



STAFF REPORT

1414 CARPENTER FLETCHER RD. RECREATIONAL OPEN SPACE VARIANCE

B2500018

Meeting Date: August 26, 2025

| | | | |
|-----------------------------|--|---|---------------|
| Reference Name | 1414 Carpenter Fletcher Rd. Recreational Open Space (Case B2500018) | Jurisdiction | City |
| Request | A request for a variance from the recreational open space requirements | | |
| Site Characteristics | Tier | Suburban | |
| | Zoning District | Residential Suburban-Multifamily (RS-M) | |
| | Overlays | Major Transportation Corridor I-40 (MTC I-40) | |
| | Site Acreage | 17.33 | |
| Applicant | Katie Hamilton | Submittal Date | June 30, 2025 |
| Location | 1414 Carpenter Fletcher Road, 1408 Carpenter Fletcher Road, 1406 Carpenter Fletcher Road, 4310 NC 55 Highway | | |
| REID(s) | 155117, 155122, 155123, 154210 | | |
| Place Type | Transit Opportunity Area, Recreation & Open Space | | |

1. Summary

Katie Hamilton, on behalf of the property owner, requests a variance from Unified Development Ordinance (UDO) Paragraph 7.2.3A for a proposed project at 1414 Carpenter Fletcher Road, 1408 Carpenter Fletcher Road, 1406 Carpenter Fletcher Road, and 4310 NC 55 Highway. The properties are undeveloped and a site plan currently under review, D2400010, proposes construction of a 200-unit apartment complex, including 31 affordable housing units. UDO Paragraph 6.3.1A.1 requires that residential developments in a Residential Suburban-Multifamily (RS-M) zoning district provide a minimum 18% of their total acreage as open space. UDO Paragraph 7.2.3A further stipulates that at least one-third of the total required open space shall consist of recreational open space, which is developed with fixed improvements for recreational purposes. The current iteration of the site plan (see *Attachment E – Site Plan D2400010*) provides significant open space and proposes development of the required recreational open space in the form of a dog park and ADA-compliant all-weather trails. The site is significantly encumbered by wetlands and floodplains (approximately 85%) and thus, by necessity, the proposed recreational open space areas are designed in those encumbered areas. This proposed development project is reliant on financing through the U.S. Department of Housing and Urban Development (HUD), which has informed the applicant that any disturbance or

improvement within the floodplain beyond those considered “de minimis” will preclude the availability of funding for the project. Thus, to maintain that funding source, the applicant seeks relief from the requirement of providing recreational open space. UDO Paragraph 7.2.2A lays out exempting conditions of certain residential developments that allow an applicant to provide to the City with payment in lieu of required open space, however the proposed plan does not fall into any of the listed exceptions.

The properties are in a RS-M zoning district, a Major Transportation Corridor I-40 (MTC I-40) Overlay, within the Suburban development tier, and the Transit Opportunity Area and Recreation & Open Space Place Types.

2. Summary of Issues

The proposed project appears to meet most of the four findings of fact that are required for the Board to approve the variance. Witness testimony and board discussion during the public hearing may provide additional evidence to support or oppose the four findings of fact.

Recommended Conditions of Approval

1. The improvements shall be substantially consistent with the plans and all information submitted to the Board as part of the application.

3. Variance Requirements for Approval: UDO Section 3.14

The Board of Adjustment may vary certain requirements of this Ordinance, in harmony with the general purpose of these regulations, where special conditions applicable to the property in question would make the strict enforcement of the regulations impractical or result in a hardship in making reasonable use of the property.

UDO Paragraph 3.14.8 establishes the findings listed below that the Board of Adjustment must make in granting any variance.

- A. *Unnecessary hardship would result from the strict application of the Ordinance. It shall not be necessary to demonstrate that, in the absence of the variance, no reasonable use can be made of the property.***

Staff Analysis. The proposed project relies on the recombination of four lots to efficiently use the limited buildable area that exists outside of the floodplain, and to preserve the floodplain by utilizing it for open space and tree preservation requirements. A strict application of the ordinance would not prevent any development occurring but would severely restrict what is possible and result in unnecessary hardship for the applicant and property owner. Any residential development project here would be required to meet the same open space standards required by the UDO and would be met with the same constraints of the floodplain. As the application materials note, the soil conditions on the buildable portions of the property are such that significant engineering is required to construct anything. The combination of these two circumstances suggests that any development here would rely on a similar lot recombination and that only a project of sufficient scale can be expected to realistically make the required engineering effort, likely precluding the use of this property for lower intensity residential development. In addition, the unavailability of the payment in lieu option presents additional hardship for this project simply because it does not fall within the defined exceptions.

- B. *The hardship results from conditions that are peculiar to the property, such as location, size, or topography. Hardships resulting from personal circumstances, as well as hardships resulting***

from conditions that are common to the neighborhood or the general public, may not be the basis for granting a variance.

Staff Analysis. The hardship results partially from the specific HUD policies that preclude funding for projects proposing development or improvements (beyond those considered “de minimis”) within the floodplain. This is not peculiar to the property as HUD applies the same criteria regardless of project location. However, the hardship in this case also results from the significant degree to which the property is encumbered by floodplain and wetlands—the largest of the four parcels is >99% covered by floodplain. Overall, approximately 85% of the 17.3-acre site is within the floodplain. And while floodplain encumbrance is common in the general vicinity, most of the surrounding properties that are similarly affected were developed many years or even decades ago, under different floodplain regulations.

- C. *The hardship did not result from actions taken by the applicant or the property owner. The act of purchasing property with knowledge that circumstances exist that may justify granting a variance shall not be regarded as a self-created hardship.***

Staff Analysis. The hardship results partially from action taken by the applicant. The decision to pursue HUD funding that disallows floodplain improvements is self-imposed, and other sources of project funding might come without the same restrictions and allow approved recreational open space improvements in the floodplain. On the other hand, the existence of such extensive floodplains and wetlands on the property is not the result of any action taken by the applicant or property owner.

- D. *The requested variance is consistent with the spirit, purpose, and intent of the Ordinance, such that public safety is secured, and substantial justice achieved.***

Staff Analysis. The intent of the Unified Development Ordinance is to promote the health, safety, and general welfare of the residents of the City and County of Durham. In this spirit, the Ordinance provides development standards and, when necessary, aims to prescribe uniformity for specific types of development. The open space and recreational open space requirements in the UDO are written with the intent of providing accessible natural and recreational open spaces to all residents of Durham that facilitate environmental protection and provide social amenities. These open spaces are meant to be established as undeveloped properties are developed and not providing them is in general a disservice to the community. However, the requested variance is in keeping with spirit of the UDO and the adopted comprehensive plan. While the variance seeks relief from providing much of the outdoor recreational open space, the proposed plan still includes ~11,000 sq ft (or ~25% of the 45,182 sq ft total recreational open space required) of recreational open space in the form of a courtyard and an indoor amenity center. In general, the applicant proposes to provide significantly more open space than is required (28% of the total site instead of the required 18%). And in further support of the public recreational goals of Durham, the applicant proposes to provide a public access easement for the North Prong Creek greenway trail. Additionally, the proposed plan involves building much needed housing—including affordable housing and medium-density options—near major transit corridors in the Suburban development tier of the City, which is expected to receive the most growth over the coming decades (UDO Paragraph 4.1.2A.2). The Residential Suburban-Multifamily zoning districts allow for denser multi-family residential development, nearby to civic, commercial or employment uses. The proposed development is near the Research Triangle Park and the employment-heavy areas around it. Moreover, the designated Transit Oriented Development Place Type seeks development that provides affordable housing, facilitates non-

automotive lifestyles via close access to public bus routes and basic amenities, and is integrated with green spaces. All of these goals are largely achieved in the proposed site plan and would not be possible to the same degree if the applicant were required to provide the recreational open space on the portions of the property that are outside of the floodplain.

4. Notification

Staff certifies that letters have been sent to property owners and residents within 600 feet of the site and the posting of a sign on the property has been carried out in accordance with UDO Paragraph 3.2.5. In addition, email notice was provided per the Durham Planning and Development Public Notification Service.

5. Staff Contact

Michael Everhart, 919-560-4137, ext. 28285, or Michael.Everhart@DurhamNC.gov

6. Attachments

Attachment A – Context Map

Attachment B – Aerial Map

Attachment C – Place Type Map

Attachment D – Application

Attachment E – Site Plan D2400010

7. Possible Motion

I hereby make a motion that case number **B2500018, an application for a variance from recreational open space standards**, on property located at **1414 Carpenter Fletcher Rd, 1408 Carpenter Fletcher Road, 1406 Carpenter Fletcher Road, and 4310 NC 55 Hwy**, has successfully met the applicable requirements of the Unified Development Ordinance and is hereby granted subject to the following conditions:

1. The improvements shall be substantially consistent with the plans and all information submitted to the Board as part of the application.



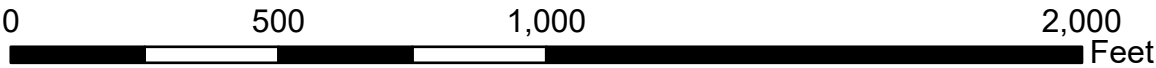
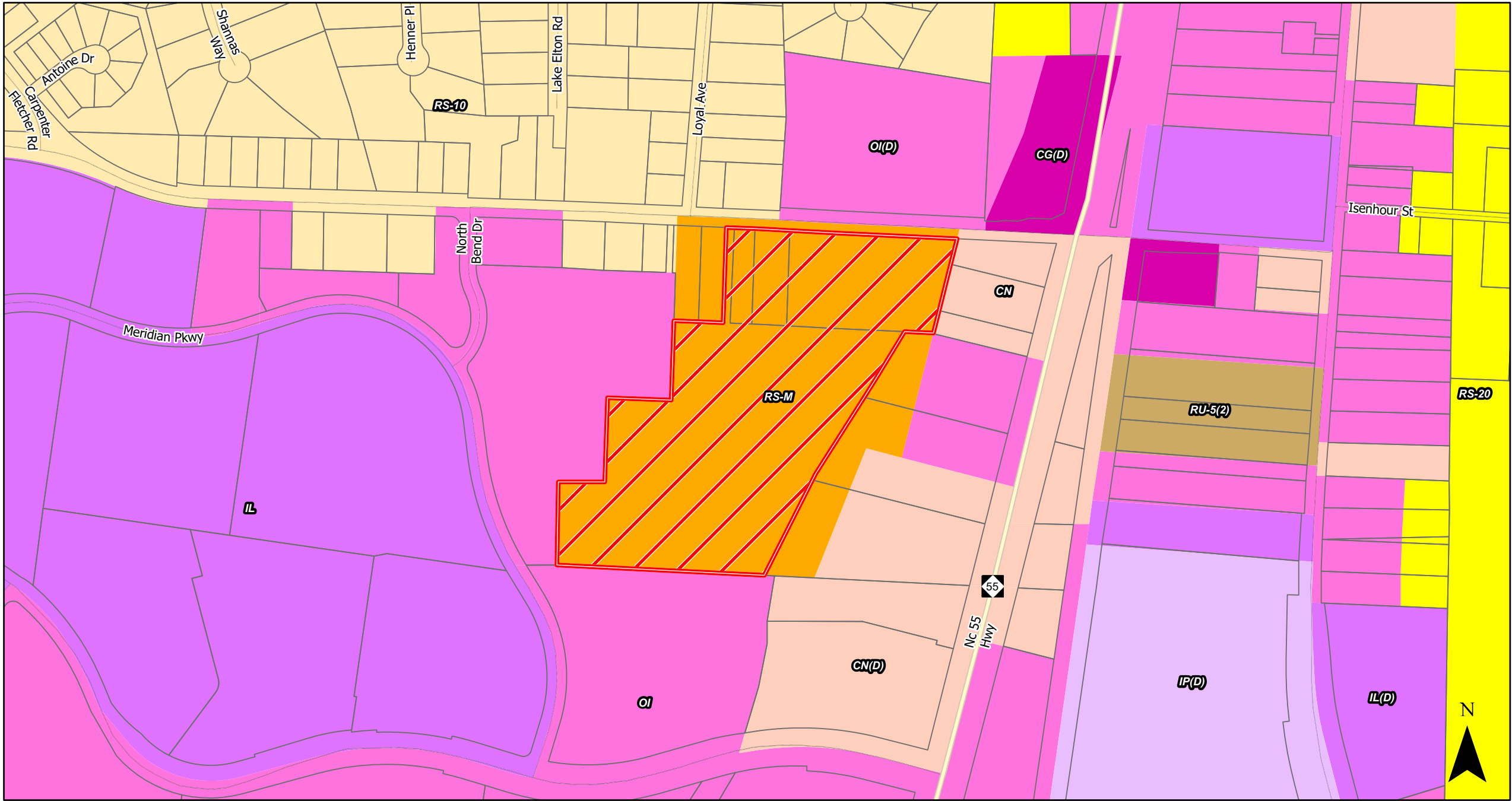
Planning

Attachment A: Zoning Context Map

B2500018 - 1414 Carpenter Fletcher Rd Recreational Open Space Variance

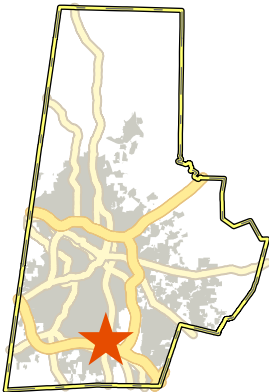
- Legend:
- B2500018
 - Parcels
 - City of Durham
 - Durham Zoning
 - RS-20
 - RS-10
 - RS-M
 - RU-5(2)
 - CN
 - OI
 - CG
 - IL
 - IP

Existing: Residential Suburban - Multifamily (RS-M)






Durham City-County Planning Department
July 10, 2025

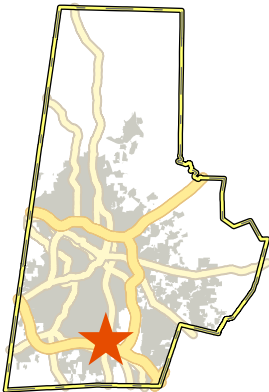
Maps, tabular data, and spatial information presented are developed from public records. While efforts have been made to use the most current and accurate public record data, no warranties as to the accuracy of the data provided are being made by the City of Durham, the County of Durham, and the mapping and software companies involved. Users of this content should consult public information sources to verify the accuracy of the data provided.



Attachment B: Aerial Map

B2500018 - 1414 Carpenter Fletcher Rd Recreational Open Space Variance

- Legend:
-  B2500018
 -  Parcels
 -  City of Durham



Durham City-County Planning Department
July 10, 2025

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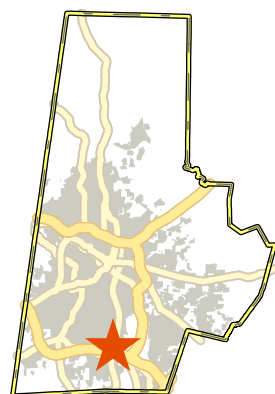
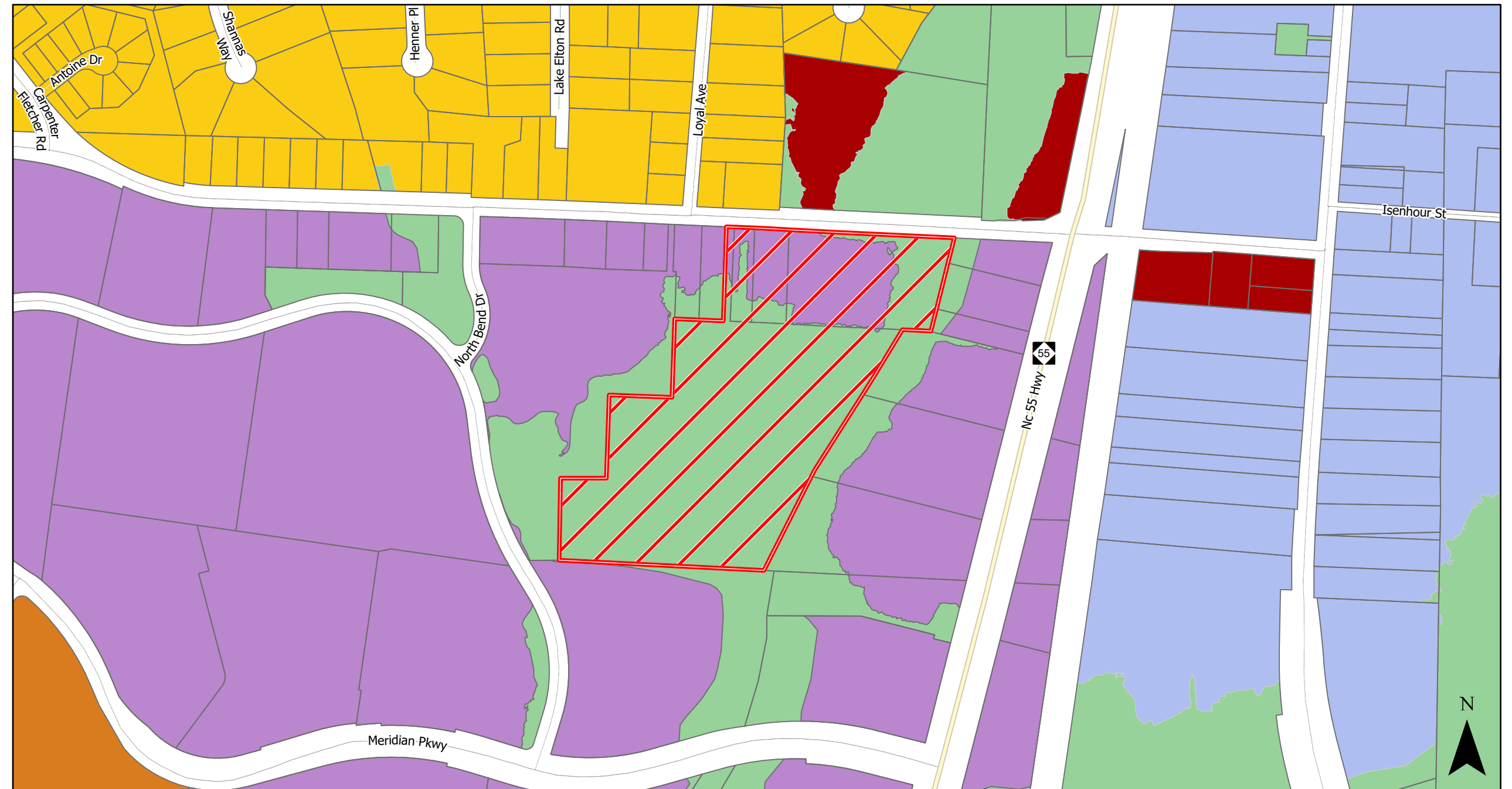
Attachment C: Place Type Map

B2500018 - 1414 Carpenter Fletcher Rd Recreational Open Space Variance

Legend:

- B2500018
- Parcels
- City of Durham
- Place Types**
- Apartment & Townhouse Neighborhood
- Established Residential
- General Industrial
- Neighborhood Services
- Recreation & Open Space
- Transit Opportunity Area

Existing: Transit Opportunity Area and Recreation & Open Space



0 500 1,000 2,000 Feet

Durham City-County Planning Department
July 10, 2025

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Minor Special Use Permit (mSUP), Variance, and Reasonable Accommodation Application

City-County Planning Department

Download and open PDF document file before entering information

Planning

Application Guide and Submittal Portal: <https://durhamnc.gov/5007>

Application Questions: BOA@DurhamNC.gov | 919-560-4137

PROJECT INFORMATION:

| | |
|--|--|
| Application Type: <input type="checkbox"/> mSUP <input checked="" type="checkbox"/> Variance <input type="checkbox"/> Reasonable Accommodation | |
| Site Address: 1414 Carpenter Fletcher Rd | Total Site Area (in acres): 17.287 |
| Zoning District(s): RS-M | Zoning Overlay(s): MTC(I-40) |
| Jurisdiction: <input checked="" type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Both | Development Tier(s): Suburban |
| REID(s): 155117, 155122, 155123, 154210 | Associated Site Plan Case Number: D2400010 |
| Current Use(s): Vacant | Proposed Use(s): Multifamily |

APPLICATION REQUIREMENTS (INCLUDE LIST NUMBER IN ATTACHMENT NAME WITH SUBMITTAL)

This application is a form of written testimony and is used to provide evidence that the required findings for approval can be made. The applicant has the burden of proof and must provide sufficient evidence in order for the required findings to be made. All submitted information and documents may be used during the public hearing.

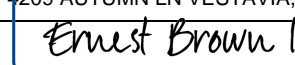

ALL EVIDENCE PRESENTED IN RELATION TO EFFECT ON REAL ESTATE VALUE AND/OR TRAFFIC IMPACTS SHOULD BE PROVIDED BY EXPERT WITNESSES. EVIDENCE PRESENTED BY NON-EXPERT WITNESSES CANNOT BE RELIED UPON BY THE BOARD. G.S 160D-1402



NOTE: Attendance at the Board of Adjustment hearing is required. Applicants may represent themselves or may be represented by someone appropriate for quasi-judicial public hearings. Decisions can be appealed to Superior Court within 30 days.

| | |
|---|--|
| 1. Documentation of the Pre-submittal Meeting (Required) | 4. Floor Plan, Elevations, and Plot Plan or Site Plan, as applicable |
| 2. Payment Receipts | (Additional supporting documents may be requested by the Case Planner and/or may be provided by the applicant) |
| 3. For mSUPs: Responses to General Findings and Review Factors (UDO Section 3.9.8A and B), Additional Findings and/or Review Factors (if applicable), and Responses to Limited Use Standards (if applicable) <u>For Variances:</u> Responses to General Findings and Review Factors (UDO Section 3.14.8) <u>For Reasonable Accommodations:</u> Responses to General Findings (UDO Section 3.24) | |

ACKNOWLEDGEMENTS AND PETITIONS

I, the undersigned, acknowledge that the application is complete and that all information included is accurate to the best of my knowledge. Applications are considered accepted only after they have been determined to be complete according to paragraph 3.2.4 of the Unified Development Ordinance, not upon submission.

| | Owner | Applicant | Agent (if applicable) |
|--------------------|---|---|-----------------------|
| Name: | Ernest Brown | Katie Hamilton | I |
| Firm: | NC DURHAM 1414 CARPENTER FLETCHER RD LLC | Infinite Tide Design PLLC | |
| Phone: | 205.586.3062 | 704.796.6002 | |
| Email: | ebrown@ebcapitalpartners.com | infinite_tide_design@gmail.com | |
| Address: | 4209 AUTUMN LN VESTAVIA, AL 35243 | 109 Carmel Woods Ct, Wake Forest | |
| Digital Signature: |  |  | |
| Date Signed: | 56056B87D3A24DA... 6/26/2025 | 6.25.2025 | |

| | |
|---------------------------------------|---|
| <u>All applications:</u> | <p>In granting a Minor Special Use Permit, Variance, or Reasonable Accommodation request, the Board of Adjustment may prescribe reasonable and appropriate conditions provided that the conditions are reasonably related to the request. The conditions shall become part of the approval. Violations of any of the conditions shall be treated in the same manner as other violations of the Ordinance.</p> <p>The Board of Adjustment may prescribe whether a reasonable accommodation is granted to the applicant or shall be allowed to pass with transfer of property.</p> <p>Furthermore, Special Use Permits and Variances shall become null and void in any of the following cases (Section 3.9.14 or 3.14.8 of the UDO):</p> <p>A. If a site plan or architectural review, as applicable, is not approved within 12 months of the date of permit approval.</p> <p>B. If an approved site plan, architectural review application, or building permit expires.</p> <p>C. If a building permit is not issued within two years of the date of approval, in cases where a corresponding site plan or architectural review is not required. In the case of a Variance, also if the Ordinance standard subject to the variance has been amended prior to the issuance of a building permit.</p> <p>D. If a substantial violation of the conditions of the permit, as determined by the Planning Director or designee occurs. The addition of language to the special use permit regarding such voiding shall not be required.</p> <p>Digital Signature:  Date Signed: 6/25/25</p> |
| <u>For mSUPs:</u> | <p>I, _____, hereby petition the Durham Board of Adjustment for a Minor Special Use Permit to allow use of the property as described in material submitted with this request.</p> <p>Digital Signature: _____ Date Signed: _____</p> |
| <u>For Variances:</u> | <p>I, <u>Katie Hamilton</u>, hereby petition the Durham Board of Adjustment for a Variance from the literal provisions cited to allow use of the property as described in material submitted with this request.</p> <p>Digital Signature:  Date Signed: 6/25/25</p> |
| <u>For Reasonable Accommodations:</u> | <p>I, _____, do hereby petition the City of Durham/County of Durham for a Reasonable Accommodation to the Unified Development Ordinance provisions described in material submitted with this request to allow use of the property also as described in this request.</p> <p>Digital Signature: _____ Date Signed: _____</p> |

RESPONSES REQUIRED (PLACE RESPONSES IN A SEPARATE WORD DOCUMENT FOR SUBMITTAL)

| | |
|--|--|
| Minor Special Use Permit Responses: | <ol style="list-style-type: none"> Ordinance provision(s) that require and mSUP for this project What is proposed? <p>General Findings: Applications for minor special use permits shall be approved only if the Board of Adjustment finds that the use as proposed, or the use as proposed with conditions, is:</p> <ol style="list-style-type: none"> In harmony with the area and not substantially injurious to the value of properties in the general vicinity; In conformance with all special requirements applicable to the use; Will not adversely affect the health or safety of the public; and Will adequately address the review factors identified below <p>Review Factors: The applicant shall demonstrate that the review factors listed below have been adequately addressed:</p> <ol style="list-style-type: none"> Circulation: Number and location of access points to the property and the proposed structures and uses, with particular reference to automotive, bicycle, mass transit and pedestrian safety and convenience, traffic flow and control, and access in case of fire or catastrophe. Parking and Loading: Location of off-street parking and loading areas. Service Entrances and Areas: Locations of refuse and service areas with particular reference to ingress and egress of service vehicles. Lighting: Locations of exterior lighting with reference to glare, traffic safety, economic effect and compatibility with other property in the area. |
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| | <ol style="list-style-type: none"> 5. Signs: Appropriateness of signs considering location, color, height, size, and design within the context of other property in the area. 6. Utilities: Location and availability of utilities. 7. Open Spaces: Location of required yards and other open spaces and preservation of existing trees and other natural features 8. Environmental Protection: Preservation of tree coverage, Durham Inventory Sites, floodplain, stream buffers, wetlands, steep slopes, open space, and other natural features, and protection of water quality. 9. Screening, Buffering, and Landscaping: Installation of screening, buffering, fencing, and landscaping where necessary to protect adjacent property. 10. Effect on Adjacent Property: Effects of the proposed use on nearby properties, including, but not limited to, the effects of noise, odor, lighting, and traffic. 11. Compatibility: The level of general compatibility with nearby properties and impacted neighborhoods, including but not limited to the appropriateness of the scale, design, and use in relationship to other properties. 12. Consistency with Policy: Consistency with the Comprehensive Plan and applicable development tier guidelines, overlay purposes, and zoning district intent statements in Article 4, Zoning Districts. 13. Other Factors: Any other factors that the approving authority considers to be appropriate to the property in question. <p>Also address Limited Use Standards, as applicable</p> |
| <p>Variance Responses:</p> <p>Burden of Proof: <i>The applicant seeking the variance shall have the burden of presenting evidence sufficient to allow the Board of Adjustment or Governing Body to reach the conclusions set forth below, as well as the burden of persuasion on those issues.</i></p> | <ol style="list-style-type: none"> 1. Ordinance provision(s) from which a variance is requested 2. What is proposed? 3. What the Ordinance provision(s) require <p>General Findings: <i>The Board of Adjustment must make these findings in order to grant any variance.</i></p> <ol style="list-style-type: none"> 1. Unnecessary hardship would result from the strict application of the Ordinance. It shall not be necessary to demonstrated that, in the absence of the variance, no reasonable used can be made of the property. 2. The hardship results from conditions that are peculiar to the property, such as location, size, or topography. Hardships resulting from personal circumstances, as well as hardships resulting from conditions that are common to the neighborhood or the general public, may not be the basis for granting a variance. 3. The hardship did not result from actions taken by the applicant or the property owner. The act of purchasing property with knowledge that circumstances exist that may justify granting a variance shall not be regarded as a self-created hardship. 4. The requested variance is consistent with the spirit, purpose, and intent of the Ordinance, such that public safety is secured, and substantial justice achieved. |
| <p>Reasonable Accommodation Responses:</p> | <p>General Findings: <i>Applications for Reasonable Accommodations shall be approved only if the Board of Adjustment finds based on competent, material, and substantial evidence, that the proposed accommodation:</i></p> <ol style="list-style-type: none"> 1. Will be used by an individual or individuals with a disability or handicap protected under federal law; 2. Is "reasonable." An accommodation is reasonable if it will not undermine the legitimate purposes and effects of existing zoning regulations, and if it will not impose significant financial and administrative burdens upon the city or county and/or constitute a substantial or fundamental alteration of the ordinance provisions; 3. Is "necessary." An accommodation is necessary if it will provide direct or meaningful therapeutic amelioration of the effects of the particular disability or handicap, and it will afford handicapped or disabled persons equal opportunity to enjoy and use housing in residential districts in the city or county. |



Katie Hamilton
109 Carmel Woods Ct
Wake Forest, NC 27587

June 30, 2025
Revised July 11, 2025

City of Durham Board of Adjustment
C/O City of Durham Planning Department

Regarding: General Findings and Review Factors for Variance **B2500018**
Variance Sought: Civil & LA Permitting
Project: 1414 Carpenter Fletcher Rd
Location: Durham, NC

The variance sought herein seeks relief from UDO sections 6.3.1.1.A and 7.2.3.A.1. This variance would allow the applicant of 1414 Carpenter Fletcher Rd to not provide recreational open space in environmentally sensitive areas. Strict adherence to these sections of Durham's Unified Development Ordinance would necessitate the installation of open space for recreational purposes at 1414 Carpenter Fletcher.

UDO Sections Applicable to Variance

- Per UDO Sections 6.3.1.1.A, 7.2.2. A, and 7.2.3.A.1 Recreational open space is required in the amount of 45,182 square feet.

Variance Responses

1. Ordinance provision(s) from which a variance is requested

6.3.1. DEVELOPMENT STANDARDS - A. DIMENSIONAL STANDARDS -1.

RS-M REQUIRED OPEN SPACE = 18% OF GROSS AREA

7.2.3. Design and Use of Required Open Space A. Recreational Open Space –

Where open space is required, at least one-third shall consist of recreational open space.

2. What is proposed?

- 1414 Carpenter Fletcher Rd is being developed as a 200 unit affordable apartment community that will be financed through HUD (US Department of Housing and Urban Development).
- The design of 1414 Carpenter Fletcher Rd includes a structured parking deck lined by apartments on 3 sides and a small courtyard surrounded by apartments. The subsoil conditions of 1414 Carpenter Fletcher Rd consists of what our engineer has termed "soupy with a side of Chevrolet". This fun phrase indicates a fact of the site that is less fun. The site's soil is primarily fill material that is 8-12' deep and consists of rocky debris, likely from previous construction, mixed with wet soils. This material being below the surface creates an unstable situation for construction of any building and will require costly structural supports and structural fill soil.
- In previous submittals of the site plan associated with 1414 Carpenter Fletcher Rd. recreational open spaces including a dog park and boardwalk were proposed in areas of the property that consisted of wetlands, stream buffers, floodplain, and floodway. These open space elements connected the apartment building to both the proposed dog park as well as an existing City of Durham Greenway easement. **With this variance, these recreational open spaces will be removed from the proposal and only the recreational open spaces internal to the proposed building will remain.**



- Upon further review by consultants at Berkadia who specialize in mortgage banking for FHA and HUD loans, it was determined that the proposed recreational open spaces would be beyond the de minimis improvements HUD allows within the floodplain as outlined in the excerpt from the CFR below:

§ 55.8 Limitations on HUD assistance in floodplains.

- (a) HUD financial assistance (including mortgage insurance) may not be approved with respect to:
- (1) Any action located in a floodway unless one of the following applies:
 - (i) An exception listed in [§ 55.12](#) applies; or
 - (ii) A permanent covenant or comparable restriction will preserve all onsite FFRMS floodplain and/or wetland areas from future development or expansion of existing uses in the floodplain and/or wetland areas. Any rehabilitation, including reconstruction in the case of properties affected by Presidentially declared disasters, that does not expand the footprint of the buildings or the number of units on the site would be allowed within the FFRMS floodplain outside of the floodway. No buildings or improvements may modify or occupy the floodway, with the exception of:
 - (A) Functionally dependent uses (as defined in [§ 55.2\(b\)\(7\)](#)) and utility lines;
 - (B) De minimis improvements, including minimal ground disturbance or placement of impervious surface area to ensure accessibility where this is permitted by local ordinances and does not increase flood risk to the property; or
 - (C) Buildings and improvements that will be removed as part of the proposed action.

3. What the Ordinance provision(s) require

The ordinance requires that 18% of the site be open space and 1/3 of that open space be recreational open space. This equates to 45,182 Square feet of recreational open space being required.

Findings

In granting any variance, the Board of Adjustment shall make the following findings:

A. Unnecessary hardship would result from the strict application of the Ordinance. It shall not be necessary to demonstrate that, in the absence of the variance, no reasonable use can be made of the property.

The strict application of the ordinance would result in unnecessary hardship for the following reasons:

- 1) Requiring that recreational open space be built rather than allowing a fee in lieu would require that 1/3 of 18% of the site area (45,182 SF) be recreational open space. On a site that only has +/- 112,000SF outside of environmental features, this would equate to approximately 40% of the buildable land.
- 2) The requirement to build recreational open space in the floodplain and floodway would disadvantage the site from being able to acquire HUD financing, which would make the development of the site as affordable housing extremely difficult.

B. The hardship results from conditions that are peculiar to the property, such as location, size, or topography. Hardships resulting from personal circumstances, as well as hardships resulting from conditions that are common to the neighborhood or the general public, may not be the basis for granting a variance.

The hardship resulting from the UDO's requiring recreational open spaces without an allowance for fee in lieu are specific to this property in the following ways:

- 1) Approximately 85% of the property is encumbered by environmental features (floodway, floodplain, stream buffers, and wetlands).
- 2) The 15% of the site that is buildable area includes 8-12' of rocky fill mixed with alluvial soil that needs to be structurally reinforced to support any building on the site with rigid inclusions, auger cast



piles, and aggregate piers. Structural reinforcement would be required for any type of building constructed here including single family residential. However, the cost of structural reinforcement can only be bore by a multifamily building as the structural reinforcement for even a single family residence would be substantial and costly.

C. The hardship did not result from actions taken by the applicant or the property owner. The act of purchasing property with knowledge that circumstances exist that may justify granting a variance shall not be regarded as a self-created hardship.

The property owner did not take any action to create the hardships laid out in this variance application. The property owner purchased this land after the fill had been placed on the site decades ago. The property owner also pursued a site plan with the intent of providing recreational open space in accordance with the UDO before learning from their consultants that HUD would not accept these recreational amenities in environmentally sensitive areas

D. The requested variance is consistent with the spirit, purpose, and intent of the Ordinance, such that public safety is secured, and substantial justice is achieved.

The requested variance is in keeping with the intent if not the letter of the ordinance. This variance will allow the property owner to build affordable housing on this site, which is heavily encouraged throughout the UDO and by Durham's elected officials and general public. Additionally, the multifamily building proposed at 1414 Carpenter Fletcher Road will continue to have an interior courtyard for residents, so the intent of the recreational open space requirement to provide privatized amenities for residents will be met in a reduced capacity onsite. The proposed courtyard and amenity center total just over 11,000 square feet, which equates to over 9% of the buildable area. So substantial justice will be achieved as residents will have accessible amenities onsite and no unnecessary impacts will be proposed in environmentally sensitive areas.

Katie Hamilton
Infinite Tide Design, PLLC



June 25th, 2025

Subject: Financing For Carpenter Fletcher / Floodway Disturbance

To: Durham Board of Adjustment

Berkadia is currently working on trying to finance the Carpenter Fletcher project in Chapel, Hill NC. The financing includes not only the apartments themselves but also the amenities included in the collateral. One of those amenities is a dog park that resides near a significant amount of floodplain and floodway. Due to the likely disturbance of the floodway the financing being pursued would likely become unattainable. Per the CFR 55.8 improvements of any kind in a floodway will cause a project to be unfinanceable with HUD.

Due to the rules that have been in place for years and FFRMS still being in place there are some technical situations which would permit the very minor disturbance of the floodway. Over the past decade or so years HUD has not closed a loan with the disturbance of the floodway. The issue specific to this project is having a trail traverse the floodway would likely be determined by HUD as much more than a de minimis improvement. I would point out that prior to FFRMS (put in place approximately approximately a year ago), a simple existing easement located within the floodway was an absolutely not permitted under the financing being pursued.

Yours truly,

By:

Berkadia Commercial Mortgage LLC
Eben Williams
Senior Director

1414 CARPENTER FLETCHER RD

VARIANCE APPLICATION FOR RELIEF FROM RECREATIONAL OPEN SPACE

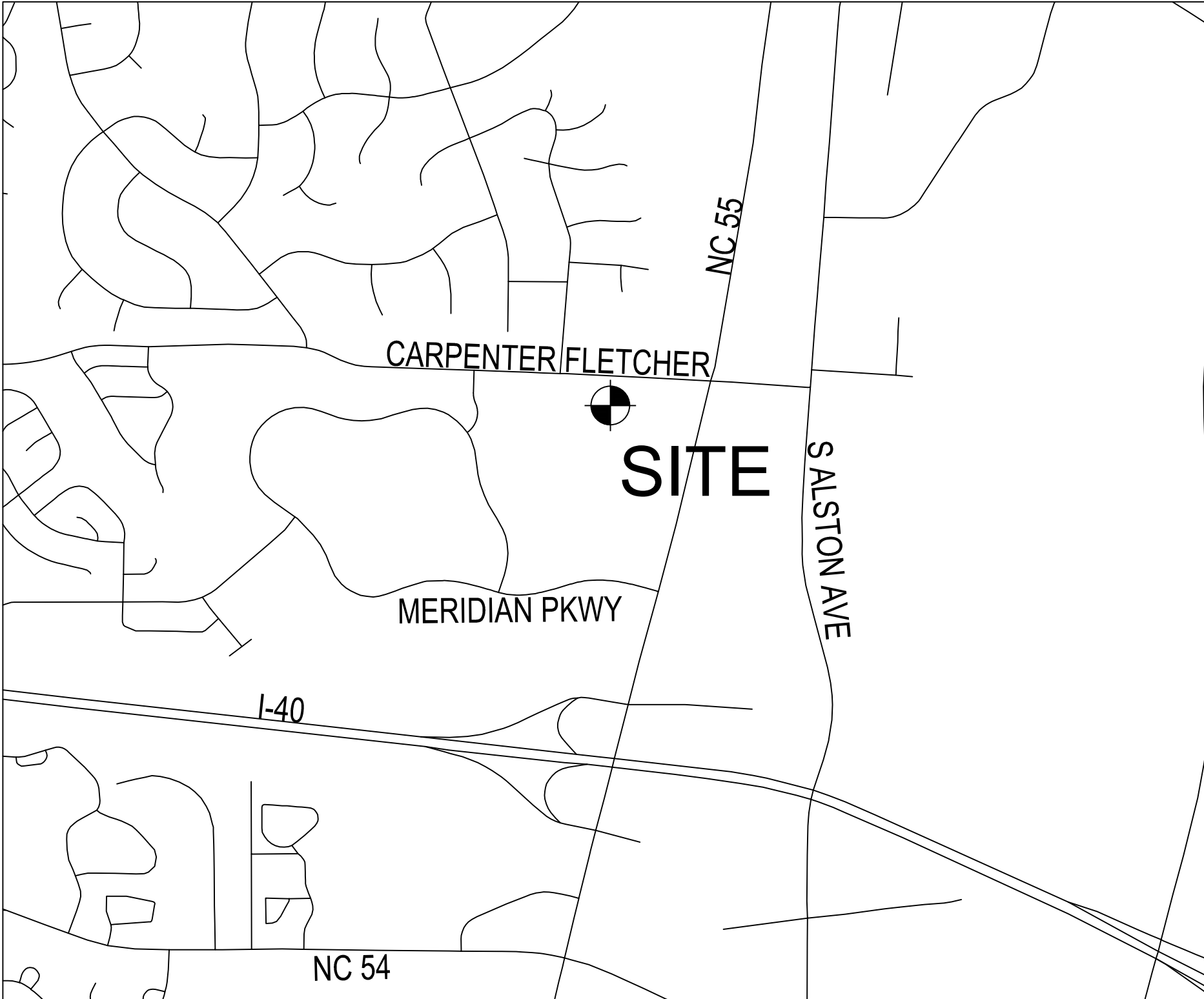
1414 CARPENTER FLETCHER RD, 27713

SITE PLAN CASE# D2400010 / VARIANCE CASE # B2500018

SUBMITTED ON: 6.30.2025

REVISED: 7.14.2025

| SITE DATA | |
|---|--|
| REIDS: | 155117, 155122, 155123, 154210 |
| PINS: | 0738174953, 0738171954, 0738170965, 0738079491 |
| ZONING: | RS-M |
| DEVELOPMENT TIER: | SUBURBAN |
| WATERSHED PROTECTION OVERLAY: | NONE |
| ZONING OVERLAY: | MT-C (-40) |
| RIVER BASIN: | CAPE FEAR |
| EXISTING LAND USE: | VACANT |
| PROPOSED LAND USE: | RESIDENTIAL - MULTIFAMILY |
| FLOOD PLAIN DATA: | FIRM PANEL:3720073800K.EFFECTIVE DATE:10/19/2018 |
| DENSITY DATA: | |
| SITE ACREAGE: | 17.287 AC |
| PROPOSED NUMBER OF UNITS: | 200 UNITS (31 AFFORDABLE + 169 MARKET RATE) |
| ALLOWABLE DENSITY: | 8.00 DU/AC + UP TO 267 AFFORDABLE DENSITY CREDITS |
| PROPOSED DENSITY: | 8.00 DU/AC + 62 AFFORDABLE DENSITY CREDITS |
| RESIDENTIAL UNIT DATA: | |
| DEVELOPMENT TYPE: | APARTMENTS |
| MAX BUILDING HEIGHT: | 3-STORIES/40 FEET + 1-STORY/15 FEET FOR AFFORDABLE DENSITY BONUS |
| PROPOSED BUILDING HEIGHT: | 49'-4" |
| TREE COVERAGE DATA: | |
| TREE PRESERVATION REQUIRED: | 150,607 SF (20.00%) |
| TREE PRESERVATION PROVIDED: | 152,802 SF (20.29%) |
| STORMWATER/EROSION CONTROL DATA: | |
| LIMITS OF DISTURBANCE: | 148,590 SF |
| EXISTING IMPERVIOUS AREA (ON SITE): | 00 SF |
| BASELINE IMPERVIOUS AREA (MARCH 17, 2009): | 40,777 SF (5.42%) |
| PROPOSED IMPERVIOUS AREA (IN ROW): | 15,954 SF |
| PROPOSED IMPERVIOUS AREA (ONSITE): | 86,250 SF (11.45%) |
| TOTAL PROPOSED IMPERVIOUS: | 102,204 SF (13.57%) |
| PROPOSED IMPERVIOUS INCREASE FROM BASELINE DATE OF 3/17/2009: | 61,427 SF |
| OPEN SPACE DATA: | |
| OPEN SPACE REQUIRED: | 135,546 SF (18.00%) |
| OPEN SPACE PROVIDED: | 213,572 SF (28.36%) |
| RECREATIONAL OPEN SPACE REQUIRED: | 45,182 SF (6 REQUIRED OPEN SPACE) |
| RECREATIONAL OPEN SPACE PROVIDED: | 11,000 SF (6 OF 18% OF BUILDABLE AREA) PER VARIANCE |
| PARKING DATA: | |
| REQUIRED PARKING: | 0 SPACES |
| PROPOSED PARKING: | 239 SPACES |
| REQUIRED ADA PARKING: | 7 ADA SPACE (2 VAN ACCESSIBLE) |
| PROPOSED ADA PARKING: | 10 ADA SPACE (2 VAN ACCESSIBLE) |
| BIKE PARKING REQUIRED: | 20 SPACES |
| BIKE PARKING PROVIDED: | 20 SPACES |



VICINITY MAP

NOT TO SCALE

| SHEET INDEX | |
|--------------|--------------------------|
| Sheet Number | Sheet Title |
| C0.00 | COVER SHEET |
| C1.00 | EXISTING CONDITIONS PLAN |
| C3.00 | SITE PLAN |

SPECIAL CONDITIONS OF APPROVAL

- CARPENTER FLETCHER ROADWAY IMPROVEMENTS: PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY, CONSTRUCT AN EXCLUSIVE WESTBOUND LEFT-TURN LANE ON CARPENTER FLETCHER ROAD AT THE WESTERN SITE ACCESS WITH ADEQUATE STORAGE AND APPROPRIATE TAPERS.
- DEDICATE ADDITIONAL EASEMENTS FOR THE FRONTAGE OF THE SITE ALONG CARPENTER FLETCHER ROAD AS SHOWN ON SHEET C3.00. A COPY OF THE RECORDED PLAT MUST BE SUBMITTED WITH THE FIRST BUILDING PERMIT APPLICATION.
- THE FOLLOWING MUST BE DONE AT THE TIME OF FINAL PLAT: DOCUMENTATION ESTABLISHING THAT PROPER LEGAL PROVISIONS (INCLUDING ATTORNEYS CERTIFICATE) HAVE BEEN MADE FOR THE ESTABLISHMENT OF A HOMEOWNERS ASSOCIATION DECLARATION OF COVENANTS AND RESTRICTIONS FOR THE COMMON AREAS FOR PERPETUAL OWNERSHIP AND MAINTENANCE OF COMMONLY OWNED IMPROVEMENTS AND LANDS SHALL BE PROVIDED AS REQUIRED BY THE UNIFIED DEVELOPMENT ORDINANCE.
- THE FOLLOWING MUST BE DONE PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY: PERMANENT SIGNS CLEARLY IDENTIFYING THE RIPARIAN BUFFER SHALL BE INSTALLED PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY AND MAINTAINED IN PERPETUITY.
- THIS PROJECT IS UTILIZING THE AFFORDABLE HOUSING BONUS CONTAINED IN UDO SECTION 8.6. THE PROJECT WILL PROVIDE 31 AFFORDABLE RENTAL UNITS THAT MEET THE REQUIREMENTS OF THIS SECTION AND COMPLIANCE WITH THE CITY'S RULES AND PROCEDURES FOR THE AFFORDABLE HOUSING BONUS ("RULES AND PROCEDURES") IN EFFECT ON THE DATE OF SITE PLAN APPROVAL. WILL BE REQUIRED. DEVELOPER MUST COMPLY WITH THE APPLICATION PROCESS PROVIDED IN SECTION II OF THE RULES AND PROCEDURES BEFORE ANY CERTIFICATES OF COMPLIANCE WILL BE ISSUED FOR THE PROJECT.
- A NEW 30FT WIDE GREENWAY TRAIL EASEMENT TO CONNECT TO FUTURE NORTH PRONG CREEK TRAIL. THIS EASEMENT IS SUBJECT TO THE TERMS STATED IN REAL ESTATE BOOK 1503, PAGES 898-899 AS SHOWN IN PLAT BOOK 142, PAGE 206 IS CONVEYED TO THE CITY OF DURHAM. THE NEW GREENWAY TRAIL EASEMENT SHALL BE RECORDED, AND EVIDENCE OF RECORDATION SHALL BE PROVIDED AT THE TIME OF ISSUANCE OF THE FIRST BUILDING PERMIT. THE DIGITAL DATA FOR THE EASEMENT LOCATION AND GEOMETRY (CAD LINE WORK OR GIS DATA) SHALL BE PROVIDED IN THE AS-BUILT PACKAGE SUBMITTAL TO PUBLIC WORKS.

BY-RIGHT VARIATIONS

PUBLIC WORKS CONDITIONS OF APPROVAL

- THE DESIGNING PROFESSIONAL (A NCPE, NCPLS OR NCRLA - AS REQUIRED) SHALL SUBMIT THREE (3) SETS OF CONSTRUCTION DRAWINGS TO THE PUBLIC WORKS DEPARTMENT - DEVELOPMENT REVIEW FOR REVIEW AND APPROVAL. CONSTRUCTION DRAWING APPROVAL IS REQUIRED PRIOR TO COMMENCING CONSTRUCTION (SEE CONSTRUCTION PLAN APPROVAL PROCESS). THE APPROVAL OF CONSTRUCTION DRAWINGS IS SEPARATE FROM SITE PLAN APPROVAL. CITY OFFICIALS SHALL REVIEW ALL SIZES, MATERIALS, SLOPES, LOCATIONS, EXTENSIONS AND DEPTHS FOR ALL PROPOSED UTILITIES (WATER LINES, SANITARY SEWER LINES AND STORM DRAINAGE CONVEYANCE SYSTEMS) FOR COMPLIANCE WITH ALL APPLICABLE REGULATORY STANDARDS, SPECIFICATIONS, AND BEST MANAGEMENT PRACTICES.
- THE DESIGNING PROFESSIONAL (A NCPE, NCPLS OR NCRLA - AS REQUIRED) SHALL SUBMIT ONE (1) SET OF AS-BUILT DRAWINGS TO THE PUBLIC WORKS DEPARTMENT - DEVELOPMENT REVIEW FOR REVIEW AND APPROVAL. AS-BUILT DRAWING APPROVAL IS REQUIRED PRIOR TO WATER METER INSTALLATION AND/OR SANITARY SEWER SERVICE CONNECTION AND PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
- FIRE FLOW ANALYSIS REQUIRED FOR REVIEW AND APPROVAL AS PART OF THE CONSTRUCTION DRAWING APPROVAL PROCESS. TO SCHEDULE FLOW TEST OR TO OBTAIN CURRENT SYSTEM DATA, COMPLETE THE ONLINE APPLICATION (HTTP://DURHAMNC.GOV/ICHP/PWD/PAGES/FIRE_FLOW.ASPX).
- IF A METER 2" OR LARGER IS PROPOSED, CONTACT WATER MANAGEMENT AT 560-4361 PRIOR TO THE CONSTRUCTION OF THE METER VAULT TO VERIFY THE TYPE AND DIMENSIONS OF THE METER.
- WATER PERMIT REQUIRED AFTER CONSTRUCTION DRAWING APPROVAL AND PRIOR TO COMMENCING WATER MAIN INSTALLATION.
- SIDEWALK NOTE: THE LOCATION OF THE SIDEWALKS SHOWN ON THIS PLAN IS SCHEMATIC. A CITY OF DURHAM AND/OR NCDOT ENCROACHMENT PERMIT IS REQUIRED PRIOR TO ANY CONSTRUCTION. AFTER OBTAINING THE REQUIRED PERMITS, PLEASE CONTACT THE CITY OF DURHAM ENGINEERING INSPECTION OFFICE AT 560-4326 FOR A PRE-CONSTRUCTION CONFERENCE AND FIELD VISIT PRIOR TO ANY WORK ON THE PROPOSED SIDEWALK.
- DRIVEWAY PERMIT NOTES: A CITY OF DURHAM DRIVEWAY PERMIT IS REQUIRED PRIOR TO ANY DRIVEWAY CONSTRUCTION ON PUBLIC RIGHT-OF-WAY. SUBMIT PLANS FOR DRIVEWAY PERMIT APPROVAL TO CITY ENGINEERING DEVELOPMENT REVIEW. AFTER OBTAINING THE PERMIT, PLEASE CALL CITY OF DURHAM ENGINEERING INSPECTION OFFICE AT 560-4326 PRIOR TO START OF CONSTRUCTION.
- STORMWATER SERVICES NOTES: AT A MINIMUM, THE STORMWATER DESIGN DETAILS FOR THIS PROJECT SHALL BE GOVERNED BY THE MINIMUM STANDARDS OF THE MOST RECENT EDITION OF THE CITY OF DURHAM (CITY) REFERENCE GUIDE FOR DEVELOPMENT (RGD) AND ANY LETTERS TO INDUSTRY (POSTED ON THE CITY'S WEBSITE) THAT ARE IN EFFECT THE DATE CONSTRUCTION DRAWINGS ARE FIRST RECEIVED FOR REVIEW BY THE CITY.
- FINAL DESIGN CALCULATIONS FOR THE STORMWATER CONTROL MEASURE(S) (SCM(S)) REQUIRE THE USE OF STORAGE INDICATION ROUTING METHODOLOGY SUCH AS TR-20 OR HEC-1 MODELS. FOR EACH SCM, AS APPLICABLE, STAGE-STORAGE RELATIONSHIP AND INFLOW AND OUTFLOW HYDROGRAPHS ARE REQUIRED. ALL TABULATED DATA INCLUDING CALCULATIONS SHOWING THE LIMITING DISCHARGE, WHETHER ORIFICE, WEIR, BARREL, OR OUTLET CONTROL, AS APPROPRIATE IS REQUIRED. HYDROCAD, HYDRAFLOW HYDROGRAPHS, AND PONDPACK ARE COMMONLY USED AND RECOGNIZED SOFTWARE PROGRAMS WHICH INCORPORATE ROUTING METHODOLOGY ACCEPTED BY THE CITY.
- USE FOR RESIDENTIAL DEVELOPMENTS WITH A HOMEOWNERS ASSOCIATION: STORMWATER CONTROL MEASURE(S) (SCM(S)) PERMIT FEE(S) AND A PAYMENT INTO THE STORMWATER REPLACEMENT FUND ARE REQUIRED FOR ALL SCM(S) ASSOCIATED WITH THIS DEVELOPMENT. CONSTRUCTION OF THE DEVELOPMENT IS NOT ALLOWED TO COMMENCE UNTIL THESE ITEMS ARE PROVIDED IN ACCORDANCE WITH CITY STORMWATER STANDARDS OR IN ACCORDANCE WITH WRITTEN POLICY. THE DESIGNER SHALL SUBMIT A SEALED ENGINEER'S CONSTRUCTION COST ESTIMATE FOR EVERY SCM PROPOSED IN THE DEVELOPMENT PRIOR TO APPROVAL OF THE CONSTRUCTION DRAWINGS.
- USE FOR MULTI-FAMILY AND OTHER TYPE DEVELOPMENTS: STORMWATER CONTROL MEASURE(S) (SCM(S)) PERMIT FEE(S) AND EITHER A PAYMENT INTO THE STORMWATER REPLACEMENT FUND OR THE PROVISION OF AN ALTERNATE SECURITY ARE REQUIRED FOR ALL SCM(S) ASSOCIATED WITH THIS DEVELOPMENT. CONSTRUCTION OF THE DEVELOPMENT IS NOT ALLOWED TO COMMENCE UNTIL THESE ITEMS ARE PROVIDED IN ACCORDANCE WITH CITY STORMWATER STANDARDS OR IN ACCORDANCE WITH WRITTEN POLICY. THE DESIGNER SHALL SUBMIT A SEALED ENGINEER'S CONSTRUCTION COST ESTIMATE FOR EVERY SCM PROPOSED IN THE DEVELOPMENT PRIOR TO APPROVAL OF THE CONSTRUCTION DRAWINGS.
- AN AS-BUILT CERTIFICATION FOR THE STORMWATER CONTROL MEASURE(S) (SCM(S)), PROVIDED BY THE CERTIFYING ENGINEER, IS REQUIRED. THE AS-BUILT CERTIFICATION SHALL BE SUBMITTED IN ACCORDANCE WITH THE CITY OF DURHAM SCM AS-BUILT PROGRAM, REFER TO SECTION 8.6. AS-BUILT CERTIFICATION REQUIREMENTS FOR SCMS IN THE CITY OF DURHAM, OF THE REFERENCE GUIDE FOR DEVELOPMENT. THE SCM AS-BUILT CERTIFICATION(S) SHALL BE APPROVED BY THE STORMWATER DEVELOPMENT REVIEW SECTION PRIOR TO ISSUANCE OF ANY FINAL CERTIFICATES OF OCCUPANCY/COMPLIANCE FOR DEVELOPMENT. WITH THE EXCEPTION OF WHEN AN APPROPRIATE CONSTRUCTION SECURITY HAS BEEN PROVIDED FOR SINGLE FAMILY OR TOWNHOME DEVELOPMENT, WITH THIS PROVIDED CONSTRUCTION SECURITY, CERTIFICATES OF OCCUPANCY/COMPLIANCE CAN BE ISSUED FOR A PERCENTAGE OF SINGLE FAMILY LOTS IN ACCORDANCE WITH CITY REQUIREMENTS.
- STORMWATER CONTROL MEASURE(S) (SCM(S)) DESIGN CALCULATIONS WILL NOT BE REVIEWED OR APPROVED WITH THE SITE PLAN/PRELIMINARY PLAT SUBMITTAL. ALL SCM DESIGNS WILL BE REVIEWED AND APPROVED DURING THE CONSTRUCTION DRAWINGS SUBMITTAL PROCESS. IF, AT THE TIME OF CONSTRUCTION DRAWINGS SUBMITTAL, IT IS FOUND THAT THE PROPOSED SCM(S) IS UNDERSIZED, NOT PROPERLY ACCESSIBLE, OR OTHERWISE INSUFFICIENT OR UNSUITABLE FOR THE SITE, IT IS THE RESPONSIBILITY OF THE APPLICANT TO INSURE THAT THE APPLICABLE STORMWATER ORDINANCE REQUIREMENTS ARE MET. A REVISED SITE PLAN OR PRELIMINARY PLAT MAY BE REQUIRED IF THE ORIGINALLY PROPOSED SCM(S) ARE FOUND INSUFFICIENT, NOT PROPERLY ACCESSIBLE, OR UNSUITABLE AND ALTERNATIVE SCM(S) WITH ASSOCIATED EASEMENTS ARE REQUIRED.
- THE DEVELOPER/CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE STORMWATER DEVELOPMENT REVIEW SECTION PRIOR TO COMMENCING WORK ON ANY STORMWATER CONTROL MEASURE (SCM). IF THE SCM WILL BE CONSTRUCTED INITIALLY AS A SEDIMENTATION AND EROSION CONTROL (S&EC) DEVICE, TO BE CONVERTED TO A PERMANENT SCM AT A LATER TIME, THE PRE-CONSTRUCTION MEETING SHOULD BE SCHEDULED PRIOR TO CONSTRUCTION OF THE S&EC DEVICE. CALL 919-560-4326 EXT. 30238 TO SCHEDULE THE REQUIRED MEETING. A MINIMUM OF THREE BUSINESS DAYS PRIOR TO THE DESIRED MEETING DATE. THIS IS IN ADDITION TO OTHER PRE-CONSTRUCTION MEETING REQUIREMENTS FOR EROSION CONTROL, ENGINEERING INSPECTIONS, ETC.
- THE CITY OF DURHAM AND THEIR ASSIGNS HAVE RIGHT OF ACCESS TO THE PERMANENT STORMWATER CONTROL MEASURE(S) (SAND FILTER & UNDERGROUND DETENTION) FOR INSPECTIONS AND MAINTENANCE ENFORCEMENT. A BLANKET ACCESS EASEMENT TO, OVER AND AROUND THE STORMWATER CONTROL MEASURE IS HEREBY GRANTED FOR INSPECTIONS AS WELL AS ENFORCEMENT OF OPERATION & MAINTENANCE. ANY OBSTRUCTION PLACED IN THE BLANKET EASEMENT THAT IMPEDES NECESSARY MAINTENANCE ENFORCEMENT WILL BE REMOVED AND ALL THE ASSOCIATED COSTS WILL BE BORNE SOLELY BY THE OWNER.

