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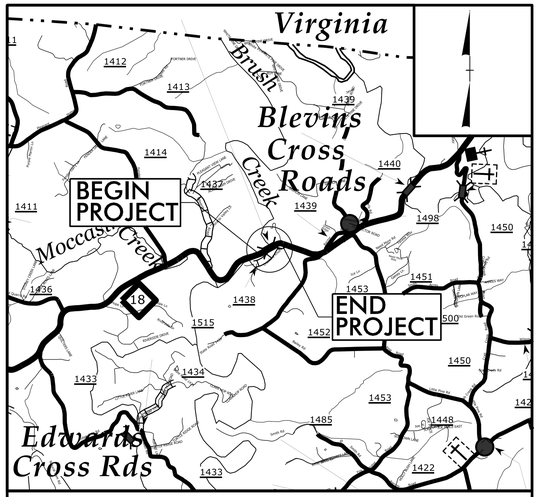
09/08/99

TIP PROJECT: B–5388

CONTRACT: C204255

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



VICINITY MAP

N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

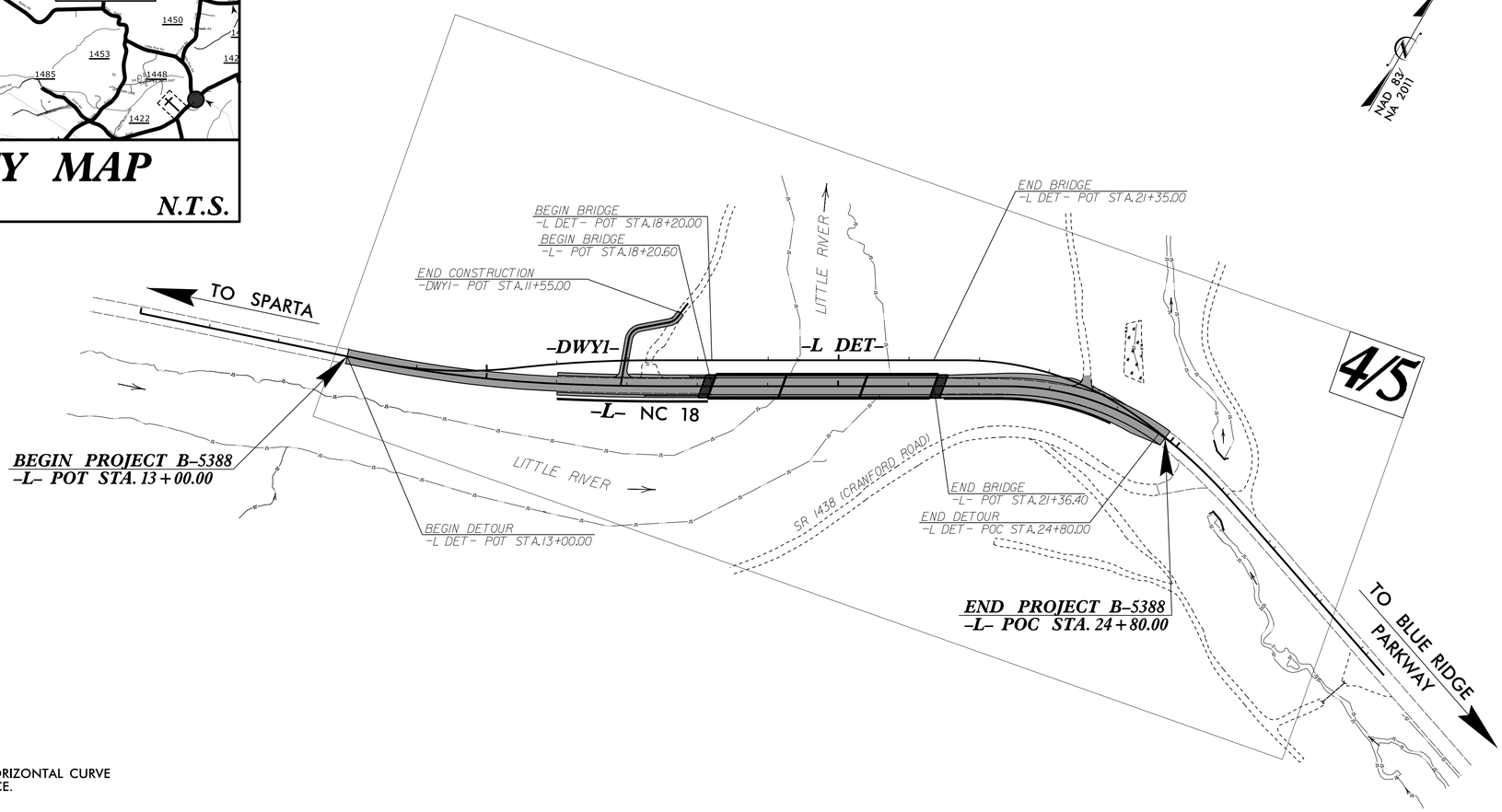
ALLEGHANY COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5388	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46103.1.1	N/A	P.E.
46103.2.1	N/A	ROW/UTIL
46103.3.1	N/A	CONST.

