

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

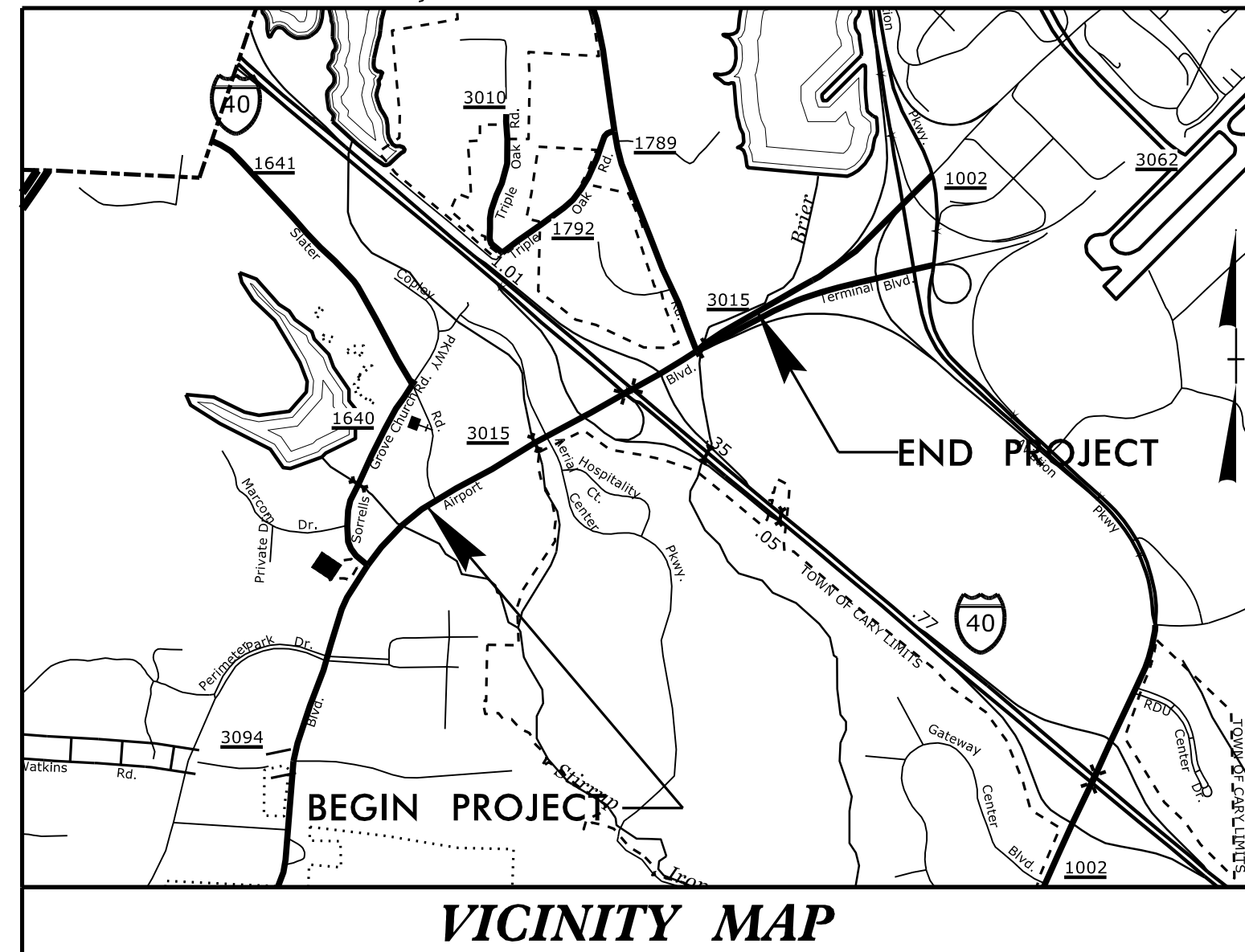
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

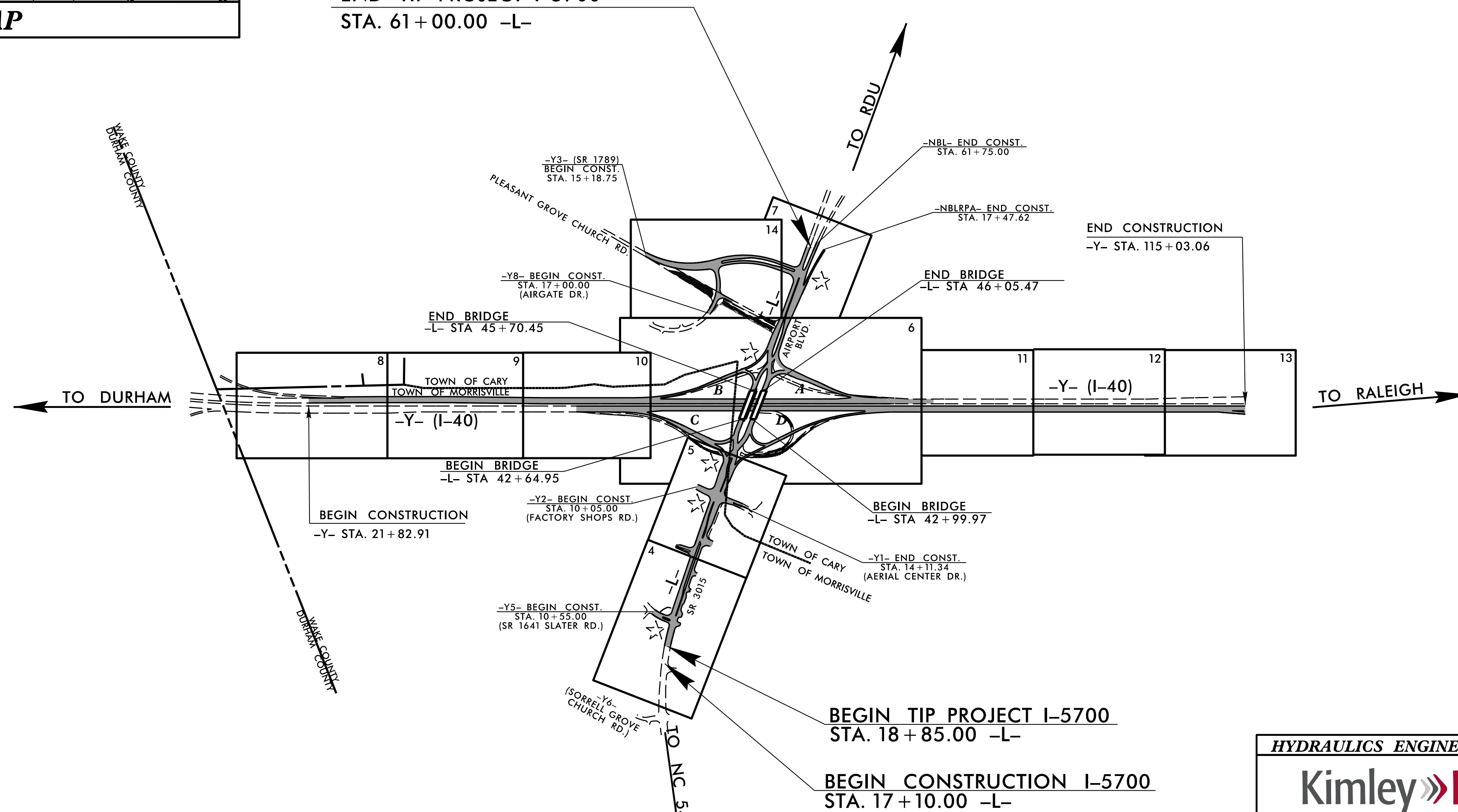
**LOCATION: I-40 AND SR 3015 (AIRPORT BLVD.), REVISE INTERCHANGE
AND CONSTRUCT AUXILIARY LANE ON I-40 WESTBOUND
FROM SR 3015 (AIRPORT BLVD.) TO I-540.**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, ITS, SIGNALS
CULVERTS AND STRUCTURES**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5700	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50118.1.FS1	NHPP-040-1(259)286	PE	
50118.2.1	NHPP-040-1(259)286	UTIL., ROW	
50118.3.GV1	NHPP-040-1(259)286	CONST.	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



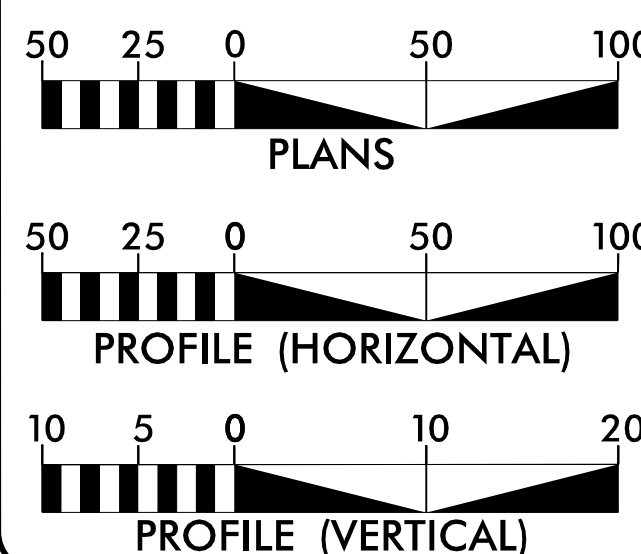
END TIP PROJECT I-5700
STA. 61+00.00 -L-



EXISTING SIGNALS TO BE MODIFIED

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

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 33,660
 ADT 2040 = 46,500
 K = 9 %
 D = 65 %
 T = 6 % *
 V = 50 MPH
 * TTST = 2% DUAL = 4%
 FUNC CLASS = ARTERIAL
 STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5700 = 0.740 MILES
 LENGTH STRUCTURE TIP PROJECT I-5700 = 0.058 MILES
 TOTAL LENGTH OF TIP PROJECT I-5700 = 0.798 MILES



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

1223 JONES FRANKLIN ROAD
Raleigh, N.C. 27606
License No. F-0377
Exp: 9/9/2017
Exp: 9/9/2017

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 24, 2018

LETTING DATE:
NOVEMBER 19, 2019

NCDOT CONTACT:

EDWARD G. WETHERILL, PE
PROJECT ENGINEER

BOB A. MAY, PE
PROJECT DESIGN ENGINEER

PAMELA R. WILLIAMS, PE
PROJECT MANAGEMENT TEAM LEAD

HYDRAULICS ENGINEERING FIRM

Kimley»Horn

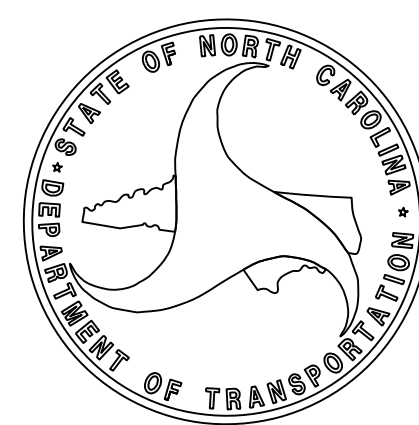
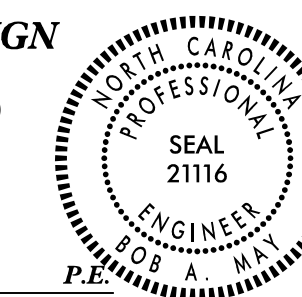
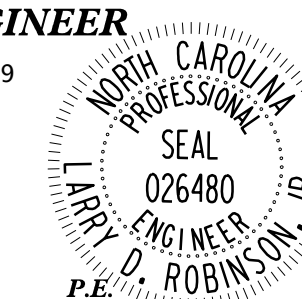
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

HYDRAULICS ENGINEER
10/2/2019

Developed by:
Larry D. Robinson
SIGNATURE:

ROADWAY DESIGN
ENGINEER
10/1/2019

Developed by:
Bob A. May
SIGNATURE:



TIP PROJECT: I-5700

CONTRACT: C204351



SHEET NUMBER	SHEET	TITLE
1	TITLE SHEET	
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS	
1B	CONVENTIONAL SYMBOLS	
2A-1 THRU 2A-7	PAVEMENT SCHEDULE AND TYPICAL SECTIONS	
2B-1 THRU 2B-3	ROADWAY DETAILS	
2C-1 THRU 2C-14	SPECIAL DETAILS	
2D-1 THRU 2D-8	DRAINAGE DETAILS	
2G-1 THRU 2G-4	GEOTECHNICAL DETAILS	
3B-1 THRU 3B-2	ROADWAY SUMMARIES EARTHWORK, REMOVAL OF EXIST. PAVEMENT, SHOULDER BERM GUTTER, WOVEN WIRE FENCE, AND GUARDRAIL	
3D-1 THRU 3D-10	DRAINAGE SUMMARIES	
3G-1	GEOTECHNICAL SUMMARIES	
3P-1	PARCEL INDEX SHEET	
4 THRU 14	PLAN SHEETS	
15 THRU 26	PROFILE SHEETS	
RW-01 THRU RW-14	RIGHT OF WAY / SURVEY PLANS	
TMP-01 THRU TMP-62	TRAFFIC MANAGEMENT PLANS	
PMP-01 THRU PMP-14	PAVEMENT MARKING PLANS	
E-1 THRU E-9	ELECTRICAL PLANS	
EC-1 THRU EC-25	EROSION CONTROL PLANS	
RF-1	REFORESTATION PLANS	
SIGN-1 THRU SIGN-51	SIGNING PLANS	
SIG-1 THRU SIG-29.1	SIGNAL PLANS	
SIG-M1 THRU SIG-M8	METAL POLES	
SCP-1 THRU SCP-11	SIGNAL COMMUNICATIONS PLANS	
ITS-1 THRU ITS-13	ITS PLANS	
UC-1 THRU UC-10	UTILITIES CONSTRUCTION PLANS	
UD-1 THRU UD-12	UTILITIES BY OTHERS PLANS	
X-0	INDEX OF CROSS-SECTIONS	
X-1A THRU X-1C	CROSS-SECTION SUMMARY SHEET	
X-1 THRU X-150	CROSS-SECTIONS	
S1-1 THRU S1-31	STRUCTURE PLANS	
S2-1 THRU S2-33	STRUCTURE PLANS	
C1-1 THRU C1-4	CULVERT PLANS	
C2-1 THRU C2-6	CULVERT PLANS	
C3-1 THRU C3-5	CULVERT PLANS	
C4-1 THRU C4-4	CULVERT PLANS	

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
225.07	Grading for False Cut at Grade Separations
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
240.01	Guide for Berm Ditch Construction
275.01	Rock Plating
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
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	
610.01	Guide for Paving Shoulders Under Bridges - Method I
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
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.27	Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.57	Reinforced Brick Endwall - for Single 60" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
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
840.25	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
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.45	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
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
852.01	Concrete Islands
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: 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 & 560.02

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. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

SUBSURFACE DRAINS:
SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

SHOULDER DRAINS:
SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.03 AND DETAILS IN PLANS 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 Duke Energy, AT&T, Spectrum, CenturyLink, Crown Castle, Verizon, PSNC, Town Of Cary, and Airport Authority 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 (SEE BELOW). BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

-L- 23+75.00 - 27+25.00	-Y- 47+75.00 - 49+25.00
-RPA- 17+70.00 - 21+20.00	-Y- 49+75.00 - 51+25.00
-RPASPUR- 10+00.00 - 12+07.00	-Y- 60+75.00 - 63+25.00
-RPB- 11+25.00 - 17+25.00	-Y- 70+25.00 - 72+75.00
-RPB- 17+75.00 - 21+75.00	-Y- 102+75.00 - 113+06.00
-RPBSPUR- 10+00.00 - 13+00.00	-Y3- 15+25.00 - 16+25.00
	-Y3- 17+25.00 - 20+25.00

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Computed Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-x-x-x-
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	---WLB---
Proposed Lateral, Tail, Head Ditch	-----
False Sump	▽

RAILROADS:

Standard Gauge	-----
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	-----
New Right of Way Line with Pin and Cap	-----
New Right of Way Line with Concrete or Granite R/W Marker	-----
New Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
New Control of Access	-----
Existing Easement Line	-----
New Temporary Construction Easement	-----
New Temporary Drainage Easement	-----
New Permanent Drainage Easement	-----
New Permanent Drainage / Utility Easement	-----
New Permanent Utility Easement	-----
New Temporary Utility Easement	-----
New Aerial Utility Easement	-----

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	○

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

Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	-----
Paved Ditch Gutter	-----
Storm Sewer Manhole	-----
Storm Sewer	-----

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊞
U/G Power Cable Hand Hole	⊞
H-Frame Pole	●
U/G Power Line LOS B (S.U.E.*)	-----
U/G Power Line LOS C (S.U.E.*)	-----
U/G Power Line LOS D (S.U.E.*)	-----

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊞
Telephone Cell Tower	⊞
U/G Telephone Cable Hand Hole	⊞
U/G Telephone Cable LOS B (S.U.E.*)	-----
U/G Telephone Cable LOS C (S.U.E.*)	-----
U/G Telephone Cable LOS D (S.U.E.*)	-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊞
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	-----

TV:

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

GAS:

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

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊞
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
SS Forced Main Line LOS B (S.U.E.*)	-----
SS Forced Main Line LOS C (S.U.E.*)	-----
SS Forced Main Line LOS D (S.U.E.*)	-----

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊞
Utility Unknown U/G Line LOS B (S.U.E.*)	-----
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊞
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.

6/2/99

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	E4	PROP. APPROX. 13½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD. IN EACH OF THREE LAYERS.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E5	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.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	J1	PROP. 8" AGGREGATE BASE COURSE.
C4	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	J2	PROP. 10" AGGREGATE BASE COURSE.
C5	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.	K	PROP. 8" CHEMICAL STABILIZATION (SOIL -CEMENT BASE/LIME- TREATED SOIL). BASE TREATED WITH CEMENT AT A RATE OF 56 lbs. PER SQ. YARD OR SOIL TREATED WITH LIME AT A RATE OF 24 lbs. PER SQ. YARD.
C6	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.	K1	PROP. 8" CLASS IV SUBGRADE STABILIZATION.
C7	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.	N	GEOTEXTILE FOR PAVEMENT STABILIZATION
C8	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	R1	2'-6" CONCRETE CURB
C9	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.	R2	1'-6" CONCRETE CURB
C10	PROP. APPROX. ¾" ASPHALT CONCRETE SURFACE COURSE, TYPE S4.75A, AT AN AVERAGE RATE OF 75 LBS. PER SQ. YD.	R3	5" CONC. MONOLITHIC ISLAND (SURFACE MOUNTED)
C11	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.	S	4" CONCRETE SIDEWALK.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	T	EARTH MATERIAL.
D2	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D3	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V1	MILLING BITUMINOUS PAVEMENT 1½" DEPTH.
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.	V2	MILLING BITUMINOUS PAVEMENT. 3¾" DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	Y	MILLED RUMBLE STRIPS
E3	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.		

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

NOTES TO CONTRACTOR

Perform the work in accordance with Section 607 of the January 2018 North Carolina Department of Transportation Standard Specifications for Roads and Structures. Resurfacing will be accomplished at the same time as the milling operation.

25' TO 1' DEPTH
INCIDENTAL
MILLING

BEGINNING OF PROJECT

EXISTING PAVEMENT

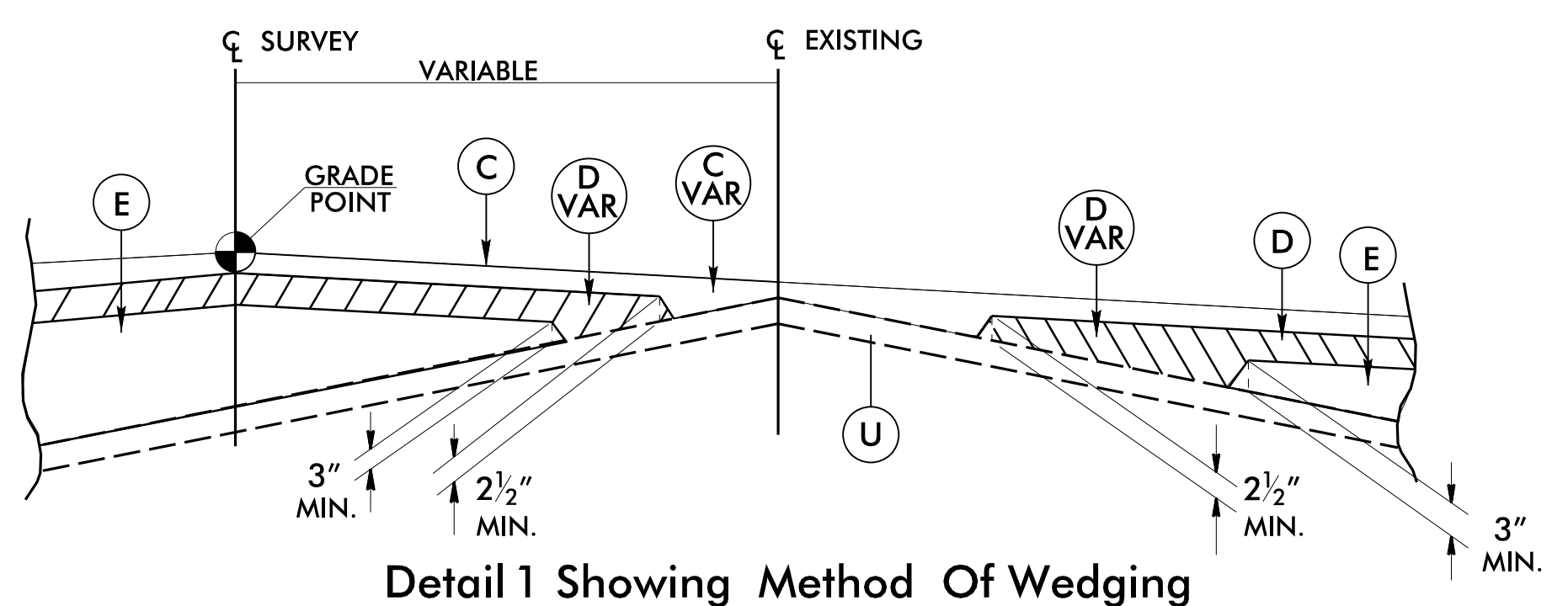
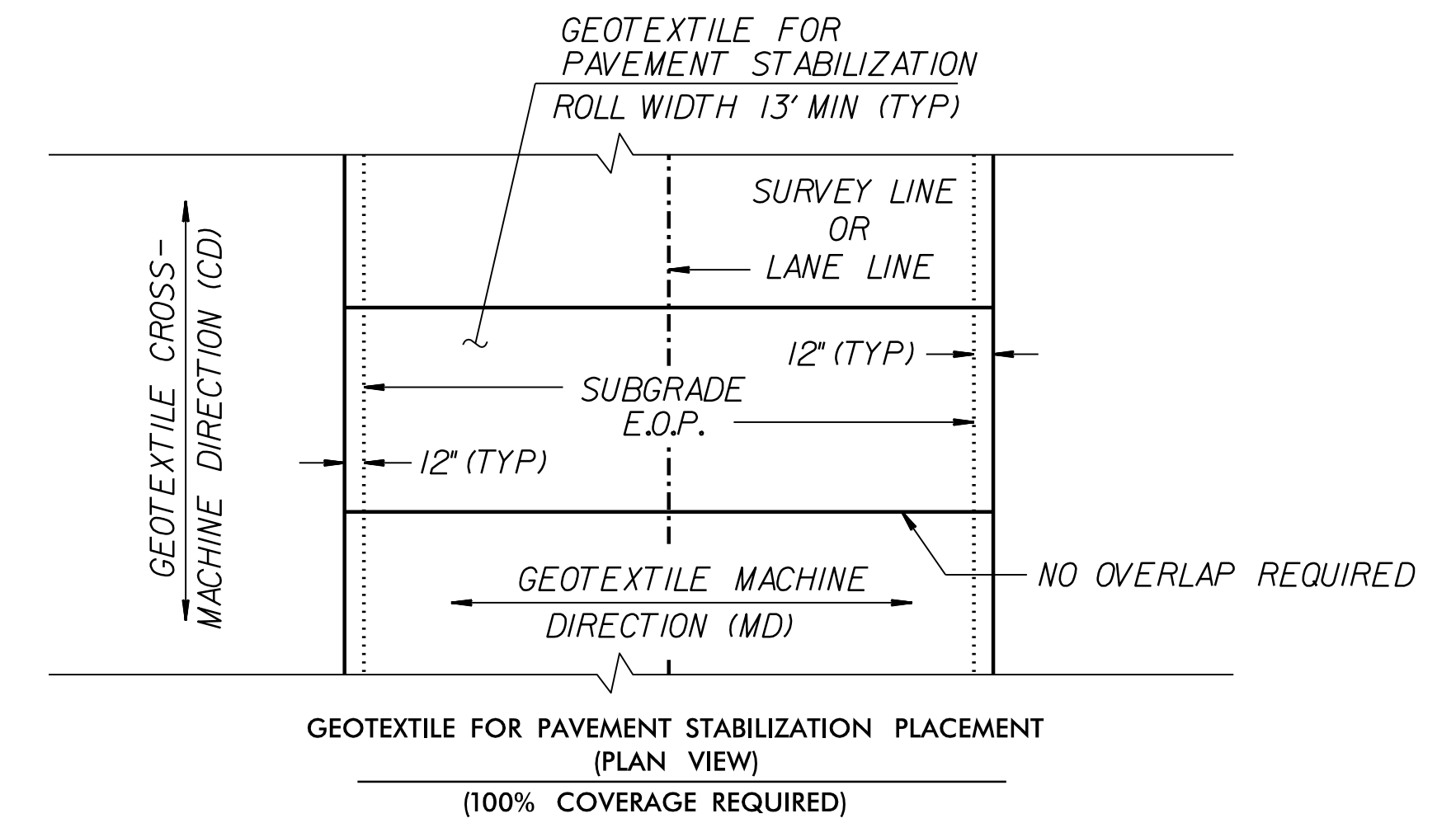
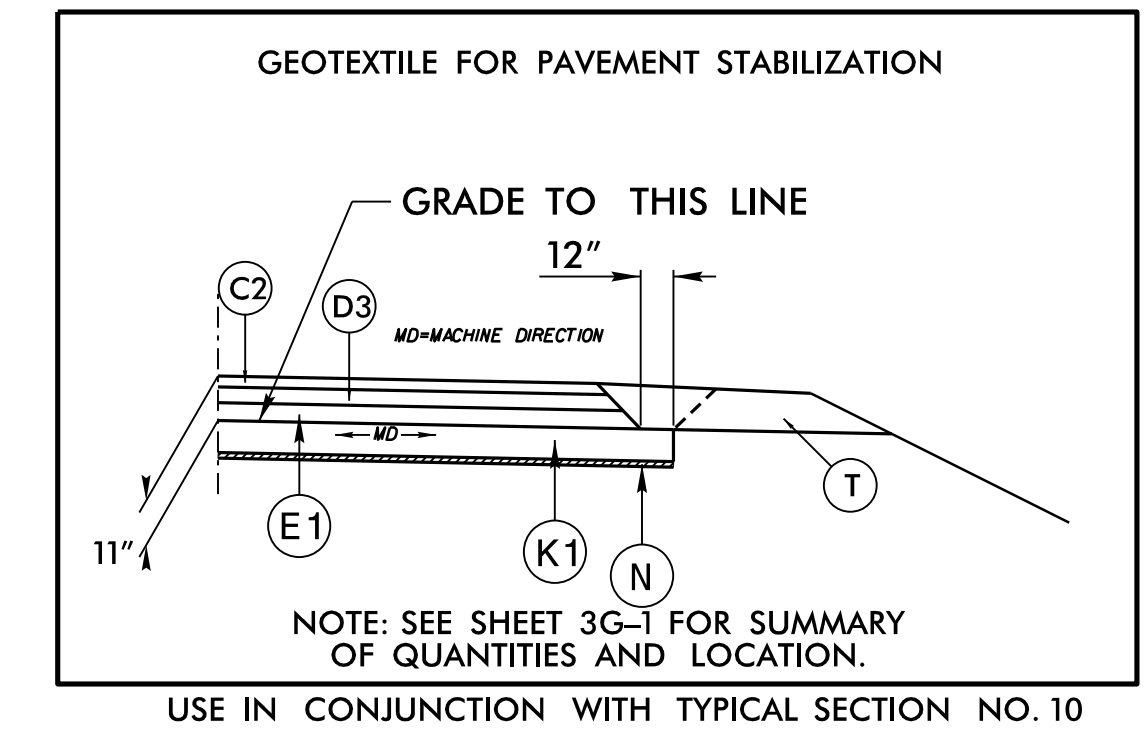
1½"

NOTE: UTILIZE INCIDENTAL MILLING TO MAKE PAVEMENT TIE-INS

- L- STA. 19+60.00 TO -L- STA. 20+35.00
- L- STA. 60+25.00 TO -L- STA. 62+00.00
- NBL- STA. 61+00.00 TO -NBL- STA. 61+75.00
- NBLRPA- STA. 16+72.62 TO -NBLRPA- STA. 17+47.62
- Y1- STA. 13+36.34 TO -Y1- STA. 14+11.34
- Y2- STA. 10+05.00 TO -Y2- STA. 10+80.00
- Y3- STA. 15+18.75 TO -Y3- STA. 15+93.75
- Y5- STA. 10+70.00 TO -Y5- STA. 11+45.00
- Y8- STA. 17+00.00 TO -Y8- STA. 17+75.00

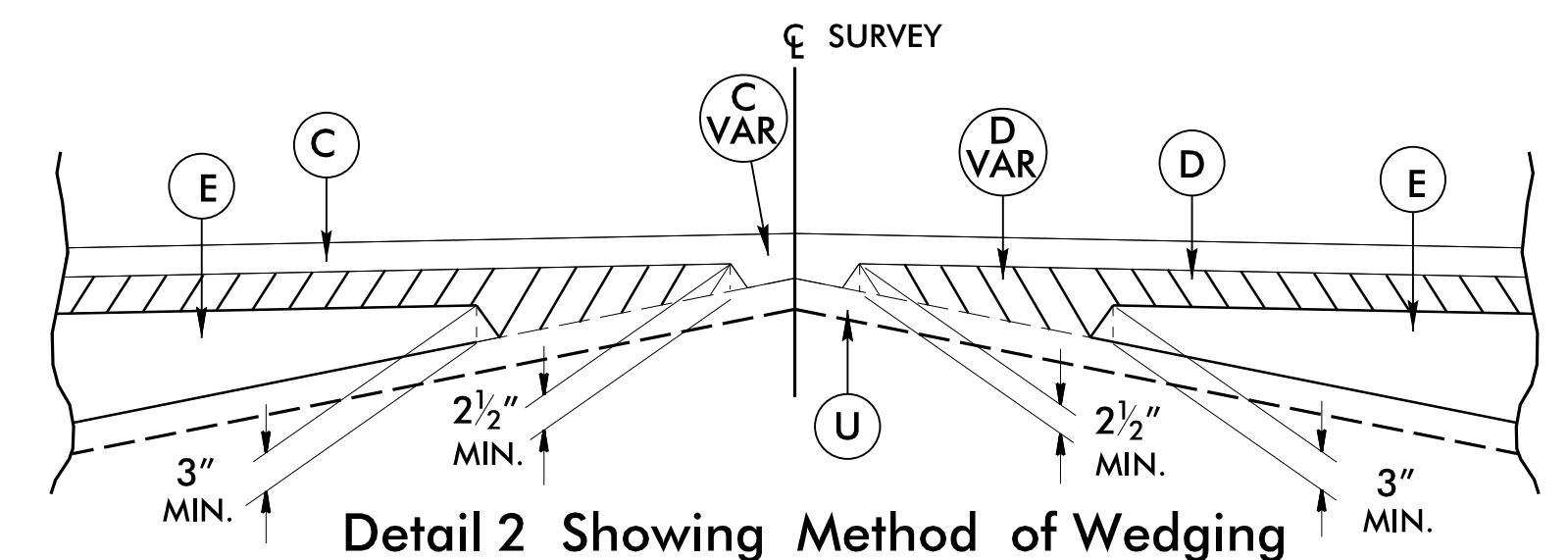
PROJECT REFERENCE NO. 1-5700	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER 10/7/2019 F. A. May	PAVEMENT DESIGN ENGINEER 10/7/2019 Clark S. Morrison
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION	

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



USE WITH WEDGING DETAILS

SURVEY	DETAIL	C	C VAR	D	D VAR	E
-L-	1 & 2	C6	C7	D3	D4	E5
-Y1- -Y2- -Y3- -Y8-	2	C1	C3	D3	D4	E5
-RPA- -RPB- -RPC- -RPD-	2	C6	C7	D2	D4	E5
-NBLRPA-	2	C2	C3	D1	D4	E5

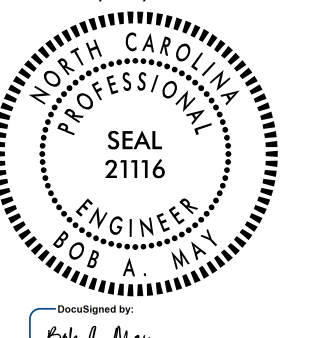
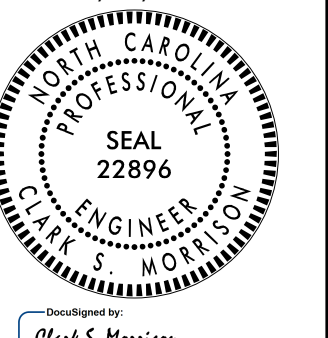


10/4/2019 10:47:00 Relu_psh02A-1_T.ppt.dgn

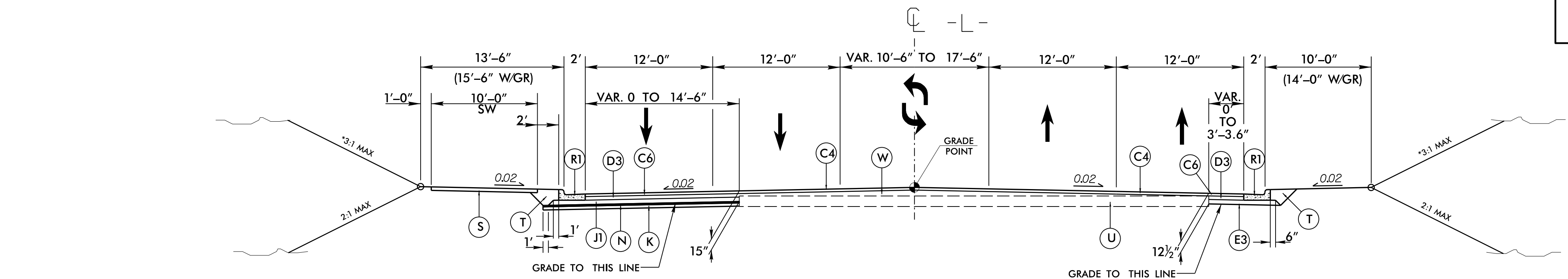
6/2/2019

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

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

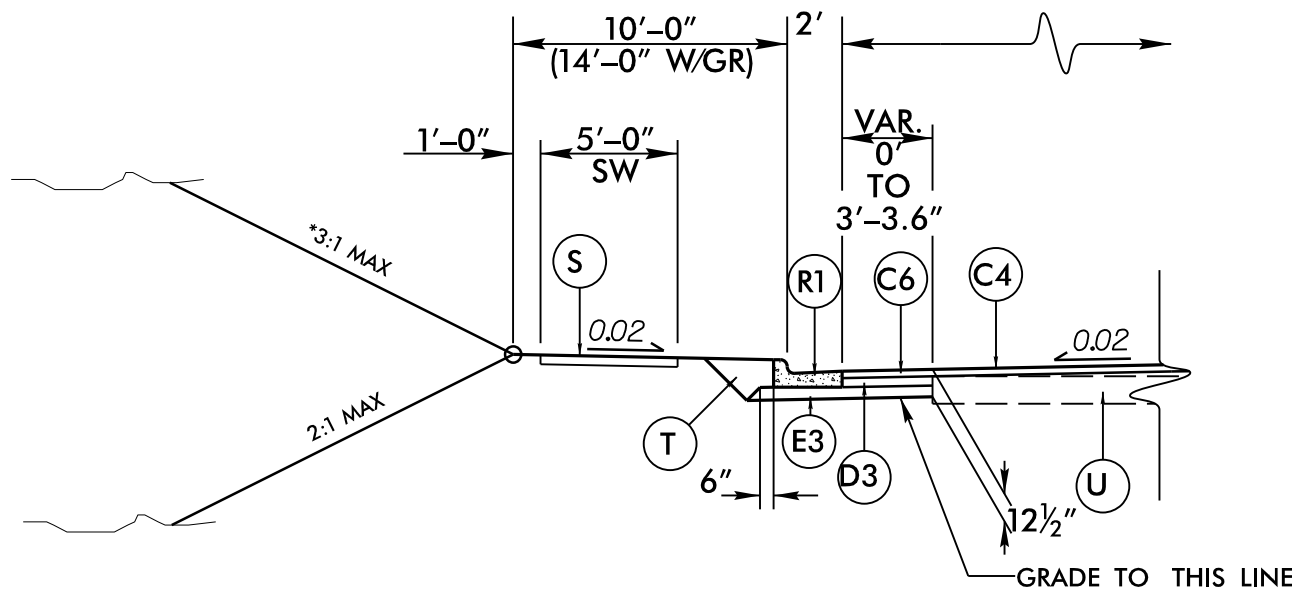
PROJECT REFERENCE NO. 1-5700	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER 11/12/2019 	PAVEMENT DESIGN ENGINEER 11/12/2019 

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 1

-L- (AIRPORT BOULEVARD)
 *NOTE: 3:1 MAXIMUM CUT SLOPES ARE BEING UTILIZED DUE TO PRESENCE OF TRIASSIC SOILS.
 USE TYPICAL SECTION NO. 1
 -L- STA. 19+60.00 TO 22+24.95

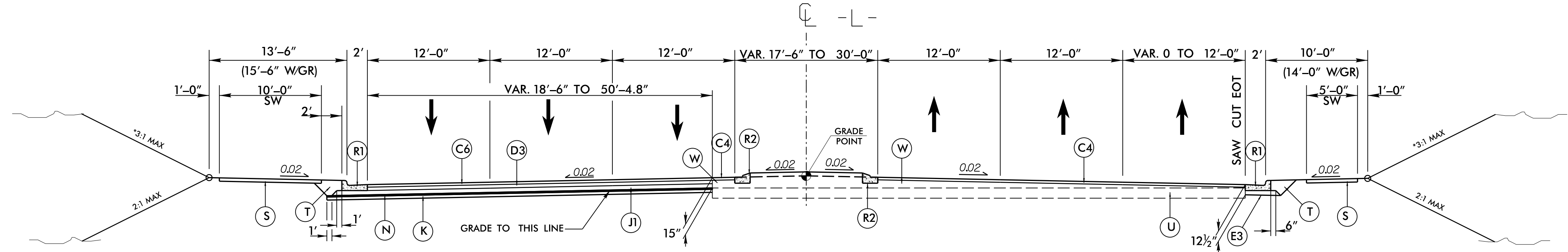


PARTIAL TYPICAL SECTION NO. 1

USE IN CONJUNCTION WITH TS NO. 1
 USE PARTIAL TYPICAL SECTION NO. 1
 -L- STA. 18+85.00 TO 21+11.49 LT.
 -L- STA. 18+85.00 TO 21+06.42 RT.

