

Engineering has reviewed the plans for the Woodlands Landing at Echo Farms-Tract 3A project submitted February 1, 2019 and have the following comments:

*****Woodlands at Echo Farms-Phase 3B will have to be modified from a high density permit to an off-site permit with the removal of Pond 3.1B from the permit documents. Modified application, supplements, O&Ms, calculations, plans and any other pertinent documentation will need to be submitted for review along with a \$500 permit modification fee. Coordinate with Norris & Tunstall to determine who will handle the modification.**

Stormwater Management Permit Application Form (Form SWP 2.2)

1. IV. Project Information: #2, #4 and #5: Make sure the Total Property Area, Total Surface Water Area and Total Project Area is correct for the boundary that includes Pond 3.1B.
2. IV. Project Information:
 - a. #9: Make sure this table includes all on-site newly constructed impervious surface area for the updated project area. Update #10 and #11, if necessary.
 - b. #12: This must include the newly constructed impervious surface in the Echo Farms Blvd/Belfairs/Midvale roundabout (Midvale connection) and the Chastain Drive connection in Phase 3B (see attachment).
 - c. Pond 3.1B needs to be added to the table. On-site drainage area is for 3A only. Off-site drainage area is for Phase 3B. All Phase 3B impervious (including any 3B Future Development) will be listed as 'Offsite'.

Supplement-EZ Form

3. Supplement EZ form needs to include Pond 3.1B.
4. Minor revision: Both Wet Ponds: Wet Pond MDC from 02H .1053: #5: Depth of forebay at exit (inches): Enter 48 inches for 3A-1 and 36 inches for 3A-2. Because this is a state form, everything needs to be entered correctly.

Operation & Maintenance Agreement

5. The pond information for ponds 3A-1 and 3A-2 has been reversed (see attached).
6. Submit a fully executed O&M for Pond 3B.1.

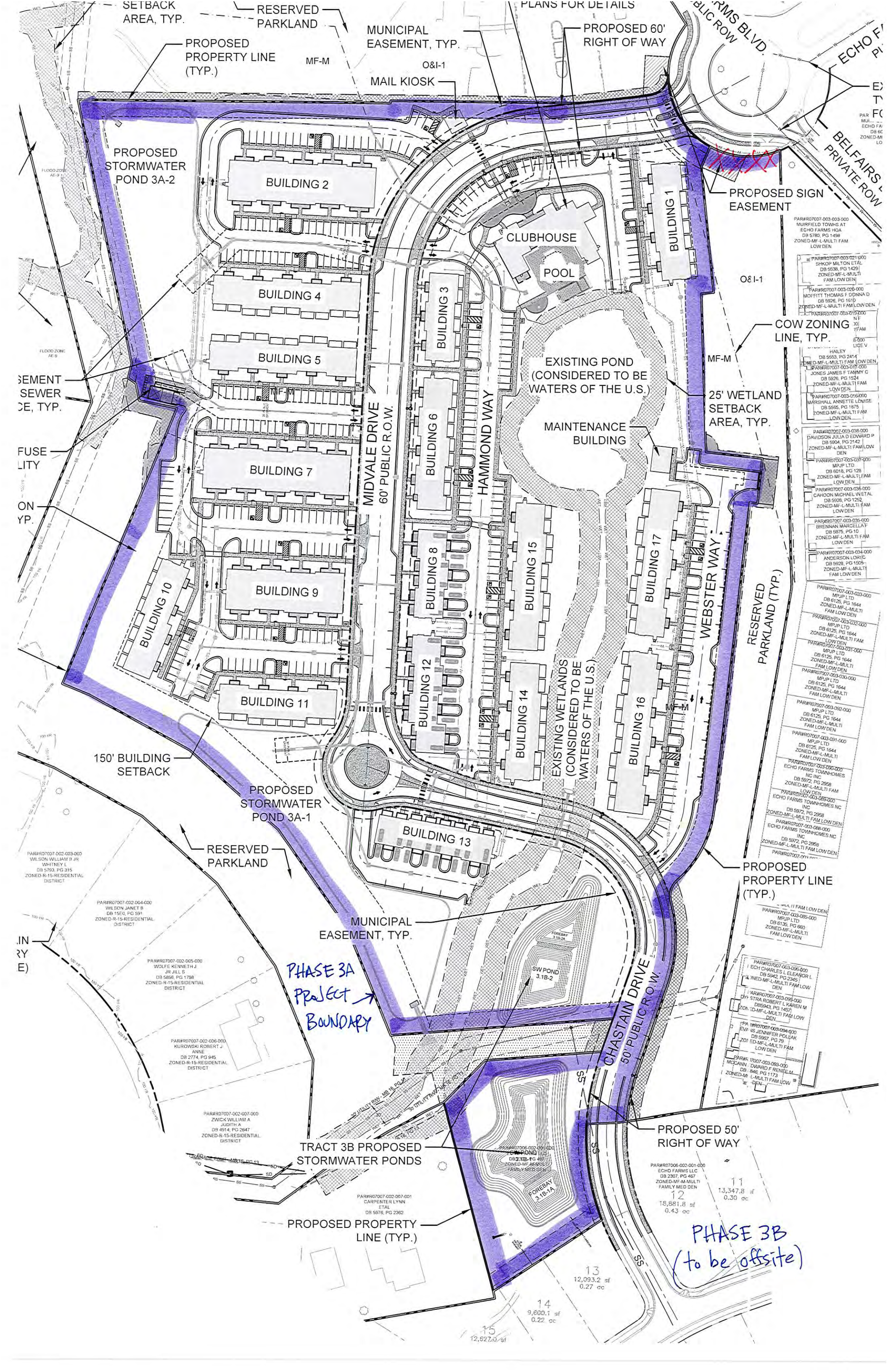
Stormwater and Erosion Control Narrative

7. **Placeholder:** Provide permit for impacting wetlands.
8. Update Narrative and calculations to include Pond 3.1B. Because the proposed 3A drainage and impervious areas are less than what was proposed in the 3B SW permit, Pond 3.1B needs to be reassessed using the actual square footages to see if the water quality (1.5") and water quantity (pre/post) requirements are still being met. Modification of Pond 3.1B may be required.
9. Storm Drain Design Computations: Pond 3.1B: The inlet drainage area for DI-3.1B-4 is shown to be 0.16 acres. This is in conflict with the drainage area permitted in Phase 3B for the same structure (0.50 acres). Also, Phase 3B has this same structure as a flared end section to collect runoff from a swale that runs along the rear of Phase 3B lots. Phase 3A should fully incorporate the approved Phase 3B permit plans.

Plans

10. Provide the landscaping plan. I need them submitted by the responsible party for review. I cannot release the project until landscape plans are submitted and reviewed.
11. Provide the 10' maintenance and access shoulder and 5' landscape buffer around the perimeter of the wet ponds per section V-4 (g & h) of the technical standards. Show on plans.
12. See marked-up construction plans for further review comments.

Please submit one complete set of plans, the stormwater narrative, application, calculations and any other supporting documentation to Engineering for additional review. Please call or email if there are any questions. Thank you.



PROPOSED STORMWATER POND 3A-2

BUILDING 2

BUILDING 4

BUILDING 5

BUILDING 7

BUILDING 9

BUILDING 11

150' BUILDING SETBACK

PROPOSED STORMWATER POND 3A-1

RESERVED PARKLAND

MUNICIPAL EASEMENT, TYP.

PHASE 3A Project BOUNDARY

TRACT 3B PROPOSED STORMWATER PONDS

PROPOSED PROPERTY LINE (TYP.)

MUNICIPAL EASEMENT, TYP.

MAIL KIOSK

PROPOSED 60' RIGHT OF WAY

CLUBHOUSE

POOL

EXISTING POND (CONSIDERED TO BE WATERS OF THE U.S.)

MAINTENANCE BUILDING

EXISTING WETLANDS (CONSIDERED TO BE WATERS OF THE U.S.)

BUILDING 13

BUILDING 12

BUILDING 8

BUILDING 10

BUILDING 11

BUILDING 12

BUILDING 13

BUILDING 14

BUILDING 15

BUILDING 16

BUILDING 17

BUILDING 1

WEBSTER WAY

CHASTAIN DRIVE 50' PUBLIC R.O.W.

PROPOSED 50' RIGHT OF WAY

11
13,347.8 sf
0.30 ac

PHASE 3B (to be offsite)

12
18,881.8 sf
0.43 ac

13
12,093.2 sf
0.27 ac

14
9,600.1 sf
0.22 ac

15
12,627.0 sf

PROPOSED SIGN EASEMENT

COW ZONING LINE, TYP.

25' WETLAND SETBACK AREA, TYP.

RESERVED PARKLAND (TYP.)

PROPOSED PROPERTY LINE (TYP.)

PROPOSED 50' RIGHT OF WAY

PROPOSED 50' RIGHT OF WAY

PROPOSED 50' RIGHT OF WAY

PROPOSED 50' RIGHT OF WAY

PROPOSED 50' RIGHT OF WAY

PROPOSED 50' RIGHT OF WAY

PROPOSED 50' RIGHT OF WAY

PROPOSED 50' RIGHT OF WAY

PROPOSED 50' RIGHT OF WAY

PROPOSED 50' RIGHT OF WAY

PROPOSED PROPERTY LINE (TYP.)

SEWER EASEMENT, TYP.

FUSE LITY

ON

YP.

IN

RY

E)

RESERVED PARKLAND

PROPOSED PROPERTY LINE (TYP.)

PROPOSED PROPERTY LINE (TYP.)

PROPOSED PROPERTY LINE (TYP.)

PAR/R07007-003-003-000
MUIRFIELD TOWNS AT
ECHO FARMS HOA
DB 5780, PG 1498
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-021-000
SHKOP MILTON ETAL
DB 5538, PG 1491
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-025-000
MOFFITT THOMAS F DONNA D
DB 5926, PG 1610
ZONED-MF-L-MULTI FAM LOW DEN

PAR/R07007-003-019-000
HAILLEY
DB 5563, PG 2414
ZONED-MF-L-MULTI FAM LOW DEN

PAR/R07007-003-019-000
JONES JAMES F TAMMY C
DB 5926, PG 1524
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-016-000
MARSHALL ANNETTE LOUISE
DB 5565, PG 1875
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-038-000
DAVIDSON JULIA D EDWARD P
DB 5904, PG 2142
ZONED-MF-L-MULTI FAM LOW

PAR/R07007-003-037-000
MRJP LTD
DB 6018, PG 128
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-036-000
CHADCOCK MICHAEL W ETAL
DB 5928, PG 1252
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-036-000
BRENNAN MARCELLA F
DB 5875, PG 10
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-034-000
ANDERSON LORIC
DB 5928, PG 1509
ZONED-MF-L-MULTI
FAM LOW DEN

PAR/R07007-003-033-000
MRJP LTD
DB 6125, PG 1644
ZONED-MF-L-MULTI
FAM LOW DEN

PAR/R07007-003-032-000
MRJP LTD
DB 6125, PG 1644
ZONED-MF-L-MULTI
FAM LOW DEN

PAR/R07007-003-032-000
MRJP LTD
DB 6125, PG 1644
ZONED-MF-L-MULTI
FAM LOW DEN

PAR/R07007-003-031-000
MRJP LTD
DB 6125, PG 1644
ZONED-MF-L-MULTI
FAM LOW DEN

PAR/R07007-003-030-000
ECHO FARMS TOWNHOMES
NC INC
DB 5972, PG 2958
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-029-000
ECHO FARMS TOWNHOMES
NC INC
DB 5972, PG 2958
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-028-000
ECHO FARMS TOWNHOMES
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DB 5972, PG 2958
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PAR/R07007-003-027-000
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NC INC
DB 5972, PG 2958
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-026-000
ECHO FARMS TOWNHOMES
NC INC
DB 5972, PG 2958
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-025-000
ECHO FARMS TOWNHOMES
NC INC
DB 5972, PG 2958
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-024-000
ECHO FARMS TOWNHOMES
NC INC
DB 5972, PG 2958
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-023-000
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NC INC
DB 5972, PG 2958
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LOW DEN

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DB 5972, PG 2958
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LOW DEN

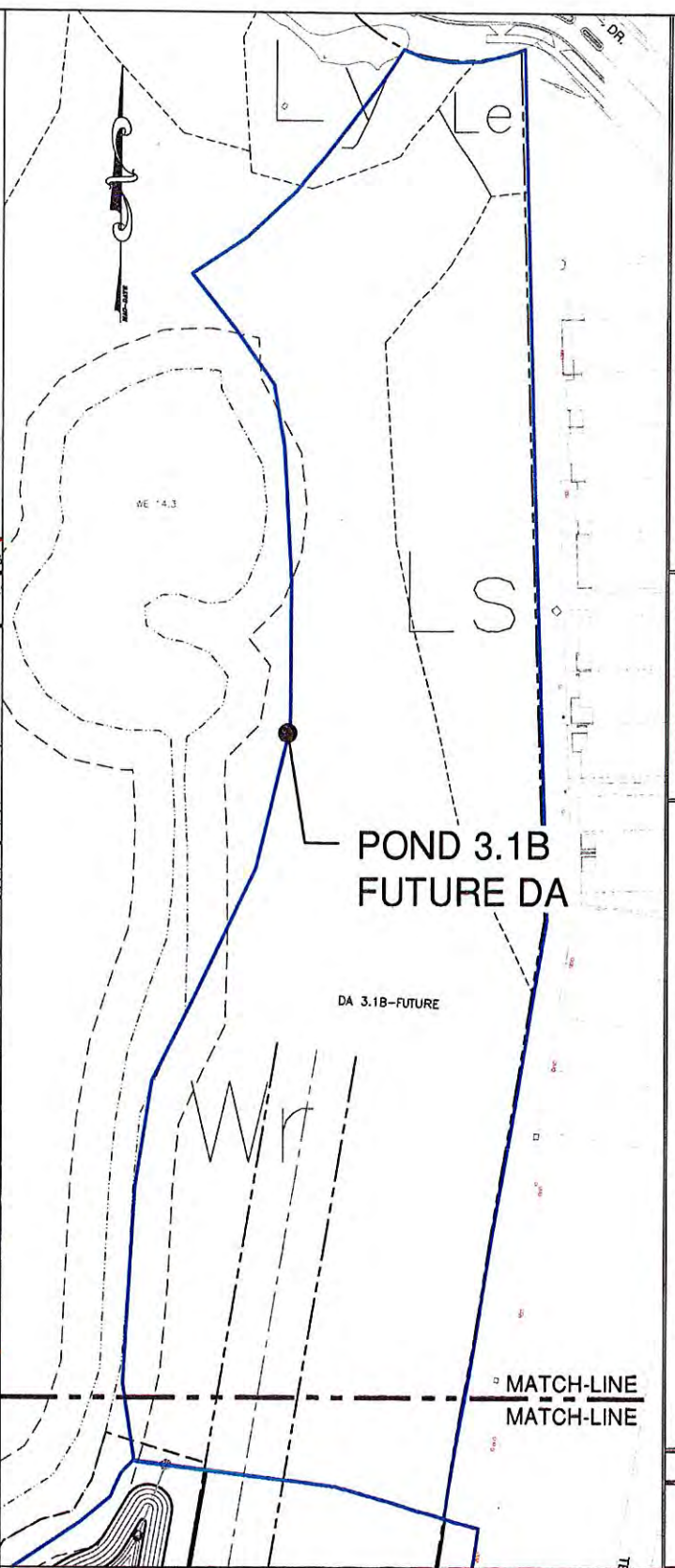
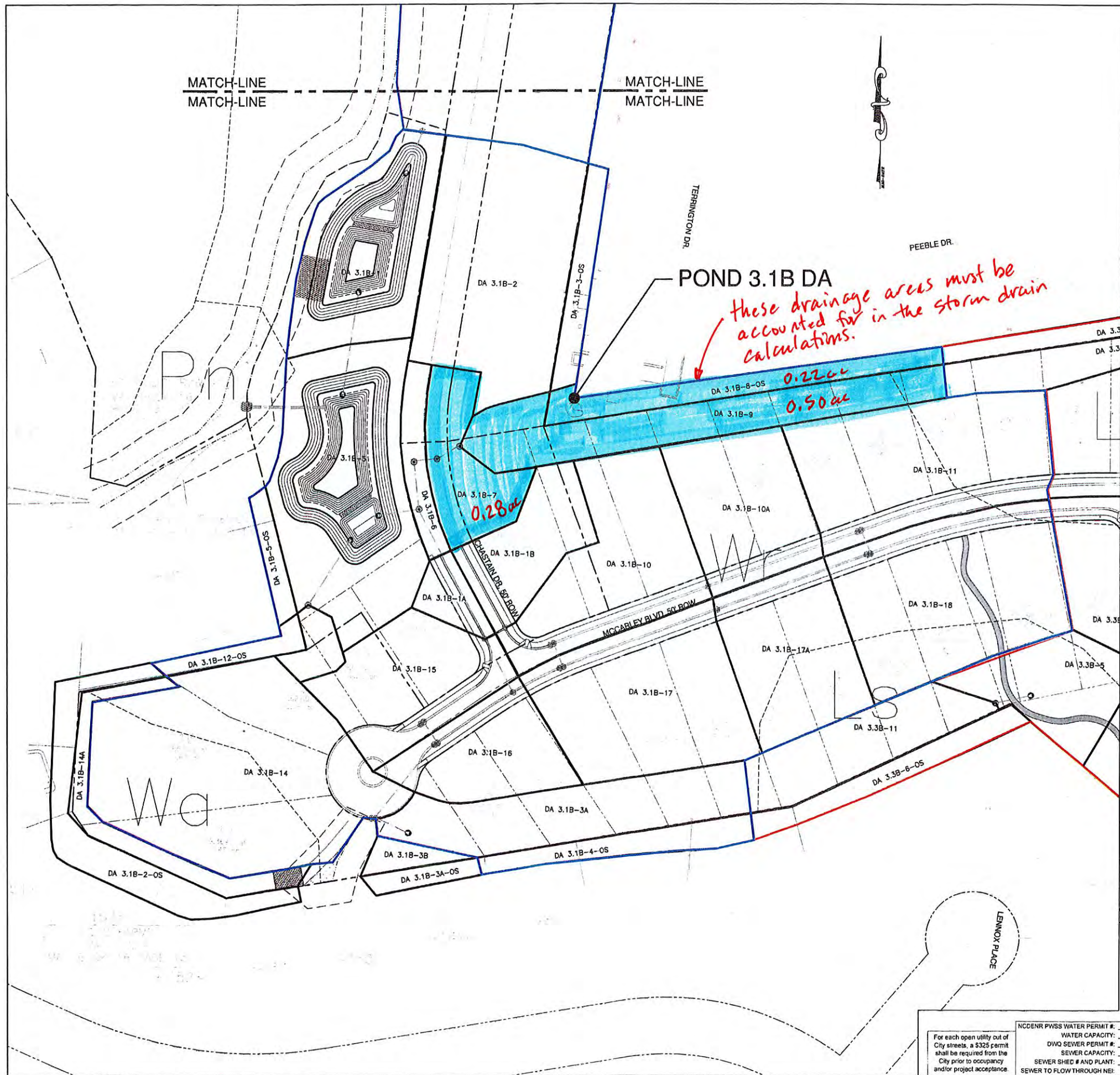
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ECHO FARMS TOWNHOMES
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DB 5972, PG 2958
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-019-000
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NC INC
DB 5972, PG 2958
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-018-000
ECHO FARMS TOWNHOMES
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DB 5972, PG 2958
ZONED-MF-L-MULTI FAM
LOW DEN

PAR/R07007-003-017-000
ECHO FARMS TOWNHOMES
NC INC
DB 5972, PG 2958
ZONED-MF-L-MULTI FAM
LOW DEN



DRAINAGE AREA PLAN - POND 3.1B
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANFORD, NJ 07012
 732-521-2900

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE: (910) 343-9653
 1429 ASHLITTLE RIVER RD, N.Y.
 ASH, NC 28420
 PHONE: (910) 267-5900

Licence #C-3641
16083
 DES. JST
 ODR. JPN
 DRWL. NKS
 DATE 6/27/18



C1.5

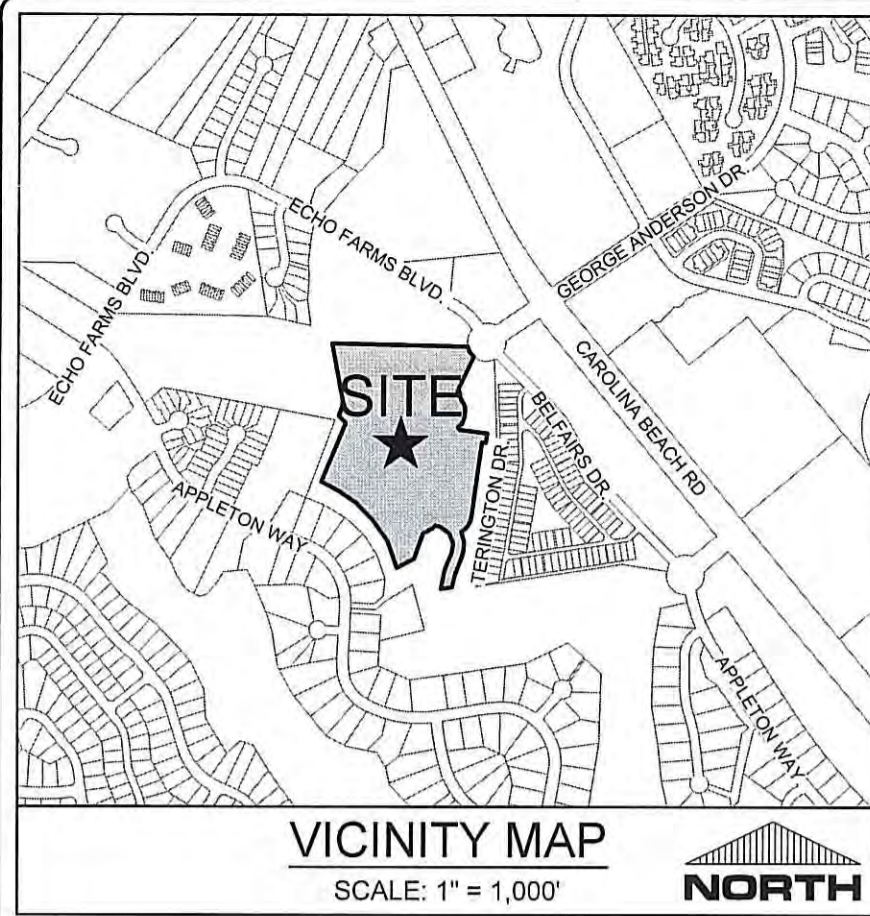
For each open utility out of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

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)