LOCATION: REPLACE BRIDGE 21 OVER LITTLE RIVER ON NC 18

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



DESIGN EXCEPTION REQUIRED FOR HORIZONTAL CURVE RADIUS AND STOPPING SIGHT DISTANCE.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2020 = 1650 VPD
ADT 2040 = 2000 VPD
K = 60 %
D = 10 %
T = 6 %
V (–L–) = 50 MPH
V (–L DET–) = 40 MPH
*TTST = 1% DUALS = 5%
FUNC CLASS =
MAJOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5388 = 0.163 MILES
LENGTH BRIDGE TIP PROJECT B–5388 = 0.060 MILES

TOTAL LENGTH TIP PROJECT B–5388 = 0.223 MILES

Prepared in the Office of:
CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 20, 2018

LETTING DATE:
DECEMBER 18, 2018

DAVID J. CLODGO, PE
PROJECT ENGINEER

KIT A. PERSIANI, PE
PROJECT DESIGN ENGINEER

DAVID STUTTS, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18533 ENGINEER A. T. NOTTINGHAM

DocuSigned by:
Andrew T. Nottingham
SIGNATURE:
P.E. 11/8/2018

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO

DocuSigned by:
David J. Clodgo
SIGNATURE:
P.E. 11/8/2018

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5388	1A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035683 ENGINEER DAVID J. CLODGO

11/7/2018

CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3220
NC COA No. P-1255

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-2	SURVEY CONTROL SHEETS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1 THRU 2C-3	SPECIAL DETAILS
2G-1	GEOTECHNICAL DETAILS
3B-1	ROADWAY SUMMARY
3D-1	DRAINAGE SUMMARY
3G-1	GEOTECHNICAL SUMMARY
4 THRU 6	PLAN AND PROFILE SHEETS
RW01 THRU RW04	MODIFIED R/W PLAN SHEETS
TMP-1 THRU TMP-6	TRANSPORTATION MANAGEMENT PLANS
PMP-1	PAVEMENT MARKING PLAN
EC-1 THRU EC-7	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
SIGN-1 THRU SIGN-3	SIGNING PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
W-1 THRU W-5	RETAINING WALL PLANS
X-1	CROSS-SECTION INDEX SHEET
X-1A	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-47	CROSS-SECTIONS
S-1 THRU S-38	STRUCTURE PLANS

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
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
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.01	Concrete Paved Ditches
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation (Special Detail for Sheet 6 of 8)
862.03	Structure Anchor Units (Special Detail for Type III Anchor Units Sheets 1 of 7 and 2 of 7)
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.04	Barbed Wire Fence with Wood Posts (2 - 7 Strands)
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

GENERAL NOTES

EFF. 01-16-2018 REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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 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. N. 560.01.

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

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 SKY LINE/SKY BEST COMMUNICATIONS.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS (NCDOT).

