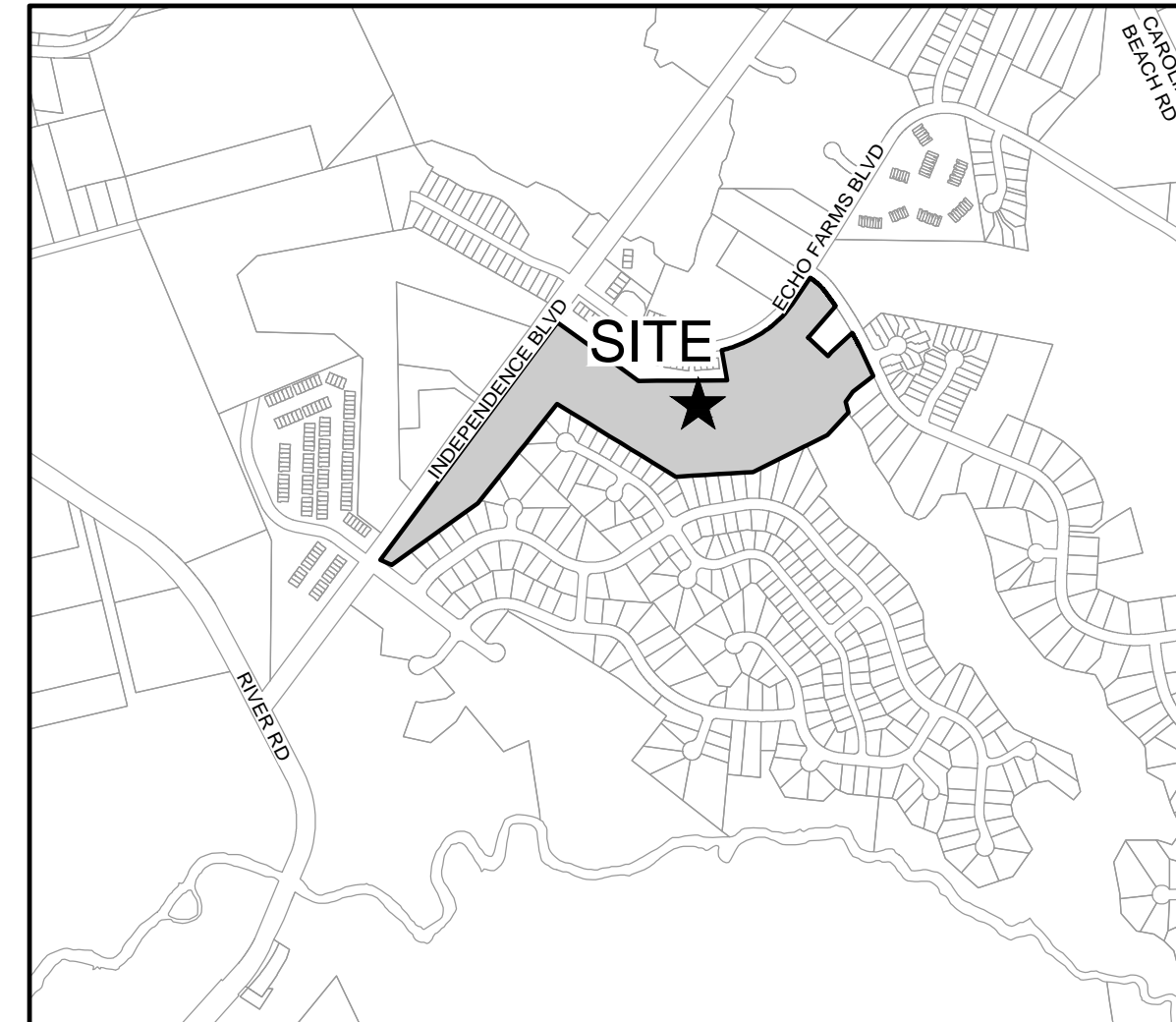


WOODLANDS AT ECHO FARMS TRACT 2

4114 ECHO FARMS BLVD.
WILMINGTON, NORTH CAROLINA 28412

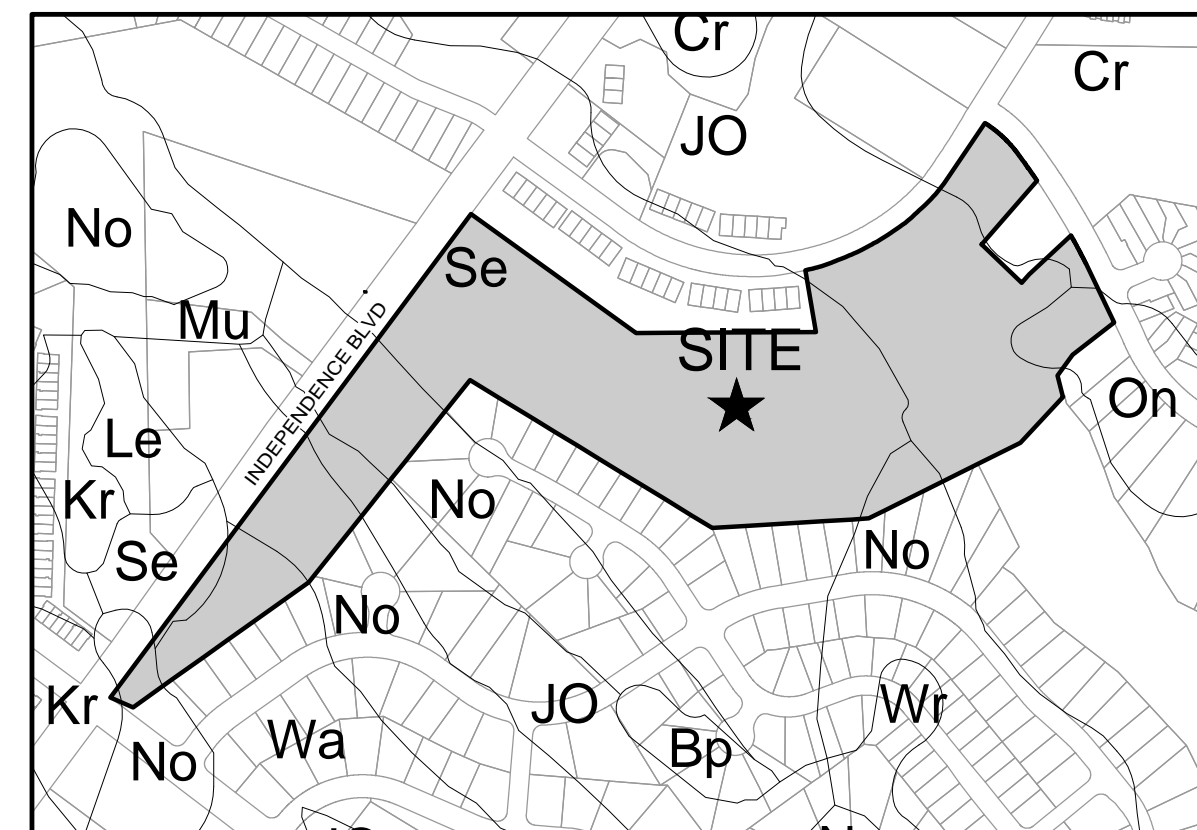
DESIGN DOCUMENTS
MARCH 2019

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	WATER CAPACITY:	_____ GPD
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	SEWER CAPACITY:	_____ GPD
	SEWER SHED # AND PLANT:	_____
	SEWER TO FLOW THROUGH NEI:	YES or NO (CIRCLE ONE)
Approved Construction Plan		
Name _____		Date _____
Planning _____		
Traffic _____		
Fire _____		
Date: _____		Permit # _____
Signed: _____		



VICINITY MAP

SCALE: 1"=1000'



SOILS MAP

SCALE: 1"=500'

NOTICE REQUIRED

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

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

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

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

CONTACT THESE UTILITIES

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

ATTN: ZONING INSPECTIONS
PH: 910-254-0900

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

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

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

OPERATIONS/MAINTENANCE
PH: 910-322-6550

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

TRANSMISSION AGENT
BILL WILDER
PH: 910-772-4903

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

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

SPECTRUM
GENERAL PH: 800-892-4357

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

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

SHEET INDEX

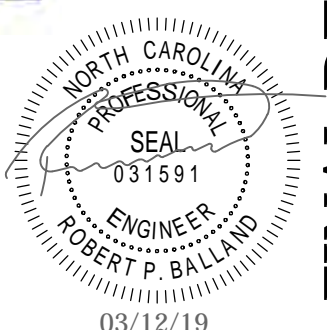
SHEET NUMBER	SHEET TITLE
C-0.0	COVER SHEET
C-1.0	GENERAL NOTES
C-2.0-2.2	SITE PLANS
C-2.3	SITE INVENTORY PLAN
C-3.0 & C-3.1	PH. I EROSION CONTROL PLANS
C-3.2 & C-3.3	GRADING & DRAINAGE PLANS
C-4.0-4.3	UTILITY PLAN & PROFILES
C-5.0-5.2	DETAILS

PREPARED BY:

PARAMOUNTE
ENGINEERING, INC.

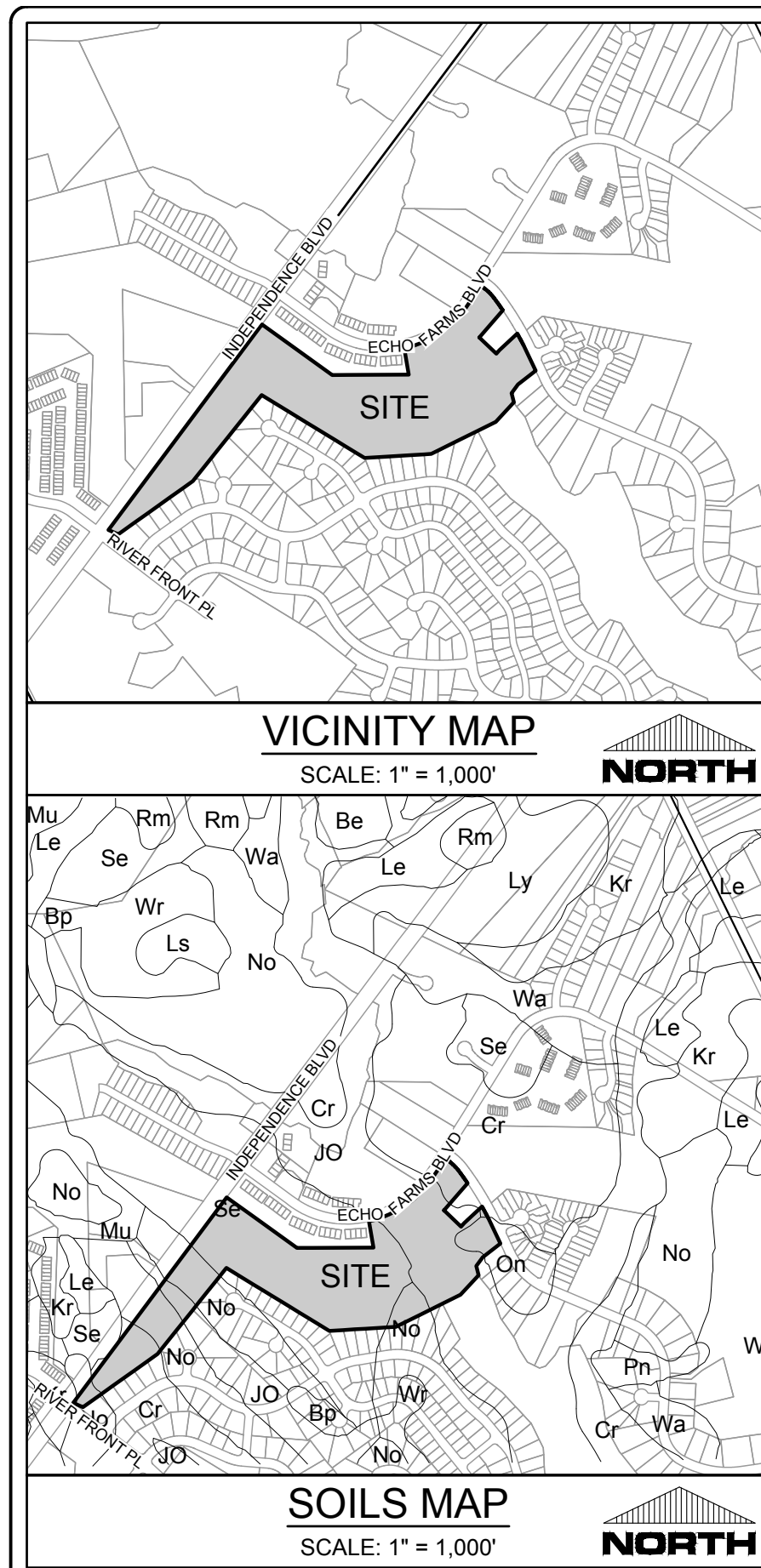
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)

NC License #: C-2846
PROJECT # 17358.PE



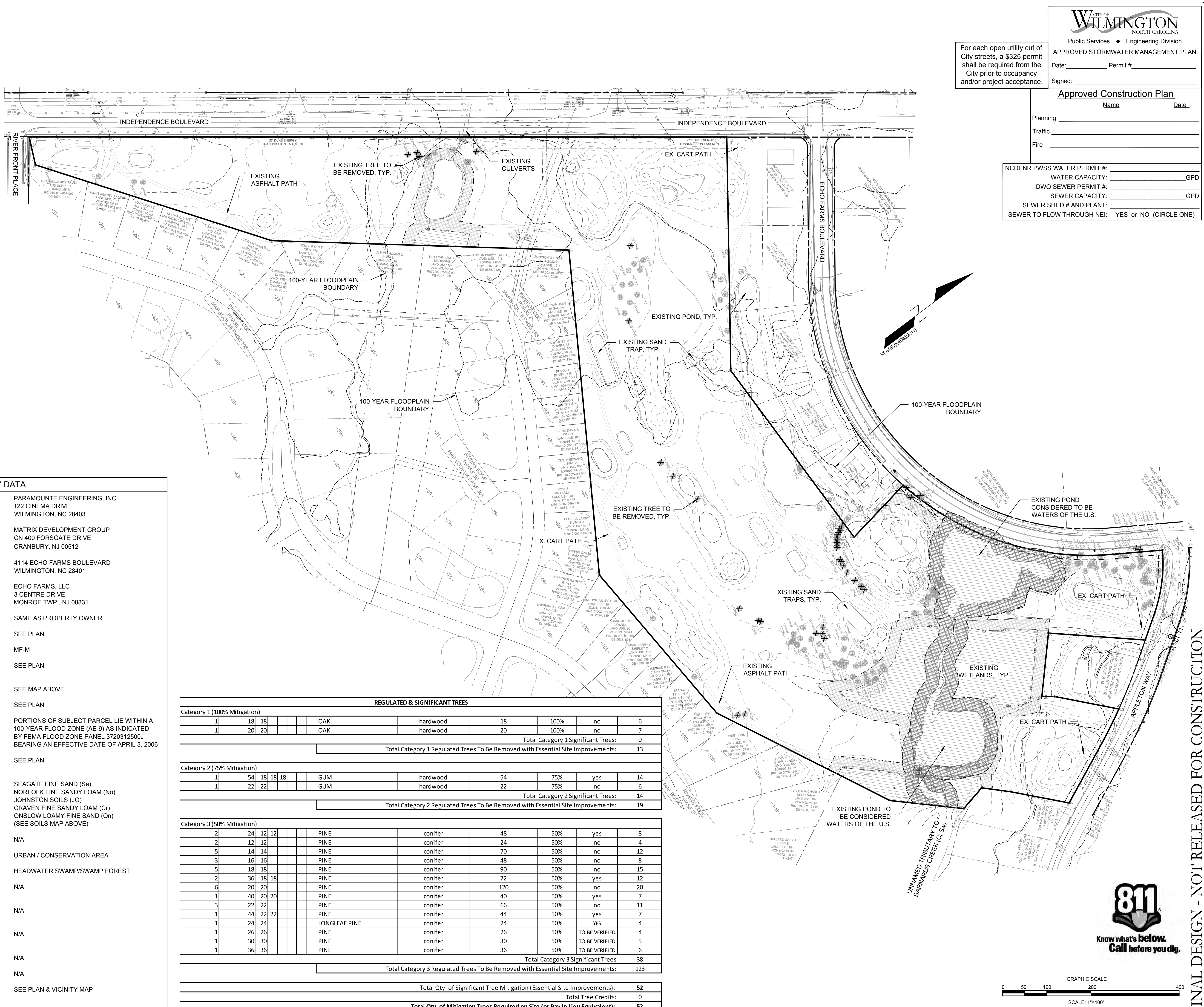
03/12/19

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION



SITE INVENTORY DATA

- PREPARER OF THE PLAN: PARAMOUNT ENGINEERING, INC. 122 CINEMA DRIVE WILMINGTON, NC 28403
- APPLICANT NAME: MATRIX DEVELOPMENT GROUP CN 400 FORSGATE DRIVE CRANBURY, NJ 08512
- SITE ADDRESS: 4114 ECHO FARMS BOULEVARD WILMINGTON, NC 28401
- PROPERTY OWNER: ECHO FARMS, LLC 3 CENTRE DRIVE MONROE TWP., NJ 08831
- DEVELOPER: SAME AS PROPERTY OWNER
- PROPERTY BOUNDARY: SEE PLAN
- ZONING: MF-M
- ADJACENT PROPERTY INFORMATION (OWNER AND ZONING): SEE PLAN
- VICINITY MAP: SEE MAP ABOVE
- TOPOGRAPHY: SEE PLAN
- 100 YEAR FLOOD PLAIN BOUNDARY: PORTIONS OF SUBJECT PARCEL LIE WITHIN A 100-YEAR FLOOD ZONE (AE-9) AS INDICATED BY FEMA FLOOD ZONE PANEL 372031250J BEARING AN EFFECTIVE DATE OF APRIL 3, 2006
- LOCATION OF EXISTING DITCHES, CREEKS, AND STREAMS: SEE PLAN
- SOILS: SEAGATE FINE SAND (Se) NORFOLK FINE SANDY LOAM (No) JOHNSTON SOILS (JO) CRAVEN FINE SANDY LOAM (Cr) ONSLOW LOAMY FINE SAND (On) (SEE SOILS MAP ABOVE)
- CAMA AEC & ASSOCIATED SETBACKS: N/A
- CAMA LAND CLASSIFICATION: URBAN / CONSERVATION AREA
- CONSERVATION RESOURCES: HEADWATER SWAMP/SWAMP FOREST
- LOCAL, STATE, OR FEDERAL HISTORIC OR ARCHAEOLOGICAL SITE: N/A
- LOCATION OF CEMETERIES, BURIAL SITES, OR BURIAL GROUNDS: N/A
- SQUARE FOOTAGE OF FORESTED AREA, HABITAT, AND DOMINANT SPECIES: N/A
- SECTION 404 WETLANDS AND SECTION 10 WATERS: N/A
- PROTECTED SPECIES OR HABITAT: N/A
- THOROUGHFARES, BIKE ROUTES, SIDEWALKS, TRANSIT FACILITIES (EXISTING OR PROPOSED): SEE PLAN & VICINITY MAP



REGULATED & SIGNIFICANT TREES

Category 1 (100% Mitigation)									
Tree ID	DBH	Height	Species	Category	Health	Value	Replacement	Notes	Count
1	18	18	OAK	hardwood	18	100%	no		6
1	20	20	OAK	hardwood	20	100%	no		7
Total Category 1 Significant Trees:									0
Total Category 1 Regulated Trees To Be Removed with Essential Site Improvements:									13
Category 2 (75% Mitigation)									
1	54	18	GUM	hardwood	54	75%	yes		14
1	22	22	GUM	hardwood	22	75%	no		6
Total Category 2 Significant Trees:									14
Total Category 2 Regulated Trees To Be Removed with Essential Site Improvements:									19
Category 3 (50% Mitigation)									
2	24	12	PINE	conifer	48	50%	yes		8
2	12	12	PINE	conifer	24	50%	no		4
5	14	14	PINE	conifer	70	50%	no		12
3	16	16	PINE	conifer	48	50%	no		8
5	18	18	PINE	conifer	90	50%	no		15
2	36	18	PINE	conifer	72	50%	yes		12
6	20	20	PINE	conifer	120	50%	no		20
1	40	20	PINE	conifer	40	50%	yes		7
3	22	22	PINE	conifer	66	50%	no		11
1	44	22	PINE	conifer	44	50%	yes		7
1	24	24	LONGLEAF PINE	conifer	24	50%	YES		4
1	26	26	PINE	conifer	26	50%	TO BE VERIFIED		4
1	30	30	PINE	conifer	30	50%	TO BE VERIFIED		5
1	36	36	PINE	conifer	36	50%	TO BE VERIFIED		6
Total Category 3 Significant Trees:									38
Total Category 3 Regulated Trees To Be Removed with Essential Site Improvements:									123
Total Qty. of Significant Tree Mitigation (Essential Site Improvements):									52
Total Tree Credits:									0
Total Qty. of Mitigation Trees Required on Site (or Pay in Lieu Equivalent):									52

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APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit # _____

Signed: _____

Approved Construction Plan

Name _____ Date _____

Planning _____

Traffic _____

Fire _____

NC DENR PWSS WATER PERMIT #: _____ GPD

WATER CAPACITY: _____ GPD

DWQ SEWER PERMIT #: _____

SEWER CAPACITY: _____ GPD

SEWER SHED # AND PLANT: _____

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

WILMINGTON NORTH CAROLINA
Public Services • Engineering Division

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

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

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

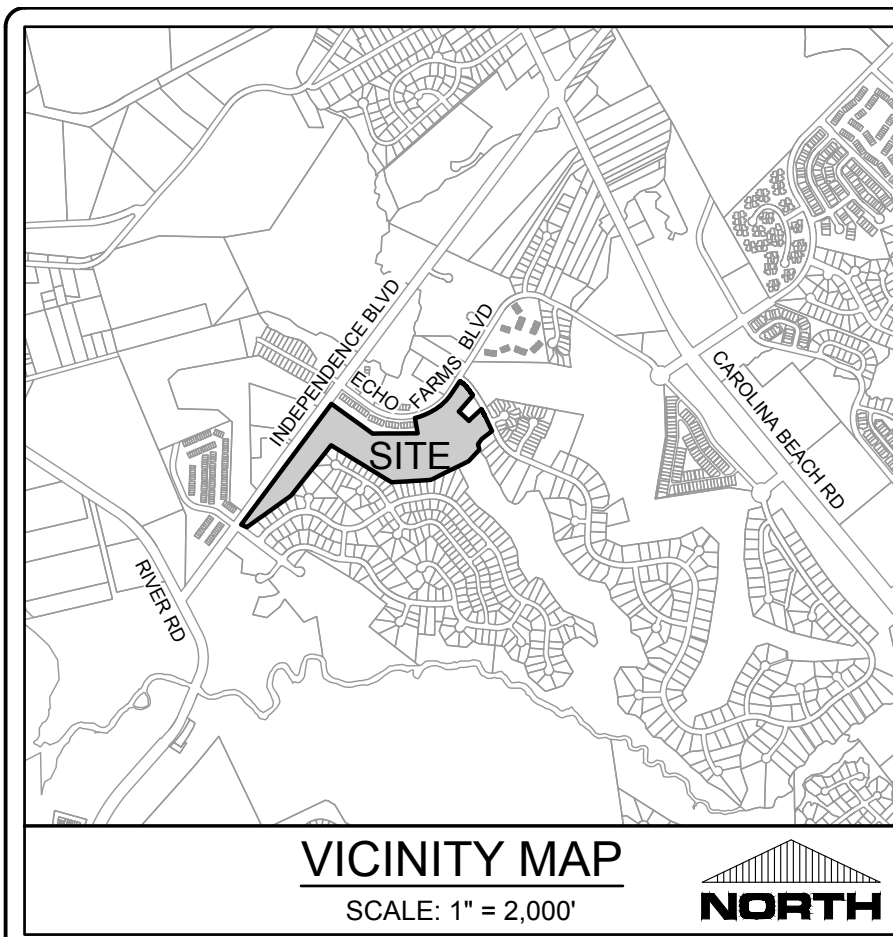
DRAWING INFORMATION:
DATE: 03/12/19
SCALE: 1" = 100'
DRAWN: RPB
CHECKED: RPB

SEAL:
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL NO. 031591
ROBERT P. BALLARD
03/12/19

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

C-2.3
PEI JOB#: 17358.PE

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION



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

Date: _____ Permit # _____
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MH	=	STORM DRAIN MANHOLE
RD	=	ROOF DRAIN CLEANOUT
FFE	=	FINISHED FLOOR ELEVATION
BPE	=	BUILDING PAD ELEVATION

LEGEND:

—16—	EXISTING CONTOUR	TC=25.05	PROPOSED TOP OF CURB ELEVATION
—29—	PROPOSED CONTOUR	[Symbol]	INLET PROTECTION
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GL=25.05	PROPOSED GUTTER FLOW LINE	[Symbol]	DRAINAGE FLOW PATH
		[Symbol]	DRAINAGE INLET LABEL
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		[Symbol]	GEOTECH BORING LOCATION
		[Symbol]	DRAINAGE FLOW PATH & SLOPE

Approved Construction Plan

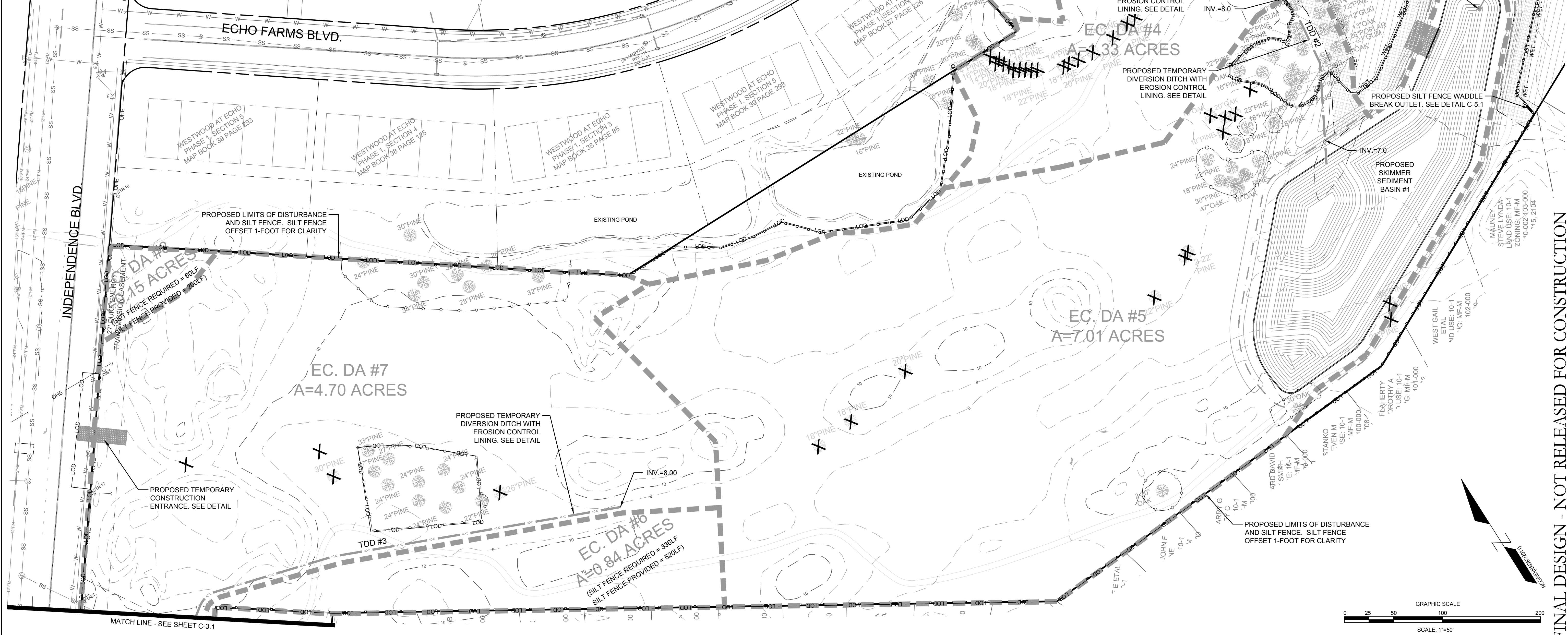
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Traffic	
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REVISIONS:

CLIENT INFORMATION:
ECHO FARMS, LLC
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CN 4000 FORSCATE DRIVE
CRANBURY, NJ 08512