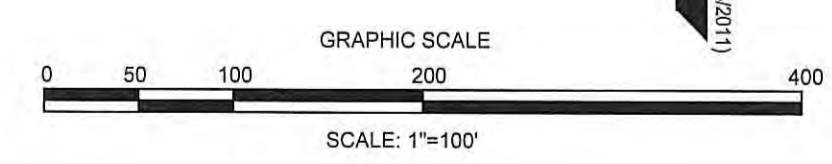
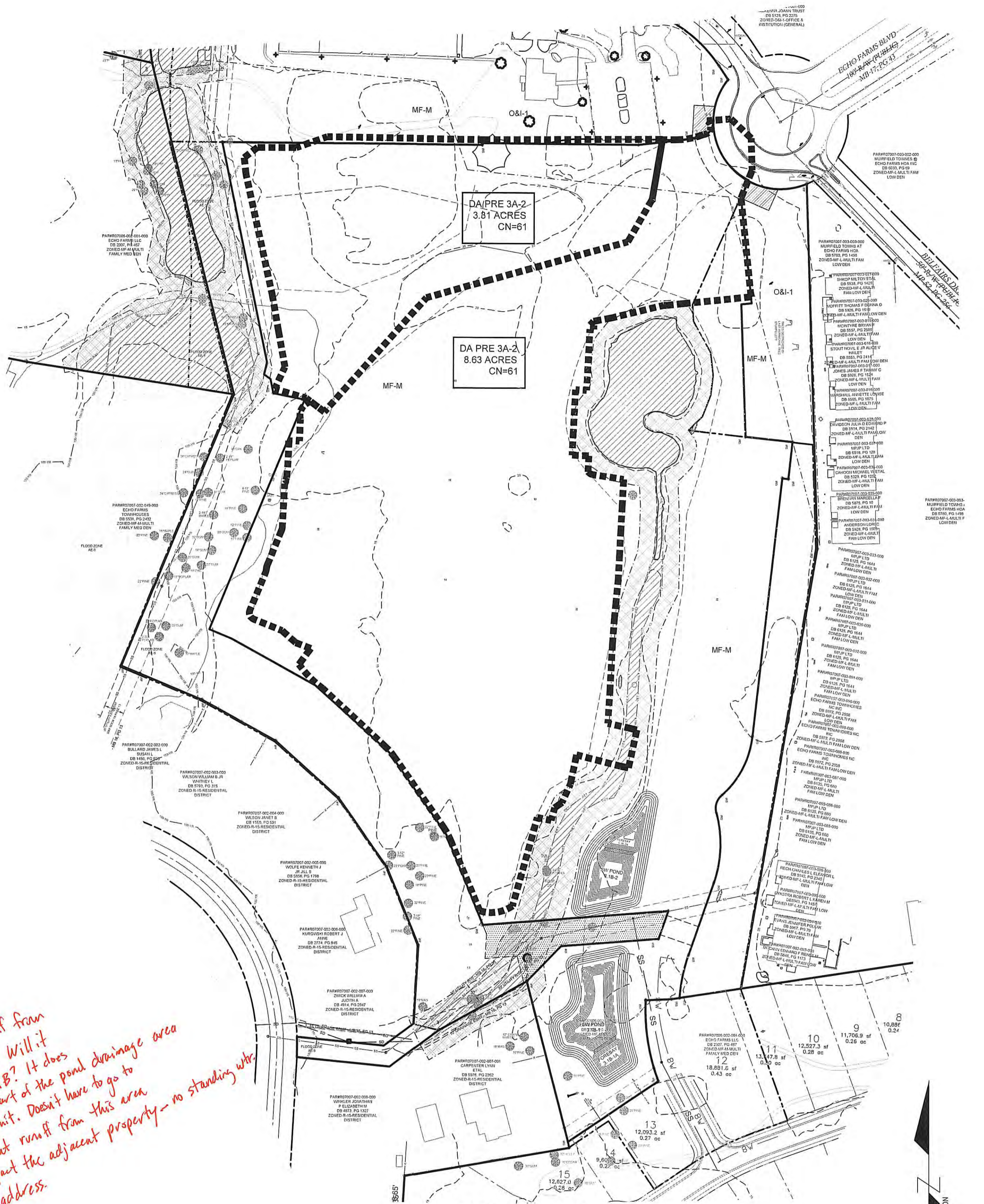
CITY OF WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: 6/28/18
 Signed: [Signature]

SCALE: 1" = 50'
 0 50 100 150

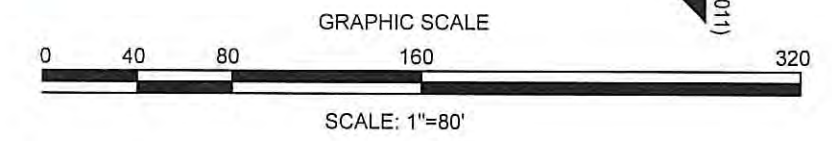
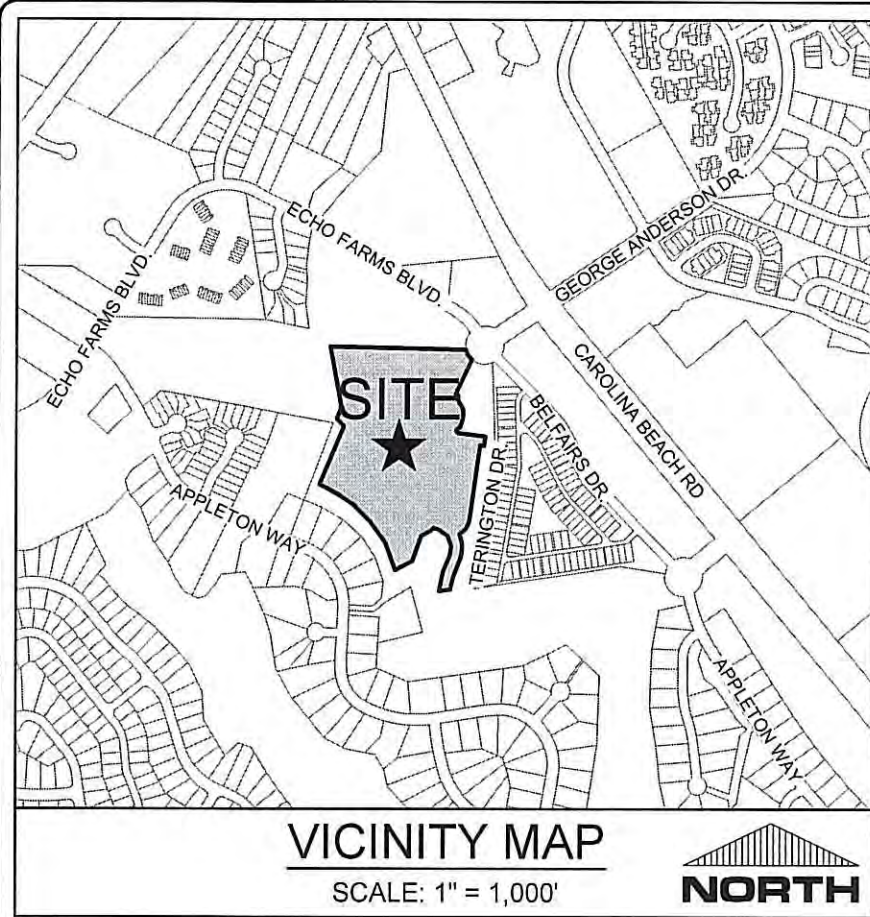
Approved Construction Plan
 Name: [Signature]
 Date: 6-28-2018
 Planning: [Signature]
 Traffic: [Signature]
 Fire: [Signature]



where does runoff from this area go? Will it enter pond 3-1B? It does show to be part of the pond drainage area in the 3B SW permit. Doesn't have to go to the pond but runoff from this area cannot impact the adjacent property - no standing water. Please address.



<p>PROJECT STATUS: CONCEPTUAL LAYOUT: PRELIMINARY LAYOUT: RELEASED FOR CONST.</p>	<p>REVISIONS:</p>
<p>DRAWING INFORMATION: DATE: 02/01/19 DESIGNED: RSK CHECKED: PPS</p>	<p>CLIENT INFORMATION: ECHO FARMS, LLC c/o MATRIX DEVELOPMENT GROUP CN 4000 FORSGATE DRIVE CRANBURY, NJ 08512</p>
<p>PRE/POST DA MAP WOODLANDS LANDING AT ECHO FARMS (TRACT 3A) WILMINGTON, NORTH CAROLINA</p>	<p>PARAMOUNT ENGINEERING, INC. 122 Cinema Drive Wilmington, North Carolina 28403 (910) 791-6707 (O) (910) 791-6760 (F) NC License #: C-2846</p>
<p>SEAL ROBERT P. SKILLMAN ENGINEER 031591 02/01/19</p>	<p>DA-1</p>
<p>PEI JOB#: 18292.PE</p>	



REVISIONS: 	
CLIENT INFORMATION: ECHO FARMS, LLC c/o MATRIX DEVELOPMENT GROUP CN 4000 FORSGATE DRIVE CRANBURY, NJ 08512	PROJECT STATUS: CONCEPTUAL LAYOUT: PRELIMINARY LAYOUT: RELEASED FOR CONSTRUCTION: DATE: 11/06/18 DESIGNED: RFB CHECKED: RFB
PARAMOUNT ENGINEERING 122 Cinema Drive Wilmington, North Carolina 28403 (910) 791-5707 (O) (910) 791-6760 (F) NC License #: C-2846	DRAWING INFORMATION: DATE: 11/06/18 DESIGNED: RFB CHECKED: RFB
INLET DA MAP WOODLANDS LANDING AT ECHO FARMS (TRACT 3A) WILMINGTON, NORTH CAROLINA	SEAL: ENGINEER ROBERT P. SKALLAND 02/01/19
DA-2	PEI JOB#: 18252.PE

WOODLANDS LANDING AT ECHO FARMS - TRACT 3A

4114 ECHO FARMS BLVD.
WILMINGTON, NORTH CAROLINA 28412

DESIGN DOCUMENTS

FEBRUARY 2019

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)
ENGINEERING/INSPECTIONS
PH: 910-332-6660

OPERATIONS/MAINTENANCE
PH: 910-322-8550

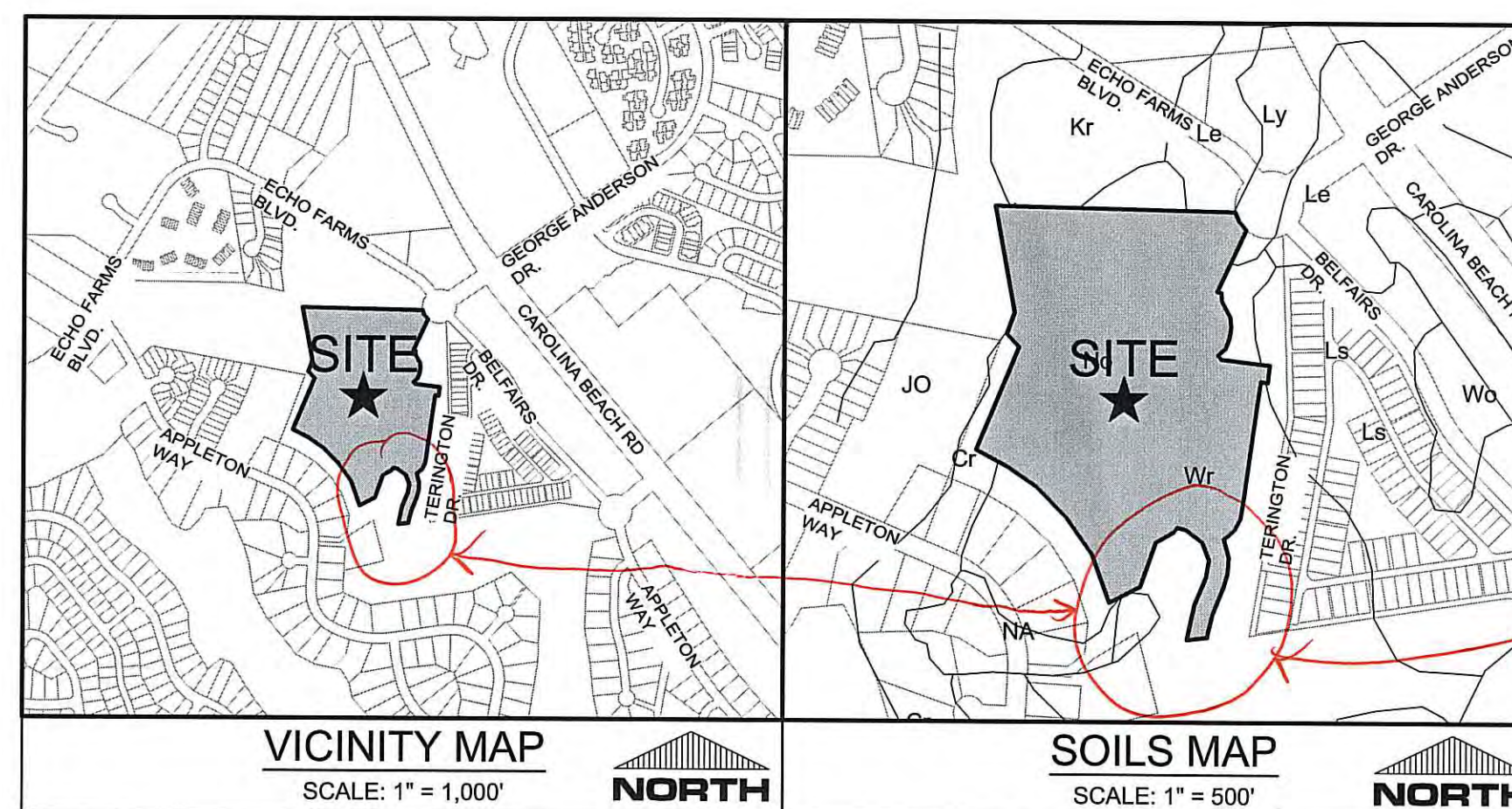
DUKE ENERGY
DISTRIBUTION CONSTRUCTION SERVICE
DEP CSC PH: 1-800-452-2777

TRANSMISSION AGENT
BILL WILDER
PH: 910-772-4903

AT&T/BELL SOUTH
ATTN: STEVE DAYVAULT (BUILDING ENGINEERING)
PH: 910-341-0741

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

SPECTRUM
GENERAL PH: 800-892-4357



OWNER:
ECHO FARMS, LLC C/O MATRIX DEVELOPMENT GROUP
4000N FORSGATE DRIVE
CRANBURY, NEW JERSEY 08512
(732) 521-2900

DEVELOPER:
GHK CAPE FEAR DEVELOPMENT, LLC
1051 MILITARY CUTOFF ROAD, SUITE 200
WILMINGTON, NC 28405
(910) 344-1000

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



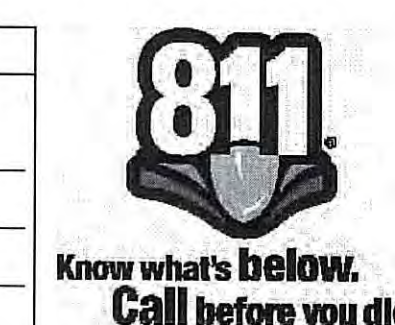
SHEET INDEX	
SHEET NUMBER	SHEET TITLE
C-0.0	COVER SHEET
C-1.0	GENERAL NOTES
C-2.0-2.3	SITE PLANS
C-2.4	SITE INVENTORY PLAN
C-2.5	OPEN SPACE EXHIBIT
C-3.0	EROSION CONTROL PLAN, PH. I
C-4.0	OVERALL DRAINAGE PLAN
C-4.1 - C-4.3	GRADING & DRAINAGE PLANS
C-5.0 - C-5.2	UTILITY PLAN & PROFILES
C-6.0 - C-6.2	ROADWAY PROFILES
C-7.0-C-7.3, C-7.5	DETAILS

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)

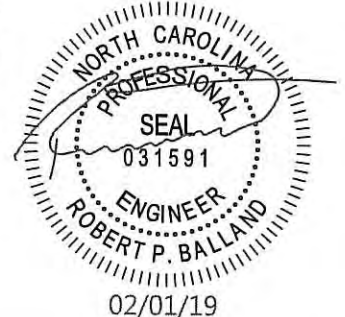
CITY OF WILMINGTON
NORTH CAROLINA
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit #: _____
Signed: _____

Approved Construction Plan
Name _____ Date _____
Planning _____
Traffic _____
Fire _____

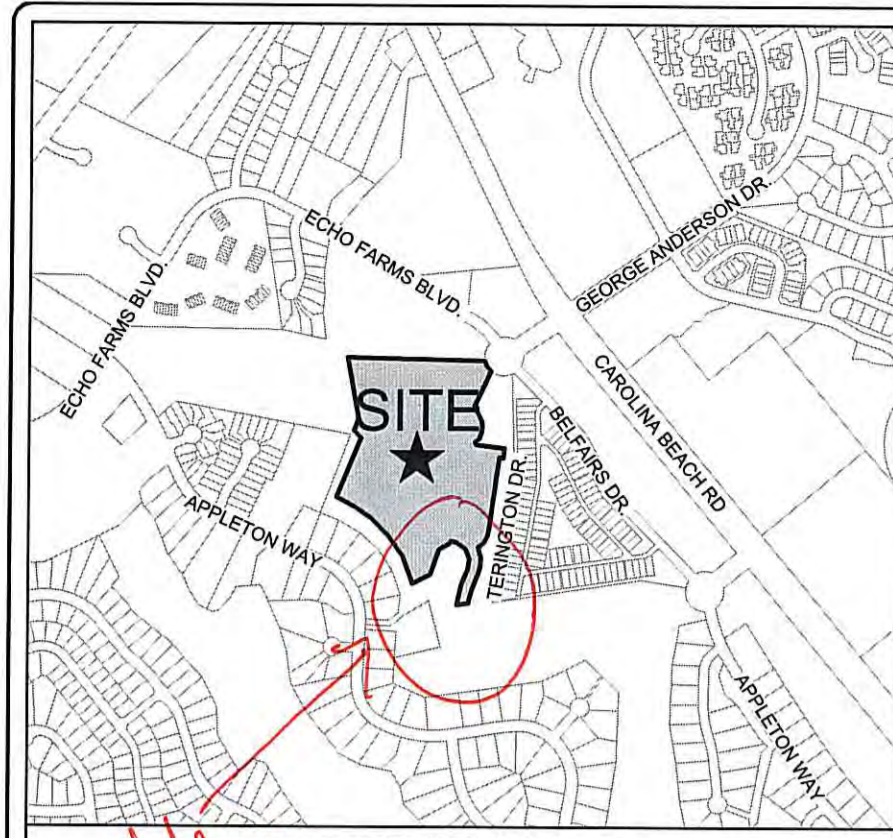


PREPARED BY:
PARAMOUNTE ENGINEERING, INC.

122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846
PROJECT # 18252.PE



FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION



VICINITY MAP
SCALE: 1" = 1,000'

SITE DATA TABULATION

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 #: R07006-002-054-000
RECORDED MAP BOOK: BK 65, PG 81
TOTAL SITE AREA: 18.55 ACRES (807,945 SF)
CURRENT ZONING: MF-M, O&I
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: 176 UNITS - MULTI-FAMILY (ATTACHED)
REQUIRED/PROPOSED BLDG. LOT COVERAGE: 30% MAX PER CODE (PROPOSED=14%)
PROPOSED BLDG. CONSTRUCTION: TYPE V-B

MULTI FAMILY SETBACK STANDARDS

	PROVIDED	REQUIRED
MINIMUM FRONT SETBACK	SEE PLANS	35 FT
MINIMUM SIDE SETBACK	SEE PLANS	20 FT
MINIMUM CORNER SIDE SETBACK	SEE PLANS	30 FT
MINIMUM REAR SETBACK	SEE PLANS	25 FT

MAXIMUM ALLOWED DENSITY TRACT 3A

DENSITY ALLOWED IN MF-M: 17 DU/AC (315 UNITS = 17 DU/AC X 18.5 TOTAL AC)
DENSITY PROVIDED IN MF-M: 9.5 DU/AC = 176 UNITS TOTAL / 18.5 TOTAL AC (17 BUILDINGS, 1 AMENITY / CLUBHOUSE)

OPEN SPACE REQUIREMENTS

SEE C-2.5 OPEN SPACE EXHIBIT

	PROVIDED	REQUIRED
35% OF TRACT REQUIRED	6.61 AC	6.48 AC
TOTAL	3.28 AC	3.24 AC
ACTIVE (50% OF REQUIRED)	3.33 AC	3.24 AC
PASSIVE (50% OF REQUIRED)		

(OPEN SPACE DOES NOT INCLUDE NATURAL PONDS, STORMWATER PONDS, LAKES, STREAMS, AND MARSHES)

FLOOD NOTE

THE SUBJECT PARCEL LIES WITHIN FLOOD ZONE AE (EL 9) AS INDICATED BY FEMA FLOOD ZONE MAP NUMBER 3720312500K BEARING AN EFFECTIVE DATE OF AUGUST 28, 2018.

ZONING NOTE

THE SUBJECT PARCEL DOES NOT LIE WITHIN A SPECIAL HIGHWAY OVERLAY DISTRICT.

SITE INFORMATION

EXISTING IMPERVIOUS TO REMAIN	0 SF
PROPOSED IMPERVIOUS AREA	
MULTI-FAMILY BUILDINGS	113,515 SF
AMENITY BUILDINGS, MAIL KIOSK	485 SF
ON-SITE SIDEWALKS/PATHS	49,245 SF
FUTURE	4,200 SF
ASPHALT/ CONCRETE/ CURB & GUTTER	212,800 SF
TOTAL PROPOSED IMP. AREA	380,245 SF (8.73 AC)
PROPOSED PERCENT IMPERVIOUS	380,245 SF / 804,559 SF = 47.3%

WATER AND SEWER CAPACITY

ALL EXISTING WATER AND SEWER UTILITIES ARE OWNED BY CFPWA

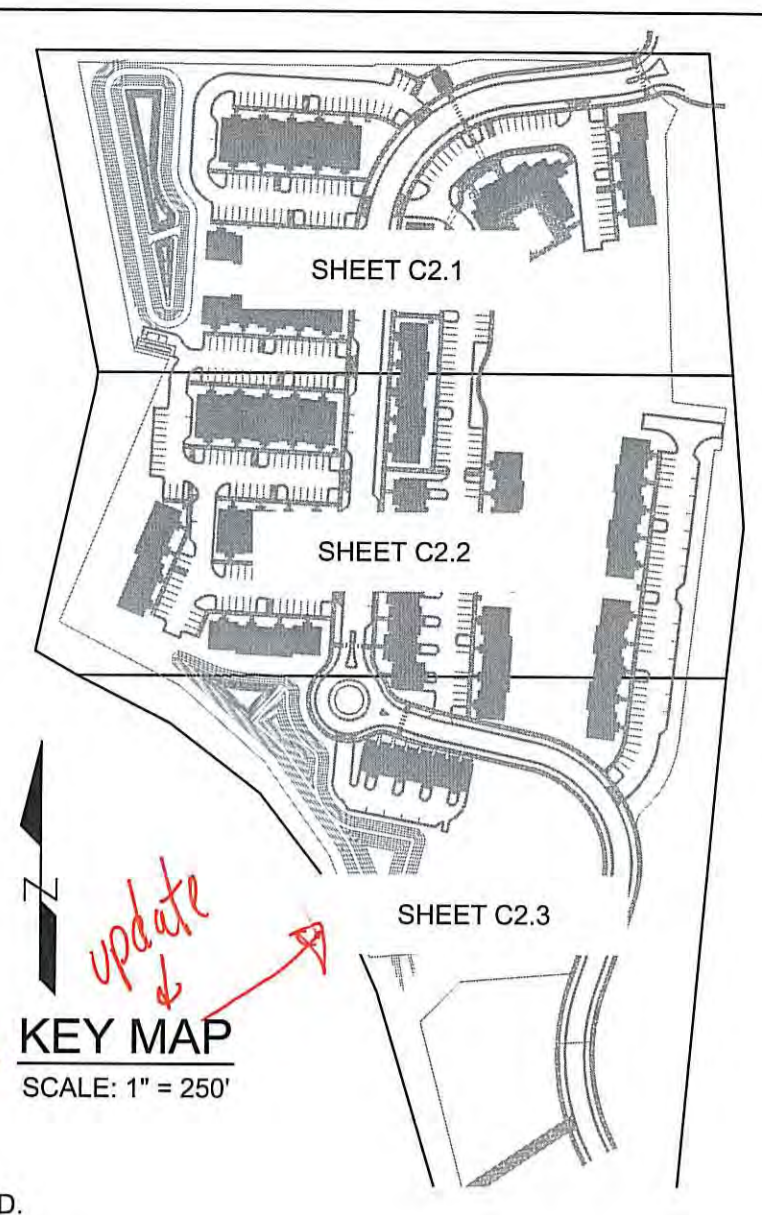
SANITARY SEWER
EXISTING - NONE
MULTI-FAMILY - ASSUMING 120 GPD/BED
PROPOSED - 176 MULTI-FAMILY UNITS TOTAL
56 - 1 BDRM UNITS @ 120 GPD/UNIT = 6,720 GPD
98 - 2 BDRM UNITS @ 240 GPD/UNIT = 23,520 GPD
22 - 3 BDRM UNITS @ 360 GPD/UNIT = 7,920 GPD
TOTAL SEWER FLOW = 38,160 GPD

WATER

EXISTING - NONE
PROPOSED - 176 MULTI-FAMILY UNITS AT 400 GPD/UNIT = 70,400 GPD
TOTAL WATER DEMAND = 70,400 GPD

WASTE DISPOSAL

WASTE DISPOSAL WILL BE PROVIDED WITH A CENTRAL DUMPSTER LOCATION. THIS LOCATION HAS BEEN NOTED ON THE PLAN.