SYSTIME = 5/8/2019 08:51:08
I:\B-5388\RDSTAN\B5388_Rdy_psh_1A.dgn
USER: DCSTANLEY

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5388	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

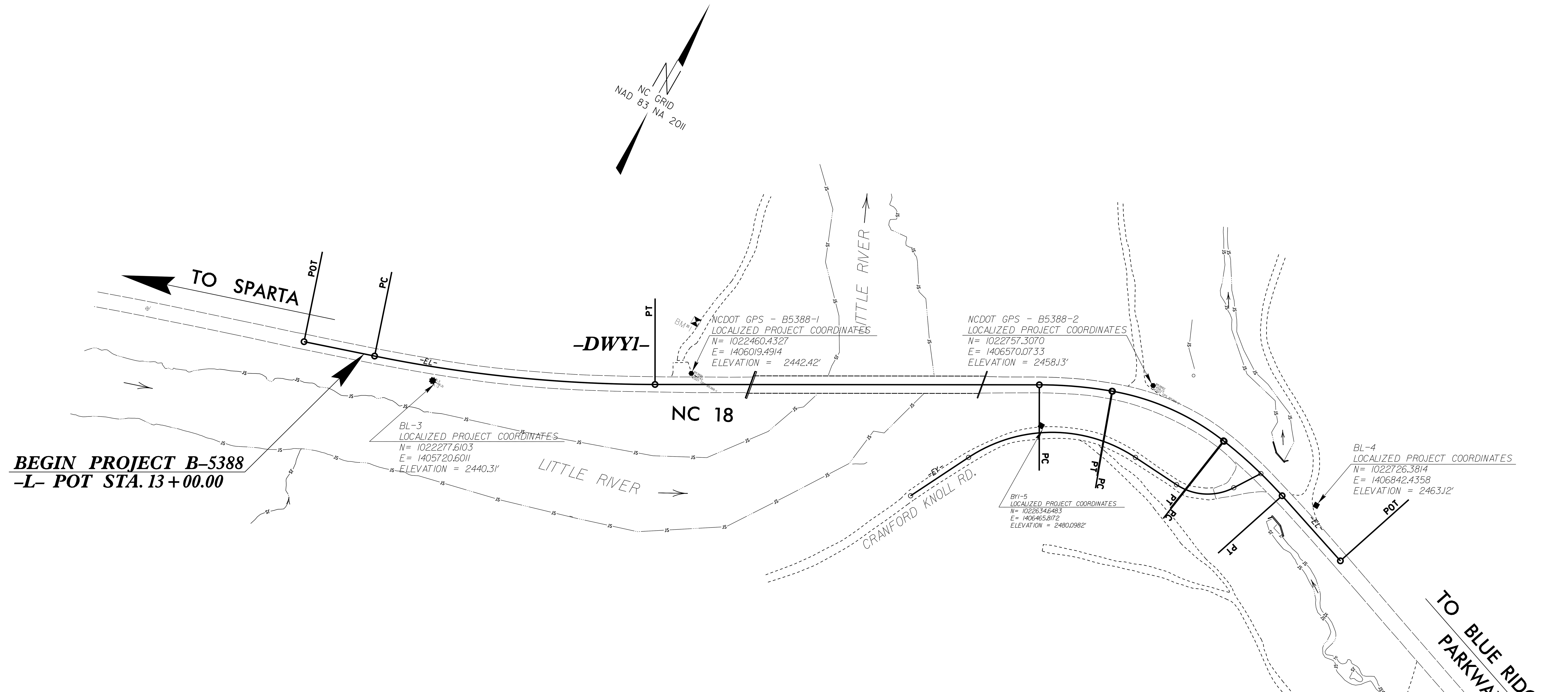
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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

PROJECT REFERENCE NO.	SHEET NO.
B–5388	1C–1
Location and Surveys	

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5833-1"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 1022460.4327(ft) EASTING: 1406019.4914(ft)
ELEVATION: 2442.42(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0000150612
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5833-1" TO -L- STATION 13+00.00 IS
S 63° 35' 05" W 443.63
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

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

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BL

POINT	DESC.	NORTH	EAST	ELEVATION
BL3	BL-3	1022277.6103	1405720.6011	2440.31
B53881	NCDOT GPS B5388	1022460.4327	1406019.4914	2442.42
B53882	NCDOT GPS B5388	1022757.3070	1406570.0733	2458.13
BL4		1022726.3814	1406842.4358	2463.12

BY1

POINT	DESC.	NORTH	EAST	ELEVATION
BY16		1022726.3814	1406842.4358	2463.12
BY15	BY1-5	1022634.6483	1406465.8172	2480.10

BM1 ELEVATION = 2449.88
N 1022524 E 1405990
BM#1 CHISELED X IN ROCK

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	1022236.770	1405543.331							
LINE			N 71°40'44.4" E	97.49					
PC	1022267.415	1405635.877							
CURVE			N 65°56'40.1" E	381.66	11°28'08.4"(LT)	03°00'00.0"	382.30	191.79	1909.86
PT	1022422.988	1405984.392							
LINE			N 60°12'35.9" E	520.35					
PC	1022681.509	1406435.978							
CURVE			N 65°09'03.0" E	98.69	09°52'54.2"(RT)	10°00'00.0"	98.82	49.53	572.96
PT	1022722.984	1406525.535							
LINE			N 70°05'30.2" E	0.77					
PC	1022723.246	1406526.258							
CURVE			N 84°13'34.9" E	164.61	28°16'09.5"(RT)	17°00'00.0"	166.29	84.87	337.03
PT	1022739.805	1406690.032							
LINE			S 81°38'20.4" E	1.09					
PC	1022739.647	1406691.112							
CURVE			S 76°38'58.2" E	107.74	09°52'15.0"(RT)	09°09'00.0"	107.88	54.07	626.18
PT	1022714.768	1406795.945							
LINE			S 71°39'36.0" E	118.31					
POT	1022677.541	1406908.244							

EY

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	1022464.383	1406359.613							
LINE			N 26°38'46.1" E	94.10					
PC	1022548.488	1406401.815							
CURVE			N 60°10'08.5" E	226.02	67°02'44.8"(RT)	28°00'00.0"	239.45	135.56	204.63
PT	1022660.920	1406597.886							
LINE			S 86°18'29.0" E	66.75					
PC	1022656.622	1406664.493							
CURVE			N 63°10'19.9" E	77.59	61°02'22.2"(LT)	75°00'00.0"	81.39	45.04	76.39
PT	1022691.640	1406733.733							
LINE			N 32°39'08.8" E	41.39					
POT	1022726.492	1406756.067							

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-5388	2A-1

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035683, DAVID J. CLODGO. DocuSigned by: David J. Clodgo, DD481DE87C3C4F0... 11/9/2018

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896, CLARK S. MORRISON. DocuSigned by: Clark Morrison, B0A110DD1E004C4... 11/9/2018

CDM Smith — CDM Smith Inc., 5400 Glenwood Avenue, Suite 400, Raleigh, NC 27612-3228, NC COA No. F-1255

NC DEPARTMENT OF TRANSPORTATION, PAVEMENT MANAGEMENT UNIT, 1593 MAIL SERVICE CENTER, RALEIGH, NC 27699-1593

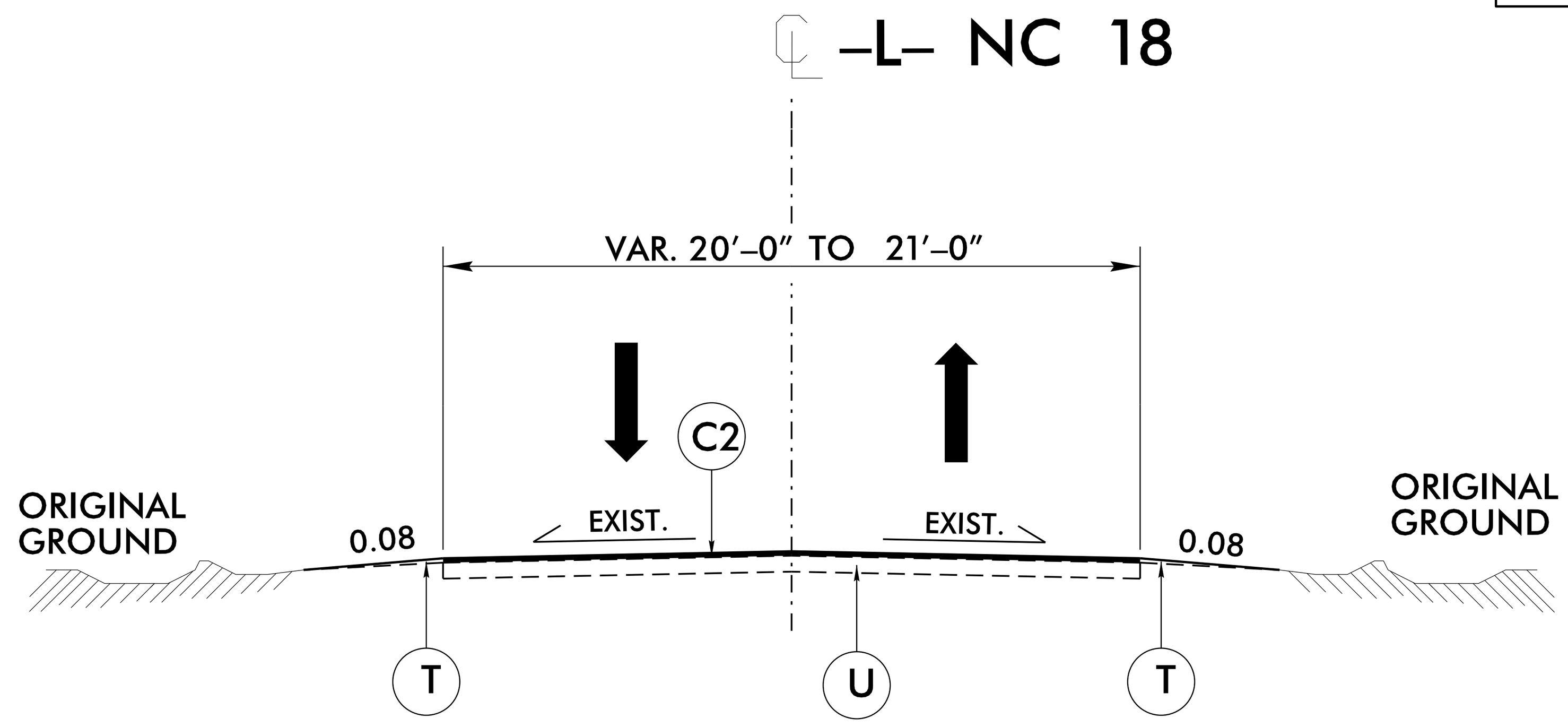
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	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.
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.	J1	6" AGGREGATE BASE COURSE
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.	P1	PRIME COAT AT A RATE OF 0.35 GAL./ SQ. YD.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R1	SHOULDER BERM GUTTER
D2	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.	T	EARTH MATERIAL
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
		W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE -L- WEDGING DETAIL)