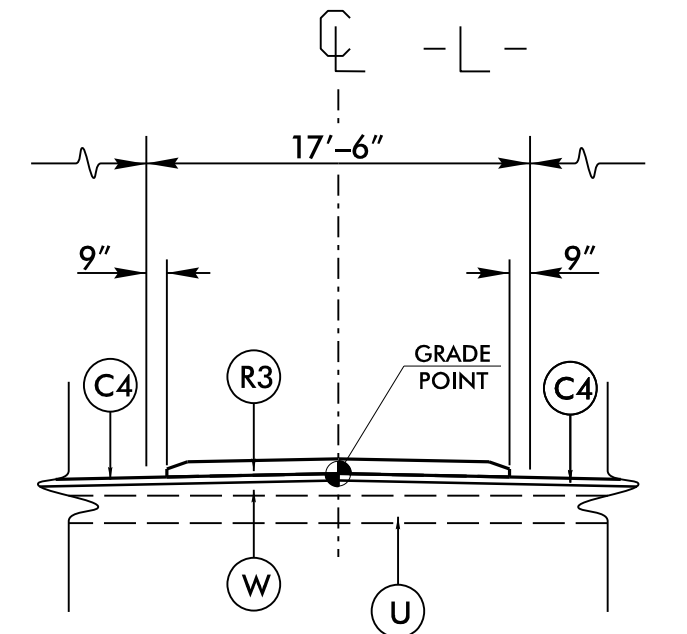
NOTE: TRANSITION FROM EXISTING PAVEMENT TO TYPICAL SECTION NO. 1 -L- STA. 18+85.00 TO 19+60.00

PAVEMENT SCHEDULE	
C4	1 1/2" S9.5C
C6	3" S9.5C
D3	4" I19.0C
E3	5 1/2" B25.0C
J1	8" ABC
K	8" CHEM. STAB.
K1	8" CL. IV SUB. STAB.
N	GEOTEXTILE
R1	2'-6" C&G
R2	1'-6" C&G
R3	CONC. ISLAND
S	4" CONC. SW
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING



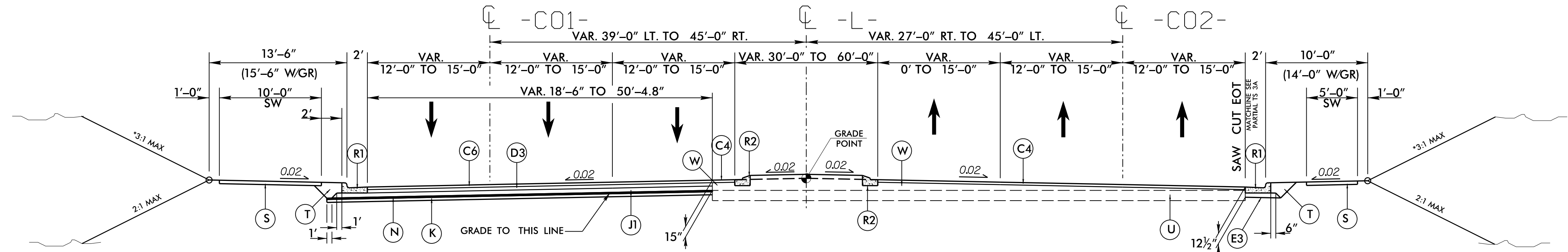
TYPICAL SECTION NO. 2

-L- (AIRPORT BOULEVARD)
 *NOTE: 3:1 MAXIMUM CUT SLOPES ARE BEING UTILIZED DUE TO PRESENCE OF TRIASSIC SOILS.
 USE TYPICAL SECTION NO. 2
 -L- STA. 22+24.95 TO 35+70



PARTIAL TYPICAL SECTION NO. 2

USE IN CONJUNCTION WITH TS NOS. 2 & 3
 USE PARTIAL TYPICAL SECTION NO. 2
 -L- STA. 22+00.00 TO 24+00.00
 -L- STA. 26+82.55 TO 27+82.55
 -L- STA. 35+95.00 TO 38+68.00



TYPICAL SECTION NO. 3

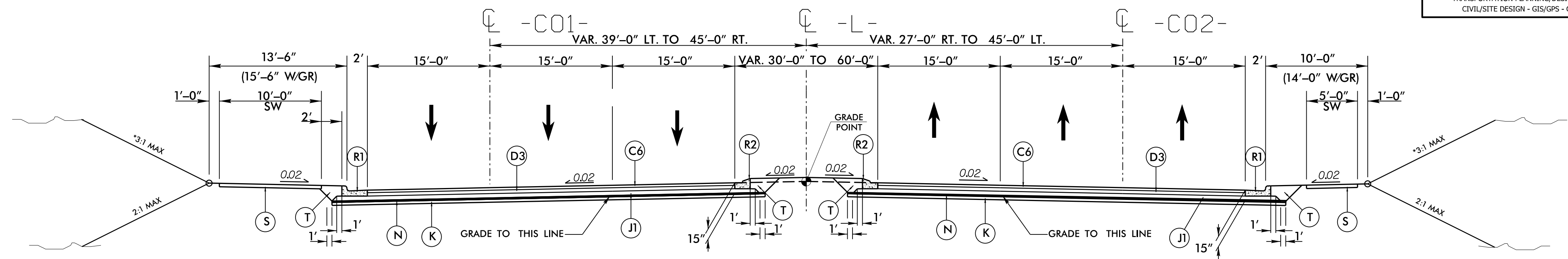
-L- (AIRPORT BOULEVARD)
 *NOTE: 3:1 MAXIMUM CUT SLOPES ARE BEING UTILIZED DUE TO PRESENCE OF TRIASSIC SOILS.
 USE TYPICAL SECTION NO. 3
 -L- STA. 35+70.00 TO 39+07.67
 -L- STA. 49+26.56 TO 53+50.00

11/27/2018 11:58:00 Relu_psh02A-2_1.up.dgn

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

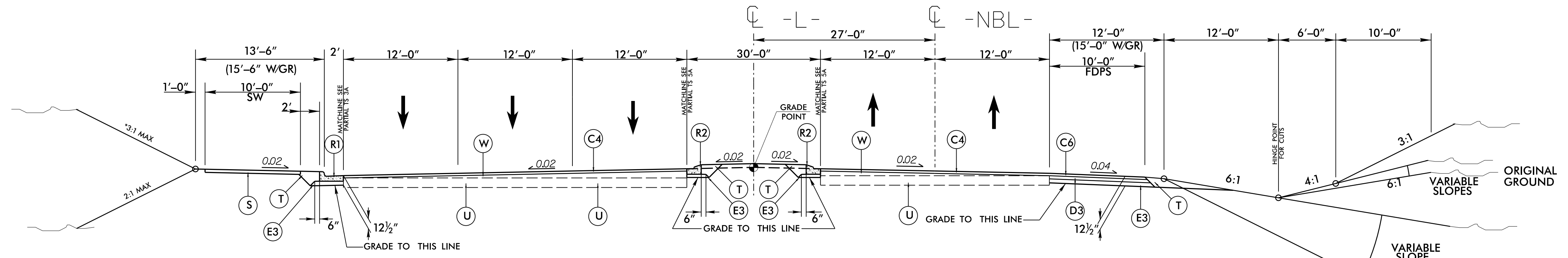
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO. 1-5700	SHEET NO. 2A-3
ROADWAY DESIGN ENGINEER 11/12/2019	PAVEMENT DESIGN ENGINEER 11/12/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



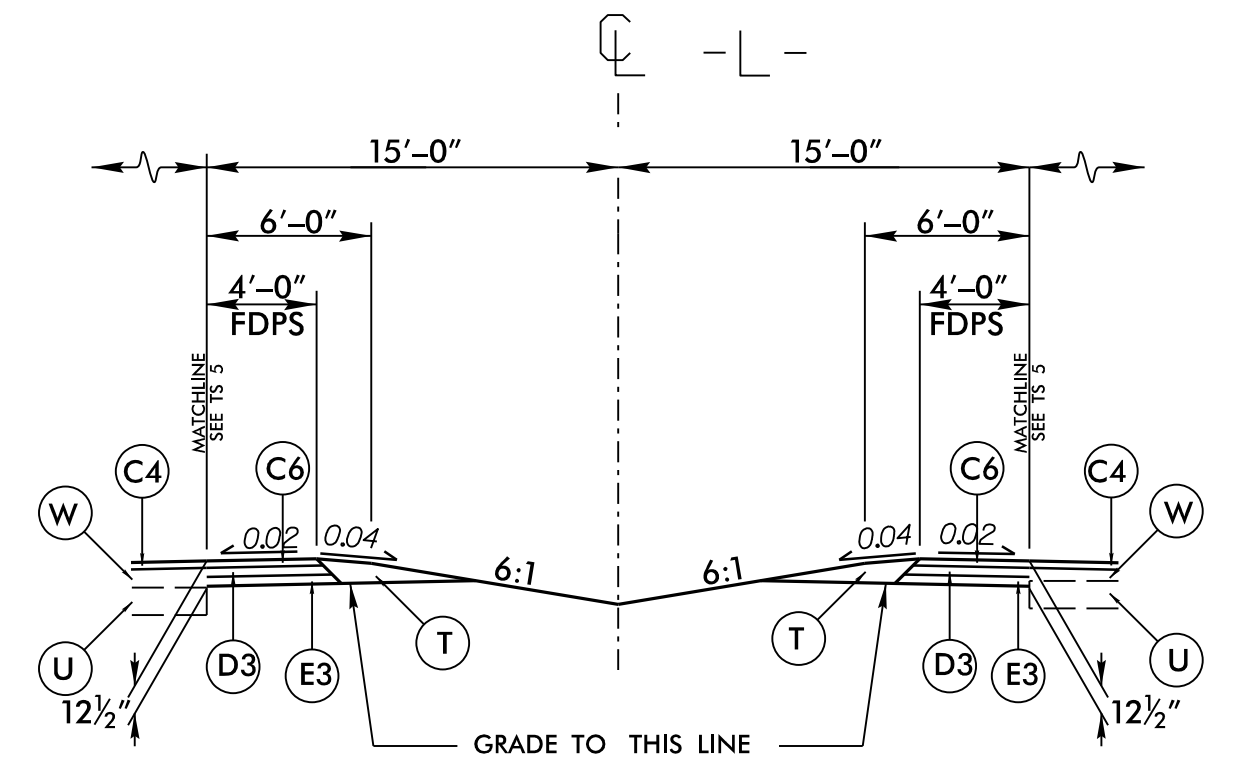
TYPICAL SECTION NO. 4

-L- (AIRPORT BOULEVARD)
 *NOTE: 3:1 MAXIMUM CUT SLOPES ARE BEING UTILIZED DUE TO PRESENCE OF TRIASSIC SOILS.
 USE TYPICAL SECTION NO. 4
 -L- STA. 39+07.67 TO 42+64.95 (BEG. BR.) LT.
 -L- STA. 39+07.67 TO 42+99.97 (BEG. BR.) RT.
 -L- STA. 45+70.45 (END BR.) LT. TO 49+26.56
 -L- STA. 46+05.47 (END BR.) RT. TO 49+26.56



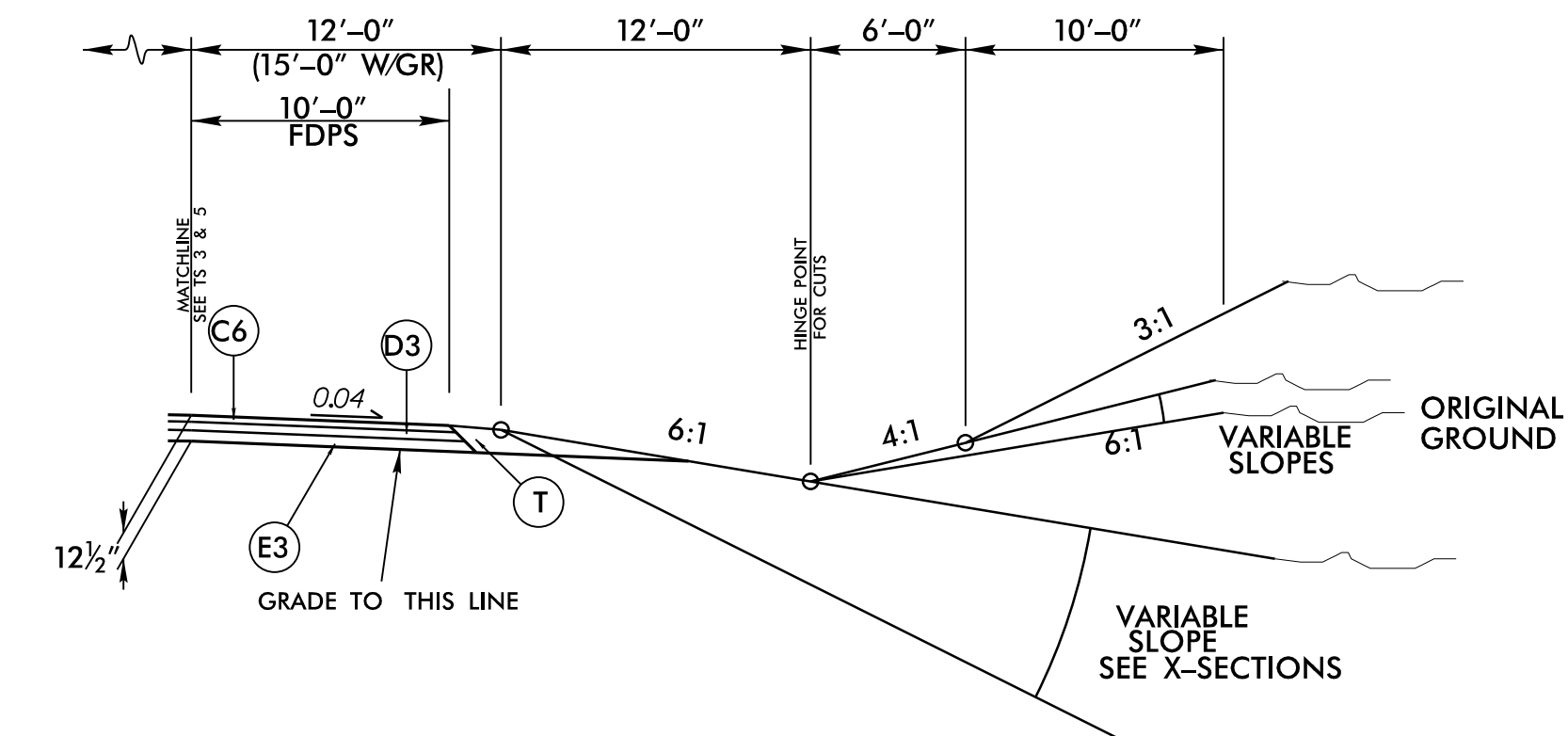
TYPICAL SECTION NO. 5

-L- (AIRPORT BOULEVARD)
 *NOTE: 3:1 MAXIMUM CUT SLOPES ARE BEING UTILIZED DUE TO PRESENCE OF TRIASSIC SOILS.
 USE TYPICAL SECTION NO. 5
 -L- STA. 53+50.00 TO 61+00.00
 -NBL- STA. 56+18.52 TO 61+75.00



TYPICAL SECTION NO. 5A

USE PARTIAL TYPICAL SECTION 5A IN CONJUNCTION W/TS NO. 5
 USE TYPICAL SECTION NO. 5A
 -L- STA. 58+69.56 TO -NBL- STA. 61+75.00 RT.
 -L- STA. 58+69.56 TO 61+00.00 LT.

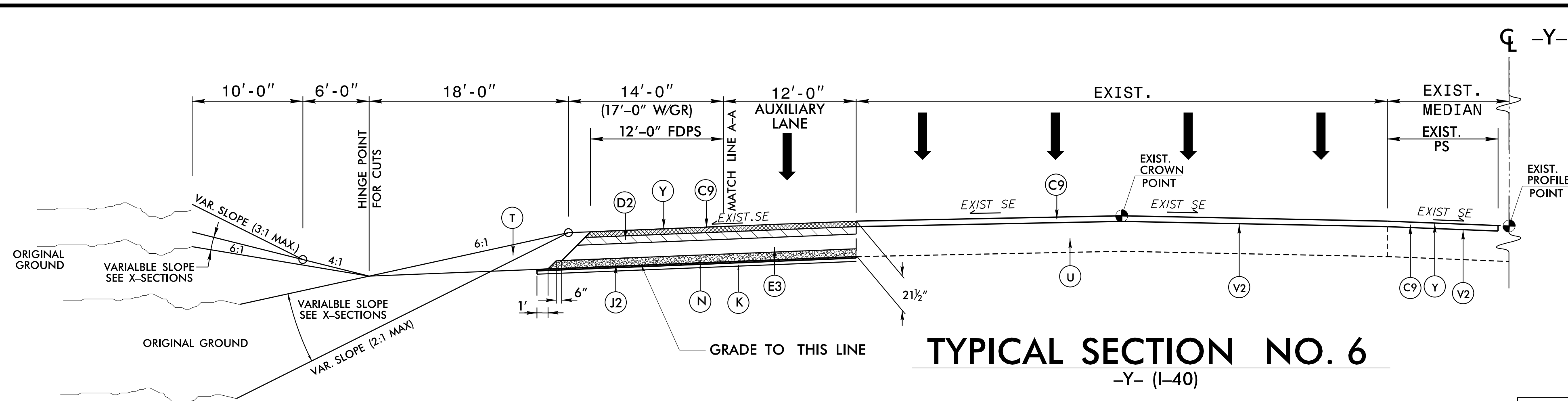


TYPICAL SECTION NO. 3A

USE TYPICAL SECTION NO. 3A
 -L- STA. 50+40.52 TO 53+50.00 RT.
 -L- STA. 59+25.54 TO 61+00.00 LT.

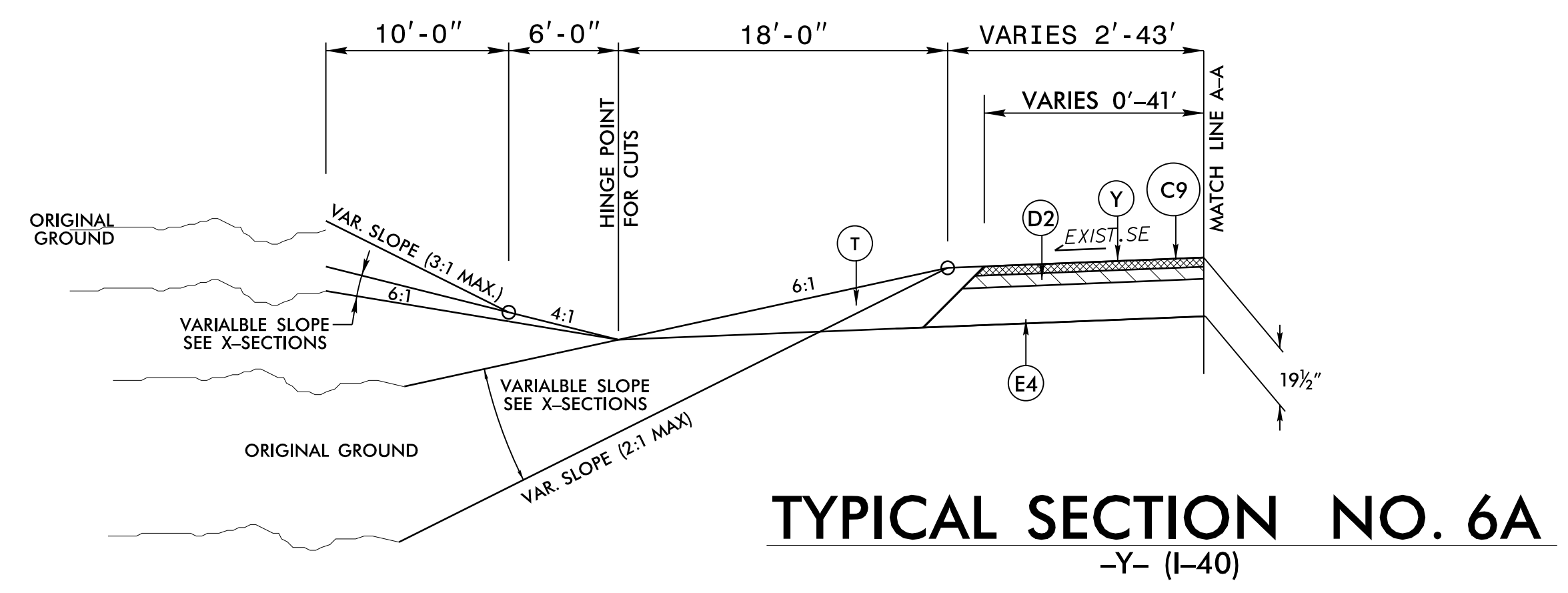
PAVEMENT SCHEDULE	
C4	1 1/2" S9.5C
C6	3" S9.5C
D3	4" I19.0C
E3	5 1/2" B25.0C
J1	8" ABC
K	8" CHEM. STAB.
K1	8" CL. IV SUB. STAB.
N	GEOTEXTILE
R1	2'-6" C&G
R2	1'-6" C&G
S	4" CONC. SW
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

6/2/2019

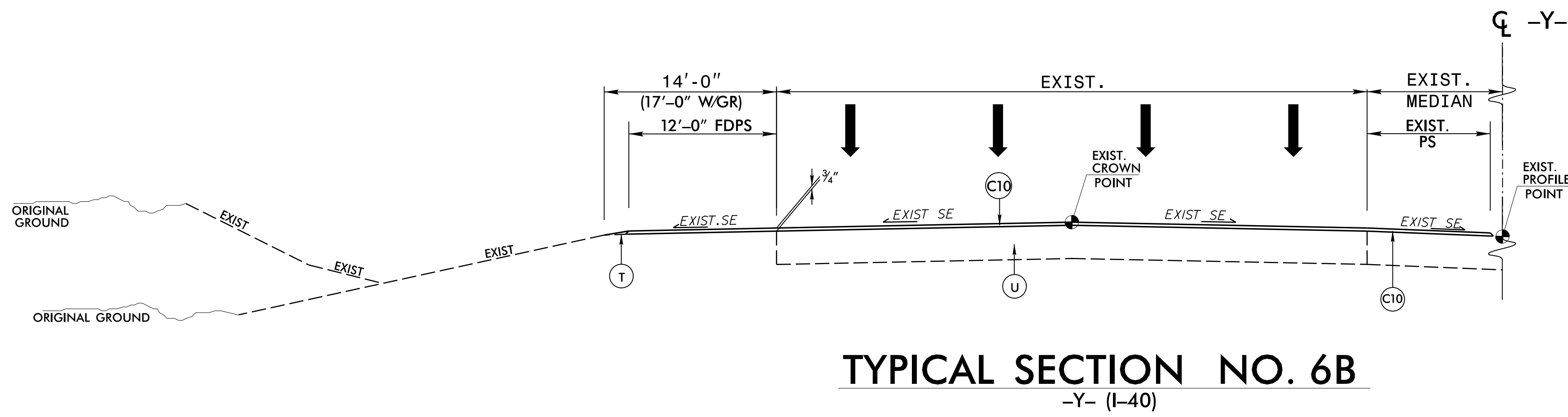


USE TYPICAL SECTION NO. 6
 -Y- STA. 25+32.85 TO 53+50.00 LT.
 -Y- STA. 48+45.00 TO 52+00.00 RT. (INVERT TYPICAL)
 -Y- STA. 81+10.00 TO 113+06.23 RT. (INVERT TYPICAL)

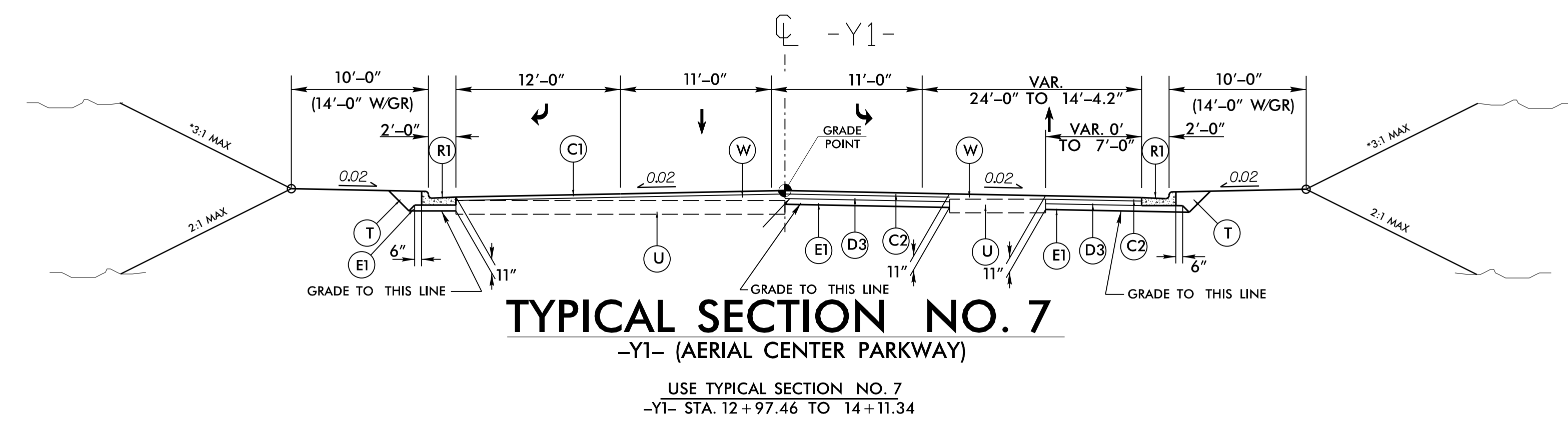
* NOTE: AS STATED IN TRAFFIC CONTROL PLANS, PHASE I STEP 3, -Y- (I-40) WILL BE OVERLAYED WITH 3/4" S4.75A INITIALLY. IN PHASE II STEP 1 -Y- WILL BE MILLED 3 3/4" AND OVERLAYED WITH 1 1/2" S9.5D. IN PHASE V -Y- WILL BE OVERLAYED WITH 1 1/2" S9.5D.



USE PARTIAL TYPICAL SECTION 6A IN CONJUNCTION W/TS NO. 6
 -Y- STA. 57+88.22 TO 75+12.27 LT.
 -Y- STA. 56+15.63 TO 75+85.15 RT. (INVERT TYPICAL)



USE TYPICAL SECTION NO. 6B IN CONJUNCTION W/TS NO. 6
 -Y- STA. 25+32.85 TO 53+50.00 LT.
 -Y- STA. 48+45.00 TO 52+00.00 RT. (INVERT TYPICAL)
 -Y- STA. 81+10.00 TO 113+06.23 RT. (INVERT TYPICAL)



PROJECT REFERENCE NO. 1-5700	SHEET NO. 2A-4
ROADWAY DESIGN ENGINEER 11/12/2019 SEAL 21116 PAUL R. MARY	PAVEMENT DESIGN ENGINEER 11/12/2019 SEAL 22896 CLARK S. HANCOCK
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION	

PAVEMENT SCHEDULE	
C1	1 1/2" S9.5B
C2	3" S9.5B
C9	3" S9.5D
C10	3/4" S4.75A
D2	3" I19.0C
D3	4" I19.0C
E1	4" B25.0C
E3	5 1/2" B25.0C
E4	13 1/2" B25.0C
J2	10" ABC
K	8" CHEM. STAB.
K1	8" CL. IV SUB. STAB.
N	GEOTEXTILE
R1	2'-6" C&G
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	1 1/2" MILLING
V2	3 3/4" MILLING
W	WEDGING
Y	MILLED RUM. STRIPS

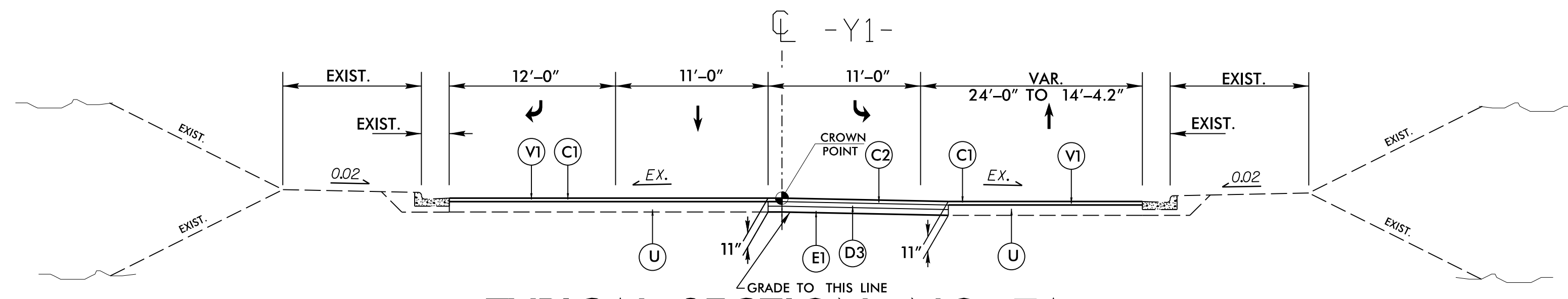
11/27/2019 11:58:00 AM Relu_psh02A-4_Typ.dgn

6/2/09

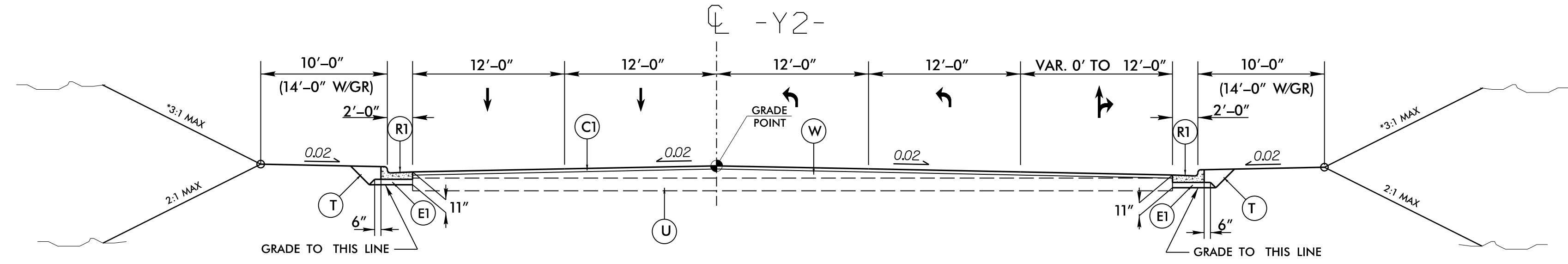
WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 8077
 Fax: 919 851 8107

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

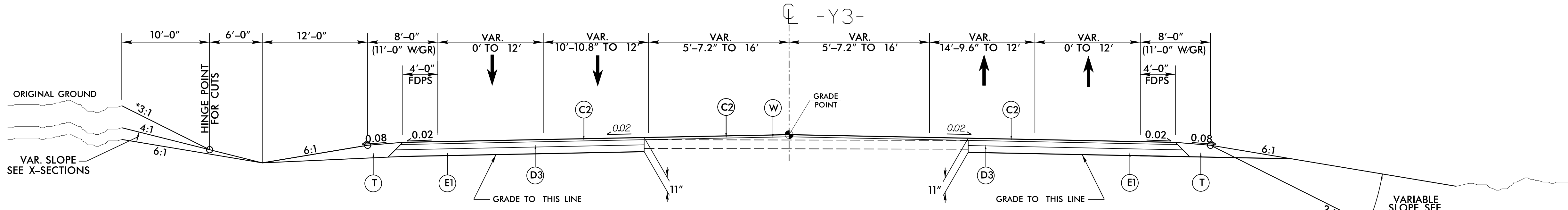
PROJECT REFERENCE NO. 1-5700	SHEET NO. 2A-5
ROADWAY DESIGN ENGINEER PAUL A. MAY SEAL 21116	PAVEMENT DESIGN ENGINEER CLARK S. HARRISON SEAL 22896
Designed by: Paul A. May Checked by: Clark S. Harrison	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



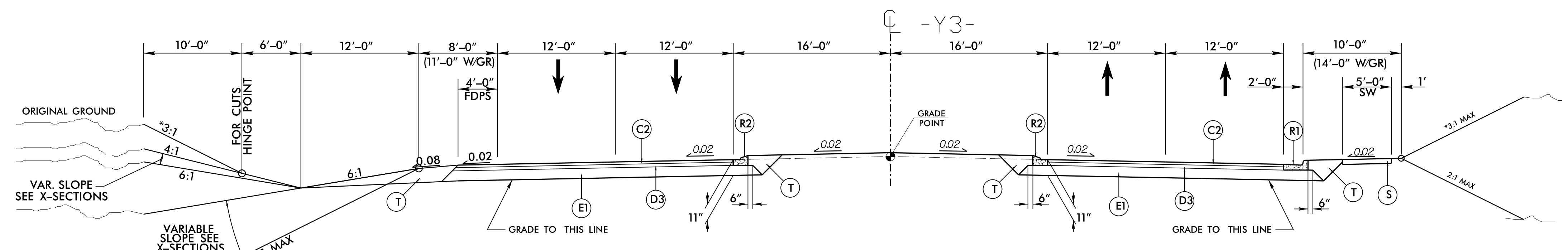
TYPICAL SECTION NO. 7A
 -Y1- (AERIAL CENTER PARKWAY)
 USE TYPICAL SECTION NO. 7A
 -Y1- STA. 14+11.34 TO 15+00.00



TYPICAL SECTION NO. 8
 -Y2- (FACTORY SHOPS RD.)
 USE TYPICAL SECTION NO. 8
 -Y2- STA. 10+05.00 TO 11+76.05



TYPICAL SECTION NO. 9
 -Y3- (PLEASANT GROVE CHURCH RD.)
 *NOTE: 3:1 MAXIMUM CUT SLOPES ARE BEING UTILIZED DUE TO PRESENCE OF TRIASSIC SOILS.
 USE TYPICAL SECTION NO. 9
 -Y3- STA. 15+18.75 TO 18+41.03



TYPICAL SECTION NO. 10
 -Y3- (PLEASANT GROVE CHURCH RD.)
 *NOTE: 3:1 MAXIMUM CUT SLOPES ARE BEING UTILIZED DUE TO PRESENCE OF TRIASSIC SOILS.
 USE TYPICAL SECTION NO. 10
 -Y3- STA. 18+41.03 TO 30+73.03
 SEE GEOTEXTILE FOR PAVEMENT STABILIZATION DETAIL

PAVEMENT SCHEDULE	
C1	1 1/2" S9.5B
C2	3" S9.5B
D3	4" I19.0C
E1	4" B25.0C
R1	2'-6" C&G
R2	1'-6" C&G
S	4" CONC. SW
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

10/4/2009
 10:42:00
 Relu_psh02A-5_Typ.dgn

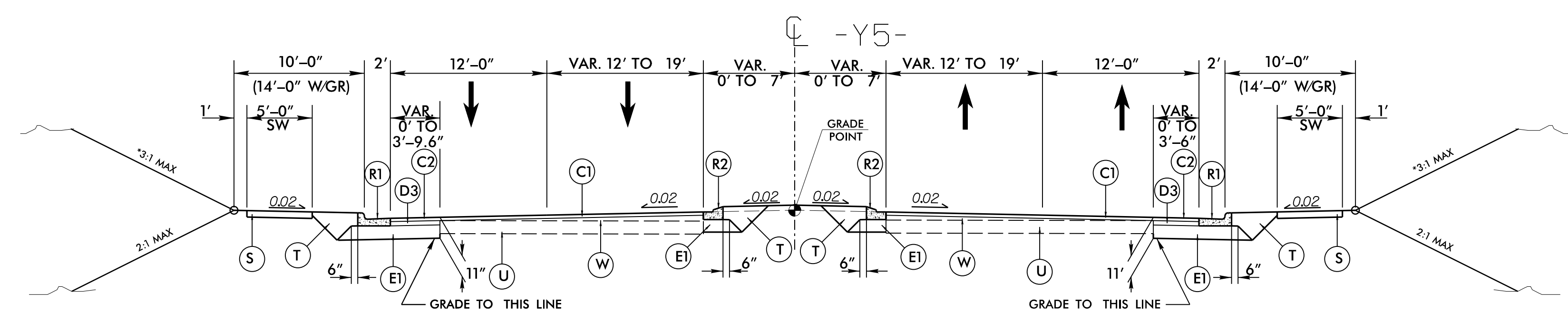
6/2/2019

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

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

PROJECT REFERENCE NO. 1-5700	SHEET NO. 2A-6
ROADWAY DESIGN ENGINEER 11/12/2019	PAVEMENT DESIGN ENGINEER 11/12/2019

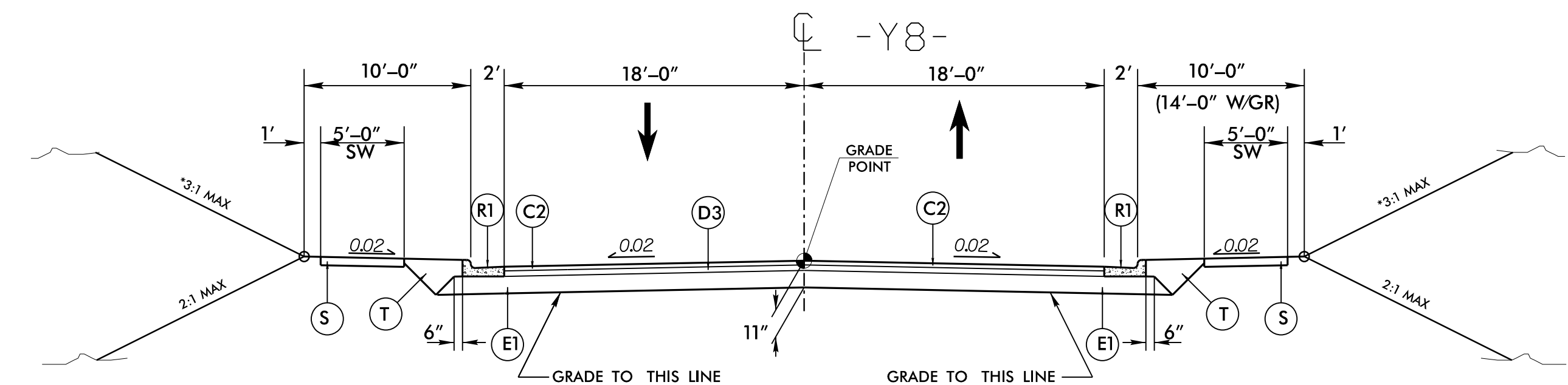
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 11

-Y5- (SR 1641 SLATER RD.)
 *NOTE: 3:1 MAXIMUM CUT SLOPES ARE BEING UTILIZED DUE TO PRESENCE OF TRIASSIC SOILS.
 USE TYPICAL SECTION NO. 11
 -Y5- STA. 10+70.00 TO 12+61.43

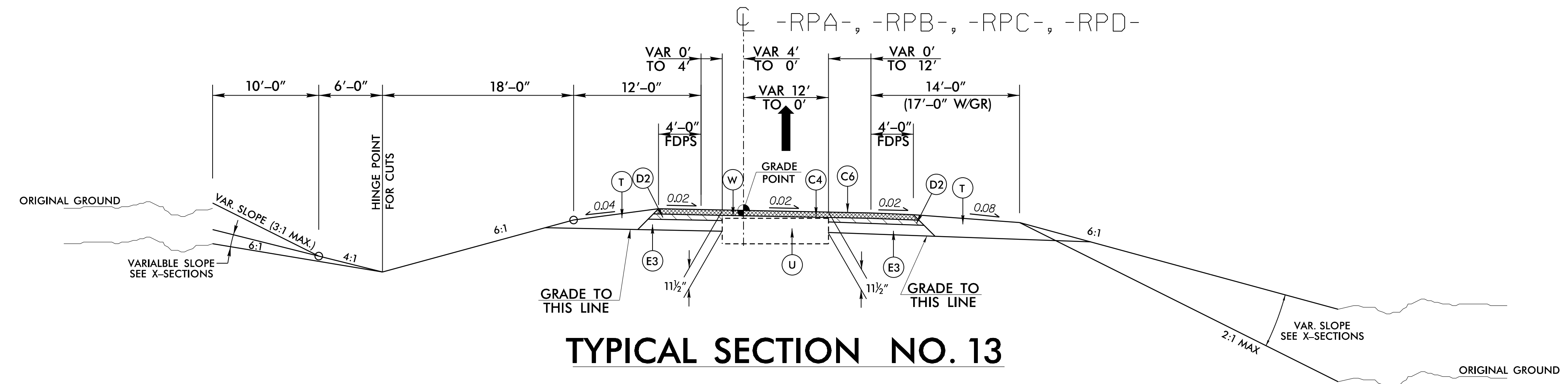
NOTE: RAISED MONOLITHIC ISLAND TO BE CONSTRUCTED AT FOLLOWING LOCATION:
 -Y5- STA. 11+79.34 TO 12+57.35



TYPICAL SECTION NO. 12

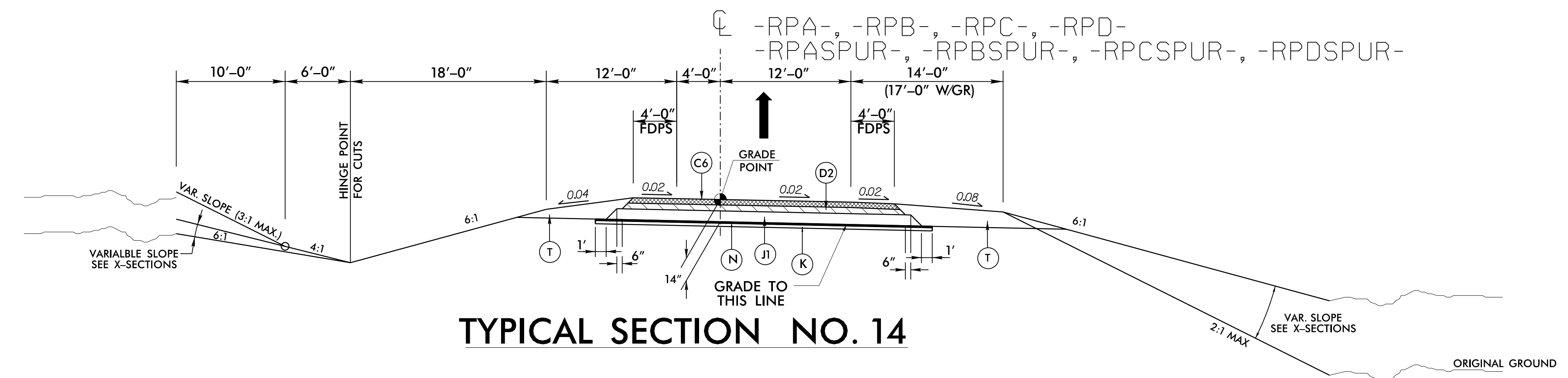
-Y8- (AIRGATE DR.)
 *NOTE: 3:1 MAXIMUM CUT SLOPES ARE BEING UTILIZED DUE TO PRESENCE OF TRIASSIC SOILS.

USE TYPICAL SECTION NO. 12
 -Y8- STA. 17+00.00 TO 21+78.46



TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13
 -RPA- STA. 10+00.00 TO 11+50.00
 (MIRROR) -RPB- STA. 10+00.00 TO 11+50.00
 -RPC- STA. 10+00.00 TO 11+00.00
 (MIRROR) -RPD- STA. 10+00.00 TO 12+50.00

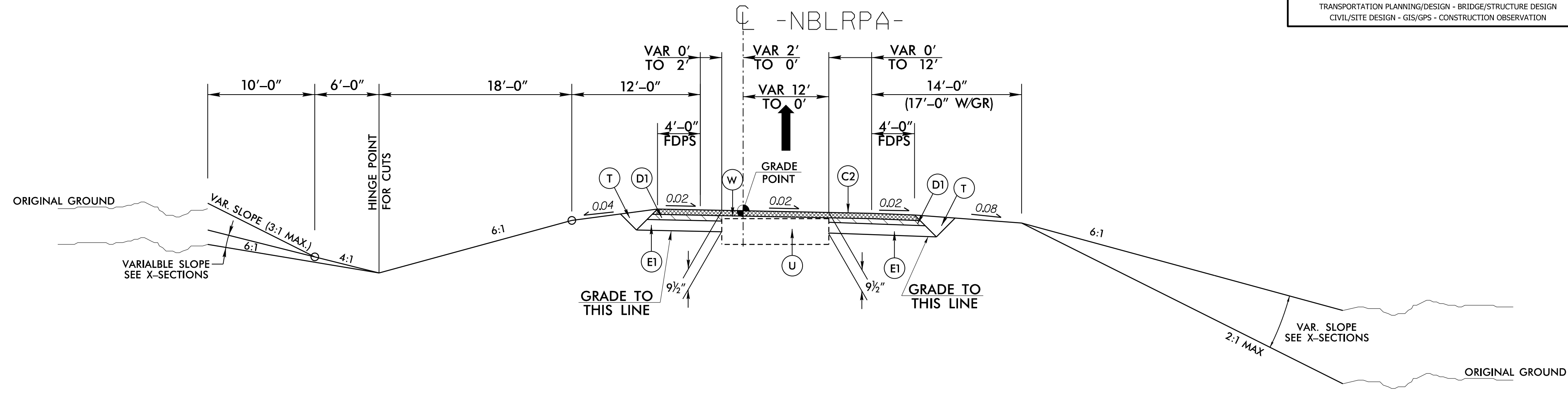


TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14
 -RPA- STA. 11+50.00 TO 22+25.73
 (MIRROR) -RPB- STA. 11+50.00 TO 23+93.68
 -RPC- STA. 11+00.00 TO 22+86.11
 (MIRROR) -RPD- STA. 12+50.00 TO 26+69.97
 -RPASPUR- STA. 10+00.00 TO 12+06.55
 -RPBSPUR- STA. 10+00.00 TO 14+09.31
 -RPCSPUR- STA. 20+40.66 TO 22+80.65
 -RPDSPUR- STA. 10+00.00 TO 14+78.07
 SEE PAVEMENT STABILIZATION DETAIL C

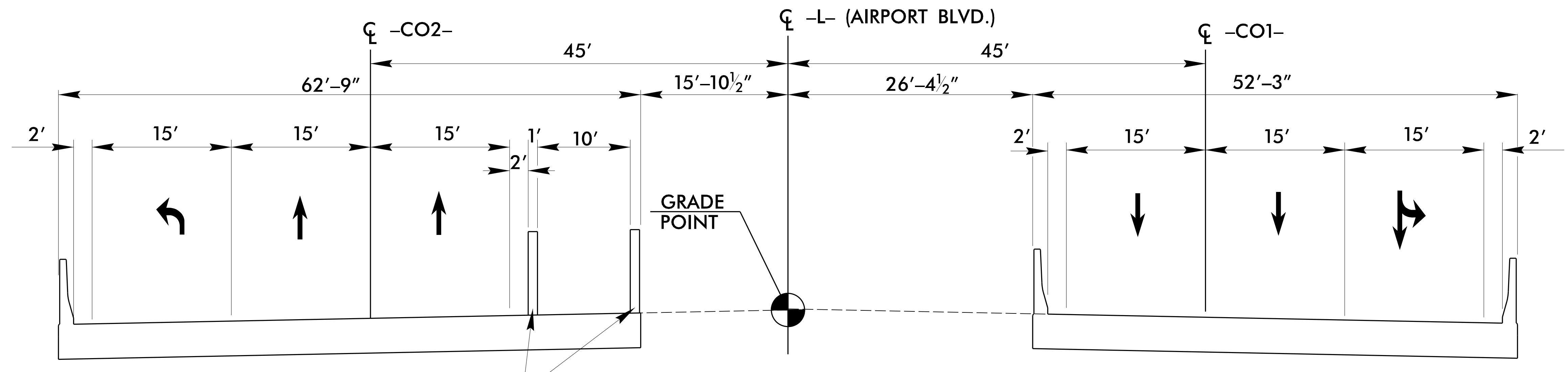
PAVEMENT SCHEDULE	
C2	3" S9.5B
C4	1 1/2" S9.5C
C6	3" S9.5C
D2	3" I19.0C
D3	4" I19.0C
E1	4" B25.0C
E3	5 1/2" B25.0C
J1	8" ABC
K	8" CHEM. STAB.
K1	8" CL. IV SUB. STAB.
N	GEOTEXTILE
R1	2'-6" C&G
S	4" CONC. SW
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

11/27/2019 11:58:10 AM Relu_psh02A-6_Typ.dgn

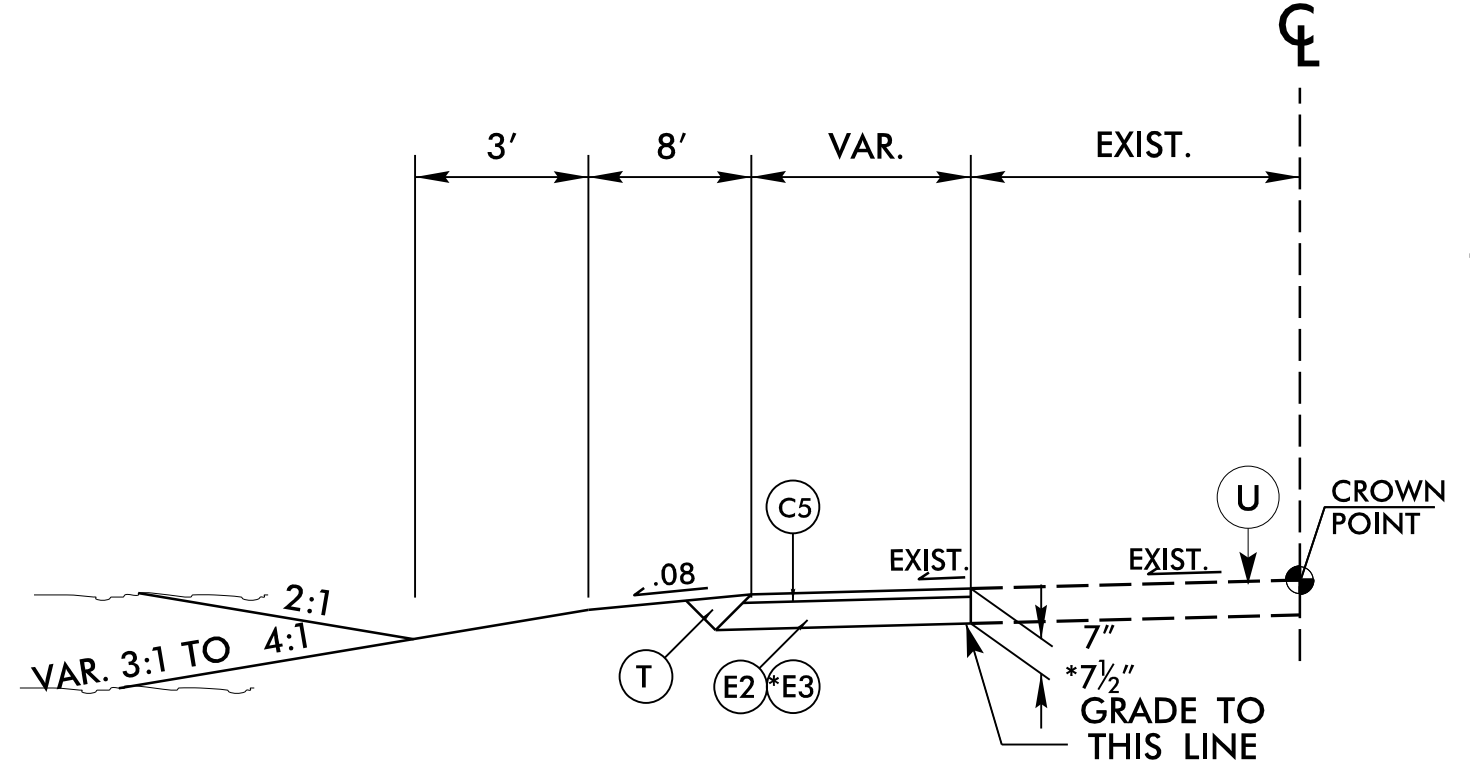


TYPICAL SECTION NO. 15
 USE TYPICAL SECTION NO. 15
 -NBLRPA- STA. 12+29.11 TO 17+47.62

PAVEMENT SCHEDULE	
C2	3" S9.5B
C5	2" S9.5C
D1	2 1/2" I19.0C
E1	4" B25.0C
E2	5" B25.0C
E3	5 1/2" B25.0C
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING




TYPICAL SECTION NO. 16
 -L- (AIRPORT BOULEVARD)
 USE TYPICAL SECTION NO. 16
 -L- STA. 42+64.95 (BEG. BR.) TO 45+70.45 (END BR.) LT.
 -L- STA. 42+99.97 (BEG. BR.) TO 46+05.47 (END BR.) RT.