KEY MAP
SCALE: 1" = 250'

SRB-7-117-M818 TRACT 3A SRB CONDITIONS:

- The use and development of the subject property shall comply with all regulations and requirements imposed by the Land Development Code, the City of Wilmington Technical Standards and Specification Manual and any other applicable federal, state or local law, ordinance or regulation, as well as any condition stated below. In the event of a conflict, the more stringent requirement or higher standard shall apply.
- Approval of this preliminary plan does not constitute technical approval of a site plan. Final approval by the Technical Review Committee and the issuance of all required permits must occur prior to release of the project for construction.
- If, for any reason, any condition for approval is found to be illegal or invalid or if the applicant should fail to accept any condition following approval, the approval of the preliminary plan shall be null and void.
- The use and development of the subject property shall be in accordance with the approved preliminary plan as submitted and approved.
- Utilities shall be placed in appropriate locations relative to the public rights-of-way and co-location of water and sewer utilities with the required street trees (per the City TSSM) shall be pursued by the applicant and designer.
- A tree preservation plan and tree removal permit shall be required for this project and city staff shall issue these based on acceptable limits of clearing and tree preservation.
- All existing protected trees not located within the building footprint or impacted by essential site improvements, shall be preserved or mitigated.
- Trees designated to be preserved shall be properly protected during construction and tree protection fencing shall be noted on the construction plans. Tree clearing will be limited to essential site improvements within the project limits as shown on the approved site plan.
- Resource areas, buffers and setbacks per requirements of the LDC shall be shown and labeled on the Preliminary Plan.
- All existing and proposed public and non-municipal easements shall be added as necessary to the Preliminary Plan.
- An acceptable Preliminary Plan which adequately addresses all TRC and SRB comments shall be submitted for signature within thirty (30) calendar days of SRB approval.
- Exterior site lighting shall be installed so as not to shine directly onto adjacent residential parcels.
- The use of pine straw as ground cover shall be prohibited within ten (10) feet of any combustible exterior construction.
- Water mains may be located within the street to allow for street trees to be planted in street plazas along all streets.
- Stormwater ponds shall be designed as open space amenities.
- Any improvements or construction in the conservation resource buffer shall be limited to hand equipment with minimal disturbance due to the sensitivity of the conservation resource.
- Pedestrian connections shall be provided in multiple locations to the surrounding park property with specific locations to be determined at TRC review in coordination with the City/County park property development.
- Non-municipal utilities shall not be permitted in the right-of-way except that crossings are limited to main/trunk lines as allowed by standard right-of-way procedures or as permitted by the City Engineer to cross the right-of-way at the narrowest extent deemed necessary.
- On-street parking shall be provided on the proposed public right-of-way Midvale Drive adjacent to the mail kiosk if feasible.
- All city, state and federal regulations shall be followed.

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.
- SEE SHEET C-6.2 FOR TYPICAL ROADWAY CROSS SECTIONS.
- ALL PROPOSED VEGETATION WITHIN SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30' - 10'.
- CONTACT TRAFFIC ENGINEERING FORTY-EIGHT HOURS PRIOR TO ANY EXCAVATION IN THE RIGHT-OF-WAY. 910-341-3258

STREET LIGHTING NOTES:

- 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.
- STREETLIGHTS WILL BE REVIEWED THROUGH THE SUBDIVISION PROCESS AND MUST MEET CRITERIA ESTABLISHED IN CITY'S STREET LIGHTING POLICY.
- IF ANY OF THE EXISTING STREET LIGHTS COINCIDE WITH THE PROPOSED, REQUIRED NUMBER OF STREET LIGHTS MUST BE AMENDED TO COMPLY WITH THE STREET LIGHTING POLICY.
- 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.

PARKING (PROPOSED)

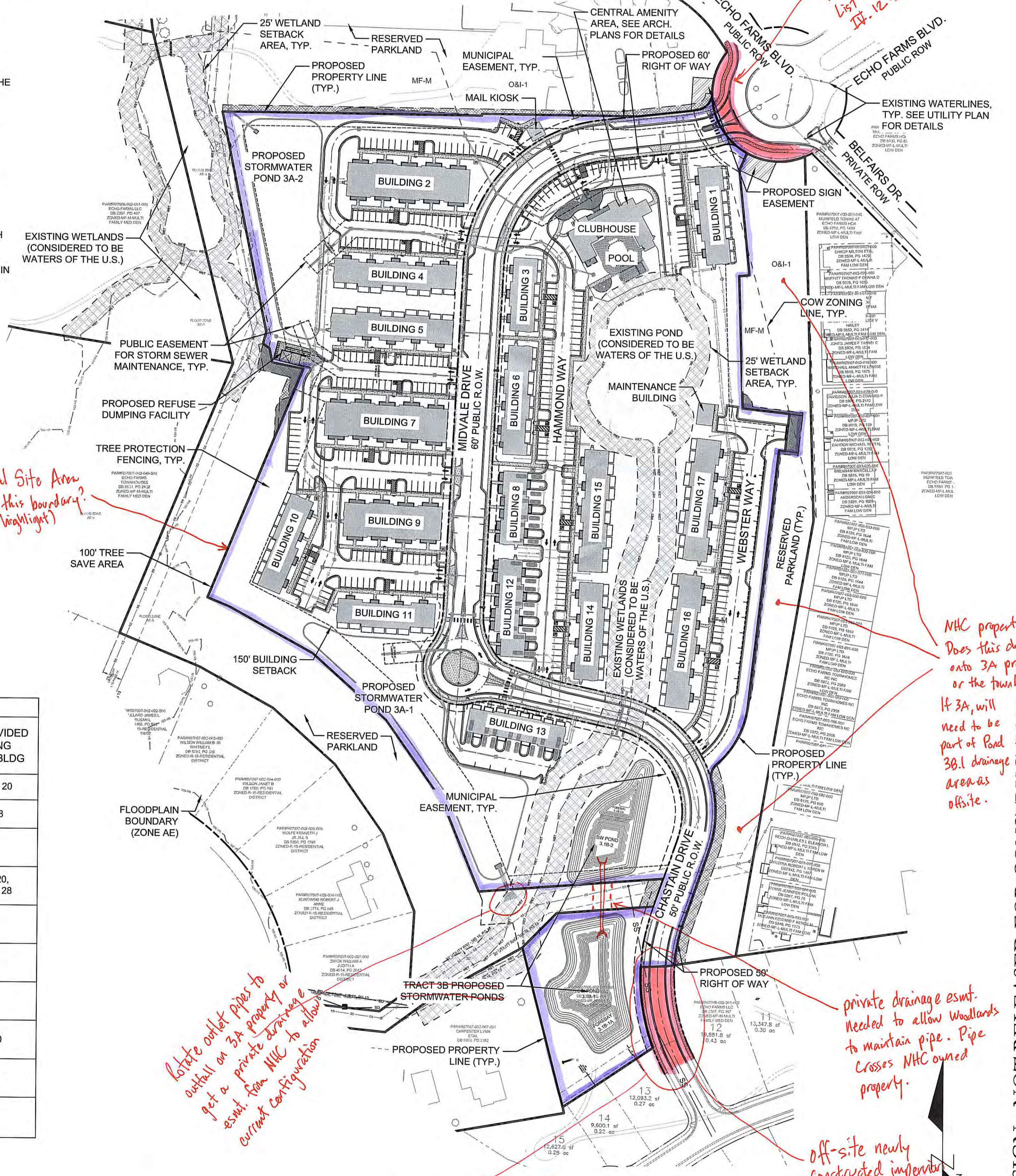
MINIMUM REQUIRED: 329 (SEE CALCULATIONS BELOW)
MAXIMUM ALLOWED: 440 (2.5 PER UNIT)
MINIMUM HANDICAP: 8 (2% OF TOTAL SPACES PROVIDED)
1 HANDICAP VAN (1 PER EVERY 8 HANDICAP SPACES)
16 (INCLUDING 2 VAN)
MINIMUM BICYCLE: 20 SPACES
BICYCLE PROVIDED: 20 SPACES
TOTAL PROVIDED: 407 SPACES (385 SURFACE SPACES + 22 GARAGES)

REQUIRED PARKING SPACES CALCULATIONS

1 BDRM = # OF UNITS X 1.5 SPACES
2 BDRM = # OF UNITS X 2.0 SPACES
3 OR MORE BDRM = # OF UNITS X 2.25 SPACES

PROPOSED BUILDING INFORMATION & REQUIRED PARKING CALCULATIONS

BUILDING #	# OF STORIES	PROPOSED BLDG. HEIGHT	# OF UNITS/BLDG	# OF BDRMS/UNIT	# OF REQ'D PARKING SPACES/BLDG (MIN.)	# OF PROVIDED PARKING SPACES/BLDG
1, 11, 14	2	32' - 10 3/4"	8	2	16	16, 20, & 20
2, 7	2	39' - 7 1/2"	20	1	30	39 & 38
3	2	32' - 10 3/4"	6	2	12	15
4, 5, 6, 15, 16, 17	2	32' - 10 3/4"	10	2	20	25, 20, 20, 20, 28, & 28
8	3	43' - 4 1/4"	6	3	13.5	16
9	2	39' - 7 1/2"	16	1	24	25
10	2	32' - 10 3/4"	8	2	16	16
12, 13	3	43' - 4 1/4"	8	3	18	20 & 20
OTHER (AMENITY & MAIL KIOSK)						18 & 3
TOTAL PARKING SPACES =					330	407



The following allowances and waivers from the City's Technical Standards (TSSM) and Land Development Code (LDC) requirement are granted:

- Approval of a waiver from width of a sidewalk requirement of six (6) feet when located on the back of curb to be five (5) feet in width due to the site constraints and the design of the road with the proposed on-street parking.
- Conditional approval of a waiver from the required ten (10) foot municipal easement requirement on public right-of-way due to the site constraints as discussed and design of the roadway. This waiver is approved based on paragraph 18 hereinabove.

Off-site newly constructed impervious surface area. List in SW application III. 12 table

MHC property. Does this drain into 3A property? or the townhome? If 3A, will need to be part of Pond 3B.1 drainage areas offsite.

private drainage esmt. needed to allow Woodlands to maintain pipe. Pipe crosses MHC owned property.

coordinate with Phase 3B (W&R) for storm pipe installation. Which phase is being built first?

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

Approved Construction Plan

Name _____ Date _____

Planning _____

Traffic _____

Fire _____

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)

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:
ECHO FARMS, LLC
c/o MATRIX DEVELOPMENT GROUP
CN 400 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

OVERALL SITE PLAN
WOODLANDS LANDING
AT ECHO FARMS (TRACT 3A)
WILMINGTON, NORTH CAROLINA

PROJECT STATUS:
CONCEPTUAL LAYOUT: _____
FINAL DESIGN LAYOUT: _____
RELEASED FOR CONSTRUCTION: _____

DRAWING INFORMATION:
DATE: _____
SCALE: _____
DRAWN BY: _____
CHECKED BY: _____

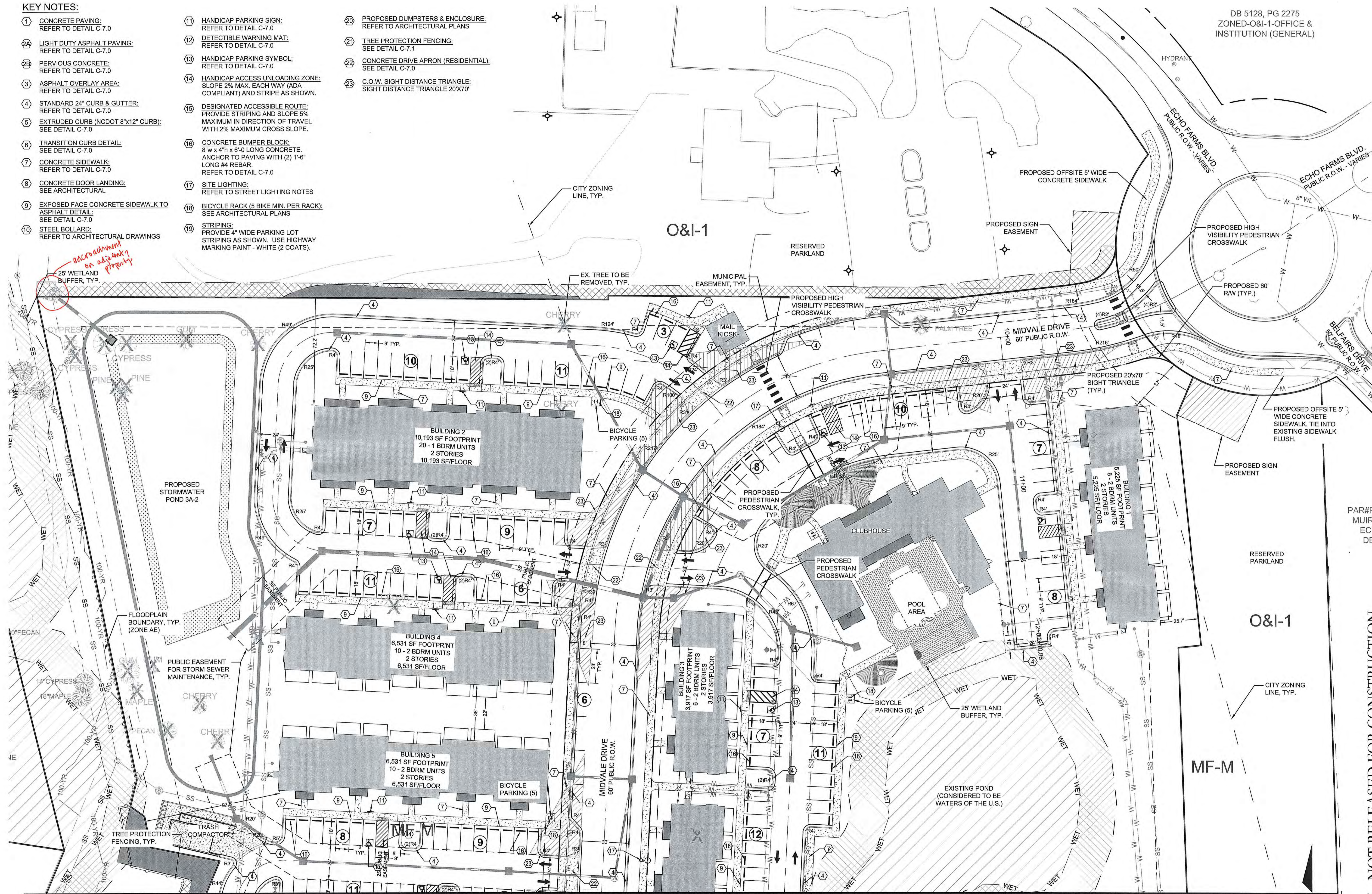
SEAL:
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL
031591
ROBERT P. BALLARD
02/01/19

C-2.0
PEI JOB#: 18252.PE

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION

KEY NOTES:

- 1 CONCRETE PAVING:
REFER TO DETAIL C-7.0
- 2A LIGHT DUTY ASPHALT PAVING:
REFER TO DETAIL C-7.0
- 2B PERVIOUS CONCRETE:
REFER TO DETAIL C-7.0
- 3 ASPHALT OVERLAY AREA:
REFER TO DETAIL C-7.0
- 4 STANDARD 24" CURB & GUTTER:
REFER TO DETAIL C-7.0
- 5 EXTRUDED CURB (NCDOT 8"x12" CURB):
SEE DETAIL C-7.0
- 6 TRANSITION CURB DETAIL:
SEE DETAIL C-7.0
- 7 CONCRETE SIDEWALK:
REFER TO DETAIL C-7.0
- 8 CONCRETE DOOR LANDING:
SEE ARCHITECTURAL
- 9 EXPOSED FACE CONCRETE SIDEWALK TO
ASPHALT DETAIL:
SEE DETAIL C-7.0
- 10 STEEL BOLLARD:
REFER TO ARCHITECTURAL DRAWINGS
- 11 HANDICAP PARKING SIGN:
REFER TO DETAIL C-7.0
- 12 DETECTIBLE WARNING MAT:
REFER TO DETAIL C-7.0
- 13 HANDICAP PARKING SYMBOL:
REFER TO DETAIL C-7.0
- 14 HANDICAP ACCESS UNLOADING ZONE:
SLOPE 2% MAX. EACH WAY (ADA
COMPLIANT) AND STRIPE AS SHOWN.
- 15 DESIGNATED ACCESSIBLE ROUTE:
PROVIDE STRIPING AND SLOPE 5%
MAXIMUM IN DIRECTION OF TRAVEL
WITH 2% MAXIMUM CROSS SLOPE.
- 16 CONCRETE BUMPER BLOCK:
8" w x 4" h x 6'-0" LONG CONCRETE.
ANCHOR TO PAVING WITH (2) 1'-6"
LONG #4 REBAR.
REFER TO DETAIL C-7.0
- 17 SITE LIGHTING:
REFER TO STREET LIGHTING NOTES
- 18 BICYCLE RACK (5 BIKE MIN. PER RACK):
SEE ARCHITECTURAL PLANS
- 19 STRIPING:
PROVIDE 4" WIDE PARKING LOT
STRIPING AS SHOWN. USE HIGHWAY
MARKING PAINT - WHITE (2 COATS).
- 20 PROPOSED DUMPSTERS & ENCLOSURE:
REFER TO ARCHITECTURAL PLANS
- 21 TREE PROTECTION FENCING:
SEE DETAIL C-7.1
- 22 CONCRETE DRIVE APRON (RESIDENTIAL):
SEE DETAIL C-7.0
- 23 C.O.W. SIGHT DISTANCE TRIANGLE:
SIGHT DISTANCE TRIANGLE 20'X70'



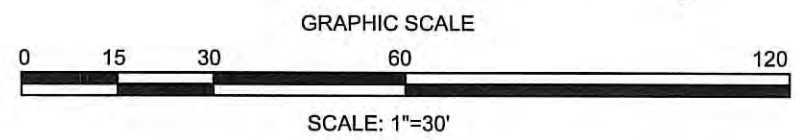
MATCH LINE - SEE SHEET C-2.2

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)

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

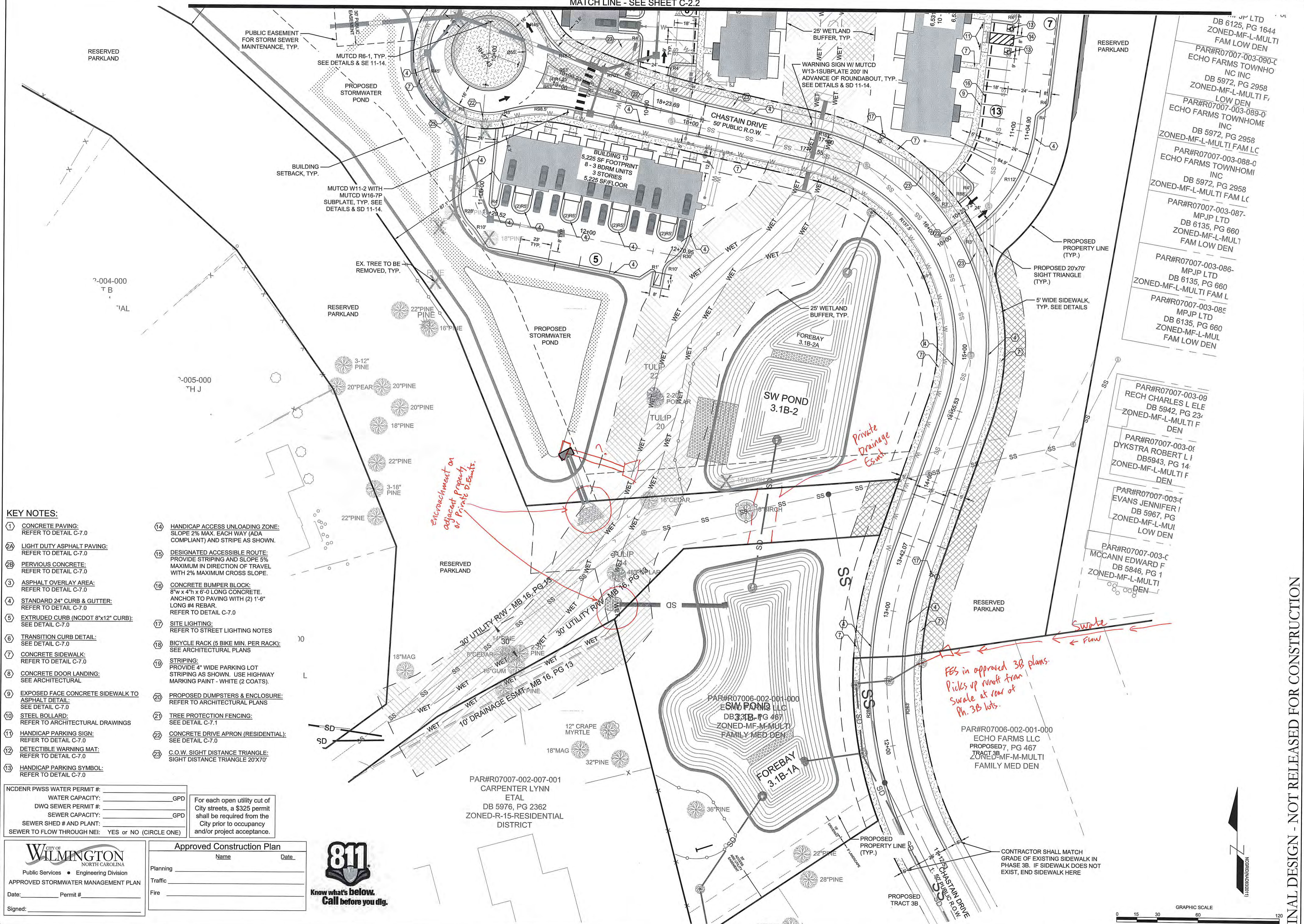
Approved Construction Plan
 Name _____ Date _____
 Planning _____
 Traffic _____
 Fire _____



FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION

<p>REVISIONS:</p>	<p>CLIENT INFORMATION: ECHO FARMS, LLC c/o MATRIX DEVELOPMENT GROUP CN 4000 FORSGATE DRIVE CRANBURY, NJ 08512</p>
<p>PARAMOUNT ENGINEERING, INC. 122 Cinema Drive Wilmington, North Carolina 28403 (910) 791-6707 (O) (910) 791-6766 (F) NC License #: C-2846</p>	<p>PAR#F MUIR ECI DE</p>
<p>PROJECT STATUS: CONCEPT LAYOUT: PRELIMINARY LAYOUT: PREPARED FOR CONSTRUCTION</p>	<p>SITE PLAN WOODLANDS LANDING AT ECHO FARMS (TRACT 3A) WILMINGTON, NORTH CAROLINA</p>
<p>DRAWING INFORMATION DATE: 02/01/19 DRAWN: RPB CHECKED: RPB</p>	<p>Professional Engineer Seal: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031591 ROBERT P. BALLARD 02/01/19</p>
<p>SCALE: 1"=30'</p>	<p>C-2.1 PEI JOB#: 18252.PE</p>

MATCH LINE - SEE SHEET C-2.2



- KEY NOTES:**
- 1 CONCRETE PAVING: REFER TO DETAIL C-7.0
 - 2A LIGHT DUTY ASPHALT PAVING: REFER TO DETAIL C-7.0
 - 2B PERVIOUS CONCRETE: REFER TO DETAIL C-7.0
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 - 6 TRANSITION CURB DETAIL: SEE DETAIL C-7.0
 - 7 CONCRETE SIDEWALK: REFER TO DETAIL C-7.0
 - 8 CONCRETE DOOR LANDING: SEE ARCHITECTURAL
 - 9 EXPOSED FACE CONCRETE SIDEWALK TO ASPHALT DETAIL: SEE DETAIL C-7.0
 - 10 STEEL BOLLARD: REFER TO ARCHITECTURAL DRAWINGS
 - 11 HANDICAP PARKING SIGN: REFER TO DETAIL C-7.0
 - 12 DETECTIBLE WARNING MAT: REFER TO DETAIL C-7.0
 - 13 HANDICAP PARKING SYMBOL: REFER TO DETAIL C-7.0
 - 14 HANDICAP ACCESS UNLOADING ZONE: SLOPE 2% MAX. EACH WAY (ADA COMPLIANT) AND STRIPE AS SHOWN.
 - 15 DESIGNATED ACCESSIBLE ROUTE: PROVIDE STRIPING AND SLOPE 5% MAXIMUM IN DIRECTION OF TRAVEL WITH 2% MAXIMUM CROSS SLOPE.
 - 16 CONCRETE BUMPER BLOCK: 8" W x 4" H x 6'-0" LONG CONCRETE. ANCHOR TO PAVING WITH (2) 1"-6" LONG #4 REBAR. REFER TO DETAIL C-7.0
 - 17 SITE LIGHTING: REFER TO STREET LIGHTING NOTES
 - 18 BICYCLE RACK (6 BIKE MIN. PER RACK): SEE ARCHITECTURAL PLANS
 - 19 STRIPING: PROVIDE 4" WIDE PARKING LOT STRIPING AS SHOWN. USE HIGHWAY MARKING PAINT - WHITE (2 COATS).
 - 20 PROPOSED DUMPSTERS & ENCLOSURE: REFER TO ARCHITECTURAL PLANS
 - 21 TREE PROTECTION FENCING: SEE DETAIL C-7.1
 - 22 CONCRETE DRIVE APRON (RESIDENTIAL): SEE DETAIL C-7.0
 - 23 C.O.W. SIGHT DISTANCE TRIANGLE: SIGHT DISTANCE TRIANGLE 20'X70'

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)

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

Date: _____ Permit # _____
Signed: _____

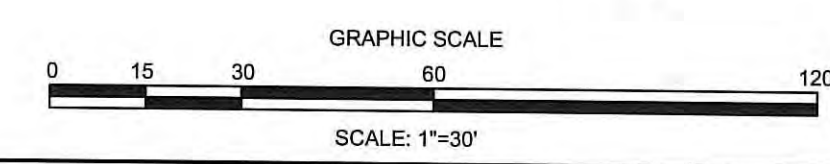
Approved Construction Plan

Name _____ Date _____

Planning _____

Traffic _____

Fire _____



FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION

REVISIONS:

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
WOODLANDS LANDING
AT ECHO FARMS (TRACT 3A)
WILMINGTON, NORTH CAROLINA

PROJECT STATUS:

CONCEPTUAL LAYOUT: _____

FINAL DESIGN: _____

RELEASED FOR CONSTRUCTION: _____

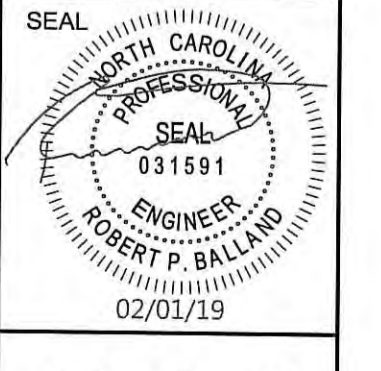
DRAWING INFORMATION:

DATE: _____

SCALE: _____

DESIGNED: _____

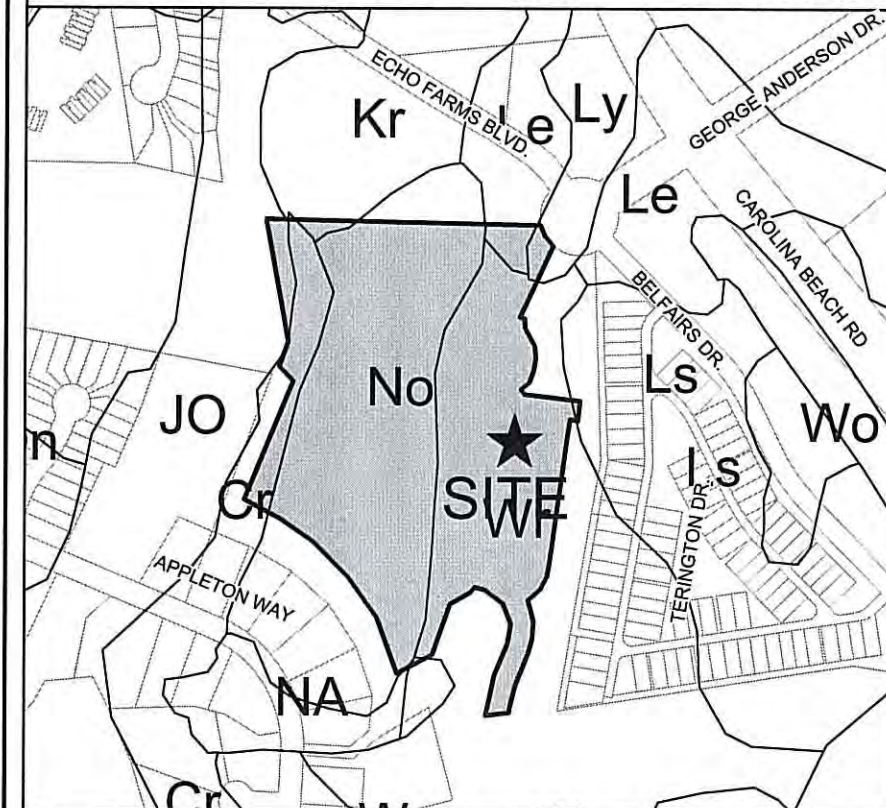
CHECKED: _____



C-2.3
PEI JOB#: 18252.PE



VICINITY MAP
SCALE: 1" = 1,000'



SOILS MAP
SCALE: 1" = 500'

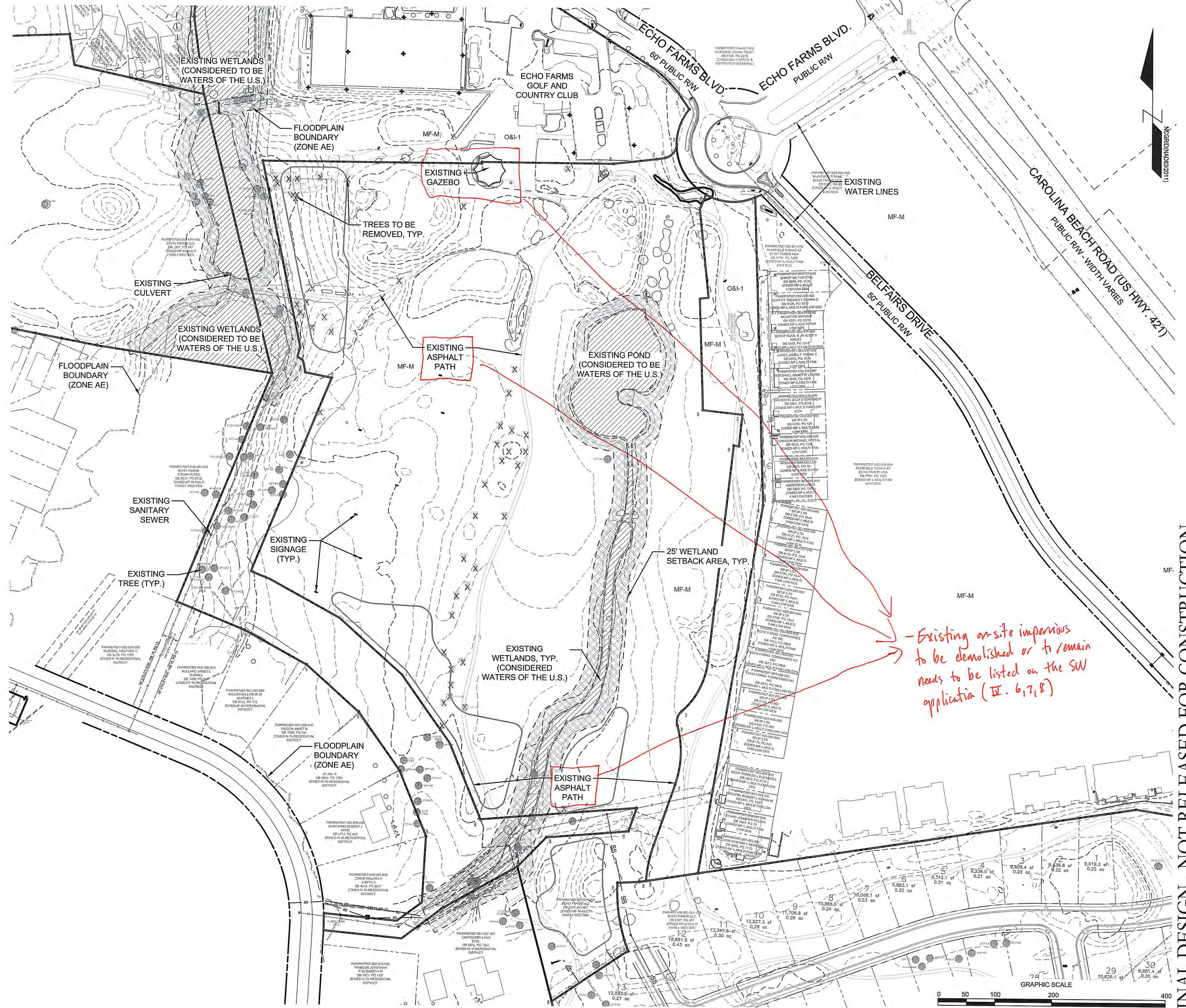
Woodland Landings @ Echo Farms Tree Removal & Required Mitigation

Qty of Trees	Caliper Inches*	Individual Trunk Callipers AND Individual Cluster	Tree Common Name	City Tree Type Classification	Total Cal. Inches to be Removed	% Mitigation	Significant	Total Qty. of Mitigation 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								
REGULATED & SIGNIFICANT TREES								
Category 1 (100% Mitigation)								
1	14	14	OAK	hardwood	14	100%	no	5
1	15	15	OAK	hardwood	15	100%	no	5
1	10	10	BIRCH	hardwood	10	100%	no	3
1	20	20	MAPLE (RED MAPLE)	hardwood	20	100%	no	7
1	12	12	HOLLY	ornamental flowering	12	100%	yes	8
1	17	17	CYPRESS	ornamental flowering	17	100%	no	11
1	21	21	CYPRESS	ornamental flowering	21	100%	no	14
1	24	24	CYPRESS	conifer	24	100%	yes	8
1	28	28	CYPRESS	conifer	28	100%	yes	9
Total Category 1 Significant Trees Mitigation Required:								25
Total Category 1 Regulated Trees To Be Removed with Essential Site Improvements:								70
Category 2 (75% Mitigation)								
1	10	10	GUM	hardwood	10	75%	no	3
1	26	26	GUM	hardwood	26	75%	yes	7
1	33	33	GUM	hardwood	33	75%	yes	8
1	21	21	CEDAR	conifer	21	75%	no	5
1	20	20	PECAN	hardwood	20	75%	no	5
Total Category 2 Significant Trees:								15
Total Category 2 Regulated Trees To Be Removed with Essential Site Improvements:								28

Category 3 (50% Mitigation)									
1	12	12	PINE	conifer	12	50%	no	2	
1	16	16	PINE	conifer	16	50%	no	3	
5	18	18	PINE	conifer	90	50%	no	15	
1	19	19	PINE	conifer	95	50%	no	16	
1	20	20	PINE	conifer	20	50%	no	3	
4	21	21	PINE	conifer	84	50%	no	14	
3	22	22	PINE	conifer	66	50%	no	11	
2	23	23	PINE	conifer	46	50%	no	8	
2	24	24	PINE	conifer	48	50%	TO BE VERIFIED	8	
1	25	25	PINE	conifer	25	50%	TO BE VERIFIED	4	
3	26	26	PINE	conifer	78	50%	TO BE VERIFIED	13	
1	27	27	PINE	conifer	27	50%	TO BE VERIFIED	5	
2	30	30	CHERRY (BLACK CHERRY)	ornamental flowering	20	50%	yes	3	
1	17	17	CHERRY (BLACK CHERRY)	ornamental flowering	17	50%	yes	3	
2	20	20	CHERRY (BLACK CHERRY)	ornamental flowering	40	50%	yes	7	
1	21	21	CHERRY (BLACK CHERRY)	ornamental flowering	21	50%	yes	4	
Total Category 3 Significant Trees:								116	
Total Category 3 Regulated Trees To Be Removed with Essential Site Improvements:								118	
Category 4 (25% Mitigation)									
1	16	16	PALM		16	25%	no	1	
Total Category 4 Significant Trees:								0	
Total Category 3 Regulated Trees To Be Removed with Essential Site Improvements:								1	
Total Qty. of Significant Tree Mitigation (Essential Site Improvements):								56	
Total Tree Credits:								0	
Total Qty. of Mitigation Trees Required on Site (or Pay In Lieu Equivalent):								56	

SITE INVENTORY DATA

1. PREPARER OF THE PLAN:	PARAMOUNTE ENGINEERING, INC. 122 CINEMA DRIVE WILMINGTON, NC 28403
2. APPLICANT NAME:	MATRIX DEVELOPMENT GROUP CN 400 FORSGATE DRIVE CRANBURY, NJ 08512
3. SITE ADDRESS:	4114 ECHO FARMS BOULEVARD WILMINGTON, NC 28401
4. PROPERTY OWNER:	ECHO FARMS, LLC 3 CENTRE DRIVE MONROE TWP., NJ 08831
5. DEVELOPER:	SAME AS PROPERTY OWNER
6. PROPERTY BOUNDARY:	SEE PLAN
7. ZONING:	MF-M & O&I-1
8. ADJACENT PROPERTY INFORMATION (OWNER AND ZONING):	SEE PLAN
9. VICINITY MAP:	SEE MAP ABOVE
10. TOPOGRAPHY:	SEE PLAN
11. 100 YEAR FLOOD PLAIN BOUNDARY:	SUBJECT PARCEL LIES WITHIN FLOOD ZONE AE (EL 9) AS INDICATED BY FEMA FLOOD ZONE MAP NUMBER 3720312500K BEARING AN EFFECTIVE DATE OF AUGUST 28, 2018.
12. LOCATION OF EXISTING DITCHES, CREEKS, AND STREAMS:	SEE PLAN
13. SOILS:	ONSLow LOAMY FINE SAND (On) JOHNSTON SOILS (JO) CRAVEN FINE SANDY LOAM (Cr) (SEE SOILS MAP ABOVE)
14. CAMA AEC & ASSOCIATED SETBACKS:	N/A
15. CAMA LAND CLASSIFICATION:	URBAN / CONSERVATION AREA
16. CONSERVATION RESOURCES:	SWAMP FOREST
17. LOCAL, STATE, OR FEDERAL HISTORIC OR ARCHAEOLOGICAL SITE:	N/A
18. LOCATION OF CEMETERIES, BURIAL SITES, OR BURIAL GROUNDS:	N/A
19. SQUARE FOOTAGE OF FORESTED AREA, HABITAT, AND DOMINANT SPECIES:	N/A
20. SECTION 404 WETLANDS AND SECTION 10 WATERS:	N/A
21. PROTECTED SPECIES OR HABITAT:	N/A
22. THOROUGHFARES, BIKE ROUTES, SIDEWALKS, TRANSIT FACILITIES (EXISTING):	SEE PLAN & VICINITY MAP



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.

Planning _____
Traffic _____
Fire _____

Approved Construction Plan
Name _____ Date _____

NOENR 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)



REVISIONS:

CLIENT INFORMATION:
ECHO FARMS, LLC
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SITE INVENTORY PLAN
WOODLANDS LANDING
AT ECHO FARMS (TRACT 3A)
WILMINGTON, NORTH CAROLINA

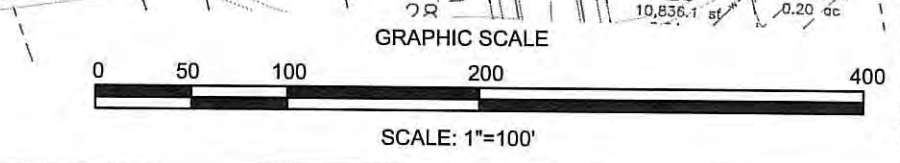
PROJECT STATUS:
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
RELEASED FOR CONSTRUCTION:

DRAWING INFORMATION:
DATE: 02/01/19
DESIGNED: ROBERT P. BALLI
DRAWN: _____
CHECKED: _____

SEAL:
ENGINEER
ROBERT P. BALLI
02/01/19

C-2.4
PEI JOB#: 18252.PE

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION



LEGEND:

INLET PROTECTION PROVIDED FOR ALL PROPOSED CATCH BASIN AND DROP INLETS (SEE DETAILS)

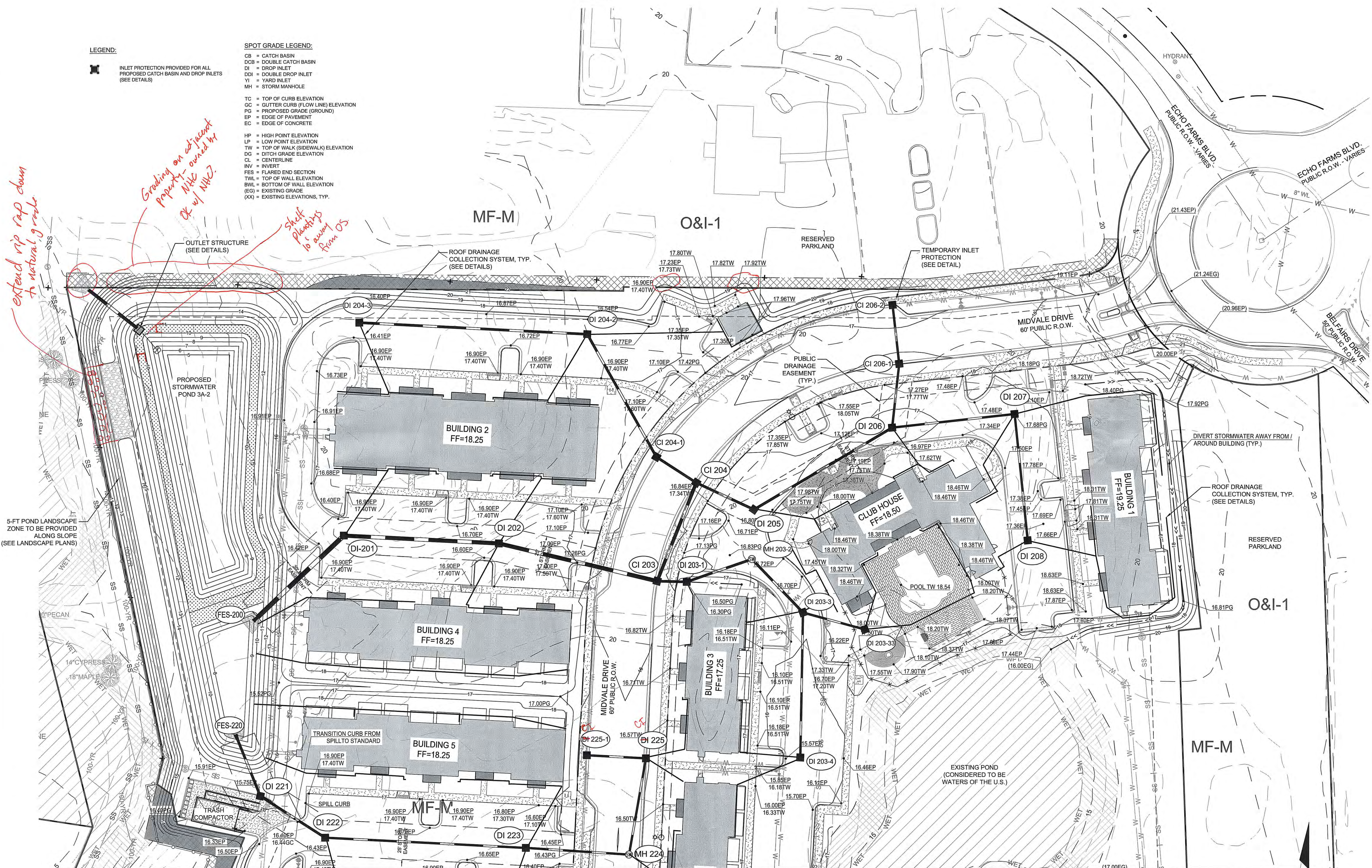
SPOT GRADE LEGEND:

- CB = CATCH BASIN
- DCB = DOUBLE CATCH BASIN
- DI = DROP INLET
- DDI = DOUBLE DROP INLET
- YI = YARD INLET
- MH = STORM MANHOLE
- TC = TOP OF CURB ELEVATION
- GC = GUTTER CURB (FLOW LINE) ELEVATION
- PG = PROPOSED GRADE (GROUND)
- EP = EDGE OF PAVEMENT
- EC = EDGE OF CONCRETE
- HP = HIGH POINT ELEVATION
- LP = LOW POINT ELEVATION
- TW = TOP OF WALK (SIDEWALK) ELEVATION
- DG = DITCH GRADE ELEVATION
- CL = CENTERLINE
- INV = INVERT
- FES = FLARED END SECTION
- TWL = TOP OF WALL ELEVATION
- BWL = BOTTOM OF WALL ELEVATION
- (EG) = EXISTING GRADE
- (XX) = EXISTING ELEVATIONS, TYP.