| CITY OF DURHAM PUBLIC WORKS DEPARTMENT APPROVED | |
|---|-------------|
| ENGINEERING | DATE: |
| STORMWATER | DATE: |
| TRANSPORTATION | DATE: |
| | DATE: |
| | DATE: |

D2400010 / B2500018

PROPERTY OWNER

NC Durham 1414 Carpenter Fletcher, LLC

4209 AUTUMN LANE
VESTAVIA HILLS, AL 35243

ERNEST BROWN
205.586.3062
ebrown@ebcapitalpartners.com

APPLICANT

NC Durham 1414 Carpenter Fletcher, LLC

4209 AUTUMN LANE
VESTAVIA HILLS, AL 35243

ERNEST BROWN
205.586.3062
ebrown@ebcapitalpartners.com

LANDSCAPE ARCHITECT

INFINITE TIDE DESIGNS PLLC

109 CARMEL WOODS CT
WAKE FOREST, NC 27578

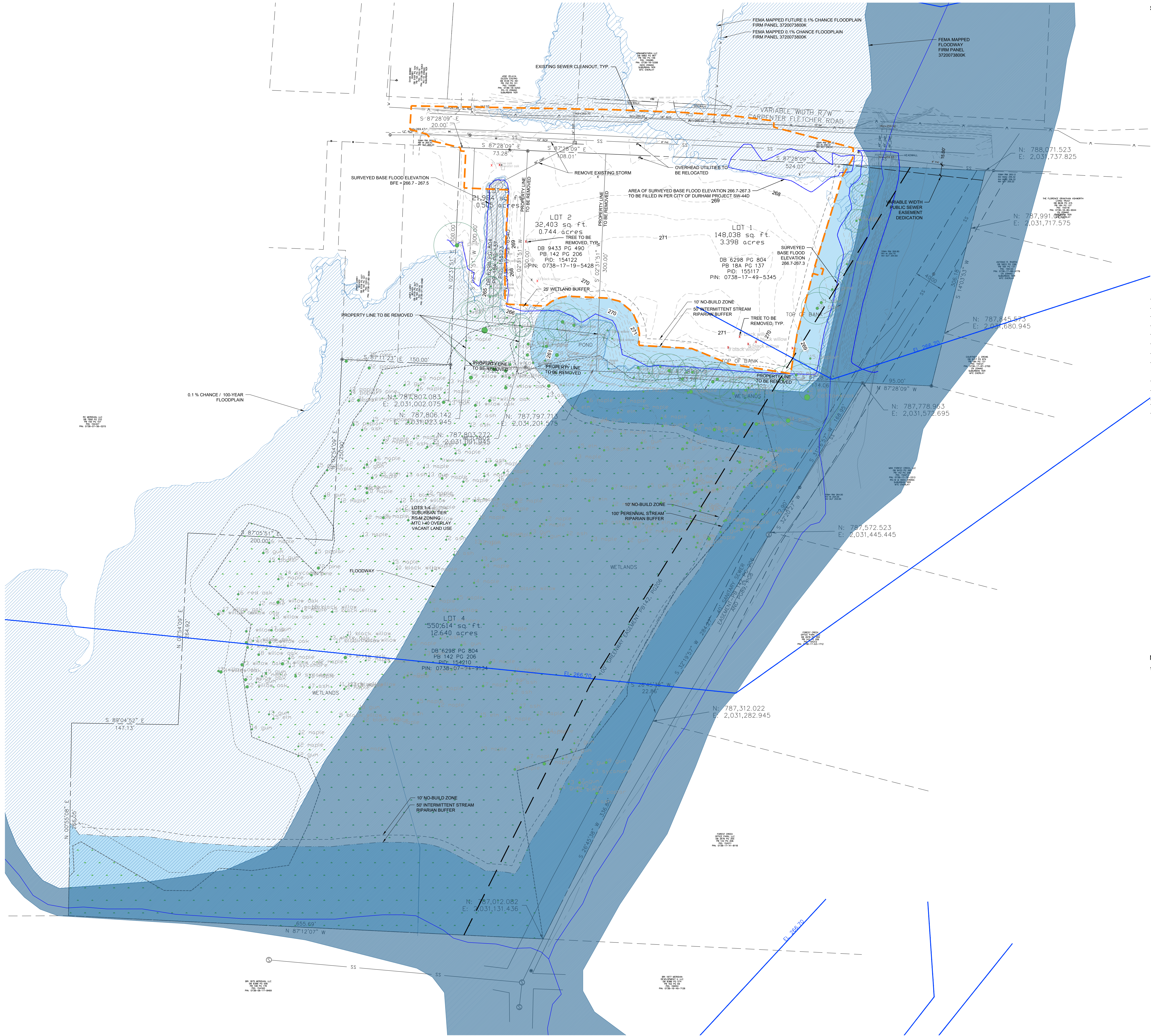
KATIE HAMILTON
704-796-6002
INFINITETIDEDESIGN@GMAIL.COM

CIVIL ENGINEER

Pipeline Engineering, PLLC

320 Onondaga Ct.
Holly Springs, NC 27540

TIM SUMMERVILLE
919.740.3397



SURVEY LEGEND:

- △ SURVEY CONTROL POINT
- EIP EXISTING IRON PIPE
- ECM EXISTING CONCRETE MONUMENT
- ▲ COMPUTED POINT
- ⊙ STORM DRAIN MANHOLE
- ⊞ STORM DRAIN CURB INLET
- ⊙ SANITARY SEWER MANHOLE
- ⊙ SANITARY SEWER CLEANOUT
- ⊙ SANITARY FORCEMAIN VALVE
- ⊙ HYDRANT
- ⊙ WV WATER VALVE
- ⊙ WM WATER METER
- ⊙ WM WATER MANHOLE
- ⊙ WM WATER VAULT
- ⊙ WM WELL
- ⊙ GM GAS VALVE
- ⊙ GM GAS METER
- ⊙ TM TELEPHONE MANHOLE
- ⊙ TPED TELEPHONE PEDESTAL
- ⊙ TM TV MANHOLE
- ⊙ TVP TV PEDESTAL
- ⊙ FOWP FIBER OPTIC WITNESS POST
- ⊙ FB FIBER OPTIC BOX
- ⊙ EM ELECTRIC MANHOLE
- ⊙ EM ELECTRIC METER
- ⊙ EB ELECTRIC BOX
- ⊙ UP UTILITY POLE
- ⊙ GP GUY POLE
- ⊙ GW GUY WIRE
- ⊙ LP LIGHT POLE
- ⊙ MH MANHOLE
- ⊙ S SIGN
- ⊙ WF WIRE FENCE
- ⊙ CLF CHAIN LINK FENCE
- ⊙ T UNDERGROUND TELEPHONE LINE
- ⊙ FO UNDERGROUND FIBER OPTIC LINE
- ⊙ G UNDERGROUND GAS LINE
- ⊙ E UNDERGROUND ELECTRIC LINE
- ⊙ W UNDERGROUND WATER LINE
- ⊙ SS SANITARY SEWER LINE
- ⊙ SD STORM DRAIN LINE
- ⊙ OHW OVERHEAD WIRES
- ⊙ U UNIDENTIFIED LINE
- ⊙ S UNKNOWN DESTINATION
- ⊙ DIP CONCRETE SURFACE
- ⊙ DIP DUCTILE IRON PIPE
- ⊙ PVC POLYVINYL CHLORIDE PIPE
- ⊙ HDPE HIGH-DENSITY POLYETHYLENE PIPE
- ⊙ RCP REINFORCED CONCRETE PIPE
- ⊙ CMP CORRUGATED METAL PIPE
- ⊙ CB CATCH BASIN
- ⊙ L LIMITS OF DISTURBANCE
- ⊙ FEMA MAPPED REGULATORY FLOODWAY
- ⊙ FEMA MAPPED ZONE AE / 0.1% CHANCE FLOODPLAIN
- ⊙ FEMA MAPPED FUTURE 0.1% CHANCE FLOODPLAIN
- ⊙ WETLANDS
- ⊙ RIPARIAN BUFFERS
- ⊙ TREE PRESERVATION
- ⊙ PASSIVE OPEN SPACE
- ⊙ SURVEYED BASE FLOOD ELEVATION (266.7 - 267.5)
- ⊙ SURVEYED SPECIMEN TREE
- ⊙ SPECIMEN TREE CRITICAL ROOT PROTECTION ZONE
- ⊙ FEMA FLOODPLAIN CROSS-SECTIONS
- ⊙ SURVEYED SPECIMEN TREE TO BE REMOVED

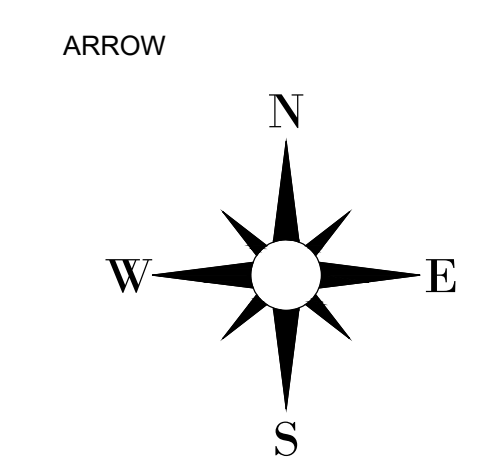
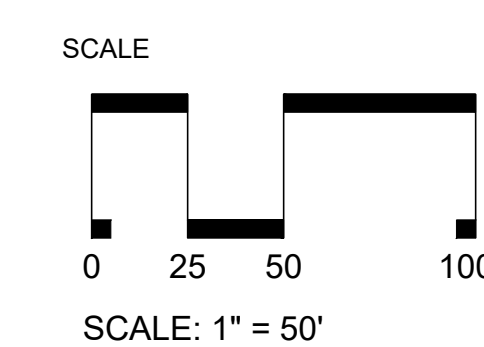
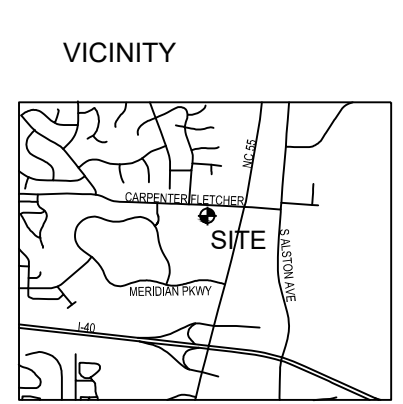
NOTES:

- LONG RANGE PLANNING IMPACTS
- DURHAM TRAILS AND GREENWAYS MASTER PLAN - PLANNED NORTH PRONG CREEK TRAIL

Infinite Tide

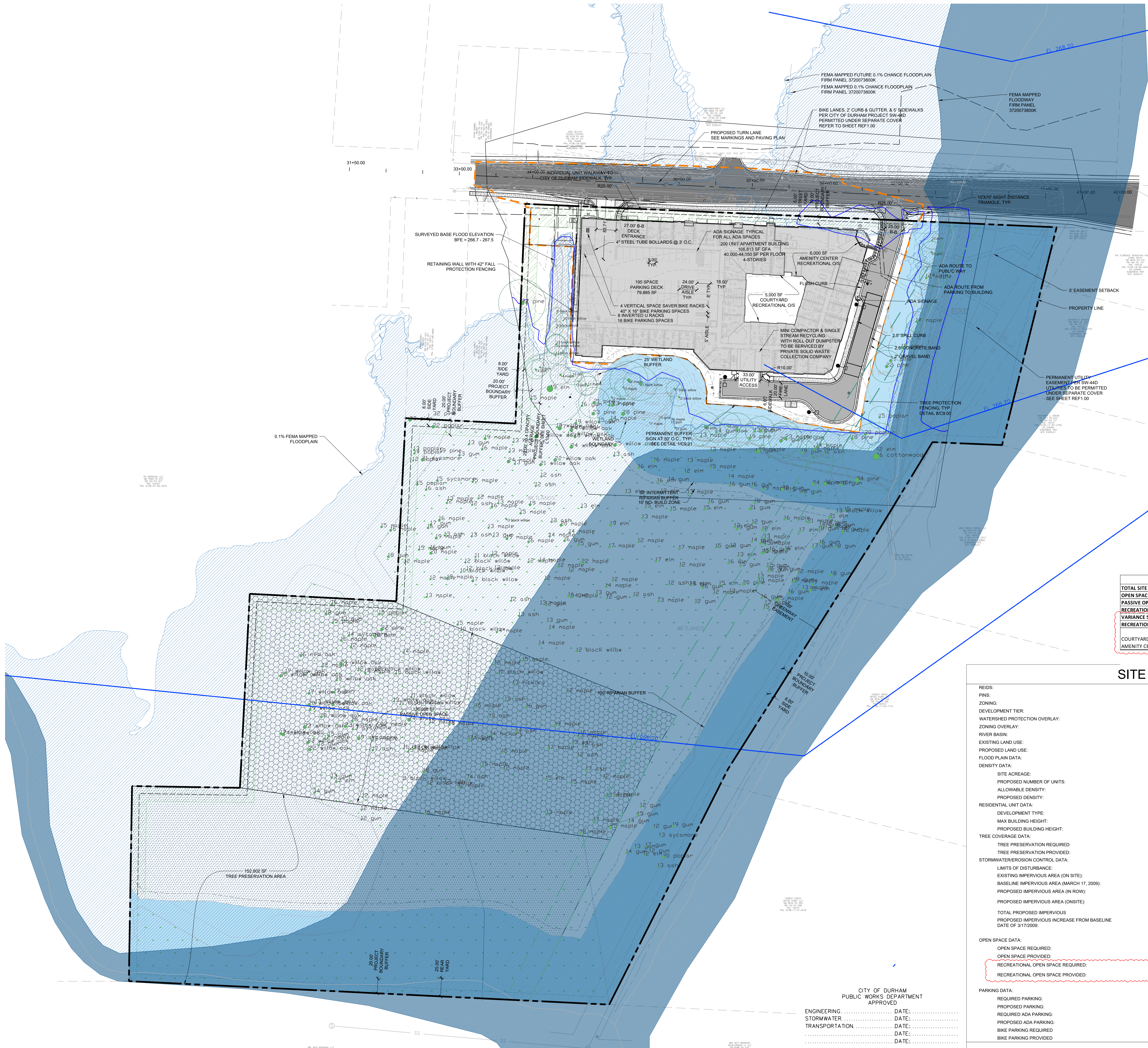


| No. | Date | Description | COMMENTS & AFFORDABLE UNITS |
|-----|------------|-------------|-----------------------------|
| 1 | 05.07.2024 | 05.07.2024 | 05.07.2024 |
| 2 | 07.29.2024 | 07.29.2024 | 07.29.2024 |
| 3 | 03.24.2025 | 03.24.2025 | 03.24.2025 |
| 4 | 07.02.2025 | 07.02.2025 | 07.02.2025 |



EXISTING CONDITIONS PLAN

DATE: 05/07/2024
DRAWN BY: [Name]
PROJECT: 1414 CARPENTER FLETCHER RD
PROJECT #: 02400010
SHEET TITLE: EXISTING CONDITIONS PLAN
SHEET NO.: C1.00



- SITE LEGEND:**
- | SYMBOL | DESCRIPTION |
|-----------|---|
| [Pattern] | PROPOSED BUILDING |
| [Pattern] | PROPOSED CONCRETE SIDEWALK |
| [Pattern] | PROPOSED ASPHALT |
| [Pattern] | PROPOSED CONCRETE PAVERS |
| [Pattern] | PROPOSED GRAVEL |
| [Pattern] | PROPOSED CURB & GUTTER |
| [Pattern] | PROPOSED STOP BAR |
| [Pattern] | PROPOSED SIGN |
| [Pattern] | PROPOSED ADA PARKING SPACE |
| [Pattern] | PROPOSED RETAINING WALL |
| [Pattern] | PROPOSED FULL CUT OFF LIGHT |
| [Pattern] | PROPOSED U - SHAPED BIKE RACK |
| [Pattern] | PROPERTY LINE |
| [Pattern] | LIMITS OF DISTURBANCE |
| [Pattern] | FEMA MAPPED REGULATORY FLOODWAY |
| [Pattern] | FEMA MAPPED ZONE AE / 0.1% CHANCE FLOODPLAIN |
| [Pattern] | FEMA MAPPED FUTURE 0.1% CHANCE FLOODPLAIN |
| [Pattern] | WETLANDS |
| [Pattern] | RIPARIAN BUFFERS |
| [Pattern] | TREE PRESERVATION |
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| [Pattern] | SURVEYED BASE FLOOD ELEVATION (266.7 - 267.5) |
| [Pattern] | SURVEYED SPECIMEN TREE |
| [Pattern] | SPECIMEN TREE CRITICAL ROOT PROTECTION ZONE |
| [Pattern] | FEMA FLOODPLAIN CROSS-SECTIONS |
| [Pattern] | PROJECT BOUNDARY BUFFER |

SITE NOTES:

- SW-440 IMPROVEMENTS AS SHOWN ARE PRELIMINARY IN NATURE. CONSTRUCTION PLANS ARE STILL UNDER REVIEW AND SUBJECT TO CHANGE.

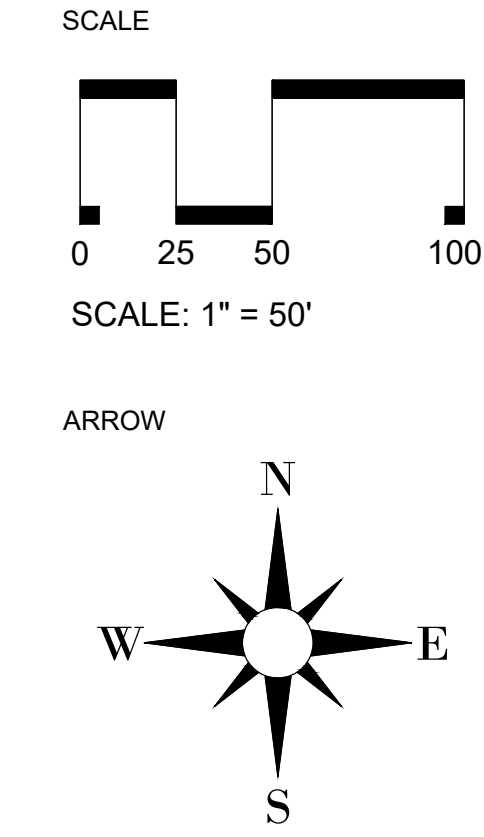
| OPEN SPACE CALCULATIONS | | |
|--|---------|----|
| TOTAL SITE AREA (SF) | 753,060 | SF |
| OPEN SPACE REQUIRED (18%) | 135,551 | SF |
| PASSIVE OPEN SPACE PROVIDED | 136,988 | SF |
| RECREATIONAL OPEN SPACE REQUIRED (1/3) | 45,184 | SF |
| VARIANCE SOUGHT FOR REC OPEN SPACE | 34,184 | SF |
| RECREATIONAL OPEN SPACE PROVIDED | 11,000 | SF |
| ACTIVE OPEN SPACE TYPOLOGIES | | |
| COURTYARD | 5,000 | SF |
| AMENITY CENTER | 6,000 | SF |

| SITE DATA | |
|---|--|
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| PINS: | 0738174953, 0738171954, 0738170955, 0738079491 |
| ZONING: | RS-M |
| DEVELOPMENT TIER: | SUBURBAN |
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| ZONING OVERLAY: | MTG (I-40) |
| RIVER BASIN: | CAPE FEAR |
| EXISTING LAND USE: | VACANT |
| PROPOSED LAND USE: | RESIDENTIAL - MULTIFAMILY |
| FLOOD PLAN DATA: | FIRM PANEL:3720073800K;EFFECTIVE DATE:10/19/2018 |
| DENSITY DATA: | |
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| PROPOSED IMPERVIOUS AREA (ONSITE): | 86,250 SF (11.45%) |
| TOTAL PROPOSED IMPERVIOUS: | 102,204 SF (13.57%) |
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| OPEN SPACE PROVIDED: | 213,572 SF (28.36%) |
| RECREATIONAL OPEN SPACE REQUIRED: | 45,182 SF (6% REQUIRED OPEN SPACE) |
| RECREATIONAL OPEN SPACE PROVIDED: | 11,000 SF (4% OF 18% OF BUILDABLE AREA) PER VARIANCE |
| PARKING DATA: | |
| REQUIRED PARKING: | 0 SPACES |
| PROPOSED PARKING: | 239 SPACES |
| REQUIRED ADA PARKING: | 7 ADA SPACE (2 VAN ACCESSIBLE) |
| PROPOSED ADA PARKING: | 10 ADA SPACE (2 VAN ACCESSIBLE) |
| BIKE PARKING REQUIRED: | 20 SPACES |
| BIKE PARKING PROVIDED: | 20 SPACES |



| No. | Date | Description |
|-----|------------|------------------------------|
| 1 | 05.07.2024 | COMMENTS & AFFORDABLE UNITS |
| 2 | 07.29.2024 | COMMENTS |
| 3 | 03.24.2025 | BUILDING DESIGN COORDINATION |
| 4 | 07.02.2025 | GMP |

VICINITY





Geotechnical Engineering Report
1414 Carpenter Fletcher Road
Durham, North Carolina
S&ME Project No. 23050294

PREPARED FOR:

Land Planning & Entitlements, LLC
4209 Autumn Lane
Vestavia Hills, Alabama 35243

PREPARED BY:

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

May 18, 2023



May 18, 2023

Land Planning & Entitlements, LLC
4209 Autumn Lane
Vestavia Hills, Alabama 35243

Attention: Mr. Ernest Brown

Reference: **Geotechnical Engineering Report**
1414 Carpenter Fletcher Road
Durham, North Carolina
S&ME Project No. 23050294

Dear Mr. Brown:

S&ME is pleased to submit this Geotechnical Engineering Report for the referenced project. The exploration was made in general accordance with our Proposal No. 23050294_rev dated April 17, 2023. This report presents a brief confirmation of our understanding of the project, the exploration results, and our geotechnical conclusions and recommendations regarding site grading and building/pavement support.

We appreciate the opportunity to work with you by providing geotechnical engineering services for this project. Please contact us should any questions arise regarding the information in this report or when further services are needed.

Sincerely,

S&ME, Inc.

Anthony Marzulla
Geotechnical Staff Professional
amarzulla@smeinc.com

Keith Brown, P.E.
Senior Geotechnical Engineer/VP
kbrown@smeinc.com



Table of Contents

| | | |
|------------|---|-----------|
| 1.0 | Executive Summary | 1 |
| 2.0 | Project Information..... | 1 |
| 3.0 | Exploration and Testing Program | 2 |
| 4.0 | Site Conditions | 2 |
| 4.1 | Area Geology | 3 |
| 5.0 | Subsurface Conditions..... | 3 |
| 5.1 | Surface Materials | 3 |
| 5.2 | Previously Placed Fill Soils | 3 |
| 5.3 | Alluvial Soils..... | 4 |
| 5.4 | Residual Soils | 4 |
| 5.5 | Partially Weathered Rock | 4 |
| 5.6 | Water..... | 5 |
| 6.0 | Design Recommendations | 5 |
| 6.1 | Building, Perimeter Retaining Walls, and Slab Support..... | 5 |
| 6.2 | Structural Fill Loading..... | 6 |
| 6.3 | Settlement Performance Requirements | 6 |
| 6.4 | Building and Retaining Wall Foundations – Rigid Inclusions..... | 6 |
| 6.5 | Minimum Depth/Dimension | 7 |
| 7.0 | General Design Recommendations..... | 7 |
| 7.1 | Floor Slab Support – Aggregate Piers..... | 7 |
| 7.2 | Lateral Earth Pressures | 8 |
| 7.2.1 | <i>MSE Retaining Walls</i> | <i>9</i> |
| 7.3 | Seismic Conditions..... | 9 |
| 7.4 | Pavement Recommendations | 9 |
| 7.4.1 | <i>Asphalt Pavement</i> | <i>9</i> |
| 7.4.2 | <i>Concrete Pavement.....</i> | <i>10</i> |
| 7.4.3 | <i>Subgrade and Drainage.....</i> | <i>11</i> |
| 8.0 | Site Grading Recommendations | 11 |



| | | |
|-------|---|-----------|
| 8.1 | Site Preparation..... | 11 |
| 8.1.1 | General | 11 |
| 8.1.2 | Unexpected Conditions | 12 |
| 8.1.3 | Crane Pad Support..... | 12 |
| 8.1.4 | Construction Surface | 12 |
| 8.1.5 | Test Pit Evaluation | 12 |
| 8.1.6 | Proofrolling | 12 |
| 8.2 | Excavation | 13 |
| 8.3 | Fill Placement and Compaction..... | 13 |
| 8.3.1 | Use of Excavated Soils as Fill..... | 13 |
| 8.3.2 | Use of Off-Site Borrow Materials as Fill..... | 14 |
| 8.3.3 | Site Drainage and Dewatering..... | 14 |
| 8.4 | Subgrade Repair and Improvement Methods..... | 14 |
| 9.0 | Foundation Construction and Engineering Evaluation | 14 |
| 10.0 | Pre-Construction Meeting | 15 |
| 11.0 | Limitations of Report | 15 |

Important Information About Your Geotechnical Engineering Report

Appendix

Boring Location Plan with Aerial and Conceptual (Figure 1)

Boring Profile (Figure 2)

Summary of Exploration Procedures

Boring Logs



1.0 Executive Summary

For convenience, this report is summarized below. This brief summary should not be used for design or construction purposes without reviewing the more detailed information presented in the remainder of this report.

- The site is underlain by previously placed fill with a thickness of about 8 to 12 feet. Fill is in turn underlain by alluvial (water deposited) soils which are about 5 to 10 feet thick. The fill is poorly compacted, and portions of the fill contain organics and rock fragments. Auger refusal occurred at a depth of 5.5 feet in boring B-3 on construction debris, boulders, or rock fill. The alluvial soils are soft to stiff and very loose to medium dense.
- A historic flood plain occupies approximately half of the site.
- Unexpected subsurface conditions should be anticipated, and a contingency budget established.
- Structural loads will cause underlying soils to settle. We estimate that settlement will be greater than can be tolerated by the proposed structures.
- S&ME assumes less than 1 to 2 feet of structural fill will be required to bring the site to design subgrade elevation. If greater fill heights are proposed, S&ME must be notified to allow us to modify our recommendations.
- Our experience indicates that auger cast piles are the typical foundation option on sites with similar subsurface conditions. The Owner has indicated that they wish to utilize a ground improvement technique to support the residential and parking structures. Ground improvement can consist of rigid inclusions instead of auger cast piles due to cost considerations. Building slabs must also be supported using a ground improvement system. Compacted aggregate piers should be used to support slabs.
- Both rigid inclusions and compacted aggregate piers should be designed and installed by a specialty contractor using a process known as "delegated design." Delegated design is necessary because of the differences in approach, equipment, and technique from different specialty contractors. The specialty contractor will determine specific design and installation information based on allowable settlement criteria and structural loads provided by the Structural Engineer and subsurface conditions encountered presented herein. S&ME anticipates the Specialty Contractor will develop a soil improvement solution that allows for development of an allowable bearing pressure of 3,000 to 5,000 psf for aggregate piers and 5,000 to 9,000 psf for rigid inclusions.
- Site grading operations will be critical to successful performance of the project. Given the erratic conditions and the potential for unexpected conditions, field engineering decisions in addition to materials testing will be very important. S&ME should be retained to perform these services during construction.

2.0 Project Information

Our understanding of the project is based on the following:

- Conceptual site plan transmitted to Keith Brown (S&ME) from Ernest Brown via email on April 12, 2023. The conceptual site plan was prepared by MHA Works and dated April 12, 2023.

We understand a mixed-use building consisting of first floor podium with 3 levels of wood framed apartments will be constructed at 1414 Carpenter Fletcher Road in Durham, North Carolina. In addition, a 3 to 4 story precast concrete parking garage will be constructed.



Structural loading information was not available at the time of this report; however, we anticipate maximum column and wall loads will likely be less than 600 to 800 kips and 20 to 30 kips per linear foot (wall footing) in the parking deck and 350 kips and 6 to 8 kips per linear foot (wall footing) in the residential portion. Site grading information was also not available at the time of this report; however, we anticipate maximum excavation and fill depths of 2 to 3 feet. If fill heights greater than this are anticipated, S&ME should be notified such that we can modify the recommendations found herein. The Specialty Foundation Contractor should be provided with a grading plan and construction sequence prior to the start of their foundation design. Any changes in site grades should similarly be communicated to the Specialty Foundation Contractor to allow for their review and comment.

3.0 Exploration and Testing Program

Our field exploration included a visual site reconnaissance and performance of 10 soil test borings (B-01 through B-10). Borings were performed by S&ME with a CME 550 drill rig using hollow-stem auger drilling techniques and equipped with an automatic hammer. Test locations were marked in the field using hand-held GPS equipment and by referencing existing site features and should be considered approximate. Approximate test locations are shown on Figure 1 in Appendix I.

Soil test borings were advanced to approximate depths ranging from 5½ to 34 feet below existing ground surface. Standard Penetration Testing (ASTM D 1586) and split-spoon sampling were performed at 2½-foot intervals above a depth of 10 feet and then at 5-foot intervals thereafter.

Groundwater measurements were attempted after drilling was completed within all borings. The boreholes were then backfilled with auger cuttings and a hole-closure device placed near the surface.

Test Boring Records and a Generalized Subsurface Conditions Profile, showing specific subsurface information from each boring, are included in the Appendix. Stratification lines shown on Test Boring Records and the Conditions Profile are intended to represent approximate depths of changes in soil types. Naturally, transitional changes in soil types are often gradual and cannot be defined at exact depths.

Following completion of the field work, split-spoon soil samples were transported to our laboratory where a Geotechnical Professional manually classified the soil in general accordance with the Unified Soil Classification System (USCS). The classification and field-testing results are presented on the individual Boring Logs in the Appendix, along with a Test Boring Log Legend and Field-Testing Procedures. Ground surface elevations shown on the Test Boring Records and Subsurface Profiles were estimated from Durham County GIS and should be considered approximate. The GPS coordinates shown on the Boring Logs were estimated from Google Earth and should also be considered approximate.

4.0 Site Conditions

The existing site is currently heavily wooded. Topographically the edge of the site slopes downward abruptly in all directions but north, falling from elevation 270 to 260 feet. The central and northern portions of the site are relatively flat. Google Earth Aerial imagery indicates the southern portion of the site is in a flood plain. The flood plain has produced water-deposited materials (alluvium soils) across the site.



4.1 Area Geology

The site is located on the eastern edge of one of several trough shaped basins that are present within the Piedmont Physiographic Province. The basins were formed during the Triassic and early Jurassic periods because of faulting and regional subsidence. Over time, the basins were filled with sediment eroded from the adjacent igneous and metamorphic formations. Although the basins may be grouped into areas having distinguishable geologic characteristics, locally the area is simply referred to as the Triassic Basin. Sedimentary sandstones, siltstones, mudstones, and conglomerates are the predominant rock types within the Triassic Basin. Igneous intrusions (dikes and sills) are present within the sedimentary rocks in many areas.

Near the ground surface, the Triassic rocks and igneous intrusions are often discontinuous with depth. The Triassic rocks can be present as relatively thin layers and intrusions in the form of boulders. Typical soils within the Triassic Basin consist of silts, clays, and clayey/silty sands. Near the surface the silts and clays are often moderately to highly plastic. Where present, residual soils formed by weathering of igneous intrusions can be of a softer/wetter consistency than surrounding Triassic sediments (silts and clays).

5.0 Subsurface Conditions

The following is a brief and general description of subsurface conditions encountered at the site from the subsurface exploration. More detailed information is provided on the individual Boring Logs included in the Appendix.

Similar soils were grouped into strata on the logs. The strata contact lines represent approximate boundaries between soil types; the actual transition between soil types in the field could be gradual in both the horizontal and vertical directions.

5.1 Surface Materials

A surficial layer of topsoil was observed within borings to depths ranging from approximately 3 to 5 inches. Topsoil is typically a dark-colored soil material containing roots, fibrous matter, and/or other organic components, and is unsuitable for engineering purposes. The topsoil depths provided in this report are based on measurements made during field exploration and should be considered approximate. We note that the transition from surface materials to underlying soils may be gradual.

5.2 Previously Placed Fill Soils

Previously placed fill soils were encountered beneath topsoil in all borings to depths of 8 to 12 feet. Boring B-3 encountered auger refusal at 5.5 feet. We assume refusal was on either construction debris, a boulder or rock fill. Recovered fill soils generally consisted of highly plastic sandy elastic silt (USCS classification MH), low plasticity sandy silts and clays (CL and ML), and silty sands (SM). These fill soils had various amounts of gravel, organic debris such as roots and black small wood pieces to larger black pieces of wood. Fill soils were observed to be moist to wet. SPT N-values of fill soils ranged from weight of hammer to 15 blows per foot (BPF). Weight-of-hammer designations mean the sampler was advanced through the desired interval solely under the weight of the drill rod and seating of the 140-pound hammer without any blows. The blow counts are influenced by the debris and rock pieces contained within the soil mass. As such the existing fill should be assumed to be poorly compacted.



5.3 Alluvial Soils

Alluvial soils are water-deposited materials (termed alluvium) that have been eroded and washed down from higher ground. Alluvial soils were encountered directly beneath fill soil materials in all borings except B-06. Alluvial soils were encountered to depths ranging from about 8 to 27 feet below existing ground surface. These soils were generally comprised of low plasticity sandy silts and clays (ML and CL), highly plastic sandy elastic silts (MH), silty and clayey sands (SM and SC) and poorly graded sands with silt (SP-SM). Alluvial soils contained varying amounts of rock fragments. Alluvial soils were found to be wet. SPT N-values of alluvial soils ranged from 3 to 15 blows per foot (bpf). Rock fragments within soil samples likely amplified blow counts within alluvial soils, making them appear denser than actually exists.

5.4 Residual Soils

Residual soils were encountered below alluvial soils in borings B-01, B-02, B-07, and B-09. Residual soils encountered generally consisted of silty sands (SM) and low plasticity sandy silts (ML). Residual soils were observed to be wet. SPT N-values within the residual soils ranged from 24 to 46 blows per foot (bpf).

5.5 Partially Weathered Rock

Partially weathered rock (PWR) was encountered within all borings, except for B-07 and B-09, at depths ranging from approximately 22 to 27 feet below existing ground surface. Partially weathered rock is a transitional material between very hard soil and rock which exhibits a standard penetration resistance of more than 100 blows per foot. Partially weathered rock can be penetrated with some difficulty by power augers. Standard penetration test values in partially weathered rock ranged from 50 blows in 6 inches of penetration to 50 blows with no penetration. Partially weathered rock materials were generally sampled as silty sands and sandy silts.

Auger refusal materials were encountered in four (4) borings at depths varying from approximately 5½ to 34 feet below existing ground surface. Auger refusal material may consist of layers of less weathered PWR, boulders, construction debris or the top of parent rock.

Partially weathered rock and auger refusal data is summarized in the table below. Depths to partially weathered rock and auger refusal material are approximate. Elevations of PWR and auger refusal material will vary between borings.



Table 5-1 – Partially Weathered Rock & Auger Refusal Summary

| Boring | Approximate Ground Surface Elevation (feet) | Approximate Depth to PWR (feet) | Approximate PWR Elevation (feet) | Approximate Depth to Auger Refusal Material (feet) |
|--------|---|---------------------------------|----------------------------------|--|
| B-01 | 270 | 22 | 248 | -- |
| B-02 | 270 | 22 | 248 | -- |
| B-03 | 270 | N/A | N/A | 264½ |
| B-04 | 270 | 27 | 243 | 236 |
| B-05 | 270 | 22 | 248 | 246½ |
| B-06 | 270 | 16½ | 253½ | 253 |
| B-08 | 270 | 22 | 248 | -- |
| B-10 | 269 | 22 | 247 | -- |

-- Not encountered

5.6 Water

Water was encountered in borings B-01, B-02, B-03, and B-09 at depths ranging from approximately 8 to 21 feet below ground surface. Perched water may be encountered in alluvial, residual or fill soils overlying less permeable soils. Groundwater elevations can be expected to fluctuate due to seasonal variations in rainfall, evaporation, and other factors.

6.0 Design Recommendations

The following design recommendations are based upon our understanding of the proposed construction and results of the exploration as discussed above. If the above-described project conditions are incorrect or modified after submission of this report, or if subsurface conditions encountered during construction are different from those reported, S&ME should be notified and these recommendations must be re-evaluated, and appropriate revisions made to our report. In addition, as the design progresses or the requirements change, we would be happy to expand or provide additional recommendations as needed for the selected structure type, structural loads, and grading considerations.

The development and construction team must understand our recommendations are based on the premise that our representatives will be on-site to observe and document site work, including site preparation, excavation, proofrolling, undercutting, and possibly observing construction of ground improvement systems, fill placement, and to perform density testing of fills. Proper site preparation and maintenance is very important in helping to provide time- and cost-efficient construction. Our field observations and tests can be a vital component in improving the performance and efficiency of the site work.

6.1 Building, Perimeter Retaining Walls, and Slab Support

A typical foundation alternative for sites with similar subsurface conditions is to utilize auger cast piles. It is our understanding the Owner, in the interest of reducing building and foundation costs, would like the soils improved



beneath foundations and slabs using aggregate piers and rigid inclusions. Floor slabs will be supported using aggregate piers. Perimeter retaining walls, building retaining walls, building walls and building columns will be supported on rigid inclusions.

Designing the foundations and slabs for improved soils replaces the need for structural support (auger cast piles or driven piles) of the slab and grade beams. Soil improved foundation design is a delegated design and is the responsibility of the specialty foundation contractor (responsible for determining the allowable bearing pressure and meeting settlement tolerances defined by the structural engineer).

S&ME is providing a discussion of our experience with similar foundation types in similar conditions. Typically, structural loads (magnitude and configuration) are provided by the structural engineer to a specialty contractor who designs a soil improvement system which renders an allowable bearing pressure for the structural engineer's use in the design of their footings. In other situations, the structural engineer provides a design bearing pressure they have selected based on experience from the geotechnical engineer, their own experience with similar projects and the owner's concurrence. The specialty foundation contractor then verifies the assumed loads, bearing pressure and settlement tolerances can be achieved or recommends a reduction/increase in allowable design bearing pressure. S&ME should be allowed to review the specialty contractor design to provide feedback to the design team and owner.

6.2 Structural Fill Loading

It is important to understand that placement of soil creates a load that will induce settlement that must be allowed to occur prior to footing or slab construction. How long it will take for fill to settle depends upon the rate of consolidation of fine grain soils, the thickness of the layers, the soils drainage path (how far water has to travel to a more permeable layer) and the magnitude and area loaded. If not allowed to settle prior to footing construction the foundation soil must be improved to accommodate the induced loads. S&ME and the Specialty Foundation Contractor should be notified if proposed structural fill depths will exceed 3 feet.

6.3 Settlement Performance Requirements

As previously discussed, the structural engineer must specify the settlement criteria for the proposed structures and slabs. Typically, this value is 1 inch of total settlement and 0.5 inches of differential settlement following footing or wall construction, which includes accounting for fill induced settlement associated with backfill operations. As such, the specialty foundation contractor should be presented with the construction sequencing and develop a design based on the settlement criteria, building loads and structural fill loadings.

6.4 Building and Retaining Wall Foundations – Rigid Inclusions

Based on data obtained from the borings, we calculated estimated settlements for shallow foundations without ground improvement subject to the loading conditions discussed in the Project Information section. Settlements greater than 1 inch are anticipated. Therefore, ground improvement is necessary.

We considered use of aggregate piers beneath building and retaining wall foundations. Satisfactory aggregate pier performance requires suitable lateral confinement. Aggregate piers that extend through relatively thick weak deposits may bulge. The bulging results in a softer response and potentially large displacements. Bulging will be a concern because of the potential presence of voids in the existing fill, poorly compacted fill and the thick soft



clayey alluvial soils. Because of the concern with bulging using aggregate piers, S&ME recommends all structural foundations be supported on soil improved foundations consisting of rigid inclusions.

Unreinforced bored and grouted columns are commonly used as rigid inclusions. The strength and stiffness of the rigid inclusion is not dependent on the lateral confinement and bulging is therefore not a concern. Poorly compacted fill and construction debris/organics are anticipated within portions of the existing fill and in other unexplored portions of the site. The contractor should be prepared to over excavate and remove any debris which refuses the equipment's advancement of tooling.

Rigid inclusions should be procured using a performance specification. S&ME anticipates a specialty foundation contractor delegated design will be able to develop an allowable bearing capacity of 5,000 to 9,000 pounds per square foot (psf). The specialty foundation contractor will develop a foundation solution (allowable bearing pressure) based on the structural loads and settlement criteria. The performance specification should require the contractor to provide a design submittal, a proposed construction specification and a proposed QA/QC plan, all of which should be reviewed by S&ME.

6.5 Minimum Depth/Dimension

Building foundations should bear at least 18 inches below final grade so they will not be adversely affected by frost penetration. Continuous strip footings should not be less than 24 inches wide and isolated column/pedestal footings should not be less than 36 inches wide. These recommendations are made to help prevent a "localized" or "punching" shear failure condition which could exist with very narrow footings.

7.0 General Design Recommendations

7.1 Floor Slab Support – Aggregate Piers

A compacted aggregate pier ground improvement system could be used for support of the floor slabs in lieu of structural support (auger cast piles). An aggregate pier ground improvement system consists of drilling or forming a hole that extends through soft, compressible materials and then backfilling it with compacted stone. The system reduces settlement by creating a stiffened composite soil matrix.

The means and methods of aggregate pier installation are often proprietary or at least contractor specific. Therefore, an aggregate pier ground improvement system should be procured using a performance specification. The specification should include this exploration report (specialty contractor understands that poorly compacted fill, construction debris and organics exist in portions of the site), the sustained loads for the slabs, and the desired settlement tolerance (e.g, <1-inch total post-construction, 0.5" differential post-construction) as determined by the structural engineer. The performance specification should require the contractor to provide a design submittal, a proposed construction specification, and a proposed QA/QC plan, all of which should be reviewed by S&ME.

The concrete ground floor slabs for the proposed buildings will then be supported by soil which has been improved through use of aggregate piers. We recommend a 6-inch-thick layer of crushed stone be used to separate the floor slabs from the subgrade soils. This layer will help provide uniform support for the floor slab and provide a working surface during wet weather. The crushed stone should consist of crushed aggregate base



course stone (CABC) compacted to at least 98 percent of its modified Proctor maximum dry density. Based on the boring data, a modulus of subgrade reaction of 150 pounds per cubic inch (pci) may be used for floor slab design.

The need for a plastic vapor retarder separating the proposed slabs for each site from the subgrade materials was not indicated from a subsurface water standpoint. However, depending on final grades, usage and design of the floor slab, floor coverings and the local building code, a vapor retarder could be required.

7.2 Lateral Earth Pressures

Based on the provided information, we expect below grade walls could be used for this project. We assume these walls will be cast-in-place (CIP) concrete walls. CIP walls must be capable of resisting lateral earth pressures that will be imposed on them. Lateral earth pressures to be resisted by the CIP walls will be partially dependent upon the method of construction. Assuming the CIP walls are relatively rigid and structurally braced against rotation, they should be designed for a condition approaching the "at-rest" lateral pressure. In the event the walls are free to deflect during backfilling, as for any exterior walls that are not restrained or rigidly braced, the "active" pressure conditions will be applicable for design. The following lateral earth pressure parameters are recommended for design, based on our experience, and assuming a level backfill and a frictionless wall.

Table 6.2 – Recommended Parameters for Cast-In-Place Wall Backfill

| Parameter | On-Site Soils | Off-Site Borrow (GW, GP, SW, SP, or SM with <25% Fines) |
|--|---------------|--|
| Friction Angle, ϕ (degrees) | 28 | 32 |
| At-Rest Earth Pressure Coefficient (K_o) | 0.53 | 0.47 |
| At-Rest Equivalent Earth Pressure (psf/ft) | 69 | 61 |
| Active Coefficient Earth Pressure (K_a) | 0.36 | 0.31 |
| Active Equivalent Earth Pressure (psf/ft) | 47 | 40 |
| Passive Earth Pressure Coefficient (K_p) | 2.77 | 3.25 |
| Passive Equivalent Earth Pressure (psf/ft) | 360 | 423 |
| Moist Unit Weight of Backfill (pcf) | 130 | 130 |
| Ultimate Friction Coefficient Between Wall Foundations and Bearing Soils (assumed to be on-site soils) | 0.36 | |

The recommended lateral earth pressure coefficients/parameters do not consider the development of hydrostatic pressure from such things as rainwater runoff, varying subsurface water levels, or leaking utilities behind the earth retaining wall structures. As such, positive wall drainage must be provided for all earth retaining structures. These drainage systems can be constructed of open-graded washed stone isolated from the soil backfill with a geosynthetic filter fabric and drained by perforated pipe or weep holes. As an alternative, several wall drainage products are produced specifically for this application. Lateral earth pressures arising from surcharge loading or slopes above the wall should be added to the above earth pressures to determine the total lateral pressure.



The soil backfills placed behind CIP retaining walls and for fill placed in the passive zone for CIP walls should be placed and compacted in accordance with Section 8.3. We caution that operating compaction equipment directly behind the retaining structures can create lateral earth pressures far more than those recommended for design. Therefore, bracing of the walls could be needed during backfilling operations.

7.2.1 *MSE Retaining Walls*

Mechanically Stabilized Earth (MSE) retaining walls could be considered for site walls (i.e., not supporting structures). We can provide additional design information for MSE walls and/or design MSE walls if requested. If this is a delegated design then the wall designer should be responsible for settlement, global stability and sliding analyses.

7.3 **Seismic Conditions**

Based on our test borings and per Section 1613 of the North Carolina Building Code 2018 Edition (2015 International Building Code with North Carolina Amendments) the Seismic Site Class is D. The spectral design accelerations are presented in Table 5-1.

Table 6-1 NCBC 2018 Design Accelerations

| Site Class | S_s | S_1 | F_a | F_v | F_{PGA} | $PGAM$ | S_{DS} | S_{D1} |
|------------|--------|--------|-------|-------|-----------|--------|----------|----------|
| D | 0.155g | 0.077g | 1.6 | 2.4 | 1.6 | 0.116g | 0.165g | 0.123g |

For a structure having a Risk Category classification of I, II, or III, the S_{DS} and S_{D1} values obtained are consistent with "Seismic Design Category B" as defined by the 2018 North Carolina Building Code and ASCE 7-10. For a structure having a Risk Category classification of IV, the S_{DS} and S_{D1} values obtained are consistent with "Seismic Design Category C" as defined by the 2018 North Carolina Building Code and ASCE 7-10.

Considering the small hazard and the characteristics of the sand-like soils, liquefaction triggering is not a design concern.

7.4 **Pavement Recommendations**

Pavement design procedures are based on AASHTO "Guide for Design of Pavement Structures" (1993) and associated literature. At the time of this report, traffic loading information was not available. Our recommended pavement thicknesses are based on experience with similar projects. The pavement analysis was based on an initial serviceability index of 4.2 (4.5 for concrete), a terminal serviceability index of 2.0, and a 20-year design life.

7.4.1 *Asphalt Pavement*

Based on the field testing, and experience, a design CBR value of 4 percent was used for pavement design. This CBR value is based on the top 12 inches being uniformly compacted to at least 98% of the soil's standard Proctor MDD. For the light-duty pavement areas (i.e. parking stalls) an 18-kip equivalent single axle loads (ESAL) value of 25,000 was used. For heavy-duty pavement area (i.e. access drives and route to dumpster pad) an ESAL value of 100,000 was used.



Recommendations for the standard and heavy-duty pavements are provided in the following table.

| Material Type | Light Duty | Heavy Duty |
|------------------------------------|-----------------------|------------------------|
| Asphalt Surface Course (S-9.5B) | 3 inches* (S-9.5B) | 1.5 inches (S-9.5B) |
| Asphalt Binder Course (I-19.0C) | --- | 2 inches |
| Aggregate Base Course | 6 inches | 8 inches |

*Placed in two lifts

All materials and construction methods should conform to the 2018 edition of the NCDOT "Standard Specifications for Roads and Structures." The aggregate base course (ABC) stone should consist of stone meeting the requirements under Section 520. ABC stone should be compacted to at least 98 percent of the maximum dry density as determined by the modified Proctor compaction test, AASHTO T-180M as modified by NCDOT. To confirm that the base course stone has been uniformly compacted, in place density tests should be performed by a qualified soils technician and the area should be thoroughly proofrolled under his observation.

Asphaltic concrete should conform to Section 610 in the 2018 edition of the NCDOT "Standard Specifications for Roads and Structures." Sufficient testing and observation should be performed during pavement construction to confirm that the required thickness, density, and quality requirements of the specifications are achieved.

Although our analysis was based on traffic loading for a 20-year design life, our experience indicates that pavement maintenance is necessary due to normal weathering of the asphaltic concrete. Normal weathering (i.e., oxidation) causes asphalt to become more brittle resulting in loss of tensional strength. This loss in strength can cause minor cracking which provides access for water infiltration into the stone base and subgrade. As the degree of saturation of the subgrade increases, the strength of the subgrade decreases leading to pavement failure. Routine maintenance in the form of sealing, patching, and maintaining proper drainage is required to increase pavement life. It is not uncommon for overlays to be required after 10 to 12 years.

7.4.2 Concrete Pavement

The concrete pavement design was performed using the same design traffic as in the heavy-duty asphalt pavement areas (100,000 ESALs). The compressive strength of the concrete was assumed to be 4,000 psi. A modulus of subgrade reaction of 150 pci was used for design assuming 6 inches of compacted ABC stone is placed beneath the concrete pavement. We have assumed that load transfer across contraction (saw) joints will be handled by aggregate interlock. ABC should meet the material and compaction requirements stated in the "Flexible (Asphalt) Pavement" section above.



Concrete pavement is recommended for heavily loaded traffic and dumpster pad areas. The table below presents our recommended concrete pavement section thicknesses.

| Material Type | Concrete Pavement Design |
|-----------------------------------|---------------------------|
| Air Entrained Concrete (4000 psi) | 5 inches |
| Aggregate Base Course (ABC) stone | 6.0 inches |
| Maximum Joint Spacing | 12 feet in all directions |

Saw joints should be cut to a depth of at least $\frac{1}{4}$ of the thickness of the concrete pavement to promote shrinkage cracking along the joint. The ABC stone should be compacted to at least 98 percent of its modified Proctor maximum dry density.

7.4.3 Subgrade and Drainage

Pavement performance is highly dependent on the subgrade condition, including installed thickness, compaction, and drainage. Design should not result in water “ponding” on the pavement surface or behind curbing. Design should also result in positive drainage being available from the stone base material.

The subgrade soils should be reevaluated by proofrolling immediately prior to pavement construction and after any unstable areas have been repaired. This recommendation is important to the long-term performance of the pavements. Areas adjacent to pavements, such as embankments, landscaped islands, ditching, etc., which can drain water (rainwater or sprinklers) should be designed to prevent water seepage below the pavements. This could require the use of subdrains (French drains) or swales.

If pavement installation is performed in wet weather (although this is not recommended), special care will be needed. Our experience is that pavement installation over wet subgrade soils and crushed stone will significantly reduce the pavement’s life.

8.0 Site Grading Recommendations

8.1 Site Preparation

8.1.1 General

Initial site preparation should include stripping of topsoil and removing any other deleterious materials within proposed development areas for a lateral distance of at least 20 feet beyond the limits of new construction. Site grading will be difficult during periods of extended rainfall that generally occur during the winter and early spring months. Near-surface soils are moisture sensitive, and when wet, will tend to rut and pump under construction equipment traffic. In addition, these soils are difficult to dry during wet weather conditions. To reduce potential earthwork problems, site preparation and grading should be scheduled during drier summer months, if possible. If grading during wet weather is attempted, repair of near-surface soils and possible use of select off-site borrow will be necessary to adequately prepare subgrades for new construction.



Heavy rubber-tired construction equipment should not be allowed to operate on exposed subgrades during wet conditions. Even during drier periods of the year, we recommend that exposed subgrades be sloped and sealed at the end of each day to promote runoff and reduce infiltration from rainfall. Water should not be allowed to pond on exposed subgrades. To further reduce potential deterioration of exposed subgrades, construction traffic patterns should be managed to limit equipment passes across the site. An all-weather surface may be necessary for heavy construction traffic to reduce degrading the soil subgrade during construction. Options for stabilizing all weather surfaces include compacted crushed stone or chemical (lime) stabilization.

8.1.2 Unexpected Conditions

Based on experience with sites such as this, unexpected subsurface conditions are often encountered. This can include deeper and poorer fill than encountered by the borings, debris or other structures.

Please note that organics were encountered in several of our borings. In addition, rock pieces were encountered from the split-spoon samples visually classified as fill. As such those materials are softer than the measured values indicate. S&ME also encountered auger refusal at boring B-03 at a depth of 5 ½ feet.

Given the above considerations, we recommend that a contingency budget be established for dealing with unexpected conditions during site grading and ground improvement installation.

8.1.3 Crane Pad Support

The contractor is responsible for determining the adequacy of any proposed crane pads and is specifically excluded from this scope of work.

8.1.4 Construction Surface

Because of the presence of poorly compacted fill the contractor should be prepared to stabilize all work surfaces, to allow for operation of their construction equipment. Typical stabilization includes undercut and replacement with offsite or onsite borrow soils (depth to be determined based on actual conditions), use of geogrid and crushed aggregate base course stone or some combination thereof. Upon completion of construction activities, the subgrade should be proofrolled and any yielding areas repaired prior to placement of compacted structural fill.

8.1.5 Test Pit Evaluation

Test pits are recommended to further evaluate the areas of existing fill detected in the borings. The test pits should be excavated by the proposed grading contractor prior to grading. The contractor should evaluate the suitability of material for reuse (compared to that which is described in Section 8.3) and evaluate the subgrade soils upon which construction activities will take place.

8.1.6 Proofrolling

Following initial site preparation measures, after conducting the test pits, and after excavation to the design subgrade levels, the exposed subgrade should be thoroughly proofrolled with a heavily loaded, tandem-axle dump truck or similar rubber-tired equipment under the observation of the Geotechnical Engineer or his representative. The proofrolling will help reveal the presence of unstable or otherwise unsuitable surface



materials. Areas that are unstable should be undercut as recommended by the Geotechnical Engineer and backfilled as discussed in Section 8.3.

8.2 Excavation

The boring data indicates excavations will primarily extend through low to high consistency residual and fill soils. Shallow rock was encountered in boring B-03 and can exist at erratic elevations in this area. There is always a potential for rock to be encountered in unexplored areas in this geologic province. The following presents our comments regarding excavation of these various materials based on our experience.

