

### LEGEND

	PROPERTY LINE		EXISTING TREE TO BE REMOVED
	DISTURBED AREA LIMITS		EXISTING TREE TO BE SAVED AND PROTECTED
	PROPOSED CONTOUR		WETLANDS
	TEMPORARY SILT FENCE		EROSION CONTROL MAT
	PROPOSED STORMDRAIN PIPE		6' WIDE MULTI USE PATH
	SWALE		
	PROPOSED WATERLINE		
	PROPOSED SANITARY SEWER		
	EXISTING CONTOUR		
	TREE PROTECTION FENCING		
	PERENNIAL STREAM CENTERLINE		
	WATERS OF THE US TOB		
	LOT DRAINAGE ARROW		
	PROPOSED FINISH GRADE SPOT ELEVATION		
	FLARED END SECTION WITH RIP-RAP ENERGY DISSIPATOR		
	DROP INLET WITH INLET PROTECTION (DI)		
	CURB INLET WITH INLET PROTECTION (CI)		
	JUNCTION BOX WITH INLET PROTECTION (JB)		
	PROPOSED FIRE HYDRANT		

**NOTE:**  
 CI TOP REFERS TO ELEVATION AT FLOW LINE  
 DI TOP REFERS TO ELEVATION AT GRATE

**NOTES:**

1. ALL COMMON SPACE/OPEN SPACE SHALL BE OWNED AND MAINTAINED BY THE PROPERTY OWNERS ASSOCIATION AFTER COMPLETION OF CONSTRUCTION AND AFTER BEING TURNED OVER TO THE PROPERTY OWNERS ASSOCIATION BY THE DEVELOPER.
2. ALL STRUCTURES LOCATED WITHIN THE FLOOD PLAIN MUST COMPLY WITH ALL FLOOD PLAIN REQUIREMENTS.
3. FLOOD LINES SHOWN ON PLANS ARE FOR INFORMATIONAL PURPOSES ONLY AND REFLECT THE PRELIMINARY FIRMS EXPECTED TO BECOME EFFECTIVE AUGUST 2018.
4. IF THESE UNITS ARE SOLD AT ANY POINT, THE BUYER MUST RECEIVE A SUBDIVISION STREET DISCLOSURE STATEMENT.
5. ANY RESURFACING/CONSTRUCTION OF PEDESTRIAN TRAILS IN CONSERVATION RESOURCE WILL BE LIMITED TO HAND EQUIPMENT AND MINIMAL DISTURBANCE PERMITTED DUE TO THE SENSITIVITY OF THE RESOURCE.

#### SITE DATA TABLE TRACT 3B [R1]

TRACT 3B AREA: 36.32 AC (1,582,509 SF)  
 TRACT 3B FHL PROPOSED AREA OF SINGLE FAMILY: 37.40 AC (1,629,144 SF)  
 (1.08 AC FROM TRACT 3A)

ZONE: MF-M  
 CAMA LAND CLASSIFICATION: URBAN/CONSERVATION AREA

REQUIRED SETBACKS:  
 ATT/DET/DU/TR/Q: F=15' R=15' SI=5 SC=10

BUILDING SEPARATION: 16' MIN. REQUIRED AND PROVIDED

SINGLE FAMILY LOTS SIZE: APPROXIMATELY 60' WIDE X 120' LONG.

MINIMUM WIDTH: 50'  
 MINIMUM SQUARE FOOTAGE: 5,000 SF  
 MAXIMUM LOT COVERAGE: 50%  
 MAX. BUILDING HEIGHT: 35'-96' WITH ADDITIONAL YARD REQUIREMENTS.

MAXIMUM ALLOWED DENSITY: 9 UNITS/ACRE  
 FOR AREAS LOCATED WITHIN A CAMA CONSERVATION AREA THE MAXIMUM ALLOWED DENSITY IS 2.5 UNITS/ACRE.

DENSITY TRACT 3B:  
 92 UNITS  
 MAXIMUM ALLOWED UNITS @ 9 UNITS/ACRE = 337 UNITS  
 PROPOSED DENSITY 2.45 UNITS/ACRE = 92 UNITS

OPEN SPACE REQUIREMENT SF: 0.03 AC PER LOT  
 TRACT 3B REQUIRED: 2.76 AC AVAILABLE: 4.93 AC  
 AS SHOWN: 1.65 AC OPEN SPACE 3.28 AC ACTIVE OPEN SPACE

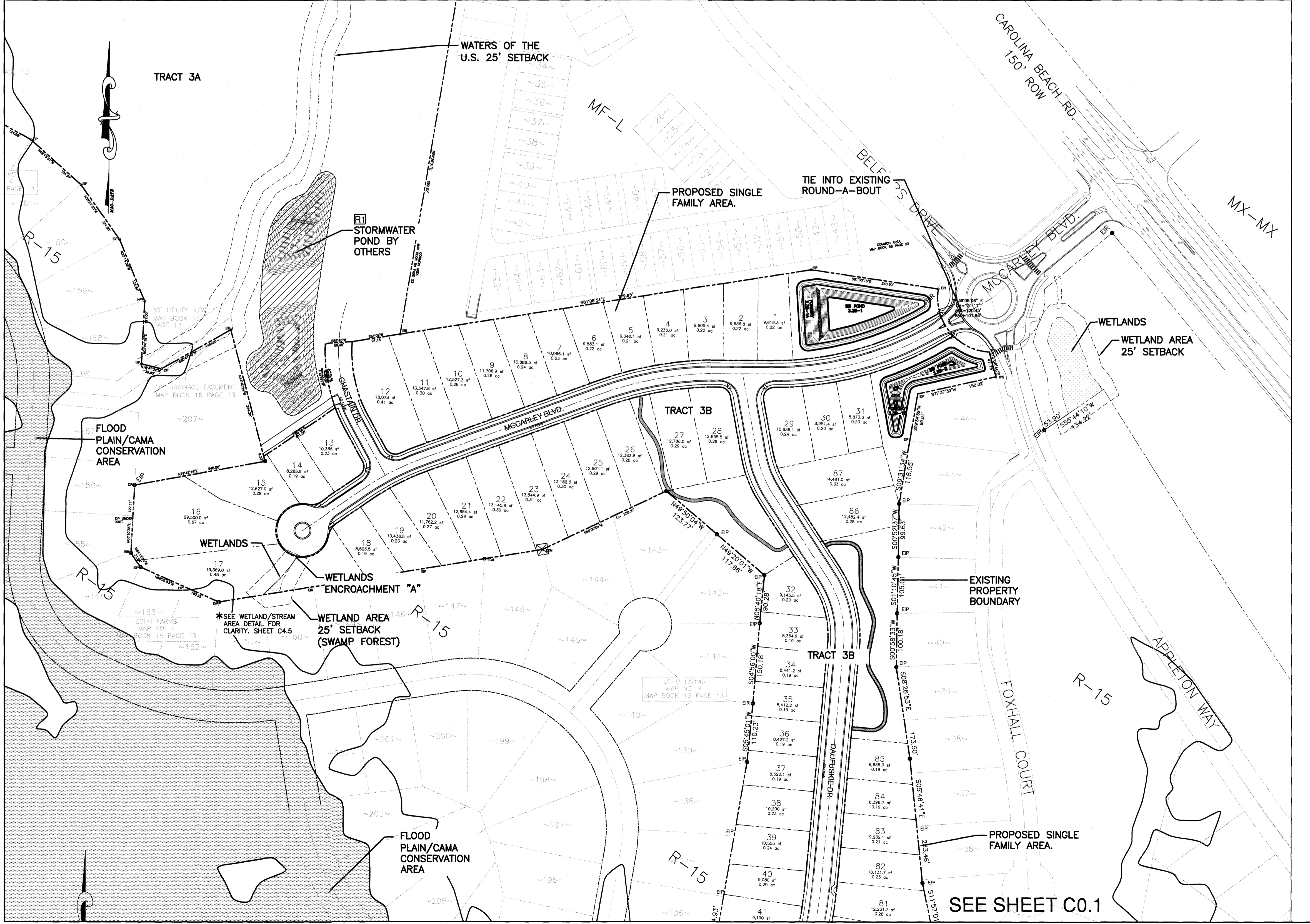
SOLID WASTE DISPOSAL:  
 SF: HAND CART

WATER AND SEWER CAPACITY:  
 SF: 480 G.P.D. PER UNIT = 44,160 G.P.D.

ADJACENT PROPERTY INFORMATION: SEE SURVEY PLAN

DATE	DESCRIPTION	BY

**OVERALL SITE PLAN**  
**WOODLANDS AT ECHO FARMS**  
 4114 ECHO FARMS BLVD.  
 WILMINGTON, NC 28412  
 NEW HANOVER COUNTY



**WETLANDS IMPERVIOUS ENCROACHMENT**

CAMA LAND CLASSIFICATION: URBAN/CONSERVATION AREA  
 WETLANDS (SWAMP FOREST) EXIST ON SITE AND ARE DELINEATED ON THE SITE PLAN.  
 CONSERVATION OVERLAY DISTRICT: 12.5' OFFSET FROM WETLANDS NO ENCROACHMENT ALLOWED.  
 CONSERVATION OVERLAY DISTRICT: 25' OFFSET FROM WETLANDS UP TO 25% ENCROACHMENT OF IMPERVIOUS IS ALLOWED.

ENCROACHMENT "A": TOTAL AREA WITHIN 25' SETBACK= 6,064 SF (LOT 17)  
 25%= 1516 SF IMPERVIOUS ALLOWED  
 AREA OF ENCROACHMENT=130 SF  
 PERCENT OF ENCROACHMENT=2.14%  
 AMOUNT ALLOWED REMAINING=1,386 SF  
 (SEE WETLANDS/STREAM AREA DETAIL C4.5)

**EXISTING IMPERVIOUS AREA**  
 TRACT 3B IMPERVIOUS AREA SINGLE FAMILY DETACHED:  
 CART PATH: 40,575 SF  
 CART PATH TO BE REMOVED: 40,575 SF  
 CART PATH TO REMAIN: 0 SF

**NEW IMPERVIOUS AREA**  
 TRACT 3B IMPERVIOUS AREA SINGLE FAMILY DETACHED:  
 SIDEWALK: 45,989 SF  
 ASPHALT/CONC./C&G: 167,871 SF  
 MULTI USE PATH: 22,392 SF  
 LOTS (92) @ 3,800 SF: 349,600 SF  
 TRACT 3B FUTURE: 56,660 SF

[R1] TOTAL: 642,492 SF  
 PERCENT IMP.: 40.6%

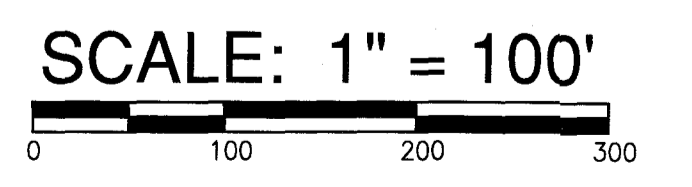
**NEW OFF-SITE IMPERVIOUS AREA**  
 TRACT 3B IMPERVIOUS AREA SINGLE FAMILY DETACHED:  
 SIDEWALK: 1,229 SF  
 ASPHALT/CONC./C&G: 5,195 SF

TOTAL: 6,424 SF

**SRB APPROVAL #OBG-4-317**

NOTE: ALL FEDERAL, STATE AND LOCAL PERMITS ARE REQUIRED PRIOR TO FULL CONSTRUCTION RELEASE. THIS INCLUDES, BUT IS NOT LIMITED TO: STATE STORM WATER, STATE UTILITY EXTENSION PERMITS, WETLAND DISTURBANCE PERMITS, CITY STORM WATER PERMITS, TREE PROTECTION PERMITS, ETC.

NOTE: UPON COMPLETION OF A PROJECT, AND BEFORE A CERTIFICATE OF OCCUPANCY SHALL BE GRANTED, THE APPLICANT SHALL CERTIFY THAT THE COMPLETED PROJECT IS IN ACCORDANCE WITH THE APPROVED STORMWATER MANAGEMENT PLANS AND DESIGNS, AND SHALL SUBMIT ACTUAL "AS-BUILT" PLANS FOR ALL STORMWATER MANAGEMENT FACILITIES OR PRACTICES AFTER FINAL CONSTRUCTION IS COMPLETED. AS-BUILT PLANS SHALL BE PREPARED IN ACCORDANCE WITH THE CITY TECHNICAL STANDARDS. AS-BUILT STORMWATER MEASURES, CONTROLS, AND DEVICES ARE TO BE IN COMPLIANCE WITH THE REQUIREMENTS OF THIS ORDINANCE. A FINAL INSPECTION AND APPROVAL BY THE CITY MANAGER SHALL OCCUR BEFORE THE RELEASE OF ANY PERFORMANCE SECURITIES.



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

Signed: \_\_\_\_\_  
**Approved Construction Plan**  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_

Planning: \_\_\_\_\_  
 Traffic: \_\_\_\_\_  
 Fire: \_\_\_\_\_

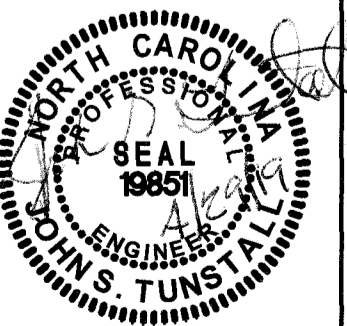
For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

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)

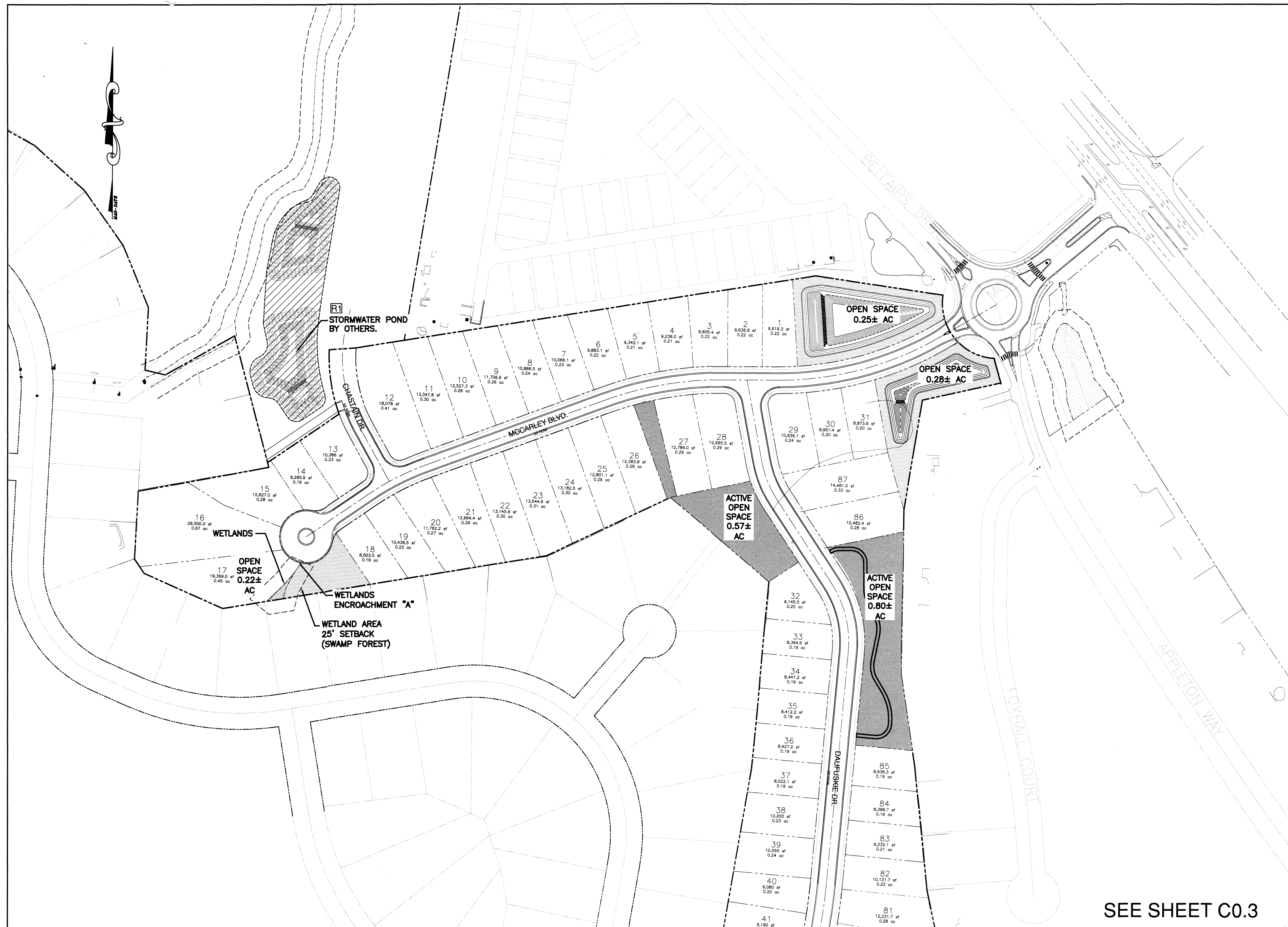
LAND OWNER/APPLICANT  
 ECHO FARMS, LLC  
 MATRIX DEVELOPMENT GROUP  
 CN4000 FORSGATE DRIVE  
 CRANBURY, NJ 08512  
 732-521-2800

**NORRIS & TUNSTALL**  
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 WILMINGTON, NC 28401  
 PHONE (910) 343-9653  
 1429 ASH-LITTLE RIVER RD. NW  
 ASH, NC 28420  
 PHONE (910) 281-5900

License #C-3641  
**16083**  
 DES. JST  
 CDR. JPN  
 DRWN. NKS  
 DATE 6/27/18



**CO**



SEE SHEET C0.3

DATE	DESCRIPTION	BY
	REVISIONS	
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R1: 3.18.19 SWP 3.1B REMOVED FROM PROJECT AREA. PERMITTING BY OTHERS. REV. PROJECT AREA, DENSITY AND OPENSPACE. REV. STORMWATER AND STORMWATER DETAILS FOR SWP 3.1B. REVISED TREE REMOVAL TABLE ACCORDINGLY. REV. CHASTAIN DR. ROW AND CENTERLINE AS PER DRAWINGS BY OTHERS. ADDED SECTION DETAIL.

**OPEN SPACE PLAN**  
**WOODLANDS AT ECHO FARMS**  
 4114 ECHO FARMS BLVD.  
 WILMINGTON, NC 28412  
 NEW HANOVER COUNTY

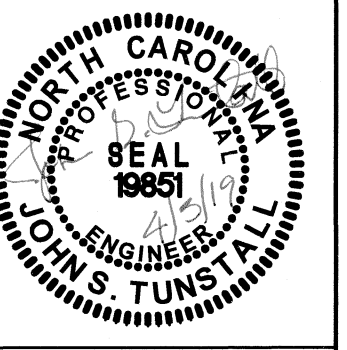
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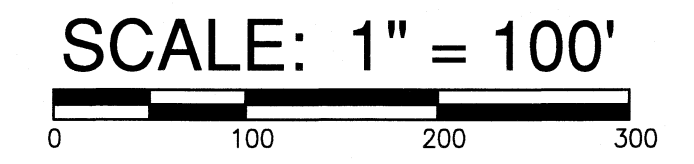


**C0.2**

**LEGEND**

	OPEN SPACE
	OPEN SPACE (ACTIVE)

**NOTE:**  
 1. OPEN SPACE PLAN REFLECTS PRELIMINARY AREAS OPEN FOR DESIGNATION AS ACTIVE OR PASSIVE RECREATION AREAS AND OPEN SPACE.  
 2. OPEN SPACE DOES NOT INCLUDE NEW POND AREAS.



APPROVED STORMWATER MANAGEMENT PLAN

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

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

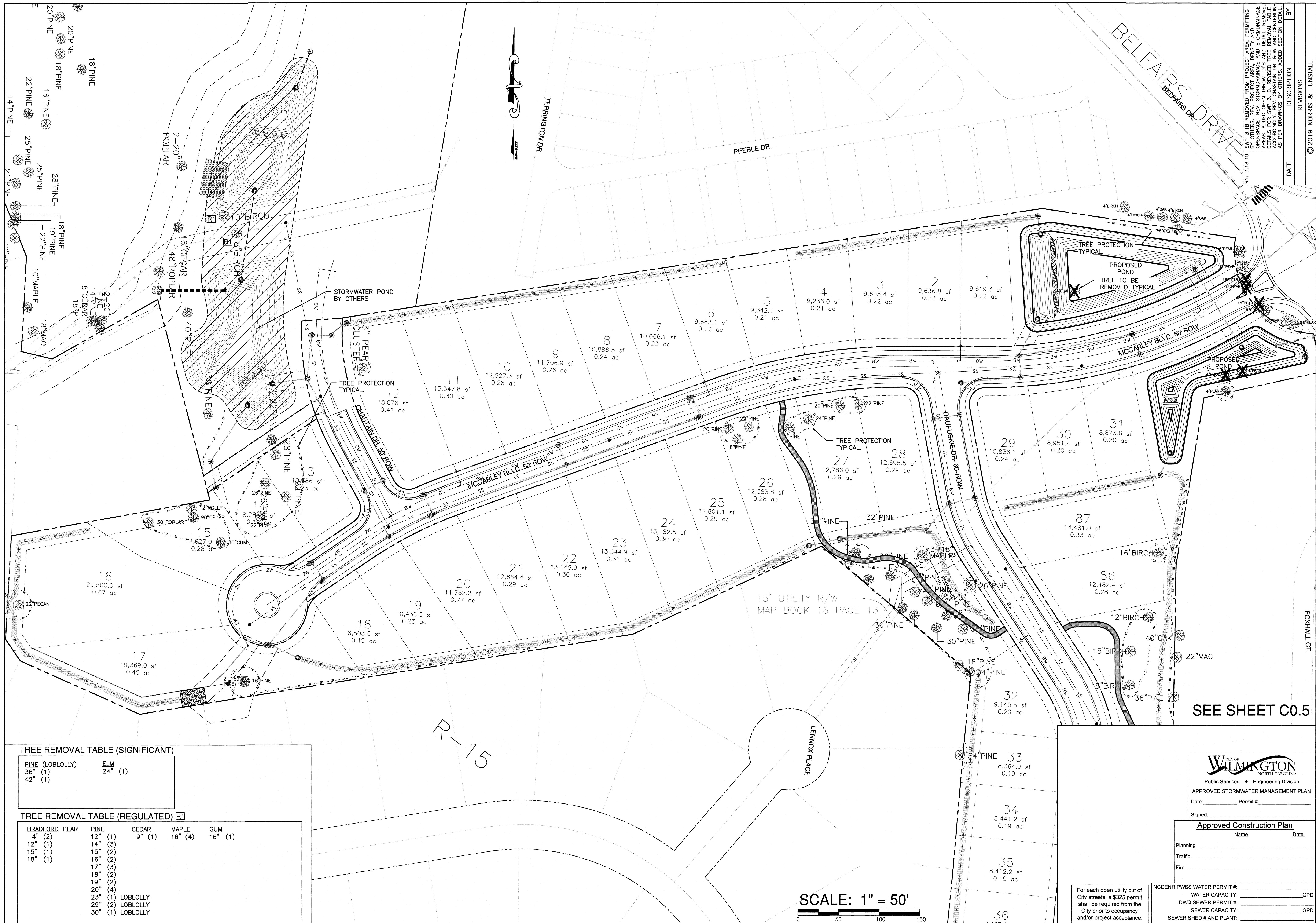
**Approved Construction Plan**

Name \_\_\_\_\_ Date \_\_\_\_\_

Planning \_\_\_\_\_  
 Traffic \_\_\_\_\_  
 Fire \_\_\_\_\_

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NCDCNR 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)



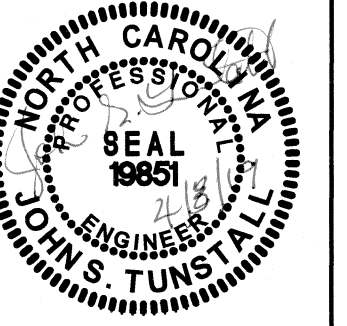
DATE	DESCRIPTION	BY
01/18/19	SWP 3.1B REMOVED FROM PROJECT AREA. PERMITTING BY OTHERS. REV. PROJECT AREA, DENSITY AND IMPROVEMENTS. ADDED OPEN THROAT PDS AND REMOVED AREAS. ADDED OPEN THROAT PDS AND REMOVED DETAILS FOR SWP 3.1B. REVISED TREE REMOVAL TABLE ACCORDINGLY. REV. CHASTAIN DR. ROW AND CENTERLINE AS PER DRAWINGS BY OTHERS. ADDED SECTION DETAIL.	