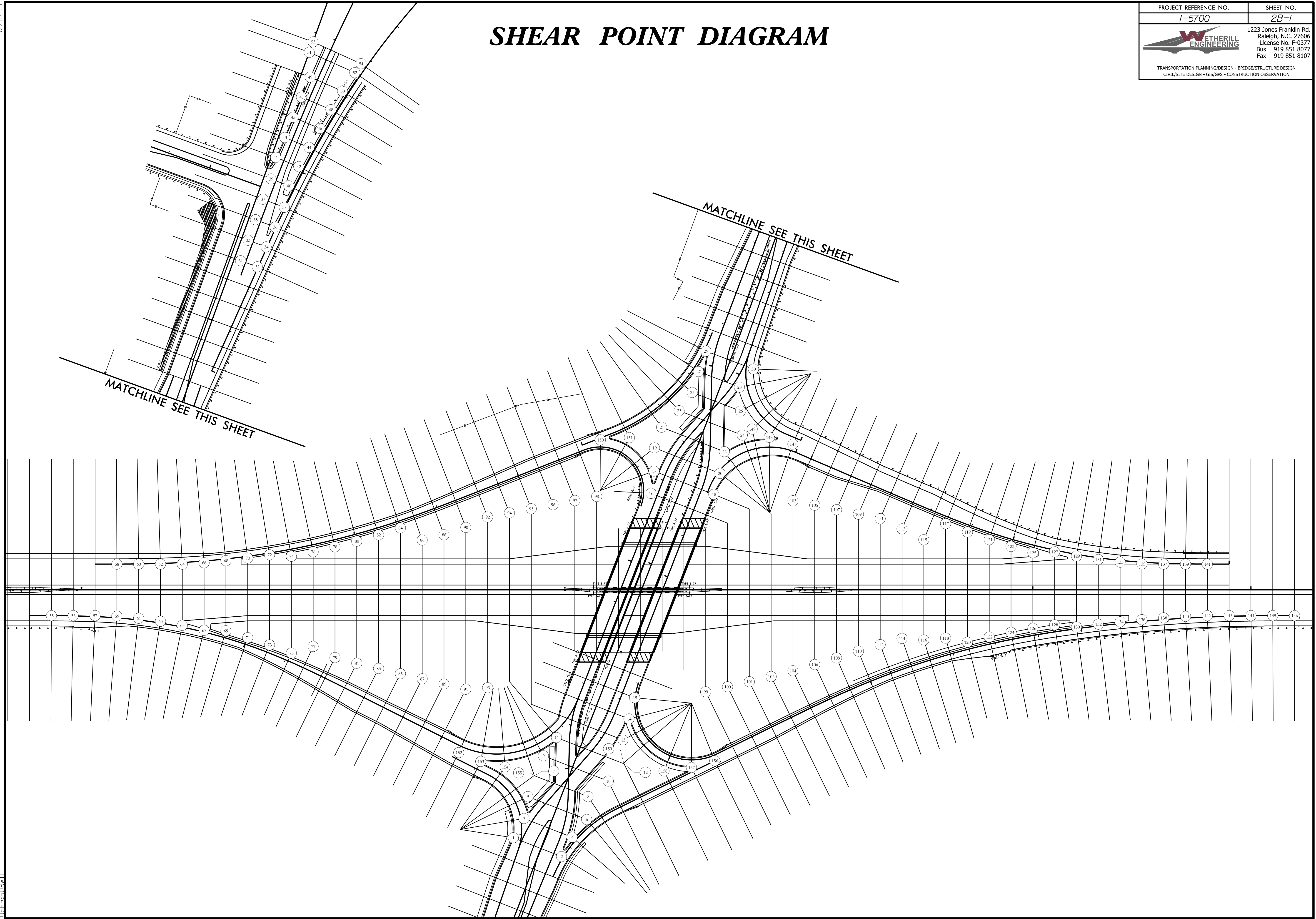


TYPICAL SECTION NO. 17
 TEMPORARY PAVEMENT (SEE TCP PLANS FOR LOCATIONS)
 *-L- RT. STA. 30+38.23 +/- TO STA. 34+17.69 +/- (INVERT TYP.)
 *-L- RT. STA. 37+61.08 +/- TO STA. 38+80.52 +/- (INVERT TYP.)
 *-L- RT. STA. 48+19.94 +/- TO STA. 51+98.71 +/- (INVERT TYP.)
 -RPA- RT. STA. 21+13.48 +/- TO STA. 21+76.75 +/- (INVERT TYP.)
 *-L- LT. STA. 46+88.49 +/- TO STA. 47+53.49 +/-
 -RPCSPUR- RT. STA. 21+25.00 +/- TO -L- LT. STA. 39+00.00 +/-
 -RPBSPUR- RT. STA. 10+67.53 +/- TO -L- LT. STA. 48+50.00 +/- (INVERT TYP.)
 -RPCSPUR- RT. STA. 21+13.46 +/- TO -L- LT. STA. 21+75.75 +/- (INVERT TYP.)
 -RPDSPUR- RT. STA. 10+61.02 +/- TO STA. 13+32.00 +/- (INVERT TYP.)
 -RPB- RT. STA. 17+00.00 +/- TO STA. 18+65.00 +/- (INVERT TYP.)
 -RPA- RT. STA. 20+85.00 +/- TO STA. 21+95.00 +/- (INVERT TYP.)
 -C_EY1_RPD- LT. STA. 10+78.00 +/- TO STA. 20+86.79 +/-

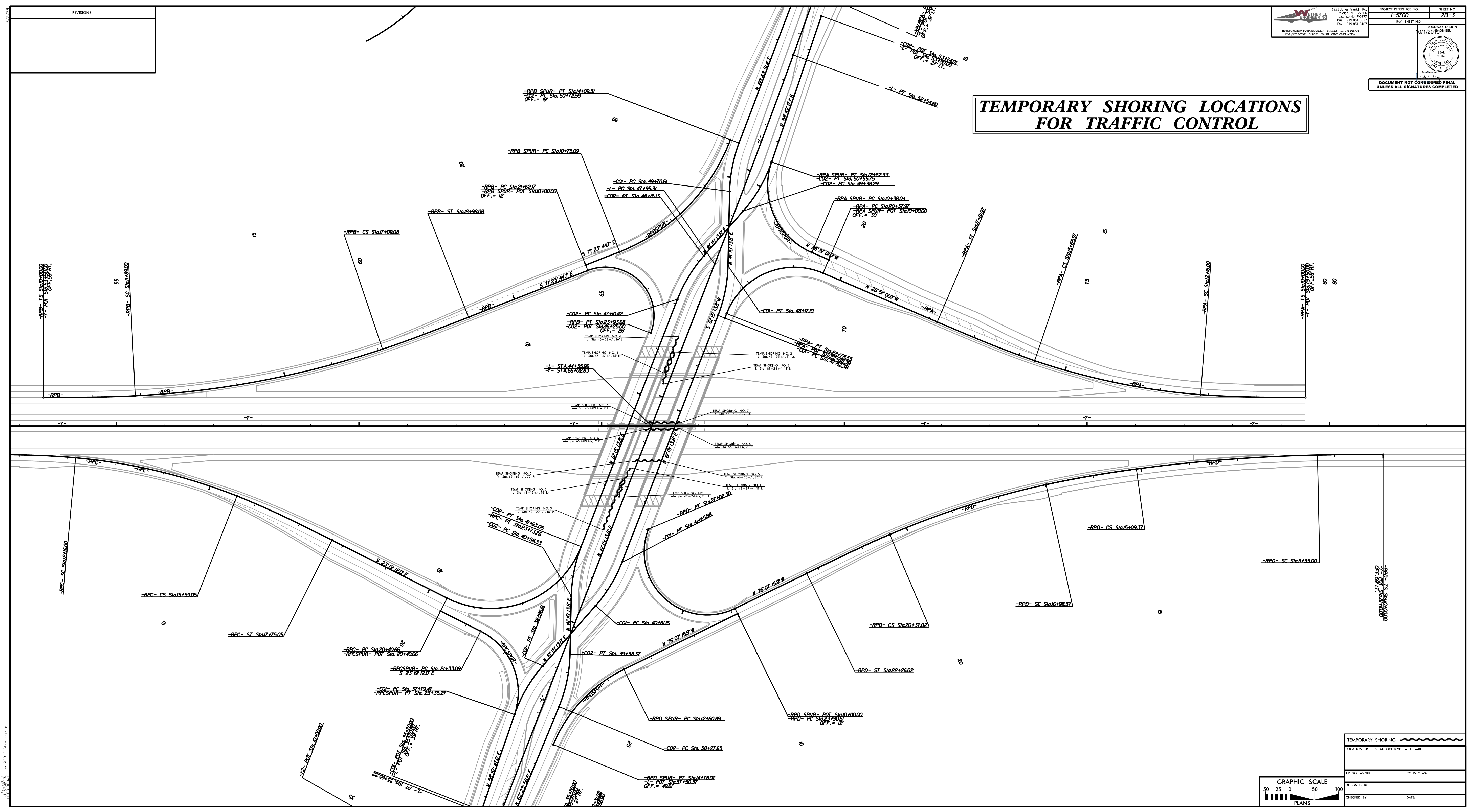
5/28/99

SHEAR POINT DIAGRAM

PROJECT REFERENCE NO.	SHEET NO.
1-5700	2B-1
	
1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION	



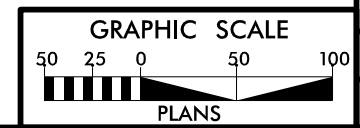
7/2/2008 Relu_psh02B-1_SPD.dgn



NO.	REVISIONS

<p>1223 SIVAS FURNACE RD. FARMERS, AL. 37066 PHONE NO. 60777 BUS. 939 851 8077 FAX. 939 858 8107</p>	PROJECT REFERENCE NO.	SHEET NO.
	7-5700	28-3
TRANSPORTATION PLANNING DESIGN & RECONSTRUCTION DESIGN CONSTRUCTION DESIGN - CONTRACTOR PREPARATION	REV. SHEET NO.	DATE
	0/1/2018	

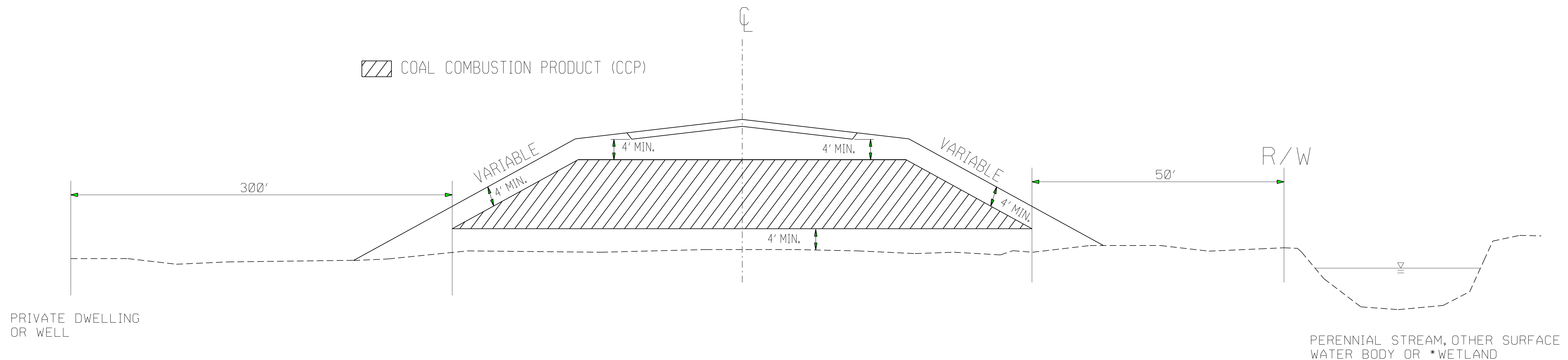
TEMPORARY SHORING LOCATIONS FOR TRAFFIC CONTROL



TEMPORARY SHORING	
LOCATION: SR 3015 (AIRPORT BLVD) WITH I-40	
TP NO. 1-5700	COUNTY: WAKE
DESIGNED BY:	
CHECKED BY:	
	DATE:

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

COAL COMBUSTION PRODUCT PLACEMENT



PRIVATE DWELLING OR WELL

PERENNIAL STREAM, OTHER SURFACE WATER BODY OR *WETLAND

*(OBTAIN PERMISSION FROM ARMY CORPS OF ENGINEERS)

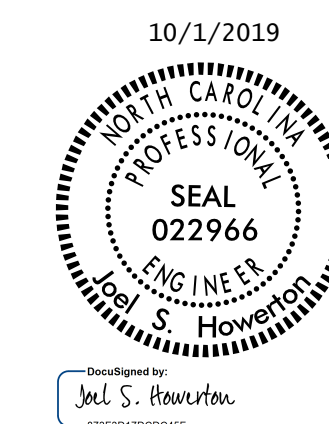
PLACE CCP IN HATCHED AREA IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS

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

PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

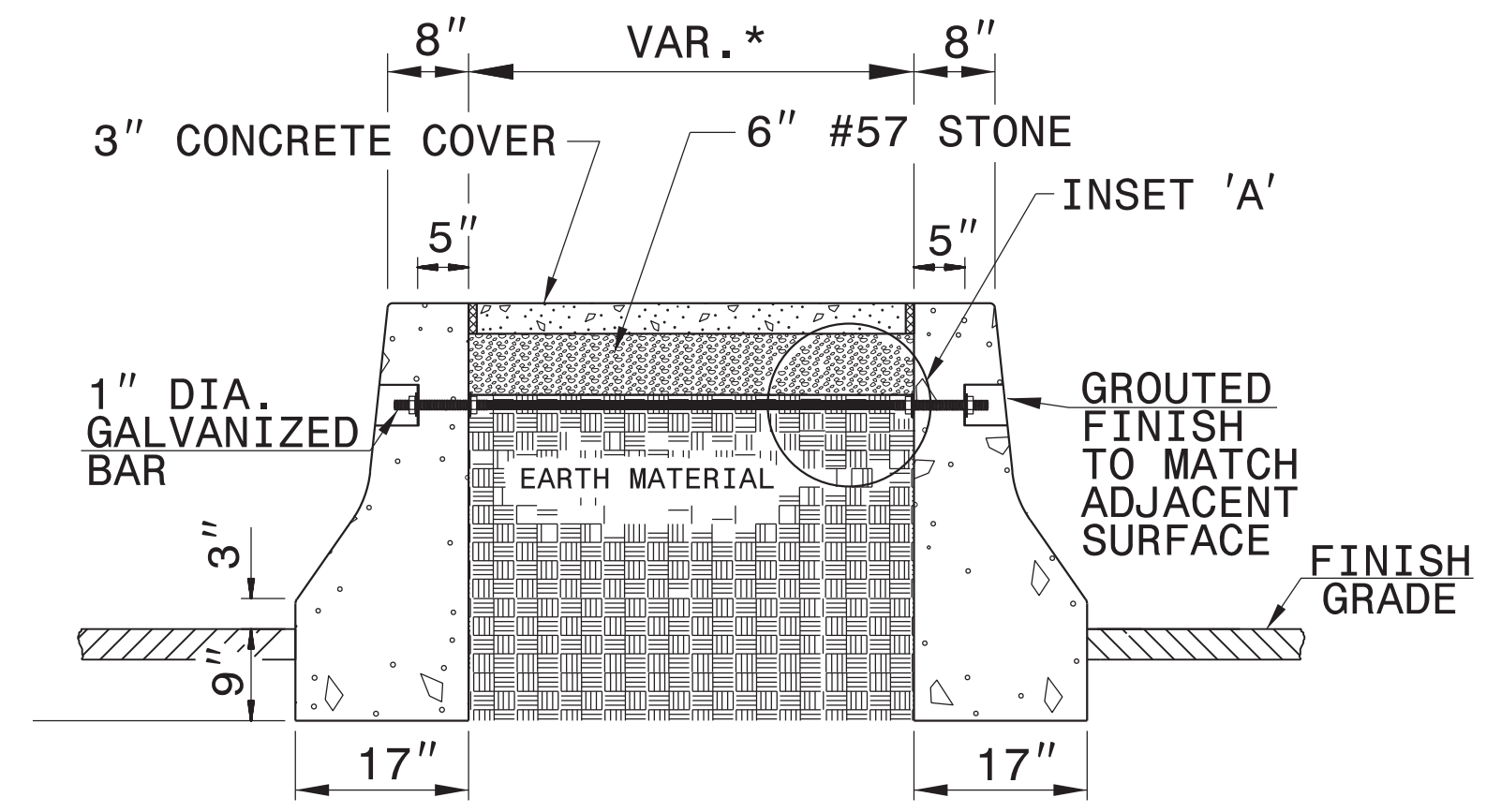
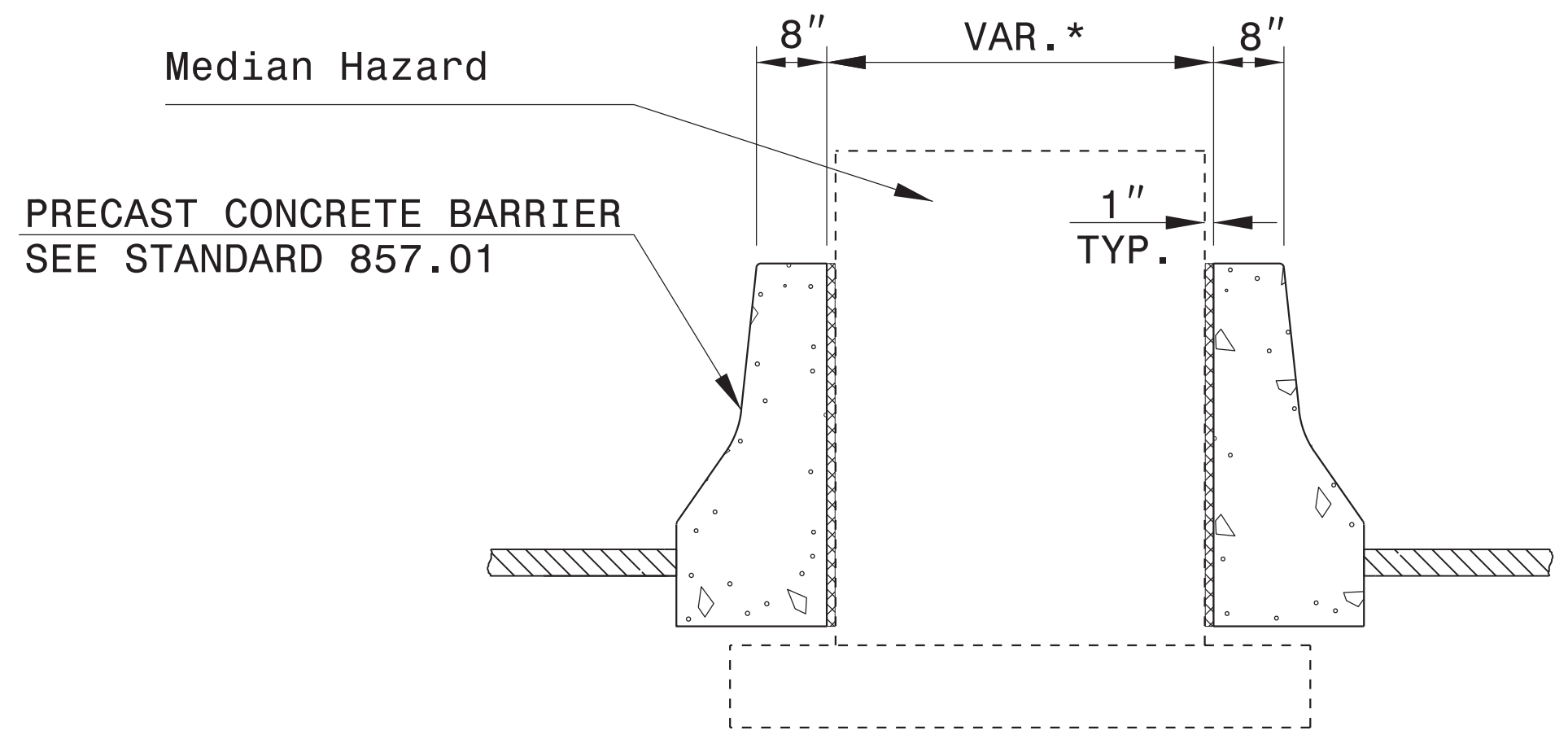
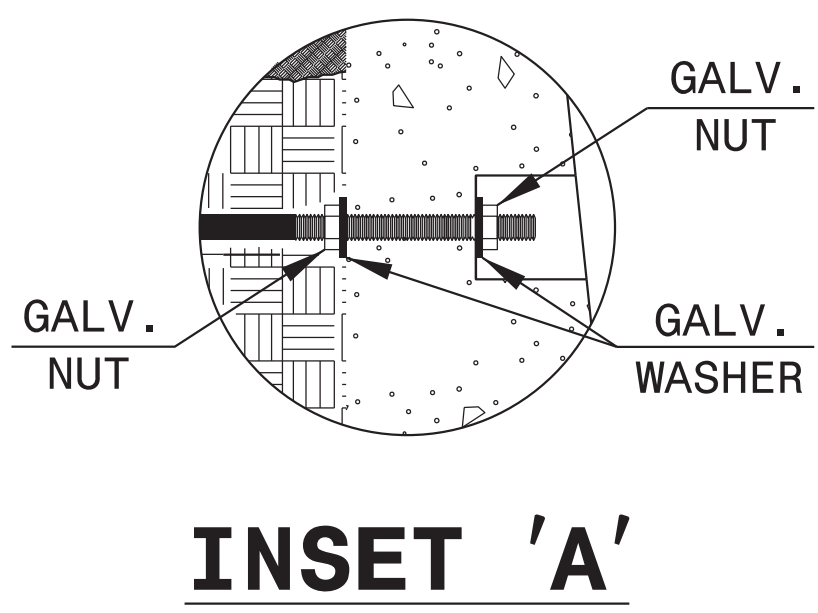
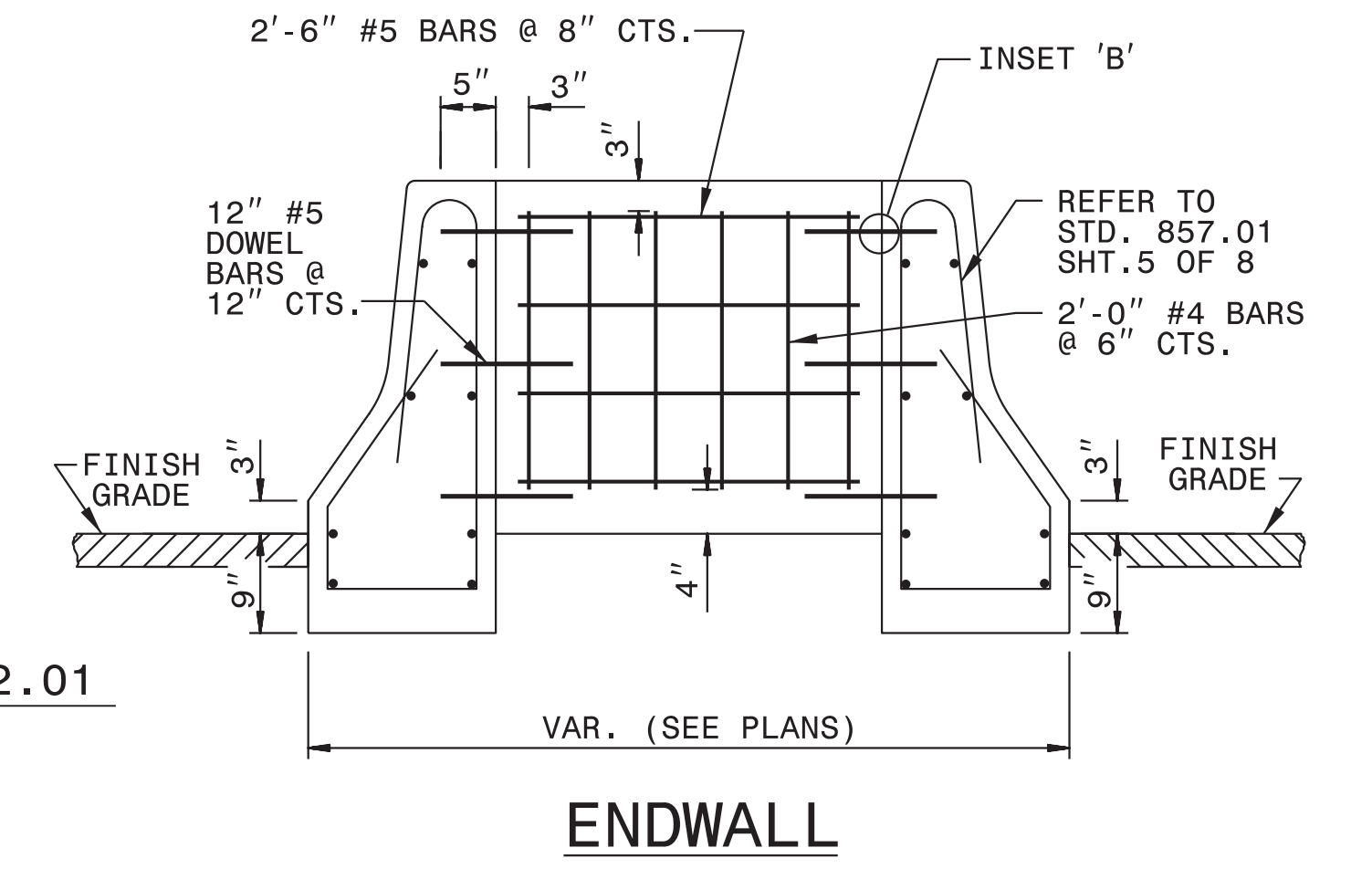
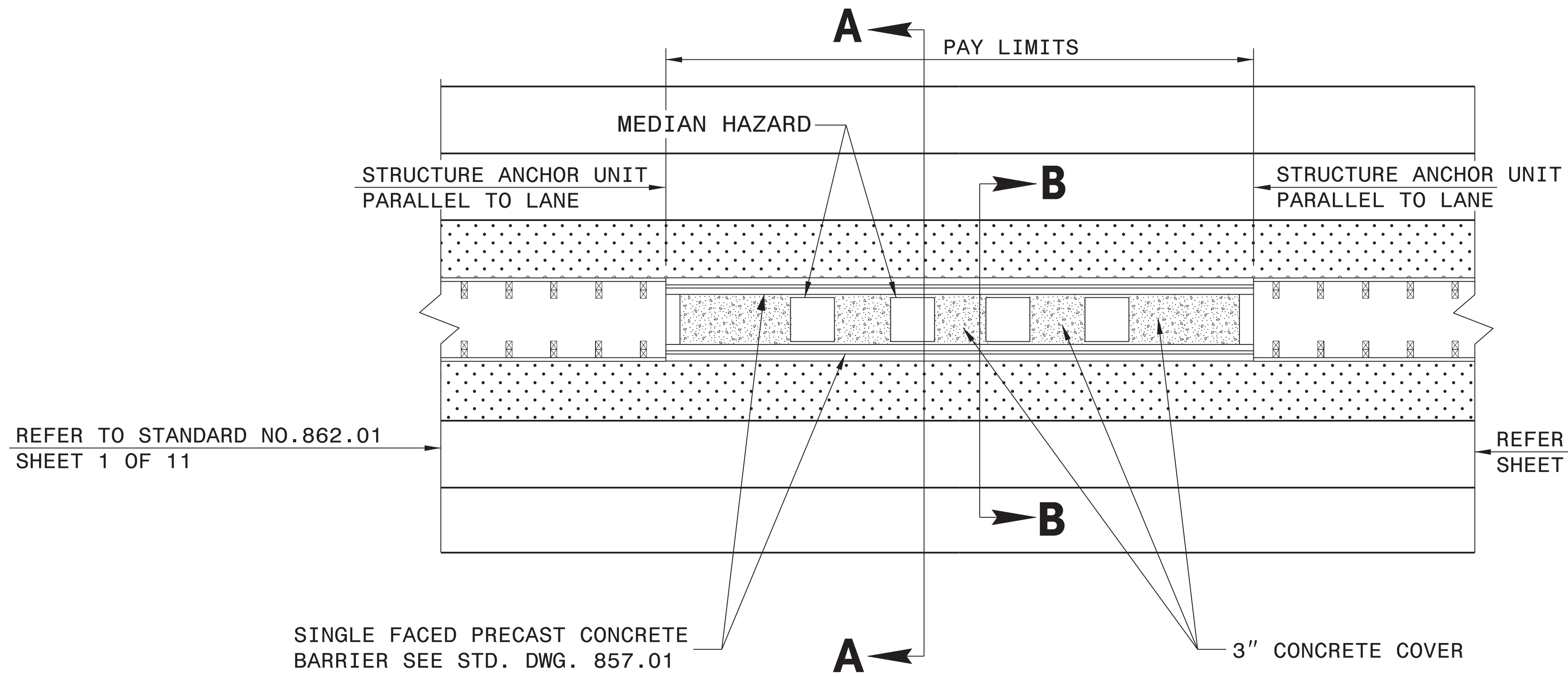
PLACE SOIL BORROW MATERIAL ON THE OUTSIDE OF CCP AS EACH LIFT OF CCP IS PLACED

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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\Projects\Special Details\Howerton\Coal Combustion Product Detail.dgn Howerton AT USD-232595

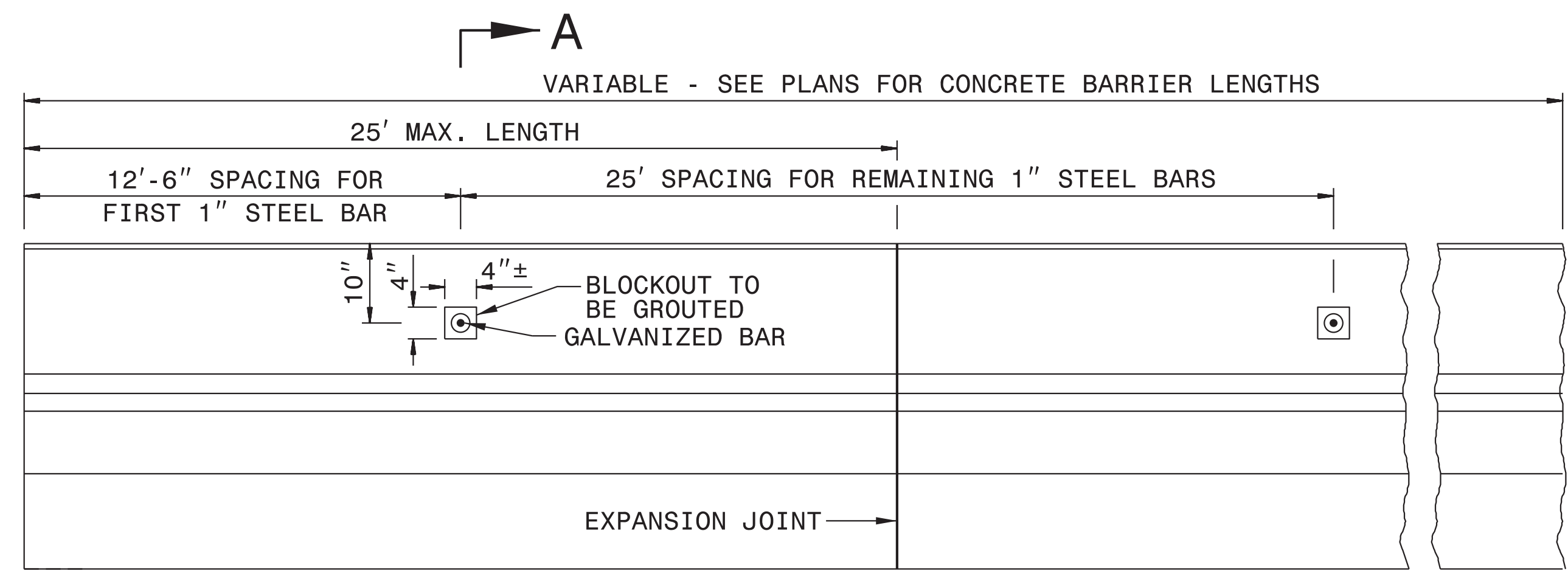


SECTION A-A

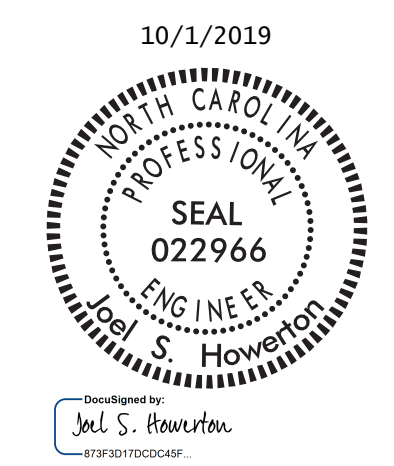
SECTION B-B

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



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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: ;howerton\Barrier Cover for Median Hazard Protection

I5-NOV-2017 13:03 S:\Contracts\Special Details\howerton\Barrier Cover for Median Hazard Protection.dgn howerton AT CSD-292595

04-SEP-2018 08:31 S:\Contracts\Special Details\Standard Drawings\Division 8\862D01 Impact Attenuator Sheets 1 and 2.dgn Jhowerton AT USD-292595

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

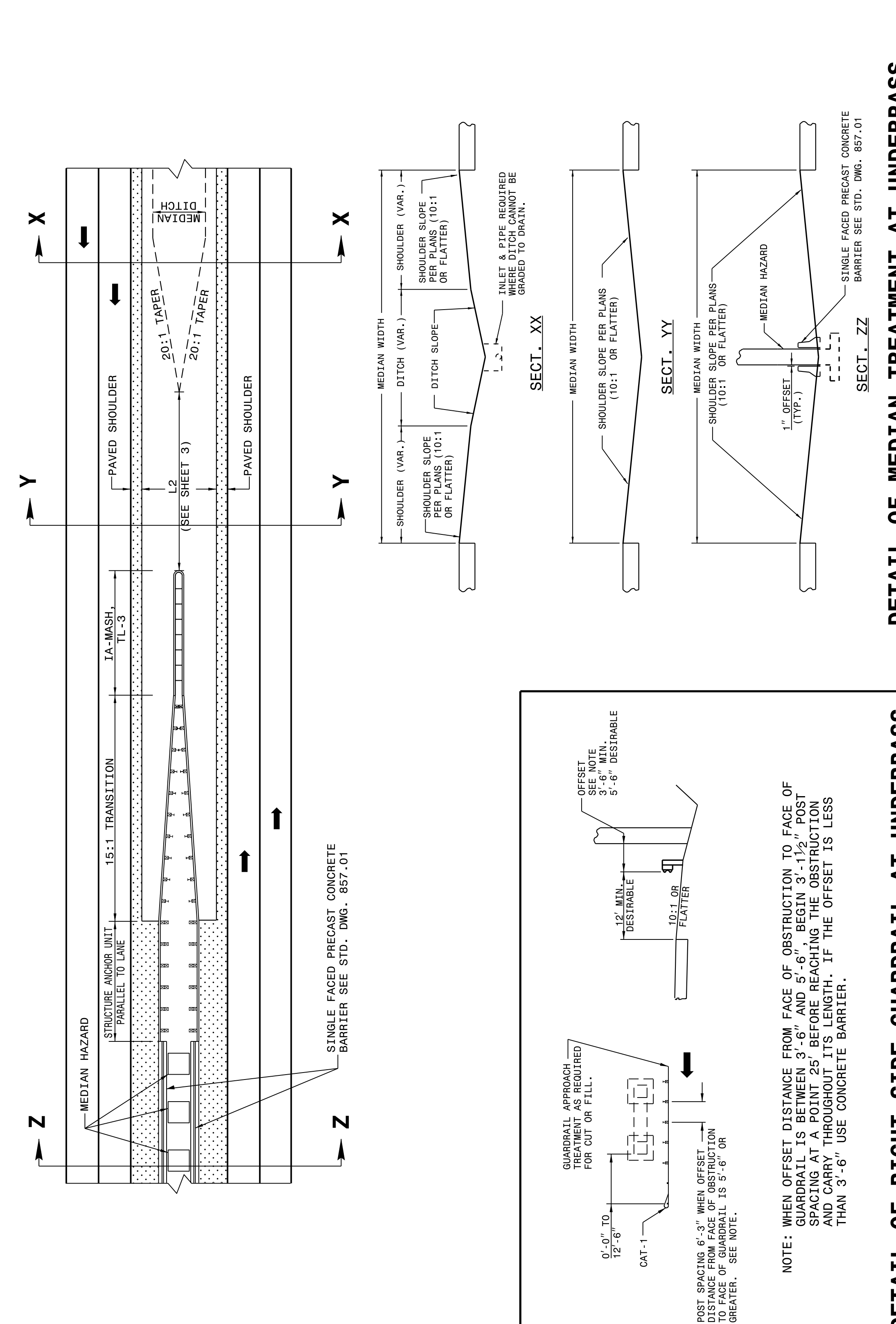
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01



DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS

DETAIL OF MEDIAN TREATMENT AT UNDERPASS

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

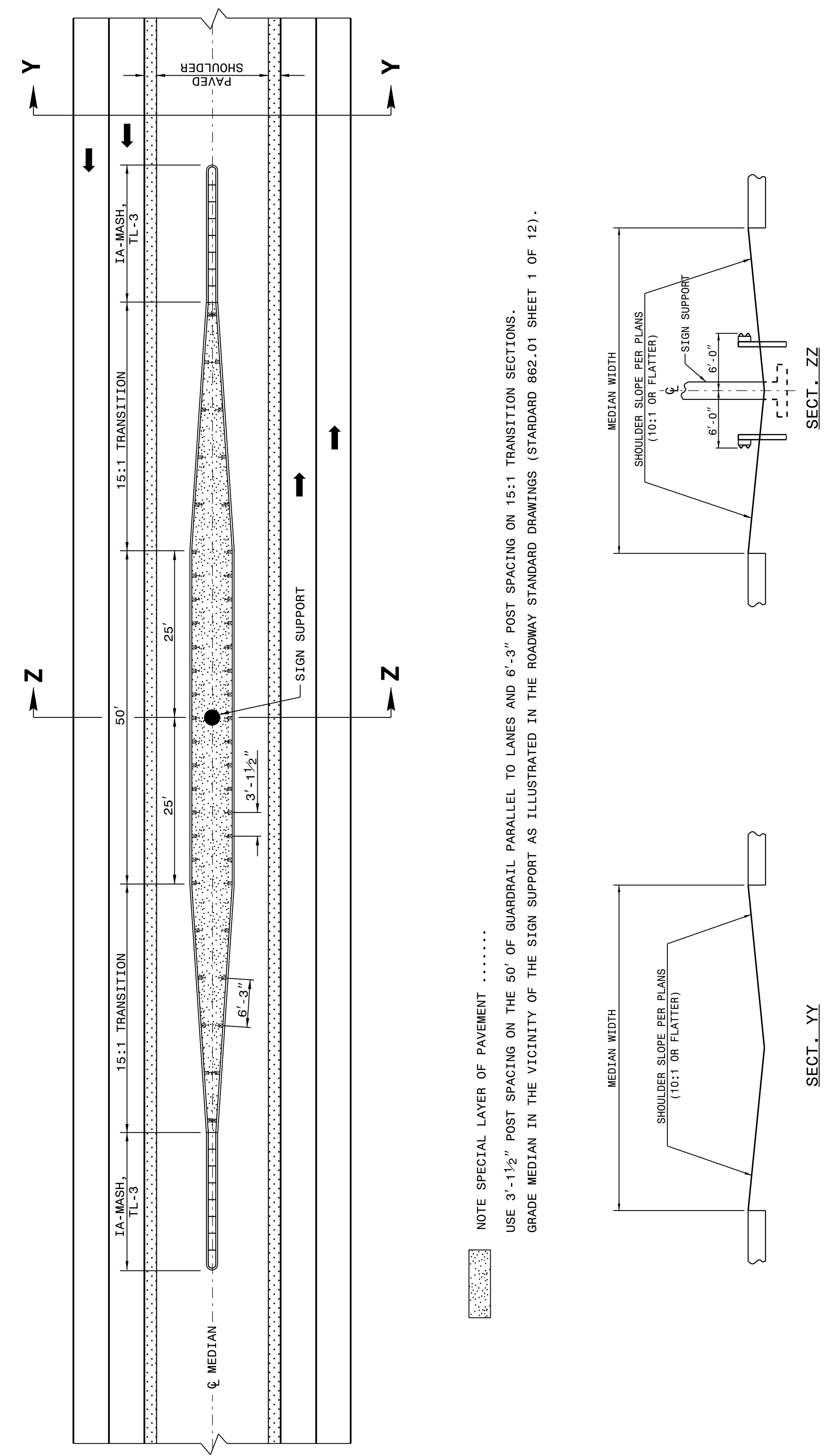
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 11
862D01

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 11
862D01



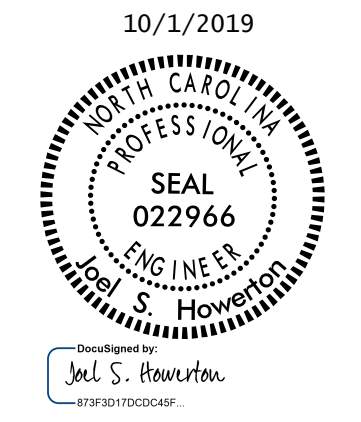
DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

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: 08-23-18
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: DATE:



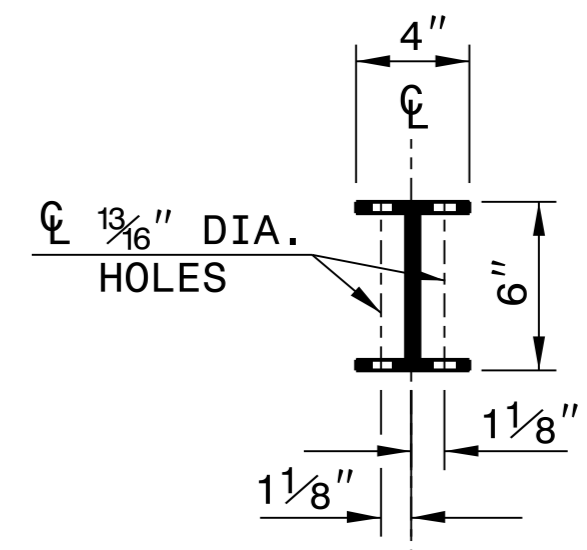
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



STANDARD W-BEAM GUARDRAIL



PLAN



**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

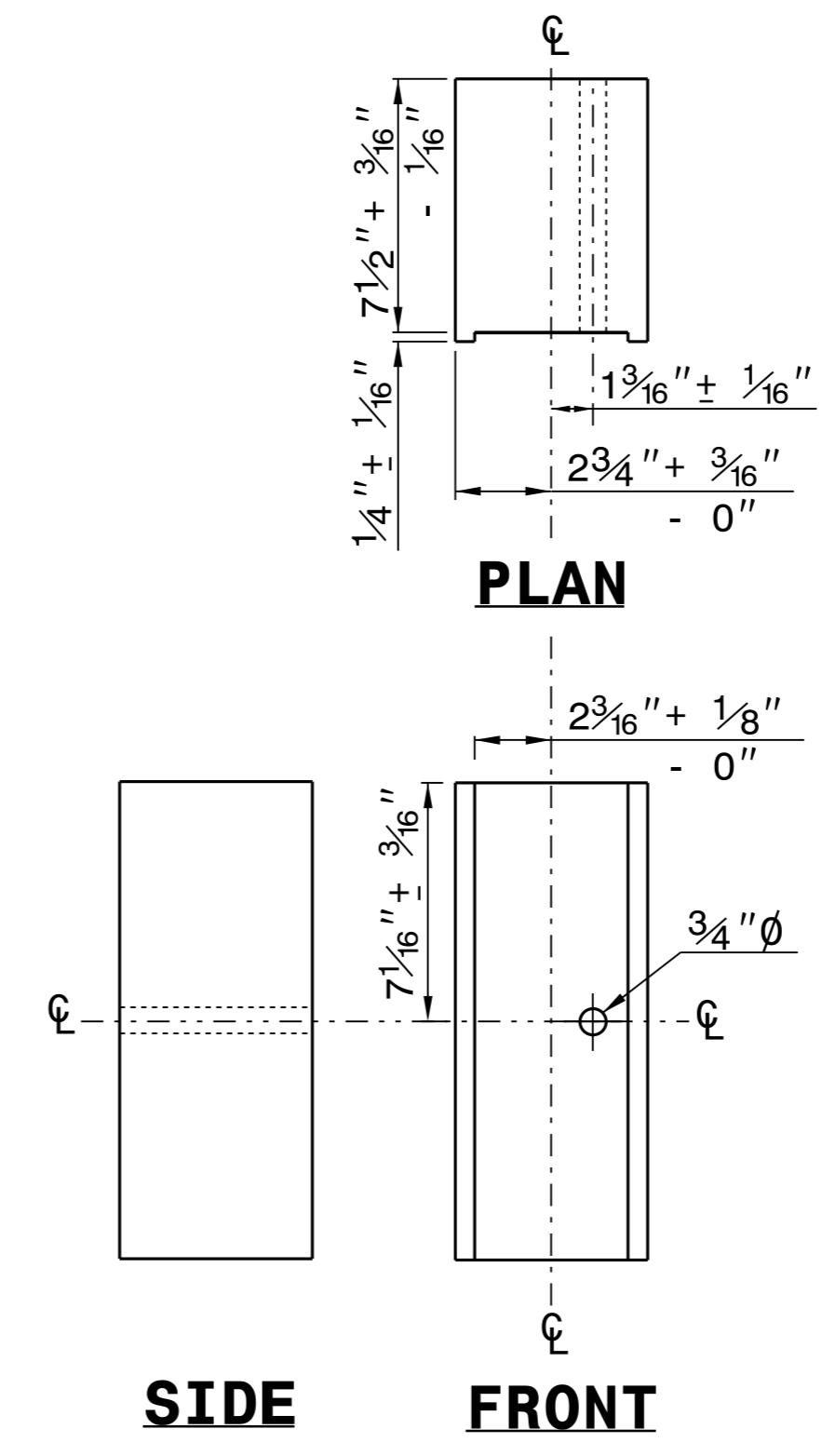
**STANDARD
LINE POST**

**SHORT WOOD
BREAKAWAY POST**



**STEEL TUBE
TS 6"x8"x0.1875"**

SYSTEM PARTS

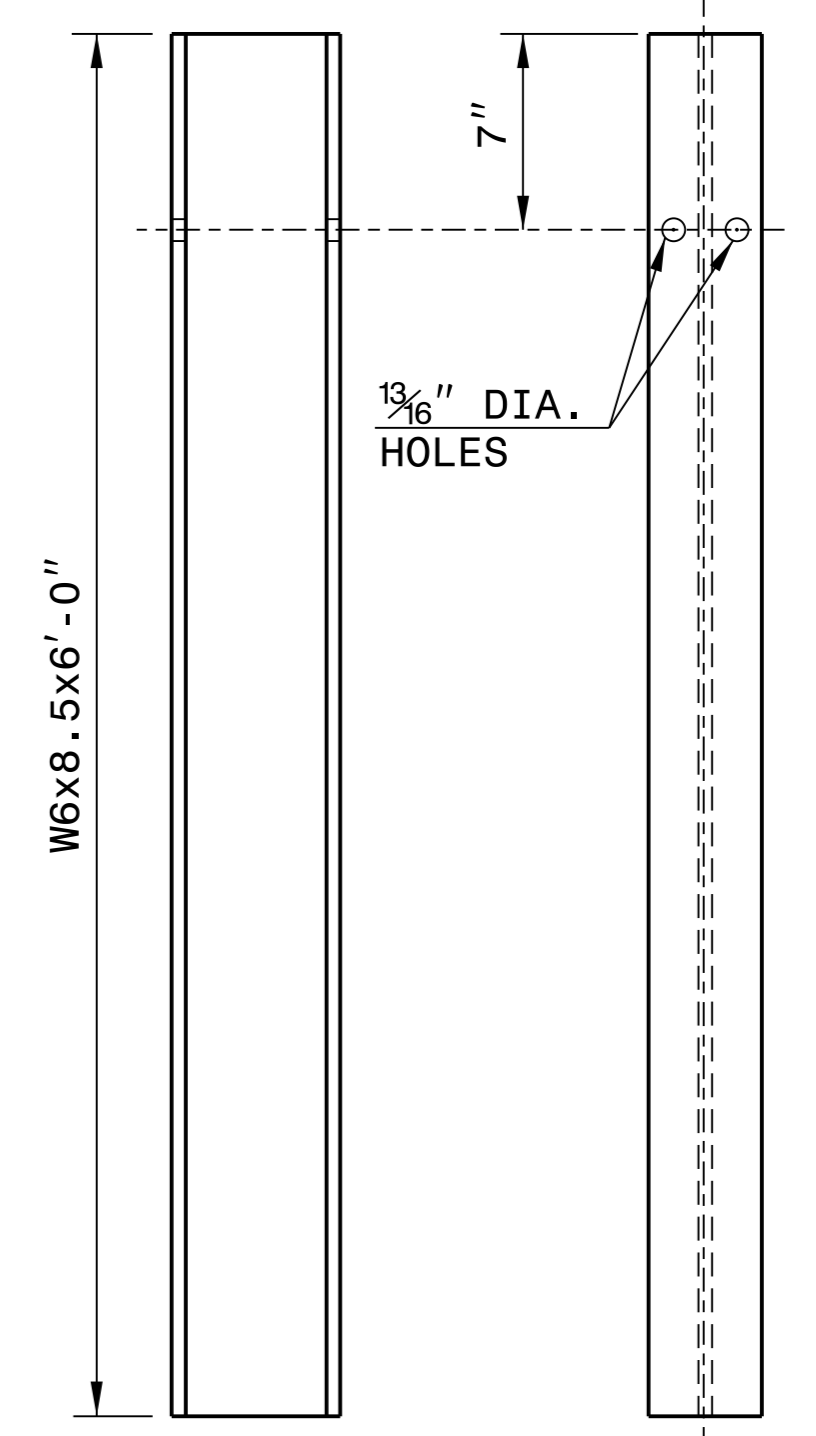


PLAN

SIDE

FRONT

**ROUTED
OFFSET BLOCK**



SIDE

FRONT

"W6" STEEL POST

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



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

SEE TITLE BLOCK

ORIGINAL BY: J. HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE: _____
CHECKED BY: DATE: _____
FILE SPEC.: _____

I4-DEC-2017 10:36
 S:\Contracts\Projects\Special Details\Standard Drawings\Division 8\0862d0301.dgn
 Jhowerton AT: USD-292595

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
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p>NOTE:</p> <ul style="list-style-type: none"> **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER. *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT. -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB. -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER). -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW. -SEE SHEET 3 FOR POST SECTIONS 1 THRU 9. </div> </div>		
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE		

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
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p>NOTE:</p> <ul style="list-style-type: none"> **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER. *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT. -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB. -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER). -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW. -SEE SHEET 3 FOR POST SECTIONS 1 THRU 9. </div> </div>		
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER		

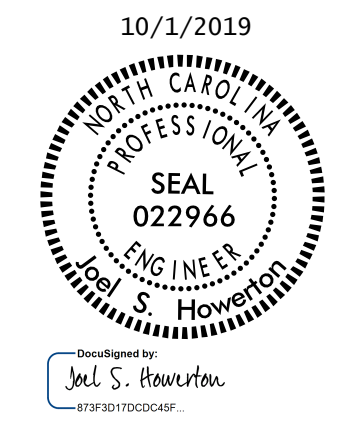
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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.:	



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

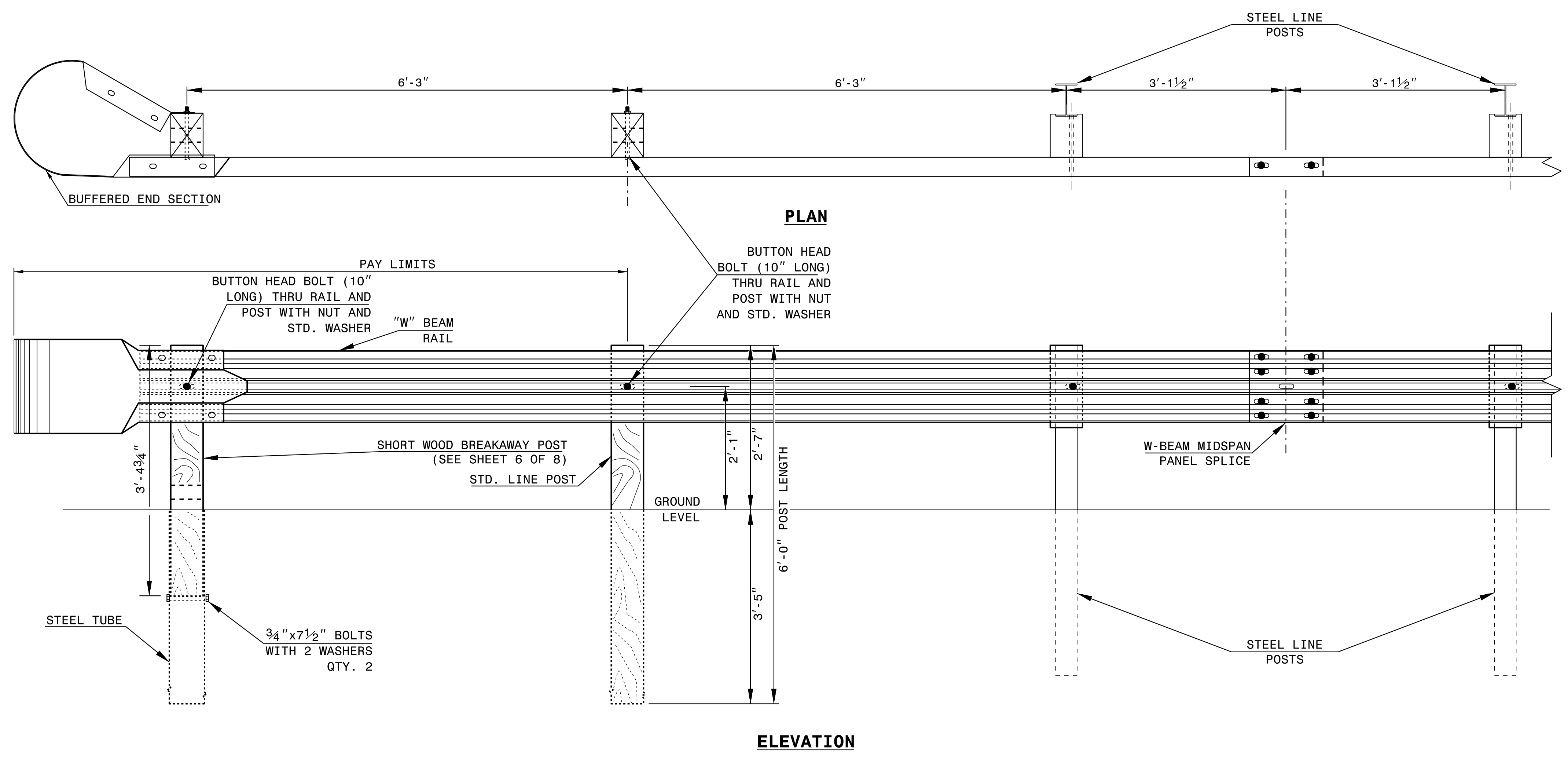
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

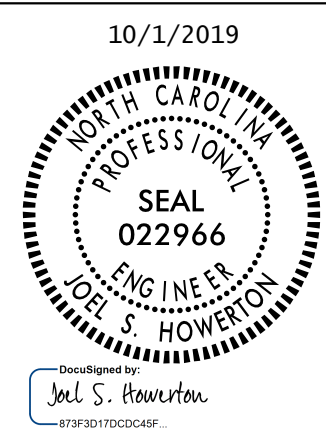
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY
A.T. - 1 SYSTEM

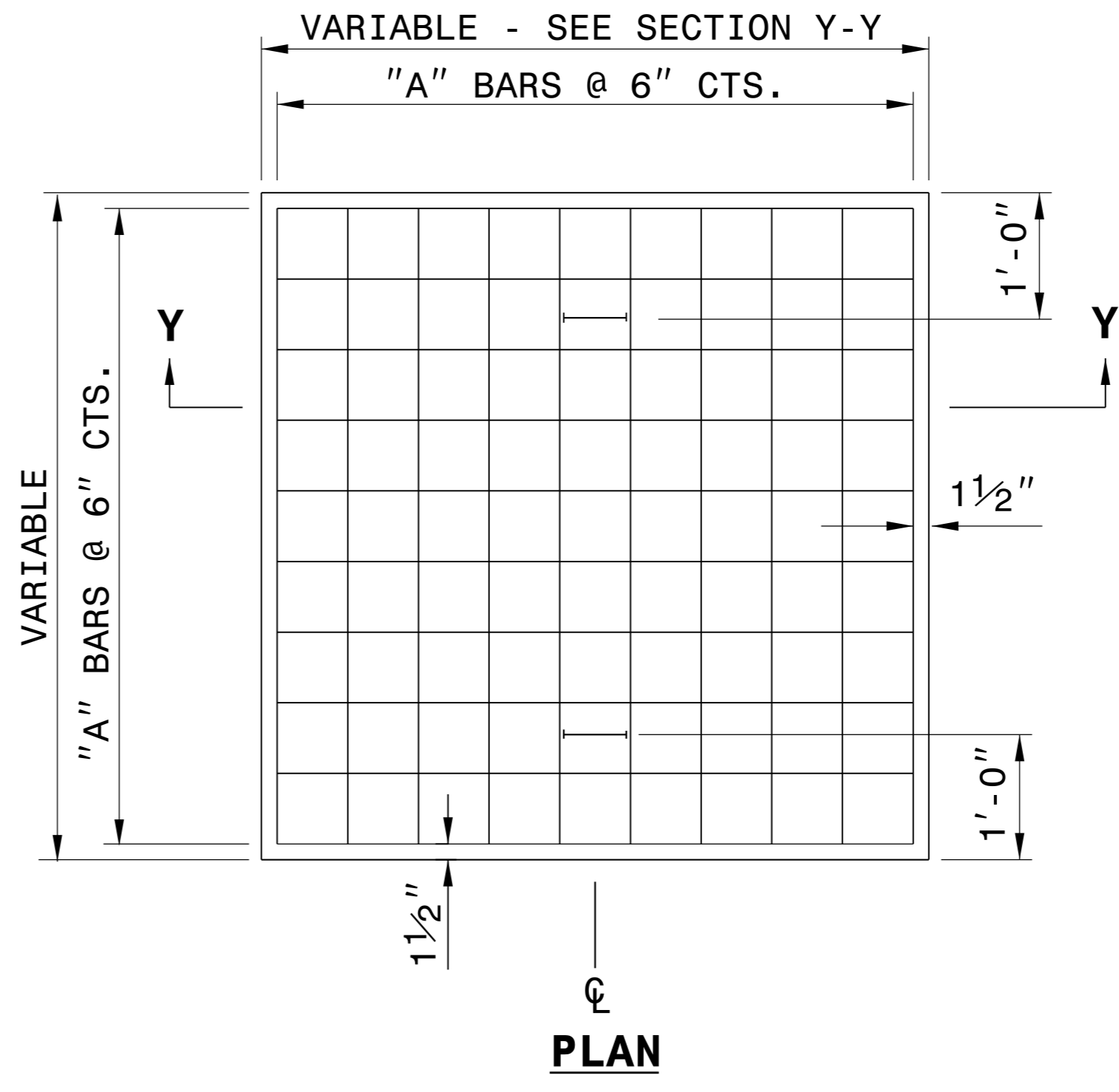
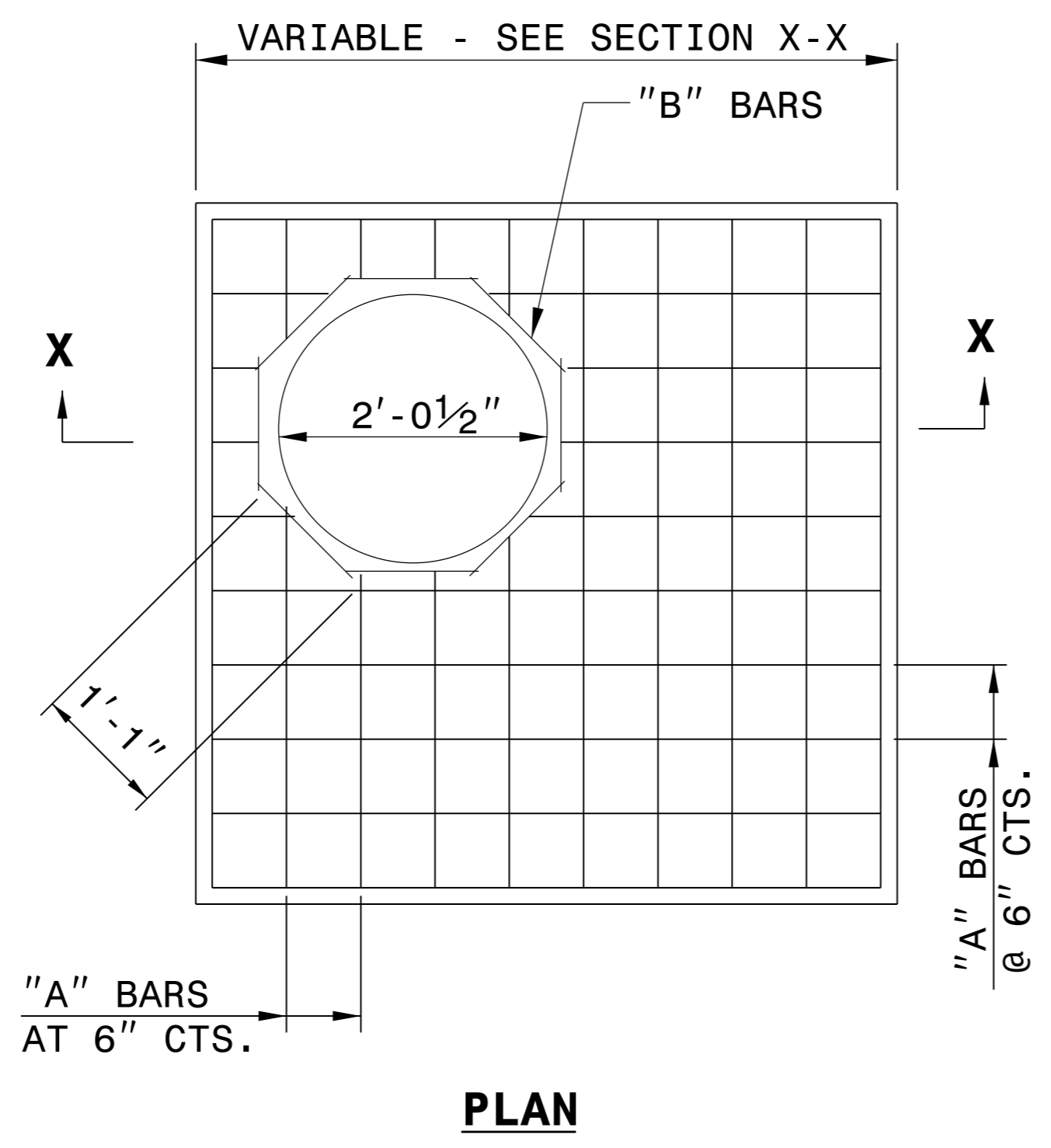
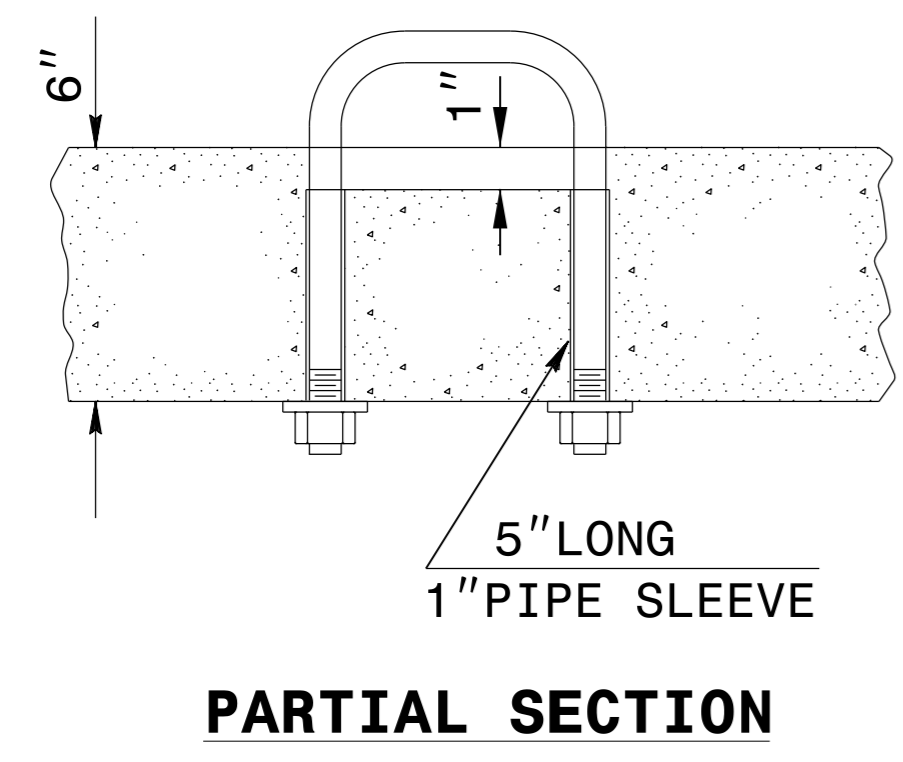


DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

A.T. - 1 SYSTEM

ORIGINAL BY: _____ DATE: _____
 MODIFIED BY: _____ DATE: _____
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: _____

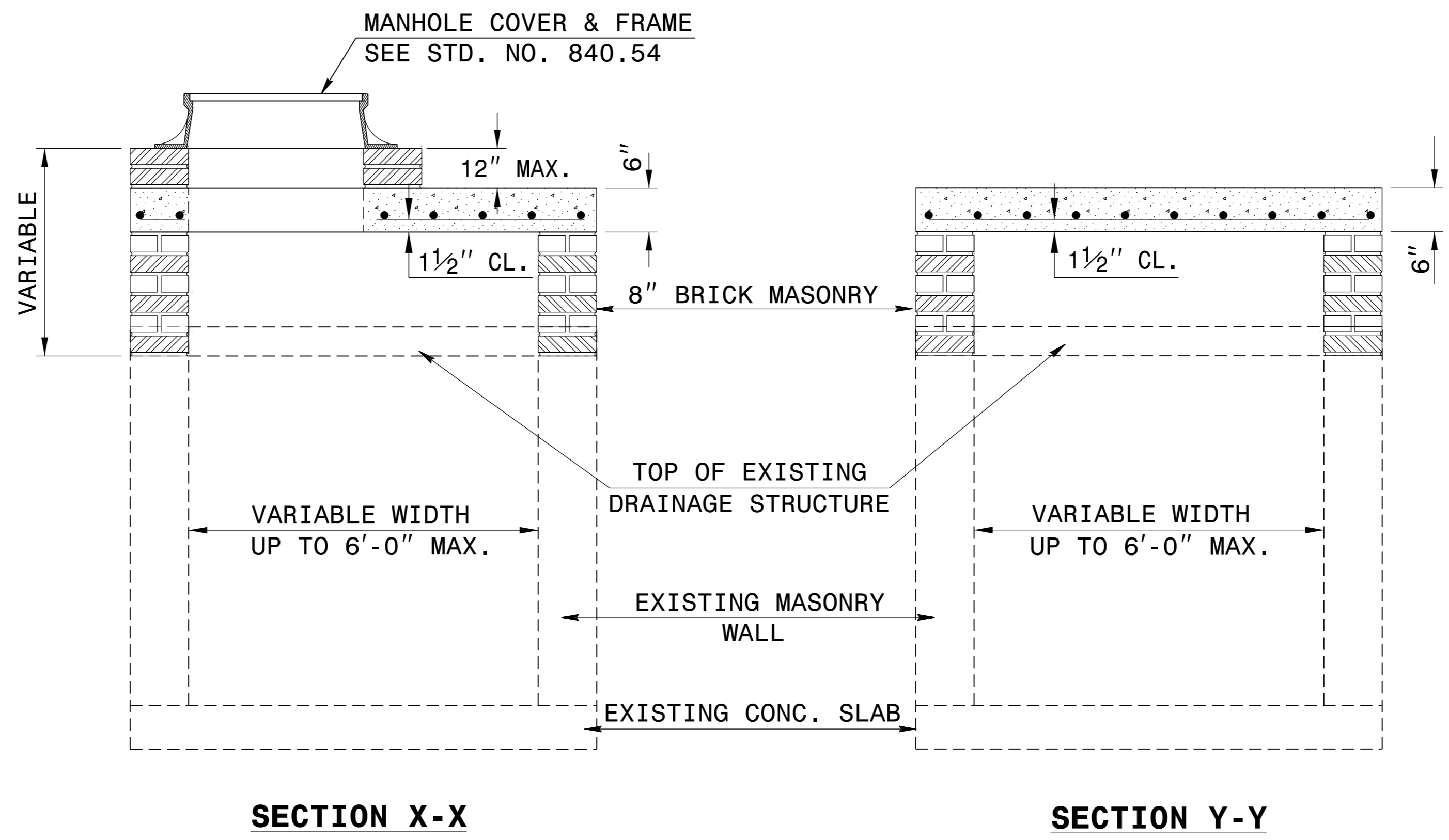
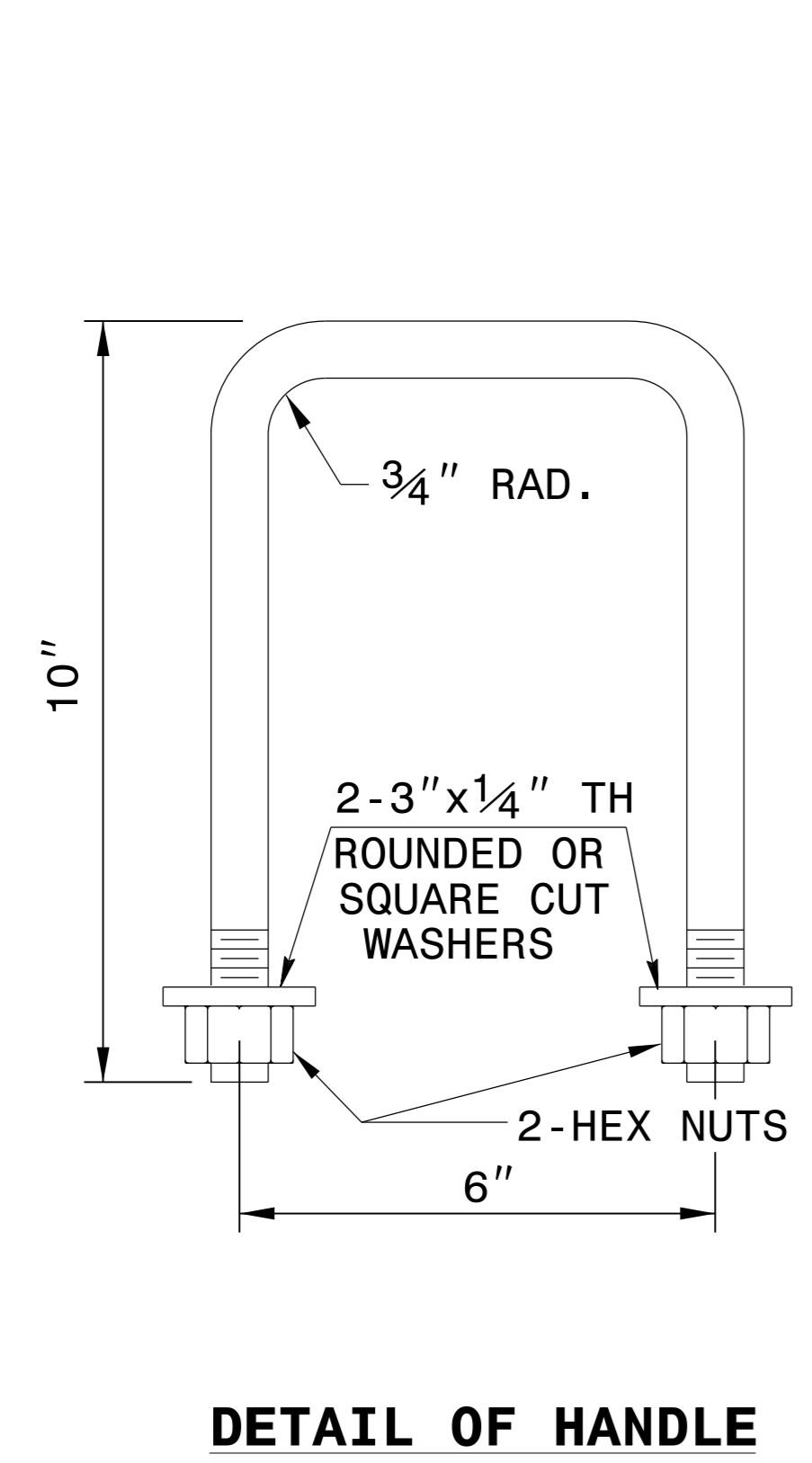


GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

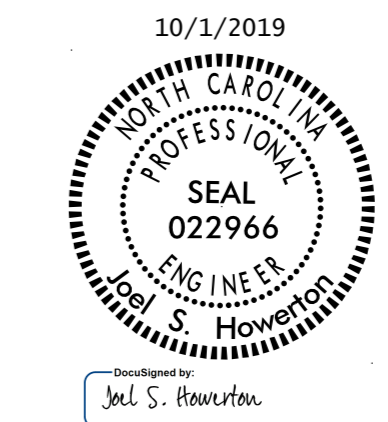
THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.

DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.



BILL OF MATERIALS				
REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *
MASONRY				CU YDS
TOP SLAB CONCRETE CLASS "B"				.4326 *
BRICK MASONRY PER FT HT (MIN)				.4111

*** NOTE:**
 QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.



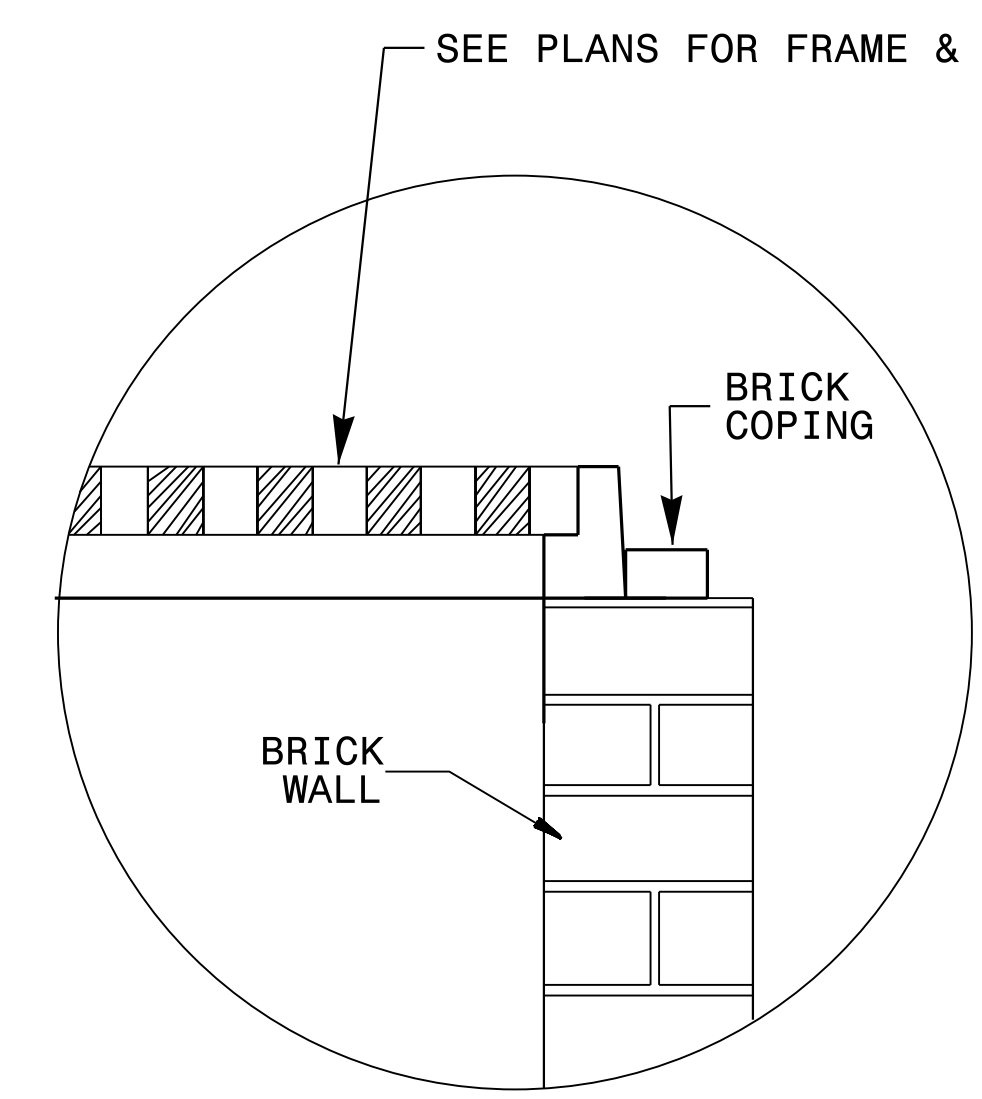
10/1/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

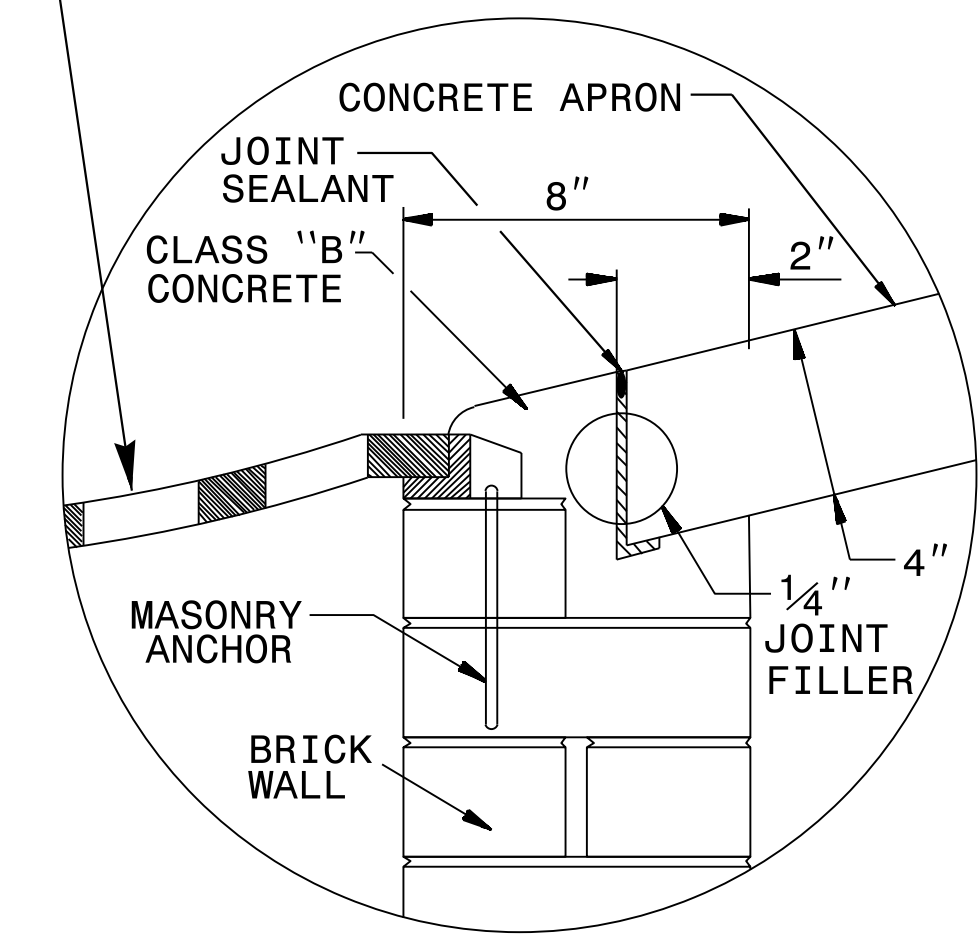
CONTRACT STANDARDS AND DEVELOPMENT UNIT
 Office 919-707-6950 FAX 919-250-4119

DETAIL TO CONVERT EXISTING DI, CB, OTCB or GI TO JUNCTION BOX (MANHOLE OPTIONAL)

ORIGINAL BY: T.S.S. DATE: NOV. 1997
 MODIFIED BY: T.S.S. DATE: FEB. 2000
 CHECKED BY: DATE:
 FILE SPEC.: ds174:/usr/details/stand/boxtojbe.dgn



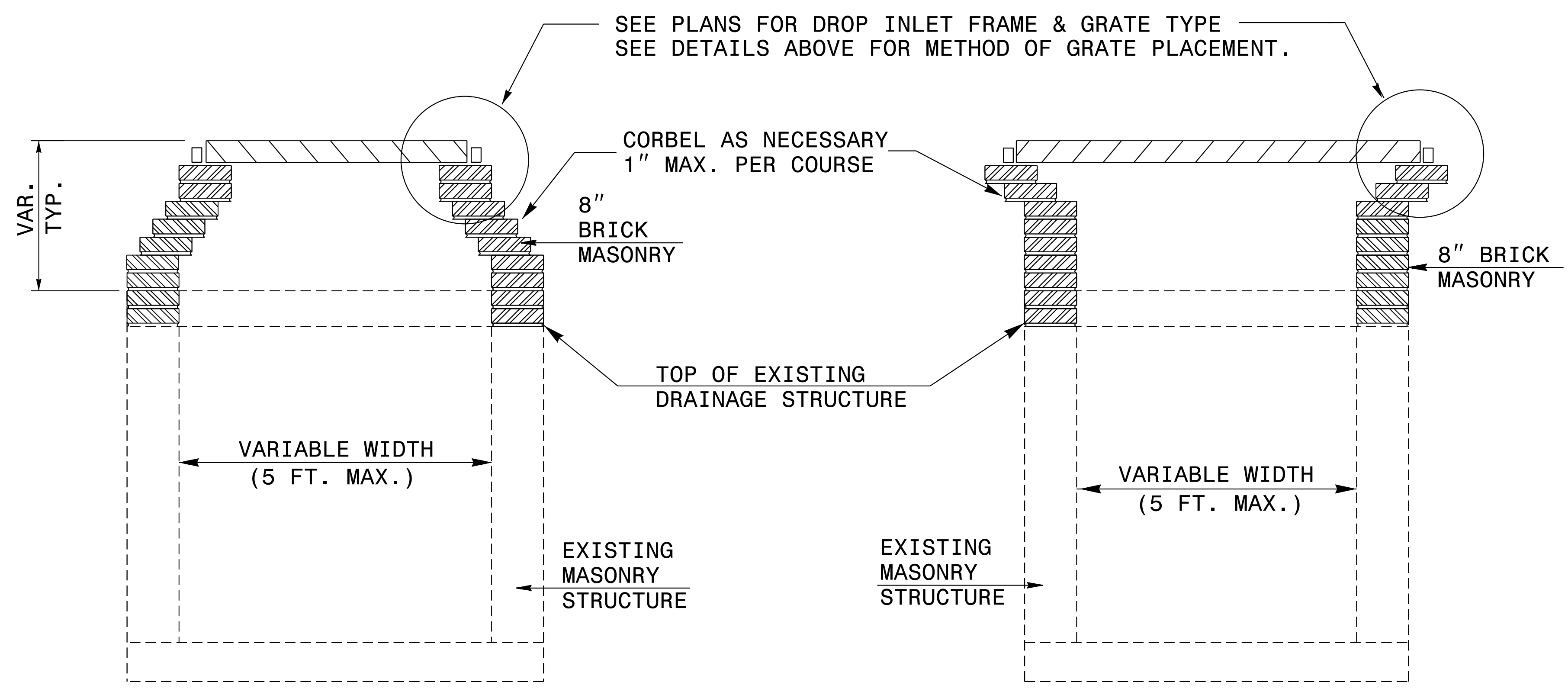
GRATE PLACEMENT DETAIL
FOR DROP INLETS



GRATE PLACEMENT DETAIL
FOR GRATED DROP INLETS

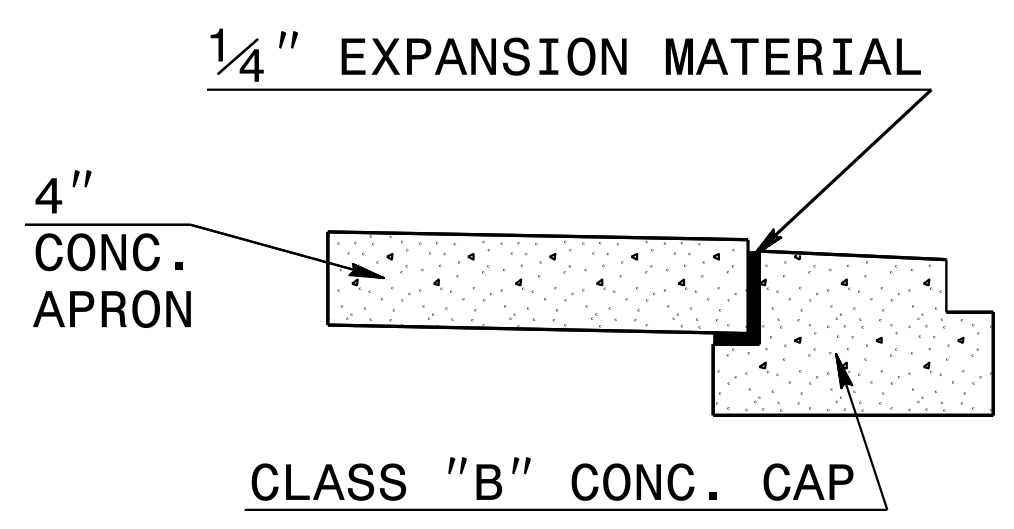
GENERAL NOTES:

- CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.
- USE CLASS B CONCRETE.
- THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.
- JUMBO CONCRETE BRICK WILL BE PERMITTED. 4" CONCRETE BRICK OR 8" SOLID CONCRETE BLOCK ARE REQUIRED FOR DRAINAGE STRUCTURE.
- INCLUDE 18" CONCRETE APRON IN UNIT PRICE BID PER EACH, CONVERT EXISTING CATCH BASIN TO DROP INLET.
- SPECIAL DESIGN IS REQUIRED FOR USE UNDER PAVEMENT.
- CONFIRM DIMENSIONS ON EACH INDIVIDUAL FRAME & GRATE PROPOSAL.
- SEE STD. DRAWING 840.25 FOR MASONRY ANCHORAGE.

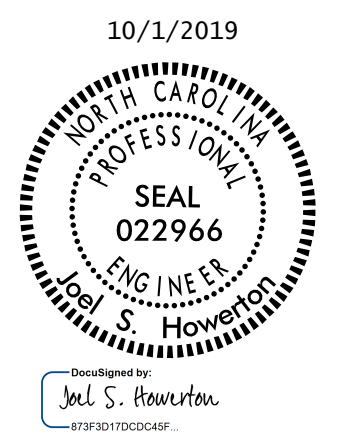


TYPICAL SECTION

TYPICAL SECTION



EXPANSION JOINT DETAIL



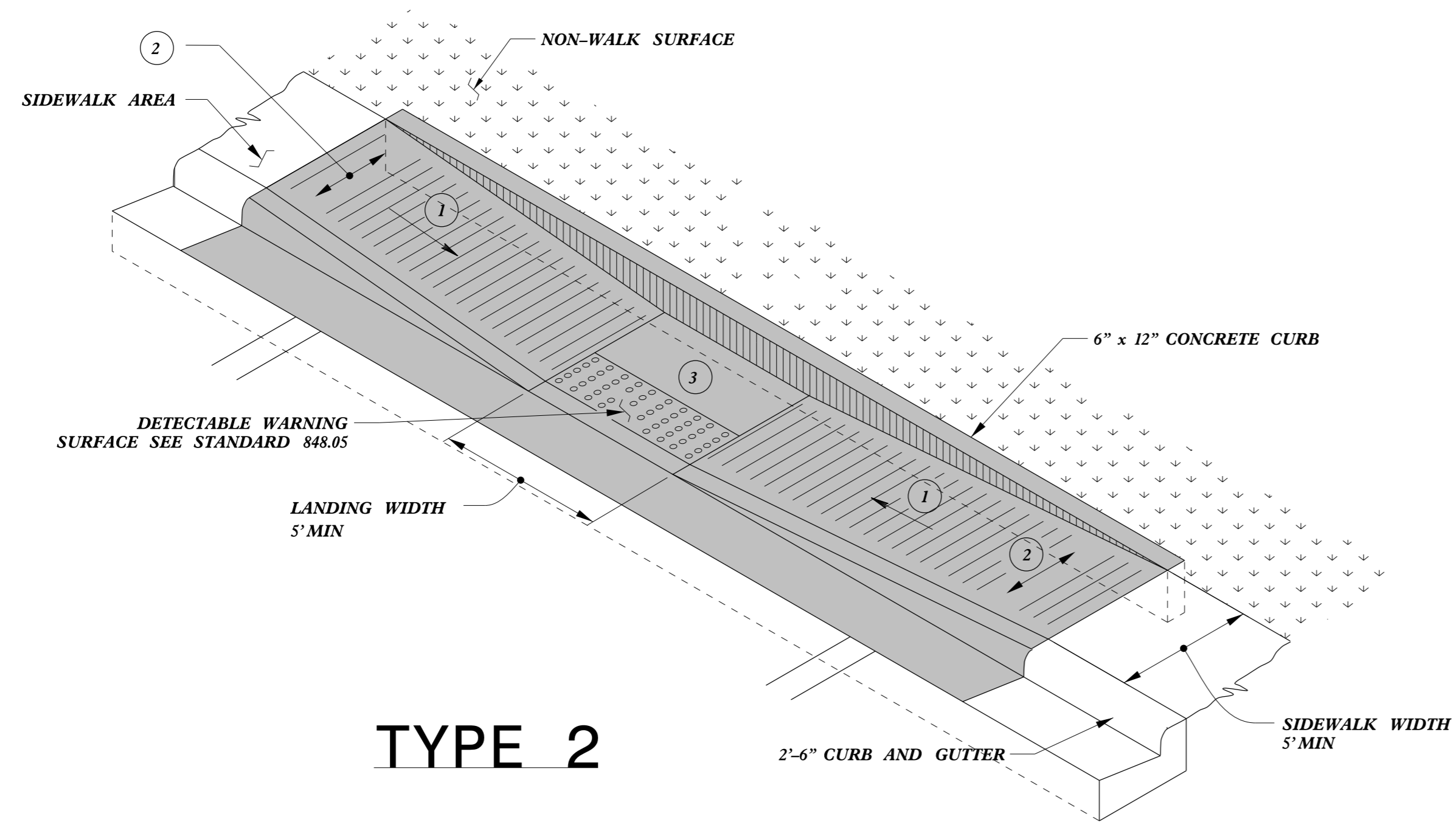
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DETAIL TO CONVERT EXISTING CATCH BASIN OR JUNCTION BOX TO DI OR 2-GI

ORIGINAL BY: T.S.S.	DATE: NOV. 1997
MODIFIED BY: T.S.S.	DATE: FEB. 2000
CHECKED BY:	DATE:
FILE SPEC.: s:usr/details/stand/cbtod102.dgn	

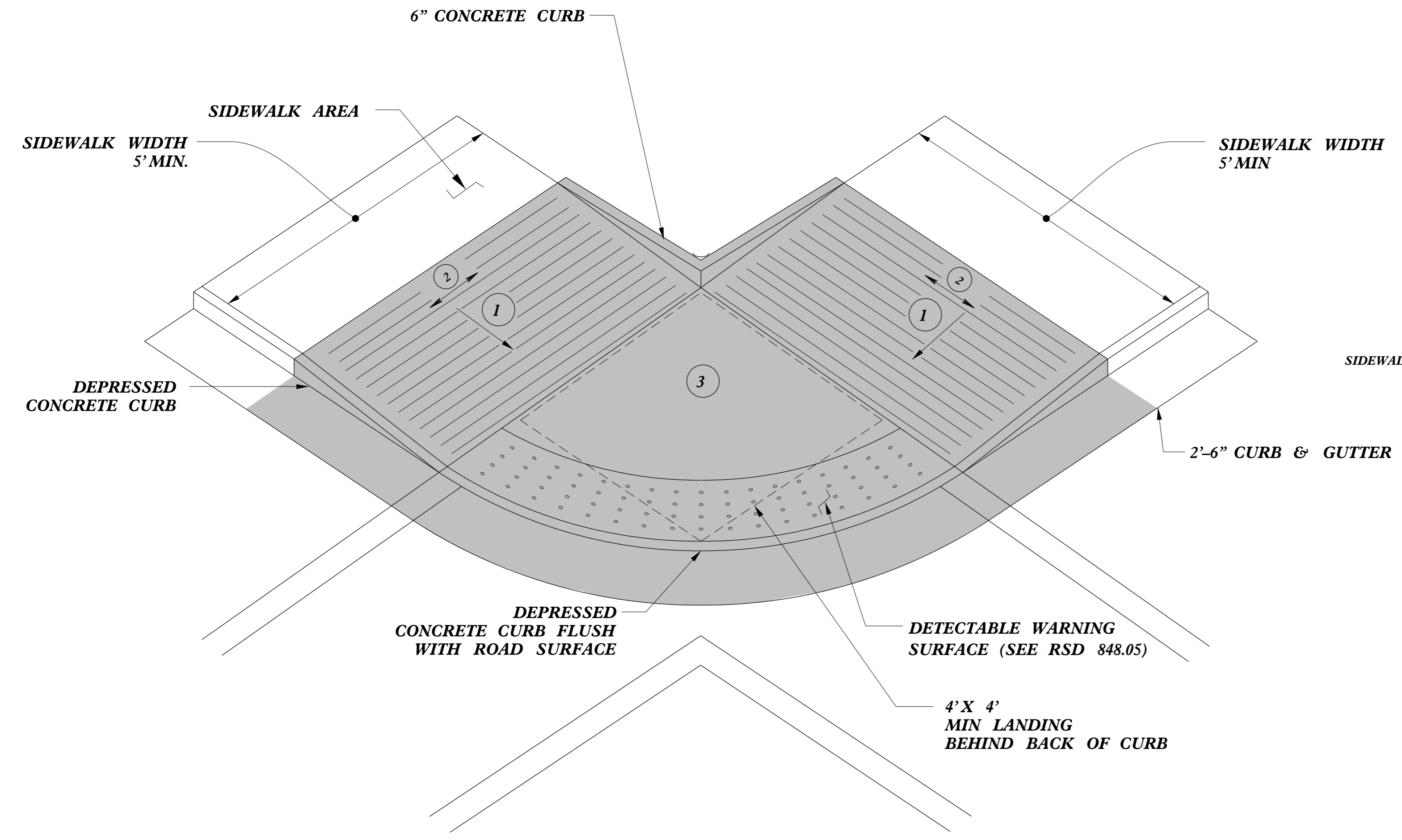
26-JUN-2017 10:39 S:\Contracts\Special Details\Howerton\Convert CB or JB to DI.dgn Jhowerton AT USD-292595



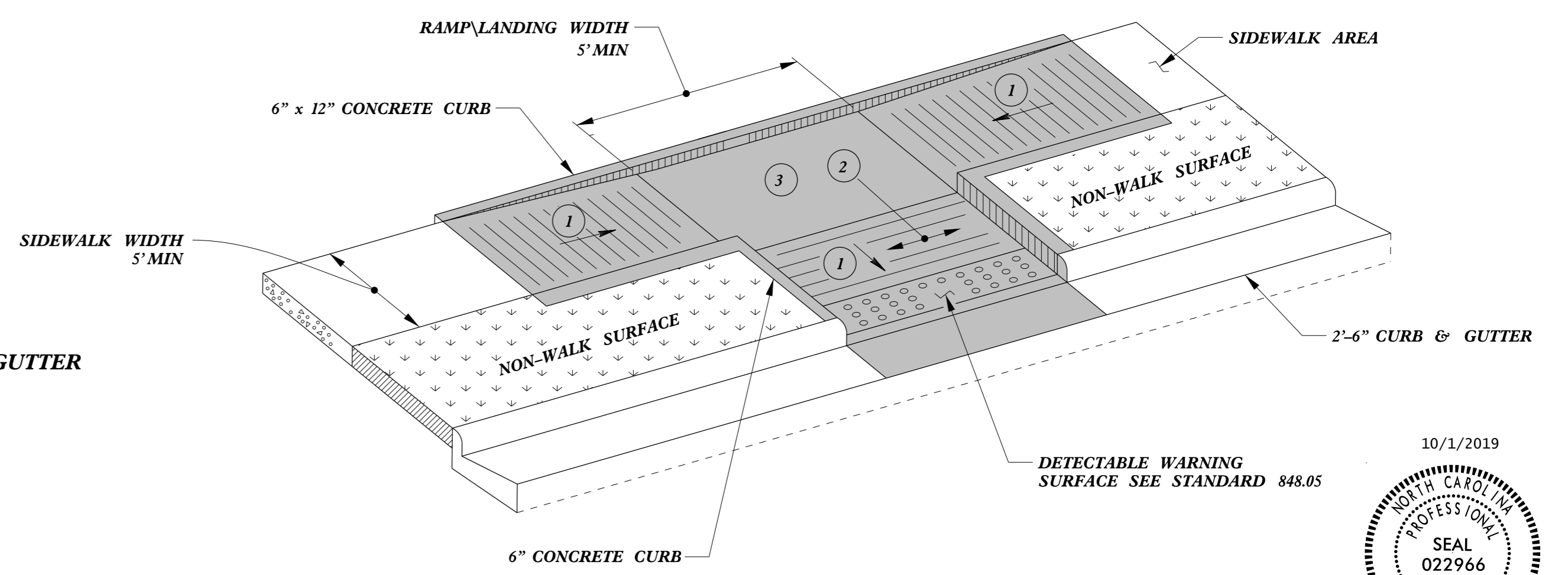
TYPE 2

PAY LIMITS FOR 1 CURB RAMP

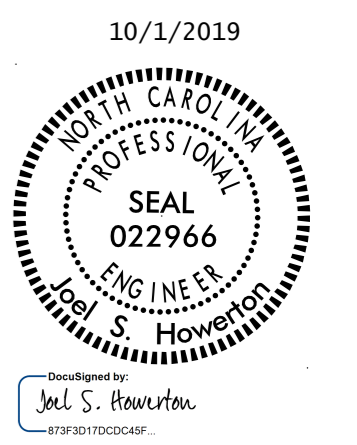
- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.



TYPE 2A



TYPE 3



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

CURB RAMPS
Parallel Ramps

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

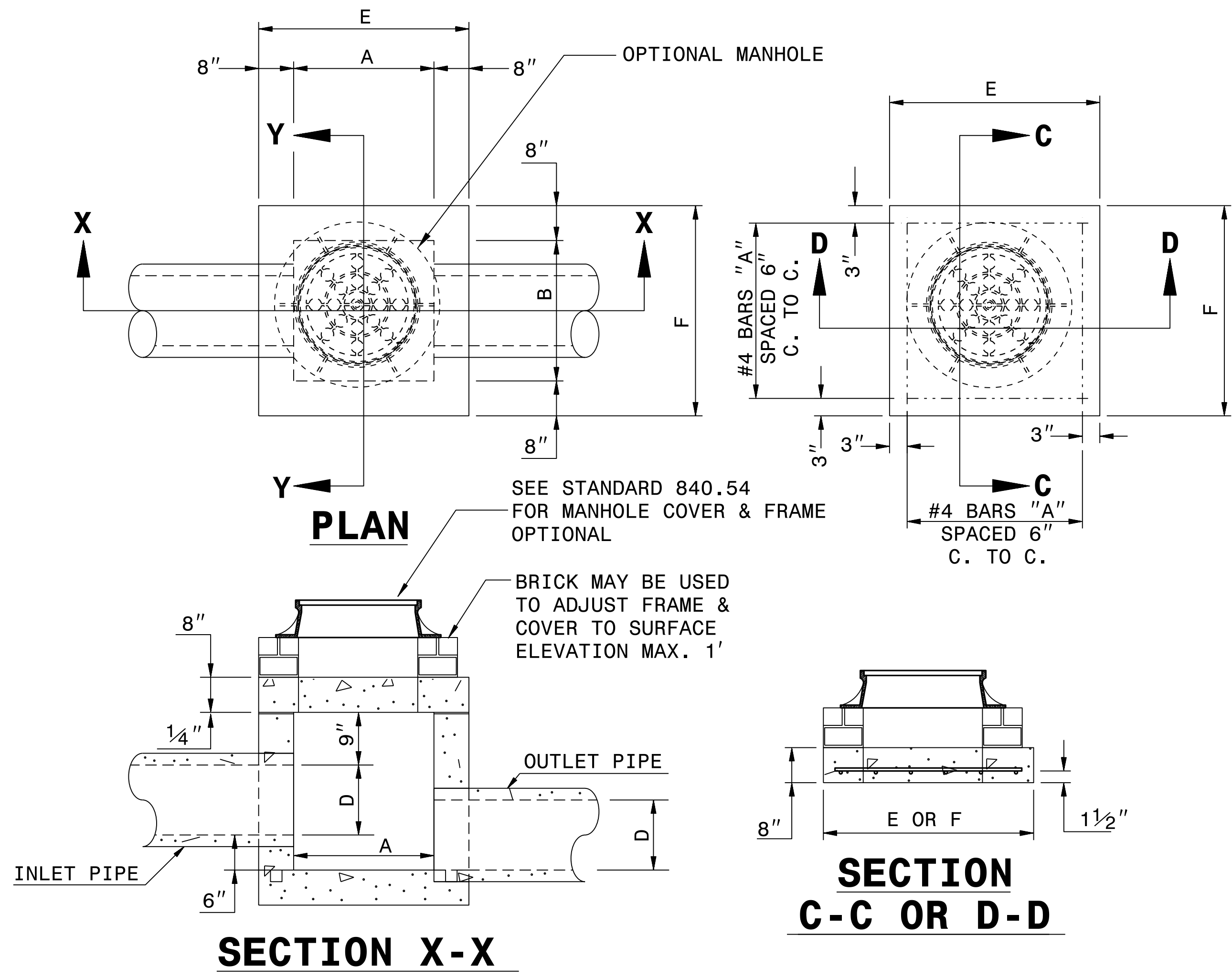
REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

5/14/99

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

ROADWAY DETAIL DRAWING FOR
CONCRETE JUNCTION BOX
 (WITH OPTIONAL MANHOLE)
 UP TO 30' OF FILL

SHEET 1 OF 1
840D31



GENERAL NOTES:

CHAMFER ALL EXPOSED CORNERS 1".

USE CLASS "B" CONCRETE THROUGHOUT.

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

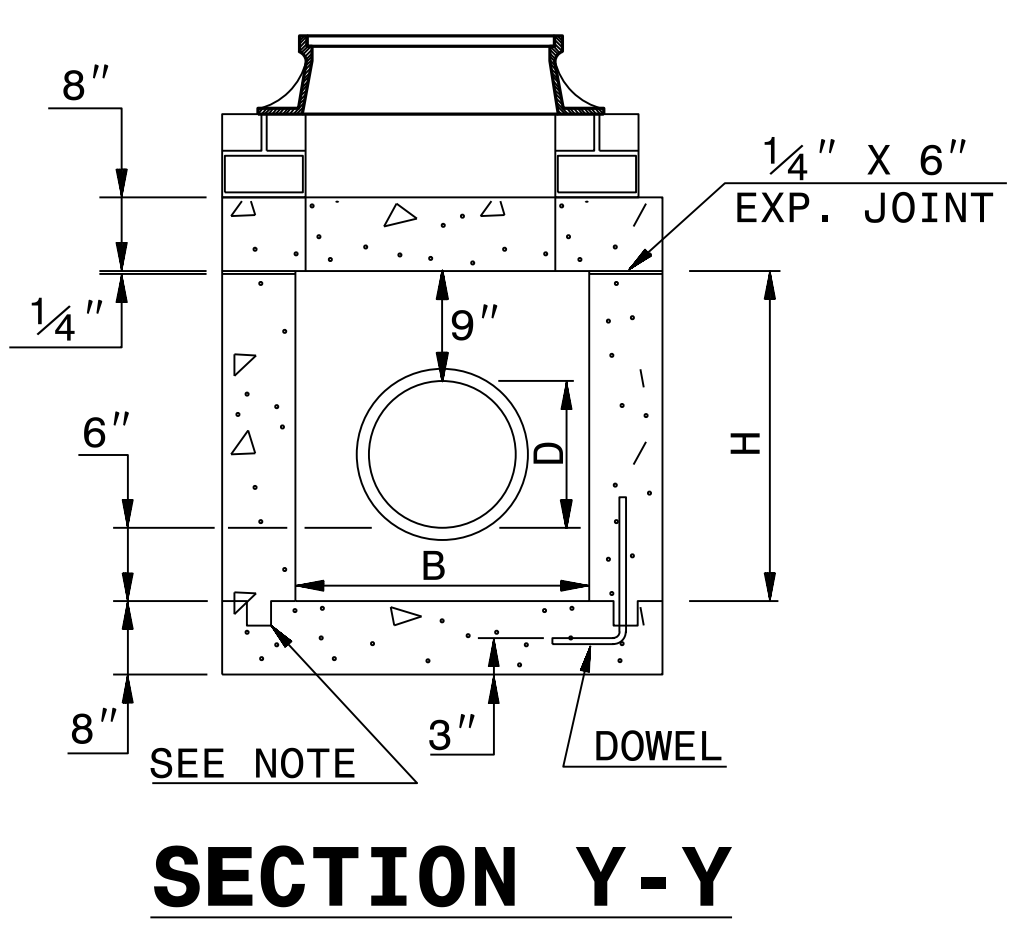
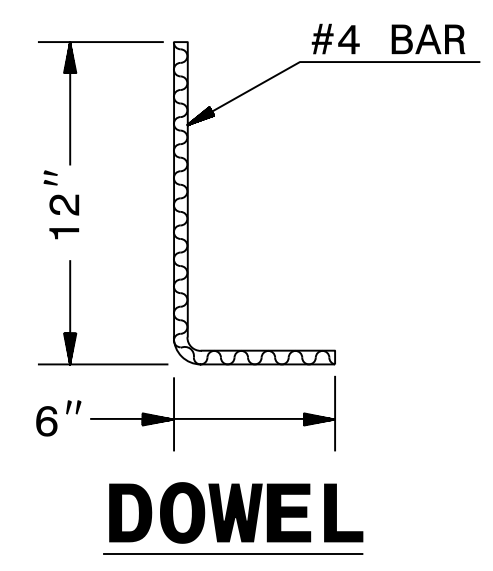
USE FORMS TO CONSTRUCT THE BOTTOM SLAB.

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

PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTERS IN ACCORDANCE WITH STD. NO. 840.66.

ADJUST THE STEEL, CONCRETE AND BRICK MASONRY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB, ADDITIONAL VARIABLE HEIGHT BRICK MASONRY, OPENING IN TOP SLAB.)

MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 25 FEET.



DIMENSIONS AND QUANTITIES FOR CONCRETE JUNCTION BOXES														
PIPE	DIMENSIONS OF BOX AND PIPE			REINFORCEMENT BARS "A"		TOP SLAB DIMENSIONS		CUBIC YARDS IN BOX			TOTAL QUANTITIES BOX AND SLABS		DEDUCTIONS FOR ONE PIPE CU.YDS.	
	SPAN	WIDTH	HEIGHT	NO.	LENGTH	E	F	TOP SLAB	BOTTOM SLAB	WALL/ FT. OF HT.	LBS. REINF	CU. YDS. MIN. "H"	C.S.	R.C.
12"	2'-0"	2'-0"	2'-3"	12	2'-9"	3'-0"	3'-0"	0.222	0.222	0.246	22	0.998	0.015	0.024
15"	2'-3"	2'-3"	2'-6"	12	3'-0"	3'-3"	3'-3"	0.261	0.261	0.271	24	1.200	0.023	0.036
18"	2'-6"	2'-6"	2'-9"	14	3'-3"	3'-6"	3'-6"	0.302	0.302	0.295	30	1.416	0.033	0.049
24"	3'-0"	3'-0"	3'-3"	16	3'-9"	4'-0"	4'-0"	0.394	0.394	0.344	40	1.907	0.059	0.085
30"	3'-6"	3'-6"	3'-9"	18	4'-3"	4'-6"	4'-6"	0.499	0.499	0.394	51	2.474	0.092	0.127
36"	4'-0"	4'-0"	4'-3"	20	4'-9"	5'-0"	5'-0"	0.616	0.616	0.443	64	3.114	0.132	0.178
42"	4'-6"	4'-6"	4'-9"	22	5'-3"	5'-6"	5'-6"	0.745	0.745	0.492	77	3.828	0.180	0.243
48"	5'-4"	5'-4"	5'-3"	26	6'-3"	6'-4"	6'-4"	0.988	0.988	0.541	111	4.819	0.235	0.317
54"	5'-10"	5'-10"	5'-9"	28	6'-7"	6'-10"	6'-10"	1.150	1.150	0.591	126	5.696	0.297	0.401
60"	6'-6"	6'-6"	6'-3"	30	7'-3"	7'-6"	7'-6"	1.386	1.386	0.640	145	6.770	0.367	0.495
66"	7'-1"	7'-1"	6'-9"	32	7'-10"	8'-1"	8'-1"	1.609	1.609	0.689	169	7.870	0.444	0.589

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

ROADWAY DETAIL DRAWING FOR
CONCRETE JUNCTION BOX
 (WITH OPTIONAL MANHOLE)
 UP TO 30' OF FILL

SHEET 1 OF 1
840D31

30-DEC-2019 09:00 S:\Contracts\Special Details\Howerton\840d31 Special JB up to 30ft of Fill.dgn Jhowerton AT_CSD-320965



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

SEE PLATE FOR TITLE

ORIGINAL BY: J. HOWERTON DATE: 12/30/19
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC. jhowerton/840d31 up to 30ft of fill.dgn


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

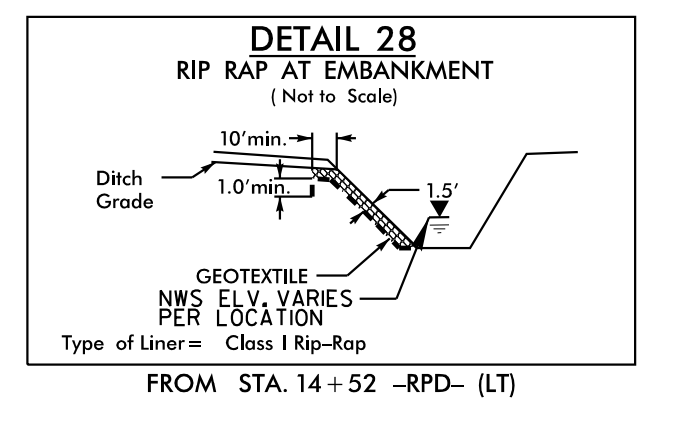
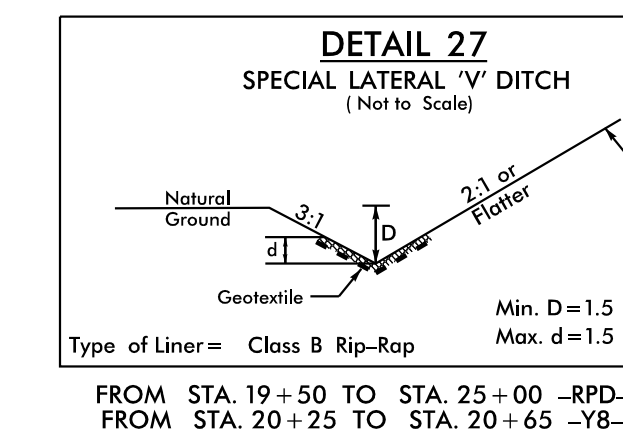
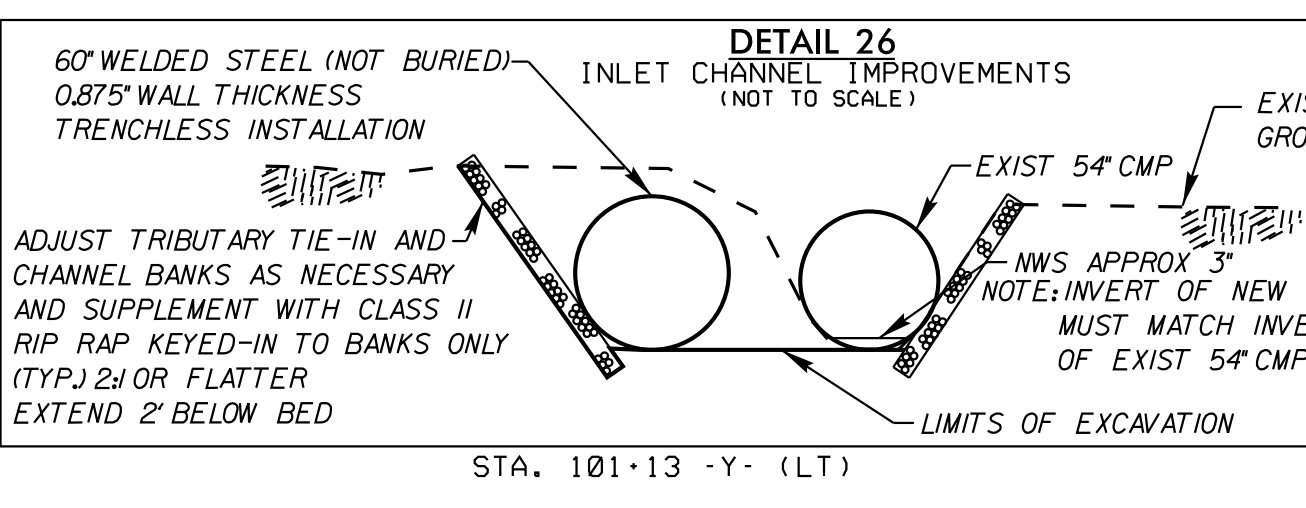
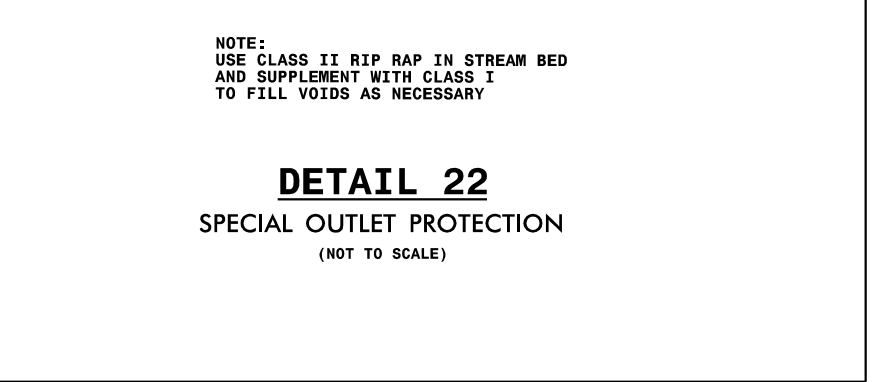
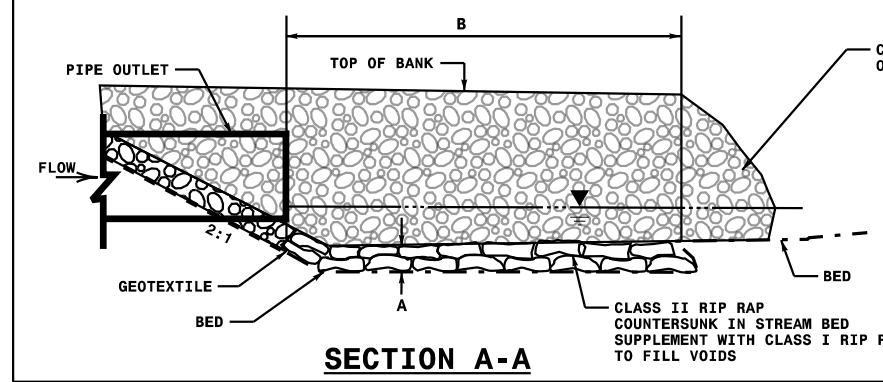
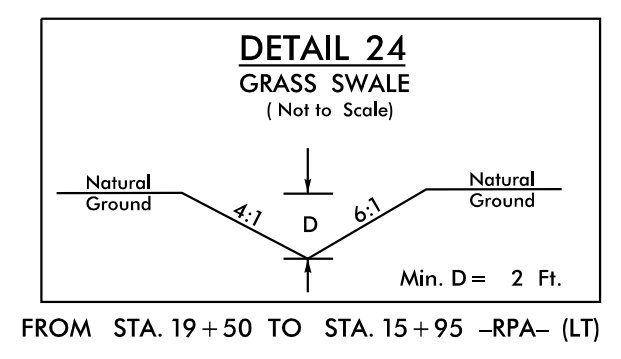
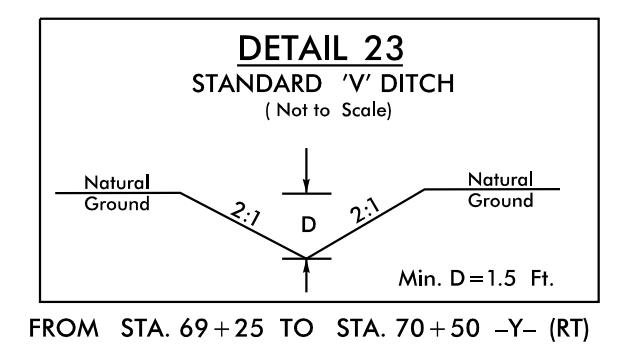
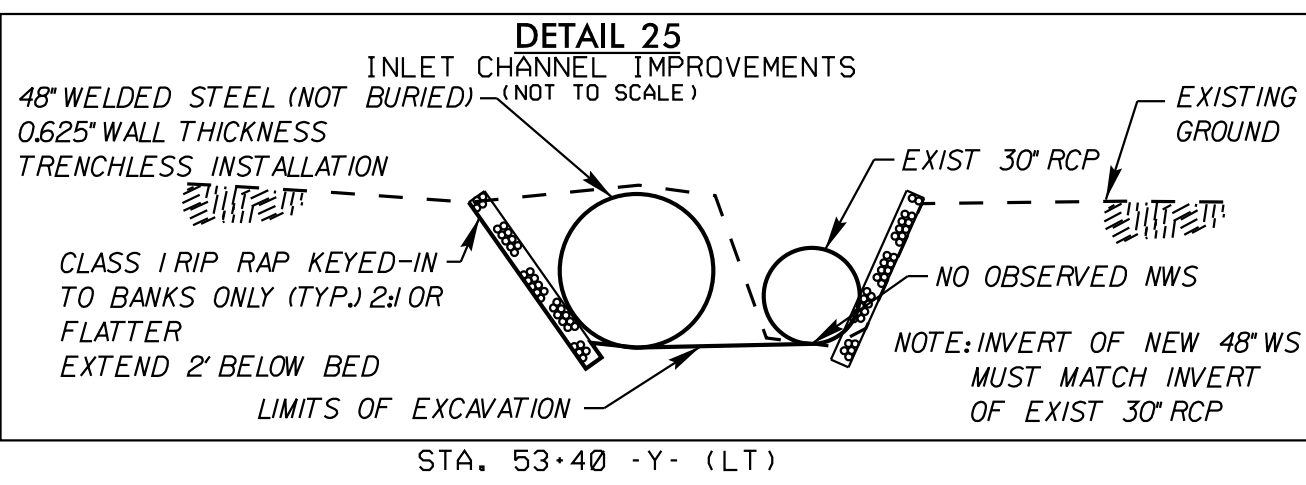
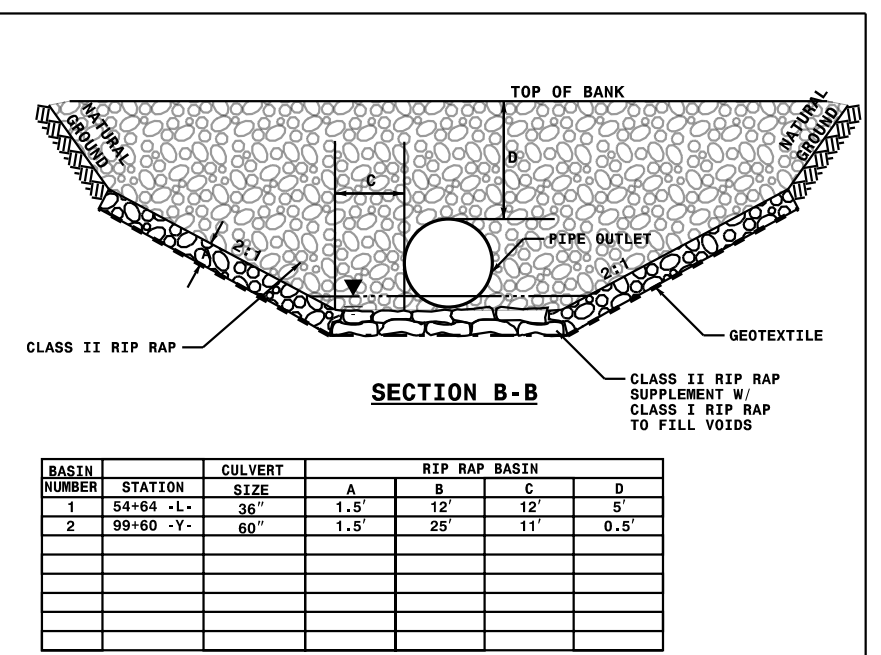
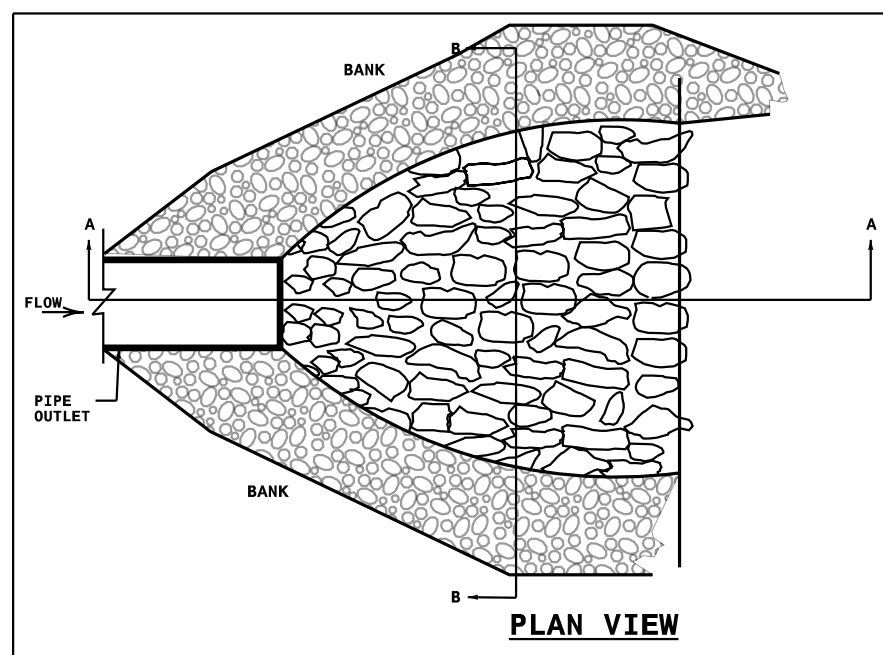
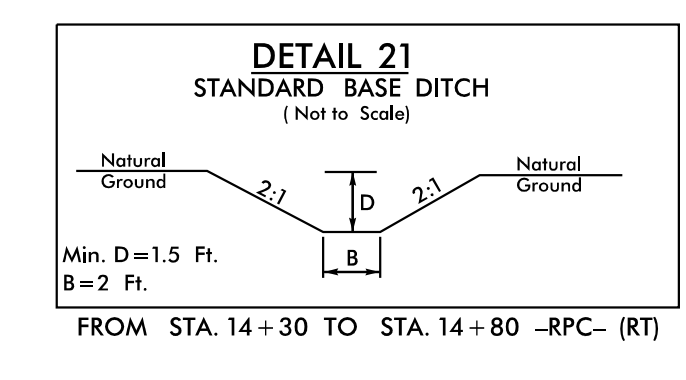
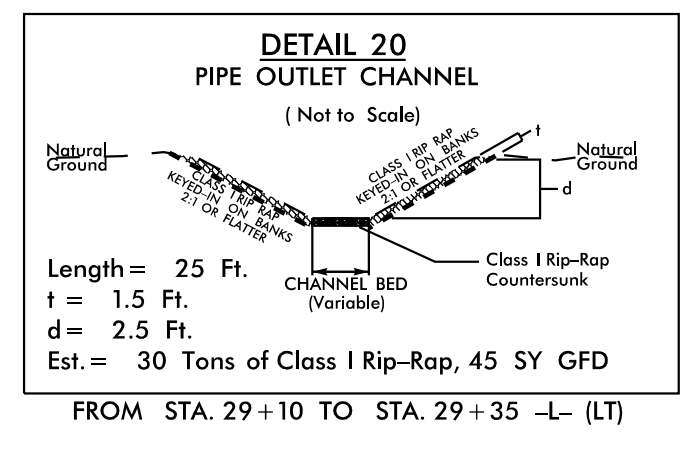
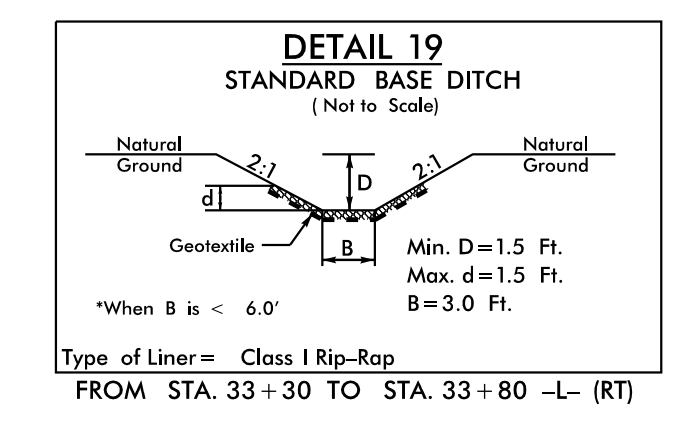
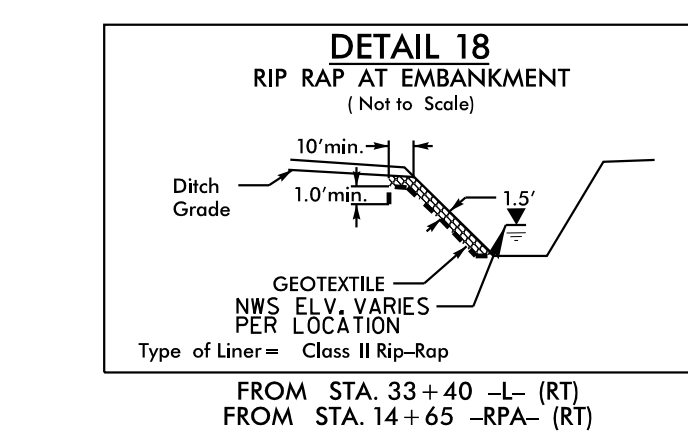
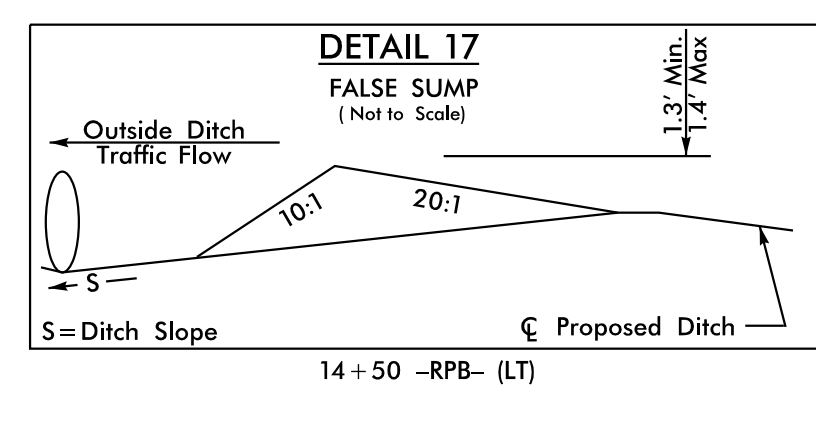
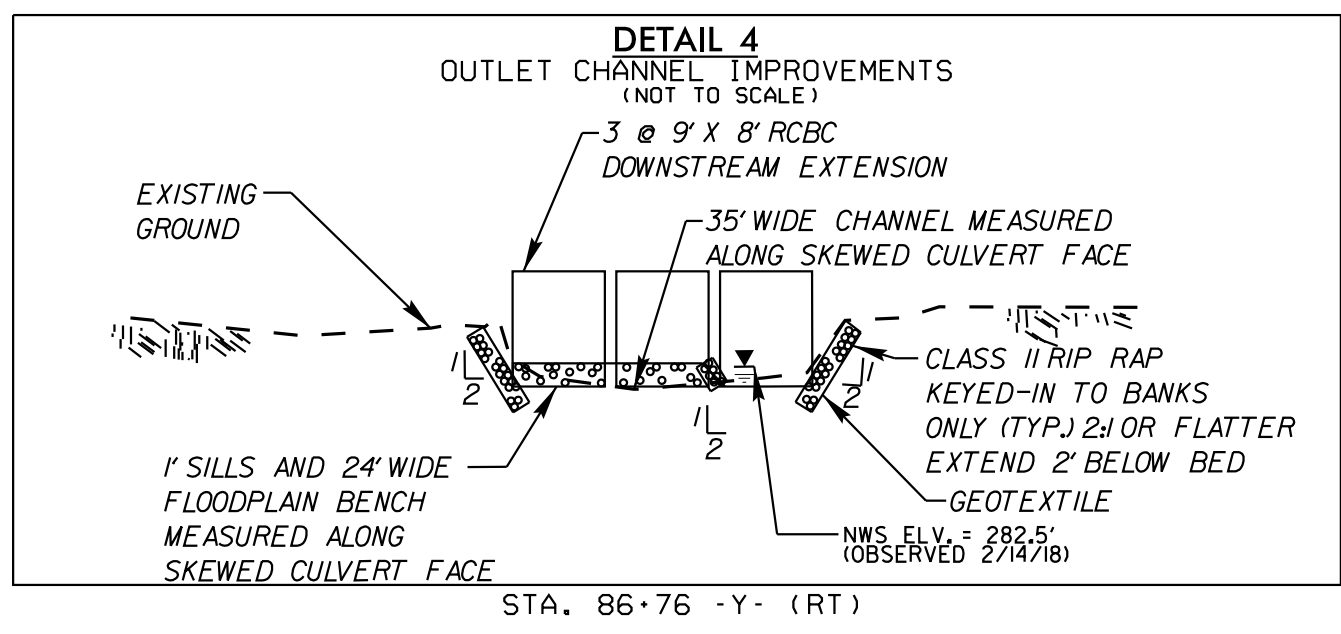
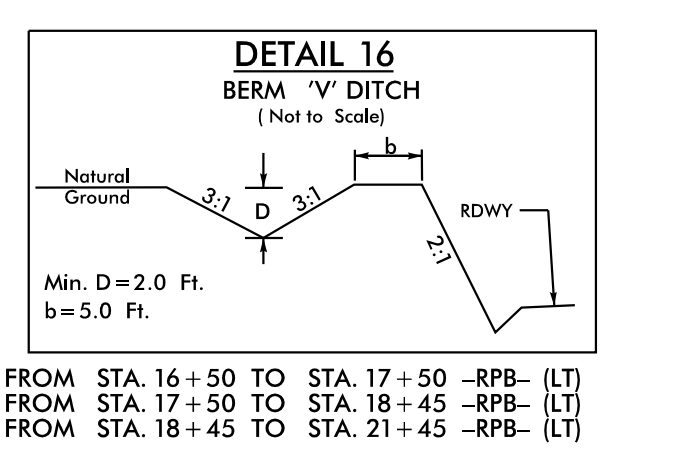
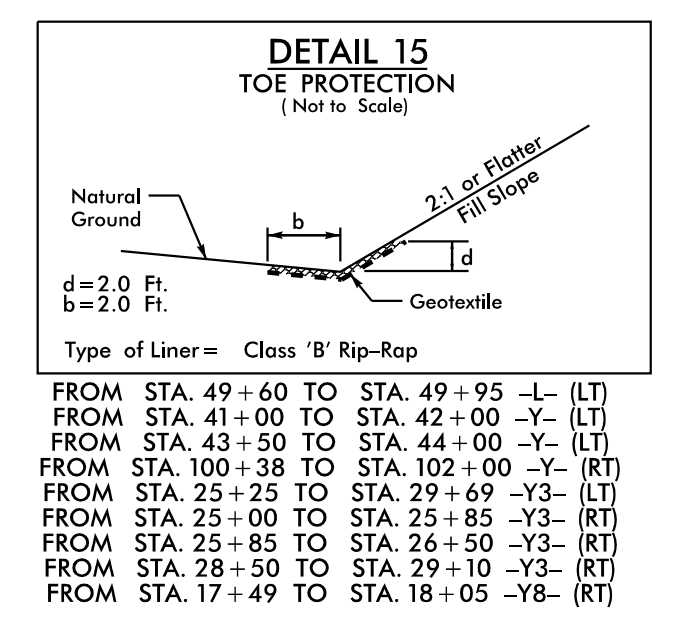
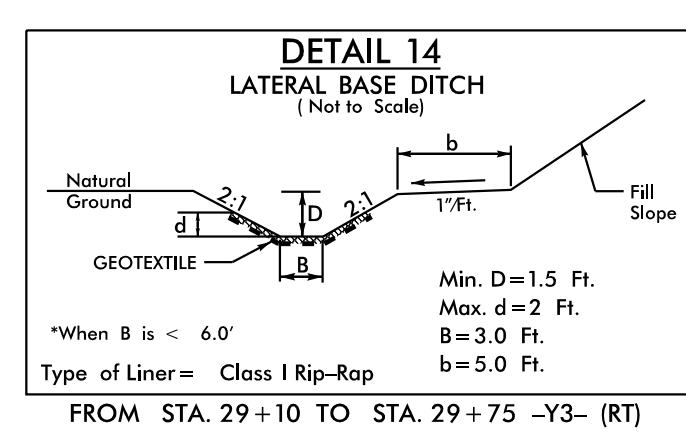
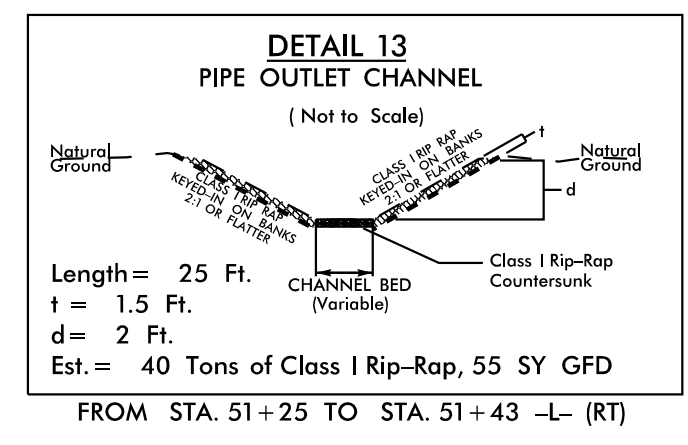
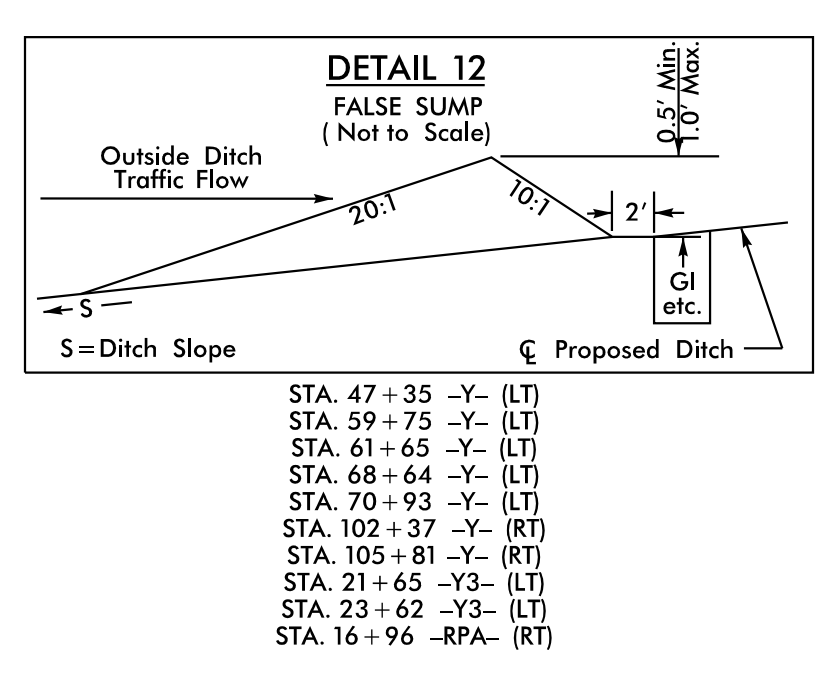
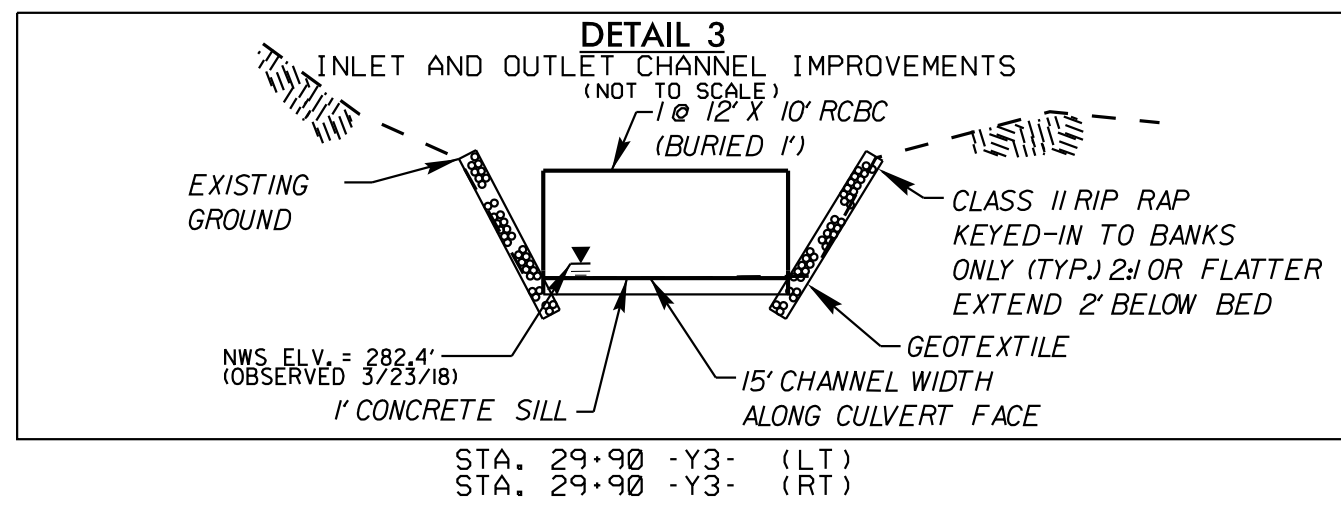
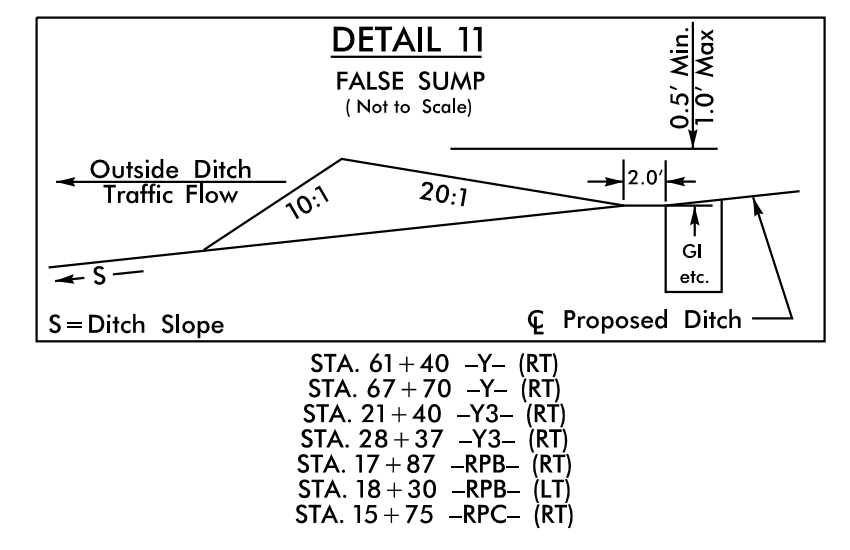
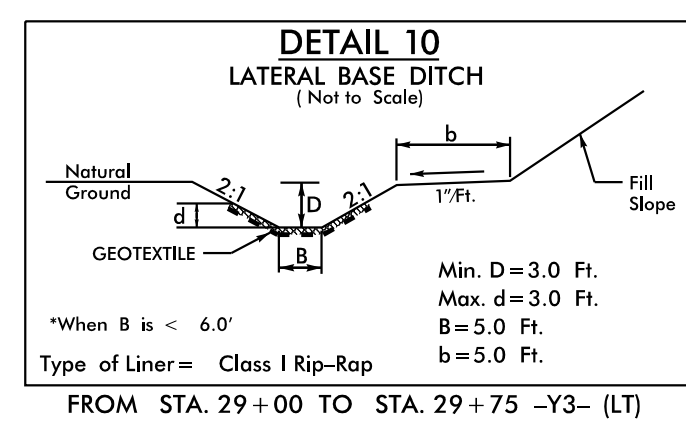
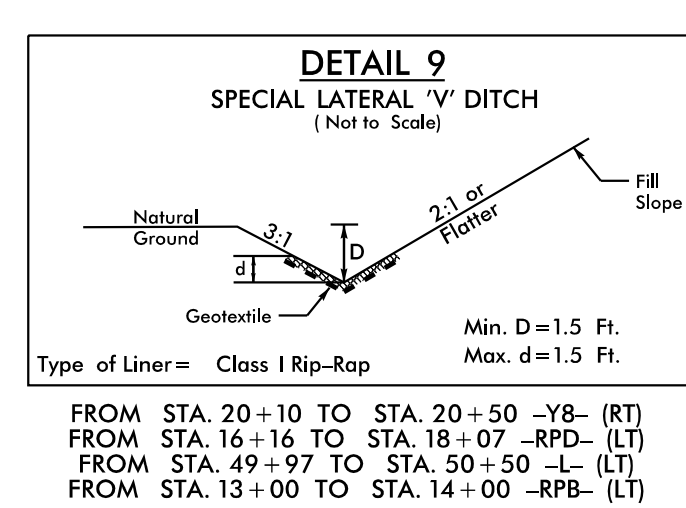
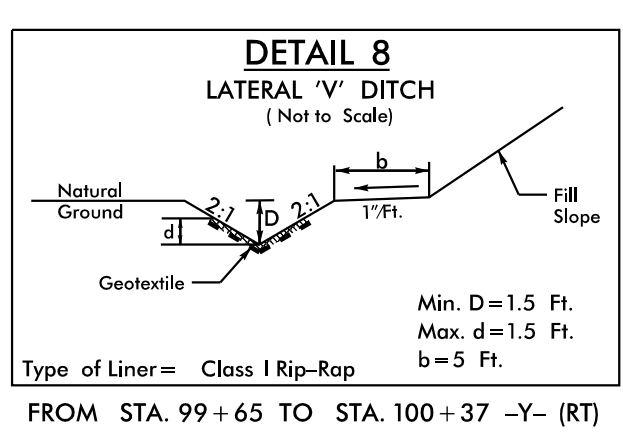
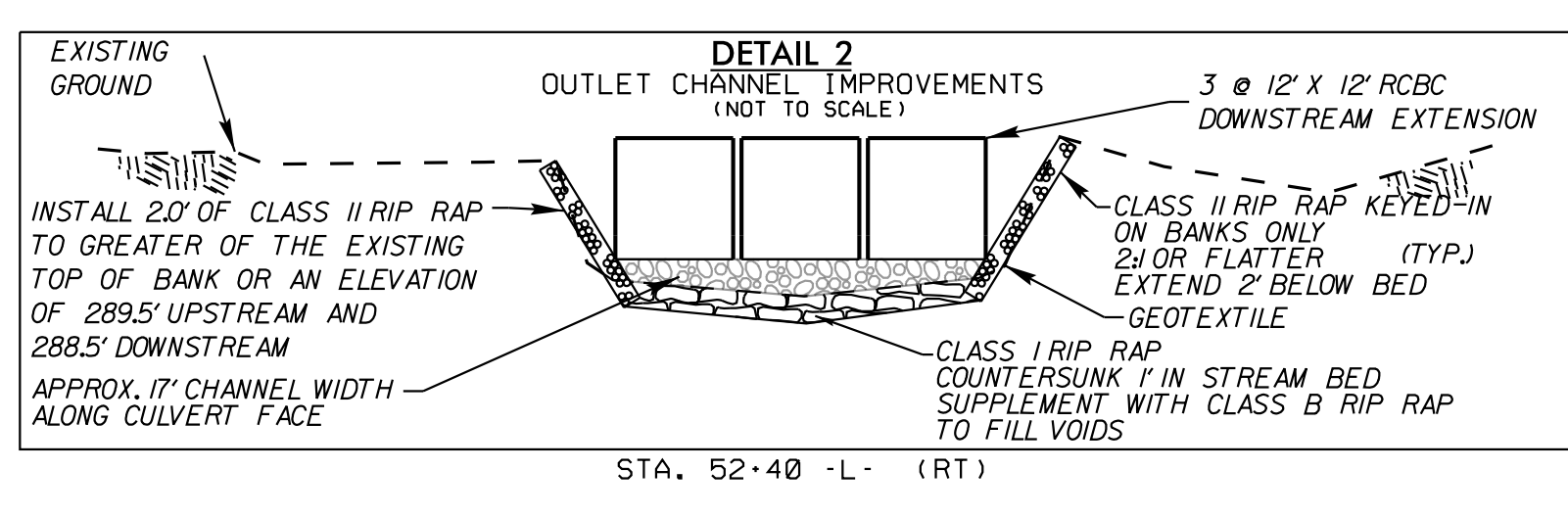
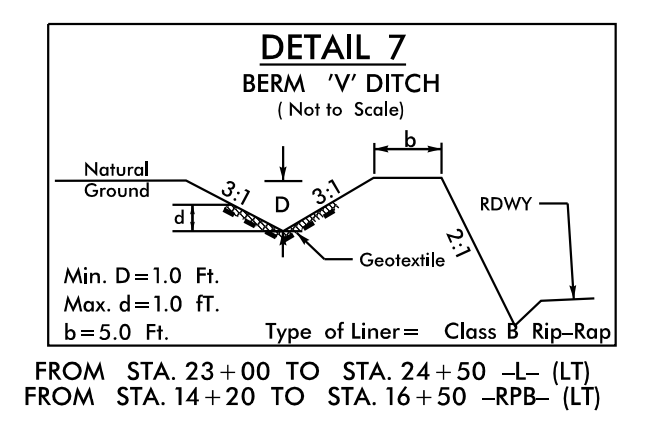
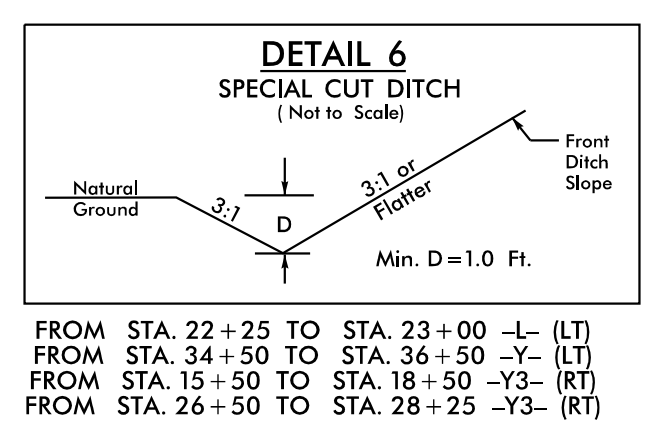
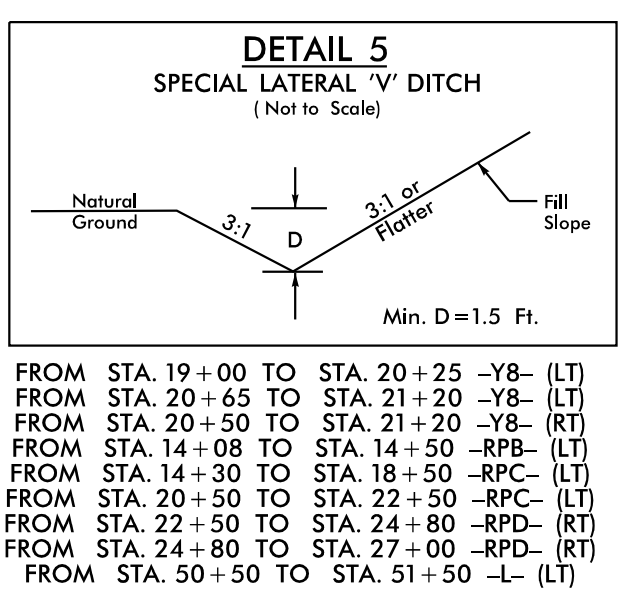
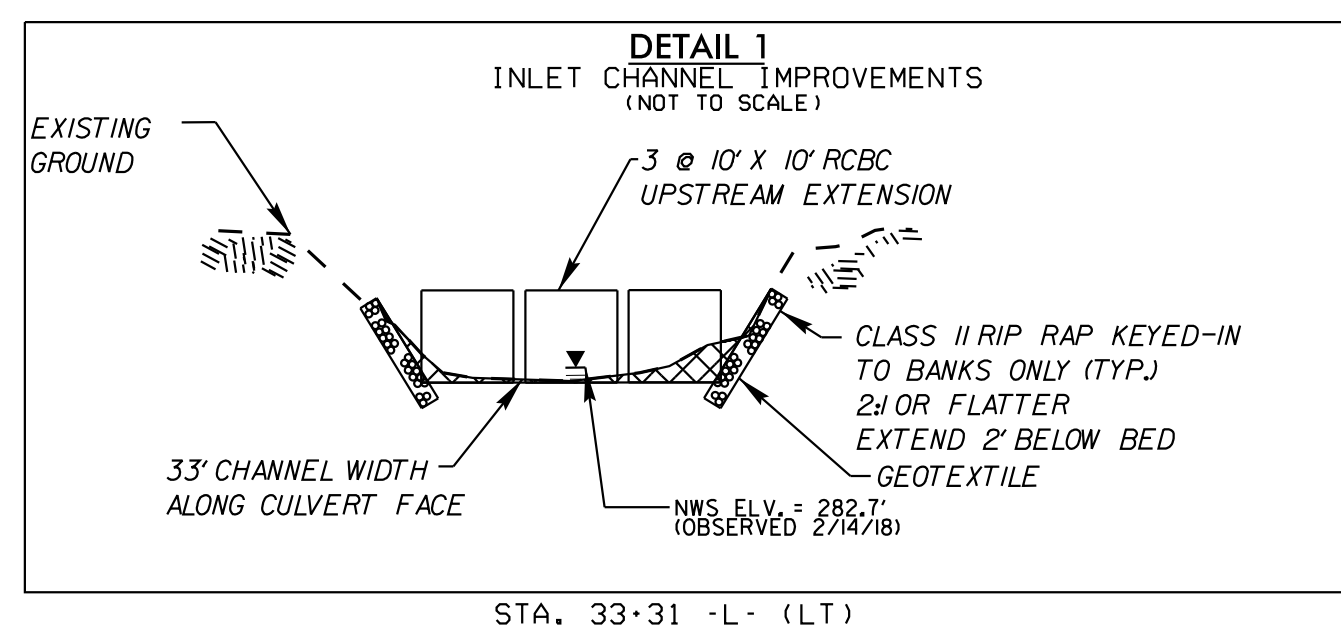
5/14/19

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

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

Kimley Horn
 P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

PROJECT REFERENCE NO. 1-5700	SHEET NO. 2D-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER 10/8/2019
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



GRADING AND FILTRATION BASIN

NOTES:

1. PROVIDED FILTRATION BED SURFACE AREA=6601 SF (EL=298.00')
2. TEMPORARY PONDING AREA WITH 24" DEPTH= 11383 SF (EL=300.00')
3. FILTRATION FOREBAY BOTTOM EL = 295.00'
4. FILTRATION FOREBAY BOTTOM EL = 295.00'

CLASS "B" RIP RAP
EST. 22 TONS
EST. 50 SY GFD
SEE DETAIL 3/SHEET 2D-4

CLASS "B" RIP RAP
EST. 32 TONS
EST. 70 SY GFD
SEE DETAIL 3/SHEET 2D-4

CLASS "B" RIP RAP
EST. 32 TONS
EST. 70 SY GFD
SEE DETAIL 3/SHEET 2D-4

**COORDINATE TABLE: FILTRATION BASIN
CORNERS OF TOP OF MEDIA FILTER BASIN**

	NORTHING	EASTING	ELEVATION
1	768,657.3684	2,054,350.1955	298.00
2	768,673.6609	2,054,386.2448	298.00
3	768,612.4009	2,054,439.0902	298.00
4	768,580.5808	2,054,452.3630	298.00
5	768,558.4211	2,054,426.8571	298.00
6	768,548.4897	2,054,399.6238	298.00

**COORDINATE TABLE: FOREBAY #1
CORNERS OF TOP OF MEDIA FILTER BASIN**

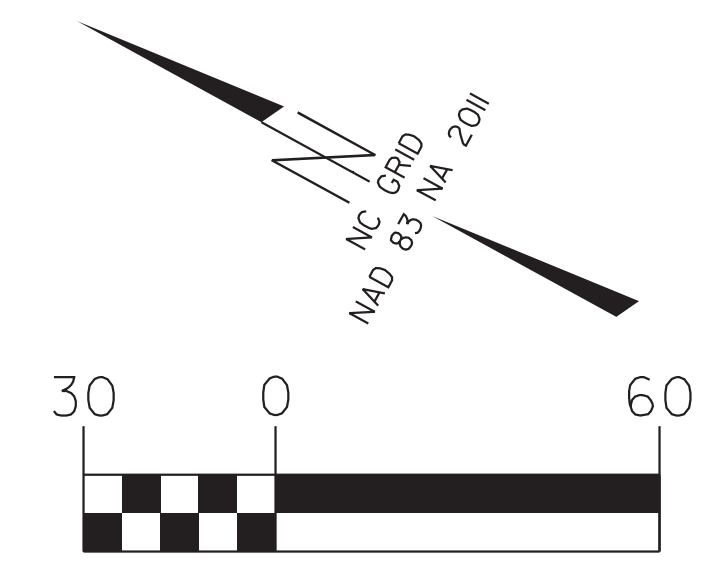
	NORTHING	EASTING	ELEVATION
7	768,670.2040	2,054,350.9858	295.00
8	768,677.2370	2,054,347.8606	295.00
9	768,678.7217	2,054,351.2166	295.00
10	768,671.9383	2,054,354.3125	295.00

**COORDINATE TABLE: FOREBAY #2
CORNERS OF TOP OF MEDIA FILTER BASIN**

	NORTHING	EASTING	ELEVATION
11	768,591.2160	2,054,461.5851	295.00
12	768,597.5224	2,054,458.9119	295.00
13	768,602.5067	2,054,470.6489	295.00
14	768,596.1544	2,054,473.4416	295.00

**COORDINATE TABLE: FOREBAY #3
CORNERS OF TOP OF MEDIA FILTER BASIN**

	NORTHING	EASTING	ELEVATION
15	768,543.9387	2,054,421.4976	295.00
16	768,537.5768	2,054,424.0358	295.00
17	768,532.8437	2,054,412.1953	295.00
18	768,539.2541	2,054,409.5385	295.00

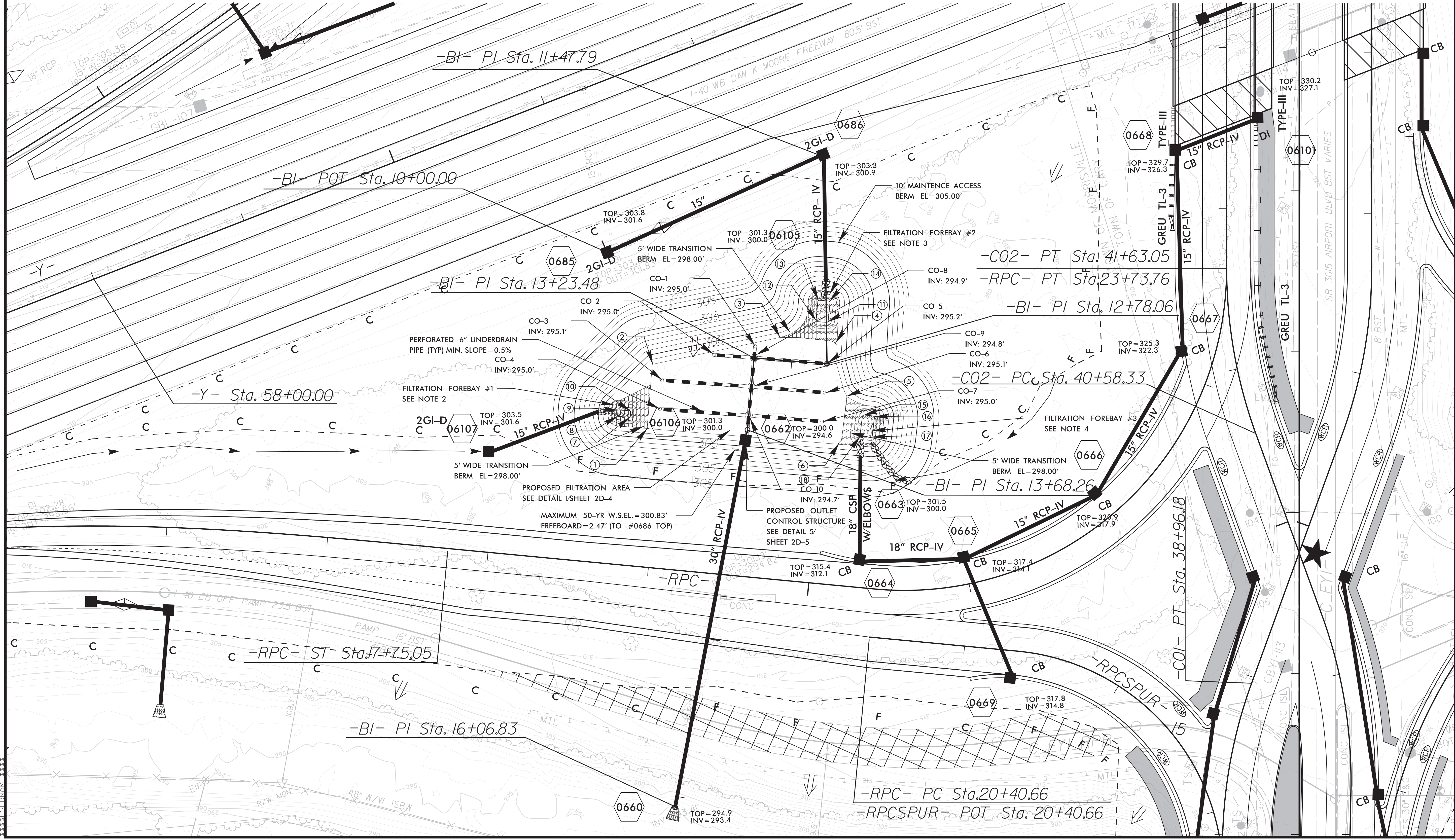


ETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

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

Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

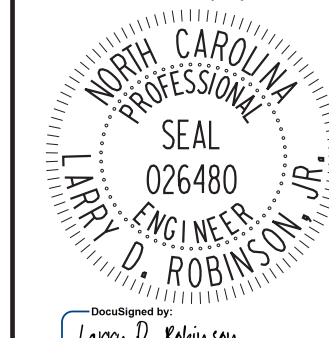
PROJECT REFERENCE NO. 1-5700	SHEET NO. 2D-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER 10/27/2019
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	

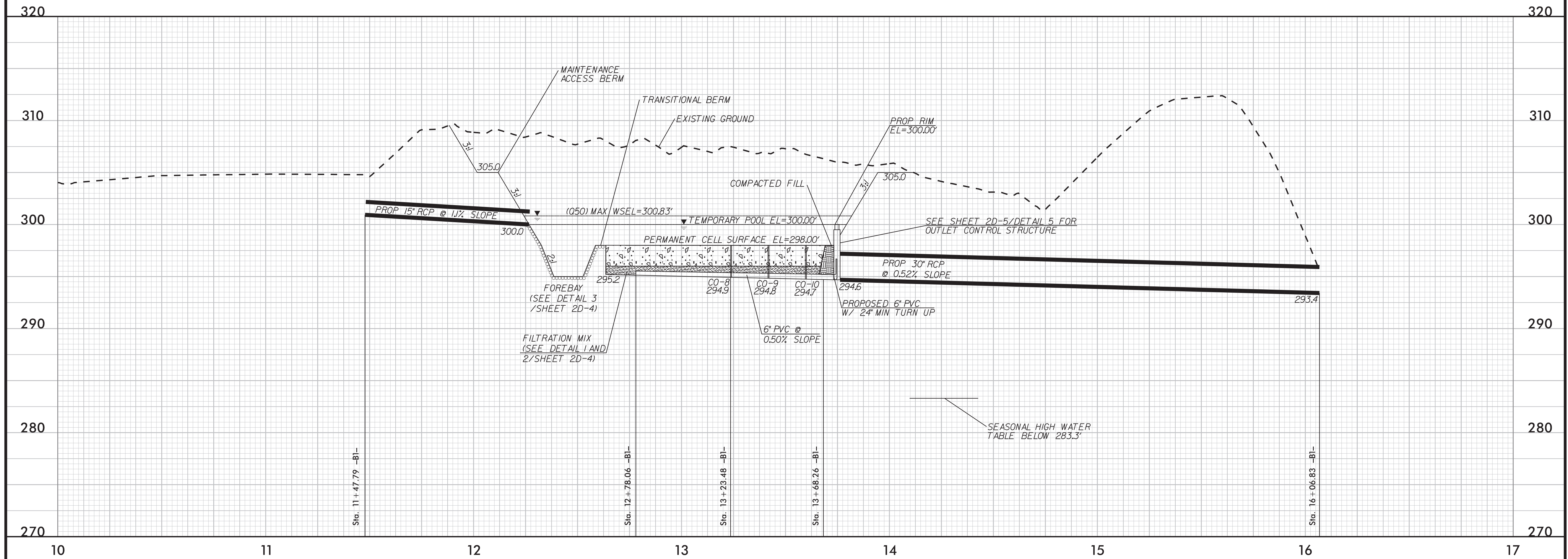


ETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 8077
 Fax: 919 851 8107

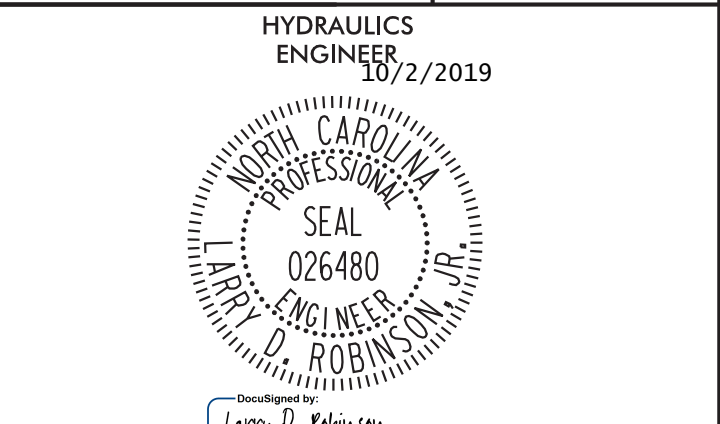
TRANSPORTATION PLANNING/DESIGN • BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

Kimley»Horn
 ©2019
 P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

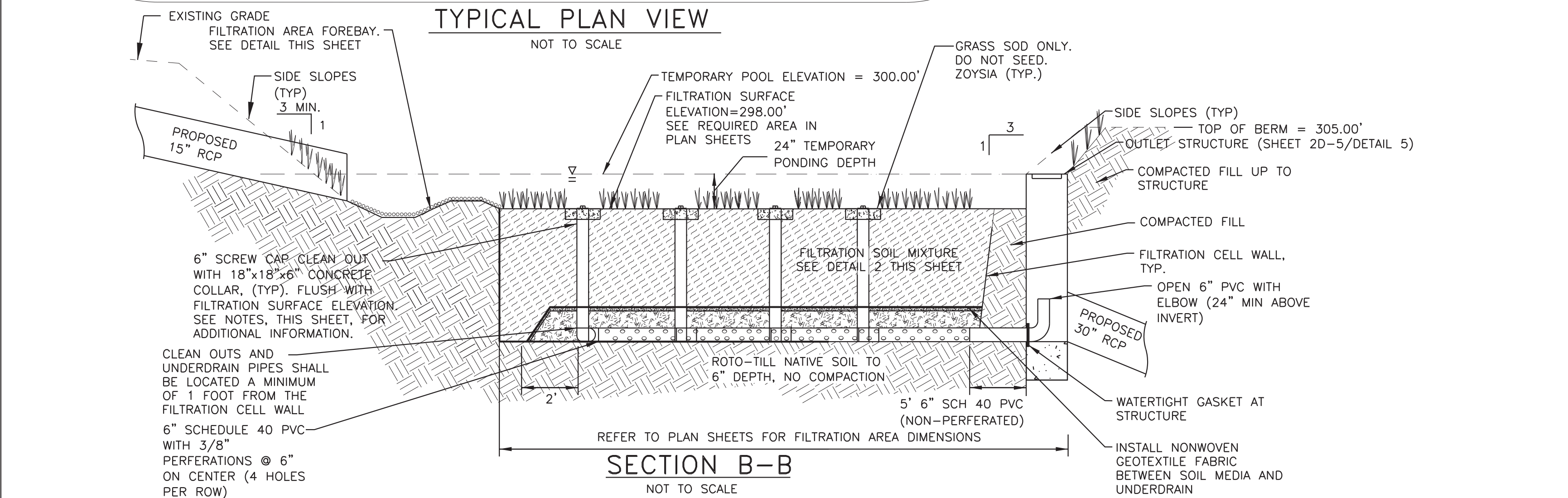
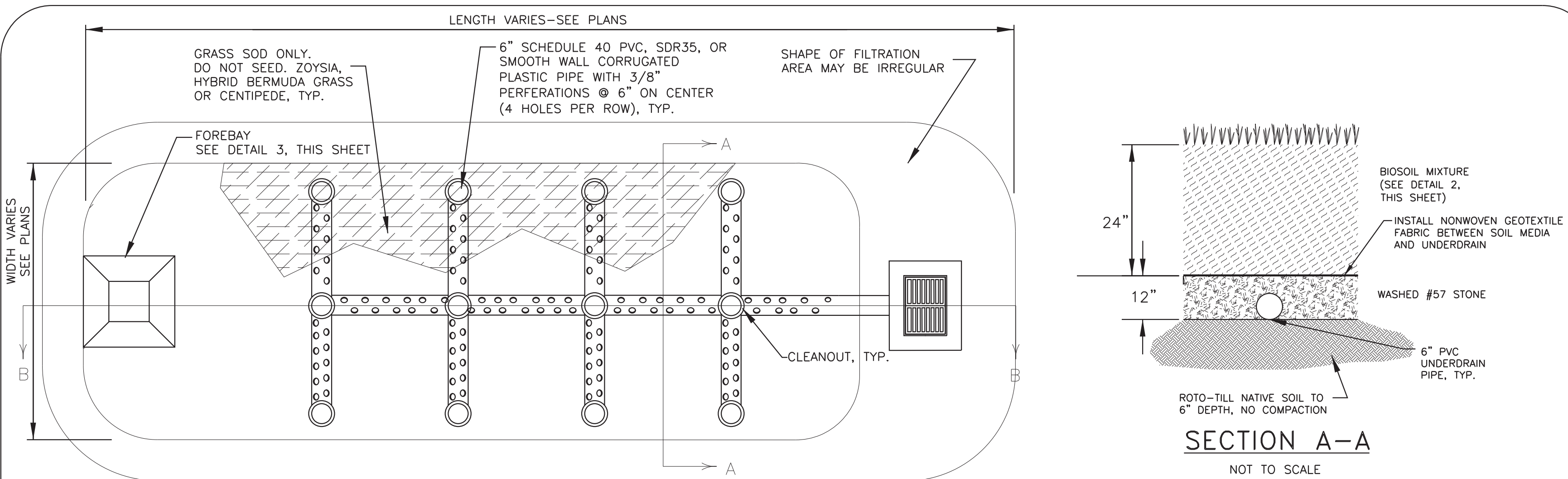
PROJECT REFERENCE NO. <i>1-5700</i>	SHEET NO. <i>2D-3</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER 10/2/2019
	
Designed by <i>Larry D. Robinson</i>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



69
68
67
66
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NOTES:
ACCESS BERM SHOULD BE PROVIDED FOR MAINTENANCE.
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.
UNDERDRAIN SHOULD BE BEDDED ON A THIN LAYER OF NO.57 WASHED STONE AND BACKFILLED TO A TOTAL MINIMUM STONCE DEPTH OF 12 INCHES.
IF BASIN IS USED TO COLLECT SEDIMENTATION AS AN EROSION CONTROL MEASURE, DO NOT INSTALL UNDERDRAIN, WASHED STONE, NOR ENGINEERED SOIL MEDIA FILTER UNTIL EROSION CONTROL MEASURES INSIDE MEDIA FILTER BASIN ARE REMOVED.
TEMPORARY PONDING DEPTH: 24"
UNDERDRAIN TO BE 6" SCHEDULE 40 PVC CORRUGATED PLASTIC PIPE WITH 3/8" PERF. @ 6" O.C., 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; GRAVEL NOT NECESSARY UNDER PIPES. MINIMUM SLOPE FOR UNDERDRAIN SHALL BE 0.005 FT/FT
UNDERDRAIN PIPES AND CLEANOUTS SHOULD BE LOCATED IN THE QUANTITY AND ELEVATION FOUND ON THE GRADING AND DRAINAGE PLAN (SHEET 2D-2).
CLEANOUT PIPE SHALL BE LOCATED A MINIMUM OF 1.0' FROM THE FILTRATION CELL WALL.
EXPOSED CLEANOUT CAP AND CONNECTORS TO BE CONSTRUCTED OF WHITE UV RESISTANT PVC MATERIAL.
GRASS SOD: SOD IS TO BE PLANTED WITHIN THE FILTRATION AREA AND ALONG THE ADJACENT SIDE SLOPES. SOD IS TO BE ZOYSIA WHICH HAS BEEN GROWN IN SANDY SOILS. LARGE DEPOSITS OF FINES ATTACHED TO THE ROOTS SHALL BE WASHED OFF OR REMOVED FROM THE SOD PRIOR TO INSTALLATION.
THE LOCATION OF FILTRATION AREA SHALL BE PROTECTED FROM EROSION AND SEDIMENT DURING SITE CONSTRUCTION. FILTRATION SOIL MIXTURE SHALL NOT BE PLACED UNTIL THE SURROUNDING SITE IS STABILIZED AND APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING FILTRATION SOIL MIXTURE IMPACTED BY SEDIMENT DEPOSITS DURING CONSTRUCTION.
FILTRATION BASIN CONSTRUCTION SEQUENCE:
1. CONSTRUCT EROSION CONTROL MEASURES.
2. MAINTAIN EXISTING DITCHES AS NECESSARY UNTIL FILTRATION MEDIA INSTALLATION IS COMPLETE. USE TEMPORARY BYPASS CONVEYANCE AS NECESSARY. (INTENTION IS TO BYPASS FLOW THROUGH EXISTING DITCHES UNTIL THE BASIN IS STABLE)
3. ENSURE SITE IS PROPERLY STABILIZED WITH A GOOD STAND OF ESTABLISHED VEGETATION BEFORE PROCEEDING. ALL SLOPES DRAINING TO THE FILTRATION AREA SHOULD HAVE ESTABLISHED AT LEAST 90% VEGETATED COVERAGE, AND BE APPROVED BY THE ENGINEER.
4. EXCAVATE AS NECESSARY TO INSTALL FOREBAY, RIP RAP, UNDERDRAIN SYSTEM AND BIOSOIL MIXTURE AFTER COMPLETING UNDERDRAIN SYSTEM ADD BIOSOIL MIXTURE PER THE DETAILS ON THIS SHEET.
5. AFTER THE FILTRATION AREA HAS REACHED FINAL GRADE, REMOVE PORTION OF EXISTING SYSTEM AND CONSTRUCT PROPOSED SYSTEM TO ALLOW FLOW INTO BASIN.

