

# WOODLANDS AT ECHO FARMS

## TRACT 2

4114 ECHO FARMS BLVD.  
WILMINGTON, NORTH CAROLINA 28412

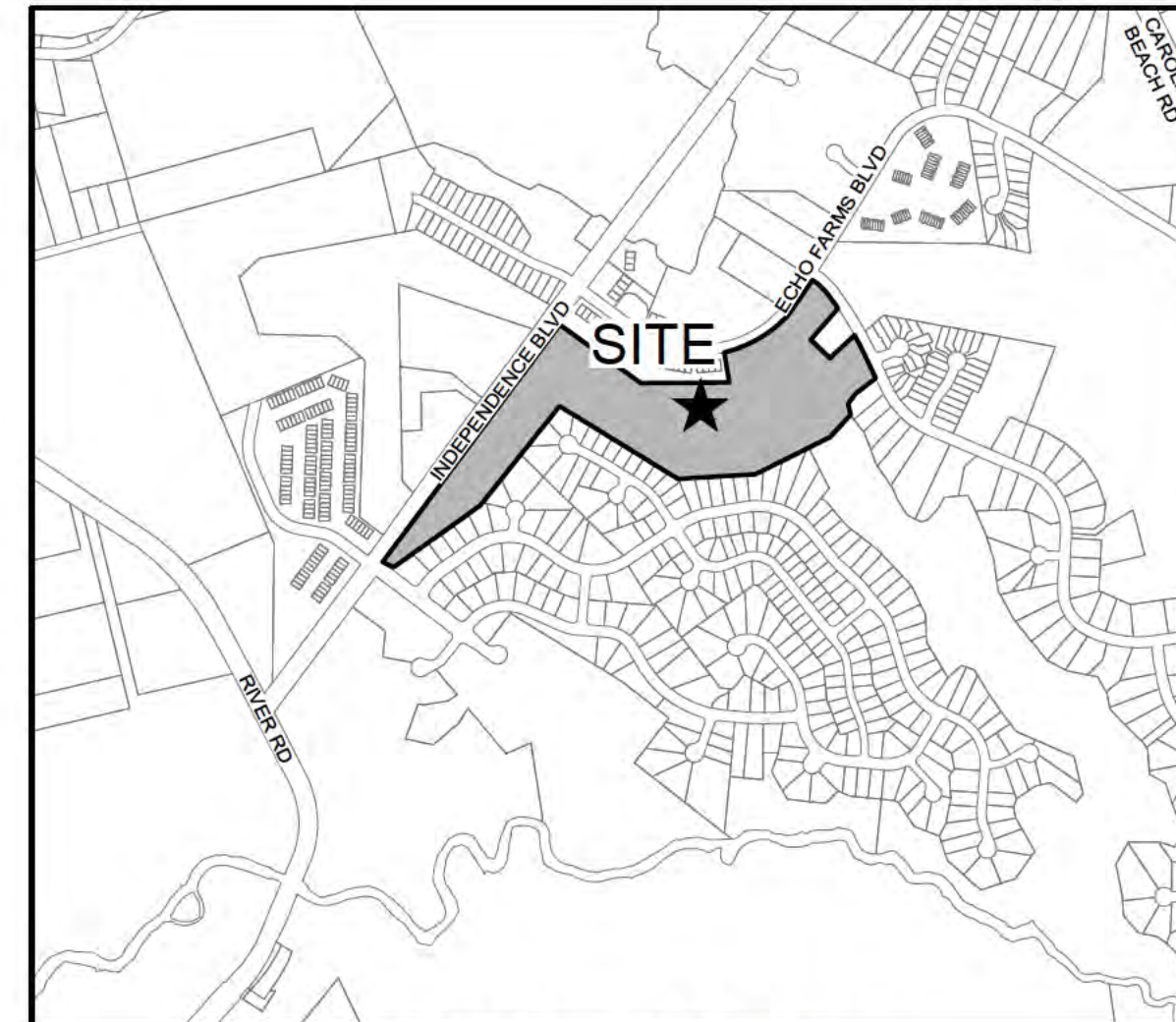
### DESIGN DOCUMENTS

#### JULY 2020

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or consist accordance.	NCDENR PWSS WATER PERMIT #:	_____
	WATER CAPACITY:	_____ GPD
	DWQ SEWER PERMIT #:	_____
	SEWER CAPACITY:	_____ GPD
	SEWER SHED # AND PLANT:	_____
	SEWER TO FLOW THROUGH NEI:	YES or NO (CIRCLE ONE)

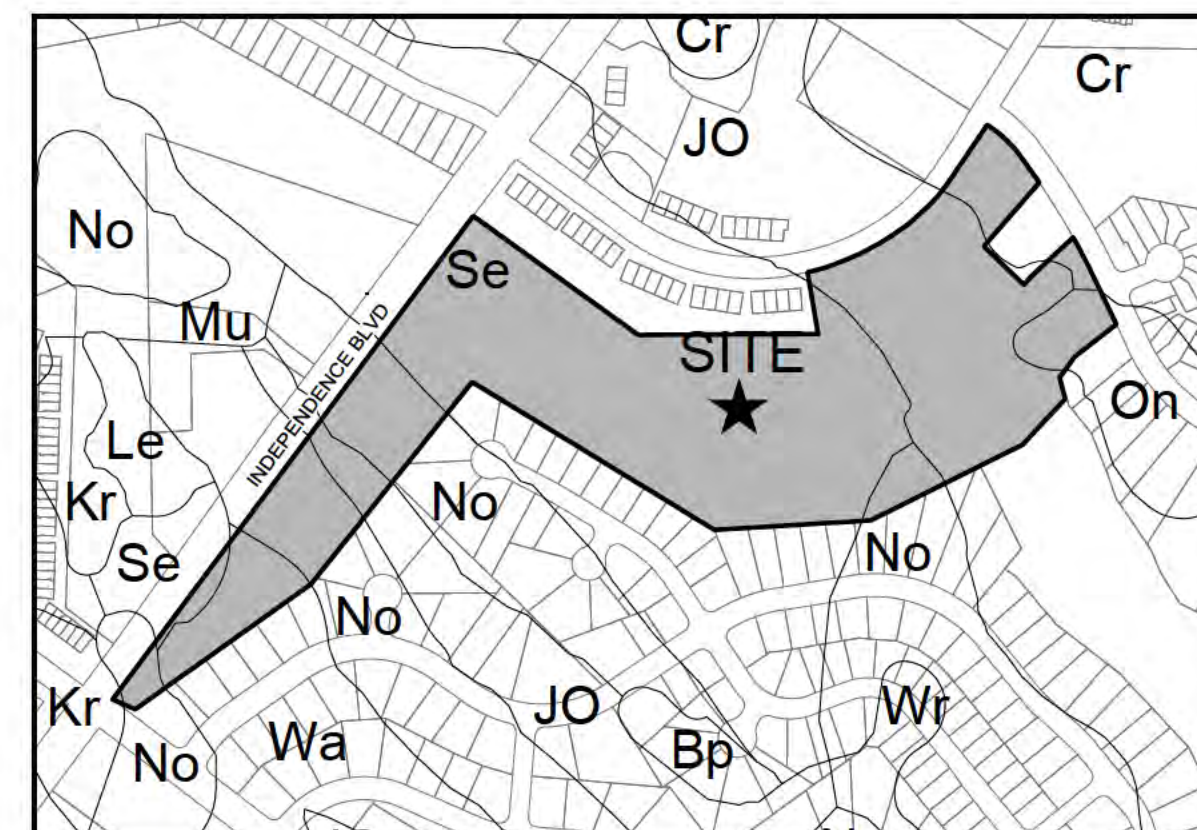
**WOODLANDS AT ECHO FARMS**  
**TRACT 2**  
**APPROVED 7/21/20**  
**SWP 2020024**  
**BC, RC, CW, MB, BM**

**City of WILMINGTON**  
NORTH CAROLINA  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN  
Date: \_\_\_\_\_ Permit #: \_\_\_\_\_  
Signed: \_\_\_\_\_



VICINITY MAP

SCALE: 1"=1000'



SOILS MAP

SCALE: 1"=500'

**NOTICE REQUIRED**

ALL EXISTING UNDERGROUND UTILITIES SHALL BE PHYSICALLY LOCATED PRIOR TO THE BEGINNING OF ANY CONSTRUCTION IN THE VICINITY OF SAID UTILITIES.

CONTRACTORS SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATION AT LEAST TWO WORKING DAYS, BUT NOT MORE THAN TEN WORKING DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION.

CONTRACTORS SHALL CONTACT OVERHEAD ELECTRIC PROVIDER TO COMPLY WITH FEDERAL OSHA 1910.333 MINIMUM APPROACH DISTANCE TO ENERGIZED POWERLINES AND OSH 29 CFR 1926.1407-1411 MUST BE FOLLOWED.

CONTRACTOR SHALL CONTACT AT&T PRIOR TO ANY DEMOLITION TO ALLOW FOR AT&T TO DISCONNECT COMMUNICATIONS CABLES COMING INTO THE SITE.

**CONTACT THESE UTILITIES**

CITY OF WILMINGTON PLANNING & DEVELOPMENT  
ATTN: BRIAN CHAMBERS, PLANNER  
PH: 910-342-2782

ATTN: ZONING INSPECTIONS  
PH: 910-254-0900

PIEDMONT NATURAL GAS  
ATTN: CATHY PLEASANT  
PH: 910-251-2827

EMERGENCY DIAL 911  
POLICE - FIRE - RESCUE  
ATTN: CITY OF WILMINGTON FIRE & LIFE SAFETY  
PH: 910-343-0696

CAPE FEAR PUBLIC UTILITY AUTHORITY (WATER & SEWER)  
ENGINEER NG/INSPECTIONS  
PH: 910-332-6560

OPERATIONS/MAINTENANCE  
PH: 910-322-6550

DUKE ENERGY  
DISTRIBUTION CONSTRUCTION SERVICE  
DEP CSC PH: 1-800-452-2777

TRANSMISSION AGENT  
BILL WILDER  
PH: 910-772-4903

AT&T/BELL SOUTH  
ATTN: STEVE DAYVAULT (BUILD NG ENGINEER NG)  
PH: 910-341-0741

ATTN: JAMES BATSON, ENGINEERING  
PH: 910-341-1621

SPECTRUM  
GENERAL PH: 800-892-4357

OWNER / DEVELOPER:  
ECHO FARMS, LLC C/O MATRIX DEVELOPMENT GROUP  
400 CN FORSGATE DRIVE  
CRANBURY, NEW JERSEY 08512  
(732) 521-2900

ENGINEER (CIVIL):  
PARAMOUNTE ENGINEERING, INC.  
122 CINEMA DRIVE  
WILMINGTON, NORTH CAROLINA 28403  
ATTN: ROB BALLAND, P.E. (910) 791-6707

**SHEET INDEX**

SHEET NUMBER	SHEET TITLE
C-0.0	COVER SHEET
C-1.0 & C-1.1	GENERAL NOTES
C-2.0-2.2	SITE PLANS
C-2.3	SITE INVENTORY PLAN
C-3.0 & C-3.1	PH. I EROSION CONTROL PLANS
C-3.2 & C-3.3	GRADING & DRAINAGE PLANS
C-4.0 - C-4.3	UTILITY PLAN & PROFILES
C-5.0 - C-5.2	DETAILS
C-5.3 - C-5.5	UTILITY DETAILS

PREPARED BY:

**PARAMOUNTE**  
ENGINEERING, INC.

122 Cinema Drive  
Wilmington, North Carolina 28403  
(910) 791-6707 (O) (910) 791-6700 (F)  
NC License #: C-2846

PROJECT # 17358.PE





**GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT**  
 Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

**SECTION E: GROUND STABILIZATION**

Required Ground Stabilization Timeframes		
Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

**Note:** After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

**GROUND STABILIZATION SPECIFICATION**  
 Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

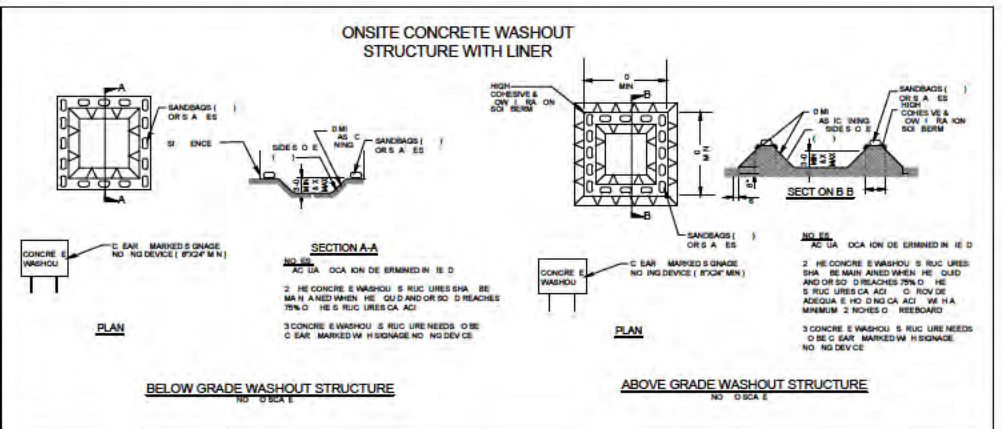
Temporary Stabilization	Permanent Stabilization
<ul style="list-style-type: none"> <li>Temporary grass seed covered with straw or other mulches and tackifiers</li> <li>Hydroseeding</li> <li>Roller erosion control products with or without temporary grass seed</li> <li>Appropriately applied straw or other mulch</li> <li>Plastic sheeting</li> </ul>	<ul style="list-style-type: none"> <li>Permanent grass seed covered with straw or other mulches and tackifiers</li> <li>Geotextile fabrics such as permanent soil reinforcement matting</li> <li>Hydroseeding</li> <li>Shrubs or other permanent plantings covered with mulch</li> <li>Uniform and evenly distributed ground cover sufficient to restrain erosion</li> <li>Structural methods such as concrete, asphalt or retaining walls</li> <li>Roller erosion control products with grass seed</li> </ul>

**POLYACRYLAMIDES (PAMS) AND FLOCCULANTS**

- Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
- Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
- Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
- Provide ponding area for containment of treated Stormwater before discharging offsite.
- Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

**EQUIPMENT AND VEHICLE MAINTENANCE**

- Maintain vehicles and equipment to prevent discharge of fluids.
- Provide drip pans under any stored equipment.
- Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
- Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
- Remove leaking vehicles and construction equipment from service until the problem has been corrected.
- Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.



**LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE**

- Never bury or burn waste. Place litter and debris in approved waste containers.
- Provide a sufficient number and size of waste containers (e.g. dumpster, trash receptacle) on site to contain construction and domestic wastes.
- Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
- Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
- Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
- Anchor all lightweight items in waste containers during times of high winds.
- Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
- Dispose waste off-site at an approved disposal facility.
- On business days, clean up and dispose of waste in designated waste containers.

**CONCRETE WASHOUTS**

- Do not discharge concrete or cement slurry from the site.
- Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
- Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
- Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
- Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
- Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
- Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
- Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
- Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
- At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

**PAINT AND OTHER LIQUID WASTE**

- Do not dump paint and other liquid waste into storm drains, streams or wetlands.
- Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
- Contain liquid wastes in a controlled area.
- Containment must be labeled, sized and placed appropriately for the needs of site.
- Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

**PORTABLE TOILETS**

- Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
- Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
- Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

**EARTHEN STOCKPILE MANAGEMENT**

- Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
- Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
- Provide stable stone access point when feasible.
- Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

**HERBICIDES, PESTICIDES AND RODENTICIDES**

- Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
- Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
- Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
- Do not stockpile these materials onsite.

**HAZARDOUS AND TOXIC WASTE**

- Create designated hazardous waste collection areas on-site.
- Place hazardous waste containers under cover or in secondary containment.
- Do not store hazardous chemicals, drums or bagged materials directly on the ground.

**NCG01 GROUND STABILIZATION AND MATERIALS HANDLING**

EFFECTIVE: 04/01/19

**PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING**

**SECTION A: SELF-INSPECTION**  
 Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those unattended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&S Measures	At least once per 7 calendar days and within 24 hours of a rain event > 1.0 inch in 24 hours	1. Identification of the measures inspected. 2. Date and time of the inspection. 3. Name of the person performing the inspection. 4. Indication of whether the measures were operating properly. 5. Description of maintenance needs for the measure. 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDOs)	At least once per 7 calendar days and within 24 hours of a rain event > 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected. 2. Date and time of the inspection. 3. Name of the person performing the inspection. 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration. 5. Indication of visible sediment leaving the site. 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event > 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits. 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event > 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream discharge, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit and this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&S measures, clearing and grubbing, installation of storm drainage facilities, completion of all land disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

**NOTE:** The rain inspection resets the required 7 calendar day inspection requirement.

**PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING**

**SECTION B: RECORDKEEPING**  
**1. E&S Plan Documentation**  
 The approved E&S plan as well as any approved deviation shall be kept on the site. The approved E&S plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&S plan shall be documented in the manner described:

Item to Document	Documentation Requirements
(a) Each E&S Measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&S Plan.	Initial and date each E&S Measure on a copy of the approved E&S Plan or complete, date and sign an inspection report that lists each E&S Measure shown on the approved E&S Plan. This documentation is required upon the initial installation of the E&S Measures or if the E&S Measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&S Plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&S Plan.	Initial and date a copy of the approved E&S Plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&S Measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&S Measures.	Initial and date a copy of the approved E&S Plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

**2. Additional Documentation**  
 In addition to the E&S Plan documents above, the following items shall be kept on the site and available for agency inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

- This general permit as well as the certificate of coverage, after it is received.
- Records of inspections made during the previous 30 days. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.
- All data used to complete the Notice of Intent and older inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

**PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING**

**SECTION C: REPORTING**  
**1. Occurrences that must be reported**  
 Permittees shall report the following occurrences:  
 (a) Visible sediment deposition in a stream or wetland.  
 (b) Oil spills if:  
 • They are 25 gallons or more,  
 • They are less than 25 gallons but cannot be cleaned up within 24 hours,  
 • They cause sheen on surface waters (regardless of volume), or  
 • They are within 100 feet of surface waters (regardless of volume).  
 (c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.  
 (d) Anticipated bypasses and unanticipated bypasses.  
 (e) Noncompliance with the conditions of this permit that may endanger health or the environment.

**2. Reporting Timeframes and Other Requirements**  
 After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at (800) 662-7956, (800) 858-0368 or (919) 733-3300.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	<ul style="list-style-type: none"> <li>Within 24 hours, an oral or electronic notification.</li> <li>Within 7 calendar days, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis.</li> <li>If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring. Inspectors or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired waters conditions.</li> </ul>
(b) Oil spills and release of hazardous substances per Item 10(c) above	<ul style="list-style-type: none"> <li>Within 24 hours, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.</li> </ul>
(c) Anticipated bypasses [40 CFR 122.41(m)(5)]	<ul style="list-style-type: none"> <li>A report at least ten days before the date of the bypass. If possible, the report shall include an evaluation of the anticipated quality and effect of the bypass.</li> </ul>
(d) Unanticipated bypasses [40 CFR 122.41(m)(4)]	<ul style="list-style-type: none"> <li>Within 24 hours, an oral or electronic notification.</li> <li>Within 7 calendar days, a report that includes an evaluation of the quality and effect of the bypass.</li> </ul>
(e) Noncompliance with the conditions of this permit that may endanger health or the environment [40 CFR 122.41(f)(7)]	<ul style="list-style-type: none"> <li>Within 24 hours, an oral or electronic notification.</li> <li>Within 7 calendar days, a report that contains a description of the noncompliance and its causes, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue, and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. [40 CFR 122.41(f)(6)].</li> <li>Division staff may waive the requirement for a written report on a case-by-case basis.</li> </ul>

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NCDCNR PWSS WATER PERMIT #: \_\_\_\_\_  
 WATER CAPACITY: \_\_\_\_\_ GPD  
 DWQ SEWER PERMIT #: \_\_\_\_\_  
 SEWER CAPACITY: \_\_\_\_\_ GPD  
 SEWER SHED # AND PLANT: \_\_\_\_\_  
 SEWER TO FLOW THROUGH NET: YES or NO (CIRCLE ONE)

**WILMINGTON**  
 NORTH CAROLINA  
 Public Services • Engineering Division  
 APPROVED STORMWATER MANAGEMENT PLAN  
 Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
 Signed: \_\_\_\_\_

**WOODLANDS AT ECHO FARMS**  
 TRACT 2  
 APPROVED 7/21/20  
 SWP 2020024  
 BC, RC, CW, MB, BM



**NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING**

EFFECTIVE: 04/01/19

REVISIONS:

**PARAMOUNT ENGINEERING**  
 122 Cinema Drive  
 Wilmington, North Carolina 28403  
 (910) 791-6707 (O) (910) 791-6760 (F)  
 NC License #: C-2846

**GENERAL NOTES**  
 TRACT 2  
 WOODLANDS @ ECHO FARMS  
 NEW HANOVER COUNTY  
 NORTH CAROLINA

**PROJECT STATUS**  
 CONCEPTUAL LAYOUT:  
 PRELIMINARY LAYOUT:  
 RELEASED FOR CONSTRUCTION:  
 DRAWING INFORMATION  
 DATE: 07/21/20  
 DESIGNED BY: RPB  
 DRAWN BY: RPB  
 CHECKED BY: RPB

**C-1.1**  
 PEI JOB#: 17358.PE

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION



**LEGEND:**

[Symbol]	PROPOSED CONCRETE
[Symbol]	PROPOSED LIGHT POLE
[Symbol]	PROPOSED ACTIVE OPEN SPACE
[Symbol]	PROPOSED PASSIVE OPEN SPACE
[Symbol]	PROPOSED 25' COD BUFFER
[Symbol]	PROPOSED 30' AEC BUFFER
[Symbol]	EXISTING WETLAND BOUNDARY

**SITE DATA TABULATION**

OWNER: ECHO FARMS, LLC  
 MATRIX DEVELOPMENT GROUP  
 CN 400 FORSGATE DRIVE  
 CRANBURY, NJ 08012  
 4114 ECHO FARMS BLVD.  
 WILMINGTON, NC 28412  
 R07006-002-001-000  
 BK 2307, PG 450  
 26.75 ACRES (1,165,205 SF)  
 MF-M  
 URBAN/ CONSERVATION AREA  
 35' - 96' (WITH ADDITIONAL YARD REQ.)  
 GOLF COURSE  
 SINGLE-FAMILY RESIDENTIAL (DETACHED)

PROJECT ADDRESS:  
 TAX PARCEL IDENTIFICATION #:  
 RECORDED DEED BOOK:  
 TOTAL SITE AREA:  
 CURRENT ZONING:  
 CAMA LAND USE CLASSIFICATION:  
 MAXIMUM ALLOWABLE BUILDING HEIGHT:  
 EXISTING LAND USE:  
 PROPOSED LAND USE:

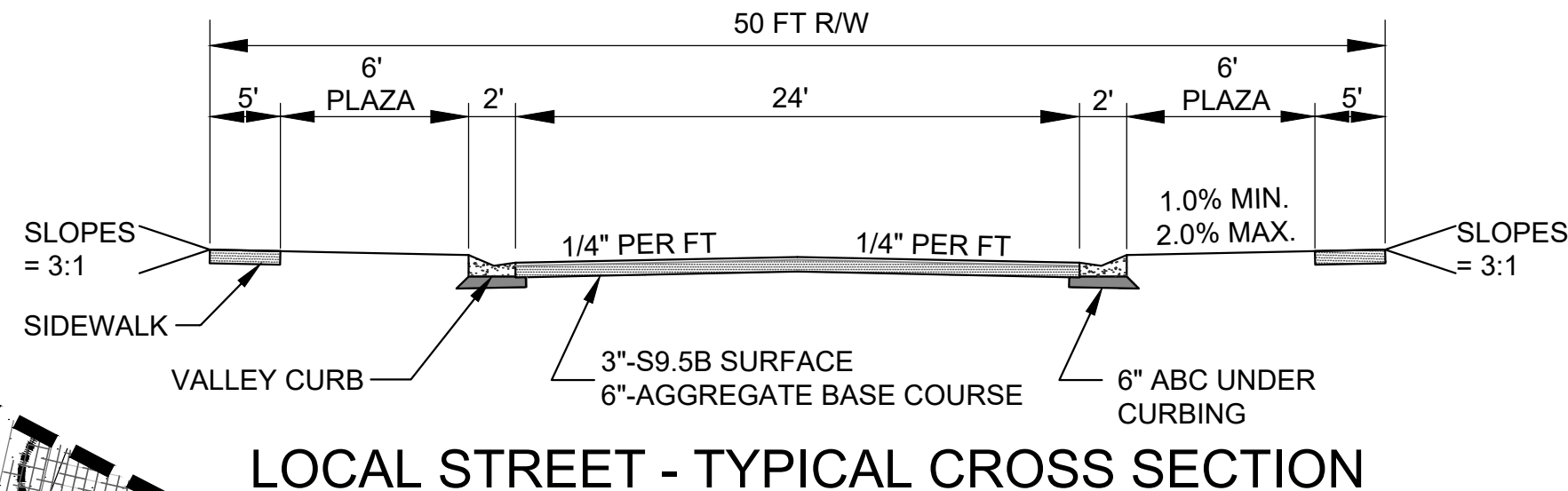
**GENERAL NOTES:**

- INSTALL REFLECTORS PER CITY AND NCDOT STANDARDS. TRAFFIC ENGINEERING MUST APPROVE OF PAVEMENT MARKING LAYOUT PRIOR TO ACTUAL STRIPING.
- IT SHALL BE THE RESPONSIBILITY OF THE SUBDIVIDER TO ERECT OFFICIAL STREET NAME SIGNS AT ALL INTERSECTIONS ASSOCIATED WITH THE SUBDIVISION IN ACCORDANCE WITH THE TECHNICAL STANDARDS AND SPECIFICATIONS MANUAL. THE SUBDIVIDER MAY ACQUIRE AND ERECT OFFICIAL STREET NAME SIGNS OR MAY CHOOSE TO CONTRACT WITH THE CITY TO INSTALL THE STREET SIGNS AND THE SUBDIVIDER SHALL PAY THE COST OF SUCH INSTALLATION. CONTACT TRAFFIC ENGINEERING AT 910-341-7888 TO DISCUSS INSTALLATION OF TRAFFIC AND STREET NAME SIGNS. PROPOSED STREET NAMES MUST BE APPROVED PRIOR TO INSTALLATION OF STREET NAME SIGNS.
- ALL SIGNS AND PAVEMENT MARKINGS IN AREAS OPEN TO PUBLIC TRAFFIC ARE TO MEET MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES) STANDARDS.
- CONTACT TRAFFIC ENGINEERING FORTY-EIGHT HOURS PRIOR TO ANY EXCAVATION IN THE RIGHT-OF-WAY. 910-341-3258

**CONSERVATION RESOURCE:**

RESOURCE TYPE: HEADWATER SWAMP/SWAMP FOREST  
 SETBACK DISTANCE: 25 FEET (RESIDENTIAL)  
 SETBACK AREA: 72,717 SF

ROADWAY GRADING IMPERVIOUS (TRAIL)  
 TOTAL IMPACT: 3,502 SF (4.8%)  
 6,908 SF (9.5%)  
 1,483 SF (2.0%)  
 11,893 SF (16.4%)



LINE	BEARING	DISTANCE
L1	S 36°47'34" W	44.71'
L2	S 37°34'14" E	1.31'
L3	N 54°13'09" W	26.24'
L4	N 87°18'04" E	39.88'
L5	S 40°25'47" W	23.75'
L6	S 70°51'34" W	14.23'
L7	S 54°32'17" W	34.35'
L8	S 38°38'00" W	35.97'
L9	N 54°33'10" E	1.32'
L10	N 59°39'31" E	47.37'
L11	S 36°51'53" W	10.01'
L12	S 54°13'15" E	5.15'
L13	S 51°28'07" E	44.85'
L14	N 67°47'08" W	32.38'
L15	N 54°13'09" W	18.94'
L16	S 68°22'43" E	34.22'
L17	S 36°46'19" W	15.83'
L18	N 89°44'30" W	4.83'
L19	S 40°25'47" W	43.90'
L20	N 17°44'04" W	30.35'
L21	N 67°47'08" W	49.40'
L22	S 51°28'07" E	40.54'
L23	S 17°40'24" E	30.00'
L24	N 68°42'15" W	18.62'
L25	N 88°48'21" W	33.43'
L26	S 38°38'00" W	5.03'
L27	N 00°55'24" E	17.37'
L28	S 59°58'24" E	3.02'
L29	N 23°37'17" E	10.23'
L30	S 39°11'51" W	13.59'
L31	N 51°28'07" W	10.55'
L32	N 66°22'43" W	47.59'
L33	N 17°40'24" W	47.79'
L34	N 59°39'31" E	4.73'
L35	N 10°00'00" W	49.72'
L36	S 89°34'27" E	47.79'
L37	N 51°28'07" W	4.92'
L38	S 68°22'43" E	7.12'
L39	S 54°53'47" E	18.62'
L40	N 68°48'21" W	29.58'
L41	N 67°47'08" W	17.16'
L42	S 10°00'00" E	49.72'
L43	N 00°00'00" E	49.72'
L44	N 10°00'00" W	48.29'
L45	N 10°00'00" W	29.38'
L46	N 80°00'00" E	50.07'
L47	S 70°51'34" W	9.38'
L48	N 66°42'15" W	9.41'
L49	S 80°00'00" W	50.07'
L50	N 26°05'11" E	47.21'
L51	N 10°00'00" E	48.29'
L52	N 80°00'00" E	50.07'
L53	S 10°00'00" W	29.39'
L54	S 80°00'00" W	50.07'
L55	S 33°18'18" W	50.07'
L56	S 34°22'33" E	2.52'
L57	S 47°16'07" E	32.82'
L58	S 23°39'27" W	50.07'
L59	N 24°28'37" W	13.78'
L60	N 44°29'16" E	0.04'
L61	N 11°53'13'45" W	10.37'
L62	N 53°13'45" W	40.00'
L63	S 65°56'15" E	12.33'
L64	S 30°36'29" E	15.85'
L65	N 54°32'17" E	34.36'
L66	N 35°27'43" W	11.00'
L67	N 54°32'17" E	28.00'
L68	S 39°21'43" E	11.00'
L69	N 53°13'51" W	1.35'
L70	S 30°20'29" E	5.81'
L71	N 89°44'30" W	10.97'
L72	S 40°25'47" W	43.32'
L73	S 40°25'47" W	22.01'
L74	S 70°51'34" W	13.24'
L75	S 70°51'34" W	10.37'
L76	N 66°42'15" W	9.49'
L77	N 24°13'22" E	5.00'

**SETBACK STANDARDS**

MINIMUM FRONT SETBACK	15 FT
MINIMUM SIDE SETBACK	5 FT
MINIMUM CORNER SETBACK	10 FT
MINIMUM REAR SETBACK	15 FT

**PROVIDED / REQUIRED**

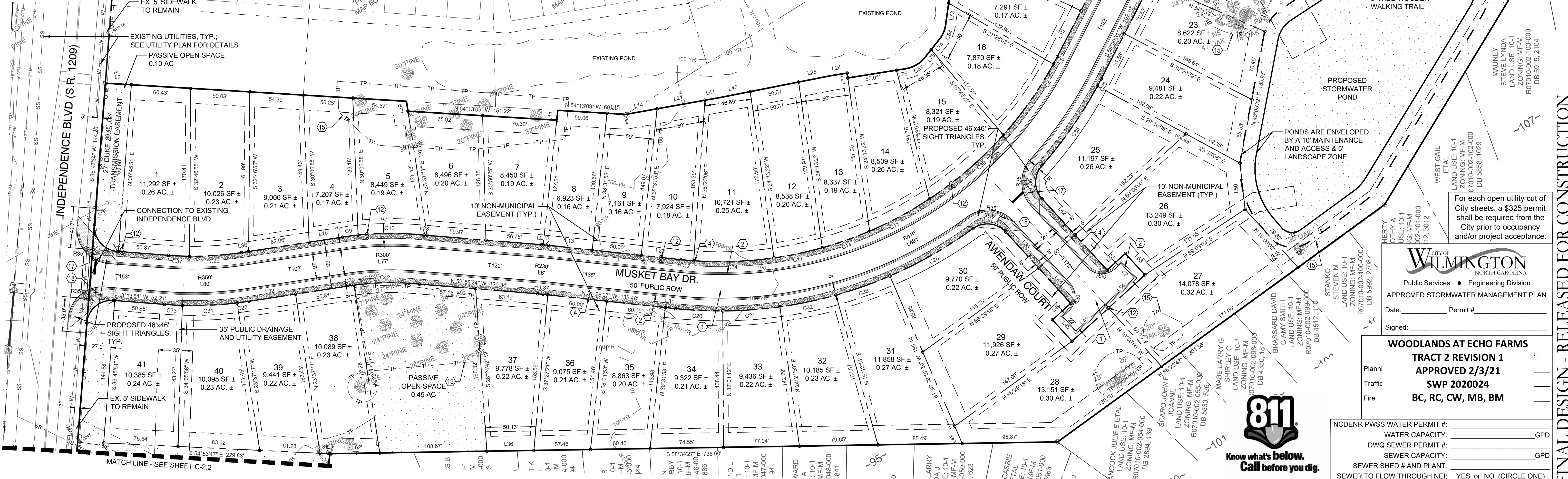
PROVIDED	REQUIRED
15 FT	15 FT
5 FT	5 FT
10 FT	10 FT
15 FT	15 FT

**KEY NOTES:**

- ASPHALT PAVING: REFER TO DETAIL C-5.0
- VALLEY CURB: REFER TO DETAIL C-5.0
- STANDARD 24" CURB & GUTTER: REFER TO DETAIL C-5.0
- TRANSITION CURB DETAIL: SEE DETAIL C-5.0
- CONCRETE SIDEWALK: REFER TO DETAIL C-5.0
- EXPOSED FACE CONCRETE SIDEWALK TO ASPHALT DETAIL: SEE DETAIL C-5.0
- HANDICAP PARKING SIGN: REFER TO DETAIL C-5.0
- DETECTABLE WARNING MAT: REFER TO DETAIL C-5.0
- HANDICAP PARKING SYMBOL: REFER TO DETAIL C-5.0
- HANDICAP ACCESS UNLOADING ZONE: SLOPE 2% MAX. EACH WAY (ADA COMPLIANT) AND STRIPE AS SHOWN.
- DESIGNATED ACCESSIBLE ROUTE: PROVIDE STRIPING AND SLOPE 5% MAXIMUM IN DIRECTION OF TRAVEL WITH 2% MAXIMUM CROSS SLOPE.
- CONCRETE BUMPER BLOCK: 8" w x 4" h x 6'-0" LONG CONCRETE. ANCHOR TO PAVING WITH (2) 1"-Ø LONG #4 REBAR. REFER TO DETAIL C-5.0
- STREET LIGHTING FIXTURES: OWNER TO COORDINATE WITH C.O.W.
- BICYCLE RACK (5 BIKE MIN. PER RACK): CONTRACTOR SHALL SUBMIT SHOP DWGS.
- STRIPING: PROVIDE 4" WIDE PARKING LOT STRIPING AS SHOWN. USE HIGHWAY MARKING PAINT - WHITE (2 COATS).
- TREE PROTECTION FENCING: SEE DETAIL C-5.1
- C.O.W. SIGHT DISTANCE TRIANGLE: SIGHT DISTANCE TRIANGLE 20'X70' ALL PROPOSED VEGETATION WITHIN SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30'-10'
- STOP SIGN (PER MUTCD): SEE DETAIL C-5.0
- STREET SIGN: SEE DETAIL C-5.0
- SEGMENTAL RETAINING WALL: CONTRACTOR SHALL SUBMIT DESIGN BUILD FOR OWNER REVIEW

**CONSERVATION RESOURCE:**

ROADWAY GRADING IMPERVIOUS (TRAIL)  
 TOTAL IMPACT: 3,502 SF (4.8%)  
 6,908 SF (9.5%)  
 1,483 SF (2.0%)  
 11,893 SF (16.4%)



**REVISIONS:**

NO.	DATE	REVISION

**CLIENT INFORMATION:**  
 ECHO FARMS, LLC  
 c/o MATRIX DEVELOPMENT GROUP  
 CN 4000 FORSGATE DRIVE  
 CRANBURY, NJ 08512

**PARAMOUNT ENGINEERING**  
 122 Cinema Drive  
 Wilmington, North Carolina 28403  
 (910) 791-6707 (O) (910) 791-6760 (F)  
 NC License #: C-2846

**SITE PLAN TRACT 2 WOODLANDS @ ECHO FARMS CITY OF WILMINGTON NORTH CAROLINA**

**FINAL DESIGN - RELEASED FOR CONSTRUCTION**

**PROJECT STATUS:**  
 ORIGINAL LAYOUT: \_\_\_\_\_  
 REVISIONS: \_\_\_\_\_  
 RELEASED FOR CONSTRUCTION: \_\_\_\_\_

**DRAWING INFORMATION:**  
 DATE: 12/07/20  
 SCALE: 1" = 50'  
 DRAWING NO: R18  
 CHECKED: \_\_\_\_\_

**APPROVED STORMWATER MANAGEMENT PLAN**  
 Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
 Signed: \_\_\_\_\_

**WOODLANDS AT ECHO FARMS TRACT 2 REVISION 1 APPROVED 2/3/21 SWP 2020024 BC, RC, CW, MB, BM**

**811 Know what's below. Call before you dig.**

**PLANNI:** Traffic, Fire

**NCDENR PWSS WATER PERMIT #:** \_\_\_\_\_ GPD  
**WATER CAPACITY:** \_\_\_\_\_ GPD  
**DWO SEWER PERMIT #:** \_\_\_\_\_ GPD  
**SEWER CAPACITY:** \_\_\_\_\_ GPD  
**SEWER SHED # AND PLANT:** \_\_\_\_\_  
**SEWER TO FLOW THROUGH NEI:** YES or NO (CIRCLE ONE)

**C-2.1**  
 PEI JOB#: 17358.PE

**LEGEND:**

	PROPOSED CONCRETE
	PROPOSED LIGHT POLE
	PROPOSED ACTIVE OPEN SPACE
	PROPOSED PASSIVE OPEN SPACE
	PROPOSED 25' COD BUFFER
	PROPOSED 30' AEC BUFFER
	EXISTING WETLAND BOUNDARY

- KEY NOTES:**
- ASPHALT PAVING: REFER TO DETAIL C-5.0
  - VALLEY CURB: REFER TO DETAIL C-5.0
  - STANDARD 24" CURB & GUTTER: REFER TO DETAIL C-5.0
  - TRANSITION CURB DETAIL: SEE DETAIL C-5.0
  - CONCRETE SIDEWALK: REFER TO DETAIL C-5.0
  - EXPOSED FACE CONCRETE SIDEWALK TO ASPHALT DETAIL: SEE DETAIL C-5.0
  - HANDICAP PARKING SIGN: REFER TO DETAIL C-5.0
  - DETECTABLE WARNING MAT: REFER TO DETAIL C-5.0
  - HANDICAP PARKING SYMBOL: REFER TO DETAIL C-5.0
  - HANDICAP ACCESS UNLOADING ZONE: SLOPE 2% MAX. EACH WAY (ADA COMPLIANT) AND STRIPE AS SHOWN.
  - DESIGNATED ACCESSIBLE ROUTE: PROVIDE STRIPING AND SLOPE 5% MAXIMUM IN DIRECTION OF TRAVEL WITH 2% MAXIMUM CROSS SLOPE.
  - CONCRETE BUMPER BLOCK: 8" x 4" x 6" LONG CONCRETE. ANCHOR TO PAVING WITH (2) 1" 6" LONG #4 REBAR. REFER TO DETAIL C-5.0
  - STREET LIGHTING FIXTURES: OWNER TO COORDINATE WITH C.O.W.
  - BICYCLE RACK (6 BIKE MIN. PER RACK): SEE ARCHITECTURAL PLANS
  - STRIPING: PROVIDE 4" WIDE PARKING LOT STRIPING AS SHOWN. USE HIGHWAY MARKING PAINT - WHITE (2 COATS).
  - TREE PROTECTION FENCING: SEE DETAIL C-5.1
  - C.O.W. SIGHT DISTANCE TRIANGLE: SIGHT DISTANCE TRIANGLE 20'X70' ALL PROPOSED VEGETATION WITHIN SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30'-10'
  - STOP SIGN (PER MUTCD): SEE DETAIL C-5.0
  - STREET SIGN: SEE DETAIL C-5.0