**TREE PLAN**  
 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  
 CRANFURY, NJ 08012  
 732-521-2900

**NORRIS & TUNSTALL**  
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License #C-3641  
**16083**  
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 DRWN. NKS  
 DATE 6/27/18



**C0.4**

**TREE REMOVAL TABLE (SIGNIFICANT)**

PINE (LOBLOLLY)	ELM
36" (1)	24" (1)
42" (1)	

**TREE REMOVAL TABLE (REGULATED)**

BRADFORD PEAR	PINE	CEDAR	MAPLE	GUM
4" (2)	12" (1)	9" (1)	16" (4)	16" (1)
12" (1)	14" (3)			
15" (1)	15" (2)			
18" (1)	16" (2)			
	17" (3)			
	18" (2)			
	19" (2)			
	20" (4)			
	23" (1) LOBLOLLY			
	29" (2) LOBLOLLY			
	30" (1) LOBLOLLY			

**SCALE: 1" = 50'**  
 0 50 100 150

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 WATER CAPACITY: \_\_\_\_\_ GPD  
 DWQ SEWER PERMIT # \_\_\_\_\_  
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 SEWER SHED # AND PLANT: \_\_\_\_\_  
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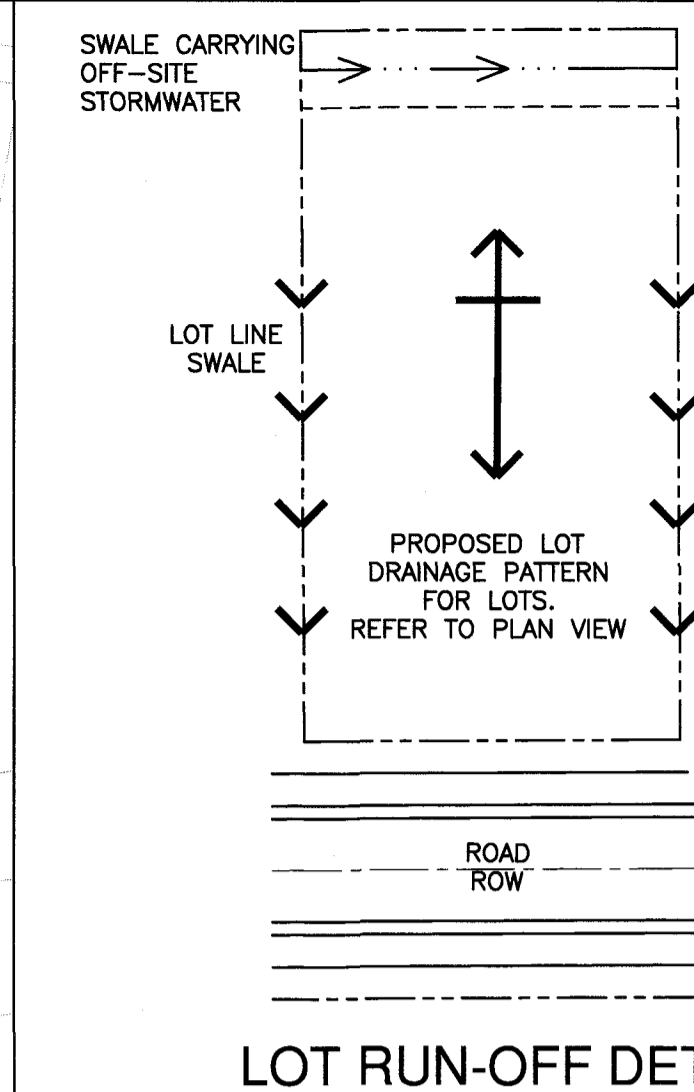
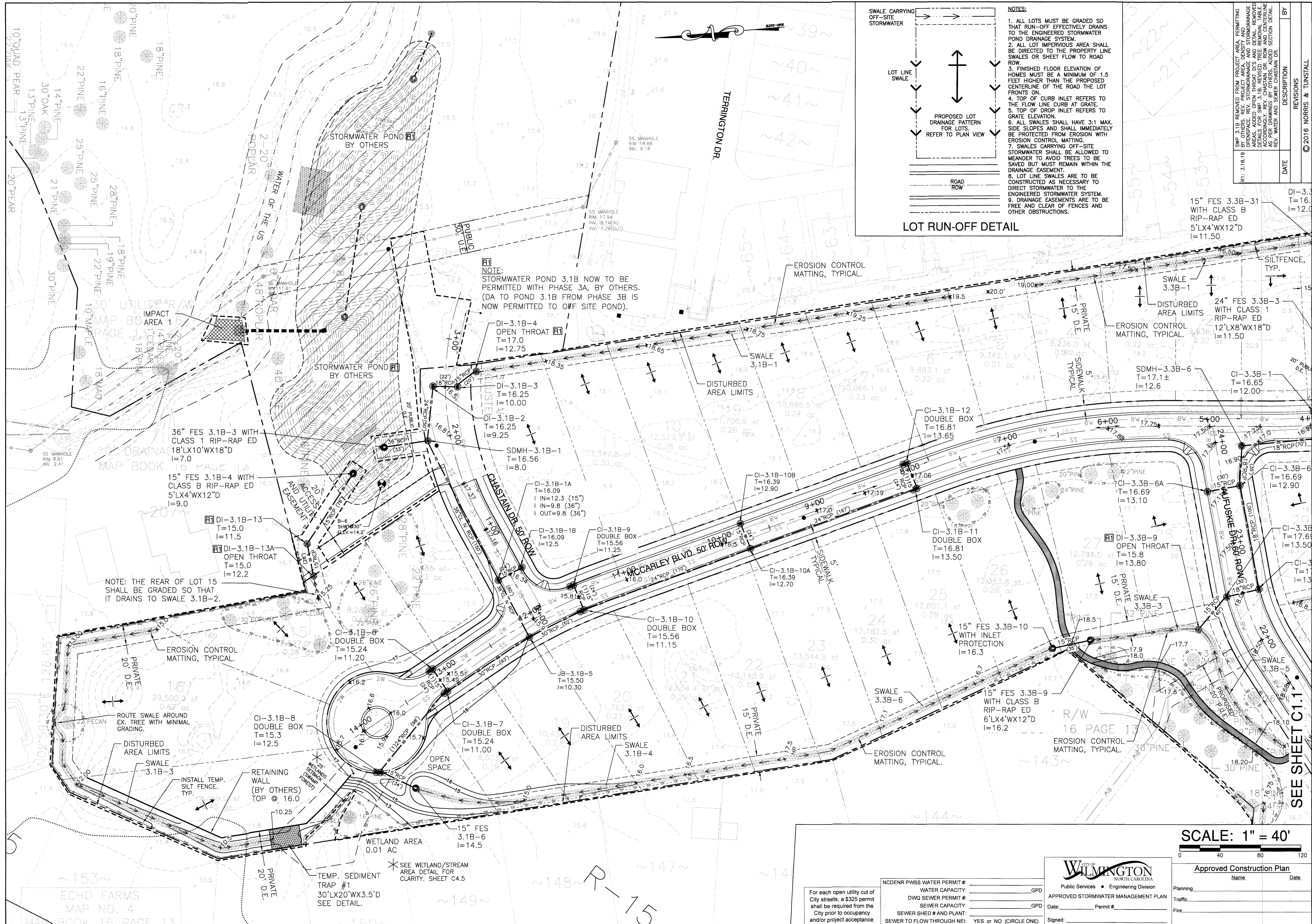
SEE SHEET C0.5

FOXHALL CT.

15' UTILITY R/W  
 MAP BOOK 16 PAGE 13

R-15

LENNOX PLACE



- NOTES:**
1. ALL LOTS MUST BE GRADED SO THAT RUN-OFF EFFECTIVELY DRAINS TO THE ENGINEERED STORMWATER POND DRAINAGE SYSTEM.
  2. ALL LOT IMPERVIOUS AREA SHALL BE DIRECTED TO THE PROPERTY LINE SWALES OR SHEET FLOW TO ROAD ROW.
  3. FINISHED FLOOR ELEVATION OF HOMES MUST BE A MINIMUM OF 1.5 FEET HIGHER THAN THE PROPOSED CENTERLINE OF THE ROAD THE LOT FRONTS ON.
  4. TOP OF CURB INLET REFERS TO THE FLOW LINE CURB AT GRATE.
  5. TOP OF DROP INLET REFERS TO GRATE ELEVATION.
  6. ALL SWALES SHALL HAVE 3:1 MAX. SIDE SLOPES AND SHALL IMMEDIATELY BE PROTECTED FROM EROSION WITH EROSION CONTROL MATTING.
  7. SWALES CARRYING OFF-SITE STORMWATER SHALL BE ALLOWED TO MEANDER TO AVOID TREES TO BE SAVED BUT MUST REMAIN WITHIN THE DRAINAGE EASEMENT.
  8. LOT LINE SWALES ARE TO BE CONSTRUCTED AS NECESSARY TO DIRECT STORMWATER TO THE ENGINEERED STORMWATER SYSTEM.
  9. DRAINAGE EASEMENTS ARE TO BE FREE AND CLEAR OF FENCES AND OTHER OBSTRUCTIONS.

NO.	DATE	DESCRIPTION	BY
1	3.18.19	SNIP 3.1B REMOVED FROM PROJECT AREA, PERMITTING BY OTHERS. REV. STORMWATER AND STORMWATER OPENSPACE. REV. STORMWATER AND STORMWATER DETAILS FOR SWP 3.1B. REVISED PER REMOVAL OF SWP 3.1B. REV. CHASTAIN DR. ROW AND CENTERLINE AS PER DRAWINGS BY OTHERS. ADDED SECTION DETAIL REV. WATER AND SWALE GRADIAN DR.	

**NOTE:**  
STORMWATER POND 3.1B NOW TO BE PERMITTED WITH PHASE 3A, BY OTHERS. (DA TO POND 3.1B FROM PHASE 3B IS NOW PERMITTED TO OFF SITE POND).

**NOTE:** THE REAR OF LOT 15 SHALL BE GRADED SO THAT IT DRAINS TO SWALE 3.1B-2.

**SCALE: 1" = 40'**

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NCDENR 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)	

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

APPROVED STORMWATER MANAGEMENT PLAN

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

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

**Approved Construction Plan**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Planning: \_\_\_\_\_

Traffic: \_\_\_\_\_

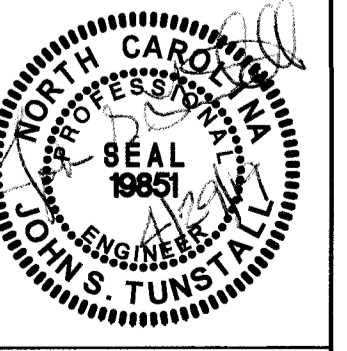
Fire: \_\_\_\_\_

**GRADING, DRAINAGE AND EROSION CONTROL PLAN**  
WOODLANDS AT ECHO FARMS  
4114 ECHO FARMS BLVD.  
WILMINGTON, NC 28412  
NEW HANOVER COUNTY

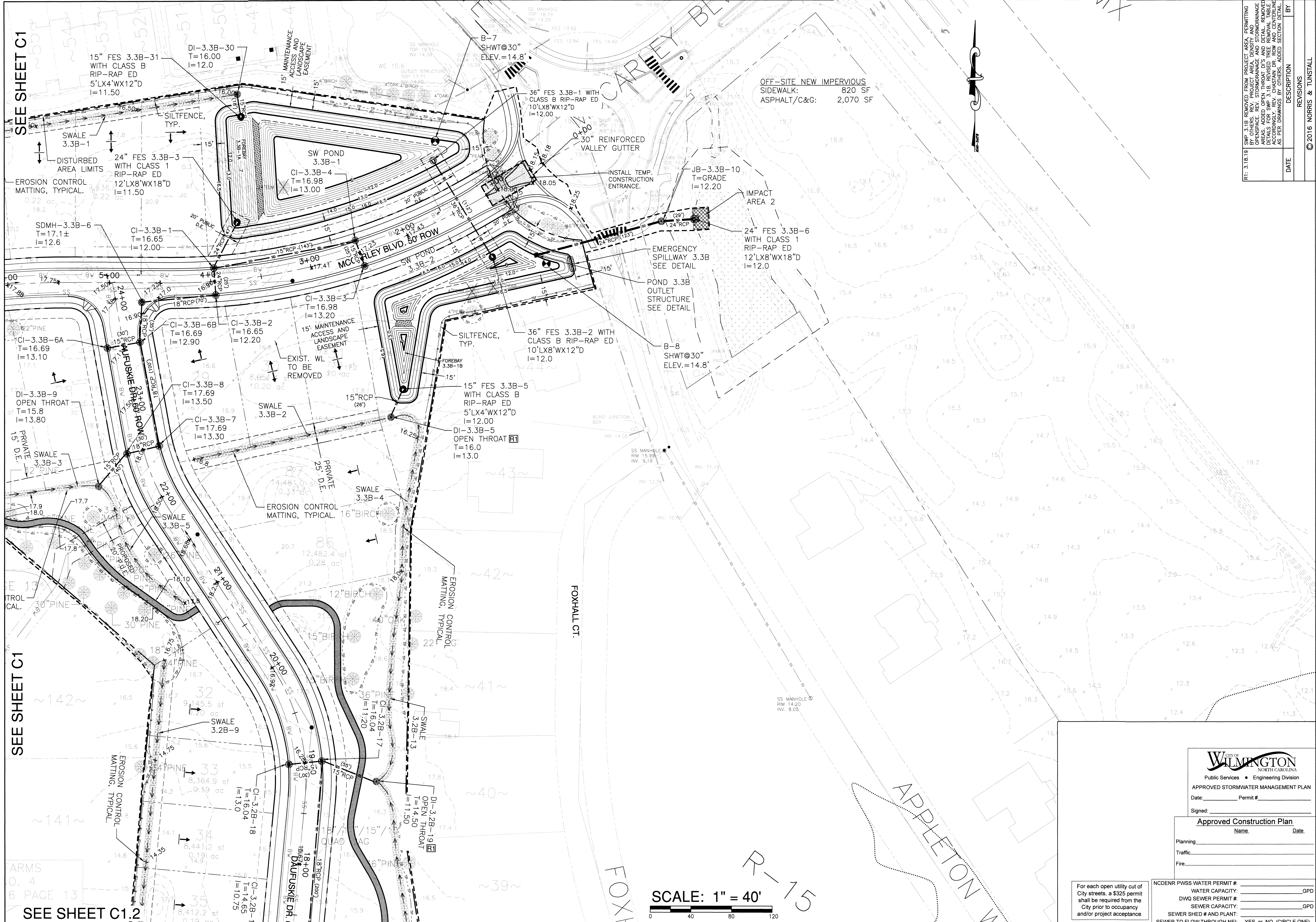
**LAND OWNER/APPLICANT**  
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MATRIX DEVELOPMENT GROUP  
CN4000 FORSGATE DRIVE  
CRANBURY, NJ 05012  
732-521-2900

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WILMINGTON, NC 28401  
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DES. JST  
CHK. JPN  
DRWN. NKS  
DATE 9/24/18



**C1**



SEE SHEET C1

SEE SHEET C1

SEE SHEET C1.2

DATE	DESCRIPTION	BY

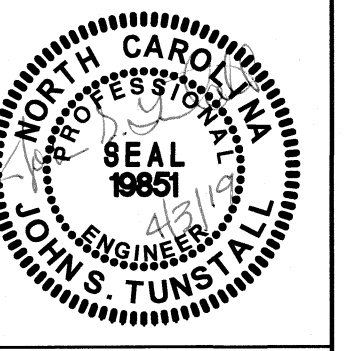
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**C1.1**

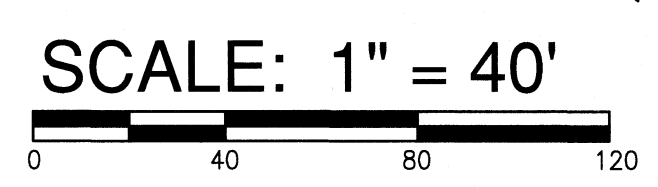
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WATER CAPACITY:	
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SEWER SHED # AND PLANT:	
SEWER TO FLOW THROUGH NEI:	YES or NO (CIRCLE ONE)

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

**Approved Construction Plan**  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_

Planning: \_\_\_\_\_  
 Traffic: \_\_\_\_\_  
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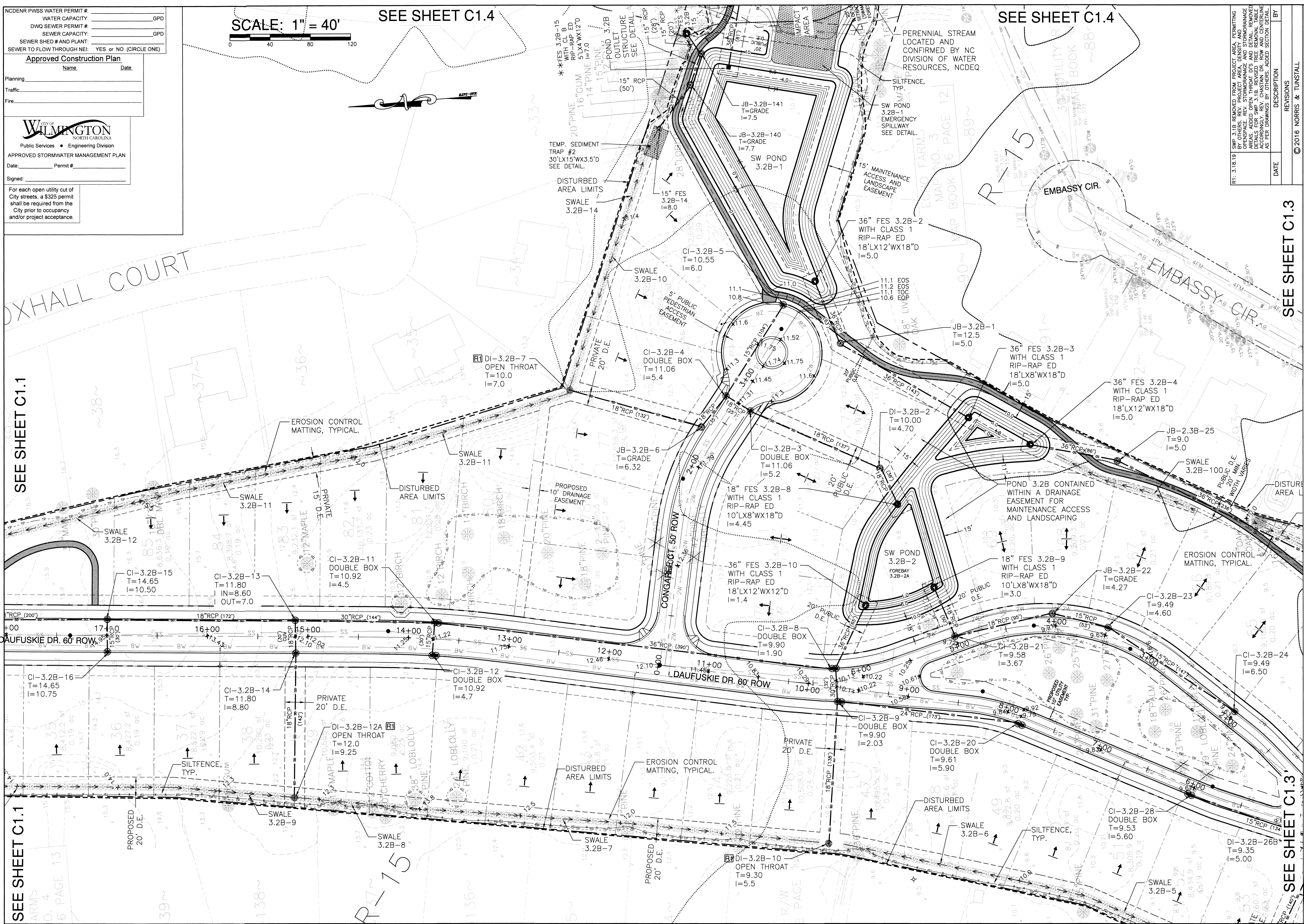
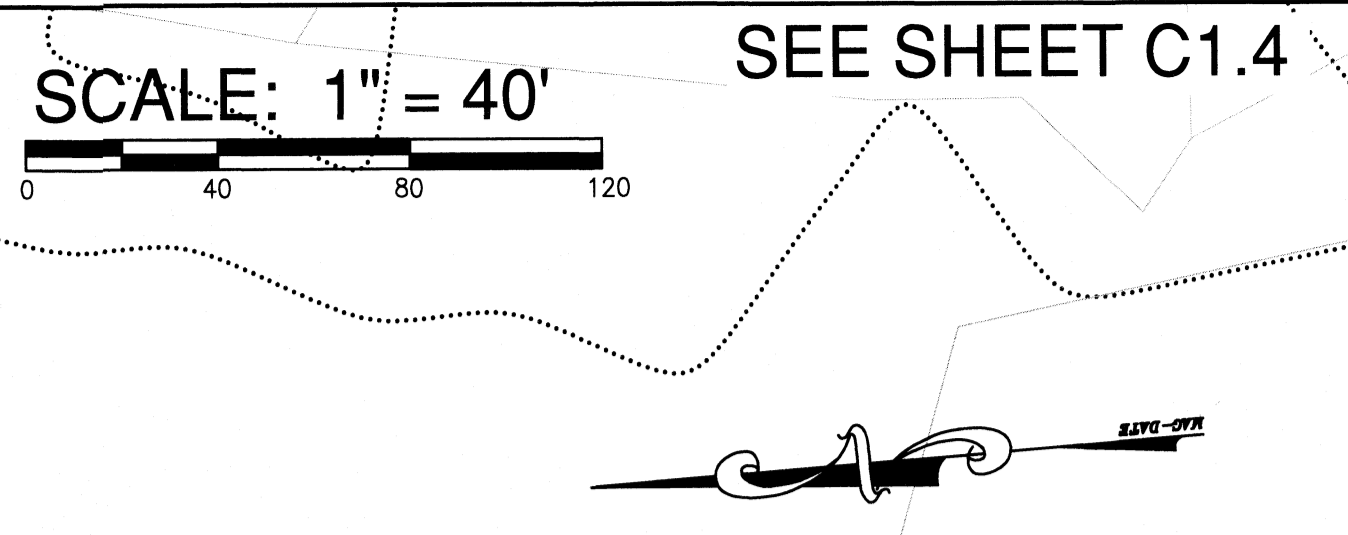
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**Approved Construction Plan**  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_

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

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SEE SHEET C1.1

SEE SHEET C1.1

SEE SHEET C1.3

SEE SHEET C1.3

**LAND OWNER/APPLICANT**  
 ECHO FARMS, LLC  
 MATRIX DEVELOPMENT GROUP  
 CN4000 FORSGATE DRIVE  
 CRANBURY, NJ 08512  
 732-521-2900

**REVISIONS**

DATE	DESCRIPTION	BY

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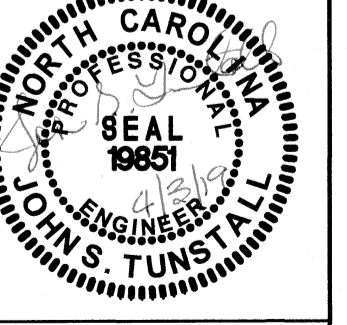
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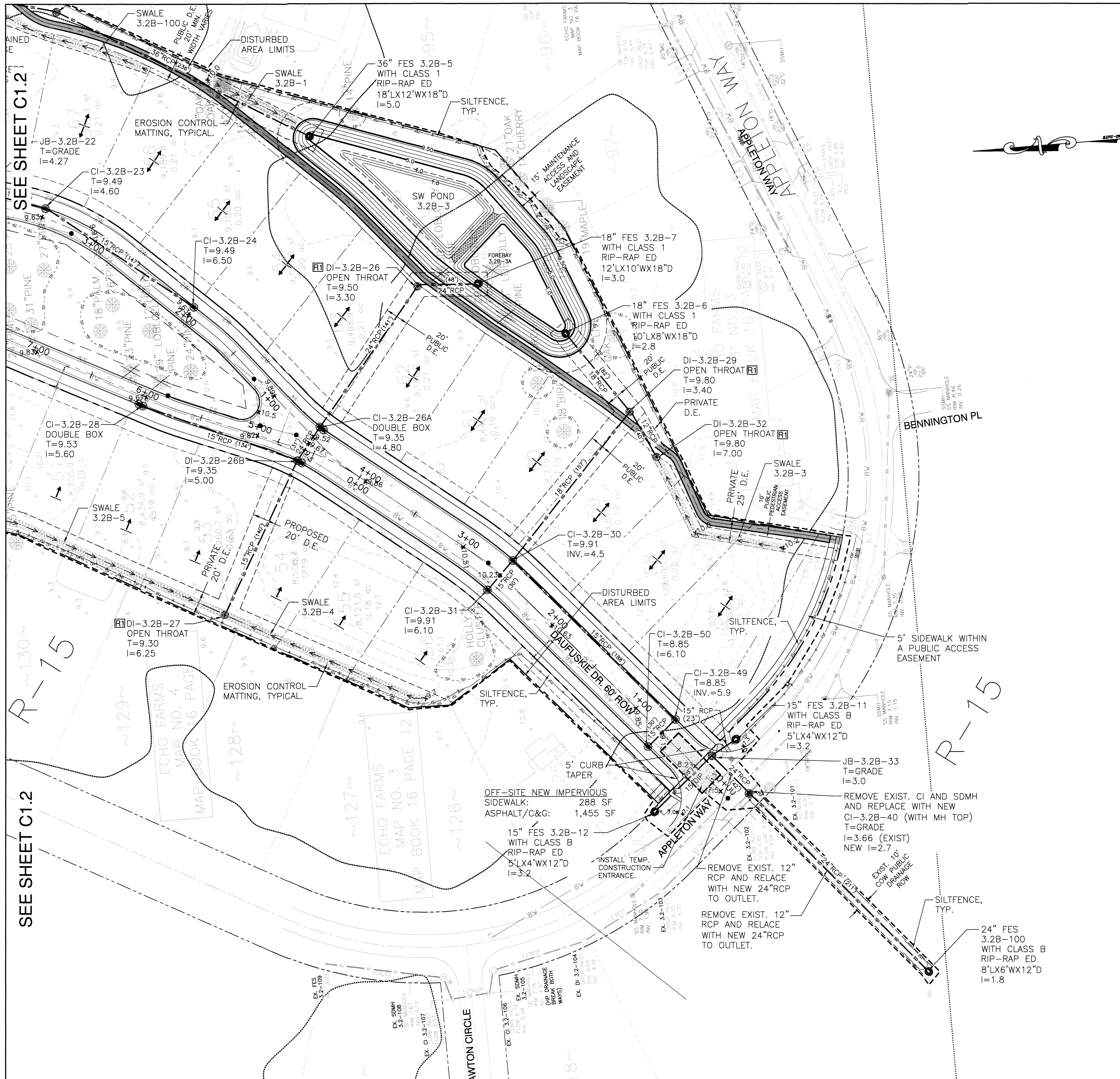
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**C1.2**



NOTE:  
 1. THE BACK OF LOTS 60-66 SHALL BE GRADED SO THEY WILL SHEET FLOW RUNOFF OVER THE MUP AND INTO EITHER POND 3.2B-3 OR SWALE 3.2B-1.