REVISIONS

FILTRATION SOIL MIXTURE SHALL BE A MIX THAT MEETS THE FOLLOWING SPECIFICATION:

ITEM	PERCENT BY VOLUME	MATERIAL
SAND	80%	RECYCLED EXPANDED SLATE FINES
ORGANIC MATTER	20%	APPROVED COMPOST ORGANIC COMPONENT

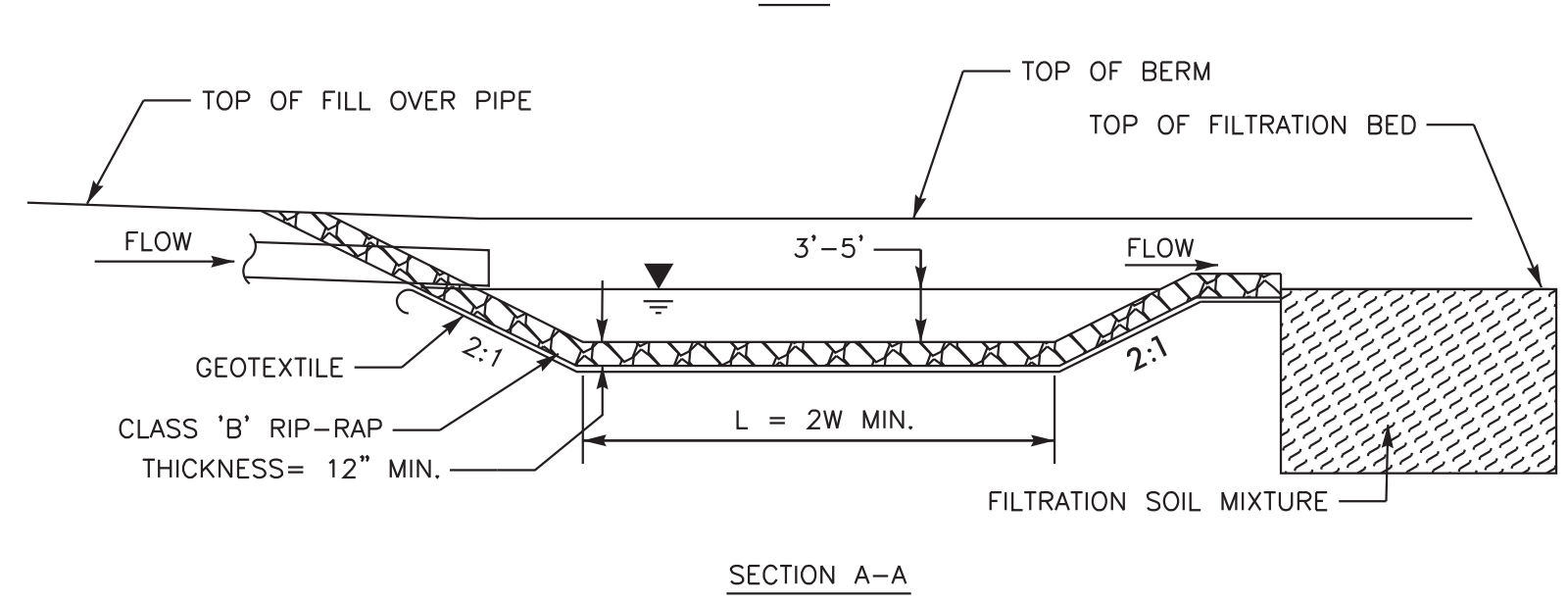
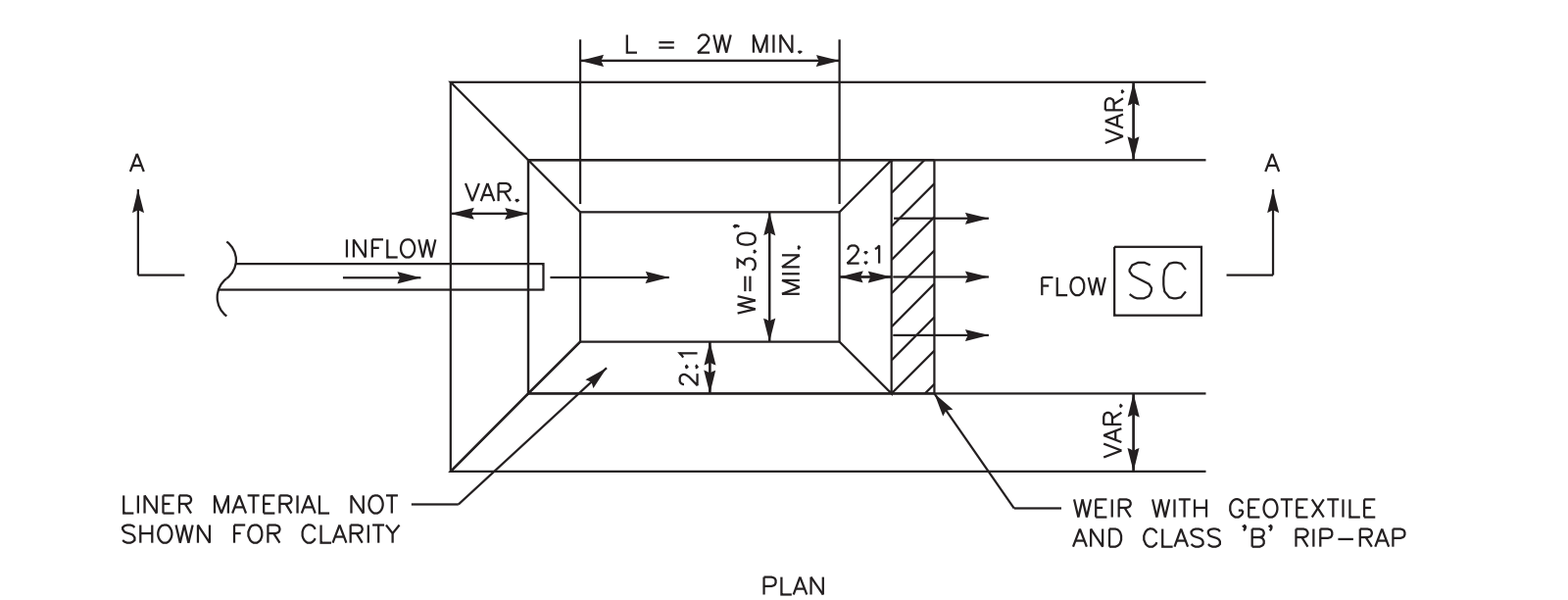
FILTRATION SOIL MIXTURE (FSM): SHALL BE THOROUGHLY MECHANICALLY MIXED AT 1 PART COMPOST WITH 4 PARTS OF EXPANDED SLATE FINES UNTIL A UNIFORM DISTRIBUTION OF THE COMPONENTS IS ACHIEVED. SHALL BE PLACED AND GRADED USING LOW GROUND-CONTACT PRESSURE EQUIPMENT OR BY EXCAVATORS AND/OR BACKHOES OPERATING ON THE GROUND ADJACENT TO THE FILTRATION FACILITY. NO HEAVY EQUIPMENT SHALL BE USED WITHIN THE PERIMETER OF THE FILTRATION FACILITY BEFORE, DURING, OR AFTER THE PLACEMENT OF THE FSM. THE FSM SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED 12 INCHES FOR THE ENTIRE AREA OF THE FILTRATION FACILITY. THE FSM SHALL BE COMPACTED BY SATURATING THE ENTIRE AREA OF THE FILTRATION FACILITY AFTER EACH LIFT OF FSM IS PLACED UNTIL WATER FLOWS FROM THE UNDERDRAIN. WATER FOR SATURATION SHALL BE APPLIED BY SPRAYING OR SPRINKLING. AN APPROPRIATE SEDIMENT CONTROL DEVICE SHALL BE USED TO TREAT ANY SEDIMENT-LADEN WATER DISCHARGED FROM THE UNDERDRAIN. IF THE FSM BECOMES CONTAMINATED DURING THE CONSTRUCTION OF THE FACILITY, THE CONTAMINATED MATERIAL SHALL BE REMOVED AND REPLACED WITH UNCONTAMINATED MATERIAL AT NO ADDITIONAL COST TO THE ADMINISTRATION. FINAL GRADING OF THE FSM SHALL BE PERFORMED AFTER A 24-HOUR SETTLING PERIOD. FINAL ELEVATIONS SHALL BE WITHIN 2 INCHES OF ELEVATIONS SHOWN ON THE CONTRACT PLANS.

THE FILTRATION SOIL MIXTURE (FSM) SHALL HAVE A P-INDEX RANGE LESS THAN 30.
HYDRAULIC CONDUCTIVITY OF FILTRATION SOIL MIX SHALL BE BETWEEN 3.0-6.0 IN/HR.

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

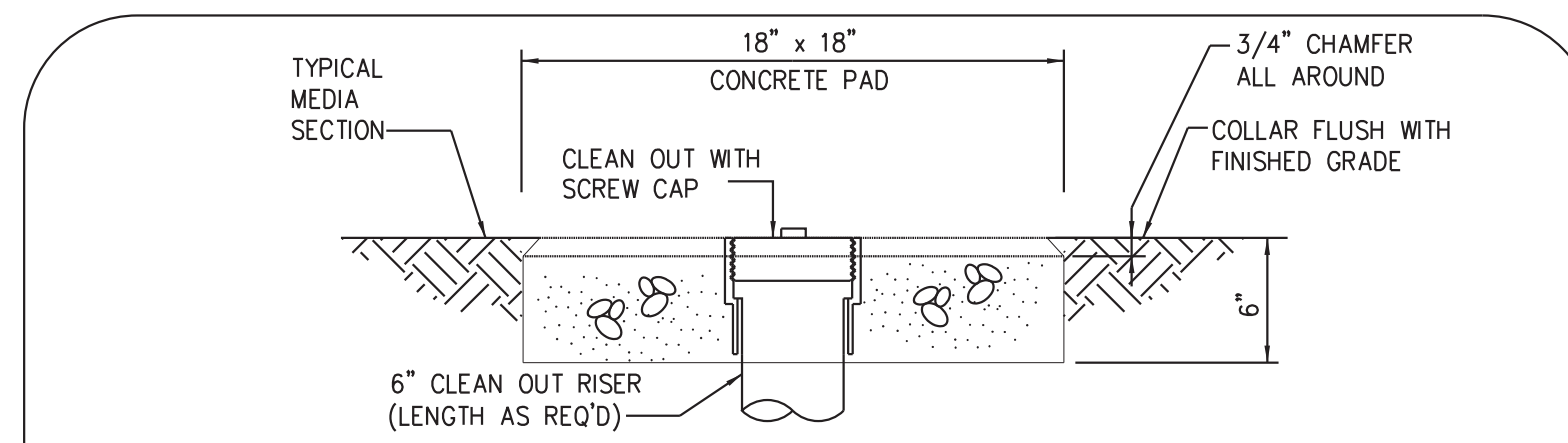
PRIOR TO PLACING THE UNDERDRAIN AND THE FSM, THE BOTTOM OF THE EXCAVATION SHALL BE ROTO-TILLED TO A MINIMUM DEPTH OF 6 INCHES TO ALLEVIATE ANY COMPACTION OF THE FACILITY BOTTOM. ANY SUBSTITUTE METHOD FOR ROTO-TILLING MUST BE APPROVED BY THE ENGINEER PRIOR TO USE. ANY PONDED WATER SHALL BE REMOVED FROM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

DETAIL 2: FILTRATION SOIL MIXTURE

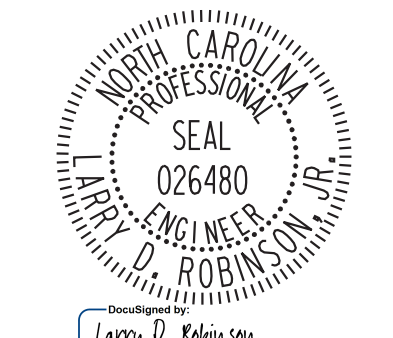


NOTES:
1) FOREBAY LAYOUT MAY BE IRREGULAR. SEE PLANS.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

DETAIL 3: FILTRATION AREA FOREBAY



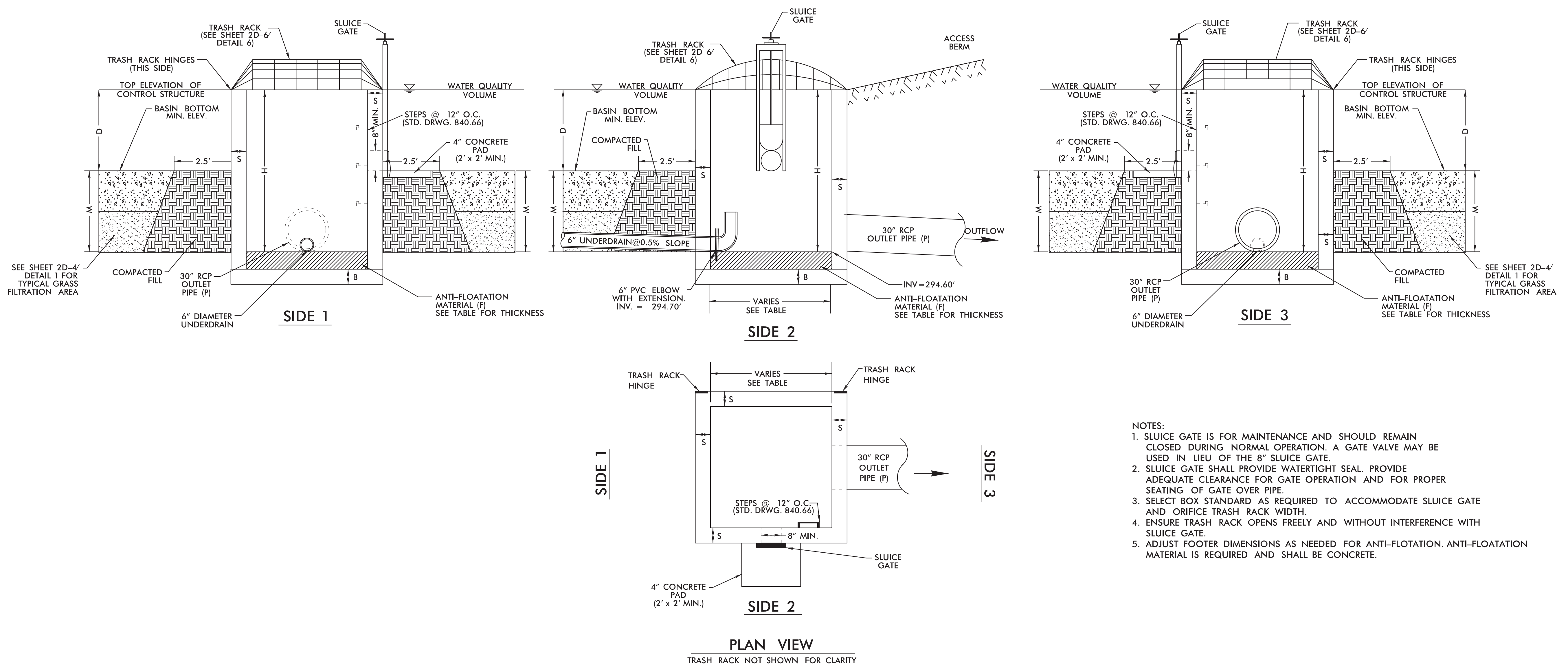
DETAIL 4: 18" x 18" x 6" CONCRETE COLLAR



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

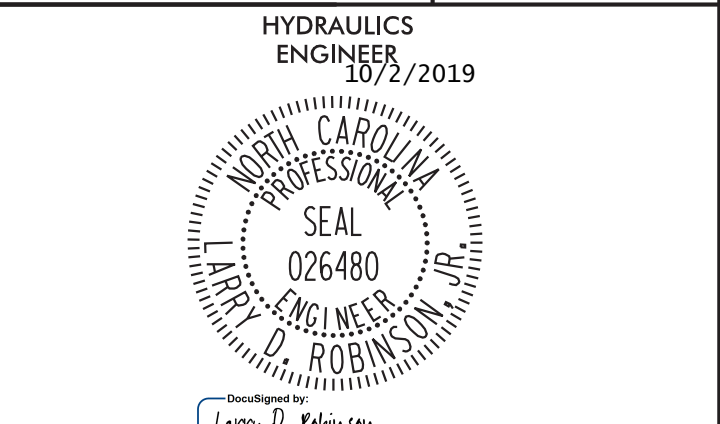
DETAIL 5
FILTRATION BASIN DRAWDOWN STRUCTURE

NOT TO SCALE



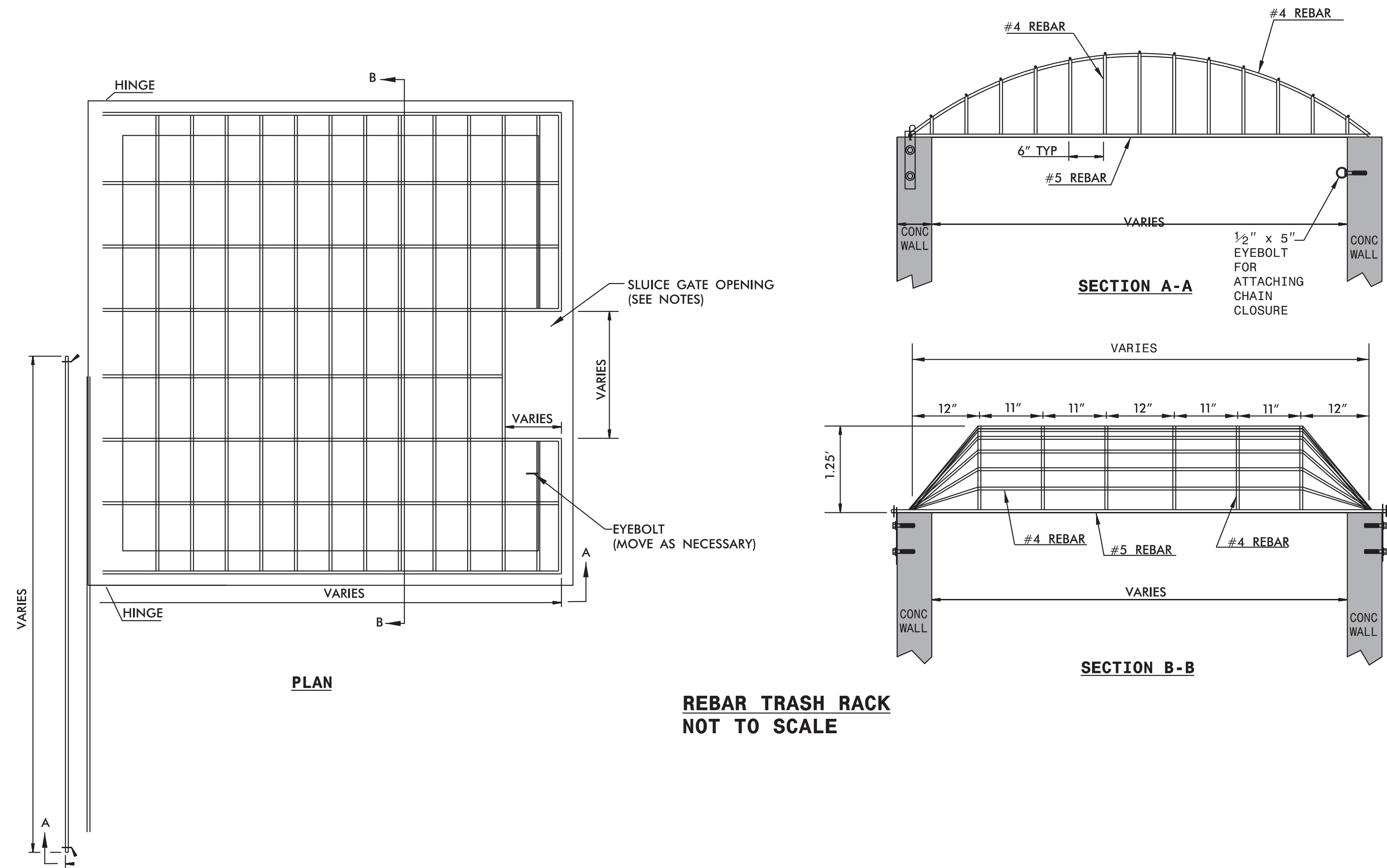
- NOTES:**
1. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION. A GATE VALVE MAY BE USED IN LIEU OF THE 8" SLUICE GATE.
 2. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
 3. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND ORIFICE TRASH RACK WIDTH.
 4. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
 5. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTATION. ANTI-FLOTATION MATERIAL IS REQUIRED AND SHALL BE CONCRETE.

MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE												
STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEVATION CONTROL STRUCTURE	ANTI-FLOATATION MATERIAL (F) THICKNESS FEET	CTL. STR. DIMENSIONS (W x L x H)	OUTLET PIPE DIAMETER(P) INCHES	INVERT ELEVATION OUTLET PIPE (P)	MEDIA FILTER + AGGREGATE DEPTH (M) FEET
19+52.47 -RPC-	0662	6	6	298	300	2	291.1	3.5	4' X 4' X 5.4'	30	294.6	3



**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

DETAIL 6
TRASH RACK DETAILS
 NOT TO SCALE



REBAR TRASH RACK
NOT TO SCALE

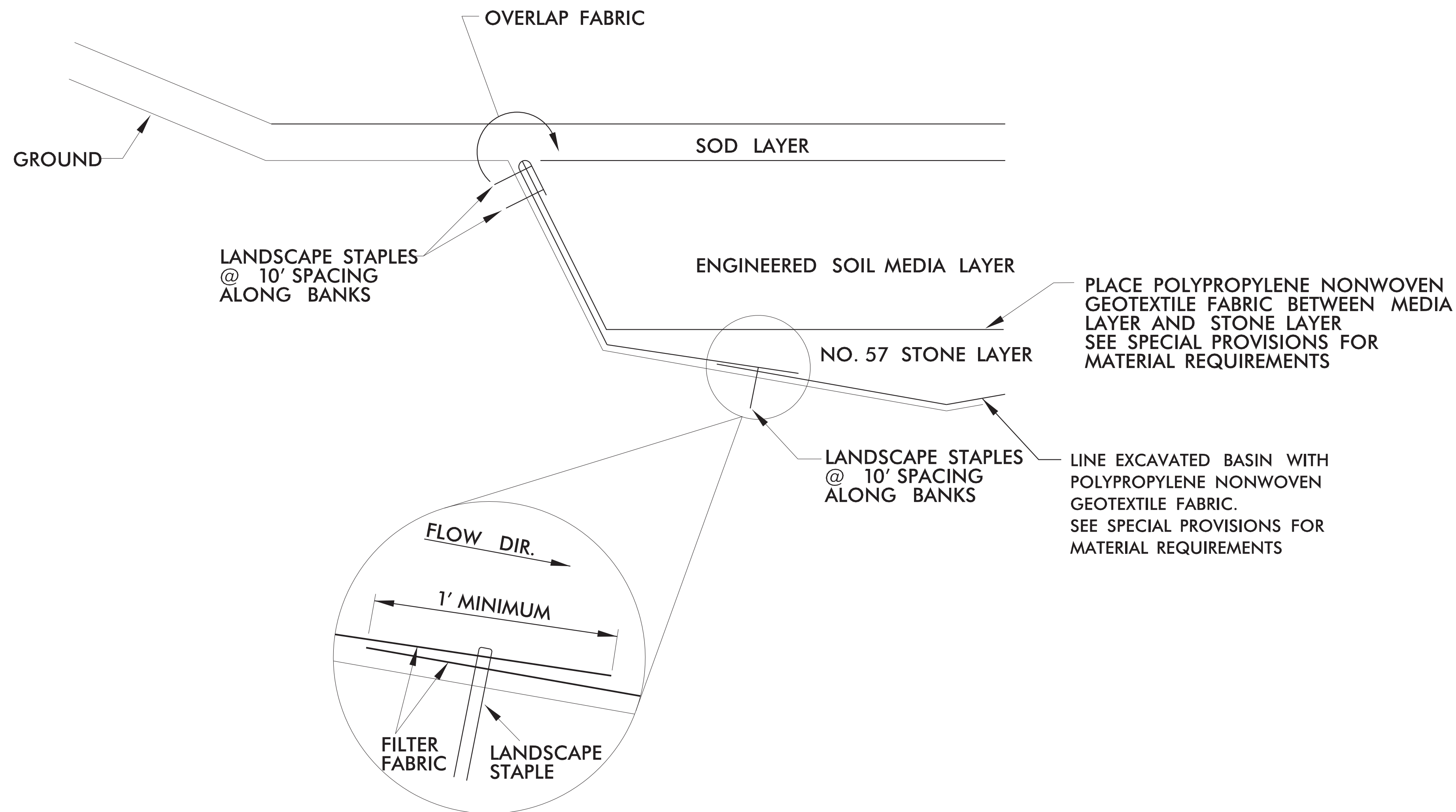
- RISER TRASH RACK NOTES:**
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
 2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
 3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.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



**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

DETAIL 7 FILTRATION BASIN FABRIC INSTALLATION

N.T.S.



NOTES:

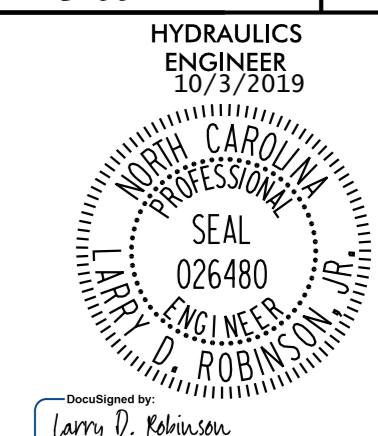
- 1) LINING FABRIC SHOULD BE FOLDED BACK TO OVERLAP DIVIDING FABRIC AND SECURED WITH LANDSCAPE STAPLES TO ENSURE SEALING THE STONE FROM SOIL.
- 2) FABRIC SHOULD BE LAYED IN A WAY TO PREVENT WATER FROM FLOWING BETWEEN OVERLAPPED PIECES. (SEE BLOWUP)
- 3) FABRIC SHOULD BE OVERLAPPED A MINIMUM OF 12 INCHES AND SECURED WITH STAPLES.
- 4) NO OVERLAPPING SHOULD OCCUR UNDER DRAIN PIPES.
- 5) SEE SHEET 2D-4 FOR PLANTING DETAILS, SOIL MEDIA, AND ANY OTHER FILTRATION BASIN DETAILS.

5/14/99

Kimley » Horn
 P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

RIGHT-OF-WAY REV.
 CONST. REV.

PROJECT REFERENCE NO. 1-5700 SHEET NO. 2D-8



**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

SUMMARY OF EARTHWORK
 (for Filtration Basin)

ITEM DESCRIPTION	UNIT	QUANTITY
		FILTRATION BASIN
BASIN EXCAVATION	CY	3550
BASIN WASTE	CY	3550
BASIN CLEARING AND GRUBBING	ACR	0.78

ITEMS ARE INCLUDED IN FILTRATION BASIN PAY ITEM.

SUMMARY OF BASIN COMPONENT ITEMS
 (for Filtration Basin)

ITEM DESCRIPTION	UNIT	QUANTITY
		FILTRATION BASIN
OUTLET CONTROL STRUCTURE BOX (840.45)	EA	1
CONCRETE PAD, 2' x 2' x 4' THICK	EA	1
8" SLUICE GATE	EA	1
RISER TRASH RACK	EA	1
GEOTEXTILE FOR DRAINAGE (TYPE 2, NON-WOVEN)	SY	930
WASHED NO. 57 STONE	TON	330
UNDERDRAIN PIPE - 6" PVC PERFORATED	LF	324
UNDERDRAIN PIPE - 6" PVC NONPERFORATED	LF	8
6" x 6" x 6" x 6" PVC TEE	EA	3
6" PVC 90-DEGREE BEND	EA	8
6" CLEANOUT	EA	10
ENGINEERED SOIL MEDIA	CY	490
CONCRETE PAD, 2' x 2' x 6" THICK WITH TWO #3 HOOPS	EA	10
6" CLEANOUT CAP (THREADED)	EA	10
SOD, ZOYSIA, HALF-CUT	SY	740
RIPRAP, CL. B	TON	86

ITEMS ARE INCLUDED IN FILTRATION BASIN PAY ITEM.

10/1/2019

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 BETWEEN 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:

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ PCF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ PSF
- DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
- 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.
- 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".
- 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".
- MINIMUM REQUIRED EXTENSION IS 6' FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32' FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
- 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.
- 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
- CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.

GEOTECHNICAL ENGINEER

ENGINEER

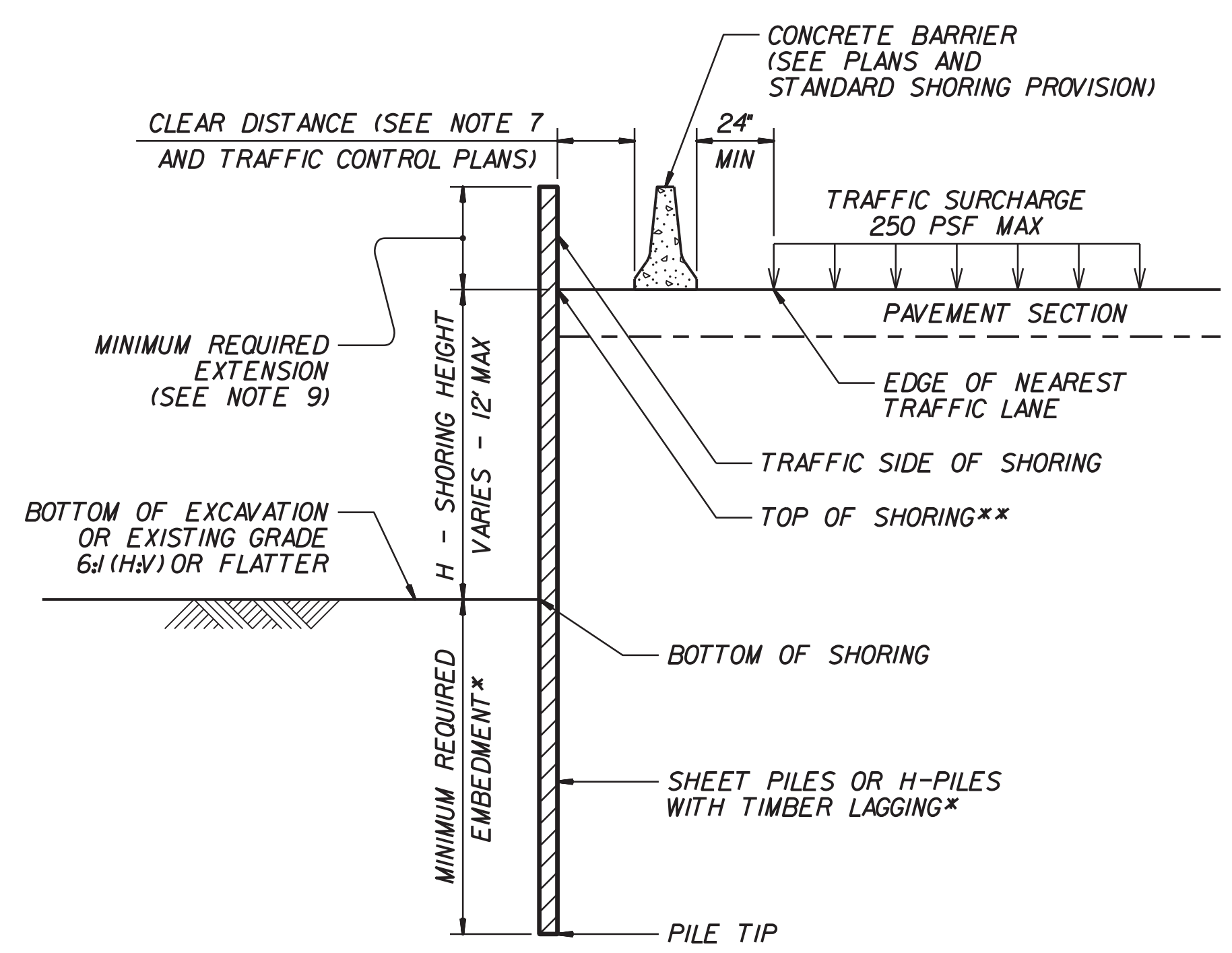
SEAL PE #

ENGINEER SEAL NAME

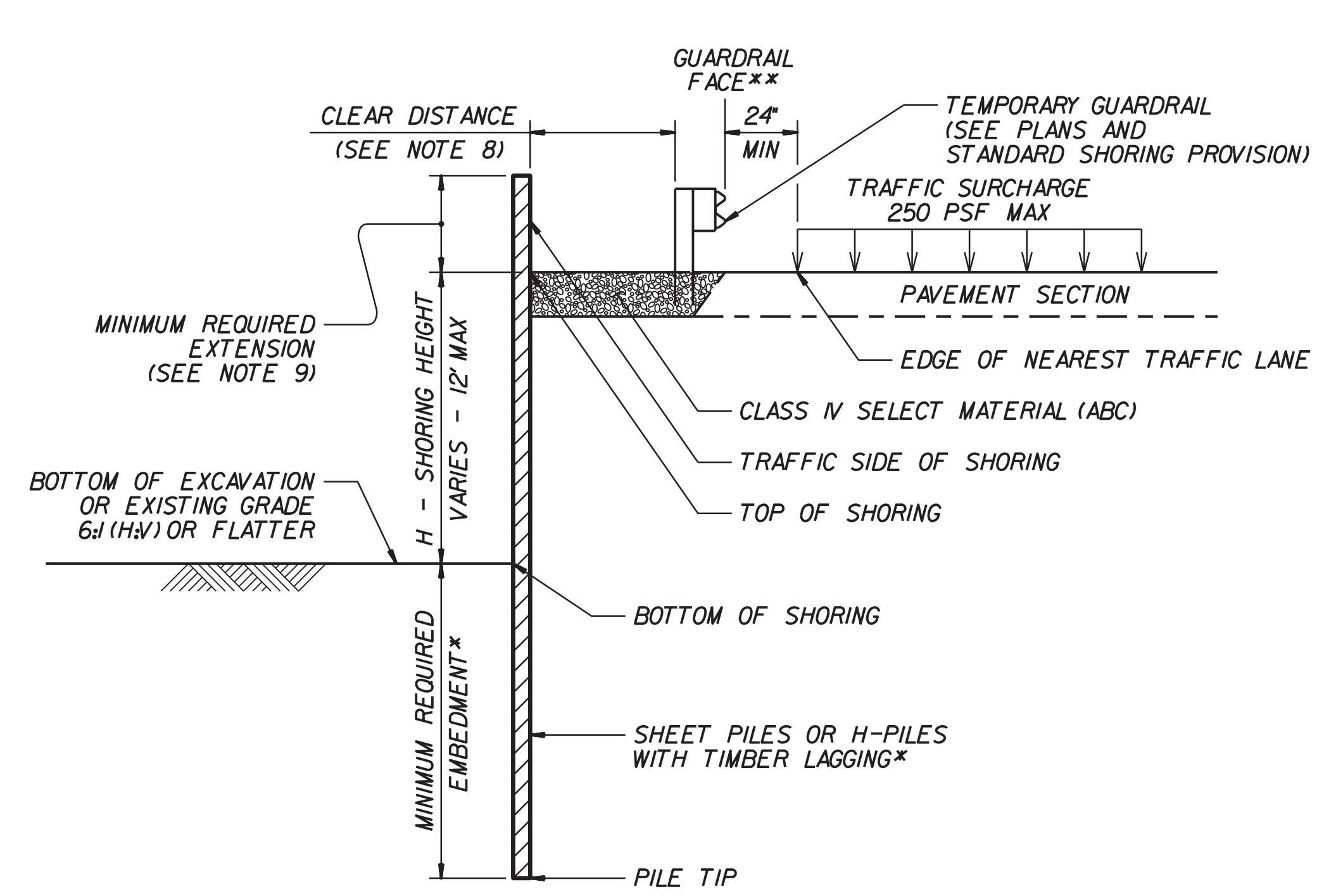
SIGNATURE DATE

SIGNATURE DATE

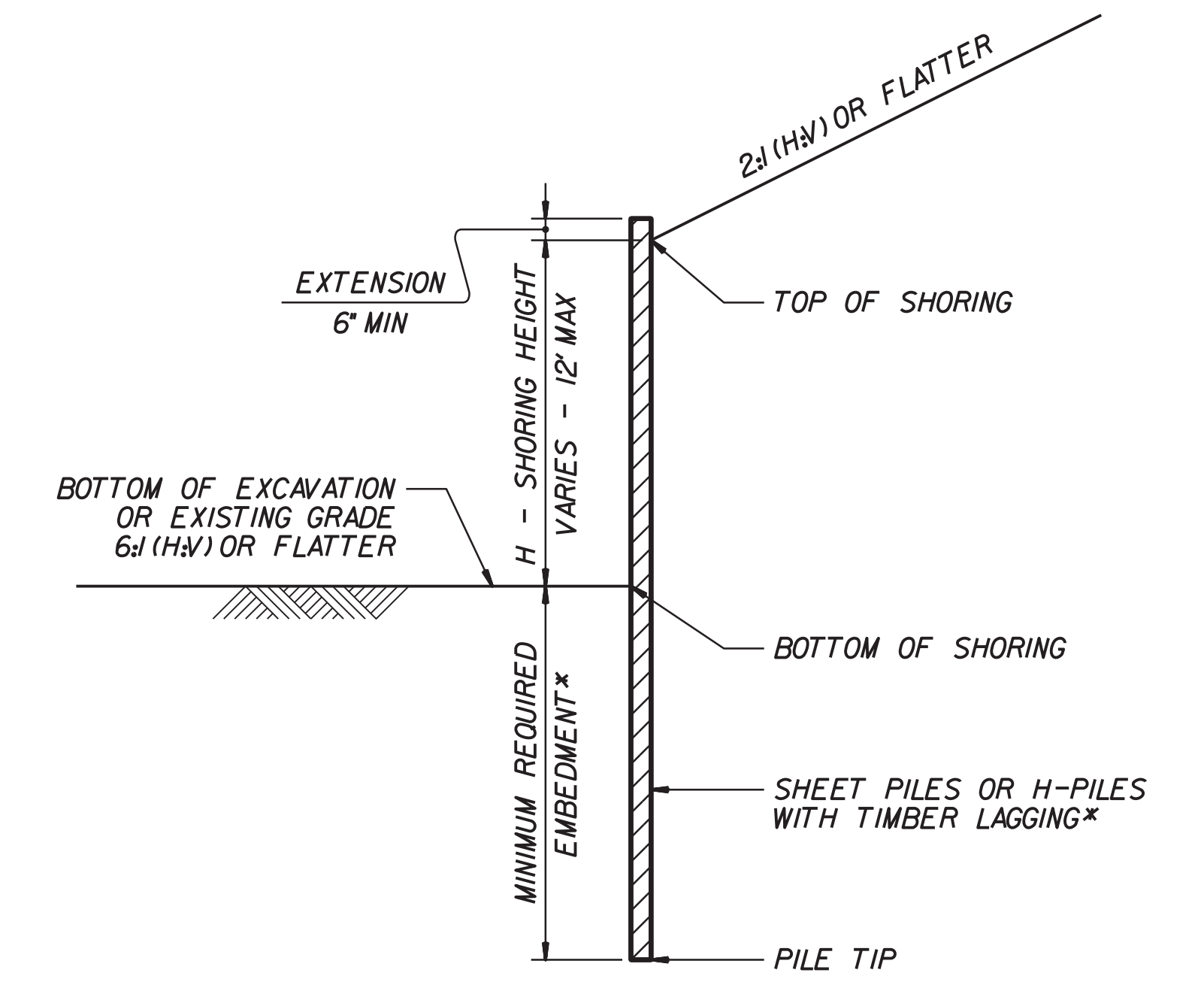
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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.

