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TIP PROJECT: R-5968EA

CONTRACT: LSC 700001931

$$$$$$$$SYSTIME$$$$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
$$$$$$$$USERNAME$$$$$$$$

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GRANVILLE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5968EA	1	16

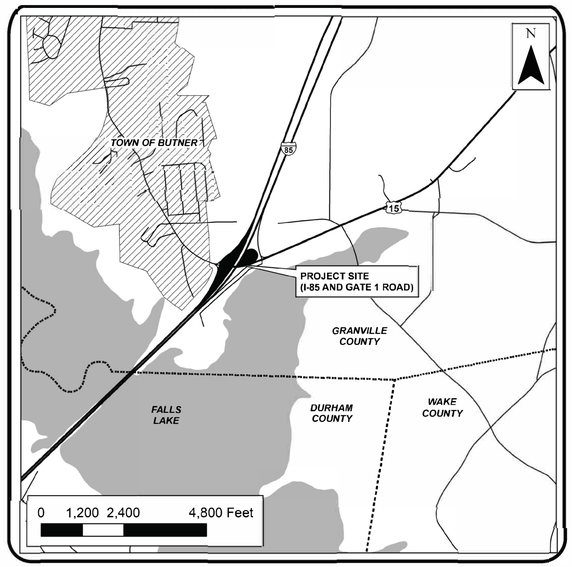
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
48797.3.3	0085061	

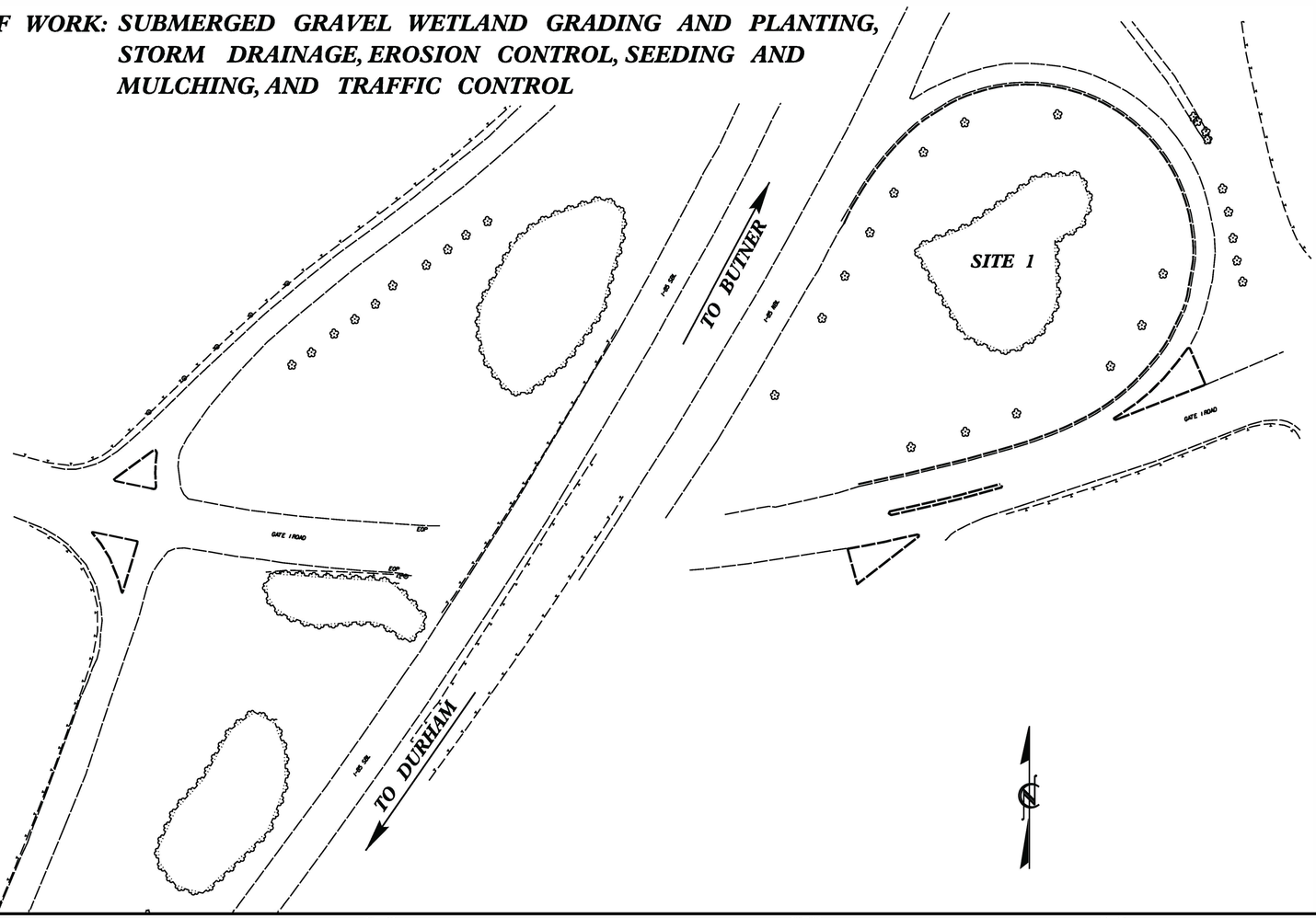
LOCATION: ***INTERCHANGE OF I-85 AND GATE 1 ROAD NEAR TOWN OF BUTNER***

TYPE OF WORK: ***SUBMERGED GRAVEL WETLAND GRADING AND PLANTING, STORM DRAINAGE, EROSION CONTROL, SEEDING AND MULCHING, AND TRAFFIC CONTROL***

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Plan Sheet Symbols

VICINITY MAP





GRAPHIC SCALES

50 25 0 50 100
40 20 0 40 80
30 15 0 30 60
20 10 0 20 40

NCDOT CONTACTS

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RETROFIT MANAGER

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POST-CONSTRUCTION STORMWATER PROGRAM MANAGER

Prepared In the Office of:

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2018 STANDARD SPECIFICATIONS

LETTING DATE:
12/8/2021

MAUREEN HARRIS, PE
PROJECT ENGINEER

ROBERT TUCKER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER 8/4/21

SIGNATURE: _____ *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
R-5968EA	1A

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER 8/4/21

INDEX OF SHEETS

SHEET NUMBER	SHEET DESCRIPTION
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL MAP
1C-2	EXISTING CONDITIONS - SITE 1
2D-1	SUBMERGED GRAVEL WETLAND SYSTEM DETAILS
3D-1	SUBMERGED GRAVEL WETLAND SYSTEM PIPE SUMMARY
3D-2	SUBMERGED GRAVEL WETLAND SYSTEM QUANTITIES
4-A	SITE 1 - SUBMERGED GRAVEL WETLAND FINE GRADING PLAN
4-B	SITE 1 - SUBMERGED GRAVEL WETLAND PROFILES
EC-1	SITE 1 - EROSION AND SEDIMENT CONTROL PLAN
EC-2	EROSION AND SEDIMENT CONTROL DETAILS
EC-3	EROSION AND SEDIMENT CONTROL NOTES
L-1	SITE 1 - SUBMERGED GRAVEL WETLAND PLANTING PLAN
L-2	PLANTING NOTES
TMP-1	TRAFFIC MANAGEMENT AND CONTROL PLAN

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "2018 Roadway Standard Drawings" Highway Design Branch - N.C. Department of Transportation - Raleigh, N.C. are applicable to the project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 3 - PIPE CULVERTS	
310.02	Parallel Pipe End Section - Precast Concrete Section for 15" to 24" Pipe
DIVISION 8 - INCIDENTALS	
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg.s 840.14 and 840.15
840.20	Frames and Wide Slot Flat Grates

GENERAL NOTES

1. WASHED SAND SHALL BE ACCORDING TO PROJECT SPECIAL PROVISIONS.
2. ALL AGGREGATE SHALL BE WASHED BEFORE INSTALLATION AS NOTED ON PLANS.
3. CONTRACTOR SHALL USE HYDRAULIC CEMENT TO SEAL ALL CONCRETE OPENINGS AND JOINTS TO PREVENT LEAKING.
4. CONTRACTOR SHALL INCLUDE TERMINATION VENT SCREEN ON OPEN ENDS OF ALL 6 INCH SCHEDULE 40 PVC DRAINAGE PIPES.
5. CONTRACTORS SHALL SECURE 6 INCH SCHEDULE 40 PVC DRAINAGE PIPES WITH NCDOT APPROVED T-POST AND ZIP-TIES.
6. CONTRACTOR SHALL INSTALL AND SECURE 6 INCH SCHEDULE 40 PVC DRAINAGE PIPES PRIOR TO BACKFILLING DOUBLE-WASHED ASTM STONE AND WASHED SAND. DURING BACKFILLING CONTRACTOR SHALL TEMPORARILY CAP 6 INCH SCHEDULE 40 PVC DRAINAGE PIPES TO PREVENT PIPES FROM CLOGGING.
7. CONTRACTOR SHALL CAP END OF 12 INCH SCHEDULE 40 PVC PIPE NOT IN USE.
8. CONTRACTOR SHALL REMOVE ALL TREES WITHIN LIMITS OF DISTURBANCE. ALL TREES OUTSIDE LIMITS OF DISTURBANCE SHALL BE PROTECTED AND RETAINED.

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PROJECT REFERENCE NO.	SHEET NO.
R-5968EA	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap — PE
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- Above Ground Water Line — A/G Water

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS

EROSION & SEDIMENT CONTROL:

- Temporary Silt Fence
- Special Sediment Control Fence
- Wattle — EW
- Special Stilling Basin
- Rock Inlet Sediment Trap – Type A
- Temporary Rock Silt Check – Type A
- Temporary Rock Silt Check – Type B
- Temporary Erosion Control Matting

6/2/99

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
R-5968EA	1C-1
Location and Surveys	

SEPI
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: C-2197

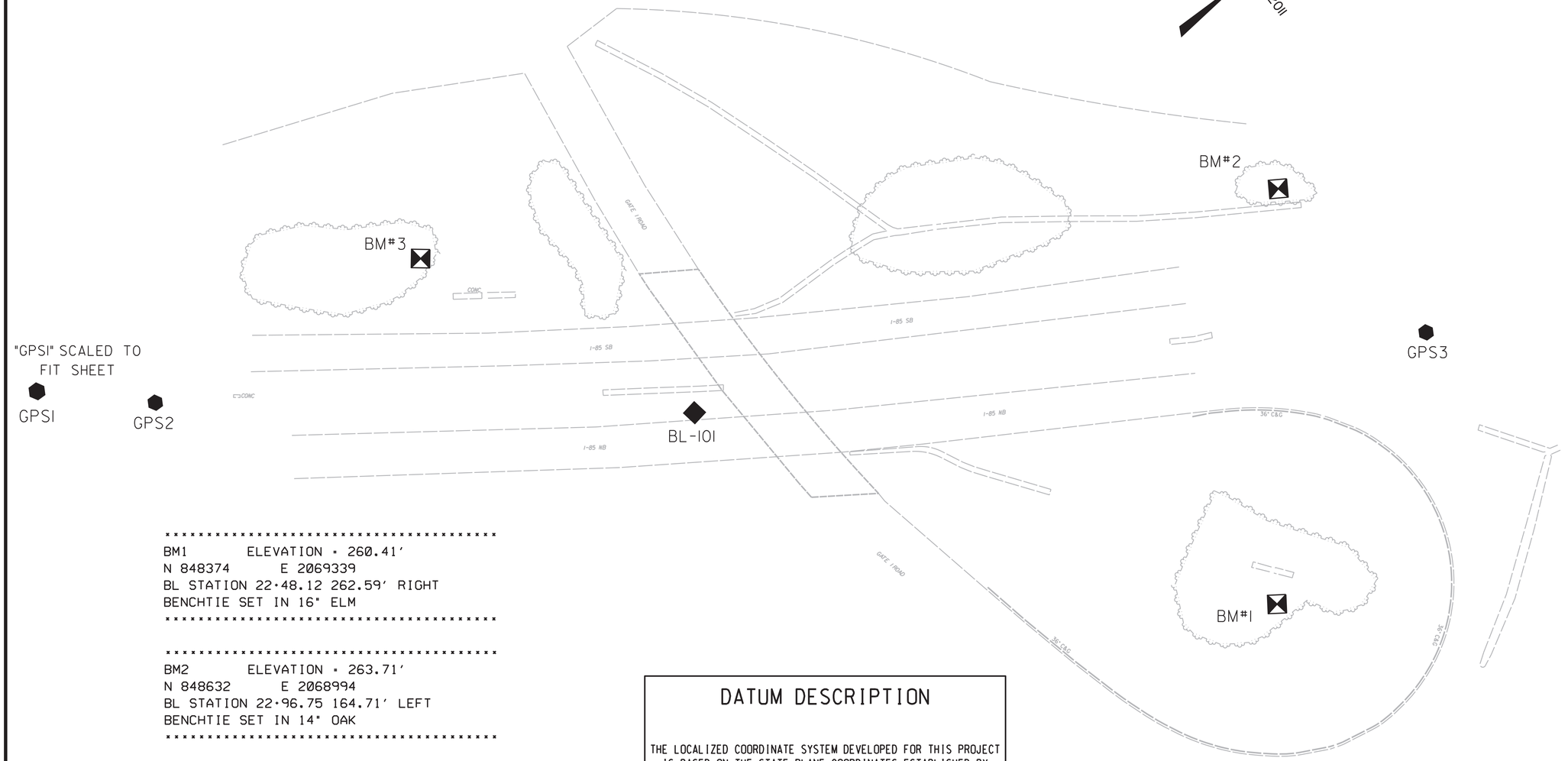
NORTH CAROLINA PROFESSIONAL SEAL L-3994 LAND SURVEYOR JEFFREY S. COATS

DocuSigned by:
Jeffrey S. Coats
49B9E8CC3DF54D9...
11/26/2019

BL

POINT	DESC.	NORTH	EAST	ELEVATION
GPS1	R4436-1	847111.5692	2068068.6529	283.81
GPS2	R4436-2	847564.5122	2068477.8348	276.26
BL101	BL-101	848007.2250	2068819.6340	271.11
GPS3	R4436-3	848665.7878	2069205.3790	268.69
GPS4	R4436-4	849350.1779	2069504.3444	272.08

NC GRID NAD 83 NA 2011



****
BM1 ELEVATION = 260.41'
N 848374 E 2069339
BL STATION 22+48.12 262.59' RIGHT
BENCHTIE SET IN 16" ELM
****

****
BM2 ELEVATION = 263.71'
N 848632 E 2068994
BL STATION 22+96.75 164.71' LEFT
BENCHTIE SET IN 14" OAK
****

****
BM3 ELEVATION = 269.45'
N 847874 E 2068522
BL STATION 13+82.76 154.42' LEFT
BENCHTIE SET IN 16" PINE
****

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "GPS2"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 847564.5122(ft) EASTING: 2068477.8348(ft)
ELEVATION: 276.26(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999968820 1/X = 1.00003118

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
3. EDGE OF PAVEMENT (EOP) OF ALL ROADS, EXCLUDING I-85 NB OFF RAMP, WERE DRAWN BASED OFF NC ONE MAP.

