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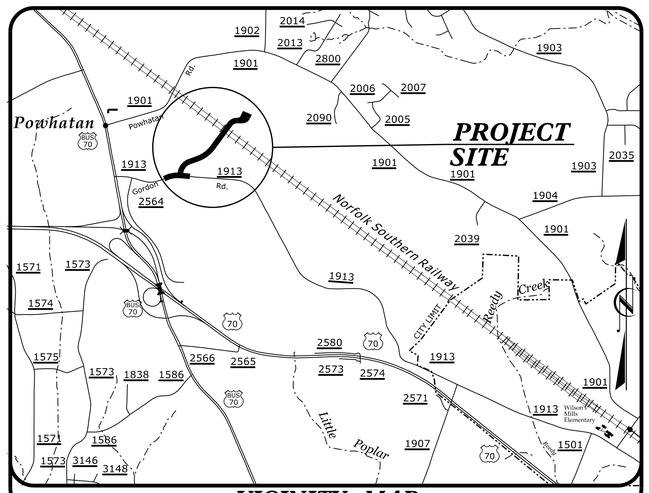
09/08/99

PROJECT: R-5769

CONTRACT: C203921

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JOHNSTON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5769	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46448.1.1	N/A	PE
46448.2.1	N/A	UTIL., R/W
46448.3.1	N/A	CONST.

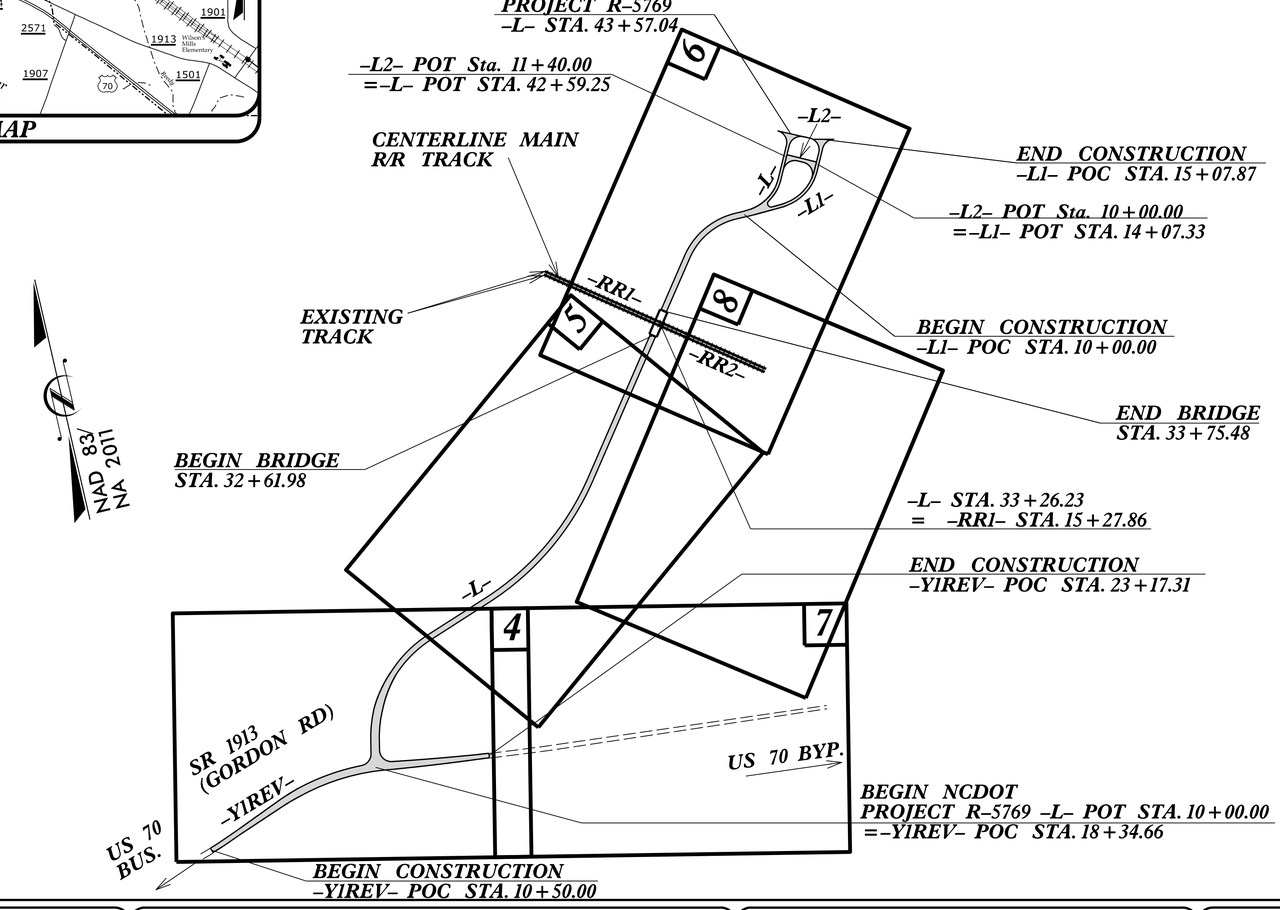
WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

LOCATION: NOVO NORDISK ACCESS ROAD FROM SR 1913 (GORDON RD.) TO PROPOSED NOVO NORDISK SITE

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

FINAL PLANS



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100 PLANS

50 25 0 50 100 PROFILE (HORIZONTAL)

10 5 0 10 20 PROFILE (VERTICAL)

DESIGN DATA

ADT 2040 = 700

T = 4 % *
V = 40 MPH
* (TTST = 2% + DUAL = 2%)
FUNC CLASS = RURAL LOCAL
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT R-5769 =	0.615 MILES
LENGTH STRUCTURE PROJECT R-5769 =	0.021 MILES
TOTAL LENGTH PROJECT R-5769 =	0.636 MILES

NCDOT CONTACT: JERRY PAGE, PE
DIVISION 4 PROJECT MANAGER

Prepared for:
DIVISION OF HIGHWAYS
DIVISION FOUR
509 Ward Boulevard, Wilson NC, 27895

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 15, 2016

LETTING DATE: OCTOBER 18, 2016

EDWARD G, WETHERILL, PE
PROJECT ENGINEER

GREG S. PURVIS, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: 8/24/2016 P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: 8/24/2016 P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

8/24/2016
...\Proj\R-5769_Rdy_tsh.dgn
USER:Keys

8/17/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5769	1A

ROADWAY DESIGN ENGINEER

DocuSigned by: Greg S. Purvis
D1F0F7C256E3403...

NORTH CAROLINA PROFESSIONAL SEAL 22999 8/24/2016 ENGINEER GREGORY S. PURVIS

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
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INDEX OF SHEETS

INDEX OF SHEETS

LIST OF STANDARD DRAWINGS

EFF. 01-17-2012
REV. 02-29-2016

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "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.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
840.00	Concrete Base Pad for Drainage Structures
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

GENERAL NOTES

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 10-31-2014

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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 III.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE:

A) Power (Distribution) - Duke Energy

B) Gas (Transmission) - Piedmont Natural Gas

C) Communications - CenturyLink

D) Water - Johnston County Public Utilities

E) CATV - Time Warner Cable

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

8/23/2016 ...\Proj\R-5769_Rdy_PSH_1A.dgn

04/06/15

PROJECT REFERENCE NO.	SHEET NO.
R-5769	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
- 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 — 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

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.

SURVEY CONTROL SHEET R–5769

PROJECT REFERENCE NO.	SHEET NO.
R-5769	1C-1
Location and Surveys	

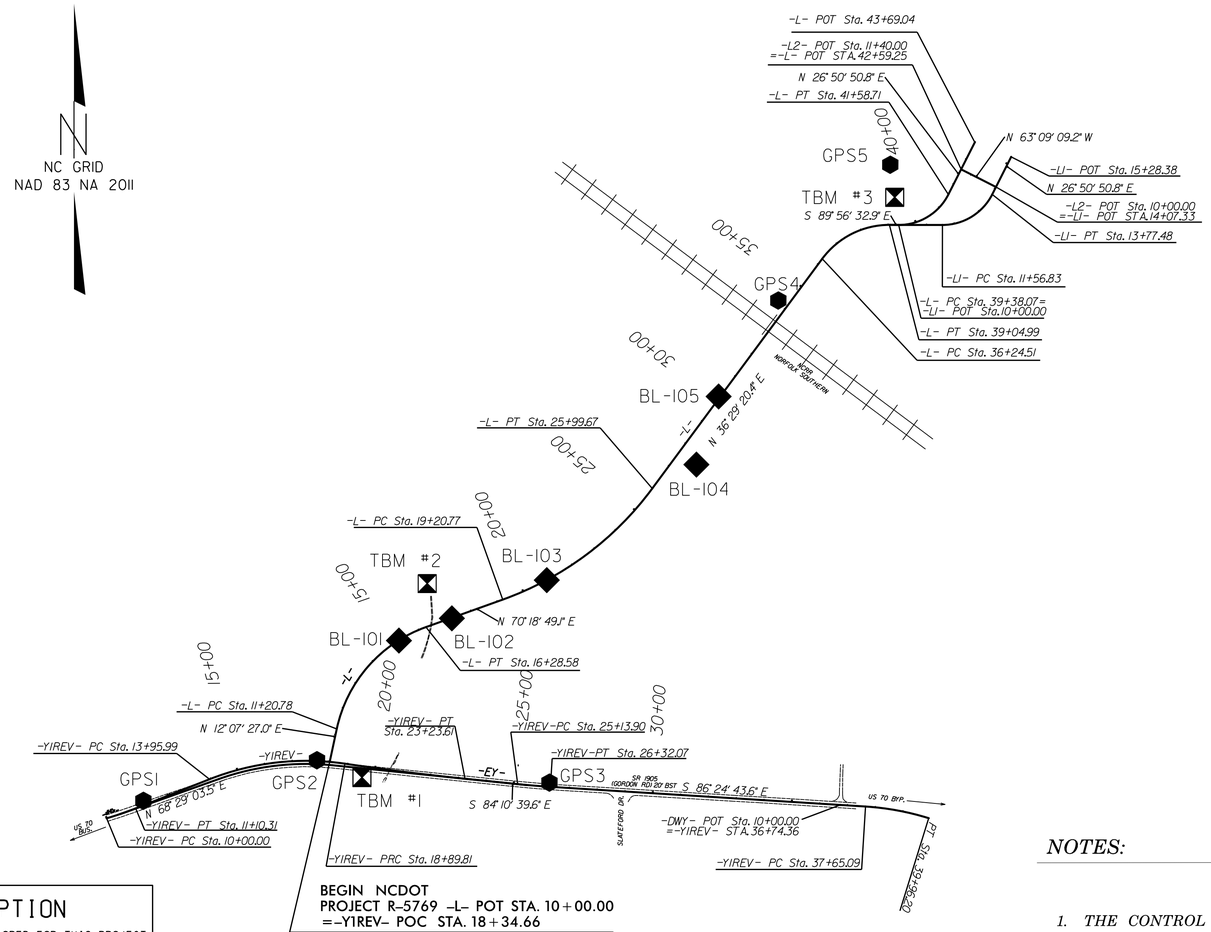
BY

POINT	DESC.	NORTH	EAST	ELEVATION	Y1REV STATION	OFFSET
GPS1		676881.1100	2175005.6400	282.27	11+45.96	15.16 LT
GPS2		677026.7000	2175628.5300	281.61	17+88.87	3.01 LT
GPS3		676946.3580	2176462.7960	289.41	26+27.59	14.84 LT

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
GPS2		677026.7000	2175628.5300	281.61	OUTSIDE PROJECT LIMITS	
BL-101		677455.7700	2175922.5610	281.81	15+19.37	1.31 RT
BL-102		677535.7050	2176112.4450	281.25	17+26.23	1.86 RT
BL-103		677672.5980	2176452.8650	286.13	20+93.43	0.59 RT
BL-104		678087.3050	2176989.9030	284.61	27+62.14	76.05 RT
BL-105		678331.7540	2177069.5480	289.09	30+06.03	5.28 LT
GPS4		678676.3330	2177284.0880	292.28	34+10.65	37.71 LT
GPS5		679163.3700	2177685.8710	285.99	39+07.57	215.93 LT



BENCHMARK DATA

```
**********************************************
TBM1        ELEVATION = 278.45
N 676965       E 2175790
BL STATION 5+40.00 168 RIGHT
Y1REV- STA. 19+57.34 40.07' RT.
BENCHLITE NAIL IN BASE OF 14" SWEET GUM
**********************************************
**********************************************
TBM2        ELEVATION = 282.65
N 677661       E 2176024
BL STATION 11+93.00 149 LEFT
-L- STA. 16+85.13 145.43' LT.
BENCHLITE NAIL IN BASE OF 18" GUM
**********************************************
**********************************************
TBM3        ELEVATION = 286.33
N 679047       E 2177702
BL STATION 34+86.00 87 RIGHT
-L- STA. 39+23.65 99.24' LT.
BENCHLITE NAIL IN BASE OF 15" SWEET GUM
**********************************************
```

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "M&C-1"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 679994.2595(ft) EASTING: 2175428.0044(ft)
ELEVATION: 294.47(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999884119
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "M&C-1" TO -L- STATION IS

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

NOTE: DRAWING NOT TO SCALE

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
   HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   R5769_WEI_BASELINE.TXT

   SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY WETHERILL ENGINEERING.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

PROJECT REFERENCE NO.	SHEET NO.
R-5769	ID-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

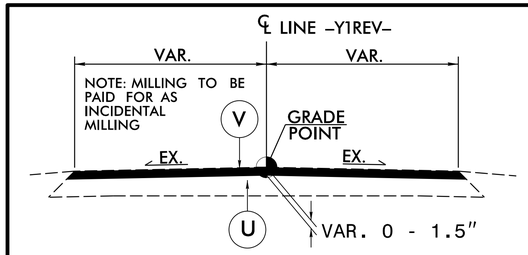
CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L	10+00.00	677020.7157	2175674.0910
2	L	10+50.00	677069.6004	2175684.5926
3	L	11+00.00	677118.4851	2175695.0941
4	L	11+50.00	677167.1743	2175706.4267
5	L	12+00.00	677214.6156	2175722.1506
6	L	12+50.00	677260.2501	2175742.5322
7	L	13+00.00	677303.6219	2175767.3679
8	L	13+50.00	677344.2975	2175796.4094
9	L	14+00.00	677381.8706	2175829.3666
10	L	14+50.00	677415.9658	2175865.9102
11	L	15+00.00	677446.2424	2175905.6751
12	L	15+50.00	677472.3978	2175948.2640
13	L	16+00.00	677494.1708	2175993.2512
14	L	16+50.00	677511.7779	2176040.0390
15	L	17+00.00	677528.6215	2176087.1166
16	L	17+50.00	677545.4650	2176134.1941
17	L	18+00.00	677562.3086	2176181.2717
18	L	18+50.00	677579.1521	2176228.3492
19	L	19+00.00	677595.9957	2176275.4267
20	L	19+50.00	677613.1880	2176322.3761
21	L	20+00.00	677632.2308	2176368.6036
22	L	20+50.00	677653.2647	2176413.9598
23	L	21+00.00	677676.2502	2176458.3588
24	L	21+50.00	677701.1438	2176501.7168
25	L	22+00.00	677727.8983	2176543.9519
26	L	22+50.00	677756.4633	2176584.9841
27	L	23+00.00	677786.7848	2176624.7360
28	L	23+50.00	677818.8054	2176663.1325
29	L	24+00.00	677852.4646	2176700.1009
30	L	24+50.00	677887.6989	2176735.5714
31	L	25+00.00	677924.4415	2176769.4769
32	L	25+50.00	677962.6231	2176801.7534
33	L	26+00.00	678002.1715	2176832.3398
34	L	26+50.00	678042.3701	2176862.0732
35	L	27+00.00	678082.5686	2176891.8067
36	L	27+50.00	678122.7672	2176921.5401
37	L	28+00.00	678162.9657	2176951.2735
38	L	28+50.00	678203.1643	2176981.0070
39	L	29+00.00	678243.3628	2177010.7404
40	L	29+50.00	678283.5614	2177040.4738
41	L	30+00.00	678323.7599	2177070.2072
42	L	30+50.00	678363.9585	2177099.9407
43	L	31+00.00	678404.1570	2177129.6741
44	L	31+50.00	678444.3555	2177159.4075
45	L	32+00.00	678484.5541	2177189.1410
46	L	32+50.00	678524.7526	2177218.8744
47	L	33+00.00	678564.9512	2177248.6078
48	L	33+50.00	678605.1497	2177278.3412
49	L	34+00.00	678645.3483	2177308.0747
50	L	34+50.00	678685.5468	2177337.8081
51	L	35+00.00	678725.7454	2177367.5415
52	L	35+50.00	678765.9439	2177397.2749
53	L	36+00.00	678806.1425	2177427.0084
54	L	36+50.00	678845.6726	2177457.5939
55	L	37+00.00	678880.2822	2177493.5994
56	L	37+50.00	678908.4390	2177534.8475
57	L	38+00.00	678929.3628	2177580.1952
58	L	38+50.00	678942.4736	2177628.3857
59	L	39+00.00	678947.4081	2177678.0835
60	L	39+50.00	678947.7554	2177728.0766
61	L	40+00.00	678956.8636	2177777.1077
62	L	40+50.00	678977.8191	2177822.3611
63	L	41+00.00	679009.3190	2177861.0233
64	L	41+50.00	679049.4048	2177890.6903
65	L	42+00.00	679093.9273	2177913.4391
66	L	42+50.00	679138.5379	2177936.0199
67	L	43+00.00	679183.1485	2177958.6007
68	L	43+50.00	679227.7591	2177981.1816
69	L	43+69.04	679244.7465	2177989.7802
70	L1	10+00.00	678947.4114	2177716.1500
71	L1	10+50.00	678947.3612	2177766.1500
72	L1	11+00.00	678947.3110	2177816.1499
73	L1	11+50.00	678947.2608	2177866.1499
74	L1	12+00.00	678951.8515	2177915.8201
75	L1	12+50.00	678968.4747	2177962.8380
76	L1	13+00.00	678996.2134	2178004.2815
77	L1	13+50.00	679033.3432	2178037.5740
78	L1	14+00.00	679077.0257	2178061.7972
79	L1	14+50.00	679121.6363	2178084.3781
80	L1	15+00.00	679166.2469	2178106.9589
81	L1	15+28.38	679191.5707	2178119.7772

Point #	Chain	Station	Northing (Y)	Easting (X)
82	L2	10+00.00	679083.5657	2178065.1077
83	L2	10+50.00	679106.1466	2178020.4971
84	L2	11+00.00	679128.7274	2177975.8865
85	L2	11+40.00	679146.7921	2177940.1980

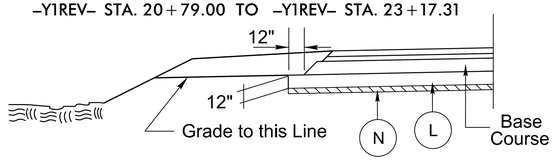
8/17/99

8/23/2016
R-5769_Rdy_PSH_ID-1.dgn



V: MILLING DETAIL

USE MILLING DETAIL AS FOLLOWS:
–Y1REV– STA. 10+50.00 TO –Y1REV– STA. 12+29.00
–Y1REV– STA. 20+79.00 TO –Y1REV– STA. 23+17.31



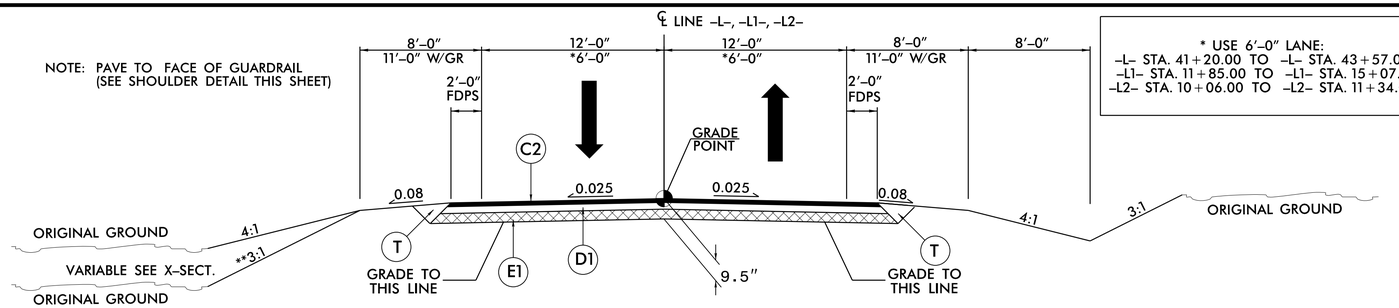
AGGREGATE SUBGRADE DETAIL

USE AGGREGATE SUBGRADE DETAIL
–Y1REV– STA. 10+50.00 TO –Y1REV– STA. 22+75.00 LT.