EFC08  
 X=2326757.565  
 Y=1485689.951  
 Z=7.452

DATE	DESCRIPTION	BY
	REVISIONS	

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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 \_\_\_\_\_

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

**SCALE: 1" = 40'**  
 0 40 80 120

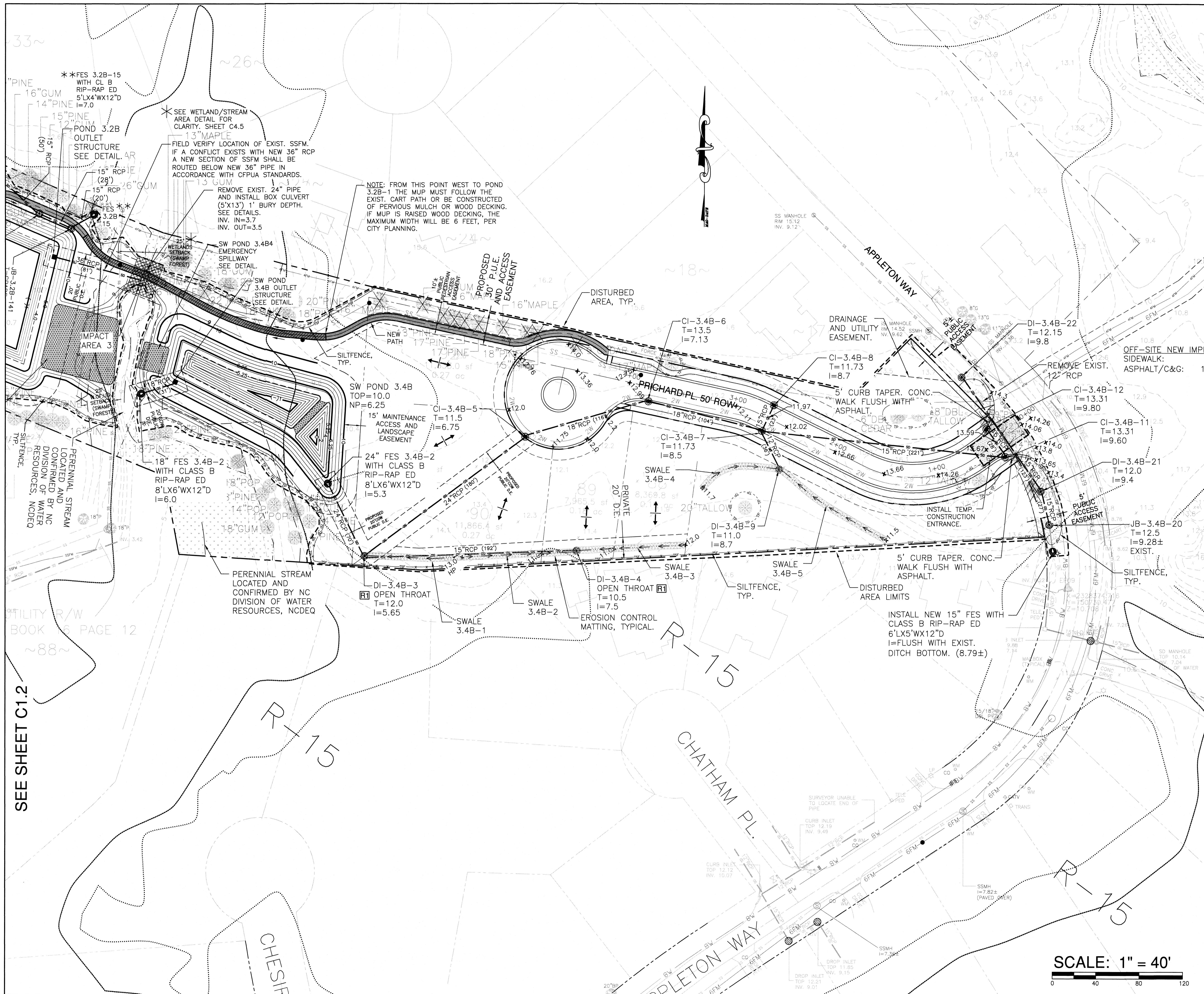
SEE SHEET C1.2

SEE SHEET C1.2

**C1.3**

SEE SHEET C1.2

SEE SHEET C1.2



DATE	DESCRIPTION	BY

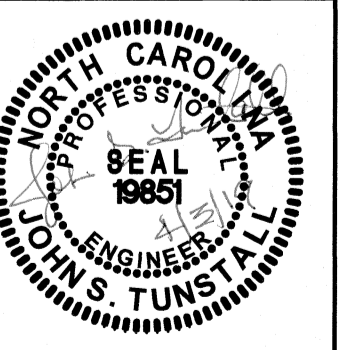
© 2016 NORRIS & TUNSTALL

**GRADING, DRAINAGE AND EROSION CONTROL PLAN**  
**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  
 GRANBURY, NJ 00512  
 732-521-2900

**NORRIS & TUNSTALL**  
 CONSULTING ENGINEERS P.C.  
 902 MARKET STREET  
 WILMINGTON, NC 28401  
 PHONE (910) 343-9653  
 1429 ASH-LITTLE RIVER RD, NW  
 ASHLAND, NC 28620  
 PHONE (910) 287-5900

License #C-3641  
**16083**  
 DES. JST  
 OKD. JPN  
 DRWN. NKS



**C1.4**

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

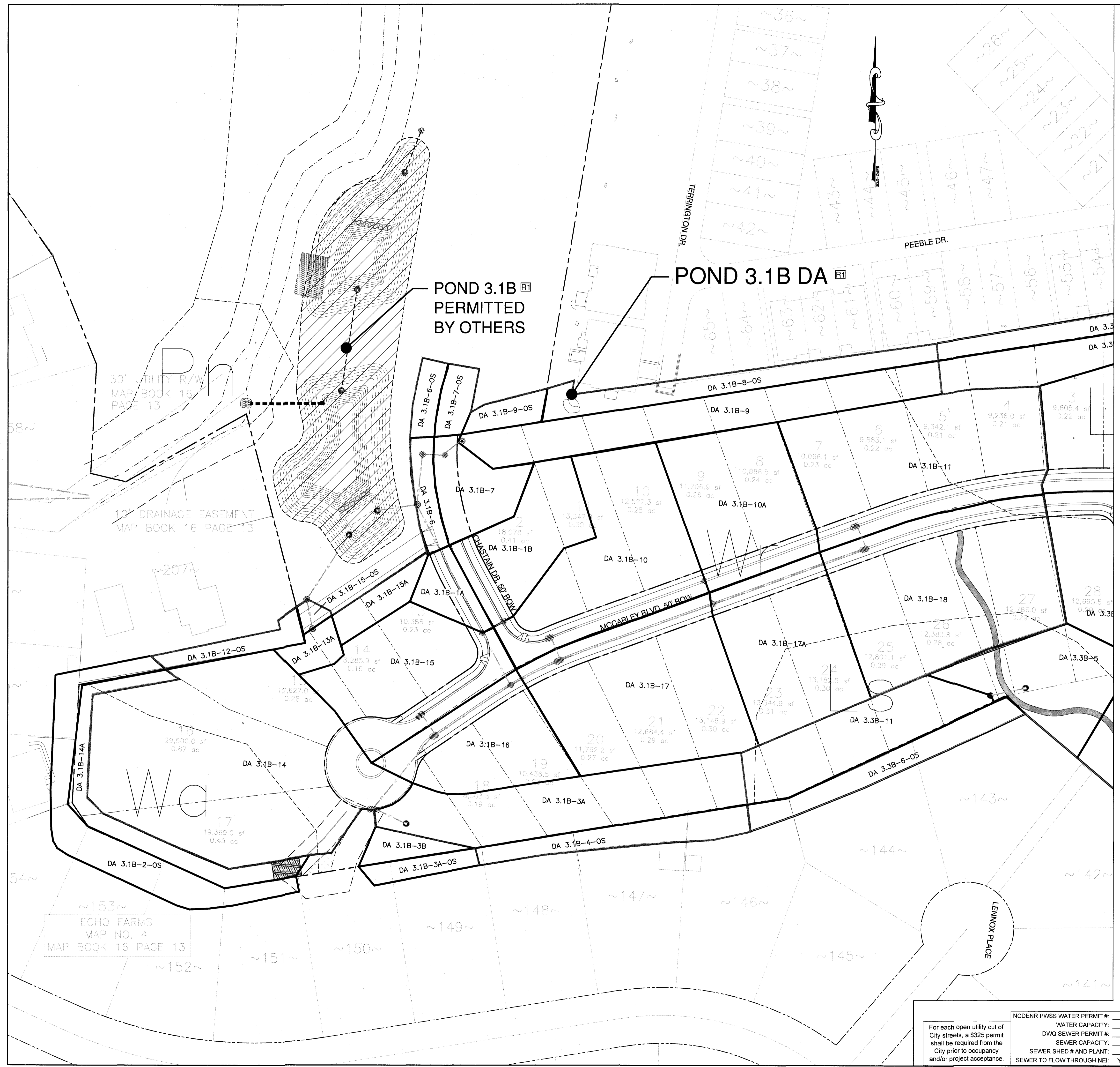
**City of WILMINGTON**  
 Public Services • Engineering Division  
**APPROVED STORMWATER MANAGEMENT PLAN**  
 Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
 Signed: \_\_\_\_\_

**Approved Construction Plan**  
 Name \_\_\_\_\_ Date \_\_\_\_\_  
 Planning \_\_\_\_\_  
 Traffic \_\_\_\_\_  
 Fire \_\_\_\_\_

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

**SCALE: 1" = 40'**  
 0 40 80 120





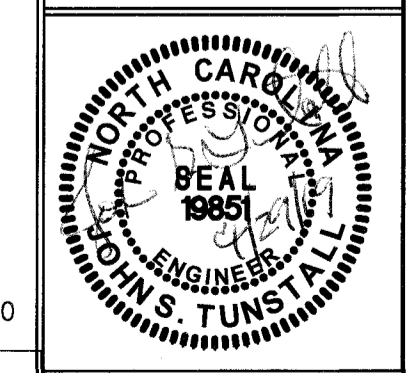
DATE	DESCRIPTION	BY
	REVISIONS	

© 2016 NORRIS & TUNSTALL  
 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  
 60400 FORSGATE DRIVE  
 CRANBURY, NJ 08512  
 732-521-2900

**NORRIS & TUNSTALL**  
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 902 MARKET STREET  
 WILMINGTON, NC 28401  
 PHONE (910) 343-9625  
 1429 ASH-LITTLE RIVER RD, NW  
 ASHLAND, NC 28620  
 PHONE (910) 287-5900

Licence #C-3641  
**16083**  
 DES. JST  
 CKD. JPN  
 DRWN. NKS  
 DATE 6/27/18



SCALE: 1" = 50'  
 0 50 100 150

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

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)

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

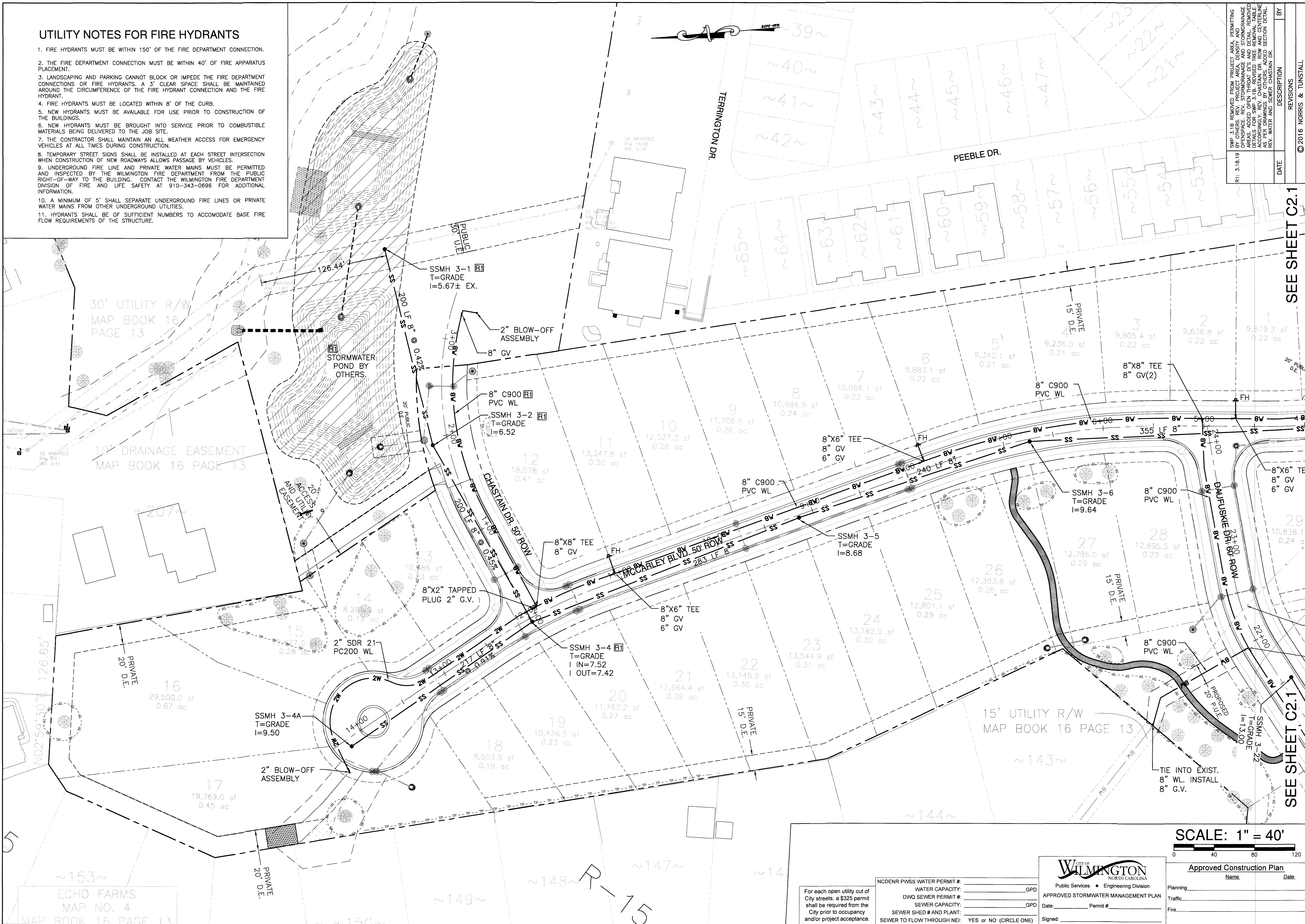
Approved Construction Plan  
 Name \_\_\_\_\_ Date \_\_\_\_\_  
 Planning \_\_\_\_\_  
 Traffic \_\_\_\_\_  
 Fire \_\_\_\_\_

**C1.5**

C:\projects\2016\16083 Woodlands at Echo Farms\16083.mxd\16083.master.r43.dwg, 4/29/2019 1:46:53 PM

**UTILITY NOTES FOR FIRE HYDRANTS**

1. FIRE HYDRANTS MUST BE WITHIN 150' OF THE FIRE DEPARTMENT CONNECTION.
2. THE FIRE DEPARTMENT CONNECTION MUST BE WITHIN 40' OF FIRE APPARATUS PLACEMENT.
3. LANDSCAPING AND PARKING CANNOT BLOCK OR IMPEDE THE FIRE DEPARTMENT CONNECTIONS OR FIRE HYDRANTS. A 3' CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF THE FIRE HYDRANT CONNECTION AND THE FIRE HYDRANT.
4. FIRE HYDRANTS MUST BE LOCATED WITHIN 8' OF THE CURB.
5. NEW HYDRANTS MUST BE AVAILABLE FOR USE PRIOR TO CONSTRUCTION OF THE BUILDINGS.
6. NEW HYDRANTS MUST BE BROUGHT INTO SERVICE PRIOR TO COMBUSTIBLE MATERIALS BEING DELIVERED TO THE JOB SITE.
7. THE CONTRACTOR SHALL MAINTAIN AN ALL WEATHER ACCESS FOR EMERGENCY VEHICLES AT ALL TIMES DURING CONSTRUCTION.
8. TEMPORARY STREET SIGNS SHALL BE INSTALLED AT EACH STREET INTERSECTION WHEN CONSTRUCTION OF NEW ROADWAYS ALLOWS PASSAGE BY VEHICLES.
9. UNDERGROUND FIRE LINE AND PRIVATE WATER MAINS MUST BE PERMITTED AND INSPECTED BY THE WILMINGTON FIRE DEPARTMENT FROM THE PUBLIC RIGHT-OF-WAY TO THE BUILDING. CONTACT THE WILMINGTON FIRE DEPARTMENT DIVISION OF FIRE AND LIFE SAFETY AT 910-343-0696 FOR ADDITIONAL INFORMATION.
10. A MINIMUM OF 5' SHALL SEPARATE UNDERGROUND FIRE LINES OR PRIVATE WATER MAINS FROM OTHER UNDERGROUND UTILITIES.
11. HYDRANTS SHALL BE OF SUFFICIENT NUMBERS TO ACCOMMODATE BASE FIRE FLOW REQUIREMENTS OF THE STRUCTURE.



NO.	DATE	DESCRIPTION	BY
1	3.18.19	SWP 3 IS REMOVED FROM PROJECT AREA. PERMITTING BY OTHERS. REV. PROJECT AREA DENSITY. OPENSPACE. REV. STORMWATER AND STORMWATER AREAS. ADDED OPEN THROAT DTS AND DETAIL. REMOVED ACCORDINGLY. REV. CHASTAIN DR. ROW AND CENTERLINE AS PER DRAWINGS BY OTHERS. ADDED SECTION DETAIL. REV. WATER AND SEWER CHASTAIN DR.	
		REVISIONS	
		© 2016 NORRIS & TUNSTALL	

SEE SHEET C2.1

SEE SHEET C2.1

SEE SHEET C2.1

SEE SHEET C2.1

SEE SHEET C2.1

SEE SHEET C2.1

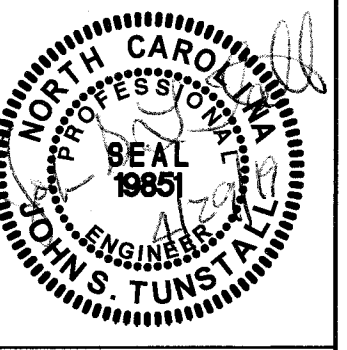
SEE SHEET C2.1

UTILITY PLAN  
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  
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732-521-2900

**NORRIS & TUNSTALL**  
CONSULTING ENGINEERS P.C.  
902 MARKET STREET  
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PHONE (910) 343-9653  
1429 ASH-LITTLE RIVER RD., NW  
ASH, NC 28620  
PHONE (910) 287-5900

License #C-3641  
**16083**  
DES. JST  
CHK. JPN  
DRWN. NKS  
DATE 9/20/18



**C2**

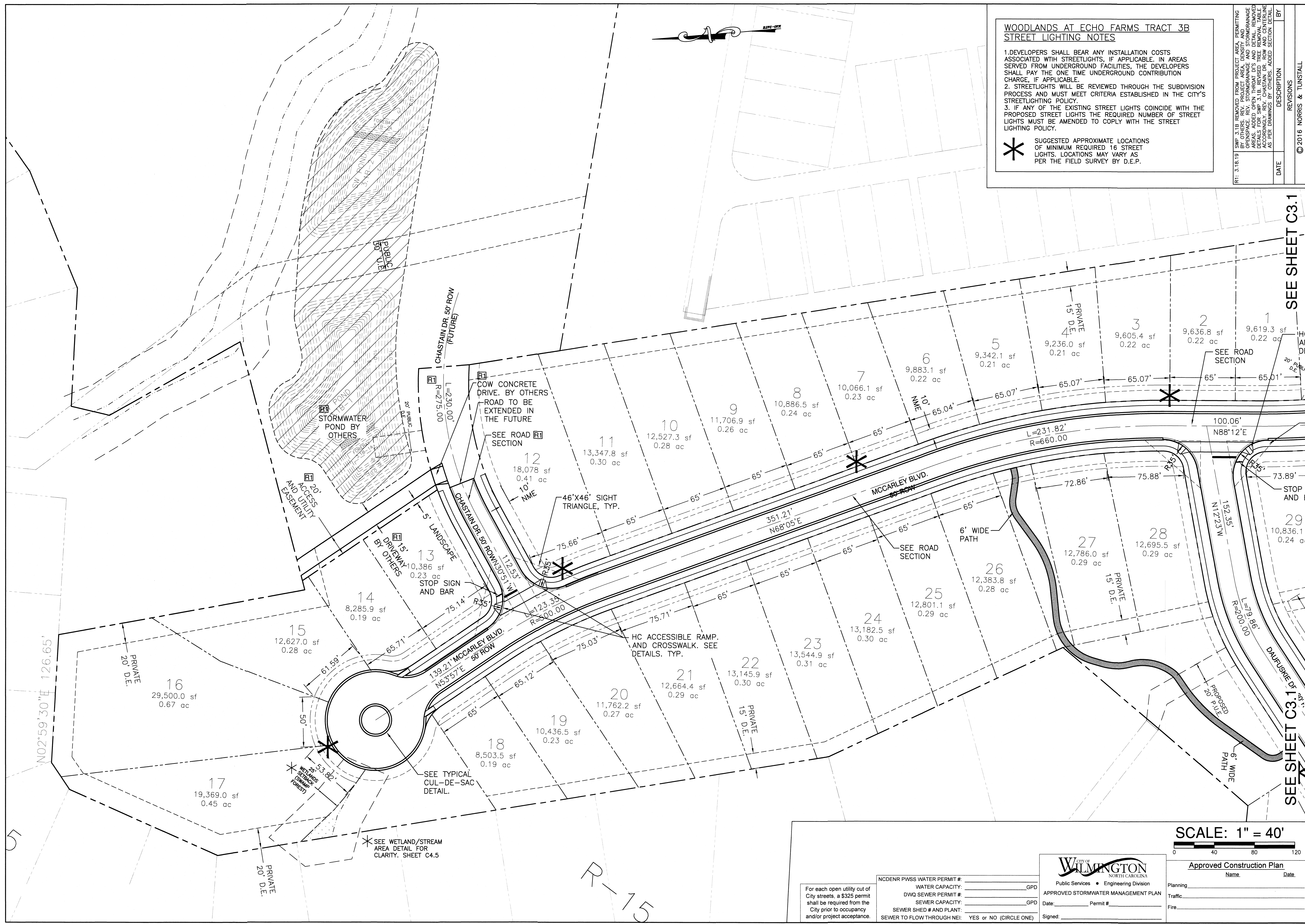
For each open utility out of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NC DENR 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)

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

SCALE: 1" = 40'  
0 40 80 120

Approved Construction Plan  
Name \_\_\_\_\_ Date \_\_\_\_\_  
Planning \_\_\_\_\_  
Traffic \_\_\_\_\_  
Fire \_\_\_\_\_



**WOODLANDS AT ECHO FARMS TRACT 3B STREET LIGHTING NOTES**

1. DEVELOPERS SHALL BEAR ANY INSTALLATION COSTS ASSOCIATED WITH STREETLIGHTS. IN AREAS SERVED FROM UNDERGROUND FACILITIES, THE DEVELOPERS SHALL PAY THE ONE TIME UNDERGROUND CONTRIBUTION CHARGE, IF APPLICABLE.
2. STREETLIGHTS WILL BE REVIEWED THROUGH THE SUBDIVISION PROCESS AND MUST MEET CRITERIA ESTABLISHED IN THE CITY'S STREETLIGHTING POLICY.
3. IF ANY OF THE EXISTING STREET LIGHTS COINCIDE WITH THE PROPOSED STREET LIGHTS THE REQUIRED NUMBER OF STREET LIGHTS MUST BE AMENDED TO COMPLY WITH THE STREET LIGHTING POLICY.

\* SUGGESTED APPROXIMATE LOCATIONS OF MINIMUM REQUIRED 16 STREET LIGHTS. LOCATIONS MAY VARY AS PER THE FIELD SURVEY BY D.E.P.