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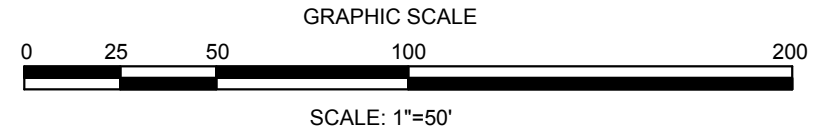
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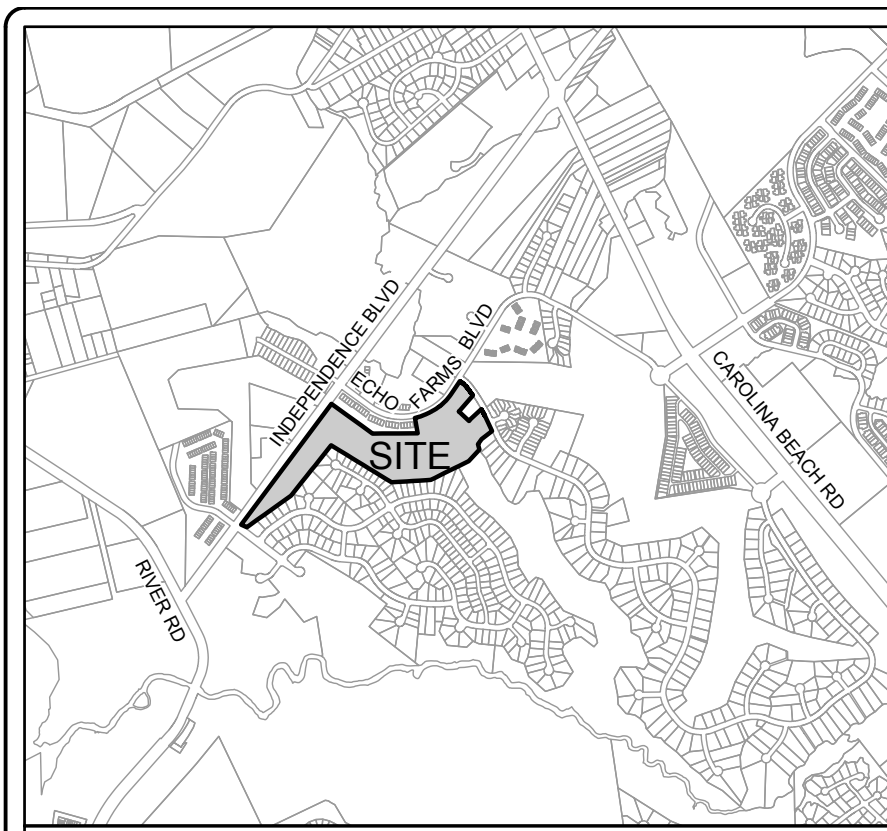
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DESIGNED: _____
DRAWN: _____
CHECKED: _____

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NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL NO. 031591
ROBERT P. BALL
03/12/19

C-3.0
PEI JOB#: 17358.PE

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION





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

Date: _____ Permit # _____
Signed: _____



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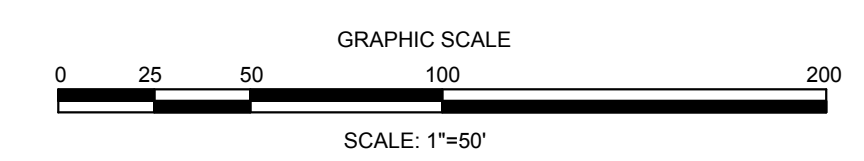
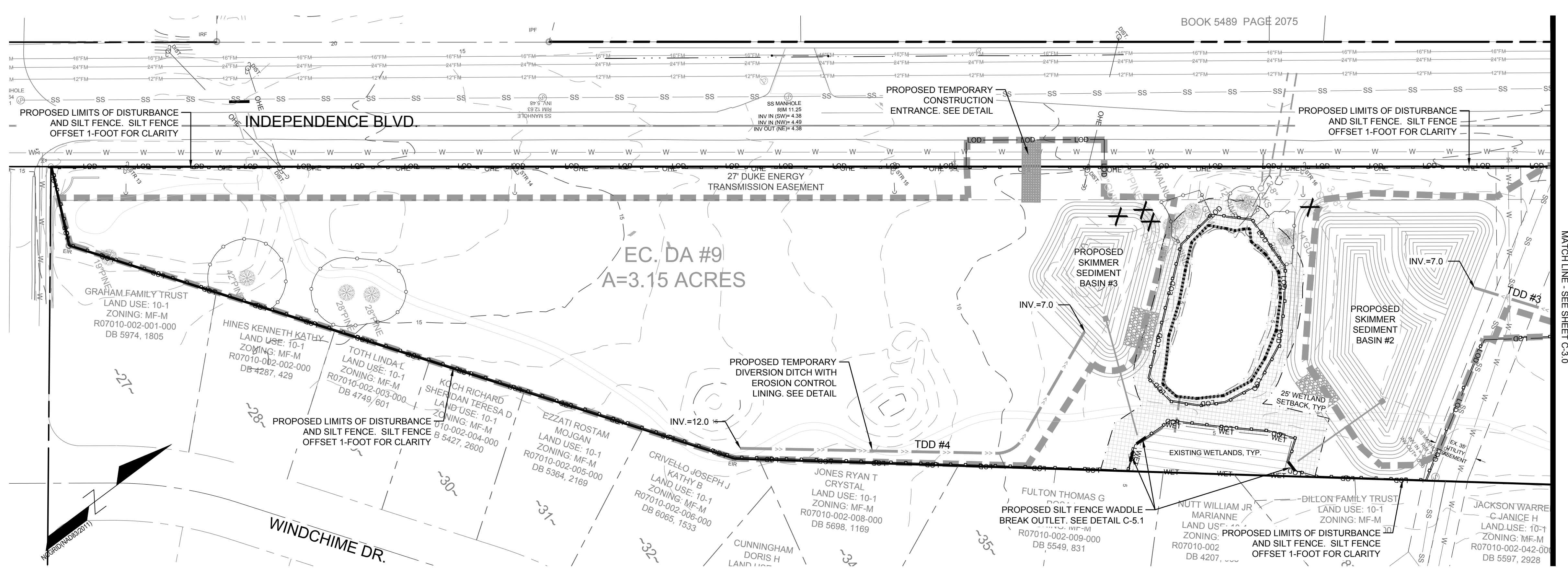
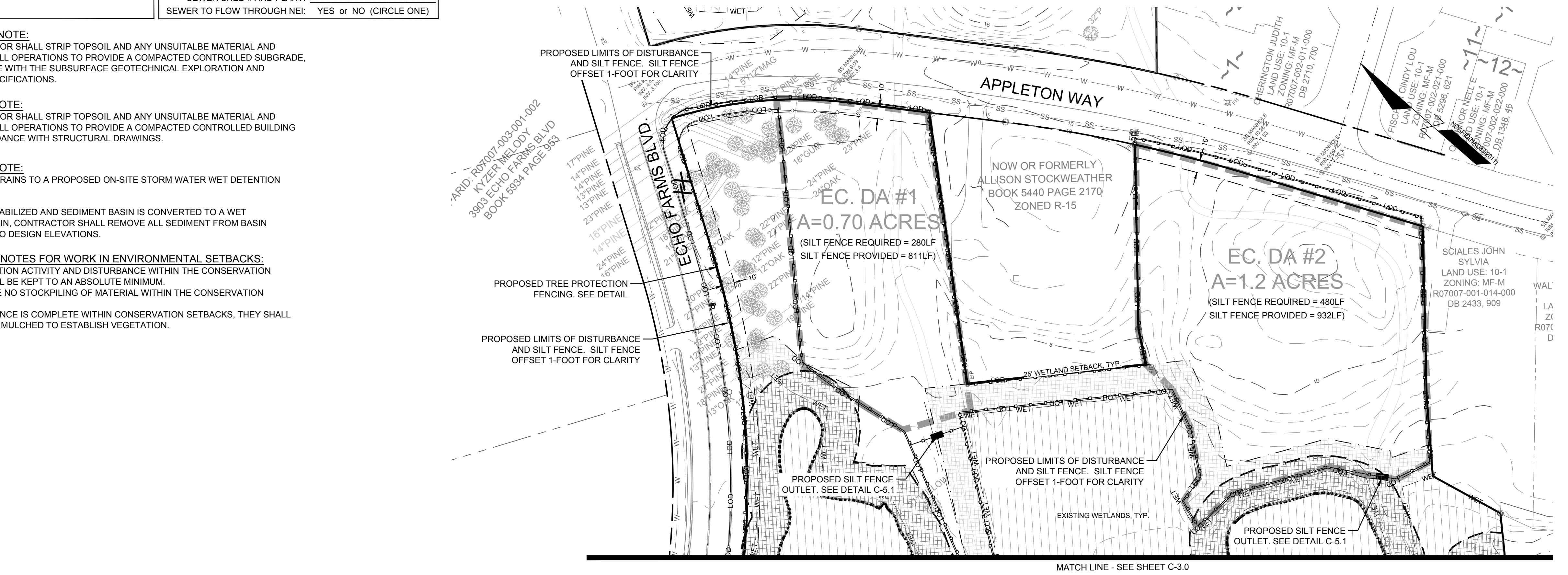
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REVISIONS:

NO.	DESCRIPTION

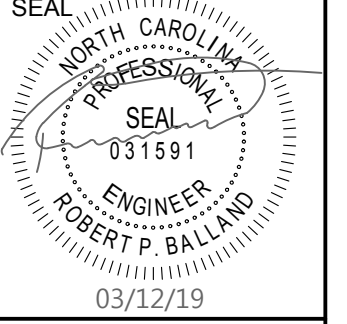
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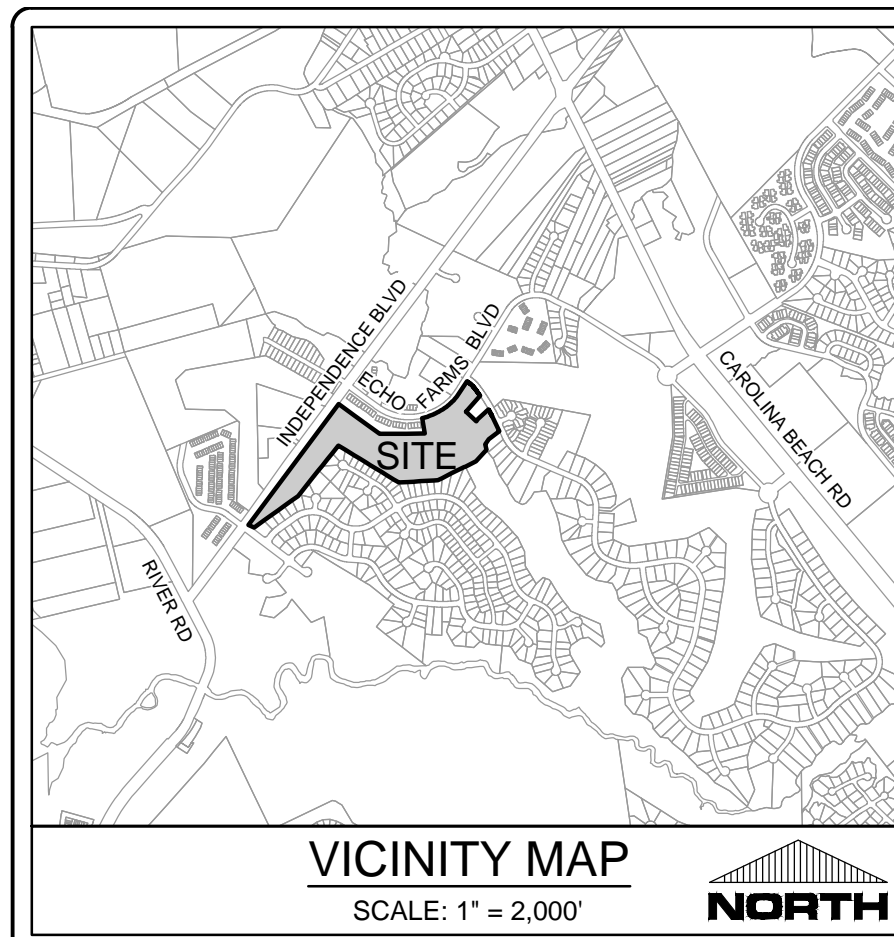
PH. I EROSION CONTROL PLAN
TRACT 2
WOODLANDS @ ECHO FARMS
CITY OF WILMINGTON
NORTH CAROLINA

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

DRAWING INFORMATION:
DATE: 03/12/19
DESIGNED: _____
DRAWN: _____
CHECKED: _____



C-3.1
PEI JOB#: 17358.PE



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

Date: _____ Permit # _____
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LEGEND:

---16---	EXISTING CONTOUR	TC=25.05	PROPOSED TOP OF CURB ELEVATION
---	PROPOSED CONTOUR	LOD	LIMITS OF DISTURBANCE
EG=25.05	EXISTING GRADE SPOT ELEVATION	---	SILT FENCE
EP=25.05	PROPOSED EDGE OF PAVEMENT	---	TREE PROTECTION FENCING
TW=25.05	PROPOSED SIDEWALK ELEVATION	---	DRAINAGE FLOW PATH
GL=25.05	PROPOSED GUTTER FLOW LINE	---	DRAINAGE INLET LABEL
		CB-202	GUTTER
		S-01	ROCK INLET PROTECTION
		ELEV. 33.5	GEOTECH BORING LOCATION
		1.5%	DRAINAGE FLOW PATH & SLOPE

Approved Construction Plan

Name _____ Date _____

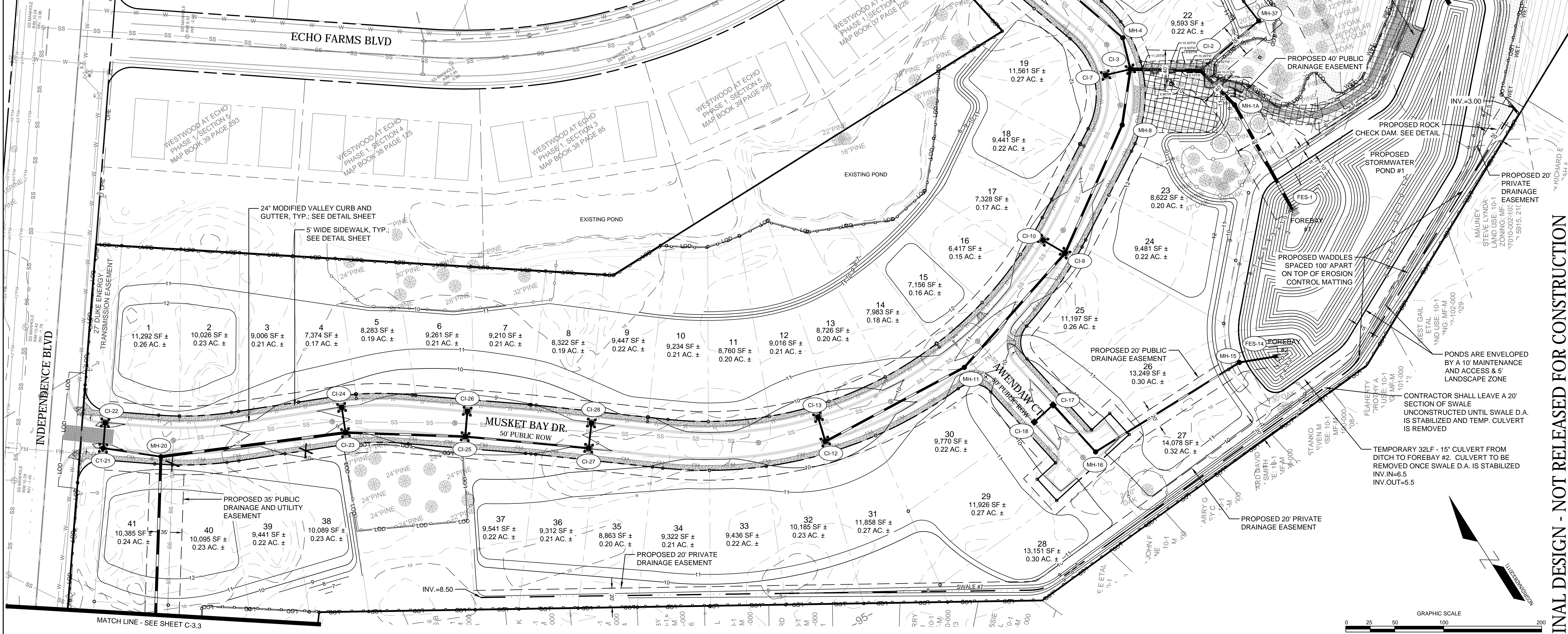
Planning _____
 Traffic _____
 Fire _____

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)

- GENERAL NOTES:**
- ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL STATE OF NC, CITY OF WILMINGTON, AND NEW HANOVER COUNTY STANDARDS AND SPECIFICATIONS.
 - THE CONTRACTOR SHALL PLACE INLET PROTECTION AROUND ALL STORM DRAIN INLETS TO PROTECT THE SYSTEM FROM COLLECTING SEDIMENTATION DURING CONSTRUCTION. INLET PROTECTION SHALL REMAIN IN PLACE UNTIL THE ROADS ARE PAVED.
 - CONTRACTOR SHALL ADJUST ALL FRAMES OF EX. UTILITY INFRASTRUCTURE WITHIN ASPHALT OVERLAY AND NEW ASPHALT AREAS TO MATCH PROPOSED GRADES.
 - ALL PROPOSED SPOT ELEVATIONS SHOWN ARE PROPOSED EDGE OF PAVEMENT UNLESS NOTED OTHERWISE.
 - ALL ROOF DRAINS AND IMPERVIOUS SURFACES SHALL BE DIRECTED TOWARDS ON-SITE COLLECTION SYSTEM. NO ROOF DRAINS OR IMPERVIOUS AREA SHALL BE DIRECTED OFF-SITE WITHOUT ENTERING THE ON-SITE COLLECTION SYSTEM FIRST.
 - ALL SIDEWALK CROSS SLOPES HAVE BEEN GRADED TO MEET ADA REGULATIONS. CONTRACTOR SHALL CONFIRM GRADES BEFORE PLACING PAVEMENT OR SIDEWALKS AND REPORT ANY DISCREPANCIES TO OWNER AND/OR ENGINEER.
 - THE CONTRACTOR SHALL USE EITHER RCP (CL. III or CL. IV) OR ADS HP STORM PIPE FOR THE STORM DRAINAGE SYSTEM UNLESS NOTED OTHERWISE. IF THE CONTRACTOR CHOOSES TO USE ADS HP STORM PIPE, IT SHALL BE INSTALLED TO MANUFACTURER SPECIFICATIONS. IN ADDITION, THE CONTRACTOR SHALL BE SURE TO PROVIDE CONCRETE COLLARS AROUND EACH F.E.S. TO PREVENT FLOTTATION IF PP PIPE IS CHOSEN.
 - CONTRACTOR SHALL COORDINATE WITH OWNER TO DETERMINE IF A GEOTECHNICAL ENGINEERING REPORT WAS COMPLETED FOR THE SITE.
 - CONTRACTOR SHALL STAKE SILT FENCE ALONG LIMITS OF DISTURBANCE LINE. THE SILT FENCE LINETYPE IS OFFSET ON THE DRAWING FOR CLARITY.

- ASPHALT AREA NOTE:**
 1. SITE CONTRACTOR SHALL STRIP TOPSOIL AND ANY UNSUITABLE MATERIAL AND PROVIDE CUT/FILL OPERATIONS TO PROVIDE A COMPACTED CONTROLLED SUBGRADE, IN ACCORDANCE WITH THE SUBSURFACE GEOTECHNICAL EXPLORATION AND TECHNICAL SPECIFICATIONS.
- BUILDING PAD NOTE:**
 1. SITE CONTRACTOR SHALL STRIP TOPSOIL AND ANY UNSUITABLE MATERIAL AND PROVIDE CUT/FILL OPERATIONS TO PROVIDE A COMPACTED CONTROLLED BUILDING PAD, IN ACCORDANCE WITH STRUCTURAL DRAWINGS.
- STORMWATER NOTE:**
 1. THIS PROJECT DRAINS TO A PROPOSED ON-SITE STORM WATER WET DETENTION BASIN.
 2. ONCE SITE IS STABILIZED AND SEDIMENT BASIN IS CONVERTED TO A WET DETENTION BASIN, CONTRACTOR SHALL REMOVE ALL SEDIMENT FROM BASIN AND RESTORE TO DESIGN ELEVATIONS.
- DUKE ENERGY NOTES:**
 1. NO STOCKPIILING OF MATERIAL IS ALLOWED AT ANY TIME IN THE DUKE ENERGY TRANSMISSION EASEMENT ALONG INDEPENDENCE BLVD.
 2. NO GRADING IS ALLOWED WITHIN 25 FEET OF ANY GUY ANCHOR OR TRANSMISSION POLE.
 3. THERE IS NO GRADE CHANGES ALLOWED IN THE TRANSMISSION EASEMENT UNLESS SHOWN ON THE PLANS.
 4. NO SUBDIVISION ENTRY SIGNAGE IS ALLOWED IN THE DUKE ENERGY TRANSMISSION EASEMENT.



REVISIONS:

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

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

GRADING & DRAINAGE PLAN
TRACT 2
WOODLANDS @ ECHO FARMS
CITY OF WILMINGTON
NORTH CAROLINA

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION

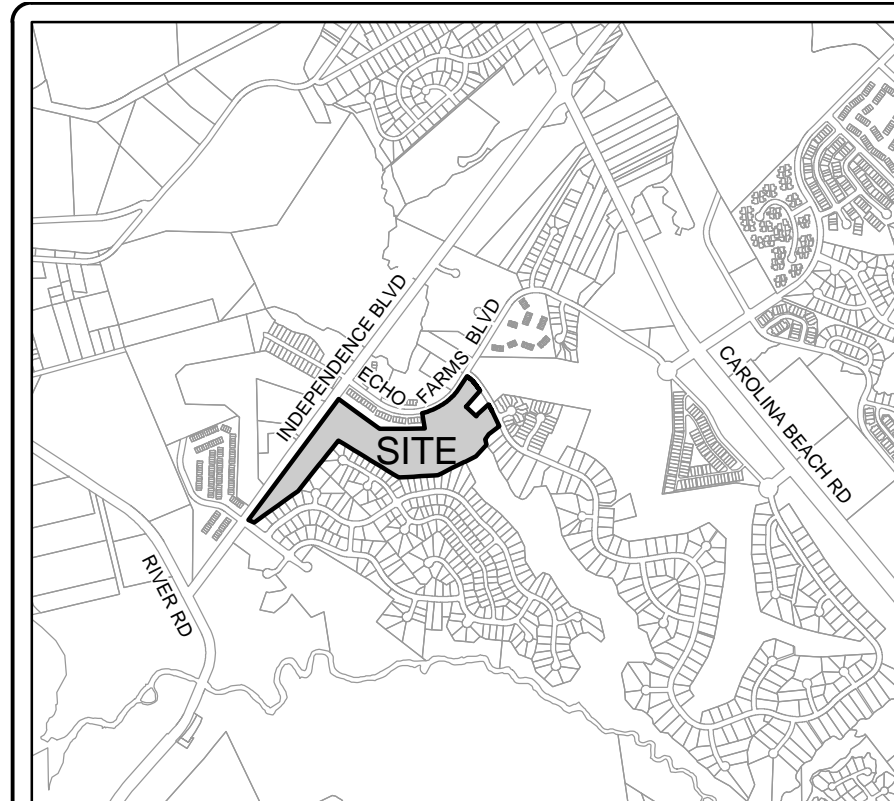
PROJECT STATUS:
 CONCEPTUAL LAYOUT:
 PRELIMINARY LAYOUT:
 RELEASED FOR CONST.:

DRAWING INFORMATION:
 DATE: 03/12/19
 1" = 40' RFB
 DESIGNED: ROBERT P. BALL
 DRAWN: _____
 CHECKED: _____

SEAL:

C-3.2

PEI JOB#: 17358.PE



VICINITY MAP
SCALE: 1" = 2,000'

LEGEND:

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

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

Date: _____ Permit # _____
Signed: _____

Approved Construction Plan
Name _____ Date _____

Planning _____
Traffic _____
Fire _____

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

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

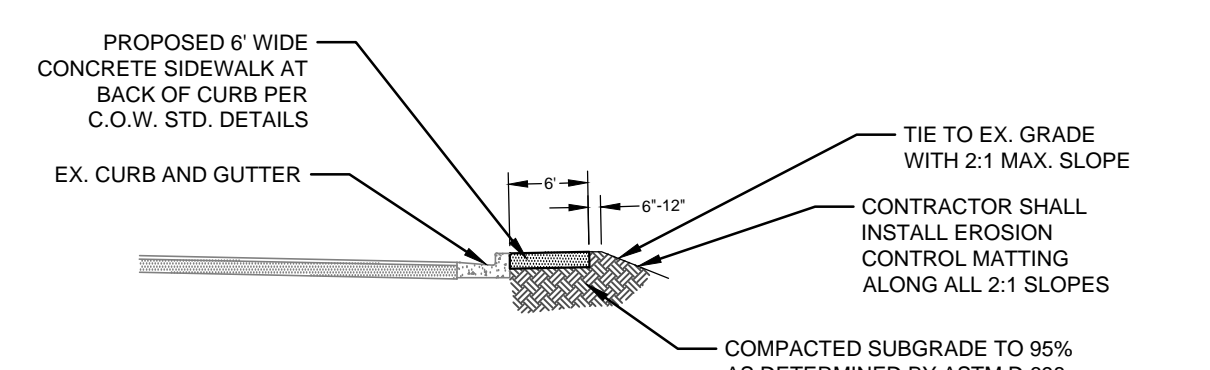
DWQ SEWER PERMIT #: _____
SEWER CAPACITY: _____ GPD

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

STORM SEWER SCHEDULE:

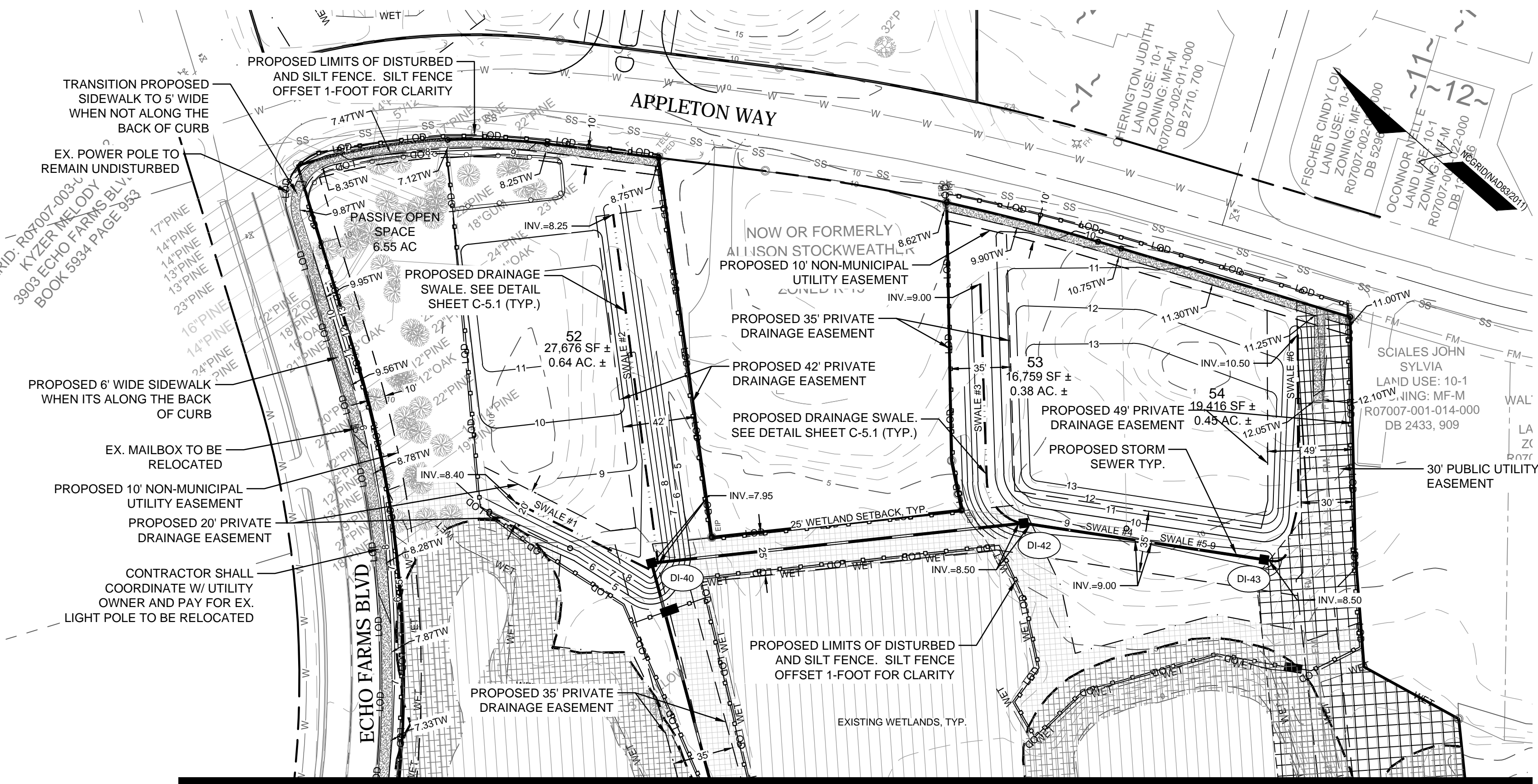
Upstream Node	Downstream Node	Diameter (in)	Upstream Pipe Invert (ft)	Downstream Pipe Invert (ft)	Pipe Length (ft)	Slope (%)	Upstream Rim Elev (ft)	Downstream Rim Elev (ft)	Pipe Material
MH-1A	FES-1	36	-0.45	-1.00	118	0.46	8.00	N/A	RCP III
CI-2	MH-1A	36	-0.23	-0.45	50	0.45	9.44	8.00	RCP III
CI-3	CI-2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

