / SITE.
2. ALL LANDSCAPING BUFFERS SHALL BE MAINTAINED BY THE HOA.
3. ALL MECHANICAL EQUIPMENT SHALL BE SCREENED ENTIRELY FROM VIEW, AS REQUIRED BY THE UDC.



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Planned Development/
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BUCKHORN BRANCH PARK

Town of Clayton, North Carolina

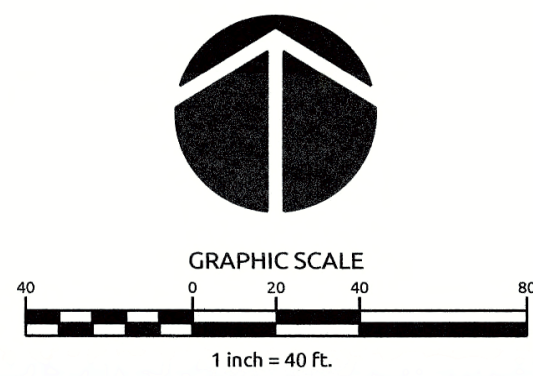
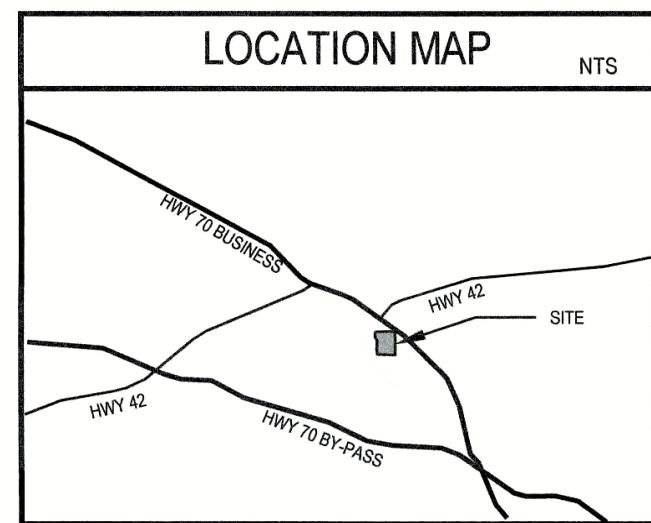
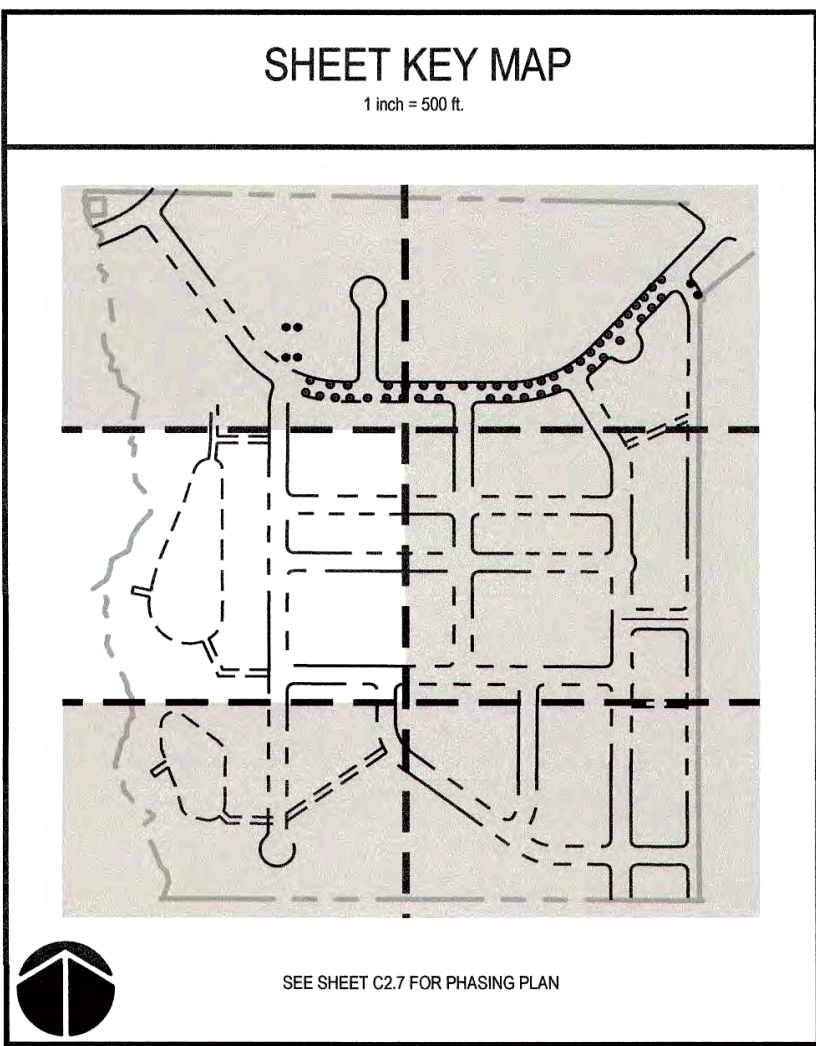
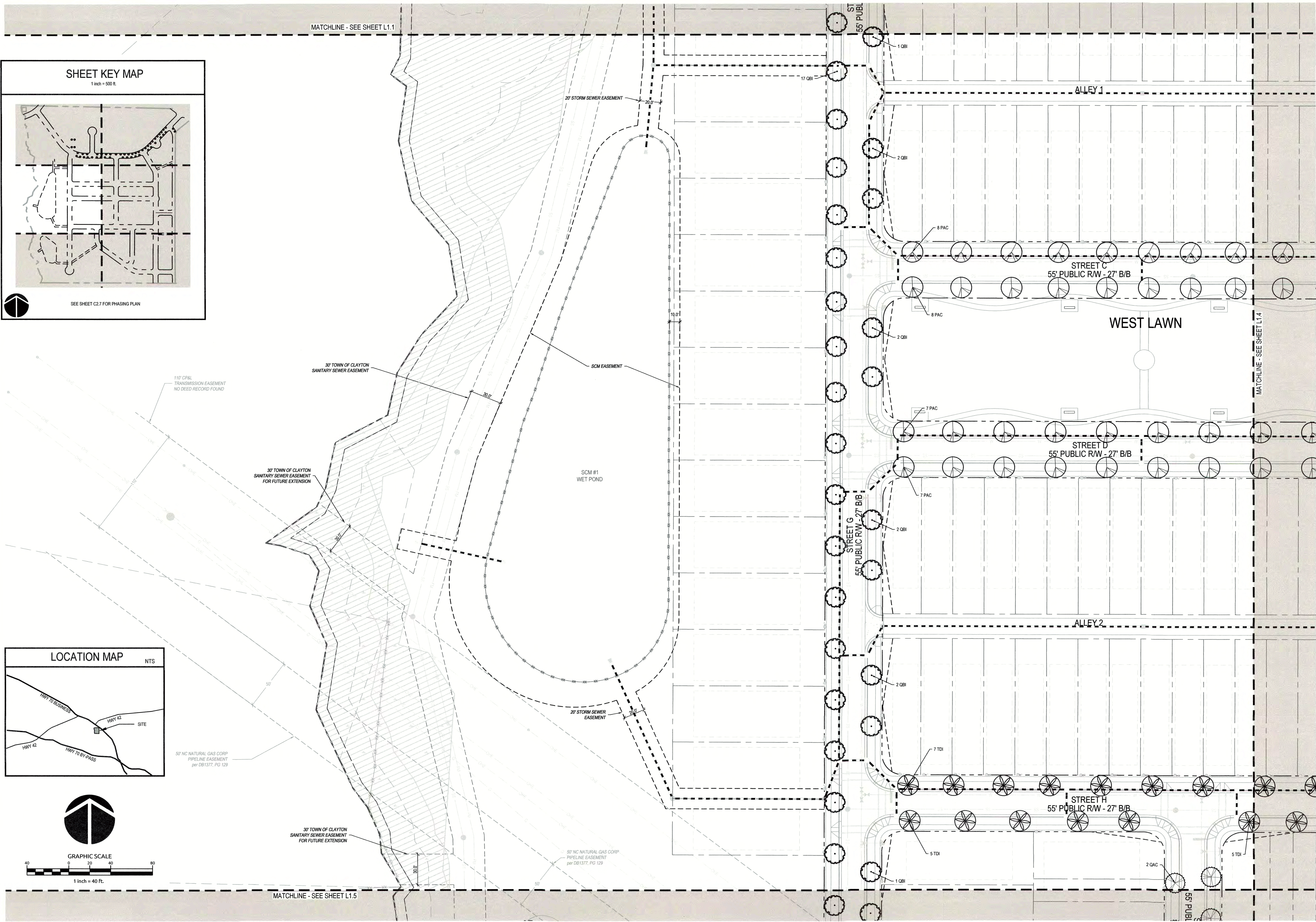
OVERALL LANDSCAPE
PLAN

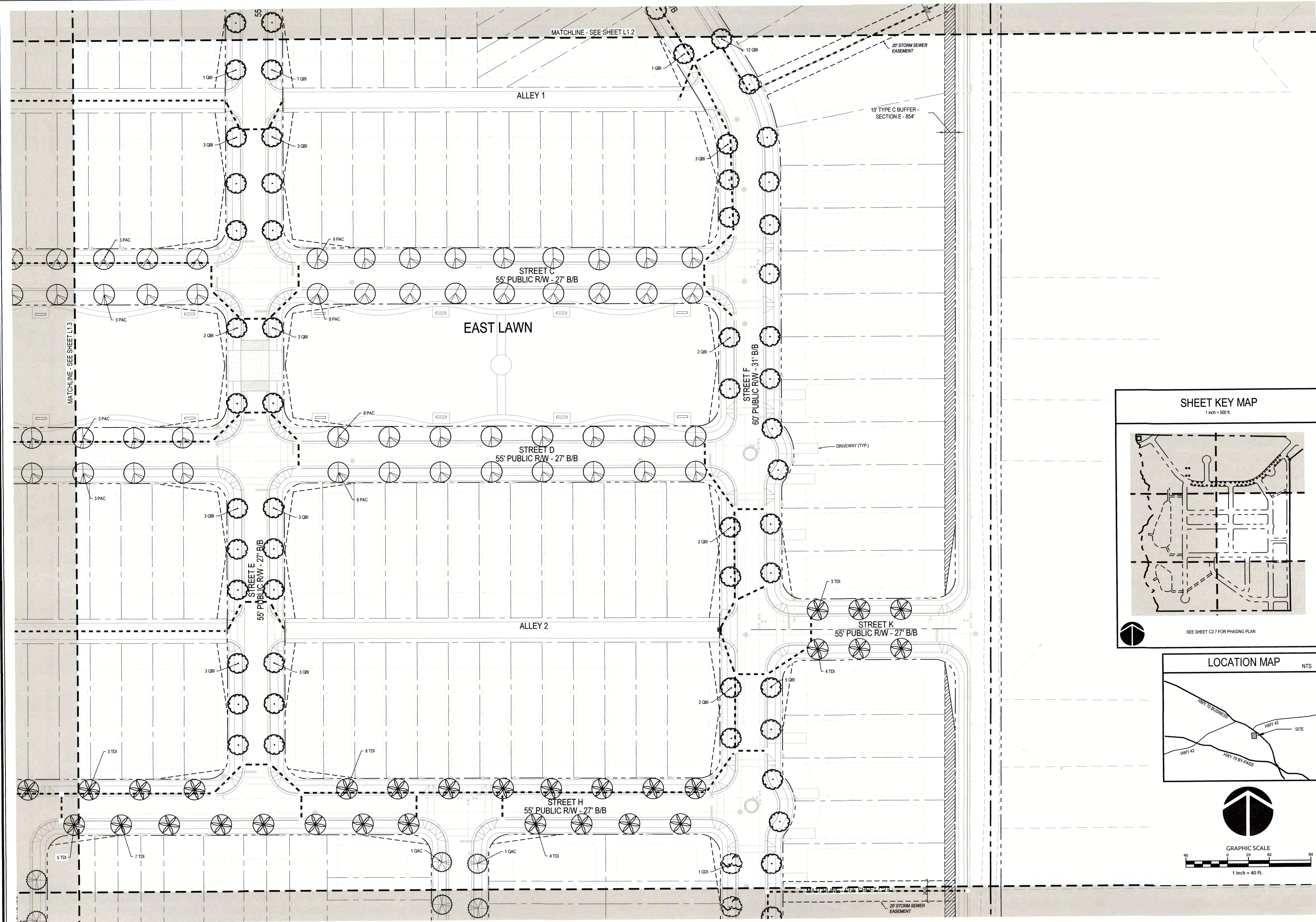
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CONSTRUCTION
2019.12.10

Revisions

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Planned Development/
Major Subdivision Plan for
BUCKHORN BRANCH PARK

Town of Clayton, North Carolina

ENLARGED LANDSCAPE PLAN

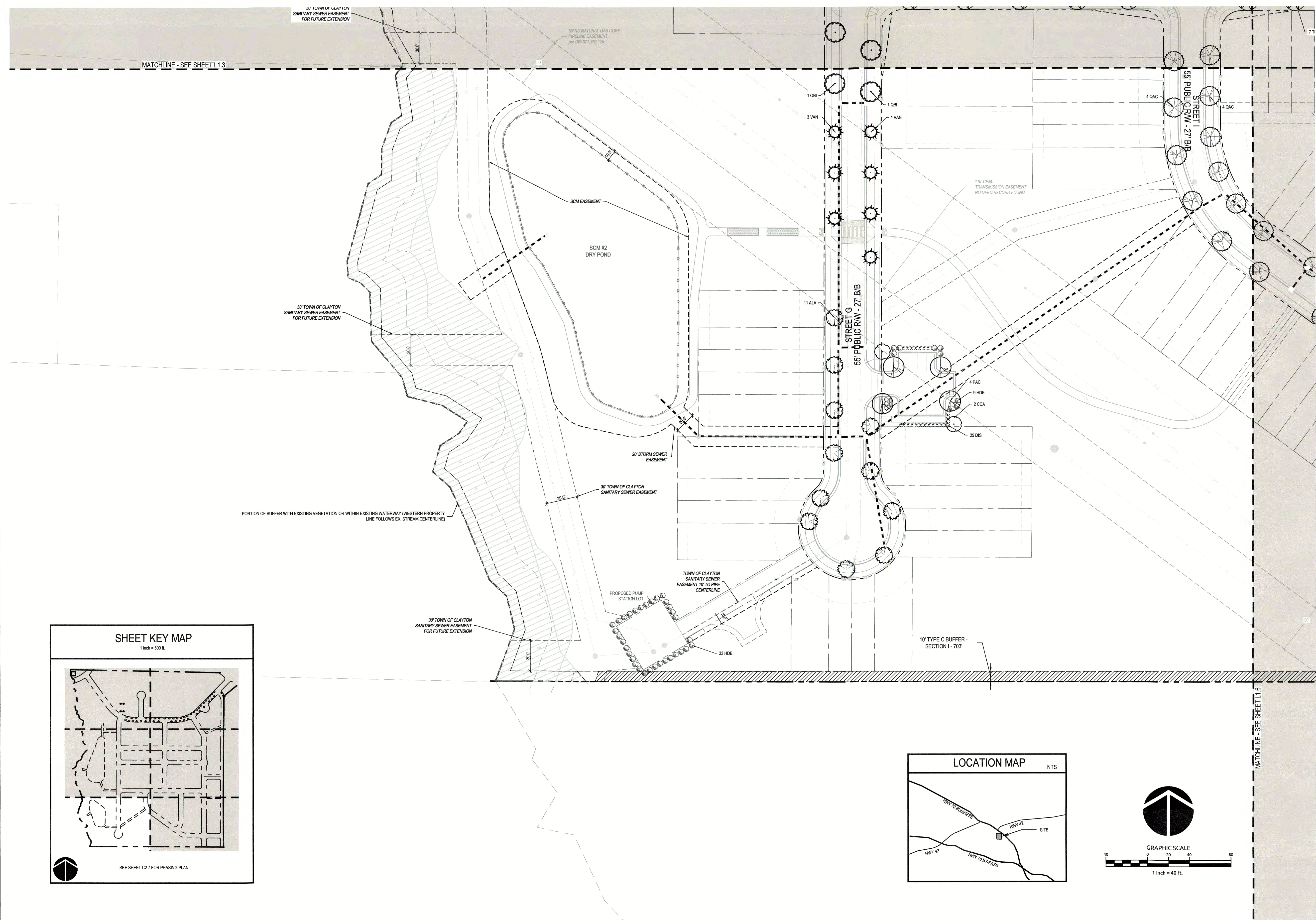
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2019.12.6

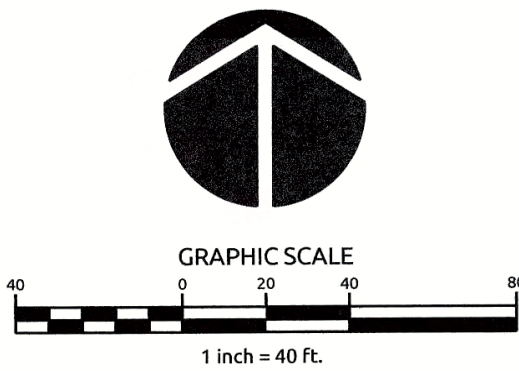
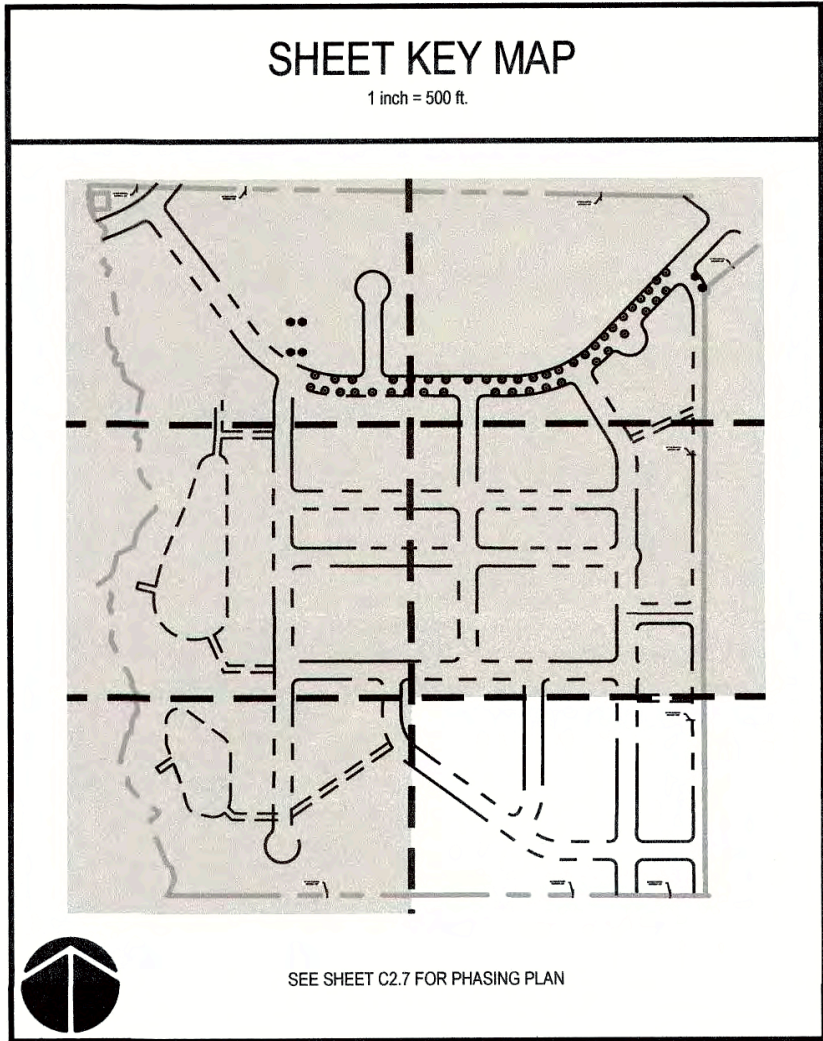
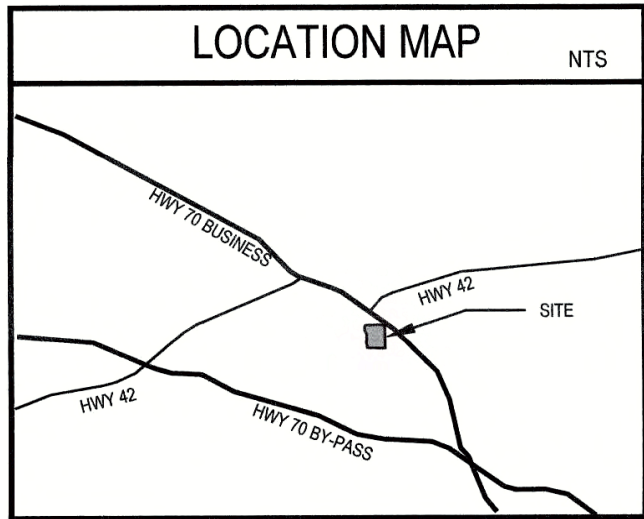
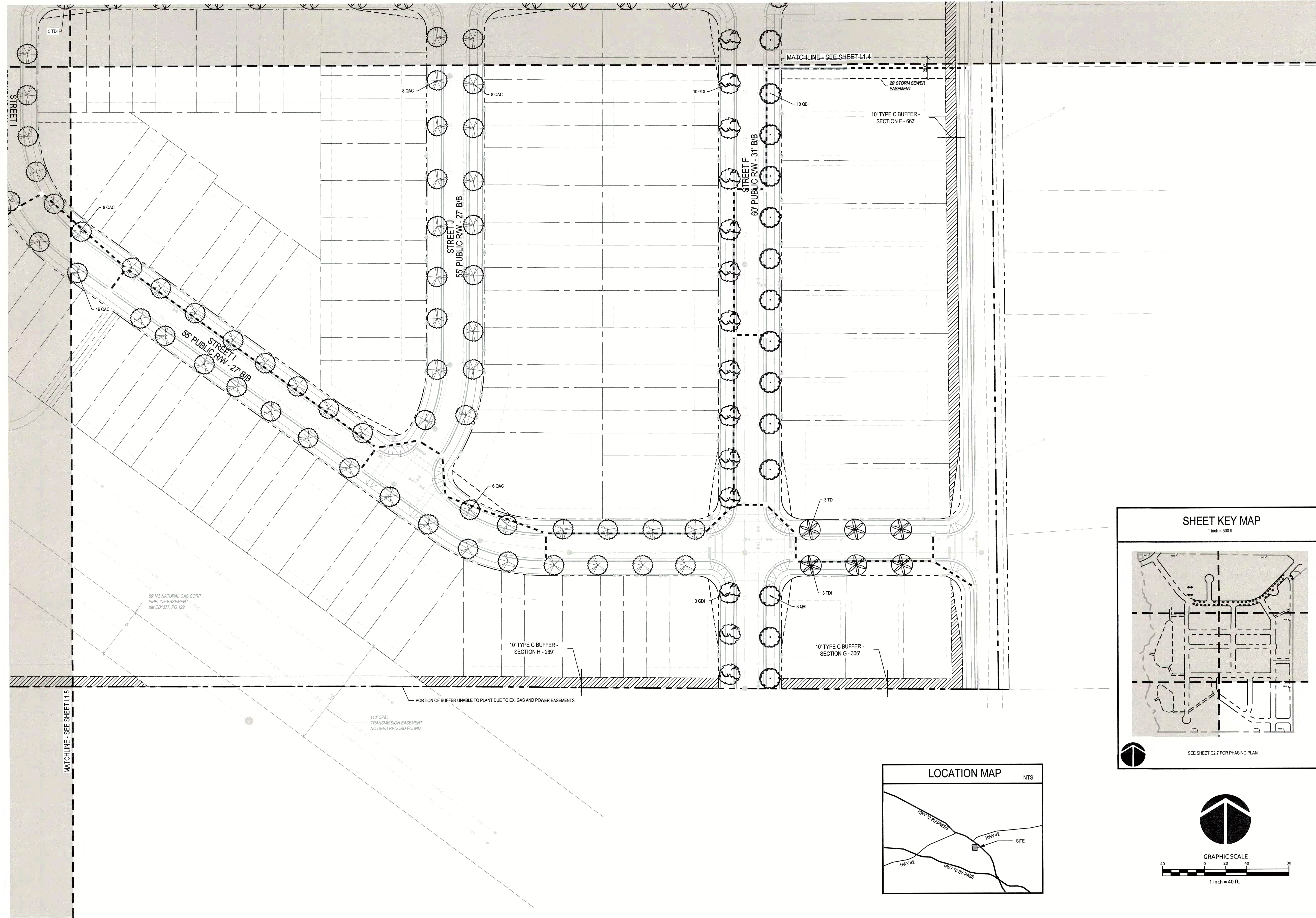
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Planned Development/
Major Subdivision Plan for
BUCKHORN BRANCH PARK

Town of Clayton, North Carolina

**ENLARGED LANDSCAPE
PLAN**

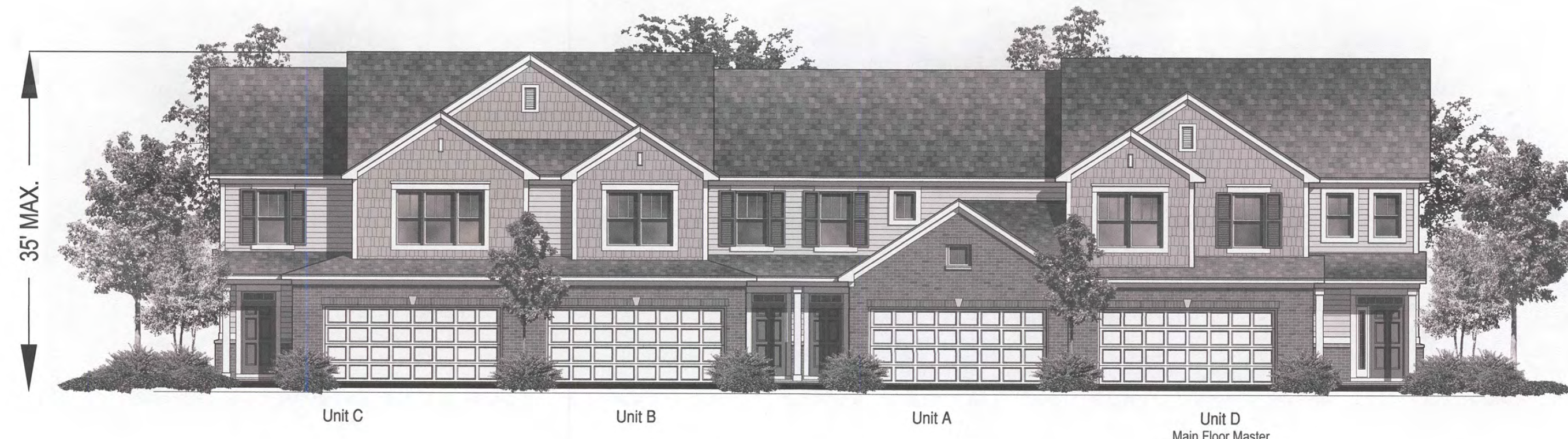
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Drawn by WR
Designed by WR



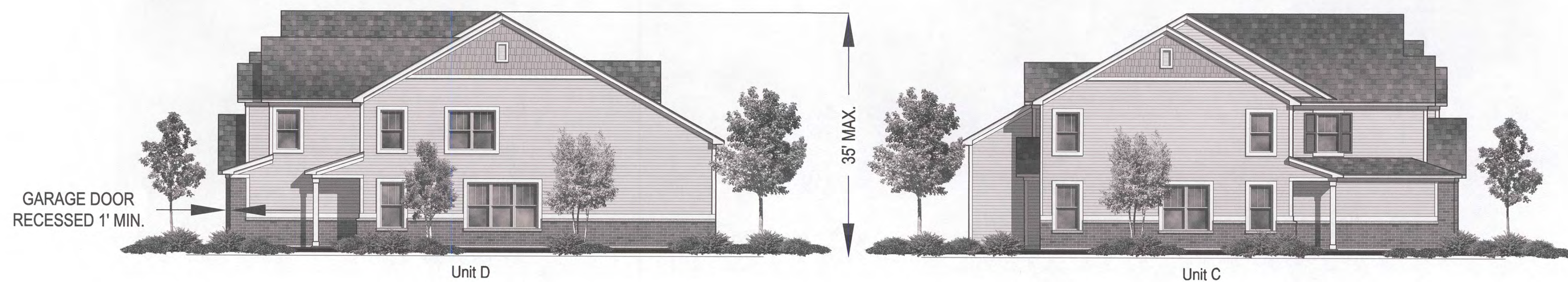
Revisions

Sheet No.
L1.6

237 S Wilmington Street Suite 200 | Raleigh, NC 27601 | t: 919.469.2340 | license # C 0852 | www.withersravenel.com



FRONT ELEVATION
FRONT-LOAD TOWNHOME BUILDING ELEVATION
1/8" = 1' ±



RIGHT SIDE ELEVATION
1/8" = 1' ±

LEFT SIDE ELEVATION
1/8" = 1' ±

REQUIRED ARCHITECTURAL ELEMENTS:

THREE OF THE FOLLOWING ARCHITECTURAL FEATURES SHALL BE USED FOR EACH BUILDING:

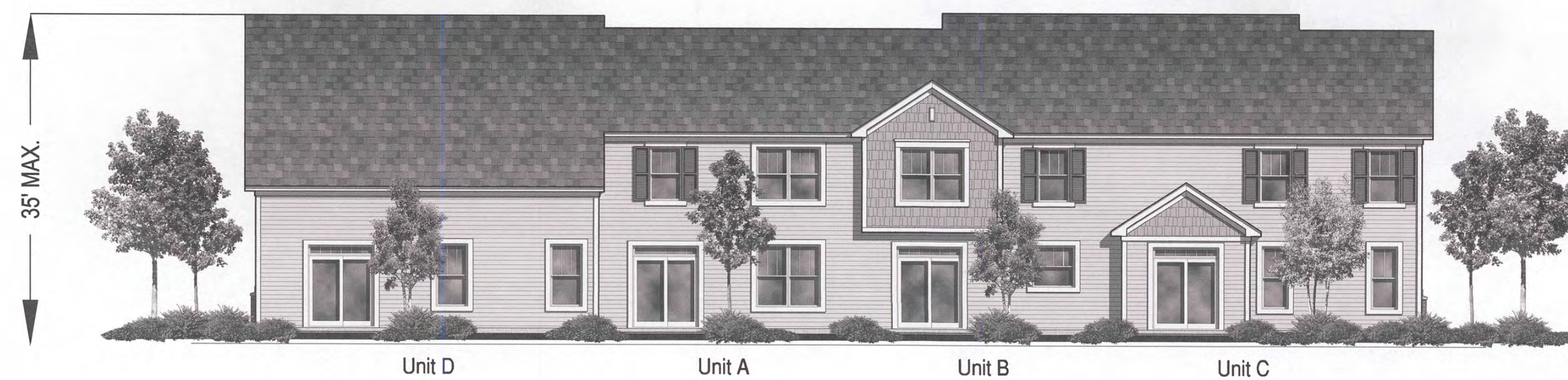
1. ROOFLINE NOT IN SINGLE MASS, BROKEN UP HORIZONTALLY AND VERTICALLY BETWEEN UNITS;
2. FRONT-LOADED UNITS WITH PROMINENT COVERED PORCH/STOOP AREA;
3. PORCH;
4. STOOPS AREAS;
5. BALCONIES;
6. GARAGE DOORS WITH WINDOWS, DECORATIVE DETAILS OR CARRIAGE STYLE ADORNMENTS;
7. VARYING WINDOW SIZE AND/OR TYPE.

THREE OF THE FOLLOWING DECORATIVE FEATURES SHALL BE USED ON EACH BUILDING:

- a. DECORATIVE SHAKE,
- b. BOARD AND BATTEN,
- c. DECORATIVE PORCH RAILING/POSTS,
- d. SHUTTERS,
- e. DECORATIVE/FUNCTIONAL AIR VENTS ON ROOF OR FOUNDATION;
- f. RECESSED WINDOWS,
- g. DECORATIVE WINDOWS,
- h. DECORATIVE BRICK/STONE

ARCHITECTURAL MATERIALS:

1. ROOFING: PITCHED SHINGLES PER DEVELOPER.
2. WINDOWS: MANUFACTURER PER DEVELOPER. WINDOWS THAT ARE NOT RECESSED MUST BE TRIMMED.
3. ENTRY DOOR: AS SELECTED BY DEVELOPER.
4. GARAGE DOORS: AS SELECTED BY DEVELOPER.
5. SIDING: SIDING MATERIAL SHALL BE VARIED IN TYPE AND/OR COLOR ON 30% OF EACH FACADE ON EACH BUILDING. AT LEAST TWO OF THE FOLLOWING MATERIALS SHALL BE USED ON EACH BUILDING:
 - WOOD
 - VINYL
 - FIBER-CEMENT
 - METAL
 - MASONRY BRICK
 - MASONRY STONE
 - STONE VENEER
 - SYNTHETIC STONE



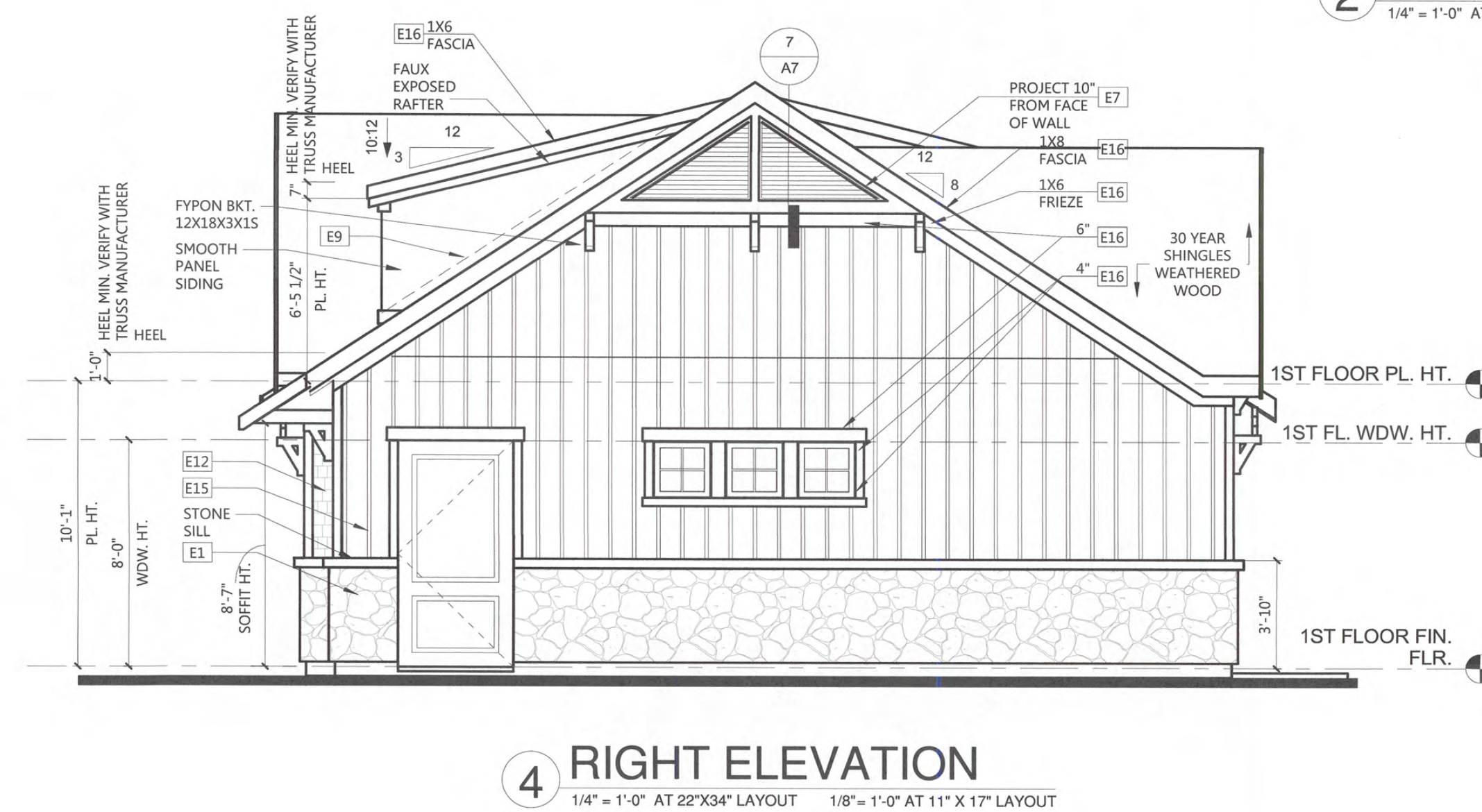
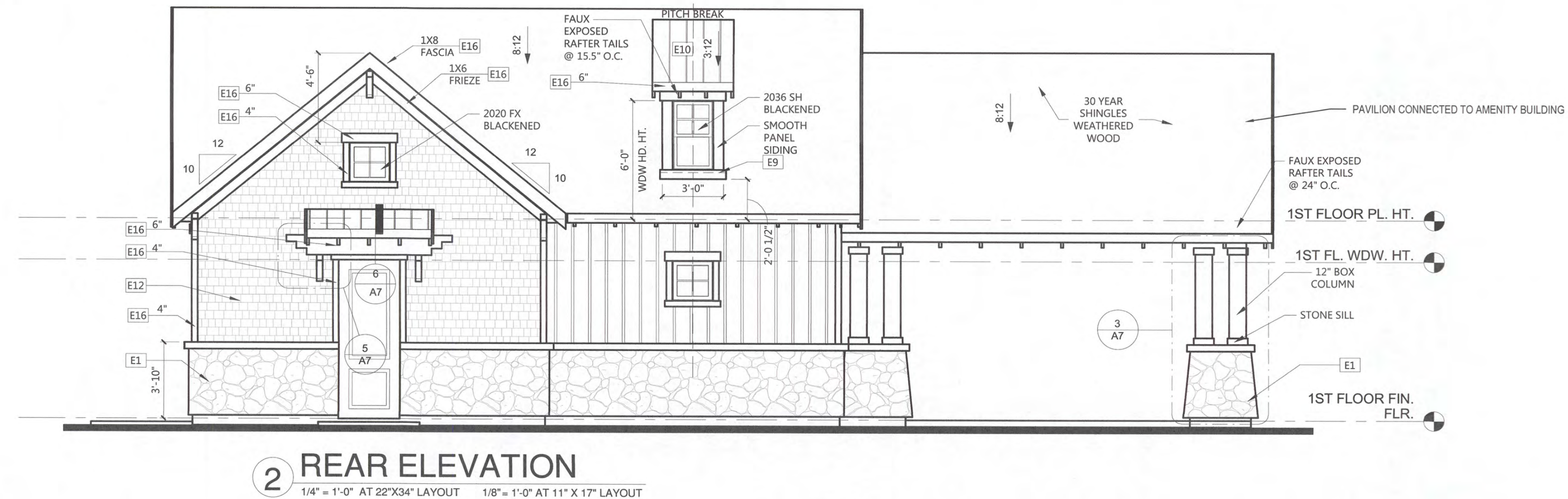
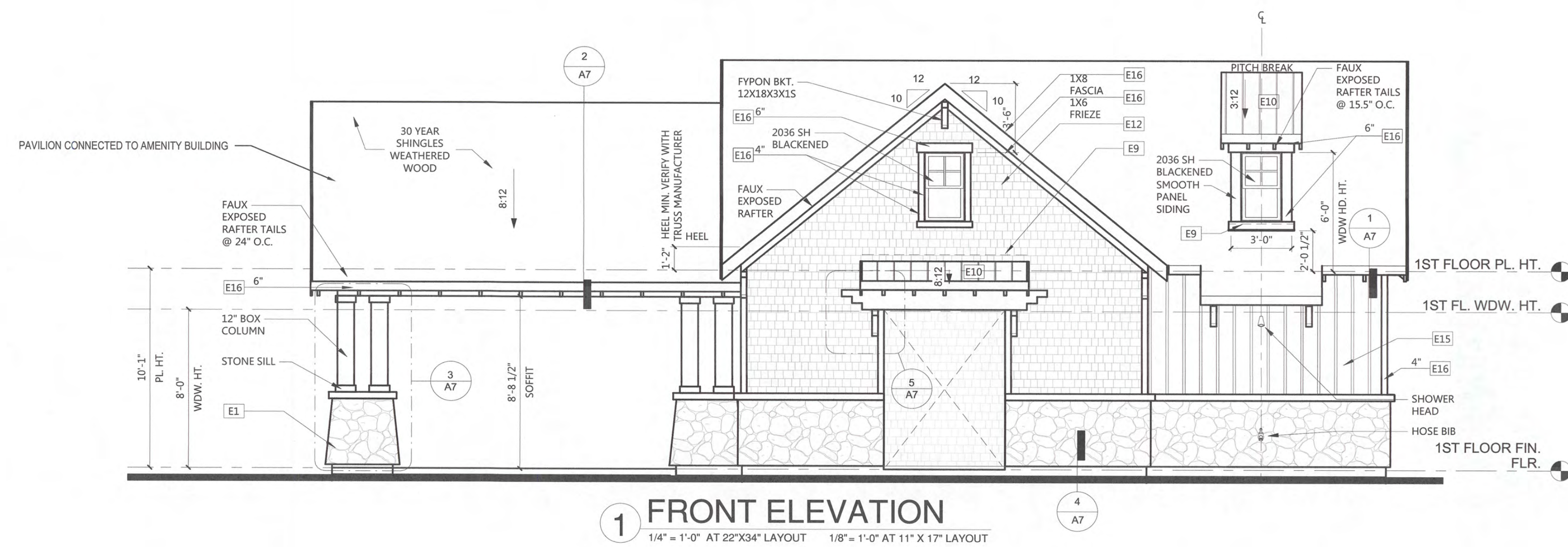
REAR ELEVATION
1/8" = 1' ±

BUCKHORN BRANCH PARK
CLAYTON, NC

ARCHITECTURAL ELEVATIONS (TOWNHOMES)

PRELIMINARY PLAN
NOT APPROVED FOR CONSTRUCTION

Sheet No.
A1.0



NOT TO SCALE

BUCKHORN BRANCH PARK
CLAYTON, NC

ARCHITECTURAL ELEVATIONS (AMENITY CENTER)

PRELIMINARY PLAN
NOT APPROVED FOR CONSTRUCTION

Sheet No.
A1.1



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

DELIVERY VIA EMAIL

March 13, 2019

Samantha L. Wullenwaber, MPA
Planning Director - Town of Clayton
PO Box 879
Clayton, NC 27528

COUNTY: Johnston

SUBJECT: **TIA Review of Proposed Buckhorn Branch Subdivision**

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

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.

US 70 Bus and Wildwood Drive Intersection

- Construct eastbound right turn lane with 100' of storage and appropriate taper

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
 Brittany Chase, PE – Ramey Kemp and Associates
 Driveway Permit File



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

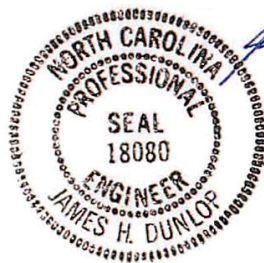
DEPARTMENT OF TRANSPORTATION

TRANSPORTATION MOBILITY AND SAFETY DIVISION
TRAFFIC MANAGEMENT UNIT
CONGESTION MANAGEMENT SECTION

March 6, 2019

Traffic Impact Analysis Review Report
Buckhorn Branch Residential

TIA Project: SC-2019-038
Division: 4
County: Johnston
Description: Buckhorn Branch Residential on Wildwood Drive



James H. Dunlop 6 March 2019
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/



Buckhorn Branch Residential TIA

SC-2019-038

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	2/27/19
Complete Information Received by CMS	2/28/19
Date of Preliminary Review Accepting TIA for Review	3/6/19
Sealed TIA Prepared by EXULT Engineering	2/27/19
Site Plan Prepared by EXULT Engineering	N/A

Proposed Development

According to the TIA, the proposed Buckhorn Branch Residential is to be located on Wildwood Drive in Johnston County. The TIA states the development is to be constructed by 2023 and is to consist of the following:

Land Use	Land Use Code	Size
Single Family	210	205 units
Multifamily Housing (Low-Rise)	220	120 units

Trip Generation - Unadjusted Volumes During a Typical Weekday

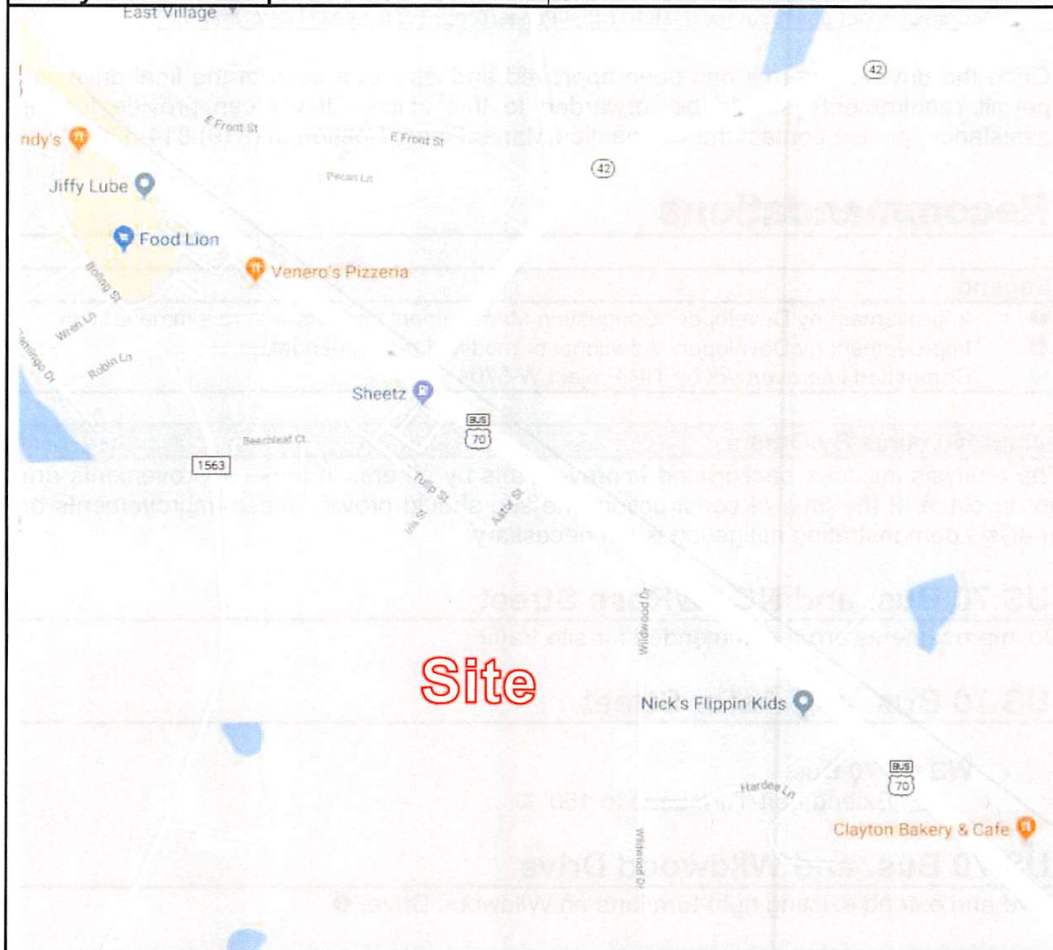
Based on appropriate methodology outlined in the *ITE Trip Generation Manual, 10th Ed.*

	IN	OUT	TOTAL
AM Peak Hour	51	157	208
PM Peak Hour	172	101	273
Daily Trips			2,882



Study Area

Study Area and Proposed Site Location - ↑ N



TIA Comments

The following items vary from our recommended practices:

- Recommendation Diagram left out the third eastbound through lane at the US 70 Bus. and Wildwood Drive Intersection.



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.

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 TIP Project W-5704 |

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.

US 70 Bus. and NC 42/Rose Street

No improvements are recommended for site traffic.

US 70 Bus. and Astor Street

- **WB US 70 Bus.**
 - Extend Left-Turn Lane to 150' ❸

US 70 Bus. and Wildwood Drive

Pave and extend existing right-turn lane on Wildwood Drive. ❶

US 70 Bus. Median Opening

- **WB US 70 Bus.**
 - Extend U-Turn Lane to 185' ❸
- **EB US 70 Bus.**
 - Extend U-Turn Lane to 185' ❸

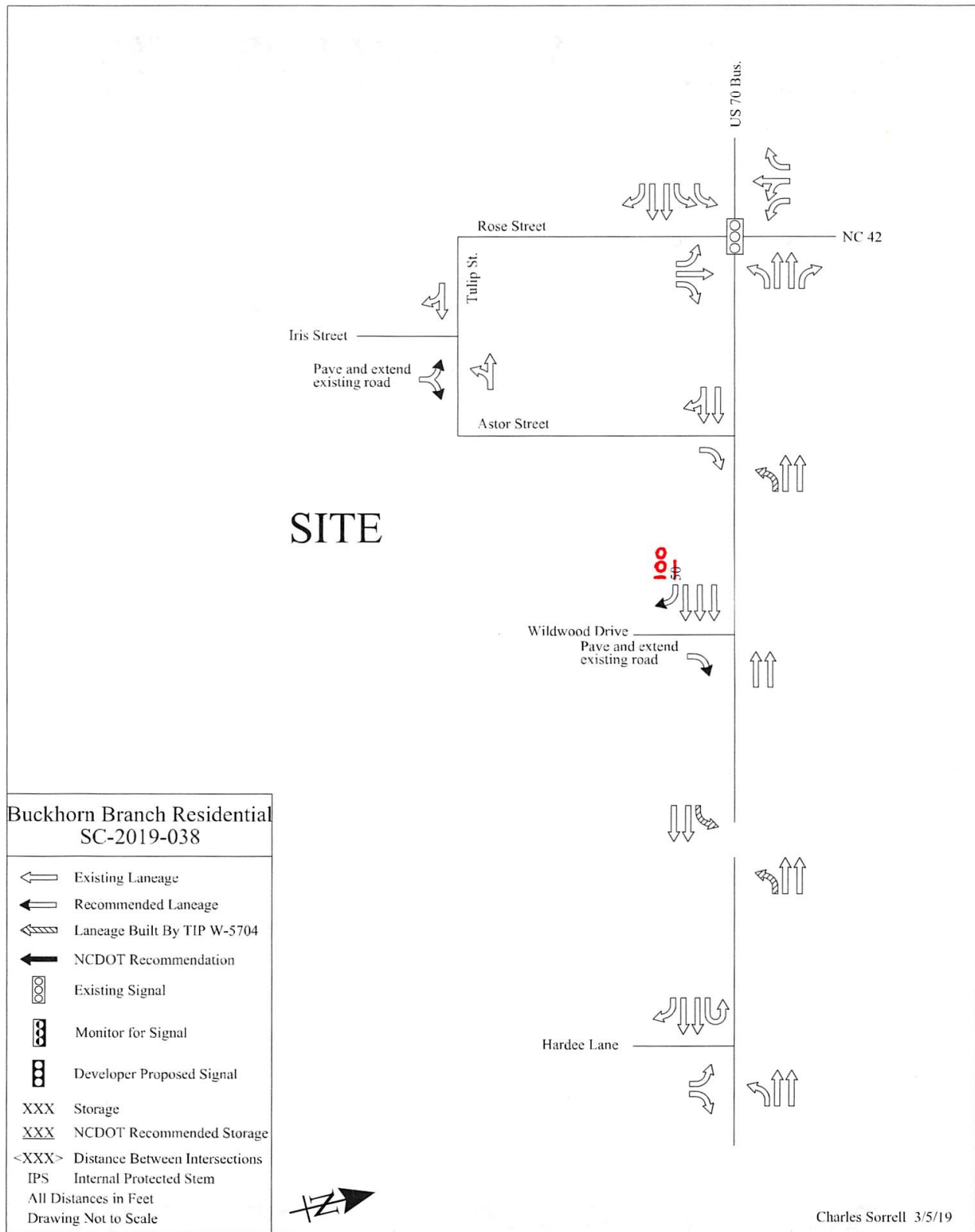


US 70 Bus. and Hardee Lane

No improvements are recommended for site traffic.

Iris Street and Tulip Street

Pave and extend existing left/right-turn lane on Iris Street. ①



APPENDIX

**MEMORANDUM OF UNDERSTANDING AND SCOPING
CORRESPONDENCE**



NCDOT TIA Scoping Checklist



Project Name: Buckhorn Branch

TIA Scoping Date: 12-14-18

☐ **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		Please Select	Please Select		Please Select	
Access B						
Access C						
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	US 70 Business	Rose St/NC 42		Connector 1		
Access 2	US 70 Business	Astor Street	Mvmt Restriction	Connector 2		
Access 3	US 70 Business	Wildwood Drive	Other	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 access to development via Iris Street to Tulip Street, Astor Street Access (Left-over), and Rose Street Access (FM Signal). In scoping meeting, discussed Iris Street, Tulip Street, Rose Street, and Astor Street need to be upgraded to Town of Clayton standards. Proposed Wildwood access (RIRO) is shifted west approximately 95 feet from existing location on US 70 Business.

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 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.

Once existing peak hour traffic count data is collected at the study intersections, we will estimate trip distribution based on existing traffic patterns and submit for approval.

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 Period	Auto		
AM Peak	%	%	%
PM Peak	%	%	%
Daily	%	%	%
	%	%	%

- ☐ Identify proper infrastructure and accommodation for other modes of travel.

☒ Analysis Peak Periods:

- ☒ Weekday AM Peak 7 am - 9 am
- ☒ Weekday PM Peak 4 pm - 6 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	US 70 Business	Rose St/NC 42	Signal	Require New Counts			
#2	US 70 Business	Astor Street	2-Way Stop	Require New Counts			
#3	US 70 Business	Wildwood Dr	2-Way Stop	Require New Counts			
#4	US 70 Business	U-Turn Hardee Ln	Yield	Require New Counts			
#5							
#6							
#7							
#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: _____



NCDOT TIA Scoping Checklist

TIA Need
Screening



TIA
Scoping



TIA
Submittal



☒ Future Year Conditions

☒ Project Build-Out Year: 2023

☐ 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
W-5704 A & B	US 70 Safety Improvements		2019
Nearby Approved Development	Location	Future Land Use (exclude any completed phases)	Committed Improvements
N/A			

☒ Annual Growth Factor: 2 %

Justification/Data Source: Town of Clayton/NCDOT

☒ Local Comprehensive Transportation Plan Compliance

☒ Identify Applicable Local Transportation Planning Documents

Town of Clayton Transportation Priority Projects Map

☐ Identify Applicable Roadways inside the Study Area

Road Name	Classification	Speed Limit	Proposed Cross-Section	Proposed Right-of-Way	Compliance Requirements	Affect Study Intersection #
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 Modification due to Wildwood Drive access shifting to west from existing location

☒ 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	X	Required	X

☒ Additional Comments (municipal TIA requirements, approved variations from NCDOT guidelines)

Exult Engineering will coordinate directly with NCDOT Congestion Management throughout the analysis process if we propose any variations from NCDOT guidelines.



NCDOT TIA Scoping Checklist

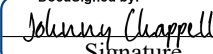


Agreement by All Parties

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 12 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

DocuSigned by:

Signature
AF93A789F406B485...
Johnny Chappell (Concept 8 Holdings)
Print Name
1/14/2019 | 2:10:04 PM EST
Date

TIA CONSULTANT


Signature
Cole Dagerhardt, P.E.
Print Name
2019.01.14
14:38:58 -05'00'
Date

LOCAL GOVERNMENT REPRESENTATIVE (If Applicable)

Signature

Print Name

Date
Email concurrence may be used in lieu of the signature.

NCDOT DISTRICT REPRESENTATIVE

Reviewed and approved by the NCDOT Division _____ District _____ on _____.

Signature

Print Name
Email concurrence may be used in lieu of the signature.

Brittany Chase

From: Lawhorn, Samuel C <sclawhorn@ncdot.gov>
Sent: Tuesday, January 29, 2019 7:06 PM
To: Brittany Chase; Samantha Wullenwaber; Dunlop, James H; Sorrell, Charles V
Cc: Haley Hogg; Damiere Powell; Coleman Dagerhardt; Taylor Honeycutt
Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

Brittany,

I agree the traffic may need shifting once the analysis is completed. Unless there is large delays at both other exits, I see the traffic at Astor being a minimum. The Wildwood dr connection should be a quicker and easier to get to US 70 than Astor street, so traffic taking a U-turn would most likely exit from Wildwood. Of course if there is delays at the Hardee Ln U-turn movement this would encourage more traffic at Astor. If there are any changes to these distribution I would request they are explained as part of the TIA.

Sam Lawhorn, P.E.
District 3 Engineer
Highway Division 4
North Carolina Department of Transportation

919-739-5300
sclawhorn@ncdot.gov

2671 US 70 West
Goldsboro, NC 27530



*Email correspondence to and from this address is subject to the
North Carolina Public Records Law and may be disclosed to third parties.*

From: Brittany Chase <Brittany@ExultEngineering.com>
Sent: Tuesday, January 29, 2019 4:57 PM
To: Lawhorn, Samuel C <sclawhorn@ncdot.gov>; Samantha Wullenwaber <swullenwaber@townofclaytonnc.org>; Dunlop, James H <jdunlop@ncdot.gov>; Sorrell, Charles V <csorrell@ncdot.gov>
Cc: Haley Hogg <hhogg@townofclaytonnc.org>; Damiere Powell <dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt <Taylor@ExultEngineering.com>
Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

CAUTION: External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to report.spam@nc.gov

Hi Sam,

I have included a figure depicting the traffic assignment percentages as well for your approval. This is the preliminary assignment we propose for the site traffic with the understanding some shifting may occur once we determine the delays at the study intersections. For instance, if we find that the northbound left-turn from Rose Street operates with shorter delay than the U-Turn on US 70 Business, this may be the more desirable route for site traffic ultimately heading west on US 70 Business.

Please let me know if you have any questions or comments.

Thank you,



Brittany Chase, P.E.

Exult Engineering | P.O. Box 99277, Raleigh, NC 27624

Office: 984-500-5428 | Mobile: 919-610-4444

Email: Brittany@ExultEngineering.com

Website: www.ExultEngineering.com

From: Lawhorn, Samuel C <sclawhorn@ncdot.gov>

Sent: Monday, January 28, 2019 11:10 AM

To: Brittany Chase <Brittany@ExultEngineering.com>; Samantha Wullenwaber <swullenwaber@townofclaytonnc.org>; Dunlop, James H <jdunlop@ncdot.gov>; Sorrell, Charles V <csorrell@ncdot.gov>

Cc: Haley Hogg <hhogg@townofclaytonnc.org>; Damiere Powell <dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt <Taylor@ExultEngineering.com>

Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

Brittany,

I agree that the proposed outbound distributions are good assumptions, but do you have any proposed distributions for the site driveways? For example the distribution between Wildwood Dr and Rose St?

Sam Lawhorn, P.E.

District 3 Engineer

Highway Division 4

North Carolina Department of Transportation

919-739-5300

sclawhorn@ncdot.gov

2671 US 70 West

Goldsboro, NC 27530



Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

From: Brittany Chase <Brittany@ExultEngineering.com>
Sent: Monday, January 28, 2019 10:13 AM
To: Samantha Wullenwaber <swullenwaber@townofclaytonnc.org>; Lawhorn, Samuel C <sclawhorn@ncdot.gov>; Dunlop, James H <jdunlop@ncdot.gov>; Sorrell, Charles V <csorrell@ncdot.gov>
Cc: Haley Hogg <hhogg@townofclaytonnc.org>; Damiere Powell <dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt <Taylor@ExultEngineering.com>
Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

CAUTION: External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to report.spam@nc.gov

Good morning all,

I hope all are doing well this morning!

I have attached the existing AM and PM peak hour traffic counts at the study intersections as well as the proposed distribution for the site traffic. Please let us know if you have any comments regarding the distribution at your earliest convenience, so we can move forward with our analysis.

Thank you and have a great day!



Brittany Chase, P.E.
Exult Engineering | P.O. Box 99277, Raleigh, NC 27624
Office: 984-500-5428 | Mobile: 919-610-4444
Email: Brittany@ExultEngineering.com
Website: www.ExultEngineering.com

From: Samantha Wullenwaber <swullenwaber@townofclaytonnc.org>
Sent: Tuesday, January 22, 2019 11:49 AM
To: Brittany Chase <Brittany@ExultEngineering.com>; Lawhorn, Samuel C <sclawhorn@ncdot.gov>; Dunlop, James H <jdunlop@ncdot.gov>; Sorrell, Charles V <csorrell@ncdot.gov>
Cc: Haley Hogg <hhogg@townofclaytonnc.org>; Damiere Powell <dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt <Taylor@ExultEngineering.com>
Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

Brittany,

That will work. Thank you.

Samantha L. Wullenwaber, MPA
Planning Director
Town of Clayton
111 East Second Street | PO Box 879 | Clayton, NC 27528
O (919)553-5002 | D (919)359-9364
swullenwaber@townofclaytonnc.org



From: Brittany Chase <Brittany@ExultEngineering.com>
Sent: Tuesday, January 22, 2019 10:23 AM
To: Samantha Wullenwaber <swullenwaber@townofclaytonnc.org>; Lawhorn, Samuel C <sclawhorn@ncdot.gov>; Dunlop, James H <jdunlop@ncdot.gov>; Sorrell, Charles V <csorrell@ncdot.gov>
Cc: Haley Hogg <hhogg@townofclaytonnc.org>; Damiere Powell <dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt <Taylor@ExultEngineering.com>
Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

Good morning Samantha –

I hope all is well - thank you for your email.

When preparing the scoping checklist, we looked at the internal streets and did not see a need to study the following intersections because of the lack of conflicting movements:

- Rose Street at Tulip Street
- Astor Street at Tulip Street
- Iris Street at internal Street "A"

However, there will likely be conflicting movements at the intersection of Iris Street and Tulip Street. Please confirm this is the only intersection you would like us to add.

Thank you,



Brittany Chase, P.E.
Exult Engineering | P.O. Box 99277, Raleigh, NC 27624
Office: 984-500-5428 | Mobile: 919-610-4444
Email: Brittany@ExultEngineering.com
Website: www.ExultEngineering.com

From: Samantha Wullenwaber <swullenwaber@townofclaytonnc.org>
Sent: Tuesday, January 22, 2019 9:04 AM
To: Brittany Chase <Brittany@ExultEngineering.com>; Lawhorn, Samuel C <sclawhorn@ncdot.gov>; Dunlop, James H <jdunlop@ncdot.gov>; Sorrell, Charles V <csorrell@ncdot.gov>
Cc: Haley Hogg <hhogg@townofclaytonnc.org>; Damiere Powell <dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt <Taylor@ExultEngineering.com>
Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

Brittany,

Thank you for sending this. Please include the internal streets in the subdivision abutting Buckhorn Branch, mainly Tulip St. If you have any questions, please let me know. Thank you.

Samantha L. Wullenwaber, MPA
Planning Director
Town of Clayton
111 East Second Street | PO Box 879 | Clayton, NC 27528
O (919)553-5002 | D (919)359-9364
swullenwaber@townofclaytonnc.org



From: Brittany Chase <Brittany@ExultEngineering.com>
Sent: Monday, January 14, 2019 3:43 PM
To: Lawhorn, Samuel C <sclawhorn@ncdot.gov>; Dunlop, James H <jdunlop@ncdot.gov>; Sorrell, Charles V <csorrell@ncdot.gov>
Cc: Samantha Wullenwaber <swullenwaber@townofclaytonnc.org>; Haley Hogg <hhogg@townofclaytonnc.org>; Damiere Powell <dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt <Taylor@ExultEngineering.com>
Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

Good afternoon,

I have attached the TIA Scoping Checklist Form for Buckhorn Branch to serve as the MOU from the scoping meeting. I have also attached the site plan. Please note, the client was unable to realign Wildwood Drive for access to the left-over/median break that is part of W-5704. Therefore, the access will remain as shown during the scoping meeting. Please review and let me know if you have any questions, comments, or changes.

Thank you,



Brittany Chase, P.E.
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Office: 984-500-5428 | Mobile: 919-610-4444
Email: Brittany@ExultEngineering.com
Website: www.ExultEngineering.com

From: Brittany Chase
Sent: Thursday, January 3, 2019 10:35 AM

To: Lawhorn, Samuel C <sclawhorn@ncdot.gov>; Dunlop, James H <jdunlop@ncdot.gov>; Sorrell, Charles V <csorrell@ncdot.gov>

Cc: swullenwaber@townofclaytonnc.org; hhogg@townofclaytonnc.org; Damiere Powell <dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt <Taylor@ExultEngineering.com>

Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

Thank you all for your quick responses. We will relay this information to the client. We are waiting to send out the TIA Scoping Checklist/MOU until the alignment is determined.

Thank you and have a great day,



Brittany Chase, P.E.

Exult Engineering | P.O. Box 99277, Raleigh, NC 27624

Office: 984-500-5428 | Mobile: 919-610-4444

Email: Brittany@ExultEngineering.com

Website: www.ExultEngineering.com

From: Lawhorn, Samuel C <sclawhorn@ncdot.gov>

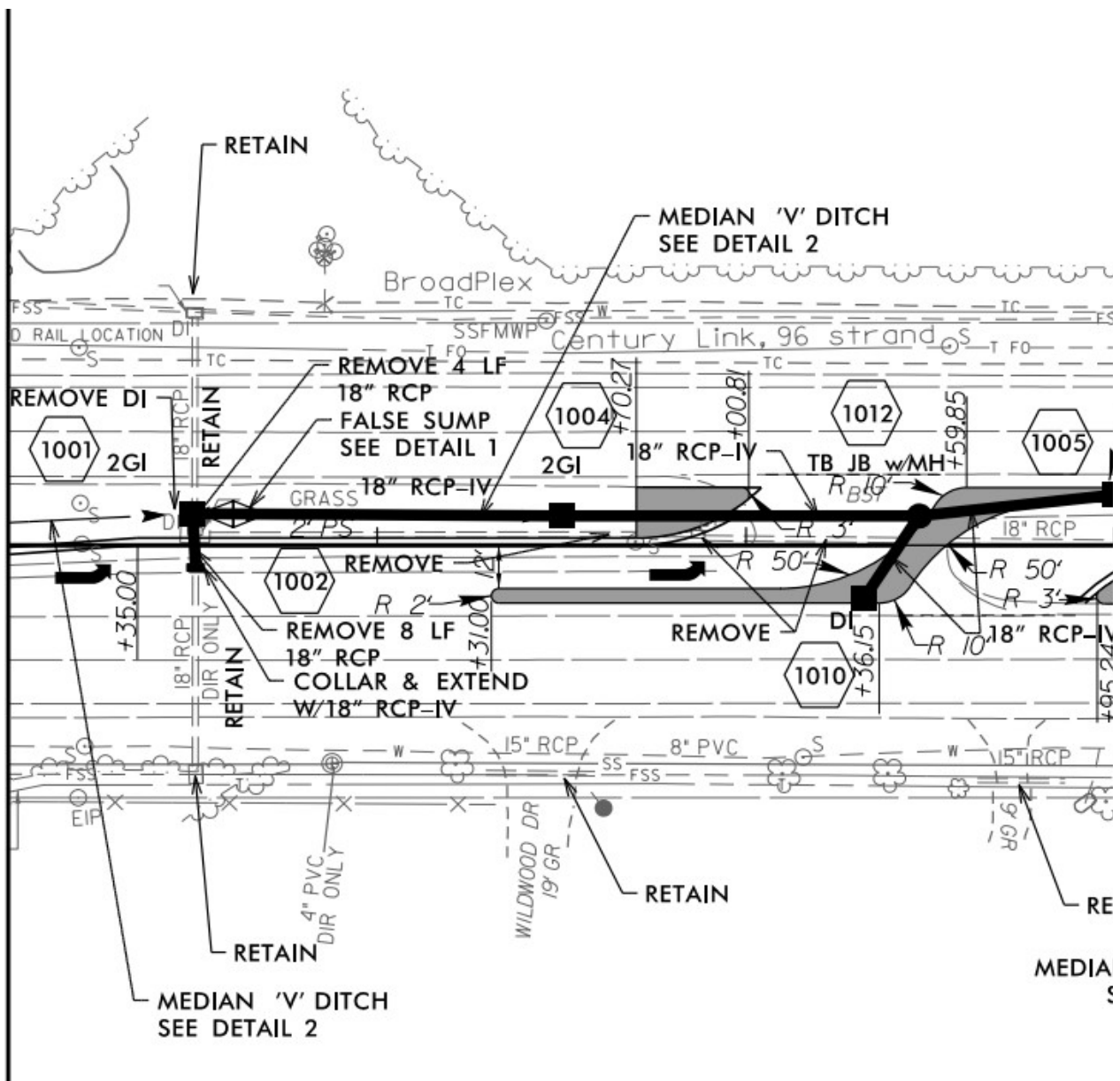
Sent: Wednesday, January 2, 2019 4:21 PM

To: Dunlop, James H <jdunlop@ncdot.gov>; Brittany Chase <Brittany@ExultEngineering.com>; Sorrell, Charles V <csorrell@ncdot.gov>

Cc: swullenwaber@townofclaytonnc.org; hhogg@townofclaytonnc.org; Damiere Powell <dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt <Taylor@ExultEngineering.com>

Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

Below is the current plans for W-5704A, that is currently under construction. As you can see there will not be full access allow at this location, but it would be limited to a left over. I would okay with the alignment though, as long as the new driveway aligned directly across from the new left over. I would not want anyone having to go against traffic for any distance, so the new driveway would need to be located almost directly at the current 9' gravel drive that is being retained. Also it should be noted that the new driveway should be very close to a 90 degree related to US 70, so the current proposed driveway angle would need to shift more to the East. If these two requirements can not be meet the driveway will need to be at the current wildwood location.



Sam Lawhorn, P.E.
 District 3 Engineer
 Highway Division 4
 North Carolina Department of Transportation

919-739-5300
sclawhorn@ncdot.gov

2671 US 70 West
 Goldsboro, NC 27530



Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

From: Dunlop, James H
Sent: Wednesday, January 2, 2019 2:25 PM
To: Brittany Chase <Brittany@ExultEngineering.com>; Lawhorn, Samuel C <sclawhorn@ncdot.gov>; Sorrell, Charles V <csorrell@ncdot.gov>
Cc: swullenwaber@townofclaytonnc.org; hhogg@townofclaytonnc.org; Damiere Powell <dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt <Taylor@ExultEngineering.com>
Subject: RE: [External] Buckhorn Branch - Wildwood at US 70 Business

Congestion Management is OK with the realignment, with the note that it may not remain as a full-movement median opening (I don't have the full plans for W-5704 in front of me.)

Unless I've forgotten something, the basic network setup remains the same; you're just moving Wildwood to the east rather than move the median opening to the west. So, I don't see any real changes in your TIA scope.

Sam at the District has the final call from NCDOT, so take my comments as advisory.

James H. Dunlop, P.E.
Congestion Management Engineer
Transportation Mobility and Safety Division
North Carolina Department of Transportation

919 814 4936
jdunlop@ncdot.gov

750 North Greenfield Parkway
Garner, North Carolina 27529



Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

From: Brittany Chase <Brittany@ExultEngineering.com>
Sent: Wednesday, January 02, 2019 1:59 PM
To: Lawhorn, Samuel C <sclawhorn@ncdot.gov>; Dunlop, James H <jdunlop@ncdot.gov>; Sorrell, Charles V

<csorrell@ncdot.gov>

Cc: swullenwaber@townofclaytonnc.org; hhogg@townofclaytonnc.org; Damiere Powell

<dpowell@townofclaytonnc.org>; Coleman Dagerhardt <Cole@ExultEngineering.com>; Taylor Honeycutt

<Taylor@ExultEngineering.com>

Subject: [External] Buckhorn Branch - Wildwood at US 70 Business

CAUTION: External email. Do not click links or open attachments unless you verified. Send all suspicious email as an attachment to report.spam@nc.gov

Good afternoon,

Happy New Year! I hope you all are well.

As you may recall, Exult Engineering, NCDOT and the Town of Clayton met on December 14th to discuss the TIA scope for the proposed Buckhorn Branch development. Since the meeting, a new tract of land has been added to the site that would allow for the relocation of the Wildwood Drive connection to US 70 Business to align with the median break shown on the roadway design plans for W-5704 (please see attached revised site plan). Our client has asked us to confirm that this realignment is acceptable to NCDOT, given that the Wildwood Drive connection would have no impact on the current construction of W-5704. How would you like us to proceed with this possible change in alignment? Is this something that can be presented on a conceptual plan at this point for discussion purposes and included as the site access in the TIA? Please advise on how we should proceed.

Thank you and have a great day,



Brittany Chase, P.E.

Exult Engineering | P.O. Box 99277, Raleigh, NC 27624

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Website: www.ExultEngineering.com

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TRAFFIC COUNT DATA

Clayton, NC
Classified Turn Movement Count

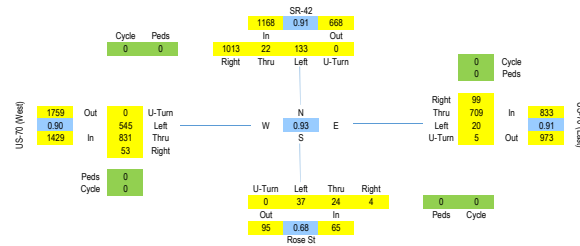
Site 1 of 4
US-70 (West)
US-70 (East)
Rose St
SR-42

Lat/Long
35.636496° -78.442244°

Date
Wednesday 9 January 2019

Weather
Mostly Sunny
Temp: 15°C

0700 - 0900 (Weekday AM Peak)



TIME	Eastbound US-70 (West)				Westbound US-70 (East)				Northbound Rose St				Southbound SR-42				Int Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
0700 - 0715	0	110	147	12	1	4	205	30	0	10	6	0	0	29	4	277	835	3423
0715 - 0730	0	114	186	14	0	5	172	22	0	11	4	1	0	36	8	258	834	3465
0730 - 0745	0	147	242	8	2	3	201	24	0	11	6	0	0	29	6	263	942	3412
0745 - 0800	0	129	215	9	1	3	176	23	0	3	4	1	0	30	2	216	812	3203
0800 - 0815	0	155	188	22	2	6	160	30	0	12	10	2	0	38	6	276	807	3160
0815 - 0830	0	147	130	13	1	6	157	20	0	7	8	6	0	37	6	213	751	
0830 - 0845	0	94	132	2	1	5	155	20	0	13	2	0	0	36	9	262	733	
0845 - 0900	0	109	144	13	0	2	141	14	0	9	6	3	0	41	10	277	769	
Grand Total	0	1005	1384	93	8	37	1367	183	0	76	46	13	0	278	51	2042	6983	
Total (%)	0.00	40.49	56.76	3.75	0.50	2.32	85.71	11.47	0.00	56.30	34.07	9.63	0.00	11.73	2.15	86.12		
	0.00	15.27	21.02	1.41	0.12	0.56	20.77	2.78	0.00	1.15	0.70	0.20	0.00	4.22	0.77	31.02		
Motorcycles	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Passenger cars	0	668	1143	62	0	14	1102	128	0	52	27	6	0	228	34	1768		
4 tire, single unit	0	276	177	25	6	20	208	43	0	20	14	4	0	42	14	238		
Buses	0	9	3	0	1	0	3	1	0	0	0	0	0	0	0	1	2	
2 axle, 6 tire, single unit	0	29	10	5	0	1	23	0	0	1	5	3	0	5	1	20		
3 axle, single unit	0	5	9	1	0	1	6	2	0	0	0	0	0	0	0	2		
4 or more axle, single unit	0	4	23	0	0	0	10	0	0	0	0	0	0	0	0	1	3	
4 or less axle, single trailer	0	0	9	0	0	1	2	1	0	2	0	0	0	0	0	0	0	
5-axle tractor semitrailer	0	12	7	0	0	0	9	8	0	0	0	0	0	0	3	0	7	
6 or more axle, single trailer	0	1	3	0	0	0	4	0	0	0	0	0	0	0	0	0	1	
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Motorcycles (%)	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	
Passenger cars (%)	0.00	66.47	82.59	66.67	0.00	37.84	80.61	69.95	0.00	68.42	58.70	46.15	0.00	82.01	66.67	86.58		
4 tire, single unit (%)	0.00	27.46	12.79	26.88	75.00	54.05	15.22	23.50	0.00	26.32	30.43	30.77	0.00	15.11	27.45	11.66		
Buses (%)	0.00	0.90	0.22	0.00	12.50	0.00	0.22	0.55	0.00	0.00	0.00	0.00	0.00	0.00	1.96	0.10		
2 axle, 6 tire, single unit (%)	0.00	2.89	0.72	5.38	0.00	2.70	1.68	0.00	0.00	1.32	10.87	23.08	0.00	1.80	1.96	0.98		
3 axle, single unit (%)	0.00	0.50	0.65	1.09	12.50	2.70	0.44	1.09	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.10		
4 or more axle, single unit (%)	0.00	0.40	1.66	0.00	0.00	0.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.96	0.15		
4 or less axle, single trailer (%)	0.00	0.00	0.65	0.00	0.00	2.70	0.15	0.55	0.00	2.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5-axle tractor semitrailer (%)	0.00	1.19	0.51	0.00	0.00	0.00	0.66	4.37	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.34		
6 or more axle, single trailer (%)	0.00	0.10	0.22	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05		
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Peak Rolling Hour Flow Rates

TIME	Eastbound US-70 (West)				Westbound US-70 (East)				Northbound Rose St				Southbound SR-42				Int Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
0715 - 0730	0	114	186	14	0	5	172	22	0	11	4	1	0	36	8	258	834
0730 - 0745	0	147	242	8	2	3	201	24	0	11	6	0	0	29	6	263	942
0745 - 0800	0	129	215	9	1	3	176	23	0	3	4	1	0	30	2	216	812
0800 - 0815	0	155	188	22	2	6	160	30	0	12	10	2	0	38	6	276	907
Grand Total	0	545	831	53	5	20	709	99	0	37	24	4	0	133	22	1013	3495
Approach (%)	0.00	38.14	58.15	3.71	0.60	2.40	85.11	11.88	0.00	56.92	36.92	6.15	0.00	11.39	1.88	86.73	
Total (%)	0.00	15.58	23.78	1.52	0.14	0.57	20.29	2.83	0.00	1.06	0.68	0.11	0.00	3.81	0.63	28.98	
PHF	0%	86%	66%	60%	63%	63%	68%	63%	0%	77%	60%	50%	0%	88%	69%	92%	93%
Motorcycles	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Passenger cars	0	358	715	40	0	6	561	68	0	26	15	1	0	107	15	879	2791
4 tire, single unit	0	132	82	11	4	12	117	25	0	8	8	2	0	22	8	115	364
Buses	0	4	1	0	1	0	1	1	0	0	0	0	0	0	1	0	9
2 axle, 6 tire, single unit	0	14	5	2	0	1	11	0	0	0	1	1	0	3	0	11	49
3 axle, single unit	0	2	3	0	0	0	1	0	0	1	0	0	0	0	0	1	8
4 or more axle, single unit	0	4	17	0	0	0	7	0	0	0	0	0	0	0	0	1	29
4 or less axle, single trailer	0	0	4	0	0	1	1	1	0	2	0	0	0	0	0	0	9
5-axle tractor semitrailer	0	9	3	0	0	0	6	4	0	0	0	0	0	1	0	5	28
6 or more axle, single trailer	0	1	1	0	0	0	4	0	0	0	0	0	0	0	0	0	6
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles (%)	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.06
Passenger cars (%)	0.00	65.69	86.04	75.47	0.00	30.00	73.13	68.69	0.00	70.27	62.50	25.00	0.00	80.45	68.18	86.77	79.96
4 tire, single unit (%)	0.00	27.89	9.87	20.75	80.00	60.00	16.50	25.25	0.00	21.62	33.33	50.00	0.00	16.54	27.27	11.35	16.14
Buses (%)	0.00	0.73	0.12	0.00	20.00	0.00	0.14	1.01	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.26
2 axle, 6 tire, single unit (%)	0.00	2.57	0.60	3.77	0.00	5.00	1.55	0.00	0.00	0.00	4.17	25.00	0.00	2.26	0.00	1.09	1.40
3 axle, single unit (%)	0.00	0.37	0.36	0.00	0.00	0.00	0.14	0.00	0.00	2.70	0.00	0.00	0.00	0.00	0.00	0.10	0.23
4 or more axle, single unit (%)	0.00	0.73	2.95	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.83
4 or less axle, single trailer (%)	0.00	0.00	0.48	0.00	0.00	5.00	0.14	1.01	0.00	5.41	0.00	0.00	0.00	0.00	0.00	0.00	0.26
5-axle tractor semitrailer (%)	0.00	1.65	0.36	0.00	0.00	0.00	0.85	4.04	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.49	0.80
6 or more axle, single trailer (%)	0.00	0.18	0.12	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Clayton, NC
Classified Turn Movement Count

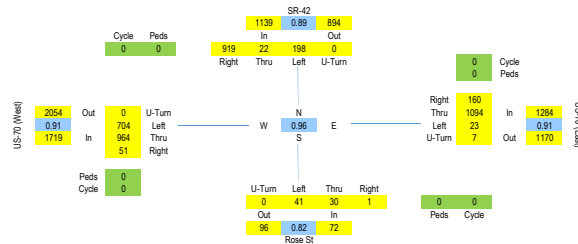
Site 1 of 4
US-70 (West)
US-70 (East)
Rose St
SR-42

Lat/Long
35.636496° -78.442244°

Date
Wednesday 9 January 2019

Weather
Mostly Sunny
Temp: 15°C

1600 - 1800 (Weekday PM Peak)



TIME	Eastbound US-70 (West)				Westbound US-70 (East)				Northbound Rose St				Southbound SR-42				Int Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
1600 - 1615	0	220	213	12	2	3	189	44	0	16	8	1	0	31	8	215	962	3844
1615 - 1630	0	216	198	13	0	4	173	39	0	17	3	1	0	46	5	192	963	3933
1630 - 1645	0	221	202	17	5	3	201	43	0	7	7	2	0	70	0	208	965	4126
1645 - 1700	0	163	205	8	1	8	233	31	0	15	6	1	0	69	6	238	984	4214
1700 - 1715	0	198	262	12	4	2	276	35	0	11	6	0	0	40	5	197	1048	4206
1715 - 1730	0	177	228	18	2	9	288	43	0	7	10	0	0	49	4	266	1101	
1730 - 1745	0	166	269	13	0	4	297	51	0	8	8	0	0	40	7	218	1081	
1745 - 1800	0	206	201	11	1	5	199	45	0	11	5	2	0	43	10	237	976	
Grand Total	0	1569	1778	104	15	38	1856	331	0	86	53	7	0	388	54	1771	8950	
Approach (%)	0.00	45.47	51.52	3.01	0.67	1.70	82.86	14.78	0.00	58.90	36.30	4.79	0.00	17.53	2.44	80.03		
Total (%)	0.00	19.49	22.09	1.29	0.19	0.47	23.06	4.11	0.00	1.07	0.66	0.09	0.00	4.82	0.67	22.00		
Motorcycles	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Passenger cars	0	1228	1571	78	0	22	1631	274	0	63	39	7	0	318	46	1480		
4 tire, single unit	0	316	164	25	9	12	181	47	0	20	14	0	0	58	7	265		
Buses	0	2	3	0	4	1	1	0	0	0	0	0	0	1	1	0		
2 axle, 6 tire, single unit	0	14	19	1	0	3	7	4	0	3	0	0	0	4	0	14		
3 axle, single unit	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0		
4 or more axle, single unit	0	3	3	0	0	0	14	1	0	0	0	0	0	0	0	0		
4 or less axle, single trailer	0	0	3	0	0	0	8	0	0	0	0	0	0	0	0	0		
5-axle tractor semitrailer	0	5	7	0	0	0	7	4	0	0	0	0	0	0	6	0		
6 or more axle, single trailer	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0		
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Motorcycles (%)	0.00	0.06	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06		
Passenger cars (%)	0.00	78.27	88.36	75.00	0.00	57.89	87.88	82.78	0.00	73.26	73.58	100.00	0.00	81.96	85.19	83.57		
4 tire, single unit (%)	0.00	20.14	9.22	24.04	60.00	31.58	9.75	14.20	0.00	23.26	26.42	0.00	0.00	14.95	12.96	14.96		
Buses (%)	0.00	0.13	0.17	0.00	26.67	2.63	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.26	1.85	0.00		
2 axle, 6 tire, single unit (%)	0.00	0.89	1.07	0.96	0.00	7.89	0.38	1.21	0.00	3.49	0.00	0.00	0.00	1.03	0.00	0.79		
3 axle, single unit (%)	0.00	0.00	0.22	0.00	13.33	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.11		
4 or more axle, single unit (%)	0.00	0.19	0.17	0.00	0.00	0.00	0.75	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11		
4 or less axle, single trailer (%)	0.00	0.00	0.17	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06		
5-axle tractor semitrailer (%)	0.00	0.32	0.39	0.00	0.00	0.00	0.38	1.21	0.00	0.00	0.00	0.00	0.00	1.55	0.00	0.28		
6 or more axle, single trailer (%)	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06		
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Peak Rolling Hour Flow Rates

TIME	Eastbound US-70 (West)				Westbound US-70 (East)				Northbound Rose St				Southbound SR-42				Int Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
1645 - 1700	0	163	205	8	1	8	233	31	0	15	6	1	0	69	6	238	984
1700 - 1715	0	198	262	12	4	2	276	35	0	11	6	0	0	40	5	197	1048
1715 - 1730	0	177	228	18	2	9	288	43	0	7	10	0	0	49	4	266	1101
1730 - 1745	0	166	269	13	0	4	297	51	0	8	8	0	0	40	7	218	1081
Grand Total	0	704	964	51	7	23	1094	160	0	41	30	1	0	198	22	919	4214
Approach (%)	0.00	40.95	56.08	2.97	0.55	1.79	85.20	12.46	0.00	56.94	41.67	1.39	0.00	17.38	1.93	80.88	
Total (%)	0.00	19.71	22.86	1.21	0.17	0.55	25.96	3.80	0.00	0.97	0.71	0.02	0.00	4.70	0.52	21.61	
PHF	91%	89%	90%	71%	44%	64%	92%	78%	0%	68%	75%	25%	0%	72%	79%	86%	96%
Motorcycles	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Passenger cars	0	588	862	34	0	12	916	124	0	27	21	1	0	196	20	772	3593
4 tire, single unit	0	137	81	16	3	9	99	33	0	12	9	0	0	36	7	136	373
Buses	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3
2 axle, 6 tire, single unit	0	4	8	1	0	2	3	0	0	2	0	0	0	1	0	7	28
3 axle, single unit	0	0	2	0	1	0	6	0	0	0	0	0	0	1	0	0	10
4 or more axle, single unit	0	1	0	0	0	0	6	0	0	0	0	0	0	0	0	1	8
4 or less axle, single trailer	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	1	6
5-axle tractor semitrailer	0	3	5	0	0	0	1	3	0	0	0	0	0	4	0	1	17
6 or more axle, single trailer	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycles (%)	0.00	0.14	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Passenger cars (%)	0.00	79.26	89.42	66.67	0.00	52.17	89.21	77.50	0.00	65.85	70.00	100.00	0.00	78.79	90.91	84.00	84.55
4 tire, single unit (%)	0.00	19.46	8.40	31.37	42.86	39.13	9.05	20.63	0.00	29.27	30.00	0.00	0.00	18.18	9.09	14.80	13.60
Buses (%)	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
2 axle, 6 tire, single unit (%)	0.00	0.57	0.83	1.96	0.00	8.70	0.27	0.00	0.00	4.88	0.00	0.00	0.00	0.51	0.00	0.76	0.66
3 axle, single unit (%)	0.00	0.00	0.21	0.00	14.29	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.24
4 or more axle, single unit (%)	0.00	0.14	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.19	0.19
4 or less axle, single trailer (%)	0.00	0.00	0.21	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.14
5-axle tractor semitrailer (%)	0.00	0.43	0.52	0.00	0.00	0.00	0.09	1.88	0.00	0.00	0.00	0.00	0.00	2.02	0.00	0.11	0.40
6 or more axle, single trailer (%)	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.05
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Clayton, NC
Classified Turn Movement Count

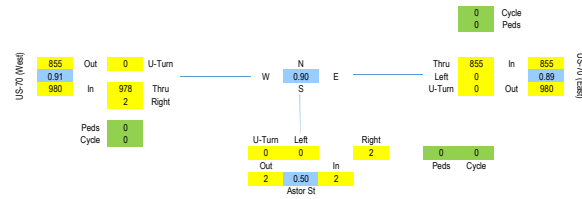
Site 2 of 4
US-70 (West)
US-70 (East)
Astor St

Lat/Long
35.634934° -78.439760°

Date
Wednesday 9 January 2019

Weather
Mostly Sunny
Temp: 15°C

0700 - 0900 (Weekday AM Peak)



	Eastbound US-70 (West)			Westbound US-70 (East)			Northbound Astor St			Int Total	Rolling Hour
	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right		
TIME	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9		
0700 - 0715	0	166	1	0	0	227	0	0	1	395	1795
0715 - 0730	0	222	0	0	0	212	0	0	0	434	1637
0730 - 0745	0	269	0	0	0	239	0	0	1	509	1763
0745 - 0800	0	252	1	0	0	203	0	0	1	457	1616
0800 - 0815	0	235	1	0	0	201	0	0	0	437	1510
0815 - 0830	0	180	0	0	0	179	0	0	1	360	
0830 - 0845	0	176	1	0	0	184	0	0	1	362	
0845 - 0900	0	182	1	0	0	157	0	0	1	351	
Grand Total	0	1692	5	0	0	1602	0	0	6	3365	
Approach (%)	0.00	99.71	0.29	0.00	0.00	100.00	0.00	0.00	100.00		
Total (%)	0.00	51.20	0.15	0.00	0.00	48.47	0.00	0.00	0.18		
Motorcycles	0	1	0	0	0	1	0	0	0		
Passenger cars	0	1386	0	0	0	1249	0	0	4		
4 tire, single unit	0	228	4	0	0	278	0	0	1		
Buses	0	5	0	0	0	5	0	0	0		
2 axle, 6 tire, single unit	0	17	1	0	0	24	0	0	1		
3 axle, single unit	0	10	0	0	0	10	0	0	0		
4 or more axle, single unit	0	23	0	0	0	10	0	0	0		
4 or less axle, single trailer	0	9	0	0	0	4	0	0	0		
5-axle tractor semitrailer	0	10	0	0	0	17	0	0	0		
6 or more axle, single trailer	0	3	0	0	0	4	0	0	0		
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0		
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0		
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0		
Motorcycles (%)	0.00	0.06	0.00	0.00	0.00	0.06	0.00	0.00	0.00		
Passenger cars (%)	0.00	81.91	0.00	0.00	0.00	77.97	0.00	0.00	66.67		
4 tire, single unit (%)	0.00	13.48	80.00	0.00	0.00	17.35	0.00	0.00	16.67		
Buses (%)	0.00	0.30	0.00	0.00	0.00	0.31	0.00	0.00	0.00		
2 axle, 6 tire, single unit (%)	0.00	1.00	20.00	0.00	0.00	1.50	0.00	0.00	16.67		
3 axle, single unit (%)	0.00	0.59	0.00	0.00	0.00	0.62	0.00	0.00	0.00		
4 or more axle, single unit (%)	0.00	1.36	0.00	0.00	0.00	0.62	0.00	0.00	0.00		
4 or less axle, single trailer (%)	0.00	0.53	0.00	0.00	0.00	0.25	0.00	0.00	0.00		
5-axle tractor semitrailer (%)	0.00	0.59	0.00	0.00	0.00	1.06	0.00	0.00	0.00		
6 or more axle, single trailer (%)	0.00	0.18	0.00	0.00	0.00	0.25	0.00	0.00	0.00		
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Peak Rolling Hour Flow Rates

	Eastbound US-70 (West)			Westbound US-70 (East)			Northbound Astor St			Int Total
	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right	
TIME	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	
0715 - 0730	0	222	0	0	0	212	0	0	0	434
0730 - 0745	0	269	0	0	0	239	0	0	1	509
0745 - 0800	0	252	1	0	0	203	0	0	1	457
0800 - 0815	0	235	1	0	0	201	0	0	0	437
Grand Total	0	1978	2	0	0	855	0	0	2	1837
Approach (%)	0.00	99.80	0.20	0.00	0.00	100.00	0.00	0.00	100.00	
Total (%)	0.00	53.24	0.11	0.00	0.00	46.54	0.00	0.00	0.11	
PHF	0%	91%	50%	0%	0%	89%	0%	0%	50%	
Motorcycles	0	1	0	0	0	1	0	0	0	2
Passenger cars	0	819	0	0	0	688	0	0	0	1477
4 tire, single unit	0	118	2	0	0	154	0	0	1	275
Buses	0	2	0	0	0	2	0	0	0	4
2 axle, 6 tire, single unit	0	8	0	0	0	11	0	0	1	20
3 axle, single unit	0	3	0	0	0	5	0	0	0	8
4 or more axle, single unit	0	16	0	0	0	7	0	0	0	23
4 or less axle, single trailer	0	6	0	0	0	2	0	0	0	8
5-axle tractor semitrailer	0	4	0	0	0	11	0	0	0	15
6 or more axle, single trailer	0	1	0	0	0	4	0	0	0	5
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0	0
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0
Motorcycles (%)	0.00	0.10	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.11
Passenger cars (%)	0.00	83.74	0.00	0.00	0.00	78.96	0.00	0.00	0.00	80.40
4 tire, single unit (%)	0.00	12.07	100.00	0.00	0.00	18.01	0.00	0.00	50.00	14.97
Buses (%)	0.00	0.20	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.22
2 axle, 6 tire, single unit (%)	0.00	0.82	0.00	0.00	0.00	1.29	0.00	0.00	50.00	1.09
3 axle, single unit (%)	0.00	0.31	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.44
4 or more axle, single unit (%)	0.00	0.14	0.00	0.00	0.00	0.62	0.00	0.00	0.00	1.25
4 or less axle, single trailer (%)	0.00	0.61	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.44
5-axle tractor semitrailer (%)	0.00	0.41	0.00	0.00	0.00	1.29	0.00	0.00	0.00	0.82
6 or more axle, single trailer (%)	0.00	0.10	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.27
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Clayton, NC
Classified Turn Movement Count

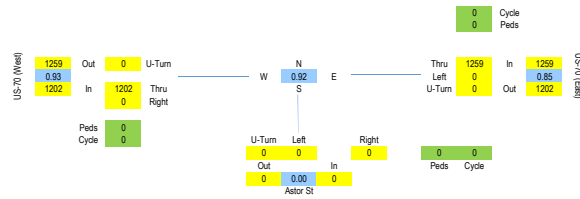
Site 2 of 4
US-70 (West)
US-70 (East)
Astor St

Lat/Long
35.634934° -78.439760°

Date
Wednesday 9 January 2019

Weather
Mostly Sunny
Temp: 15°C

1600 - 1800 (Weekday PM Peak)



TIME	Eastbound US-70 (West)			Westbound US-70 (East)			Northbound Astor St			Int Total	Rolling Hour
	U-Turn 2.1	Thru 2.2	Right 2.3	U-Turn 2.4	Left 2.5	Thru 2.6	U-Turn 2.7	Left 2.8	Right 2.9		
1600 - 1615	0	250	0	0	0	253	0	0	0	503	2025
1615 - 1630	0	251	0	0	0	228	0	0	0	479	2188
1630 - 1645	0	273	0	0	0	251	0	0	0	524	2331
1645 - 1700	0	267	0	0	0	252	0	0	0	519	2461
1700 - 1715	0	309	0	0	0	307	0	0	0	616	2427
1715 - 1730	0	302	0	0	0	370	0	0	0	672	
1730 - 1745	0	324	0	0	0	330	0	0	0	654	
1745 - 1800	0	229	0	0	0	259	0	0	0	485	
Grand Total	0	2205	0	0	0	2247	0	0	0	4452	
Approach (%)	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00		
Total (%)	0.00	49.53	0.00	0.00	0.00	50.47	0.00	0.00	0.00		
Motorcycles	0	3	0	0	0	0	0	0	0		
Passenger cars	0	1908	0	0	0	1932	0	0	0		
4 tire, single unit	0	236	0	0	0	251	0	0	0		
Buses	0	8	0	0	0	6	0	0	0		
2 axle, 6 tire, single unit	0	23	0	0	0	14	0	0	0		
3 axle, single unit	0	7	0	0	0	9	0	0	0		
4 or more axle, single unit	0	3	0	0	0	15	0	0	0		
4 or less axle, single trailer	0	3	0	0	0	8	0	0	0		
5-axle tractor semitrailer	0	13	0	0	0	11	0	0	0		
6 or more axle, single trailer	0	1	0	0	0	0	0	0	0		
5 or less axle, multi-trailer	0	0	0	0	0	1	0	0	0		
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0		
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0		
Motorcycles (%)	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Passenger cars (%)	0.00	86.53	0.00	0.00	0.00	85.98	0.00	0.00	0.00		
4 tire, single unit (%)	0.00	10.70	0.00	0.00	0.00	11.17	0.00	0.00	0.00		
Buses (%)	0.00	0.36	0.00	0.00	0.00	0.27	0.00	0.00	0.00		
2 axle, 6 tire, single unit (%)	0.00	1.04	0.00	0.00	0.00	0.62	0.00	0.00	0.00		
3 axle, single unit (%)	0.00	0.32	0.00	0.00	0.00	0.40	0.00	0.00	0.00		
4 or more axle, single unit (%)	0.00	0.14	0.00	0.00	0.00	0.67	0.00	0.00	0.00		
4 or less axle, single trailer (%)	0.00	0.14	0.00	0.00	0.00	0.36	0.00	0.00	0.00		
5-axle tractor semitrailer (%)	0.00	0.59	0.00	0.00	0.00	0.49	0.00	0.00	0.00		
6 or more axle, single trailer (%)	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00		
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Peak Rolling Hour Flow Rates

TIME	Eastbound US-70 (West)			Westbound US-70 (East)			Northbound Astor St			Int Total
	U-Turn 2.1	Thru 2.2	Right 2.3	U-Turn 2.4	Left 2.5	Thru 2.6	U-Turn 2.7	Left 2.8	Right 2.9	
1645 - 1700	0	267	0	0	0	252	0	0	0	519
1700 - 1715	0	309	0	0	0	307	0	0	0	616
1715 - 1730	0	302	0	0	0	370	0	0	0	672
1730 - 1745	0	324	0	0	0	330	0	0	0	654
Grand Total	0	1202	0	0	0	1259	0	0	0	2461
Approach (%)	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	
Total (%)	0.00	49.54	0.00	0.00	0.00	51.16	0.00	0.00	0.00	
PHF	0%	93%	0%	0%	0%	85%	0%	0%	0%	92%
Motorcycles	0	3	0	0	0	0	0	0	0	3
Passenger cars	0	1050	0	0	0	1084	0	0	0	2134
4 tire, single unit	0	121	0	0	0	151	0	0	0	272
Buses	0	2	0	0	0	3	0	0	0	5
2 axle, 6 tire, single unit	0	12	0	0	0	5	0	0	0	17
3 axle, single unit	0	2	0	0	0	3	0	0	0	5
4 or more axle, single unit	0	0	0	0	0	6	0	0	0	6
4 or less axle, single trailer	0	2	0	0	0	3	0	0	0	5
5-axle tractor semitrailer	0	9	0	0	0	4	0	0	0	13
6 or more axle, single trailer	0	1	0	0	0	0	0	0	0	1
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0	0
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0
Motorcycles (%)	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Passenger cars (%)	0.00	87.35	0.00	0.00	0.00	86.10	0.00	0.00	0.00	86.71
4 tire, single unit (%)	0.00	10.07	0.00	0.00	0.00	11.99	0.00	0.00	0.00	11.05
Buses (%)	0.00	0.17	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.20
2 axle, 6 tire, single unit (%)	0.00	1.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.69
3 axle, single unit (%)	0.00	0.17	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.20
4 or more axle, single unit (%)	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.24
4 or less axle, single trailer (%)	0.00	0.17	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.20
5-axle tractor semitrailer (%)	0.00	0.75	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.53
6 or more axle, single trailer (%)	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Clayton, NC
Classified Turn Movement Count