extend rip rap down to natural grade

Grading on adjacent property owned by NHC OK w/ NHC

Sheet plumbing from OS



MATCH LINE - SEE SHEET C-4.2

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

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

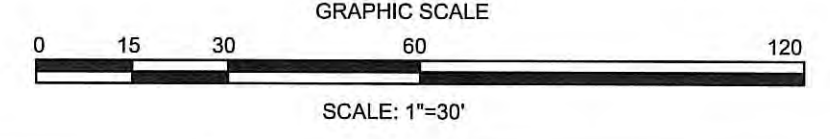
Approved Construction Plan

Name _____ Date _____

Planning _____

Traffic _____

Fire _____



REVISIONS:

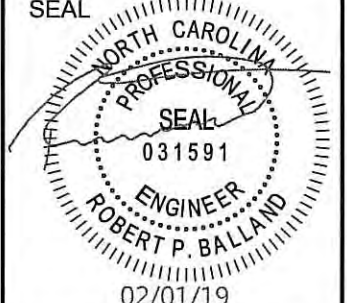
CLIENT INFORMATION:
ECHO FARMS, LLC
c/o MATRIX DEVELOPMENT GROUP
CN 4000 FORSGATE DRIVE
CRANBURY, NJ 08512

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

GRADING & DRAINAGE PLAN
WOODLANDS LANDING
AT ECHO FARMS (TRACT 3A)
WILMINGTON, NORTH CAROLINA

PROJECT STATUS:
CONCEPTUAL LAYOUT: _____
FINAL DESIGN: _____
RELEASED FOR CONSTRUCTION: _____

DRAWING INFORMATION:
DATE: _____
SCALE: _____
DESIGNED: _____
CHECKED: _____



C-4.1

PEI JOB#: 18252.PE

LEGEND:

INLET PROTECTION PROVIDED FOR ALL PROPOSED CATCH BASIN AND DROP INLETS (SEE DETAILS)

SPOT GRADE LEGEND:

- CB = CATCH BASIN
- DCB = DOUBLE CATCH BASIN
- DI = DROP INLET
- DDI = DOUBLE DROP INLET
- YI = YARD INLET
- MH = STORM MANHOLE
- TC = TOP OF CURB ELEVATION
- GC = GUTTER CURB (FLOW LINE) ELEVATION
- PG = PROPOSED GRADE (GROUND)
- EP = EDGE OF PAVEMENT
- EC = EDGE OF CONCRETE
- (A)
- HP = HIGH POINT ELEVATION
- LP = LOW POINT ELEVATION
- TW = TOP OF WALK (SIDEWALK) ELEVATION
- DG = DITCH GRADE ELEVATION
- CL = CENTERLINE
- INV = INVERT
- FES = FLARED END SECTION
- TWL = TOP OF WALL ELEVATION
- BWL = BOTTOM OF WALL ELEVATION
- EO = EXISTING GRADE
- (XX) = EXISTING ELEVATIONS, TYP.
- (XY)



Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
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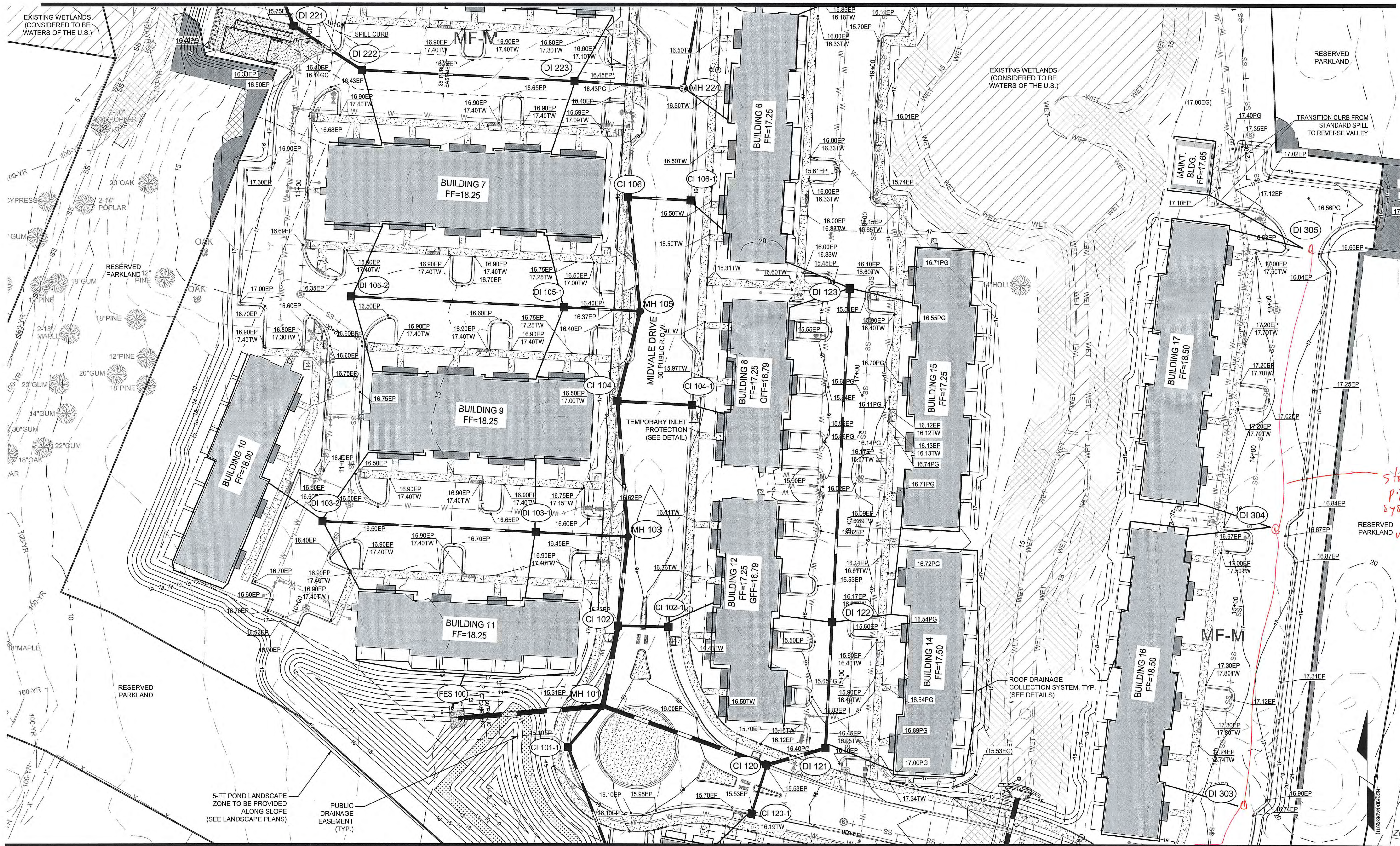
Approved Construction Plan

Name _____ Date _____
 Planning _____
 Traffic _____
 Fire _____

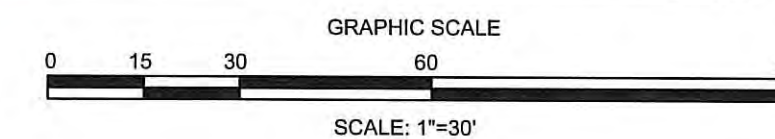


Know what's below. Call before you dig.

MATCH LINE - SEE SHEET C-4.1



MATCH LINE - SEE SHEET C-4.3



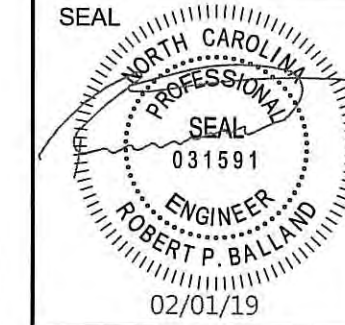
REVISIONS:

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 CRANBURY, NJ 08512

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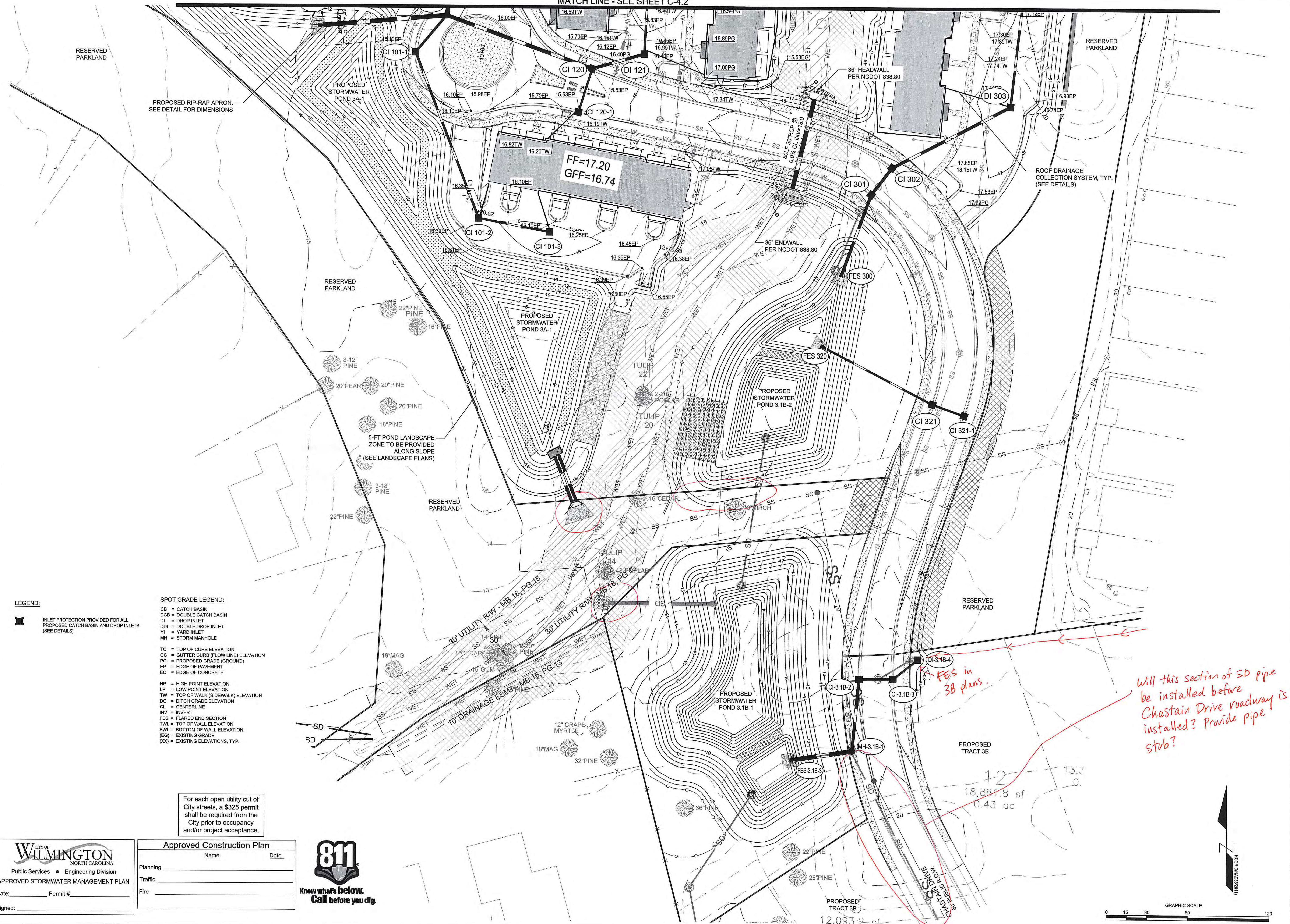
GRADING & DRAINAGE PLAN
 WOODLANDS LANDING
 AT ECHO FARMS (TRACT 3A)
 WILMINGTON, NORTH CAROLINA

PROJECT STATUS:
 CONCEPTUAL LAYOUT:
 FINAL DESIGN LAYOUT:
 RELEASED FOR CONSTRUCTION:
 DRAWING INFORMATION:
 DATE: 02/01/19
 SCALE: 1"=30'
 DRAWN BY: RAE
 CHECKED BY: RAE



C-4.2

PEI JOB#: 18252.PE



LEGEND:

INLET PROTECTION PROVIDED FOR ALL PROPOSED CATCH BASIN AND DROP INLETS (SEE DETAILS)

SPOT GRADE LEGEND:

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- DCB = DOUBLE CATCH BASIN
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- DDI = DOUBLE DROP INLET
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Approved Construction Plan

Name	Date
Planning	
Traffic	
Fire	



Know what's below. Call before you dig.

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

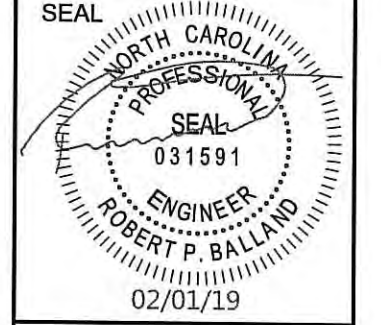
REVISIONS:

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GRADING & DRAINAGE PLAN
 WOODLANDS LANDING
 AT ECHO FARMS (TRACT 3A)
 WILMINGTON, NORTH CAROLINA

PROJECT STATUS:
 CONCEPTUAL LAYOUT:
 PRELIMINARY LAYOUT:
 RELEASED FOR CONSTRUCTION:
DRAWING INFORMATION:
 DATE: 01/09/19
 DESIGNED: TFB
 DRAWN: AEC
 CHECKED: RPB

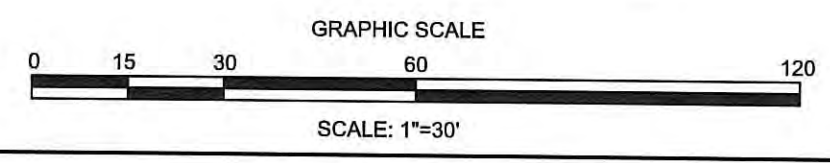


C-4.3

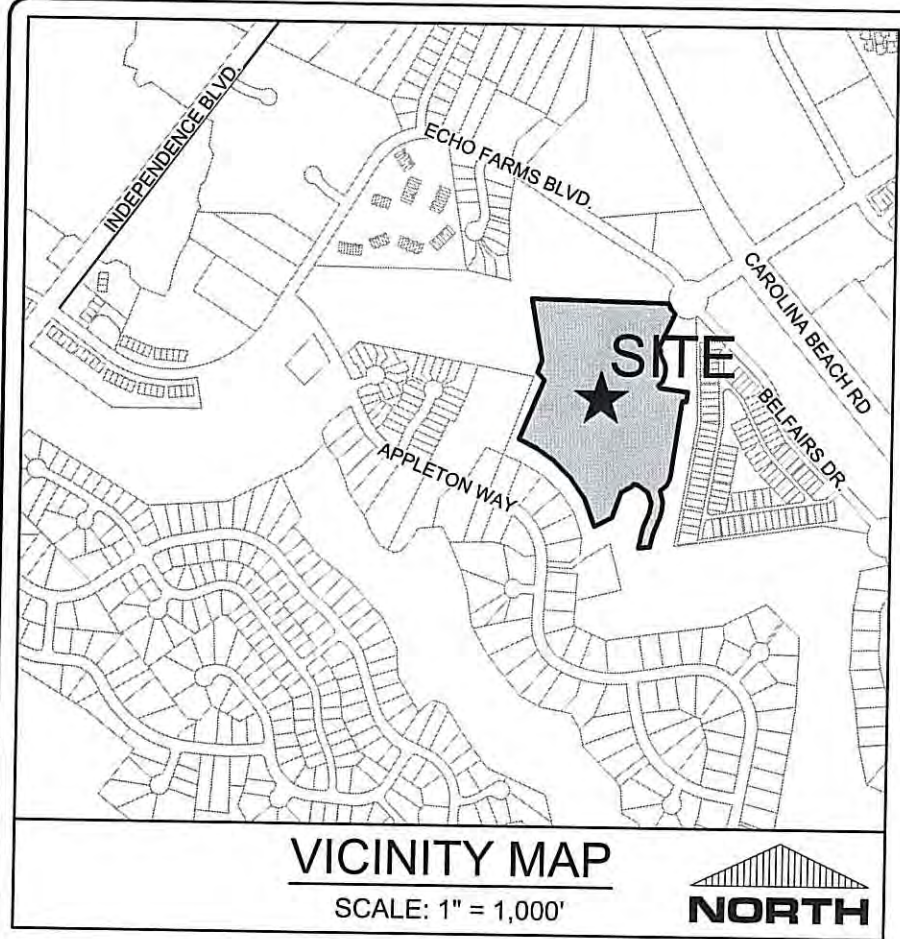
PEI JOB#: 18252.PE

Will this section of SD pipe be installed before Chastain Drive roadway is installed? Provide pipe stub?

FES in 3B plans.



Valves, Fti's, cleanouts, etc. need to be kept outside of the sidewalk - setting/tripping hazard.



- 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.
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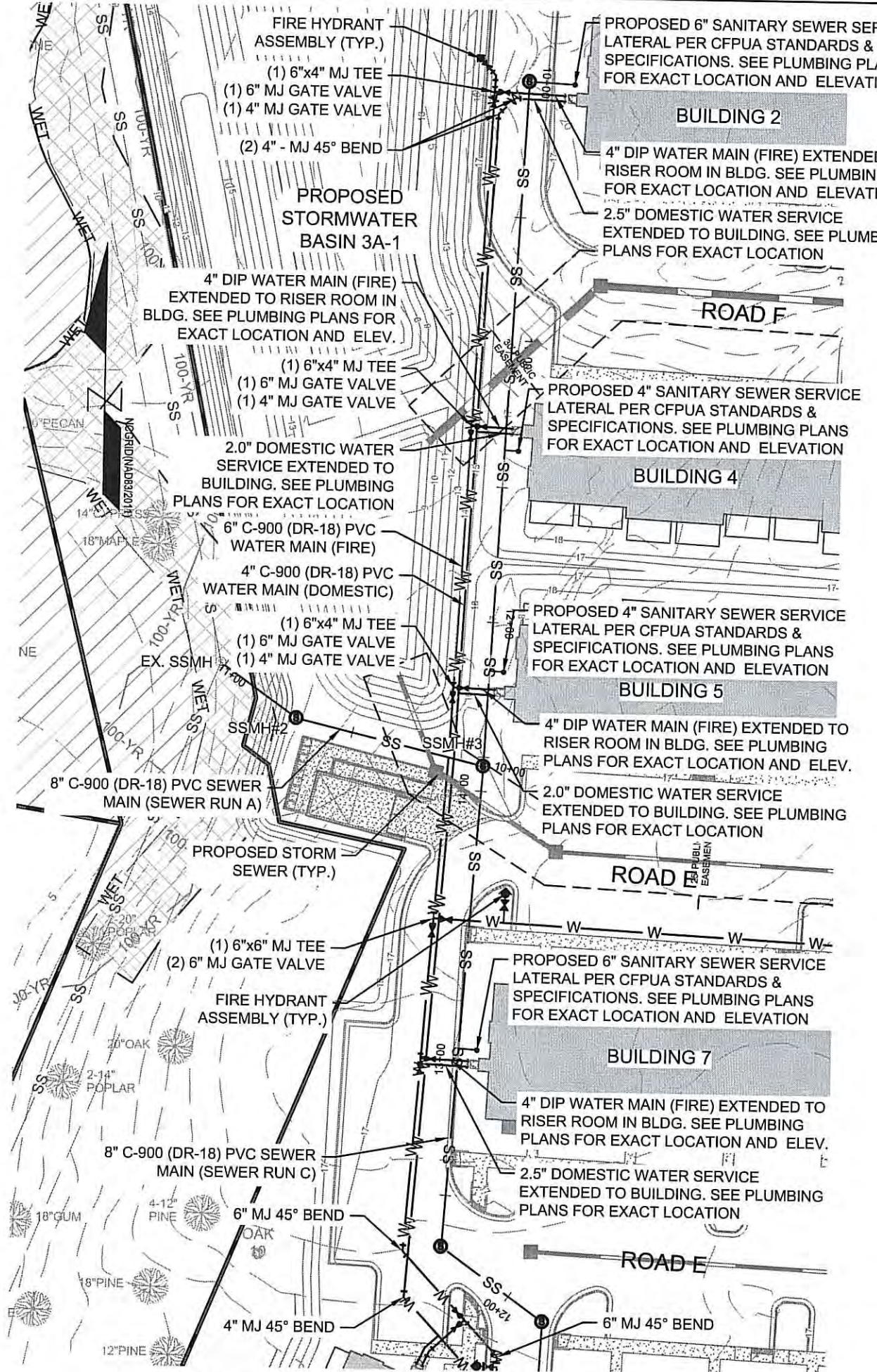
UTILITY INFORMATION
SANITARY SEWER
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WATER & SEWER SERVICE NOTE:

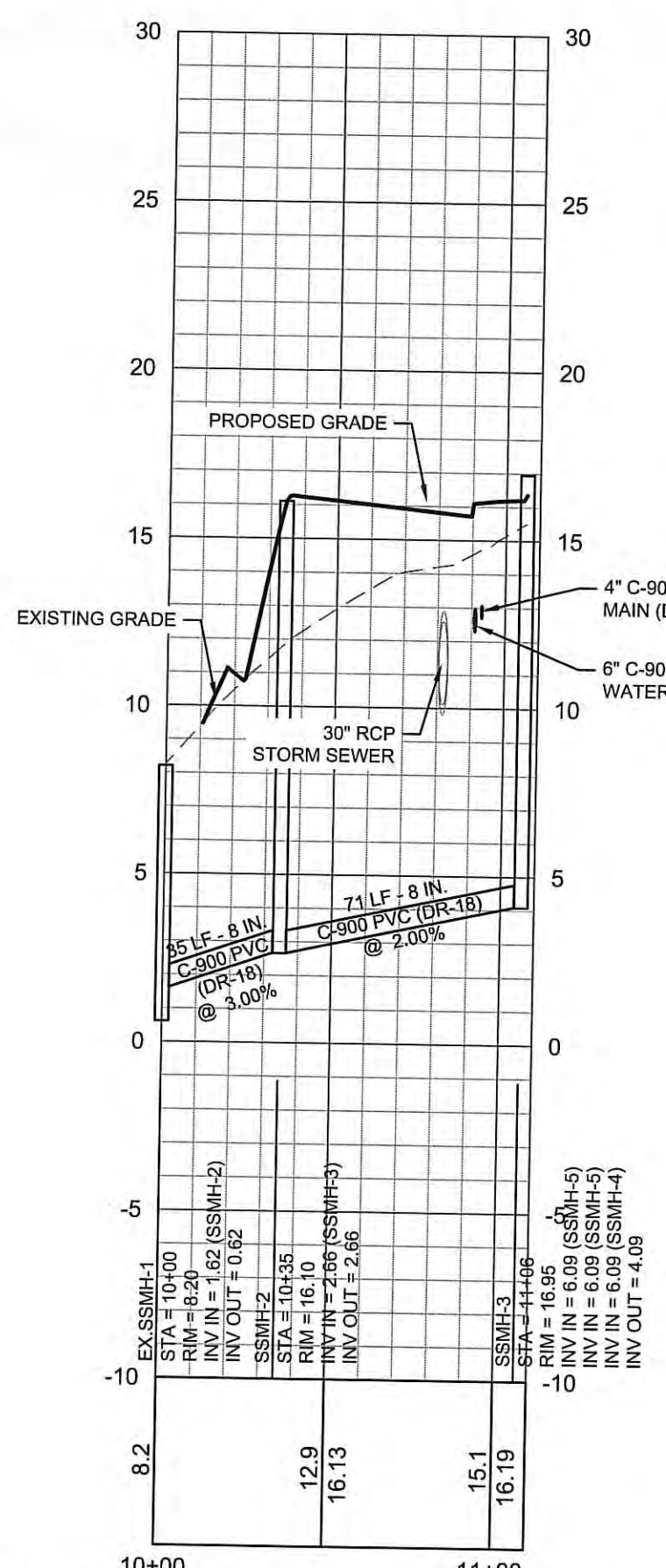
- CONTRACTOR SHALL INSTALL WATER AND SEWER SERVICES IN ACCORDANCE WITH CFPWA STANDARD DETAILS AND SPECIFICATIONS.