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

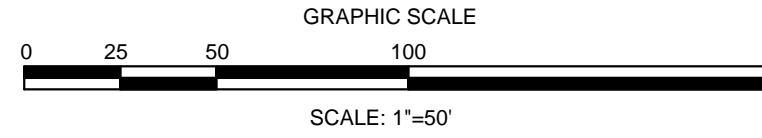
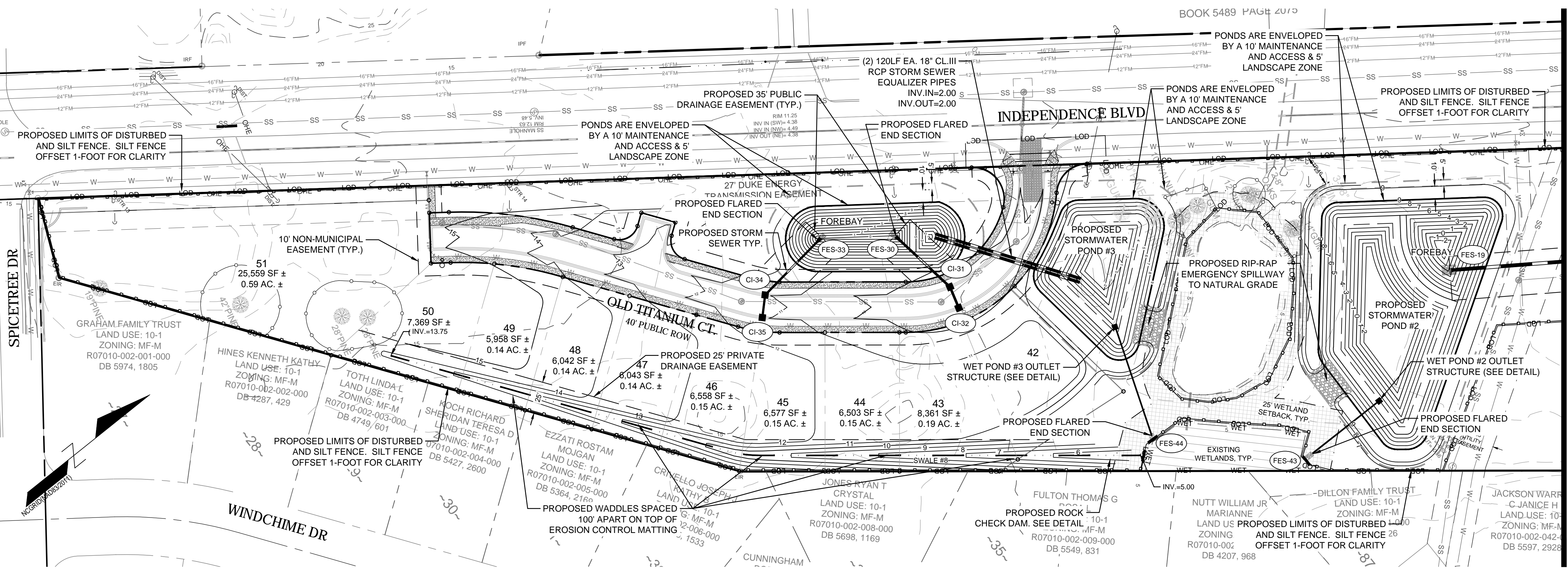


**SIDEWALK - TYPICAL CROSS SECTION
ALONG BACK OF CURB**
NOT TO SCALE

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



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 - CONTRACTOR SHALL ADJUST ALL FRAMES OF EX. UTILITY INFRASTRUCTURE WITHIN ASPHALT OVERLAY AND NEW ASPHALT AREAS TO MATCH PROPOSED GRADES.
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 - NO GRADING IS ALLOWED WITHIN 25 FEET OF ANY GUY ANCHOR OR TRANSMISSION POLE.
 - THERE IS NO GRADE CHANGES ALLOWED IN THE TRANSMISSION EASEMENT UNLESS SHOWN ON THE PLANS.
 - NO SUBDIVISION ENTRY SIGNAGE IS ALLOWED IN THE DUKE ENERGY TRANSMISSION EASEMENT.



FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION

REVISIONS:

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

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

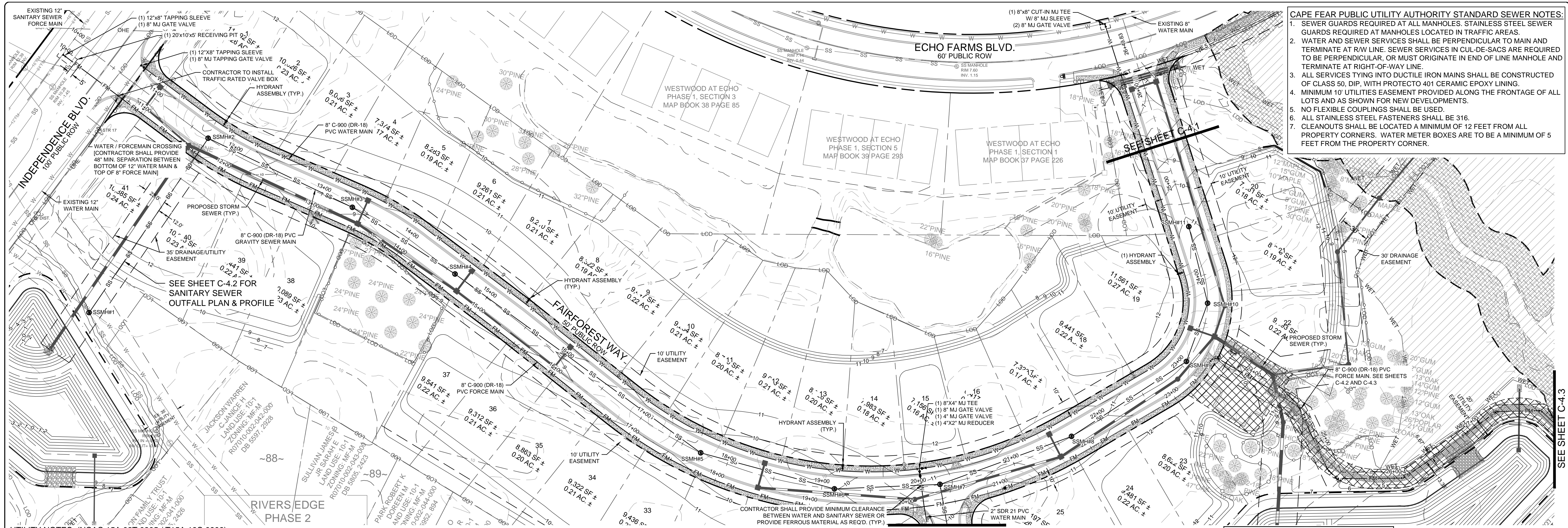
**GRADING-DRAINAGE-EC PLAN
TRACT 2
WOODLANDS @ ECHO FARMS
CITY OF WILMINGTON
NORTH CAROLINA**

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

DRAWING INFORMATION:
DATE: 03/12/19
1" = 50'
DESIGNED: _____
DRAWN: _____
CHECKED: _____

SEAL:
NORTH CAROLINA PROFESSIONAL ENGINEER
ROBERT P. BALL
031591
03/12/19

C-3.3
PEI JOB#: 17358.PE



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

- UTILITY NOTES: (NCAC 15A.02T.0305 / T15A.18C.0906)**
- WATER MAINS SHALL BE LAID SO AS TO PROVIDE A MINIMUM HORIZONTAL SEPARATION OF 10 FEET FROM SEWERS. IF CONDITIONS EXIST SUCH THAT THIS SEPARATION CANNOT BE ACHIEVED, THE WATER MAIN CAN BE INSTALLED AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, EITHER IN A SEPARATE TRENCH, OR IN THE SAME TRENCH ON A BENCH OF UNDISTURBED EARTH.
 - WHEN CROSSING A WATER MAIN OVER A SEWER, THE WATER MAIN SHALL BE LAID AT LEAST 18 INCHES ABOVE THE SEWER. IF CONDITIONS EXIST SUCH THAT THIS SEPARATION CANNOT BE ACHIEVED, BOTH THE WATER MAIN AND SEWER SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE WITH JOINTS THAT MEET WATER MAIN STANDARDS. THE DUCTILE IRON PIPE SHALL EXTEND 10 FEET ON EACH SIDE OF THE CROSSING WITH A SECTION OF WATER MAIN PIPE CENTERED ON THE CROSSING.
 - CROSSING A WATER MAIN UNDER A SEWER, WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS UNDER A SEWER, BOTH THE WATER MAIN AND THE SEWER SHALL BE CONSTRUCTED OF FERROUS MATERIALS AND WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING.
 - WHERE VERTICAL CLEARANCE IS LESS THAN 24" BETWEEN SANITARY SEWER AND STORM DRAIN, SANITARY SEWER SHALL BE DUCTILE IRON PIPE FOR A MINIMUM OF 10' EITHER SIDE OF CROSSING AND STORM DRAIN SHALL BE RC PIPE.

- WHERE VERTICAL CLEARANCE IS LESS THAN 18" BETWEEN WATER MAIN AND STORM DRAIN, WATER MAIN SHALL BE DUCTILE IRON PIPE FOR A MINIMUM OF 10' EITHER SIDE OF CROSSING AND STORM DRAIN SHALL BE RC PIPE.
- UTILITY INFORMATION**
SANITARY SEWER
 THIS PROJECT IS CONSTRUCTING A SANITARY SEWER GRAVITY SYSTEM THAT WILL CONNECT TO AN EXISTING 10-INCH GRAVITY SYSTEM IN RIVERS EDGE PHASE II SUBDIVISION. SANITARY SEWER ALLOCATION IS PROVIDED BY CFPWA.
WATER
 THIS PROJECT WILL CONNECT TO EXISTING WATER MAIN LOCATED WITHIN INDEPENDENCE BLVD. AND ECHO FARMS BLVD. RIGHT OF WAY. THIS PROJECT IS CONSTRUCTING 8-INCH WATER MAINS THAT WILL LOOP BETWEEN THE EXISTING WATER MAINS. DOMESTIC WATER ALLOCATION PROVIDED BY CFPWA.
- WATER & SEWER SERVICE NOTE:**
 1. CONTRACTOR SHALL INSTALL WATER AND SEWER SERVICES IN ACCORDANCE WITH CFPWA STANDARD DETAILS AND SPECIFICATIONS. (1) 4-INCH SEWER SERVICE IN ACCORDANCE WITH CFPWA STANDARD DETAILS PER LOT.

SEE SHEET C-4.1
ROAD R - PLAN VIEW
 HORIZONTAL SCALE: 1"=50'

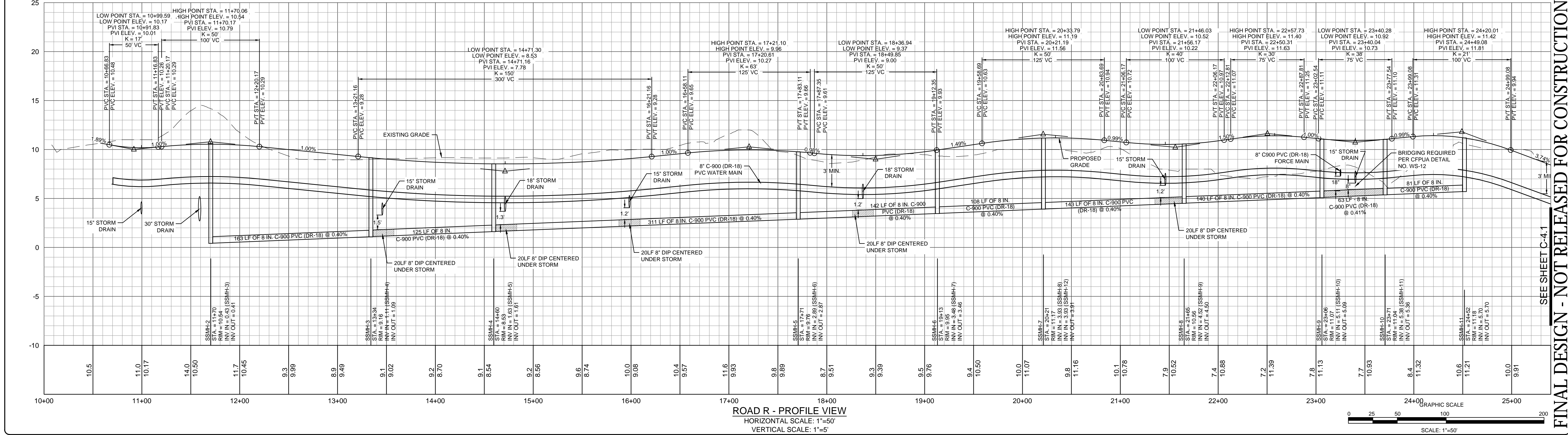
Approved Construction Plan		
Name	Date	
Planning		
Traffic		
Fire		

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

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

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

NCGR01040329011



ROAD R - PROFILE VIEW
 HORIZONTAL SCALE: 1"=50'
 VERTICAL SCALE: 1"=5'

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION

REVISIONS:

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

PARAMOUNT ENGINEERING
 122 Cinema Drive
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PLAN & PROFILE
TRACT 2
WOODLANDS @ ECHO FARMS
CITY OF WILMINGTON
NORTH CAROLINA

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

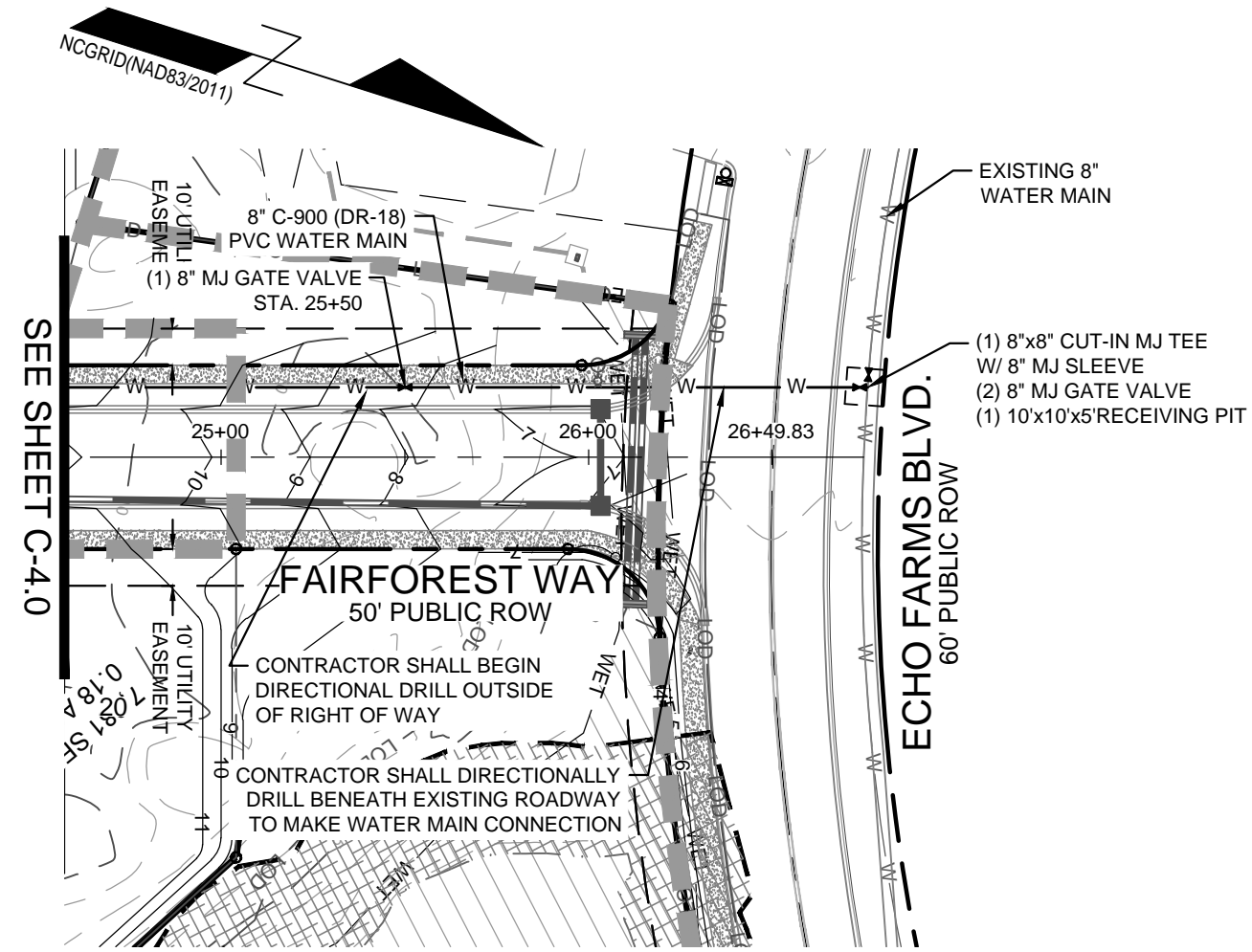
DRAWING INFORMATION:
 DATE: 03/12/19
 1" = 80'
 1" = 50'
 1" = 100'
 1" = 200'
 DESIGNED:
 DRAWN:
 CHECKED:

SEAL:
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL
 031591
 ROBERT P. BALL
 03/12/19

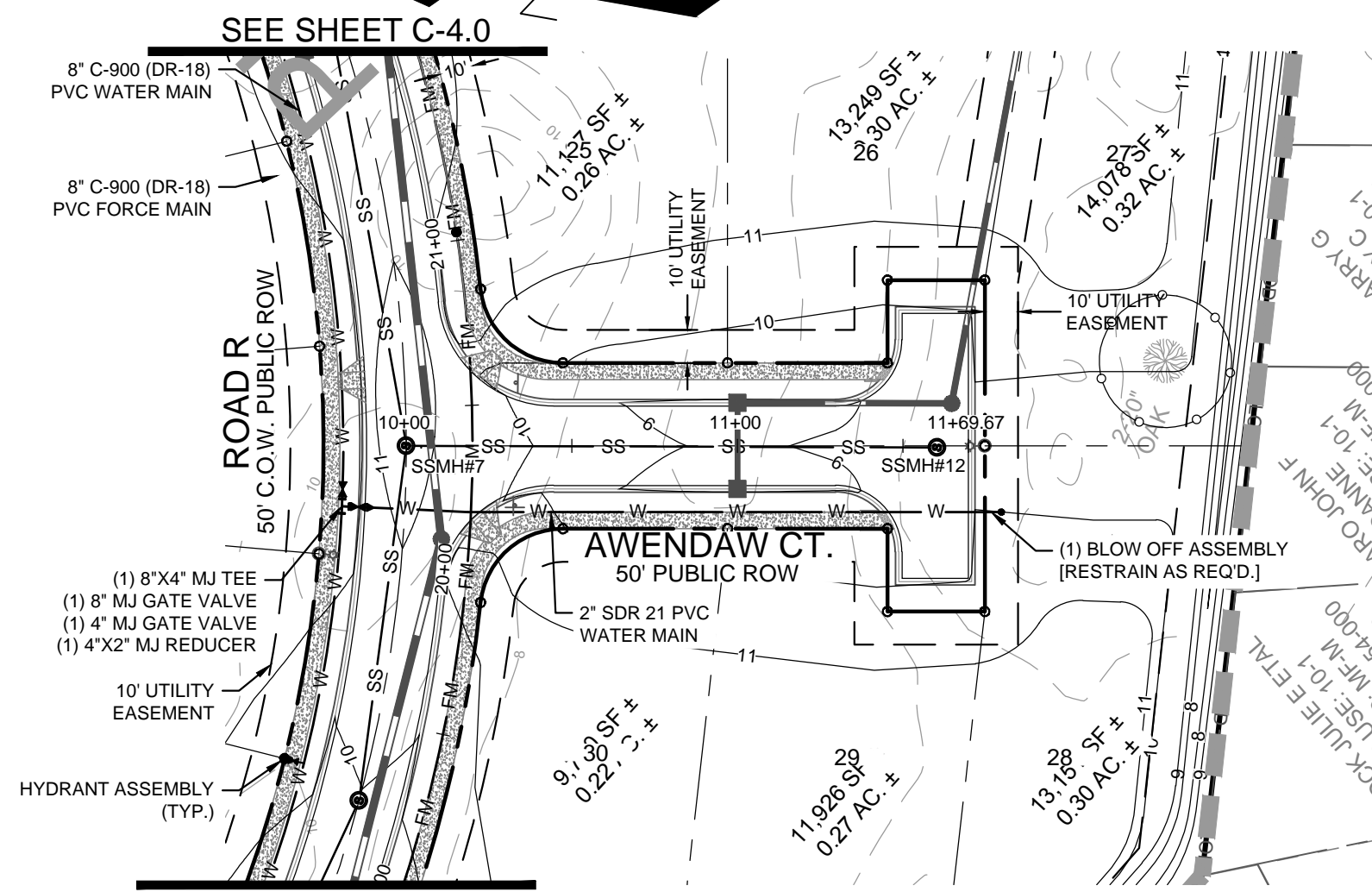
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 PEI JOB#: 17358.PE

CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD SEWER NOTES:

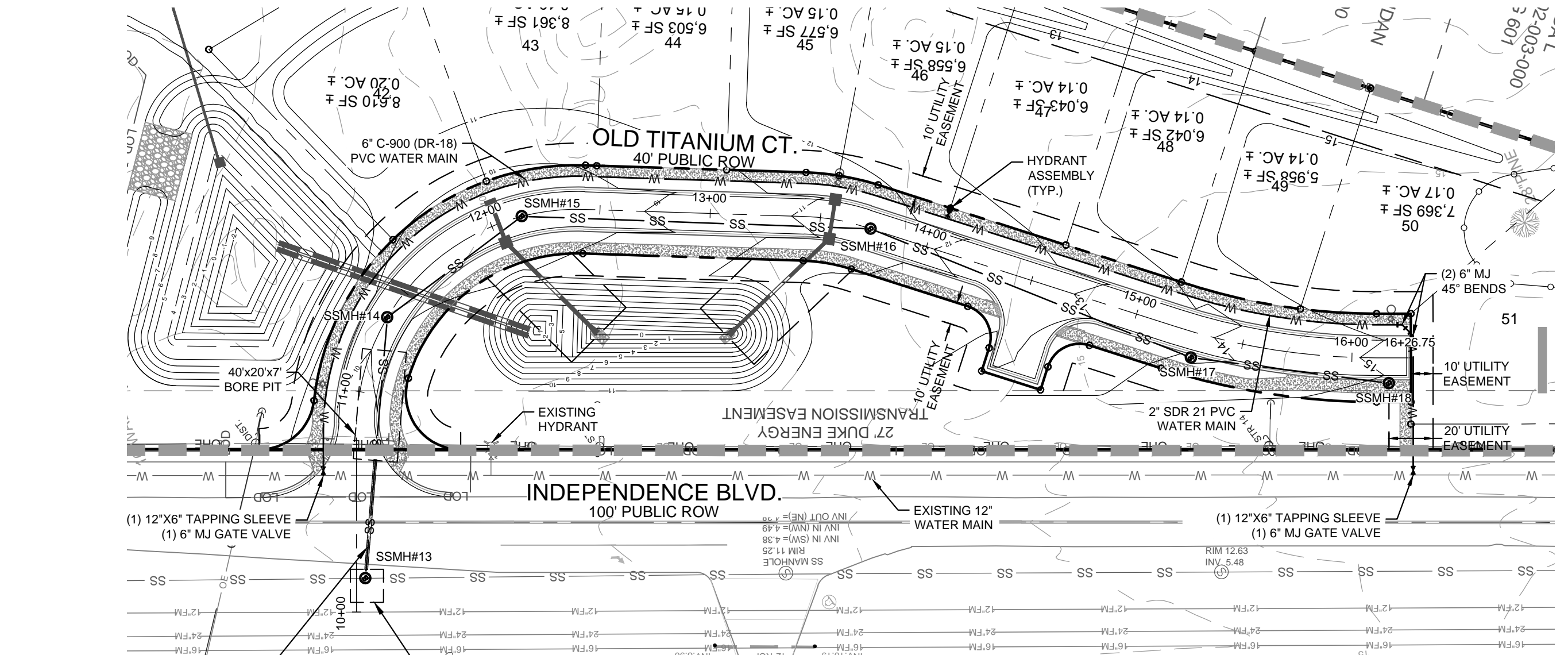
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- ALL SERVICES TYING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF CLASS 50, DIP, WITH PROTECTO 401 CERAMIC EPOXY LINING.
- MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
- NO FLEXIBLE COUPLINGS 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.