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½″ IN DEPTH.
D1	PROP. APPROX. 2.5″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 5.5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
J	ABC (M) SHOULDER CONSTRUCTION
L	Class IV Subgrade Stabilization
N	Fabric Stabilization
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING. (SEE MILLING DETAIL)
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
FDPS = FULL DEPTH PAVED SHOULDER

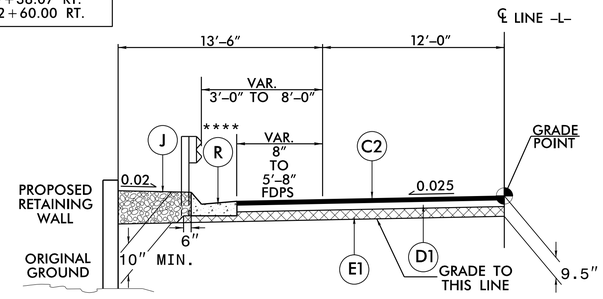
NOTE: PAVE TO FACE OF GUARDRAIL (SEE SHOULDER DETAIL THIS SHEET)



**1.5:1 FILL SLOPE WITH ROCK PLATING
SEE DETAIL SHEETS 2G–11 AND 2G–12
USE IN THE FOLLOWING LOCATIONS:
–L– STA. 24+50.00 TO –L– STA. 32+61.98 LT. & RT.
–L– STA. 33+69.00 TO –L– STA. 39+38.07 RT.
–L1– STA. 10+00.00 TO –L1– STA. 12+60.00 RT.

TYPICAL SECTION NO. 1

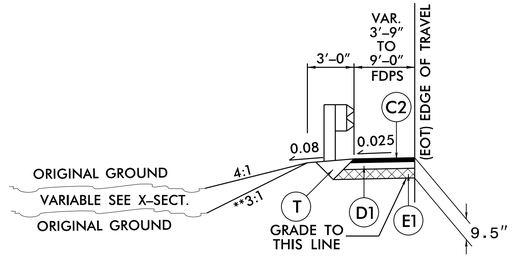
–L– STA. 10+16.62 TO –L– STA. 32+61.98 (BEGIN BRIDGE)
–L– STA. 33+75.48 (END BRIDGE) TO –L– STA. 43+57.04
–L1– STA. 10+00.00 TO –L1– STA. 15+07.87
–L2– STA. 10+06.00 TO –L2– STA. 11+34.00



****SEE SHEET 3B–1 FOR SHOULDER BERM GUTTER LIMITS

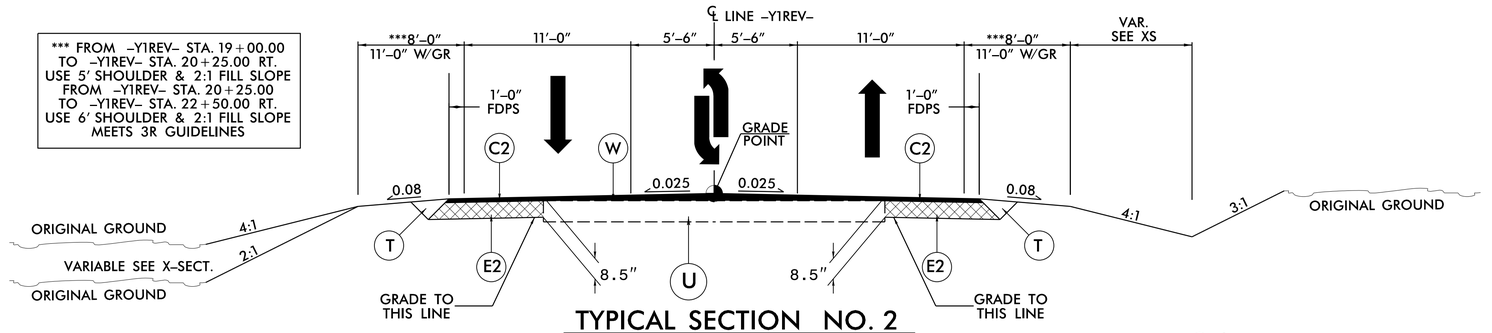
TYPICAL SECTION NO. 1A

–L– STA. 32+17.73 TO –L– STA. 32+61.98 (BEGIN BRIDGE) LT. & RT.
–L– STA. 33+75.48 (END BRIDGE) TO –L– STA. 34+20+/– RT.
–L– STA. 33+75.48 (END BRIDGE) TO –L– STA. 34+60+/– LT.



SHOULDER DETAIL

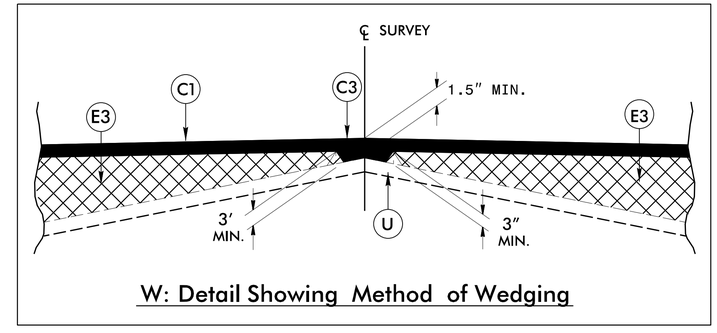
USE SHOULDER DETAIL IN CONJUNCTION WITH TYPICAL SECTION NO. 1
–L– STA. 23+75.00 TO –L– STA. 32+17.73 LT.
–L– STA. 23+75.00 TO –L– STA. 32+17.73 RT.
–L– STA. 34+37.00 TO –L– STA. 40+56.73 LT.
–L– STA. 34+37.00 TO –L– STA. 39+38.07 RT.
–L1– STA. 10+00.00 TO –L1– STA. 13+24.91 RT.



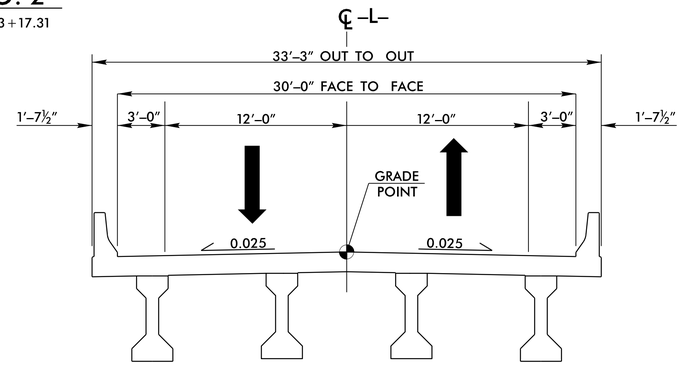
*** FROM –Y1REV– STA. 19+00.00 TO –Y1REV– STA. 20+25.00 RT.
USE 5′ SHOULDER & 2:1 FILL SLOPE
FROM –Y1REV– STA. 20+25.00 TO –Y1REV– STA. 22+50.00 RT.
USE 6′ SHOULDER & 2:1 FILL SLOPE
MEETS 3R GUIDELINES

TYPICAL SECTION NO. 2

–Y1REV– STA. 10+50.00 TO –Y1REV– STA. 23+17.31



W: Detail Showing Method of Wedging



TYPICAL SECTION ON STRUCTURE

–L– STA. 32+61.98 (BEGIN BRIDGE) TO –L– STA. 33+75.48 (END BRIDGE)

* USE 6′–0″ LANE:
–L– STA. 41+20.00 TO –L– STA. 43+57.04
–L1– STA. 11+85.00 TO –L1– STA. 15+07.87
–L2– STA. 10+06.00 TO –L2– STA. 11+34.00

PROJECT REFERENCE NO.	SHEET NO.
R–5769	2A–1

ROADWAY DESIGN ENGINEER
Docusigned by: Greg S. Purvis
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22995 8/24/2016 GREGORY S. PURVIS

PAVEMENT DESIGN ENGINEER
Docusigned by: Clark S Morrison
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22896 8/26/2016 CLARK S. MORRISON

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F–0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN – BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN – GIS/GPS – CONSTRUCTION OBSERVATION

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R-5769_Rdy_TYP.dgn
USER:Kevin

CROSS SECTION LAYOUT

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2B-1

ROADWAY DESIGN ENGINEER

DocuSigned by: Greg S. Purvis

NORTH CAROLINA PROFESSIONAL SEAL 22998 ENGINEER GREGORY S. PURVIS 8/24/2016

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

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35+00

S 53°12' 53.3" E

S 53°13' 11.3" E

TYPE B-77

TYPE B-77

TYPE B-77

TYPE B-77

9' 20.4" E

-RR2- S 53°12' 53.3" E

-RR1- S 53°13' 11.3" E

47.9" W

-DWY- POT Sta. 22+74.39

-RR2- POT Sta. 20+20.76

-RR1- POT Sta. 20+21.48

57' 00.2" E

22+16.96

64.14

-L- PT Sta. 41+58.71

40+00

-L- POT Sta. 43+69.04

-L2- POT Sta. 11+40.00
=-L- POT STA. 42+59.25

S 89°56' 32.9" E

-L- 39+50.00

-L- 40+00.00

-L- 40+50.00

-L- 40+75.00

-L- 41+00.00

-L- 41+50.00

N 26° 50' 50.8" E

-L- 42+00.00

-L- 42+50.00

-L- 42+75.00

-L- 43+00.00

-L- 43+05.00

END NCDOT
PROJECT R-5769
-L- STA. 43+57.04

-L- PC Sta. 36+24.51

-L- PT Sta. 39+04.99

-L- PC Sta. 39+38.07=
-L1- POT Sta. 10+00.00
BEGIN CONSTRUCTION

-L1- 10+11.95

-L1- 10+62.47

-L1- 11+15.08

-L1- 11+41.93

-L1- 11+74.43

GRAD 350 TL-3

-L1- PC Sta. 11+56.83

CAT-1

-L1- 12+56.68

-L1- 13+47.97

-L1- 13+98.08

-L1- 14+23.08

-L1- 14+48.08

-L1- 14+53.08

N 63° 09' 09.2" W

END CONSTRUCTION
-L1- POC STA. 15+07.87

N 26° 50' 50.8" E

-L1- PT Sta. 15+28.38

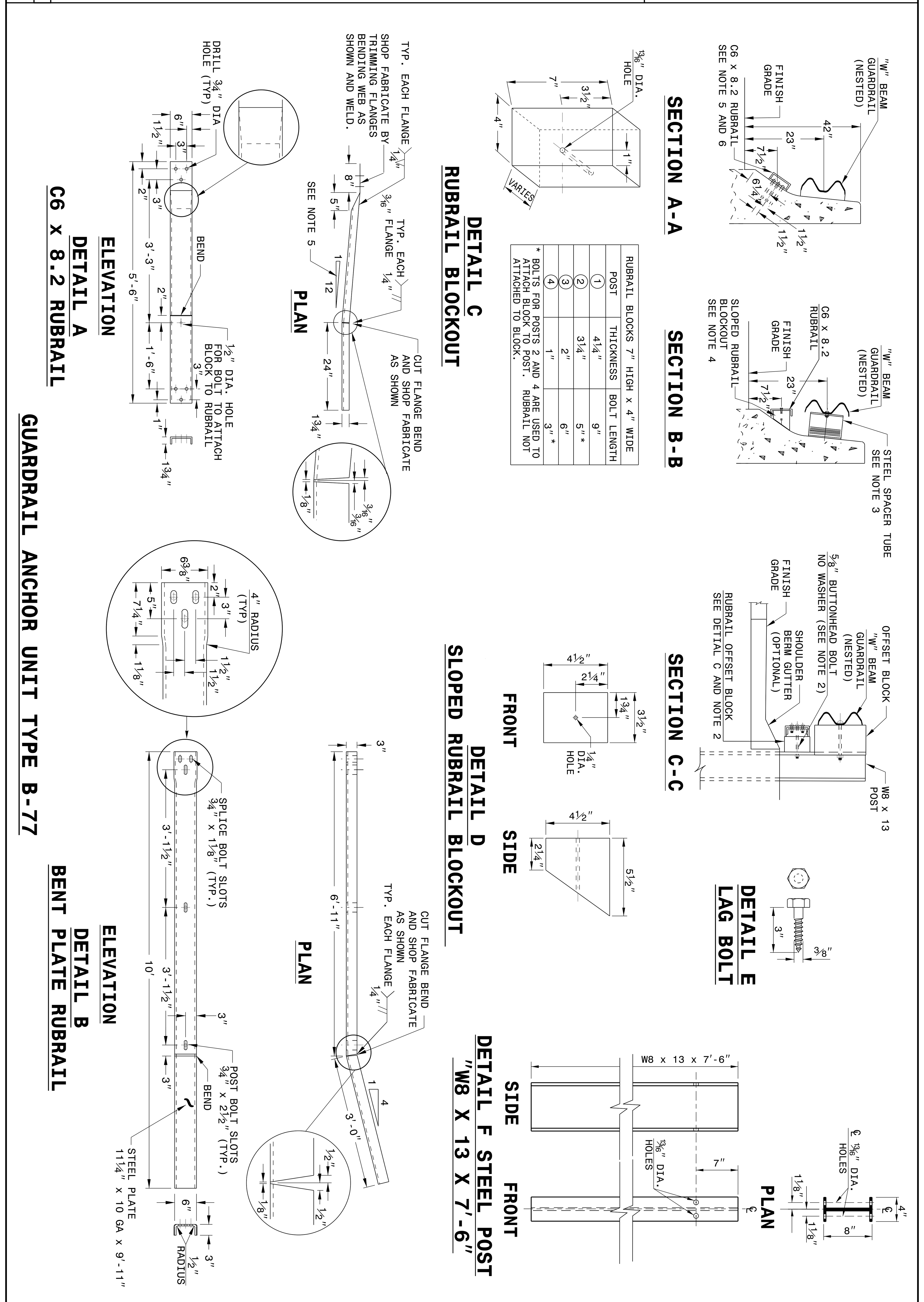
-L1- PT Sta. 13+77.48

-L2- POT Sta. 10+00.00
=-L1- POT STA. 14+07.33

-L-	-L1-
PI Sta 37+75.94 △ = 53° 34' 06.6" (RT) D = 19° 05' 54.9" L = 280.48' T = 151.44' R = 300.00' SE = RC	PI Sta 40+61.13 △ = 63° 12' 36.2" (LT) D = 28° 38' 52.4" L = 220.64' T = 123.07' R = 200.00' SE = RC
	PI Sta 12+79.90 △ = 63° 12' 36.2" (LT) D = 28° 38' 52.4" L = 220.64' T = 123.07' R = 200.00' SE = RC

8/23/2016
R-5769_Rdy_PSH 2B-1.dgn
USER:gpurvis

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2C-1

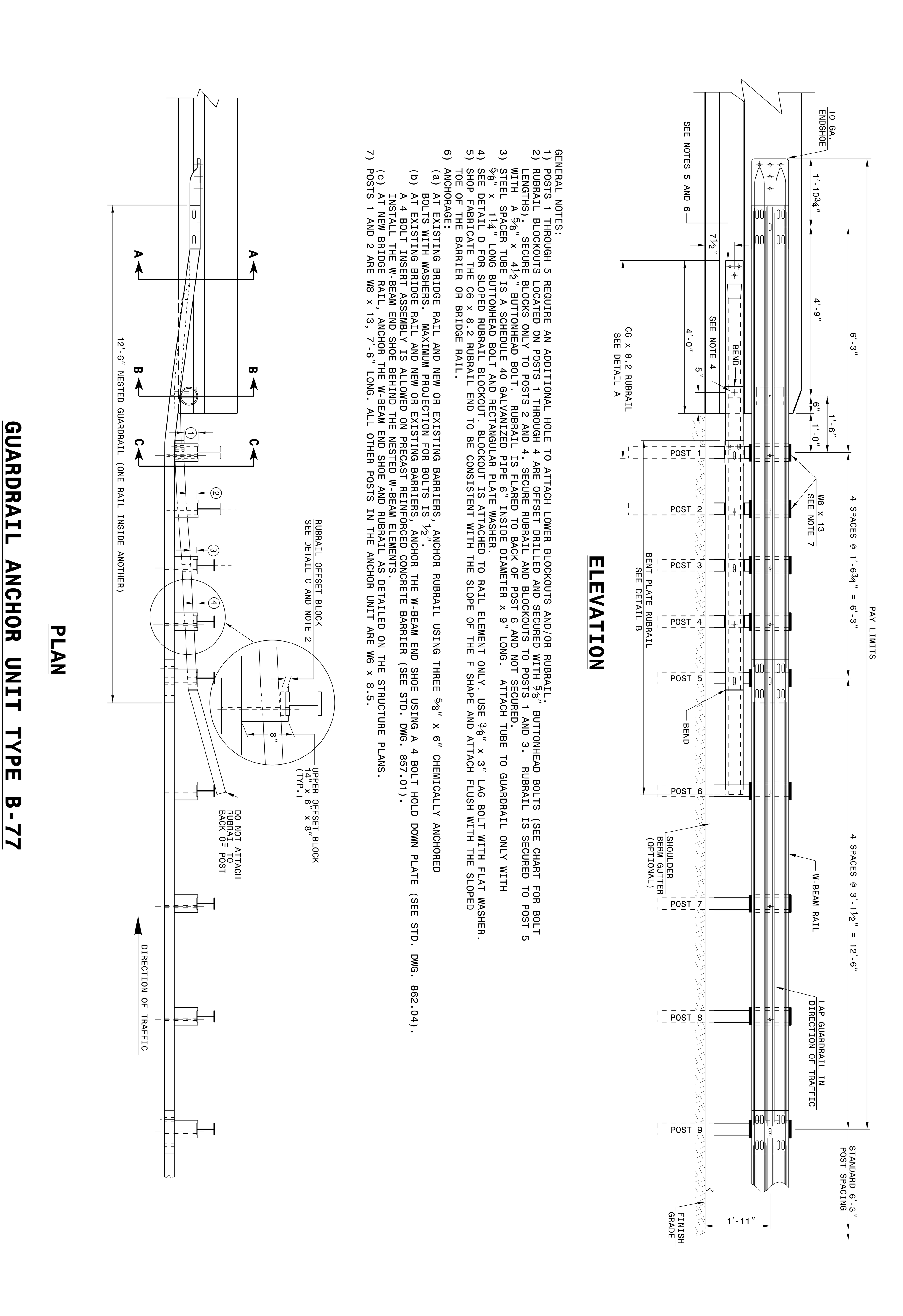


SHEET 5 OF 7

862D03

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

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



SHEET 4 OF 7

862D03

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

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

DocuSigned by:
Joel Howerton

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton
8/24/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-1

GEOTECHNICAL ENGINEER

Docusigned by: Matthew Alexander

NORTH CAROLINA PROFESSIONAL SEAL 040231 ENGINEER MATTHEW ALEXANDER

8/17/2016

SIGNATURE DATE

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0 50 100 (FEET)