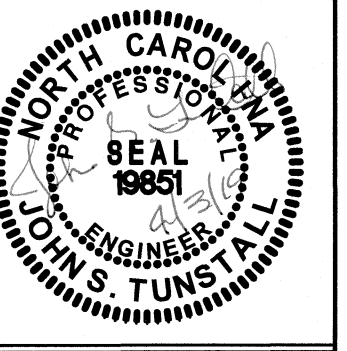
DATE	DESCRIPTION	BY
	SWP 3.1B REMOVED FROM PROJECT AREA, PERMITTING BY OTHERS. REV. PROJECT AREA, DENSITY AND OPENSPACE. REV. STORMWATER AND STORMWATER DETENTION. REV. TREE REMOVAL TABLE DETAILS FOR SWP 3.1B. REVISED TREE REMOVAL TABLE ACCORDINGLY. REV. CHASTAIN DR. ROW AND CENTERLINE AS PER DRAWINGS BY OTHERS. ADDED SECTION DETAIL.	
	REVISIONS	
	© 2016 NORRIS & TUNSTALL	

LAYOUT PLAN  
WOODLANDS AT ECHO FARMS  
4114 ECHO FARMS BLVD.  
WILMINGTON, NC 28412  
NEW HANOVER COUNTY

LAND OWNER/APPLICANT  
ECHO FARMS, LLC  
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CN4000 FORSGATE DRIVE  
CRANBURY, NJ 08512  
732-521-2900

**NORRIS & TUNSTALL**  
CONSULTING ENGINEERS P.C.  
1429 ASH-LITTLE RIVER RD, NW  
WILMINGTON, NC 28401  
PHONE: (910) 347-9655

License #C-3641  
**16083**  
DES. JST  
CHK. JPN  
DRWN. NKS  
DATE 6/27/18



**C3**

SCALE: 1" = 40'

Approved Construction Plan  
Name: \_\_\_\_\_ Date: \_\_\_\_\_

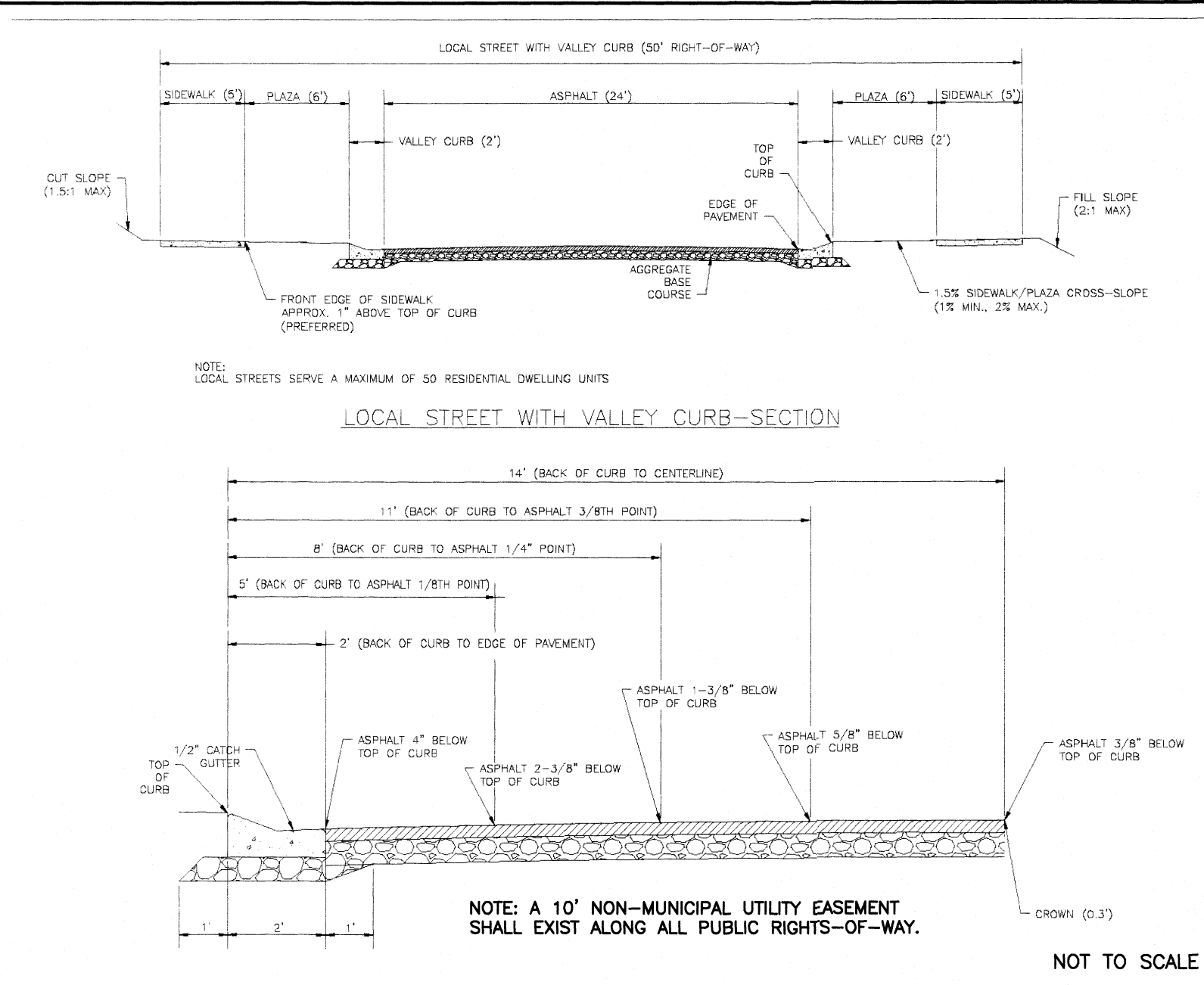
City of Wilmington  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN  
Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
Signed: \_\_\_\_\_

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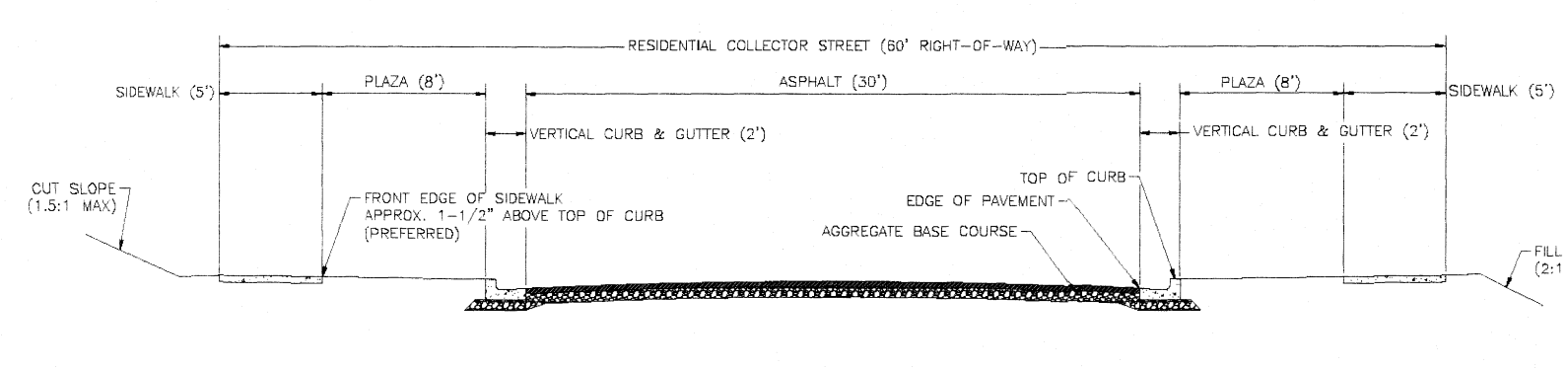
MCDENR PWSS WATER PERMIT #: \_\_\_\_\_ GPD  
WATER CAPACITY: \_\_\_\_\_ GPD  
DWQ SEWER PERMIT #: \_\_\_\_\_ GPD  
SEWER CAPACITY: \_\_\_\_\_ GPD  
SEWER SHED # AND PLANT: \_\_\_\_\_  
SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

Planning \_\_\_\_\_  
Traffic \_\_\_\_\_  
Fire \_\_\_\_\_

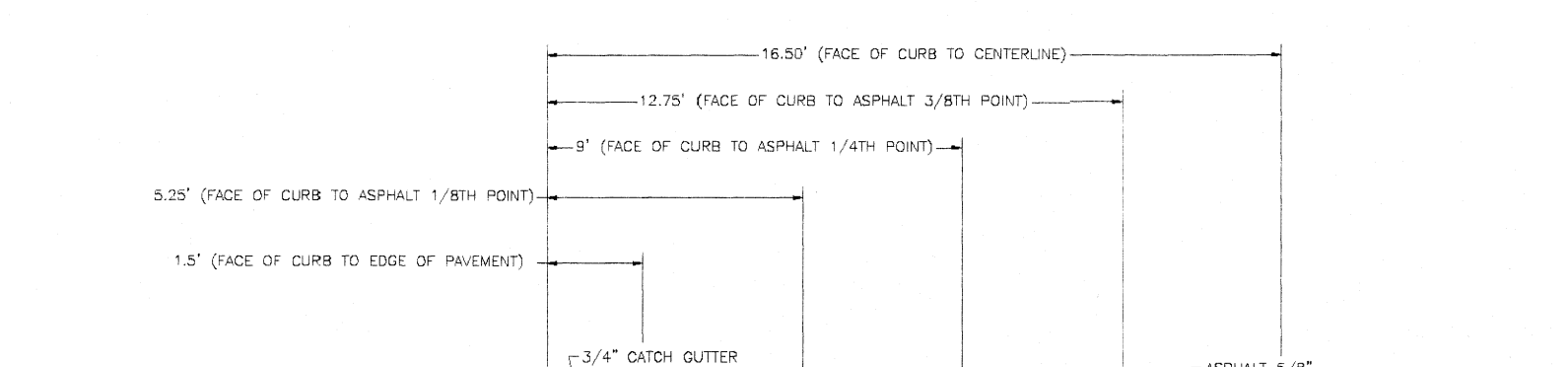
SEE SHEET C3.1



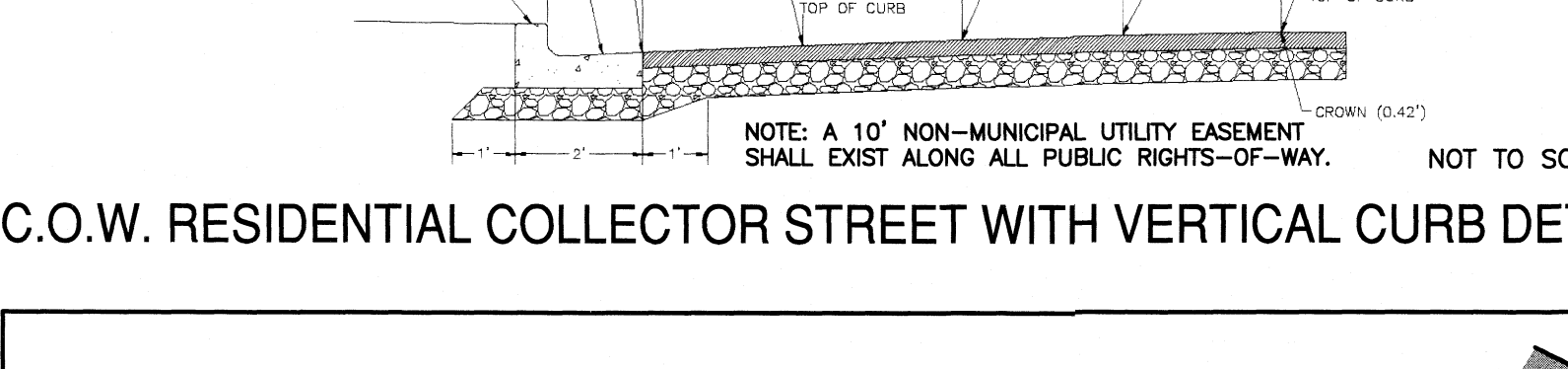
C.O.W. LOCAL STREET WITH VALLEY CURB SECTION



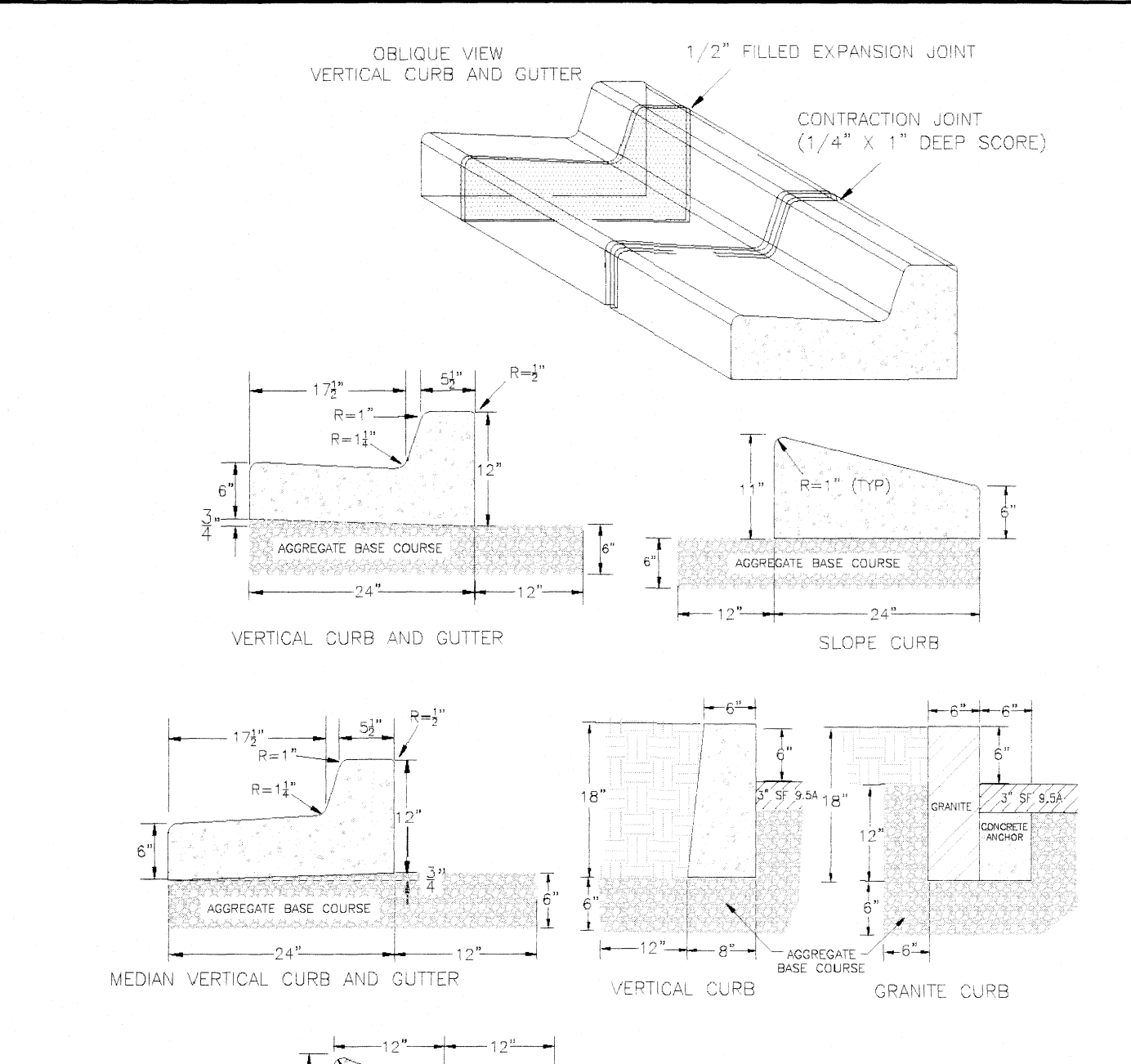
C.O.W. LOCAL STREET WITH VALLEY CURB DETAIL



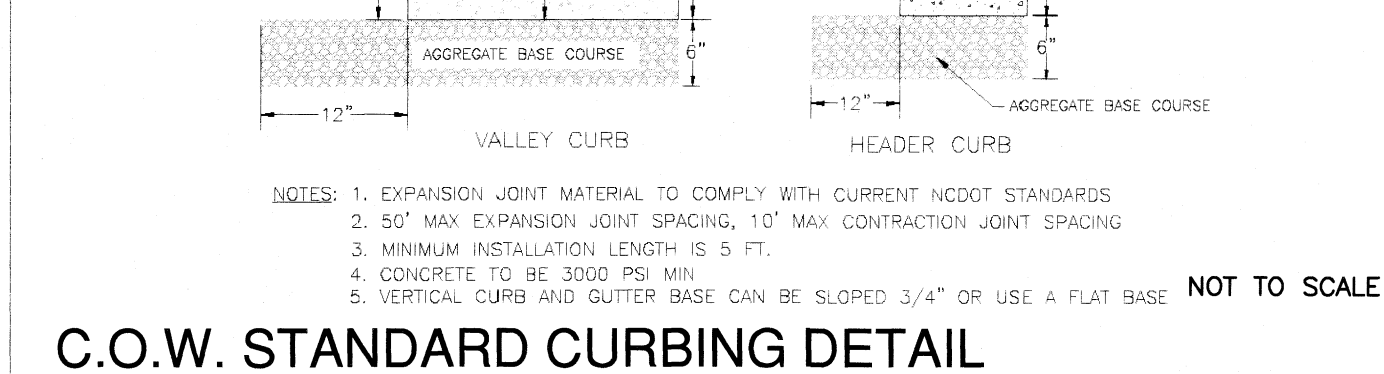
C.O.W. RESIDENTIAL COLLECTOR STREET WITH VALLEY CURB SECTION