26-NOV-2019 13:04
K:\2019\SEPI\9138.00 Tetra Tech I-85 and Gate 1 Rd\DGN\Control Sheet\R4436_SEPI_RW02C-1_191126.dgn
SCoats
ALL RAL-SCOATS

6/2/99

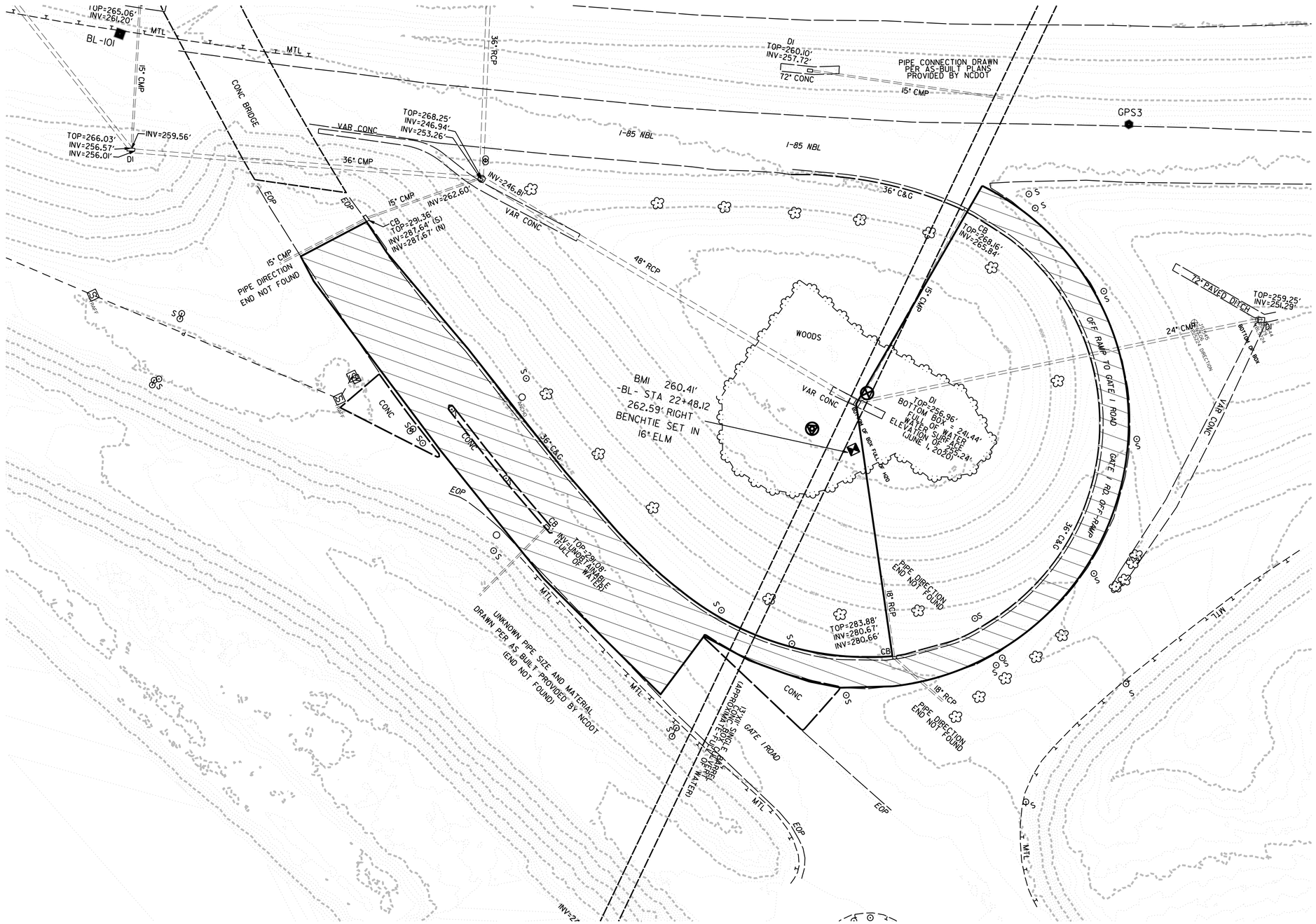
PROJECT REFERENCE NO.	SHEET NO.
R-5968EA	1C-2

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER 8/6/21

40 20 0 40 80

EXISTING CONDITIONS
SITE 1



SITE DATA

Drainage Area = 1.9 ac.
Impervious Area = 0.9 ac.
SHWT = 12 in. (below surface)
K_{sat} = 0.11 in/hr (at depth of 10 in.)

DESCRIPTION	SYMBOL
SHWT Soil Boring Location	⊕
K_{sat} Soil Testing Location	△
Impervious Area	▨

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SUBMERGED GRAVEL WETLAND SYSTEM DETAILS

PROJECT REFERENCE NO.	SHEET NO.
R–5968EA	2D–1

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER — 9/21

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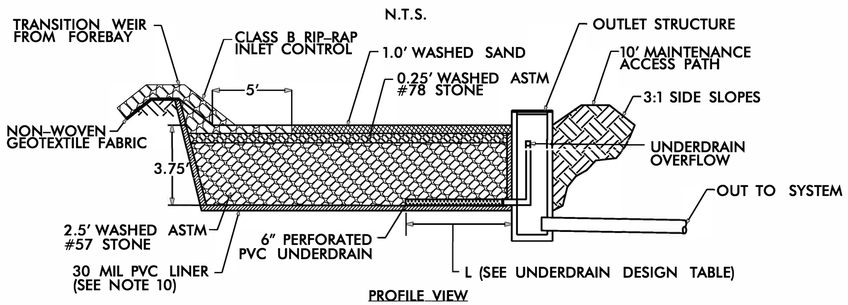
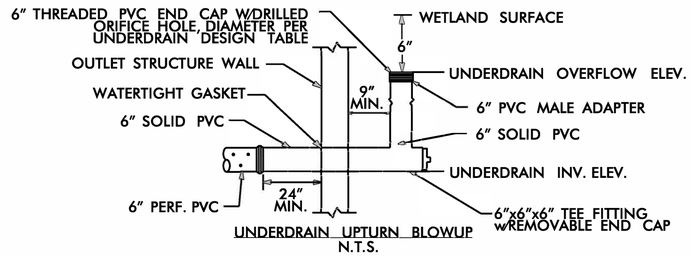
DETAIL A

SUBMERGED GRAVEL WETLAND SYSTEM

N.T.S.



PROFILE VIEW



UNDERDRAIN UPTURN BLOWUP
N.T.S.

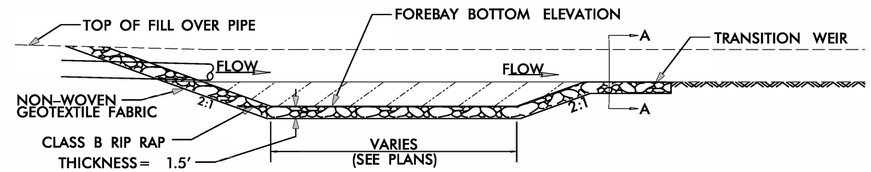
SUBMERGED GRAVEL WETLAND ELEVATIONS TABLE

SITE NO.	OUTLET TYPE	TOP (WEIR) ELEV.	UNDERDRAIN OVERFLOW ELEV.	BASIN SURFACE ELEV.	BASIN BOTTOM/ UNDERDRAIN INV. ELEV.	BOTTOM SAND ELEV.	BOTTOM #78 STONE EL.
1	2OTCB (STD. 840.04)	259.0'	256.5'	257.0'	253.3'	256.0'	255.8'

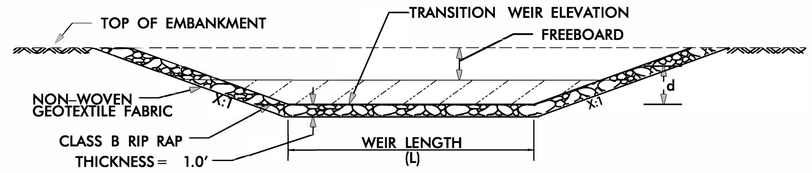
DETAIL B

FOREBAY

N.T.S.



PROFILE VIEW



SECTION A–A
"TRANSITION BERM CROSS–SECTION"

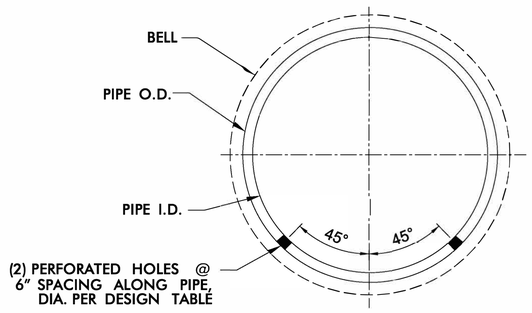
FOREBAY MINIMUM DIMENSIONS TABLE

SITE NO.	FOREBAY BOTTOM ELEV.	TRANSITION WEIR ELEV.	TRANSITION WEIR LENGTH (L)	WEIR SIDE SLOPES (X:1)	d
1 (S FOREBAY)	257.0'	260.0'	8.0'	2	1.0'
1 (NE FOREBAYS)	257.0'	260.0'	8.0'	2	1.0'

DETAIL C

PERFORATED HOLE PLACEMENT

N.T.S



UNDERDRAIN DESIGN TABLE

SITE NO.	UNDERDRAIN PIPE LENGTH (L)	PERFORATED HOLE DIAMETER	PERFORATED HOLE SPACING	END CAP ORIFICE DIAMETER
1	8'	0.375"	0.5'	0.65"

NOTES:

1. WASHED SAND SHALL BE ACCORDING TO PROJECT SPECIAL PROVISIONS.
2. ALL AGGREGATE SHALL BE WASHED AND FREE OF FINES BEFORE INSTALLATION.
3. CONTRACTOR SHALL USE HYDRAULIC CEMENT TO SEAL ALL CONCRETE OPENINGS AND JOINTS TO PREVENT LEAKING.
4. CONTRACTOR SHALL INCLUDE TERMINATION VENT SCREEN ON OPEN ENDS OF ALL 6 INCH SCHEDULE 40 PVC DRAINAGE PIPES.
5. CONTRACTOR SHALL INSTALL AND SECURE 6 INCH SCHEDULE 40 PVC DRAINAGE PIPES PRIOR TO BACKFILLING WASHED ASTM STONE AND WASHED SAND. DURING BACKFILLING CONTRACTOR SHALL TEMPORARILY CAP 6 INCH SCHEDULE 40 PVC DRAINAGE PIPES TO PREVENT PIPES FROM CLOGGING.
6. HORIZONTAL PLACEMENT OF THE UNDERDRAIN SHALL BE IN ACCORDANCE WITH THE APPROVED IMPROVEMENT PLANS, OR AS INDICATED BY THE PROJECT ENGINEER.
7. PERFORATED PLASTIC PIPE SHALL BE SMOOTH–WALL PVC PLASTIC PIPE OR CORRUGATED PVC PLASTIC PIPE WITH A SMOOTH INTERIOR SURFACE, MADE OF PVC PLASTIC HAVING A CELL CLASSIFICATION OF 12454 OR 13364, AS DEFINED IN ASTM D1784.
8. PIPE, FITTING, AND JOINT DIMENSIONS SHALL BE COMPATIBLE AND MEASURED IN ACCORDANCE WITH ASTM D 2122. FITTING AND JOINT MATERIAL SHALL BE COMPATIBLE WITH THE PIPE MATERIAL.
9. PIPE PENETRATIONS THROUGH PRECAST STRUCTURES SHALL BE SEALED ACCORDING TO PROJECT SPECIFICATIONS.
10. NON–WOVEN GEOTEXTILE FABRIC SHALL BE PLACED ON BOTH SIDES OF PVC LINER. LINER AND GEOTEXTILE SHALL BE ATTACHED TO OUTLET STRUCTURE (ALL SIDES) USING A BATTEN BAR AND ANCHORS (SEE DETAIL F, SHEET 2D–2). UNDERDRAIN PENETRATION THROUGH PVC LINER SHALL BE SEALED ACCORDING TO DETAIL G, SHEET 2D–2.

PROJECT REFERENCE NO.	SHEET NO.
R–5968EA	2D–2

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER

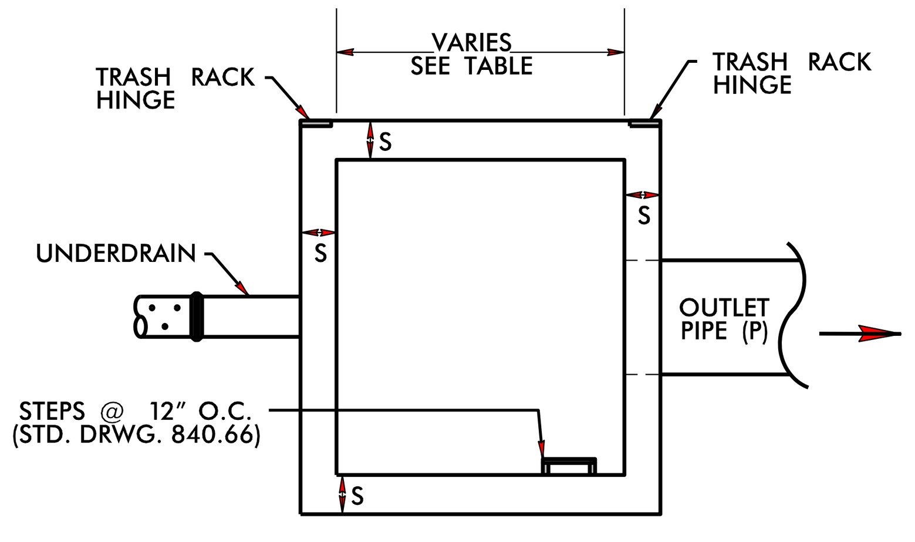
[illegible] 8/4/21

SUBMERGED GRAVEL WETLAND SYSTEM DETAILS

DETAIL D

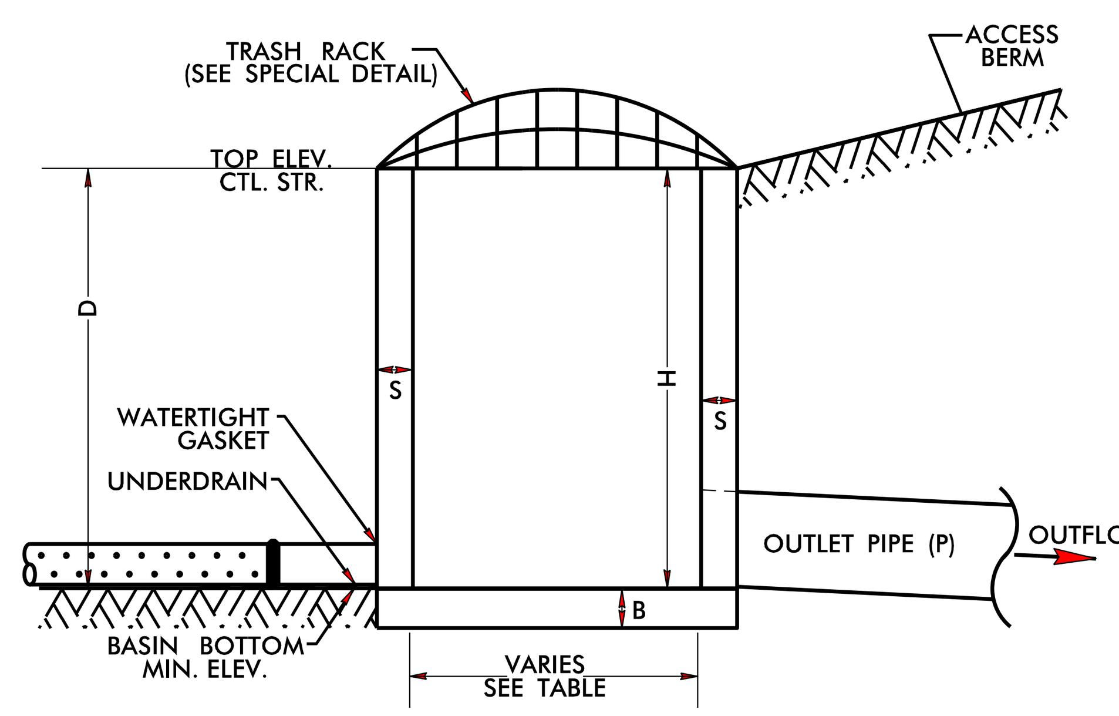
OUTLET CONTROL STRUCTURE

N.T.S.



PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY



PROFILE

MINIMUM DIMENSIONS FOR DRAWDOWN STRUCTURE													
SITE	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	UNDERDRAIN INV. IN	OUTLET PIPE INV.	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS			OUTLET PIPE DIAMETER(P) INCHES	OUTLET PIPE MATERIAL
									W	L	H		
1	0403	6	6	253.3'	259.0'	253.3'	252.7'	252.7'	2'–8"	4'–0"	6'–4"	24	RCP–III

OUTLET CONTROL STRUCTURE NOTES:

1. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.

2. ENSURE TRASH RACK OPENS FREELY

3. FOR SITES 1 AND 2, THE OUTLET CONTROL STRUCTURE (STRUCTURES 0403 & 0503) SHALL BE PRECAST AND DESIGNED ACCORDING TO NCDOT STD 840.04, BUT WITH NO SLAB TOP OR CURB INLET OPENINGS.

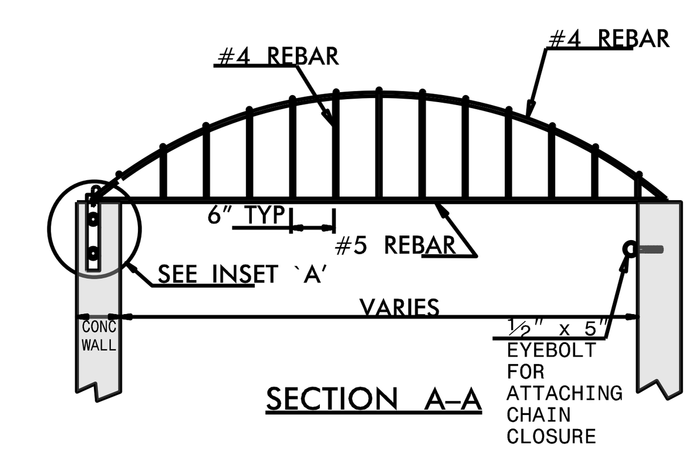
4. FOR THE SITE 3 OUTLET CONTROL STRUCTURE (STRUCTURE 0603), THE CONTRACTOR SHALL MODIFY THE EXISTING DROP INLET BY RAISING THE RIM ELEVATION ACCORDING TO NCDOT STD 840.05, BUT WITH NO SLAB TOP OR CURB INLET OPENINGS. THE PROPOSED BRICK RISER STRUCTURE SHALL MATCH THE HORIZONTAL DIMENSIONS OF THE EXISTING DI AND BE SET ON A LEVEL COURSE OF MORTAR AS NEEDED. THE RIM OF THE BRICK STRUCTURE SHALL BE LEVELED WITH MORTAR PRIOR TO INSTALLATION OF THE TRASH RACK.

DETAIL E

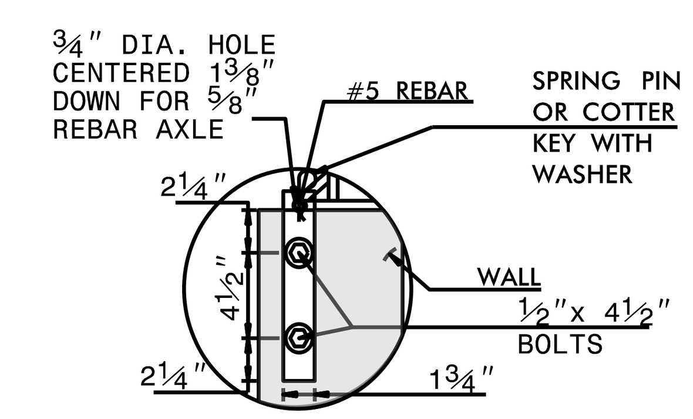
REBAR TRASH RACK

N.T.S.

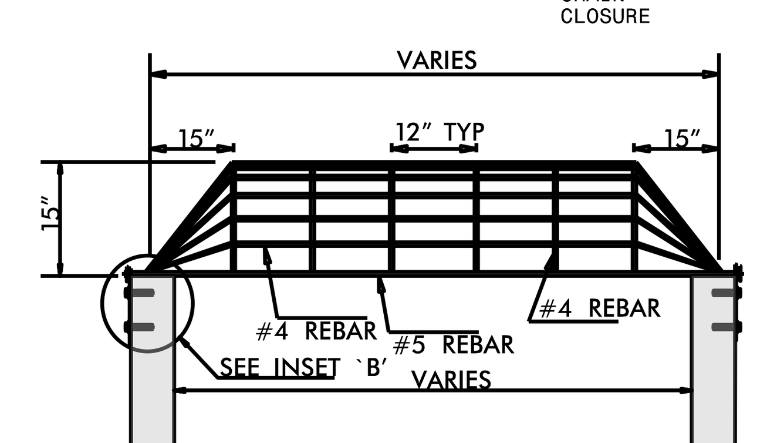
RISER TRASH RACK NOTES:
1) ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A *" BEAD.
2) IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3) EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4) RACK AND HARDWARE SHALL BE ALUMINUM OR REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A–153.
5) PROVIDE OPENING IN TRASH RACK TO ACCOMODATE SLUICE GATE, IF APPLICABLE, ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.



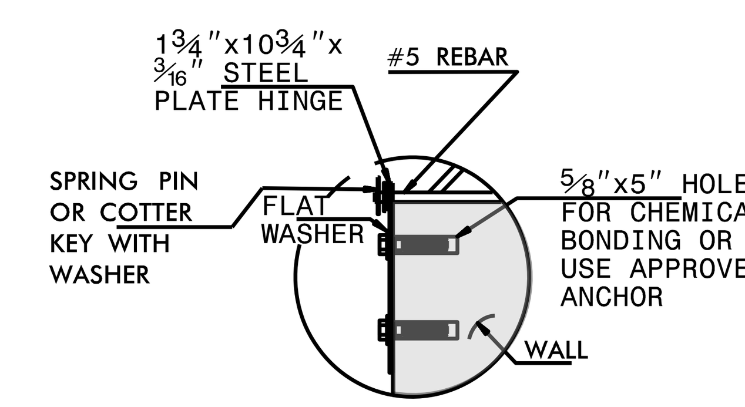
SECTION A–A



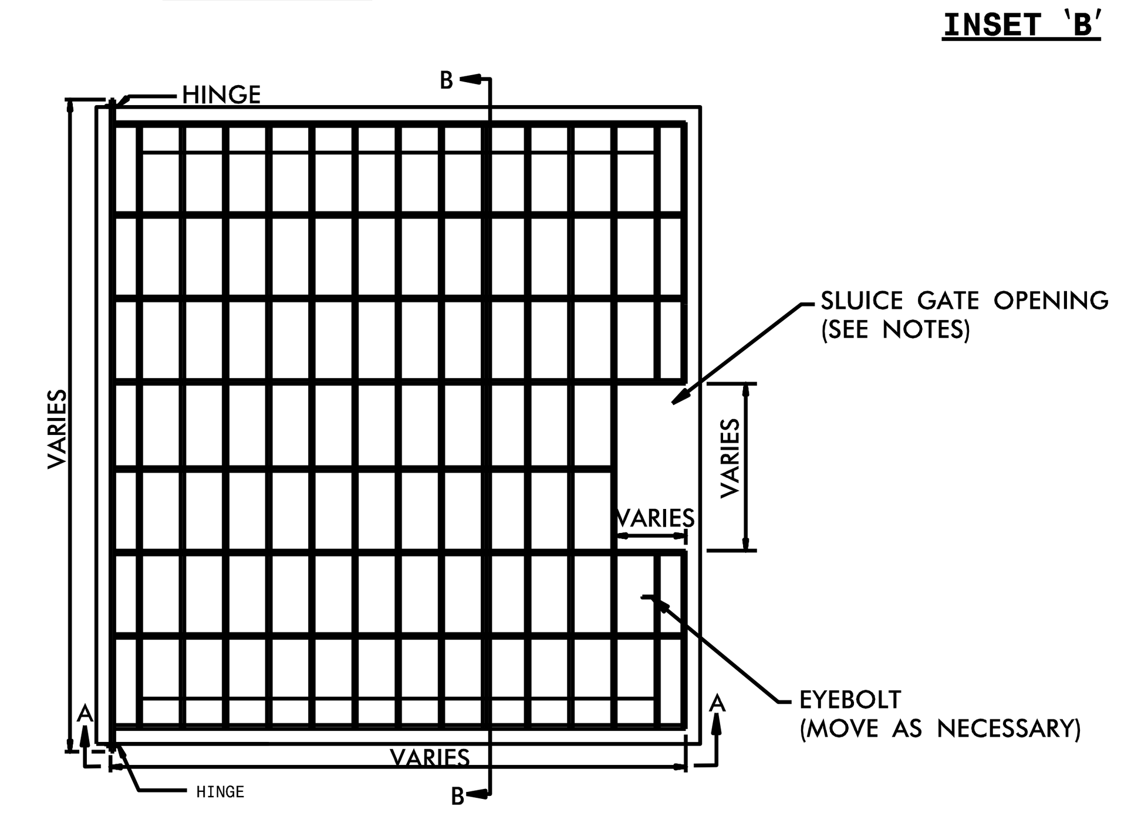
INSET `A'



SECTION B–B



INSET `B'

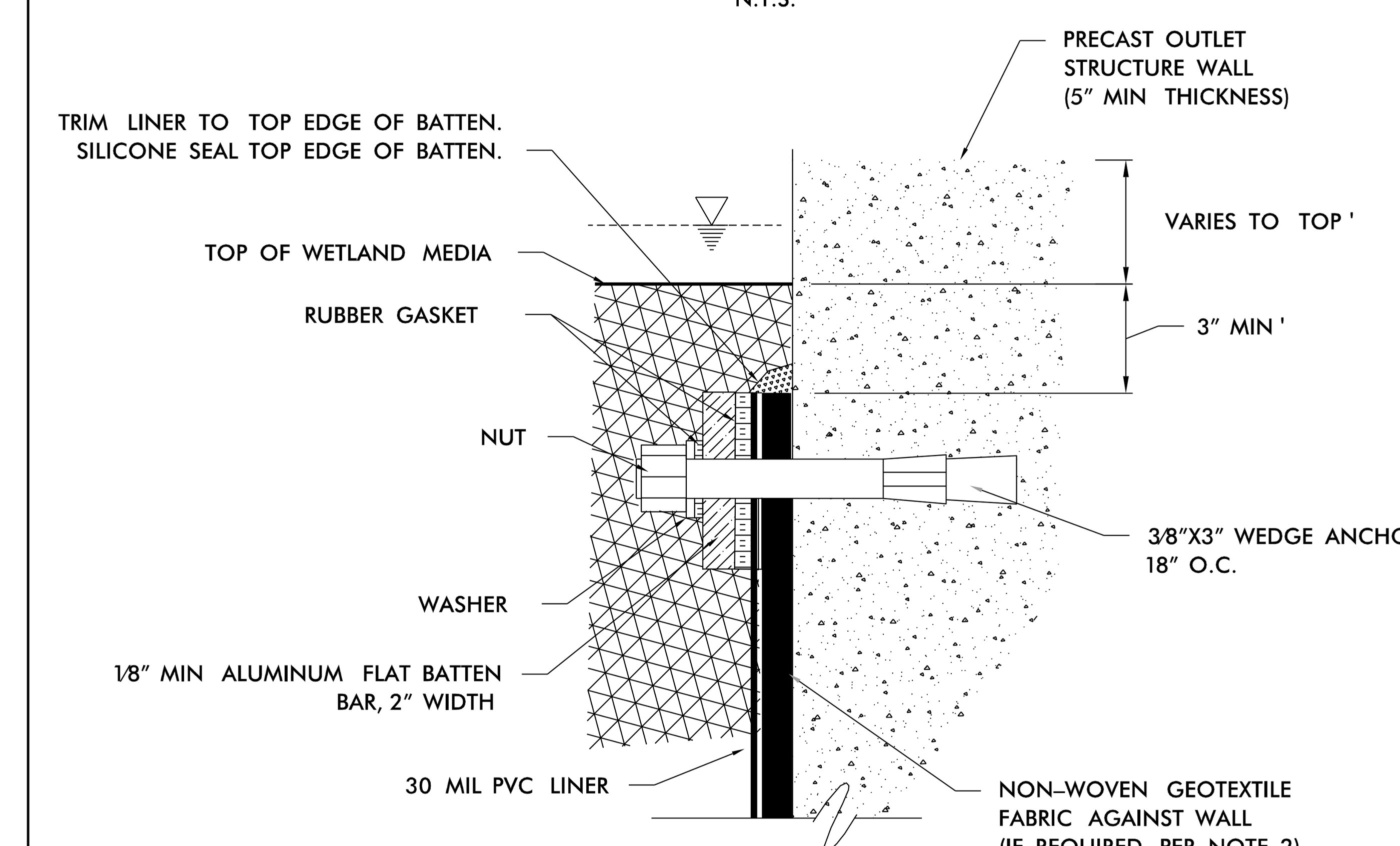


PLAN

DETAIL F

LINER ATTACHMENT

N.T.S.



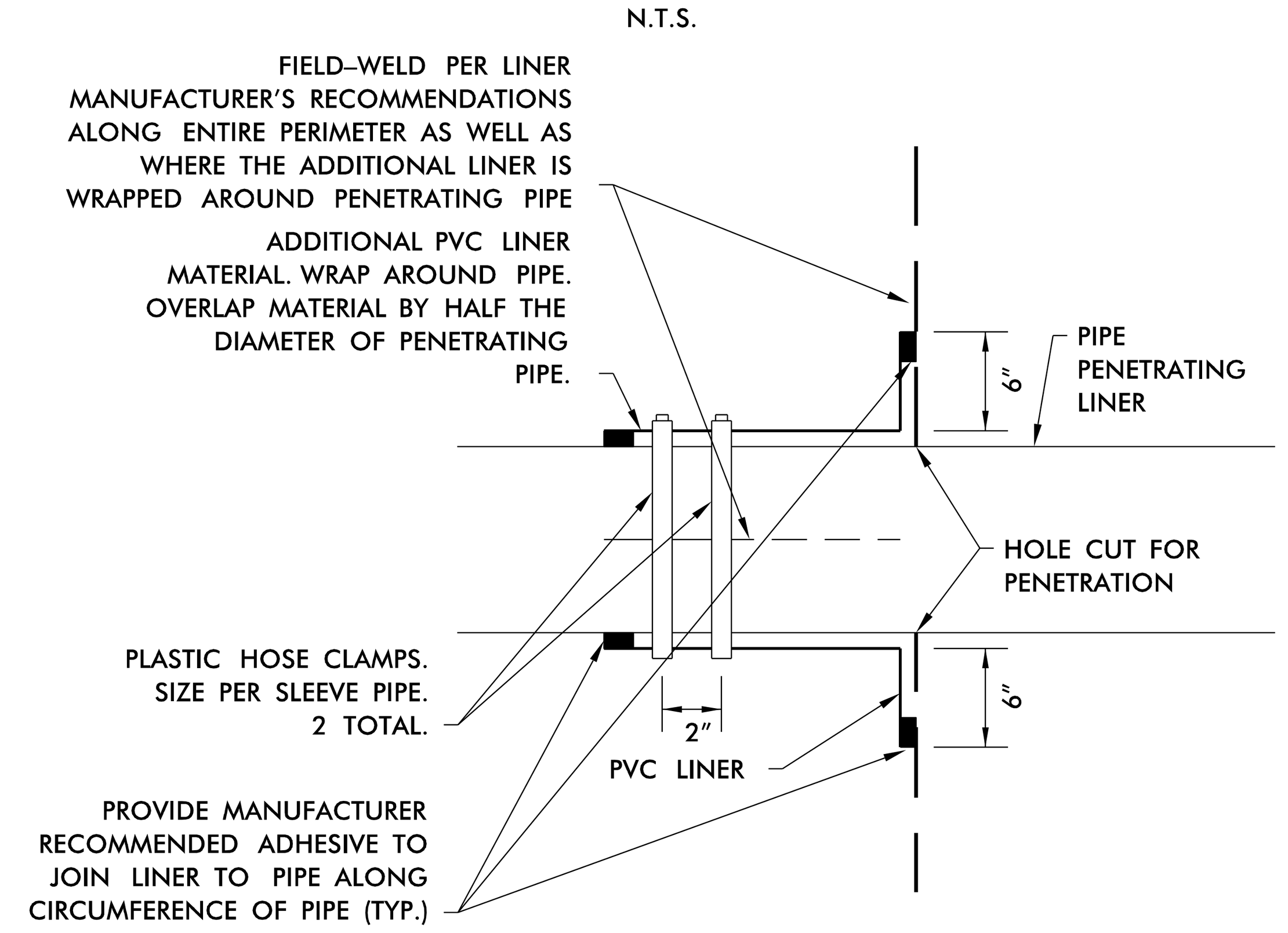
LINER ATTACHMENT NOTES:

1. THE SURFACE OF THE OUTLET STRUCTURE TO WHICH THE GEOMEMBRANE LINER IS TO BE ATTACHED SHALL BE REMOVED OF IRREGULARITIES ON THE CONCRETE SURFACE PRIOR TO INSTALLATION.
2. IF IRREGULARITIES (I.E., SHARP PROTRUSIONS EXCEEDING 1/2 INCH FROM SURFACE FACE) CAN NOT BE REMOVED FROM A FORMED STRUCTURE, A PROTECTIVE GEOTEXTILE LAYER SHOULD BE PLACED BETWEEN THE SURFACE AND THE GEOMEMBRANE WITHIN VICINITY OF PROTRUSIONS.
3. REFER TO PLANS FOR VERTICAL DIMENSIONS OF WETLAND MEDIA COMPONENTS.
4. VERIFY GEOTEXTILE MANUFACTURER'S INSTALLATION RECOMMENDATIONS WITH ENGINEER FOR APPROVAL.

DETAIL G

LINER PENETRATION

N.T.S.



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$$$$$USERNAME$$$$

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER

[illegible] 8/4/21

SUBMERGED GRAVEL WETLAND SYSTEM PIPE SUMMARY & QUANTITIES

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL
		401	402	266.6′	261.9′	259.5′	
		403	408	259.8′	253.3′	252.7′	
		407	405	283.9′	280.7′	258.6′	
		405	404	263.0′	258.4′	258.0′	
		406	401	268.2′	265.8′	264.0′	

FROM	TO	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12″	15″	18″	24″	30″	36″	42″	48″
401	402		78						
403	408				61				
407	405			101					
405	404			28					
406	401			16					

FROM	TO	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12″ .064	15″ .064	18″ .064	24″ .064	30″ .079	36″ .079	42″ .109	48″ .109
401	402								
403	408								
407	405								
405	404								
406	401								

FROM	TO	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12″	15″	18″	24″	30″	36″	42″	48″	15″ SIDE DRAIN PIPE	18″ SIDE DRAIN PIPE	24″ SIDE DRAIN PIPE
401	402											
403	408											
407	405											
405	404											
406	401											

FROM	TO	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	LIN. *FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
401	402									
403	408									
407	405									
405	404									
406	401									

FROM	TO	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	OUTLET CONTROL STRUCTURE STD. 840.04	OUTLET CONTROL STRUCTURE STD. 840.05	M.H. FRAME AND COVER STD. 840.54	FES STD. 310.02	NCDOT TRASH RACK	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
401	402														1						
403	408											1				1					
407	405										1			1							
405	404														1						
406	401										1			1							

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

SUMMARY OF EARTHWORK

SITE	UNCL. EXCAV. (CY)	FILL (CY)	BORROW (CY)	WASTE (CY)
1	360	508	148	0

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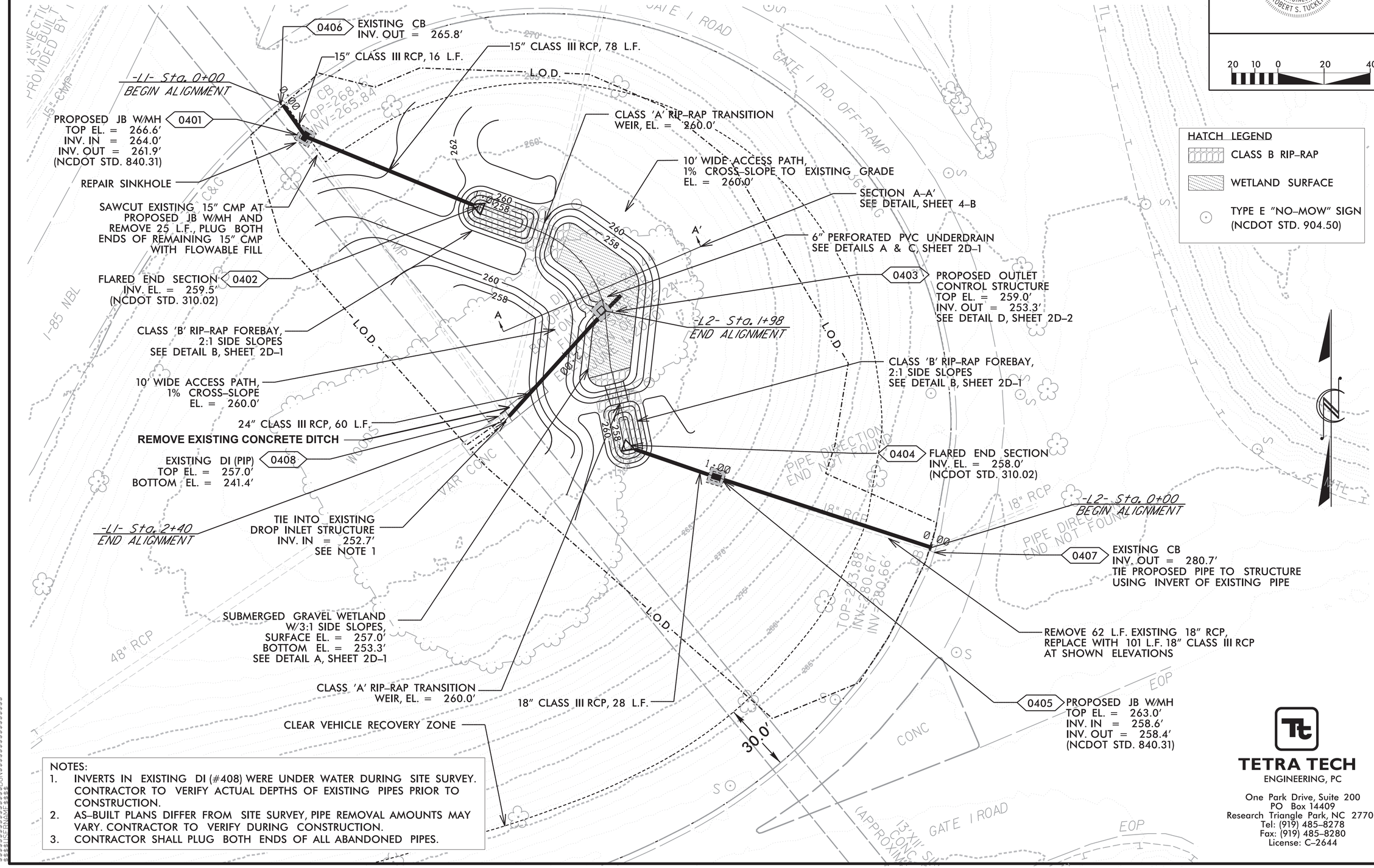
PROJECT REFERENCE NO.	SHEET NO.
R–5968EA	4–A

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040727 ENGINEER ROBERT S. TUCKER — 8/4/21

20 10 0 20 40

SITE 1 SUBMERGED GRAVEL WETLAND FINE GRADING PLAN



NOTES:
1. INVERTS IN EXISTING DI (#408) WERE UNDER WATER DURING SITE SURVEY. CONTRACTOR TO VERIFY ACTUAL DEPTHS OF EXISTING PIPES PRIOR TO CONSTRUCTION.
2. AS–BUILT PLANS DIFFER FROM SITE SURVEY, PIPE REMOVAL AMOUNTS MAY VARY. CONTRACTOR TO VERIFY DURING CONSTRUCTION.
3. CONTRACTOR SHALL PLUG BOTH ENDS OF ALL ABANDONED PIPES.

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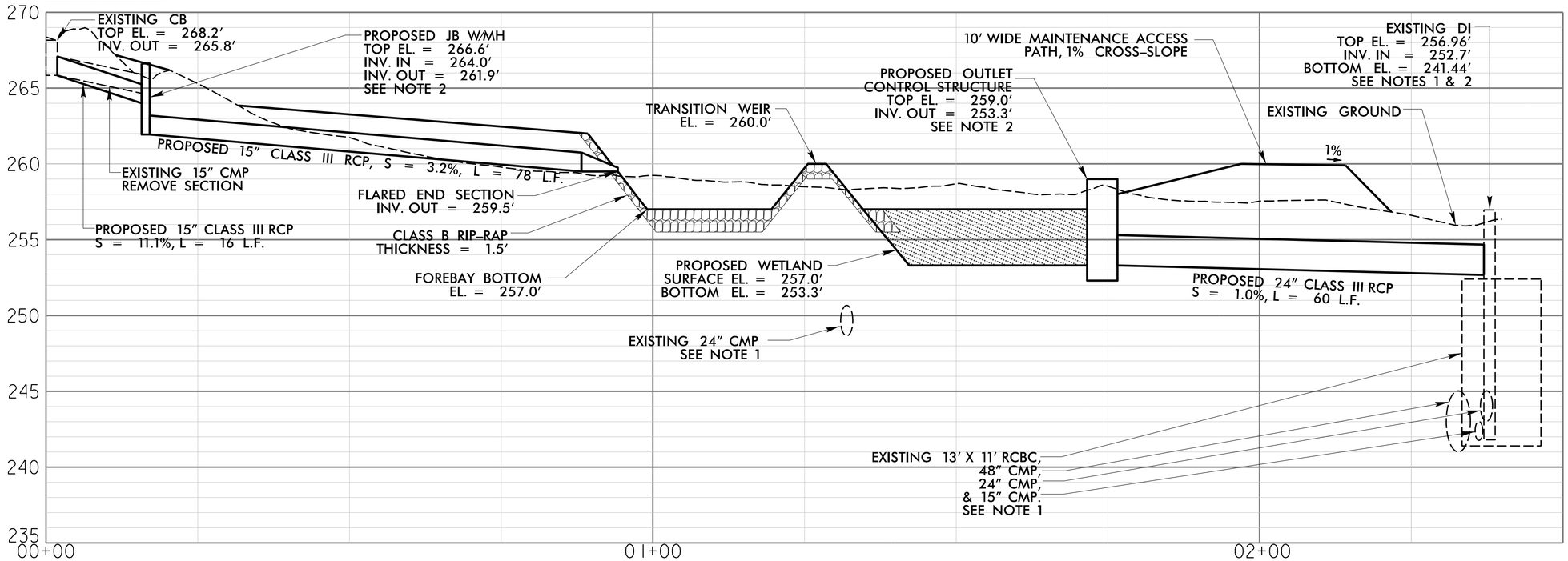
SITE 1 SUBMERGED GRAVEL WETLAND
PROFILES & CROSS SECTION

PROJECT REFERENCE NO.	SHEET NO.
R–5968EA	4–B

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER 8/4/21

–L1– PROFILE



HATCH LEGEND

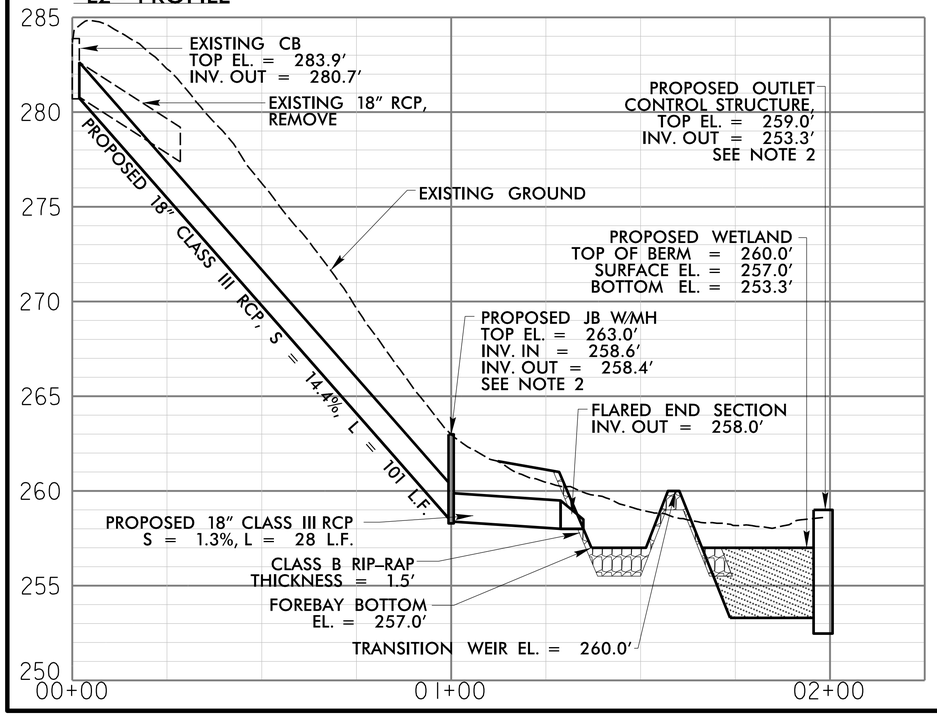
- CLASS B RIP–RAP
- WETLAND

–L1– PROFILE

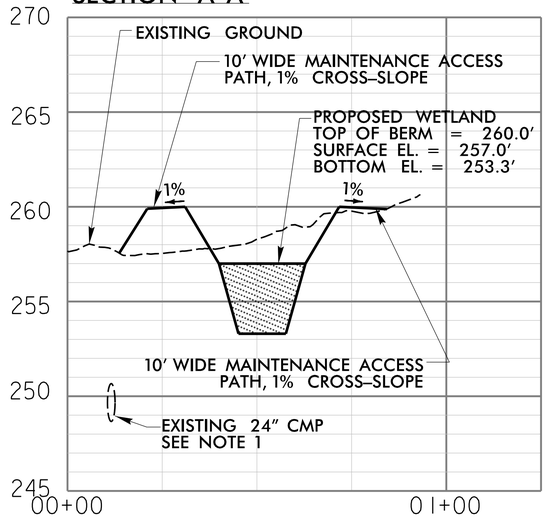
10 5 0 10 20 HORIZONTAL

4 2 0 4 8 VERTICAL

–L2– PROFILE



SECTION A–A'



–L2– PROFILE & SECTION A–A'

20 10 0 20 40 HORIZONTAL

4 2 0 4 8 VERTICAL

NOTES:

1. INVERTS OF PIPES CONNECTED TO EXISTING DI WERE UNDER WATER OR UNABLE TO BE FOUND DURING SITE SURVEY. CONTRACTOR TO VERIFY ACTUAL DEPTHS OF EXISTING STRUCTURES PRIOR TO CONSTRUCTION. EXISTING PIPE ELEVATIONS SHOWN IN PROFILE ARE ESTIMATES.
2. CONTRACTOR TO COORDINATE WITH PROJECT ENGINEER REGARDING FINAL INVERT ELEVATIONS FOR PROPOSED PIPES.

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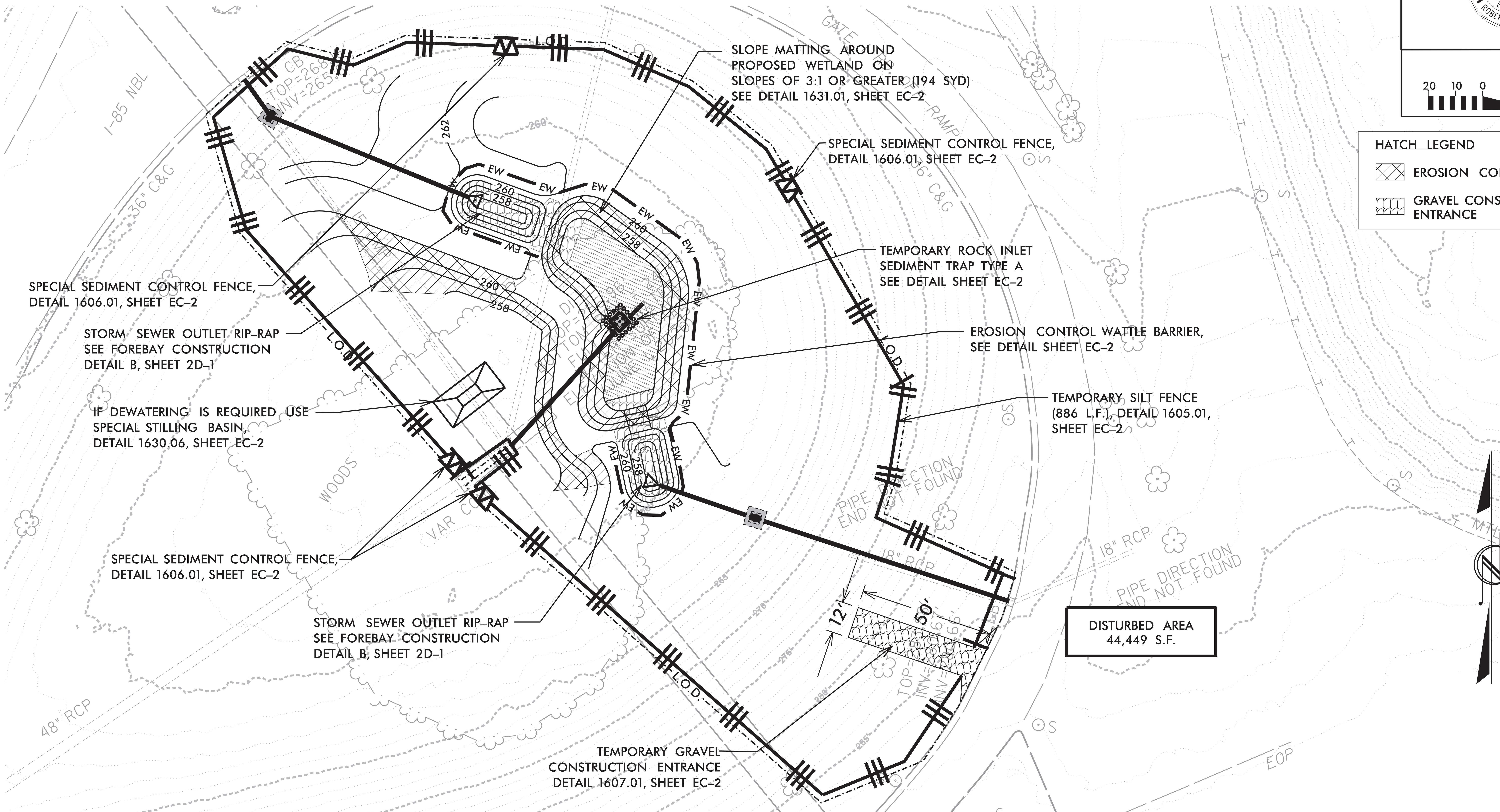
R–5968EA	EC–1

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER

[illegible] 8/4/21

SITE 1 EROSION AND SEDIMENT CONTROL PLAN



20 10 0 20 40

HATCH LEGEND

▨ EROSION CONTROL MATTING

▥ GRAVEL CONSTRUCTION ENTRANCE

SITE 1 – EROSION CONTROL NARRATIVE:
THIS PROJECT IS LOCATED WITHIN THE EASTERN INTERCHANGE OFFRAMP OF I–85 AT GATE ONE ROAD IN GRANVILLE COUNTY, NORTH CAROLINA, JUST EAST OF THE TOWN OF BUTNER. CONSTRUCTION INSTALLATION CONSISTS OF A PERMANENT BEST MANAGEMENT PRACTICE (BMP) DESIGNED GRAVEL WETLAND AND ITS ASSOCIATED UTILITY AND GRADING WORK FOR STORMWATER RUNOFF MANAGEMENT AND IMPROVEMENT. EROSION CONTROL MEASURES WILL BE IN ADDITION TO OTHER BMP INSTALLATIONS AT THE SAME INTERCHANGE BUT LOCATED ALONG ITS WESTERN EDGE.

SEDIMENT RUNOFF IS TO BE CONTROLLED DURING CONSTRUCTION BY SILT FENCE, STONE AND GRAVEL INLET PROTECTION, AND TWO FOREBAYS AS SHOWN ON THE PLAN. DRAINAGE FROM THIS SITE IS TRIBUTARY TO NEARBY FALLS LAKE IN THE NEUSE RIVER BASIN.

SITE 1 IS IN ZONE X, AN AREA OF MINIMAL FLOOD HAZARD, AS SHOWN ON FEMA FLOODPLAIN MAP PANEL NO. 3720086400L, DATED 12/6/2019.

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PROJECT REFERENCE NO.	SHEET NO.
R-5968EA	EC-2

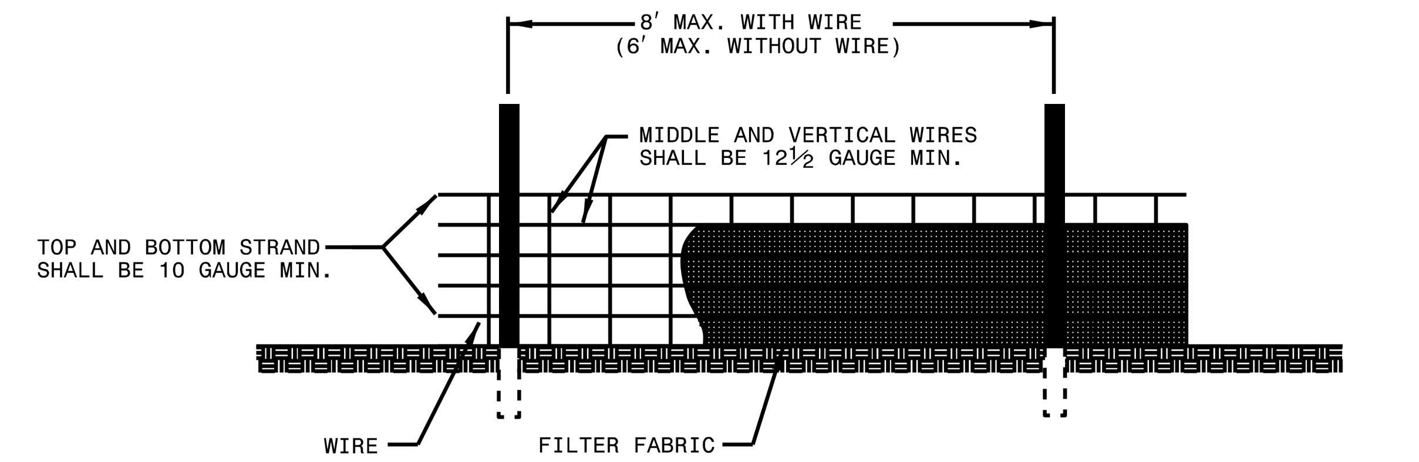
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER 8/4/21

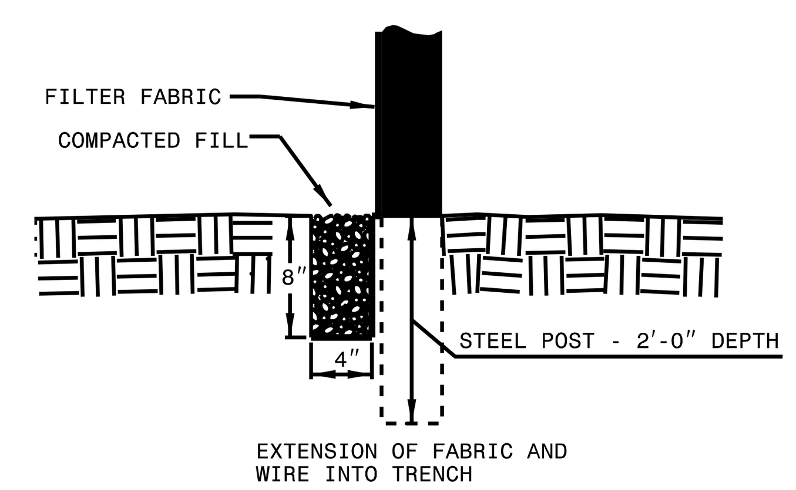
EROSION AND SEDIMENT CONTROL STANDARD DETAILS

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR **TEMPORARY SILT FENCE**



NOTES
USE WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
USE FILTER FABRIC A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER.
PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.



SHEET 1 OF 1 1605.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR **SPECIAL SEDIMENT CONTROL FENCE**

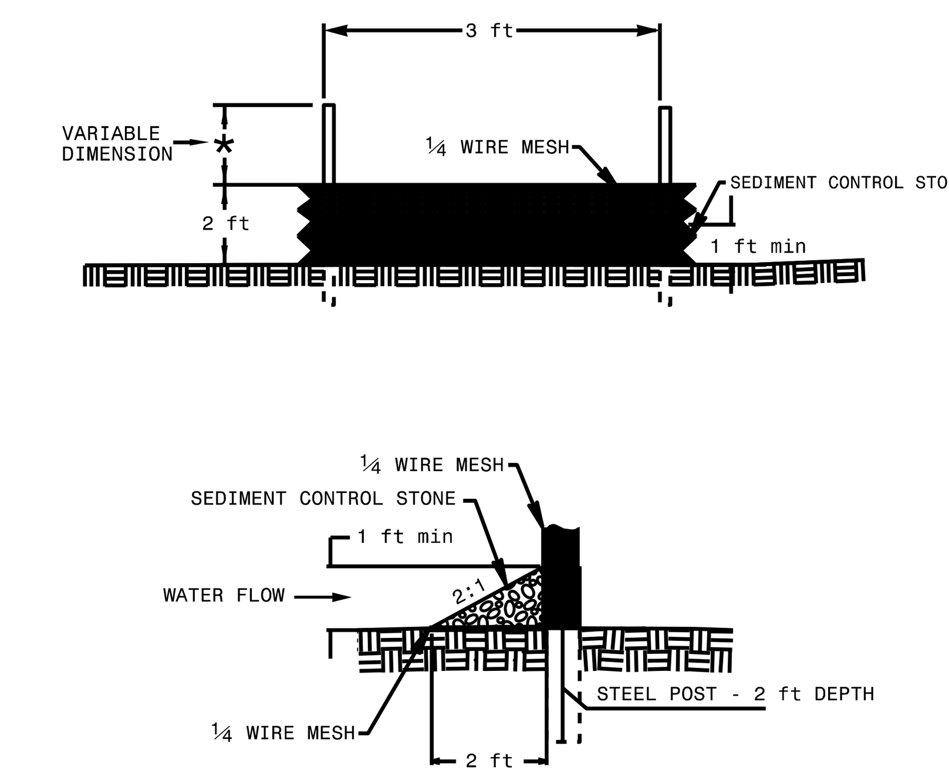
GENERAL NOTES:

USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

USE HARDWARE CLOTH 24 GAUGE WIRE MESH WITH 1/4 INCH MESH OPENINGS.