ROAD R - PLAN VIEW
HORIZONTAL SCALE: 1"=50'



ROAD R2 - PLAN VIEW
HORIZONTAL SCALE: 1"=50'



ROAD U - PLAN VIEW
HORIZONTAL SCALE: 1"=50'

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

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

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

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

WATER & SEWER SERVICE NOTE:

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

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

Date: _____ Permit # _____

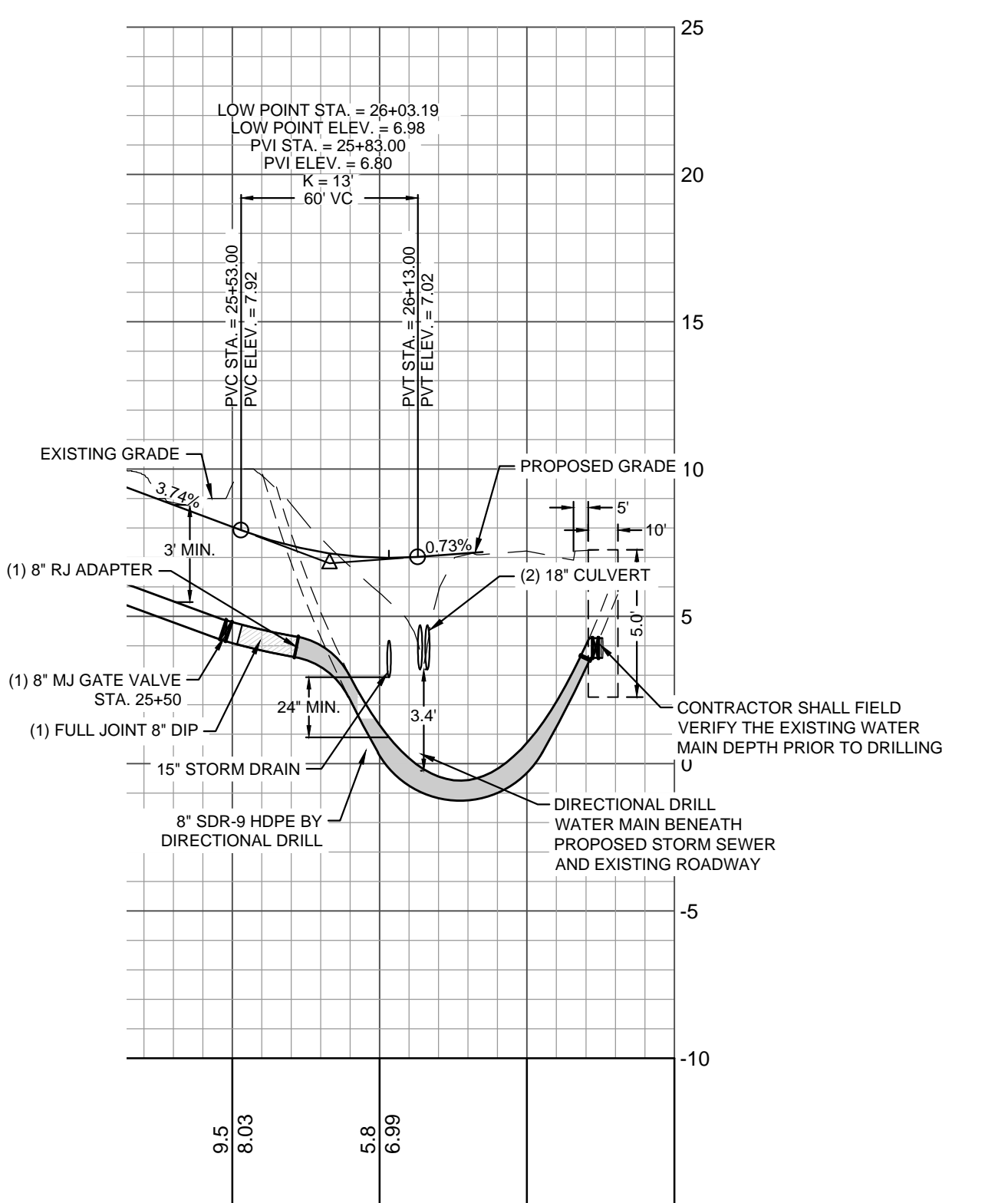
Signed: _____

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)

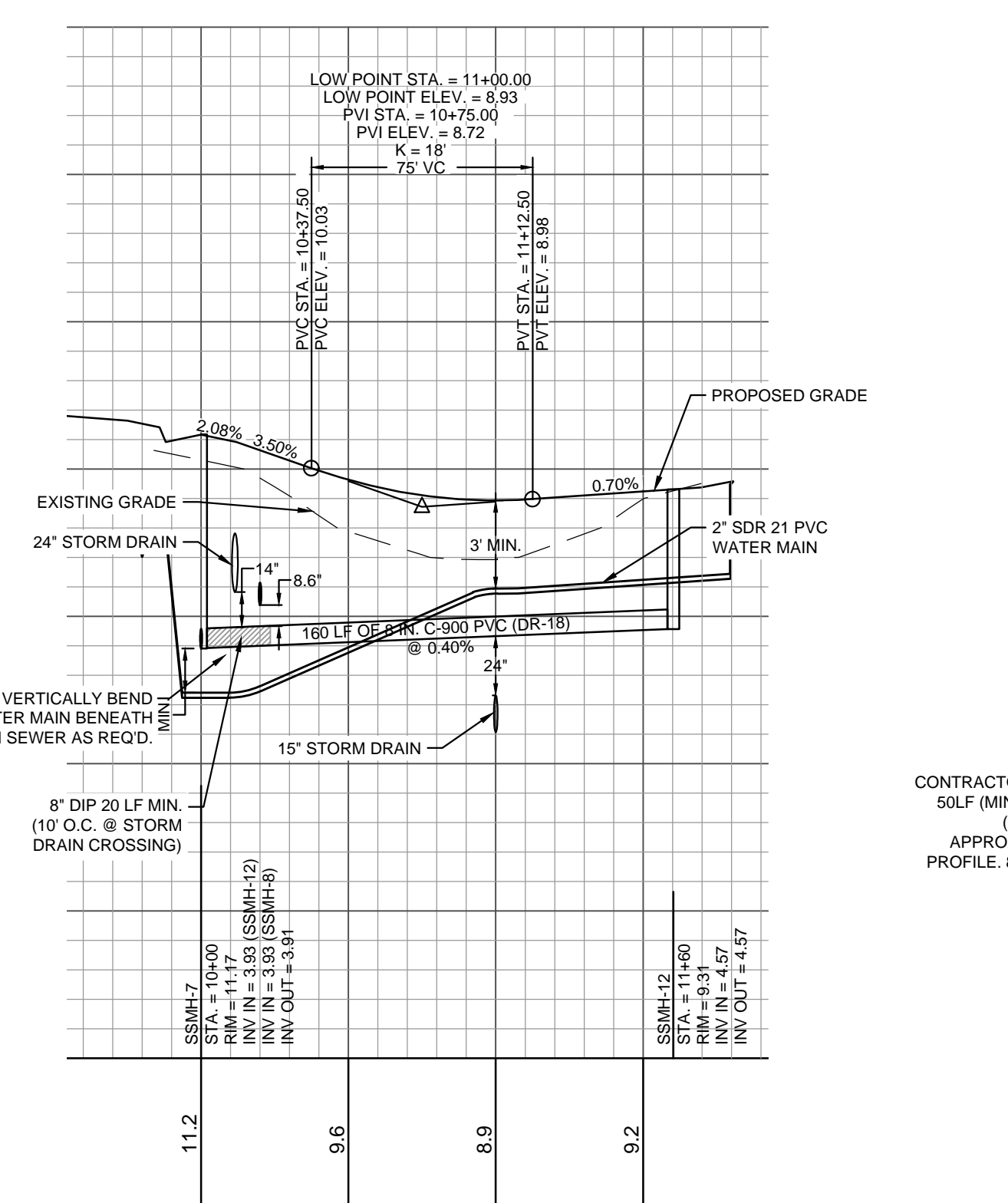
For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

811
Know what's Below.
Call before you dig.

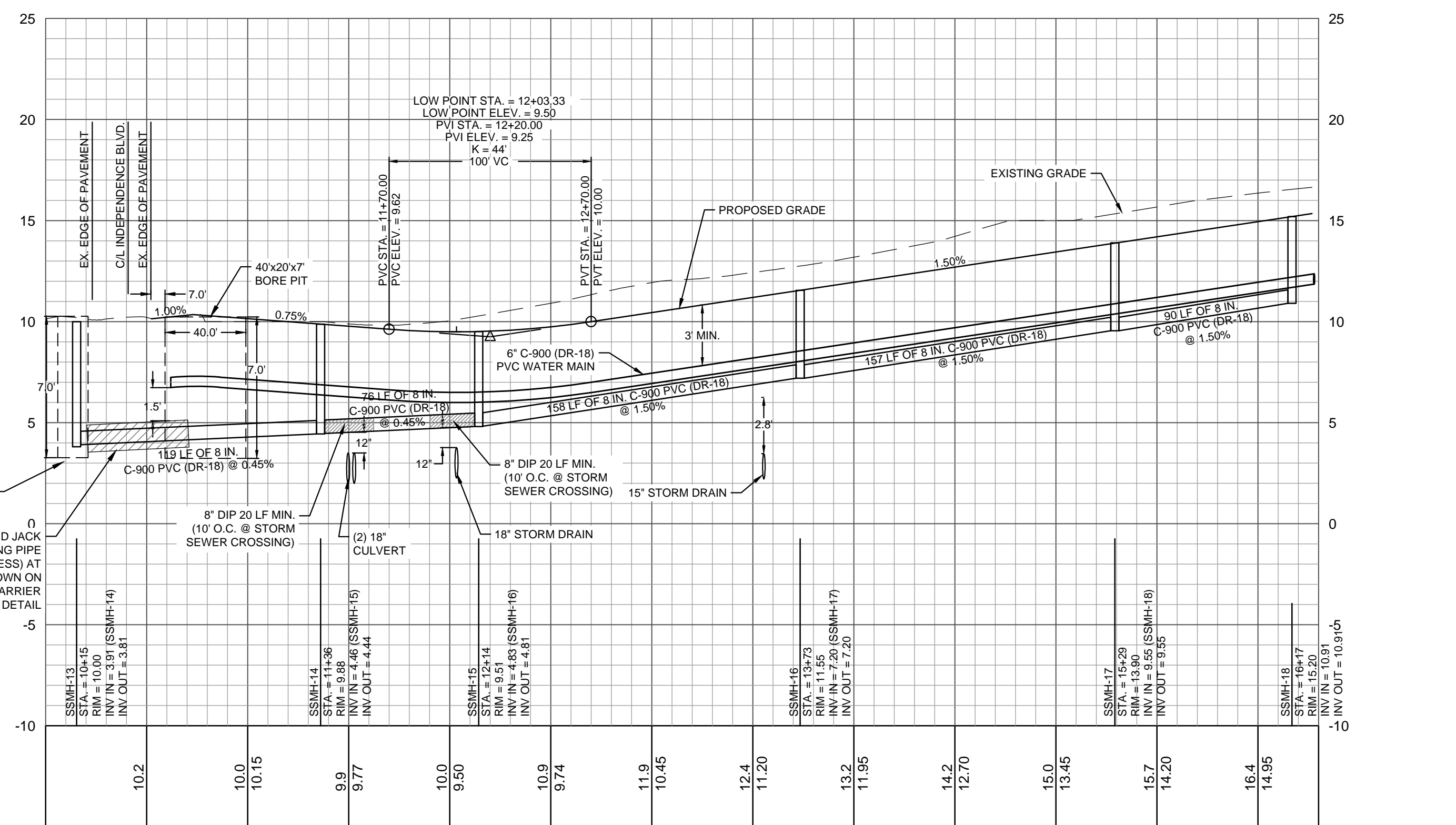
Approved Construction Plan	
Name	Date
Planning _____	_____
Traffic _____	_____
Fire _____	_____



ROAD R - PROFILE VIEW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=5'



ROAD R2 - PROFILE VIEW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=5'



ROAD U - PROFILE VIEW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=5'

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION

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

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

DRAWING INFORMATION
DATE: 03/12/19
1" RFB
RFB
RFB
DESIGNED:
DRAWN:
CHECKED:

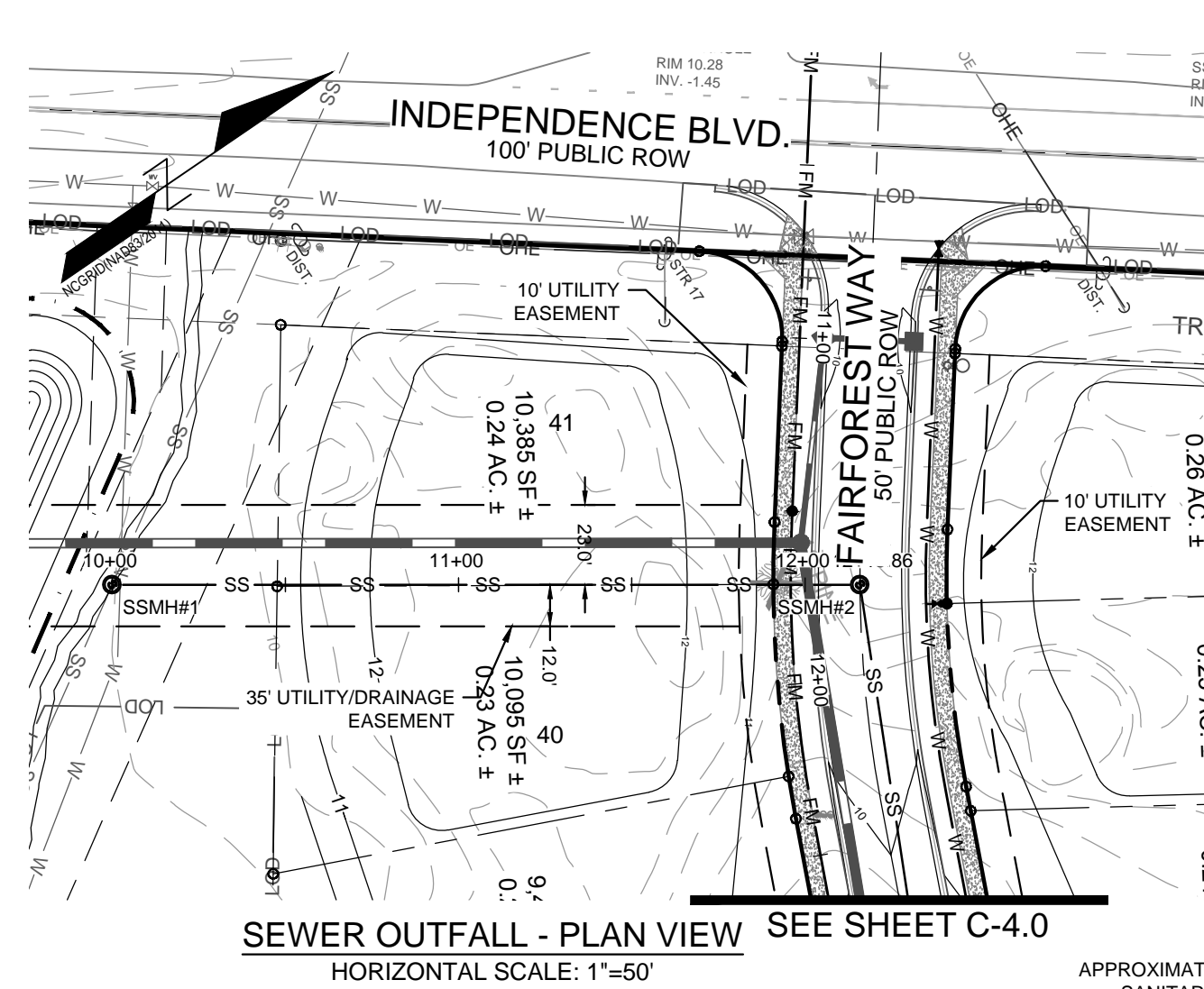
SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
0315491
ROBERT P. BALL
03/12/19

C-4.1
PEI JOB#: 17358.PE

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

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

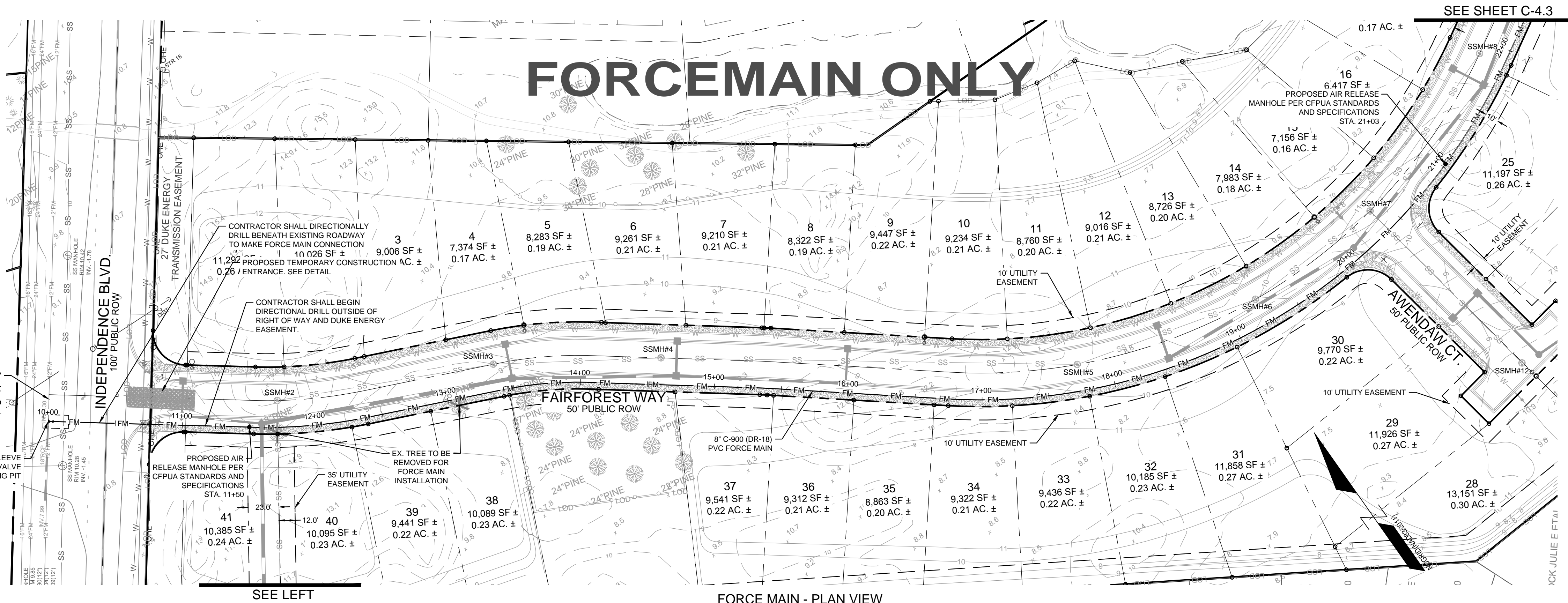
REVISIONS:



- CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD SEWER NOTES:**
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 - MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
 - NO FLEXIBLE COUPLINGS SHALL BE USED.
 - ALL STAINLESS STEEL FASTENERS SHALL BE 316.
 - CLEANOUTS SHALL BE LOCATED A MINIMUM OF 12 FEET FROM ALL PROPERTY CORNERS. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.

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

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WILMINGTON
NORTH CAROLINA
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____
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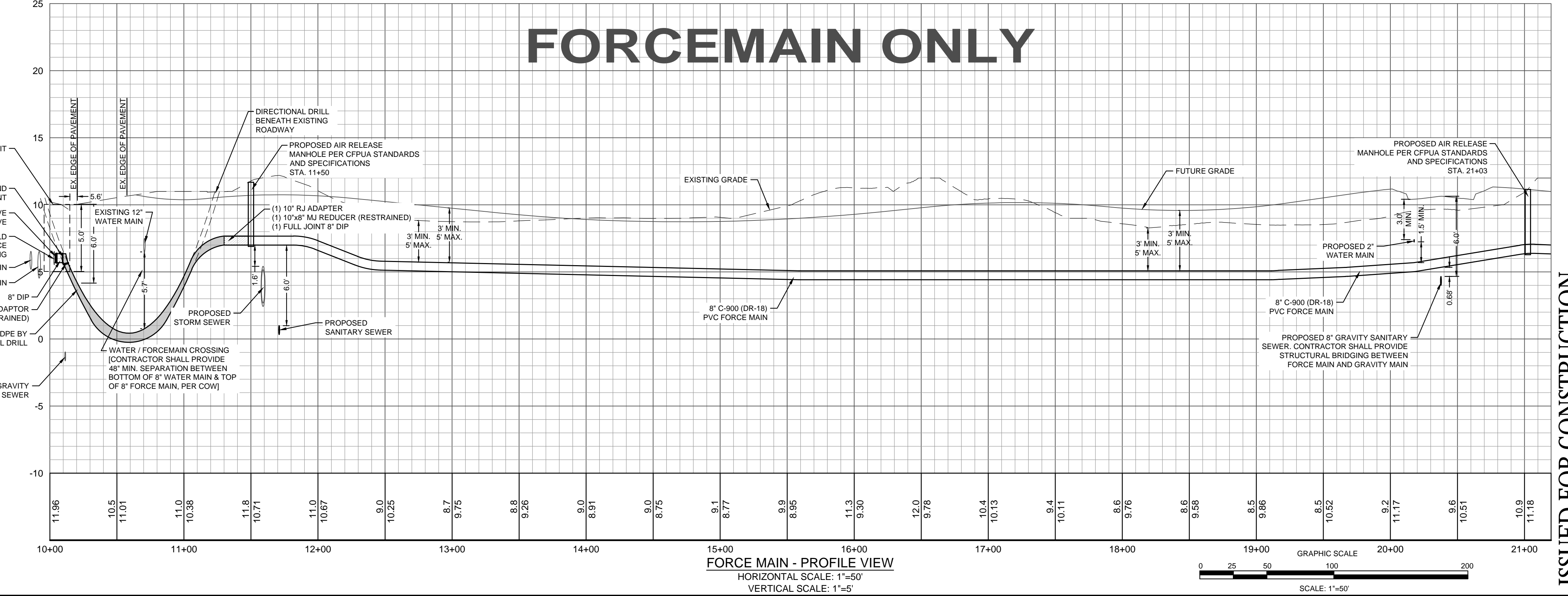
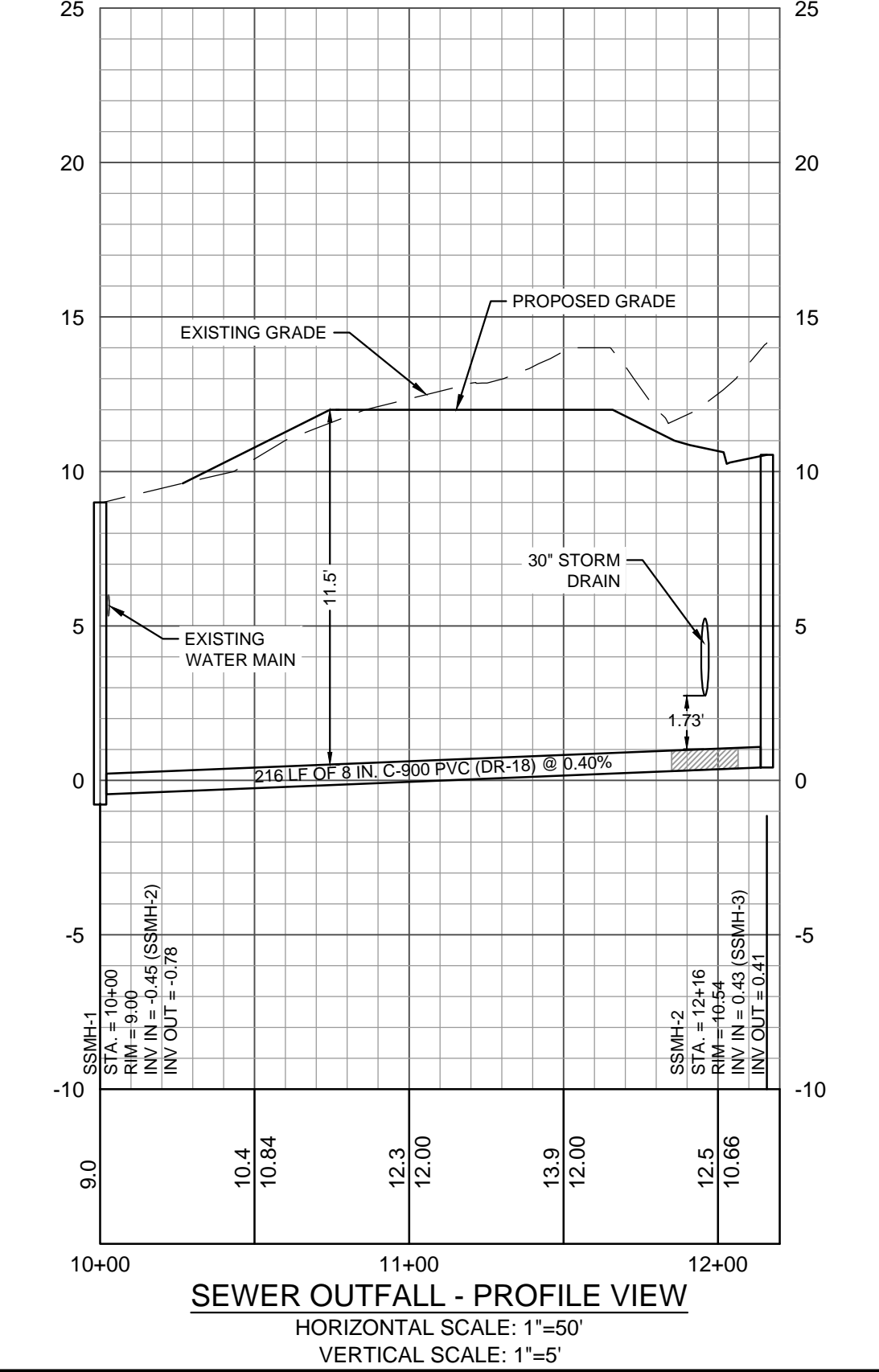
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Approved Construction Plan

Name	Date
Planning _____	_____
Traffic _____	_____
Fire _____	_____

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REVISIONS:
CLIENT INFORMATION:
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c/o MATRIX DEVELOPMENT GROUP
CN 4000 FORSCATE DRIVE
CRANBURY, NJ 08512

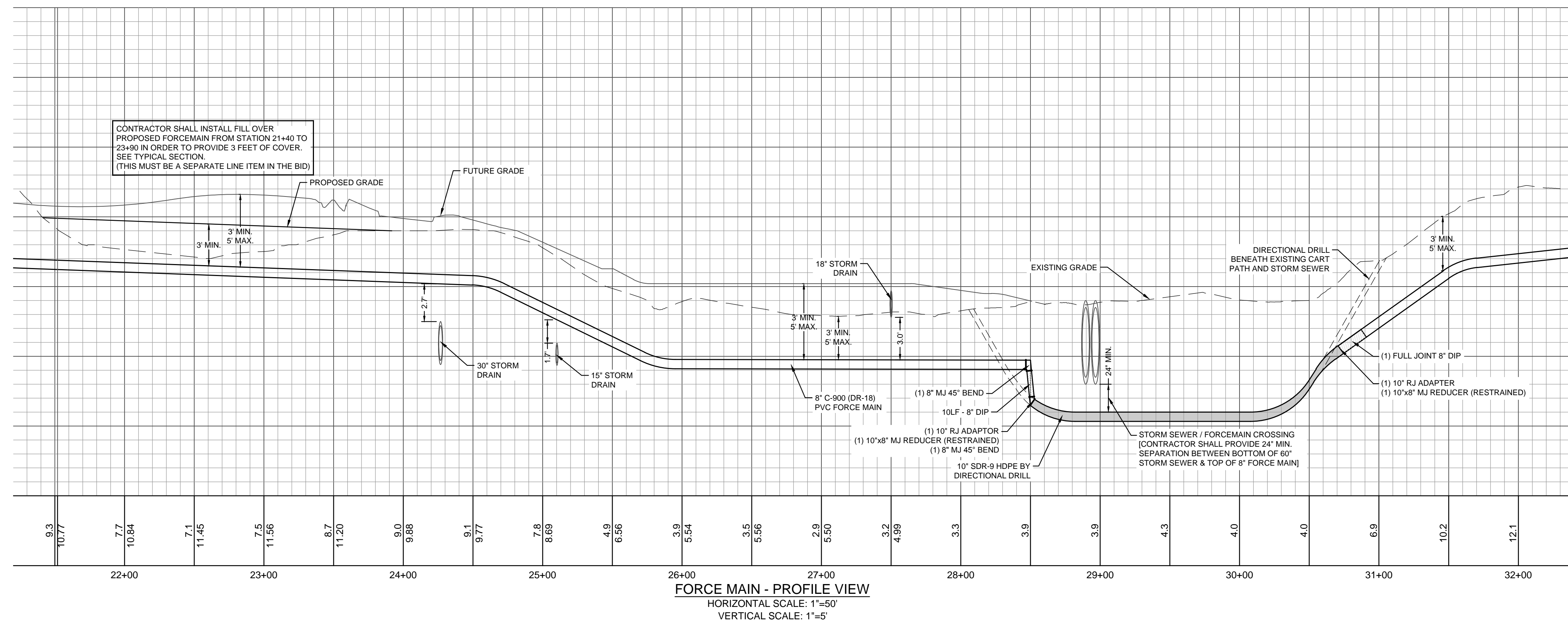
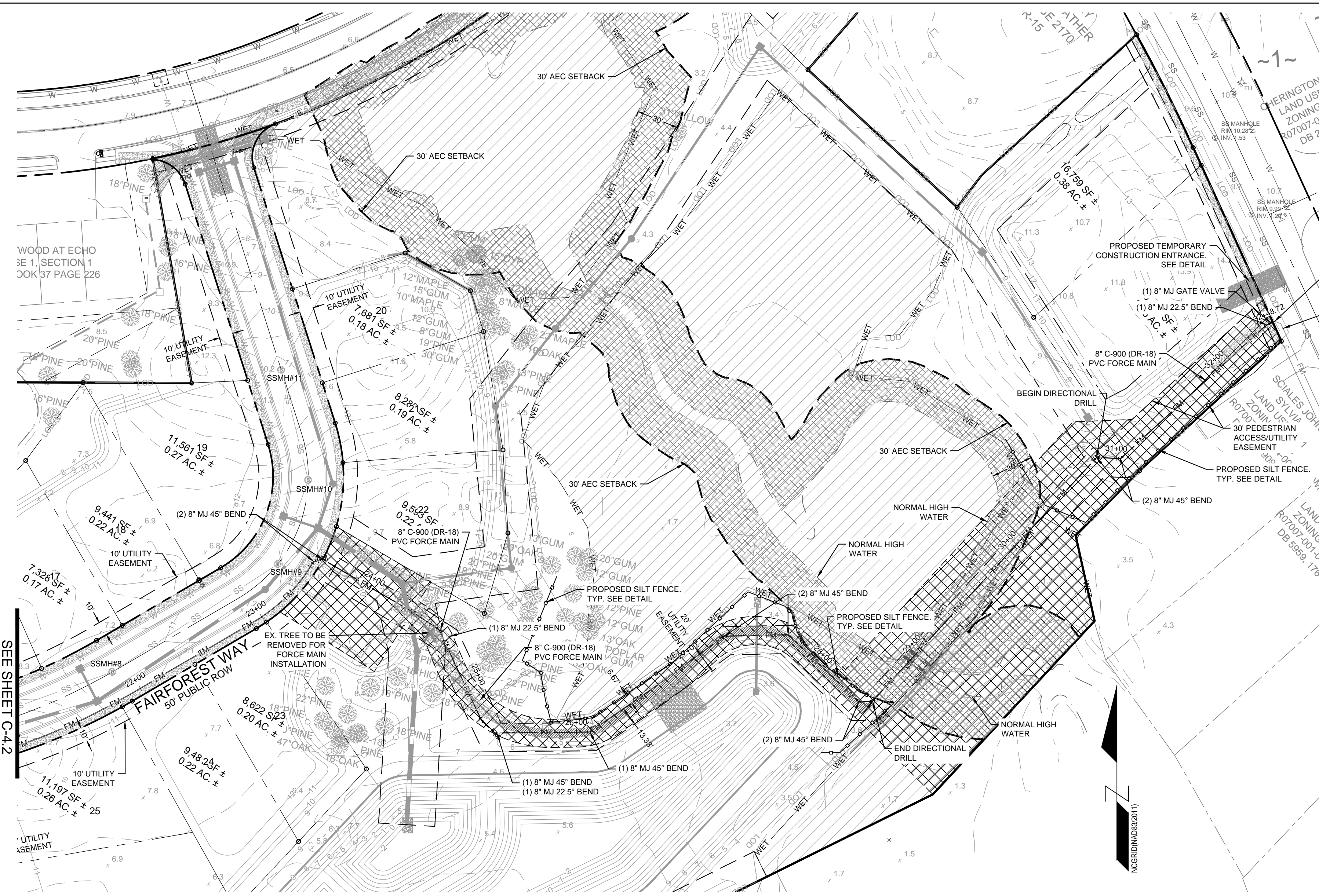
PARAMOUNT
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122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
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FORCE MAIN PLAN & PROFILE
TRACT 2
WOODLANDS @ ECHO FARMS
CITY OF WILMINGTON
NORTH CAROLINA