**SITE DATA TABULATION**

**OWNER:** ECHO FARMS, LLC  
MATRIX DEVELOPMENT GROUP  
CN 400 FORSGATE DRIVE  
CRANBURY, NJ 08512

**PROJECT ADDRESS:** 4114 ECHO FARMS BLVD.  
WILMINGTON, NC 28412

**TAX PARCEL IDENTIFICATION #:** R07006-002-001-000  
**RECORDED DEED BOOK:** BK 2307, PG 450  
**TOTAL SITE AREA:** 26.75 ACRES (1,165,205 SF)  
**CURRENT ZONING:** MF-M  
**CAMA LAND USE CLASSIFICATION:** URBAN/ CONSERVATION AREA  
**MAXIMUM ALLOWABLE BUILDING HEIGHT:** 35' - 96" (WITH ADDITIONAL YARD REQ.)  
**EXISTING LAND USE:** GOLF COURSE  
**PROPOSED LAND USE:** SINGLE-FAMILY RESIDENTIAL (DETACHED)  
**REQUIRED/PROPOSED LOT COVERAGE:** 50% MAX PER CODE

- GENERAL NOTES:**
- INSTALL REFLECTORS PER CITY AND NCDOT STANDARDS. TRAFFIC ENGINEERING MUST APPROVE OF PAVEMENT MARKING LAYOUT PRIOR TO ACTUAL STRIPING.
  - IT SHALL BE THE RESPONSIBILITY OF THE SUBDIVIDER TO ERECT OFFICIAL STREET NAME SIGNS AT ALL INTERSECTIONS ASSOCIATED WITH THE SUBDIVISION IN ACCORDANCE WITH THE TECHNICAL STANDARDS AND SPECIFICATIONS MANUAL. THE SUBDIVIDER MAY ACQUIRE AND ERECT OFFICIAL STREET NAME SIGNS OR MAY CHOOSE TO CONTRACT WITH THE CITY TO INSTALL THE STREET SIGNS AND THE SUBDIVIDER SHALL PAY THE COST OF SUCH INSTALLATION. CONTACT TRAFFIC ENGINEERING AT 910-341-7888 TO DISCUSS INSTALLATION OF TRAFFIC AND STREET NAME SIGNS. PROPOSED STREET NAMES MUST BE APPROVED PRIOR TO INSTALLATION OF STREET NAME SIGNS.
  - ALL SIGNS AND PAVEMENT MARKINGS IN AREAS OPEN TO PUBLIC TRAFFIC ARE TO MEET MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES) STANDARDS.
  - CONTACT TRAFFIC ENGINEERING FORTY-EIGHT HOURS PRIOR TO ANY EXCAVATION IN THE RIGHT-OF-WAY. 910-341-3258

**CONSERVATION RESOURCE:**

RESOURCE TYPE:	HEADWATER SWAMP/SWAMP FOREST
SETBACK DISTANCE:	25 FEET (RESIDENTIAL)
SETBACK AREA:	72,717 SF
SETBACK AREA IMPACT:	
ROADWAY GRADING:	3,502 SF (4.8%)
IMPERVIOUS (TRAIL):	6,908 SF (9.5%)
TOTAL IMPACT:	1,483 SF (2.0%)
	11,893 SF (16.4%)

- STREET LIGHTING NOTES:**
- THE STANDARD STREETLIGHT SHALL BE A DEP ENCLOSED CUTOFF (COBRA TYPE), HIGH PRESSURE SODIUM VAPOR (HPSV) OR DEP DESIGNATED LED EQUIVALENT FIXTURE INSTALLED WITHIN THE RECOMMENDED RANGE OF MOUNTING HEIGHTS FOR THE SPECIFIC FIXTURE. THE STANDARD STREETLIGHT SHALL BE INSTALLED ON A WOODEN POLE IN AREAS SERVED FROM OVERHEAD FACILITIES AND ON A FIBERGLASS POLE IN AREAS SERVED FROM UNDERGROUND FACILITIES.
  - A LAYOUT FOR THE STANDARD STREET LIGHTING HAS BEEN PROVIDED WITH THE REVIEW. MINIMUM OF SEVEN STREET LIGHTS ARE REQUIRED FOR THIS SUB-DIVISION. ALTHOUGH, DEVELOPERS MAY CHOOSE TO PROVIDE ANY EXTRA LIGHTS OR ORNAMENTAL. ANY INSTALLATIONS ABOVE THE CRITERIA OF STANDARD STREET LIGHTING, WILL BE CONSIDERED AS NONSTANDARD AND HAS TO CONFORM TO THE CITY'S NON-STANDARD STREET LIGHTING PROCEDURE AS PER THE POLICY.
  - IF DEVELOPER PREFERS TO INSTALL NON-STANDARD STREET LIGHTS FOR THIS SUB-DIVISION, AT LEAST ONE NON-STANDARD STREET LIGHT WILL BE REQUIRED AT THE INTERSECTION OF MCCARLEY BLVD. AND PROPOSED ROAD A.
  - DEVELOPERS SHALL BEAR ANY INSTALLATION COSTS ASSOCIATED WITH STREETLIGHTS, IF APPLICABLE. IN AREAS SERVED FROM UNDERGROUND FACILITIES, THE DEVELOPERS SHALL PAY THE ONE-TIME UNDERGROUND CONTRIBUTION CHARGE, IF APPLICABLE.
  - THE PLANNING, DEVELOPMENT AND TRANSPORTATION DIRECTOR OR DESIGNEE AND THE CITY LANDSCAPE DESIGNER WILL COORDINATE PLAZA PLANTINGS AND STREETLIGHT LOCATIONS TO MINIMIZE THE OBSTRUCTION OF LIGHT BY VEGETATION.



APPROVED STORMWATER MANAGEMENT PLAN

Date: \_\_\_\_\_ Permit # \_\_\_\_\_

Signed: \_\_\_\_\_

**WOODLANDS AT ECHO FARMS**  
**TRACT 2 REVISION 1**  
**APPROVED 2/3/21**  
**SWP 2020024**  
**BC, RC, CW, MB, BM**

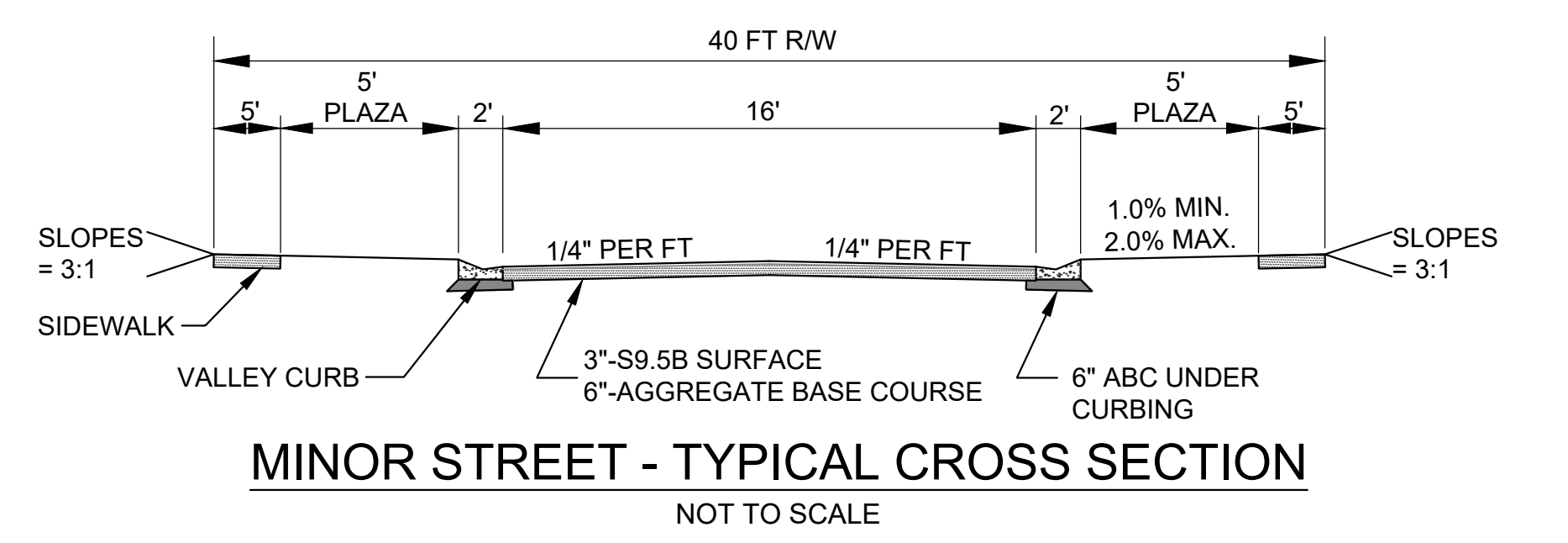
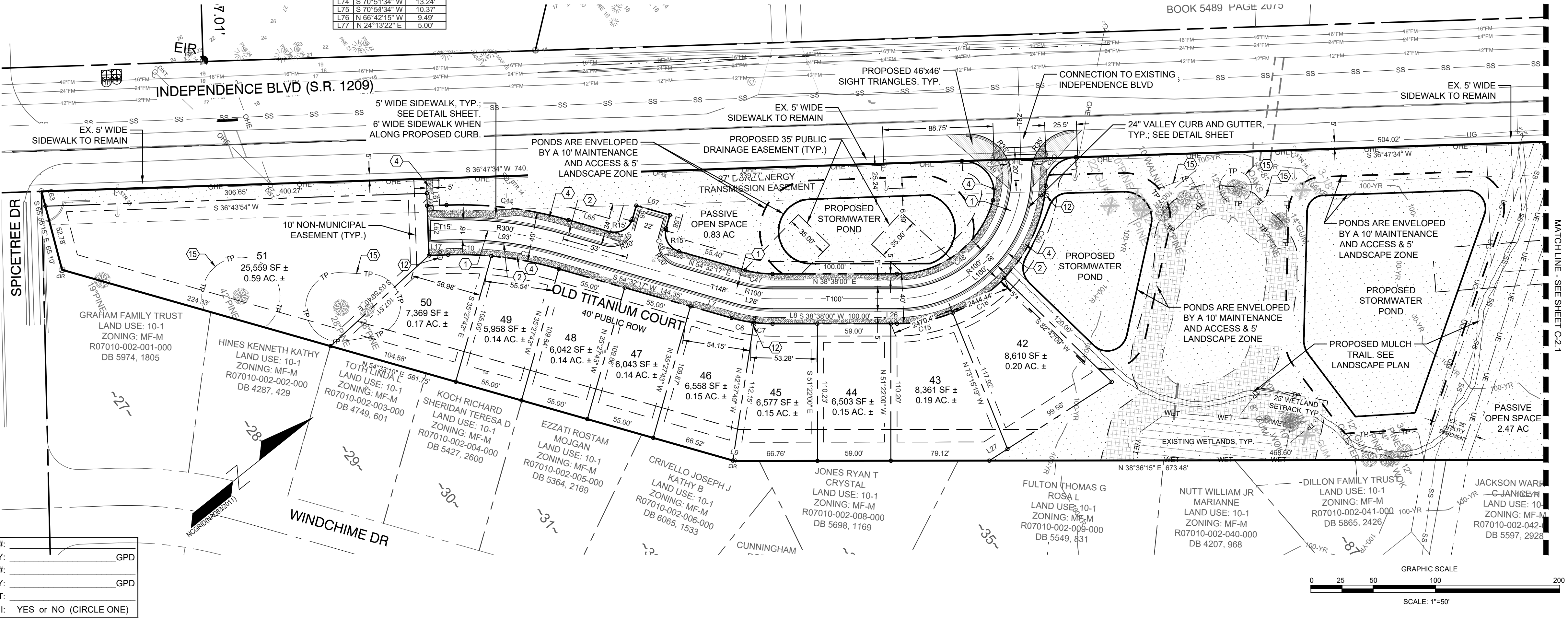


For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NCDENR PWSS WATER PERMIT #:

WATER CAPACITY:	_____ GPD
DWQ SEWER PERMIT #:	_____
SEWER CAPACITY:	_____ GPD
SEWER SHED # AND PLANT:	_____
SEWER TO FLOW THROUGH NEI:	YES or NO (CIRCLE ONE)

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA	LINE BEARING	DISTANCE
C1	25.00'	39.28'	35.36'	S 08°13'04" E	90°01'15"	L1 S 36°47'34" W	44.71'
C2	25.00'	30.56'	28.69'	S 62°41'22" W	70°01'57"	L2 S 53°13'41" E	1.31'
C3	280.71'	55.30'	55.21'	S 49°30'56" W	11°17'15"	L3 S 54°13'09" W	28.24'
C4	385.00'	50.17'	50.13'	S 63°46'57" E	7°27'56"	L4 N 87°18'04" E	39.88'
C5	26.00'	13.81'	13.85'	S 55°38'40" W	30°25'48"	L5 S 40°25'47" W	23.75'
C6	120.00'	18.24'	18.22'	S 55°13'34" W	6°42'27"	L6 S 75°12'54" W	14.23'
C7	120.00'	15.07'	15.06'	S 42°13'55" W	7°11'50"	L7 S 54°32'17" W	34.35'
C8	385.00'	2.63'	2.63'	N 59°5'11" E	0°23'28"	L8 S 38°38'00" W	35.97'
C9	325.00'	16.07'	16.07'	S 64°57'44" E	2°49'58"	L9 N 53°33'01" E	1.32'
C10	280.71'	34.73'	34.71'	S 40°19'40" W	47.37'	L10 N 59°39'31" E	47.37'
C11	385.00'	52.92'	52.88'	S 84°46'11" E	7°52'32"	L11 S 38°31'53" W	10.01'
C12	385.00'	12.99'	12.99'	S 52°38'53" E	1°56'01"	L12 S 51°02'01" E	40.34'
C13	152.00'	28.68'	28.62'	S 11°36'03" E	13°08'42"	L13 S 51°28'07" E	44.85'
C14	385.00'	51.02'	50.98'	S 77°02'08" E	7°35'33"	L14 N 67°47'08" W	32.38'
C15	120.00'	45.84'	45.57'	S 27°41'20" W	21°53'19"	L15 N 54°15'09" W	18.94'
C16	325.00'	16.07'	16.07'	S 64°57'44" E	2°49'58"	L16 S 52°33'01" E	1.32'
C17	385.00'	50.14'	50.11'	S 69°30'30" E	7°27'44"	L17 S 38°46'19" W	15.55'
C18	120.00'	50.35'	49.99'	S 04°43'25" W	24°02'31"	L18 N 89°44'30" W	8.93'
C19	125.00'	8.47'	8.47'	S 97°43'08" W	3°32'54"	L19 S 40°25'47" W	4.90'
C20	435.00'	47.85'	47.83'	N 54°49'12" W	6°18'11"	L20 N 17°44'04" W	30.35'
C21	435.00'	58.17'	58.13'	N 61°48'10" W	7°39'44"	L21 N 67°47'08" W	49.40'
C22	375.00'	12.41'	12.41'	N 69°25'51" W	1°53'45"	L22 S 51°02'01" E	40.34'
C23	435.00'	8.15'	8.15'	S 60°11'43" W	1°04'23"	L23 S 17°40'24" E	30.00'
C24	75.00'	101.23'	93.72'	N 20°59'33" E	77°19'55"	L24 N 68°42'15" W	16.62'
C25	125.00'	45.91'	45.85'	S 65°59'39" W	21°02'31"	L25 N 69°46'21" W	33.43'
C26	435.00'	97.19'	96.99'	N 87°21'33" W	12°48'05"	L26 S 38°38'00" W	5.03'
C27	25.00'	36.55'	33.38'	N 51°52'48" W	83°45'36"	L27 N 05°53'47" E	17.37'
C28	285.00'	5.38'	5.38'	N 52°13'15" W	1°30'16"	L28 S 52°59'24" E	3.02'
C29	325.00'	53.19'	53.13'	S 61°41'25" E	9°22'37"	L29 N 23°37'17" E	10.23'
C30	275.00'	4.19'	4.19'	N 65°56'30" W	0°52'26"	L30 S 52°15'18" E	1.55'
C31	375.00'	55.67'	55.62'	N 60°13'48" W	6°30'21"	L31 N 51°02'01" E	10.16'
C32	435.00'	58.17'	58.13'	N 69°27'54" W	7°39'44"	L32 N 66°22'43" W	47.59'
C33	375.00'	17.99'	17.99'	N 54°36'09" W	2°44'56"	L33 N 17°46'24" W	47.72'
C34	385.00'	81.73'	81.70'	S 69°41'48" W	17°09'44"	L34 N 53°13'41" E	4.23'
C35	435.00'	98.23'	98.17'	S 67°14'45" W	13°01'42"	L35 N 10°00'00" W	49.72'
C36	25.00'	36.55'	33.38'	S 31°52'48" W	83°45'36"	L36 S 58°32'27" E	47.72'
C37	325.00'	21.41'	21.40'	S 55°56'54" W	3°46'25"	L37 N 17°23'07" E	4.32'
C38	435.00'	98.17'	98.13'	N 77°07'48" W	4°15'22"	L38 S 69°22'45" E	7.12'
C39	385.00'	159.77'	158.63'	N 79°24'14" E	23°46'38"	L39 S 54°53'47" E	10.05'
C40	26.00'	19.26'	18.82'	N 87°55'21" W	42°28'10"	L40 N 68°42'15" W	29.58'
C41	1207.961'	89.70'	89.68'	S 41°15'21" W	4°15'22"	L41 N 67°47'08" W	17.16'
C42	275.00'	66.66'	66.49'	N 58°33'39" W	13°53'16"	L42 S 10°00'00" W	49.72'
C43	341.859'	57.18'	57.12'	N 38°49'11" W	9°35'00"	L43 N 09°00'00" W	19.30'
C44	320.00'	99.22'	98.63'	N 01°39'17" E	17°45'56"	L44 N 10°00'00" W	49.72'
C45	15.00'	23.56'	21.21'	N 09°32'17" E	90°00'00"	L45 N 10°00'00" W	29.39'
C46	15.00'	23.56'	21.21'	S 89°27'43" E	90°00'00"	L46 N 80°00'00" W	25.00'
C47	80.00'	22.21'	22.14'	N 46°30'08" E	15°54'17"	L47 N 54°13'22" E	9.38'
C48	80.00'	104.48'	97.21'	N 01°13'10" E	74°49'39"	L48 N 66°42'15" W	9.41'
C49	25.00'	46.69'	40.20'	N 89°42'03" W	107°00'47"	L49 S 80°00'00" W	50.00'
C50	120.00'	82.81'	81.17'	S 27°02'09" E	39°22'16"	L50 N 39°11'11" E	47.21'
C51	25.00'	39.26'	35.35'	S 31°46'52" W	89°58'36"	L51 S 10°00'00" E	48.29'
C52	25.00'	36.49'	33.34'	S 05°11'17" E	83°37'41"	L52 N 80°00'00" W	25.00'
C53	31.00'	22.86'	22.44'	N 81°52'55" W	42°28'10"	L53 S 10°00'00" W	29.39'
C54	31.00'	16.46'	16.27'	S 55°38'40" W	30°25'48"	L54 S 80°00'00" W	50.00'
						L55 S 37°18'18" W	28.76'
						L56 S 47°18'07" E	32.52'
						L57 S 47°18'07" E	32.52'
						L58 S 23°30'27" W	8.32'
						L59 N 23°30'27" W	13.78'
						L60 N 44°29'16" E	0.04'
						L61 N 53°13'45" W	10.00'
						L62 N 53°13'45" W	40.00'
						L63 S 85°56'15" E	12.33'
						L64 N 36°46'19" E	15.55'
						L65 S 75°12'54" W	34.16'
						L66 N 35°27'43" W	11.00'
						L67 N 54°32'17" E	28.00'
						L68 S 35°27'43" W	11.00'
						L69 N 53°13'51" W	1.35'
						L70 S 30°20'29" E	5.81'
						L71 N 89°44'30" W	10.57'
						L72 S 40°25'47" W	43.32'
						L73 S 40°25'47" W	22.01'
						L74 S 70°51'34" W	13.24'
						L75 S 70°51'34" W	10.37'
						L76 N 66°42'15" W	9.49'
						L77 N 24°13'22" E	5.00'



**REVISIONS:**

NO.	DATE	REVISION
1	12/01/2020	REVISED PER CITY COMMENTS

**CLIENT INFORMATION:**  
ECHO FARMS, LLC  
c/o MATRIX DEVELOPMENT GROUP  
CN 4000 FORSGATE DRIVE  
CRANBURY, NJ 08512

**PARAMOUNT ENGINEERING INC.**  
122 Cinema Drive  
Wilmington, North Carolina 28403  
(910) 791-6707 (O) (910) 791-6760 (F)  
NC License #: C-2846

**SITE PLAN TRACT 2 WOODLANDS @ ECHO FARMS CITY OF WILMINGTON NORTH CAROLINA**

**PROJECT STATUS:**  
CONTRACT/LAYOUT: \_\_\_\_\_  
FINAL DESIGN: \_\_\_\_\_  
RELEASED FOR CONSTRUCTION: \_\_\_\_\_

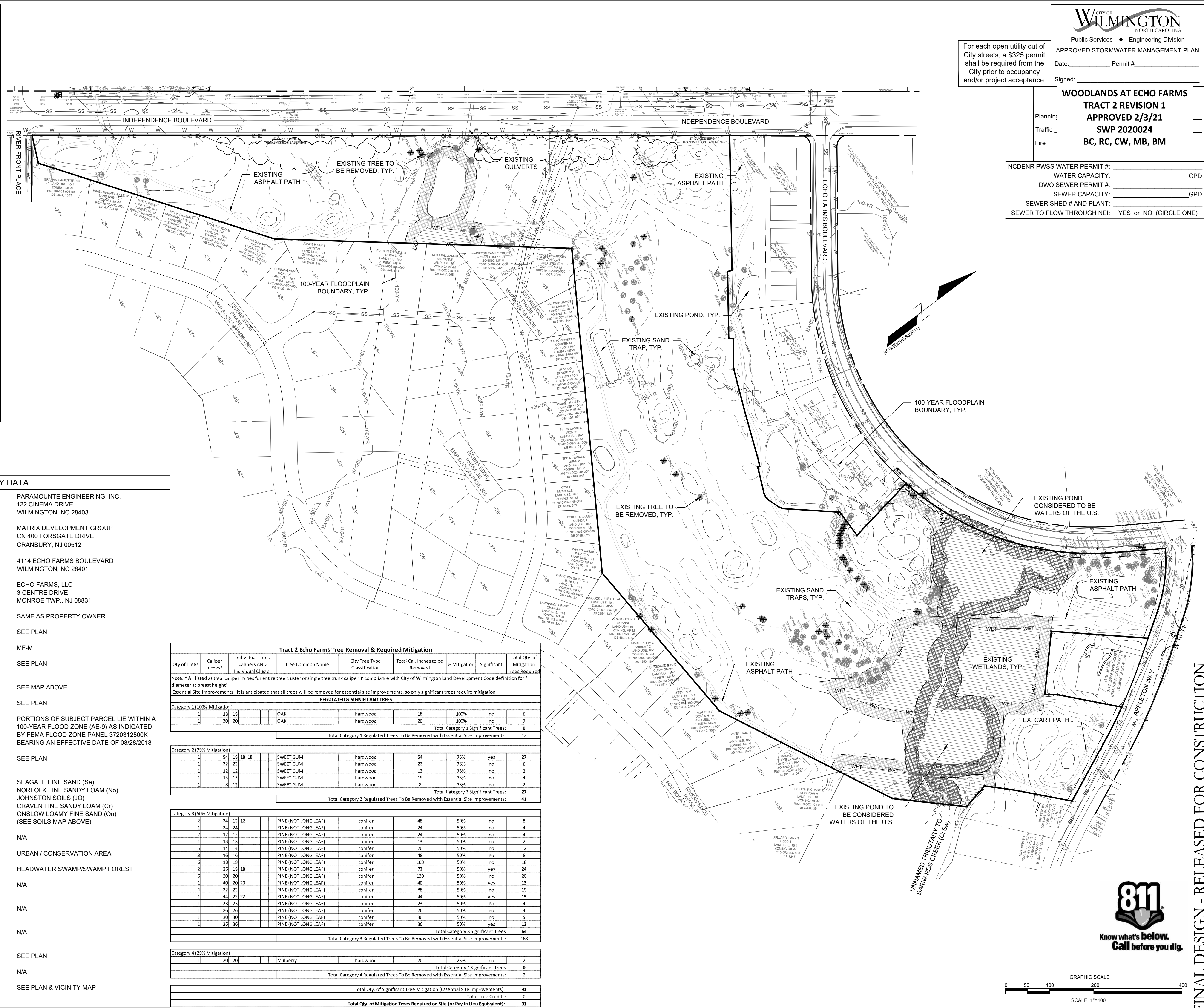
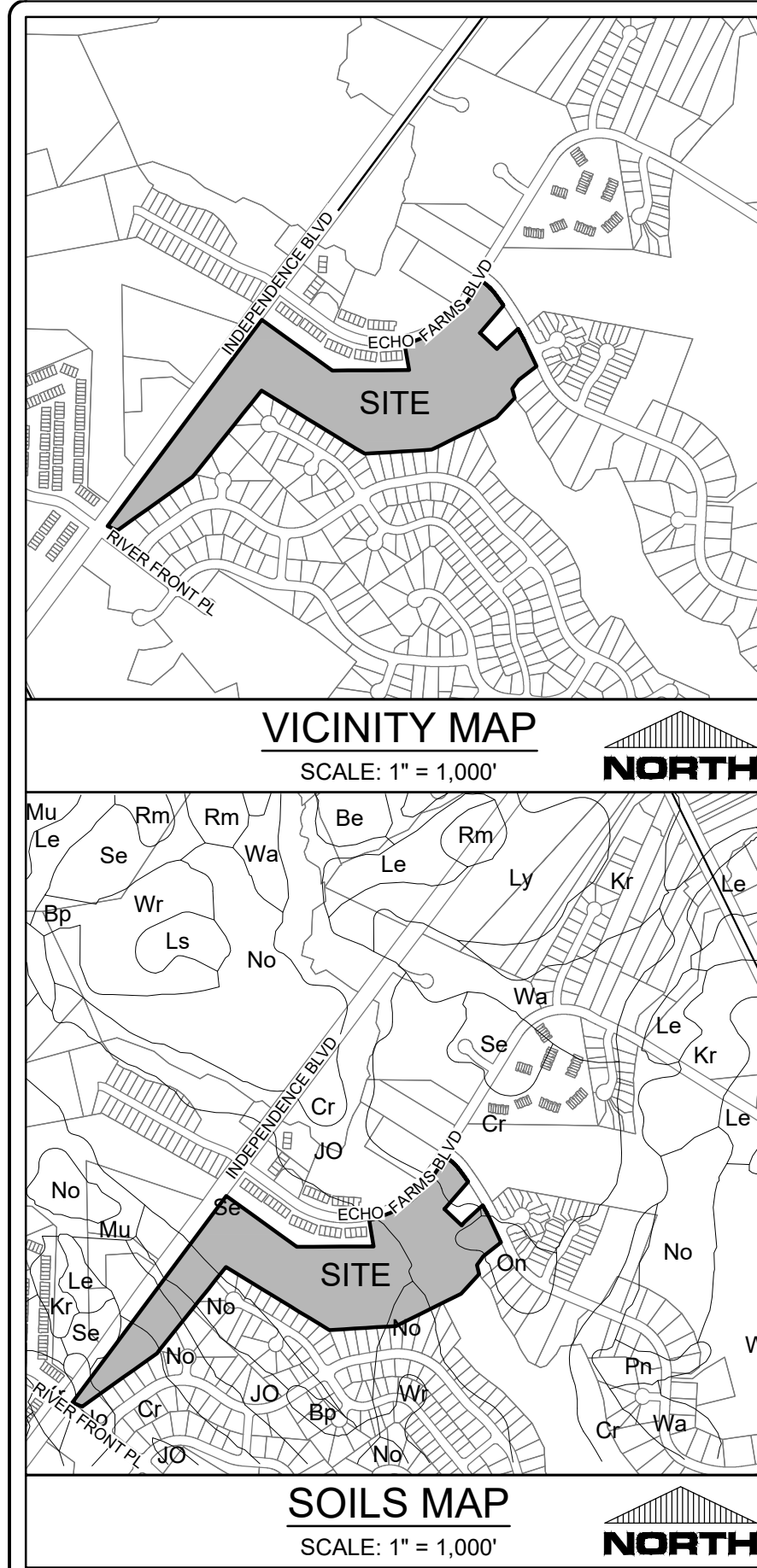
**DRAWING INFORMATION:**  
DATE: 12/01/20  
SCALE: 1"=50'  
DRAWN BY: PJB  
CHECKED: PJB

**SEAL REDACTED**

**C-2.2**

PEI JOB#: 17358.PE

FINAL DESIGN - RELEASED FOR CONSTRUCTION



For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

APPROVED STORMWATER MANAGEMENT PLAN  
 Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
 Signed: \_\_\_\_\_

**WOODLANDS AT ECHO FARMS  
 TRACT 2 REVISION 1  
 APPROVED 2/3/21  
 SWP 2020024  
 BC, RC, CW, MB, BM**

NC DENR PWSS WATER PERMIT #: \_\_\_\_\_ GPD  
 WATER CAPACITY: \_\_\_\_\_ GPD  
 DWQ SEWER PERMIT #: \_\_\_\_\_ GPD  
 SEWER CAPACITY: \_\_\_\_\_ GPD  
 SEWER SHED # AND PLANT: \_\_\_\_\_  
 SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

**SITE INVENTORY DATA**

- PREPARER OF THE PLAN: PARAMOUNTE ENGINEERING, INC. 122 CINEMA DRIVE WILMINGTON, NC 28403
- APPLICANT NAME: MATRIX DEVELOPMENT GROUP CN 400 FORSGATE DRIVE CRANBURY, NJ 00512
- SITE ADDRESS: 4114 ECHO FARMS BOULEVARD WILMINGTON, NC 28401
- PROPERTY OWNER: ECHO FARMS, LLC 3 CENTRE DRIVE MONROE TWP., NJ 08831
- DEVELOPER: SAME AS PROPERTY OWNER
- PROPERTY BOUNDARY: SEE PLAN
- ZONING: MF-M
- ADJACENT PROPERTY INFORMATION (OWNER AND ZONING): SEE PLAN
- VICINITY MAP: SEE MAP ABOVE
- TOPOGRAPHY: SEE PLAN
- 100 YEAR FLOOD PLAIN BOUNDARY: PORTIONS OF SUBJECT PARCEL LIE WITHIN A 100-YEAR FLOOD ZONE (AE-9) AS INDICATED BY FEMA FLOOD ZONE PANEL 3720312500K BEARING AN EFFECTIVE DATE OF 08/28/2018
- LOCATION OF EXISTING DITCHES, CREEKS, AND STREAMS: SEE PLAN
- SOILS: SEAGATE FINE SAND (Se)  
 NORFOLK FINE SANDY LOAM (No)  
 JOHNSTON SOILS (Jo)  
 CRAVEN FINE SANDY LOAM (Cr)  
 ONSLOW LOAMY FINE SAND (On)  
 (SEE SOILS MAP ABOVE)
- CAMA AEC & ASSOCIATED SETBACKS: N/A
- CAMA LAND CLASSIFICATION: URBAN / CONSERVATION AREA
- CONSERVATION RESOURCES: HEADWATER SWAMP/SWAMP FOREST
- LOCAL, STATE, OR FEDERAL HISTORIC OR ARCHAEOLOGICAL SITE: N/A
- LOCATION OF CEMETERIES, BURIAL SITES, OR BURIAL GROUNDS: N/A
- SQUARE FOOTAGE OF FORESTED AREA, HABITAT, AND DOMINANT SPECIES: N/A
- SECTION 404 WETLANDS AND SECTION 10 WATERS: SEE PLAN
- PROTECTED SPECIES OR HABITAT: N/A
- THOROUGHFARES, BIKE ROUTES, SIDEWALKS, TRANSIT FACILITIES (EXISTING OR PROPOSED): SEE PLAN & VICINITY MAP

**Tract 2 Echo Farms Tree Removal & Required Mitigation**

Qty of Trees	Caliper Inches*	Individual Trunk Individual Cluster	Tree Common Name	City Tree Type Classification	Total Cal. Inches to be Removed	% Mitigation	Significant	Total Qty. of Trees Required
Note: * All listed as total caliper inches for entire tree cluster or single tree trunk caliper in compliance with City of Wilmington Land Development Code definition for "diameter at breast height"								
Essential Site Improvements: It is anticipated that all trees will be removed for essential site improvements, so only significant trees require mitigation								
<b>REGULATED &amp; SIGNIFICANT TREES</b>								
Category 1 (100% Mitigation)								
1	18	18	OAK	hardwood	18	100%	no	6
1	20	20	OAK	hardwood	20	100%	no	7
						Total Category 1 Significant Trees:	0	0
						Total Category 1 Regulated Trees To Be Removed with Essential Site Improvements:	13	
Category 2 (75% Mitigation)								
1	54	18	18	SWEET GUM	54	75%	yes	27
1	12	12		SWEET GUM	12	75%	no	3
1	15	15		SWEET GUM	15	75%	no	4
1	8	12		SWEET GUM	8	75%	no	2
						Total Category 2 Significant Trees:	27	
						Total Category 2 Regulated Trees To Be Removed with Essential Site Improvements:	41	
Category 3 (50% Mitigation)								
2	24	12	12	PINE (NOT LONG LEAF)	48	50%	no	8
1	24	24		PINE (NOT LONG LEAF)	24	50%	no	4
2	12	12		PINE (NOT LONG LEAF)	24	50%	no	4
1	13	13		PINE (NOT LONG LEAF)	13	50%	no	2
5	14	14		PINE (NOT LONG LEAF)	70	50%	no	12
3	16	16		PINE (NOT LONG LEAF)	48	50%	no	8
6	18	18		PINE (NOT LONG LEAF)	108	50%	no	18
2	36	18	18	PINE (NOT LONG LEAF)	72	50%	yes	24
6	20	20		PINE (NOT LONG LEAF)	120	50%	no	20
1	40	20	20	PINE (NOT LONG LEAF)	40	50%	yes	13
4	22	22		PINE (NOT LONG LEAF)	88	50%	no	15
1	44	22	22	PINE (NOT LONG LEAF)	44	50%	yes	15
1	23	23		PINE (NOT LONG LEAF)	23	50%	no	4
1	26	26		PINE (NOT LONG LEAF)	26	50%	no	4
1	30	30		PINE (NOT LONG LEAF)	30	50%	no	5
1	36	36		PINE (NOT LONG LEAF)	36	50%	yes	12
						Total Category 3 Significant Trees:	64	
						Total Category 3 Regulated Trees To Be Removed with Essential Site Improvements:	168	
Category 4 (25% Mitigation)								
1	20	20		Mulberry	20	25%	no	2
						Total Category 4 Significant Trees:	0	
						Total Category 4 Regulated Trees To Be Removed with Essential Site Improvements:	2	
						Total Qty. of Significant Tree Mitigation (Essential Site Improvements):	91	
						Total Tree Credits:	0	
						Total Qty. of Mitigation Trees Required on Site (or Pay in Uev Equivalent):	91	

**WILMINGTON**  
 NORTH CAROLINA  
 Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN  
 Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
 Signed: \_\_\_\_\_

**WOODLANDS AT ECHO FARMS  
 TRACT 2 REVISION 1  
 APPROVED 2/3/21  
 SWP 2020024  
 BC, RC, CW, MB, BM**

NC DENR PWSS WATER PERMIT #: \_\_\_\_\_ GPD  
 WATER CAPACITY: \_\_\_\_\_ GPD  
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CLIENT INFORMATION:  
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**SITE INVENTORY PLAN  
 TRACT 2  
 WOODLANDS @ ECHO FARMS  
 CITY OF WILMINGTON  
 NORTH CAROLINA**

PROJECT STATUS:  
 ORIGINAL LAYOUT: 12/07/20  
 FINAL DESIGN LAYOUT: 12/07/20  
 RELEASED FOR CONSTRUCTION: 12/07/20

DRAWING INFORMATION:  
 DATE: 12/07/20  
 SCALE: 1" = 100'  
 AEC: ALE  
 CHECKED: RPE

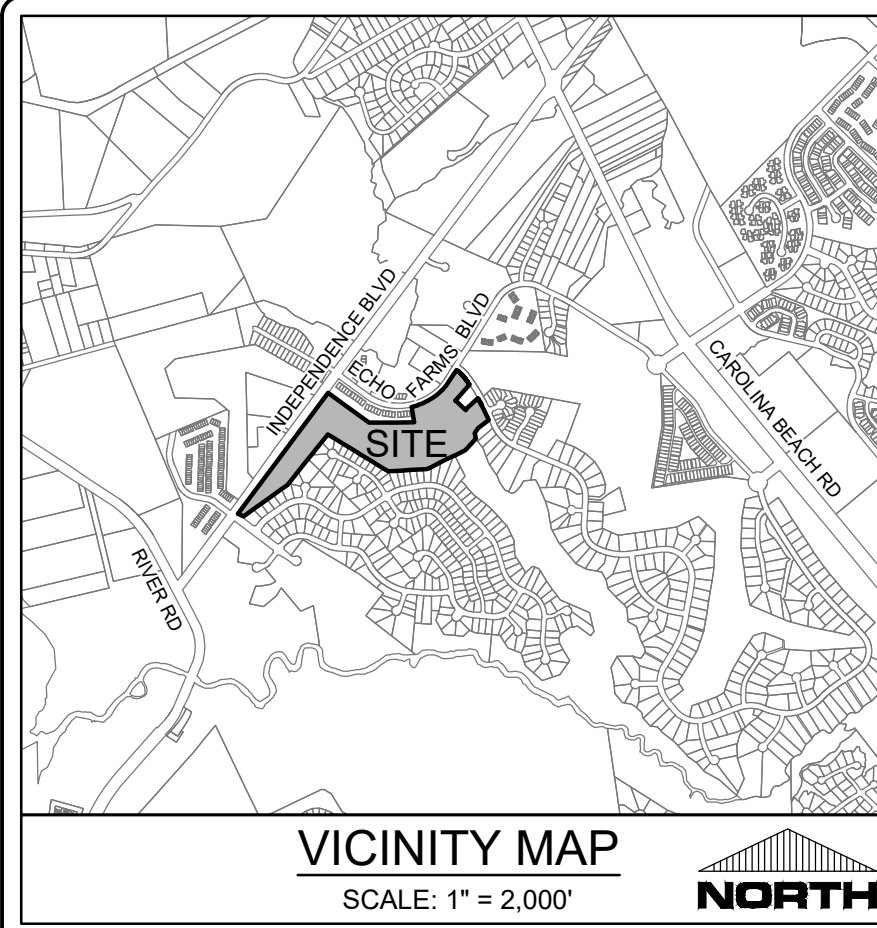
**SEAL REDACTED**

**811**  
 Know what's below.  
 Call before you dig.

GRAPHIC SCALE  
 0 50 100 200 400  
 SCALE: 1" = 100'