- *Low to High Consistency Soils*: These materials can normally be excavated by conventional earthmoving equipment typically used in this area. That is, mass excavation can be accomplished by a moderately heavy tracked excavator or heavy front-end loader. Local excavation for foundations and shallow utility trenches can typically be accomplished by a heavy backhoe or tracked excavator.
- *Construction Debris, Organics and Poorly Compacted Fill*: These materials can normally be excavated by conventional earthmoving equipment typically used in this area. That is, mass excavation can be accomplished by a moderately heavy tracked excavator or heavy front-end loader.
- *Partially Weathered Rock*: A portion of partially weathered rock may be loosened by hard ripping. It should be noted this process may be very slow and not compatible with the construction schedule. Ripping can create large rock pieces which must be broken down prior to use as structural fill.

Please note that all excavations should be sloped or shored in accordance with local, state, and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. The contractor is solely responsible for site safety. This information is provided only as a service and under no circumstances should S&ME be assumed to be responsible for construction site safety.

8.3 Fill Placement and Compaction

After excavation, undercutting, and stabilization, areas requiring fill placement should be raised to their design subgrade configuration with soil free of deleterious materials. Any rock fragments within the new fill should be less than 2 inches in diameter. The fill should be uniformly spread in 6- to 8-inch-thick loose lifts and be compacted to at least 95 percent of the soil's maximum dry density, as determined by a laboratory standard Proctor compaction test (ASTM D698), except within 12 inches of subgrade where compaction should be increased to 98%. The moisture content should be controlled at plus to minus 3 percent of optimum.

Fill placement should be monitored by a qualified Materials Technician working under the general direction of the Geotechnical Engineer. In addition to this visual evaluation, the Technician should perform enough in-place field density tests to confirm that the required degree of compaction is being attained. Periodic field "check plugs" should be performed to help determine the correct Proctor data to use.

8.3.1 Use of Excavated Soils as Fill

Any proposed structural fill should consist of a clean material (free of organics and debris), have a maximum particle size no greater than 1 inch, be of low to moderately low plasticity soil (liquid limit less than 40, plasticity index less than 15), with a standard Proctor maximum dry density of at least 100 pounds per cubic foot (pcf) and



moisture content within 3 percent of optimum. In areas where existing fill is excavated, it should be assumed this material is not suitable for reuse as structural fill.

8.3.2 Use of Off-Site Borrow Materials as Fill

Imported fill will likely be necessary to bring the site to design subgrade, fill the undercut areas and backfill utility trenches. This fill should also consist of a clean material (free of organics and debris), have a maximum particle size no greater than 1 inch, be of low to moderately low plasticity soil (liquid limit less than 40, plasticity index less than 15), with a standard Proctor maximum dry density of at least 100 pounds per cubic foot (pcf). The borrow material should be evaluated by a Geotechnical Professional prior to use.

8.3.3 Site Drainage and Dewatering

After initial site preparation, the site will be relatively flat which could promote ponding of surface water and increased subgrade instability, especially during wetter and colder times of the year and in below grade excavations. It is important the grading contractor protect the exposed soils from becoming wet or saturated during inclement weather. Positive site drainage should be maintained during all operations, including the initial stripping of the site and after excavation to subgrade levels. This may include surface ditches around the perimeter, internal ditching, and in some cases French drains. Failure to provide positive site drainage can often result in extensive and costly repairs to the exposed subgrade, as well as construction delays.

During wet weather, special measures could be necessary for this site. These could include the following:

- Excavated ditches or berms to help reduce rainwater runoff from flowing onto the construction area.
- Rainwater should not be allowed to pond.
- The exposed ground surface should be sealed at the end of each workday (if inclement weather is expected) to help reduce rainwater seepage into the soil.
- Additional undercutting of unstable soil could be needed during wet weather.

All stormwater should be diverted from the proposed retaining wall construction.

8.4 Subgrade Repair and Improvement Methods

The exposed subgrade soil of both cut and fill areas can deteriorate when exposed to construction activity and environmental changes such as freezing, erosion, softening from ponded rainwater, and rutting from construction equipment. We recommend the exposed subgrade surfaces that have deteriorated be properly repaired by scarifying and recompacting immediately prior to construction. If this must be performed during wet weather conditions, it would be worthwhile to consider undercutting the deteriorated soil and replacing it with compacted crushed stone.

9.0 Foundation Construction and Engineering Evaluation

A representative of the Geotechnical Engineer should be on site during initial site preparation measures, grading, undercutting, foundation installation, as well as during ground improvement installation. The representative of the Geotechnical Engineer should confirm the bearing surface is suitable for support of the new structures.

During soil improvement, our representative should observe the element depths, orientation, replacement ratio and confirm their positioning is in conformance with the design documents.



Foundation concrete should be placed in the excavation the same day the foundations are excavated. If an excavation is to remain open overnight or rain is imminent, a 3- to 4-inch-thick mud mat of lean (2,000 psi) concrete should be placed in the bottom of the excavation to protect the bearing materials. This will help limit the potential for additional excavation of wet, softened soils which often results when excavations are exposed to inclement weather.

10.0 Pre-Construction Meeting

Due to the unknown construction sequence, site challenges including the existing fill and installation of ground improvement elements, it is recommended that a pre-construction meeting be conducted with the Owner, the general contractor, grading contractor, the specialty foundation contractor and a representative of our firm. During this meeting, the recommendations in this report should be discussed with construction methods determined.

11.0 Limitations of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty, either express or implied, is made.

We relied on project information and incomplete construction sequences given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information if necessary.

Our conclusions and recommendations are based on limited data from a field exploration program. Subsurface conditions can often vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in this report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

S&ME should be retained to review the final plans and specifications to confirm that earthwork, foundation, and other recommendations are properly interpreted and implemented. The geotechnical recommendations are contingent on S&ME's review of final plans and specifications followed by our observation and monitoring of earthwork and foundation construction activities.



BUILT FOR VERSATILITY

Important Information About Your Geotechnical Engineering Report

Variations in subsurface conditions can be a principal cause of construction delays, cost overruns and claims. The following information is provided to assist you in understanding and managing the risk of these variations.

Geotechnical Findings Are Professional Opinions

Geotechnical engineers cannot specify material properties as other design engineers do. Geotechnical material properties have a far broader range on a given site than any manufactured construction material, and some geotechnical material properties may change over time because of exposure to air and water, or human activity.

Site exploration identifies subsurface conditions at the time of exploration and only at the points where subsurface tests are performed or samples obtained. Geotechnical engineers review field and laboratory data and then apply their judgment to render professional opinions about site subsurface conditions. Their recommendations rely upon these professional opinions. Variations in the vertical and lateral extent of subsurface materials may be encountered during construction that significantly impact construction schedules, methods and material volumes. While higher levels of subsurface exploration can mitigate the risk of encountering unanticipated subsurface conditions, no level of subsurface exploration can eliminate this risk.

Scope of Geotechnical Services

Professional geotechnical engineering judgment is required to develop a geotechnical exploration scope to obtain information necessary to support design and construction. A number of unique project factors are considered in developing the scope of geotechnical services, such as the exploration objective; the location, type, size and weight of the proposed structure; proposed site grades and improvements; the construction schedule and sequence; and the site geology.

Geotechnical engineers apply their experience with construction methods, subsurface conditions and exploration methods to develop the exploration scope. The scope of each exploration is unique based on available project and site information. Incomplete project information or constraints on the scope of exploration increases the risk of variations in subsurface conditions not being identified and addressed in the geotechnical report.

Services Are Performed for Specific Projects

Because the scope of each geotechnical exploration is unique, each geotechnical report is unique. Subsurface conditions are explored and recommendations are made for a specific project. Subsurface information and recommendations may not be adequate for other uses. Changes in a proposed structure location, foundation loads, grades, schedule, etc. may require additional geotechnical exploration, analyses, and consultation. The geotechnical engineer should be consulted to determine if additional services are required in response to changes in proposed construction, location, loads, grades, schedule, etc.

Geo-Environmental Issues

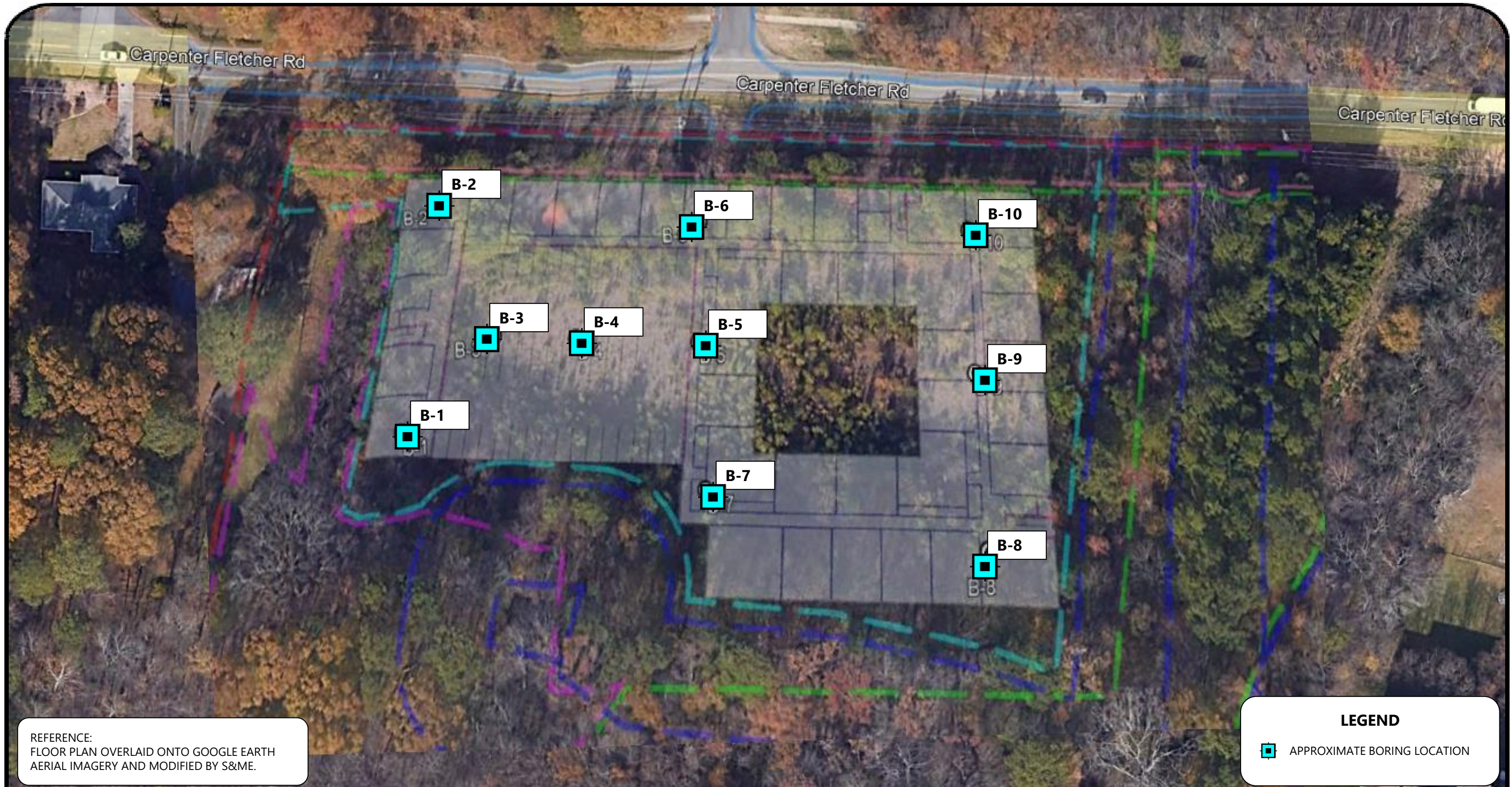
The equipment, techniques, and personnel used to perform a geo-environmental study differ significantly from those used for a geotechnical exploration. Indications of environmental contamination may be encountered incidental to performance of a geotechnical exploration but go unrecognized. Determination of the presence, type or extent of environmental contamination is beyond the scope of a geotechnical exploration.

Geotechnical Recommendations Are Not Final

Recommendations are developed based on the geotechnical engineer's understanding of the proposed construction and professional opinion of site subsurface conditions. Observations and tests must be performed during construction to confirm subsurface conditions exposed by construction excavations are consistent with those assumed in development of recommendations. It is advisable to retain the geotechnical engineer that performed the exploration and developed the geotechnical recommendations to conduct tests and observations during construction. This may reduce the risk that variations in subsurface conditions will not be addressed as recommended in the geotechnical report.

Appendices

Appendix I – Figures



TEST LOCATION PLAN

1414 CARPENTER FLETCHER ROAD
DURHAM, NORTH CAROLINA

SCALE:
NOT TO SCALE

DATE:
5/16/2023

PROJECT NUMBER:
23050294

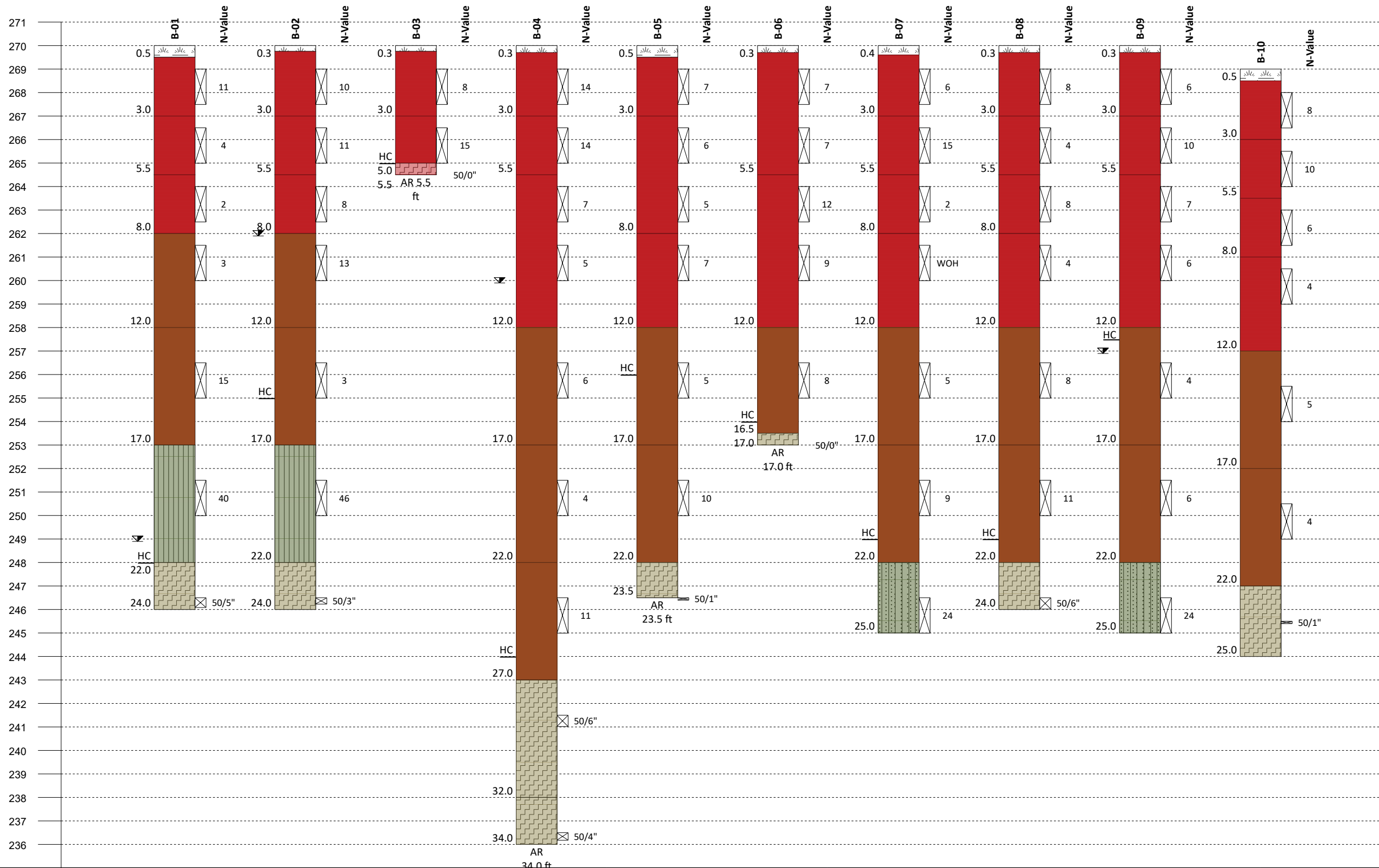
FIGURE NO.

1

Legend Key

- Existing Fill
- Alluvium
- Residuum
- Topsoil
- ML
- SM
- CL
- MH
- Interme...
Geomat...
- SP-SM
- SC

235.00



The depicted stratigraphy is shown for illustrative purposes only and is not warranted. Separations between different strata may be gradual and likely vary considerably from those shown. Profiles between nearby borings have been estimated using reasonable engineering care and judgement. The actual subsurface conditions will vary between boring locations.

| | |
|---|---------------------|
| ⊗ | AT TIME OF DRILLING |
| ⬇ | END OF DRILLING |
| ⬇ | AFTER DRILLING |



Generalized Subsurface Profile

Carpenter Fletcher Road
Durham, NC

| | |
|-----------------|--------------|
| SCALE: | Not to scale |
| DATE: | May 17, 2023 |
| PROJECT NUMBER: | 23050294 |

FIGURE NO.

2

Appendix II – Soil Test Boring Logs

◆ Summary of Exploration Procedures

The American Society for Testing and Materials (ASTM) publishes standard methods to explore soil, rock and ground water conditions in Practice D-420-18, "*Standard Guide for Site Characterization for Engineering Design and Construction Purposes*." The boring and sampling plan must consider the geologic or topographic setting. It must consider the proposed construction. It must also allow for the background, training, and experience of the geotechnical engineer. While the scope and extent of the exploration may vary with the objectives of the client, each exploration includes the following key tasks:

- Reconnaissance of the Project Area
- Preparation of Exploration Plan
- Layout and Access to Field Sampling Locations
- Field Sampling and Testing of Earth Materials
- Laboratory Evaluation of Recovered Field Samples
- Evaluation of Subsurface Conditions

The standard methods do not apply to all conditions or to every site. Nor do they replace education and experience, which together make up engineering judgment. Finally, ASTM D 420 does not apply to environmental investigations.

◆ Reconnaissance of the Project Area

We walked over the site to note land use, topography, ground cover, and surface drainage. We observed general access to proposed sampling points and noted any existing structures.

Checks for Hazardous Conditions - State law requires that we notify the North Carolina (NC 811) before we drill or excavate at any site. NC 811 is operated by the major water, sewer, electrical, telephone, CATV, and natural gas suppliers of North Carolina. NC 811 forwarded our location request to the participating utilities. Location crews then marked buried lines with colored flags within 72 hours. They did not mark utility lines beyond junction boxes or meters. We checked proposed sampling points for conflicts with marked utilities, overhead power lines, tree limbs, or man-made structures during the site walkover.

◆ Boring and Sampling

Soil Test Boring with Mud Rotary Drilling

Soil sampling and penetration testing were performed in general accordance with ASTM D1586, "Standard Test Method for Penetration Test and Split Barrel Sampling of Soils. Rotary drilling processes were used to advance the hole and a heavy drilling fluid was circulated in the bore holes to stabilize the sides and flush the cuttings. At regular intervals, drilling tools were removed and soil samples were obtained with a standard 1.4 inch I. D., two-inch O. D., split barrel sampler. The sampler was first seated six inches to penetrate any loose cuttings, then driven an additional 12 inches with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler through the two final six inch increments was recorded as the penetration resistance (SPT N) value. The N-value, when properly interpreted by qualified professional staff, is an index of the soil strength and foundation support capability.

Soil Test Boring with Hollow Stem Auger Drilling

Soil sampling and penetration testing were performed in general accordance with ASTM D 1586, "Standard Test Method for Penetration Test and Split Barrel Sampling of Soils". Rotary drilling processes were used to advance the boreholes. At regular intervals, the drilling tools were removed and soil samples were obtained with a standard 1.4 inch I. D., two-inch O. D., split barrel sampler. The sampler was first seated six inches to penetrate any loose cuttings, then driven an additional 18 inches with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler through the two intermediate six inch increments was recorded as the penetration resistance (SPT N) value. The N-value, when properly interpreted by qualified professional staff, is an index of the soil strength and foundation support capability. The bottom 6 inches of each sample recovered in the split barrel sampler was placed in a glass jar, closed with a screw top lid, and labeled.

Hand Auger Borings

Auger borings were advanced using hand-operated augers. The soils encountered were identified in the field by cuttings brought to the surface. Representative samples of the cuttings were placed in plastic bags and transported to the laboratory.

Dynamic Cone Penetrometer (DCP) testing was performed in conjunction within the borings in general accordance with ASTM STP 399, *"Dynamic Cone for Shallow In-Situ Penetration Testing"*. At selected intervals, the augers were withdrawn and soil consistency measured with a dynamic cone penetrometer. The conical point of the penetrometer was first seated 1-3/4 inches to penetrate any loose cuttings in the boring, then driven two additional 1-3/4 inch increments by a 15 pound hammer falling 20 inches. The number of hammer blows required to achieve this penetration was recorded. When properly evaluated by qualified professional staff, the blow count is an index to the soil strength. Hand auger borings were backfilled with soil cuttings after termination of drilling. Soil cuttings removed from each hole were collected as a bulk sample for laboratory testing.

Water Level Measurement

Subsurface water levels in the boreholes were measured during the onsite exploration by measuring depths from the existing grade to the current water level using a tape.

Backfilling of Borings

Once subsurface water levels were obtained, boring spoils were backfilled into the open bore holes. Bore holes were backfilled to the existing ground surface or bottom of pavement surface.

LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES

(Shown in Graphic Log)



Fill



Asphalt



Concrete



Topsoil



Gravel



Sand



Silt



Clay



Organic



Silty Sand



Clayey Sand



Sandy Silt



Clayey Silt



Sandy Clay



Silty Clay



Partially Weathered Rock



Cored Rock

WATER LEVELS

(Shown in Water Level Column)

▽ = Water Level At Termination of Boring

▼ = Water Level Taken After 24 Hours

◀ = Loss of Drilling Water

HC = Hole Cave

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY

Very Soft

Soft

Firm

Stiff

Very Stiff

Hard

Very Hard

STD. PENETRATION RESISTANCE BLOWS/FOOT

0 to 2

3 to 4

5 to 8

9 to 15

16 to 30

31 to 50

Over 50

RELATIVE DENSITY OF COHESIONLESS SOILS

RELATIVE DENSITY

Very Loose

Loose

Medium Dense

Dense

Very Dense

STD. PENETRATION RESISTANCE BLOWS/FOOT

0 to 4

5 to 10

11 to 30

31 to 50

Over 50

SAMPLER TYPES

(Shown in Samples Column)

Shelby Tube



Split Spoon



Rock Core



No Recovery

TERMS

Standard Penetration Resistance - The Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in. I.D. Split Spoon Sampler 1 Foot. As Specified in ASTM D-1586.

REC - Total Length of Rock Recovered in the Core Barrel Divided by the Total Length of the Core Run Times 100%.

RQD - Total Length of Sound Rock Segments Recovered that are Longer Than or Equal to 4" (mechanical breaks excluded) Divided by the Total Length of the Core Run Times 100%.



| | | | | | |
|--------------------------------------|--|--|--|---|--|
| PROJECT: | | Carpenter Fletcher Road Durham, NC S&ME Project No. 23050294 | | BORING LOG: B-01 <i>Sheet 1 of 1</i> | |
| DATE DRILLED: 05/04/2023 | | ELEVATION: 270 ft | | NOTES: Boring location and elevation should be considered approximate. | |
| DRILL RIG: CME 550 | | DATUM: NAVD88 | | | |
| DRILLER: T Shearin | | BORING DEPTH: 24.0 ft | | | |
| HAMMER TYPE: Automatic hammer | | CLOSURE: Cuttings with Hole Closure Device | | | |
| DRILLING METHOD: 3-1/4" HSA | | LOGGED BY: Anthony Marzulla | | LATITUDE: 35.914818 LONGITUDE: -78.895006 | |
| SAMPLING METHOD: SS | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | | |

| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION |
|-----------------|------------------------|-------------------|---------|--------------------------|--|-------------------------------------|--------------------------------|----|----|----|-----|-----------|
| | | | | | | | 20 | 40 | 60 | 80 | 100 | |
| 0 | | | | | TOPSOIL, 5" | | | | | | | 270 |
| 0.5 | | Fill | | SS-1 (18 in) | SANDY SILT (ML), trace organics, rootlets, stiff, brown, moist | 2-5-6 N = 11 | ● | | | | | |
| 3.0 | | | | SS-2 (18 in) | SANDY SILT (ML), trace organics, rootlets, soft, brown, moist | 3-2-2 N = 4 | ● | | | | | |
| 5.5 | | | | SS-3 (18 in) | SANDY ELASTIC SILT (MH), trace wood, very soft, brown, moist | 1-1-1 N = 2 | ● | | | | | |
| 8.0 | | Alluvium | | SS-4 (18 in) | SANDY ELASTIC SILT (MH), soft, gray brown, wet | 1-2-1 N = 3 | ● | | | | | |
| 12.0 | | | | SS-5 (18 in) | SILTY SAND (SM), trace rock fragments, medium dense, gray brown, fine to medium grained, moist | 5-7-8 N = 15 | ● | | | | | |
| 17.0 | | Residuum | | SS-6 (18 in) | SANDY SILT (ML), hard, red brown, wet | 10-17-23 N = 40 | | ● | | | | |
| 22.0 | Hole Cave at 22.0 feet | | | IGM | PWR, sampled as red brown, sandy silt, moist | 50/5" N = 50/5" | | | | | | |
| 24.0 | | | | SS-7 (6 in) | Borehole terminated at 24.0 feet | | | | | ● | | |
| 25 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |

| GROUNDWATER | DATE | DEPTH (FT) | REMARKS |
|-----------------|------------|------------|------------------|
| ATD | | | |
| END OF DRILLING | 05/04/2023 | 21.0 | Hole caved @ 22' |
| AFTER DRILLING | | | |
| AFTER DRILLING | | | |

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
 AR = Auger Refusal

| PROJECT: Carpenter Fletcher Road Durham, NC S&ME Project No. 23050294 | | | | BORING LOG: B-02 Sheet 1 of 1 | | | |
|---|--|--|--|---|--|--|--|
| DATE DRILLED: 05/04/2023 | | ELEVATION: 270 ft | | NOTES: Boring location and elevation should be considered approximate. | | | |
| DRILL RIG: CME 550 | | DATUM: NAVD88 | | | | | |
| DRILLER: T Shearin | | BORING DEPTH: 24.0 ft | | | | | |
| HAMMER TYPE: Automatic hammer | | CLOSURE: Cuttings with Hole Closure Device | | | | | |
| DRILLING METHOD: 3-1/4" HSA | | LOGGED BY: Anthony Marzulla | | LATITUDE: 35.915210 LONGITUDE: -78.894918 | | | |
| SAMPLING METHOD: SS | | | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | | |

| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION |
|-----------------|------------------------|-------------------|---------|--------------------------|---|-------------------------------------|--------------------------------|----|----|----|-----|-----------|
| | | | | | | | 20 | 40 | 60 | 80 | 100 | |
| 0 | | | | | TOPSOIL, 3" | | | | | | | 270 |
| 0.3 | | Fill | | SS-1 (18 in) | SANDY SILT (ML), trace gravel, stiff, brown, moist | 3-5-5 N = 10 | ● | | | | | |
| 3.0 | | | | SS-2 (18 in) | SANDY LEAN CLAY (CL), stiff, gray tan, moist | 4-5-6 N = 11 | ● | | | | | |
| 5.5 | | | | SS-3 (18 in) | SANDY LEAN CLAY (CL), firm, gray tan, moist | 2-3-5 N = 8 | ● | | | | | |
| 8.0 | | Alluvium | | SS-4 (18 in) | SANDY LEAN CLAY (CL), trace rootlets, stiff, gray tan, moist | 3-5-8 N = 13 | ● | | | | | |
| 12.0 | | | | SS-5 (18 in) | POORLY GRADED SAND WITH SILT (SP-SM), very loose, gray tan, fine to medium grained, moist | 2-2-1 N = 3 | ● | | | | | |
| 15 | Hole Cave at 15.0 feet | Residuum | | SS-6 (18 in) | SANDY SILT (ML), hard, brown, wet | 5-9-37 N = 46 | | ● | | | | |
| 22.0 | | | | SS-7 (4 in) | PWR, sampled as brown, silty sand, fine to medium grained, moist | 50/3" N = 50/3" | | | | ● | | |
| 24.0 | | | | | Borehole terminated at 24.0 feet | | | | | | | |

| GROUNDWATER | | DATE | DEPTH (FT) | REMARKS |
|-----------------|---|------------|------------|------------------|
| ATD | ≡ | | | |
| END OF DRILLING | ≡ | 05/04/2023 | 8.0 | Hole caved @ 15' |
| AFTER DRILLING | ≡ | | | |
| AFTER DRILLING | ≡ | | | |



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
 AR = Auger Refusal

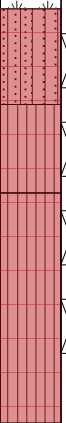
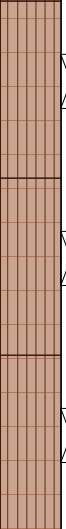

| | | | | | |
|--------------------------------------|--|---|--|---|--|
| PROJECT: | | Carpenter Fletcher Road Durham, NC S&ME Project No. 23050294 | | BORING LOG: B-03 <i>Sheet 1 of 1</i> | |
| DATE DRILLED: 05/03/2023 | | ELEVATION: 270 ft | | NOTES: Boring location and elevation should be considered approximate. | |
| DRILL RIG: CME 550 | | DATUM: NAVD88 | | | |
| DRILLER: T Shearin | | BORING DEPTH: 5.5 ft | | | |
| HAMMER TYPE: Automatic hammer | | CLOSURE: Cuttings with Hole Closure Device | | | |
| DRILLING METHOD: 3-1/4" HSA | | LOGGED BY: Anthony Marzulla | | LATITUDE: 35.914988 LONGITUDE: -78.894810 | |
| SAMPLING METHOD: SS | | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | |

| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION |
|-----------------|---------------------------|-------------------|---------|--------------------------|---|-------------------------------------|--------------------------------|----|----|----|-----|-----------|
| | | | | | | | 20 | 40 | 60 | 80 | 100 | |
| 0 | | | | | TOPSOIL, 3" | | | | | | | 270 |
| 0.3 | | Fill | | SS-1 (18 in) | SILTY SAND (SM), loose, gray, fine grained, moist | 7-5-3 N = 8 | ● | | | | | |
| 3.0 | | | | SS-2 (18 in) | SANDY SILT (ML), trace wood, stiff, brown, moist | 3-6-9 N = 15 | ● | | | | | |
| 5.0 | Hole Cave at 5.0 feet | | | SS-3 (0 in) | PWR, sampled as no recovery | 50/0" | | | | | | 265 |
| 5.5 | Auger refusal at 5.5 feet | | | | Borehole terminated at 5.5 feet | N = 50/0" | | | | ● | | |
| 10 | | | | | | | | | | | | 260 |
| 15 | | | | | | | | | | | | 255 |
| 20 | | | | | | | | | | | | 250 |
| 25 | | | | | | | | | | | | 245 |
| 30 | | | | | | | | | | | | 240 |


| GROUNDWATER | DATE | DEPTH (FT) | REMARKS |
|-----------------|------------|---------------|----------------------------------|
| ATD | | | |
| END OF DRILLING | 05/03/2023 | | Not encountered, hole caved @ 5' |
| AFTER DRILLING | | | |
| AFTER DRILLING | | | |

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
 AR = Auger Refusal

| | | | | | |
|--------------------------------------|--|---|--|---|--|
| PROJECT: | | Carpenter Fletcher Road Durham, NC S&ME Project No. 23050294 | | BORING LOG: B-04 <i>Sheet 1 of 2</i> | |
| DATE DRILLED: 05/03/2023 | | ELEVATION: 270 ft | | NOTES: Boring location and elevation should be considered approximate. | |
| DRILL RIG: CME 550 | | DATUM: NAVD88 | | | |
| DRILLER: T Shearin | | BORING DEPTH: 34.0 ft | | | |
| HAMMER TYPE: Automatic hammer | | CLOSURE: Cuttings with Hole Closure Device | | | |
| DRILLING METHOD: 3-1/4" HSA | | LOGGED BY: Anthony Marzulla | | LATITUDE: 35.914982 LONGITUDE: -78.894642 | |
| SAMPLING METHOD: SS | | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | |


| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION |
|-----------------|------------------------|-------------------|---|--------------------------|--|-------------------------------------|--------------------------------|----|----|----|-----|-----------|
| | | | | | | | 20 | 40 | 60 | 80 | 100 | |
| 0 | | | | | TOPSOIL, 4" | | | | | | | 270 |
| 0.3 | | Fill |  | SS-1 (18 in) | SILTY SAND (SM), trace gravel, medium dense, gray, medium to coarse grained, moist | 7-8-6 N = 14 | ● | | | | | |
| 3.0 | | | | SS-2 (18 in) | SANDY SILT (ML), stiff, brown, moist | 5-6-8 N = 14 | ● | | | | | |
| 5.5 | | | | SS-3 (18 in) | SANDY SILT (ML), trace gravel, firm, brown, moist | 3-4-3 N = 7 | ● | | | | | |
| 10 | | | | SS-4 (18 in) | | 1-2-3 N = 5 | ● | | | | | |
| 12.0 | | Alluvium |  | SS-5 (18 in) | SANDY SILT (ML), trace gravel, firm, brown, wet | 2-3-3 N = 6 | ● | | | | | |
| 17.0 | | | | SS-6 (18 in) | SANDY SILT (ML), soft, brown tan, wet | 3-2-2 N = 4 | ● | | | | | |
| 22.0 | | | | SS-7 (18 in) | SANDY SILT (ML), stiff, brown, wet | 4-4-7 N = 11 | ● | | | | | |
| 27.0 | Hole Cave at 26.0 feet | | | SS-8 (6 in) | PWR, sampled as brown purple, silty sand, fine to medium grained, moist | 50/6" N = 50/6" | | | | ● | | |
| 30 | | IGM |  | | | | | | | | | 240 |

| GROUNDWATER | DATE | DEPTH (FT) | REMARKS |
|-----------------|------------|------------|------------------|
| ATD | | | |
| END OF DRILLING | 05/03/2023 | 10.0 | Hole caved @ 26' |
| AFTER DRILLING | | | |
| AFTER DRILLING | | | |



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
 AR = Auger Refusal

| | | | | | |
|--------------------------------------|--|---|--|---|--|
| PROJECT: | | Carpenter Fletcher Road Durham, NC S&ME Project No. 23050294 | | BORING LOG: B-04 <i>Sheet 2 of 2</i> | |
| DATE DRILLED: 05/03/2023 | | ELEVATION: 270 ft | | NOTES: Boring location and elevation should be considered approximate. | |
| DRILL RIG: CME 550 | | DATUM: NAVD88 | | | |
| DRILLER: T Shearin | | BORING DEPTH: 34.0 ft | | | |
| HAMMER TYPE: Automatic hammer | | CLOSURE: Cuttings with Hole Closure Device | | | |
| DRILLING METHOD: 3-1/4" HSA | | LOGGED BY: Anthony Marzulla | | LATITUDE: 35.914982 LONGITUDE: -78.894642 | |
| SAMPLING METHOD: SS | | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | |

| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION | |
|-----------------|----------------------------|-------------------|---|--------------------------|---|-------------------------------------|--------------------------------|-------|---------|----|-----|-----------|-----|
| | | | | | | | | | | | | | |
| | | | | | | | △ % Fines | ○ NMC | ┐ PL-LL | | | | |
| | | | | | | | 20 | 40 | 60 | 80 | 100 | | |
| 32.0 | | IGM |  | SS-9 (4 in) | PWR, sampled as brown purple, sandy silt, moist | 50/4" N = 50/4" | | | | | | | |
| 34.0 | Auger refusal at 34.0 feet | | | ⊠ | Borehole terminated at 34.0 feet | | | | | | | | ● |
| 35 | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | 230 |
| 45 | | | | | | | | | | | | | 225 |
| 50 | | | | | | | | | | | | | 220 |
| 55 | | | | | | | | | | | | | 215 |
| 60 | | | | | | | | | | | | | 210 |

| GROUNDWATER | | DATE | DEPTH (FT) | REMARKS |
|-----------------|---|------------|---------------|------------------|
| ATD | Σ | | | |
| END OF DRILLING | ▼ | 05/03/2023 | 10.0 | Hole caved @ 26' |
| AFTER DRILLING | ▼ | | | |
| AFTER DRILLING | ▼ | | | |



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
 AR = Auger Refusal

| PROJECT: | | | | Carpenter Fletcher Road Durham, NC | | BORING LOG: B-05 | |
|-------------------------------|--|--|--|---|--|--|--|
| S&ME Project No. 23050294 | | | | Sheet 1 of 1 | | | |
| DATE DRILLED: 05/03/2023 | | | ELEVATION: 270 ft | | | NOTES: Boring location and elevation should be considered approximate. | |
| DRILL RIG: CME 550 | | | DATUM: NAVD88 | | | | |
| DRILLER: T Shearin | | | BORING DEPTH: 23.5 ft | | | | |
| HAMMER TYPE: Automatic hammer | | | CLOSURE: Cuttings with Hole Closure Device | | | | |
| DRILLING METHOD: 3-1/4" HSA | | | LOGGED BY: Anthony Marzulla | | | LATITUDE: 35.914977 LONGITUDE: -78.894382 | |
| SAMPLING METHOD: SS | | | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | | |

| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION |
|-----------------|----------------------------|-------------------|---------|--------------------------|---|-------------------------------------|--------------------------------|----|----|----|-----|-----------|
| | | | | | | | 20 | 40 | 60 | 80 | 100 | |
| 0 | | | | | TOPSOIL, 5" | | | | | | | 270 |
| 0.5 | | Fill | | SS-1 (18 in) | SILTY SAND (SM), trace rock fragments, loose, gray, fine to medium grained, moist | 7-4-3 N = 7 | ● | | | | | |
| 3.0 | | | | SS-2 (18 in) | SANDY ELASTIC SILT (MH), firm, brown gray, moist | 3-3-3 N = 6 | ● | | | | | |
| 5 | | | | SS-3 (18 in) | | 3-2-3 N = 5 | ● | | | | | |
| 8.0 | | | | SS-4 (18 in) | SANDY SILT (ML), trace rock fragments, firm, brown gray, moist | 3-4-3 N = 7 | ● | | | | | |
| 10 | | Alluvium | | | | | | | | | | |
| 12.0 | | | | SS-5 (18 in) | SILTY SAND (SM), loose, brown, fine to medium grained, wet | 2-2-3 N = 5 | ● | | | | | |
| 15 | Hole Cave at 14.0 feet | | | | | | | | | | | |
| 17.0 | | | | SS-6 (18 in) | SANDY SILT (ML), stiff, brown, wet | 3-5-5 N = 10 | ● | | | | | |
| 20 | | IGM | | | | | | | | | | |
| 22.0 | | | | | | | | | | | | |
| 23.5 | Auger refusal at 23.5 feet | | | SS-7 (1 in) | PWR, sampled as brown, sandy silt, wet Borehole terminated at 23.5 feet | 50/1" N = 50/1" | | | | ● | | |
| 25 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |

| GROUNDWATER | | DATE | DEPTH (FT) | REMARKS |
|-----------------|---|------------|------------|-----------------------------------|
| ATD | ☒ | | | |
| END OF DRILLING | ☒ | 05/03/2023 | | Not encountered, hole caved @ 14' |
| AFTER DRILLING | ☒ | | | |
| AFTER DRILLING | ☒ | | | |



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
 AR = Auger Refusal

| | | | | | |
|--------------------------------------|--|---|--|---|--|
| PROJECT: | | Carpenter Fletcher Road Durham, NC S&ME Project No. 23050294 | | BORING LOG: B-06 <i>Sheet 1 of 1</i> | |
| DATE DRILLED: 05/03/2023 | | ELEVATION: 270 ft | | NOTES: Boring location and elevation should be considered approximate. | |
| DRILL RIG: CME 550 | | DATUM: NAVD88 | | | |
| DRILLER: T Shearin | | BORING DEPTH: 17.0 ft | | | |
| HAMMER TYPE: Automatic hammer | | CLOSURE: Cuttings with Hole Closure Device | | | |
| DRILLING METHOD: 3-1/4" HSA | | LOGGED BY: Anthony Marzulla | | LATITUDE: 35.915175 LONGITUDE: -78.894377 | |
| SAMPLING METHOD: SS | | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | |

| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION | |
|-----------------|----------------------------|-------------------|---------|--------------------------|---|-------------------------------------|--------------------------------|----|----|----|-----|-----------|-----|
| | | | | | | | 20 | 40 | 60 | 80 | 100 | | |
| 0 | | | | | TOPSOIL, 4" | | | | | | | 270 | |
| 0.3 | | Fill | | SS-1 (18 in) | SANDY SILT (ML), trace rock fragments, trace rootlets, firm, brown, moist | 2-3-4 N = 7 | ● | | | | | | |
| | | | | SS-2 (18 in) | | | 3-4-3 N = 7 | ● | | | | | |
| 5 | | | | | SS-3 (18 in) | SANDY SILT (ML), stiff, brown, wet | 4-5-7 N = 12 | ● | | | | | 265 |
| 5.5 | | | | | SS-4 (18 in) | | 7-5-4 N = 9 | ● | | | | | 260 |
| 10 | | Alluvium | | | SANDY SILT (ML), firm, gray brown, wet | | | | | | | | |
| 12.0 | | | | | | SS-5 (18 in) | 5-4-4 N = 8 | ● | | | | | 255 |
| 15 | | | | | | | | | | | | | |
| 16.5 | Hole Cave at 16.0 feet | IG M | | SS-6 (0 in) | PWR, sampled as red brown, sandy silt, moist | 50/0" | | | | | | | |
| 17.0 | Auger refusal at 17.0 feet | | | | | Borehole terminated at 17.0 feet | N = 50/0" | | | | | | 250 |
| 20 | | | | | | | | | | | | 245 | |
| 25 | | | | | | | | | | | | 240 | |
| 30 | | | | | | | | | | | | | |

| GROUNDWATER | DATE | DEPTH (FT) | REMARKS |
|-----------------|------------|---------------|-----------------------------------|
| ATD | | | |
| END OF DRILLING | 05/03/2023 | | Not encountered, hole caved @ 16' |
| AFTER DRILLING | | | |
| AFTER DRILLING | | | |



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
 AR = Auger Refusal

| | | | | | | | |
|--|--|--|--|---|--|--|--|
| PROJECT: Carpenter Fletcher Road Durham, NC S&ME Project No. 23050294 | | | | BORING LOG: B-07 <i>Sheet 1 of 1</i> | | | |
| DATE DRILLED: 05/03/2023 | | ELEVATION: 270 ft | | NOTES: Boring location and elevation should be considered approximate. | | | |
| DRILL RIG: CME 550 | | DATUM: NAVD88 | | | | | |
| DRILLER: T Shearin | | BORING DEPTH: 25.0 ft | | | | | |
| HAMMER TYPE: Automatic hammer | | CLOSURE: Cuttings with Hole Closure Device | | | | | |
| DRILLING METHOD: 3-1/4" HSA | | LOGGED BY: Anthony Marzulla | | LATITUDE: 35.914723 LONGITUDE: -78.894365 | | | |
| SAMPLING METHOD: SS | | | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | | |

| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION |
|-----------------|-------------------------|-------------------|---------|----------------------------------|---|-------------------------------------|--------------------------------|----|----|----|-----|-----------|
| | | | | | | | 20 | 40 | 60 | 80 | 100 | |
| 0 | | | | | TOPSOIL, 5" | | | | | | | 270 |
| 0.4 | | Fill | | SS-1 (18 in) | SANDY LEAN CLAY (CL), firm, brown, moist | 2-2-4 N = 6 | ● | | | | | |
| 3.0 | | | | SS-2 (18 in) | SANDY LEAN CLAY (CL), stiff, gray brown, moist | 4-8-7 N = 15 | ● | | | | | |
| 5.5 | | | | SS-3 (18 in) | SILTY SAND (SM), with silt, trace rootlets, very loose, gray, fine to medium grained, moist | 0-1-1 N = 2 | ● | | | | | |
| 8.0 | | | | SS-4 (18 in) | SANDY LEAN CLAY (CL), trace rootlets, very soft, gray tan, wet | 0-0-0 N = WOH | ● | | | | | |
| 12.0 | | Alluvium | | SS-5 (18 in) | SANDY LEAN CLAY (CL), trace rootlets, firm, brown, wet | 3-2-3 N = 5 | ● | | | | | |
| 17.0 | | | | SS-6 (18 in) | SANDY LEAN CLAY (CL), stiff, gray brown, wet | 3-4-5 N = 9 | ● | | | | | |
| 22.0 | Hole Caved at 21.0 feet | Residuum | | SS-7 (18 in) | SILTY SAND (SM), medium dense, brown, fine to medium grained, wet | 3-5-19 N = 24 | ● | | | | | |
| 25.0 | | | | Borehole terminated at 25.0 feet | | | | | | | | |

| GROUNDWATER | DATE | DEPTH (FT) | REMARKS |
|-----------------|------------|------------|-----------------------------------|
| ATD | | | |
| END OF DRILLING | 05/03/2023 | | Not encountered, hole caved @ 21' |
| AFTER DRILLING | | | |
| AFTER DRILLING | | | |



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
 AR = Auger Refusal

| | | | | | |
|--------------------------------------|--|---|--|---|--|
| PROJECT: | | Carpenter Fletcher Road Durham, NC S&ME Project No. 23050294 | | BORING LOG: B-08 <i>Sheet 1 of 1</i> | |
| DATE DRILLED: 05/03/2023 | | ELEVATION: 270 ft | | NOTES: Boring location and elevation should be considered approximate. | |
| DRILL RIG: CME 550 | | DATUM: NAVD88 | | | |
| DRILLER: T Shearin | | BORING DEPTH: 24.0 ft | | | |
| HAMMER TYPE: Automatic hammer | | CLOSURE: Cuttings with Hole Closure Device | | | |
| DRILLING METHOD: 3-1/4" HSA | | LOGGED BY: Anthony Marzulla | | LATITUDE: 35.914620 LONGITUDE: -78.893780 | |
| SAMPLING METHOD: SS | | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | |

| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION |
|-----------------|------------------------|-------------------|---------|--------------------------|--|-------------------------------------|--------------------------------|----|----|----|-----|-----------|
| | | | | | | | 20 | 40 | 60 | 80 | 100 | |
| 0 | | | | | TOPSOIL, 4" | | | | | | | 270 |
| 0.3 | | Fill | | SS-1 (18 in) | SANDY SILT (ML), firm, gray brown, moist | 3-4-4 N = 8 | | | | | | |
| 3.0 | | | | SS-2 (18 in) | SANDY SILT (ML), soft, brown, moist | 2-2-2 N = 4 | | | | | | |
| 5.5 | | | | SS-3 (18 in) | SANDY LEAN CLAY (CL), firm, brown, moist | 3-4-4 N = 8 | | | | | | |
| 8.0 | | | | SS-4 (18 in) | SANDY LEAN CLAY (CL), soft, brown, wet | 2-2-2 N = 4 | | | | | | |
| 12.0 | | Alluvium | | SS-5 (18 in) | CLAYEY SAND (SC), loose, gray tan, fine to medium grained, wet | 2-4-4 N = 8 | | | | | | |
| 17.0 | | | | SS-6 (18 in) | CLAYEY SAND (SC), medium dense, dark gray, fine to medium grained, wet | 7-6-5 N = 11 | | | | | | |
| 22.0 | Hole Cave at 21.0 feet | IGM | | | PWR, sampled as no recovery | | | | | | | |
| 24.0 | | | | SS-7 (6 in) | Borehole terminated at 24.0 feet | 50/6" N = 50/6" | | | | | | |

| GROUNDWATER | DATE | DEPTH (FT) | REMARKS |
|-----------------|------------|---------------|-----------------------------------|
| ATD | | | |
| END OF DRILLING | 05/03/2023 | | Not encountered, hole caved @ 21' |
| AFTER DRILLING | | | |
| AFTER DRILLING | | | |

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
 AR = Auger Refusal

| | | | | | | | |
|--|--|---|--|--|--|---|--|
| PROJECT: Carpenter Fletcher Road Durham, NC S&ME Project No. 23050294 | | | | BORING LOG: B-09 <i>Sheet 1 of 1</i> | | | |
| DATE DRILLED: 05/04/2023 | | ELEVATION: 270 ft | | NOTES: Boring location and elevation should be considered approximate. | | | |
| DRILL RIG: CME 550 | | DATUM: NAVD88 | | | | | |
| DRILLER: T Shearin | | BORING DEPTH: 25.0 ft | | | | | |
| HAMMER TYPE: Automatic hammer | | CLOSURE: Cuttings with Hole Closure Device | | | | | |
| DRILLING METHOD: 3-1/4" HSA | | | | LOGGED BY: Anthony Marzulla | | LATITUDE: 35.914921 LONGITUDE: -78.893805 | |
| SAMPLING METHOD: SS | | | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | | |

| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION |
|-----------------|------------------------|-------------------|---------|--------------------------|---|-------------------------------------|--------------------------------|----|----|----|-----|-----------|
| | | | | | | | 20 | 40 | 60 | 80 | 100 | |
| 0 | | | | | TOPSOIL, 4" | | | | | | | 270 |
| 0.3 | | Fill | | SS-1 (18 in) | SANDY LEAN CLAY (CL), firm, tan, moist | 3-3-3 N = 6 | ● | | | | | |
| 3.0 | | | | SS-2 (18 in) | SANDY SILT (ML), stiff, brown, moist | 3-5-5 N = 10 | ● | | | | | |
| 5.5 | | | | SS-3 (18 in) | SANDY SILT (ML), trace rock fragments, firm, brown, moist | 3-3-4 N = 7 | ● | | | | | |
| | | | | SS-4 (18 in) | | 3-3-3 N = 6 | ● | | | | | |
| 12.0 | Hole Cave at 12.5 feet | Alluvium | | SS-5 (18 in) | SILTY SAND (SM), trace rock fragments, very loose, brown, fine to medium grained, wet | 2-2-2 N = 4 | ● | | | | | 265 |
| 17.0 | | | | SS-6 (18 in) | SANDY SILT (ML), firm, brown gray, wet | 2-2-4 N = 6 | ● | | | | | 250 |
| 22.0 | | | | SS-7 (18 in) | SILTY SAND (SM), medium dense, brown, fine to medium grained, wet | 4-7-17 N = 24 | ● | | | | | 245 |
| 25.0 | | | | | Borehole terminated at 25.0 feet | | | | | | | 240 |

| GROUNDWATER | DATE | DEPTH (FT) | REMARKS |
|-----------------|------------|------------|--------------------|
| ATD | | | |
| END OF DRILLING | 05/04/2023 | 13.0 | Hole caved @ 12.5' |
| AFTER DRILLING | | | |
| AFTER DRILLING | | | |



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
 AR = Auger Refusal

| | | | | | |
|--------------------------------------|--|---|--|---|--|
| PROJECT: | | Carpenter Fletcher Road Durham, NC S&ME Project No. 23050294 | | BORING LOG: B-10 <i>Sheet 1 of 1</i> | |
| DATE DRILLED: 05/03/2023 | | ELEVATION: 269 ft | | NOTES: Boring location and elevation should be considered approximate. | |
| DRILL RIG: CME 550 | | DATUM: NAVD88 | | | |
| DRILLER: T Shearin | | BORING DEPTH: 25.0 ft | | | |
| HAMMER TYPE: Automatic hammer | | CLOSURE: Cuttings with Hole Closure Device | | | |
| DRILLING METHOD: 3-1/4" HSA | | LOGGED BY: Anthony Marzulla | | LATITUDE: 35.915162 LONGITUDE: -78.893819 | |
| SAMPLING METHOD: SS | | | PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84) | | |

| DEPTH (feet) | NOTES | Origin/Identifier | GRAPHIC | SAMPLE NO. (RECOVERY) | MATERIAL DESCRIPTION | BLOW COUNT DATA (SPT N-value) | STANDARD PENETRATION TEST DATA | | | | | ELEVATION |
|-----------------|-------|-------------------|---------|--------------------------|--|-------------------------------------|--------------------------------|----|----|----|-----|-----------|
| | | | | | | | 20 | 40 | 60 | 80 | 100 | |
| 0 | | | | | TOPSOIL, 5" | | | | | | | 269 |
| 0.5 | | Fill | | SS-1 (18 in) | SANDY SILT (ML), trace roots, firm, brown, moist | 3-4-4 N = 8 | ● | | | | | |
| 3.0 | | | | SS-2 (18 in) | SANDY SILT (ML), trace wood, stiff, brown, moist | 4-5-5 N = 10 | ● | | | | | |
| 5.5 | | | | SS-3 (18 in) | SANDY LEAN CLAY (CL), trace rootlets, firm, brown, moist | 3-3-3 N = 6 | ● | | | | | 264 |
| 8.0 | | | | SS-4 (18 in) | SANDY LEAN CLAY (CL), soft, brown, wet | 1-2-2 N = 4 | ● | | | | | 259 |
| 12.0 | | Alluvium | | SS-5 (18 in) | SANDY LEAN CLAY (CL), firm, brown, wet | 0-2-3 N = 5 | ● | | | | | 254 |
| 17.0 | | | | SS-6 (18 in) | SILTY SAND (SM), very loose, gray brown, fine to medium grained, wet | 2-2-2 N = 4 | ● | | | | | 249 |
| 22.0 | | IGM | | SS-7 (1 in) | PWR, sampled as brown, sandy silt moist | 50/1" N = 50/1" | | | | ● | | 244 |
| 25.0 | | | | | Borehole terminated at 25.0 feet | | | | | | | 239 |

| GROUNDWATER | DATE | DEPTH (FT) | REMARKS |
|-----------------|------|---------------|---------|
| ATD | ☒ | | |
| END OF DRILLING | ☒ | | |
| AFTER DRILLING | ☒ | | |
| AFTER DRILLING | ☒ | | |

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
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1414 CARPENTER FLETCHER RD

COMBINED LVL 4 SITE PLAN & CONSTRUCTION DOCUMENTS

1414 CARPENTER FLETCHER RD, 27713

SITE PLAN CASE# D2400010

SUBMITTED ON: 1.15.2024

| SITE DATA | |
|---|--|
| REIDS: | 155117, 155122, 155123, 154210 |
| PINS: | 0738174953, 0738171954, 0738170965, 0738079491 |
| ZONING: | RS-M |
| DEVELOPMENT TIER: | SUBURBAN |
| WATERSHED PROTECTION OVERLAY: | NONE |
| ZONING OVERLAY: | MT-C (-40) |
| RIVER BASIN: | CAPE FEAR |
| EXISTING LAND USE: | VACANT |
| PROPOSED LAND USE: | RESIDENTIAL - MULTIFAMILY |
| FLOOD PLAIN DATA: | FIRM PANEL:3720073800K,EFFECTIVE DATE:10/19/2018 |
| DENSITY DATA: | |
| SITE ACREAGE: | 17.287 AC |
| PROPOSED NUMBER OF UNITS: | 200 UNITS (31 AFFORDABLE + 169 MARKET RATE) |
| ALLOWABLE DENSITY: | 8.00 DU/AC + UP TO 267 AFFORDABLE DENSITY CREDITS |
| PROPOSED DENSITY: | 8.00 DU/AC + 62 AFFORDABLE DENSITY CREDITS |
| RESIDENTIAL UNIT DATA: | |
| DEVELOPMENT TYPE: | APARTMENTS |
| MAX BUILDING HEIGHT: | 3-STORIES/40 FEET + 1-STORY/15 FEET FOR AFFORDABLE DENSITY BONUS |
| PROPOSED BUILDING HEIGHT: | 49'-4" |
| TREE COVERAGE DATA: | |
| TREE PRESERVATION REQUIRED: | 150,607 SF (20.00%) |
| TREE PRESERVATION PROVIDED: | 152,802 SF (20.29%) |
| STORMWATER/EROSION CONTROL DATA: | |
| LIMITS OF DISTURBANCE: | 148,590 SF |
| EXISTING IMPERVIOUS AREA (ON SITE): | 00 SF |
| BASELINE IMPERVIOUS AREA (MARCH 17, 2009): | 40,777 SF (5.42%) |
| PROPOSED IMPERVIOUS AREA (IN ROW): | 15,954 SF |
| PROPOSED IMPERVIOUS AREA (ONSITE): | 86,250 SF (11.45%) |
| TOTAL PROPOSED IMPERVIOUS: | 102,204 SF (13.57%) |
| PROPOSED IMPERVIOUS INCREASE FROM BASELINE DATE OF 3/17/2009: | 61,427 SF |
| OPEN SPACE DATA: | |
| OPEN SPACE REQUIRED: | 135,546 SF (18.00%) |
| OPEN SPACE PROVIDED: | 213,572 SF (28.36%) |
| ACTIVE OPEN SPACE REQUIRED: | 45,182 SF (6 REQUIRED OPEN SPACE) |
| ACTIVE OPEN SPACE PROVIDED: | 60,770 SF |
| PARKING DATA: | |
| REQUIRED PARKING: | 0 SPACES |
| PROPOSED PARKING: | 239 SPACES |
| REQUIRED ADA PARKING: | 7 ADA SPACE (2 VAN ACCESSIBLE) |
| PROPOSED ADA PARKING: | 10 ADA SPACE (2 VAN ACCESSIBLE) |
| BIKE PARKING REQUIRED: | 20 SPACES |
| BIKE PARKING PROVIDED: | 20 SPACES |