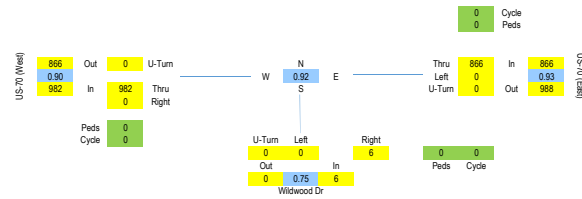
Site 3 of 4
US-70 (West)
US-70 (East)
Widwood Dr

Lat/Long
35.633282° -78.437142°

Date
Wednesday 9 January 2019

Weather
Mostly Sunny
Temp: 15°C

0700 - 0900 (Weekday AM Peak)



	Eastbound US-70 (West)			Westbound US-70 (East)			Northbound Widwood Dr			Int Total	Rolling Hour
	U-Turn 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	Left 3.5	Thru 3.6	U-Turn 3.7	Left 3.8	Right 3.9		
TIME											
0700 - 0715	0	171	0	0	0	224	0	0	0	395	1803
0715 - 0730	0	218	0	0	0	217	0	0	2	437	1664
0730 - 0745	0	272	0	0	0	232	0	0	0	504	1766
0745 - 0800	0	253	0	0	0	212	0	0	2	467	1626
0800 - 0815	0	239	0	0	0	205	0	0	2	446	1504
0815 - 0830	0	175	0	0	0	174	0	0	0	349	
0830 - 0845	0	178	0	0	0	186	0	0	0	364	
0845 - 0900	0	190	0	0	0	155	0	0	0	345	
Grand Total	0	1696	0	0	0	1605	0	0	6	3307	
Approach (%)	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00		
Total (%)	0.00	51.29	0.00	0.00	0.00	48.53	0.00	0.00	0.18		
Motorcycles	0	1	0	0	0	1	0	0	0		
Passenger cars	0	1388	0	0	0	1251	0	0	5		
4 tire, single unit	0	229	0	0	0	279	0	0	1		
Buses	0	5	0	0	0	5	0	0	0		
2 axle, 6 tire, single unit	0	18	0	0	0	24	0	0	0		
3 axle, single unit	0	10	0	0	0	10	0	0	0		
4 or more axle, single unit	0	23	0	0	0	10	0	0	0		
4 or less axle, single trailer	0	9	0	0	0	4	0	0	0		
5-axle tractor semitrailer	0	10	0	0	0	17	0	0	0		
6 or more axle, single trailer	0	3	0	0	0	4	0	0	0		
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0		
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0		
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0		
Motorcycles (%)	0.00	0.06	0.00	0.00	0.00	0.06	0.00	0.00	0.00		
Passenger cars (%)	0.00	81.84	0.00	0.00	0.00	77.94	0.00	0.00	83.33		
4 tire, single unit (%)	0.00	13.50	0.00	0.00	0.00	17.38	0.00	0.00	16.67		
Buses (%)	0.00	0.29	0.00	0.00	0.00	0.31	0.00	0.00	0.00		
2 axle, 6 tire, single unit (%)	0.00	1.06	0.00	0.00	0.00	1.50	0.00	0.00	0.00		
3 axle, single unit (%)	0.00	0.59	0.00	0.00	0.00	0.62	0.00	0.00	0.00		
4 or more axle, single unit (%)	0.00	1.36	0.00	0.00	0.00	0.62	0.00	0.00	0.00		
4 or less axle, single trailer (%)	0.00	0.53	0.00	0.00	0.00	0.25	0.00	0.00	0.00		
5-axle tractor semitrailer (%)	0.00	0.59	0.00	0.00	0.00	1.06	0.00	0.00	0.00		
6 or more axle, single trailer (%)	0.00	0.18	0.00	0.00	0.00	0.25	0.00	0.00	0.00		
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Peak Rolling Hour Flow Rates

	Eastbound US-70 (West)			Westbound US-70 (East)			Northbound Widwood Dr			Int Total
	U-Turn 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	Left 3.5	Thru 3.6	U-Turn 3.7	Left 3.8	Right 3.9	
TIME										
0715 - 0730	0	218	0	0	0	217	0	0	2	437
0730 - 0745	0	272	0	0	0	232	0	0	0	504
0745 - 0800	0	253	0	0	0	212	0	0	2	467
0800 - 0815	0	239	0	0	0	205	0	0	2	446
Grand Total	0	982	0	0	0	866	0	0	6	1854
Approach (%)	0.00	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	
Total (%)	0.00	52.97	0.00	0.00	0.00	46.71	0.00	0.00	0.32	
PHF	0%	90%	0%	0%	0%	93%	0%	0%	75%	92%
Motorcycles	0	1	0	0	0	1	0	0	0	2
Passenger cars	0	821	0	0	0	866	0	0	5	1692
4 tire, single unit	0	120	0	0	0	157	0	0	1	278
Buses	0	2	0	0	0	4	0	0	0	6
2 axle, 6 tire, single unit	0	9	0	0	0	11	0	0	0	20
3 axle, single unit	0	4	0	0	0	4	0	0	0	8
4 or more axle, single unit	0	15	0	0	0	6	0	0	0	21
4 or less axle, single trailer	0	5	0	0	0	2	0	0	0	7
5-axle tractor semitrailer	0	4	0	0	0	11	0	0	0	15
6 or more axle, single trailer	0	1	0	0	0	4	0	0	0	5
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0	0
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0
Motorcycles (%)	0.00	0.10	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.11
Passenger cars (%)	0.00	83.60	0.00	0.00	0.00	78.91	0.00	0.00	83.33	80.47
4 tire, single unit (%)	0.00	12.22	0.00	0.00	0.00	18.13	0.00	0.00	16.67	14.96
Buses (%)	0.00	0.20	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.32
2 axle, 6 tire, single unit (%)	0.00	0.92	0.00	0.00	0.00	1.27	0.00	0.00	0.00	1.08
3 axle, single unit (%)	0.00	0.41	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.43
4 or more axle, single unit (%)	0.00	1.53	0.00	0.00	0.00	0.69	0.00	0.00	0.00	1.13
4 or less axle, single trailer (%)	0.00	0.51	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.38
5-axle tractor semitrailer (%)	0.00	0.41	0.00	0.00	0.00	1.27	0.00	0.00	0.00	0.81
6 or more axle, single trailer (%)	0.00	0.10	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.27
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Clayton, NC
Classified Turn Movement Count

Site 3 of 4
US-70 (West)
US-70 (East)
Wildwood Dr

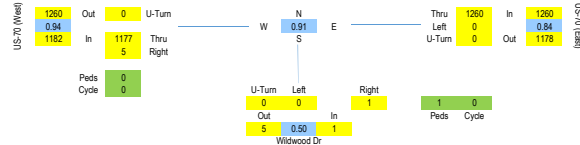
Lat/Long
35.633282° -78.437142°

Date
Wednesday 9 January 2019

Weather
Mostly Sunny
Temp: 15°C

1600 - 1800 (Weekday PM Peak)

0 Cycle
0 Peds



	Eastbound US-70 (West)					Westbound US-70 (East)					Northbound Wildwood Dr					Int Total	Rolling Hour
	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Thru	U-Turn	Left	Right	U-Turn	Left	Right		
TIME	3.1																
1600 - 1615	0	245	0	0	0	251	0	0	251	0	0	0	0	0	0	496	2018
1615 - 1630	0	249	0	0	0	221	0	0	221	0	0	0	0	0	0	471	2147
1630 - 1645	0	281	0	0	0	251	0	0	251	0	0	0	0	0	0	534	2346
1645 - 1700	0	264	1	0	0	254	0	0	254	0	0	0	0	0	0	520	2443
1700 - 1715	0	311	3	0	0	311	0	0	311	0	0	0	0	0	0	625	2438
1715 - 1730	0	294	1	0	0	375	0	0	375	0	0	0	0	0	0	670	
1730 - 1745	0	308	0	0	0	320	0	0	320	0	0	0	0	0	0	629	
1745 - 1800	0	256	0	0	0	258	0	0	258	0	0	0	0	0	0	514	
Grand Total	0	2208	5	0	0	2241	0	1		0	1	1	0	1		4459	
Approach (%)	0.00	99.77	0.23	0.00	0.00	99.91	0.00	33.33		0.00	33.33	33.33	0.00	0.02			
Total (%)	0.00	49.52	0.11	0.00	0.00	50.26	0.00	0.02		0.00	0.02	0.02	0.00	0.00			
Motorcycles	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0		
Passenger cars	0	1911	3	0	0	1929	0	0	1929	0	0	1	0	0	1		
4 tire, single unit	0	237	1	0	0	249	0	0	249	0	0	0	0	0	0		
Buses	0	8	0	0	0	6	0	0	6	0	0	0	0	0	0		
2 axle, 6 tire, single unit	0	22	1	0	0	13	0	1	13	0	1	0	0	1	0		
3 axle, single unit	0	7	0	0	0	9	0	0	9	0	0	0	0	0	0		
4 or more axle, single unit	0	3	0	0	0	15	0	0	15	0	0	0	0	0	0		
4 or less axle, single trailer	0	3	0	0	0	8	0	0	8	0	0	0	0	0	0		
5-axle tractor semitrailer	0	13	0	0	0	11	0	0	11	0	0	0	0	0	0		
6 or more axle, single trailer	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0		
5 or less axle, multi-trailer	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0		
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Motorcycles (%)	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Passenger cars (%)	0.00	86.55	60.00	0.00	0.00	86.08	0.00	0.00	86.08	0.00	0.00	100.00	0.00	0.00	100.00		
4 tire, single unit (%)	0.00	10.73	20.00	0.00	0.00	11.11	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00		
Buses (%)	0.00	0.36	0.00	0.00	0.00	0.27	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00		
2 axle, 6 tire, single unit (%)	0.00	1.00	20.00	0.00	0.00	0.58	0.00	100.00	0.58	0.00	100.00	0.00	0.00	100.00	0.00		
3 axle, single unit (%)	0.00	0.32	0.00	0.00	0.00	0.40	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00		
4 or more axle, single unit (%)	0.00	0.14	0.00	0.00	0.00	0.67	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00		
4 or less axle, single trailer (%)	0.00	0.14	0.00	0.00	0.00	0.36	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00		
5-axle tractor semitrailer (%)	0.00	0.59	0.00	0.00	0.00	0.49	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00		
6 or more axle, single trailer (%)	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00		
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Peak Rolling Hour Flow Rates

	Eastbound US-70 (West)					Westbound US-70 (East)					Northbound Wildwood Dr					Int Total	Rolling Hour
	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Thru	U-Turn	Left	Right	U-Turn	Left	Right		
TIME	3.1																
1645 - 1700	0	264	1	0	0	254	0	0	254	0	0	0	0	0	0	520	
1700 - 1715	0	311	3	0	0	311	0	0	311	0	0	0	0	0	0	625	
1715 - 1730	0	294	1	0	0	375	0	0	375	0	0	0	0	0	0	670	
1730 - 1745	0	308	0	0	0	320	0	0	320	0	0	0	0	0	0	629	
Grand Total	0	1177	5	0	0	1260	0	0		0	0	1	0	0	1	2444	
Approach (%)	0.00	99.98	0.42	0.00	0.00	100.00	0.00	0.00		0.00	0.00	50.00	0.00	0.00	0.04		
Total (%)	0.00	48.16	0.20	0.00	0.00	51.55	0.00	0.00		0.00	0.00	0.04	0.00	0.00	0.04		
PHF	0%	94%	94%	0%	0%	84%	0%	0%		0%	0%	25%	0%	0%	25%	91%	
Motorcycles	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
Passenger cars	0	1017	3	0	0	1094	0	0	1094	0	0	1	0	0	1	2116	
4 tire, single unit	0	129	1	0	0	142	0	0	142	0	0	0	0	0	0	272	
Buses	0	2	0	0	0	1	0	0	1	0	0	0	0	0	0	3	
2 axle, 6 tire, single unit	0	11	1	0	0	4	0	0	4	0	0	0	0	0	0	16	
3 axle, single unit	0	3	0	0	0	7	0	0	7	0	0	0	0	0	0	10	
4 or more axle, single unit	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	6	
4 or less axle, single trailer	0	2	0	0	0	3	0	0	3	0	0	0	0	0	0	5	
5-axle tractor semitrailer	0	9	0	0	0	3	0	0	3	0	0	0	0	0	0	12	
6 or more axle, single trailer	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Motorcycles (%)	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	
Passenger cars (%)	0.00	86.41	60.00	0.00	0.00	86.83	0.00	0.00	86.83	0.00	0.00	100.00	0.00	0.00	100.00	86.58	
4 tire, single unit (%)	0.00	10.96	20.00	0.00	0.00	11.27	0.00	0.00	11.27	0.00	0.00	0.00	0.00	0.00	0.00	11.13	
Buses (%)	0.00	0.17	0.00	0.00	0.00	0.08	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.12	
2 axle, 6 tire, single unit (%)	0.00	0.93	20.00	0.00	0.00	0.32	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.65	
3 axle, single unit (%)	0.00	0.25	0.00	0.00	0.00	0.56	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.41	
4 or more axle, single unit (%)	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.25	
4 or less axle, single trailer (%)	0.00	0.17	0.00	0.00	0.00	0.24	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.20	
5-axle tractor semitrailer (%)	0.00	0.76	0.00	0.00	0.00	0.24	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.49	
6 or more axle, single trailer (%)	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Clayton, NC
Classified Turn Movement Count

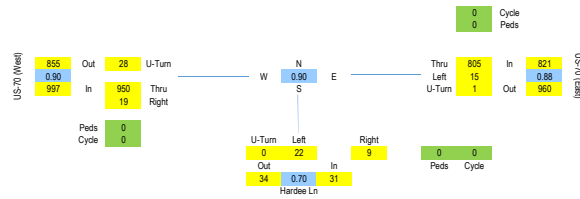
Site 4 of 4
US-70 (West)
US-70 (East)
Hardee Ln

Lat/Long
35.630262° -78.432785°

Date
Wednesday 9 January 2019

Weather
Mostly Sunny
Temp: 15°C

0700 - 0900 (Weekday AM Peak)



	Eastbound US-70 (West)			Westbound US-70 (East)			Northbound Hardee Ln			Int Total	Rolling Hour
	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right		
TIME	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9		
0700 - 0715	1	168	7	1	7	217	0	3	0	404	1814
0715 - 0730	4	211	4	0	9	208	0	4	0	440	1940
0730 - 0745	2	268	6	0	0	232	0	3	2	513	1759
0745 - 0800	7	245	4	1	3	186	0	9	2	457	1608
0800 - 0815	15	226	5	0	3	179	0	6	5	439	1506
0815 - 0830	3	165	4	0	2	170	0	6	0	350	
0830 - 0845	2	166	7	1	4	174	0	7	1	362	
0845 - 0900	5	175	14	0	6	144	0	8	3	355	
Grand Total	39	1624	51	3	34	1510	0	46	13	3329	
Approach (%)	2.28	94.75	2.98	0.19	2.20	97.61	0.00	77.97	22.03		
Total (%)	1.17	48.92	1.54	0.09	1.02	45.48	0.00	1.39	0.39		
Motorcycles	0	1	0	0	0	1	0	0	0		
Passenger cars	25	1334	43	1	21	1202	0	16	9		
4 tire, single unit	14	211	8	1	10	243	0	20	3		
Buses	0	5	0	0	0	5	0	0	0		
2 axle, 6 tire, single unit	0	18	0	1	0	18	0	6	0		
3 axle, single unit	0	10	0	0	1	9	0	0	0		
4 or more axle, single unit	0	23	0	0	2	10	0	0	1		
4 or less axle, single trailer	0	9	0	0	0	1	0	3	0		
5-axle tractor semitrailer	0	10	0	0	0	17	0	0	0		
6 or more axle, single trailer	0	3	0	0	0	4	0	0	0		
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0		
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0		
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0		
Motorcycles (%)	0.00	0.06	0.00	0.00	0.00	0.07	0.00	0.00	0.00		
Passenger cars (%)	64.10	82.14	84.31	33.33	61.76	79.60	0.00	34.78	69.23		
4 tire, single unit (%)	35.90	12.99	15.69	33.33	29.41	16.09	0.00	43.48	23.08		
Buses (%)	0.00	0.31	0.00	0.00	0.00	0.33	0.00	0.00	0.00		
2 axle, 6 tire, single unit (%)	0.00	1.11	0.00	33.33	0.00	1.19	0.00	13.04	0.00		
3 axle, single unit (%)	0.00	0.62	0.00	0.00	2.94	0.60	0.00	2.17	0.00		
4 or more axle, single unit (%)	0.00	1.42	0.00	0.00	5.88	0.66	0.00	0.00	7.89		
4 or less axle, single trailer (%)	0.00	0.55	0.00	0.00	0.00	0.07	0.00	6.52	0.00		
5-axle tractor semitrailer (%)	0.00	0.62	0.00	0.00	0.00	1.13	0.00	0.00	0.00		
6 or more axle, single trailer (%)	0.00	0.18	0.00	0.00	0.00	0.26	0.00	0.00	0.00		
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Peak Rolling Hour Flow Rates

	Eastbound US-70 (West)			Westbound US-70 (East)			Northbound Hardee Ln			Int Total	Rolling Hour
	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right		
TIME	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9		
0715 - 0730	4	211	4	0	9	208	0	4	0	440	
0730 - 0745	2	268	6	0	0	232	0	3	2	513	
0745 - 0800	7	245	4	1	3	186	0	9	2	457	
0800 - 0815	15	226	5	0	3	179	0	6	5	439	
Grand Total	28	950	19	1	15	805	0	22	9	1849	
Approach (%)	2.81	85.28	1.91	0.12	1.83	98.05	0.00	70.97	29.03		
Total (%)	1.51	51.38	1.03	0.05	0.81	43.54	0.00	1.19	0.48		
PHF	47%	89%	79%	25%	42%	87%	0%	61%	45%		
Motorcycles	0	1	0	0	0	1	0	0	0	2	
Passenger cars	18	814	15	0	8	837	0	2	5	1499	
4 tire, single unit	10	94	4	0	5	131	0	13	3	260	
Buses	0	2	0	0	0	4	0	0	0	6	
2 axle, 6 tire, single unit	0	8	0	1	0	9	0	4	0	22	
3 axle, single unit	0	4	0	0	1	4	0	0	0	9	
4 or more axle, single unit	0	16	0	0	1	5	0	0	1	23	
4 or less axle, single trailer	0	5	0	0	0	0	0	3	0	8	
5-axle tractor semitrailer	0	5	0	0	0	10	0	0	0	15	
6 or more axle, single trailer	0	1	0	0	0	4	0	0	0	5	
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	
Motorcycles (%)	0.00	0.11	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.11	
Passenger cars (%)	54.29	85.68	78.95	0.00	53.33	79.13	0.00	9.09	55.56	81.07	
4 tire, single unit (%)	35.71	9.89	21.05	0.00	33.33	16.27	0.00	59.09	33.33	14.06	
Buses (%)	0.00	0.21	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.32	
2 axle, 6 tire, single unit (%)	0.00	0.84	0.00	100.00	0.00	1.12	0.00	18.18	0.00	1.19	
3 axle, single unit (%)	0.00	0.42	0.00	0.00	6.67	0.50	0.00	0.00	0.00	0.49	
4 or more axle, single unit (%)	0.00	1.68	0.00	0.00	6.67	0.62	0.00	0.00	11.11	1.24	
4 or less axle, single trailer (%)	0.00	0.53	0.00	0.00	0.00	0.00	0.00	13.64	0.00	0.43	
5-axle tractor semitrailer (%)	0.00	0.53	0.00	0.00	0.00	1.24	0.00	0.00	0.00	0.81	
6 or more axle, single trailer (%)	0.00	0.11	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.27	
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Clayton, NC
Classified Turn Movement Count

Site 4 of 4
US-70 (West)
US-70 (East)
Hardee Ln

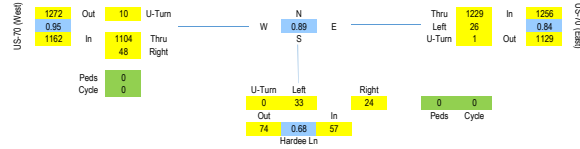
Lat/Long
35.630262° -78.432785°

Date
Wednesday 9 January 2019

Weather
Mostly Sunny
Temp: 15°C

1600 - 1800 (Weekday PM Peak)

0 Cycle
0 Peds



TIME	Eastbound US-70 (West)			Westbound US-70 (East)			Northbound Hardee Ln			Int Total	Rolling Hour
	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right		
1600 - 1615	3	235	12	0	2	230	0	14	8	504	2058
1615 - 1630	1	227	20	0	3	201	0	13	1	466	2169
1630 - 1645	8	245	21	0	9	228	0	10	12	533	2388
1645 - 1700	1	253	22	0	8	255	0	9	7	555	2470
1700 - 1715	4	287	5	0	3	285	0	12	9	605	2475
1715 - 1730	2	299	6	0	5	371	0	8	4	695	
1730 - 1745	3	280	6	0	7	312	0	4	3	615	
1745 - 1800	1	238	31	1	11	261	0	9	8	560	
Grand Total	23	2964	123	1	48	2143	0	79	52	4533	
Approach (%)	1.04	93.39	5.57	0.05	2.19	97.76	0.00	60.31	39.69		
Total (%)	0.51	45.53	2.71	0.02	1.06	47.28	0.00	1.74	1.15		
Motorcycles	0	3	0	0	0	1	0	0	0		
Passenger cars	19	1790	104	1	38	1851	0	61	41		
4 tire, single unit	3	219	15	0	5	235	0	12	10		
Buses	0	8	0	0	0	6	0	0	0		
2 axle, 6 tire, single unit	1	18	3	0	2	10	0	2	1		
3 axle, single unit	0	7	0	0	0	9	0	4	0		
4 or more axle, single unit	0	3	0	0	3	11	0	4	0		
4 or less axle, single trailer	0	2	1	0	0	8	0	0	0		
5-axle tractor semitrailer	0	13	0	0	0	11	0	0	0		
6 or more axle, single trailer	0	1	0	0	0	0	0	0	0		
5 or less axle, multi-trailer	0	0	0	0	0	1	0	0	0		
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0		
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0		
Motorcycles (%)	0.00	0.15	0.00	0.00	0.00	0.05	0.00	0.00	0.00		
Passenger cars (%)	82.61	86.72	84.55	100.00	79.17	86.37	0.00	77.22	78.85		
4 tire, single unit (%)	13.04	10.61	12.20	0.00	10.42	10.97	0.00	15.19	19.23		
Buses (%)	0.00	0.39	0.00	0.00	0.00	0.28	0.00	0.00	0.00		
2 axle, 6 tire, single unit (%)	4.35	0.87	2.44	0.00	4.17	0.47	0.00	2.53	1.92		
3 axle, single unit (%)	0.00	0.34	0.00	0.00	0.00	0.42	0.00	0.00	0.00		
4 or more axle, single unit (%)	0.00	0.15	0.00	0.00	6.25	0.51	0.00	5.06	0.00		
4 or less axle, single trailer (%)	0.00	0.10	0.81	0.00	0.00	0.37	0.00	0.00	0.00		
5-axle tractor semitrailer (%)	0.00	0.63	0.00	0.00	0.00	0.51	0.00	0.00	0.00		
6 or more axle, single trailer (%)	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00		
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Peak Rolling Hour Flow Rates

TIME	Eastbound US-70 (West)			Westbound US-70 (East)			Northbound Hardee Ln			Int Total	Rolling Hour
	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right		
1700 - 1715	4	287	5	0	3	285	0	12	9	605	
1715 - 1730	2	299	6	0	5	371	0	8	4	695	
1730 - 1745	3	280	6	0	7	312	0	4	3	615	
1745 - 1800	1	238	31	1	11	261	0	9	8	560	
Grand Total	10	1104	48	1	26	1229	0	33	24	2475	
Approach (%)	0.86	95.01	4.13	0.08	2.07	97.85	0.00	57.89	42.11		
Total (%)	0.40	44.61	1.94	0.04	1.05	49.66	0.00	1.35	0.97		
PHF	63%	95%	39%	25%	59%	63%	0%	69%	67%	89%	
Motorcycles	0	3	0	0	0	1	0	0	0	4	
Passenger cars	8	966	43	1	22	1075	0	27	20	2162	
4 tire, single unit	1	111	5	0	2	130	0	5	4	267	
Buses	0	3	0	0	0	3	0	0	0	6	
2 axle, 6 tire, single unit	1	7	0	0	1	2	0	0	0	11	
3 axle, single unit	0	3	0	0	0	3	0	0	0	6	
4 or more axle, single unit	0	0	0	0	1	3	0	1	0	5	
4 or less axle, single trailer	0	2	0	0	0	0	0	0	0	2	
5-axle tractor semitrailer	0	8	0	0	0	3	0	0	0	11	
6 or more axle, single trailer	0	1	0	0	0	0	0	0	0	1	
5 or less axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	
6 axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	
7 or more axle, multi-trailer	0	0	0	0	0	0	0	0	0	0	
Motorcycles (%)	0.00	0.27	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.16	
Passenger cars (%)	80.00	87.50	89.58	100.00	84.62	87.47	0.00	81.82	83.33	87.38	
4 tire, single unit (%)	10.00	10.05	10.42	0.00	7.69	11.31	0.00	15.15	16.67	10.79	
Buses (%)	0.00	0.27	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.24	
2 axle, 6 tire, single unit (%)	10.00	0.63	0.00	0.00	3.85	0.16	0.00	0.00	0.00	0.44	
3 axle, single unit (%)	0.00	0.27	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.24	
4 or more axle, single unit (%)	0.00	0.00	0.00	0.00	3.85	0.24	0.00	3.03	0.00	0.20	
4 or less axle, single trailer (%)	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	
5-axle tractor semitrailer (%)	0.00	0.72	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.44	
6 or more axle, single trailer (%)	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	
5 or less axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6 axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7 or more axle, multi-trailer (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

SITE VISIT DATA COLLECTION

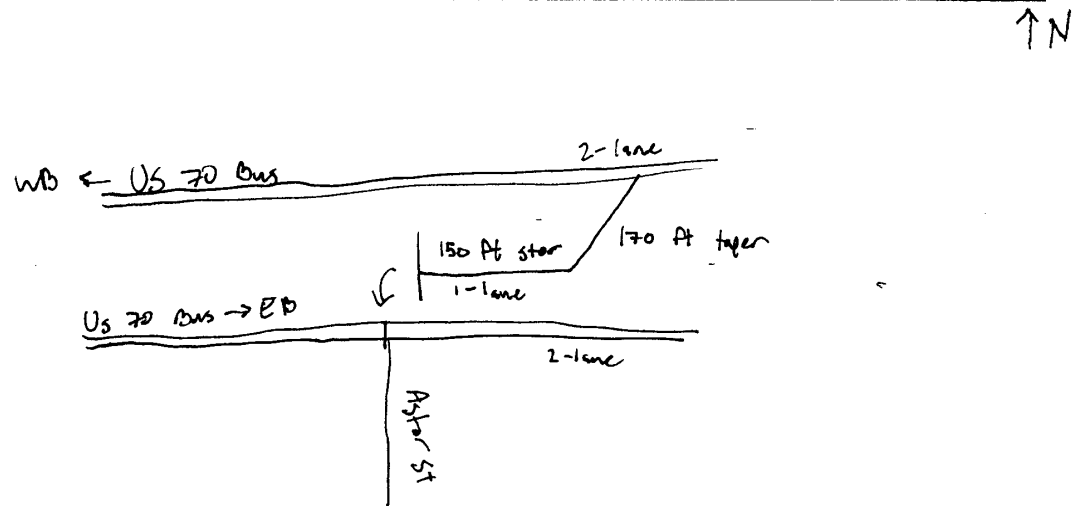
Project: Buckhorn Ranch TIA

Date: 2/6/19

Initials: JAC

Intersection: US 70 Bus @ Astor St

Sketch:



- Label: Street names, storage lengths, taper lengths, Speed limits, lane geometry, driveways
- Photos of all approaches & departures
- Signal Head / Phasing Information:
 - Northbound
 - Southbound
 - Eastbound
 - Westbound
- Approximate cycle length:
- Problems Observed? Excessive Queues, etc.?

Project: Buckhorn Branch TIA

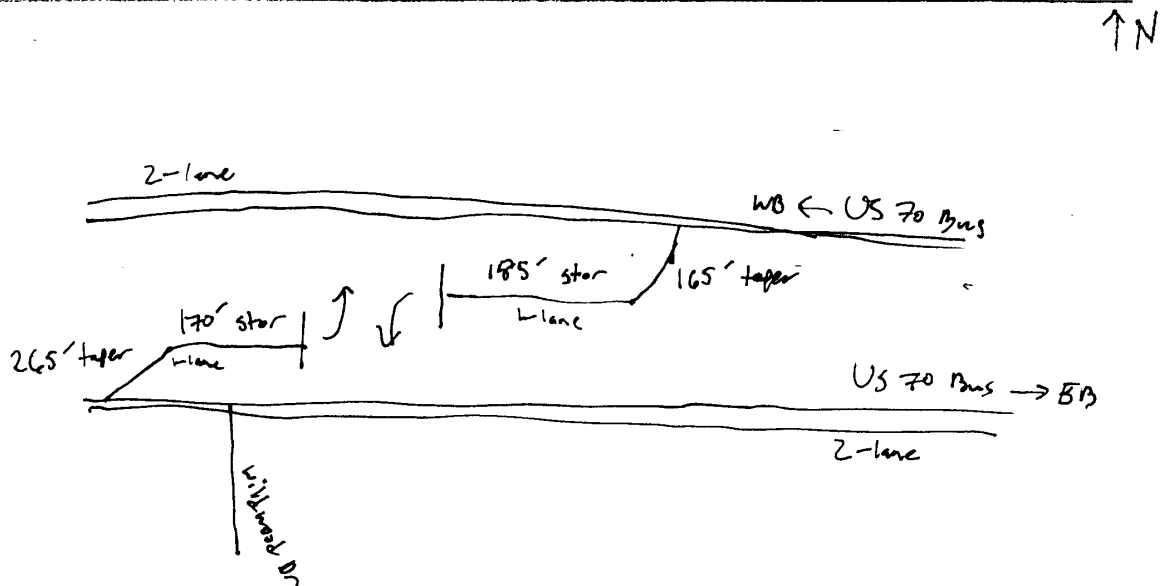
Date: 2/6/19

Initials: JAC

Intersection: US 70 Bus @ Wildwood Dr

and US 70 Bus @ U-Turn Median Opening

Sketch:



- Label: Street names, storage lengths, taper lengths, Speed limits, lane geometry, driveways
- Photos of all approaches & departures
- Signal Head/Phasing Information:
 - Northbound
 - Southbound
 - Eastbound
 - Westbound
- Approximate cycle length:
- Problems Observed? Excessive Queues, etc.?

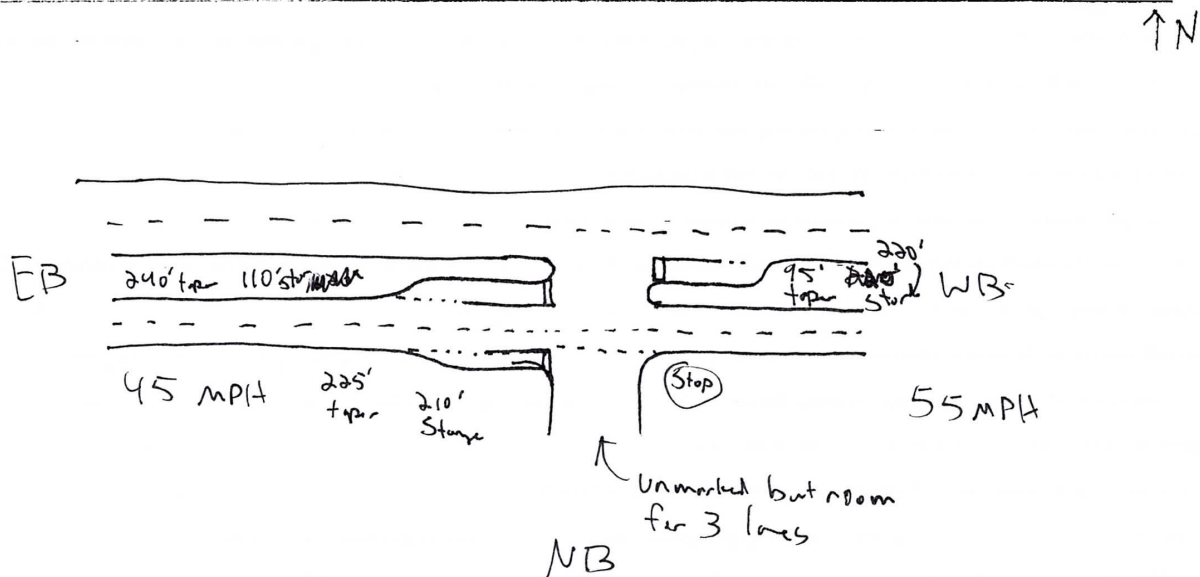
Project: Buckhorn Branch

Date: 1/18/19

Initials: CSD

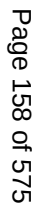
Intersection: US 70 BUS @ Hardee

Sketch:



- Label: Street names, storage lengths, taper lengths, Speed limits, lane geometry, driveways
- Photos of all approaches & departures
- Signal Head/Phasing Information:
 - Northbound
 - Southbound
 - Eastbound
 - Westbound
- Approximate cycle length:
- Problems Observed? Excessive Queues, etc.?

EXISTING SIGNAL INFORMATION



401037 - US 70 @ NC 42/Rose St.
2-1 Phase Control Functions Page 1
1/22/2019 3:17 PM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time Min 2																
Time Extension 2																
Time Max 2																
Soft Recall																
Minimum Recall						2		6								
Maximum Recall 1																
Maximum Recall 2																
Call Non-Act 1																
Call Non-Act 2																
Omit Phase																
Dual Entry																
No Skip																
Added Extension																
Simultaneous Gap						1	2	3	4	5	6	7	8			
Guaranteed Passage																
Green Interval Flash																
Fast Green Flash																
Red Rest																
Backup Protection																
Inhibit Reserve																
Inhibit Max (Coord)						1	2	3	4	5	6	7	8	9	10	11
Inhibit Coordination																
Dynamic Max/Max3																
Variable Initial						2		6								
Gap Reduction						2		6								
Omit Pedestrian																
Time Walk 2																
Time FDWalk 2																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Soft Recall																
Ped Recall																
Rest In Walk																
Modified Rest In Walk																
Ped Reserve																
Flashing Walk																
Advanced Walk																
Delayed Walk																
Ped Yellow Clear																
Ped Red Clear																
Startup In Green						2		6								
Startup In Yellow																
Startup Red Clear																
First Phases																
Startup Calls																
Startup Ped Calls																
Flash Entry						2		6								
Yellow Flash						2		6								
Wag Phases						1	3	6	8							
Wag Overlaps																
Manual Control						1	2	3	4	5	6	7	8			
Manual Control Omit Ped																
Red Detector Lock																
Yellow Detector Lock						2		6								
Active Logic 1 - 16																
Active Logic 17 - 32																
Dynamic/Backup																

401037 - US 70 @ NC 42/Rose St.
3 - Phase Timing 1
1/22/2019 3:17 PM

Phase Timing Elements	Phase															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green 1	7	20	7	15	7	20	0	0	0	0	0	0	0	0	0	0
Minimum Green 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Re-service Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Extension 1 (Gap 1)	2.0	6.0	2.0	5.0	2.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Extension 2 (Gap 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Green 1	20	100	20	30	50	100	0	0	0	0	0	0	0	0	0	0
Maximum Green 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Clearance	3.0	4.5	3.8	4.5	3.0	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Red Clearance	3.4	1.4	2.5	2.0	3.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	1.8	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dont Walk 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dont Walk 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Advance Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk Delay Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternate Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alternate Dont Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alternate Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dynamic Max / Max 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dynamic Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Seconds / Actuation	0.0	1.5	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Variable Initial	0	34	0	0	0	34	0	0	0	0	0	0	0	0	0	0
Time Before Reduction	0	30	0	0	0	30	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	45	0	0	0	45	0	0	0	0	0	0	0	0	0	0
Minimum Gap	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alt Flash Frequency (0-25.5 Hz)	1.0															

401037 - US 70 @ NC 42/Rose St.
 4 - Phase Sequence Page 1
 1/22/2019 3:17 PM

Rings	Barrier 1			Barrier 2			Barrier 3			Barrier 4		
	1	2	0	3	4	0	0	0	0	0	0	0
1		5	6	0	0	0	0	0	0	0	0	0
2		0	0	0	0	0	0	0	0	0	0	0
3		0	0	0	0	0	0	0	0	0	0	0
4		0	0	0	0	0	0	0	0	0	0	0

Rings	Barrier 5			Barrier 6			Barrier 7			Barrier 8		
	0	0	0	0	0	0	0	0	0	0	0	0
1		0	0	0	0	0	0	0	0	0	0	0
2		0	0	0	0	0	0	0	0	0	0	0
3		0	0	0	0	0	0	0	0	0	0	0
4		0	0	0	0	0	0	0	0	0	0	0

401037 - US 70 @ NC 42/Rose St.
 4 - Phase Sequence Page 2
 1/22/2019 3:17 PM

Rings	Barrier 1			Barrier 2		Barrier 3		Barrier 4	
	0	2	1	3	4	0	0	0	0
1									
2	5	6	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0

Rings	Barrier 5			Barrier 6		Barrier 7		Barrier 8	
	0	0	0	0	0	0	0	0	0
1									
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0

401037 - US 70 @ NC 42/Rose St.
 4 - Phase Sequence Page 3
 1/22/2019 3:17 PM

Rings	Barrier 1			Barrier 2			Barrier 3			Barrier 4		
	1	2		3	4		0	0	0	0	0	0
1												
2	0	6	5	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0

Rings	Barrier 5			Barrier 6			Barrier 7			Barrier 8		
	0	0	0	0	0	0	0	0	0	0	0	0
1												
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0

401037 - US 70 @ NC 42/Rose St.
9 - Coordination Plan 1
1/22/2019 3:17 PM

Coordination Plan # 1

Cycle length (0-999 sec)	150
Min Transition Cycle (0-999 sec)	130
Max Transition Cycle (0-999 sec)	170

Offset # or Ring:

Offsets (0-999 sec)	1	2	3	4
Act Coord Phase Min Green (0-255)	0	0	0	0

Splits (0-255 sec)

Phase	1	2	3	4	5	6	7	8
Split	15	95	18	22	38	72	0	0
Phase	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0

Verify Plan Data

Phase/Function Settings:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coordinated Phase		2				6										
Float Force Offs																
Hold to Force Off																
Hi Priority Ped																
Dynamic/Backup																

Options:

Split/Timing in percent?	(Y/N)	N
*Permissive Mode (0-4)	0	*0 = Auto
Enable Transition Permissive Mode?	N	1 = Open
Adjust Non-Coordinated Splits?	Y	2 = Manual
Cycle Once per Cycle Length?	Y	3 = Window
		4 = Walk

Active Pages:

Phase Sequence Page (1-12)	3
Phase Timing Page (1-4)	1
Phase Control Page (1-4)	1
Overlap Control Page (1-4)	1
Input Page (1-4)	1
Output Page (1-4)	1

Global Manual Permissive windows:

*Applies when "Window" permissive is selected	
Manual Perm 1 End Point (0-255 sec)	0
Manual Perm 2 Start Point (0-255 sec)	0
Manual Perm 2 End Point (0-255 sec)	0

Manual Permissives by Phase:

*Applies when "Manual" permissive is selected

(0-255 sec)	Vehicle		Pedestrian	
	Start	Stop	Start	Stop
Phase 1	0	0	0	0
Phase 2	0	0	0	0
Phase 3	0	0	0	0
Phase 4	0	0	0	0
Phase 5	0	0	0	0
Phase 6	0	0	0	0
Phase 7	0	0	0	0
Phase 8	0	0	0	0
Phase 9	0	0	0	0
Phase 10	0	0	0	0
Phase 11	0	0	0	0
Phase 12	0	0	0	0
Phase 13	0	0	0	0
Phase 14	0	0	0	0
Phase 15	0	0	0	0
Phase 16	0	0	0	0

401037 - US 70 @ NC 42/Rose St.
9 - Coordination Plan 2
1/22/2019 3:17 PM

Coordination Plan # 2

Cycle length (0-999 sec)	130
Min Transition Cycle (0-999 sec)	110
Max Transition Cycle (0-999 sec)	150

Offset # or Ring:

Offsets (0-999 sec)	1	2	3	4
Act Coord Phase Min Green (0-255)	0	0	0	0

Splits (0-255 sec)

Phase	1	2	3	4	5	6	7	8
Split	15	75	18	22	35	55	0	0
Phase	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0

Verify Plan Data

Phase/Function Settings:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coordinated Phase	2					6										
Float Force Offs																
Hold to Force Off																
Hi Priority Ped																
Dynamic/Backup																

Options:

Split/Timing in percent?	(Y/N)	N
*Permissive Mode (0-4)	0	*0 = Auto
Enable Transition Permissive Mode?	N	1 = Open
Adjust Non-Coordinated Splits?	Y	2 = Manual
Cycle Once per Cycle Length?	Y	3 = Window
		4 = Walk

Active Pages:

Phase Sequence Page (1-12)	1
Phase Timing Page (1-4)	1
Phase Control Page (1-4)	1
OverLap Control Page (1-4)	1
Input Page (1-4)	1
Output Page (1-4)	1

Global Manual Permissive windows:

*Applies when "Window" permissive is selected	
Manual Perm 1 End Point (0-255 sec)	0
Manual Perm 2 Start Point (0-255 sec)	0
Manual Perm 2 End Point (0-255 sec)	0

Manual Permissives by Phase:

*Applies when "Manual" permissive is selected

(0-255 sec)	Vehicle		Pedestrian	
	Start	Stop	Start	Stop
Phase 1	0	0	0	0
Phase 2	0	0	0	0
Phase 3	0	0	0	0
Phase 4	0	0	0	0
Phase 5	0	0	0	0
Phase 6	0	0	0	0
Phase 7	0	0	0	0
Phase 8	0	0	0	0
Phase 9	0	0	0	0
Phase 10	0	0	0	0
Phase 11	0	0	0	0
Phase 12	0	0	0	0
Phase 13	0	0	0	0
Phase 14	0	0	0	0
Phase 15	0	0	0	0
Phase 16	0	0	0	0

401037 - US 70 @ NC 42/Rose St.
9 - Coordination Plan 3
1/22/2019 3:17 PM

Coordination Plan # 3

Cycle length (0-999 sec)	200
Min Transition Cycle (0-999 sec)	180
Max Transition Cycle (0-999 sec)	220

Offset # or Ring:

Offsets (0-999 sec)	1	2	3	4
Act Coord Phase Min Green (0-255)	0	0	0	0

Splits (0-255 sec)

Phase	1	2	3	4	5	6	7	8
Split	15	142	18	25	70	87	0	0
Phase	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0

Verify Plan Data

Phase/Function Settings:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coordinated Phase	2					6										
Float Force Offs																
Hold to Force Off																
Hi Priority Ped																
Dynamic/Backup																

Options:

Split/Timing in percent?	(Y/N)	N
*Permissive Mode (0-4)	0	*0 = Auto
Enable Transition Permissive Mode?	N	1 = Open
Adjust Non-Coordinated Splits?	Y	2 = Manual
Cycle Once per Cycle Length?	Y	3 = Window
		4 = Walk

Active Pages:

Phase Sequence Page (1-12)	3
Phase Timing Page (1-4)	1
Phase Control Page (1-4)	1
OverLap Control Page (1-4)	1
Input Page (1-4)	1
Output Page (1-4)	1

Global Manual Permissive windows:

*Applies when "Window" permissive is selected	
Manual Perm 1 End Point (0-255 sec)	0
Manual Perm 2 Start Point (0-255 sec)	0
Manual Perm 2 End Point (0-255 sec)	0

Manual Permissives by Phase:

*Applies when "Manual" permissive is selected

(0-255 sec)	Vehicle		Pedestrian	
	Start	Stop	Start	Stop
Phase 1	0	0	0	0
Phase 2	0	0	0	0
Phase 3	0	0	0	0
Phase 4	0	0	0	0
Phase 5	0	0	0	0
Phase 6	0	0	0	0
Phase 7	0	0	0	0
Phase 8	0	0	0	0
Phase 9	0	0	0	0
Phase 10	0	0	0	0
Phase 11	0	0	0	0
Phase 12	0	0	0	0
Phase 13	0	0	0	0
Phase 14	0	0	0	0
Phase 15	0	0	0	0
Phase 16	0	0	0	0

401037 - US 70 @ NC 42/Rose St.
9 - Coordination Plan 4
1/22/2019 3:17 PM

Coordination Plan # 4

Cycle length (0-999 sec)	110
Min Transition Cycle (0-999 sec)	90
Max Transition Cycle (0-999 sec)	130

Offset # or Ring:

Offsets (0-999 sec)	1	2	3	4
Act Coord Phase Min Green (0-255)	0	0	0	0

Splits (0-255 sec)

Phase	1	2	3	4	5	6	7	8
Split	15	58	15	22	28	45	0	0
Phase	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0

Verify Plan Data

Phase/Function Settings:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coordinated Phase	2					6										
Float Force Offs																
Hold to Force Off																
Hi Priority Ped																
Dynamic/Backup																

Options:

Split/Timing in percent?	(Y/N)	N
*Permissive Mode (0-4)	0	*0 = Auto
Enable Transition Permissive Mode?	N	1 = Open
Adjust Non-Coordinated Splits?	Y	2 = Manual
Cycle Once per Cycle Length?	Y	3 = Window
		4 = Walk

Active Pages:

Phase Sequence Page (1-12)	3
Phase Timing Page (1-4)	1
Phase Control Page (1-4)	1
Overlap Control Page (1-4)	1
Input Page (1-4)	1
Output Page (1-4)	1

Global Manual Permissive windows:

*Applies when "Window" permissive is selected	
Manual Perm 1 End Point (0-255 sec)	0
Manual Perm 2 Start Point (0-255 sec)	0
Manual Perm 2 End Point (0-255 sec)	0

Manual Permissives by Phase:

*Applies when "Manual" permissive is selected

(0-255 sec)	Vehicle		Pedestrian	
	Start	Stop	Start	Stop
Phase 1	0	0	0	0
Phase 2	0	0	0	0
Phase 3	0	0	0	0
Phase 4	0	0	0	0
Phase 5	0	0	0	0
Phase 6	0	0	0	0
Phase 7	0	0	0	0
Phase 8	0	0	0	0
Phase 9	0	0	0	0
Phase 10	0	0	0	0
Phase 11	0	0	0	0
Phase 12	0	0	0	0
Phase 13	0	0	0	0
Phase 14	0	0	0	0
Phase 15	0	0	0	0
Phase 16	0	0	0	0

401037 - US 70 @ NC 42/Rose St.
9 - Coordination Plan 5
1/22/2019 3:17 PM

Coordination Plan # 5

Cycle length (0-999 sec)	120
Min Transition Cycle (0-999 sec)	100
Max Transition Cycle (0-999 sec)	140

Offset # or Ring:

Offsets (0-999 sec)	1	2	3	4
Act Coord Phase Min Green (0-255)	0	0	0	0

Splits (0-255 sec)

Phase	1	2	3	4	5	6	7	8
Split	15	65	18	22	25	55	0	0
Phase	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0

Verify Plan Data

Phase/Function Settings:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coordinated Phase	2					6										
Float Force Offs																
Hold to Force Off																
Hi Priority Ped																
Dynamic/Backup																

Options:

Split/Timing in percent?	(Y/N)	N
*Permissive Mode (0-4)	0	*0 = Auto
Enable Transition Permissive Mode?	N	1 = Open
Adjust Non-Coordinated Splits?	Y	2 = Manual
Cycle Once per Cycle Length?	Y	3 = Window
		4 = Walk

Active Pages:

Phase Sequence Page (1-12)	2
Phase Timing Page (1-4)	1
Phase Control Page (1-4)	1
OverLap Control Page (1-4)	1
Input Page (1-4)	1
Output Page (1-4)	1

Global Manual Permissive windows:

*Applies when "Window" permissive is selected	
Manual Perm 1 End Point (0-255 sec)	0
Manual Perm 2 Start Point (0-255 sec)	0
Manual Perm 2 End Point (0-255 sec)	0

Manual Permissives by Phase:

*Applies when "Manual" permissive is selected

(0-255 sec)	Vehicle		Pedestrian	
	Start	Stop	Start	Stop
Phase 1	0	0	0	0
Phase 2	0	0	0	0
Phase 3	0	0	0	0
Phase 4	0	0	0	0
Phase 5	0	0	0	0
Phase 6	0	0	0	0
Phase 7	0	0	0	0
Phase 8	0	0	0	0
Phase 9	0	0	0	0
Phase 10	0	0	0	0
Phase 11	0	0	0	0
Phase 12	0	0	0	0
Phase 13	0	0	0	0
Phase 14	0	0	0	0
Phase 15	0	0	0	0
Phase 16	0	0	0	0

401037 - US 70 @ NC 42/Rose St.
B - Scheduling Events 1-100
1/22/2019 3:17 PM

Event #	Event Type	Event Details										Pri		Start Date		Stop Date		Start Time		Stop Time		DOW Enabled							Del When	Event Groups Assigned																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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		LM	HH	MM	DD	MM	DD	HH	MM	HH	MM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1	Coordination Plan (1-66)												L	1	1	12	31	6	15	9	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

TIP PROJECT INFORMATION



10/10/2017
\\Proj\W-5704A&B_Rdy.psh.8.dgn

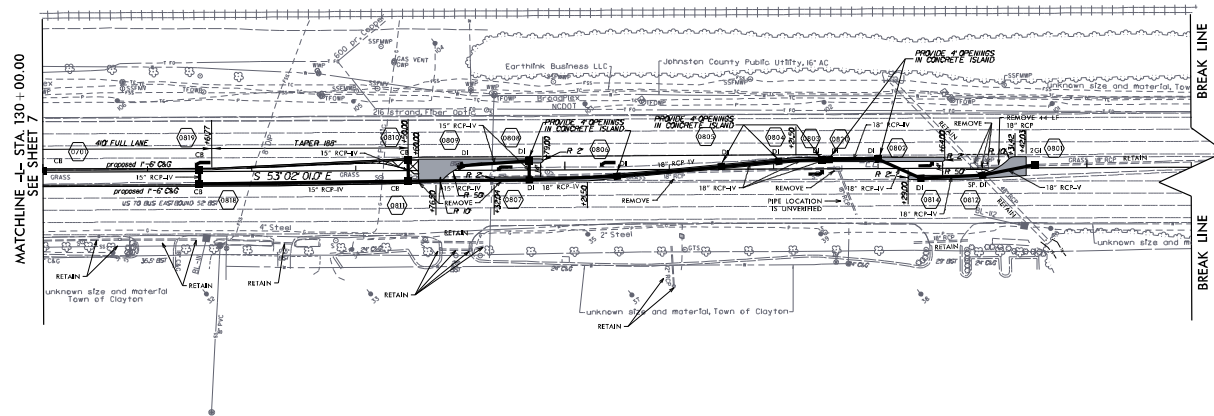
NOTE: THERE MAY BE POTENTIAL CONFLICT
BETWEEN PROPOSED STORM DRAINAGE
SYSTEM AND EXISTING 8" DUCTILE IRON
WATER LINE NEAR -L- STA 134+30+/-

PROJECT REFERENCE NO.		SHEET
W-5704A&B		8
RW SHEET NO.		
ROADWAY DESIGN HYDROLOGIST	HYDRAULICS ENGINEER	
 N. WAYNE SMITH NORTH CAROLINA PROFESSIONAL ENGINEER NO. 96771 EXPIRES 12/31/2017	 DAVID L. HESTER NORTH CAROLINA PROFESSIONAL ENGINEER NO. 10255 EXPIRES 12/31/2017	
DOCUMENT NOT COMPLETE FINAL UNLESS ALL SIGNATURES COMPLETED		

SEPI

ENGINEERING & CONSTRUCTION

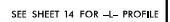
1025 Wade Avenue
Raleigh, NC 27605
Tel: 919-786-0477
Fax: 919-786-0591
E: lhhester@cccl787.com



NOTE: SEE SHEET 2A-2,
INSET B FOR MEDIAN
DIMENSIONS

 WHERE PAVEMENT IS
BEING REMOVED,
REPLACE WITH GRASS

SEE SHEET 13 FOR -L- PROFILE

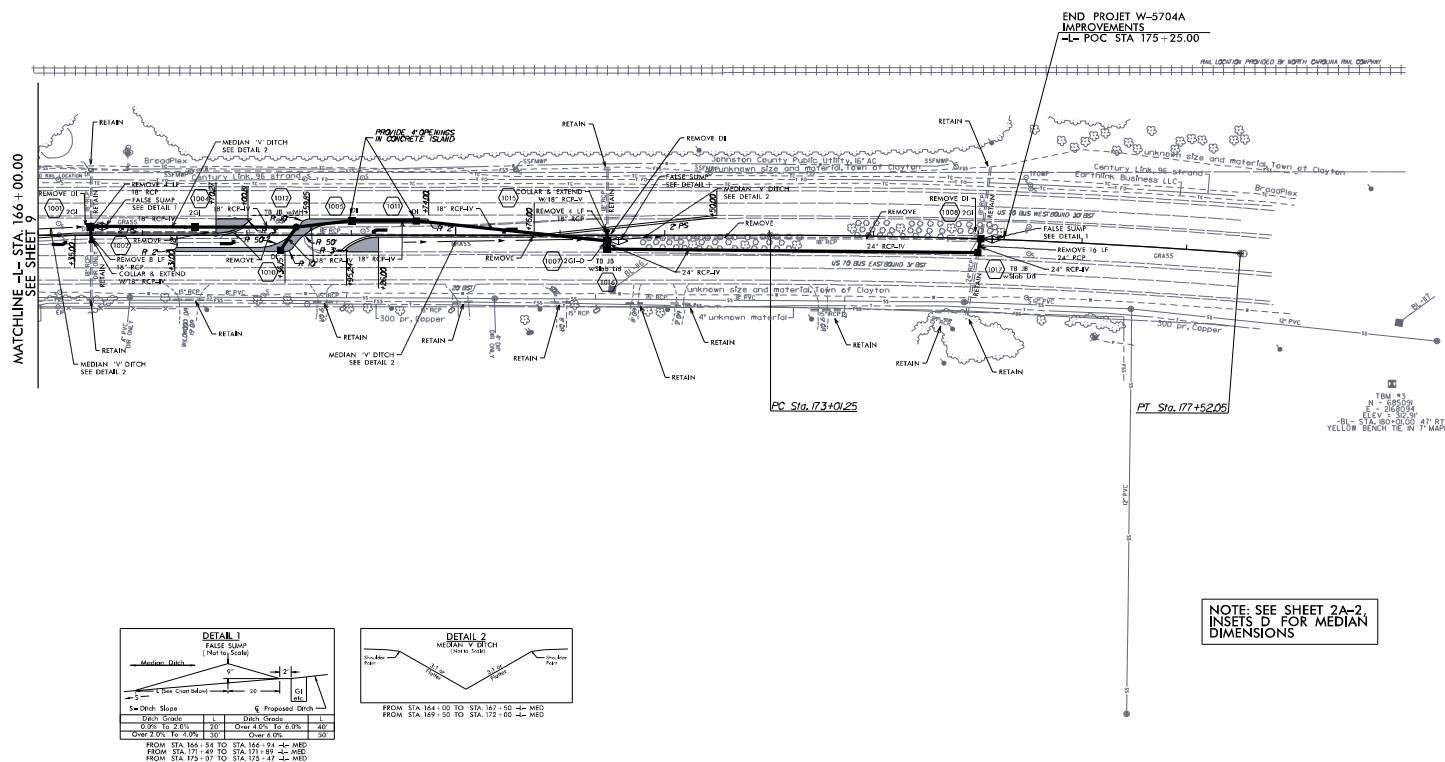


-L-
PI Sta 175+26.76
$\Delta = 4^{\circ} 30' 28.8''$ (RT)
$D = 1^{\circ} 00' 00.0''$
$L = 450.80'$
$T = 225.52'$
$R = 5729.58'$

170

75

PROJECT REFERENCE NO.		SHEET NO.	
W-5704A&B		10	
REV SHEET NO.			
ROADWAY DESIGN		HYDRAULICS	
10/14/2013		10/14/2013	
			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
		1205 Weiss Avenue Rainier, WA 98148 Phone: 206-834-6077 Fax: 206-834-6081 E-mail: info@sepi.com	

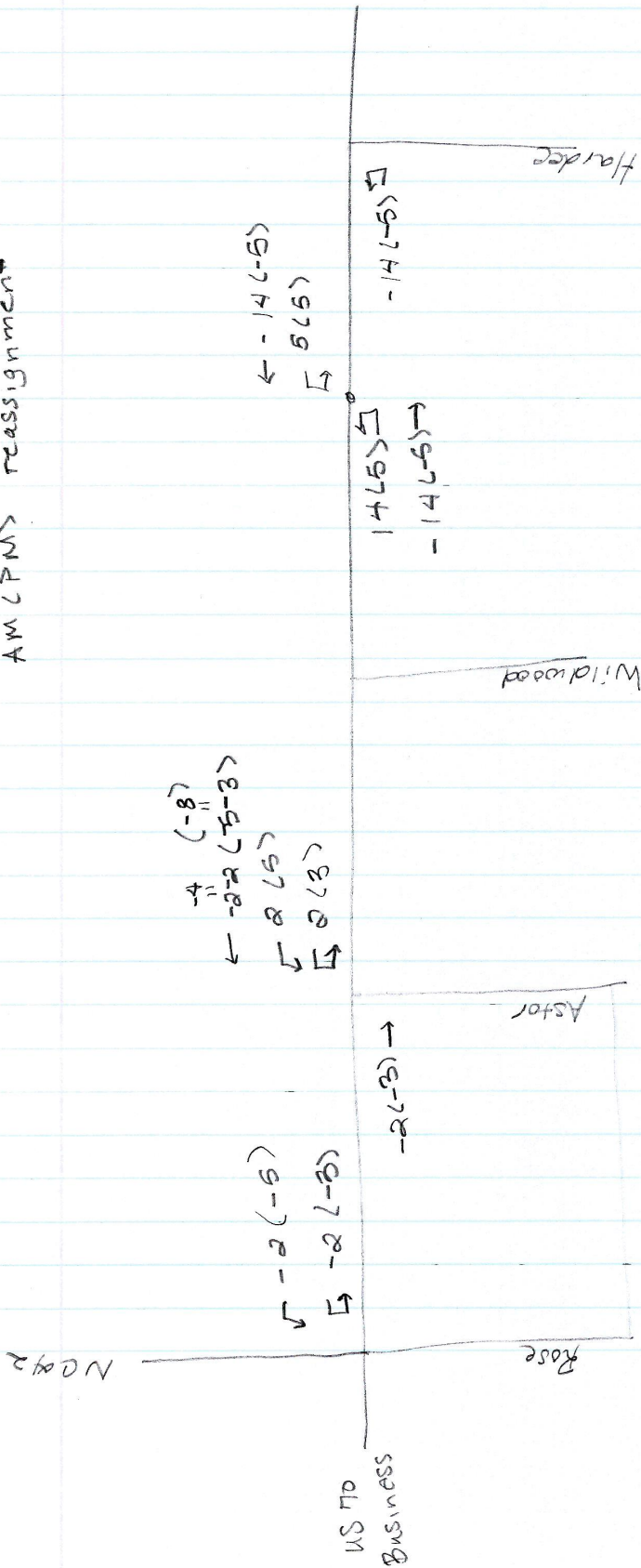


NOTE: SEE SHEET 2A-2,
INSETS D FOR MEDIAN
DIMENSIONS

SEE SHEET 14 FOR -L- PROFILE

TRAFFIC REASSIGNMENT DUE TO TIP COMPLETION

AM (PM) reassignment



- U-Turns at Rose - assume $\frac{1}{2}$ access homes between Rose + Astor
 $\frac{1}{2}$ access homes / small businesses East of Astor
- Lefts at Rose - split between homes + Sheetz. Trip gen for approx. 20 homes that may turn at Astor from East on US 70 Business. Trip gen AM (5, 14)
 PM (14, 8)
- If $\frac{1}{3}$ from West, $\frac{1}{3}$ from north, $\frac{1}{3}$ from east $\rightarrow$ approx 2 enter in AM + 5 enter in PM
- U-Turns at Hardee - assume $\frac{1}{8}$ because of homes + small businesses West of Wildwood
- NB U-Turns - limited # homes on South side of US 70 between U-Turn + Hardee so added 5 to this movement

INTERSECTION VOLUME SPREADSHEETS

ITE Trip Generation (10th Edition) Buckhorn Branch													
Site Trips													
LUC	Land Use	Intensity	Units	Avg Rate or Equation?	Daily Trips			AM Peak Hour Trips			PM Peak Hour Trips		
					Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
					Daily Trips			AM Trips	AM Trips In	AM Trips Out	PM Trips	PM Trips In	PM Trips Out
210	Single-Family Detached Housing	205	Dwelling Unit(s)	Eq	2,014	1,007	1,007	151	38	113	203	128	75
220	Multifamily Housing (Low-Rise)	120	Dwelling Unit(s)	Eq	868	434	434	57	13	44	70	44	26
Total					2,882	1,441	1,441	208	51	157	273	172	101

Intersection Development Worksheet																
Intersection #1 - US 70 Business at NC 42/Rose Street																
AM PEAK HOUR - 07:15 AM - 08:15 AM																
	Northbound Rose Street				Southbound NC 42				Eastbound US 70 Business				Westbound US 70 Business			
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn
2019 Existing Traffic																
2019 Traffic Count	37	24	4	0	133	22	1013	0	545	831	53	0	20	709	99	5
Balancing													1	19	2	
2019 Balanced Traffic	37	24	4	0	133	22	1013	0	545	831	53	0	21	728	101	5
Construction Reassignment													-2			-2
2019 Total Adjusted Traffic	37	24	4	0	133	22	1013	0	545	831	53	0	19	728	101	3
2019 Existing Traffic	37	24	4	0	133	22	1013	0	545	831	53	0	19	728	101	3
Background Growth Calculation																
Growth Factor	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
2023 Background Growth	4	2	1	0	11	2	84	0	45	69	5	0	2	61	9	1
Approved Developments																
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	41	26	5	0	144	24	1097	0	590	900	58	0	21	789	110	4
Trip Assignment																
Outbound Assigned Percentage	35%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	10%	0%
Outbound Primary Site Trips	54	16	0	0	0	0	0	0	0	0	0	0	0	24	16	0
Inbound Assigned Percentage	0%	0%	0%	0%	10%	10%	0%	0%	0%	20%	30%	0%	10%	0%	0%	0%
Inbound Primary Site Trips	0	0	0	0	5	5	0	0	0	10	15	0	5	0	0	0
Total Primary Site Trips	54	16	0	0	5	5	0	0	0	10	15	0	5	24	16	0
Total Project Traffic	54	16	0	0	5	5	0	0	0	10	15	0	5	24	16	0
2023 Buildout Volumes	95	42	5	0	149	29	1097	0	590	910	73	0	26	813	126	4

PM PEAK HOUR - 04:45 PM - 05:45 PM																
	Northbound Rose Street				Southbound NC 42				Eastbound US 70 Business				Westbound US 70 Business			
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn
2019 Existing Traffic																
2019 Traffic Count	41	30	1	0	198	22	919	0	704	964	51	0	23	1094	160	7
Balancing																
2019 Balanced Traffic	41	30	1	0	198	22	919	0	704	964	51	0	23	1094	160	7
Construction Reassignment													-5			-3
2019 Total Adjusted Traffic	41	30	1	0	198	22	919	0	704	964	51	0	18	1094	160	4
2019 Existing Traffic	41	30	1	0	198	22	919	0	704	964	51	0	18	1094	160	4
Background Growth Calculation																
Growth Factor	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
2023 Background Growth	4	3	1	0	17	2	76	0	59	80	5	0	2	91	14	1
Approved Developments																
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	46	33	2	0	215	24	995	0	763	1044	56	0	20	1185	174	5
Trip Assignment																
Outbound Assigned Percentage	35%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	10%	0%
Outbound Primary Site Trips	35	10	0	0	0	0	0	0	0	0	0	0	0	15	11	0
Inbound Assigned Percentage	0%	0%	0%	0%	10%	10%	0%	0%	0%	20%	30%	0%	10%	0%	0%	0%
Inbound Primary Site Trips	0	0	0	0	18	17	0	0	0	34	51	0	18	0	0	0
Total Primary Site Trips	35	10	0	0	18	17	0	0	0	34	51	0	18	15	11	0
Total Project Traffic	35	10	0	0	18	17	0	0	0	34	51	0	18	15	11	0
2023 Buildout Volumes	80	43	2	0	233	41	995	0	763	1078	107	0	38	1200	185	5

Intersection Development Worksheet																
Intersection #2 - US 70 Business at Astor Street																
AM PEAK HOUR - 07:15 AM - 08:15 AM																
	Northbound Astor Street				Southbound				Eastbound US 70 Business				Westbound US 70 Business			
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn
2019 Existing Traffic																
2019 Traffic Count	0	0	2	0	0	0	0	0	0	978	2	0	0	855	0	0
Balancing																
2019 Balanced Traffic	0	0	2	0	0	0	0	0	0	978	2	0	0	855	0	0
Construction Reassignment										-2				2	-4	2
2019 Total Adjusted Traffic	0	0	2	0	0	0	0	0	0	976	2	0	0	851	0	2
2019 Existing Traffic	0	0	2	0	0	0	0	0	0	976	2	0	0	851	0	2
Background Growth Calculation																
Growth Factor	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
2023 Background Growth	0	0	1	0	0	0	0	0	0	81	1	0	0	71	0	1
Approved Developments																
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	0	0	3	0	0	0	0	0	0	1067	3	0	0	922	0	3
Trip Assignment																
Outbound Assigned Percentage	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%
Outbound Primary Site Trips	0	0	24	0	0	0	0	0	0	0	0	0	0	40	0	0
Inbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	0%	0%	10%	10%	0%	10%
Inbound Primary Site Trips	0	0	0	0	0	0	0	0	0	15	0	0	6	5	0	5
Total Primary Site Trips	0	0	24	0	0	0	0	0	0	15	0	0	6	45	0	5
Total Project Traffic	0	0	24	0	0	0	0	0	0	15	0	0	6	45	0	5
2023 Buildout Volumes	0	0	27	0	0	0	0	0	0	1072	3	0	9	967	0	8

PM PEAK HOUR - 04:45 PM - 05:45 PM																
	Northbound Astor Street				Southbound				Eastbound US 70 Business				Westbound US 70 Business			
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn
2019 Existing Traffic																
2019 Traffic Count	0	0	0	0	0	0	0	0	0	1202	0	0	0	1259	0	0
Balancing																
2019 Balanced Traffic	0	0	0	0	0	0	0	0	0	1202	0	0	0	1284	0	0
Construction Reassignment										-3				5	-8	3
2019 Total Adjusted Traffic	0	0	0	0	0	0	0	0	0	1199	0	0	0	1276	0	3
2019 Existing Traffic	0	0	0	0	0	0	0	0	0	1199	0	0	0	1276	0	3
Background Growth Calculation																
Growth Factor	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
2023 Background Growth	0	0	0	0	0	0	0	0	0	99	0	0	0	106	0	1
Approved Developments																
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	0	0	0	0	0	0	0	0	0	1298	0	0	0	1382	0	4
Trip Assignment																
Outbound Assigned Percentage	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%
Outbound Primary Site Trips	0	0	16	0	0	0	0	0	0	0	0	0	0	26	0	0
Inbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	0%	0%	10%	10%	0%	10%
Inbound Primary Site Trips	0	0	0	0	0	0	0	0	0	52	0	0	17	18	0	17
Total Primary Site Trips	0	0	16	0	0	0	0	0	0	52	0	0	17	44	0	17
Total Project Traffic	0	0	16	0	0	0	0	0	0	52	0	0	17	44	0	17
2023 Buildout Volumes	0	0	16	0	0	0	0	0	0	1350	0	0	23	1426	0	21

Intersection Development Worksheet

Intersection #3 - US 70 Business at Wildwood Drive

AM PEAK HOUR - 07:15 AM - 08:15 AM

	Northbound Wildwood Drive				Southbound				Eastbound US 70 Business				Westbound US 70 Business			
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn
2019 Existing Traffic																
2019 Traffic Count	0	0	6	0	0	0	0	0	0	982	0	0	0	866	0	0
Balancing																
2019 Balanced Traffic	0	0	6	0	0	0	0	0	0	982	0	0	0	866	0	0
Construction Reassignment	0	0	0	0	0	0	0	0	0	982	0	0	0	866	0	0
2019 Total Adjusted Traffic	0	0	6	0	0	0	0	0	0	982	0	0	0	866	0	0
2019 Existing Traffic	0	0	6	0	0	0	0	0	0	982	0	0	0	866	0	0
Background Growth Calculation																
Growth Factor	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
2023 Background Growth	0	0	1	0	0	0	0	0	0	81	0	0	0	72	0	0
Approved Developments																
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	0	0	7	0	0	0	0	0	0	1063	0	0	0	938	0	0
Trip Assignment																
Outbound Assigned Percentage	0%	0%	40%	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	25%	0%	0%
Outbound Primary Site Trips	0	0	63	0	0	0	0	0	0	24	0	0	0	40	0	0
Inbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%	0%	30%	0%	0%
Inbound Primary Site Trips	0	0	0	0	0	0	0	0	0	0	20	0	0	16	0	0
Total Primary Site Trips	0	0	63	0	0	0	0	0	0	24	20	0	0	56	0	0
Total Project Traffic	0	0	63	0	0	0	0	0	0	24	20	0	0	56	0	0
2023 Buildout Volumes	0	0	70	0	0	0	0	0	0	1087	20	0	0	994	0	0

PM PEAK HOUR - 04:45 PM - 05:45 PM

	Northbound Wildwood Drive				Southbound				Eastbound US 70 Business				Westbound US 70 Business			
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn
2019 Existing Traffic																
2019 Traffic Count	0	0	1	0	0	0	0	0	0	1177	5	0	0	1260	0	0
Balancing																
2019 Balanced Traffic	0	0	1	0	0	0	0	0	0	1177	5	0	0	1285	0	0
Construction Reassignment	0	0	0	0	0	0	0	0	0	1177	5	0	0	1285	0	0
2019 Total Adjusted Traffic	0	0	1	0	0	0	0	0	0	1177	5	0	0	1285	0	0
2019 Existing Traffic	0	0	1	0	0	0	0	0	0	1177	5	0	0	1285	0	0
Background Growth Calculation																
Growth Factor	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
2023 Background Growth	0	0	1	0	0	0	0	0	0	98	1	0	0	106	0	0
Approved Developments																
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	0	0	2	0	0	0	0	0	0	1276	6	0	0	1391	0	0
Trip Assignment																
Outbound Assigned Percentage	0%	0%	40%	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	25%	0%	0%
Outbound Primary Site Trips	0	0	40	0	0	0	0	0	0	16	0	0	0	26	0	0
Inbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%	0%	30%	0%	0%
Inbound Primary Site Trips	0	0	0	0	0	0	0	0	0	0	69	0	0	52	0	0
Total Primary Site Trips	0	0	40	0	0	0	0	0	0	16	69	0	0	78	0	0
Total Project Traffic	0	0	40	0	0	0	0	0	0	16	69	0	0	78	0	0
2023 Buildout Volumes	0	0	42	0	0	0	0	0	0	1291	75	0	0	1469	0	0

Intersection Development Worksheet																
Intersection #4 - US 70 Business at U-Turn (E. of Wildwood)																
AM PEAK HOUR - 07:15 AM - 08:15 AM																
	Northbound U-Turn (E. of Wildwood)				Southbound				Eastbound US 70 Business				Westbound US 70 Business			
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn
2019 Existing Traffic																
2019 Traffic Count	0	0	0	0	0	0	0	0	0	988	0	0	0	866	0	0
Balancing																
2019 Balanced Traffic	0	0	0	0	0	0	0	0	0	988	0	0	0	866	0	0
Construction Reassignment										-14		14		-14		5
2019 Total Adjusted Traffic	0	0	0	0	0	0	0	0	0	974	0	14	0	852	0	5
2019 Existing Traffic	0	0	0	0	0	0	0	0	0	974	0	14	0	852	0	5
Background Growth Calculation																
Growth Factor	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
2023 Background Growth	0	0	0	0	0	0	0	0	0	81	0	2	0	71	0	1
Approved Developments																
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	0	0	0	0	0	0	0	0	0	1055	0	16	0	923	0	6
Trip Assignment																
Outbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	0%	12%	0%	13%	0%	0%
Outbound Primary Site Trips	0	0	0	0	0	0	0	0	0	68	0	19	0	21	0	0
Inbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	0%	0%
Inbound Primary Site Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0
Total Primary Site Trips	0	0	0	0	0	0	0	0	0	68	0	19	0	37	0	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	68	0	19	0	37	0	0
2023 Buildout Volumes	0	0	0	0	0	0	0	0	0	1123	0	35	0	960	0	6

PM PEAK HOUR - 04:45 PM - 05:45 PM																
	Northbound U-Turn (E. of Wildwood)				Southbound				Eastbound US 70 Business				Westbound US 70 Business			
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn
2019 Existing Traffic																
2019 Traffic Count	0	0	0	0	0	0	0	0	0	1178	0	0	0	1260	0	0
Balancing														25		
2019 Balanced Traffic	0	0	0	0	0	0	0	0	0	1178	0	0	0	1285	0	0
Construction Reassignment										-5		5		-5		5
2019 Total Adjusted Traffic	0	0	0	0	0	0	0	0	0	1173	0	5	0	1280	0	5
2019 Existing Traffic	0	0	0	0	0	0	0	0	0	1173	0	5	0	1280	0	5
Background Growth Calculation																
Growth Factor	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
2023 Background Growth	0	0	0	0	0	0	0	0	0	97	0	1	0	106	0	1
Approved Developments																
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	0	0	0	0	0	0	0	0	0	1270	0	6	0	1386	0	6
Trip Assignment																
Outbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	0%	12%	0%	13%	0%	0%
Outbound Primary Site Trips	0	0	0	0	0	0	0	0	0	44	0	12	0	14	0	0
Inbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	0%	0%
Inbound Primary Site Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	52	0	0
Total Primary Site Trips	0	0	0	0	0	0	0	0	0	44	0	12	0	66	0	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	44	0	12	0	66	0	0
2023 Buildout Volumes	0	0	0	0	0	0	0	0	0	1314	0	18	0	1452	0	6

Intersection Development Worksheet																
Intersection #5 - US 70 Business at Hardee Lane																
AM PEAK HOUR - 07:15 AM - 08:15 AM																
	Northbound Hardee Lane				Southbound				Eastbound US 70 Business				Westbound US 70 Business			
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn
2019 Existing Traffic																
2019 Traffic Count	22	0	9	0	0	0	0	0	0	950	19	28	15	805	0	1
Balancing																
2019 Balanced Traffic	22	0	9	0	0	0	0	0	0	950	19	28	15	805	0	1
Construction Reassignment												-14				
2019 Total Adjusted Traffic	22	0	9	0	0	0	0	0	0	950	19	14	15	805	0	1
2019 Existing Traffic	22	0	9	0	0	0	0	0	0	950	19	14	15	805	0	1
Background Growth Calculation																
Growth Factor	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
2023 Background Growth	2	0	1	0	0	0	0	0	0	79	2	-2	2	67	0	1
Approved Developments																
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	24	0	10	0	0	0	0	0	0	1029	21	16	17	872	0	2
Trip Assignment																
Outbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	0%	13%	0%	0%	0%	0%
Outbound Primary Site Trips	0	0	0	0	0	0	0	0	0	47	0	21	0	0	0	0
Inbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	0%	0%
Inbound Primary Site Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0
Total Primary Site Trips	0	0	0	0	0	0	0	0	0	47	0	21	0	16	0	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	47	0	21	0	16	0	0
2023 Buildout Volumes	24	0	10	0	0	0	0	0	0	1076	21	37	17	888	0	2
PM PEAK HOUR - 05:00 PM - 06:00 PM																
	Northbound Hardee Lane				Southbound				Eastbound US 70 Business				Westbound US 70 Business			
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn
2019 Existing Traffic																
2019 Traffic Count	33	0	24	0	0	0	0	0	0	1104	48	10	26	1229	0	1
Balancing																
2019 Balanced Traffic	34	0	24	0	0	0	0	0	0	1104	48	10	26	1243	0	1
Construction Reassignment												-5				
2019 Total Adjusted Traffic	34	0	24	0	0	0	0	0	0	1104	48	5	26	1243	0	1
2019 Existing Traffic	34	0	24	0	0	0	0	0	0	1104	48	5	26	1243	0	1
Background Growth Calculation																
Growth Factor	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
2023 Background Growth	3	0	2	0	0	0	0	0	0	92	4	1	3	103	0	1
Approved Developments																
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	37	0	26	0	0	0	0	0	0	1196	52	6	29	1346	0	2
Trip Assignment																
Outbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	0%	13%	0%	0%	0%	0%
Outbound Primary Site Trips	0	0	0	0	0	0	0	0	0	30	0	14	0	0	0	0
Inbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	0%	0%
Inbound Primary Site Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	52	0	0
Total Primary Site Trips	0	0	0	0	0	0	0	0	0	30	0	14	0	52	0	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	30	0	14	0	52	0	0
2023 Buildout Volumes	37	0	26	0	0	0	0	0	0	1226	52	20	29	1398	0	2

Intersection Development Worksheet

Intersection #6 - Iris Street at Tulip Street

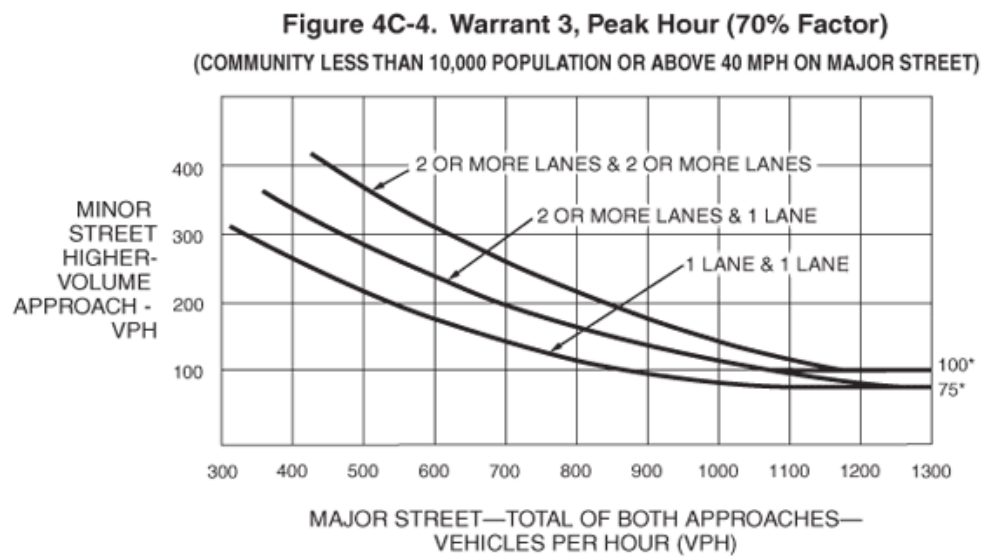
AM PEAK HOUR - 06:00 AM - 07:00 AM

	Northbound Iris Street				Southbound Iris Street				Eastbound Tulip Street				Westbound Tulip Street				
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	
2019 Existing Traffic																	
2019 Traffic Count																	
Estimated Traffic	5		5						5	5			5	5			
2019 Balanced Traffic	5	0	5	0	0	0	0	0	0	5	5	0	0	5	5	0	0
Construction Reassignment																	
2019 Total Adjusted Traffic	5	0	5	0	0	0	0	0	0	5	5	0	0	5	5	0	0
2019 Existing Traffic	5	0	5	0	0	0	0	0	0	5	5	0	0	5	5	0	0
Background Growth Calculation																	
Growth Factor	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approved Developments																	
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	5	0	5	0	0	0	0	0	0	5	5	0	0	5	5	0	0
Trip Assignment																	
Outbound Assigned Percentage	45%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Outbound Primary Site Trips	70	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	10%	0%	0%	0%	0%
Inbound Primary Site Trips	0	0	0	0	0	0	0	0	0	0	25	0	6	0	0	0	0
Total Primary Site Trips	70	0	24	0	0	0	0	0	0	0	25	0	6	0	0	0	0
Total Project Traffic	70	0	24	0	0	0	0	0	0	0	25	0	6	0	0	0	0
2023 Buildout Volumes	75	0	29	0	0	0	0	0	0	0	5	30	0	11	5	0	0

PM PEAK HOUR - 03:00 PM - 04:00 PM

	Northbound Iris Street				Southbound Iris Street				Eastbound Tulip Street				Westbound Tulip Street				
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	
2019 Existing Traffic																	
2019 Traffic Count																	
Balancing	5		5						5	5			5	5			
2019 Balanced Traffic	5	0	5	0	0	0	0	0	0	5	5	0	0	5	5	0	0
Construction Reassignment																	
2019 Total Adjusted Traffic	5	0	5	0	0	0	0	0	0	5	5	0	0	5	5	0	0
2019 Existing Traffic	5	0	5	0	0	0	0	0	0	5	5	0	0	5	5	0	0
Background Growth Calculation																	
Growth Factor	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approved Developments																	
Total Approved Development Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Background Traffic	5	0	5	0	0	0	0	0	0	5	5	0	0	5	5	0	0
Trip Assignment																	
Outbound Assigned Percentage	45%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Outbound Primary Site Trips	46	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inbound Assigned Percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	10%	0%	0%	0%	0%
Inbound Primary Site Trips	0	0	0	0	0	0	0	0	0	0	86	0	18	0	0	0	0
Total Primary Site Trips	46	0	16	0	0	0	0	0	0	0	86	0	18	0	0	0	0
Total Project Traffic	46	0	16	0	0	0	0	0	0	0	86	0	18	0	0	0	0
2023 Buildout Volumes	51	0	21	0	0	0	0	0	0	0	5	91	0	23	5	0	0

SIGNAL WARRANT INFORMATION



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

SYNCHRO REPORTS

US 70 BUSINESS AT NC 42/ROSE STREET

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing AM - Under Construction
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	545	831	53	5	21	728	101	37	24	4	133	22
Future Volume (vph)	545	831	53	5	21	728	101	37	24	4	133	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	700		150		115		350	155		100	310	
Storage Lanes	1		1		1		1	1		1	1	
Taper Length (ft)	150				155			60			100	
Satd. Flow (prot)	3367	3471	1553	0	1736	3471	1553	1736	1827	1553	1649	1675
Flt Permitted	0.950				0.400			0.950			0.950	0.965
Satd. Flow (perm)	3367	3471	1553	0	731	3471	1553	1736	1827	1553	1649	1675
Right Turn on Red			Yes				Yes			Yes		
Satd. Flow (RTOR)			72				164			114		
Link Speed (mph)		45				45			25			45
Link Distance (ft)		971				934			464			686
Travel Time (s)		14.7				14.2			12.7			10.4
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.91	0.68	0.68	0.68	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)											42%	
Lane Group Flow (vph)	606	923	59	0	28	800	111	54	35	6	85	85
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			12			12
Link Offset(ft)		0				0			0			0
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Number of Detectors	1	1	0	1	1	1	0	1	1	1	1	1
Detector Template				Left								
Leading Detector (ft)	40	306	0	20	55	306	0	40	40	35	40	40
Trailing Detector (ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Position(ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Size(ft)	40	6	20	20	60	6	20	40	40	40	40	40
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	pm+ov	custom	Prot	NA	Perm	Split	NA	pm+ov	Split	NA
Protected Phases	5	2	3		1	6		3	3	1!	4	4
Permitted Phases			2	1!			6			3		
Detector Phase	5	2	3	1	1	6	6	3	3	1	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	7.0	7.0	7.0	20.0	20.0	7.0	7.0	7.0	15.0	15.0
Minimum Split (s)	14.0	26.0	14.0	14.0	14.0	26.0	26.0	14.0	14.0	14.0	22.0	22.0
Total Split (s)	38.0	95.0	18.0	15.0	15.0	72.0	72.0	18.0	18.0	15.0	22.0	22.0
Total Split (%)	25.3%	63.3%	12.0%	10.0%	10.0%	48.0%	48.0%	12.0%	12.0%	10.0%	14.7%	14.7%
Maximum Green (s)	31.7	89.1	11.7	8.6	8.6	66.2	66.2	11.7	11.7	8.6	15.5	15.5
Yellow Time (s)	3.0	4.5	3.8	3.0	3.0	4.5	4.5	3.8	3.8	3.0	4.5	4.5

Buckhorn Branch 01/28/2019 Existing AM - Under Construction
Exult

Synchro 10 Report
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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing AM - Under Construction
02/23/2019

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	1013
Future Volume (vph)	1013
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1553
Flt Permitted	
Satd. Flow (perm)	1553
Right Turn on Red	Yes
Satd. Flow (RTOR)	480
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.91
Heavy Vehicles (%)	4%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	1113
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	0
Detector Template	
Leading Detector (ft)	0
Trailing Detector (ft)	0
Detector 1 Position(ft)	0
Detector 1 Size(ft)	20
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Turn Type	Free
Protected Phases	
Permitted Phases	Free
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	

Buckhorn Branch 01/28/2019 Existing AM - Under Construction
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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing AM - Under Construction
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
All-Red Time (s)	3.3	1.4	2.5	3.4	3.4	1.3	1.3	2.5	2.5	3.4	2.0	2.0
Lost Time Adjust (s)	-1.3	-0.9	-1.3		-1.4	-0.8	-0.8	-1.3	-1.3	-1.4	-1.5	-1.5
Total Lost Time (s)	5.0	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	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	C-Min	Max	Max	Max	Min	Min	Max	Max	Max	Max	Max
Act Effect Green (s)	33.0	64.0	108.0		10.0	41.0	41.0	39.0	39.0	49.0	17.0	17.0
Actuated g/C Ratio	0.22	0.43	0.72		0.07	0.27	0.27	0.26	0.26	0.33	0.11	0.11
v/c Ratio	0.82	0.62	0.05		0.58	0.84	0.20	0.12	0.07	0.01	0.46	0.45
Control Delay	65.8	35.1	0.9		110.9	60.0	1.6	46.4	46.0	0.0	70.8	70.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	35.1	0.9		110.9	60.0	1.6	46.4	46.0	0.0	70.8	70.4
LOS	E	D	A		F	E	A	D	D	A	E	E
Approach Delay		45.6				54.6			43.3			11.8
Approach LOS		D				D			D			B
Queue Length 50th (ft)	293	367	0		27	391	0	41	26	0	83	83
Queue Length 95th (ft)	366	391	10		#80	433	8	64	46	0	145	145
Internal Link Dist (ft)		891				854			384			606
Turn Bay Length (ft)	700		150		115		350	155		100	310	
Base Capacity (vph)	740	2082	1138		48	1550	784	451	475	584	186	189
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.44	0.05		0.58	0.52	0.14	0.12	0.07	0.01	0.46	0.45

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 50 (33%), Referenced to phase 2:EBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 36.6

Intersection LOS: D

Intersection Capacity Utilization 63.8%

ICU Level of Service B

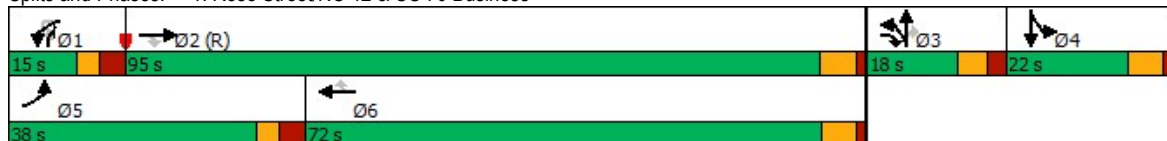
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

! Phase conflict between lane groups.

Splits and Phases: 1: Rose Street/NC 42 & US 70 Business



Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing AM - Under Construction
02/23/2019

Lane Group	SBR
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	150.0
Actuated g/C Ratio	1.00
v/c Ratio	0.72
Control Delay	2.9
Queue Delay	0.0
Total Delay	2.9
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1553
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.72
Intersection Summary	

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing PM - Under Construction
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	704	964	51	7	23	1094	160	41	30	1	198	22
Future Volume (vph)	704	964	51	7	23	1094	160	41	30	1	198	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	700		150		115		350	155		100	310	
Storage Lanes	1		1		1		1	1		1	1	
Taper Length (ft)	150				155			60			100	
Satd. Flow (prot)	3433	3539	1583	0	1770	3539	1583	1770	1863	1583	1681	1702
Flt Permitted	0.950				0.400			0.950			0.950	0.962
Satd. Flow (perm)	3433	3539	1583	0	745	3539	1583	1770	1863	1583	1681	1702
Right Turn on Red			Yes				Yes			Yes		
Satd. Flow (RTOR)			56				127			86		
Link Speed (mph)		45				45			25			45
Link Distance (ft)		971				934			464			686
Travel Time (s)		14.7				14.2			12.7			10.4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.82	0.82	0.82	0.89	0.89
Shared Lane Traffic (%)											45%	
Lane Group Flow (vph)	774	1059	56	0	33	1202	176	50	37	1	122	125
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			12			12
Link Offset(ft)		0				0			0			0
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Number of Detectors	1	1	0	1	1	1	0	1	1	1	1	1
Detector Template				Left								
Leading Detector (ft)	40	306	0	20	55	306	0	40	40	35	40	40
Trailing Detector (ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Position(ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Size(ft)	40	6	20	20	60	6	20	40	40	40	40	40
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	pm+ov	custom	Prot	NA	Perm	Split	NA	pm+ov	Split	NA
Protected Phases	5	2	3		1	6		3	3	1!	4	4
Permitted Phases			2	1!			6			3		
Detector Phase	5	2	3	1	1	6	6	3	3	1	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	7.0	7.0	7.0	20.0	20.0	7.0	7.0	7.0	15.0	15.0
Minimum Split (s)	14.0	26.0	14.0	14.0	14.0	26.0	26.0	14.0	14.0	14.0	22.0	22.0
Total Split (s)	70.0	142.0	18.0	15.0	15.0	87.0	87.0	18.0	18.0	15.0	25.0	25.0
Total Split (%)	35.0%	71.0%	9.0%	7.5%	7.5%	43.5%	43.5%	9.0%	9.0%	7.5%	12.5%	12.5%
Maximum Green (s)	63.7	136.1	11.7	8.6	8.6	81.2	81.2	11.7	11.7	8.6	18.5	18.5
Yellow Time (s)	3.0	4.5	3.8	3.0	3.0	4.5	4.5	3.8	3.8	3.0	4.5	4.5
All-Red Time (s)	3.3	1.4	2.5	3.4	3.4	1.3	1.3	2.5	2.5	3.4	2.0	2.0

Buckhorn Branch 01/28/2019 Existing PM - Under Construction
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Synchro 10 Report
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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing PM - Under Construction
02/23/2019

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	919
Future Volume (vph)	919
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Right Turn on Red	Yes
Satd. Flow (RTOR)	528
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.89
Shared Lane Traffic (%)	
Lane Group Flow (vph)	1033
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	0
Detector Template	
Leading Detector (ft)	0
Trailing Detector (ft)	0
Detector 1 Position(ft)	0
Detector 1 Size(ft)	20
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Turn Type	Free
Protected Phases	
Permitted Phases	Free
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	

Buckhorn Branch 01/28/2019 Existing PM - Under Construction
Exult

Synchro 10 Report
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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing PM - Under Construction
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lost Time Adjust (s)	-1.3	-0.9	-1.3		-1.4	-0.8	-0.8	-1.3	-1.3	-1.4	-1.5	-1.5
Total Lost Time (s)	5.0	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	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	C-Min	Max	Max	Max	Min	Min	Max	Max	Max	Max	Max
Act Effct Green (s)	65.0	129.3	155.0		10.0	74.3	74.3	20.7	20.7	30.7	20.0	20.0
Actuated g/C Ratio	0.32	0.65	0.78		0.05	0.37	0.37	0.10	0.10	0.15	0.10	0.10
v/c Ratio	0.69	0.46	0.05		0.89	0.91	0.26	0.27	0.19	0.00	0.73	0.74
Control Delay	62.8	18.3	1.1		204.4	70.9	12.8	90.1	88.4	0.0	111.0	111.6
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.8	18.3	1.1		204.4	70.9	12.8	90.1	88.4	0.0	111.0	111.6
LOS	E	B	A		F	E	B	F	F	A	F	F
Approach Delay		36.0				66.7			88.3			23.2
Approach LOS		D				E			F			C
Queue Length 50th (ft)	461	353	0		44	792	42	62	46	0	167	171
Queue Length 95th (ft)	539	358	11		#129	841	99	107	85	0	#266	#274
Internal Link Dist (ft)		891				854			384			606
Turn Bay Length (ft)	700		150		115		350	155		100	310	
Base Capacity (vph)	1115	2424	1239		37	1450	723	183	192	315	168	170
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.44	0.05		0.89	0.83	0.24	0.27	0.19	0.00	0.73	0.74

Intersection Summary

Area Type: Other

Cycle Length: 200

Actuated Cycle Length: 200

Offset: 50 (25%), Referenced to phase 2:EBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 42.8

Intersection LOS: D

Intersection Capacity Utilization 75.6%

ICU Level of Service D

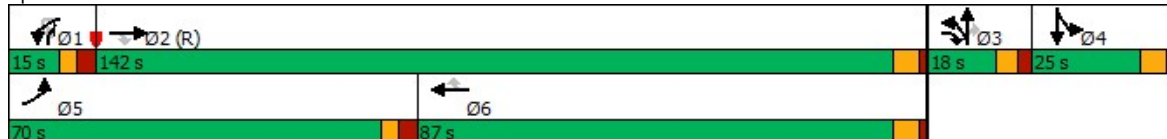
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

! Phase conflict between lane groups.