**C-2.3**  
 PEI JOB#: 17358.PE

FINAL DESIGN - RELEASED FOR CONSTRUCTION



**CITY OF WILMINGTON**  
NORTH CAROLINA  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN

Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
Signed: \_\_\_\_\_

**WOODLANDS AT ECHO FARMS**  
**TRACT 2 REVISION 1**  
**APPROVED 2/3/21**  
**SWP 2020024**  
**BC, RC, CW, MB, BM**

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**NOTATION:**

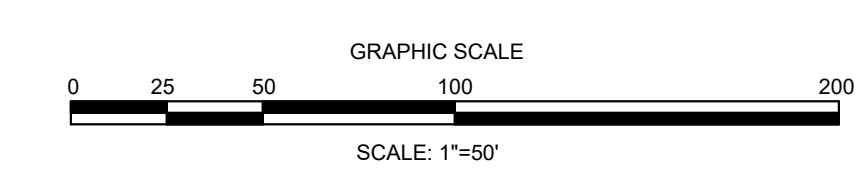
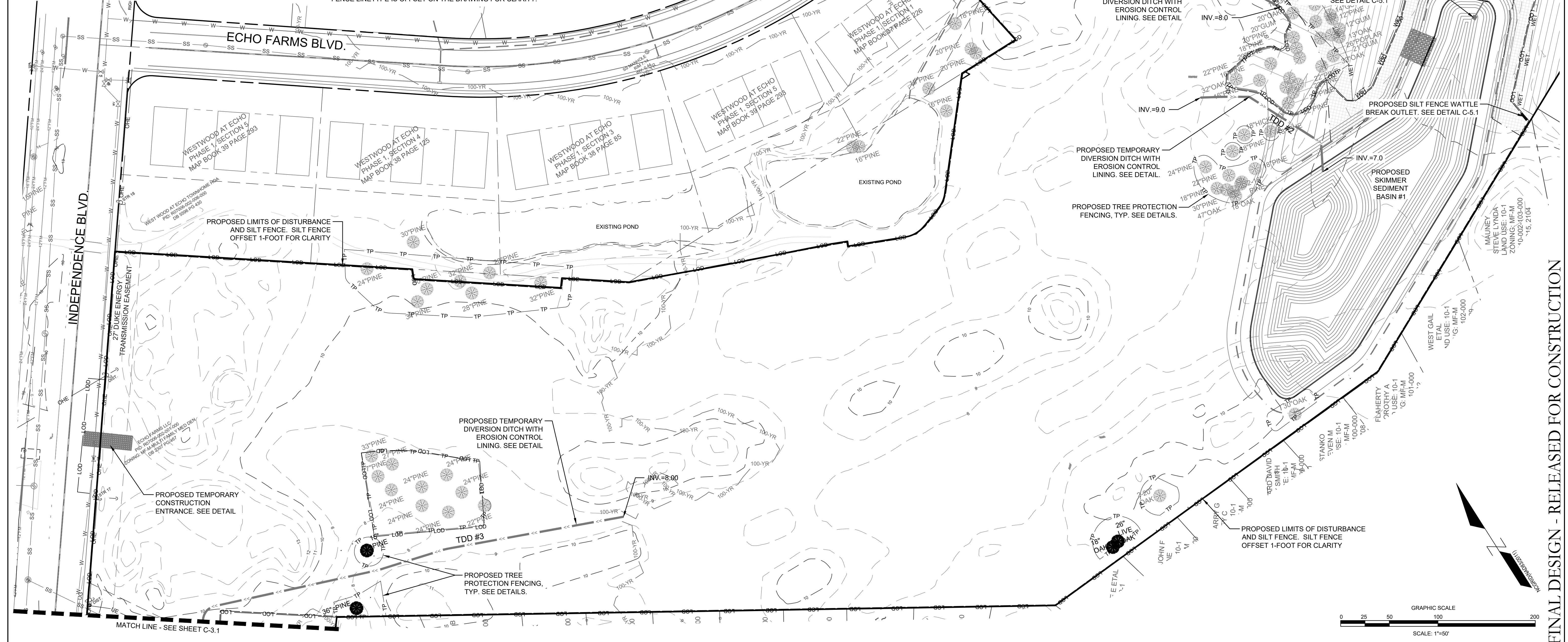
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DI	=	DROP INLET
CO	=	CLEANOUT
DDI	=	DOUBLE DROP INLET
MH	=	STORM DRAIN MANHOLE
RD	=	ROOF DRAIN CLEANOUT
FFE	=	FINISHED FLOOR ELEVATION
BPE	=	BUILDING PAD ELEVATION

**LEGEND:**

---	-16-	EXISTING CONTOUR	TC=25.05	PROPOSED TOP OF CURB ELEVATION
---	-29-	PROPOSED CONTOUR	INLET PROTECTION	INLET PROTECTION
EG=25.05		EXISTING GRADE SPOT ELEVATION	LOD	LIMITS OF DISTURBANCE
EP=25.05		PROPOSED EDGE OF PAVEMENT	---	SILT FENCE
TW=25.05		PROPOSED SIDEWALK ELEVATION	---	TREE PROTECTION FENCING
GL=25.05		PROPOSED GUTTER FLOW LINE	---	DRAINAGE FLOW PATH
			CB-202	DRAINAGE INLET LABEL
			---	SPILL GUTTER
			---	ROCK INLET PROTECTION
			---	GEOTECH BORING LOCATION
			---	DRAINAGE FLOW PATH & SLOPE

- GENERAL NOTES:**
- ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL STATE OF NC, CITY OF WILMINGTON, AND NEW HANOVER COUNTY STANDARDS AND SPECIFICATIONS.
  - THE CONTRACTOR SHALL PLACE INLET PROTECTION AROUND ALL STORM DRAIN INLETS TO PROTECT THE SYSTEM FROM COLLECTING SEDIMENTATION DURING CONSTRUCTION. INLET PROTECTION SHALL REMAIN IN PLACE UNTIL THE ROADS ARE PAVED.
  - CONTRACTOR SHALL ADJUST ALL FRAMES OF EX. UTILITY INFRASTRUCTURE WITHIN ASPHALT OVERLAY AND NEW ASPHALT AREAS TO MATCH PROPOSED GRADES.
  - ALL PROPOSED SPOT ELEVATIONS SHOWN ARE PROPOSED EDGE OF PAVEMENT UNLESS NOTED OTHERWISE.
  - ALL ROOF DRAINS AND IMPERVIOUS SURFACES SHALL BE DIRECTED TOWARDS ON-SITE COLLECTION SYSTEM. NO ROOF DRAINS OR IMPERVIOUS AREA SHALL BE DIRECTED OFF-SITE WITHOUT ENTERING THE ON-SITE COLLECTION SYSTEM FIRST.
  - ALL SIDEWALK CROSS SLOPES HAVE BEEN GRADED TO MEET ADA REGULATIONS. CONTRACTOR SHALL CONFIRM GRADES BEFORE PLACING PAVEMENT OR SIDEWALKS AND REPORT ANY DISCREPANCIES TO OWNER AND/OR ENGINEER.
  - THE CONTRACTOR SHALL USE EITHER RCP (CL. III or CL. IV) OR ADS HP STORM PIPE FOR THE STORM DRAINAGE SYSTEM UNLESS NOTED OTHERWISE. IF THE CONTRACTOR CHOOSES TO USE ADS HP STORM PIPE, IT SHALL BE INSTALLED TO MANUFACTURER SPECIFICATIONS. IN ADDITION, THE CONTRACTOR SHALL BE SURE TO PROVIDE CONCRETE COLLARS AROUND EACH F.E.S. TO PREVENT FLOATATION IF PP PIPE IS CHOSEN.
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- ASPHALT AREA NOTE:**
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- STORMWATER NOTE:**
- THIS PROJECT DRAINS TO A PROPOSED ON-SITE STORM WATER WET DETENTION BASIN.
  - ONCE SITE IS STABILIZED AND SEDIMENT BASIN IS CONVERTED TO A WET DETENTION BASIN, CONTRACTOR SHALL REMOVE ALL SEDIMENT FROM BASIN AND RESTORE TO DESIGN ELEVATIONS.
- CONSTRUCTION NOTES FOR WORK IN ENVIRONMENTAL SETBACKS:**
- ANY CONSTRUCTION ACTIVITY AND DISTURBANCE WITHIN THE CONSERVATION SETBACKS SHALL BE KEPT TO AN ABSOLUTE MINIMUM.
  - THERE SHALL BE NO STOCKPILING OF MATERIAL WITHIN THE CONSERVATION SETBACKS.
  - ONCE DISTURBANCE IS COMPLETE WITHIN CONSERVATION SETBACKS, THEY SHALL BE SEEDED AND MULCHED TO ESTABLISH VEGETATION.



**REVISIONS:**

NO.	DATE	REVISION

**CLIENT INFORMATION:**

ECHO FARMS, LLC  
c/o MATRIX DEVELOPMENT GROUP  
CN 4000 FORSGATE DRIVE  
CRANBURY, NJ 08512

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**PH. I EROSION CONTROL PLAN**  
**TRACT 2**  
**WOODLANDS @ ECHO FARMS**  
**CITY OF WILMINGTON**  
**NORTH CAROLINA**

**PROJECT STATUS:**  
ORIGINAL LAYOUT: 12/07/20  
FINAL DESIGN: 02/03/21  
RELEASED FOR CONSTRUCTION: 02/03/21

**DRAWING INFORMATION:**  
DATE: 12/07/20  
SCALE: 1" = 50'  
DRAWN BY: JPB  
CHECKED BY: RPB

**SEAL REDACTED**

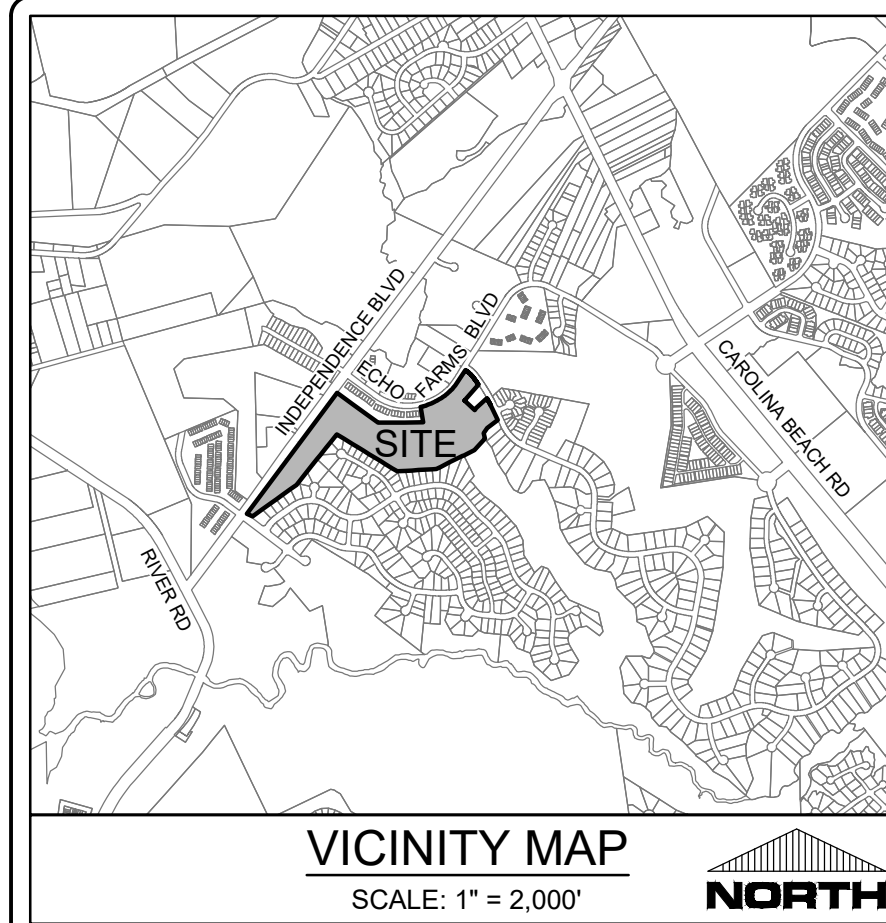
**C-3.0**

PEI JOB#: 17358.PE

FINAL DESIGN - RELEASED FOR CONSTRUCTION







**CITY OF WILMINGTON**  
NORTH CAROLINA  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN

Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
Signed: \_\_\_\_\_

**WOODLANDS AT ECHO FARMS**  
**TRACT 2 REVISION 1**  
**APPROVED 2/3/21**  
**SWP 2020024**  
**BC, RC, CW, MB, BM**

**811**  
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**NOTATION:**

CI	=	CURB INLET
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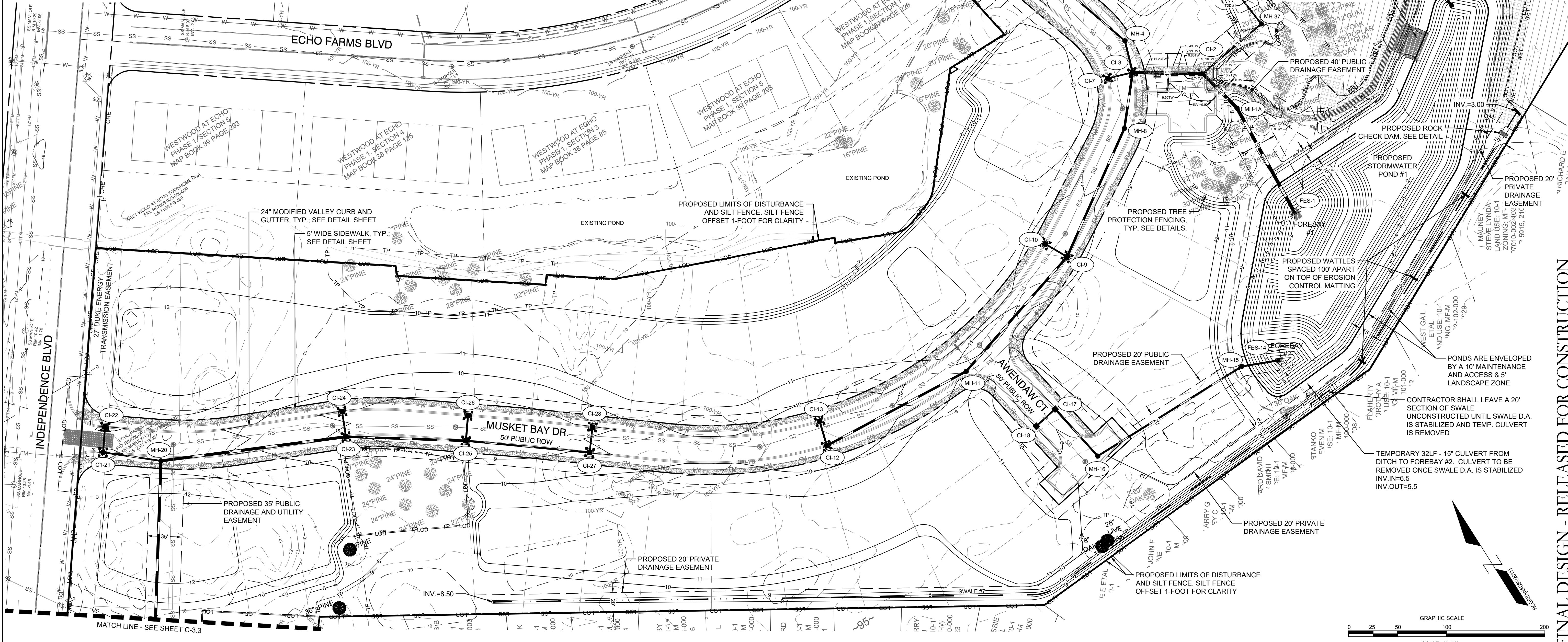
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**LEGEND:**

—16—	EXISTING CONTOUR	TC=25.05	PROPOSED TOP OF CURB ELEVATION
—29—	PROPOSED CONTOUR	[Symbol]	INLET PROTECTION
EG=25.05	EXISTING GRADE SPOT ELEVATION	[Symbol]	LIMITS OF DISTURBANCE
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GL=25.05	PROPOSED GUTTER FLOW LINE	[Symbol]	DRAINAGE FLOW PATH
		[Symbol]	DRAINAGE INLET LABEL
		[Symbol]	SPILL GUTTER
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- DUKE ENERGY NOTES:**
- NO STOCKPILING OF MATERIAL IS ALLOWED AT ANY TIME IN THE DUKE ENERGY TRANSMISSION EASEMENT ALONG INDEPENDENCE BLVD.
  - NO GRADING IS ALLOWED WITHIN 25 FEET OF ANY GUY ANCHOR OR TRANSMISSION POLE.
  - THERE IS NO GRADE CHANGES ALLOWED IN THE TRANSMISSION EASEMENT UNLESS SHOWN ON THE PLANS.
  - NO SUBDIVISION ENTRY SIGNAGE IS ALLOWED IN THE DUKE ENERGY TRANSMISSION EASEMENT.



**REVISIONS:**

NO.	DATE	DESCRIPTION

**CLIENT INFORMATION:**  
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**GRADING & DRAINAGE PLAN**  
**TRACT 2**  
**WOODLANDS @ ECHO FARMS**  
**CITY OF WILMINGTON**  
**NORTH CAROLINA**

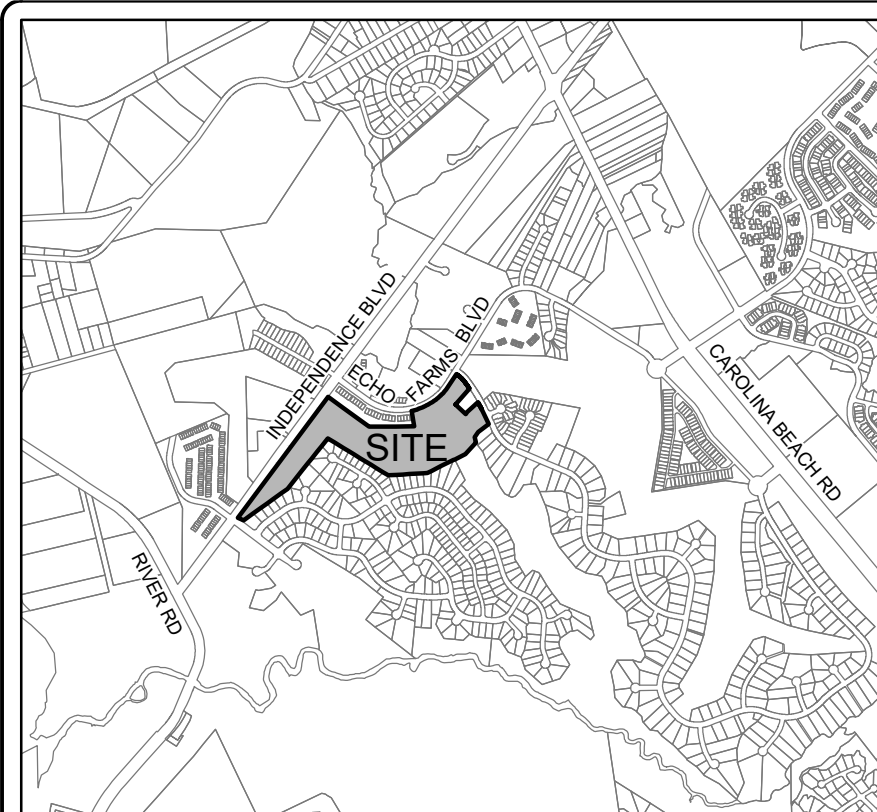
**FINAL DESIGN - RELEASED FOR CONSTRUCTION**

**PROJECT STATUS:**  
ORIGINAL LAYOUT: 12/07/20  
FINAL DESIGN LAYOUT: 12/07/20  
RELEASED FOR CONSTRUCTION: 12/07/20

**DRAWING INFORMATION:**  
DATE: 12/07/20  
SCALE: 1" = 50'  
DRAWN BY: PJB  
CHECKED BY: PJB

**SEAL REDACTED**

**C-3.2**  
PEI JOB#: 17358.PE



VICINITY MAP  
SCALE: 1" = 2,000'

**LEGEND:**

16	EXISTING CONTOUR
29	PROPOSED CONTOUR
EG=25.05	EXISTING GRADE SPOT ELEVATION
EP=25.05	PROPOSED EDGE OF PAVEMENT
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[Symbol]	LIMITS OF DISTURBANCE
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[Symbol]	TREE PROTECTION FENCING
[Symbol]	DRAINAGE FLOW PATH
CB-202	DRAINAGE INLET LABEL
[Symbol]	SPILL GUTTER
[Symbol]	ROCK INLET PROTECTION
S-01 ELEV. 33.5	GEOTECH BORING LOCATION
[Symbol]	DRAINAGE FLOW PATH & SLOPE
[Symbol]	PROTECTIVE TREE FENCING

**CITY OF WILMINGTON**  
NORTH CAROLINA  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN

Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
Signed: \_\_\_\_\_

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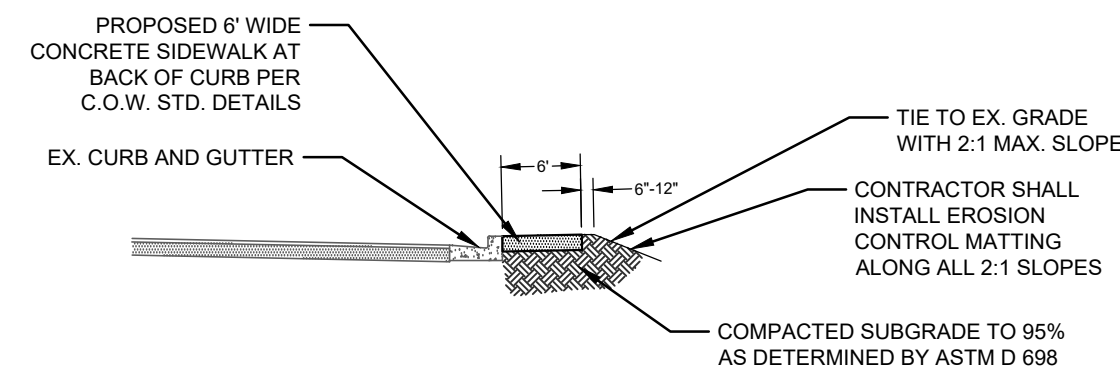


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SEWER TO FLOW THROUGH NEI:	YES or NO (CIRCLE ONE)	

**NOTATION:**

CI	=	CURB INLET
DI	=	DROP INLET
CO	=	CLEANOUT
DDI	=	DOUBLE DROP INLET
MH	=	STORM DRAIN MANHOLE
RD	=	ROOF DRAIN CLEANOUT
FFE	=	FINISHED FLOOR ELEVATION
BPE	=	BUILDING PAD ELEVATION



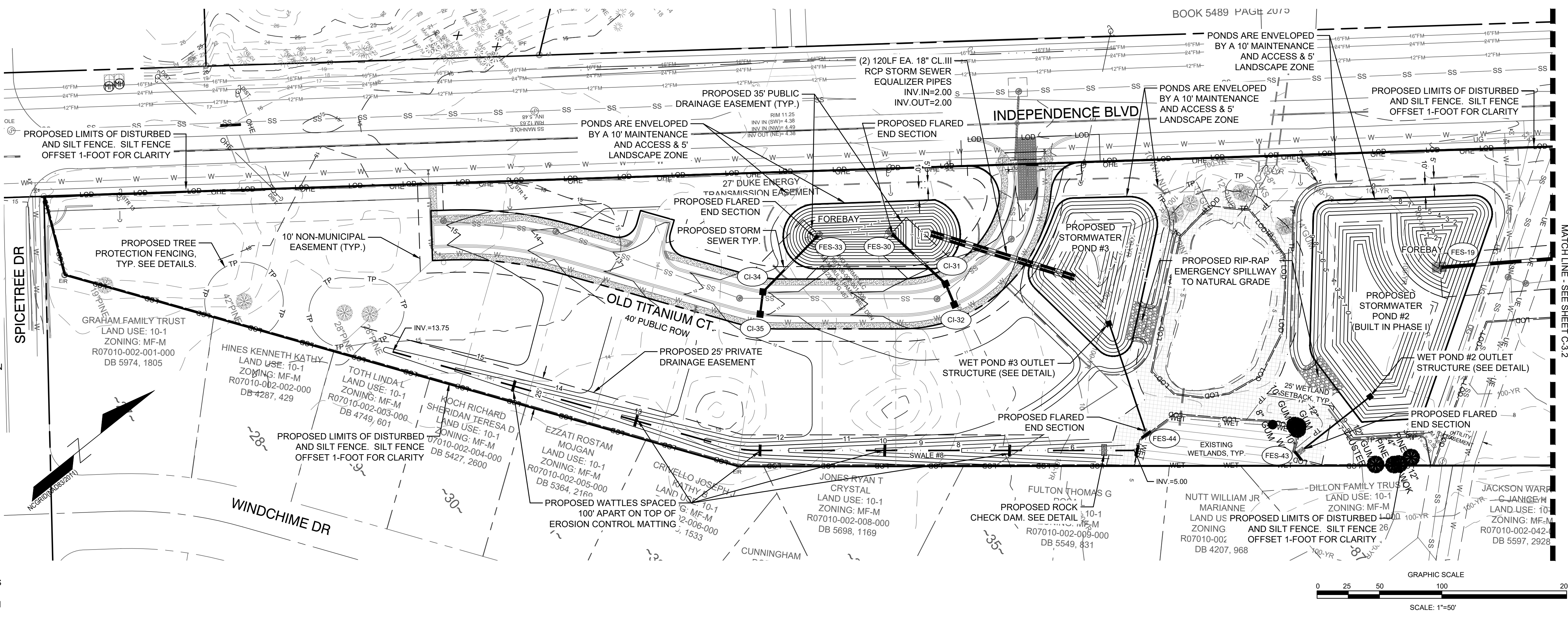
**SIDEWALK - TYPICAL CROSS SECTION**  
ALONG BACK OF CURB  
NOT TO SCALE

- CONSTRUCTION NOTES FOR WORK IN ENVIRONMENTAL SETBACKS:**
- ANY CONSTRUCTION ACTIVITY AND DISTURBANCE WITHIN THE CONSERVATION SETBACKS SHALL BE KEPT TO AN ABSOLUTE MINIMUM.
  - THERE SHALL BE NO STOCKPILING OF MATERIAL WITHIN THE CONSERVATION SETBACKS.
  - ONCE DISTURBANCE IS COMPLETE WITHIN CONSERVATION SETBACKS, THEY SHALL BE SEEDED AND MULCHED TO ESTABLISH VEGETATION.

**STORM SEWER SCHEDULE:**

Upstream Node	Downstream Node	Diameter (in)	Upstream Pipe Invert (ft)	Downstream Pipe Invert (ft)	Pipe Length (ft)	Slope (%)	Upstream Rim Elev (ft)	Downstream Rim Elev (ft)	Pipe Material
MH-1A	FES-1	36	-0.45	-1.00	118	0.46	8.00	N/A	RCP III
CI-2	MH-1A	36	-0.23	-0.45	50	0.45	9.44	8.00	RCP III
CI-3	CI-2	36	-0.01	-0.23	71	0.30	10.63	9.44	RCP III
MH-37	CI-2	15	0.07	-0.23	78	0.38	9.00	9.44	RCP III
MH-38	MH-37	15	0.65	0.07	116	0.50	9.00	9.00	RCP III
CI-7	CI-3	15	6.63	6.50	26	0.52	10.63	10.63	RCP III
MH-4	CI-3	18	1.34	1.24	33	0.32	11.18	10.63	RCP III
MH-8	CI-3	24	0.16	-0.01	58	0.30	11.13	10.63	RCP III
MH-40	MH-38	15	1.00	0.65	69	0.50	8.00	9.00	RCP III
CI-9	MH-8	24	0.61	0.16	143	0.32	10.23	11.13	RCP III
CI-5	MH-4	18	2.06	1.34	240	0.30	6.69	11.18	RCP III
CI-10	CI-9	15	6.37	6.29	26	0.30	10.23	10.23	RCP III
MH-11	CI-9	24	1.08	0.61	156	0.30	10.79	10.23	RCP III
CI-6	CI-5	18	2.14	2.06	26	0.30	6.69	6.69	RCP III
CI-12	MH-11	24	1.64	1.16	161	0.30	9.08	10.79	RCP III
CI-13	CI-12	18	5.01	4.93	26	0.31	9.08	9.08	RCP III
MH-15	FES-14	18	0.26	0.00	36	0.73	9.00	N/A	RCP III
MH-16	MH-15	18	0.78	0.26	173	0.30	9.48	9.00	RCP III
CI-17	MH-16	18	0.97	0.78	65	0.29	8.64	9.48	RCP III
CI-18	CI-17	15	1.16	0.97	26	0.73	8.64	8.64	RCP III
MH-20	FES-19	30	2.70	2.00	248	0.28	10.68	N/A	RCP III
CI-21	MH-20	15	3.38	3.20	60	0.30	8.88	10.68	RCP III
CI-23	MH-20	30	3.27	2.70	190	0.30	8.76	10.68	RCP III
CI-24	CI-23	15	3.35	3.27	26	0.30	8.77	8.76	RCP III
CI-25	CI-23	24	3.64	3.27	122	0.30	8.24	8.76	RCP III
CI-22	CI-21	15	3.46	3.38	26	0.30	9.88	9.88	RCP III
CI-26	CI-25	18	3.72	3.64	26	0.30	8.24	8.24	RCP III
CI-27	CI-25	18	4.02	3.64	127	0.30	8.78	8.24	RCP III
CI-28	CI-27	15	4.10	4.02	26	0.30	8.78	8.78	RCP III
CI-31	FES-30	18	2.23	1.00	54	2.27	9.29	N/A	RCP III
CI-32	CI-31	18	2.32	2.23	18	0.50	9.29	9.29	RCP III
CI-34	FES-33	15	2.18	1.50	59	1.15	11.07	N/A	RCP III
CI-35	CI-34	15	2.27	2.18	18	0.50	11.07	11.07	RCP III
MH-39	MH-41	15	-3.00	-3.00	84	0.00	8.00	8.00	RCP IV
DI-40	MH-39	15	2.23	1.41	164	0.50	7.95	8.00	RCP III
DI-42	DI-40	15	3.30	2.23	215	0.50	8.50	7.95	RCP III
DI-43	DI-42	15	4.00	3.30	139	0.50	8.50	8.50	RCP III

- GENERAL NOTES:**
- ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL STATE OF NC, CITY OF WILMINGTON, AND NEW HANOVER COUNTY STANDARDS AND SPECIFICATIONS.
  - THE CONTRACTOR SHALL PLACE INLET PROTECTION AROUND ALL STORM DRAIN INLETS TO PROTECT THE SYSTEM FROM COLLECTING SEDIMENTATION DURING CONSTRUCTION. INLET PROTECTION SHALL REMAIN IN PLACE UNTIL THE ROADS ARE PAVED.
  - CONTRACTOR SHALL ADJUST ALL FRAMES OF EX. UTILITY INFRASTRUCTURE WITHIN ASPHALT OVERLAY AND NEW ASPHALT AREAS TO MATCH PROPOSED GRADES.
  - ALL PROPOSED SPOT ELEVATIONS SHOWN ARE PROPOSED EDGE OF PAVEMENT UNLESS NOTED OTHERWISE.
  - ALL ROOF DRAINS AND IMPERVIOUS SURFACES SHALL BE DIRECTED TOWARDS ON-SITE COLLECTION SYSTEM. NO ROOF DRAINS OR IMPERVIOUS AREA SHALL BE DIRECTED OFF-SITE WITHOUT ENTERING THE ON-SITE COLLECTION SYSTEM FIRST.
  - ALL SIDEWALK CROSS SLOPES HAVE BEEN GRADED TO MEET ADA REGULATIONS. CONTRACTOR SHALL CONFIRM GRADES BEFORE PLACING PAVEMENT OR SIDEWALKS AND REPORT ANY DISCREPANCIES TO OWNER AND/OR ENGINEER.
  - THE CONTRACTOR SHALL USE EITHER RCP (CL. III or CL. IV) OR ADS HP STORM PIPE FOR THE STORM DRAINAGE SYSTEM UNLESS NOTED OTHERWISE. IF THE CONTRACTOR CHOOSES TO USE ADS HP STORM PIPE, IT SHALL BE INSTALLED TO MANUFACTURER SPECIFICATIONS. IN ADDITION, THE CONTRACTOR SHALL BE SURE TO PROVIDE CONCRETE COLLARS AROUND EACH F.E.S. TO PREVENT FLOATATION IF PP PIPE IS CHOSEN.
  - CONTRACTOR SHALL COORDINATE WITH OWNER TO DETERMINE IF A GEOTECHNICAL ENGINEERING REPORT WAS COMPLETED FOR THE SITE.
  - CONTRACTOR SHALL STAKE SILT FENCE ALONG LIMITS OF DISTURBANCE LINE. THE SILT FENCE LINETYPE IS OFFSET ON THE DRAWING FOR CLARITY.
- ASPHALT AREA NOTE:**
- SITE CONTRACTOR SHALL STRIP TOPSOIL AND ANY UNSUITABLE MATERIAL AND PROVIDE CUT/FILL OPERATIONS TO PROVIDE A COMPACTED CONTROLLED SUBGRADE, IN ACCORDANCE WITH THE SUBSURFACE GEOTECHNICAL EXPLORATION AND TECHNICAL SPECIFICATIONS.
- BUILDING PAD NOTE:**
- SITE CONTRACTOR SHALL STRIP TOPSOIL AND ANY UNSUITABLE MATERIAL AND PROVIDE CUT/FILL OPERATIONS TO PROVIDE A COMPACTED CONTROLLED BUILDING PAD, IN ACCORDANCE WITH STRUCTURAL DRAWINGS.
- STORMWATER NOTE:**
- THIS PROJECT DRAINS TO A PROPOSED ON-SITE STORM WATER WET DETENTION BASIN.
  - ONCE SITE IS STABILIZED AND SEDIMENT BASIN IS CONVERTED TO A WET DETENTION BASIN, CONTRACTOR SHALL REMOVE ALL SEDIMENT FROM BASIN AND RESTORE TO DESIGN ELEVATIONS.
- DUKE ENERGY NOTES:**
- NO STOCKPILING OF MATERIAL IS ALLOWED AT ANY TIME IN THE DUKE ENERGY TRANSMISSION EASEMENT ALONG INDEPENDENCE BLVD.
  - NO GRADING IS ALLOWED WITHIN 25 FEET OF ANY GUY ANCHOR OR TRANSMISSION POLE.
  - THERE IS NO GRADE CHANGES ALLOWED IN THE TRANSMISSION EASEMENT UNLESS SHOWN ON THE PLANS.
  - NO SUBDIVISION ENTRY SIGNAGE IS ALLOWED IN THE DUKE ENERGY TRANSMISSION EASEMENT.



FINAL DESIGN - RELEASED FOR CONSTRUCTION

**REVISIONS:**

NO.	DATE	REVISION PER CITY COMMENTS

**ECHO FARMS, LLC**  
c/o MATRIX DEVELOPMENT GROUP  
CN 4000 FORSGATE DRIVE  
CRANBURY, NJ 08512

**PARAMOUNT ENGINEERING**  
122 Cinema Drive  
Wilmington, North Carolina 28403  
(910) 791-6707 (O) (910) 791-6760 (F)  
NC License #: C-2846

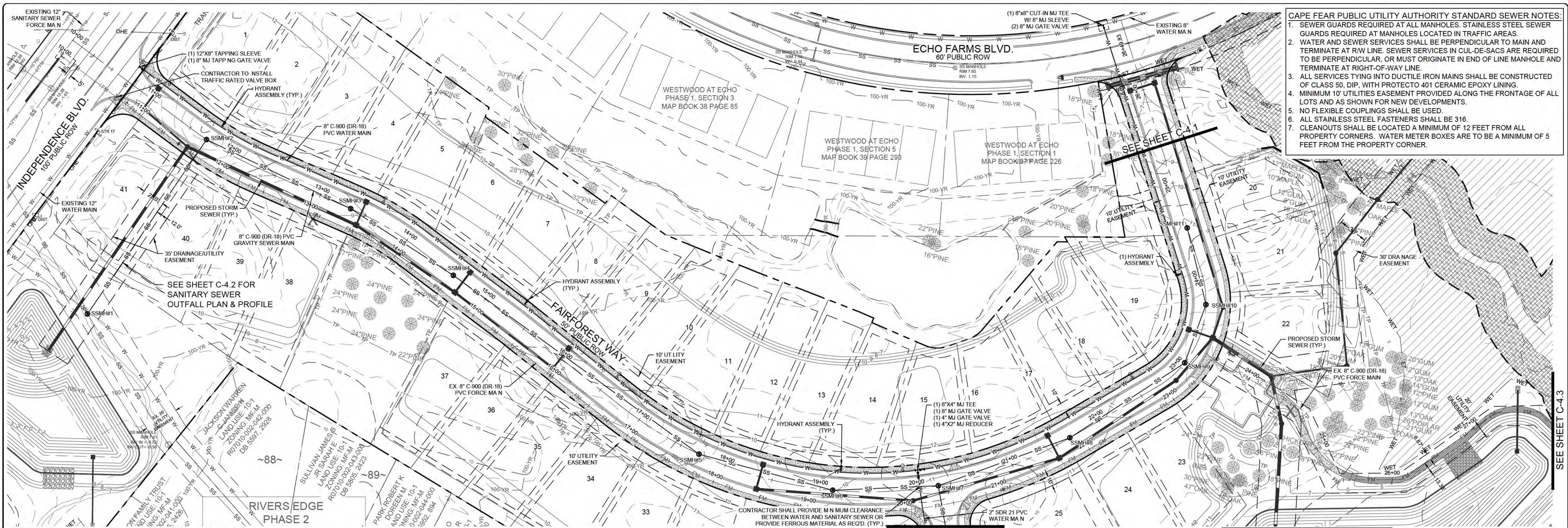
**GRADING-DRAINAGE-EC PLAN**  
TRACT 2  
WOODLANDS @ ECHO FARMS  
CITY OF WILMINGTON  
NORTH CAROLINA

**PROJECT STATUS:**  
ORIGINAL LAYOUT: 12/07/20  
FINAL DESIGN: 12/07/20  
RELEASED FOR CONSTRUCTION: 12/07/20

**DRAWING INFORMATION:**  
DATE: 12/07/20  
SCALE: 1" = 50'  
PLOT DATE: 12/07/20  
PLOT SCALE: 1" = 50'  
DRAWN BY: [Name]  
CHECKED BY: [Name]

**SEAL REDACTED**

**C-3.3**  
PEI JOB#: 17358.PE



- CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD SEWER NOTES:**
- SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
  - WATER AND SEWER SERVICES SHALL BE PERPENDICULAR TO MAIN AND TERMINATE AT RW LINE. SEWER SERVICES IN CUL-DE-SACS ARE REQUIRED TO BE PERPENDICULAR, OR MUST ORIGINATE IN END OF LINE MANHOLE AND TERMINATE AT RIGHT-OF-WAY LINE.
  - ALL SERVICES TYING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF CLASS 50, DIP, WITH PROTECTO 401 CERAMIC EPOXY LINING.
  - MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
  - NO FLEXIBLE COUPLINGS SHALL BE USED.
  - ALL STAINLESS STEEL FASTENERS SHALL BE 316.
  - CLEANOUTS SHALL BE LOCATED A MINIMUM OF 12 FEET FROM ALL PROPERTY CORNERS. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.