VICINITY MAP
NOT TO SCALE

| SHEET INDEX | |
|--------------|-----------------------------------|
| Sheet Number | Sheet Title |
| C0.00 | COVER SHEET |
| C0.10 | GENERAL NOTES |
| C1.00 | EXISTING CONDITIONS PLAN |
| REF1.00 | CITY OF DURHAM REFERENCED PLANS |
| C3.00 | SITE PLAN |
| C4.00 | MARKINGS & SIGNAGE PLAN |
| C5.00 | GRADING AND DRAINAGE PLAN |
| C5.10 | SCM PLAN & DETAILS |
| C6.00 | UTILITY PLAN |
| C9.00 | SITE DETAILS |
| C9.01 | SITE DETAILS |
| C9.10 | WATER DETAILS |
| C9.11 | STORM DETAILS |
| L10.00 | LANDSCAPE PLAN |
| L11.00 | TREE PRESERVATION & BUFFER PHOTOS |
| S901-A905 | PARKING DECK PLANS TIER 1-5 |

PLAN REVISIONS

1ST RESPONSE TO COMMENTS & AFFORDABLE HOUSING ADDITION - 5.07.2024
2ND RESPONSE TO COMMENTS - 7.29.2024

PUBLIC WORKS CONDITIONS OF APPROVAL

- THE DESIGNING PROFESSIONAL (A NCPE, NCPLS OR NCRLA - AS REQUIRED) SHALL SUBMIT THREE (3) SETS OF CONSTRUCTION DRAWINGS TO THE PUBLIC WORKS DEPARTMENT - DEVELOPMENT REVIEW FOR REVIEW AND APPROVAL. CONSTRUCTION DRAWING APPROVAL IS REQUIRED PRIOR TO COMMENCING CONSTRUCTION (SEE CONSTRUCTION PLAN APPROVAL PROCESS). THE APPROVAL OF CONSTRUCTION DRAWINGS IS SEPARATE FROM SITE PLAN APPROVAL. CITY OFFICIALS SHALL REVIEW ALL SIZES, MATERIALS, SLOPES, LOCATIONS, EXTENSIONS AND DEPTHS FOR ALL PROPOSED UTILITIES (WATERLINES, SANITARY, SEWER LINES AND STORM DRAINAGE CONVEYANCE SYSTEMS) FOR COMPLIANCE WITH ALL APPLICABLE REGULATORY STANDARDS, SPECIFICATIONS, AND BEST MANAGEMENT PRACTICES.
- THE DESIGNING PROFESSIONAL (A NCPE, NCPLS OR NCRLA - AS REQUIRED) SHALL SUBMIT ONE (1) SET OF AS-BUILT DRAWINGS TO THE PUBLIC WORKS DEPARTMENT - DEVELOPMENT REVIEW FOR REVIEW AND APPROVAL. AS-BUILT DRAWING APPROVAL IS REQUIRED PRIOR TO WATER METER INSTALLATION AND/OR SANITARY SEWER SERVICE CONNECTION AND PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
- FIRE FLOW ANALYSIS REQUIRED FOR REVIEW AND APPROVAL AS PART OF THE CONSTRUCTION DRAWING APPROVAL PROCESS. TO SCHEDULE FLOW TEST OR TO OBTAIN CURRENT SYSTEM DATA, COMPLETE THE ONLINE APPLICATION ([HTTP://DURHAMNC.GOV/ICH/OP/PWD/PAGES/FIRE_FLOW.ASPX](http://durhamnc.gov/ich/OP/PWD/PAGES/FIRE_FLOW.ASPX)).
- IF A METER 2" OR LARGER IS PROPOSED, CONTACT WATER MANAGEMENT AT 560-4381 PRIOR TO THE CONSTRUCTION OF THE METER VAULT TO VERIFY THE TYPE AND DIMENSIONS OF THE METER.
- WATER PERMIT REQUIRED AFTER CONSTRUCTION DRAWING APPROVAL AND PRIOR TO COMMENCING WATER MAIN INSTALLATION.
- SIDEWALK NOTE:
THE LOCATION OF THE SIDEWALKS SHOWN ON THIS PLAN IS SCHEMATIC. A CITY OF DURHAM AND/OR NCDOT ENCROACHMENT PERMIT IS REQUIRED PRIOR TO ANY CONSTRUCTION. AFTER OBTAINING THE REQUIRED PERMITS, PLEASE CONTACT THE CITY OF DURHAM ENGINEERING INSPECTION OFFICE AT 560-4326 PRIOR TO START OF CONSTRUCTION.
- DRIVEWAY PERMIT NOTES:
A CITY OF DURHAM DRIVEWAY PERMIT IS REQUIRED PRIOR TO ANY DRIVEWAY CONSTRUCTION ON PUBLIC RIGHT-OF-WAY. SUBMIT PLANS FOR DRIVEWAY PERMIT APPROVAL TO CITY ENGINEERING DEVELOPMENT REVIEW. AFTER OBTAINING THE PERMIT, PLEASE CALL THE CITY OF DURHAM ENGINEERING INSPECTION OFFICE AT 560-4326 PRIOR TO START OF CONSTRUCTION.
- STORMWATER SERVICES NOTES: AT A MINIMUM, THE STORMWATER DESIGN DETAILS FOR THIS PROJECT SHALL BE GOVERNED BY THE MINIMUM STANDARDS OF THE MOST RECENT EDITION OF THE CITY OF DURHAM (CITY) REFERENCE GUIDE FOR DEVELOPMENT (RGD) AND ANY LETTERS TO INDUSTRY (POSTED ON THE CITY'S WEBSITE) THAT ARE IN EFFECT THE DATE CONSTRUCTION DRAWINGS ARE FIRST RECEIVED FOR REVIEW BY THE CITY.
- FINAL DESIGN CALCULATIONS FOR THE STORMWATER CONTROL MEASURE(S) (SCM(S)) REQUIRE THE USE OF STORAGE INDICATION ROUTING METHODOLOGY SUCH AS TR-20 OR HEC-1 MODELS. FOR EACH SCM, AS APPLICABLE, STAGE-STORAGE RELATIONSHIP AND INFLOW AND OUTFLOW HYDROGRAPHS ARE REQUIRED. ALL TABULATED DATA INCLUDING CALCULATIONS SHOWING THE LIMITING DISCHARGE, WHETHER ORIFICE, WEIR, BARREL, OR OUTLET CONTROL, AS APPROPRIATE IS REQUIRED. HYDROCAD, HYDRAFLOW HYDROGRAPHS, AND PONDPACK ARE COMMONLY USED AND RECOGNIZED SOFTWARE PROGRAMS WHICH INCORPORATE ROUTING METHODOLOGY ACCEPTED BY THE CITY.
- USE FOR RESIDENTIAL DEVELOPMENTS WITH A HOMEOWNERS ASSOCIATION: STORMWATER CONTROL MEASURE(S) (SCM(S)) PERMIT FEE(S) AND A PAYMENT INTO THE STORMWATER REPLACEMENT FUND ARE REQUIRED FOR ALL SCM(S) ASSOCIATED WITH THIS DEVELOPMENT. CONSTRUCTION OF THE DEVELOPMENT IS NOT ALLOWED TO COMMENCE UNTIL THESE ITEMS ARE PROVIDED IN ACCORDANCE WITH CITY STORMWATER STANDARDS OR IN ACCORDANCE WITH WRITTEN POLICY. THE DESIGNER SHALL SUBMIT A SEALED ENGINEER'S CONSTRUCTION COST ESTIMATE FOR EVERY SCM PROPOSED IN THE DEVELOPMENT PRIOR TO APPROVAL OF THE CONSTRUCTION DRAWINGS.
- USE FOR MULTI-FAMILY AND OTHER TYPE DEVELOPMENTS: STORMWATER CONTROL MEASURE(S) (SCM(S)) PERMIT FEE(S) AND EITHER A PAYMENT INTO THE STORMWATER REPLACEMENT FUND OR THE PROVISION OF AN ALTERNATE SECURITY ARE REQUIRED FOR ALL SCM(S) ASSOCIATED WITH THIS DEVELOPMENT. CONSTRUCTION OF THE DEVELOPMENT IS NOT ALLOWED TO COMMENCE UNTIL THESE ITEMS ARE PROVIDED IN ACCORDANCE WITH CITY STORMWATER STANDARDS OR IN ACCORDANCE WITH WRITTEN POLICY. THE DESIGNER SHALL SUBMIT A SEALED ENGINEER'S CONSTRUCTION COST ESTIMATE FOR EVERY SCM PROPOSED IN THE DEVELOPMENT PRIOR TO APPROVAL OF THE CONSTRUCTION DRAWINGS.
- AN AS-BUILT CERTIFICATION FOR THE STORMWATER CONTROL MEASURE(S) (SCM(S)), PROVIDED BY THE CERTIFYING ENGINEER, IS REQUIRED. THE AS-BUILT CERTIFICATION SHALL BE SUBMITTED IN ACCORDANCE WITH THE CITY OF DURHAM SCM AS-BUILT PROGRAM, REFER TO SECTION 8.6. AS-BUILT CERTIFICATION REQUIREMENTS FOR SCMS IN THE CITY OF DURHAM, OF THE REFERENCE GUIDE FOR DEVELOPMENT. THE SCM AS-BUILT CERTIFICATION(S) SHALL BE APPROVED BY THE STORMWATER DEVELOPMENT REVIEW SECTION PRIOR TO ISSUANCE OF ANY FINAL CERTIFICATES OF OCCUPANCY/COMPLIANCE FOR DEVELOPMENT. WITH THE EXCEPTION OF WHEN AN APPROPRIATE CONSTRUCTION SECURITY HAS BEEN PROVIDED FOR SINGLE FAMILY OR TOWNHOME DEVELOPMENT, WITH THIS PROVIDED CONSTRUCTION SECURITY, CERTIFICATES OF OCCUPANCY/COMPLIANCE CAN BE ISSUED FOR A PERCENTAGE OF SINGLE FAMILY LOTS IN ACCORDANCE WITH CITY REQUIREMENTS.
- STORMWATER CONTROL MEASURE(S) (SCM(S)) DESIGN CALCULATIONS WILL NOT BE REVIEWED OR APPROVED WITH THE SITE PLAN/PRELIMINARY PLAT SUBMITTAL. ALL SCM DESIGNS WILL BE REVIEWED AND APPROVED DURING THE CONSTRUCTION DRAWING SUBMITTAL. IF, AT THE TIME OF CONSTRUCTION DRAWING SUBMITTAL, IT IS FOUND THAT THE PROPOSED SCM(S) IS UNDERSIZED, NOT PROPERLY ACCESSIBLE, OR OTHERWISE INSUFFICIENT OR UNSUITABLE FOR THE SITE, IT IS THE RESPONSIBILITY OF THE APPLICANT TO INSURE THAT THE APPLICABLE STORMWATER ORDINANCE REQUIREMENTS ARE MET. A REVISED SITE PLAN OR PRELIMINARY PLAT MAY BE REQUIRED IF THE ORIGINALLY PROPOSED SCM(S) ARE FOUND INSUFFICIENT, NOT PROPERLY ACCESSIBLE, OR UNSUITABLE AND ALTERNATIVE SCM(S) WITH ASSOCIATED EASEMENTS ARE REQUIRED.
- THE DEVELOPER/CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE STORMWATER DEVELOPMENT REVIEW SECTION PRIOR TO COMMENCING WORK ON ANY STORMWATER CONTROL MEASURE (SCM). IF THE SCM WILL BE CONSTRUCTED INITIALLY AS A SEDIMENTATION AND EROSION CONTROL (S&EC) DEVICE, TO BE CONVERTED TO A PERMANENT SCM AT A LATER TIME, THE PRE-CONSTRUCTION MEETING SHOULD BE SCHEDULED PRIOR TO CONSTRUCTION OF THE S&EC DEVICE. CALL 919-560-4326 EXT. 30238 TO SCHEDULE THE REQUIRED MEETING. A MINIMUM OF THREE BUSINESS DAYS PRIOR TO THE DESIRED MEETING DATE, THIS IS IN ADDITION TO OTHER PRE-CONSTRUCTION MEETING REQUIREMENTS FOR EROSION CONTROL, ENGINEERING INSPECTIONS, ETC.
- THE CITY OF DURHAM AND THEIR ASSIGNS HAVE RIGHT OF ACCESS TO THE PERMANENT STORMWATER CONTROL MEASURE(S) (SAND FILTER & UNDERGROUND DETENTION) FOR INSPECTIONS AND MAINTENANCE ENFORCEMENT. A BLANKET EASEMENT TO, OVER AND AROUND THE STORMWATER CONTROL MEASURE IS HEREBY GRANTED FOR INSPECTIONS AS WELL AS ENFORCEMENT OF OPERATION & MAINTENANCE. ANY OBSTRUCTION PLACED IN THE BLANKET EASEMENT THAT IMPEDES NECESSARY MAINTENANCE ENFORCEMENT WILL BE REMOVED AND ALL THE ASSOCIATED COSTS WILL BE BORNE SOLELY BY THE OWNER.

CITY OF DURHAM
PUBLIC WORKS DEPARTMENT
APPROVED

| | |
|----------------------|-------------|
| ENGINEERING | DATE: |
| STORMWATER | DATE: |
| TRANSPORTATION | DATE: |
| | DATE: |
| | DATE: |

D2400010

GENERAL CONDITIONS OF APPROVAL

- THIS SITE IS NOT IN ANY SPECIAL FLOOD HAZARD AREAS OR FUTURE CONDITIONS FLOOD HAZARD AREAS, AS SHOWN ON FIRM PANEL. FIRM PANEL:3720082300K,EFFECTIVE DATE:10/19/2018
- PRIVATE ACCESS DRIVE DESIGN NOTE FOR TOWNHOUSES IN THE CITY LIMITS:
 - THE DRIVES AND UTILITIES ARE PRIVATE AND WILL NOT BE PUBLICLY MAINTAINED.
 - THE DRIVES AND UTILITIES ARE TO REMAIN PRIVATE SINCE THE DESIGN DOES NOT MEET CITY DESIGN CRITERIA AND WILL NOT BE MADE PUBLIC NOR MAINTAINED BY THE CITY.
 - THE SELLER IS REQUIRED TO NOTIFY THE BUYER OF ITEMS A AND B ABOVE.
- LANDSCAPE MULCH: PINE STRAW SHALL NOT BE USED AS MULCH OR GROUND COVER WITHIN TEN FEET OF ANY STRUCTURES CONSISTING OF EXTERIOR COMBUSTIBLE CONSTRUCTION AS SPECIFIED BY DURHAM CITY CODE SECTION 46-47.
- UDO LANDSCAPE COMPLIANCE CERTIFICATION NOTE (UDO SECTION 9.2.50): THESE STANDARDS MUST BE VERIFIED BY A LANDSCAPE COMPLIANCE FORM COMPLETED BY A PROFESSIONAL LANDSCAPE ARCHITECT OR LICENSED LANDSCAPE CONTRACTOR PRIOR TO THE CERTIFICATE OF COMPLIANCE BEING ISSUED. SUBMIT TO THE DURHAM CITY-COUNTY PLANNING DEPARTMENT SITE COMPLIANCE STAFF WHEN SCHEDULING A SITE COMPLIANCE INSPECTION.
- BED AND HOLE PREPARATION:
 - TREATMENT WAS ADDED ONLY PER RECOMMENDATIONS, BASED ON SOIL TESTS, SOIL TEST RESULTS ARE ATTACHED, IF APPLICABLE.
 - TREE HOLES AND PLANTING BEDS HAVE BEEN TESTED FOR INFILTRATION.
 - THERE WAS NO LANDSCAPE FABRIC USED ON SITE.
 - SOIL IS FRIABLE AND DRAINS AT A DEPTH OF 2' FOR TREE PLANTING AREAS.
- TREE PREPARATION:
 - THE ROOT COLLAR OF ALL TREES HAS BEEN EXPOSED AND IS FREE FROM SOIL, DEBRIS AND MULCH.
 - GIRDLING ROOTS HAVE BEEN CUT AWAY FROM THE TRUNK AND CORRECTED WITHIN THE PLANTING MIX.
- TREE INSTALLATION:
 - TREES ARE INSTALLED WITH ROOT COLLARS EXPOSED AND COMPLETELY ABOVE GRADE.
 - TREES AND PLANTS WERE WATERED WITHIN TWO DAYS OF INSTALLATION.
 - MULCH HAS BEEN INSTALLED WITHIN A WEEK OF INSTALLATION.
- LANDSCAPING/C.O. STANDARDS NOTE: ALL LANDSCAPING MUST BE IN PLACE PRIOR TO REQUEST FOR A CERTIFICATE OF COMPLIANCE. CONTACT DURHAM CITY COUNTY PLANNING DEPARTMENT SITE COMPLIANCE STAFF FOR INSPECTION.
- LANDSCAPE RE-INSPECTION FEE: EACH LANDSCAPING COMPLIANCE INSPECTION AFTER THE INITIAL INSPECTION WILL INCUR A RE-INSPECTION FEE. PAYMENT MUST BE RECEIVED BY THE DURHAM CITY COUNTY PLANNING DEPARTMENT PRIOR TO RE-INSPECTION.
- STREET TREE NOTE FOR ALL PRELIMINARY AND FINAL PLATS WHERE TREES WILL BE PLANTED: STREET TREES MEETING THE REQUIREMENTS OF UDO SECTION 9.6 SHALL BE PLANTED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF COMPLIANCE. UNLESS THE PLANTING HAS BEEN POSTPONED IN ACCORDANCE WITH THE REQUIREMENTS OF UDO SEC. 9.11.
- TREE PROTECTION NOTE (UDO SEC. 8.3): TREE PROTECTION FENCING MUST BE IN PLACE PRIOR TO ANY DEMOLITION, LAND DISTURBANCE, OR ISSUANCE OF A GRADING PERMIT AND SHALL INCLUDE WARNING SIGNS POSTED IN BOTH ENGLISH AND SPANISH, AS FOLLOWS: * NO TRESPASSING/TREE PROTECTION AREA/PROHIBIDO ENTRAR / ZONA PROTECTORA PARA LOS ARBOLES. *
- PROTECTION OF EXISTING VEGETATION (UDO SEC. 8.3): AT THE START OF GRADING INVOLVING THE LOWERING OF EXISTING GRADE AROUND A TREE OR STRIPPING OF TOPSOIL, A CLEAN, SHARP, VERTICAL CUT SHALL BE MADE AT THE EDGE OF THE TREE SAVE AREA PRIOR TO OR AT THE SAME TIME AS SILT FENCE AND OTHER EROSION CONTROL MEASURES ARE INSTALLED. THE TREE PROTECTION FENCING SHALL BE INSTALLED ON THE SIDE OF THE CUT FARTHEST AWAY FROM THE TREE TRUNK AND SHALL REMAIN IN PLACE UNTIL ALL CONSTRUCTION IN THE VICINITY OF THE TREES IS COMPLETE. NO STORAGE OF MATERIALS, FILL, OR EQUIPMENT AND NO TRESPASSING SHALL BE ALLOWED WITHIN THE BOUNDARY OF THE PROTECTED AREA.
- UDO SITE LIGHTING NOTE (UDO SECTION 7.4):
 - THE MAXIMUM ILLUMINATION PERMITTED AT THE END OF A PROPERTY LINE SHALL BE AS SET FORTH BELOW, WHERE A DEVELOPMENT IS UNIFIED WITH SHARED PARKING OR OTHER MEASURE SHOWN ON A SITE PLAN, THE MAXIMUM ILLUMINATION LEVELS SHALL APPLY ONLY TO THE EXTERIOR LOT LINES OF THE PROJECT (ANY INTERIOR LOT LINES SHALL BE EXEMPT FROM THIS PARAGRAPH).
 - THE MAXIMUM ILLUMINATION AT THE EDGE OF THE PROPERTY LINE ADJACENT TO A RESIDENTIAL ZONING DISTRICT IS 0.5 FOOT-CANDLES. THE MAXIMUM ILLUMINATION AT THE EDGE OF THE PROPERTY LINE ADJACENT TO A NONRESIDENTIAL ZONING DISTRICT IS 5.0 FOOT-CANDLES.
 - THE MAXIMUM ILLUMINATION AT THE EDGE OF THE PROPERTY LINE ADJACENT TO A STREET IS 5.0 FOOT-CANDLES.
 - THE LEVEL OF ILLUMINATION AS MEASURED IN FOOT-CANDLES AT ANY ONE POINT SHALL MEET THE STANDARDS IN THE TABLE IN UDO SECTION 7.4 WITH MINIMUM AND MAXIMUM LEVELS MEASURED ON THE PAVEMENT WITHIN THE LIGHTED AREA.
 - THE MAXIMUM HEIGHT FOR DIRECTIONAL OR FULL CUT-OFF LIGHTING FIXTURES (FIXTURES DESIGNED TO INSURE THAT NO LIGHT IS EMITTED ABOVE A HORIZONTAL LINE PARALLEL TO THE GROUND) SHALL BE 30 FEET ABOVE GRADE. THE MAXIMUM HEIGHT FOR NON-DIRECTIONAL LIGHTING FIXTURES, WHICH ARE DEFINED AS FIXTURES DESIGNED TO ALLOW LIGHT TO BE EMITTED ABOVE A HORIZONTAL LINE PARALLEL TO THE GROUND, SHALL BE 15 FEET ABOVE GRADE.
 - NON-DIRECTIONAL LIGHTING FIXTURES SHALL BE TRANSLUCENT OR HAVE BAFFLES TO PREVENT VIEWS OF THE LIGHT SOURCE.
 - UNDER-CANOPY LIGHTING SHALL BE RESTRICTED TO LIGHTING FIXTURES (INCLUDING LENSES) THAT DO NOT PROJECT BELOW THE BOTTOM OF THE CANOPY.
 - LIGHTING SHALL BE ORIENTED NOT TO DIRECT GLARE OR EXCESSIVE ILLUMINATION ONTO STREETS IN A MANNER THAT MAY DISTRACT OR INTERFERE WITH THE VISION OF DRIVERS ON SUCH STREETS.
 - THESE STANDARDS MUST BE VERIFIED BY FIELD SURVEY (BY USE OF PHOTOMETRIC SURVEY) PRIOR TO THE CERTIFICATE OF COMPLIANCE BEING ISSUED. ALL OF THIS INFORMATION, INCLUDING DETAILS, WILL BE REQUIRED ON BUILDING PLANS PRIOR TO ISSUANCE OF A BUILDING PERMIT.
- FIRE NOTES:
 - PROVIDE FIRE PLANS EXAMINER ONE COPY OF UTILITY CONSTRUCTION DRAWINGS, SHOWING UNDERGROUND PIPING LAYOUT AND ALL FIRE APPURTENANCES. PERMIT FOR INSTALLATION OF PRIVATE FIRE HYDRANT(S) MUST BE ISSUED BY FIRE PLANS EXAMINER PRIOR TO INSTALLATION OF SAID HYDRANTS.
 - SAFEGUARDS DURING THE CONSTRUCTION, ALTERATION, OR DEMOLITION OF STRUCTURES SHOWN ON THIS SITE PLAN SHALL BE IN ACCORDANCE WITH CHAPTER 33 OF THE 2018 NORTH CAROLINA FIRE CODE AND NFPA241 (2013 EDITION).*
- FOR COUNTY SOIL AND EROSION CONTROL:
 - A SEDIMENTATION AND EROSION CONTROL PLAN MUST BE SUBMITTED AND APPROVED PRIOR TO THE ISSUANCE OF A LAND-DISTURBANCE PERMIT.
 - IF AN OFFSITE SOIL SPOIL OR BORROW SITE IS UTILIZED, THEN THE DISTURBED AREA FOR THE SPOIL/BORROW SITE MUST BE INCLUDED IN THE LAND-DISTURBANCE PLAN AND PERMIT UNLESS THE SPOIL/BORROW SITE ALREADY HAS A LAND-DISTURBANCE PERMIT.
- SOLID WASTE COLLECTION NOTES:
 - SOLID WASTE COLLECTION UTILIZES PRIVATE ROLL OUT CARTS AND SHOULD BE COORDINATED WITH PRIVATE SOLID WASTE COLLECTION COMPANY.
 - SOLID WASTE CONTAINMENT CAPACITY AND COLLECTION FREQUENCY WILL BE SUFFICIENT TO PREVENT THE ILLEGAL PLACEMENT OF TRASH AND RECYCLABLES.
- OPEN SPACE SHALL BE HELD IN COMMON OWNERSHIP TO BE MAINTAINED BY COMMUNITY HOA.
- BY REFERENCING ROADWAY IMPROVEMENTS ON THE PLAN, THE APPLICANT AGREES TO CONSTRUCT SAID IMPROVEMENTS PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY IN A MANNER THAT WILL ALLOW THEM TO FUNCTION AS NOTED ON THE PLAN AND IN ACCORDANCE WITH NCDOT AND CITY OF DURHAM STANDARDS AND POLICIES. THIS INCLUDES (WHERE APPROPRIATE) BUT IS NOT LIMITED TO: ADEQUATE TRANSITION TAPERS, ALIGNMENT OF LANES THROUGH INTERSECTIONS, ASSOCIATED SIGNAL MODIFICATIONS, PAVEMENT MARKINGS, ASSOCIATED SIGNAGE, CURB AND GUTTER, COORDINATION WITH OTHER PROPOSED ROADWAY IMPROVEMENTS AND BIKE LANES. THE APPLICANT ALSO ACCEPTS THE FINANCIAL RESPONSIBILITY FOR ACQUISITION OF ANY ADDITIONAL RIGHT-OF-WAY NECESSARY TO ACCOMMODATE THESE IMPROVEMENTS AND ANY REQUIRED SIDEWALK CONSTRUCTION.
- SOLID WASTE CONTAINMENT CAPACITY AND COLLECTION FREQUENCY WILL BE SUFFICIENT TO PREVENT THE ILLEGAL PLACEMENT OF TRASH AND RECYCLABLES.
- IN THE EVENT OF COMPACTOR FAILURE, THE OWNER/MANAGER SHALL PROVIDE COLLECTION OF NON-COMPACTED GARBAGE AS FREQUENTLY AS NECESSARY TO ADEQUATELY SERVE THE COMMUNITY AND PREVENT THE ILLEGAL PLACEMENT OR DISPOSAL OF GARBAGE AND RECYCLABLES.
- THE WORK TAKING PLACE RELATED TO THE CHANGES IN THIS SITE PLAN WILL BE FULLY COMPLIANT WITH THE NORTH CAROLINA ACCESSIBILITY CODES (ANSI 117.1 -2009 AND CHAPTER 11 OF THE NCBC) UNLESS AND EXCEPT IN AREAS WHERE AN APPROVED STATEMENT FROM A SITE ENGINEER, SURVEYOR OR ARCHITECT VERIFIES THAT SITE CONDITIONS EXIST WHERE THE TOPOGRAPHY OF THE SITE IS EXTREME AND ONLY ALTERNATE METHODS OF COMPLIANCE ARE POSSIBLE. A SEALED AS-BUILT SURVEY OF THE SITE, PERFORMED BY THE DESIGN PROFESSIONAL OR DESIGNEE, MUST BE SUBMITTED TO THE BUILDING INSPECTIONS DEPARTMENT CERTIFYING THAT ALL SITE ACCESSIBILITY CODE REQUIREMENTS SUCH AS CURB CUTS, RAMP SLOPES, SIDEWALK SLOPES AND WIDTHS, AND ACCESS AND PARKING CROSS SLOPES MEET THE REQUIREMENTS OF THE NC ACCESSIBILITY CODES PRIOR TO CO ISSUANCE.
- DURHAM COUNTY WILL NOT SIGN THE NCDOT ALLOCATION APPROVAL OR APPROVE THE RELEASE OF A WATER METER UNTIL SYSTEM DEVELOPMENT FEES ARE PAID.

PROPERTY OWNER

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GENERAL NOTES:

- ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE OFFICE OF STATE CONSTRUCTION, DEPARTMENT OF INSURANCE, NCDENR, AND ALL OTHER APPLICABLE LOCAL, STATE AND FEDERAL GUIDELINES. ALL UTILITY CONSTRUCTION SHALL COMPLY WITH APPLICABLE LOCAL JURISDICTIONAL STANDARDS AND SPECIFICATIONS.
- EXISTING SURVEY INFORMATION INCLUDING TOPOGRAPHIC INFORMATION PROVIDED BY SWIFT PARTNERS, UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF ANY WORK. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES OR CONFLICTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING, COORDINATING AND PAYMENT FOR ALL NECESSARY LOCATING SERVICES INCLUDING INDEPENDENT LOCATING SERVICES. THE CONTRACTOR SHALL PROVIDE NOTICE OF EXCAVATION TO NOTIFICATION CENTER AND FACILITY OWNERS (PER NC STATUTE) NO LESS THAN 3 BUSINESS DAYS AND NO MORE THAN 12 WORKING DAYS PRIOR TO BEGINNING DEMOLITION, EXCAVATION OR ANY OTHER FORM OF CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNERS REPRESENTATIVE OF ANY DISCREPANCIES OR CONFLICTS. NO EXCAVATION OR DEMOLITION SHALL BE STARTED WITHOUT ALL UTILITIES BEING LOCATED.
- ALL SUB-SURFACE UTILITIES IDENTIFIED ON THE CONSTRUCTION DOCUMENTS ARE SHOWN IN THEIR APPROXIMATE LOCATION BASED ON SURVEY INFORMATION GATHERED FROM FIELD INSPECTION AND/OR ANY OTHER APPLICABLE RECORD DRAWINGS WHICH MAY BE AVAILABLE. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNERS REPRESENTATIVE OF ANY DISCREPANCIES OR CONFLICTS.
- EXISTING IMPROVEMENTS DAMAGED OR DESTROYED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE RESTORED OR REPLACED TO ORIGINAL CONDITION AND TO THE SATISFACTION OF THE OWNERS REPRESENTATIVE AT THE CONTRACTORS EXPENSE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND COORDINATING PERMITS, INSPECTIONS, CERTIFICATIONS AND OTHER REQUIREMENTS WHICH MUST BE MET UNDER THIS CONTRACT.
- THE CONTRACTOR SHALL MAINTAIN 'AS-BUILT' DRAWINGS TO RECORD THE ACTUAL LOCATION OF ALL PIPING PRIOR TO CONCEALMENT, VALVE AND MANHOLE CHANGES, AND HARDSCAPE OR LANDSCAPE CHANGES. DRAWINGS SHALL BE PROVIDED TO THE OWNERS REPRESENTATIVE AT REGULAR INTERVALS, OR AS REQUESTED THROUGHOUT THE PROJECT FOR RECORD KEEPING.
- IF DEPARTURES FROM THE PROJECT DRAWINGS OR SPECIFICATIONS ARE DEEMED NECESSARY BY THE CONTRACTOR, DETAILS OF SUCH DEPARTURES AND REASONS THERE OF SHALL BE SUBMITTED TO THE OWNERS REPRESENTATIVE FOR REVIEW. NO DEPARTURES FROM THE CONTRACT DOCUMENTS SHALL BE MADE WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE OWNERS REPRESENTATIVE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RELOCATION OF ANY EXISTING UTILITY LINES REQUIRED TO COMPLETE ANY PORTION OF CONSTRUCTION. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE COORDINATION AND COSTS OF THE RELOCATION AND ASSOCIATED WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE PREMISES FREE FROM ACCUMULATIONS OF WASTE MATERIALS AND RUBBISH CAUSED BY THE CONTRACTOR. ALL DEBRIS SHALL BE REMOVED FROM THE PROJECT SITE ON A DAILY BASIS.
- THE ENGINEER AND/OR OWNER DISCLAIM ANY ROLE IN THE CONSTRUCTION MEANS AND/OR METHODS ASSOCIATED WITH THE PROJECT AS SET FORTH IN THESE PLANS.
- ROADWAYS (TEMPORARY OR PERMANENT) MUST BE CAPABLE OF SUPPORTING FIRE FIGHTING APPARATUS (85,000 LBS) DURING ALL PHASES OF CONSTRUCTION ONCE VERTICAL CONSTRUCTION HAS BEGUN.

EXISTING CONDITION NOTES:

- THIS SURVEY MAP IS INTENDED TO REPRESENT THE EXISTING CONDITIONS/TOPOGRAPHY ON A PORTION OF THE PROPERTY AND ALL ENCUMBRANCES UPON THE PROPERTY MAY NOT BE SHOWN.
- HORIZONTAL DATUM IS NAD 83-2011 AND VERTICAL DATUM IS NAVD88.
- THIS DRAWING DOES NOT CONFORM TO N.C. GS47-30 AND THEREFORE IS NOT FOR RECORDATION.
- UTILITIES SHOWN HEREON ARE BASED ON ABOVE GROUND VISIBLE EVIDENCE AND UTILITY DESIGNATION / MARKING SERVICES PERFORMED BY STEWART INC. AND THE AVAILABLE RECORD INFORMATION. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL UTILITIES PRIOR TO COMMENCING CONSTRUCTION.
- SURVEY INFORMATION COLLECTED BY NEWCOMB LAND SURVEYORS PLLC
- TREES SHOWN HEREON MAY NOT REPRESENT ALL VEGETATION ON THE SUBJECT PROPERTY.
- NO WETLANDS HAVE BEEN IDENTIFIED WITHIN THE PROJECT OR PARCEL SHOWN.

DEMOLITION NOTES:

- REFER TO SHEET C3.00 FOR GENERAL NOTES.
- THE CONTRACTOR SHALL REMOVE CONCRETE (WHERE REQUIRED) TO THE FIRST COLD JOINT OR SAW CUT TO OBTAIN A CLEAN EDGE.
- THE CONTRACTOR SHALL SAWCUT EXISTING ASPHALT (WHERE REQUIRED) TO OBTAIN A CLEAN EDGE.
- CLEANOUTS AND WATER VALVES LOCATED IN AREAS OF DEMOLITION OR SUBSEQUENT CONSTRUCTION SHALL BE PROTECTED FROM DAMAGE AND RAISED TO BE FLUSH WITH NEW GRADE.
- ANY UTILITY SERVICES SHOWN TO BE REMOVED OR RELOCATED SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY PROVIDER. CONTRACTOR IS RESPONSIBLE FOR APPROPRIATE SEQUENCING OF UTILITY DEMOLITION WITH THE RESPECTIVE UTILITY AGENCIES.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL UTILITIES PRIOR TO BEGINNING DEMOLITION OPERATIONS. NOTIFY "NORTH CAROLINA ONE CALL" (TELEPHONE: 1-800-432-4949) AT LEAST 48 HOURS PRIOR TO START OF DEMOLITION TO HAVE EXISTING UTILITIES LOCATED. CONTRACTOR SHALL CONTACT ANY LOCAL UTILITIES THAT PROVIDE THEIR OWN LOCATOR SERVICES INDEPENDENT OF "NORTH CAROLINA ONE CALL."
- CLEAN SOILS SHALL BE UTILIZED FOR BACKFILL. COMPACTION OF THESE SOILS SHALL BE PERFORMED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.
- ALL ITEMS DESIGNATED TO BE REMOVED SHALL BE REMOVED COMPLETELY, INCLUDING ALL SUBGRADE MATERIALS DIRECTLY ASSOCIATED WITH ITEMS TO BE REMOVED.
- ALL ITEMS DESIGNATED TO BE REMOVED SHALL BE DISPOSED OF LEGALLY OFF-SITE UNLESS OTHERWISE NOTED ON THIS PLAN.
- REFER TO LANDSCAPE AND EROSION CONTROL DRAWINGS FOR TREE PROTECTION PLAN AND REQUIREMENTS.
- ALL DEMOLITION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL JURISDICTIONAL CODES OR REQUIREMENTS.
- TREE PROTECTION FENCING SHALL BE IN PLACE PRIOR TO BEGINNING DEMOLITION.
- EROSION CONTROL PERMIT SHALL BE OBTAINED AND ONSITE PRIOR TO BEGINNING DEMOLITION.
- ITEMS DESIGNATED TO BE SALVAGED AND/OR RE-USED SHALL BE REMOVED BY THE CONTRACTOR AND PROVIDED TO THE OWNER. COORDINATE STORAGE LOCATION WITH OWNER'S REPRESENTATIVE.
- WHERE UTILITIES ("TO BE REMOVED") IMPACT THE FOOTPRINT OF THE NEW BUILDING, THE CONTRACTOR SHALL EXECUTE AND REMOVE AN ADDITIONAL 2 FEET OF SOILS TO EITHER SIDE OF THE PIPE, AND 1 FOOT BELOW. CLEAN SUITABLE SOIL SHALL BE UTILIZED FOR BACKFILL AND COMPACTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- DEMOLITION AND SUBSEQUENT CONSTRUCTION OF STORM DRAINAGE PIPING SHALL BE PERFORMED IN SUCH A MANNER THAT THE OLD PIPE AND STRUCTURES REMOVED DO NOT IMPACT DRAINAGE UPSTREAM OF THE SYSTEM. PROVISIONS SHALL BE MADE TO MAINTAIN STORM WATER DRAINAGE PATTERNS DURING CONSTRUCTION.
- DEMOLITION AND SUBSEQUENT CONSTRUCTION OF UTILITIES (WATER, SEWER, ETC) SHALL BE PERFORMED IN SUCH A MANNER THAT THE OLD PIPE AND STRUCTURES REMOVED DO NOT IMPACT OR MINIMIZE SERVICE INTERRUPTION TO EXISTING FACILITIES TO REMAIN. PROVISIONS SHALL BE MADE TO MAINTAIN SERVICE DURING CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL DAMAGES TO THE EXISTING DRIVEWAY, PARKING LOT, SIDEWALK AND CURB AND GUTTER AS A RESULT OF CONSTRUCTION ACTIVITY AND TRAFFIC. CONTRACTOR SHALL MAINTAIN A PRE-CONSTRUCTION VIDEO OR PHOTO DOCUMENTATION TO SHOW NO DAMAGES OCCURRED.
- ALL MATERIALS, FURNISHINGS, UTILITIES, AND PAVEMENT THAT ARE NOT SCHEDULED TO BE DEMOLISHED AND ARE DAMAGED BY THE CONTRACTOR AS A RESULT OF THE DEMOLITION OR CONSTRUCTION OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- WHERE UTILITIES ARE SHOWN TO BE "REMOVED", CONTRACTOR SHALL INCLUDE NECESSARY PLUGS OR VALVES TO ENSURE UTILITY LINES TO REMAIN WILL CONTINUE TO BE IN SERVICE. COORDINATE NECESSARY SHUT DOWN AND REMOVAL WITH THE LOCAL JURISDICTION OR UTILITY OWNER.
- CONTRACTOR SHALL PROVIDE PEDESTRIAN INGRESS / EGRESS TO ALL EXISTING BUILDINGS, PARKING LOTS, AND PATHS OF PEDESTRIAN TRAVEL THROUGHOUT THE CONSTRUCTION PERIOD.

MATERIALS AND FURNISHINGS NOTES:

- ABBREVIATIONS FOR SPECIFIC HARDSCAPE MATERIALS AND FURNISHINGS ARE LISTED IN THE LEGEND AND ARE USED THROUGHOUT THE DRAWING SET'S HARDSCAPE & FURNISHINGS PLANS, PAVING PATTERN PLANS AND SITE DETAILS.
- REFER TO RELATED SPECIFICATION SECTION FOR SPECIFIC SUBMITTALS OF PRODUCT DATA, SAMPLES, SHOP DRAWINGS, QUALITY ASSURANCE REQUIREMENTS, EXECUTION REQUIREMENTS, AND FOR FURTHER PRODUCT INFORMATION NOT INCLUDED IN THIS SCHEDULE.
- CONTRACTOR TO SUBMIT COLOR SAMPLES AND PROVIDE MOCK-UPS FOR ALL CAST IN PLACE CONCRETE FOR APPROVAL BY LANDSCAPE ARCHITECT.

SITE NOTES:

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF THE CONSTRUCTION LAYDOWN AREA, PERIMETER FENCE, AND ASSOCIATED GATES. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE REMOVAL OF THE CONSTRUCTION LAYDOWN AREA PERIMETER FENCE AND ASSOCIATED GATES AT THE COMPLETION OF THE PROJECT.
- THE CONTRACTOR SHALL REFERENCE THE DESIGN PLANS FOR DIMENSIONS, JOINT LOCATIONS, AND INLAY SPECIFICATIONS NEAR BUILDINGS AND IN COURTYARDS. CONTRACTOR SHALL PROVIDE JOINTS IN WALKWAYS AND HARDSCAPE PER DETAILS OR AS INDICATED ON LANDSCAPE/HARDSCAPE PLAN SHEETS.
- ALL CONSTRUCTION TRAFFIC SHALL ENTER SITE FROM _____ CARPENTER FLETCHER _____ UNLESS OTHERWISE APPROVED IN WRITING FROM THE OWNER'S REPRESENTATIVE FOR AN ALTERNATE POINT OF ACCESS.
- REFER TO ARCHITECTURAL PLANS FOR BUILDING INFORMATION.
- ALL DIMENSIONS ARE IN DECIMAL FEET TO OUTSIDE FACE OF BUILDINGS, TO CENTERLINES, AND/OR FACE OF CURB UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND COORDINATES AND REPORT ANY DISCREPANCIES TO THE OWNERS REPRESENTATIVE PRIOR TO ANY CONSTRUCTION.
- ALL WRITTEN DIMENSIONS SHALL PREVAIL. DO NOT SCALE FROM DRAWINGS.
- ALL UTILITIES WITH SURFACE ACCESS SHALL BE LOCATED WITHIN THE PAVING PATTERNS AND SHALL BE COORDINATED WITH LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION. REFER TO LAYOUT DRAWINGS.
- ALL ANGLES ARE 90 DEGREES UNLESS OTHERWISE NOTED.
- ALIGN ALL JOINTS, CORNERS, AND EDGES AS SHOWN.
- CONTRACTOR SHALL REFER TO AND COORDINATE WITH ARCHITECTURAL, STRUCTURAL, AND MEP DRAWINGS AT ALL TIMES PRIOR TO AND DURING CONSTRUCTION.
- ALL CURB TAPERS ARE SIX (6) FEET LONG UNLESS OTHERWISE SHOWN ON PLAN.
- WHERE NEW SIDEWALK ADJOINS EXISTING WALK, PROVIDE EXPANSION JOINT BY DRILLING INTO THE FACE OF THE EXISTING WALK FOR PLACEMENT OF DOWELS. THE NEW SIDEWALKS INTO NEAREST EXISTING PAVEMENT JOINT, MATCH WIDTH OF EXISTING WALKWAY.
- WHERE SIDEWALK OR WALKWAYS ARE ADJACENT TO PARKING SPACES THE WALKWAY SHALL BE A MINIMUM 6.5' WIDE AS MEASURED FROM THE FACE OF CURB.
- MAXIMUM RUNNING SLOPE FOR WALKING SURFACES CANNOT BE GREATER THAN 1:20 AND CROSS SLOPES CANNOT BE GREATER THAN 1:48. HANDICAP SPACES SURFACE SLOPES SHALL NOT EXCEED 1:48 IN ALL DIRECTIONS.
- SIGHT TRIANGLES - NOTHING OVER 30" HIGH SHALL BE ALLOWED WITHIN THE SIGHT DISTANCE TRIANGLES.
- THE SITE SHALL BE FULLY STABILIZED (80% COVERAGE) PRIOR TO ISSUANCE OF A BUILDING CERTIFICATE OF OCCUPANCY OR PROJECT APPROVAL.
- HANDICAP RAMPS SHALL BE INSTALLED PER LATEST EDITION OF THE NC BUILDING CODE AND ANSI 117.1.1 WITH DETECTABLE WARNING DOMES WITH A COLOR CONTRAST OF 70% MINIMUM. SEE DETAILS AND GRADING SPOT ELEVATIONS. IF THE EXISTING CONDITIONS PRECLUDE THE ABILITY TO PROVIDE A MAXIMUM SLOPE 1/12 FOR 6'-FEET OR A MAXIMUM CROSS SLOPE OF 1:48 AND A 30' MINIMUM LANDING, THE CONTRACTOR SHALL NOTIFY ENGINEER OR OWNER REPRESENTATIVE PRIOR TO INSTALLATION.
- THE TESTING AGENCY SHALL BE RESPONSIBLE FOR PROVIDING THE ASPHALT AND CONTRACTOR CERTIFICATION MEMO TO NCDOT FOR ALL ROADWAY IMPROVEMENTS WITHIN THE PUBLIC RIGHT-OF-WAY.

GRADING AND STORM DRAINAGE NOTES:

- REFER TO SHEET C3.00 FOR GENERAL NOTES.
- CONTRACTOR SHALL REPORT ANY GRADE DISCREPANCIES TO THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING CONSTRUCTION OPERATIONS.
- THE MAXIMUM SLOPE ALONG ANY HANDICAP ACCESSIBLE PATHWAY SHALL NOT EXCEED 5.0% AND SHALL NOT EXCEED A 2.0% CROSS SLOPE. HANDICAP RAMPS INDICATED ON PLANS SHALL BE A MAXIMUM OF 1/12 SLOPES WITH A MAXIMUM RISE OF 30" BETWEEN LANDINGS. NON-CURB CUT RAMPS SHALL HAVE HANDRAILS AND GUARDS PER DETAILS WITH 5' LANDINGS AT THE BOTTOM AND TOP OF RAMP.
- ALL PROPOSED ELEVATIONS SHOWN ARE EDGE OF PAVEMENT ELEVATIONS UNLESS OTHERWISE SPECIFIED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL NEWLY CONSTRUCTED STORM DRAINAGE IMPROVEMENTS AND RECEIVING STORM DRAINAGE SYSTEMS REMAIN CLEAN OF SEDIMENT AND DEBRIS. PRIOR TO OWNER ACCEPTANCE OF SYSTEM, THE CONTRACTOR SHALL COORDINATE AND PROVIDE A VISUAL OBSERVATION VIDEO OF ALL STORM DRAINAGE IMPROVEMENTS 12" AND LARGER. THE VISUAL OBSERVATION SHALL BE PERFORMED BY THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL PROVIDE TWO (2) DVD COPIES OF THE ENTIRE DRAINAGE VISUAL OBSERVATION.
- PRIOR TO ISSUANCE OF A BUILDING CERTIFICATE OF OCCUPANCY THE CONTRACTOR SHALL PROVIDE THE OWNER WITH THE VIDEO INSPECTION OF THE STORM SEWER SYSTEM. (BOTH PUBLIC AND PRIVATE). THIS SUBMITTAL MAY NEED TO BE REVIEWED AND ACCEPTED BY THE LOCAL JURISDICTION PRIOR TO THE ISSUANCE OF THE BUILDING CO.
- REFER TO THE EROSION CONTROL DETAILS SHEET FOR THE SEQUENCE OF CONSTRUCTION.
- INTERIM GRADING SHALL BE PROVIDED THAT ENSURES THE PROTECTION OF STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, AND WASHOUT.
- INTERIM GRADING SHALL BE PROVIDED TO DIRECT WATER AWAY FROM BUILDINGS AND PREVENT PONDING.
- THE ROOF LEADERS WHERE POSSIBLE TO UNDERGROUND STORM SYSTEM. CONTRACTOR TO FIELD VERIFY LOCATE AND INSTALL WHERE POSSIBLE OR AS SHOWN ON PLANS. WHERE ROOF LEADERS DAYLIGHT AT GRADE A SPLASH BLOCK APPROVED BY THE OWNERS REPRESENTATIVE SHALL BE INSTALLED.
- MAXIMUM SLOPE ACROSS ANY HANDICAPPED PARKING SPACE AND AISLE SHALL NOT EXCEED 2% IN ANY DIRECTION.
- PROPOSED CONTOURS ARE APPROXIMATE. SPOT ELEVATIONS AND ROADWAY PROFILES SHALL BE USED IN CASE OF DISCREPANCY.
- PLACE BACKFILL AND FILL MATERIALS IN LAYER NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HEAVY COMPACTION EQUIPMENT, AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS. PLACE BACKFILL AND FILL MATERIALS EVENLY ON ALL SIDES TO REQUIRED ELEVATION AND UNIFORMLY ALONG THE FULL LENGTH OF EACH STRUCTURE. COMPACT SOIL TO NOT LESS THAN 95 PERCENT OF MAXIMUM DRY UNIT WEIGHT ACCORDING TO ASTM D 698 FOR EACH LAYER OF BACKFILL OR FILL MATERIAL UP TO TWO FEET OF FINISHED GRADE. COMPACT SOIL TO NOT LESS THAN 98 PERCENT OF MAXIMUM DRY UNIT WEIGHT ACCORDING TO ASTM D 698 FOR EACH LAYER OF BACKFILL OR FILL MATERIAL FOR THE FINAL TWO FEET.
- SITE GRADING IMMEDIATELY ADJACENT TO FOUNDATION OF BUILDING SHALL SLOPE NOT LESS THAN 1:20 AWAY FOR MINIMUM DISTANCE OF 10 FEET. ALTERNATIVE METHOD SHALL BE PROVIDED TO DIVERT WATER AWAY FROM FOUNDATION VIA SWALES SLOPED AT A MINIMUM OF 2% OR IMPERVIOUS SURFACES SLOPED AWAY A MINIMUM OF 2% AWAY FROM BUILDING.
- CONTRACTOR SHALL ADJUST RIM ELEVATIONS OF EXISTING MANHOLES, METERS, VALVES, ETC. AS REQUIRED TO MEET NEW FINISHED GRADES.
- CONTRACTOR SHALL SLOPE GRADES TO ASSURE POSITIVE STORMWATER FLOW TO KEEP WATER FROM POOLING ALONG CURBS AND WALLS.
- TOP OF WALL ELEVATIONS INDICATE THE ELEVATION AT THE TOP OF THE CAP, UNLESS OTHERWISE NOTED.
- BOTTOM OF WALL ELEVATIONS INDICATE THE ELEVATION OF THE FINISHED GRADE.

PAVING PATTERN NOTES:

- END ALL UNIT PAVING PATTERNS WITH A FULL OR HALF SIZE PAVER UNLESS OTHERWISE NOTED. USE OVERSIZE PAVERS WHERE PATTERN ENDS ON A UNIT SMALLER THAN HALF SIZE.
- LAYOUT OF UNIT PAVING PATTERNS AND CONCRETE JOINTS AS INDICATED ON THIS PLAN. REFERENCE LAYOUT PLANS FOR FURTHER PAVING LAYOUT INFORMATION.
- PAVERS ABUTTING TRUNCATED DOMES SHALL BE A CONTRASTING COLOR.
- ALIGN ALL TRUNCATED DOME PAVER JOINTS WITH ABUTTING PAVER JOINTS.
- PROVIDE CONTINUOUS EXPANSION JOINTS BETWEEN BACK OF CURB AND ADJOINING PAVEMENT.
- PROVIDE CONTINUOUS EXPANSION JOINT BETWEEN ALL VERTICAL SURFACES AND ADJOINING PAVEMENT.
- ALL DIMENSIONS MEASURED TO CENTERLINE OF JOINTS.
- ALL WRITTEN DIMENSIONS SHALL PREVAIL. DO NOT SCALE FROM DRAWINGS.
- ALL ANGLES 90 DEGREES UNLESS OTHERWISE NOTED.
- ALIGN ALL JOINTS, CORNERS AND EDGES AS SHOWN.
- FINAL LAYOUTS TO BE APPROVED BY LANDSCAPE ARCHITECT.

SIGNAGE, STRIPING AND MARKING NOTES:

- ALL INTERNAL SIGNAGE SHALL BE COORDINATED WITH OWNER FOR ACTUAL LOCATION AT TIME OF INSTALLATION. SIGNAGE LEADING ONTO PUBLIC THOROUGHFARE SHALL BE INSTALLED AT RIGHT OF WAY PER DOT STANDARDS.
- ALL PAVEMENT STRIPING (EXCEPT INDIVIDUAL PARKING BAY STRIPING) SHALL BE THERMOPLASTIC REFLECTIVE PAINT. MATERIALS AND DIMENSIONS SHALL CONFORM TO NCDOT STANDARDS AND SPECIFICATIONS. PARKING BAY STRIPING SHALL BE WHITE REFLECTIVE PAINT.
- CROSSWALKS SHALL BE CONSTRUCTED OF THERMOPLASTIC MATERIALS AND CONSTRUCTED IN ACCORDANCE WITH STATE DOT SPECIFICATIONS. CONTRACTOR TO INSTALL CROSSWALKS IN SUCH A MANNER THAT CROSSWALKS ARE ALIGNED BETWEEN HANDICAP/WALKWAY ACCESS POINTS OR PERPENDICULAR TO THE ROADWAY / DRIVE LANE.
- ADA SYMBOLS SHOWN THESE DRAWINGS ARE FOR LOCATION PURPOSES ONLY AND NOT INTENDED TO BE PAINTED. CONTRACTOR RESPONSIBLE FOR INSTALLING ALL REQUIRED ADA SIGNAGE.

UTILITY NOTES:

- REFER TO SHEET C3.00 FOR GENERAL NOTES.
- UNLESS OTHERWISE NOTED, ALL MANHOLES SHALL BE PRE-CAST CONCRETE STRUCTURES.
- THE CONTRACTOR SHALL COORDINATE THE CONSTRUCTION OF UNDERGROUND UTILITIES (WATER, SEWER, STORM, ELECTRICAL, GAS, OR OTHER) FOR THIS PROJECT WITH THE BUILDING PLANS. THE UTILITY CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE INSTALLATION OF ALL UTILITY SERVICES TO WITHIN FIVE (5) FEET OF THE BUILDING CONNECTION POINT.
- THE CONTRACTOR SHALL COORDINATE WITH OTHER CONTRACTORS ON SITE AND UTILITY PROVIDERS DURING CONSTRUCTION TO ENSURE SMOOTH TRANSITION BETWEEN DISCIPLINES.
- THE CONTRACTOR SHALL COORDINATE ALL PEDESTRIAN AND VEHICULAR INTERRUPTIONS WITH OWNERS REPRESENTATIVE AT LEAST 72 HOURS PRIOR TO BEGINNING WORK.
- THE CONTRACTOR SHALL NOT PROCEED WITH ANY WORK INSIDE THE PUBLIC RIGHT OF WAY PRIOR TO RECEIPT AND COMPLIANCE WITH ALL APPLICABLE NCDOT PERMITS. ADDITIONALLY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY FLAGGERS AND TRAFFIC CONTROL DURING ALL WORK INSIDE THE PUBLIC RIGHTS OF WAY.
- THE CONTRACTOR SHALL NOT RE-USE ANY FIRE HYDRANT REMOVED AS PART OF THIS PROJECT. ANY FIRE HYDRANT SHOWN TO BE REMOVED OR RELOCATED SHALL BE REPLACED WITH A NEW FIRE HYDRANT MEETING THE LOCAL JURISDICTIONAL REQUIREMENTS AND STANDARDS.
- ALL EXISTING SUB-SURFACE UTILITIES IDENTIFIED ON THE CONSTRUCTION DOCUMENTS ARE SHOWN IN THEIR APPROXIMATE LOCATION BASED ON SURVEY INFORMATION GATHERED FROM FIELD INSPECTION AND/OR ANY OTHER APPLICABLE RECORD DRAWINGS WHICH MAY BE AVAILABLE. DEPTHS OF EXISTING UTILITIES SHOWN IN PROFILE VIEWS ARE BASED ON STANDARD ASSUMPTIONS. THE CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION, DEPTH, SIZE AND MATERIAL OF ANY AND ALL SUB-SURFACE CONDITIONS REFERENCED IN THESE PLANS PRIOR TO ANY EXCAVATION OR CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNERS REPRESENTATIVE OF ANY DISCREPANCIES OR CONFLICTS.
- ELEVATIONS OF UTILITIES ARE GIVEN TO THE EXTENT OF INFORMATION AVAILABLE, WHERE ELEVATIONS ARE NOT GIVEN AT POINTS OF EXISTING UTILITY CROSSINGS, SUCH ELEVATIONS SHALL BE DETERMINED BY THE CONTRACTOR AND REPORTED TO THE ENGINEER, WHEN UNKNOWN LINES ARE EXPOSED, THEIR LOCATIONS AND ELEVATIONS SHALL ALSO BE REPORTED TO THE ENGINEER.
- UNDERGROUND UTILITIES SHOWN ON THIS PLAN SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION OF PARKING AREA, DRIVES, CURBS AND GUTTER OR CONCRETE WALKS / PADS. IF UTILITIES SHOWN ON THIS PLAN CANNOT BE INSTALLED PRIOR TO INSTALLATION OF IMPERVIOUS (ASPHALT / CONCRETE) CONDUIT SHALL BE INSTALLED FOR THE "FUTURE" UTILITY INSTALLATION.
- AS-BUILT DOCUMENTATION REQUIREMENTS: PRIOR TO APPROVAL FROM LOCAL JURISDICTION OR ENGINEER THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS IN BOTH PAPER AND ELECTRONIC FORMAT (CAD / PDF) PREPARED AND SEALED BY A PROFESSIONAL LAND SURVEYOR SHOWING ALL UTILITY INSTALLATION. HORIZONTAL AND VERTICAL INFORMATION SHALL BE PROVIDED FOR WATER, SEWER, STORM INCLUDING ALL STRUCTURES, VALVES, HYDRANTS, AND OTHER APPURTENANCES.

PROPOSED UTILITY SEPARATION:

- WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM EXISTING OR PROPOSED SEWERS, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT A 10-FOOT HORIZONTAL SEPARATION IN WHICH CASE:
 - THE WATER MAIN IS LAID IN A SEPARATE TRENCH, WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER; OR
 - THE WATER MAIN IS LAID IN THE SAME TRENCH AS THE SEWER WITH THE WATER MAIN LOCATED AT ONE SIDE OF A BENCH OF UNDISTURBED EARTH, AND WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
- CROSSING A WATER MAIN OVER A SEWER, WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS OVER A SEWER, THE WATER MAIN SHALL BE LAID AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT A 18 INCH VERTICAL SEPARATION, IN WHICH CASE BOTH THE WATER MAIN AND SEWER SHALL BE CONSTRUCTED OF FERROUS MATERIALS AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING.
- CROSSING A WATER MAIN UNDER A SEWER, WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS UNDER A SEWER, BOTH THE WATER MAIN AND THE SEWER SHALL BE CONSTRUCTED OF FERROUS MATERIALS AND WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING.
- SEPARATION OF SANITARY SEWERS AND STORM SEWERS:
 - A 24" VERTICAL SEPARATION SHALL BE PROVIDED BETWEEN STORM SEWER AND SANITARY SEWER LINES OR BOTH THE SANITARY AND THE STORM LINES SHALL BE CONSTRUCTED OF FERROUS MATERIALS.

SEWER NOTES:

- SANITARY SEWER CLEANOUTS LOCATED IN PAVEMENT AREAS SHALL BE HEAVY DUTY TRAFFIC BEARING CASTINGS.
- UNLESS OTHERWISE NOTED, ALL SANITARY SEWER MANHOLES ARE 4' DIA.
- MANHOLES LOCATED IN PAVEMENT, CONCRETE OR OTHER TRAFFIC AREAS SHALL BE SET AT GRADE. MANHOLES LOCATED IN OTHER AREAS (I.E. GRASS OR WOODED AREAS) SHALL HAVE THEIR RIMS RAISED SIX INCHES ABOVE THE SURROUNDING GRADE. MANHOLES SUBJECT TO POSSIBLE WATER INFILTRATION SHALL HAVE WATERTIGHT, BOLTED LIDS.
- MINIMUM REQUIRED SLOPES FOR SEWER SERVICES:
 - SEWER SERVICE - 2.00% SLOPE
 - SEWER SERVICE - 1.00% SLOPE
 - SEWER SERVICE - 0.50% SLOPE
- UNLESS OTHERWISE NOTED, LOCATE SANITARY SERVICE CLEANOUTS AT ALL HORIZONTAL OR VERTICAL CHANGES IN DIRECTION. MAXIMUM SPACING BETWEEN CLEANOUTS SHALL BE 75 FEET.
- SEWER LINES LESS THAN 3 FEET OF COVER SHALL BE CLASS 50 DUCTILE IRON PIPE. SEWER LINES WITH GREATER THAN 3 FEET OF COVER SHALL BE AS NOTED BELOW:
 - SEWER SERVICE - SCH 80
 - SEWER SERVICE - SCH 80
 - SEWER SERVICE - SDR-35
- SEWER LINES UNDER CONSTRUCTION SHALL BE PROTECTED FROM DIRT, DEBRIS OR OTHER CONTAMINANTS ENTERING THE NEW SYSTEM. A MECHANICAL PLUG SHALL BE UTILIZED BOTH IMMEDIATELY UPSTREAM OF THE NEW CONSTRUCTION AND AT THE FIRST MANHOLE DOWNSTREAM IN THE EXISTING SYSTEM. EXISTING STRUCTURES, PIPING AND APPURTENANCES SHALL BE PROTECTED FROM ANY INFLOW OF WATER, DIRT OR DEBRIS DUE TO NEW CONSTRUCTION CONNECTING TO OR IN THE VICINITY OF THE EXISTING SYSTEM. CONTRACTOR TO REMOVE DEBRIS AND PLUG PRIOR TO OCCUPANCY.
- ALL MANHOLES COVERS SHALL BE PAINTED TO LOCAL JURISDICTIONAL REQUIREMENTS.

WATER NOTES:

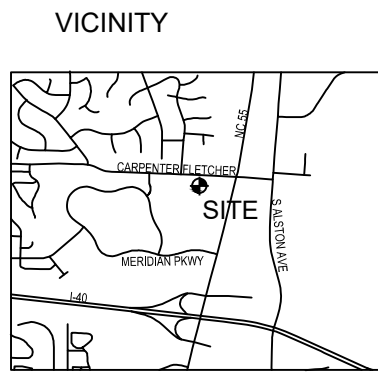
- AS INDICATED, ALL WATERLINES SHALL BE DUCTILE IRON PIPE MEETING THE REQUIREMENTS OF ANSI/AWWA C151 PRESSURE CLASS 350 OR SOFT COPPER TYPE K PIPE PER ASTM B88. IF PVC WATERLINE IS INDICATED ON THE PLANS IT SHALL MEET THE REQUIREMENTS OF AWWA C-900, CLASS 250.
- ALL WATERLINES SHALL HAVE A MINIMUM OF 3.5 FEET OF COVER.
- TESTING NOTES:
 - PRESSURE: LEAKAGE SHALL NOT EXCEED THE MAXIMUM ALLOWABLE LEAKAGE SPECIFIED IN AWWA C 600. MINIMUM TEST PRESSURE SHALL BE 150 PSI FOR DOMESTIC AND 200 PSI FOR FIRE PROTECTION. BACTERIOLOGICAL: TWO SAMPLES FOR BACTERIOLOGICAL SAMPLING SHALL BE COLLECTED AT LEAST 24 HOURS APART. IF CONTAMINATION IS INDICATED, THEN THE DISINFECTION PROCEDURE AND TESTING SHALL BE REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED.
- THE CHLORINE IN HEAVILY CHLORINATED WATER FLUSHED FROM MAINS NEEDS TO BE NEUTRALIZED BEFORE DISCHARGE. CONTRACTORS SHALL NEUTRALIZE HEAVILY CHLORINATED WATER FLUSHED FROM MAINS PRIOR TO DISCHARGE OR TRANSPORT ALL HEAVILY CHLORINATED WATER OFFSITE FOR PROPER DISPOSAL.
- PAINT VALVE COVERS, FIRE HYDRANTS AND OTHER WATER APPARATUS TO MEET THE LOCAL JURISDICTIONAL REQUIREMENTS.



Infinite
Tide



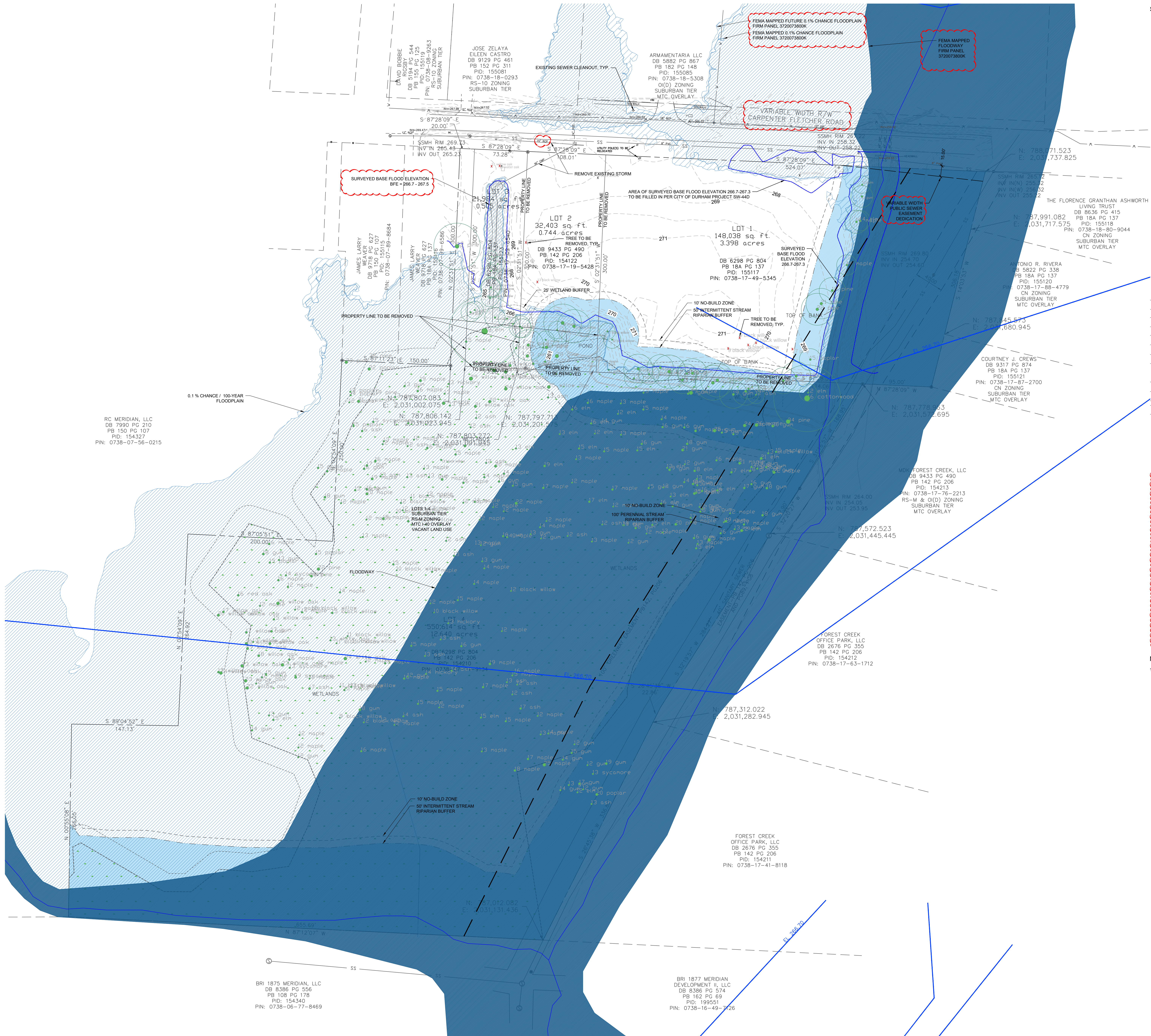
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SCALE

ARROW

DATE: 05.07.2024
DRAWN BY: [Signature]
PROJECT: 1414 CARPENTER FLETCHER RD
PROJECT #: 02400010
SHEET TITLE: #####
SHEET NO.: #####



SURVEY LEGEND:

- △ SURVEY CONTROL POINT
- EIP
- EECM
- ▲ COMPUTED POINT
- ⊙ STORM DRAIN MANHOLE
- ⊞ STORM DRAIN CURB INLET
- ⊙ SANITARY SEWER MANHOLE
- ⊙ SANITARY SEWER CLEANOUT
- ⊙ SANITARY FORCEMAIN VALVE
- ⊙ HYDRANT
- ⊙ WATER VALVE
- ⊙ WATER METER
- ⊙ WATER MANHOLE
- ⊙ WATER VAULT
- ⊙ WELL
- ⊙ GAS VALVE
- ⊙ GAS METER
- ⊙ TELEPHONE MANHOLE
- ⊙ TELEPHONE PEDESTAL
- ⊙ TV MANHOLE
- ⊙ TV PEDESTAL
- ⊙ FIBER OPTIC WITNESS POST
- ⊙ FIBER OPTIC BOX
- ⊙ ELECTRIC MANHOLE
- ⊙ ELECTRIC METER
- ⊙ ELECTRIC BOX
- ⊙ UTILITY POLE
- ⊙ GUY POLE
- ⊙ GUY WIRE
- ⊙ LIGHT POLE
- ⊙ MANHOLE
- ⊙ SIGN
- ⊙ WIRE FENCE
- ⊙ CHAIN LINK FENCE
- ⊙ UNDERGROUND TELEPHONE LINE
- ⊙ UNDERGROUND FIBER OPTIC LINE
- ⊙ UNDERGROUND GAS LINE
- ⊙ UNDERGROUND ELECTRIC LINE
- ⊙ UNDERGROUND WATER LINE
- ⊙ SANITARY SEWER LINE
- ⊙ STORM DRAIN LINE
- ⊙ OVERHEAD WIRES
- ⊙ UNIDENTIFIED LINE
- ⊙ UNKNOWN DESTINATION
- ⊙ CONCRETE SURFACE
- ⊙ DUCTILE IRON PIPE
- ⊙ PVC
- ⊙ HDPE
- ⊙ RCP
- ⊙ CMP
- ⊙ CB

LIMITS OF DISTURBANCE

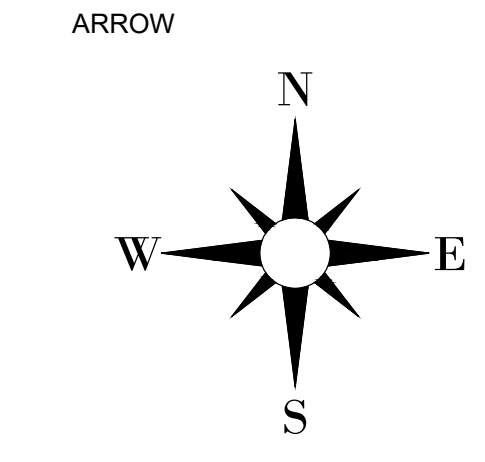
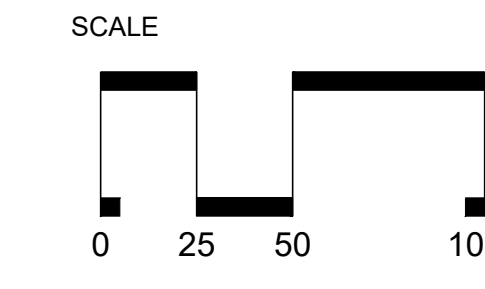
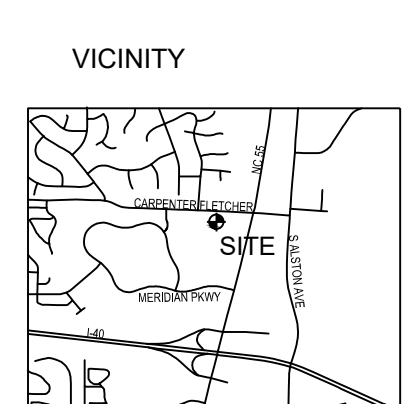
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- FEMA MAPPED ZONE AE / 0.1% CHANCE FLOODPLAIN
- FEMA MAPPED FUTURE 0.1% CHANCE FLOODPLAIN
- WETLANDS
- RIPARIAN BUFFERS
- TREE PRESERVATION
- PASSIVE OPEN SPACE
- SURVEYED BASE FLOOD ELEVATION (266.7 - 267.5)
- SURVEYED SPECIMEN TREE
- SURVEYED SPECIMEN TREE CRITICAL ROOT PROTECTION ZONE
- FEMA FLOODPLAIN CROSS-SECTIONS
- SURVEYED SPECIMEN TREE TO BE REMOVED

NOTES:

- LONG RANGE PLANNING IMPACTS
- DURHAM TRAILS AND GREENWAYS MASTER PLAN - PLANNED NORTH PRONG CREEK TRAIL



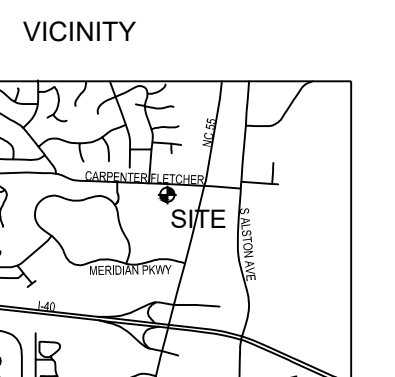
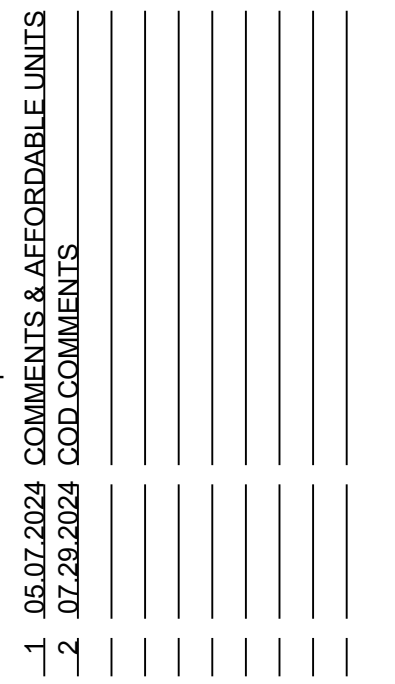
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**Infinite
Tide**

FIRM FINANCE CORP.



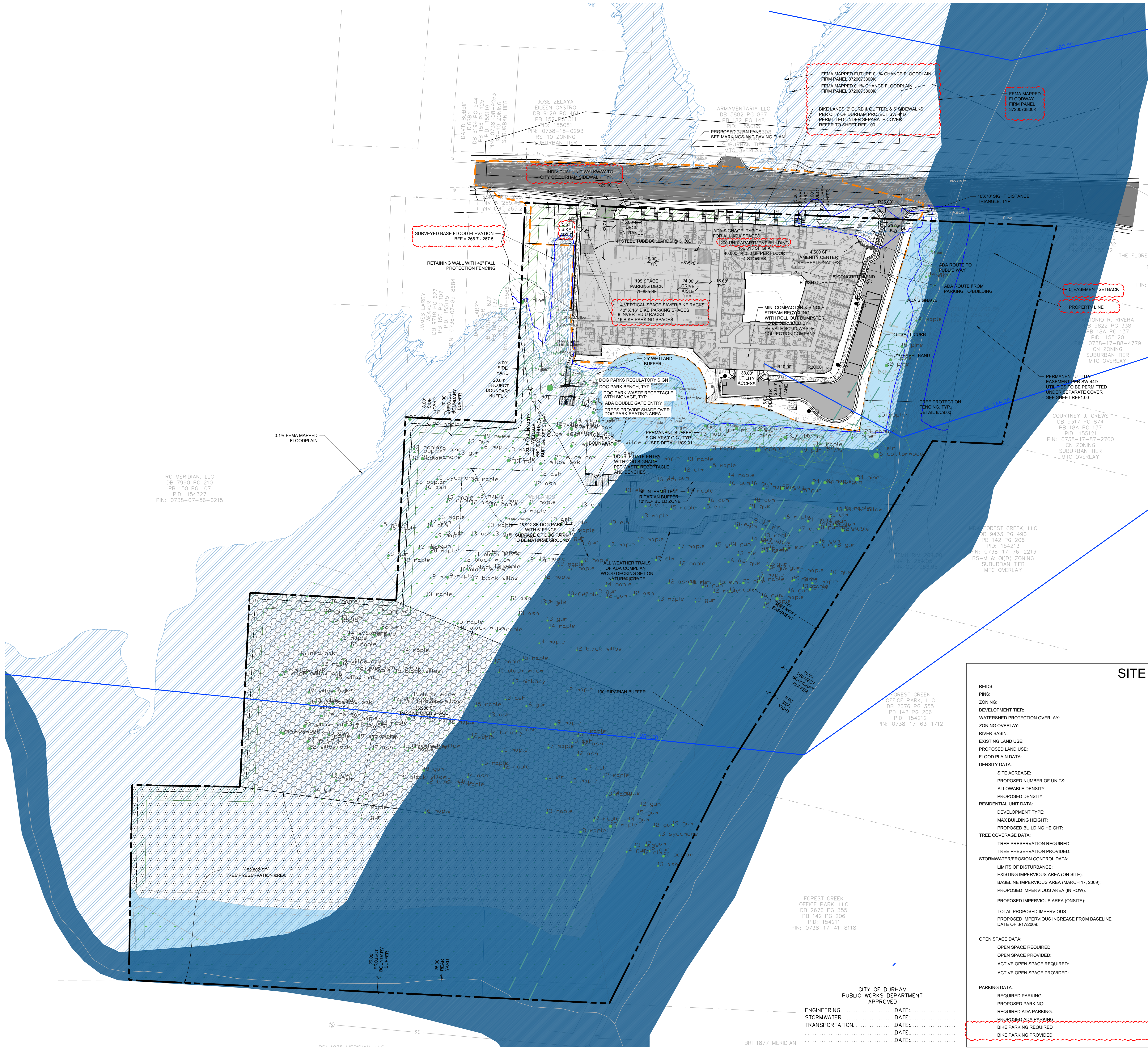
SCALE

ARROW

GET IT? YOU DON'T HAVE THE EXPERIENCE I HAVE

THE UNIVERSITY OF DUBLIN

REF1.00



SITE LEGEND:

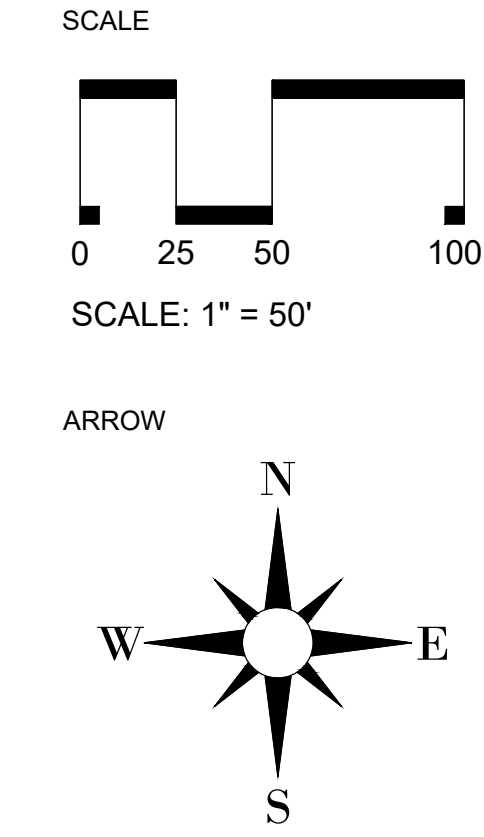
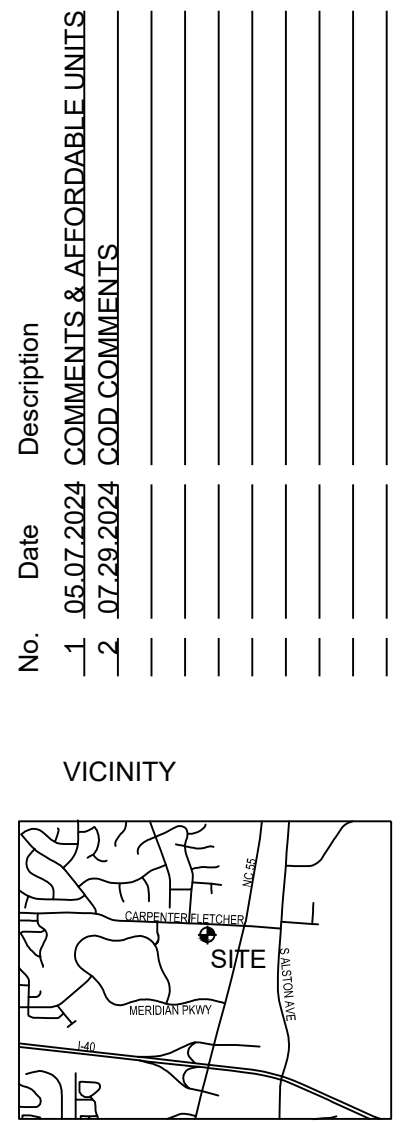
| SYMBOL | DESCRIPTION |
|-----------|---|
| [Pattern] | PROPOSED BUILDING |
| [Pattern] | PROPOSED CONCRETE SIDEWALK |
| [Pattern] | PROPOSED ASPHALT |
| [Pattern] | PROPOSED CONCRETE PAVERS |
| [Pattern] | PROPOSED GRAVEL |
| [Pattern] | PROPOSED CURB & GUTTER |
| [Pattern] | PROPOSED STOP BAR |
| [Pattern] | PROPOSED SIGN |
| [Pattern] | PROPOSED ADA PARKING SPACE |
| [Pattern] | PROPOSED RETAINING WALL |
| [Pattern] | PROPOSED FULL CUT OFF LIGHT |
| [Pattern] | PROPOSED U-SHAPED BIKE RACK |
| [Pattern] | PROPERTY LINE |
| [Pattern] | LIMITS OF DISTURBANCE |
| [Pattern] | FEMA MAPPED REGULATORY FLOODWAY |
| [Pattern] | FEMA MAPPED ZONE AE / 0.1% CHANCE FLOODPLAIN |
| [Pattern] | FEMA MAPPED FUTURE 0.1% CHANCE FLOODPLAIN |
| [Pattern] | WETLANDS |
| [Pattern] | RIPARIAN BUFFERS |
| [Pattern] | TREE PRESERVATION |
| [Pattern] | PASSIVE OPEN SPACE |
| [Pattern] | SURVEYED BASE FLOOD ELEVATION (266.7 - 267.5) |
| [Pattern] | SURVEYED SPECIMEN TREE |
| [Pattern] | SPECIMEN TREE CRITICAL ROOT PROTECTION ZONE |
| [Pattern] | FEMA FLOODPLAIN CROSS-SECTIONS |
| [Pattern] | PROJECT BOUNDARY BUFFER |

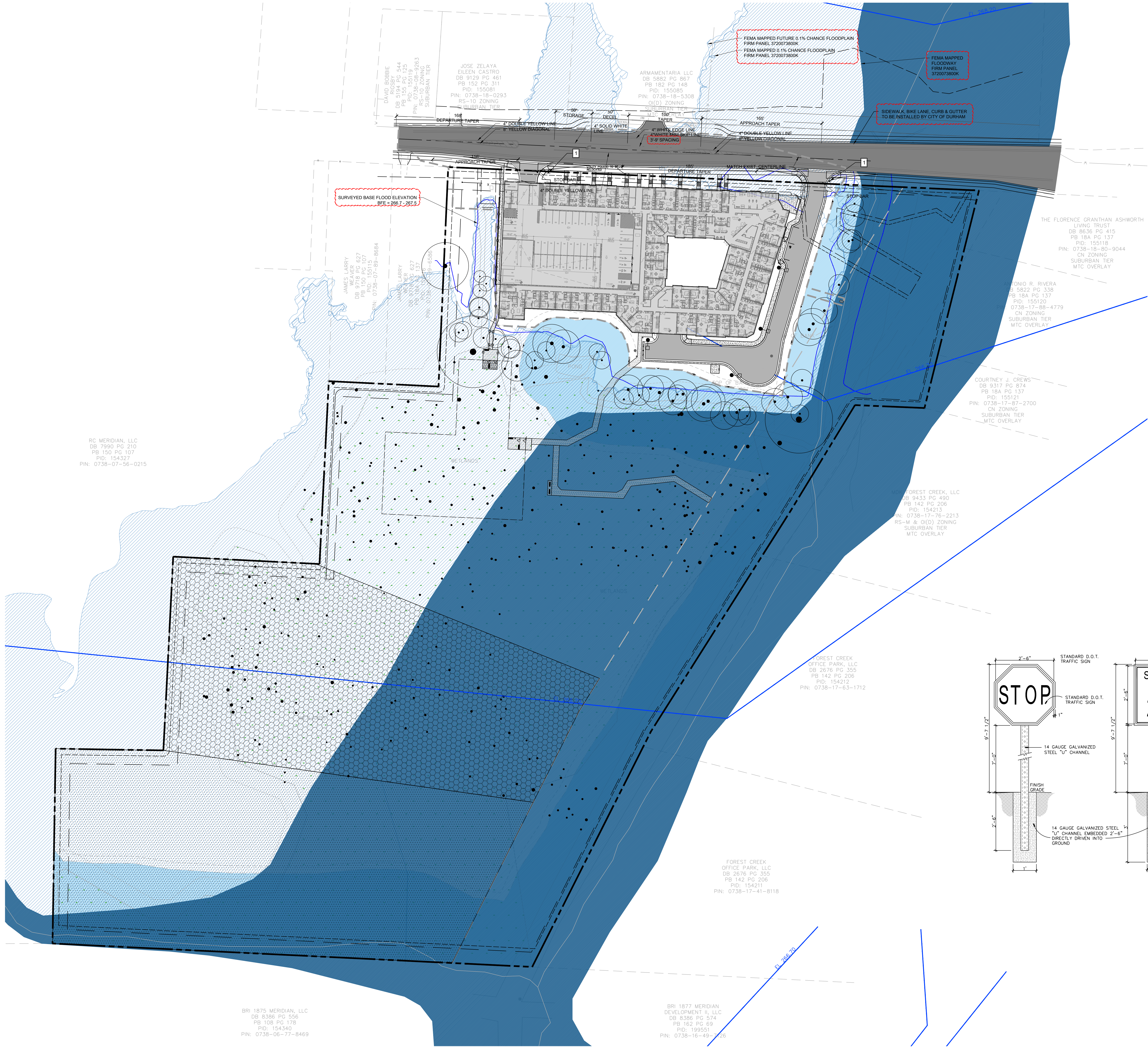
SITE NOTES:

1. SW-44D IMPROVEMENTS AS SHOWN ARE PRELIMINARY IN NATURE. CONSTRUCTION PLANS ARE STILL UNDER REVIEW AND SUBJECT TO CHANGE.

| OPEN SPACE CALCULATIONS | |
|----------------------------------|------------|
| TOTAL SITE AREA (SF) | 753,060 SF |
| OPEN SPACE REQUIRED (18%) | 135,551 SF |
| PASSIVE OPEN SPACE PROVIDED | 136,988 SF |
| ACTIVE OPEN SPACE REQUIRED (1/3) | 45,184 SF |
| ACTIVE OPEN SPACE PROVIDED | 45,378 SF |
| ACTIVE OPEN SPACE TYPOLOGIES | |
| DOG PARK | 28,992 SF |
| DOG RUN | 1,041 SF |
| TRAILS | 5,186 SF |
| COURTYARD | 5,659 SF |
| AMENITY CENTER | 4,500 SF |

| SITE DATA | |
|---|--|
| REIDS: | 155117, 155122, 155123, 154210 |
| PINS: | 0738174953, 0738171954, 0738170955, 0738079491 |
| ZONING: | RS-M |
| DEVELOPMENT TIER: | SUBURBAN |
| WATERSHED PROTECTION OVERLAY: | NONE |
| ZONING OVERLAY: | MTC (I-40) |
| RIVER BASIN: | CAPE FEAR |
| EXISTING LAND USE: | VACANT |
| PROPOSED LAND USE: | RESIDENTIAL - MULTIFAMILY |
| FLOOD PLAIN DATA: | FIRM PANEL:3720073800K;EFFECTIVE DATE:10/19/2018 |
| DENSITY DATA: | |
| SITE ACREAGE: | 17.287 AC |
| PROPOSED NUMBER OF UNITS: | 200 UNITS (31 AFFORDABLE + 169 MARKET RATE) |
| ALLOWABLE DENSITY: | 8.00 DU/AC + UP TO 267 AFFORDABLE DENSITY CREDITS |
| PROPOSED DENSITY: | 8.00 DU/AC + 62 AFFORDABLE DENSITY CREDITS |
| RESIDENTIAL UNIT DATA: | |
| DEVELOPMENT TYPE: | APARTMENTS |
| MAX BUILDING HEIGHT: | 3-STORIES/40 FEET + 1-STORY/15 FEET FOR AFFORDABLE DENSITY BONUS |
| PROPOSED BUILDING HEIGHT: | 49'-4" |
| TREE COVERAGE DATA: | |
| TREE PRESERVATION REQUIRED: | 150,607 SF (20.00%) |
| TREE PRESERVATION PROVIDED: | 152,802 SF (20.29%) |
| STORMWATER EROSION CONTROL DATA: | |
| LIMITS OF DISTURBANCE: | 149,590 SF |
| EXISTING IMPERVIOUS AREA (ON SITE): | 00 SF |
| BASELINE IMPERVIOUS AREA (MARCH 17, 2009): | 40,777 SF (5.42%) |
| PROPOSED IMPERVIOUS AREA (IN ROW): | 15,954 SF |
| PROPOSED IMPERVIOUS AREA (ONSITE): | 86,250 SF (11.45%) |
| TOTAL PROPOSED IMPERVIOUS: | 102,204 SF (13.57%) |
| PROPOSED IMPERVIOUS INCREASE FROM BASELINE DATE OF 3/17/2009: | 61,427 SF |
| OPEN SPACE DATA: | |
| OPEN SPACE REQUIRED: | 135,546 SF (18.00%) |
| OPEN SPACE PROVIDED: | 213,572 SF (28.36%) |
| ACTIVE OPEN SPACE REQUIRED: | 45,182 SF (6 REQUIRED OPEN SPACE) |
| ACTIVE OPEN SPACE PROVIDED: | 60,770 SF |
| PARKING DATA: | |
| REQUIRED PARKING: | 0 SPACES |
| PROPOSED PARKING: | 239 SPACES |
| REQUIRED ADA PARKING: | 7 ADA SPACE (2 VAN ACCESSIBLE) |
| DATE: | 10 ADA SPACE (2 VAN ACCESSIBLE) |
| BIKE PARKING REQUIRED: | 20 SPACES |
| BIKE PARKING PROVIDED: | 20 SPACES |





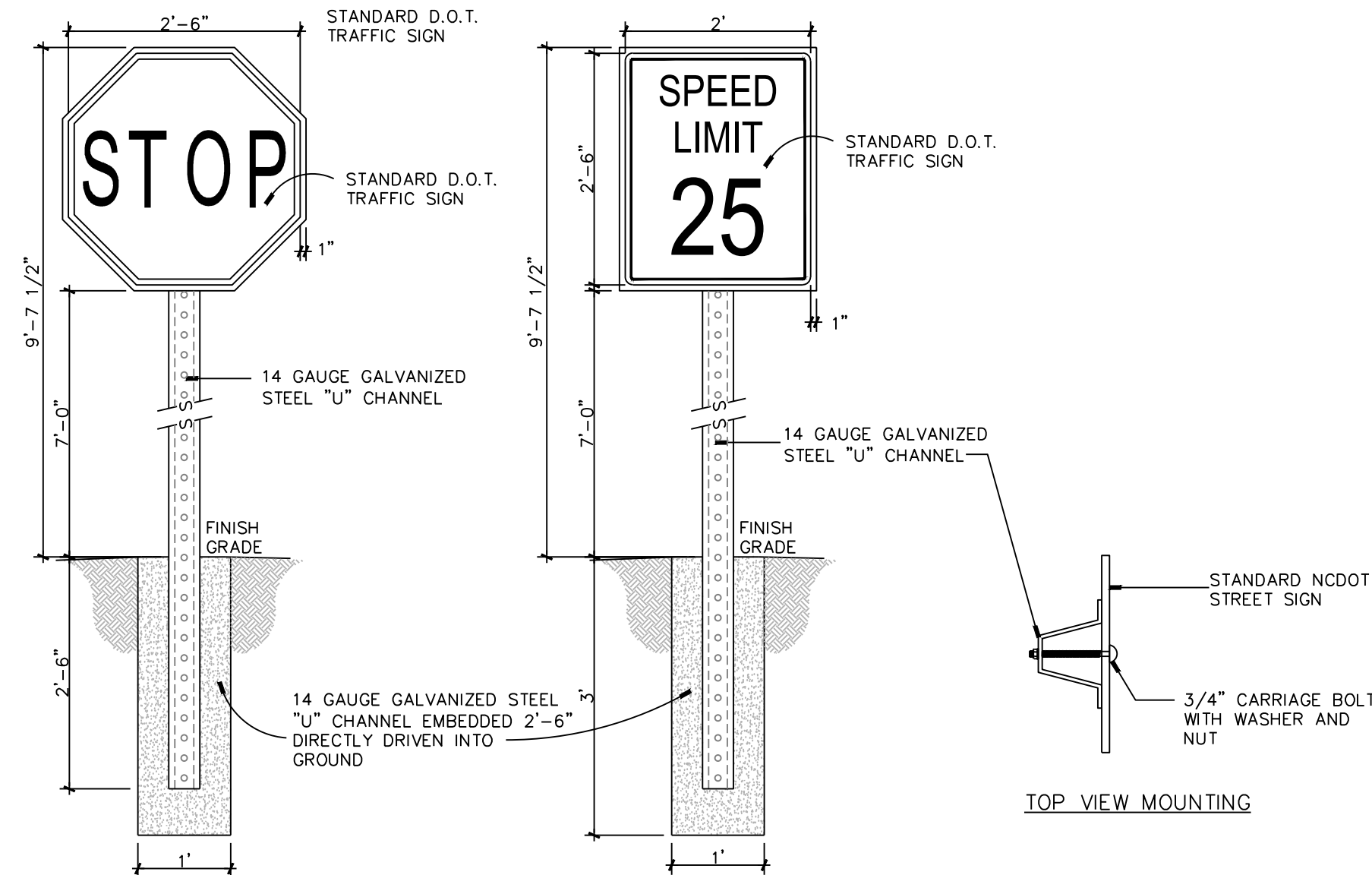
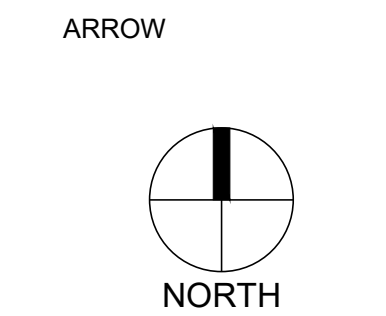
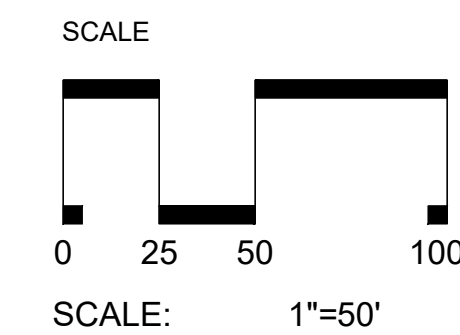
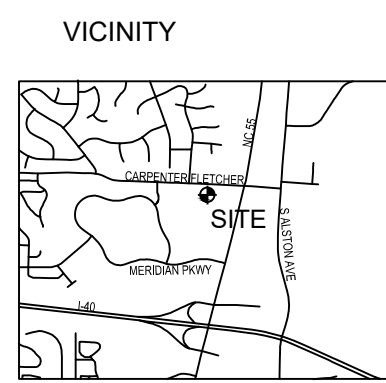
| SIGNAGE LEGEND | | | |
|----------------|-----------------|---------|------|
| KEY TAG | DESCRIPTION | MUTCD # | SIGN |
| 1 | STOP 30"x30" | R1-1 | |



Infinite
Tide



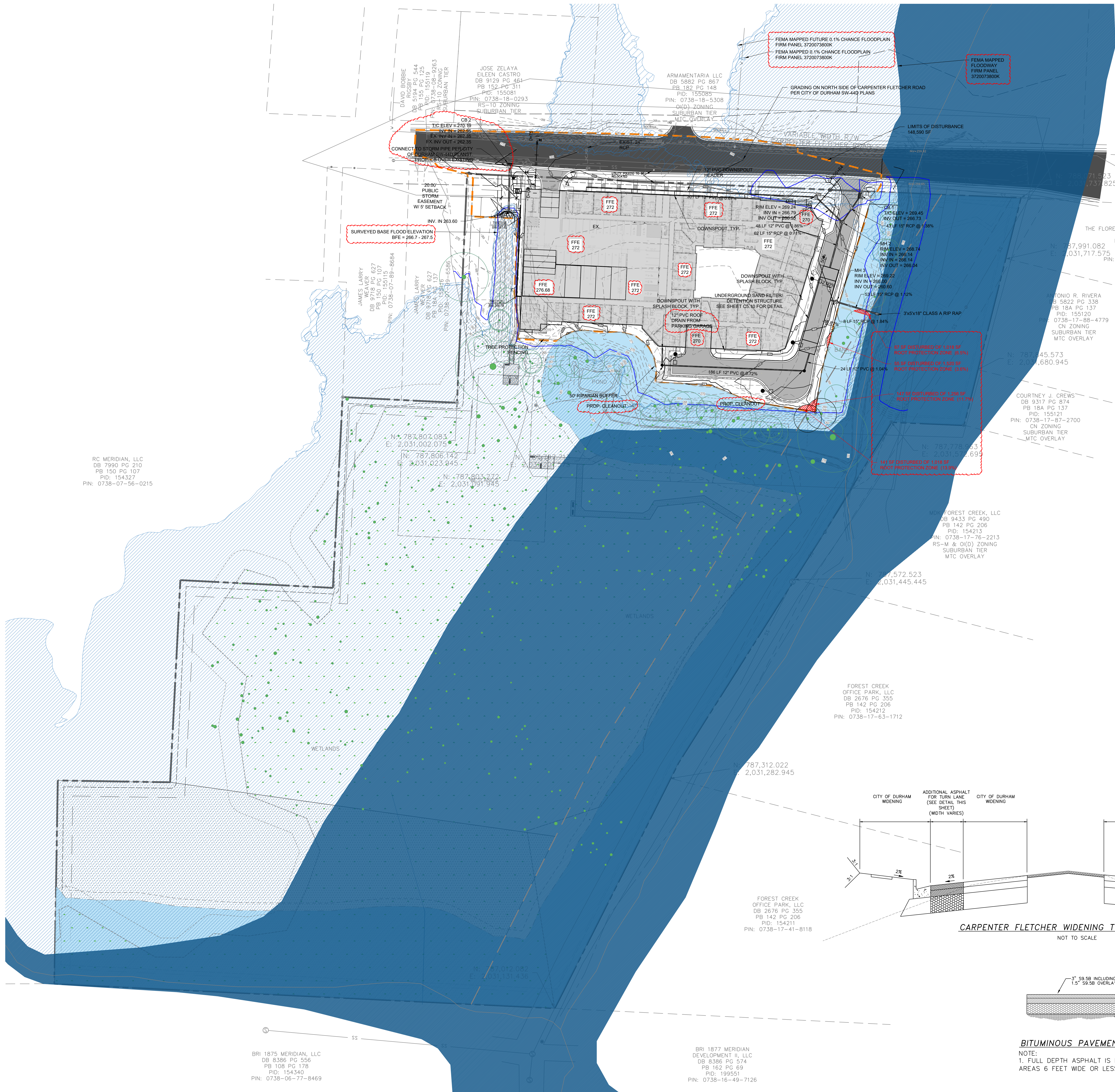
| No. | Date | Description |
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| 1 | 05.07.2024 | COMMENTS & AFFORDABLE UNITS |
| 2 | 07.29.2024 | CCD COMMENTS |



CITY OF DURHAM
PUBLIC WORKS DEPARTMENT
APPROVED

| | |
|----------------|------|
| ENGINEERING | DATE |
| STORMWATER | DATE |
| TRANSPORTATION | DATE |
| | DATE |

DATE: 05.07.2024
DRAWN BY: [blank]
PROJECT: 1414 CARPENTER FLETCHER RD
PROJECT #: D2400010
SHEET TITLE
SIGNAGE & MARKINGS PLAN
SHEET NO.
C4.00



GRADING LEGEND:

| SYMBOL | DESCRIPTION |
|---------------------|-------------------------|
| [Orange line] | LIMITS OF DISTURBANCE |
| [Thick orange line] | PROPOSED MAJOR CONTOUR |
| [Thin orange line] | PROPOSED MINOR CONTOUR |
| [Grey line] | EXISTING MAJOR CONTOUR |
| [Thin grey line] | EXISTING MINOR CONTOUR |
| [Dashed line] | PROPOSED STORM DRAINAGE |
| [Circle with cross] | PROPOSED JUNCTION BOX |
| [Square with cross] | PROPOSED CATCH BASIN |
| [Grid pattern] | PROPOSED AREA DRAIN |
| [Arrow] | RIPRAP DISSIPATOR |
| [Arrow with cross] | FLOW DIRECTION |
| [Thick line] | PROPOSED ELEVATION |
| [Thin line] | TOP/BOTTOM OF CURB |
| [Thin line] | TOP/BOTTOM OF WALL |

LIMITS OF DISTURBANCE

- FEMA MAPPED REGULATORY FLOODWAY
- FEMA MAPPED ZONE AE / 0.1% CHANCE FLOODPLAIN
- FEMA MAPPED FUTURE 0.1% CHANCE FLOODPLAIN
- WETLANDS
- RIPARIAN BUFFERS
- TREE PRESERVATION
- PASSIVE OPEN SPACE
- SURVEYED BASE FLOOD ELEVATION (266.7 - 267.5)
- SURVEYED SPECIMEN TREE
- SPECIMEN TREE CRITICAL ROOT PROTECTION ZONE
- FEMA FLOODPLAIN CROSS-SECTIONS
- DISTURBED SPECIMEN CRZ

NOTES:

- AT THE START OF GRADING INVOLVING THE LOWERING OF THE EXISTING GRADE AROUND A TREE OR STRIPPING OF TOPSOIL, A CLEAN, SHARP, VERTICAL CUT SHALL BE MADE AT THE EDGE OF THE TREE SAVE AREA AT THE SAME TIME AS OTHER EROSION CONTROL MEASURES ARE INSTALLED. TREE PROTECTION FENCING SHALL BE INSTALLED ON THE SIDE OF THIS CUT FARTHEST AWAY FROM THE TREE TRUNK.
- NO STORAGE OF MATERIALS, DUMPING OF WASTE MATERIALS, FILL, OR PARKING OF EQUIPMENT SHALL BE ALLOWED WITHIN THE ROOT PROTECTION ZONE, AND NO TRESPASSING SHALL BE ALLOWED WITHIN THE BOUNDARY OF THE ROOT PROTECTION ZONE.

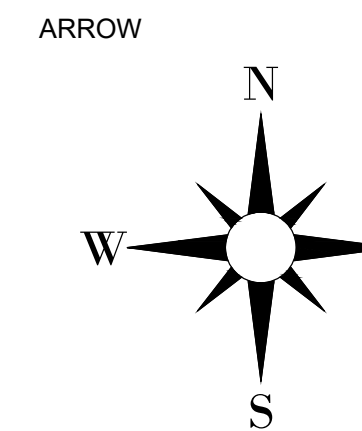
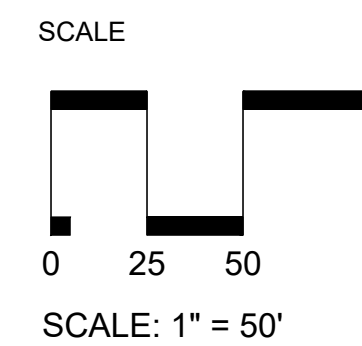
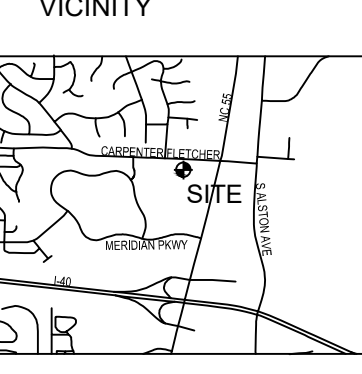
AREA OF DISTURBANCE = 148,590



Infinity Tide



| No. | Date | Description | Comments & AFFORDABLE UNITS | Comments |
|-----|------------|-------------------|-----------------------------|----------|
| 1 | 05.07.2024 | ISSUED FOR REVIEW | | |
| 2 | 07.29.2024 | ISSUED FOR REVIEW | | |



GRADING AND DRAINAGE PLAN

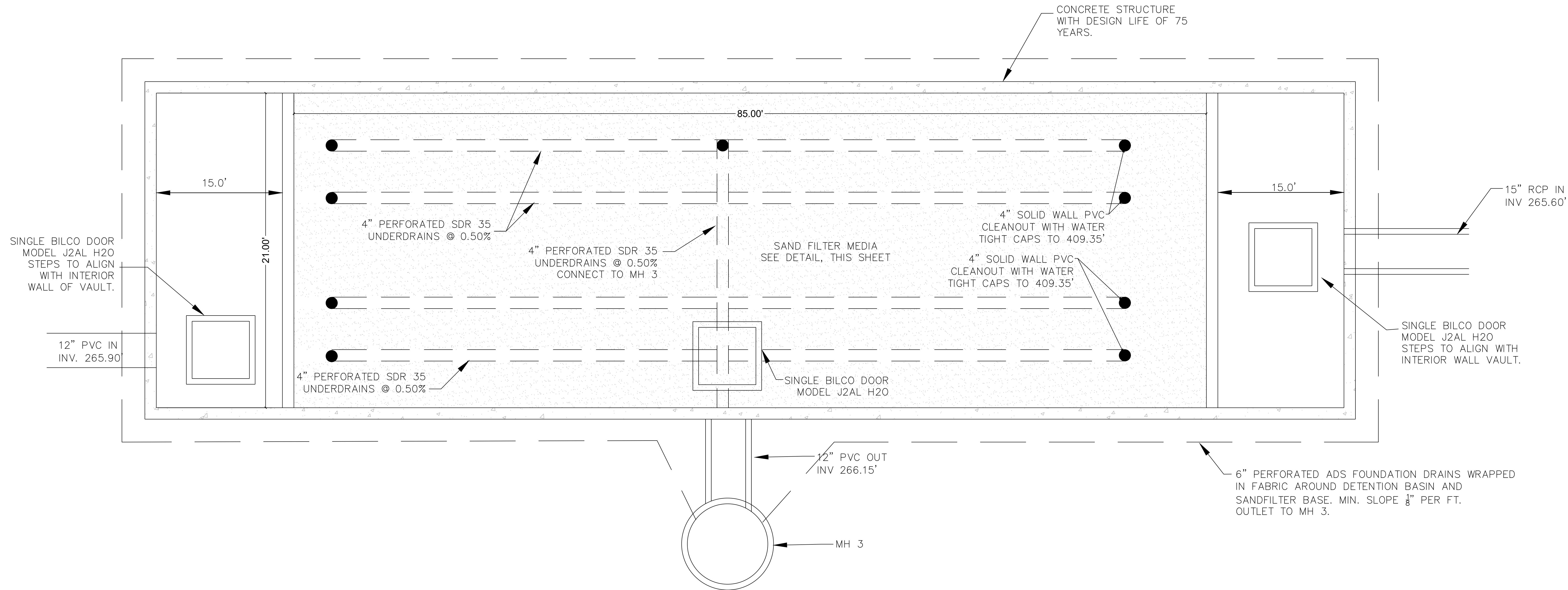
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PROJECT #: 02400010

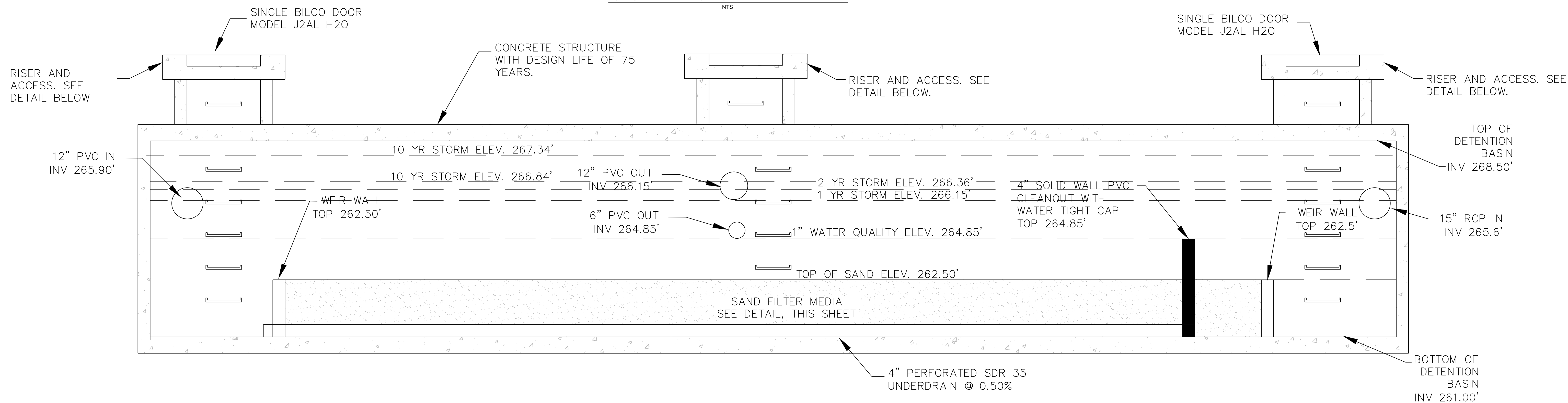
CITY OF DURHAM
PUBLIC WORKS DEPARTMENT
APPROVED

ENGINEERING: DATE:
STORMWATER: DATE:
TRANSPORTATION: DATE:

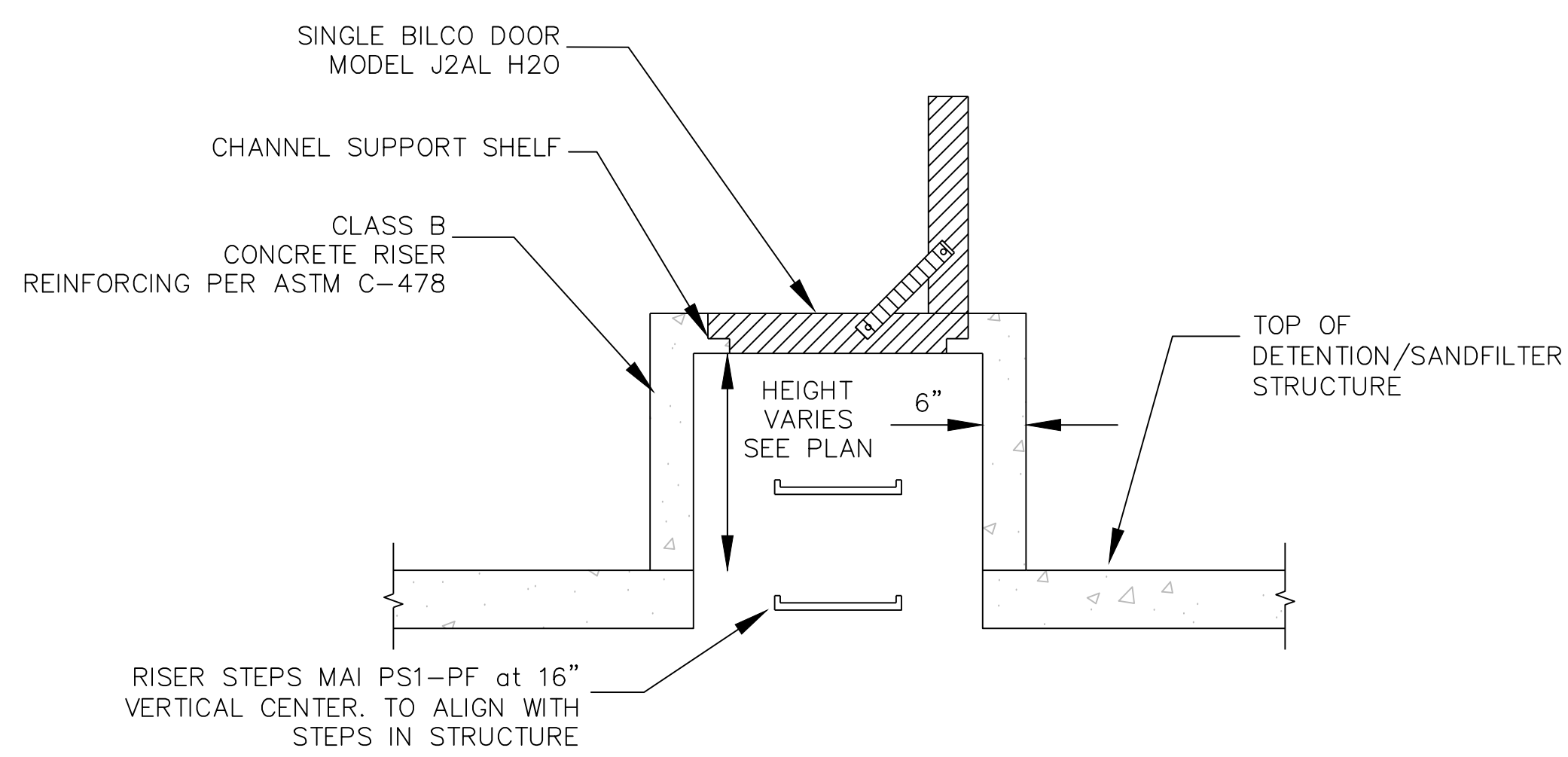
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C5.00



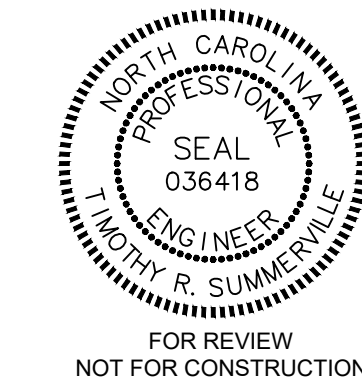
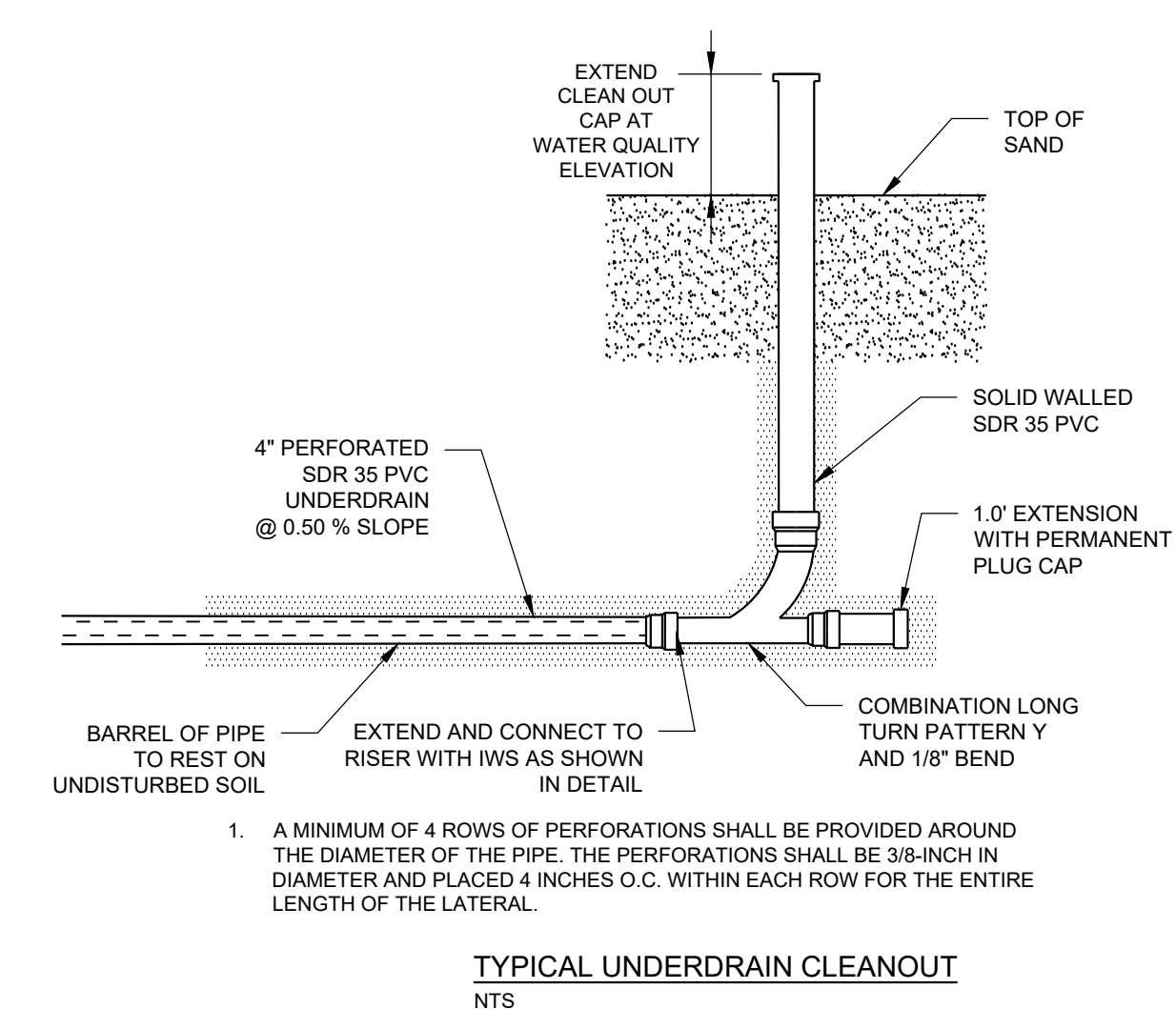
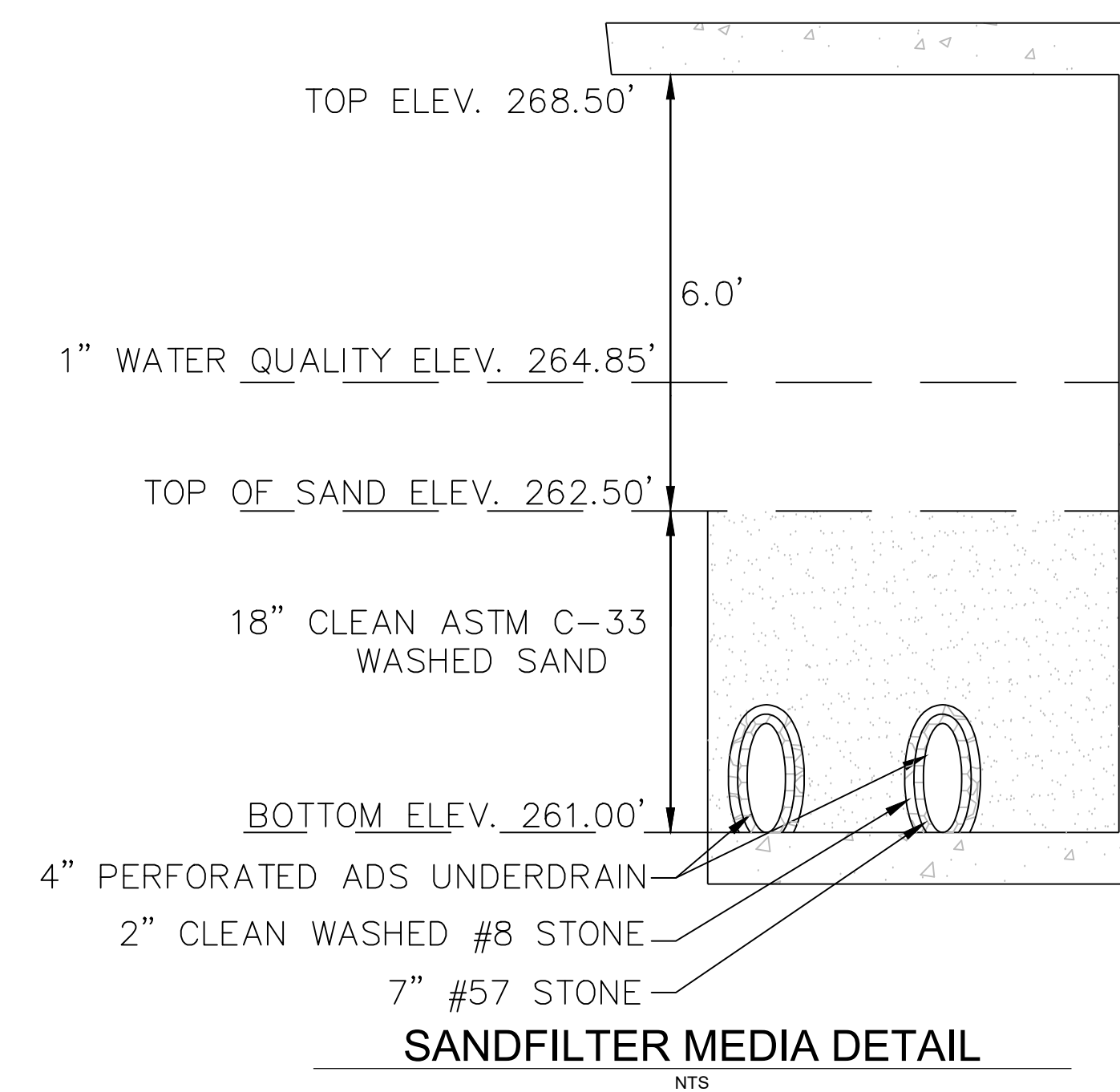
CAST-IN-PLACE SANDFILTER PLAN



CAST-IN-PLACE SANDFILTER PROFILE



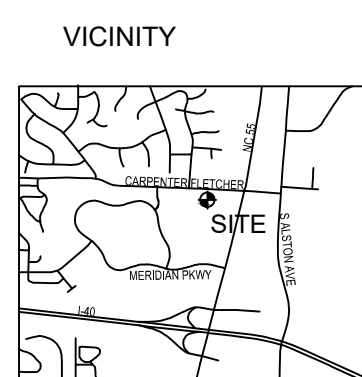
RISER ACCESS DETAIL



Infinite Tide



| No. | Date | Description |
|-----|------------|-----------------------------|
| 1 | 05.07.2024 | COMMENTS & AFFORDABLE UNITS |
| 2 | 07.29.2024 | ADD COMMENTS |



SCALE

ARROW

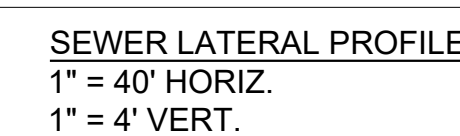
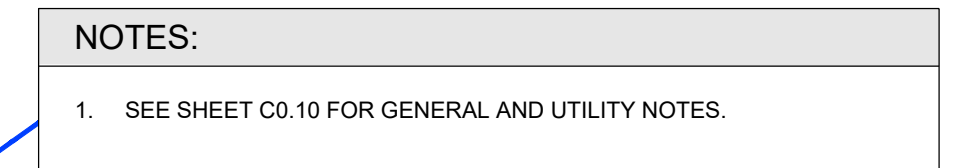
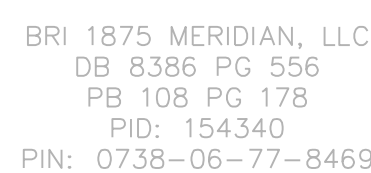
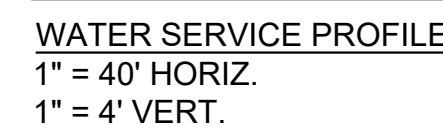
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DATE: 05.07.2024
DRAWN BY: JMS
PROJECT: 1414 CARPENTER FLETCHER RD
PROJECT #: D2400010

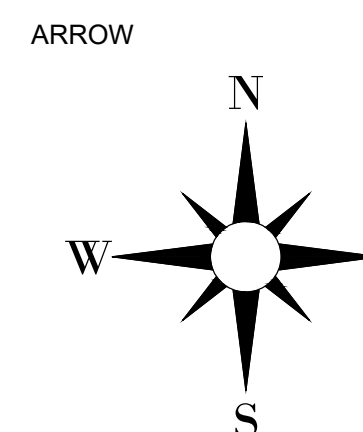
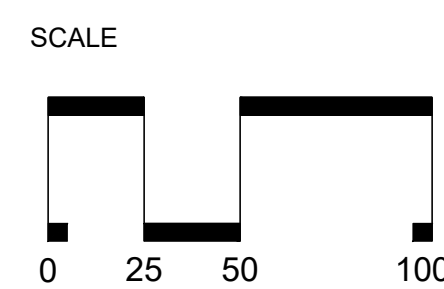
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C5.10

SCM PLAN & DETAILS



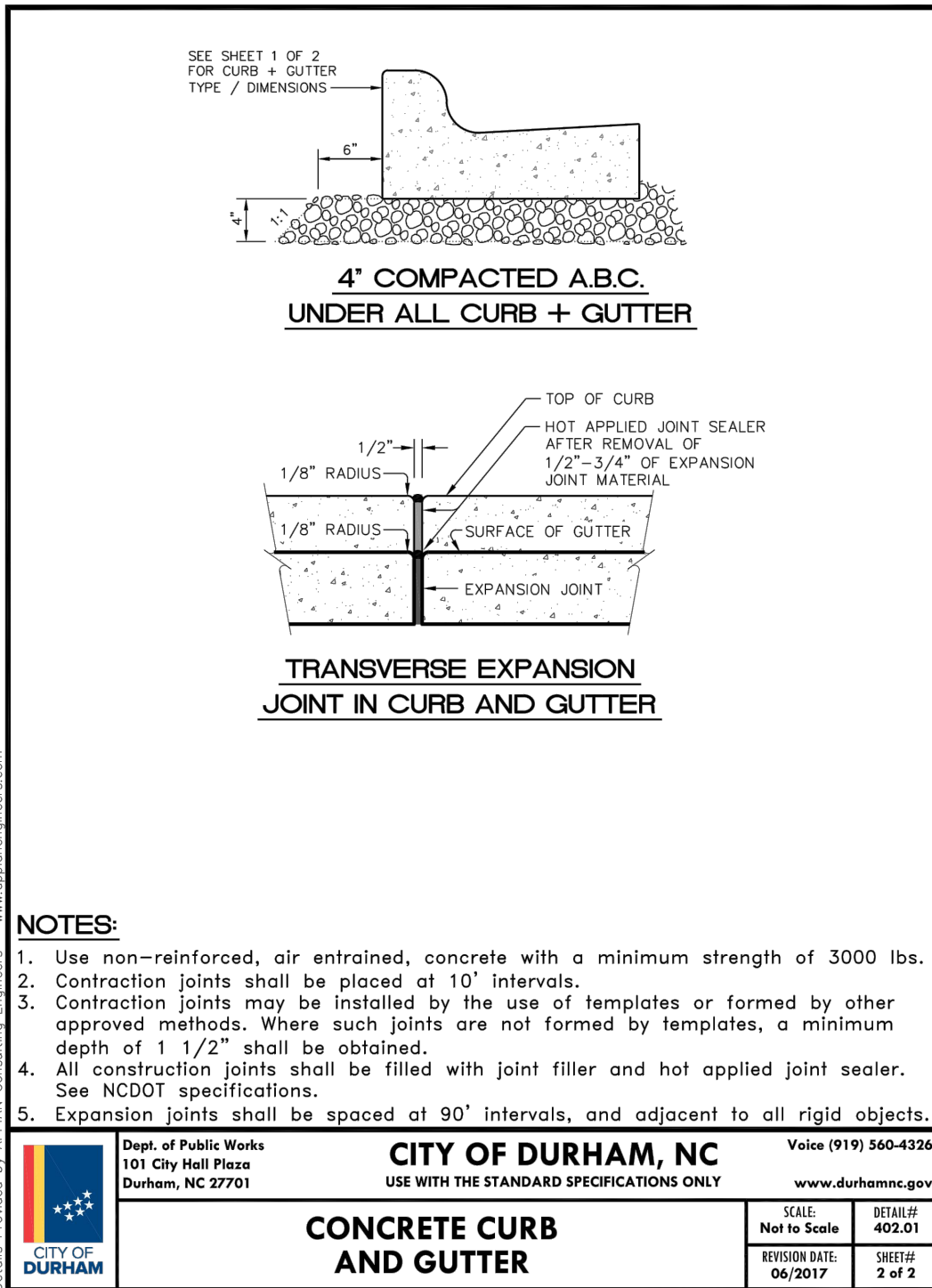
Infinite Tide

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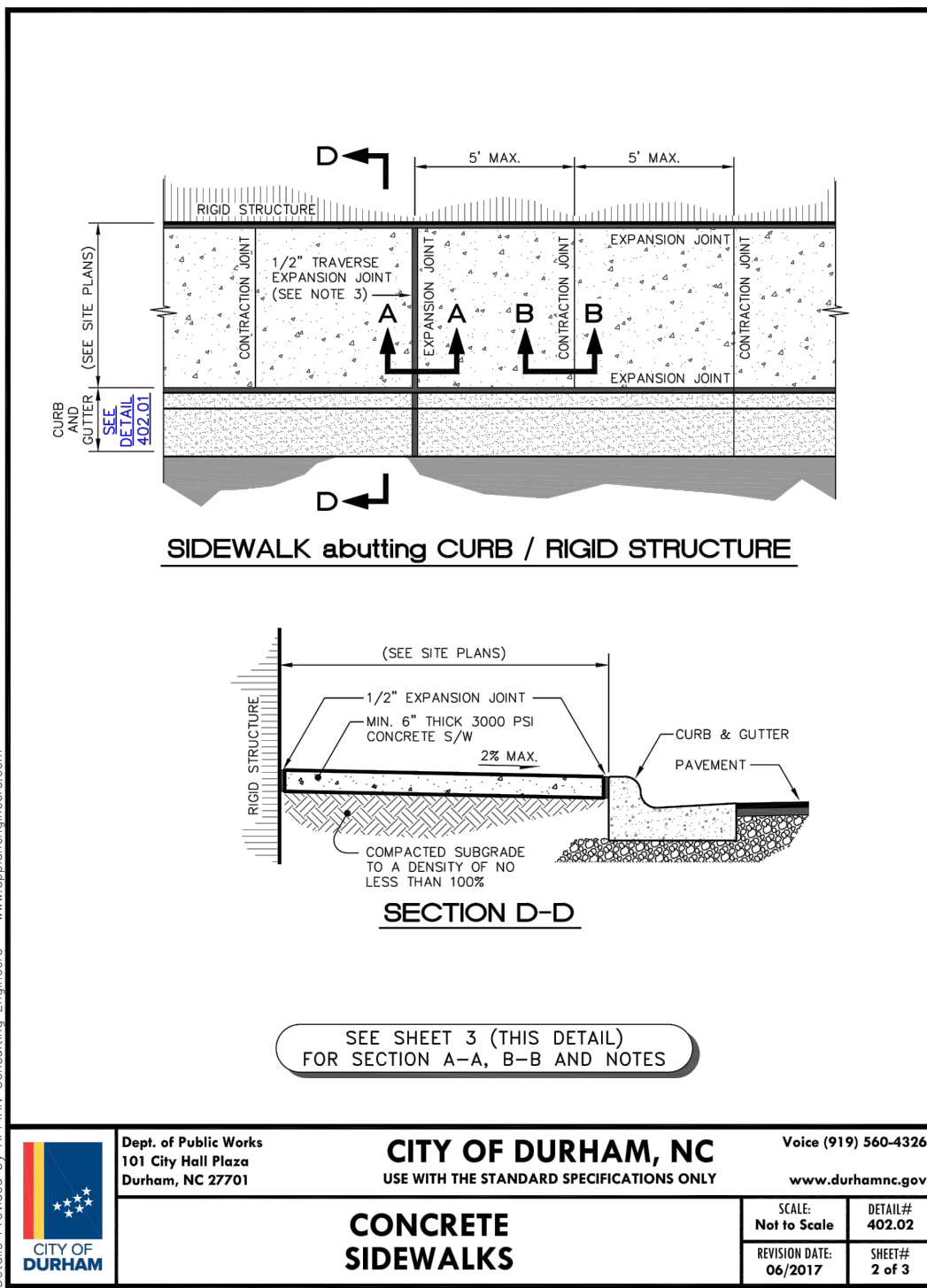
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CHECKED BY: TS
DRAWN BY: TS
PROJECT: 1414 CARPENTER FLETCHER RD
PROJECT #: D2400010

SHEET NO

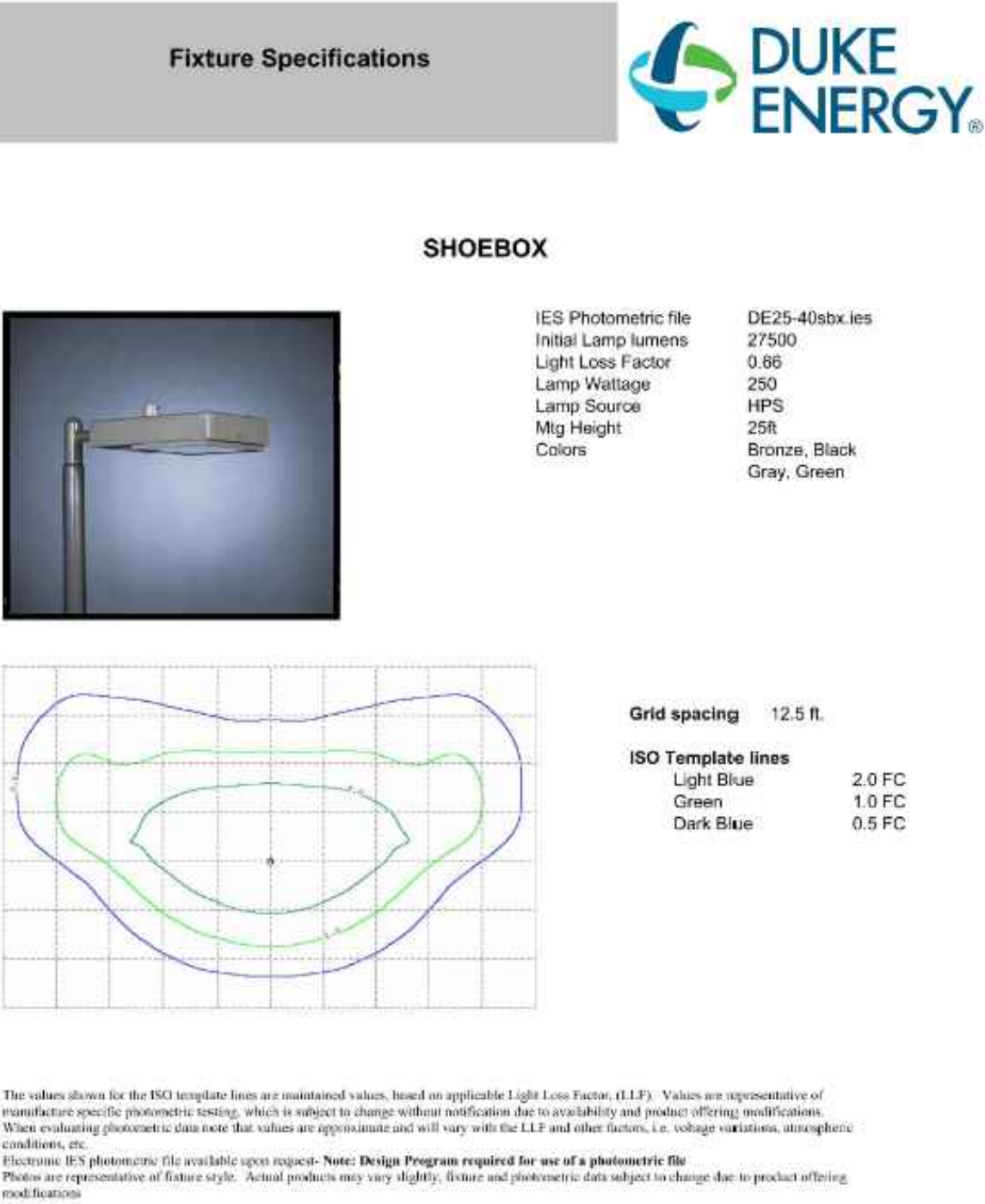
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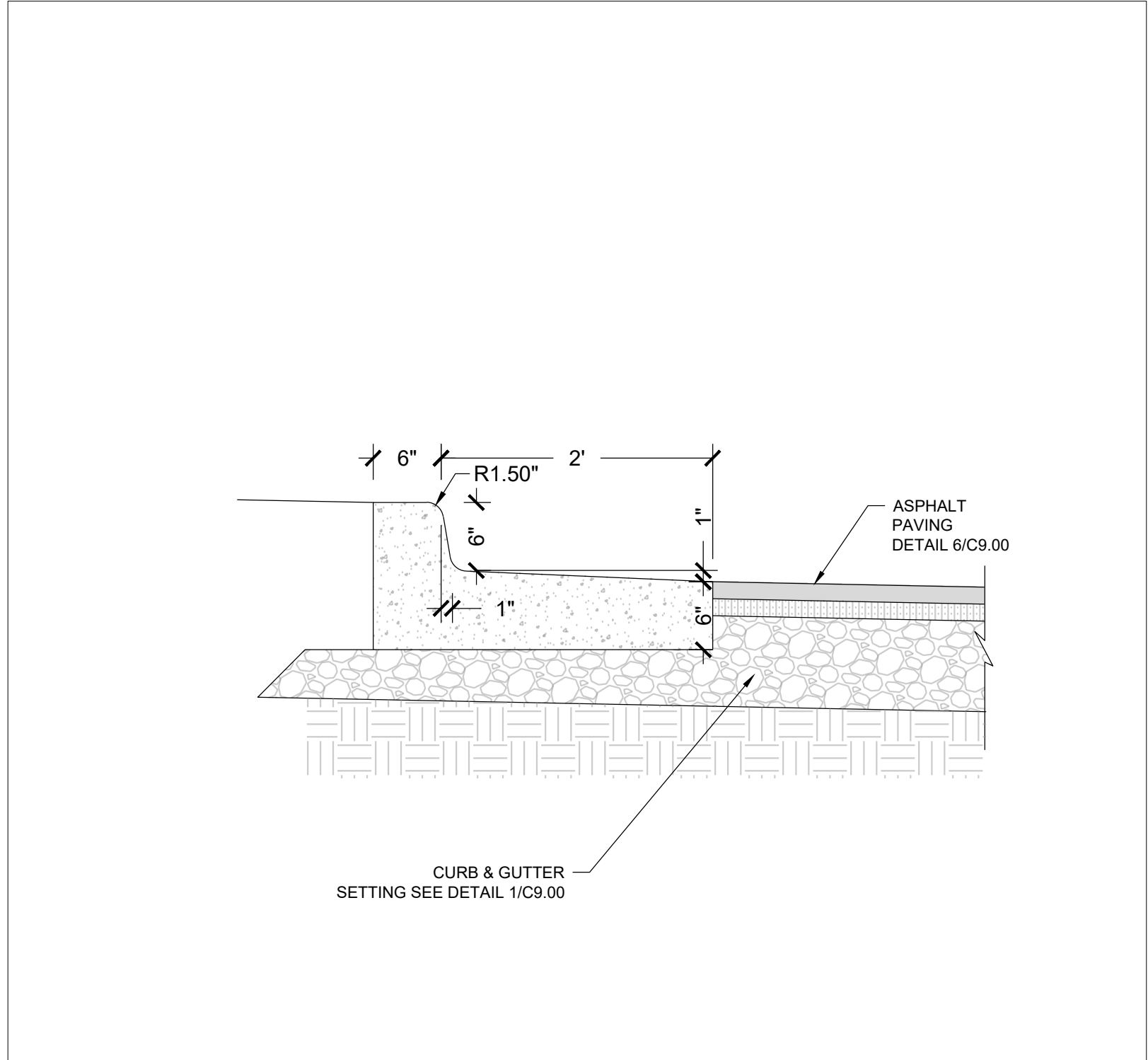
1 CURB & GUTTER SECTION NTS



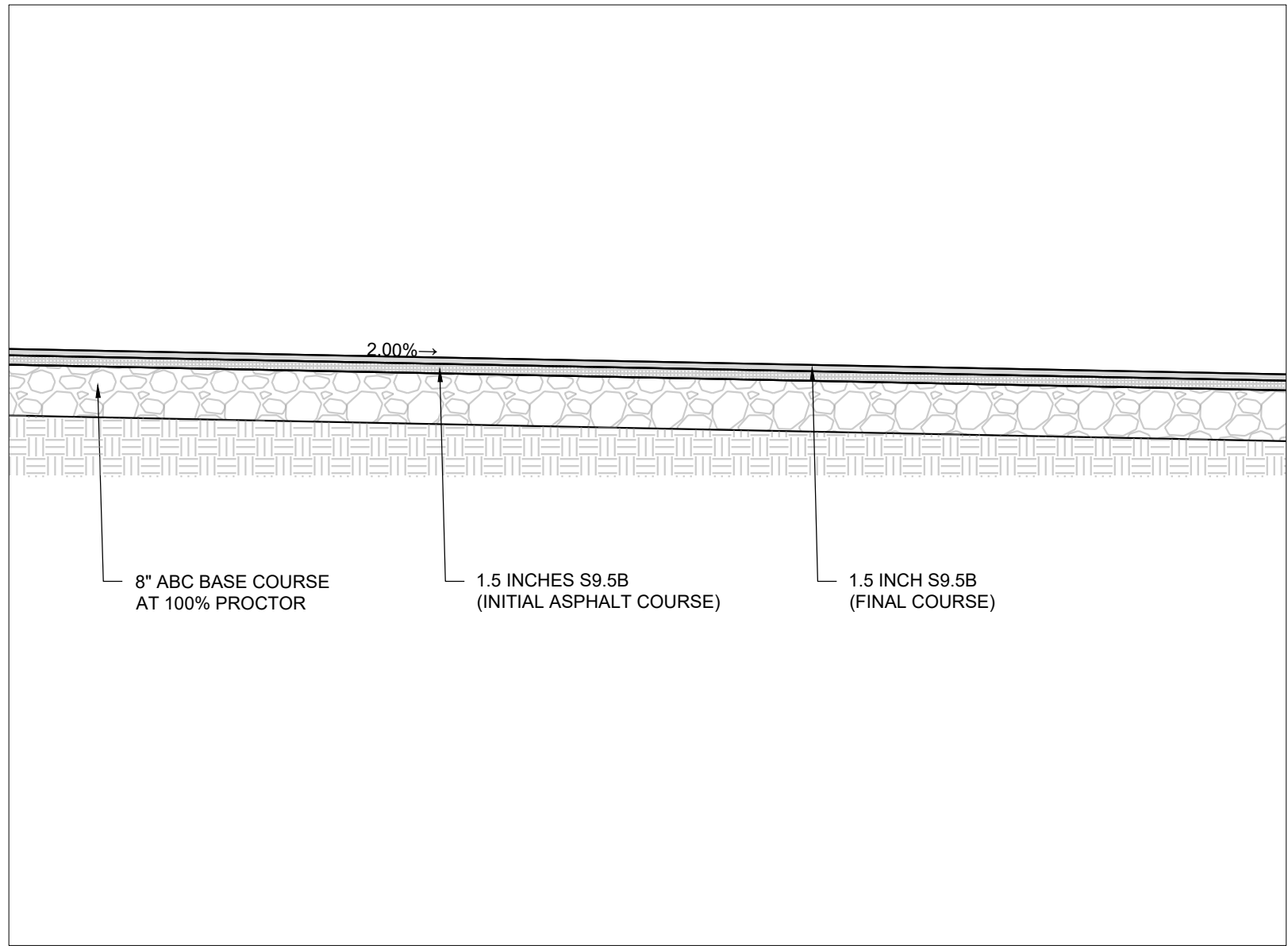
5 CONCRETE SIDEWALKS PLAN 3/8" = 1'-0"



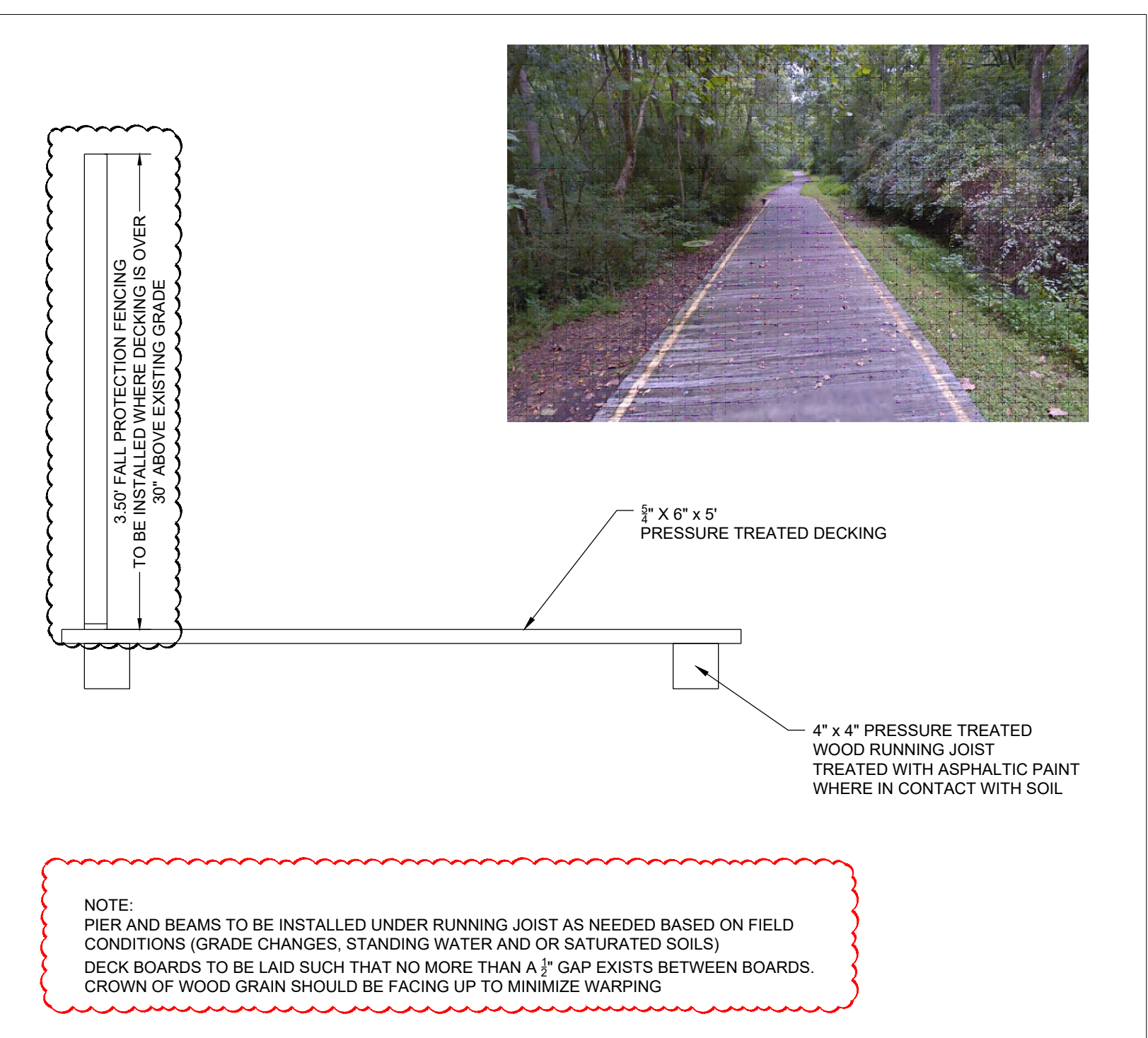
9 SHOEBOX LIGHTING PLAN 3/8" = 1'-0"



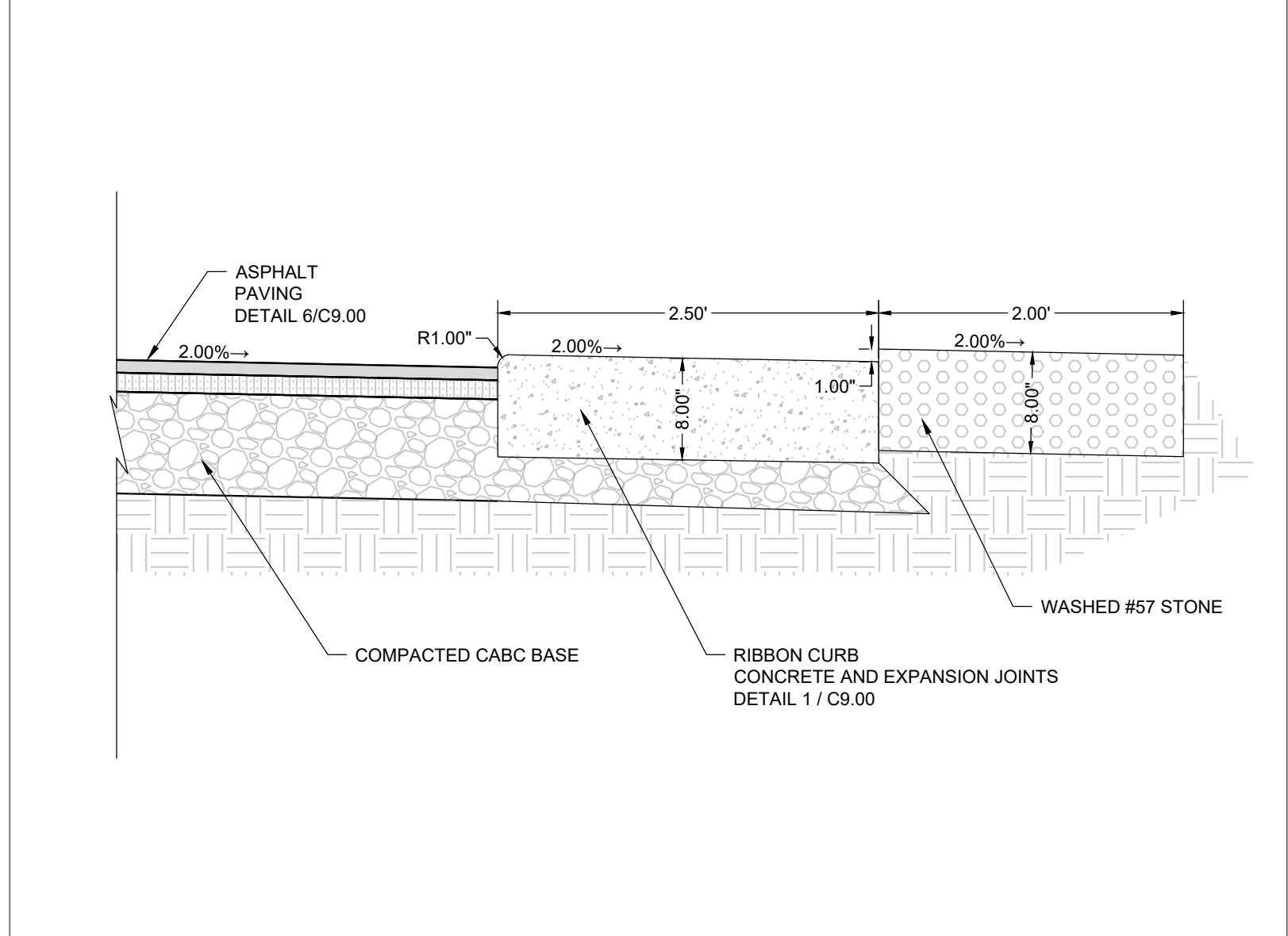
2 SPILL CURB SECTION 1" = 1'-0"



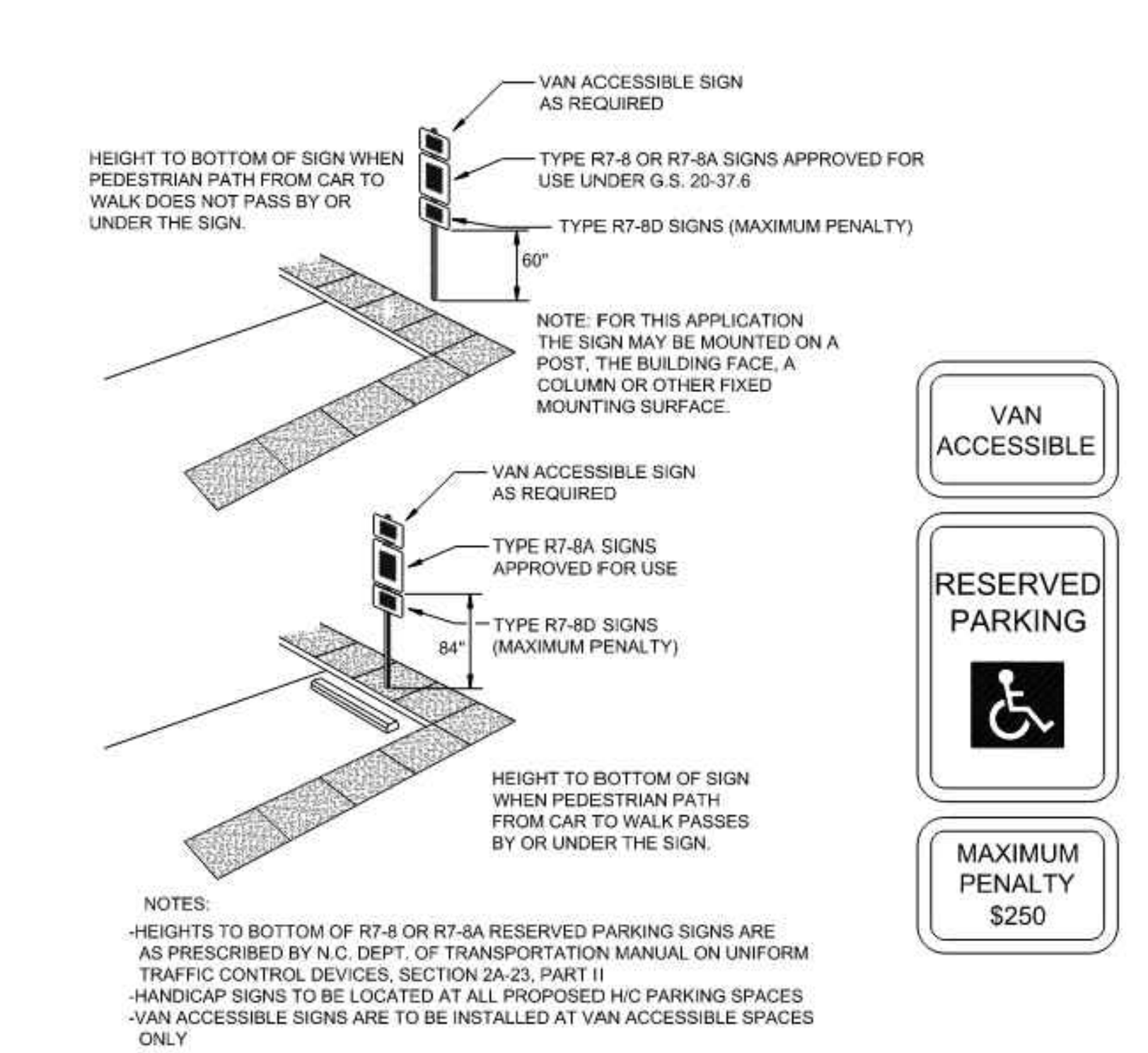
6 ASPHALT PAVING SECTION 1/2" = 1'-0"



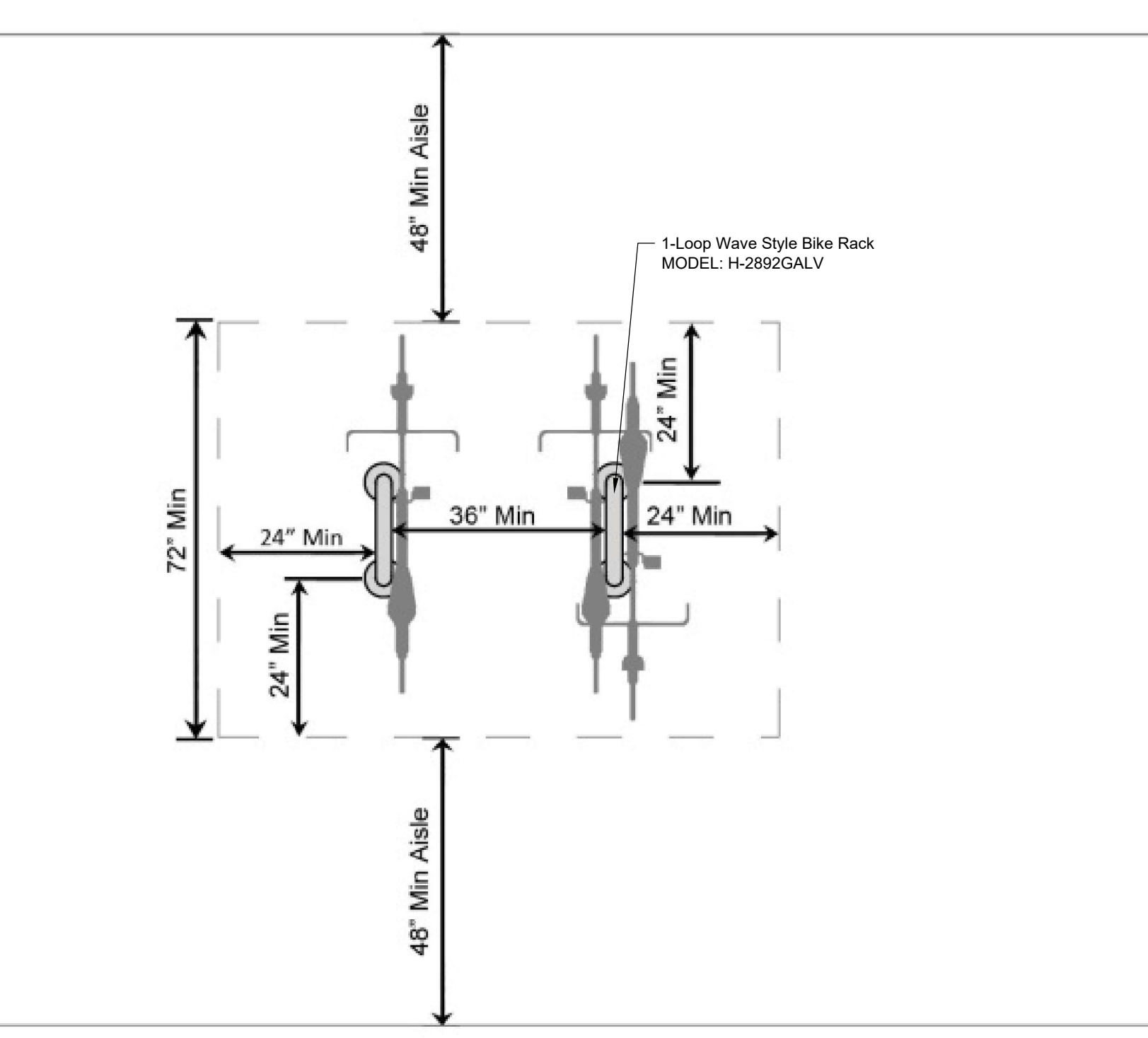
10 WOOD PLANK TRAIL SECTION NTS



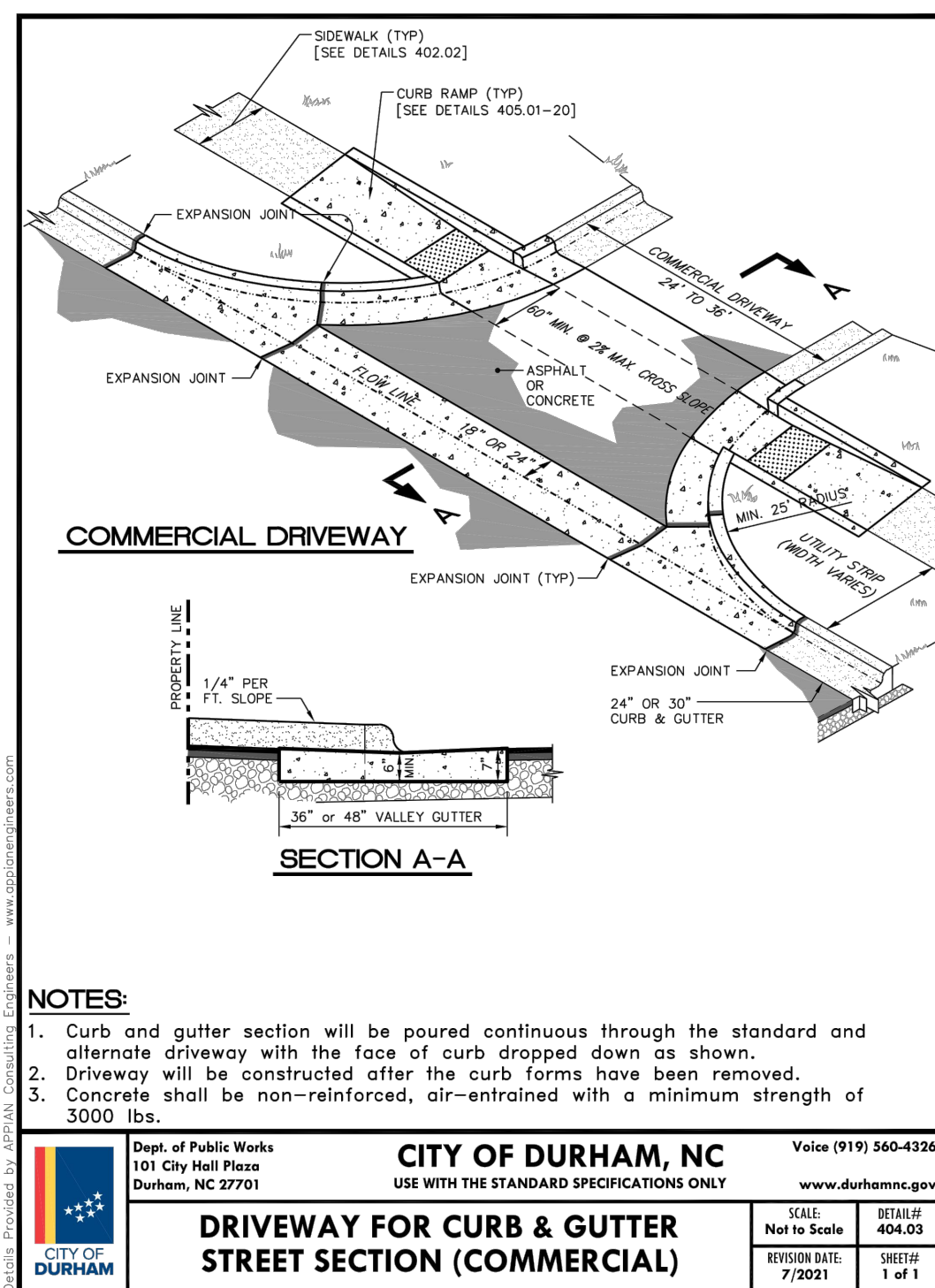
3 FLUSH CURB & GRAVEL BAND PLAN 3/8" = 1'-0"



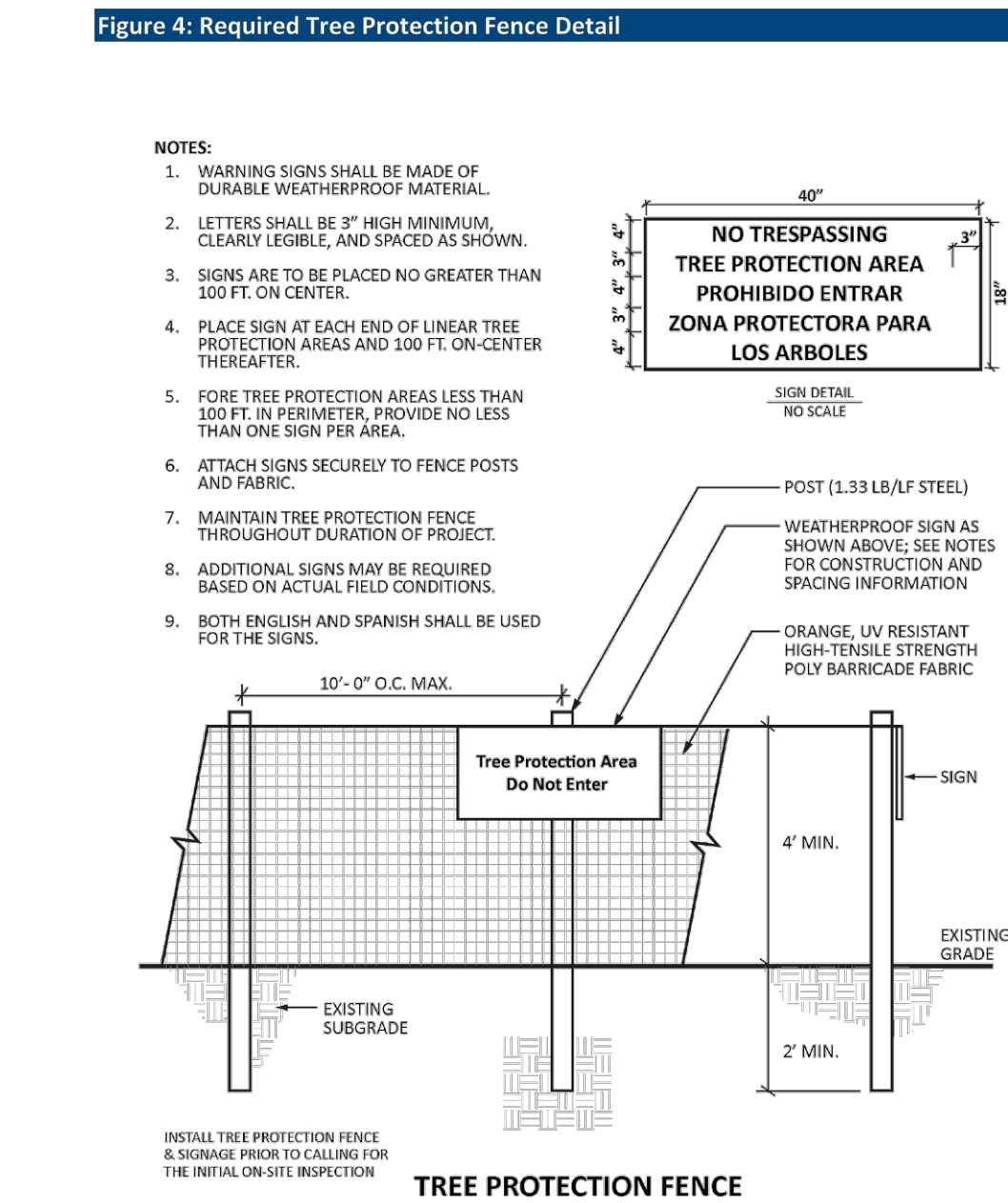
7 ADA PARKING SIGN PLAN NTS



11 INVERTED U BIKE RACK PLAN NTS



4 DRIVEWAY APRON PLAN 3/8" = 1'-0"



8 TREE PROTECTION FENCING PLAN



11 INVERTED U BIKE RACK ELEVATION NTS

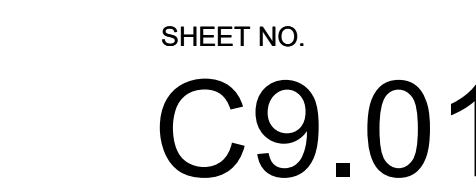
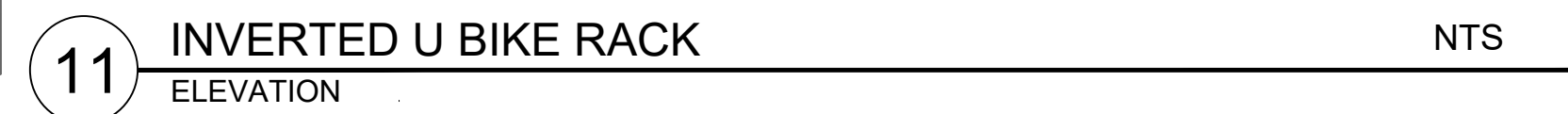
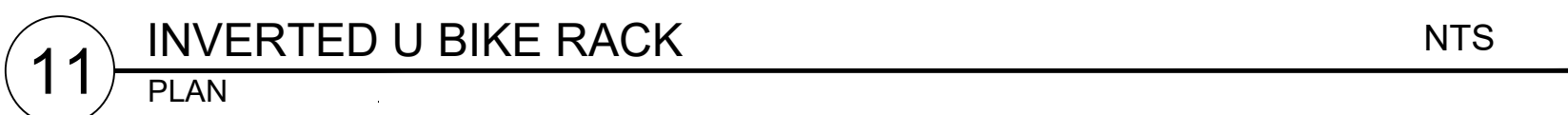
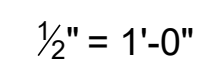
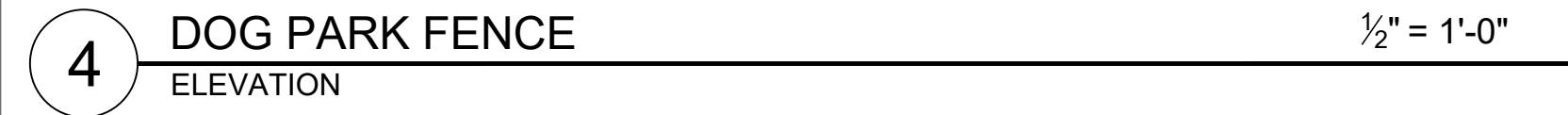
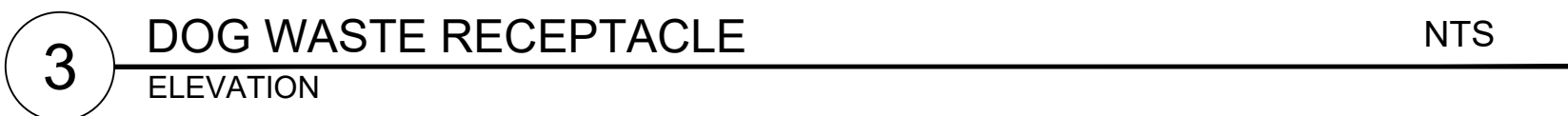