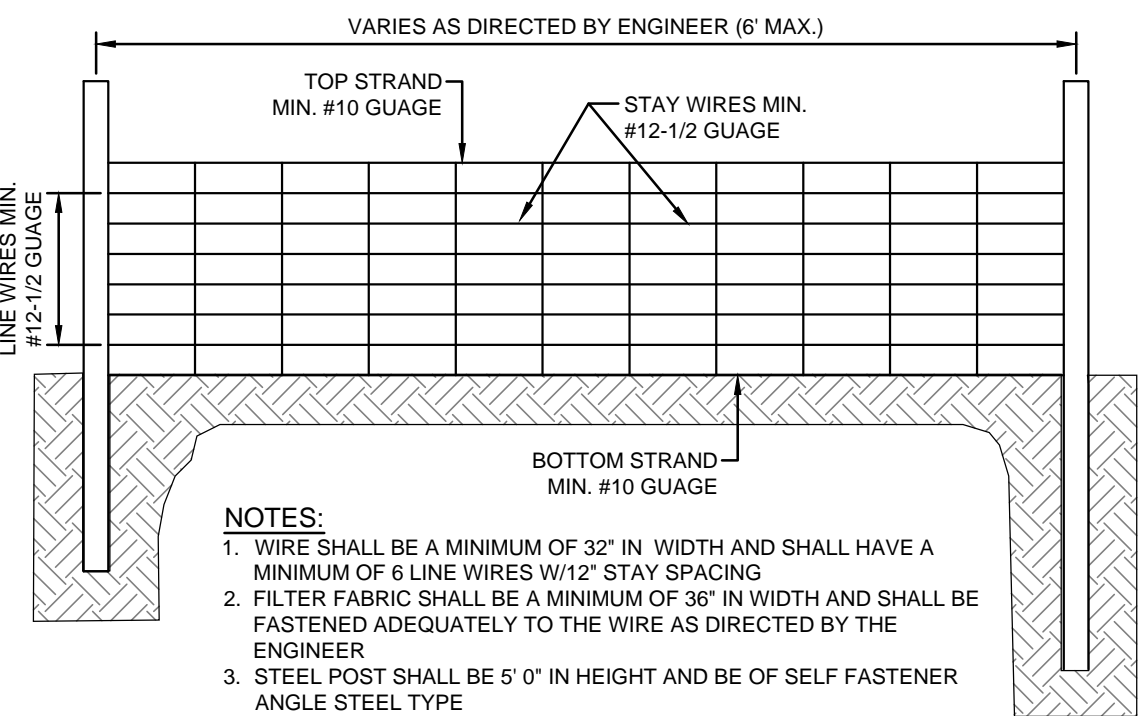
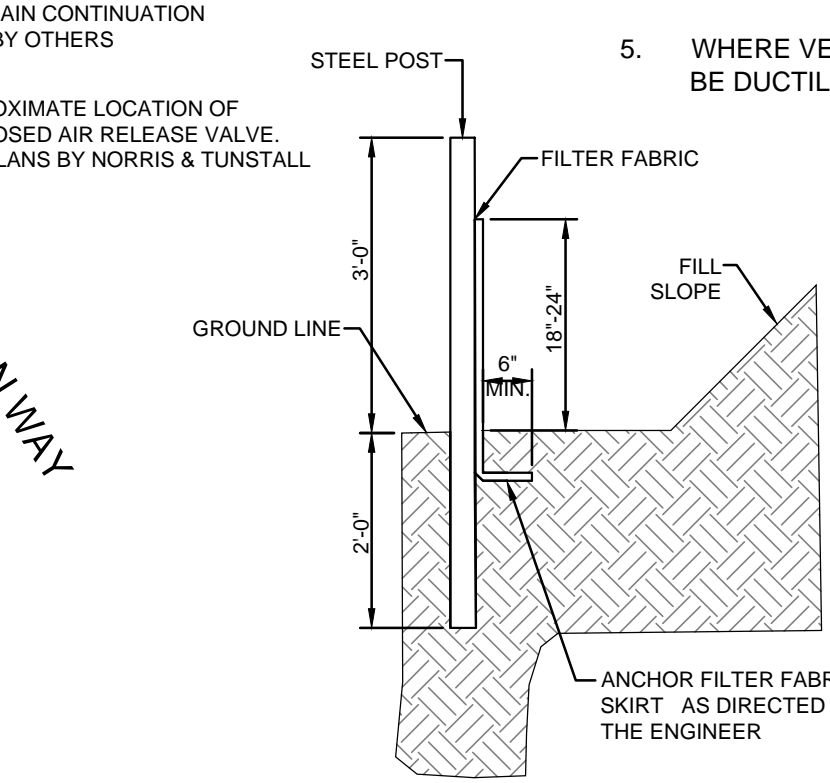
PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
RELEASED FOR CONST.
DRAWING INFORMATION
DATE: 03/12/19
1" RFB
1" RFB
DESIGNED:
DRAWN:
CHECKED:
SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
ROBERT P. BALL
03/12/19

C-4.2
PEI JOB#: 17358.PE

ISSUED FOR CONSTRUCTION



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GUIDELINES FOR TEMPORARY SILT FENCE DETAIL
NOT TO SCALE

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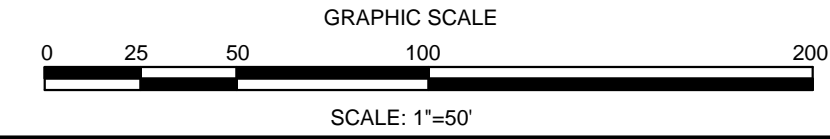
CITY OF WILMINGTON
NORTH CAROLINA
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____
Signed: _____

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



REVISIONS:

CLIENT INFORMATION:
ECHO FARMS, LLC
c/o MATRIX DEVELOPMENT GROUP
CN 4000 FORSCATE DRIVE
CRANFORD, NJ 08812

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

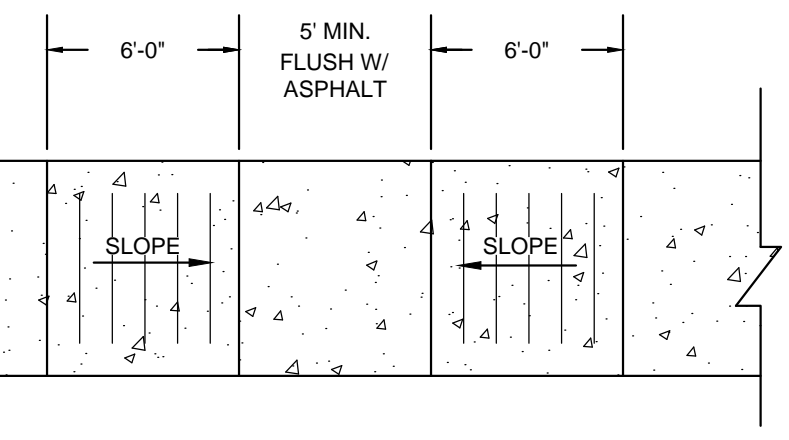
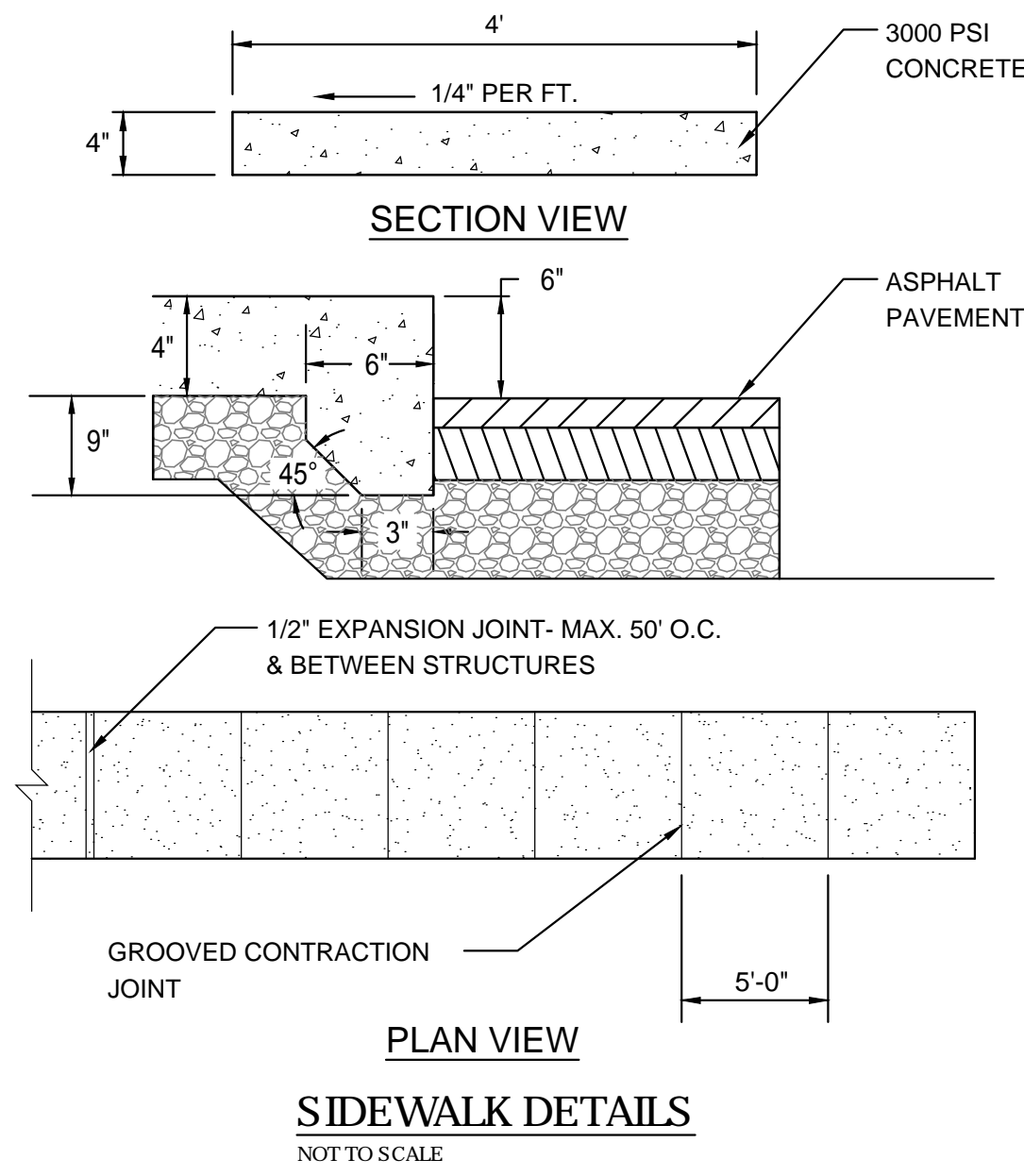
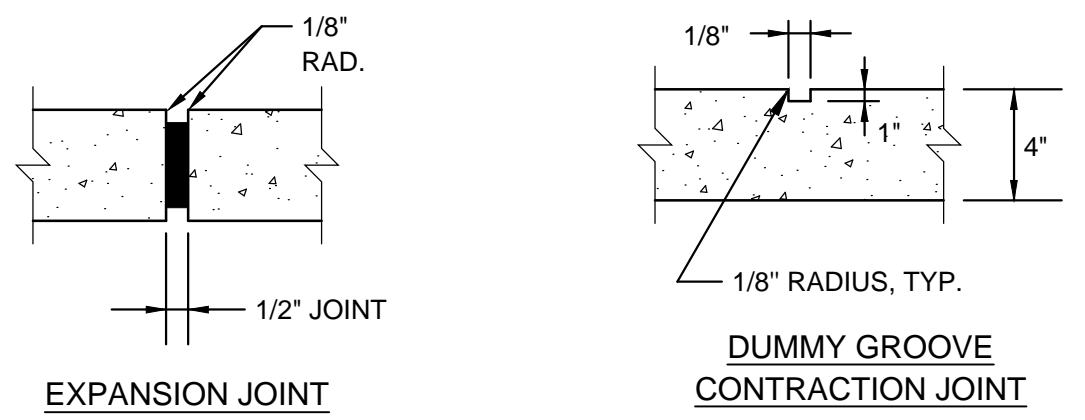
PROJECT STATUS:
CONCEPTUAL LAYOUT: _____
PRELIMINARY LAYOUT: _____
RELEASED FOR CONST: _____

DRAWING INFORMATION:
DATE: 03/12/19
1" RFB
DESIGNED: _____
DRAWN: _____
CHECKED: _____

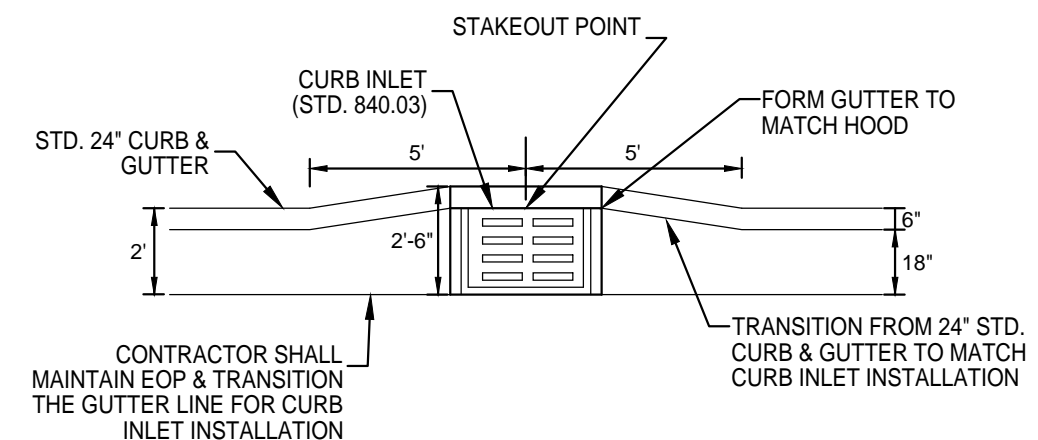
SEAL:
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL
031541
ENGINEER
ROBERT P. BALL
03/12/19

C-4.3
PEI JOB#: 17358.PE

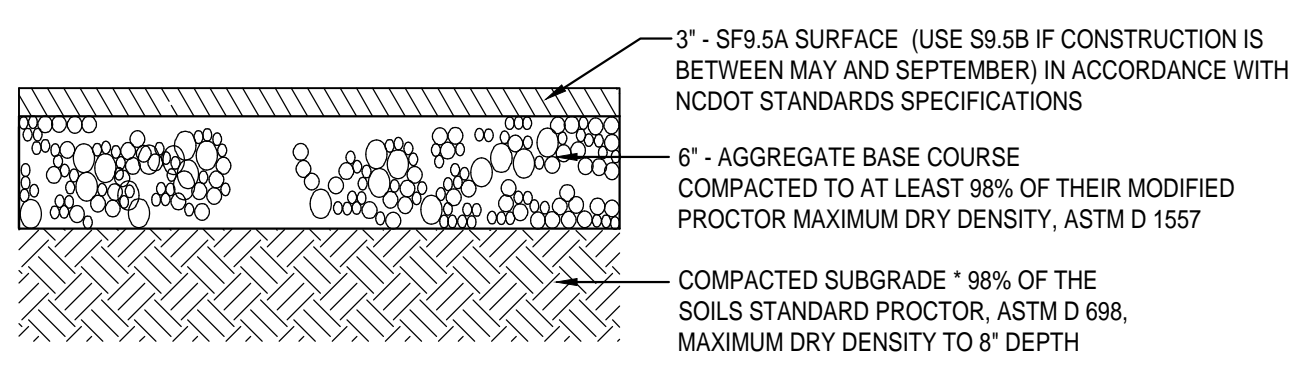
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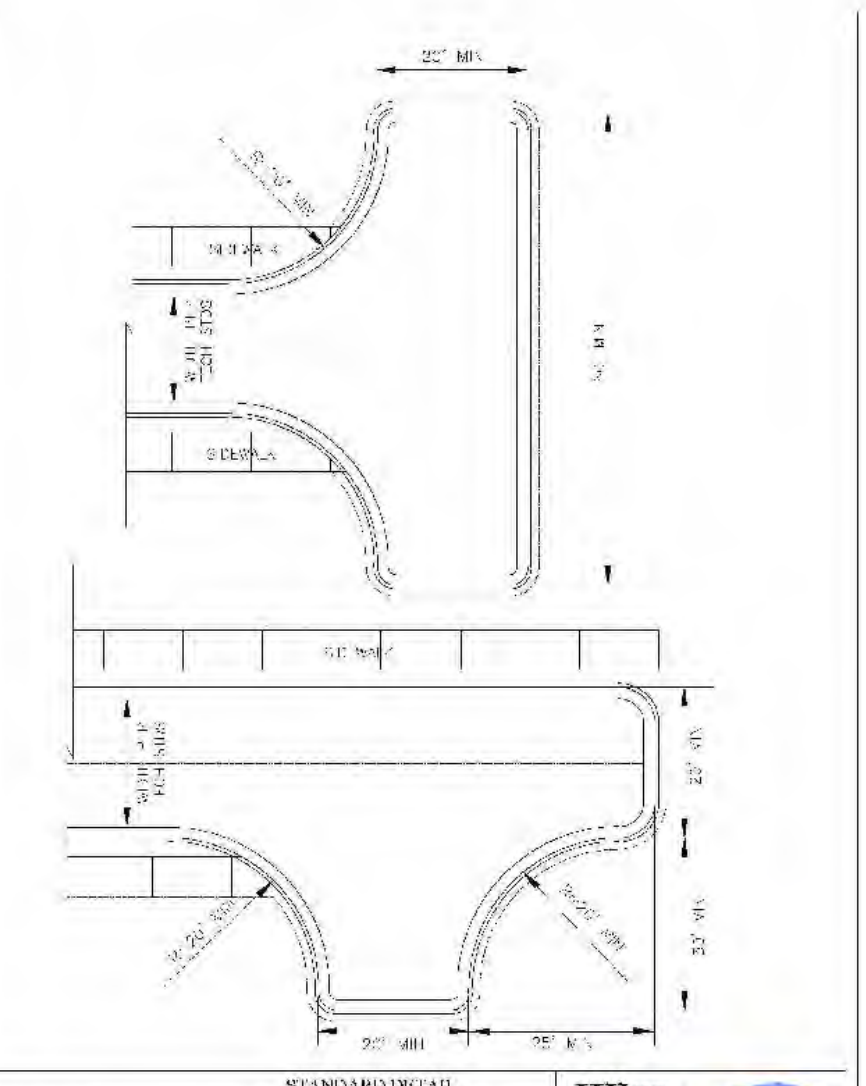
TYPE 1 - HANDICAP RAMP (PARALLEL RAMPS)
NOT TO SCALE



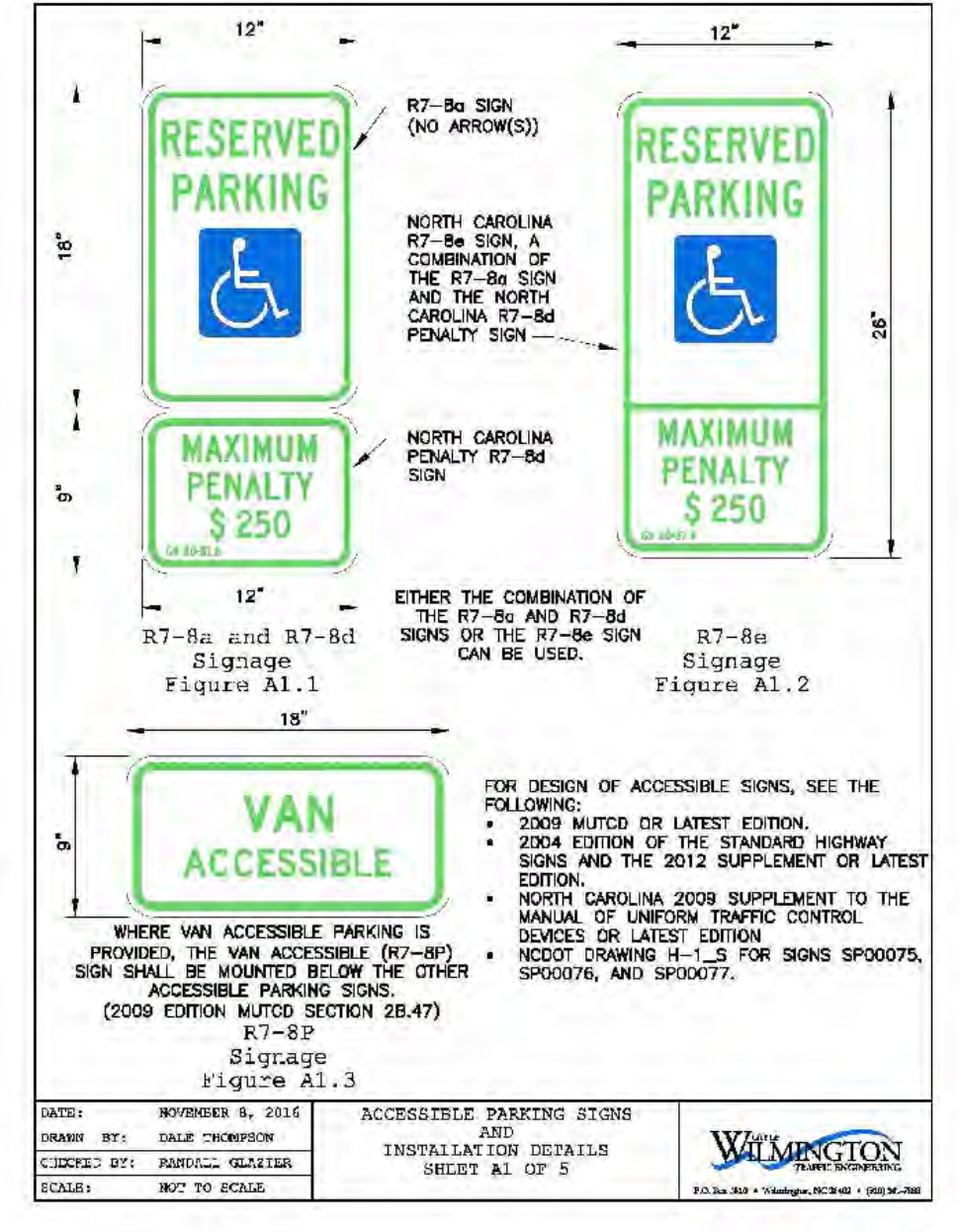
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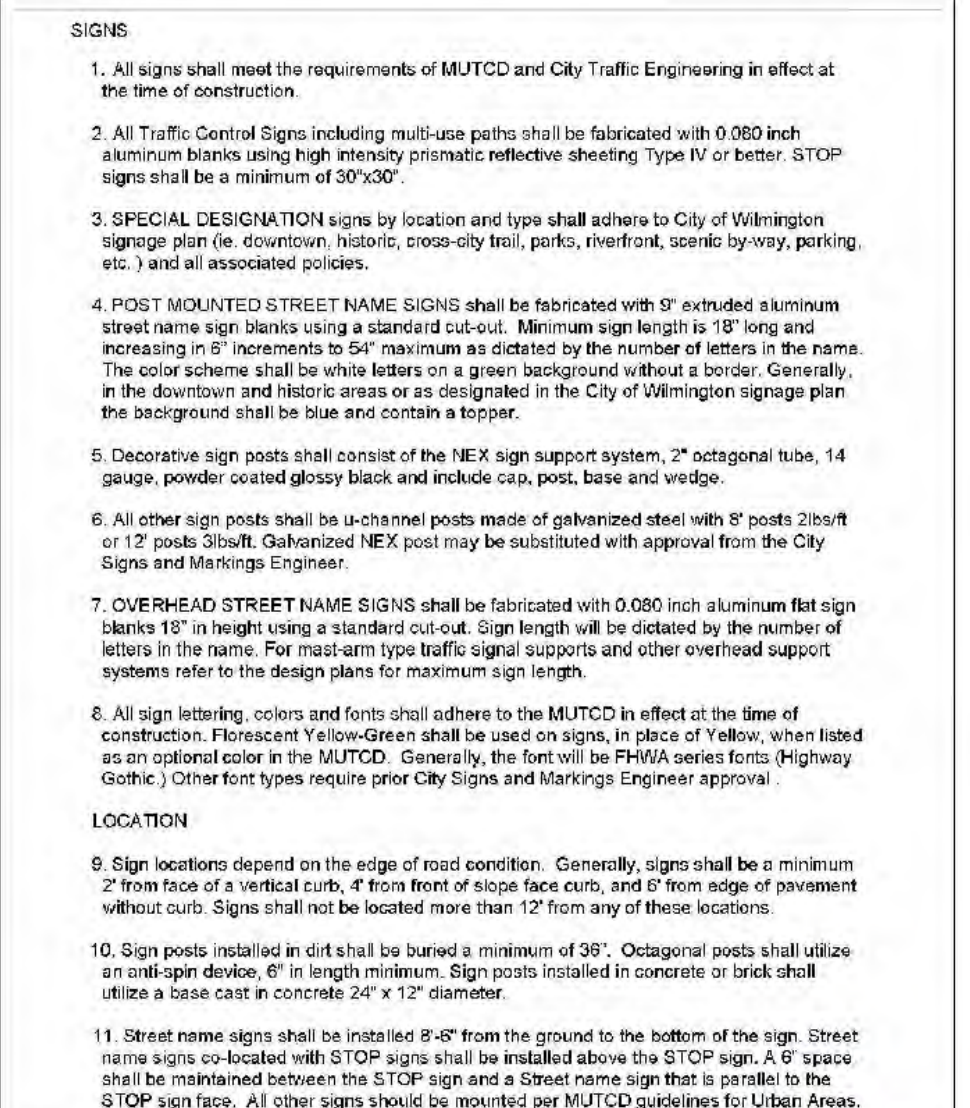
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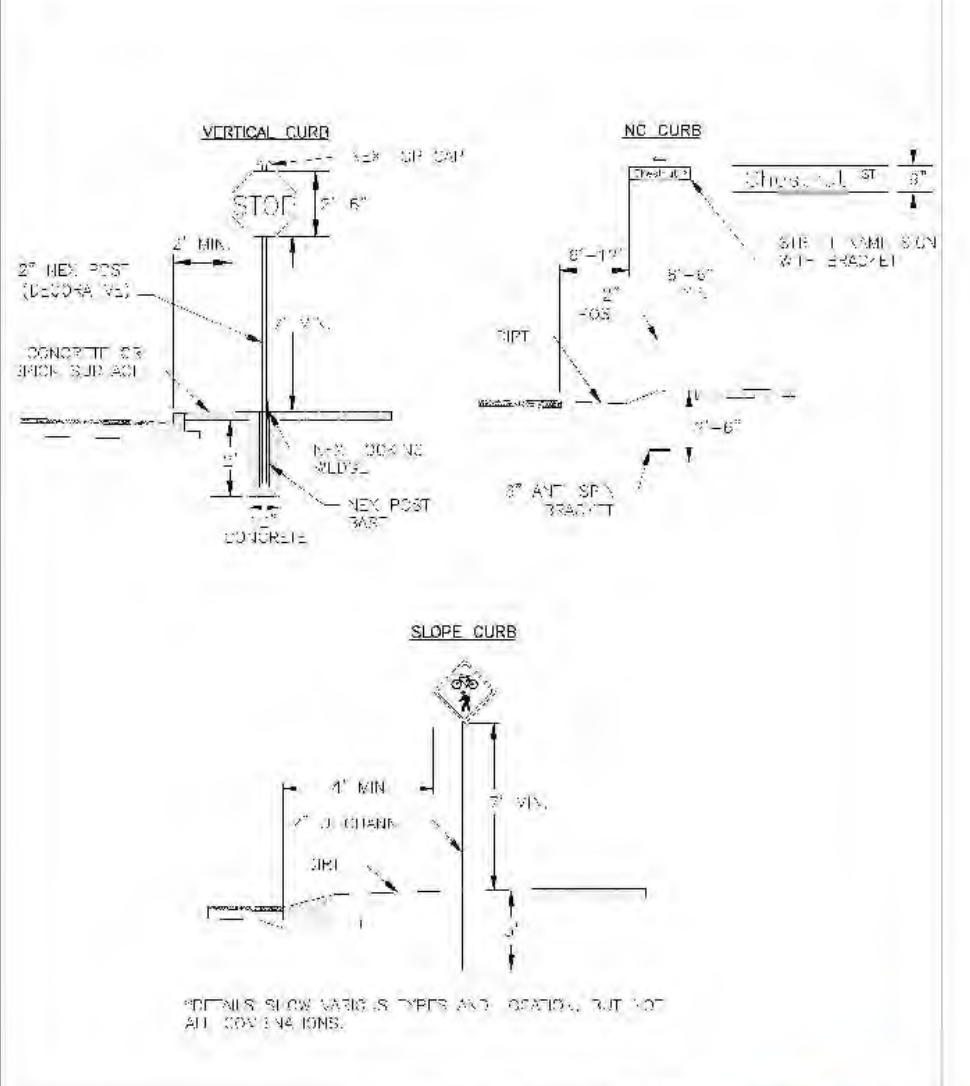
TURNAROUNDS
SD 3-05