- FIRE & LIFE SAFETY NOTES:**
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 - ALL HYDRANTS TO BE INSTALLED PER CITY OF WILMINGTON ORDINANCES AND CFPWA STANDARDS.

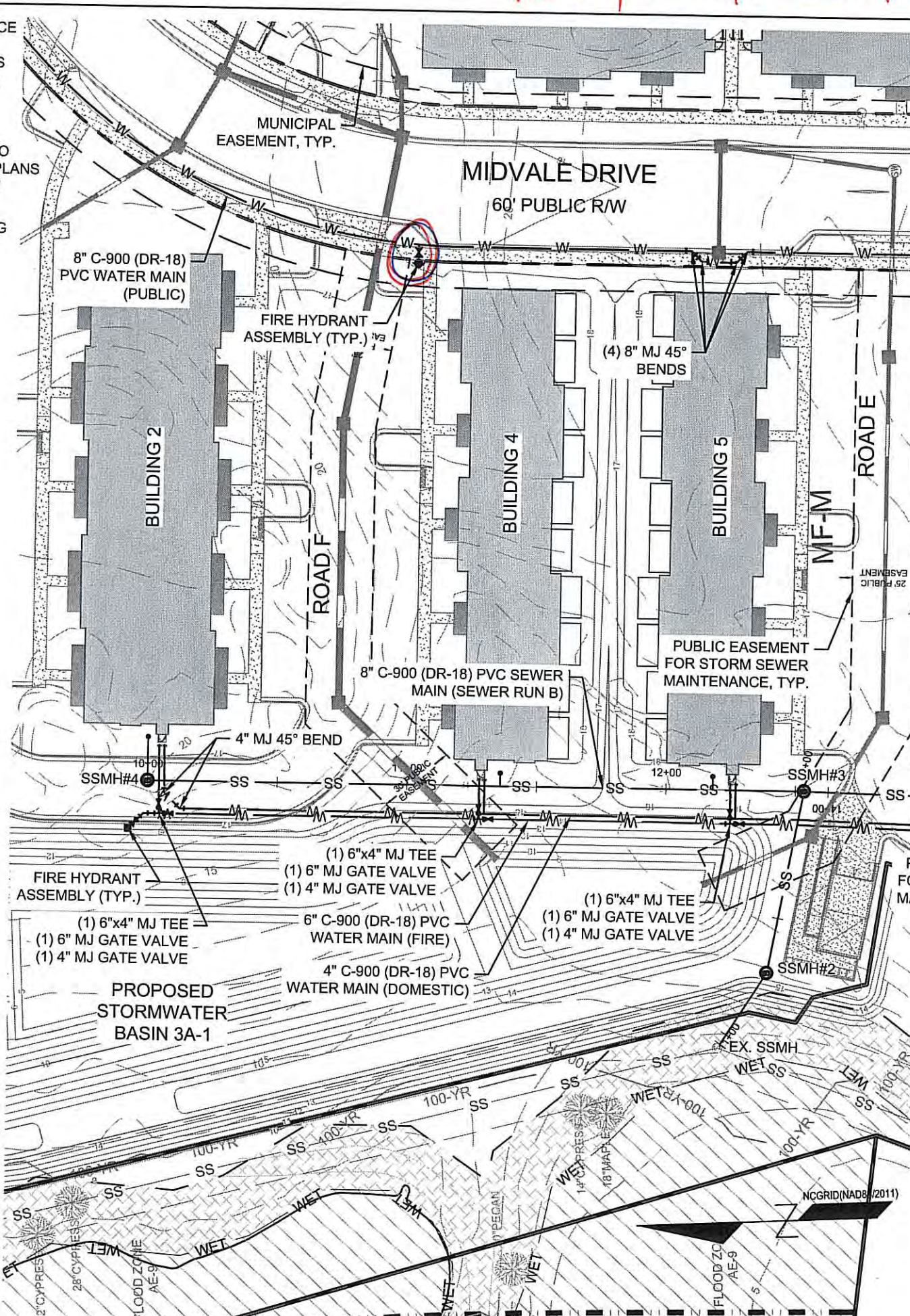
- CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD SEWER NOTES:**
- SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
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 - NO FLEXIBLE COUPLINGS SHALL BE USED.
 - ALL STAINLESS STEEL FASTENERS 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.



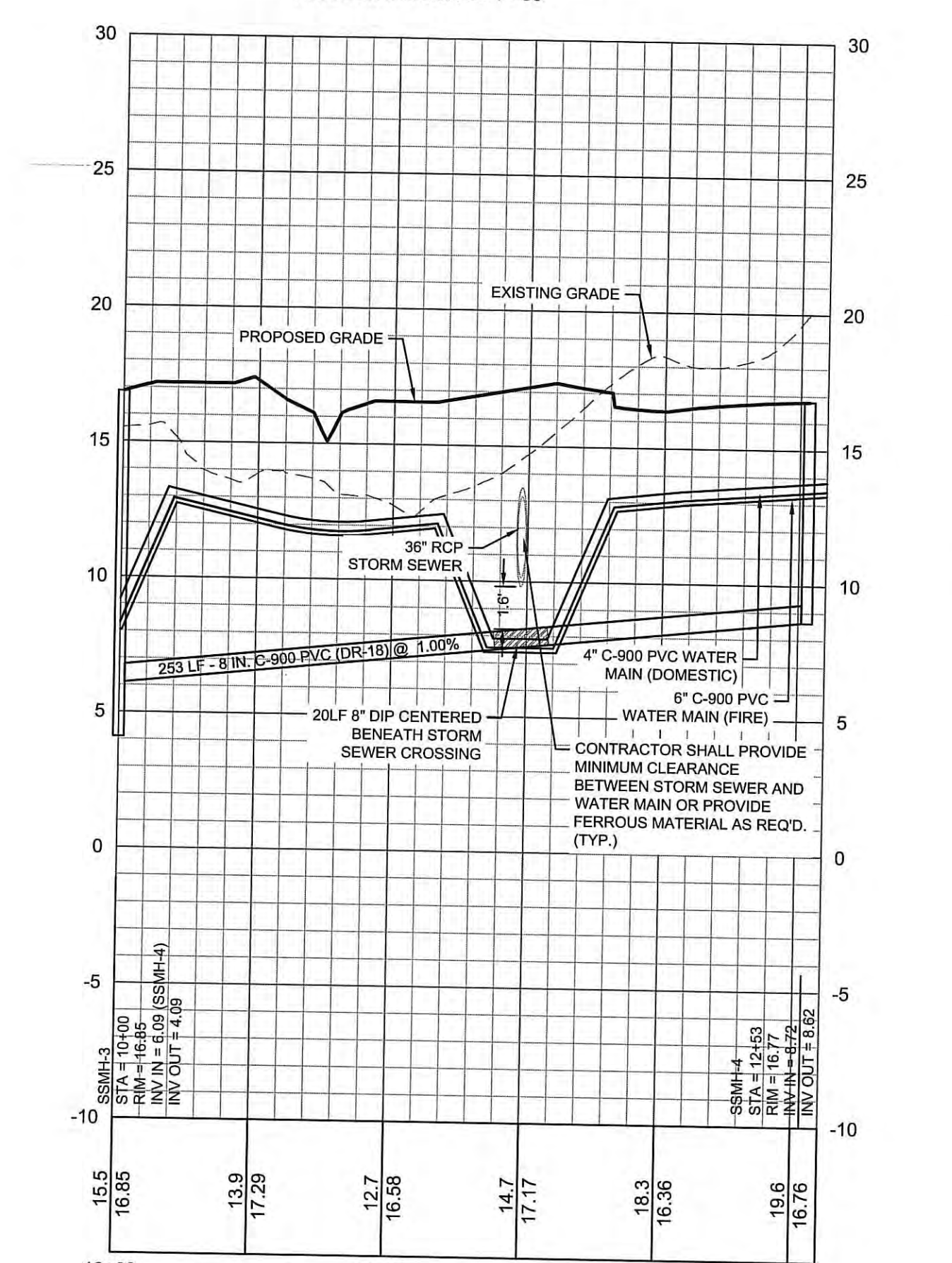
SANITARY SEWER RUN A - PLAN VIEW
 HORIZONTAL SCALE: 1"=50'



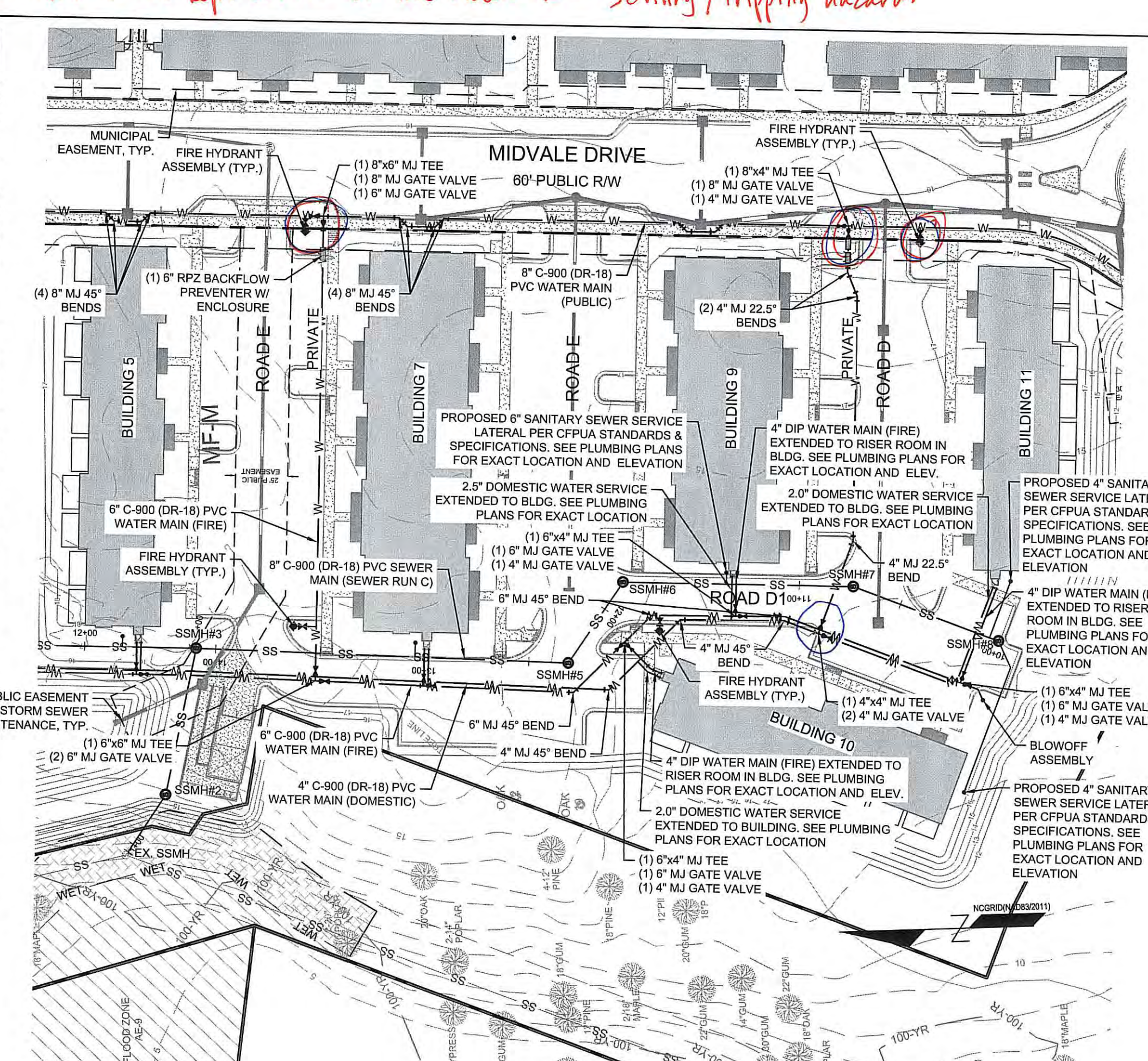
SANITARY SEWER RUN A - PROFILE VIEW
 HORIZONTAL SCALE: 1"=50'
 VERTICAL SCALE: 1"=5'



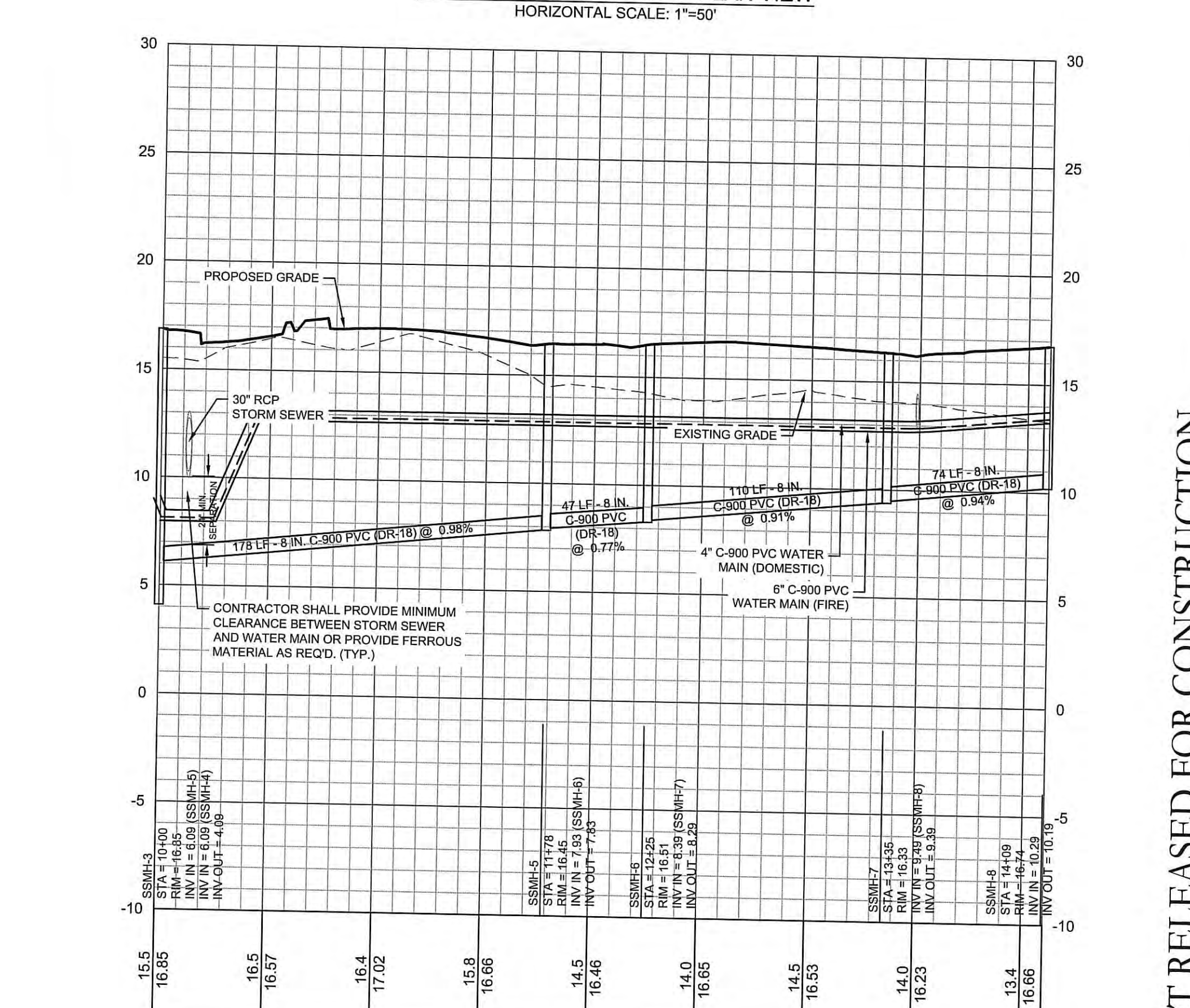
SANITARY SEWER RUN B - PLAN VIEW
 HORIZONTAL SCALE: 1"=50'



SANITARY SEWER RUN B - PROFILE VIEW
 HORIZONTAL SCALE: 1"=50'
 VERTICAL SCALE: 1"=5'



SANITARY SEWER RUN C - PLAN VIEW
 HORIZONTAL SCALE: 1"=50'



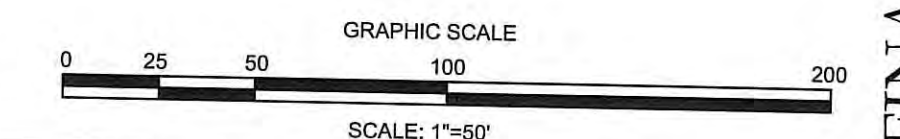
SANITARY SEWER RUN C - PROFILE VIEW
 HORIZONTAL SCALE: 1"=50'
 VERTICAL SCALE: 1"=5'

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 FLOW # AND PLANT: _____
 SEWER TO SHED THROUGH NEI: YES or NO (CIRCLE ONE)

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

Approved Construction Plan
 Name _____ Date _____
 Planning _____
 Traffic _____
 Fire _____



FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION

REVISIONS:

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

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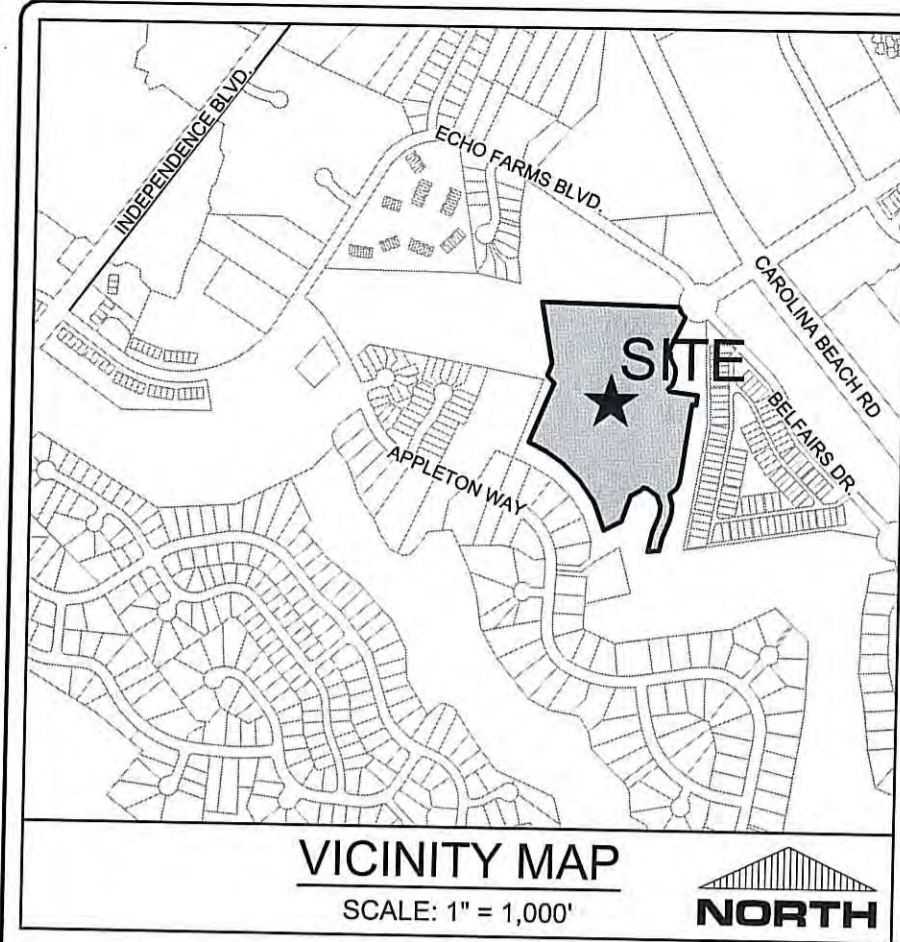
UTILITY PLAN & PROFILE
WOODLANDS LANDING
AT ECHO FARMS (TRACT 3A)
WILMINGTON, NORTH CAROLINA

PROJECT STATUS:
 CONCEPTUAL LAYOUT:
 FINAL DESIGN FOR CONSTRUCTION:
 RELEASED FOR CONSTRUCTION:

DRAWING INFORMATION:
 DATE: _____
 SCALE: _____
 DESIGNED: _____
 CHECKED: _____

SEAL: _____
 NORTH CAROLINA PROFESSIONAL ENGINEER
 ROBERT P. BALLARD
 02/01/19

C-5.0
 PEI JOB#: 18252-PE



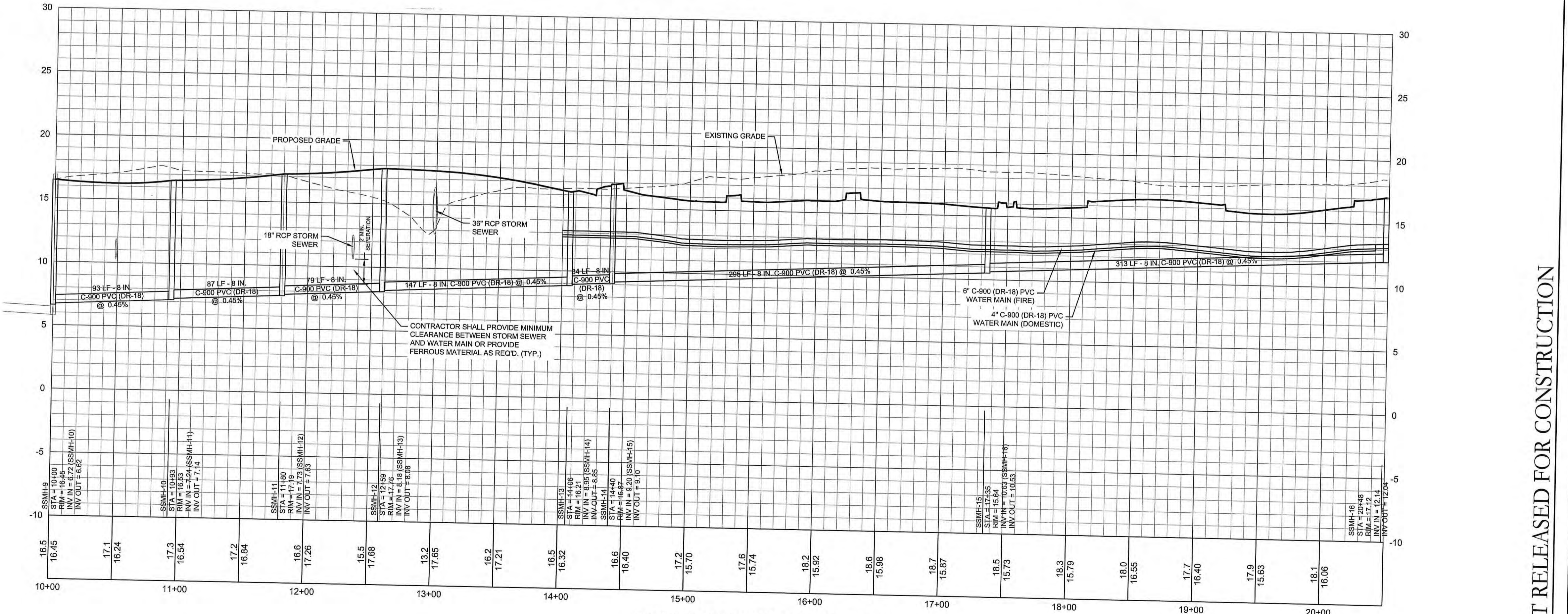
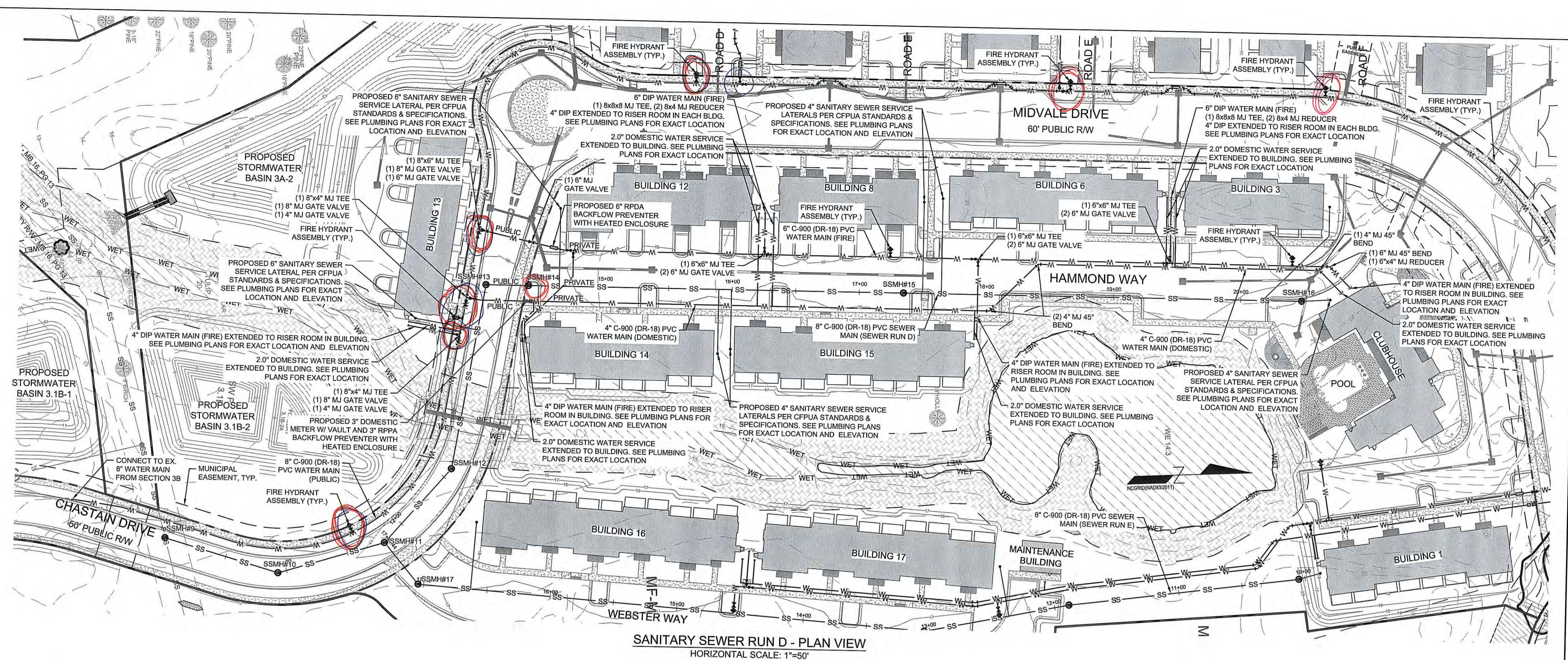
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NCDENR PWSS WATER PERMIT # _____
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 SEWER CAPACITY: _____ GPD
 SEWER FLOW # AND PLANT: _____
 SEWER TO SHED THROUGH NEI: YES or NO (CIRCLE ONE)

WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

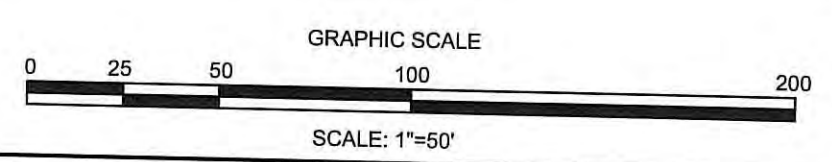
Date: _____ Permit # _____

Signed: _____

Approved Construction Plan

Name _____ Date _____

Planning _____
 Traffic _____
 Fire _____



FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION

REVISIONS:

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

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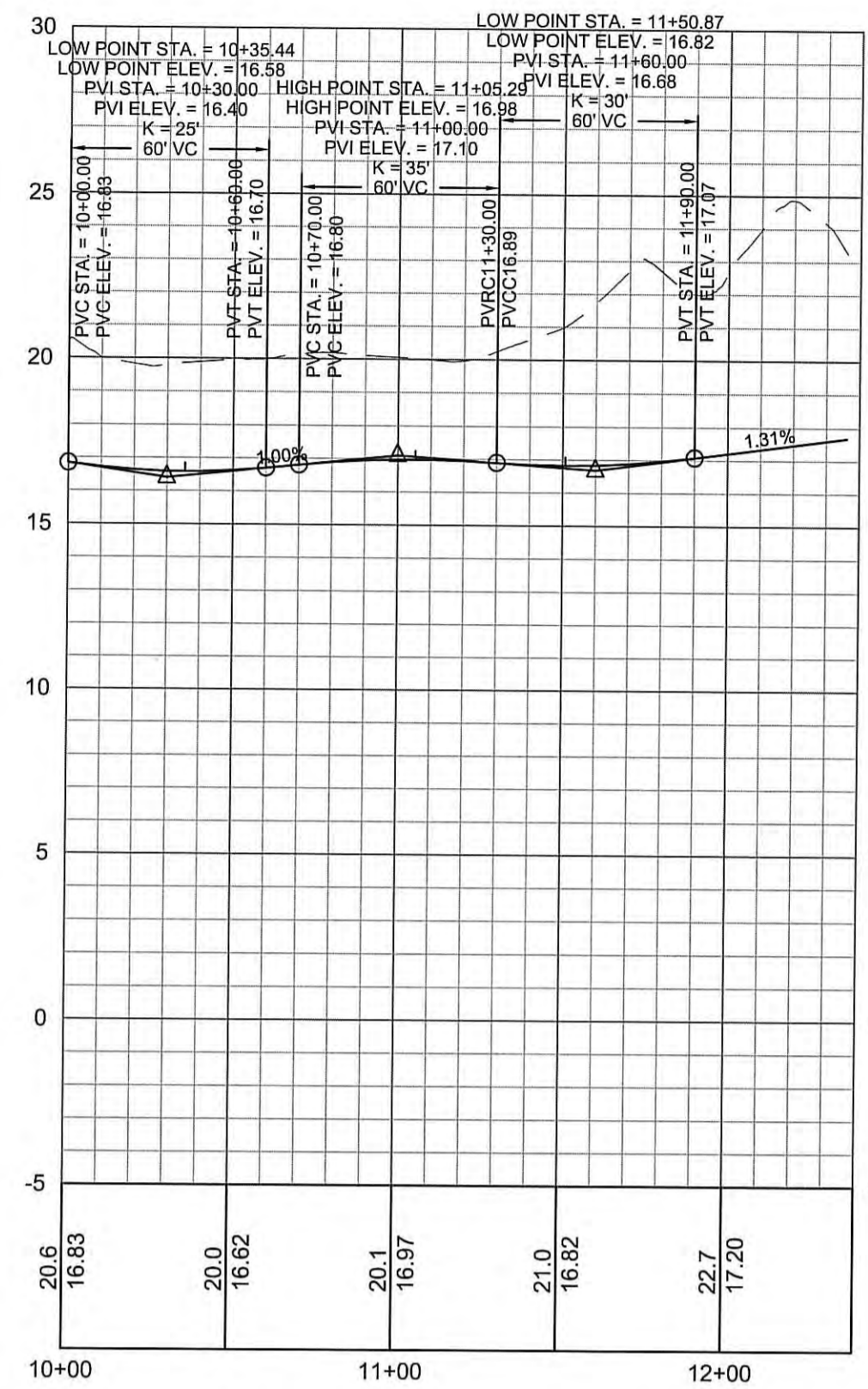
UTILITY PLAN & PROFILE
WOODLANDS LANDING
 AT ECHO FARMS (TRACT 3A)
 WILMINGTON, NORTH CAROLINA

PROJECT STATUS:
 CONCEPTUAL LAYOUT:
 FINAL DESIGN:
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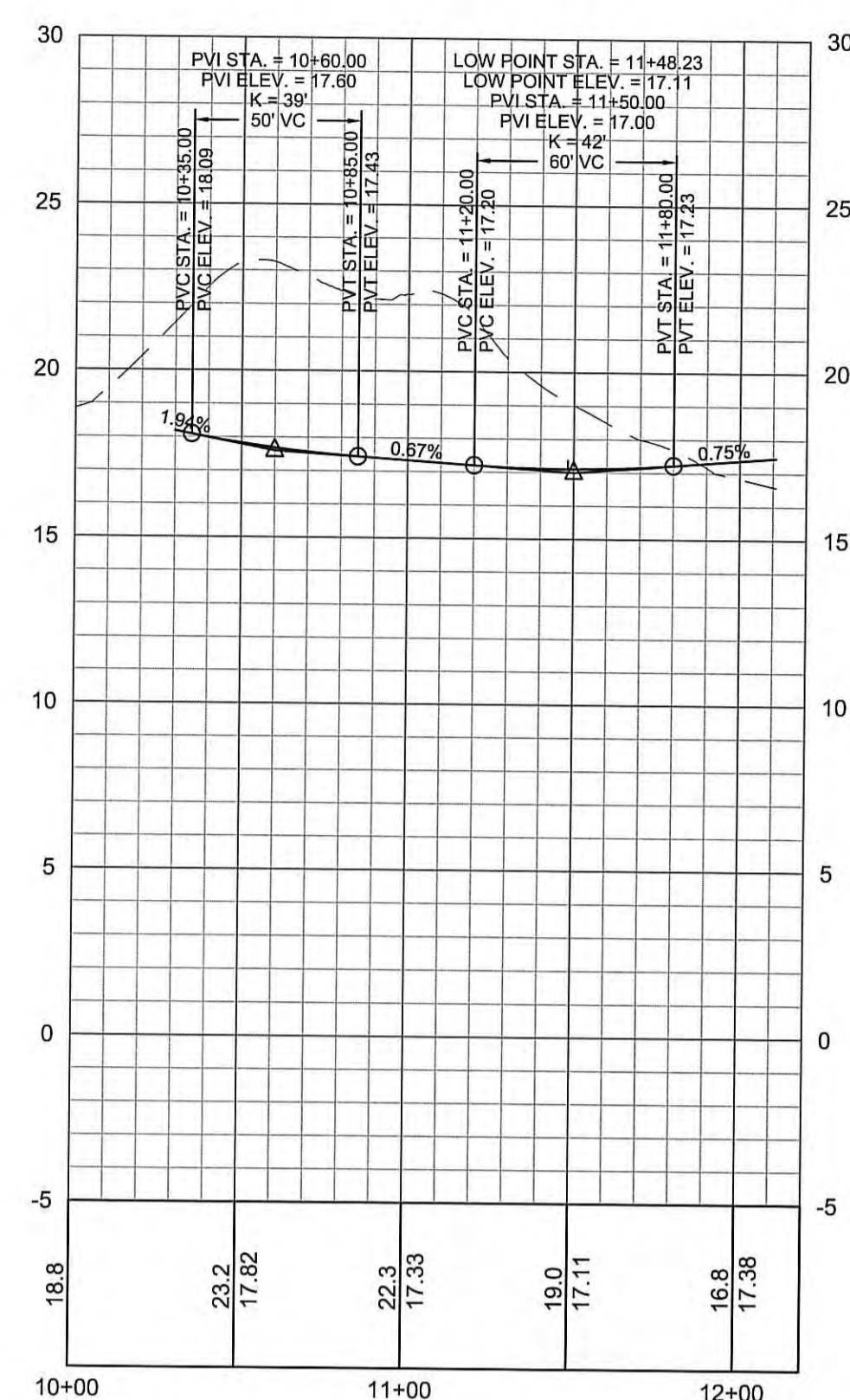
DRAWING INFORMATION:
 DATE: 02/11/19
 SCALE: 1"=50'
 DESIGNED: RPB
 CHECKED: RPB

SEAL
 NORTH CAROLINA PROFESSIONAL SEAL
 031591
 ENGINEER
 ROBERT P. BALLARD
 02/01/19

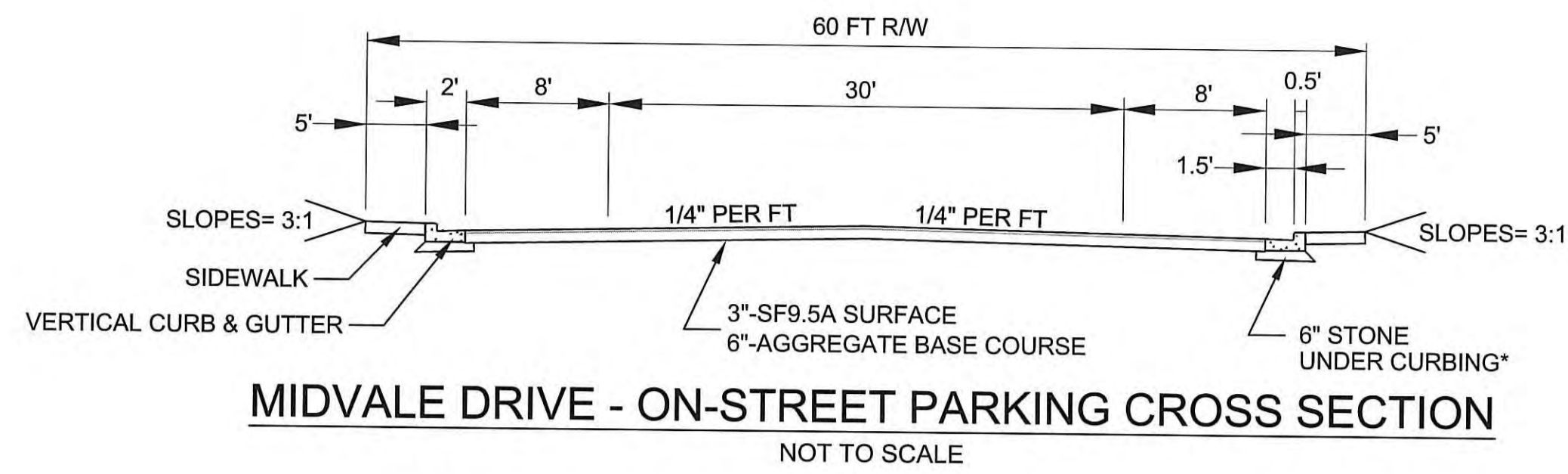
C-5.1
 PEI JOB#: 18252.PE



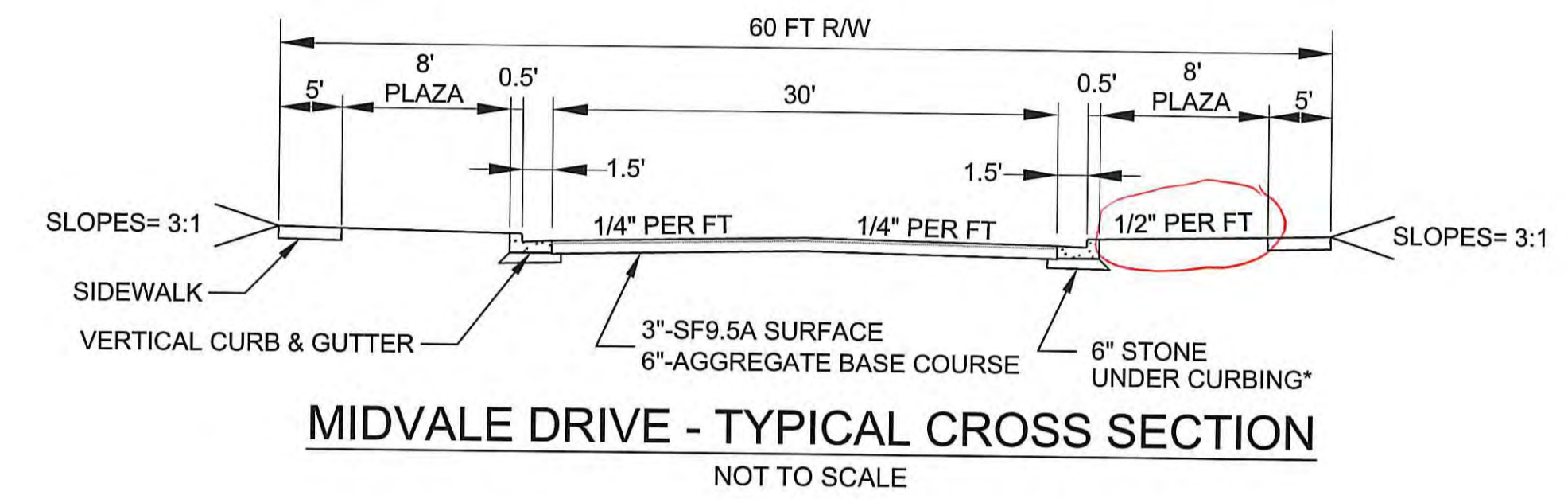
ROAD G (STA. 10+00 - 12+40)
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=5'



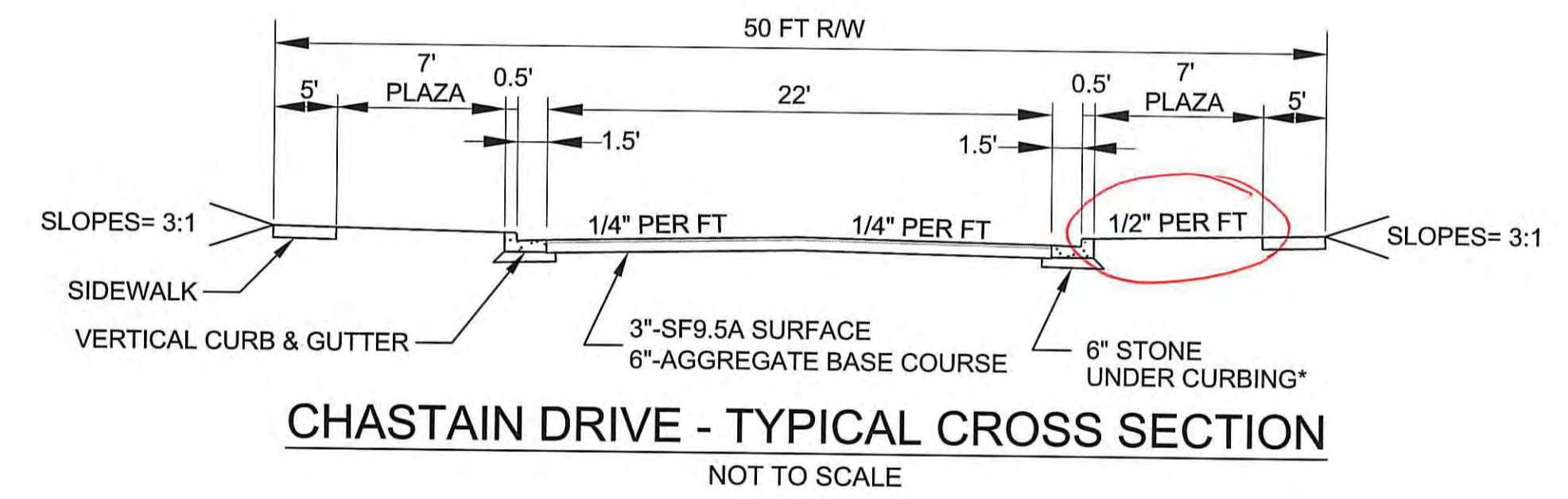
ROAD H (STA. 10+00 - 12+20)
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=5'



MIDVALE DRIVE - ON-STREET PARKING CROSS SECTION
NOT TO SCALE

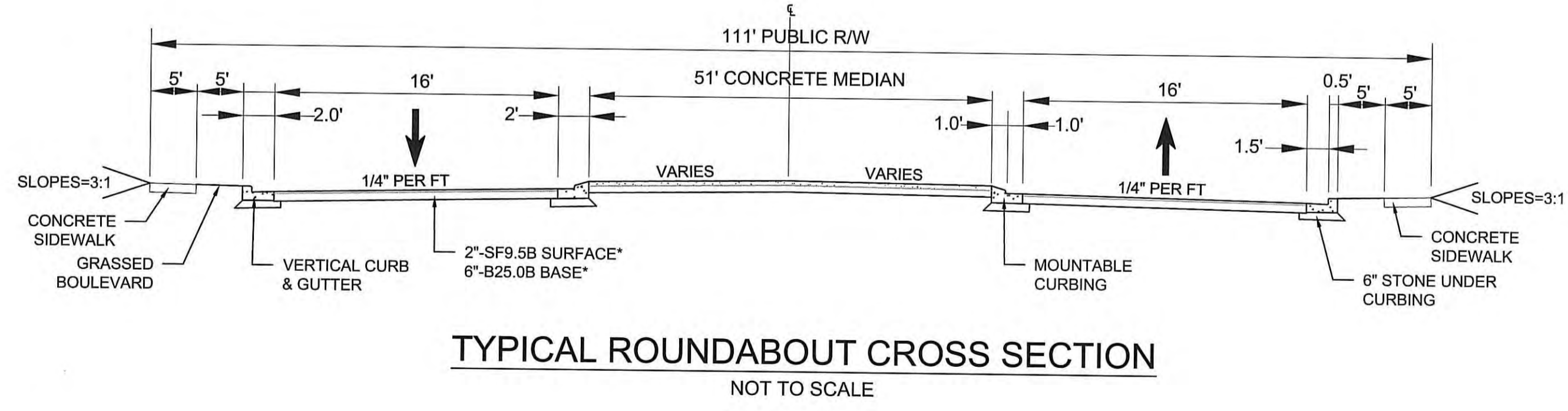


MIDVALE DRIVE - TYPICAL CROSS SECTION
NOT TO SCALE

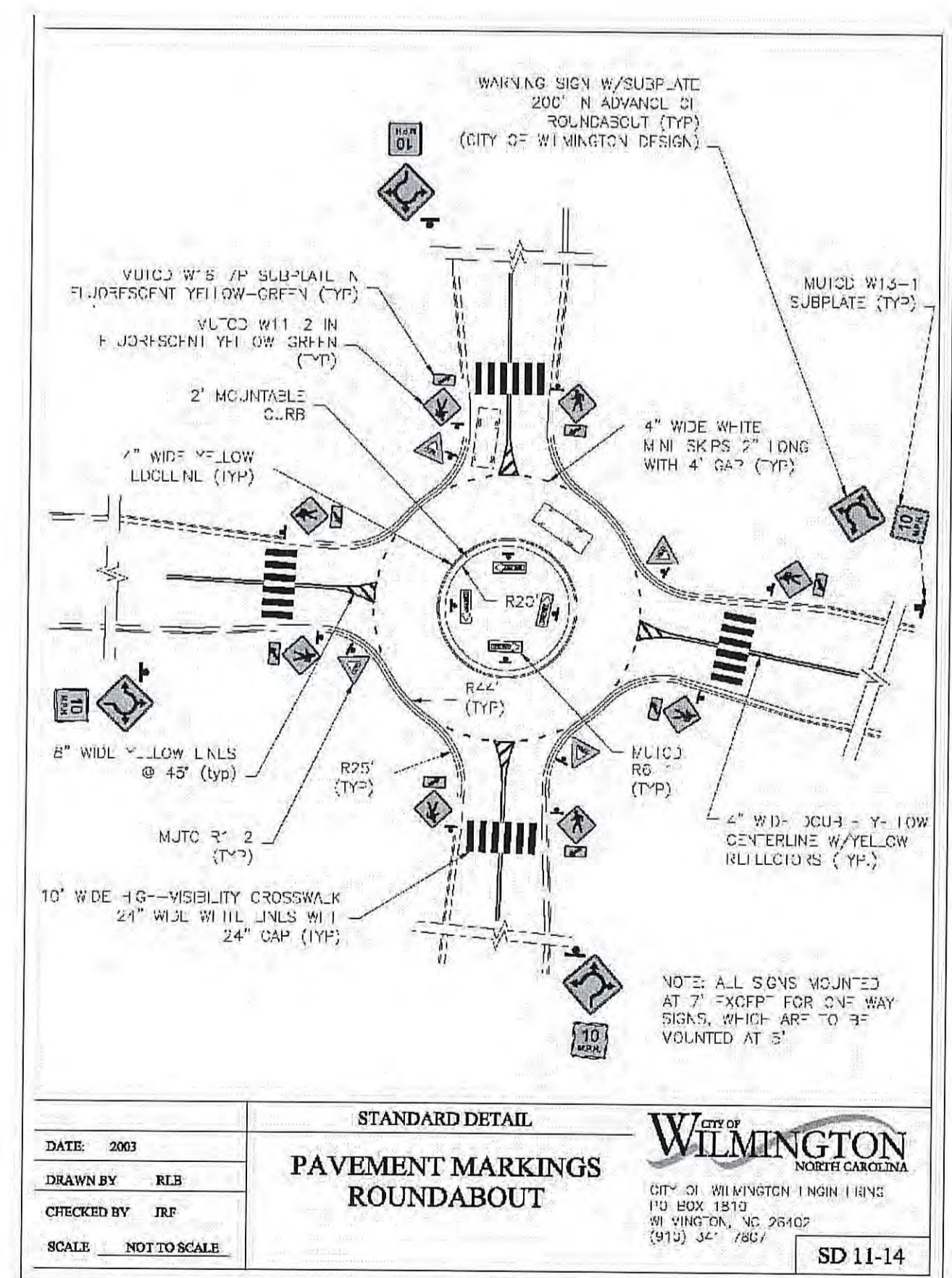


CHASTAIN DRIVE - TYPICAL CROSS SECTION
NOT TO SCALE

Cross slopes for plaza/sidewalk are to 1.5% (1% min / 2% max.) per the technical standards.