**UTILITY NOTES: (NCAC 15A.021.0305 / T15A.18C.0906)**

- WATER MAINS SHALL BE LAID SO AS TO PROVIDE A MINIMUM HORIZONTAL SEPARATION OF 10 FEET FROM SEWERS. IF CONDITIONS EXIST SUCH THAT THIS SEPARATION CANNOT BE ACHIEVED, THE WATER MAIN CAN BE INSTALLED AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, EITHER IN A SEPARATE TRENCH, OR IN THE SAME TRENCH ON A BENCH OF UNDISTURBED EARTH.
- WHEN CROSSING A WATER MAIN OVER A SEWER, THE WATER MAIN SHALL BE LAID AT LEAST 18 INCHES ABOVE THE SEWER. IF CONDITIONS EXIST SUCH THAT THIS SEPARATION CANNOT BE ACHIEVED, BOTH THE WATER MAIN AND SEWER SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE WITH JOINTS THAT MEET WATER MAIN STANDARDS. THE DUCTILE IRON PIPE SHALL EXTEND 10 FEET ON EACH SIDE OF THE CROSSING WITH A SECTION OF WATER MAIN PIPE CENTERED ON THE 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.
- WHERE VERTICAL CLEARANCE IS LESS THAN 24" BETWEEN SANITARY SEWER AND STORM DRAIN, SANITARY SEWER SHALL BE DUCTILE IRON PIPE FOR A MINIMUM OF 10' EITHER SIDE OF CROSSING AND STORM DRAIN SHALL BE RC PIPE.

- WHERE VERTICAL CLEARANCE IS LESS THAN 18" BETWEEN WATER MAIN AND STORM DRAIN, WATER MAIN SHALL BE DUCTILE IRON PIPE FOR A MINIMUM OF 10' EITHER SIDE OF CROSSING AND STORM DRAIN SHALL BE RC PIPE.

**UTILITY INFORMATION**

**SANITARY SEWER**  
THIS PROJECT IS CONSTRUCTING A SANITARY SEWER GRAVITY SYSTEM THAT WILL CONNECT TO AN EXISTING 10-INCH GRAVITY SYSTEM IN RIVERS EDGE PHASE II SUBDIVISION. SANITARY SEWER ALLOCATION IS PROVIDED BY CFPWA.

**WATER**  
THIS PROJECT WILL CONNECT TO EXISTING WATER MAIN LOCATED WITHIN INDEPENDENCE BLDV. AND ECHO FARMS BLDV. RIGHT OF WAY. THIS PROJECT IS CONSTRUCTING 8-INCH WATER MAINS THAT WILL LOOP BETWEEN THE EXISTING WATER MAINS. DOMESTIC WATER ALLOCATION PROVIDED BY CFPWA.

**WATER & SEWER SERVICE NOTE:**

- CONTRACTOR SHALL INSTALL WATER AND SEWER SERVICES IN ACCORDANCE WITH CFPWA STANDARD DETAILS AND SPECIFICATIONS. (1) 4-INCH SEWER SERVICE IN ACCORDANCE WITH CFPWA STANDARD DETAILS PER LOT.

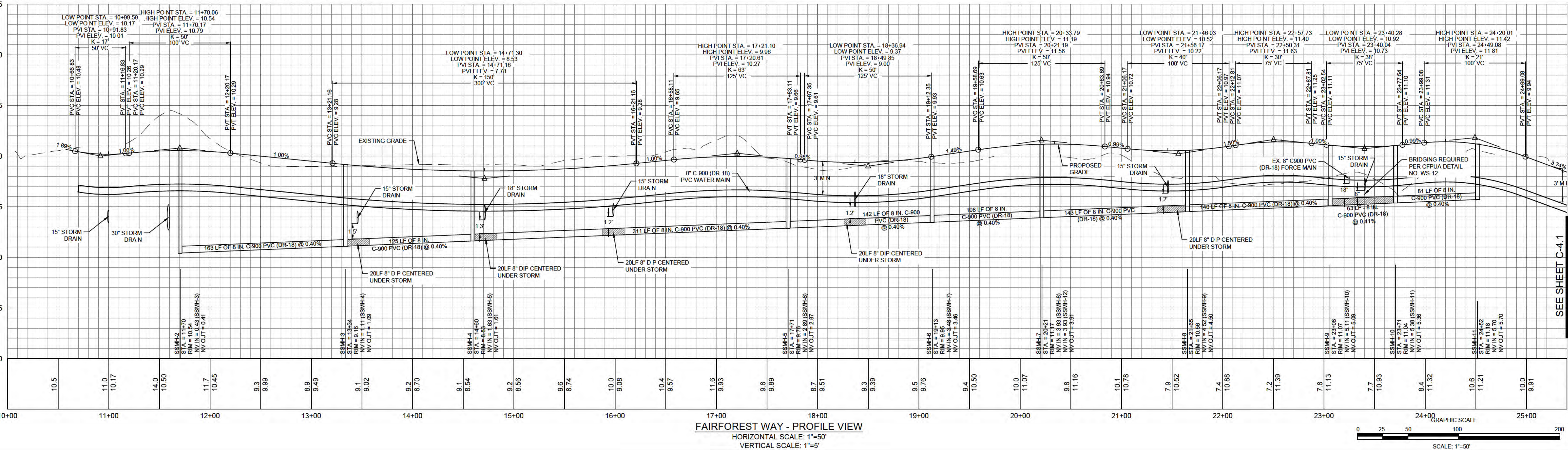
**FAIRFOREST WAY - PLAN VIEW**  
HORIZONTAL SCALE: 1"=50'

**WOODLANDS AT ECHO FARMS**  
**TRACT 2**  
**APPROVED 7/21/20**  
**SWP 2020024**  
**BC, RC, CW, MB, BM**

Plan	
Traff	
Fire	

**CITY OF WILMINGTON**  
NORTH CAROLINA  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.



**FAIRFOREST WAY - PROFILE VIEW**  
HORIZONTAL SCALE: 1"=50'  
VERTICAL SCALE: 1"=5'

FINAL DESIGN - RELEASED FOR CONSTRUCTION

**REVISIONS:**

**CLIENT INFORMATION:**  
ECHO FARMS, LLC  
c/o MATRIX DEVELOPMENT GROUP  
CN 4000 FORSGATE DRIVE  
CRANBURY, NJ 08512

**PARAMOUNT ENGINEERING, INC.**  
122 Cinema Drive  
Wilmington, North Carolina 28403  
(910) 791-6707 (O) (910) 791-6760 (F)  
NC License #: C-2846

**PROJECT STATUS:**  
CONCEPTUAL LAYOUT:  
PRELIMINARY LAYOUT:  
RELEASED FOR CONSTRUCTION

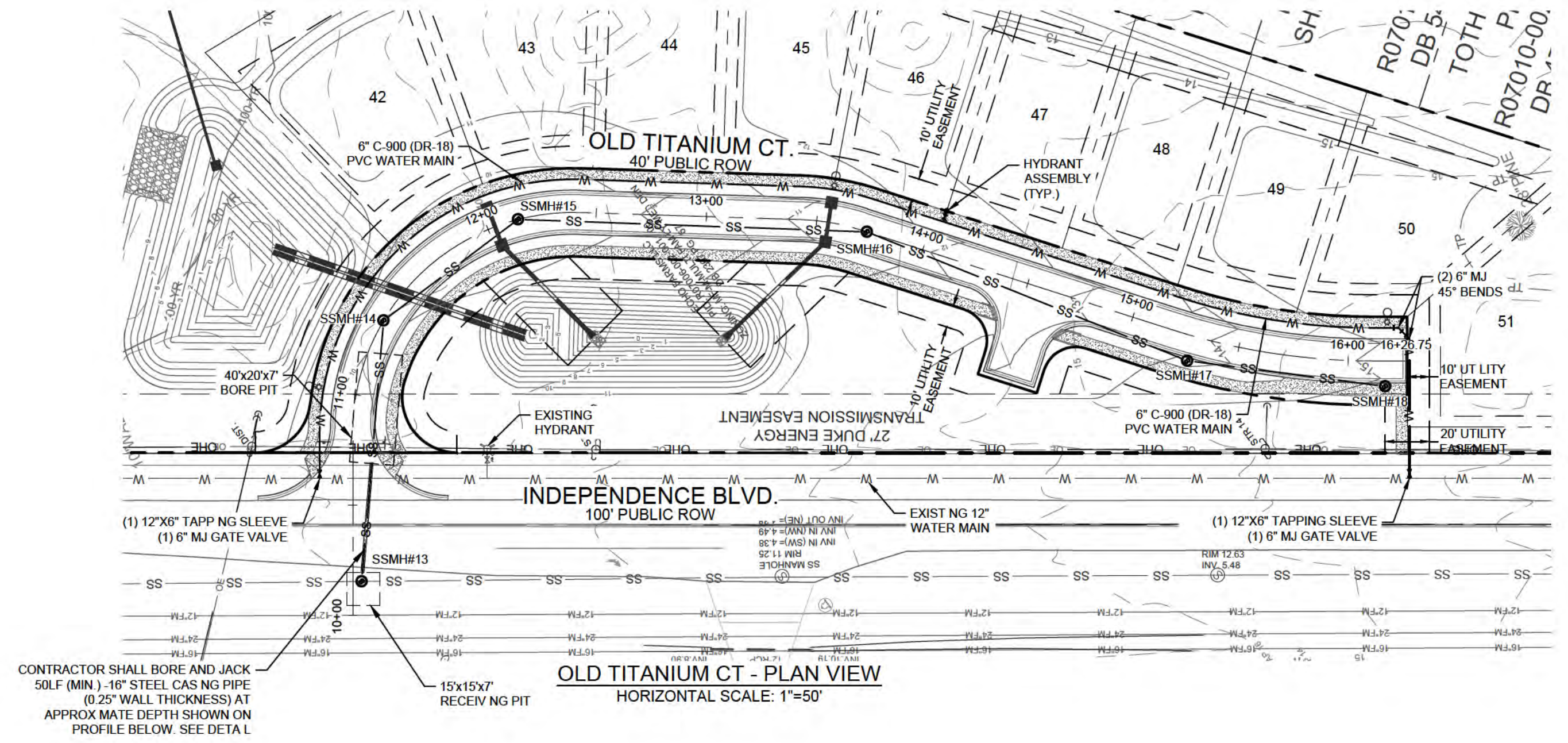
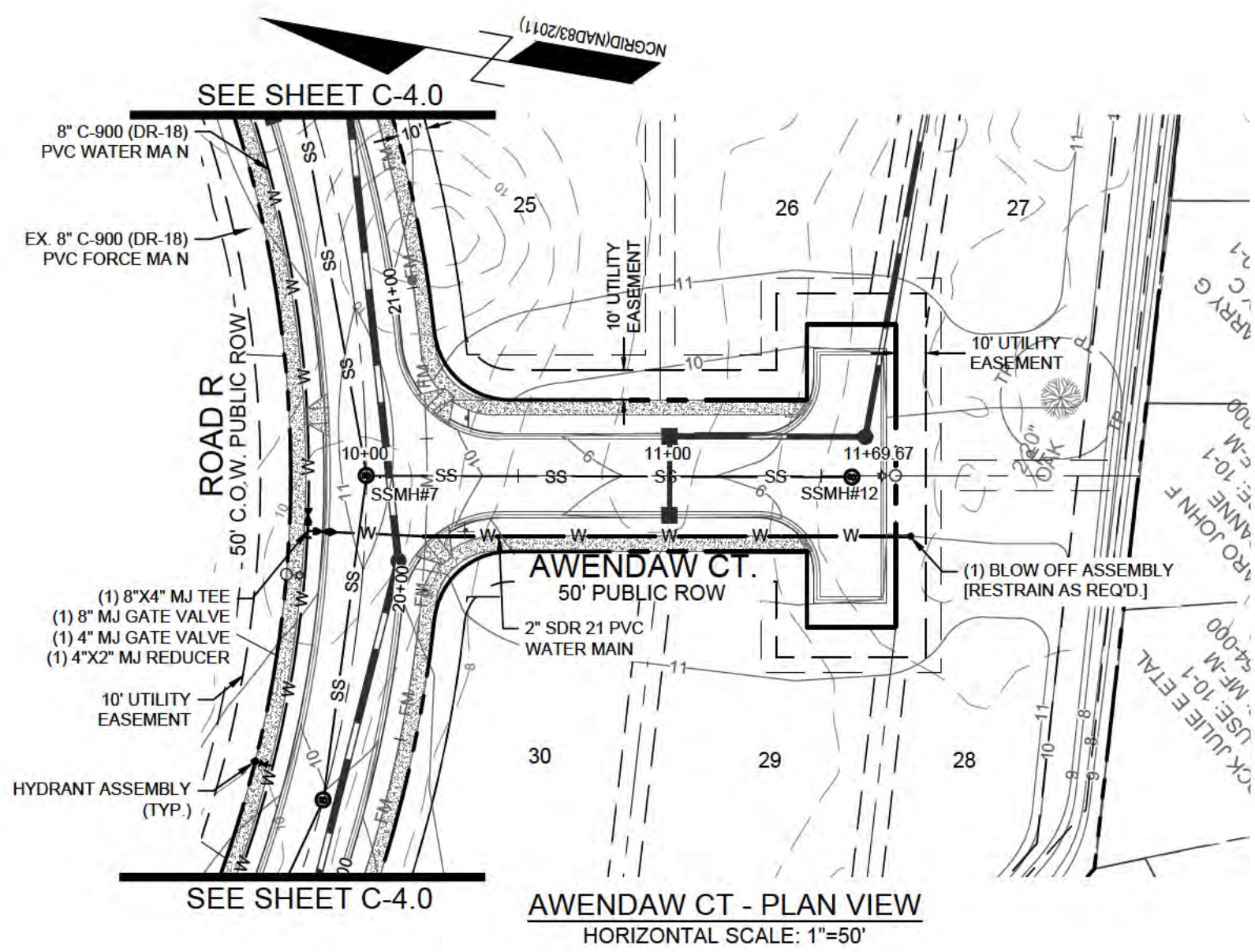
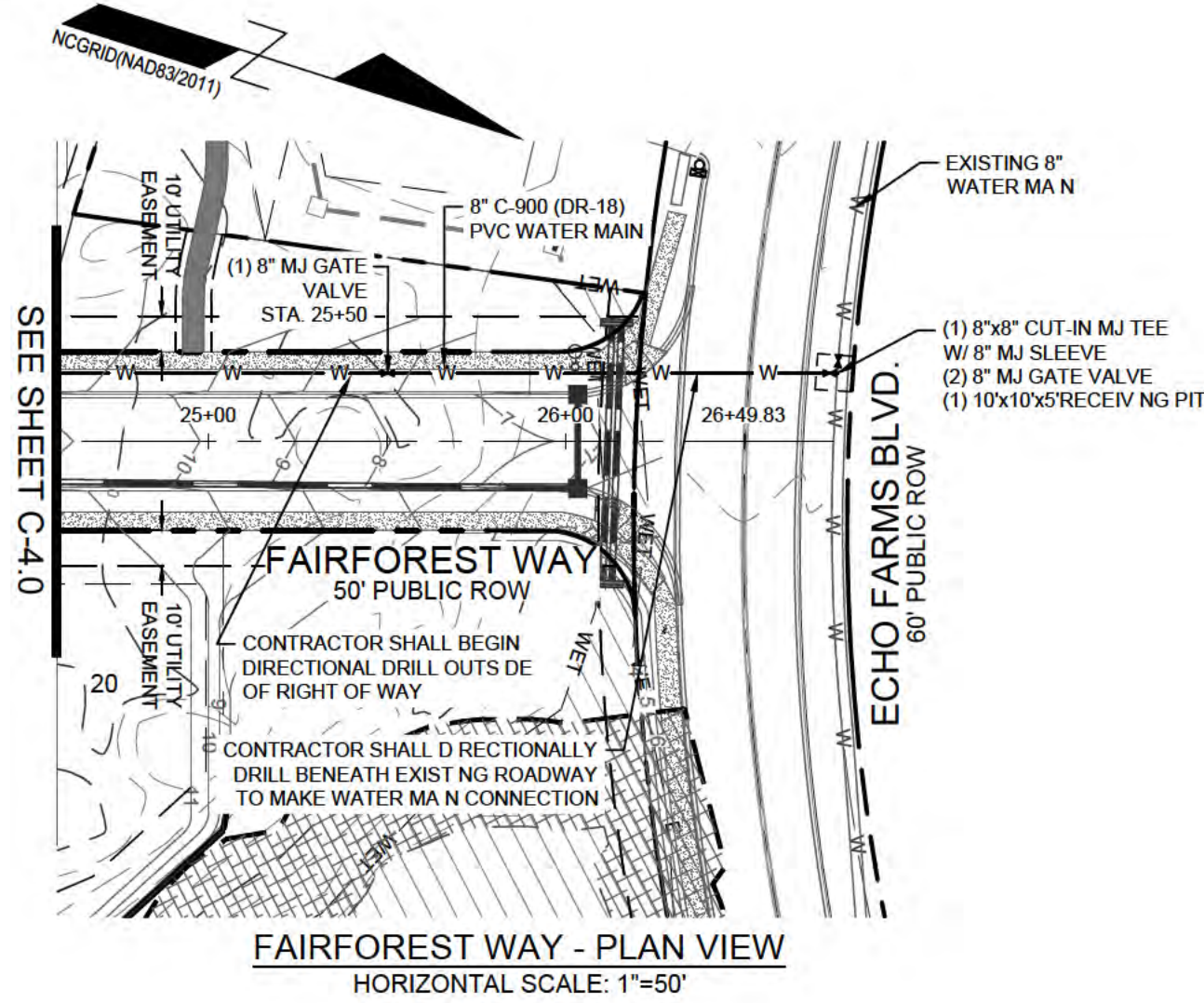
**DRAWING INFORMATION:**  
DATE: 07/21/20  
DESIGNED BY: RPB  
DRAWN BY: RPB  
CHECKED BY: RPB

**PLAN & PROFILE**  
**TRACT 2**  
**WOODLANDS @ ECHO FARMS**  
**CITY OF WILMINGTON**  
**NORTH CAROLINA**

**C-4.0**  
PEI JOB#: 17358.PE

**CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD SEWER NOTES:**

- SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
- WATER AND SEWER SERVICES SHALL BE PERPENDICULAR TO MAIN AND TERMINATE AT R/W LINE. SEWER SERVICES IN CUL-DE-SACS ARE REQUIRED TO BE PERPENDICULAR, OR MUST ORIGINATE IN END OF LINE MANHOLE AND TERMINATE AT RIGHT-OF-WAY LINE.
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- MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
- NO FLEXIBLE COUPLINGS SHALL BE USED.
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- CLEANOUTS SHALL BE LOCATED A MINIMUM OF 12 FEET FROM ALL PROPERTY CORNERS. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.



**UTILITY NOTES: (NCAC 15A.02T.0305 / T15A.18C.0906)**

- WATER MAINS SHALL BE LAID SO AS TO PROVIDE A MINIMUM HORIZONTAL SEPARATION OF 10 FEET FROM SEWERS. IF CONDITIONS EXIST SUCH THAT THIS SEPARATION CANNOT BE ACHIEVED, THE WATER MAIN CAN BE INSTALLED AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, EITHER IN A SEPARATE TRENCH, OR IN THE SAME TRENCH ON A BENCH OF UNDISTURBED EARTH.
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**UTILITY INFORMATION**

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**WATER & SEWER SERVICE NOTE:**

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**WOODLANDS AT ECHO FARMS TRACT 2**  
APPROVED 7/21/20  
SWP 2020024  
BC, RC, CW, MB, BM

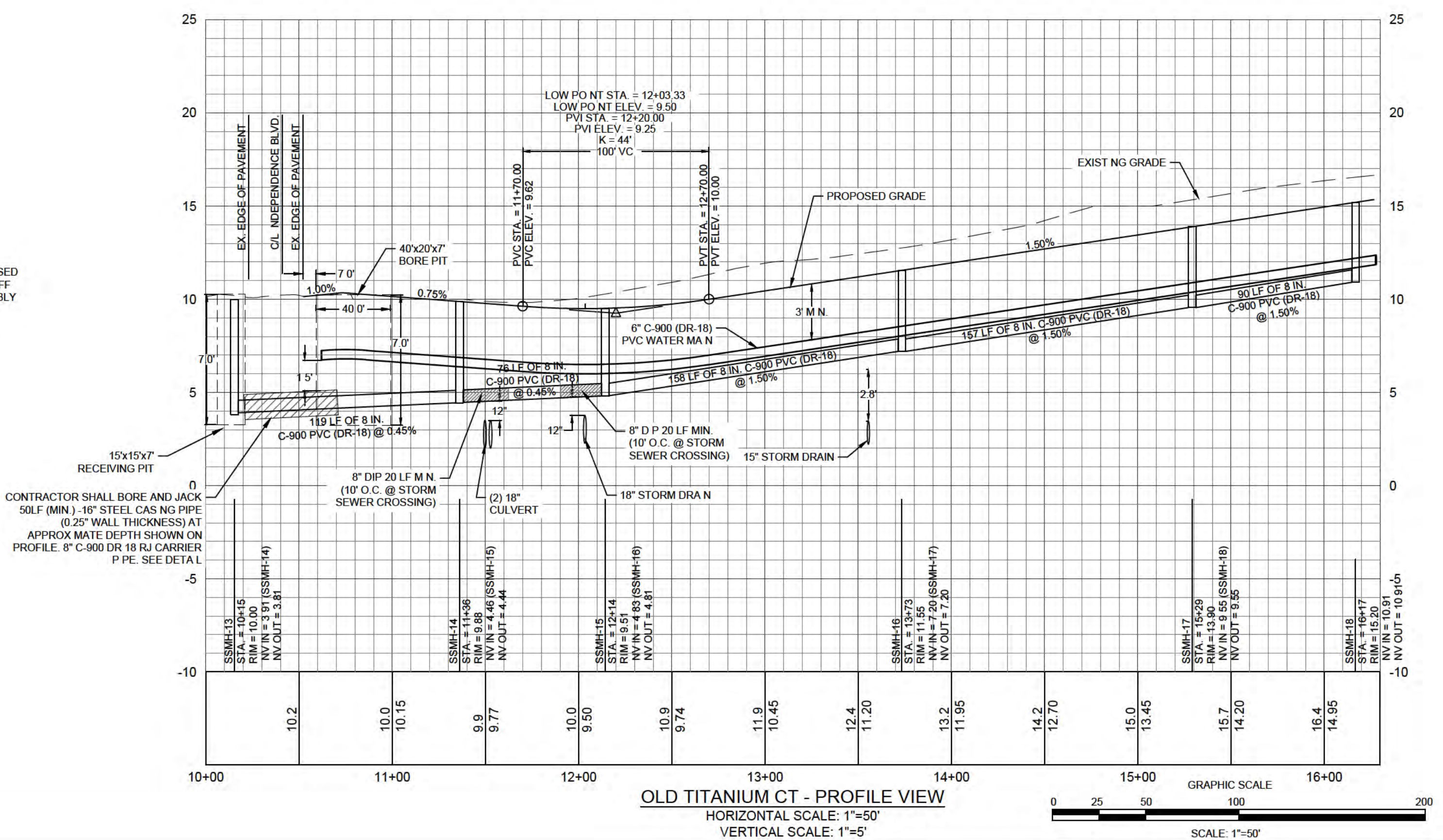
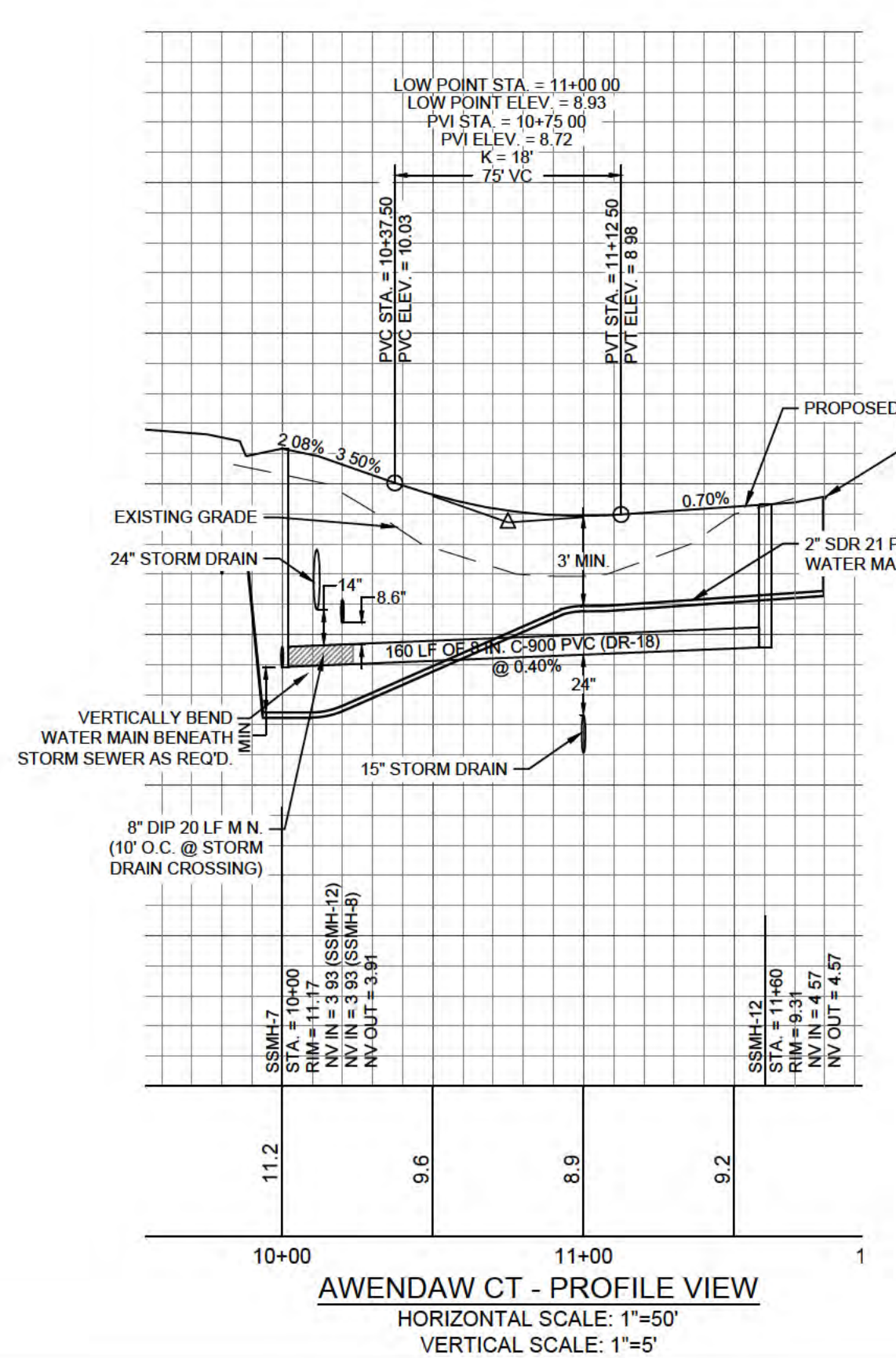
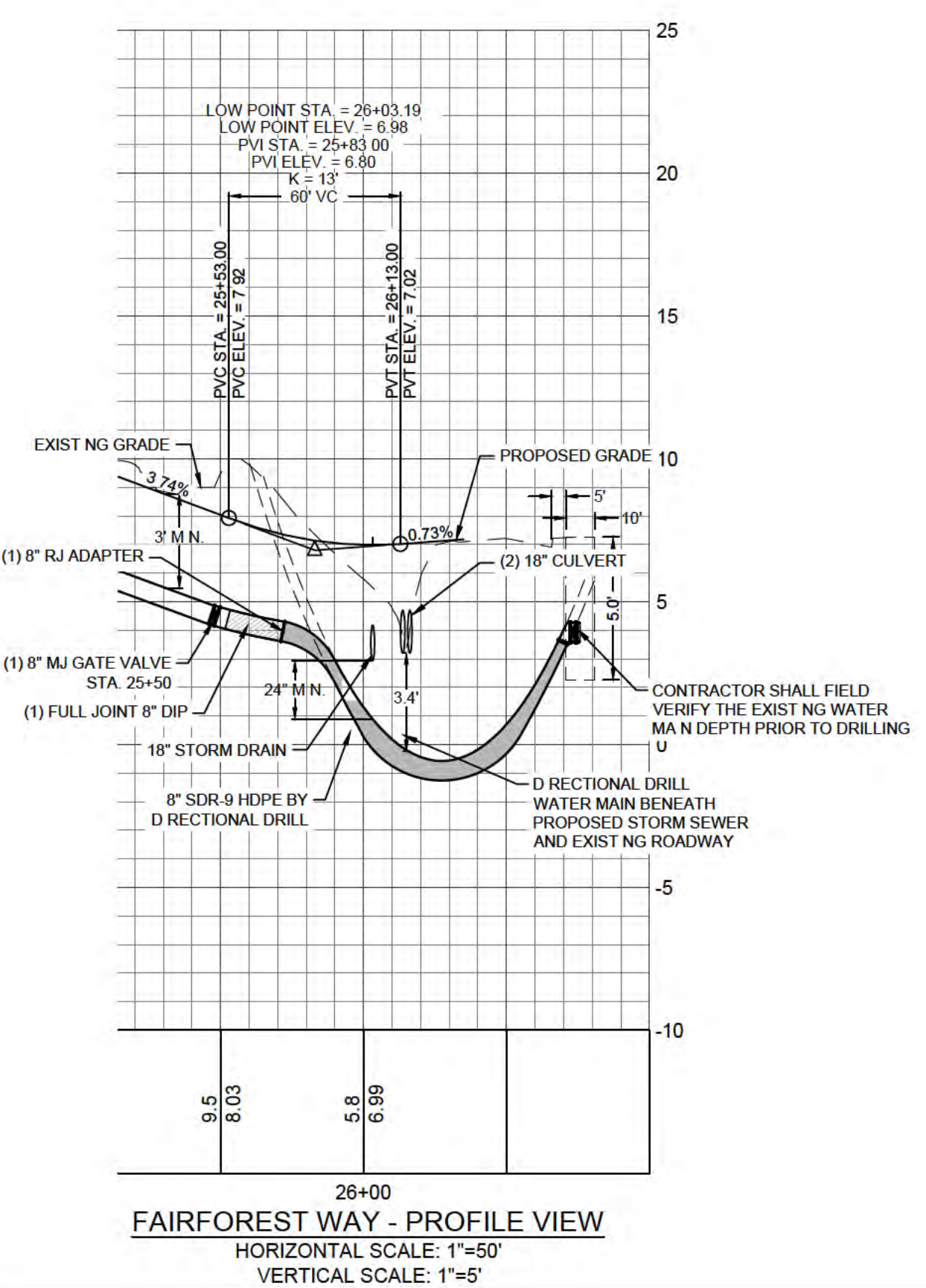
**CITY OF WILMINGTON NORTH CAROLINA**  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN

Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
Signed: \_\_\_\_\_

NC DENR PWSS WATER PERMIT #: \_\_\_\_\_  
WATER CAPACITY: \_\_\_\_\_ GPD  
DWQ SEWER PERMIT #: \_\_\_\_\_  
SEWER CAPACITY: \_\_\_\_\_ GPD  
SEWER SHED # AND PLANT: \_\_\_\_\_  
SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

**811**  
Know what's below.  
Call before you dig.

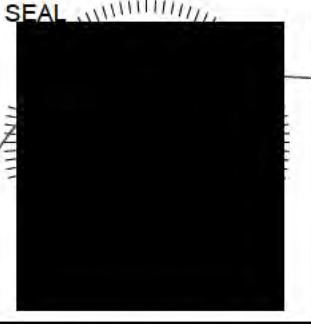


FINAL DESIGN - RELEASED FOR CONSTRUCTION

**PLAN & PROFILE**  
TRACT 2  
WOODLANDS @ ECHO FARMS  
CITY OF WILMINGTON  
NORTH CAROLINA

**PROJECT STATUS**  
CONCEPTUAL LAYOUT:  
PRELIMINARY LAYOUT:  
RELEASED FOR CONST:

**DRAWING INFORMATION**  
DATE: 07/21/20  
DESIGNED: RPB  
DRAWN: RPB  
CHECKED: RPB

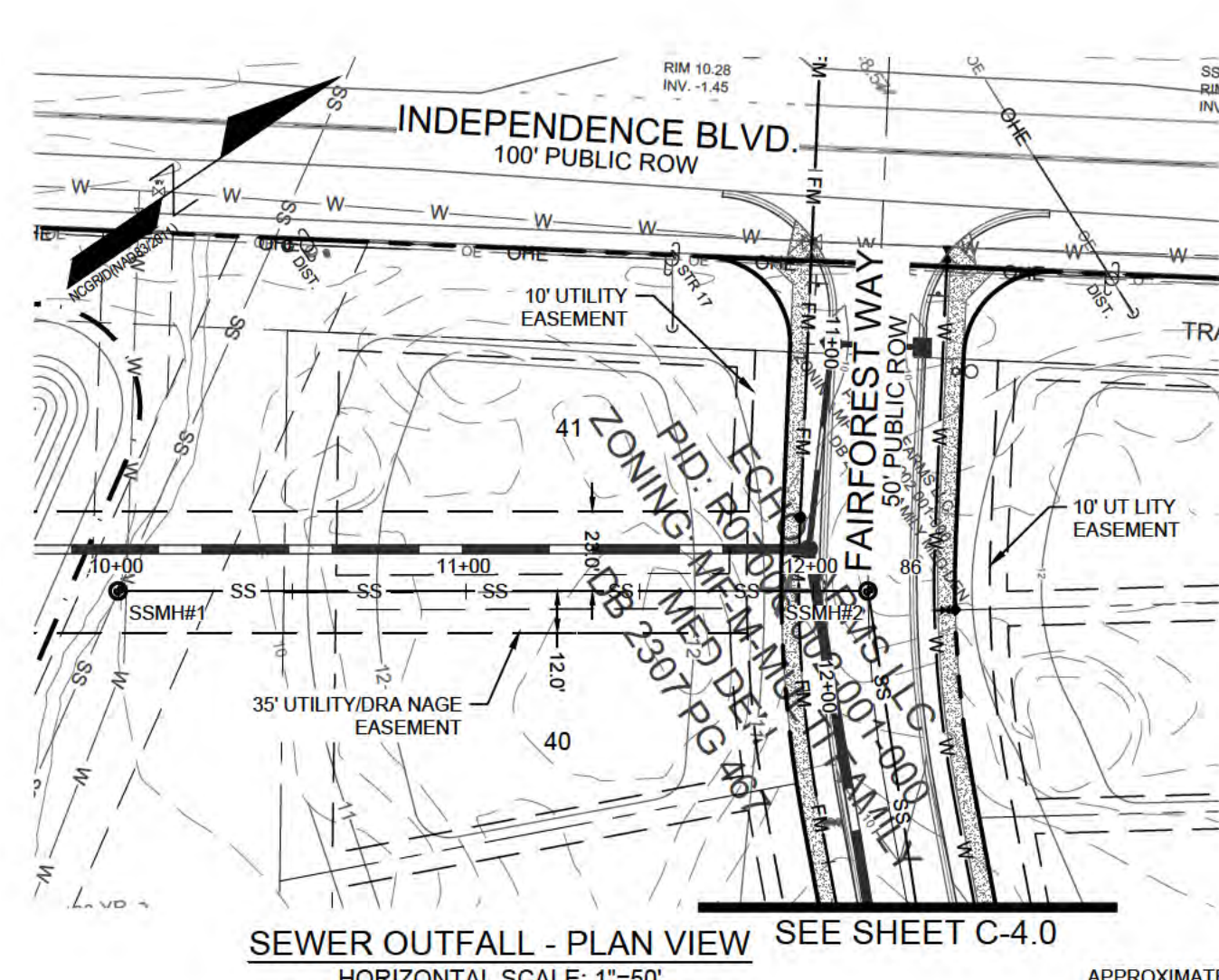


**C-4.1**

**PARAMOUNT ENGINEERING**  
122 Cinema Drive  
Wilmington, North Carolina 28403  
(910) 791-6707 (O) (910) 791-6760 (F)  
NC License #: C-2846

**CLIENT INFORMATION**  
ECHO FARMS, LLC  
c/o MATRIX DEVELOPMENT GROUP  
CN 4000 FORSGATE DRIVE  
CRANBURY, NJ 08512

**REVISIONS:**

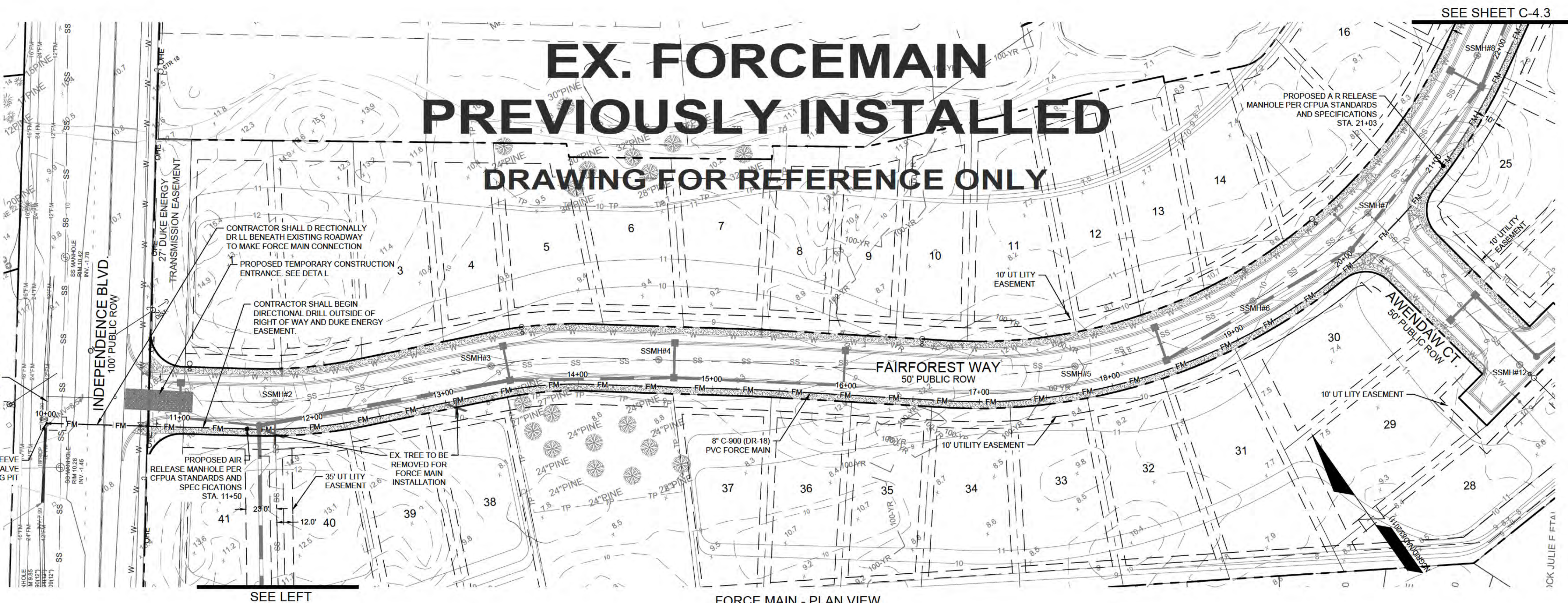
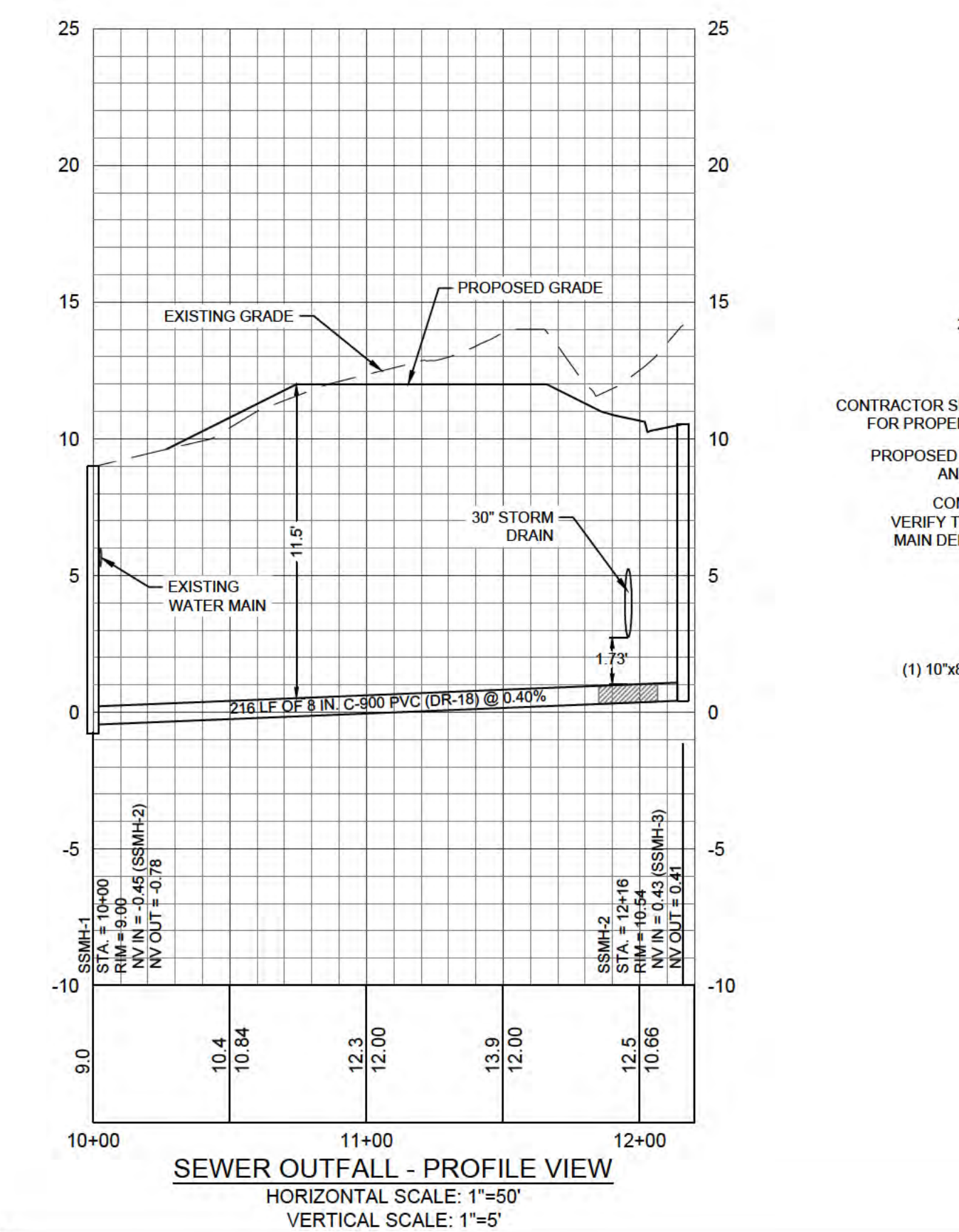


**CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD SEWER NOTES:**

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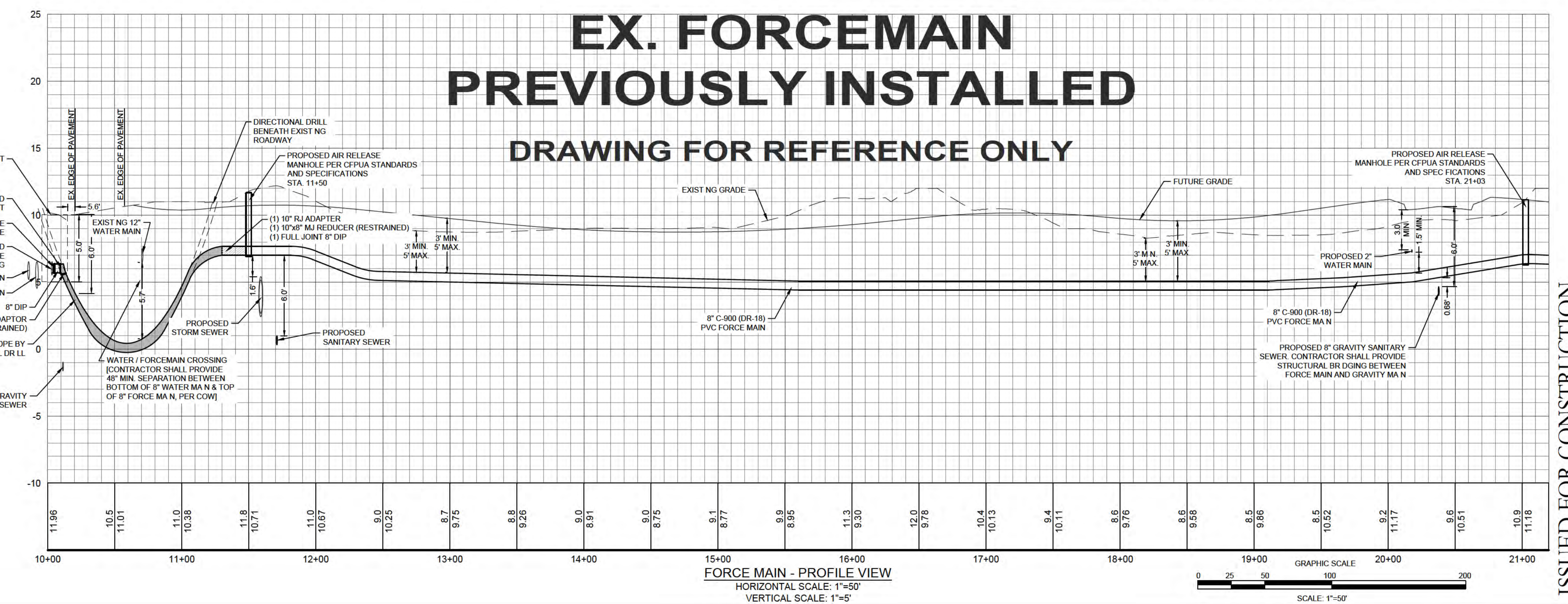
**UTILITY NOTES: (NCAC 15A.02T.0305 / T15A.18C.0906)**

- WATER MAINS SHALL BE LAID SO AS TO PROVIDE A MINIMUM HORIZONTAL SEPARATION OF 10 FEET FROM SEWERS. IF CONDITIONS EXIST SUCH THAT THIS SEPARATION CANNOT BE ACHIEVED, THE WATER MAIN CAN BE INSTALLED AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, EITHER IN A SEPARATE TRENCH, OR IN THE SAME TRENCH ON A BENCH OF UNDISTURBED EARTH.
- WHEN CROSSING A WATER MAIN OVER A SEWER, THE WATER MAIN SHALL BE LAID AT LEAST 18 INCHES ABOVE THE SEWER. IF CONDITIONS EXIST SUCH THAT THIS SEPARATION CANNOT BE ACHIEVED, BOTH THE WATER MAIN AND SEWER SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE WITH JOINTS THAT MEET WATER MAIN STANDARDS. THE DUCTILE IRON PIPE SHALL EXTEND 10 FEET ON EACH SIDE OF THE CROSSING WITH A SECTION OF WATER MAIN PIPE CENTERED ON THE 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.
- WHERE VERTICAL CLEARANCE IS LESS THAN 24" BETWEEN SANITARY SEWER AND STORM DRAIN, SANITARY SEWER SHALL BE DUCTILE IRON PIPE FOR A MINIMUM OF 10' EITHER SIDE OF CROSSING AND STORM DRAIN SHALL BE RC PIPE.
- WHERE VERTICAL CLEARANCE IS LESS THAN 18" BETWEEN WATER MAIN AND STORM DRAIN, WATER MAIN SHALL BE DUCTILE IRON PIPE FOR A MINIMUM OF 10' EITHER SIDE OF CROSSING AND STORM DRAIN SHALL BE RC PIPE.



**FORCE MAIN NOTE:**

- FORCE MAIN SHALL NOT HAVE ANY INTERMEDIATE HIGH POINTS BETWEEN AIR RELEASE VALVES (ARV'S) CONTRACTOR SHALL INSTALL MAIN SUCH THAT VERTICAL ALIGNMENT MAINTAINS NEGATIVE GRADE TO EACH LOW POINT AND THEN POSITIVE GRADE TO EACH HIGH POINT. ARV'S TO BE INSTALLED AT EACH HIGH POINT. THE CONTRACTOR SHALL INFORM OWNER AND ENGINEER OF ANY CONFLICTS OR OTHER CONDITIONS THAT MAY ADVERSELY AFFECT THE VERTICAL ALIGNMENT. CONTRACTOR SHALL PROVIDE PIPE ELEVATIONS AT 200' INTERVALS AND AT ARV'S (TOP OF PIPE).



# EX. FORCEMAIN PREVIOUSLY INSTALLED DRAWING FOR REFERENCE ONLY

# EX. FORCEMAIN PREVIOUSLY INSTALLED DRAWING FOR REFERENCE ONLY

**WOODLANDS AT ECHO FARMS  
TRACT 2  
APPROVED 7/21/20  
SWP 2020024  
BC, RC, CW, MB, BM**

**CITY OF WILMINGTON**  
NORTH CAROLINA  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN

Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
Signed: \_\_\_\_\_

NCDEN PWSS WATER PERMIT #: \_\_\_\_\_  
WATER CAPACITY: \_\_\_\_\_ GPD  
DWQ SEWER PERMIT #: \_\_\_\_\_  
SEWER CAPACITY: \_\_\_\_\_ GPD  
SEWER SHED # AND PLANT: \_\_\_\_\_  
SEWER TO FLOW THROUGH NEI: YES OR NO (CIRCLE ONE)

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.



ISSUED FOR CONSTRUCTION

**REVISIONS:**

**CLIENT INFORMATION:**  
ECHO FARMS, LLC  
c/o MATRIX DEVELOPMENT GROUP  
CN 4000 FORSGATE DRIVE  
CRANFURY, NJ 08512

**PARAMOUNT ENGINEERING, INC.**  
122 Cinema Drive  
Wilmington, North Carolina 28403  
(910) 791-6707 (O) (910) 791-6760 (F)  
NC License #: C-2846

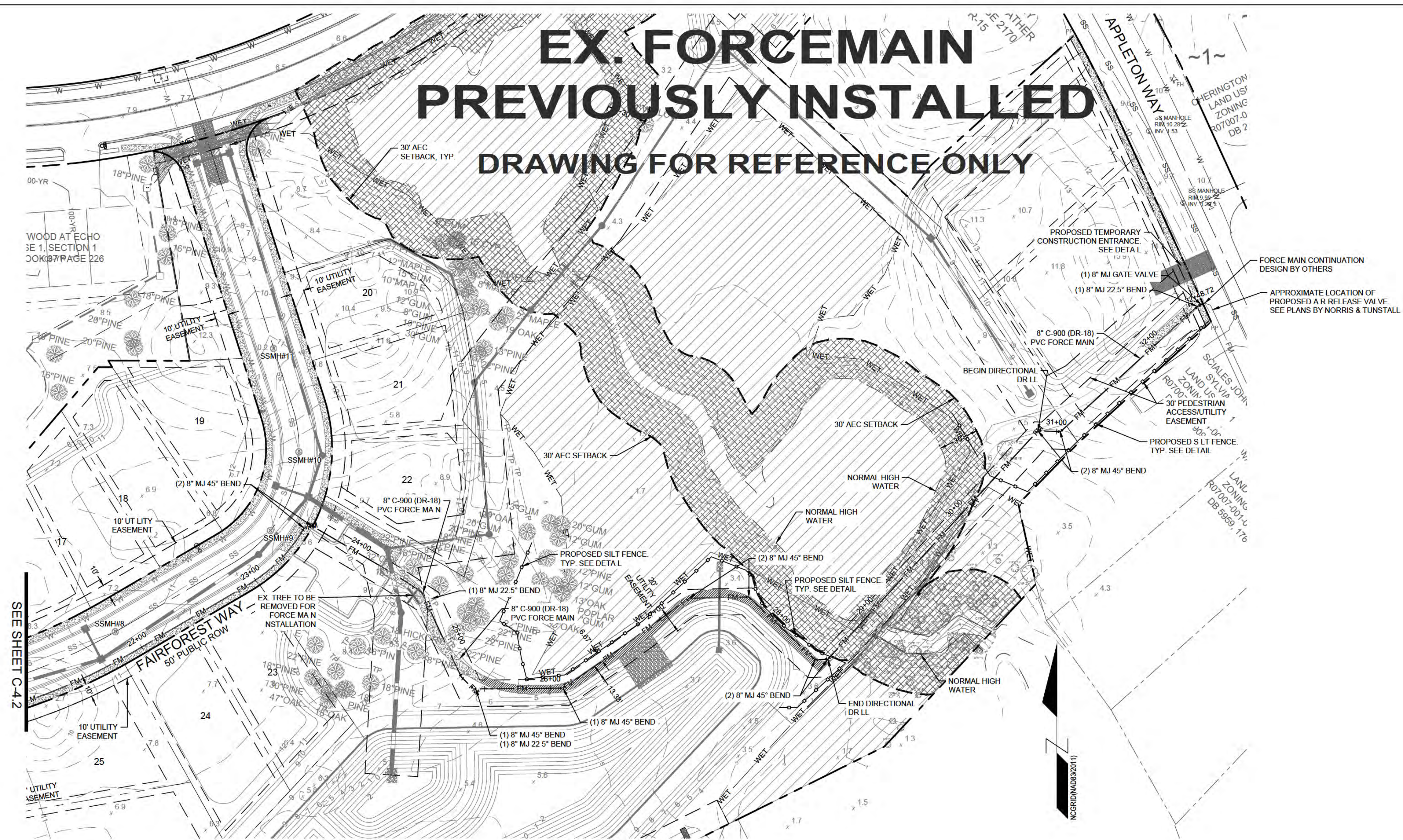
**PROJECT STATUS:**  
CONCEPTUAL LAYOUT:  
PRELIMINARY LAYOUT:  
RELEASED FOR CONSTRUCTION

**DRAWING INFORMATION:**  
DATE: 07/21/20  
DESIGNED: PJB  
DRAWN: PJB  
CHECKED: PJB

**FORCEMAIN PLAN & PROFILE  
TRACT 2  
WOODLANDS @ ECHO FARMS  
CITY OF WILMINGTON  
NORTH CAROLINA**

**C-4.2**  
PEI JOB#: 17358.PE

# EX. FORCEMAIN PREVIOUSLY INSTALLED DRAWING FOR REFERENCE ONLY



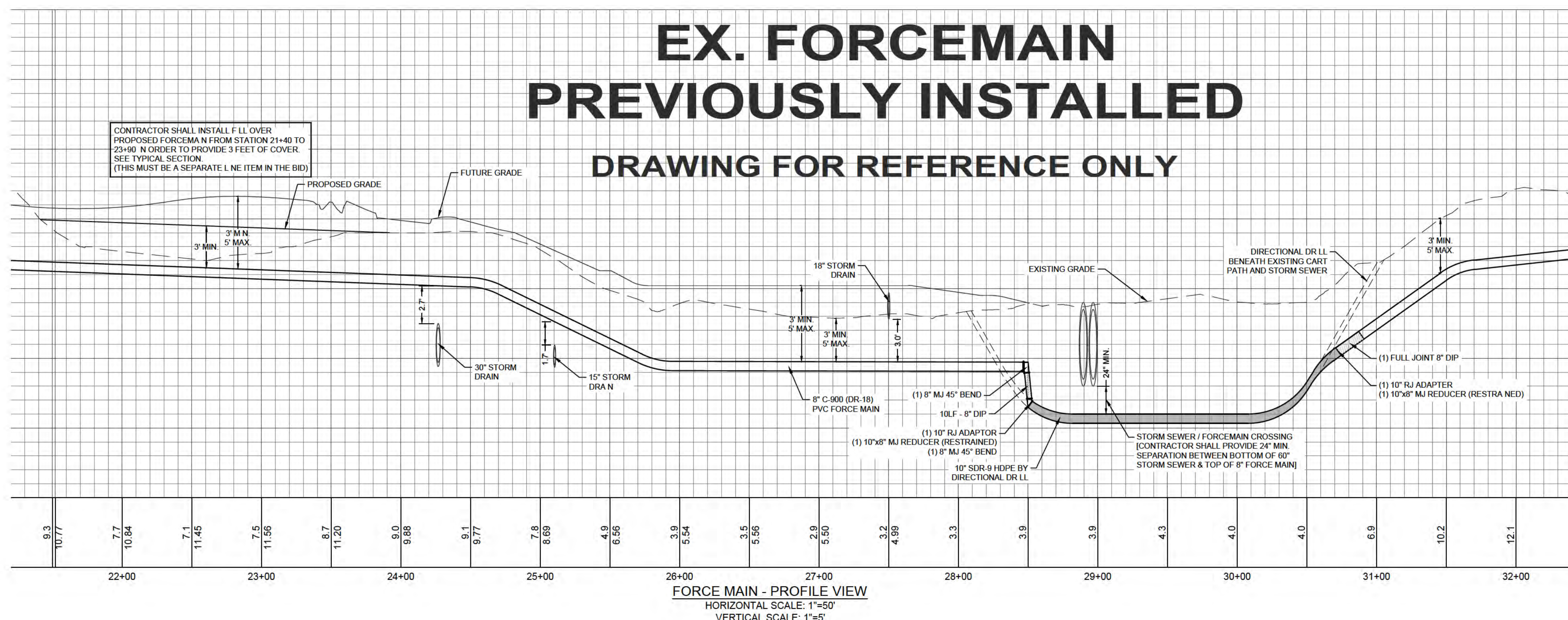
FORCE MAIN - PLAN VIEW  
HORIZONTAL SCALE: 1"=50'

- UTILITY NOTES: (NCAC 15A.02T.0305 / T15A.18C.0906)**
1. WATER MAINS SHALL BE LAID SO AS TO PROVIDE A MINIMUM HORIZONTAL SEPARATION OF 10 FEET FROM SEWERS. IF CONDITIONS EXIST SUCH THAT THIS SEPARATION CANNOT BE ACHIEVED, THE WATER MAIN CAN BE INSTALLED AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, EITHER IN A SEPARATE TRENCH, OR IN THE SAME TRENCH ON A BENCH OF UNDISTURBED EARTH.
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  4. WHERE VERTICAL CLEARANCE IS LESS THAN 24" BETWEEN SANITARY SEWER AND STORM DRAIN, SANITARY SEWER SHALL BE DUCTILE IRON PIPE FOR A MINIMUM OF 10' EITHER SIDE OF CROSSING AND STORM DRAIN SHALL BE RC PIPE.
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- CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD SEWER NOTES:**
1. SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
  2. WATER AND SEWER SERVICES SHALL BE PERPENDICULAR TO MAIN AND TERMINATE AT R/W LINE. SEWER SERVICES IN CUL-DE-SACS ARE REQUIRED TO BE PERPENDICULAR, OR MUST ORIGINATE IN END OF LINE MANHOLE AND TERMINATE AT RIGHT-OF-WAY LINE.
  3. ALL SERVICES TYING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF CLASS 50, DIP, WITH PROTECTO 401 CERAMIC EPOXY LINING.
  4. MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
  5. NO FLEXIBLE COUPLINGS SHALL BE USED.
  6. ALL STAINLESS STEEL FASTENERS SHALL BE 316.
  7. CLEANOUTS SHALL BE LOCATED A MINIMUM OF 12 FEET FROM ALL PROPERTY CORNERS. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.

- FORCE MAIN NOTE:**
1. FORCE MAIN SHALL NOT HAVE ANY INTERMEDIATE HIGH POINTS BETWEEN AIR RELEASE VALVES (ARV'S) CONTRACTOR SHALL INSTALL MAIN SUCH THAT VERTICAL ALIGNMENT MAINTAINS NEGATIVE GRADE TO EACH LOW POINT AND THEN POSITIVE GRADE TO EACH HIGH POINT. ARV'S TO BE INSTALLED AT EACH HIGH POINT. THE CONTRACTOR SHALL INFORM OWNER AND ENGINEER OF ANY CONFLICTS OR OTHER CONDITIONS THAT MAY ADVERSELY AFFECT THE VERTICAL ALIGNMENT. CONTRACTOR SHALL PROVIDE PIPE ELEVATIONS AT 200' INTERVALS AND AT ARV'S (TOP OF PIPE).

# EX. FORCEMAIN PREVIOUSLY INSTALLED DRAWING FOR REFERENCE ONLY



FORCE MAIN - PROFILE VIEW  
HORIZONTAL SCALE: 1"=50'  
VERTICAL SCALE: 1"=5'

**City of WILMINGTON**  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN

Date: \_\_\_\_\_ Permit # \_\_\_\_\_

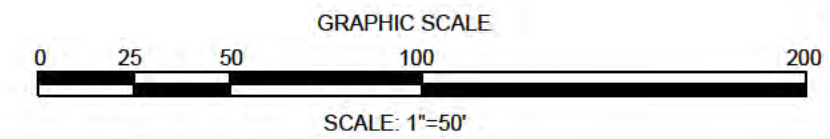
Signed: \_\_\_\_\_

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NCDENR PWSS WATER PERMIT #: \_\_\_\_\_  
WATER CAPACITY: \_\_\_\_\_ GPD  
DWQ SEWER PERMIT #: \_\_\_\_\_  
SEWER CAPACITY: \_\_\_\_\_ GPD  
SEWER SHED # AND PLANT: \_\_\_\_\_  
SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

**WOODLANDS AT ECHO FARMS  
TRACT 2**  
APPROVED 7/21/20  
SWP 2020024  
BC, RC, CW, MB, BM



REVISIONS:

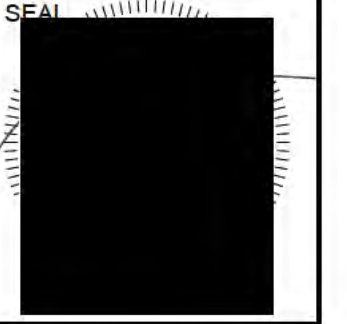
CLIENT INFORMATION:  
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CRANBURY, NJ 08512

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FORCEMAIN PLAN & PROFILE  
TRACT 2  
WOODLANDS @ ECHO FARMS  
CITY OF WILMINGTON  
NORTH CAROLINA

PROJECT STATUS:  
CONCEPTUAL LAYOUT: \_\_\_\_\_  
PRELIMINARY LAYOUT: \_\_\_\_\_  
RELEASED FOR CONSTRUCTION: \_\_\_\_\_

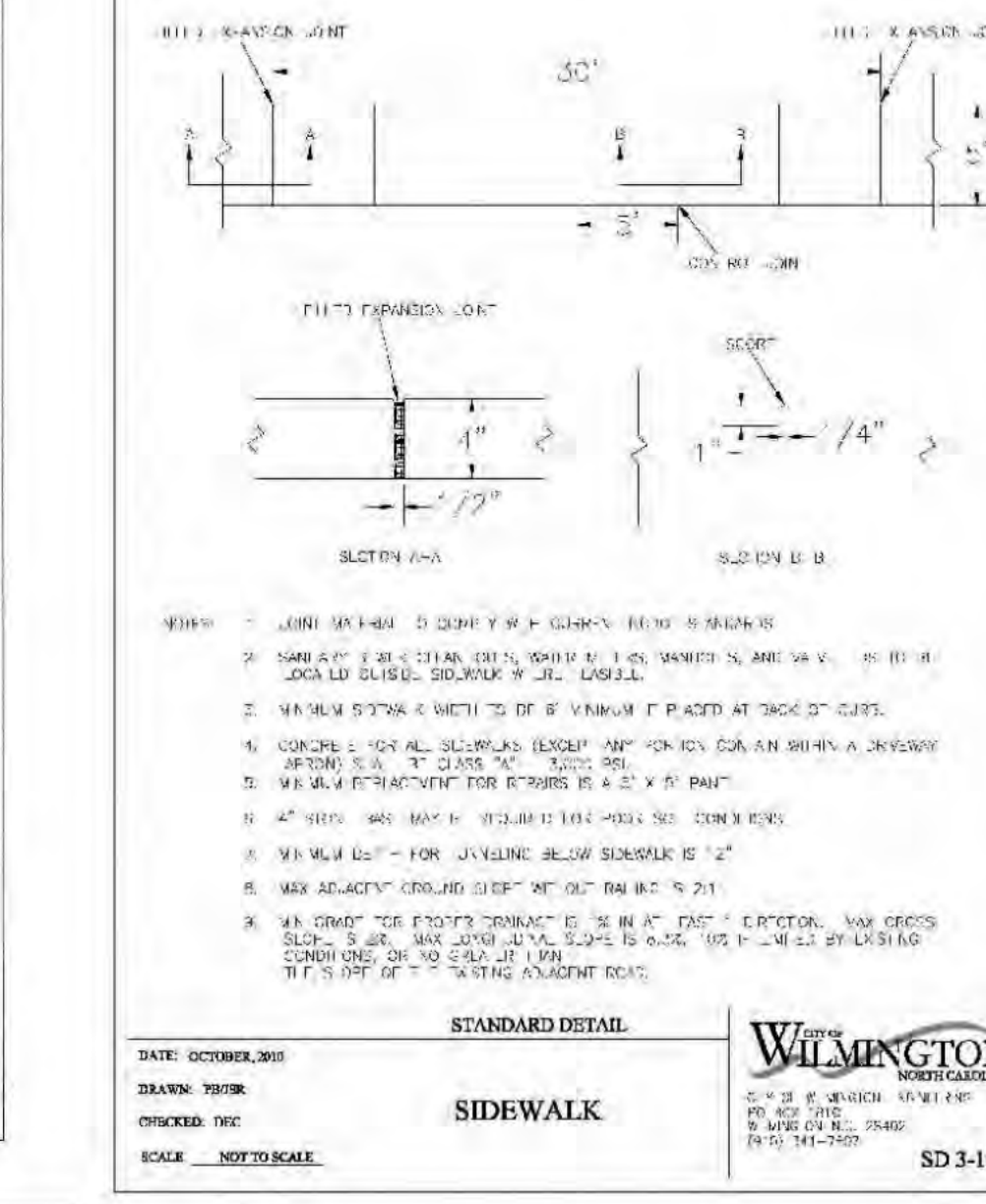
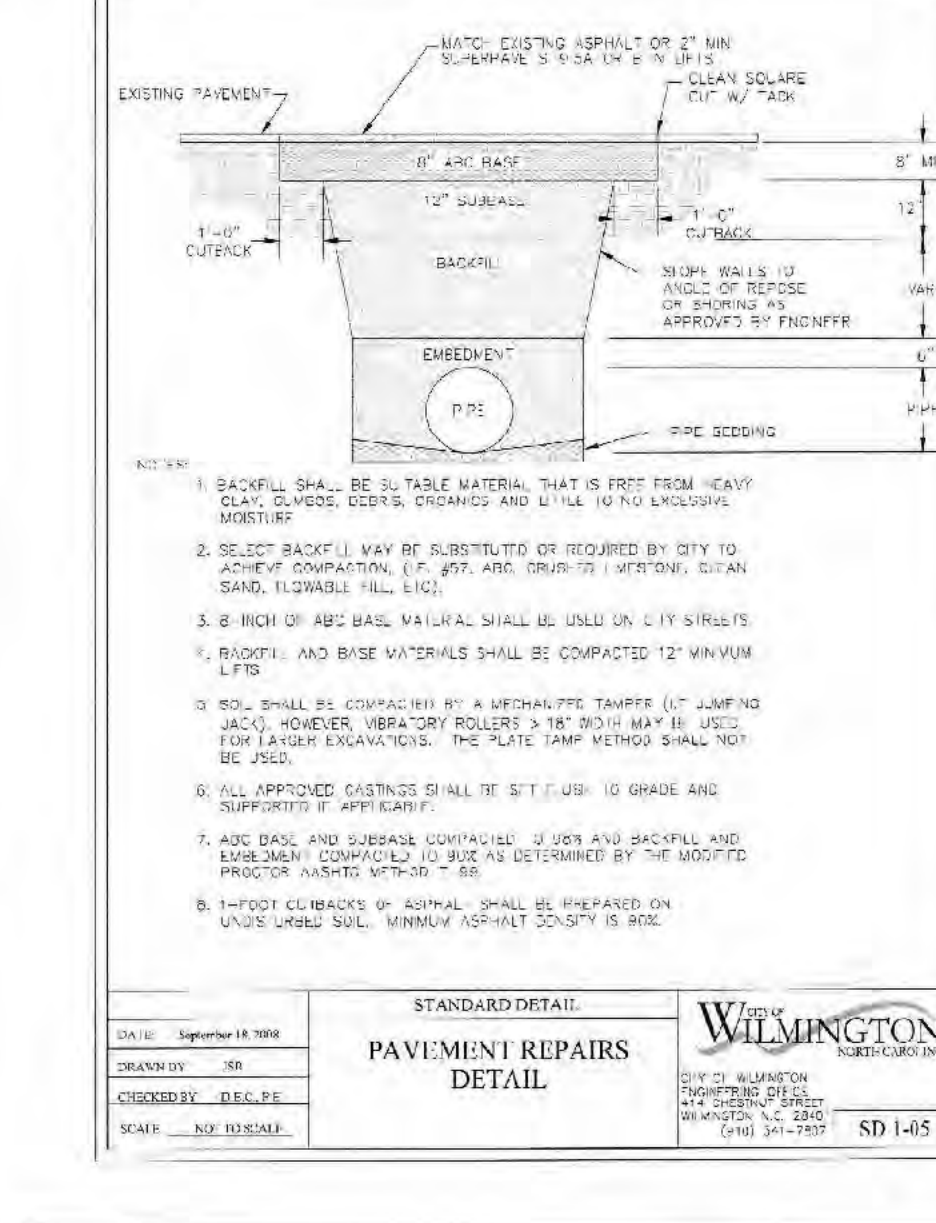
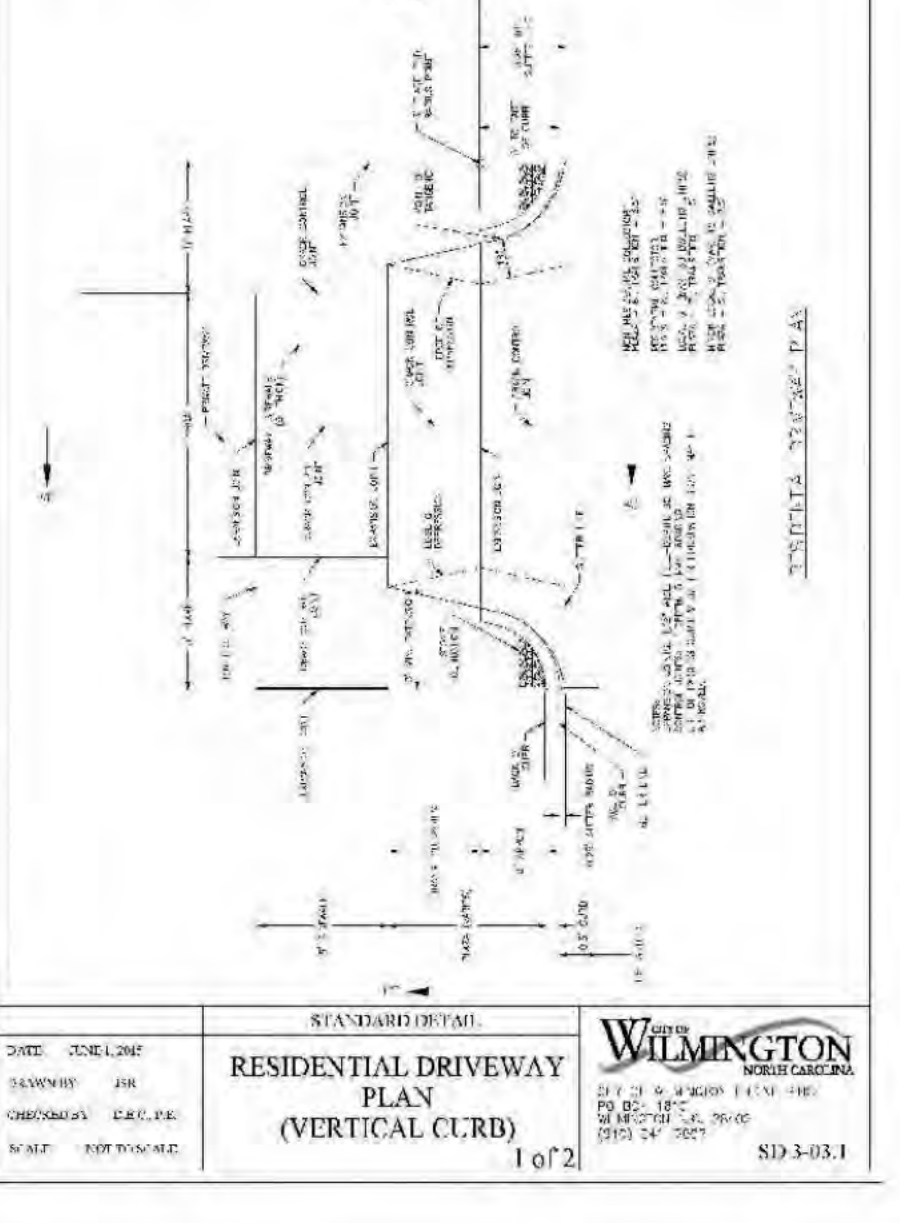
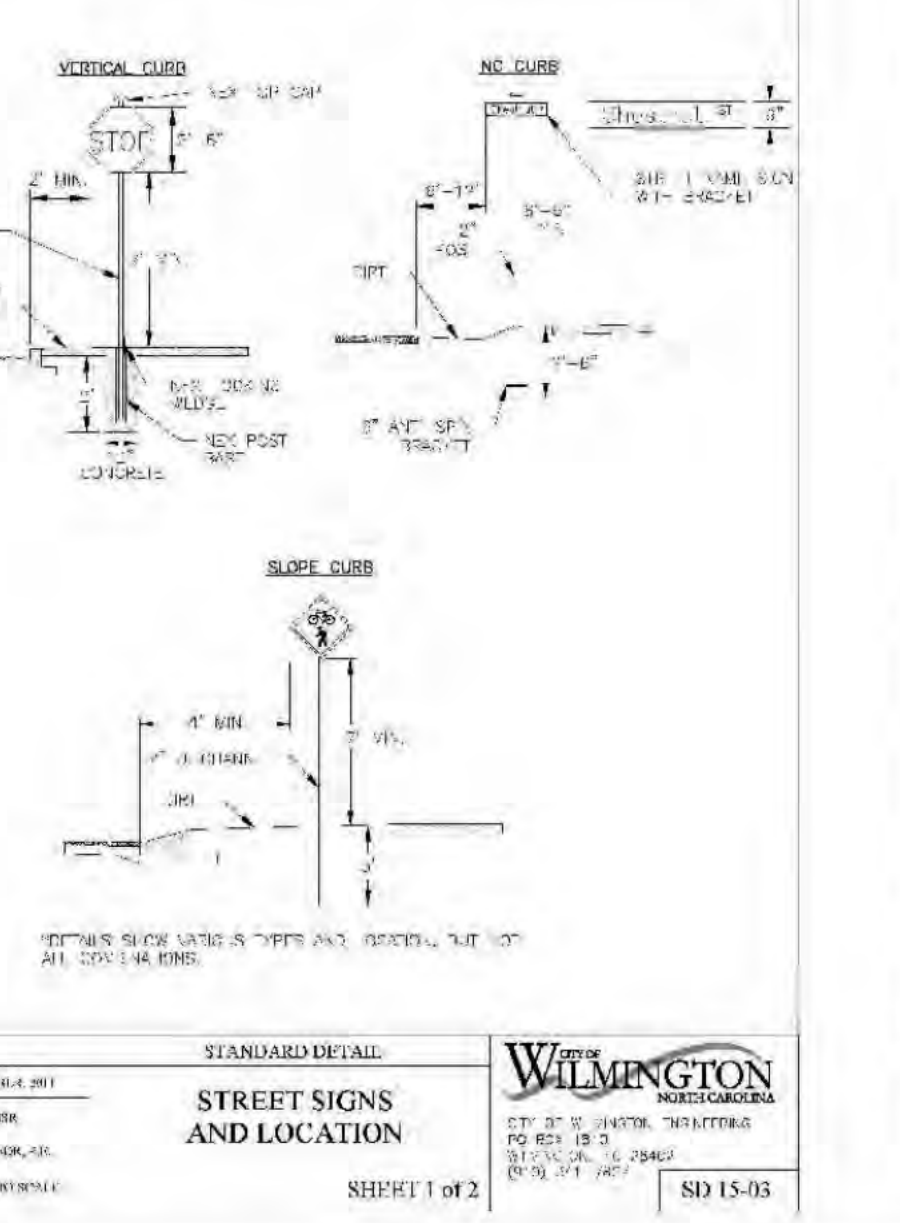
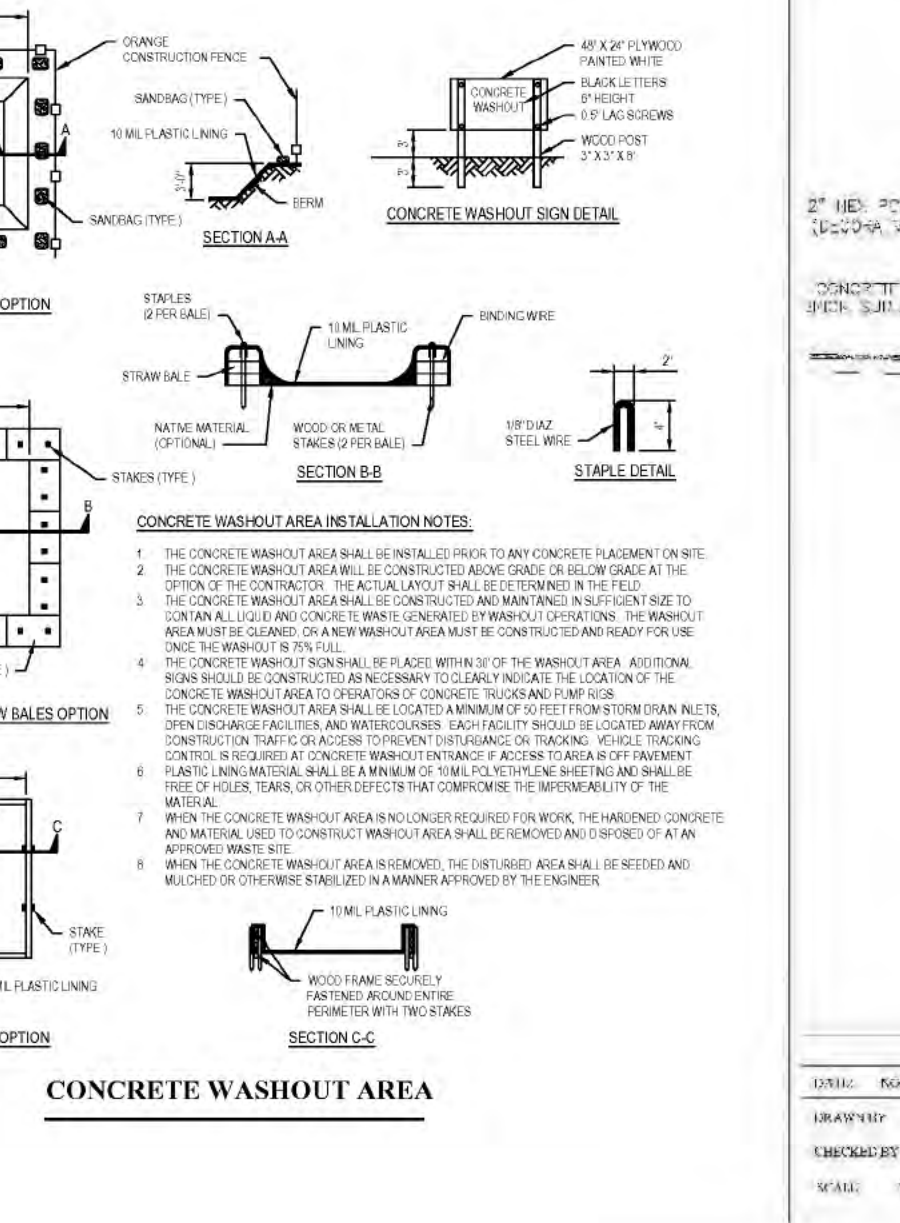
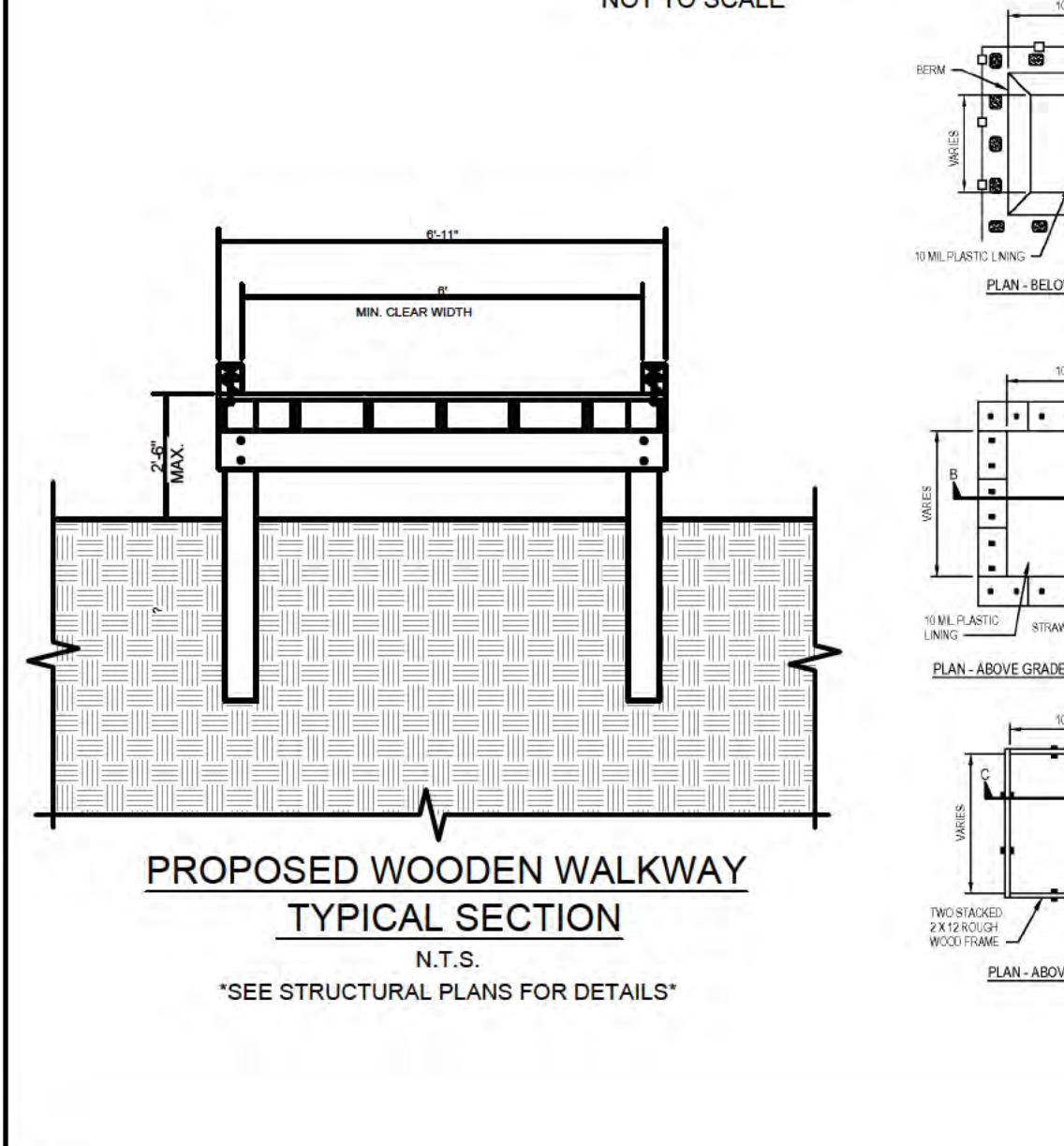
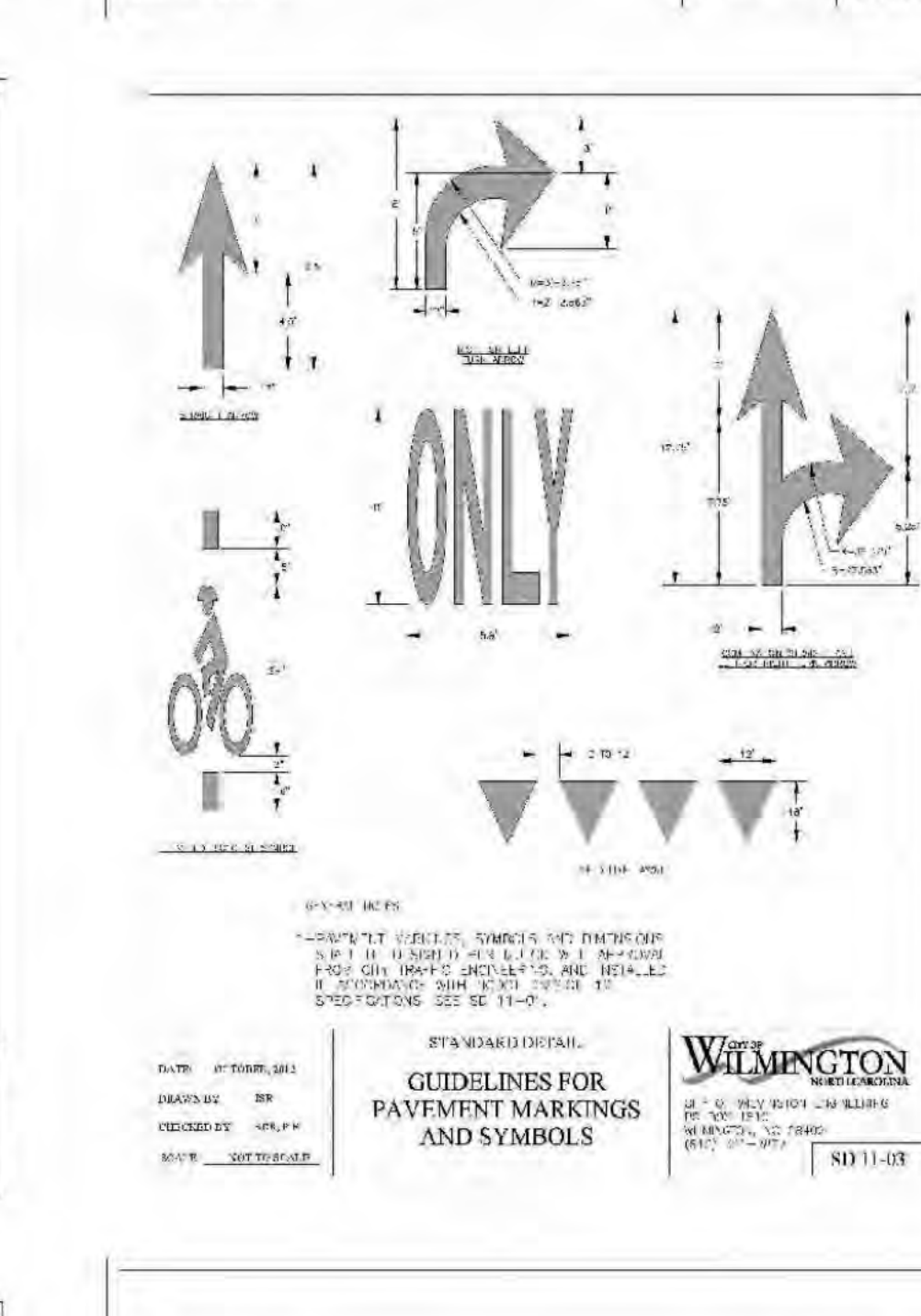
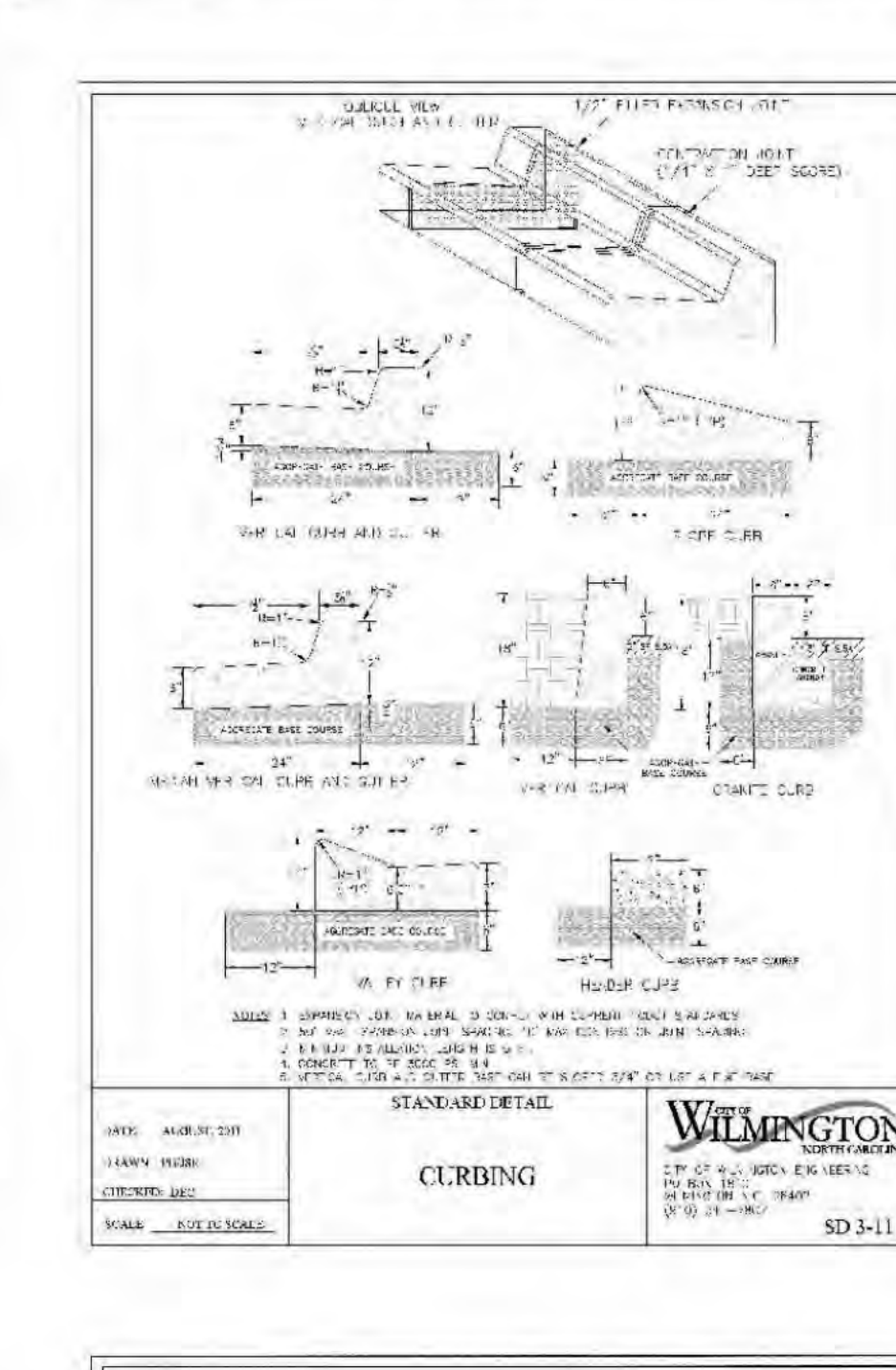
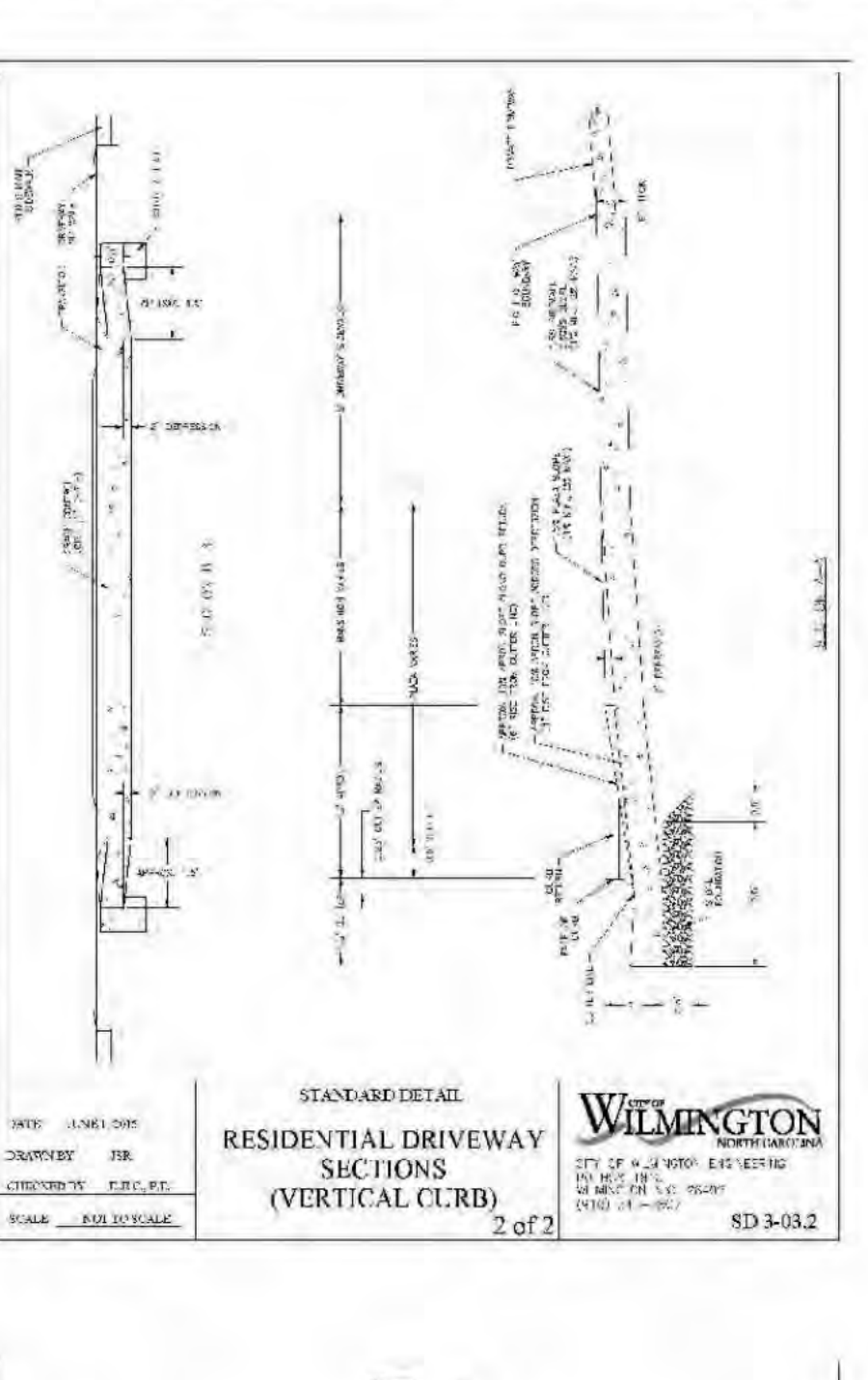
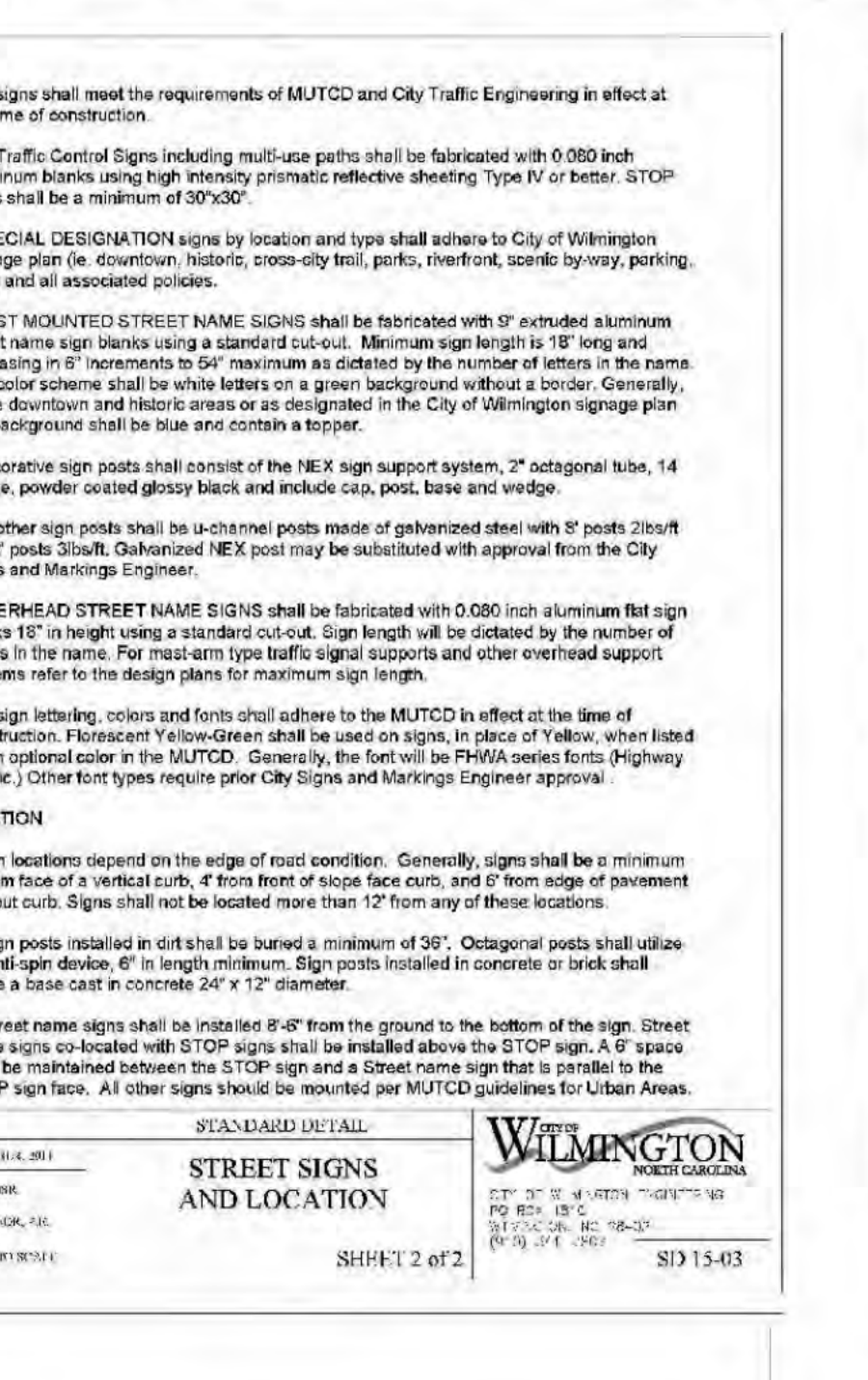
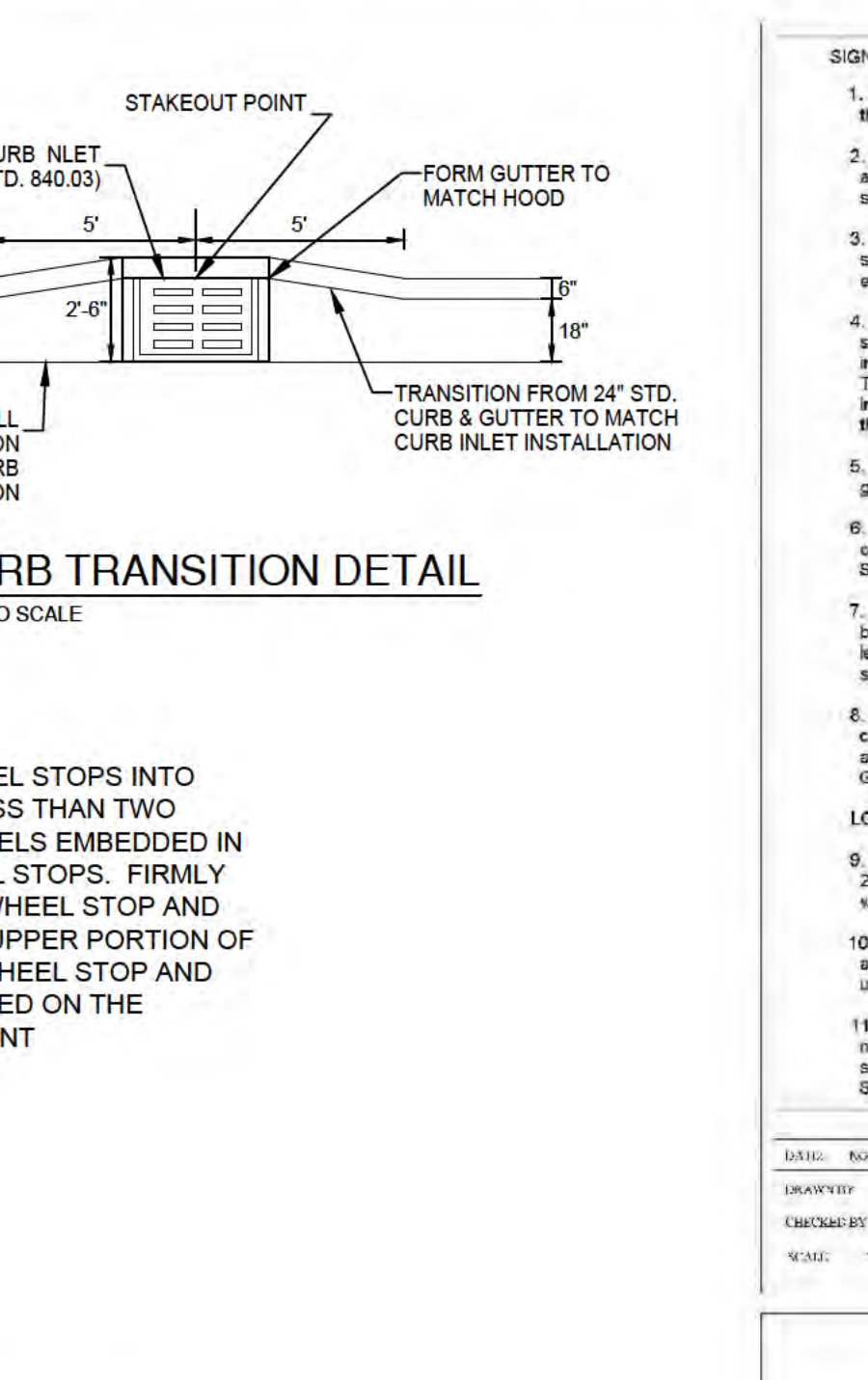
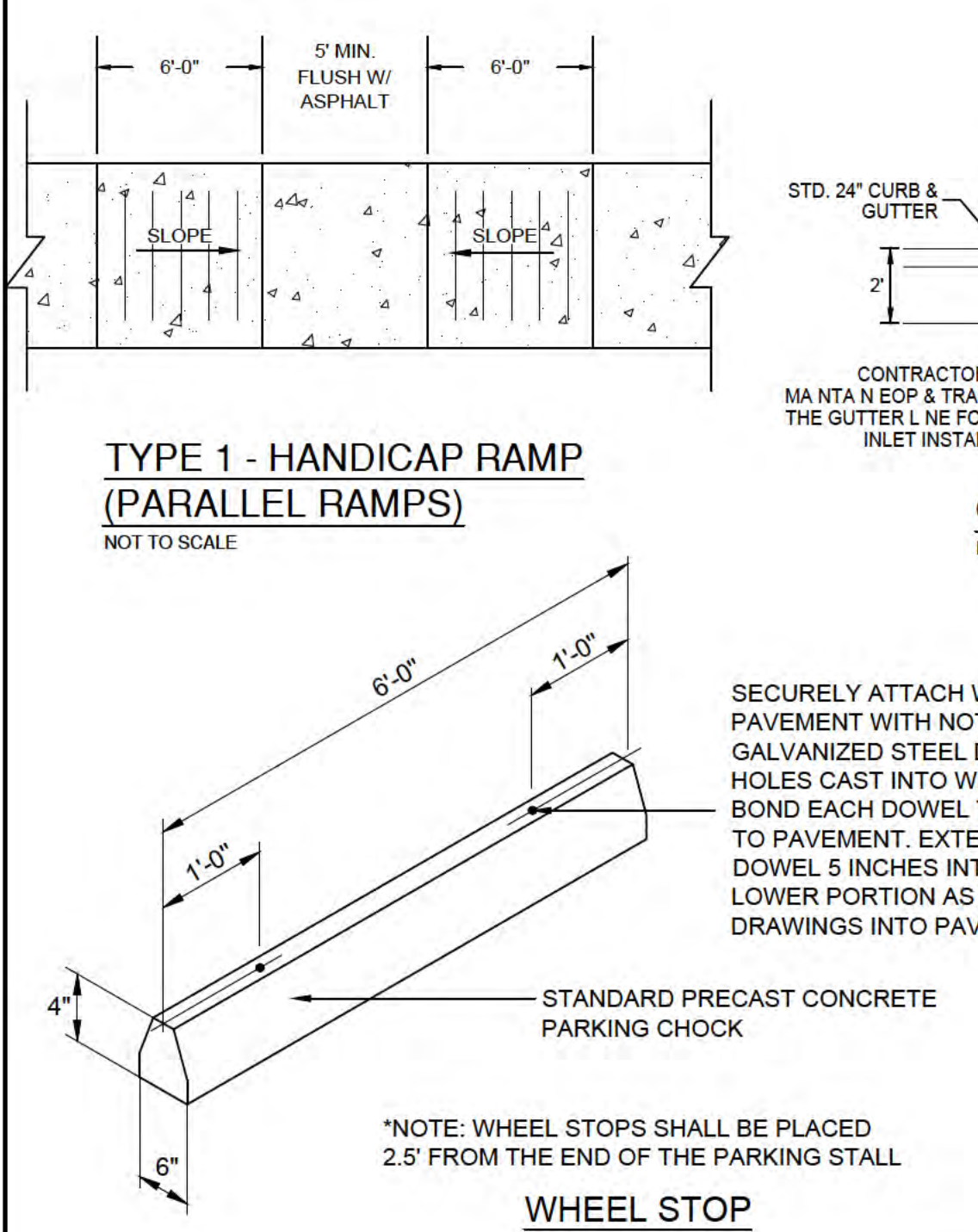
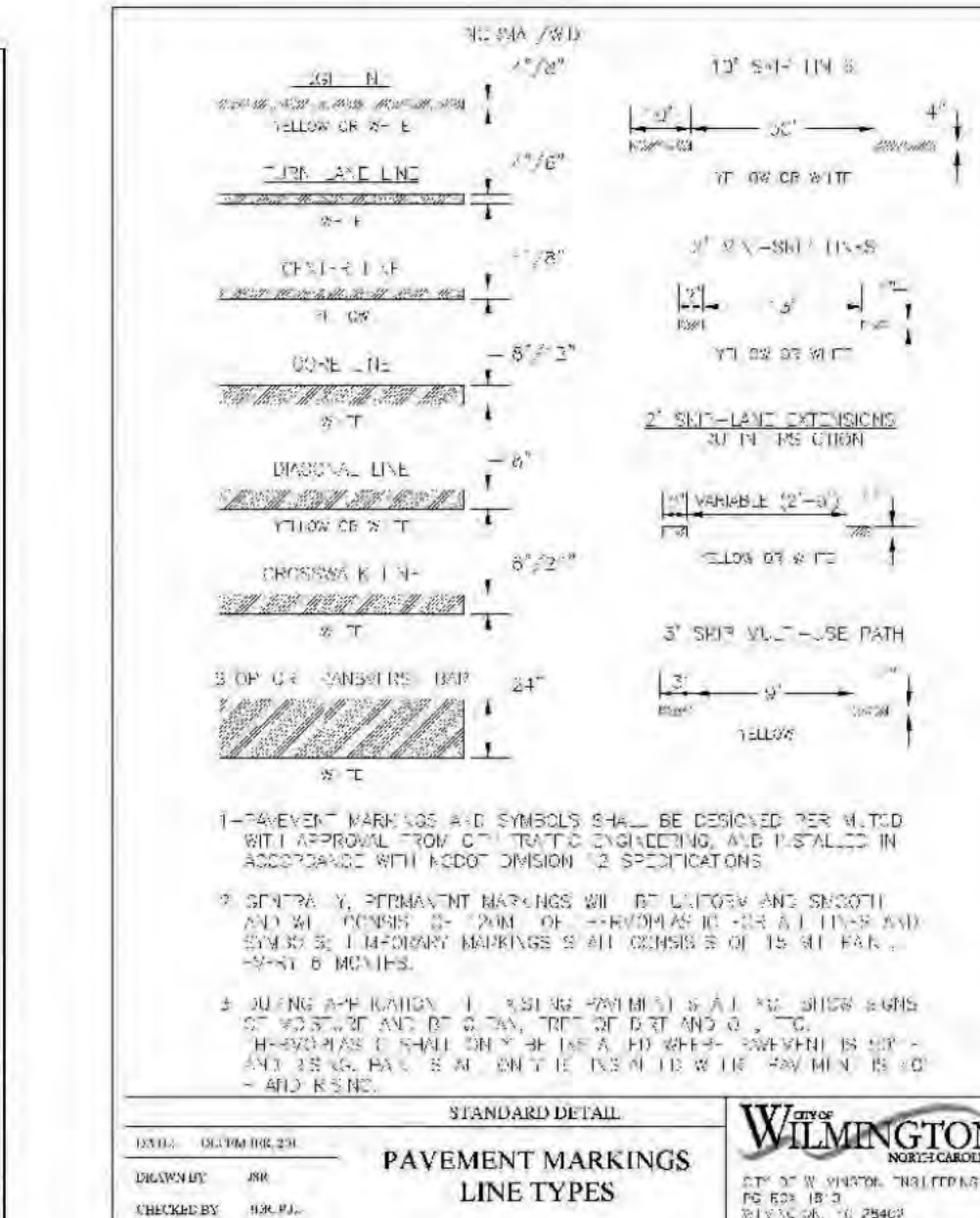
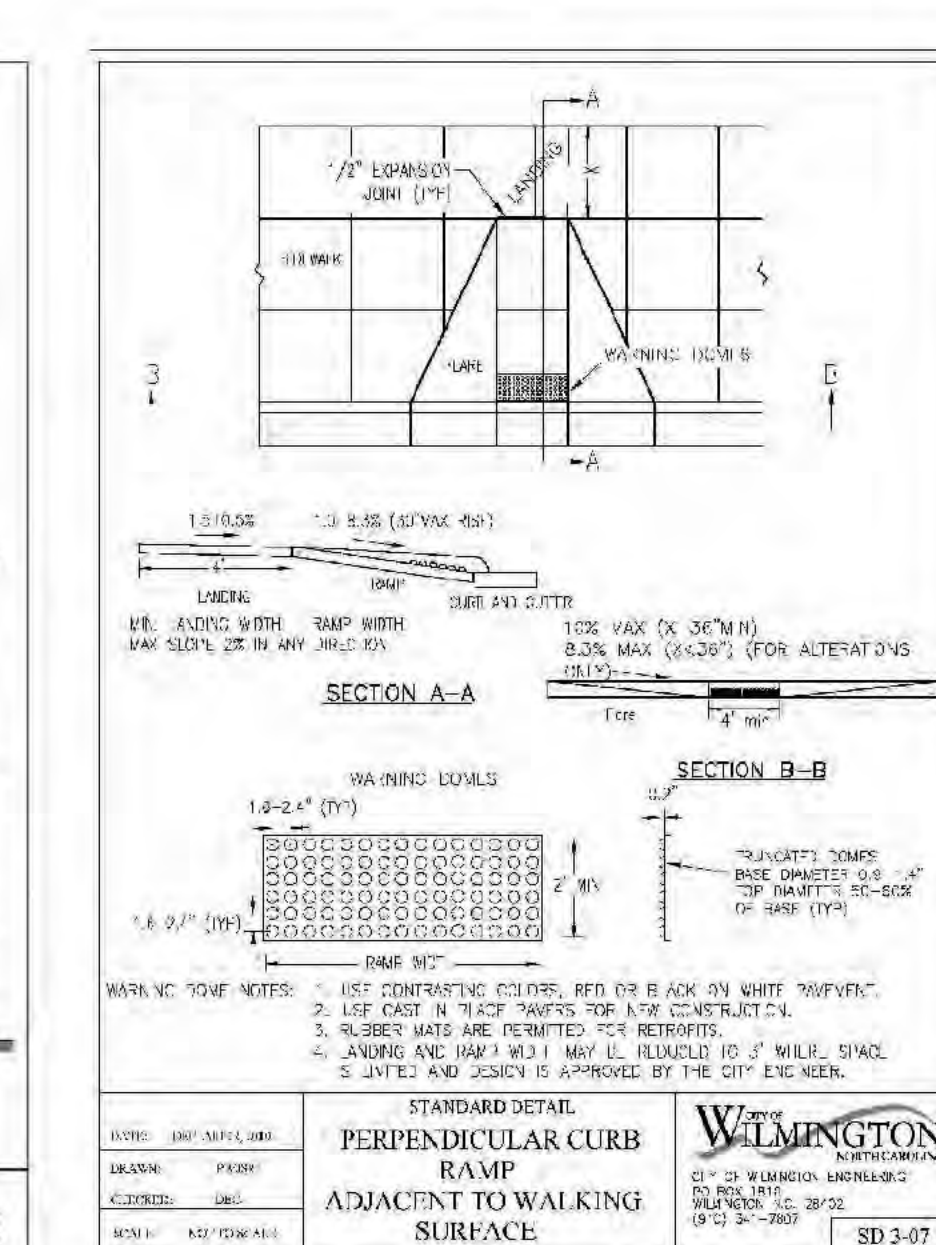
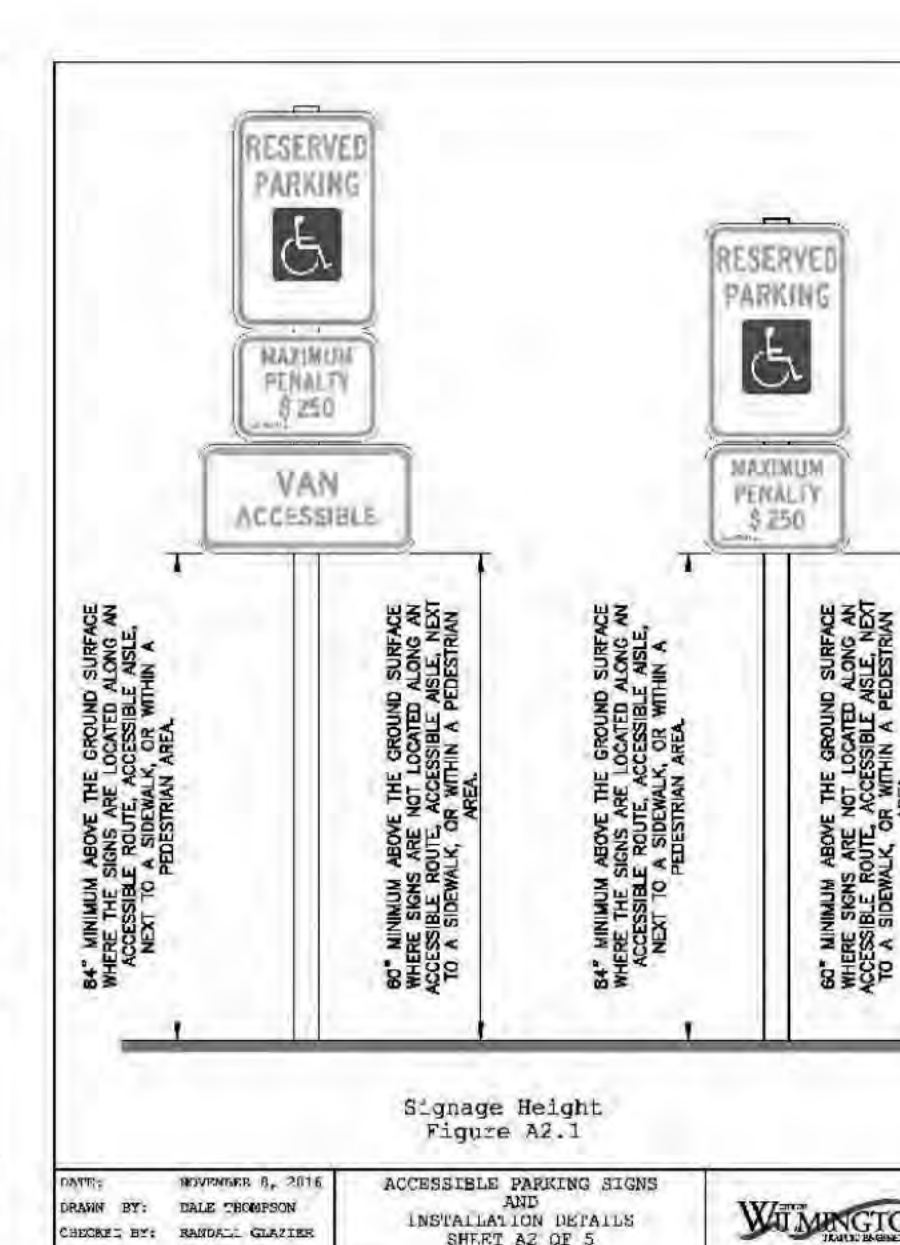
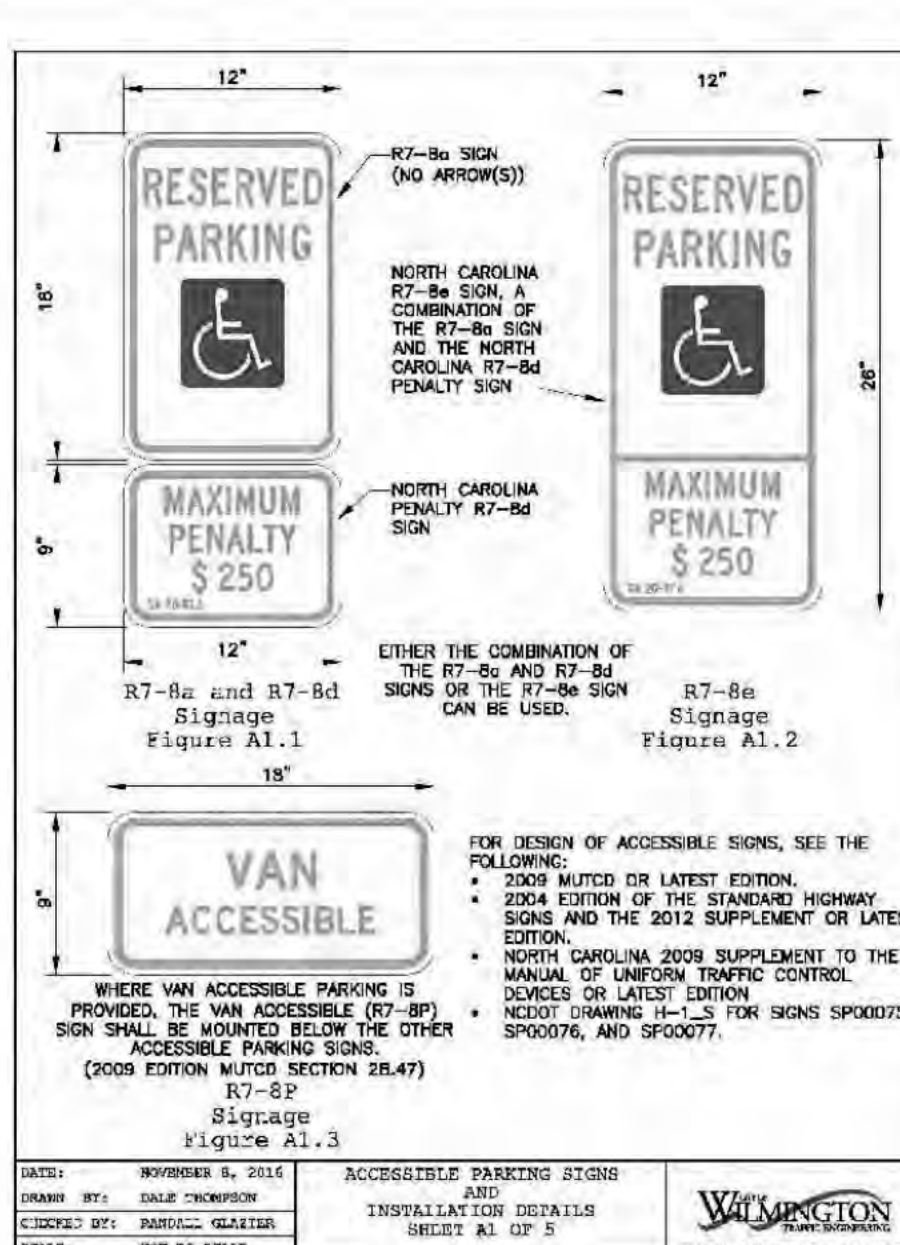
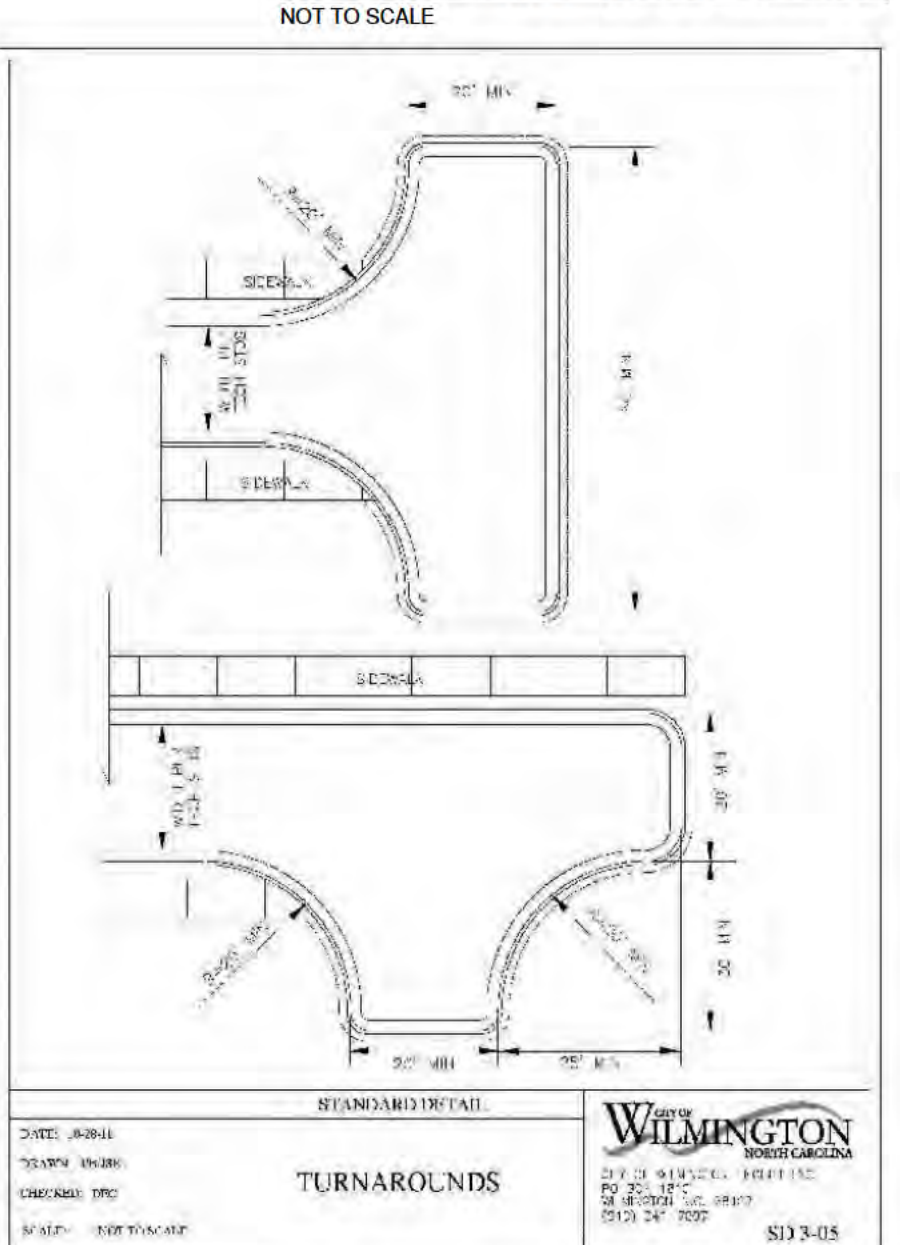
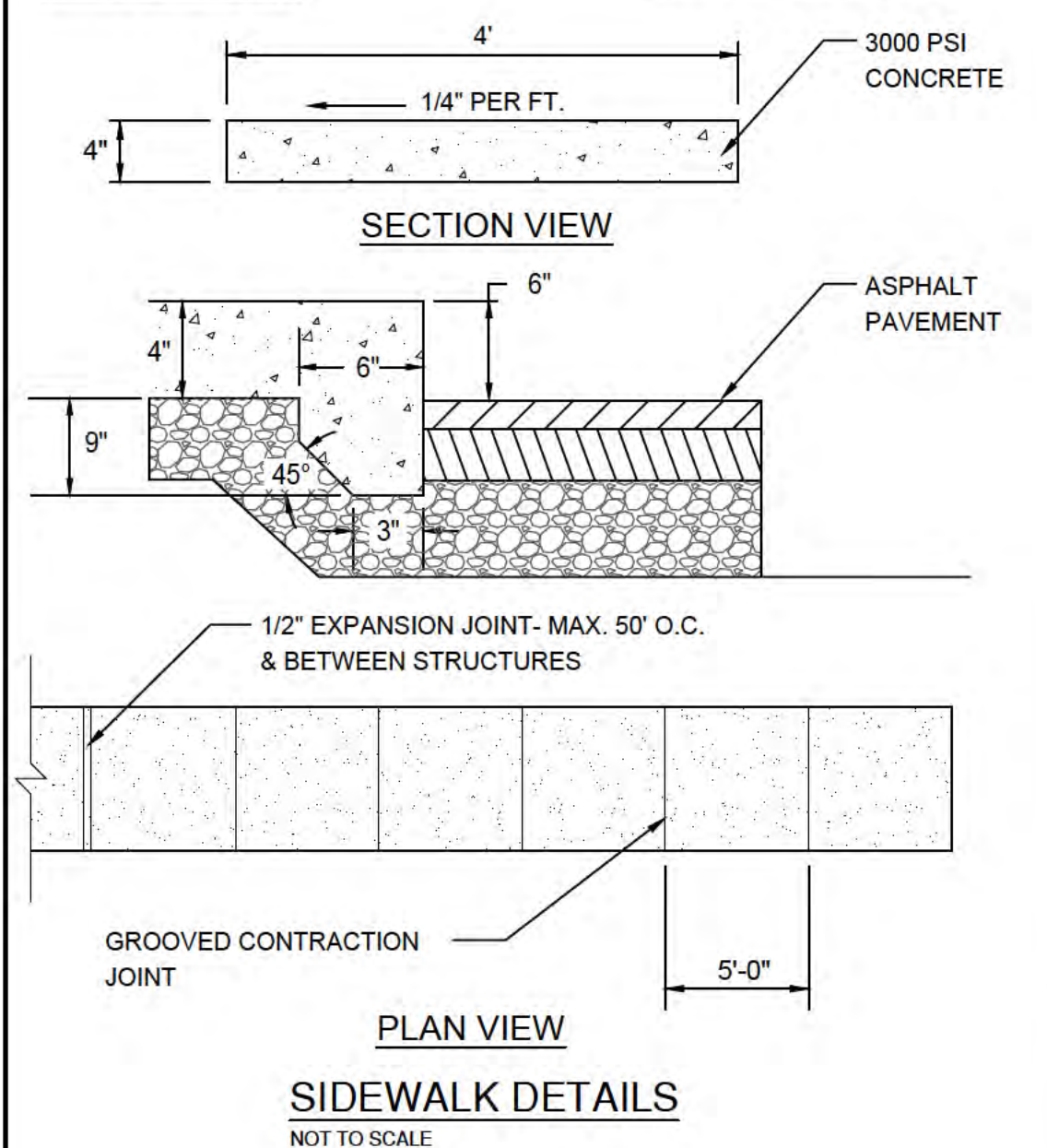
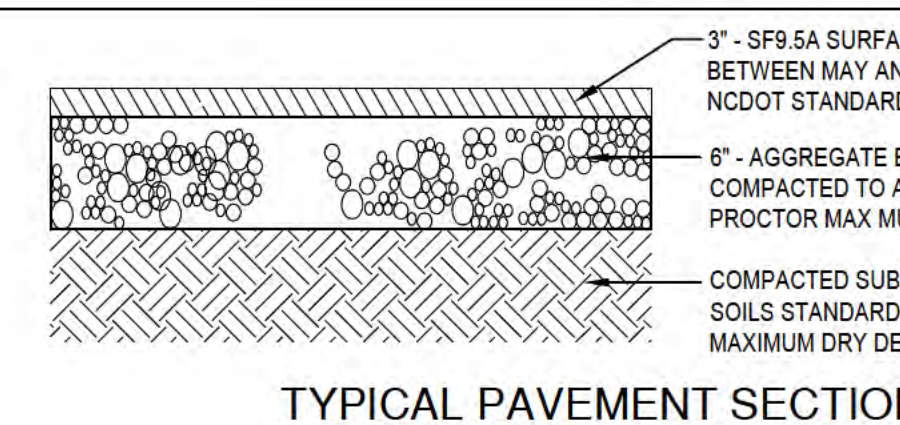
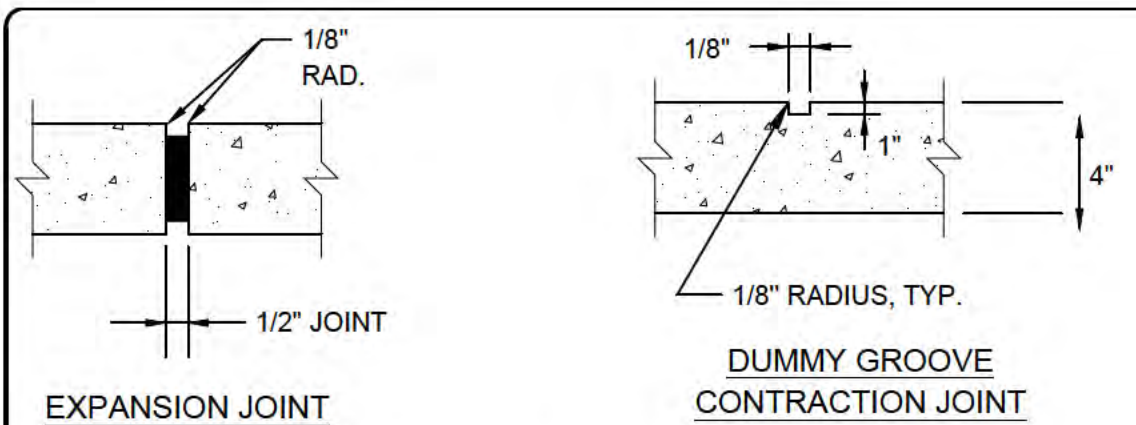
DRAWING INFORMATION:  
DATE: 07/21/20  
DESIGNED BY: \_\_\_\_\_  
DRAWN BY: \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_



