TIP PROJECT: R-4436GI

CONTRACT: 34625.2.58

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4436GI	1	

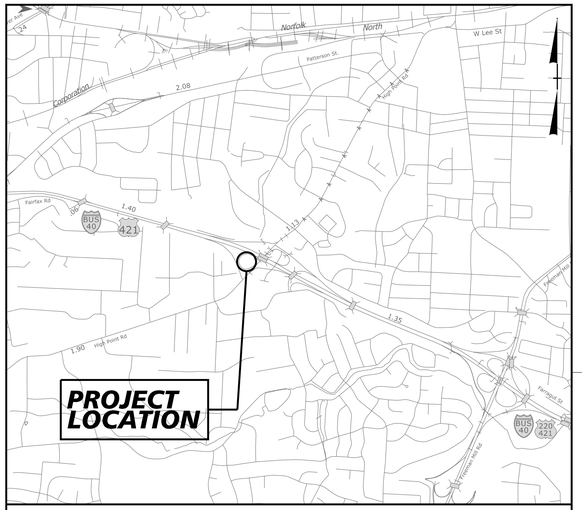
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34625.2.58	STP-0040(037)	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

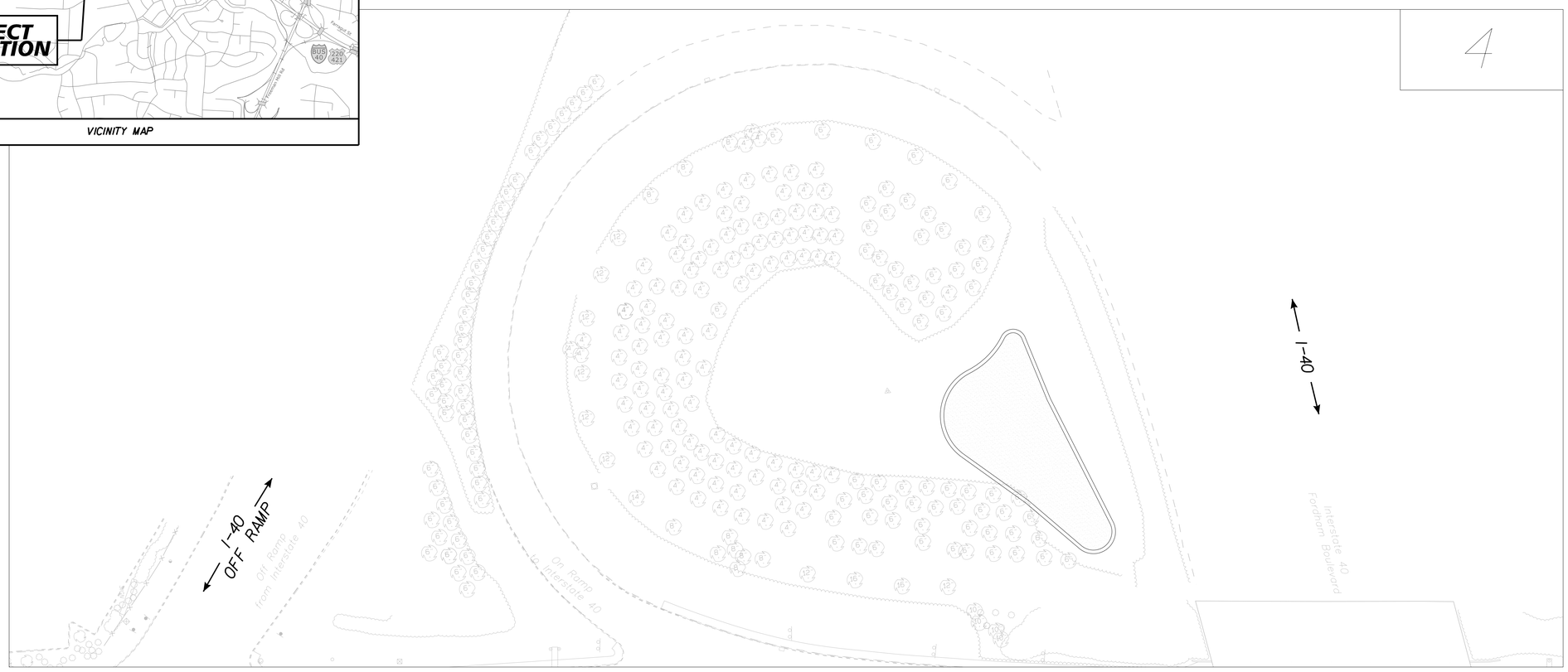
GUILFORD COUNTY

LOCATION: SOUTHWEST LOOP OF I-40 AND HIGH POINT ROAD INTERCHANGE
TYPE OF WORK: GRADING AND STORMWATER BMP
100% PLAN SUBMITTAL



VICINITY MAP

NAD 83/ NSRS 2007



NCDOT CONTACT: BRIAN LIPSCOMB
PROJECT ENGINEER
HYDRAULICS UNIT

GRAPHIC SCALES

30 15 0 30 60
PLANS

30 15 0 30 60
PROFILE (HORIZONTAL)

3 1.5 0 3 6
PROFILE (VERTICAL)

DESIGN DATA

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-4436 = 0.145 MILES

TOTAL LENGTH TIP PROJECT R-4436 = 0.145 MILES

PLANS PREPARED FOR THE NCDOT BY:

Kimley»Horn ©2015
NC LICENSE #F-0102
P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636
PHONE: (919) 677-2050

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:
MAY 5, 2016

BRYAN T. VICKERY, P.E.
PROJECT ENGINEER

LARRY D. ROBINSON, P.E.
PROJECT DESIGN ENGINEER

DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042551 ENGINEER BRYAN T. VICKERY

1/29/2016

SIGNATURE: ***P.E.***

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

1/29/2016

PROJECT REFERENCE NO.	SHEET NO.
R-4436GI	1-A

HYDRAULIC DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042551 ENGINEER BRYAN T. VICKERY

2/23/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2	BMP DETAILS
3	QUANTITIES
3-A	DRAINAGE SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
EC-1, EC-2	EROSION CONTROL PLAN AND DETAILS

2012 SPECIFICATIONS

EFFECTIVE: 01-17-12
REVISED: 07/30/12

GRADE LINE:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II AS SHOWN IN STD NO 200.02.