TYPICAL ROUNDABOUT CROSS SECTION
NOT TO SCALE



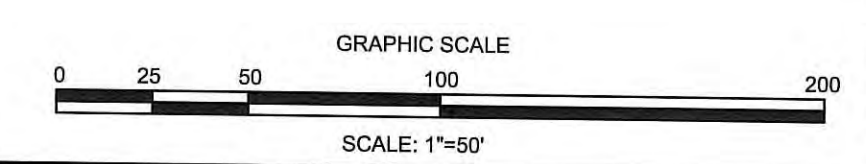
DATE: 2003	STANDARD DETAIL
DRAWN BY: RLS	PAVEMENT MARKINGS ROUNDABOUT
CHECKED BY: JEP	
SCALE: NOT TO SCALE	

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

CNDENR 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)

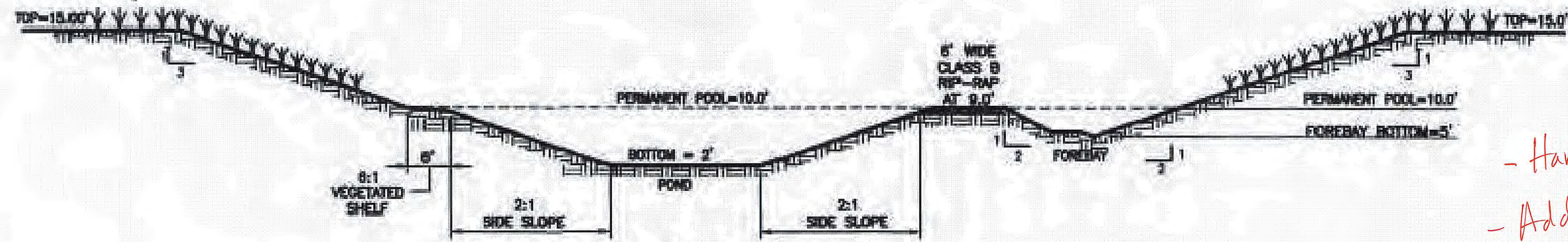
CITY OF WILMINGTON
NORTH CAROLINA
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____
Signed: _____

Approved Construction Plan
Name _____ Date _____
Planning _____
Traffic _____
Fire _____
Signed: _____



FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION

REVISIONS:	CLIENT INFORMATION: ECHO FARMS, LLC c/o MATRIX DEVELOPMENT GROUP CN 4000 FORSGATE DRIVE CRANBURY, NJ 08512
PROJECT STATUS: FINAL DESIGN: PRELIMINARY LAYOUT: RELEASED FOR CONST.	PARAMOUNT ENGINEERING 122 Cinema Drive Wilmington, North Carolina 28403 (910) 791-6707 (O) (910) 791-6760 (F) NC License #: C-2846
DRAWING INFORMATION: DATE: 02/01/19 SCALE: AS NOTED DRAWN: RLS CHECKED: JEP	ROADWAY PROFILES WOODLANDS LANDING AT ECHO FARMS (TRACT 3A) WILMINGTON, NORTH CAROLINA
SEAL: ROBERT P. BALLARD ENGINEER 031591 02/01/19	C-6.2 PEI JOB#: 18252.PE



SW POND 3.1B-1 AND 3.1B-2

DETENTION POND NOTES:

- UPON STABILIZATION OF SITE, RESTORE POND TO DESIGN SIZE AND SHAPE.
- INSTALL TOPSOIL ON SIDE SLOPES ABOVE NORMAL POOL AND SEED WITH A MIX OF 20% CARPET GRASS, 24% BERMUDA, 20% FESCUE, 10% CREEPING RED FESCUE, AND 24% RYE. SEED AT A RATE OF 2-3 POUNDS PER 1000 SF.
- VEGETATED SHELF: THE CONTRACTOR SHALL INSTALL EQUAL NUMBERS OF THE LISTED SUITABLE SPECIES. GROUP SIMILAR SPECIES OF PLANTS TOGETHER (APPROX. 10-15 PLANTS PER GROUP). NO PLANTS SHALL BE PLANTED WITHIN 10 FEET OF THE OUTLET STRUCTURE.
- BOTTOM HALF OF VEGETATED SHELF SHALL BE PLANTED WITH SHALLOW WATER PLANT SPECIES, A MINIMUM OF (3) DIVERSE SPECIES, SEE TABLE.
- TOP HALF OF VEGETATED SHELF SHALL BE PLANTED WITH SHALLOW LAND PLANT SPECIES, A MINIMUM OF (3) DIVERSE SPECIES, SEE TABLE.
- THE VEGETATED SHELF SHALL BE PLANTED WITH PLUGS OR POTS (MIN. 2 CU IN) AT 24"-36" O.C. IN A CHECKERBOARD PATTERN. A MINIMUM OF 50 PLANTS PER 200 SF OF SHELF AREA SHALL BE PLANTED.
- ALL FOREBAYS SHALL BE CONSTRUCTED SO THAT THE FOREBAY ENTRANCE IS DEEPER THAN THE EXIT.

APPROVED SHALLOW WATER PLANTS	APPROVED SHALLOW LAND PLANTS
SWEETFLAG	SWAMP MILKWEED
WATER PLANTAIN	QUILL SEDGE
WATERPOD	WHITE TURTLEHEAD
BLUE FLAG IRIS	DWARF JOE PYE WEED
SOFT RUSH	JOE PYE WEED
ARROW ARUM	SPOTTED TRUMPETWEED
PRIMROSE WILLOW	SCARLET ROSE MALLOW
PICKERELWEED	HALBERDLEAF ROSEMALLOW
DUCK POTATO	SEASHORE MALLOW
BULLTONGUE	CARDINAL FLOWER
LIZARD'S TAIL	LONGLEAF LOBELIA
SOFT STEM BULRUSH	GREAT BLUE LOBELIA
THREE-SQUARE BULRUSH	STARRUSH WHITETOP
WOOLGRASS	NARROW PLUMEGRASS
GIANT CUTGRASS	

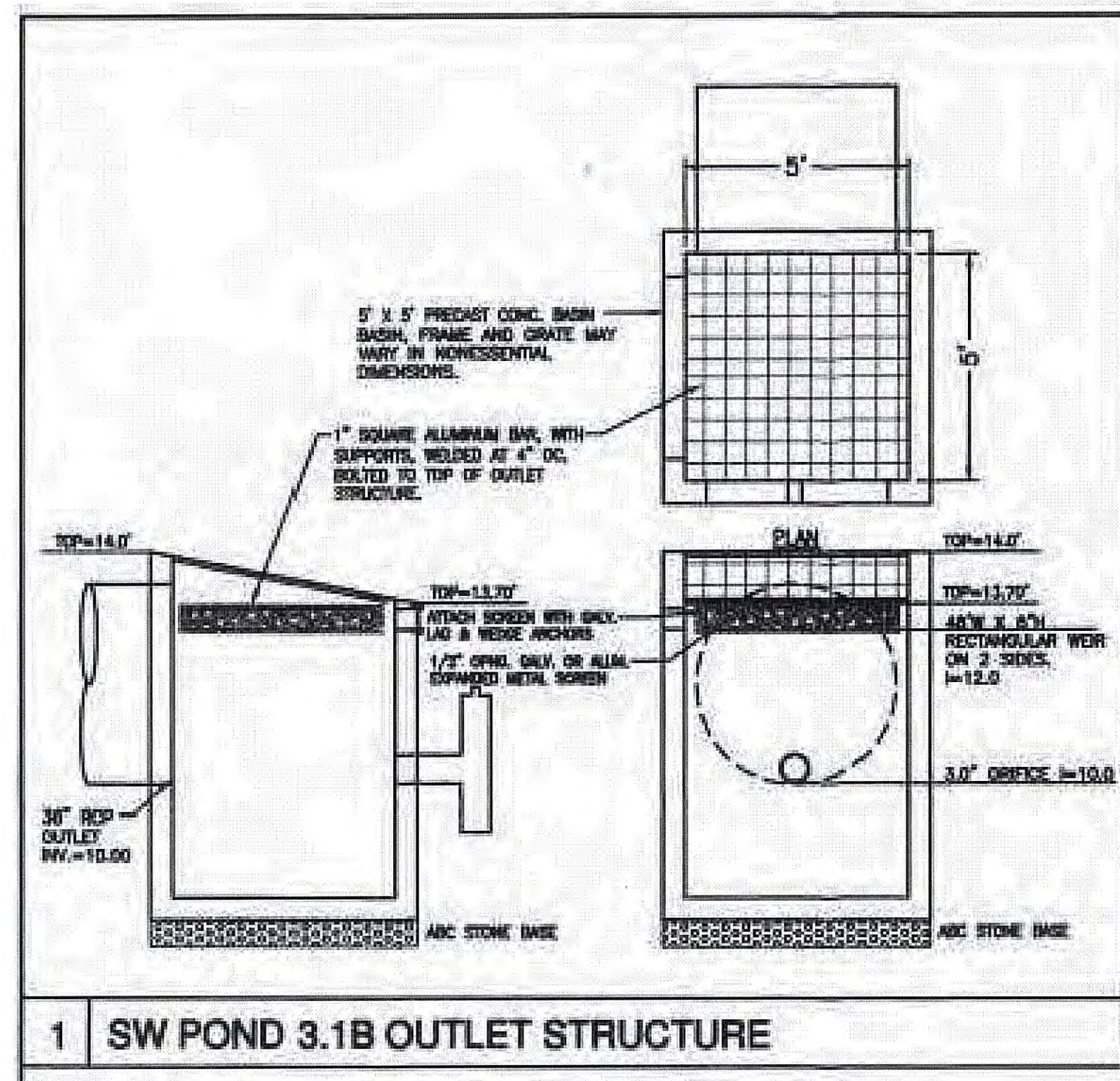
*CATTAILS SHALL NOT BE PLANTED.

PONDS 3.1B-1 & 3.1B-2 DETAIL SECTIONS & NOTES

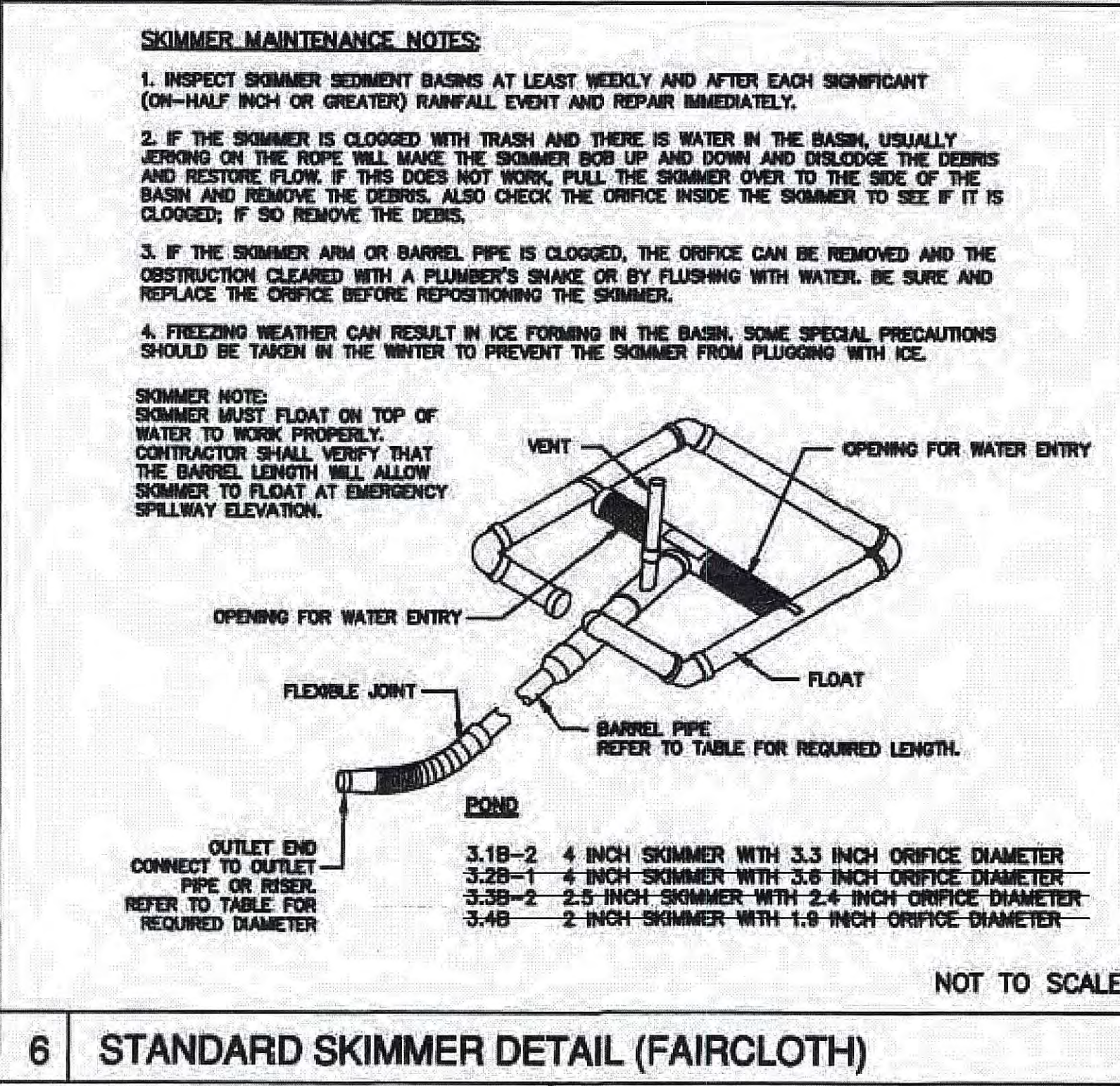
N.T.S.
REFERENCE: NORRIS & TUNSTALL CONSULTING ENGINEERS P.C.
PLANS FOR ECHO FARMS TRACT 3B
APPROVED JULY 2018

POND BACKFILL WITH SATISFACTORY SOILS SPECIFICATION
CLEAN SOILS WITH ORGANICS LESS THAN 2% WITH BETWEEN 40 AND 60% PASSING THE NO. 200 SIEVE WITH A PLASTICITY INDEX AND LIQUID LIMIT OF LESS THAN 20 AND 50 PERCENT, RESPECTIVELY; FREE OF ROCK OR GRAVEL LARGER THAN 2" IN ANY DIMENSION, ROOTS, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER AS INDICATED BY ENGINEER. COMPACT TO MIN. 95% M.D.D. PER ASTM D 698.

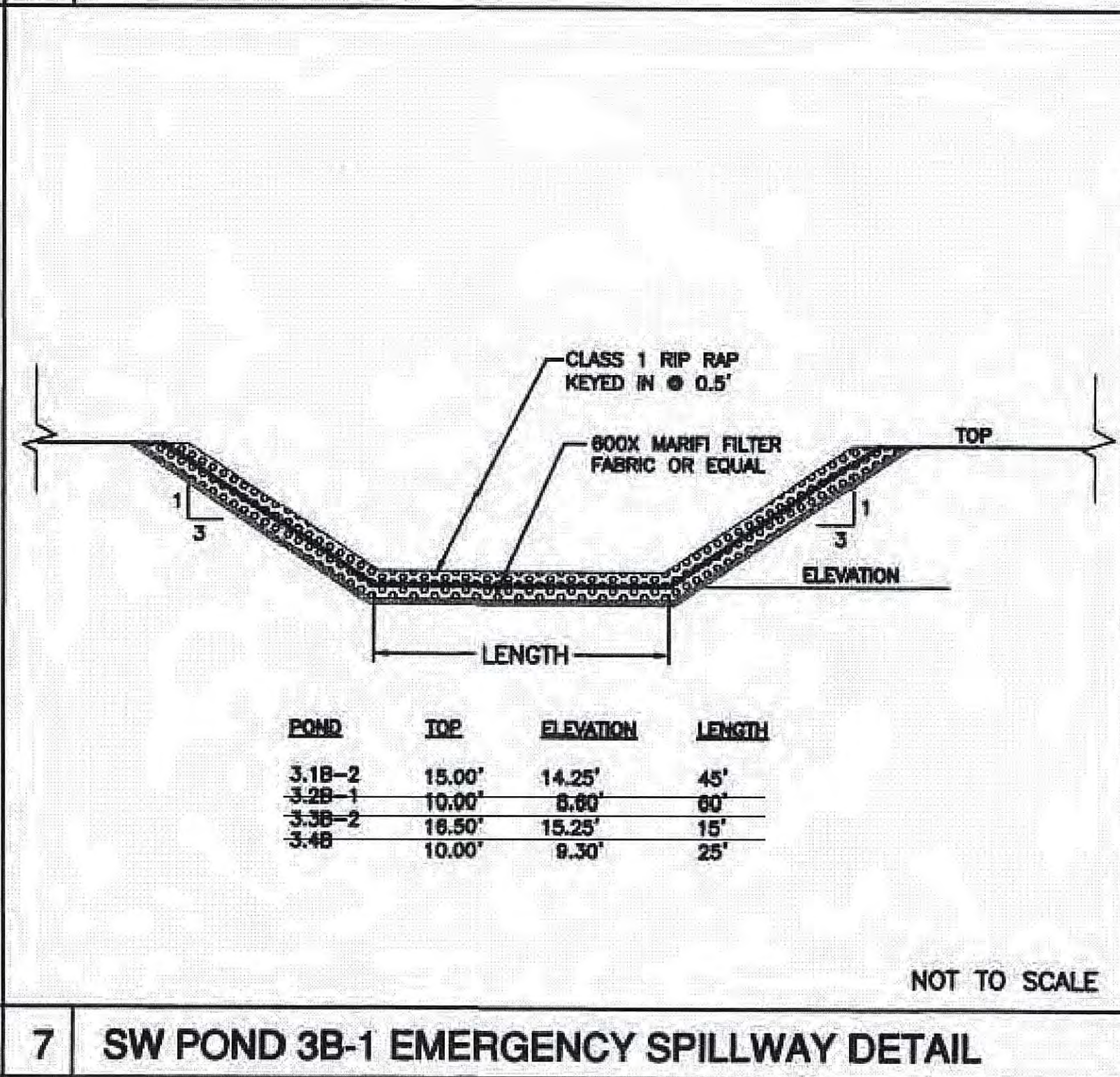
*- Hard to read
- Add plan views and cross-sections from approved 3B plans to this plan set. since 3B.1 is part of 3A now.*



1 SW POND 3.1B OUTLET STRUCTURE



6 STANDARD SKIMMER DETAIL (FAIRCLOTH)



7 SW POND 3B-1 EMERGENCY SPILLWAY DETAIL

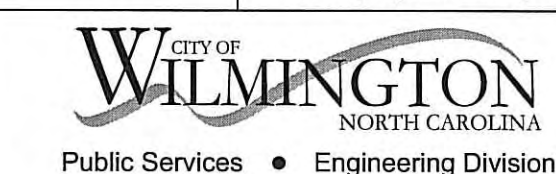
PONDS 3.1B-1 & 3.1B-2 POND DETAILS

N.T.S.
REFERENCE: NORRIS & TUNSTALL CONSULTING ENGINEERS P.C.
PLANS FOR ECHO FARMS TRACT 3B
APPROVED JULY 2018



Know what's below. Call before you dig.

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

Approved Construction Plan
Name _____ Date _____

Planning _____
Traffic _____
Fire _____

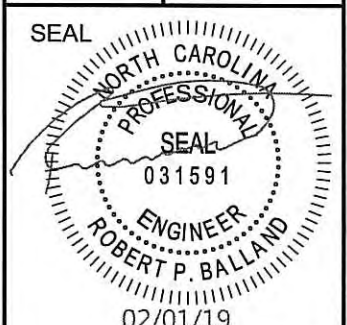
REVISIONS:

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) 791-6700 (F)
NC License #: C-2846

DETAILS
WOODLANDS LANDING
AT ECHO FARMS (TRACT 3A)
WILMINGTON, NORTH CAROLINA

PROJECT STATUS:
CONCEPTUAL LAYOUT: _____
FINAL DESIGN: _____
RELEASED FOR CONSTRUCTION: _____
DRAWING INFORMATION:
DATE: _____
SCALE: _____
DESIGNED: _____
CHECKED: _____



C-7.3

PEJ JOB#: 18252.PE

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION