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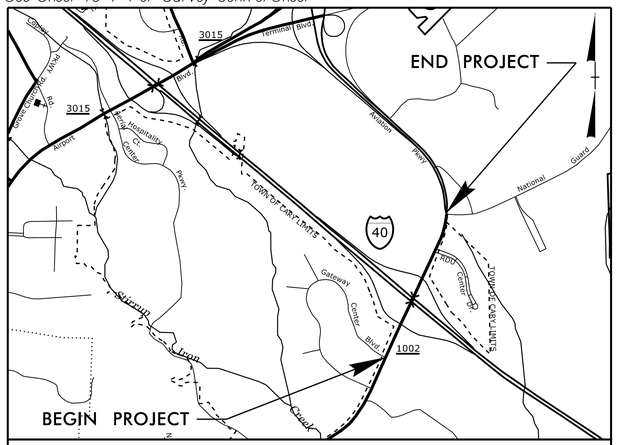
09/08/99

TIP PROJECT: I-5506

CONTRACT: C204069

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

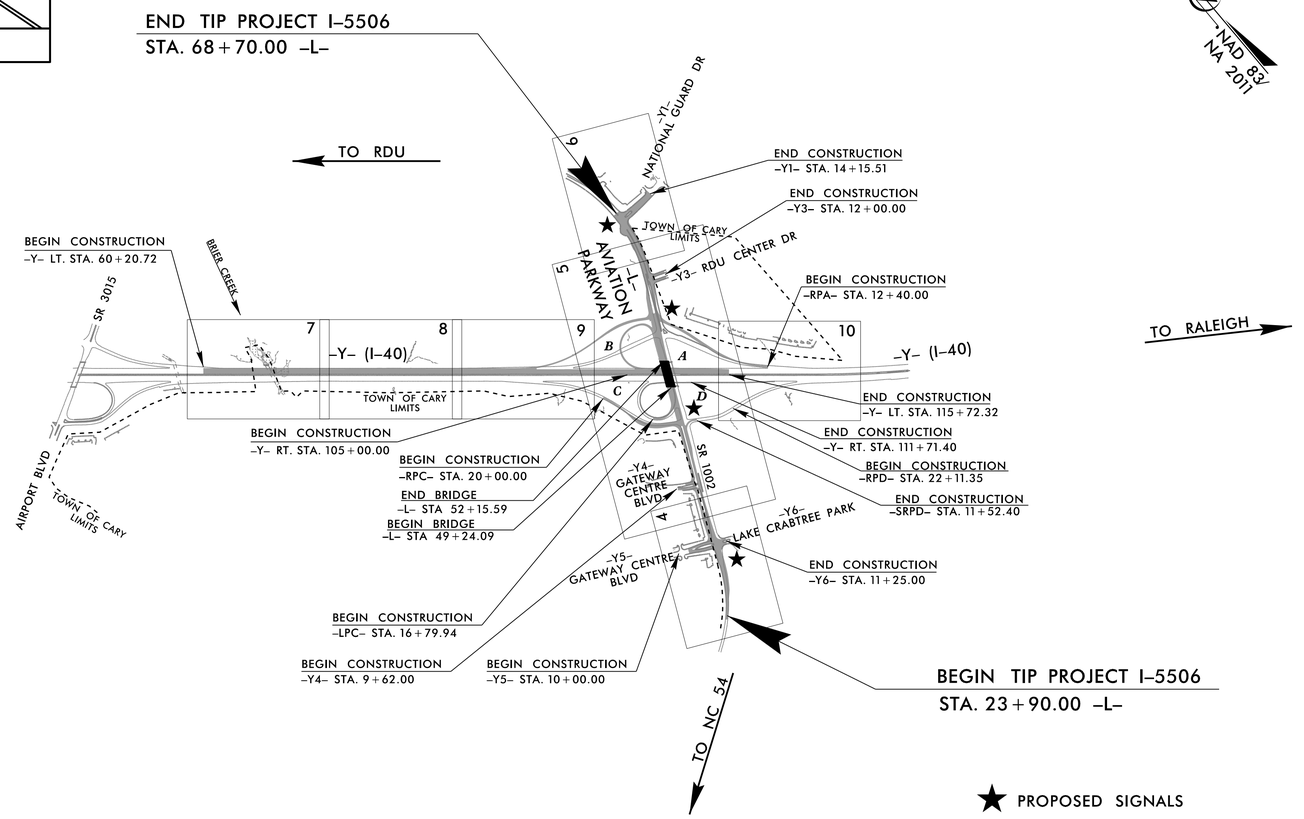
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5506	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
43608.1.1	NHPP-040-7(154)284	PE
43608.2.2	NHPP-040-7(154)284	ROW/UTIL.
43608.3.3	NHPP-040-7(154)284	CONST.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION: I-40 AND SR 1002 (AVIATION PARKWAY) INTERCHANGE

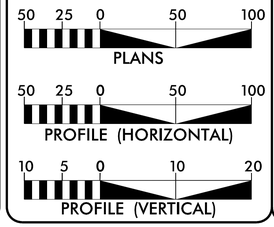
TYPE OF WORK: ITS, DRAINAGE, GRADING, PAVING, SIGNALS CULVERT AND STRUCTURE



THIS IS A PARTIAL CONTROLLED- ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS SHOWN ON THE PLANS.

★ PROPOSED SIGNALS

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 28,555
ADT 2040 = 37,600
K = 55 %
D = 10 %
T = 7 % *
V = 50 MPH
* TTST=2% DUAL=5%
FUNC CLASS= "MINOR ARTERIAL"
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5506 = 0.793 MILES
LENGTH STRUCTURE TIP PROJECT I-5506 = 0.055 MILES
TOTAL LENGTH OF TIP PROJECT I-5506 = 0.848 MILES

Prepared for the North Carolina Department of Transportation in the Office of:

WETHERILL ENGINEERING
1223 JONES FRANKLIN ROAD
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 24, 2017

LETTING DATE:
FEBRUARY 20, 2018

EDWARD G. WETHERILL, PE
PROJECT ENGINEER

BOB A. MAY, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: GARY LOVERING, PE
ROADWAY DESIGN: PROJECT ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER MAX S. PRICE
Docusigned by: Max S. Price
SIGNATURE: 3D0F881484...
P.E. 12/28/2017

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY
Docusigned by: Bob A. May
SIGNATURE: 8D84424429493...
P.E. 12/27/2017

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

12/2/2017
...\Proj\I5506_Ray_PSH_01_tsh.dgn
USER:Rodell

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

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

PROJECT REFERENCE NO.	SHEET NO.
I-5506	1A

ROADWAY DESIGN ENGINEER
1/18/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

Sheet Number	Sheet
1	Title Sheet
1A	Index of Sheets, General Notes and list of Standards
1B	Conventional Symbols
1C-1 THRU 1C-2	Survey Control Sheets
2A-1 THRU 2A-6	Typical Sections and Pavement Schedule
2B-1 THRU 2B-4	Roadway Details (By Roadway Personnel)
2C-1 THRU 2C-6	Special Details (By Contracts)
2D-1 THRU 2D-8	Drainage Details
2G-1	Geotechnical Details Standard Temp. Shoring
2G-2 THRU 2G-4	Geotechnical Details Standard Temp. Wall
3B-1 THRU 3B-2	Guardrail , Earthwork , Pavement Removal, Breaking Of Exist. Pavement, Underdrains, Temp. Shoring Summaries, & Woven Wire Fence
3D-1 THRU 3D-5	Drainage Summaries
3G-1	Geotechnical Summaries
3P-1	Parcel Index Sheets
4 Thru 19	Plan and Profile Sheets
TMP-1 THRU TMP-37	Traffic Management Plans
PMP-1 THRU PMP-10	Pavement Marking Plans
E-1 THRU E-6	Electrical Plans
EC-1 THRU EC-18	Erosion Control Plans
RF-1	Reforestation Plans
SIGN-1 THRU SIGN-5G	Signing Plans
SIG-1 THRU SIG-M8	Signal Plans
SCP-1 Thru SCP-27	Signal Communication Plans
UC-1 THRU UC-6	Utility Construction Plans
UO-1 THRU UO-4	Utilities by Others Plans
X-1 THRU X-1A	Cross-Section Summary Sheet
X-1 Thru X-76	Cross-Sections
C-1 Thru C-4	Culvert Plans
S01-1 Thru S01-46	Structure Plans

LIST OF STANDARD DRAWINGS

EFF. 01-16-2018
REV.

2018 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, 2018 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
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.03	Guide for Paving Shoulders Under Bridges - Method III
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.02	Concrete Endwall and Sluice Gate - 15" thru 36" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
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
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.37	Steel Grate and Frame
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
848.06	Curb Ramp - Existing Curb & Gutter
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
852.01	Concrete Islands
852.04	Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
852.10	Median Construction - with Curb and Gutter
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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 PAVEMENT 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 III.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 & 225 .05 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

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

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 NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

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 Town Of Cary (Water & Sewer),

PSNC (Gas), Duke Energy (Distribution), AT&T, Level 3, Duke Net / Charter,

Town OF Cary (Sewer)

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

ROCK

ROCK IS ANTICIPATED BETWEEN RPA 16+75 - 20+50 & RPB 11+15 - 18+00. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

8/17/99

1/18/2018
I5506_rdy_psh_01A.dgn

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
I-5506	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard (Vineyard)

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole (P)
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole (HH)
- 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.)

01/21/16

PROJECT REFERENCE NO.	SHEET NO.
I-5506	1C-1
Location and Surveys	

SURVEY CONTROL SHEET I-5506

BM1 ELEVATION = 325.83
N 768763 E 2055295
Y STATION 48+13.00 477 LEFT
NAIL W/TAG IN 18" PINE

BM2 ELEVATION = 362.22
N 766801 E 2057265
L STATION 58+33.00 3216 LEFT
NAIL W/TAG

BM2 ELEVATION = 362.22
N 766801 E 2057265
Y STATION 75+83.00 240 LEFT
NAIL W/TAG

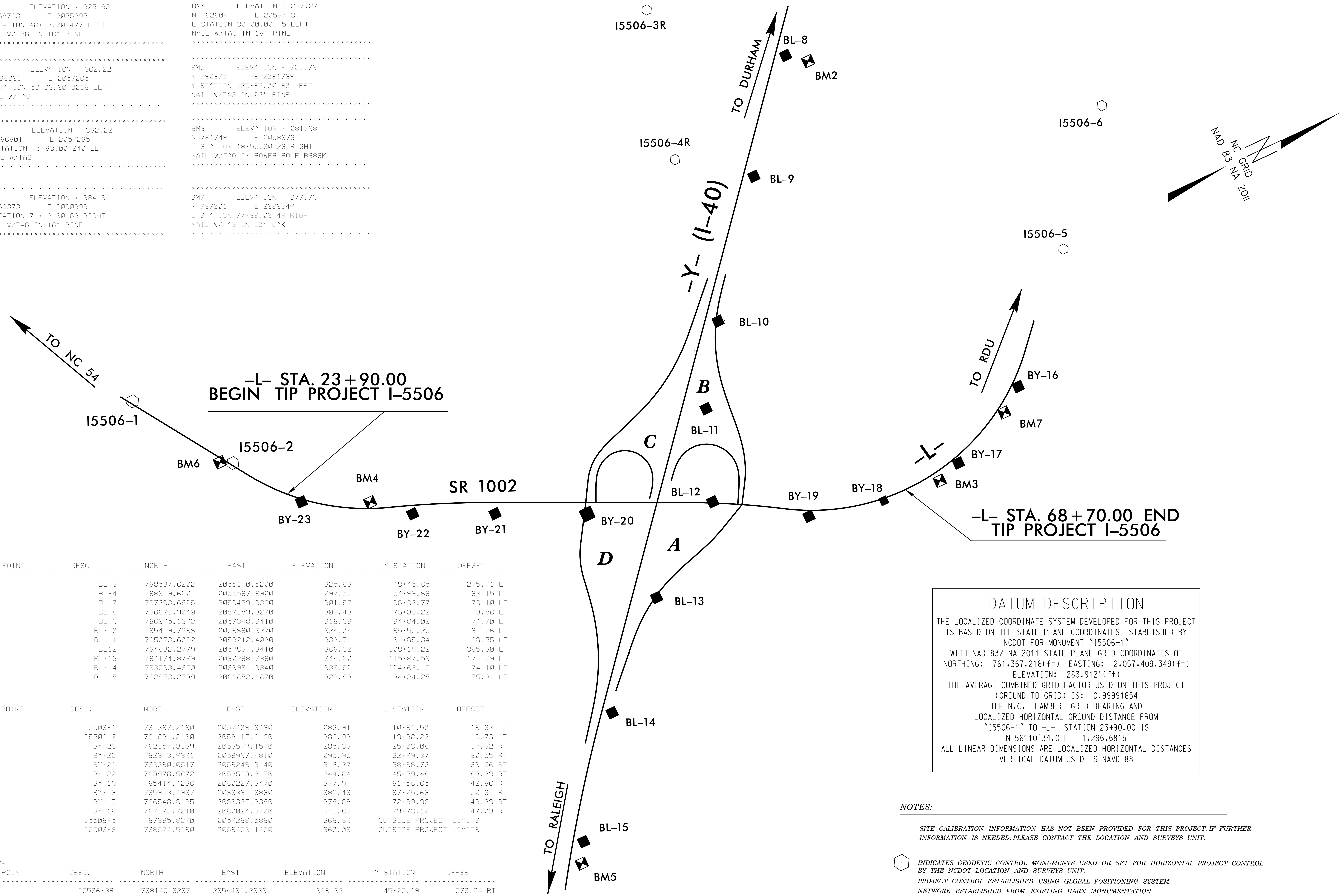
BM3 ELEVATION = 384.31
N 766373 E 2060393
L STATION 71+12.00 63 RIGHT
NAIL W/TAG IN 16" PINE

BM4 ELEVATION = 287.27
N 762604 E 2058793
L STATION 30+00.00 45 LEFT
NAIL W/TAG IN 18" PINE

BM5 ELEVATION = 321.79
N 762875 E 2061789
Y STATION 135+82.00 90 LEFT
NAIL W/TAG IN 22" PINE

BM6 ELEVATION = 281.98
N 761748 E 2058073
L STATION 18+55.00 28 RIGHT
NAIL W/TAG IN POWER POLE B988K

BM7 ELEVATION = 377.79
N 767001 E 2060149
L STATION 77+68.00 49 RIGHT
NAIL W/TAG IN 10' OAK



BL

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
3	BL-3	768587.6202	2055190.5200	325.68	48+45.65	275.91 LT
4	BL-4	768019.6207	2055567.6920	297.57	54+99.66	83.15 LT
7	BL-7	767283.6825	2056429.3360	301.57	66+32.77	73.10 LT
8	BL-8	766671.9040	2057159.3270	309.43	75+85.22	73.56 LT
9	BL-9	766095.1392	2057848.6410	316.36	84+84.00	74.70 LT
10	BL-10	765419.7286	2058680.3270	324.04	95+55.25	91.76 LT
11	BL-11	765073.6022	2059212.4020	333.71	101+85.34	168.55 LT
12	BL12	764832.2779	2059837.3410	366.32	108+19.22	385.30 LT
13	BL-13	764174.8799	2060288.7860	344.20	115+87.59	171.79 LT
14	BL-14	763533.4670	2060901.3840	336.52	124+69.15	74.10 LT
15	BL-15	762953.2789	2061652.1670	328.98	134+24.25	75.31 LT

BY

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	I5506-1	761367.2160	2057409.3490	283.91	10+91.50	18.33 LT
2	I5506-2	761831.2100	2058117.6160	283.92	19+38.22	16.73 LT
23	BY-23	762157.8139	2058579.1570	285.33	25+03.08	19.32 RT
22	BY-22	762843.9891	2058997.4810	295.95	32+99.37	60.55 RT
21	BY-21	763380.0517	2059249.3140	319.27	38+96.73	80.66 RT
20	BY-20	763978.5872	2059533.9170	344.64	45+59.48	83.29 RT
19	BY-19	765414.4236	2060227.3470	377.94	61+56.65	42.86 RT
18	BY-18	765973.4937	2060391.0880	382.43	67+25.68	50.31 RT
17	BY-17	766548.8125	2060337.3390	379.68	72+89.96	43.39 RT
16	BY-16	767171.7210	2060024.3700	373.88	79+73.10	47.03 RT
5	I5506-5	767885.8270	2059268.5860	366.69	OUTSIDE PROJECT LIMITS	
6	I5506-6	768574.5190	2058453.1450	360.06	OUTSIDE PROJECT LIMITS	

BRAMP

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
103	I5506-3R	768145.3207	2054401.2030	318.32	45+25.19	570.24 RT
104	I5506-4R	767873.1964	2055460.8160	296.18	55+11.88	97.72 RT

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "I5506-1"
WITH NAD 83/ NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 761,367.216(ft) EASTING: 2,057,409.349(ft)
ELEVATION: 283.912'(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991654
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "I5506-1" TO -L- STATION 23+90.00 IS
N 56°10'34.0 E 1,296.6815
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

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 THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

GEOID G12NC

NOTE: DRAWING NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
I-5506	1C-2
Location and Surveys	

PROPOSED ALIGNMENT CONTROL SHEET I-5506

REVISIONS

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	761301.6177	2057342.9793
PC	20+81.24	761895.8376	2058246.3001
PRC	31+30.82	762707.4007	2058882.6861
PT	38+47.36	763369.7315	2059155.3057
PC	52+48.35	764637.3511	2059751.9026
PRC	59+76.63	765275.6920	2060101.5315
PT	82+25.08	767324.0265	2059814.0346
POT	84+54.05	767476.6528	2059643.3558

Y

TYPE	STATION	NORTH	EAST
POT	10+00.00	770847.8024	2052066.9449
PC	125+00.00	763456.8672	2060877.3977
PT	137+87.15	762686.3793	2061907.6371
POT	152+87.15	761856.4901	2063157.1505

Y1

TYPE	STATION	NORTH	EAST
POT	10+00.00	766031.7683	2060345.1881
PC	12+84.89	766040.8506	2060629.9287
PT	17+85.80	766156.5368	2061113.7830
POT	27+19.96	766552.3071	2061959.9599

Y3

TYPE	STATION	NORTH	EAST
POT	10+00.00	765363.3221	2060152.9429
POT	12+05.00	765292.5342	2060345.3334

Y4

TYPE	STATION	NORTH	EAST
PC	9+44.84	763497.2004	2058979.6787
PT	11+21.28	763402.3072	2059127.8470
POT	11+60.00	763385.8202	2059162.8777

Y5

TYPE	STATION	NORTH	EAST
PC	10+00.00	763010.1814	2058425.0484
PT	11+80.86	762924.8909	2058584.3789
POT	15+36.29	762779.3729	2058908.6593

Y6

TYPE	STATION	NORTH	EAST
POT	10+00.00	762778.6486	2058908.3936
POT	11+70.00	762706.1606	2059062.1646

RPA

TYPE	STATION	NORTH	EAST
POT	10+00.00	763620.9663	2060773.5830
TS	12+86.00	763820.0311	2060568.2315
SC	15+02.00	763974.9020	2060417.7741
CS	19+09.93	764322.9043	2060208.7120
SRS	21+25.93	764528.4686	2060142.6383
SC	23+41.93	764734.0329	2060076.5645
PT	24+35.35	764819.6850	2060039.3456
POT	26+50.94	765013.9225	2059945.7954

RPB

TYPE	STATION	NORTH	EAST
TS	10+00.00	765612.8890	2058399.0877
SC	13+00.00	765429.9489	2058636.5914
CS	17+32.17	765265.3632	2059033.6747
SRS	20+32.17	765226.6423	2059330.9553
SC	23+32.17	765180.8145	2059626.9091
PT	25+43.62	765094.0382	2059818.9827
POT	26+93.62	765013.9225	2059945.7954

RPC

TYPE	STATION	NORTH	EAST
POT	10+00.00	765484.3411	2058368.7215
POT	10+00.01	765484.3326	2058368.7302
TS	13+18.02	765262.8553	2058596.9366
SC	15+43.02	765102.0749	2058754.2502
PRC	23+70.99	764362.1533	2059100.1236
PT	26+98.90	764098.0996	2059276.5264
POT	29+00.49	763993.6554	2059448.9514

RPD

TYPE	STATION	NORTH	EAST
POT	10+00.00	763264.0987	2061019.0168
TS	11+61.42	763362.7964	2060891.2833
SC	13+86.42	763495.9890	2060710.0072
CS	19+51.15	763716.2989	2060193.4099
ST	21+76.15	763754.9213	2059971.8030
PC	22+11.35	763760.1241	2059936.9912
PT	24+59.80	763845.9562	2059705.7334
POT	27+57.26	764004.5763	2059454.0913

LPC

TYPE	STATION	NORTH	EAST
TS	10+00.00	764428.3949	2059627.4747
SC	12+00.00	764528.6713	2059456.9925
PCC	17+44.35	764169.5561	2059301.7901
PT	20+06.66	764227.9477	2059524.4049

LPB

TYPE	STATION	NORTH	EAST
TS	10+00.00	764625.2828	2059576.3755
SC	12+00.00	764773.3206	2059444.4002
CS	16+78.42	765100.2885	2059669.0646
ST	18+78.42	765030.1728	2059854.5814
POT	19+66.00	764987.7192	2059931.1876

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	24+30.00	-49.64	762151.9591	2058479.3580
L	24+30.00	-70.00	762166.1830	2058464.7962
L	26+65.00	-87.00	762347.8360	2058595.9628
L	26+65.00	-70.00	762337.8397	2058609.7133
L	27+95.00	75.00	762365.6857	2058802.4796
L	27+95.00	52.37	762377.4802	2058783.1712
L	28+70.00	75.00	762433.5754	2058841.8214
L	29+00.00	-87.00	762536.5454	2058713.2436
L	29+50.00	75.00	762507.9142	2058880.2745
L	29+75.00	-65.00	762590.8065	2058764.7040
L	29+75.00	-50.00	762584.4548	2058778.2928
L	30+00.00	80.00	762553.2584	2058906.9878
L	30+55.00	75.00	762608.1976	2058925.0906
L	30+80.00	-50.00	762677.9722	2058818.3655
L	31+01.51	67.18	762656.2480	2058935.5251
L	33+00.00	76.26	762838.9783	2059012.3848
L	33+25.00	-58.75	762910.6272	2058895.2570
L	34+92.00	-58.75	763067.0077	2058957.6005
L	35+92.00	-46.75	763155.2222	2059007.6812
L	37+70.00	-46.75	763319.0186	2059080.2282
L	62+00.00	78.00	765440.3425	2060278.2078
L	63+00.00	78.00	765537.2549	2060318.2311
L	65+25.00	62.00	765766.6480	2060370.0824
L	65+25.00	78.00	765763.1563	2060385.6968
L	66+95.00	62.00	765940.6904	2060399.4101
L	68+64.00	56.60	766115.8668	2060404.7317

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	66+36.00	82.00	765876.9439	2060411.0999
L	66+56.00	81.00	765897.8855	2060413.1361
L	66+56.00	62.00	765900.5035	2060394.3173
L	66+36.00	62.00	765879.9468	2060391.3267

CONTROL ACCESS MARKER CONCRETE-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	39+58.00	-47.00	763489.8542	2059159.8955
L	41+41.60	-44.00	763654.6979	2059240.7937
L	44+64.68	-44.00	763947.0216	2059378.3740
L	58+00.00	-171.00	765211.7134	2059862.2850
L	59+13.60	100.00	765169.7797	2060153.3779
L	59+50.00	-140.00	765327.2396	2059968.6086
L	60+00.00	-110.05	765352.8614	2060019.8972
L	63+01.43	-81.26	765594.6938	2060169.6780
L	65+90.00	-81.89	765858.4952	2060241.9004

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	11+05.00	50.00	765985.1412	2060451.7287
Y1	11+05.00	-50.00	766085.0903	2060448.5407

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	14+25.00	50.00	766003.7708	2060776.6601
Y1	14+25.00	-100.00	766152.1894	2060754.9359
Y1	13+50.00	-100.00	766144.2831	2060686.4743
Y1	12+84.89	-70.00	766110.8151	2060627.6971
Y1	12+84.89	50.00	765990.8761	2060631.5227
Y1	11+50.00	-81.00	766117.5092	2060492.5295

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y3	10+95.83	-47.27	765374.5934	2060259.2026

CONTROL ACCESS MARKER CONCRETE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y3	10+95.95	47.31	765285.7868	2060226.6539

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y4	10+70.00	58.62	763374.8631	2059053.4233
Y4	10+70.00	-50.94	763470.2028	2059107.4183

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y5	14+06.42	-54.77	762882.5170	2058812.5932
Y5	14+41.17	55.67	762767.5309	2058799.0784

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y6	11+25.00	63.65	762667.7784	2058994.3217
Y6	11+25.00	-45.00	762766.0527	2059040.6484

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPA	23+19.00	81.61	764740.7937	2060161.2647
RPA	23+29.00	138.52	764770.8233	2060210.8033
RPA	23+89.18	80.00	764809.6344	2060131.9302
RPA	23+95.43	125.67	764834.1773	2060171.0376

CONTROL ACCESS MARKER CONCRETE-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPA	20+06.77	122.27	764451.4056	2060293.2281
RPA	21+25.93	106.19	764557.9151	2060244.6588
RPA	23+41.93	80.00	764763.0366	2060151.1218
RPA	24+35.35	80.00	764854.3988	2060111.4216
RPA	25+27.52	80.00	764937.4415	2060071.4259

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPB	19+50.00	-88.08	765321.7680	2059257.6732
RPB	19+50.00	-101.00	765334.6315	2059258.9280
RPB	19+70.00	-87.41	765319.2438	2059277.1697
RPB	19+70.00	-104.00	765335.7570	2059278.7137

CONTROL ACCESS MARKER CONCRETE-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPB	16+45.00	-84.75	765368.1780	2058973.0823
RPB	17+32.17	-85.00	765348.4448	2059051.6315
RPB	20+32.17	-85.00	765311.3147	2059338.4107
RPB	22+00.00	-90.00	765297.4749	2059511.1842
RPB	23+32.17	-85.00	765262.3803	2059650.8261
RPB	23+58.00	-100.00	765268.0761	2059682.9460
RPB	24+15.00	-114.00	765258.4845	2059748.7487
RPB	24+72.00	-100.00	765218.5762	2059801.9400

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

6/2/99

1/10/2018 ...\Roadway\Proj\i5506_ls_1c-2.dgn

WETHERILL ENGINEERING
1223 Jones Franklin Road
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

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY 12/27/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22896 CLARK S. MORRISON 1/3/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

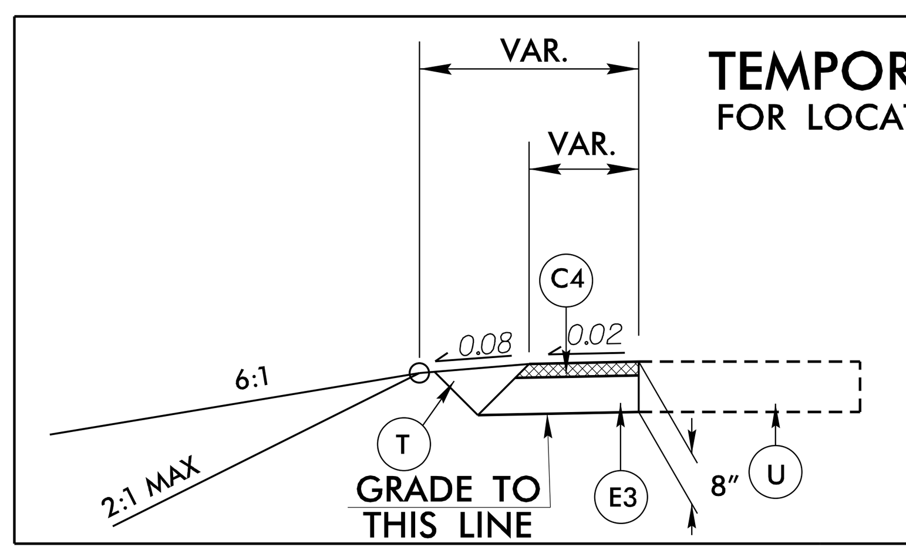
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	5" MONOLITHIC CONCRETE ISLAND (SURF. MTD.).
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	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.	R4	EXPRESSWAY GUTTER.
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 2" IN DEPTH.	E3	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	S	4" CONCRETE SIDEWALK.
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E4	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	T	EARTH MATERIAL.
C5	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E5	PROP. APPROX. 10.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	U	EXISTING PAVEMENT.
C6	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E6	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, 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.	V1	PROPOSED 1.5" MILLING.
C7	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J1	PROP. 8" AGGREGATE BASE COURSE.	V2	PROPOSED 3" MILLING.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	J2	PROP. 10" AGGREGATE BASE COURSE.	W1	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	J3	PROP. VAR. DEPTH AGGREGATE BASE COURSE.	W2	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)
D3	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	K	BASE TO BE TREATED WITH LIME TO A DEPTH OF 8", AT A RATE OF 20 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER. BASE TO BE TREATED WITH CEMENT TO A DEPTH OF 7", AT A RATE OF 55 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER.	Y	MILLED RUMBLE STRIPS
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.				
D5	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0D, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	N	GEOTEXTILE FOR PAVEMENT STABILIZATION		
D6	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0D, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R1	2'-6" CONCRETE CURB AND GUTTER.		
		R2	1'-6" CONCRETE CURB AND GUTTER.		

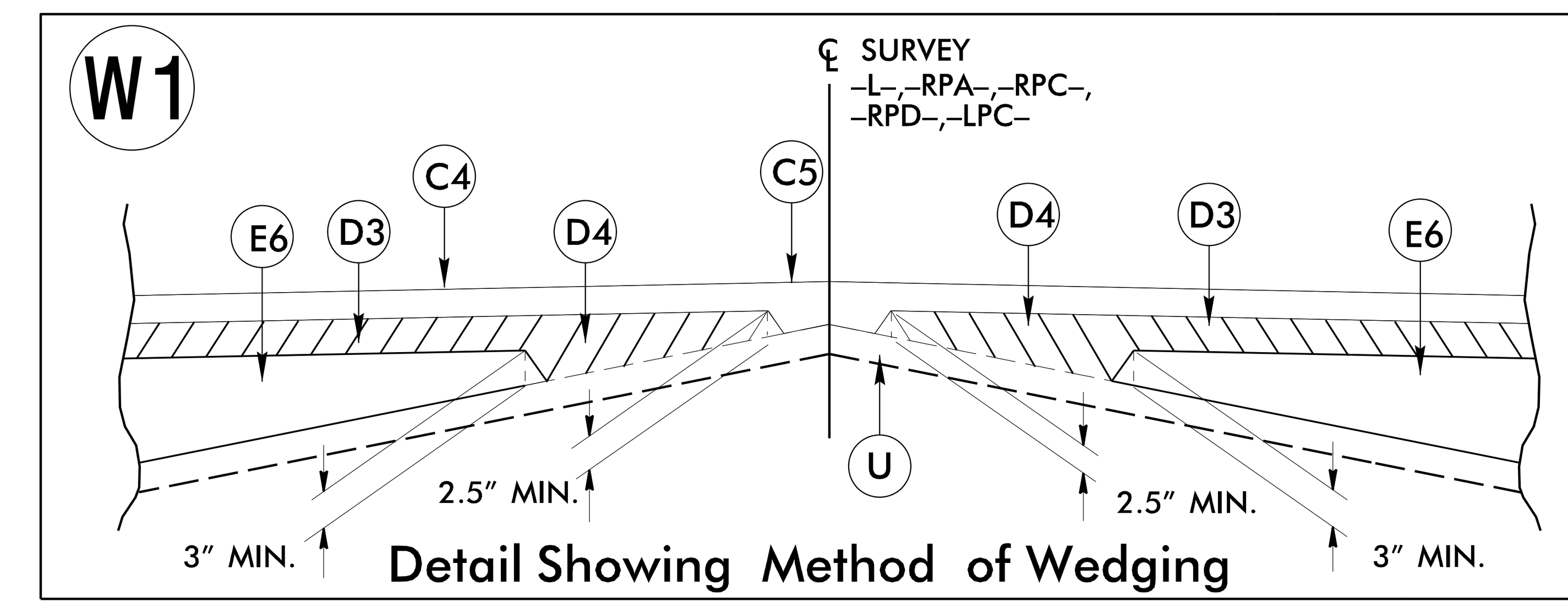
NOTE: ALL EOP SLOPES ARE 1:1 UNLESS OTHERWISE SHOWN

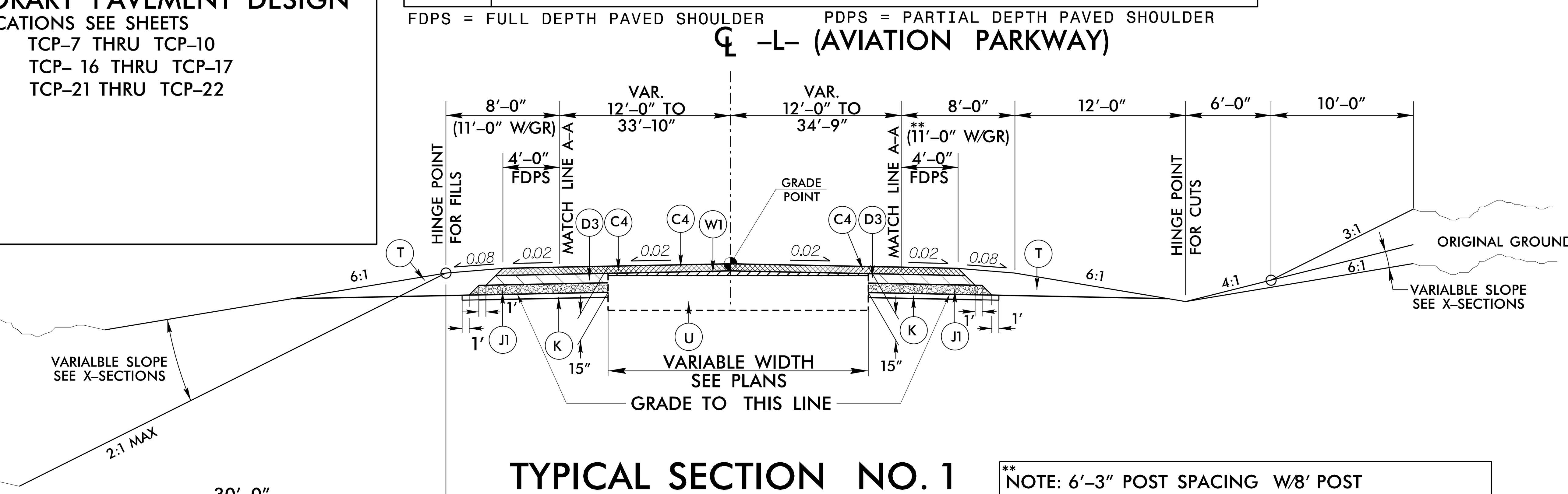
FDPS = FULL DEPTH PAVED SHOULDER PDPS = PARTIAL DEPTH PAVED SHOULDER

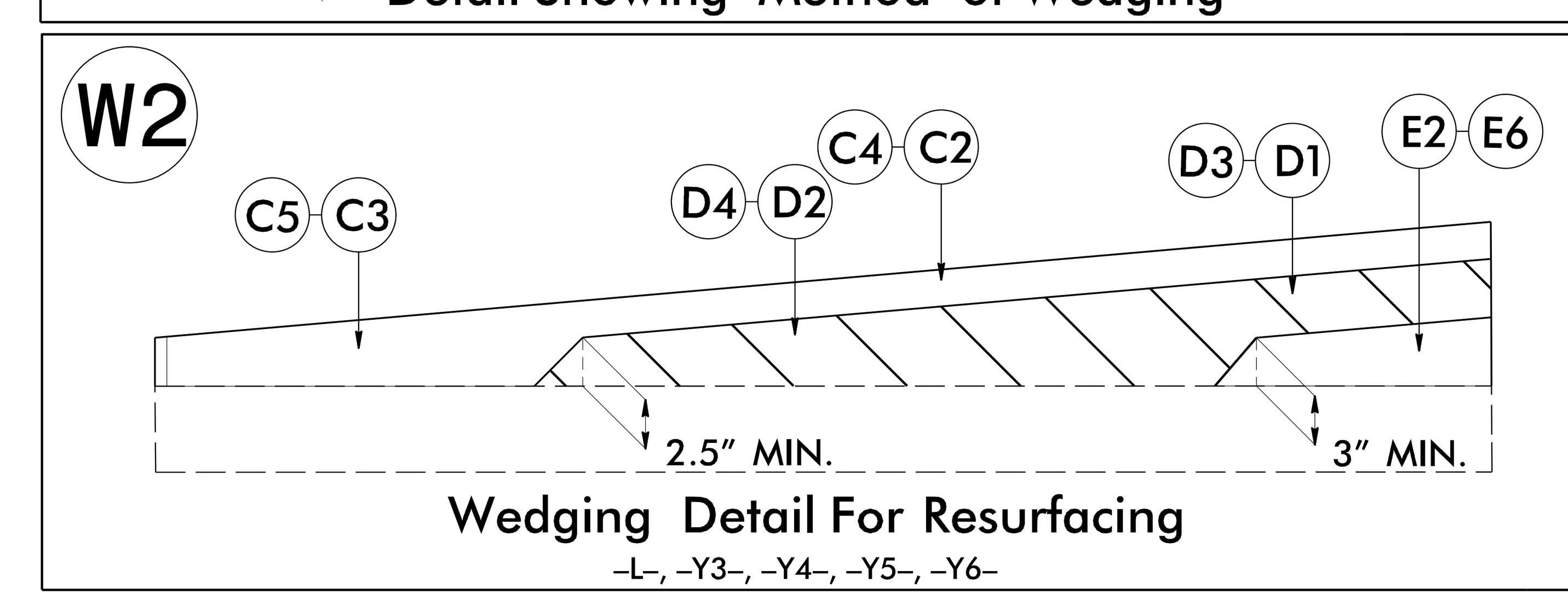
TEMPORARY PAVEMENT DESIGN

FOR LOCATIONS SEE SHEETS
TCP-7 THRU TCP-10
TCP- 16 THRU TCP-17
TCP-21 THRU TCP-22









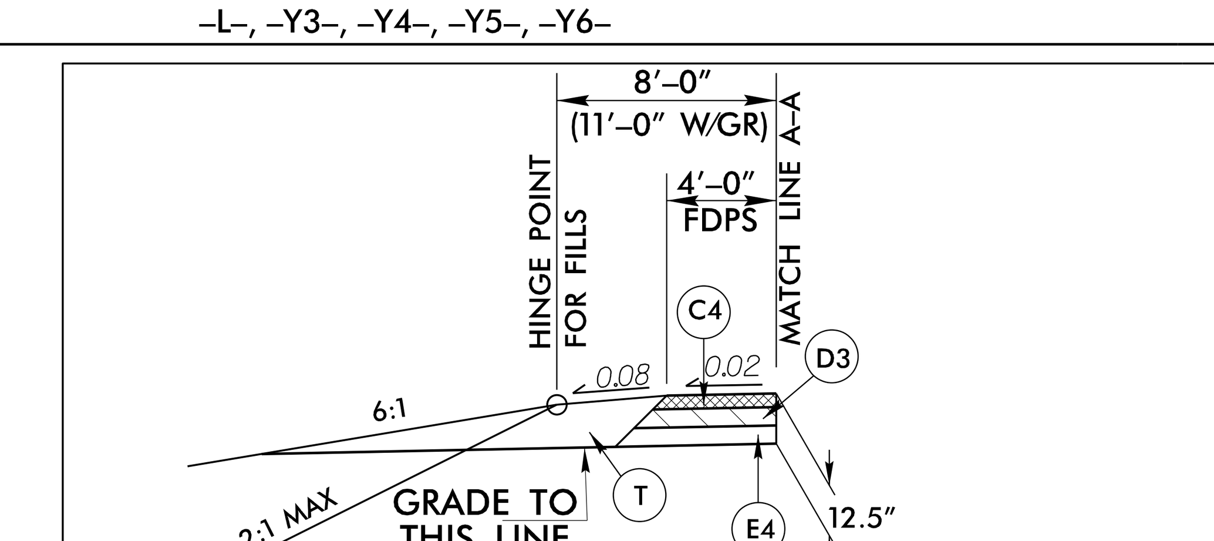
TYPICAL SECTION NO. 1

**NOTE: 6'-3" POST SPACING W/8' POST
-L- RT. STA. 23+90.00 TO -L- RT. STA. 27+00.00

USE TYPICAL SECTION NO. 1

-L- STA. 23+90.00 TO -L- STA. 29+52.97 RT.
-L- STA. 23+90.00 TO -L- STA. 30+05.44 LT.

PERFORM INCIDENTAL MILLING AT THE FOLLOWING LOCATIONS:
-L- STA. 23+90.00 TO -L- STA. 24+65.00



USE WITH TYP. SECTION. NO. 1
Narrow Widening (10' or less)

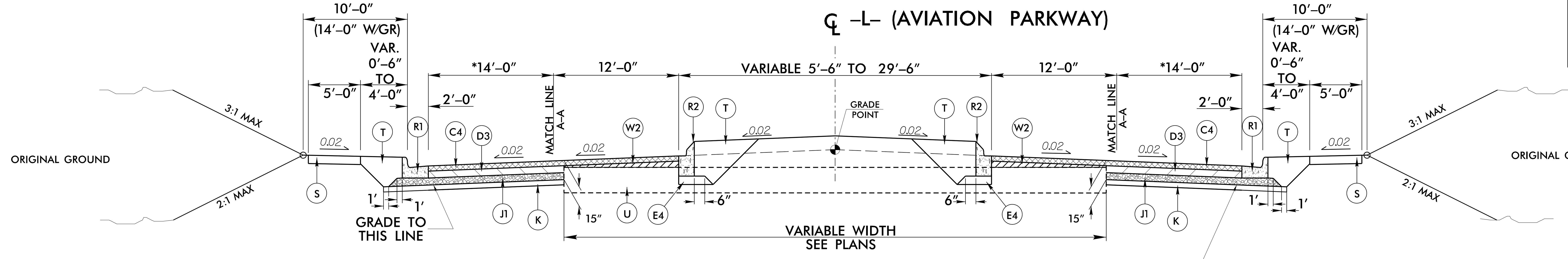
8/17/99

WETHERILL ENGINEERING
1223 Jones Franklin Road
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

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DocuSigned by: Bob A. May 513D8...24429493... NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY	DocuSigned by: Clark S. Morrison B0A110D...C4... NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
12/27/2017	1/3/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE	
C4	3" S9.5C
D3	4" I19.0C
E4	5½" B25.0C
J1	8" ABC
K	SUBGRADE STAB.
N	GEO. FOR PAV. STAB.
R1	2'-6" CURB
R2	1'-6" CURB
R3	CONC. ISLAND
S	4" SIDEWALK
T	EARTH MAT.
U	EXIST. PAVEMENT
W	WEDGING



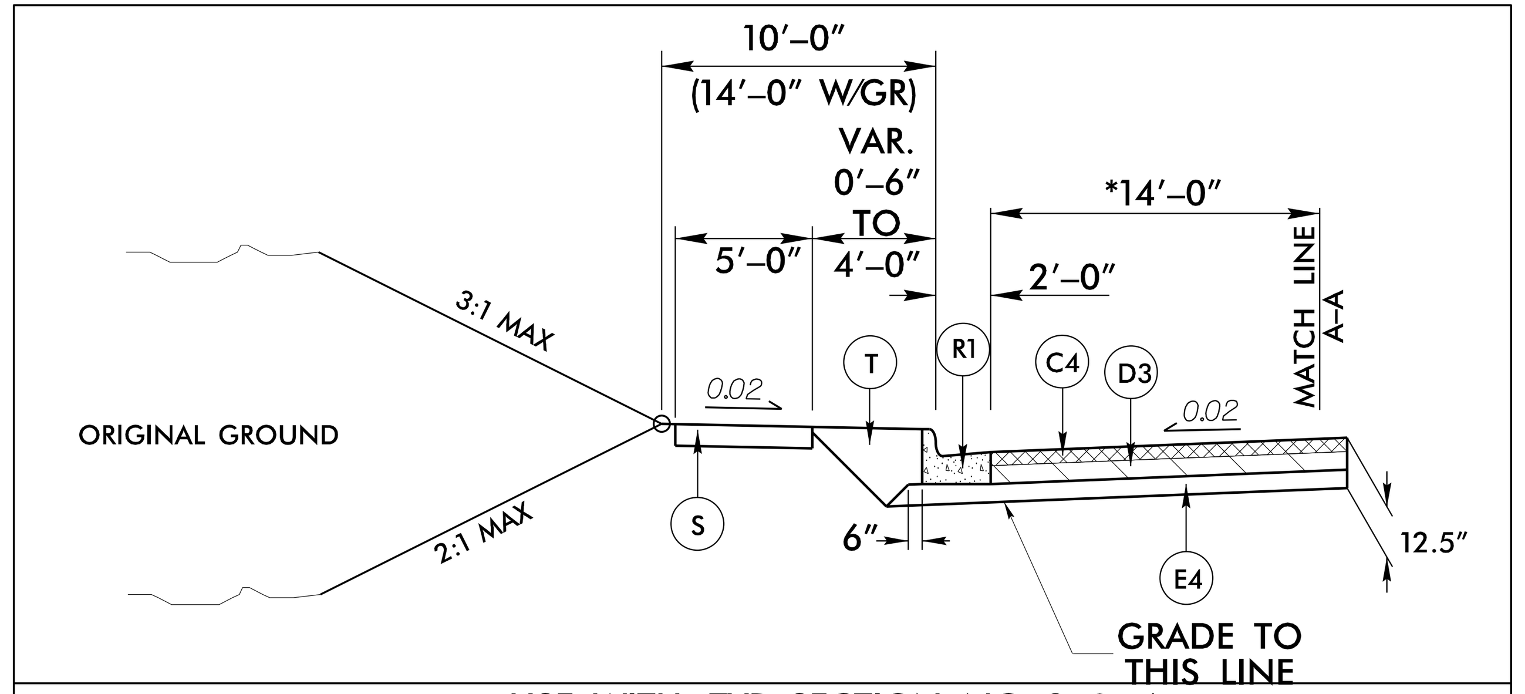
TYPICAL SECTION NO. 2

NOTE: SEE PLANS FOR TURN LANES & AUXILLARY LANES/TAPERS

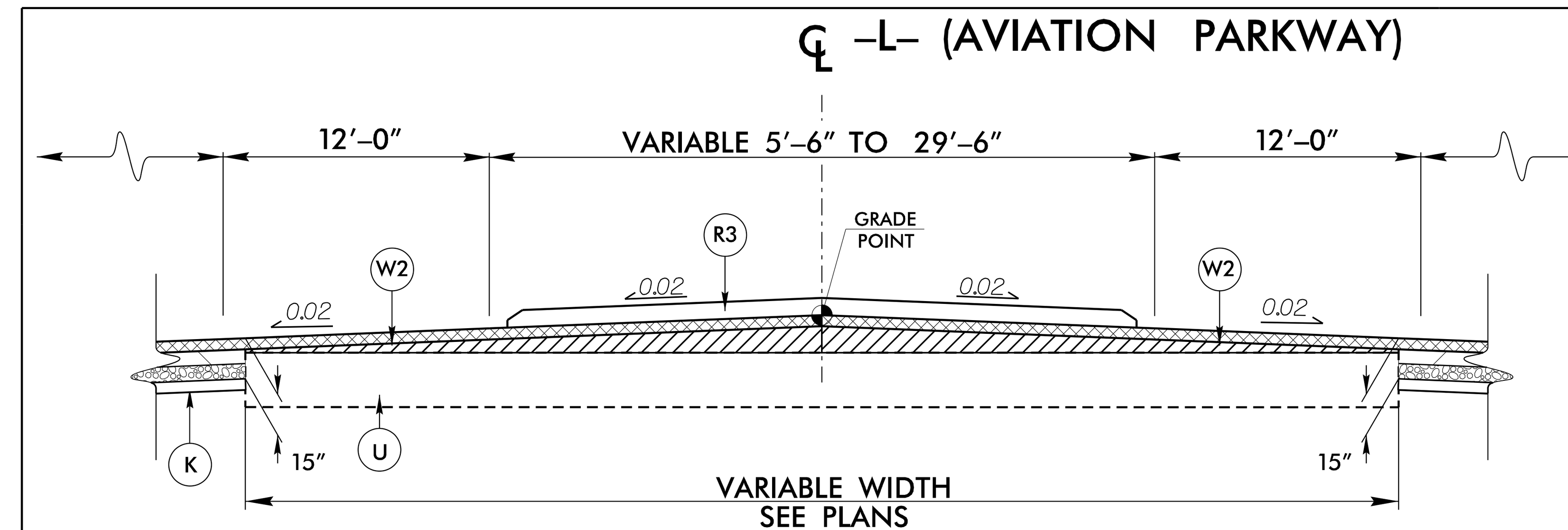
* – EXTRA WIDTH FOR BICYCLES TO SHARE ROAD

USE TYPICAL SECTION NO. 2

–L– STA. 29+52.97 TO 45+50.00 RT.
–L– STA. 30+05.44 TO 45+50.00 LT.
–L– STA. 55+00.00 TO 65+80.00



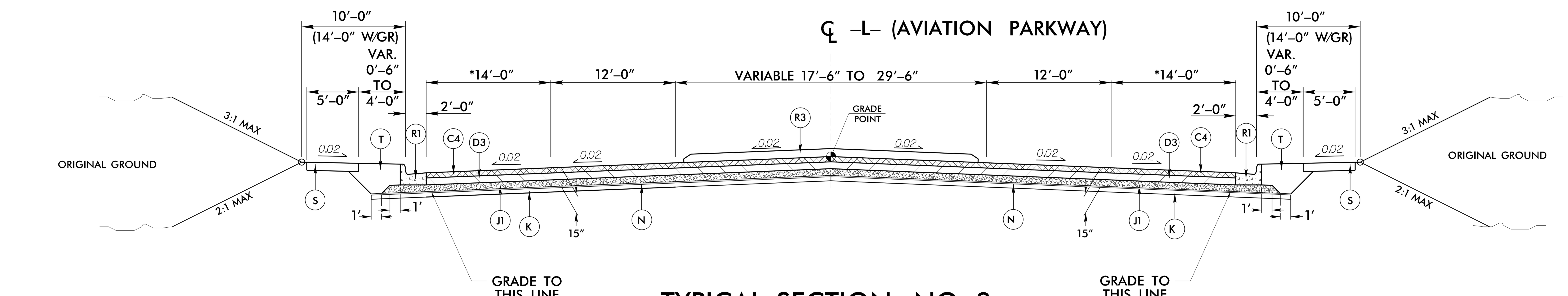
USE WITH TYP. SECTION. NO. 2 & 4
Narrow Widening (10' or less)



PARTIAL TYPICAL SECTION NO. 2

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1 & 2

–L– STA. 25+65.56 TO 35+61.48
–L– STA. 60+30.00 TO 65+80.00



TYPICAL SECTION NO. 3

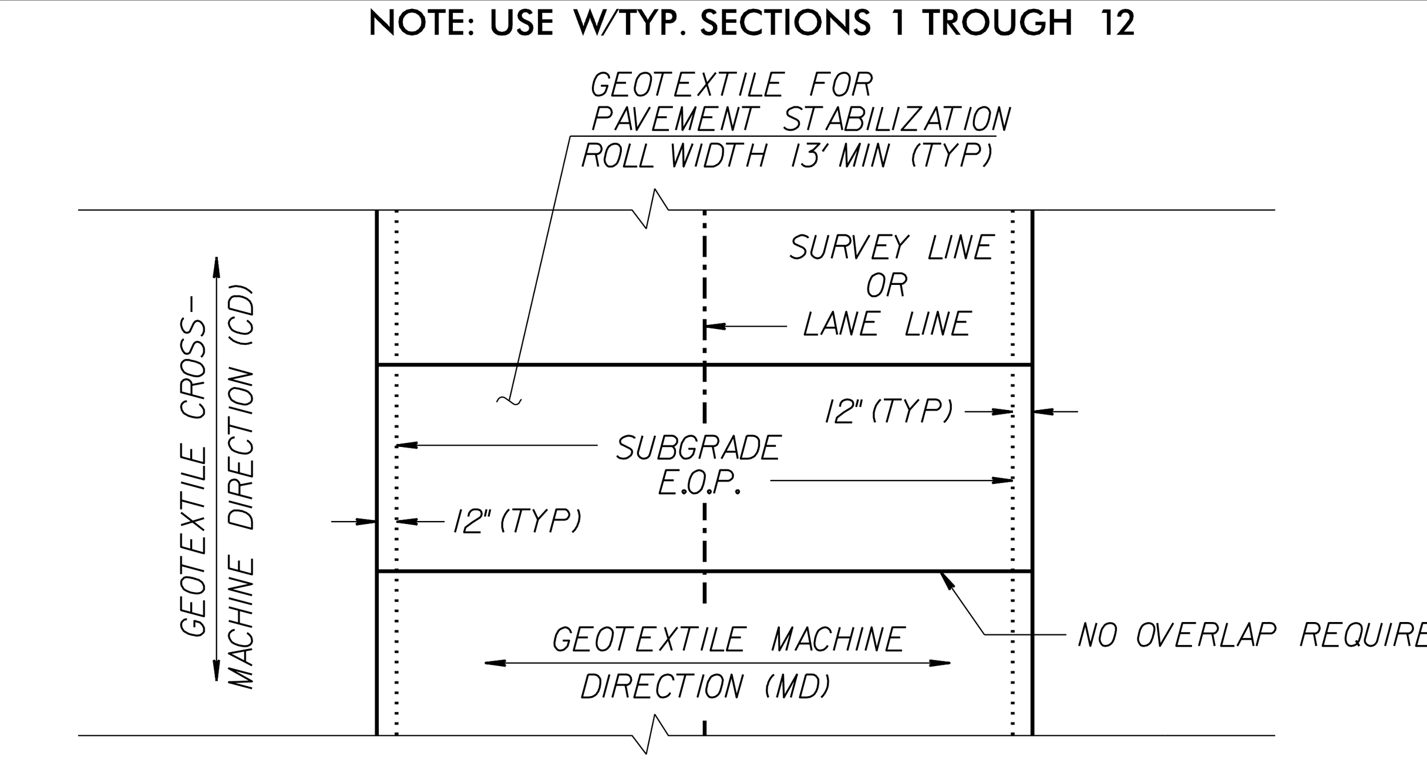
NOTE: SEE PLANS FOR TURN LANES & AUXILLARY LANES/TAPERS

* – EXTRA WIDTH FOR BICYCLES TO SHARE ROAD

USE TYPICAL SECTION NO. 3

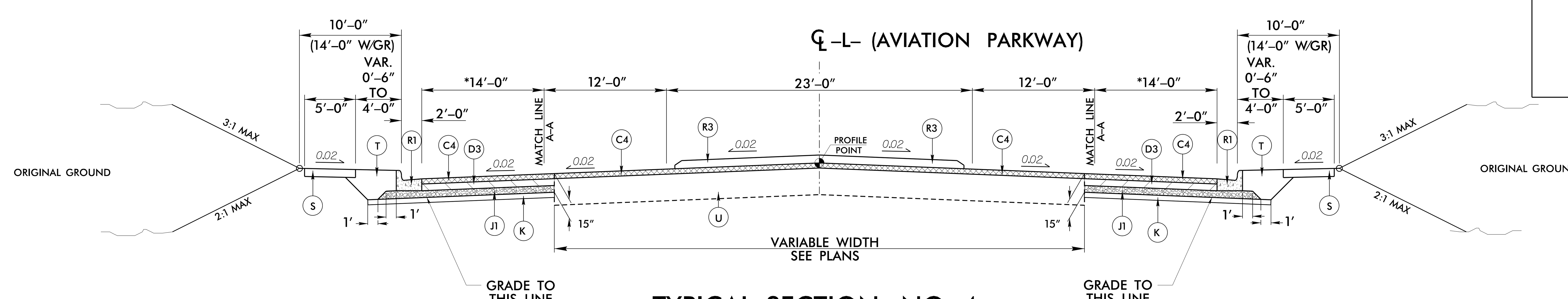
–L– STA. 45+50.00 TO 49+24.09 (BEGIN BRIDGE)
–L– STA. 52+15.59 (END BRIDGE) TO 55+00.00

NOTE: USE W/TYP. SECTIONS 1 TROUGH 12



GEOTEXTILE FOR PAVEMENT STABILIZATION PLACEMENT (PLAN VIEW)

(100% COVERAGE REQUIRED)
–L– STA. 47+50 TO STA. 49+00
–L– STA. 52+25 TO STA. 54+75
–RPB– STA. 22+00 TO STA. 26+50
–LPB– STA. 15+00 TO STA. 19+28
–Y– STA. 62+50 TO STA. 75+00
–Y– STA. 79+50 TO STA. 83+00



TYPICAL SECTION NO. 4

NOTE: SEE PLANS FOR TURN LANES & AUXILLARY LANES/TAPERS

* – EXTRA WIDTH FOR BICYCLES TO SHARE ROAD

USE TYPICAL SECTION NO. 4

–L– STA. 65+80.00 TO 68+70.00 (RESURFACE & WIDENING ONLY)

PERFORM VARIABLE DEPTH MILLING AT THE FOLLOWING LOCATIONS:
–L– STA. 67+95.00 TO –L– STA. 68+70.00

12/1/2017
...\I5506_rdy_psh_02A-2_typ.dgn
USER:ROdell

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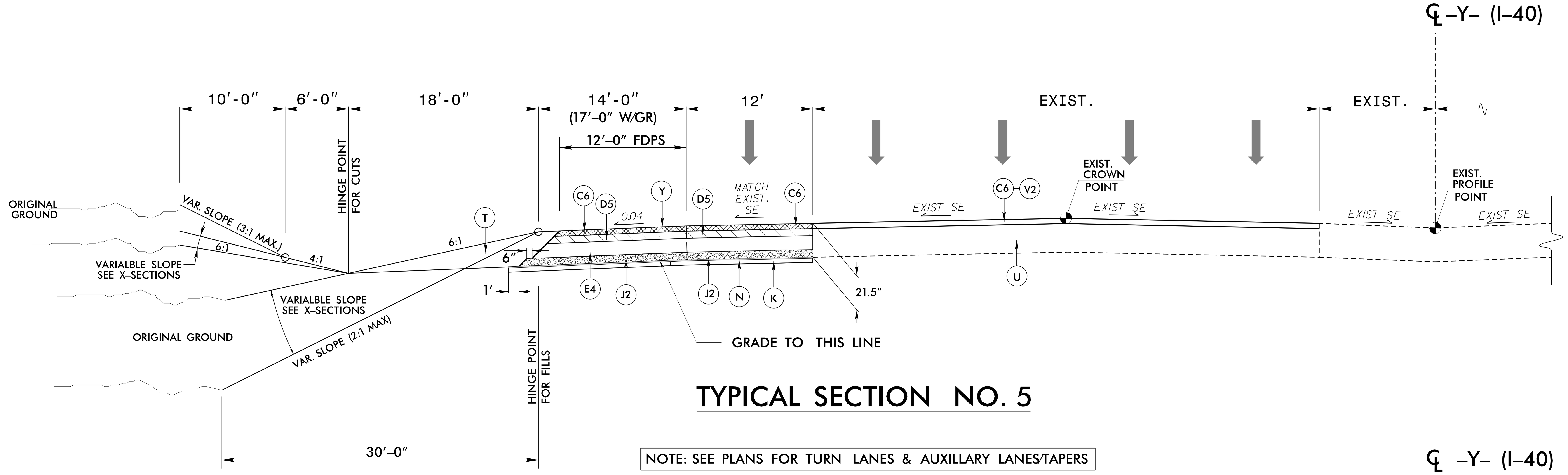
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2A-3
ROADWAY DESIGN ENGINEER 12/27/2017 SEAL 21116 Bob A. May	PAVEMENT DESIGN ENGINEER 1/3/2018 SEAL 22896 Clark S. Morrison

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE	
C6	3.0" S9.5D
C7	VAR. S9.5D
D5	3.0" I19.0D
E4	5½" B25.0C
E5	10" B25.0C
J2	10" ABC
K	SUBGRADE STAB.
N	GEO. FOR PAV. STAB.
R4	EXPRESSWAY GUTTER
T	EARTH MAT.
U	EXIST. PAVEMENT
V2	3" MILLING
Y	MILLED RUMBLE STRIPS



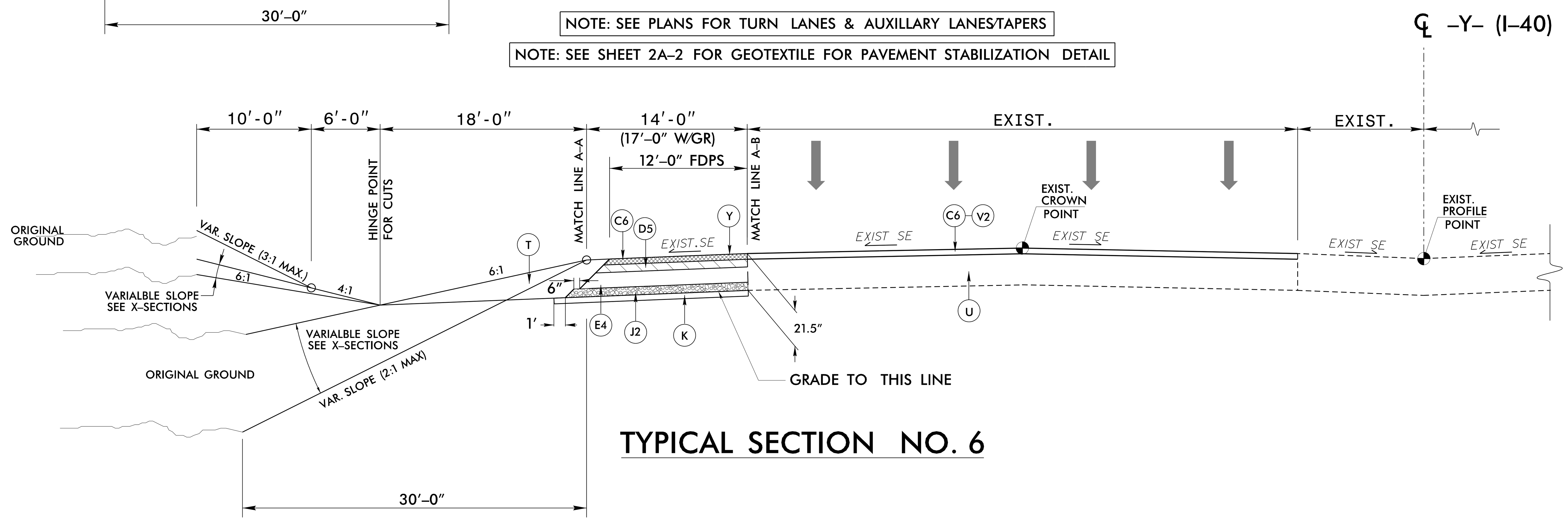
TYPICAL SECTION NO. 5

NOTE: SEE PLANS FOR TURN LANES & AUXILLARY LANES/TAPERS

NOTE: SEE SHEET 2A-2 FOR GEOTEXTILE FOR PAVEMENT STABILIZATION DETAIL

USE TYPICAL SECTION NO. 5

-Y- STA. 60+20.72 TO -Y- STA. 92+15.65
-Y- STA. 107+52.32 TO -Y- STA. 115+72.32

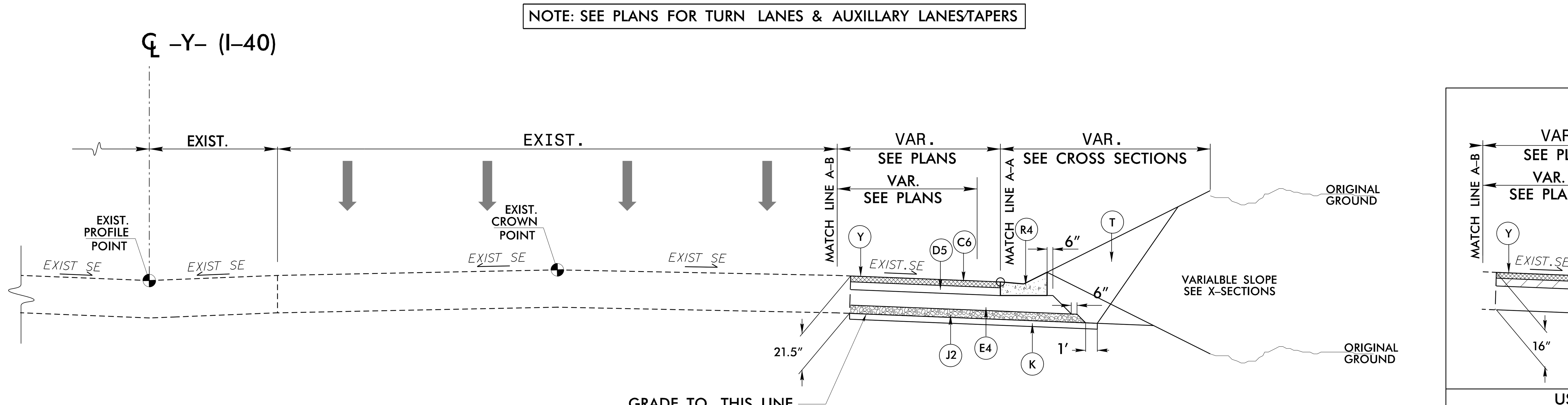


TYPICAL SECTION NO. 6

NOTE: SEE PLANS FOR TURN LANES & AUXILLARY LANES/TAPERS

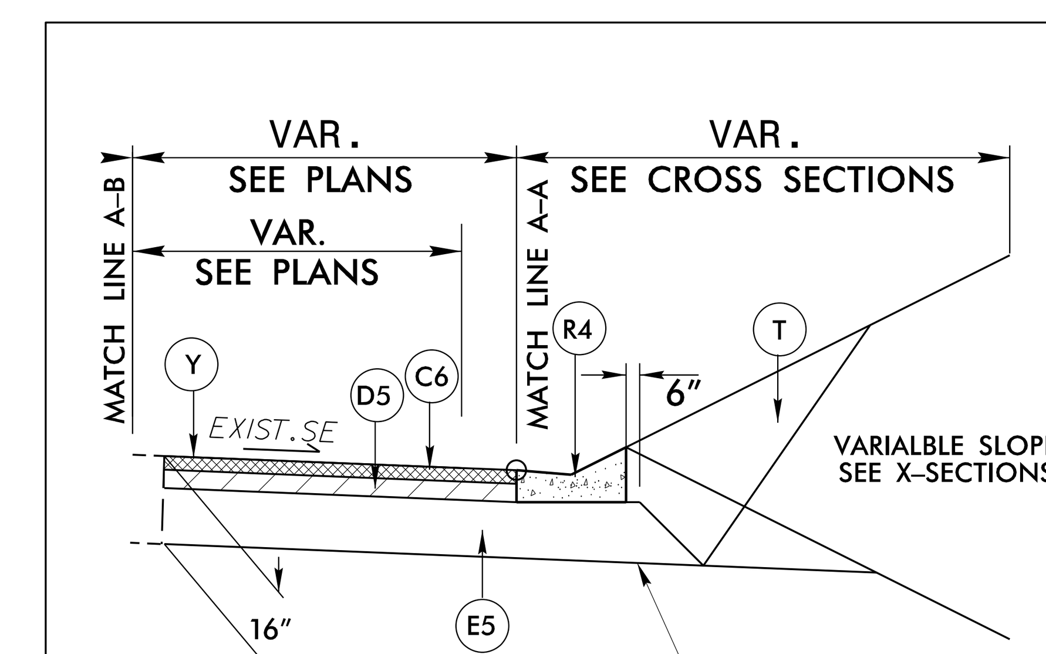
USE TYPICAL SECTION NO. 6

-Y- LT STA. 92+15.65 TO -Y- STA. 107+52.32

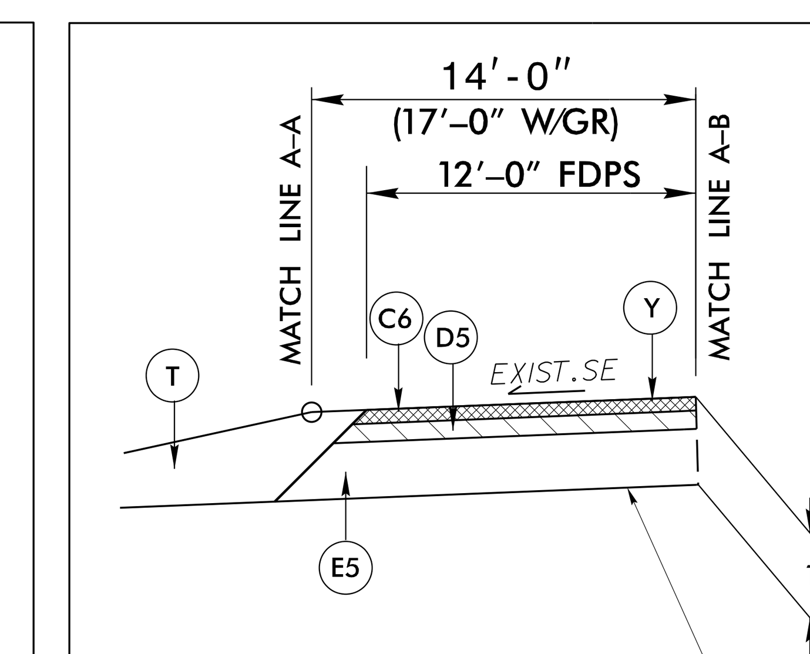


TYPICAL SECTION NO. 7

NOTE: SEE PLANS FOR TURN LANES & AUXILLARY LANES/TAPERS



USE WITH TYP. SECTION NO. 7
Narrow Widening (10' or less)



USE WITH TYP. SECTION NO. 5 & 6
Narrow Widening (10' or less)

USE TYPICAL SECTION NO. 7

-Y- RT STA. 107+91.35 TO -Y- STA. 111+71.40

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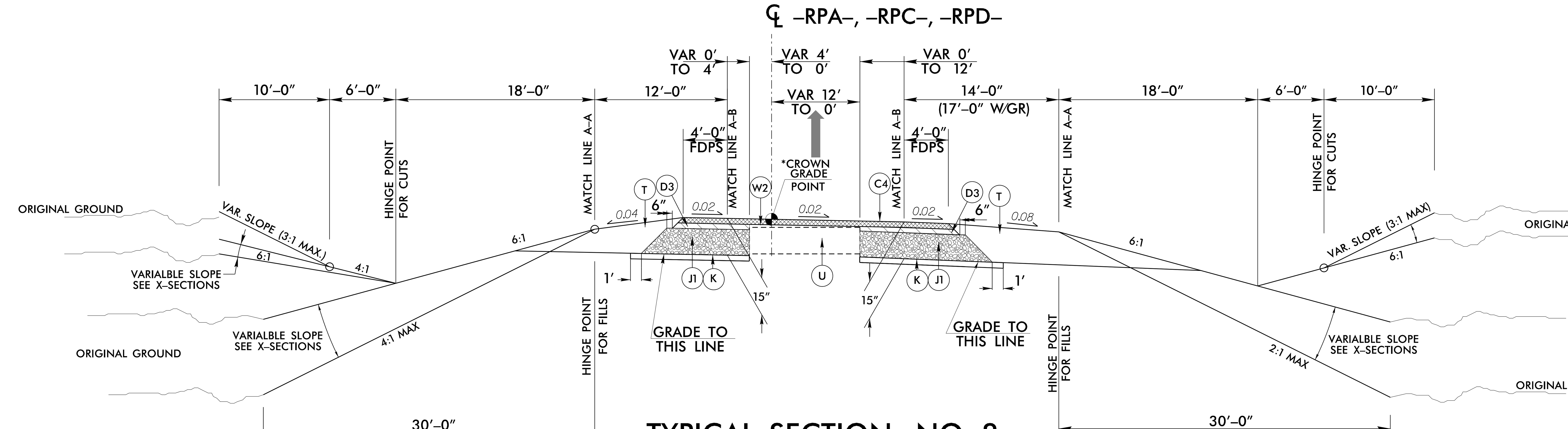
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2A-4
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
12/27/2017	1/3/2018
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY	NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE	
C4	3" S9.5C
D3	4" I19.0C
E4	5½" B25.0C
J1	8" ABC
K	SUBGRADE STAB.
N	GEO. FOR PAV. STAB.
R1	2'-6" CURB
T	EARTH MAT.
U	EXIST. PAVEMENT
W	WEDGING

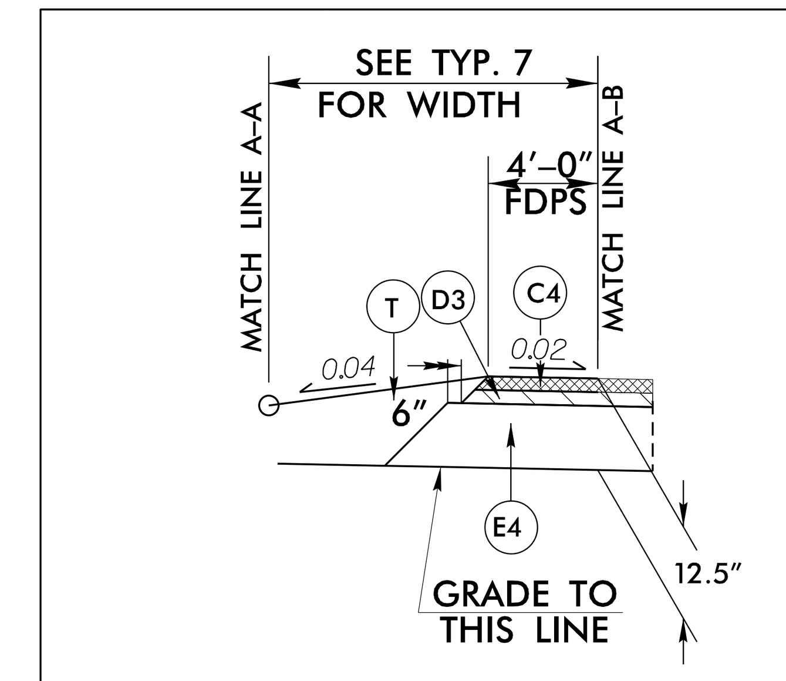


TYPICAL SECTION NO. 8

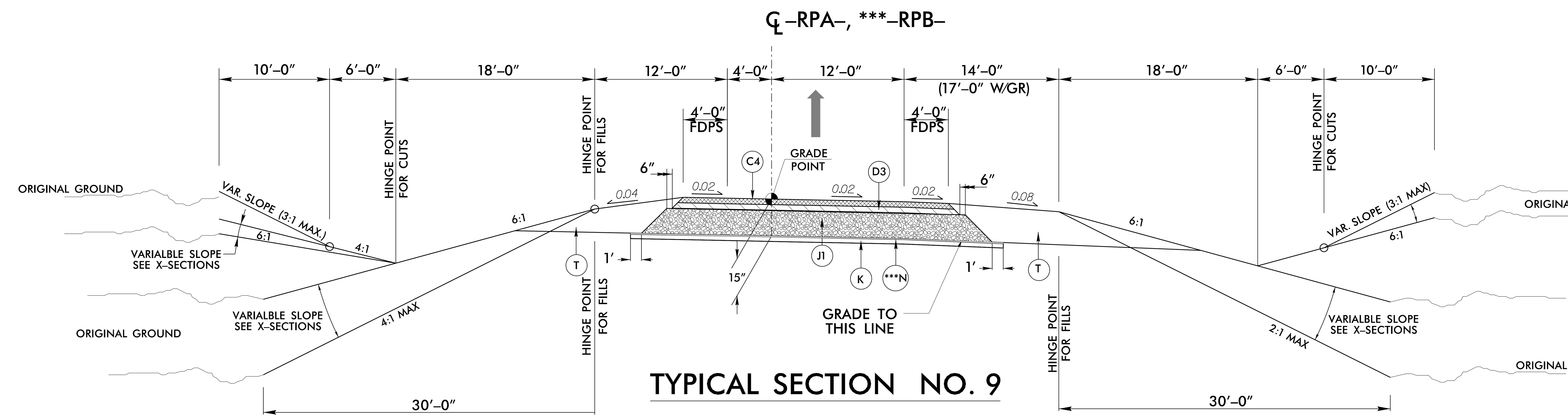
NOTE: SEE PLANS FOR TURN LANES & AUXILLARY LANES/TAPERS

USE TYPICAL SECTION NO. 8

-RPA- STA. 13+35.00 TO 17+82.86
-RPC- STA. 20+00.00 TO 28+68.82
*-RPD- STA. 25+80.00 TO 26+41.53 (INVERT TYPICAL)



USE WITH TYP. SECTION. NO. 8
Narrow Widening (10' or less)



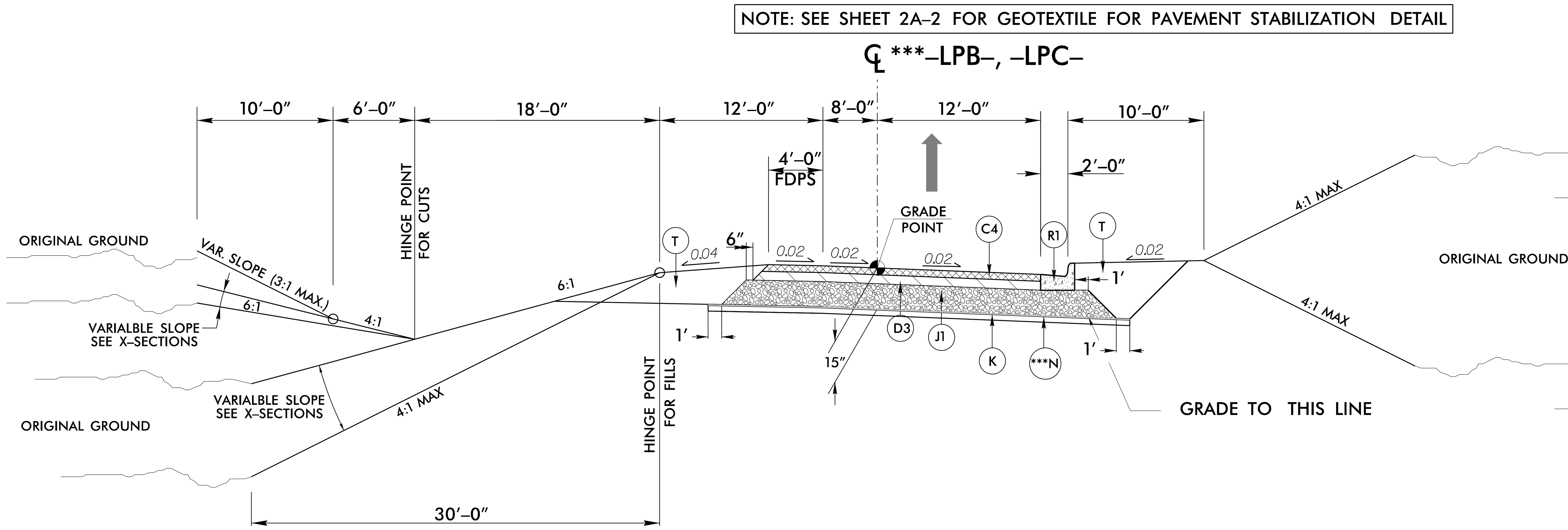
TYPICAL SECTION NO. 9

NOTE: SEE PLANS FOR TURN LANES & AUXILLARY LANES/TAPERS

NOTE: SEE SHEET 2A-2 FOR GEOTEXTILE FOR PAVEMENT STABILIZATION DETAIL

USE TYPICAL SECTION NO. 9

-RPA- STA. 17+82.86 TO 25+97.12
***-RPB- STA. 10+00.00 TO 26+56.07 (INVERT TYPICAL)



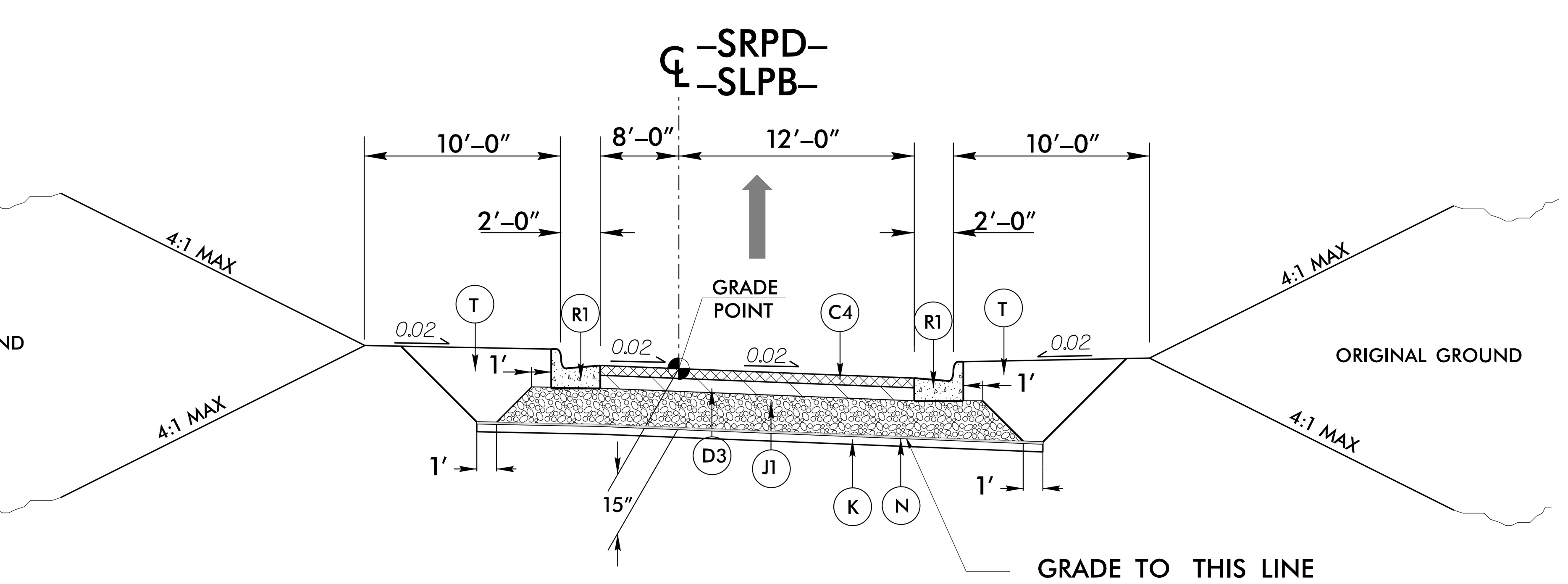
TYPICAL SECTION NO. 10

NOTE: SEE PLANS FOR TURN LANES, AUXILLARY LANES & TAPERS

NOTE: SEE SHEET 2A-2 FOR GEOTEXTILE FOR PAVEMENT STABILIZATION DETAIL

USE TYPICAL SECTION NO. 10

***-LPB- STA. 10+00.00 TO 18+00.12
-LPC- STA. 18+61.30 TO 20+06.66



TYPICAL SECTION NO. 11

NOTE: SEE PLANS FOR TURN LANES, AUXILLARY LANES & TAPERS

USE TYPICAL SECTION NO. 11

-SRPD- STA. 10+00.00 TO 11+52.40
-SLPB- STA. 18+00.12 TO 19+97.45

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PROJECT REFERENCE NO.	SHEET NO.
I-5506	2A-5
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
Bob A. May — SEAL 21116 — 12/27/2017	Clark S. Morrison — SEAL 22896 — 1/3/2018

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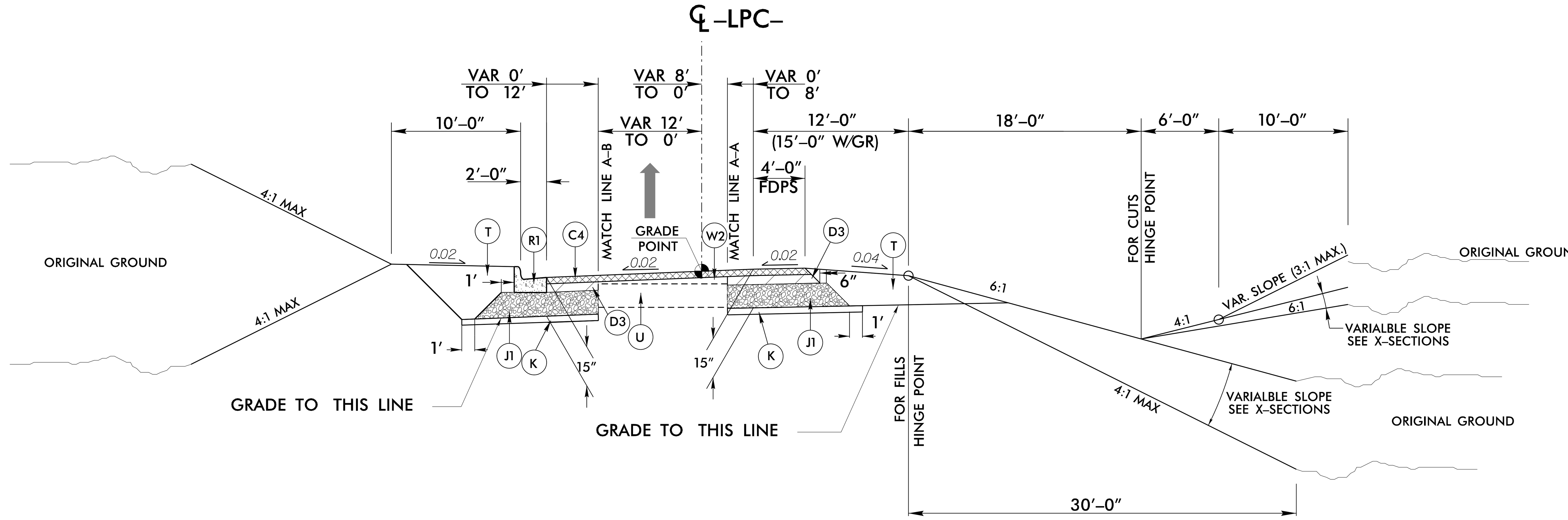
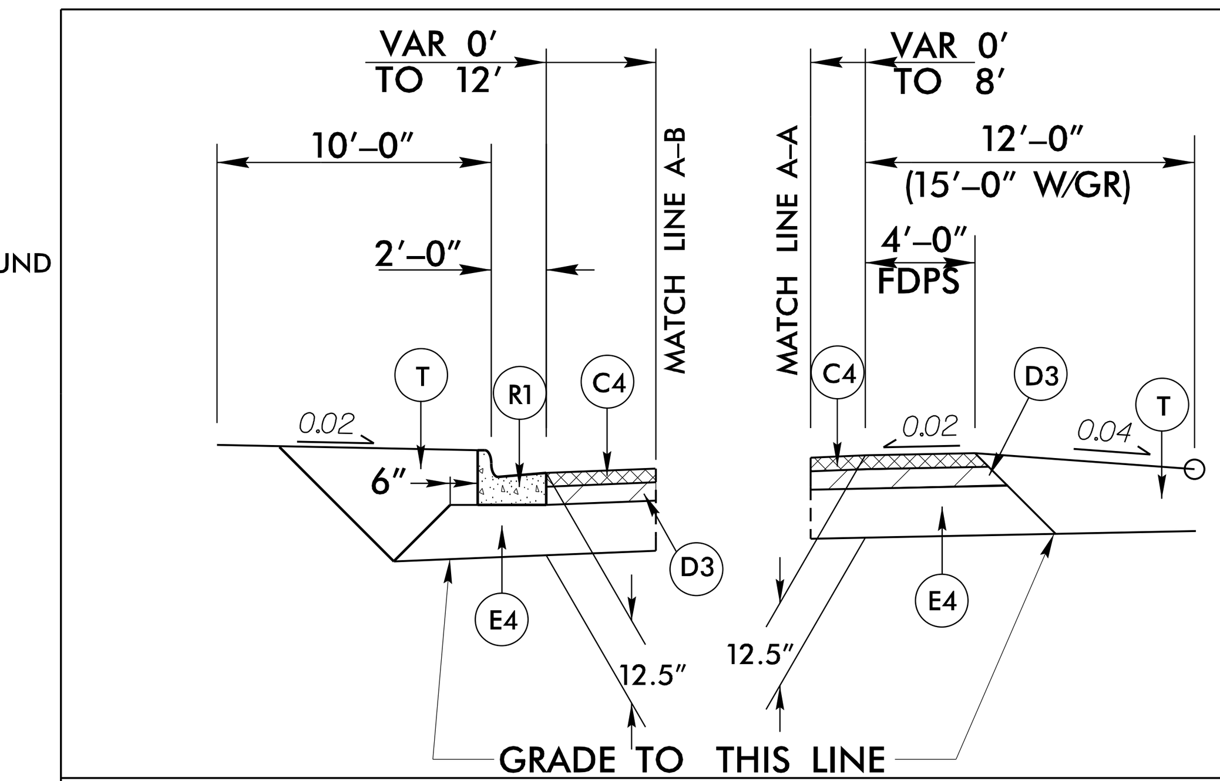


TYPICAL SECTION NO. 12

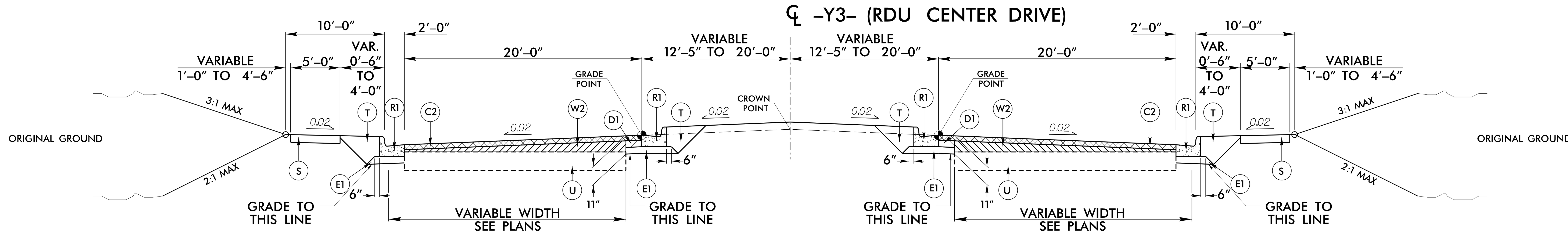
NOTE: SEE PLANS FOR TURN LANES & AUXILLARY LANES/TAPERS



USE WITH TYP. SECTION NO. 12
Narrow Widening (10' or less)

USE TYPICAL SECTION NO. 12

-LPC- STA. 16+79.94 TO 18+61.30

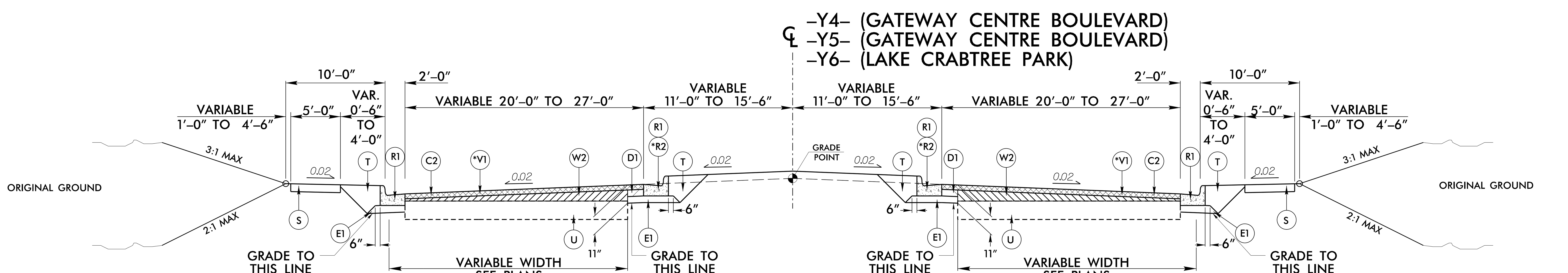


TYPICAL SECTION NO. 13

NOTE: SEE PLANS FOR SIDEWALK LOCATIONS AND WIDTHS

USE TYPICAL SECTION NO. 13

-Y3- STA. 10+42.08 TO 11+50.00

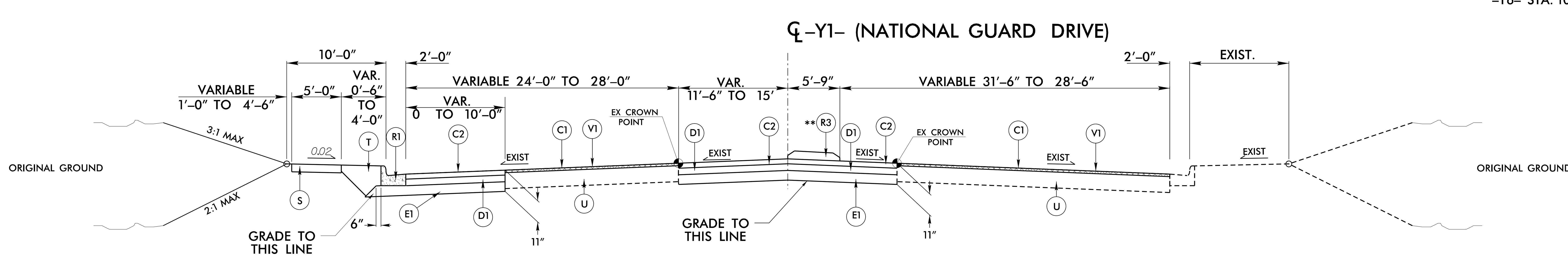


TYPICAL SECTION NO. 14

NOTE: SEE PLANS FOR SIDEWALK LOCATIONS AND WIDTHS

USE TYPICAL SECTION NO. 14

-Y4- STA. 9+62.00 TO 11+25.25 RT.
-Y4- STA. 10+40.00 TO 11+25.25 LT.
* -Y5- STA. 12+50.00 TO 15+01.46
-Y6- STA. 10+34.89 TO 11+20.00



** ISLAND TRANSITIONS FROM RT. TO LT. SEE PLANS FOR LOCATION

TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15

-Y1- STA. 10+37.66 TO 14+13.95

PAVEMENT SCHEDULE	
C1	1½" S9.5B
C2	3" S9.5B
C4	3" S9.5C
D1	4" I19.0B
D3	4" I19.0C
E1	4" B25.0B
E4	5½" B25.0C
J1	8" ABC
K	SUBGRADE STAB.
N	GEO. FOR PAV. STAB.
R1	2'-6" CURB
R2	1'-6" CURB
R3	CONC. ISLAND
S	4" SIDEWALK
T	EARTH MAT.
U	EXIST. PAVEMENT
V1	1½" MILLING
W	WEDGING

8/17/99
12/1/2017 I-5506_rdy_psh_02A-5_typ.dgn

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PROJECT REFERENCE NO.	SHEET NO.
I-5506	2A-6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY
12/27/2017

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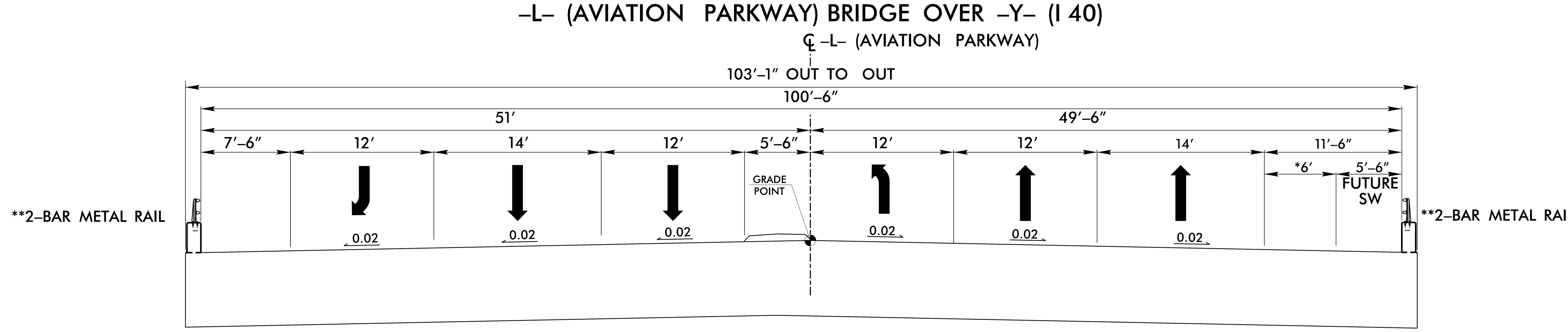
-L- (AVIATION PARKWAY) BRIDGE OVER -Y- (I 40)



-L- (AVIATION PARKWAY) STRUCTURE OVER -Y- (I-40)

-Y- STA. 49+24.09 TO -Y- STA. 52+15.59

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PROJECT REFERENCE NO.	SHEET NO.
I-5506	2B-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY
12/27/2017

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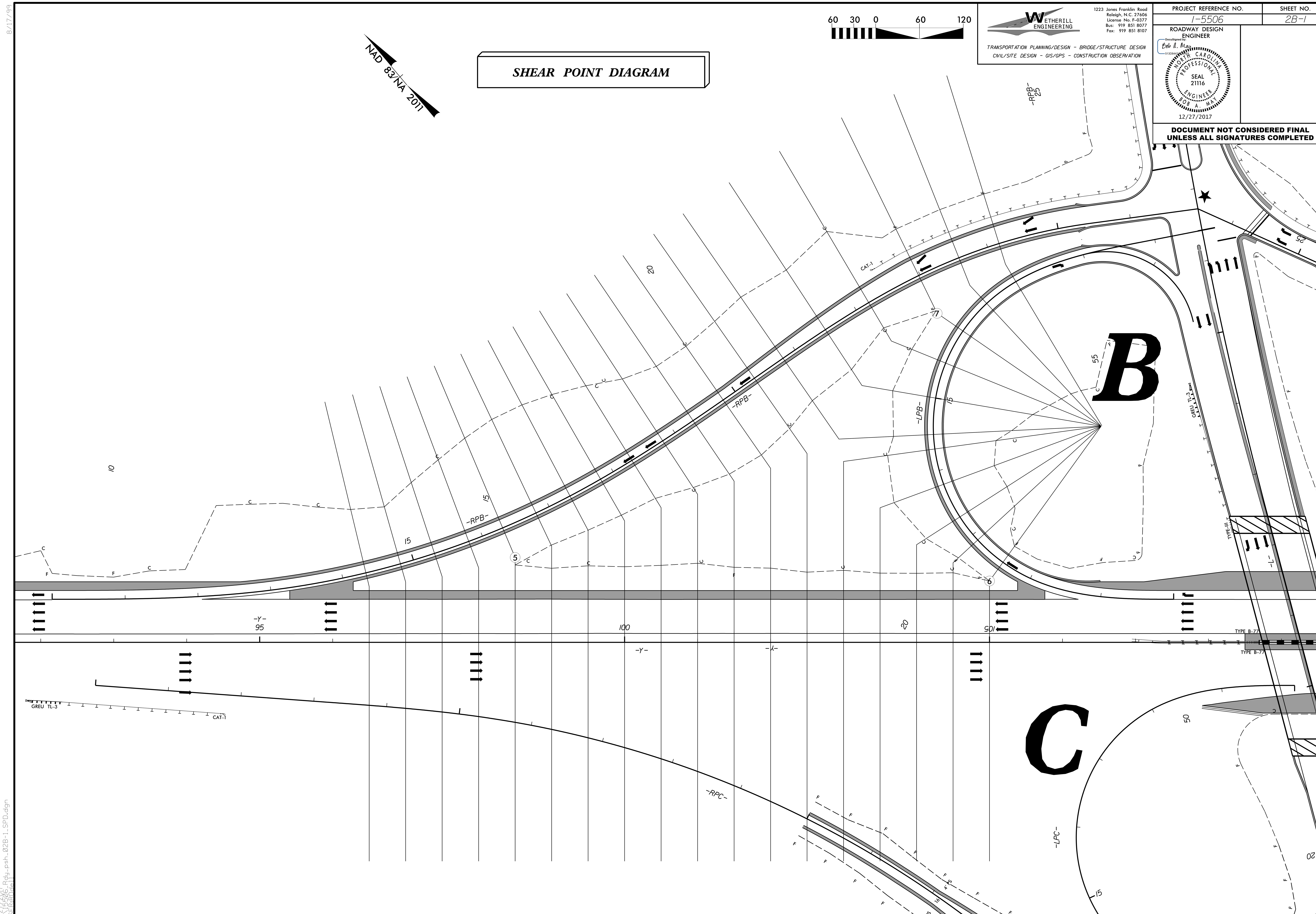
SHEAR POINT DIAGRAM



PROJECT REFERENCE NO.	SHEET NO.
I-5506	2B-2
R/W SHEET NO.	

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CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

ROADWAY DESIGN ENGINEER
Bob A. May
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY
12/27/2017

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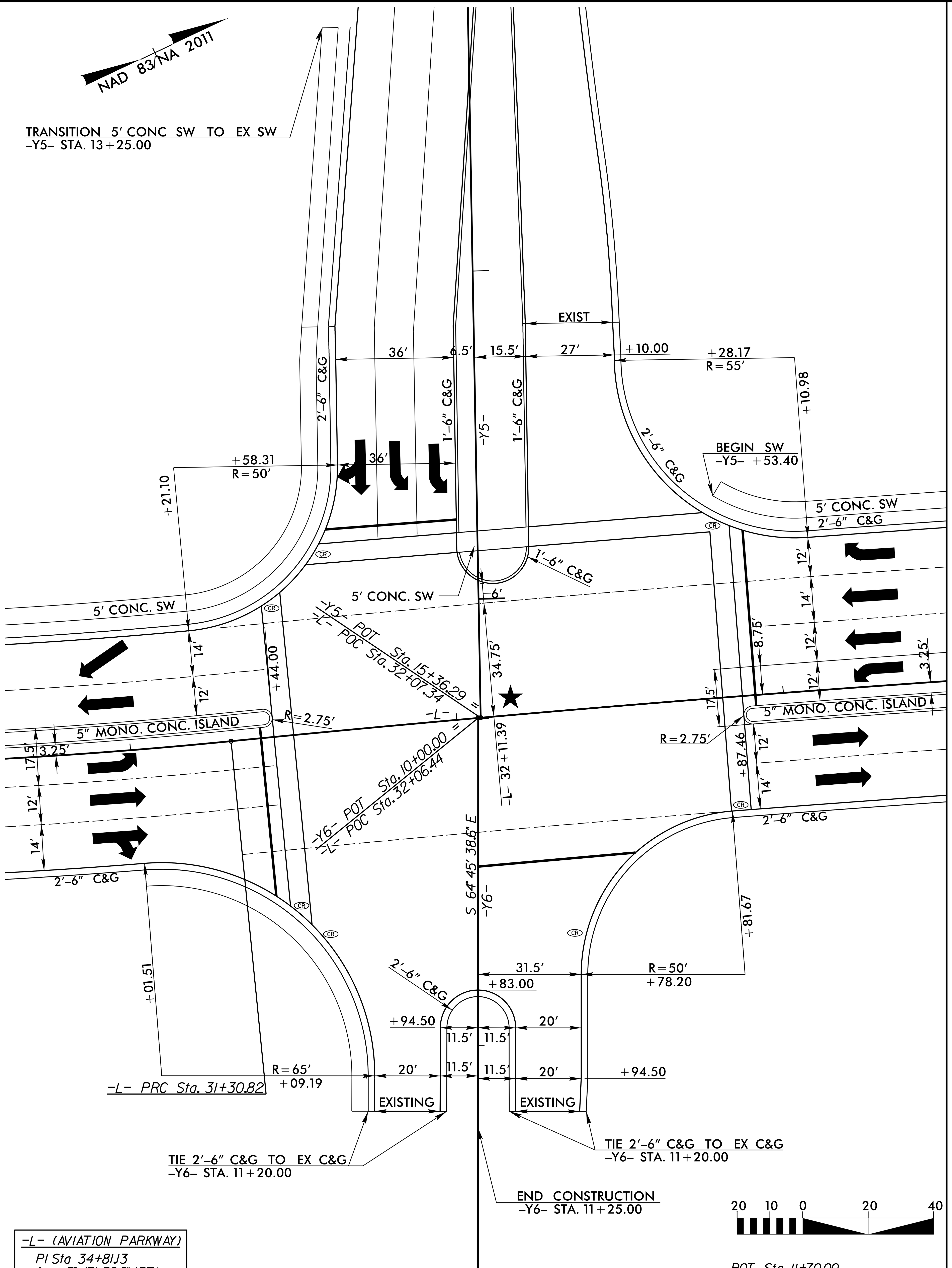
REVISIONS

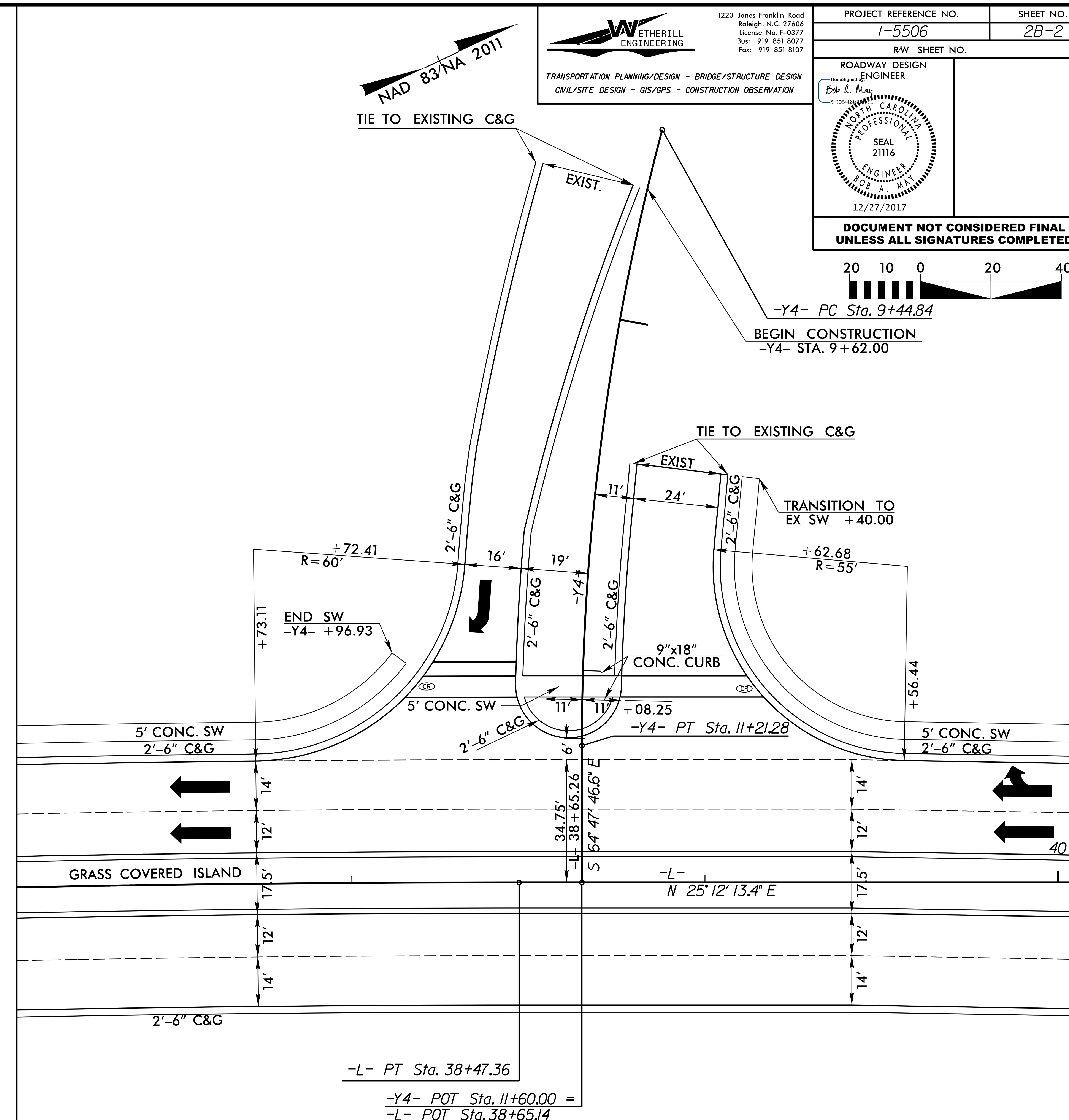


-L- (AVIATION PARKWAY)
PI Sta 34+81.13
Δ = 5° 47' 36.6" (RT)
D = 0° 47' 25.0"
L = 733.09'
T = 366.86'
R = 7,250.00'
SE = NC
DS = 50 MPH

★ REVISED SIGNAL

SEE SHEET 4 FOR PLAN VIEW

SEE PAVEMENT MARKING PLANS FOR CURB RAMP LOCATIONS AND STATIONING



-L- (AVIATION PARKWAY)
PI Sta 34+81.13
Δ = 5° 47' 36.6" (RT)
D = 0° 47' 25.0"
L = 733.09'
T = 366.86'
R = 7,250.00'
SE = NC
DS = 50 MPH

-Y4- (GATEWAY CENTRE BLVD.)
PI Sta 10+33.56
Δ = 14° 52' 01.2" (LT)
D = 8° 25' 33.1"
L = 176.44'
T = 88.72'
R = 680.00'
SE = EXIST.

SEE SHEET 5 FOR PLAN VIEW

SEE PAVEMENT MARKING PLANS FOR CURB RAMP LOCATIONS AND STATIONING

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
I-5506	2B-3

R/W SHEET NO.

ROADWAY DESIGN ENGINEER
DocuSigned by: Bob A. May
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY
12/27/2017

HYDRAULICS ENGINEER

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NAD 83/NA 2011

BEGIN C&G LT. RT.
-RPC- +79.64
+02.55

8:1 PS
36′
12′
4′ PS
+48.58
R=75′
2′-6″ C&G
END SW
-L- +89.11

BEGIN C&G
-LPC- +70.64
4′ PS
8′
12′
-LPC-
2′-6″ C&G
8′
12′
R=10′
+75.48
2′-6″ C&G

-RPC- POT Sta. 29+00.49 =
-L- POT Sta. 45+36.93
-RPC-
14′
12′
1′-6″ C&G
5.5′
GRASS COVERED ISLAND
12′
R=8.75′
45
-L-
N 25° 12′ 13.4″ E
14′
12′
17.5
12′
14′
12′
R=7.75′
+26.97
+93.25
R=8.75′
5″ MONO. CONC. ISLAND
+84.00
+99.80
14′
12′
14′
4′
EDGE OF LANE
R=4′
2′-6″ C&G
-RPD- POT Sta. 27+57.26 =
-L- POT Sta. 45+49.00
-SRPD-
2′-6″ C&G
18′
-L- POT Sta.44+42.56 =
-SRPD- PC Sta.10+00.00
OFF 38′ RT.
BEG C&G
+17.21
-RPD- POT Sta.26+17.21=
-SRPD- POT Sta. 11+52.40
BEG C&G
+17.21
EX PS
EX
EX PS
BEGIN CONSTRUCTION
-RPD- STA. 25+80.00
N 57° 46′ 30.5″ W
-RPD-

20 10 0 20 40

★ REVISED SIGNAL
SEE SHEET 5 FOR PLAN VIEW

SEE PAVEMENT MARKING PLANS FOR CURB RAMP LOCATIONS AND STATIONING

-LPB- POC Sta. 18+00.12
-SLPB- PC Sta. 18+00.12

NAD 83/NA 2011

BEGIN C&G LT
-LPB- STA. +00.36
12′
2′-6″ C&G
-LPB- ST Sta. 18+78.42
-LPB- POT Sta. 19+66.00 =
-L- POC Sta.56+42.00
+48.35
-SLPB-
2′-6″ C&G
+29.70
2′-6″ C&G
+38.06
2′-6″ C&G
+91.82
R=4′
41.5′
R=2.75′
+24.00
-LPB-
S 61° 00′ 20.3″ E
+88.25
R=15′
-RPB-
S 57° 43′ 00.3″ E
14′
12′
5.5′ 5″ MONO. CONC. ISLAND
12′
12′
12′
14′
6′
-L-
R=10′
+16.41
2′-6″ C&G
N 25° 43′ 00.3″ W
-RPA-
5′ CONC. SW

4′ PS
25
4′ PS
BEGIN C&G LT, RT
-RPB- STA. +28.70
-RPB- PT Sta. 25+43.62
16′
+76.90
12′
+90.63
R=50′
+49.99
2′-6″ C&G
12′
14′
12′
1′-6″ C&G
11.5′
GRASS COVERED ISLAND
+25.45
R=14.75′
18′
12′
1′-6″ C&G
14′
26′
2′-6″ C&G
5′ CONC. SW
-RPA- POT Sta. 26+50.94 =
-RPB- POT Sta. 26+93.62 =
-L- POC Sta.56+72.00
+94.95
R=225′

BEGIN C&G
-RPA- +54.40
4′
+79.38
R=80′
25
12′
12′
4′ PS
4′ PS
BEGIN C&G
-RPA- +54.40
-RPA- PT Sta. 24+35.35

20 10 0 20 40

★ REVISED SIGNAL
SEE SHEET 5 FOR PLAN VIEW

SEE PAVEMENT MARKING PLANS FOR CURB RAMP LOCATIONS AND STATIONING

12/27/2017
I-5506
USER:RBDale1

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Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2B-4
R/W SHEET NO.	

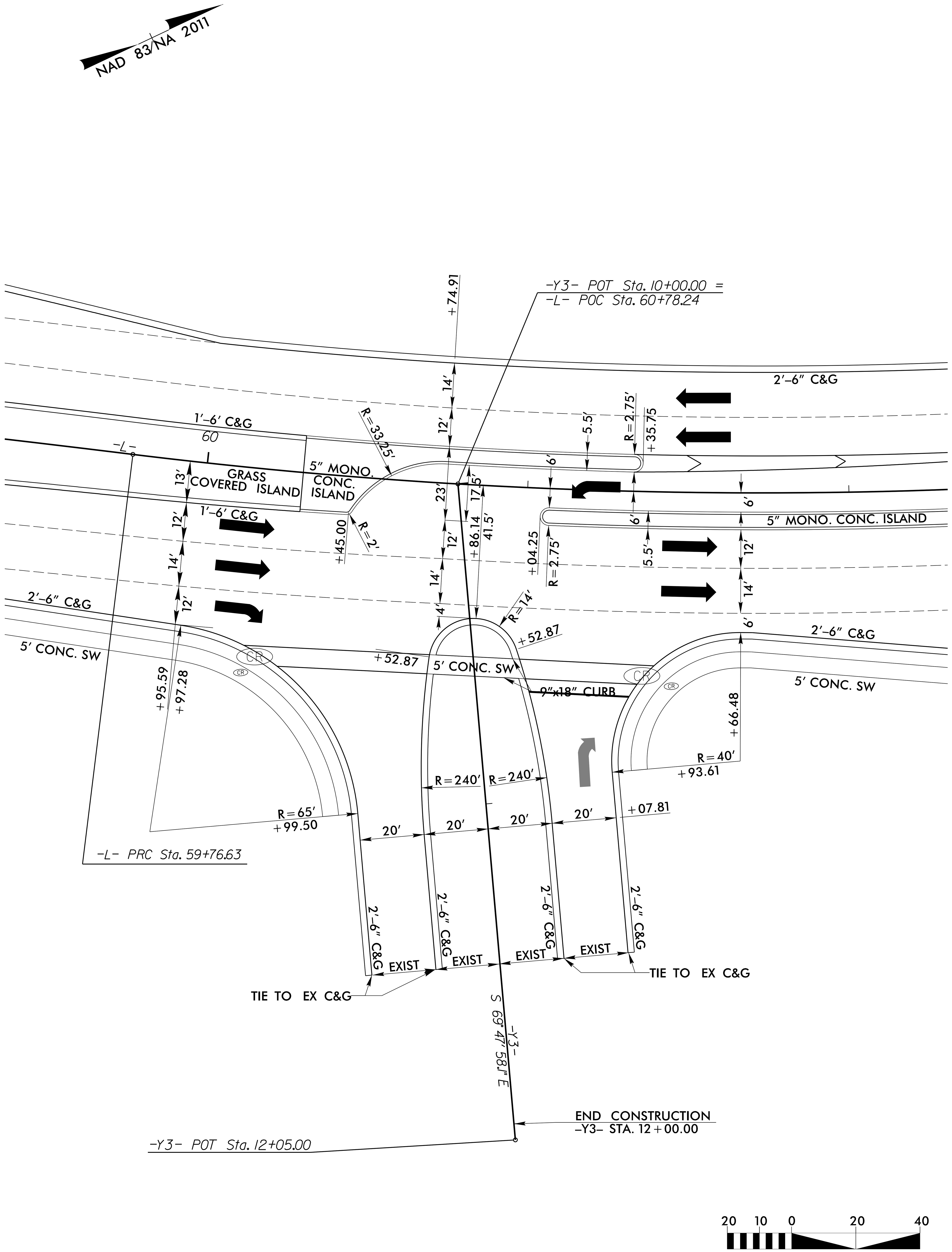
ROADWAY DESIGN ENGINEER

SEAL 21116 – NORTH CAROLINA PROFESSIONAL ENGINEER – BOB A. MAY

12/27/2017

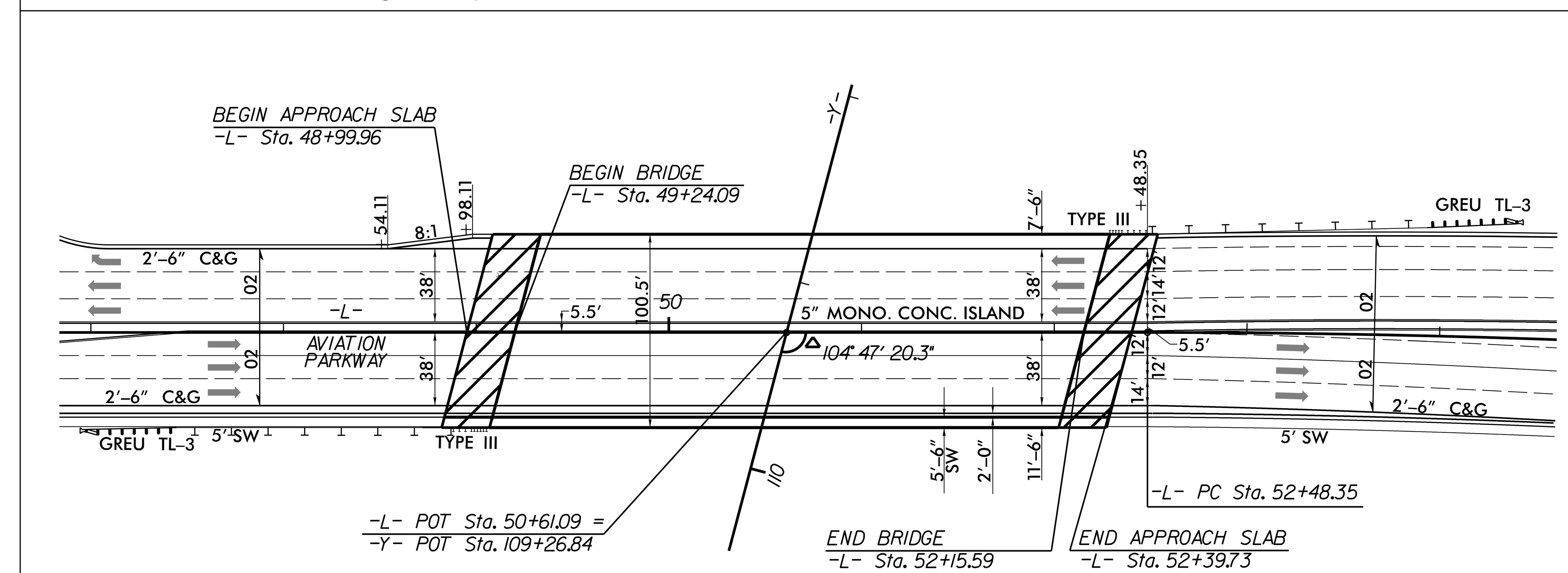
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



SEE SHEET 5 FOR PLAN VIEW
SEE PAVEMENT MARKING PLANS FOR CURB RAMP LOCATIONS AND STATIONING

STRUCTURE/PAVEMENT RELATIONSHIP

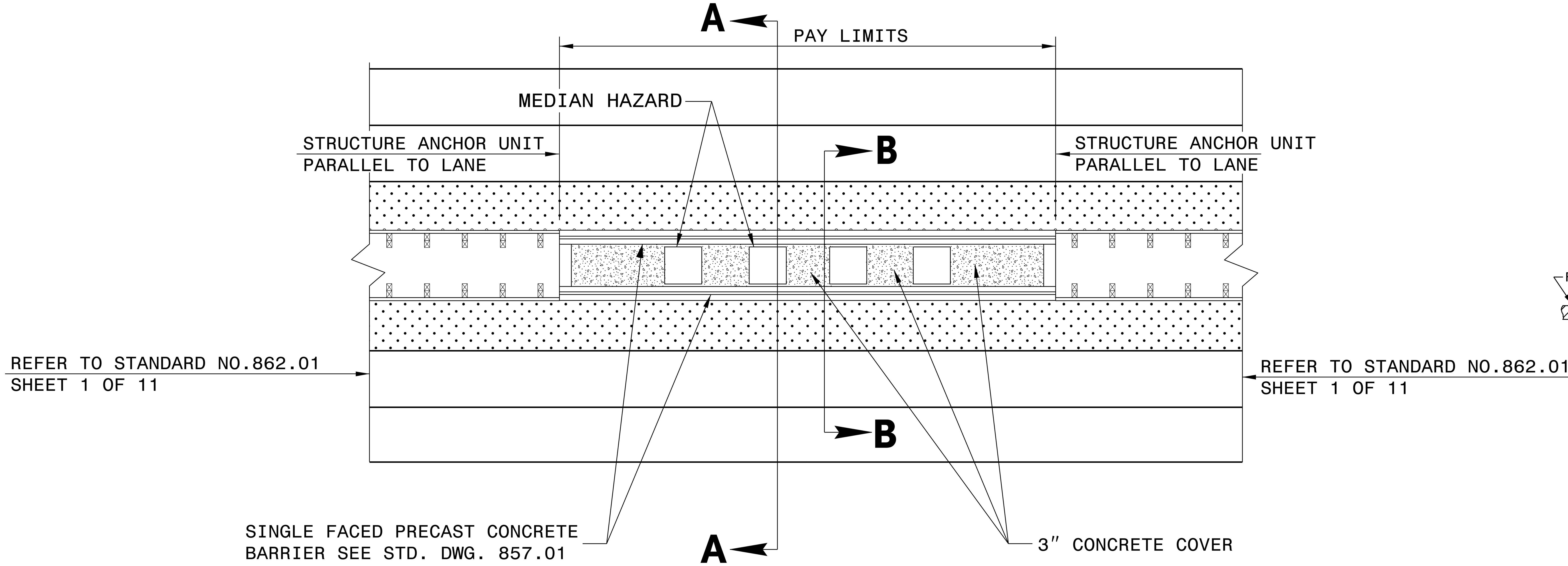


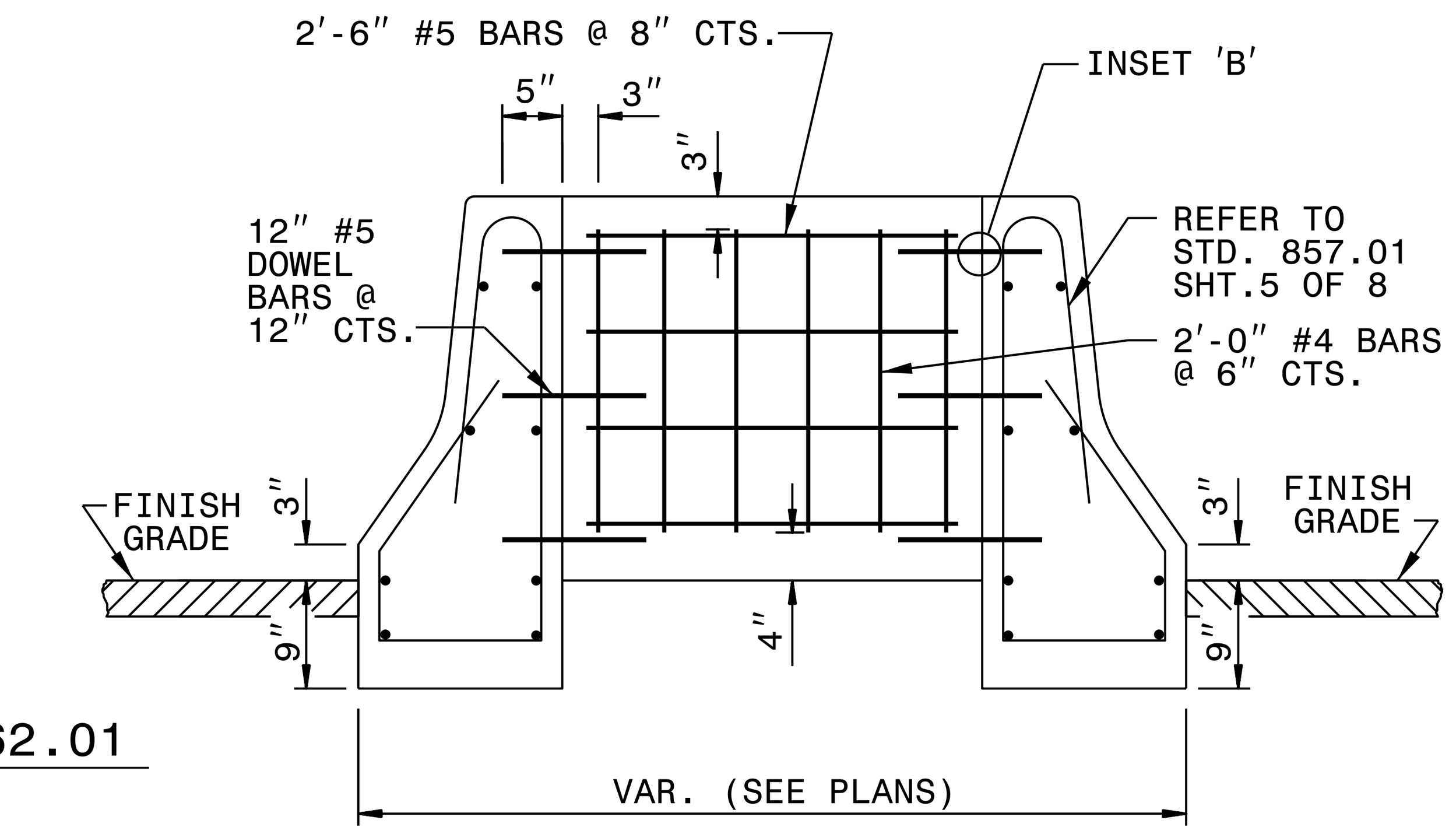
(SEE SHEET 5 PLAN OVERVIEW)
(SEE SHEETS S01-1 THRU S01-46 FOR STRUCTURE PLANS)

8/17/99

11/27/2017 I5506_rdy_psh_02B-4_IntersBrgDtl.dgn

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2C-1





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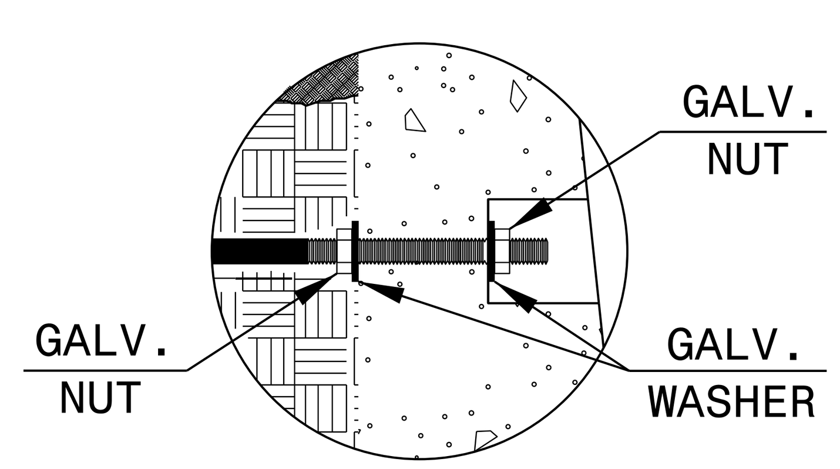
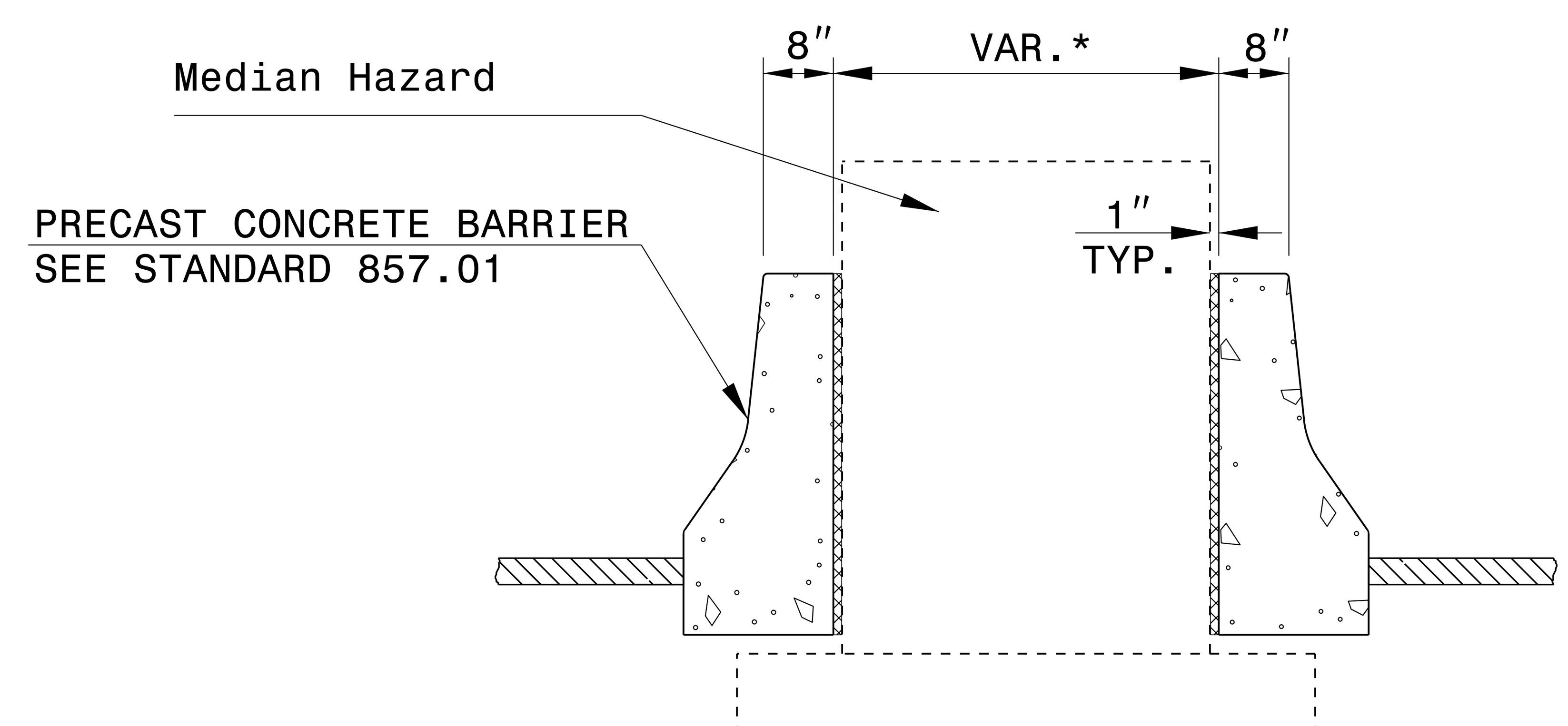
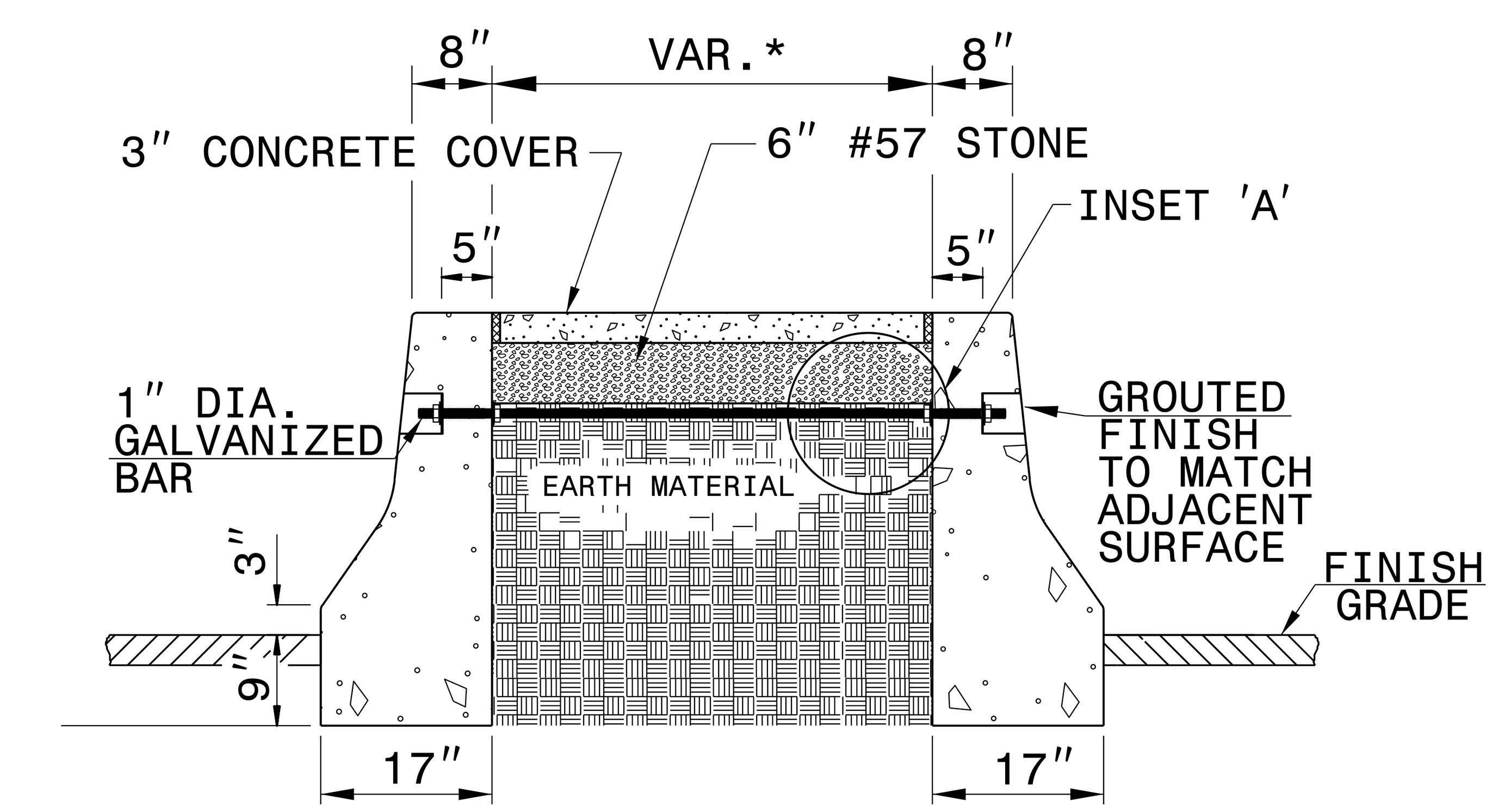


INSET 'A'



SECTION A-A



SECTION B-B

GENERAL NOTES:

*THIS DIMENSION MAY VARY DEPENDING ON THE WIDTH OF THE PIER.

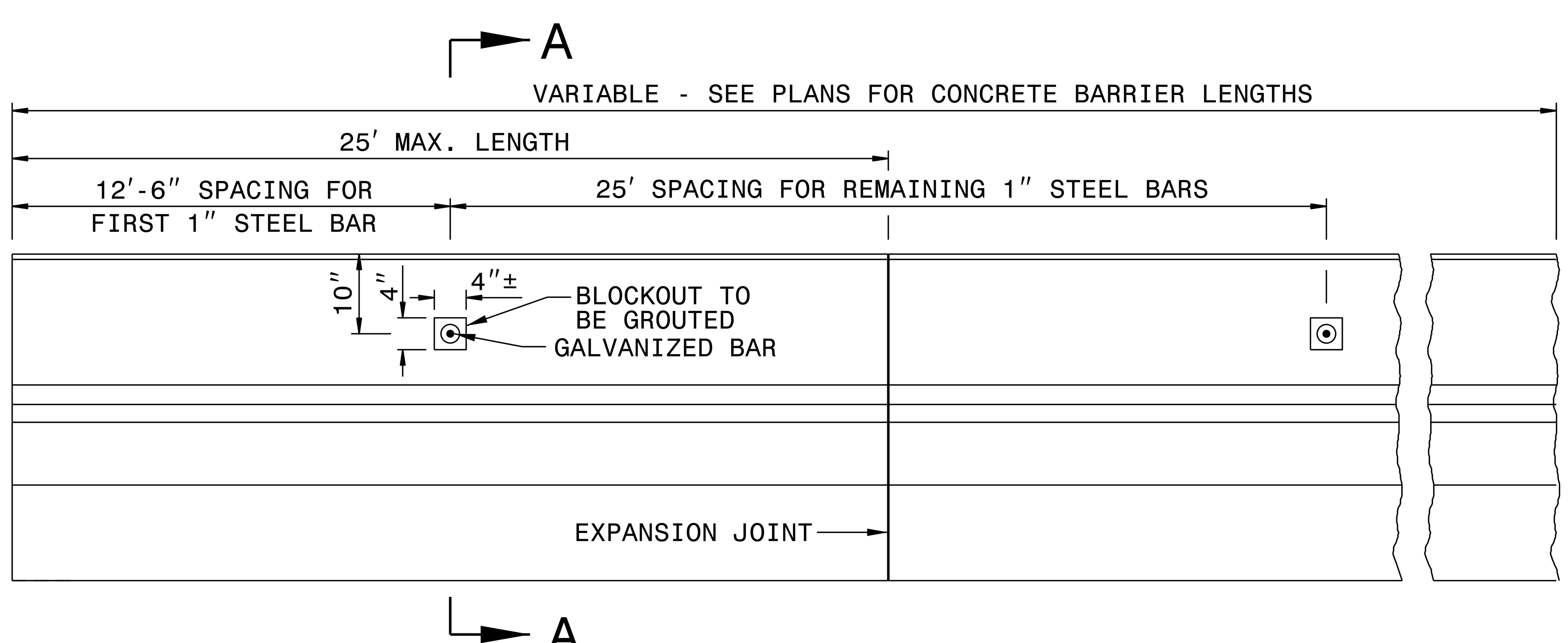
INSET FIRST 1" DIA. GALVANIZED BAR 12'-6" AND SPACE THE REMAINING 1" BARS AT 25'-0".

USE AN APPROVED BONDING SYSTEM IN ACCORDANCE WITH SECTION 1081-1, TYPE 3A OF THE STANDARD SPECIFICATIONS.

USE CLASS B CONCRETE FOR THE CONCRETE COVER

SEAL ALL EXPANSION JOINTS WITH JOINT FILLER (SEE SECTION 1028 OF THE SPECIFICATIONS).

PLACE A 1" BAR BETWEEN EACH SET OF PIERS



ELEVATION

20-DEC-2017 07:51
S:\Contracts\Contracts\Special Details\jhowerton\Barrier Cover for Median Hazard Protection.dgn
jhowerton AT CSD-242595

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UNLESS ALL SIGNATURES COMPLETED

Joel S. Howerton
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton
12/28/2017

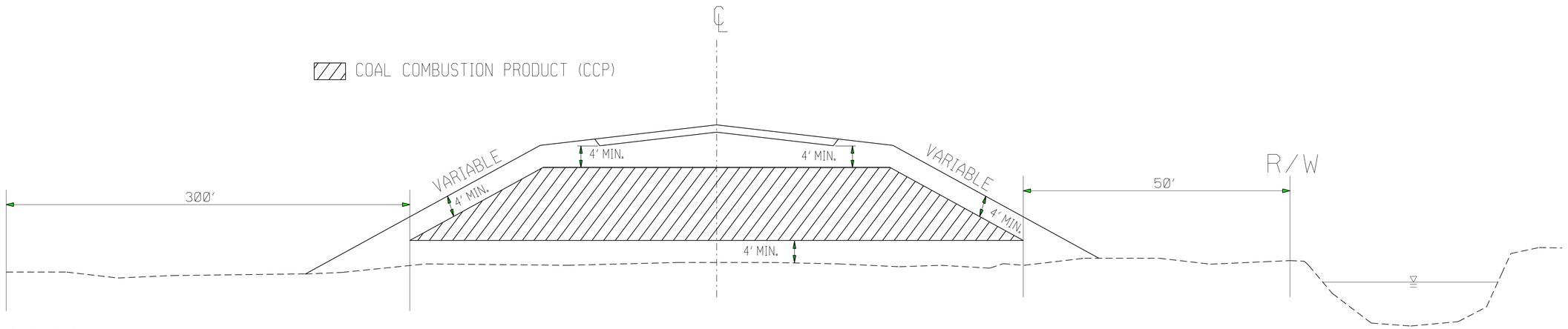
CONTRACT STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

DETAIL OF MEDIAN HAZARD PROTECTION

ORIGINAL BY: T.S.Spell DATE: 2-4-10
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: jhowerton\Barrier Cover for Median Hazard Protection

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2C-2

COAL COMBUSTION PRODUCT PLACEMENT



*(OBTAIN PERMISSION FROM ARMY CORPS OF ENGINEERS)

PLACE CCP IN HATCHED AREA IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS

PLACE CCP A MINIMUM OF 5' ABOVE SEASONAL HIGH GROUND WATER

PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

PLACE SOIL BORROW MATERIAL ON THE OUTSIDE OF CCP AS EACH LIFT OF CCP IS PLACED

Docusigned by: Joel S. Howerton

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

12/28/2017

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

COAL COMBUSTION PRODUCT PLACEMENT DETAIL

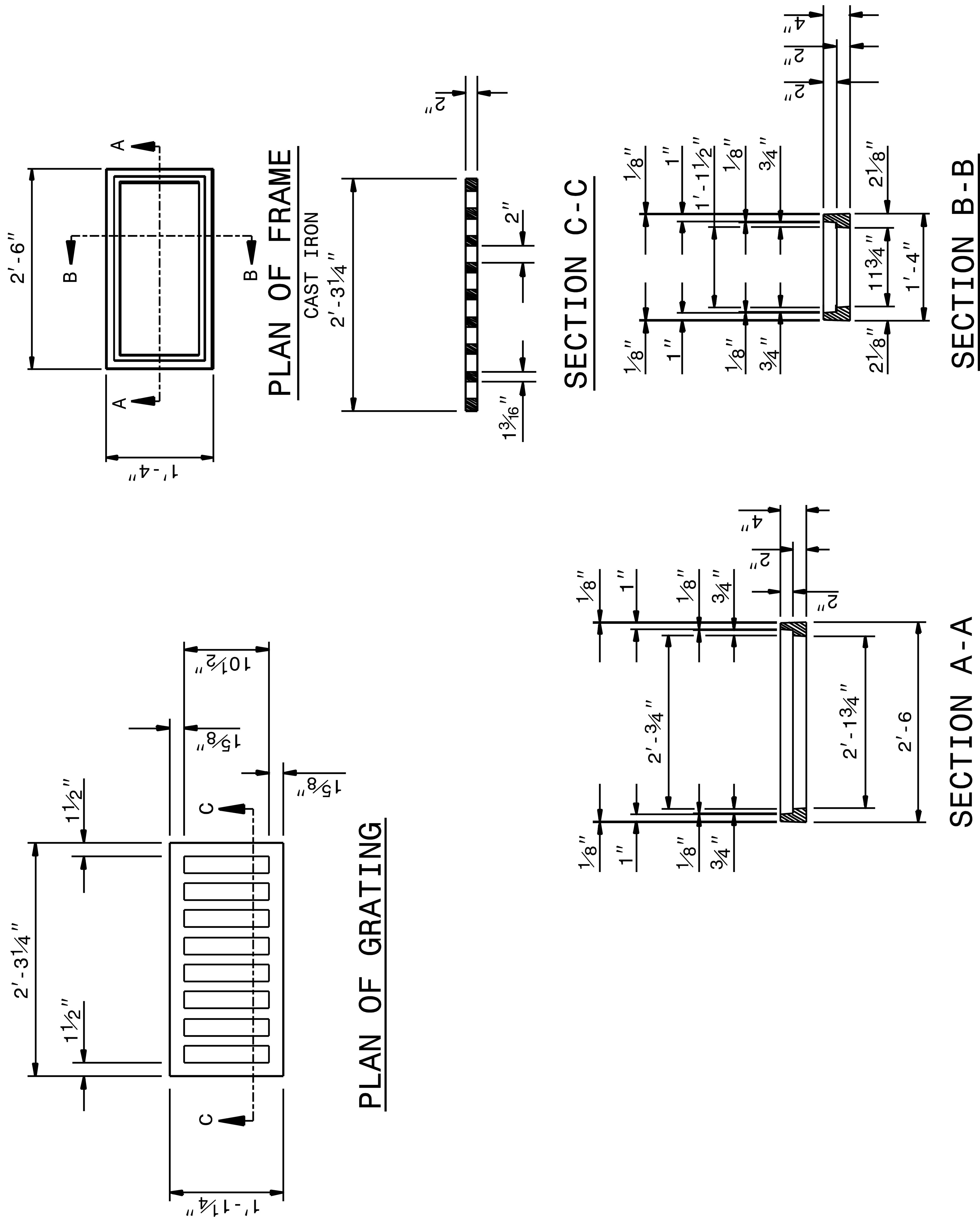
ORIGINAL BY: J.S.H. DATE: 3/16/15
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: joel/coal combustion material detail.dgn

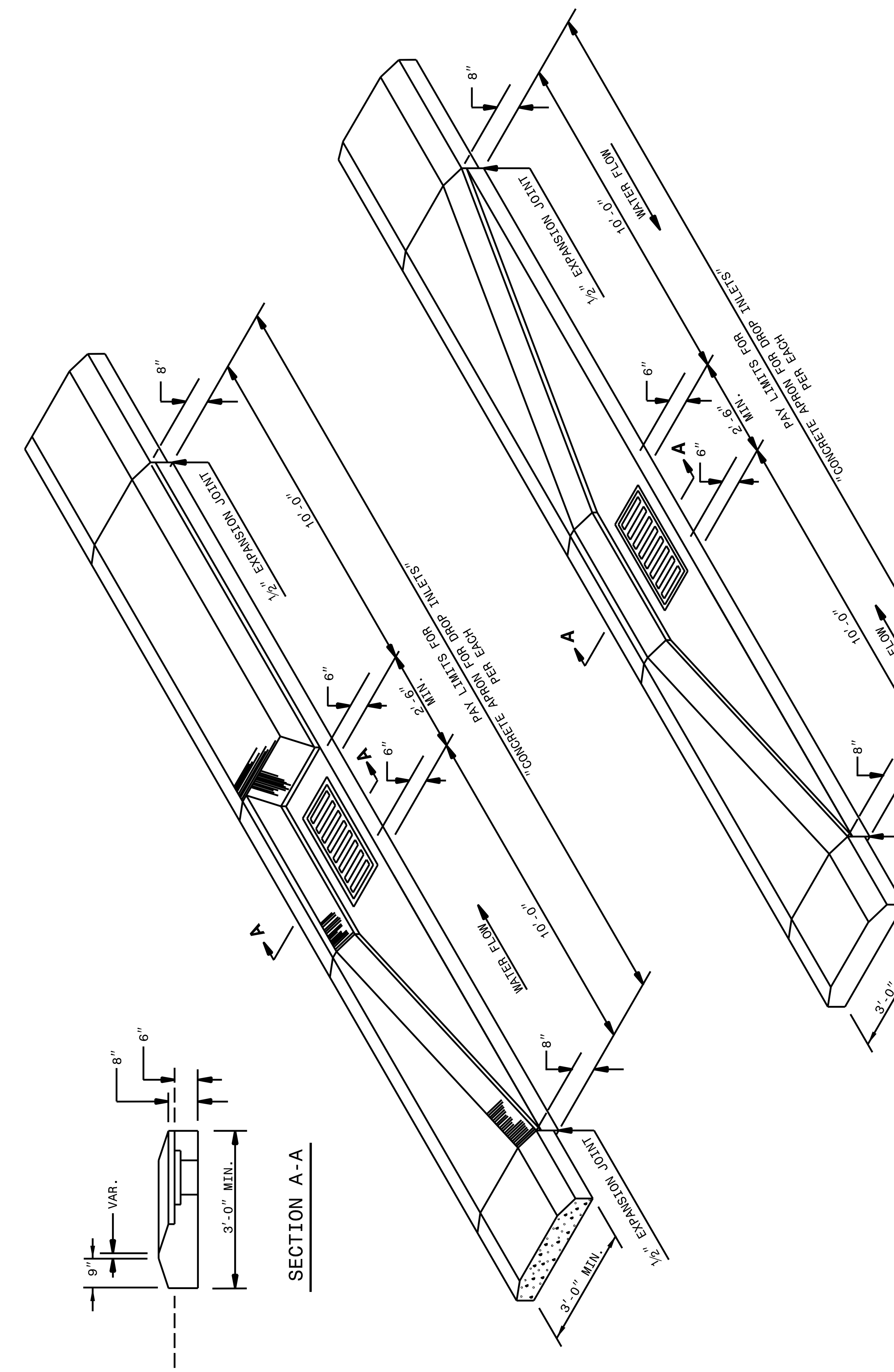
07-SEP-2017 08:21
S:\Contracts\Special Details\jhowerton\Coal Combustion Product Detail.dgn
jhowerton AT CSD-292595

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2C-3

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR NARROW DROP INLET FRAME AND GRATE FOR USE WITH DETAIL 840D11 & 840D12
SHEET 1 OF 1 840D13
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR METHOD FOR PLACEMENT OF DROP INLETS IN ISLANDS
SHEET 1 OF 1 852D03





NOTES:
REFER TO DETAIL 840D11 AND 840D12 FOR DRAINAGE STRUCTURE.

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

ENGLISH DETAIL DRAWING FOR
NARROW DROP INLET FRAME AND GRATE
FOR USE WITH DETAIL 840D11 & 840D12

SHEET 1 OF 1 **840D13**

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

ENGLISH DETAIL DRAWING FOR
METHOD FOR PLACEMENT OF DROP INLETS IN ISLANDS

SHEET 1 OF 1 **852D03**

DocuSigned by: Joel S. Howerton
873F3D17D...
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton
12/28/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE PLATE FOR TITLE

ORIGINAL BY: 1998 STDS DATE:
MODIFIED BY: E.E. WARD DATE: 3-21-02
CHECKED BY: DATE:
FILE SPEC.: /usr/details/stand/840stds/840d11.dgn

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

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

5/14/99

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

ENGLISH DETAIL DRAWING FOR
BRICK NARROW DROP INLET
12" THRU 24" PIPE

SHEET 1 OF 1 **840D12**

GENERAL NOTES:

CLASS 'B' CONCRETE TO BE USED.

ALL MORTAR JOINTS ARE ½" ± ⅛".

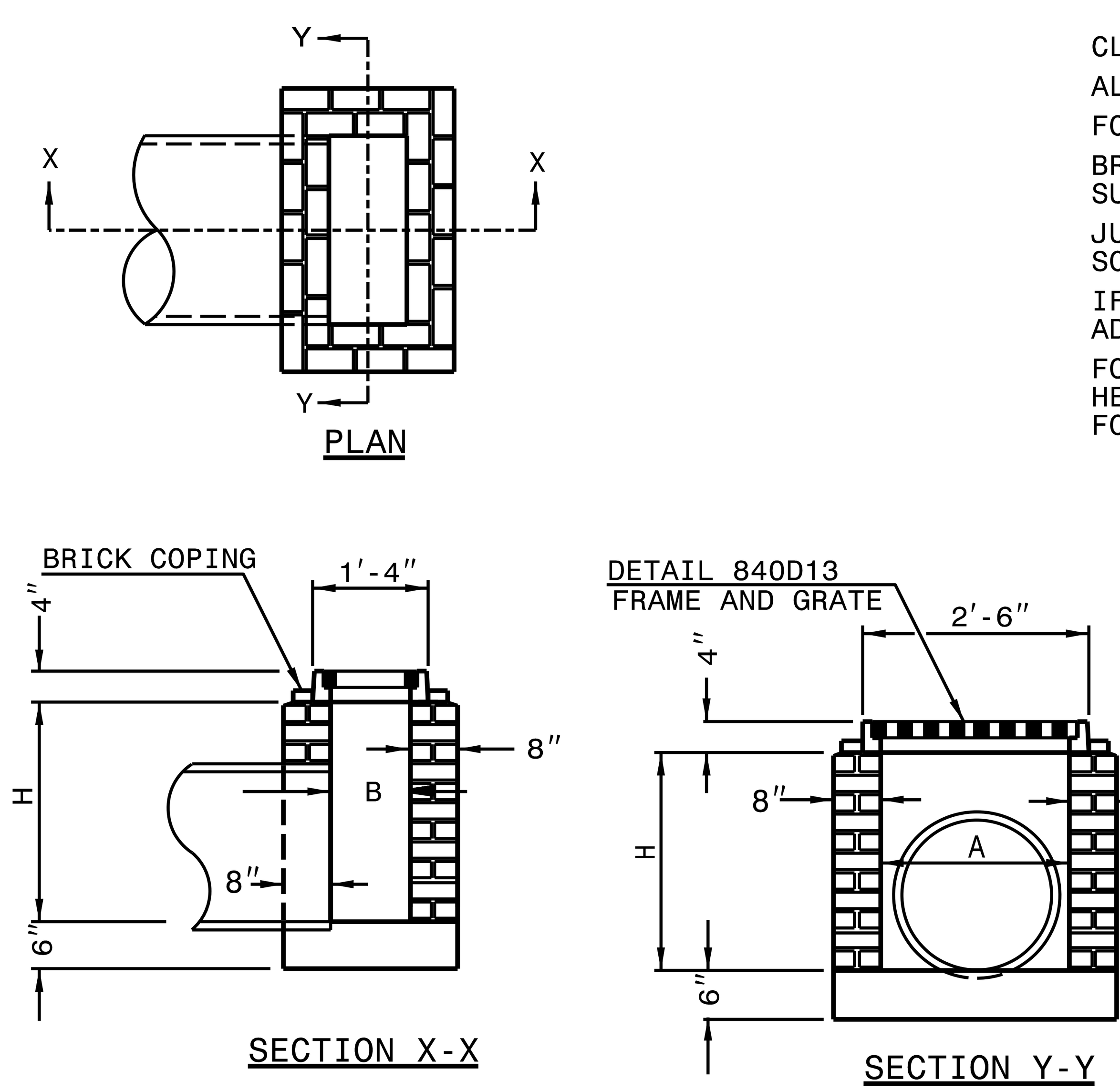
FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

BRICK MASONRY DROP INLET NOT TO BE USED IN LOCATIONS SUBJECT TO TRAFFIC.

JUMBO BRICK WILL BE PERMITTED. CONCRETE BRICK OR 4" SOLID CONCRETE BLOCKS MAY BE USED IN LIEU OF CLAY BRICK.

IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD 840.00.

FOR 8'-0" IN HEIGHT OR LESS USE 8" WALL. OVER 8'-0" IN HEIGHT USE 12" WALL TO 6'-0" FROM TOP OF WALL, AND 8" WALL FOR THE REMAINING 6'-0". QUANTITIES TO BE ADJUSTED ACCORDINGLY.



DIMENSIONS AND QUANTITIES FOR DROP INLET

DIMENSIONS OF BOX & PIPE				CONC. IN BASE	TOTAL BRICK MASONRY			DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	HEIGHT						
D	A	B	H (MIN.)	CY. YDS.	PER FT. HEIGHT	BRICK COPING	MIN. H	C.M.	R.C.
12"	2'-0"	0'-10"	2'-8"	0.133	0.206	0.025	0.574	0.020	0.032
15"	2'-0"	0'-10"	3'-0"	0.133	0.206	0.025	0.643	0.031	0.047
18"	2'-0"	0'-10"	3'-5"	0.133	0.206	0.025	0.729	0.044	0.065
24"	2'-0"	0'-10"	4'-0"	0.133	0.206	0.025	0.849	0.078	0.113

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

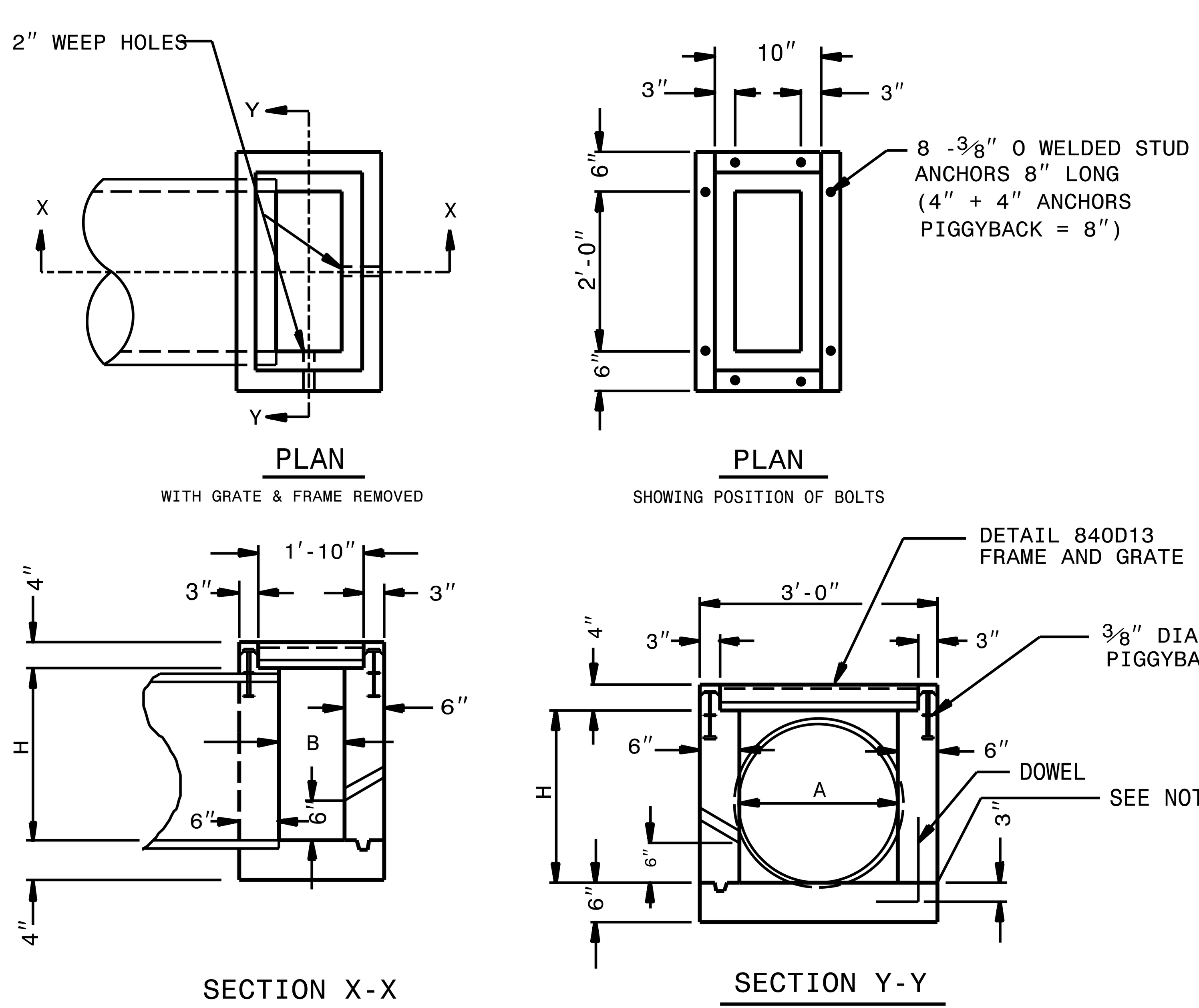
ENGLISH DETAIL DRAWING FOR
BRICK NARROW DROP INLET
12" THRU 24" PIPE

SHEET 1 OF 1 **840D12**

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

ENGLISH DETAIL DRAWING FOR
CONCRETE NARROW DROP INLET
12" THRU 24" PIPE

SHEET 1 OF 1 **840D11**



GENERAL NOTES:

CLASS "B" CONCRETE TO BE USED THROUGHOUT.

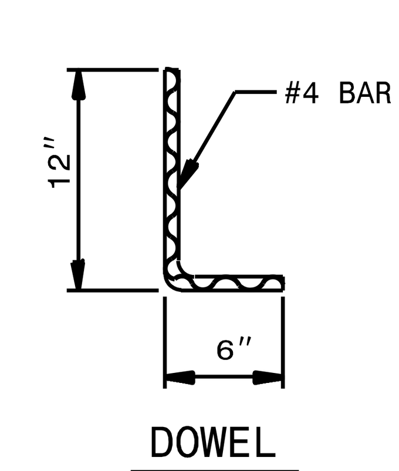
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTER, AS DIRECTED BY ENGINEER.

TWO 2" PIPE WEEP HOLES TO BE PLACED AS DIRECTED BY ENGINEER.

FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD 840.00.

A STONE DRAIN CONSISTING OF 1 CUBIC FOOT OF NO. 78M STONE CONTAINED IN A BAG OF POROUS FABRIC SHALL BE PLACED AT EACH WEEP HOLE.



DIMENSIONS AND QUANTITIES FOR DROP INLET

DIMENSIONS OF BOX & PIPE				CUBIC YARDS IN BOX		TOTAL QUAN. BOX & COVER	DEDUCTIONS FOR ONE PIPE CU. YDS.	
PIPE	SPAN	WIDTH	HEIGHT					
D	A	B	H	FLOOR & COPING	WALL PER FT. H	CU. YDS. MIN. H	C.M.	R.C.
12"	2'-0"	0'-10"	2'-8"	0.129	0.142	0.507	0.015	0.024
15"	2'-0"	0'-10"	3'-0"	0.129	0.142	0.555	0.023	0.036
18"	2'-0"	0'-10"	3'-5"	0.129	0.142	0.614	0.033	0.049
24"	2'-0"	0'-10"	4'-0"	0.129	0.142	0.697	0.059	0.085

DIMENSIONS FOR CHANNELS

CHANNELS			
NO.	SIZE	LENGTH	TOTAL LIN. FT.
2	3" X 4.1#	2'-6"	5'-0"
2	3" X 4.1#	1'-10"	3'-8"

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

ENGLISH DETAIL DRAWING FOR
CONCRETE NARROW DROP INLET
12" THRU 24" PIPE

SHEET 1 OF 1 **840D11**

ORIGINAL BY: 1998 STDS DATE:
MODIFIED BY: E.E. WARD DATE: 3-21-02
CHECKED BY: DATE:
FILE SPEC.: /usr/details/stand/840stds/840d11.dgn

SEE PLATE FOR TITLE

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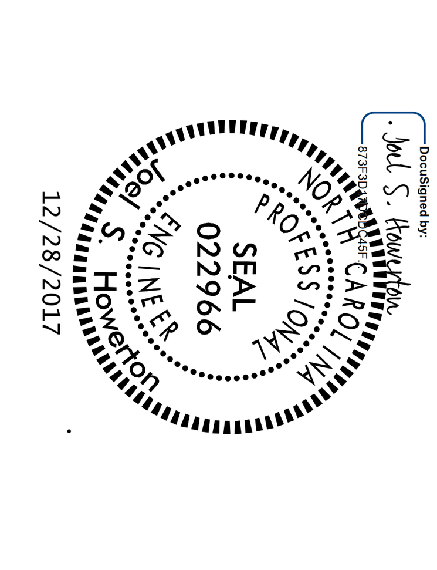
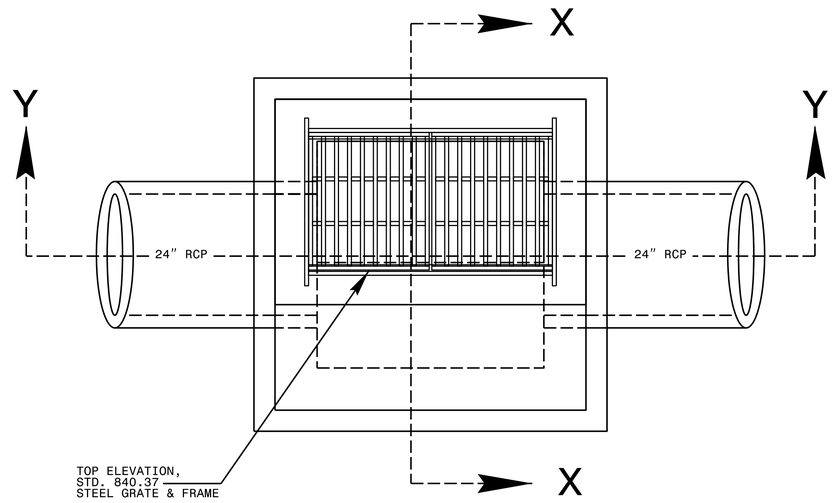
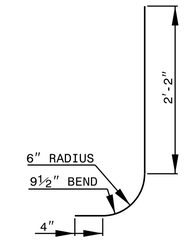


PROJECT REFERENCE NO.	SHEET NO.
I-5506	2C-4

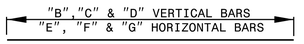
PROJECT REFERENCE NO.	SHEET NO.
I-5506	2C-5



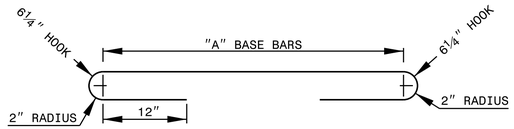
PLAN



CORNER BARS



STRAIGHT BARS



BASE BARS

GENERAL NOTES:

USE CLASS "AA" CONCRETE THROUGHOUT.

PROVIDE ALL DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR 2" KEYWAY OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

USE STD NO. 840.37 FOR STEEL GRATE AND FRAME.

CONSTRUCT WITH PIPE CROWNS MATCHING OR AS DIRECTED BY THE ENGINEER.

MAINTAIN A MINIMUM OF 2" CLEARANCE ON ALL REINFORCING STEEL.

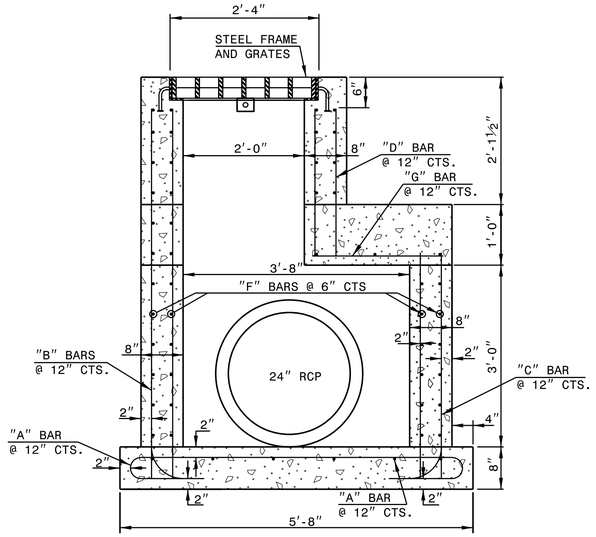
REINFORCING STEEL TO BE CUT, BENT OR RELOCATED TO POSITION PIPE AS DIRECTED BY THE ENGINEER.

CHAMFER ALL EXPOSED CORNERS 1".

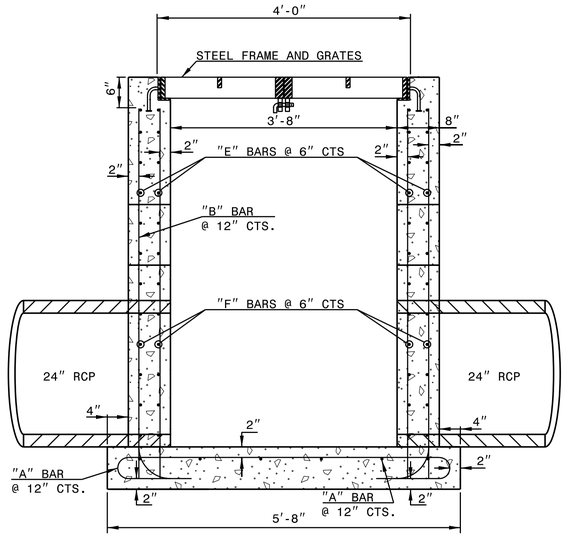
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
A	12	#5	8'-0½"	101
B	28	#5	6'-1½"	179
C	12	#5	3'-8"	46
D	12	#5	2'-5½"	31
E	16	#5	3'-0"	50
F	47	#5	4'-8"	229
G	6	#5	2'-0"	13
COR.	4	#5	3'-3½"	14
TOTAL REINF. STEEL(lbs)				663
TOTAL CONC. (cu. yds)				3.9

NO DEDUCTIONS FOR PIPES



SECTION X-X



SECTION Y-Y

Docusigned by:
Joel S. Howerton
873F3D1...

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON

12/28/2017

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

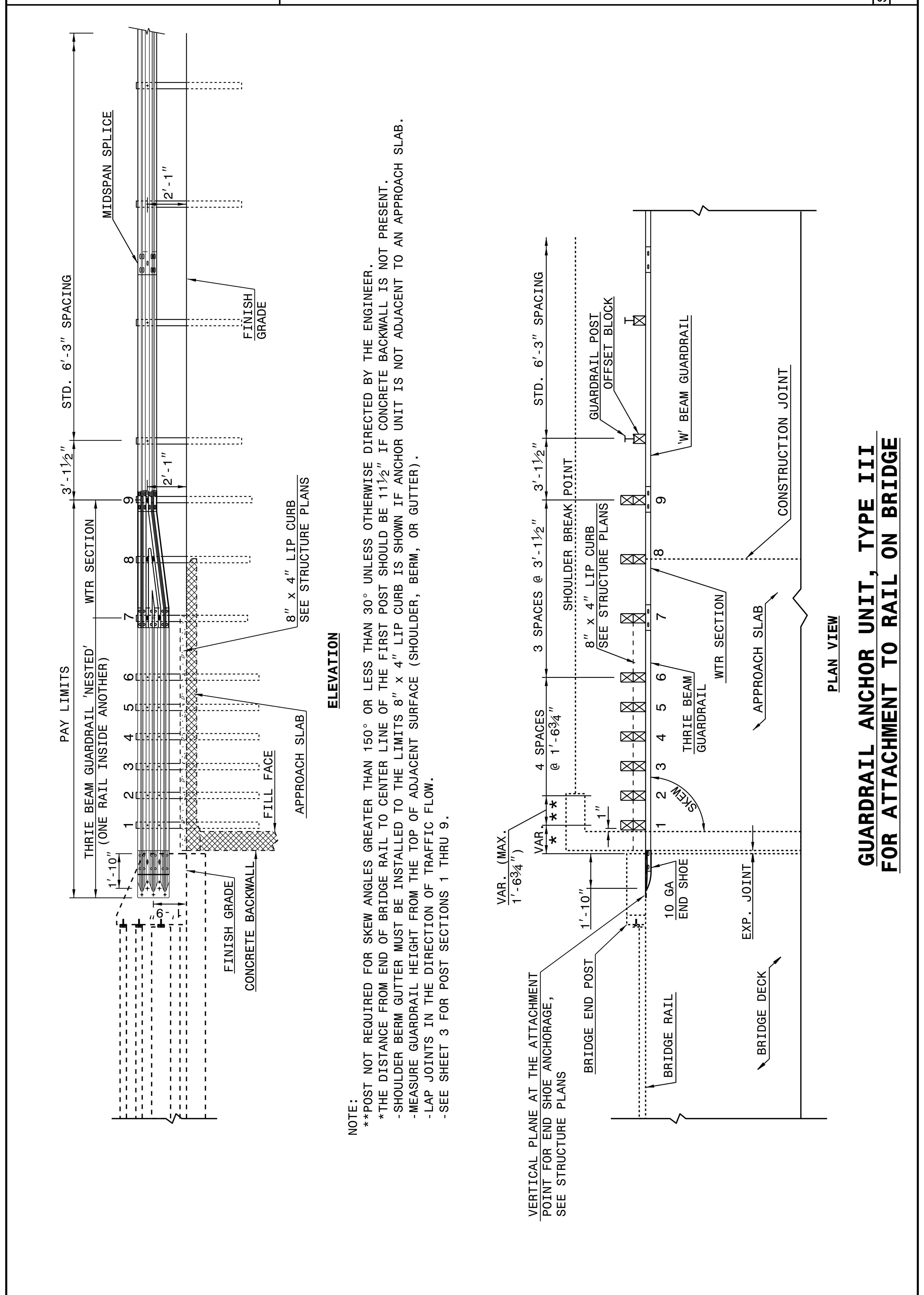
TRAFFIC BEARING DROP INLET DETAIL

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: kkempf DATE: 12/1/17
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/kkempf/english/I5506 tbdi steelgrate.dgn

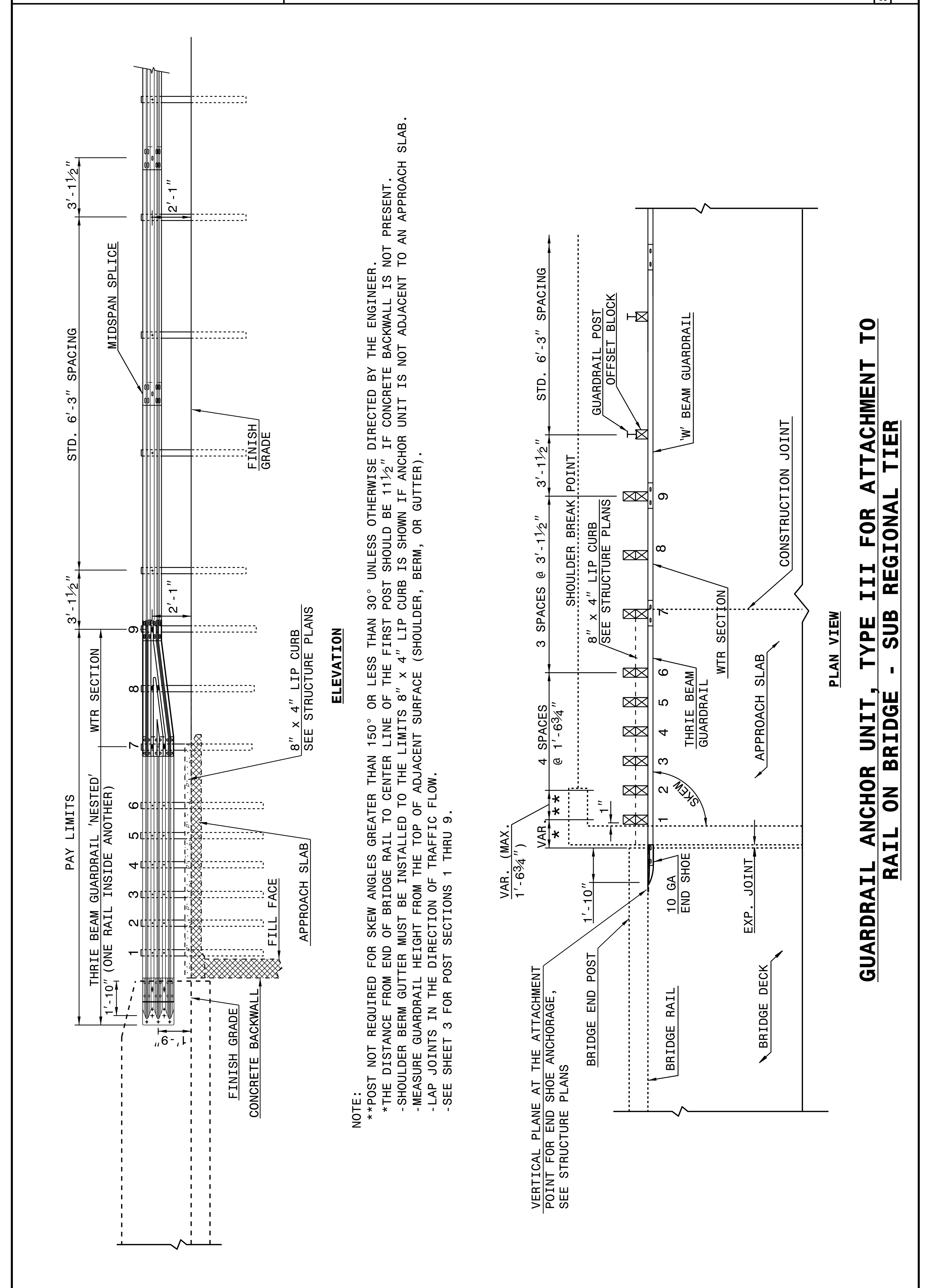
PROJECT REFERENCE NO.	SHEET NO.
I-5506	2C-6

ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE — STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — SHEET 1 OF 7 862D03

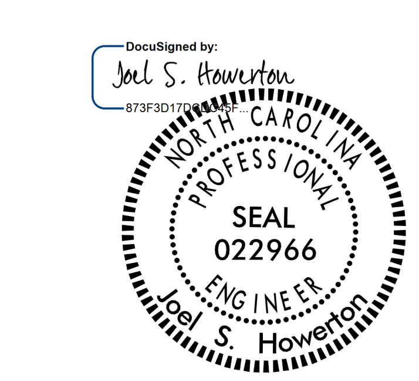
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER — STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — SHEET 2 OF 7 862D03



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR **STRUCTURE ANCHOR UNITS** GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE	SHEET 1 OF 7 **862D03**



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR **STRUCTURE ANCHOR UNITS** GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER	SHEET 2 OF 7 **862D03**



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.:

8/17/99

DRAINAGE DETAILS
(NOT TO SCALE)

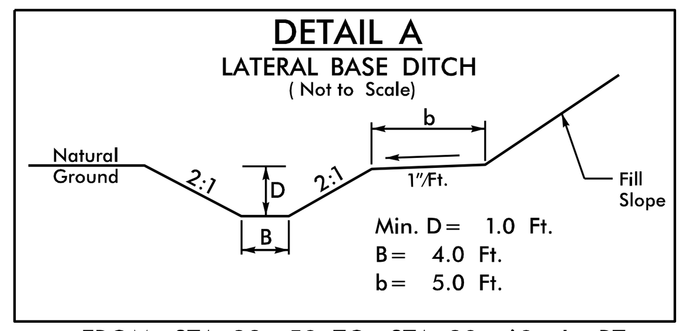
WETHERILL ENGINEERING
1223 Jones Franklin Road
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2D-1
R/W SHEET NO.	

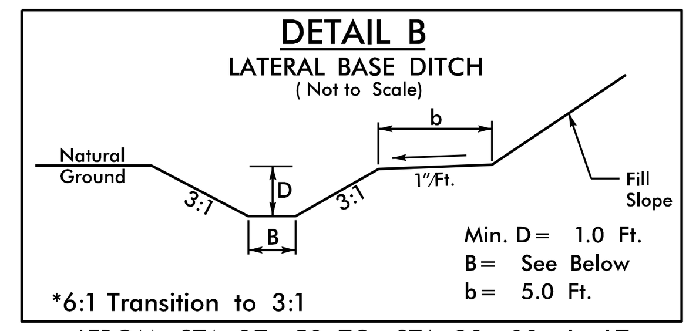
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23993 — MAX S. PRICE — 12/28/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



FROM STA. 28+50 TO STA. 30+60 -L- RT

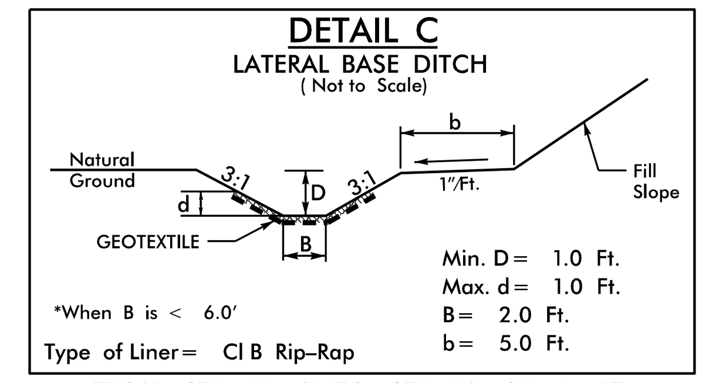


*FROM STA. 27+50 TO STA. 28+00 -L- LT
Use B=8.0 Ft.

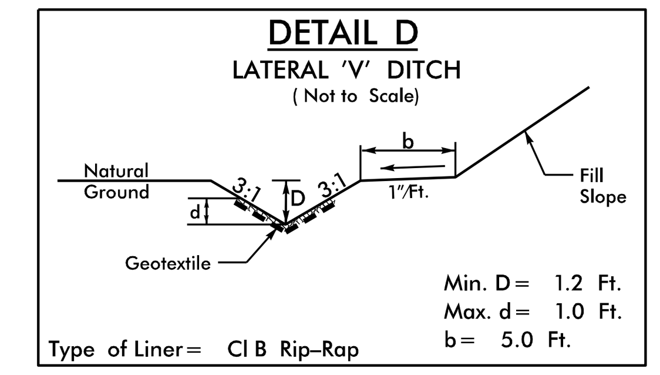
FROM STA. 28+00 TO STA. 29+00 -L- LT
Use B=8.0 Ft.

FROM STA. 68+00 TO STA. 70+50 -Y- LT
Use B=9.0 Ft.

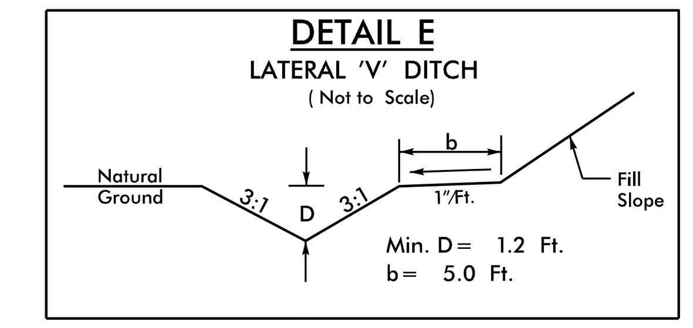
FROM STA. 70+50 TO STA. 74+00 -Y- LT
Use B=4.0 Ft.



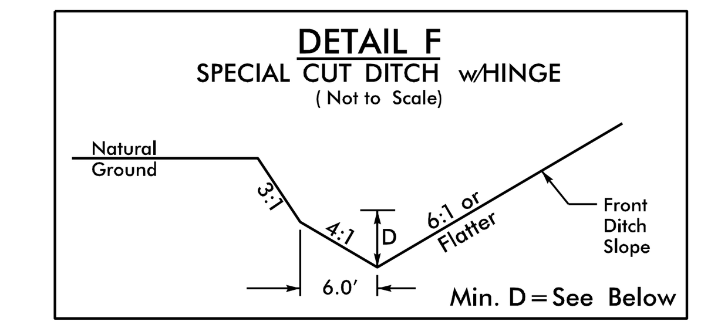
FROM STA. 57+81 TO STA. 58+25 -L- LT



FROM STA. 58+25 TO STA. 59+00 -L- LT

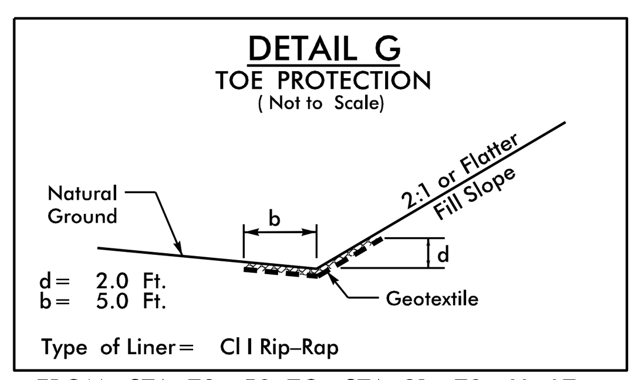


FROM STA. 59+00 TO STA. 59+50 -L- LT
FROM STA. 23+60 TO STA. 24+75 -RPB- LT

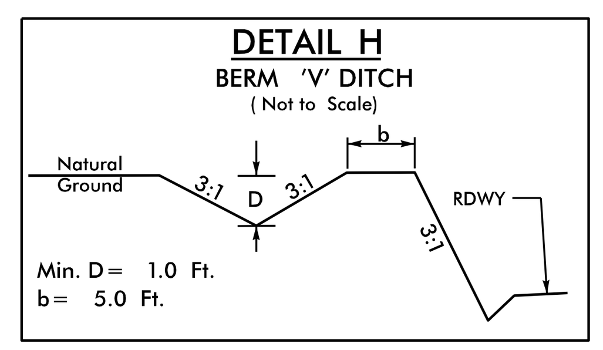


FROM STA. 75+50 TO STA. 77+50 -Y- LT
Use Min. D=1.5 Ft.

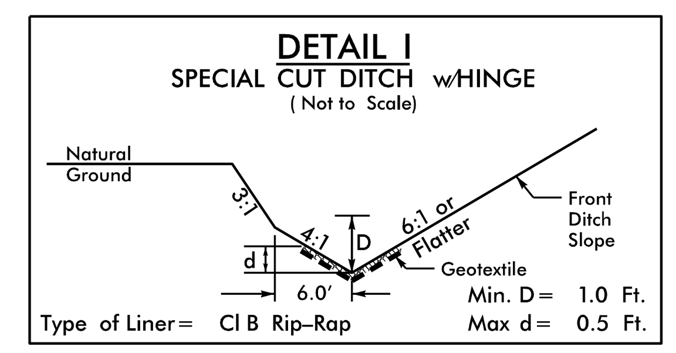
FROM STA. 14+70 TO STA. 16+02 -RPB- LT
FROM STA. 12+72 TO STA. 13+50 -RPA- RT
Use Min. D=1.1 Ft.



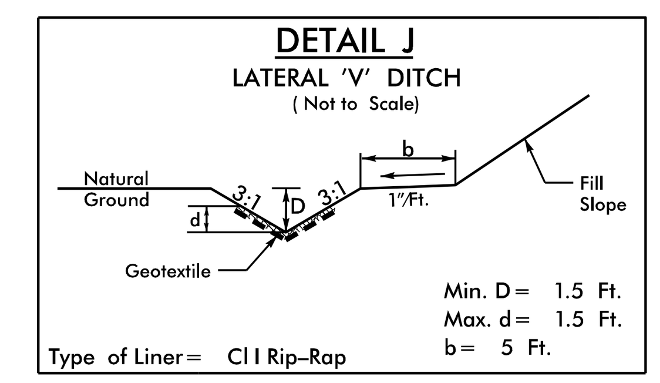
FROM STA. 79+50 TO STA. 81+70 -Y- LT



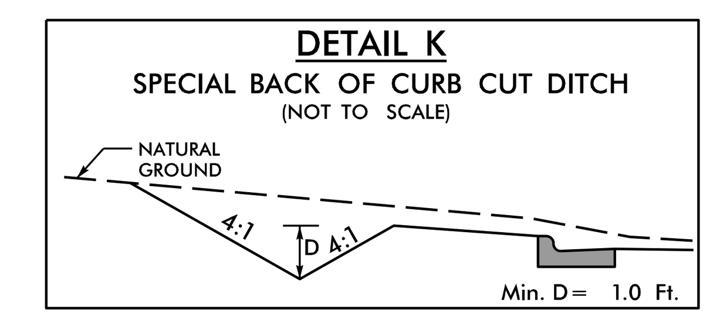
FROM STA. 18+13.5 TO STA. 19+88 -RPA- RT
FROM STA. 14+00 TO STA. 14+68 -RPB- LT
FROM STA. 17+60 TO STA. 19+60 -RPB- LT



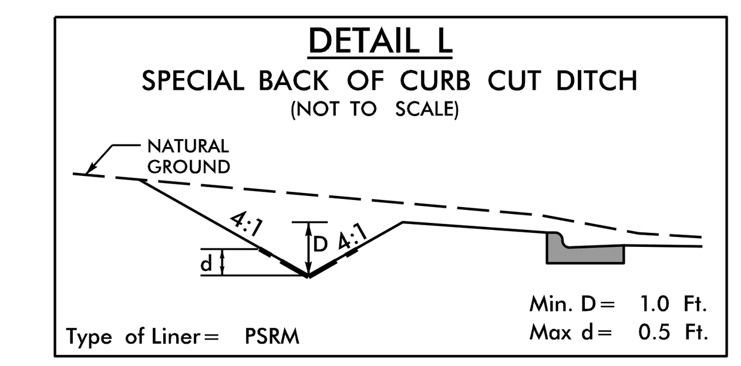
FROM STA. 21+50 TO STA. 22+73 -RPB- LT



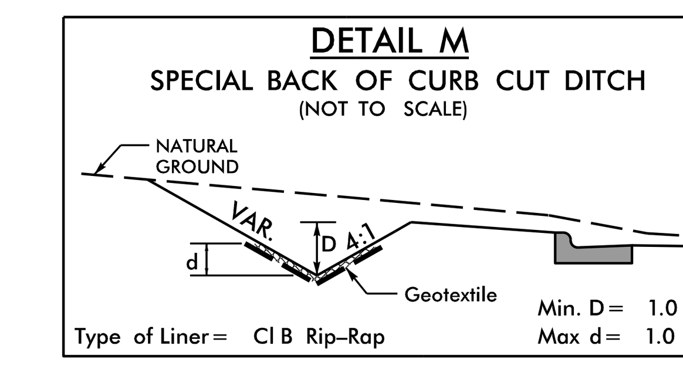
FROM STA. 24+75 TO STA. 25+45 -RPB- LT



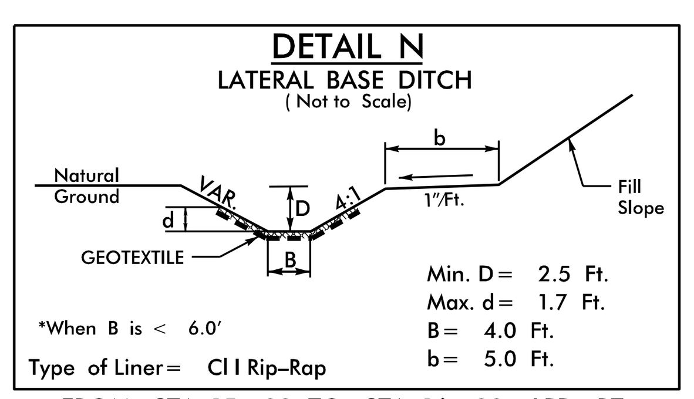
FROM STA. 12+85 TO STA. 13+50 -LPB- RT



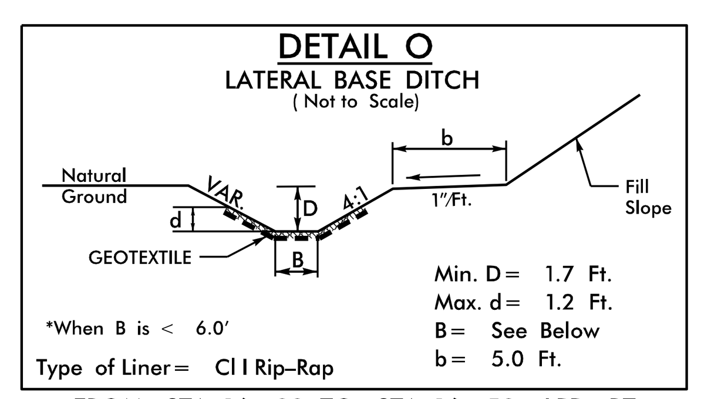
FROM STA. 13+50 TO STA. 14+30 -LPB- RT



FROM STA. 14+30 TO STA. 15+00 -LPB- RT

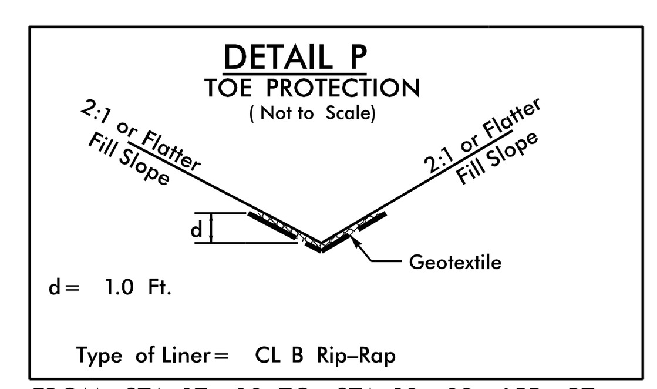


FROM STA. 15+00 TO STA. 16+00 -LPB- RT

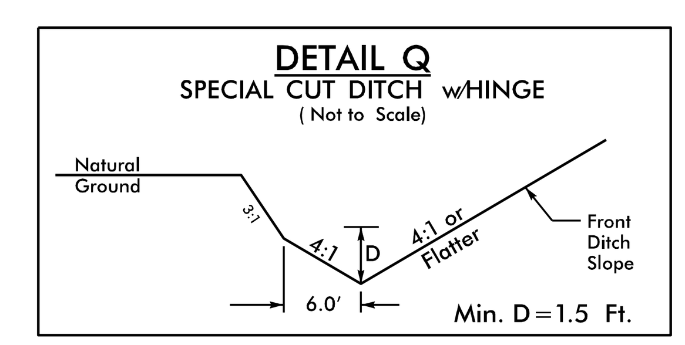


FROM STA. 16+00 TO STA. 16+50 -LPB- RT
Use B=4.0 Ft.

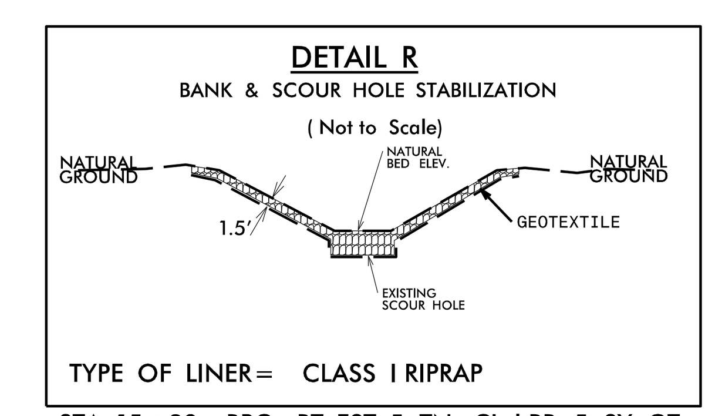
FROM STA. 16+50 TO STA. 17+80 -LPB- RT
Use B=3.0 Ft.



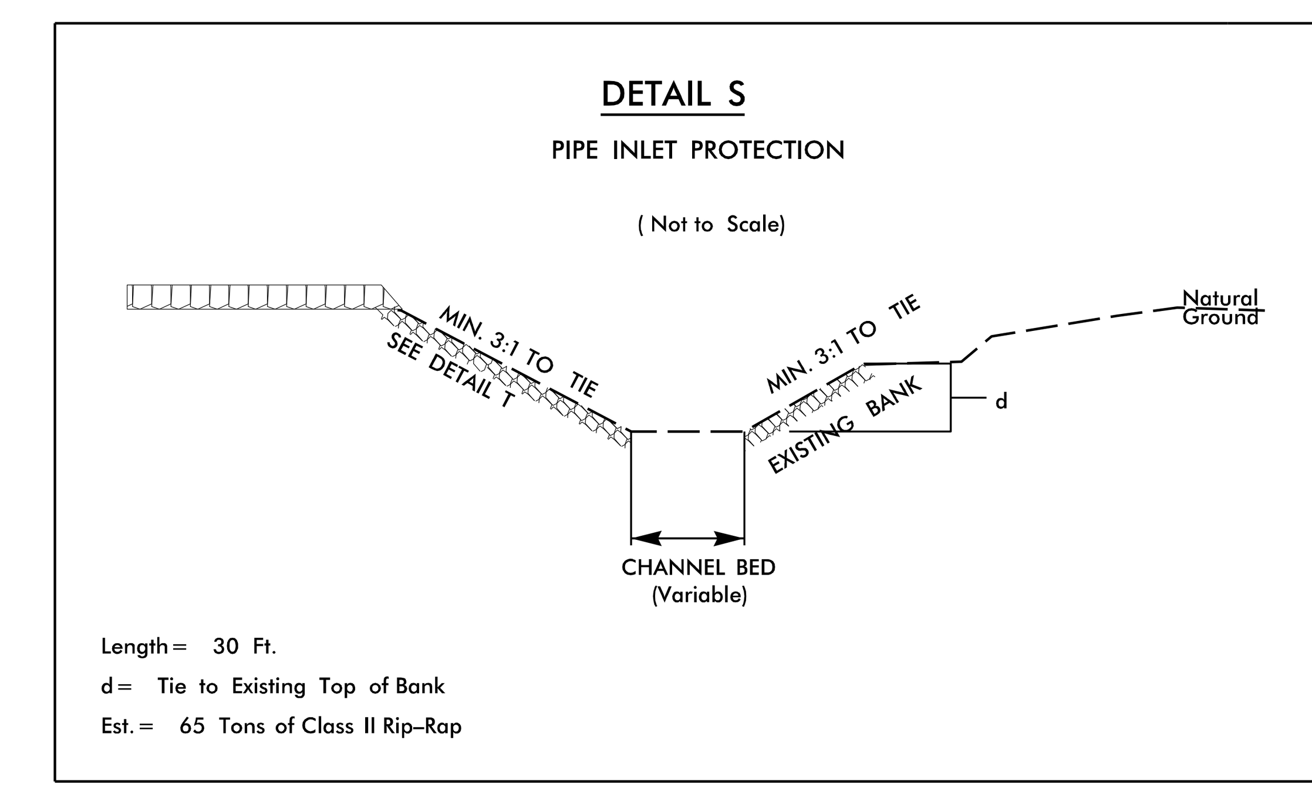
FROM STA. 17+00 TO STA. 18+82 -LPB- RT



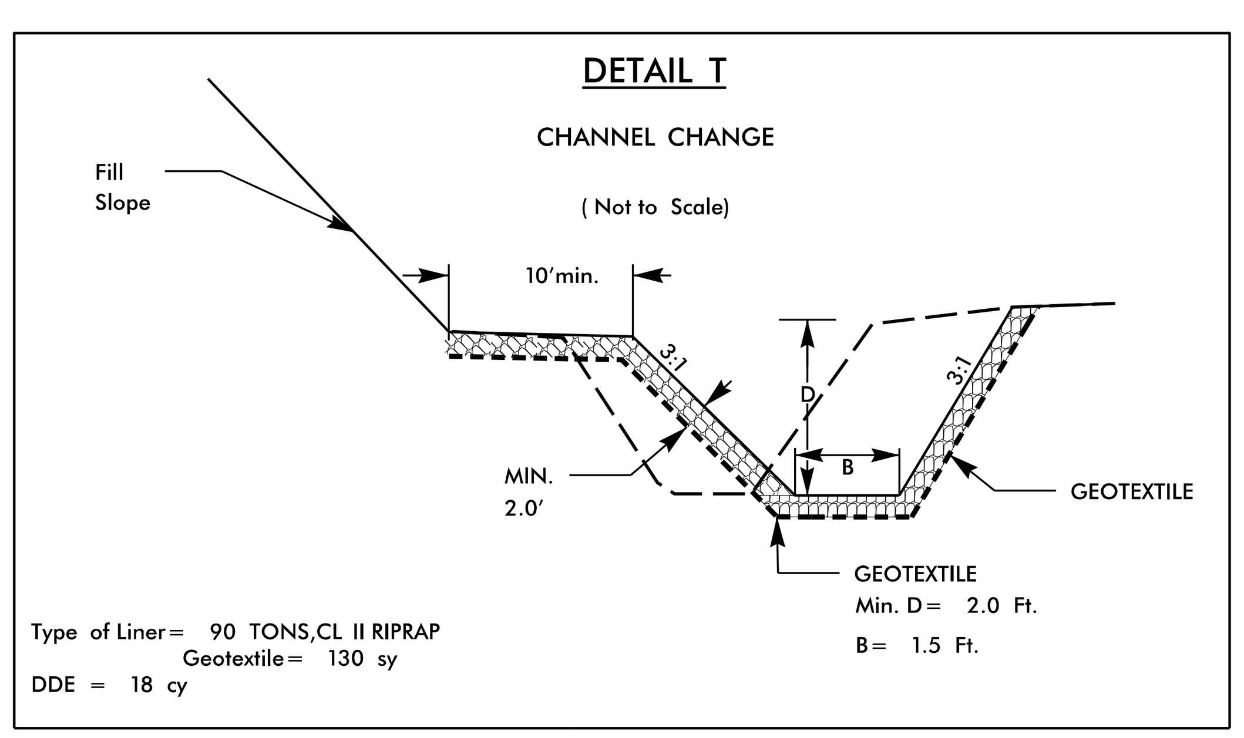
FROM STA. 115+00 TO STA. 115+72.32 -Y- LT



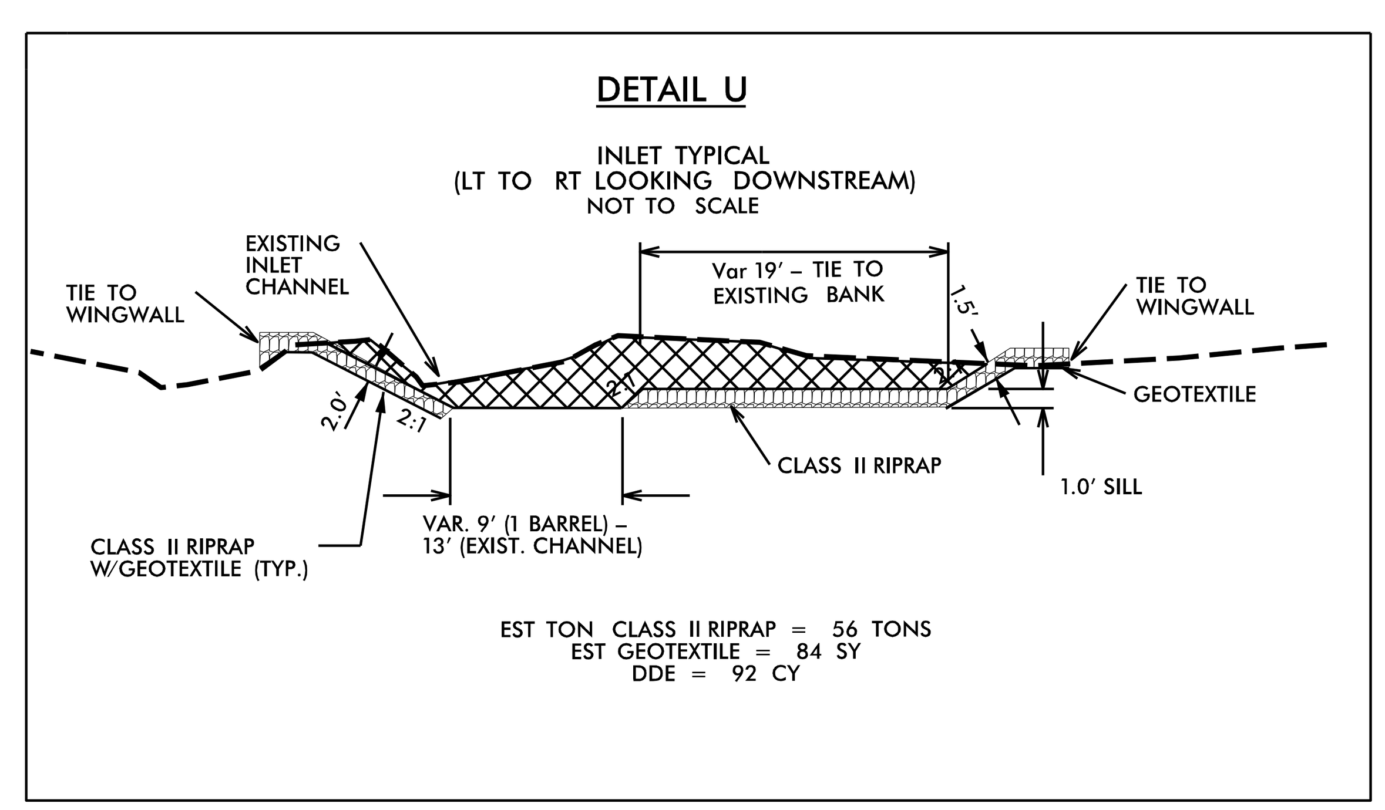
STA. 15+83 -RPC- RT EST 5 TN CL I RR; 5 SY GT
STA. 22+36 -RPD- LT EST 22 TN CL I RR; 30 SY GT



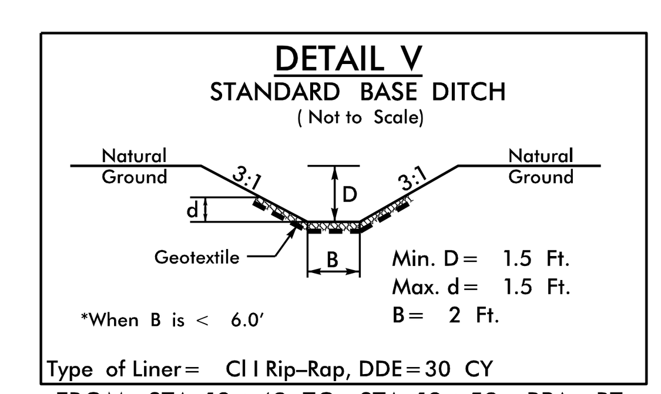
FROM STA. 81+58 TO STA. 81+80 -Y- LT



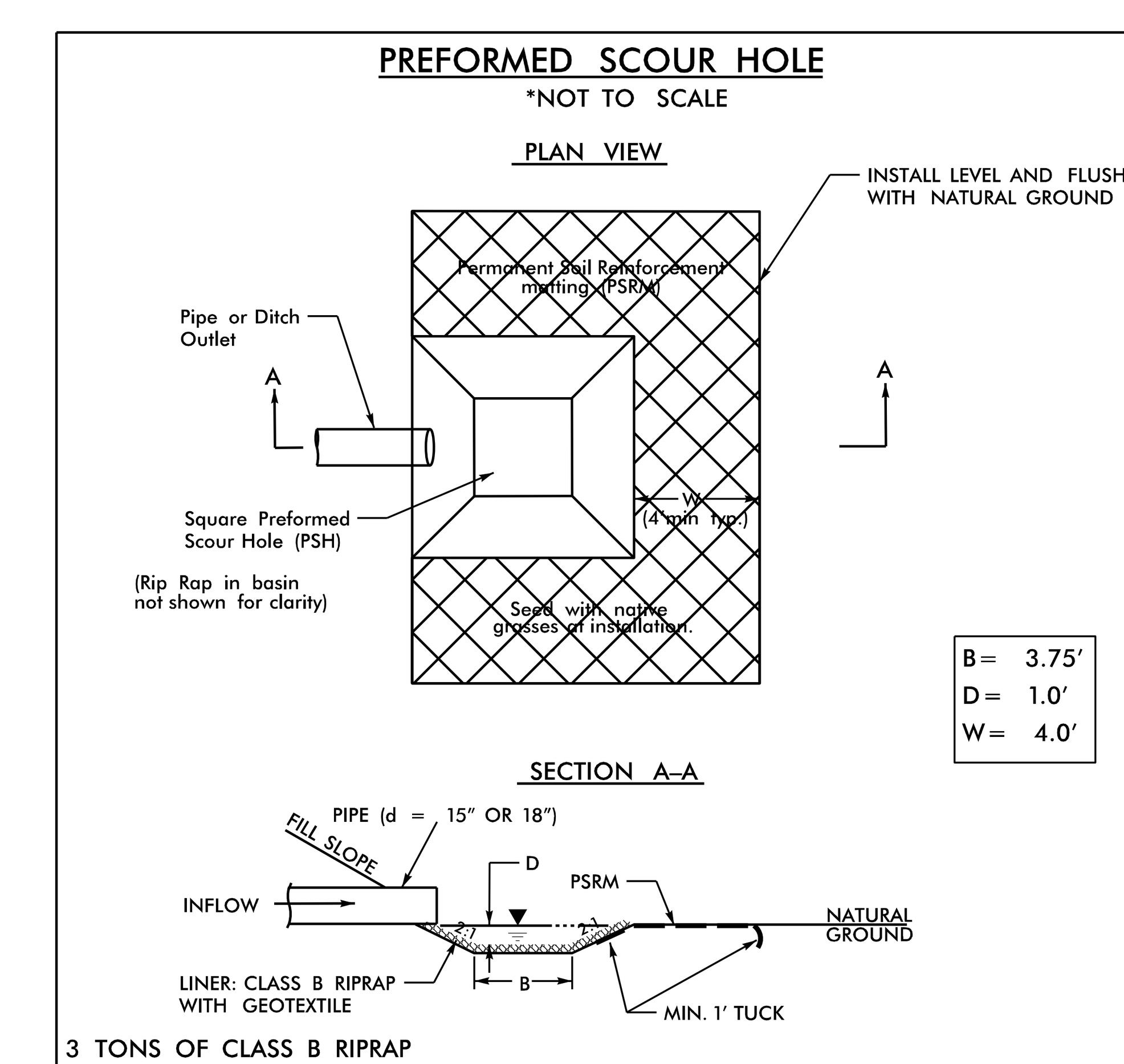
FROM STA. 81+80 TO STA. 82+30 -Y- LT


DETAIL U
INLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE
EXISTING INLET CHANNEL
TIE TO WINGWALL
Var 19' - TIE TO EXISTING BANK
TIE TO WINGWALL
GEOTEXTILE
CLASS II RIPRAP
1.0' SILL
CLASS II RIPRAP W/GEOTEXTILE (TYP.)
VAR. 9' (1 BARREL) - 13' (EXIST. CHANNEL)
EST TON CLASS II RIPRAP = 56 TONS
EST GEOTEXTILE = 84 SY
DDE = 92 CY

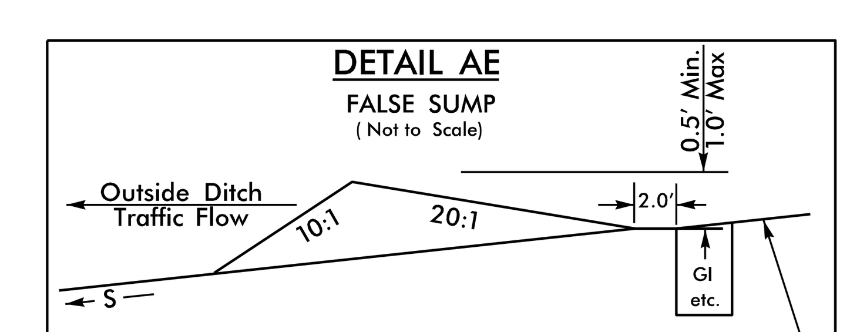
FROM STA. 66+40 TO STA. 67+20 -Y- LT



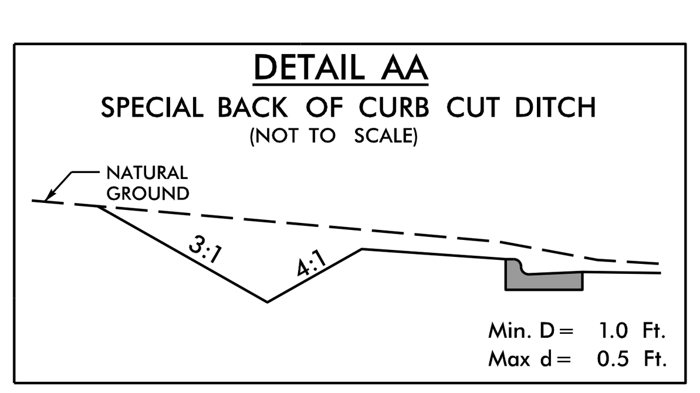
FROM STA. 12+49 TO STA. 12+59 -RPA- RT


PREFORMED SCOUR HOLE
*NOT TO SCALE
PLAN VIEW
INSTALL LEVEL AND FLUSH WITH NATURAL GROUND
Permanent Soil Reinforcement matting (PSRM)
Pipe or Ditch Outlet
Square Preformed Scour Hole (PSH)
(Rip Rap in basin not shown for clarity)
Seed with native grasses at installation
SECTION A-A
PIPE (d = 15" OR 18")
FILL SLOPE
INFLOW
PSRM
NATURAL GROUND
LINER: CLASS B RIPRAP WITH GEOTEXTILE
MIN. 1' TUCK
B= 3.75'
D= 1.0'
W= 4.0'
3 TONS OF CLASS B RIPRAP
6 SQ YDS OF GEOTEXTILE

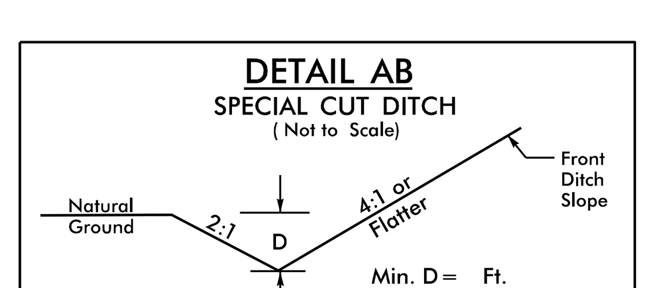
STA. 25+70 -L- LT



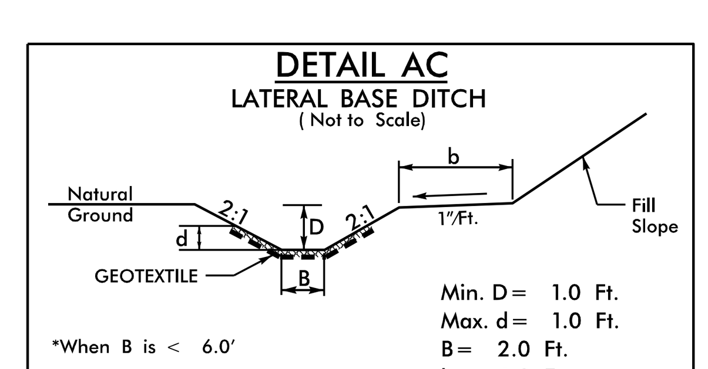
STA. 86+18 -Y- LT
STA. 89+00 -Y- LT
STA. 92+20 -Y- LT
STA. 14+70 -RPB- LT
STA. 17+64 -RPB- RT
STA. 17+70 -RPB- LT
STA. 17+70 -RPB- RT
STA. 19+60 -RPB- LT
STA. 19+94 -RPB- RT
STA. 21+60 -RPB- RT



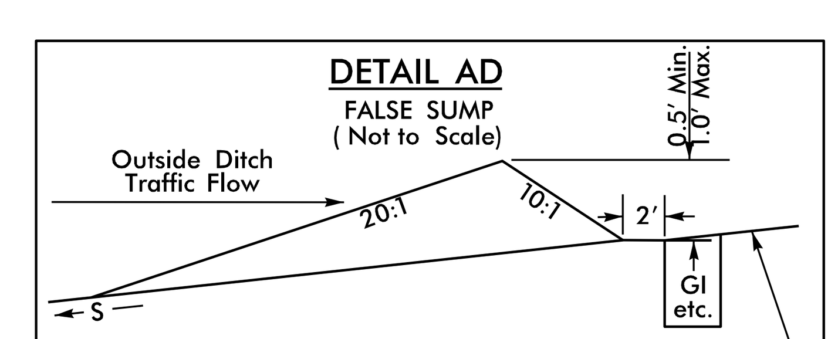
FROM STA. 27+80 TO STA. 28+10 -RPC- RT



FROM STA. 27+00 TO STA. 27+80 -RPC- RT



FROM STA. 25+70 TO STA. 27+00 -RPC- RT



STA. 17+79 -RPA- LT
STA. 18+00 -RPA- RT
STA. 21+40 -RPA- LT
STA. 21+40 -RPA- RT
STA. 22+15 -RPA- RT

12/15/2017
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8/17/99

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

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2D-2
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER MAX S. PRICE

12/28/2017

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MEDIA FILTER TYPICAL CROSS SECTION DETAILS

NOTES

1. FOR BASIN AND FOREBAY LAYOUTS SEE DETAILS SHEETS 2D-7 AND 2D-8.
2. FOREBAYS WITH PIPED INLETS SHALL BE LINED WITH CLASS B RIPRAP.
3. ACCESS BERM SHOULD BE PROVIDED FOR MAINTENANCE.
4. 6-INCH UNDERDRAIN IS THE PRIMARY DRAWDOWN DEVICE.
5. UNDERDRAIN PIPES SHOULD BE PLACED A MAXIMUM OF 5 FEET FROM THE EDGE OF THE BASIN AND MUST HAVE A MAXIMUM OF 10 FEET BETWEEN THE UNDERDRAIN PIPES.
6. UNDERDRAIN SHOULD BE BEDDED ON A THIN LAYER OF NO.57 WASHED STONE AND BACKFILLED TO A TOTAL MINIMUM STONE DEPTH OF 12 INCHES.
7. PERFORATED PIPE HOLES ARE 3/8 INCH IN DIAMETER AND LONGITUDINALLY SPACED 6 INCHES ON CENTER ALONG 4 ROWS.
8. TOP OF MEDIA FILTER MUST BE LEVEL.
9. IF BASIN IS USED TO COLLECT SEDIMENTATION AS AN EROSION CONTROL MEASURE, DO NOT INSTALL UNDERDRAIN PIPES, WASHED STONE, NOR ENGINEERED SOIL MEDIA FILTER UNTIL EROSION CONTROL MEASURES INSIDE MEDIA FILTER BASIN ARE REMOVED.

REFERENCED SPECIAL DETAILS

FOR "OUTLET CONTROL STRUCTURE DETAILS" SEE SHEET 2D-3
FOR "TRASH RACKS DETAILS" SEE SHEET 2D-4
FOR "CLEANOUT DETAIL" SEE SHEET 2D-5

FOR SLUICE GATE DETAILS SEE MANUFACTURER'S DIMENSIONS AND SPECIFICATIONS

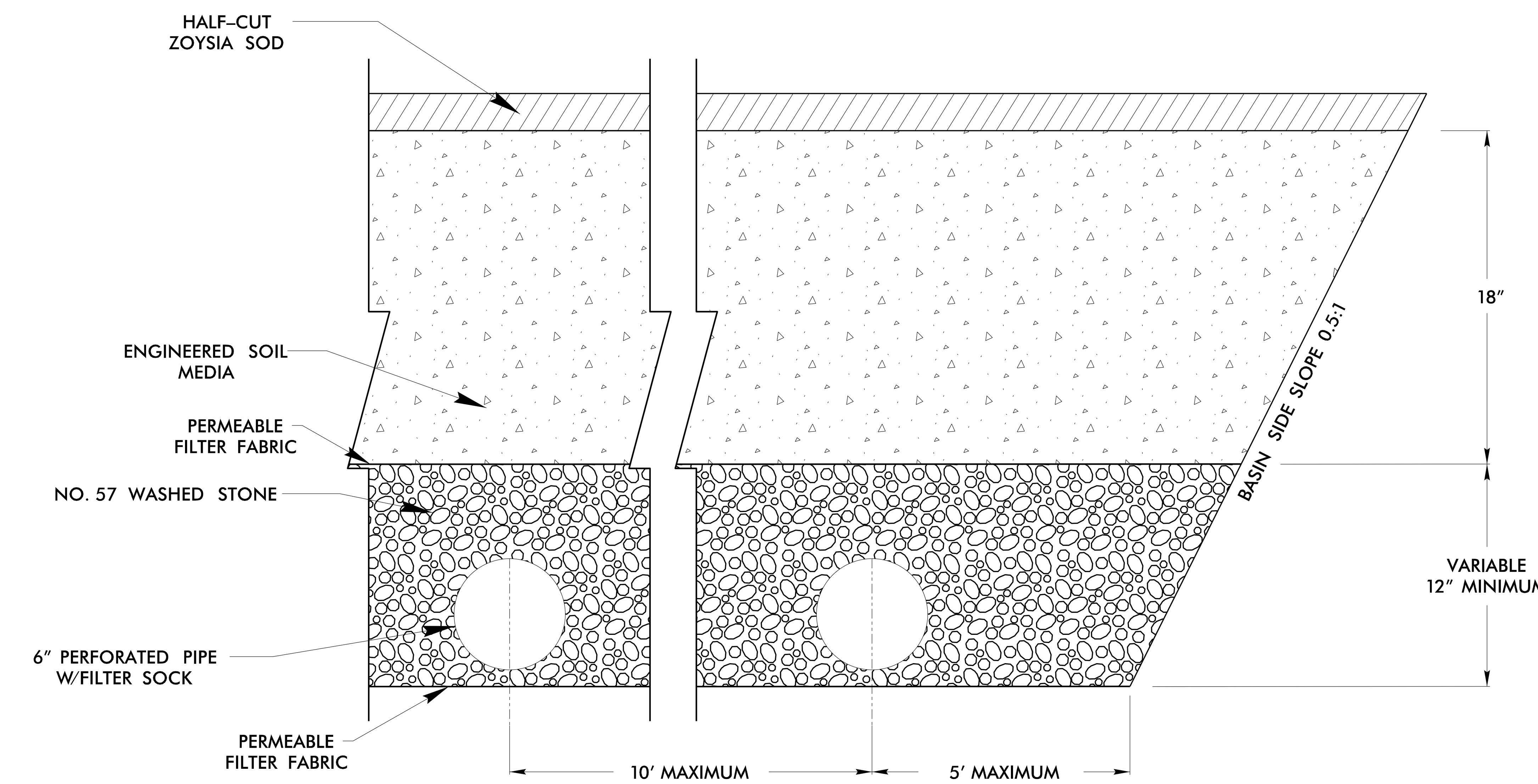
SPECIFICATIONS

ENGINEERED SOIL MEDIA SHALL CONSIST OF:
(1) HOMOGENOUS SOIL MIX OF 85-88 PERCENT BY WEIGHT SAND (USDA SOIL TEXTURAL CLASSIFICATION), 8 TO 12 PERCENT FINES (SILT AND CLAY), AND 2 TO 5 PERCENT ORGANIC MATTER (ORGANIC MATTER SHALL BE LEAF OR BARK COMPOST, OR SIMILAR, AND SHALL NOT BE ANIMAL MANURE).
(2) P-INDEX BETWEEN 10 AND 30
(3) PH VALUE BETWEEN 5.5 - 7.5
(4) PERMEABILITY BETWEEN 1 AND 2 INCHES/HOUR
(5) BE UNIFORM AND FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR MATERIAL GREATER THAN 2 INCHES

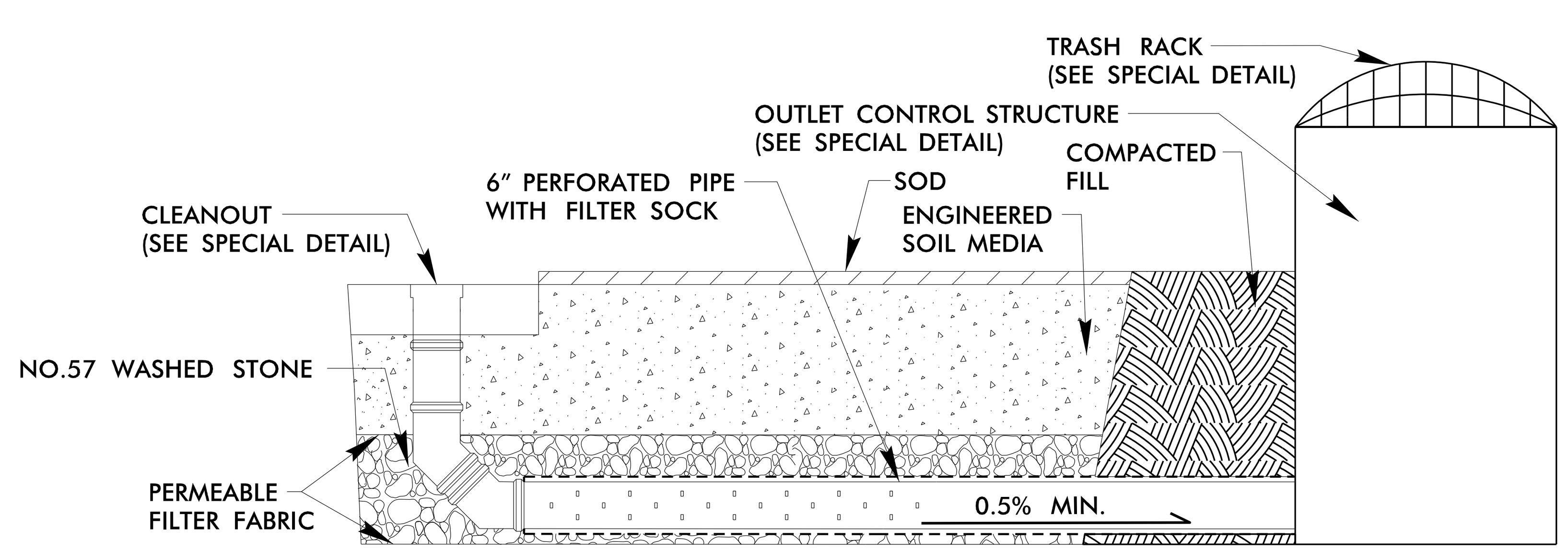
PLAN

SEE SHEET 2D-7 FOR "PLAN VIEW - BASIN 1"
SEE SHEET 2D-8 FOR "PLAN VIEW - BASIN 2"

SECTION B-B

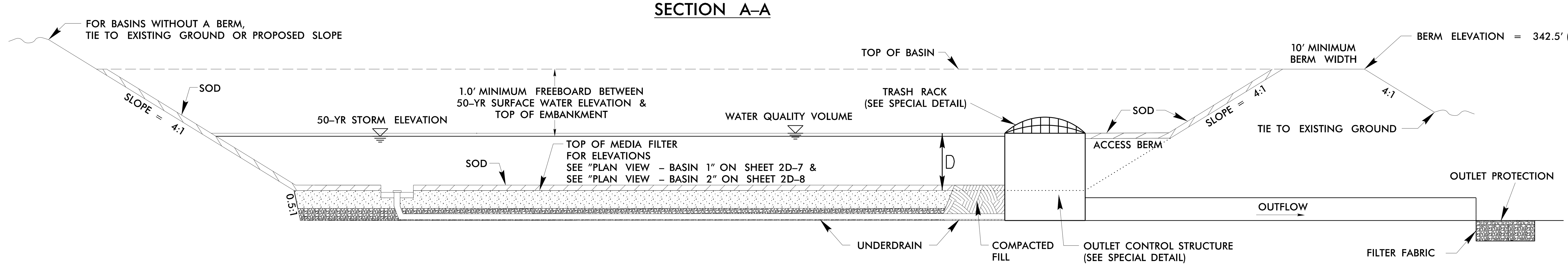


SECTION C-C



PROFILE

SECTION A-A



NOT TO SCALE

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8/17/99

OUTLET CONTROL STRUCTURE DETAILS

WETHERILL ENGINEERING
1223 Jones Franklin Road
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

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2D-3
R/W SHEET NO.	

HYDRAULICS ENGINEER
DocuSigned by: Max S. Price
82CBB...FEB1484...
NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER MAX S. PRICE
12/28/2017

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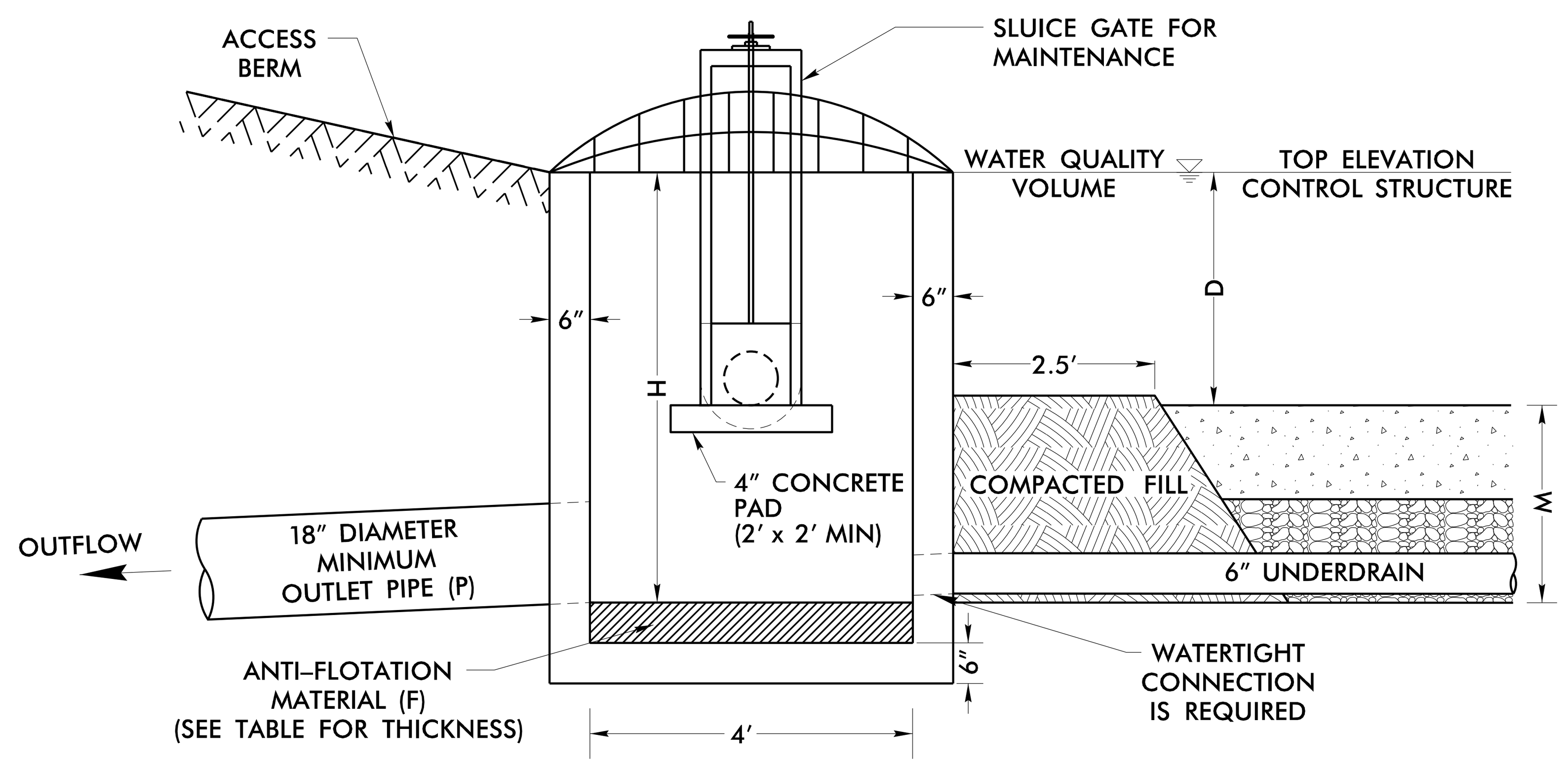
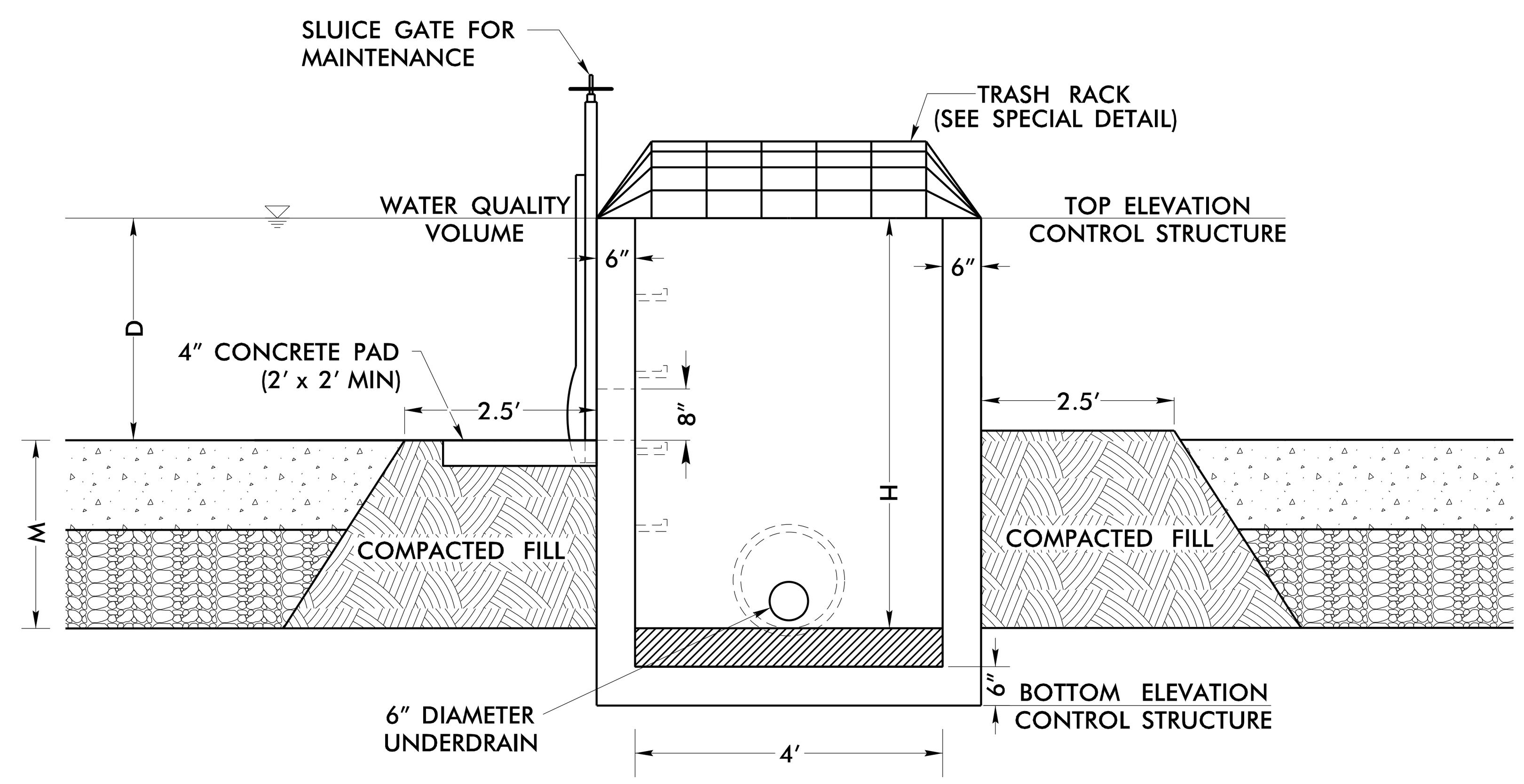
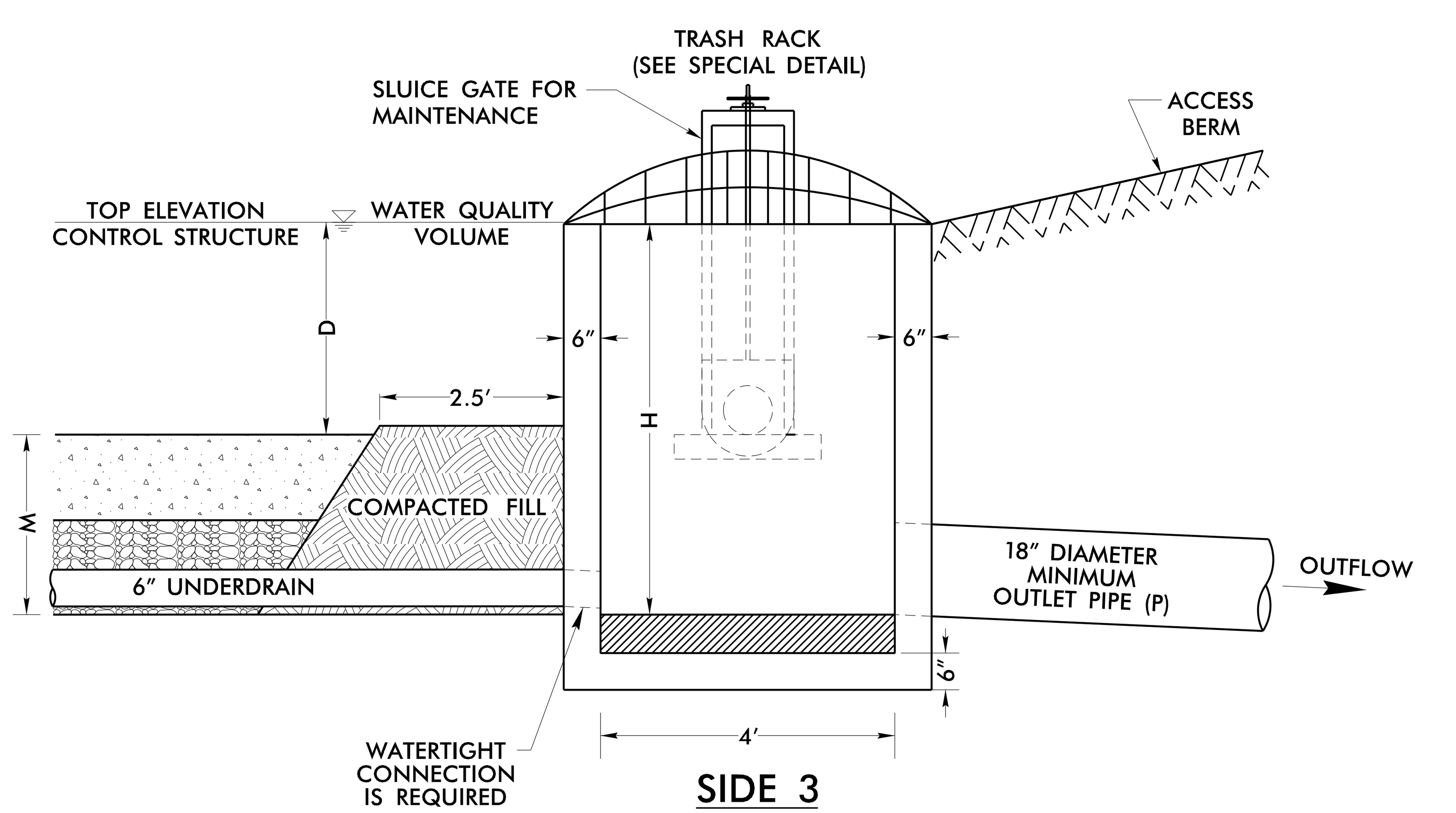


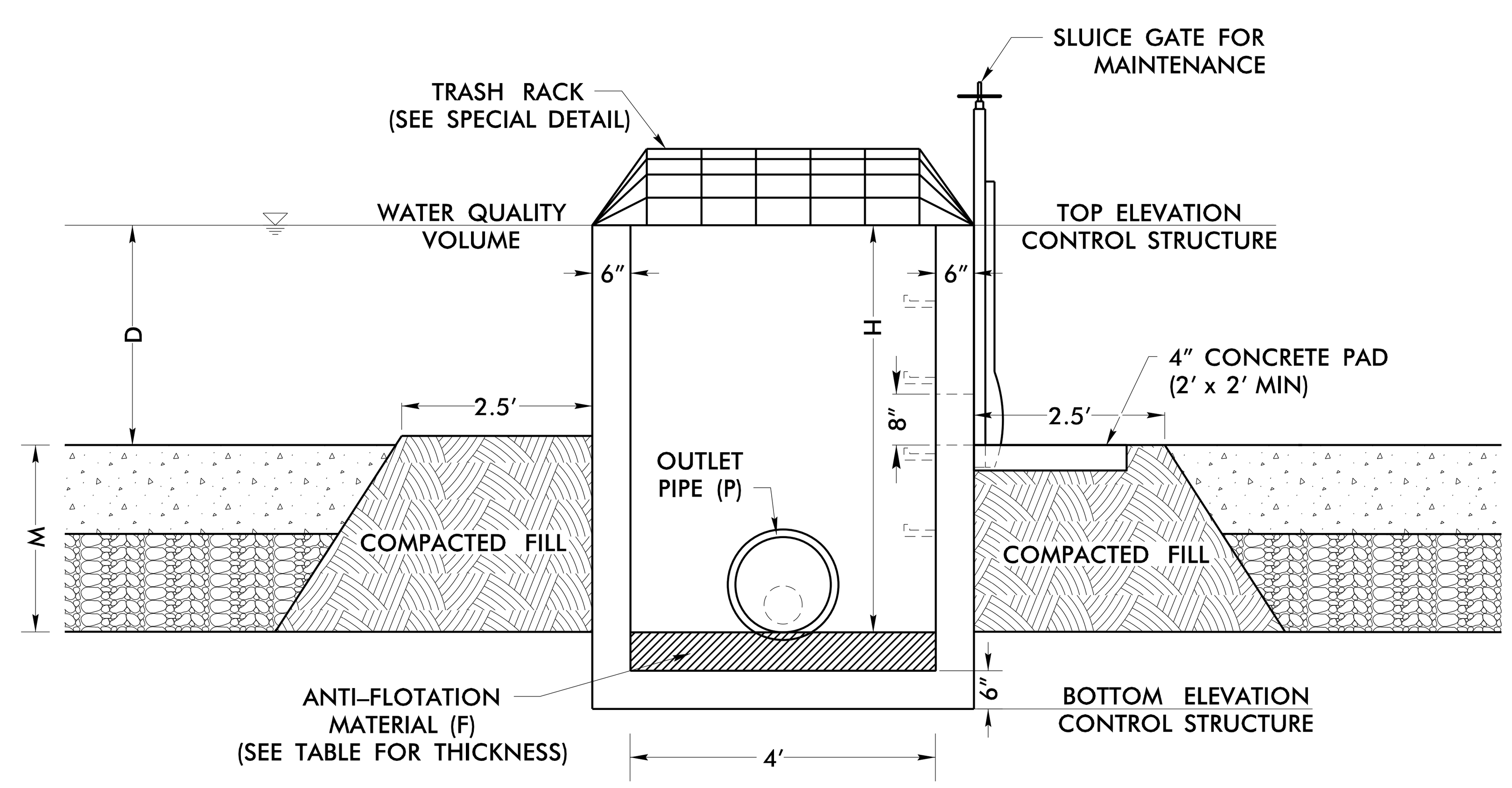
SIDE 1



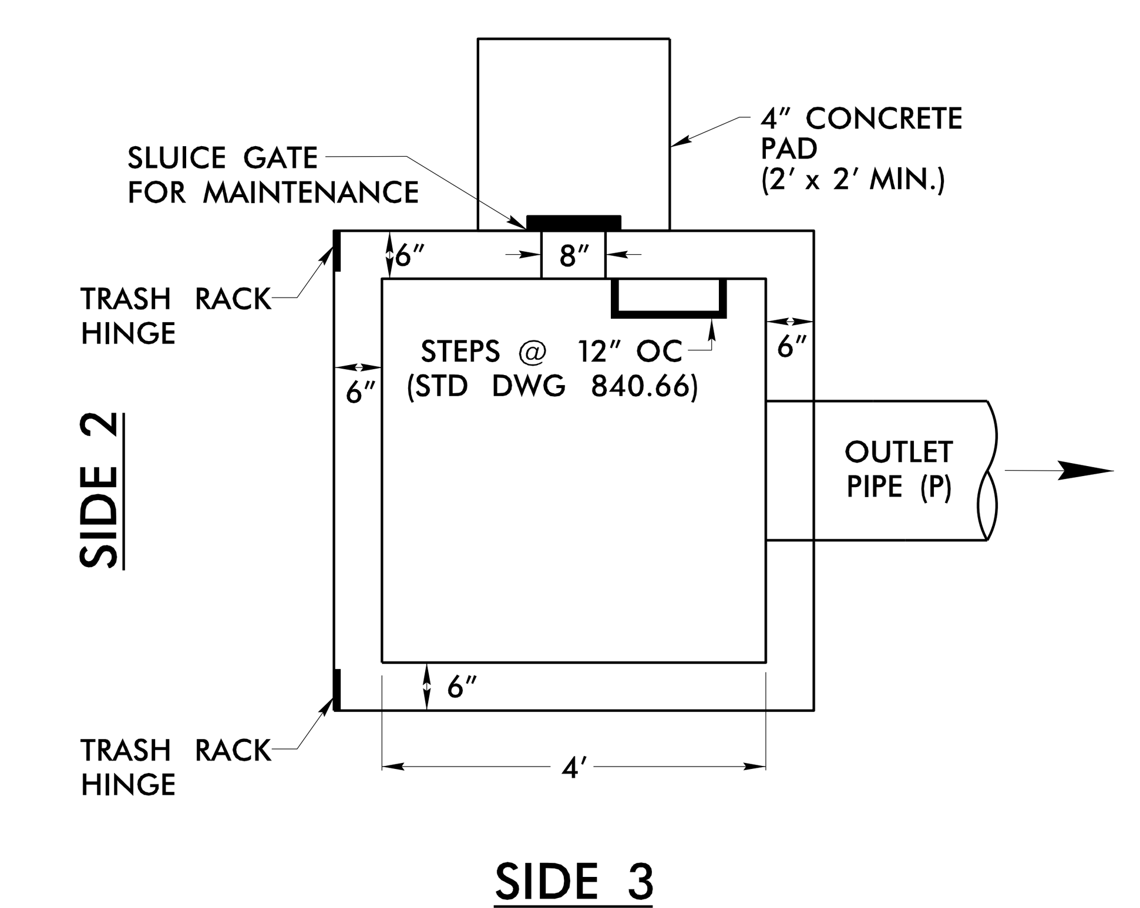
SIDE 2



SIDE 3



SIDE 4



PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

DIMENSIONS

D = PONDING DEPTH (BASED ON WATER QUALITY ELEVATION)
M = MEDIA FILTER + AGGREGATE THICKNESS
F = ANTI-FLOTATION MATERIAL THICKNESS
SLAB THICKESS IS 0.5′
MINIMUM H = D + M

NOTES

1. A SLUICE GATE COVERING AN 8″ ORIFICE WILL PROVIDE FOR DRAWDOWN DURING BASIN MAINTENANCE AND SHALL REMAIN CLOSED DURING NORMAL OPERATION.
2. THE SLUICE GATE FOR MAINTENANCE SHALL BE PLACED ON THE OUTSIDE OF THE STRUCTURE.
3. SLUICE GATES SHALL PROVIDE A WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
4. ENSURE THAT THE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.
5. ANTI-FLOTATION MATERIAL IS REQUIRED AND SHALL BE CONCRETE.

REFERENCED SPECIAL DETAILS

FOR "MEDIA FILTER TYPICAL CROSS SECTION DETAILS" SEE SHEET 2D-2
FOR "TRASH RACKS DETAILS" SEE SHEET 2D-4

MINIMUM DIMENSIONS FOR MEDIA FILTER BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	TOP ELEVATION MEDIA FILTER	TOP ELEVATION CONTROL STRUCTURE	BASIN DEPTH (D)	MEDIA FILTER + AGGREGATE DEPTH (M)	ANTI-FLOTATION MATERIAL (F) THICKNESS	BOTTOM ELEVATION CONTROL STRUCTURE	DIMENSIONS CONTROL STRUCTURE (W x L x H)	INVERT ELEVATION UNDERDRAIN OUTLET PIPE	DIAMETER OUTLET PIPE (P)	INVERT ELEVATION OUTLET PIPE (P)
47+63 -L- LT	0574	339.30	340.70	1.4′	3.16′	1.0′	335.14	4′x4′x4.8′	336.24	24″	336.14
14+00 -LPB- RT	0571	335.00	337.60	2.6′	3.3′	1.0′	330.20	4′x4′x5.9′	331.80	24″	331.70

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TRASH RACKS DETAILS

WETHERILL ENGINEERING
1223 Jones Franklin Road
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

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2D-4
R/W SHEET NO.	

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NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER
12/28/2017

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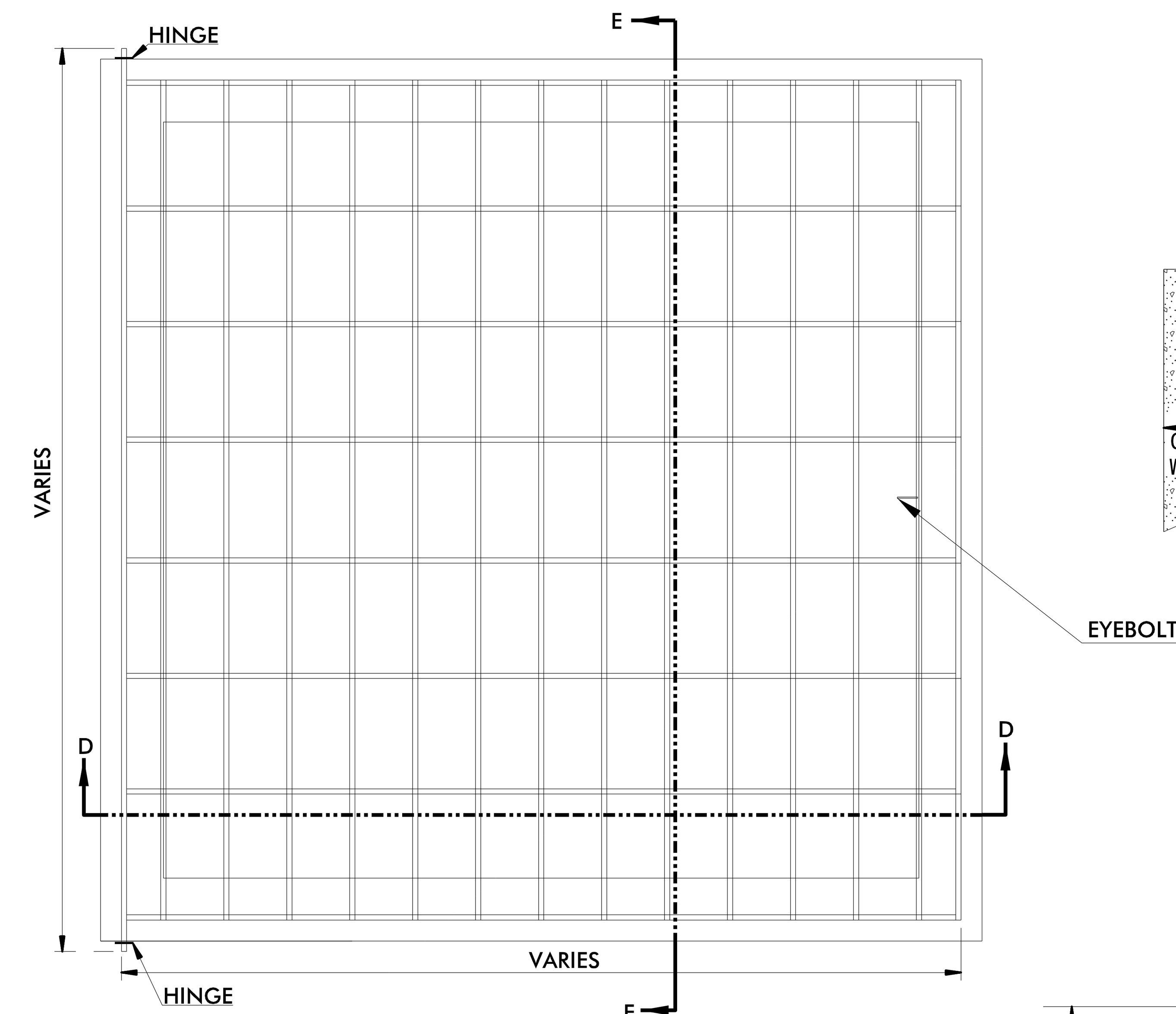
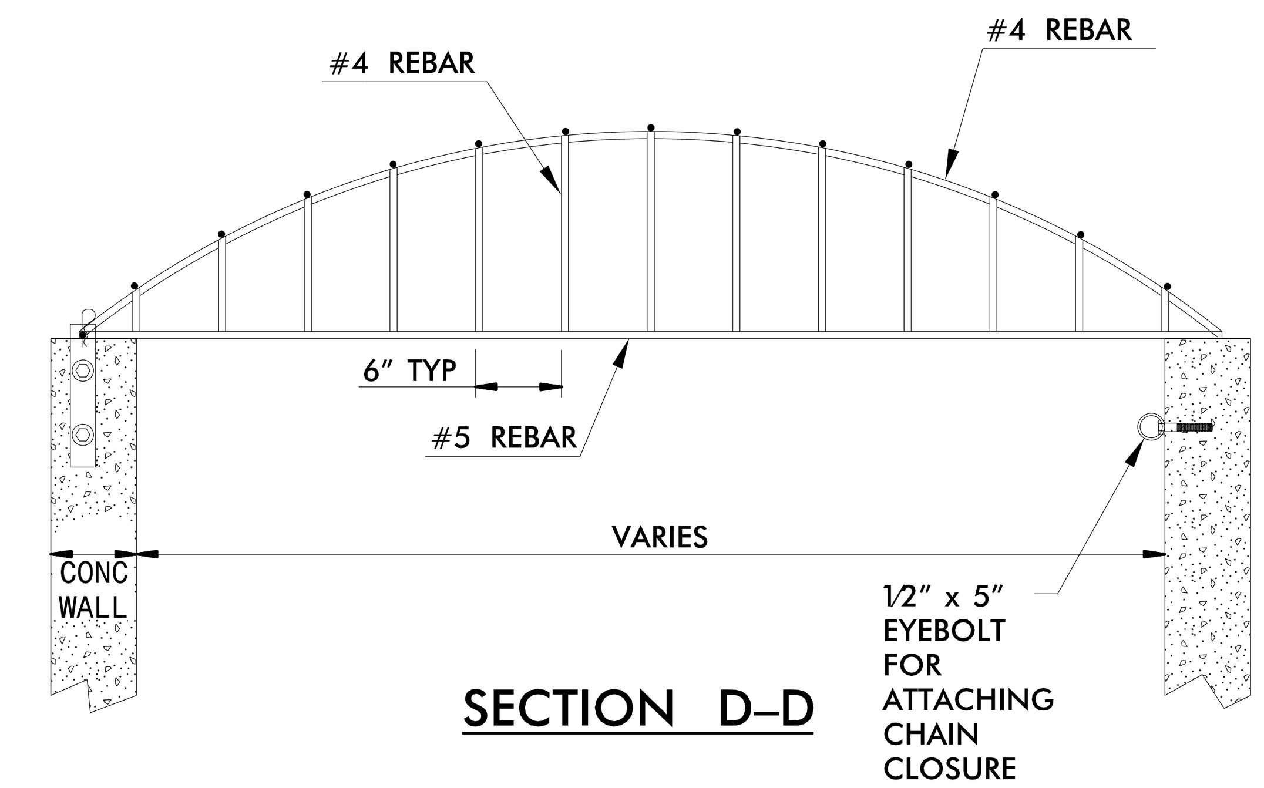
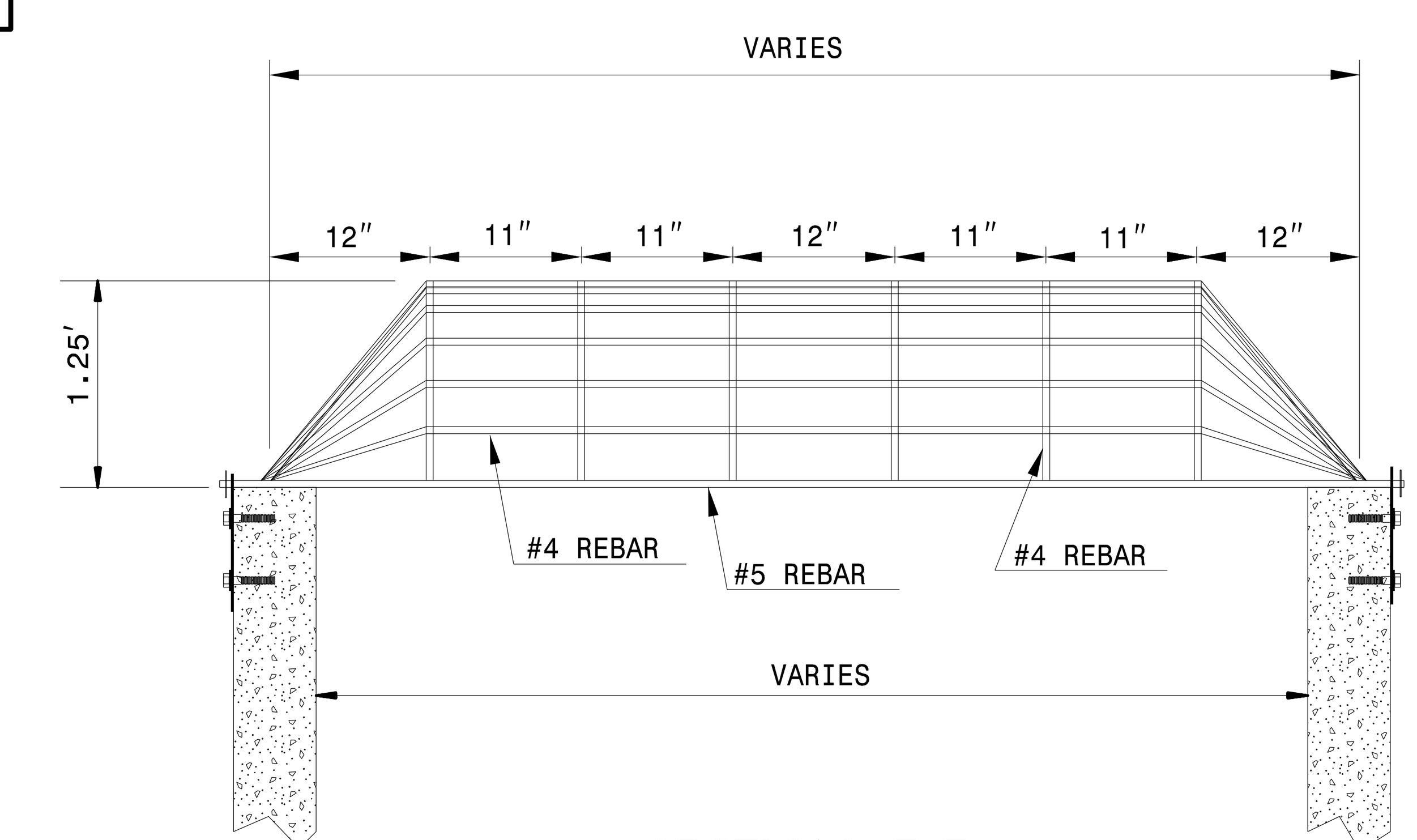


PLAN



SECTION D–D



SECTION E–E

RISER TRASH RACK NOTES:

1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A-153.

REBAR TRASH RACK

NOTES

TRASH RACK IS INCIDENTAL TO THE MEDIA FILTER BASIN CONTROL STRUCTURE

NOT TO SCALE

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12/15/2017 I5506_rdy_psh_02D-4_DrnDetails.dgn

8/17/99

FOREBAY AND CLEANOUT DETAILS

WETHERILL ENGINEERING
1223 Jones Franklin Road
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

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2D-5
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER MAX S. PRICE

12/28/2017

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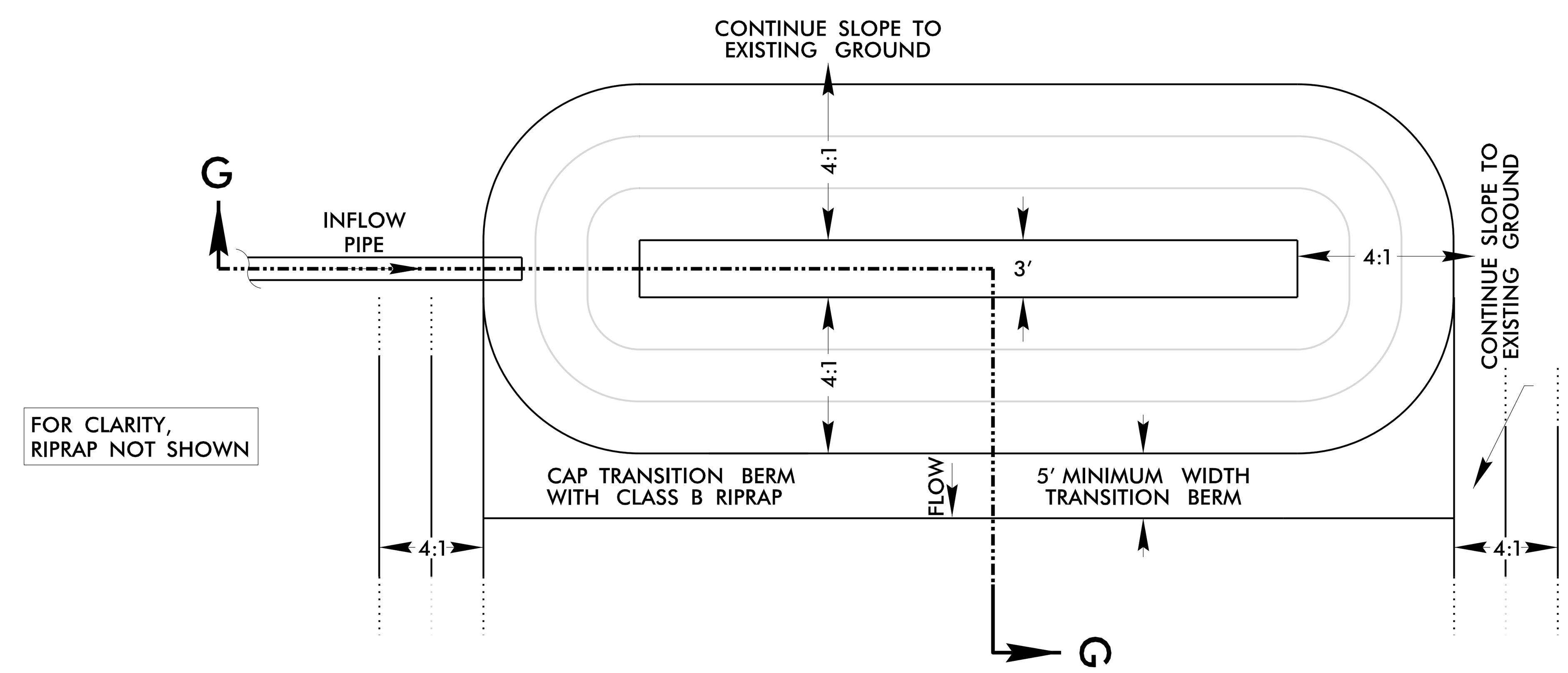
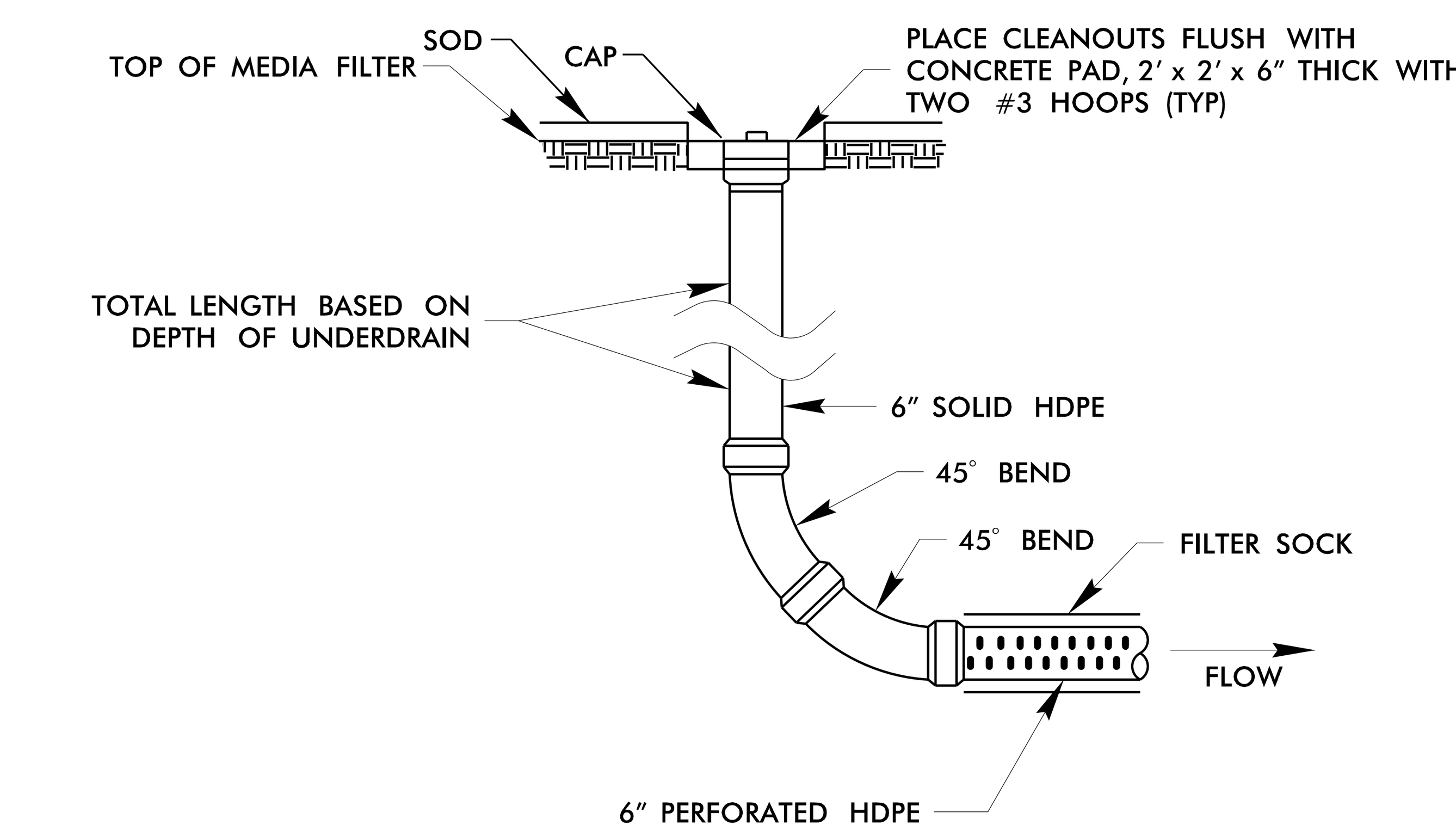


PLAN

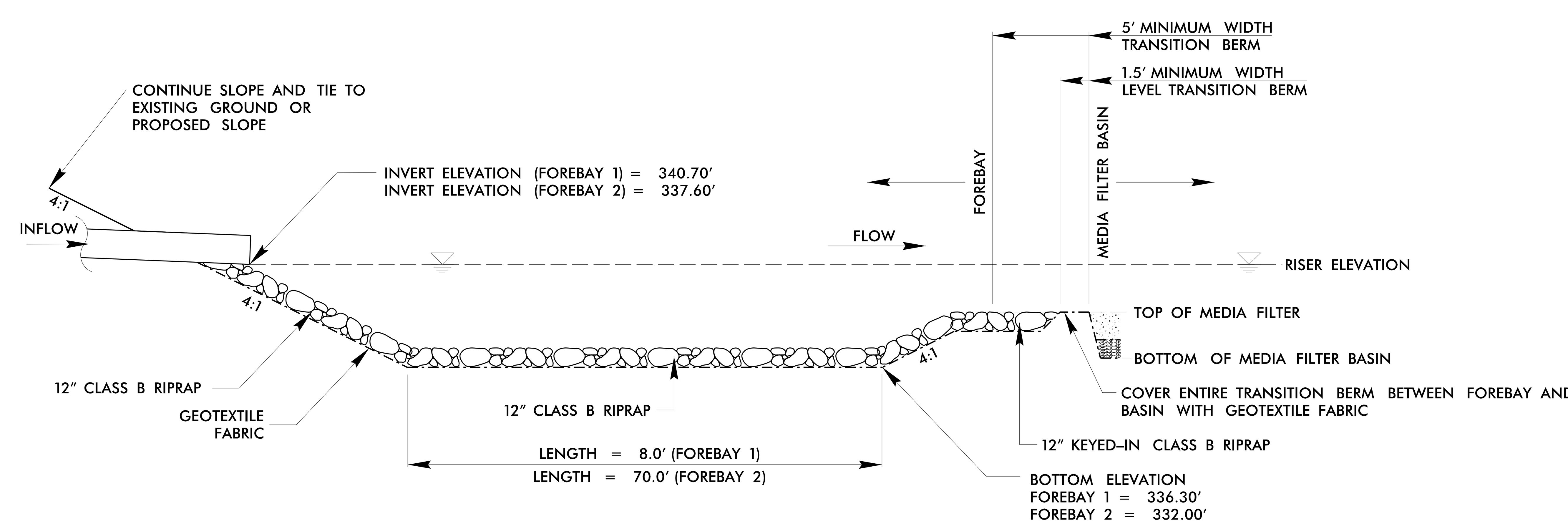
LINEAR FOREBAY



NOTES:

1. ONLY UNDERDRAIN PIPE THAT IS LOCATED BENEATH ENGINEERED SOIL MEDIA SHOULD BE PERFORATED.
2. PROVIDE THREADED SCREW CAP.

CLEANOUT DETAIL



SECTION G-G

FOREBAY

NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WETHERILL ENGINEERING
1223 Jones Franklin Road
Raleigh, N.C. 27606
License No. F-0377
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CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2D-6
R/W SHEET NO.	

HYDRAULICS ENGINEER
Max S. Price
NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER MAX S. PRICE
12/28/2017

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SUMMARY OF EARTHWORK
(for Stormwater BMP's)

ITEM DESCRIPTION	UNIT	QUANTITY		
		BASIN 1	BASIN 2	PROJECT TOTALS
BASIN EXCAVATION	CY	1050	9670	10720
BASIN WASTE	CY	950	9670	10620
BASIN CLEARING AND GRUBBING	ACR	0	0.43	0.43

ITEMS ARE INCLUDED IN MEDIA FILTER BASIN PAY ITEM.

SUMMARY OF BASIN COMPONENT ITEMS
(for Stormwater BMP's)

ITEM DESCRIPTION	UNIT	QUANTITY		
		BASIN 1	BASIN 2	PROJECT TOTALS
OUTLET CONTROL STRUCTURE BOX (840.45)	EA	1	1	2
CONCRETE PAD, 2′ x 2′ x 4″ THICK	EA	1	1	2
8″ SLUICE GATE	EA	1	1	2
RISER TRASH RACK	EA	1	1	2
GEOTEXTILE FOR DRAINAGE (TYPE 2, NON-WOVEN)	SY	715	1635	2350
WASHED NO. 57 STONE	TON	150	385	535
UNDERDRAIN PIPE – 6″ HDPE PERFORATED	LF	315	510	825
UNDERDRAIN PIPE – 6″ HDPE NONPERFORATED	LF	9	7	16
6″ HDPE WYE	EA	1	1	2
6″ x 6″ x 6″ HDPE TEE	EA	2	4	6
6″ HDPE 45-DEGREE BEND	EA	8	12	20
6″ CLEANOUT	EA	4	6	10
ENGINEERED SOIL MEDIA	CY	135	305	440
CONCRETE PAD, 2′ x 2′ x 6″ THICK WITH TWO #3 HOOPS	EA	4	6	10
6″ CLEANOUT CAP (THREADED)	EA	4	6	10
SOD, ZOYSIA, HALF-CUT	SY	835	1295	2130
RIPRAP, CL. B	TON	50	170	220

ITEMS ARE INCLUDED IN MEDIA FILTER BASIN PAY ITEM.

PLAN VIEW – BASIN 1

WETHERILL ENGINEERING
1223 Jones Franklin Road
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

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2D-7
R/W SHEET NO.	

HYDRAULICS ENGINEER
DocuSigned by: Max S. Price
NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER MAX S. PRICE
12/28/2017

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MEDIA FILTER BASIN DIMENSIONS

BASIN	PROJECT STATION	BASIN VOLUME REQUIRED (cf)	WATER QUALITY VOLUME PROVIDED (cf)	BASIN DEPTH	FILTER LENGTH	FILTER WIDTH	BERM WIDTH	SIDE SLOPE	TOP ELEVATION MEDIA FILTER	RISER ELEVATION	BERM ELEVATION
1	-L- 47+63 (LT)	4442	4492	1.4′	110′	22′	10′	4:1	339.30′	340.70′	342.50′

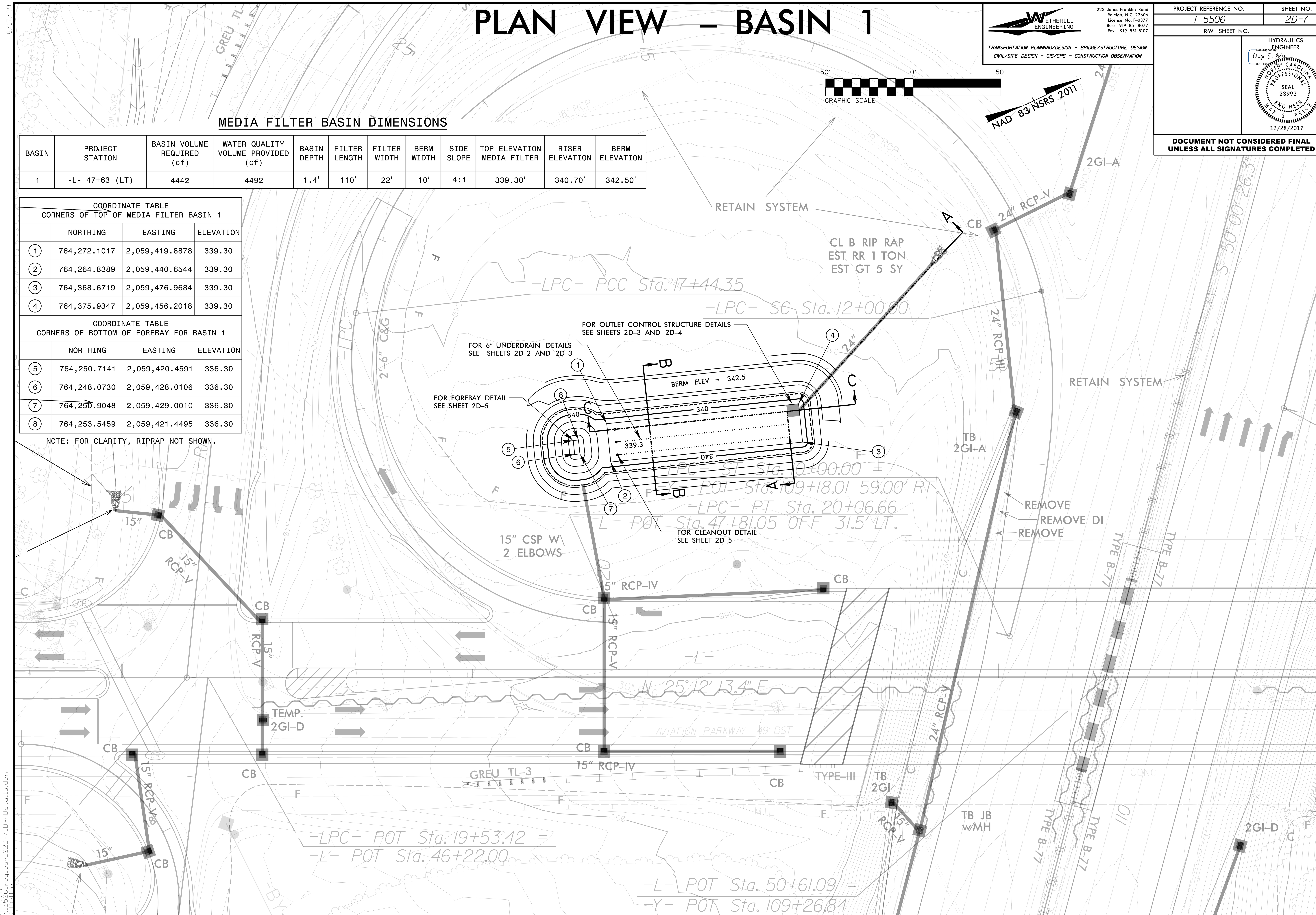
COORDINATE TABLE
CORNERS OF TOP OF MEDIA FILTER BASIN 1

	NORTHING	EASTING	ELEVATION
1	764,272.1017	2,059,419.8878	339.30
2	764,264.8389	2,059,440.6544	339.30
3	764,368.6719	2,059,476.9684	339.30
4	764,375.9347	2,059,456.2018	339.30

COORDINATE TABLE
CORNERS OF BOTTOM OF FOREBAY FOR BASIN 1

	NORTHING	EASTING	ELEVATION
5	764,250.7141	2,059,420.4591	336.30
6	764,248.0730	2,059,428.0106	336.30
7	764,250.9048	2,059,429.0010	336.30
8	764,253.5459	2,059,421.4495	336.30

NOTE: FOR CLARITY, RIPRAP NOT SHOWN.



PLAN VIEW - BASIN 2

WETHERILL ENGINEERING
1223 Jones Franklin Road
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

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2D-8
R/W SHEET NO.	

HYDRAULICS ENGINEER
DocuSigned by: Max S. Price
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23993 MAX S. PRICE
12/28/2017

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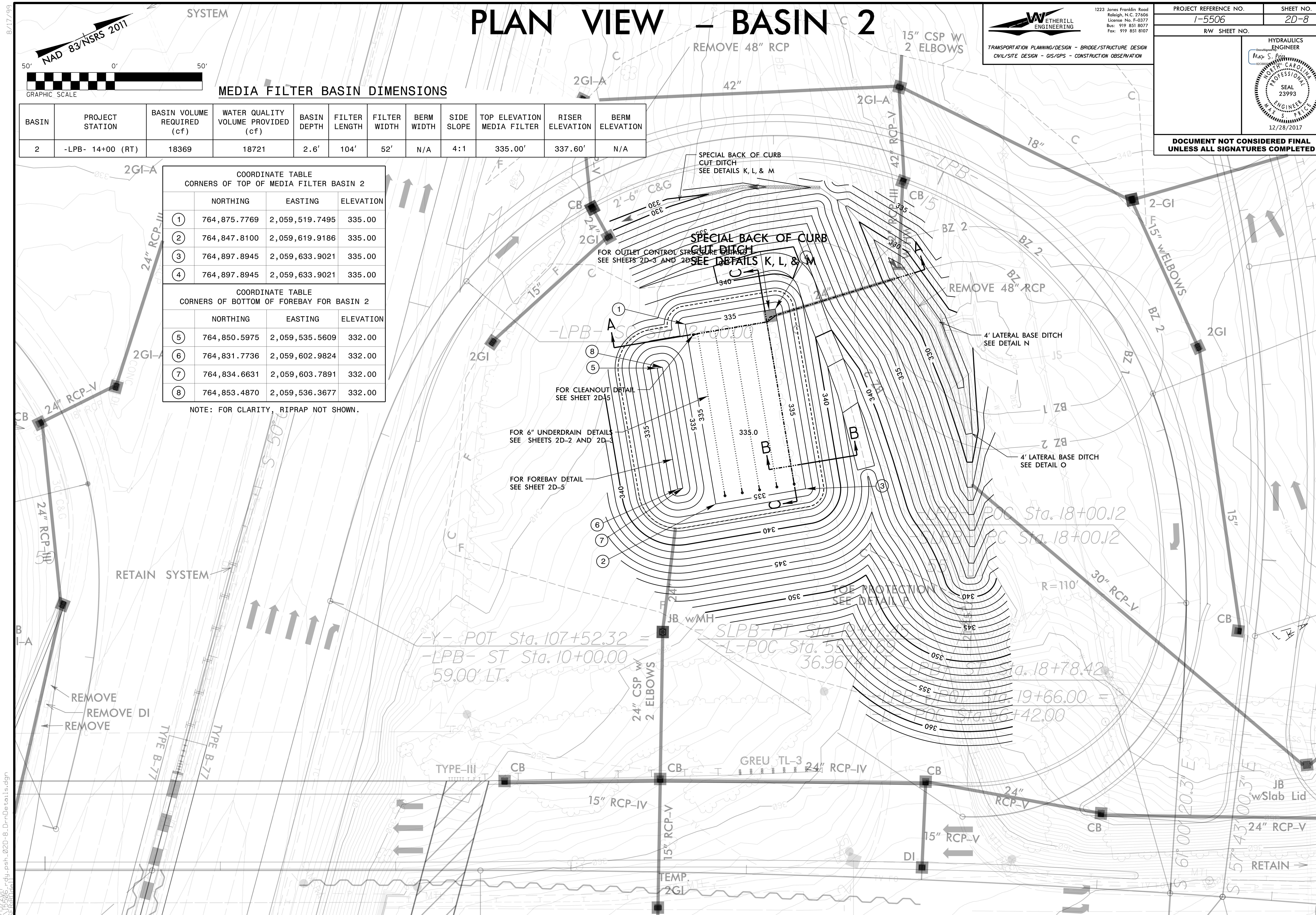
MEDIA FILTER BASIN DIMENSIONS

BASIN	PROJECT STATION	BASIN VOLUME REQUIRED (cf)	WATER QUALITY VOLUME PROVIDED (cf)	BASIN DEPTH	FILTER LENGTH	FILTER WIDTH	BERM WIDTH	SIDE SLOPE	TOP ELEVATION MEDIA FILTER	RISER ELEVATION	BERM ELEVATION
2	-LPB- 14+00 (RT)	18369	18721	2.6'	104'	52'	N/A	4:1	335.00'	337.60'	N/A

COORDINATE TABLE CORNERS OF TOP OF MEDIA FILTER BASIN 2			
	NORTHING	EASTING	ELEVATION
1	764,875.7769	2,059,519.7495	335.00
2	764,847.8100	2,059,619.9186	335.00
3	764,897.8945	2,059,633.9021	335.00
4	764,897.8945	2,059,633.9021	335.00

COORDINATE TABLE CORNERS OF BOTTOM OF FOREBAY FOR BASIN 2			
	NORTHING	EASTING	ELEVATION
5	764,850.5975	2,059,535.5609	332.00
6	764,831.7736	2,059,602.9824	332.00
7	764,834.6631	2,059,603.7891	332.00
8	764,853.4870	2,059,536.3677	332.00

NOTE: FOR CLARITY, RIPRAP NOT SHOWN.



PROJECT REFERENCE NO.	SHEET NO.
I-5506	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 11/22/2017
F760CAEB96FC4D3... SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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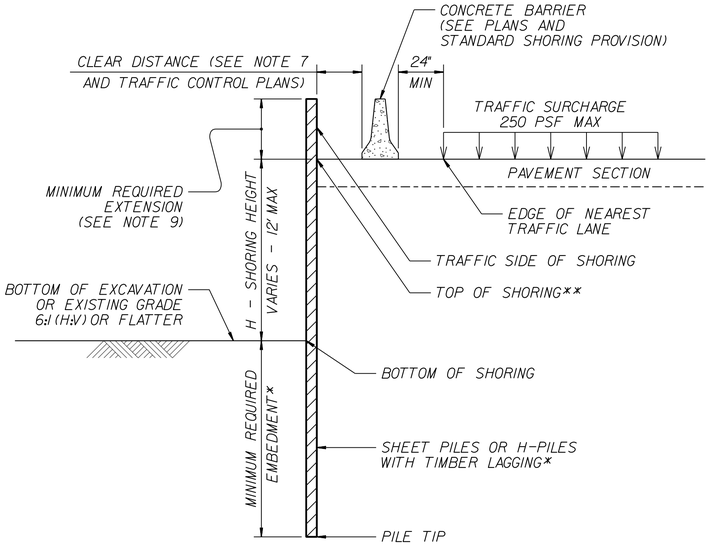
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BEWTEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
	12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
	12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

***DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".**

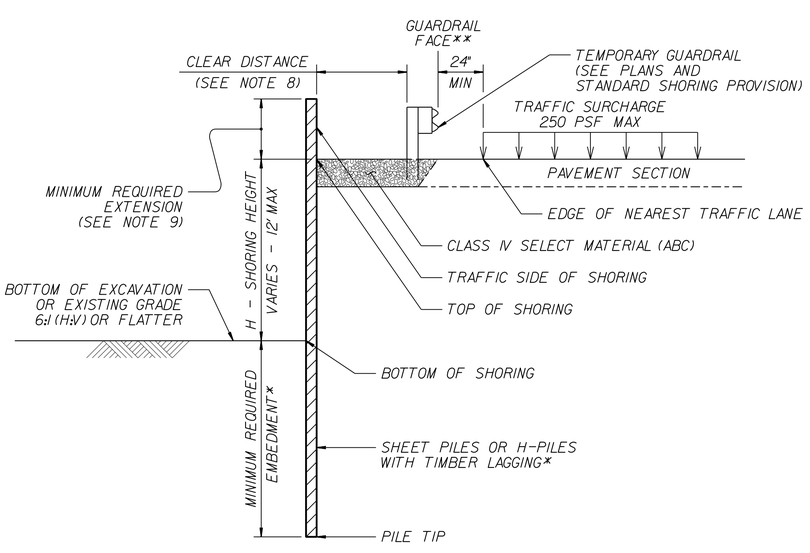
NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
7. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
8. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
9. MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
10. MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
11. SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
12. CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



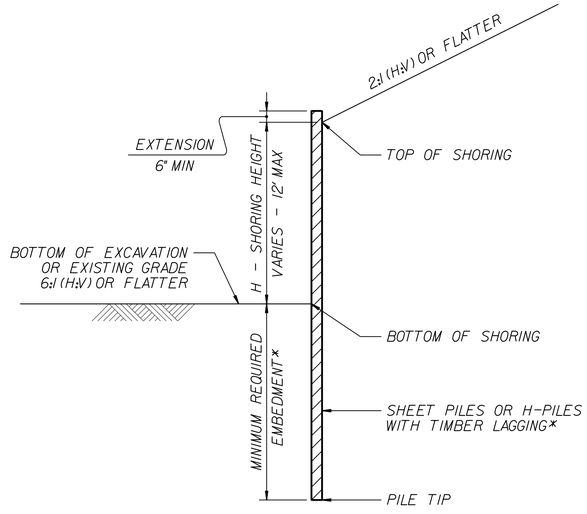
CONCRETE BARRIER

****TOP OF SHORING = EDGE OF PAVEMENT**



TEMPORARY GUARDRAIL

****GUARDRAIL FACE = EDGE OF PAVEMENT**



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden F780CAE8... SIGNATURE 11/22/2017 DATE

ENGINEER

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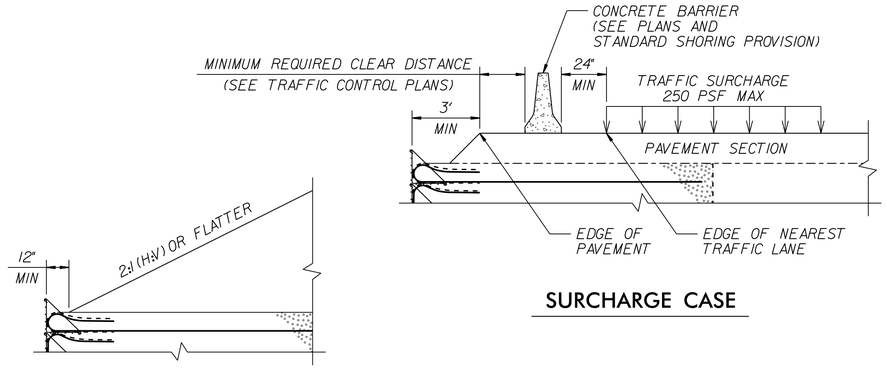
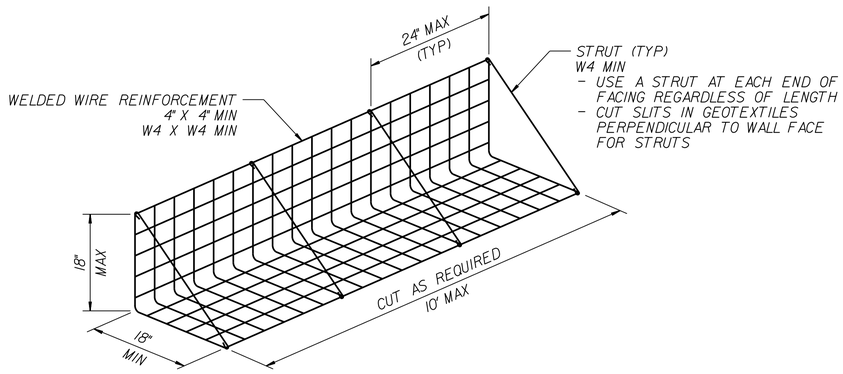
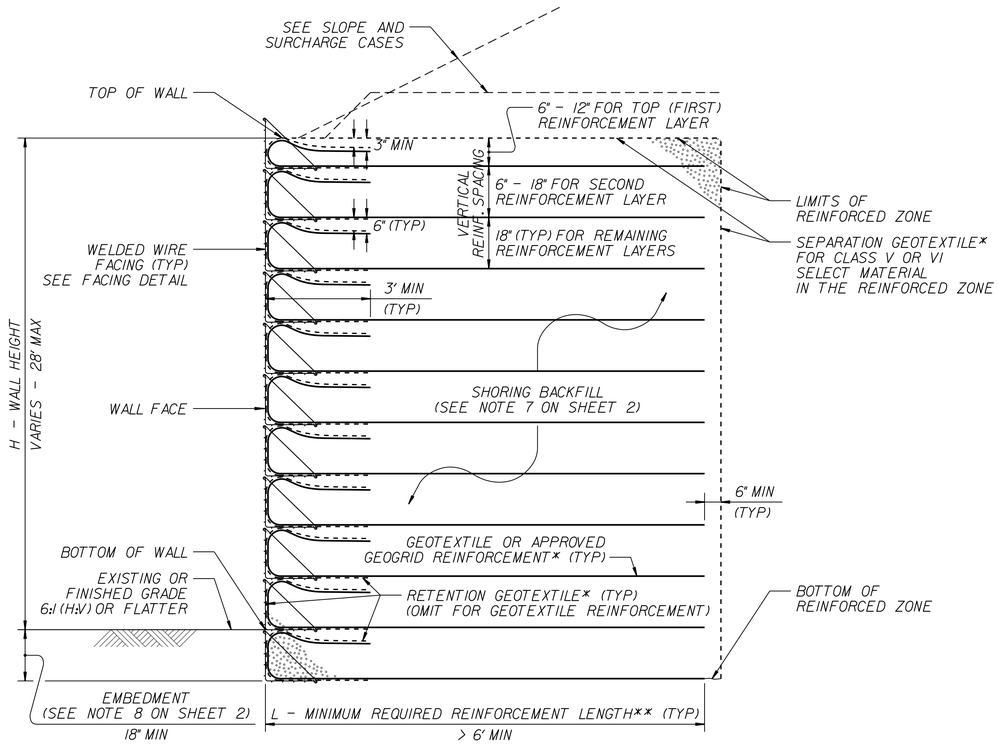


SURCHARGE CASE

SLOPE CASE

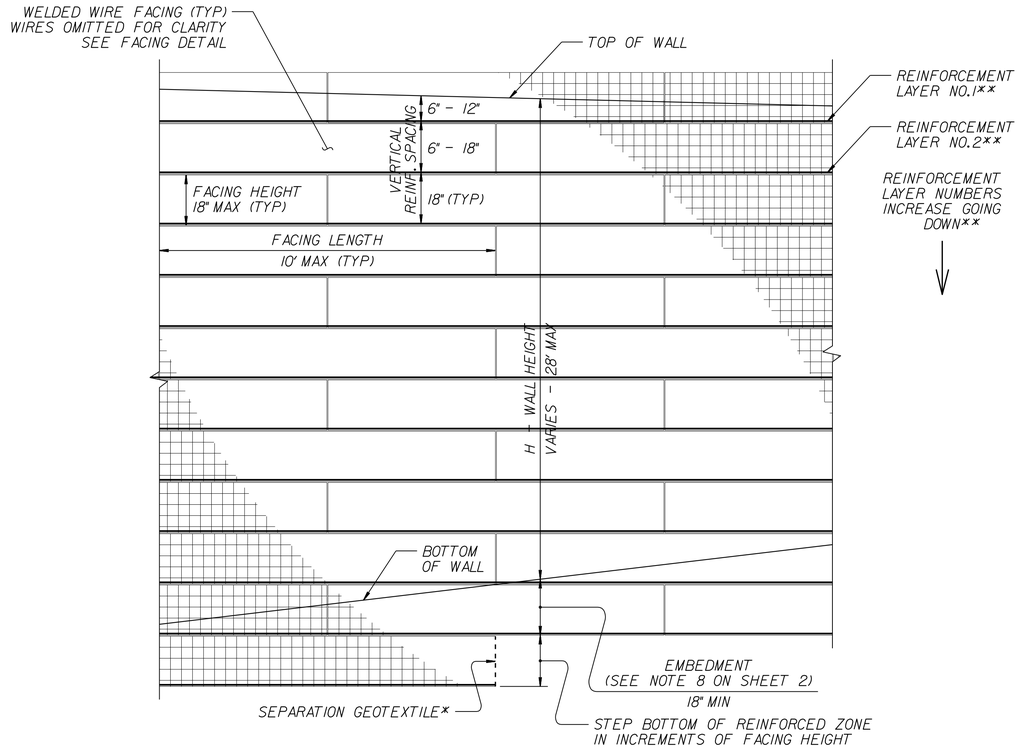


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2G-3

GEOTECHNICAL ENGINEER — SEAL 022246, NORTH CAROLINA PROFESSIONAL ENGINEER, SCOTT A. HIDDEN — DocuSigned by: Scott A. Hidden 11/22/2017

ENGINEER

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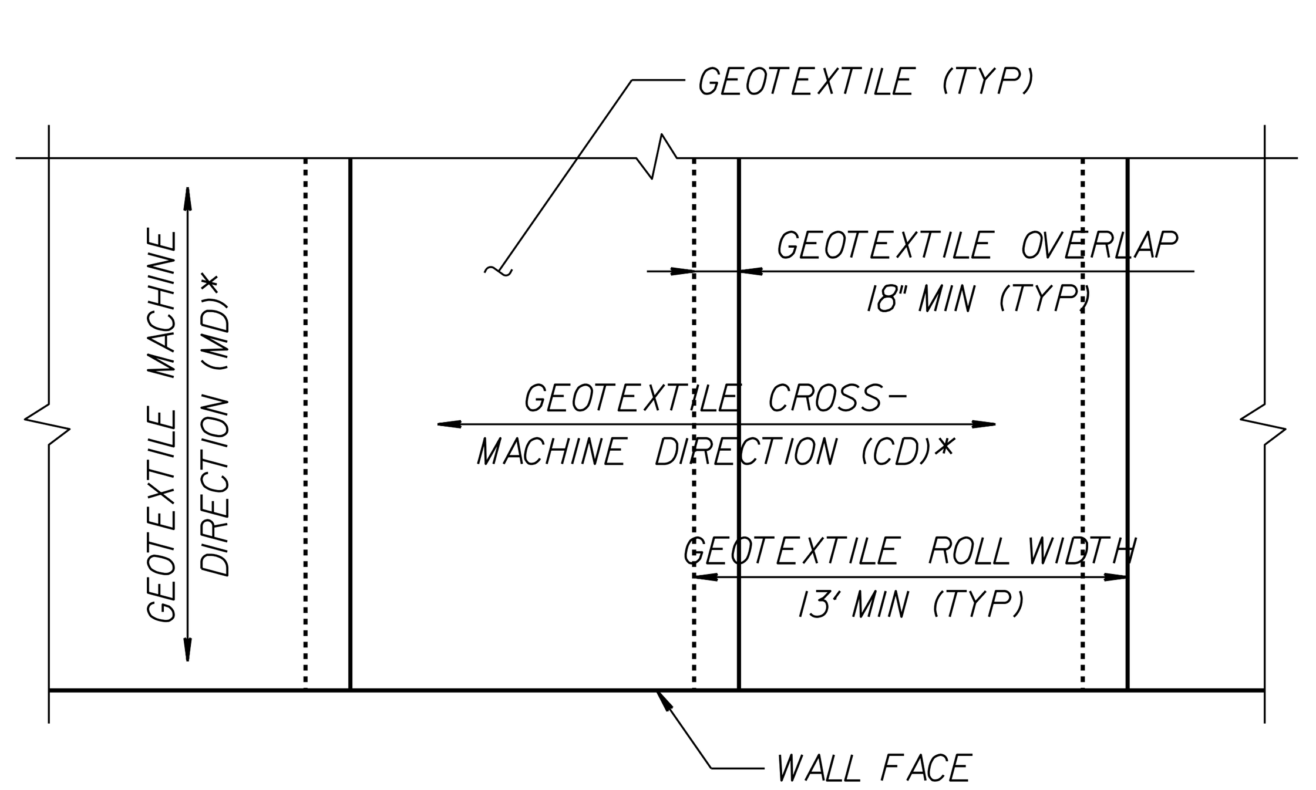
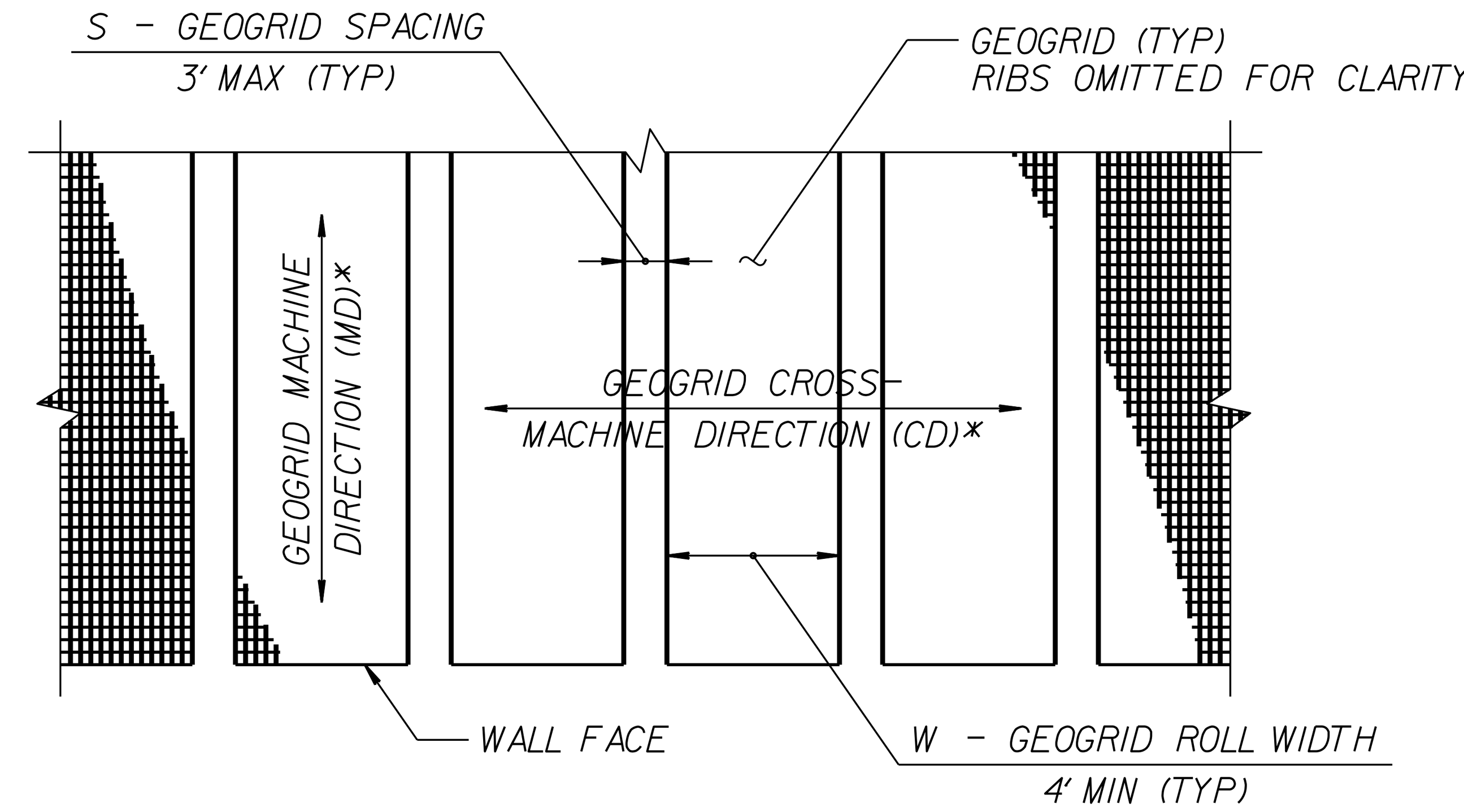


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

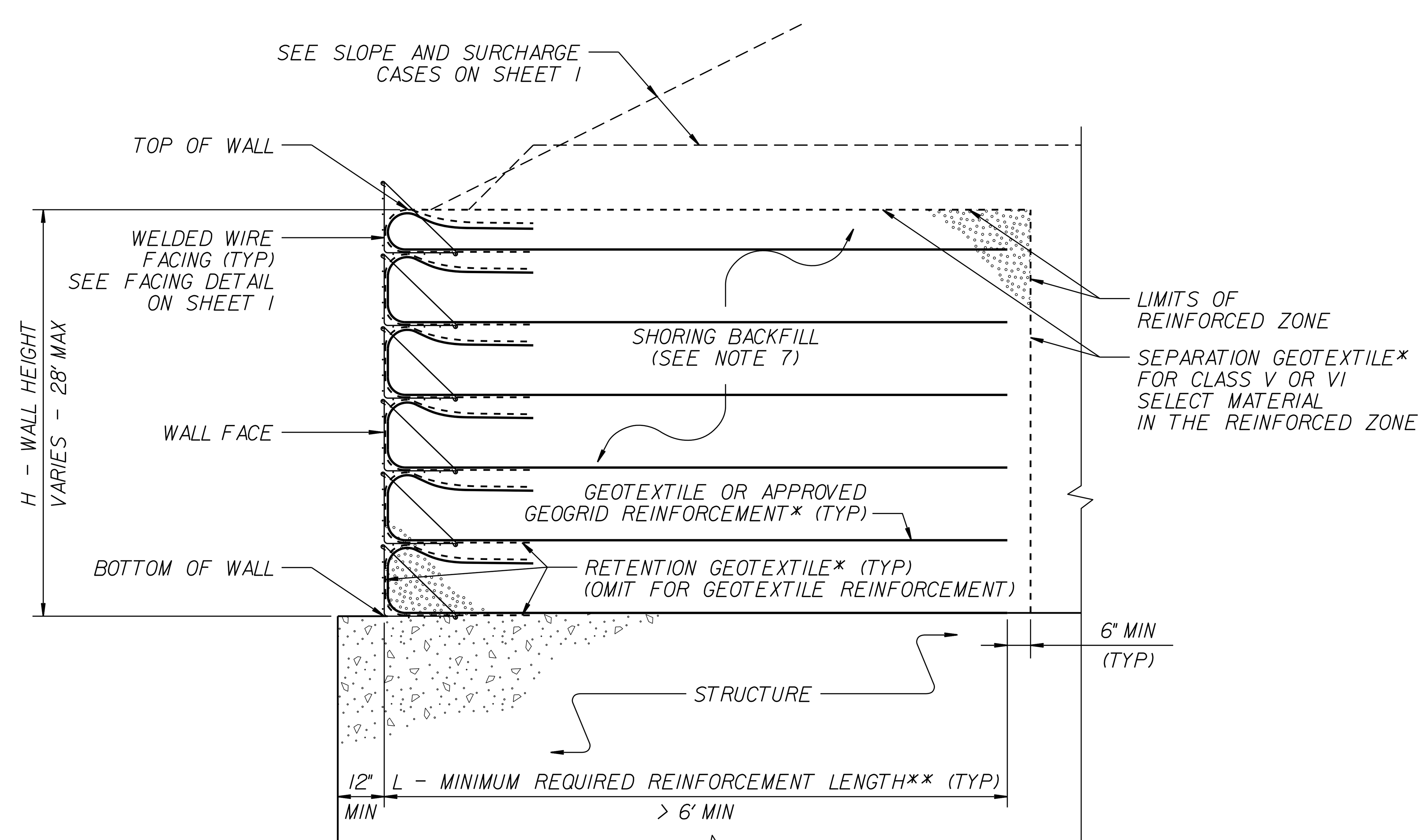


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S} \times 100 \geq 80\%$, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM:
    connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Manual.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE 1 OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

    IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) ≥ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD ≥ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:
    connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL
SHEET 2 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
I-5506	2G-4

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden E760CAEB96EC4D3...

11/22/2017

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																									
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT
SHORT–TERM DESIGN STRENGTH (LB/FT)

(SEE NOTE 10 ON SHEET 2.)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1
FOR REINFORCEMENT LAYER NUMBERING.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

COMPUTED BY: SLK DATE: 08/17
CHECKED BY: REO DATE: 10/17

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
I-5506	3B-I

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUMMARY OF EARTHWORK IN CUBIC YARDS

STATION	STATION	EXCAVATION	EMBANK. '+%	BORROW	TOTAL
Phase I					
-RPB- 10+00.00	-RPB- 26+56.07	49,222	32,255	8,046	25,013
-Y- LT 60+20.72	-Y- LT 92+00.00	5,425	17,021	11,596	
-Y- LT 96+50.00	-Y- LT 105+50.00	1,302	84		1,218
-Y- LT 108+50.00	-Y- LT 115+72.32	4,288	325		3,963
	SUBTOTAL	60,237	49,685	19,642	30,194
-RPA- 13+35.00	-RPA- 25+97.12	14,970	4,879		10,091
	SUBTOTAL	14,970	4,879		10,091
-L- LT 45+50.00	-L- LT 49+24.09 BEG BRG		6,679	6,679	
-L- LT 52+15.59 END BRG	-L- LT 56+50.00		17,420	17,420	
-LPC- 16+79.94	-LPC- 20+06.66	48	600	552	
	SUBTOTAL	48	24,700	24,651	
Phase I SUBTOTAL		75,255	79,264	44,293	40,285
Phase II					
-L- LT 23+90.00	-L- LT 32+00.00	188	624	436	
-Y5- RT 12+50.00	-Y5- RT 15+01.46	574	34		540
	SUBTOTAL	762	658	436	540
-Y5- LT 12+50.00	-Y5- LT 15+01.46	245	13		232
-L- LT 32+50.00	-L- LT 37+72.37	50	2,064	2,014	
	SUBTOTAL	295	2,077	2,014	232
-Y4- LT 10+40.00	-Y4- LT 11+25.25	148	10		138
-L- LT 39+00.00	-L- LT 45+00.00	594	1,218	624	
-Y4- RT 10+40.00	-Y4- RT 11+25.25	201	12		189
	SUBTOTAL	943	1,240	624	327
-L- LT 56+50.00	-L- LT 65+91.04	103	16,387	16,284	
-LPB- 10+00.00	-LPB- 19+23.50	9,078	34,495	25,417	
-RPC- 20+00.00	-RPC- 28+68.82	263	4,928	4,665	
	SUBTOTAL	9,444	55,810	46,366	
Phase II SUBTOTAL	**Phase II SUBTOTAL**	11,444	59,785	49,440	1,099
Phase III					
-L- RT 23+90.00	-L- RT 32+81.34	41	2,144	2,103	
-Y6- RT 10+34.89	-Y6- RT 11+20.00	39	38		1
	SUBTOTAL	80	2,182	2,103	1
-Y6- LT 10+34.89	-Y6- LT 11+20.00	28	5		23
-L- RT 32+81.34	-L- RT 44+45.95	92	370	278	
-SRPD- 10+00.00	-SRPD- 11+52.40	23	174	151	
-L- RT 46+00.00	-L- RT 49+20.00		1,099	1,099	
	SUBTOTAL	143	1,648	1,528	23
-L- RT 52+15.59 END BRG	-L- RT 56+50.00	8	1,430	1,422	
	SUBTOTAL	8	1,430	1,422	
-L- RT 56+50.00	-L- RT 60+50.00	66	1,258	1,192	
Y3- RT 10+35.11	-Y3- RT 11+50.00	24	221	197	
	SUBTOTAL	90	1,479	1,389	
-Y3- LT 10+40.65	-Y3- LT 11+50.00	13	85	72	
-L- RT 61+70.00	-L- RT 66+96.90	108	985	877	
-Y1- 10+35.65	-Y1- 13+71.33	129	238	109	
	SUBTOTAL	250	1,308	1,058	
Phase III SUBTOTAL	**Phase III SUBTOTAL**	571	8,047	7,500	24
	PHASE I SUBTOTAL	75,255	79,264	44,293	40,285
	PHASE II SUBTOTAL	11,444	59,785	49,440	1,099
	PHASE III SUBTOTAL	571	8047	7500	24
TOTAL		87,270	147,096	101,233	41,408
MATERIAL FOR SHOULDER CONSTRUCTION			4,356	4,356	
LOSS DUE TO CLEARING & GRUBBING		-3,500		3,500	
ROCK WASTE TO REPLACE BORROW				-28,129	-28,129
ADJUST FOR ROCK SWELL			-2,813	-2,813	
WASTE IN LIEU OF BORROW				-13,279	-13,279
ELIMINATE EARTH SHRINKAGE			-6,188	-6,188	
PROJECT TOTAL		83,770	142,451	58,680	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				2,934	
GRAND TOTAL		83,770	142,451	61,614	
SAY		85,000		65,000	
Pavement Structure Vol.	22,619 CY				
SEE REF: ARTICLE 225-3 OF STANDARD SPECIFICATIONS					
EST. DDE = 10,800 CUBIC YARDS					

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT.

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	32+30	45+25	RT	5143.22
-L-	49+00	49+32	RT.	221.89
-L-	52+00	52+35	RT.	216.89
-L-	56+85	60+13	RT.	447.00
-RPA-	15+02	25+75	LT.	4410.33
-RPB-	14+14	26+70	RT.	3799.22
-Y-	60+21	115+72	LT.	6168.09
TEMP	TRAFFIC	CONTROL		
-L-	35+61	44+95		1805.78
-L-	43+49	44+83		49.44
-L-	45+67	47+12		155.78
-L-	48+02	48+94		23.89
-L-	57+26	60+30		894.44
-RPA-	24+54	25+59		199.00
-SLPB-	18+03	19+29		35.11
-L-	23+66	30+50		152.44
			TOTAL:	23,722.53
			SAY:	23,730

BREAKING OF EXIST. PAVEMENT SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	52+35	54+50	RT	1,893.33
-L-	45+45	49+00	RT.	22,592.00
			TOTAL:	4,403.56
			SAY:	4,410

TEMPORARY SHORING

SURVEY LINE	OFFSET	STATION	STATION	SF
-L- RT	8.3', 7'	48+50	48+98	221.00
-L- RT	7'	48+98	49+73	293.00
-L- RT	7'	48+98	49+23	198.00
-L- RT	7'	51+45	52+38	410.00
-L- RT	7'	52+14	52+38	190.00
-L- RT	7', 10.7'	52+38	53+50	672.00
-L- RT	15.6', 8.3'	45+74	48+50	966.00
-L- RT	10.7', 12.6'	53+50	55+00	510.00
-Y- LT	6.3'	109+25	110+25	550.00
-Y- RT	6.2'	109+25	110+25	570.00
-Y- RT	79.2'	109+50	110+36	525.00
			TOTAL:	5,105.00
			SAY:	5,105.00

WOVEN WIRE FENCE SUMMARY

STATION TO STATION	LT. OR RT.	FABRIC L.F.	4" POSTS	5" POSTS
-L- 39+58 - 44+64	LT	510.00	27	17
-L- 58+00 - 65+90	LT	773.00	43	23
-RPB- 16+44 - 25+21	LT	914.00	48	32
-RPA- 20+07- 25+67	RT.	578.00	35	11
-L- 57+23 - 60+48	RT.	327.00	17	11
-RPC- 25+48.83 - 28+64.28	RT.	316.00	17	11
TOTAL		3,418.00	187	105
SAY		**3,420**	**187**	**105**

COMPUTED BY: WEI(reo) DATE:
CHECKED BY: DATE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
GUARDRAIL SUMMARY

PROJECT REFERENCE NO.	SHEET NO.
I-5506	3B-2

"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

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 FACE CONC. BARRIER	MED. HAZARD PROTECTION	REMOVE EXISTING GUARDRAIL	EXTRA LENGTH GUARDRAIL POST (8' STEEL) EACH	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	B-77	GREU TL-3	M-350	TYPE-III	CAT-1	VI MOD	BIC		G	NG					
L	23+90.00	26+00.00	LT	210			23+90.00		8	11	50		1				1											180		Tie to Exist.
L	23+90.00	27+00.00	RT	325				27+00.00	8	11										1								425	70	Tie To Exist., USE LONGER GUARDRAIL POST
L	46+93.56	49+11.02	RT	217.46			49+11.02		11.5		50		1				1		1									281		
L	52+29.05	54+44.90	LT	215.85			52+29.05		7.5		50		1				1		1									281		
L	55+56.00	57+50.00	LT																									194		
RPB / L	22+50.00	62+50.00	LT	858.55	58		61+50.00		14		50		1				1											571		
L	58+05.00	59+96.85	RT	191.85				59+96.85	14											1								350		
RPA/L	24+25.00	58+05.24	RT	291			25+00.00		14	17	50		1				1											154		
RPB	22+50.00	25+90.63	LT	354.3			22+50.00		14	17										1								400		
RPC	25+25.00	27+00.00	RT	197.75			26+00.00	27+00.00	14	17	50		1				1			1										
Y	60+20.72	75+50.00	LT	1529.28			60+20.72	75+50.00	14	17		50		1			1											1570.29		Tie To Exist.
Y	80+00.00	84+00.00	LT	400			80+00.00	82+50.00	14	17		50		1			1			1								435		
Y	106+95.00	107+36.95	CL			41.95																						41.95		
Y	107+36.95	108+68.70	LT MED	131.75												1												131.75		Tie To Exist.
Y	107+36.95	108+68.70	RT MED	131.75												1												131.75		Tie To Exist.
Y	109+82.18	111+50.93	LT MED	168.75												1												168.75		Tie To Exist.
Y	109+82.18	111+50.93	RT MED	168.75												1												168.75		Tie To Exist.
Y	111+50.93	111+92.88	CL			41.95																						41.95		
Y	108+68.70	109+82.18																									113.48	227		
Y	30+00.00	33+21.00	LT MED	321			32+06.00		5.5		90		6															115		Tie To Exist. (See Signing Plans)
Y	30+00.00	33+21.00	RT MED	321			32+06.00		5.5		90		6																	Tie To Exist. (See Signing Plans)
Y	42+07.50	45+85.11	RT MED	377.61			44+45.00		14	17	50		1				1													Tie To Exist. (See Signing Plans)
Y	111+16.25	113+10.00	LT	187.5			111+35.00		14	17	50		1				1			1										See Signing Plans
Y /RPA	126+53.00	10+26.48	LT /RT	368.35			10+07.73		14	17	50		1				1			1										See Signing Plans
Y	148+75.00	151+25.00	LT	250			149+00.00		14	17	50		1				1			1										See Signing Plans
Y / RPC	97+79.59	11+80.00	RT	275			11+55.00		14	17	50		1				1			1										See Signing Plans
Total				7492.5	58	83.9									0	4	13	0	2	9	0	0	0			0	113.48	5868.19	70	
Anchor	Deductions																													
	B-77	4	18.75	-75																										
	GREU TL-3	13	50	-650																										
	TYPE-III	2	18.75	-37.5																										
	CAT-1	9	6.25	-56.25																										
	Grand Total			6673.75	58	83.9									0	4	13	0	2	9	0	0	0				113.48	5868.15	70	
	Say			6675	62.5	87.5										4	13		2	9							114	5869	70	
	Additional Guardrail Posts = 10 EA.																													

RAL-WS061

COMPUTED BY: Anne D. Gamber **DATE:** 5/23/2017

CHECKED BY: B. MAY, R.ODELL **DATE:**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
I-5506	3D-1

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 15 (.064)	C. S. PIPE 24 (.064)
L 25+70	48	LT	0401																			
L 25+72	0	CL	0402		285.2																	
			0402	0401		282.0	279.9															
L 27+00	4	RT	0414		286.0																	
			0414	0402		282.6	282.0															
L 28+73	6	LT	0403		286.3																	
			0403	0414		283.1	282.6															
L 30+59	43	RT	0416		290.9																	
			0416	0404		285.5	285.4					28										
Y6 10+56	37	LT	0405		294.8																	
L 33+05	63	RT	0406		295.0																	
			0406	0405		293.0	291.0															
L 32+85	37	RT	0407		295.8																	
			0407	0405		292.8	291.0															
L 29+50	52	LT	0415		283.4																	
			0415	0408		281.2	280.7	1.0														
L 30+25	37	LT	0409		287.1																	
			0409	0415		283.9	281.2				72											
L 30+20	5	LT	0410		287.9																	
			0410	0409		284.9	283.9															
L 33+12	49	LT	0411		296.6																	
			0411	0409		293.4	283.9	0.7														
L 34+90	49	LT	0412		303.9																	
			0412	0411		300.9	293.6	1.4														
L 37+00	37	LT	0542		312.6																	
			0542	0412		309.6	300.9															
L 39+55	37	LT	0545		322.5																	
			0545	0542		319.5	309.6															
L 39+71	37	LT	0580		323.3																	
			0580	0545		320.0	319.3															
L 35+00	37	RT	0413		304.5																	
			0413	0412		301.5	300.9	0.4														
L 37+00	37	RT	0543		312.6																	
			0543	0413		309.6	301.5															
L38+12	37	RT	0544		317.2																	
			0544	0543		314.2	309.6															
L 39+50	37	RT	0546		322.3																	
			0546	0544		319.3	314.2															
L 41+42	33	LT	0548		330.0																	
			0548	0549		327.0	324.9	0.4														
L 41+67	20	RT	0595																			
L 41+45	40	RT	0549		330.0																	
L 43+00	34	LT	0550		336.5																	
			0550	0548		333.5	327.0															
L 43+00	52	RT	0551		336.1																	
			0551	0549		333.1	324.9															
RPD 26+55	22	LT	0553		344.2																	
			0553	0552		341.0	340.0			36												
L 45+06	44	RT	0554		344.2																	
			0554	0553		341.2	341.0															
SHEET TOTALS										36	72	28										

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 12	15	18	24	42	48	R. C. PIPE CLASS IV 12	15	18	24	R. C. PIPE CLASS V 12	15	18	24	30	36	42	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY
L 25+70	0401																					
L 25+72	0402																					
	0402	0401												48								
L 27+00	0414																					
	0414	0402								128												
L 28+73	0403																					
	0403	0414								172												
L 30+59	0416																					
	0416	0404																				
Y6 10+56	0405																					
L 33+05	0406																					
	0406	0405				64																
L 32+85	0407																					
	0407	0405		48																		
L 29+50	0415																					
	0415	0408													48							
L 30+25	0409																					
	0409	0415																				
L 30+20	0410																					
	0410	0409		32																		
L 33+12	0411																					
	0411	0409													284							
L 34+90	0412																					
	0412	0411								176												
L 37+00	0542																					
	0542	0412								212												
L 39+55	0545																					
	0545	0542												256								
L 39+71	0580																					
	0580	0545								16												
L 35+00	0413																					
	0413	0412												84								
L 37+00	0543																					
	0543	0413								196												
L38+12	0544																					
	0544	0543								112												
L 39+50	0546																					
	0546	0544								136												
L 41+42	0548																					
	0548	0549												72								
L 41+67	0595																					
L 41+45	0549																					
L 43+00	0550																					
	0550	0548								156												
L 43+00	0551																					
	0551	0549												156								
RPD 26+55	0553																					
	0553	0552																				
L 45+06	0554																					
	0554	0553												60								
SHEET TOTALS				80		64				1304				676	332							

LINE & STATION	FROM	TO	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	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. (W.S. FLAT) FRAME W/ 2 GRATE STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24
L 25+70	0401																			
L 25+72	0402		1							1		1	1							
	0402	0401																		
L 27+00	0414		1							1		1	1							
	0414	0402																		
L 28+73	0403		1							1		1	1							
	0403	0414																		
L 30+59	0416		1	0.4																
	0416	0404																		
Y6 10+56	0405		1			1			1											
L 33+05	0406																			
	0406	0405																		
L 32+85	0407		1			1			1											
	0407	0405																		
L 29+50	0415		1													1		1		
	0415	0408																		
L 30+25	0409		1			1		1												
	0409	0415																		
L 30+20	0410		1							1		1	1							
	0410	0409																		
L 33+12	0411		1			1		1												
	0411	0409																		
L 34+90	0412		1			1		1												
	0412	0411																		
L 37+00	0542		1			1		1												
	0542	0412																		
L 39+55	0545		1			1		1												
	0545	0542																		
L 39+71	0580		1			1		1												
	0580	0545																		
L 35+00	0413		1			1			1											
	0413	0412																		
L 37+00	0543		1			1			1											
	0543	0413																		
L38+12	0544		1			1			1											
	0544	0543																		
L 39+50	0546		1			1			1											
	0546	0544																		
L 41+42	0548		1			1		1												
	0548	0549																		
L 41+67	0595		1												1					1
L 41+45	0549		1	0.1		1			1											
L 43+00	0550		1			1		1												
	0550	0548																		
L 43+00	0551		1			1			1											
	0551	0549																		
RPD 26+55	0553		1			1		1												
	0553	0552																		
L 45+06	0554		1			1			1											
	0554	0553																		
SHEET TOTALS			25	0.5		18		9	9	4		4	4		1	1		1		1

LINE & STATION	FROM	TO	STEEL GRATE AND FRAME STD. 840.37	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	NARROW DI W/ FRAME & GRATE 840D13 SEE PSH 2C	JB STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	METHOD FOR PLACEMENT OF DI IN ISLANDS 852D03	15" SIDE DRAIN PIPE ELBOWS	18" SIDE DRAIN PIPE ELBOWS	24" CS PIPE ELBOW .064 THICK	MEDIA FILTER BASIN CONTROL STRUCTURE	4" CONCRETE PAVED DITCH, S.Y.	PREFORMED SCOUR HOLE (PER EACH)	15" CS PIPE ELBOW .064 THICK	18" CS PIPE ELBOW .064 THICK	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
L 25+70	0401																1							
L 25+72	0402																							
	0402	0401																						
L 27+00	0414																							
	0414	0402																						
L 28+73	0403																							
	0403	0414																						
L 30+59	0416								1	1														
	0416	0404																						
Y6 10+56	0405																							
L 33+05	0406																							
	0406	0405																						
L 32+85	0407																							
	0407	0405																						
L 29+50	0415																							
	0415	0408																						
L 30+25	0409																							
	0409	0415																						
L 30+20	0410																							
	0410	0409																						
L 33+12	0411																						120	
	0411	0409																		17				
L 34+90	0412																							
	0412	0411																						
L 37+00	0542																							
	0542	0412																						
L 39+55	0545																							
	0545	0542																						
L 39+71	0580																						18	
	0580	0545																						
L 35+00	0413																							
	0413	0412																						
L 37+00	0543																							
	0543	0413																						
L38+12	0544																							
	0544	0543																						
L 39+50	0546																			7				
	0546	0544																						
L 41+42	0548																							
	0548	0549																						
L 41+67	0595																							TEMPORARY TO BE INSTALLED BEFORE PHASE II AND REMOVED DURING PHASE III
L 41+45	0549																							
L 43+00	0550																							
	0550	0548																		3			14	
L 43+00	0551																							
	0551	0549																						
RPD 26+55	0553																							
	0553	0552																						
L 45+06	0554																							
	0554	0553																						
SHEET TOTALS									1	1							1			27			152	

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

RAL-WS061

COMPUTED BY: Anne D. Gamber DATE: 5/23/2017

CHECKED BY: B. MAY, R.ODELL DATE:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
I-5506	3D-2

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 (Size / Thickness or Gauge)	Offset	Structure Number From	Structure Number To	Top Elevation FT.	Invert Elevation FT.	Invert Elevation FT.	Minimum Required Slope %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	42	48	Do Not Use RCP	Do Not Use CSP	Do Not Use CAAP	Do Not Use HDPE	Do Not Use PVC	C. S. Pipe 15 (.064)	C. S. Pipe 24 (.064)
L 45+80	24 RT	0596																			
L 45+80	44 RT	0592		346.8																	
		0592	0591		343.8	343.4															
L 45+80	33 LT	0591		346.9																	
		0591	0593		343.4	341.3															
RPC 28+10	26 RT	0593		344.3																	
		0593	0573		341.3	341.0			24												
L 47+75	45 LT	0503		353.7																	
		0503	0505		350.5	340.7														64	
L 47+10	44 RT	0504		353.7																	
		0504	0503		350.7	350.5															
L 49+00	51 LT	0506		358.3																	
		0506	0503		355.3	350.5															
L 48+75	50 RT	0507		357.4																	
		0507	0504		354.4	345.7															
L 52+62	51 LT	0508		366.8																	
		0508	0510		363.8	362.6															
L 52+36	50 RT	0509		366.5																	
		0509	0511		363.5	362.9															
L 53+50	53 LT	0510		367.8																	
		0510	0525		360.9	343.9															84
L 53+50	21 RT	0597		365.0																	
L 53+50	43 RT	0511		368.0																	
		0511	0510		362.9	361.6															
RPA 17+79	49 LT	0512		345.1																	
RPA 18+00	49 RT	0513		341.5																	
		0513	0512		338.0	332.8															
		0514	0513		359.7	338.8														56	
RPA 21+40	56 RT	0515		356.7																	
		0515	0513		353.1	338.8			328												
RPA 21+40	24 LT	0516		356.1																	
		0516	0515		353.3	353.1															
		0517	0518		363.1	357.3														20	
RPA 22+15	56 RT	0518		360.1																	
		0518	0515		357.3	353.1			72												
RPA 24+76	27 RT	0519		367.9																	
		0519	0521		364.9	364.6															
RPA 24+76	6 LT	0520		368.3																	
		0520	0519		365.3	364.9															
RPA 25+50	32 RT	0521		370.0																	
		0521	0576		364.6	348.3			60						X						
L 55+35	46 RT	0522		370.0																	
		0522	0511		367.0	362.9															
L 55+00	7 LT	0523		370.6																	
		0523	0524		367.5	366.5															
L 55+00	56 LT	0524		369.5																	
		0524	0510		365.3	360.9	0.4														
L 53+50	137 LT	0525		348.3																	
		0525	0578		340.6	337.6					60										
L 57+52	49 RT	0526		372.3																	
SHEET TOTALS									484		60									140	84

From	To	R. C. Pipe Class III 12	15	18	24	42	48	R. C. Pipe Class IV 12	15	18	24	R. C. Pipe Class V 12	15	18	24	30	36	42
0596																		
0592																		
0592	0591												76					
0591																		
0591	0593												88					
0593																		
0593	0573																	
0503																		
0503	0505																	
0504																		
0504	0503												88					
0506																		
0506	0503								124									
0507																		
0507	0504								100									
0508																		
0508	0510								88									
0509																		
0509	0511								112									
0510																		
0510	0525																	
0597																		
0511																		
0511	0510												92					
0512																		
0513																		
0513	0512										100							
0514	0513																	
0515																		
0515	0513																	
0516																		
0516	0515								80									
0517	0518																	
0518																		
0518	0515																	
0519																		
0519	0521								72									
0520																		
0520	0519												32					
0521																		
0521	0576																	
0522																		
0522	0511								184									
0523																		
0523	0524												48					
0524																		
0524	0510										148							
0525																		
0525	0578																	
0526																		
SHEET TOTALS									760		248		424					

From	To	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	D.I. Std. 852.04 or Std. 852.06	C.B. Std. 852.05	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
0596					1													1
0592					1			1			1							
0592	0591																	
0591					1			1		1								
0591	0593																	
0593					1			1			1							
0593	0573																	
0503					1			1		1								
0503	0505																	
0504					1			1			1							
0504	0503																	
0506					1			1		1								
0506	0503																	
0507					1			1			1							
0507	0504																	
0508					1			1		1								
0508	0510																	
0509					1			1			1							
0509	0511																	
0510					1	1.9		1		1								
0510	0525																	
0597					1												1	
0511					1	0.1		1			1							
0511	0510																	
0512					1	5.0	2.3									1		
0513					1												1	
0513	0512																	
0514	0513																	
0515					1												1	
0515	0513																	
0516					1												1	
0516	0515																	
0517	0518																	
0518					1												1	
0518	0515																	
0519					1			1			1							
0519	0521																	
0520					1			1		1								
0520	0519																	
0521					1	0.4		1			1							
0521	0576																	
0522					1			1			1							
0522	0511																	
0523					1							1		1	1			
0523	0524																	
0524					1			1		1								
0524	0510																	
0525					1	2.7												
0525	0578																	
0526					1			1			1							
SHEET TOTALS					26	10.1	2.3	17		7	10	1		1	1	1	5	1

From	To	G.D.I. (W.S. FLAT) Frame w/ 2 Grate Std. 840.20	G.D.I. (W.S. SAG) Frame w/ 2 Grates Std. 840.22	G.D.I. (N.S. SAG) Frame w/ Grate Std. 840.24	G.D.I. (N.S. SAG) Frame w/ 2 Grates Std. 840.24	Steel Grate and Frame Std. 840.37	G.D.I. (N.S. FLAT) Frame w/ 2 Grates Std. 840.29	T.B.J.B. Std. 840.34	T.B.D.I. Std. 840.35	T.B.D.I. for Steel Grates Std. 840.36	Narrow DI w/ Frame & Grate 840D13 see PSH 2C	JB Std. 840.31 or Std. 840.32	M.H. Frame and Cover Std. 840.54	Method for Placement of DI in Islands 852D03	15" Side Drain Pipe Elbows	18" Side Drain Pipe Elbows	24" CS Pipe Elbow .064 Thick	Media Filter Basin Control Structure	4" Concrete Paved Ditch, S.Y.	Preformed Scour Hole (per each)	15" CS Pipe Elbow .064 Thick	18" CS Pipe Elbow .064 Thick	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
0596					1																						TEMPORARY TO BE INSTALLED BEFORE PHASE II AND REMOVED DURING PHASE III
0592																											
0592	0591																										
0591																											
0591	0593																										
0593																											
0593	0573																										
0503																											
0503	0505																				2						
0504																											
0504	0503																										
0506																											
0506	0503																										
0507																											
0507	0504																										
0508																											
0508	0510																										
0509																											
0509	0511																										
0510																											
0510	0525																2										
0597					1																						TEMPORARY TO BE INSTALLED BEFORE PHASE II AND REMOVED DURING PHASE III
0511																											
0511	0510																										
0512			1																								
0513			1																							49	
0513	0512																									80	
0514	0513																		11		2						
0515			1																								
0515	0513																									332	
0516			1																								
0516	0515																										
0517	0518																		11		2						
0518			1																								
0518	0515																										
0519																											
0519	0521																										
0520																											
0520	0519																										
0521																											
0521	0576														2												
0522																											
0522	0511																										
0523																											
0523	0524																										
0524																											
0524	0510																										
0525												1	1														
0525	0578																										
0526																											
SHEET TOTALS			5		2							1	1		2		2		22		6					461	

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

RAL-WS061

COMPUTED BY: Anne D. Gamber **DATE:** 5/23/2017

CHECKED BY: B. MAY, R.ODELL **DATE:**

PROJECT NO.	SHEET NO.
I-5506	3D-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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 (SIZE / THICKNESS OR GAUGE)	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	42	48		DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIP 15 .064	24 .064
			0526	0522		369.3	367.0																
L 56+00	43	LT	0594		370.8																		
			0594	0524		365.7	365.3	0.4															
L 57+50	51	LT	0527		372.2																		
			0527	0594		365.5	365.7	0.3															
L 59+33	12	RT	0528		375.8																		
			0528	0529		372.8	371.2																
L 59+30	48	LT	0529		374.2																		
			0529	0581		367.2	366.6																
L 60+67	8	LT	0530		376.4																		
			0530	0579		373.2	372.5																
L 61+10	9	RT	0531		377.4																		
			0531	0530		374.3	373.2																
L 62+06	68	RT	0532																				
			0532	0533		375.4	374.8																
L 61+88	9	RT	0533		377.9																		
			0533	0534		374.8	373.0																
L 61+75	39	LT	0534		376.0																		
			0534	0579		369.2	368.1	0.9															
L 63+00	10	RT	0535		378.8																		
			0535	0536		375.7	374.0																
L 63+00	37	LT	0536		377.0																		
			0536	0534		369.9	369.2	0.5															
L 57+80	144	LT	0538																				
			0538	0539		338.0	336.4					96											
L 57+14	79	LT	0539		340.1																		
			0539	0540		335.9	331.1	0.3															
Y 115+45	86	LT	0555		335.5																		
Y 112+50	103	LT	0556		334.0																		
			0556	0557		332.1	331.4	0.4		100													
Y 111+52	84	LT	0557		336.0																		
Y 110+00	99	LT	0558		334.9																		
			0558	0557		333.0	331.4			152													
LPB 11+80	33	RT	0559		331.0																		
			0559	0560		328.3	326.6			88													
LPB 12+85	33	RT	0560		329.3																		
			0560	0561		325.8	325.7					20											
LPB 12+85	14	RT	0561		329.5																		
			0561	0562		325.7	321.8																
LPB 13+06	44	LT	0562		328.4																		
LPB 14+63	37	LT	0563		333.2																		
			0563	0562		327.0	321.4							180									
LBB 15+00	61	RT	0541		331.1																		
			0541	0564		327.6	327.5																
SHEET TOTALS										340		116		180									

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 12	15	18	24	42	48		R. C. PIPE CLASS IV 12	15	18	24		R. C. PIPE CLASS V 12	15	18	24	30	36	42			ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY
	0526	0522														212										
L 56+00	0594																									
	0594	0524																104								
L 57+50	0527																									
	0527	0594																148								
L 59+33	0528																									
	0528	0529														60										
L 59+30	0529																									
	0529	0581											164													
L 60+67	0530																									
	0530	0579														32										
L 61+10	0531																									
	0531	0530														44										
L 62+06	0532																									
	0532	0533														64										
L 61+88	0533																									
	0533	0534														48										
L 61+75	0534																									
	0534	0579										112														
L 63+00	0535																									
	0535	0536														44										
L 63+00	0536																									
	0536	0534										120														
L 57+80	0538																									
	0538	0539																								
L 57+14	0539																									
	0539	0540																	248							
Y 115+45	0555																									
Y 112+50	0556																									
	0556	0557																								
Y 111+52	0557																									
Y 110+00	0558																									
	0558	0557																								
LPB 11+80	0559																									
	0559	0560																								
LPB 12+85	0560																									
	0560	0561																								
LPB 12+85	0561																									
	0561	0562																60								
LPB 13+06	0562																									
LPB 14+63	0563																									
	0563	0562																								
LBB 15+00	0541																							4.500		
	0541	0564					52																			
SHEET TOTALS							52					232	164			504		312	248					4.500		

LINE & STATION	FROM	TO	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	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. (W.S. FLAT) FRAME W/ 2 GRATE STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	STEEL GRATE AND FRAME STD. 840.37	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	NARROW DI W/ FRAME & GRATE 840D13 SEE PSH 2C	JB STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	METHOD FOR PLACEMENT OF DI IN ISLANDS 852D03
	0526	0522																												
L 56+00	0594		1	0.1		1		1																						
	0594	0524																												
L 57+50	0527		1	0.7		1		1																						
	0527	0594																												
L 59+33	0528		1			1		1				1																		
	0528	0529																												
L 59+30	0529		1	2.0		1		1																						
	0529	0581																												
L 60+67	0530		1								1		1	1																
	0530	0579																												
L 61+10	0531		1								1		1	1																
	0531	0530																												
L 62+06	0532																													
	0532	0533																												
L 61+88	0533		1								1		1	1																
	0533	0534																												
L 61+75	0534		1	1.8		1		1																						
	0534	0579																												
L 63+00	0535		1								1		1	1																
	0535	0536																												
L 63+00	0536		1	2.1		1		1																						
	0536	0534																												
L 57+80	0538																													
	0538	0539																												
L 57+14	0539		1																									1		
	0539	0540																												
Y 115+45	0555		1														1		1											
Y 112+50	0556		1														1		1											
	0556	0557																												
Y 111+52	0557		1																					1						
Y 110+00	0558		1														1		1											
	0558	0557																												
LPB 11+80	0559		1													1			1											
	0559	0560																												
LPB 12+85	0560		1													1			1											
	0560	0561																												
LPB 12+85	0561		1			1	1																							
	0561	0562																												
LPB 13+06	0562		1	2.1											1				1											
LPB 14+63	0563		1	1.3											1				1											
	0563	0562																												
LBB 15+00	0541																													
	0541	0564																												
SHEET TOTALS			20	10.1		7	1	6			4	1	4	4	2	2	3		7					1				1		

LINE & STATION	FROM	TO	15" SIDE DRAIN PIPE ELBOWS	18" SIDE DRAIN PIPE ELBOWS	24" CS PIPE ELBOW .064 THICK	MEDIA FILTER BASIN CONTROL STRUCTURE	4" CONCRETE PAVED DITCH, S.Y.	PREFORMED SCOUR HOLE (PER EACH)	15" CS PIPE ELBOW .064 THICK	18" CS PIPE ELBOW .064 THICK	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
	0526	0522									2			400	
L 56+00	0594														
	0594	0524													
L 57+50	0527														
	0527	0594													
L 59+33	0528														
	0528	0529									2				
L 59+30	0529														
	0529	0581													
L 60+67	0530														
	0530	0579									1				
L 61+10	0531														
	0531	0530													
L 62+06	0532														
	0532	0533									8				
L 61+88	0533														
	0533	0534													
L 61+75	0534														
	0534	0579												148	
L 63+00	0535														
	0535	0536									2				
L 63+00	0536													18	
	0536	0534													
L 57+80	0538														
	0538	0539													
L 57+14	0539														
	0539	0540													
Y 115+45	0555														
Y 112+50	0556														
	0556	0557													
Y 111+52	0557														
Y 110+00	0558														
	0558	0557													
LPB 11+80	0559														
	0559	0560													
LPB 12+85	0560														
	0560	0561													
LPB 12+85	0561														
	0561	0562												243	
LPB 13+06	0562														
LPB 14+63	0563														
	0563	0562													
LBB 15+00	0541														
	0541	0564													
SHEET TOTALS											15			809	

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

RAL-WS061

COMPUTED BY:	Anne D. Gamber	DATE:	5/23/2017
CHECKED BY:	B. MAY, R.ODELL	DATE:	

PROJECT NO.	SHEET NO.
I-5506	3D-4

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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 %
LPB 14+80	14 RT	0564		334.6			
		0564	0563		327.5	327.0	
LPB 14+60	55 LT	0565		336.9			
		0565	0563		335.7	329.2	
RPB 22+81	59 RT	0567		336.3			
		0567	0563		333.3	329.0	
LPB 16+65	34 LT	0568		347.7			
		0568	0567		345.0	333.5	
RPB 25+42	10 RT	0569		364.2			
		0569	0568		361.2	346.3	
RPB 22+73	72 LT	0570					
		0570	0567		339.0	333.3	
LPB 14+01	102 RT	0571	0572		331.7	329.0	
L 48+85	157 LT	0574	0575		336.1	335.8	
RPB 19+94	34 RT	0577		334.7			
		0577	0502		332.0	330.0	
L 60+60	40 LT	0579		375.5			
		0579	0529		367.6	367.2	
L 57+66	52 LT	0581		372.4			
		0581	0527		366.6	366.5	0.3
Y 111+73	80 RT	0582					
		0582	0854		332.2	329.6	
Y 110+27	99 RT	0583		335.2			
		0583	0584		332.5	331.9	
Y 110+38	80 RT	0584		336.0			
		0584	0585		328.8	327.9	0.3
Y 107+93	88 RT	0585		333.6			
		0585	0587		327.9	327.5	0.4
LPC 12+44	14 LT	0587		332.7			
		0587	0588		327.5	325.9	0.9
Y 106+65	90 RT	0588		331.6			
		0588	0589		325.9	324.6	0.7
Y 105+14	83 RT	0589		329.3			
Y 105+06	87 RT	0590					
		0589	0590		324.6	324.5	0.9
L 64+52	52 LT	0601		377.3			
		0601	0536		371.3	370.2	0.8
L 64+49	10 RT	0602		380.0			
		0602	0601		376.8	374.3	
L 65+75	37 LT	0603		377.8			
		0603	0601		371.9	371.3	0.4
L 65+75	2 LT	0604		380.2			
		0604	0603		375.8	374.8	
L 65+76	55 LT	0605		375.5			
		0605	0603		372.0	371.9	0.3
L 66+55	78 LT	0606		377.1			
		0606	0605		374.1	372.0	
Y1 12+04	3 RT	0607		377.6			
Y1 12+05	38 LT	0608		376.8	373.4		
Y1 12+34	1 LT	0609		377.2			

FROM	TO	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 15 (.064)	C. S. PIPE 24 (.064)	R. C. PIPE CLASS III 12	15	18	24	42	48	R. C. PIPE CLASS IV 12	15	18	24	R. C. PIPE CLASS V 12	15	18	24	30	36	42
0564	0563																															52
0565	0563													20																		
0567	0563			148																												
0568	0567		92						X																							
0569	0568		164																													
0570	0567																											132				
0571	0572				72																											
0574	0575				116																											
0577	0502																										84					
0579	0529																								128							
0581	0527																								16							
0582	0854																										136					
0583	0584																										20					
0584	0585																												244			
0585	0587																		104													
0587	0588																												48			
0588	0589																		148													
0589	0590																		8													
0601	0536																						148									
0602	0601																										60					
0603	0601																										120					
0604	0603																										32					
0605	0603		20																													
0606	0605		80																													
SHEET TOTALS			356	148	188									20					260				148		144		452	132	292			52

FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES 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	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16
0564					1	2.1		1			1				
0565															
0567					1										
0568					1										
0569					1			1			1				
0570															
0577					1										
0579					1	2.9		1		1					
0581					1	0.8		1		1					
0582															
0583					1										
0584					1	2.2									
0585					1	0.7									
0587					1	0.2		1	1						
0588					1	0.7									
0589					1										
0590															
0601					1	1.0		1		1					
0602					1							1		1	1
0603					1	0.9		1		1					
0604					1							1		1	1
0605					1										
0606					1			1	1						
0607					1							1			
0608					1			1			1				
0609					1							1			
SHEET TOTALS					22	11.5		9	2	4	3	4		2	2

FROM	TO	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. (W.S. FLAT) FRAME W/ 2 GRATE STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	STEEL GRATE AND FRAME STD. 840.37	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	NARROW DI W/ FRAME & GRATE 840D13 SEE PSH 2C	JB STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	METHOD FOR PLACEMENT OF DI IN ISLANDS 852D03	15" SIDE DRAIN PIPE ELBOWS	18" SIDE DRAIN PIPE ELBOWS	24" CS PIPE ELBOW .064 THICK	MEDIA FILTER BASIN CONTROL STRUCTURE	4" CONCRETE PAVED DITCH, S.Y.	PREFORMED SCOUR HOLE (PER EACH)	15" CS PIPE ELBOW .064 THICK	18" CS PIPE ELBOW .064 THICK	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
0565	0563																							2						
0567			1			1																								
0568			1			1																								
0568	0567																	2												
0570	0567																													MATCH INVERTS AT OUTLET BOX
0571	0572																				1									SEE SHEET 2D-5 AND 2D-6
0574	0575																				1									SEE SHEET 2D-3 AND 2D-4
0577			1			1																								
0582																											0.3990			
0583					1							1																		
0584											1					1														
0585									1				1																	SEE SPECIAL DETAL SHEET 2C-5
0585	0587																									17				
0588		1				1																								
0589		1				1																								
0590																											0.5526			
0605			1					1																						
0607														1			1													STRUCTURE APRONS INCLUDED IN THE PAY ITEM OF CON. TRAN. SEC. FOR DI
0608																														MATCH INVERTS NOT CROWNS
0609														1			1													STRUCTURE APRONS INCLUDED IN THE PAY ITEM OF CON. TRAN. SEC. FOR DI
SHEET TOTALS		2	4		1	5		1	1		1	1	1	2		1	2	2			2			2		17	0.9516			

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

NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)

RAL-WS061

COMPUTED BY: Anne D. Gamber DATE: 5/23/2017

CHECKED BY: B. MAY, R.ODELL DATE:

PROJECT NO.	SHEET NO.
I-5506	3D-5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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	To	Top Elevation Ft.	Invert Elevation Ft.	Invert Elevation Ft.	Minimum Required Slope %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	42	48	Do Not Use RCP	Do Not Use CSP	Do Not Use CAAP	Do Not Use HDPE	Do Not Use PVC
		0609	0607		374.2	372.9													
Y1 12+34	39 LT	0610		376.6															
		0610	0608		373.6	373.4													
Y 76+50	109 LT	0801																	
		0801	0802		306.1	304.9				32									
Y 76+40	80 LT	0802		310.2															
Y 81+73	140 LT	0803																	
Y 81+65	121 LT	0804																	
		0803	0804		282.6	282.6								16					
Y 86+18	103 LT	0806		314.6															
		0806	0805		307.9	307.0						84							
Y 86+22	87 LT	0807		314.3															
		0807	0806		308.9	308.8	0.3			20									
Y 89+00	103 LT	0901		316.9															
		0901	0806		312.1	309.9					280								
Y 92+20	99 LT	0902		319.1															
		0902	0901		313.4	312.1					320								
		0903	0904		332.8	319.3				44					X				
RPB 14+70	44 LT	0904		321.5															
		0904	0905		319.3	319.1	0.4												
Y 96+64	87 LT	0905		325.6															
Y 98+50	110 LT	0906		321.8															
		0906	0905		319.7	319.1				188									
		0501	0502		345.4	330.0			44						X				
RPB 19+60	44 LT	0502		332.8															
		0502	0907		330.0	323.8			184										
RPB 17+70	44 LT	0907		325.7															
		0907	0908		323.5	323.3													
RPB 17+70	34 RT	0908		328.1															
		0908	0909		323.3	321.4				56									
RPB 17+64	91 RT	0909		324.5															
Y 100+30	91 LT	0910		325.6															
		0910	0909		322.9	321.4			56										
RPB 12+84	44 LT	0911		319.7															
		0911	0902		316.9	314.2			272										
RPA 16+05	42 LT	1001		336.6															
		1001	0555		333.8	332.9			156										
SHEET TOTALS									712	340	600	84		16					
PROJECT TOTALS									1928	560	992	84	180	16					

Line & Station	From	To	C. S. Pipe 15 (.064)	C. S. Pipe 24 (.064)	R. C. Pipe Class III 12	15	18	24	42	48	R. C. Pipe Class IV 12	15	18	24	R. C. Pipe Class V 12	15	18	24	30	36	42	Endwalls Std. 838.01 or Std. 838.11 (Unless Noted Otherwise) CY	Reinforced Endwalls CY	Drainage Structure Masonry CY
	0609	0607				32																		
Y1 12+34	0610																							
	0610	0608				28																		
Y 76+50	0801																							
	0801	0802																						
Y 76+40	0802																							
Y 81+73	0803																					4.900		
Y 81+65	0804																							
	0803	0804																						
Y 86+18	0806																							
	0806	0805																						
Y 86+22	0807																							
	0807	0806																						
Y 89+00	0901																							
	0901	0806																						
Y 92+20	0902																							
	0902	0901																						
	0903	0904																						
RPB 14+70	0904																							
	0904	0905															60							
Y 96+64	0905																							
Y 98+50	0906																							
	0906	0905																						
	0501	0502																						
RPB 19+60	0502																							
	0502	0907																						
RPB 17+70	0907																							
	0907	0908															76							
RPB 17+70	0908																							
	0908	0909																						
RPB 17+64	0909																							
Y 100+30	0910																							
	0910	0909																						
RPB 12+84	0911																							
	0911	0902																						
RPA 16+05	1001																							
	1001	0555																						
SHEET TOTALS						60											136					4.900		
PROJECT TOTALS			160	84		140		324	52			2212	232	556		2056	600	604	248		52	9.400		

Line & Station	From	To	Quantities for Drainage Structures (Note: Total Lin. Ft. for Pay Quantity shall be A + (1.3 X B)) 0' thru 5' EACH	5' thru 10' (A) LIN. FT.	10' and above (B) 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	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. (W.S. Flat) Frame W/ 2 Grate Std. 840.20	G.D.I. (W.S. Sag) Frame W/ 2 Grates Std. 840.22	G.D.I. (N.S. Sag) Frame W/ Grate Std. 840.24	G.D.I. (N.S. Sag) Frame W/ 2 Grates Std. 840.24
	0609	0607																		
Y1 12+34	0610		1			1	1													
	0610	0608																		
Y 76+50	0801																			
	0801	0802																		
Y 76+40	0802		1	0.3																
Y 81+73	0803																			
Y 81+65	0804																			
	0803	0804																		
Y 86+18	0806		1	1.7										1				1		
	0806	0805																		
Y 86+22	0807		1	0.4																
	0807	0806																		
Y 89+00	0901		1											1				1		
	0901	0806																		
Y 92+20	0902		1	0.7										1				1		
	0902	0901																		
	0903	0904																		
RPB 14+70	0904		1													1		1		
	0904	0905																		
Y 96+64	0905		1	1.5																
Y 98+50	0906		1													1		1		
	0906	0905																		
	0501	0502																		
RPB 19+60	0502		1												1			1		
	0502	0907																		
RPB 17+70	0907		1													1		1		
	0907	0908																		
RPB 17+70	0908		1												1			1		
	0908	0909																		
RPB 17+64	0909		1												1			1		
Y 100+30	0910		1												1			1		
	0910	0909																		
RPB 12+84	0911		1												1			1		
	0911	0902																		
RPA 16+05	1001		1												1			1		
	1001	0555																		
SHEET TOTALS			16	4.6		1	1							3	6	3		12		
PROJECT TOTALS			109	39.8		52	4	26	22	13	1	11	11	8	18	8	1	30		4

Line & Station	From	To	Steel Grate and Frame Std. 840.37	G.D.I. (N.S. Flat) Frame W/ 2 Grates Std. 840.29	T.B.J.B. Std. 840.34	T.B.D.I. Std. 840.35	T.B.D.I. for Steel Grates Std. 840.36	Narrow DI W/ Frame & Grate 840D13 See PSH 2C	JB Std. 840.31 or Std. 840.32	M.H. Frame and Cover Std. 840.54	Method for Placement of DI in Islands 852D03	15" Side Drain Pipe Elbows	18" Side Drain Pipe Elbows	24" CS Pipe Elbow .064 Thick	Media Filter Basin Control Structure	4" Concrete Paved Ditch, S.Y.	Preformed Scour Hole (Per Each)	15" CS Pipe Elbow .064 Thick	18" CS Pipe Elbow .064 Thick	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
	0609	0607																						
Y1 12+34	0610																							
	0610	0608																						
Y 76+50	0801																							
	0801	0802																						
Y 76+40	0802				1					1														
Y 81+73	0803																							
Y 81+65	0804																				1.0126			
	0803	0804																						
Y 86+18	0806																							
	0806	0805																						
Y 86+22	0807				1					1														
	0807	0806																						
Y 89+00	0901																							
	0901	0806																						
Y 92+20	0902																							
	0902	0901																					594	
	0903	0904											2			11								
RPB 14+70	0904																							
	0904	0905																						
Y 96+64	0905								1	1														
Y 98+50	0906																							
	0906	0905																						
	0501	0502										2				11								
RPB 19+60	0502																							
	0502	0907																						
RPB 17+70	0907																							
	0907	0908																						
RPB 17+70	0908																							
	0908	0909																					40	
RPB 17+64	0909																							
Y 100+30	0910																						133	
	0910	0909																					.	
RPB 12+84	0911																							
	0911	0902																						
RPA 16+05	1001																							
	1001	0555																						
SHEET TOTALS					2				1	3		2	2			22					1.0126		767	
PROJECT TOTALS			1		4	1	1	2	4	6	2	6	2	2	2	44	1	8		59	1.9642		2189	

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

COMPUTED BY: GEU DATE: Sep - 16
CHECKED BY: GEU DATE: Nov - 17

(2-20-18)

PROJECT NO.	SHEET NO.
I-5506	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
-L-	29+50	30+50	LT	UD	100
-L-	36+50	37+50	LT	UD	100
-LPB-	13+30	15+25	LT/CL	UD	400
-RPB-	12+34	22+50	LT	UD	1,050
CONTINGENCY				UD	500
				TOTAL LF:	2150

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION

LINE	Station	Station	Geotextile for Pavement Stabilization SY	Class IV Subgrade Stabilization TONS
-L-	47+50	49+00	1100	
-L-	52+25	54+75	1800	
-RPB-	22+00	26+50	1350	
-LPB-	15+00	19+28	1300	
-Y-	62+50	75+00	4000	
-Y-	79+50	83+00	1100	
CONTINGENCY				
		TOTAL SY/TONS:	10650	0*

*Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			AST	3				500	
CONTINGENCY			ASU	12	2500	5000	7500		
CONTINGENCY			ASU	12	1000	2000	4000	0	0
		TOTAL CY/TONS/SY:			3500	7000**	11500**	500	0

*ASU = Aggregate Subgrade
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

PROJ. REFERENCE NO.	SHEET NO.
I-5506	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
18	6	RALEIGH-DURHAM INTERNATIONAL
9	4	THE COUNTY OF WAKE
10	5,6,9	RALEIGH-DURHAM AIRPORT AUTHORITY
17	5	JMDH REAL ESTATE OF RALEIGH, LLC,
		A DELAWARE LIMITED LIABILITY COMPANY
19	5,6	RDU CENTER IV, LLC,
		A NORTH CAROLINA LIMITED LIABILITY COMPANY
20	5	WINN LIMITED PARTNERSHIP
21	4,5	CROWN-RALEIGH I, LLC,
		A DELAWARE LIMITED LIABILTY COMPANY
22	4	LARZ CARY LLC
23	5,10	IHP MORRISVILLE (NC) OWNER, LLC
25	4,5,10	RALEIGH-DURHAM INTERNATIONAL

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

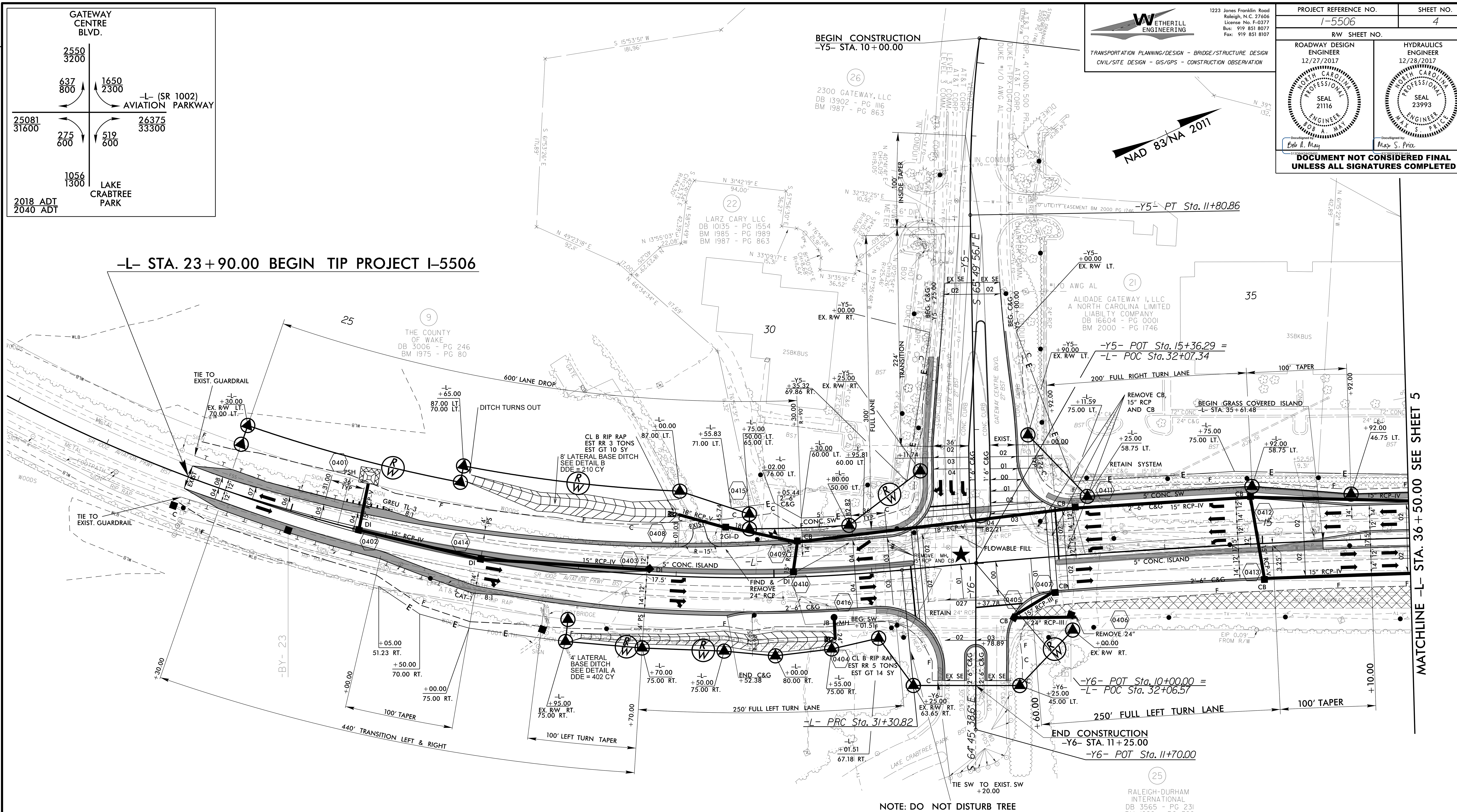
PROJECT REFERENCE NO.	SHEET NO.
I-5506	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER 12/27/2017	HYDRAULICS ENGINEER 12/28/2017

WETHERILL ENGINEERING
1223 Jones Franklin Road
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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY — Bob A. May
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23993 MAX S. PRICE — Max S. Price

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



-Y1- (GATEWAY CENTER BLVD.)
PI Sta 10+90.57
Δ = 7° 43' 21.7" (LT)
D = 4° 16' 12.0"
L = 180.86'
T = 90.57'
R = 1,341.82'
SE = EXIST. FT/FT
DS = 40 MPH

-L- (AVIATION PARKWAY)	
PI Sta 26+25.20	PI Sta 34+89.38
Δ = 37° 07' 16.9" (LT)	Δ = 5° 39' 45.6" (RT)
D = 3° 32' 12.4"	D = 0° 47' 25.0"
L = 1,049.58'	L = 716.53'
T = 543.95'	T = 358.56'
R = 1,620.00'	R = 7,250.00'
SE = 0.04 FT/FT	SE = NC
DS = 50 MPH	DS = 50 MPH

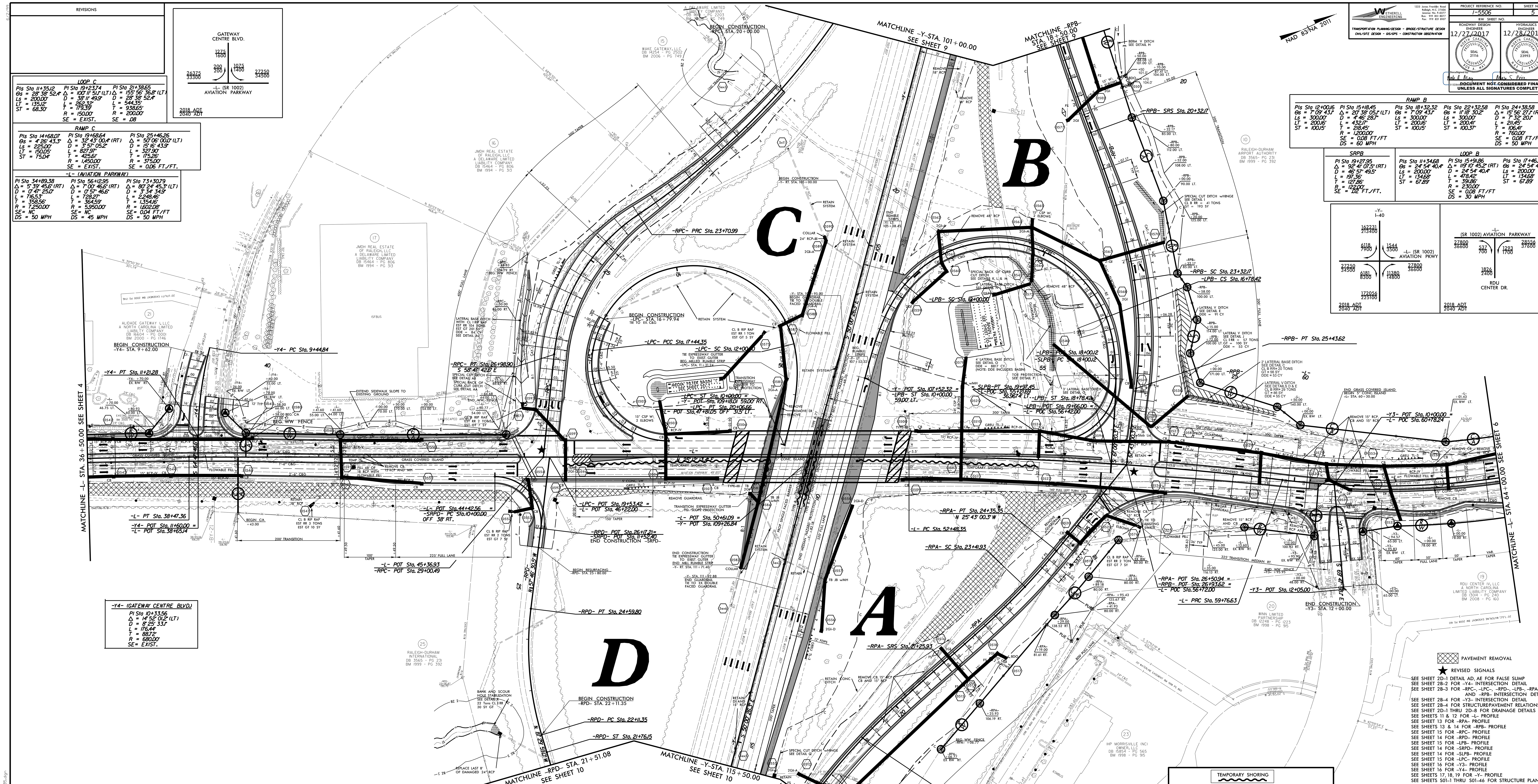
PAVEMENT REMOVAL

★ REVISED SIGNAL

SEE SHEET 2B-2 FOR -Y5- AND -Y6- INTERSECTION DETAILS
SEE SHEET 11 FOR -L- PROFILE
SEE SHEET 16 FOR -Y5- AND -Y6- PROFILES
SEE SHEET 2D-1 FOR DITCH DETAILS

8/17/99
11/30/2017 ...\I5506_Rdy_psh_04.dgn

REVISIONS



LOOP C

Pls Sta 11+35.12	PI Sta 19+23.74	PI Sta 21+38.65
θs = 28° 38′ 52.4″	Δ = 100° 11′ 51.1″ (LT)	Δ = 155° 56′ 36.8″ (LT)
Ls = 200.00′	D = 38° 11′ 49.9″	D = 28° 38′ 52.4″
LT = 135.12′	L = 262.32′	L = 544.35′
ST = 68.30′	T = 179.39′	T = 938.65′
	R = 150.00′	R = 200.00′
	SE = EXIST.	SE = .08

RAMP C

Pls Sta 14+68.07	PI Sta 19+68.64	PI Sta 25+46.26
θs = 4° 26′ 43.3″	Δ = 32° 43′ 00.4″ (RT)	Δ = 50° 06′ 00.0″ (LT)
Ls = 225.00′	D = 3° 57′ 05.2″	D = 15° 16′ 43.9″
LT = 150.05′	L = 827.97′	L = 327.90′
ST = 75.04′	T = 425.61′	T = 175.26′
	R = 1,450.00′	R = 375.00′
	SE = EXIST.	SE = 0.06 FT./FT.

-L- (AVIATION PARKWAY)

PI Sta 34+89.38	PI Sta 56+12.95	PI Sta 73+30.79
Δ = 5° 39′ 45.6″ (RT)	Δ = 7° 00′ 46.6″ (RT)	Δ = 80° 24′ 45.3″ (LT)
D = 0° 47′ 25.0″	D = 0° 57′ 46.6″	D = 3° 34′ 34.9″
L = 716.53′	L = 728.27′	L = 2,248.46′
T = 358.56′	T = 364.59′	T = 1,354.16′
R = 7,250.00′	R = 5,950.00′	R = 1,602.08′
SE = NC	SE = NC	SE = 0.04 FT/FT
DS = 50 MPH	DS = 45 MPH	DS = 50 MPH

-Y4- (GATEWAY CENTRE BLVD.)

PI Sta 10+33.56
Δ = 14° 52′ 01.2″ (LT)
D = 8° 25′ 33.1″
L = 176.44′
T = 88.72′
R = 680.00′
SE = EXIST.

RAMP B

Pls Sta 12+00.16	PI Sta 15+18.45	Pls Sta 18+32.32	Pls Sta 22+32.58	PI Sta 24+38.58
θs = 7° 09′ 43.1″	Δ = 20° 38′ 05.1″ (LT)	θs = 7° 09′ 43.1″	θs = 11° 18′ 30.2″	Δ = 15° 56′ 27.1″ (RT)
Ls = 300.00′	D = 4° 46′ 28.7″	Ls = 300.00′	Ls = 300.00′	D = 7° 32′ 20.1″
LT = 200.16′	L = 432.17′	LT = 200.16′	LT = 200.41′	L = 211.45′
ST = 100.15′	T = 218.45′	ST = 100.15′	ST = 100.37′	T = 106.41′
	R = 1,200.00′			R = 760.00′
	SE = 0.08 FT/FT			SE = 0.08 FT/FT
	DS = 60 MPH			DS = 50 MPH

SRPB

PI Sta 19+27.95
Δ = 92° 41′ 07.5″ (RT)
D = 46° 57′ 49.5″
L = 197.36′
T = 127.86′
R = 122.00′
SE = .02 FT./FT.

LOOP B

Pls Sta 11+34.68	PI Sta 15+91.86	Pls Sta 17+46.31
θs = 24° 54′ 40.4″	Δ = 119° 10′ 45.2″ (RT)	θs = 24° 54′ 40.4″
Ls = 200.00′	D = 24° 54′ 40.4″	Ls = 200.00′
LT = 134.68′	L = 478.42′	LT = 134.68′
ST = 67.89′	T = 391.86′	ST = 67.89′
	R = 230.00′	
	SE = 0.08 FT/FT	
	DS = 30 MPH	

RAMP D

Pls Sta 13+11.46	PI Sta 16+71.95	Pls Sta 20+26.19
θs = 4° 09′ 30.8″	Δ = 20° 52′ 31.1″ (LT)	θs = 4° 09′ 30.8″
Ls = 225.00′	D = 3° 41′ 47.4″	Ls = 225.00′
LT = 150.04′	L = 564.73′	LT = 150.04′
ST = 75.04′	T = 285.53′	ST = 75.04′
	R = 1,550.00′	
	SE = EXIST.	

RAMP D SPUR

PI Sta 11+01.76
Δ = 97° 01′ 16.2″ (RT)
D = 63° 39′ 43.1″
L = 152.40′
T = 101.76′
R = 90.00′
SE = .02

RAMP A

PI Sta 17+07.95	Pls Sta 19+81.99	Pls Sta 22+69.99	PI Sta 23+88.66
Δ = 19° 28′ 38.4″ (RT)	θs = 5° 09′ 23.8″	θs = 5° 09′ 23.8″	Δ = 4° 27′ 36.5″ (LT)
D = 4° 46′ 28.7″	Ls = 216.00′	Ls = 216.00′	D = 4° 46′ 28.7″
L = 407.93′	LT = 144.06′	LT = 144.06′	L = 93.41′
T = 205.95′	ST = 72.06′	ST = 72.06′	T = 46.73′
R = 1,200.00′			R = 1,200.00′
SE = 0.08 FT./FT.			SE = 0.06 FT./FT.
DS = 60 MPH			DS = 40 MPH

PAVEMENT REMOVAL

★ REVISED SIGNALS

SEE SHEET 2D-1 DETAIL AD, AE FOR FALSE SUMP
SEE SHEET 2B-2 FOR -Y4- INTERSECTION DETAIL
SEE SHEET 2B-3 FOR -RPC-, -LPC-, -RPD-, -LPB-, -RPA-, AND -RPB- INTERSECTION DETAILS
SEE SHEET 2B-4 FOR -Y3- INTERSECTION DETAIL
SEE SHEET 2B-4 FOR STRUCTURE/PAVEMENT RELATIONSHIP
SEE SHEET 2D-1 THRU 2D-8 FOR DRAINAGE DETAILS
SEE SHEETS 11 & 12 FOR -L- PROFILE
SEE SHEET 13 FOR -RPA- PROFILE
SEE SHEETS 13 & 14 FOR -RPB- PROFILE
SEE SHEET 15 FOR -RPC- PROFILE
SEE SHEET 14 FOR -RPD- PROFILE
SEE SHEET 15 FOR -LPB- PROFILE
SEE SHEET 14 FOR -SRPD- PROFILE
SEE SHEET 14 FOR -SLPB- PROFILE
SEE SHEET 15 FOR -LPC- PROFILE
SEE SHEET 16 FOR -Y3- PROFILE
SEE SHEET 16 FOR -Y4- PROFILE
SEE SHEETS 17, 18, 19 FOR -Y- PROFILE
SEE SHEETS S01-1 THRU S01-46 FOR STRUCTURE PLANS

TEMPORARY SHORING

-L- STA. 48+50+/- OFF 8.3′ RT TO STA. 48+98+/- OFF 7′ RT
-L- STA. 48+98+/- OFF 7′ RT TO STA. 49+73+/- OFF 7′ RT
-L- STA. 48+98+/- OFF 7′ RT TO STA. 49+23+/- OFF 7′ RT
-L- STA. 51+45+/- OFF 7′ RT TO STA. 52+38+/- OFF 7′ RT
-L- STA. 52+14+/- OFF 7′ RT TO STA. 52+38+/- OFF 7′ RT
-L- STA. 52+38+/- OFF 7′ RT TO STA. 53+50+/- OFF 10.7′ RT
-L- STA. 45+74+/- OFF 15.6′ RT TO STA. 48+50+/- OFF 8.3′ RT
-L- STA. 53+50+/- OFF 10.7′ RT TO STA. 55+00+/- OFF 12.6′ RT
-Y- STA. 109+25+/- OFF 6.3′ LT TO STA. 110+25+/- OFF 6.3′ LT
-Y- STA. 109+25+/- OFF 6.2′ RT TO STA. 110+25+/- OFF 6.2′ RT
-Y- STA. 109+50+/- OFF 79.2′ RT TO STA. 110+36+/- OFF 79.2′ RT

GRAPHIC SCALE
50 25 0 50 100
PLANS

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

PROJECT REFERENCE NO.: I-5506
SHEET NO.: 5
R/W SHEET NO.

ROADWAY DESIGN ENGINEER 12/27/2017 — NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY — DocuSigned by: Bob A. May
HYDRAULICS ENGINEER 12/28/2017 — NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER MAX S. PRICE — DocuSigned by: Max S. Price

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION: INTERCHANGE - I-40 AND SR 1002 (AVIATION PARKWAY)
TIP NO.: I-5506 COUNTY: WAKE
DESIGNED BY: B.A.M.
CHECKED BY: E.G.W. DATE:

PROJECT REFERENCE NO.	SHEET NO.
I-5506	6
R/W SHEET NO.	

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

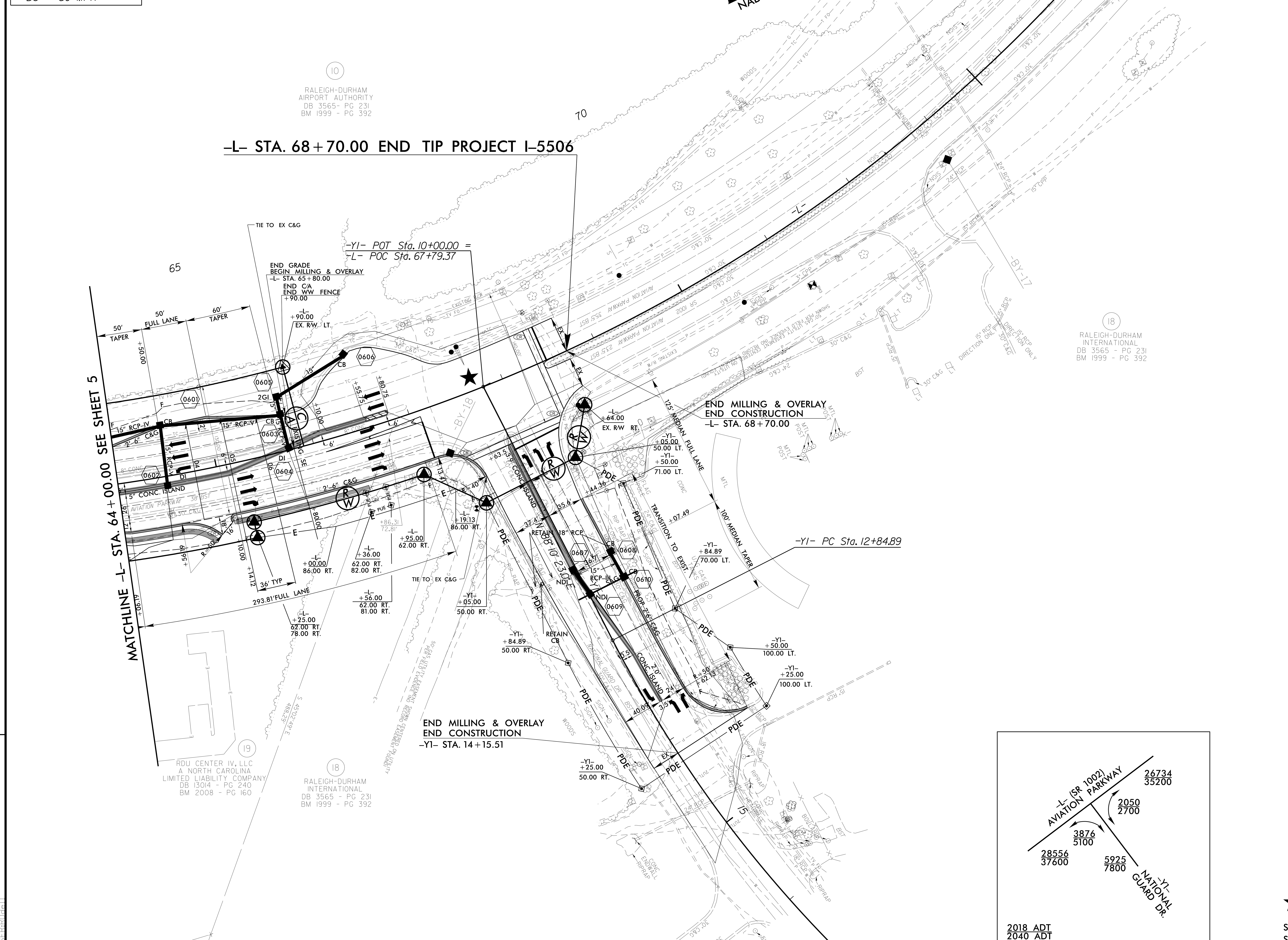
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY — 12/27/2017

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23993 MAX S. PRICE — 12/28/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L- (AVIATION PARKWAY)	-Y1- (NATIONAL GUARD DR.)
PI Sta 73+30.79	PI Sta 15+38.84
Δ = 80° 24' 45.3" (LT)	Δ = 23° 14' 21.4" (LT)
D = 3° 34' 34.9"	D = 4° 38' 21.6"
L = 2,248.46'	L = 500.92'
T = 1,354.16'	T = 253.95'
R = 1,602.08'	R = 1,235.00'
SE = 0.04 FT/FT	SE = EXIST.
DS = 50 MPH	

REVISIONS



-L- (SR 1002) AVIATION PARKWAY
-Y1- NATIONAL GUARD DR.

26734	35200
2050	2700
3876	5100
28556	37600
5925	7800

2018 ADT
2040 ADT

★ REVISED SIGNAL

SEE SHEET 12 FOR -L- PROFILE
SEE SHEET 19 FOR -Y1- PROFILE

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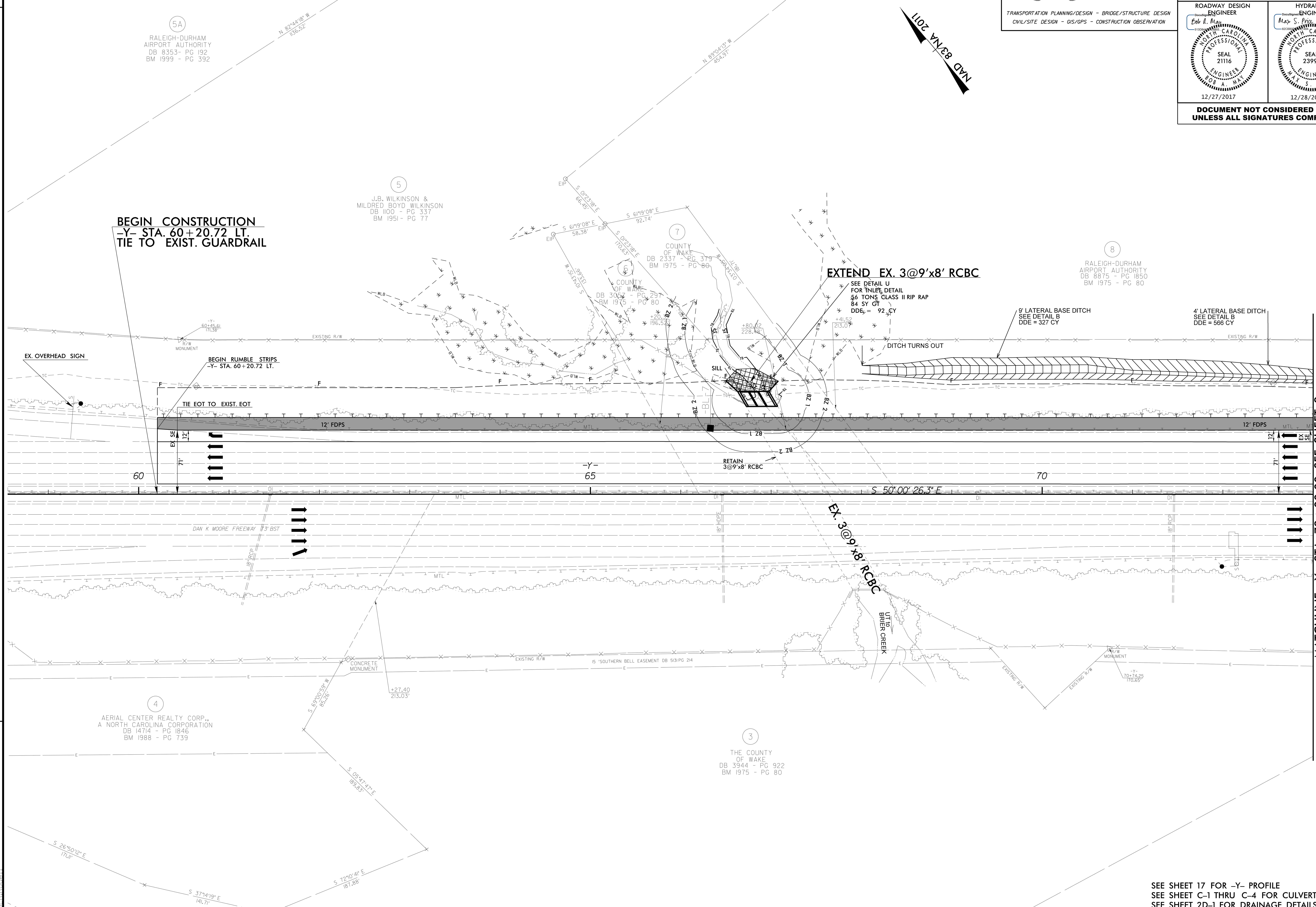
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
I-5506	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Bob A. May	Max S. Price
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY	NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER MAX S. PRICE
12/27/2017	12/28/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



SEE SHEET 17 FOR -Y- PROFILE
SEE SHEET C-1 THRU C-4 FOR CULVERT PLANS
SEE SHEET 2D-1 FOR DRAINAGE DETAILS

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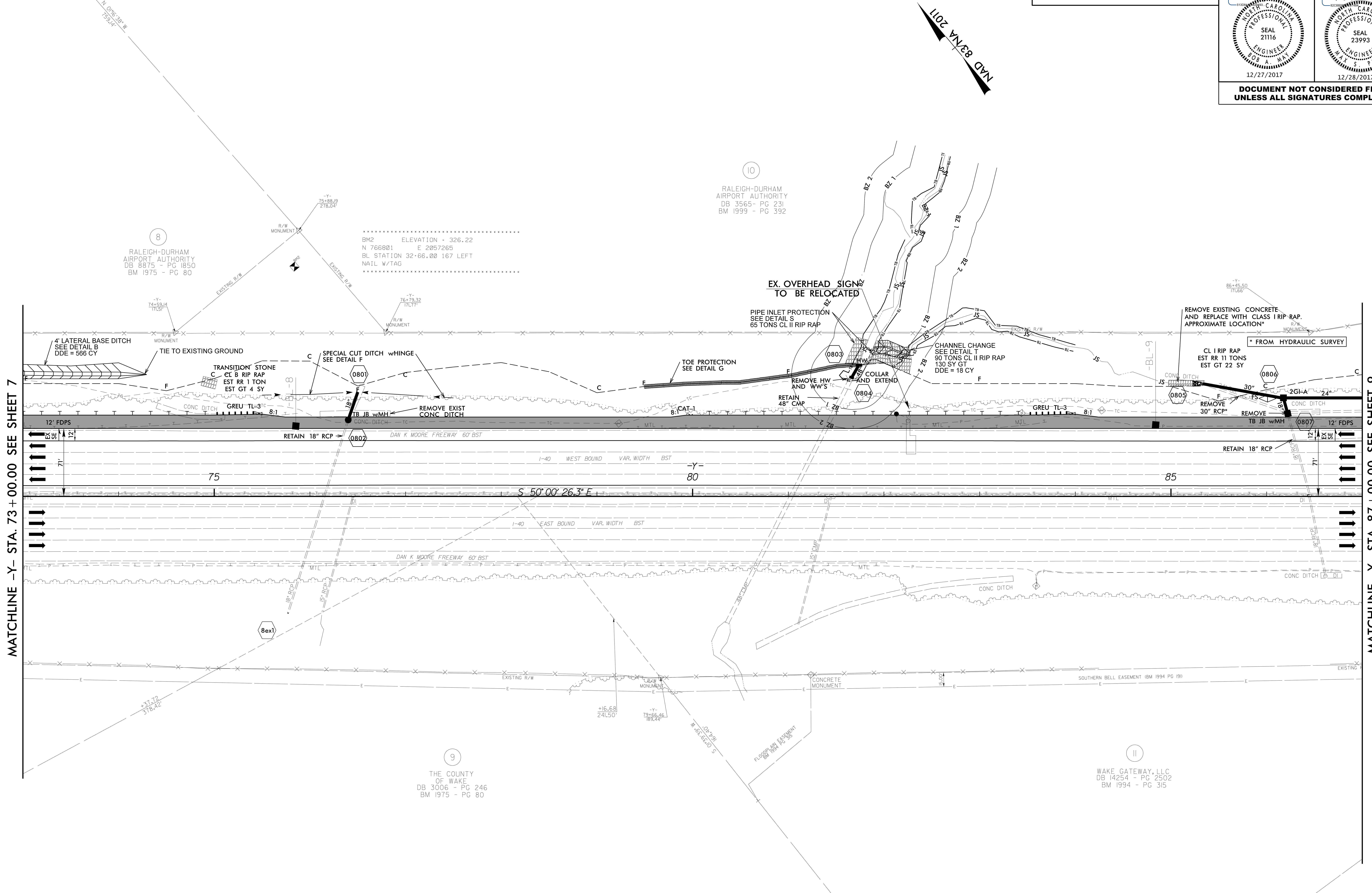
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
I-5506	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY 12/27/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23993 MAX S. PRICE 12/28/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

8/17/99


NAD 83/NA 2011
RALEIGH-DURHAM AIRPORT AUTHORITY DB 8875 - PG 1850 BM 1975 - PG 80
BM2 ELEVATION = 326.22
N 766801 E 2057265
BL STATION 32+66.00 167 LEFT
NAIL W/TAG
RALEIGH-DURHAM AIRPORT AUTHORITY DB 3565- PG 231 BM 1999 - PG 392
EX. OVERHEAD SIGN TO BE RELOCATED
PIPE INLET PROTECTION SEE DETAIL S 65 TONS CL II RIP RAP
CHANNEL CHANGE SEE DETAIL T 90 TONS CL II RIP RAP 130 SY GT DDE = 18 CY
REMOVE EXISTING CONCRETE AND REPLACE WITH CLASS I RIP RAP. APPROXIMATE LOCATION*
* FROM HYDRAULIC SURVEY
CL I RIP RAP EST RR 11 TONS EST GT 22 SY
4' LATERAL BASE DITCH SEE DETAIL B DDE = 566 CY
TIE TO EXISTING GROUND
SPECIAL CUT DITCH wHINGE SEE DETAIL F
TRANSITION STONE CL B RIP RAP EST RR 1 TON EST GT 4 SY
TOE PROTECTION SEE DETAIL G
REMOVE HW AND WW'S
COLLAR AND EXTEND
RETAIN 48" CMP
GREU TL-3
TB JB wMH
REMOVE EXIST CONC DITCH
RETAIN 18" RCP
12' FDPS
REMOVE 30" RCP*
2GI-A
24"
30"
RETAIN 18" RCP
0801
0802
0803
0804
0805
0806
0807
8ex1
CAT-1
DAN K MOORE FREEWAY 60' BST
I-40 WEST BOUND VAR. WIDTH BST
I-40 EAST BOUND VAR. WIDTH BST
-Y-
75
80
85
S 50°00' 26.3" E
CONC DITCH
CONCRETE MONUMENT
SOUTHERN BELL EASEMENT (BM 1994 PG 191)
FLOODPLAIN EASEMENT
THE COUNTY OF WAKE DB 3006 - PG 246 BM 1975 - PG 80
WAKE GATEWAY, LLC DB 14254 - PG 2502 BM 1994 - PG 315
-BL-9
MATCHLINE -Y- STA. 73+00.00 SEE SHEET 7
MATCHLINE -Y- STA. 87+00.00 SEE SHEET 9

SEE SHEET 2D-1 DETAIL AE FOR FALSE SUMP
SEE SHEET 17 FOR -Y- PROFILE
SEE SHEET 2D-1 FOR DRAINAGE DETAILS

12/8/2017

8/17/99

REVISIONS

RAMP B

PIs Sta 12+00.16	PI Sta 15+18.45	PIs Sta 18+32.32	PIs Sta 22+32.58	PI Sta 24+38.58
θs = 7° 09' 43.1"	Δ = 20° 38' 05.1" (LT)	θs = 7° 09' 43.1"	θs = 11° 18' 30.2"	Δ = 15° 56' 27.1" (RT)
Ls = 300.00'	D = 4° 46' 28.7"	Ls = 300.00'	Ls = 300.00'	D = 7° 32' 20.1"
LT = 200.16'	L = 432.17'	LT = 200.16'	LT = 200.41'	L = 211.45'
ST = 100.15'	T = 218.45'	ST = 100.15'	ST = 100.37'	T = 106.41'
	R = 1,200.00'			R = 760.00'
	SE = 0.08 FT/FT			SE = 0.08 FT/FT
	DS = 60 MPH			DS = 50 MPH

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CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
I-5506	9

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — SEAL 21116 — BOB A. MAY — 12/27/2017

HYDRAULICS ENGINEER — SEAL 23993 — MAX S. PRICE — 12/28/2017

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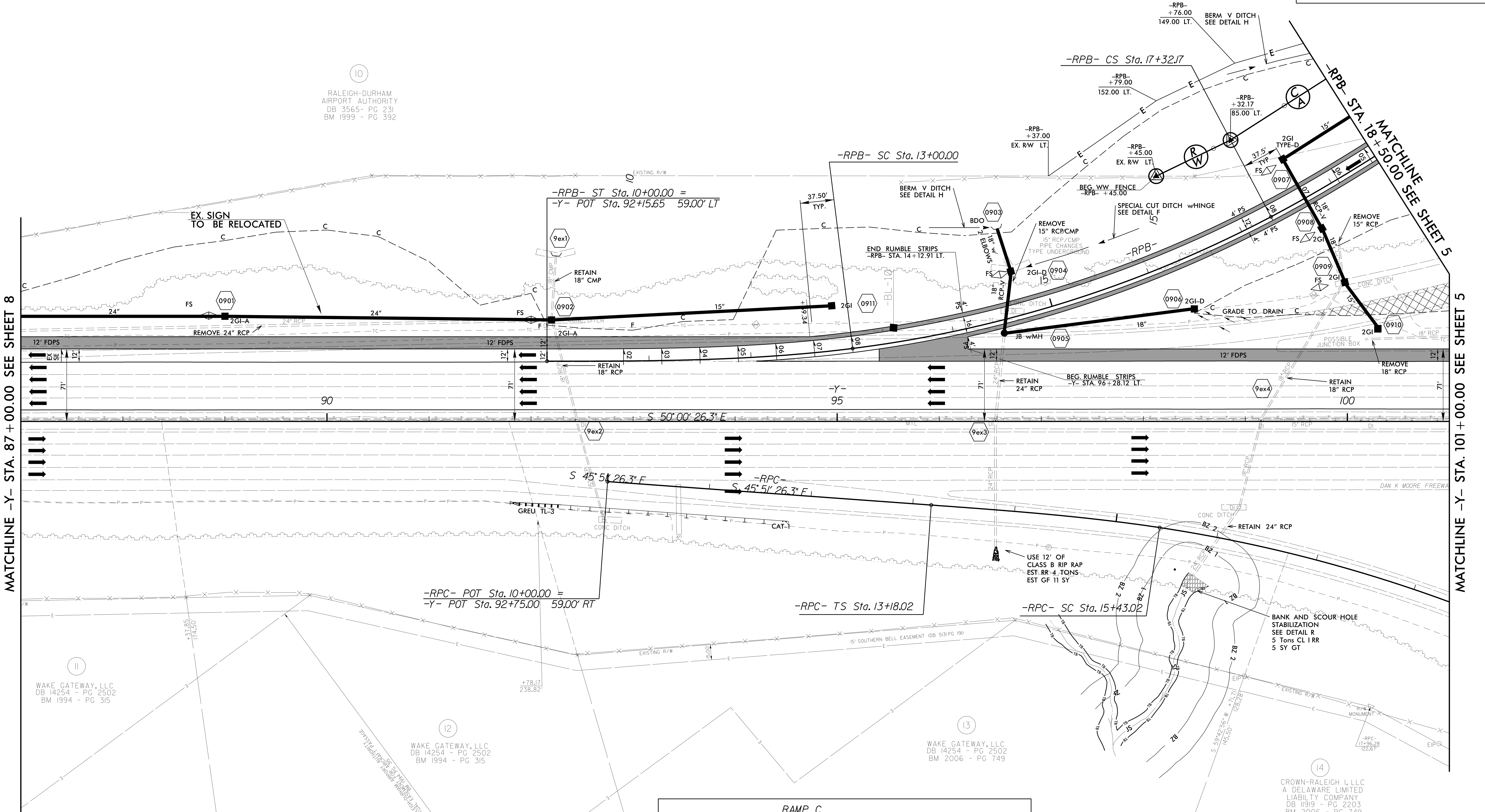
NAD 83/NA 2011
MATCHLINE -Y- STA. 87+00.00 SEE SHEET 8
MATCHLINE -Y- STA. 101+00.00 SEE SHEET 5
-RPB- STA. 18+50.00 MATCHLINE SEE SHEET 5
RALEIGH-DURHAM AIRPORT AUTHORITY
DB 3565- PG 231
BM 1999 - PG 392
EX. SIGN TO BE RELOCATED
-RPB- ST Sta. 10+00.00 =
-Y- POT Sta. 92+15.65 59.00' LT
-RPB- SC Sta. 13+00.00
-RPB- CS Sta. 17+32.17
BERM V DITCH SEE DETAIL H
SPECIAL CUT DITCH w/HINGE SEE DETAIL F
END RUMBLE STRIPS -RPB- STA. 14+12.91 LT.
BEG. RUMBLE STRIPS -Y- STA. 96+28.12 LT.
BEG. WW FENCE -RPB- +45.00
REMOVE 15" RCP/CMP
REMOVE 24" RCP
REMOVE 15" RCP
REMOVE 18" RCP
RETAIN 18" CMP
RETAIN 18" RCP
RETAIN 24" RCP
GRADE TO DRAIN
JB w/MH
12' FDPS
S 50° 00' 26.3" E
-Y-
S 45° 51' 26.3" E
-RPC-
GREU TL-3
CAT-1
-RPC- POT Sta. 10+00.00 =
-Y- POT Sta. 92+75.00 59.00' RT
-RPC- TS Sta. 13+18.02
-RPC- SC Sta. 15+43.02
USE 12' OF CLASS B RIP RAP
EST RR 4 TONS
EST GF 11 SY
BANK AND SCOUR HOLE STABILIZATION
SEE DETAIL R
5 Tons CL I RR
5 SY GT
WAKE GATEWAY, LLC
DB 14254 - PG 2502
BM 1994 - PG 315
WAKE GATEWAY, LLC
DB 14254 - PG 2502
BM 1994 - PG 315
WAKE GATEWAY, LLC
DB 14254 - PG 2502
BM 2006 - PG 749
CROWN-RALEIGH I, LLC
A DELAWARE LIMITED
LIABILITY COMPANY
DB 11919 - PG 2203
BM 2006 - PG 749
DAN K MOORE FREEWAY

RAMP C

PIs Sta 14+68.07	PI Sta 19+68.64	PI Sta 25+46.26
θs = 4° 26' 43.3"	Δ = 32° 43' 00.4" (RT)	Δ = 50° 06' 00.0" (LT)
Ls = 225.00'	D = 3° 57' 05.2"	D = 15° 16' 43.9"
LT = 150.05'	L = 827.97'	L = 327.90'
ST = 75.04'	T = 425.61'	T = 175.26'
	R = 1,450.00'	R = 375.00'
	SE = EXIST.	SE = 0.06 FT./FT.

PAVEMENT REMOVAL

SEE SHEET 2D-1 DETAIL AE FOR FALSE SUMP
SEE SHEET 2D-1 FOR DRAINAGE DETAILS
SEE SHEET 18 FOR -Y- PROFILE
SEE SHEET 13 & 14 FOR -RPB- PROFILE

12/20/2017
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PROJECT REFERENCE NO.	SHEET NO.
I-5506	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER 12/27/2017 SEAL 21116 Bob A. May	HYDRAULICS ENGINEER 12/28/2017 SEAL 23993 Max S. Price

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REVISIONS

8/17/99

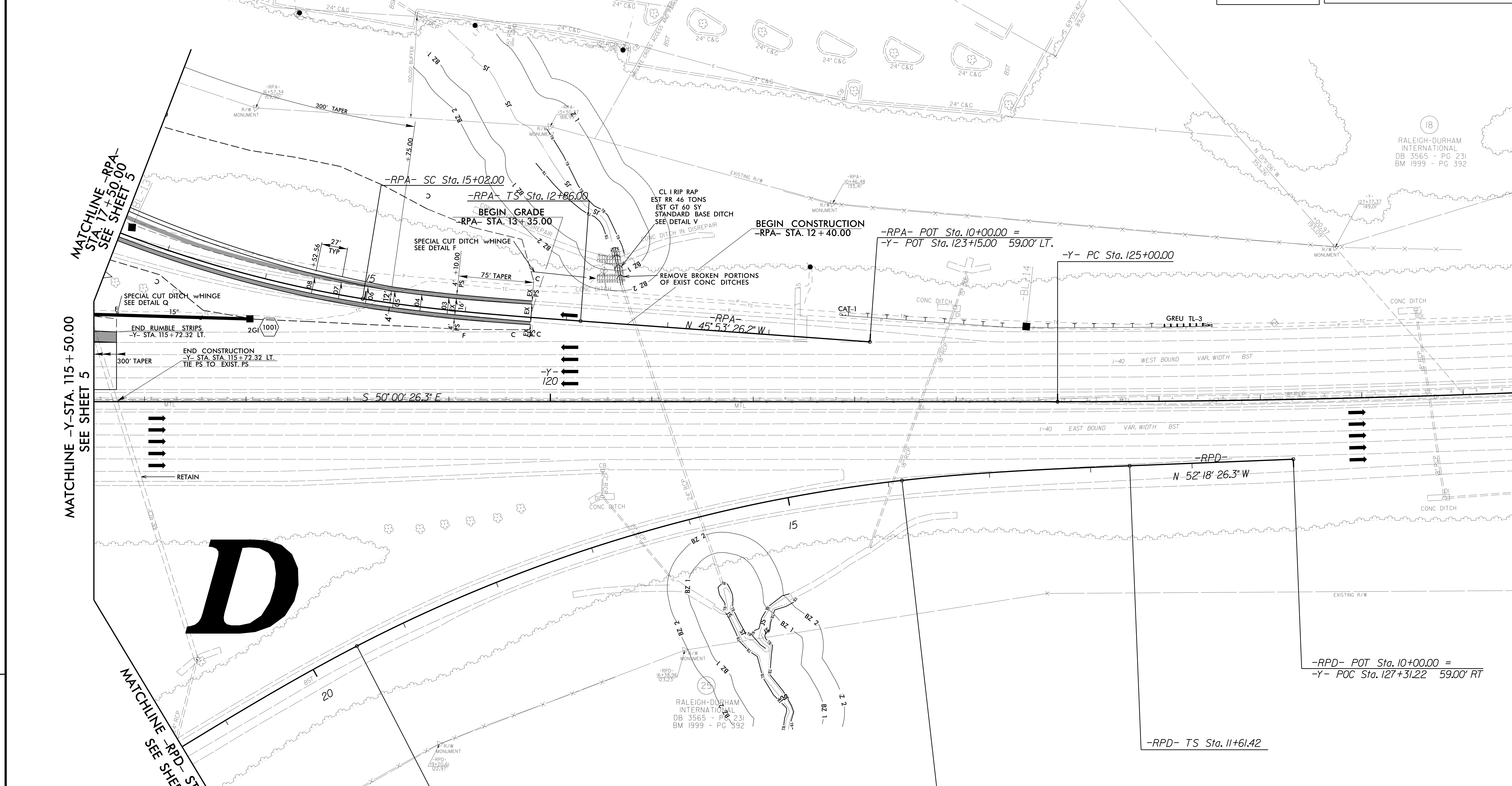
RAMP A

PIs Sta 14+30.06	PI Sta 17+07.95
Θs = 5° 09' 23.8"	Δ = 19° 28' 38.4" (RT)
Ls = 216.00'	D = 4° 46' 28.7"
LT = 144.06'	L = 407.93'
ST = 72.06'	T = 205.95'
	R = 1,200.00'
	SE = 0.08 FT./FT.
	DS = 60 MPH

NAD 83/NA 2011

-Y- (I-40)

PI Sta 131+44.25
Δ = 6° 24' 06.4" (LT)
D = 0° 29' 50.5"
L = 1,287.15'
T = 644.25'
R = 11,520.00'
SE = EXIST.

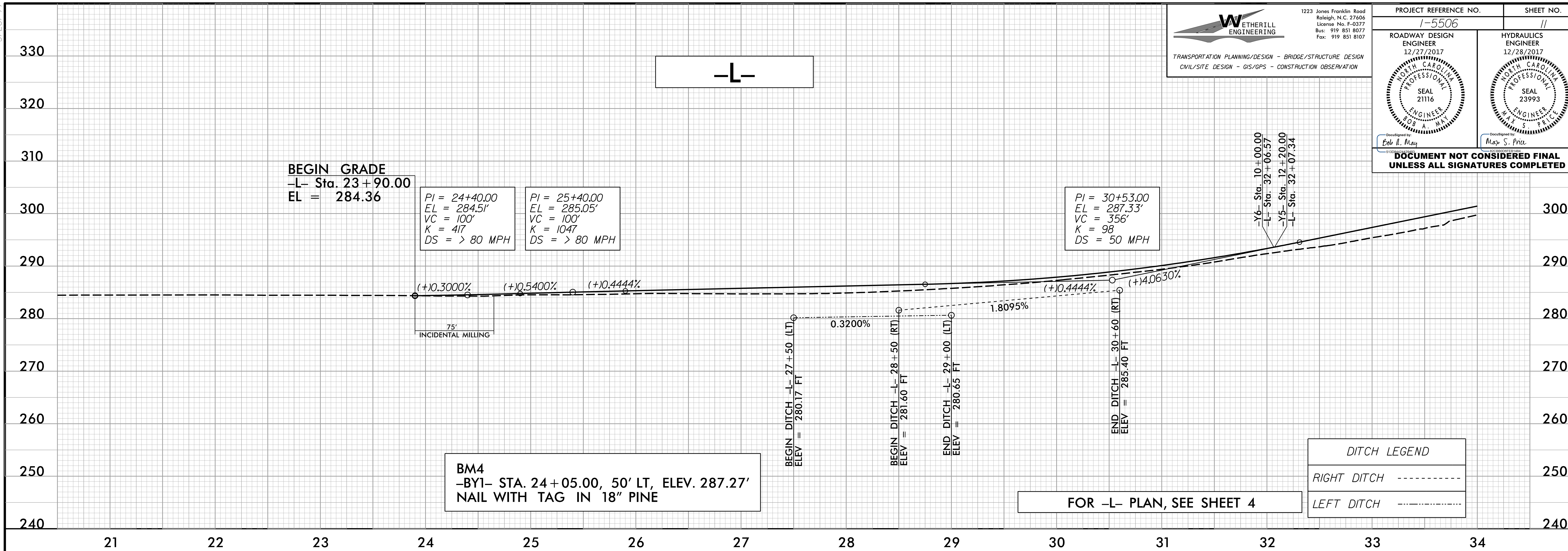


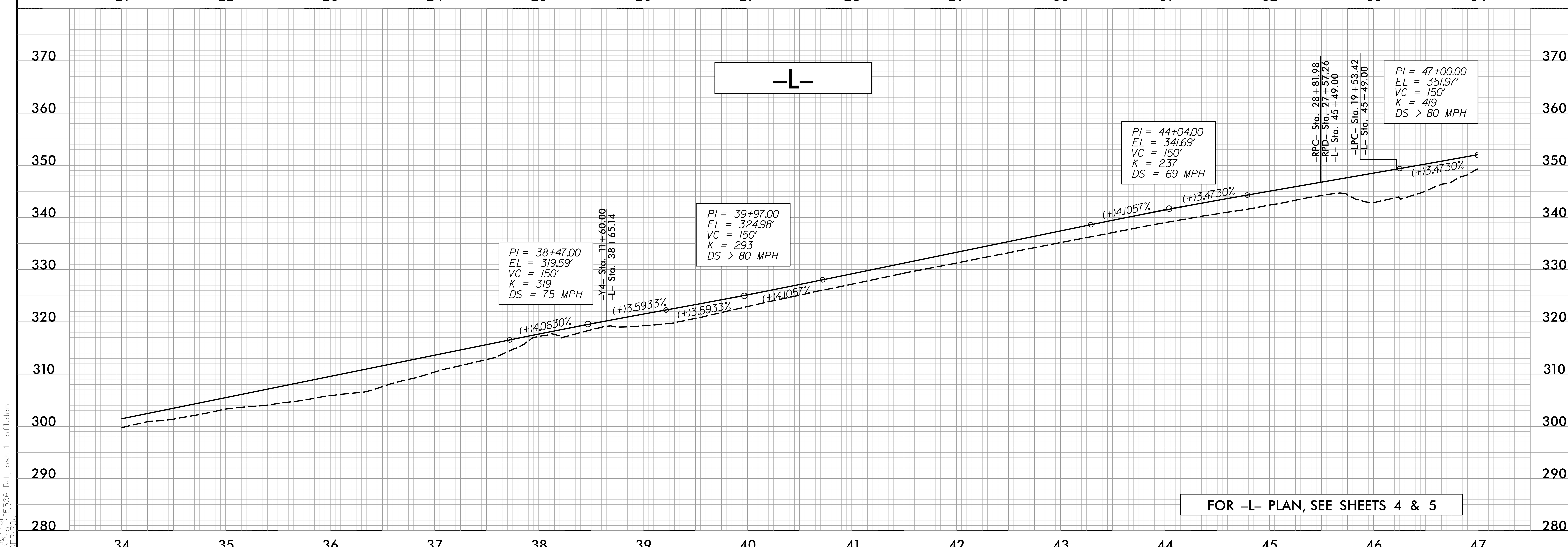
RAMP D

PIs Sta 13+11.46	PI Sta 16+71.95	PIs Sta 20+26.19
Θs = 4° 09' 30.8"	Δ = 20° 52' 31.1" (LT)	Θs = 4° 09' 30.8"
Ls = 225.00'	D = 3° 41' 47.4"	Ls = 225.00'
LT = 150.04'	L = 564.73'	LT = 150.04'
ST = 75.04'	T = 285.53'	ST = 75.04'
	R = 1,550.00'	
	SE = EXIST.	

SEE SHEET 2D-1 FOR DRAINAGE DETAILS
SEE SHEET 13 FOR -RPA- PROFILE
SEE SHEETS 18, 19 FOR -Y- PROFILE

11/30/2017





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PROJECT REFERENCE NO.	SHEET NO.
I-5506	12

ROADWAY DESIGN ENGINEER 12/27/2017 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY — Bob A. May

HYDRAULICS ENGINEER 12/28/2017 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23993 MAX S. PRICE — Max S. Price

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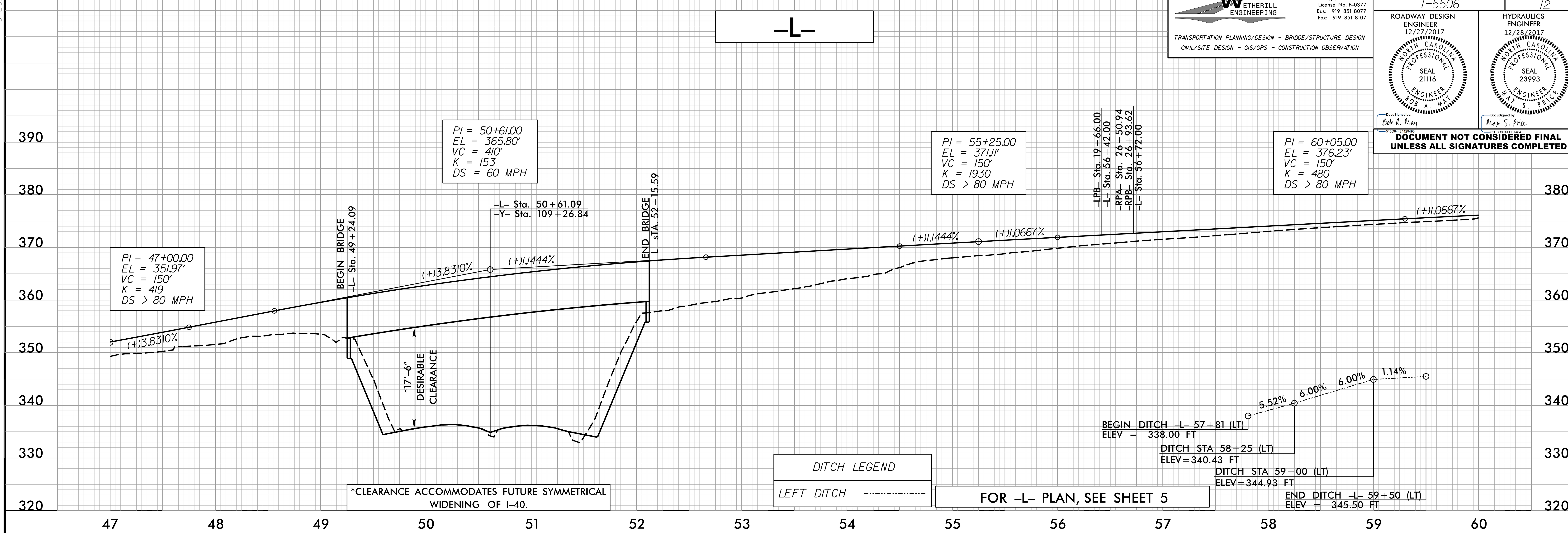

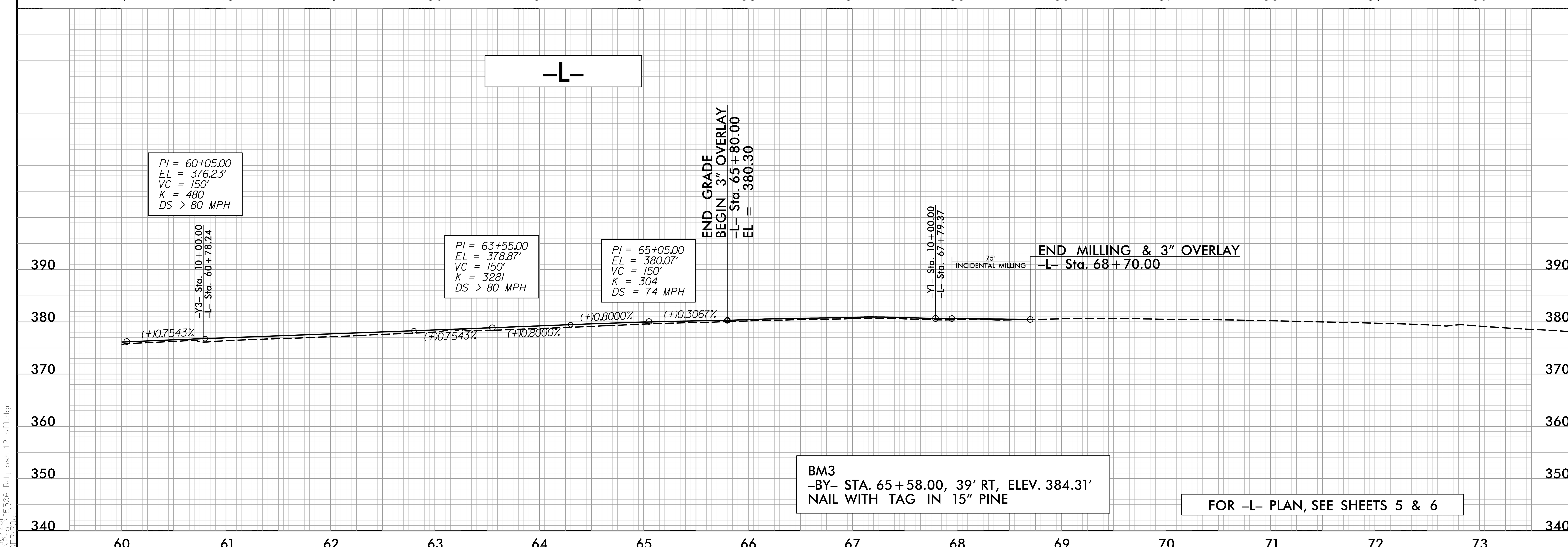

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5/28/99

DITCH LEGEND	
RIGHT DITCH	----------

BEGIN GRADE
–RPA– Sta. 13+35.00
EL = 338.63

PI = 14+10.00
EL = 339.05'
VC = 150'
K = 153
DS = 64 MPH

(+)0.5600%
75'
INCIDENTAL MILLING
(+)1.5419%
1.0000%

BEGIN DITCH –RPA– 12+72 (RT)
ELEV = 333.70 FT

END DITCH –RPA– 13+50 (RT)
ELEV = 334.48 FT

–RPA–

PI = 16+13.00
EL = 342.18'
VC = 150'
K = 190
DS = 72 MPH

PI = 18+30.00
EL = 347.24'
VC = 284'
K = 136
DS = 60 MPH

PI = 21+40.00
EL = 360.92'
VC = 320'
K = 152
DS = 60 MPH

(+)1.5419%
(+)2.3318%
(+)2.3318%
(+)4.4129%
(+)4.4129%
(+)2.3071%
(+)2.3071%
(+)2.2517%

–RPA– Sta. 26+50.94
–L– Sta. 56+72.00
EL = 372.68

END GRADE
–RPA– Sta. 25+97.12
EL = 371.47'

FOR –RPA– PLAN, SEE SHEETS 5 & 10

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PROJECT REFERENCE NO.	SHEET NO.
I-5506	13

ROADWAY DESIGN ENGINEER
Bob R. Mary
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY
12/27/2017

HYDRAULICS ENGINEER
Mary S. Price
NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER MARY S. PRICE
12/28/2017

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–RPB–

BEGIN GRADE
–RPB– Sta. 10+00.00
EL = 323.10

PI = 11+45.00
EL = 324.26'
VC = 156'
K = 312
DS = 75 MPH

(+)0.8000%
(+)0.3000%
0.31%
(+)0.3000%
(+)4.1000%
(–)1.20%

BEGIN DITCH –RPB– 14+70 (LT)
ELEV = 321.50 FT

END DITCH –RPB– 16+02 (LT)
ELEV = 321.91 FT

PI = 16+95.00
EL = 325.91'
VC = 600'
K = 158
DS = 65 MPH

BEGIN DITCH –RPB– STA 21+50 (LT)
ELEV = 341.98 FT

END DITCH –RPB– STA 22+73 (LT)
ELEV = 340.50 FT

DITCH LEGEND	
LEFT DITCH	·-·-·-·-·

BM2
–BL– STA. 32+66.00, 167' LT, ELEV. 326.22'
NAIL WITH TAG

FOR –RPB– PLAN, SEE SHEETS 5 & 9

11/30/2017
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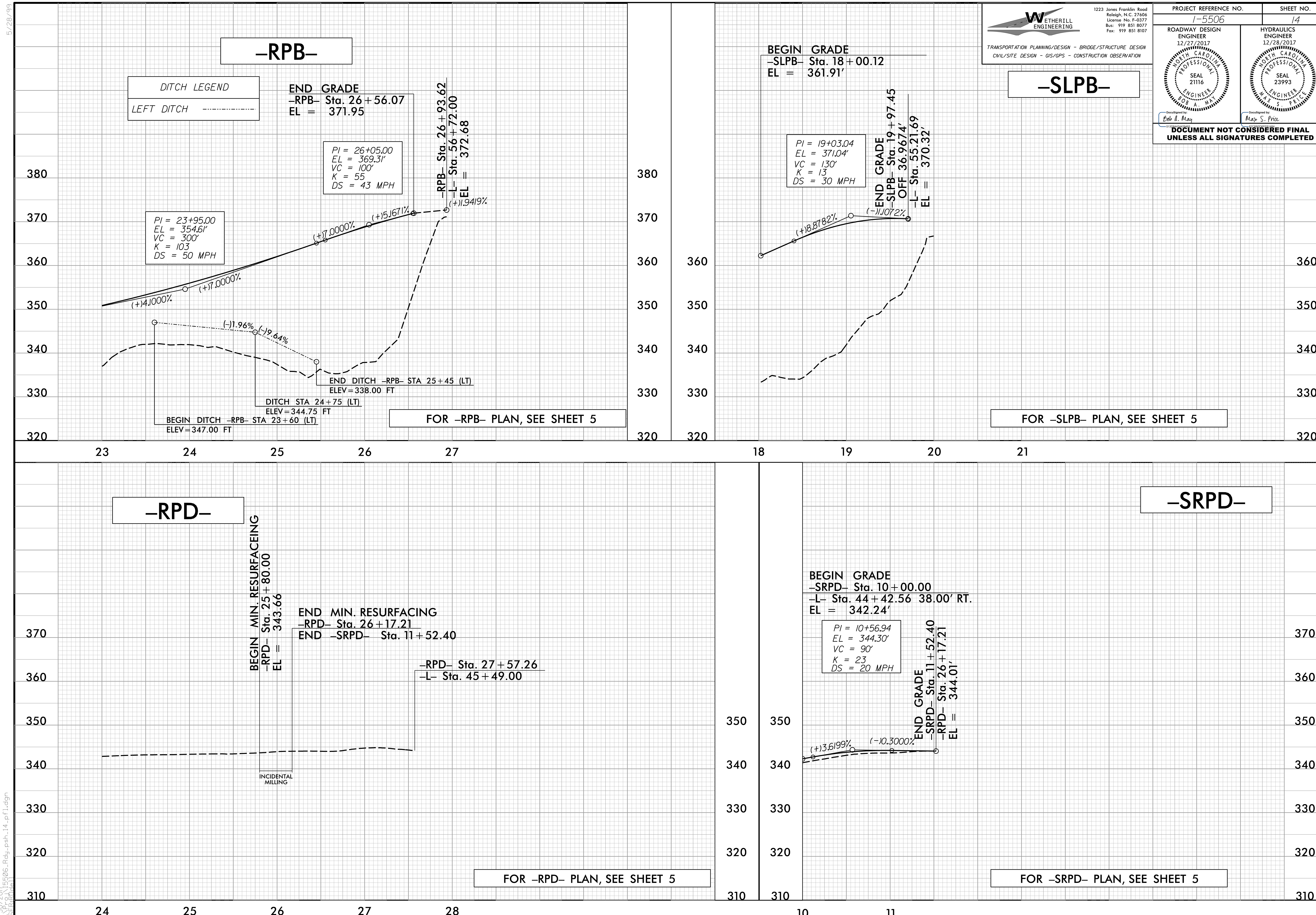

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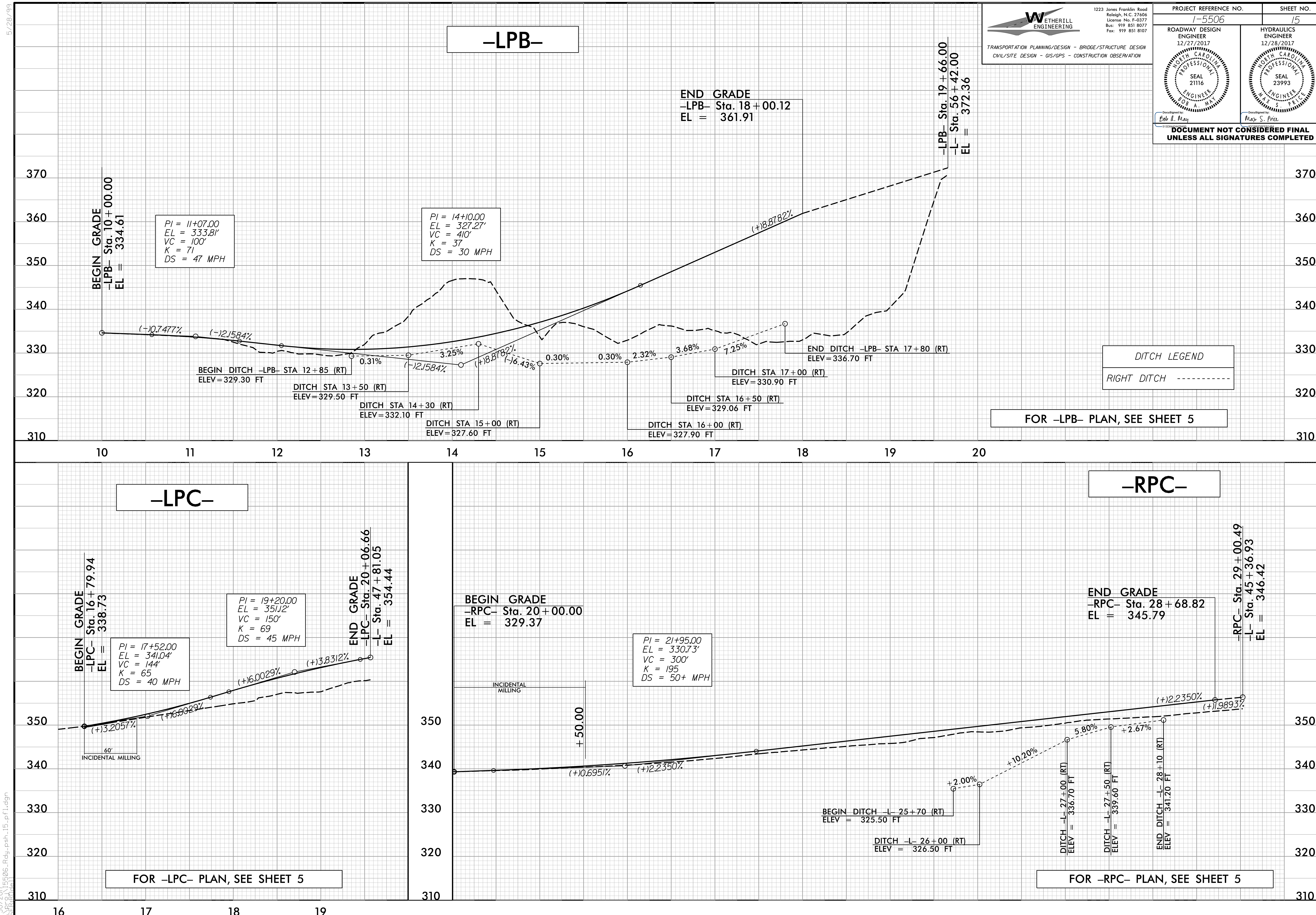

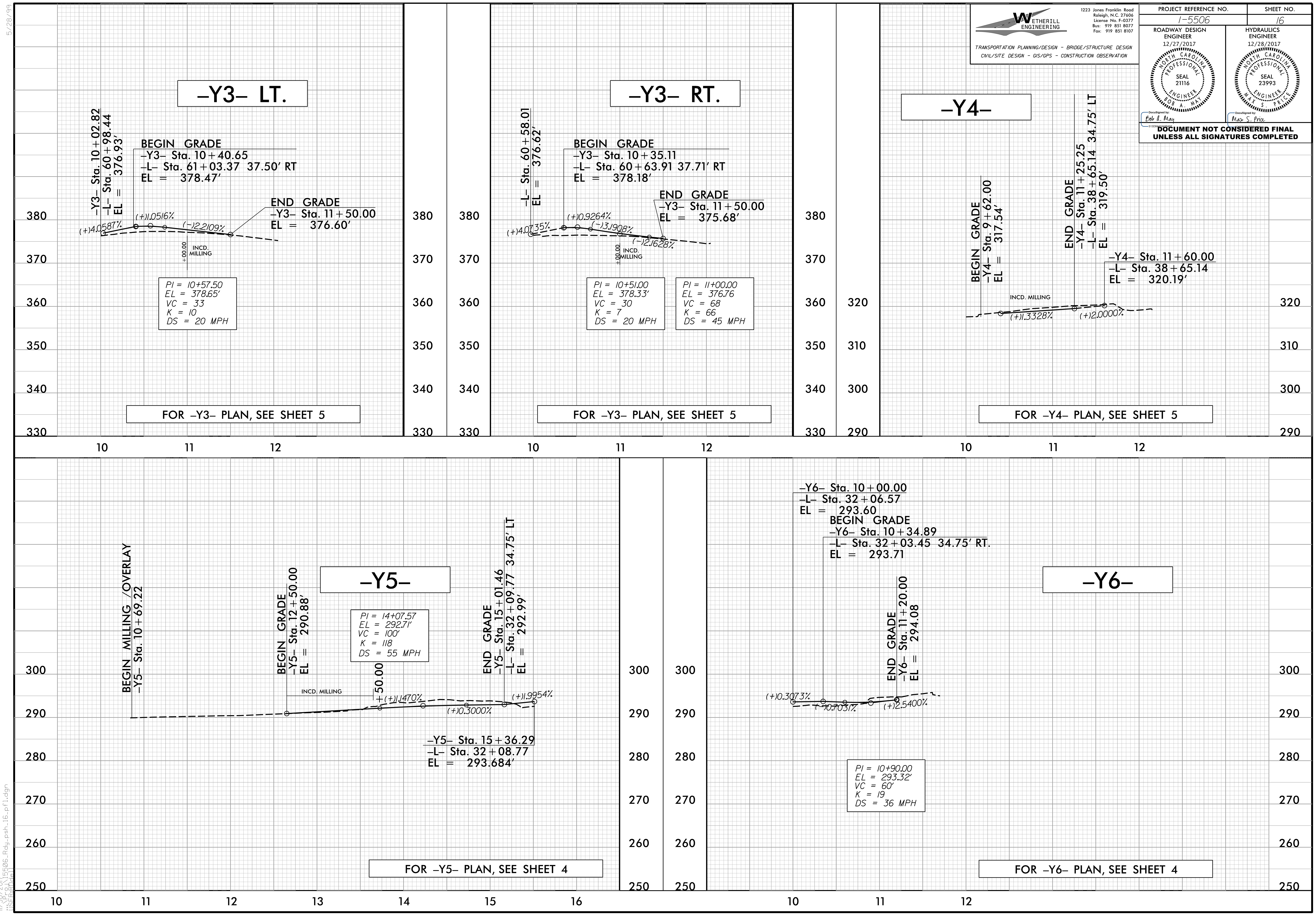

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PROJECT REFERENCE NO.	SHEET NO.
I-5506	17

ROADWAY DESIGN ENGINEER 12/27/2017 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY — DocuSigned by: Bob A. May 513D84424429493...

HYDRAULICS ENGINEER 12/28/2017 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23993 MAX S. PRICE — DocuSigned by: Max S. Price 82CBB0D6FEB1484...

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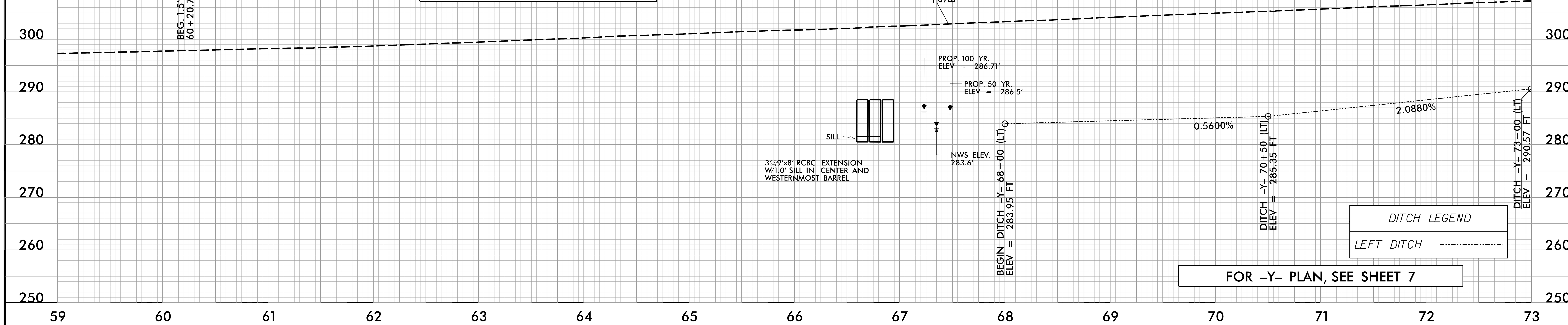
-Y-

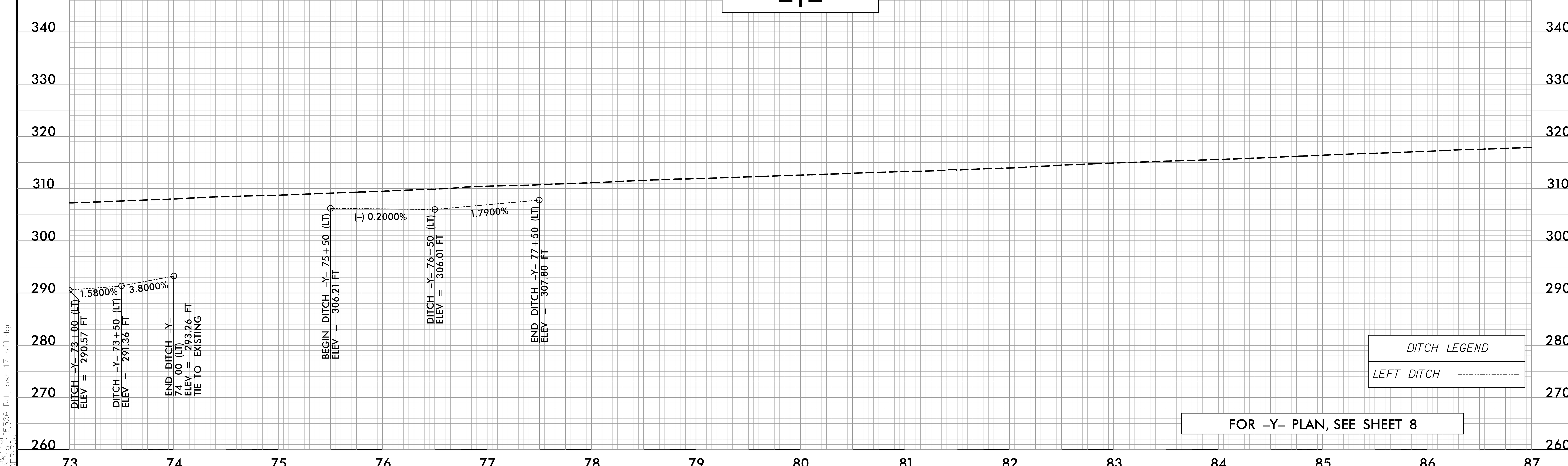
CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 600	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 286.5	FT
BASE DISCHARGE	= 650	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 286.71	FT
OVERTOPPING DISCHARGE	= 550	CFS
OVERTOPPING FREQUENCY	= 50-	YRS
OVERTOPPING ELEVATION	= 286.3	FT



BM2
-BL- STA. 32+66.00, 167' LT, ELEV. 326.22'
NAIL WITH TAG

-Y-



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PROJECT REFERENCE NO.	SHEET NO.
I-5506	18

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
12/27/2017	12/28/2017
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY	NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER MAX S. PRICE
DocuSigned by: Bob A. May 513D84424429493...	DocuSigned by: Max S. Price 82CBB0D6FEB1484...

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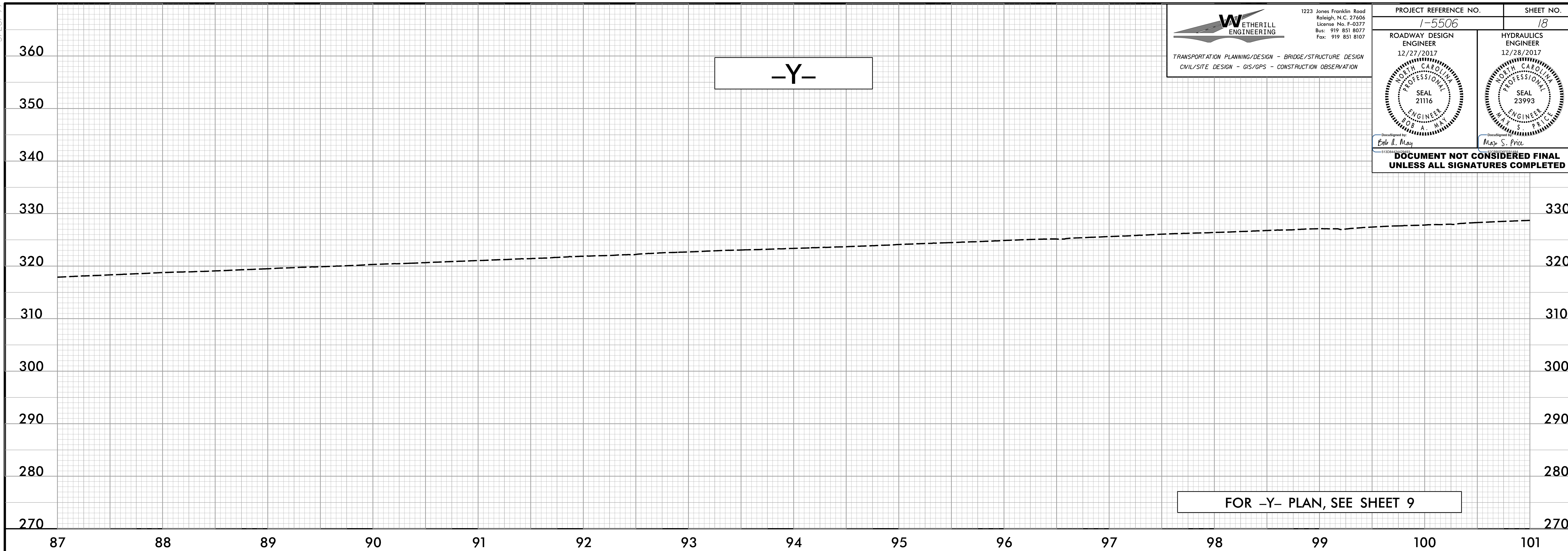

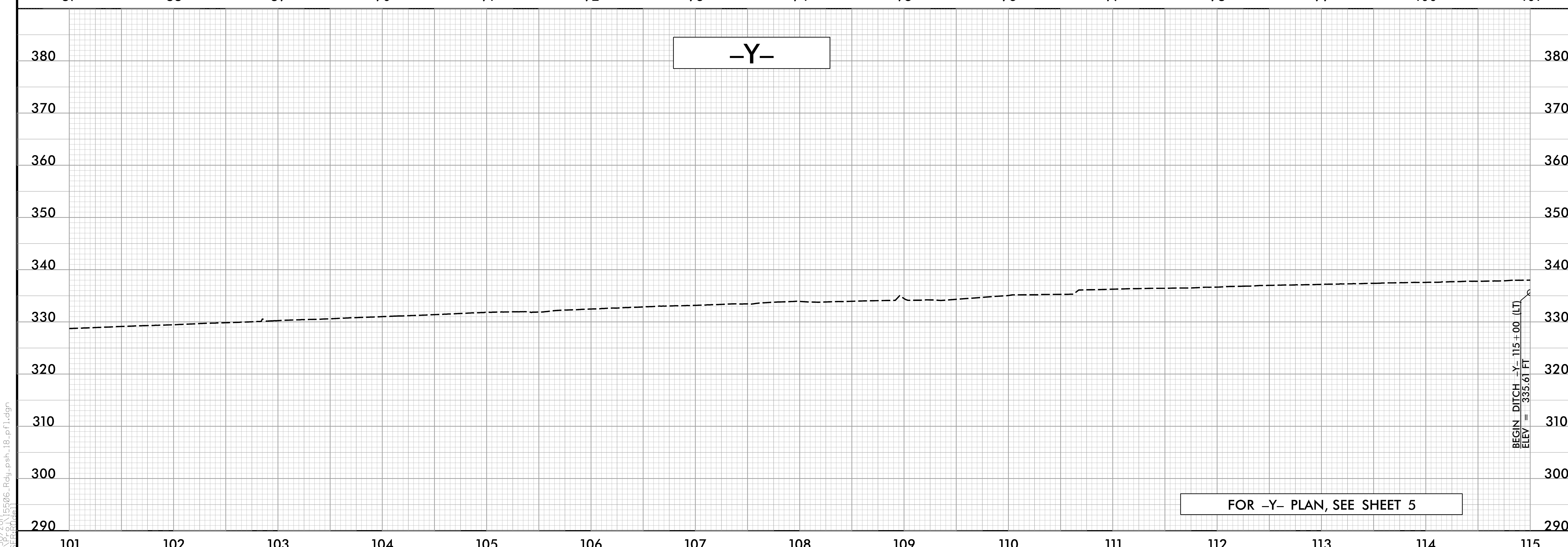

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11/30/2017 ...\I5506_Rdy_psh_18_pf1.dgn

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PROJECT REFERENCE NO.	SHEET NO.
I-5506	19

ROADWAY DESIGN ENGINEER
DocuSigned by: Bob A. May
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY
12/27/2017

HYDRAULICS ENGINEER
DocuSigned by: Max S. Price
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23993 MAX S. PRICE
12/28/2017

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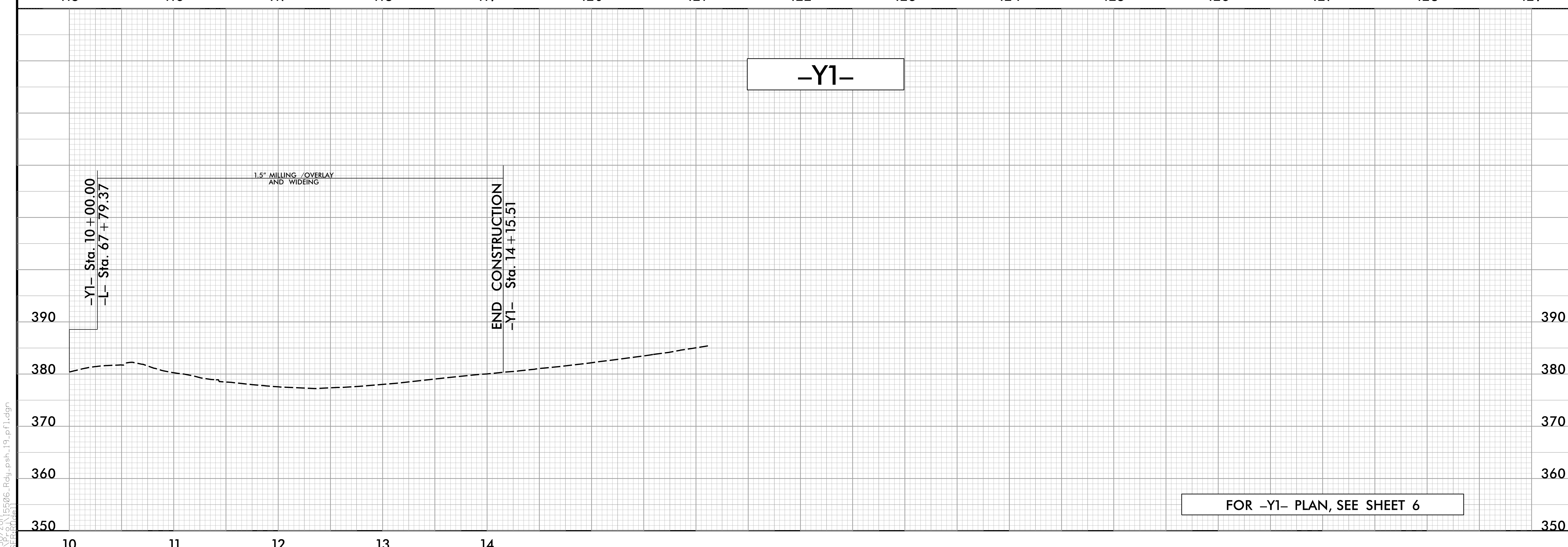
–Y–

FOR –Y– PLAN, SEE SHEET 10

–Y1–



FOR –Y1– PLAN, SEE SHEET 6