N

20+00 25+00 30+00

BEGIN ROCK EMBANKMENT ONLY
-L- 20+80

BEGIN ROCK EMBANKMENT AND
SINGLE LAYER OF GEOTEXTILE
FOR EMBANKMENT STABILIZATION
-L- 24+50

BEGIN ROCK EMBANKMENT AND
TWO LAYERS OF GEOTEXTILE
FOR EMBANKMENT STABILIZATION
-L- 27+50

BEGIN TWO LAYERS OF GEOTEXTILE
FOR EMBANKMENT STABILIZATION
-L- 29+40

MACHINE DIRECTION

END ROCK EMBANKMENT ONLY
-L- 24+50

END ROCK EMBANKMENT AND
SINGLE LAYER OF GEOTEXTILE
FOR EMBANKMENT STABILIZATION
-L- 27+50

END ROCK EMBANKMENT AND
TWO LAYERS OF GEOTEXTILE
FOR EMBANKMENT STABILIZATION
-L- 29+40

END TWO LAYERS OF GEOTEXTILE
FOR EMBANKMENT STABILIZATION
-L- 30+00

SEE SHEETS 2G-4 TO 2G-10 FOR NOTES AND DETAILS

19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00

330 320 310 300 290 280 270 260

SEE SECTION B-B'
SHEET 2G-4

SEE SECTION D-D'
SHEET 2G-5

SINGLE LAYER OF GEOTEXTILE FOR
EMBANKMENT STABILIZATION

PROPOSED GRADE

TWO LAYERS OF GEOTEXTILE
FOR EMBANKMENT STABILIZATION

ROCK EMBANKMENT

TOP OF ROCK EMBANKMENT = ELEV. 287.5 FT

EXISTING GROUND

A A' B B' C C' D D' E E'

SEE SECTION A-A'
SHEET 2G-4

SEE SECTION C-C'
SHEET 2G-5

SEE SECTION E-E'
SHEET 2G-6

PREPARED BY: FIELDS, W. D.	DATE: 06/2016
REVIEWED BY: ALEXANDER, M. J. / NASH, A. A.	DATE: 07/2016

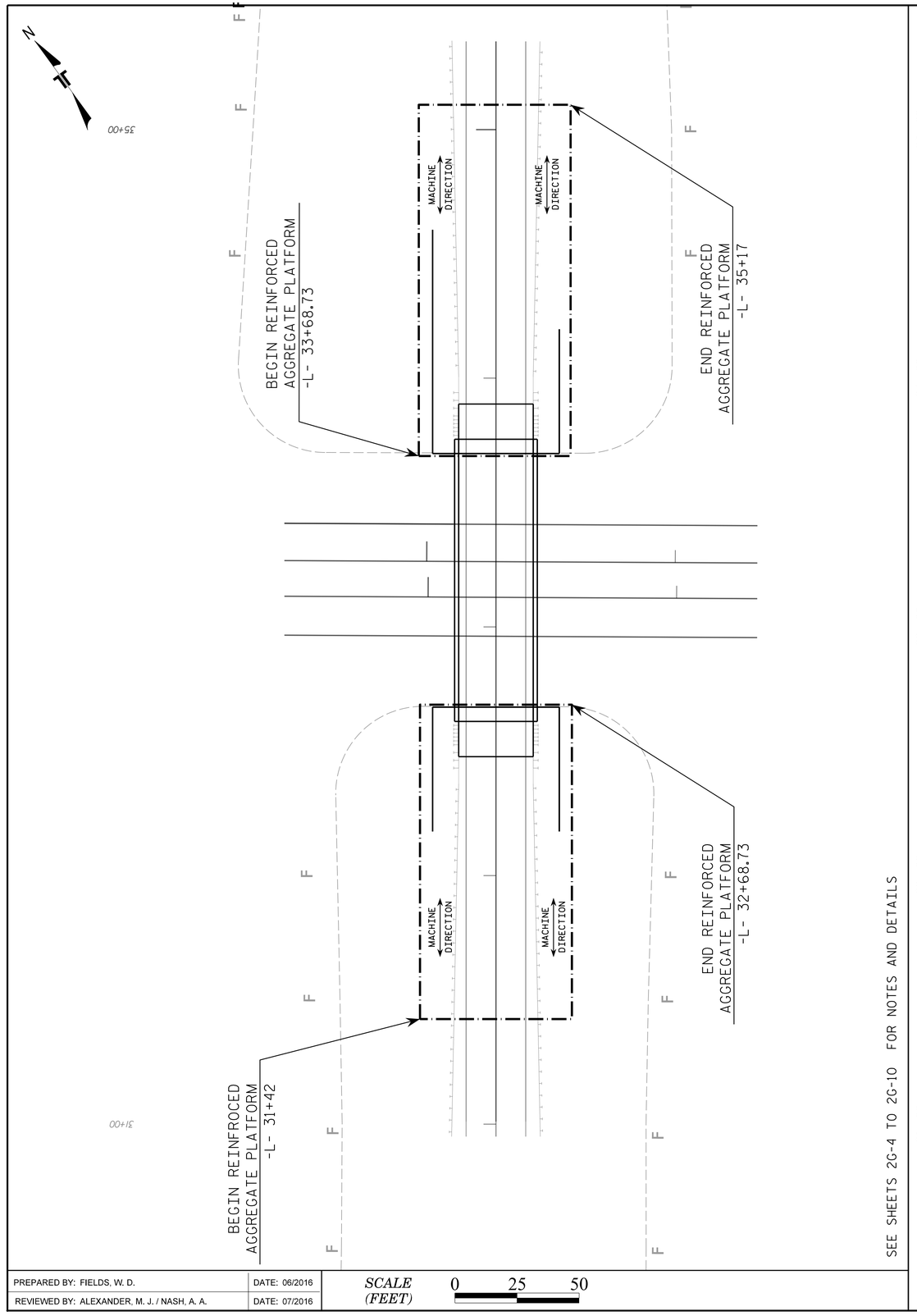
HORIZ. SCALE (FEET) 0 50 100 VE=5:1

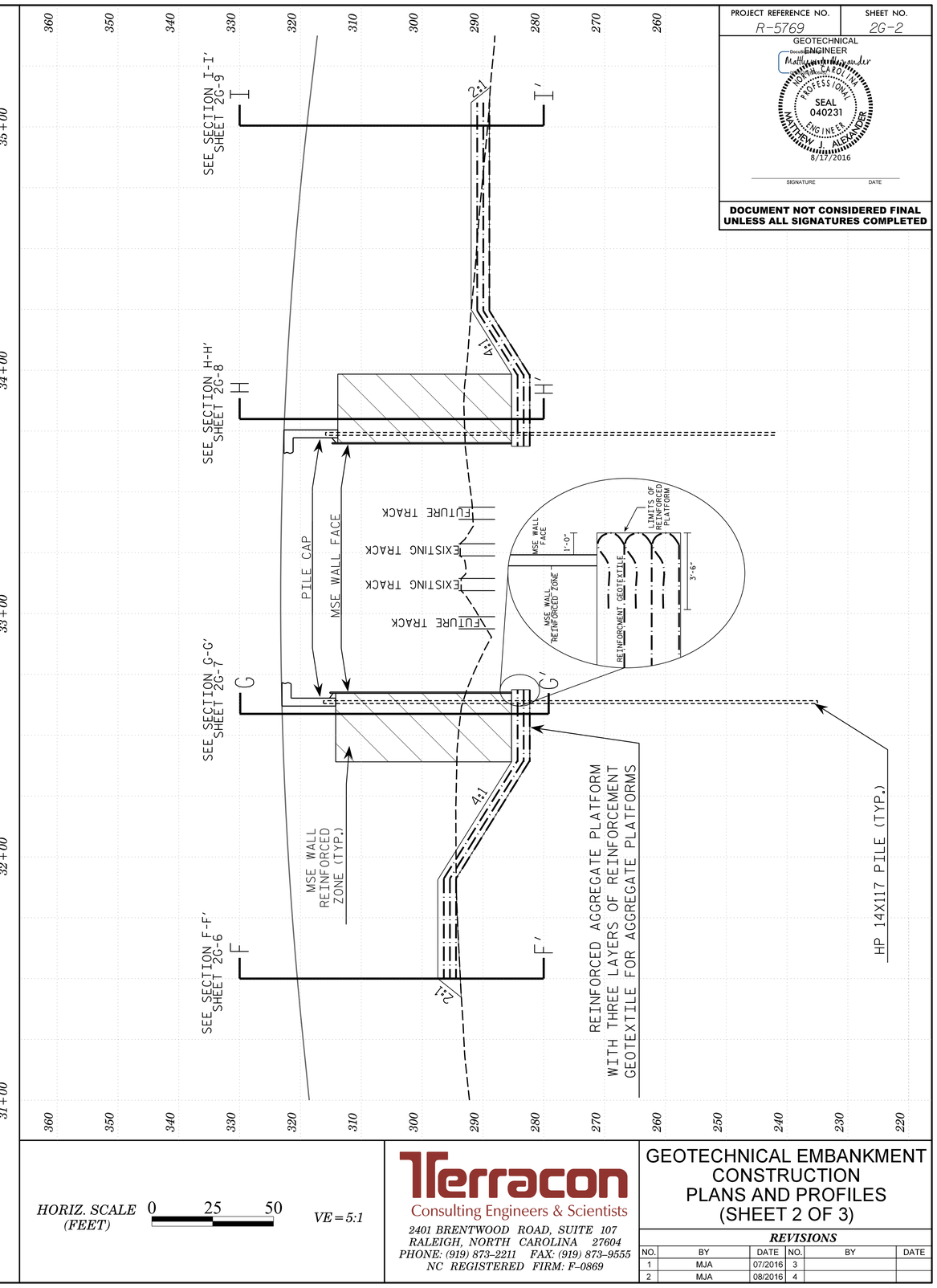
Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: F-0869

GEOTECHNICAL EMBANKMENT CONSTRUCTION PLANS AND PROFILES (SHEET 1 OF 3)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MJA	07/2016	3		
2	MJA	08/2016	4		





PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-2

GEOTECHNICAL ENGINEER

Docusigned by: Matthew Alexander

NORTH CAROLINA PROFESSIONAL SEAL 040231 ENGINEER MATTHEW ALEXANDER

8/17/2016

SIGNATURE DATE

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PREPARED BY: FIELDS, W. D.	DATE: 06/2016
REVIEWED BY: ALEXANDER, M. J. / NASH, A. A.	DATE: 07/2016

SCALE (FEET) 0 25 50

HORIZ. SCALE (FEET) 0 25 50

VE = 5:1

Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: F-0869

GEOTECHNICAL EMBANKMENT CONSTRUCTION PLANS AND PROFILES (SHEET 2 OF 3)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MJA	07/2016	3		
2	MJA	08/2016	4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-3

GEOTECHNICAL ENGINEER

Matthew Alexander

NORTH CAROLINA PROFESSIONAL SEAL 040231 ENGINEER MATTHEW ALEXANDER

8/17/2016

SIGNATURE DATE

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0 50 100 (FEET)

N

35+00

40+00

APPROXIMATE LIMITS OF ROCK EMBANKMENT

-L- 35+80

-L- 35+50

MACHINE DIRECTION

LIMITS OF SINGLE LAYER OF GEOTEXTILE FOR EMBANKMENT STABILIZATION

-L- 39+38.07

-L1- 10+00

MACHINE DIRECTION

-L1- 11+15

END NCDOT PROJECT R-5769 -L- STA. 43+57.04

END CONSTRUCTION -L1- POC STA. 15+07.87

SEE SHEETS 2G-4 TO 2G-10 FOR NOTES AND DETAILS

33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00

330 320 310 300 290 280 270 260

PROPOSED GRADE

SINGLE LAYER OF GEOTEXTILE FOR EMBANKMENT STABILIZATION

EXISTING GROUND

ROCK EMBANKMENT

TOP OF ROCK EMBANKMENT = ELEV. 286.5 FT

J

J'

SEE SECTION J-J' SHEET 2G-9

PREPARED BY: FIELDS, W. D.	DATE: 06/2016	HORIZ. SCALE (FEET) 0 50 100	VE=5:1
REVIEWED BY: ALEXANDER, M. J. / NASH, A. A.	DATE: 07/2016		

Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: F-0869

GEOTECHNICAL EMBANKMENT CONSTRUCTION PLANS AND PROFILES (SHEET 3 OF 3)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MJA	07/2016	3		
2	MJA	08/2016	4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-4

GEOTECHNICAL ENGINEER

DocuSigned by: Matthew Alexander

NORTH CAROLINA PROFESSIONAL SEAL 040231 ENGINEER MATTHEW J. ALEXANDER

8/17/2016

SIGNATURE DATE

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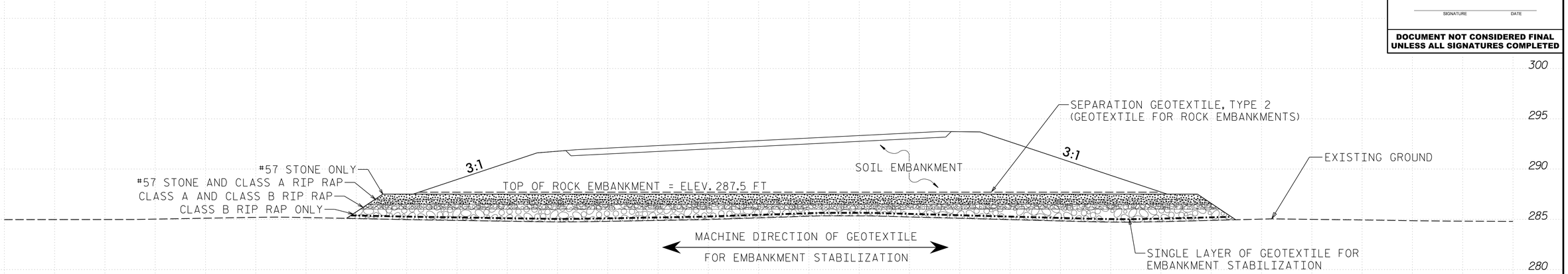
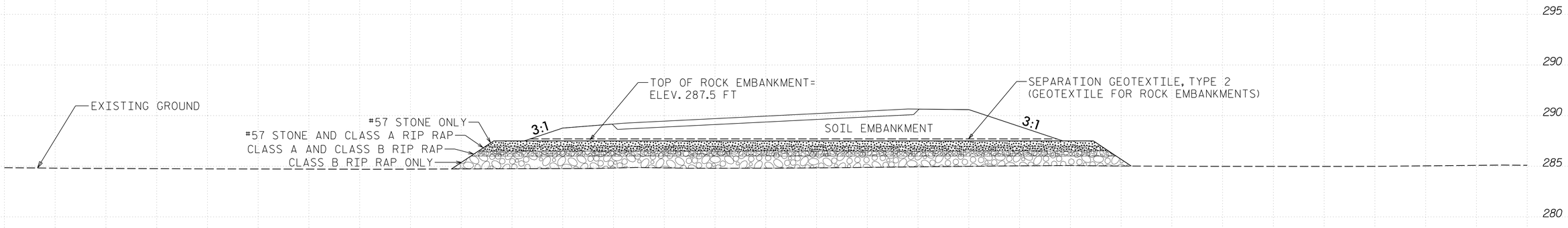


SECTION B–B'



SECTION A–A'

PREPARED BY: FIELDS, W. D.	DATE: 07/2016	*HORIZ. SCALE (FEET)* 0 5 10	*VE = 1:1*
REVIEWED BY: ALEXANDER, M. J. / NASH, A. A.	DATE: 07/2016		

Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: F-0869

GEOTECHNICAL EMBANKMENT CONSTRUCTION TYPICAL CROSS SECTIONS (SHEET 1 OF 6)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MJA	08/2016	3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-5

GEOTECHNICAL ENGINEER

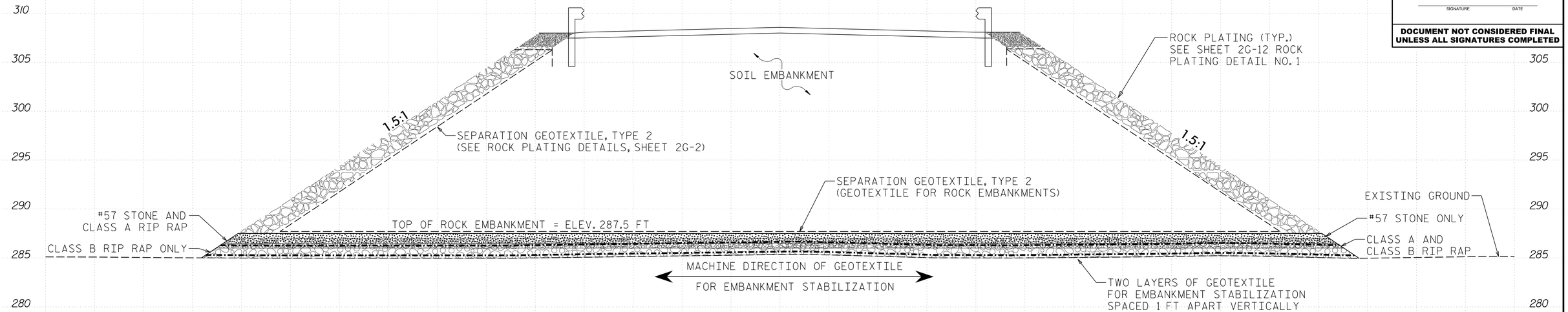
Matthew Alexander

NORTH CAROLINA PROFESSIONAL SEAL 040231 ENGINEER MATTHEW J ALEXANDER

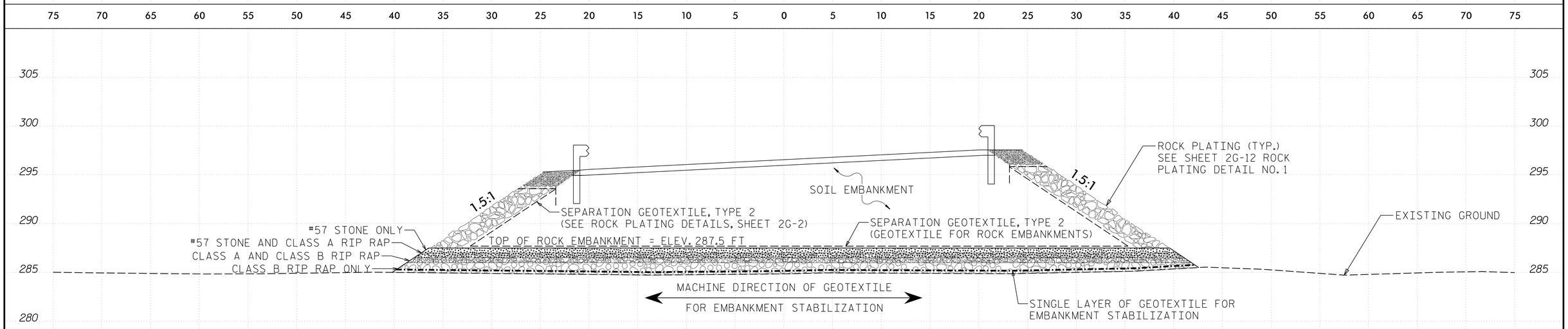
8/17/2016

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SECTION D–D'



SECTION C–C'

PREPARED BY: FIELDS, W. D.	DATE: 07/2016	*HORIZ. SCALE (FEET)* 0 5 10	*VE = 1:1*
REVIEWED BY: ALEXANDER, M. J. / NASH, A. A.	DATE: 07/2016		

Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: F-0869

GEOTECHNICAL EMBANKMENT CONSTRUCTION TYPICAL CROSS SECTIONS (SHEET 2 OF 6)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MJA	08/2016	3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-6

GEOTECHNICAL ENGINEER

Document: Matthew Alexander

NORTH CAROLINA PROFESSIONAL SEAL 040231 ENGINEER MATTHEW J ALEXANDER

8/17/2016

SIGNATURE DATE

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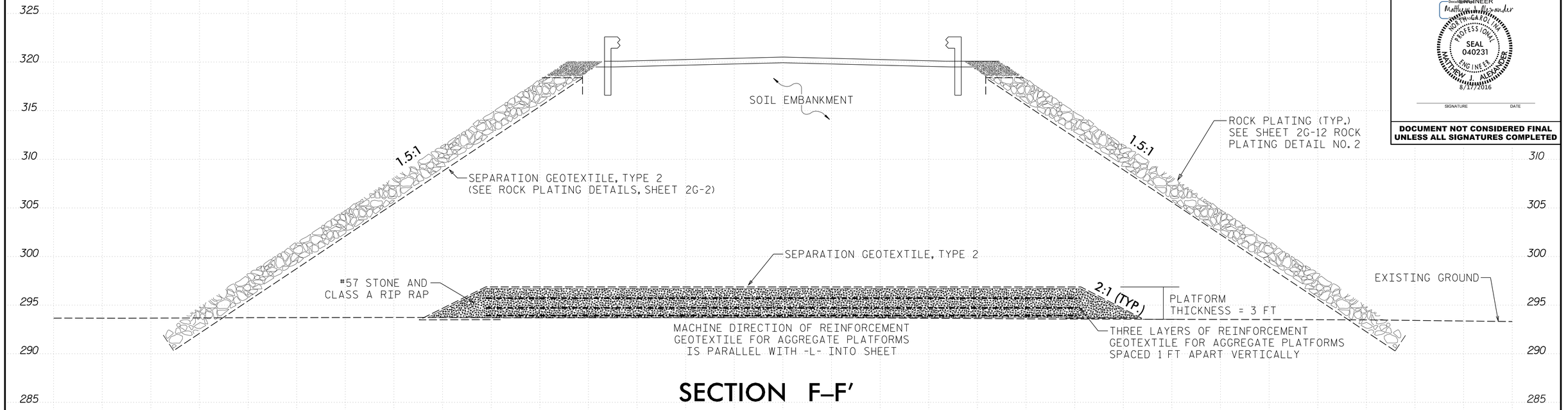
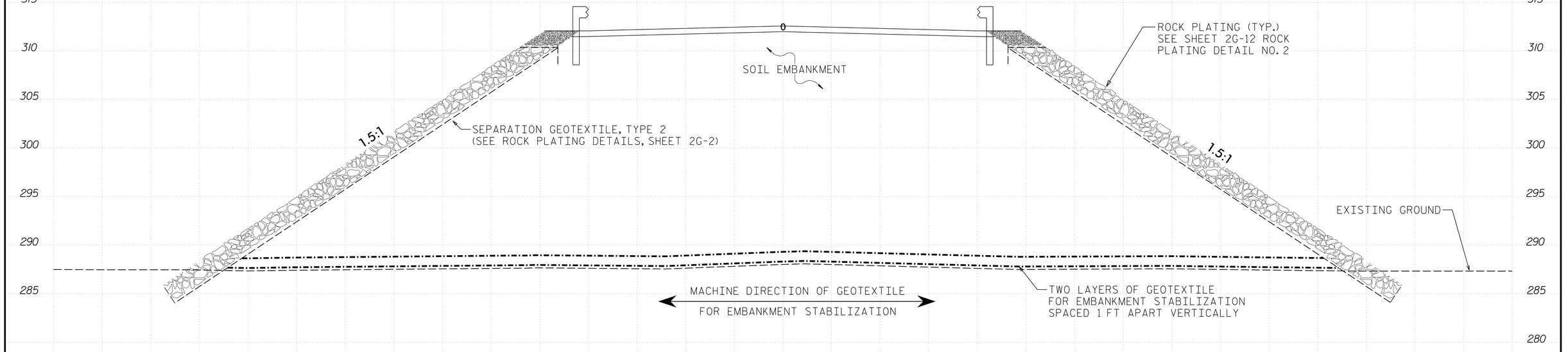


SECTION F–F'



SECTION E–E'

PREPARED BY: FIELDS, W. D.	DATE: 07/2016
REVIEWED BY: ALEXANDER, M. J. / NASH, A. A.	DATE: 07/2016

HORIZ. SCALE (FEET) 0 5 10 *VE = 1:1*

Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: F-0869

GEOTECHNICAL EMBANKMENT CONSTRUCTION TYPICAL CROSS SECTIONS (SHEET 3 OF 6)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MJA	08/2016	3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-7

GEOTECHNICAL ENGINEER

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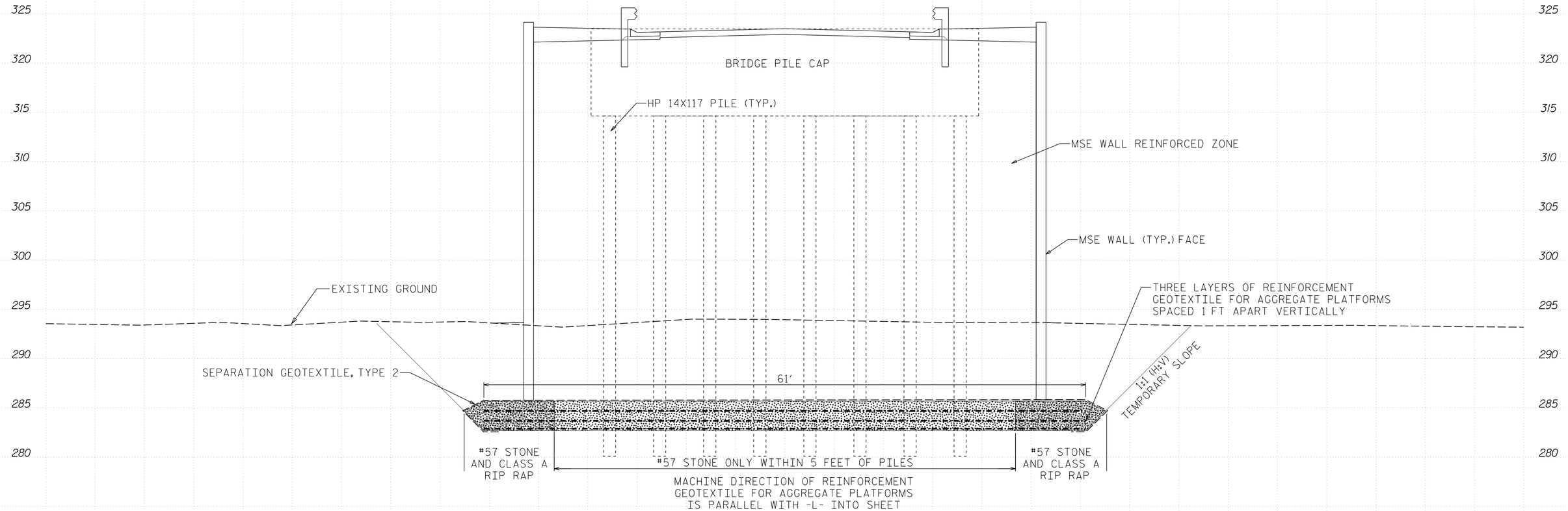

SECTION G–G′

PREPARED BY: FIELDS, W. D.	DATE: 07/2016	*HORIZ. SCALE (FEET)* 0 5 10	*VE = 1:1*
REVIEWED BY: ALEXANDER, M. J. / NASH, A. A.	DATE: 07/2016		

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Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
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GEOTECHNICAL EMBANKMENT CONSTRUCTION TYPICAL CROSS SECTIONS (SHEET 4 OF 6)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MJA	08/2016	3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-8

GEOTECHNICAL ENGINEER

Matthew Alexander

NORTH CAROLINA PROFESSIONAL SEAL 040231 ENGINEER MATTHEW J. ALEXANDER

8/17/2016

SIGNATURE DATE

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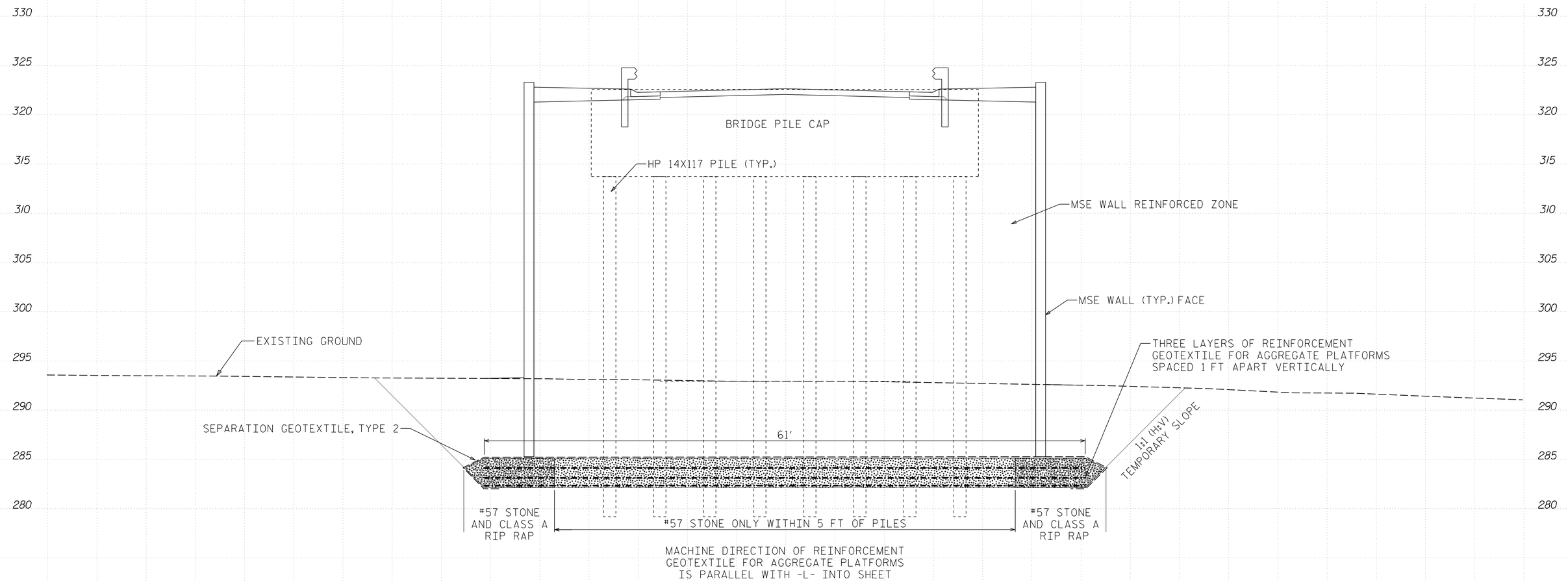

SECTION H–H'

PREPARED BY: FIELDS, W. D.	DATE: 07/2016	*HORIZ. SCALE (FEET)* 0 5 10	*VE = 1:1*
REVIEWED BY: ALEXANDER, M. J. / NASH, A. A.	DATE: 07/2016		

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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
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GEOTECHNICAL EMBANKMENT CONSTRUCTION
TYPICAL CROSS SECTIONS
(SHEET 5 OF 6)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MJA	08/2016	3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-9

GEOTECHNICAL ENGINEER

Matthew J. Alexander

NORTH CAROLINA PROFESSIONAL SEAL 040231 ENGINEER MATTHEW J. ALEXANDER 8/17/2016

SIGNATURE DATE

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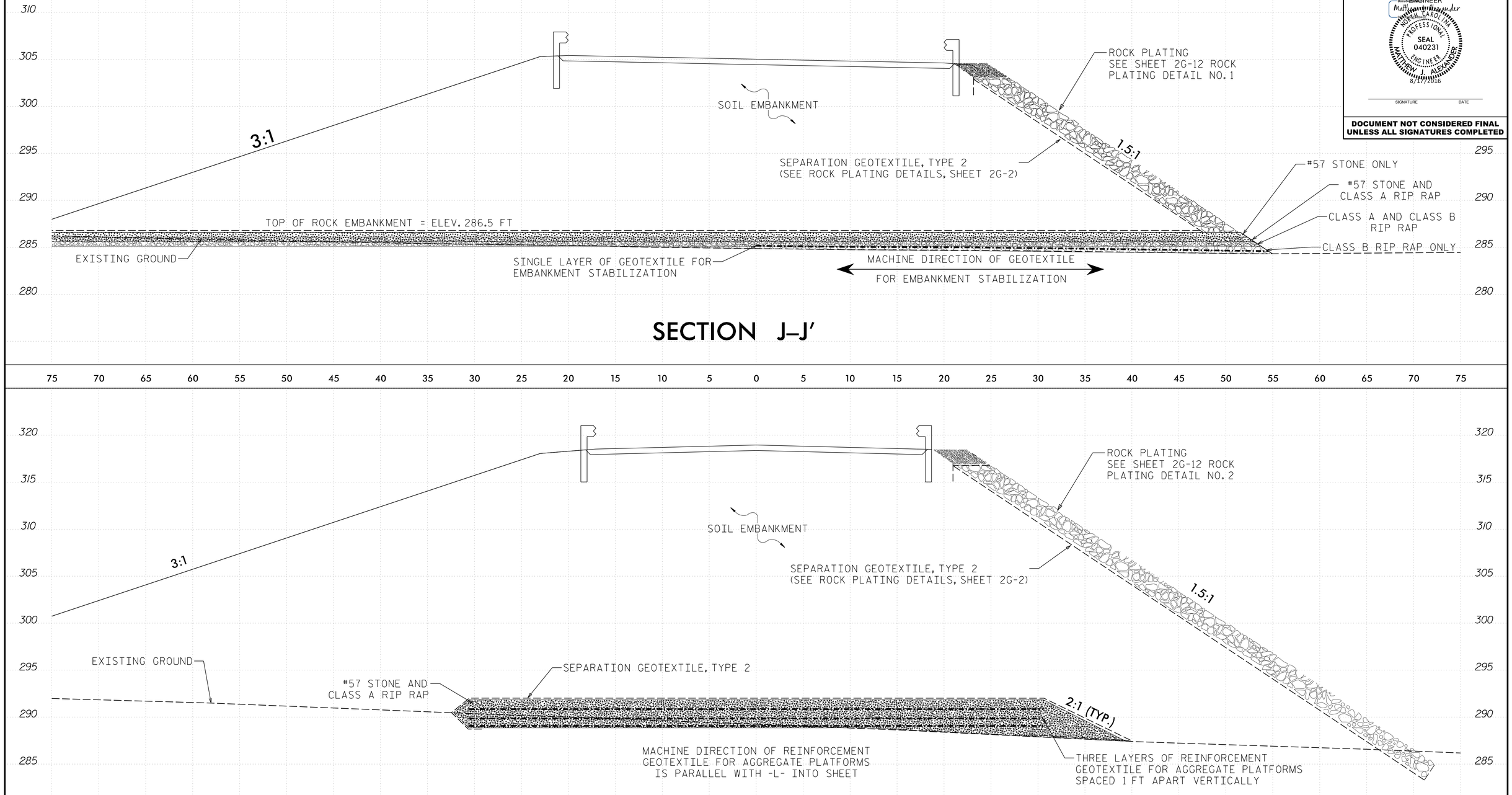

SECTION J–J'

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

SECTION I–I'

PREPARED BY: FIELDS, W. D.	DATE: 07/2016
REVIEWED BY: ALEXANDER, M. J. / NASH, A. A.	DATE: 07/2016

HORIZ. SCALE (FEET) 0 5 10 *VE = 1:1*

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Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
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GEOTECHNICAL EMBANKMENT CONSTRUCTION TYPICAL CROSS SECTIONS (SHEET 6 OF 6)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MJA	08/2016	3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-10

GEOTECHNICAL ENGINEER

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GEOTEXTILE FOR EMBANKMENT STABILIZATION

NOTES

FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION, SEE GEOTEXTILE FOR EMBANKMENT STABILIZATION SPECIAL PROVISION.

DO NOT GRUB, ONLY CLEAR THE AREA WITHIN THE LIMITS OF THE GEOTEXTILE FOR EMBANKMENT STABILIZATION.

PLACE THE GEOTEXTILE FOR EMBANKMENT STABILIZATION WITHOUT ANY WRINKLES OR CREASES.

THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.

GEOTEXTILE FOR EMBANKMENT STABILIZATION SHEETS SHOULD BE CONTINOUS IN THE MACHINE DIRECTION PERPENDICULAR TO -L- AS SHOWN IN THE PLANS AND OF SUFFICIENT LENGTH TO COVER THE AREA INDICATED. THE GEOTEXTILE SHOULD BE PLACED NEAR THE BASE OF THE EMBANKMENT FROM TOE OF SLOPE TO TOE OF SLOPE BETWEEN -L- STA. 24+50 AND -L- 30+00.

GEOTEXTILE FOR EMBANKMENT STABILIZATION 2 WITH MACHINE/ROLL DIRECTION PARALLEL TO -L- MUST HAVE A CONTINUOS LENGTH OF 120 FEET FROM -L- STA. 31+50 TO 32+68.73.

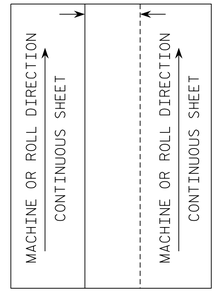
GEOTEXTILE FOR EMBANKMENT STABILIZATION 2 WITH MACHINE/ROLL DIRECTION PARALLEL TO -L- MUST HAVE A CONTINUOS LENGTH OF 142 FEET FROM -L- STA. 33+68.73 TO 35+10.

NO SEAMS OR JOINTS ARE ALLOWED IN THE GEOTEXTILE MACHINE/ROLL DIRECTION.

THE MINIMUM OVERLAP BETWEEN ADJACENT GEOTEXTILE OF THE SAME MACHINE/ROLL DIRECTION IS 18 INCHES UNLESS SEWING IS USED TO ACHIEVE THE REQUIRED SEAM STRENGTH.

ESTIMATED QUANTITIES GEOTEXTILE FOR EMBANKMENT STABILIZATION	
GEOTEXTILE FOR EMBANKMENT STABILIZATION	12,700 SY
GEOTEXTILE FOR EMBANKMENT STABILIZATION - CONTINGENCY	500 SY

18 INCHES MIN. OVERLAP OR SEE MANUFACTURER GUIDELINES IF SEWN.



REINFORCING GEOTEXTILE OVERLAP DETAIL

ROCK EMBANKMENTS

NOTES

FOR ROCK EMBANKMENTS, SEE ROCK EMBANKMENTS SPECIAL PROVISION.

CONSTRUCT ROCK EMBANMKMENTS AS SHOWN IN THE EMBANKMENT CONSTRUCTION GEOTECHNICAL DETAILS SHEETS AND IN ACCORDANCE WITH THE ROCK EMBANKMENTS SPECIAL PROVISION.

USE RIP RAP CLASS B, RIP RAP CLASS A, AND #57 STONE (SELECT MATERIAL, CLASS VI) TO CONSTRUCT ROCK EMBANKMENTS AS SHOWN IN THE PLANS. RIP RAP CLASS A AND #57 STONE SHOULD BE USED TO CHOKE OFF VOIDS IN RIP RAP CLASS B ROCK EMBANKMENTS BEFORE PLACING SEPARATION GEOTEXTILES AND SOIL EMBANKMENT FILL.

RIP RAP CLASS B AND RIP RAP CLASS A SHOULD MEET THE REQUIREMENTS IN SECTION 1042 OF THE STANDARD SPECIFICATIONS.

#57 STONE (SELECT MATERIAL, CLASS VI) SHALL MEET THE GRADATION REQUIREMENTS IN SECTION 1016 OF THE STANDARD SPECIFICATIONS.

INSTALL GEOTEXTILE ON TOP OF ROCK EMBANKMENTS IN ACCORDANCE WITH THE ROCK EMBANKMENTS SPECIAL PROVISION AND ARTICLE 270-3 OF THE STANDARD SPECIFICATIONS.

ESTIMATED QUANTITIES ROCK EMBANKMENTS	
ROCK EMBANKMENTS	12,200 TONS
ROCK EMBANKMENTS - CONTINGENCY	6,100 TONS
#57 STONE (SELECT MATERIAL, CLASS VI)	3,900 TONS
#57 STONE - CONTINGENCY	2,000 TONS
GEOTEXTILE FOR ROCK EMBANKMENTS, TYPE 2	15,500 SY

ROCK EMBANKMENT LOCATIONS SUMMARY		
APPROXIMATE BEGINNING STATION	APPROXIMATE ENDING STATION	TOP OF ROCK EMBANKMENT ELEVATION
-L- 20+80	-L- 29+40	287.5 FT.
-L- 35+80	-L- 43+57.04	286.5
-L1- 10+00	-L1- 15+07.87	286.5
-L2- 10+00	-L2- 11+40	286.5

REINFORCED AGGREGATE PLATFORMS

NOTES

FOR REINFORCED AGGREGATE PLATFORMS, SEE REINFORCED AGGREGATE PLATFORMS SPECIAL PROVISION.

CONSTRUCT REINFORCED AGGREGATE PLATFORMS AS SHOWN IN THE EMBANKMENT CONSTRUCTION GEOTECHNICAL DETAILS SHEETS AND IN ACCORDANCE WITH THE REINFORCED AGGREGATE PLATFORMS SPECIAL PROVISION.

USE RIP RAP, CLASS A AND #57 STONE (SELECT MATERIAL, CLASS VI) FOR AGGREGATE PLATFORMS TO CONSTRUCT REINFORCED AGGREGATE PLATFORMS AS SHOWN IN THE PLANS. DO NOT PLACE RIP RAP CLASS A WITHIN 5 FEET OF BRIDGE FOUNDATION PILES. USE ONLY #57 STONE TO CONSTRUCT REINFORCED AGGREGATE PLATFORMS WITHIN 5 FEET OF BRIDGE FOUNDATION PILES.

SLIT THE REINFORCEMENT GEOTEXTILE FOR AGGREGATE PLATFORMS APPROXIMATELY 20 INCHES IN THE MACHINE DIRECTION USING A HOT KNIFE AT THE BRIDGE FOUNDATION PILE LOCATIONS.

FOR REINFORCEMENT GEOTEXTILE FOR AGGREGATE PLATFORMS, SEE REINFORCED AGGREGATE PLATFORMS SPECIAL PROVISION.

PLACE THE GEOTEXTILE FOR EMBANKMENT STABILIZATION WITHOUT ANY WRINKLES OR CREASES.

THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.

REINFORCEMENT GEOTEXTILE FOR AGGREGATE PLATFORMS WITH MACHINE/ROLL DIRECTION PARALLEL TO -L- MUST HAVE A CONTINUOS LENGTH OF 120 FEET FROM -L- STA. 31+50 TO 32+68.73.

REINFORCEMENT GEOTEXTILE FOR AGGREGATE PLATFORMS WITH MACHINE/ROLL DIRECTION PARALLEL TO -L- MUST HAVE A CONTINUOS LENGTH OF 142 FEET FROM -L- STA. 33+68.73 TO 35+10.

NO SEAMS OR JOINTS ARE ALLOWED IN THE GEOTEXTILE MACHINE/ROLL DIRECTION.

THE MINIMUM OVERLAP BETWEEN ADJACENT GEOTEXTILE OF THE SAME MACHINE/ROLL DIRECTION IS 18 INCHES UNLESS SEWING IS USED TO ACHIEVE THE REQUIRED SEAM STRENGTH.

RIP RAP CLASS A SHOULD MEET THE REQUIREMENTS IN SECTION 1042 OF THE STANDARD SPECIFICATIONS.

#57 STONE (SELECT MATERIAL, CLASS VI) SHALL MEET THE GRADATION REQUIREMENTS IN SECTION 1016 OF THE STANDARD SPECIFICATIONS.

INSTALL GEOTEXTILE WITHIN AND ON TOP OF REINFORCED AGGREGATE PLATFORMS IN ACCORDANCE WITH THE ROCK EMBANKMENTS SPECIAL PROVISION AND ARTICLE 270-3 OF THE STANDARD SPECIFICATIONS.

ESTIMATED QUANTITIES REINFORCED AGGREGATE PLATFORMS	
RIP RAP, CLASS A	500 TONS
#57 STONE (SELECT MATERIAL, CLASS VI)	800 TONS
SEPARATION GEOTEXTILE, TYPE 2	2,200 SY
REINFORCEMENT GEOTEXTILE FOR AGGREGATE PLATFORMS	5,500 SY

REINFORCED AGGREGATE PLATFORMS LOCATIONS SUMMARY	
APPROXIMATE BEGINNING STATION	APPROXIMATE ENDING STATION
-L- 31+42	-L- 32+68.73
-L- 33+68.73	-L- 35+10

PREPARED BY: ALEXANDER, M. J.	DATE: 07/2016
REVIEWED BY: NASH, A. A.	DATE: 07/2016

Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: F-0869

GEOTECHNICAL EMBANKMENT CONSTRUCTION NOTES

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MJA	07/2016	3		
2	MJA	08/2016	4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-11

0 50 100
FEET

GEOTECHNICAL ENGINEER

8/17/2016

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PREPARED BY: ALEXANDER, M. J.	DATE: 07/2016
REVIEWED BY: NASH, A. A.	DATE: 07/2016

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Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
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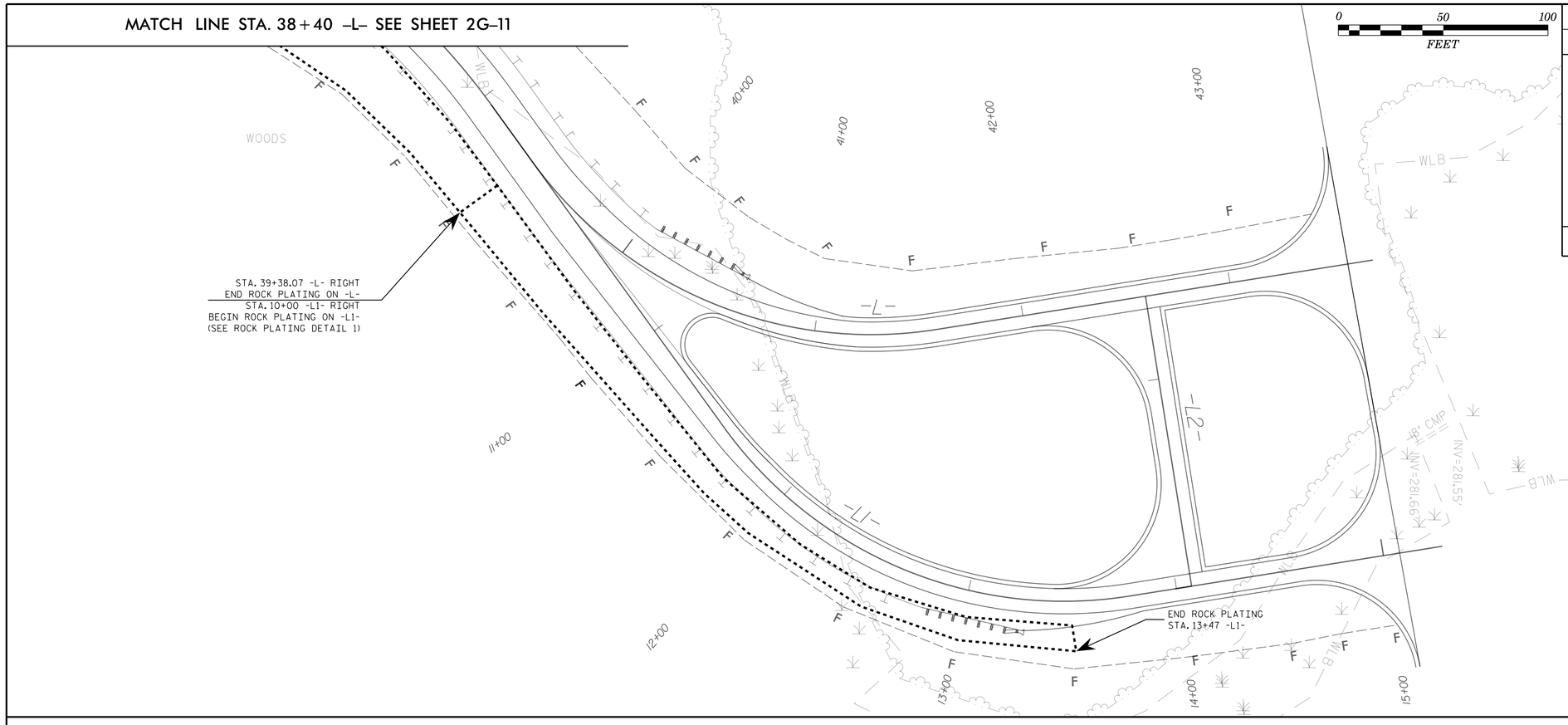
NOVO NORDISK ACCESS ROAD
ROCK PLATING LOCATION PLAN

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		



PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-12

GEOTECHNICAL ENGINEER

Docusigned by: Matthew Alexander

NORTH CAROLINA PROFESSIONAL SEAL 040231 ENGINEER MATTHEW J ALEXANDER

8/17/2016

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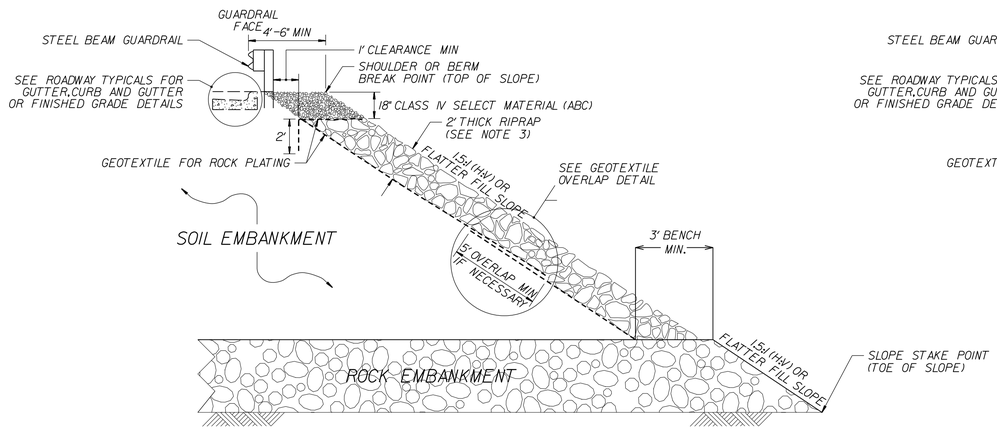
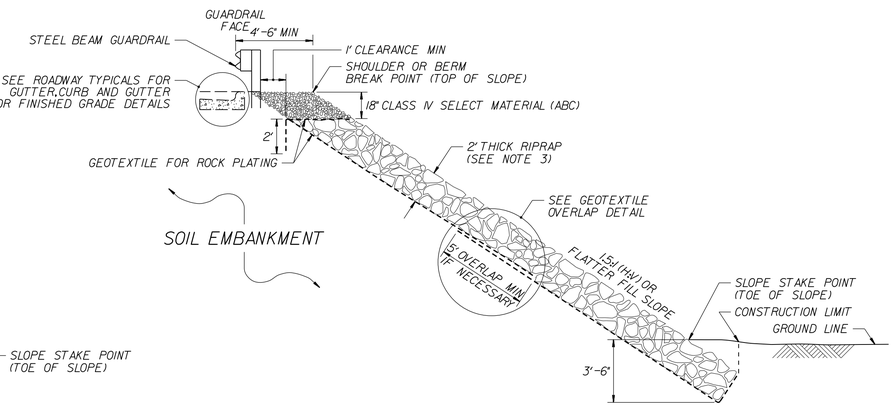


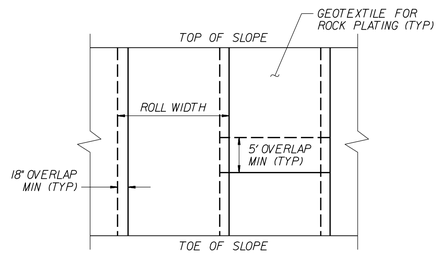
ROCK PLATING DETAIL NO. 1

ROCK PLATING ON SOIL SLOPES CONSTRUCTED ON ROCK EMBANKMENTS



ROCK PLATING DETAIL NO. 2

ROCK PLATING ON SOIL SLOPES CONSTRUCTED ON SOIL



GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)

NOTES:

1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
2. FOR ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
3. USE CLASS 1, 2 OR B RIPRAP.
4. SEE ROADWAY PLANS FOR ROCK EMBANKMENT DETAILS.

PREPARED BY: ALEXANDER, M. J.	DATE: 07/2016
REVIEWED BY: NASH, A. A.	DATE: 07/2016

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Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
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NOVO NORDISK ACCESS ROAD ROCK PLATING LOCATION PLAN AND DETAILS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-13

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DocuSigned by: Matthew J. Alexander

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8/17/2016

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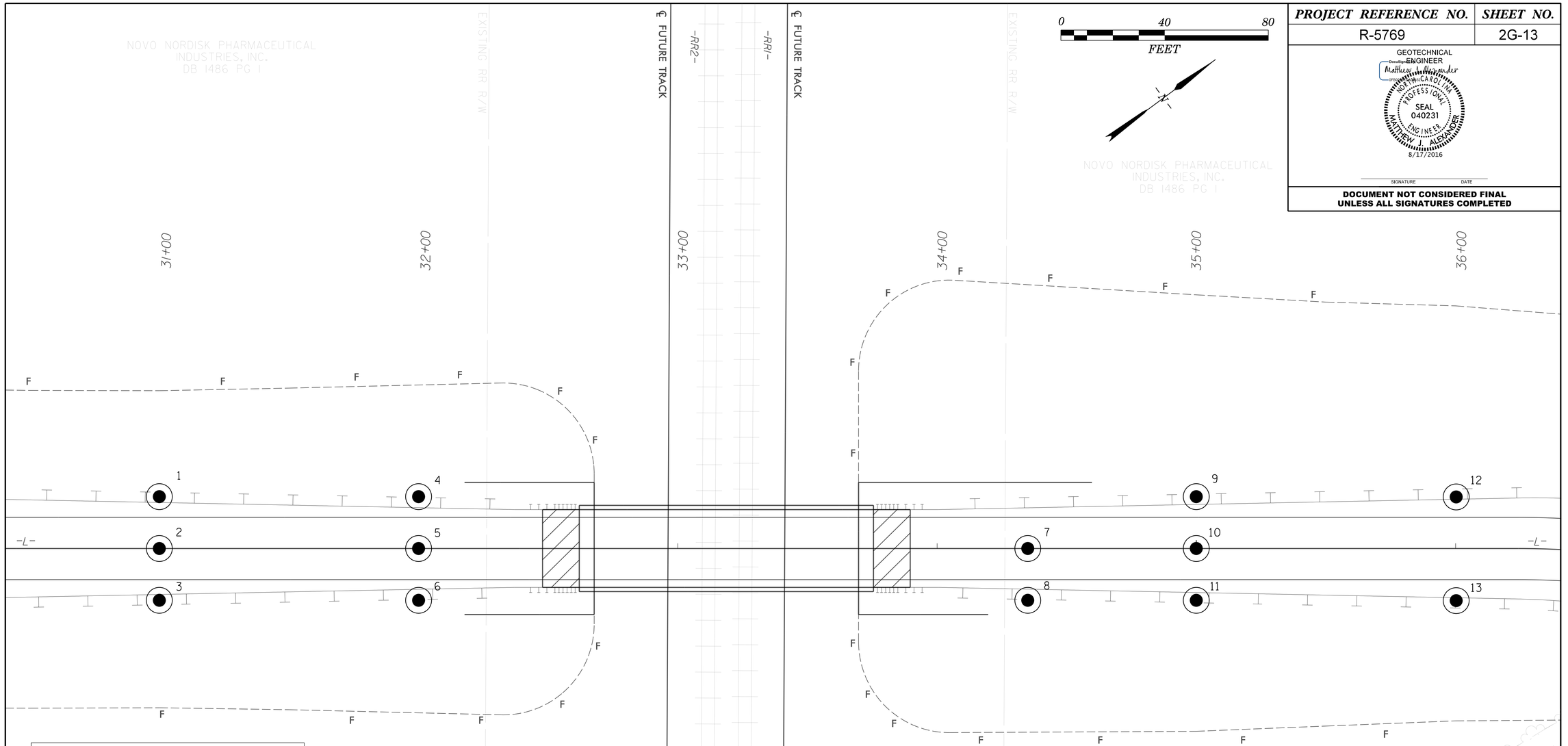

SETTLEMET GAUGE LOCATIONS

GAUGE NO.	STATION -L-	OFFSET FROM -L-
1	31+00	20' LT.
2	31+00	CL
3	31+00	20' RT.
4	32+00	20' LT.
5	32+00	CL
6	32+00	20' RT.
7	34+35	CL
8	34+35	20' RT.
9	35+00	20' LT.
10	35+00	CL
11	35+00	20' RT.
12	36+00	20' LT.
13	36+00	20' RT.

SETTLEMET GAUGE QUANTITIES	
EMBANKMENT SETTLEMENT GAUGES	13

NOTES:

REFER TO SHEET 2G-14 FOR SETTLEMENT GAUGE DETAILS AND CONSTRUCTION SEQUENCE

PREPARED BY: M. J. ALEXANDER	DATE: 06/2016
REVIEWED BY: A. A. NASH	DATE: 06/2016

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Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
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EMBANKMENT MONITORING SETTLEMENT GAUGE LOCATION PLAN

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
R-5769	2G-14

GEOTECHNICAL ENGINEER
Matthew Alexander
NORTH CAROLINA PROFESSIONAL SEAL 040231 ENGINEER MATHEW J. ALEXANDER
8/17/2016
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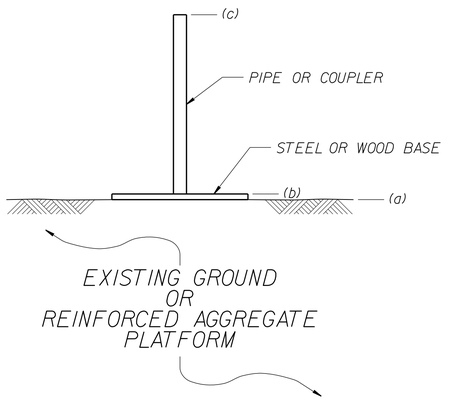
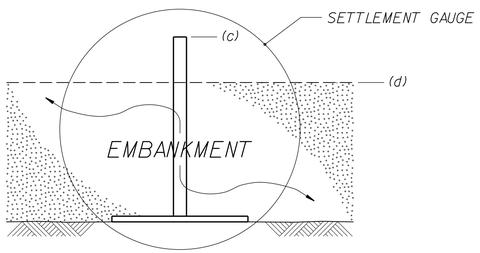
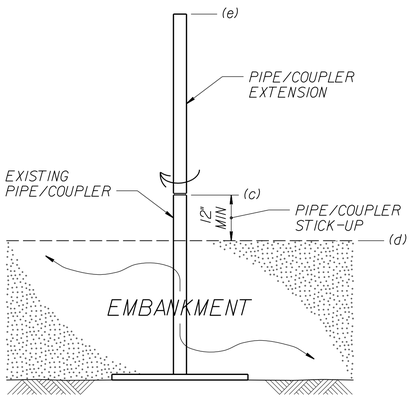
EMBANKMENT MONITORING SEQUENCE



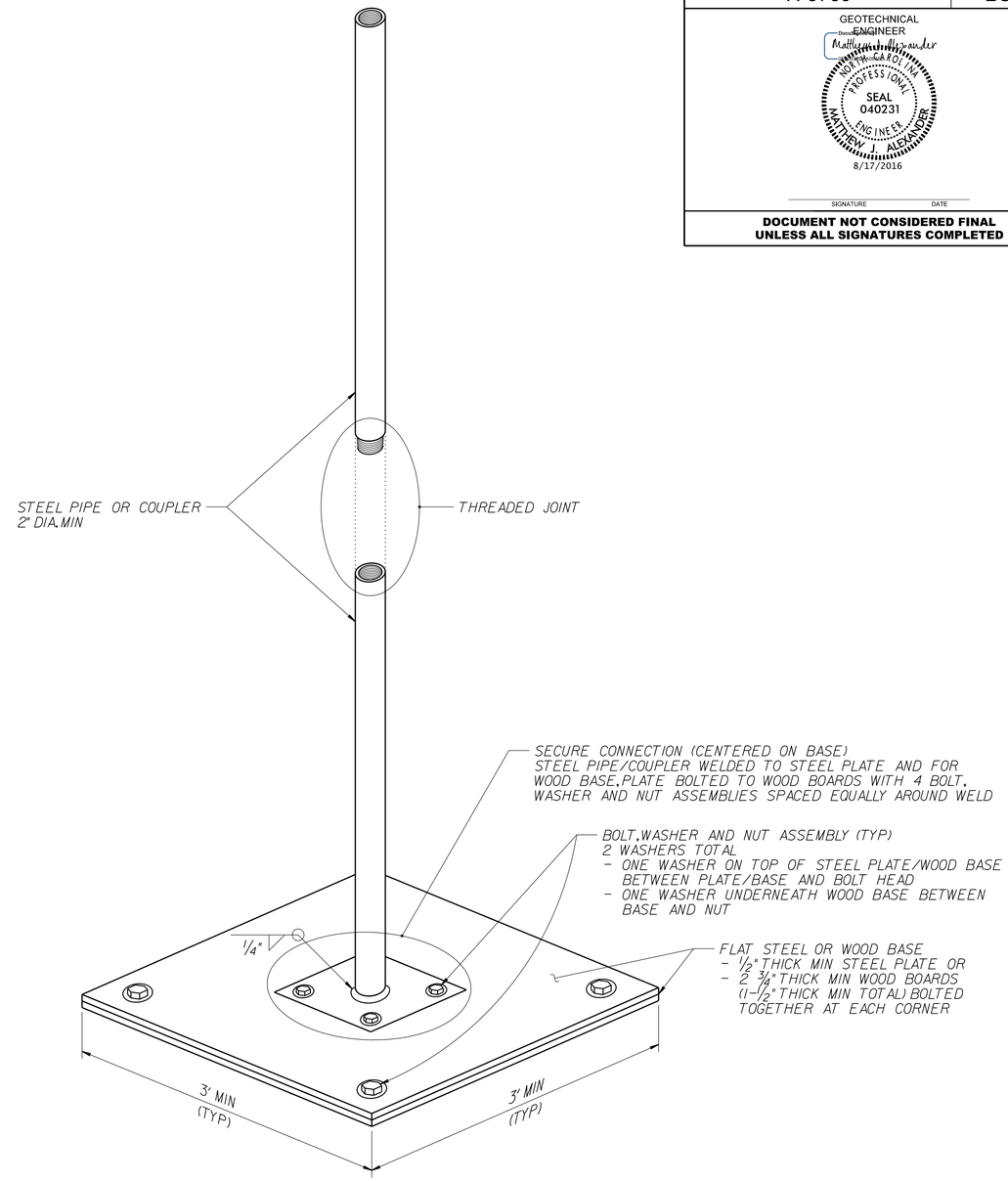
1. PLACE STEEL/WOOD BASE AT APPROXIMATE GAUGE LOCATIONS SHOWN IN THE PLANS AS DETERMINED BY THE ENGINEER.
2. SET BASE ON LEVEL GROUND SO PIPE/COUPLER IS PLUMB.
3. BEFORE CONSTRUCTING EMBANKMENT, NOTIFY ENGINEER TO SURVEY AND RECORD THE FOLLOWING:
   (a) EXISITING GROUND ELEVATION,
   (b) TOP OF BASE ELEVATION AND
   (c) TOP OF PIPE ELEVATION.



4. MAKE SETTLEMENT GAUGE HIGHLY VISIBLE SO GAUGE IS NOT HIT OR DAMAGED.
5. PLACE AND COMPACT FILL MATERIAL AROUND SETTLEMENT GAUGE WITHOUT DISTURBING GAUGE.
6. NOTIFY ENGINEER WEEKLY TO SURVEY AND RECORD THE FOLLOWING:
   (c) TOP OF PIPE ELEVATION AND
   (d) EMBANKMENT ELEVATION.



7. CONNECT PIPE/COUPLER EXTENSION TO EXISTING PIPE/COUPLER AS NEEDED TO MAINTAIN A PIPE/COUPLER STICK-UP OF AT LEAST 12" WHILE MONITORING SETTLEMENT.
8. SCREW PIPES/COUPLERS TOGETHER HAND TIGHT AND THEN TIGHTEN 2 TO 3 FULL TURNS WITH A WRENCH.
9. NOTIFY ENGINEER TO SURVEY AND RECORD THE FOLLOWING:
   (c) TOP OF PIPE ELEVATION,
   (d) EMBANKMENT ELEVATION AND
   (e) TOP OF EXTENSION ELEVATION.
10. RETURN TO STEP 4 WITH NEW TOP OF PIPE ELEVATION EQUAL TO TOP OF EXTENSION ELEVATION.



SETTLEMENT GAUGE

NOTES:

1. SEE SHEET 2G-10 AND ROADWAY SUMMARY SHEETS FOR APPROXIMATE SETTLEMENT GAUGE LOCATIONS.
2. FOR STANDARD EMBANKMENT MONITORING, SEE EMBANKMENT SETTLEMENT GAUGES PROVISION.
3. FOR LOCATIONS OVER THE REINFORCED AGGREGATE PLATFORM, INSTALL SETTLEMENT GAUGES AFTER CONSTRUCTION OF THE REINFORCED AGGREGATE PLATFORM. FOR LOCATIONS NOT OVER THE REINFORCED AGGREGATE PLATFORM, INTALL SETTLEMENT GAUGES AFTER CLEARING AND GRUBBING GAUGE LOCATIONS AND BEFORE CONSTRUCTING EMBANKMENTS WITH EMBANKMENT MONITORING.

Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: F-0869

EMBANKMENT MONITORING DETAILS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

COMPUTED BY: JCH DATE: 8/23/16
CHECKED BY: GSP DATE: 8/23/16

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Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

SUMMARY OF EARTHWORK

(IN CUBIC YARDS)

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
–L– 10+75.00	–L– 32+61.98 (BEGIN BRIDGE)	1747	61606	61121	1262
SUBTOTALS:		1747	61606	61121	1262
–L– 33+75.48 (END BRIDGE)	–L– 43+05.00	1560	63271	63204	1493
–L1– 10+00.00	–L1– 14+53.08				
–L2– 10+25.00	–L2– 11+20.00	0	1065	1065	
SUBTOTALS:		1560	64336	64269	1493
–Y1REV– 10+50.00	–Y1REV– 23+17.31	360	2044	1813	129
SUBTOTALS:		360	2044	1813	129
TOTAL:		3667	127986	127203	2884
LOSS DUE TO CLEARING & GRUBBING					
PROJECT TOTALS:		3667	127986	127203	2884
5% TO REPLACE TOP SOIL ON BORROW PIT				6360	
GRAND TOTALS:		3667		133563	
SAY:		3800		140000	

PER GEOTECH RECOMMENDATIONS, ESTIMATE CLASS IV SUBGRADE STABILIZATION = 400 TON
PER GEOTECH RECOMMENDATIONS, ESTIMATE SHALLOW UNDERCUT BY STATIONS = 300 CY
PER GEOTECH RECOMMENDATIONS, ESTIMATE SHALLOW UNDERCUT CONTINGENCY = 200 CY
TOTAL SHALLOW UNDERCUT = 500 CY

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

PARCEL INDEX

PARCEL NO.	PROPERTY OWNERS NAMES	SHEET NO.
1	NOVO NORDISK PHARMACEUTICAL INDUSTRIES, INC.	4 – 8
2	CLAUDIA GONZALEZ SANTILLAN JOSE GUADALUPE ROCHA SAUCEDO	4
3	BETTY C WOODALL	7
4	BETTY L. MITCHELL	7,8
5	NEW BETHEL CHURCH	5,8

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION	LENGTH (FT)
–L–	32+00.00	BEGIN APP. SLAB	LT	47.81
–L–	END APP. SLAB	34+60.00	LT	70.35
–L–	32+00.00	BEGIN APP. SLAB	RT	47.81
–L–	END APP. SLAB	34+60.00	RT	70.35
			TOTAL:	236.32
			SAY:	237

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	TYPE III	GRAU 350 TL-3	M-350	B-77	CAT-1	VI MOD	BIC	AT-1	EA	G	NG				
–L–	23+75.00	32+61.98	LT.	887.50'				24+50.00	8'–0"	11'–0"		50'–0"		1'–0"			1		1											
–L–	23+75.00	32+61.98	RT.	887.50'			24+50.00		8'–0"	11'–0"	50'–0"		1'–0"				1		1											
–L–	33+75.48	40+56.73	LT.	681.25'			39+80.00		8'–0"	11'–0"	50'–0"		1'–0"				1		1											
–L–	33+75.48	13+24.91 (–L1–)	RT.	887.50'				12+50 (–L1–)	8'–0"	11'–0"									1	1										
			PROJECT SUBTOTAL	3343.75'													3		4	1										
		LESS ANCHOR DEDUCTIONS		(–)231.25'												GUARDRAIL ANCHOR DEDUCTIONS														
			PROJECT TOTAL	3112.50'												TYPE B–77 = 4 @ 18.75' = 75'														
																GRAU–350 TL–3 = 3 @ 50' = 150'														
			SAY	3112.50'												CAT–1 = 1 @ 6.25' = 6.25'														
						ADDITIONAL GUARDRAIL POSTS = 5 EACH										TOTAL DEDUCTIONS = 231.25'														

COMPUTED BY: GSP DATE: 04/27/16
CHECKED BY: KA DATE: 04/28/16

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

SUB-REGIONAL & REGIONAL

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	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
-L- 10+42.00	CL	0402			280.0	277.0													
-Y1REV- 20+52.00	CL																		
-L- 26+48.00	CL	0501			282.7	282.5													
-L- 26+53.00	CL	0502			282.7	282.5													
-L- 32+04.00	RT.	0601		321.7	318.9														
-L- 32+04.00	RT.	0601	0612		318.9	294.1			48							X			X
-L- 32+04.00	LT.	0602		321.7	318.9														
-L- 32+04.00	LT.	0602	0603		318.9	294.3			48							X			X
-L- 34+56.00	LT.	0604		320.3	317.5														
-L- 34+56.00	CL	0604	0605		317.5	317.3													
-L- 34+56.00	RT.	0605		320.3	317.3														
-L- 34+56.00	RT.	0605	0606		317.3	287.9			56							X			X
-L- 41+65.00	LT.	0607		286.2	283.0														
-L- 42+00.00	LT.	0607	0608		283.0	282.7													
-L- 42+35.00	LT.	0608		285.8	282.7														
-L- 42+29.00	RT.	0608	0610		282.7	282.0													
-L1- 13+02.00	LT.	0609		287.5	284.3														
-L1- 13+36.00	LT.	0609	0610		284.3	282.0													
-L1- 13+69.00	LT.	0610		286.3	282.0														
-L1- 14+12.00	LT.	0610	0611		282.0	281.5	X												
-L1- 14+53.00	LT.	0611		284.7	281.3														
TOTAL									152										

STATION	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"
-L- 10+42.00																		104				
-Y1REV- 20+52.00																						
-L- 26+48.00												92										
-L- 26+53.00												92										
-L- 32+04.00																						
-L- 32+04.00																						
-L- 32+04.00																						
-L- 32+04.00																						
-L- 34+56.00																						
-L- 34+56.00																32						
-L- 34+56.00																						
-L- 34+56.00																						
-L- 41+65.00																						
-L- 42+00.00								72														
-L- 42+35.00																						
-L- 42+29.00								144														
-L1- 13+02.00																						
-L1- 13+36.00								60														
-L1- 13+69.00																						
-L1- 14+12.00								84														
-L1- 14+53.00																						
TOTAL								360				184				32		104				

STATION	**" R. C. PIPE (CLASS V)	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	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'	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	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	TRAFFIC BEARING GRATED DROP INLET STD. 840.35	(N.S.) FRAME WITH TWO GRATES STD. 840.29	DROP INLET STD. 840.14 OR STD. 840.15	DROP INLET FRAME AND GRATE STD. 840.16	J.B. STD. 840.31 OR 840.32	M.H. FRAME & COVER STD. 840.54	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. TYPE "D" STD. 840.19 OR 840.28	PIPE CLEANOUT EA.	ELBOWS NO. & SIZE	PIPE REMOVAL LIN.FT.	REMARKS
-L- 10+42.00																													
-Y1REV- 20+52.00																												50'	REMOVE EX. 30" RCP.
-L- 26+48.00						4.5																							
-L- 26+53.00																													
-L- 32+04.00								1									1	1											
-L- 32+04.00																											2@15"		
-L- 32+04.00								1									1	1											
-L- 32+04.00																											2@15"		
-L- 34+56.00								1									1	1											
-L- 34+56.00																													
-L- 34+56.00								1									1	1											
-L- 34+56.00																											2@15"		
-L- 41+65.00								1											1	1									
-L- 42+00.00																													
-L- 42+35.00								1											1	1									
-L- 42+29.00																													
-L1- 13+02.00								1											1	1									
-L1- 13+36.00																													
-L1- 13+69.00								1											1	1									
-L1- 14+12.00																													
-L1- 14+53.00								1											1	1									
TOTAL						4.5		9									4	4	5	5							6@15"	50'	

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

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54" & OVER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 54"	60"	66"	72"	78"	84"	C.S. PIPE 54" .109	54" .138	54" SHOP ELON-GATED .138	54" SHOP ELON-GATED .168	60" .138	60" .168	66" .138	66" .168	72" .138	72" .168
-Y1REV- 20+52.00	CL	0401			273.6	273.3																	
-L- 16+43.00	CL	0403			277.7	276.4		108															
TOTAL								108															

STATION	CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) 54"	60"	66"	72"	78"	84"	REINFORCED ENDWALLS WITH R.C. - C.Y.	WITH C.S. - C.Y.	MASONARY DRAINAGE STRUCTURES CUBIC YARDS	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & SIZE	REINF. CONC. ELBOWS NO. & SIZE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
-Y1REV- 20+52.00	64						10															
-L- 16+43.00							5															
TOTAL	64						15															

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

COMPUTED BY:	ALEXANDER, M. J.	DATE:	07/2016
CHECKED BY:	NASH, A. A.	DATE:	07/2016

(2-16-16)

PROJECT NO.	SHEET NO.
R-5769	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2*	Riprap Class 1/2/B	Rock Plating SY
-L-	3:1	24+50	1.5:1	29+40	LT AND RT	1	1/2/B	2,800
-L-	1.5:1	29+40	1.5:1	32+68	LT AND RT	2	1/2/B	3,450
-L-	1.5:1	33+69	1.5:1	35+80	RT	2	1/2/B	1,600
-L-	1.5:1	35+80	1.5:1	39+38	RT	1	1/2/B	1,450
-L1-	1.5:1	10+00	3:1	13+47	RT	1	1/2/B	400
							TOTAL SY:	9,700

*SEE SHEET 2G-12 FOR ROCK PLATING DETAILS.

SUMMARY OF GEOTEXTILE FOR EMBANKMENT STABILIZATION

LINE	Beginning Station	Ending Station	Number of Layers	SY
-L-	24+50	27+50	1	3,100
-L-	27+50	30+00	2	6,700*
-L-	35+50	39+38	1	2,150
-L1-	10+00	11+15	1	750
CONTINGENCY			--	500
			TOTAL SY:	13,200

*Quantity listed is area covered times the number of layers.

SUMMARY OF ROCK EMBANKMENT

LINE	Beginning Station	Ending Station	Rock Embank-ment TONS	#57 Stone TONS	Geotextile for Rock Embank-ment SY
-L-	20+80	29+40	7,500	1,800	6,800
-L-	35+80	43+57	3,100	1,500	6,700
-L1-	10+00	15+08	1,300	500	1,900
-L2-	10+00	11+40	300	100	100
CONTINGENCY			6,100	2,000	--
		TOTAL TONS/SY:	18,300	5,900	15,500

SUMMARY OF REINFORCED AGGREGATE PLATFORMS

LINE	Beginning Station	Ending Station	Rip Rap Class A TONS	#57 Stone TONS	Separation Geotextile SY	Reinforcement Geotextile for Aggregate Platforms	
						Number of Layers	SY
-L-	31+42	32+39	200	400	1,000	3	2,550
-L-	33+69	35+17	250	400	1,200	3	2,950
	TOTAL TONS/SY:		500	800	2,200	--	5,500

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
1	-L- 31+00	20	LT
2	-L- 31+00	CL	--
3	-L- 31+00	20	RT
4	-L- 32+00	20	LT
5	-L- 32+00	CL	--
6	-L- 32+00	20	RT
7	-L- 34+35	CL	--
8	-L- 34+35	20	RT
9	-L- 35+00	20	LT
10	-L- 35+00	CL	CL
11	-L- 35+00	20	RT
12	-L- 36+00	20	LT
13	-L- 36+00	20	RT
	TOTAL GAUGES (EACH):		13

SUMMARY OF AGGREGATE SUBGRADE

LINE	Station	Station	Aggregate Thickness INCHES	Shallow Undercut CY	Geotextile for Soil Stabilization SY*	Class IV Subgrade Stabilization TONS
-Y1REV-	10+50	22+75	12	300	1,200	200
CONTINGENCY				200	200	200
		TOTAL CY/TONS/SY:		500	1,400**	400

**Total square yards of "Geotextile for Soil Stabilization" is only the estimated quantity for aggregate subgrade and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.

-Y1REV-			-L-
PI Sta 10+55.20 △ = 5° 28' 44.6" (LT) D = 4° 58' 01.2" L = 110.31' T = 55.20' R = 1,153.53' SE = SEE PLANS	PI Sta 16+48.69 △ = 29° 58' 45.7" (RT) D = 6° 04' 15.1" L = 493.82' T = 252.70' R = 943.78' SE = .06 DS = 50MPH*	PI Sta 21+06.75 △ = 2° 38' 28.8" (LT) D = 0° 36' 32.0" L = 433.80' T = 216.94' R = 9,410.00' SE = SEE PLANS	PI Sta 13+99.02 △ = 58° 11' 22.1" (RT) D = 11° 27' 33.0" L = 507.80' T = 278.24' R = 500.00' SE = .06 DS = 40MPH

*- MEETS SUBREGIONAL TIER GUIDELINES

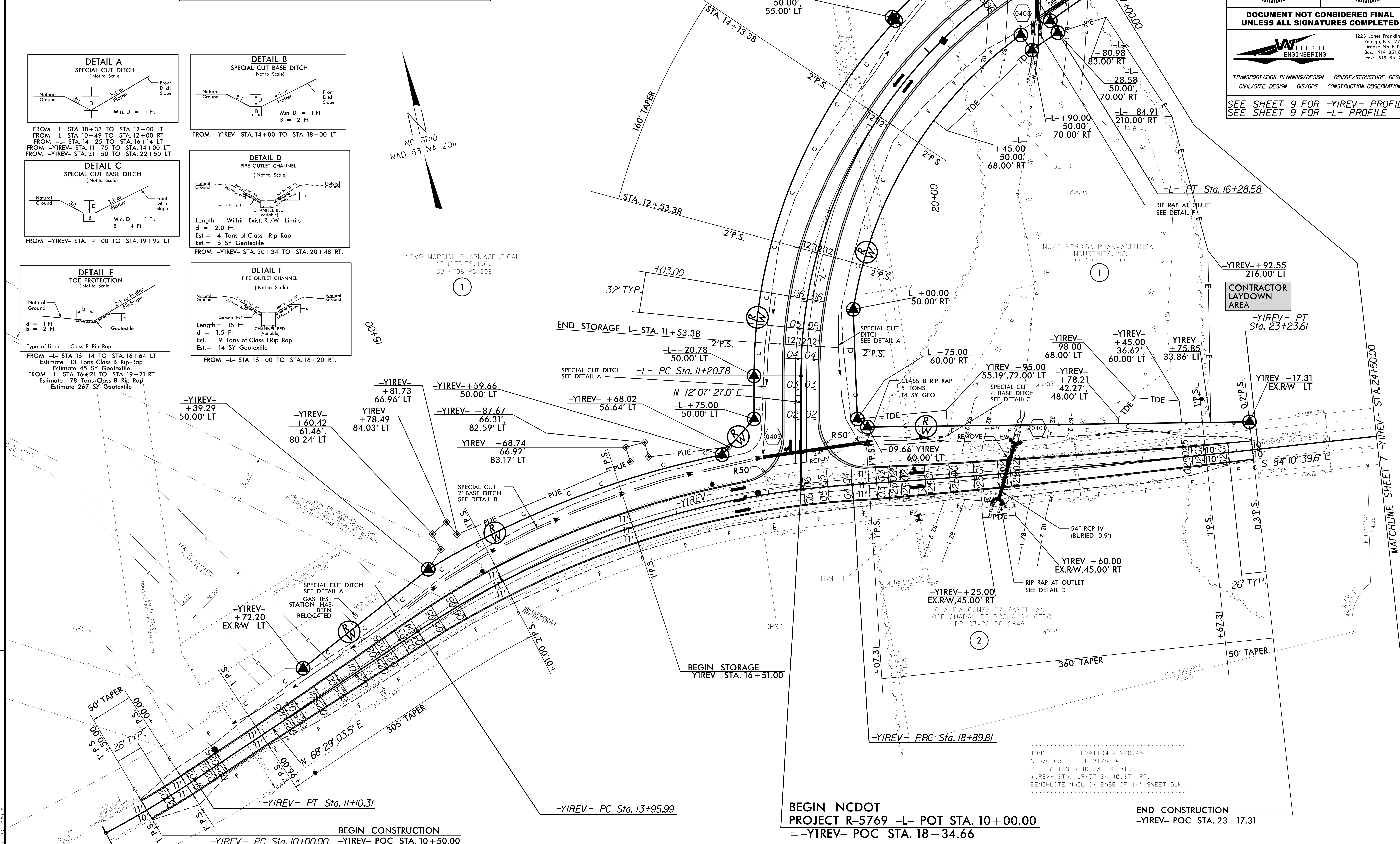
PROJECT REFERENCE NO.	SHEET NO.
R-5769	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 22999 8/24/2016 GREGORY S. PURVIS	SEAL 31977 8/24/2016 KEVIN B. ALFORD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WETHERILL ENGINEERING
1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

SEE SHEET 9 FOR -Y1REV- PROFILE
SEE SHEET 9 FOR -L- PROFILE



DETAIL A
SPECIAL CUT DITCH
FROM -L- STA. 10+33 TO STA. 12+00 LT
FROM -L- STA. 10+49 TO STA. 12+00 RT
FROM -L- STA. 14+25 TO STA. 16+14 LT
FROM -Y1REV- STA. 11+75 TO STA. 14+00 LT
FROM -Y1REV- STA. 21+50 TO STA. 22+50 LT
DETAIL B
SPECIAL CUT BASE DITCH
FROM -Y1REV- STA. 14+00 TO STA. 18+00 LT
DETAIL C
SPECIAL CUT BASE DITCH
FROM -Y1REV- STA. 19+00 TO STA. 19+92 LT
DETAIL D
PIPE OUTLET CHANNEL
Length = Within Exist. R/W Limits
d = 2.0 Ft.
Est. = 4 Tons of Class I Rip-Rap
Est. = 6 SY Geotextile
FROM -Y1REV- STA. 20+34 TO STA. 20+48 RT.
DETAIL E
TOE PROTECTION
Type of Liner= Class B Rip-Rap
FROM -L- STA. 16+14 TO STA. 16+64 LT
Estimate 13 Tons Class B Rip-Rap
Estimate 45 SY Geotextile
FROM -L- STA. 16+21 TO STA. 19+21 RT
Estimate 78 Tons Class B Rip-Rap
Estimate 267 SY Geotextile
DETAIL F
PIPE OUTLET CHANNEL
Length = 15 Ft.
d = 1.5 Ft.
Est. = 9 Tons of Class I Rip-Rap
Est. = 14 SY Geotextile
FROM -L- STA. 16+00 TO STA. 16+20 RT.
NC GRID NAD 83 NA 2011
NOVO NORDISK PHARMACEUTICAL INDUSTRIES, INC. DB 4706 PG 206
CLAUDIA GONZALEZ SANTILLAN JOSE GUADALUPE ROCHA SAUCEDO DB 03426 PG 0849
CONTRACTOR LAYDOWN AREA
MATCHLINE SHEET 5 -L- STA.17+00.00
MATCHLINE SHEET 7 -Y1REV- STA.24+50.00
-L- PT Sta. 16+28.58
-L- PC Sta. 11+20.78
-Y1REV- PT Sta. 23+23.61
-Y1REV- PRC Sta. 18+89.81
-Y1REV- PC Sta. 13+95.99
-Y1REV- PT Sta. 11+10.31
-Y1REV- PC Sta. 10+00.00
END STORAGE -L- STA. 11+53.38
BEGIN STORAGE -Y1REV- STA. 16+51.00
BEGIN CONSTRUCTION -Y1REV- POC STA. 10+50.00
BEGIN NCDOT PROJECT R-5769 -L- POT STA. 10+00.00 =-Y1REV- POC STA. 18+34.66
END CONSTRUCTION -Y1REV- POC STA. 23+17.31
N 12° 07' 27.0" E
S 84° 10' 39.6" E
N 68° 29' 03.5" E
54" RCP-IV (BURIED 0.9')
24" RCP-IV
CLASS B RIP RAP 5 TONS 14 SY GEO
RIP RAP AT OUTLET SEE DETAIL D
RIP RAP AT OULET SEE DETAIL F
360' TAPER
305' TAPER
160' TAPER
50' TAPER
TBM1 ELEVATION = 278.45
N 676965 E 2175790
BL STATION 5+40.00 168 RIGHT
Y1REV- STA. 19+57.34 40.07' RT.
BENCHLITE NAIL IN BASE OF 14" SWEET GUM

PROJECT REFERENCE NO.	SHEET NO.
R-5769	5

R/W SHEET NO.

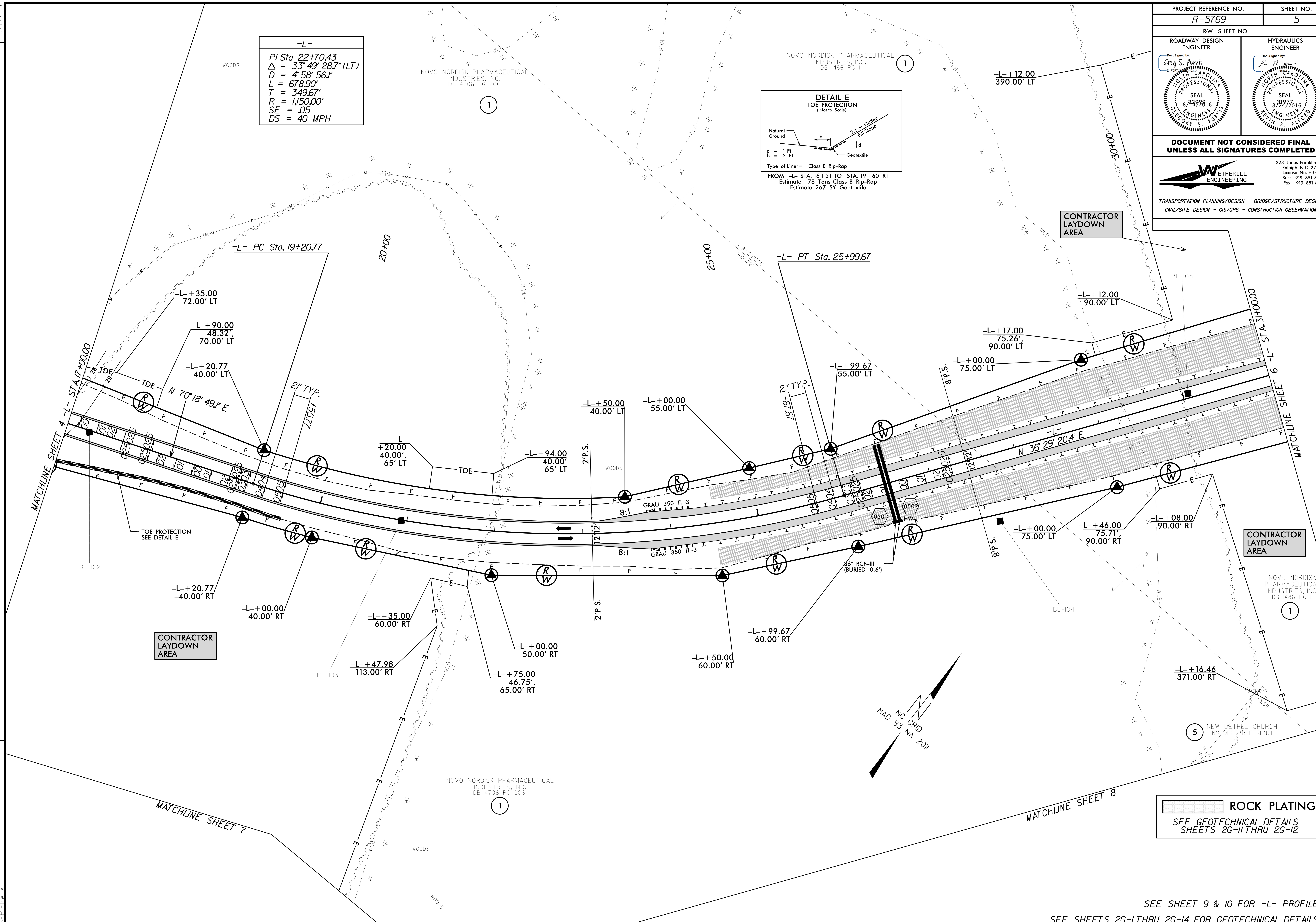
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Greg S. Purvis — SEAL 22998 — 8/24/2016	SEAL 31977 — 8/24/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

REVISIONS



-L-
PI Sta 22+70.43
△ = 33° 49' 28.7" (LT)
D = 4° 58' 56.1"
L = 678.90'
T = 349.67'
R = 1,150.00'
SE = .05
DS = 40 MPH
DETAIL E
TOE PROTECTION
(Not to Scale)
Natural Ground
2:1 or Flatter Fill Slope
Geotextile
d = 1 Ft.
b = 2 Ft.
Type of Liner= Class B Rip-Rap
FROM -L- STA. 16+21 TO STA. 19+60 RT
Estimate 78 Tons Class B Rip-Rap
Estimate 267 SY Geotextile
NOVO NORDISK PHARMACEUTICAL INDUSTRIES, INC. DB 4706 PG 206
NOVO NORDISK PHARMACEUTICAL INDUSTRIES, INC. DB 1486 PG 1
NEW BETHEL CHURCH NO DEED REFERENCE
CONTRACTOR LAYDOWN AREA
-L- PC Sta. 19+20.77
-L- PT Sta. 25+99.67
N 70° 18' 49.1" E
N 36° 29' 20.4" E
MATCHLINE SHEET 4 -L- STA.17+00.00
MATCHLINE SHEET 6 -L- STA.31+00.00
MATCHLINE SHEET 7
MATCHLINE SHEET 8
TOE PROTECTION SEE DETAIL E
36" RCP-III (BURIED 0.6')
GRAU 350 TL-3
21' TYP.
NC GRID NAD 83 NA 2011
ROCK PLATING
SEE GEOTECHNICAL DETAILS SHEETS 2G-11 THRU 2G-12

SEE SHEET 9 & 10 FOR -L- PROFILE

SEE SHEETS 2G-1 THRU 2G-14 FOR GEOTECHNICAL DETAILS

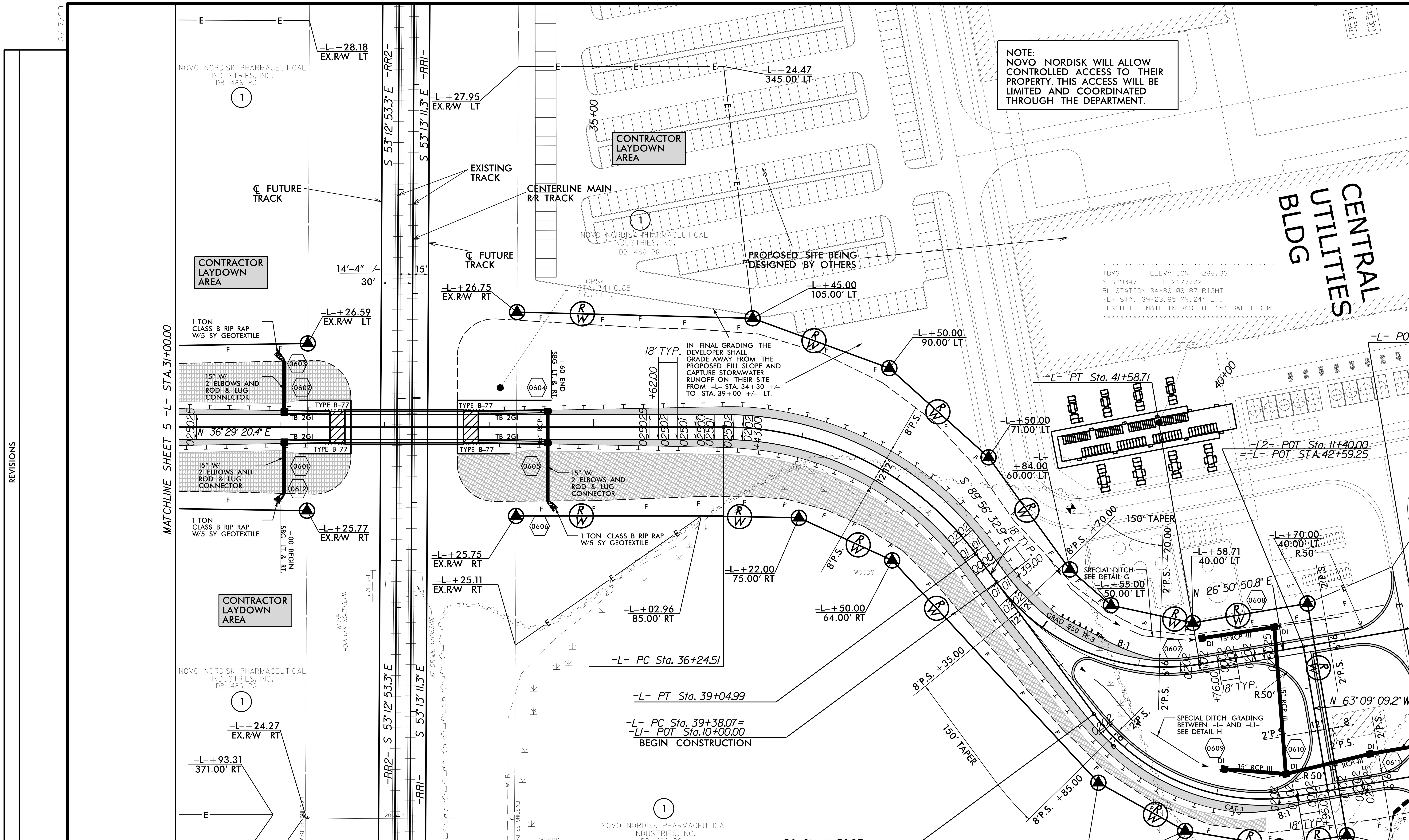
PROJECT REFERENCE NO.	SHEET NO.
R-5769	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

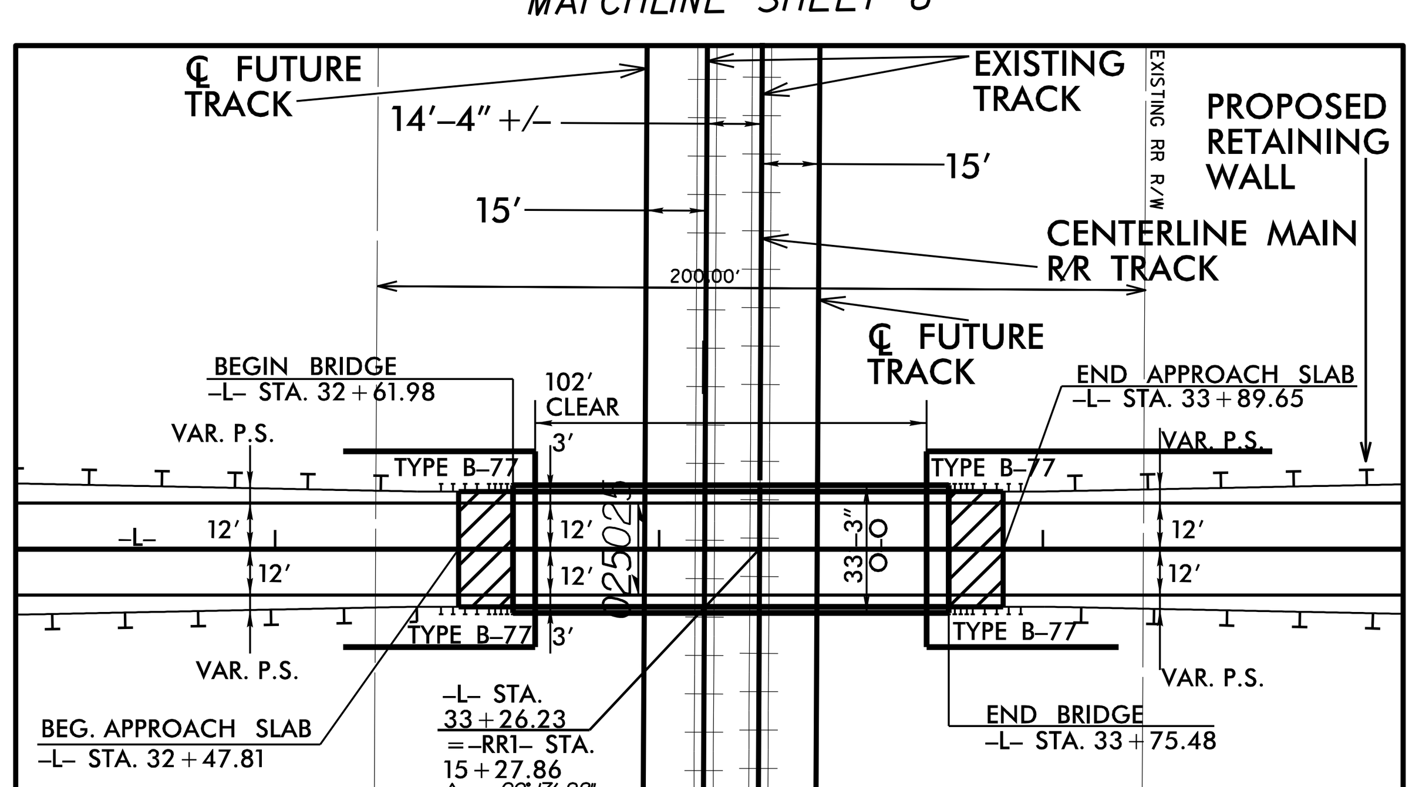
SEAL 22999 8/24/2016 GREGORY S. PURVIS — NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 31977 8/24/2016 KEVIN B. ALFORD — NORTH CAROLINA PROFESSIONAL ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

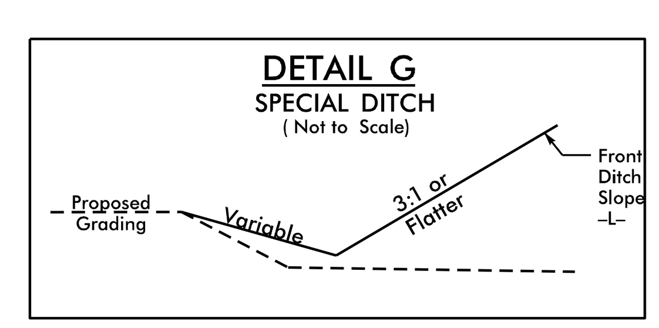
WETHERILL ENGINEERING
1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

NOTE:
NOVO NORDISK WILL ALLOW CONTROLLED ACCESS TO THEIR PROPERTY. THIS ACCESS WILL BE LIMITED AND COORDINATED THROUGH THE DEPARTMENT.