C-4.3

PEI JOB#: 17358.PE

ISSUED FOR CONSTRUCTION



**WOODLANDS AT ECHO FARMS**  
**TRACT 2**  
**APPROVED 7/21/20**  
**SWP 2020024**  
**BC, RC, CW, MB, BM**

**CITY OF WILMINGTON**  
 NORTH CAROLINA  
 Public Services • Engineering Division  
**APPROVED STORMWATER MANAGEMENT PLAN**  
 Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
 Signed: \_\_\_\_\_

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**PARAMOUNT ENGINEERING**  
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 (910) 791-6707 (O) (910) 791-6760 (F)  
 NC License #: C-2846

**DETAILS**  
**TRACT 2**  
**WOODLANDS @ ECHO FARMS**  
**NEW HANOVER COUNTY**  
**NORTH CAROLINA**

**PROJECT STATUS:**  
 CONCEPT LAYOUT:  
 PRELIMINARY LAYOUT:  
 RELEASED FOR CONSTRUCTION

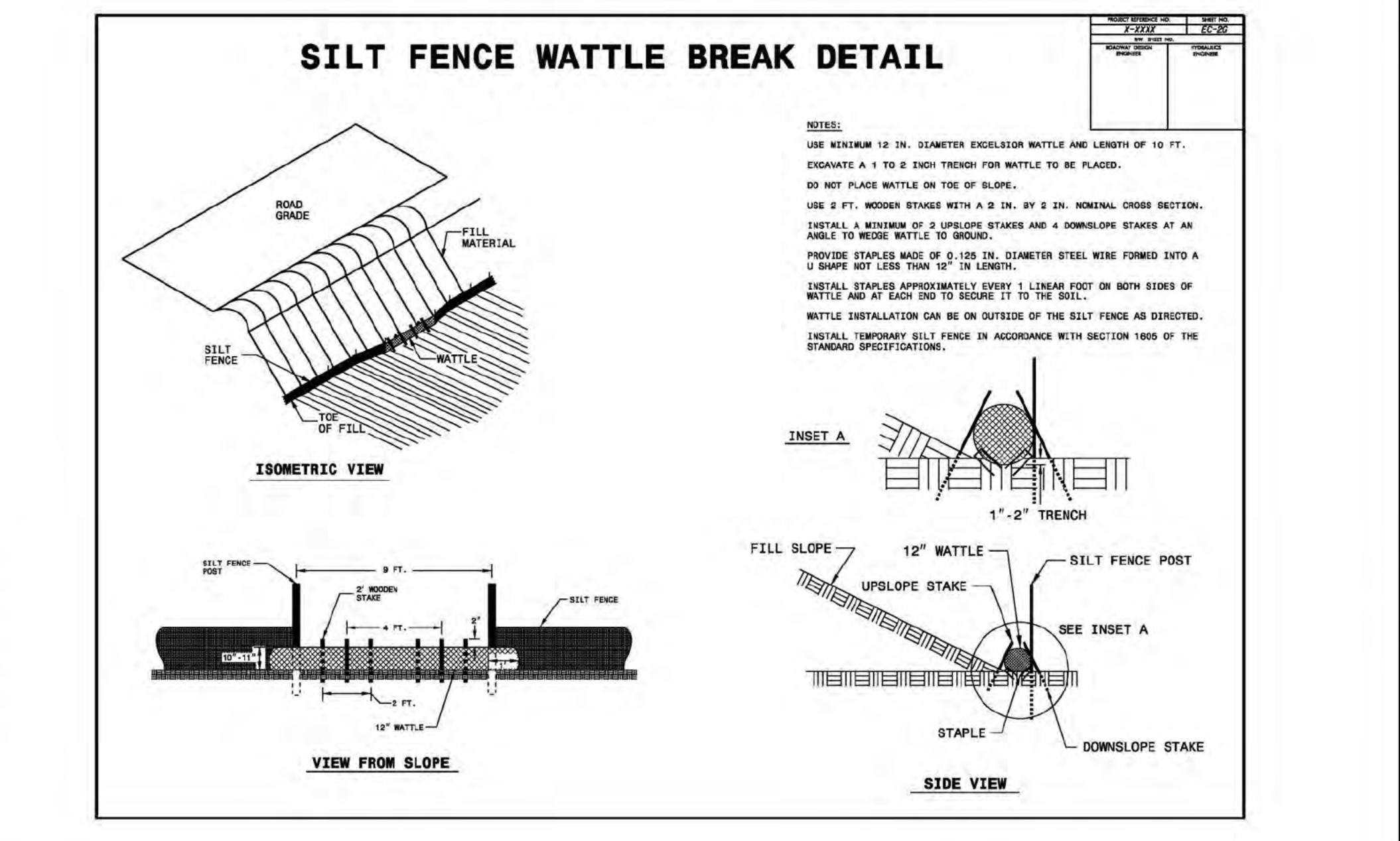
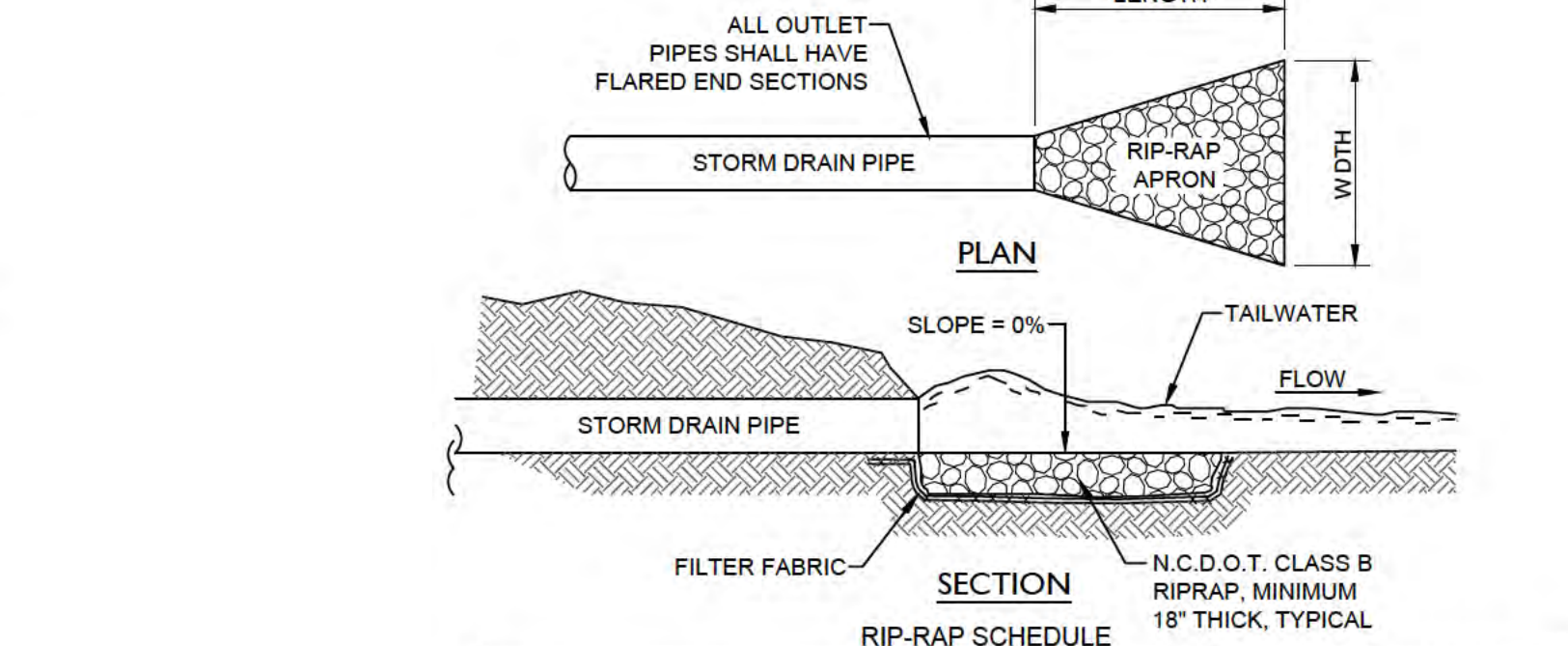
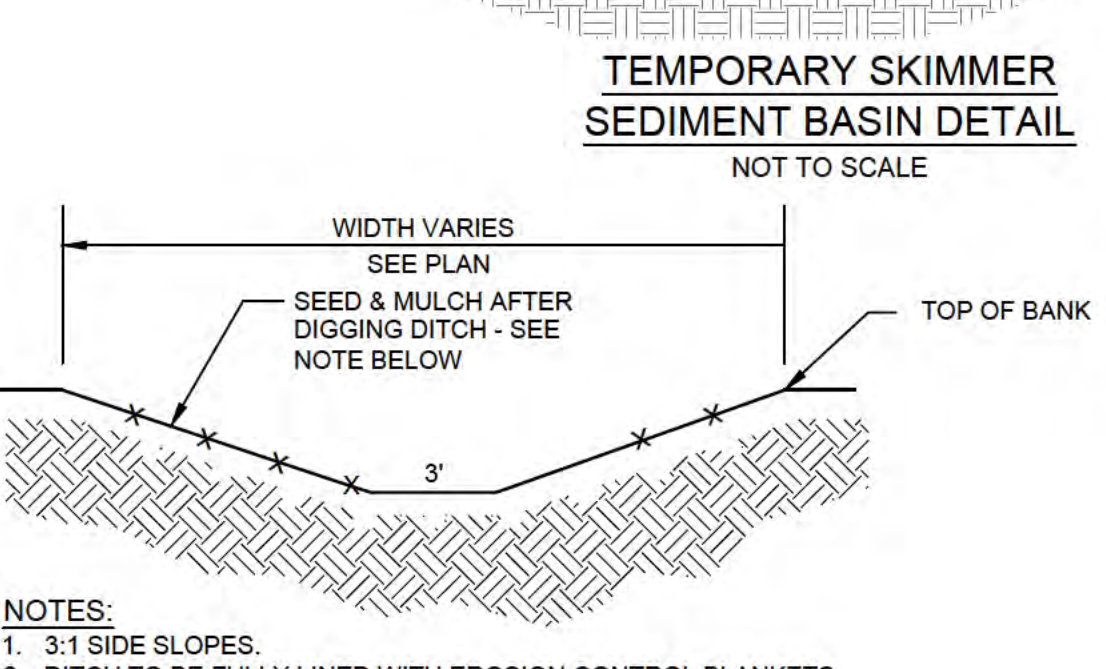
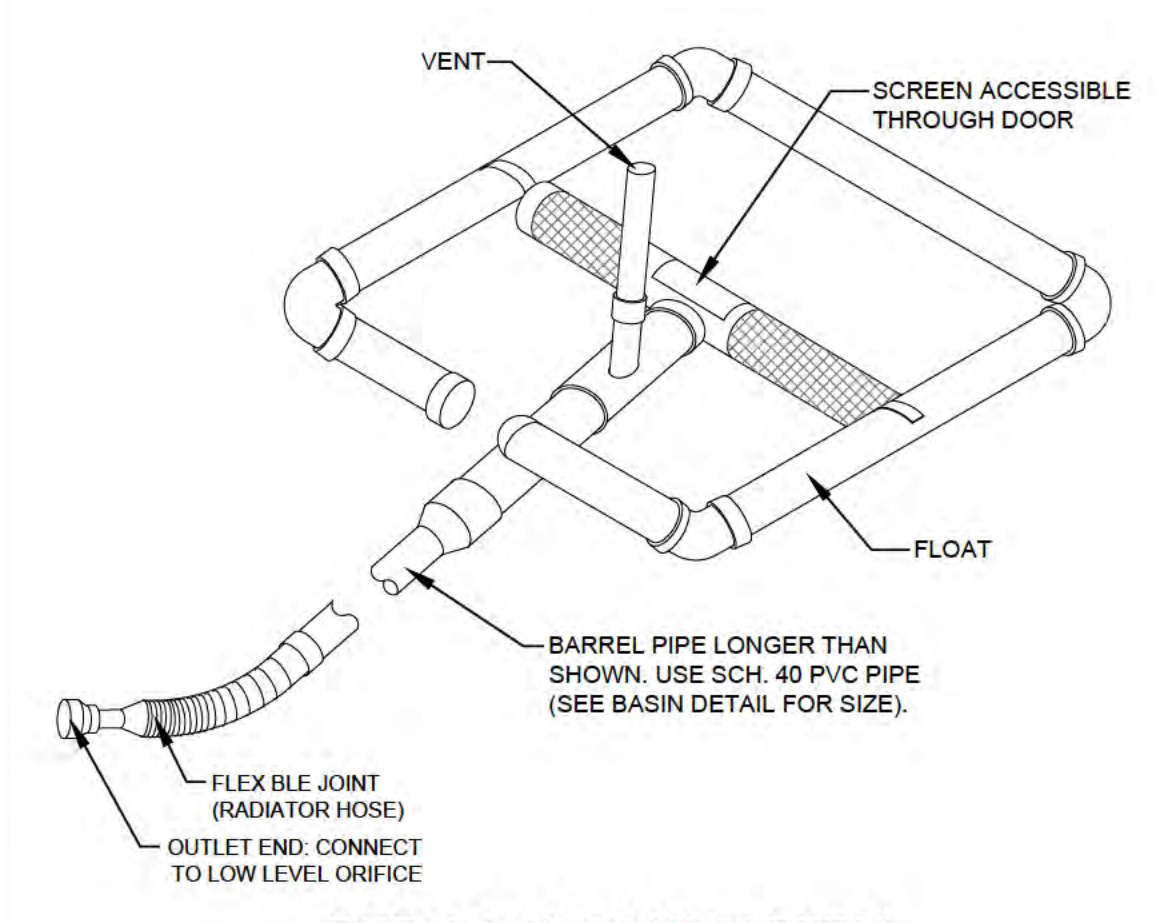
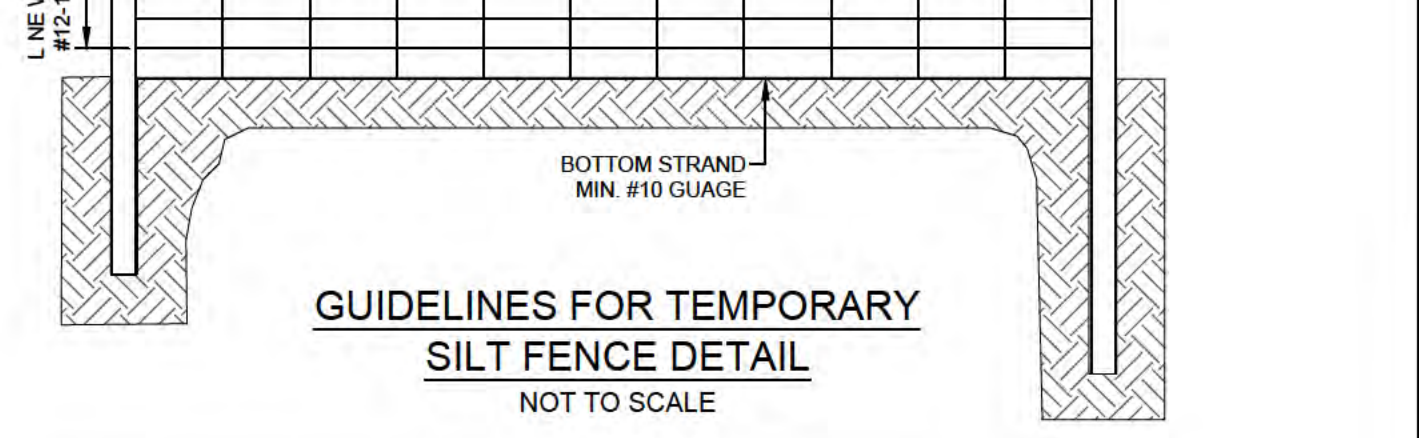
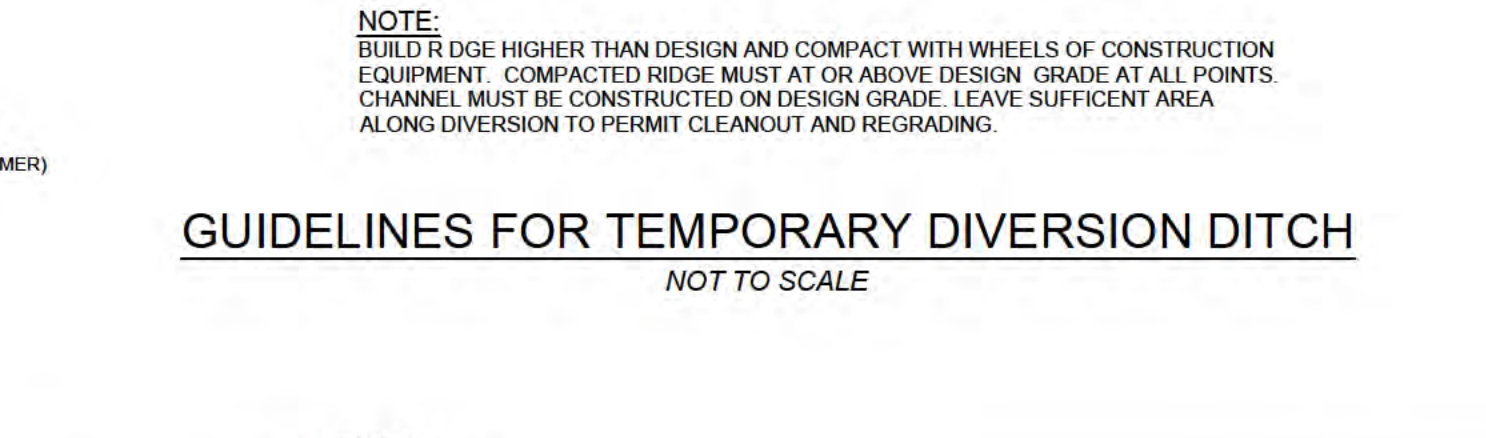
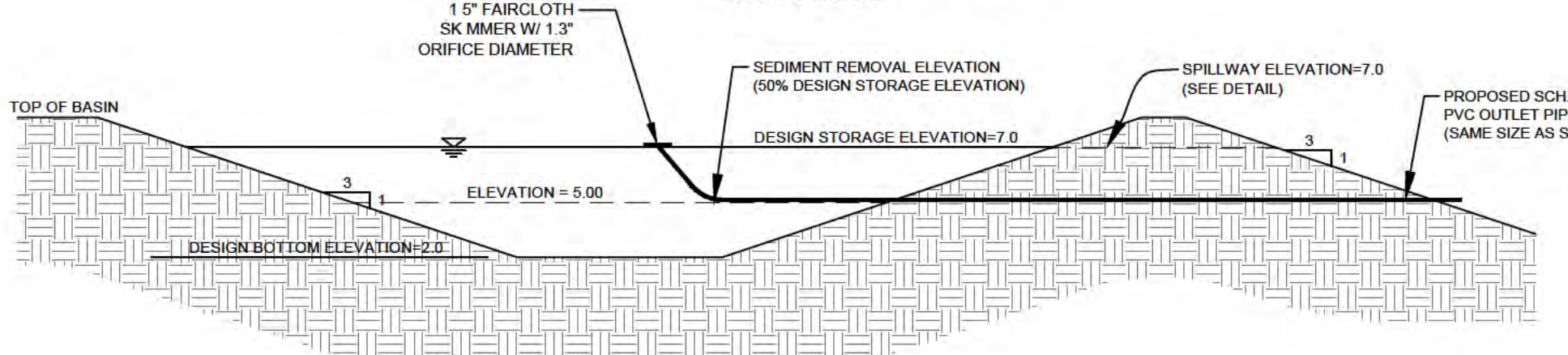
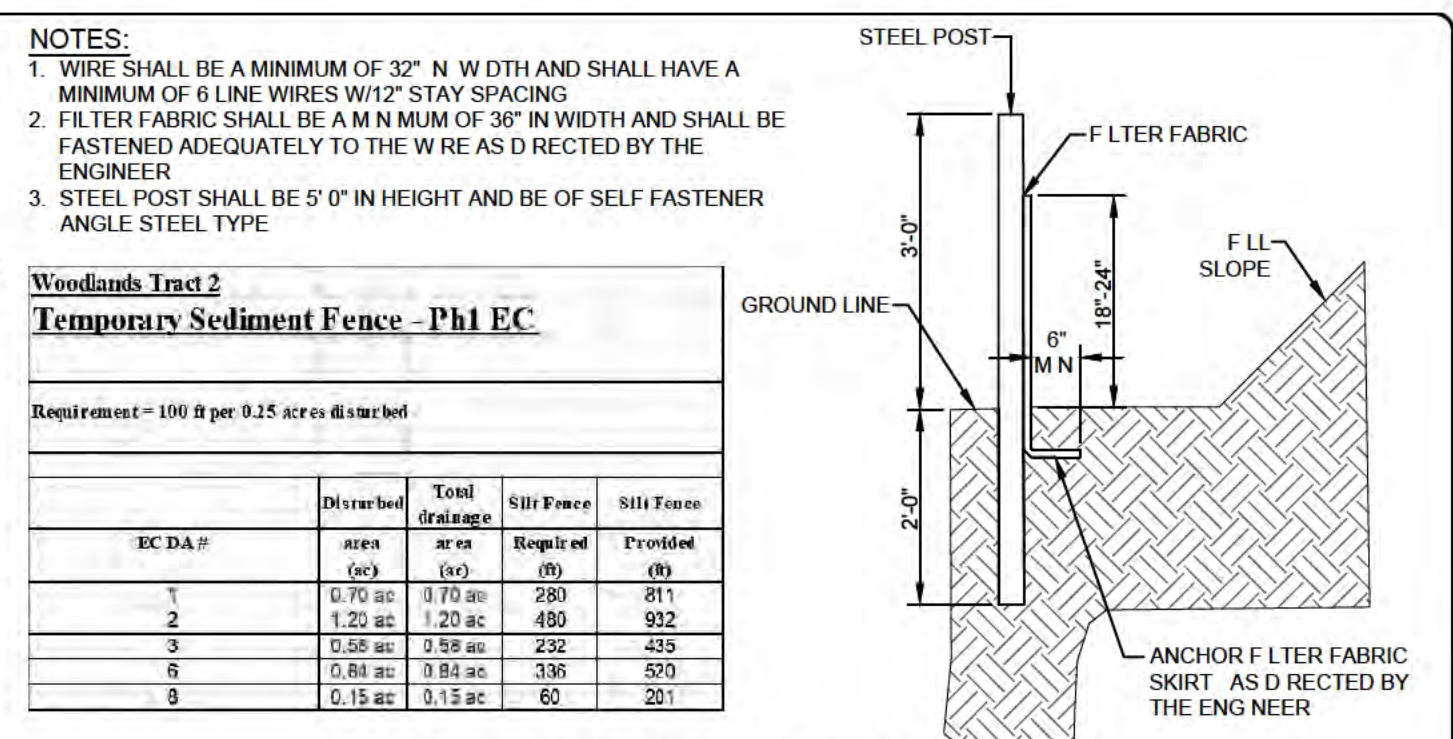
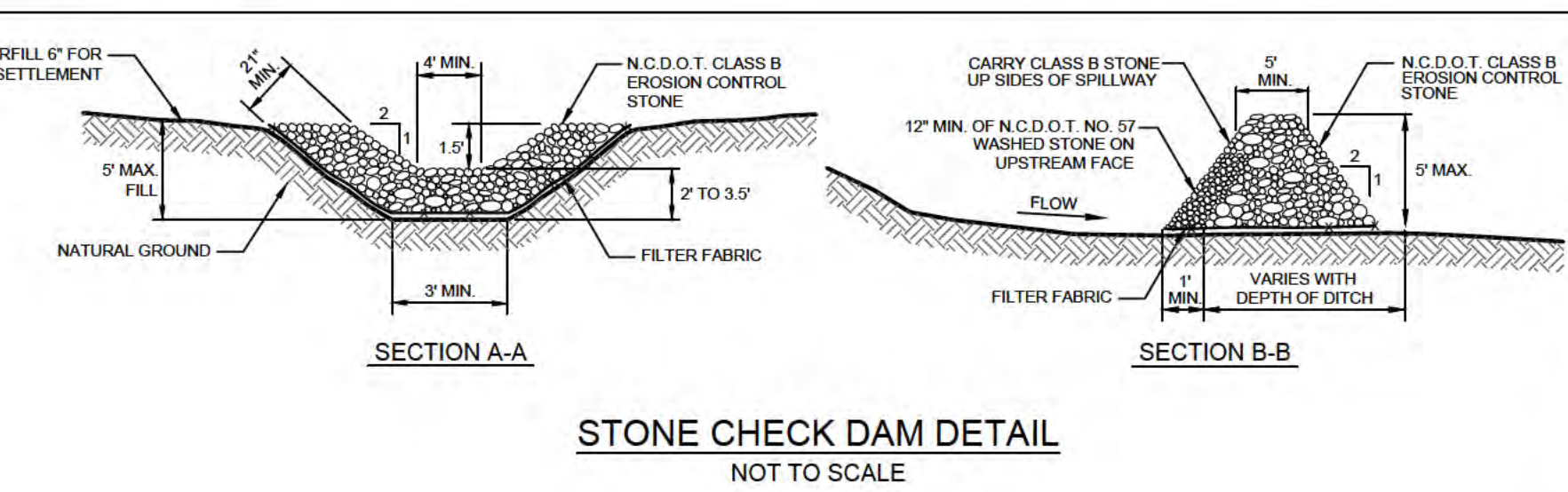
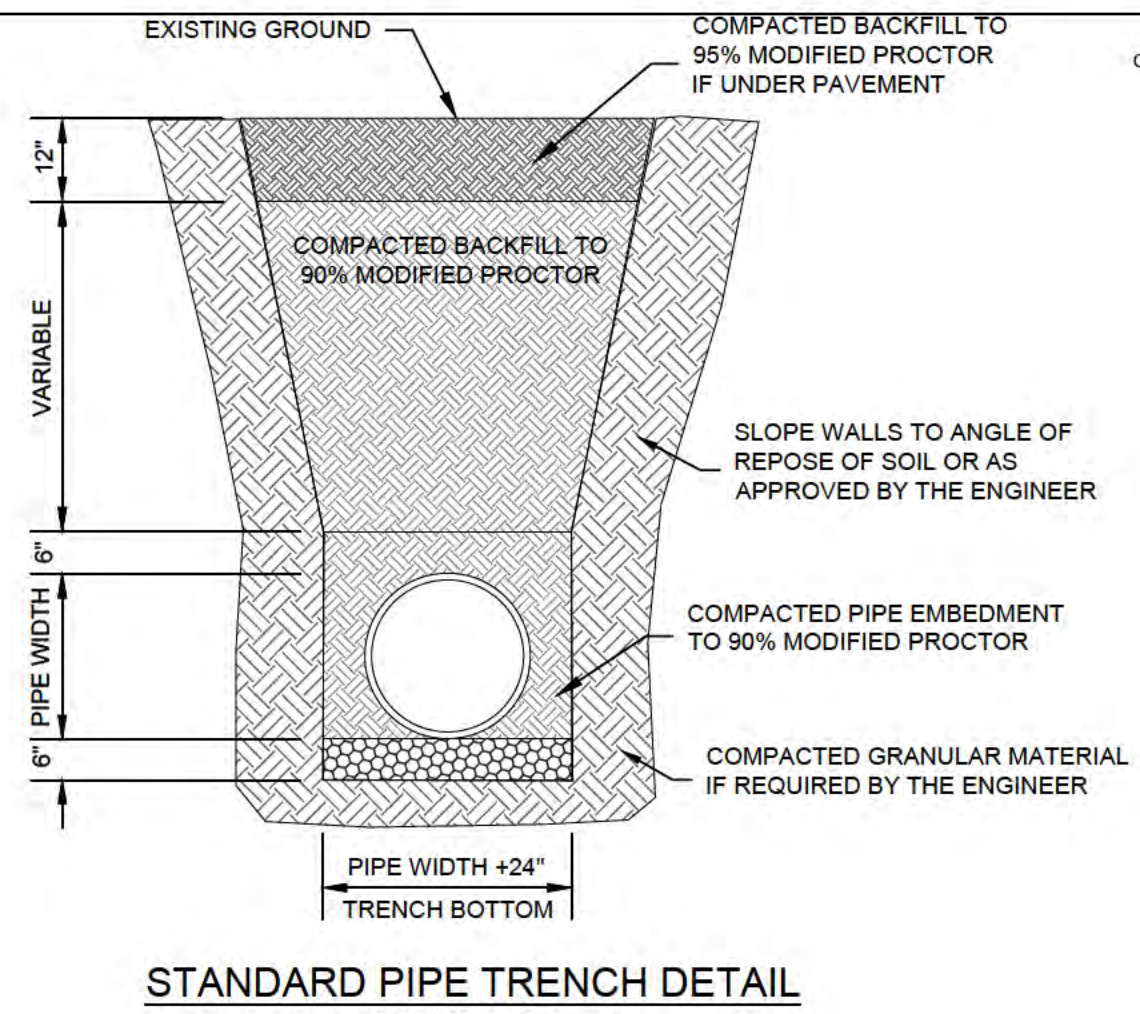
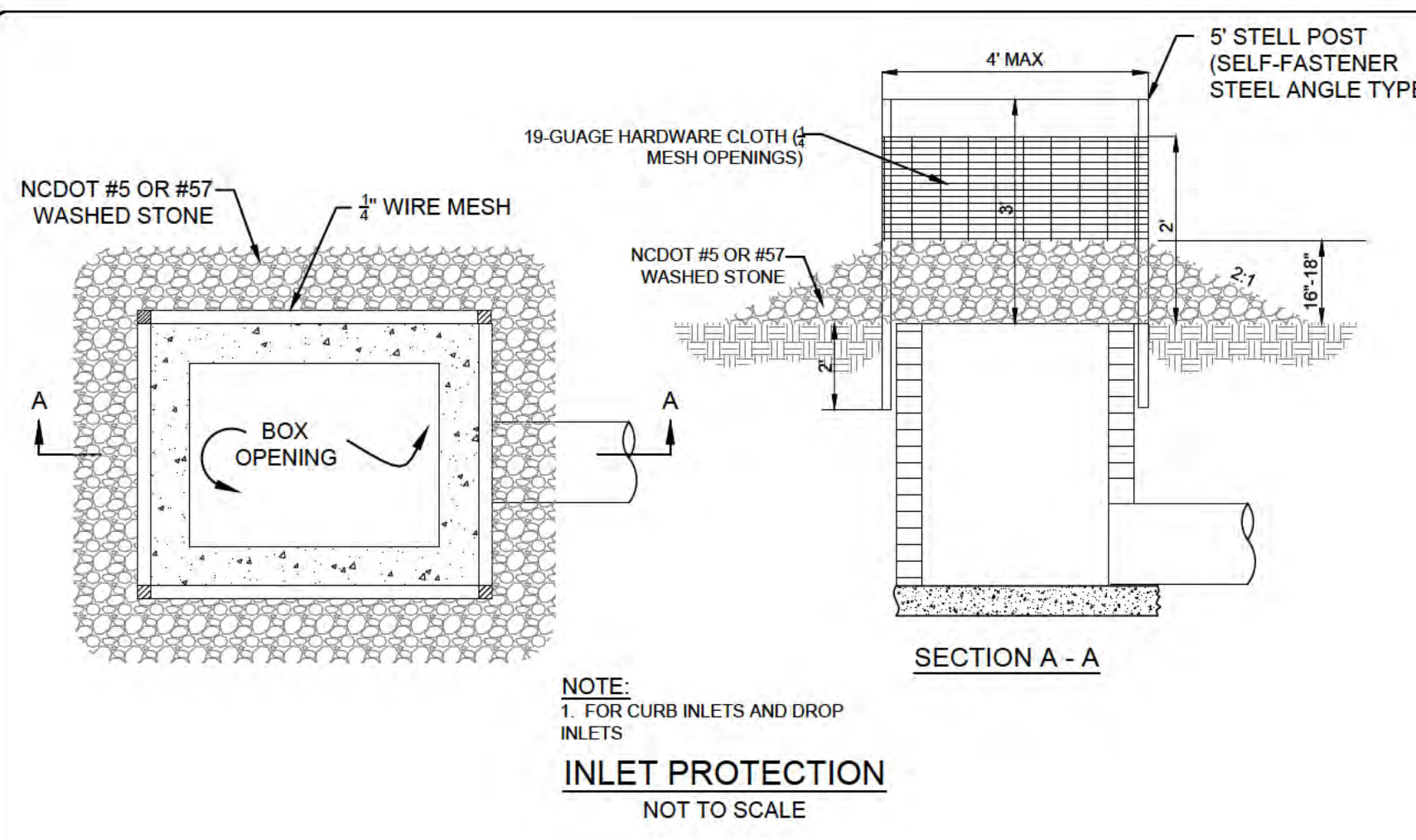
**DRAWING INFORMATION:**  
 DATE: 07/21/20  
 DRAWN: JPB  
 CHECKED: JPB  
 DESIGNED: JPB  
 SCALE: NOT TO SCALE