INSTALL 5 FT. SELF FASTENER ANGLE STEEL POST 2 FT. DEEP MINIMUM.

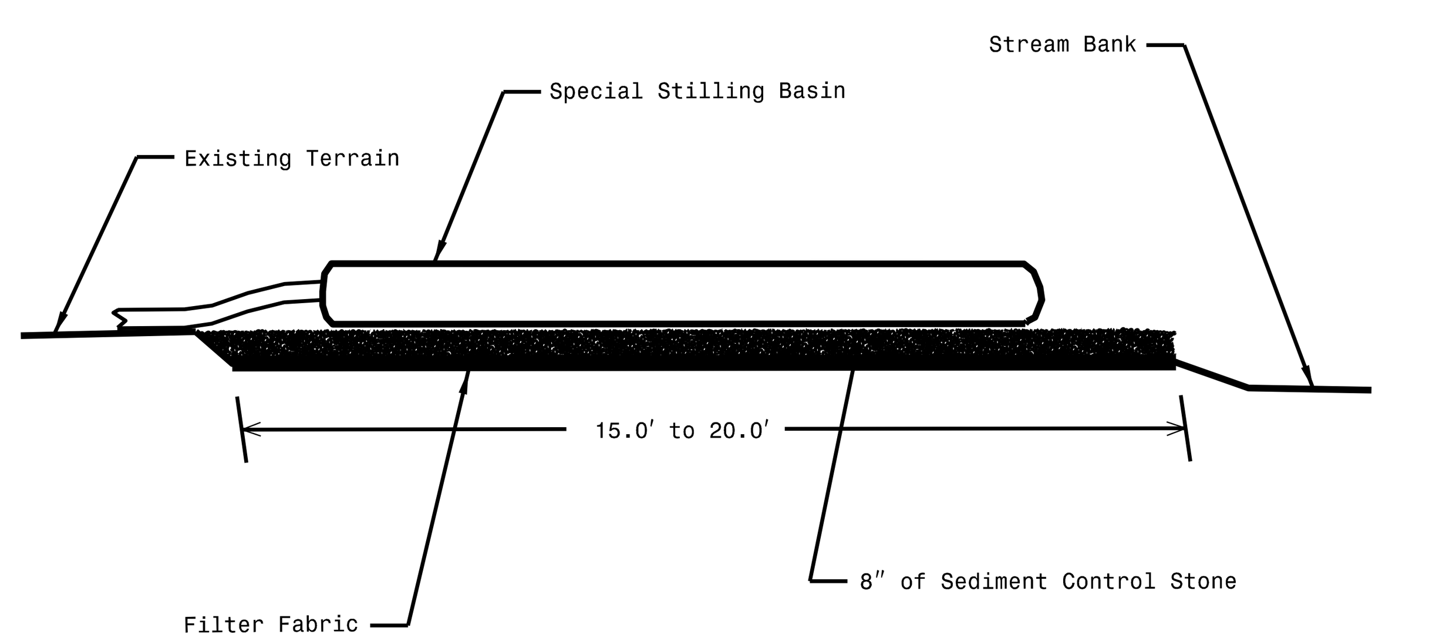
SPACE POST A MAXIMUM OF 3 FT.



SHEET 1 OF 1 1606.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR **SPECIAL STILLING BASIN**



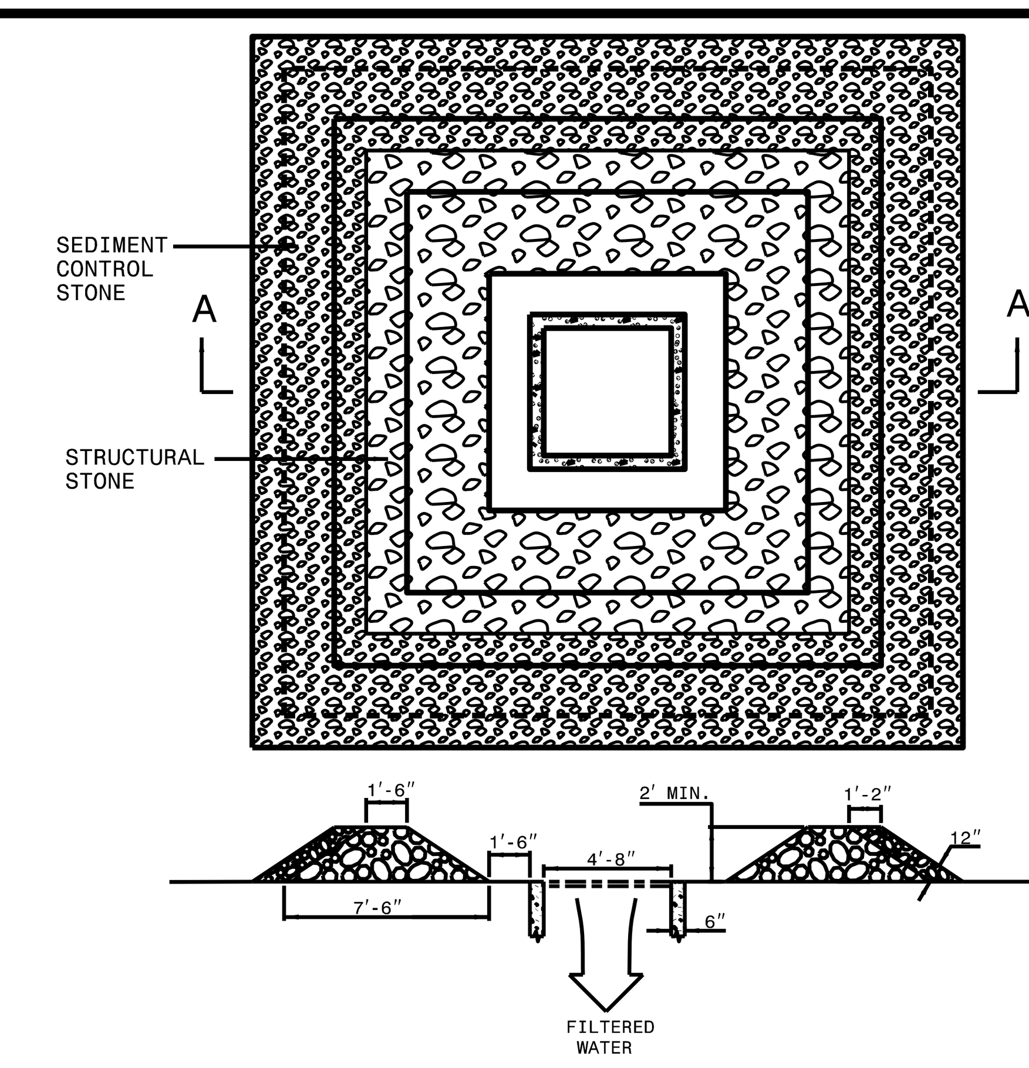
Note: Provide Stabilized Outlet to Streambank

Not To Scale

SHEET 1 OF 1 1630.06

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR **ROCK INLET SEDIMENT TRAP TYPE 'A'**

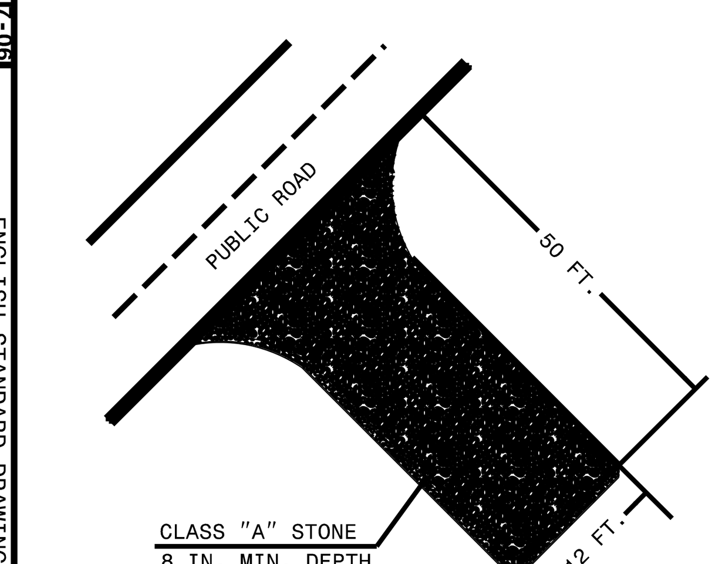


NOTE:
CLEAN SEDIMENT WHEN FULL OR AS DIRECTED BY ENGINEER.
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL.
USE CLASS 'B' STONE FOR STRUCTURAL STONE.
CONSTRUCT TOP OF BERM A MINIMUM OF ONE FOOT BELOW THE SHOULDER OR ANY DIVERSION POINT.

SHEET 1 OF 1 1632.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR **GRAVEL CONSTRUCTION ENTRANCE**



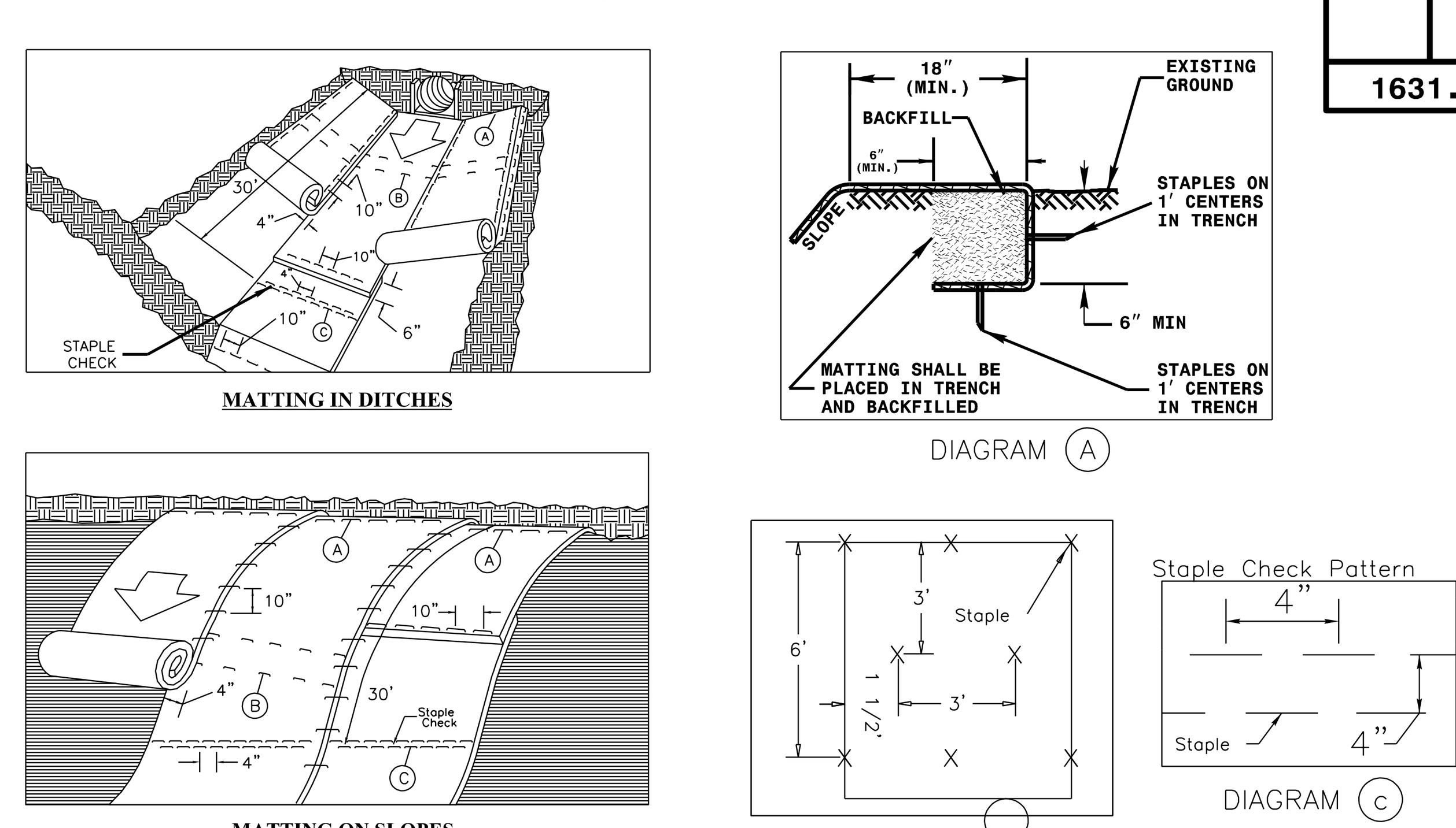
NOTES:
1. PROVIDE TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS.
2. LOCATE ENTRANCE(S) TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. LOCATE GRAVEL CONSTRUCTION ENTRANCE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. PROVIDE FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE.
6. NUMBER AND LOCATION OF CONSTRUCTION ENTRANCES TO BE DETERMINED BY THE ENGINEER.
7. USE CLASS 'A' STONE OR OTHER COARSE AGGREGATE APPROVED BY THE ENGINEER.

NOTE: PLACE FILTER FABRIC BENEATH STONE

SHEET 1 OF 1 1607.01

MATTING INSTALLATION DETAIL

1631.01



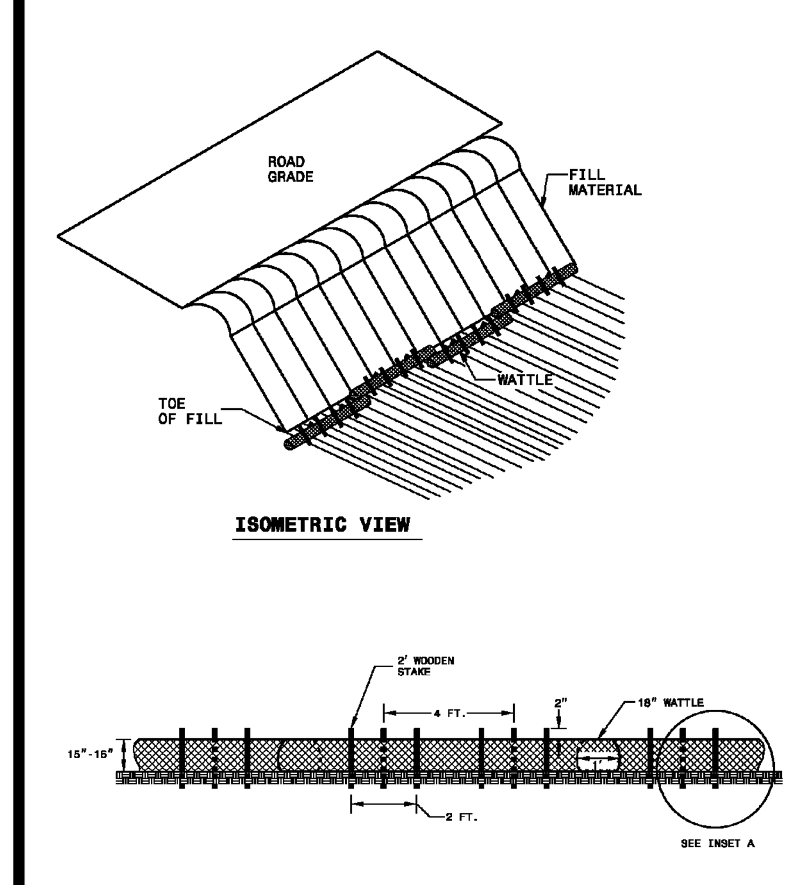
NOTES:

THIS DETAIL APPLIES TO STRAW, EXCELSIOR, AND PERMANENT SOIL REINFORCEMENT MAT (PSRM) INSTALLATION.

STAPLES SHALL BE NO. 11 GAUGE STEEL WIRE FORMED INTO A "U" SHAPE WITH A MINIMUM THROAT WIDTH OF 1 INCH AND NOT LESS THAN 6 INCHES IN LENGTH.

NOT TO SCALE

WATTLE BARRIER DETAIL



NOTES:

USE MINIMUM 18 IN. NOMINAL DIAMETER EXCELSIOR WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 2 TO 3 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLES ON TOE OF SLOPE.

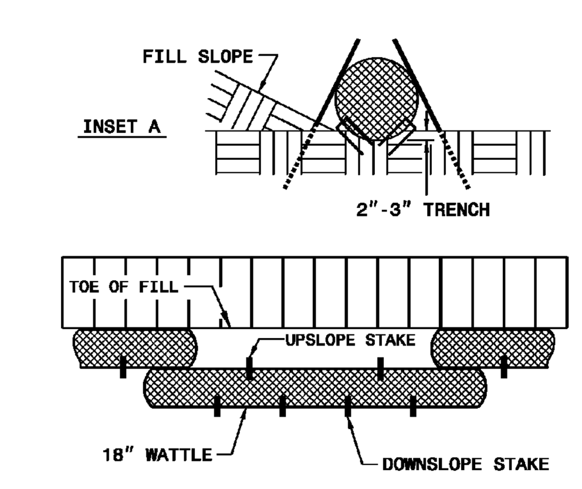
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

FOR BREAKS ALONG LARGE SLOPES, USE MAXIMUM SPACING OF 20 FT.



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PROJECT REFERENCE NO.	SHEET NO.
R–5968EA	EC–3

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER 8/4/21

EROSION AND SEDIMENT CONTROL NOTES

EROSION CONTROL NOTES:

1. ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION FOR ROADS AND STRUCTURES DATED JANUARY 2018.
2. CONTRACTOR MUST MAINTAIN ALL EROSION CONTROL MEASURES THROUGHOUT THE DURATION OF THE PROJECT UNLESS OTHERWISE INDICATED ON THE PLANS OR DIRECTED BY THE INSPECTOR.
3. CONTRACTOR MUST CONSTRUCT DIVERSION DITCHES WHEN NECESSARY TO ENSURE ALL SEDIMENT IS DIRECTED INTO EROSION CONTROL MEASURES.
4. CUT AND FILL SLOPES SHALL BE STABILIZED WITHIN 15 DAYS OF ANY PHASE OF GRADING.
5. ALL ROADWAYS ADJACENT TO THIS PROJECT MUST REMAIN CLEAN AT ALL TIMES OR A WASH STATION MAY BE REQUIRED.
6. INSTALL WATTLES AROUND BASINS AND FOREBAYS ONCE CONSTRUCTED, TO REMAIN IN PLACE UNTIL SURROUNDING AREA HAS STABILIZED WITH VEGETATION.

GENERAL NOTES:

1. EXISTING TOPOGRAPHY TAKEN FROM FIELD SURVEY BY SEPI ENGINEERING AND CONSTRUCTION.
2. THE SILT FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITEWORK IS COMPLETED AND THE FINAL SITE INSPECTION IS SCHEDULED.
3. RESEEDING OF PERMANENT GROUNDCOVER WILL BE ESTABLISHED IN 15 WORKING DAYS OR 30 CALENDAR DAYS, WHICHEVER IS SHORTER.
4. IF NECESSARY, PUMPS SHALL BE USED TO DEWATER THE WORKING AREA. THE PUMPS MUST BE OF SUFFICIENT SIZE TO DEWATER THE WORK AREA AND TO PUMP WATER FROM THE BOTTOM OF THE WORKING AREA TO A SPECIAL STILLING BASIN. ALL PUMP EFFLUENT SHALL BE DISCHARGED THROUGH A SPECIAL STILLING BASIN.

SEEDBED PREPARATION:

1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3 INCHES DEEP OVER ADVERSE SOIL CONDITIONS, IF AVAILABLE.
2. RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
3. REMOVE ALL LOOSE ROCK, ROOTS AND OTHER OBSTRUCTION LEAVING SURFACES REASONABLY SMOOTH AND UNIFORM.
4. APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL (SEE BELOW).
5. CONTINUE TILLAGE UNTIL A WELL–PULVERIZED, FIRM REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP
6. SEED A FRESHLY PREPARED SEEDBED AND COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND SHOULD BE OVER 70% DAMAGED, RE–ESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
9. CONSULT CONSERVATION INPSECTOR ON MAINTENANCE TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.

   APPLY: AGRICULTURAL LIMESTONE 2 TONS/ACRE (34 TONS/ACRE ON CLAY SOILS)
   FERTILIZER 1,000 LBS/ACRE; 10 10 10
   SUPERPHOSPHATE 500 LBS/ACRE; 20%
   MULCH 2 TONS/ACRE; SMALL GRAIN STRAW
   ANCHOR ASPHALT EMULSION @ 300 GAL/ACRE

MAINTENANCE PLAN:

1. ALL EROSION AND SEDIMENTATION CONTROL PRACTICES WILL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY RUNOFF PRODUCING RAINFALL EVENT BUT IN NO CASE LESS THAN ONCE EVERY WEEK. ALL NEEDED REPAIRS WILL BE MADE IMMEDIATEDLY TO MAINTAIN ALL PRACTICES AS DESIGNED.
2. SEDIMENT WILL BE REMOVED FROM BEHIND THE SILT FENCE WHEN IT BECOMES 6–INCHES DEEP AT THE FENCE. THE SILT FENCE WILL BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER.
3. INLET PROTECTION DEVICES MUST BE INSPECTED AFTER EVERY RAINFALL EVENT. DAMAGED SILT FENCE MUST BE REPLACED AND GRAVEL MUST BE CLEANED OR REPLACED WHEN INLET NO LONGER DRAINS PROPERLY.
4. ALL TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED ONCE THE OWNER AGENCY ACCEPTS THE CONSTRUCTION AND VEGETATION HAS BEEN FULLY ESTABLISHED.

CONSTRUCTION SEQUENCE NOTES:

1. INSTALL CONSTRUCTION ENTRANCE.
2. INSTALL ALL SILT FENCE AS SHOWN ON PLAN. OBTAIN APPROVAL OF INSTALLATION.
3. CLEAR PROJECT WORK LIMITS ONLY AS NEEDED TO INSTALL PERIMETER EROSION CONTROL DEVICES.
4. INSTALL EROSION CONTROL MEASURES. OBTAIN CERTIFICATE OF COMPLIANCE FROM EROSION CONTROL INSPECTOR.
5. CLEAR AND GRUB AREAS WITHIN CONSTRUCTION LIMITS AND BEGIN GRADING ACTIVITIES.
6. INSTALL STORM DRAINAGE, BEGINNING AT DOWNSTREAM END AND WORKING UPSTREAM. MAINTAIN INLET PROTECTION DEVICES AS DRAINAGE STRUCTURES ARE INSTALLED AND AREAS ARE BROUGHT UP TO FINISHED GRADE. CAP ALL OPENINGS FOR UNDERDRAINS IN OUTLET STRUCTURES AS NEEDED.
7. INSTALL TEMPORARY AND PERMANENT EROSION CONTROL SLOPE MATTING AS STABILIZE ALL BARE AREAS AND PRODUCE VEGETATIVE COVER.
8. EXCAVATE AND REMOVE SOIL FOR GRAVEL BED. INSTALL LINER, UNDERDRAINS, AND SUBMERGED GRAVEL WETLAND MEDIA.
9. AFTER WETLAND MEDIA INSTALLATION, IMMEDIATELY INSTALL PROTECTIVE WATTLES AROUND WETLANDS AND FOREBAYS AS SHOWN ON THE PLANS.
10. UPON SUBSTANTIAL COMPLETION OR WORK, REQUEST FINAL APPROVAL FROM EROSION CONTROL INSPECTOR. UPON APPROVAL, REMOVE ALL TEMPORARY EROSION CONTROL DEVICES.

SEEDING SCHEDULE SHOULDERS, SIDE DITCHES, SLOPES (MAX. 3:1)

DATE	TYPE	PLANTING RATE
AUG 15 – NOV 1	TALL FESCUE	300 LBS/ACRE
NOV 1 – MAR 1	TALL FESCUE & ABRUZZI RYE	300 LBS/ACRE
MAR 1 – APR 15	TALL FESCUE	300 LBS/ACRE
APR 15 – JUNE 30	HULLED COMMON BERMUDAGRASS	25 LBS/ACRES
JUNE 30 – AUG 15	TALL FESCUE AND ***BROWNTOP MILLET ***OR SORGHUM–SUDAN HYBRIDS	35 LBS/ACRE

SLOPES (3:1 TO 2:1)

DATE	TYPE	PLANTING RATE
MAR 1 – JUNE 1	SERICEA LESPEDEZA (SCARIFIED) AND	50 LBS/ACRE
MAR 1 – APR 15	ADD TALL FESCUE AND	120 LBS/ACRE
MAR 1 – JUNE 30	ADD WEEPING LOVEGRASS OR	10 LBS/ACRE
MAR 1 – JUNE 30	ADD HULLED COMMON BERMUDAGRASS	25 LBS/ACRE
JUNE 1 – SEP 1	***TALL FESCUE AND ***BROWNTOP MILLET ***OR SORGHUM–SUDAN HYBRIDS	120 LBS/ACRE 35 LBS/ACRE 30 LBS/ACRE
SEP 1 – MAR 1	SERICEA LESPEDEZA (UNHULLED–UNSCARIFIED) AND TALL FESCUE	70 LBS/ACRE 120 LBS/ACRE
NOV 1 – MAR 1	ADD ABRUZZI RYE	25 LBS/ACRE

CONSULT EROSION CONTROL ENGINEER FOR ADDITIONAL INFORMATION CONCERNING OTHER ALTERNATIVES FOR VEGETATION OF DENUDED AREAS. THE ABOVE VEGETATION RATES ARE THOSE WHICH DO WELL UNDER LOCAL CONDTIONS; OTHER SEEDING RATE COMBINATIONS ARE POSSIBLE.

***TEMPORARY – RESEED ACCORDING TO OPTIMUM SEASON FOR DESIRED PERMANENT VEGETATION. DO NOT ALLOW TEMPORARY COVER TO GROW OVER 12 INCHES IN HEIGHT BEFORE MOVWING, OTHERWISE FESCUE MAY BE SHADED OUT.

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SITE 1 PLANTING PLAN

PROJECT REFERENCE NO.	SHEET NO.
R-5968EA	L-1

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER 8/4/21

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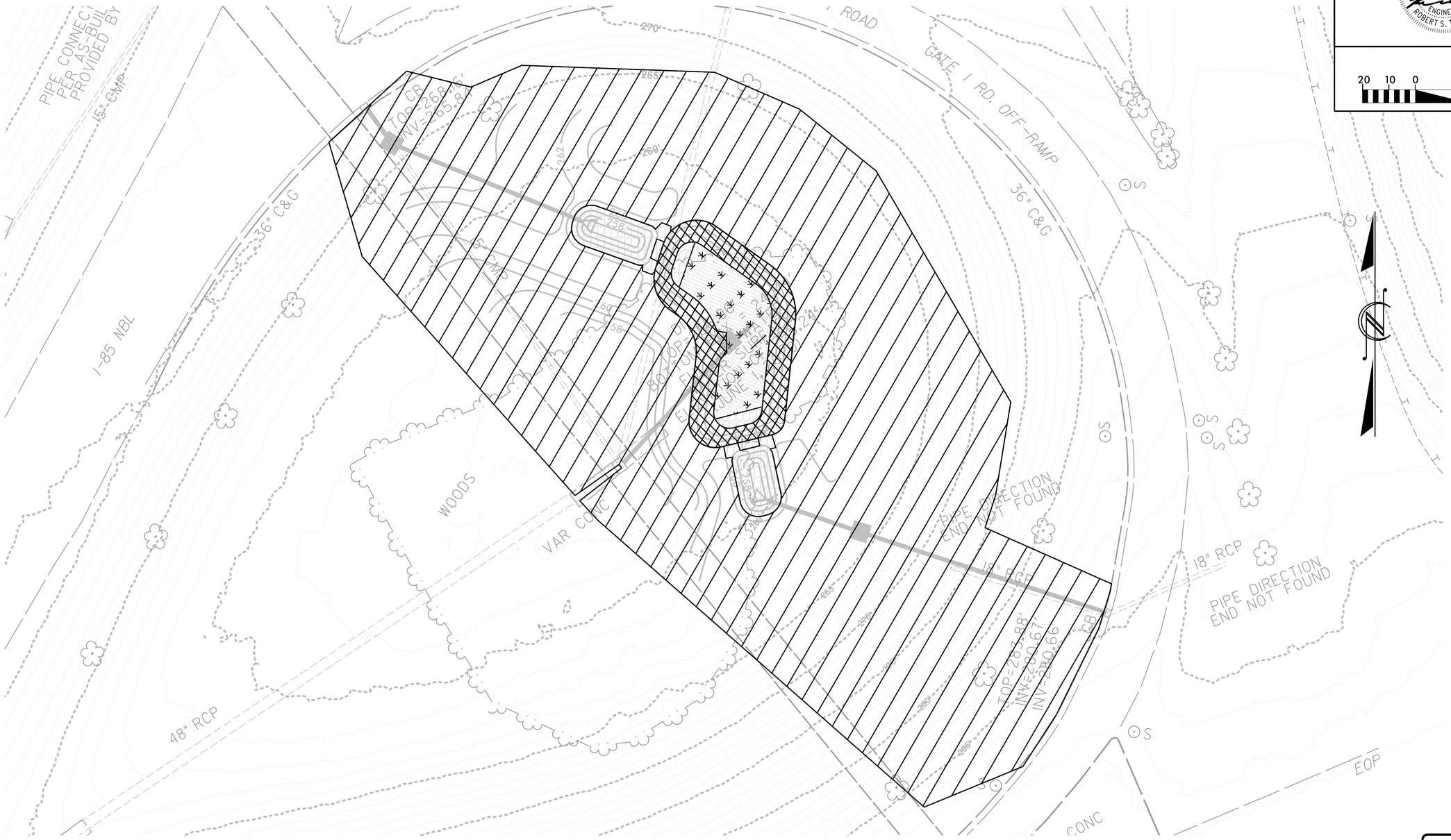

WETLAND BOTTOM
AREA = 1,245 SF

WETLAND SLOPES
AREA = 1,770 SF

UPLAND SLOPES
AREA = 40,270 SF

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PROJECT REFERENCE NO.	SHEET NO.
R–5968EA	L–2

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER 2024/2.1

PLANTING SCHEDULE & NOTES

PLANTING SCHEDULE

THE FOLLOWING TABLE SHOWS THE PREFERRED SEASONAL PERIODS WITHIN WHICH TO PLANT THE VARIOUS TYPES OF PLANTS. MODIFICATIONS CAN BE PERMITTED. A REQUEST MUST BE MADE IN WRITING DESCRIBING THE DESIRED PLANTING TIME FRAME AND THE MEASURES THAT WILL BE TAKEN TO ENSURE PLANT SURVIVAL.

Plant Type	Begin Plant	End Planting
Wetland Plants (plugs and tubelings)	April 15	June 15
Permanent Seeding		
Spring	February 1	April 1
Fall	August 1	October 15
Temporary Seeding		
Rye Grain (120 lb/ac)	September 1	April 15
German Millet (40 lb/ac)	April 16	August 31
Sod		
Common Bermudagrass	April 15	November 15

Planting Zones	Total Area (sf)
Wetland Bottom	1,245
Wetland Slopes	1,770
Upland Slopes	40,270

Zone: Wetland Bottom

Scientific Name	Common Name	Spacing (ft) O.C.	Minimum Plant Size	Plant Quantity (%)	Distribution Type
Acorus americanus	Sweet flag	2x2	Plug	10	Small clump
Andropogon gerardii	Big bluestem	2x2	Plug	5	Small clump
Andropogon glomeratus	Bushy beardgrass	2x2	Plug	10	Small clump
Carex lurida	Shallow sedge	1x1	Plug	15	Small clump
Elocharis obtusa	Blunt spikerush	3x3	Plug	5	Small clump
Equisetum hyemale	Horsetail	2x2	Plug	10	Small clump
Hibiscus coccineus	Scarlet rose mallow	3x3	Plug	5	Random
Juncus effusus	Soft rush	2x2	Plug	15	Small clump
Lobelia cardinalis	Cardinal flower	3x3	Plug	5	Random
Rudbeckia fulgida 'Goldsturm'	Goldsturm black-eyed susan	2x2	Plug	5	Small clump
Sorghastrum nutans	Indian grass	2x2	Plug	10	Small clump
Verbena hastata	Blue vervain	2x2	Plug	5	Random

Zone: Wetland Slopes

Seeding Rate: 20 to 25 lbs/ac

Scientific Name	Common Name	Percentage of Mix (%)	Distribution Type
Andropogon gerardii	Big bluestem	12	Overseed
Carex vulpinoidea	Fox sedge	10	Overseed
Coreopsis lanceolata	Lance-leaf tickseed	5	Overseed
Elymus virginicus	Virginia wild rye	15	Overseed
Festuca ovina var. duriuscula	Hard fescue	5	Overseed
Panicum virgatum	Switchgrass	10	Overseed
Rudbeckia hirta	Blackeyed susan	1	Overseed
Schizachyrium scoparium	Little bluestem	8	Overseed
Sorghastrum nutans	Indian grass	9	Overseed
Tridens flavus	Purple top	12	Overseed
Tripsacum dactyloides	Eastern gammagrass	13	Overseed

Zone: Upland Slopes

Seeding Rate: 20-24 lbs/1000 sf

Scientific Name	Common Name	Percentage of Mix (%)	Distribution Type
Festuca arundinacea	Tall fescue	40	Overseed
Festuca sp.	Fine fescue	30	Overseed
Poa pratensis	Kentucky bluegrass	30	Overseed

PLANTING NOTES

1. THE PLANTS AS LISTED IN THE PLANT TABLES WILL BE PLANTED IN EACH DESIGNATED PLANTING ZONE.
2. THE ZONES ARE DEFINED BY LOCATIONS SHOWN ON THE PLANS AND SHALL BE LAID OUT TO WITHIN +/–1' OF THE DEFINED BOUNDARY.
3. SPECIES ALTERNATIVES TO THE PLANT LIST MAY BE ALLOWED WITH PRIOR APPROVAL FROM THE ENGINEER.
4. THE CORRECT SPACING OF VEGETATION WITHIN EACH ZONE SHOULD BE CHECKED BY THE PLANTING SUPERVISOR ON A REGULAR BASIS.
5. THE FOLLOWING DESCRIBES THE VARIOUS TYPES OF PLANT DISTRIBUTIONS CALLED FOR ON THIS PROJECT:

   RANDOM – PLANTS LISTED AS "RANDOM" SHALL BE MIXED WITH OTHER PLANTS OF SAME DISTRIBUTION TYPE AND PLANTED RANDOMLY IN AN IRREGULAR PATTERN. NOTE THAT TWO OR MORE OF THE SAME SPECIES CAN BE PLANTED ADJACENT TO EACH OTHER, WHILE OTHER TIMES THERE MAY ONLY BE ONE PLANT OF A SPECIES COMPLETELY SURROUNDED BY ONE OR MORE OTHER SPECIES.

   SMALL CLUMP – A GROUP OF ONE SPECIES OF PLANT INSTALLED TOGETHER AS A GROUP RANGING IN SIZE FROM 10 TO 50 PLANTS. THE MASS MUST EXTEND AT A MINIMUM OF TWO (2) ROWS IN EACH DIRECTION WHEN POSSIBLE.

   CLUMP – A GROUP OF ONE SPECIES OF PLANT INSTALLED TOGETHER AS A GROUP RANGING IN SIZE FROM 50 TO 150 PLANTS. THE MASS MUST EXTEND AT A MINIMUM OF FIVE (5) ROWS IN EACH DIRECTION WHEN POSSIBLE.

   OVER SEEDING – SEED MIX SHALL BE BROADCAST OVER PREPARED SEEDBED (REFER TO SPECIAL PROVISIONS).
6. TOPSOIL AND EROSION CONTROL MATTING (EXCELSIOR TYPE) SHALL BE APPLIED TO THE WETLAND SLOPE ZONE ACCORDING TO THE SPECIAL PROVISIONS.
7. FOR UPLAND SLOPES PLANTING SCHEDULE, REFER TO EROSION AND SEDIMENT CONTROL PLANTING SCHEDULE, SHEET EC–6.
8. MINIMUM 1–YEAR ESTABLISHMENT PERIOD IS REQUIRED FOR ALL PLANTINGS AND RE–VEGETATED AREAS.

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HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040377 ENGINEER ROBERT S. TUCKER 8/4/21

TRANSPORTATION MANAGEMENT PLAN

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GENERAL NOTES

THE FOLLOWING GENERAL NOTES SHALL APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

1. THE TRAFFIC CONTROL PLANS FOR THIS PROJECT CONSIST OF DETAIL DRAWINGS, STANDARD DETAIL DRAWINGS, AND ROADWAY STANDARD DRAWINGS SHOWING TRAFFIC CONTROL DEVICES TO BE USED WHERE VARIOUS TYPES OF CONSTRUCTION ACTIVITIES ARE OCCURING ON THE PROJECT. THESE DRAWINGS ARE FOR TYPICAL SITUATIONS AND SHOULD BE ADAPTED TO THE ACTUAL FIELD CONDITIONS, SUCH AS WHEN PHYSICAL DIMENSIONS ARE NOT ATTAINABLE, OR WHEN MORE THAN ONE DRAWING IS APPLIED SIMULTANEOUSLY RESULTING IN DUPLICATE SIGNING, OR UNDESIRED OVERLAPPING OF DEVICES. WHEN THESE SITUATIONS ARISE, THE CONTRACTOR AT THE DIRECTION OF THE ENGINEER SHALL BE RESPONSIBLE FOR ADAPTING THE TRAFFIC CONTROL PLAN TO FIELD CONDITIONS TO PROVIDE SAFE AND EFFICIENT TRAFFIC MOVEMENT. MODIFICATIONS MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES.

2. TIME RESTRICTIONS
   - A) CONSTRUCTION ACCESS OF HEAVY EQUIPMENT SHALL BE PROHIBITED DURING PEAK HOURS OF 7 AM - 9 AM AND 4 PM - 6 PM.
   - B) ANY NIGHT WORK PERFORMED BY THE CONTRACTOR SHALL BE LIGHTED IN ACCORDANCE WITH NCDOT AND MUTCD STANDARDS. ALL NIGHT WORK MUST MEET THE REQUIREMENTS OF LOCAL ORDINANCES.

3. SHOULDER CLOSURE REQUIREMENTS
   - A) CONTRACTOR SHALL CLOSE SHOULDERS ON BOTH ENTRANCE/EXIT LOOPS AND ON I-85 MAIN LINES (WHERE DEPICTED ON THE PLANS) PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES.
   - B) SHOULDER CLOSURES SHALL BE REMOVED AS SOON AS PRACTICAL AFTER WORK BEHIND THE CLOSURE IS COMPLETED OR WHEN SHOULDER CLOSURE IS NO LONGER NEEDED.
   - C) CONTRACTOR SHALL MAINTAIN EXISTING TRAFFIC PATTERNS AND LANE CONFIGURATIONS AT THE END OF EACH DAYS OPERATION AND DURING CONSTRUCTION INACTIVITY, EXCEPT AS OTHERWISE INDICATED IN THE PHASING PLAN.
   - D) WHEN SHOULDER CLOSURES ARE NOT IN EFFECT, CHANNELIZING DEVICES IN WORK AREAS SHALL BE SPACED NO GREATER THAN TWICE THE POSTED SPEED LIMIT, EXCEPT 10-FEET ON CENTER IN RADII, AND SHALL BE SET 3' OFF THE EDGE OF AN EXISTING TRAVEL LANE.

4. SIGNING
   - A) EXISTING TRAFFIC SIGNAGE SHALL BE MOVED AND OTHERWISE MAINTAINED BY THE CONTRACTOR AS APPROPRIATE DURING CONSTRUCTION.
   - B) ALL NECESSARY TRAFFIC CONTROL SIGNING SHALL BE IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

5. INGRESS/EGRESS
   - A) WORK ZONE VEHICLE ACCESS SHALL ADHERE TO NCDOT STD. 1101.05 FOR ROADSIDE ACCESS POINT IN MULTILANE ROAD.
   - B) CONTRACTOR SHALL INSTALL A PORTABLE "TRUCK ENTRANCE" SIGN ON THE I-85 EXIT RAMP APPROXIMATELY 300' BEFORE THE CONSTRUCTION ENTRANCE.

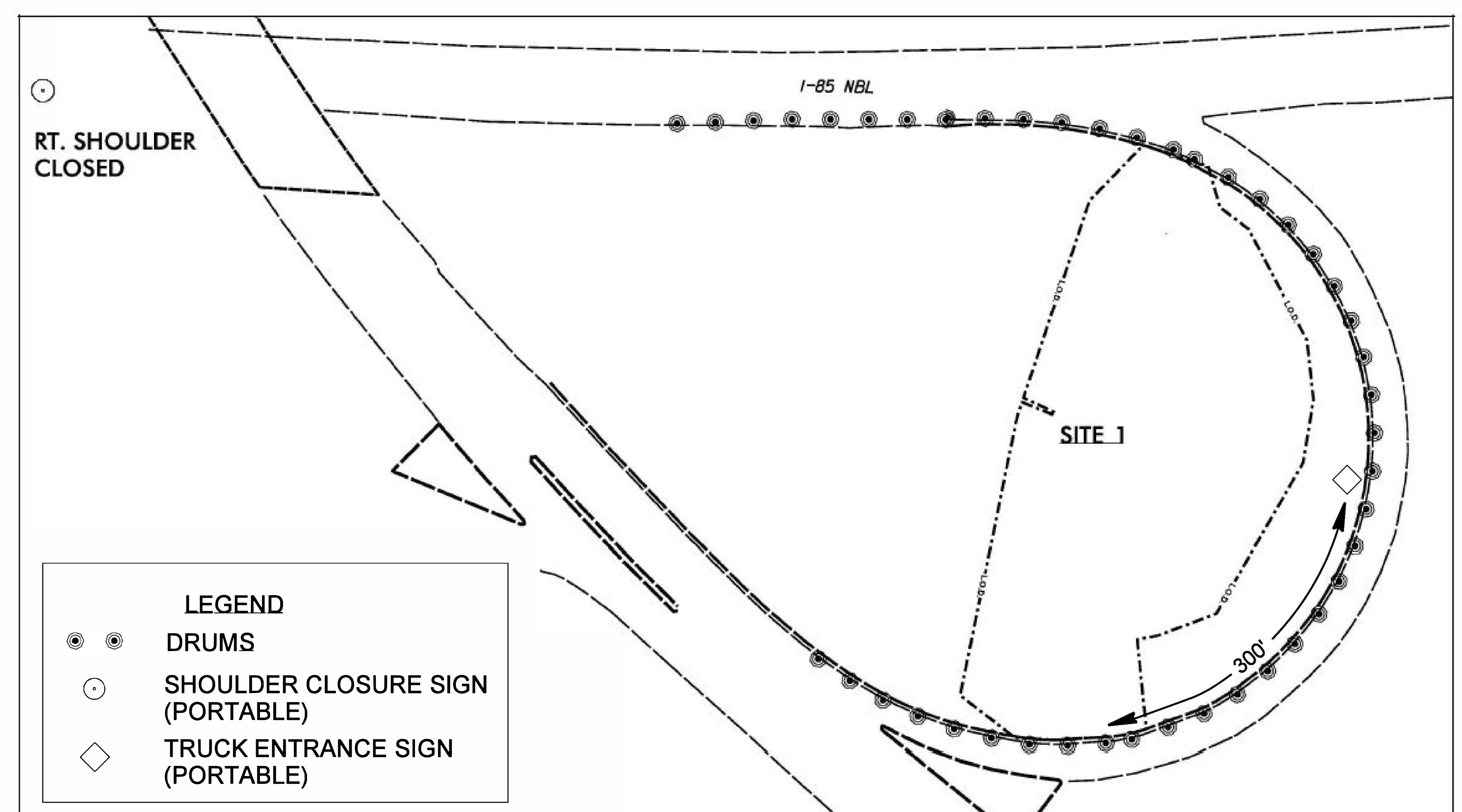
ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "2018 ROADWAY STANDARD DRAWINGS"- HIGHWAY DESIGN BRANCH -N.C. DEPARTMENT OF TRANSPORTATION -RALEIGH, N.C., ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD.	NO.TITLE
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL PLAN DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1160.01	TEMPORARY CRASH CUSHION

SITE 1 NOTES

1. SHOULDER CLOSURE ALONG ENTRANCE LOOP SHALL EXTEND ALL THE WAY TO DECEL LANE ON I-85 AS DEPICTED ON PLANS.



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