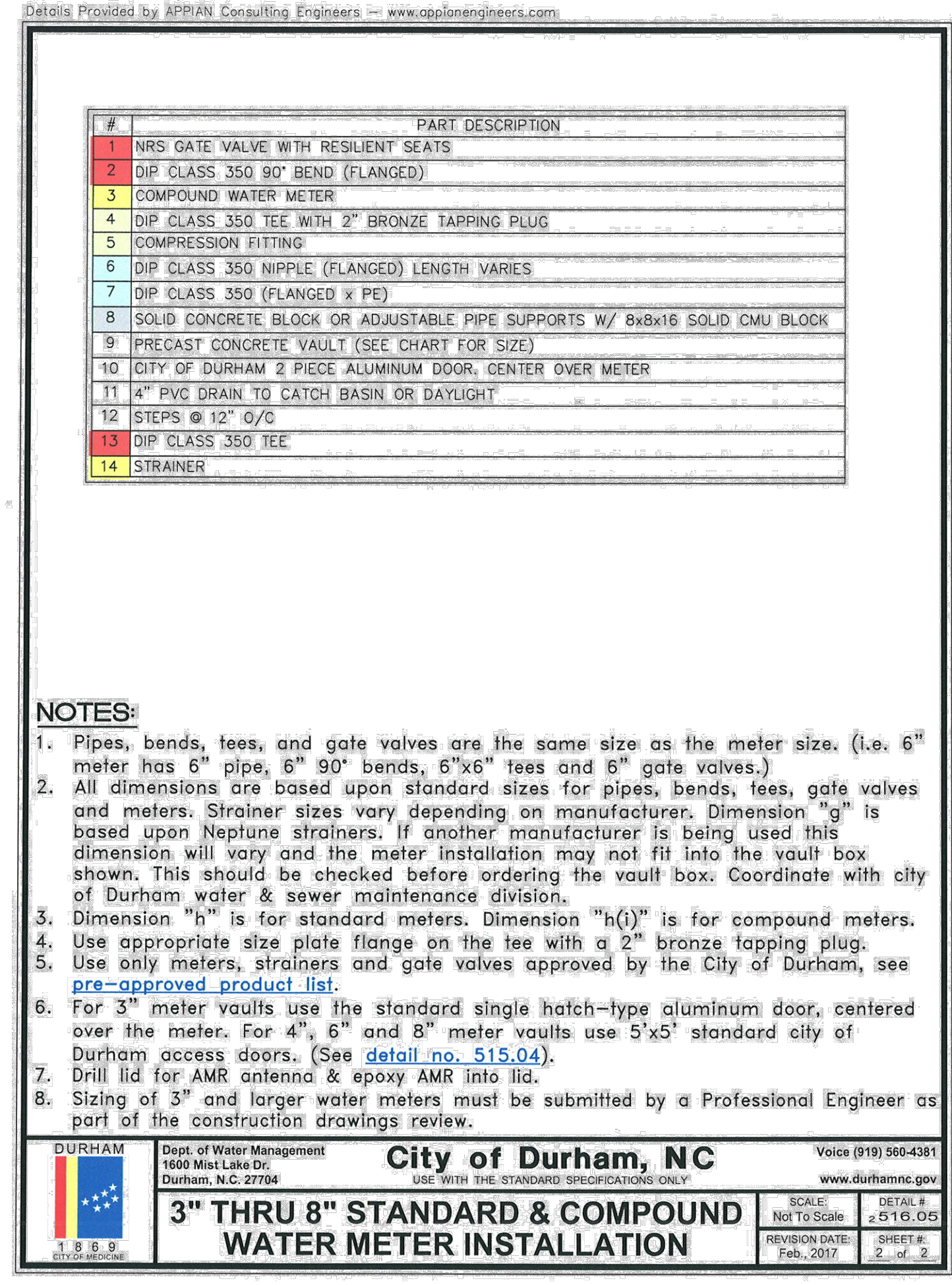
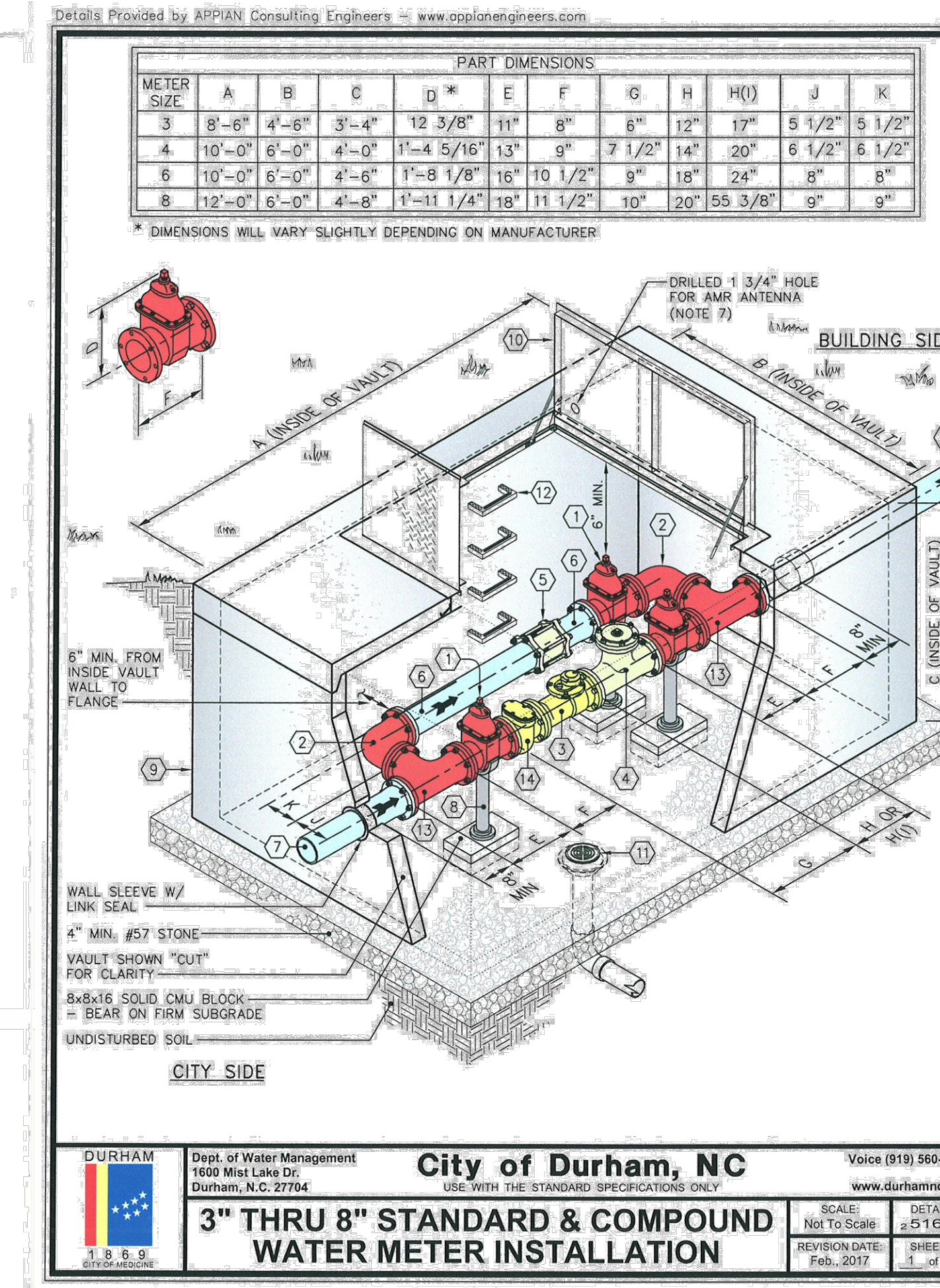
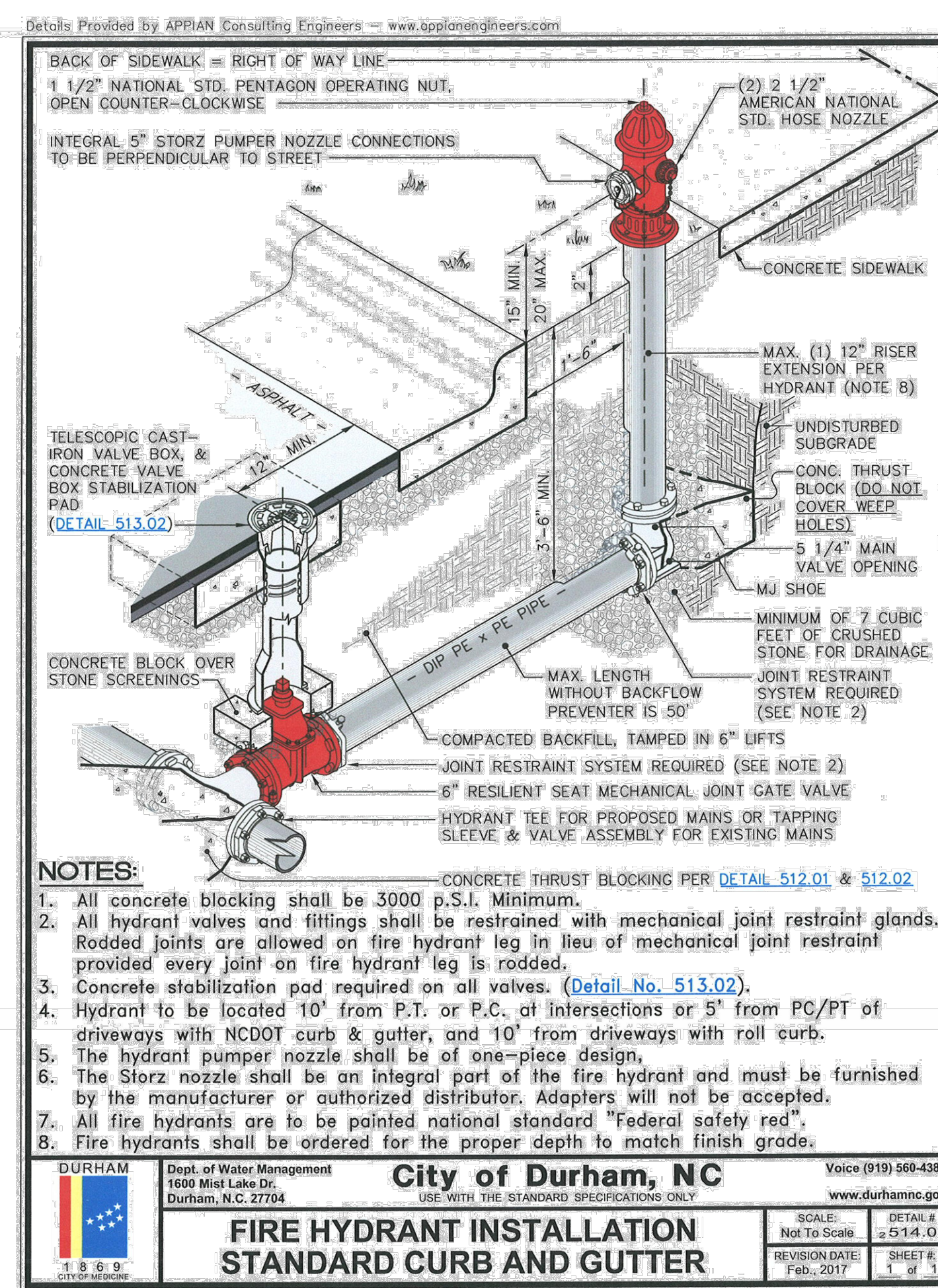
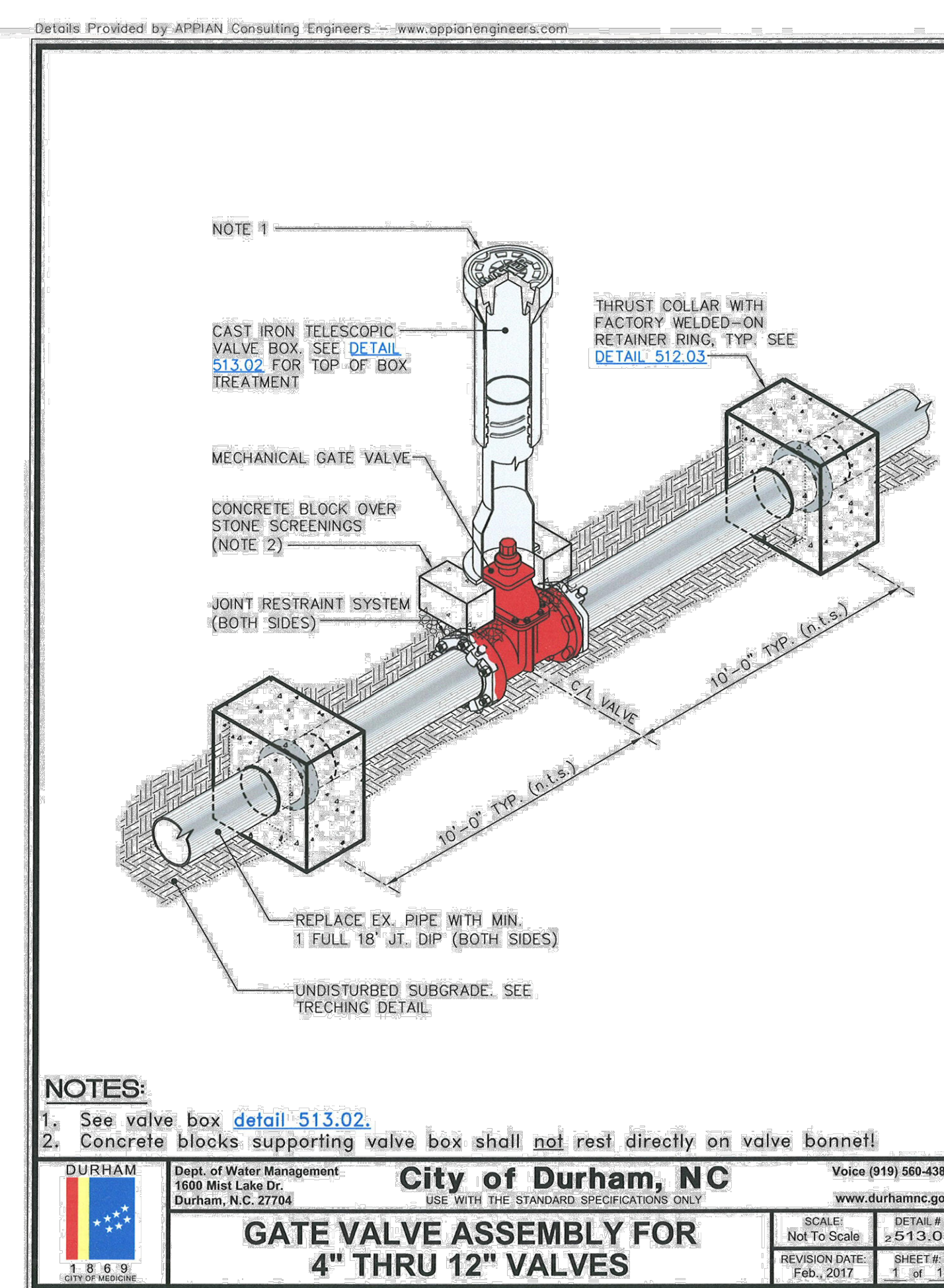
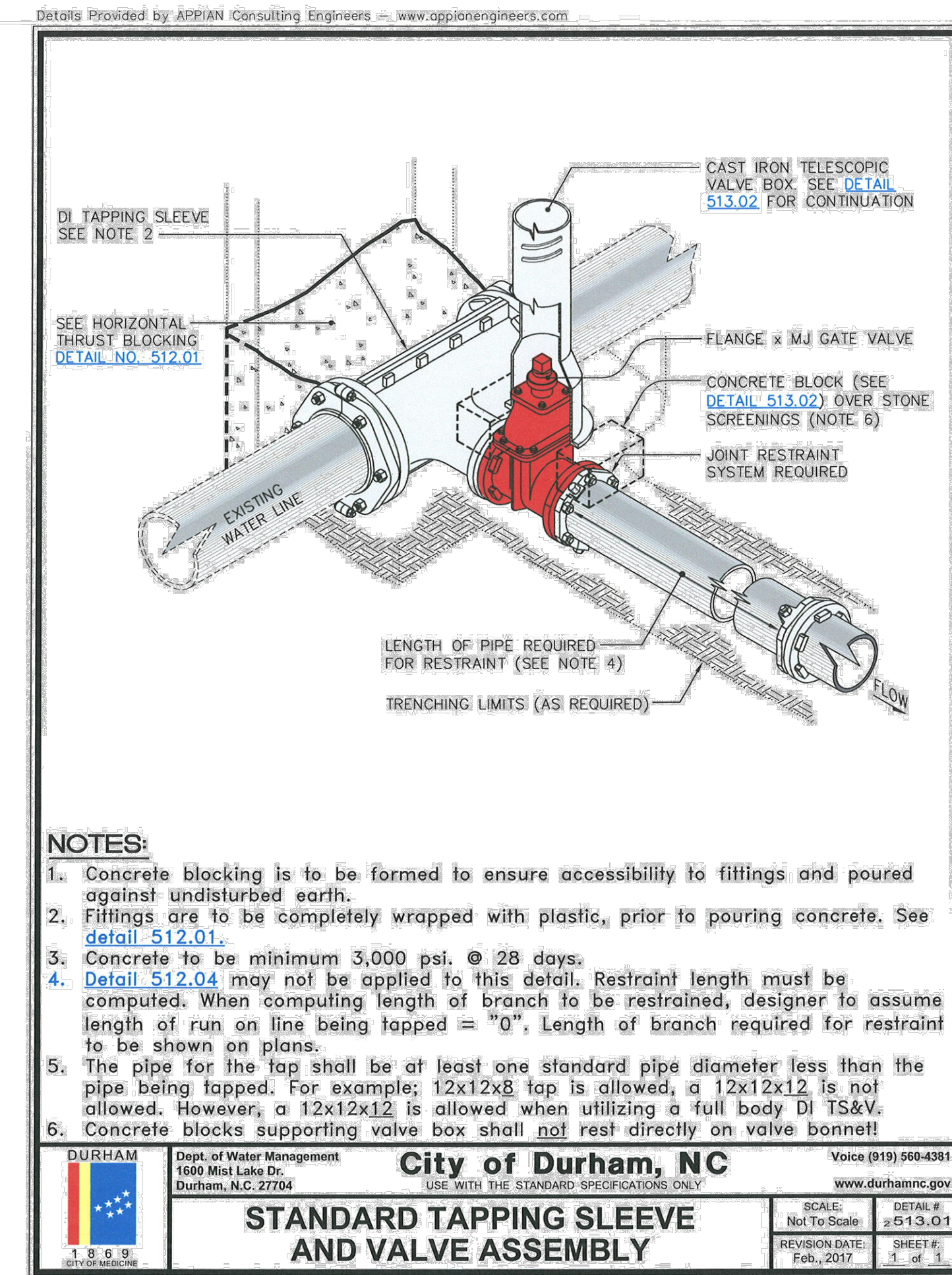
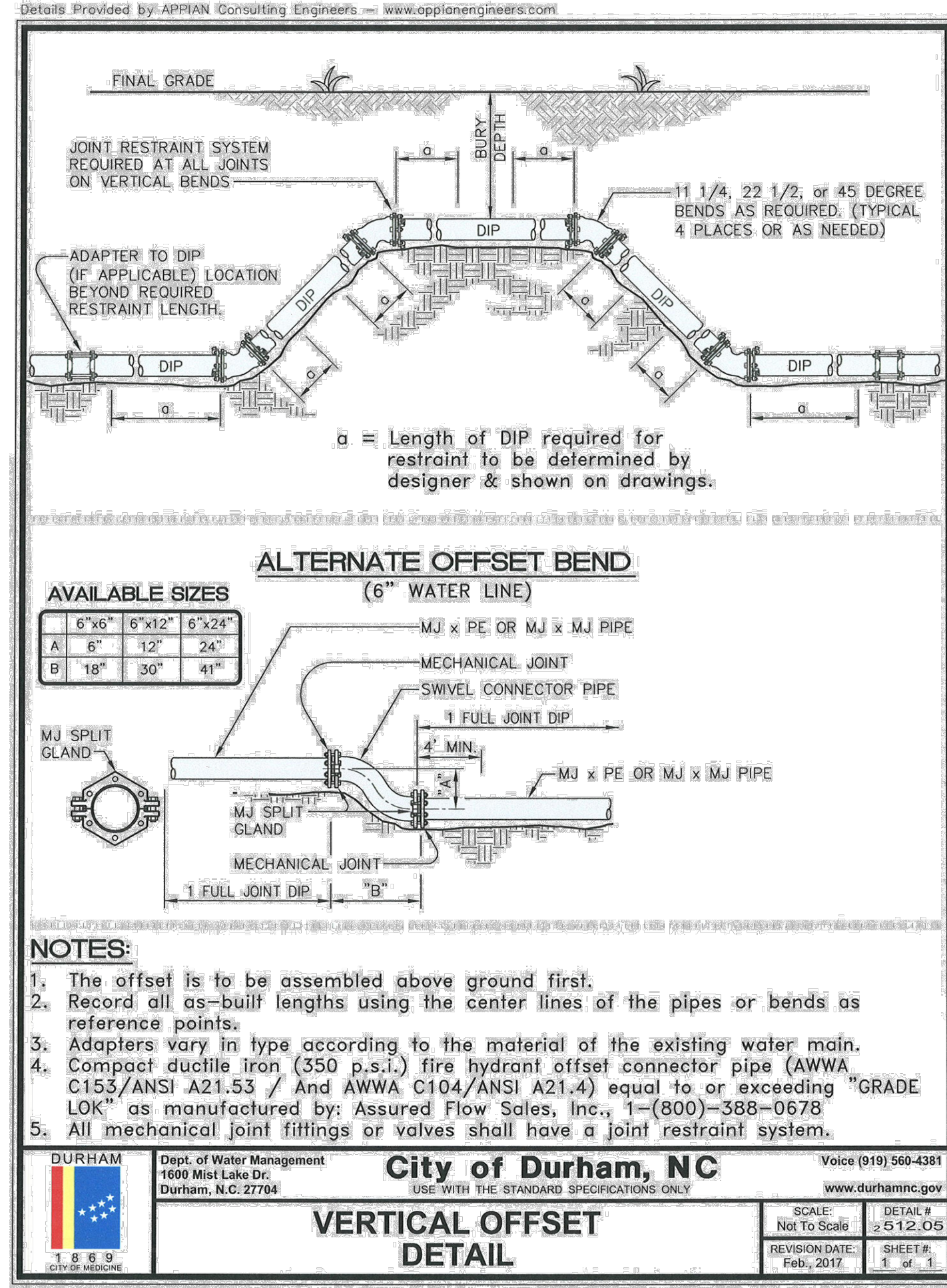
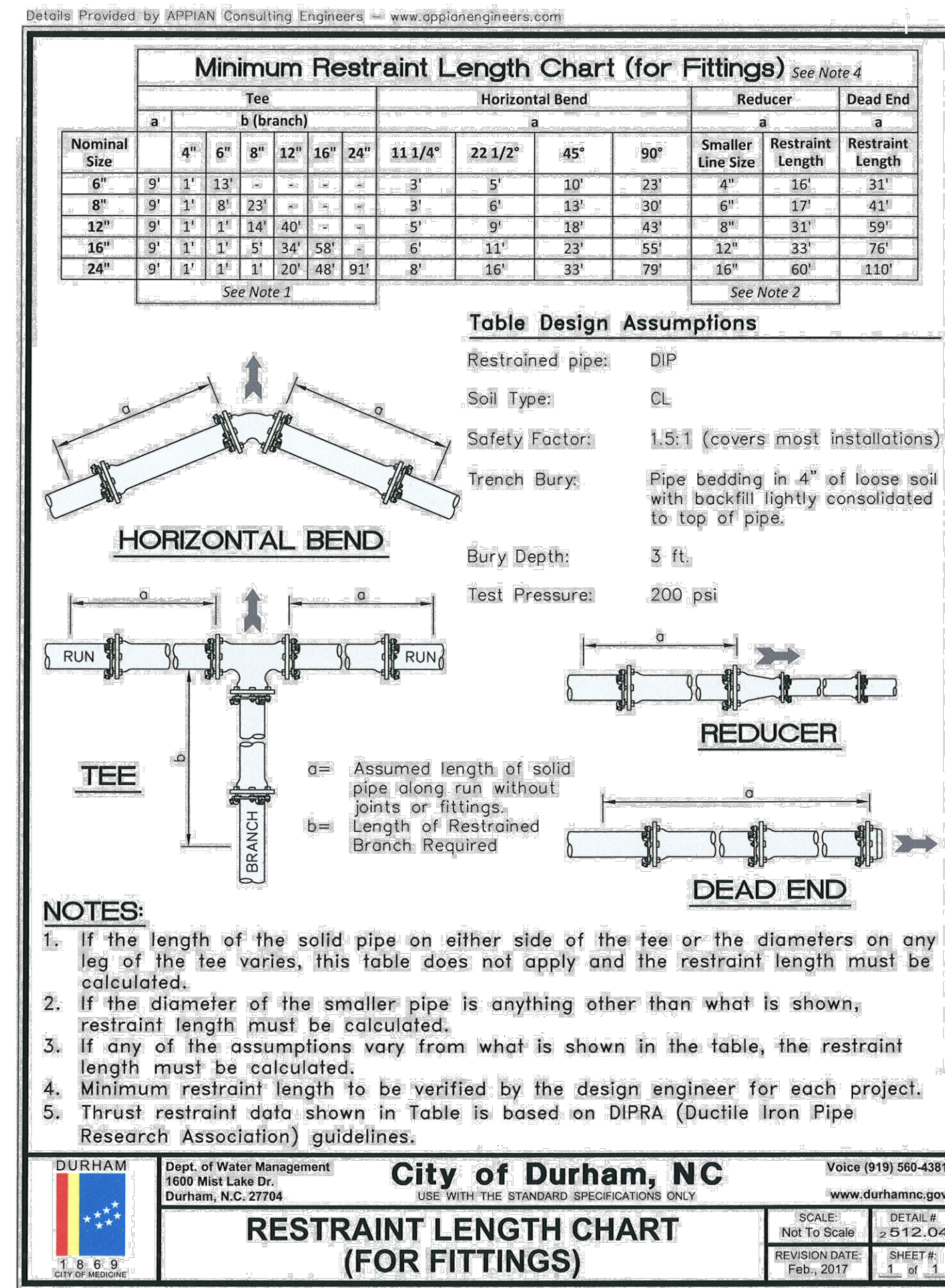
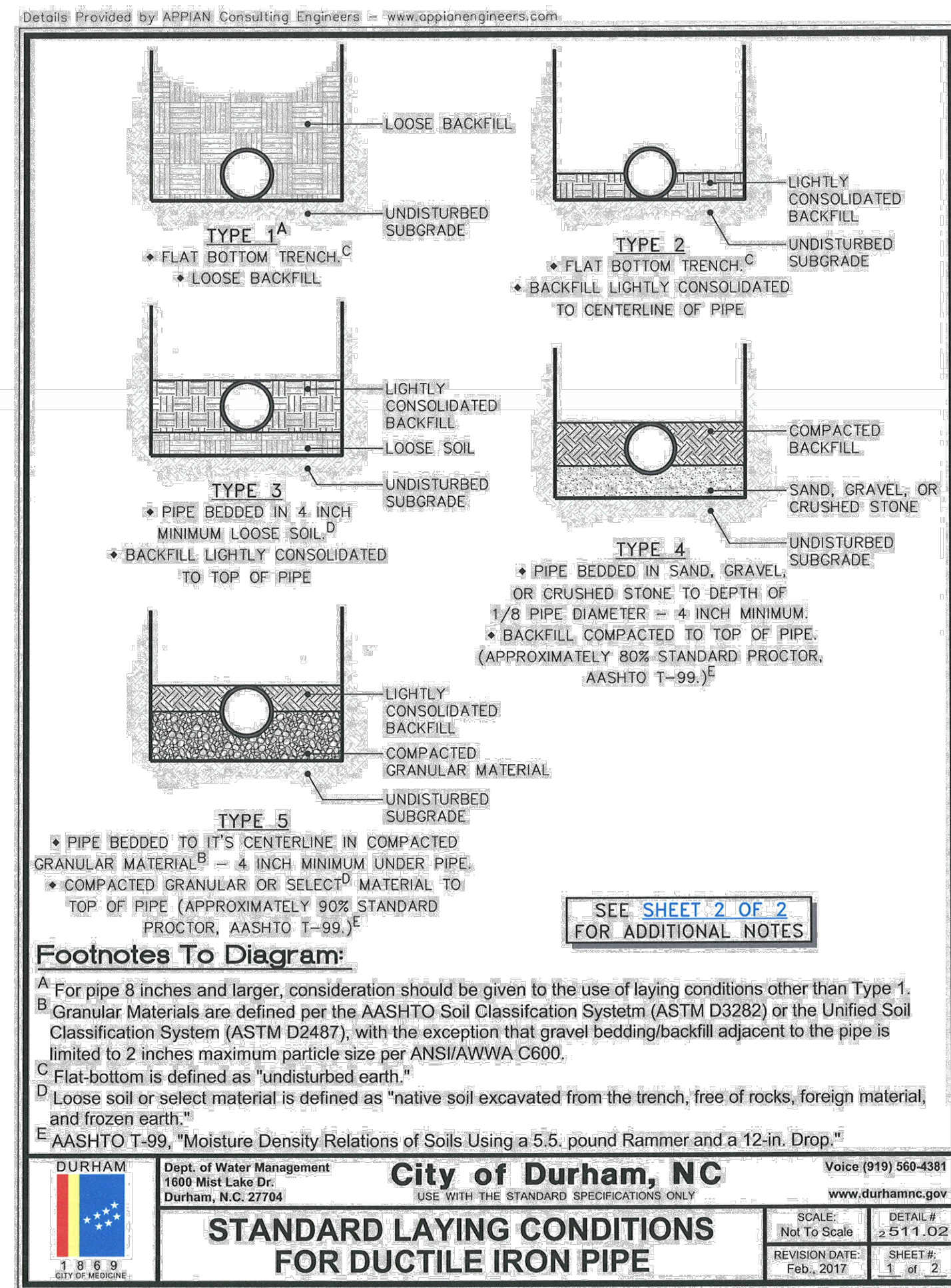
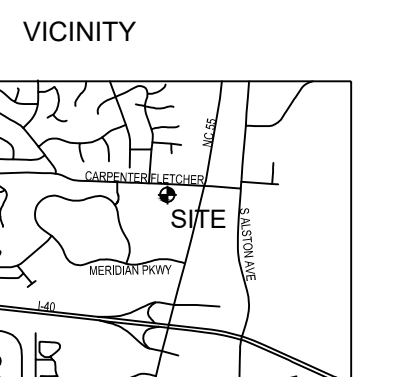
| No. | Date | Description | COMMENTS & AFFORDABLE UNITS | CCD COMMENTS |
|-----|------------|-------------|-----------------------------|--------------|
| 1 | 05.07.2024 | | | |
| 2 | 07.28.2024 | | | |

VICINITY

SCALE

ARROW

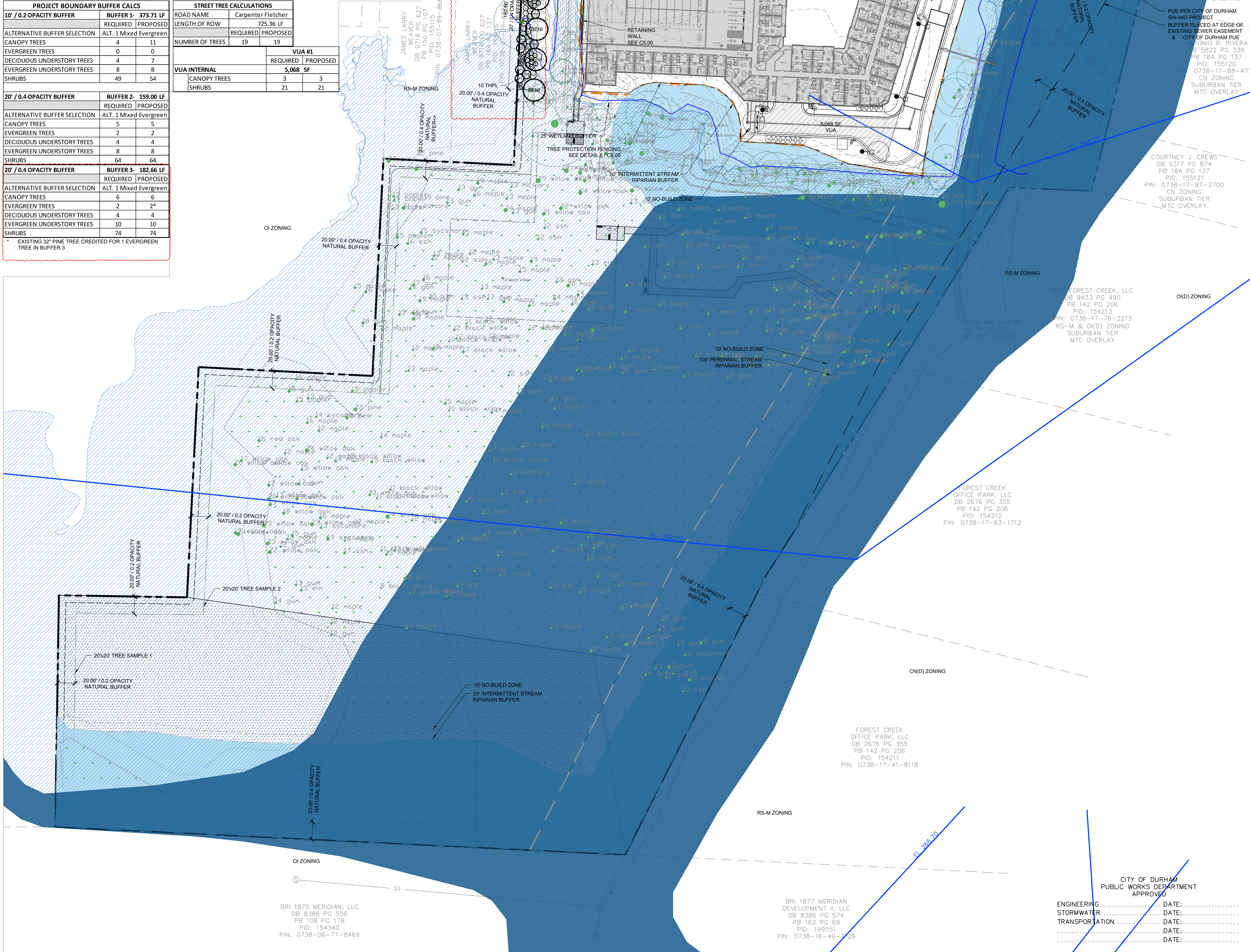




| PLANTING SCHEDULE | | | | | |
|-------------------|-----|-------------------------------------|--------------------------------|----------|-----------------------------|
| KEY | QTY | SCIENTIFIC NAME | SCIENTIFIC NAME | SIZE | |
| TREES | | | | | |
| ACBU | 20 | ACER BUERGERIANUM | TRIDENT MAPLE | 2.5" CAL | BUFFER CANOPY & STREET TREE |
| ACRU | 3 | ACER BARBATUM | SOUTHERN SUGAR MAPLE | 2.5" CAL | VUA |
| AMAR | 3 | AMELANCHIER ARBOREA | SERVICEBERRY | 8" HT | BUFFER UNDERSTORY DECIDUOUS |
| BENI | 6 | BETULA NIGRA 'DURA-HEAT' | DURAHEAT RIVER BIRCH | 8" HT | BUFFER CANOPY |
| CECT | 8 | CERCIS CANADENSIS 'TEXENSIS' | TEXAS REDBUD | 8" HT | BUFFER UNDERSTORY DECIDUOUS |
| ILOP | 8 | ILEX OPACA 'WILLIAM HAWKINS' | WILLIAM HAWKINS AMERICAN HOLLY | 8" HT | BUFFER UNDERSTORY EVERGREEN |
| JUVI | 2 | JUNIPERUS VIRGINIANA | EASTERN REDCEDAR | 8" HT | BUFFER CANOPY EVERGREEN |
| MGLG | 9 | MAGNOLIA GRANDIFLORA 'LITTLE GEM' | LITTLE GEM MAGNOLIA | 8" HT | BUFFER UNDERSTORY EVERGREEN |
| MGVI | 1 | MAGNOLIA VIRGINIANA | SWEETBAY MAGNOLIA | 8" HT | BUFFER CANOPY EVERGREEN |
| PRMU | 4 | PRUNUS MUME | JAPANESE APRICOT | 8" HT | BUFFER UNDERSTORY DECIDUOUS |
| THPL | 10 | THUJA PLICATA | WESTERN ARBORVITAE | 8" HT | BUFFER UNDERSTORY EVERGREEN |
| SHRUBS | | | | | |
| AG | 19 | ABELIA GRANDIFLORA | JOHN CREECH ABELIA | 15" HT | BUFFER |
| CJ | 16 | CAMELIA JAPONICA | JAPANESE CAMELIA | 15" HT | BUFFER |
| CS | 31 | CAMELIA SINENSIS | TEA CAMELIA | 15" HT | BUFFER |
| GS | 13 | GELSEMIUM SEMPERVIRENS | CAROLINA JESSAMINE | 15" HT | BUFFER |
| HO | 21 | HYDRANGEA QUERCIFOLIA | OAK LEAF HYDRANGEA | 15" HT | BUFFER |
| ID | 16 | ILEX DECIDUA | POSSUMHAW | 15" HT | BUFFER |
| OF | 23 | OSMANTHUS FRAGRANS | FRAGRANT OSMANTHUS | 15" HT | VUA & BUFFER |
| OL | 13 | PRUNUS LAURO-CERASUS 'OTTO LUYKEN' | OTTO LUYKEN LAUREL | 15" HT | VUA |
| RO | 28 | ROSMARINUS OFFICINALIS 'BLUE SPIRE' | BLUE SPIRE ROSEMARY | 15" HT | BUFFER |
| VO | 27 | VIBURNUM OBOVATUM | WALTER VIBURNUM | 15" HT | BUFFER |

| PROJECT BOUNDARY BUFFER CALCS | | | |
|--|------------------------|----------|----------|
| 10' / 0.2 OPACITY BUFFER | BUFFER 1- 373.71 LF | REQUIRED | PROPOSED |
| ALTERNATIVE BUFFER SELECTION | ALT. 1 Mixed Evergreen | | |
| CANOPY TREES | 4 | 11 | |
| EVERGREEN TREES | 0 | 0 | |
| DECIDUOUS UNDERSTORY TREES | 4 | 7 | |
| EVERGREEN UNDERSTORY TREES | 8 | 8 | |
| SHRUBS | 49 | 54 | |
| 20' / 0.4 OPACITY BUFFER | | | |
| 20' / 0.4 OPACITY BUFFER | BUFFER 2- 159.00 LF | REQUIRED | PROPOSED |
| ALTERNATIVE BUFFER SELECTION | ALT. 1 Mixed Evergreen | | |
| CANOPY TREES | 5 | 5 | |
| EVERGREEN TREES | 2 | 2 | |
| DECIDUOUS UNDERSTORY TREES | 4 | 4 | |
| EVERGREEN UNDERSTORY TREES | 8 | 8 | |
| SHRUBS | 64 | 64 | |
| 20' / 0.4 OPACITY BUFFER | | | |
| 20' / 0.4 OPACITY BUFFER | BUFFER 3- 182.66 LF | REQUIRED | PROPOSED |
| ALTERNATIVE BUFFER SELECTION | ALT. 1 Mixed Evergreen | | |
| CANOPY TREES | 6 | 6 | |
| EVERGREEN TREES | 2 | 2* | |
| DECIDUOUS UNDERSTORY TREES | 4 | 4 | |
| EVERGREEN UNDERSTORY TREES | 10 | 10 | |
| SHRUBS | 74 | 74 | |
| * EXISTING 32" PINE TREE CREDITED FOR 1 EVERGREEN TREE IN BUFFER 3 | | | |

| STREET TREE CALCULATIONS | | | |
|--------------------------|--------------------|----|--|
| ROAD NAME | Carpenter Fletcher | | |
| LENGTH OF ROW | 725.36 LF | | |
| REQUIRED | PROPOSED | | |
| NUMBER OF TREES | 19 | 19 | |
| VUA #1 | | | |
| REQUIRED | PROPOSED | | |
| VUA INTERNAL | 5,068 SF | | |
| CANOPY TREES | 3 | 3 | |
| SHRUBS | 21 | 21 | |



TREES SHOWN IN PUE ASSOCIATED WITH SW-44D WILL BE REMOVED IN ASSOCIATION WITH CITY OF DURHAM PROJECT, BUT WILL NOT BE REMOVED BY 1414 CARPENTER FLETCHER DEVELOPER

- LIMITS OF DISTURBANCE
- FEMA MAPPED REGULATORY FLOODWAY
- FEMA MAPPED ZONE AE / 0.1% CHANCE FLOODPLAIN
- FEMA MAPPED FUTURE 0.1% CHANCE FLOODPLAIN
- WETLANDS
- RIPIARIAN BUFFERS
- TREE PRESERVATION
- PASSIVE OPEN SPACE
- SURVEYED BASE FLOOD ELEVATION (266.7 - 267.5)
- SURVEYED SPECIMEN TREE
- SPECIMEN TREE CRITICAL ROOT PROTECTION ZONE
- FEMA FLOODPLAIN CROSS-SECTIONS
- PROJECT BOUNDARY BUFFER

Figure 1: Required Tree Planting Detail

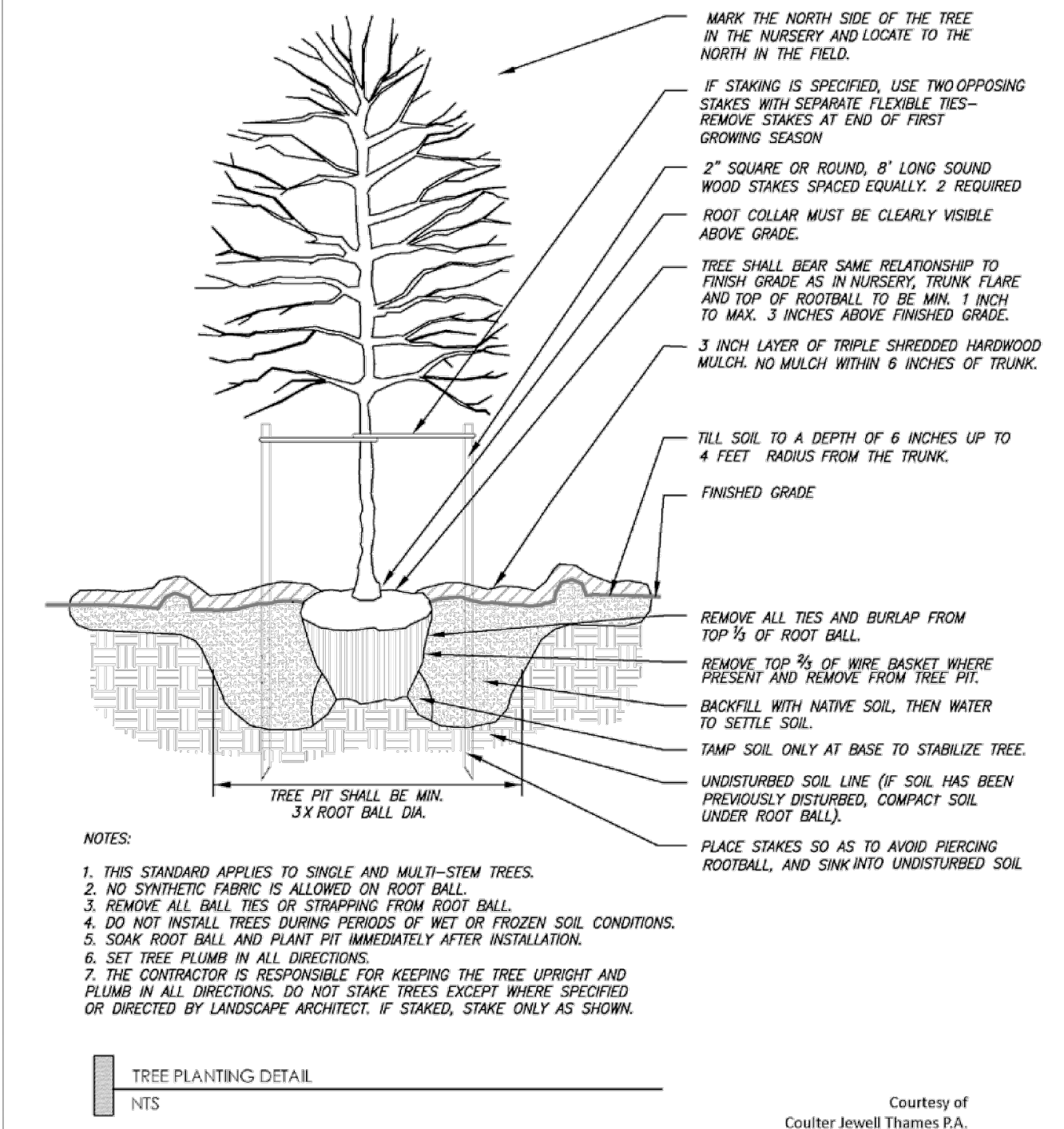
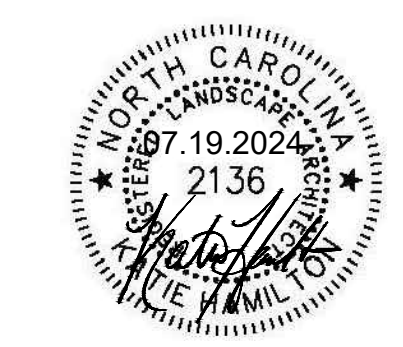
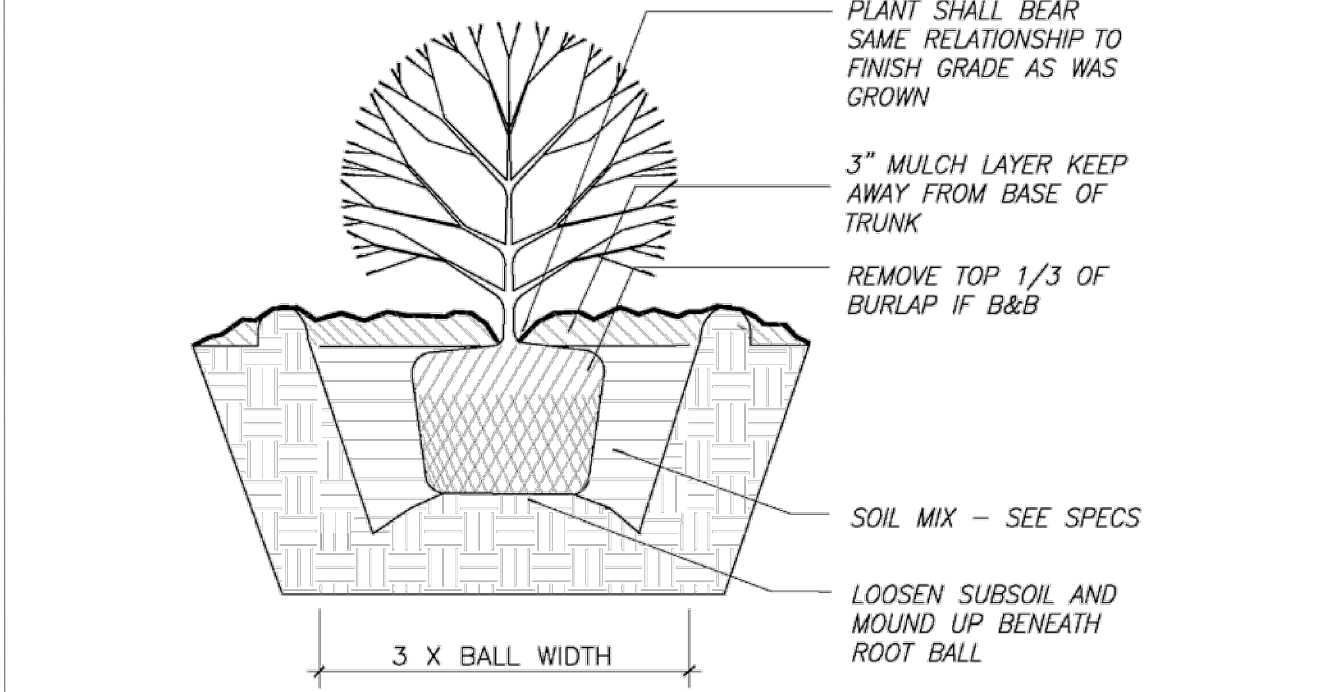


Figure 3: Recommended Shrub Planting Detail



Infinite Tide



| No. | Date | Description | COMMENTS & AFFORDABLE UNITS |
|-----|------------|-------------|-----------------------------|
| 1 | 05.07.2024 | | |
| 2 | 07.29.2024 | | |