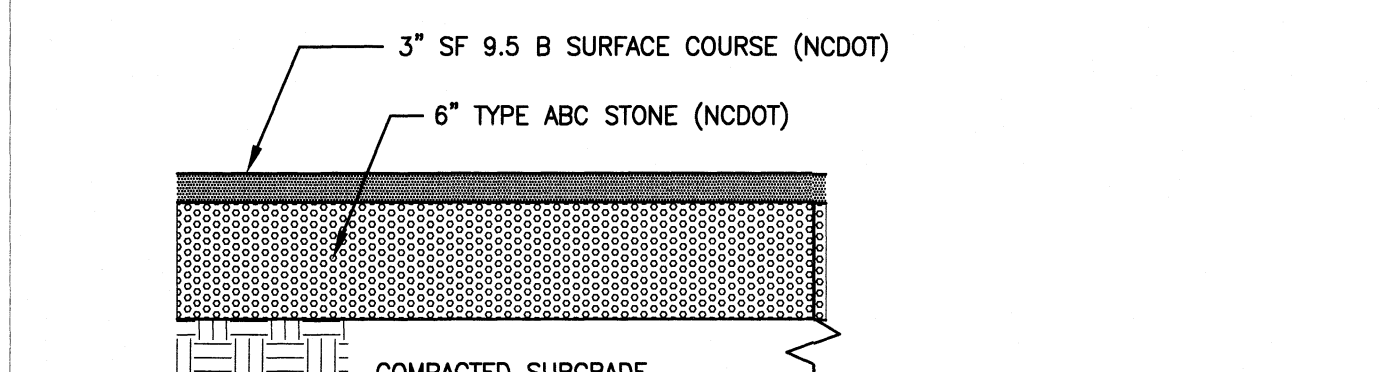
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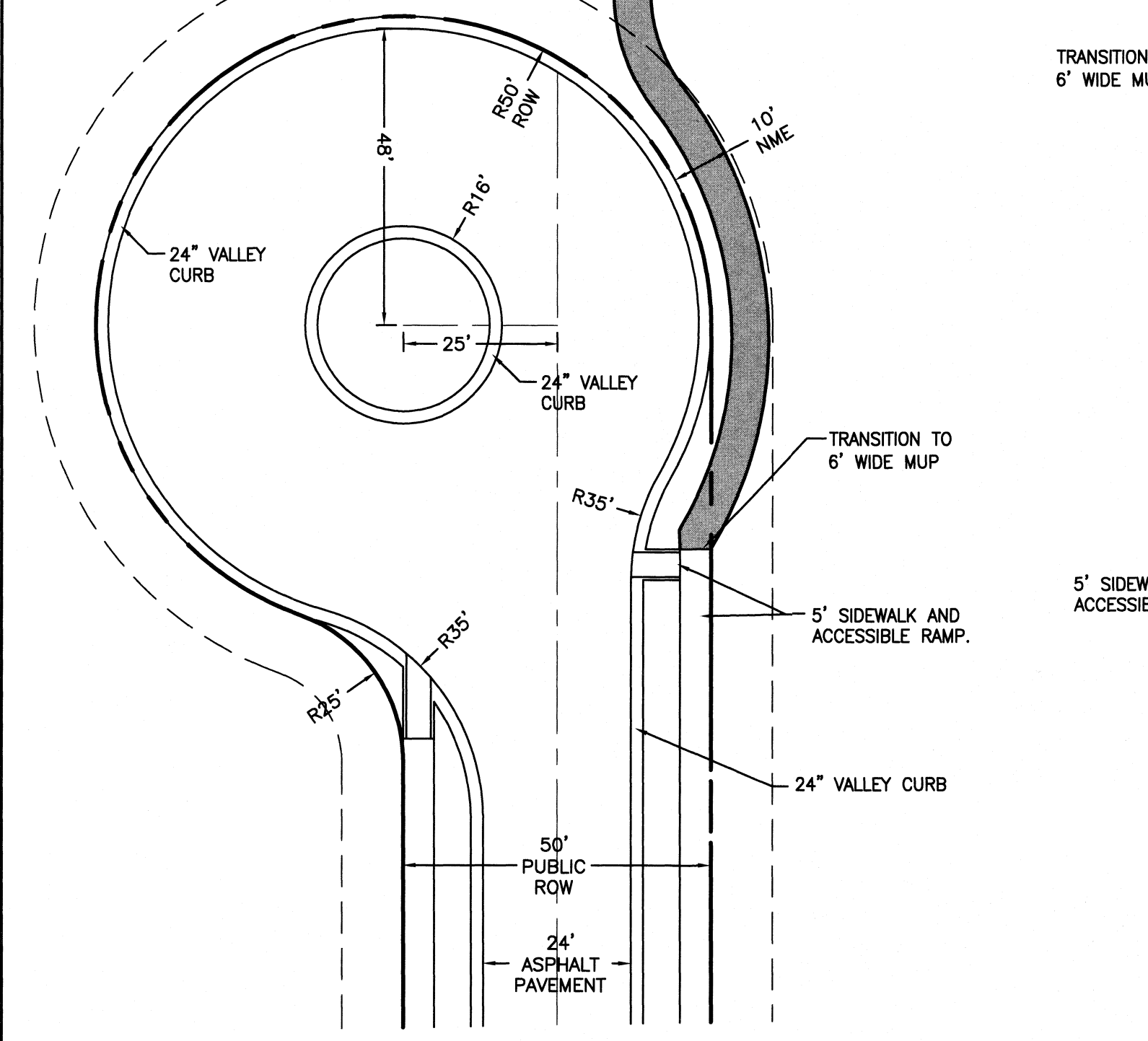
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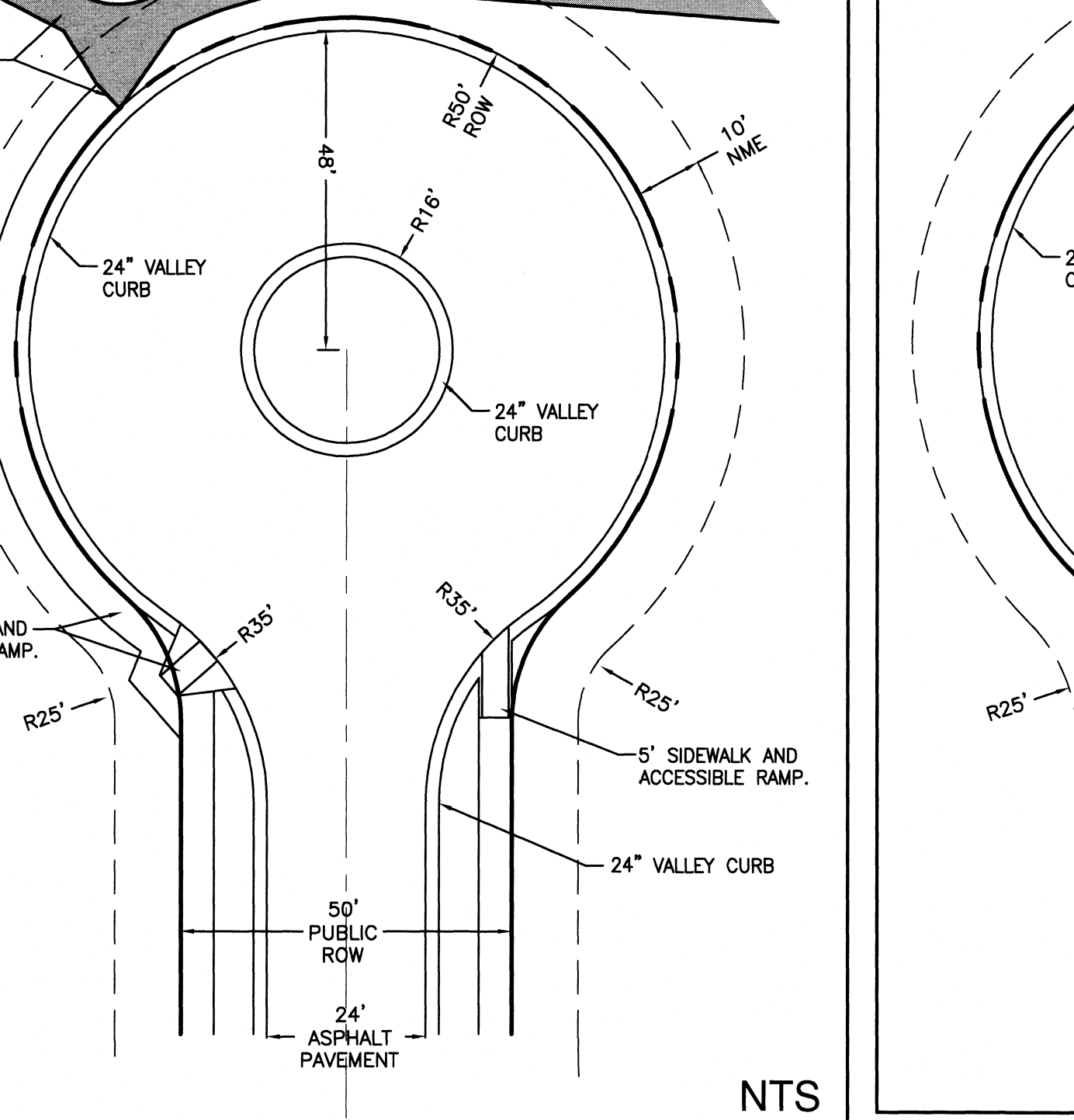
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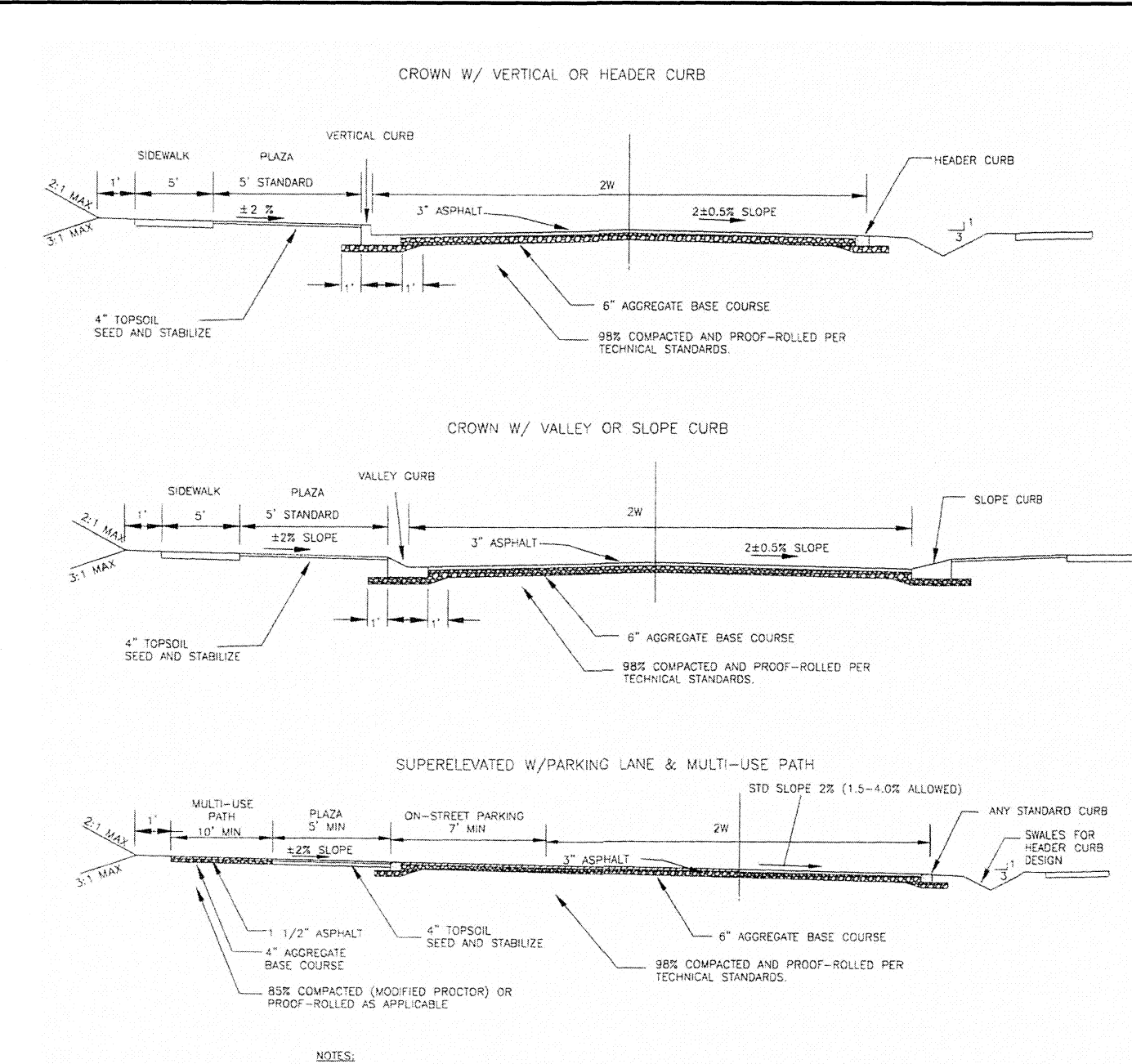
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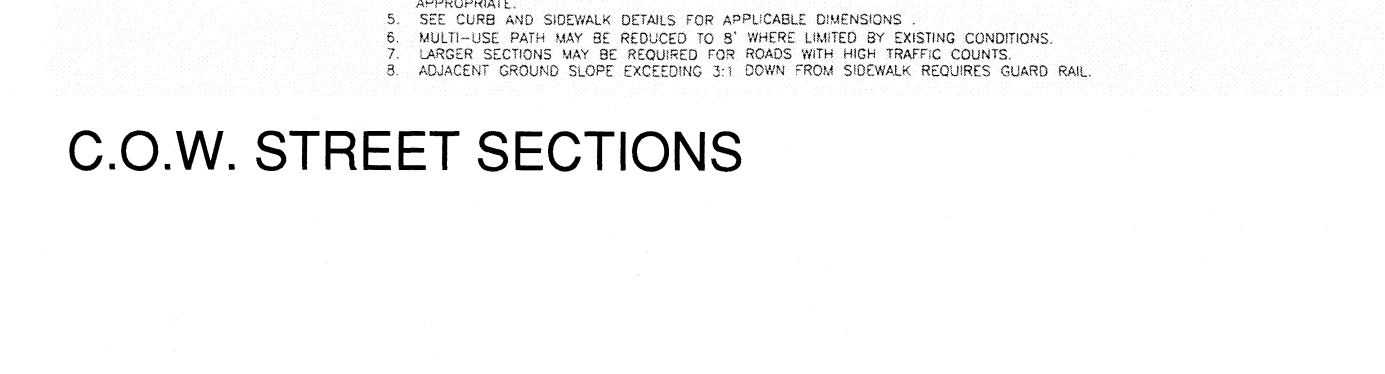
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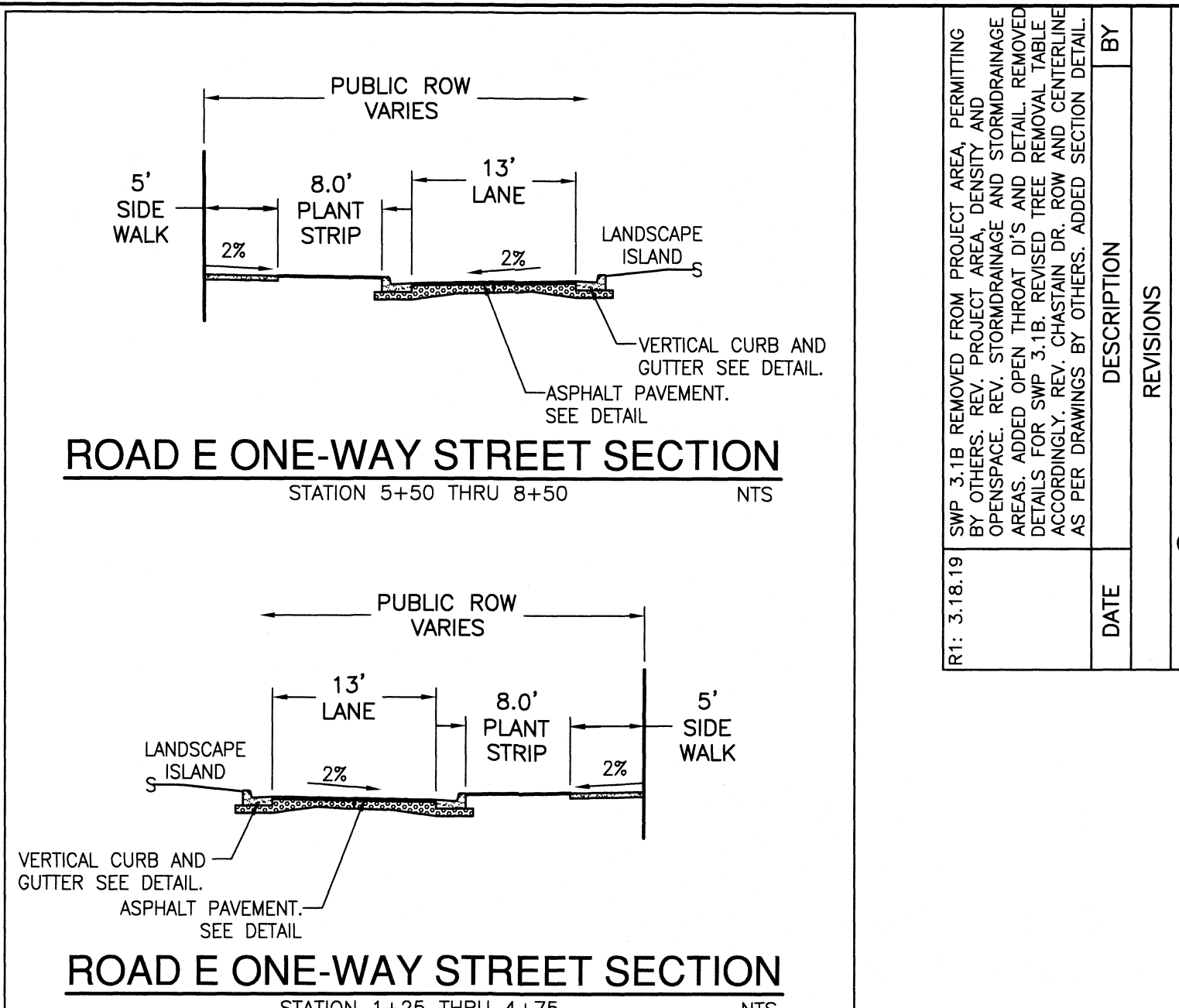
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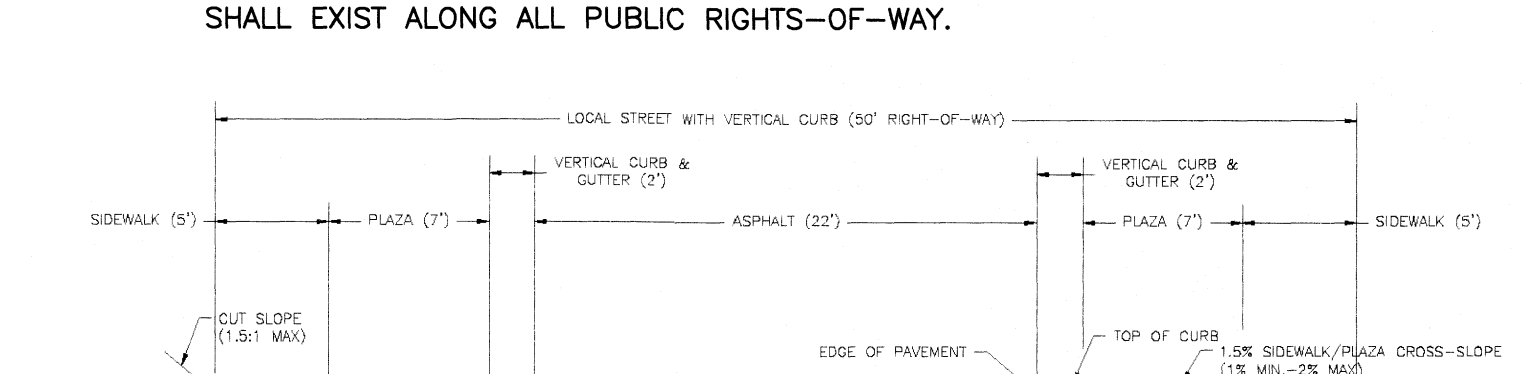
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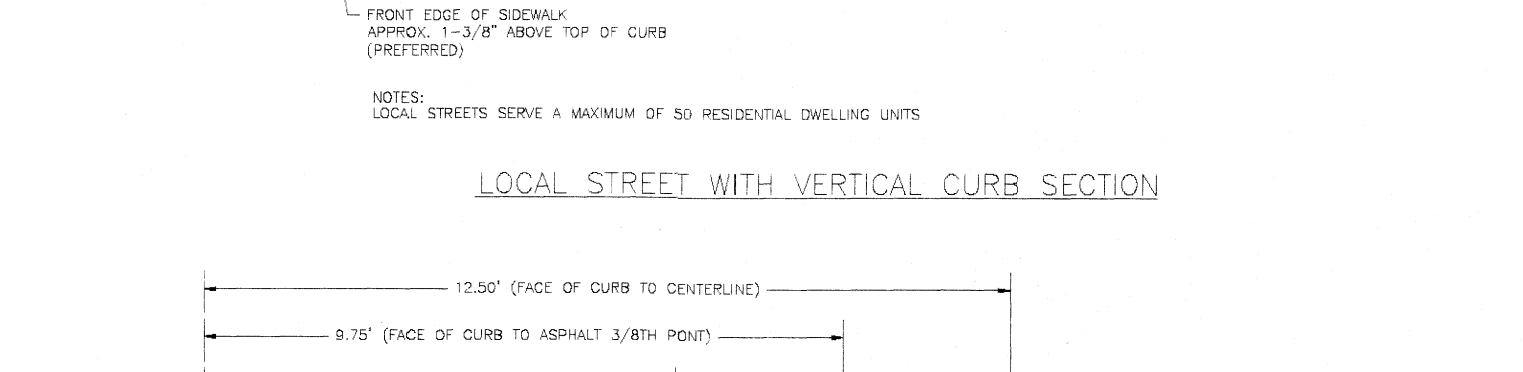
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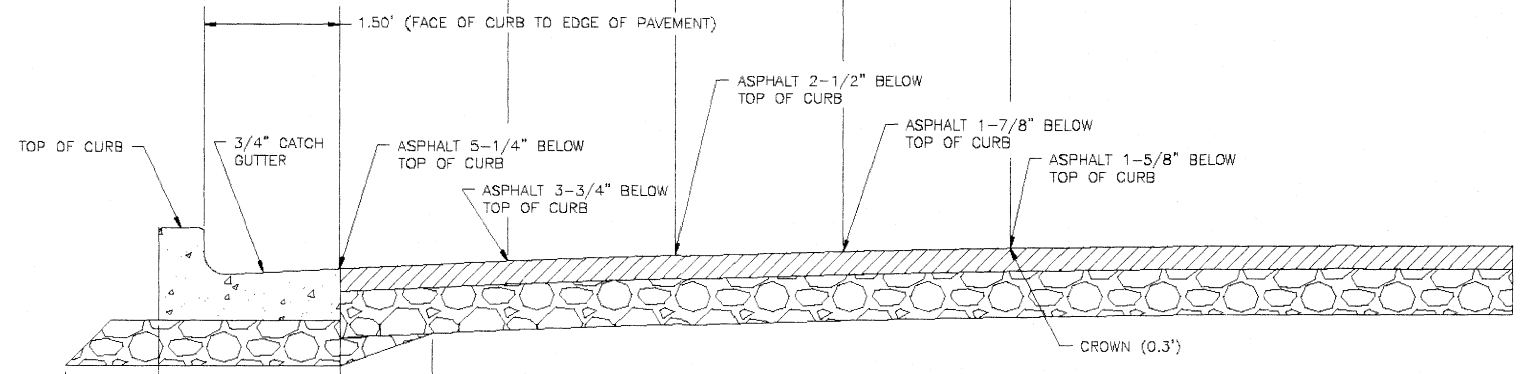
ROAD E ONE-WAY STREET SECTION



ROAD E ONE-WAY STREET SECTION



C.O.W. LOCAL STREET WITH VALLEY CURB SECTION



C.O.W. LOCAL STREET WITH VALLEY CURB SECTION

CITY OF WILMINGTON STANDARD NOTES:

- CONTACT THE NORTH CAROLINA ONE CALL CENTER PRIOR TO DOING ANY DIGGING AT 1-800-832-4949.
- PRIOR TO ANY CLEARING, GRADING OR CONSTRUCTION ACTIVITY, TREE PROTECTION FENCING WILL BE INSTALLED AROUND PROTECTED TREES OR GROVES OF TREES AND NO CONSTRUCTION WORKERS, TOOLS, MATERIALS, OR VEHICLES ARE PERMITTED WITHIN THE TREE PROTECTION FENCING.
- ALL PAVEMENT MARKINGS IN PUBLIC RIGHTS-OF-WAY AND FOR DRIVEWAYS ARE TO BE THERMOPLASTIC AND MEET CITY AND/OR NCDOT STANDARDS.
- ALL PARKING SHALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
- INSTALL REFLECTORS PER CITY AND NCDOT STANDARDS. TRAFFIC ENGINEERING MUST APPROVE OF PAVEMENT MARKING LAYOUT PRIOR TO ACTUAL STRIPING.
- ALL TRAFFIC CONTROL SIGNS AND MARKINGS OFF THE RIGHT-OF-WAY ARE TO BE MAINTAINED BY THE PROPERTY OWNER IN ACCORDANCE WITH MUTCD STANDARDS. 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 341-7888 TO DISCUSS INSTALLATION OF TRAFFIC AND STREET NAME SIGNS. POSTED STREET NAMES MUST BE APPROVED PRIOR TO INSTALLATION OF STREET NAME SIGNS.
- CONTACT TRAFFIC ENGINEERING AT 341-7888 FORTY-EIGHT HOURS PRIOR TO ANY EXCAVATION IN THE RIGHT-OF-WAY.
- A UTILITY CUT PERMIT IS REQUIRED FOR EACH OPEN CUT OF A CITY STREET. CONTACT 341-8888 FOR MORE DETAILS. IN CERTAIN CASES AN ENTIRE RESURFACING OF THE AREA BEING OPEN CUT MAY BE REQUIRED.
- ANY BROKEN OR MISSING SIDEWALK PANELS, DRIVEWAY PANELS, AND CURBING WILL BE REPLACED.
- CONTACT TRAFFIC ENGINEERING AT 341-7888 TO DISCUSS STREET LIGHTING OPTIONS.
- PROJECT SHALL COMPLY WITH CFPWA CROSS CONNECTION CONTROL REQUIREMENTS. WATER METER(S) CANNOT BE RELEASED UNTIL ALL REQUIREMENTS ARE MET AND THE STATE HAS GIVEN THEIR FINAL APPROVAL. CALL 343-3910 FOR INFORMATION.
- IF THE CONTRACTOR DESIRES CFPWA WATER FOR CONSTRUCTION HE SHALL APPLY IN ADVANCE FOR THIS SERVICE AND MUST PROVIDE A REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTION DEVICE ON THE DEVELOPER'S SIDE OF THE WATER METER BOX.
- ANY IRRIGATION SYSTEM SUPPLIED BY CFPWA WATER SHALL COMPLY WITH CFPWA CROSS CONNECTION CONTROL REGULATIONS. CALL 332-8558 FOR INFORMATION.
- ANY BACKFLOW PREVENTION DEVICES REQUIRED BY CFPWA WILL NEED TO BE ON THE LIST OF APPROVED DEVICES BY USC/CCHIR OR ASSE.
- WHEN PVC WATER MAINS AND/OR POLYETHYLENE SERVICES ARE PROPOSED, THE PIPES ARE TO BE MARKED WITH NO. 10 INSULATED SINGLE STRAND COPPER WIRE INSTALLED THE ENTIRE LENGTH AND SECURED TO ALL VALVES. THIS WIRE IS TO BE ACCESSIBLE AT ALL FIRE HYDRANTS AND WATER METER BOXES TO AID IN FUTURE LOCATION OF FACILITIES.
- THE NUMBER AND SPACING OF DRIVEWAYS FOR ALL INTERCONNECTED SITES WILL BE DETERMINED BY THE COMBINED FRONTAGE OF THE INTERCONNECTED PROPERTIES.
- UNDERGROUND FIRE LINE MUST BE PERMITTED AND INSPECTED BY THE WILMINGTON FIRE DEPARTMENT FROM THE PUBLIC ROW TO THE BUILDING. CONTACT THE WILMINGTON FIRE DEPARTMENT DIVISION OF FIRE AND LIFE SAFETY AT 910-343-0696 FOR ADDITIONAL INFORMATION.
- A LANDSCAPE PLAN INDICATING THE LOCATION OF REQUIRED STREET TREES SHALL BE SUBMITTED TO THE CITY OF WILMINGTON TRAFFIC ENGINEER DIVISION AND PARKS AND RECREATION DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO THE RECORDING OF THE FINAL PLAN.
- IF AN IRRIGATION SYSTEM IS PLANNED FOR THE SITE, UTILIZE MOISTURE SENSORS.
- ALL PROPOSED VEGETATION WITHIN THE SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30'-10'.
- PLEASE CONSIDER INCORPORATING XERIC LANDSCAPING FOR ALL NEW LANDSCAPING.
- THE CONTRACTOR WILL MAINTAIN ALL-WEATHER EMERGENCY ACCESS TO CONSTRUCTION SITE AT ALL TIMES.

NCDENR PWSS WATER PERMIT #:	
WATER CAPACITY:	GPD
DWQ SEWER PERMIT #:	
SEWER CAPACITY:	GPD
SEWER SHED # AND PLANT:	
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Approved Construction Plan

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Planning: \_\_\_\_\_

Traffic: \_\_\_\_\_

Fire: \_\_\_\_\_

Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

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

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

NOTES AND DETAILS

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

CRANFURY, NJ 08512

732-521-2900

NORRIS & TUNSTALL

CONSULTING ENGINEERS P.C.