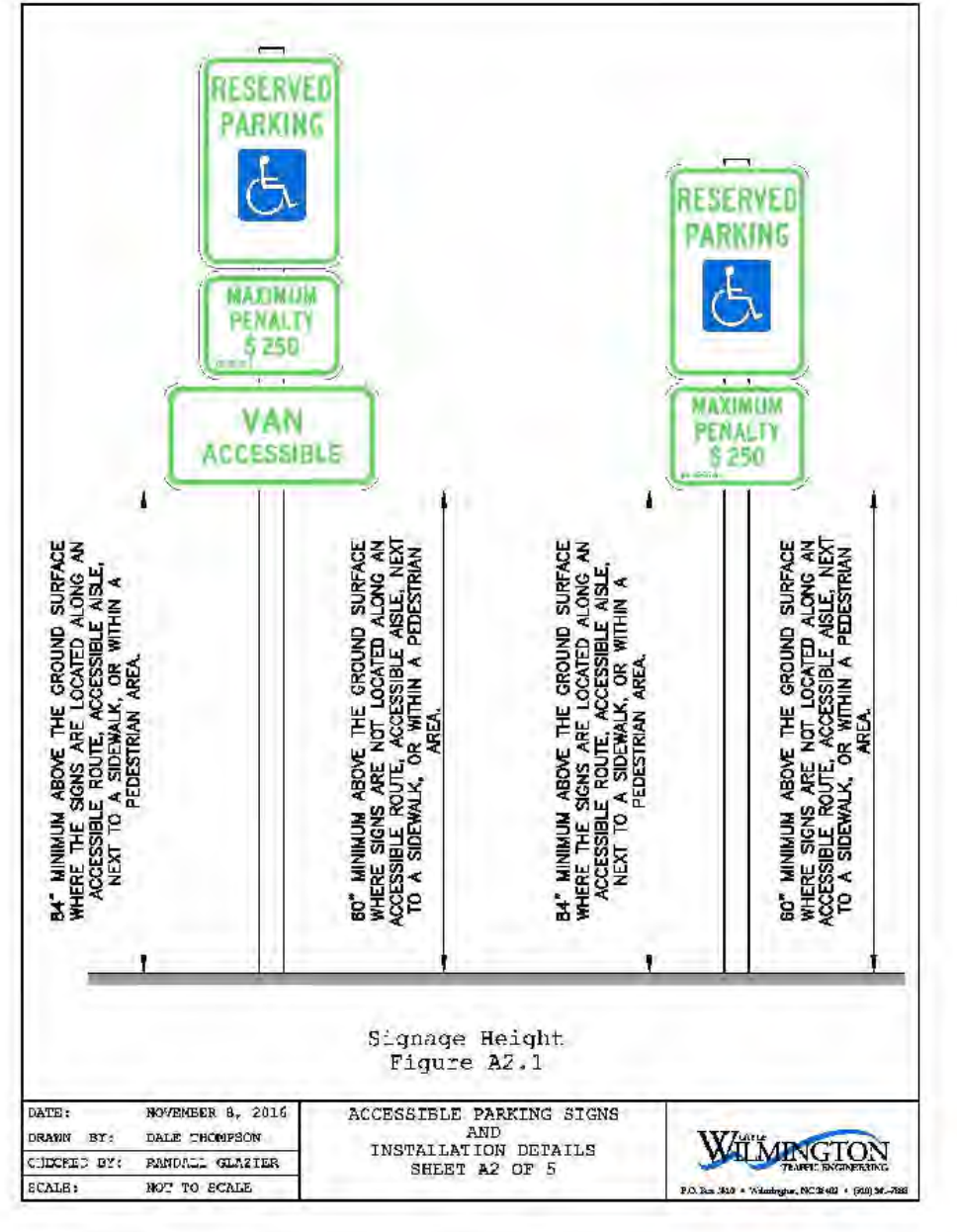
RESERVED PARKING AND VAN ACCESSIBLE SIGNAGE
SD 3-07



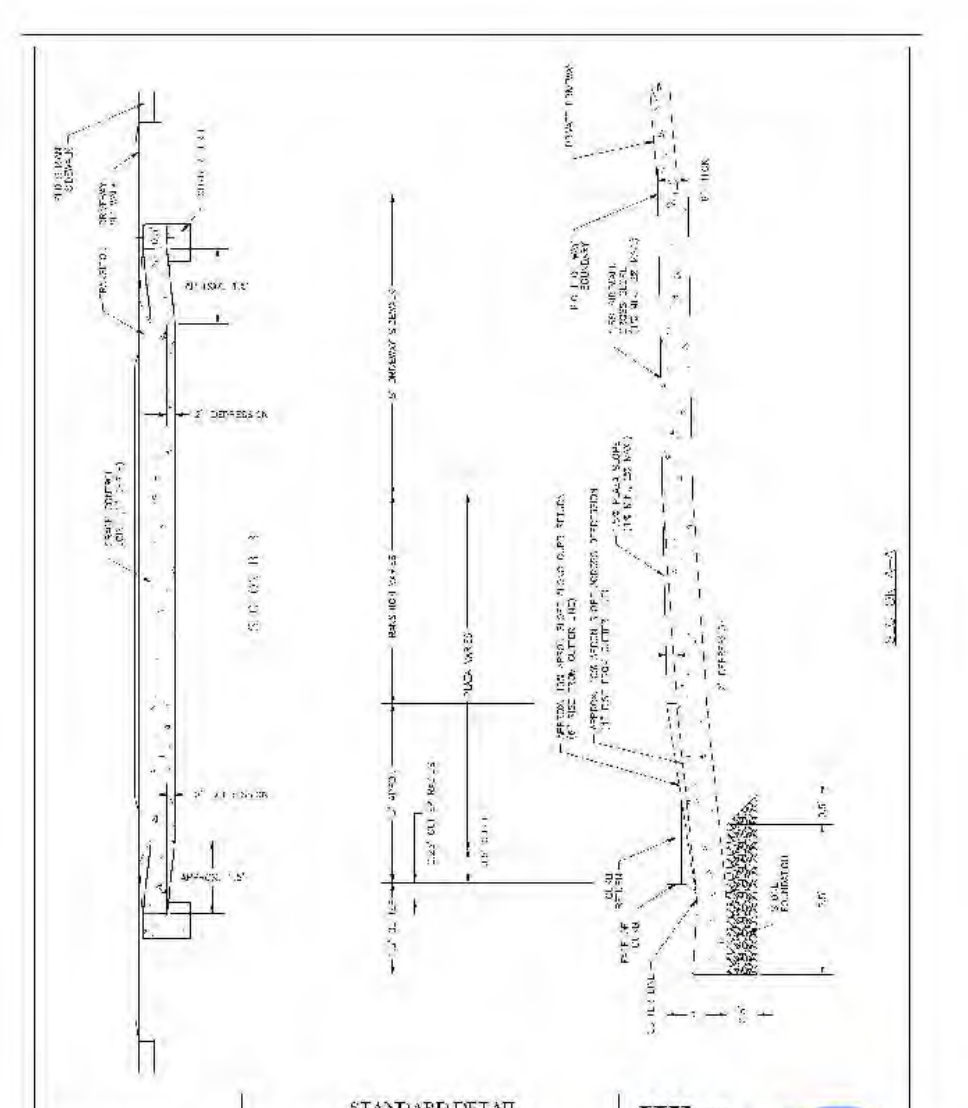
STREET SIGNS AND LOCATION
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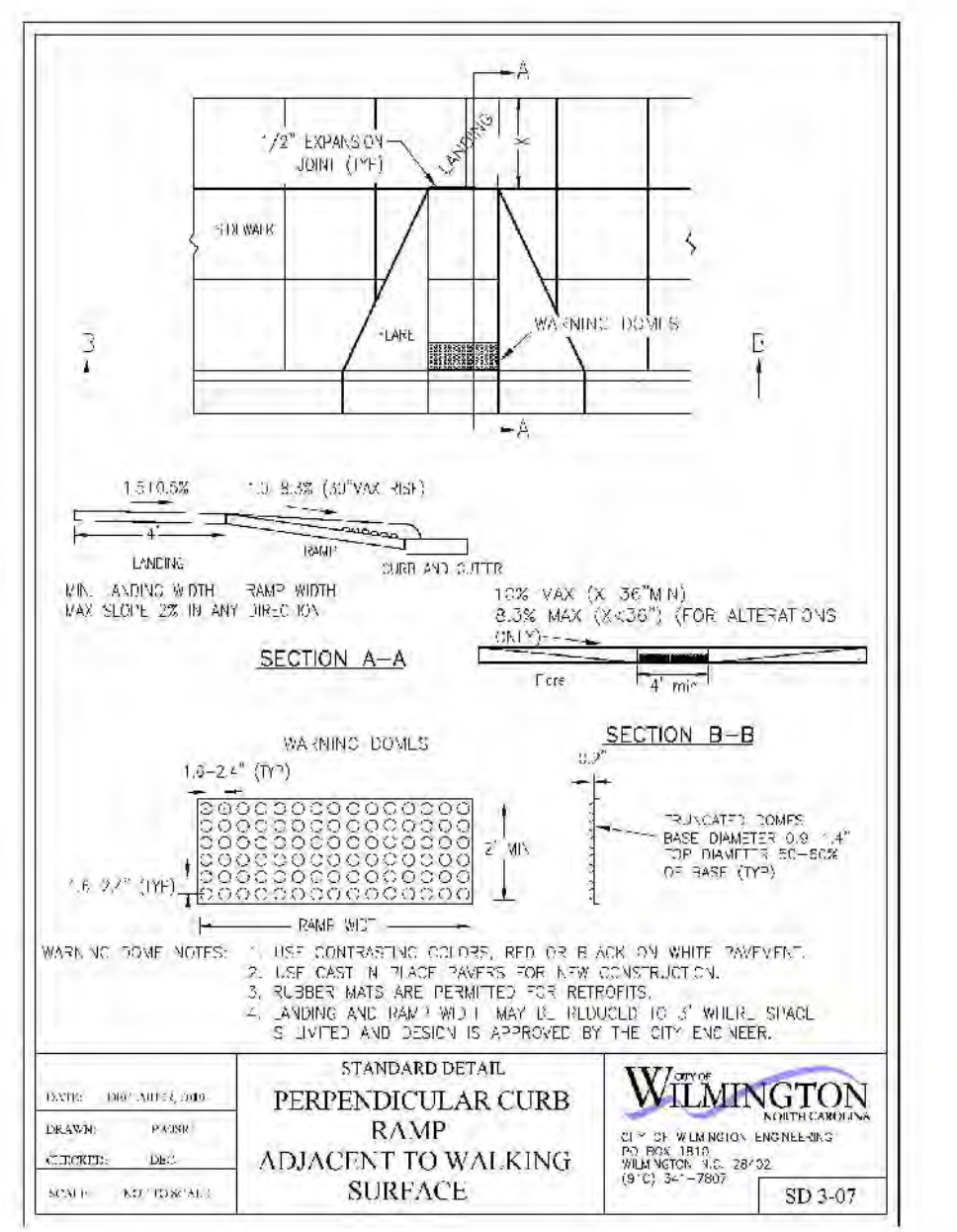
RESIDENTIAL DRIVEWAY PLAN (VERTICAL CURB)
SD 3-03.1



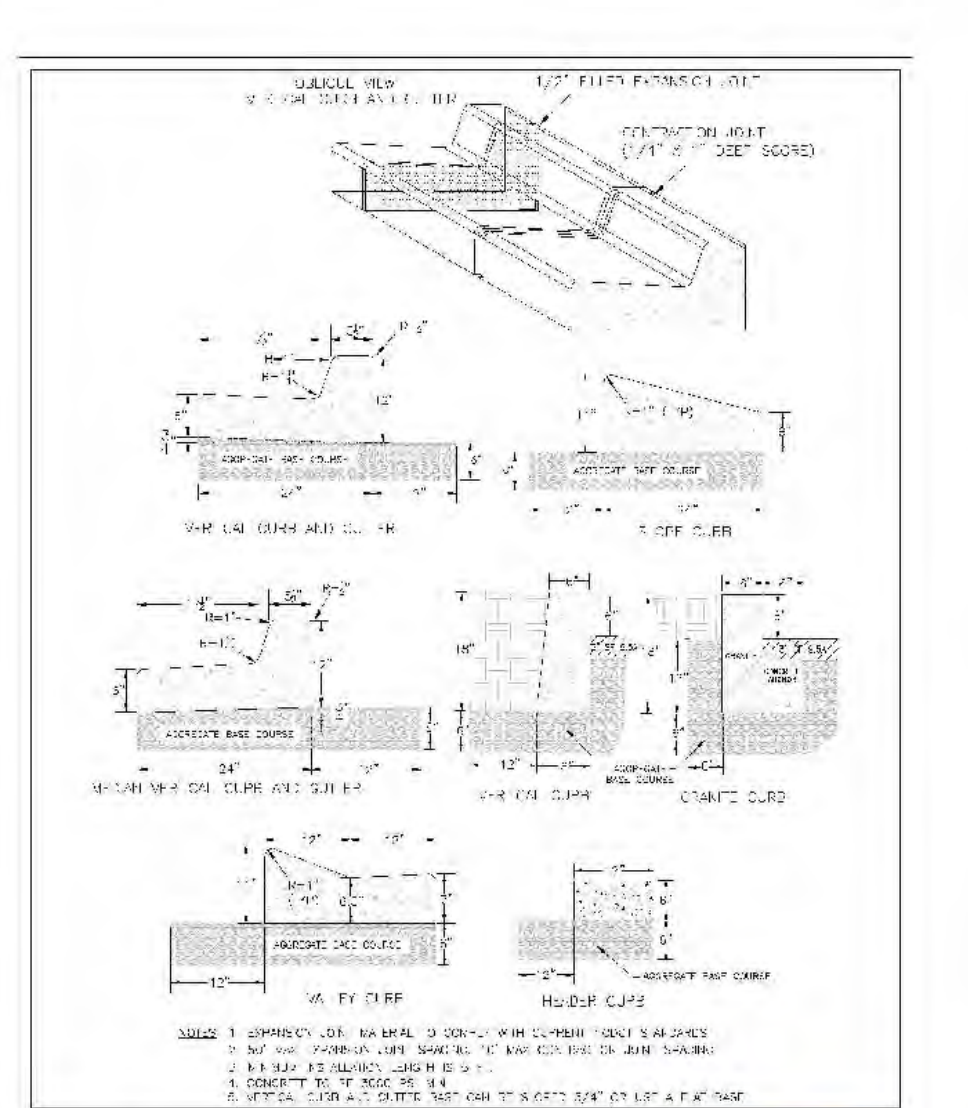
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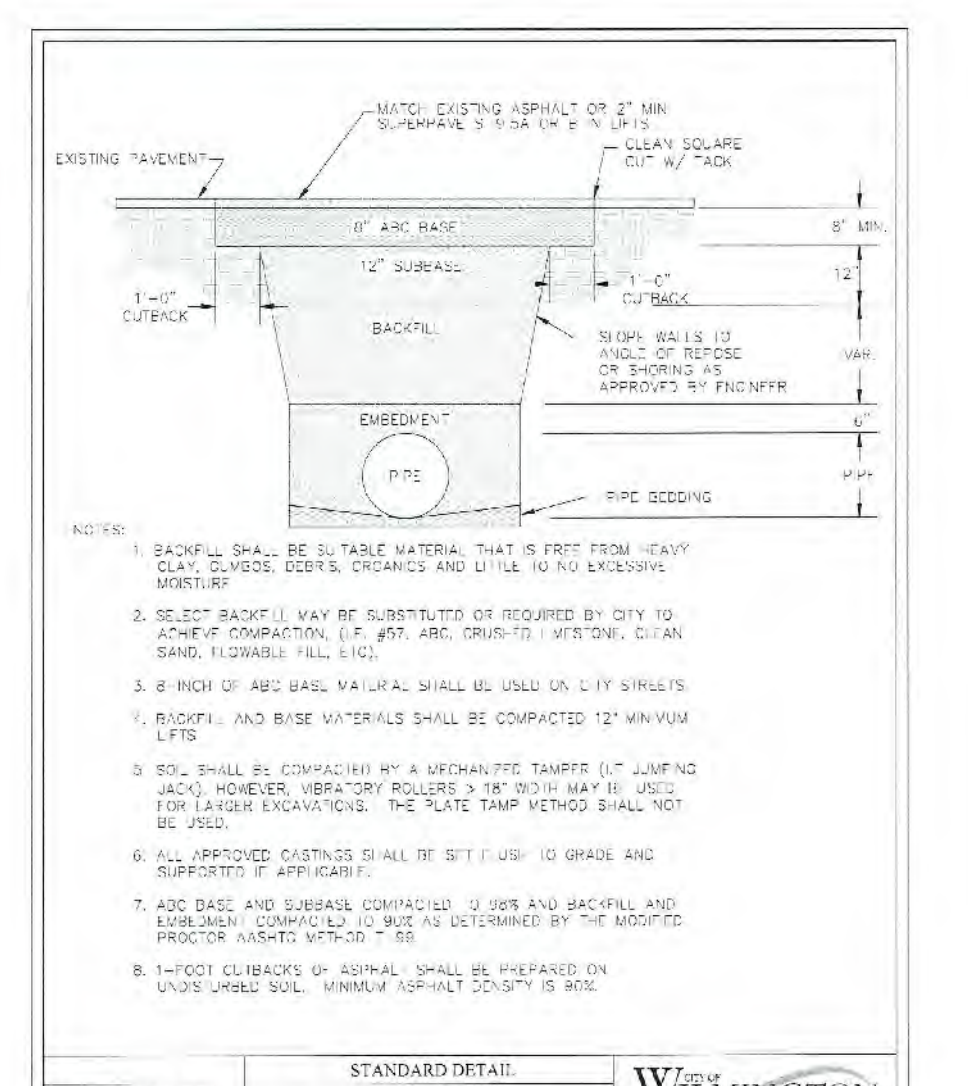
RESIDENTIAL DRIVEWAY SECTIONS (VERTICAL CURB)
SD 3-03.2



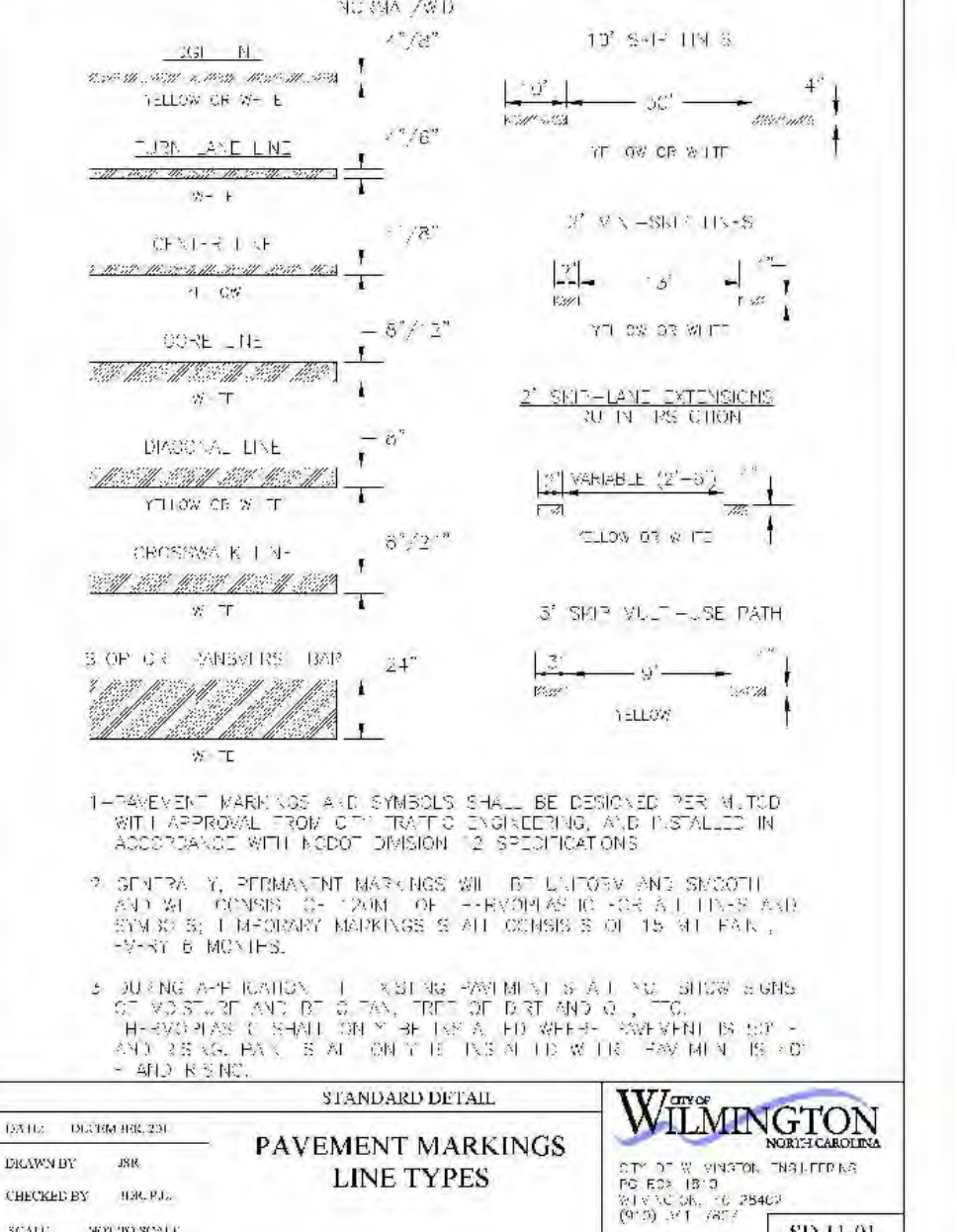
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SD 3-07



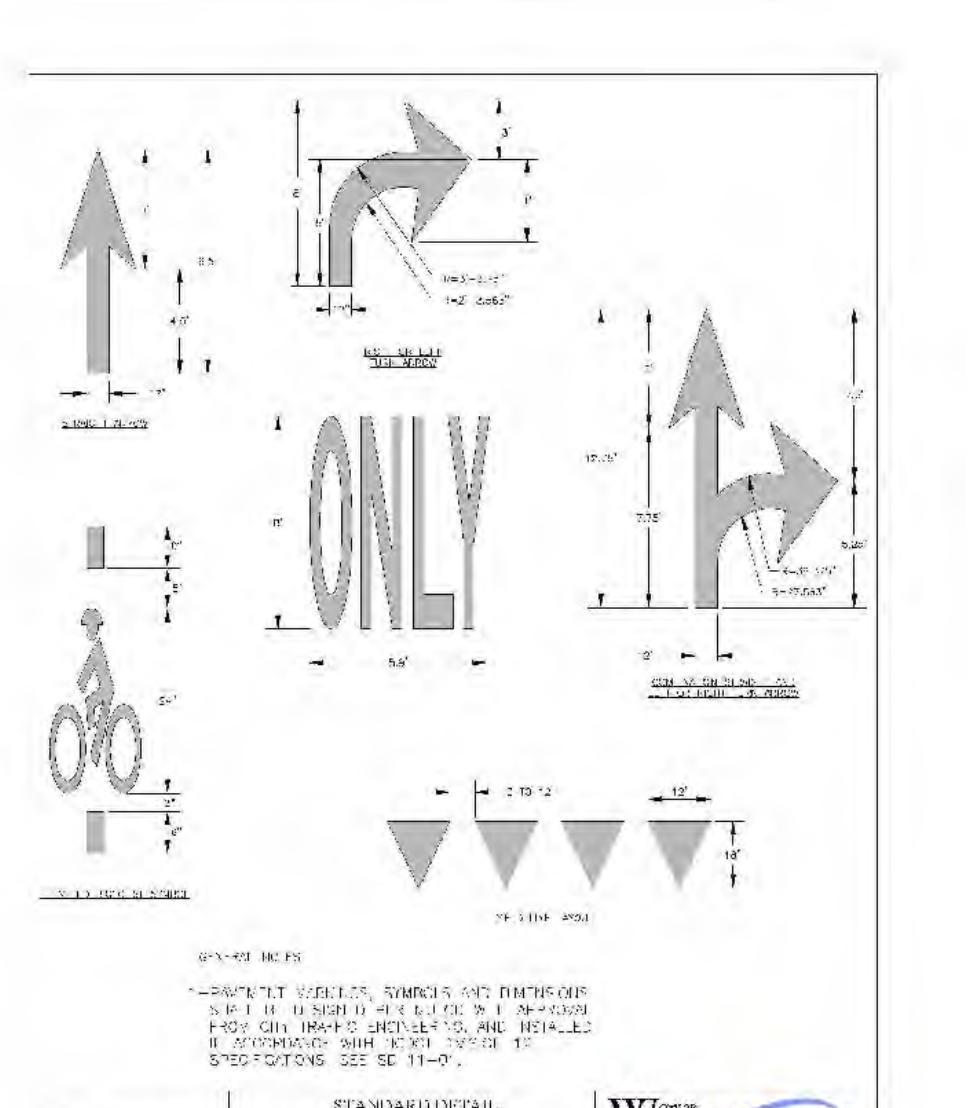
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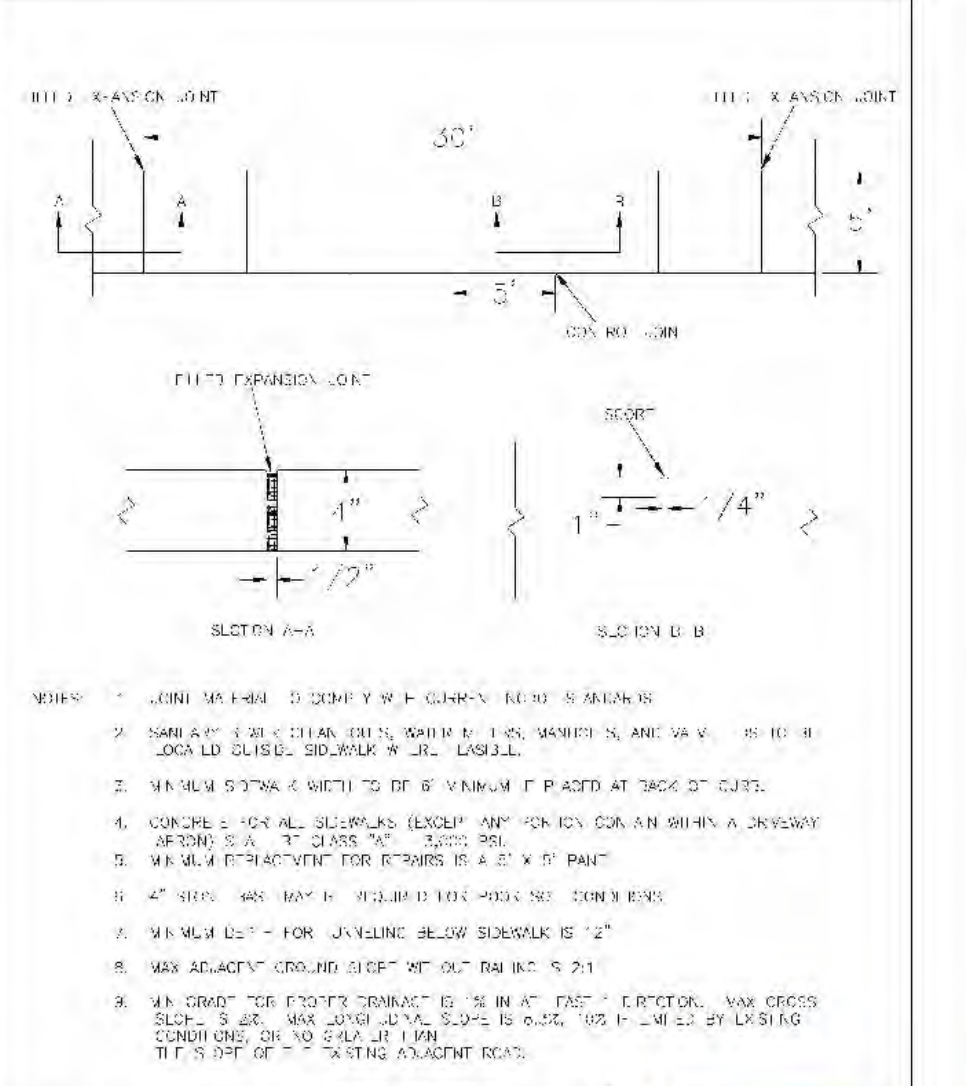
PAVEMENT REPAIRS DETAIL
SD 1-05