TRAFFIC CONTROL:

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 40 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

DO NOT CONDUCT ANY HAULING OPERATIONS AGAINST THE FLOW OF TRAFFIC OF AN OPEN TRAVELWAY UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR OTHERWISE DIRECTED BY NCDOT DIVISION CONSTRUCTION ENGINEER.

DO NOT CONDUCT MULTI-VEHICLE HAULING OPERATIONS BETWEEN THE HOURS OF 6:00-9:00 AM AND 4:00-7:00 PM MONDAY THRU FRIDAY UNLESS APPROVED BY NCDOT DIVISION CONSTRUCTION ENGINEER.

THE FOLLOWING ROADWAY STANDARDS AND ANY OTHER APPLICABLE STANDARDS WITHIN THE "ROADWAY STANDARD DRAWINGS" HIGHWAY DESIGN BRANCH-N.C. DEPARTMENT OF TRANSPORTATION RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD NO.	DESCRIPTION
200.02	METHOD OF CLEARING - METHOD II
838.01	CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS - 15" THRU 48" PIPE
840.14	CONCRETE DROP INLET - 12" THRU 30" PIPE
840.16	DROP INLET FRAME AND GRATES - FOR USE WITH STD DWGS 840.14 AND 840.15
840.66	DRAINAGE STRUCTURE STEPS

2/23/2016

PROJECT REFERENCE NO.	SHEET NO.
R-4436GI	1-B

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
- 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
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- 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:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

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
- 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

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

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

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
- SS Forced Main Line LOS D (S.U.E.*) — FSS

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.

REVISIONS

1/29/2016

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RIGHT–OF–WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
R-4436GI	1-C

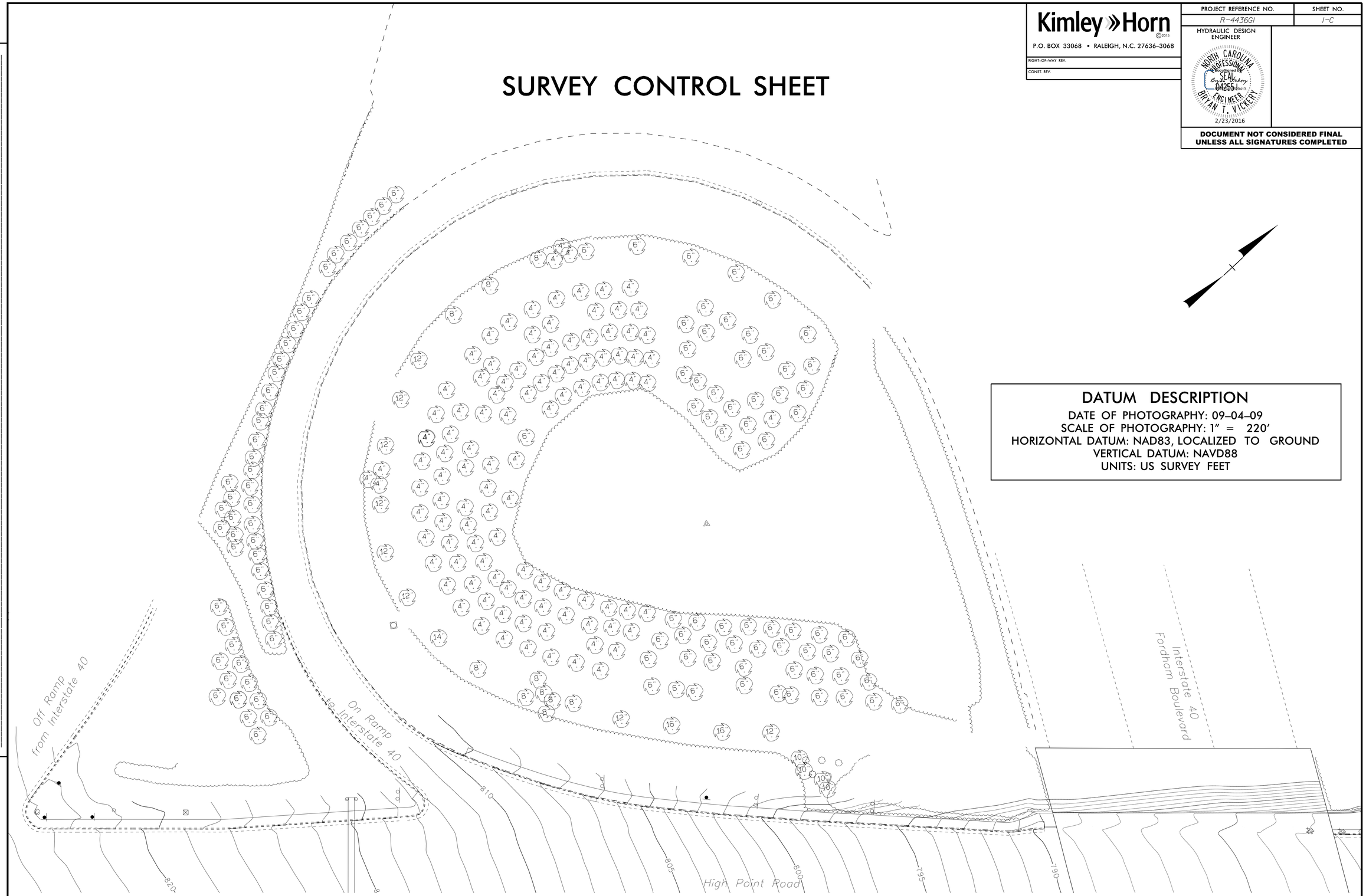
HYDRAULIC DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042551 ENGINEER BRYAN T. VICKERY

2/23/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SURVEY CONTROL SHEET



DATUM DESCRIPTION

DATE OF PHOTOGRAPHY: 09–04–09
SCALE OF PHOTOGRAPHY: 1" = 220'
HORIZONTAL DATUM: NAD83, LOCALIZED TO GROUND
VERTICAL DATUM: NAVD88
UNITS: US SURVEY FEET

NOTE: DRAWING NOT TO SCALE

REVISIONS

2/23/2016

PROJECT REFERENCE NO.	SHEET NO.
R-4436GI	2

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RIGHT-OF-WAY REV.

CONST. REV.

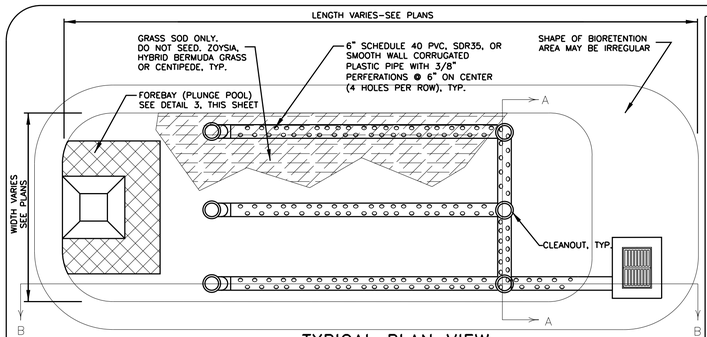
HYDRAULIC DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042551 ENGINEER BRYAN T. VICKERY

3/17/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



TYPICAL PLAN VIEW

NOT TO SCALE

NOTES:
PONDING DEPTH: 9"

UNDERDRAIN TO BE 6" SCHEDULE 40 PVC CORRUGATED PLASTIC PIPE WITH 3/8" PERF. @ 6" O.C., 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; GRAVEL NOT NECESSARY UNDER PIPES. MINIMUM SLOPE FOR UNDERDRAIN SHALL BE 0.005 FT/FT

UNDERDRAIN PIPES AND CLEANOUTS SHOULD BE LOCATED IN THE QUANTITY AND ELEVATION FOUND ON THE GRADING AND DRAINAGE PLAN (SHEET 4).

CLEANOUT PIPE SHALL BE LOCATED A MINIMUM OF 1.0' FROM THE BIORETENTION CELL WALL.

EXPOSED CLEANOUT CAP AND CONNECTORS TO BE CONSTRUCTED OF WHITE UV RESISTANT PVC MATERIAL.

GRASS SOD: SOD IS TO BE PLANTED WITHIN THE BIORETENTION AREA AND ALONG THE ADJACENT SIDE SLOPES. SOD IS TO BE ZOYSIA WHICH HAS BEEN GROWN IN SANDY SOILS. LARGE DEPOSITS OF FINES ATTACHED TO THE ROOTS SHALL BE WASHED OFF OR REMOVED FROM THE SOD PRIOR TO INSTALLATION.

THE LOCATION OF BIORETENTION AREA SHALL BE PROTECTED FROM EROSION AND SEDIMENT DURING SITE CONSTRUCTION. BIORETENTION SOIL MIXTURE SHALL NOT BE PLACED UNTIL THE SURROUNDING SITE IS STABILIZED AND APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING BIORETENTION SOIL MIXTURE IMPACTED BY SEDIMENT DEPOSITS DURING CONSTRUCTION.

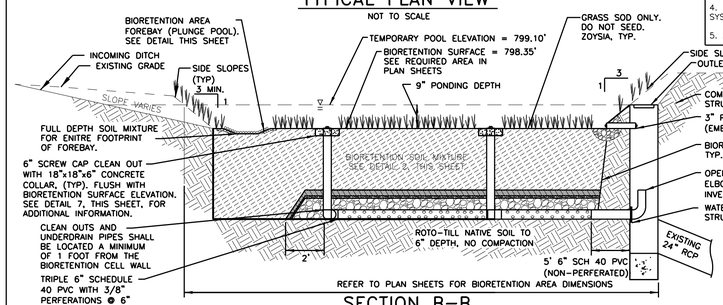
BIORETENTION BASIN CONSTRUCTION SEQUENCE:
1. CONSTRUCT SIDEWALK, FLUME, GRASS SWALE, EROSION CONTROL MEASURES, AND PIPE NETWORK

2. BLOCK OFF FLOW TO FLUMES UNTIL BIORETENTION IS COMPLETE. (INTENTION IS TO BYPASS FLOW TO EXISTING CB'S UNTIL THE DITCHES AND BASIN ARE STABLE)

3. ENSURE SITE IS PROPERLY STABILIZED WITH A GOOD STAND OF ESTABLISHED VEGETATION BEFORE PROCEEDING. ALL SLOPES DRAINING TO THE BIORETENTION AREA SHOULD HAVE ESTABLISHED AT LEAST 90% VEGETATED COVERAGE, AND BE APPROVED BY THE ENGINEER.

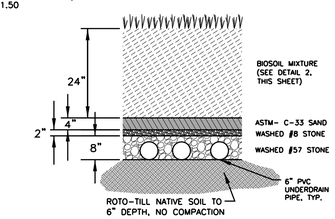
4. EXCAVATE AS NECESSARY TO INSTALL UNDERDRAIN SYSTEM AND BIOSOIL MIXTURE AFTER COMPLETING UNDERDRAIN SYSTEM ADD BIOSOIL MIXTURE PER THE DETAILS ON THIS SHEET.

5. AFTER THE BIORETENTION AREA HAS REACHED FINAL GRADE, ADD GRASS SOD AS SHOWN.



SECTION B-B

NOT TO SCALE

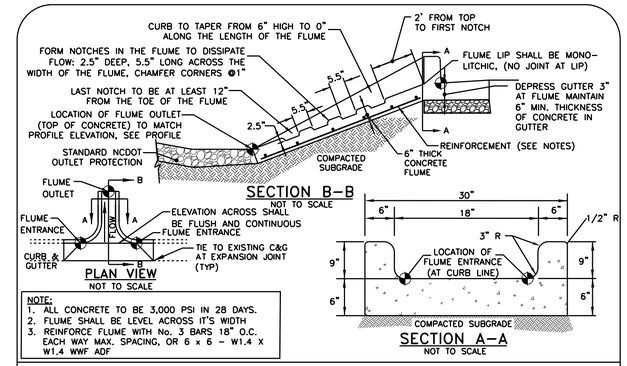


SECTION A-A

NOT TO SCALE

DETAIL 1: TYPICAL GRASS BIORETENTION AREA

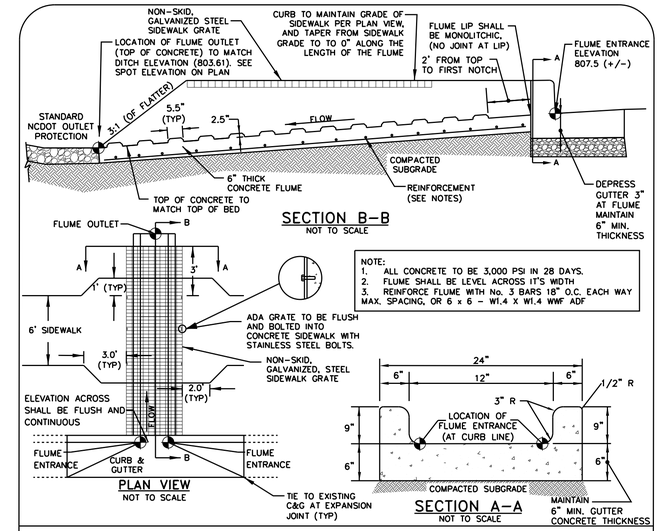
(NOT TO SCALE)
FROM -DITCHRP- Sta. 14+09.85 to -DITCHRP- Sta. 15+58.89



NOTE:
1. ALL CONCRETE TO BE 3,000 PSI IN 28 DAYS.
2. FLUME SHALL BE LEVEL ACROSS IT'S WIDTH
3. REINFORCE FLUME WITH No. 3 BARS 18" O.C. EACH WAY MAX. SPACING, OR 6 x 6 - W1.4 X W1.4 WWF ADF

DETAIL 5: STANDARD 1.5 FOOT OPEN CONCRETE FLUME

(NOT TO SCALE)
AT -RP- Sta. 12+25.00
AT -RP- Sta. 13+50.00



NOTE:
1. ALL CONCRETE TO BE 3,000 PSI IN 28 DAYS.
2. FLUME SHALL BE LEVEL ACROSS IT'S WIDTH
3. REINFORCE FLUME WITH No. 3 BARS 18" O.C. EACH WAY MAX. SPACING, OR 6 x 6 - W1.4 X W1.4 WWF ADF

DETAIL 6: STANDARD 1 FOOT CONCRETE FLUME WITH SIDEWALK GRATE

(NOT TO SCALE)

BIORETENTION SOIL MIXTURE SHALL BE A WELL GRADED MIX OF 30% LOUISBURG BALLFIELD MIX AND 70% ASTM C-33 CONSTRUCTION SAND OR A MIX THAT MEETS THE FOLLOWING SPECIFICATION:

ITEM	PERCENT BY VOLUME	MATERIAL
SAND	85-88%	CONSTRUCTION SAND (ASTM C-33 SAND)
FINES	8-12%	SILT AND CLAY
ORGANIC MATTER	3-5%	HARDWOOD MULCH/ORGANICS

BIORETENTION SOIL MIXTURE (BSM): SHALL BE PLACED AND GRADED USING LOW GROUND-CONTACT PRESSURE EQUIPMENT OR BY EXCAVATORS AND/OR BACKHOES OPERATING ON THE GROUND ADJACENT TO THE BIORETENTION FACILITY. NO HEAVY EQUIPMENT SHALL BE USED WITHIN THE PERIMETER OF THE BIORETENTION FACILITY BEFORE, DURING, OR AFTER THE PLACEMENT OF THE BSM. THE BSM SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED 12 INCHES FOR THE ENTIRE AREA OF THE BIORETENTION FACILITY. THE BSM SHALL BE COMPACTED BY SATURATING THE ENTIRE AREA OF THE BIORETENTION FACILITY AFTER EACH LIFT OF BSM IS PLACED UNTIL WATER FLOWS FROM THE UNDERDRAIN. WATER FOR SATURATION SHALL BE APPLIED BY SPRAYING OR SPRINKLING. AN APPROPRIATE SEDIMENT CONTROL DEVICE SHALL BE USED TO TREAT ANY SEDIMENT-LADEN WATER DISCHARGED FROM THE UNDERDRAIN. IF THE BSM BECOMES CONTAMINATED DURING THE CONSTRUCTION OF THE FACILITY, THE CONTAMINATED MATERIAL SHALL BE REMOVED AND REPLACED WITH UNCONTAMINATED MATERIAL AT NO ADDITIONAL COST TO THE ADMINISTRATION. FINAL GRADING OF THE BSM SHALL BE PERFORMED AFTER A 24-HOUR SETTLING PERIOD. FINAL ELEVATIONS SHALL BE WITHIN 2 INCHES OF ELEVATIONS SHOWN ON THE CONTRACT PLANS.

THE BIORETENTION SOIL MIXTURE (BSM) SHALL HAVE A P-INDEX RANGE BETWEEN 10 AND 30.

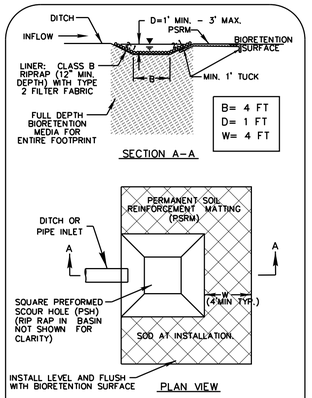
SANDY LOAM/LOAMY SAND; FINES SHOULD BE LIMITED TO TWENTY PER CENT OR LESS PASSING THROUGH A #200 SIEVE.

HYDRAULIC CONDUTIVITY OF BIORETENTION SOIL MIX SHALL BE BETWEEN 1.0-6.0 IN/HR.

THE BIORETENTION SOIL MIXTURE (BSM) SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES EXCLUDING MULCH. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS.

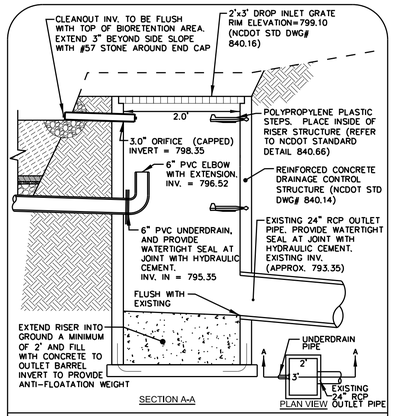
PRIOR TO PLACING THE UNDERDRAIN AND THE BSM, THE BOTTOM OF THE EXCAVATION SHALL BE ROTO-TILLED TO A MINIMUM DEPTH OF 6 INCHES TO ALLEVIATE ANY COMPACTION OF THE FACILITY BOTTOM. ANY SUBSTITUTE METHOD FOR ROTO-TILLING MUST BE APPROVED BY THE ENGINEER PRIOR TO USE. ANY PONDED WATER SHALL BE REMOVED FROM THE BOTTOM OF THE FACILITY AND THE SOIL SHALL BE FRIABLE BEFORE ROTO-TILLING.

DETAIL 2: BIORETENTION SOIL MIXTURE



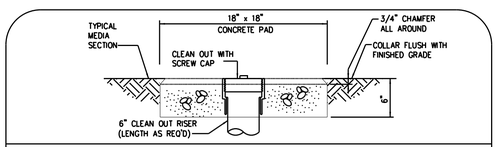
DETAIL 3: BIORETENTION AREA FOREBAY (PLUNGE POOL)

(NOT TO SCALE)



DETAIL 4: OUTLET STRUCTURE

(NOT TO SCALE)



DETAIL 7: 18" x 18" x 6" CONCRETE COLLAR

3/17/2016

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PROJECT REFERENCE NO.	SHEET NO.
R-4436GI	3
R/W SHEET NO.	

HYDRAULIC DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042551 ENGINEER BRYAN T. VICKERY
Bryan T. Vickery
2/23/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
0000100000	800	MOBILIZATION	1	L.S.
0000400000	801	CONSTRUCTION SURVEYING	1	L.S.
0022000000	225	UNCLASSIFIED EXCAVATION	1,450	C.Y.
0318000000	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	15	TON
0372000000	310	18″ RC PIPE CULVERTS, CLASS III	20	L.F.
0995000000	340	PIPE REMOVAL	4	L.F.
8748000000	SP	SELECT MATERIAL, CLASS III	100	C.Y.
1011000000	500	FINE GRADING	1	L.S.
	SP	BIORETENSION SOIL MIXTURE	727	C.Y.
	SP	CONCRETE COLLAR	6	EA.
	SP	#8 STONE	60	TON
1077000000	SP	#57 STONE	230	TON
	SP	ASTM - C-33 SAND	110	TON
	SP	6″ UNDERDRAIN PIPE - PERFORATED	340	L.F.
	SP	6″ UNDERDRAIN PIPE - NON-PERFORATED	24	L.F.
	SP	6″ PVC CLEANOUT	20	L.F.
	SP	3″ PVC, SCHEDULE 40	10	L.F.
	SP	1′ WIDE CONCRETE FLUME	30	L.F.
	SP	1.5′ WIDE CONCRETE FLUME	40	L.F.
	SP	ADA STEEL GRATE	1	EA.
2209000000	838	ENDWALLS	1	C.Y.
2286000000	840	MASONRY DRAINAGE STRUCTURES	1	EA.
2364000000	840	FRAME WITH TWO GRATES, STD 840.16	1	EA.
2549000000	846	2′-6″ CONCRETE CURB & GUTTER (PER COG STD #501)	45	L.F.
2591000000	848	4″ CONCRETE SIDEWALK	5	S.Y.
	SP	ANTI-FLOTATION CONCRETE	1	C.Y.
3649000000	876	RIP RAP, CLASS B	56	TON
3656000000	876	GEOTEXTILE FOR DRAINAGE	135	S.Y.
6000000000	1605	TEMPORARY SILT FENCE	1000	L.F.
	SP	TREE PROTECTION FENCE	380	L.F.
6012000000	1610	SEDIMENT CONTROL STONE	15	TON
6038000000	SP	PERMANENT SOIL REINFORCEMENT MAT	320	S.Y.
6042000000	1632	¼″ HARDWARE CLOTH	70	L.F.
6084000000	1660	SEEDING AND MULCHING	0.7	ACR.
6102000000	1664	SODDING	900	SY
6105000000	1664	WATER	50	M/G
	SP	TRAFFIC CONTROL	1	L.S.

*SEE SHEET 3-A FOR DRAINAGE QUANTITIES SUMMARY

2/23/2016

D083340

COMPUTED BY:	BTV	DATE:	11-18-2015
CHECKED BY:	LDR	DATE:	11-18-2015

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-4436GI	3-A

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
DITCHRP 14+00	0	CL	0401			799.4	798.7														
DITCHRP 15+59	0	CL	0402		799.1																
DITCHRP 15+73	18	RT																			
SHEET TOTALS																					
PROJECT TOTALS																					

LINE & STATION	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	54	60	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48
DITCHRP 14+00											20															
DITCHRP 15+59																										
DITCHRP 15+73																										
SHEET TOTALS											20															
PROJECT TOTALS											20															

LINE & STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05
DITCHRP 14+00															
DITCHRP 15+59							1								
DITCHRP 15+73				0.700											
SHEET TOTALS				0.700			1								
PROJECT TOTALS				0.700			1								

LINE & STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	M.H. STD. 840.51, 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	30" C.S. ELBOW	36" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
DITCHRP 14+00																									
DITCHRP 15+59	1	1																							
DITCHRP 15+73																								4	
SHEET TOTALS	1	1																						4	
PROJECT TOTALS	1	1																						4	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

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PROJECT REFERENCE NO.	SHEET NO.
R-4436GI	4
R/W SHEET NO.	

HYDRAULIC DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042551 ENGINEER BRYAN T. VICKERY

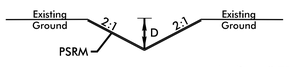
1/29/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEE GENERAL NOTES SHEET 1-A FOR TRAFFIC CONTROL GUIDANCE AND RESTRICTIONS

REVISIONS

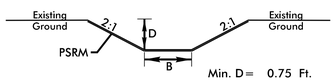
DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 0.75 Ft.
Type of Liner= PSRM

FROM Sta. 10+00 TO Sta. 12+05 -DITCHL- (CL)
FROM Sta. 12+25 TO Sta. 13+50 -RP- (RT)

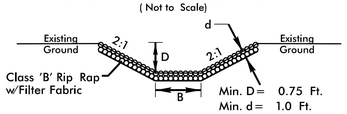
DETAIL 2
SPECIAL LATERAL 3' BASE DITCH
(Not to Scale)



Min. D= 0.75 Ft.
Min. B = 3.0 Ft.
Type of Liner= PSRM

FROM Sta. 13+50 TO Sta. 16+30 -RP- (RT)

DETAIL 3
SPECIAL LATERAL 4' BASE DITCH
(Not to Scale)



Min. D= 0.75 Ft.
Min. d= 1.0 Ft.
Min. B= 4.0 Ft.
Type of Liner= Rip Rap w/ Filter Fabric

FROM Sta. 16+30 TO Sta. 17+20 -RP- (RT)

-RP- I-40 EB RAMP
PI Sta 19+52.23
△ = 204° 07' 34.8" (RT)
D = 28° 09' 18.6"
L = 725.00'
T = 952.23'
R = 203.50'

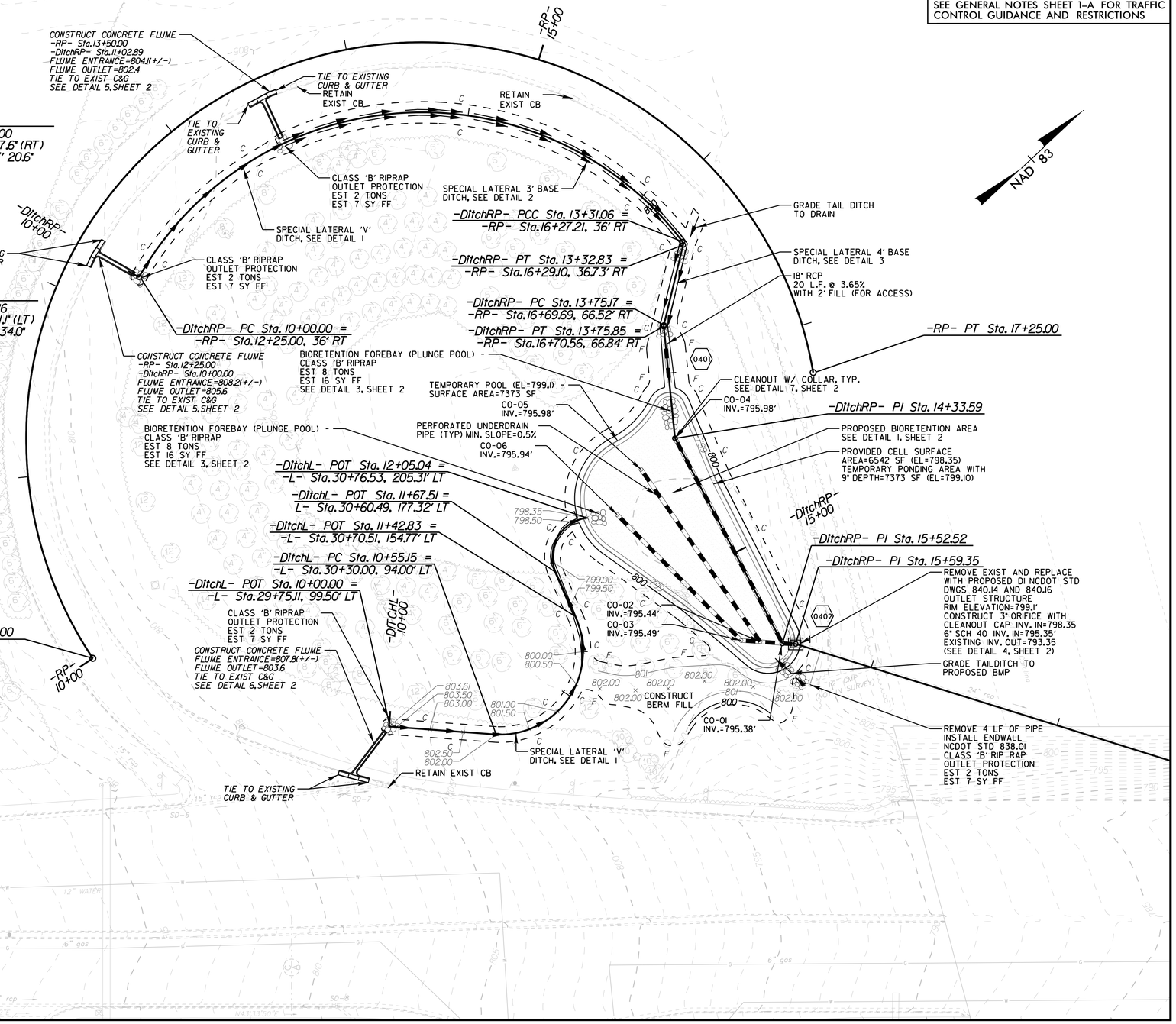
-DitchRP- I-40 EB RAMP DITCH
PI Sta 12+54.24
△ = 113° 14' 35.1" (RT)
D = 34° 12' 23.2"
L = 331.06'
T = 254.24'
R = 167.50'

PI Sta 13+32.00
△ = 50° 40' 07.6" (RT)
D = 286° 47' 20.6"
L = 1.77'
T = 0.95'
R = 2.00'

PI Sta 13+75.51
△ = 19° 16' 32.6" (LT)
D = 286° 47' 20.3"
L = 0.67'
T = 0.34'
R = 2.00'

-DitchL- HIGH POINT ROAD DITCH
PI Sta 11+94.79
△ = 107° 30' 46.5" (RT)
D = 286° 28' 44.0"
L = 37.53'
T = 27.28'
R = 20.00'

PI Sta 11+25.86
△ = 117° 49' 31.1" (LT)
D = 134° 22' 34.0"
L = 87.68'
T = 70.72'
R = 42.64'



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RIGHT-OF-WAY REV.
CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
R-4436GI	5
R/W SHEET NO.	

HYDRAULIC DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042551 ENGINEER BRYAN T. VICKERY
1/29/2016

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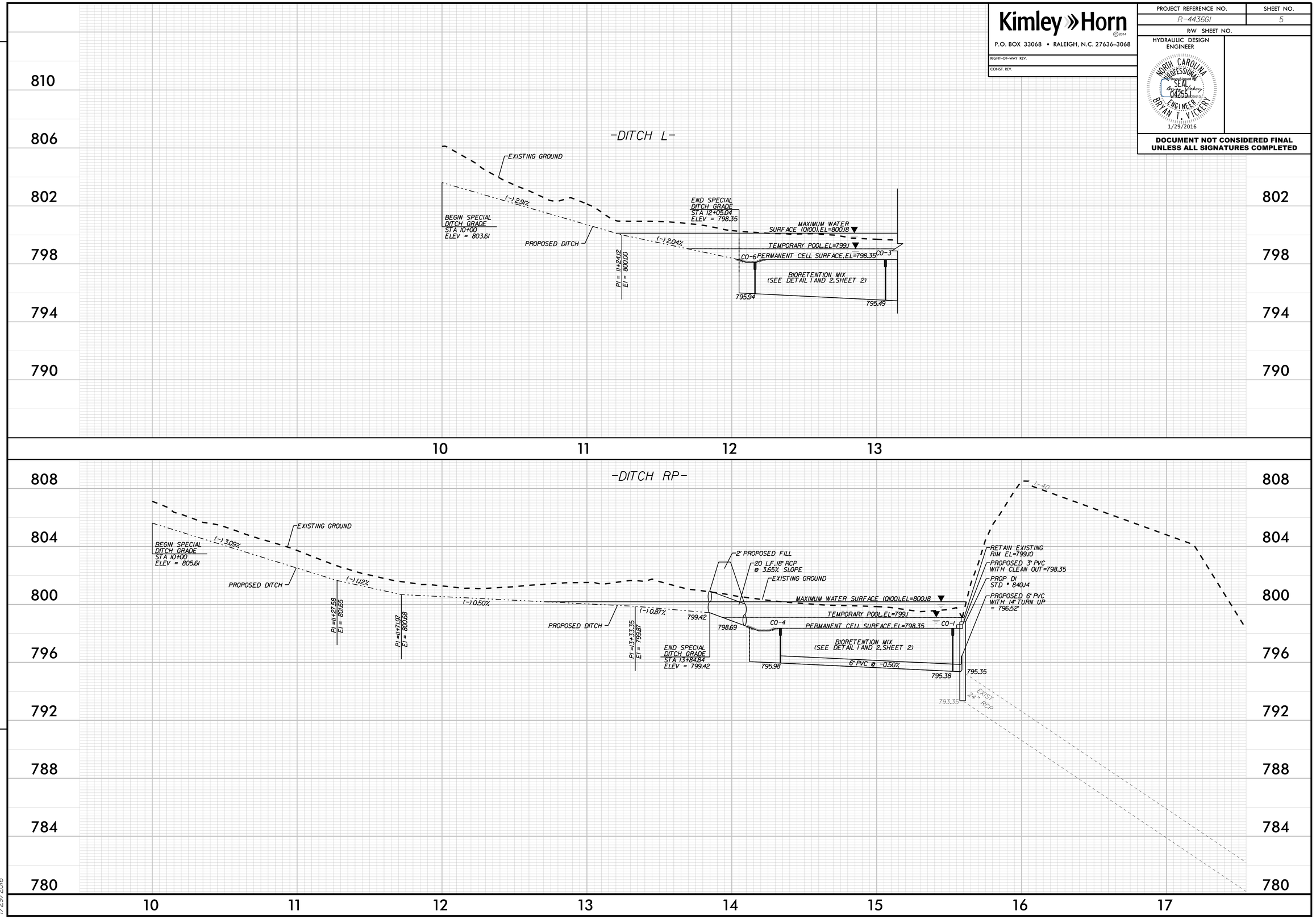
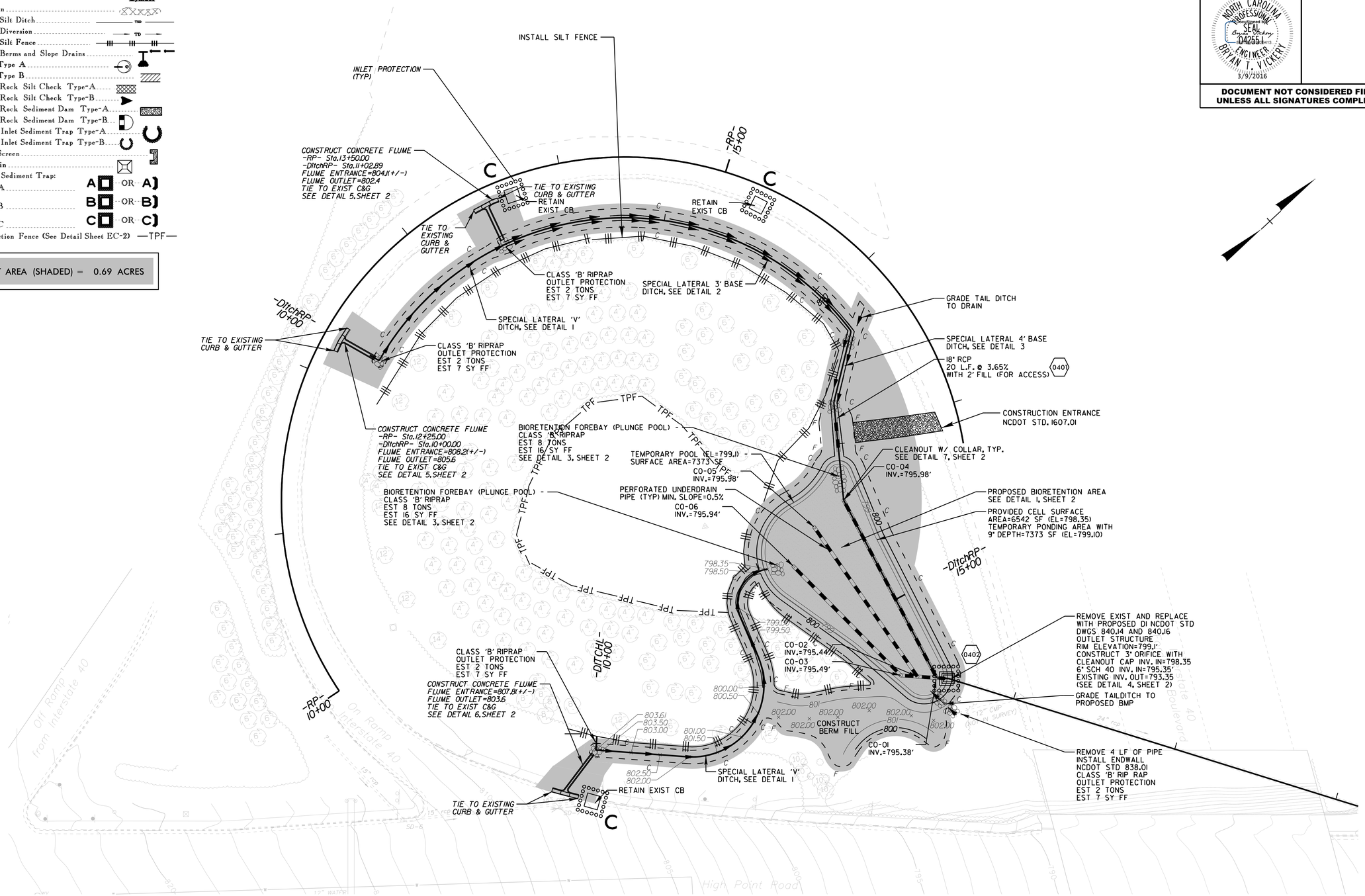


1/29/2016

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
	Reforestation	
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1622.01	Temporary Berms and Slope Drains	
1630.01	Silt Basin Type A	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
1633.02	Temporary Rock Silt Check Type-B	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1636.01	Rock Silt Screen	
1630.04	Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A OR A
1632.02	Type B	B OR B
1632.03	Type C	C OR C
SP	Tree Protection Fence (See Detail Sheet EC-2)	—TPF—

TOTAL IMPACT AREA (SHADED) = 0.69 ACRES



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R-4436GI	EC-1
R/W SHEET NO.	

HYDRAULIC DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042551 ENGINEER BRYAN T. VICKERY
3/9/2016

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REVISIONS

3/9/2016

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PROJECT REFERENCE NO.	SHEET NO.
R-4436GI	EC-2
R/W SHEET NO.	

HYDRAULIC DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042551 ENGINEER BRYAN T. VICKERY

2/23/2016

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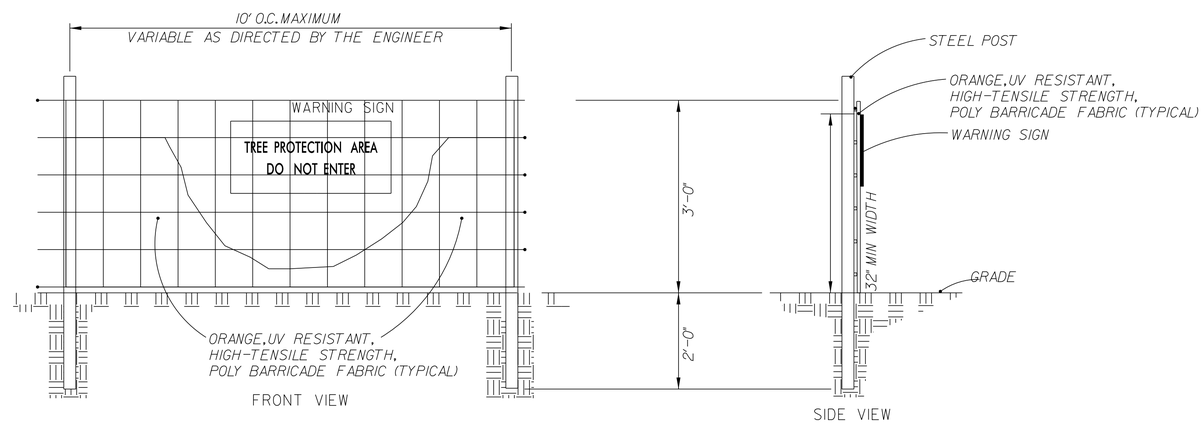
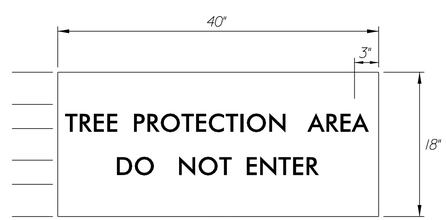
REVISIONS





WARNING SIGN DETAIL

NOTES

WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.
LETTERS TO BE 3" HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.
SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS.
PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER.
FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.
ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.
ADDITIONAL SIGNS MAY BE REQUIRED BY CITY OR NCDENR, BASED ON ACTUAL FIELD CONDITIONS.
SIGNS SHALL BE INCIDENTAL TO THE FENCE.

TREE PROTECTION DETAIL

NOT TO SCALE

2/23/2016