1429 ASH-LITTLE RIVER RD. NW

ASH, NC 28401

PHONE: (910) 261-5900

902 MARKET STREET

WILMINGTON, NC 28401

PHONE: (910) 343-9653

16083

DES: JST

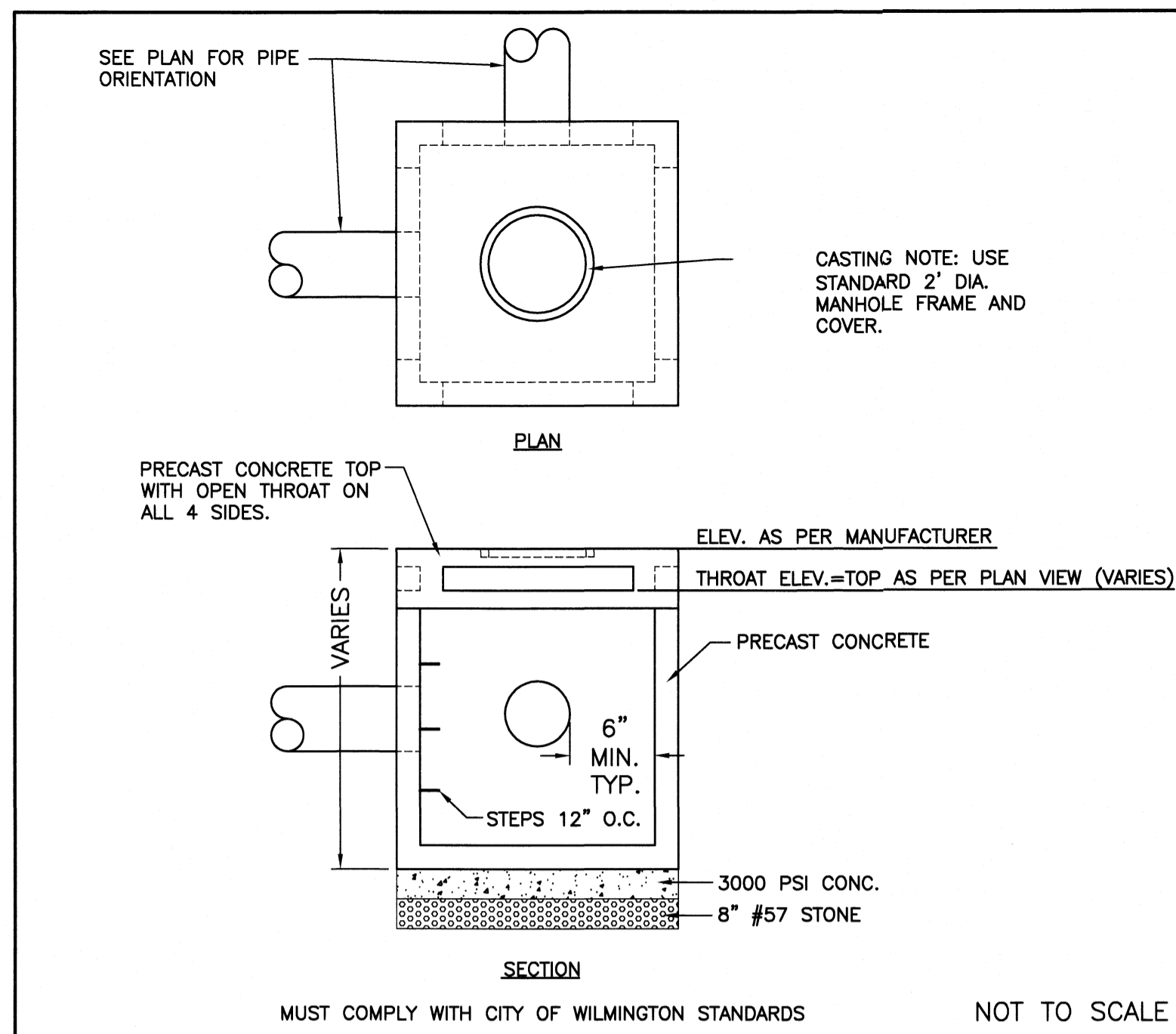
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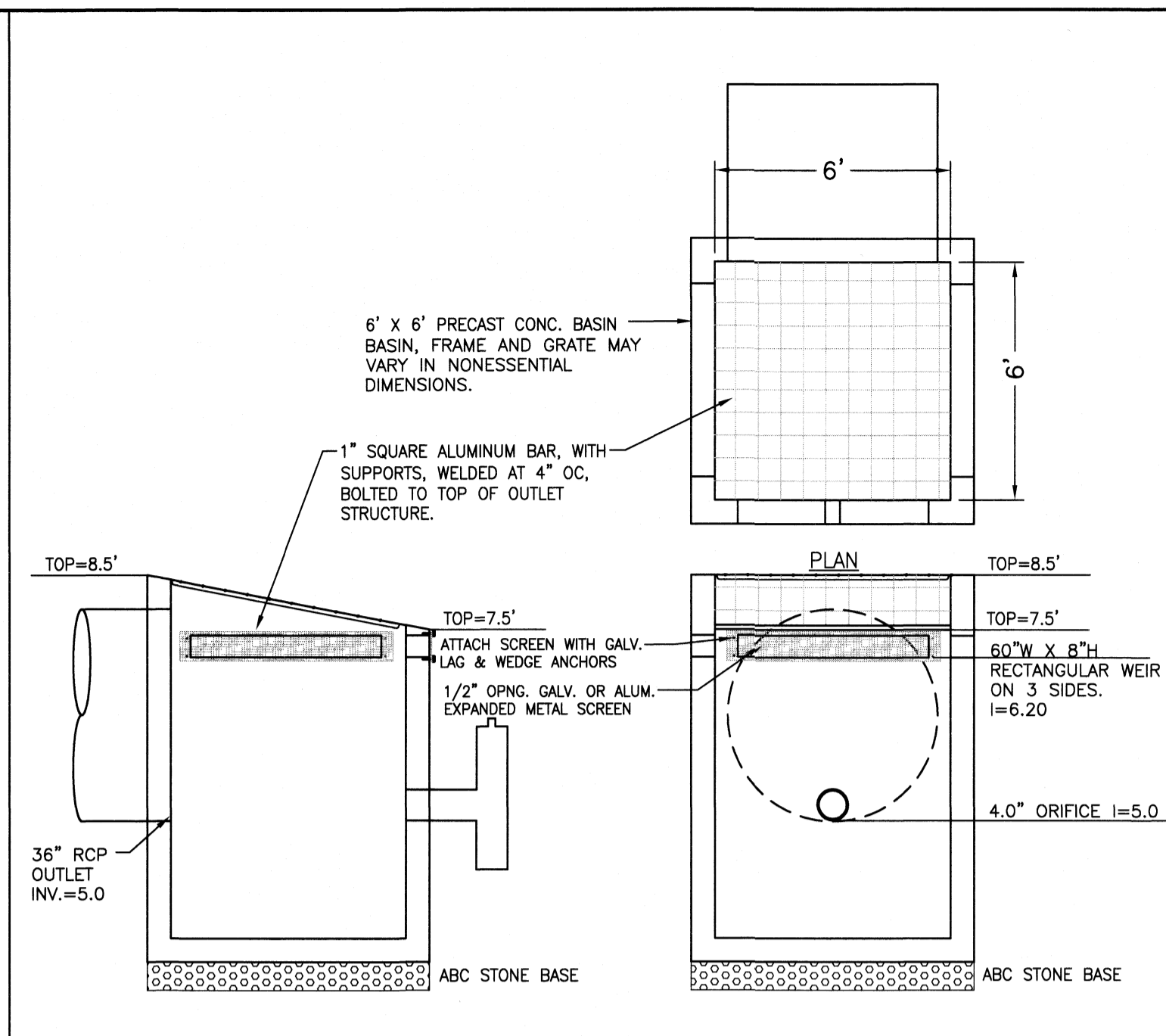
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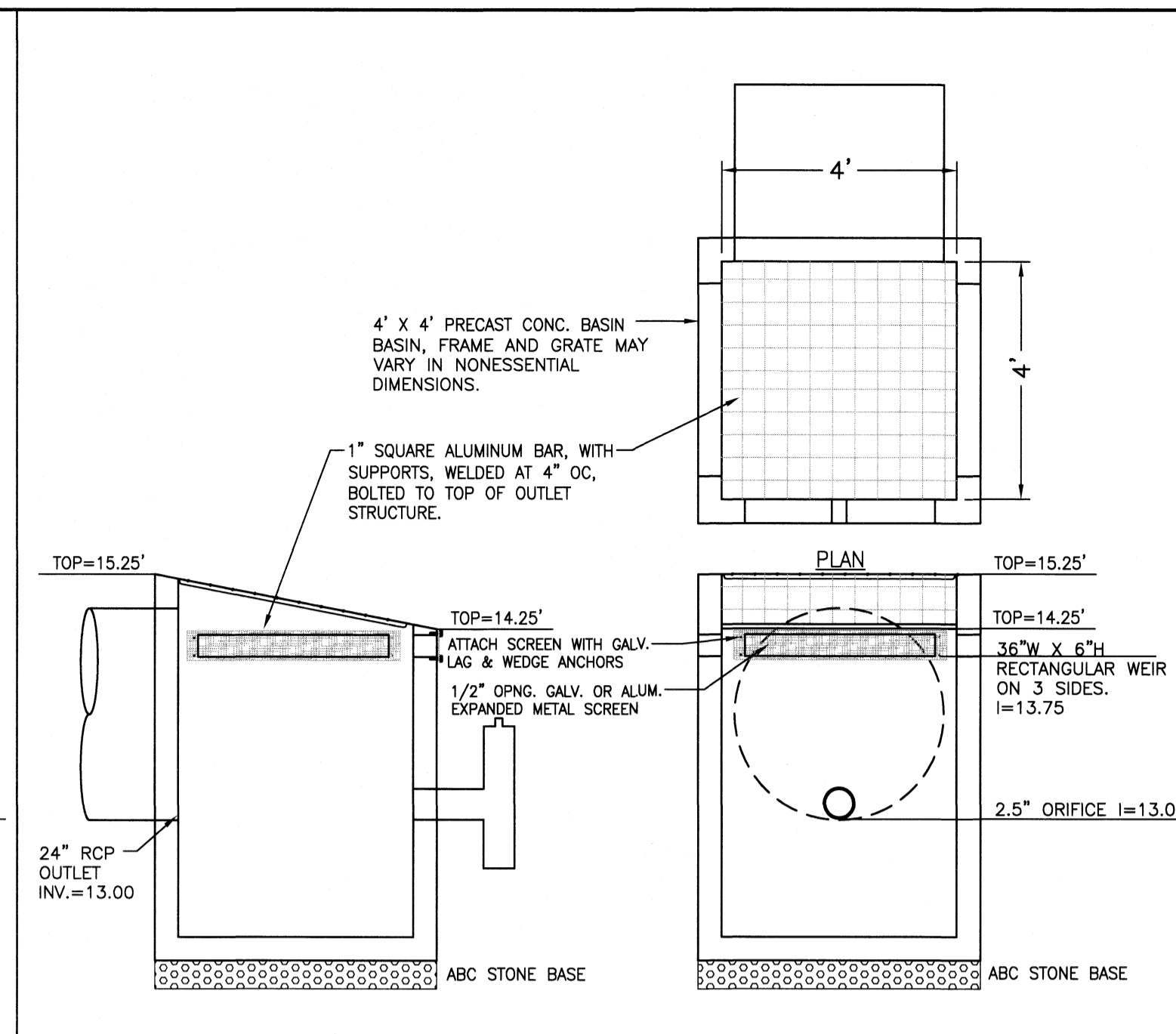
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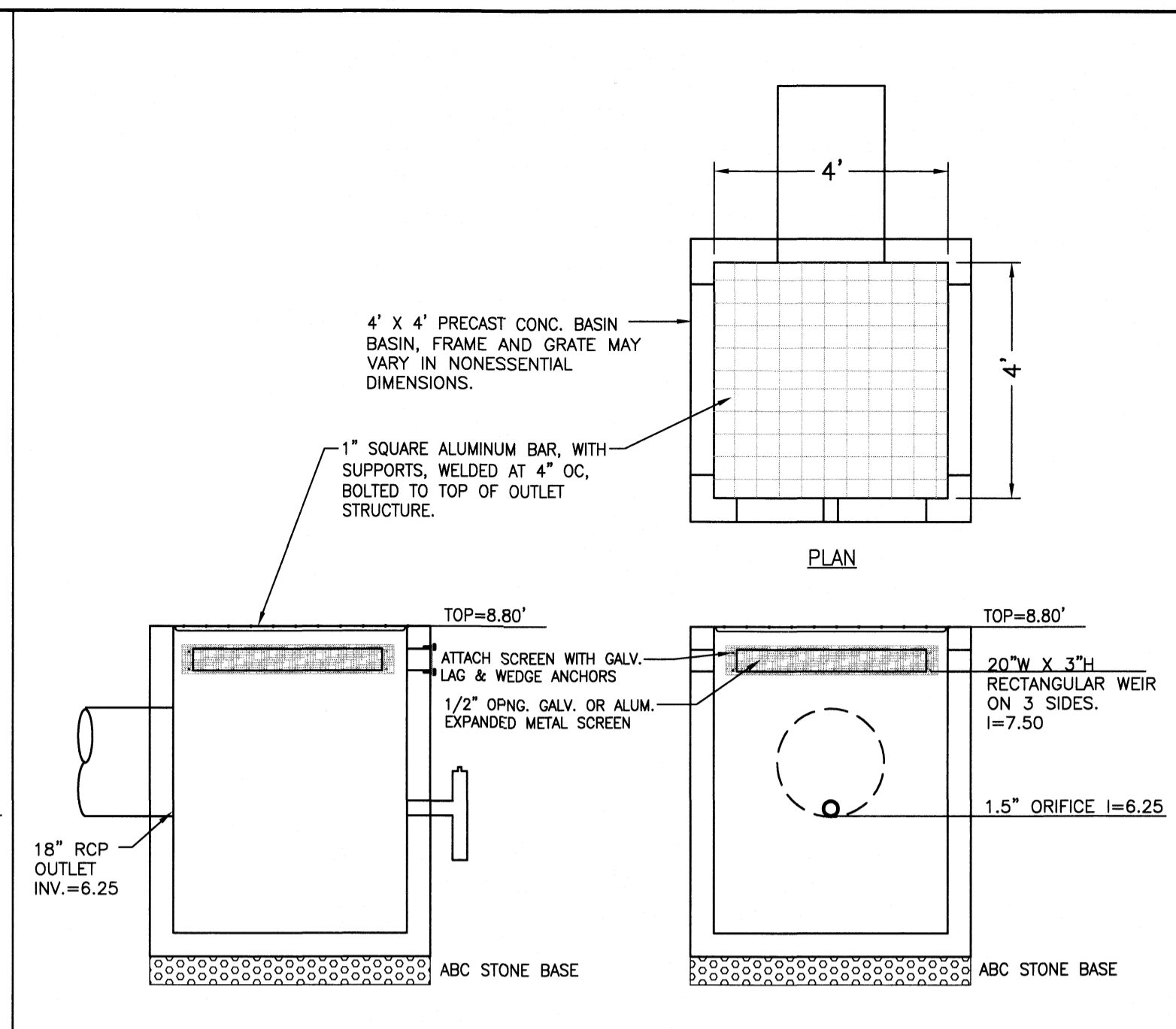
1 DROP INLET DETAIL WITH OPEN THROAT TOP <sup>R1</sup>



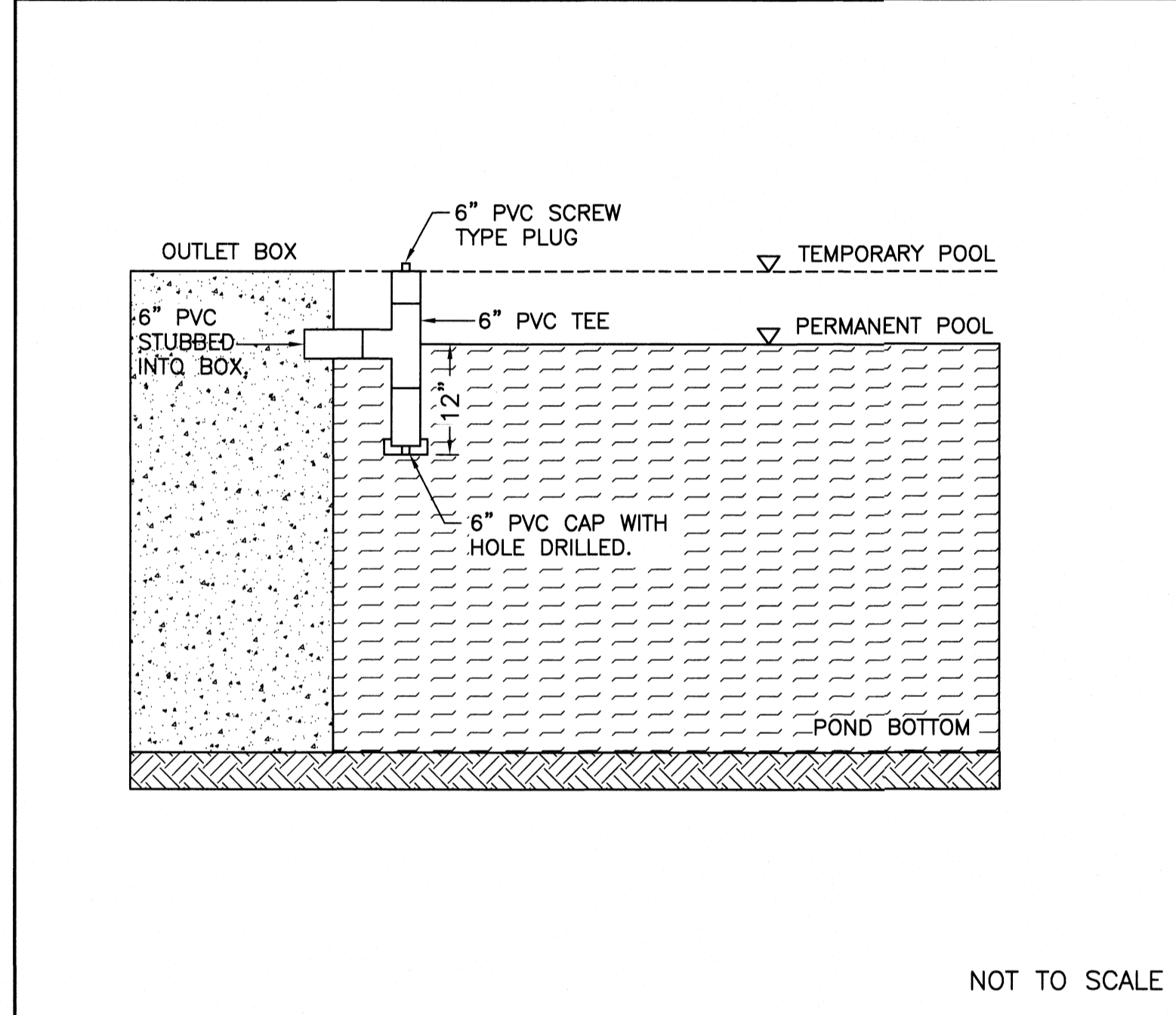
2 SW POND 3.2B OUTLET STRUCTURE



3 SW POND 3.3B OUTLET STRUCTURE



4 SW POND 3.4B OUTLET STRUCTURE

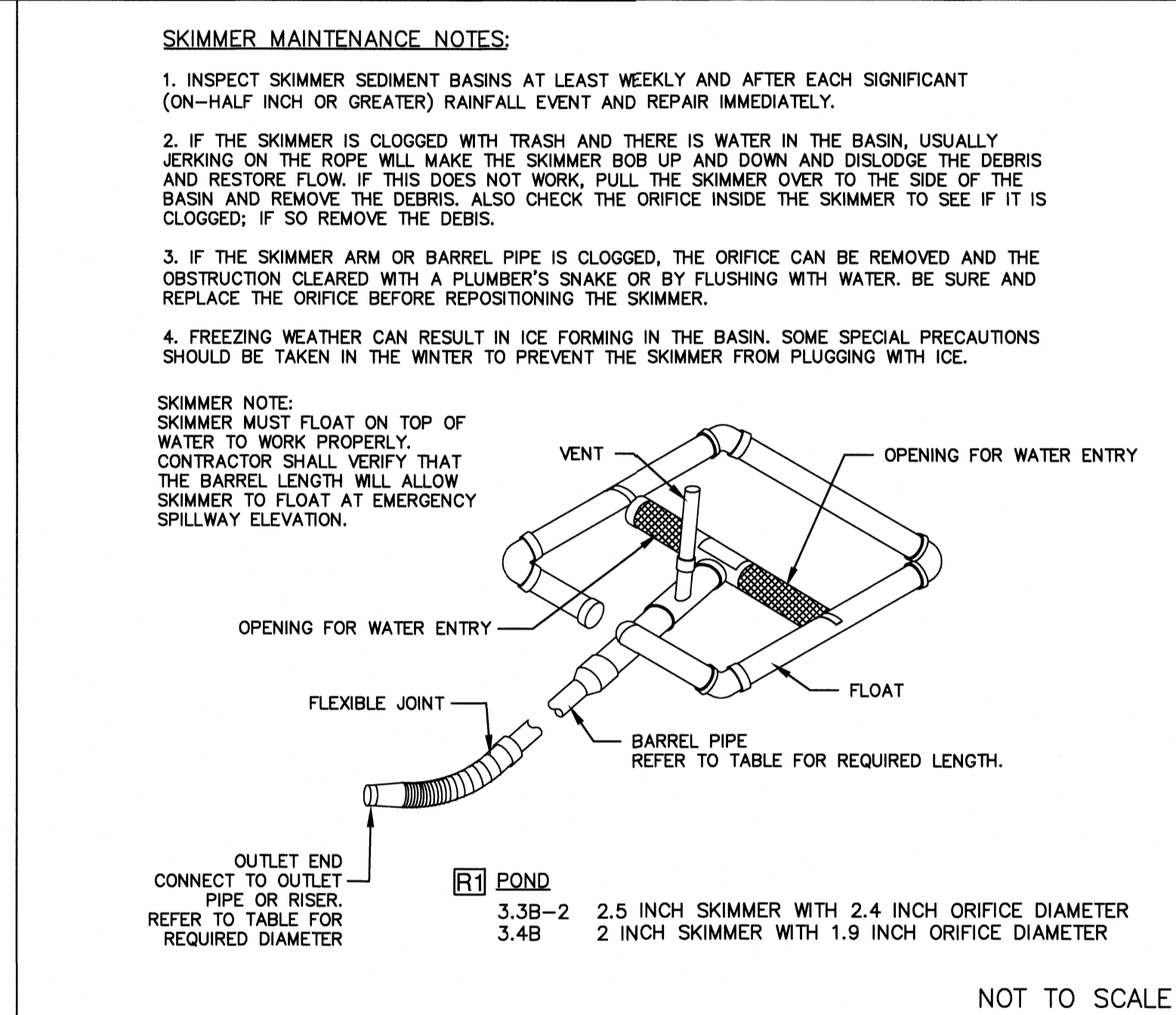


5 SUBMERGED ORIFICE OUTLET CONFIGURATION

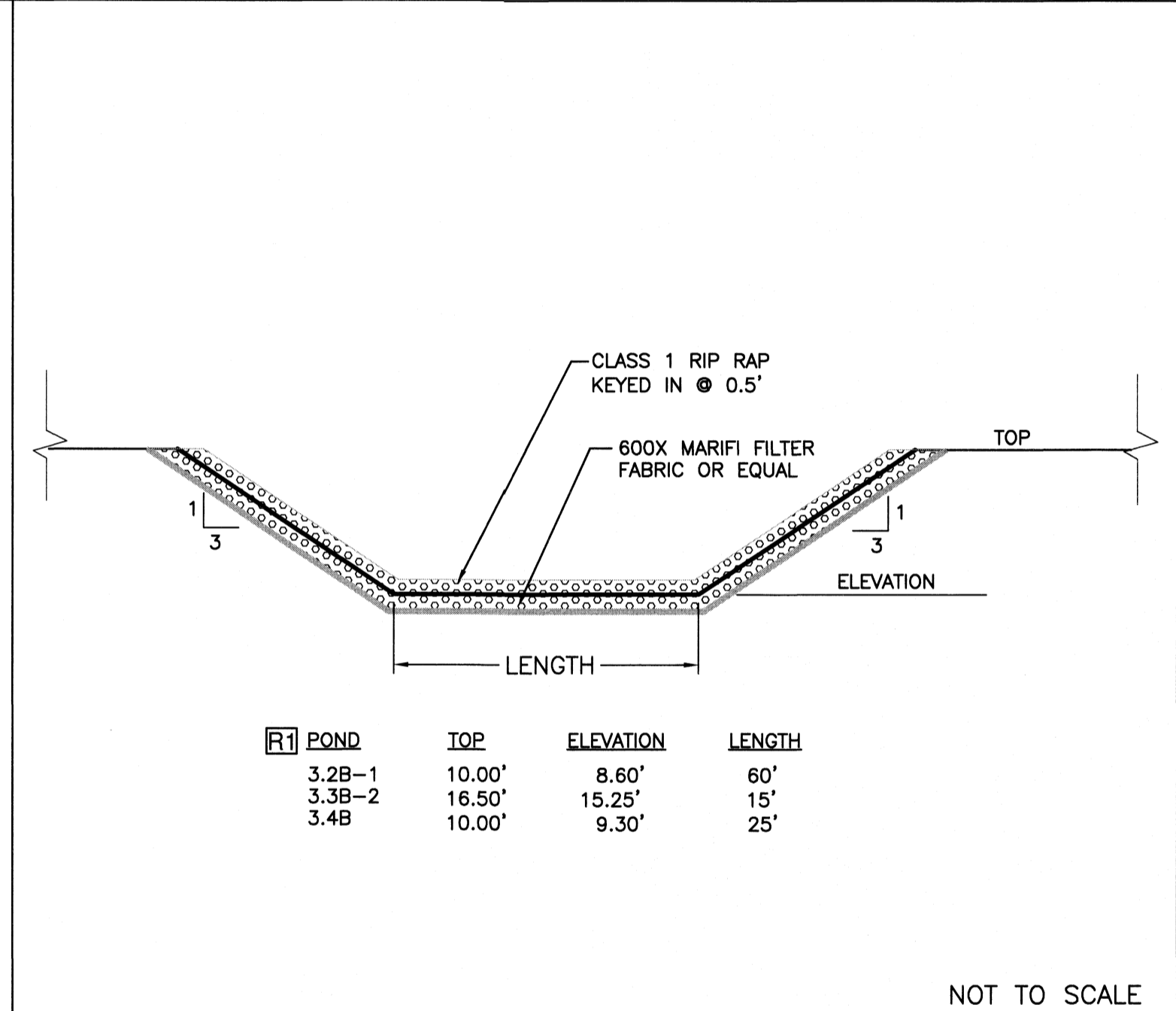
**REVISIONS**

DATE	DESCRIPTION	BY
3.18.19	SWP 3.1B REMOVED FROM PROJECT AREA, PERMITTING BY OTHERS. REV. PROJECT AREA, DENSITY AND OPENSPACE. REV. STORMDRAINAGE AND STORMDRAINAGE AREAS. ADDED OPEN THROAT DI'S AND DETAIL. REMOVED DETAILS FOR SWP 3.1B. REVISED TREE REMOVAL TABLE ACCORDINGLY. REV. CHASTAIN DR. ROW AND CENTERLINE AS PER DRAWINGS BY OTHERS. ADDED SECTION DETAIL.	