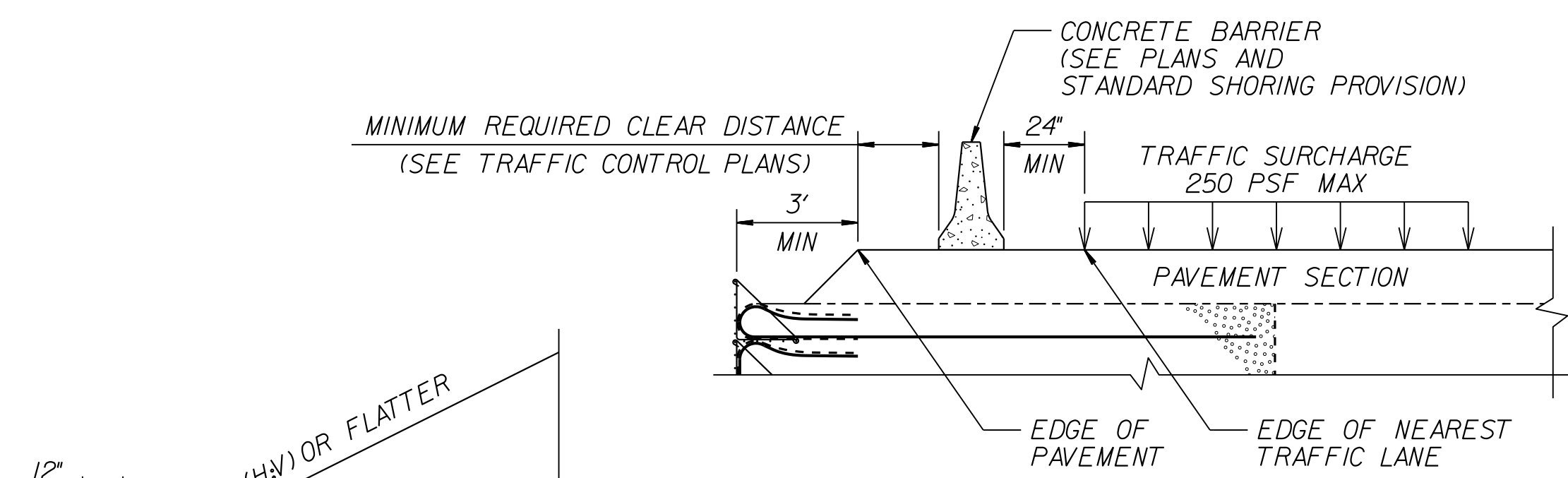
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

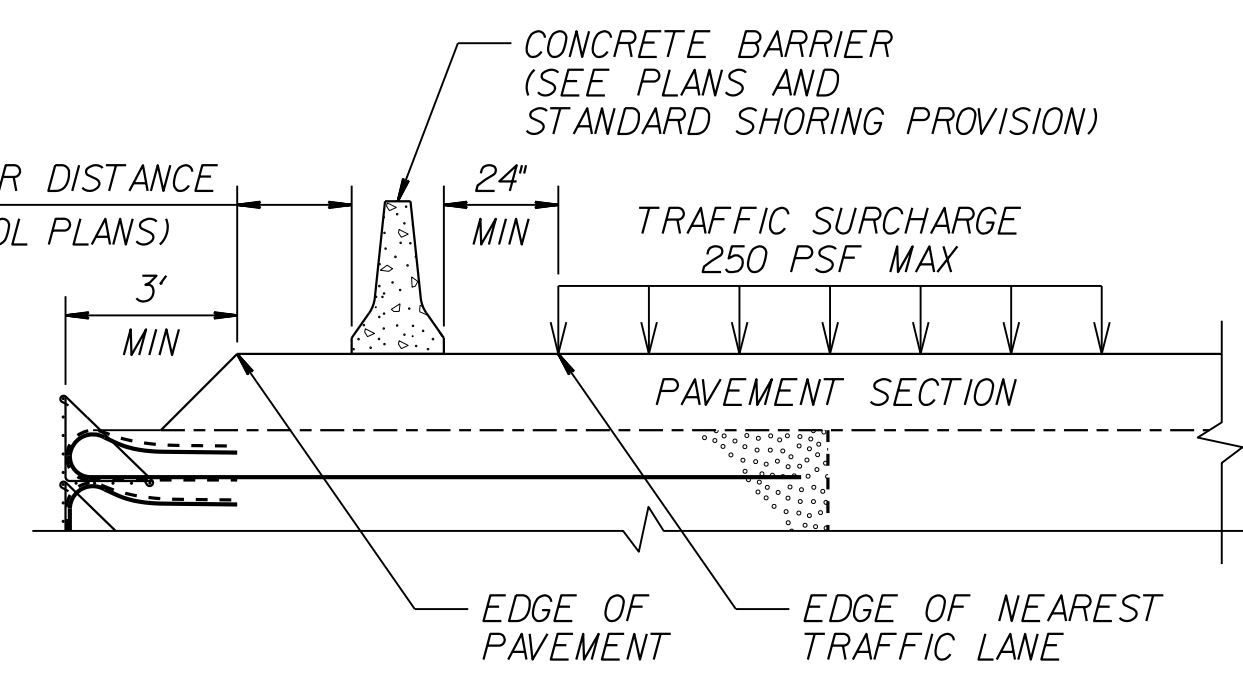
STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

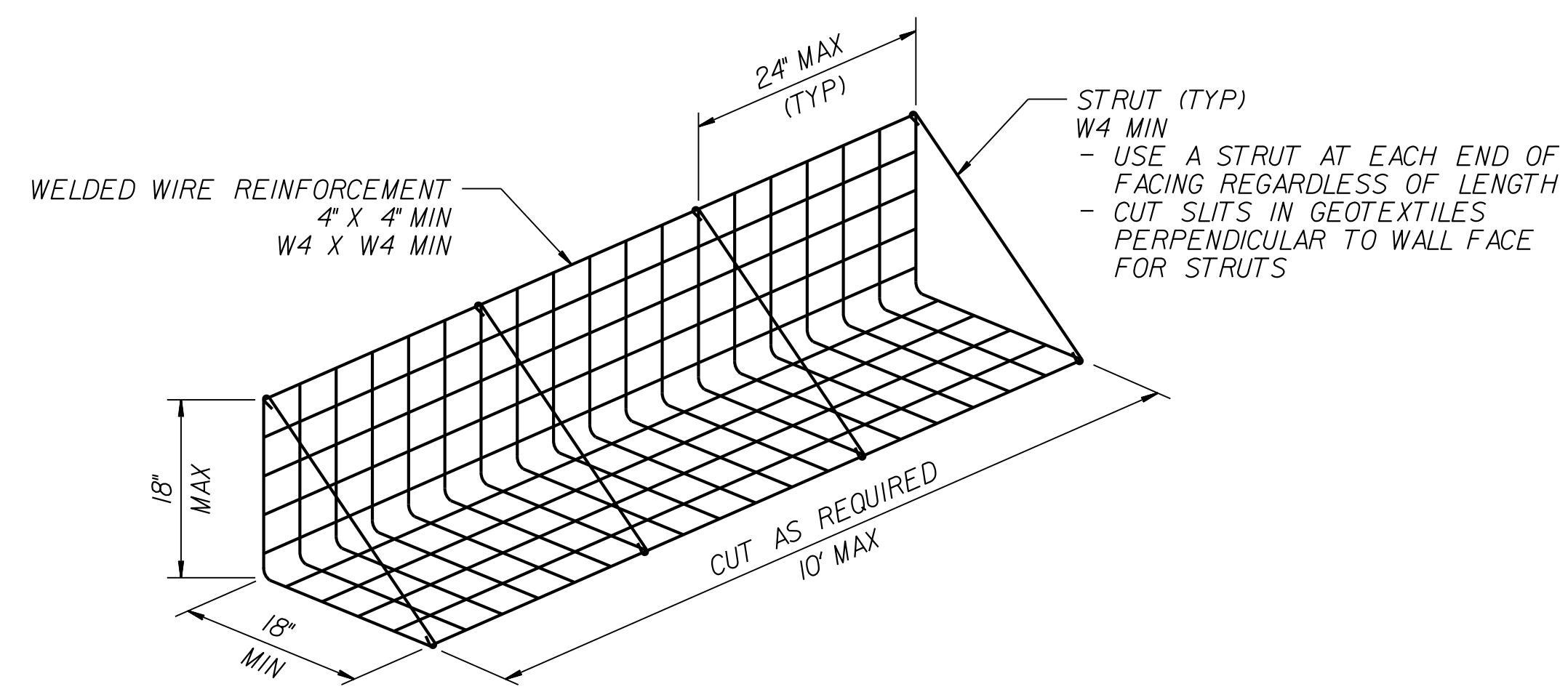
DATE: 11-19-13



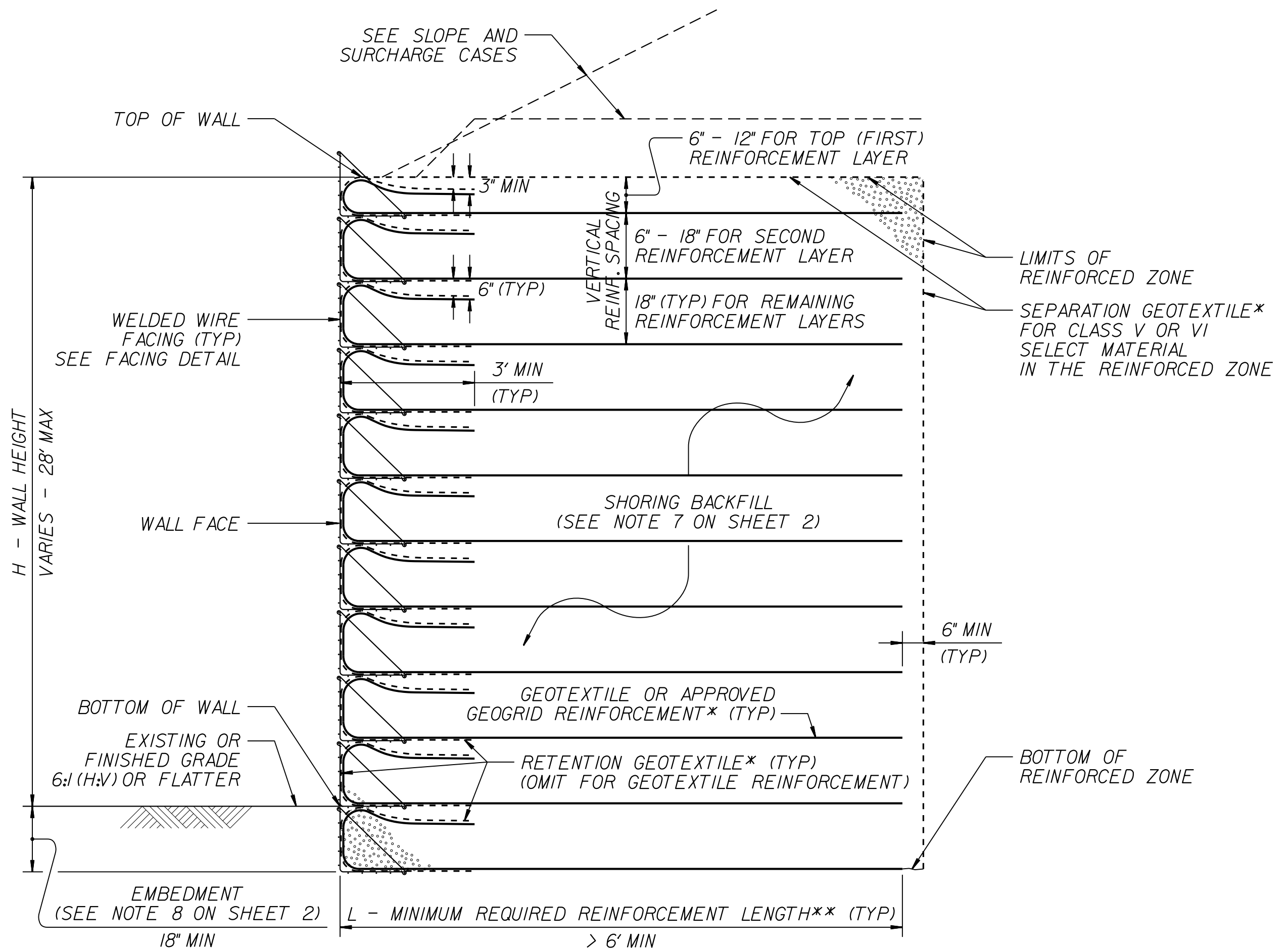
SLOPE CASE



SURCHARGE CASE

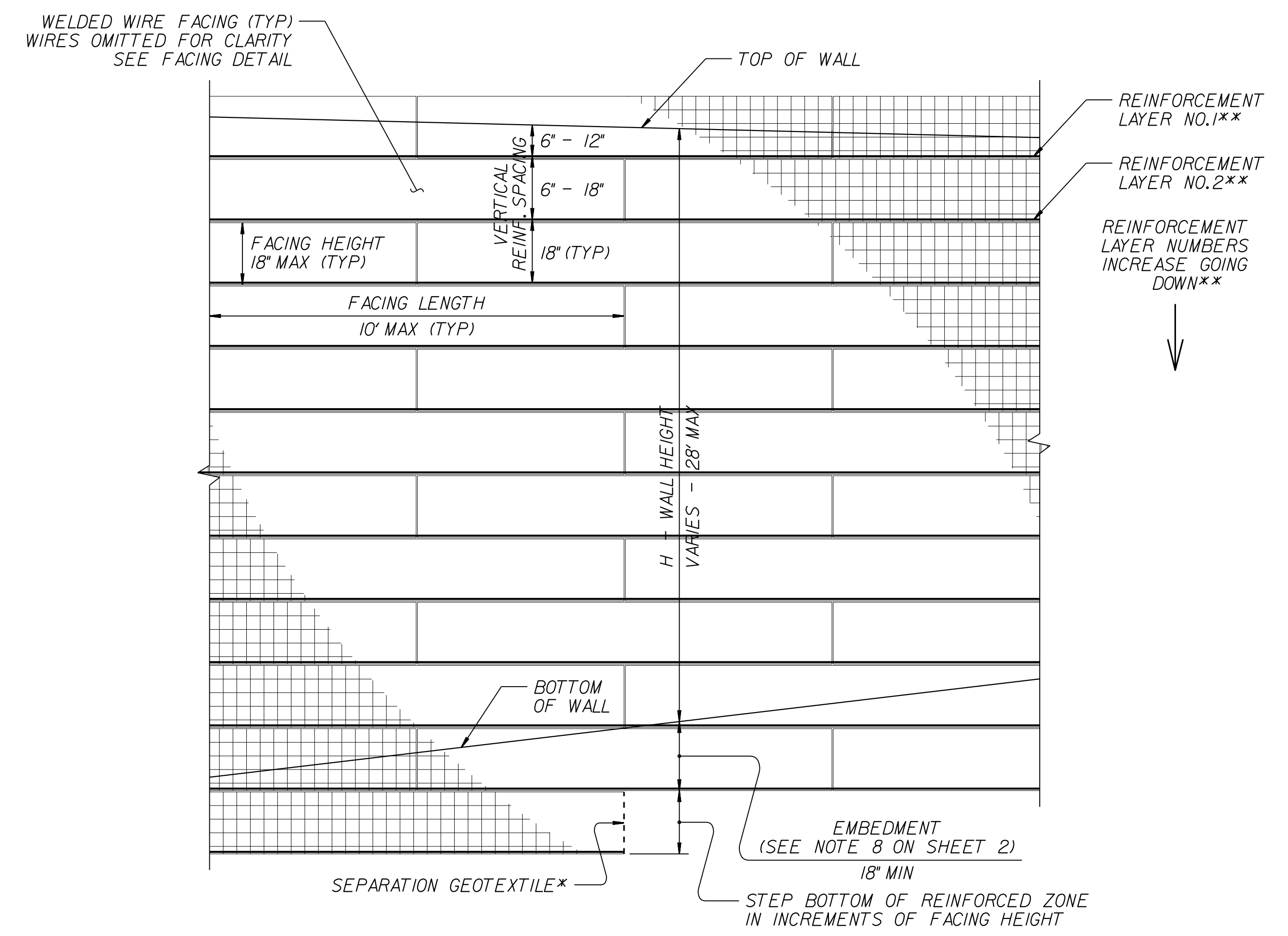


FACING DETAIL



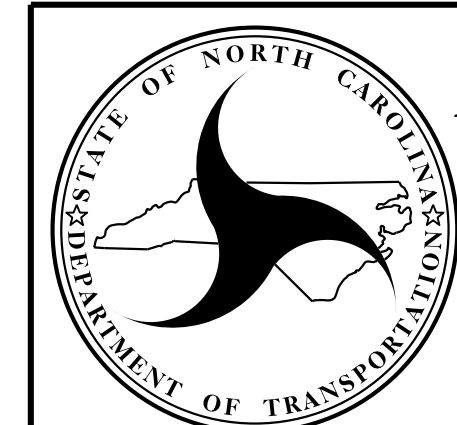
STANDARD TEMPORARY WALL

(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.

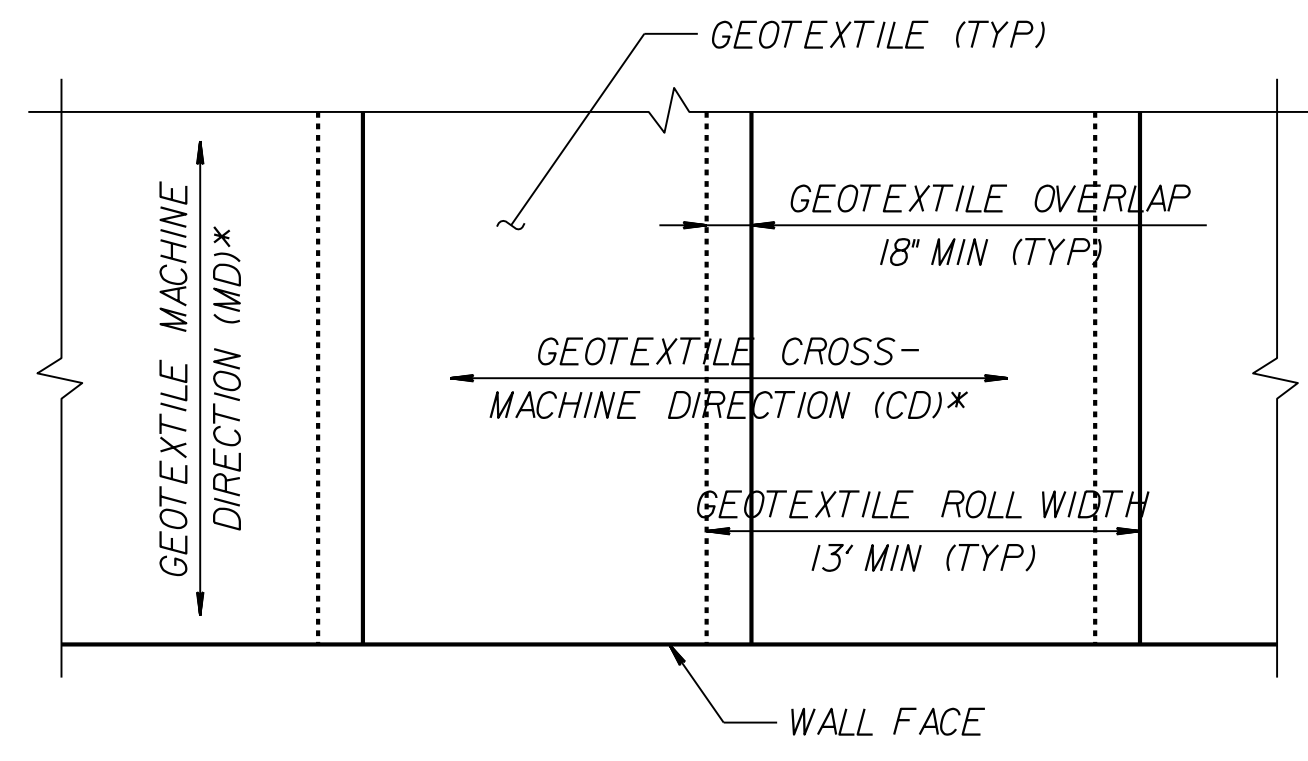


NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

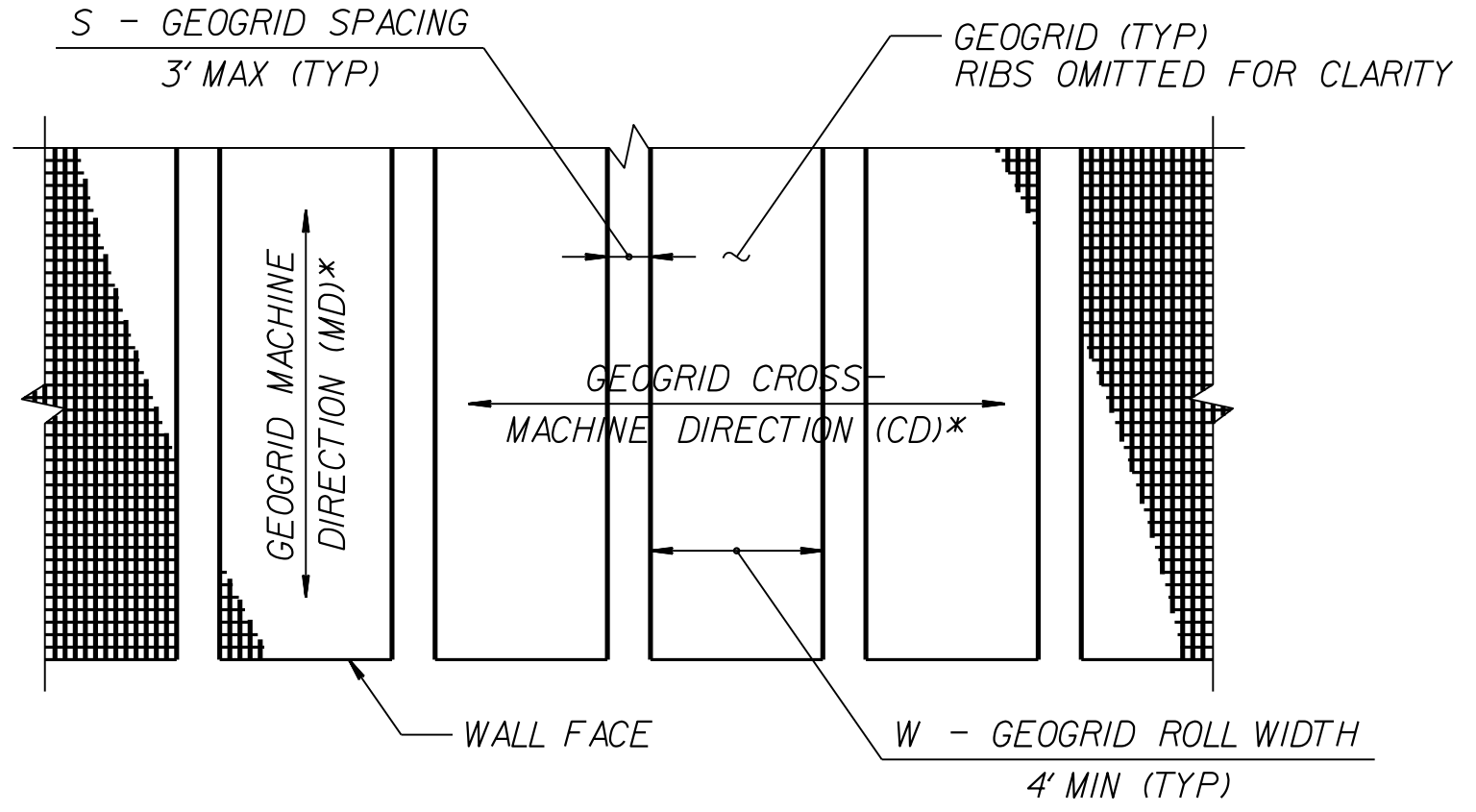
**GEOTECHNICAL
 ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.02

STANDARD
 TEMPORARY WALL
 SHEET 1 OF 3

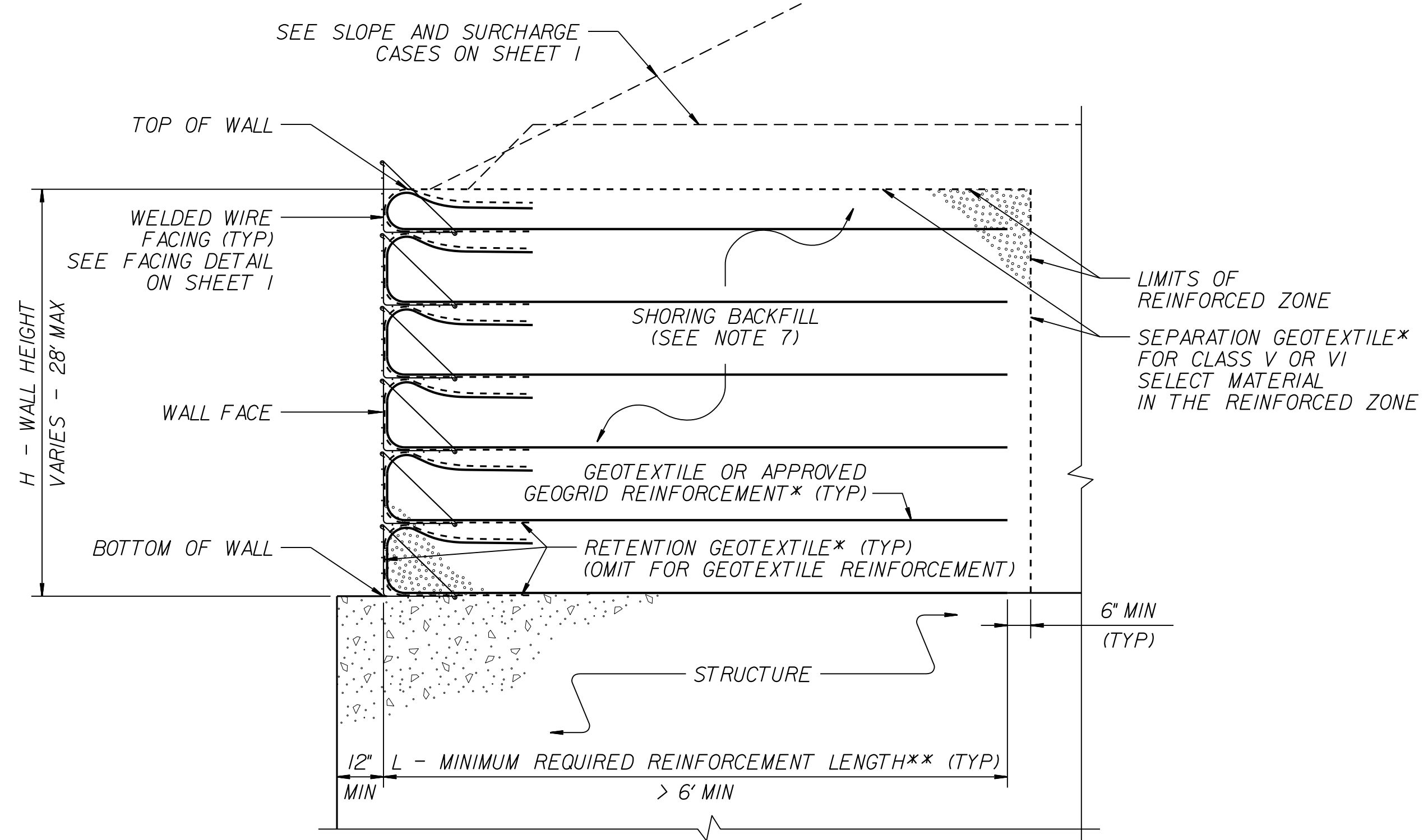


GEOTEXTILE PLACEMENT
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



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.



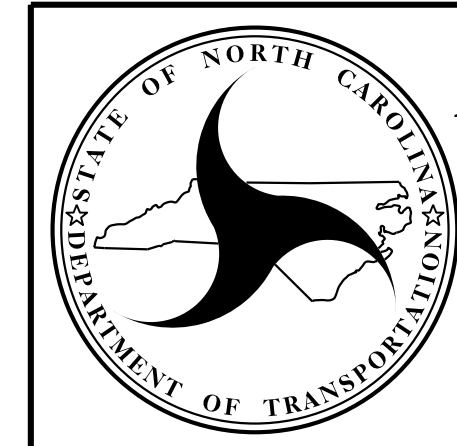
TEMPORARY WALL ON STRUCTURE DETAIL
*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ PCF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ PSF
- DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
- 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.
- 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.
- EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
- DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
- 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 I 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.
- FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
 - 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) \geq (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
- REINFORCEMENT STRENGTH IN CD \geq MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
 - 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
 - DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
 - FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
 - DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
 - CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
 - FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
 - 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.

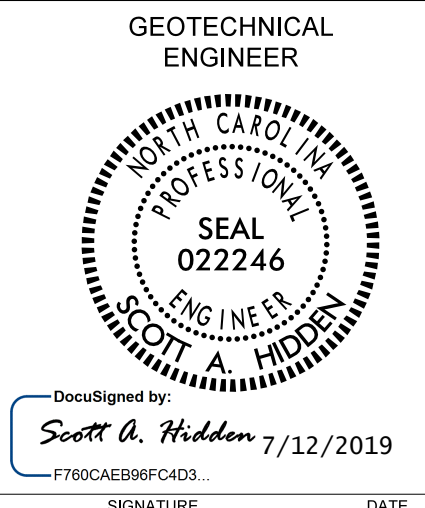


NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 2 OF 3

PROJECT REFERENCE NO. I-5700	SHEET NO. 2G-4
	ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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	
		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	
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	CLASS V OR CLASS VI SELECT MATERIAL	6	6	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)

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.

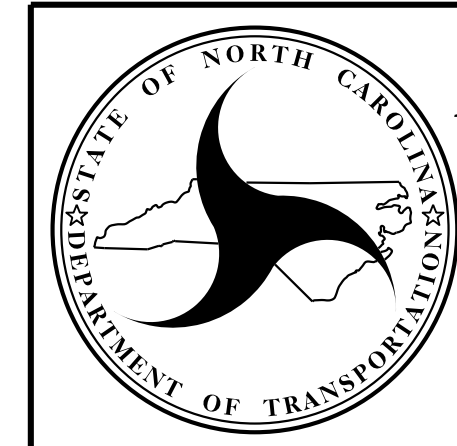
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	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.)

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

SUMMARY OF EARTHWORK
 (EARTHWORK VOLUMES ARE IN CUBIC YARDS)

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-Y LT- 25+32.85	41+21.00	2999	199		2800
-Y LT- 41+21.00	53+50.00	1790	1612		178
-Y LT- 53+50.00	79+00.00	6996	94		6902
SUBTOTALS:		11785	1905		9880
-Y RT- 48+45.00	52+00.00	506	88		418
-Y RT- 52+00.00	81+10.00	5428	134		5294
-Y RT- 81+10.00	113+06.23	9116	16898	7782	
SUBTOTALS:		15050	17120	7782	5,712
-L LT- 18+85.00	21+34.46	46	14		32
-Y5- 10+80.00	12+50.00	152	44		108
-L LT- 21+34.46	34+66.90	10053	5011		5042
-Y2- 10+00.00	12+50.00	47	488	441	
-L LT- 34+66.90	37+79.30	36	3665	3629	
-L LT- 37+79.30	41+51.53	8	7100	7092	
-L LT- 41+51.53	42+57.40 (Beg. Bridge)		2560	2560	
SUBTOTALS:		10342	18882	13722	5182
-RPCSPUR- 20+46.66	23+35.27	103	3286	3183	
-RPC- 10+00.00	23+72.23	3717	20562	16845	
SUBTOTALS:		3820	23848	20028	
-RPBSPUR- 10+00.00	14+09.31	4304	526		3778
-RPB- 10+00.00	23+61.90	33937	402		33535
SUBTOTALS:		38241	928		37313
-L LT- 46+13.96 (End Bridge)	50+45.29	9	809	800	
-L LT- 50+45.29	58+25.54	806	918	112	
-Y3- 15+18.75	31+24.03	28657	56063	27406	
-Y8- 17+00.00	22+18.46	307	1943	1636	
-L LT- 58+25.54	61+00.00	275	6		269
SUBTOTALS:		30054	59739	29954	269
-L RT- 18+85.00	34+60.00	218	328	110	
-Y1- 12+42.46	14+11.34	115	649	534	
-L RT- 34+60.00	37+50.37	47	38		9
-L RT- 37+50.37	42+35.65	8	1642	1634	
-L RT- 42+35.65	42+57.40 (Beg. Bridge)		533	533	
SUBTOTALS:		388	3190	2811	9
-RPA- 10+00.00	22+86.42	17262	2725		14537
-RPASPUR- 10+00.00	12+62.33	2913	23		2890
SUBTOTALS:		20175	2748		17427
-RPD- 10+10.00	26+66.45	3030	18652	15622	
-RPDSPUR- 10+00.00	14+28.86	90	6346	6256	
SUBTOTALS:		3120	24998	21878	
-L RT- 46+13.96 (End Bridge)	46+98.03		689	689	
-L RT- 46+98.03	50+32.17	23	376	353	
-L RT- 50+32.17	53+90.00	58	5380	5322	
-NBLRPA- 10+00.00	19+71.71	499	235		264
-L RT- 53+90.00	56+18.52	92	31		61
-NBL- 56+18.52	61+50.00	739			739
-L RT- 56+18.52	61+00.00	146	60		86
SUBTOTALS:		1557	6771	6364	1150
TOTALS:		134532	160129	102539	76942
MATERIALS FOR SHOULDER CONSTRUCTION			9600	9600	
LOSS DUE TO CLEARING AND GRUBBING		-8100		8100	
ROCK WASTE TO REPLACE BORROW				-12918	-12918
WASTE IN LIEU OF BORROW				-64024	-64024
ADJUST FOR ROCK WASTE			-2584	-2584	
PROJECT TOTAL		126432	167145	40714	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				2036	
GRAND TOTALS:		126432	167145	42749	
SAY:		126500		43000	

PAVEMENT STR. VOL. = 49,282 CY

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

REMOVAL OF EXISTING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AREA (SF)	AREA (SY)
-L- 24+24	24+69	RT	168	19
-L- 25+01	26+39	RT	1036	115
-L- 26+72	29+62	RT	4370	486
-L- 30+27	34+24	RT	7480	831
-L- 34+84	37+12	RT	1568	174
-L- 38+16	40+44	RT	9120	1013
-RPD- 25+33	-Y- 113+06	RT	73180	8131
-Y- 67+98		RT	10000	1111
-Y- 48+45	-RPC- 24+54	RT	36836	4093
-Y- 25+33	78+98	LT	90069	10008
-RPA- 10+00	-L- 57+86	RT	12654	1406
-RPA- 14+39	21+92	LT	14707	1634
-RPA- 21+87	21+93	LT	88	10
-L- 51+67	52+25	LT	24744	2749
-L- 52+46	61+01	LT	14452	1606
-Y3- 15+95	21+89	RT	38332	4259
-L- 49+53	54+48	CL	12587	1399
-L- 48+19	49+53	CL	1111	123
-L- 39+08	42+65	RT	19868	2208
-L- 45+70	49+27	CL	24540	2727
-L- 49+27	49+51	CL	223	25
TEMP. PAVEMENT				
-L- 30+38.23	34+17.69	RT	3250	361
-L- 37+61.08	38+80.52	RT	884	98
-L- 48+19.94	51+98.71	RT	2343	260
-RPA- 21+13.48	21+75.75	RT	1378	153
-RPBSPUR- 10+63.41	-L- 48+50.00	RT	11855	1317
-L- 46+88.49	47+53.49	LT	470	52
-RPCSPUR- 21+25.00	-L- 39+00.00	RT	4976	553
-RPDSPUR- 10+61.02	13+32.00	RT	5895	655
-RPCSPUR- 21+13.46	21+75.75	RT	1614	179
-RPB- 17+00.00	18+65.00	RT	124	14
-RPA- 20+85.00	18+65.00	RT	3348	372
-C_EYI_RPD- 10+78.00	20+87.00	RT	9874	1097.11
TOTAL			49238	
SAY			49500	

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- /NBLRPA- RT.	49+95.00	17+48.00	1142.90
-L- LT	58+71.00	61+00.00	256.90
-RPA- RT.	10+00.00	11+05.00	105.00
-Y- LT.	25+33.00	34+30.00	897.00
-Y- LT.	40+94.00	45+07.00	413.00
-Y- RT.	48+45.00	53+00.00	455.00
-RPD- LT.	16+70.00	101+70.00	2730.30
TOTAL:			6000.10
SAY:			6100.00

WOVEN WIRE FENCE, 48" FABRIC

STATION	STATION	LOCATION	FABRIC (LF)	4" POSTS	5" POSTS
-RPB- 18+65	21+82.23	LT	345	21	7
-L- 50+82.74	53+59.35	LT	296	16	10
-Y3- 29+00	29+45.95	RT	128	4	9
-Y3- 29+00	29+52.86	LT	143	5	9
-L- 42+82.40		CL	47	1	4
-L- 45+88.88		CL	46	1	4
-Y- 25+32.85	35+86.01	LT	1056	68	13
TOTAL			2061	117	56
SAY			2100	120	60

**STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS**

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	1000
				TOTAL LF:	1000

*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)	Offset
-L-	33+00	34+00	522		LT
-L-	35+50	38+00	1,389		LT
-L-	41+00	43+00	1,178		LT
-L-	46+00	46+50	289		RT
-L-	51+00	53+50	694		RT
-RPC-	20+50	23+21	1,114		CL
-RPD-	24+00	26+66	709		CL
-Y-	84+00	102+00	4,400		RT
-Y3-	25+00	27+00	1,800	787	LT/RT
-Y3-	27+00	30+50	2,683	1,173	LT
CONTINGENCY					
			TOTAL SY/TONS:	14,778	1,960*

*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(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			AST	3				250	
CONTINGENCY			ASU (1)	12	1500	3000	4500		
			TOTAL CY/TONS/SY:		1500	3000**	4500**	250	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)

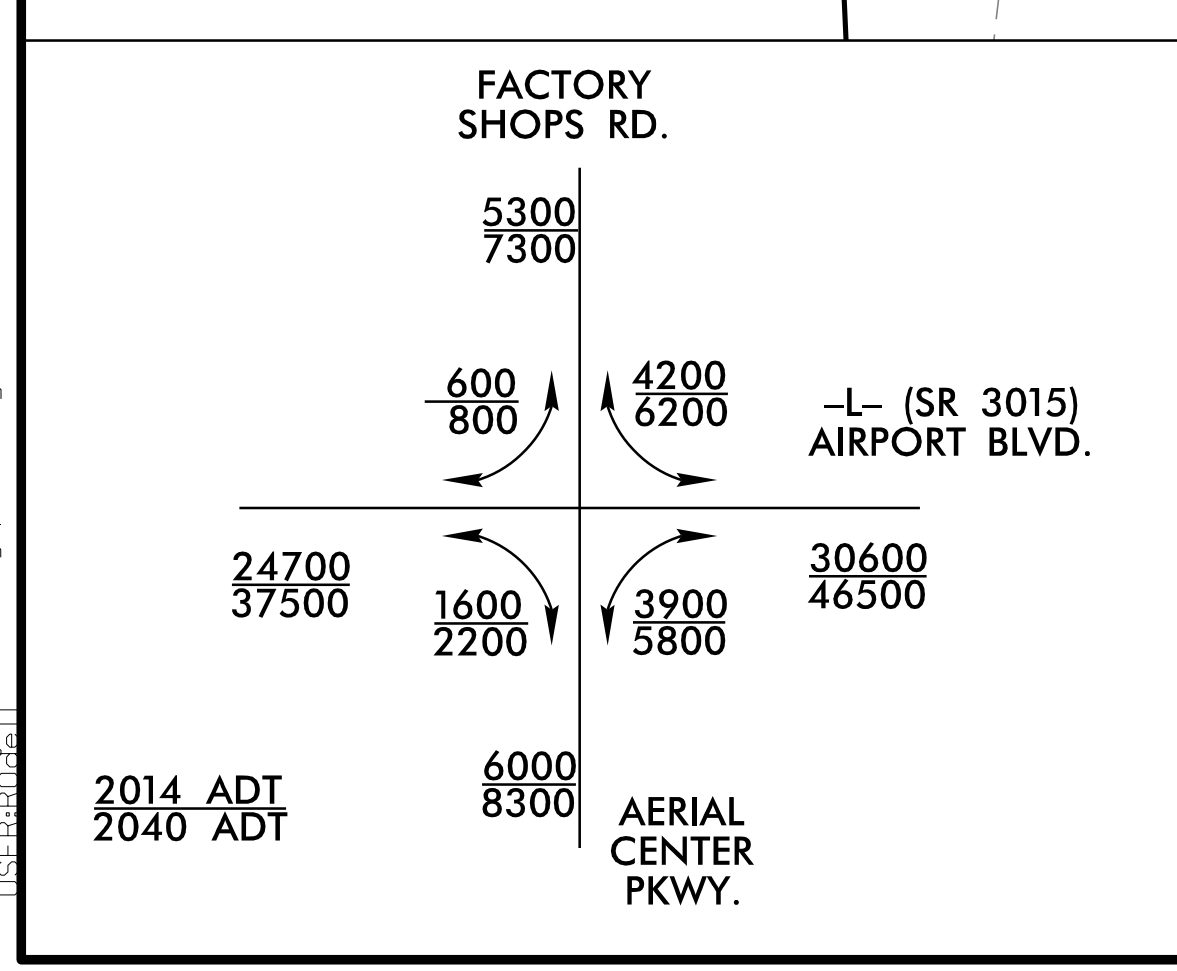
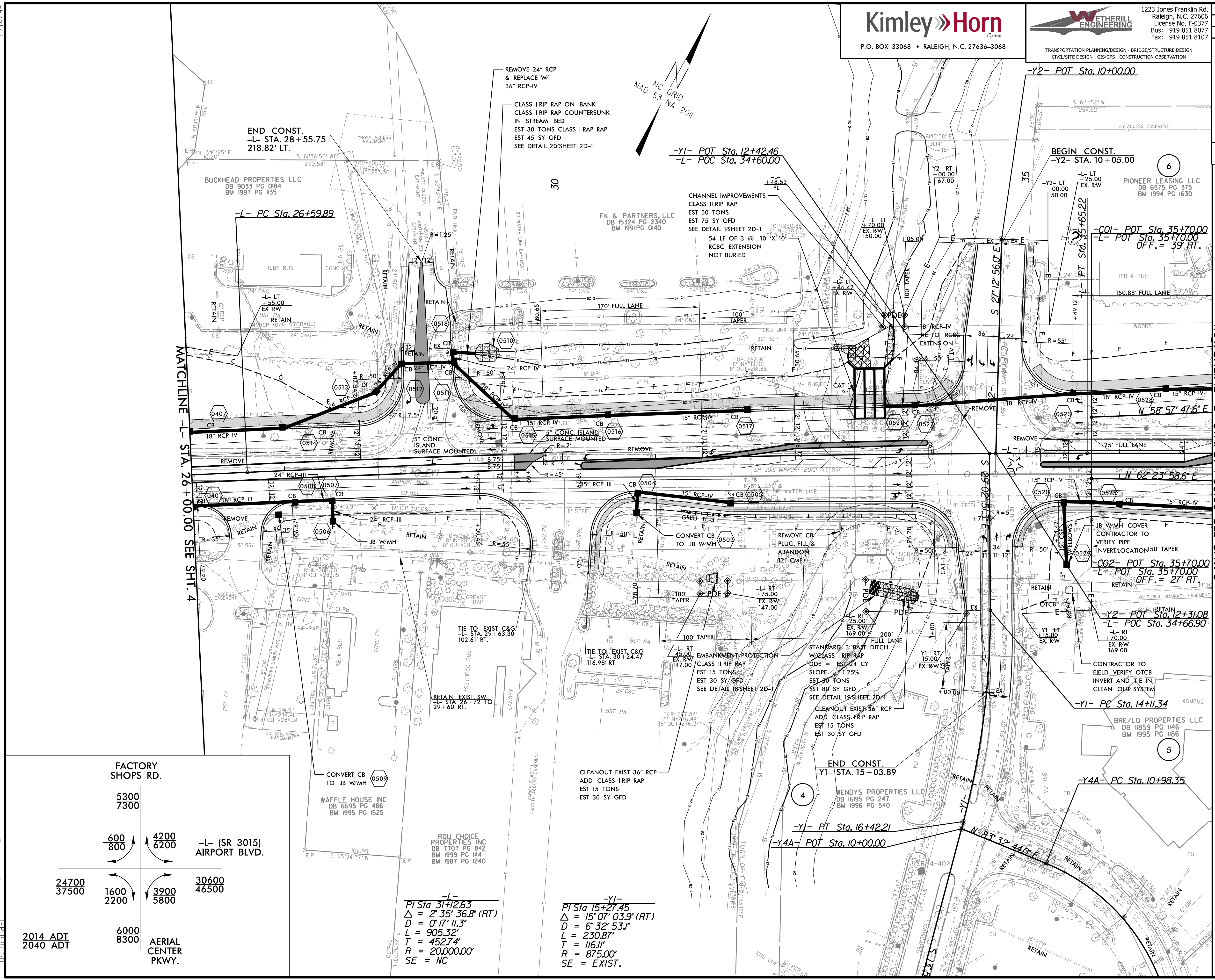
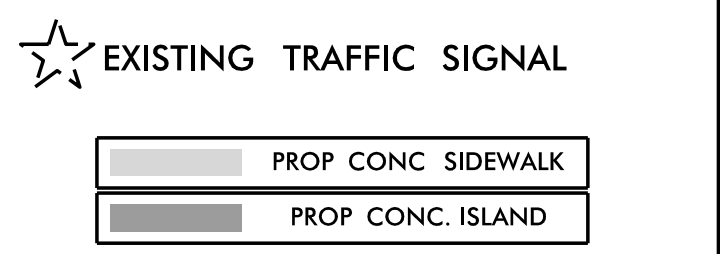
*AST = Aggregate Stabilization

**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

5/14/19

PROJECT REFERENCE NO. 1-5700	SHEET NO. 5
ROADWAY DESIGN ENGINEER 10/16/2019	HYDRAULICS ENGINEER 10/16/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-L-
 P/Sta 31+263
 $\Delta = 2' 35'' 36.8''$ (RT)
 $D = 0' 17'' 11.3''$
 $L = 905.32'$
 $T = 452.74'$
 $R = 20,000.00'$
 SE = NC

-Y1-
 P/Sta 15+27.45
 $\Delta = 15' 07'' 03.9''$ (RT)
 $D = 6' 32'' 53.1''$
 $L = 230.87'$
 $T = 116.11'$
 $R = 875.00'$
 SE = EXIST.

SEE SHTS. 15 & 16 FOR -L- PROFILE
 SEE SHT. 17 FOR -Y1- PROFILE
 SEE SHT. 18 FOR -Y2- PROFILE
 SEE SHT. 2D-1 FOR DRAINAGE DETAILS
 SEE SHTS. C1-1 THRU C1-4 FOR CULVERT PLANS

10/16/2019 57000_Rdwy_psh.05.dgn