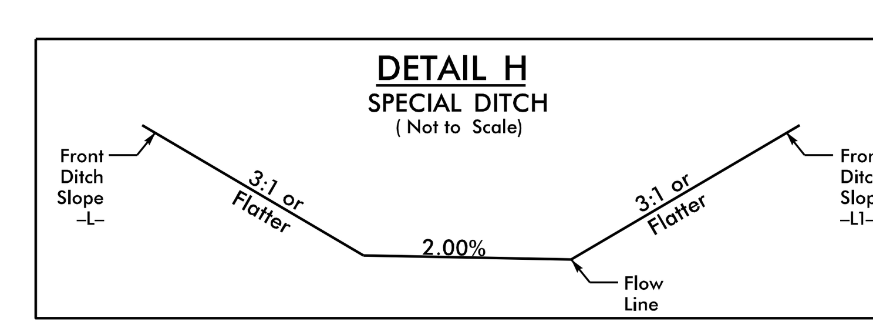

REVISIONS
NOVO NORDISK PHARMACEUTICAL INDUSTRIES, INC. DB 1486 PG 1
CONTRACTOR LAYDOWN AREA
CENTRAL UTILITIES BLDG
EXISTING TRACK
CENTERLINE MAIN R/R TRACK
℄ FUTURE TRACK
PROPOSED SITE BEING DESIGNED BY OTHERS
MATCHLINE SHEET 5 -L- STA.31+00.00
MATCHLINE SHEET 8
IN FINAL GRADING THE DEVELOPER SHALL GRADE AWAY FROM THE PROPOSED FILL SLOPE AND CAPTURE STORMWATER RUNOFF ON THEIR SITE FROM -L- STA. 34+30 +/- TO STA. 39+00 +/- LT.
1 TON CLASS B RIP RAP W/5 SY GEOTEXTILE
-L- PC Sta. 36+24.51
-L- PT Sta. 39+04.99
-L- PC Sta. 39+38.07 = -L1- POT Sta.10+00.00 BEGIN CONSTRUCTION
-L1- PC Sta. 11+56.83
-L- PT Sta. 41+58.71
-L- POT Sta. 43+69.04
-L2- POT Sta. 11+40.00 = -L- POT STA.42+59.25
END NCDOT PROJECT R-5769 -L- STA. 43+57.04
END CONSTRUCTION -L1- POC STA. 15+07.87
-L1- POT Sta. 15+28.38
-L1- PT Sta. 13+77.48
-L2- POT Sta. 10+00.00 = -L1- POT STA.14+07.33
TBM3 ELEVATION - 286.33 N 679047 E 2177702 BL STATION 34+86.00 87 RIGHT -L- STA. 39+23.65 99.24' LT. BENCHLITE NAIL IN BASE OF 15" SWEET GUM
S 53°12'53.3" E
S 53°13'11.3" E
N 36°29'20.4" E
S 89°56'32.9" E
N 26°50'50.8" E
N 63°09'09.2" W
150' TAPER
18" RCP (TO BE CONSTRUCTED BY OTHERS)
CB (TO BE CONSTRUCTED BY OTHERS)
36" RCP (TO BE CONSTRUCTED BY OTHERS)
SPECIAL DITCH GRADING BETWEEN -L- AND -L1- SEE DETAIL H
SPECIAL DITCH SEE DETAIL G


℄ FUTURE TRACK
EXISTING TRACK
PROPOSED RETAINING WALL
CENTERLINE MAIN R/R TRACK
BEGIN BRIDGE -L- STA. 32+61.98
END APPROACH SLAB -L- STA. 33+89.65
BEG. APPROACH SLAB -L- STA. 32+47.81
END BRIDGE -L- STA. 33+75.48
-L- STA. 33+26.23 = -RR1- STA. 15+27.86 Δ = 90°17'28"
102' CLEAR
TYPE B-77
VAR. P.S.

SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP



FROM -L- STA. 39+50 TO STA. 43+05 LT



FROM -L- STA. 40+50 TO STA. 43+05 RT

-L-		-L1-
PI Sta 37+75.94	PI Sta 40+61.13	PI Sta 12+79.90
Δ = 53°34'06.6" (RT)	Δ = 63°12'36.2" (LT)	Δ = 63°12'36.2" (LT)
D = 19°05'54.9"	D = 28°38'52.4"	D = 28°38'52.4"
L = 280.48'	L = 220.64'	L = 220.64'
T = 151.44'	T = 123.07'	T = 123.07'
R = 300.00'	R = 200.00'	R = 200.00'
SE = RC	SE = RC	SE = RC

NC GRID NAD 83 NA 2011

ROCK PLATING
SEE GEOTECHNICAL DETAILS SHEETS 2G-11 THRU 2G-12

SEE SHEET 10 FOR -L-, -L1-, & -L2- PROFILE
SEE SHEETS 2G-1 THRU 2G-14 FOR GEOTECHNICAL DETAILS
SEE SHEETS S-1 THRU S-23 FOR STRUCTURE PLANS
SEE SHEETS W-1 THRU W-6 FOR WALL PLANS

8/23/2016 R-5769_RDY_psh6.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-5769	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DocuSigned by: Greg S. Purvis — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22999 8/24/2016 GREGORY S. PURVIS	DocuSigned by: K. B. Alford — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 8/24/2016 KEVIN B. ALFORD

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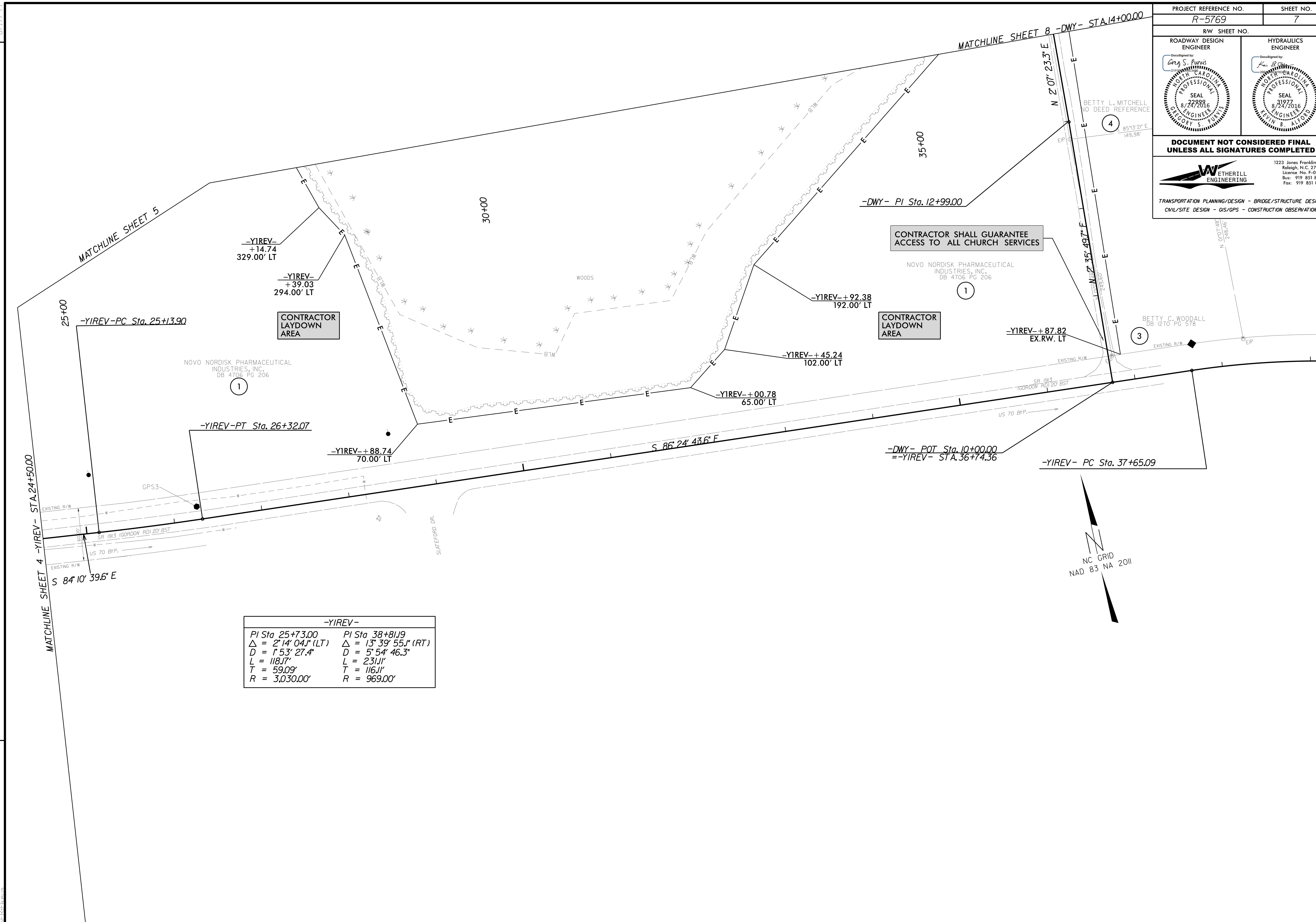

-YIREV-	
PI Sta 25+73.00	PI Sta 38+81.19
Δ = 2° 14' 04.1" (LT)	Δ = 13° 39' 55.1" (RT)
D = 1° 53' 27.4"	D = 5° 54' 46.3"
L = 118.17'	L = 231.11'
T = 59.09'	T = 116.11'
R = 3,030.00'	R = 969.00'

8/23/2016 R-5769_RDY_psh7.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-5769	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 22999 8/24/2016 GREGORY S. PURVIS	SEAL 31977 8/24/2016 KEVIN B. ALFORD

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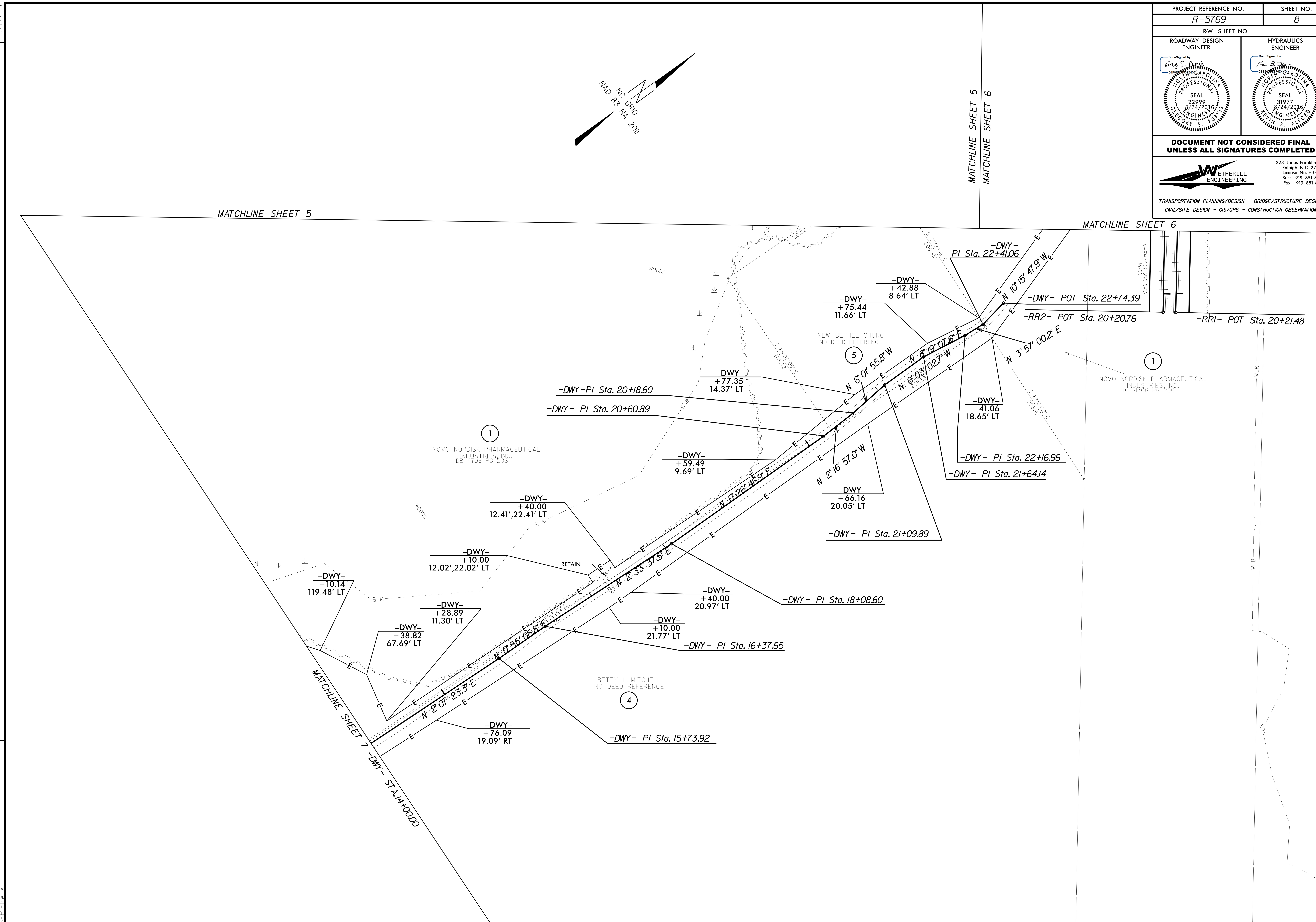
REVISIONS

8/17/99



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PROJECT REFERENCE NO.	SHEET NO.
R-5769	9

ROADWAY DESIGN ENGINEER — Greg S. Purvis — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22999 8/24/2016 GREGORY S. PURVIS

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 8/24/2016 KEVIN B. ALFORD

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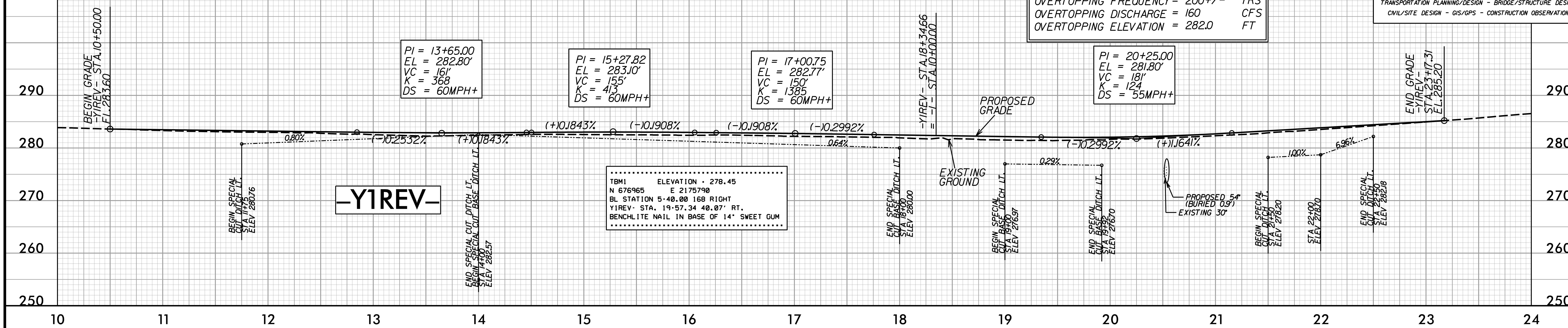
PIPE HYDRAULIC DATA

PROP. 54" Sta. 20+54 -Y1REV-

DRAINAGE AREA	= 123.3	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 100	CFS
DESIGN HW ELEVATION	= 279.3	FT
100 YEAR DISCHARGE	= 140	CFS
100 YEAR HW ELEVATION	= 281.1	FT
OVERTOPPING FREQUENCY	= 200+/-	YRS
OVERTOPPING DISCHARGE	= 160	CFS
OVERTOPPING ELEVATION	= 282.0	FT



PIPE HYDRAULIC DATA

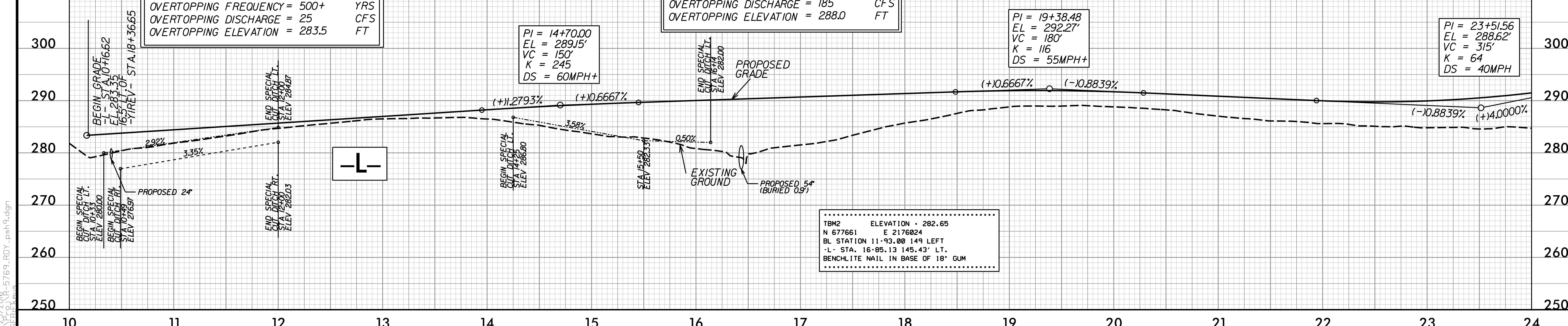
PROP. 24" Sta. 10+40 -L-

DRAINAGE AREA	= 4.4	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 10	CFS
DESIGN HW ELEVATION	= 281.7	FT
100 YEAR DISCHARGE	= 12	CFS
100 YEAR HW ELEVATION	= 281.9	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 25	CFS
OVERTOPPING ELEVATION	= 283.5	FT

PIPE HYDRAULIC DATA

PROP. 54" Sta. 16+43 -L-

DRAINAGE AREA	= 110.2	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 100	CFS
DESIGN HW ELEVATION	= 283.4	FT
100 YEAR DISCHARGE	= 130	CFS
100 YEAR HW ELEVATION	= 284.8	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 185	CFS
OVERTOPPING ELEVATION	= 288.0	FT



PROJECT REFERENCE NO.	SHEET NO.
R-5769	10

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DocuSigned by: Greg S. Purvis D1F0F7C266E3403... NORTH CAROLINA PROFESSIONAL SEAL 22999 8/24/2016 ENGINEER GREGORY S. PURVIS	DocuSigned by: 2BE802BEB76D44D... NORTH CAROLINA PROFESSIONAL SEAL 31977 8/24/2016 ENGINEER KEVIN B. ALFORD

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PIPE HYDRAULIC DATA

PROP. 2@36" Sta. 26+50 -L-

DRAINAGE AREA	= 39.5	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 26	CFS
DESIGN HW ELEVATION	= 285.3	FT
100 YEAR DISCHARGE	= 42	CFS
100 YEAR HW ELEVATION	= 286.5	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 71	CFS
OVERTOPPING ELEVATION	= 289.5	FT