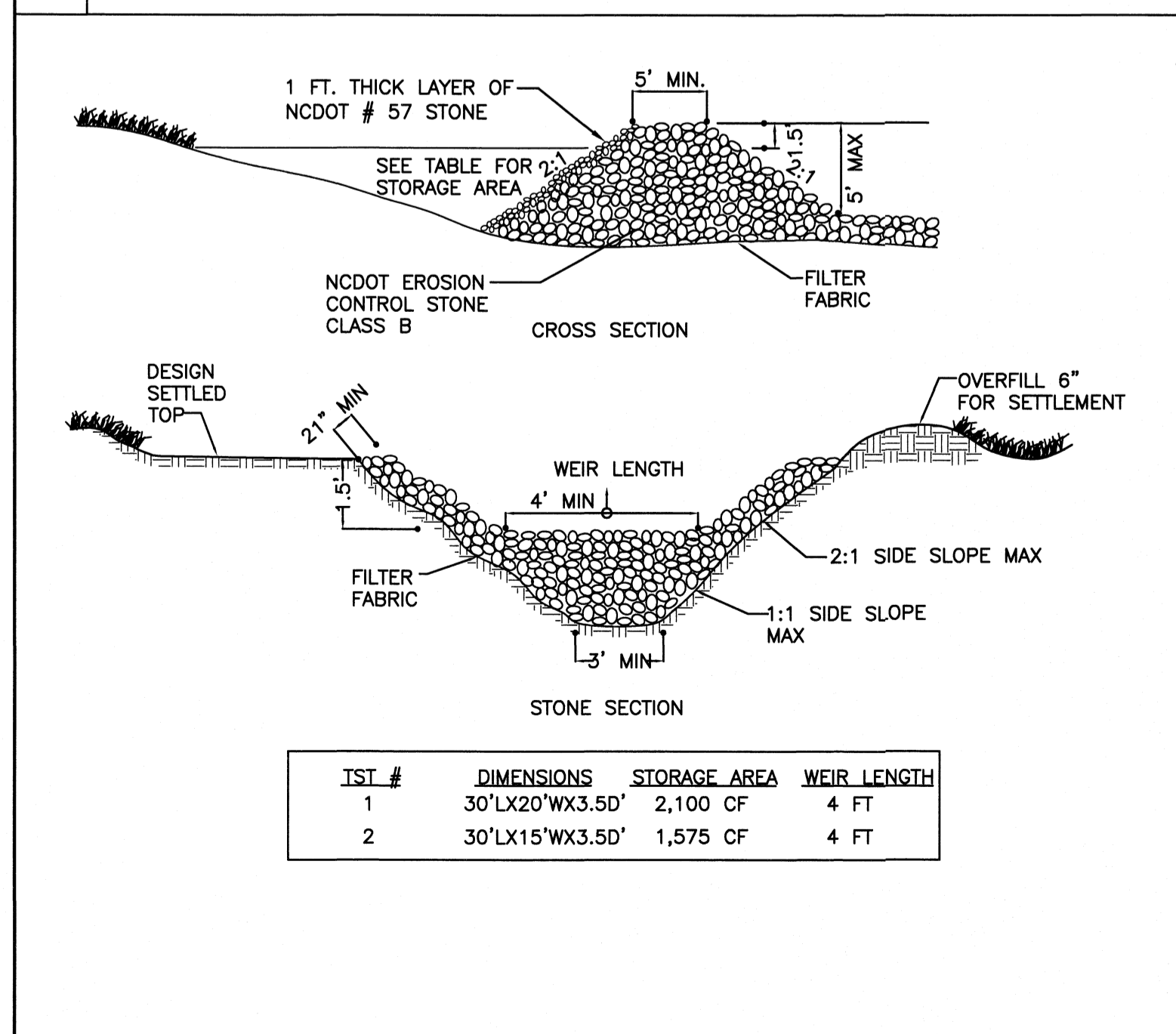
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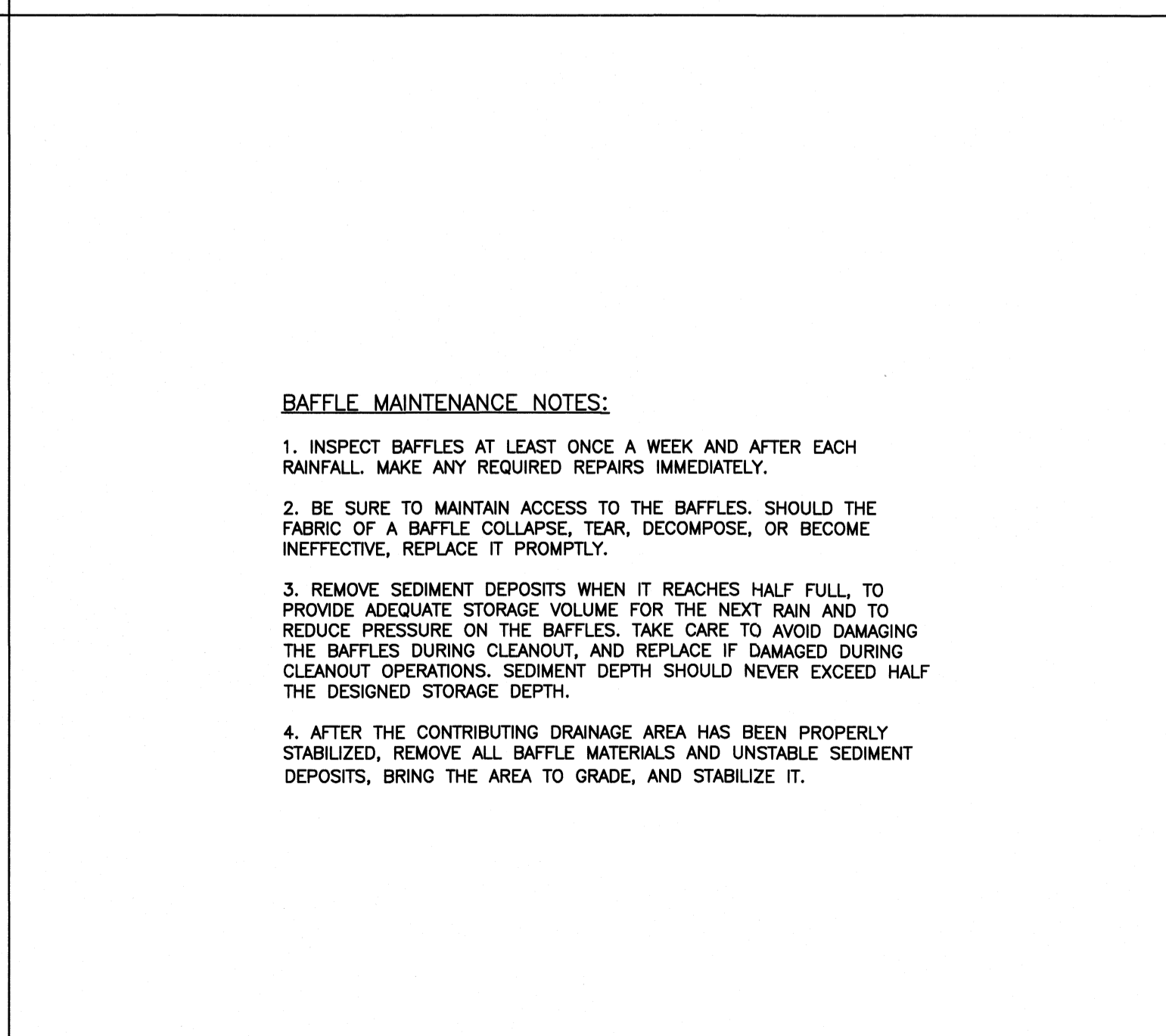
6 STANDARD SKIMMER DETAIL (FAIRCLOTH)



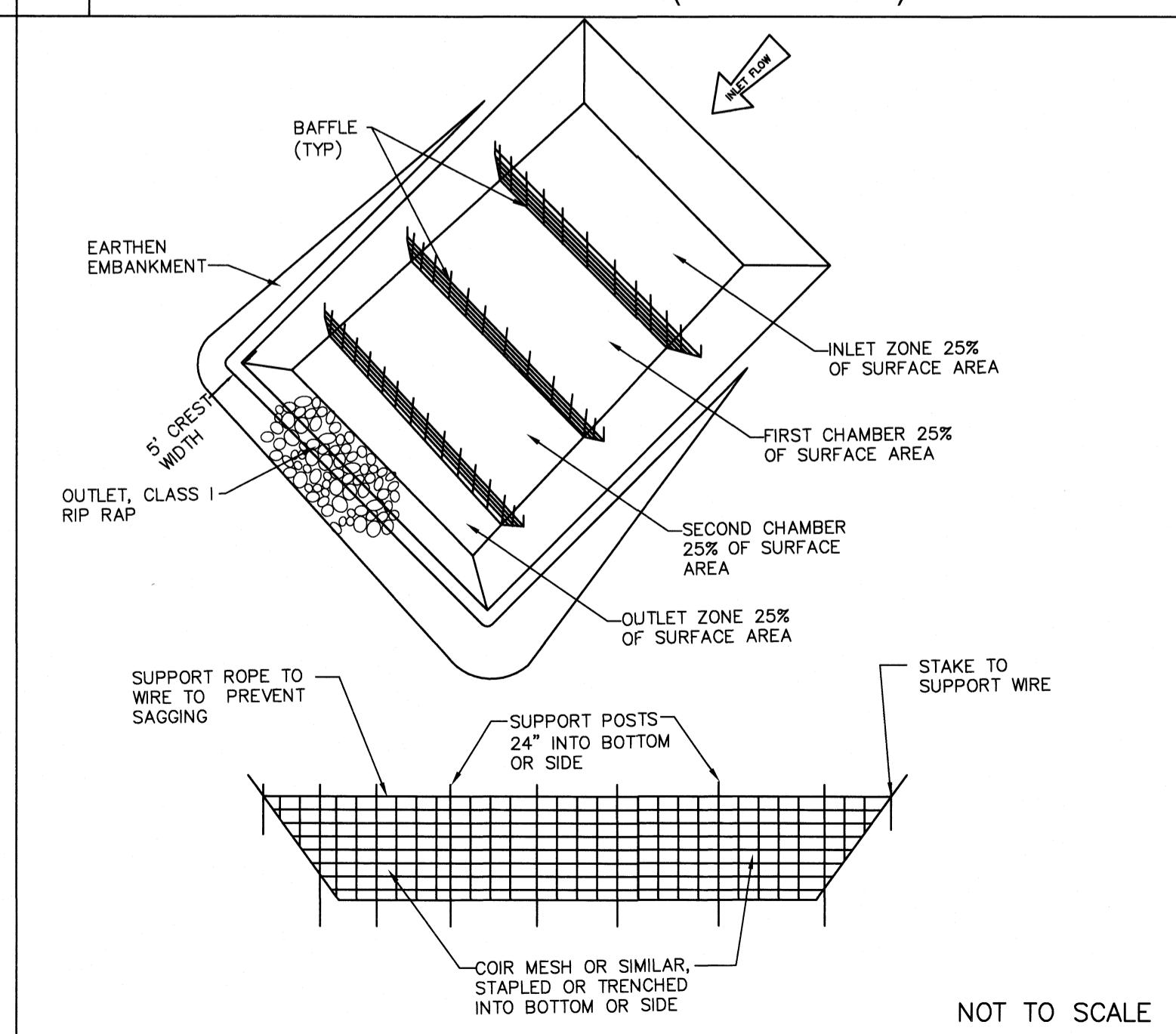
7 SW POND 3B-1 EMERGENCY SPILLWAY DETAIL



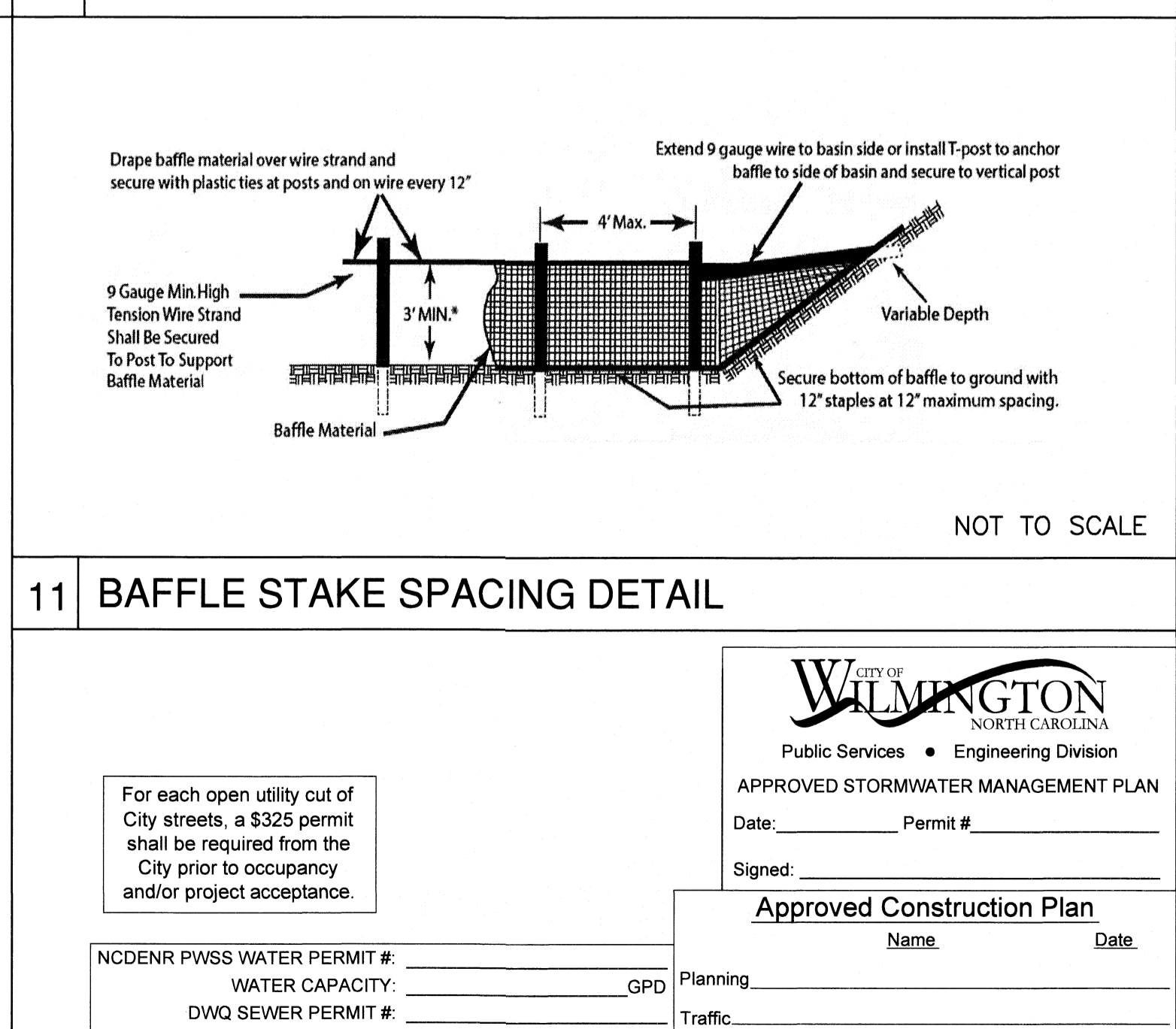
8 TEMPORARY SEDIMENT TRAP DETAIL



9 BAFFLE MAINTENANCE NOTES



10 BAFFLE DETAIL



11 BAFFLE STAKE SPACING DETAIL

**NOTES AND DETAILS**  
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  
CRANBURY, NJ 08512  
732-521-2900

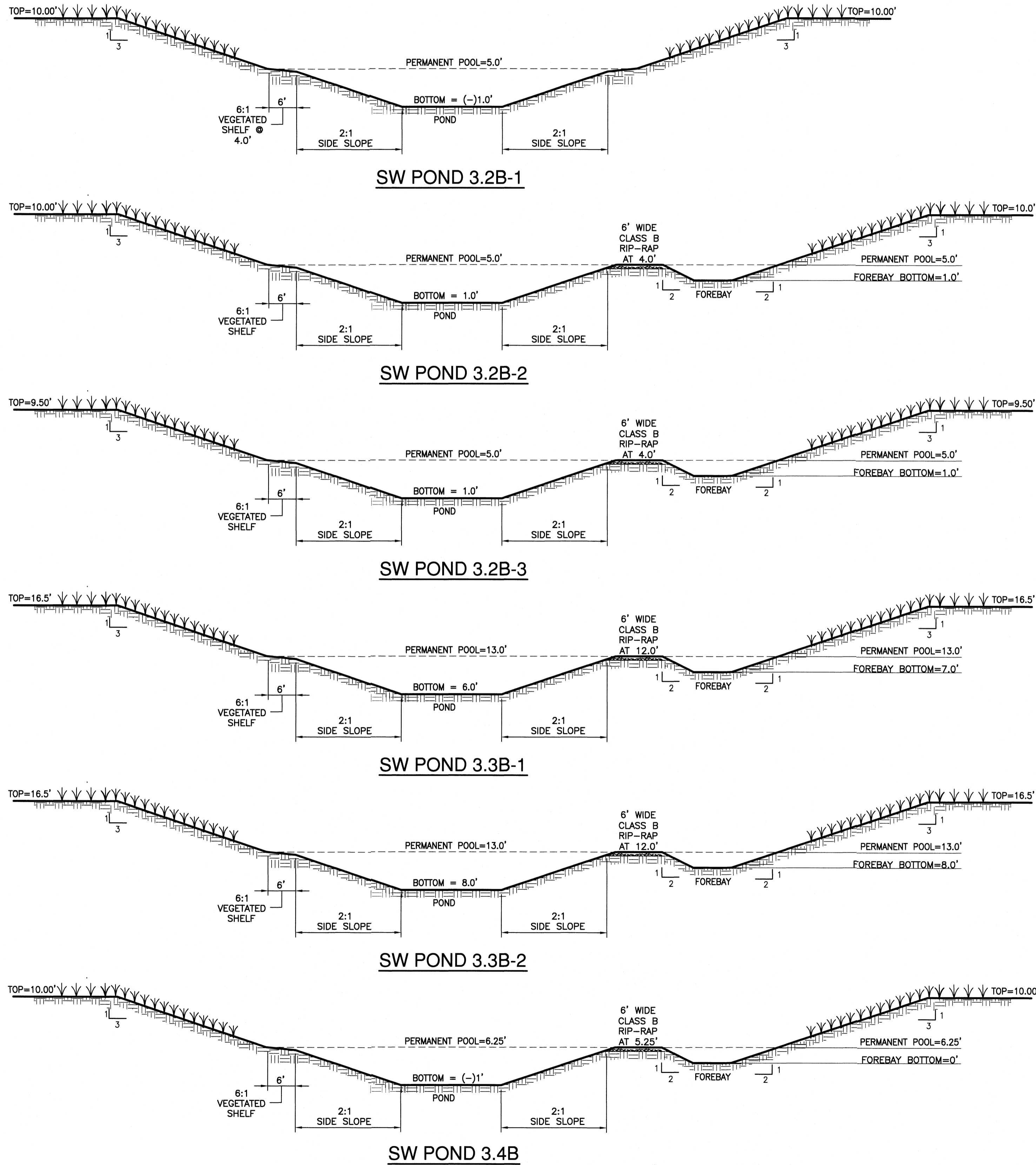
**NORRIS & TUNSTALL**  
CONSULTING ENGINEERS P.C.  
1429 ASH-LITTLE RIVER RD, NW  
ATLANTA, GA 30341  
PHONE: (770) 287-5900

License #C-3641  
16083  
DES. JST  
CHK. JPN  
DRWN. NKS  
DATE 6/27/18

**SEAL**  
19851  
NORRIS & TUNSTALL  
REGISTERED PROFESSIONAL ENGINEERS  
JOHN S. TUNSTALL

**C4.4**

BY OTHERS  
**SW POND 3.1B-1 AND 3.1B-2**



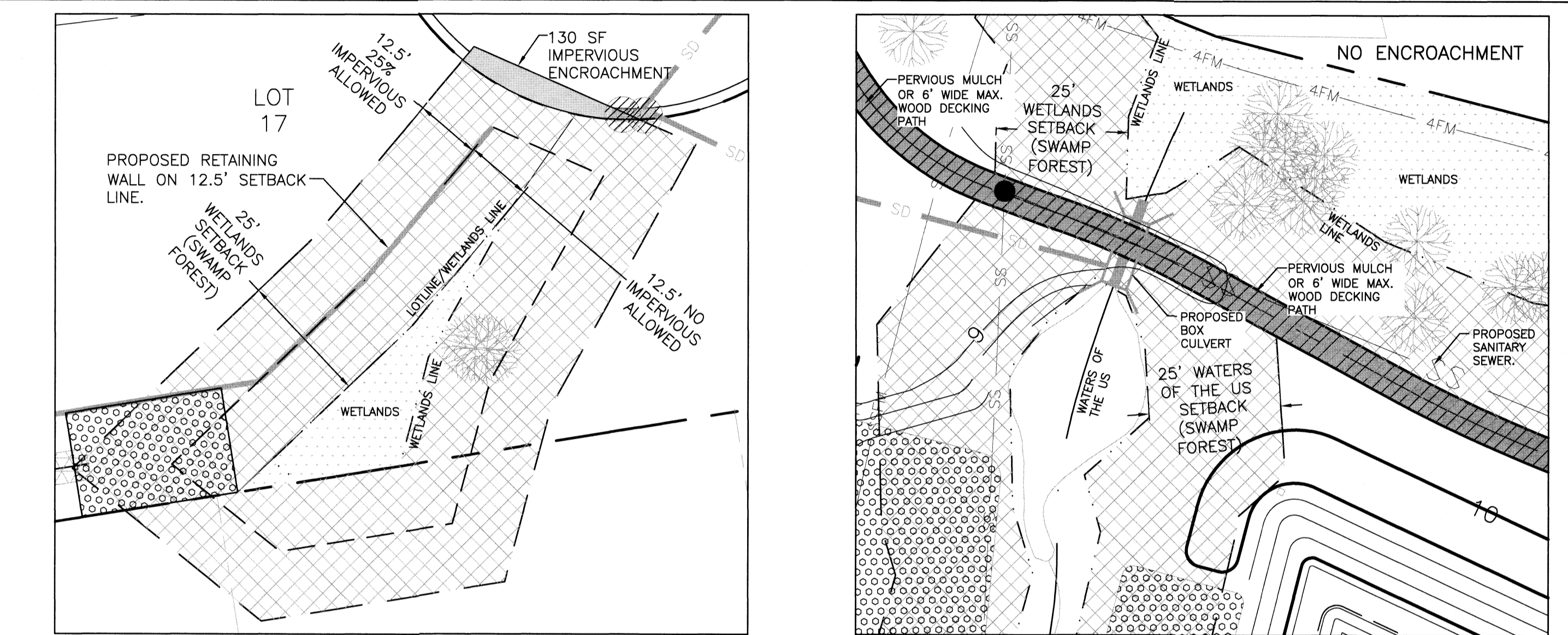
**SW POND AND FOREBAY DETAIL SECTIONS**

Approved Construction Plan		
Name	Date	
Planning		
Traffic		
Fire		

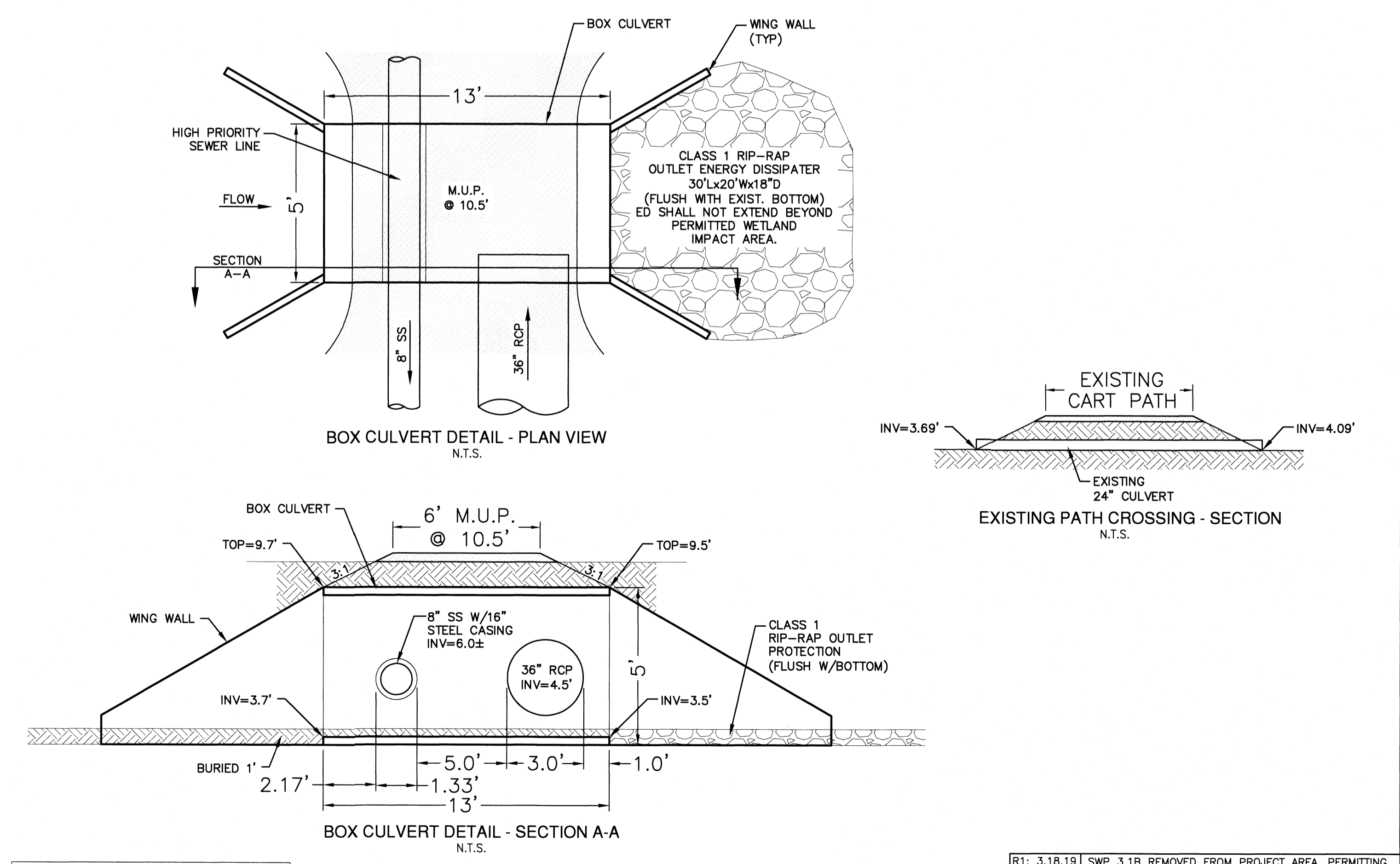
- DETENTION POND NOTES:**
- UPON STABILIZATION OF SITE, RESTORE POND TO DESIGN SIZE AND SHAPE.
  - INSTALL TOPSOIL ON SIDE SLOPES ABOVE NORMAL POOL AND SEED WITH A MIX OF 20% CARPET GRASS, 24% BERMUDA, 20% FESCUE, 10% CREEPING RED FESCUE, AND 24% RYE. SEED AT A RATE OF 2-3 POUNDS PER 1000 SF.
  - VEGETATED 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.