VICINITY

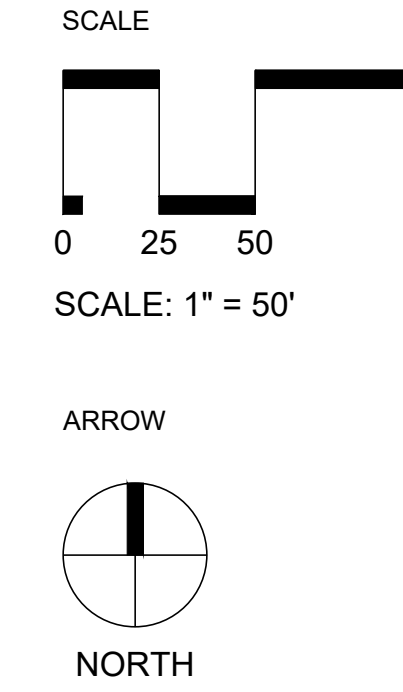




PHOTO 1 - TREE COVERAGE



PHOTO 2 - NATURAL BUFFER



PHOTO 3 - NATURAL BUFFER



PHOTO 4 - NATURAL BUFFER



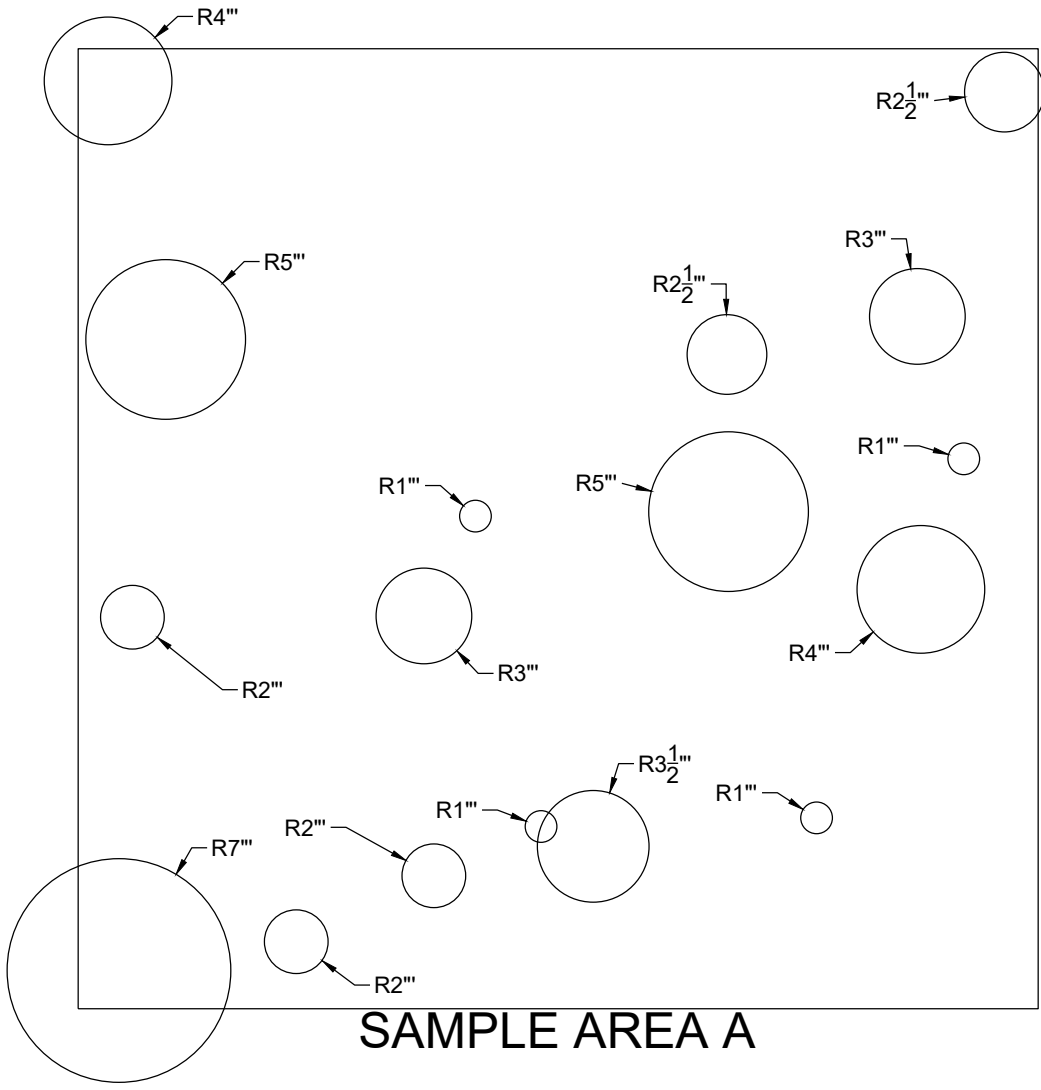
PHOTO 5 - NATURAL BUFFER



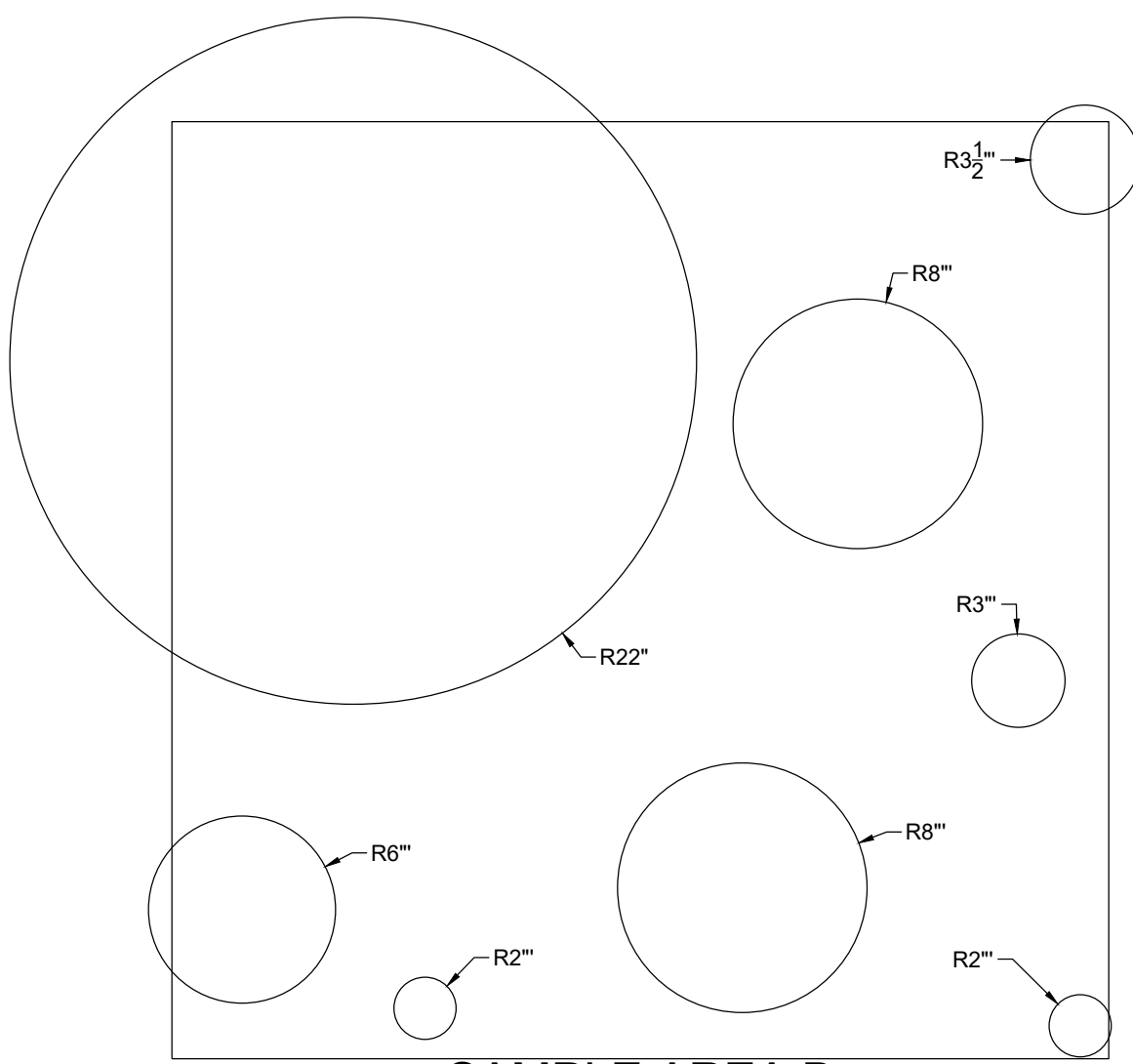
PHOTO 7 - NATURAL BUFFER



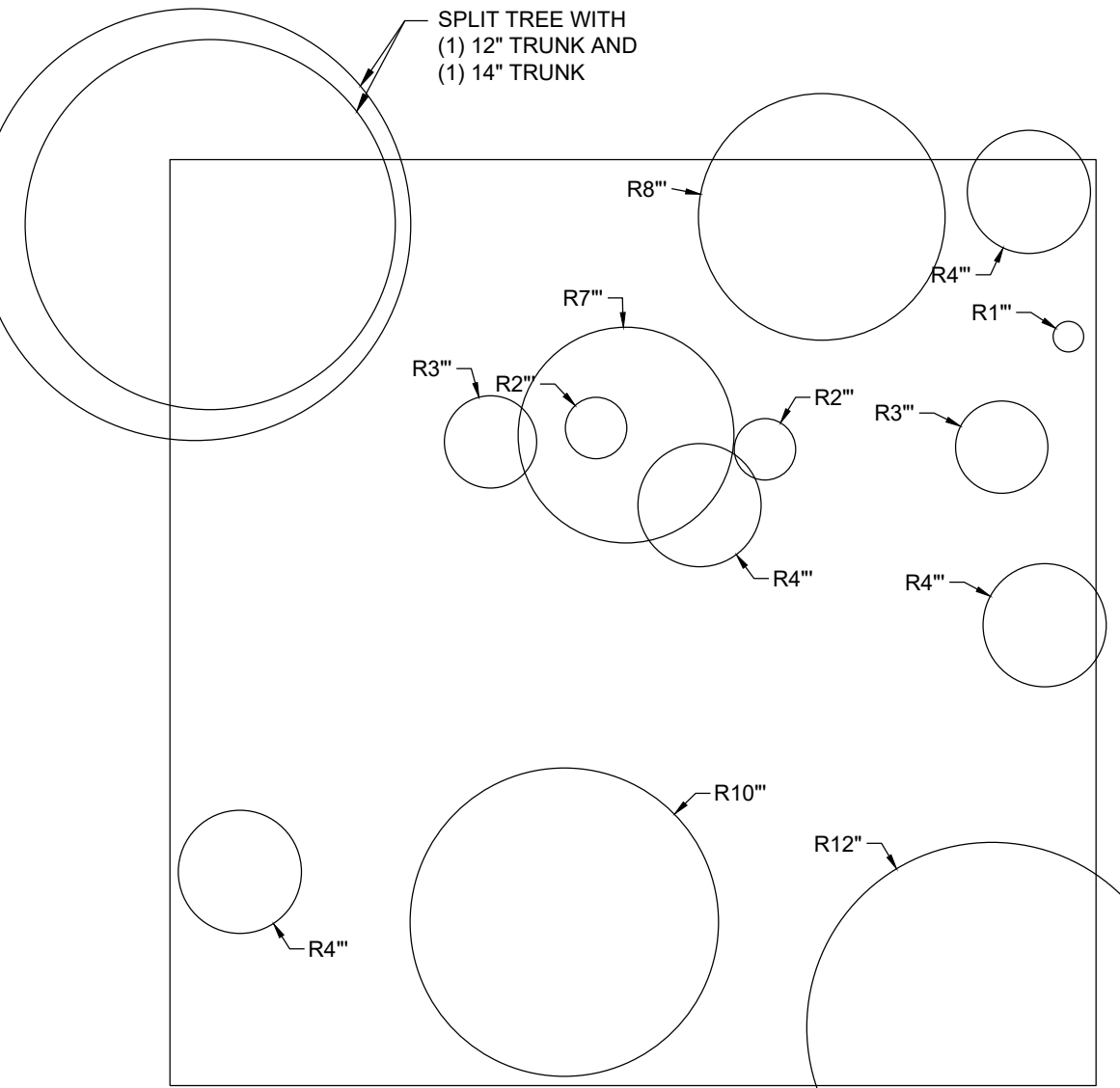
PHOTO 6 - NATURAL BUFFER



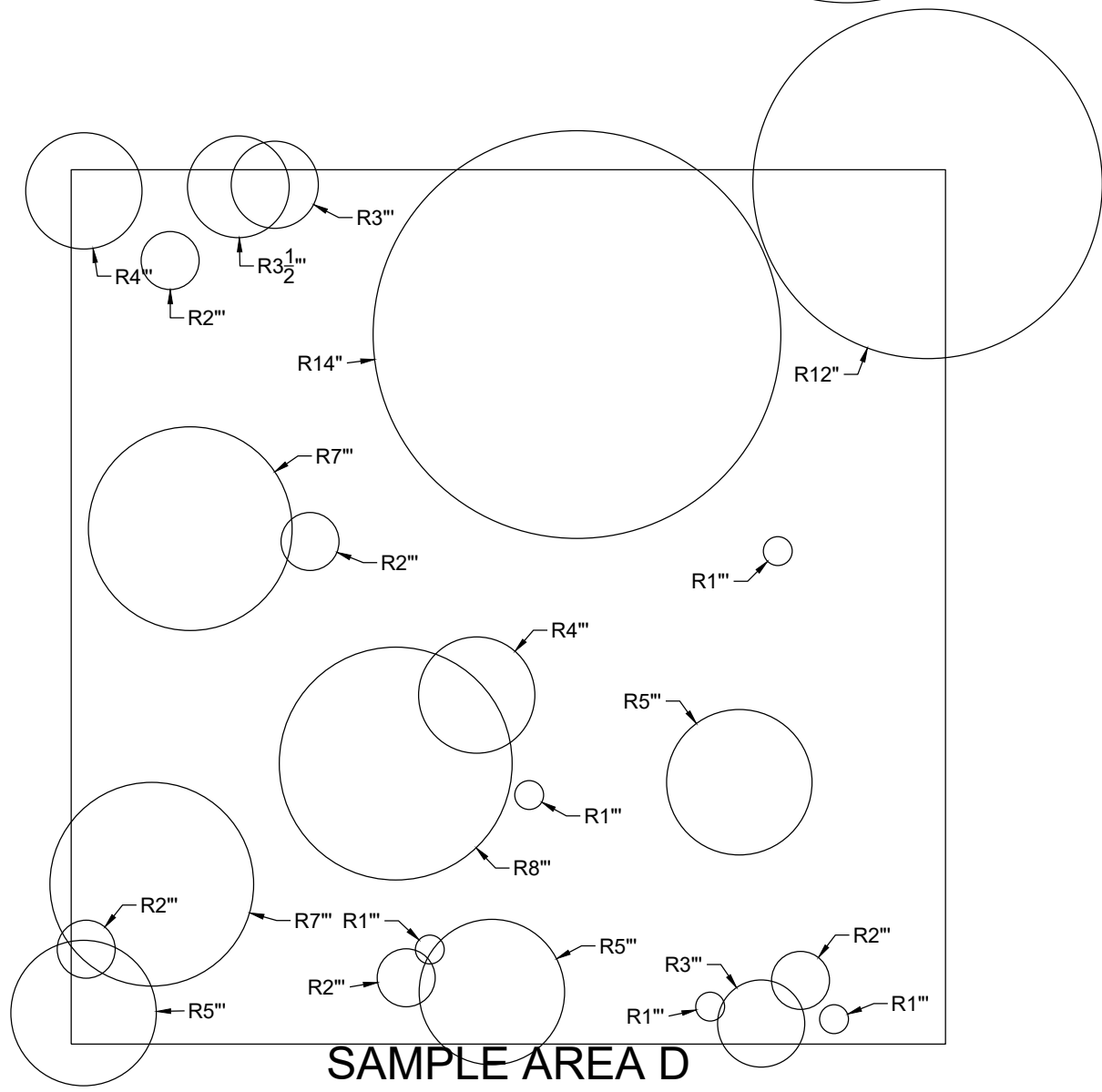
SAMPLE AREA A



SAMPLE AREA B

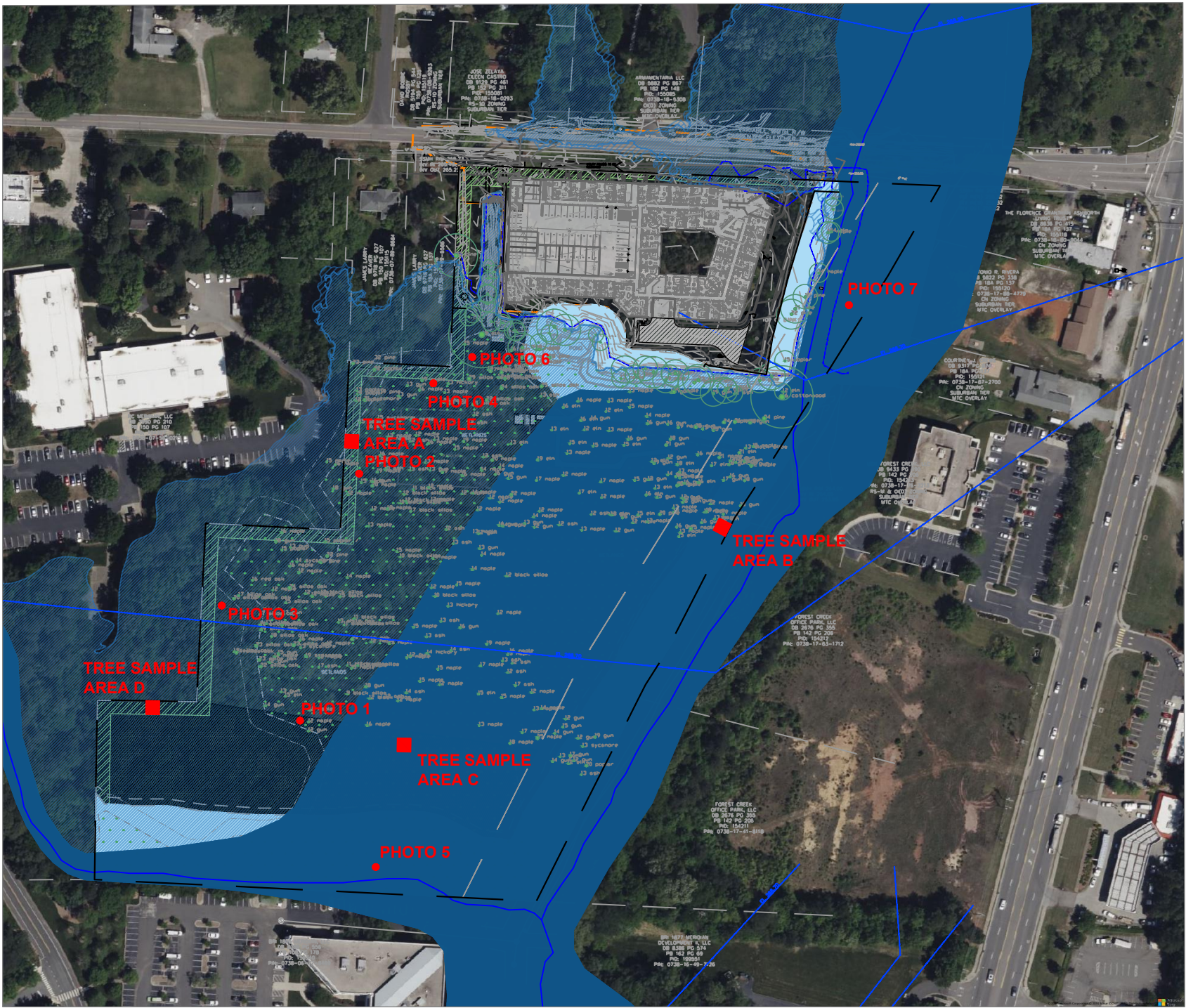


SAMPLE AREA C



SAMPLE AREA D

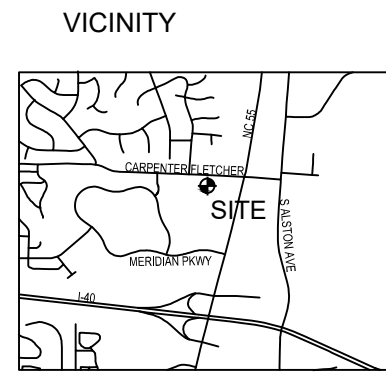
SAMPLE AREA LEGEND:
RXX" = CALIPER OF TREE
NOTE: TREE SPECIES WERE NOT IDENTIFIED. SHRUBS
WERE NOT IDENTIFIED AND GROUND COVERS WERE
NOT SURVEYED.



Infinite
Tide

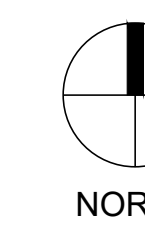


| No. | Date | Description | Comments & Afordable Units |
|-----|------------|----------------------------|----------------------------|
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| 2 | 07.29.2024 | Comments & Afordable Units | |



SCALE

ARROW



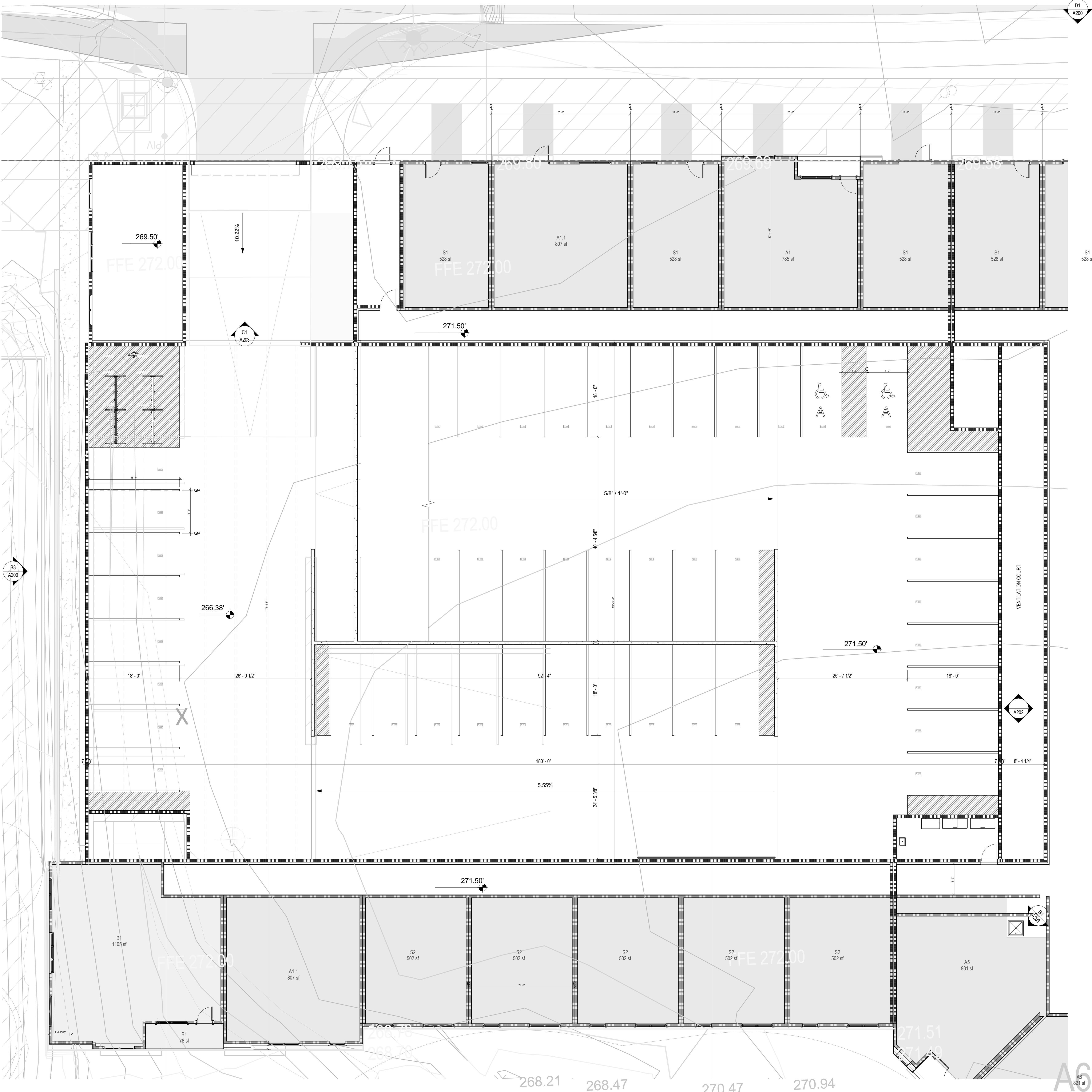
NORTH

DATE: 05.07.2024
DRAWN BY: [Name]
PROJECT: 1414 CARPENTER FLETCHER RD
PROJECT #: D2400010
SHEET TITLE
TREE PRESERVATION & BUFFER PHOTOS
SHEET NO.

CITY OF DURHAM
PUBLIC WORKS DEPARTMENT
APPROVED

ENGINEERING DATE:
STORMWATER DATE:
TRANSPORTATION DATE:
..... DATE:

L11.00



CONSTRUCTION PLAN GENERAL NOTES

1. SEE ALSO: PRECAST CONCRETE GARAGE DRAWINGS PROVIDED BY CONSULTANT
2. SEE VENTILATION CALCULATIONS.
3. ALL PARKING STRIPING WILL BE WHITE. STRIPING SHALL BE WHITE FLAT PROCESSIONAL TRAFFIC MARKING PAINT SIMILAR OR EQUAL TO PRO-PARK WATERBORNE TRAFFIC MARKING PAINT BY SHERWIN-WILLIAMS.
4. SEE PRE-CAST CONCRETE DRAWINGS FOR PRE-CAST PANEL INFORMATION.
5. ALL GUARDRAILS SHALL BE "CABLE" GUARDRAILS. EXTERIOR & INTERIOR GUARDRAILS SHALL BE DESIGNED FOR 6,000 LB VEHICLE IMPACT LOAD WHERE LOCATED 28" AND ABOVE.
6. EXTERIOR FINISH ON PRE-CAST PANELS TO BE FACTORY FINISH (GRAY) ON INTERNAL VENT COURT.
7. PROVIDE ROLL APPLIED WATER RESISTANT CONCRETE SEALER ON TOP OF DOUBLE-TEES @ TOP LEVEL OF PARKING DECK.
8. SEE PRE-CAST DRAWINGS, CIVIL DRAWINGS, & PLUMBING DRAWINGS FOR FLOOR DRAIN LOCATIONS.
9. GC SHALL BE RESPONSIBLE FOR COORDINATION AND PROPER ALIGNMENT OF FLOOR SYSTEMS BETWEEN PRE-CAST PARKING DECK AND ADJACENT WOOD FRAME CORRIDORS TO ENSURE ACCESSIBLE ROUTE BETWEEN STRUCTURES.
10. ACCESSIBLE PARKING SPACES AND AISLES ARE NOT TO EXCEED A SLOPE OF 1:48 OR 2% MAX IN ANY DIRECTION PER 2009 ANSI 502.5. CONCRETE WASHES WITHIN THESE ACCESSIBLE ZONES NOT TO EXCEED 2% SLOPE.
11. PROVIDE PEDESTRIAN VEHICLE INTERFACE CROSSING SIGNAGE AND CONVEX CORNER MIRRORS AT ALL BLIND CORNERS IN ORDER TO PROVIDE PEDESTRIAN SAFETY. CONFIRM ALL LOCATIONS WITH AUTHORITY HAVING JURISDICTION.

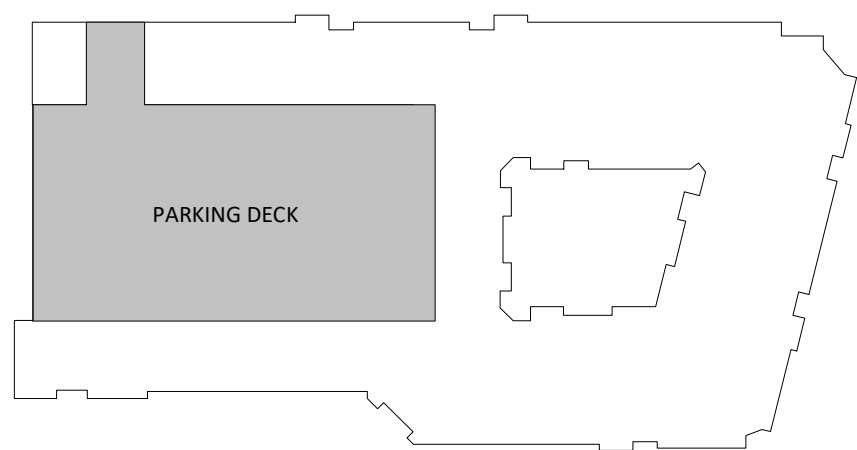
PARKING DECK KEY NOTES:

- 1 24" HIGH PRECAST WALL W/ CABLE GUARDRAIL ABOVE. HORIZONTAL STEEL CABLES @ 4" O.C. TOP CABLE @ MIN. 42" A.F.F. SEE DETAIL B11A931.
- 2 WASH SLOPED TOWARDS FLOOR DRAINS - SEE PLUMBING DRAWINGS FOR DETAILS.
- 3 6" DIA STEEL BOLLARD. COORDINATE EXACT LOCATION IN FIELD WITH PRE-CAST INSTALLER. *NOTE: GC IS RESPONSIBLE FOR COORDINATING WITH LOCAL AHI TO DETERMINE EXTENT OF ADDITIONAL LOCATIONS REQUIRED. SHOULD ASSUME ALL STANDPIPES AND VERTICAL PLUMBING STACKS MUST BE PROTECTED BY EITHER BOLLARDS OR STEEL COLLARS. SEE DETAIL C11A931.
- 4 CLEARANCE BAR ABOVE
- 5 OVERHEAD VEHICULAR GATE WITH CARD READER
- 6 VEHICLE DETECTION LOOP
- 7 BIKE RACK
- 8 "FIXIT" (OR SIMILAR) BICYCLE REPAIR STATION WITH AIR KIT.
- 9 LIGHT POLE LOCATION - SEE ELECTRICAL DRAWINGS. MOUNT ON PRECAST HAUNCHES ON TOP OF CENTER LIGHT WALL.
- 10 FLOOR DRAIN - RE: PLUMBING DRAWINGS
- 11 VERTICAL PLUMBING STACK - RE: PLUMBING DRAWINGS
- 12 INSTALL WATERPROOF TRAFFIC COATING SYSTEM OVER EXTENT OF ROOMS ON LEVEL BELOW. EXTEND 48" BEYOND EXTENT OF ROOM.
- 13 VINYL COATED CHAIN LINK FENCE TO ENCLOSE BICYCLE PARKING ROOM.
- 14 PAINTED DIRECTIONAL ARROWS
- 15 DOUBLE EV CHARGING STATION
- 16 GATE CONTROLLER
- 17 36" WIDE GATE PROVIDE PANIC HARDWARE IN DIRECTION OF EGRESS

PARKING DECK KEY NOTES:

- | | |
|-----|--------------------------------|
| EV | ELECTRIC VEHICLE PARKING SPACE |
| A | HANDICAP VEHICLE PARKING SPACE |
| VAN | HANDICAP VAN PARKING SPACE |
| C | COMPACT PARKING SPACE |

KEY PLAN



OWNER/DEVELOPER

D **EB Capital Partners**

EB PARTNERS
Durham, NC

SITE DESIGN

INFINITE TIDE

Katie Hamilton
1010 Skyler Ln
Durham, NC 27703

STRUCTURAL ENGINEER

ELLINWOOD+MACHADO

Craig Fisher
4208 Six Forks Rd STE 830,
Raleigh, NC 27603

MEP ENGINEER

VP ENGINEERING

Daniel Payne
P.O. BOX 12540
CHARLOTTE, NC 28220

C

B

**1414 CARPENTER
FLETCHER**

MULTIFAMILY BUILDING
DURHAM, NC

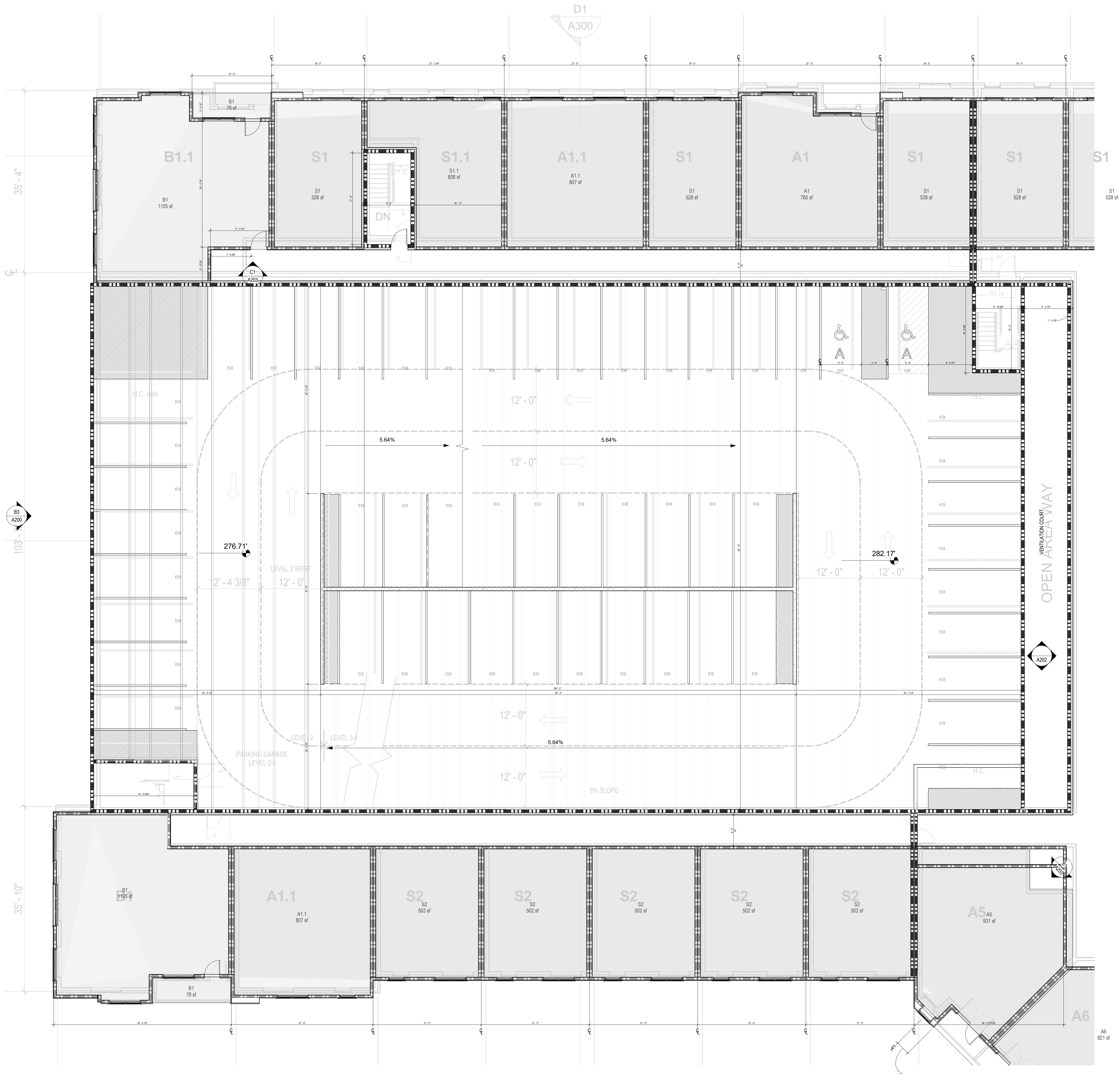
CLIENT: EB PARTNERS

| REV. | DATE | DESCRIPTION |
|------|------|---|
| A | | DESIGN DEVELOPMENT |
| | | DELIVERABLE: SET |
| | | ISSUE DATE: TBD |
| | | Copyright (c) by CI Design, Inc. All Rights Reserved. |
| | | DRAWN BY: Author |
| | | CHECKED BY: Checker |
| | | PROJECT NUMBER: XX000000 |

SHEET TITLE:
**PARKING DECK PLAN
TIER 1**

SHEET NUMBER:

A901



CONSTRUCTION PLAN GENERAL NOTES

1. SEE ALSO: PRECAST CONCRETE GARAGE DRAWINGS PROVIDED BY CONSULTANT
2. SEE VENTILATION CALCULATIONS.
3. ALL PARKING STRIPING WILL BE WHITE. STRIPING SHALL BE WHITE FLAT PROCESSIONAL TRAFFIC MARKING PAINT SIMILAR OR EQUAL TO PRO-PARK WATERBORNE TRAFFIC MARKING PAINT BY SHERWIN-WILLIAMS.
4. SEE PRE-CAST CONCRETE DRAWINGS FOR PRE-CAST PANEL INFORMATION.
5. ALL GUARDRAILS SHALL BE "CABLE" GUARDRAILS. EXTERIOR & INTERIOR GUARDRAILS SHALL BE DESIGNED FOR 6,000 LB VEHICLE IMPACT LOAD WHERE LOCATED 28" AND ABOVE.
6. EXTERIOR FINISH ON PRE-CAST PANELS TO BE FACTORY FINISH (GRAY) ON INTERNAL VENT COURT.
7. PROVIDE ROLL APPLIED WATER RESISTANT CONCRETE SEALER ON TOP OF DOUBLE-TEES @ TOP LEVEL OF PARKING DECK.
8. SEE PRE-CAST DRAWINGS, CIVIL DRAWINGS, & PLUMBING DRAWINGS FOR FLOOR DRAIN LOCATIONS.
9. GC SHALL BE RESPONSIBLE FOR COORDINATION AND PROPER ALIGNMENT OF FLOOR SYSTEMS BETWEEN PRE-CAST PARKING DECK AND ADJACENT WOOD FRAME CORRIDORS TO ENSURE ACCESSIBLE ROUTE BETWEEN STRUCTURES.
10. ACCESSIBLE PARKING SPACES AND AISLES ARE NOT TO EXCEED A SLOPE OF 1:48 OR 2% MAX IN ANY DIRECTION PER 2009 ANSI 502.5. CONCRETE WASHES WITHIN THESE ACCESSIBLE ZONES NOT TO EXCEED 2% SLOPE.
11. PROVIDE PEDESTRIAN VEHICLE INTERFACE CROSSING SIGNAGE AND CONVEX CORNER MIRRORS AT ALL BLIND CORNERS IN ORDER TO PROVIDE PEDESTRIAN SAFETY. CONFIRM ALL LOCATIONS WITH AUTHORITY HAVING JURISDICTION.

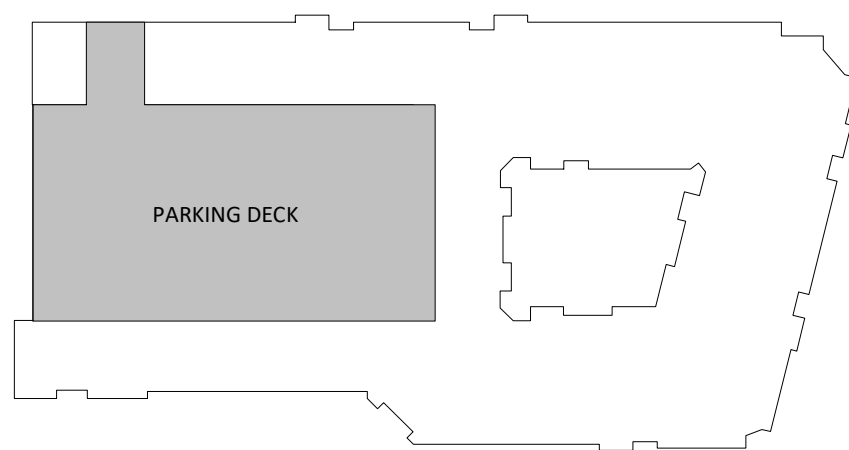
PARKING DECK KEY NOTES:

1. 24" HIGH PRECAST WALL W/ CABLE GUARDRAIL ABOVE. HORIZONTAL STEEL CABLES @ 4" O.C. TOP CABLE @ MIN. 42" A.F.F. SEE DETAIL B1/A931.
2. WASH SLOPED TOWARDS FLOOR DRAINS - SEE PLUMBING DRAWINGS FOR DETAILS.
3. 6" DIA STEEL BOLLARD. COORDINATE EXACT LOCATION IN FIELD WITH PRE-CAST INSTALLER. *NOTE: GC IS RESPONSIBLE FOR COORDINATING WITH LOCAL A.H.U. TO DETERMINE EXTENT OF ADDITIONAL LOCATIONS REQUIRED. SHOULD ASSUME ALL STANDPIPES AND VERTICAL PLUMBING STICKS MUST BE PROTECTED BY EITHER BOLLARDS OR STEEL COLLARS. SEE DETAIL C1/A931.
4. CLEARANCE BAR ABOVE
5. OVERHEAD VEHICULAR GATE WITH CARD READER
6. VEHICLE DETECTION LOOP
7. BIKE RACK
8. "FIXIT" (OR SIMILAR) BICYCLE REPAIR STATION WITH AIR KIT.
9. LIGHT POLE LOCATION - SEE ELECTRICAL DRAWINGS. MOUNT ON PRECAST HAUNCHES ON TOP OF CENTER LIGHT WALL.
10. FLOOR DRAIN - RE: PLUMBING DRAWINGS
11. VERTICAL PLUMBING STACK - RE: PLUMBING DRAWINGS
12. INSTALL WATERPROOF TRAFFIC COATING SYSTEM OVER EXTENT OF ROOMS ON LEVEL BELOW. EXTEND 48" BEYOND EXTENT OF ROOM.
13. VINYL COATED CHAIN LINK FENCE TO ENCLOSE BICYCLE PARKING ROOM.
14. PAINTED DIRECTIONAL ARROWS
15. DOUBLE EV CHARGING STATION
16. GATE CONTROLLER
17. 36" WIDE GATE PROVIDE PANIC HARDWARE IN DIRECTION OF EGRESS

PARKING DECK KEY NOTES:

- | | |
|-----|--------------------------------|
| EV | ELECTRIC VEHICLE PARKING SPACE |
| A | HANDICAP VEHICLE PARKING SPACE |
| VAN | HANDICAP VAN PARKING SPACE |
| C | COMPACT PARKING SPACE |

KEY PLAN



PARKING DECK - LEVEL 2

A1

1/8" = 1'-0"



T 617.848.9511
BOSTON, MA
250 SUMMER STREET
ci-designinc.com

OWNER/DEVELOPER

D
EB Capital Partners

EB PARTNERS

Durham, NC

SITE DESIGN

INFINITE TIDE

Katie Hamilton
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Durham, NC 27703

STRUCTURAL ENGINEER

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MEP ENGINEER

VP ENGINEERING

Daniel Payne
P.O. BOX 12540
CHARLOTTE, NC 28220

C

B

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FLETCHER
MULTIFAMILY BUILDING
DURHAM, NC

CLIENT: EB PARTNERS

REV. DATE DESCRIPTION

A DESIGN DESIGN DEVELOPMENT

DELIVERABLE: SET

ISSUE DATE: TBD

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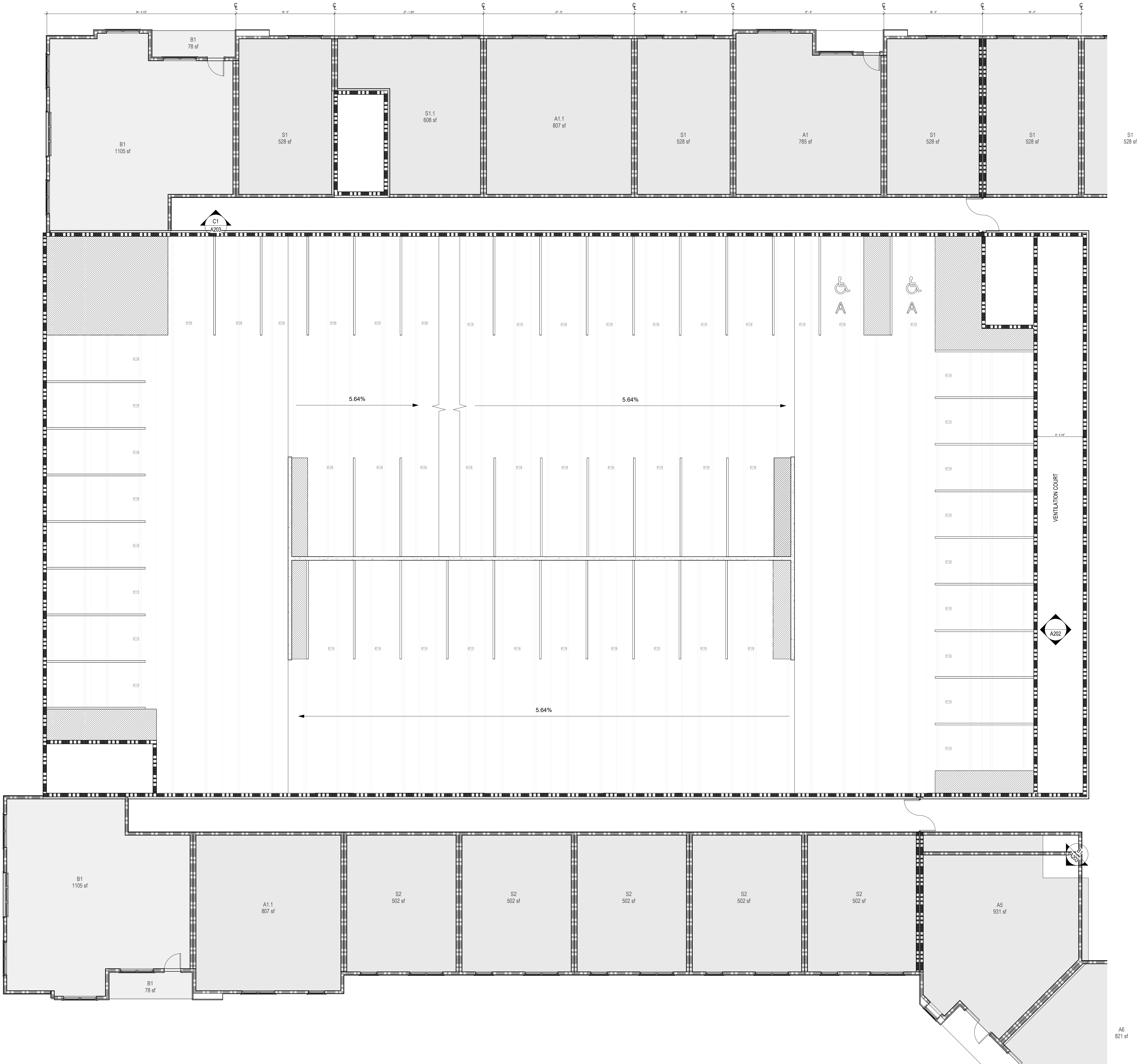
SHEET TITLE:

PARKING DECK PLAN

TIER 2

SHEET NUMBER:

A902



CONSTRUCTION PLAN GENERAL NOTES

1. SEE ALSO: PRECAST CONCRETE GARAGE DRAWINGS PROVIDED BY CONSULTANT
2. SEE VENTILATION CALCULATIONS.
3. ALL PARKING STRIPING WILL BE WHITE. STRIPING SHALL BE WHITE FLAT PROCESSIONAL TRAFFIC MARKING PAINT SIMILAR OR EQUAL TO PRO-PARK WATERBORNE TRAFFIC MARKING PAINT BY SHERWIN-WILLIAMS.
4. SEE PRE-CAST CONCRETE DRAWINGS FOR PRE-CAST PANEL INFORMATION.
5. ALL GUARDRAILS SHALL BE "CABLE" GUARDRAILS. EXTERIOR & INTERIOR GUARDRAILS SHALL BE DESIGNED FOR 6,000 LB VEHICLE IMPACT LOAD WHERE LOCATED 28' AND ABOVE.
6. EXTERIOR FINISH ON PRE-CAST PANELS TO BE FACTORY FINISH (GRAY) ON INTERNAL VENT COURT.
7. PROVIDE ROLL APPLIED WATER RESISTANT CONCRETE SEALER ON TOP OF DOUBLE-TEES @ TOP LEVEL OF PARKING DECK.
8. SEE PRE-CAST DRAWINGS, CIVIL DRAWINGS, & PLUMBING DRAWINGS FOR FLOOR DRAIN LOCATIONS.
9. GC SHALL BE RESPONSIBLE FOR COORDINATION AND PROPER ALIGNMENT OF FLOOR SYSTEMS BETWEEN PRE-CAST PARKING DECK AND ADJACENT WOOD FRAME CORRIDORS TO ENSURE ACCESSIBLE ROUTE BETWEEN STRUCTURES.
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11. PROVIDE PEDESTRIAN VEHICLE INTERFACE CROSSING SIGNAGE AND CONVEX CORNER MIRRORS AT ALL BLIND CORNERS IN ORDER TO PROVIDE PEDESTRIAN SAFETY. CONFIRM ALL LOCATIONS WITH AUTHORITY HAVING JURISDICTION.

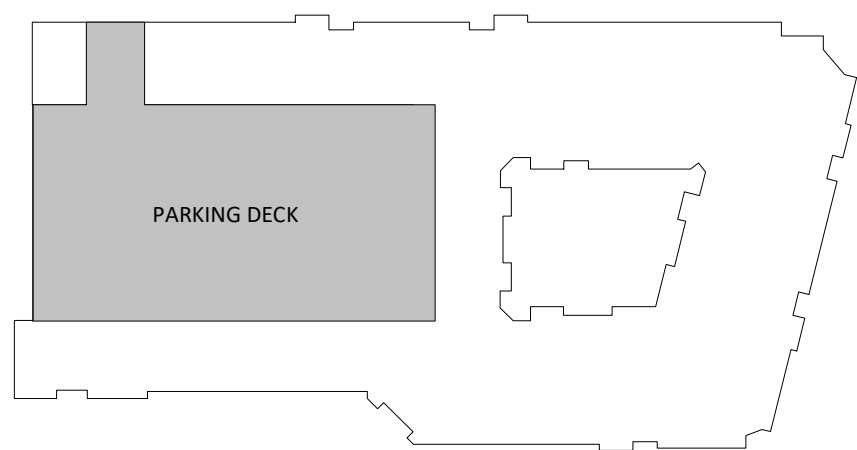
PARKING DECK KEY NOTES:

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- 2 WASH SLOPED TOWARDS FLOOR DRAINS - SEE PLUMBING DRAWINGS FOR DETAILS.
- 3 6" DIA STEEL BOLLARD. COORDINATE EXACT LOCATION IN FIELD WITH PRE-CAST INSTALLER. *NOTE: GC IS RESPONSIBLE FOR COORDINATING WITH LOCAL A4U TO DETERMINE EXTENT OF ADDITIONAL LOCATIONS REQUIRED. SHOULD ASSUME ALL STANDPIPES AND VERTICAL PLUMBING STICKS MUST BE PROTECTED BY EITHER BOLLARDS OR STEEL COLLARS. SEE DETAIL C11A931.
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- 6 VEHICLE DETECTION LOOP
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- 9 LIGHT POLE LOCATION - SEE ELECTRICAL DRAWINGS. MOUNT ON PRECAST HAUNCHES ON TOP OF CENTER LIGHT WALL.
- 10 FLOOR DRAIN - RE: PLUMBING DRAWINGS
- 11 VERTICAL PLUMBING STACK - RE: PLUMBING DRAWINGS
- 12 INSTALL WATERPROOF TRAFFIC COATING SYSTEM OVER EXTENT OF ROOMS ON LEVEL BELOW. EXTEND 48" BEYOND EXTENT OF ROOM.
- 13 VINYL COATED CHAIN LINK FENCE TO ENCLOSE BICYCLE PARKING ROOM.
- 14 PAINTED DIRECTIONAL ARROWS
- 15 DOUBLE EV CHARGING STATION
- 16 GATE CONTROLLER
- 17 36" WIDE GATE PROVIDE PANIC HARDWARE IN DIRECTION OF EGRESS

PARKING DECK KEY NOTES:

- | | |
|-----|--------------------------------|
| EV | ELECTRIC VEHICLE PARKING SPACE |
| A | HANDICAP VEHICLE PARKING SPACE |
| VAN | HANDICAP VAN PARKING SPACE |
| C | COMPACT PARKING SPACE |

KEY PLAN



PARKING DECK - LEVEL 3

A1

1/8" = 1'-0"

OWNER/DEVELOPER

D *EB Capital Partners*

EB PARTNERS
Durham, NC

SITE DESIGN

INFINITE TIDE

Katie Hamilton
1010 Skyler Ln
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STRUCTURAL ENGINEER

ELLINWOOD+MACHADO

Craig Fisher
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Raleigh, NC 27603

MEP ENGINEER

VP ENGINEERING

Daniel Payne
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CHARLOTTE, NC 28220

C

B

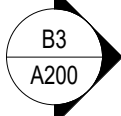
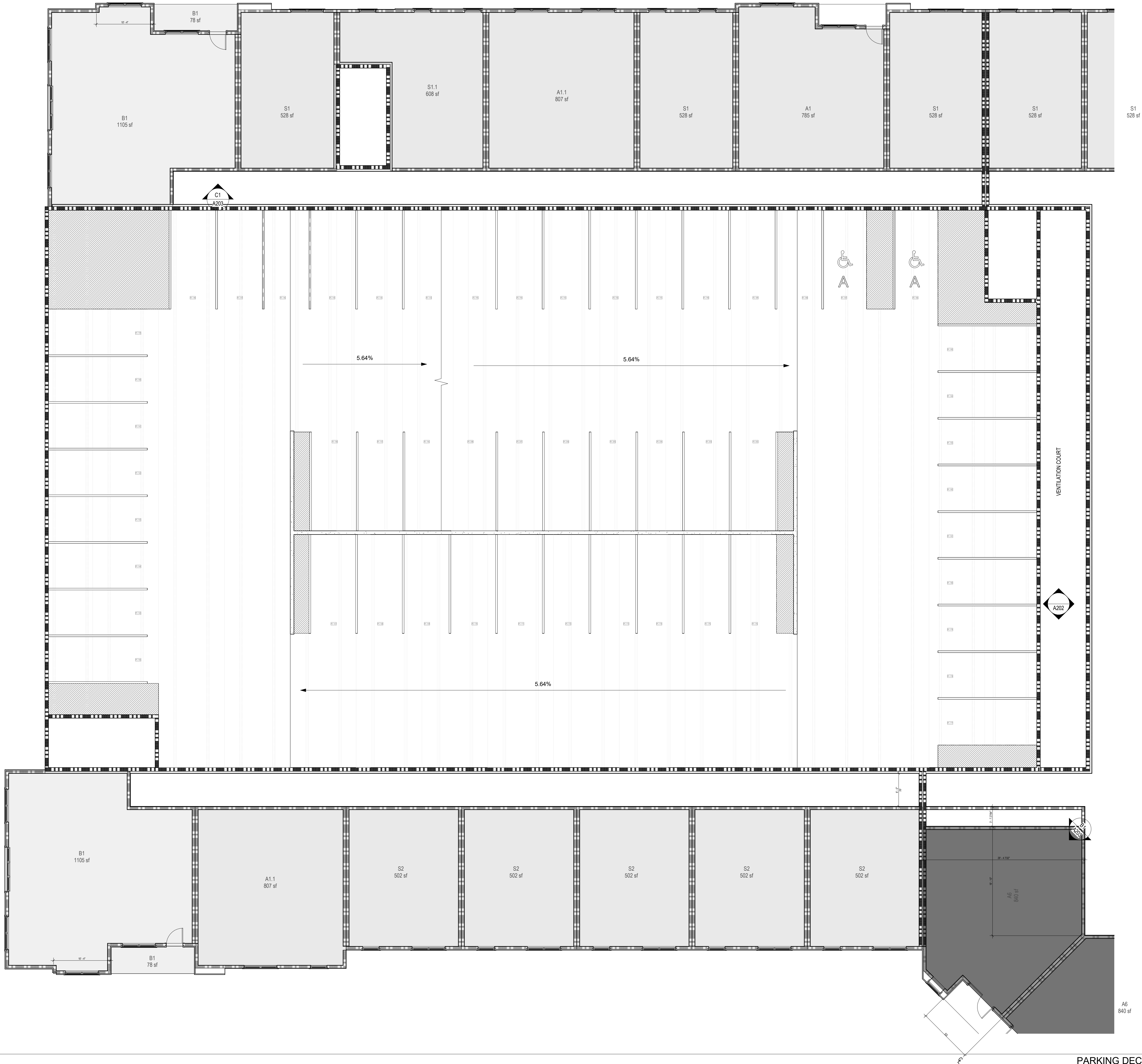
1414 CARPENTER
FLETCHER
MULTIFAMILY BUILDING
DURHAM, NC
CLIENT: EB PARTNERS

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SHEET TITLE:
**PARKING DECK PLAN
TIER 3**

SHEET NUMBER:

A903



CONSTRUCTION PLAN GENERAL NOTES

1. SEE ALSO: PRECAST CONCRETE GARAGE DRAWINGS PROVIDED BY CONSULTANT
2. SEE VENTILATION CALCULATIONS.
3. ALL PARKING STRIPING WILL BE WHITE. STRIPING SHALL BE WHITE FLAT PROCESSIONAL TRAFFIC MARKING PAINT SIMILAR OR EQUAL TO PRO-PARK WATERBORNE TRAFFIC MARKING PAINT BY SHERWIN-WILLIAMS.
4. SEE PRE-CAST CONCRETE DRAWINGS FOR PRE-CAST PANEL INFORMATION.
5. ALL GUARDRAILS SHALL BE "CABLE" GUARDRAILS. EXTERIOR & INTERIOR GUARDRAILS SHALL BE DESIGNED FOR 6,000 LB VEHICLE IMPACT LOAD WHERE LOCATED 29' AND ABOVE.
6. EXTERIOR FINISH ON PRE-CAST PANELS TO BE FACTORY FINISH (GRAY) ON INTERNAL VENT COURT.
7. PROVIDE ROLL APPLIED WATER RESISTANT CONCRETE SEALER ON TOP OF DOUBLE-TEES @ TOP LEVEL OF PARKING DECK.
8. SEE PRE-CAST DRAWINGS, CIVIL DRAWINGS, & PLUMBING DRAWINGS FOR FLOOR DRAIN LOCATIONS.
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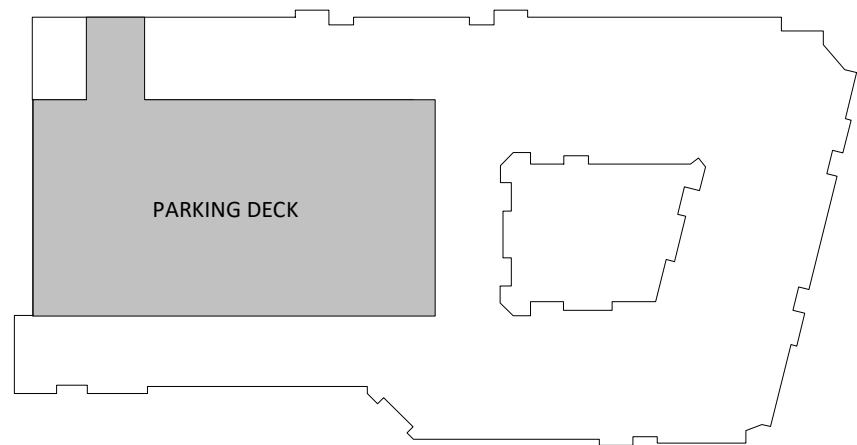
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PARKING DECK KEY NOTES:

- | | |
|-----|--------------------------------|
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| A | HANDICAP VEHICLE PARKING SPACE |
| VAN | HANDICAP VAN PARKING SPACE |
| C | COMPACT PARKING SPACE |

KEY PLAN



PARKING DECK - LEVEL 4
1/8" = 1'-0"

A1

OWNER/DEVELOPER

D *EB Capital Partners*

EB PARTNERS
Durham, NC

SITE DESIGN

INFINITE TIDE

Katie Hamilton
1010 Skyler Ln
Durham, NC 27703

STRUCTURAL ENGINEER

ELLINWOOD+MACHADO

Craig Fisher
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Raleigh, NC 27603

MEP ENGINEER

VP ENGINEERING

Daniel Payne
P.O. BOX 12540
CHARLOTTE, NC 28220

C

B

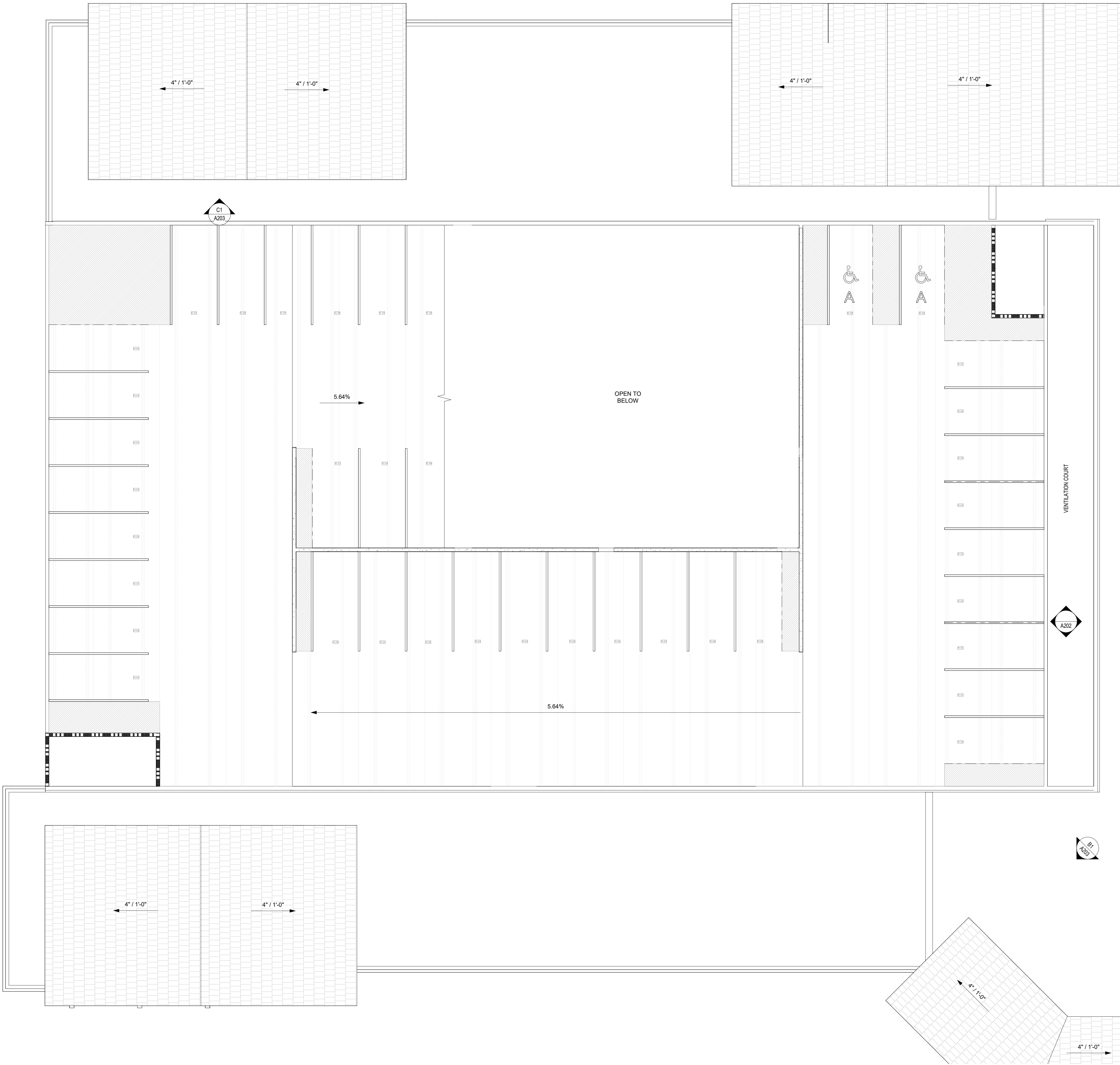
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FLETCHER**
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DURHAM, NC
CLIENT: EB PARTNERS

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SHEET TITLE:
**PARKING DECK PLAN
TIER 4**

SHEET NUMBER:

A904



CONSTRUCTION PLAN GENERAL NOTES

1. SEE ALSO: PRECAST CONCRETE GARAGE DRAWINGS PROVIDED BY CONSULTANT
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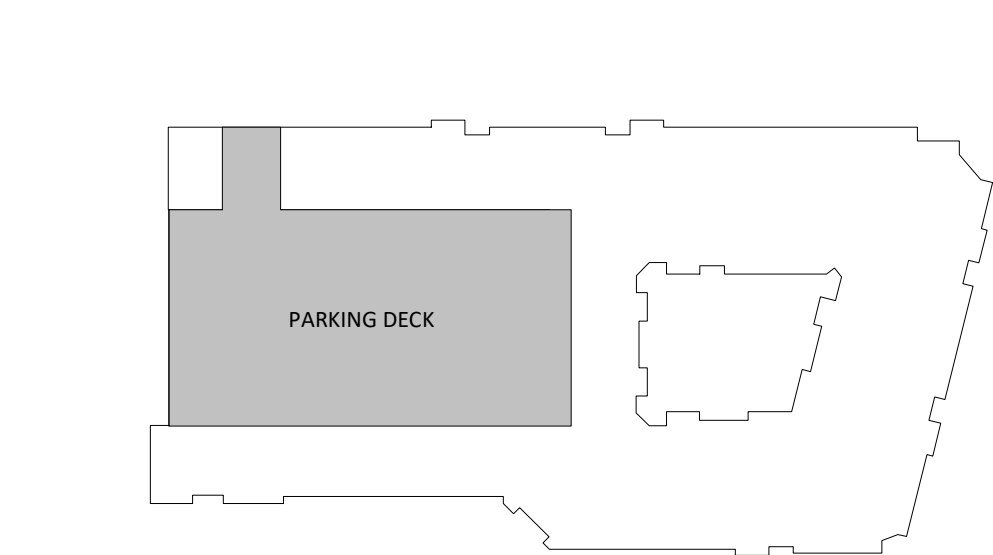
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PARKING DECK KEY NOTES:

- | | |
|-----|--------------------------------|
| EV | ELECTRIC VEHICLE PARKING SPACE |
| A | HANDICAP VEHICLE PARKING SPACE |
| VAN | HANDICAP VAN PARKING SPACE |
| C | COMPACT PARKING SPACE |

KEY PLAN



PARKING DECK - LEVEL 5
1/8" = 1'-0"

A1

OWNER/DEVELOPER

D *EB Capital Partners*

EB PARTNERS
Durham, NC

SITE DESIGN

INFINITE TIDE

Katie Hamilton
1010 Skyler Ln
Durham, NC 27703

STRUCTURAL ENGINEER

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MULTIFAMILY BUILDING
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| | PROJECT NUMBER: | XX000000 |

SHEET TITLE:
**PARKING DECK PLAN
- TIER 5**

SHEET NUMBER:

A905