PAVEMENT MARKINGS LINE TYPES
SD 11-01



GUIDELINES FOR PAVEMENT MARKINGS AND SYMBOLS
SD 11-01



SIDEWALK
SD 3-10

Approved Construction Plan

Name: _____ Date: _____

Planning: _____

Traffic: _____

Fire: _____

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Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit # _____

Signed: _____

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

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CLIENT INFORMATION:
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PROJECT STATUS:
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RELEASED FOR CONSTRUCTION

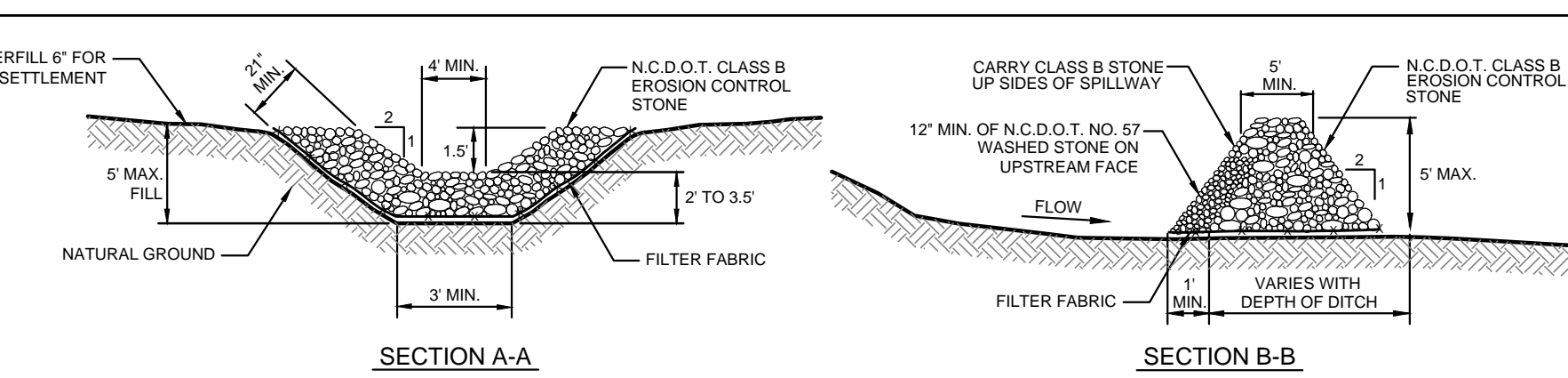
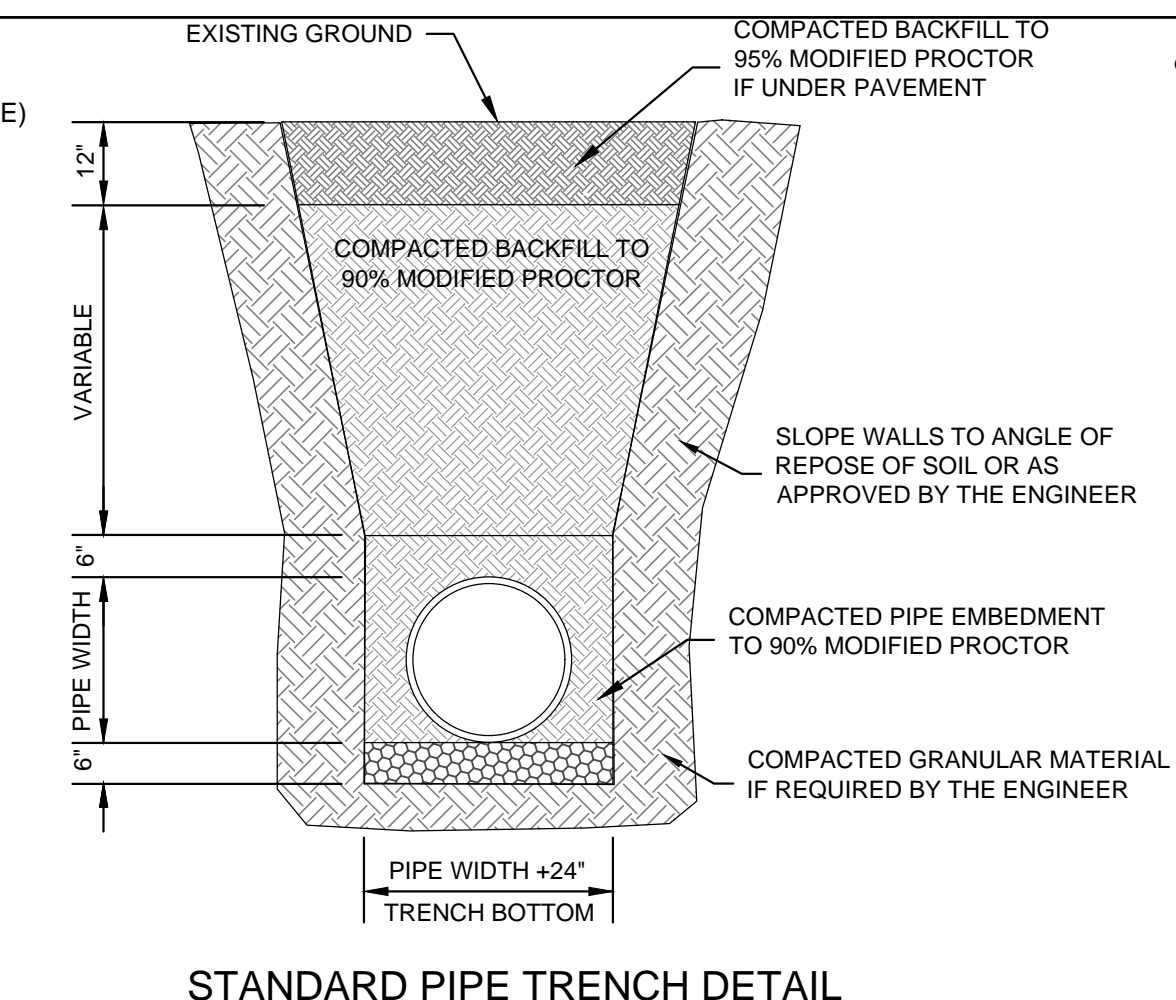
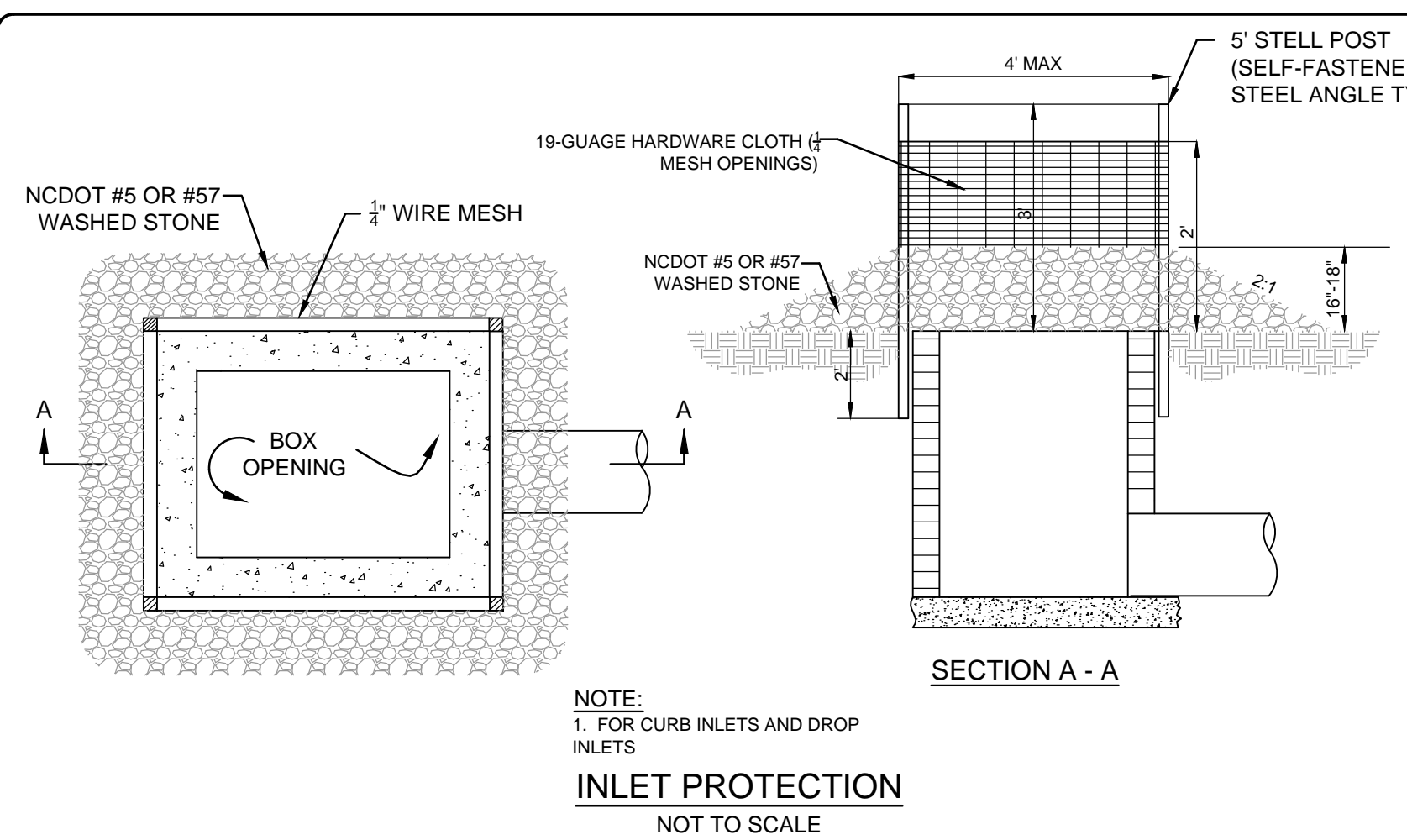
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DATE: 03/27/19
DESIGNED: RPB
DRAWN: AIC
CHECKED: RPB

SEAL:
NORTH CAROLINA PROFESSIONAL ENGINEER
ROBERT P. BALLING
031591
03/12/19

C-5.0

PEI JOB#: 17358.PE

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION



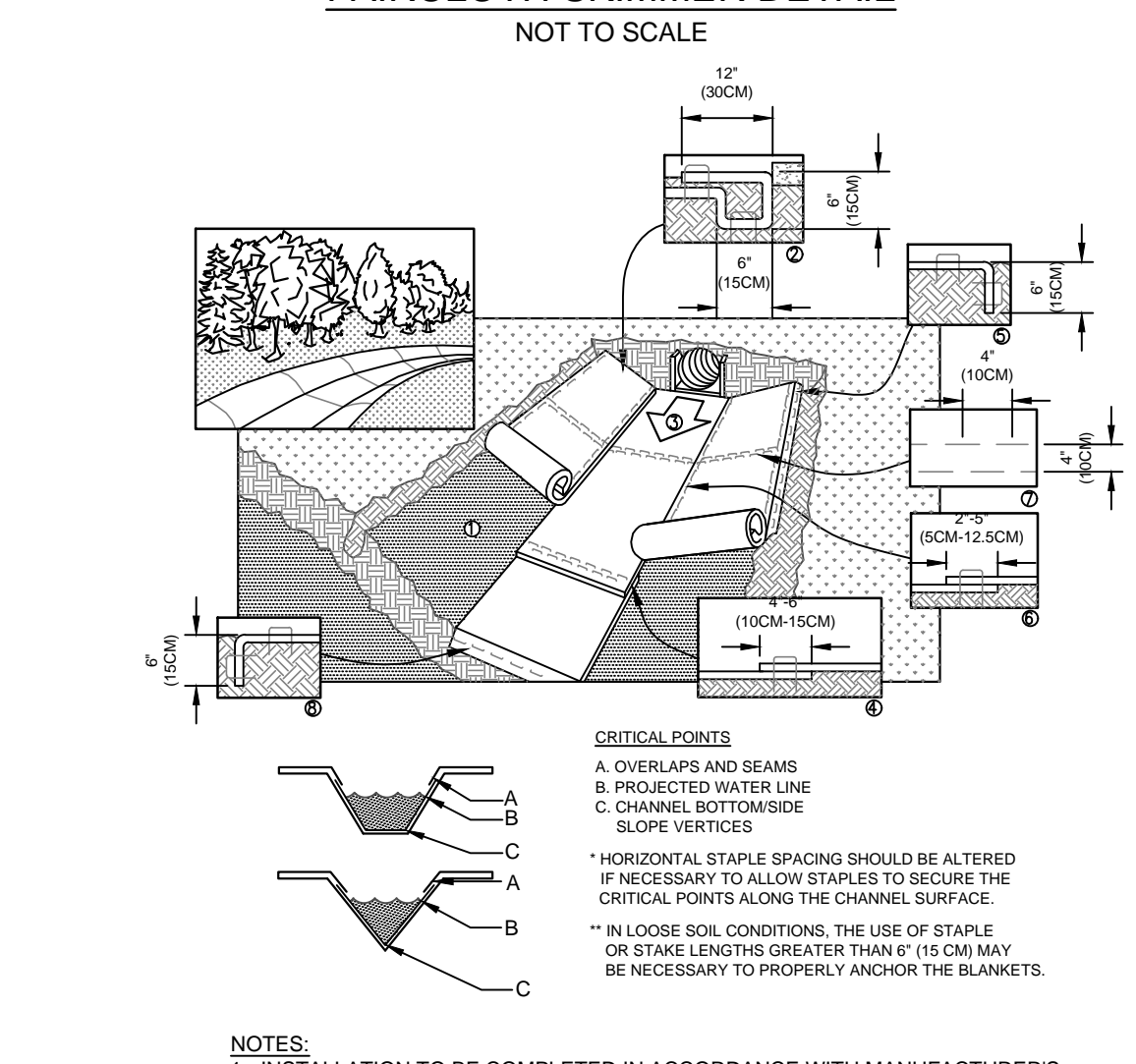
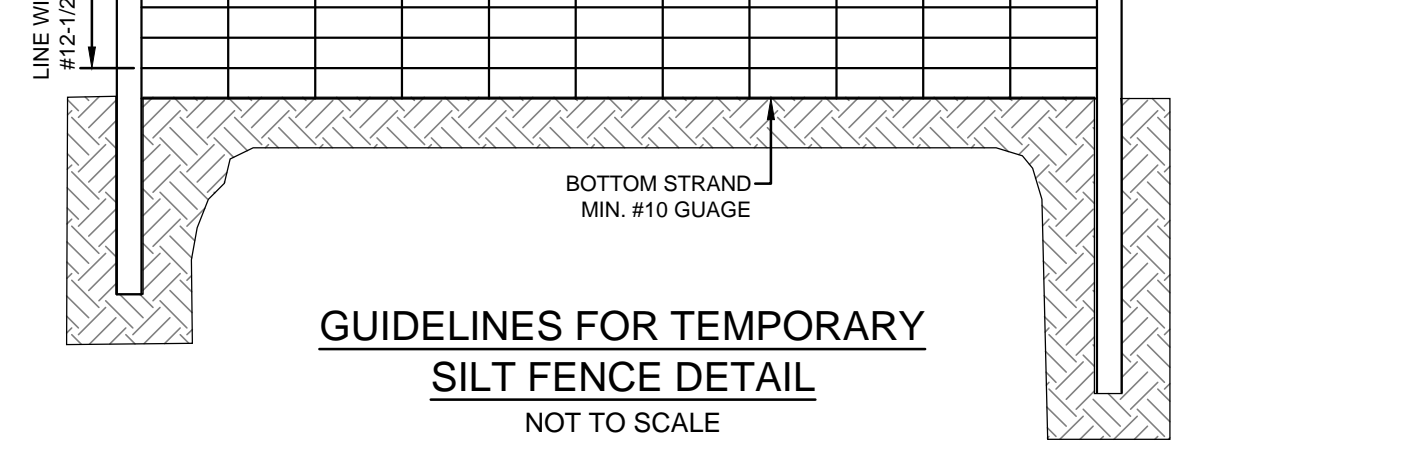
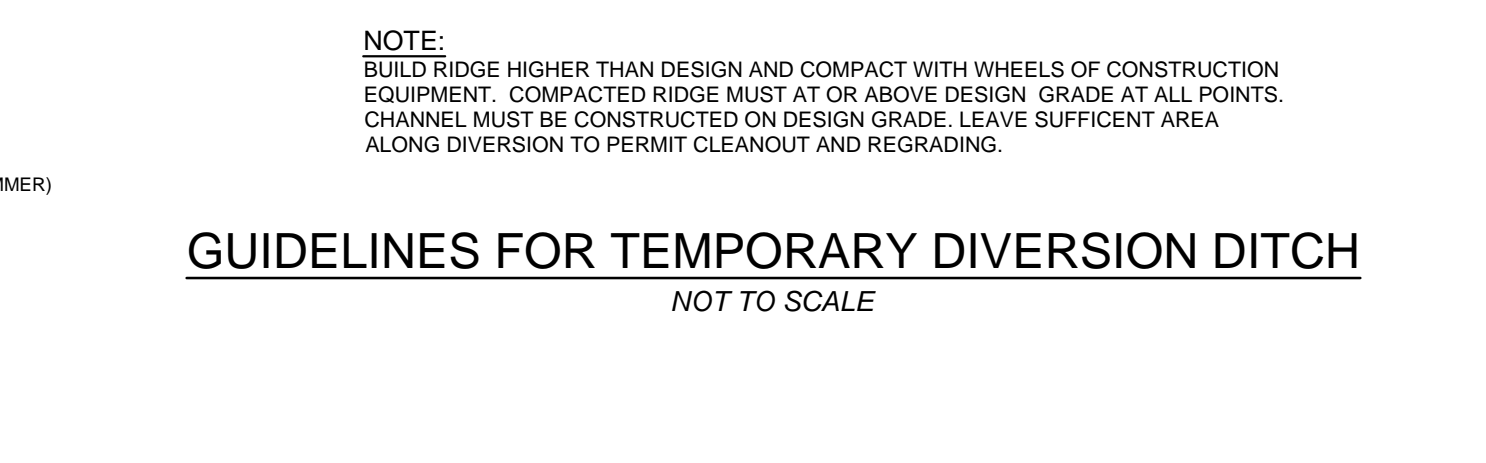
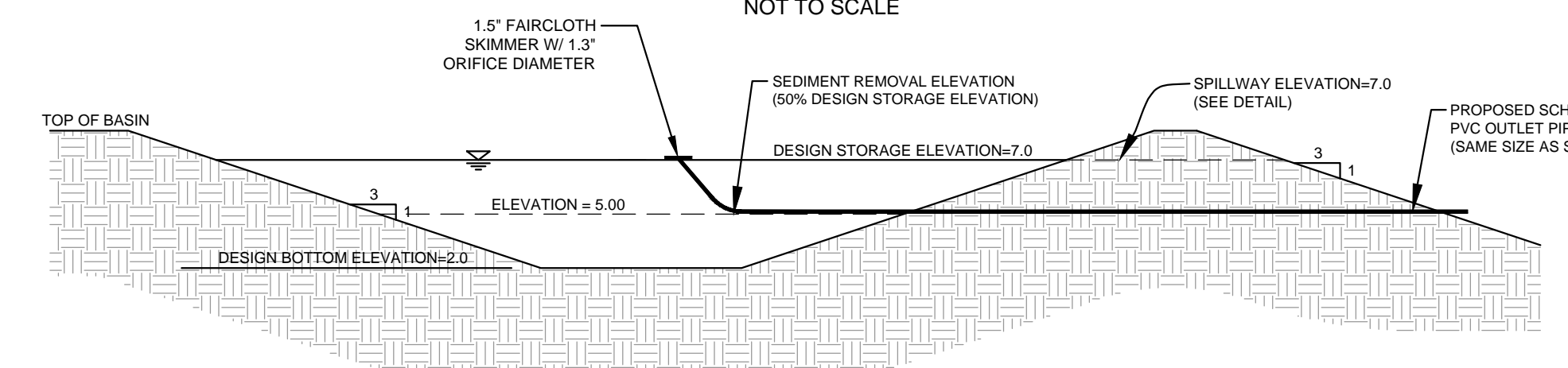
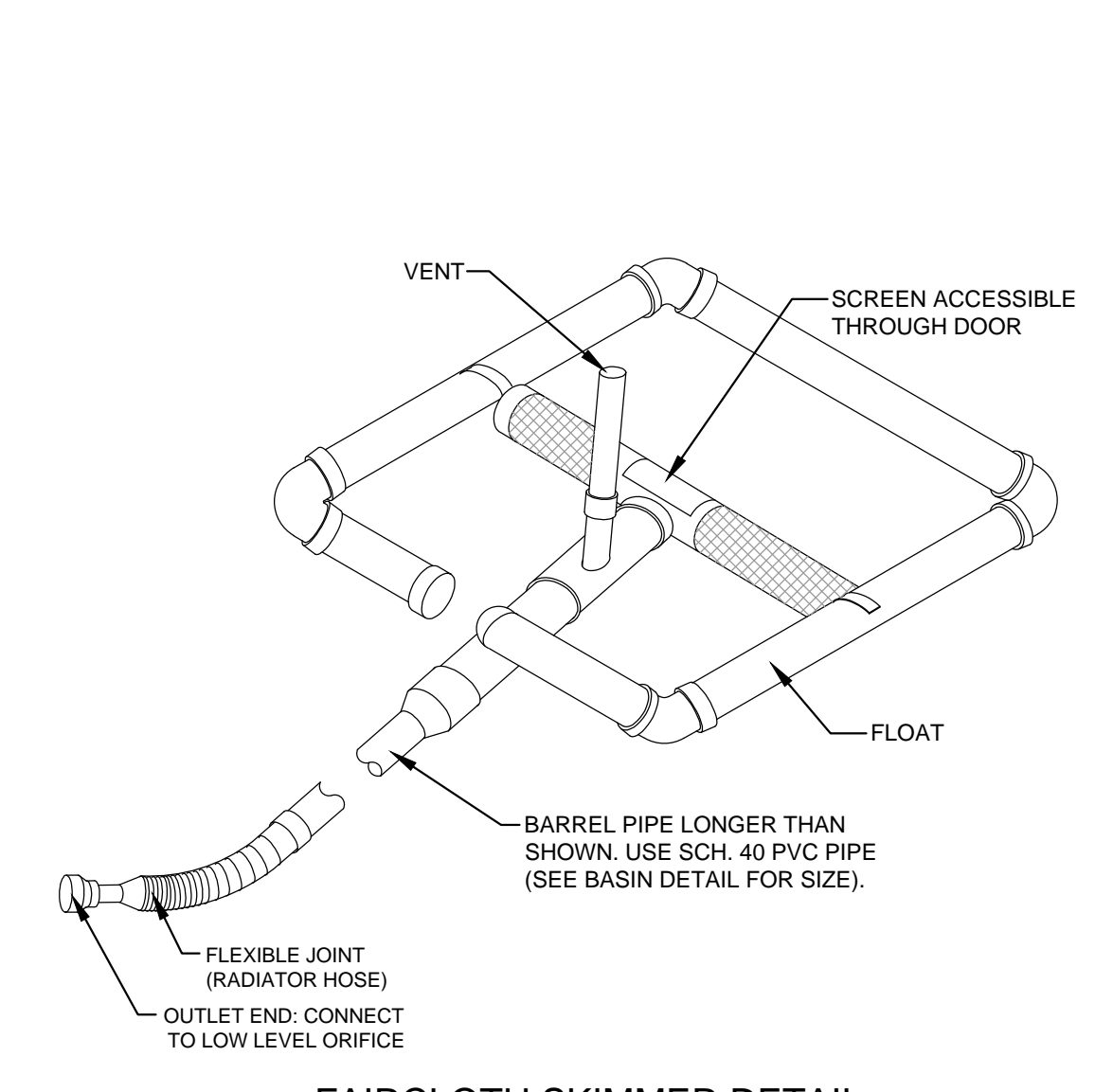
**Woodlands Tract 2
Temporary Sediment Fence - Ph I EC**

Regulation = 100 lb per 0.25 acres disturbed

EC DL #	Disturbed Area (sq ft)	Total drainage area (sq ft)	Required Silt Fence (ft)	Provided Silt Fence (ft)
1	0.70 ac	0.70 ac	280	311
2	1.20 ac	1.20 ac	480	932
3	1.55 ac	1.55 ac	232	433
6	0.84 ac	0.84 ac	336	520
8	0.15 ac	0.15 ac	60	201