**6 WETLAND/STREAM AREA DETAILS** NOT TO SCALE



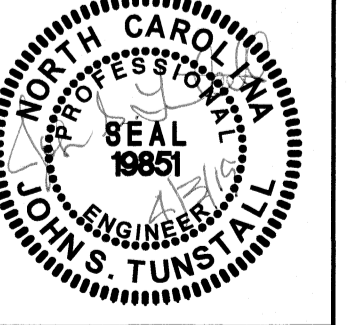
<p><b>CITY OF WILMINGTON</b>          NORTH CAROLINA          Public Services • Engineering Division          APPROVED STORMWATER MANAGEMENT PLAN          Date: _____ Permit #: _____          Signed: _____</p>	<p>For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.</p>	<p>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)</p>	<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>3.18.19</td> <td>SWP 3.1B REMOVED FROM PROJECT AREA, PERMITTING BY OTHERS. REV. PROJECT AREA, DENSITY AND OPENSPACE. REV. STORMDRAINAGE AND STORMDRAINAGE AREAS. ADDED OPEN THROAT D'S AND DETAIL. REMOVED DETAILS FOR SWP 3.1B. REVISED TREE REMOVAL TABLE ACCORDINGLY. REV. CHASTAIN DR. ROW AND CENTERLINE AS PER DRAWINGS BY OTHERS. ADDED SECTION DETAIL.</td> <td></td> </tr> </tbody> </table> <p>© 2016 NORRIS &amp; TUNSTALL</p>	DATE	DESCRIPTION	BY	3.18.19	SWP 3.1B REMOVED FROM PROJECT AREA, PERMITTING BY OTHERS. REV. PROJECT AREA, DENSITY AND OPENSPACE. REV. STORMDRAINAGE AND STORMDRAINAGE AREAS. ADDED OPEN THROAT D'S AND DETAIL. REMOVED DETAILS FOR SWP 3.1B. REVISED TREE REMOVAL TABLE ACCORDINGLY. REV. CHASTAIN DR. ROW AND CENTERLINE AS PER DRAWINGS BY OTHERS. ADDED SECTION DETAIL.	
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NOTES AND DETAILS  
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 4114 ECHO FARMS BLVD.  
 WILMINGTON, NC 28412  
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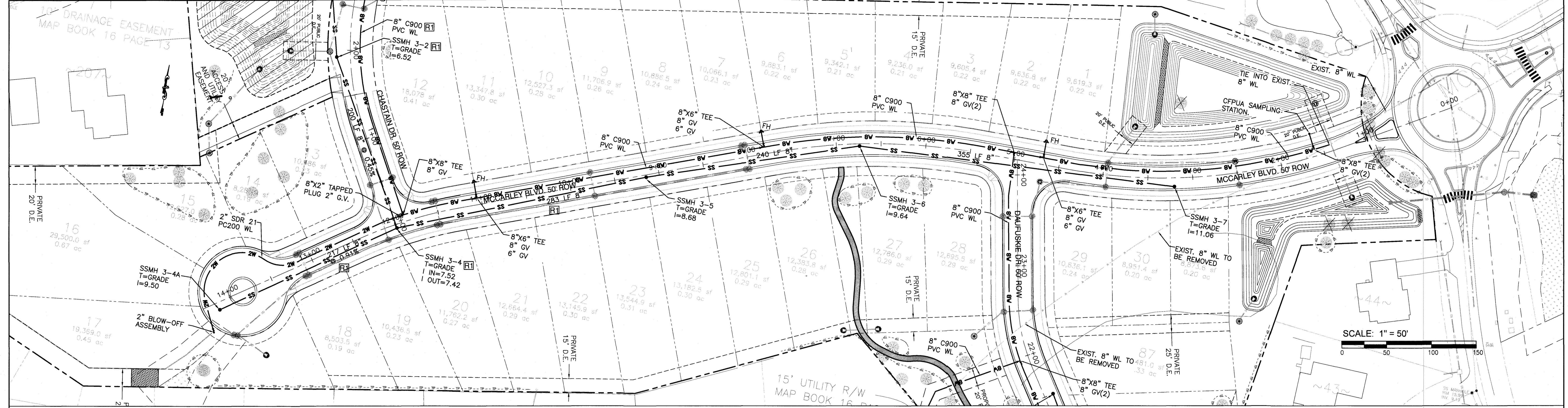
**NORRIS & TUNSTALL**  
 CONSULTING ENGINEERS P.C.  
 1429 ASH-LITTLE RIVER RD. NW  
 WASHINGTON, NC 28620  
 PHONE (710) 267-5868

License #C-3641  
**16083**  
 DES. JST  
 CKD. JPN  
 DRWN. NKS  
 DATE 6/27/18



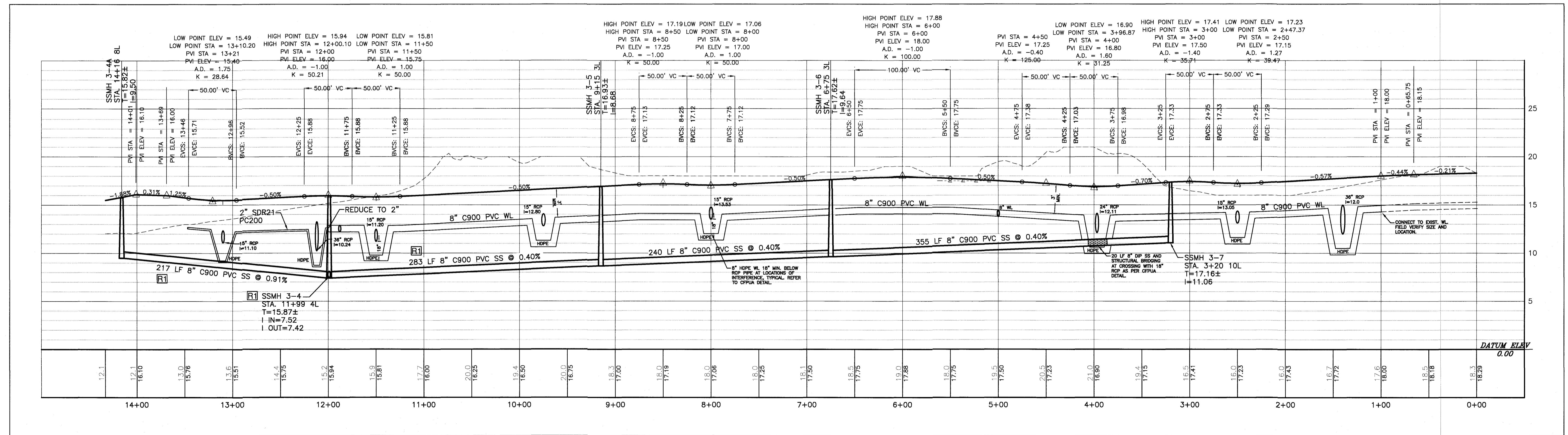
**C4.5**

PR2



SCALE: 1" = 50'

PR4



HORIZ. 1" = 50'  
VERT. 1" = 5'

**CFPPA 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 RIGHT-OF-WAY 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.

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)

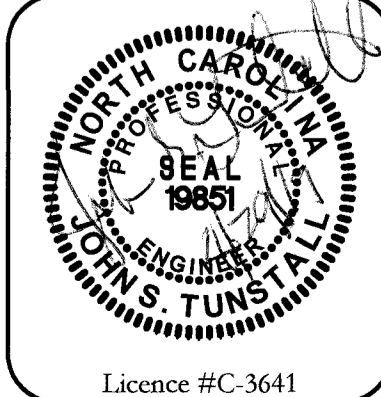
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**Approved Construction Plan**  
 Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Planning: \_\_\_\_\_  
 Traffic: \_\_\_\_\_  
 Fire: \_\_\_\_\_

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

**\* SEE SHEET PR4 FOR STORMDRAIN CROSSING USING HDPE PIPE DETAIL**

REV. NO.	DESCRIPTION	DATE
1	REV. WATER AND SEWER MCCARLEY DR.	4.25.19



**NORRIS & TUNSTALL**  
 CONSULTING ENGINEERS P.C.  
 902 MARKET STREET  
 WILMINGTON, NC 28401  
 PHONE (910) 343-9653

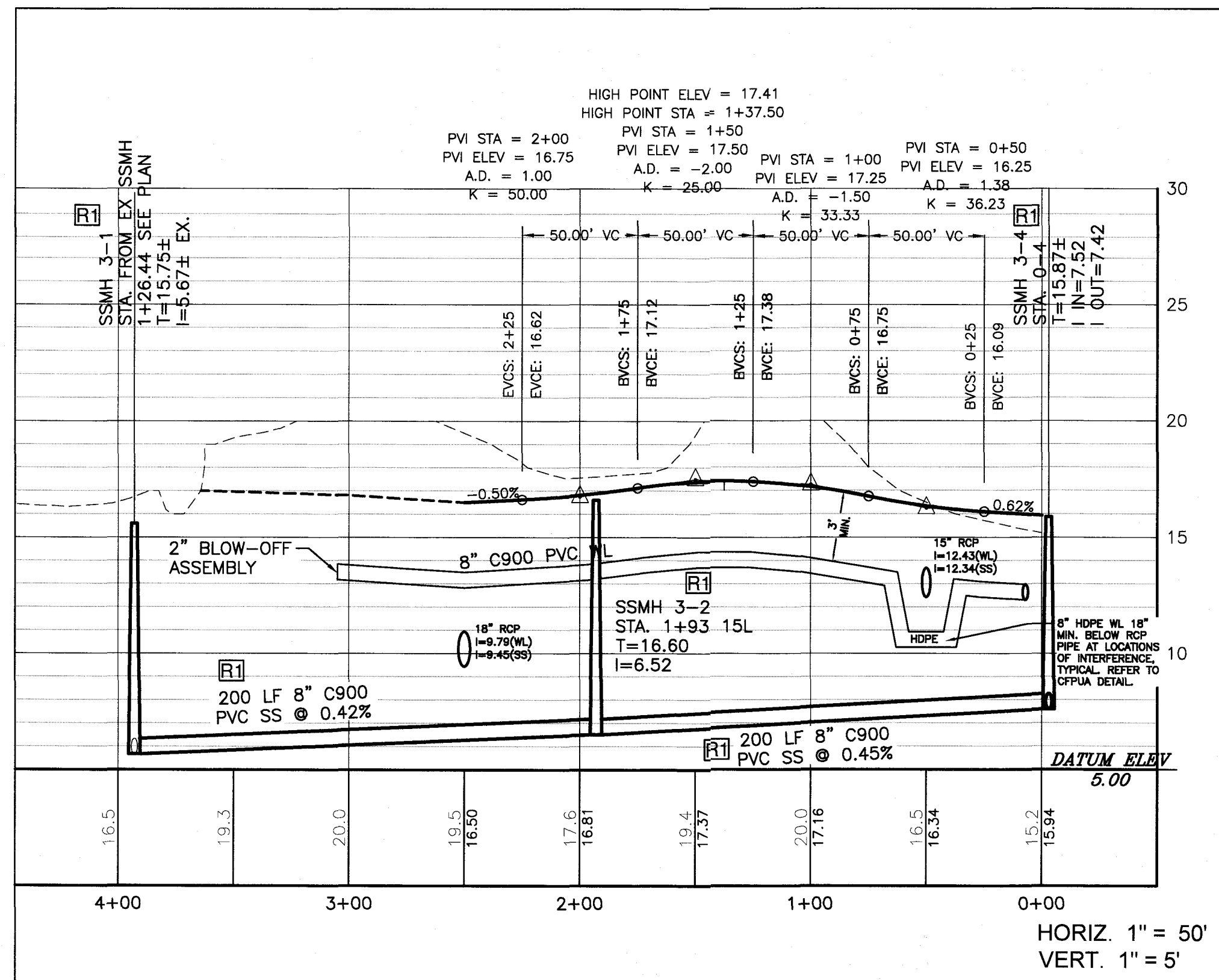
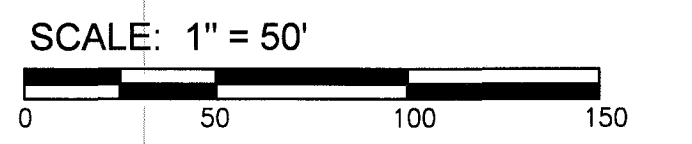
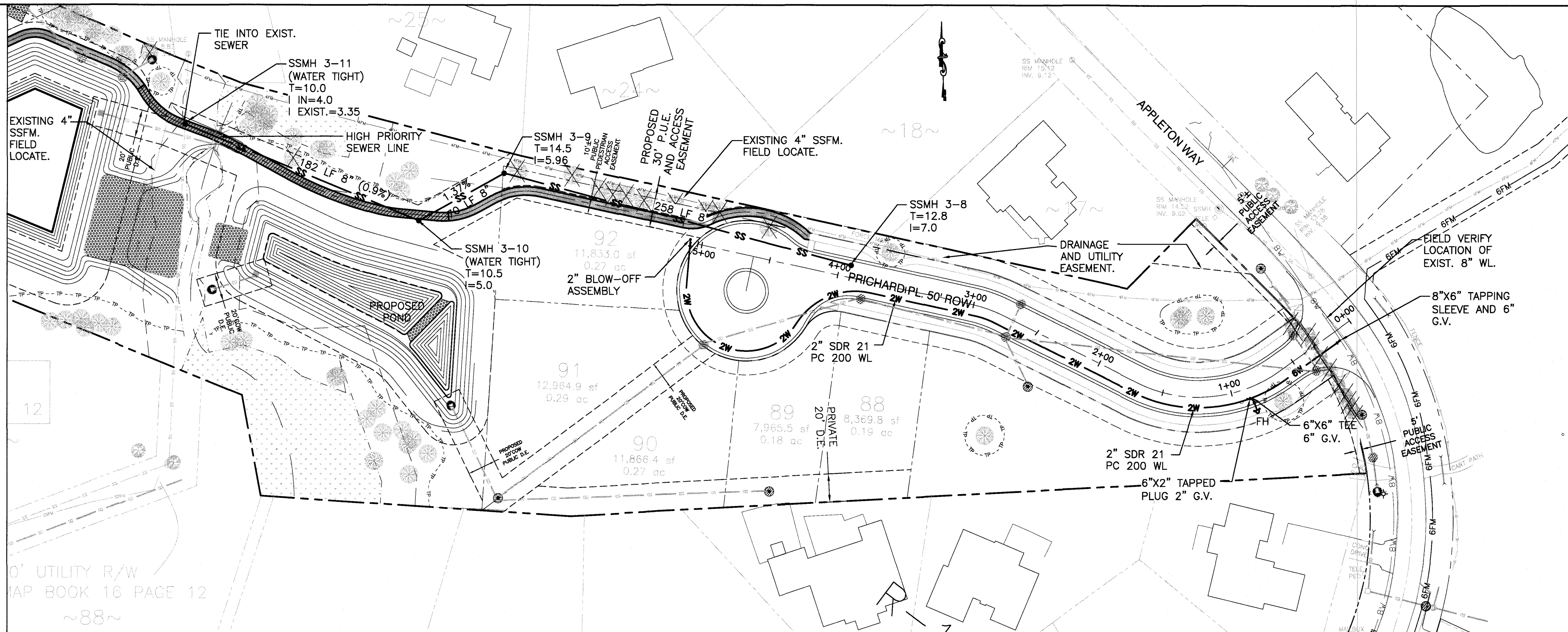
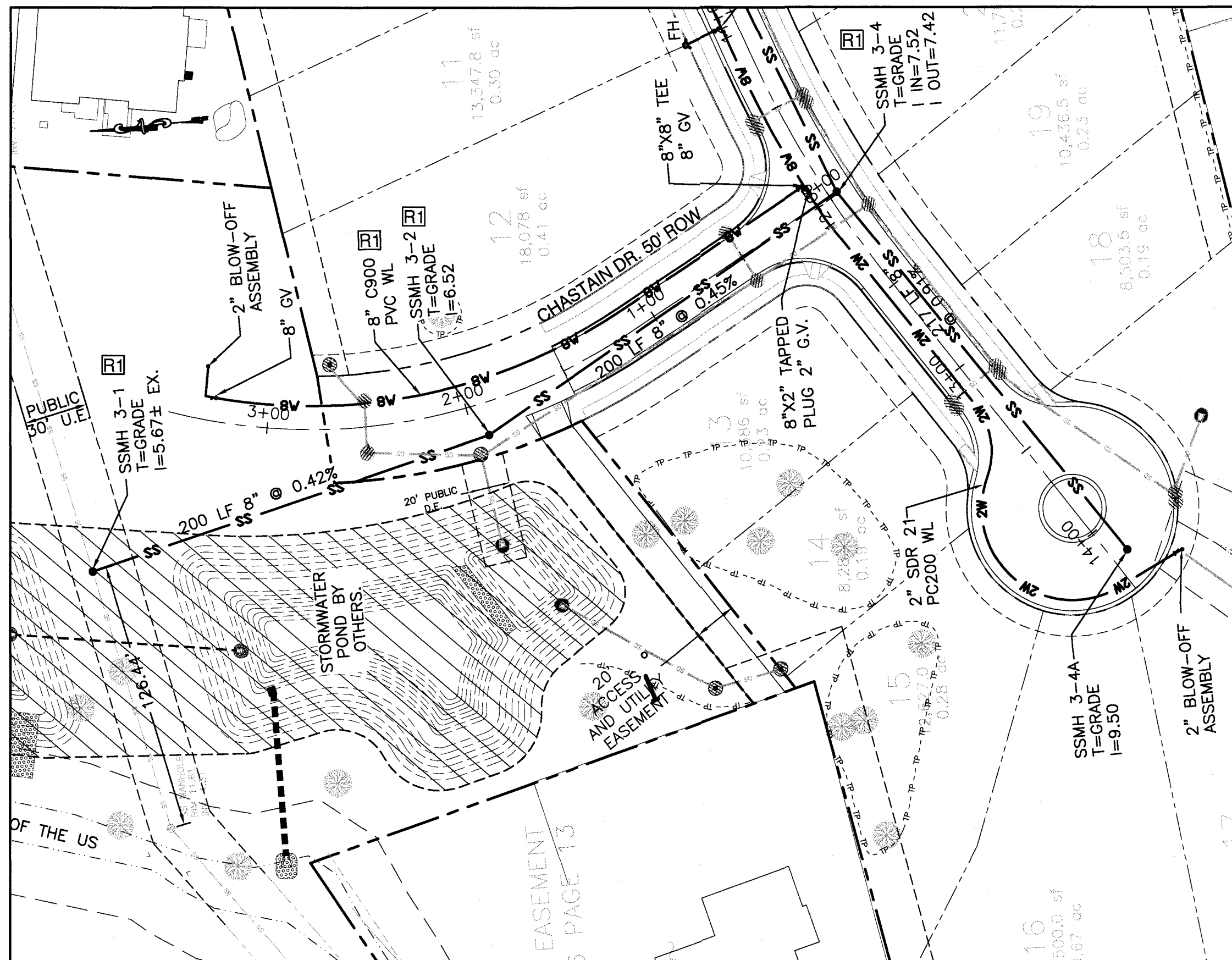
WOODLANDS AT ECHO FARMS  
 PHASE 1 - TRACT 3B  
 WATERLINE LAYOUT AND SANITARY SEWER  
 PLAN & PROFILE

DATE: 9/20/18  
 SCALE: 1" = 50'  
 1" = 5'  
 DRAWN: NKS  
 CHECKED: TJC  
 PROJECT NO: 16083

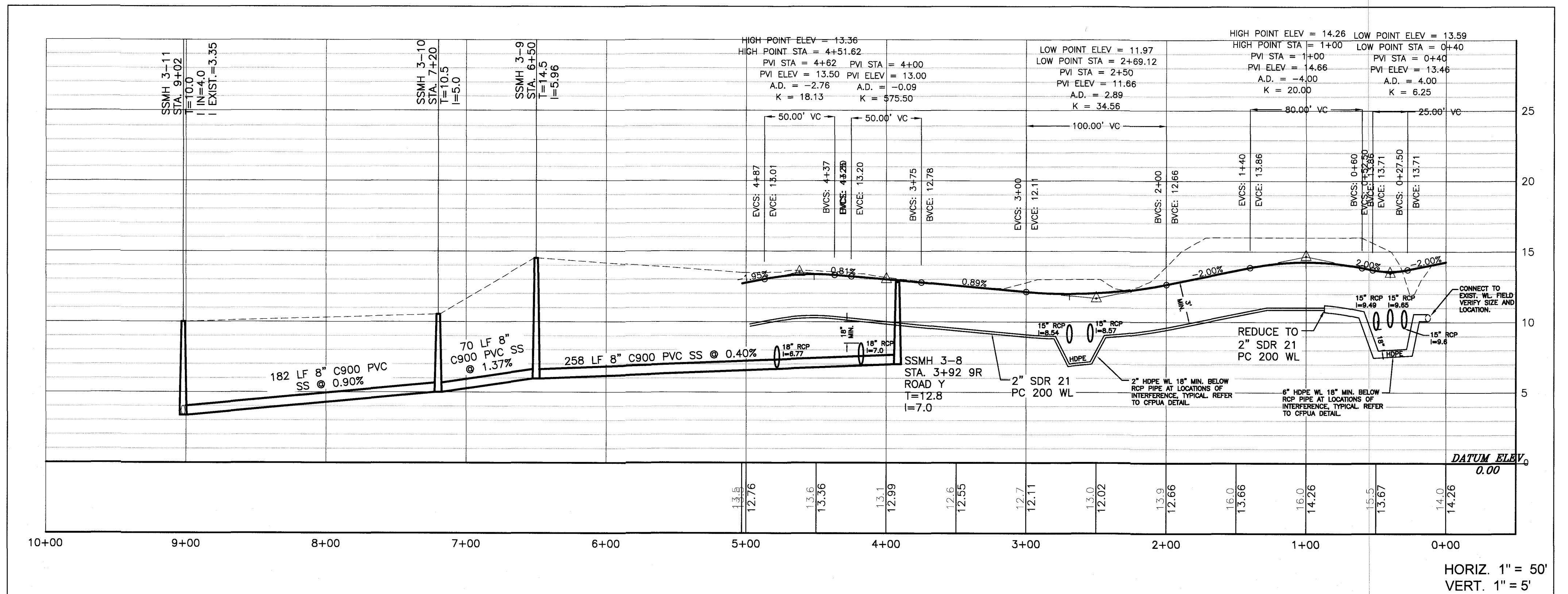
SHEET NO:  
**PR1**

MCCARLEY BLVD.

G:\projects\2016\16083 Woodlands at Echo Farms\16083 master.dwg, 4/29/2019 1:50:06 PM



CHASTAIN DR.



PRICHARD PLACE

**CPUPA STANDARD SEWER NOTES:**

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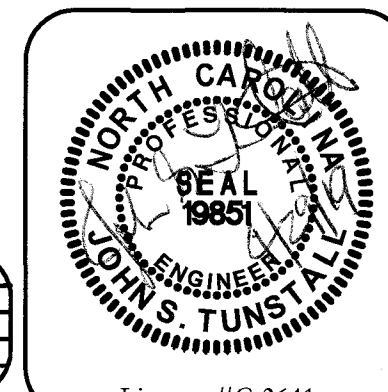
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 NORTH CAROLINA  
 Public Services • Engineering Division  
 APPROVED STORMWATER MANAGEMENT PLAN  
 Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
 Signed: \_\_\_\_\_

**\* SEE SHEET PR4 FOR STORMDRAIN CROSSING USING HDPE PIPE DETAIL**

REV. NO.	DESCRIPTION	DATE
01	REV. WATER AND SEWER CHASTAIN DR.	4.25.19



**NORRIS & TUNSTALL**  
 CONSULTING ENGINEERS P.C.  
 902 MARKET STREET  
 WILMINGTON, NC 28401  
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WOODLANDS AT ECHO FARMS  
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SHEET NO:  
**PR2**