**PEI JOB#: 17358.PE**

**C-5.0**

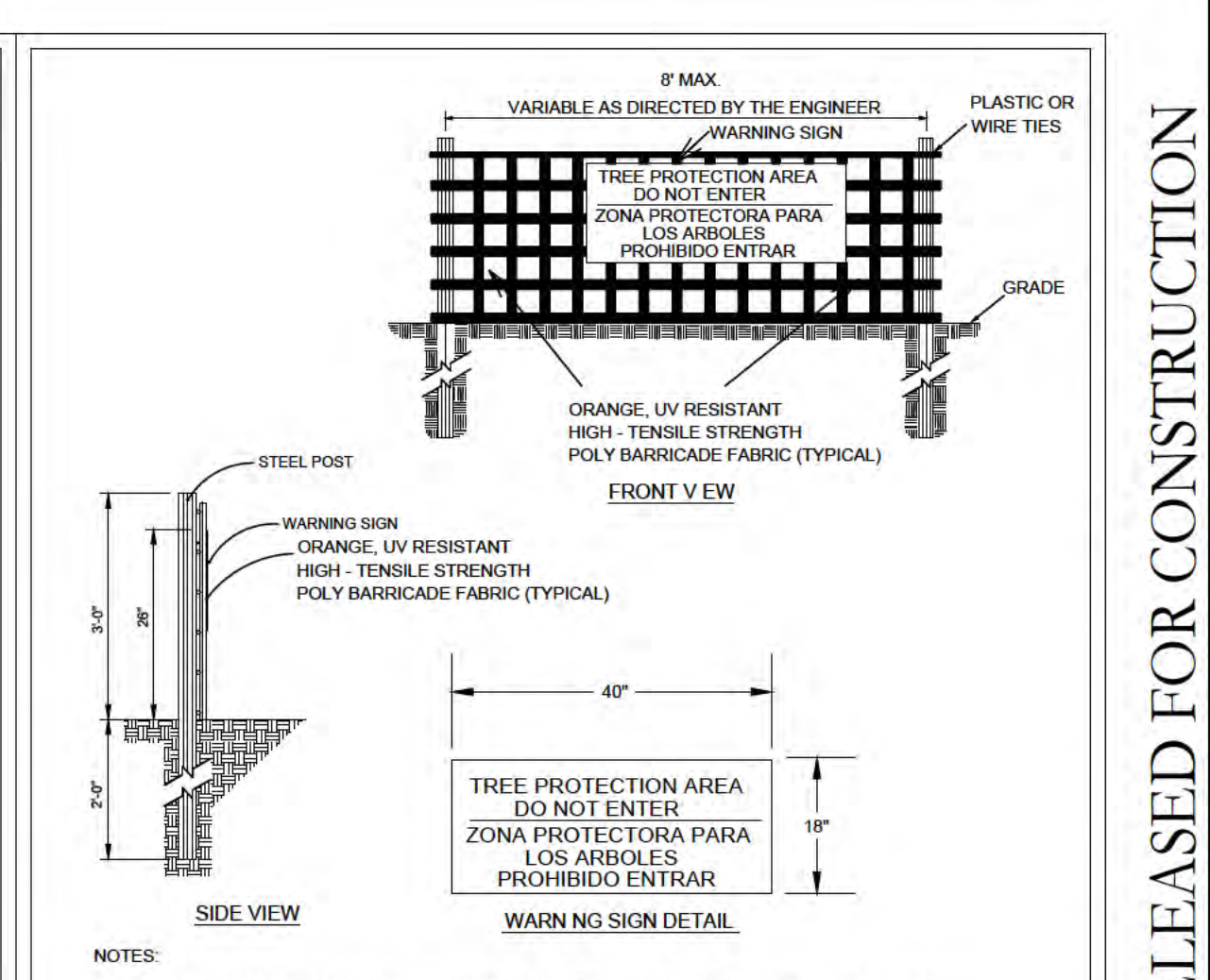
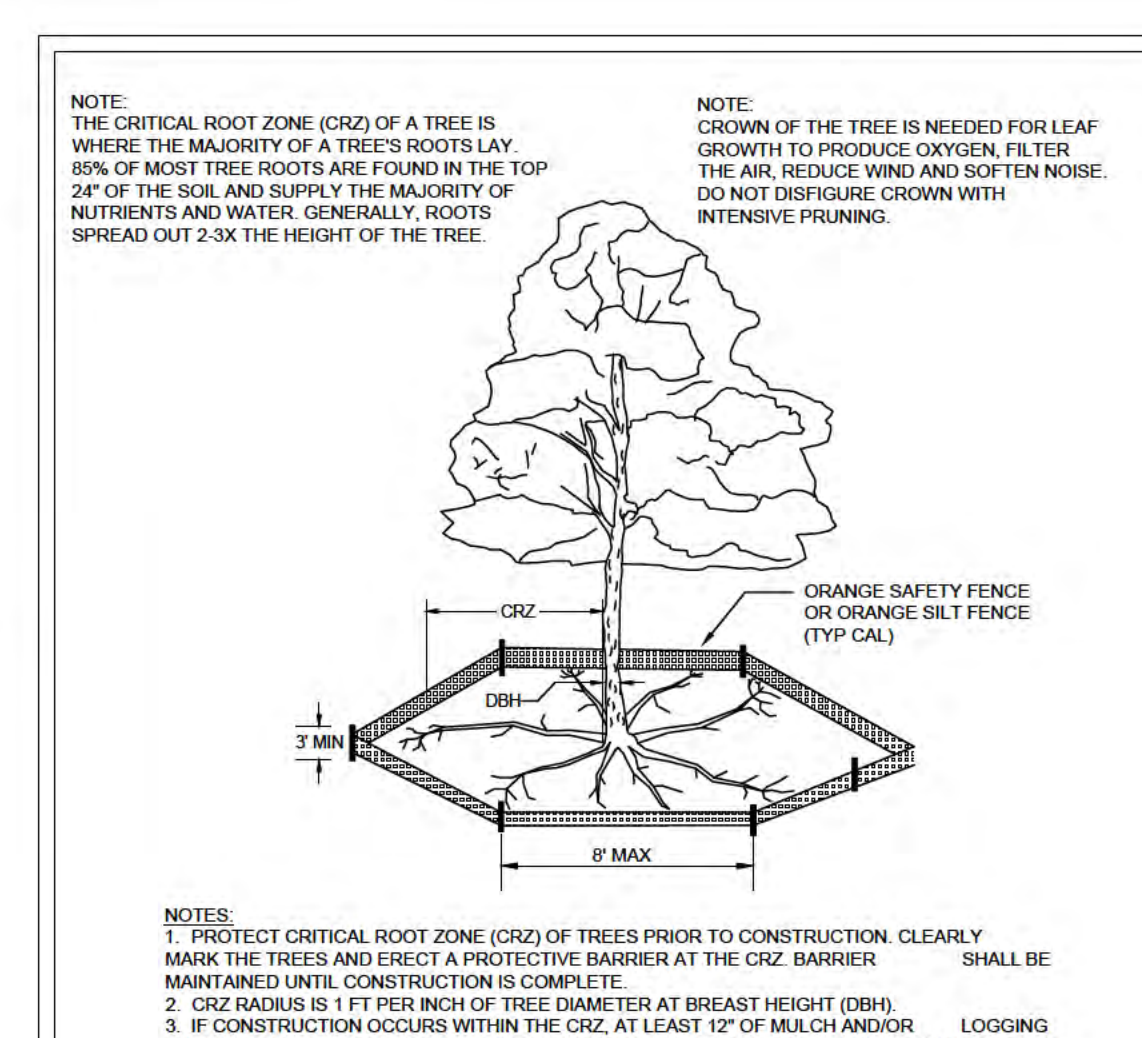
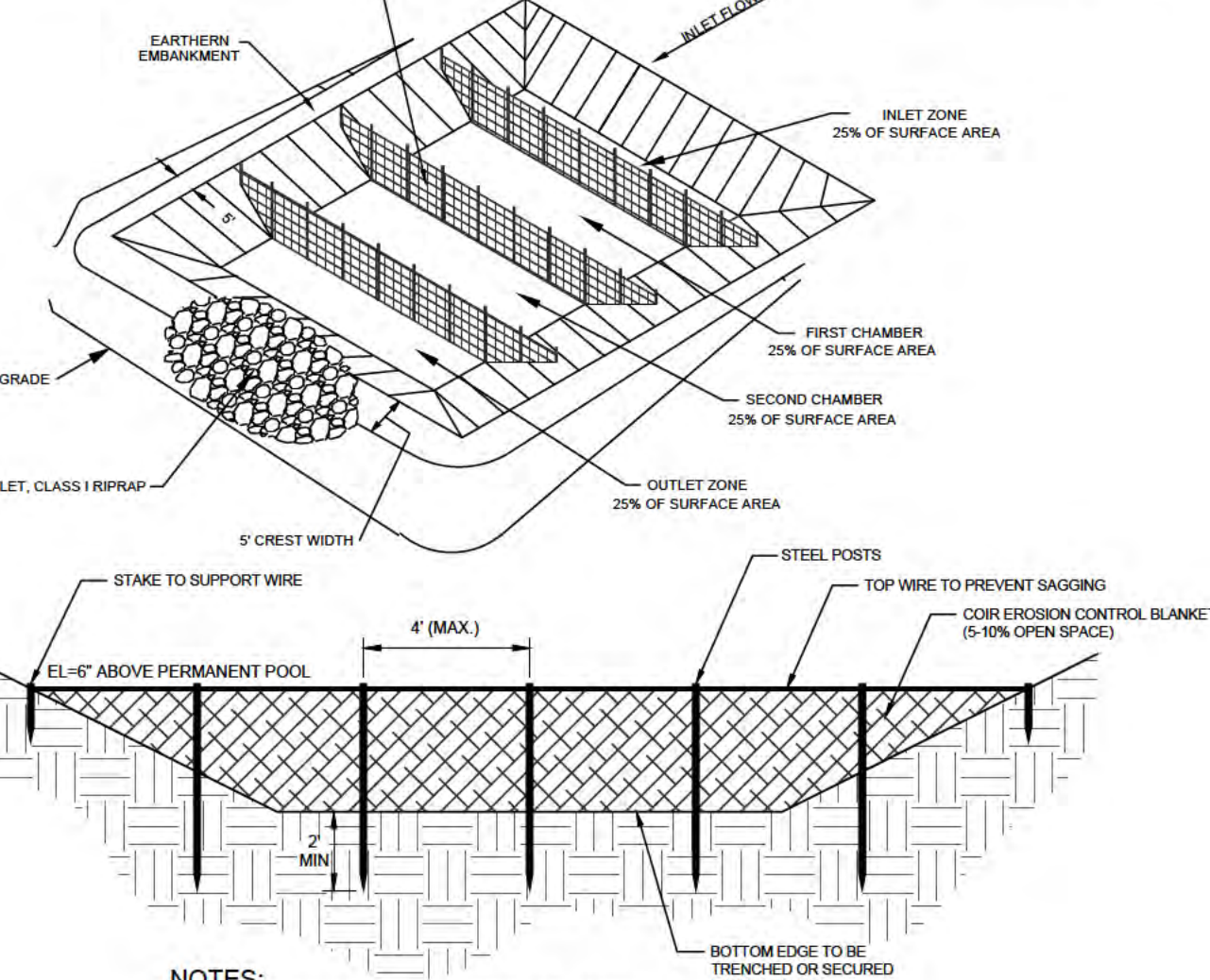
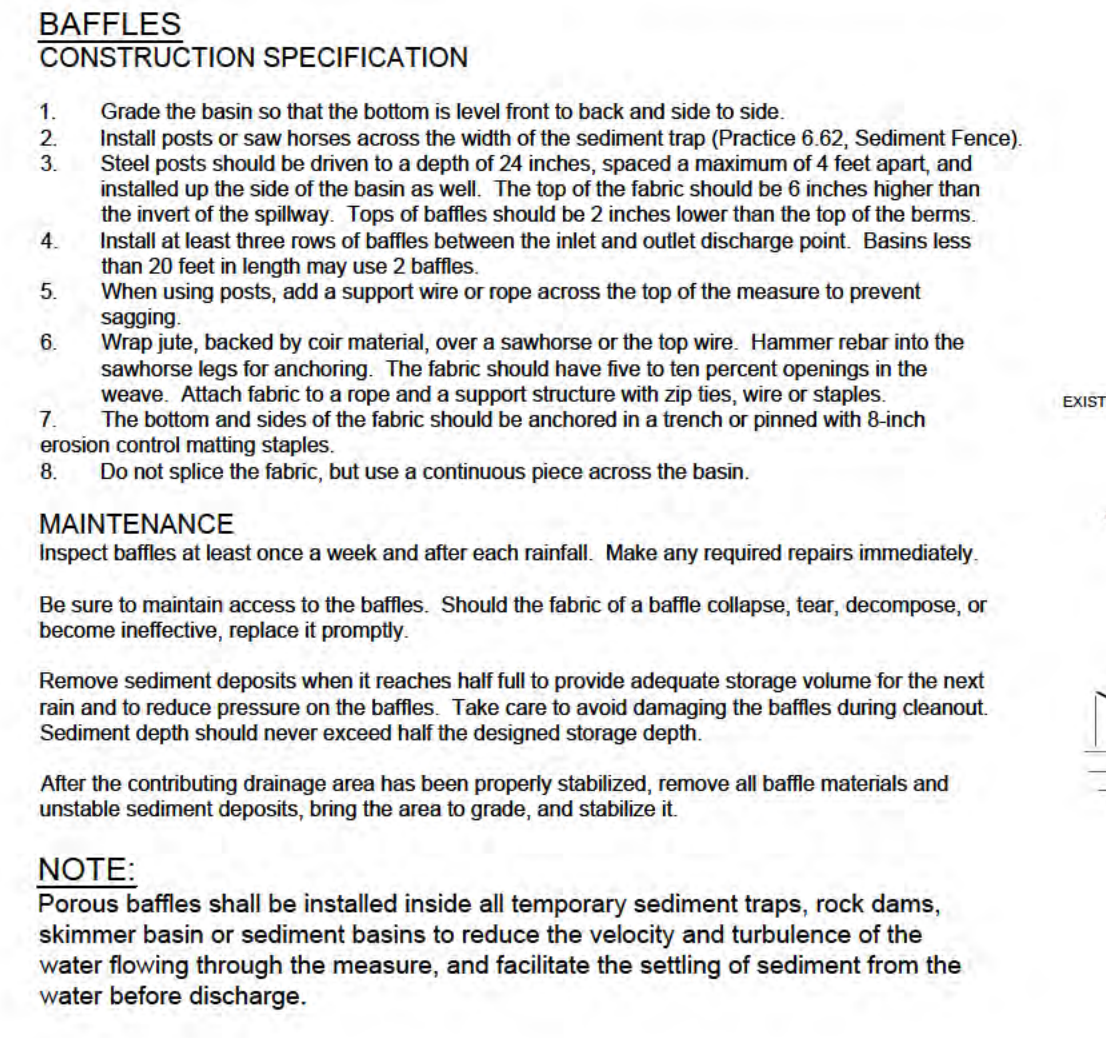
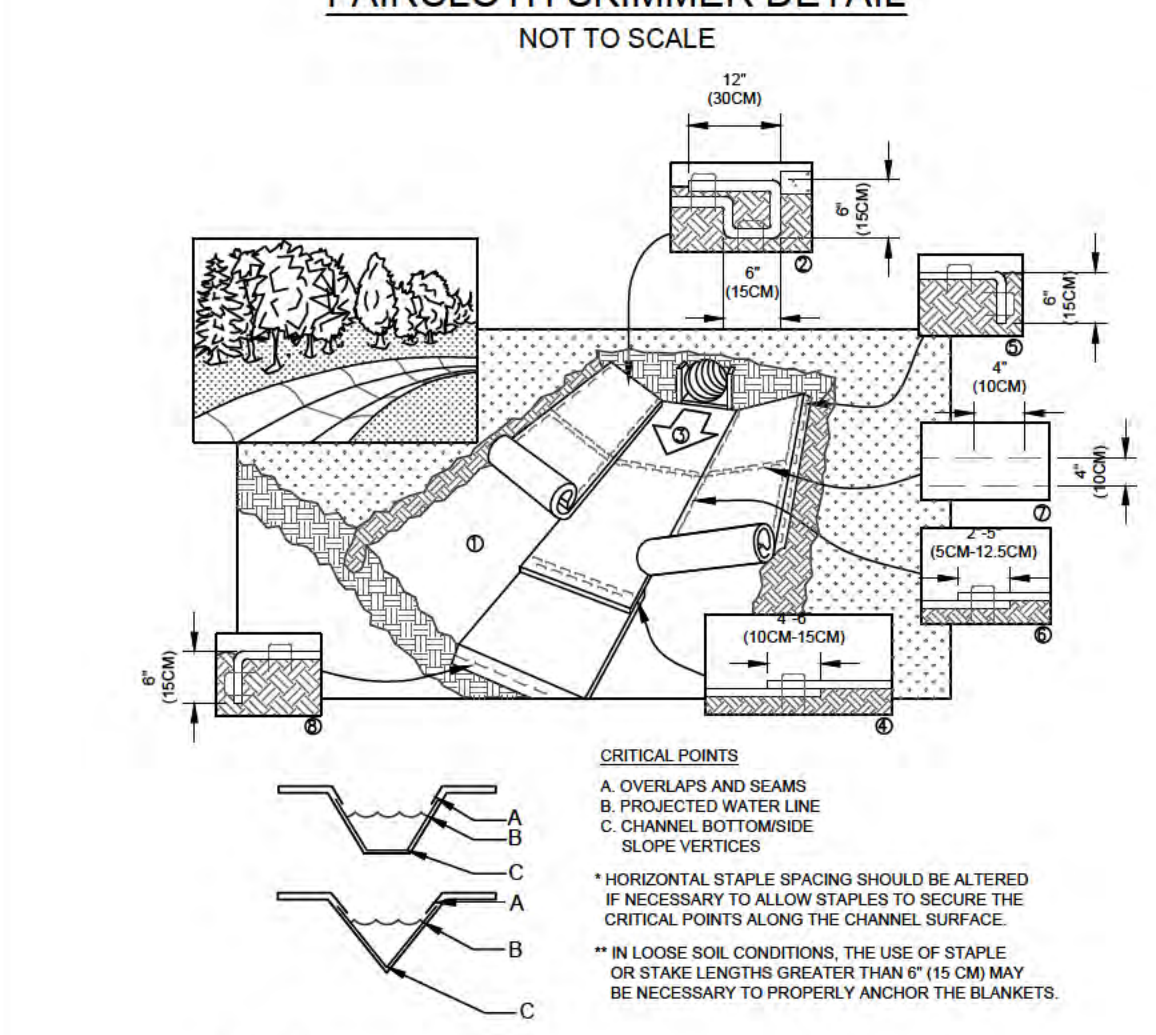
**FINAL DESIGN - RELEASED FOR CONSTRUCTION**





NOTES:  
1. 3:1 SIDE SLOPES.  
2. DITCH TO BE FULLY LINED WITH EROSION CONTROL BLANKETS PRIOR TO SEEDING & MULCHING FROM TOP OF BANK TO TOP OF BANK, AS REQUIRED BY LAND QUALITY.  
3. PROPOSED SWALES WILL HAVE A BOTTOM WIDTH OF 3 FEET.  
4. SEE PLAN FOR HORIZONTAL LOCATION OF SWALES.  
5. SWALES TO BE CONSTRUCTED WITH 6" OF DEPTH ADDED TO CALCULATED DEPTH ABOVE.

SWALE #	RUNOFF				CHANNEL													
	Area (sq)	Length (ft)	Flow (cfs)	Velocity (ft/s)	Flow (cfs)	Velocity (ft/s)	Flow (cfs)	Velocity (ft/s)	Flow (cfs)	Velocity (ft/s)	Flow (cfs)	Velocity (ft/s)	Flow (cfs)	Velocity (ft/s)	Flow (cfs)	Velocity (ft/s)	Adequate Capacity / Lining Required?	
1	6.17	0.46	0.87	0.8	7.96	0.9053	0.20	0.72	4.28	0.17	0.63	0.83	0.63	0.63	0.63	0.63	0.63	Y
2	0.18	0.82	0.88	2.65	4.34	7.96	0.9053	0.20	1.22	4.48	0.88	0.88	0.88	0.88	0.88	0.88	0.88	Y
3	0.19	0.82	0.89	1.94	9.03	4.00	0.3034	0.28	1.08	4.77	0.20	0.81	0.81	0.81	0.81	0.81	0.81	Y
4	0.38	1.38	0.21	88	9.03	4.50	0.3074	0.19	0.62	3.89	0.13	0.62	0.43	0.43	0.43	0.43	0.43	Y
5	0.10	0.48	0.33	88	14.03	3.00	0.2024	0.19	0.62	3.89	0.13	0.62	0.43	0.43	0.43	0.43	0.43	Y
6	0.35	0.56	0.91	1.48	10.92	3.00	0.3137	0.20	0.72	4.28	0.17	0.63	0.83	0.83	0.83	0.83	0.83	Y
7	0.60	0.38	0.88	19.76	8.63	3.00	0.3048	0.19	0.62	3.89	0.13	0.62	0.43	0.43	0.43	0.43	0.43	Y
8	0.80	0.36	1.33	463	13.76	3.00	0.3148	0.20	0.72	4.28	0.17	0.63	0.83	0.83	0.83	0.83	0.83	Y



Surface Area (sq)	Length (ft)	Inlet Area (sq)	Chamber 1 Area (sq)	Chamber 2 Area (sq)	Outlet Area (sq)	Baffle #1 (Distance from End) (ft)	Baffle #2 (Distance from End) (ft)	Baffle #3 (Distance from End) (ft)
1,500	88	375	375	375	375	17	34	51

**WOODLANDS AT ECHO FARMS TRACT 2**

Planr  
Trafri  
Fire

APPROVED 7/21/20  
SWP 2020024  
BC, RC, CW, MB, BM

NCDENR PWSS WATER PERMIT #:  
WATER CAPACITY: \_\_\_\_\_ GPD  
DWQ SEWER PERMIT #:  
SEWER CAPACITY: \_\_\_\_\_ GPD  
SEWER SHED # AND PLANT:  
SEWER TO FLOW THROUGH NET: YES OR NO (CIRCLE ONE)

Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN  
Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
Signed: \_\_\_\_\_

**TREE PROTECTION DURING CONSTRUCTION**

DATE: JAN 2015  
DRAWN BY: JSR  
CHECKED BY: RDG, P.E.  
SCALE: NOT TO SCALE

STANDARD DETAIL  
CITY OF WILMINGTON ENGINEERING  
PO BOX 1810  
WILMINGTON, NC 28402  
(910) 341-1907

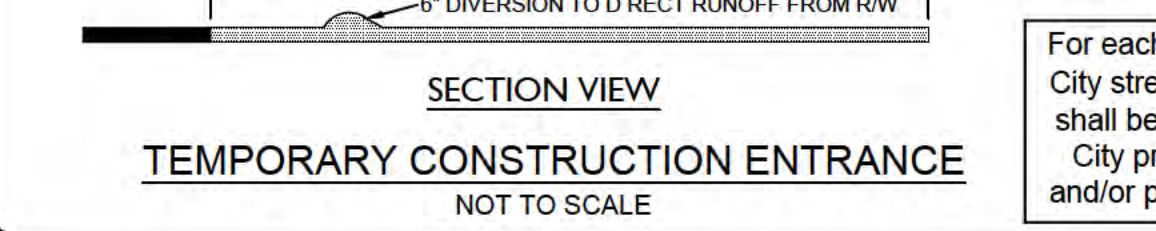
SHEET 1 of 2  
SD 15-09

**TREE PROTECTION DURING CONSTRUCTION**

DATE: JAN 2015  
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STANDARD DETAIL  
CITY OF WILMINGTON ENGINEERING  
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SHEET 2 of 2  
SD 15-09



REVISIONS:

CLIENT INFORMATION:  
ECHO FARMS, LLC  
c/o MATRIX DEVELOPMENT GROUP  
CN 4000 FORSGATE DRIVE  
CRANBURY, NJ 08512

PARAMOUNT ENGINEERING INC.  
122 Cinema Drive  
Wilmington, North Carolina 28403  
(910) 791-6707 (O) (910) 791-6766 (F)  
NC License #: C-2846

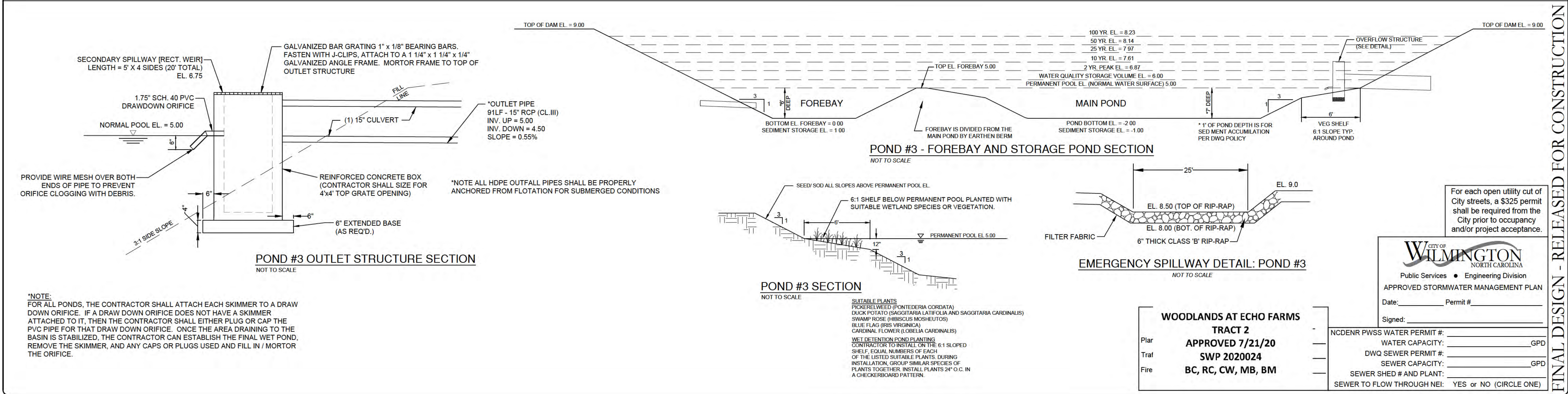
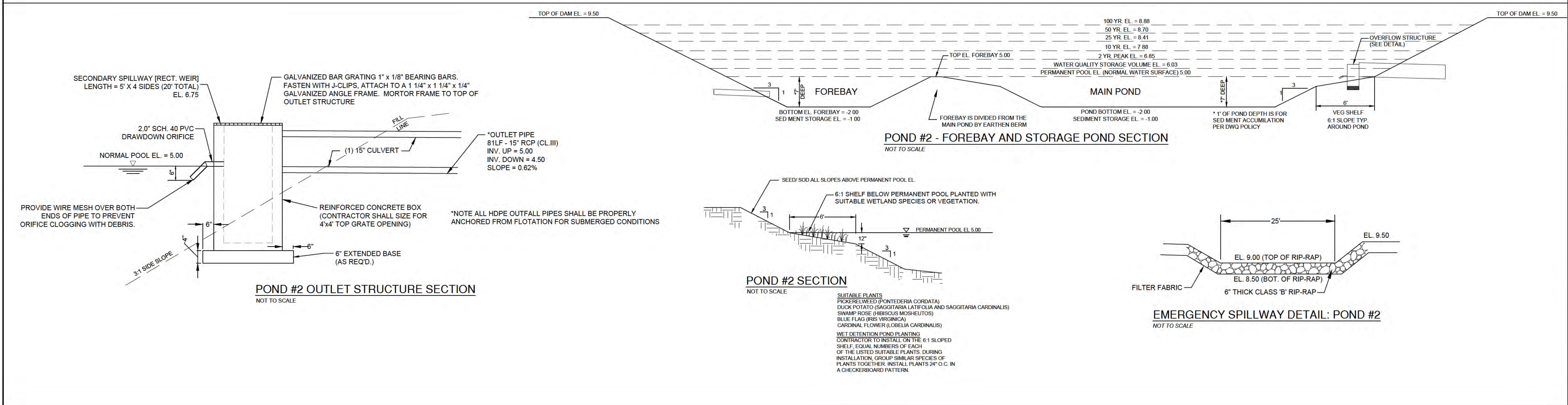
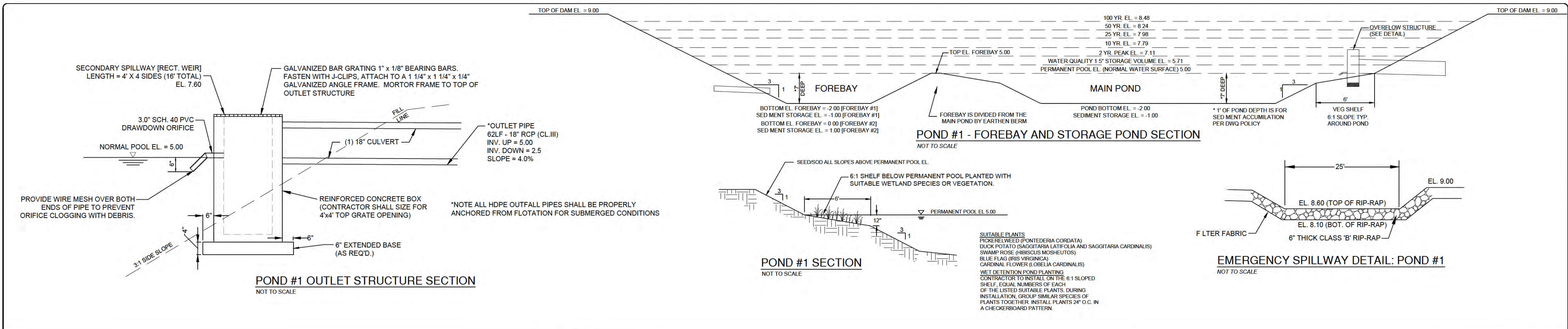
PROJECT STATUS:  
CONCEPTUAL LAYOUT:  
PRELIMINARY LAYOUT:  
RELEASED FOR CONSTRUCTION

DRAWING INFORMATION:  
DATE: 07/21/20  
DRAWN BY: JSR  
DESIGNED BY: RDG  
CHECKED BY: RDG, P.E.  
CREATED BY: RDG, P.E.

DETAILS TRACT 2 WOODLANDS AT ECHO FARMS NEW HANOVER COUNTY NORTH CAROLINA

FINAL DESIGN - RELEASED FOR CONSTRUCTION

PEI JOB#: 17358.PE



**\*NOTE:**  
FOR ALL PONDS, THE CONTRACTOR SHALL ATTACH EACH SKIMMER TO A DRAW DOWN ORIFICE. IF A DRAW DOWN ORIFICE DOES NOT HAVE A SKIMMER ATTACHED TO IT, THEN THE CONTRACTOR SHALL EITHER PLUG OR CAP THE PVC PIPE FOR THAT DRAW DOWN ORIFICE. ONCE THE AREA DRAINING TO THE BASIN IS STABILIZED, THE CONTRACTOR CAN ESTABLISH THE FINAL WET POND, REMOVE THE SKIMMER, AND ANY CAPS OR PLUGS USED AND FILL IN / MORTOR THE ORIFICE.

**SUITABLE PLANTS**  
PICKERELWEED (PONTEDERIA CORDATA)  
DUCK POTATO (SAGGITARIA LATIFOLIA AND SAGGITARIA CARDINALIS)  
SWAMP ROSE (HIBISCUS MOSHEUTOS)  
BLUE FLAG (IRIS VIRGINICA)  
CARDINAL FLOWER (LOBELIA CARDINALIS)  
**WET DETENTION POND PLANTING**  
CONTRACTOR TO INSTALL ON THE 6:1 SLOPED SHELF, EQUAL NUMBERS OF EACH OF THE LISTED SUITABLE PLANTS. DURING INSTALLATION, GROUP SIMILAR SPECIES OF PLANTS TOGETHER. INSTALL PLANTS 24" O.C. IN A CHECKERBOARD PATTERN.

**WOODLANDS AT ECHO FARMS**  
**TRACT 2**  
**APPROVED 7/21/20**  
**SWP 2020024**  
**BC, RC, CW, MB, BM**

NC DENR PWSS WATER PERMIT #: \_\_\_\_\_  
WATER CAPACITY: \_\_\_\_\_ GPD  
DWQ SEWER PERMIT #: \_\_\_\_\_  
SEWER CAPACITY: \_\_\_\_\_ GPD  
SEWER SHED # AND PLANT: \_\_\_\_\_  
SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

**CITY OF WILMINGTON**  
NORTH CAROLINA  
Public Services • Engineering Division  
**APPROVED STORMWATER MANAGEMENT PLAN**  
Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
Signed: \_\_\_\_\_

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

**REVISIONS:**

**CLIENT INFORMATION:**  
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c/o MATRIX DEVELOPMENT GROUP  
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NC License #: C-2846

**PROJECT STATUS:**  
CONCEPTUAL LAYOUT:  
PRELIMINARY LAYOUT:  
RELEASED FOR CONSTRUCTION:  
**DRAWING INFORMATION:**  
DATE: 07/21/20  
DESIGNED: RPB  
DRAWN: RPB  
CHECKED: RPB

**DETAILS**  
**TRACT 2**  
**WOODLANDS @ ECHO FARMS**  
**NEW HANOVER COUNTY**  
**NORTH CAROLINA**

**FINAL DESIGN - RELEASED FOR CONSTRUCTION**

**C-5.2**  
PEI JOB#: 17358.PE