Splits and Phases: 1: Rose Street/NC 42 & US 70 Business





Lane Group	SBR
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effect Green (s)	200.0
Actuated g/C Ratio	1.00
v/c Ratio	0.65
Control Delay	2.1
Queue Delay	0.0
Total Delay	2.1
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1583
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.65
Intersection Summary	

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing AM - With TIP
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	545	831	53	3	19	728	101	37	24	4	133	22
Future Volume (vph)	545	831	53	3	19	728	101	37	24	4	133	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	700		150		115		350	155		100	310	
Storage Lanes	1		1		1		1	1		1	1	
Taper Length (ft)	150				155			60			100	
Satd. Flow (prot)	3367	3471	1553	0	1736	3471	1553	1736	1827	1553	1649	1675
Flt Permitted	0.950				0.400			0.950			0.950	0.965
Satd. Flow (perm)	3367	3471	1553	0	731	3471	1553	1736	1827	1553	1649	1675
Right Turn on Red			Yes				Yes			Yes		
Satd. Flow (RTOR)			72				164			114		
Link Speed (mph)		45				45			25			45
Link Distance (ft)		971				934			464			686
Travel Time (s)		14.7				14.2			12.7			10.4
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.91	0.68	0.68	0.68	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)											42%	
Lane Group Flow (vph)	606	923	59	0	24	800	111	54	35	6	85	85
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			12			12
Link Offset(ft)		0				0			0			0
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Number of Detectors	1	1	0	1	1	1	0	1	1	1	1	1
Detector Template				Left								
Leading Detector (ft)	40	306	0	20	55	306	0	40	40	35	40	40
Trailing Detector (ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Position(ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Size(ft)	40	6	20	20	60	6	20	40	40	40	40	40
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	pm+ov	custom	Prot	NA	Perm	Split	NA	pm+ov	Split	NA
Protected Phases	5	2	3		1	6		3	3	1!	4	4
Permitted Phases			2	1!			6			3		
Detector Phase	5	2	3	1	1	6	6	3	3	1	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	7.0	7.0	7.0	20.0	20.0	7.0	7.0	7.0	15.0	15.0
Minimum Split (s)	14.0	26.0	14.0	14.0	14.0	26.0	26.0	14.0	14.0	14.0	22.0	22.0
Total Split (s)	38.0	95.0	18.0	15.0	15.0	72.0	72.0	18.0	18.0	15.0	22.0	22.0
Total Split (%)	25.3%	63.3%	12.0%	10.0%	10.0%	48.0%	48.0%	12.0%	12.0%	10.0%	14.7%	14.7%
Maximum Green (s)	31.7	89.1	11.7	8.6	8.6	66.2	66.2	11.7	11.7	8.6	15.5	15.5
Yellow Time (s)	3.0	4.5	3.8	3.0	3.0	4.5	4.5	3.8	3.8	3.0	4.5	4.5

Buckhorn Branch 01/28/2019 Existing AM - With TIP
Exult

Synchro 10 Report
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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing AM - With TIP
02/23/2019

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	1013
Future Volume (vph)	1013
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1553
Flt Permitted	
Satd. Flow (perm)	1553
Right Turn on Red	Yes
Satd. Flow (RTOR)	480
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.91
Heavy Vehicles (%)	4%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	1113
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	0
Detector Template	
Leading Detector (ft)	0
Trailing Detector (ft)	0
Detector 1 Position(ft)	0
Detector 1 Size(ft)	20
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Turn Type	Free
Protected Phases	
Permitted Phases	Free
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	

Buckhorn Branch 01/28/2019 Existing AM - With TIP
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Synchro 10 Report
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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing AM - With TIP
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
All-Red Time (s)	3.3	1.4	2.5	3.4	3.4	1.3	1.3	2.5	2.5	3.4	2.0	2.0
Lost Time Adjust (s)	-1.3	-0.9	-1.3		-1.4	-0.8	-0.8	-1.3	-1.3	-1.4	-1.5	-1.5
Total Lost Time (s)	5.0	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	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	C-Min	Max	Max	Max	Min	Min	Max	Max	Max	Max	Max
Act Effect Green (s)	33.0	64.0	108.0		10.0	41.0	41.0	39.0	39.0	49.0	17.0	17.0
Actuated g/C Ratio	0.22	0.43	0.72		0.07	0.27	0.27	0.26	0.26	0.33	0.11	0.11
v/c Ratio	0.82	0.62	0.05		0.50	0.84	0.20	0.12	0.07	0.01	0.46	0.45
Control Delay	65.8	35.1	0.9		101.8	60.6	1.8	46.4	46.0	0.0	70.8	70.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	35.1	0.9		101.8	60.6	1.8	46.4	46.0	0.0	70.8	70.4
LOS	E	D	A		F	E	A	D	D	A	E	E
Approach Delay		45.6				54.7			43.3			11.8
Approach LOS		D				D			D			B
Queue Length 50th (ft)	293	367	0		23	391	0	41	26	0	83	83
Queue Length 95th (ft)	366	391	10		m#66	432	9	64	46	0	145	145
Internal Link Dist (ft)		891				854			384			606
Turn Bay Length (ft)	700		150		115		350	155		100	310	
Base Capacity (vph)	740	2082	1138		48	1550	784	451	475	584	186	189
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.44	0.05		0.50	0.52	0.14	0.12	0.07	0.01	0.46	0.45

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 50 (33%), Referenced to phase 2:EBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 36.6

Intersection LOS: D

Intersection Capacity Utilization 63.8%

ICU Level of Service B

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 1: Rose Street/NC 42 & US 70 Business



Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing AM - With TIP
02/23/2019

Lane Group	SBR
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effect Green (s)	150.0
Actuated g/C Ratio	1.00
v/c Ratio	0.72
Control Delay	2.9
Queue Delay	0.0
Total Delay	2.9
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1553
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.72
Intersection Summary	

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing PM - With TIP
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	704	964	51	4	18	1094	160	41	30	1	198	22
Future Volume (vph)	704	964	51	4	18	1094	160	41	30	1	198	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	700		150		115		350	155		100	310	
Storage Lanes	1		1		1		1	1		1	1	
Taper Length (ft)	150				155			60			100	
Satd. Flow (prot)	3433	3539	1583	0	1770	3539	1583	1770	1863	1583	1681	1702
Flt Permitted	0.950				0.400			0.950			0.950	0.962
Satd. Flow (perm)	3433	3539	1583	0	745	3539	1583	1770	1863	1583	1681	1702
Right Turn on Red			Yes				Yes			Yes		
Satd. Flow (RTOR)			56				127			86		
Link Speed (mph)		45				45			25			45
Link Distance (ft)		971				934			464			686
Travel Time (s)		14.7				14.2			12.7			10.4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.82	0.82	0.82	0.89	0.89
Shared Lane Traffic (%)											45%	
Lane Group Flow (vph)	774	1059	56	0	24	1202	176	50	37	1	122	125
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			12			12
Link Offset(ft)		0				0			0			0
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Number of Detectors	1	1	0	1	1	1	0	1	1	1	1	1
Detector Template				Left								
Leading Detector (ft)	40	306	0	20	55	306	0	40	40	35	40	40
Trailing Detector (ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Position(ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Size(ft)	40	6	20	20	60	6	20	40	40	40	40	40
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	pm+ov	custom	Prot	NA	Perm	Split	NA	pm+ov	Split	NA
Protected Phases	5	2	3		1	6		3	3	1!	4	4
Permitted Phases			2	1!			6			3		
Detector Phase	5	2	3	1	1	6	6	3	3	1	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	7.0	7.0	7.0	20.0	20.0	7.0	7.0	7.0	15.0	15.0
Minimum Split (s)	14.0	26.0	14.0	14.0	14.0	26.0	26.0	14.0	14.0	14.0	22.0	22.0
Total Split (s)	70.0	142.0	18.0	15.0	15.0	87.0	87.0	18.0	18.0	15.0	25.0	25.0
Total Split (%)	35.0%	71.0%	9.0%	7.5%	7.5%	43.5%	43.5%	9.0%	9.0%	7.5%	12.5%	12.5%
Maximum Green (s)	63.7	136.1	11.7	8.6	8.6	81.2	81.2	11.7	11.7	8.6	18.5	18.5
Yellow Time (s)	3.0	4.5	3.8	3.0	3.0	4.5	4.5	3.8	3.8	3.0	4.5	4.5
All-Red Time (s)	3.3	1.4	2.5	3.4	3.4	1.3	1.3	2.5	2.5	3.4	2.0	2.0

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Synchro 10 Report
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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing PM - With TIP
02/23/2019

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	919
Future Volume (vph)	919
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Right Turn on Red	Yes
Satd. Flow (RTOR)	528
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.89
Shared Lane Traffic (%)	
Lane Group Flow (vph)	1033
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	0
Detector Template	
Leading Detector (ft)	0
Trailing Detector (ft)	0
Detector 1 Position(ft)	0
Detector 1 Size(ft)	20
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Turn Type	Free
Protected Phases	
Permitted Phases	Free
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	

Buckhorn Branch 01/28/2019 Existing PM - With TIP
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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing PM - With TIP
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lost Time Adjust (s)	-1.3	-0.9	-1.3		-1.4	-0.8	-0.8	-1.3	-1.3	-1.4	-1.5	-1.5
Total Lost Time (s)	5.0	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	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	C-Min	Max	Max	Max	Min	Min	Max	Max	Max	Max	Max
Act Effct Green (s)	65.0	129.3	155.0		10.0	74.3	74.3	20.7	20.7	30.7	20.0	20.0
Actuated g/C Ratio	0.32	0.65	0.78		0.05	0.37	0.37	0.10	0.10	0.15	0.10	0.10
v/c Ratio	0.69	0.46	0.05		0.65	0.91	0.26	0.27	0.19	0.00	0.73	0.74
Control Delay	62.8	18.3	1.1		154.2	70.9	12.8	90.1	88.4	0.0	111.0	111.6
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.8	18.3	1.1		154.2	70.9	12.8	90.1	88.4	0.0	111.0	111.6
LOS	E	B	A		F	E	B	F	F	A	F	F
Approach Delay		36.0				65.0			88.3			23.2
Approach LOS		D				E			F			C
Queue Length 50th (ft)	461	353	0		32	792	42	62	46	0	167	171
Queue Length 95th (ft)	539	358	11		#91	841	99	107	85	0	#266	#274
Internal Link Dist (ft)		891				854			384			606
Turn Bay Length (ft)	700		150		115		350	155		100	310	
Base Capacity (vph)	1115	2424	1239		37	1450	723	183	192	315	168	170
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.44	0.05		0.65	0.83	0.24	0.27	0.19	0.00	0.73	0.74

Intersection Summary

Area Type: Other

Cycle Length: 200

Actuated Cycle Length: 200

Offset: 50 (25%), Referenced to phase 2:EBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 42.2

Intersection LOS: D

Intersection Capacity Utilization 75.6%

ICU Level of Service D

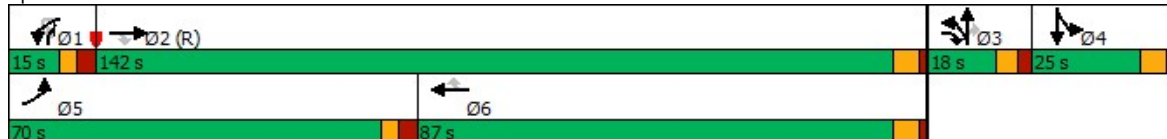
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

! Phase conflict between lane groups.

Splits and Phases: 1: Rose Street/NC 42 & US 70 Business



Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Existing PM - With TIP
02/23/2019



Lane Group	SBR
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effect Green (s)	200.0
Actuated g/C Ratio	1.00
v/c Ratio	0.65
Control Delay	2.1
Queue Delay	0.0
Total Delay	2.1
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1583
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.65
Intersection Summary	

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Background AM
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	590	900	58	4	21	789	110	41	26	5	144	24
Future Volume (vph)	590	900	58	4	21	789	110	41	26	5	144	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	700		150		115		350	155		100	310	
Storage Lanes	1		1		1		1	1		1	1	
Taper Length (ft)	150				155			60			100	
Satd. Flow (prot)	3433	3539	1583	0	1770	3539	1583	1770	1863	1583	1681	1709
Flt Permitted	0.950				0.190			0.950			0.950	0.966
Satd. Flow (perm)	3433	3539	1583	0	354	3539	1583	1770	1863	1583	1681	1709
Right Turn on Red			No				Yes			No		
Satd. Flow (RTOR)							195					
Link Speed (mph)		45				45			25			45
Link Distance (ft)		971				934			464			686
Travel Time (s)		14.7				14.2			12.7			10.4
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
Shared Lane Traffic (%)											42%	
Lane Group Flow (vph)	656	1000	64	0	27	877	122	46	29	6	93	94
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			12			12
Link Offset(ft)		0				0			0			0
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Number of Detectors	1	1	0	1	1	1	0	1	1	1	1	1
Detector Template				Left								
Leading Detector (ft)	40	306	0	20	55	306	0	40	40	35	40	40
Trailing Detector (ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Position(ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Size(ft)	40	6	20	20	60	6	20	40	40	40	40	40
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	pm+ov	custom	Prot	NA	Perm	Split	NA	pm+ov	Split	NA
Protected Phases	5	2	3		1	6		3	3	1!	4	4
Permitted Phases			2	1!			6			3		
Detector Phase	5	2	3	1	1	6	6	3	3	1	4	4
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	14.0	19.0	19.0	14.0	14.0	14.0	19.0	19.0
Total Split (s)	44.0	78.0	15.0	26.0	26.0	60.0	60.0	15.0	15.0	26.0	21.0	21.0
Total Split (%)	31.4%	55.7%	10.7%	18.6%	18.6%	42.9%	42.9%	10.7%	10.7%	18.6%	15.0%	15.0%
Maximum Green (s)	37.0	71.0	8.0	19.0	19.0	53.0	53.0	8.0	8.0	19.0	14.0	14.0
Yellow Time (s)	5.0	5.0	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	2.0	2.0

Buckhorn Branch 01/28/2019 Background AM
Exult

Synchro 10 Report
Page 1

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Background AM
02/23/2019

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	1097
Future Volume (vph)	1097
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Right Turn on Red	Yes
Satd. Flow (RTOR)	521
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Shared Lane Traffic (%)	
Lane Group Flow (vph)	1219
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	0
Detector Template	
Leading Detector (ft)	0
Trailing Detector (ft)	0
Detector 1 Position(ft)	0
Detector 1 Size(ft)	20
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Turn Type	Free
Protected Phases	
Permitted Phases	Free
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	

Buckhorn Branch 01/28/2019 Background AM
Exult

Synchro 10 Report
Page 2

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Background AM
02/23/2019

	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lost Time Adjust (s)	-2.0	-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	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	C-Min	Max	Max	Max	Min	Min	Max	Max	Max	Max	Max
Act Effct Green (s)	39.0	59.3	88.0		21.0	41.3	41.3	23.7	23.7	44.7	16.0	16.0
Actuated g/C Ratio	0.28	0.42	0.63		0.15	0.30	0.30	0.17	0.17	0.32	0.11	0.11
v/c Ratio	0.69	0.67	0.06		0.51	0.84	0.20	0.15	0.09	0.01	0.48	0.48
Control Delay	49.4	34.4	10.3		88.4	54.5	0.8	55.1	54.2	22.8	67.4	67.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	34.4	10.3		88.4	54.5	0.8	55.1	54.2	22.8	67.4	67.1
LOS	D	C	B		F	D	A	E	D	C	E	E
Approach Delay		39.2				49.0			52.4			12.1
Approach LOS		D				D			D			B
Queue Length 50th (ft)	275	380	21		23	395	0	36	23	3	85	86
Queue Length 95th (ft)	345	408	41		m#69	438	1	m81	m57	m12	148	150
Internal Link Dist (ft)		891				854			384			606
Turn Bay Length (ft)	700		150		115		350	155		100	310	
Base Capacity (vph)	956	1845	995		53	1390	740	299	315	505	192	195
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.54	0.06		0.51	0.63	0.16	0.15	0.09	0.01	0.48	0.48

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 32.9

Intersection LOS: C

Intersection Capacity Utilization 62.4%

ICU Level of Service B

Analysis Period (min) 15

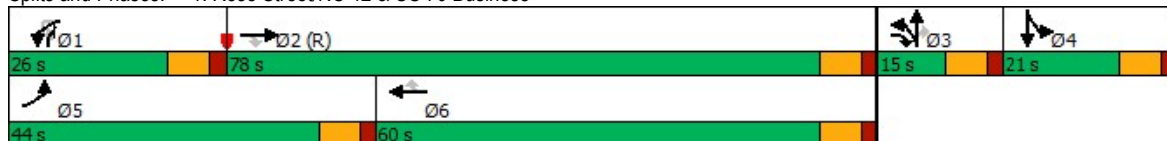
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 1: Rose Street/NC 42 & US 70 Business





Lane Group	SBR
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effect Green (s)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.77
Control Delay	3.7
Queue Delay	0.0
Total Delay	3.7
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1583
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.77
Intersection Summary	

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Background PM
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	763	1044	56	5	20	1185	174	45	33	2	215	24
Future Volume (vph)	763	1044	56	5	20	1185	174	45	33	2	215	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	700		150		115		350	155		100	310	
Storage Lanes	1		1		1		1	1		1	1	
Taper Length (ft)	150				155			60			100	
Satd. Flow (prot)	3433	3539	1583	0	1770	3539	1583	1770	1863	1583	1681	1702
Flt Permitted	0.950				0.190			0.950			0.950	0.962
Satd. Flow (perm)	3433	3539	1583	0	354	3539	1583	1770	1863	1583	1681	1702
Right Turn on Red			No				Yes			No		
Satd. Flow (RTOR)							195					
Link Speed (mph)		45				45			25			45
Link Distance (ft)		971				934			464			686
Travel Time (s)		14.7				14.2			12.7			10.4
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
Shared Lane Traffic (%)											45%	
Lane Group Flow (vph)	848	1160	62	0	28	1317	193	50	37	2	131	135
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			12			12
Link Offset(ft)		0				0			0			0
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Number of Detectors	1	1	0	1	1	1	0	1	1	1	1	1
Detector Template				Left								
Leading Detector (ft)	40	306	0	20	55	306	0	40	40	35	40	40
Trailing Detector (ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Position(ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Size(ft)	40	6	20	20	60	6	20	40	40	40	40	40
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	pm+ov	custom	Prot	NA	Perm	Split	NA	pm+ov	Split	NA
Protected Phases	5	2	3		1	6		3	3	1!	4	4
Permitted Phases			2	1!			6			3		
Detector Phase	5	2	3	1	1	6	6	3	3	1	4	4
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	14.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	43.0	80.0	14.0	26.0	26.0	63.0	63.0	14.0	14.0	26.0	20.0	20.0
Total Split (%)	30.7%	57.1%	10.0%	18.6%	18.6%	45.0%	45.0%	10.0%	10.0%	18.6%	14.3%	14.3%
Maximum Green (s)	36.0	73.0	7.0	19.0	19.0	56.0	56.0	7.0	7.0	19.0	13.0	13.0
Yellow Time (s)	5.0	5.0	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	2.0	2.0

Buckhorn Branch 01/28/2019 Background PM
Exult

Synchro 10 Report
Page 1

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Background PM
02/23/2019

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	995
Future Volume (vph)	995
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Right Turn on Red	Yes
Satd. Flow (RTOR)	470
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Shared Lane Traffic (%)	
Lane Group Flow (vph)	1106
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	0
Detector Template	
Leading Detector (ft)	0
Trailing Detector (ft)	0
Detector 1 Position(ft)	0
Detector 1 Size(ft)	20
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Turn Type	Free
Protected Phases	
Permitted Phases	Free
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	

Buckhorn Branch 01/28/2019 Background PM
Exult

Synchro 10 Report
Page 2

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Background PM
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lost Time Adjust (s)	-2.0	-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	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	C-Min	Max	Max	Max	Min	Min	Max	Max	Max	Max	Max
Act Effect Green (s)	38.0	73.2	89.0		21.0	56.2	56.2	10.8	10.8	31.8	15.0	15.0
Actuated g/C Ratio	0.27	0.52	0.64		0.15	0.40	0.40	0.08	0.08	0.23	0.11	0.11
v/c Ratio	0.91	0.63	0.06		0.53	0.93	0.26	0.37	0.26	0.01	0.73	0.74
Control Delay	64.0	25.4	9.9		90.3	51.9	4.1	70.9	67.2	28.0	83.5	84.6
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	25.4	9.9		90.3	51.9	4.1	70.9	67.2	28.0	83.5	84.6
LOS	E	C	A		F	D	A	E	E	C	F	F
Approach Delay		40.7				46.6			68.4			18.4
Approach LOS		D				D			E			B
Queue Length 50th (ft)	387	372	20		24	583	0	45	33	1	123	127
Queue Length 95th (ft)	#502	443	39		#73	688	46	90	72	7	#224	#234
Internal Link Dist (ft)		891				854			384			606
Turn Bay Length (ft)	700		150		115		350	155		100	310	
Base Capacity (vph)	931	1895	1006		53	1466	770	136	144	360	180	182
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.61	0.06		0.53	0.90	0.25	0.37	0.26	0.01	0.73	0.74

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 36.9

Intersection LOS: D

Intersection Capacity Utilization 80.3%

ICU Level of Service D

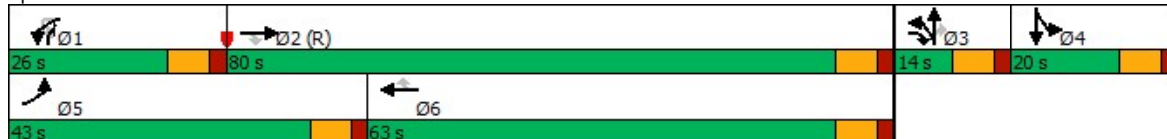
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

! Phase conflict between lane groups.

Splits and Phases: 1: Rose Street/NC 42 & US 70 Business





Lane Group	SBR
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effect Green (s)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.70
Control Delay	2.6
Queue Delay	0.0
Total Delay	2.6
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1583
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.70
Intersection Summary	

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Buildout AM with Improvements
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	590	910	73	4	26	813	126	95	42	5	149	29
Future Volume (vph)	590	910	73	4	26	813	126	95	42	5	149	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	700		150		115		350	155		100	310	
Storage Lanes	1		1		1		1	1		1	1	
Taper Length (ft)	150				155			60			100	
Satd. Flow (prot)	3433	3539	1583	0	1770	3539	1583	1770	1863	1583	1681	1711
Flt Permitted	0.950				0.190			0.950			0.950	0.967
Satd. Flow (perm)	3433	3539	1583	0	354	3539	1583	1770	1863	1583	1681	1711
Right Turn on Red			No				Yes			No		
Satd. Flow (RTOR)							195					
Link Speed (mph)		45				45			25			45
Link Distance (ft)		971				934			464			686
Travel Time (s)		14.7				14.2			12.7			10.4
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
Shared Lane Traffic (%)											41%	
Lane Group Flow (vph)	656	1011	81	0	33	903	140	106	47	6	98	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			12			12
Link Offset(ft)		0				0			0			0
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Number of Detectors	1	1	0	1	1	1	0	1	1	1	1	1
Detector Template				Left								
Leading Detector (ft)	40	306	0	20	55	306	0	40	40	35	40	40
Trailing Detector (ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Position(ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Size(ft)	40	6	20	20	60	6	20	40	40	40	40	40
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	pm+ov	custom	Prot	NA	Perm	Split	NA	pm+ov	Split	NA
Protected Phases	5	2	3		1	6		3	3	1!	4	4
Permitted Phases			2	1!			6			3		
Detector Phase	5	2	3	1	1	6	6	3	3	1	4	4
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	14.0	19.0	19.0	14.0	14.0	14.0	19.0	19.0
Total Split (s)	42.0	73.0	20.0	26.0	26.0	57.0	57.0	20.0	20.0	26.0	21.0	21.0
Total Split (%)	30.0%	52.1%	14.3%	18.6%	18.6%	40.7%	40.7%	14.3%	14.3%	18.6%	15.0%	15.0%
Maximum Green (s)	35.0	66.0	13.0	19.0	19.0	50.0	50.0	13.0	13.0	19.0	14.0	14.0
Yellow Time (s)	5.0	5.0	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	2.0	2.0

Buckhorn Branch 01/28/2019 Buildout AM with Improvements
Exult

Synchro 10 Report
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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Buildout AM with Improvements
02/23/2019

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	1097
Future Volume (vph)	1097
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Right Turn on Red	Yes
Satd. Flow (RTOR)	493
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Shared Lane Traffic (%)	
Lane Group Flow (vph)	1219
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	0
Detector Template	
Leading Detector (ft)	0
Trailing Detector (ft)	0
Detector 1 Position(ft)	0
Detector 1 Size(ft)	20
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Turn Type	Free
Protected Phases	
Permitted Phases	Free
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	

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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Buildout AM with Improvements
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lost Time Adjust (s)	-2.0	-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	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	C-Min	Max	Max	Max	Min	Min	Max	Max	Max	Max	Max
Act Effect Green (s)	37.0	58.1	88.0		21.0	42.1	42.1	24.9	24.9	45.9	16.0	16.0
Actuated g/C Ratio	0.26	0.42	0.63		0.15	0.30	0.30	0.18	0.18	0.33	0.11	0.11
v/c Ratio	0.72	0.69	0.08		0.62	0.85	0.23	0.34	0.14	0.01	0.51	0.51
Control Delay	52.2	35.8	10.5		102.2	55.2	2.1	56.1	53.2	22.0	68.4	68.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	35.8	10.5		102.2	55.2	2.1	56.1	53.2	22.0	68.4	68.4
LOS	D	D	B		F	E	A	E	D	C	E	E
Approach Delay		40.8				49.7			54.0			12.7
Approach LOS		D				D			D			B
Queue Length 50th (ft)	281	392	27		29	409	0	86	37	3	89	91
Queue Length 95th (ft)	352	424	49		m#88	453	14	156	80	11	155	157
Internal Link Dist (ft)		891				854			384			606
Turn Bay Length (ft)	700		150		115		350	155		100	310	
Base Capacity (vph)	907	1718	995		53	1314	710	315	331	519	192	195
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.59	0.08		0.62	0.69	0.20	0.34	0.14	0.01	0.51	0.51

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 34.4

Intersection LOS: C

Intersection Capacity Utilization 63.7%

ICU Level of Service B

Analysis Period (min) 15

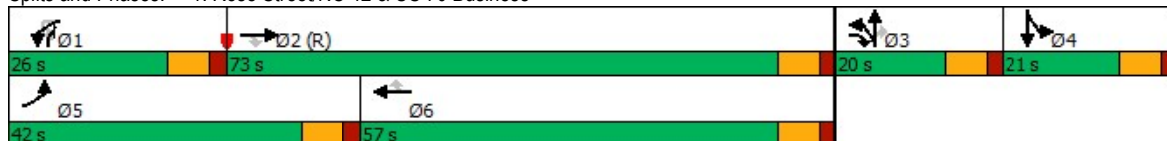
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 1: Rose Street/NC 42 & US 70 Business





Lane Group	SBR
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effect Green (s)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.77
Control Delay	3.7
Queue Delay	0.0
Total Delay	3.7
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1583
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.77
Intersection Summary	

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Buildout PM with Improvements
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	763	1078	107	5	38	1200	185	80	43	2	233	41
Future Volume (vph)	763	1078	107	5	38	1200	185	80	43	2	233	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	700		150		115		350	155		100	310	
Storage Lanes	1		1		1		1	1		1	1	
Taper Length (ft)	150				155			60			100	
Satd. Flow (prot)	3433	3539	1583	0	1770	3539	1583	1770	1863	1583	1681	1709
Flt Permitted	0.950				0.121			0.950			0.950	0.966
Satd. Flow (perm)	3433	3539	1583	0	225	3539	1583	1770	1863	1583	1681	1709
Right Turn on Red			No				Yes			No		
Satd. Flow (RTOR)							193					
Link Speed (mph)		45				45			25			45
Link Distance (ft)		971				934			464			686
Travel Time (s)		14.7				14.2			12.7			10.4
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
Shared Lane Traffic (%)											42%	
Lane Group Flow (vph)	848	1198	119	0	48	1333	206	89	48	2	150	155
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			12			12
Link Offset(ft)		0				0			0			0
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Number of Detectors	1	1	0	1	1	1	0	1	1	1	1	1
Detector Template				Left								
Leading Detector (ft)	40	306	0	20	55	306	0	40	40	35	40	40
Trailing Detector (ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Position(ft)	0	300	0	0	-5	300	0	0	0	-5	0	0
Detector 1 Size(ft)	40	6	20	20	60	6	20	40	40	40	40	40
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	pm+ov	custom	Prot	NA	Perm	Split	NA	pm+ov	Split	NA
Protected Phases	5	2	3		1	6		3	3	1!	4	4
Permitted Phases			2	1!			6			3		
Detector Phase	5	2	3	1	1	6	6	3	3	1	4	4
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	14.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	41.0	66.0	16.0	38.0	38.0	63.0	63.0	16.0	16.0	38.0	20.0	20.0
Total Split (%)	29.3%	47.1%	11.4%	27.1%	27.1%	45.0%	45.0%	11.4%	11.4%	27.1%	14.3%	14.3%
Maximum Green (s)	34.0	59.0	9.0	31.0	31.0	56.0	56.0	9.0	9.0	31.0	13.0	13.0
Yellow Time (s)	5.0	5.0	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	2.0	2.0

Buckhorn Branch 01/28/2019 Buildout PM with Improvements
Exult

Synchro 10 Report
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Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Buildout PM with Improvements
02/23/2019

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	995
Future Volume (vph)	995
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Right Turn on Red	Yes
Satd. Flow (RTOR)	468
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Shared Lane Traffic (%)	
Lane Group Flow (vph)	1106
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	0
Detector Template	
Leading Detector (ft)	0
Trailing Detector (ft)	0
Detector 1 Position(ft)	0
Detector 1 Size(ft)	20
Detector 1 Type	Cl+Ex
Detector 1 Channel	
Detector 1 Extend (s)	0.0
Detector 1 Queue (s)	0.0
Detector 1 Delay (s)	0.0
Turn Type	Free
Protected Phases	
Permitted Phases	Free
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	

Buckhorn Branch 01/28/2019 Buildout PM with Improvements
Exult

Synchro 10 Report
Page 2

Buckhorn Branch
1: Rose Street/NC 42 & US 70 Business

Buildout PM with Improvements
02/23/2019

												
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lost Time Adjust (s)	-2.0	-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	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	C-Min	Max	Max	Max	Min	Min	Max	Max	Max	Max	Max
Act Effct Green (s)	36.0	59.5	77.0		33.0	56.5	56.5	12.5	12.5	45.5	15.0	15.0
Actuated g/C Ratio	0.26	0.42	0.55		0.24	0.40	0.40	0.09	0.09	0.32	0.11	0.11
v/c Ratio	0.96	0.80	0.14		0.91	0.93	0.27	0.56	0.29	0.00	0.83	0.85
Control Delay	73.4	39.6	15.9		152.0	52.4	5.1	76.3	65.8	20.5	95.6	97.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	39.6	15.9		152.0	52.4	5.1	76.3	65.8	20.5	95.6	97.1
LOS	E	D	B		F	D	A	E	E	C	F	F
Approach Delay		51.6				49.3			71.9			22.9
Approach LOS		D				D			E			C
Queue Length 50th (ft)	394	483	51		43	594	7	80	42	1	143	148
Queue Length 95th (ft)	#526	574	85		#129	#708	56	#154	86	6	#272	#281
Internal Link Dist (ft)		891				854			384			606
Turn Bay Length (ft)	700		150		115		350	155		100	310	
Base Capacity (vph)	882	1541	870		53	1466	768	158	166	514	180	183
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.78	0.14		0.91	0.91	0.27	0.56	0.29	0.00	0.83	0.85

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 43.8

Intersection LOS: D

Intersection Capacity Utilization 81.6%

ICU Level of Service D

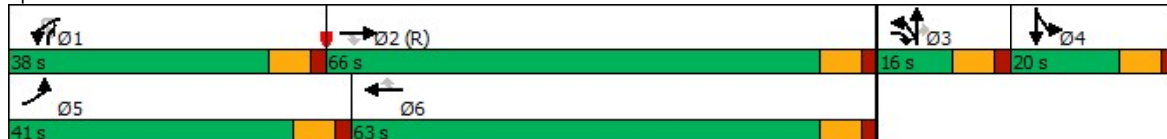
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

! Phase conflict between lane groups.

Splits and Phases: 1: Rose Street/NC 42 & US 70 Business





Lane Group	SBR
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effect Green (s)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.70
Control Delay	2.6
Queue Delay	0.0
Total Delay	2.6
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1583
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.70
Intersection Summary	

US 70 BUSINESS AT ASTOR STREET

Buckhorn Branch
2: Astor Street & US 70 Business

Existing AM - Under Construction
02/23/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	0	978	2	0	855	0	2
Future Volume (vph)	0	978	2	0	855	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160		0	140		0	0
Storage Lanes	1		0	1		1	0
Taper Length (ft)	225			130		50	
Satd. Flow (prot)	1827	3471	0	1827	3471	1580	0
Flt Permitted							
Satd. Flow (perm)	1827	3471	0	1827	3471	1580	0
Link Speed (mph)		45			45	25	
Link Distance (ft)		934			996	496	
Travel Time (s)		14.2			15.1	13.5	
Peak Hour Factor	0.91	0.91	0.91	0.89	0.89	0.50	0.50
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	1077	0	0	961	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	12	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Sign Control		Free			Free	Stop	
Intersection Summary							
Area Type:	Other						
Control Type:	Unsignalized						
Intersection Capacity Utilization	37.1%			ICU Level of Service A			
Analysis Period (min)	15						

Buckhorn Branch
2: Astor Street & US 70 Business

Existing AM - Under Construction
02/23/2019

Intersection							
Int Delay, s/veh	0						
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↕↕		↔	↕↕	↕↕	
Traffic Vol, veh/h	0	978	2	0	855	0	2
Future Vol, veh/h	0	978	2	0	855	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	None	-	None
Storage Length	160	-	-	140	-	0	-
Veh in Median Storage, #	-	0	-	-	0	0	-
Grade, %	-	0	-	-	0	0	-
Peak Hour Factor	91	91	91	89	89	50	50
Heavy Vehicles, %	4	4	4	4	4	4	4
Mvmt Flow	0	1075	2	0	961	0	4
Major/Minor	Major1		Major2		Minor1		
Conflicting Flow All	961	0	0	1077	0	1557	539
Stage 1	-	-	-	-	-	1076	-
Stage 2	-	-	-	-	-	481	-
Critical Hdwy	6.48	-	-	4.18	-	6.88	6.98
Critical Hdwy Stg 1	-	-	-	-	-	5.88	-
Critical Hdwy Stg 2	-	-	-	-	-	5.88	-
Follow-up Hdwy	2.54	-	-	2.24	-	3.54	3.34
Pot Cap-1 Maneuver	346	-	-	632	-	101	482
Stage 1	-	-	-	-	-	284	-
Stage 2	-	-	-	-	-	582	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	346	-	-	632	-	101	482
Mov Cap-2 Maneuver	-	-	-	-	-	101	-
Stage 1	-	-	-	-	-	284	-
Stage 2	-	-	-	-	-	582	-
Approach	EB		WB		NB		
HCM Control Delay, s	0		0		12.5		
HCM LOS					B		
Minor Lane/Major Mvmt	NBLn1	EBU	EBT	EBR	WBL	WBT	
Capacity (veh/h)	482	346	-	-	632	-	
HCM Lane V/C Ratio	0.008	-	-	-	-	-	
HCM Control Delay (s)	12.5	0	-	-	0	-	
HCM Lane LOS	B	A	-	-	A	-	
HCM 95th %tile Q(veh)	0	0	-	-	0	-	

Buckhorn Branch
2: Astor Street & US 70 Business

Existing PM - Under Construction
02/23/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	0	1202	0	0	1284	0	0
Future Volume (vph)	0	1202	0	0	1284	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160		0	140		0	0
Storage Lanes	1		0	1		1	0
Taper Length (ft)	225			130		50	
Satd. Flow (prot)	1863	3539	0	1863	3539	1863	0
Flt Permitted							
Satd. Flow (perm)	1863	3539	0	1863	3539	1863	0
Link Speed (mph)		45			45	25	
Link Distance (ft)		934			996	496	
Travel Time (s)		14.2			15.1	13.5	
Peak Hour Factor	0.93	0.93	0.93	0.85	0.85	0.90	0.90
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	1292	0	0	1511	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	12	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Sign Control		Free			Free	Stop	
Intersection Summary							
Area Type:	Other						
Control Type: Unsignalized							
Intersection Capacity Utilization 38.8%				ICU Level of Service A			
Analysis Period (min) 15							

Buckhorn Branch
2: Astor Street & US 70 Business

Existing PM - Under Construction
02/23/2019

Intersection							
Int Delay, s/veh	0						
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↕↕		↔	↕↕	↕↕	
Traffic Vol, veh/h	0	1202	0	0	1284	0	0
Future Vol, veh/h	0	1202	0	0	1284	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	None	-	None
Storage Length	160	-	-	140	-	0	-
Veh in Median Storage, #	-	0	-	-	0	0	-
Grade, %	-	0	-	-	0	0	-
Peak Hour Factor	93	93	93	85	85	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	0	1292	0	0	1511	0	0
Major/Minor	Major1			Major2		Minor1	
Conflicting Flow All	1511	0	0	1292	0	2048	646
Stage 1	-	-	-	-	-	1292	-
Stage 2	-	-	-	-	-	756	-
Critical Hdwy	6.44	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	-	5.84	-
Follow-up Hdwy	2.52	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	155	-	-	532	-	48	414
Stage 1	-	-	-	-	-	221	-
Stage 2	-	-	-	-	-	424	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	155	-	-	532	-	48	414
Mov Cap-2 Maneuver	-	-	-	-	-	48	-
Stage 1	-	-	-	-	-	221	-
Stage 2	-	-	-	-	-	424	-
Approach	EB			WB		NB	
HCM Control Delay, s	0			0		0	
HCM LOS						A	
Minor Lane/Major Mvmt	NBLn1	EBU	EBT	EBR	WBL	WBT	
Capacity (veh/h)	-	155	-	-	532	-	
HCM Lane V/C Ratio	-	-	-	-	-	-	
HCM Control Delay (s)	0	0	-	-	0	-	
HCM Lane LOS	A	A	-	-	A	-	
HCM 95th %tile Q(veh)	-	0	-	-	0	-	

Buckhorn Branch
2: Astor Street & US 70 Business

Existing AM - With TIP
02/23/2019

							
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	976	2	2	2	851	0	2
Future Volume (vph)	976	2	2	2	851	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		180		0	0
Storage Lanes		0		1		0	1
Taper Length (ft)				130		50	
Satd. Flow (prot)	3471	0	0	1736	3471	0	1580
Flt Permitted				0.950			
Satd. Flow (perm)	3471	0	0	1736	3471	0	1580
Link Speed (mph)	45				45	25	
Link Distance (ft)	934				996	496	
Travel Time (s)	14.2				15.1	13.5	
Peak Hour Factor	0.91	0.91	0.89	0.89	0.89	0.50	0.50
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1075	0	0	4	956	0	4
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Sign Control	Free				Free	Stop	
Intersection Summary							
Area Type:	Other						
Control Type:	Unsignalized						
Intersection Capacity Utilization	37.0%			ICU Level of Service A			
Analysis Period (min)	15						

Buckhorn Branch
2: Astor Street & US 70 Business

Existing AM - With TIP
02/23/2019

Intersection							
Int Delay, s/veh	0.1						
Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↓	↑↑		↑
Traffic Vol, veh/h	976	2	2	2	851	0	2
Future Vol, veh/h	976	2	2	2	851	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	180	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	91	91	89	89	89	50	50
Heavy Vehicles, %	4	4	4	4	4	4	4
Mvmt Flow	1073	2	2	2	956	0	4
Major/Minor	Major1		Major2		Minor1		
Conflicting Flow All	0	0	1075	1075	0	-	538
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.48	4.18	-	-	6.98
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.54	2.24	-	-	3.34
Pot Cap-1 Maneuver	-	-	292	633	-	0	482
Stage 1	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	0	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	399	399	-	-	482
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Approach	EB		WB		NB		
HCM Control Delay, s	0		0.1		12.5		
HCM LOS					B		
Minor Lane/Major Mvmt	NBLn1		EBT	EBR	WBL	WBT	
Capacity (veh/h)	482		-	-	399	-	
HCM Lane V/C Ratio	0.008		-	-	0.011	-	
HCM Control Delay (s)	12.5		-	-	14.1	-	
HCM Lane LOS	B		-	-	B	-	
HCM 95th %tile Q(veh)	0		-	-	0	-	

Buckhorn Branch
2: Astor Street & US 70 Business

Existing PM - With TIP
02/23/2019

							
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	1199	0	3	5	1276	0	0
Future Volume (vph)	1199	0	3	5	1276	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		180		0	0
Storage Lanes		0		1		0	1
Taper Length (ft)				130		50	
Satd. Flow (prot)	3539	0	0	1770	3539	0	1863
Flt Permitted				0.950			
Satd. Flow (perm)	3539	0	0	1770	3539	0	1863
Link Speed (mph)	45				45	25	
Link Distance (ft)	934				996	496	
Travel Time (s)	14.2				15.1	13.5	
Peak Hour Factor	0.93	0.93	0.85	0.85	0.85	0.90	0.90
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1289	0	0	10	1501	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Sign Control	Free				Free	Stop	
Intersection Summary							
Area Type:	Other						
Control Type: Unsignalized							
Intersection Capacity Utilization 38.6%				ICU Level of Service A			
Analysis Period (min) 15							

Buckhorn Branch
2: Astor Street & US 70 Business

Existing PM - With TIP
02/23/2019

Intersection							
Int Delay, s/veh	0.1						
Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↓	↑↑		↑
Traffic Vol, veh/h	1199	0	3	5	1276	0	0
Future Vol, veh/h	1199	0	3	5	1276	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	180	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	93	93	85	85	85	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	1289	0	4	6	1501	0	0
Major/Minor	Major1		Major2		Minor1		
Conflicting Flow All	0	0	1289	1289	0	-	645
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.44	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.52	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	216	534	-	0	415
Stage 1	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	0	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	344	344	-	-	415
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Approach	EB		WB		NB		
HCM Control Delay, s	0		0.1		0		
HCM LOS					A		
Minor Lane/Major Mvmt	NBLn1		EBT	EBR	WBL	WBT	
Capacity (veh/h)	-		-	-	344	-	
HCM Lane V/C Ratio	-		-	-	0.027	-	
HCM Control Delay (s)	0		-	-	15.8	-	
HCM Lane LOS	A		-	-	C	-	
HCM 95th %tile Q(veh)	-		-	-	0.1	-	

Buckhorn Branch
2: Astor Street & US 70 Business

Background AM
02/23/2019

							
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	1057	3	3	3	922	0	3
Future Volume (vph)	1057	3	3	3	922	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		180		0	0
Storage Lanes		0		1		0	1
Taper Length (ft)				130		50	
Satd. Flow (prot)	3539	0	0	1770	3539	0	1611
Flt Permitted				0.950			
Satd. Flow (perm)	3539	0	0	1770	3539	0	1611
Link Speed (mph)	45				45	25	
Link Distance (ft)	934				996	496	
Travel Time (s)	14.2				15.1	13.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1177	0	0	6	1024	0	3
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Sign Control	Free				Free	Stop	
Intersection Summary							
Area Type:	Other						
Control Type: Unsignalized							
Intersection Capacity Utilization 39.3%				ICU Level of Service A			
Analysis Period (min) 15							

Buckhorn Branch
2: Astor Street & US 70 Business

Background AM
02/23/2019

Intersection							
Int Delay, s/veh	0.1						
Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↓	↑↑		↑
Traffic Vol, veh/h	1057	3	3	3	922	0	3
Future Vol, veh/h	1057	3	3	3	922	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	180	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	1174	3	3	3	1024	0	3
Major/Minor	Major1		Major2		Minor1		
Conflicting Flow All	0	0	1178	1177	0	-	589
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.44	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.52	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	255	589	-	0	452
Stage 1	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	354	354	-	-	452
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Approach	EB		WB		NB		
HCM Control Delay, s	0		0.1		13		
HCM LOS					B		
Minor Lane/Major Mvmt	NBLn1		EBT	EBR	WBL	WBT	
Capacity (veh/h)	452		-	-	354	-	
HCM Lane V/C Ratio	0.007		-	-	0.019	-	
HCM Control Delay (s)	13		-	-	15.4	-	
HCM Lane LOS	B		-	-	C	-	
HCM 95th %tile Q(veh)	0		-	-	0.1	-	

Buckhorn Branch
2: Astor Street & US 70 Business

Background PM
02/23/2019

							
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	1298	0	4	6	1382	0	0
Future Volume (vph)	1298	0	4	6	1382	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		180		0	0
Storage Lanes		0		1		0	1
Taper Length (ft)				130		50	
Satd. Flow (prot)	3539	0	0	1770	3539	0	1863
Flt Permitted				0.950			
Satd. Flow (perm)	3539	0	0	1770	3539	0	1863
Link Speed (mph)	45				45	25	
Link Distance (ft)	934				996	496	
Travel Time (s)	14.2				15.1	13.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1442	0	0	11	1536	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Sign Control	Free				Free	Stop	
Intersection Summary							
Area Type:	Other						
Control Type: Unsignalized							
Intersection Capacity Utilization 41.5%				ICU Level of Service A			
Analysis Period (min) 15							

Buckhorn Branch
2: Astor Street & US 70 Business

Background PM
02/23/2019

Intersection							
Int Delay, s/veh	0.1						
Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↔	↑↑		↗
Traffic Vol, veh/h	1298	0	4	6	1382	0	0
Future Vol, veh/h	1298	0	4	6	1382	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	180	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	1442	0	4	7	1536	0	0
Major/Minor	Major1	Major2		Minor1			
Conflicting Flow All	0	0	1442	1442	0	-	721
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.44	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.52	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	172	466	-	0	370
Stage 1	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	0	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	277	277	-	-	370
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Approach	EB	WB		NB			
HCM Control Delay, s	0	0.1		0			
HCM LOS	A						
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT		
Capacity (veh/h)	-	-	-	277	-		
HCM Lane V/C Ratio	-	-	-	0.04	-		
HCM Control Delay (s)	0	-	-	18.6	-		
HCM Lane LOS	A	-	-	C	-		
HCM 95th %tile Q(veh)	-	-	-	0.1	-		

Buckhorn Branch
2: Astor Street & US 70 Business

Buildout AM with Improvements
02/23/2019

							
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	1072	3	8	9	967	0	27
Future Volume (vph)	1072	3	8	9	967	0	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		180		0	0
Storage Lanes		0		1		0	1
Taper Length (ft)				130		50	
Satd. Flow (prot)	3539	0	0	1770	3539	0	1611
Flt Permitted				0.950			
Satd. Flow (perm)	3539	0	0	1770	3539	0	1611
Link Speed (mph)	45				45	25	
Link Distance (ft)	934				996	496	
Travel Time (s)	14.2				15.1	13.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1194	0	0	19	1074	0	30
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Sign Control	Free				Free	Stop	
Intersection Summary							
Area Type:	Other						
Control Type: Unsignalized							
Intersection Capacity Utilization 39.7%				ICU Level of Service A			
Analysis Period (min) 15							

Buckhorn Branch
2: Astor Street & US 70 Business

Buildout AM with Improvements
02/23/2019

Intersection							
Int Delay, s/veh	0.3						
Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↓	↑↑		↑
Traffic Vol, veh/h	1072	3	8	9	967	0	27
Future Vol, veh/h	1072	3	8	9	967	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	180	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	1191	3	9	10	1074	0	30
Major/Minor	Major1	Major2		Minor1			
Conflicting Flow All	0	0	1194	1194	0	-	597
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.44	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.52	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	249	580	-	0	446
Stage 1	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	0	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	342	342	-	-	446
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Approach	EB	WB		NB			
HCM Control Delay, s	0	0.3		13.7			
HCM LOS				B			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT		
Capacity (veh/h)	446	-	-	342	-		
HCM Lane V/C Ratio	0.067	-	-	0.055	-		
HCM Control Delay (s)	13.7	-	-	16.1	-		
HCM Lane LOS	B	-	-	C	-		
HCM 95th %tile Q(veh)	0.2	-	-	0.2	-		

Buckhorn Branch
2: Astor Street & US 70 Business

Buildout PM with Improvements
02/23/2019

							
Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	1350	0	21	23	1426	0	16
Future Volume (vph)	1350	0	21	23	1426	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		180		0	0
Storage Lanes		0		1		0	1
Taper Length (ft)				130		50	
Satd. Flow (prot)	3539	0	0	1770	3539	0	1611
Flt Permitted				0.950			
Satd. Flow (perm)	3539	0	0	1770	3539	0	1611
Link Speed (mph)	45				45	25	
Link Distance (ft)	934				996	496	
Travel Time (s)	14.2				15.1	13.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1500	0	0	49	1584	0	18
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	12				12	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Sign Control	Free				Free	Stop	
Intersection Summary							
Area Type:	Other						
Control Type: Unsignalized							
Intersection Capacity Utilization 49.4%				ICU Level of Service A			
Analysis Period (min) 15							

Buckhorn Branch
2: Astor Street & US 70 Business

Buildout PM with Improvements
02/23/2019

Intersection							
Int Delay, s/veh	0.5						
Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↓	↑↑		↑
Traffic Vol, veh/h	1350	0	21	23	1426	0	16
Future Vol, veh/h	1350	0	21	23	1426	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	180	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	1500	0	23	26	1584	0	18
Major/Minor	Major1		Major2		Minor1		
Conflicting Flow All	0	0	1500	1500	0	-	750
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.44	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.52	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	158	443	-	0	354
Stage 1	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	0	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	230	230	-	-	354
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Approach	EB		WB		NB		
HCM Control Delay, s	0		0.7		15.7		
HCM LOS					C		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT		
Capacity (veh/h)	354	-	-	230	-		
HCM Lane V/C Ratio	0.05	-	-	0.213	-		
HCM Control Delay (s)	15.7	-	-	24.8	-		
HCM Lane LOS	C	-	-	C	-		
HCM 95th %tile Q(veh)	0.2	-	-	0.8	-		

US 70 BUSINESS AT WILDWOOD DRIVE

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Existing AM - Under Construction
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Traffic Volume (vph)	982	0	0	866	0	6
Future Volume (vph)	982	0	0	866	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			50		50	
Satd. Flow (prot)	4988	0	0	3471	0	1580
Flt Permitted						
Satd. Flow (perm)	4988	0	0	3471	0	1580
Link Speed (mph)	45			45	25	
Link Distance (ft)	996			83	265	
Travel Time (s)	15.1			1.3	7.2	
Peak Hour Factor	0.90	0.90	0.93	0.93	0.75	0.75
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1091	0	0	931	0	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	29.0%			ICU Level of Service A		
Analysis Period (min)	15					

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Existing AM - Under Construction
02/23/2019

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↗
Traffic Vol, veh/h	982	0	0	866	0	6
Future Vol, veh/h	982	0	0	866	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	93	93	75	75
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	1091	0	0	931	0	8
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	546
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.18
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.94
Pot Cap-1 Maneuver	-	-	0	-	0	408
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	408
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		14		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	408	-	-	-		
HCM Lane V/C Ratio	0.02	-	-	-		
HCM Control Delay (s)	14	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0.1	-	-	-		

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Existing PM - Under Construction
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Traffic Volume (vph)	1177	5	0	1285	0	1
Future Volume (vph)	1177	5	0	1285	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			50		50	
Satd. Flow (prot)	5080	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	5080	0	0	3539	0	1611
Link Speed (mph)	45			45	25	
Link Distance (ft)	996			83	265	
Travel Time (s)	15.1			1.3	7.2	
Peak Hour Factor	0.94	0.94	0.84	0.84	0.50	0.50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1257	0	0	1530	0	2
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 38.9%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Existing PM - Under Construction
02/23/2019

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↗
Traffic Vol, veh/h	1177	5	0	1285	0	1
Future Vol, veh/h	1177	5	0	1285	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	84	84	50	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1252	5	0	1530	0	2
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	629
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	364
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	364
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		14.9		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	364	-	-	-		
HCM Lane V/C Ratio	0.005	-	-	-		
HCM Control Delay (s)	14.9	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0	-	-	-		

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Existing AM - With TIP
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Traffic Volume (vph)	982	0	0	866	0	6
Future Volume (vph)	982	0	0	866	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			50		50	
Satd. Flow (prot)	4988	0	0	3471	0	1580
Flt Permitted						
Satd. Flow (perm)	4988	0	0	3471	0	1580
Link Speed (mph)	45			45	25	
Link Distance (ft)	996			83	265	
Travel Time (s)	15.1			1.3	7.2	
Peak Hour Factor	0.90	0.90	0.93	0.93	0.75	0.75
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1091	0	0	931	0	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	29.0%			ICU Level of Service A		
Analysis Period (min)	15					

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Existing AM - With TIP
02/23/2019

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↗
Traffic Vol, veh/h	982	0	0	866	0	6
Future Vol, veh/h	982	0	0	866	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	93	93	75	75
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	1091	0	0	931	0	8
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	546
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.18
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.94
Pot Cap-1 Maneuver	-	-	0	-	0	408
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	408
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		14		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	408	-	-	-		
HCM Lane V/C Ratio	0.02	-	-	-		
HCM Control Delay (s)	14	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0.1	-	-	-		

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Existing PM - With TIP
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Traffic Volume (vph)	1177	5	0	1285	0	1
Future Volume (vph)	1177	5	0	1285	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			50		50	
Satd. Flow (prot)	5080	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	5080	0	0	3539	0	1611
Link Speed (mph)	45			45	25	
Link Distance (ft)	996			83	265	
Travel Time (s)	15.1			1.3	7.2	
Peak Hour Factor	0.94	0.94	0.84	0.84	0.50	0.50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1257	0	0	1530	0	2
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 38.9%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Existing PM - With TIP
02/23/2019

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Traffic Vol, veh/h	1177	5	0	1285	0	1
Future Vol, veh/h	1177	5	0	1285	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	84	84	50	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1252	5	0	1530	0	2
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	629
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	364
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	364
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		14.9		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	364	-	-	-		
HCM Lane V/C Ratio	0.005	-	-	-		
HCM Control Delay (s)	14.9	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0	-	-	-		

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Background AM
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↗			↑↑		↗
Traffic Volume (vph)	1063	0	0	938	0	7
Future Volume (vph)	1063	0	0	938	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			50		50	
Satd. Flow (prot)	5085	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	5085	0	0	3539	0	1611
Link Speed (mph)	45			45	25	
Link Distance (ft)	996			83	265	
Travel Time (s)	15.1			1.3	7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1181	0	0	1042	0	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 30.5%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Background AM
02/23/2019

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Traffic Vol, veh/h	1063	0	0	938	0	7
Future Vol, veh/h	1063	0	0	938	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	1181	0	0	1042	0	8
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	591
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	386
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	386
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		14.5		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	386	-	-	-		
HCM Lane V/C Ratio	0.02	-	-	-		
HCM Control Delay (s)	14.5	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0.1	-	-	-		

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Background PM
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↗
Traffic Volume (vph)	1275	6	0	1391	0	2
Future Volume (vph)	1275	6	0	1391	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			50		50	
Satd. Flow (prot)	5080	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	5080	0	0	3539	0	1611
Link Speed (mph)	45			45	25	
Link Distance (ft)	996			83	265	
Travel Time (s)	15.1			1.3	7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1424	0	0	1546	0	2
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 41.8%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Background PM
02/23/2019

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Traffic Vol, veh/h	1275	6	0	1391	0	2
Future Vol, veh/h	1275	6	0	1391	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	1417	7	0	1546	0	2
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	712
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	322
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	322
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		16.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	322	-	-	-		
HCM Lane V/C Ratio	0.007	-	-	-		
HCM Control Delay (s)	16.3	-	-	-		
HCM Lane LOS	C	-	-	-		
HCM 95th %tile Q(veh)	0	-	-	-		

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Buildout AM
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Traffic Volume (vph)	1087	20	0	994	0	70
Future Volume (vph)	1087	20	0	994	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			50		50	
Satd. Flow (prot)	5070	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	5070	0	0	3539	0	1611
Link Speed (mph)	45			45	25	
Link Distance (ft)	996			83	265	
Travel Time (s)	15.1			1.3	7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1230	0	0	1104	0	78
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 32.4%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Buildout AM
02/23/2019

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Traffic Vol, veh/h	1087	20	0	994	0	70
Future Vol, veh/h	1087	20	0	994	0	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	1208	22	0	1104	0	78
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	615
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	372
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	372
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		17.2		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	372	-	-	-		
HCM Lane V/C Ratio	0.209	-	-	-		
HCM Control Delay (s)	17.2	-	-	-		
HCM Lane LOS	C	-	-	-		
HCM 95th %tile Q(veh)	0.8	-	-	-		

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Buildout PM
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↓			↑↑		↑
Traffic Volume (vph)	1291	75	0	1469	0	42
Future Volume (vph)	1291	75	0	1469	0	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			50		50	
Satd. Flow (prot)	5045	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	5045	0	0	3539	0	1611
Link Speed (mph)	45			45	25	
Link Distance (ft)	996			83	265	
Travel Time (s)	15.1			1.3	7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1517	0	0	1632	0	47
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 43.9%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Buildout PM
02/23/2019

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Traffic Vol, veh/h	1291	75	0	1469	0	42
Future Vol, veh/h	1291	75	0	1469	0	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	1434	83	0	1632	0	47
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	759
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	300
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	300
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		19.2		
HCM LOS				C		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	300	-	-	-		
HCM Lane V/C Ratio	0.156	-	-	-		
HCM Control Delay (s)	19.2	-	-	-		
HCM Lane LOS	C	-	-	-		
HCM 95th %tile Q(veh)	0.5	-	-	-		

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Buildout AM with Improvements
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑	↑		↑↑		↑
Traffic Volume (vph)	1087	20	0	994	0	70
Future Volume (vph)	1087	20	0	994	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	0		0	0
Storage Lanes		1	0		0	1
Taper Length (ft)			50		50	
Satd. Flow (prot)	5085	1583	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	5085	1583	0	3539	0	1611
Link Speed (mph)	45			45	25	
Link Distance (ft)	996			83	265	
Travel Time (s)	15.1			1.3	7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1208	22	0	1104	0	78
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 32.0%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Buildout AM with Improvements
02/23/2019

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↗		↑↑		↗
Traffic Vol, veh/h	1087	20	0	994	0	70
Future Vol, veh/h	1087	20	0	994	0	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	50	-	-	-	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	1208	22	0	1104	0	78
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	604
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	378
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	378
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		17		
HCM LOS				C		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	378	-	-	-		
HCM Lane V/C Ratio	0.206	-	-	-		
HCM Control Delay (s)	17	-	-	-		
HCM Lane LOS	C	-	-	-		
HCM 95th %tile Q(veh)	0.8	-	-	-		

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Buildout PM with Improvements
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑	↗		↑↑		↗
Traffic Volume (vph)	1291	75	0	1469	0	42
Future Volume (vph)	1291	75	0	1469	0	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	0		0	0
Storage Lanes		1	0		0	1
Taper Length (ft)			50		50	
Satd. Flow (prot)	5085	1583	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	5085	1583	0	3539	0	1611
Link Speed (mph)	45			45	25	
Link Distance (ft)	996			83	265	
Travel Time (s)	15.1			1.3	7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1434	83	0	1632	0	47
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.9%			ICU Level of Service A		
Analysis Period (min)	15					

Buckhorn Branch
3: Wildwood Drive & US 70 Business

Buildout PM with Improvements
02/23/2019

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↗		↑↑		↗
Traffic Vol, veh/h	1291	75	0	1469	0	42
Future Vol, veh/h	1291	75	0	1469	0	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	50	-	-	-	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	1434	83	0	1632	0	47
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	717
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	319
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	319
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		18.2		
HCM LOS				C		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	319	-	-	-		
HCM Lane V/C Ratio	0.146	-	-	-		
HCM Control Delay (s)	18.2	-	-	-		
HCM Lane LOS	C	-	-	-		
HCM 95th %tile Q(veh)	0.5	-	-	-		

**US 70 BUSINESS AT MEDIAN OPENING EAST OF WILDWOOD
DRIVE**

Buckhorn Branch
4: Median Break E. of Wildwood & US 70 Business

Existing AM - Under Construction
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NEL	NER
Lane Configurations								
Traffic Volume (vph)	0	988	0	0	0	866	0	0
Future Volume (vph)	0	988	0	0	0	866	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		125		0	0
Storage Lanes	1		0		1		0	0
Taper Length (ft)	225				175		50	
Satd. Flow (prot)	1827	3471	0	1827	0	3471	0	0
Flt Permitted								
Satd. Flow (perm)	1827	3471	0	1827	0	3471	0	0
Link Speed (mph)		45				45	25	
Link Distance (ft)		83				1607	67	
Travel Time (s)		1.3				24.3	1.8	
Peak Hour Factor	0.90	0.90	0.90	0.93	0.93	0.93	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	1098	0	0	0	931	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	0	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 30.6%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
4: Median Break E. of Wildwood & US 70 Business

Existing PM - Under Construction
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NEL	NER
Lane Configurations		 				 		
Traffic Volume (vph)	0	1178	0	0	0	1285	0	0
Future Volume (vph)	0	1178	0	0	0	1285	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		125		0	0
Storage Lanes	1		0		1		0	0
Taper Length (ft)	225				175		50	
Satd. Flow (prot)	1863	3539	0	1863	0	3539	0	0
Flt Permitted								
Satd. Flow (perm)	1863	3539	0	1863	0	3539	0	0
Link Speed (mph)		45				45	25	
Link Distance (ft)		83				1607	67	
Travel Time (s)		1.3				24.3	1.8	
Peak Hour Factor	0.94	0.94	0.94	0.84	0.84	0.84	0.90	0.90
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	1253	0	0	0	1530	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	0	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 38.9%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
4: Median Break E. of Wildwood & US 70 Business

Existing AM - With TIP
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NEL	NER
Lane Configurations								
Traffic Volume (vph)	14	974	0	5	0	852	0	0
Future Volume (vph)	14	974	0	5	0	852	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		185		0	0
Storage Lanes	1		0		1		0	0
Taper Length (ft)	225				175		50	
Satd. Flow (prot)	1736	3471	0	1736	0	3471	0	0
Flt Permitted	0.950			0.950				
Satd. Flow (perm)	1736	3471	0	1736	0	3471	0	0
Link Speed (mph)		45				45	25	
Link Distance (ft)		83				1607	67	
Travel Time (s)		1.3				24.3	1.8	
Peak Hour Factor	0.90	0.90	0.90	0.93	0.93	0.93	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)								
Lane Group Flow (vph)	16	1082	0	5	0	916	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	0	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 30.3%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
4: Median Break E. of Wildwood & US 70 Business

Existing PM - With TIP
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NEL	NER
Lane Configurations		 				 		
Traffic Volume (vph)	5	1173	0	5	0	1280	0	0
Future Volume (vph)	5	1173	0	5	0	1280	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		185		0	0
Storage Lanes	1		0		1		0	0
Taper Length (ft)	225				175		50	
Satd. Flow (prot)	1770	3539	0	1770	0	3539	0	0
Flt Permitted	0.950			0.950				
Satd. Flow (perm)	1770	3539	0	1770	0	3539	0	0
Link Speed (mph)		45				45	25	
Link Distance (ft)		83				1607	67	
Travel Time (s)		1.3				24.3	1.8	
Peak Hour Factor	0.94	0.94	0.94	0.84	0.84	0.84	0.90	0.90
Shared Lane Traffic (%)								
Lane Group Flow (vph)	5	1248	0	6	0	1524	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	0	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 38.7%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
4: Median Break E. of Wildwood & US 70 Business

Background AM
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NEL	NER
Lane Configurations		 				 		
Traffic Volume (vph)	16	1055	0	6	0	923	0	0
Future Volume (vph)	16	1055	0	6	0	923	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		185		0	0
Storage Lanes	1		0		1		0	0
Taper Length (ft)	225				175		50	
Satd. Flow (prot)	1770	3539	0	1770	0	3539	0	0
Flt Permitted	0.950			0.950				
Satd. Flow (perm)	1770	3539	0	1770	0	3539	0	0
Link Speed (mph)		45				45	25	
Link Distance (ft)		83				1607	67	
Travel Time (s)		1.3				24.3	1.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)								
Lane Group Flow (vph)	18	1172	0	7	0	1026	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	0	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 32.5%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
4: Median Break E. of Wildwood & US 70 Business

Background PM
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NEL	NER
Lane Configurations								
Traffic Volume (vph)	6	1270	0	6	0	1386	0	0
Future Volume (vph)	6	1270	0	6	0	1386	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		185		0	0
Storage Lanes	1		0		1		0	0
Taper Length (ft)	225				175		50	
Satd. Flow (prot)	1770	3539	0	1770	0	3539	0	0
Flt Permitted	0.950			0.950				
Satd. Flow (perm)	1770	3539	0	1770	0	3539	0	0
Link Speed (mph)		45				45	25	
Link Distance (ft)		83				1607	67	
Travel Time (s)		1.3				24.3	1.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)								
Lane Group Flow (vph)	7	1411	0	7	0	1540	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	0	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 41.6%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
4: Median Break E. of Wildwood & US 70 Business

Buildout AM with Improvements
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NEL	NER
Lane Configurations		 				 		
Traffic Volume (vph)	35	1123	0	6	0	960	0	0
Future Volume (vph)	35	1123	0	6	0	960	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		185		0	0
Storage Lanes	1		0		1		0	0
Taper Length (ft)	225				175		50	
Satd. Flow (prot)	1770	3539	0	1770	0	3539	0	0
Flt Permitted	0.950			0.950				
Satd. Flow (perm)	1770	3539	0	1770	0	3539	0	0
Link Speed (mph)		45				45	25	
Link Distance (ft)		83				1607	67	
Travel Time (s)		1.3				24.3	1.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)								
Lane Group Flow (vph)	39	1248	0	7	0	1067	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	0	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 34.4%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
4: Median Break E. of Wildwood & US 70 Business

Buildout PM with Improvements
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NEL	NER
Lane Configurations		 				 		
Traffic Volume (vph)	18	1314	0	6	0	1452	0	0
Future Volume (vph)	18	1314	0	6	0	1452	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		185		0	0
Storage Lanes	1		0		1		0	0
Taper Length (ft)	225				175		50	
Satd. Flow (prot)	1770	3539	0	1770	0	3539	0	0
Flt Permitted	0.950			0.950				
Satd. Flow (perm)	1770	3539	0	1770	0	3539	0	0
Link Speed (mph)		45				45	25	
Link Distance (ft)		83				1607	67	
Travel Time (s)		1.3				24.3	1.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)								
Lane Group Flow (vph)	20	1460	0	7	0	1613	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	0	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 43.5%				ICU Level of Service A				
Analysis Period (min) 15								

US 70 BUSINESS AT HARDEE LANE

Buckhorn Branch
5: Hardee Lane & US 70 Business

Existing AM - Under Construction
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations								
Traffic Volume (vph)	28	950	19	1	15	805	22	9
Future Volume (vph)	28	950	19	1	15	805	22	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		210		220		0	50
Storage Lanes	1		1		1		1	1
Taper Length (ft)	240				95		50	
Satd. Flow (prot)	1719	3438	1538	0	1719	3438	1719	1538
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1719	3438	1538	0	1719	3438	1719	1538
Link Speed (mph)		45				55	25	
Link Distance (ft)		1607				727	497	
Travel Time (s)		24.3				9.0	13.6	
Peak Hour Factor	0.90	0.90	0.90	0.88	0.88	0.88	0.70	0.70
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)								
Lane Group Flow (vph)	31	1056	21	0	18	915	31	13
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	12	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type:	Unsignalized							
Intersection Capacity Utilization	36.3%				ICU Level of Service A			
Analysis Period (min)	15							

Buckhorn Branch
5: Hardee Lane & US 70 Business

Existing AM - Under Construction
02/23/2019

Intersection								
Int Delay, s/veh	1.5							
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↔	↑↑	↗		↖	↑↑	↗	↖
Traffic Vol, veh/h	28	950	19	1	15	805	22	9
Future Vol, veh/h	28	950	19	1	15	805	22	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	110	-	210	-	220	-	0	50
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	88	88	88	70	70
Heavy Vehicles, %	5	5	5	5	5	5	5	5
Mvmt Flow	31	1056	21	1	17	915	31	13
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	915	0	0	1056	1077	0	1612	528
Stage 1	-	-	-	-	-	-	1118	-
Stage 2	-	-	-	-	-	-	494	-
Critical Hdwy	6.5	-	-	6.5	4.2	-	6.9	7
Critical Hdwy Stg 1	-	-	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.9	-
Follow-up Hdwy	2.55	-	-	2.55	2.25	-	3.55	3.35
Pot Cap-1 Maneuver	368	-	-	298	626	-	92	487
Stage 1	-	-	-	-	-	-	268	-
Stage 2	-	-	-	-	-	-	570	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	368	-	-	584	584	-	82	487
Mov Cap-2 Maneuver	-	-	-	-	-	-	82	-
Stage 1	-	-	-	-	-	-	238	-
Stage 2	-	-	-	-	-	-	570	-
Approach	EB		WB		NB			
HCM Control Delay, s	0.4		0.2		56.1			
HCM LOS					F			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBU	EBT	EBR	WBL	WBT	
Capacity (veh/h)	82	487	368	-	-	584	-	
HCM Lane V/C Ratio	0.383	0.026	0.085	-	-	0.031	-	
HCM Control Delay (s)	73.9	12.6	15.7	-	-	11.4	-	
HCM Lane LOS	F	B	C	-	-	B	-	
HCM 95th %tile Q(veh)	1.5	0.1	0.3	-	-	0.1	-	

Buckhorn Branch
5: Hardee Lane & US 70 Business

Existing PM - Under Construction
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations								
Traffic Volume (vph)	10	1104	48	1	26	1243	34	24
Future Volume (vph)	10	1104	48	1	26	1243	34	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		210		220		0	50
Storage Lanes	1		1		1		1	1
Taper Length (ft)	240				95		50	
Satd. Flow (prot)	1770	3539	1583	0	1770	3539	1770	1583
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	0	1770	3539	1770	1583
Link Speed (mph)		45				55	25	
Link Distance (ft)		1607				727	497	
Travel Time (s)		24.3				9.0	13.6	
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.68	0.68
Shared Lane Traffic (%)								
Lane Group Flow (vph)	11	1162	51	0	32	1480	50	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	12	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type:	Unsignalized							
Intersection Capacity Utilization	44.4%				ICU Level of Service A			
Analysis Period (min)	15							

Buckhorn Branch
5: Hardee Lane & US 70 Business

Existing PM - Under Construction
02/23/2019

Intersection								
Int Delay, s/veh	5.7							
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↔	↑↑	↗		↖	↑↑	↗	↖
Traffic Vol, veh/h	10	1104	48	1	26	1243	34	24
Future Vol, veh/h	10	1104	48	1	26	1243	34	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	110	-	210	-	220	-	0	50
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	95	95	95	84	84	84	68	68
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	11	1162	51	1	31	1480	50	35
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	1480	0	0	1162	1213	0	1988	581
Stage 1	-	-	-	-	-	-	1184	-
Stage 2	-	-	-	-	-	-	804	-
Critical Hdwy	6.44	-	-	6.44	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.84	-
Follow-up Hdwy	2.52	-	-	2.52	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	162	-	-	261	571	-	53	457
Stage 1	-	-	-	-	-	-	253	-
Stage 2	-	-	-	-	-	-	401	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	162	-	-	545	545	-	~ 46	457
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 46	-
Stage 1	-	-	-	-	-	-	222	-
Stage 2	-	-	-	-	-	-	401	-
Approach	EB		WB		NB			
HCM Control Delay, s	0.2		0.3		181.2			
HCM LOS					F			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBU	EBT	EBR	WBL	WBT	
Capacity (veh/h)	46	457	162	-	-	545	-	
HCM Lane V/C Ratio	1.087	0.077	0.065	-	-	0.059	-	
HCM Control Delay (s)	299.5	13.5	28.8	-	-	12	-	
HCM Lane LOS	F	B	D	-	-	B	-	
HCM 95th %tile Q(veh)	4.6	0.2	0.2	-	-	0.2	-	
Notes								
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon								

Buckhorn Branch
5: Hardee Lane & US 70 Business

Existing AM - With TIP
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations								
Traffic Volume (vph)	14	950	19	1	15	805	22	9
Future Volume (vph)	14	950	19	1	15	805	22	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		210		220		0	50
Storage Lanes	1		1		1		1	1
Taper Length (ft)	240				95		50	
Satd. Flow (prot)	1719	3438	1538	0	1719	3438	1719	1538
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1719	3438	1538	0	1719	3438	1719	1538
Link Speed (mph)		45				55	25	
Link Distance (ft)		1607				727	497	
Travel Time (s)		24.3				9.0	13.6	
Peak Hour Factor	0.90	0.90	0.90	0.88	0.88	0.88	0.70	0.70
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)								
Lane Group Flow (vph)	16	1056	21	0	18	915	31	13
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	12	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 36.3%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
5: Hardee Lane & US 70 Business

Existing AM - With TIP
02/23/2019

Intersection								
Int Delay, s/veh	1.3							
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↔	↑↑	↗		↖	↑↑	↗	↖
Traffic Vol, veh/h	14	950	19	1	15	805	22	9
Future Vol, veh/h	14	950	19	1	15	805	22	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	110	-	210	-	220	-	0	50
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	88	88	88	70	70
Heavy Vehicles, %	5	5	5	5	5	5	5	5
Mvmt Flow	16	1056	21	1	17	915	31	13
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	915	0	0	1056	1077	0	1582	528
Stage 1	-	-	-	-	-	-	1088	-
Stage 2	-	-	-	-	-	-	494	-
Critical Hdwy	6.5	-	-	6.5	4.2	-	6.9	7
Critical Hdwy Stg 1	-	-	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.9	-
Follow-up Hdwy	2.55	-	-	2.55	2.25	-	3.55	3.35
Pot Cap-1 Maneuver	368	-	-	298	626	-	97	487
Stage 1	-	-	-	-	-	-	278	-
Stage 2	-	-	-	-	-	-	570	-
Platoon blocked, %		-	-			-		
Mov Cap-1 Maneuver	368	-	-	584	584	-	90	487
Mov Cap-2 Maneuver	-	-	-	-	-	-	90	-
Stage 1	-	-	-	-	-	-	258	-
Stage 2	-	-	-	-	-	-	570	-
Approach	EB		WB		NB			
HCM Control Delay, s	0.2		0.2		49.9			
HCM LOS	E							
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBU	EBT	EBR	WBL	WBT	
Capacity (veh/h)	90	487	368	-	-	584	-	
HCM Lane V/C Ratio	0.349	0.026	0.042	-	-	0.031	-	
HCM Control Delay (s)	65.1	12.6	15.2	-	-	11.4	-	
HCM Lane LOS	F	B	C	-	-	B	-	
HCM 95th %tile Q(veh)	1.4	0.1	0.1	-	-	0.1	-	

Buckhorn Branch
5: Hardee Lane & US 70 Business

Existing PM - With TIP
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations								
Traffic Volume (vph)	5	1104	48	1	26	1243	34	24
Future Volume (vph)	5	1104	48	1	26	1243	34	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		210		220		0	50
Storage Lanes	1		1		1		1	1
Taper Length (ft)	240				95		50	
Satd. Flow (prot)	1770	3539	1583	0	1770	3539	1770	1583
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	0	1770	3539	1770	1583
Link Speed (mph)		45				55	25	
Link Distance (ft)		1607				727	497	
Travel Time (s)		24.3				9.0	13.6	
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.68	0.68
Shared Lane Traffic (%)								
Lane Group Flow (vph)	5	1162	51	0	32	1480	50	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	12	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 44.4%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
5: Hardee Lane & US 70 Business

Existing PM - With TIP
02/23/2019

Intersection								
Int Delay, s/veh	5.1							
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↔	↑↑	↗		↖	↑↑	↗	↖
Traffic Vol, veh/h	5	1104	48	1	26	1243	34	24
Future Vol, veh/h	5	1104	48	1	26	1243	34	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	110	-	210	-	220	-	0	50
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	95	95	95	84	84	84	68	68
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	5	1162	51	1	31	1480	50	35
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	1480	0	0	1162	1213	0	1976	581
Stage 1	-	-	-	-	-	-	1172	-
Stage 2	-	-	-	-	-	-	804	-
Critical Hdwy	6.44	-	-	6.44	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.84	-
Follow-up Hdwy	2.52	-	-	2.52	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	162	-	-	261	571	-	54	457
Stage 1	-	-	-	-	-	-	257	-
Stage 2	-	-	-	-	-	-	401	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	162	-	-	545	545	-	~ 49	457
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 49	-
Stage 1	-	-	-	-	-	-	234	-
Stage 2	-	-	-	-	-	-	401	-
Approach	EB		WB		NB			
HCM Control Delay, s	0.1		0.3		162			
HCM LOS					F			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBU	EBT	EBR	WBL	WBT	
Capacity (veh/h)	49	457	162	-	-	545	-	
HCM Lane V/C Ratio	1.02	0.077	0.032	-	-	0.059	-	
HCM Control Delay (s)	266.8	13.5	28	-	-	12	-	
HCM Lane LOS	F	B	D	-	-	B	-	
HCM 95th %tile Q(veh)	4.4	0.2	0.1	-	-	0.2	-	
Notes								
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon								

Buckhorn Branch
5: Hardee Lane & US 70 Business

Background AM
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations								
Traffic Volume (vph)	16	1029	21	2	17	872	24	10
Future Volume (vph)	16	1029	21	2	17	872	24	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		210		220		0	50
Storage Lanes	1		1		1		1	1
Taper Length (ft)	240				95		50	
Satd. Flow (prot)	1770	3539	1583	0	1770	3539	1770	1583
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	0	1770	3539	1770	1583
Link Speed (mph)		45				55	25	
Link Distance (ft)		1607				727	497	
Travel Time (s)		24.3				9.0	13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)								
Lane Group Flow (vph)	18	1143	23	0	21	969	27	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	12	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 38.4%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
5: Hardee Lane & US 70 Business

Background AM
02/23/2019

Intersection								
Int Delay, s/veh	1.2							
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↔	↑↑	↗		↖	↑↑	↗	↖
Traffic Vol, veh/h	16	1029	21	2	17	872	24	10
Future Vol, veh/h	16	1029	21	2	17	872	24	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	110	-	210	-	220	-	0	50
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	18	1143	23	2	19	969	27	11
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	969	0	0	1143	1166	0	1706	572
Stage 1	-	-	-	-	-	-	1179	-
Stage 2	-	-	-	-	-	-	527	-
Critical Hdwy	6.44	-	-	6.44	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.84	-
Follow-up Hdwy	2.52	-	-	2.52	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	348	-	-	269	595	-	82	463
Stage 1	-	-	-	-	-	-	254	-
Stage 2	-	-	-	-	-	-	557	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	348	-	-	525	525	-	75	463
Mov Cap-2 Maneuver	-	-	-	-	-	-	75	-
Stage 1	-	-	-	-	-	-	231	-
Stage 2	-	-	-	-	-	-	557	-
Approach	EB		WB		NB			
HCM Control Delay, s	0.2		0.3		58.5			
HCM LOS					F			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBU	EBT	EBR	WBL	WBT	
Capacity (veh/h)	75	463	348	-	-	525	-	
HCM Lane V/C Ratio	0.356	0.024	0.051	-	-	0.04	-	
HCM Control Delay (s)	77.4	13	15.9	-	-	12.1	-	
HCM Lane LOS	F	B	C	-	-	B	-	
HCM 95th %tile Q(veh)	1.4	0.1	0.2	-	-	0.1	-	

Buckhorn Branch
5: Hardee Lane & US 70 Business

Background PM
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations								
Traffic Volume (vph)	6	1196	52	2	29	1346	37	26
Future Volume (vph)	6	1196	52	2	29	1346	37	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		210		220		0	50
Storage Lanes	1		1		1		1	1
Taper Length (ft)	240				95		50	
Satd. Flow (prot)	1770	3539	1583	0	1770	3539	1770	1583
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	0	1770	3539	1770	1583
Link Speed (mph)		45				55	25	
Link Distance (ft)		1607				727	497	
Travel Time (s)		24.3				9.0	13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)								
Lane Group Flow (vph)	7	1329	58	0	34	1496	41	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	12	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 47.2%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
5: Hardee Lane & US 70 Business

Background PM
02/23/2019

Intersection								
Int Delay, s/veh	5.4							
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↔	↑↑	↗		↖	↑↑	↗	↖
Traffic Vol, veh/h	6	1196	52	2	29	1346	37	26
Future Vol, veh/h	6	1196	52	2	29	1346	37	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	110	-	210	-	220	-	0	50
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	7	1329	58	2	32	1496	41	29
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	1496	0	0	1329	1387	0	2159	665
Stage 1	-	-	-	-	-	-	1343	-
Stage 2	-	-	-	-	-	-	816	-
Critical Hdwy	6.44	-	-	6.44	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.84	-
Follow-up Hdwy	2.52	-	-	2.52	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	159	-	-	204	490	-	~ 41	403
Stage 1	-	-	-	-	-	-	208	-
Stage 2	-	-	-	-	-	-	395	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	159	-	-	445	445	-	~ 36	403
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 36	-
Stage 1	-	-	-	-	-	-	184	-
Stage 2	-	-	-	-	-	-	395	-
Approach	EB		WB		NB			
HCM Control Delay, s	0.1		0.3		220.9			
HCM LOS					F			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBU	EBT	EBR	WBL	WBT	
Capacity (veh/h)	36	403	159	-	-	445	-	
HCM Lane V/C Ratio	1.142	0.072	0.042	-	-	0.077	-	
HCM Control Delay (s)	\$ 365.9	14.6	28.6	-	-	13.8	-	
HCM Lane LOS	F	B	D	-	-	B	-	
HCM 95th %tile Q(veh)	4.3	0.2	0.1	-	-	0.2	-	
Notes								
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon								

Buckhorn Branch
5: Hardee Lane & US 70 Business

Buildout AM with Improvements
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations								
Traffic Volume (vph)	37	1076	21	2	17	888	24	10
Future Volume (vph)	37	1076	21	2	17	888	24	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		210		220		0	50
Storage Lanes	1		1		1		1	1
Taper Length (ft)	240				95		50	
Satd. Flow (prot)	1770	3539	1583	0	1770	3539	1770	1583
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	0	1770	3539	1770	1583
Link Speed (mph)		45				55	25	
Link Distance (ft)		1607				727	497	
Travel Time (s)		24.3				9.0	13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)								
Lane Group Flow (vph)	41	1196	23	0	21	987	27	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	12	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 40.7%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
5: Hardee Lane & US 70 Business

Buildout AM with Improvements
02/23/2019

Intersection								
Int Delay, s/veh	1.8							
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↔	↑↑	↗		↖	↑↑	↗	↖
Traffic Vol, veh/h	37	1076	21	2	17	888	24	10
Future Vol, veh/h	37	1076	21	2	17	888	24	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	110	-	210	-	220	-	0	50
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	41	1196	23	2	19	987	27	11
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	987	0	0	1196	1219	0	1814	598
Stage 1	-	-	-	-	-	-	1278	-
Stage 2	-	-	-	-	-	-	536	-
Critical Hdwy	6.44	-	-	6.44	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.84	-
Follow-up Hdwy	2.52	-	-	2.52	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	338	-	-	248	568	-	70	445
Stage 1	-	-	-	-	-	-	225	-
Stage 2	-	-	-	-	-	-	551	-
Platoon blocked, %		-	-			-		
Mov Cap-1 Maneuver	338	-	-	497	497	-	59	445
Mov Cap-2 Maneuver	-	-	-	-	-	-	59	-
Stage 1	-	-	-	-	-	-	189	-
Stage 2	-	-	-	-	-	-	551	-
Approach	EB		WB		NB			
HCM Control Delay, s	0.6		0.3		80.8			
HCM LOS					F			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBU	EBT	EBR	WBL	WBT	
Capacity (veh/h)	59	445	338	-	-	497	-	
HCM Lane V/C Ratio	0.452	0.025	0.122	-	-	0.042	-	
HCM Control Delay (s)	108.9	13.3	17.1	-	-	12.6	-	
HCM Lane LOS	F	B	C	-	-	B	-	
HCM 95th %tile Q(veh)	1.7	0.1	0.4	-	-	0.1	-	

Buckhorn Branch
5: Hardee Lane & US 70 Business

Buildout PM with Improvements
02/23/2019

								
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations								
Traffic Volume (vph)	20	1226	52	2	29	1398	37	26
Future Volume (vph)	20	1226	52	2	29	1398	37	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		210		220		0	50
Storage Lanes	1		1		1		1	1
Taper Length (ft)	240				95		50	
Satd. Flow (prot)	1770	3539	1583	0	1770	3539	1770	1583
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	0	1770	3539	1770	1583
Link Speed (mph)		45				55	25	
Link Distance (ft)		1607				727	497	
Travel Time (s)		24.3				9.0	13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)								
Lane Group Flow (vph)	22	1362	58	0	34	1553	41	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)		12				12	12	
Link Offset(ft)		0				0	0	
Crosswalk Width(ft)		16				16	16	
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	9	15		15	9
Sign Control		Free				Free	Stop	
Intersection Summary								
Area Type:	Other							
Control Type: Unsignalized								
Intersection Capacity Utilization 48.6%				ICU Level of Service A				
Analysis Period (min) 15								

Buckhorn Branch
5: Hardee Lane & US 70 Business

Buildout PM with Improvements
02/23/2019

Intersection								
Int Delay, s/veh	8.2							
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↔	↑↑	↗		↖	↑↑	↗	↖
Traffic Vol, veh/h	20	1226	52	2	29	1398	37	26
Future Vol, veh/h	20	1226	52	2	29	1398	37	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	110	-	210	-	220	-	0	50
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	22	1362	58	2	32	1553	41	29
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	1553	0	0	1362	1420	0	2251	681
Stage 1	-	-	-	-	-	-	1406	-
Stage 2	-	-	-	-	-	-	845	-
Critical Hdwy	6.44	-	-	6.44	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.84	-
Follow-up Hdwy	2.52	-	-	2.52	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	146	-	-	194	475	-	~ 35	393
Stage 1	-	-	-	-	-	-	192	-
Stage 2	-	-	-	-	-	-	382	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	146	-	-	430	430	-	~ 27	393
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 27	-
Stage 1	-	-	-	-	-	-	150	-
Stage 2	-	-	-	-	-	-	382	-
Approach	EB		WB		NB			
HCM Control Delay, s	0.5		0.3		\$ 347			
HCM LOS					F			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBU	EBT	EBR	WBL	WBT	
Capacity (veh/h)	27	393	146	-	-	430	-	
HCM Lane V/C Ratio	1.523	0.074	0.152	-	-	0.08	-	
HCM Control Delay (s)	\$ 580.3	14.9	34	-	-	14.1	-	
HCM Lane LOS	F	B	D	-	-	B	-	
HCM 95th %tile Q(veh)	4.9	0.2	0.5	-	-	0.3	-	
Notes								
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon								

TULIP STREET AT IRIS STREET

Buckhorn Branch
6: Iris Street & Tulip Street

Existing AM - Under Construction
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	5	5	5	5	5	5
Future Volume (vph)	5	5	5	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1736	0	0	1818	1694	0
Flt Permitted				0.976	0.976	
Satd. Flow (perm)	1736	0	0	1818	1694	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	524			403	514	
Travel Time (s)	14.3			11.0	14.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	12	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 14.7%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
6: Iris Street & Tulip Street

Existing AM - Under Construction
02/23/2019

Intersection						
Int Delay, s/veh	4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Vol, veh/h	5	5	5	5	5	5
Future Vol, veh/h	5	5	5	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	6	6	6	6	6	6
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	12	0	27	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1607	-	988	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1607	-	984	1073
Mov Cap-2 Maneuver	-	-	-	-	984	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1005	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.6		8.5	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1027	-	-	1607	-	
HCM Lane V/C Ratio	0.011	-	-	0.003	-	
HCM Control Delay (s)	8.5	-	-	7.2	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Buckhorn Branch
6: Iris Street & Tulip Street

Existing PM - Under Construction
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	5	5	5	5	5	5
Future Volume (vph)	5	5	5	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1736	0	0	1818	1694	0
Flt Permitted				0.976	0.976	
Satd. Flow (perm)	1736	0	0	1818	1694	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	524			403	514	
Travel Time (s)	14.3			11.0	14.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	12	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 14.7%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
6: Iris Street & Tulip Street

Existing PM - Under Construction
02/23/2019

Intersection						
Int Delay, s/veh	4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	5	5	5	5	5
Future Vol, veh/h	5	5	5	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	6	6	6	6	6	6
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	12	0	27	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1607	-	988	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1607	-	984	1073
Mov Cap-2 Maneuver	-	-	-	-	984	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1005	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	3.6		8.5		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1027	-	-	1607	-	
HCM Lane V/C Ratio	0.011	-	-	0.003	-	
HCM Control Delay (s)	8.5	-	-	7.2	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Buckhorn Branch
6: Iris Street & Tulip Street

Existing AM - With TIP
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	5	5	5	5	5	5
Future Volume (vph)	5	5	5	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1736	0	0	1818	1694	0
Flt Permitted				0.976	0.976	
Satd. Flow (perm)	1736	0	0	1818	1694	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	524			403	514	
Travel Time (s)	14.3			11.0	14.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	12	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 14.7%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
6: Iris Street & Tulip Street

Existing AM - With TIP
02/23/2019

Intersection						
Int Delay, s/veh	4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↵			↵	↵	
Traffic Vol, veh/h	5	5	5	5	5	5
Future Vol, veh/h	5	5	5	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	6	6	6	6	6	6
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	12	0	27	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1607	-	988	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1607	-	984	1073
Mov Cap-2 Maneuver	-	-	-	-	984	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1005	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	3.6		8.5		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1027	-	-	1607	-	
HCM Lane V/C Ratio	0.011	-	-	0.003	-	
HCM Control Delay (s)	8.5	-	-	7.2	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Buckhorn Branch
6: Iris Street & Tulip Street

Existing PM - With TIP
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	5	5	5	5	5	5
Future Volume (vph)	5	5	5	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1736	0	0	1818	1694	0
Flt Permitted				0.976	0.976	
Satd. Flow (perm)	1736	0	0	1818	1694	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	524			403	514	
Travel Time (s)	14.3			11.0	14.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	12	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 14.7%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
6: Iris Street & Tulip Street

Existing PM - With TIP
02/23/2019

Intersection						
Int Delay, s/veh	4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↵			↵	↵	
Traffic Vol, veh/h	5	5	5	5	5	5
Future Vol, veh/h	5	5	5	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	6	6	6	6	6	6
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	12	0	27	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1607	-	988	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1607	-	984	1073
Mov Cap-2 Maneuver	-	-	-	-	984	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1005	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	3.6		8.5		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1027	-	-	1607	-	
HCM Lane V/C Ratio	0.011	-	-	0.003	-	
HCM Control Delay (s)	8.5	-	-	7.2	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Buckhorn Branch
6: Iris Street & Tulip Street

Background AM
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	5	5	5	5	5	5
Future Volume (vph)	5	5	5	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1736	0	0	1818	1694	0
Flt Permitted				0.976	0.976	
Satd. Flow (perm)	1736	0	0	1818	1694	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	524			403	514	
Travel Time (s)	14.3			11.0	14.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	12	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 14.7%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
6: Iris Street & Tulip Street

Background AM
02/23/2019

Intersection						
Int Delay, s/veh	4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Vol, veh/h	5	5	5	5	5	5
Future Vol, veh/h	5	5	5	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	6	6	6	6	6	6
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	12	0	27	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1607	-	988	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1607	-	984	1073
Mov Cap-2 Maneuver	-	-	-	-	984	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1005	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.6		8.5	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1027	-	-	1607	-	
HCM Lane V/C Ratio	0.011	-	-	0.003	-	
HCM Control Delay (s)	8.5	-	-	7.2	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Buckhorn Branch
6: Iris Street & Tulip Street

Background PM
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	5	5	5	5	5	5
Future Volume (vph)	5	5	5	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1736	0	0	1818	1694	0
Flt Permitted				0.976	0.976	
Satd. Flow (perm)	1736	0	0	1818	1694	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	524			403	514	
Travel Time (s)	14.3			11.0	14.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	12	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 14.7%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
6: Iris Street & Tulip Street

Background PM
02/23/2019

Intersection						
Int Delay, s/veh	4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↵			↵	↵	
Traffic Vol, veh/h	5	5	5	5	5	5
Future Vol, veh/h	5	5	5	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	6	6	6	6	6	6
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	12	0	27	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1607	-	988	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1607	-	984	1073
Mov Cap-2 Maneuver	-	-	-	-	984	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1005	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	3.6		8.5		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1027	-	-	1607	-	
HCM Lane V/C Ratio	0.011	-	-	0.003	-	
HCM Control Delay (s)	8.5	-	-	7.2	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Buckhorn Branch
6: Iris Street & Tulip Street

Buildout AM with Improvements
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	5	30	11	5	75	29
Future Volume (vph)	5	30	11	5	75	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1650	0	0	1803	1729	0
Flt Permitted				0.968	0.965	
Satd. Flow (perm)	1650	0	0	1803	1729	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	524			403	514	
Travel Time (s)	14.3			11.0	14.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	0	0	18	115	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 20.1%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
6: Iris Street & Tulip Street

Buildout AM with Improvements
02/23/2019

Intersection						
Int Delay, s/veh	6.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	30	11	5	75	29
Future Vol, veh/h	5	30	11	5	75	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	6	33	12	6	83	32
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	39	0	53	23
Stage 1	-	-	-	-	23	-
Stage 2	-	-	-	-	30	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1571	-	955	1054
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	993	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1571	-	947	1054
Mov Cap-2 Maneuver	-	-	-	-	947	-
Stage 1	-	-	-	-	992	-
Stage 2	-	-	-	-	993	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		5		9.2	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	975	-	-	1571	-	
HCM Lane V/C Ratio	0.119	-	-	0.008	-	
HCM Control Delay (s)	9.2	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.4	-	-	0	-	

Buckhorn Branch
6: Iris Street & Tulip Street

Buildout PM with Improvements
02/23/2019

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	5	91	23	5	51	21
Future Volume (vph)	5	91	23	5	51	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1626	0	0	1790	1729	0
Flt Permitted				0.961	0.966	
Satd. Flow (perm)	1626	0	0	1790	1729	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	524			403	514	
Travel Time (s)	14.3			11.0	14.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	107	0	0	32	80	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 19.0%				ICU Level of Service A		
Analysis Period (min) 15						

Buckhorn Branch
6: Iris Street & Tulip Street

Buildout PM with Improvements
02/23/2019

Intersection						
Int Delay, s/veh	4.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	91	23	5	51	21
Future Vol, veh/h	5	91	23	5	51	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	6	101	26	6	57	23
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	107	0	115	57
Stage 1	-	-	-	-	57	-
Stage 2	-	-	-	-	58	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1484	-	881	1009
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	965	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1484	-	865	1009
Mov Cap-2 Maneuver	-	-	-	-	865	-
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	965	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		6.1		9.4	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	903	-	-	1484	-	
HCM Lane V/C Ratio	0.089	-	-	0.017	-	
HCM Control Delay (s)	9.4	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-	

SIMTRAFFIC REPORTS

Queuing and Blocking Report
Existing AM - Under Construction

02/23/2019

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	UL	T	T	R	L	T	R
Maximum Queue (ft)	390	468	405	407	86	270	564	586	54	90	66	20
Average Queue (ft)	240	294	261	239	18	52	351	369	2	27	11	3
95th Queue (ft)	339	414	385	362	56	196	489	506	18	67	40	13
Link Distance (ft)		936	936	936			854	854			372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	700				150	115			350	155		100
Storage Blk Time (%)				21			65	15				
Queuing Penalty (veh)				11			17	15				

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	SB	SB	SB
Directions Served	L	LT	R
Maximum Queue (ft)	197	210	649
Average Queue (ft)	66	130	22
95th Queue (ft)	175	199	214
Link Distance (ft)		634	634
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)	310		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Astor Street & US 70 Business

Movement	NB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	2
95th Queue (ft)	15
Link Distance (ft)	421
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
Existing AM - Under Construction

02/23/2019

Intersection: 3: Wildwood Drive & US 70 Business

Movement	NB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	8
95th Queue (ft)	29
Link Distance (ft)	213
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Median Break E. of Wildwood & US 70 Business

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Hardee Lane & US 70 Business

Movement	EB	WB	NB	NB
Directions Served	U	UL	L	R
Maximum Queue (ft)	54	25	47	21
Average Queue (ft)	13	9	22	5
95th Queue (ft)	40	28	50	19
Link Distance (ft)			437	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	110	220		50
Storage Blk Time (%)			5	
Queuing Penalty (veh)			0	

Queuing and Blocking Report
Existing AM - Under Construction

02/23/2019

Intersection: 6: Iris Street & Tulip Street

Movement	NB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	12
95th Queue (ft)	36
Link Distance (ft)	485
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 43

Queuing and Blocking Report
Existing PM - Under Construction

02/23/2019

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	UL	T	T	R	L	T	R
Maximum Queue (ft)	503	512	487	447	315	269	812	854	625	87	65	20
Average Queue (ft)	292	333	244	215	16	50	524	542	184	36	25	1
95th Queue (ft)	437	476	405	375	109	180	704	719	623	75	56	7
Link Distance (ft)		936	936	936			854	854			372	
Upstream Blk Time (%)								0				
Queuing Penalty (veh)								0				
Storage Bay Dist (ft)	700				150	115			350	155		100
Storage Blk Time (%)				16		0	60	38				
Queuing Penalty (veh)				8		0	18	61				

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	SB	SB
Directions Served	L	LT
Maximum Queue (ft)	232	242
Average Queue (ft)	148	181
95th Queue (ft)	213	229
Link Distance (ft)		634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	310	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Astor Street & US 70 Business

Movement	WB
Directions Served	T
Maximum Queue (ft)	31
Average Queue (ft)	1
95th Queue (ft)	10
Link Distance (ft)	946
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
Existing PM - Under Construction

02/23/2019

Intersection: 3: Wildwood Drive & US 70 Business

Movement	NB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	1
95th Queue (ft)	10
Link Distance (ft)	213
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Median Break E. of Wildwood & US 70 Business

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Hardee Lane & US 70 Business

Movement	EB	WB	NB	NB
Directions Served	U	UL	L	R
Maximum Queue (ft)	27	52	47	22
Average Queue (ft)	3	12	27	12
95th Queue (ft)	18	41	51	28
Link Distance (ft)			437	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	110	220		50
Storage Blk Time (%)			15	
Queuing Penalty (veh)			4	

Queuing and Blocking Report
Existing PM - Under Construction

02/23/2019

Intersection: 6: Iris Street & Tulip Street

Movement	NB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	5
95th Queue (ft)	24
Link Distance (ft)	485
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 91

Queuing and Blocking Report
Existing AM - With TIP

02/23/2019

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	UL	T	T	R	L	T	R
Maximum Queue (ft)	340	377	407	420	315	269	525	561	56	174	46	20
Average Queue (ft)	250	297	294	262	25	53	380	401	4	37	14	1
95th Queue (ft)	319	378	412	388	119	199	501	524	27	96	42	9
Link Distance (ft)		936	936	936			860	860			372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	700				150	115			350	155		100
Storage Blk Time (%)				23		1	65	23		2		
Queuing Penalty (veh)				12		2	14	23		0		

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	SB	SB
Directions Served	L	LT
Maximum Queue (ft)	210	243
Average Queue (ft)	62	117
95th Queue (ft)	174	198
Link Distance (ft)		634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	310	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Astor Street & US 70 Business

Movement	WB	NB
Directions Served	UL	R
Maximum Queue (ft)	27	31
Average Queue (ft)	3	3
95th Queue (ft)	16	18
Link Distance (ft)		422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	180	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Existing AM - With TIP

02/23/2019

Intersection: 3: Wildwood Drive & US 70 Business

Movement	NB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	6
95th Queue (ft)	24
Link Distance (ft)	213
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Median Break E. of Wildwood & US 70 Business

Movement	EB	WB
Directions Served	U	U
Maximum Queue (ft)	34	26
Average Queue (ft)	10	4
95th Queue (ft)	34	18
Link Distance (ft)	34	
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	4	
Storage Bay Dist (ft)		185
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Hardee Lane & US 70 Business

Movement	EB	WB	NB	NB
Directions Served	U	UL	L	R
Maximum Queue (ft)	29	26	93	22
Average Queue (ft)	8	5	21	5
95th Queue (ft)	28	22	55	20
Link Distance (ft)			437	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	110	220		50
Storage Blk Time (%)			1	
Queuing Penalty (veh)			0	

Queuing and Blocking Report
Existing AM - With TIP

02/23/2019

Intersection: 6: Iris Street & Tulip Street

Movement	NB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	12
95th Queue (ft)	36
Link Distance (ft)	485
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 57

Queuing and Blocking Report
Existing PM - With TIP

02/23/2019

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	UL	T	T	R	L	T	R
Maximum Queue (ft)	476	570	446	421	314	269	863	868	625	109	133	20
Average Queue (ft)	318	361	222	193	29	46	548	559	168	40	19	1
95th Queue (ft)	467	528	394	369	156	173	746	764	585	96	72	6
Link Distance (ft)		936	936	936			860	860			372	
Upstream Blk Time (%)							0	0				
Queuing Penalty (veh)							1	2				
Storage Bay Dist (ft)	700				150	115			350	155		100
Storage Blk Time (%)				13			60	38			1	
Queuing Penalty (veh)				7			13	60			0	

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	SB	SB
Directions Served	L	LT
Maximum Queue (ft)	232	248
Average Queue (ft)	149	179
95th Queue (ft)	229	241
Link Distance (ft)		634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	310	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Astor Street & US 70 Business

Movement	WB	WB	WB
Directions Served	UL	T	T
Maximum Queue (ft)	27	29	32
Average Queue (ft)	2	1	1
95th Queue (ft)	14	10	10
Link Distance (ft)		941	941
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	180		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
Existing PM - With TIP

02/23/2019

Intersection: 3: Wildwood Drive & US 70 Business

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 4: Median Break E. of Wildwood & US 70 Business

Movement	EB	WB
Directions Served	U	U
Maximum Queue (ft)	31	26
Average Queue (ft)	2	2
95th Queue (ft)	15	15
Link Distance (ft)	34	
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	1	
Storage Bay Dist (ft)		185
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Hardee Lane & US 70 Business

Movement	EB	EB	WB	NB	NB
Directions Served	U	R	UL	L	R
Maximum Queue (ft)	26	22	71	107	43
Average Queue (ft)	5	1	13	36	17
95th Queue (ft)	20	7	42	79	35
Link Distance (ft)				437	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110	210	220		50
Storage Blk Time (%)				19	0
Queuing Penalty (veh)				5	0

Queuing and Blocking Report
Existing PM - With TIP

02/23/2019

Intersection: 6: Iris Street & Tulip Street

Movement	NB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	11
95th Queue (ft)	34
Link Distance (ft)	485
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 90

Queuing and Blocking Report
Background AM

02/23/2019

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	UL	T	T	R	L	T	R
Maximum Queue (ft)	386	422	495	434	315	269	577	591	122	92	90	46
Average Queue (ft)	234	277	303	268	49	48	396	413	11	34	19	3
95th Queue (ft)	357	382	441	408	195	174	526	532	57	77	56	18
Link Distance (ft)		936	936	936			860	860			372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	700				150	115			350	155		100
Storage Blk Time (%)				22			70	23			0	
Queuing Penalty (veh)				13			18	25			0	

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	SB	SB
Directions Served	L	LT
Maximum Queue (ft)	149	184
Average Queue (ft)	55	111
95th Queue (ft)	141	174
Link Distance (ft)		634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	310	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Astor Street & US 70 Business

Movement	WB	NB
Directions Served	UL	R
Maximum Queue (ft)	26	30
Average Queue (ft)	1	2
95th Queue (ft)	9	14
Link Distance (ft)		422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	180	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Background AM

02/23/2019

Intersection: 3: Wildwood Drive & US 70 Business

Movement	EB	NB
Directions Served	T	R
Maximum Queue (ft)	30	31
Average Queue (ft)	1	7
95th Queue (ft)	10	28
Link Distance (ft)	213	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	90	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Median Break E. of Wildwood & US 70 Business

Movement	EB	WB
Directions Served	U	U
Maximum Queue (ft)	34	25
Average Queue (ft)	9	4
95th Queue (ft)	32	18
Link Distance (ft)	34	
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	8	
Storage Bay Dist (ft)	185	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Hardee Lane & US 70 Business

Movement	EB	WB	NB	NB
Directions Served	U	UL	L	R
Maximum Queue (ft)	29	49	86	21
Average Queue (ft)	5	7	22	5
95th Queue (ft)	23	28	54	19
Link Distance (ft)	437			
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	110	220		50
Storage Blk Time (%)	6			
Queuing Penalty (veh)	1			

Queuing and Blocking Report
Background AM

02/23/2019

Intersection: 6: Iris Street & Tulip Street

Movement	NB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	9
95th Queue (ft)	31
Link Distance (ft)	485
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 64

Queuing and Blocking Report
Background PM

02/23/2019

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	UL	T	T	R	L	T	R
Maximum Queue (ft)	634	637	480	449	311	75	654	676	625	112	85	14
Average Queue (ft)	312	370	283	255	34	22	475	490	81	40	30	0
95th Queue (ft)	463	522	440	403	126	59	654	668	382	94	69	5
Link Distance (ft)		936	936	936			860	860			372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	700				150	115			350	155		100
Storage Blk Time (%)				20			60	35			0	
Queuing Penalty (veh)				11			15	61			0	

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	SB	SB
Directions Served	L	LT
Maximum Queue (ft)	249	278
Average Queue (ft)	133	176
95th Queue (ft)	238	256
Link Distance (ft)		634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	310	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Astor Street & US 70 Business

Movement	WB
Directions Served	UL
Maximum Queue (ft)	28
Average Queue (ft)	6
95th Queue (ft)	23
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	180
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
Background PM

02/23/2019

Intersection: 3: Wildwood Drive & US 70 Business

Movement	NB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	2
95th Queue (ft)	15
Link Distance (ft)	213
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Median Break E. of Wildwood & US 70 Business

Movement	EB	WB
Directions Served	U	U
Maximum Queue (ft)	34	27
Average Queue (ft)	3	6
95th Queue (ft)	18	24
Link Distance (ft)	34	
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	2	
Storage Bay Dist (ft)		185
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Hardee Lane & US 70 Business

Movement	EB	EB	WB	NB	NB
Directions Served	U	R	UL	L	R
Maximum Queue (ft)	27	23	91	220	91
Average Queue (ft)	3	1	19	60	20
95th Queue (ft)	15	7	56	127	68
Link Distance (ft)				437	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110	210	220		50
Storage Blk Time (%)				53	0
Queuing Penalty (veh)				14	0

Queuing and Blocking Report
Background PM

02/23/2019

Intersection: 6: Iris Street & Tulip Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	31
Average Queue (ft)	1	15
95th Queue (ft)	10	39
Link Distance (ft)	353	485
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 104

Queuing and Blocking Report
Buildout AM

02/23/2019

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	UL	T	T	R	L	T	R
Maximum Queue (ft)	298	378	514	476	311	270	531	582	56	113	105	20
Average Queue (ft)	211	259	305	275	38	48	374	385	11	59	28	1
95th Queue (ft)	285	346	444	422	128	173	513	523	48	107	73	9
Link Distance (ft)		936	936	936			860	860			372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	700				150	115			350	155		100
Storage Blk Time (%)				27			68	22			1	
Queuing Penalty (veh)				20			20	28			1	

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	SB	SB	SB
Directions Served	L	LT	R
Maximum Queue (ft)	184	646	649
Average Queue (ft)	82	153	22
95th Queue (ft)	180	315	214
Link Distance (ft)		634	634
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)	310		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Astor Street & US 70 Business

Movement	WB	NB
Directions Served	UL	R
Maximum Queue (ft)	27	53
Average Queue (ft)	7	20
95th Queue (ft)	24	50
Link Distance (ft)		422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	180	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Buildout AM

02/23/2019

Intersection: 3: Wildwood Drive & US 70 Business

Movement	EB	NB
Directions Served	T	R
Maximum Queue (ft)	31	94
Average Queue (ft)	2	40
95th Queue (ft)	14	75
Link Distance (ft)		213
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	90	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Median Break E. of Wildwood & US 70 Business

Movement	EB	WB
Directions Served	U	U
Maximum Queue (ft)	34	24
Average Queue (ft)	20	2
95th Queue (ft)	44	12
Link Distance (ft)	34	
Upstream Blk Time (%)	6	
Queuing Penalty (veh)	23	
Storage Bay Dist (ft)		185
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Hardee Lane & US 70 Business

Movement	EB	WB	NB	NB
Directions Served	U	UL	L	R
Maximum Queue (ft)	51	49	47	22
Average Queue (ft)	13	10	14	2
95th Queue (ft)	39	33	38	13
Link Distance (ft)			437	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	110	220		50
Storage Blk Time (%)			1	
Queuing Penalty (veh)			0	

Queuing and Blocking Report
Buildout AM

02/23/2019

Intersection: 6: Iris Street & Tulip Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	29	74
Average Queue (ft)	1	36
95th Queue (ft)	10	54
Link Distance (ft)	353	485
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 93

Queuing and Blocking Report
Buildout PM

02/23/2019

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	UL	T	T	R	L	T	R
Maximum Queue (ft)	606	703	644	604	315	270	832	868	625	191	108	20
Average Queue (ft)	364	419	363	315	96	108	428	430	62	79	35	3
95th Queue (ft)	547	616	526	506	281	279	618	611	315	153	84	13
Link Distance (ft)		936	936	936			860	860			372	
Upstream Blk Time (%)								0				
Queuing Penalty (veh)								2				
Storage Bay Dist (ft)	700				150	115			350	155		100
Storage Blk Time (%)		0		35		2	55	25		5	2	
Queuing Penalty (veh)		1		38		10	24	46		2	2	

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	SB	SB
Directions Served	L	LT
Maximum Queue (ft)	257	293
Average Queue (ft)	157	199
95th Queue (ft)	230	254
Link Distance (ft)		634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	310	
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 2: Astor Street & US 70 Business

Movement	WB	WB	NB
Directions Served	UL	T	R
Maximum Queue (ft)	52	29	94
Average Queue (ft)	24	1	23
95th Queue (ft)	54	9	63
Link Distance (ft)		941	422
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	180		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
Buildout PM

02/23/2019

Intersection: 3: Wildwood Drive & US 70 Business

Movement	NB
Directions Served	R
Maximum Queue (ft)	56
Average Queue (ft)	25
95th Queue (ft)	54
Link Distance (ft)	213
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Median Break E. of Wildwood & US 70 Business

Movement	EB	WB
Directions Served	U	U
Maximum Queue (ft)	31	27
Average Queue (ft)	11	3
95th Queue (ft)	35	15
Link Distance (ft)	34	
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	11	
Storage Bay Dist (ft)		185
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Hardee Lane & US 70 Business

Movement	EB	WB	NB	NB
Directions Served	U	UL	L	R
Maximum Queue (ft)	27	73	298	100
Average Queue (ft)	10	17	100	26
95th Queue (ft)	29	50	242	87
Link Distance (ft)			437	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	110	220		50
Storage Blk Time (%)			58	3
Queuing Penalty (veh)			15	1

Queuing and Blocking Report
Buildout PM

02/23/2019

Intersection: 6: Iris Street & Tulip Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	54
Average Queue (ft)	2	31
95th Queue (ft)	14	52
Link Distance (ft)	353	485
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 150

Queuing and Blocking Report
Buildout AM with Improvements

02/23/2019

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	UL	T	T	R	L	T	R
Maximum Queue (ft)	341	400	458	443	315	269	571	588	56	148	88	20
Average Queue (ft)	215	266	301	272	53	47	383	397	2	70	20	3
95th Queue (ft)	302	361	427	401	199	177	515	522	18	129	60	13
Link Distance (ft)		936	936	936			860	860			372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	700				150	115			350	155		100
Storage Blk Time (%)				26		0	64	22		0	0	
Queuing Penalty (veh)				19		2	19	27		0	0	

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	SB	SB
Directions Served	L	LT
Maximum Queue (ft)	167	202
Average Queue (ft)	49	103
95th Queue (ft)	141	176
Link Distance (ft)		634
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	310	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Astor Street & US 70 Business

Movement	WB	NB
Directions Served	UL	R
Maximum Queue (ft)	27	52
Average Queue (ft)	6	18
95th Queue (ft)	24	45
Link Distance (ft)		422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	180	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Buildout AM with Improvements

02/23/2019

Intersection: 3: Wildwood Drive & US 70 Business

Movement	EB	NB
Directions Served	T	R
Maximum Queue (ft)	53	64
Average Queue (ft)	2	25
95th Queue (ft)	17	48
Link Distance (ft)	199	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	90	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Median Break E. of Wildwood & US 70 Business

Movement	EB	WB
Directions Served	U	U
Maximum Queue (ft)	34	26
Average Queue (ft)	16	3
95th Queue (ft)	42	18
Link Distance (ft)	34	
Upstream Blk Time (%)	3	
Queuing Penalty (veh)	13	
Storage Bay Dist (ft)	185	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Hardee Lane & US 70 Business

Movement	EB	WB	NB	NB
Directions Served	U	UL	L	R
Maximum Queue (ft)	63	51	48	21
Average Queue (ft)	19	13	22	9
95th Queue (ft)	50	37	42	26
Link Distance (ft)	437			
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	110	220		50
Storage Blk Time (%)	3			
Queuing Penalty (veh)	0			

Queuing and Blocking Report
Buildout AM with Improvements

02/23/2019

Intersection: 6: Iris Street & Tulip Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	55
Average Queue (ft)	2	35
95th Queue (ft)	15	55
Link Distance (ft)	353	485
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 80

Queuing and Blocking Report
Buildout PM with Improvements

02/23/2019

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	L	T	T	R	UL	T	T	R	L	T	L
Maximum Queue (ft)	418	460	513	504	315	270	662	664	625	143	155	298
Average Queue (ft)	306	339	362	345	154	61	459	465	67	79	49	149
95th Queue (ft)	423	450	481	469	374	183	603	602	323	139	119	258
Link Distance (ft)		936	936	936			860	860			372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	700				150	115			350	155		310
Storage Blk Time (%)				37		1	56	30		0	5	0
Queuing Penalty (veh)				39		5	24	55		0	4	0

Intersection: 1: Rose Street/NC 42 & US 70 Business

Movement	SB
Directions Served	LT
Maximum Queue (ft)	337
Average Queue (ft)	193
95th Queue (ft)	272
Link Distance (ft)	634
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	1
Queuing Penalty (veh)	2

Intersection: 2: Astor Street & US 70 Business

Movement	WB	WB	NB
Directions Served	UL	T	R
Maximum Queue (ft)	52	29	52
Average Queue (ft)	20	1	12
95th Queue (ft)	47	10	38
Link Distance (ft)		941	422
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	180		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
Buildout PM with Improvements

02/23/2019

Intersection: 3: Wildwood Drive & US 70 Business

Movement	EB	NB
Directions Served	R	R
Maximum Queue (ft)	62	65
Average Queue (ft)	4	22
95th Queue (ft)	27	45
Link Distance (ft)		199
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 4: Median Break E. of Wildwood & US 70 Business

Movement	EB	WB
Directions Served	U	U
Maximum Queue (ft)	34	26
Average Queue (ft)	6	2
95th Queue (ft)	25	13
Link Distance (ft)	34	
Upstream Blk Time (%)	3	
Queuing Penalty (veh)	11	
Storage Bay Dist (ft)		185
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Hardee Lane & US 70 Business

Movement	EB	WB	NB	NB
Directions Served	U	UL	L	R
Maximum Queue (ft)	51	53	112	100
Average Queue (ft)	16	18	48	27
95th Queue (ft)	42	45	100	86
Link Distance (ft)			437	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	110	220		50
Storage Blk Time (%)			40	0
Queuing Penalty (veh)			10	0

Queuing and Blocking Report
Buildout PM with Improvements

02/23/2019

Intersection: 6: Iris Street & Tulip Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	99
Average Queue (ft)	2	37
95th Queue (ft)	15	63
Link Distance (ft)	353	485
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 151

February 2019



BUCKHORN BRANCH RESIDENTIAL

Traffic Impact Analysis

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BUCKHORN BRANCH RESIDENTIAL TRAFFIC IMPACT ANALYSIS

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Buckhorn Branch Residential Traffic Impact Analysis

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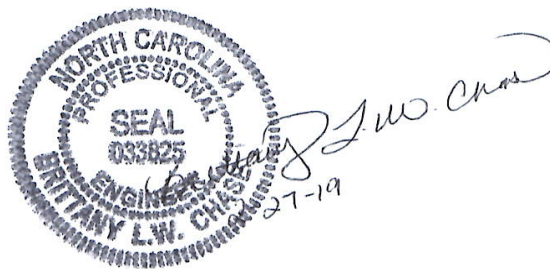


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EXECUTIVE SUMMARY

The proposed 85-acre site is situated on the south side of US 70 Business east of NC 42 in Clayton, North Carolina as shown on Figure 1. The property is currently zoned as Residential Estate. The proposed development consists of 205 single family dwelling units and 120 residential townhomes/condos and does require a Zoning Map Change to Planned Development-Residential. The proposed site is to be developed within four years by the year 2023. The purpose of this TIA is to analyze the potential traffic impacts of the proposed development on the surrounding roadway network and to identify any roadway improvements necessary to mitigate the impact of the project traffic.

A TIA Scoping Memorandum of Understanding was prepared and submitted to the Town of Clayton and North Carolina Department of Transportation (NCDOT) based on a meeting held on December 14, 2018. The MOU and subsequent correspondence regarding the scope of the TIA is included in the Appendix of this report. The Town of Clayton's *Code of Ordinances* as well as *NCDOT Congestion Management Capacity Analysis Guidelines* were referenced to perform this traffic study.

As determined by the Town of Clayton and North Carolina Department of Transportation (NCDOT), the study area includes:

1. US 70 Business at NC 42/Rose Street
2. US 70 Business at Astor Street
3. US 70 Business at Wildwood Drive
4. US 70 Business at Median Break East of Wildwood Drive
5. US 70 Business at Hardee Lane
6. Iris Street at Tulip Street

As shown on the site plan in Figure 2, the proposed development will be accessed by three existing intersections on US 70:

1. US 70 Business at NC 42/Rose Street
2. US 70 Business at Astor Street
3. US 70 Business at Wildwood Drive

It is important to note that during existing peak hour traffic count data collection, the Transportation Improvement Program (TIP) project W-5704 was under construction. The existing lane geometry (prior to completion of TIP W-5704) is shown in Figure 3A. The TIP project is expected to be completed in 2019. The 2019 lane geometry with the completion of the TIP project is shown in Figure 3B. An analysis of existing conditions during the time of traffic count data collection while the TIP W-5704 was under construction as well as an analysis of existing conditions with the completed TIP project are included in this report.

The TIP project includes several roadway improvements within the proposed development's study area. As mentioned above, these improvements are expected to be in place in 2019 and therefore were included in the 2019 Adjusted Existing Traffic, 2023 Background Traffic, and 2023 Buildout Traffic scenarios. The improvements include:

US 70 Business at Astor Street:

- Removal of eastbound U-Turn on US 70 Business. The intersection will provide a westbound left-in from US 70 Business, an eastbound right-in from US 70 Business, and a northbound right-out from Astor Street.
- Increase the westbound left-turn lane storage length on US 70 Business to provide 150' of full-width storage.

US 70 Business at Median Break East of Wildwood Drive:

- Extend eastbound U-turn lane storage length on US 70 Business to provide 170' of full-width storage.
- Extend westbound U-turn lane storage length on US 70 Business to provide 185' of full-width storage.

The proposed development is expected to generate 2,882 daily trips, 208 AM peak hour trips (51 entering, 157 exiting), and 273 PM peak hour trips (172 entering, 101 exiting).

Based on coordination with the Town, a 2% annual growth rate was applied to the existing traffic volumes to determine 2023 background traffic volumes. According to the Town, there are no approved developments to consider in the future year analysis.

To determine the traffic impacts of the proposed development, capacity analyses were performed at the study intersections under the following scenarios:

- Existing (2019) Traffic Conditions– TIP Under Construction
- Existing (2019) Traffic Conditions – Adjusted Traffic Volumes after TIP Construction
- Background (2023) Traffic Conditions
- Buildout (2023) Traffic Conditions
- Buildout (2023) Traffic Conditions with Recommended Improvements

Based on the capacity analysis presented herein, the following roadway improvements are recommended to be completed **by the developer** to accommodate buildout site traffic volumes:

US 70 Business at Wildwood Drive:

- Extend the concrete barrier to prohibit Wildwood Drive northbound right-turn traffic from accessing the median opening immediately to the east on US 70 Business.
- Construct an exclusive eastbound right-turn lane on US 70 Business at Wildwood Drive to provide 50 feet of full-width storage.
- Pave Wildwood Drive from US 70 Business to connection with "Street A" according to Town standards.

Iris Street at Tulip Street:

- Pave Iris Street according to Town standards.

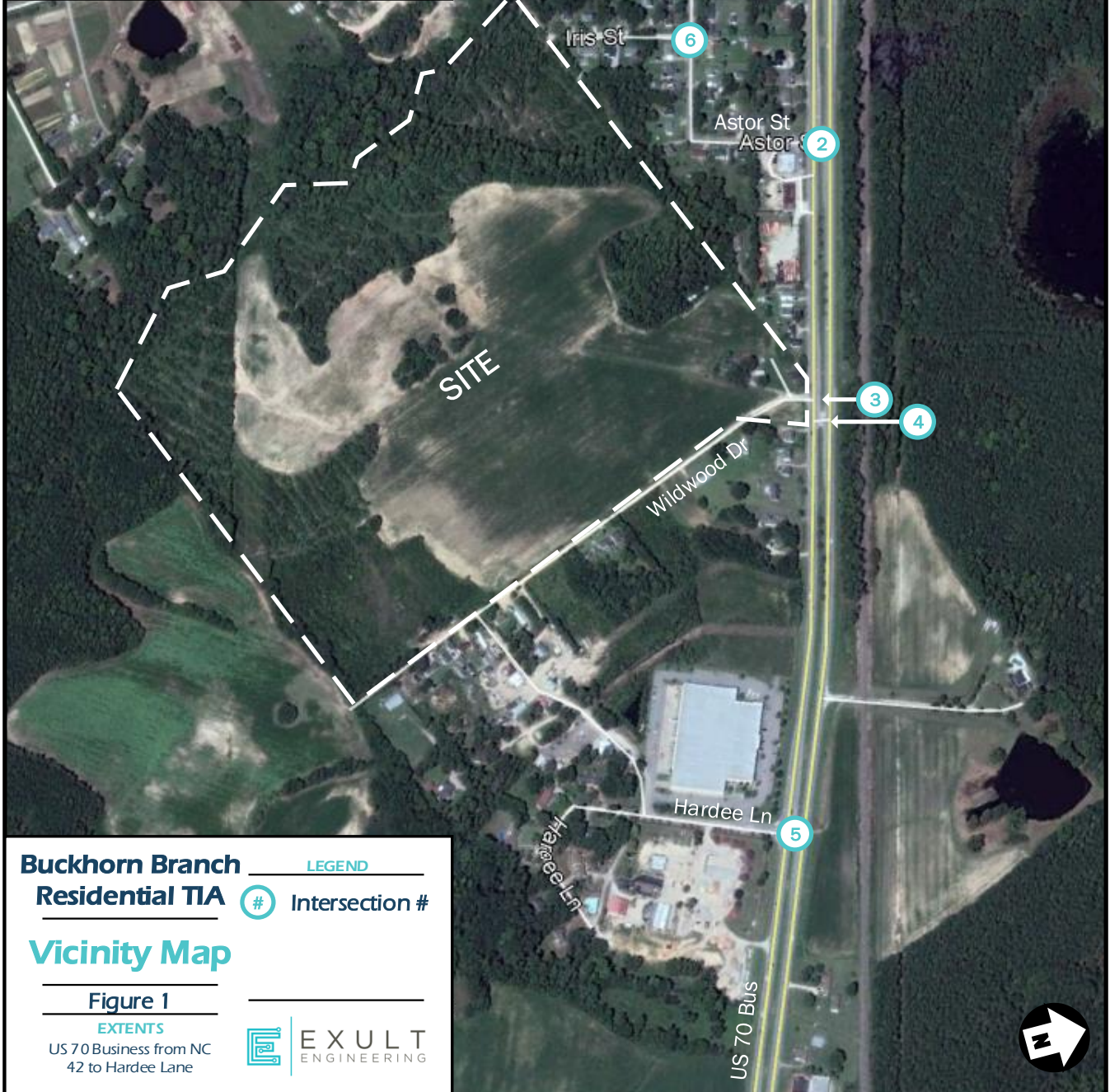
INTRODUCTION

The proposed 85-acre site is situated on the south side of US 70 Business east of NC 42 in Clayton, North Carolina as shown on Figure 1. The property is currently zoned as Residential Estate. The proposed development consists of 205 single family dwelling units and 120 residential townhomes/condos and does require a Zoning Map Change to Planned Development-Residential. As shown on the site plan on Figure 2, the proposed development will be accessed by three existing access points on US 70 Business. The proposed site is to be developed within four years by the year 2023.

The purpose of this TIA is to analyze the potential traffic impacts of the proposed development on the surrounding roadway network and to identify any roadway improvements necessary to mitigate the impact of the project traffic. This study includes the analysis of the following traffic scenarios:

- Existing (2019) Traffic Conditions— TIP Under Construction
- Existing (2019) Traffic Conditions – Adjusted Traffic Volumes after TIP Construction
- Background (2023) Traffic Conditions
- Buildout (2023) Traffic Conditions
- Buildout (2023) Traffic Conditions with Recommended Improvements

Based on coordination with the Town, a 2% annual growth rate was applied to the existing traffic volumes to determine 2023 background traffic volumes. According to the Town, there are no approved developments to consider in the future year analysis.



Buckhorn Branch Residential TIA

LEGEND

Intersection

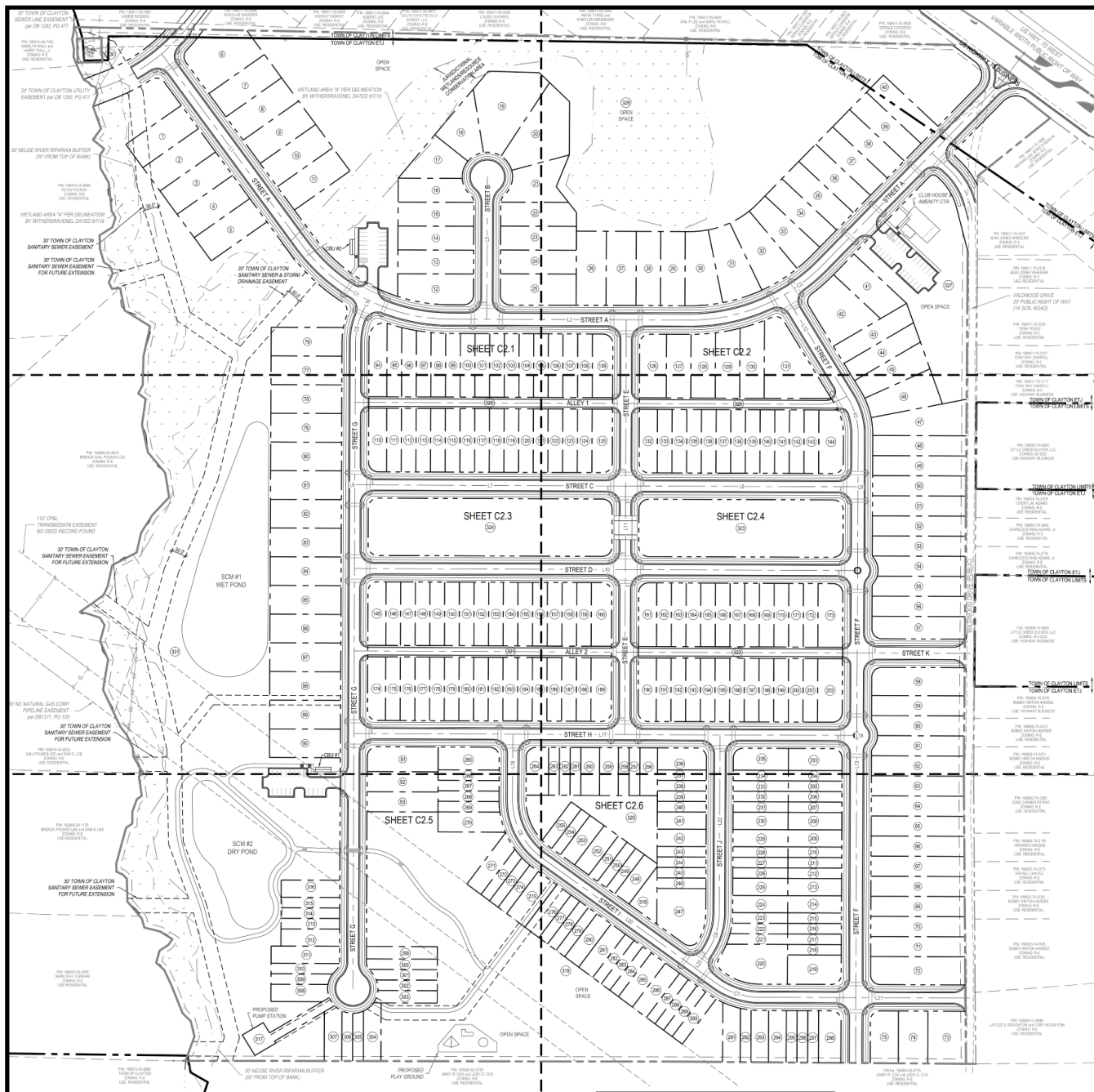
Vicinity Map

Figure 1

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US 70 Business from NC
42 to Hardee Lane





Buckhorn Branch Residential TIA **Proposed Site Plan**

Figure 2

Prepared by Withers
and Ravenel

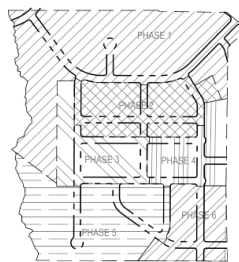
EXTENTS

US 70 Business from NC
42 to Hardee Lane
*Johnston County, NCDOT
Division 4*



PHASING PLAN

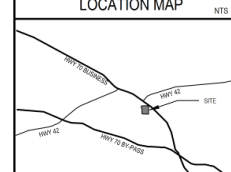
SCALE 1" = 500 FT



SITE SHEET C2.7 FOR PHASING PLAN

LOCATION MAP

NTS



EXISTING CONDITIONS

The 85-acre site is situated on the south side of US 70 Business east of NC 42 in Clayton, North Carolina. The property is currently zoned as Residential Estate. Per the Town and NCDOT, the study area for the proposed development includes the following unsignalized intersections:

1. US 70 Business at NC 42/Rose Street
2. US 70 Business at Astor Street
3. US 70 Business at Wildwood Drive
4. US 70 Business at Median Break East of Wildwood Drive
5. US 70 Business at Hardee Lane
6. Iris Street at Tulip Street

A site visit was performed on Friday, January 18, 2019 to observe existing field conditions, such as lane geometry, posted speed limits, and traffic operations. Figure 3A shows the Existing Lane Geometry at the above study intersections. It is important to note that during the site visit and existing peak hour traffic count data collection, the TIP project W-5704 was under construction. The existing lane geometry (prior to completion of TIP W-5704) is shown in Figure 3A. The TIP project is expected to be completed in 2019. The 2019 lane geometry with the completion of the TIP project is shown in Figure 3B. An analysis of existing conditions during the time of traffic count data collection while the TIP W-5704 was under construction as well as an analysis of 2019 traffic conditions with the completed TIP project are included in this report. The TIP plan sheets pertaining to the proposed development's study area are included in the Appendix of this report. The following improvements are included in the TIP project:

US 70 Business at Astor Street:

- Removal of eastbound U-Turn on US 70 Business. The intersection will provide a westbound left-in from US 70 Business, an eastbound right-in from US 70 Business, and a northbound right-out from Astor Street.
- Increase the westbound left-turn lane storage length on US 70 Business to provide 150' of full-width storage.

US 70 Business at Median Break East of Wildwood Drive:

- Extend eastbound U-turn lane storage length on US 70 Business to provide 170' of full-width storage.
- Extend westbound U-turn lane storage length on US 70 Business to provide 185' of full-width storage.

Peak-hour turning movement traffic counts were performed at the existing study intersections during the AM (7:00 – 9:00) and PM (4:00 – 6:00) peak periods on Wednesday, January 9, 2019. Traffic count data is included in the Appendix of this report. Based on the number of access points and land uses located between study intersections, traffic count balancing was performed where appropriate in a conservative manner. Balancing was necessary along westbound US 70 Business during the AM and PM peak hours. Traffic count balancing is shown in the Intersection Volume Spreadsheets in the Appendix. Figure 4A and Figure 4B depict the 2019 AM Peak Hour Existing Traffic Volumes and the 2019 PM Peak Hour Existing Traffic Volumes, respectively.

During traffic count data collection, the median opening at Astor Street and the median opening east of Wildwood Drive were closed due to construction of TIP #W-5704. With the completion of the construction of the TIP project, there is expected to be a reassignment of traffic volumes throughout the study area. The following assumptions were made in determining an appropriate reassignment of existing traffic volumes:

US 70 Business at Astor Street:

- Approximately half of the westbound U-turns counted at NC 42/Rose Street were reassigned to the westbound U-turn movement at Astor Street. This traffic is expected access the residential homes and small businesses located east of Astor Street.
- Approximately half of the homes located along Rose Street, Astor Street, Tulip Street, and Iris Street could be assumed to utilize the westbound left-turn movement at the Astor Street access as opposed to the Rose Street access. This equates to approximately 20 residential units which generate an estimated 5 vehicles entering during the AM peak hour and 14 vehicles entering during the PM peak hour. It was estimated that 1/3 of these trips would originate from the east on US 70 Business.

US 70 Business at Median Opening East of Wildwood Drive:

- Approximately half of the eastbound U-turns counted at Hardee Lane were reassigned to the eastbound U-turn movement at the Median Opening East of Wildwood Drive. This traffic is expected to come from the residential uses and small businesses west of Wildwood Drive. The traffic volumes originating from Wildwood Drive and the residential homes east of Wildwood Drive are expected to still utilize the U-turn at Hardee Lane.
- There is expected to be a negligent amount of traffic that will use the westbound U-turn movement at the Median Opening East of Wildwood Drive due to the limited land uses along the south side of US 70 Business between this median opening and Hardee Lane. Therefore, 5 peak hour vehicles were assigned to this U-turn movement. To remain conservative, there was no reduction made at other movements to counteract this addition of peak hour traffic.

Figures 4A and 4B detail the balanced peak hour traffic volumes, the reassignment of traffic to account for the construction of the TIP project, and the total 2019 adjusted peak hour traffic volumes used.

US 70 Business is currently a 4-lane roadway with a posted speed limit of 45 miles per hour (mph) west of Hardee Lane and 55 mph east of Hardee Lane in the project vicinity. US 70 Business is classified as a boulevard on the *Johnston County Comprehensive Transportation Plan* (July 2011). US 70 Business has a 2017 average annual daily traffic (AADT) volume of 21,000 vehicles per day on the *NCDOT Interactive Traffic Volume Map*.

NC 42 is currently a 4-lane roadway in the project vicinity with a posted speed limit of 45 mph. NC 42 is classified as a boulevard that needs improvement on the *Johnston County Comprehensive Transportation Plan* (July 2011) with a 2017 AADT of 24,000 vehicles per day according to the *NCDOT Interactive Traffic Volume Map*.

Rose Street is currently a local two-lane roadway with a posted speed limit of 25 mph. Assuming the PM peak hour traffic volume accounts for approximately 10% of the daily traffic, Rose Street has an estimated 2019 AADT of 1,680 vehicles per day.

Astor Street and Tulip Street are currently local two-lane roadways with a posted speed limit of 25 mph in the project vicinity. Assuming the PM peak hour traffic volumes account for approximately 10% of the daily traffic, the estimated AADTs on these roadways is estimated to be less than 200 vehicles per day. Iris Street is currently a local gravel roadway that services less than 10 homes and has minimal daily traffic volume. Wildwood Drive is also a local gravel roadway with minimal daily traffic volume.

Hardee Lane is currently a two-lane local roadway with an assumed speed limit of 25 mph in the project vicinity. Assuming the PM peak hour traffic volume accounts for approximately 10% of the daily traffic, Hardee Lane has an estimated 2019 AADT of 1,320 vehicles per day.

Buckhorn Branch Residential TIA **Existing Lane Geometry** **with TIP under Construction**

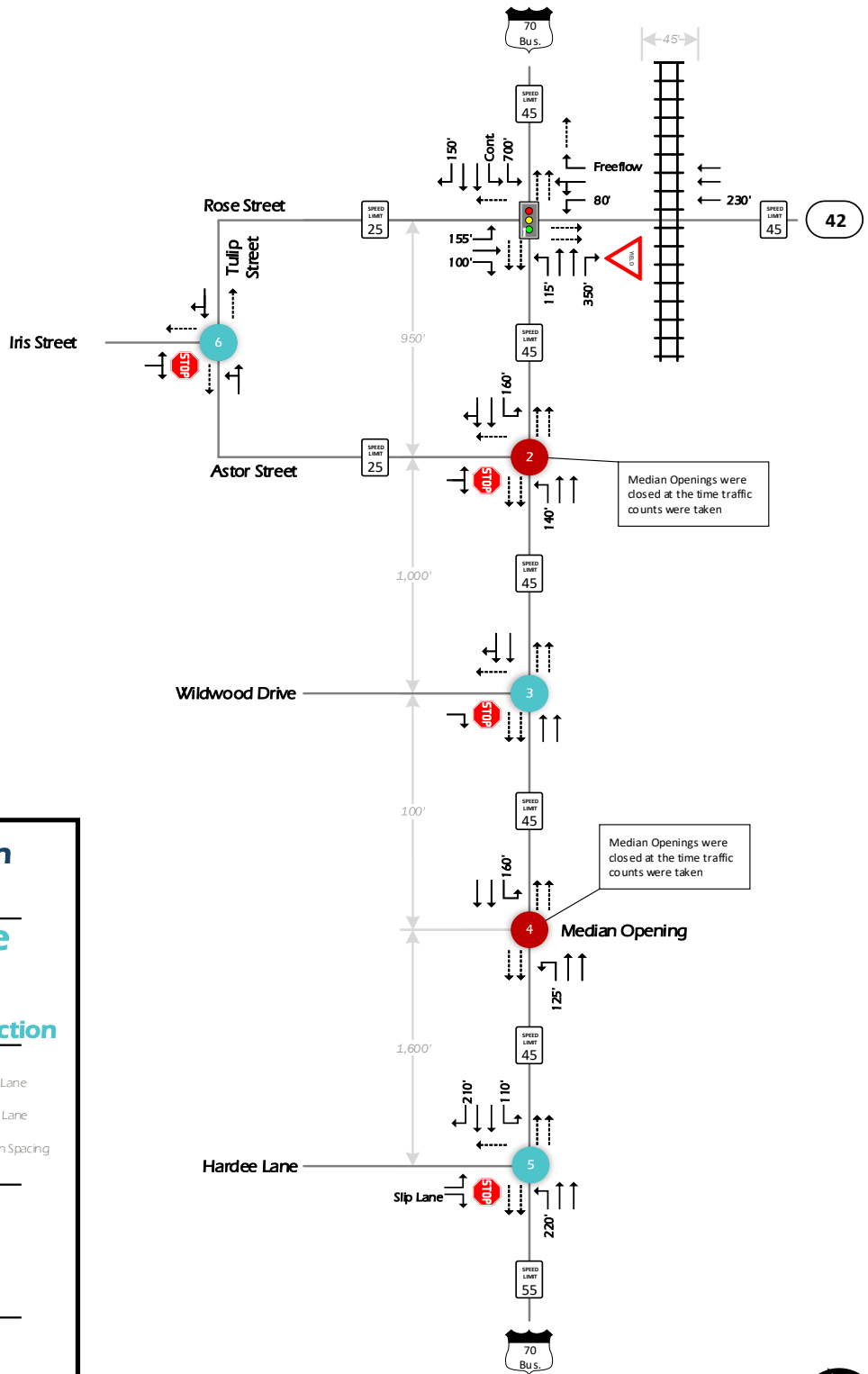
LEGEND		
	Stop Control	→ Approach Lane
	Speed Limit	 Departure Lane
	Signal Control	◀-XX'-> Intersection Spacing
	XX' - FULL STORAGE LENGTH	

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US 70 Business from NC 42 to Hardee Lane

Johnston County, NCDOT
Division 4

Figure 3A



Buckhorn Branch Residential TIA

Existing Lane Geometry

with TIP Improvements Complete

LEGEND

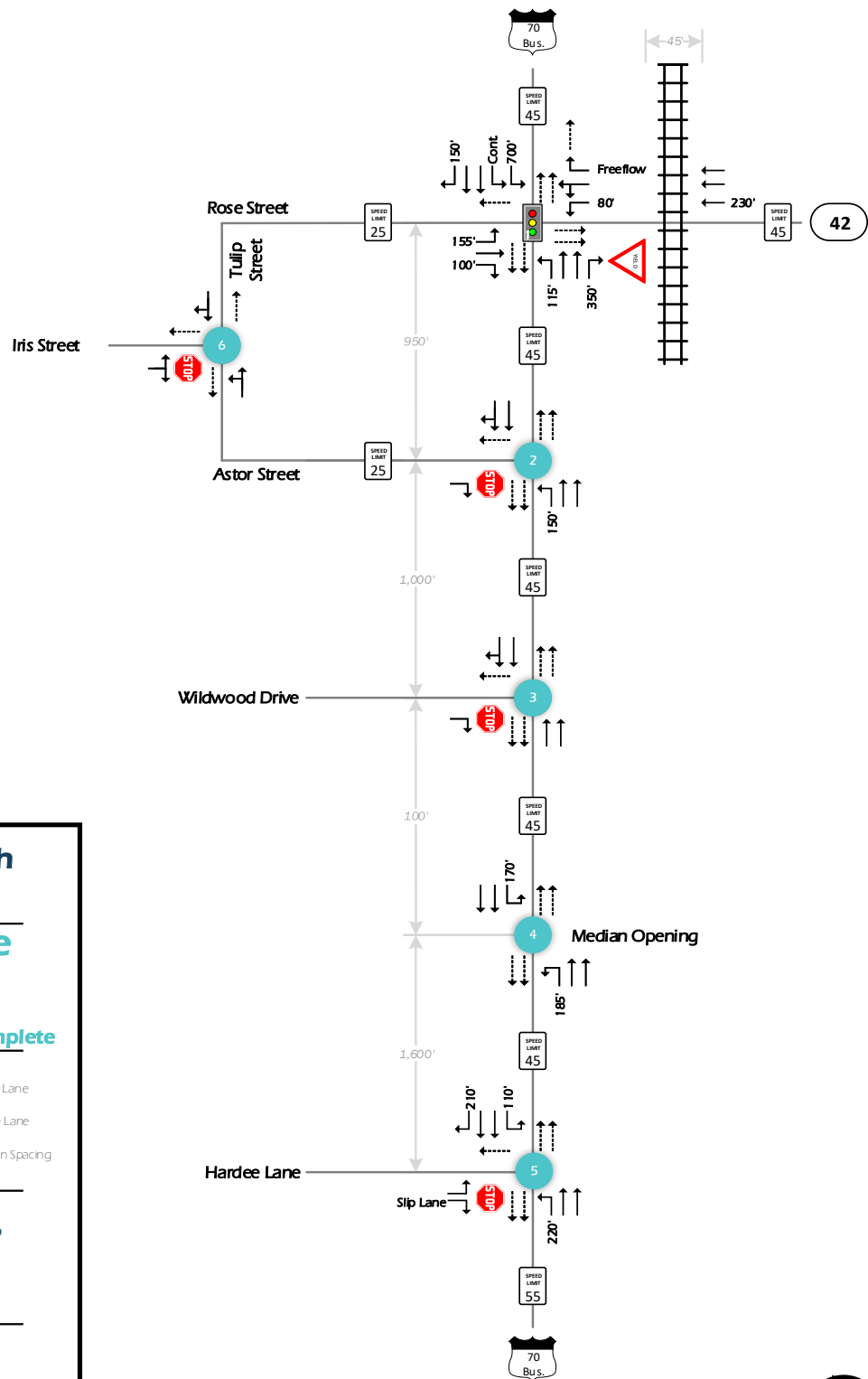
	Stop Control	→ Approach Lane
	Speed Limit	 Departure Lane
	Signal Control	◀XX'▶ Intersection Spacing
		XX' - FULL STORAGE LENGTH

EXTENTS

US 70 Business from NC 42 to
Hardee Lane

Johnston County, NCDOT
Division 4

Figure 3B



Buckhorn Branch Residential TIA

2019 Existing AM Traffic Volumes

LEGEND

XX – Existing Balanced Traffic Volumes
 (XX) – Reassignment due to Construction
 [XX] – Adjusted Existing Traffic Volumes

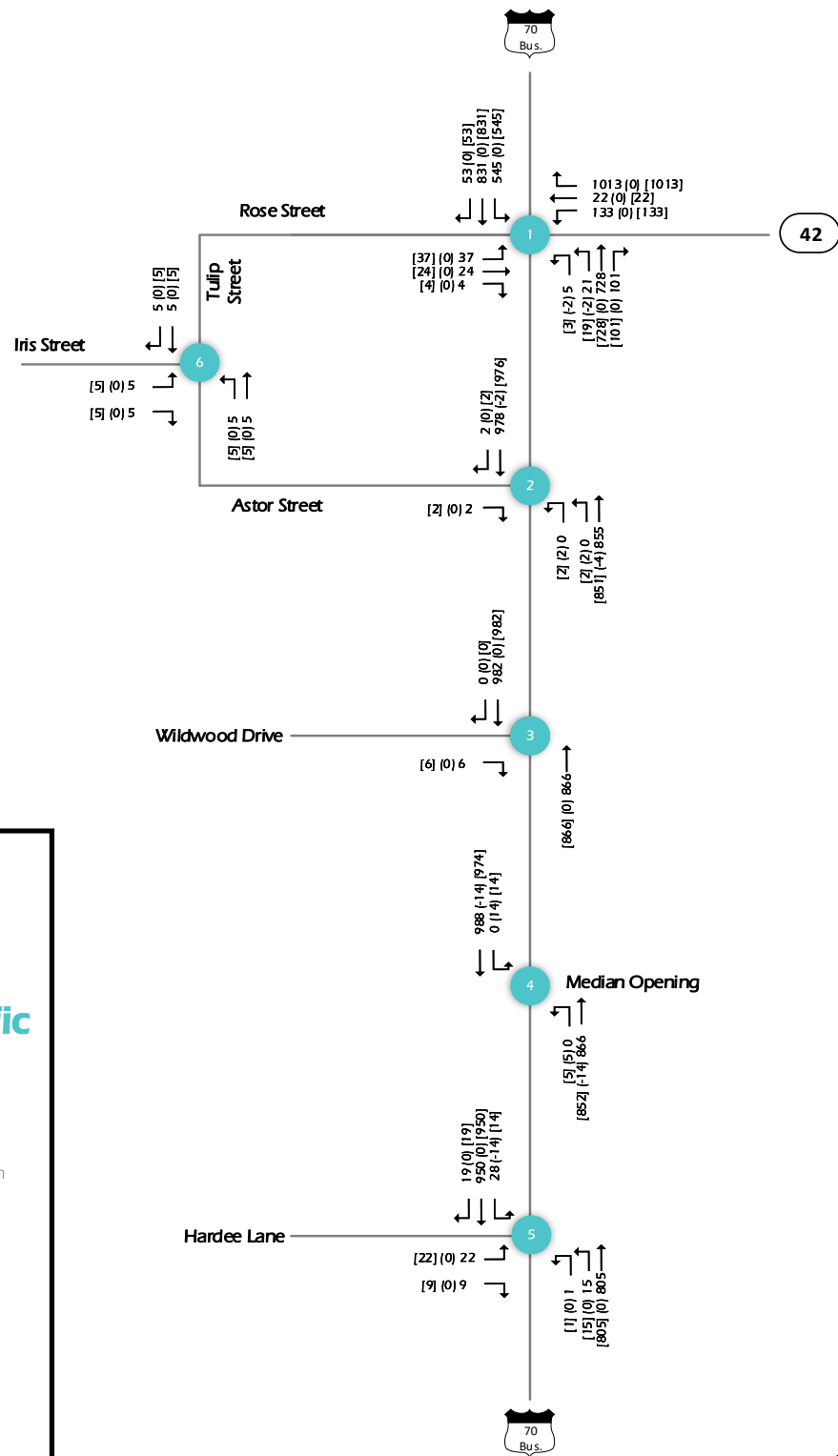
$$XX + (XX) = [XX]$$

EXTENTS

US 70 Business from NC 42 to
 Hardee Lane

Johnston County, NCDOT
 Division 4

Figure 4A



Buckhorn Branch Residential TIA

2019 Existing PM Traffic Volumes

LEGEND

XX – Existing Balanced Traffic Volumes
 (XX) – Reassignment due to Construction
 [XX] – Adjusted Existing Traffic Volumes

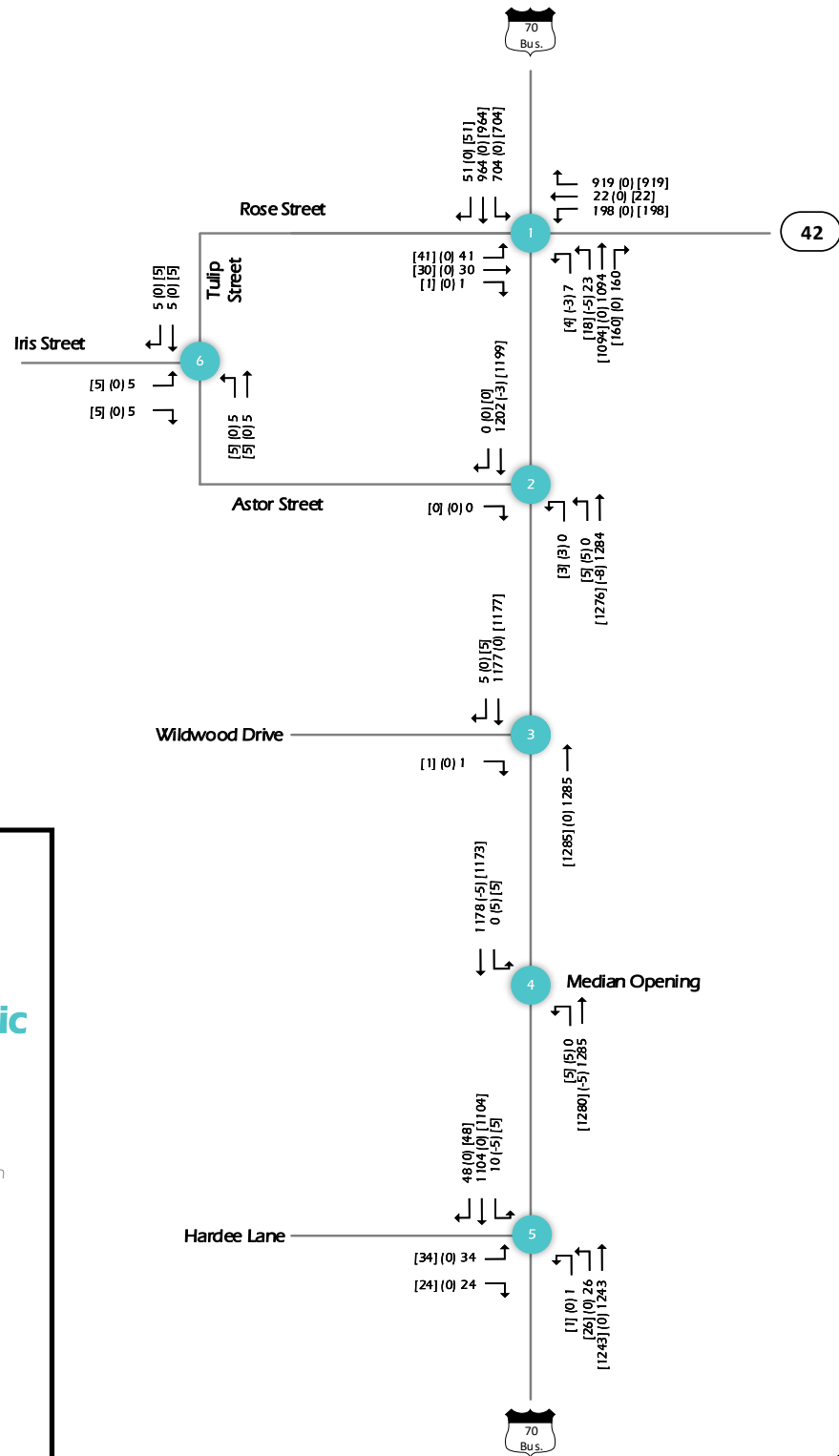
$$XX + (XX) = [XX]$$

EXTENTS

US 70 Business from NC 42 to
 Hardee Lane

Johnston County, NCDOT
 Division 4

Figure 4B



FUTURE CONDITIONS

The projected 2023 background traffic volumes consist of existing 2019 traffic volumes plus background growth. As required by the Town, an annual 2% growth rate was applied to determine 2023 background traffic volumes. Based on coordination with the Town, there were no approved developments within the project vicinity to consider when determining future year traffic volumes at the study intersections.

There is a Transportation Improvement Program (TIP) project in the vicinity of the proposed development. TIP# W-5704 was under construction at the time of the traffic data collection efforts for this TIA. The project is set to be completed under the 2019 existing traffic conditions and therefore was assumed to be in place in the background and buildout future year traffic scenarios as well.

Figures 5 and 6 show the 2023 AM Peak Hour Background Traffic Volumes and the 2023 PM Peak Hour Background Traffic Volumes, respectively. Traffic volume calculations are also included in the Appendix of this report.

Buckhorn Branch Residential TIA

2023 AM Peak Hour Background Traffic

LEGEND

XX - 2019 Existing Traffic
 (XX) - Background Growth (2%)
 [XX] - Total Background Traffic

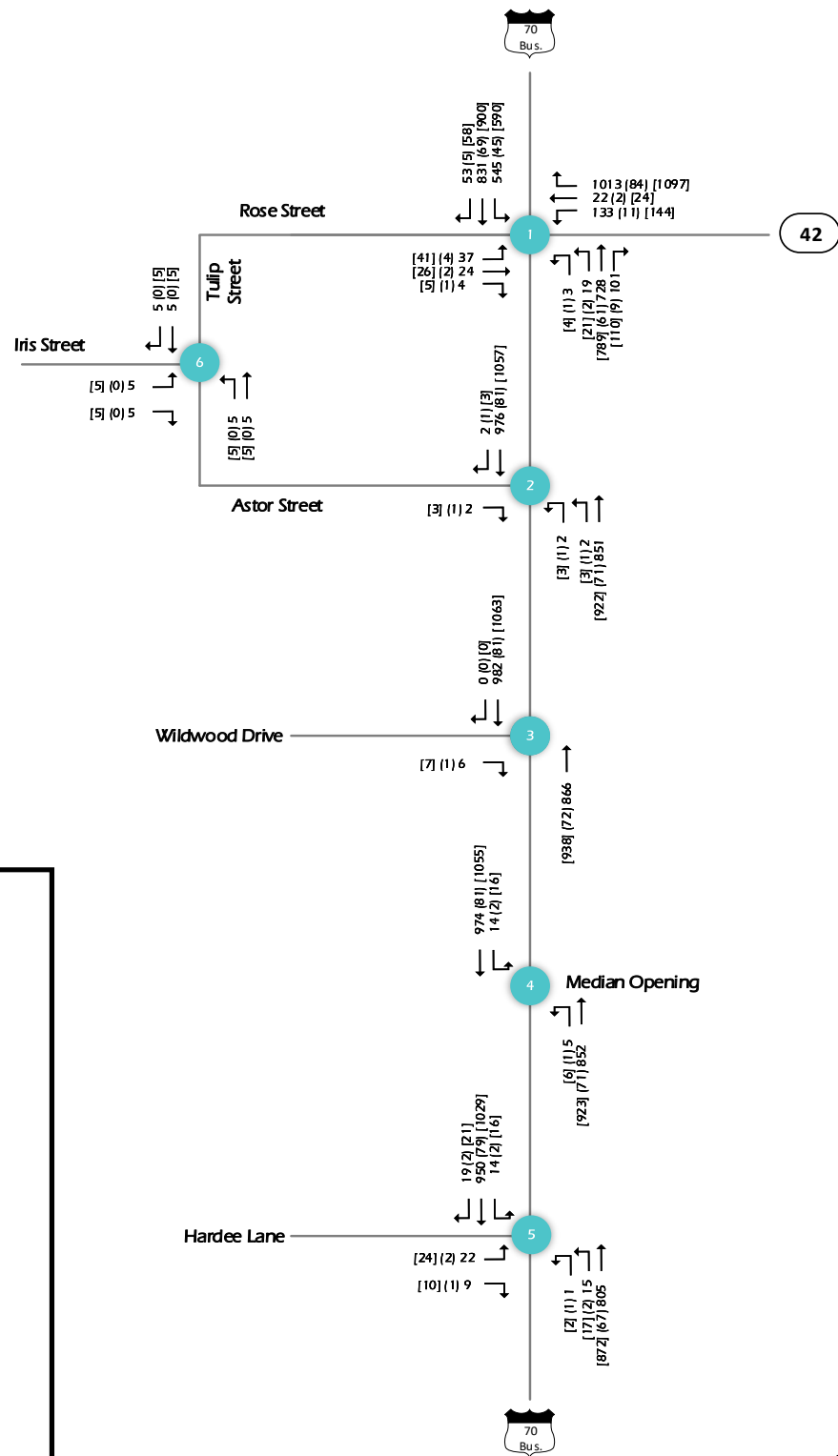
$$XX + (XX) = [XX]$$

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US 70 Business from NC 42 to
 Hardee Lane

Johnston County, NCDOT
 Division 4

Figure 5



Buckhorn Branch Residential TIA

2023 PM Peak Hour Background Traffic

LEGEND

XX - 2019 Existing Traffic
(XX) - Background Growth (2%)
[XX] - Total Background Traffic

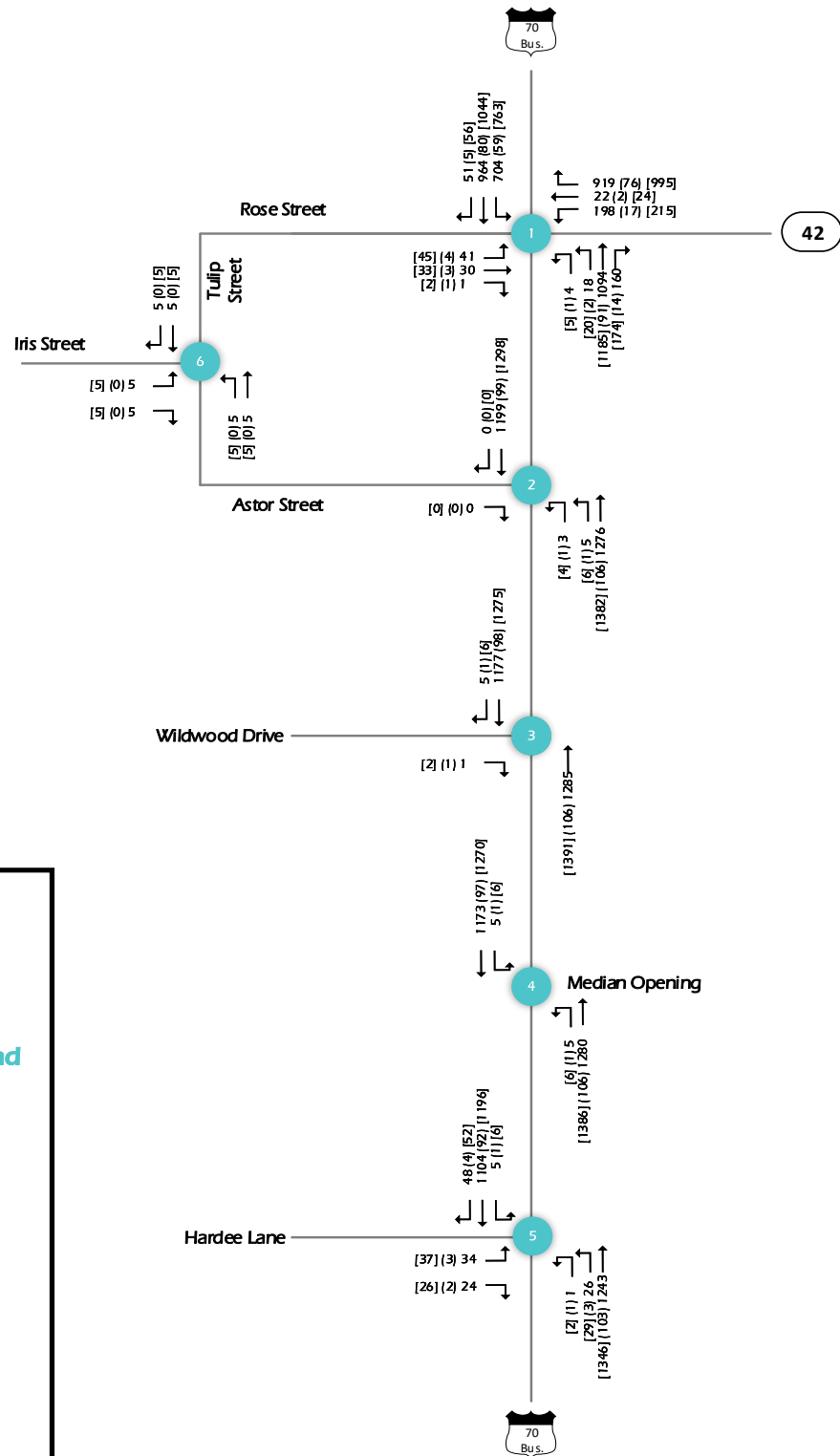
$$XX + (XX) = [XX]$$

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US 70 Business from NC 42 to
Hardee Lane

Johnston County, NCDOT
Division 4

Figure 6



PROPOSED SITE

The proposed 85-acre site is situated on the south side of US 70 Business east of NC 42 in Clayton, North Carolina as shown on Figure 1. The property is currently zoned as Residential Estate. The proposed development consists of 205 single family dwelling units and 120 residential townhomes/condos and does require a Zoning Map Change to Planned Development-Residential. The proposed development will be accessed by three existing access points on US 70 Business. The proposed site is to be developed within four years by the year 2023.

Table 1 shows the projected trip generation for the proposed development. The trip generation was based on rates published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition. The NCDOT Congestion Management Rates vs. Equations spreadsheet was used for guidance. The proposed development is expected to generate 2,882 daily trips, 208 AM peak hour trips (51 entering, 157 exiting), and 273 PM peak hour trips (172 entering, 101 exiting).

Table 1: Trip Generation

Land Use			Daily	AM Peak Hour			PM Peak Hour		
				Total	Enter	Exit	Total	Enter	Exit
210: Single Family	205	d.u.	2,014	151	38	113	203	128	75
220: Multifamily Housing (Low-Rise)	120	d.u.	868	57	13	44	70	44	26
Total			2,882	208	51	157	273	172	101

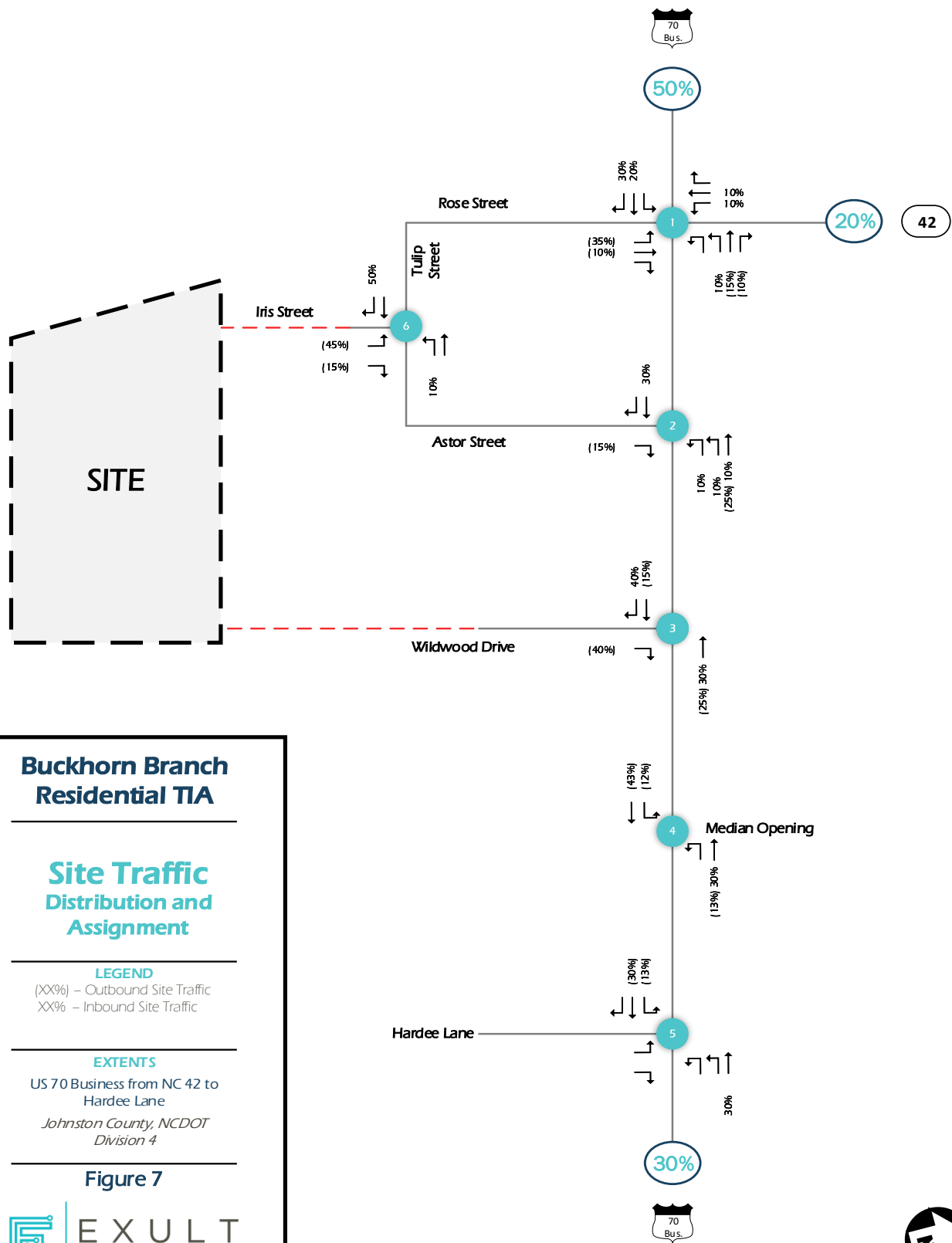
References: *Trip Generation Manual*, 10th Edition, Institute of Transportation Engineers, September 2017

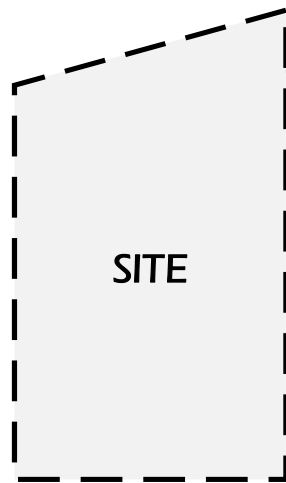
Based on the existing traffic patterns and surrounding opportunities to access retail and office developments, the proposed trip distribution for the site is as follows:

- 50% to/from the West on US 70 Business
- 30% to/from the East on US 70 Business
- 20% to/from the North on NC 42

The trip generation and site distribution was previously approved by the Town and NCDOT. Figure 7 shows the Site Traffic Distribution and Assignment at each of the study intersections. The trip assignment was also previously approved by the Town and NCDOT. The trip assignment was applied to the trips generated for the proposed development to determine the projected AM and PM peak hour site traffic. The projected AM and PM peak hour site traffic volumes were added to the 2023 background traffic volumes to determine the buildout traffic volumes at the study intersections.

The projected background traffic volumes at the study intersections are shown in Figure 8 (2023 AM Peak Hour Buildout Traffic Volumes) and Figure 9 (2023 PM Peak Hour Buildout Traffic Volumes).





Buckhorn Branch Residential TIA

2023 AM Peak Hour Buildout Traffic

LEGEND

XX – Background Traffic
 (XX) – Site Traffic
 [XX] – Total Buildout Traffic

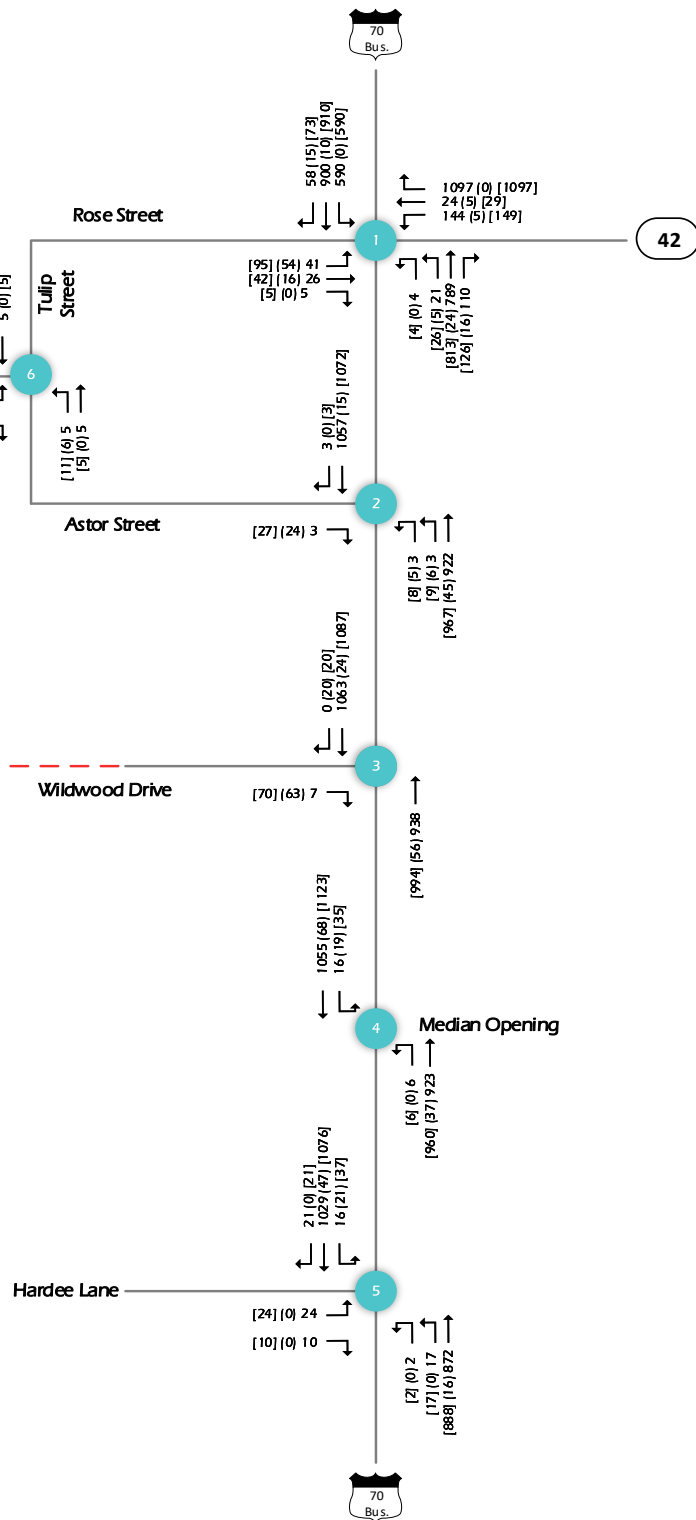
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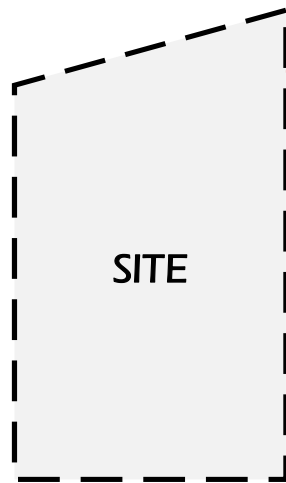
EXTENTS

US 70 Business from NC 42 to
 Hardee Lane

Johnston County, NCDOT
 Division 4

Figure 8





Buckhorn Branch Residential TIA

2023 PM Peak Hour Buildout Traffic

LEGEND

XX – Background Traffic
 (XX) – Site Traffic
 [XX] – Total Buildout Traffic

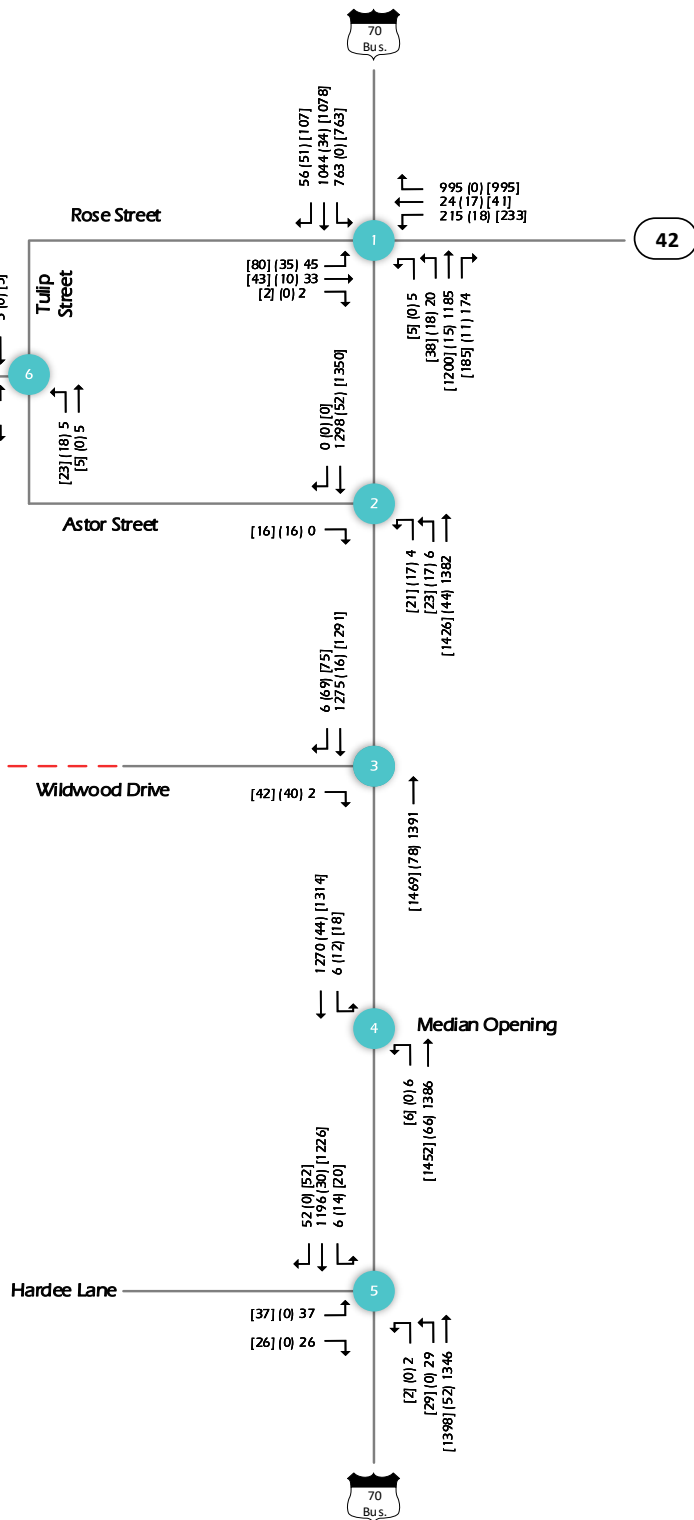
XX + (XX) = [XX]

EXTENTS

US 70 Business from NC 42 to
 Hardee Lane

Johnston County, NCDOT
 Division 4

Figure 9



CAPACITY ANALYSIS

The intersections identified within the study area were analyzed under 2019 existing, 2023 background, and 2023 buildout conditions to identify the potential traffic impact of the proposed development on the roadway network. Necessary roadway improvements to mitigate the anticipated impact of the proposed site traffic were recommended based on the level-of-service (LOS) analysis results.

The proposed site is to be developed within four years by the year 2023. This study includes the analysis of the following traffic scenarios:

- Existing (2019) Traffic Conditions– TIP Under Construction
- Existing (2019) Traffic Conditions – Adjusted Traffic Volumes after TIP Construction
- Background (2023) Traffic Conditions
- Buildout (2023) Traffic Conditions
- Buildout (2023) Traffic Conditions with Recommended Improvements

LOS is a qualitative measurement of traffic operations that is a measure of delay time. The Transportation Research Board's *Highway Capacity Manual* (HCM) defines six levels of service for intersections with LOS "A" representing the best operating condition and LOS "F" representing the worst. The following table summarizes the criteria for signalized intersections and stop-controlled intersections.

Table 2: Highway Capacity Manual (LOS and Delay)

Signalized Intersection		Stop-Controlled Intersection	
Level-of-Service (LOS)	Average Control Delay (Seconds per Vehicles)	Level-of-Service (LOS)	Average Control Delay (Seconds per Vehicle)
A	≤ 10.0	A	≤ 10.0
B	> 10.0 and ≤ 20.0	B	> 10.0 and ≤ 15.0
C	> 20.0 and ≤ 35.0	C	> 15.0 and ≤ 25.0
D	> 35.0 and ≤ 55.0	D	> 25.0 and ≤ 35.0
E	> 55.0 and ≤ 80.0	E	> 35.0 and ≤ 50.0
F	> 80.0	F	> 50.0

The current update (version 10.2) of Synchro Professional software was used to determine the LOS, delay, and expected queue length at the signalized and unsignalized intersections. SimTraffic was also used to determine the maximum queue length experienced at the study intersections. This software is based on the analysis procedures defined in the HCM. For unsignalized intersections, Synchro reports were created using the HCM 6th Edition option for unsignalized intersections. Queue lengths for the turn lanes are shown in the summary tables. Detailed Synchro and SimTraffic reports are included in the Appendix of this report.

LOS for a two-way stop-controlled (TWSC) intersection is determined by the control delay and is defined for the minor approaches. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. With respect to field measurements, this summation of control delay is defined as the total time elapsed from the time a vehicle stops at the end of the queue to the time the vehicle departs from the stop line. Capacity analysis results between LOS A and LOS C for the minor street stop-controlled approaches are assumed to represent short delays. Results between LOS D and LOS E for the minor street stop-controlled approaches are assumed to represent moderate delays, and LOS F for the minor street stop-controlled approaches is assumed to represent long delays. It is typical for minor street stop-controlled approaches and driveways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. However, the majority of the traffic moving through the intersection experiences little or no delay on the major street approaches.

Capacity Analysis Inputs

The *NCDOT Congestion Management Capacity Analysis Guidelines* were referenced to perform this traffic study. The following inputs were used for all intersections:

- Peak Hour Factor (PHF) was based on existing count data for existing scenarios for each approach. For background and buildout scenarios, a PHF of 0.90 was used.
- Heavy vehicles percentage for existing scenarios was based on existing traffic count data for the intersection. The heavy vehicle percentage was set to 2% for background and buildout scenarios.

For the signalized intersection, a detailed explanation of inputs used in the Synchro capacity analysis is described under the intersection subsection. For unsignalized intersections, queue length for HCM from Synchro is given in terms of number of vehicles. To convert to queue length in feet, an estimated 25'/vehicle was applied.

The following subsections summarize the LOS and queue length results for the capacity analysis under 2019 existing, 2023 background, and 2023 buildout traffic scenarios as well as recommended improvements for each study intersection.

US 70 Business at NC 42/Rose Street

US 70 Business at NC 42/Rose Street is currently a signalized intersection. Existing signal plans and timings obtained from NCDOT and were used for the 2019 analysis scenarios. These signal timings and plans are included in the Appendix of this report. For future background and buildout scenarios, the following input values were used in accordance with NCDOT Congestion Management guidelines:

- Cycle length minimum for the 6-phase signal was set to 140 seconds.
- Right-turns on red were not permitted except for the southbound right-turn free-flow movement and the westbound right-turn yield movement. Right-turns on red were permitted under existing scenarios.
- The minimum initial for the major street was set to 12 seconds. The minimum initial for the major street protected left-turn movements and the minor street was set to 7 seconds.
- Lost time set to 5 seconds, yellow time set to 5 seconds, and red time set to 2 seconds.
- Phasing remained consistent with existing plans. Splits were optimized.



Northbound Approach of Rose Street at US 70 Business

Table 3 summarizes the capacity analysis results for the signalized intersection of US 70 Business at NC 42/Rose Street under 2019 existing, 2023 background, and 2023 buildout scenarios. As shown in Table 3 below, the intersection of US 70 Business at NC 42/Rose Street operates under existing conditions at LOS D in both the AM and PM peak hours. With the completion of TIP W-5704 and minor reassignment of existing traffic, the intersection is expected to continue to operate at LOS D during the AM and PM peak hours. Under background conditions, the intersection is expected to operate at LOS C in the AM peak hour and LOS D in the PM peak hour. At project buildout, the intersection is anticipated to continue to operate at an acceptable LOS C in the AM peak hour and LOS D in the PM peak hour with site traffic.

There are no roadway improvements recommended at the intersection of US 70 Business at NC 42/Rose Street.

Table 3: Level-of-Service: US 70 Business at NC 42/Rose Street

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)
2019 Existing (TIP Under Construction)	Overall – D (36.6) EB – D (45.6) WB – D (54.6) NB – D (43.3) SB – B (11.8)	EBL – 366'/468' EBR – 10'/86' WBL – 80'/270' WBR – 8'/54' NBL – 64'/90' NBR – 0'/20' SBL – 145'/197' SBR – 0'/649'	Overall – D (42.8) EB – D (36.0) WB – E (66.7) NB – F (88.3) SB – C (23.2)	EBL – 539'/512' EBR – 11'/315' WBL – 129'/269' WBR – 99'/625' NBL – 107'/87' NBR – 0'/20' SBL – 266'/232' SBR – 0'
2019 Existing (TIP Completed)	Overall – D (36.6) EB – D (45.6) WB – D (54.7) NB – D (43.3) SB – B (11.8)	EBL – 366'/377' EBR – 10'/315' WBL – 66'/269' WBR – 9'/56' NBL – 64'/174' NBR – 0'/20' SBL – 145'/210' SBR – 0'	Overall – D (42.2) EB – D (36.0) WB – E (65.0) NB – F (88.3) SB – C (23.2)	EBL – 539'/570' EBR – 11'/314' WBL – 91'/269' WBR – 99'/625' NBL – 107'/109' NBR – 0'/20' SBL – 266'/232' SBR – 0'
2023 Background	Overall – C (32.9) EB – D (39.2) WB – D (49.0) NB – D (52.4) SB – B (12.1)	EBL – 345'/422' EBR – 41'/315' WBL – 69'/269' WBR – 1'/122' NBL – 81'/92' NBR – 12'/46' SBL – 148'/149' SBR – 0'	Overall – D (36.9) EB – D (40.7) WB – D (46.6) NB – E (68.4) SB – B (18.4)	EBL – 502'/637' EBR – 39'/311' WBL – 73'/75' WBR – 46'/625' NBL – 90'/112' NBR – 7'/14' SBL – 224'/249' SBR – 0'
2023 Buildout	Overall – C (34.4) EB – D (40.8) WB – D (49.7) NB – D (54.0) SB – B (12.7)	EBL – 352'/400' EBR – 49'/315' WBL – 88'/269' WBR – 14'/56' NBL – 156'/148' NBR – 11'/20' SBL – 155'/167' SBR – 0'	Overall – D (43.8) EB – D (51.6) WB – D (49.3) NB – E (71.9) SB – C (22.9)	EBL – 526'/460' EBR – 85'/315' WBL – 129'/270' WBR – 56'/625' NBL – 154'/143' NBR – 6' SBL – 272'/298' SBR – 0'

US 70 Business at Astor Street

US 70 Business at Astor Street is currently an unsignalized intersection. The minor street approach (Astor Street) operates under stop control while the major street approaches (US 70 Business) are free-flow. During field data collection, the median opening at Astor Street was closed for the construction of TIP #5704. The TIP project includes the following improvements at the intersection:

- Removal of eastbound U-Turn on US 70 Business. The intersection will provide a westbound left-in from US 70 Business, an eastbound right-in from US 70 Business, and a northbound right-out from Astor Street.
- Increase the westbound left-turn lane storage length on US 70 Business to provide 150' of full-width storage.



Eastbound Approach of US 70 Business at Astor Street

The capacity analysis results for the intersection are summarized in Table 4 below.

Table 4: Level-of-Service: US 70 Business at Astor Street

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)
2019 Existing (TIP Under Construction)	NB – B (12.5)	NB – 0'/31'	NB – A (0.0)	NB – 0'
2019 Existing (TIP Completed)	WBL – B (14.1) NB – B (12.5)	WBL – 0'/27' NB – 0'/31'	WBL – C (15.8) NB – A (0.0)	WBL – 3'/27' NB – 0'
2023 Background	WBL – C (15.4) NB – B (13.0)	WBL – 3'/26' NB – 0'/30'	WBL – C (18.6) NB – A (0.0)	WBL – 3'/28' NB – 0'
2023 Buildout	WBL – C (16.1) NB – B (13.7)	WBL – 5'/27' NB – 5'/52'	WBL – C (24.8) NB – C (15.7)	WBL – 20'/52' NB – 5'/52'

As shown in Table 4, the intersection of US 70 Business at Astor Street currently operates with short delays for the northbound minor street approach (Astor Street) during the AM and PM peak hours. The intersection is expected to operate with short delays for the northbound minor street approach and the westbound major street left-turn movement during both the AM and PM peak hours under existing with TIP completed, background, and buildout traffic conditions.

There are no roadway improvements recommended to accommodate project traffic for the intersection of US 70 Business at Astor Street.

US 70 Business at Wildwood Drive

US 70 Business at Wildwood Drive is currently an unsignalized intersection. The minor street approach (Wildwood Drive) operates under stop control while the major street approaches (US 70 Business) are free-flow.

The following improvement has been identified by NCDOT for the buildout of the site:

- Extend the concrete barrier to prohibit Wildwood Drive northbound right-turn traffic from accessing the median opening immediately to the east on US 70 Business.

The capacity analysis results for the intersection are summarized in Table 5 below.



Eastbound Approach of US 70 Business at Wildwood Drive

Table 5: Level-of-Service: US 70 Business at Wildwood Drive

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)
2019 Existing (TIP Under Construction)	NB – B (14.0)	NB – 3'/31'	NB – B (14.9)	NB – 0'/31'
2019 Existing (TIP Completed)	NB – B (14.0)	NB – 3'/31'	NB – B (14.9)	NB – 0'
2023 Background	NB – B (14.5)	NB – 3'/31'	NB – C (16.3)	NB – 0'/31'
2023 Buildout	NB – C (17.2)	NB – 20'/94'	NB – C (19.2)	NB – 13'/56'
2023 Buildout with Recommendations	NB – C (17.0)	NB – 20'/64'	NB – C (18.2)	NB – 13'/65'

As shown in Table 5, the intersection of US 70 Business at Wildwood Drive operates with short delays during the AM and PM peak hours for the northbound minor street approach (Wildwood Drive) under existing conditions. Under background and buildout conditions, the intersection is expected to continue to operate with short delays during the AM and PM peak hours.

The following improvement is recommended at the intersection of US 70 Business and Wildwood Drive to accommodate site traffic:

- Construct an exclusive eastbound right-turn lane on US 70 Business at Wildwood Drive to provide 50 feet of full-width storage.
- Pave Wildwood Drive from US 70 Business to connection with "Street A" according to Town standards.

US 70 Business at Median Opening

US 70 Business at Median Opening East of Wildwood Drive is currently an unsignalized intersection. The major street approaches (US 70 Business) are free-flow.

During field data collection, the Median Opening East of Wildwood Drive was closed due to construction of TIP #W-5704. The TIP project includes the construction of the following improvements:

- Extend the eastbound U-turn lane storage length on US 70 Business to provide 170' of full-width storage.
- Extend the westbound U-turn lane storage length on US 70 Business to provide 185' of full-width storage.

Table 6 summarizes the capacity analysis results for the unsignalized intersection of US 70 Business at Median Opening East of Wildwood Drive.



Looking West at US 70 Business and Median Opening East of Wildwood Drive

Table 6: Level-of-Service: US 70 Business at Median Opening East of Wildwood Drive

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)
2019 Existing (TIP Under Construction)	N/A	EBU – N/A WBU – N/A	N/A	EBU – N/A WBU – N/A
2019 Existing (TIP Completed)	N/A	EBU – 34' WBU – 26'	N/A	EBU – 31' WBU – 26'
2023 Background	N/A	EBU – 34' WBU – 25'	N/A	EBU – 34' WBU – 27'
2023 Buildout	N/A	EBU – 34' WBU – 26'	N/A	EBU – 34' WBU – 26'

As shown in Table 6, the storage lengths available are expected to accommodate the queue lengths projected under the future scenarios. There are no roadway improvements recommended for the intersection.

US 70 Business at Hardee Lane

US 70 Business at Hardee Lane is currently an unsignalized intersection. The minor street approach (Hardee Lane) operates under stop control while the major street approaches (US 70 Business) are free-flow.

Inputs: The northbound approach of Hardee Lane provides adequate lane width to allow for a right-turn slip lane. The approach was coded in Synchro as an exclusive northbound right-turn lane with 50 feet of storage and a separate left-turn lane to accurately reflect how the intersection operates.



Northbound Approach of Hardee Lane at US 70 Business

Table 7: Level-of-Service: US 70 Business at Hardee Lane

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)
2019 Existing (TIP Under Construction)	NB – F (56.1) EBU – C (15.7) WBL – B (11.4)	NBL – 38'/47' NBR – 3'/21' EBU – 8'/54' WBL – 3'/25'	NB – F (181.2) EBU – D (28.8) WBL – B (12.0)	NBL – 115'/47' NBR – 5'/22' EBU – 5'/27' WBL – 5'/52'
2019 Existing (TIP Completed)	NB – E (49.9) EBU – C (15.2) WBL – B (11.4)	NBL – 35'/93' NBR – 3'/22' EBU – 3'/29' WBL – 3'/26'	NB – F (162.0) EBU – D (28.0) WBL – B (12.0)	NBL – 110'/107' NBR – 5'/43' EBU – 3'/26' WBL – 5'/71'
2023 Background	NB – F (58.5) EBU – C (15.9) WBL – B (12.1)	NBL – 35'/86' NBR – 3'/21' EBU – 5'/29' WBL – 3'/49'	NB – F (220.9) EBU – D (28.6) WBL – B (13.8)	NBL – 108'/220' NBR – 5'/91' EBU – 3'/27' WBL – 5'/91'
2023 Buildout	NB – F (80.8) EBU – C (17.1) WBL – B (12.6)	NBL – 43'/48' NBR – 3'/21' EBU – 10'/63' WBL – 3'/51'	NB – F (347.0) EBU – D (34.0) WBL – B (14.1)	NBL – 123'/112' NBR – 5'/100' EBU – 13'/51' WBL – 8'/53'

As shown Table 7 above, the intersection of US 70 Business at Hardee Lane is expected to operate with short and moderate delays at the major street (US 70 Business) U-turn/left-turn movements during the AM and PM peak hours under all scenarios. Moderate or long delays are expected at the northbound minor street approach of Hardee Lane during all traffic scenarios. It is common for the minor street stop-controlled approach to experience long delays during the peak hours. Based on peak hour traffic signal warrants presented in the Federal Highway Administration's *Manual on Uniform Traffic Control Devices (MUTCD)*, the intersection is not expected to meet warrants for the installation of a traffic signal. Peak hour warrant information is included in the Appendix. There are no roadway improvements recommended to accommodate site traffic at project buildout.

Tulip Street at Iris Street

Tulip Street at Iris Street is currently an unsignalized intersection. The northbound Iris Street approach operates under stop control while the eastbound and westbound approaches of Tulip Street are free-flow. Iris Street is currently a gravel road.

The intent of analyzing the intersection was to determine how the intersection would operate with the proposed development traffic. Due to the minimum amount of traffic currently utilizing the intersection compared to the traffic anticipated to ultimately use the intersection at project buildout, existing traffic was estimated in lieu of collecting traffic counts. The estimated traffic is included in the volume figures. The annual growth rate was not applied to this intersection due to the limited growth potential along the surrounding roadways.



Northbound Approach of Iris Street at Tulip Street

The capacity analysis results for the intersection are summarized in Table 8 below.

Table 8: Level-of-Service: Tulip Street at Iris Street

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet)
2019 Existing	NB – A (8.5) WBL – A (7.2)	NB – 0'/31' WB – 0'	NB – A (8.5) WBL – A (7.2)	NB – 0'/31' WB – 0'
2023 Background	NB – A (8.5) WBL – A (7.2)	NB – 0'/31' WB – 0'	NB – A (8.5) WBL – A (7.2)	NB – 0'/31' WB – 0'/31'
2023 Buildout	NB – A (9.2) WBL – A (7.3)	NB – 10'/55' WB – 0'/31'	NB – A (9.4) WBL – A (7.5)	NB – 8'/99' WB – 3'/31'

As shown in Table 8, the intersection of Tulip Street at Iris Street currently operates with short delays for during the AM and PM peak hour. The intersection is expected to continue to operate with short delays during the AM and PM peak hour under future scenarios. The following improvement is recommended to accommodate project traffic:

- Pave Iris Street according to Town standards.

RECOMMENDATIONS

In addition to those improvements currently under construction as part of TIP #W-5704, there are recommended improvements to accommodate the project site traffic at buildout. The recommended lane geometry is shown on Figure 10.

The following roadway improvements are currently under construction as part of the TIP project:

US 70 Business at Astor Street:

- Removal of eastbound U-Turn on US 70 Business. The intersection will provide a westbound left-in from US 70 Business, an eastbound right-in from US 70 Business, and a northbound right-out from Astor Street.
- Increase the westbound left-turn lane storage length on US 70 Business to provide 150' of full-width storage.

US 70 Business at Median Break East of Wildwood Drive:

- Extend eastbound U-turn lane storage length on US 70 Business to provide 170' of full-width storage.
- Extend westbound U-turn lane storage length on US 70 Business to provide 185' of full-width storage.

Based on the capacity analysis presented herein, the following roadway improvements are recommended to be completed **by the developer** to accommodate buildout site traffic volumes:

US 70 Business at Wildwood Drive:

- Extend the concrete barrier to prohibit Wildwood Drive northbound right-turn traffic from accessing the median opening immediately to the east on US 70 Business.
- Construct an exclusive eastbound right-turn lane on US 70 Business at Wildwood Drive to provide 50 feet of full-width storage.
- Pave Wildwood Drive from US 70 Business to connection with "Street A" according to Town standards.

Iris Street at Tulip Street:

- Pave Iris Street according to Town standards.

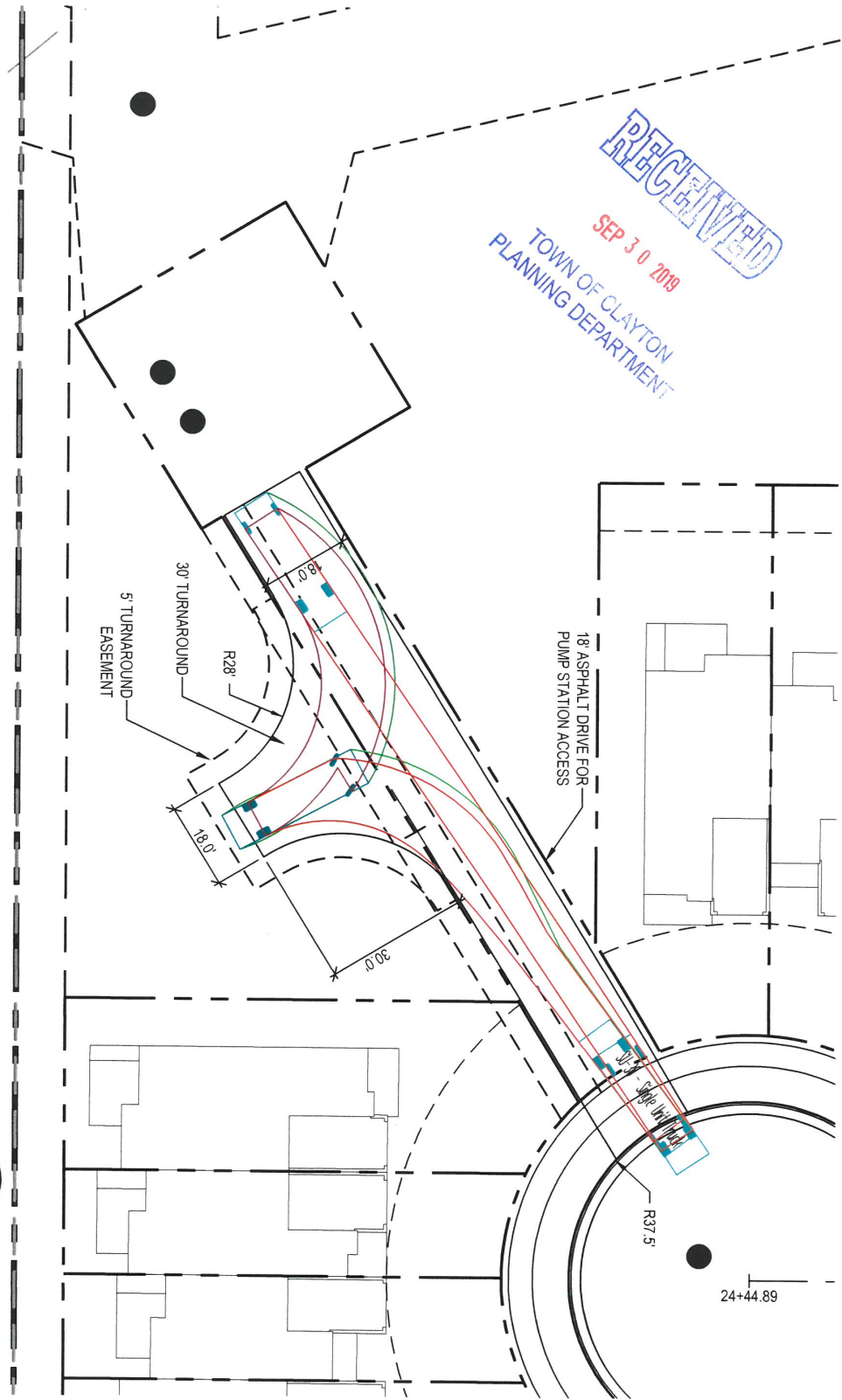
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1 inch = 30 ft.





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

*Town Council
January 6, 2020*

STAFF REPORT

Application Number: 2019-39-SD

Project Name: Buckhorn Branch Preliminary Plat (Master Plan)

Tag #: 05H03010, 05H03197D, 05H03009
Location: Off US HWY 70 BUS, Iris Street, and Wildwood Drive
Overlay: Thoroughfare Overlay District
Applicant: Withers Ravenel
Owner: Concept 8 Holdings LLC
Project Planner: Haley Hogg, Planner II

Public Noticing Dates:

- **Neighborhood Meeting:** April 11, 2019
- **Sign Posted:** November 15, 2019
- **Newspaper Ad Published:** November 6, 2019 & November 13, 2019
- **Letters Mailed:** October 30, 2019

REQUEST: Develop a 324 unit subdivision, consisting of single-family front-loaded and alley-loaded units as well as townhome units.

SITE DATA:

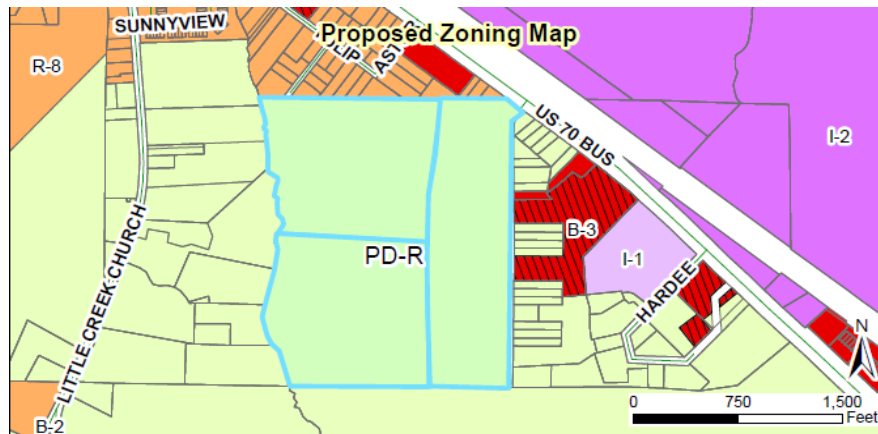
Acreage: 84.73 acres

Existing Use: Vacant



ADJACENT ZONING AND LAND USES:

Direction	Zoning	Existing Use
North	Residential-8 (R-8)	Single-family residential
South	Residential-Estate (R-E)	Single-family residential, agriculture
East	Highway Business SUD (B-3 SUD), Residential-Estate (R-E)	Single-family residential
West	Residential-Estate (R-E)	Single-family residential



DEVELOPMENT DATA:

Proposed Uses: Residential Subdivision

Lot Count: 324 lots (94 front loaded, 109 rear loaded, 121 townhomes)

Density: 3.81 units/acre

Impervious Surface: 41.2% of total site

Lot Type	Impervious Surface (max.) by lot type
Front Loaded	50%
Rear Loaded	70%
Townhomes	70%

Required Parking: 2 spaces per lot

Proposed Parking: 648 parking spaces (includes driveway and garage spaces)

Access/Streets: US HWY 70 BUS and Iris Street, with connections to Wildwood Drive; stub-out to south

STAFF ANALYSIS AND COMMENTARY:

Overview

The applicant is requesting preliminary plat (acting as a master plan) approval to develop 324 residential units, consisting of a mixture of front-loaded and rear-loaded single family residential units as well as townhome units. Running concurrently with this application is 2019-40-PDD to rezone the properties to Planned-Development Residential (PD-R). The property is located off US HWY 70 BUS, Iris Street, and Wildwood Drive. The subdivision will include an amenity center and required open space throughout. Each phase of the development will be reviewed as a minor site plan/subdivision application by the Town's Technical Review Committee (see conditions of approval).

Landscaping and Buffering

The applicant has provided required Class "C" landscape buffers around the perimeter of the site, as required by the Unified Development Code. In areas in which existing woods are located, the applicant is proposing to utilize the existing trees to meet the requirement of the class "c" buffer. Street trees will be provided throughout the development at the rate of 1 tree per 40 linear feet, or 1 tree per lot.

Recreation and Open Space

The applicant has provided sufficient open space and recreation, as required by the Unified Development Code. Per the UDC, all Planned Developments are required to meet the standards of an open space subdivision which entails 12.5% open space with 25% of that active open space. The applicant has provided 15.55 acres of open space throughout the site, with 4.43 acres of that being active open space. The active open space includes the amenity center, internal private walking trails, and neighborhood parks located in the center of the development. All open space areas will be reviewed in further detail via the associated minor site plan/subdivision plan phases (see conditions of approval).

Environmental

Two stormwater ponds have been proposed as a part of this subdivision plan. The applicant has outlined the Resource Conservation Areas throughout the development, as well as existing wetlands. There will not be any encroachments made into the existing wetlands or RCAs. Staff recommends a fence be required around the stormwater pond, for safety purposes, as residential lots directly abut the pond area (see conditions of approval).

Multi-Modal Access

There will be sidewalk provided throughout the subdivision, on both sides of the streets. The applicant is also providing sidewalk along the property's frontage along US HWY 70 BUS. Sidewalk is also provided along the eastern portion of Wildwood Drive, as well as the beginning of the western portion, which will extend in the future along the entire length of Wildwood Drive to the south. Private asphalt paths are provided around the stormwater ponds and connecting into open space areas.

Access/Streets

The applicant is proposing 5 access points within the development. One access point will be located off US HWY 70 in the form of a right-in/right-out only. Please see below for information regarding the connections to existing Iris Street and Wildwood Drive. The number of access points proposed meets the requirements of the Fire Department and the Planning Department's Unified Development Code. These access points must be constructed once certain unit count thresholds are built (see conditions of approval regarding timing of access point construction).

1. Iris Street

The development will connect to Iris Street which is currently a gravel ROW. Per UDC requirements since the development is connecting to this road to serve as a required access point, the development is responsible for bringing the road up to Town Standards. The applicant is proposing a 40' Public ROW for Iris Street which will include 5' sidewalk on one side. This street cross section is provided in the site plan and has been reviewed and approved by the Town Engineering Department.

2. Wildwood Drive

The developer owns to the center line of the existing Wildwood Drive, which is a private street. This road is currently an unpaved dirt road that serves single-family residences located along it. Per UDC requirements, since the development is connecting to this road to serve as a required access point, the development is responsible for bringing the road up to Town standards. As such, the applicant is proposing to develop a 34' Public ROW on their portion of Wildwood Drive. This will include 5' sidewalk and curb & gutter. The remaining portion of Wildwood Drive will remain unpaved at this time since the developer does not have ownership on this. However, the new pavement width will be wide enough to accommodate two way traffic. The proposed street cross section for Wildwood Drive is provided in the site plan and has been reviewed and approved by the Town Engineering Department. The developer will be responsible for extending the driveways of properties currently serviced off Wildwood Drive to the edge of pavement (see conditions of approval).

Traffic Impact Analysis

A Traffic Impact Analysis was performed by Exult Engineering for the proposed subdivision. The estimated build out of the development is 2023. The study found that the subdivision will generate 2,882 daily trips, including 208 AM peak hour and 172 PM peak hour trips. At the time of the TIA, NCDOT already had two projects on US HWY 70 BUS underway in the vicinity that have since been completed. NCDOT will require a right turn lane with 100' taper into the development's main entrance at Wildwood Drive. The recommended improvements of the TIA, as well as the NCDOT required improvements are included in the attachments to this staff report. The timing of these improvements are outlined in the recommended conditions of approval.

Trash Collection

The development will utilize individual roll-outs for trash collection. A dumpster will not be provided. If a dumpster is utilized for the amenity center, the design of the enclosure will be reviewed during the associated minor site plan of the amenity center to ensure requirements of the UDC have been met.

Schools

The proposed subdivision will be served by the following schools. The capacity and enrollment information has been provided to staff by Johnston County Schools. The student generation ratio is .65 students per unit which equates to an estimated generation of 211 school-aged children.

School District Information		
School Name	Capacity	Current Enrollment
East Clayton Elementary School	740	679
Clayton Middle School	750	555
Clayton High School	2000	2004

Consistency with Adopted Plans:

- Comprehensive Plan 2040

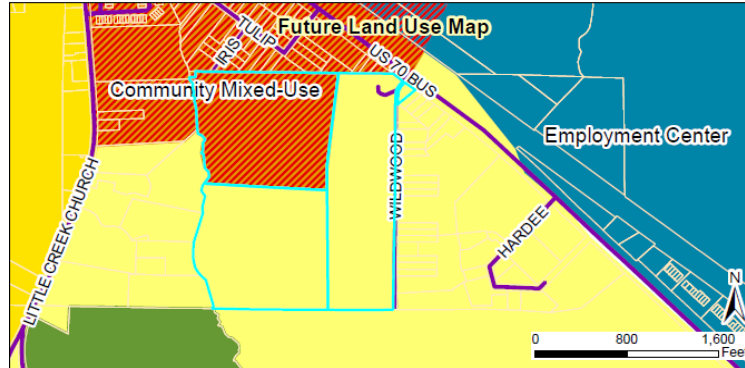
The Comprehensive Plan's Future Land Use Map designates these properties as a Medium Density Residential/Community Center ("Community Mixed Use") and Low Density Residential. Medium Density Residential allows up to 7 dwelling units/acre for Planned Development districts and Low Density Residential typically allows up to 3 units/acre. While not entirely consistent with the Future Land Use Map of the Comprehensive Plan, staff does feel that due to the location of the property off of a major road (US HWY 70 BUS) the requested rezoning would be acceptable with the plan. One of the parcels is already designated as Community Mixed Use. The density of a development is set via the Planned Development master plan. They are proposing 3.81 units per acre outlined in the master plan. It's worth noting that this is just over the maximum permitted in the Low Density Residential designation of the land use map. Town Council may approve rezoning requests that are not consistent with the Future Land Use Map, and if that occurs the land use map is automatically updated accordingly.

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.
- **Unified Development Code**
The proposed residential subdivision has been reviewed by the Technical Review Committee, and was TRC Certified by all departments. The proposed subdivision meets the applicable requirements of the Unified Development Code.



CONSIDERATIONS

- The Town Council shall make final decisions regarding Preliminary Plats.
- Preliminary Plats shall address specific Findings of Fact. The burden of proof is on the applicant. These Findings all must be met for a Preliminary Plat to be approved.
- Staff does not make recommendations on Quasi-Judicial applications in regards to approval/denial.

FINDINGS OF FACT:

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

• **Applicant Response:**

The proposed subdivision is consistent with all of the Town's plans except the Future Land Use Plan where it is mostly consistent. The north half of the development is located within a Community Center designation and the southern area is designated Low Density Residential. Due to the mix of residential types and the proposed density (3.81 DU/Acre) is close to the Low Density Residential threshold of 3 DU/Acre, we feel we meet the intent of the adopted plans for the Town.

- **Staff Commentary:** The subdivision plan has been TRC Certified by Town staff. The plan is not consistent with the Future Land Use Map of the Comprehensive Plan, but is consistent with some goals as outlined in the staff report. The proposed density is only .81 units/acre greater than the typical permitted in the current future land use designation.

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

• **Applicant Response:**

The proposed subdivision meets all of the required specifications of chapter 155.706 of the Town's UDO.

- **Staff Commentary:** The subdivision plan has been TRC Certified by Town Staff and does meet the requirements of the UDC.

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.

• **Applicant Response:**

The proposed subdivision will not be detrimental to the orderly development of other properties in the surrounding area. The project will provide future road stubs and utility extensions that will allow for future development of adjoining properties.

- **Staff Commentary:** The proposed subdivision is providing a stub-out to the south to connect to future potential development and provide access for future adjacent development. The developer is also proposing roadway improvements as outlined in the TIA required by NCDOT, as well as paving Iris Street and a portion of Wildwood Drive.

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.

• **Applicant Response:**

The project is designed with two (2) immediate access points for traffic distribution. The main entrance will be located on US Highway 70 and will allow for right-in/right-out. The secondary entrance is through Iris Street to the west. As the project is phased, additional future road connections to Wildwood Drive and the adjacent property to the south will be constructed to the property line.

- **Staff Commentary:** The project will have an access point off US HWY 70 and off Iris Street, as well as two connections to Wildwood Drive and a stub-out to adjacent future development to the South. The project

is phased accordingly and staff is recommending conditions regarding the timing of construction for required access points. Traffic improvements are being proposed on US HWY 70 in accordance with the TIA.

RECOMMENDED CONDITIONS OF APPROVAL:

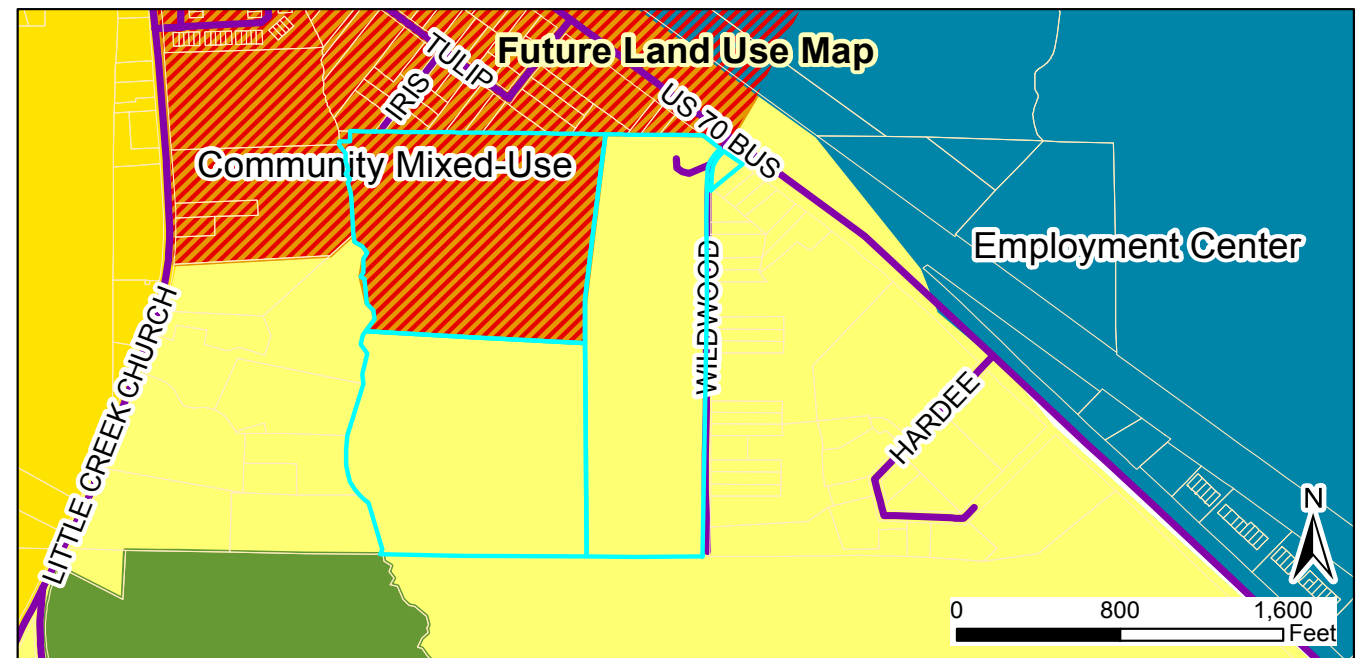
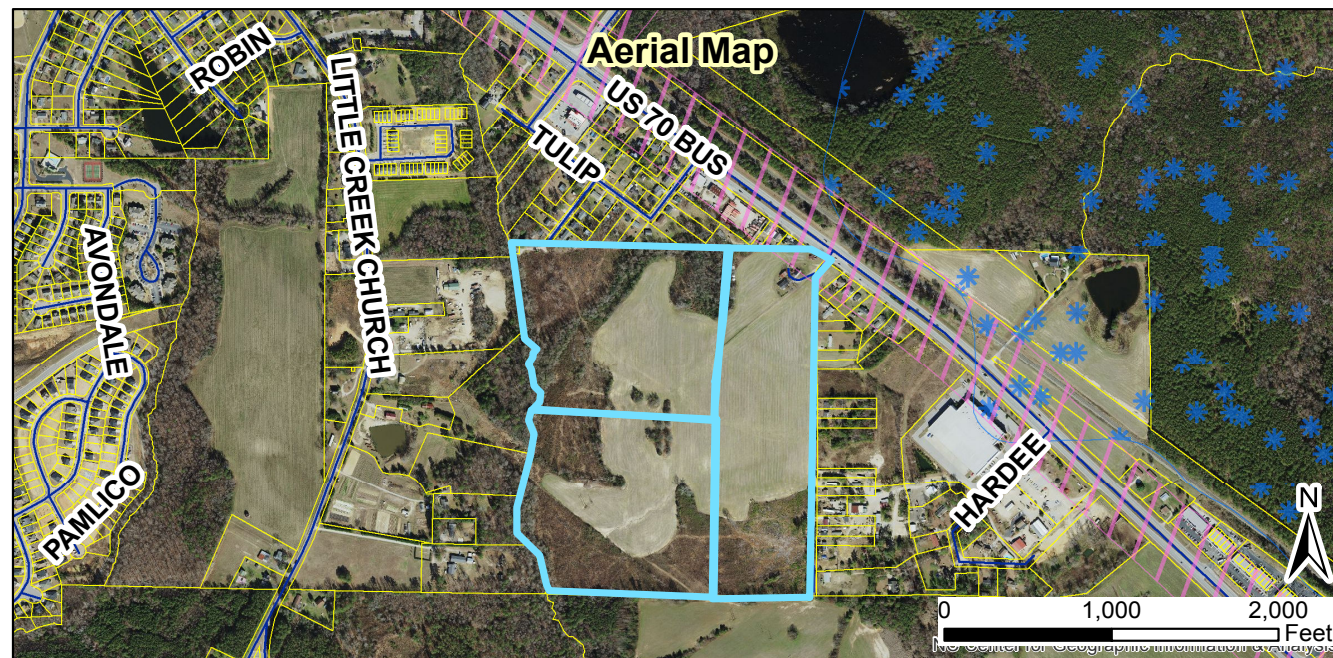
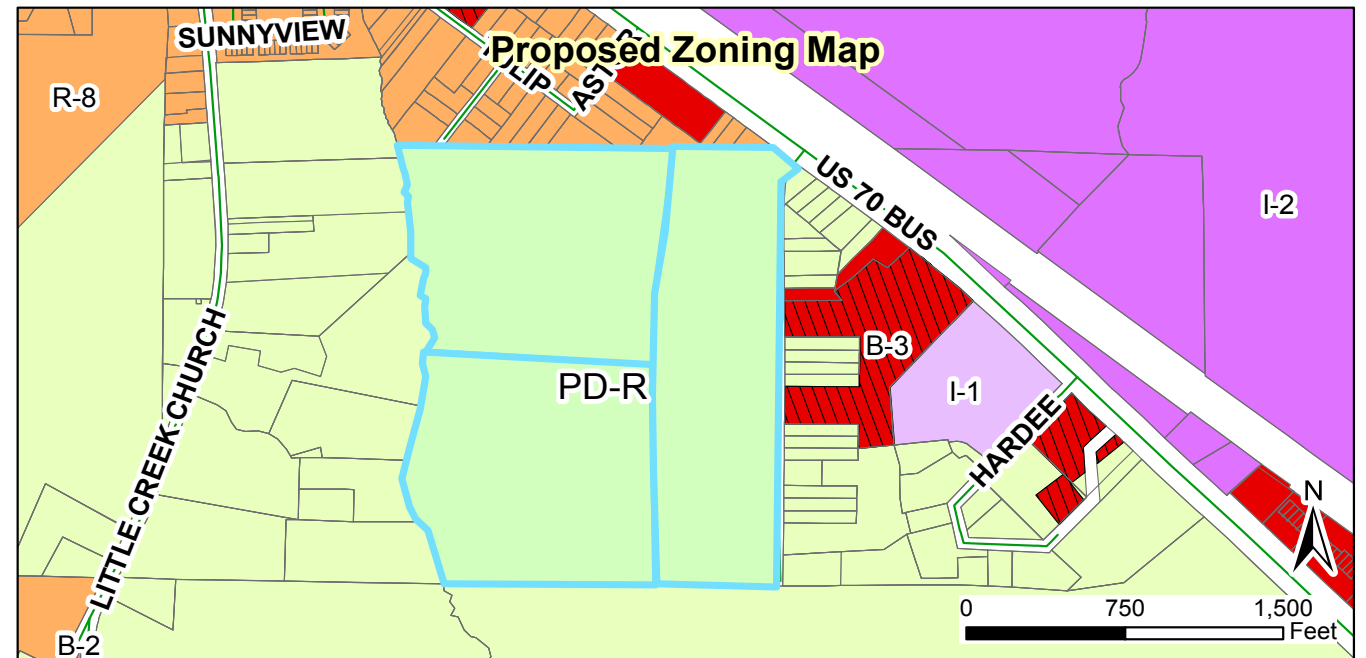
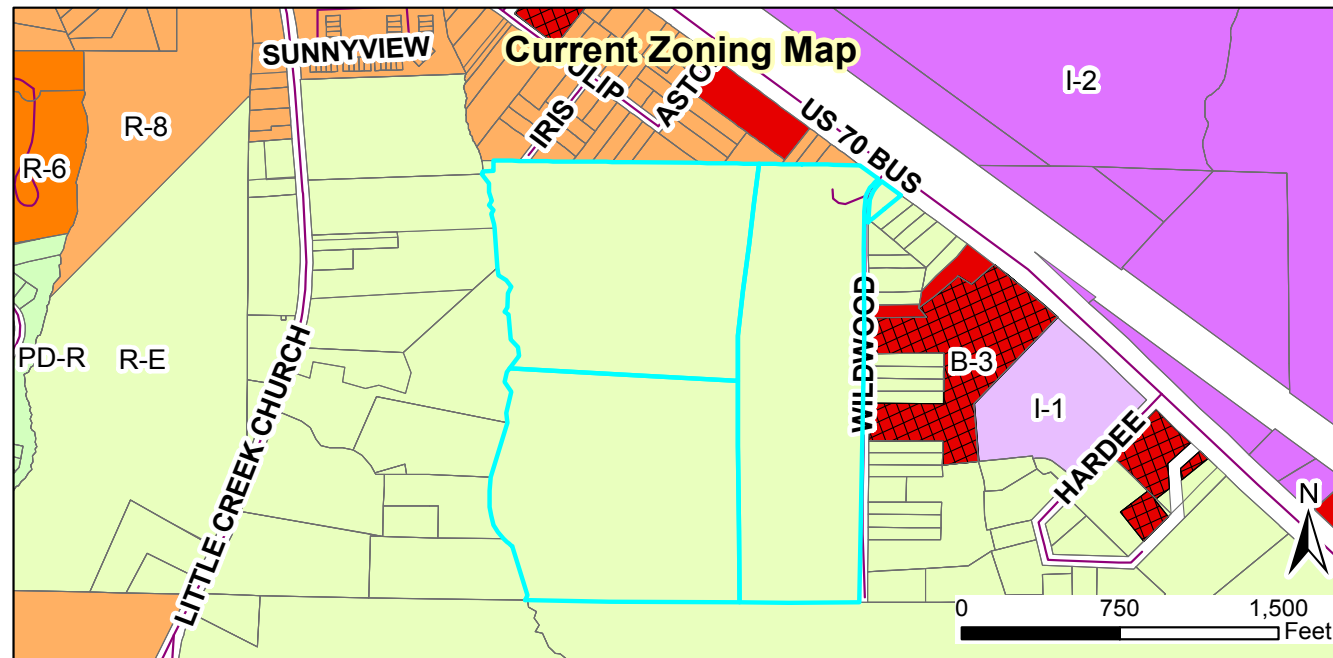
If approved, staff recommends the following Conditions of Approval be placed upon the application:

1. Following Board approvals, three copies of the Planned Development Master Plan meeting the Conditions of Approval shall be submitted to the 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.
2. Recreational amenities shall be constructed prior to or concurrent with any adjacent phases, and shall at all times provide enough amenity facilities to serve the portion of the project that is platted.
3. Each individual phase, park, greenway section, or amenity area shall be reviewed as either a minor preliminary plat or minor site plan, prior to the associated plat recordation.
4. All decorative traffic related signage shall be maintained solely by the developer or Homeowner's Association.
5. All phases of the development shall consist of complete street sections; no mid-block phasing shall be permitted.
6. No more than 100 residential building permits shall be issued prior to the construction of the amenity center.
7. No more than 75 residential building permits shall be issued prior to the required secondary access point being constructed.
8. No more than 250 residential building permits shall be issued prior to the required third access being constructed.
9. All roadway and traffic improvements required by the Town and/or NCDOT shall be constructed or financially guaranteed prior to platting of the phase of development that will trigger their necessity. If no phase is specified, the improvements shall be required immediately.
10. All required landscaping buffers or plantings shall be installed or bonded prior to the platting of the phase in which they are located.
11. Multi-use trails shall be constructed or bonded prior to platting of the phase in which they are located.
12. The new pump station and force main shall be sized to accommodate full buildout of the basin. Final sizing details will be determined during construction drawing review.
13. The new pump station and force main shall be completed, permitted, and on-line prior to the platting of Phase 1.
14. The existing pump station and force main off Iris Street shall be abandoned to Town standards prior to the platting of Phase 2.
15. The developer shall extend the driveways of the existing eastern properties serviced off Wildwood Drive to the edge of pavement to ensure safe and adequate access. This shall be shown on the construction drawings and reviewed by the Engineering Department.

ATTACHMENTS:

- 1) Application
- 2) Staff Report Maps
- 3) Neighborhood Meeting Materials
- 4) Site Plan

- 5) Adjacent Property Letter
- 6) Newspaper Ad
- 7) Traffic Impact Analysis
- 8) NCDOT Congestion Management Comments- TIA
- 9) Truck Turn Exhibit
- 10) Wastewater Allocation Request



2019-40-PDD Buckhorn Branch Rezoning
Request: Rezone from R-E to PD-R
2019-39-SD Buckhorn Branch Preliminary Plat
Request: Residential subdivision

Applicant: Withers Ravenel
 Property Owner: Concept 8 Holdings, LLC
 Tag #: 05H03010, 05H03197D, 05H03009

Staff Report Map



Document Path: O:\PLANNING\SUBDIVISIONS\MAJOR SUBDIVISIONS\2019\2019-39-SD - Buckhorn Branch Park\Staff Report Maps\Staff Report Map - 2019-39-SD- Buckhorn Branch SD.mxd

Legend

- Site
- 100-yr Flood Zone
- Thoroughfare Overlay
- Watershed Protection Overlay

10/01/19

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



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: Buckhorn Branch Park Acreage of Property: 84.73
County Tag Number: 05H03010, 05H03197D, 05H03009 NC PIN: 166811-55-8386, 166800-54-8289, 166800-64-8874
Address/Location: 706 Autumn Lane and 2 adjacent unaddressed tracts to west

Zoning District: PD-R

Town Limits / ETJ: ☐ Town Limits ☒ ETJ (Extra-Territorial Jurisdiction) **To Be Annexed**

APPLICANT INFORMATION – Applicant must be a registered engineer unless otherwise approved by Town Engineer

Applicant: WithersRavenel, Inc.
Mailing Address: 137 S. Wilmington St., Suite 200, Raleigh, NC 27601
Phone Number: (919) 535-5175 Fax: (919) 467-6008
Contact Person: Ryan Fisher, PE
Email Address: rfisher@withersravenel.com

PROPERTY OWNER INFORMATION

Name: Concept 8 Holdings, LLC (Developer. Owner Consent Forms attached)
Mailing Address: 307 South Salem St., Suite 200, Apex, NC 27502
Phone Number: (919) 883-4941 Fax: N/A
Email Address: shawn@concepteight.com (Shawn Donovan)

FOR OFFICE USE ONLY

Date Received: _____ File Number: _____ Associated Project Number: _____

PROJECT INFORMATIONUse: ☒ New ☐ Expanded ☐ ChangeUse Type: ☒ Residential ☐ Non-ResidentialProposed Use(s): Residential Existing Use(s): Agricultural

Invoice shall be mailed to the following:

Developer Name: Concept 8 Holdings, LLCMailing Address: 307 S. Salem St., #200, Apex, NC 27502Phone Number: (919) 601-5078 Fax Number: N/AEmail Address: shawn@concepteight.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: 84.73

Single Family	# of Units	GPD per Unit	Total Requested GPD
1-2 Bedroom Units	0	0	0
3 Bedroom Units	316	360	108,720
>3 Bedroom Units	0	0	0
Total	316	-----	113,760

Multi-Family	# of Units	GPD per Unit	Total Requested GPD
1-2 Bedroom Units	0	0	0
3 Bedroom Units	0	0	0
>3 Bedroom Units	0	0	0
Total	0	-----	0

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: N/A

Use	Measurement Unit	# of Units	GPD per Unit	Total Requested GPD
Clubhouse/Pool	See attached letter	Attached Letter	Attached Letter	356
Total			-----	356

TOTAL REQUESTED GALLONS PER DAY: 114,116 gpd

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.

Ryan Fisher, PE

Print Name


Signature of Applicant

2/19/2019
Date

Engineer Seal:



TOWN OF CLAYTON OFFICE USE ONLY:

Approved by: ☐ Town Manager

☐ Town Council (*requests of 10,000 GPD or more require Council approval by resolution*)

The **Town Manager / Town Council (circle one)** has authorized the allocation of _____

gallons per day for project # _____.

Date of Approval: _____

Signed:

Town Manager

If approved by Town Council:

Attach a copy of the resolution and any associated documentation.

APPENDIX A: DESIGN FLOW RATES

The following table from the North Carolina Administrative Code 02T.0114 shall be used to determine the minimum allowable design daily flow of wastewater facilities. Alternatively, the Town in its sole and absolute discretion may calculate the customer's initial average daily wastewater flow based on data from the customer's operations (or from similarly situated customers) with a comparable sanitary sewer system, where such data are available and reasonably current.

Establishment Type	Daily Flow Rate
Barber and Beauty Shops	
Barber Shops	50 gal/chair
Beauty Shops	125 gal/booth or bowl
Businesses, Offices and Factories	
General business and office facilities	25 gal/employee/shift
Factories, excluding industrial waste	25 gal/employee/shift
Factories or businesses with showers or food preparation	35 gal/employee/shift
Warehouse	100 gal/loading bay
Warehouse – self storage (not including caretaker residence)	1 gal/unit
Churches	
Churches without kitchens, day care or camps	3 gal/seat
Churches with kitchen	5 gal/seat
Churches providing day care or camps	25 gal/person (child & employee)
Fire, Rescue and Emergency Response	
Fire or rescue stations without on-site staff	25 gal/person
Fire or rescue stations with on-site staff	50 gal/person/shift
Food and Drink Facilities	
Banquet, dining hall	30 gal/seat
Bars, cocktail lounges	20 gal/seat
Caterers	50 gal/100 sq. ft. floor space
Restaurant, full Service	40 gal/seat
Restaurant, single service articles	20 gal/seat
Restaurant, drive-in	50 gal/car space
Restaurant, carry out only	50 gal/100 sq. ft. floor space
Institutions, dining halls	5 gal/meal
Deli	40 gal/100 sq. ft. floor space
Bakery	10 gal/100 sq. ft. floor space
Meat department, butcher shop or fish market	75 gal/100 sq. ft. floor space
Specialty food stand or kiosk	50 gal/100 sq. ft. floor space
Hotels and Motels	
Hotels, motels and bed & breakfast facilities, without in-room cooking facilities	120 gal/room
Hotels and motels, with in-room cooking facilities	175 gal/room
Resort hotels	200 gal/room
Cottages, cabins	200 gal/unit
Self-service laundry facilities	500 gal/machine
Medical, Dental and Veterinary Facilities	
Medical or dental offices	250 gal/practitioner/shift
Veterinary offices (not including boarding)	250 gal/practitioner/shift
Veterinary hospitals, kennels, animal boarding facilities	20 gal/pen, cage, kennel or stall
Hospitals, medical	300 gal/bed
Hospitals, mental	150 gal/bed
Convalescent, nursing, rest homes without laundry facilities	60 gal/bed
Convalescent, nursing, rest homes with laundry facilities	120 gal/bed
Residential care facilities	60 gal/person
Parks, Recreation, Camp Grounds, R-V Parks and other Outdoor Activity Facilities	
Campgrounds with comfort station, without water or sewer hookups	75 gal/campsite

Establishment Type	Daily Flow Rate
Campgrounds with water and sewer hookups	100 gal/campsite
Campground dump station facility	50 gal/space
Construction, hunting or work camps with flush toilets	60 gal/person
Construction, hunting or work camps with chemical or portable toilets	40 gal/person
Parks with restroom facilities	250 gal/plumbing fixture
Summer camps without food preparation or laundry facilities	30 gal/person
Summer camps with food preparation and laundry facilities	60 gal/person
Swimming pools, bathhouses and spas	10 gal/person
Public access restrooms	325 gal/plumbing fixture
Schools, Pre-school and Day Care	
Day care and preschool facilities	25 gal/person (child & employee)
Schools with cafeteria, gym and showers	15 gal/student
Schools with cafeteria	12 gal/student
Schools without cafeteria, gym or showers	10 gal/student
Boarding schools	60 gal/person (student & employee)
Service Stations and Car Wash Facilities	
Service stations, gas stations	250 gal/plumbing fixture
Car wash facilities	1200 gal/bay
Sports Centers	
Bowling center	50 gal/lane
Fitness, exercise, karate or dance center	50 gal/100 sq. ft.
Tennis, racquet ball	50 gal/court
Gymnasium	50 gal/100 sq. ft.
Golf course with only minimal food service	250 gal/plumbing fixture
Country clubs	60 gal/member or patron
Mini golf, putt-putt	250 gal/plumbing fixture
Go-kart, motocross	250 gal/plumbing fixture
Batting cages, driving ranges	250 gal/plumbing fixture
Marinas without bathhouse	10 gal/slip
Marinas with bathhouse	30 gal/slip
Video game arcades, pool halls	250 gal/plumbing fixture
Stadiums, auditoriums, theaters, community centers	5 gal/seat
Stores, Shopping Centers, Malls and Flea Markets	
Auto, boat, recreational vehicle dealerships/showrooms with restrooms	125 gal/plumbing fixture
Convenience stores, with food preparation	60 gal/100 sq. ft.
Convenience stores, without food preparation	250 gal/plumbing fixture
Flea markets	30 gal/stall
Shopping centers and malls with food service	130 gal/1000 sq. ft.
Stores and shopping centers without food service	100 gal/1000 sq. ft.
Transportation Terminals	
Air, bus, train, ferry, port and dock	5 gal/passenger

Source: North Carolina Administrative Code 02T.0114, January 1, 2007



February 19, 2019

Haley Hogg, CZO
Town of Clayton
111 East Second St.
Clayton, NC 27528

RE: Buckhorn Branch Park Amenity Center -Design Water/Wastewater Flow Rates

Dear Haley:

We are providing this letter as an addendum to the Town's Wastewater Allocation Request form to summarize our wastewater flow rate calculations for the proposed Buckhorn Branch Park Amenity Center, which is proposed to include a clubhouse for use by the development's residents.

The State's 2T rules do not specifically identify a typical flowrate for a clubhouse, so based on engineering judgement, we are estimating 250 gpd per plumbing fixture located within the clubhouse. Based on the anticipated plumbing design, five (5) plumbing fixtures are assumed. It is anticipated that the clubhouse will not be used on a daily basis and the flowrates should be annualized. We are anticipating the clubhouse to be used two (2) days per week once the subdivision is at full-buildout. The following calculation represents the design flow rate for the clubhouse:

$$5 \text{ plumbing fixtures} \times 250 \frac{\text{gpd}}{\text{plumbing fixture}} \times 2 \frac{\text{days}}{\text{week}} \times 52 \frac{\text{weeks}}{\text{year}} \div 365 \frac{\text{days}}{\text{year}} \\ = 356 \text{ gallons per day (annualized)}$$

Based on the calculations shown above, the design wastewater flow rate for the Buckhorn Branch Park Amenity Center will be 356 gallons per day. This calculated flow rate is in addition to the wastewater flow generated from the proposed subdivision, which can be found on the attached form.

Sincerely

WithersRavenel

Ryan Fisher, PE
Project Manager

CC: Shawn Donovan, Concept 8 Holdings, LLC
WR File



**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 **2019-39-SD – Buckhorn Branch**

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

MOTION FORM
Item #6b
2019-39-SD
Buckhorn Branch Preliminary Plat

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).

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
2019-39-SD
Buckhorn Branch Preliminary Plat

**Town of Clayton
Resolution Granting Wastewater Treatment Capacity
For Buckhorn Branch**

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 in the amount of 114,116 GPD to Buckhorn Branch as outlined in allocation request from Wither's Ravenel; **herewith attached**.
4. Said allocation is approved subject to and conditioned upon review and approval of all required regulatory processes.
5. Said allocation is non transferable, non assignable, and made for the projects as described and for the noted location unless explicitly approved by the Town of Clayton.

6. Said allocation may be revoked or reclaimed in accordance with the policies of the Town of Clayton as adopted or amended now or in the future. No property right is conferred with the granting of an allocation except as otherwise explicitly allowed by policy, ordinance, or action of the Town of Clayton.
7. Said allocation is subject to payment of applicable fees in accordance with adopted ordinances, policies, and fee schedules of the Town of Clayton.

Duly resolved by the Clayton Town Council this 6th day of January, 2020 while in regular session.

Jody McLeod
Mayor

ATTEST:

Kimberly A. Moffett, CMC, NCCMC
Town Clerk



Town Council Agenda Cover Sheet

Meeting Date

January 6, 2020

Agenda Location

Public Hearings

Item Title

2019-183-SUP Clayton Storage

Presenter

Haley Hogg, Planner II

Summary/Description

Request for issuance of a Special Use Permit to utilize the property for accessory limited outdoor storage, which requires a Special Use Permit in the B-3 zoning district. This outdoor storage would include the storage of RVs and boats. The outdoor storage would be an accessory use to an existing self-storage facility that was approved to expand via an associated Conditional Use Permit issued by Planning Board on November 25th. The Planning Board also approved an associated Major Site Plan on November 25th for the expansion of the self-storage facility. The limited outdoor storage was shown on the site plan, but is only permitted per issuance of this Special Use Permit. The property is located with access of US HWY 70 BUS, adjacent to Clayton Crossings and Meineke.

Requested Action

Approval/Denial

Funding Source (If Applicable):

N/A

Cost: N/A Yes ☐ No ☒

Additional Documents to be Included in Agenda Packet

Staff Report
Staff Report Maps
Neighborhood Meeting Materials
Second Neighborhood Meeting Materials
Associated Site Plan
Public Notice- Newspaper Ad
Public Notice- Adj. Property Letter
Stormwater Statement
Stormwater Impact Report
Floodway Letter
Neighbor Concerns

Meeting Timeline

December 16, 2019- Continued to January 6, 2020 Town Council
January 6, 2020- Town Council Hearing



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

SPECIAL USE PERMIT APPLICATION COVER SHEET

Name of Project: Clayton Storage Date: October 17th, 2019
Applicant Name: 10 F Pursuit, LLC

The following checklist to be completed by applicant:

- [☒] Pre-Application Meeting on: 5/8/2019
[☒] Application Review fee
[☒] Advertisement Fee

11 copies of the following:

- [☒] Completed Application
[☒] Owner's Consent Form
[☒] Adjacent Property Owner's List
[☒] Neighborhood Meeting Notice Letter (1 copy)
N/A [☐] Wastewater Allocation Request Form (if applicable)
[☒] Set of stamped, addressed, empty envelopes for adjacent property owner notification
[☒] Associated Site Plan (separate application required for major site plans, must be submitted concurrently)



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

SPECIAL USE PERMIT APPLICATION

Application Fee: \$400.00
Advertisement Fee: \$200.00

☒ New Special Use Permit

☐ Major Modification to an approved SUP
Permit Modified: _____

SITE INFORMATION

Name of Project: Clayton Storage

Acreage of Property: 2.49 Zoning District: B-3

County Tag #: 05025003B NC Pin #: 165915-62-4541

Address/Location: No address listed on Johnston County GIS

Existing Use: Vacant Proposed Use: Covered outdoor RV Storage

Is project within a Planned Development? ☐ Yes ☒ No If yes, which: _____

Is project within an Overlay District? ☐ Yes ☒ No If yes, which: _____

APPLICANT INFORMATION

Applicant: 10 F Pursuit, LLC

Mailing Address: 5400 Glenwood Ave., Suite G-11, Raleigh, NC 27612

Phone Number: 919-977-4457 Fax: _____

Contact Person: Clifton Minsley

Email Address: Cliff@10Federal.com

OFFICE USE ONLY

Date Received: _____ Amount Paid: _____ File Number: _____

PROPERTY OWNER INFORMATION

Name: Michael Lynn Marvel Revocable Trust under contract w/10 F Pursuit, LLC

Mailing Address: 2127 Willow Hill Ln., Clayton, NC 27520-5943

Phone Number: _____

Email Address: _____

Fax: _____

EXPLANATION OF PROJECT

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

The proposed development is an expansion of an existing non-climate controlled self-storage facility located at 11573 US-70 Highway. The development will consist of two RV storage canopy structures and an un-manned rental kiosk of approximately 200 square feet at the entrance to the site.

REQUIRED FINDINGS OF FACT

Section 155.711(I) of the Unified Land Development Code requires applications for a Special Use to address the following findings. The burden of proof is on the applicant and failure to adequately address the findings may result in denial of the application. Please attach additional pages if necessary.

1. That the application will not materially endanger the public health or safety if located where proposed, and developed according to the plans as submitted and approved.

The proposed development will be a secured facility, with controlled entry and exit points. There will be no storage of hazardous materials or products.

2. That the application meets all required specifications and conforms to the standards and practices of sound land use planning and the Town Code of Ordinances and other applicable regulations.

The development is designed using all sections of the Town of Clayton UDC, as well as state and county development regulations related to stormwater control and construction.

3. That the application will not substantially injure the value of adjoining or abutting property, and will not be detrimental to the use or development of adjacent properties or other neighborhood uses.

The adjacent parcels is currently being used as a self-storage facility, and the proposed development is an expansion of that facility. All adjacent properties are already developed and have separate access to the public transportation system. The proposed development will use existing infrastructure and will not impact adjacent properties since the proposed use matches the existing use.

4. That the application will not adversely affect the adopted plans and policies of the Town, or violate the character of existing standards for development of the adjacent properties.

The proposed use is allowed within the existing B-3 zoning district in the Town of Clayton. No variance from the current Town plan is being requested.

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 Special Use Permit. 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.

Clifton Minsley
Print Name

Signature of Applicant

8-1-19
Date

NEIGHBORHOOD MEETING INFORMATION

Purpose:

The purpose of the Neighborhood Meeting is to inform the surrounding property owners of the nature of the proposed land use and/or development features, answer questions, respond to concerns, and solicit comments.

Meeting Date:

The meeting must be held at least ten (10) calendar days prior to the 1st Public Hearing Meeting.

Meeting Time & Location:

The meeting must be held no earlier than 6:00 pm Monday through Friday, and must be held in a location generally accessible to residents within close proximity of the request. The meeting space must be able to comfortably accommodate everyone that receives an invitation.

Meeting Notice Mailing requirements:

1. The applicant must contact all adjacent property owners via first class mailing (see sample letter).
2. The mailing must include all the persons, firms, or corporations owning property within 100 feet and immediately adjacent to the subject property. Where the subject property immediately adjoins a public or private right-of-way, landscape or riparian buffer, commonly-owned private area, public property, or homeowners' association property, then letters of notification shall be sent to adjoining property owners as if they directly abut the subject property.
3. The notice must be mailed at least ten (10) calendar days but not more than twenty-five (25) days prior to the date of the Neighborhood Meeting.

Information required to be provided at the Neighborhood Meeting:

At a minimum, the following materials must be present and discussed at a Neighborhood Meeting:

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

Information provided to Planning Department:

Alert the Planning Department once the date, location, and time of the Neighborhood Meeting are determined.

Deliver the following items to the Planning Department at least ten (10) calendar days prior to the 1st Public Hearing Meeting in electronic or hard copy format:

- | | | |
|---------|-------------------------------------|---|
| | ☒ | Adjacent Property Owner's List (aka "mailing list") <i>Should be submitted with original application packet</i> |
| | ☒ | Copy of the letter mailed <i>Should be submitted with original application packet</i> |
| Pending | ☐ | Attendance Roster (aka "sign-in sheet") <i>Submit no later than 10 days prior to 1st public meeting date</i> |
| Pending | ☐ | Neighborhood Meeting Summary Form with minutes (see below) <i>Submit no later than 10 days prior to the 1st public meeting date</i> |

ADJACENT PROPERTY OWNERS LIST

Project Name: Clayton Storage

The following are all the persons, firms, or corporations owning property within 100 feet and immediately adjacent to the property (including across street rights of way) subject to this request. Where the subject property immediately adjoins a public or private right-of-way, landscape or riparian buffer, commonly-owned private area, public property, or homeowners' association property, then letters of notification shall be sent to adjoining property owners as if they directly abut the subject property. Please use a separate sheet if necessary

It is the responsibility of the applicant to correctly identify the current owner, based upon records in the Johnston County GIS Office, for all property owners of land within the required public notice radius.

PARCEL NUMBER	NAME	ADDRESS
165919-62-0143	Amelia Village Ph 1, LLC	701 Exposition Pl, S-101, Raleigh, NC 27615
165915-62-0894	Marvel Management, LLC	2127 Willow Hill Ln, Clayton, NC 27520
165915-62-2969	MDC NC 2, LLP	11995 El Camino Real San Diego, CA 92130
165915-62-4941	Larry N. Durham & Patricia Durham	1198 Peele Rd. Clayton, NC 27520
165915-62-5727	Spirit Master Funding VI, LLC	2727 N. Harwood Se, S-300 Dallas TX 75201
165915-62-6677	NKHBM LLC	23 Glen Laurel Rd., Clayton, NC 27527
165919-62-8147	Clayton Crossing Holdings, LLC	P O Box 1354, Clayton, NC 27528
165919-62-5216	Clayton Crossing Association	P O Box 534, Kittrell, NC 27544
165915-62-7594	Clayton Crossing Association	P O Box 534, Kittrell, NC 27544
165919-62-5338	Guo, Chunzhi & Zhang, Beirong	115 Stablegate Drive, Cary, NC 27513
165919-62-5346	CTA LLC	P O Box 534, Kittrell, NC 27544
165919-62-5373	Zheng, Mei Hua	1013 Murray Ave, Cherry Hill, NJ 08002
165919-62-5365	Hewitt, James M	108 Lemar Dr., Garner, NC 27529
165919-61-5968	Town of Clayton	P O Box 777, Clayton, NC 27528



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: Clayton Storage **Address or PIN #:** 165915-62-2628
165915-62-4541

AGENT/APPLICANT INFORMATION:

Garry Walston
(Name - type, print clearly)

6310 Chapel Hill Rd Ste 250
(Address)
Raleigh, NC 27607
(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 site plan application

Special Use Permit

Conditional use 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:

Clifton Minsley
(Name - type, print clearly)

5400 Glenwood Ave. Suite G-11
(Address)

Cliff Minsley
(Owner's Signature)

Raleigh, NC 27612
(City, State, Zip)

STATE OF N.C.
COUNTY OF Wake

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this _____ day of _____, 20____.

SEAL



Sandi Beltrami
Notary Public

My Commission
Expires:

April 24, 2022

10 of 10



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

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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: Clayton Storage **Address or PIN #:** 165915-62-2628
165915-62-4541

AGENT/APPLICANT INFORMATION:

Garry Walston 6310 Chapel Hill Rd Ste 250
(Name - type, print clearly) (Address)
Raleigh, NC 27607
(City, State, Zip)

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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.

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OWNER AUTHORIZATION:

Clifton Minsley 5400 Glenwood Ave. Suite G-11
(Name - type, print clearly) (Address)
Cliff Minsley Raleigh, NC 27612
(Owner's Signature) (City, State, Zip)

STATE OF N.C.
COUNTY OF WAKE

Sworn and subscribed before me the _____ day of _____, 20____, a Notary Public for the above State and County, this

SEAL



April 2019

Sandi Beltram
Notary Public

My Commission
Expires:

April 24, 2022

10 of 10



BASS, NIXON & KENNEDY, INC., CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
919/851-4422 FAX 919/851-8968 BNK@BNKinc.com

Date: August 28, 2019

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 land use change or 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 nature of the proposal. A representative of the applicant will be present to explain their application, answer questions, and solicit comments.

Meeting Date: September 10, 2019

Meeting Time: 6:30 PM

Meeting Location: Poole Room
Clayton Center
111E, 2nd St
Clayton, NC

Type of Application: Conditional Use, Special Use, Major Site Plan

Project/proposal property address: US 70 Business (GIS does not provide address)

Description of project/proposal: Request for Conditional Use, Special Use and Major Site Plan to provide storage facility expansion to accommodate covered Recreational Vehicle Storage.

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

1. A copy of the project application.
2. A map at a scale that is appropriate to the project and shows neighboring properties and roads.

A copy of the site plan is enclosed with this letter showing the proposed development.

If you have any questions prior to or after this meeting, you may contact us at 919-851-4422. You may also contact the Planning Department at 919-553-5002.

Sincerely,

A handwritten signature in cursive script that reads 'Garry P. Walston'.

Garry P. Walston, PLA
Bass, Nixon & Kennedy, Inc

Cc: Town of Clayton Planning Dept.

NEIGHBORHOOD MEETING ATTENDANCE ROSTER

Project: Clayton Storage

Application: Major Site Plan, Conditional Use Permit, Special Use Permit

Location/Date: 09-10-19, Poole Room, The Clayton Center

	NAME	ADDRESS
1	<i>Lynn Fussell</i>	<i>bcfussell@yahoo.com</i>
2	<i>Robert Williamson</i>	<i>RDW123@comcast.net</i>
3	<i>ROBBIE PELL</i>	<i>6310 CHAPEL HILL RD. RALEIGH, N.C. 27607 ROBBIE.PELL@BNKINZ.COM</i>
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NEIGHBORHOOD MEETING SUMMARY FORM

FILL OUT THE FOLLOWING:

Application: Major Site Plan, SUP, CUP Date of Mailing: 08-28-19
Date of Meeting: 09-10-19 Time of Meeting: 6:30 p.m.
Location of Meeting: Poole Room, The Clayton Center, Clayton, NC

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: Garry P. Walston, PLA, LEED Signature: Garry P. Walston

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.*

1. Cliff Minsley provided a project overview. There were only two attendees at the meeting.
2. Bob asked for an explanation of how stormwater would be handled and this was explained by Robbie Bell of BNK, stating that the project will include a stormwater control device.
3. There was some discussion as to who is responsible for maintenance of the swale that runs under 70 and drains to the creek along the rear of the site. We showed Bob from GIS aerials that the creek is actually not on the subject property but is actually on his property as well as land that is owned by the Town of Clayton just north of the creek.
4. Meeting broke up at approximately 7:30.

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

ADJACENT PROPERTY OWNERS LIST

Project Name: _____

The following are all the persons, firms, or corporations owning property within 100 feet and immediately adjacent to the property (including across street rights of way) subject to this request. Where the subject property immediately adjoins a public or private right-of-way, landscape or riparian buffer, commonly-owned private area, public property, or homeowners' association property, then letters of notification shall be sent to adjoining property owners as if they directly abut the subject property. Please use a separate sheet if necessary

It is the responsibility of the applicant to correctly identify the current owner, based upon records in the Johnston County GIS Office, for all property owners of land within the required public notice radius.

PARCEL NUMBER	NAME	ADDRESS
165919-620143	Amelia Village Phase 1, LLC	701 Exposition Pl Ste 101 Raleigh, NC 27615
165919-62-0143	Amelia Village Phase 1, LLC	701 Exposition Pl Ste. 101 Raleigh, NC 27615
165915-62-0894	Marvel Management, LLC	2127 Willow Hill Ln Clayton, NC 27520
165915-62-2969	MDC NC2, LLP	11995 El Camino Real San Diego, Ca 92130
165915-62-4941	Larry N. Durham & Patricia Durham	1198 Peele Rd Clayton, NC 27520
165915-62-5727	Spirit Master Funding VI, LLC	2727 N. Harwood St Ste. 300 Dallas, TX 75201
165915-62-6677	NKHBM, LLC	23 Glen Laurel Rd Clayton, NC 27527
165919-62-8147	Clayton Crossing Holdings, LLC	PO Box 1354 Clayton, NC 27528
165919-62-5216	Clayton Crossing Association	PO Box 535 Kitrell, NC 27544
165919-61-5968	Town of Clayton	PO Box 777 Clayton, NC 27528

October 17, 2019

To: Haley Hogg, Planner, Town of Clayton
From: Robert Williamson, Clayton Crossings Owners
Re: 2019-161-CUP Clayton Storage Conditional use Permit
US Hwy 70 Bus., Clayton N.C.

Hello,

I have been asked to write this letter on behalf of the adjacent property owners of the proposed project referenced above. The immediate and nearby existing property owners have some concerns regarding this development.

The "Neighborhood Meeting", held on September 10, was led by the applicant and his paid for engineering firm. The questions and concerns we had were not addressed by an unbiased group. Though the engineering firm answered questions and explained some areas of question, we feel the meeting lacked substantive responses intended for our best interest.

One concern we have is why a project which lies almost totally within a flood zone in an area prone to flooding, would be considered by the Town. Some buildings were built years ago prior to complete knowledge and understanding of downstream effects of stormwater run-off. However, in the present, it has become apparent that stormwater runoff and development in flood zones can lead to property damage and huge expenses to those affected adjacent to and downstream from the development.

Due to development upstream prior to stormwater planning, the surrounding properties of the proposed project have had to pay to maintain an inadequate drainage creek that runs adjacent to the proposed property requesting the approval. It has cost Frank Issa of Liberty Motors thousands of dollars and the Clayton Crossings Owners Association, also adjacent, tens of thousands of dollars to prevent the creeks bank from overflowing and to maintain erosion control. The Church at Clayton Crossings has endured a history of stormwater expenses as well.

Moreover, The Town of Clayton has recently spent thousands of dollars rerouting electric conduits in order to alleviate stormwater erosion; evidence there is a problem. In addition, water is carried under a bridge that crosses Amelia Church Road which collects debris and is already inundated with each storm. In any event, we are all concerned at what effects our properties might face if the parcel of land proposed for development becomes impervious.

The adjacent owners do not want to endure the expense of hiring engineers to ensure our best interest is protected unless we absolutely have to. As taxpayers, we are depending on the Town to do what is right. We presume that certain zoning exists for the purposes of regulating and preventing detrimental events from occurring.

We hope the meeting scheduled for October 28 will be attended by the Town's engineering team and will conduct and direct an unbiased outcome which is in the best interest of the environment, existing property owners and businesses.

Sincerely,

Robert Williamson
Clayton Crossings Owners Association

Clayton Crossings Owners Association (CCOA) Timeline of Flooding Issue at Clayton Crossings since 2010

October 28, 2019

Prepared by BC Fussell, PE (property owner and member of the CCOA architectural committee)

- March 31, 2010 – flooding from recent rains – CCOA representative Bob Williamson contacted Tim Simpson, the Operations Manager for the Town of Clayton. (Photos of clean up area attached.)
- April 16, 2010 – Bob Williamson met with Tim Walden and Earl Johnson with Town of Clayton and requested Town help to remedy the situation
- June 4, 2010 - Bob Williamson received a phone call from John McCullen the Town Engineer for Clayton. Mr McCullen stated that he didn't think the town could do anything about the flooding problem.
- August 24, 2010 –Clayton Crossings facility experienced flooding from creek in rear of building.
- June 9, 2013 - Due to the heavy rains, dirt and debris are again in the driveway near the west side of the center.
- September 24, 2013, Bob Williamson and Lynn Fussell met with the Town of Clayton and adjoining property owners at the creek that separates the Clayton Crossings property from our neighbor, "Liberty Motors" to discuss possible solutions for easing the overflow of the creek during heavy rain. The reason the sudden interest came about is due to a developer wanting to build mini storage units adjacent to our building and behind the Liberty Motor's (formerly Sonic) building. After several discussions about the cause, effect and remedy of the situation, it was suggested by the developer (Mike Marvel) that he would pay for

Timeline of Flooding Issue at Clayton Crossings since 2010

an engineering study to determine how to ease potential overflowing. An engineer's study was never obtained from the developer.

- June 23, 2014 – CCOA contracted with Criterium Giles Engineers to perform a study of the flooding experienced at Clayton Crossings. The Engineers Drainage Report received from Criterium Giles Engineers, paid for by CCOA, recommended "maintaining flood insurance for the buildings" and "provide routine maintenance of the swale on the north side of the Clayton Crossings property to ensure overgrown vegetation and ground litter is removed and positive slopes are maintained." The report also stated "the only long-term solution would be to incorporate added detention of upstream areas, which will reduce the flowrate of runoff in the stream. The incorporation of additional upstream detention would likely require changes in the development regulations."

Additional information;

- Flood insurance is being maintained for the buildings.
- Routine maintenance of the swale on the north side of the property
- There basically needs to be upstream retention ponds as well as downstream measures to ease the speed of which the water races downstream and backs up. This would involve State, local and city cooperation and participation.
- There is a meeting scheduled for July 17, 2014 at 6:00 to discuss a site plan for a proposed 2.29 acre outdoor storage facility to be built immediately adjacent to Clayton Crossings on the creek. This meeting will be held at Gilbert Land Surveying, 112 North Church St., Clayton.
- The outdoor storage facility project never went forward.
- August 31, 2017 – Bob Williamson received an email from Dale Medlin, Town of Clayton Electrical Department concerning erosion of the ditch on the North side of Clayton Crossings exposing a large conduit containing the Town's electrical facilities.
- October 6, 2017 - Bob Williamson requested a professional research and determine the owners of the property adjoining the Clayton Crossings Owners Association property.
- January 11, 2018 - Bob Williamson requested a meeting with Dale Medlin, Town of Clayton Electrical Department concerning the creek erosion located near 11471 Hwy. 70 W. Bus.
- February 1, 2018 – Dale Medlin contacted Bob Williams to cancel the erosion meeting due to a conflict.

Timeline of Flooding Issue at Clayton Crossings since 2010

- March 5, 2018 - Dale Medlin contacted Bob Williams to reschedule the erosion meeting for April 13, 2018.
- April 30, 2018 – Bob Williamson notified Dale Medlin that the CCOA had decided to go with the option of having the Town relocate the existing electric conduit and then the CCOA would repair the bank erosion. Dale Medlin agreed to work on the engineering concept for the relocation.
- July 6, 2018 – Bob Williams sent a letter to Spectrum requesting relocation of their fiber cable.
- August 21, 2018 – Town of Clayton severed the gas, internet and telephone lines while working on relocation of the underground electric facilities.
- September 12, 2018 – Town of Clayton electric conduit removed from ditch bank and ready for erosion repair. Due to impending hurricane, now workers are available to complete the repair.
- November 7, 2018 – Update from Bob Williamson on erosion repair.
 - Consulted with several experts including the N.C. State Department of Biological and Agricultural Engineering Department.
 - Site prep work has been completed which included removing several dams that were comprised of upstream debris including building material, plastic, litter and trees.
 - Contracted with a company with track-hoe operator and a crew experienced in rip-rap placement. Estimate 60 tons of rip-rap is needed to control the erosion.
 - Estimate of \$8,500.
- November 26, 2018 – Had to get second crew to perform erosion control work as first contractor did not work out. Estimate \$10,000.
- April 8, 2019 – Erosion repair completed on the ditch bank and along the North side of the Clayton Crossings property.
 - Storm pipe from parking lot clean out = \$3,090
 - Erosion repair and rip-rap placement = \$9,000
 - Berm placement along entrance drive = \$2,200
- September 10, 2019 – Bob Williams and Lynn Fussell attended the "Neighborhood Meeting" held by the Town of Clayton to discuss the issue of new development in the flood plain adjunct to Clayton Crossings. (2019-161-CUP Clayton Storage Conditional use Permit, US Hwy 70 Bus., Clayton N.C.)
- October 17, 2019 – Bob Williams sent letter to Haley Hogg, Planner, Town of Clayton expressing concern over the proposed development.

Timeline of Flooding Issue at Clayton Crossings since 2010

- October 21, 2019 – Bob Williams received email from Haley Hogg, stating that she has included your letter in the agenda package for Planning Board.

Clayton Crossings – Typical Flooding



Timeline of Flooding Issue at Clayton Crossings since 2010

March 2010 flooding debris.



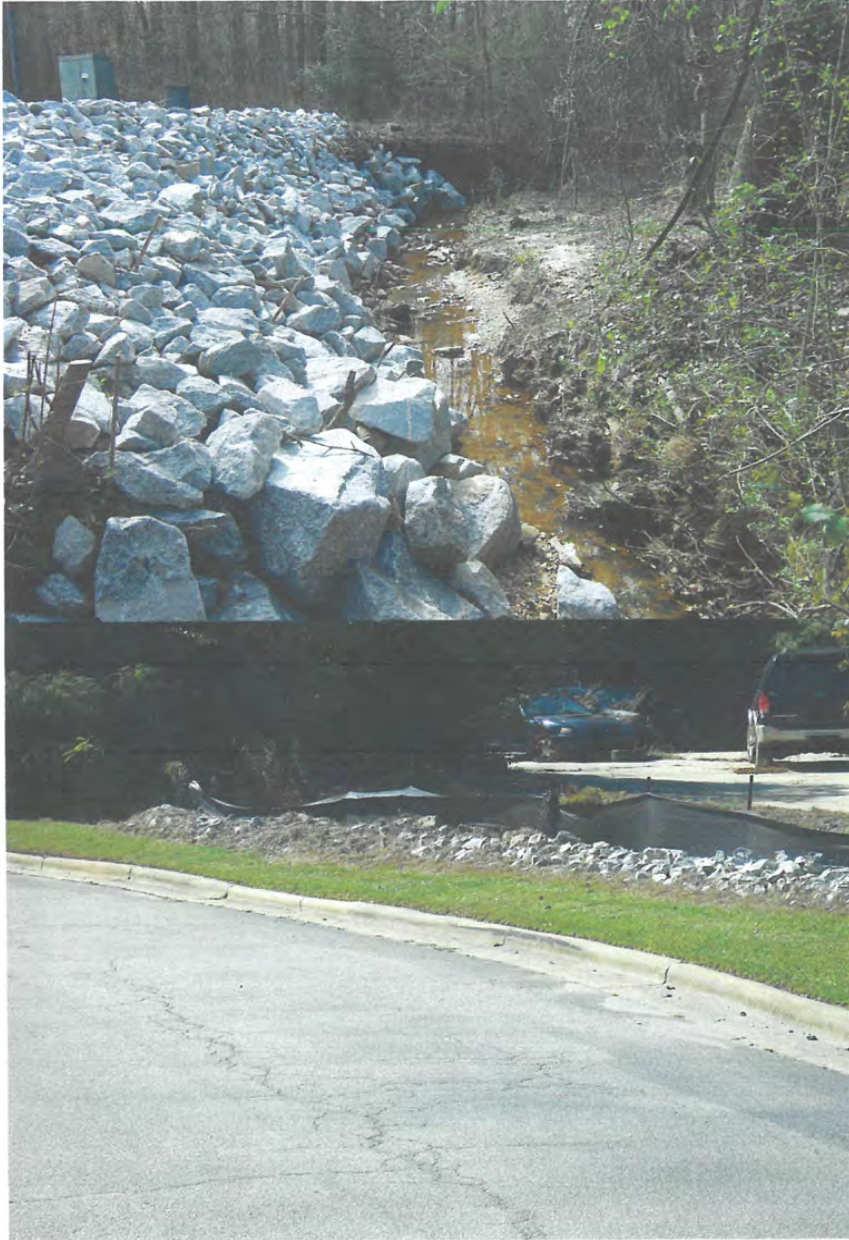
Timeline of Flooding Issue at Clayton Crossings since 2010

January 2018 Erosion Damage



Timeline of Flooding Issue at Clayton Crossings since 2010

October 2019 – Current Condition of Ditch Bank



Timeline of Flooding Issue at Clayton Crossings since 2010



CRITERIUM[®]

GILES ENGINEERS

June 23, 2014

Clayton Crossings Retail Center, Inc.
c/o Bob Williamson

1150 SE MAYNARD ROAD
SUITE 220
CARY, NC 27511
PHONE 919 465-3801
FAX 919 465-3802
NC LIC. NO.: C-2871

Re: Limited Drainage Evaluation
11481 US Highway 70 Business-West
Clayton, NC

Dear Sir:

At your request, we conducted a site inspection to evaluate and provide guidance for the drainage concerns identified at the above referenced sites. The inspection was conducted and report written by Christopher A. Flythe, PE. No calculations, building, or development code reviews were performed other than those explicitly described below.

OBSERVATIONS

1. In front of the strip retail center (east side of the building), the north side of the parking lot drains towards two curb inlets connected by a reinforced concrete pipe (RCP) with a size that appears to be 15-inch diameter. The northern curb inlet outlets into a swale approximately 10-feet behind the back of curb. At the time of inspection, there was approximately 3"-4" of standing water in the bottom of the pipe.
2. The swale identified in #1 above runs northeast to southwest and is also fed by a large diameter (approximately 36") RCP cross-pipe that discharges on the north/west side of the entrance. This pipe drains areas north of US Highway 70.
3. The swale identified in #1 above continues flowing towards the southwest, ultimately discharging into the stream to the west of the property. The swale is intermittently lined with rip rap and includes significant quantities of small trees, shrubs, and underbrush. We observed water with little movement in the entire length of the swale.
4. A small, asphalt parking area and drive is located at the rear (west) side of the building. To the west of the parking area is a grassed open space, bordered by a tree line.
5. Utilizing Johnston County GIS and the North Carolina Flood Insurance Rate Map (FIRM) panel, the floodway and floodplain information was downloaded. We note that the floodway encroaches on the rear of the lot, while the 100- and 500-year floodplain elevations encroach into the buildings themselves and envelope the main parking area.

LICENSED
PROFESSIONAL
ENGINEERS

BUILDING DIAGNOSTICS
INSPECTIONS
ENVIRONMENTAL SERVICES
CONSTRUCTION MONITORING
DESIGN



www.criterion-giles.com



DISCUSSION

The parking lot and buildings at the subject property are influenced by runoff from drainage areas far greater in size than the parcel. Because of the interconnectivity between the stream/floodway to the west of the parcel and the onsite drainage systems and swales, the surface water elevations are directly related. As the stream to the west rises due to significant runoff from upstream properties, the drainage swale running along the north side of the property identified in Observation #1 above rises as well. If the water in the stream rises high enough, it would soon extend above the curb inlets at the edge of the parking areas, causing water ponding in the parking lot.

While there are routine maintenance that can be performed on the drainage swales to ensure runoff moves as efficiently as possible, we do not believe this will have a material affect on the frequency of parking lot flooding. Routine maintenance that can be performed would be to remove trees, shrubs, limbs, and debris from the swale on a regular basis and verify that positive slope is maintained in the swale.

Because the stream water surface elevation is caused by increase in runoff from upstream areas, we believe the only long-term solution would be to incorporate added detention of upstream areas, which will reduce the flowrate of runoff in the stream. The incorporation of additional upstream detention would likely require changes in the development regulations. However, as all detention ponds are designed for a given storm event, flooding will inevitably occur for the larger storms. For this reason, we recommend obtaining flood insurance on the affected buildings in order to mitigate for the high likelihood of water damage.

RECOMMENDATIONS

1. Maintain flood insurance for the buildings on the subject parcel.
2. Provide routine maintenance on the swale on the north side of the property to ensure overgrown vegetation and ground litter is removed, and positive slopes are maintained.

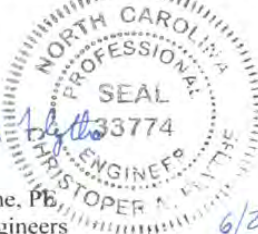
CONCLUSION

We trust that this report provides the information you require. Please contact us (919) 465-3801 if you have any questions. Thank you for the opportunity to be of assistance to you.

Sincerely,



Christopher A Flythe, PE
Criterium-Giles Engineers
NC Lic. No. C-2871
Enclosures



6/23/2014

Clayton Crossings Drainage Evaluation
Clayton, NC

- 2 -

Location:
Clayton Crossings
Clayton, NC

Photo Taken by:
Christopher A. Flythe, PE

Date:
6/17/2014



Description:
Building and
parking lot.

Photo Number
1



Description:
Parking lot curb
inlets.

Photo Number
2

Location:
Clayton Crossings
Clayton, NC

Photo Taken by:
Christopher A. Flythe, PE

Date:
6/17/2014



Description:
Standing water in
pipe at parking lot
curb inlet.

Photo Number

3



Description:
Outlet of pipe into
swale.

Photo Number

4

Location:
Clayton Crossings
Clayton, NC

Photo Taken by:
Christopher A. Flythe, PE

Date:
6/17/2014



Description:
Typical swale
section.

Photo Number
5



Description:
Floodplain behind
building.

Photo Number
6

Location:
Clayton Crossings
Clayton, NC

Photo Taken by:
Christopher A. Flythe, PE

Date:
6/17/2014



Description:
Convergence of
swale from north
side of subject
parcel

Photo Number
7



Description:
RCP cross-pipe at
US Business 70

Photo Number
8

ADDENDUM to June 23, 2014 Report

In regards to the March 14, 2014 proposal by JM Daniels Construction Company to remove and replace the existing rip rap and clean the existing swale along the north/west property line, we have the following comments.

Based on my discussions with Mr. Williams about the existing concerns, I think there will be limited benefit to the proposed repairs. I believe these repairs are good practice, meant to promote good drainage that is impeded by tree/shrub growth in the swale, and prevent erosion of the banks. This will provide some benefit at reducing flooding from the water in the swale overtopping the banks, but will not provide relief from the predominant concern associated with the floodplain to the south. It cannot be easily quantified as to the benefit of the proposed repairs, but it is assumed to be limited to the more frequent storm, smaller storm events.



October 17, 2019

To: Haley Hogg, Planner, Town of Clayton
From: Robert Williamson, Clayton Crossings Owners
Re: 2019-161-CUP Clayton Storage Conditional use Permit
US Hwy 70 Bus., Clayton N.C.

Hello,

I have been asked to write this letter on behalf of the adjacent property owners of the proposed project referenced above. The immediate and nearby existing property owners have some concerns regarding this development.

The "Neighborhood Meeting", held on September 10, was led by the applicant and his paid for engineering firm. The questions and concerns we had were not addressed by an unbiased group. Though the engineering firm answered questions and explained some areas of question, we feel the meeting lacked substantive responses intended for our best interest.

One concern we have is why a project which lies almost totally within a flood zone in an area prone to flooding, would be considered by the Town. Some buildings were built years ago prior to complete knowledge and understanding of downstream effects of stormwater run-off. However, in the present, it has become apparent that stormwater runoff and development in flood zones can lead to property damage and huge expenses to those affected adjacent to and downstream from the development.

Due to development upstream prior to stormwater planning, the surrounding properties of the proposed project have had to pay to maintain an inadequate drainage creek that runs adjacent to the proposed property requesting the approval. It has cost Frank Issa of Liberty Motors thousands of dollars and the Clayton Crossings Owners Association, also adjacent, tens of thousands of dollars to prevent the creeks bank from overflowing and to maintain erosion control. The Church at Clayton Crossings has endured a history of stormwater expenses as well.

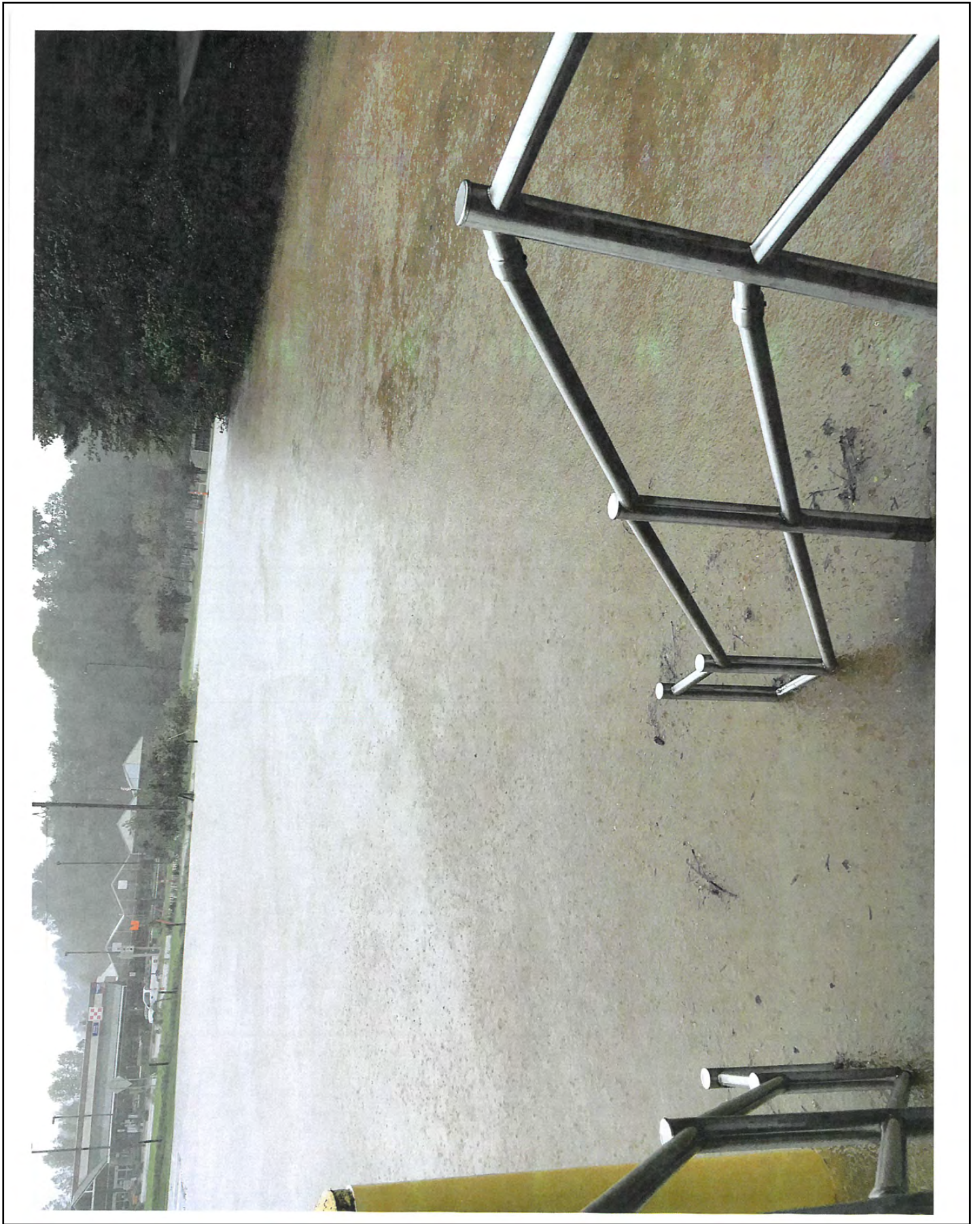
Moreover, The Town of Clayton has recently spent thousands of dollars rerouting electric conduits in order to alleviate stormwater erosion; evidence there is a problem. In addition, water is carried under a bridge that crosses Amelia Church Road which collects debris and is already inundated with each storm. In any event, we are all concerned at what effects our properties might face if the parcel of land proposed for development becomes impervious.

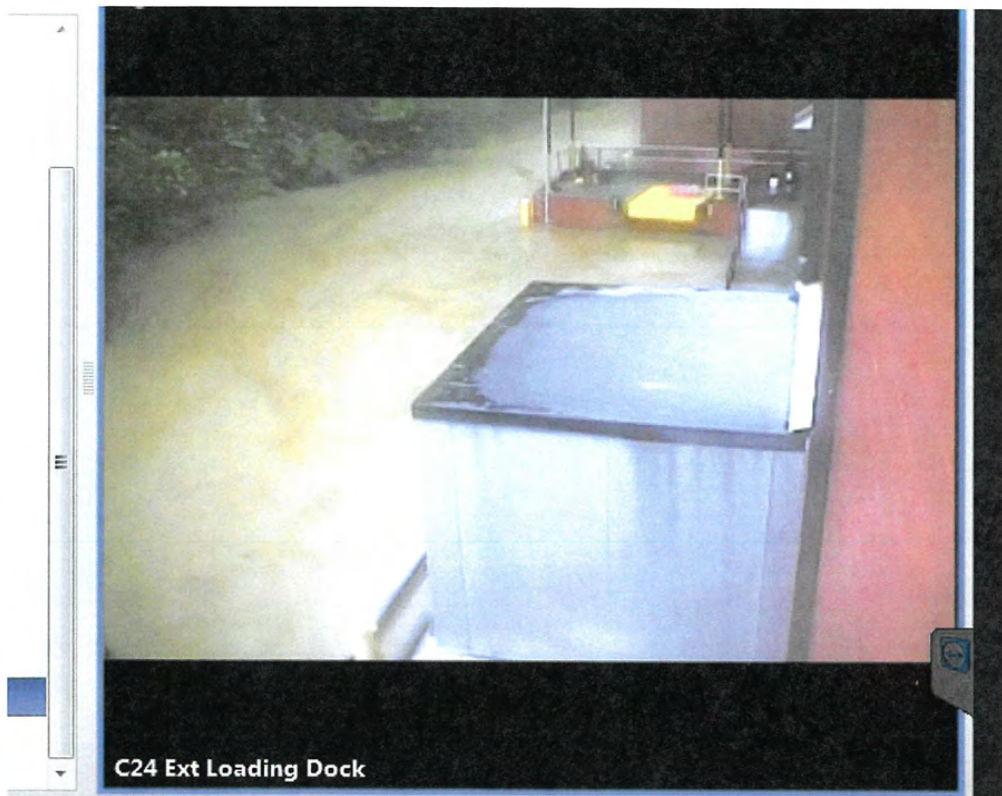
The adjacent owners do not want to endure the expense of hiring engineers to ensure our best interest is protected unless we absolutely have to. As taxpayers, we are depending on the Town to do what is right. We presume that certain zoning exists for the purposes of regulating and preventing detrimental events from occurring.

We hope the meeting scheduled for October 28 will be attended by the Town's engineering team and will conduct and direct an unbiased outcome which is in the best interest of the environment, existing property owners and businesses.

Sincerely,

Robert Williamson
Clayton Crossings Owners Association





NEIGHBORHOOD MEETING ATTENDANCE ROSTER

Project: Clayton Storage

Application: Major Site Plan, Conditional Use Permit

Location/Date: 11-21-19, The Clayton Center

	NAME	ADDRESS
1	Robert Williamson	RDW123@comcast.net
2	Michael Fussell	redwolf1099@gmail.com
3	BENNIE FUSSELL	BCFUSSELL@YAHOO.COM
4	MIKE MARVEL	MLMARVEL45@GMAIL.COM
5	Cliff Minsley	Cliff@10Federal.com
6	ROBBIE DELL	ROBBIE.DELL@BNKINC.COM
7	GARRY WALSTON	GARRY.WALSTON@BNKINC.COM
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NEIGHBORHOOD MEETING SUMMARY FORM

FILL OUT THE FOLLOWING:

Application: Major Site Plan, SUP, CUP Date of Mailing: 08-28-19
Date of Meeting: 11-21-19 Time of Meeting: 6:30 p.m.
Location of Meeting: The Clayton Center, Clayton, NC

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: Garry P. Walston, PLA, LEED 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.*

BNK presented a flood report prepared by Becky Ward for review by adjacent property owners. Robbie explained that the existing developed parcel bypasses the stormwater device and is discharged into the creek. The BMP only treats new impervious. Neighbors questioned whether the flood report made recommendations on how to reduce downstream flooding. BNK stated that was not the intent of the report and not the responsibility of a single developer of one site.

A question was raised related to landscape screening at the northeast corner of the site. Garry indicated that there is a sanitary sewer easement that turns at the corner and there is no way to create a 100% opaque screen at the corner. The developer is providing an opaque fence in this area to offset the lack of planted screening.

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



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

December 3, 2019

NOTICE

SUBJECT: **Project:** 2019-183-SUP Clayton Storage Special Use Permit
Location: US HWY 70 BUS
Tag #: 05025003B
Applicant: 10 F Pursuit LLC

Dear Clayton Area Property Owner:

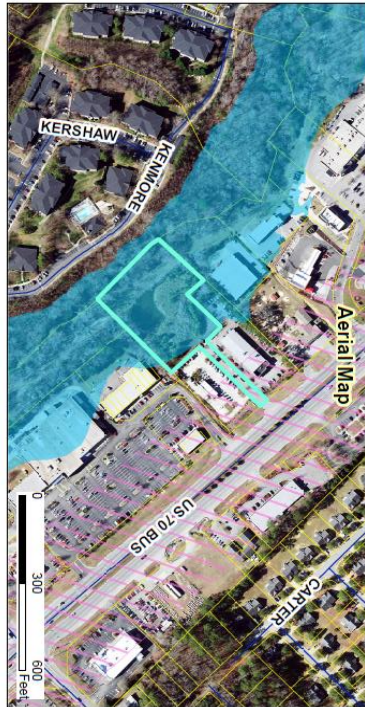
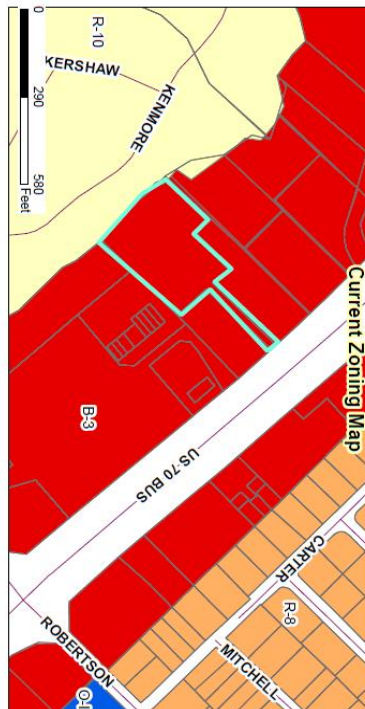
Notice is hereby given that the Clayton Town Council will hold an evidentiary hearing on **Monday, December 16, 2019 at 6:00 PM** at Town Hall, 111 E Second Street, to consider the above referenced Special Use Permit application. The applicant is requesting issuance of a Special Use Permit to allow the accessory use of limited outdoor storage on the subject property. The outdoor storage would include boats and RVs which would be stored under outdoor storage structures. Per the Unified Development Code, the accessory use of limited outdoor storage is only permitted in this zoning district (Highway-Business B-3) via issuance of a Special Use Permit. Please see the map on the back of this letter for the location of the parcels.

Based upon records in the Johnston County Tax Office, you are the owner of property that is within 100 feet of this request. You are invited to attend this meeting. During an evidentiary hearing, the 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 interested persons are invited to attend.

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

Sincerely,

Haley Hogg, AICP, CZO
Planner II



Clayton Storage
2019-183-SUP
Request: Permit limited outdoor storage as an accessory use
 Applicant: 10 T Fursuit LLC
 Property Owner: Michael Lynn Marvel Revocable Trust
 Tag #: 050250036

Staff Report Map



Downloaded from: C:\P\ANNOS\STAFF\REPORT\2019-183-SUP - Clayton Storage\Staff Report Map\Staff Report Map - 2019-183-SUP - Clayton Storage - Mr. Johnston.sld



Public Notice

In accordance with NC GS 160A-364, the Clayton Town Council will conduct an evidentiary hearing on Monday, December 16, 2019 at 6 PM in the Town Council Chambers in Town Hall, located at 111 E. Second Street to consider 2019-183-SUP Clayton Storage Special Use Permit- Request to allow the accessory use of "Limited Outdoor Storage" on the subject parcel. Per UDC requirements this use is only permitted in this district via issuance of a Special Use Permit. The property is zoned Highway-Business (B-3) and is located off US HWY 70; TAG #: 05025003B

During an evidentiary hearing, the 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 interested persons are invited to attend.

Haley Hogg, Planner II
919-553-5002

The Johnstonian

Please advertise on the following dates:
Wednesday, December 4, 2019
Wednesday, December 11, 2019

Affidavit of publication required.

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF CLAYTON STANDARDS AND SPECIFICATIONS

SYMBOLS AND ABBREVIATIONS

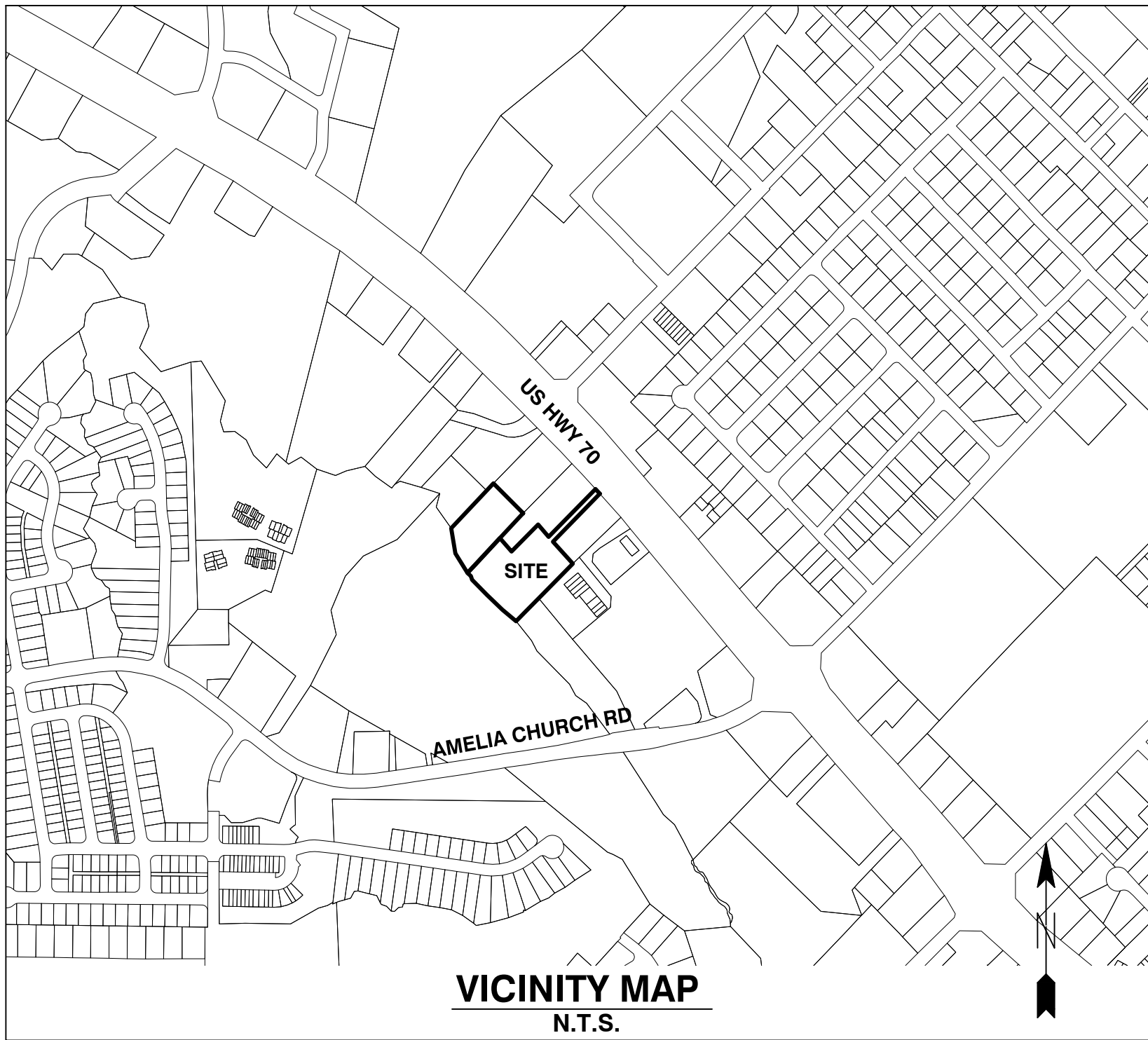
ABC	AGGREGATE BASE COURSE		EXISTING CURB INLET
ALUM	ALUMINUM		EXISTING GRATE INLET/YARD INLET
AST2	ALUMINIZED STEEL -- TYPE 2		EXISTING FLARED END SECTION
B-B	BACK TO BACK		EXISTING FIRE HYDRANT
BOA	BLOW-OFF ASSEMBLY		EXISTING BLOW-OFF ASSEMBLY
C&G	CURB AND GUTTER		EXISTING GATE VALVE
CFS	CUBIC FEET PER SECOND		EXISTING REDUCER
CI	CURB INLET		EXISTING WATER METER
CL	CENTER LINE		EXISTING SAN SEWER MANHOLE
CMP	CORRUGATED METAL PIPE		EXISTING CLEAN OUT
CO	CLEAN OUT		EXISTING POWER POLE
COM	COMMUNICATION		EXISTING TELEPHONE PEDESTAL
CONC	CONCRETE		EXISTING AREA LIGHT
DCV	DOUBLE CHECK VALVE		EXISTING SIGN
DDCV	DOUBLE DETECTOR CHECK VALVE		NEW CURB INLET
DI	DROP INLET		NEW GRATE INLET/YARD INLET
DIP	DUCTILE IRON PIPE		NEW FLARED END SECTION
EASE	EASEMENT		NEW FIRE HYDRANT
ELEC	ELECTRIC		NEW BLOW-OFF ASSEMBLY
EX	EXISTING		NEW GATE VALVE
FES	FLARED END SECTION		NEW REDUCER
FH	FIRE HYDRANT		NEW WATER METER
FM	FORCE MAIN		NEW TEE
FT	FEET		NEW PLUG
FT/SEC	FEET PER SEC		NEW MANHOLE
GALV	GALVANIZED		NEW CLEAN OUT
GV	GATE VALVE		NEW SIGN
HDPE	HIGH DENSITY POLYETHYLENE		IRON PIPE
L	LENGTH		BENCHMARK
LF	LINEAR FEET		
MH	MANHOLE		TEMP SILT FENCE
PAVE	PAVEMENT		TEMP TREE PROTECTION FENCE
PE	FINISHED PAD ELEVATION		TEMP COMBINATION SILT/TREE PROTECTION FENCE
PP	POWER POLE		TEMP DIVERSION DITCH
PVC	POLYVINYL CHLORIDE		DISTURBED LIMITS
R	RADIUS		
R/W	RIGHT-OF-WAY		STREAM
RED	REDUCER		EXISTING GAS LINE
RCP	REINFORCED CONCRETE PIPE		EXISTING COMMUNICATIONS LINE
RPZ	REDUCED PRESSURE ZONE		EXISTING UNDERGROUND TELEPHONE
SS	SANITARY SEWER		EXISTING UNDERGROUND ELECTRIC
STA	STATION		EXISTING OVERHEAD ELECTRIC
TDD	TEMPORARY DIVERSION DITCH		EXISTING WATER LINE
TEL	TELEPHONE		EXISTING SANITARY SEWER FORCE MAIN
TSB	TEMPORARY SEDIMENT BASIN		EXISTING SANITARY SEWER
UG	UNDERGROUND		EXISTING STORM DRAINAGE
WCR	WHEELCHAIR RAMP		NEW STORM DRAINAGE
W/L	WATER LINE		NEW WATER LINE
WM	WATER METER		NEW SANITARY SEWER
YI	YARD INLET		NEW SANITARY SEWER FORCE MAIN
			NEW GAS MAIN

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF CLAYTON AND NCDOT

CLAYTON STORAGE
US HWY 70

TOWN OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

TOWN OF CLAYTON PROJECT NO.
2019-162-SP



VICINITY MAP
N.T.S.

SHEET INDEX

	COVER
S-1	BOUNDARY SURVEY
C1.0	DEMOLITION PLAN
C1.1	SITE PLAN
C3.1	GRADING AND DRAINAGE PLAN
L1.1	LANDSCAPE PLAN
S-1	RV CANOPY PLAN
S-2	RV CANOPY ELEVATIONS
S-3	PORTABLE STORAGE UNIT
S-4	RENTAL KIOSK
	CLAYTON STORAGE SITE RENDERING

Received By
Town of Clayton
10/18/19

OWNER/DEVELOPER:

10 PURSUIT, LLC
4101 LAKE BOONE TRL, SUITE 100
RALEIGH, NC 27607

CONTACT: CLIFTON MINSLEY
PHONE: (919) 977-4457
EMAIL: cliff@10federal.com

CONSTRUCTION NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH APPLICABLE MUNICIPALITY STANDARDS, SPECIFICATIONS, AND DETAILS. WORK IN THIS PROJECT SHALL ALSO CONFORM TO THESE PLANS, THE LATEST EDITIONS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) ROAD AND BRIDGE SPECIFICATIONS, THE ROAD AND BRIDGE STANDARDS, THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL HANDBOOK, THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL REGULATIONS, THE FINAL GEOTECHNICAL REPORT, AND GENERAL DESIGN STANDARDS, IN THE EVENT OF CONFLICT BETWEEN ANY OF THESE STANDARDS, SPECIFICATIONS, OR PLANS, THE MOST STRINGENT SHALL GOVERN.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR TRENCH SAFETY DURING ALL PHASES OF CONSTRUCTION.
- THE LOCATION AND SIZE OF EXISTING UTILITIES AS SHOWN IS APPROXIMATE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR HORIZONTALLY AND VERTICALLY LOCATING AND PROTECTING ALL PUBLIC OR PRIVATE UTILITIES WHICH LIE IN OR ADJACENT TO THE CONSTRUCTION SITE. AT LEAST 48 HOURS PRIOR TO ANY DEMOLITION, GRADING, OR CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE NORTH CAROLINA ONE-CALL UTILITIES LOCATION SERVICE (LUCOS) AT 1-800-632-4949 FOR PROPER IDENTIFICATION OF EXISTING UTILITIES WITHIN THE SITE.
- THE CONTRACTOR SHALL SAVAGE AND PROTECT ALL EXISTING POWER POLES, SIGNS, MANHOLES, TELEPHONE RISERS, WATER VALVES, ETC., DURING ALL CONSTRUCTION PHASES. THE CONTRACTOR SHALL REPAIR, AT HIS OWN EXPENSE, ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
- TRAFFIC CONTROL ON PUBLIC STREETS SHALL BE IN CONFORMANCE WITH THE TRAFFIC CONTROL PLAN, THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AND AS FURTHER DIRECTED BY CITY AND STATE INSPECTORS.
- ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND SPECIFICATIONS AND SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES IN DRAWINGS OR SPECIFICATIONS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER, IN WRITING, WHO SHALL PROMPTLY ADDRESS SUCH INCONSISTENCIES OR AMBIGUITIES. WORK DONE BY CONTRACTOR AFTER HIS DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES, OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
- A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL ARRANGE THE MEETING WITH THE CITY ENGINEERING DIVISION.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL REQUIRED PERMITS AND APPROVALS PRIOR TO COMMENCING CONSTRUCTION.
- ALL AREAS SHALL BE GRADED FOR POSITIVE DRAINAGE, AND AS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL USE SILT FENCES (OR OTHER METHODS APPROVED BY THE ENGINEER AND APPLICABLE MUNICIPALITY) AS REQUIRED TO PREVENT SILT AND CONSTRUCTION DEBRIS FROM FLOWING ONTO ADJACENT PROPERTIES. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR LOCAL EROSION, CONSERVATION, AND SILTATION ORDINANCES. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF PERMANENT DRAINAGE FACILITIES AND THE ESTABLISHMENT OF A STAND OF GRASS OR OTHER GROWTH TO PREVENT EROSION.
- THE CONTRACTOR SHALL CLEAR AND GRUB THE SITE AND PLACE, COMPACT, AND MOISTURE CONDITION ALL FILL PER THE PROJECT GEOTECHNICAL ENGINEER'S SPECIFICATIONS. THE FILL MATERIAL TO BE USED SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.
- MATERIALS USED TO CONSTRUCT EMBANKMENTS FOR ANY PURPOSE, BACKFILL AROUND DRAINAGE STRUCTURES, OR IN UTILITY TRENCHES FOR ANY OTHER DEPRESSION REQUIRING FILL OR BACKFILL SHALL BE COMPACTED TO 90% OF MAXIMUM DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST AS SET OUT IN ASTM STANDARD D698. STONE BACKFILL SHALL BE COMPACTED TO 90% MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR TEST AS SET OUT IN ASTM STANDARD D1557. THE CONTRACTOR SHALL, PRIOR TO ANY OPERATIONS INVOLVING FILLING OR BACKFILLING, SUBMIT THE RESULTS OF THE PROCTOR TEST TOGETHER WITH A CERTIFICATION THAT THE SOIL TESTED IS REPRESENTATIVE OF THE MATERIALS TO BE USED ON THE PROJECT. TESTS SHALL BE CONDUCTED BY A CERTIFIED MATERIALS TESTING LABORATORY AND THE CERTIFICATIONS MADE BY A LICENSED PROFESSIONAL ENGINEER REPRESENTING THE LABORATORY.
- PROPOSED CONTOURS AND GUTTER GRADIENTS ARE APPROXIMATE. PROPOSED SPOT ELEVATIONS AND ROADWAY PROFILES/SUPERELEVATIONS ARE TO BE USED IN CASE OF DISCREPANCY.
- THE CONTRACTOR SHALL REVIEW, VERIFY AND COORDINATE ALL DIMENSIONS SHOWN ON PLANS, INCLUDING THE HORIZONTAL AND VERTICAL LOCATION OF CURB INLETS AND GRATE INLETS AND ALL UTILITIES CROSSING THE STORM SEWER PRIOR TO STARTING PROJECT.
- ALL CURB JOINTS SHALL EXTEND THROUGH THE CURB. MINIMUM LENGTH OF OFFSET JOINTS AT RADIUS POINTS IS 1.5 FEET. ALL JOINTS SHALL BE SEALED WITH JOINT SEALANT.
- ALL HANDICAP RAMPING, STRIPING, AND PAVEMENT MARKINGS SHALL CONFORM TO ADA REQUIREMENTS AND THE NORTH CAROLINA STATE BUILDING CODE, VOL. 1-1-C ACCESSIBILITY CODE.
- OWNER SHALL PROVIDE FENCING AND OTHER SAFETY MEASURES NECESSARY IN AND AROUND ANY PROPOSED STORMWATER MANAGEMENT MEASURES (POND, WETLANDS, ETC.) OBTAINING PROPER PERMITS SHALL BE THE RESPONSIBILITY OF THE OWNER.
- RETAINING WALLS EXCEEDING 30 INCHES IN HEIGHT SHALL INCLUDE FALL PROTECTION IN THE FORM OF A HANDRAIL OR FENCING ON THE HIGH SIDE OF THE RETAINING WALL.
- PROPER COMPACTION OF ALL FILL SOILS PLACED ON SITE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COMPACTION SHALL BE ADEQUATE TO SUPPORT THE PROPOSED USE OF AREAS IN WHICH FILL SOILS ARE PLACED. THE CONTRACTOR SHALL HIRE A GEOTECHNICAL ENGINEER TO TEST AND VERIFY THAT COMPACTION IS ADEQUATE FOR THE PROPOSED USE OF IN THE AREA OF FILL PLACEMENT.
- ALL ASPECTS OF THIS PROJECT SHALL BE IN FULL COMPLIANCE WITH CURRENT ADA STANDARDS. IF THE CONTRACTOR NOTES ANY ASPECTS OF THE PROJECT WHICH ARE NOT IN COMPLIANCE, THE ENGINEER SHALL BE NOTIFIED PRIOR TO ANY FURTHER WORK BEING PERFORMED. ANY WORK PERFORMED AFTER THE CONTRACTOR NOTES SUCH A NON COMPLIANCE IS SUBJECT TO REMOVAL AND REPAIR AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR OR OWNER SHALL EMPLOY A GEOTECHNICAL ENGINEER TO TEST ALL EMBANKMENTS AND FILL PLACEMENT FOR PROPER COMPACTION. PROPER COMPACTION SHALL BE PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS OR THESE PLANS, WHICHEVER IS MORE STRINGENT. EMBANKMENTS FOR PONDS SHALL BE PLACED IN 8 INCH LOOSE LAYERS AND SHALL BE COMPACTED TO A DENSITY OF NO LESS THAN 90% OF THE STANDARD PROCTOR MAXIMUM DENSITY AT A MOISTURE CONTENT OF + OR - TWO PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D698. THE CONTRACTOR SHALL TAKE PHOTOGRAPHS OF THE OUTLET STRUCTURE AT ALL AT ALL PHASES OF INSTALLATION AND SHALL RETAIN WITH GEOTECHNICAL TESTING DATA. THE CONTRACTOR SHALL ALSO RETAIN ALL SHIPPING RECORDS AND SPECIFICATIONS FOR THE OUTLET STRUCTURE MATERIALS AND STRUCTURES. ALL OF THE ABOVE DATA MAY BE REQUIRED AS PART OF THE MUNICIPALITY AS-BUILT PROCESS AND SHALL BE MADE AVAILABLE TO THE ENGINEER UPON REQUEST. THE CONTRACTOR AND OWNER SHALL HAVE DOCUMENTATION OF THESE TESTS AVAILABLE UPON REQUEST.
- RETAINING WALLS SHOWN HEREIN SHALL BE DESIGNED BY A QUALIFIED PROFESSIONAL ENGINEER WITH EXPERIENCE DESIGNING RETAINING WALLS. AT LEAST 14 DAYS PRIOR TO BEGINNING CONSTRUCTION OF RETAINING WALLS, THE CONTRACTOR SHALL CONTACT THE OWNER'S GEOTECHNICAL ENGINEER TO SCHEDULE AND COORDINATE ALL APPROPRIATE INSPECTIONS, TESTING, AND VERIFICATION NECESSARY DURING RETAINING WALL CONSTRUCTION. THE GEOTECHNICAL ENGINEER SHALL PROVIDE CONTINUOUS INSPECTION, TESTING AND VERIFICATION FOR THE DURATION OF RETAINING WALL CONSTRUCTION. PROPER SCHEDULING, EXECUTION, AND RECORD KEEPING FOR ALL REQUIRED INSPECTIONS, TESTING, AND VERIFICATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SUCH RECORDS SHALL BE RETAINED AND SHALL BE PROVIDED TO THE OWNER AND BASS, NIXON & KENNEDY, INC. ALL MONITORING, TESTING, AND VERIFICATION SHALL CONFORM TO THE MOST RECENT VERSION OF THE NC BUILDING CODE CHAPTER 18, SECTION 1806 OR THE WALL DESIGN ENGINEER'S SPECIFICATIONS, WHICHEVER IS MORE STRINGENT.



ENGINEER:

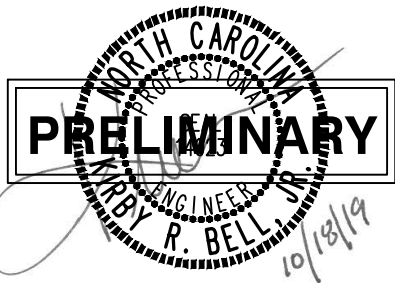


BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250
RALEIGH, NORTH CAROLINA 27607

TELEPHONE: (919) 851-4422
FAX: (919) 851-8968

CERTIFICATION NUMBERS: NCBELS (C-0110)
NCBOLA (C-0267)

CONTACT:
EMAIL:

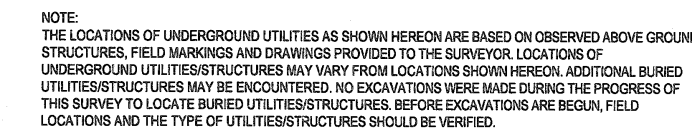


TOWN OF CLAYTON PROJECT NO. 2019-162-SP
BASS, NIXON & KENNEDY, INC.

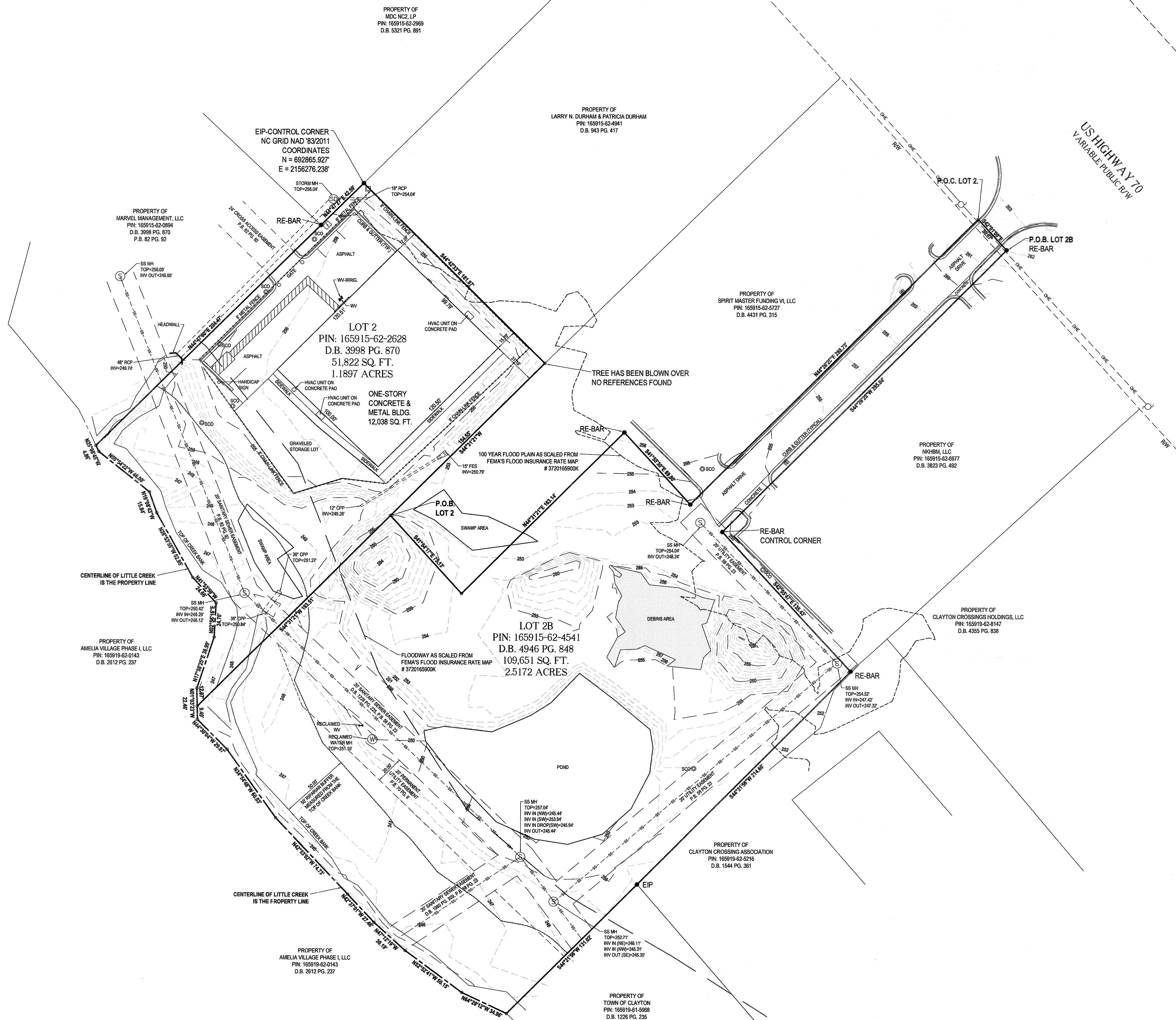
XXXXXX SUBMITTAL

CLAYTON STORAGE

03-19066



THIS 1 DAY OF JULY, 2019
SEAL _____
PROFESSIONAL LAND SURVEYOR



LEGEND	
✱	✱ EXISTING RIG PIPE
✱	✱ CALCULATED PIPE
W	W - WARD BUILT
C	C - CUB BUILT
MD-M	MD-M - STORE DRAIN MANHOLE
POWER POLE	POWER POLE
CL	CL - GUTTER WIRE
TRANSFORMER	TRANSFORMER
SS-W	SS-W - SANITARY SEWER MANHOLE
ACC	ACC - HORIZONTAL CLEANOUT
STREET LIGHT	STREET LIGHT
WV	WV - WATER VALVE
FM	FM - FIRE HYDRANT
HE	HE - HOT BOX
WM	WM - WATER METER
GM	GM - GAS METER
MANHOLE	MANHOLE
HC	HC - HANDS OFF
RFH	RFH - RIGHT OF WAY
ROP	ROP - RE-INFORCED CONCRETE PIPE
FE	FE - FUSED-AND-EMBEDDED
SANITARY SEWER LINE	
OVERHEAD	OVERHEAD
UNDERGROUND ELECTRIC LINES	
P.O.C.	P.O.C. - POINT OF COMMENCEMENT
P.O.B.	P.O.B. - POINT OF BEGINNING

CURRENT OWNER OF LOT 2
MARVEL MANAGEMENT, L.L.C.
2127 WILLOW HILL LANE
CLAYTON, N.C. 27520

CURRENT OWNER OF LOT 2
MICHAEL LYNN MARVEL
REVOCABLE TRUST
2127 WILLOW HILL LANE
CLAYTON, N.C. 27520-5943

SCALE: 1" = 40'

A horizontal bar chart showing the distribution of 160 students across five categories. The categories are represented by alternating black and white segments. The segments are labeled with their respective student counts: 20, 40, 80, 120, and 160.

1-5

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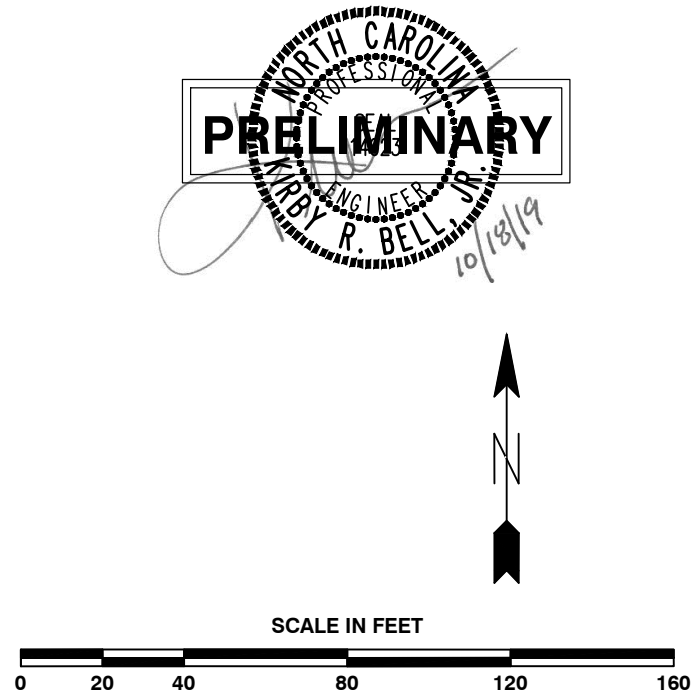
LEGEND

— • — LIMITS OF DISTURBANCE

WETLANDS EXIST ON-SITE

FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF CLAYTON AND NCDOT



TOWN OF CLAYTON PROJECT NO. XX-XX-XX



BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919) 851-4422 FAX: (919) 851-8988
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0257)

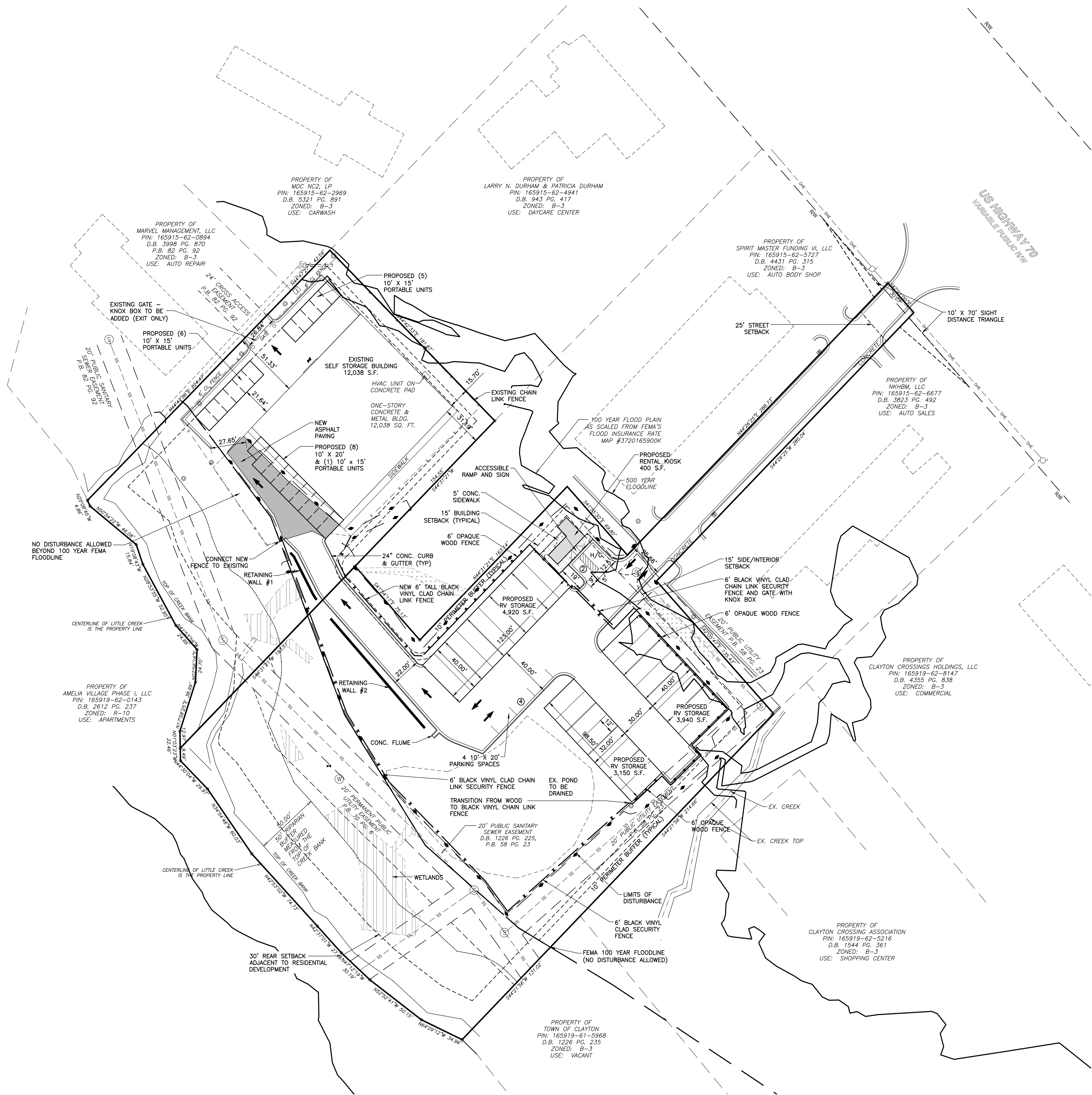
NO.	DATE	DESCRIPTION	BY
1	10-04-19	Town of Clayton Comments	IP
2	10-18-19	Town of Clayton Comments	IP

CLAYTON STORAGE
US HWY 70
TOWN OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

SHEET
C1.0

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

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SITE DATA

PROJECT NAME:	CLAYTON STORAGE
PIN/TAG:	165915-62-2628/05E99018Y 165915-62-4541/05025003B
SITE AREA (GROSS):	3.71 AC
ADDRESS:	US HWY 70
PLANNING JURISDICTION:	CLAYTON, NORTH CAROLINA CLAYTON CITY LIMITS
OWNER:	MARVEL MANAGEMENT LLC MICHAEL LYNN MARVEL REVOCABLE TRUST (UNDER CONTRACT TO 10 PURSUIT, LLC)
ZONING:	B-3
USE:	SELF STORAGE/VACANT
EXISTING:	SELF STORAGE FACILITY WITH ACCESSORY
PROPOSED:	LIMITED OUTDOOR STORAGE OF RV'S AND BOATS, MAXIMUM 26 SPACES
BUILDING SETBACKS	
STREET:	25' SF
SIDE/INTERIOR:	15' SF
REAR:	30' SF
BUILDING AREA	
EXISTING:	12,038 SF
PROPOSED:	400 SF
LEASING KIOSK:	12,010 SF
RV STORAGE:	3,450 SF
PORTABLE STORAGE UNITS:	
BUILDING HEIGHT:	
RV STORAGE:	14' HT
LEASING KIOSK:	10'-4" HT
PORTABLE STORAGE UNITS:	9'-2" HT
FLOOR AREA RATION:	0.077
BUILDING LOT COVERAGE:	7.7%
PARKING SPACES:	
REQUIRED:	1 SPACE PER 100 UNITS (111/100 = 2 REQUIRED - 6 PROVIDED)
UNITS:	65 EXISTING UNITS ON SITE 20 PROPOSED PORTABLE UNITS 26 RV SPACES 111 TOTAL UNITS
PROPOSED SPACES:	6 SPACES (INCLUDES 1 H/C SPACE)
ELECTRICAL PROVIDER:	TOWN OF CLAYTON
WATER PROVIDED:	TOWN OF CLAYTON
SANITARY SEWER PROVIDED:	TOWN OF CLAYTON
WATERSHED:	NEUSE RIVER
IMPERVIOUS AREA:	
EXISTING:	30,879 SF
PROPOSED:	28,828 SF
TOTAL:	59,707 SF 36.95% OF SITE
PERVIOUS AREA:	107,128 SF 63.05% OF SITE

A RECOMBINATION APPLICATION SHALL BE SUBMITTED TO THE TOWN AND APPROVED PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY

FENCE LEGEND

EXISTING CHAIN LINK FENCE TO REMAIN	---
PROPOSED 6" OPAQUE WOOD FENCE	=====
PROPOSED 6" BLACK VINYL CLAD CHAIN LINK FENCE	-x-x-x-x-x-x-x-

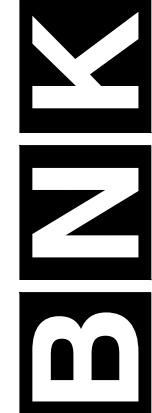
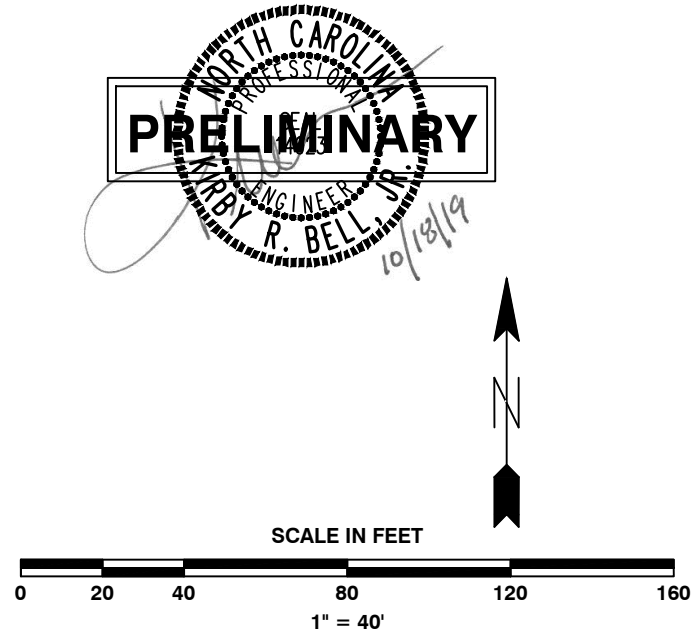
LEGEND

---	LIMITS OF DISTURBANCE
-----	-----------------------

WETLANDS EXIST ON-SITE

FLOODPLAINS EXIST ON-SITE

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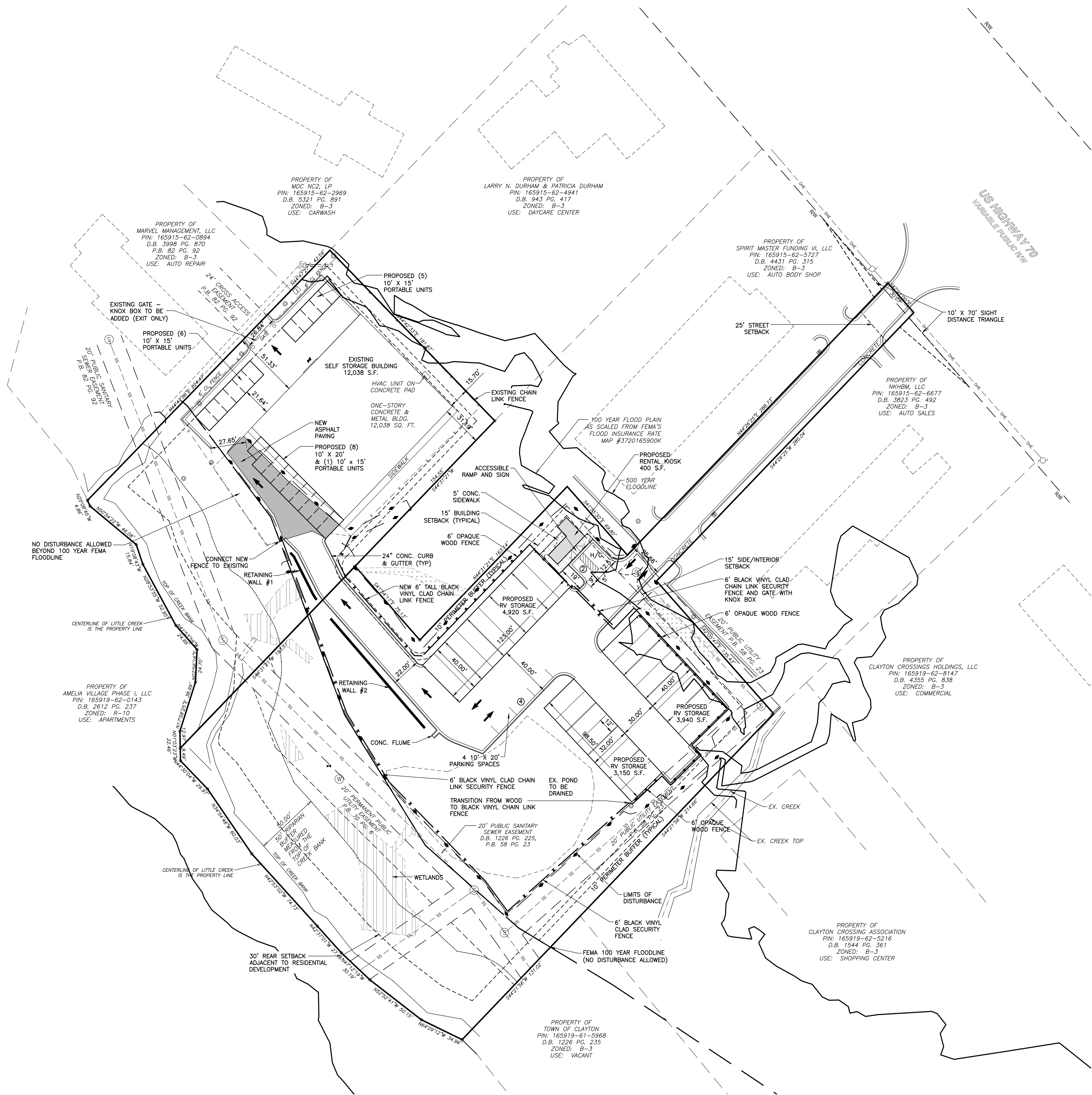
DATE	BY	IP	REVISIONS
10-18-19	Town of Clayton Comments	IP	
10-04-19	Town of Clayton Comments	IP	
10-04-19	DATE	NO.	DESCRIPTION
10-04-19	1	1	10-04-19
10-04-19	2	2	10-04-19

CLAYTON STORAGE
US HWY 70
TON OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

SHEET
C1.1

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

TON OF CLAYTON PROJECT NO. XX-XX-XX



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USE:	SELF STORAGE/VACANT
EXISTING:	SELF STORAGE FACILITY WITH ACCESSORY LIMITED OUTDOOR STORAGE OF RV'S AND BOATS, MAXIMUM 26 SPACES
PROPOSED:	
BUILDING SETBACKS	
STREET:	25' SF
SIDE/INTERIOR:	15' SF
REAR:	30' SF
BUILDING AREA	
EXISTING:	12,038 SF
PROPOSED:	400 SF
LEASING KIOSK:	12,010 SF
RV STORAGE:	3,450 SF
PORTABLE STORAGE UNITS:	
BUILDING HEIGHT:	
RV STORAGE:	14' HT
LEASING KIOSK:	10'-4" HT
PORTABLE STORAGE UNITS:	9'-2" HT
FLOOR AREA RATION:	0.077
BUILDING LOT COVERAGE:	7.7%
PARKING SPACES:	
REQUIRED:	1 SPACE PER 100 UNITS (111/100 = 2 REQUIRED - 6 PROVIDED)
UNITS:	65 EXISTING UNITS ON SITE 20 PROPOSED PORTABLE UNITS 26 RV SPACES 111 TOTAL UNITS
PROPOSED SPACES:	6 SPACES (INCLUDES 1 H/C SPACE)
ELECTRICAL PROVIDER:	TOWN OF CLAYTON
WATER PROVIDED:	TOWN OF CLAYTON
SANITARY SEWER PROVIDED:	TOWN OF CLAYTON
WATERSHED:	NEUSE RIVER
IMPERVIOUS AREA:	
EXISTING:	30,879 SF
PROPOSED:	28,828 SF
TOTAL:	59,707 SF 36.95% OF SITE
PERVIOUS AREA:	107,128 SF 63.05% OF SITE

A RECOMBINATION APPLICATION SHALL BE SUBMITTED TO THE TOWN AND APPROVED PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY

FENCE LEGEND

EXISTING CHAIN LINK FENCE TO REMAIN	---
PROPOSED 6" OPAQUE WOOD FENCE	=====
PROPOSED 6" BLACK VINYL CLAD CHAIN LINK FENCE	-x-x-x-x-x-x-x-

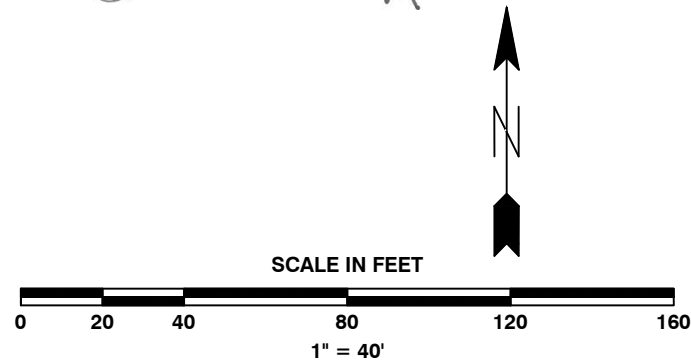
LEGEND

---	LIMITS OF DISTURBANCE
-----	-----------------------

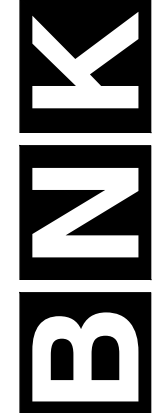
WETLANDS EXIST ON-SITE

FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TON OF CLAYTON AND NCDOT



TON OF CLAYTON PROJECT NO. XX-XX-XX



BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919) 851-4422 FAX: (919) 851-8988
CERTIFICATION NUMBERS: NCBELS (C-010); NCBOLA (C-0257)

NO.	DATE	DESCRIPTION	BY
1	10-04-19	Town of Clayton Comments	IP
2	10-18-19	Town of Clayton Comments	IP

SCALE: 1" = 40'

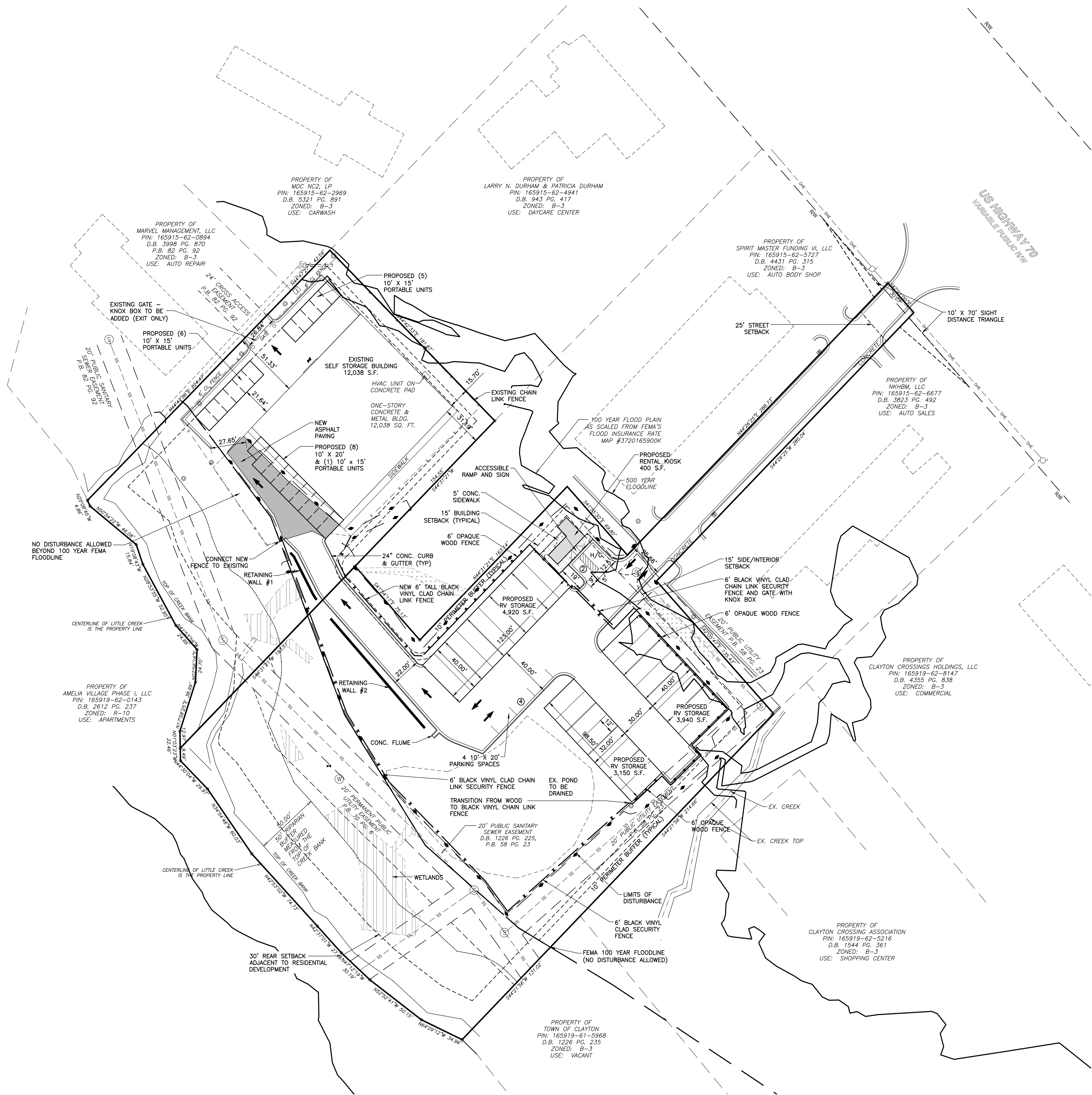
CHK BY: KRB

CLAYTON STORAGE
US HWY 70
TON OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

SHEET
C1.1

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

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SITE DATA

PROJECT NAME:	CLAYTON STORAGE
PIN/TAG:	165915-62-2628/05E99018Y 165915-62-4541/05025003B
SITE AREA (GROSS):	3.71 AC
ADDRESS:	US HWY 70
PLANNING JURISDICTION:	CLAYTON, NORTH CAROLINA CLAYTON CITY LIMITS
OWNER:	MARVEL MANAGEMENT LLC MICHAEL LYNN MARVEL REVOCABLE TRUST (UNDER CONTRACT TO 10 PURSUIT, LLC)
ZONING:	B-3
USE:	SELF STORAGE/VACANT
EXISTING:	SELF STORAGE FACILITY WITH ACCESSORY
PROPOSED:	LIMITED OUTDOOR STORAGE OF RV'S AND BOATS, MAXIMUM 26 SPACES
BUILDING SETBACKS	
STREET:	25' SF
SIDE/INTERIOR:	15' SF
REAR:	30' SF
BUILDING AREA	
EXISTING:	12,038 SF
PROPOSED:	LEASING KIOSK: 400 SF RV STORAGE: 12,010 SF PORTABLE STORAGE UNITS: 3,450 SF
BUILDING HEIGHT:	RV STORAGE: 14' HT LEASING KIOSK: 10'-4" HT PORTABLE STORAGE UNITS: 9'-2" HT
FLOOR AREA RATION:	0.077
BUILDING LOT COVERAGE:	7.7%
PARKING SPACES:	1 SPACE PER 100 UNITS (111/100 = 2 REQUIRED - 6 PROVIDED)
REQUIRED UNITS:	65 EXISTING UNITS ON SITE 20 PROPOSED PORTABLE UNITS 26 RV SPACES 111 TOTAL UNITS
PROPOSED SPACES:	6 SPACES (INCLUDES 1 H/C SPACE)
ELECTRICAL PROVIDER:	TOWN OF CLAYTON
WATER PROVIDED:	TOWN OF CLAYTON
SANITARY SEWER PROVIDED:	TOWN OF CLAYTON
WATERSHED:	NEUSE RIVER
IMPERVIOUS AREA:	
EXISTING:	30,879 SF
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TOTAL:	59,707 SF 36.95% OF SITE
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FENCE LEGEND

EXISTING CHAIN LINK FENCE TO REMAIN	---
PROPOSED 6" OPAQUE WOOD FENCE	=====
PROPOSED 6" BLACK VINYL CLAD CHAIN LINK FENCE	-x-x-x-x-x-x-x-

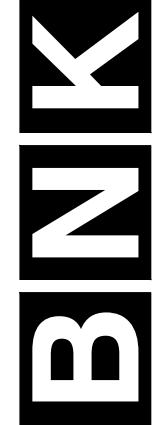
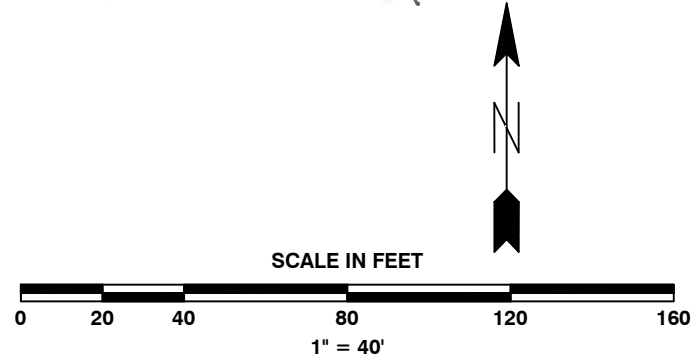
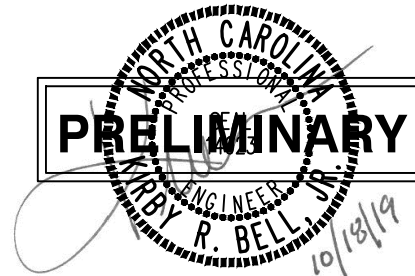
LEGEND

---	LIMITS OF DISTURBANCE
-----	-----------------------

WETLANDS EXIST ON-SITE

FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TON OF CLAYTON AND NCDOT



BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919) 851-4422 FAX: (919) 851-8988
CERTIFICATION NUMBERS: NCBELS (C-010); NCBOLA (C-0257)

NO.	DATE	DESCRIPTION	BY
1	10-04-19	Town of Clayton Comments	IP
2	10-18-19	Town of Clayton Comments	IP

03-19065	08-28-19	IP	DRAWN BY
JOB NO.	DATE		
SITE PLAN			
SCALE: 1" = 40'			
CHK BY: KRB			

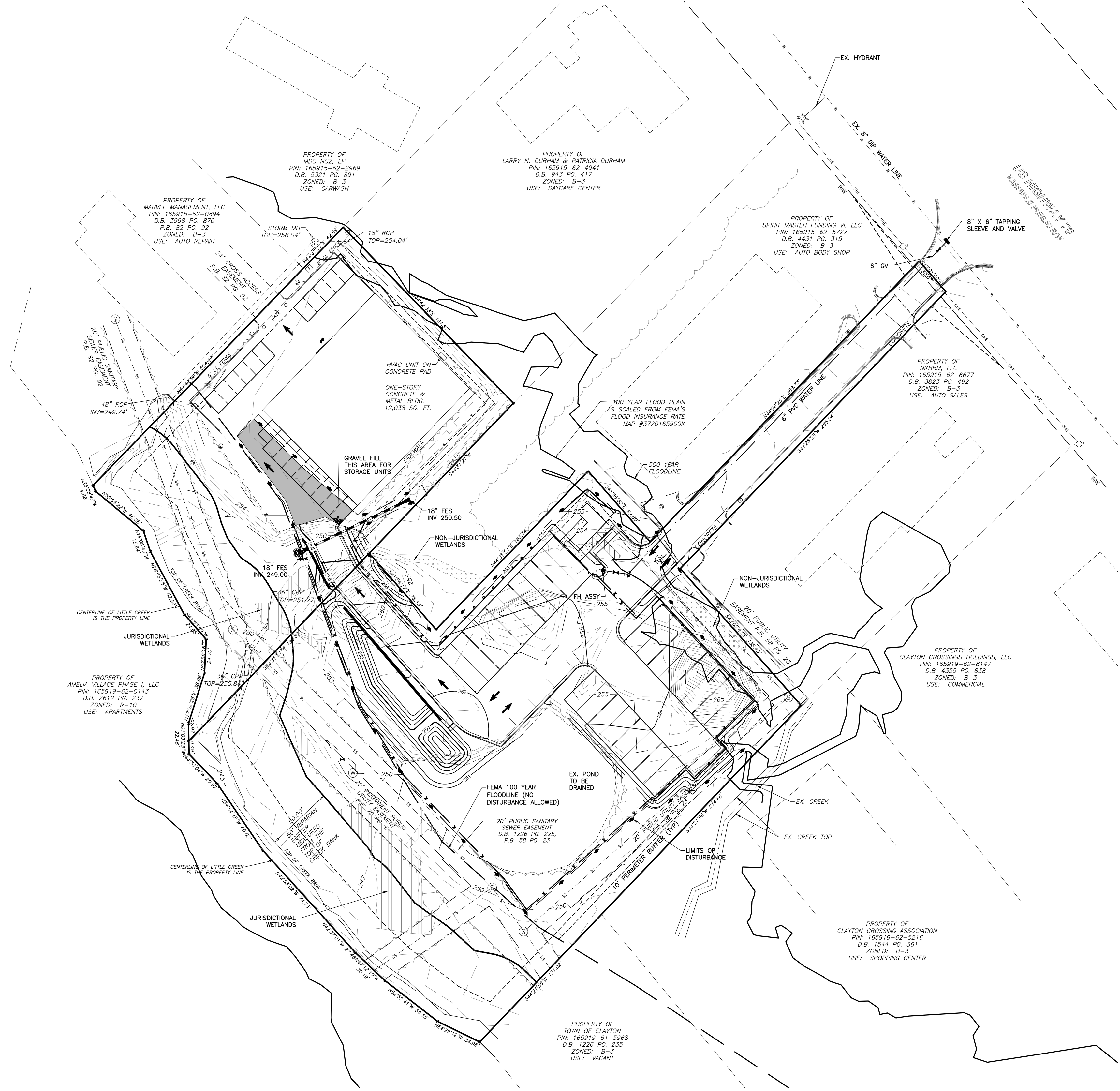
CLAYTON STORAGE
US HWY 70
TON OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

SHEET
C1.1

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

TON OF CLAYTON PROJECT NO. XX-XX-XX

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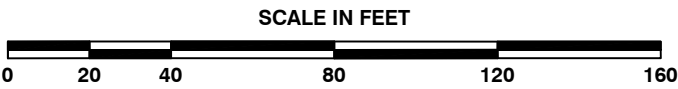
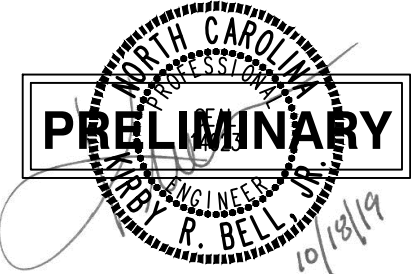
NOTES:
1. NO DOMESTIC WATER OR SANITARY SEWER USAGE PROPOSED. ONLY UTILITY PROPOSED IS A 6" PVC FIRE LINE W/ONE FIRE HYDRANT.

LEGEND
— • — LIMITS OF DISTURBANCE

WETLANDS EXIST ON-SITE

FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF CLAYTON AND NCDOT



TOWN OF CLAYTON PROJECT NO. XX-XX-XX



BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8988
CERTIFICATION NUMBERS: NCBELS (C-010); NCBOLA (C-0257)

NO.	DATE	DESCRIPTION	BY
2	10-18-19	Town of Clayton Comments	IP
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2	10-18-19	Town of Clayton Comments	IP

CLAYTON STORAGE
US HWY 70
TOWN OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

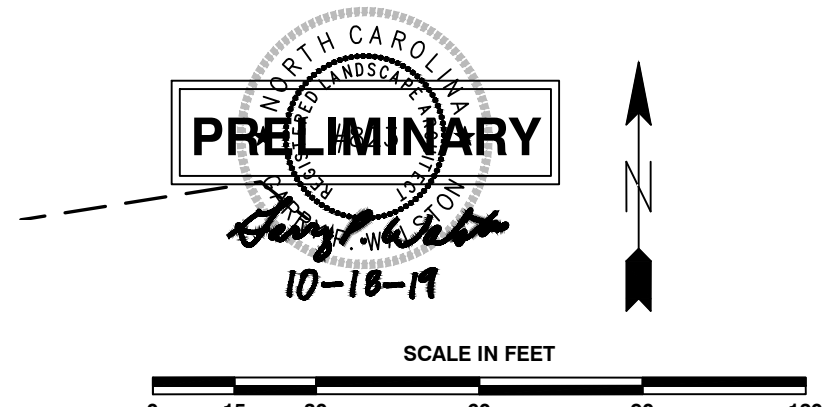
SHEET
C3.1

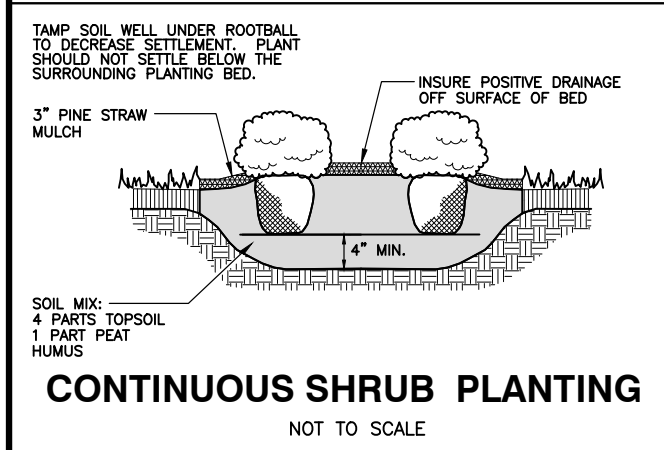
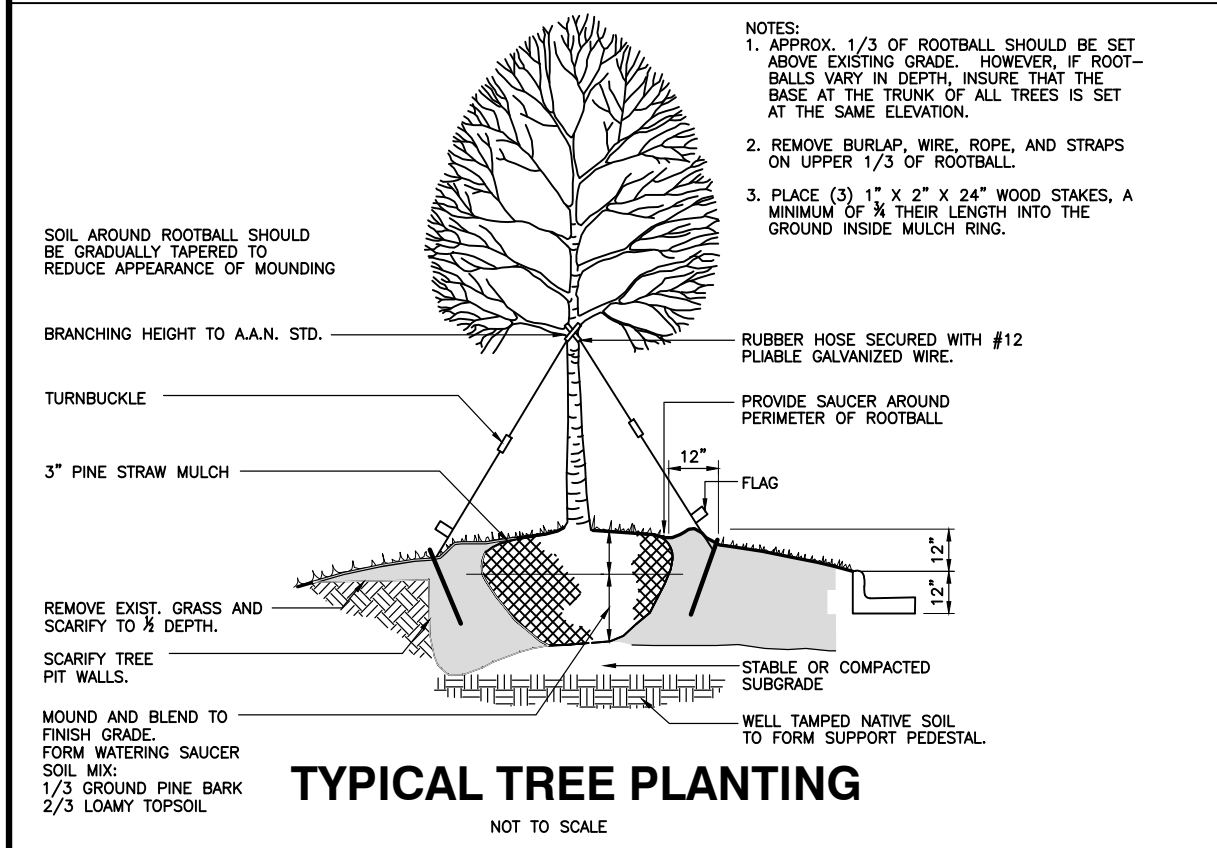
NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

CLAYTON STORAGE
US HIGHWAY 70
TOWN OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION





LANDSCAPE REQUIREMENTS:

Site Landscaping

20% OF TOTAL LOT AREA SHALL BE LANDSCAPED AT A RATE OF (1) CANOPY TREE, (1) UNDERSTORY TREE, AND (2) SHRUBS PER 1,000 S.F.: 3.704 acres (161,355 S.F.)
161,355 S.F. x .20 = 32,271 S.F.
32,271/1,000 = 33
33 CANOPY TREES REQUIRED/PROVIDED
33 UNDERSTORY TREES REQUIRED/PROVIDED
EXISTING TREE COVERAGE PROVIDED BY APPROXIMATELY 0.87 ACRES OF WOODED AREA PLUS 4 NEW TREES (ASSUMED 1 TREE PER 100 S.F. = 378 EXISTING TREES)
SHRUBS REQUIRED: 32,271/500 = 65 SHRUBS REQUIRED/PROVIDED

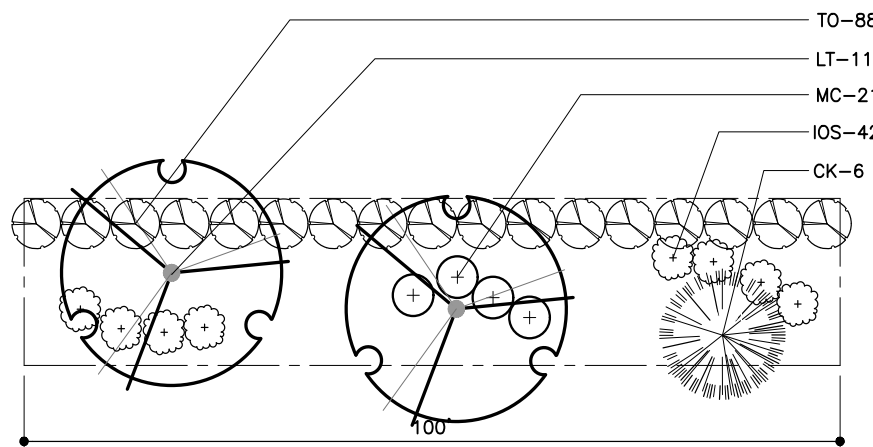
Project Boundary Buffers

10' WIDE TYPE CLASS 'B' BUFFER ALTERNATIVE 1
(2) CANOPY TREES, (2) UNDERSTORY TREES AND (12) SHRUBS PER 100 LINEAR FEET OF BUFFER
1,278 LINEAR FEET OF BUFFER
1,278/100 X 2 = 26 CANOPY TREES REQUIRED/PROVIDED
1,278/100 X 2 = 26 UNDERSTORY TREES REQUIRED/PROVIDED
1,278/100 X 12 = 154 SHRUBS REQUIRED/PROVIDED

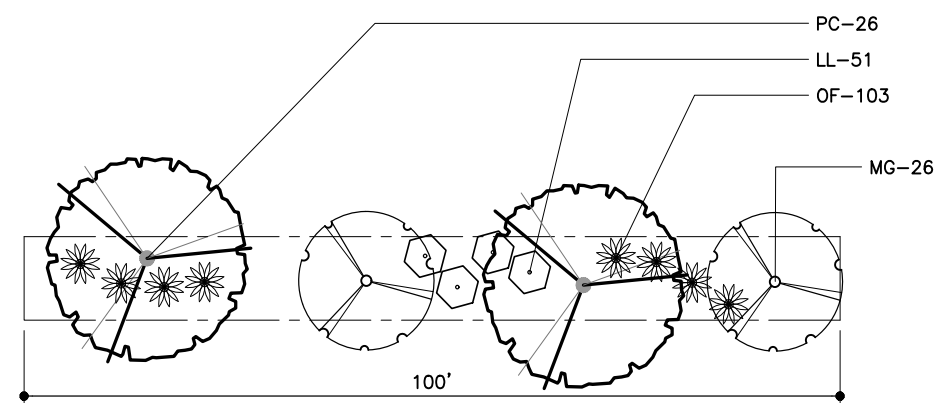
20' WIDE TYPE CLASS 'C' BUFFER ALTERNATIVE 3
(2) CANOPY TREES, (1) UNDERSTORY TREES AND (12) SHRUBS PER 100 LINEAR FEET OF BUFFER
517 LINEAR FEET OF BUFFER
517/100 X 2 = 11 CANOPY TREES REQUIRED/PROVIDED
517/100 X 1 = 6 UNDERSTORY TREES REQUIRED/PROVIDED
517/100 X 12 = 62 SHRUBS REQUIRED/PROVIDED
517/6 = 86.6' EVERGREEN SHRUBS PROVIDED

LANDSCAPE NOTES:

- ALL DISTURBED AREAS TO BE BERMUDA GRASS LAWN, UNLESS OTHERWISE INDICATED.
- PLANTING AREAS SHALL CONSIST OF UNCOMPACTED SOIL THAT IS A MINIMUM OF 8 INCHES DEEP. SOILS SHALL BE APPRECIABLY FREE OF GRAVEL, STONES, RUBBLE OR TRASH. ALL CONTAMINATED SOIL SHALL BE REMOVED.
- MULCH ALL LANDSCAPE BEDS WITH DOUBLE-SHREDDED HARDWOOD MULCH.
- CANOPY TREES SHALL BE LOCATED NO CLOSER THAN TEN FEET FROM ANY STRUCTURE. UNDERSTORY TREES SHALL BE PLANTED NO CLOSER THAN SEVEN FEET FROM ANY STRUCTURE.
- 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.
- 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 ROOF, GROUND AND WALL MOUNTED MECHANICAL EQUIPMENT INCLUDED, BUT NOT LIMITED TO AIR HANDLING EQUIPMENT, VENTS, COMPRESSORS, DUCT WORK, TRANSFORMERS AND ELEVATOR EQUIPMENT SHALL BE SCREENED FROM VIEW.
- ROOF-MOUNTED MECHANICAL EQUIPMENT SHALL BE SHIELDED FROM VIEW ON ALL SIDES. SCREENING SHALL CONSIST OF MATERIALS CONSISTENT WITH THE PRIMARY BUILDING MATERIALS, AND MAY INCLUDE METAL SCREENING OR LOUVERS WHICH ARE PAINTED TO BLEND WITH THE PRIMARY STRUCTURE.



**20' CLASS 'C' BUFFER
ALTERNATIVE 3 (517 LF)**
(EXISTING VEGETATION MAY BE USED TO SATISFY THIS REQUIREMENT WHERE APPLICABLE)



**10' CLASS 'B' BUFFER
ALTERNATIVE 1 (1,278 LF)**
(EXISTING VEGETATION MAY BE USED TO SATISFY THIS REQUIREMENT WHERE APPLICABLE)

PLANT LIST

KEY	SCIENTIFIC NAME	COMMON NAME	QUAN.	CAL	HT	ROOT	REMARKS
SHADE TREES							
CB	Carpinus betula	European Hornbeam	4	2.5"	10'	B&B	VUA
LT	Liriodendron tulipifera	Tulip Poplar	11	2.5"	8'	B&B	Buffer
PC	Pistachia chinensis	Chinese Pistache	26	2.5"	10'	B&B	Buffer
UNDERSTORY TREES							
CK	Cornus kousa	Kousa Dogwood	6	2"	8'	B&B	Buffer
MG	Magnolia grandiflora 'Little Gem'	Little Gem Magnolia	26		8'	B&B	Buffer
SHRUBS							
IC	Ilex cornuta 'Carissa'	Carissa Holly	13		18"	Cont	VUA
GI	Gardenia jasminoides 'Kleim's Hardy'	Gardenia	9		18"	Cont	VUA
IOS	Ilex cornuta 'O'Spring'	O'Spring Holly	42		24"	Cont	Buffer
JC	Juniperus chinensis 'Gold Lace'	Gold Lace Juniper	11		18"	Cont	VUA
LC	Loropetalum chinensis 'Chang's Ruby'	Loropetalum	10		18"	Cont	VUA
LL	Ligustrum lucidum	Waxleaf Privet	51		24"	Cont	Buffer
MC	Myrica cerifera	Wax Myrtle	21		24"	Cont	Buffer
OF	Osmanthus fortunei	Fortune's Osmanthus	103		24"	Cont	Buffer
TO	Thuja occidentalis 'Emerald'	Emerald Green Arborvitae	88		5'	B&B	Buffer
VI	Viburnum japonicum	Japanese Viburnum	22		18"	Cont	VUA

GENERAL NOTES

- A/C UNITS, TRANSFORMERS AND OTHER MECHANICAL OR UTILITY EQUIPMENT, NOT SHOWN ON THE PLAN, SHALL BE SCREENED FROM VIEW EITHER BY ADJUSTING PLANTINGS SHOWN IN CLOSE PROXIMITY TO EQUIPMENT OR BY THE ADDITION OF WAX MYRTLES @ 24" HT. 5' OC (SEE GENERAL NOTES FOR EQUIPMENT ACCESSIBILITY AND PLANTING PROXIMITY, ETC.).
- CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO PLANTING.
- MULCH SHALL BE 3" DEEP PINE STRAW UNLESS OTHERWISE NOTED.
- VERIFICATION OF TOTAL QUANTITIES AS SHOWN IN THE PLANT LIST AND ON THE PLAN SHALL BE THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR. ANY DISCREPANCIES BETWEEN PLANT LIST AND PLANTING PLAN SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR CLARIFICATION.
- ALL TREES, SHRUBS, GROUNDCOVER, ETC. SHALL CONFORM TO ACCEPTED STANDARDS ESTABLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
- ALL ROOTBALLS REMOVED FROM CONTAINERS SHALL BE SCARIFIED PRIOR TO PLANTING.
- B&B AS LISTED UNDER "ROOT" IN THE PLANT LIST INDICATES BALLED & BURLAPPED.
- ALL PLANTS/PLANTINGS SHALL BE MULCHED IMMEDIATELY AFTER PLANTING AND WATERED.
- ALL PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS THEY BORE TO PREVIOUS EXISTING GRADE (UNLESS OTHERWISE NOTED).
- ALL TREES AND SHRUBS SHALL REQUIRE MULCH RINGS AT THEIR BASE IF LEFT WITHIN LAWN AREAS.
- MULCH EDGES AND PROPOSED PLANTINGS SHALL NOT DISTURB ANY EXISTING GROUPS OF TREES TO REMAIN. EDGES ARE SHOWN FOR APPROXIMATION ONLY, BUT ARE TO INDICATE SMOOTH, CLEAN CURVES.
- CULVERTS, RIP-RAP STRUCTURES, AND OTHER STORMWATER DEVICES SHALL BE SCREENED WITH EVERGREEN SHRUBS. IF STRUCTURES ARE NOT SHOWN ON THE PLAN, INSTALL WAX MYRTLES @ 24" HT. - 5' OC.
- A 2' BUMPER OVERHANG, FROM THE BACK OF CURB, SHALL BE ALLOTTED FOR MATURE SHRUBS.
- TREE PROTECTION FENCING SHALL BE MAINTAINED UNTIL ALL SITE WORK IS COMPLETED. THE FENCING SHALL BE REMOVED PRIOR TO THE FINAL SITE INSPECTION FOR THE CERTIFICATE OF OCCUPANCY (C.O.). THE SITE SHALL BE STABILIZED AND SEEDING PRIOR TO THE ISSUANCE OF A (C.O.).
- ALL TREES SHALL BE LOCATED A MINIMUM OF 6' FROM SIDEWALKS.

BNK

**BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS**
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8988
CERTIFICATION NUMBERS: NCBELS (C-0110), NCBOLA (C-0257)

JOB NO.	DATE	GPW	DRAWN BY
03-19068	08-28-19		
LANDSCAPE DETAILS			
2	10-18-19		PER TOC COMMENTS
1	10-04-19		PER TOC COMMENTS
NO.	DATE		DESCRIPTION
REVISIONS			
SCALE: N.T.S.			
CHK BY: GPW			

**CLAYTON STORAGE
US HIGHWAY 70**

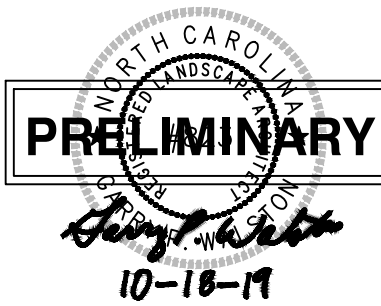
TOWN OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

**SHEET
L1.2**

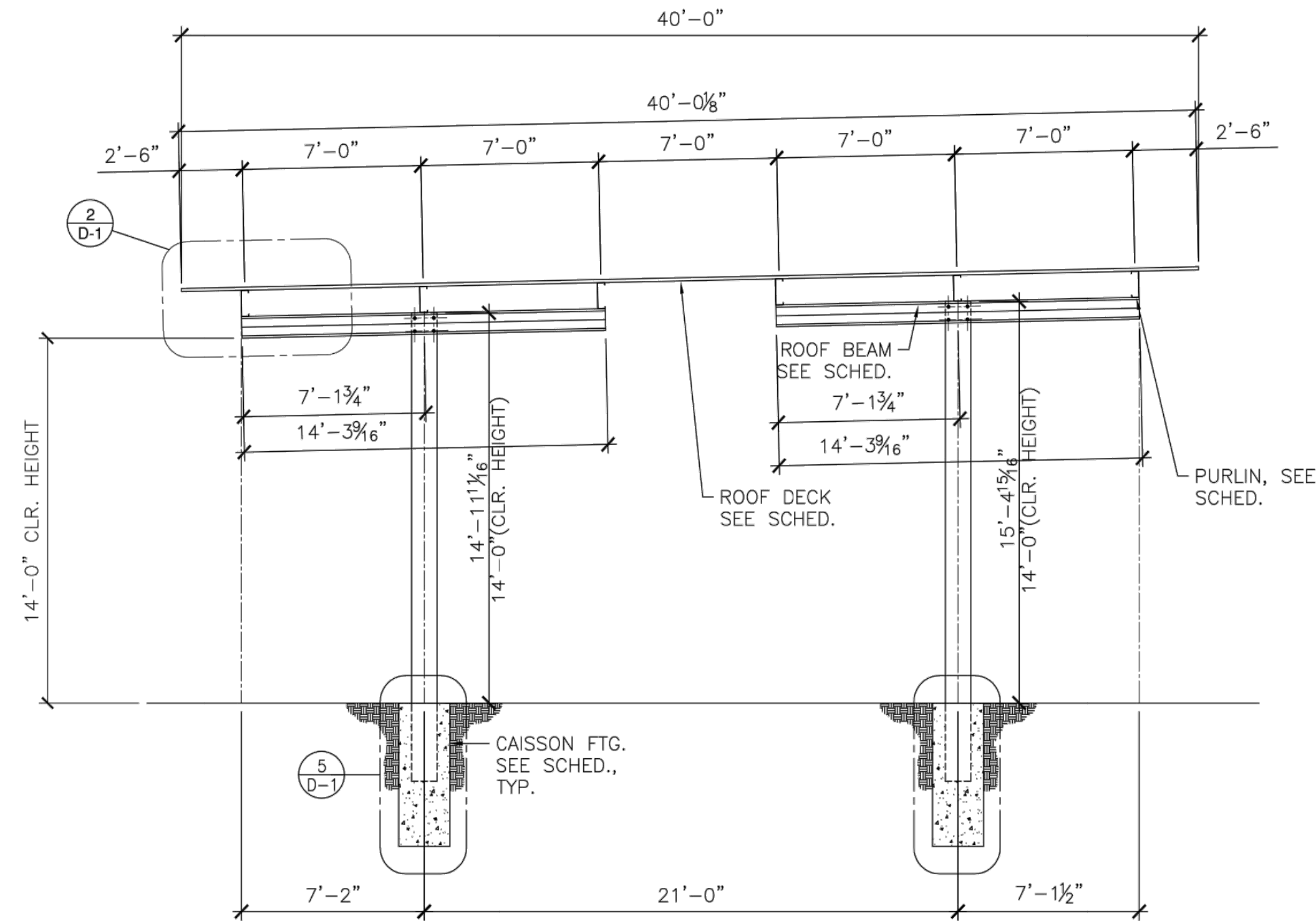
NO WETLANDS EXIST ON-SITE

NO FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF CLAYTON AND NCDOT

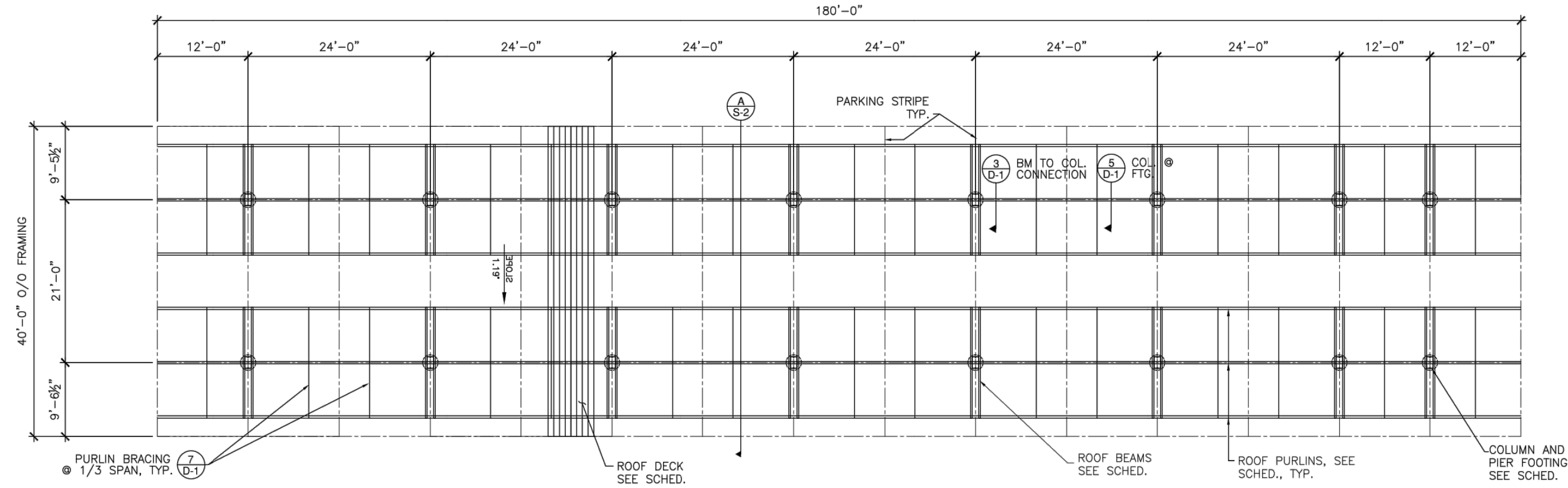


SCHEDULE	
MODEL NO.	CANOPY A
OCCUPANCY GROUP	-
TYPE OF CONSTRUCTION	-
DEPTH OF CAR SPACE	18' 0"
BAY WIDTH	27'-8 5/8"
ROOF PANEL	-
ROOF PURLIN	-
ROOF BEAM	-
COLUMN	COLUMN C1: (2) CEE -" x -" x -" GA BOXED COLUMN C2: (2) CEE -" x -" x -" GA BOXED COLUMN C3: (2) CEE -" x -" x -" GA BOXED Fy = - KSI (min.) COLUMN C1a: (2) CEE -" x -" x -" GA BOXED COLUMN C2a: (2) CEE -" x -" x -" GA BOXED COLUMN C3a: (2) CEE -" x -" x -" GA BOXED Fy = - KSI (min.)
CONC. PIER FOOTING UNCONSTRAINED CONDITION (Fin. Grade: Soil or Asphalt)	-" x -" x -" DEEP WITH (-#- VERTICAL REINF. BARS AND #- TIES AT -" O.C.
ALTERNATIVE SPREAD FOOTING	COLUMN C1: -" x -" SQ. x -" DEEP w/ (-#- REINF. BARS EACH WAY COLUMN C2 AND C3: -" x -" SQ. x -" DEEP w/ (-#- REINF. BARS EACH WAY



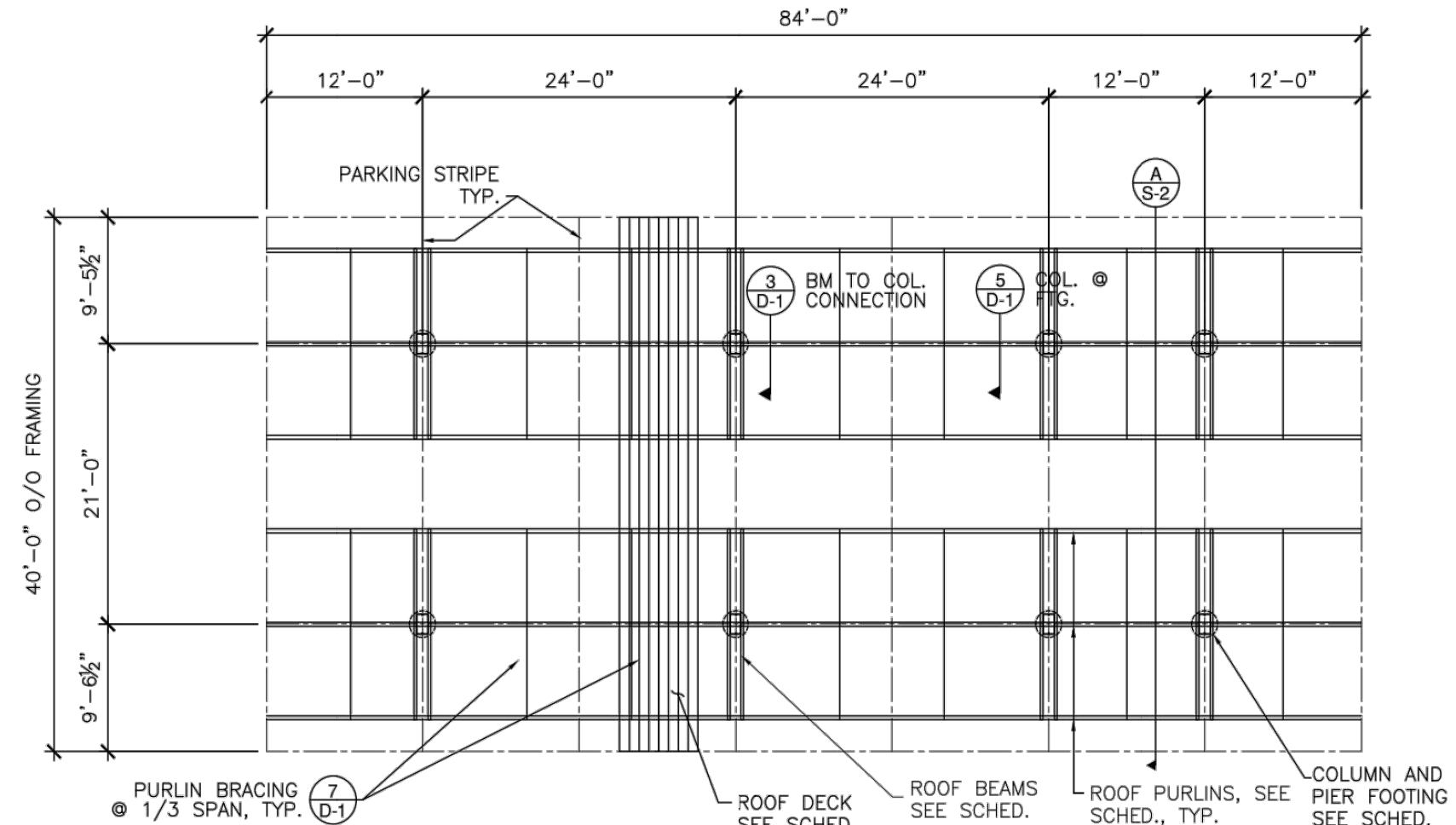
A SECTION SECTION
(CANOPY A & B)

1/4"=1'-0"



FRAMING AND FOUNDATION PLAN
(CANOPY A)

3/32"=1'-0"



FRAMING AND FOUNDATION PLAN
(CANOPY B)

3/32"=1'-0"

NOTES-SCHED	
SECTION & FRAMING PLAN	
RV CANOPY 10 Federal Storage Facility CLAYTON STORAGE FACILITY for: Clifton Minsley	
BAJA CONSTRUCTION CO., INC. 223 FOSTER ST., MARTINEZ CA 94553 1-800-366-9600 FAX: (925) 229-0161	
PROJ. NO.: B0270	DATE: 07/30/19
DRAWN: RM	CHECKED: R.P.
SHEET: S-1	



NOTES-SCHED

SECTION & FRAMING PLAN

**RV CANOPY
ELEVATIONS**
10 Federal Storage Facility

CLAYTON STORAGE FACILITY
for: Clifton Minsley

BAJA
CONSTRUCTION CO., INC.
2223 FOSTER ST., MARTINEZ CA 94553
1-800-366-9600 FAX: (925) 229-0161

[illegible]

PROJ. NO.:	DATE:
B0270	07/30/19
DRAWN:	CHECKED:
RM	R.P.
SHEET:	

SHEET-

S-2



A New Revolution in Global Door Solutions™

Relocatable Storage Units

Generate Additional Profit From Your Idle Land

Janus International offers an innovative solution to temporary storage needs for a variety of business and home applications—Movable Additional Storage Structures (MASS)



Relocatable Storage Units

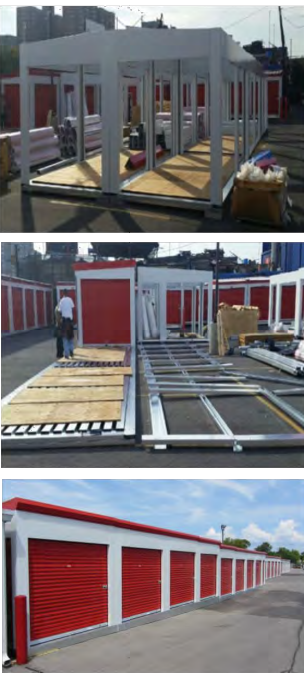


MASS self storage allows owners more flexibility than traditionally constructed building structures. Relocatable storage units are an attractive and cost-effective alternative to new construction, particularly if you are in need of just a few more storage units. And because they are movable, they can be placed in areas where you would not typically build permanent structures. These multipurpose structures can be placed in a variety of applications, including home use or outbuilding storage for businesses.

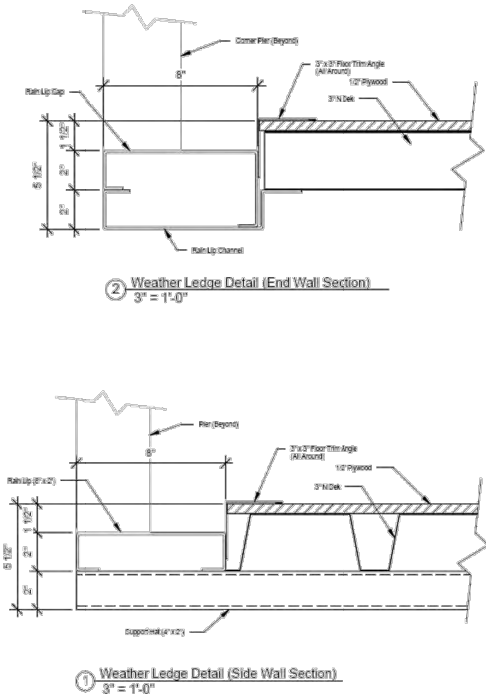
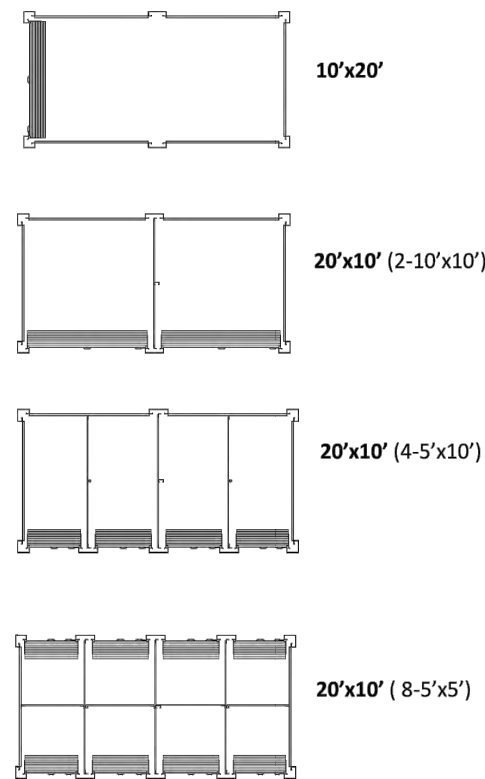


Benefits:

- MASS offers the same look and benefits of traditional storage
- Able to quickly generate additional income
- Easily movable by a 5,000 lb. forklift with extended forks
- Utilizes easy-to-operate roll up doors which require virtually no maintenance
- Secure and convenient for storage renters
- Built with special features to reduce moisture
- Easy to expand to accommodate growth
- Adaptable to odd-sized lots or slightly sloping land/driveways
- Standard building permits may not be required (check local ordinances)
- Economical—increased rental income with minimal investment
- Classified as equipment, MASS units can be depreciated over seven years
- Are often allowed where containers are restricted due to design and aesthetics



Various configurations available, including single units and lockers



Features:

- Configurable mix on an 8'x20', 10'x20' or custom size platform
- Sturdy construction
- Continuous 22ga galvanized N deck base with plywood flooring (option for diamond plate)
- 125 psf floor load
- Can be anchored to asphalt or other ground materials for stability. Tie downs by others
- Can be wired for electricity
- Uses standard 26 gauge doors in over 25 standard color options
- Standard 30 lb. snow load (optional up to 50 lb.)
- Weather resistant
- Special features, including a rain lip and elevated floor, which reduces moisture
- Skid panel outside the doors to offer a non-slip entry into unit
- Units are built close to the ground for easier access

"We have seen three major benefits of utilizing portable storage units. First, there is a tax devaluation because we can classify them as equipment. Second, no building permit is required, and third, their flexibility allows us to place these in areas where permanent buildings are not permitted."

-Tim Burnham, Facility Owner

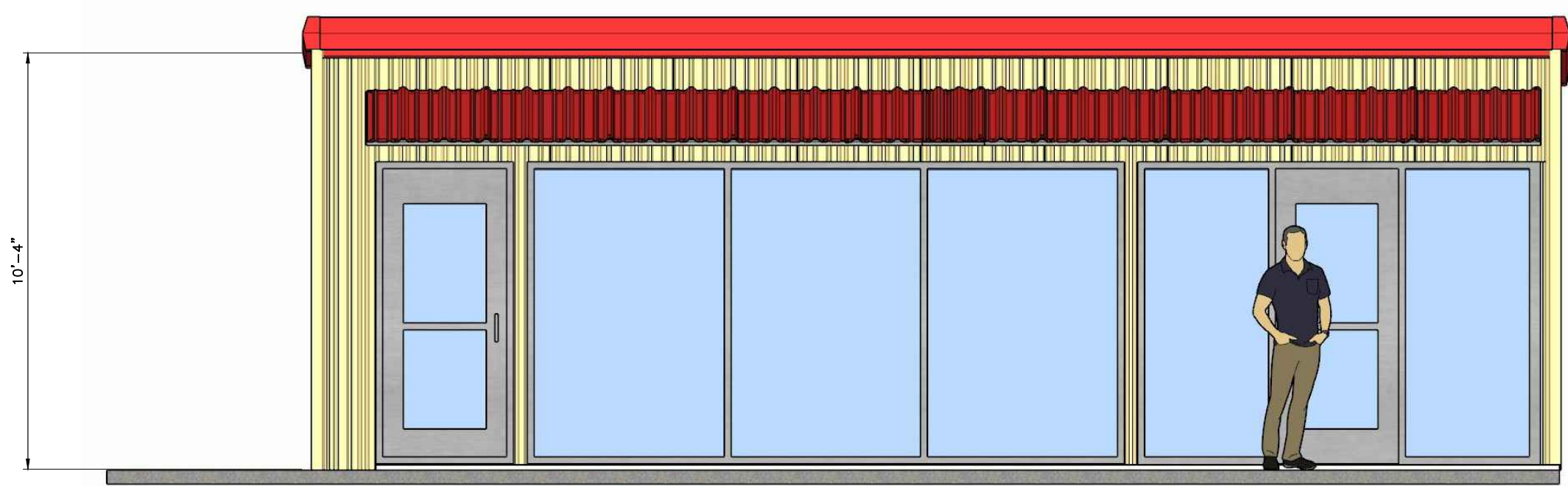


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CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8988
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0257)

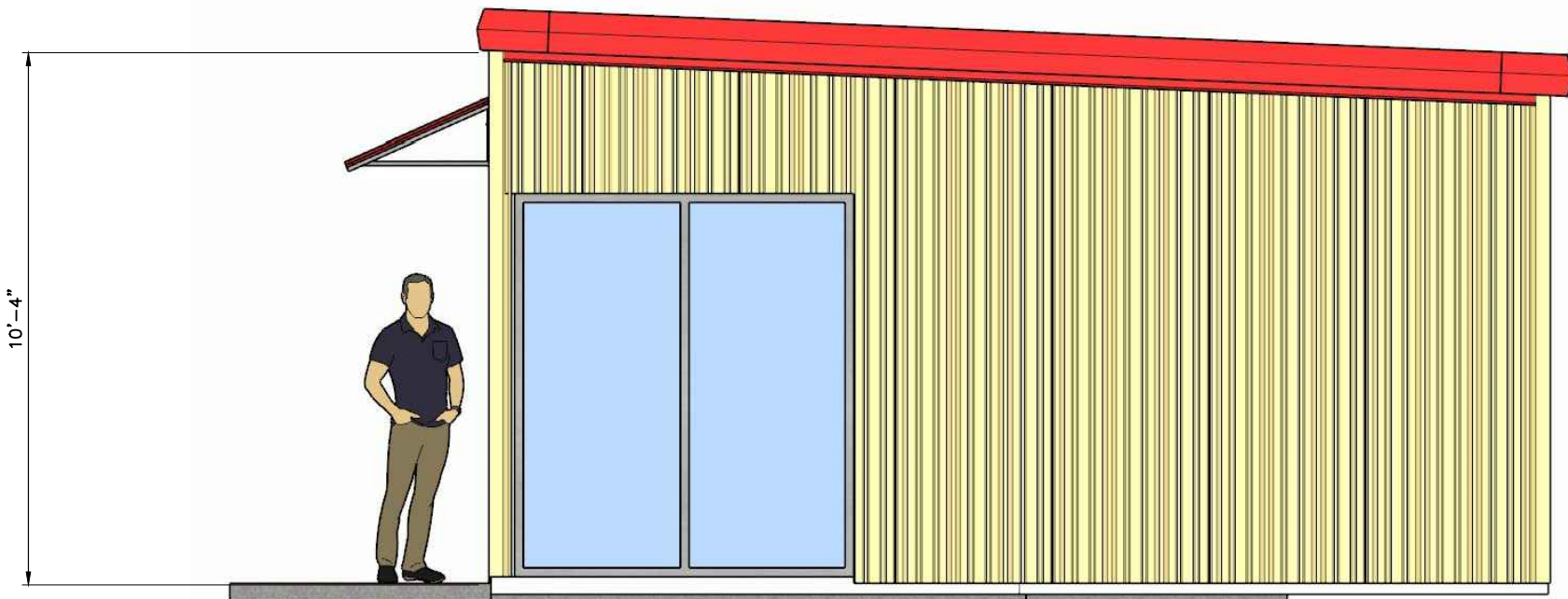
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1	10-04-19	PER TOC COMMENTS	GW

CLAYTON STORAGE
US HIGHWAY 70
TOWN OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

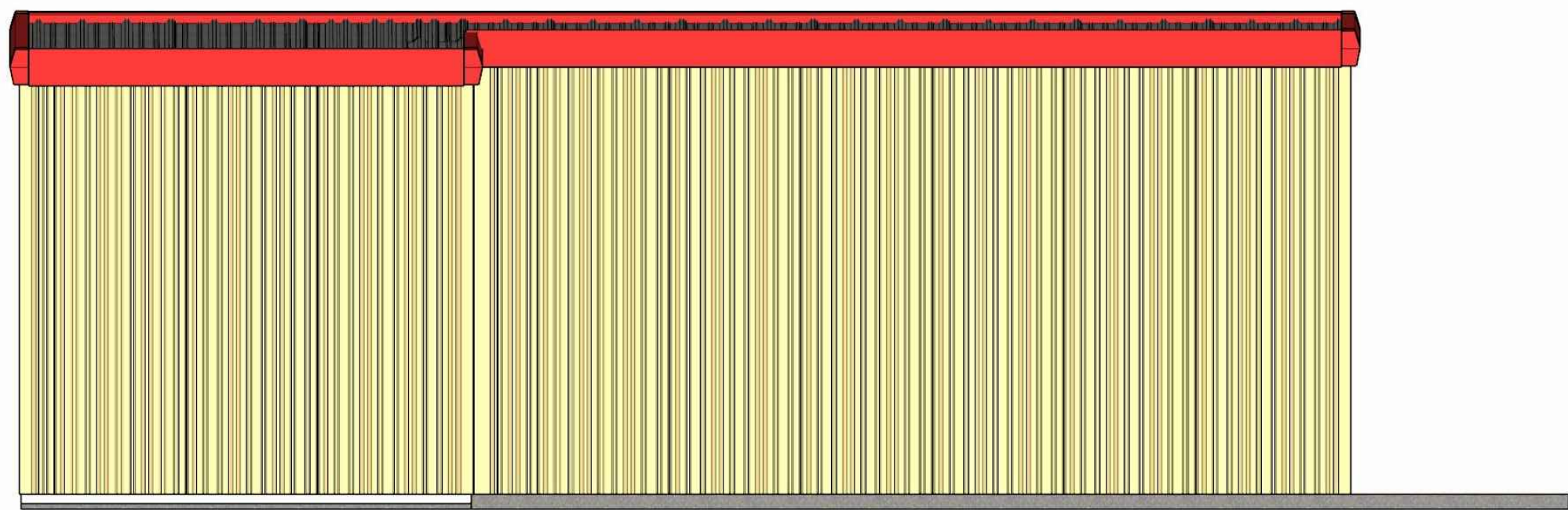
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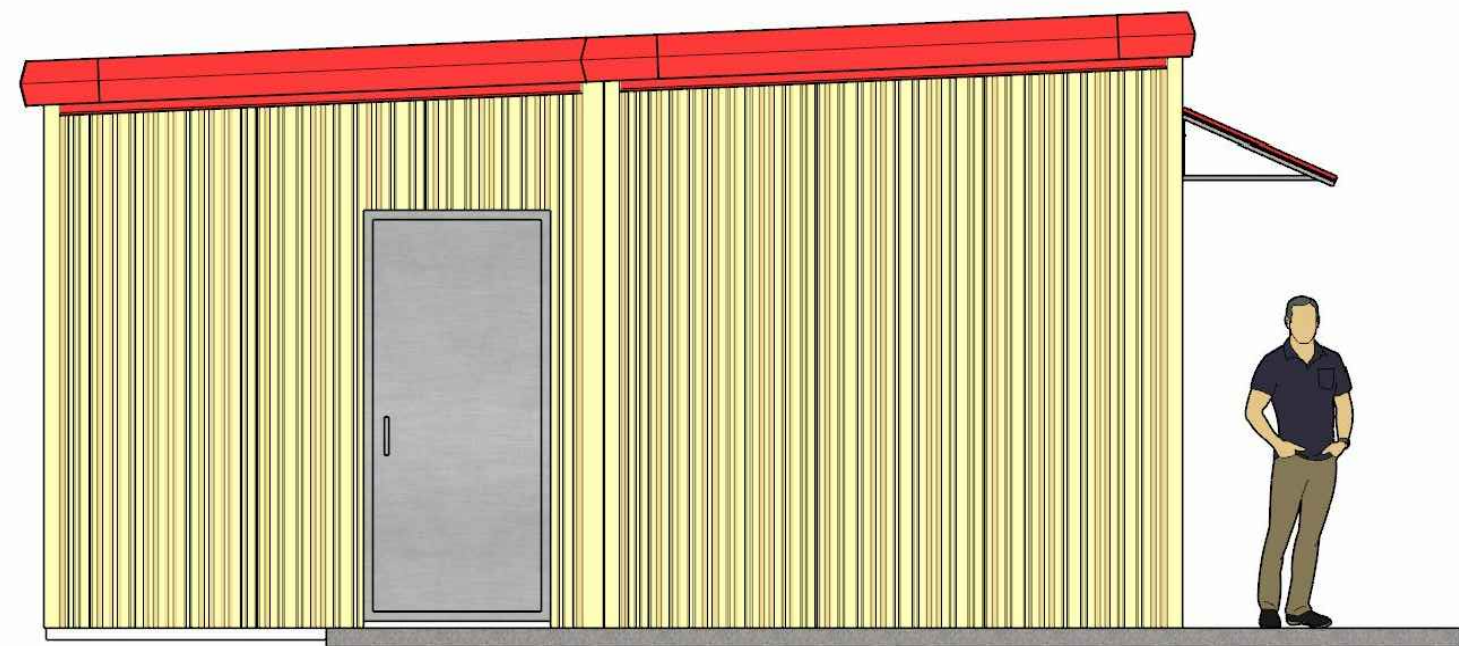
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NTS



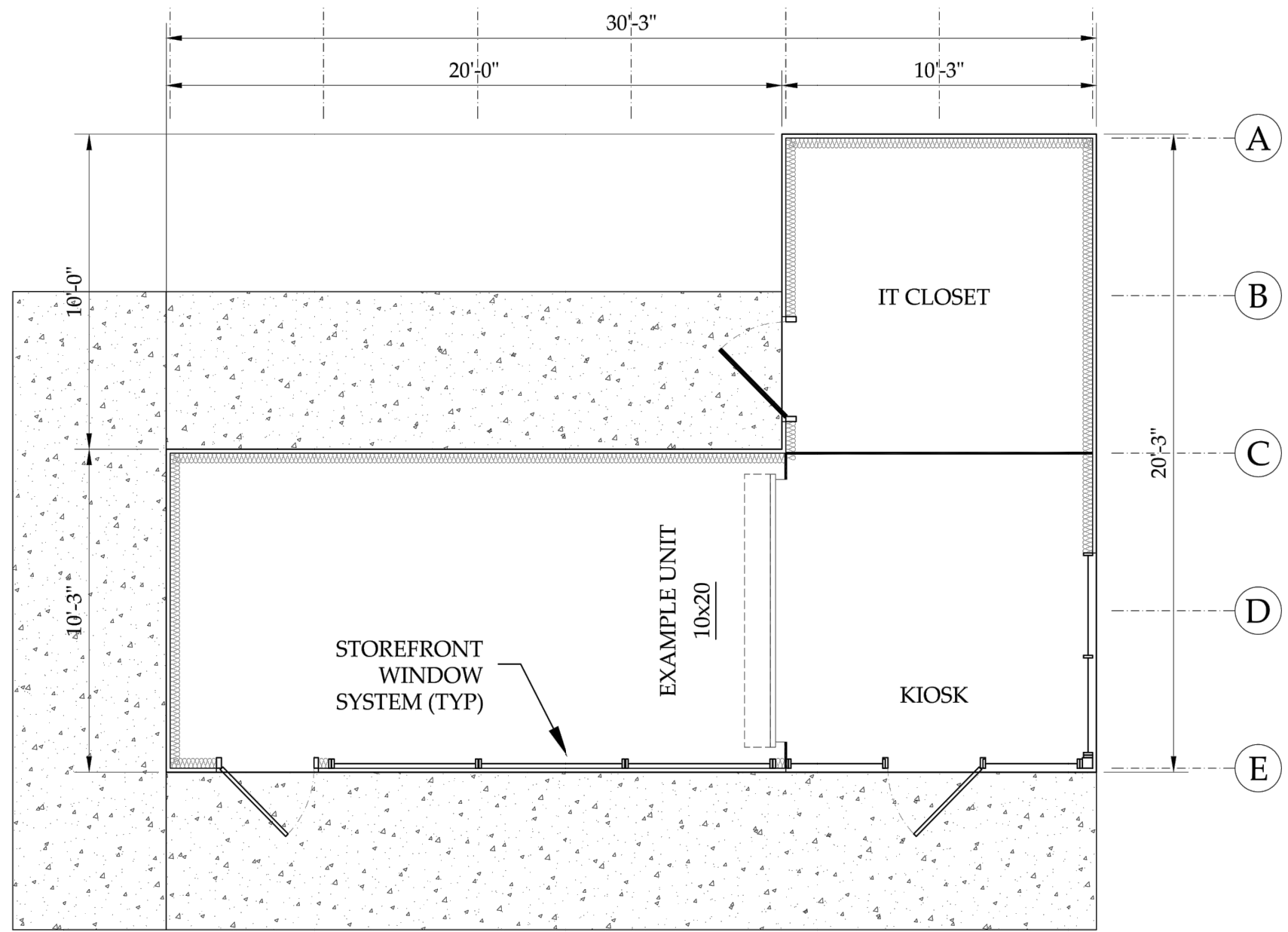
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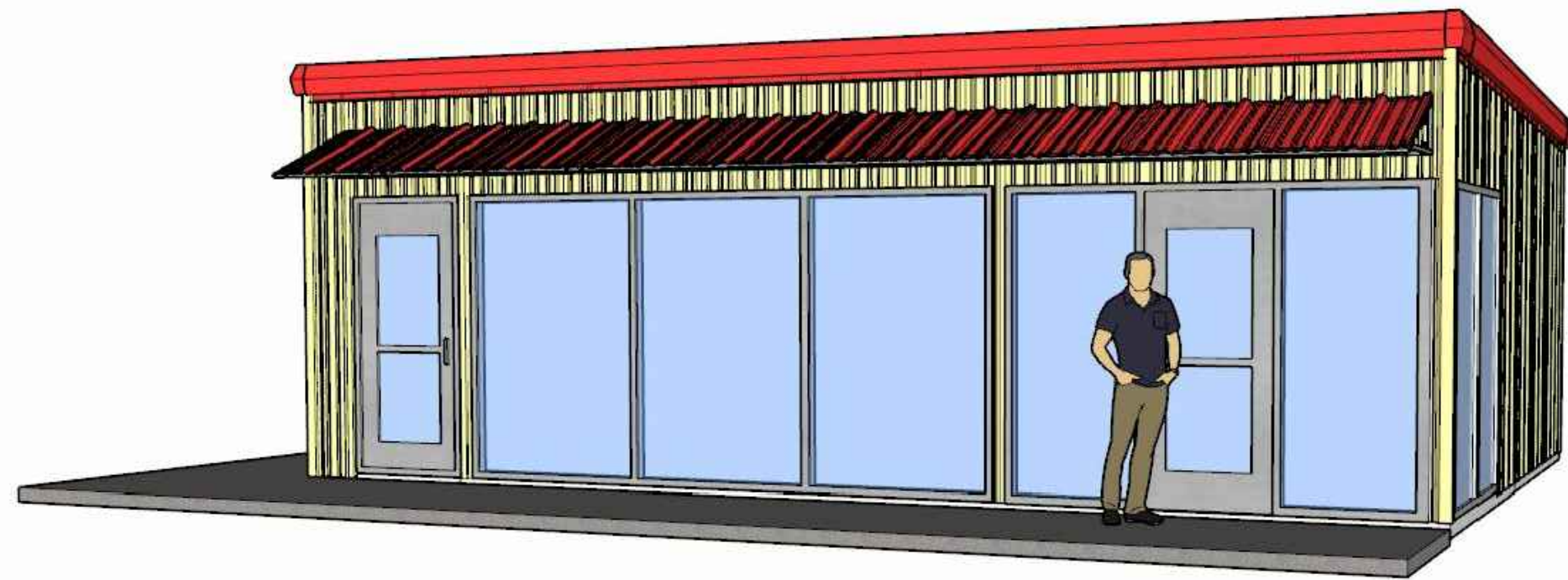
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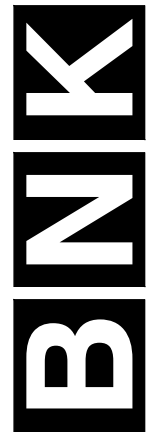
LEFT ELEVATION
NTS



FLOOR PLAN
NTS



PERSPECTIVE
NTS



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TELEPHONE: (919)851-4422 FAX: (919)851-8988
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0257)

REVISIONS		LEASING KIOSK PLANS	
NO.	DATE	DESCRIPTION	BY
2	10-18-19	PER TOC COMMENTS	GW
1	10-04-19	PER TOC COMMENTS	GW

CLAYTON STORAGE
US HIGHWAY 70
TOWN OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA

SHEET S-4



1A VIEW



2A VIEW



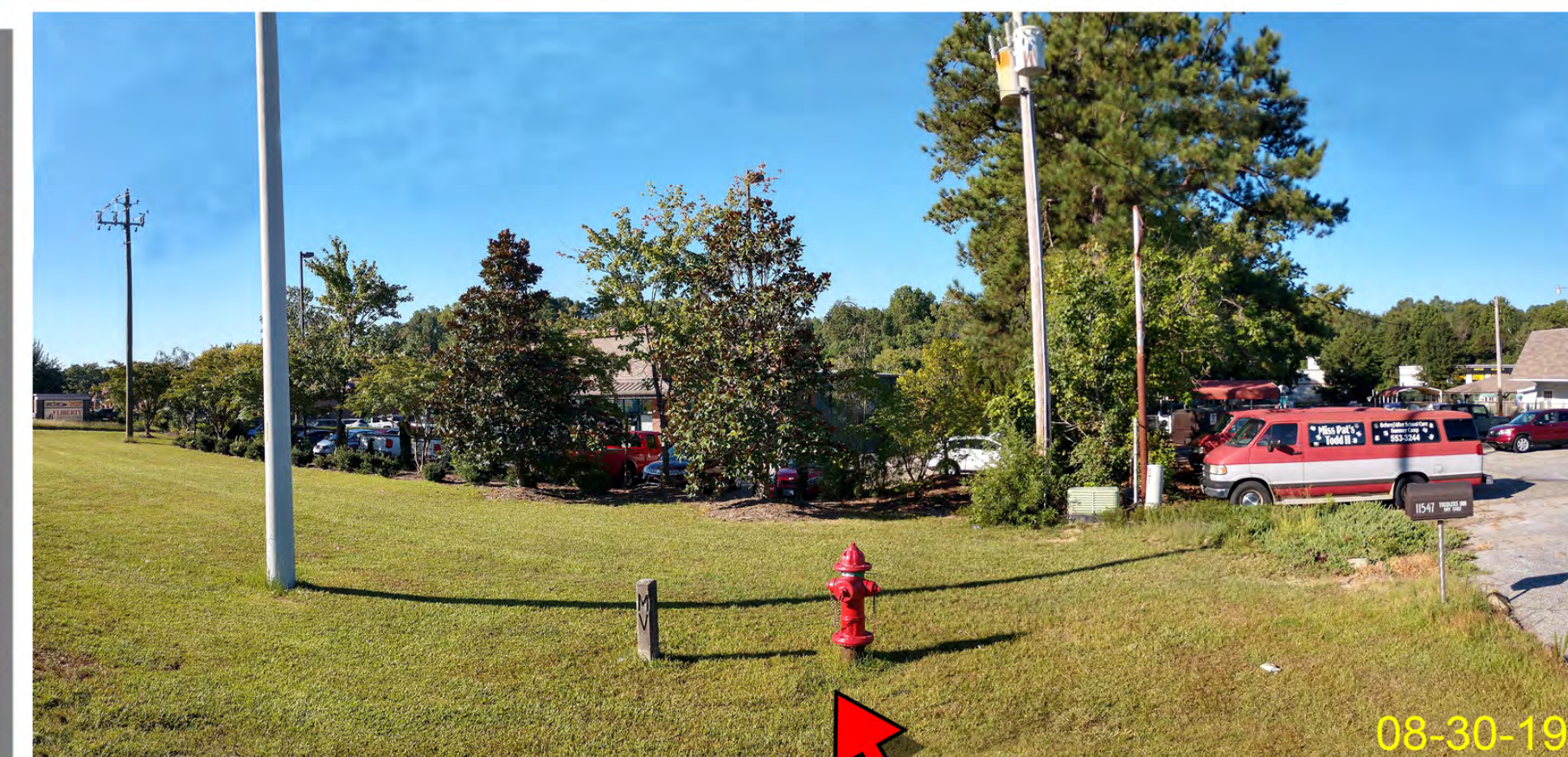
3A VIEW



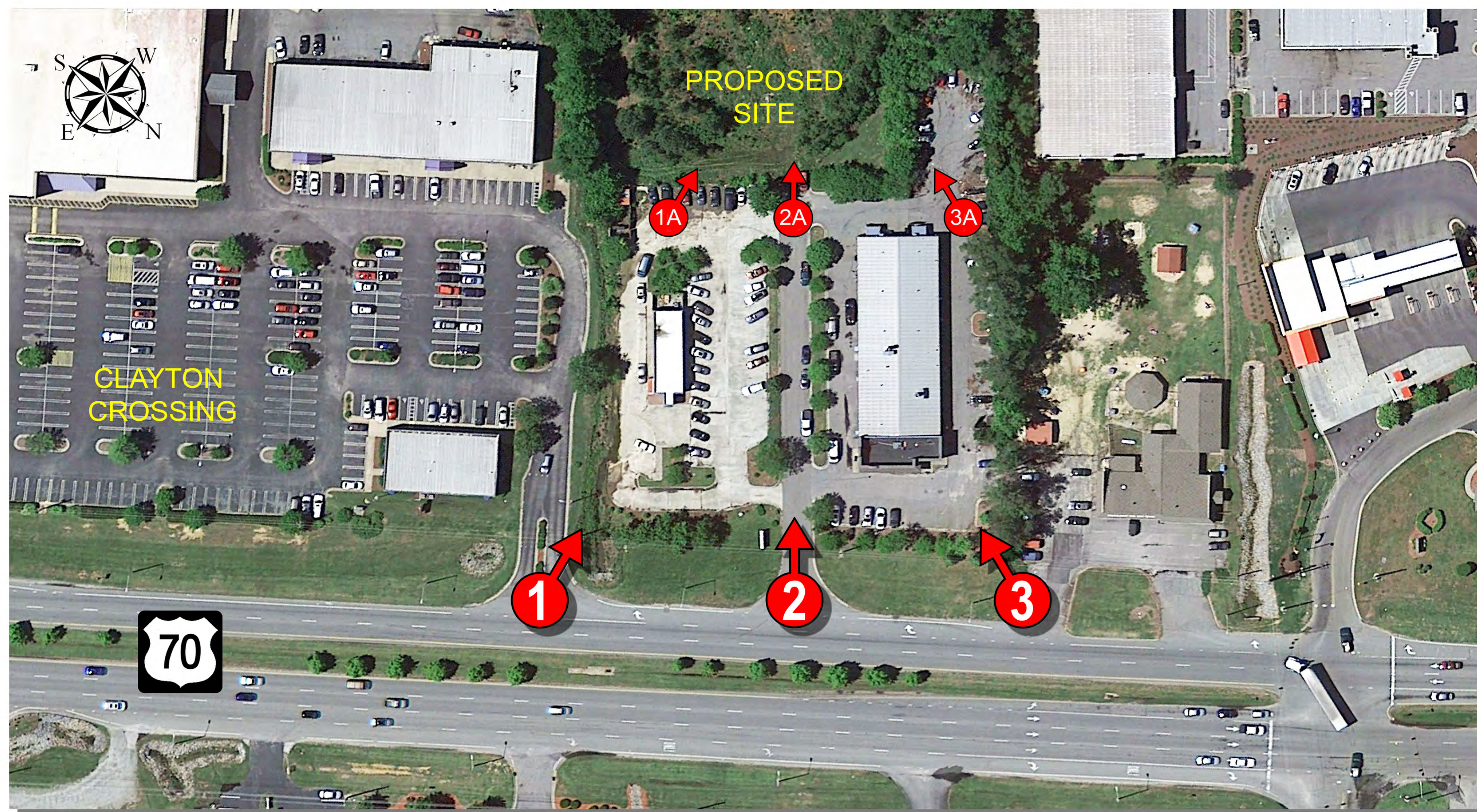
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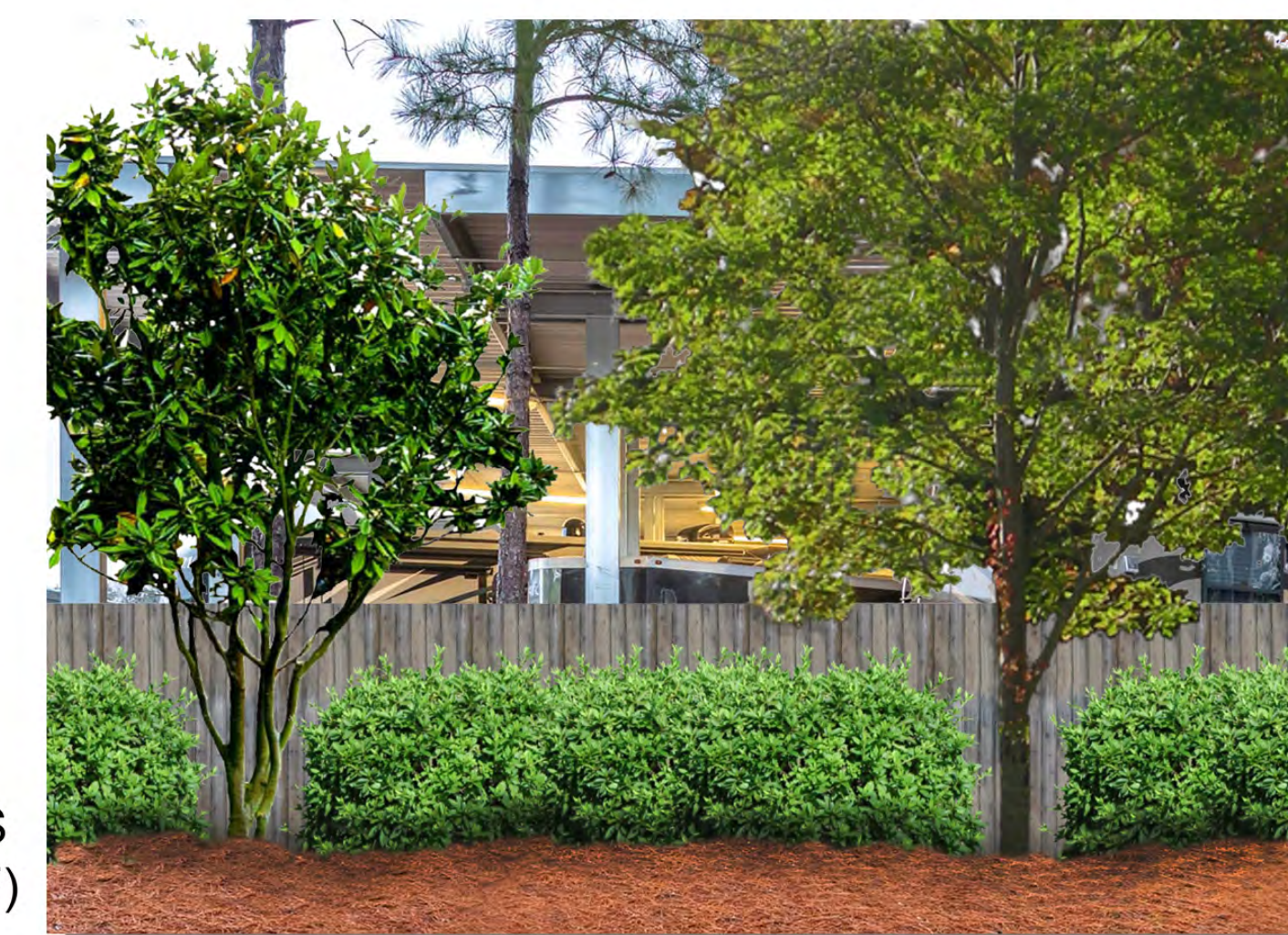


3



6' HIGH
OPAQUE
WOOD
FENCE.

10' WIDE
CLASS 'B'
BUFFER.
(2 SHADE,
2 SMALL
TREES &
12 SHRUBS
PER 100 LF)



TYPICAL SCREENING FACING HIGHWAY 70

**PROPOSED
CLAYTON STORAGE**
CLAYTON, NC

BNK

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CONSULTING ENGINEERS

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RECEIVED

OCT 04 2019

TOWN OF CLAYTON
PLANNING DEPARTMENT

October 3, 2019

Town of Clayton
P.O. Box 879
Clayton, N.C. 27518

Atten: Chris Rolland

Ref: Clayton Storage

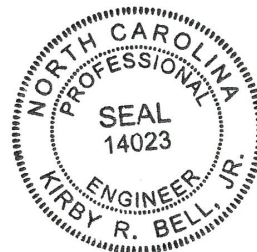
Dear Mr. Rowland:

As Engineers of Record I hereby certify that the layout of Clayton Storage as currently submitted is located outside of the published floodway as shown on panel 1659 prepared by NCFMP (see attached map). I further state that the FFE on forthcoming construction drawings will show site grades 2 feet above effective elevations per panel 1659.

Should you have any questions, please call.

Very truly yours,
Bass, Nixon & Kennedy, Inc.

Kirby R. Bell, Jr., PE, CPESC
Vice-President



Clayton Storage NC

Oct 3, 2019



Legend

- | | | | |
|--|-------------------|--|---|
| | Panels | | Flood Hazard Areas |
| | Political Areas | | AE |
| | Stream Centerline | | Floodway (AE) |
| | Cross Sections | | 0.2 % Chance Annual Flood Hazard |
| | Levee | | Future Conditions 1% Annual Chance Flood Hazard |

North Carolina Floodplain Mapping Program



STORMWATER IMPACT ANALYSIS

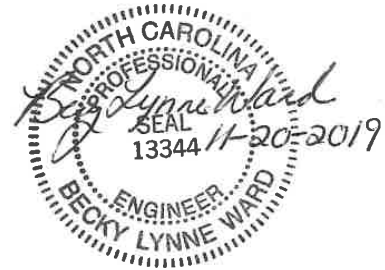
Clayton Storage

Clayton, North Carolina

Submitted on Behalf of Bass, Nixon, & Kennedy
November 20, 2019

Calculations By: Chris Rogers, EI
Checked By: Becky L. Ward, PE

Timmons Group
5410 Trinity Road, Suite 102
Raleigh, North Carolina 27607
NC Firm License: C-1652



TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

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Stormwater Impact Analysis Clayton Storage

1.0 BACKGROUND

The Clayton Storage site is located on east bound Business 70 in Clayton, NC and is adjacent to Little Creek. The address is not listed, but is between 11505 and 11537 US 70 Business, Clayton, NC 27520. Little Creek is a FEMA regulated stream with a regulated floodway and floodplain. The properties are zoned Highway Business (B-3) according to the Town of Clayton GIS zoning map.

The property encompasses two parcels, Lot 2 and Lot 2B. Little Creek forms the property line on the south west side of each parcel. Lot 2 is currently developed with a one-story concrete and metal building and an asphalt parking lot. Lot 2B is a 'flag lot' as characterized by the narrow portion of the lot that extends to Business 70. The narrow section is currently developed with a driveway with connections to adjacent lots. The remaining portion of the lot is currently undeveloped and is primarily wooded with an existing pond. Adjacent land uses include offices and commercial retail to the northwest and south east. On the southwest side of Little creek are residential developments. Lot 2B will be developed to include storage facilities and associated parking. The parking lot will extend and connect to the existing parking lot on Lot 2. According to the NRCS Web Soil Survey application, the site soils are in Hydraulic Soils Groups B and D.

The purpose of this analysis is to quantify the impacts to the peak flow and water surface elevation (WSEL) of Little Creek associated with the development of Lot 2B. A hydrologic study of the watershed catchment for existing conditions and proposed conditions was prepared to evaluate the impact on peak flow associated with the development. A hydraulic study of Little Creek was evaluated to show the water surface elevation impacts of the proposed development

2.0 HYDROLOGIC ANALYSIS

The watershed drainage area above the study includes Little Creek and Little Creek Tributary. The study area was divided into three Points of Interest (POI). POI-1 is located at Amelia Church Road, the most downstream limit of the study area. POI-2 is located near the southern property corner and represents the most downstream point of Little Creek within the site area. POI-3 is located at the confluence of Little Creek and Little Creek Tributary. Little Creek and its Tributary are FEMA regulated with regulated floodplains and floodways. The hydrological analysis evaluated three methods and their resulting discharges.

2.1 Flood Insurance Study (FIS) Report Published Discharge

The published Flood Insurance Study (FIS) Report was obtained from the NCFloodmaps website and is dated January 5, 2007. The FIS Report contains a summary of discharges table that

documents the peak flows used in the flood insurance study. The discharges are shown in Table 1.

Table 1 – FIS Report Summary of Discharges

Location	Drainage Area (sq. mi.)	1% Annual Chance (100-year) (cfs)
Little Creek		
Approximately 140 feet Downstream of NC 42	5.50	2347
Approximately 250 feet Downstream of Amelia Church Road	4.82	2100
Just Upstream of Confluence with Little Creek Tributary	2.67	1391
Little Creek Tributary		
At mouth (confluence with Little Creek)	1.18	960

A request was made on November 4, 2019 to Steve Garrett, CFM with the North Carolina Department of Public Safety (NCDPS) to determine what methods were used to calculate the peak discharge in the model. NCPDS provided a report titled: *Johnston County: Hydraulic and Hydrologic Analyses for Detailed and Limited Detailed Study Streams in Johnston County – 11/01/2010* confirmed that the regression equation (USGS SIR2009-5158) was used to calculate the peak discharges used in the Flood Insurance Study model. The truncated FIS Report is included in Appendix A.

2.2 USGS StreamStats Analysis

A preliminary evaluation was performed using the USGS StreamStats online application. The application was run for Points of Interest (POI-1 and POI-2) and for Little Creek Tributary just upstream of the confluence for the purpose of comparing with the published discharges. The discharges are shown in Table 2. The StreamStats reports are included in Appendix A.

Table 2 – Comparison of USGS StreamStats and Published Discharges

Location	Published FIS Report Discharges (cfs)	Rural StreamStats Discharge (cfs)	Urban StreamStats Discharge (cfs)
POI-1 (Amelia Church Road)	2100	1980	2370
POI-2 (At Property Corner)	2100	1880	2240

2.3 HEC-HMS Analysis – Existing Conditions

The equations used in the effective Flood Insurance Study as well as the USGS StreamStats analysis were based on regression equations with minimal data input. A more detailed analysis was performed using HEC-HMS 4.2.1 to obtain a better discharge estimate. Additionally, this method could be adjusted more specifically to reflect the site existing and proposed conditions.

The NRCS Curve Number Method was used to determine peak discharge. The watershed was divided into five catchments. Catchment C-1 is located downstream of the project site. Catchment C-2 is the area downstream of the confluence to the project site. Catchment C-2A is the project area. Catchment C-3 is the watershed area of Little Creek upstream of the confluence. Catchment C-4 is the watershed of Little Creek Tributary.

The Runoff Curve Numbers were calculated based on the land uses combined with the hydraulic soils group (HSG) for the soils in the watershed area. The land uses were defined using estimated area delineations from aerial photographic maps and Johnston County GIS planimetric data. Three principle land uses were identified in the watershed.

- Open Space (Fair Condition)
- Impervious
- Woods (Some Ground Litter)

The Runoff Curve Numbers for each land use were taken from the NCDEQ Stormwater Control Measure (SCM) Minimum Design Criteria (MDC) manual, Section B “Stormwater Calculations” Table 4.

The Time of Concentration (Tc) and Lag Time (T-Lag) calculations were conducted using the overland flow method. Each catchment was analyzed for the longest flow distance and time to determine the travel time for sheet flow, shallow concentrated flow, and channel flow. Lag Time was calculated using the formula, $T\text{-Lag} = 0.6T_c$.

Based on these input parameters, the catchment data is shown in Table 3.

Table 3 – Catchment Data

Catchment	Area (sq.mi.)	Composite Curve Number	Lag Time (min)
C-1	0.305	68	21
C-2	0.671	72	41
C-2A	0.00579	77	3
C-3	2.685	72	119
C-4	1.153	79	40

The curve number values were then adjusted using the method provided in a paper produced by Hawkins, Jiang, et al *Runoff Curve Number Method: Examination of the Initial Abstraction Ratio*. The findings indicate that an Initial Abstraction Ratio (I_a/S) of 0.05 better fits the data

they obtained. As a result, the curve numbers in this analysis were adjusted as shown in Table 4 below.

Table 4 – Adjusted Curve Numbers

Catchment	Adjusted Curve Number
C-1	56
C-2	61
C-2A	68
C-3	61
C-4	71

The meteorological data was obtained from the NOAA Atlas 14 Precipitation Frequency Data Server using Station ID: 31-1820, Clayton 3W for rainfall depth. The rainfall depth values for the 1-year, 10-year, 25-year, and 100-year storm were input into the model for a 24-hour storm. The time interval was set at 1 minute. The model was run, and the peak discharges are shown in Table 5.

Table 5 – HEC-HMS Peak Discharges – Existing Conditions

Point of Interest	Drainage Area (Ac)	1-year Peak Discharge (cfs)	10-year Peak Discharge (cfs)	25-year Peak Discharge (cfs)	100-year Peak Discharge (cfs)
POI-1	2,889.4	311.8	1309.9	1847.6	2821.7
POI-2	2,694.3	304.8	1248.0	1750.1	2655.4
C-2A	3.7	3.3	11.6	15.1	20.6

2.4 HEC-HMS Analysis – Proposed Conditions

The proposed development of the project site will involve the removal of the pond, clearing of wooded area, and construction of storage facilities and a parking lot. The site changes were adjusted in Catchment C-2A. The post project changes were the result of land use changes in Hydraulic Soils Groups B and D. The existing and proposed land uses for the site area are shown in Table 6.

Table 6 – Project Site Land Use Changes – Catchment C-2A

Land Use	Existing Conditions		Proposed Conditions		Difference (Proposed Minus Existing)	
	HSG B	HSG D	HSG B	HSG D	HSG B	HSG D
Impervious	0.61	0.61	0.70	0.69	0.09	0.08
Open Space	0.03	0.04	0.47	0.47	0.44	0.43
Woods	1.32	1.33	0.69	0.69	-0.63	-0.64
Water	0.14	0.13	0	0	-0.14	-0.13

The post project site changes in land use cause the SCS curve number used in the modeling to increase from 68 to ?? due to the additional planned impervious and open space, reflecting larger runoff potential for the project site. The post project HEC-HMS model was run with the adjusted curve number for catchment C-2A. The resulting post project discharges at the points of interest are shown in Table 7.

Table 7 – HEC-HMS Peak Discharges – Proposed Conditions

Point of Interest	Drainage Area (Ac)	1-year Peak Discharge (cfs)	10-year Peak Discharge (cfs)	25-year Peak Discharge (cfs)	100-year Peak Discharge (cfs)
POI-1	2,889.4	311.9	1310.0	1847.8	2822.0
POI-2	2,694.3	304.9	1248.2	1750.3	2655.6
C-2A	3.7	5.9	15.2	18.9	24.4

2.5 Hydrologic HEC-HMS Analysis Existing and Proposed Condition Comparisons

The project site with an area of 3.7 acres is 0.14% of the watershed area of 2,694.3 acres at POI-2, located at the downstream boundary of the project site. POI-2 is the location in the stream which the effects of the site development effect off site stream discharges and water surface elevations. The HEC-HMS analysis shows that with the proposed development discharges are expected to increase approximately 2.6 cfs in the 1-year event to 3.8 cfs in the 100-year event. It is understood that the Town of Clayton stormwater regulations require detention of the 1-year event and therefore this increased discharge will be mitigated on site. A comparison of the Site Area catchment Peak Discharge Comparison between the pre and post project conditions is shown in Table 8.

The effects of the site discharge increased on the watershed at POI-2 are shown in Table 9. Because the project site compromises only 0.14% of the watershed the resulting increase in discharge at POI-2 is approximately 0.1-0.2 cfs. The results of the analysis show that the on-site peak discharge increases however, the volume of discharge increase for the watershed is very small.

Hydrologic analysis calculations are included in Appendix A.

Table 8 – C-2A (Site Area Only) Peak Discharge Comparison

C-2A (DA=3.7 Ac)	1-year Peak Discharge (cfs)	10-year Peak Discharge (cfs)	25-year Peak Discharge (cfs)	100-year Peak Discharge (cfs)
Existing Conditions	3.3	11.6	15.1	20.6
Proposed Conditions	5.9	15.2	18.9	24.4
Difference (Proposed minus Existing)	2.6	3.6	3.7	3.8
Percent Change (%)	78.8%	31%	24.5%	18.4%

Table 9 – POI-2 (Overall Study Area Watershed) Peak Discharge Comparison

POI-2 (DA=2,694.3 Ac)	1-year Peak Discharge (cfs)	10-year Peak Discharge (cfs)	25-year Peak Discharge (cfs)	100-year Peak Discharge (cfs)
Existing Conditions	304.8	1248.0	1750.1	2655.4
Proposed Conditions	304.9	1248.2	1750.3	2655.6
Difference (Proposed minus Existing)	0.1	0.2	0.2	0.2
Percent Change (%)	0.033%	0.016%	0.011%	0.008%

3.0 HYDRAULIC ANALYSIS

To evaluate the stream water surface elevations the discharges obtained from the HEC-HMS model for the pre and post project conditions for the 100-year events were entered into FlowMaster to model the water surface elevations expected in Little creek for both the existing and post project conditions. This analysis was completed to quantify the effects of the proposed development on expected water surface elevations of Little Creek during the 100-year flood event. Existing conditions peak discharges and post development peak discharges used in this analysis are show in tables 5 and 7 respectively.

FEMA cross sections 48422 and 48719 from the effective HEC-RAS model for Little Creek were evaluated. Cross Section 48422 is located adjacent to POI-1. Cross Section 48719 is located adjacent to POI-2. The cross sections were analyzed using Bentley FlowMaster v8i. The stream slope was modeled as 0.0025 ft/ft to be consistent with HEC-RAS modeling. The water surface elevation for the existing and proposed conditions are shown in Table 10 and 11 respectively.

Table 10 – Existing Conditions Water Surface Elevation

Cross Section	10-year WSEL (ft)	25-year (WSEL) (ft)	100-year WSEL (ft)
48719 (POI-2)	251.49	252.32	253.17
48422 (POI-1)	249.77	250.44	251.42

Table 11 – Proposed Conditions Water Surface Elevation

Cross Section	10-year WSEL (ft)	25-year (WSEL) (ft)	100-year WSEL (ft)
48719 (POI-2)	251.49	252.32	253.17
48422 (POI-1)	249.77	250.44	251.42

The small increase in discharge from the project site was found to have no effect on the water surface elevation at the studied locations as shown in Table 12.

The water surface elevations for the cross sections are included in Appendix B.

Table 12 –Water Surface Elevation Comparison

Cross Section	WSEL Difference 10-year (ft)	WSEL Difference 25-year (ft)	WSEL Difference 100-Year (ft)
48719 (POI-2)	0.00	0.00	0.00
48422 (POI-1)	0.00	0.00	0.00

4.0 CONCLUSIONS

The proposed development will increase off site stormwater discharges to Little Creek. However, since the development is a small portion of the watershed no increased flooding is expected in Little Creek.

APPENDIX A

Hydrology

Hydrology Map

Flood Insurance Study (FIS) Report Summary of Discharges for Little Creek

USGS StreamStats Report – POI-1

USGS StreamStats Report – POI-2

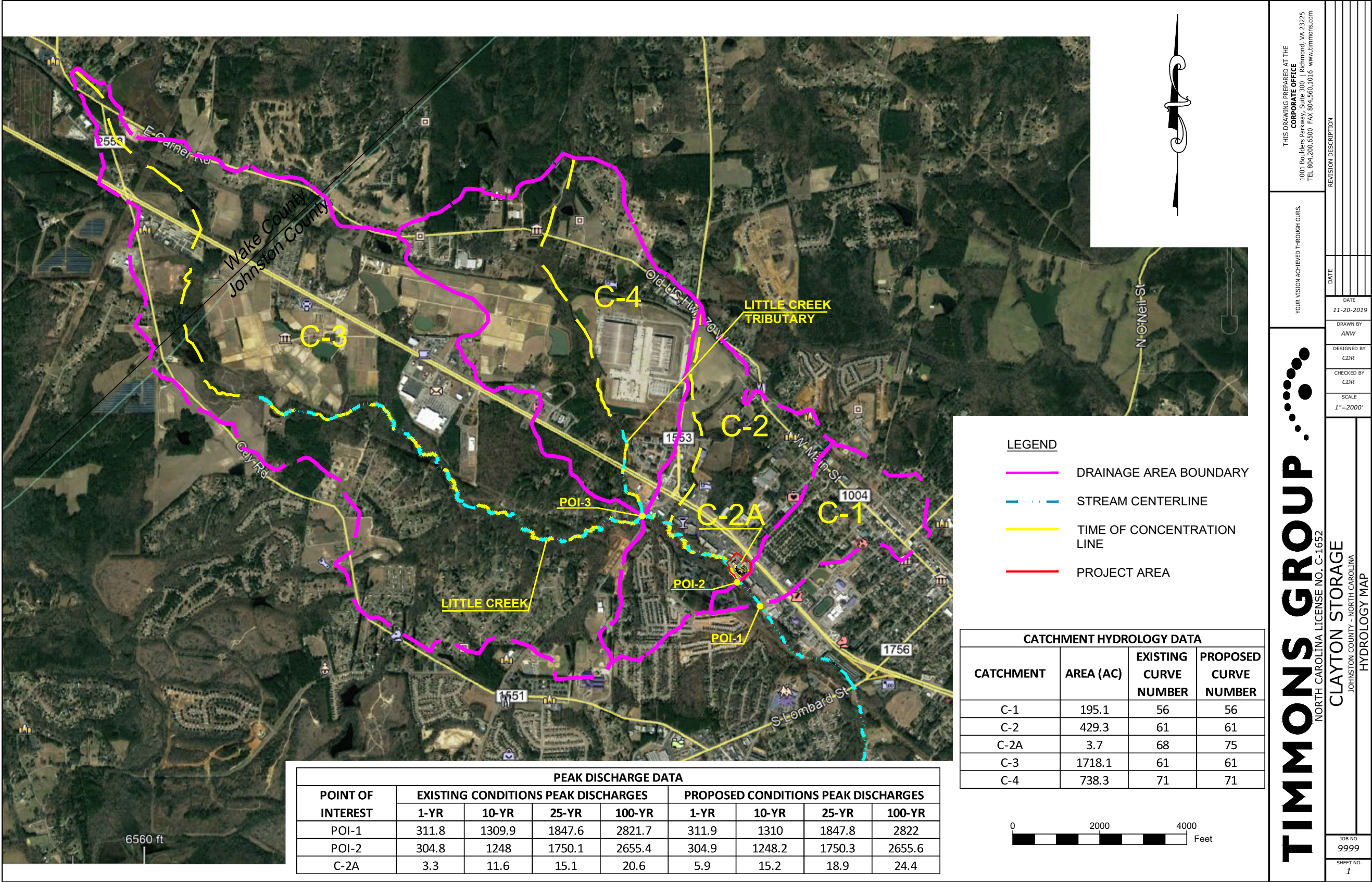
Hydrology – NRCS Curve Numbers

NRCS Curve Number Adjustment

NOAA Atlas 14 PFDS Rainfall Intensity

HEC-HMS Simulation Summary – Existing Conditions (1-yr, 10-yr, 25-yr, and 100-yr)

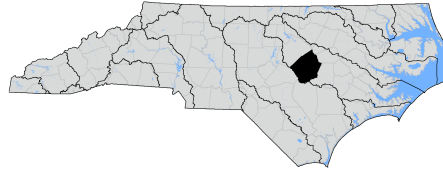
HEC-HMS Simulation Summary – Proposed Conditions (1-yr, 10-yr, 25-yr, and 100-yr)



FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in
**JOHNSTON COUNTY, NORTH
CAROLINA AND
INCORPORATED AREAS**



Community Name	Community Number
JOHNSTON COUNTY	370138
TOWN OF BENSON	370504
TOWN OF CLAYTON	370139
TOWN OF FOUR OAKS	370502
TOWN OF KENLY	370501
TOWN OF MICRO	370500
TOWN OF PINE LEVEL	370505
TOWN OF PRINCETON	370485
TOWN OF SELMA	370499
TOWN OF SMITHFIELD	370140
TOWN OF WILSON'S MILLS	370262



EFFECTIVE: 12/2/2005

REVISED: 1/5/2007

Federal Emergency Management Agency

State of North Carolina

Flood Insurance Study Number

37101CV000

www.fema.gov and www.ncfloodmaps.com



FOREWORD

This countywide Flood Insurance Study (FIS) Report was produced through a unique cooperative partnership between the State of and the Federal Emergency Management Agency (FEMA). The State of has implemented a long-term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the state level. As a part of this effort, the State of has joined with FEMA in a Cooperating Technical State (CTS) agreement to produce and maintain this FIS Report and the accompanying digital Flood Insurance Rate Map (FIRM) for .

NOTICE TO FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

The following is a list of the publication dates of this Countywide FIS Report starting with the initial Report accompanying the Statewide FIRM:

Date	Reason
12/2/2005	Initial Statewide FIS Report Effective Date
6/20/2018	Revised Countywide FIS Report Effective Date

This FIS has been produced as part of the Floodplain Mapping Program. Johnston County, , falls under the administrative jurisdiction of Region IV of the Federal Emergency Management Agency (FEMA). Questions concerning this FIS may be directed to the Floodplain Mapping Program at www.ncfloodmaps.com, the FEMA Map Assistance Center by calling the toll-free information line at 1-877-FEMA MAP (1-877-336-2627), or by contacting the FEMA Regional Office at the following address:

FEMA, Federal Insurance and Mitigation Administration
Koger Center - Rutgers Building
3003 Chamblee Tucker Road
Atlanta, Georgia 30341
(770) 220-5400

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Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)				
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Future Annual Chance	0.2% Annual Chance
Juniper Swamp Tributary 2						
Approximately 0.7 mile upstream of the confluence with Juniper Swamp Tributary 1	0.88	*	*	687	*	*
Approximately 0.4 mile upstream of the confluence with Juniper Swamp Tributary 1	0.75	*	*	623	*	*
Little Bernal Branch						
Approximately 0.4 mile upstream of the confluence with Bernal Branch	1.05	*	*	770	*	*
Approximately 0.2 mile upstream of the confluence with Bernal Branch	0.96	*	*	724	*	*
Little Black Creek						
Approximately 0.4 mile downstream of Jackson King Road	11.83	*	*	1890	*	*
Approximately 0.8 mile upstream of Jackson King Road	11.06	*	*	1820	*	*
Approximately 1.0 mile downstream of Old Stage Road	9.23	*	*	1650	*	*
Approximately 0.7 mile downstream of Old Stage Road	7.42	*	*	1460	*	*
Approximately 0.3 mile downstream of Old Stage Road	7.10	*	*	1420	*	*
At the Johnston/Wake County boundary	6.36	*	*	1330	*	*
Little Buffalo Creek						
Approximately 0.4 mile downstream of Old Route 22	24.33	*	*	5480	*	*
Just upstream of Old Route 22	23.41	*	*	5350	*	*
Just downstream of Glendale Road	22.43	*	*	5200	*	*
Just upstream of Glendale Road	21.46	*	*	5060	*	*
Approximately 0.1 mi upstream of Glendale Road	10.28	*	*	3200	*	*
Just upstream of the confluence with Little Buffalo Creek Tributary	9.97	*	*	3140	*	*
Approximately 0.8 mile upstream of Beulah town Road	8.50	*	*	2840	*	*
Approximately 0.7 mile upstream of Beulah town Road	8.12	*	*	2760	*	*
Approximately 1.1 mile Little Buffalo Creek downstream of Bay Valley Road	7.22	*	*	2560	*	*
Approximately 0.2 mile downstream of Bay Valley Road	6.63	*	*	2430	*	*
Approximately 0.2 mile downstream of Bay Valley Road	4.49	*	*	1900	*	*
Approximately 0.5 mile downstream of Glendale Road	3.81	*	*	1719	*	*
Little Buffalo Creek Tributary						
Just upstream of the confluence with Little Buffalo Creek	10.91	*	*	3320	*	*
Approximately 0.1 mile upstream of Bay Valley Road	10.51	*	*	3240	*	*
Approximately 0.4 mile upstream of North Carolina Highway 222	7.93	*	*	2720	*	*
Little Creek						
Approximately 0.6 mile upstream of Steel Bridge Road	15.93	1965	3140	3651	*	4920
Approximately 1.8 miles downstream of Ranch Road	13.05	1707	2887	3325	*	4599
Approximately 0.7 mile downstream of Ranch Road	9.92	1615	2702	3089	*	4201
Approximately 0.5 mile upstream of Ranch Road	7.12	1396	2338	2667	*	3609
Approximately 0.85 mile downstream of Amelia Church Road	6.37	1361	2269	2582	*	3472
Approximately 140 feet downstream of NC 42	5.50	1222	2059	2347	*	3171
Approximately 250 feet downstream of Amelia Church Road	4.82	1069	1833	2100	*	2868
Just upstream of confluence with Little Creek Tributary	2.67	729	1191	1391	*	1899
Just upstream of the confluence of Little Creek Tributary	2.67	*	*	816	*	*
Approximately 0.6 mile upstream of the confluence of Little Creek Tributary	2.25	*	*	741	*	*
Approximately 0.6 miles upstream of confluence with Little Creek Tributary	2.24	655	1072	1254	*	1716

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)				
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Future Annual Chance	0.2% Annual Chance
Approximately 0.8 mile upstream of the confluence of Little Creek Tributary	1.77	*	*	647	*	*
Approximately 1.2 miles upstream of the confluence of Little Creek Tributary	1.64	*	*	619	*	*
Approximately 1.5 miles upstream of the confluence of Little Creek Tributary	1.13	*	*	502	*	*
Approximately 1.7 miles upstream of the confluence of Little Creek Tributary	0.97	*	*	461	*	*
Approximately 1.9 miles upstream of the confluence of Little Creek Tributary	0.85	*	*	427	*	*
Little Creek (Basin 11, Stream 2)						
Approximately 0.6 mile upstream of the confluence with Moccasin Creek	6.38	*	*	2370	*	*
Approximately 0.3 mile upstream of the confluence with Moccasin Creek	5.86	*	*	2250	*	*
Approximately 0.1 mile upstream of the confluence with Moccasin Creek	5.39	*	*	2140	*	*
Little Creek (Into Middle Creek)						
Approximately 1.1 miles upstream of the confluence with Middle Creek	12.28	*	*	1940	*	*
Approximately 0.1 mile downstream of the Johnston/Wake County boundary	11.52	*	*	1870	*	*
At the Johnston/Wake County boundary	9.88	*	*	1711	*	*
Little Creek (Near Micro)						
Approximately 0.5 mile downstream of Bizzell Grove Church Road	16.53	*	*	4301	*	*
Approximately 0.1 mile upstream of Bizzell Grove Church Road	15.53	*	*	4140	*	*
Approximately 0.5 mile downstream of Rains Crossroads Road	14.82	*	*	4020	*	*
Just below Rains Crossroads Road	13.83	*	*	3850	*	*
At the confluence with Burnt Stocking Branch	9.68	*	*	3080	*	*
Approximately 0.1 mile upstream of the confluence with Burnt Stocking Branch	8.79	*	*	2900	*	*
Approximately 0.6 mile downstream of Lizzie Mill Rd	8.32	*	*	2800	*	*
Approximately 0.2 mile upstream of Lizzie Mill Road	7.37	*	*	2600	*	*
Just downstream of Pittman Road	6.43	*	*	2380	*	*
Approximately 0.6 mile downstream of Browns Dairy Road	5.73	*	*	2219	*	*
Approximately 0.2 mile downstream of Hawkins Road	4.81	*	*	1990	*	*
Approximately 0.2 mile upstream of Hawkins Road	3.92	*	*	1750	*	*
Approximately 0.3 mile upstream of Hawkins Road	3.26	*	*	1559	*	*
Little Creek Tributary						
At mouth	1.18	459	833	960	*	1333
Little Poplar Creek						
At the confluence with Poplar Creek	3.89	403	700	854	*	1216
Approximately 0.8 mile upstream of Swift Creek Rd	3.55	381	664	810	*	1154
Approximately 0.5 mile upstream of Swift Creek Road	3.25	361	629	769	*	1097
Approximately 0.85 mile upstream of Swift Creek Road	2.99	343	599	732	*	1045
Approximately 1.1 miles upstream of Swift Creek Road	2.75	326	570	697	*	996
Approximately 1.7 miles upstream of Swift Creek Rd	2.10	277	485	594	*	852
Approximately 0.25 mile downstream of U.S. Highway 70	1.78	250	441	540	*	775
Little River						
Approximately 1.8 miles downstream of Rains Mill Road	265.44	*	*	14600	*	*
Approximately 1.7 miles upstream of Rains Mill Road	251.08	*	*	14100	*	*
Approximately 0.6 mile downstream of Rains Crossroads Road	229.72	*	*	13800	*	*
Approximately 0.3 mile downstream of Bagley Road	220.23	*	*	12900	*	*
Approximately 0.3 mile downstream of Woodruff Road	190.67	*	*	12900	*	*

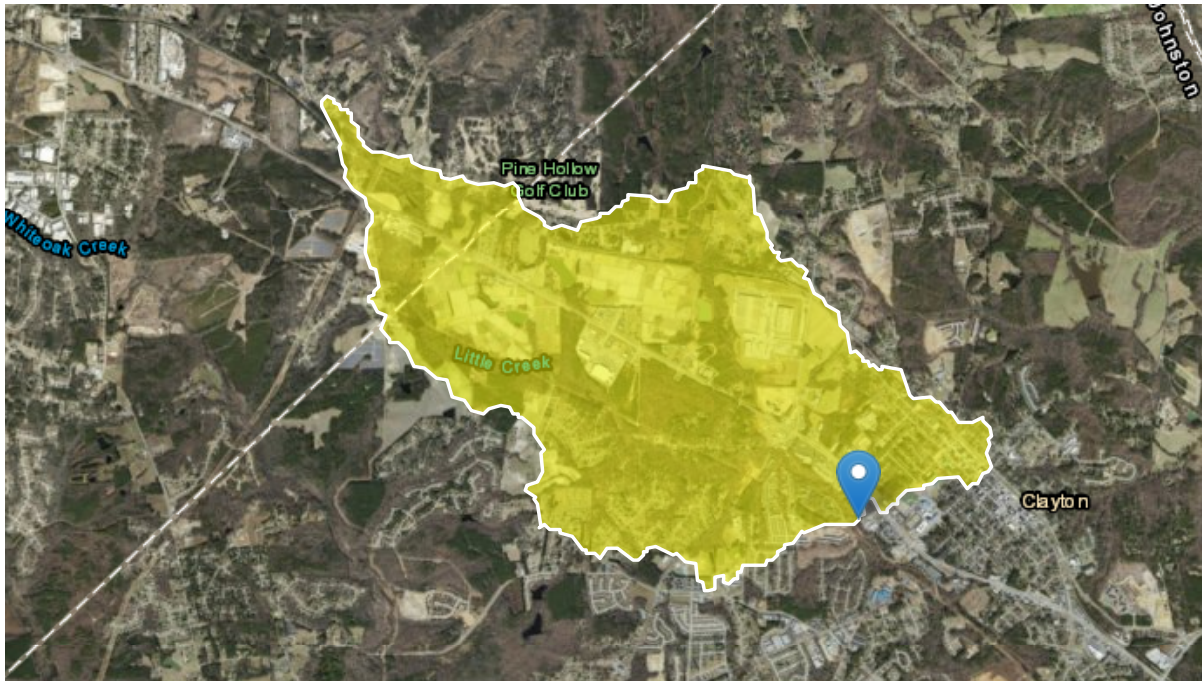
StreamStats Report - Little Creek at Amelia Church Road

Region ID: NC

Workspace ID: NC20191106192215772000

Clicked Point (Latitude, Longitude): 35.64971, -78.47223

Time: 2019-11-06 14:22:33 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4.83	square miles
PCTREG1	Percentage of drainage area located in Region 1	100	percent
PCTREG2	Percentage of drainage area located in Region 2	0	percent
PCTREG3	Percentage of drainage area located in Region 3	0	percent
PCTREG4	Percentage of drainage area located in Region 4	0	percent

Parameter Code	Parameter Description	Value	Unit
PCTREG5	Percentage of drainage area located in Region 5	0	percent
LC06IMP	Percentage of impervious area determined from NLCD 2006 impervious dataset	11.86	percent

Peak-Flow Statistics Parameters^[Peak Southeast US over 1 sqmi 2009 5158]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.83	square miles	1	9000
PCTREG1	Percent Area in Region 1	100	percent	0	100
PCTREG2	Percent Area in Region 2	0	percent	0	100
PCTREG3	Percent Area in Region 3	0	percent	0	100
PCTREG4	Percent Area in Region 4	0	percent	0	100
PCTREG5	Percent Area in Region 5	0	percent	0	100

Peak-Flow Statistics Flow Report^[Peak Southeast US over 1 sqmi 2009 5158]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	Plu	SEp
2 Year Peak Flood	440	ft ³ /s	253	765	34.5
5 Year Peak Flood	792	ft ³ /s	459	1370	34
10 Year Peak Flood	1050	ft ³ /s	600	1850	35.1
25 Year Peak Flood	1390	ft ³ /s	768	2530	37.5
50 Year Peak Flood	1700	ft ³ /s	906	3190	39.6
100 Year Peak Flood	1980	ft ³ /s	1020	3840	41.9
200 Year Peak Flood	2250	ft ³ /s	1120	4530	44.3
500 Year Peak Flood	2680	ft ³ /s	1270	5660	47.7

Peak-Flow Statistics Citations

Weaver, J.C., Feaster, T.D., and Gotvald, A.J., 2009, Magnitude and frequency of rural floods in the Southeastern United States, through 2006—Volume 2, North Carolina: U.S. Geological Survey Scientific Investigations Report 2009–5158, 111 p.
(<http://pubs.usgs.gov/sir/2009/5158/>)

Urban Peak-Flow Statistics Parameters [Region 1 Piedmont Urban over 3 sqmi 2014 5030]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.83	square miles	3	436
LC06IMP	Percent Impervious NLCD2006	11.86	percent	0	47.9

Urban Peak-Flow Statistics Flow Report [Region 1 Piedmont Urban over 3 sqmi 2014 5030]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	Plu	SEp
Urban 2 Year Peak Flood	644	ft ³ /s	335	1240	34.4
Urban 5 Year Peak Flood	1060	ft ³ /s	581	1940	31.4
Urban 10 Year Peak Flood	1360	ft ³ /s	758	2450	30.7
Urban 25 Year Peak Flood	1760	ft ³ /s	962	3230	31.4
Urban 50 Year Peak Flood	2070	ft ³ /s	1110	3860	32.4
Urban 100 Year Peak Flood	2370	ft ³ /s	1230	4580	34.2
Urban 200 Year Peak Flood	2700	ft ³ /s	1350	5380	35.8
Urban 500 Year Peak Flood	3130	ft ³ /s	1500	6550	38.7

Urban Peak-Flow Statistics Citations

Feaster, T.D., Gotvald, A.J., and Weaver, J.C., 2014, Methods for estimating the magnitude and frequency of floods for urban and small, rural streams in Georgia, South Carolina, and North Carolina, 2011 (ver. 1.1, March 2014): U.S. Geological Survey Scientific Investigations Report 2014–5030, 104 p. (<http://pubs.usgs.gov/sir/2014/5030/>)

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Application Version: 4.3.8

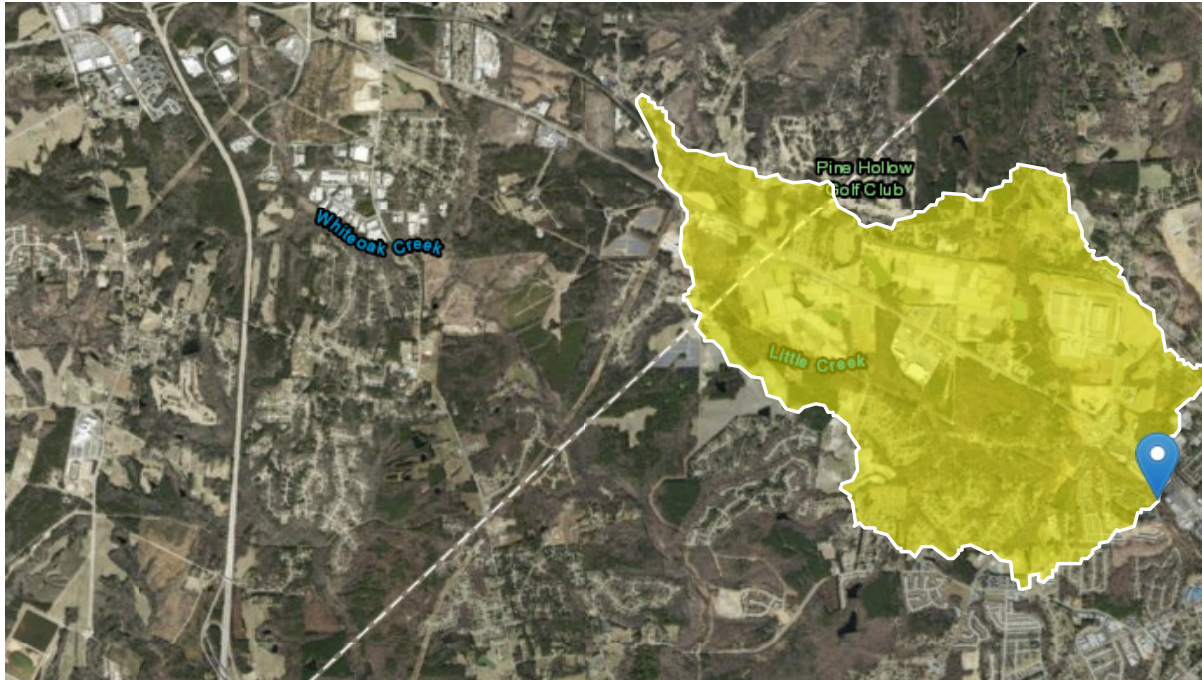
StreamStats Report - Little Creek

Region ID: NC

Workspace ID: NC20191105193038777000

Clicked Point (Latitude, Longitude): 35.65116, -78.47380

Time: 2019-11-05 14:30:56 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4.44	square miles
PCTREG1	Percentage of drainage area located in Region 1	100	percent
PCTREG2	Percentage of drainage area located in Region 2	0	percent
PCTREG3	Percentage of drainage area located in Region 3	0	percent
PCTREG4	Percentage of drainage area located in Region 4	0	percent
PCTREG5	Percentage of drainage area located in Region 5	0	percent

Parameter Code	Parameter Description	Value	Unit
LC06IMP	Percentage of impervious area determined from NLCD 2006 impervious dataset	10.11	percent

Peak-Flow Statistics Parameters^[Peak Southeast US over 1 sqmi 2009 5158]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.44	square miles	1	9000
PCTREG1	Percent Area in Region 1	100	percent	0	100
PCTREG2	Percent Area in Region 2	0	percent	0	100
PCTREG3	Percent Area in Region 3	0	percent	0	100
PCTREG4	Percent Area in Region 4	0	percent	0	100
PCTREG5	Percent Area in Region 5	0	percent	0	100

Peak-Flow Statistics Flow Report^[Peak Southeast US over 1 sqmi 2009 5158]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	Plu	SEp
2 Year Peak Flood	417	ft ³ /s	240	725	34.5
5 Year Peak Flood	751	ft ³ /s	436	1300	34
10 Year Peak Flood	999	ft ³ /s	569	1750	35.1
25 Year Peak Flood	1330	ft ³ /s	729	2410	37.5
50 Year Peak Flood	1620	ft ³ /s	861	3030	39.6
100 Year Peak Flood	1880	ft ³ /s	970	3650	41.9
200 Year Peak Flood	2140	ft ³ /s	1070	4310	44.3
500 Year Peak Flood	2560	ft ³ /s	1210	5390	47.7

Peak-Flow Statistics Citations

Weaver, J.C., Feaster, T.D., and Gotvald, A.J., 2009, Magnitude and frequency of rural floods in the Southeastern United States, through 2006—Volume 2, North Carolina: U.S. Geological Survey Scientific Investigations Report 2009–5158, 111 p. (<http://pubs.usgs.gov/sir/2009/5158/>)

Urban Peak-Flow Statistics Parameters[Region 1 Piedmont Urban over 3 sqmi 2014 5030]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.44	square miles	3	436
LC06IMP	Percent Impervious NLCD2006	10.11	percent	0	47.9

Urban Peak-Flow Statistics Flow Report[Region 1 Piedmont Urban over 3 sqmi 2014 5030]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	Plu	SEp
Urban 2 Year Peak Flood	589	ft ³ /s	307	1130	34.4
Urban 5 Year Peak Flood	983	ft ³ /s	538	1800	31.4
Urban 10 Year Peak Flood	1270	ft ³ /s	706	2290	30.7
Urban 25 Year Peak Flood	1650	ft ³ /s	901	3030	31.4
Urban 50 Year Peak Flood	1940	ft ³ /s	1040	3630	32.4
Urban 100 Year Peak Flood	2240	ft ³ /s	1160	4330	34.2
Urban 200 Year Peak Flood	2560	ft ³ /s	1280	5100	35.8
Urban 500 Year Peak Flood	2980	ft ³ /s	1430	6240	38.7

Urban Peak-Flow Statistics Citations

Feaster, T.D., Gotvald, A.J., and Weaver, J.C., 2014, Methods for estimating the magnitude and frequency of floods for urban and small, rural streams in Georgia, South Carolina, and North Carolina, 2011 (ver. 1.1, March 2014): U.S. Geological Survey Scientific Investigations Report 2014–5030, 104 p. (<http://pubs.usgs.gov/sir/2014/5030/>)

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Application Version: 4.3.8

Time of Concentration.xls

Subbasin C-1

TIME OF CONCENTRATION - SEGMENTAL APPROACH (TR-55)

Project: CLAYTON STORAGE
 Location: CLAYTON, NC
 Date: 11/6/2019
 Prepared By: C. ROGERS EI
 Checked By: B. WARD PE
 Catchment: C-1

I. SHEET FLOW

$$S1: \text{Travel Time (min)} = \frac{0.42 (nL)^{0.8}}{(P_2)^{0.5} S^{0.4}}$$

n = 0.08 Manning's roughness coefficient,
 L = 50 flow length, ft
 $P_2 = 3.49$ 2-year, 24-hour rainfall, in
 s = 4.00% land slope
 segment start elev. = 358.0
 segment end elev. = 356.0

S1 Travel Time = 2.47 min

II. SHALLOW CONCENTRATED FLOW

S2: Travel Time (min) = $\frac{L}{60V}$ V = 0.0203 Vs paved
 V = 0.0161 Vs unpaved
 s = 2.63% segment start elev. = 356.0
 segment is unpaved segment end elev. = 335.0
 L = 800 flow length, ft
 V = 2.61 average velocity, ft/s

S2 Travel Time = 5.10 min

III.a CHANNEL FLOW 1

Travel Time (min) = $\frac{L}{60V}$ V = $\frac{1.49 r^{2/3} \sqrt{s}}{n}$ r = $\frac{a}{P_w}$
 S3: Stream
 bottom width = 2.5 ft, assume trapezoidal channel w/1' flow depth
 side slopes = 2.2 ft, assume full flow
 a = 4.70 cross sectional flow area, ft²
 $P_w = 6.91$ wetted perimeter, ft
 r = 0.68 hydraulic radius, ft
 s = 2.00% segment start elev. = 335.0
 segment end elev. = 320.0
 n = 0.045 Manning's roughness coefficient, natural channel
 L = 750 flow length, ft
 V = 3.62 average velocity, ft/s

S3 Travel Time = 3.45 min

III.b CHANNEL FLOW 2

Travel Time (min) = $\frac{L}{60V}$ V = $\frac{1.49 r^{2/3} \sqrt{s}}{n}$ r = $\frac{a}{P_w}$
 S3: Stream
 bottom width = 3.0 ft, assume trapezoidal channel w/1' flow depth
 side slopes = 2.2 ft, assume full flow

Time of Concentration.xls

Subbasin C-1

a =	5.20	cross sectional flow area, ft ²	
P _w =	6.91	wetted perimeter, ft	
r =	0.75	hydraulic radius, ft	
s =	1.75%		segment start elev. = 320.0
			segment end elev. = 246.0
n =	0.045	Manning's roughness coefficient,	<u>natural channel</u>
L =	4220	flow length, ft	
V =	3.63	average velocity, ft/s	

S3 Travel Time = 19.39 min

III.c CHANNEL FLOW 3

Travel Time (min) =	$\frac{L}{60V}$	$V = \frac{1.49 r^{2/3} \sqrt{s}}{n}$	$r = \frac{a}{P_w}$
---------------------	-----------------	---------------------------------------	---------------------

S3: Stream

bottom width =	3.7	ft, assume trapezoidal channel w/1' flow depth
side slopes =	2.2	ft, assume full flow
a =	5.90	cross sectional flow area, ft ²
P _w =	6.91	wetted perimeter, ft
r =	0.85	hydraulic radius, ft
s =	0.51%	segment start elev. = 246.0
		segment end elev. = 243.0
n =	0.045	Manning's roughness coefficient, <u>natural channel</u>
L =	590	flow length, ft
V =	2.12	average velocity, ft/s

S3 Travel Time = 4.63 min

TOTAL TRAVEL TIME =	35
SCS LAG TIME =	21

Time of Concentration.xls

Subbasin C-2

TIME OF CONCENTRATION - SEGMENTAL APPROACH (TR-55)

Project: CLAYTON STORAGE
 Location: CLAYTON, NC
 Date: 11/6/2019
 Prepared By: C. ROGERS EI
 Checked By: B. WARD PE
 Catchment: C-2

I. SHEET FLOW

S1: Travel Time (min) = $\frac{0.42 (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$

n = 0.08 Manning's roughness coefficient,
 L = 50 flow length, ft
 P₂ = 3.49 2-year, 24-hour rainfall, in
 s = 0.60% land slope segment start elev. = 346.0
 segment end elev. = 345.7

S1 Travel Time = 5.28 min

II. SHALLOW CONCENTRATED FLOW

S2: Travel Time (min) = $\frac{L}{60V}$ V = 0.0203 Vs paved
 V = 0.0161 Vs unpaved

s = 1.47% segment start elev. = 345.7
 segment is unpaved segment end elev. = 306.0
 L = 2700 flow length, ft
 V = 1.96 average velocity, ft/s

S2 Travel Time = 23.00 min

III.a CHANNEL FLOW 1

Travel Time (min) = $\frac{L}{60V}$ V = $\frac{1.49 r^{2/3} \sqrt{s}}{n}$ r = $\frac{a}{P_w}$

S3: Stream

bottom width = 2.5 ft, assume trapezoidal channel w/1' flow depth
 side slopes = 2.2 ft, assume full flow
 a = 4.70 cross sectional flow area, ft²
 P_w = 6.91 wetted perimeter, ft
 r = 0.68 hydraulic radius, ft
 s = 2.00% segment start elev. = 306.0
 segment end elev. = 272.0

n = 0.045 Manning's roughness coefficient, natural channel
 L = 1700 flow length, ft
 V = 3.62 average velocity, ft/s

S3 Travel Time = 7.82 min

III.b CHANNEL FLOW 2

Travel Time (min) = $\frac{L}{60V}$ V = $\frac{1.49 r^{2/3} \sqrt{s}}{n}$ r = $\frac{a}{P_w}$

S3: Stream

bottom width = 3.0 ft, assume trapezoidal channel w/1' flow depth
 side slopes = 2.2 ft, assume full flow

Time of Concentration.xls

Subbasin C-2

a =	5.20	cross sectional flow area, ft ²	
P _w =	6.91	wetted perimeter, ft	
r =	0.75	hydraulic radius, ft	
s =	2.02%		segment start elev. = 272.0
			segment end elev. = 255.0
n =	0.045	Manning's roughness coefficient,	<u>natural channel</u>
L =	840	flow length, ft	
V =	3.90	average velocity, ft/s	

S3 Travel Time = 3.59 min

III.c CHANNEL FLOW 3

Travel Time (min) = $\frac{L}{60V}$ $V = \frac{1.49 r^{2/3} \sqrt{s}}{n}$ $r = \frac{a}{P_w}$

S3: Stream

bottom width =	3.7	ft, assume trapezoidal channel w/1' flow depth
side slopes =	2.2	ft, assume full flow
a =	5.90	cross sectional flow area, ft ²
P _w =	6.91	wetted perimeter, ft
r =	0.85	hydraulic radius, ft
s =	0.36%	segment start elev. = 255.0
		segment end elev. = 244.0
n =	0.045	Manning's roughness coefficient, <u>natural channel</u>
L =	3050	flow length, ft
V =	1.79	average velocity, ft/s

S3 Travel Time = 28.41 min

TOTAL TRAVEL TIME =	68
SCS LAG TIME =	41

Time of Concentration.xls

Subbasin C-3

TIME OF CONCENTRATION - SEGMENTAL APPROACH (TR-55)

Project: CLAYTON STORAGE
 Location: CLAYTON, NC
 Date: 11/6/2019
 Prepared By: C. ROGERS EI
 Checked By: B. WARD PE
 Catchment: C-3

I. SHEET FLOW

$$S1: \text{Travel Time (min)} = \frac{0.42 (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

n = 0.08 Manning's roughness coefficient,
 L = 50 flow length, ft
 $P_2 = 3.49$ 2-year, 24-hour rainfall, in
 s = 4.00% land slope
 segment start elev. = 377.0
 segment end elev. = 375.0

S1 Travel Time = 2.47 min

II. SHALLOW CONCENTRATED FLOW

S2: Travel Time (min) = $\frac{L}{60V}$ V = 0.0203 Vs paved
 V = 0.0161 Vs unpaved
 s = 1.67% segment start elev. = 375.0
 segment is unpaved segment end elev. = 360.0
 L = 900 flow length, ft
 V = 2.08 average velocity, ft/s

S2 Travel Time = 7.20 min

III.a CHANNEL FLOW 1

Travel Time (min) = $\frac{L}{60V}$ V = $\frac{1.49 r^{2/3} \sqrt{s}}{n}$ r = $\frac{a}{P_w}$
 S3: Stream
 bottom width = 2.5 ft, assume trapezoidal channel w/1' flow depth
 side slopes = 2.2 ft, assume full flow
 a = 4.70 cross sectional flow area, ft²
 $P_w = 6.91$ wetted perimeter, ft
 r = 0.68 hydraulic radius, ft
 s = 0.29% segment start elev. = 360.0
 segment end elev. = 357.0
 n = 0.045 Manning's roughness coefficient, natural channel
 L = 1050 flow length, ft
 V = 1.37 average velocity, ft/s

S3 Travel Time = 12.79 min

III.b CHANNEL FLOW 2

Travel Time (min) = $\frac{L}{60V}$ V = $\frac{1.49 r^{2/3} \sqrt{s}}{n}$ r = $\frac{a}{P_w}$
 S3: Stream
 bottom width = 3.0 ft, assume trapezoidal channel w/1' flow depth
 side slopes = 2.2 ft, assume full flow

Time of Concentration.xls

Subbasin C-3

a =	5.20	cross sectional flow area, ft ²	
P _w =	6.91	wetted perimeter, ft	
r =	0.75	hydraulic radius, ft	
s =	0.53%		segment start elev. = 357.0
			segment end elev. = 341.0
n =	0.045	Manning's roughness coefficient,	<u>natural channel</u>
L =	3000	flow length, ft	
V =	2.00	average velocity, ft/s	

S3 Travel Time = 25.00 min

III.c CHANNEL FLOW 3

Travel Time (min) =	$\frac{L}{60V}$	$V = \frac{1.49 r^{2/3} \sqrt{s}}{n}$	$r = \frac{a}{P_w}$
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S3: Stream

bottom width =	3.7	ft, assume trapezoidal channel w/1' flow depth	
side slopes =	2.2	ft, assume full flow	
a =	5.90	cross sectional flow area, ft ²	
P _w =	6.91	wetted perimeter, ft	
r =	0.85	hydraulic radius, ft	
s =	0.46%		segment start elev. = 341.0
			segment end elev. = 256.0
n =	0.045	Manning's roughness coefficient,	<u>natural channel</u>
L =	18300	flow length, ft	
V =	2.03	average velocity, ft/s	

S3 Travel Time = 150.20 min

TOTAL TRAVEL TIME =	198
SCS LAG TIME =	119

Time of Concentration.xls

Subbasin C-4

TIME OF CONCENTRATION - SEGMENTAL APPROACH (TR-55)

Project: CLAYTON STORAGE
 Location: CLAYTON, NC
 Date: 11/6/2019
 Prepared By: C. ROGERS EI
 Checked By: B. WARD PE
 Catchment: C-3

I. SHEET FLOW

$$S1: \text{Travel Time (min)} = \frac{0.42 (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

n = 0.08 Manning's roughness coefficient,
 L = 50 flow length, ft
 $P_2 = 3.49$ 2-year, 24-hour rainfall, in
 s = 2.00% land slope
 segment start elev. = 349.0
 segment end elev. = 348.0

S1 Travel Time = 3.26 min

II. SHALLOW CONCENTRATED FLOW

S2: Travel Time (min) = $\frac{L}{60V}$ V = 0.0203 Vs paved
 V = 0.0161 Vs unpaved
 s = 3.17% segment start elev. = 348.0
 segment is unpaved segment end elev. = 329.0
 L = 600 flow length, ft
 V = 2.87 average velocity, ft/s

S2 Travel Time = 3.48 min

III.a CHANNEL FLOW 1

Travel Time (min) = $\frac{L}{60V}$ V = $\frac{1.49 r^{2/3} \sqrt{s}}{n}$ r = $\frac{a}{P_w}$
 S3: Stream
 bottom width = 2.5 ft, assume trapezoidal channel w/1' flow depth
 side slopes = 2.2 ft, assume full flow
 a = 4.70 cross sectional flow area, ft²
 $P_w = 6.91$ wetted perimeter, ft
 r = 0.68 hydraulic radius, ft
 s = 0.80% segment start elev. = 329.0
 segment end elev. = 309.0
 n = 0.045 Manning's roughness coefficient, natural channel
 L = 2500 flow length, ft
 V = 2.29 average velocity, ft/s

S3 Travel Time = 18.19 min

III.b CHANNEL FLOW 2

Travel Time (min) = $\frac{L}{60V}$ V = $\frac{1.49 r^{2/3} \sqrt{s}}{n}$ r = $\frac{a}{P_w}$
 S3: Stream
 bottom width = 3.0 ft, assume trapezoidal channel w/1' flow depth
 side slopes = 2.2 ft, assume full flow

Time of Concentration.xls

Subbasin C-4

a =	5.20	cross sectional flow area, ft ²	
P _w =	6.91	wetted perimeter, ft	
r =	0.75	hydraulic radius, ft	
s =	0.96%		segment start elev. = 309.0
			segment end elev. = 265.0
n =	0.045	Manning's roughness coefficient,	<u>natural channel</u>
L =	4600	flow length, ft	
V =	2.68	average velocity, ft/s	

S3 Travel Time = 28.62 min

III.c CHANNEL FLOW 3

Travel Time (min) =	$\frac{L}{60V}$	$V = \frac{1.49 r^{2/3} \sqrt{s}}{n}$	$r = \frac{a}{P_w}$
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S3: Stream

bottom width =	3.7	ft, assume trapezoidal channel w/1' flow depth	
side slopes =	2.2	ft, assume full flow	
a =	5.90	cross sectional flow area, ft ²	
P _w =	6.91	wetted perimeter, ft	
r =	0.85	hydraulic radius, ft	
s =	0.48%		segment start elev. = 265.0
			segment end elev. = 257.0
n =	0.045	Manning's roughness coefficient,	<u>natural channel</u>
L =	1650	flow length, ft	
V =	2.07	average velocity, ft/s	

S3 Travel Time = 13.25 min

TOTAL TRAVEL TIME =	67
SCS LAG TIME =	40

HYDROLOGY - NRCS CURVE NUMBER

Project: CLAYTON STORAGE
 Location: CLAYTON, NC
 Date: 11/20/2019
 Prepared by: C. ROGERS EI
 Checked by: B. WARD PE
 Condition: EXISTING
 Catchment: C-1

I. SUBBASIN SOIL CHARACTERISTICS

	AREA	
	ac	%
HSG 'A'	38.50	20%
HSG 'B'	86.20	44%
HSG 'C'	49.40	25%
HSG 'D'	21.00	11%
TOTAL	195.10	ac
	8498556	sq ft
	= 0.304844	sq mi

II. SUBBASIN LAND COVER CONDITIONS

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	AREA (ac)				
	TOTAL	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	0.00	0.00	0.00	0.00	0.00
Open Space - Fair Condition	106.80	21.40	47.80	27.40	10.20
Open Space - Good Condition	0.00	0.00	0.00	0.00	0.00
Impervious - Parking Lots, Roofs, Driveways, etc	13.20	2.10	4.80	2.70	3.60
Impervious - Paved Streets w/ curbs and storm sewers	0.00	0.00	0.00	0.00	0.00
Impervious - Paved Streets w/ open ditches	0.00	0.00	0.00	0.00	0.00
Impervious - Gravel	0.00	0.00	0.00	0.00	0.00
Impervious - Dirt	0.00	0.00	0.00	0.00	0.00
Newly Graded Areas	0.00	0.00	0.00	0.00	0.00
Pasture (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Meadow	0.00	0.00	0.00	0.00	0.00
Brush (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Woods (Little to no ground litter)	0.00	0.00	0.00	0.00	0.00
Woods (Some ground litter)	75.10	15.00	33.60	19.30	7.20
Woods (Thick ground litter)	0.00	0.00	0.00	0.00	0.00
TOTAL	195.10	38.50	86.20	49.40	21.00

III. SCS CURVE NUMBER CALCULATION

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	SCS CN			
	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	68	79	86	89

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Open Space - Fair Condition		49	69	79	84
Open Space - Good Condition		39	61	74	80
Impervious - Parking Lots, Roofs, Driveways, etc		98	98	98	98
Impervious - Paved Streets w/ curbs and storm sewers		98	98	98	98
Impervious - Paved Streets w/ open ditches		83	89	98	98
Impervious - Gravel		76	85	89	91
Impervious - Dirt		72	82	85	88
Newly Graded Areas		77	86	91	94
Pasture (<50% ground cover)		68	79	86	89
Pasture (50 to 75% ground cover)		49	69	79	84
Pasture (>75% ground cover)		39	61	74	80
Meadow		30	58	71	78
Brush (<50% ground cover)		48	67	77	83
Brush (50 to 75% ground cover)		35	56	70	77
Brush (>75% ground cover)		30	48	65	73
Woods (Little to no ground litter)		45	66	77	83
Woods (Some ground litter)		36	60	73	79
Woods (Thick ground litter)		30	55	70	77
		1794	5785	3838	1778
COMPOSITE SCS CN		68			
% Impervious		7%			

HYDROLOGY - NRCS CURVE NUMBER

Project: CLAYTON STORAGE
 Location: CLAYTON, NC
 Date: 11/20/2019
 Prepared by: C. ROGERS EI
 Checked by: B. WARD PE
 Condition: EXISTING
 Catchment: C-2

I. SUBBASIN SOIL CHARACTERISTICS

	AREA	
	ac	%
HSG 'A'	84.70	20%
HSG 'B'	189.50	44%
HSG 'C'	108.80	25%
HSG 'D'	46.30	11%
TOTAL	429.30	ac
	18700308	sq ft
	= 0.670781	sq mi

II. SUBBASIN LAND COVER CONDITIONS

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	AREA (ac)				
	TOTAL	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	0.00	0.00	0.00	0.00	0.00
Open Space - Fair Condition	351.60	70.30	157.30	90.30	33.70
Open Space - Good Condition	0.00	0.00	0.00	0.00	0.00
Impervious - Parking Lots, Roofs, Driveways, etc	52.30	9.30	20.80	12.00	10.20
Impervious - Paved Streets w/ curbs and storm sewers	0.00	0.00	0.00	0.00	0.00
Impervious - Paved Streets w/ open ditches	0.00	0.00	0.00	0.00	0.00
Impervious - Gravel	0.00	0.00	0.00	0.00	0.00
Impervious - Dirt	0.00	0.00	0.00	0.00	0.00
Newly Graded Areas	0.00	0.00	0.00	0.00	0.00
Pasture (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Meadow	0.00	0.00	0.00	0.00	0.00
Brush (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Woods (Little to no ground litter)	0.00	0.00	0.00	0.00	0.00
Woods (Some ground litter)	25.40	5.10	11.40	6.50	2.40
Woods (Thick ground litter)	0.00	0.00	0.00	0.00	0.00
TOTAL	429.30	84.70	189.50	108.80	46.30

III. SCS CURVE NUMBER CALCULATION

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	SCS CN			
	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	68	79	86	89

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Open Space - Fair Condition		49	69	79	84
Open Space - Good Condition		39	61	74	80
Impervious - Parking Lots, Roofs, Driveways, etc		98	98	98	98
Impervious - Paved Streets w/ curbs and storm sewers		98	98	98	98
Impervious - Paved Streets w/ open ditches		83	89	98	98
Impervious - Gravel		76	85	89	91
Impervious - Dirt		72	82	85	88
Newly Graded Areas		77	86	91	94
Pasture (<50% ground cover)		68	79	86	89
Pasture (50 to 75% ground cover)		49	69	79	84
Pasture (>75% ground cover)		39	61	74	80
Meadow		30	58	71	78
Brush (<50% ground cover)		48	67	77	83
Brush (50 to 75% ground cover)		35	56	70	77
Brush (>75% ground cover)		30	48	65	73
Woods (Little to no ground litter)		45	66	77	83
Woods (Some ground litter)		36	60	73	79
Woods (Thick ground litter)		30	55	70	77
		4540	13576	8784	4020
COMPOSITE SCS CN		72			
% Impervious		12%			

HYDROLOGY - NRCS CURVE NUMBER

Project: CLAYTON STORAGE
 Location: CLAYTON, NC
 Date: 11/20/2019
 Prepared by: C. ROGERS EI
 Checked by: B. WARD PE
 Condition: EXISTING
 Catchment: C-2

I. SUBBASIN SOIL CHARACTERISTICS

	AREA	
	ac	%
HSG 'A'	0.00	0%
HSG 'B'	1.85	50%
HSG 'C'	0.00	0%
HSG 'D'	1.86	50%
TOTAL	3.71	ac
	161607.6	sq ft
	= 0.005797	sq mi

II. SUBBASIN LAND COVER CONDITIONS

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	AREA (ac)				
	TOTAL	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	0.00	0.00	0.00	0.00	0.00
Open Space - Fair Condition	0.07	0.00	0.03	0.00	0.04
Open Space - Good Condition	0.00	0.00	0.00	0.00	0.00
Impervious - Parking Lots, Roofs, Driveways, etc	0.99	0.00	0.50	0.00	0.49
Impervious - Paved Streets w/ curbs and storm sewers	0.00	0.00	0.00	0.00	0.00
Impervious - Paved Streets w/ open ditches	0.00	0.00	0.00	0.00	0.00
Impervious - Gravel	0.00	0.00	0.00	0.00	0.00
Impervious - Dirt	0.00	0.00	0.00	0.00	0.00
Newly Graded Areas	0.00	0.00	0.00	0.00	0.00
Pasture (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Meadow	0.00	0.00	0.00	0.00	0.00
Brush (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Woods (Little to no ground litter)	0.00	0.00	0.00	0.00	0.00
Woods (Some ground litter)	2.65	0.00	1.32		1.33
Woods (Thick ground litter)	0.00	0.00	0.00	0.00	0.00
TOTAL	3.71	0.00	1.85	0.00	1.86

III. SCS CURVE NUMBER CALCULATION

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	SCS CN			
	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	68	79	86	89

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Open Space - Fair Condition		49	69	79	84
Open Space - Good Condition		39	61	74	80
Impervious - Parking Lots, Roofs, Driveways, etc		98	98	98	98
Impervious - Paved Streets w/ curbs and storm sewers		98	98	98	98
Impervious - Paved Streets w/ open ditches		83	89	98	98
Impervious - Gravel		76	85	89	91
Impervious - Dirt		72	82	85	88
Newly Graded Areas		77	86	91	94
Pasture (<50% ground cover)		68	79	86	89
Pasture (50 to 75% ground cover)		49	69	79	84
Pasture (>75% ground cover)		39	61	74	80
Meadow		30	58	71	78
Brush (<50% ground cover)		48	67	77	83
Brush (50 to 75% ground cover)		35	56	70	77
Brush (>75% ground cover)		30	48	65	73
Woods (Little to no ground litter)		45	66	77	83
Woods (Some ground litter)		36	60	73	79
Woods (Thick ground litter)		30	55	70	77
		0	130	0	156
COMPOSITE SCS CN		77			
% Impervious		27%			

HYDROLOGY - NRCS CURVE NUMBER

Project: CLAYTON STORAGE
 Location: CLAYTON, NC
 Date: 11/20/2019
 Prepared by: C. ROGERS EI
 Checked by: B. WARD PE
 Condition: PROPOSED
 Catchment: C-2

I. SUBBASIN SOIL CHARACTERISTICS

	AREA	
	ac	%
HSG 'A'	0.00	0%
HSG 'B'	1.86	50%
HSG 'C'	0.00	0%
HSG 'D'	1.85	50%
TOTAL	3.71	ac
	161607.6	sq ft
	= 0.005797	sq mi

II. SUBBASIN LAND COVER CONDITIONS

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	AREA (ac)				
	TOTAL	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	0.00	0.00	0.00	0.00	0.00
Open Space - Fair Condition	0.93	0.00	0.46	0.00	0.47
Open Space - Good Condition	0.00	0.00	0.00	0.00	0.00
Impervious - Parking Lots, Roofs, Driveways, etc	1.39	0.00	0.70	0.00	0.69
Impervious - Paved Streets w/ curbs and storm sewers	0.00	0.00	0.00	0.00	0.00
Impervious - Paved Streets w/ open ditches	0.00	0.00	0.00	0.00	0.00
Impervious - Gravel	0.00	0.00	0.00	0.00	0.00
Impervious - Dirt	0.00	0.00	0.00	0.00	0.00
Newly Graded Areas	0.00	0.00	0.00	0.00	0.00
Pasture (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Meadow	0.00	0.00	0.00	0.00	0.00
Brush (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Woods (Little to no ground litter)	0.00	0.00	0.00	0.00	0.00
Woods (Some ground litter)	1.39	0.00	0.70	0.00	0.69
Woods (Thick ground litter)	0.00	0.00	0.00	0.00	0.00
TOTAL	3.71	0.00	1.86	0.00	1.85

III. SCS CURVE NUMBER CALCULATION

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	SCS CN			
	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	68	79	86	89

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Open Space - Fair Condition		49	69	79	84
Open Space - Good Condition		39	61	74	80
Impervious - Parking Lots, Roofs, Driveways, etc		98	98	98	98
Impervious - Paved Streets w/ curbs and storm sewers		98	98	98	98
Impervious - Paved Streets w/ open ditches		83	89	98	98
Impervious - Gravel		76	85	89	91
Impervious - Dirt		72	82	85	88
Newly Graded Areas		77	86	91	94
Pasture (<50% ground cover)		68	79	86	89
Pasture (50 to 75% ground cover)		49	69	79	84
Pasture (>75% ground cover)		39	61	74	80
Meadow		30	58	71	78
Brush (<50% ground cover)		48	67	77	83
Brush (50 to 75% ground cover)		35	56	70	77
Brush (>75% ground cover)		30	48	65	73
Woods (Little to no ground litter)		45	66	77	83
Woods (Some ground litter)		36	60	73	79
Woods (Thick ground litter)		30	55	70	77
		0	142	0	162
COMPOSITE SCS CN		82			
% Impervious		37%			

HYDROLOGY - NRCS CURVE NUMBER

Project: CLAYTON STORAGE
 Location: CLAYTON, NC
 Date: 11/20/2019
 Prepared by: C. ROGERS EI
 Checked by: B. WARD PE
 Condition: EXISTING
 Catchment: C-3

I. SUBBASIN SOIL CHARACTERISTICS

	AREA	
	ac	%
HSG 'A'	338.80	20%
HSG 'B'	758.30	44%
HSG 'C'	435.30	25%
HSG 'D'	185.70	11%
TOTAL	1718.10	ac
	74840436	sq ft
	= 2.684531	sq mi

II. SUBBASIN LAND COVER CONDITIONS

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	AREA (ac)				
	TOTAL	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	0.00	0.00	0.00	0.00	0.00
Open Space - Fair Condition	779.50	155.80	348.80	200.20	74.70
Open Space - Good Condition	0.00	0.00	0.00	0.00	0.00
Impervious - Parking Lots, Roofs, Driveways, etc	0.00	0.00	0.00	0.00	0.00
Impervious - Paved Streets w/ curbs and storm sewers	362.40	67.80	151.70	87.10	55.80
Impervious - Paved Streets w/ open ditches	0.00	0.00	0.00	0.00	0.00
Impervious - Gravel	0.00	0.00	0.00	0.00	0.00
Impervious - Dirt	0.00	0.00	0.00	0.00	0.00
Newly Graded Areas	0.00	0.00	0.00	0.00	0.00
Pasture (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Meadow	0.00	0.00	0.00	0.00	0.00
Brush (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Woods (Little to no ground litter)	0.00	0.00	0.00	0.00	0.00
Woods (Some ground litter)	576.20	115.20	257.80	148.00	55.20
Woods (Thick ground litter)	0.00	0.00	0.00	0.00	0.00
TOTAL	1718.10	338.80	758.30	435.30	185.70

III. SCS CURVE NUMBER CALCULATION

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	SCS CN			
	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	68	79	86	89

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Open Space - Fair Condition		49	69	79	84
Open Space - Good Condition		39	61	74	80
Impervious - Parking Lots, Roofs, Driveways, etc		98	98	98	98
Impervious - Paved Streets w/ curbs and storm sewers		98	98	98	98
Impervious - Paved Streets w/ open ditches		83	89	98	98
Impervious - Gravel		76	85	89	91
Impervious - Dirt		72	82	85	88
Newly Graded Areas		77	86	91	94
Pasture (<50% ground cover)		68	79	86	89
Pasture (50 to 75% ground cover)		49	69	79	84
Pasture (>75% ground cover)		39	61	74	80
Meadow		30	58	71	78
Brush (<50% ground cover)		48	67	77	83
Brush (50 to 75% ground cover)		35	56	70	77
Brush (>75% ground cover)		30	48	65	73
Woods (Little to no ground litter)		45	66	77	83
Woods (Some ground litter)		36	60	73	79
Woods (Thick ground litter)		30	55	70	77
		18426	54402	35156	16104
COMPOSITE SCS CN		72			
% Impervious		21%			

HYDROLOGY - NRCS CURVE NUMBER

Project: CLAYTON STORAGE
 Location: CLAYTON, NC
 Date: 11/20/2019
 Prepared by: C. ROGERS EI
 Checked by: B. WARD PE
 Condition: EXISTING
 Catchment: C-4

I. SUBBASIN SOIL CHARACTERISTICS

	AREA	
	ac	%
HSG 'A'	145.60	20%
HSG 'B'	325.90	44%
HSG 'C'	187.10	25%
HSG 'D'	79.70	11%
TOTAL	738.30	ac
	32160348	sq ft
	= 1.153594	sq mi

II. SUBBASIN LAND COVER CONDITIONS

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	AREA (ac)				
	TOTAL	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	0.00	0.00	0.00	0.00	0.00
Open Space - Fair Condition	473.30	94.60	211.80	121.60	45.30
Open Space - Good Condition	0.00	0.00	0.00	0.00	0.00
Impervious - Parking Lots, Roofs, Driveways, etc	257.60	49.50	110.80	63.60	33.70
Impervious - Paved Streets w/ curbs and storm sewers	0.00	0.00	0.00	0.00	0.00
Impervious - Paved Streets w/ open ditches	0.00	0.00	0.00	0.00	0.00
Impervious - Gravel	0.00	0.00	0.00	0.00	0.00
Impervious - Dirt	0.00	0.00	0.00	0.00	0.00
Newly Graded Areas	0.00	0.00	0.00	0.00	0.00
Pasture (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Pasture (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Meadow	0.00	0.00	0.00	0.00	0.00
Brush (<50% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (50 to 75% ground cover)	0.00	0.00	0.00	0.00	0.00
Brush (>75% ground cover)	0.00	0.00	0.00	0.00	0.00
Woods (Little to no ground litter)	0.00	0.00	0.00	0.00	0.00
Woods (Some ground litter)	7.40	1.50	3.30	1.90	0.70
Woods (Thick ground litter)	0.00	0.00	0.00	0.00	0.00
TOTAL	738.30	145.60	325.90	187.10	79.70

III. SCS CURVE NUMBER CALCULATION

COVER DESCRIPTION (FROM TOWN OF HOLLY SPRINGS FUTURE LAND USE PLAN)	SCS CN			
	HSG 'A'	HSG 'B'	HSG 'C'	HSG 'D'
Open Space - Poor Condition	68	79	86	89

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Open Space - Fair Condition		49	69	79	84
Open Space - Good Condition		39	61	74	80
Impervious - Parking Lots, Roofs, Driveways, etc		98	98	98	98
Impervious - Paved Streets w/ curbs and storm sewers		98	98	98	98
Impervious - Paved Streets w/ open ditches		83	89	98	98
Impervious - Gravel		76	85	89	91
Impervious - Dirt		72	82	85	88
Newly Graded Areas		77	86	91	94
Pasture (<50% ground cover)		68	79	86	89
Pasture (50 to 75% ground cover)		49	69	79	84
Pasture (>75% ground cover)		39	61	74	80
Meadow		30	58	71	78
Brush (<50% ground cover)		48	67	77	83
Brush (50 to 75% ground cover)		35	56	70	77
Brush (>75% ground cover)		30	48	65	73
Woods (Little to no ground litter)		45	66	77	83
Woods (Some ground litter)		36	60	73	79
Woods (Thick ground litter)		30	55	70	77
		9540	25671	15978	7163
COMPOSITE SCS CN		79			
% Impervious		35%			

HYDROLOGY - NRCS CURVE NUMBER ADJUSTMENT

Assumption: The ratio of 0.2 for Ia/S overpredicts runoff. Ia/S=0.05 is more appropriate. See Hawkins et al.

	C-1	C-2	C-2A ex	C-2A post	C-3	C-4
Starting CN	68	72	77	82	72	79
S(0.2)	4.706	3.889	2.987	2.195	3.889	2.658
Ia(0.2)	0.941	0.778	0.597	0.439	0.778	0.532
S(0.05)	7.896	6.341	4.681	3.285	6.341	4.094
Ia(0.05)	0.395	0.317	0.234	0.164	0.317	0.205
Final CN	56	61	68	75	61	71

NOAA Atlas 14, Volume 2, Version 3 CLAYTON 3 W
Station ID: 31-1820

Location name: Clayton, North Carolina, USA*
Latitude: 35.6408°, Longitude: -78.4633°

Elevation:
Elevation (station metadata): 300 ft**

* source: ESRI Maps

** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aerals](#)
PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.412 (0.377-0.452)	0.480 (0.440-0.525)	0.548 (0.502-0.599)	0.615 (0.562-0.672)	0.684 (0.622-0.746)	0.739 (0.669-0.806)	0.788 (0.709-0.858)	0.832 (0.745-0.907)	0.882 (0.784-0.963)	0.927 (0.817-1.01)
10-min	0.658 (0.603-0.722)	0.767 (0.703-0.840)	0.878 (0.804-0.960)	0.984 (0.899-1.08)	1.09 (0.991-1.19)	1.18 (1.07-1.28)	1.25 (1.13-1.36)	1.32 (1.18-1.44)	1.40 (1.24-1.52)	1.46 (1.29-1.60)
15-min	0.823 (0.753-0.902)	0.965 (0.884-1.06)	1.11 (1.02-1.21)	1.25 (1.14-1.36)	1.38 (1.26-1.51)	1.49 (1.35-1.62)	1.58 (1.42-1.72)	1.66 (1.49-1.82)	1.76 (1.56-1.92)	1.83 (1.61-2.00)
30-min	1.13 (1.03-1.24)	1.33 (1.22-1.46)	1.58 (1.45-1.73)	1.80 (1.65-1.97)	2.05 (1.86-2.23)	2.24 (2.03-2.45)	2.42 (2.18-2.64)	2.59 (2.32-2.83)	2.79 (2.48-3.05)	2.97 (2.61-3.24)
60-min	1.41 (1.29-1.54)	1.67 (1.53-1.83)	2.02 (1.85-2.21)	2.35 (2.15-2.57)	2.72 (2.48-2.97)	3.04 (2.75-3.32)	3.34 (3.01-3.64)	3.63 (3.25-3.96)	4.01 (3.56-4.38)	4.33 (3.82-4.74)
2-hr	1.65 (1.50-1.83)	1.97 (1.79-2.17)	2.42 (2.19-2.66)	2.84 (2.57-3.13)	3.35 (3.02-3.68)	3.80 (3.40-4.17)	4.23 (3.77-4.64)	4.68 (4.14-5.14)	5.27 (4.62-5.79)	5.80 (5.04-6.38)
3-hr	1.75 (1.59-1.94)	2.09 (1.90-2.31)	2.57 (2.34-2.84)	3.04 (2.76-3.36)	3.63 (3.27-4.00)	4.15 (3.72-4.57)	4.67 (4.15-5.14)	5.23 (4.61-5.75)	5.98 (5.21-6.58)	6.66 (5.74-7.34)
6-hr	2.09 (1.92-2.31)	2.50 (2.29-2.76)	3.08 (2.81-3.39)	3.65 (3.32-4.01)	4.37 (3.95-4.79)	5.02 (4.50-5.50)	5.67 (5.05-6.21)	6.37 (5.61-6.96)	7.33 (6.37-8.00)	8.20 (7.04-8.98)
12-hr	2.47 (2.25-2.72)	2.94 (2.69-3.24)	3.64 (3.32-4.01)	4.34 (3.94-4.77)	5.23 (4.71-5.73)	6.04 (5.40-6.60)	6.87 (6.09-7.51)	7.77 (6.81-8.48)	9.03 (7.78-9.85)	10.2 (8.65-11.1)
24-hr	2.89 (2.63-3.18)	3.50 (3.19-3.86)	4.46 (4.06-4.92)	5.24 (4.76-5.77)	6.32 (5.71-6.95)	7.19 (6.48-7.92)	8.11 (7.27-8.92)	9.08 (8.11-9.99)	10.4 (9.26-11.5)	11.6 (10.2-12.8)
2-day	3.35 (3.06-3.67)	4.04 (3.70-4.44)	5.11 (4.66-5.61)	5.97 (5.44-6.56)	7.16 (6.50-7.86)	8.12 (7.34-8.92)	9.13 (8.22-10.0)	10.2 (9.12-11.2)	11.7 (10.4-12.9)	12.9 (11.4-14.3)
3-day	3.55 (3.26-3.87)	4.28 (3.93-4.67)	5.38 (4.93-5.87)	6.26 (5.73-6.83)	7.48 (6.82-8.16)	8.46 (7.69-9.24)	9.49 (8.58-10.4)	10.6 (9.50-11.6)	12.1 (10.8-13.2)	13.3 (11.8-14.6)
4-day	3.76 (3.47-4.08)	4.52 (4.17-4.91)	5.65 (5.21-6.13)	6.55 (6.02-7.10)	7.80 (7.14-8.46)	8.81 (8.03-9.56)	9.85 (8.94-10.7)	10.9 (9.88-11.9)	12.5 (11.2-13.6)	13.7 (12.2-15.0)
7-day	4.36 (4.04-4.70)	5.23 (4.84-5.64)	6.46 (5.97-6.97)	7.43 (6.85-8.01)	8.77 (8.07-9.47)	9.85 (9.02-10.6)	11.0 (10.00-11.8)	12.1 (11.0-13.1)	13.7 (12.4-14.9)	15.0 (13.4-16.3)
10-day	4.99 (4.64-5.35)	5.95 (5.54-6.38)	7.24 (6.73-7.77)	8.24 (7.65-8.83)	9.60 (8.89-10.3)	10.7 (9.86-11.5)	11.8 (10.8-12.6)	12.9 (11.8-13.9)	14.4 (13.1-15.5)	15.6 (14.2-16.9)
20-day	6.68 (6.25-7.16)	7.92 (7.41-8.49)	9.49 (8.86-10.2)	10.7 (9.98-11.5)	12.4 (11.5-13.2)	13.7 (12.7-14.6)	15.0 (13.8-16.0)	16.3 (15.0-17.5)	18.1 (16.6-19.5)	19.5 (17.8-21.0)
30-day	8.32 (7.78-8.90)	9.82 (9.19-10.5)	11.5 (10.8-12.4)	12.9 (12.0-13.8)	14.6 (13.6-15.7)	16.0 (14.8-17.1)	17.3 (16.1-18.5)	18.7 (17.3-20.0)	20.5 (18.9-22.0)	21.9 (20.0-23.5)
45-day	10.6 (9.98-11.2)	12.4 (11.7-13.2)	14.4 (13.6-15.3)	15.9 (14.9-16.9)	17.8 (16.7-19.0)	19.3 (18.1-20.5)	20.8 (19.4-22.1)	22.2 (20.7-23.6)	24.1 (22.4-25.7)	25.5 (23.7-27.3)
60-day	12.7 (12.0-13.4)	14.9 (14.0-15.7)	17.1 (16.0-18.1)	18.7 (17.6-19.8)	20.8 (19.5-22.1)	22.4 (21.0-23.8)	24.0 (22.4-25.5)	25.5 (23.8-27.1)	27.5 (25.6-29.3)	29.0 (26.9-30.9)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)**PF graphical**

Project: Clayton Storage Simulation Run: 1-Year Ex

Start of Run: 01Jan2020, 00:00 Basin Model: Existing Conditions
End of Run: 02Jan2020, 00:00 Meteorologic Model: 1-Year
Compute Time: 12Nov2019, 14:17:55 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
C-1	0.30500	12.9	01Jan2020, 12:39	0.19
C-2	0.67100	48.1	01Jan2020, 12:58	0.31
C-2A	0.00579	3.3	01Jan2020, 12:05	0.57
C-3	2.68500	90.1	01Jan2020, 14:37	0.29
C-4	1.15300	247.2	01Jan2020, 12:49	0.68
POI-1	4.81979	311.8	01Jan2020, 13:06	0.38
POI-2	4.51479	304.8	01Jan2020, 13:04	0.39
POI-3	3.83800	262.6	01Jan2020, 12:51	0.41
R-1	4.51479	303.6	01Jan2020, 13:06	0.39
R-2	3.83800	257.8	01Jan2020, 13:05	0.40

Project: Clayton Storage Simulation Run: 10-Year Ex

Start of Run: 01Jan2020, 00:00 Basin Model: Existing Conditions
End of Run: 02Jan2020, 00:00 Meteorologic Model: 10-Year
Compute Time: 12Nov2019, 14:18:18 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
C-1	0.30500	144.4	01Jan2020, 12:28	1.15
C-2	0.67100	297.9	01Jan2020, 12:50	1.48
C-2A	0.00579	11.6	01Jan2020, 12:05	2.05
C-3	2.68500	534.3	01Jan2020, 14:19	1.40
C-4	1.15300	850.1	01Jan2020, 12:46	2.25
POI-1	4.81979	1309.9	01Jan2020, 12:58	1.58
POI-2	4.51479	1248.0	01Jan2020, 12:58	1.62
POI-3	3.83800	975.4	01Jan2020, 12:51	1.66
R-1	4.51479	1244.6	01Jan2020, 13:00	1.61
R-2	3.83800	964.2	01Jan2020, 13:01	1.64

Project: Clayton Storage Simulation Run: 25-Year Ex

Start of Run: 01Jan2020, 00:00 Basin Model: Existing Conditions
End of Run: 02Jan2020, 00:00 Meteorologic Model: 25-Year
Compute Time: 12Nov2019, 14:18:24 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
C-1	0.30500	225.1	01Jan2020, 12:27	1.77
C-2	0.67100	437.8	01Jan2020, 12:49	2.17
C-2A	0.00579	15.1	01Jan2020, 12:04	2.87
C-3	2.68500	805.7	01Jan2020, 14:17	2.06
C-4	1.15300	1132.0	01Jan2020, 12:45	3.10
POI-1	4.81979	1847.6	01Jan2020, 12:57	2.29
POI-2	4.51479	1750.1	01Jan2020, 12:57	2.33
POI-3	3.83800	1348.5	01Jan2020, 12:51	2.38
R-1	4.51479	1745.9	01Jan2020, 12:59	2.33
R-2	3.83800	1335.6	01Jan2020, 13:01	2.36

Project: Clayton Storage Simulation Run: 100-year Ex

Start of Run: 01Jan2020, 00:00 Basin Model: Existing Cor
End of Run: 02Jan2020, 00:00 Meteorologic Model: 100-Year
Compute Time: DATA CHANGED, RECOMPUTE Control Specifications:Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
C-1	0.30500	367.8	01Jan2020, 12:26	2.94
C-2	0.67100	685.3	01Jan2020, 12:48	3.47
C-2A	0.00579	20.6	01Jan2020, 12:04	4.32
C-3	2.68500	1313.4	01Jan2020, 14:16	3.33
C-4	1.15300	1607.5	01Jan2020, 12:45	4.60
POI-1	4.81979	2821.7	01Jan2020, 12:56	3.60
POI-2	4.51479	2655.4	01Jan2020, 12:57	3.65
POI-3	3.83800	2025.2	01Jan2020, 12:53	3.71
R-1	4.51479	2650.5	01Jan2020, 12:58	3.65
R-2	3.83800	2010.3	01Jan2020, 13:01	3.69

Project: Clayton Storage Simulation Run: 1-Year Post

Start of Run: 01Jan2020, 00:00 Basin Model: Proposed Condition
End of Run: 02Jan2020, 00:00 Meteorologic Model: 1-Year
Compute Time: 12Nov2019, 14:18:02 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
C-1	0.30500	12.9	01Jan2020, 12:39	0.19
C-2	0.67100	48.1	01Jan2020, 12:58	0.31
C-2A	0.00579	5.9	01Jan2020, 12:05	0.89
C-3	2.68500	90.1	01Jan2020, 14:37	0.29
C-4	1.15300	247.2	01Jan2020, 12:49	0.68
POI-1	4.81979	311.9	01Jan2020, 13:06	0.38
POI-2	4.51479	304.9	01Jan2020, 13:04	0.39
POI-3	3.83800	262.6	01Jan2020, 12:51	0.41
R-1	4.51479	303.7	01Jan2020, 13:06	0.39
R-2	3.83800	257.8	01Jan2020, 13:05	0.40

Project: Clayton Storage Simulation Run: 10-year Post

Start of Run: 01Jan2020, 00:00 Basin Model: Proposed Condition
End of Run: 02Jan2020, 00:00 Meteorologic Model: 10-Year
Compute Time: 12Nov2019, 15:13:55 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
C-1	0.30500	144.4	01Jan2020, 12:28	1.15
C-2	0.67100	297.9	01Jan2020, 12:50	1.48
C-2A	0.00579	15.2	01Jan2020, 12:04	2.64
C-3	2.68500	534.3	01Jan2020, 14:19	1.40
C-4	1.15300	850.1	01Jan2020, 12:46	2.25
POI-1	4.81979	1310.0	01Jan2020, 12:58	1.58
POI-2	4.51479	1248.2	01Jan2020, 12:58	1.62
POI-3	3.83800	975.4	01Jan2020, 12:51	1.66
R-1	4.51479	1244.8	01Jan2020, 13:00	1.61
R-2	3.83800	964.2	01Jan2020, 13:01	1.64

Project: Clayton Storage Simulation Run: 25-Year Post

Start of Run: 01Jan2020, 00:00 Basin Model: Proposed Condition
End of Run: 02Jan2020, 00:00 Meteorologic Model: 25-Year
Compute Time: 12Nov2019, 15:11:53 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
C-1	0.30500	225.1	01Jan2020, 12:27	1.77
C-2	0.67100	437.8	01Jan2020, 12:49	2.17
C-2A	0.00579	18.9	01Jan2020, 12:04	3.55
C-3	2.68500	805.7	01Jan2020, 14:17	2.06
C-4	1.15300	1132.0	01Jan2020, 12:45	3.10
POI-1	4.81979	1847.8	01Jan2020, 12:57	2.29
POI-2	4.51479	1750.3	01Jan2020, 12:57	2.33
POI-3	3.83800	1348.5	01Jan2020, 12:51	2.38
R-1	4.51479	1746.1	01Jan2020, 12:59	2.33
R-2	3.83800	1335.6	01Jan2020, 13:01	2.36

Project: Clayton Storage Simulation Run: 100-year Post

Start of Run: 01Jan2020, 00:00 Basin Model: Proposed Condition
End of Run: 02Jan2020, 00:00 Meteorologic Model: 100-Year
Compute Time: 12Nov2019, 15:11:34 Control Specifications: Control 1

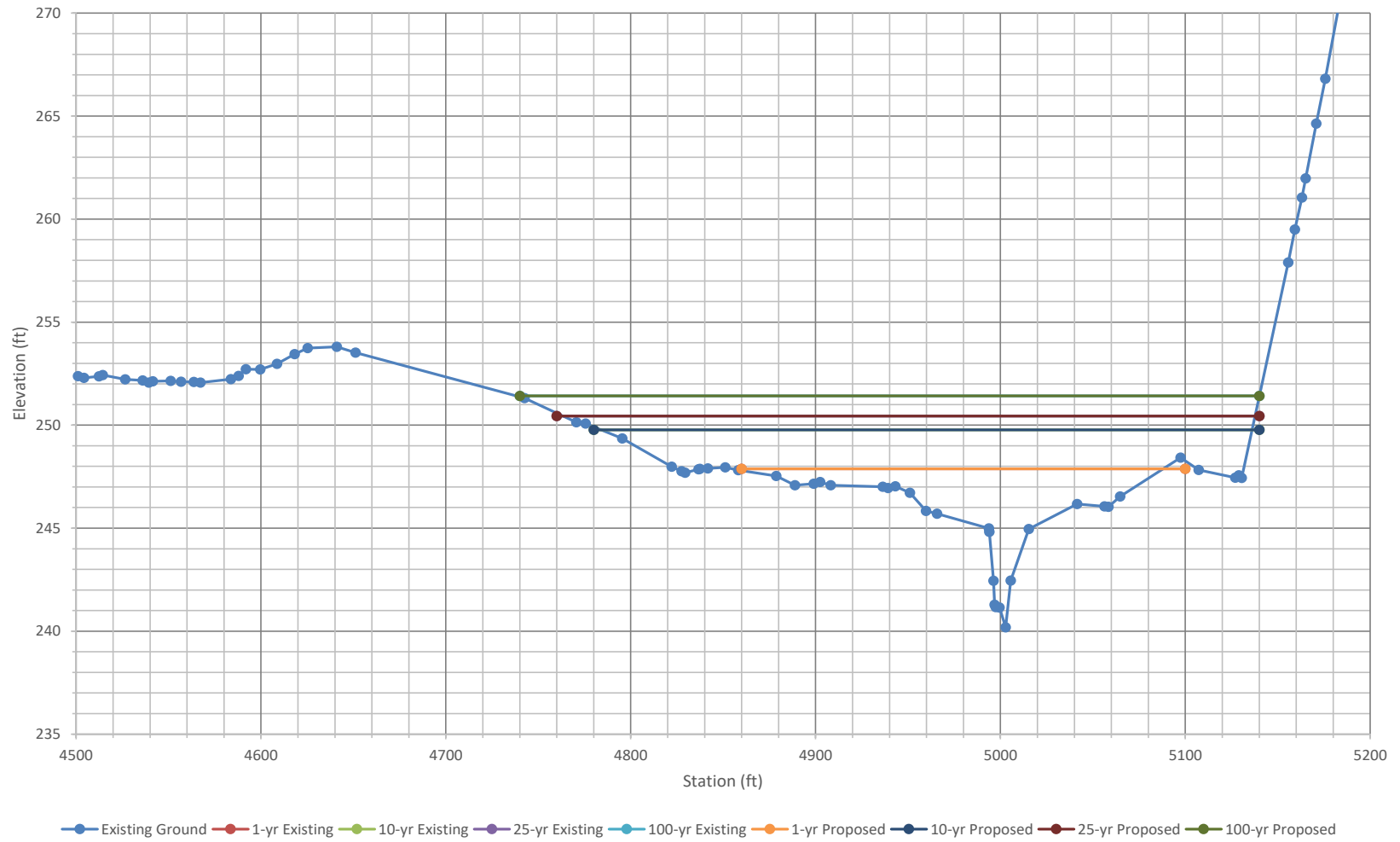
Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
C-1	0.30500	367.8	01Jan2020, 12:26	2.94
C-2	0.67100	685.3	01Jan2020, 12:48	3.47
C-2A	0.00579	24.4	01Jan2020, 12:04	5.14
C-3	2.68500	1313.4	01Jan2020, 14:16	3.33
C-4	1.15300	1607.5	01Jan2020, 12:45	4.60
POI-1	4.81979	2822.0	01Jan2020, 12:56	3.61
POI-2	4.51479	2655.6	01Jan2020, 12:57	3.65
POI-3	3.83800	2025.2	01Jan2020, 12:53	3.71
R-1	4.51479	2650.7	01Jan2020, 12:58	3.65
R-2	3.83800	2010.3	01Jan2020, 13:01	3.69

APPENDIX B

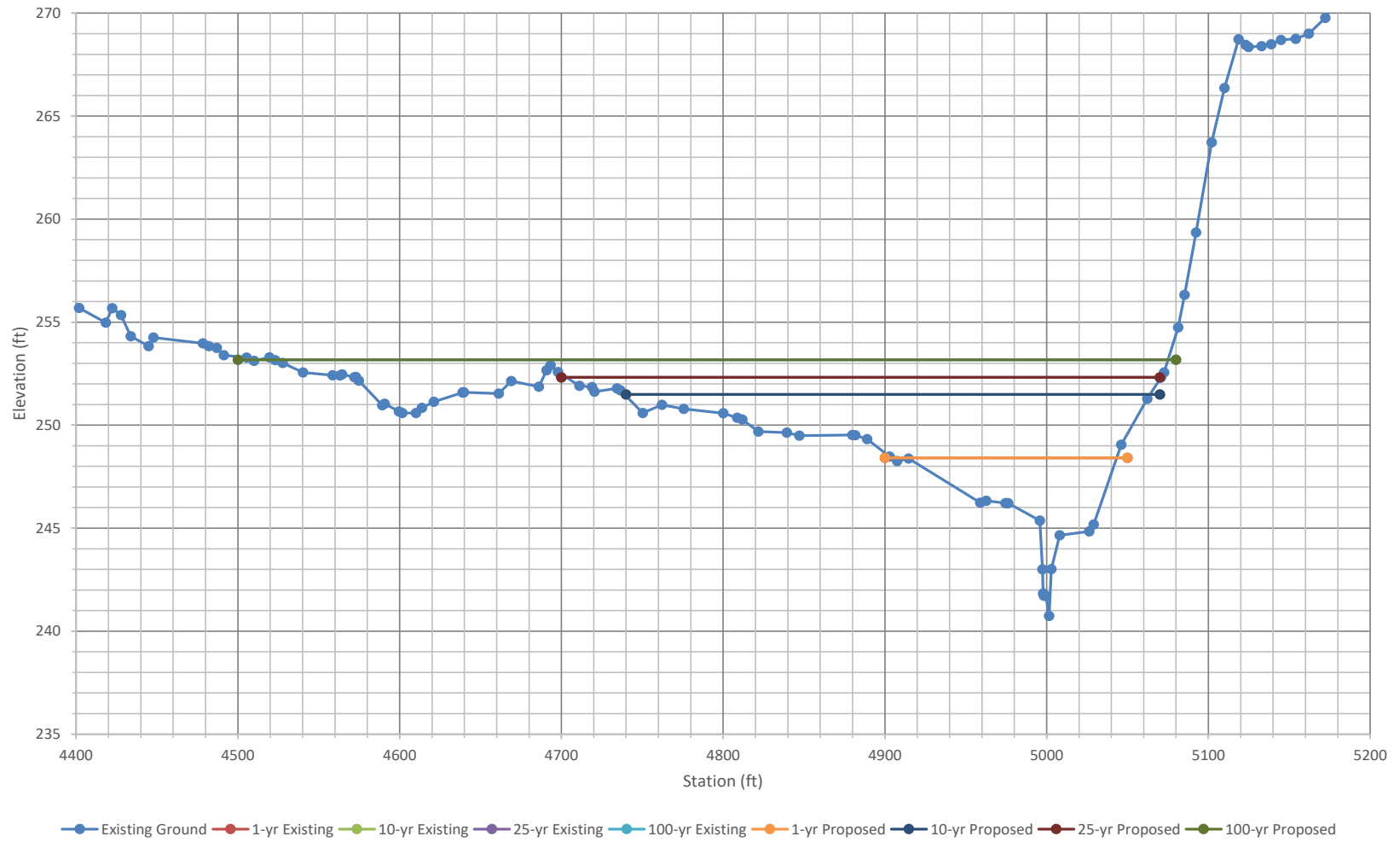
Hydraulics

FlowMaster Cross Sections – Existing Conditions (1-yr, 10-yr, 25-yr, and 100-yr)
FlowMaster Cross Sections – Proposed Conditions (1-yr, 10-yr, 25-yr, and 100-yr)

48422
POI-1



48719
POI-2



EXECUTIVE SUMMARY

FOR

CLAYTON STORAGE

CLAYTON, NC

August 1, 2019

**PRELIMINARY
STORMWATER MANAGEMENT &
STORM DRAINAGE DESIGN**

Prepared By



Bass, Nixon & Kennedy, Inc.
6310 Chapel Hill Rd., Suite 250
Raleigh, NC 27587
(919) 851-4422

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CLAYTON STORAGE CLAYTON, NC

I. INTRODUCTION

The purpose of this report is to provide an executive summary of the stormwater management and the storm drainage design for the Clayton Storage Project.

II. PRE-DEVELOPMENT SITE CONDITIONS

The site is located on south side of US Hwy 70 Business approximately 0.22 miles west of intersection of Amelia Church Rd (SR 1552) in the Town of Clayton, NC. It is bounded by commercial properties to the north, west and east and existing creek to the south. The tract of land is approximately 2.51 acres that contains an existing paved drive and mostly open grassed areas. The site drains south to the existing Little Creek.

III. POST-DEVELOPMENT SITE CONDITIONS

The proposed site plan includes 3 shelters for RV storage along with a small office. The existing impervious is 0.17 acres. The total build-out impervious area proposed is 0.83 acres. The shelters will be accessed via the existing paved drive connected to US Hwy 70.

The site plan also calls for the addition of a stormwater management wet pond facility to handle the water quality and water quantity requirements for the site.

IV. STORMWATER MANAGEMENT

Stormwater quantity issue will be addressed with sediment control measures (SCM) in the form of one existing wet detention basin west of the site. The stormwater management facility will be designed to provide 85% total suspended solids removal and attenuate the flows for the 1, 10, and 25 - year storms in accordance with the Town of Clayton Standards and Specifications.

V. POST-DEVELOPMENT NITROGEN EXPORT

(1) Type of Land Cover	(2) Site Area (Acres)	(3) TN Export Coeff. (lbs/ac/yr)	(4) TN Export by Land Use (lbs/yr)	(5) TN Export From Site (lbs/ac/yr)
Permanently preserved undisturbed open space (forest, unmown meadow)	0.00	0.6	0.00	
Permanently preserved managed open space (grass, landscaping, etc.)	1.68	1.2	2.02	
Impervious surfaces (roads, parking lots, driveways, roofs, paved storage areas, etc.)	0.83	21.2	17.60	
Total	2.51		19.62	
Average for Site				7.82

Nitrogen export exceeds 3.6 lbs/ac/yr, therefore, a combination of a sediment control measure (SCM) and nitrogen buydown is proposed.

One SCM is proposed for the project. A wet detention basin will be utilized. The wet pond will be located on the southern portion of the project and will treat approximately 9.66 acres of impervious surface.

The following calculations demonstrate that the SCM will reduce the nitrogen loading to 6.45 lbs/ac/yr and that the buydown required will be 67.93 lbs/yr.

TN CALCULATIONS - CLAYTON STORAGE

(1)	(2)	(3)	(4)	(5)
Type of Land Cover	Site Area (Acres)	TN Export Coeff. (lbs/ac/yr)	TN Export by Land Use (lbs/yr)	TN Export From Site (lbs/ac/yr)
Perm. preserved undisturbed open space (forest, unmown meadow)	0.00	0.6	0.00	
Perm. preserved managed open space (grass, landscaping, etc.)	1.68	1.2	2.02	
Impervious surfaces (roads, parking lots, driveways, roofs, paved storage areas, etc.)	0.83	21.2	17.60	
TOTAL	2.510		19.61	
Average for Site				7.81

ALLOWABLE NITROGEN EXPORT: 3.60 lb/ac/yr
 ACTUAL NITROGEN EXPORT IS: 7.81 lb/ac/yr
 BUYDOWN ALLOWED BETWEEN: 10.00 AND 3.60 lb/ac/yr
 OR: 25.10 AND 9.04 lb/yr

TREATMENT REQUIRED TO LOWER NITROGEN EXPORT:

TREAT USING: Wet Pond
 REMOVAL OF TREATMENT: 30%

TYPE OF LANDCOVER DRAINING TO TREATMENT:

Undisturbed open space (forest, unmown meadow) ac

Managed open space (grass, landscaping, etc.) 0.15 ac

Impervious surfaces (roads, parking lots, driveways, roofs, paved storage areas, etc.) 0.83 ac

AREA DRAINING TO TREATMENT: 0.98 ac

TN EXPORT OF TREATMENT AREA: 17.78 lb/yr

TN REMOVAL THROUGH TREATMENT: 5.33 lb/yr

NEW EXPORT: 14.28 lb/yr

NEW EXPORT RATE: 5.69 lb/ac/yr

BUYDOWN CALCULATIONS:

ALLOWABLE LB/YR OF EXPORT = 9.04 (based on 3.6 lb/ac/yr)

ACTUAL LB/YR OF EXPORT = 14.28

LB OF BUYDOWN REQUIRED = 5.24 LB/YR

VI. OFF-SITE AREAS

The majority of off-site drainage flows around the site to discharge into the existing Little Creek..

VII. PRELIMINARY STORWATER RUNOFF CALCULATIONS SUMMARY

Hydraflow has been utilized to provide the following analysis of the 2, 10, 25 and 100 - year storms, which meet the Town of Clayton's minimum requirements.

Pre-Development Runoff:

Utilize Rational Method to Determine Runoff: $Q=CIA$

Total Area: 2.51 acres

Composite "C"

Impervious: 0.17 ac. X 0.95 = 0.16

Grass: 2.34 ac. X 0.30 = 0.70

Total: .86/2.51ac. = 0.34

Post-Development Runoff:

Utilize Rational Method to Determine Runoff: $Q=CIA$

Total Area: 2.51 acres

Composite "C"

Grass: 1.68 ac. X 0.30 = 0.50

Impervious: 0.83 ac. X 0.95 = 0.79

Total: 1.30/2.51ac. = 0.51

Summary:

	DRAINAGE AREA (AC)	COMPOSITE RUNOFF COEFFICIENT (C)	STORM EVENT			
			1-YEAR (CFS)	2-YEAR (CFS)	10-YEAR (CFS)	25-YEAR (CFS)
PRE-DEVELOPMENT	23.82	0.26	30.56	35.64	45.69	50.73
POST-DEVELOPMENT	23.82	0.54	63.47	74.01	94.89	105.36

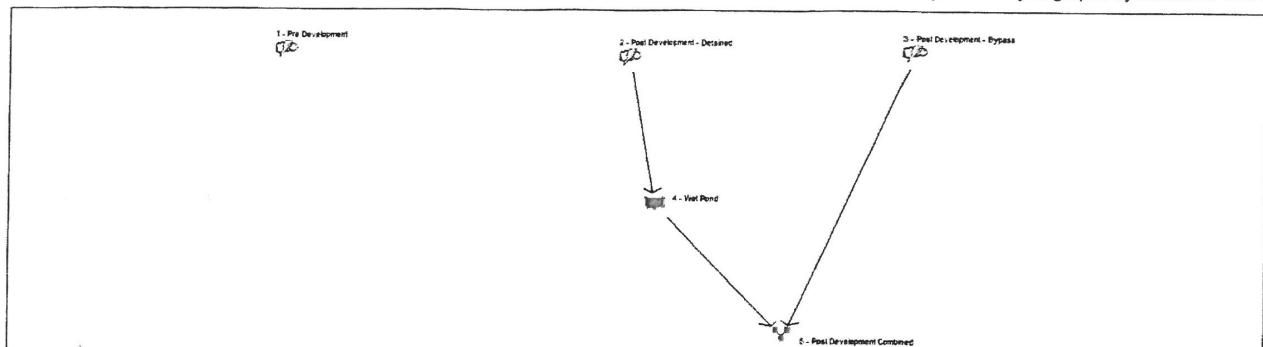
* PEAK ATTENUATION OF THE 1, 10 AND 25 - YEAR STORMS WILL BE PROVIDED IN
ACCORDANCE WITH THE TOWN OF CLAYTON STANDARDS AND SPECIFICATIONS

Peak attenuation will be provided for the 1, 10 and 25 - year storms in accordance with the Town of Clayton standards and specifications. Water flows offsite through the northern portion of the property. Hydrographs are provided in Appendix A of this document.

VIII. Appendices
A. Hydrograph Report

Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.01



Legend

Hyd. Origin	Description
1	Rational Pre Development
2	Rational Post Development - Detained
3	Rational Post Development - Bypass
4	Reservoir Wet Pond
5	Combine Post Development Combined

Project: 2019-08-01 Hydraflow Detention.gpw

Thursday, Aug 1, 2019

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.01

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	Rational	3.929	1	5	1,179	---	----	----	Pre Development
2	Rational	3.405	1	5	1,021	---	----	----	Post Development - Detained
3	Rational	2.522	1	5	757	---	----	----	Post Development - Bypass
4	Reservoir	0.025	1	10	173	2	250.19	1,019	Wet Pond
5	Combine	2.522	1	5	930	3, 4	----	----	Post Development Combined
2019-08-01 Hydraflow Detention.gpw					Return Period: 1 Year			Thursday, Aug 1, 2019	

Hydrograph Report

2

Hydraflow Hydrographs by Intelisolve v9.01

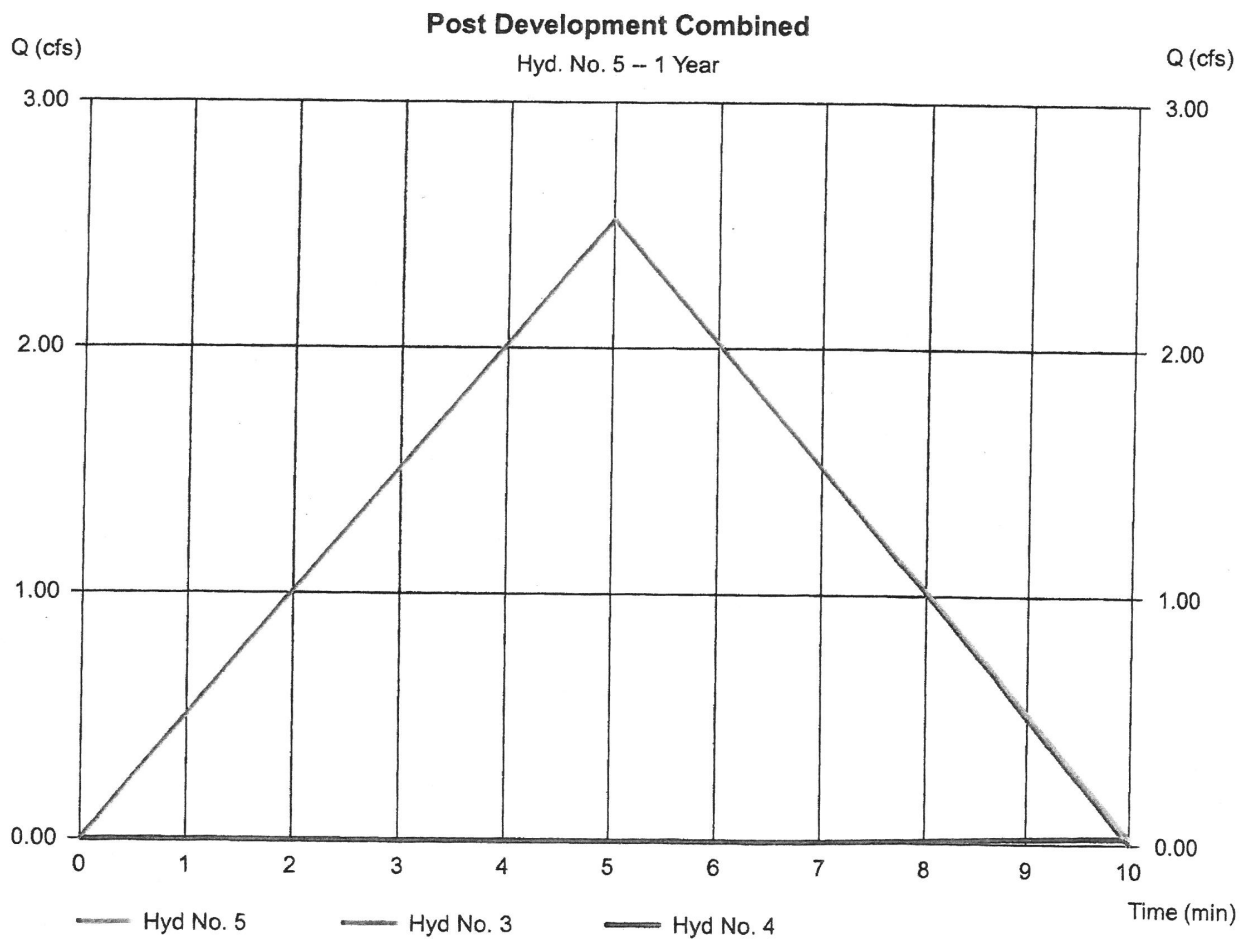
Thursday, Aug 1, 2019

Hyd. No. 5

Post Development Combined

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 3, 4

Peak discharge = 2.522 cfs
Time to peak = 5 min
Hyd. volume = 930 cuft
Contrib. drain. area= 1.660 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.01

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	Rational	6.159	1	5	1,848	---	----	----	Pre Development
2	Rational	5.337	1	5	1,601	---	----	----	Post Development - Detained
3	Rational	3.953	1	5	1,186	---	----	----	Post Development - Bypass
4	Reservoir	0.156	1	10	753	2	250.62	1,572	Wet Pond
5	Combine	3.953	1	5	1,939	3, 4	----	----	Post Development Combined
2019-08-01 Hydraflow Detention.gpw					Return Period: 10 Year			Thursday, Aug 1, 2019	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.01

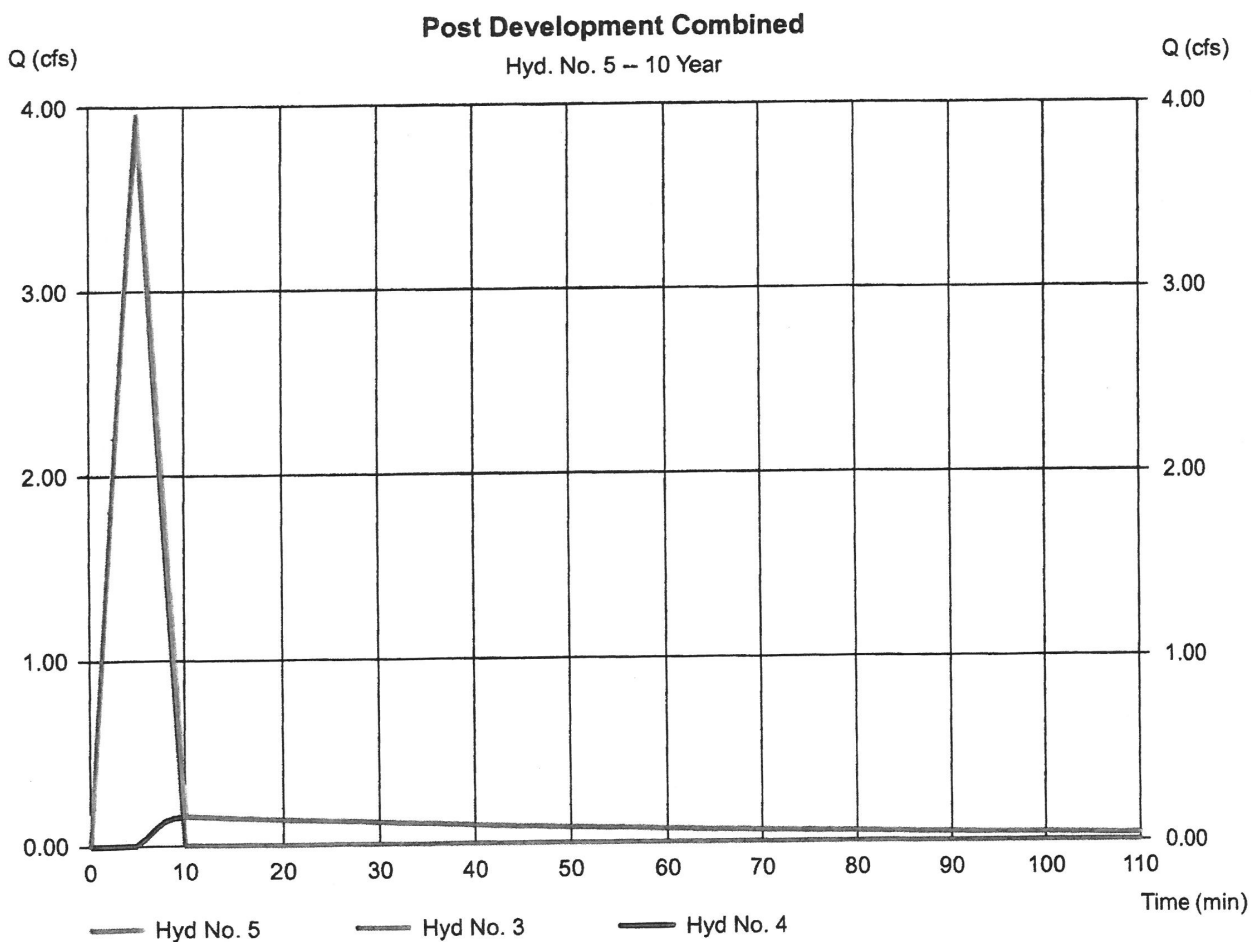
Thursday, Aug 1, 2019

Hyd. No. 5

Post Development Combined

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 1 min
 Inflow hyds. = 3, 4

Peak discharge = 3.953 cfs
 Time to peak = 5 min
 Hyd. volume = 1,939 cuft
 Contrib. drain. area = 1.660 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.01

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	Rational	6.987	1	5	2,096	---	----	----	Pre Development
2	Rational	6.054	1	5	1,816	---	----	----	Post Development - Detained
3	Rational	4.485	1	5	1,345	---	----	----	Post Development - Bypass
4	Reservoir	0.203	1	10	968	2	250.76	1,775	Wet Pond
5	Combine	4.491	1	5	2,314	3, 4	----	----	Post Development Combined
2019-08-01 Hydraflow Detention.gpw					Return Period: 25 Year			Thursday, Aug 1, 2019	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.01

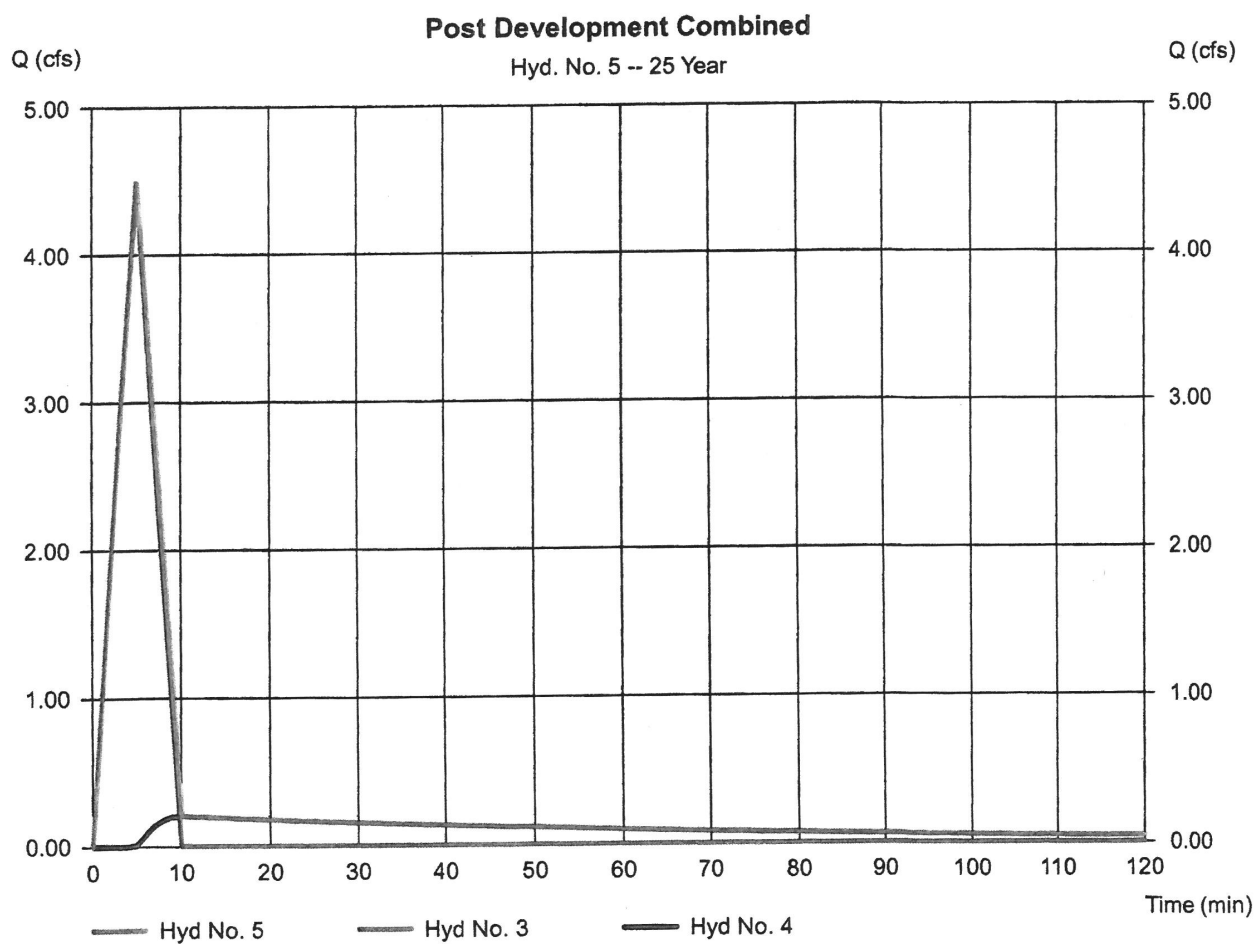
Thursday, Aug 1, 2019

Hyd. No. 5

Post Development Combined

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyds. = 3, 4

Peak discharge = 4.491 cfs
Time to peak = 5 min
Hyd. volume = 2,314 cuft
Contrib. drain. area = 1.660 ac





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

*Town Council
December 16, 2019*

STAFF REPORT

Application Number: 2019-183-SUP Project Name: Clayton Storage Special Use Permit

Tag #: 05025003B (to be recombined with adj. property to the north prior to issuance of building permits)

Location: Off US HWY 70 BUS

Applicant: 10 F Pursuit LLC

Owner: Michael Lynn Marvel Revocable Trust

Project Planner: Haley Hogg, Planner II

Public Noticing Dates:

- **Neighborhood Meeting:** September 10, 2019
- **Sign Posted:** October 17, 2019
- **Newspaper Ad Published:** December 4, 2019 & December 11, 2019
- **Adjacent Property Notification:** December 4, 2019

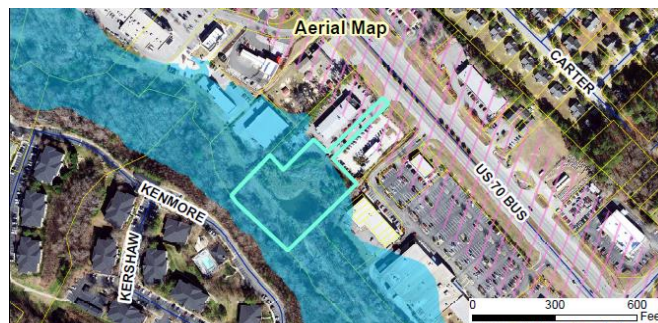
REQUEST: Request for issuance of a Special Use Permit to allow the accessory use of limited outdoor storage of RVs and boats on the subject property.

SITE DATA:

Acreage: 3.71 acres

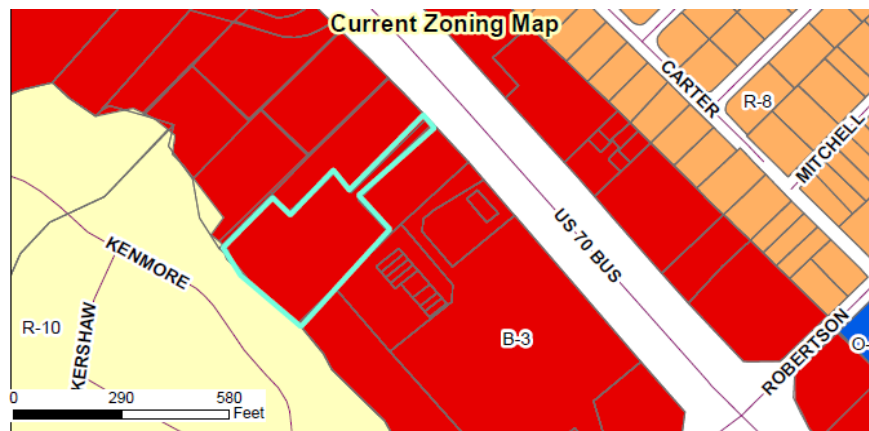
Zoning: Highway-Business (B-3)

Existing Use: Vacant (approved for self-storage use via associated Conditional Use Permit 2019-161-CUP)



ADJACENT ZONING AND LAND USES:

Direction	Zoning	Existing Use
North	Highway-Business (B-3)	Self-Storage Facility/Daycare/Auto Service
South	Highway-Business (B-3) / Residential-10 (R-10)	Retail / Apartments
East	Highway-Business (B-3)	Daycare / Auto Service / Medical Office
West	Residential-10 (R-10)	Apartments



DEVELOPMENT DATA:

Proposed Uses: Accessory Limited Outdoor Storage

Impervious Surface: 36.95%

Proposed Parking: 6 spaces, including 1 handicap space

Access/Streets: Entrance off US HWY 70 BUS, exit to the north via existing access easement through Meineke lot

STAFF ANALYSIS AND COMMENTARY:**Overview**

The applicant is requesting a Special Use Permit to allow the accessory use of limited outdoor storage on the subject property. The outdoor storage is proposed to consist of boats and RVs, stored under proposed storage canopy structures. The property is zoned Highway-Business (B-3) which only permits limited outdoor storage as an accessory use via issuance of a Special Use Permit by Town Council. This outdoor storage will be an accessory use to the existing self-storage facility to the north. If approved, this property will be recombined with the property to the north that contains the existing self-storage facility per a condition of approval outlined within the associated Conditional Use Permit.

The subject property, along with the adjacent parcel to the north, was approved for the use of Self-Storage Facility via a Conditional Use Permit 2019-161-CUP that went to Planning Board for a hearing on November 25, 2019. Alongside this Conditional Use Permit, a Major Site Plan 2019-162-SP was also approved by Planning Board. This site plan outlines the now approved expansion of the self-storage facility on the northern parcel. It also depicts the proposed outdoor storage on the subject parcel as a part of this Special Use Permit. Although the Major Site Plan has already been approved by the Planning Board, the accessory limited outdoor storage shown on the plan for this property is still subject to issuance of a Special Use Permit by Town Council, per conditions of approval placed upon the site plan's associated Conditional Use Permit.

Associated Site Plan

Per Conditions of Approval for the associated CUP 2019-161-CUP, if the Special Use Permit is approved this property will be required to be recombined with the northern parcel included within the Major Site Plan. The northern parcel contains an existing self-storage facility and was approved for additional storage buildings per the Conditional Use Permit and Major Site Plan. The proposed limited outdoor storage would be an accessory use to the existing self-storage facility.

Entrance into the subject property for the limited outdoor storage portion will be provided via an existing driveway off US HWY 70 BUS. This driveway also serves as an entrance and exit for the adjacent businesses to the east/northeast along US HWY 70. An opaque fence will be located around the entire site and visitors will enter via a gate. A self-serve kiosk and parking are provided once entering the site via the gate. Three outdoor storage structures are proposed to be located on this site. These structures will provide space to store up to 26 RVs/boats on the property. Customers of the facility will exit to the north via an existing access easement that lets out into the Meineke property.

Flood Plain

The subject property is located within the flood plain. Development may occur within a flood plain so long as specific building standards are met. The proposed structures and their placement have been reviewed by the Town Engineering & Inspections departments, and design will be finalized to ensure compliance during construction drawing review. The associated CUP included this as a condition of approval. Staff is recommending the same condition of approval be applied to this permit as well to ensure compliance.

Landscaping/Buffers

The applicant has provided the required landscaping buffers along all property lines. The proposed accessory outdoor storage will be screened from view by a 6' opaque fence and plantings as required by the UDC. The existing vegetation to the west is to remain.

Architectural Elevations

The proposed outdoor storage structures consist of galvanized steel. The plans state that the structures will have a 14' clearance. The applicant has provided view shed renderings from US HWY 70 to depict the visibility level from the highway. Based upon the renderings, the outdoor storage appears to be almost entirely screened from view of US HWY 70 due to the proposed fencing, landscaping, and existing adjacent buildings. The applicant has also provided in the plans view sheds from the rear of the adjacent properties as well.

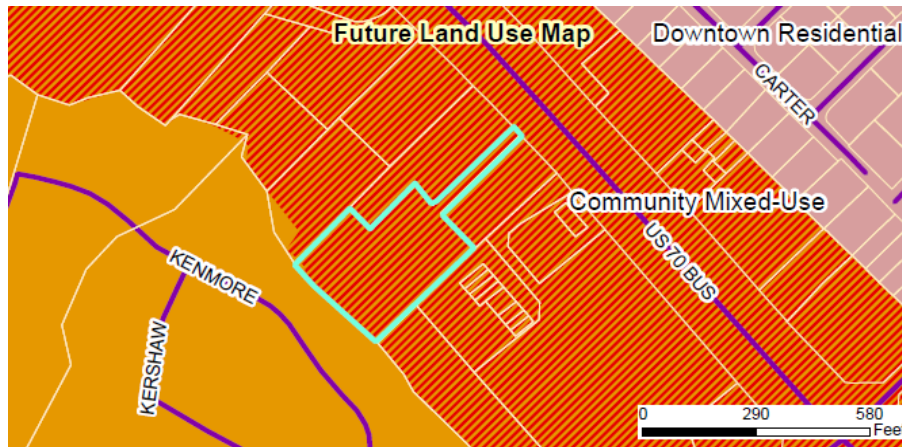
Consistency with Adopted Plans:

- **Comprehensive Plan 2040**

The Future Land Use Map designates these properties as Community Mixed Use. This designation typically includes community-serving commercial uses such as office, civic, and institutional uses as well as retail establishments. The proposed plan is generally consistent with this designation, as it is a non-residential community serving use. It is also worth noting that a self-storage facility already exists to the north of this property, and the proposed use would serve as an accessory to that existing facility.

- **Unified Development Code**

The site plan meets all applicable requirements of the Unified Development Code, subject to issuance of the required Special Use Permit to permit the accessory use of limited outdoor storage.



CONSIDERATIONS

- The Town Council shall make final decisions regarding Special Use Permits.
- Special Use Permits shall address specific Findings of Fact. The burden of proof is on the applicant. These Findings all must be met for a Special Use Permit to be approved.
- Staff does not make recommendations on Quasi-Judicial applications in regards to approval/denial.
- This permit is only for the southern parcel shown in the associated Major Site Plan (tag number noted above). The permit only pertains to the accessory use of limited outdoor storage.

FINDINGS OF FACT

Special Use Permits shall address the following findings. The burden of proof is on the applicant. Please see below for the applicant's response to each finding, as well as staff's commentary.

1. ***That the application will not materially endanger the public health or safety if located where proposed and ultimately developed according to the plans as submitted.***

Applicant Response: The proposed development will be a secured facility, with controlled entry and exit points. There will be no storage of hazardous materials or products.

Staff Commentary: The applicant is proposing a fence around the entire development, along with a security gate at the entrance.

2. ***That the application meets all required specifications and conforms to the standards and practices of sound land use planning and the Town Code of Ordinances and other applicable regulations.***

Applicant Response: The development is designed using all sections of the Town of Clayton UDC as well as state and county development regulations related to stormwater control and construction.

Staff Commentary: The application has received TRC certification and has been reviewed by Town departments. The plan meets all requirements of the UDC. Preliminary stormwater design has been reviewed by the Engineering department but is reviewed for final approval through Johnston County.

- 3. *That the application will not substantially injure the value of adjoining or abutting property, and will not be detrimental to the use or development of adjacent properties or other neighborhood uses.***

Applicant Response: The adjacent parcel is currently being used as a self-storage facility, and the proposed development is an expansion of that facility. All adjacent properties are already developed and have separate access to the public transportation system. The proposed development will use existing infrastructure and will not impact adjacent properties since the proposed use matches the existing use.

Staff Commentary: The northernmost parcel is currently used as an indoor self-storage facility. The southernmost parcel, which is the subject parcel for this Special Use Permit, is currently vacant and the applicant is proposing accessory limited outdoor storage at this location. The proposed entrance into the site is existing.

- 4. *That the application will not adversely affect the adopted plans and policies of the Town, or violate the character of existing standards for development of the adjacent properties.***

Applicant Response: The proposed use is allowed within the existing B-3 zoning district in the Town of Clayton. No variance from the current Town plan is being requested.

Staff Commentary: The property is zoned Highway-Business (B-3). The accessory use of limited outdoor storage is not permitted outright in this zoning district. The use is subject to issuance of a Special Use Permit by the Town Council. No variances have been requested. The proposed outdoor storage structures and facility all meet applicable requirements of the UDC.

RECOMMENDED CONDITIONS OF APPROVAL:

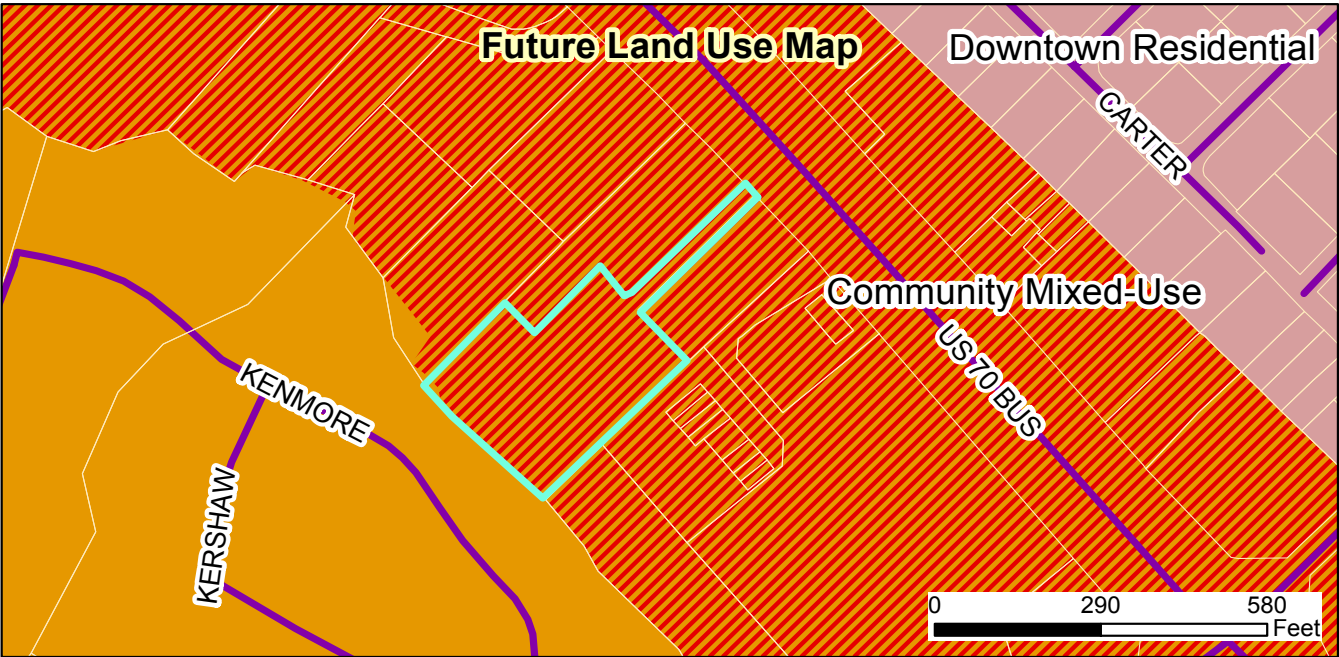
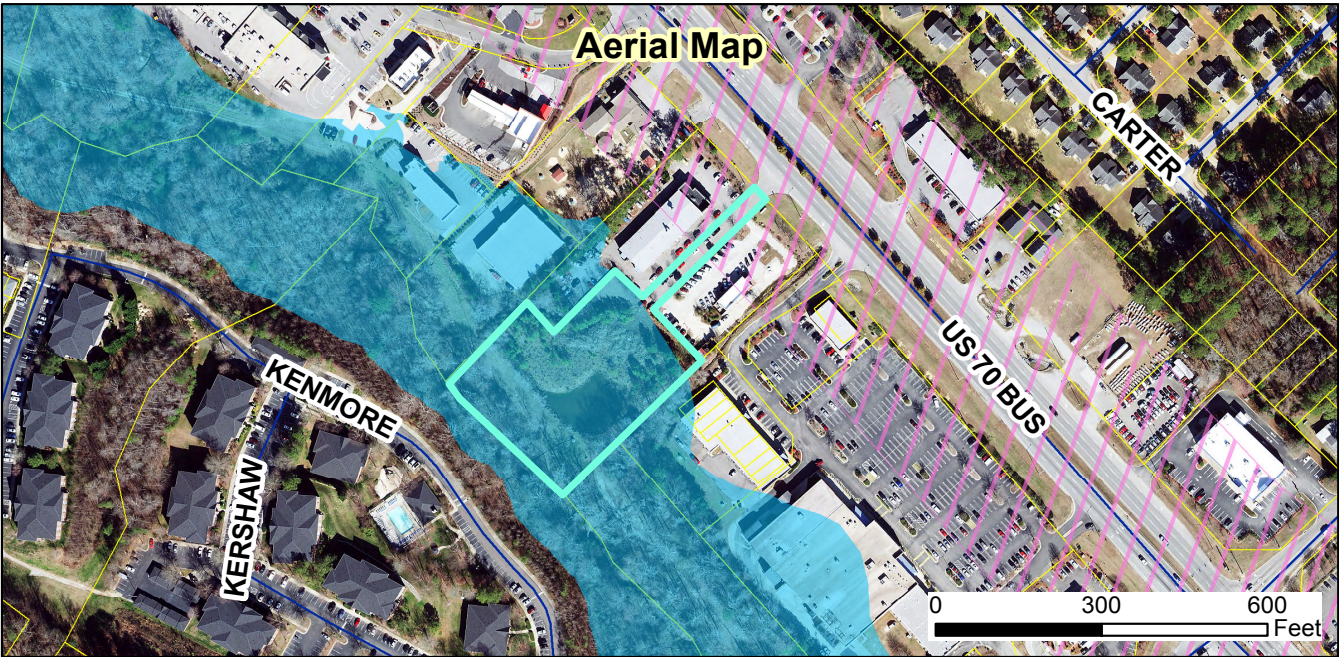
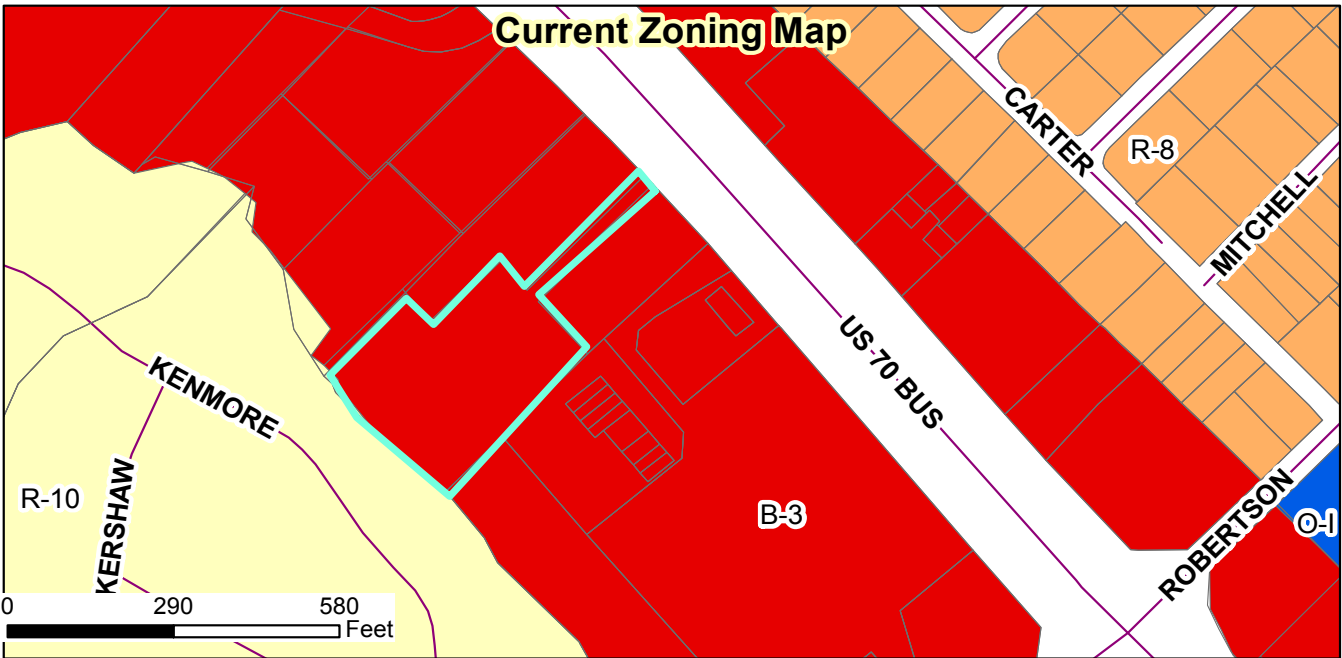
If approved, staff recommends the following Conditions of Approval be placed upon the application:

1. Three final sets of the associated site plan 2019-162-SP, meeting these conditions of approval as well as all conditions of approval placed upon the associated Conditional Use Permit 2019-161-CUP, shall be submitted to the Planning Department following board approval for final review and approval by staff.
2. This Special Use Permit is to permit accessory limited outdoor storage on the subject parcel only. The northern parcel shown in the associated Major Site Plan 2019-162-SP is not permitted for accessory outdoor storage via this permit.
3. The accessory limited outdoor storage shall only include RVs and boats as depicted on the associated Major Site Plan 2019-162-SP. The maximum number of RVs and boats permitted to be stored on the property shall be 26.
4. All accessory limited outdoor storage that occurs on this property shall be contained under the proposed outdoor storage structures. No outdoor storage shall be permitted elsewhere on the parcel.

5. The property shall only be permitted limited outdoor storage as an accessory use. This use shall occur incidental to the primary use of self-storage facility. As such, the subject property shall be recombined with the property to the north that contains the existing primary use of self-storage facility, as outlined in the associated Major Site Plan 2019-162-SP. This recombination shall occur prior to issuance of building permits.
 6. During the construction drawing phase, a no-rise certification letter shall be submitted to the Engineering Department. This letter must be submitted by a NC licensed engineer and certify that any development within the floodway will not increase flood heights upstream or downstream.
 7. All Finished Floor Elevations shall be reviewed and approved by the Town Engineering and Inspections department at the time of construction drawing review, in order to ensure compliance with flood plain regulations.
 8. No vehicles shall be stored or parked overnight within the entrance drive into the development located off US HWY 70 BUS. This area shall remain clear and utilized for access only to ensure safe access into the site for customers and emergency vehicles.
-

ATTACHMENTS:

- 1) Application
- 2) Staff Report Maps
- 3) First Neighborhood Meeting Materials
- 4) Second Neighborhood Meeting Materials
- 5) Associated Approved Major Site Plan
- 6) Neighbor Concerns
- 7) Clayton Storage Floodway Letter
- 8) Stormwater Impact Report
- 9) Stormwater Statement
- 10) Adjacent Property Letter
- 11) Newspaper Ad



Clayton Storage
2019-183-SUP
Request: Permit limited outdoor storage as an accessory use
Applicant: 10 F Pursuit LLC
Property Owner: Michael Lynn Marvel Revocable Trust
Tag #: 05025003B

Staff Report Map



Document Path: O:\PLANNING\SPECIAL USE\2019-183-SUP - Clayton Storage\Staff Report Maps\Staff Report Map - 2019-183-SUP - Clayton Storage.mxd

12/03/19
Produced by: TOC Planning
Disclaimer: Town of Clayton assumes no legal responsibility for the quality of the data represented here.

- Legend**
- Site
 - 100-yr Flood Zone
 - Thoroughfare Overlay
 - Watershed Protection Overlay

Johnston.sid

RGB

Red: Band 1

**Town of Clayton
Town Council
SUP 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

SUP Application **2019-183-SUP – Clayton Storage**

This motion is based on the following findings:

1. The application **WILL NOT** materially endanger the public health or safety if located where proposed, and developed according to the plans as submitted and approved.

OR

The application **WILL** materially endanger the public health or safety if located where proposed, and developed according to the plans as submitted and approved. (State evidence supporting finding.)

2. The application **MEETS** all required specifications and **CONFORMS** to the standards and practices of sound land use planning and the Town Code of Ordinances, or other applicable regulations.

OR

The application **DOES NOT MEET** all required specifications and **DOES NOT CONFORM** to the standards and practices of sound land use planning and the Town Code of Ordinances, or other applicable regulations. (State evidence supporting finding.)

**MOTION FORM
Item #6c
2019-183-SUP
Clayton Storage**

3. The application **WILL NOT** substantially injure the value of adjoining or abutting property, and **WILL NOT** be detrimental to the use or development of adjacent properties or other neighborhood uses.

OR

The application **WILL** substantially injure the value of adjoining or abutting property, and **WILL** be detrimental to the use or development of adjacent properties or other neighborhood uses. (State evidence supporting finding).

4. The application **WILL NOT** adversely affect the adopted plans and policies of the Town, or violate the character of existing standards for development of the adjacent properties.

OR

The application **WILL** adversely affect the adopted plans and policies of the Town, or violate the character of existing standards for development of the adjacent properties. (State evidence supporting finding.)

[If approved with conditions] The applicant meets the above findings subject to the following conditions:

MOTION FORM
Item #6c
2019-183-SUP
Clayton Storage



Town Council Agenda Cover Sheet

Meeting Date

January 6, 2020

Agenda Location

Public Hearings

Item Title

2019-243-OA Access Ordinance Amendment

Presenter

Planning Department

Summary/Description

Request to amend the Unified Development Code to clarify the general development standards for residential and non-residential development. The amendment includes access points clarification, sidewalk, and fee-in-lieu clarification among other items.

Requested Action

Approval

Funding Source (If Applicable):

N/A

Cost: N/A Yes ☐ No ☒

Additional Documents to be Included in Agenda Packet

Application
Strikethrough Copy
Clean Copy
Staff Report
PB Recommendation

Meeting Timeline

December 17, 2019- Planning Board
January 6, 2020- 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

ORDINANCE AMENDMENT APPLICATION

Pursuant to Article 7, Section 155.703 of the Unified Development Code, the Town Council, Board of Adjustment, Planning Board, Planning Director, or the general public may petition the Town Council to amend the Code of Ordinances.

Application Fee: TBD

Advertisement Fee: \$100.00

All fees are due when the application is submitted.

AMENDMENT INFORMATION

Project Name: Access / Sidewalk Ordinance Amendment

Existing title of Code Section(s): General Development Standards- Access

Code Section Number(s): 155.400 Access

APPLICANT/CONTACT INFORMATION

Applicant: Town of Clayton Planning Department

Mailing Address: PO Box 879 Clayton, NC 27520

Phone Number: 919-553-5002

Fax: _____

Contact Person: Haley Hogg, Planner II & Samantha Wullenwaber, Planning Director

Email Address: hhogg@townofclaytonnc.org & swullenwaber@townofclaytonnc.org

DESCRIPTION OF REQUESTED CHANGES

Please provide a general justification of the requested ordinance amendment. Attach additional sheets if necessary.

Update the requirements for access points for residential subdivisions and multi-family developments to ensure adequate access for emergency vehicles including fire, police, and EMS. Additionally, the amendment specifies the requirements of sidewalks and when sidewalk development vs. fee-in-lieu is appropriate.

FOR OFFICE USE ONLY

Date Received: 12-2-19

Amount Paid: NO Fee -
Town initiated

File Number: 2019-243

REQUIRED INFORMATION (to be submitted with the application)

The following items must accompany this application for it to be deemed complete.

To be completed by the applicant:			For staff use only:		
Submit 9 copies of all materials unless otherwise noted or directed by staff	Yes	N/A	Yes	No	N/A
1. A pre-application conference was held with Town of Clayton staff. Date: _____	☐				
2. Review Fee and Advertisement Fee	☐				
3. Completed application	☒				
4. A bound strikethrough/underline copy of the Code section(s) proposed for revision	☒				
5. A bound "clean" copy of the Code section(s) proposed for revision	☒				

APPROVAL CRITERIA

All applications for Ordinance Amendment must address the following criteria:

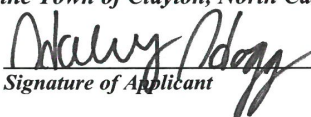
1. The extent to which the proposed text amendment is consistent with the remainder of the chapter, including specifically, any purpose and intent statements.
The proposed text amendment is consistent with the remainder of the chapter, including any purpose and intent statements.
2. The extent to which the proposed text amendment represents a new idea not considered in the existing chapter, or represents a revision necessitated by changing circumstances over time.
The proposed amendment does not represent a new idea not considered in the existing chapter, but does represent a revision necessitated to ensure adequate vehicular and pedestrian access is provided.
3. Whether or not the proposed text amendment corrects an error in the chapter.
The text amendment does not correct an error in the chapter.
4. Whether or not the proposed text amendment revises the chapter to comply with state or federal statutes or case law.
The proposed amendment is not proposed to comply with state or federal statutes or case law.

APPLICANT AFFIDAVIT

I/We, the undersigned, do hereby make application and petition to the Town Council of the Town of Clayton to amend the Code of Ordinances 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.

Haley Hogg

Print Name



Signature of Applicant

12/2/19

Date

PUBLIC NOTICE

In accordance with NC GS 160A-364, the Clayton Town Council will hold a public hearing on Monday, January 6, 2020, at 6:00 PM in the Council Chambers at the Clayton Center, 111 E Second Street, to consider the following amendment to the Unified Development Code: 2019-243-OA Access Ordinance Amendment. Copies of the proposed amendment are available in the Planning office and the Town Clerk's office for review by the public. Title XV, Chapter 155 is proposed to be amended to add the following section:

- Section 400: Access

The public is invited to attend.

Haley Hogg, Planner II
919-553-5002

The Johnstonian Newspaper

Please advertise on the following dates:
December 25, 2019
January 1, 2020

Affidavit of publication required.

**TOWN OF CLAYTON
PLANNING BOARD WRITTEN RECOMMENDATION
Ordinance Amendment**

2019-243-OA Access & Sidewalk Ordinance Amendment

On December 17, 2019 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 17th day of December, 2019 while in regular session.

Signed:


Robert J. Ahlert, Planning Board Chair

TOWN OF CLAYTON
ORDINANCE AMENDMENT
CONSISTENCY AND REASONABLENESS STATEMENT
[2019-243-OA Access Ordinance Amendment]

The Town Council of the Town of Clayton hereby states:

Section 1: The above referenced ordinance amendment IS APPROVED.

Section 2: The above referenced ordinance amendment IS CONSISTENT with:

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

- Goal M2: Support interconnected street systems that efficiently disperse traffic.
- Goal LU2: Encourage quality development which maximizes existing infrastructure, promotes walking and biking, and enhances travel safety.

The requested ordinance amendment is consistent with the above referenced goals of the Comprehensive Plan 2040. The proposed amendment seeks to modify the UDC 155.400 section regarding access and general development standards. The proposed amendment updates and clarifies access and sidewalk requirements for residential and non-residential developments. The amendment will ensure that street systems associated with future residential and non-residential developments are interconnected to disperse traffic in an efficient manner. The amendment will also further encourage quality development that promotes walking with sidewalk requirements that are clearly outlined for clarification purposes.

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, specifically

that the ordinance amendment is consistent with the Comprehensive Plan 2040,

the above referenced ordinance amendment is reasonable and in the public interest.

ARTICLE 4: GENERAL DEVELOPMENT STANDARDS

CONTENTS:

§ 155.400	ACCESS	1
§ 155.401	OFF-STREET PARKING AND LOADING	Error! Bookmark not defined.
PART 1.	PARKING STANDARDS.....	Error! Bookmark not defined.
PART 2.	QUEUING STANDARDS	Error! Bookmark not defined.
PART 3.	LOADING STANDARDS	Error! Bookmark not defined.
§ 155.402	LANDSCAPING, SCREENING AND BUFFERING	Error! Bookmark not defined.
PART 1.	SITE INTERIOR LANDSCAPE REQUIREMENTS.....	Error! Bookmark not defined.
PART 2.	PERIMETER BUFFERS	Error! Bookmark not defined.
PART 3.	STREET YARD TREES.....	Error! Bookmark not defined.
PART 4.	SCREENING	Error! Bookmark not defined.
PART 5.	GENERAL LANDSCAPING, SCREENING AND BUFFERING PROVISIONS.....	Error! Bookmark not defined.
§ 155.403	SIGNS	Error! Bookmark not defined.
§ 155.404	OUTDOOR LIGHTING	Error! Bookmark not defined.
§155.405	DESIGN STANDARDS- NON-RESIDENTIAL & MULTI-FAMILY.....	67

§ 155.400 ACCESS

(A) PURPOSE AND INTENT

It is the intent of this Section to establish procedures and design standards for driveways and access points to promote efficiency and safety of the connecting street system, support operations of the surrounding pedestrian and bicycle network, ensure safe roadway access to all parcels and lots, and promote a vibrant and attractive streetscape character. These procedures and standards are intended to preserve and enhance the character of the community, and protect the health, safety and general welfare of Clayton's residents.

(B) ACCESS

For the purposes of this section, access means the point or points of ingress and egress from a development or parcel to the existing right-of-way network.

(C) **ACCESS REQUIRED**

- (1) Except as provided in paragraph(c)(2) below, no principal building, structure, or use may be erected or established on any lot which does not abut at least 30 feet on a street that is publicly-dedicated and maintained by the Town or the North Carolina Department Of Transportation.
- (2) The Planning Director may authorize, in specific situations, alternative driveway access when:
 - (a) The effect of such application would be to deprive the parcel of reasonable access; or
 - (b) The size, configuration, or lack of frontage makes alternatives infeasible.
 - (c) At a minimum, entrances and exits, except those associated with a single-family residential use, shall be subject to the dimensional standards provided in Table 4-1 below.

TABLE 4-1 –DIMENSIONAL STANDARDS OF ACCESS WAYS

Min. Entrance/Exit Width	Feet ⁽¹⁾
One-Way	15
Two-Way without median	25 (35 maximum)
Two-way with median	40 ⁽²⁾
Right Turn Radius ⁽³⁾	
Minimum	25
Maximum	30
Notes:	
1. All entrances and exits are subject to approval by the Town of Clayton and/or NCDOT. Widths exceeding these standards may be approved by the Planning Director or Town Engineer, depending on the use.	
2. Width excludes median. 20 foot unobstructed pavement required on both sides of median, excluding landscape islands.	
3. Measured on side of driveway exposed to entry or exit by right turning vehicles.	

(D) **COMPLIANCE WITH LOCAL AND STATE REQUIREMENTS**

- (3) Prior to beginning any construction, permits necessary to connect to the right-of-way network of the town or state shall be secured. Driveway connections to individual residences are generally excluded from this requirement, but may be necessary if a safety concern is identified.
- (4) Failure to secure necessary permits prior to construction may result in the removal of the driveways and/or denial of access at that location.

- (5) A Certificate of Occupancy shall not be issued until the access requirements of this chapter have been met.

(E) **ACCESS TO RESIDENTIAL SUBDIVISIONS**

- (1) When a residential subdivision borders on or contains a major thoroughfare, direct driveway access from lots within the subdivision onto the thoroughfare shall not be permitted.
- (2) In order to accommodate emergency and service vehicles, the following standards shall apply:

(a) Any residential subdivision of greater than 30 lots shall include at least two separate and constructed access points. ~~The second access may consist of an existing or future street connection to an adjacent development.~~

~~(b) Any residential subdivision of greater than 75 lots shall include at least two access points. The second access may consist of a street connection to an existing adjacent development.~~

~~(c) No more than 75 certificates of occupancy may be issued within the subdivision until the required secondary access has been constructed or bonded for construction.~~

~~(b) Residential subdivisions of 250 or more lots shall provide at least three separate and constructed access points. Where three or more access points are required, the Town Council may waive the requirement for immediate construction of more than two access points, provided that subdivision phasing and design illustrates the additional required connections.~~

~~(c) Street stub-outs to adjacent undeveloped properties shall be provided as deemed appropriate. Stub-outs to adjacent undeveloped properties shall not count towards the minimum number of required access points. All stub-outs shall be constructed to the property line.~~

~~(d) Street connections shall be made to existing stub-outs on adjacent developed properties. These street connections may count towards the minimum number of required access points.~~

~~(e) All required access points outlined in this section shall be constructed prior to plat recordation of the phase in which the access points are located.~~

~~(3) A waiver (see § 155.706(1)(7)) of these standards may be allowed by the Town Council during approval of the preliminary subdivision plat only where limited frontage, natural features~~

~~(slope, topography), or similar circumstances preclude the required connections and there is no substantial impact noted regarding emergency service delivery.~~

(F) MULTI-FAMILY RESIDENTIAL DEVELOPMENTS

(a) Multi-Family projects having more than 100 dwelling units shall provide at least two separate and constructed access points. Required access points shall be constructed prior to issuance of the first Certificate of Occupancy for the phase in which they are located.

(F)(G) RESIDENTIAL DRIVEWAY STANDARDS

Residential driveway access to and from streets shall be constructed in accordance with Town standards as outlined below:

(1) Design

The standard residential driveway access for the Town shall be a "ramp" type driveway section. Ramp-type driveways shall be constructed in accordance with Town standards and specifications as outlined in the Town's *Engineering Design Manual*.

(2) Width

The width of a residential driveway shall be no less than ten feet and no more than 24 feet. When two residential driveways coincide along a property line, the maximum width of both driveways combined shall not exceed 24 feet.

(3) Number

The number of driveway access points servicing a residential lot should be limited to one. In no instance shall there be more than two residential driveway access points servicing the lot.

(4) Setbacks

- (a) Residential driveways shall be spaced at least 20 feet from any other driveway on the same lot.
- (b) Driveways shall be no closer than three and one-half feet to any lot line, except where two residential driveways coincide along the same lot line.
- (c) The minimum corner clearance from the curb line or edge of pavement of intersecting streets shall be at least 20 feet from the point of tangency of the radius curvature, or 20 feet from the intersection of right-of-way lines, whichever is greater.
- (d) The radius of the driveway shall not encroach on the minimum corner clearance.

(G)(H) NON-RESIDENTIAL DRIVEWAY STANDARDS

(1) **Design**

Non-residential driveway access to and from streets shall be constructed in accordance with the standards and specifications provided in the manual, *Policy on Street and Driveway Access to North Carolina Highways*, as adopted and amended by NCDOT.

(2) **Number**

- (a) For any development, the number of driveway access points may be restricted where it is necessary for purposes of decreasing traffic congestion or hazards. These restrictions may include required common access points.
- (b) Approval of driveway access between a lot and the right-of-way at an interval less than those specified by the *Policy on Street and Driveway Access to North Carolina Highways* manual, as adopted and amended by NCDOT, may be granted only by review and recommendation of the Town Engineer and NCDOT.

(3) **Outparcels**

Outparcels shall take access from within the development, where possible.

~~(H)~~(I) **CROSS ACCESS CONNECTIONS**

- (1) Internal driveway connections to adjacent existing or future development shall be provided for residential and commercial development, and clearly identified. All driveway connections shall be constructed and stubbed to the property line, and future development of adjacent property shall complete a connection to any existing stub.
- (2) Access easements may be required to ensure outparcels or adjacent developments have adequate access if ownership patterns change.
- ~~(3) The Planning Board or Town Council may waive the requirement for a driveway connection required above in those cases where unusual topography or site conditions would render such a connection or easement of no benefit to adjoining properties.~~

~~(H)~~(J) **SHARED ACCESS**

A shared access easement may be required between adjacent lots fronting on ~~a thoroughfare~~ in order to minimize the total number of access points along those streets and to facilitate traffic flow between lots.

~~(H)~~(K) **CLOSURE OR RELOCATION OF EXISTING ACCESS POINTS**

- (1) The Planning Board or Town Council, in conjunction with NCDOT, shall have the authority to require the closure or relocation of existing access points where multiple access points to the site are available.

- (2) The Planning Board or Town Council may approve the closure of driveway access in those cases where adjoining parcels are subsequently developed with a residential use.

~~(K)~~(L) **VISIBILITY AT INTERSECTIONS**

- (1) On a corner lot, nothing shall be erected, placed, planted, or allowed to grow in such a manner as to materially impede vision between a height of 30 inches and ten feet in a triangular area formed by a diagonal line between two points on the right-of-way lines, 20 feet from where they intersect.
- (2) Adequate sight distance should be provided at all driveway access points and shall be in accordance with the standards provided in the manual, *Policy on Street and Driveway Access to North Carolina Highways*, as adopted and amended by the NCDOT.

~~(L)~~(M) **THOROUGHFARE OVERLAY DISTRICT**

In addition to the standards set forth in this Section, driveways to be constructed within a Thoroughfare Overlay District are subject to the additional standards set forth in § 155.204(A).

(N) **SIDEWALKS**

- (1) All sidewalks associated with a residential subdivision shall be required as outlined in Article 6 of this chapter.
- (2) All residential and non-residential development projects not associated with a residential subdivision shall be required to install sidewalks and curb-and-gutter along all property lines with road frontage. If there is no existing sidewalk within 300' of the proposed development project, a fee-in-lieu of sidewalk may be accepted.
- (3) If fee-in-lieu of sidewalk is made, an Engineer's estimate for fee-in-lieu shall be provided to the Town's Engineering department for review. Fee-in-lieu shall be paid for sidewalks prior to issuance of building permits.

(4) Sidewalks shall be installed prior to issuance of a Certificate of Occupancy for the development.

(Ord. 2005-11-02, passed 11-21-05; Am. Ord. 2013-09-03, passed 9-3-13)

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For the purposes of this section, access means the point or points of ingress and egress from a development or parcel to the existing right-of-way network.

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- (1) Except as provided in paragraph(c)(2) below, no principal building, structure, or use may be erected or established on any lot which does not abut at least 30 feet on a street that is publicly-dedicated and maintained by the Town or the North Carolina Department Of Transportation.
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- (a) Any residential subdivision of greater than 30 lots shall include at least two separate and constructed access points.
 - (b) Residential subdivisions of 250 or more lots shall provide at least three separate and constructed access points.
 - (c) Street stub-outs to adjacent undeveloped properties shall be provided as deemed appropriate. Stub-outs to adjacent undeveloped properties shall not count towards the minimum number of required access points. All stub-outs shall be constructed to the property line.
 - (d) Street connections shall be made to existing stub-outs on adjacent developed properties. These street connections may count towards the minimum number of required access points.
 - (e) All required access points outlined in this section shall be constructed prior to plat recordation of the phase in which the access points are located.

(F) **MULTI-FAMILY RESIDENTIAL DEVELOPMENTS**

- (a) Multi-Family projects having more than 100 dwelling units shall provide at least two separate and constructed access points. Required access points shall be constructed prior to issuance of the first Certificate of Occupancy for the phase in which they are located.

(G) **RESIDENTIAL DRIVEWAY STANDARDS**

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The standard residential driveway access for the Town shall be a "ramp" type driveway section. Ramp-type driveways shall be constructed in accordance with Town standards and specifications as outlined in the Town's *Engineering Design Manual*.

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- (b) Driveways shall be no closer than three and one-half feet to any lot line, except where two residential driveways coincide along the same lot line.
- (c) The minimum corner clearance from the curb line or edge of pavement of intersecting streets shall be at least 20 feet from the point of tangency of the radius curvature, or 20 feet from the intersection of right-of-way lines, whichever is greater.
- (d) The radius of the driveway shall not encroach on the minimum corner clearance.

(H) **NON-RESIDENTIAL DRIVEWAY STANDARDS**

(1) **Design**

Non-residential driveway access to and from streets shall be constructed in accordance with the standards and specifications provided in the manual, *Policy on Street and Driveway Access to North Carolina Highways*, as adopted and amended by NCDOT.

(2) **Number**

- (a) For any development, the number of driveway access points may be restricted where it is necessary for purposes of decreasing traffic congestion or hazards. These restrictions may include required common access points.
- (b) Approval of driveway access between a lot and the right-of-way at an interval less than those specified by the *Policy on Street and Driveway Access to North Carolina Highways* manual, as adopted and amended by NCDOT, may be granted only by review and recommendation of the Town Engineer and NCDOT.

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Outparcels shall take access from within the development, where possible.

(I) **CROSS ACCESS CONNECTIONS**

- (1) Internal driveway connections to adjacent existing or future development shall be provided for residential and commercial development, and clearly identified. All driveway connections shall be constructed and stubbed to the property line, and future development of adjacent property shall complete a connection to any existing stub.
- (2) Access easements may be required to ensure outparcels or adjacent developments have adequate access if ownership patterns change.

(J) **SHARED ACCESS**

A shared access easement may be required between adjacent lots fronting on a thoroughfare in order to minimize the total number of access points along those streets and to facilitate traffic flow between lots.

(K) **CLOSURE OR RELOCATION OF EXISTING ACCESS POINTS**

- (1) The Planning Board or Town Council, in conjunction with NCDOT, shall have the authority to require the closure or relocation of existing access points where multiple access points to the site are available.
- (2) The Planning Board or Town Council may approve the closure of driveway access in those cases where adjoining parcels are subsequently developed with a residential use.

(L) **VISIBILITY AT INTERSECTIONS**

- (1) On a corner lot, nothing shall be erected, placed, planted, or allowed to grow in such a manner as to materially impede vision between a height of 30 inches and ten feet in a triangular area formed by a diagonal line between two points on the right-of-way lines, 20 feet from where they intersect.
- (2) Adequate sight distance should be provided at all driveway access points and shall be in accordance with the standards provided in the manual, *Policy on Street and Driveway Access to North Carolina Highways*, as adopted and amended by the NCDOT.

(M) **THOROUGHFARE OVERLAY DISTRICT**

In addition to the standards set forth in this Section, driveways to be constructed within a Thoroughfare Overlay District are subject to the additional standards set forth in § 155.204(A).

(N) **SIDEWALKS**

- (1) All sidewalks associated with a residential subdivision shall be required as outlined in Article 6 of this chapter.
- (2) All residential and non-residential development projects not associated with a residential subdivision shall be required to install sidewalks and curb-and-gutter along all property lines

with road frontage. If there is no existing sidewalk within 300' of the proposed development project, a fee-in-lieu of sidewalk may be accepted.

- (3) If fee-in-lieu of sidewalk is made, an Engineer's estimate for fee-in-lieu shall be provided to the Town's Engineering department for review. Fee-in-lieu shall be paid for sidewalks prior to issuance of building permits.
- (4) Sidewalks shall be installed prior to issuance of a Certificate of Occupancy for the development. (Ord. 2005-11-02, passed 11-21-05; Am. Ord. 2013-09-03, passed 9-3-13)



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
January 6, 2020*

STAFF REPORT

Application Number: 2019-243-OA
Project Name: Access & Sidewalk Ordinance Amendment

Applicant: Town of Clayton

Public Noticing:

- Newspaper ad to be published December 25, 2019 & January 1, 2020

REQUEST: Request to amend the Unified Development Code Title XV, §155.400. This amendment seeks to clarify the general development standards for residential and non-residential development. The amendment includes access points clarification, sidewalk, and fee-in-lieu clarification among other items.

SECTIONS PROPOSED FOR AMENDMENT:

The following sections of Title XV, Chapter 155 and their general description are proposed for amendment:

- 400- Access

STAFF ANALYSIS AND COMMENTARY:

Overview

This ordinance amendment modifies Section 400 of the Unified Development Code which pertains to general development standards. The primary proposed changes are outlined in detail below:

Access to Residential Subdivisions

1. Number of Access Points

Staff is proposing to amend the requirement for the minimum number of access points for residential subdivisions for safety purposes. These proposed changes have been discussed internally among the Planning, Engineering, Public Services, Police, Inspections, and Fire departments.

At this time the Fire Department enforces the access requirements of Appendix D of the North Carolina State Fire Code for residential subdivisions, which requires all subdivisions over 30 lots to include at least two separate and constructed access points. The UDC's current language contradicts this requirement as

Page 1 of 3

it currently allows the secondary access to be provided in the form of a stub-out or future connection to adjacent parcels. Staff is proposing to modify the requirement to better match the Fire Code requirement.

The proposed ordinance amendment is slightly more stringent than the Fire Code. As currently written, the fire code allows at times the number of access points to be reduced if individual housing units have sprinkler systems installed. While this addresses the concern of fire, it still does not address the issue of access for other emergency services such as EMS and Police. For this reason staff is proposing the recommended number of access points be required regardless of whether or not sprinkler systems are installed within individual units. This means that any subdivision over 30 lots would be required to have two constructed access points serving the development.

These changes are proposed for safety reasons. If a subdivision is constructed with only one access point there is a risk that if that access point is blocked for any reason then emergency services would not be able to get to residents within the development. The proposed changes are to ensure that adequate access for emergency services (fire, EMS, and police) is provided for residences. This also allows for looping of utility lines which is necessary for water quality and flow. Looping water lines instead of creating dead ends helps water quality and pressure.

2. Waivers

This ordinance amendment proposes the removal of the language regarding waivers for required access points. The Fire Code does not permit waivers. In instances that the UDC may be stricter regarding access points, a variance process would be more appropriate when there is a unique hardship as it is a quasi-judicial process which requires evidence and specific Findings to be met.

3. Timing of Construction

Staff is proposing that the required access points be constructed prior to plat recordation of the phase in which the access points are located.

Access to Multi-Family Developments

The UDC does not currently specify access requirements for multi-family residential developments. This would include apartment developments primarily, but may also include townhomes that are built to multi-family building code standards. The proposed required number of access points is based upon the Fire Code, which is already being enforced by the Town's Fire department. As with the modifications for residential subdivisions, the proposed ordinance amendment would not allow a reduction in the number of required access points regardless of whether or not the buildings have sprinkler systems installed. These access points would be required to be constructed prior to issuance of the first CO in the phase in which they are located.

Sidewalks

The UDC does not currently have clear standards in regards to the requirements of sidewalk and situations in which fee-in-lieu of sidewalk is appropriate. The amendment proposed pertains only to residential and non-residential developments not associated with major subdivisions, as major subdivisions are subject to separate requirements in Section 6 of the UDC. The proposed ordinance amendment clarifies that sidewalks and curb-and-gutter are required along all property lines with road frontage for developments. In instances where there is no existing sidewalk within 300', fee-in-lieu may be paid instead prior to issuance of building permits.

Approval Criteria:

- **Consistency with remainder of the Chapter**

The request is consistent with the remainder of Chapter 155.

- **Novelty of the request**

The request does not represent novel changes to the Code. The code currently outlines requirements for access points and sidewalks. The modifications are simply updating the access point requirements to better match the Fire Code and the sidewalks to provide additional clarification.

CONSIDERATIONS

- The Planning Board shall make a recommendation to Town Council. The Town Council shall make a final decision regarding revisions to the Town Code.
-

STAFF RECOMMENDATION:

Staff is recommending approval of the proposed amendment.

ATTACHMENTS:

- 1) Application
- 2) Draft Ordinance Amendment, in strikethrough/underline
- 3) Draft Ordinance- Clean Copy
- 4) PB Recommendation

**Town of Clayton
Town Council
Zoning Ordinance Amendment Motion Sheet
(Rezoning)**

After considering the recommendations of the Planning Board and Planning Director, I move to **[approve OR deny] Case # 2019-243-OA – Code of Ordinance Chapter 155 – Section 400**
[IF APPROVING]

and to approve the Statement of Consistency and Reasonableness included in the Agenda packet [with the following modifications: STATE MODIFICATIONS, IF ANY].

**MOTION FORM
Item 6d
2019-243-OA
Text Amendment –155.400**

TOWN OF CLAYTON
Amendment to the Code of Ordinances: Chapter 155, Section 400

BEING HEREBY AOPTED BY THE TOWN COUNCIL FOR THE TOWN OF CLAYTON, NORTH CAROLINA, to amend Chapter 155, Section 400 to read as follows

§ 155.400 ACCESS

(A) **PURPOSE AND INTENT**

It is the intent of this Section to establish procedures and design standards for driveways and access points to promote efficiency and safety of the connecting street system, support operations of the surrounding pedestrian and bicycle network, ensure safe roadway access to all parcels and lots, and promote a vibrant and attractive streetscape character. These procedures and standards are intended to preserve and enhance the character of the community, and protect the health, safety and general welfare of Clayton's residents.

(B) **ACCESS**

For the purposes of this section, access means the point or points of ingress and egress from a development or parcel to the existing right-of-way network.

(C) **ACCESS REQUIRED**

- (1) Except as provided in paragraph(c)(2) below, no principal building, structure, or use may be erected or established on any lot which does not abut at least 30 feet on a street that is publicly-dedicated and maintained by the Town or the North Carolina Department Of Transportation.
- (2) The Planning Director may authorize, in specific situations, alternative driveway access when:
 - (a) The effect of such application would be to deprive the parcel of reasonable access; or
 - (b) The size, configuration, or lack of frontage makes alternatives infeasible.
 - (c) At a minimum, entrances and exits, except those associated with a single-family residential use, shall be subject to the dimensional standards provided in Table 4-1 below.

TABLE 4-1 –DIMENSIONAL STANDARDS OF ACCESS WAYS

Min. Entrance/Exit Width	Feet ⁽¹⁾
One-Way	15
Two-Way without median	25 (35 maximum)
Two-way with median	40 ⁽²⁾
Right Turn Radius ⁽³⁾	
Minimum	25
Maximum	30
Notes:	
1. All entrances and exits are subject to approval by the Town of Clayton and/or NCDOT. Widths exceeding these standards may be approved by the Planning Director or Town Engineer, depending on the use.	
2. Width excludes median. 20 foot unobstructed pavement required on both sides of median, excluding landscape islands.	
3. Measured on side of driveway exposed to entry or exit by right turning vehicles.	

(D) **COMPLIANCE WITH LOCAL AND STATE REQUIREMENTS**

- (3) Prior to beginning any construction, permits necessary to connect to the right-of-way network of the town or state shall be secured. Driveway connections to individual residences are generally excluded from this requirement, but may be necessary if a safety concern is identified.
- (4) Failure to secure necessary permits prior to construction may result in the removal of the driveways and/or denial of access at that location.
- (5) A Certificate of Occupancy shall not be issued until the access requirements of this chapter have been met.

(E) **ACCESS TO RESIDENTIAL SUBDIVISIONS**

- (1) When a residential subdivision borders on or contains a major thoroughfare, direct driveway access from lots within the subdivision onto the thoroughfare shall not be permitted.
- (2) In order to accommodate emergency and service vehicles, the following standards shall apply:
 - (a) Any residential subdivision of greater than 30 lots shall include at least two separate and constructed access points.
 - (b) Residential subdivisions of 250 or more lots shall provide at least three separate and constructed access points.
 - (c) Street stub-outs to adjacent undeveloped properties shall be provided as deemed appropriate. Stub-outs to adjacent undeveloped properties shall not count towards the minimum number of required access points. All stub-outs shall be constructed to the property line.

- (d) Street connections shall be made to existing stub-outs on adjacent developed properties. These street connections may count towards the minimum number of required access points.
- (e) All required access points outlined in this section shall be constructed prior to plat recordation of the phase in which the access points are located.

(F) **MULTI-FAMILY RESIDENTIAL DEVELOPMENTS**

- (a) Multi-Family projects having more than 100 dwelling units shall provide at least two separate and constructed access points. Required access points shall be constructed prior to issuance of the first Certificate of Occupancy for the phase in which they are located.

(G) **RESIDENTIAL DRIVEWAY STANDARDS**

Residential driveway access to and from streets shall be constructed in accordance with Town standards as outlined below:

(1) **Design**

The standard residential driveway access for the Town shall be a "ramp" type driveway section. Ramp-type driveways shall be constructed in accordance with Town standards and specifications as outlined in the Town's *Engineering Design Manual*.

(2) **Width**

The width of a residential driveway shall be no less than ten feet and no more than 24 feet. When two residential driveways coincide along a property line, the maximum width of both driveways combined shall not exceed 24 feet.

(3) **Number**

The number of driveway access points servicing a residential lot should be limited to one. In no instance shall there be more than two residential driveway access points servicing the lot.

(4) **Setbacks**

- (a) Residential driveways shall be spaced at least 20 feet from any other driveway on the same lot.
- (b) Driveways shall be no closer than three and one-half feet to any lot line, except where two residential driveways coincide along the same lot line.
- (c) The minimum corner clearance from the curb line or edge of pavement of intersecting streets shall be at least 20 feet from the point of tangency of the radius curvature, or 20 feet from the intersection of right-of-way lines, whichever is

greater.

- (d) The radius of the driveway shall not encroach on the minimum corner clearance.

(H) **NON-RESIDENTIAL DRIVEWAY STANDARDS**

(1) **Design**

Non-residential driveway access to and from streets shall be constructed in accordance with the standards and specifications provided in the manual, *Policy on Street and Driveway Access to North Carolina Highways*, as adopted and amended by NCDOT.

(2) **Number**

- (a) For any development, the number of driveway access points may be restricted where it is necessary for purposes of decreasing traffic congestion or hazards. These restrictions may include required common access points.
- (b) Approval of driveway access between a lot and the right-of-way at an interval less than those specified by the *Policy on Street and Driveway Access to North Carolina Highways* manual, as adopted and amended by NCDOT, may be granted only by review and recommendation of the Town Engineer and NCDOT.

(3) **Outparcels**

Outparcels shall take access from within the development, where possible.

(I) **CROSS ACCESS CONNECTIONS**

- (1) Internal driveway connections to adjacent existing or future development shall be provided for residential and commercial development, and clearly identified. All driveway connections shall be constructed and stubbed to the property line, and future development of adjacent property shall complete a connection to any existing stub.
- (2) Access easements may be required to ensure outparcels or adjacent developments have adequate access if ownership patterns change.

(J) **SHARED ACCESS**

A shared access easement may be required between adjacent lots fronting on a thoroughfare in order to minimize the total number of access points along those streets and to facilitate traffic flow between lots.

(K) **CLOSURE OR RELOCATION OF EXISTING ACCESS POINTS**

- (1) The Planning Board or Town Council, in conjunction with NCDOT, shall have the authority to require the closure or relocation of existing access points where multiple access points to the site are available.
- (2) The Planning Board or Town Council may approve the closure of driveway access in

those cases where adjoining parcels are subsequently developed with a residential use.

(L) **VISIBILITY AT INTERSECTIONS**

- (1) On a corner lot, nothing shall be erected, placed, planted, or allowed to grow in such a manner as to materially impede vision between a height of 30 inches and ten feet in a triangular area formed by a diagonal line between two points on the right-of-way lines, 20 feet from where they intersect.
- (2) Adequate sight distance should be provided at all driveway access points and shall be in accordance with the standards provided in the manual, *Policy on Street and Driveway Access to North Carolina Highways*, as adopted and amended by the NCDOT.

(M) **THOROUGHFARE OVERLAY DISTRICT**

In addition to the standards set forth in this Section, driveways to be constructed within a Thoroughfare Overlay District are subject to the additional standards set forth in § 155.204(A).

(N) **SIDEWALKS**

- (1) All sidewalks associated with a residential subdivision shall be required as outlined in Article 6 of this chapter.
- (2) All residential and non-residential development projects not associated with a residential subdivision shall be required to install sidewalks and curb-and-gutter along all property lines with road frontage. If there is no existing sidewalk within 300' of the proposed development project, a fee-in-lieu of sidewalk may be accepted.
- (3) If fee-in-lieu of sidewalk is made, an Engineer's estimate for fee-in-lieu shall be provided to the Town's Engineering department for review. Fee-in-lieu shall be paid for sidewalks prior to issuance of building permits.
- (4) Sidewalks shall be installed prior to issuance of a Certificate of Occupancy for the development.

Duly adopted this the 6th day of January, 2020 while in regular session.

Jody McLeod
Mayor

ATTEST:

Kimberly A. Moffett, CMC, NCCMC
Town Cler



Town Council Agenda Cover Sheet

Meeting Date

December 16 2019

Agenda Location

New Business

Item Title

Downtown Mural Program Guidelines & Application

Presenter

Stacy Beard, Public Information Officer

Summary/Description

The Town of Clayton continues to make a name for itself as a community that supports and fosters appreciation of the arts. From its rotating downtown Sculpture Trail program, now 7 years strong, to its partnership with Clayton Visual Arts to fill the lobby of Town Hall with monthly art exhibits, to the annual arts grant, Clayton understands that investing in the arts goes well beyond aesthetics.

One art form gaining popularity is large-scale outdoor murals. Cities and towns across the country are finding that murals can serve to foster tourism, bring better business traffic, increase building occupancy, or eradication of blight. Murals are an investment in a town's unique identity, its cultural cohesiveness and sense of place.

Exploration of a mural program has been ongoing within town staff and town advisory boards for several years. They included research of a rotating mural project, similar to the Sculpture Trail, to the idea for a student-led initiative to paint downtown buildings. Now a set of guidelines and clear processes have been laid out to ensure dynamic, long-lasting, and promotable murals in Clayton's downtown core.

At this meeting, staff is requesting that Town Council appoint the Town of Clayton Public Art Advisory Board (PAAB) with oversight responsibility pertaining to the creation, review and approval of mural requests on privately-owned non-residential buildings in the Economic Development Downtown District using the criteria and processes set forth in the attached guidelines and application. Mural designs on privately-owned buildings in the Town of Clayton would be approved through this Town of Clayton mural approval process. The process is very similar and is a combination of the structures already being used for the Sculpture Trail program and the Downtown Façade Grant program, which include a subcommittee of downtown and community stakeholders, including members of the Downtown Advisory Board, in guiding these improvements to our vibrant downtown.

Requested Action

Approval

Funding Source (If Applicable):

N/A

Cost: N/A Yes ☐ No ☒

Additional Documents to be Included in Agenda Packet

Downtown Mural Program Guidelines & Application



DOWNTOWN MURAL PROGRAM

Eligibility, Guidelines, and Criteria

PURPOSE

Mural projects are an investment in cultural capital that goes far beyond tourism, improved aesthetics, better business traffic, increase in building occupancy, or eradication of blight. Murals are an investment in a town's unique identity, its cultural cohesiveness and sense of place.

Town Council has appointed the Town of Clayton Public Art Advisory Board (PAAB) with oversight responsibility pertaining to the creation, review and approval of mural requests on privately-owned non-residential buildings in the Economic Development Downtown District using the criteria and processes set forth below.

Applications for mural designs on privately-owned buildings in the Town of Clayton must be approved through the Town of Clayton mural application approval process.

DEFINITION OF MURAL

Any mosaic, painting, or graphic art or combination thereof which is applied to a building and not interpreted to be advertising by the Planning Director or their designee. Murals that contain any brand name, product name, letters of the alphabet spelling or abbreviating the name of any product, company, profession, or business, or any logo, trademark, trade name, or other commercial message are considered advertising signs and must meet the requirements of the Town of Clayton's Unified Development Code.

ELIGIBILITY

- 1) The applicant must be the owner/tenant of a building/property located within the boundaries of the mural program, which is identified as the "Downtown Core" on the Town's adopted Future Land Use Map.
- 2) If the applicant is a tenant, they must have the owner's written permission with the application.
- 3) The property shall be classified as non-residential in Zoning and Use.

GUIDELINES

- 1) Improvements must conform to the Town of Clayton's Unified Development Code, North Carolina Building Code and other applicable plans and policies of the Town.
- 2) Murals may not detract from the architectural integrity and historic character of the primary facades of the building.
- 3) Theme / Design Criteria:
 - a. Murals must reflect the character, culture and/or history of Downtown Clayton;
 - b. Appropriate thematic and other relationships to the surrounding environment;
 - c. Readability and appropriateness of scale; and

- d. Content: No signage or subject matter that could be construed as advertising or political messages.
- 4) The building owner agrees to allow images and video of the completed murals to be placed on the Town of Clayton's web pages, social media, publications/videos and local media.

CRITERIA

- 1) The property owner must agree to complete the work within one calendar year from the date of approval and that all work is completed according to state and local building codes and ordinances, and approved, when necessary, by the proper authorities.
- 2) The property owner must agree to maintain the mural improvements set forth in the application. Owner maintenance includes but is not limited to not painting over, destroying, obscuring, or altering the mural. This provision may be waived if the building owner can demonstrate a hardship which requires the removal of the mural.
- 3) Once the mural is complete, an anti-graffiti coating shall be applied to protect it.
- 4) The artist and building owner must sign a contractual agreement regarding a waiver of proprietary rights and maintenance responsibilities of the mural during its lifetime. Maintenance shall include but is not limited to re-painting/touch-up painting to keep the art looking current and not faded, as determined by the Public Art Advisory Board.
- 5) The building owner must show the consent of adjacent property owners who face the wall or facade on which the mural will be displayed.

APPLICATION PROCESS

- 1) Applicant will complete the application, including mural plans/sketches and cost estimate.
- 2) Applications or questions shall be submitted to the Town of Clayton Economic Development Specialist at 919-359-9349 or info@TownofClaytonNC.org
- 3) Application review will include town staff and the Public Art Advisory Board. The Board will form a mural committee comprised of any one member of the Clayton Downtown Development Association, two members of the Public Art Advisory Board, one Clayton Downtown District Business owner, a representative from the Chamber of Commerce, and two members of the local art community. Their recommendation will then be presented to Town Council.
- 4) A notification letter will be sent to applicants concerning the approval or denial of the application within 45 days of receipt of a completed application.
- 5) An approval letter must be received **BEFORE** the mural is installed, at which time Economic Development staff will inspect completed work to verify installation is in accordance with the approval and program guidelines.



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

DOWNTOWN MURAL APPLICATION

The Mural Program is designed to enhance Downtown Clayton's unique identity and cultural cohesiveness.

PROJECT INFORMATION:

Name of Project: _____

Building Address: _____ Parcel Tag #: _____

Project Description (use additional sheets if needed
and include mural plans/sketches): _____

APPLICANT INFORMATION

Applicant: _____

I am the: ☐ Property Owner ☐ Tenant

Mailing Address: _____

Phone Number: _____ Fax: _____

Contact Person: _____

Email Address: _____

Length of Time at Address: _____ Length of Time
Remaining on Lease: _____

FOR OFFICE USE ONLY

Date Received: _____ Amount Paid: (no fee required) File Number: _____

PROPERTY OWNER INFORMATION

Name: _____

Mailing Address: _____

Phone Number: _____ Fax: _____

Email Address: _____

REQUIRED INFORMATION (to be submitted with the application)

The following items must accompany this application.

To be completed by the applicant:	Please Initial Below if complete or to indicate concurrence
1. A pre-application conference was held with Economic Development. Date: _____	
2. I understand <i>before</i> any work is begun on the project that this application <i>must</i> be reviewed and <i>approved</i> .	
3. Project plans, specifications, sketches, sizing, or other appropriate design information.	
4. I have read the attached information regarding purpose, eligibility, and process, and my project meets all criteria.	
5. Photograph(s) of existing conditions of the property.	
6. Samples of paint and material colors to be used for the mural.	
7. Cost estimates for the project.	
8. Owner's Consent Form (<i>required if applicant is not the property owner</i>).	
9. I understand I must receive all applicable permits, such as Zoning Compliance Permit, Sign Permit, and Building Permit, prior to beginning work.	
10. I understand the work must be completed within one calendar year from the date of approval and that all work is completed according to state and local building codes and ordinances, and approved, when necessary, by the proper authorities.	
11. I understand that I am responsible for the ongoing maintenance of improvements described here from the date of project completion or until such time as the building is sold.	
12. I acknowledge that the Town and PAAB are obligated only to administer the program procedures and are not liable to the applicant, owner or third parties for any obligations or claims of any nature growing out of, arising out of or otherwise related to the project or application undertaken by the applicant and/or owner. There is no principal/agent or employer/employee relationship between the Town, the PAAB, and the applicant and/or owner.	

APPLICANT / PROPERTY OWNER SIGNATURES

Applicant's Name (Print Name)

Signature of Applicant

Date

Property Owner's Name (Print)

Signature of Property Owner

Date

Please return completed application to the Town of Clayton, Attn. Economic Development, PO Box 879, Clayton, NC 27528, or in person at the Economic Development office at 111 E. 2nd St, Clayton NC 27520.

STAFF REVIEW *(the applicant should leave this section blank)*

This application has been reviewed by the following:

Economic Development Staff:

Name (print)

Signature

Date

Comments/Conditions:

Planning Department: Zoning Compliance Review (if applicable):

Name (print)

Signature

Date

Comments/Conditions:

Building Department: Inspector Review (if applicable):

Name (print)

Signature

Date

Comments/Conditions:

Public Art Advisory Board:

Committee Review:

Date

☐

Approved

☐

Denied

Comments/Conditions:



**Town of Clayton
Economic Development Department**

111 E. Second Street, Clayton, NC 27520

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: _____ **Address or PIN #:** _____

AGENT/APPLICANT INFORMATION:

(Name - type, print clearly)

(Address)

(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*):

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:

(Name - type, print clearly)

(Address)

(Owner's Signature)

(City, State, Zip)

STATE OF _____

COUNTY OF _____

Sworn and subscribed before me _____, a Notary Public for the above State and County, this
the _____ day of _____, 20____.

SEAL

Notary Public

My Commission Expires: _____



Town Council Agenda Cover Sheet

Meeting Date

January 6, 2020

Agenda Location

New Business

Item Title

Fire Advisory Board Recommendations

Presenter

Kimberly Moffett, Town Clerk

Summary/Description

Recommendations for appointments to vacancies on the Fire Advisory Board are submitted for your consideration and approval. All board vacancies were advertised and applications received. The attached chart indicates name of recommended appointee as well as term expirations.

Requested Action

Approval

Funding Source (If Applicable):

N/A

Cost: N/A Yes ☐ No ☒

Additional Documents to be Included in Agenda Packet

Recommendation Chart

Applications

Meeting Timeline

Click or tap here to enter text.

2020 Appointment Recommendations for Volunteer Advisory Boards

BOARD	POSITION NUMBER	RECOMMENDED APPOINTEE NAME	APPOINTMENT TYPE	RESIDENCY	TERM EXPIRATION
Fire Advisory Board	FD5	Matt Sutphin	Re-Appointment	Fire Dept.	12/31/2020
Fire Advisory Board	FD6	Karen Patterson	Re-Appointment	Resident	12/31/2020

M TION 2022 2023

2019 Appointment Recommendations for Volunteer Advisory Boards

BOARD	POSITION NUMBER	RECOMMENDED APPOINTEE NAME	APPOINTMENT TYPE	RESIDENCY	TERM EXPIRATION
Library Advisory Board	LA7	Vanessa Flores-Watson	New-Appointment	In-Town	12/31/2022
Library Advisory Board	LA8	Laurie Lee	Re-Appointment	In-Town	12/31/2022
Planning Board	PB6	Travis Avery*	New-Appointment	In-Town	12/31/2021
Planning Board	PB7	Andria Merritt	Re-Appointment	In-Town	12/31/2022
Planning Board	PB9	Brian Tiede	New-Appointment	ETJ	12/31/2022

* - Filling Unexpired Term



Clerk's Office Use	
Date Rec'd:	8/27/19
Town/ETJ:	In/Town Fire Dept.

ADVISORY BOARD CANDIDATE APPLICATION

The Town of Clayton welcomes and appreciates your interest in serving the Town. This application is designed to gather information to evaluate your qualifications. Candidates may be interviewed prior to appointment.

If requesting consideration for more than one board, please submit a separate application for each board.

CHOOSE ONE:

- | | |
|---|--|
| ☐ Planning Board | ☐ Library Advisory Board |
| ☐ Downtown Development Association | ☒ Fire Department Advisory Board |
| ☐ Recreation Advisory Committee | ☐ Public Arts Advisory Board |

PLEASE NOTE: In accordance with North Carolina law, this application is a public record and will be disclosed upon request without notice. If there is any information you do not want released to the public, please do not include it.

Please type or print using dark ink.

Name: Matthew Sutphin

Mailing Address: 337 S. Fayetteville St. Clayton 27320

Physical HOME Address: 11

Phone Number (HOME): N/A (WORK) 919-553-1520

FAX Number: N/A Mobile Number: 919-422-4925

Email Address: msutphin@townofclaytonnc.org

☐ Female* ☒ Male*

Employer: TOC

Occupation: Firefighter

*This information is voluntary and is requested for the sole purpose of assuring that a cross section of the community is appointed; NCGS 143-157.1

Residency within the Town limits or ETJ (extra territorial jurisdiction) is required for membership on **most** Council advisory boards.

Length of residence in Clayton: 2012

Do you live in **Clayton Corporate Limits**: ☒ Yes ☐ No **ETJ**: ☐ Yes ☐ No

How did you find out about this board?

☐ Facebook ☐ Website ☐ Newspaper ☐ Twitter
☐ TV ☐ Friend ☐ Email ☐ Other

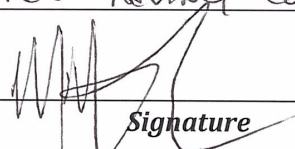
Outline your qualifications and why you wish to serve on the board you indicated:

State why you believe you would be an asset to this board:

Do you anticipate a conflict of interest if asked to serve as a member of the requested board:

☒ No ☐ Yes *If Yes, please explain:*

Please list any current or previous service to the community, civic organizations, activities and any special talents:

Boards/Civic Organization/Talents	From	To
JC Firefighter Assoc. (President)		
Clayton FD Advisory Board (Chair)		
LGFCU Advisory Council (Board Member)		
 Signature		8/26/19 Date

- Please do not submit resumes or attachments.
- This application is a PUBLIC RECORD.
- Information contained in the application will be considered when making appointments.
- Candidates may be interviewed prior to appointment.
- If not initially appointed to serve, applications will remain active for one year from date of receipt.

Applications should be submitted to the Town Clerk in person at 111 East Second Street, by mail at Town of Clayton, PO Box 879, Clayton, NC 27528 or via email at kmoffett@townofclaytonnc.org



Clerk's Office Use

Date Rec'd: _____

Town/ETJ: _____

ADVISORY BOARD CANDIDATE APPLICATION

The Town of Clayton welcomes and appreciates your interest in serving the Town. This application is designed to gather information to evaluate your qualifications. Candidates may be interviewed prior to appointment.

If requesting consideration for more than one board, please submit a separate application for each board.

CHOOSE ONE:

☐ Planning Board

☐ Library Advisory Board

☐ Downtown Development Association

☒ Fire Department Advisory Board

☐ Recreation Advisory Committee

☐ Public Arts Advisory Board

PLEASE NOTE: In accordance with North Carolina law, this application is a public record and will be disclosed upon request without notice. If there is any information you do not want released to the public, please do not include it.

Please type or print using dark ink.

Name: Karen Patterson

Mailing Address: 117 Penny Street, Clayton

Physical HOME Address: same as above

Phone Number ^{Cell} (HOME): 919-810-7727 (WORK) NA

FAX Number: NA Mobile Number: _____

Email Address: Karen.F.Patterson@gmail.com

☒ Female*

☐ Male*

Employer: NC Forest Service (Rtr.), US Forest Serv., N.C. Dept. of Public Safety

Occupation: Incident Business Mang., Finance Sect. Chief, Safety Coordinator

*This information is voluntary and is requested for the sole purpose of assuring that a cross section of the community is appointed; NCGS 143-157.1

Residency within the Town limits or ETJ (extra territorial jurisdiction) is required for membership on **most** Council advisory boards.

Length of residence in Clayton: 35 yrs.

Do you live in **Clayton Corporate Limits**: ☒ Yes ☐ No **ETJ**: ☐ Yes ☐ No

How did you find out about this board?

☐ Facebook ☐ Website ☐ Newspaper ☐ Twitter
☐ TV ☐ Friend ☐ Email ☒ Other

Outline your qualifications and why you wish to serve on the board you indicated:

Current and previous job experience gives me the ability to communicate and coordinate with multiple agencies and staff members most specifically in the areas of operations, incident

State why you believe you would be an asset to this board: Command and disaster response.

I am excited about plans to combine the police dept. and fire dept., making this a joint emergency services board. Safety and welfare are paramount to our citizens. Serving on this board allows me to support and advocate for the agencies

Do you anticipate a conflict of interest if asked to serve as a member of the requested board: that provide these services

☒ No ☐ Yes If Yes, please explain:

Please list any current or previous service to the community, civic organizations, activities and any special talents:

Boards/Civic Organization/Talents	From	To
<u>Fire Dept. Advisory Board</u>	<u>May, 2008</u>	<u>present</u>
<u>SECU Advisory Board</u>	<u>Jan., 2016</u>	<u>present</u>
<u>Southern Area Incident Mang. Team</u>	<u>2007</u>	<u>present</u>


Signature

9/23/19
Date

- Please do not submit resumes or attachments.
- This application is a PUBLIC RECORD.
- Information contained in the application will be considered when making appointments.
- Candidates may be interviewed prior to appointment.
- If not initially appointed to serve, applications will remain active for one year from date of receipt.

Applications should be submitted to the Town Clerk in person at 111 East Second Street, by mail at Town of Clayton, PO Box 879, Clayton, NC 27528 or via email at kmoffett@townofclaytonnc.org



Town Council Agenda Cover Sheet

Meeting Date

January 6, 2020

Agenda Location

New Business

Item Title

Capital Project Budget Ordinances

Presenter

Robert McKie, Finance Director

Summary/Description

The Finance Director will present two capital project budget ordinances for replacement of the Little Creek Outfall sewer line due to degradation and flow limitations and to extend the Walnut Creek sanitary sewer line to facilitate growth.

Requested Action

Approval

Funding Source (If Applicable):

Little Creek - CWSRF Loan; Walnut Creek – Pay Go

Cost: N/A **Yes** ☒ **No** ☐

Additional Documents to be Included in Agenda Packet

Little Creek Outfall Sewer Line Capital Project Budget Ordinance

Walnut Creek Sanitary Sewer Extension Capital Project Budget Ordinance

Meeting Timeline

Click or tap here to enter text.

**TOWN OF CLAYTON
LITTLE CREEK OUTFALL SEWER LINE
CAPITAL PROJECT BUDGET ORDINANCE**

BE IT HEREBY ADOPTED BY THE TOWN COUNCIL FOR THE TOWN OF CLAYTON that the following ordinance shall be established to replace the Little Creek Outfall sewer line due to line degradation and flow limitations:

Revenues

<u>Line Item</u>	<u>Description</u>	<u>Amount</u>
642-49 81	Due from Water & Sewer Fund	\$1,928,750
	Total	\$1,928,750

Expenditures

<u>Line Item</u>	<u>Description</u>	<u>Amount</u>
642-56 00	Professional Services	\$123,000
642-58 31	Sewer Line Improvements	\$1,420,000
642-58 99	Contingency	\$385,750
	Total	\$1,928,750

Duly adopted this 6th day of January, 2020 while in regular session.

Jody L. McLeod
Mayor

Attest:

Kimberly A. Moffett, CMC, NCCMC
Town Clerk

**TOWN OF CLAYTON
WALNUT CREEK SANITARY SEWER EXTENSION
CAPITAL PROJECT BUDGET ORDINANCE**

BE IT HEREBY ADOPTED BY THE TOWN COUNCIL FOR THE TOWN OF CLAYTON that the following ordinance shall be established to abandon the existing lift station and extend the sanitary sewer line to facilitate growth:

Revenues

<u>Line Item</u>	<u>Description</u>	<u>Amount</u>
643-48 05	Finance Capital	\$5,688,875
	Total	\$5,688,875

Expenditures

<u>Line Item</u>	<u>Description</u>	<u>Amount</u>
643-56 00	Professional Services	\$451,100
643-58 31	Sewer Line Improvements	\$4,100,000
643-58 99	Contingency	\$1,137,775
	Total	\$5,688,875

Duly adopted this 6th day of January, 2020 while in regular session.

Jody L. McLeod
Mayor

Attest:

Kimberly A. Moffett, CMC, NCCMC
Town Clerk