GUIDELINES FOR TEMPORARY DIVERSION DITCH
NOT TO SCALE

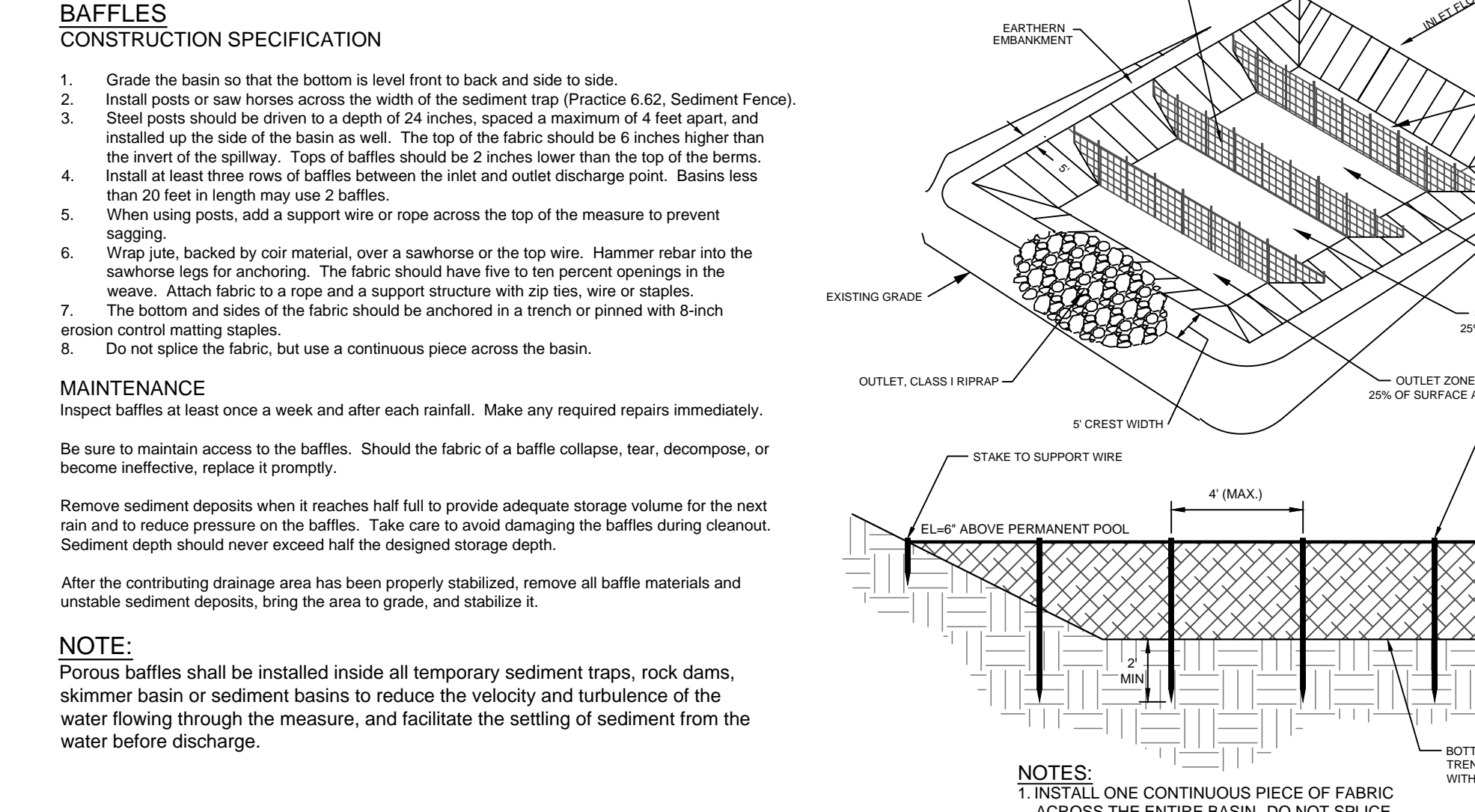
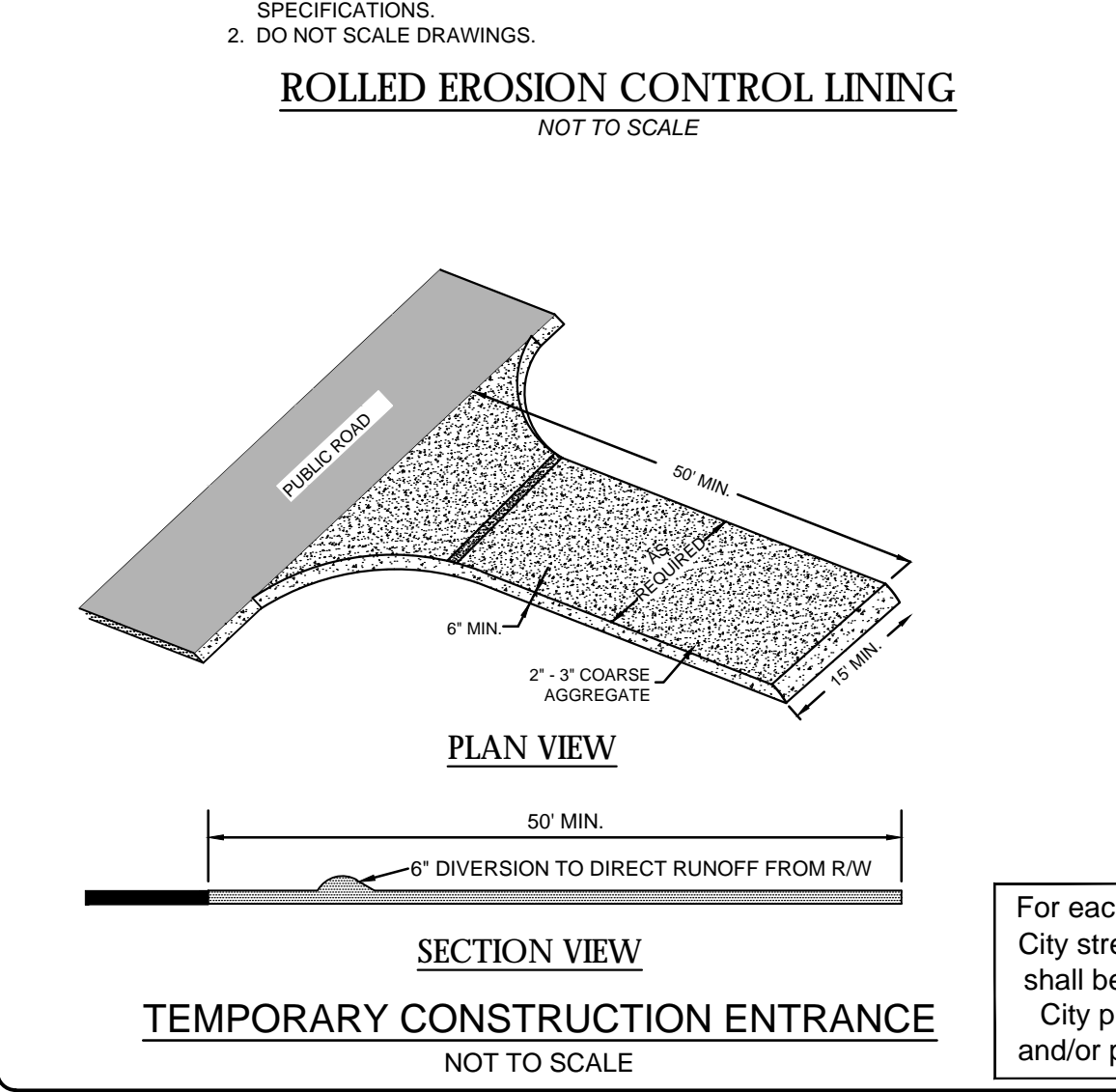
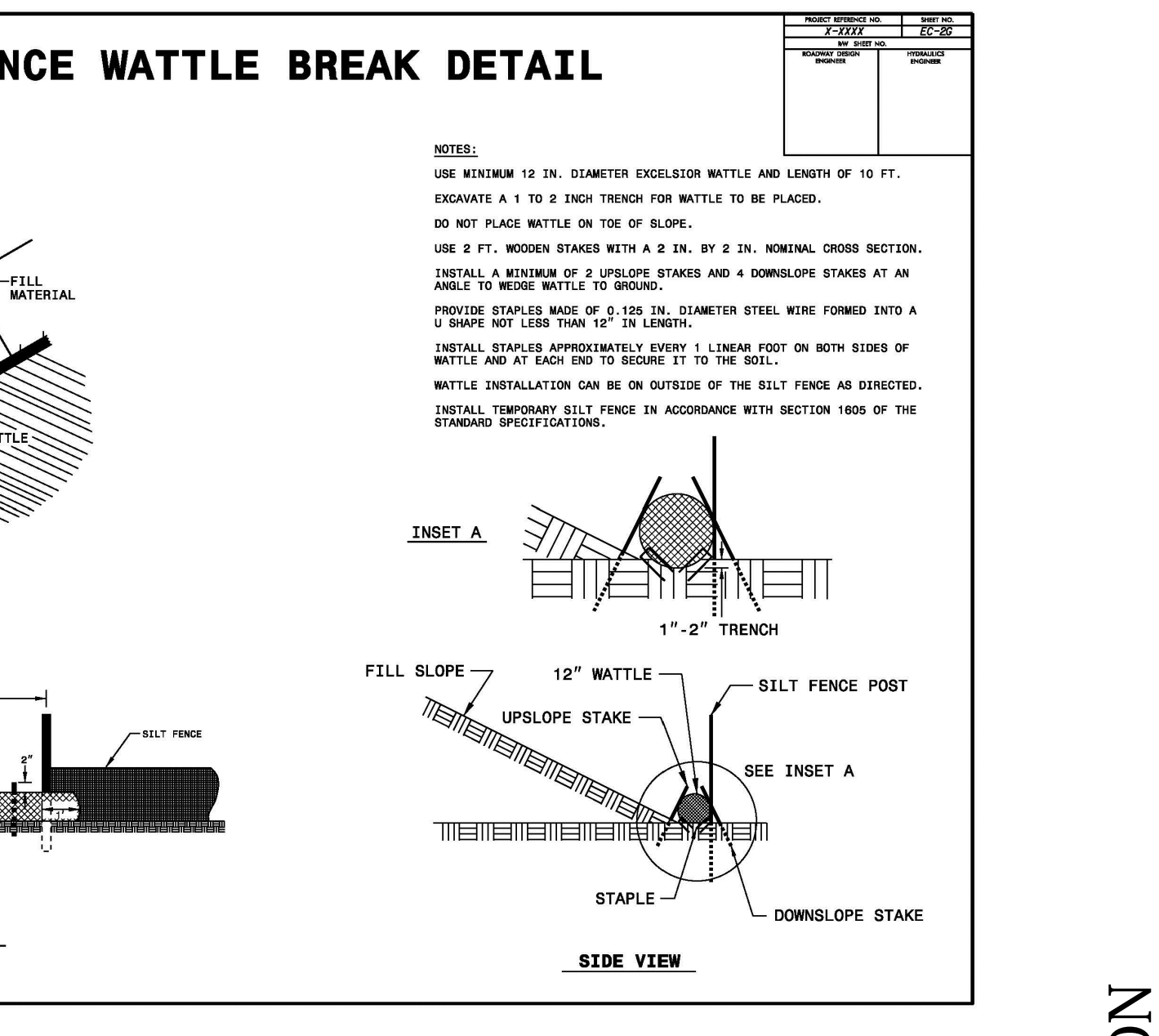
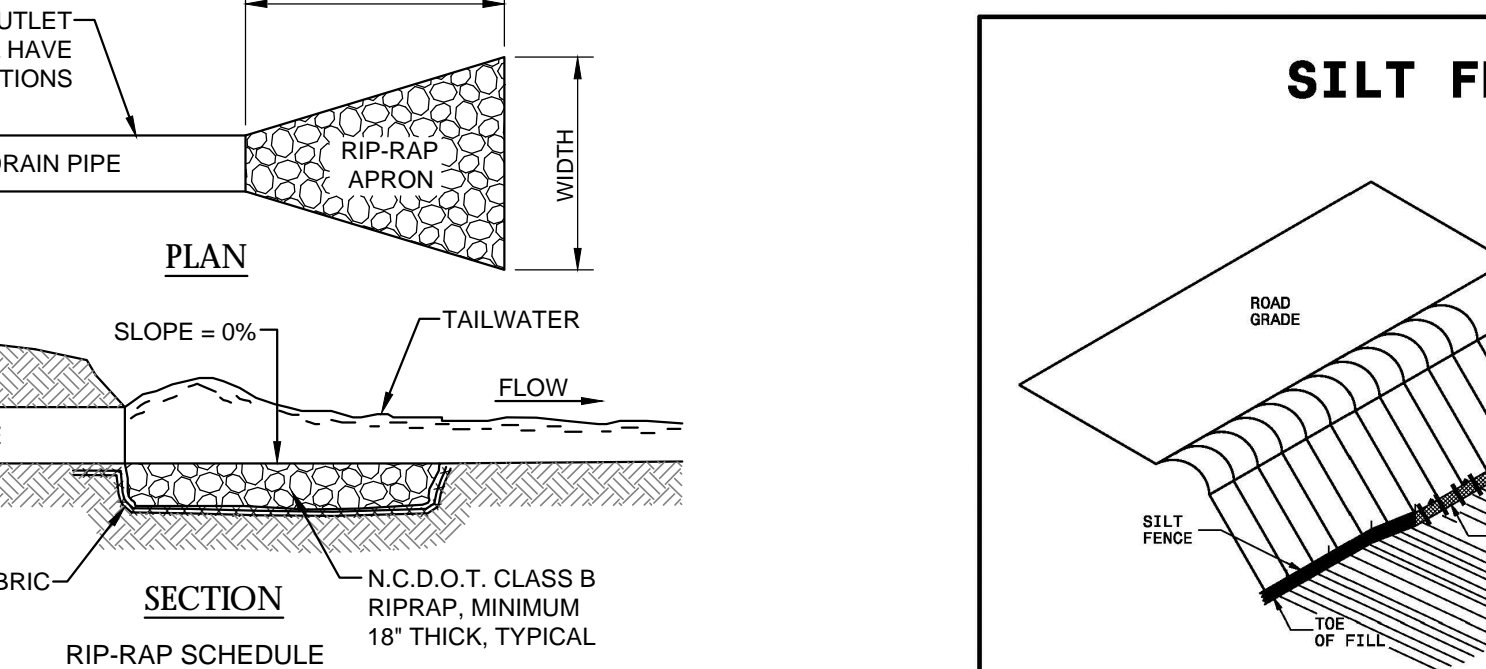
GUIDELINES FOR TEMPORARY SILT FENCE DETAIL
NOT TO SCALE



NOTES:

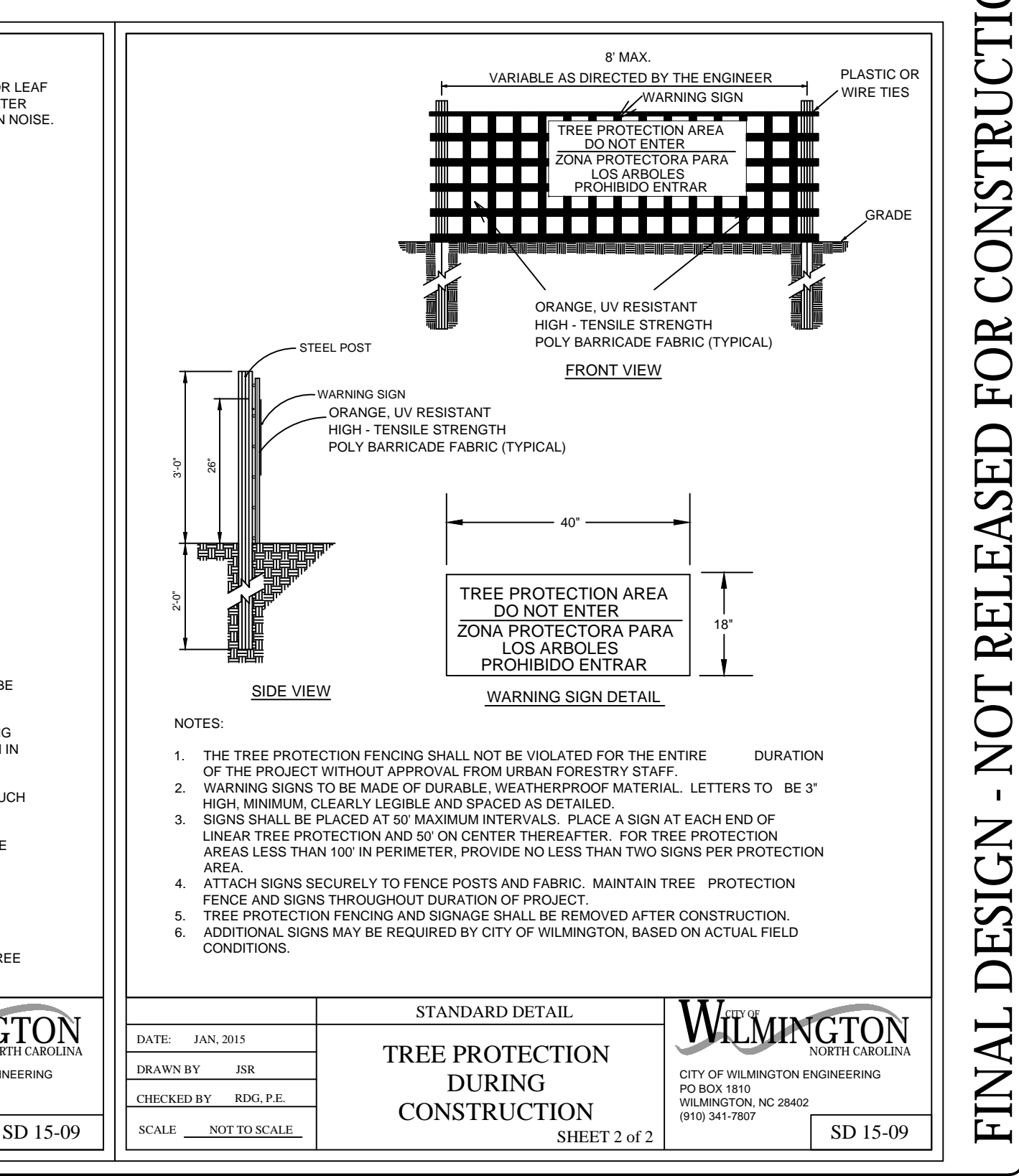
- 3:1 SIDE SLOPES.
- DITCH TO BE FULLY LINED WITH EROSION CONTROL BLANKETS PRIOR TO SEEDING & MULCHING FROM TOP OF BANK TO TOP OF BANK, AS REQUIRED BY LAND QUALITY.
- PROPOSED SWALES WILL HAVE A BOTTOM WIDTH OF 3 FEET.
- SEE PLAN FOR HORIZONTAL LOCATION OF SWALES.
- SWALES TO BE CONSTRUCTED WITH 6" OF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

SWALE #	RUNOFF				CHANNEL															
	A _u (acres)	C	Q ₁₀ (cfs)	Q ₅ (cfs)	Length (ft)	Flow (ft)	Depth (ft)	Area (sq ft)	Perimeter (ft)	Velocity (ft/s)	Capacity (cfs)	Velocity (ft/s)	Capacity (cfs)	Velocity (ft/s)	Capacity (cfs)	Velocity (ft/s)	Capacity (cfs)	Velocity (ft/s)	Capacity (cfs)	
1	0.17	0.44	0.27	88	6.40	7.96	0.3043	2.20	0.72	4.26	0.17	0.63	0.60	Y	N					
2	0.13	0.35	0.28	107	4.25	7.96	0.3043	1.11	1.23	4.06	0.38	0.66	0.69	Y	N					
3	0.19	0.82	0.85	146	9.03	8.00	0.3034	2.28	1.68	2.72	0.20	0.81	0.87	Y	N					
4	0.28	1.38	0.91	88	9.09	8.50	0.3074	1.18	0.67	3.85	0.13	0.67	0.43	Y	N					
5	0.19	0.48	0.33	88	9.03	8.50	0.3034	1.11	0.67	3.85	0.13	0.67	0.43	Y	N					
6	0.24	1.18	0.91	146	10.50	8.50	0.3117	2.20	0.72	4.26	0.17	1.33	0.86	Y	N					
7	0.60	3.10	0.98	1279	8.03	10.50	0.3146	2.28	4.22	8.08	0.34	1.61	0.97	Y	N					
8	0.80	3.36	0.92	1823	13.75	8.50	0.3146	2.28	6.88	4.61	0.21	1.99	1.06	Y	N					



BAFFLE DETAIL
NOT TO SCALE

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



Approved Construction Plan

Name: _____ Date: _____

Planning: _____

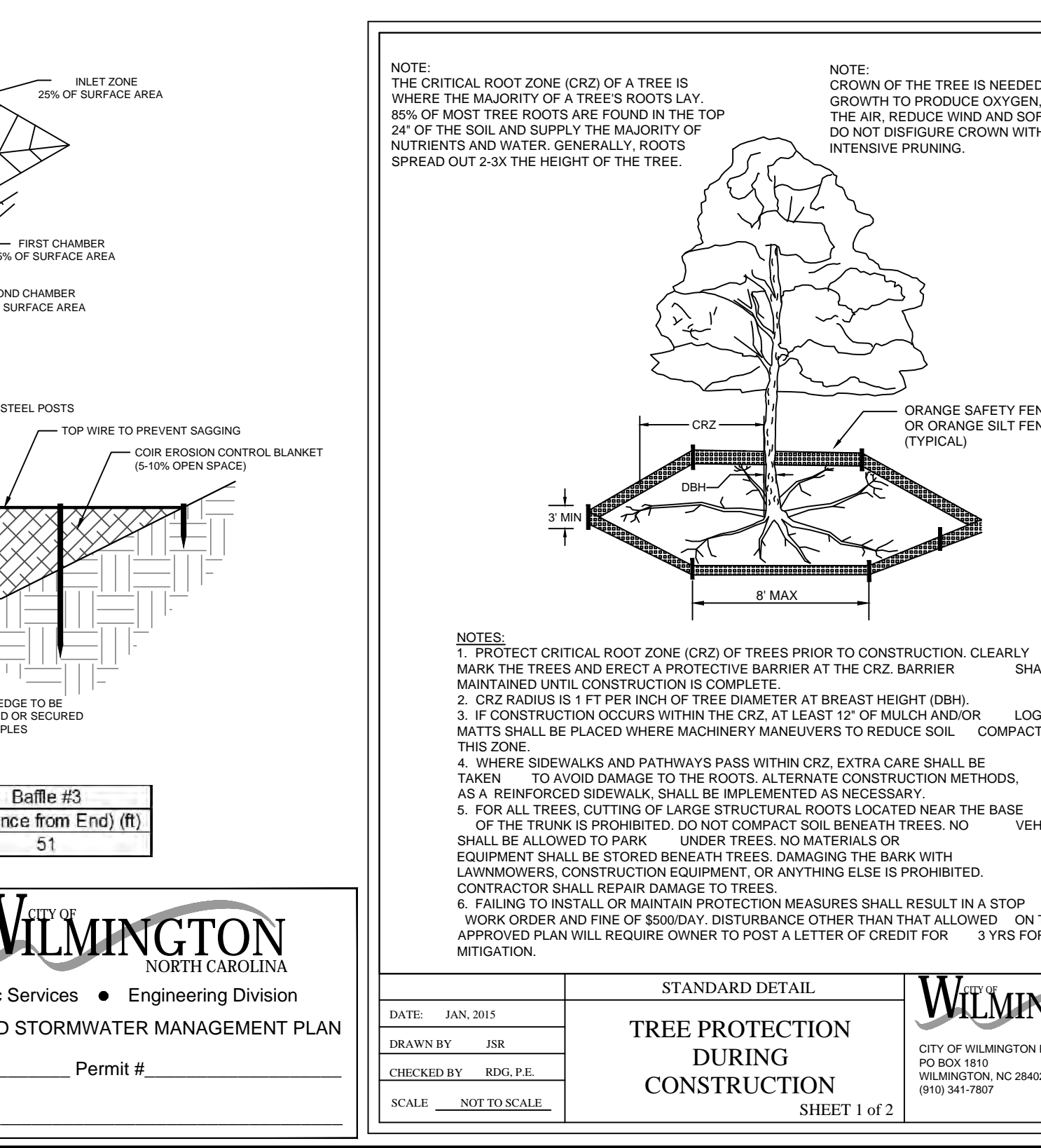
Traffic: _____

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.

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

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



REVISIONS:

CLIENT INFORMATION:
ECHO FARMS, LLC
c/o MATRIX DEVELOPMENT GROUP
CN 4000 FORSCATE 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

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

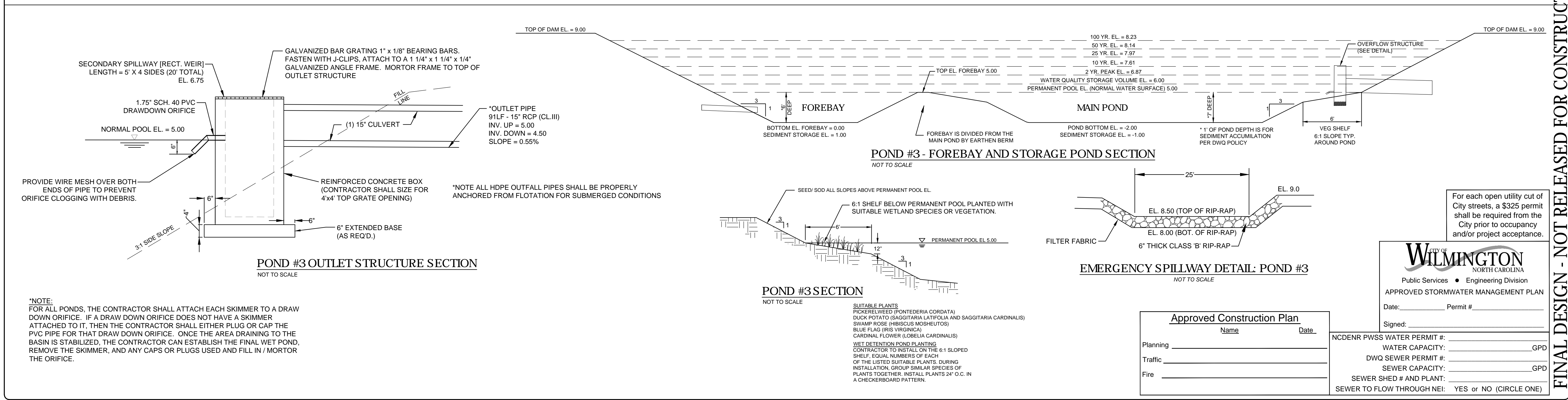
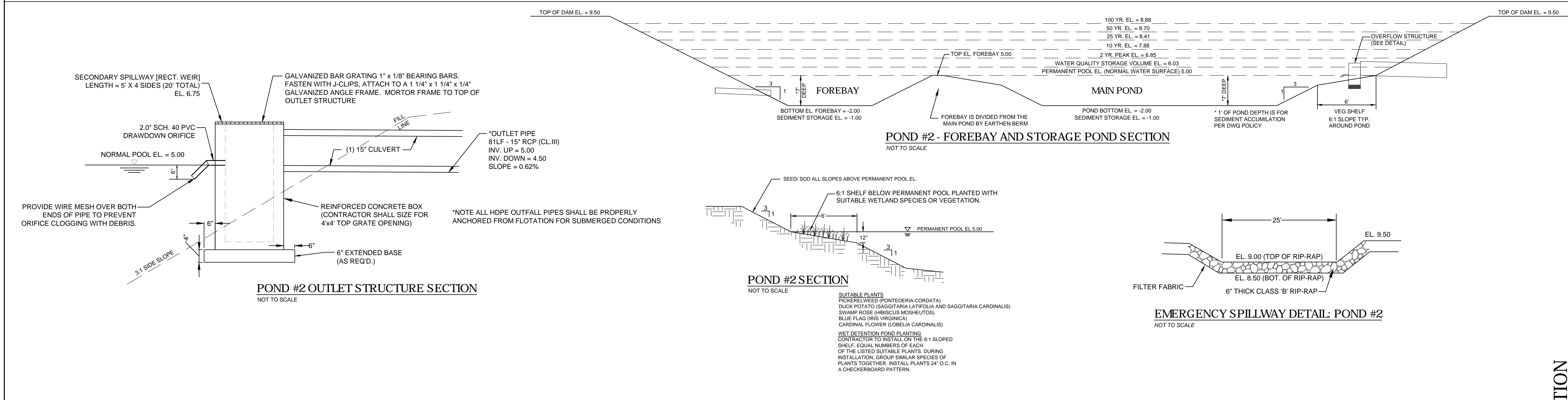
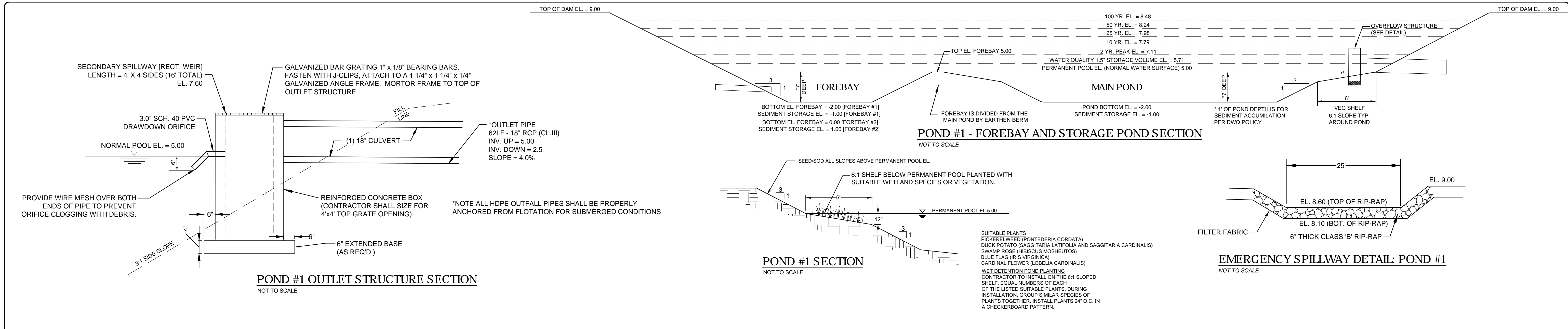
PROJECT STATUS:
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
RELEASED FOR CONSTRUCTION

DRAWING INFORMATION:
DATE: 03/12/19
DESIGNED: ROBERT P. BALLING
DRAWN: AEC
CHECKED: RPB

SEAL:
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL
031591
ROBERT P. BALLING
03/12/19

C-5.1
PEI JOB#: 17358.PE

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION



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

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.

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

Date: _____ Permit # _____
 Signed: _____

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

REVISIONS:

CLIENT INFORMATION:
 ECHO FARMS, LLC
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 122 Cinema Drive
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 (910) 791-6707 (O) (910) 791-6760 (F)
 NC License #: C-2846

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

PROJECT STATUS:
 CONCEPTUAL LAYOUT:
 PRIMARY LAYOUT:
 RELEASED FOR CONST.

DRAWING INFORMATION:
 DATE: 03/12/19
 DESIGNED: RFB
 DRAWN: RFB
 CHECKED: RFB

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL NO: 031591
 ENGINEER: ROBERT P. BALLANTINE
 03/12/19

C-5.2

PEI JOB#: 17358.PE

FINAL DESIGN - NOT RELEASED FOR CONSTRUCTION