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

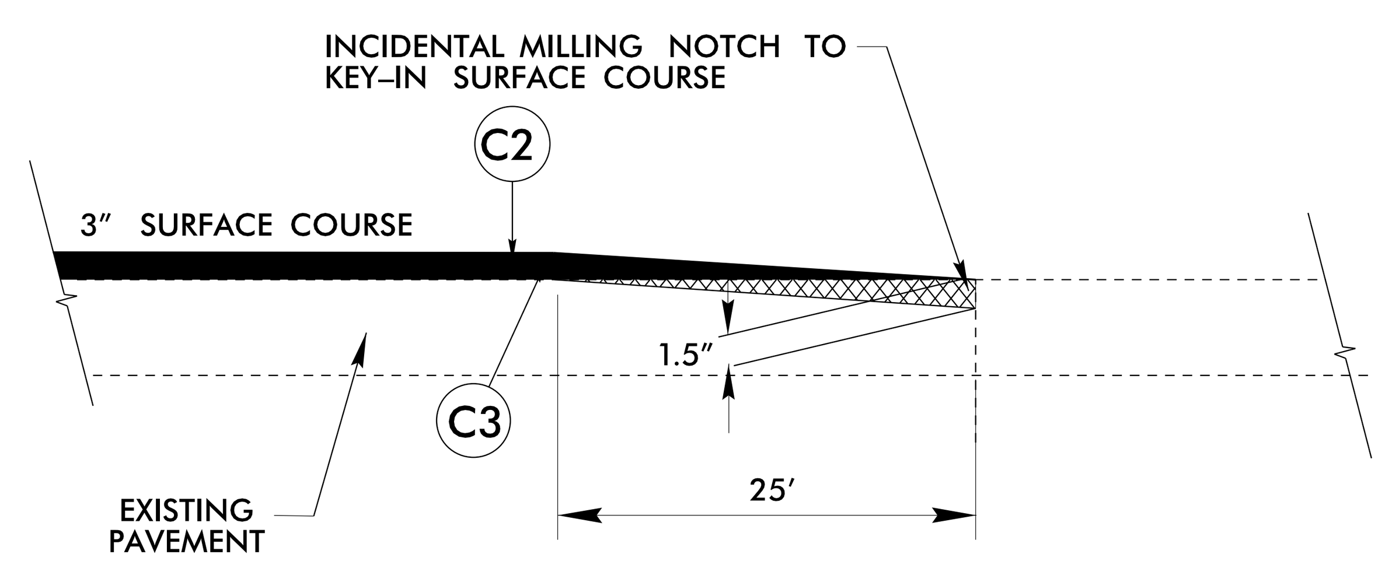


TYPICAL SECTION NO. 1

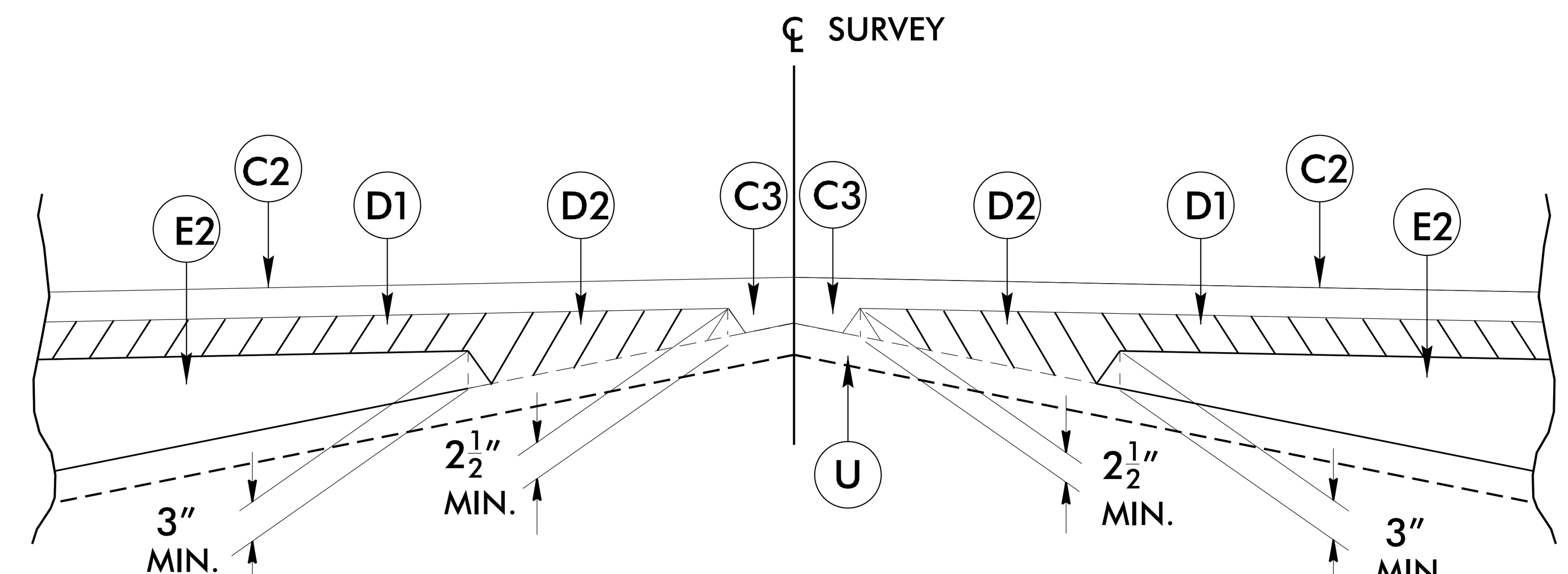
USE TYPICAL SECTION NO. 1

-L- STA. 13+00.00 TO 16+01.36
-L- STA. 24+10.00 TO 24+80.00

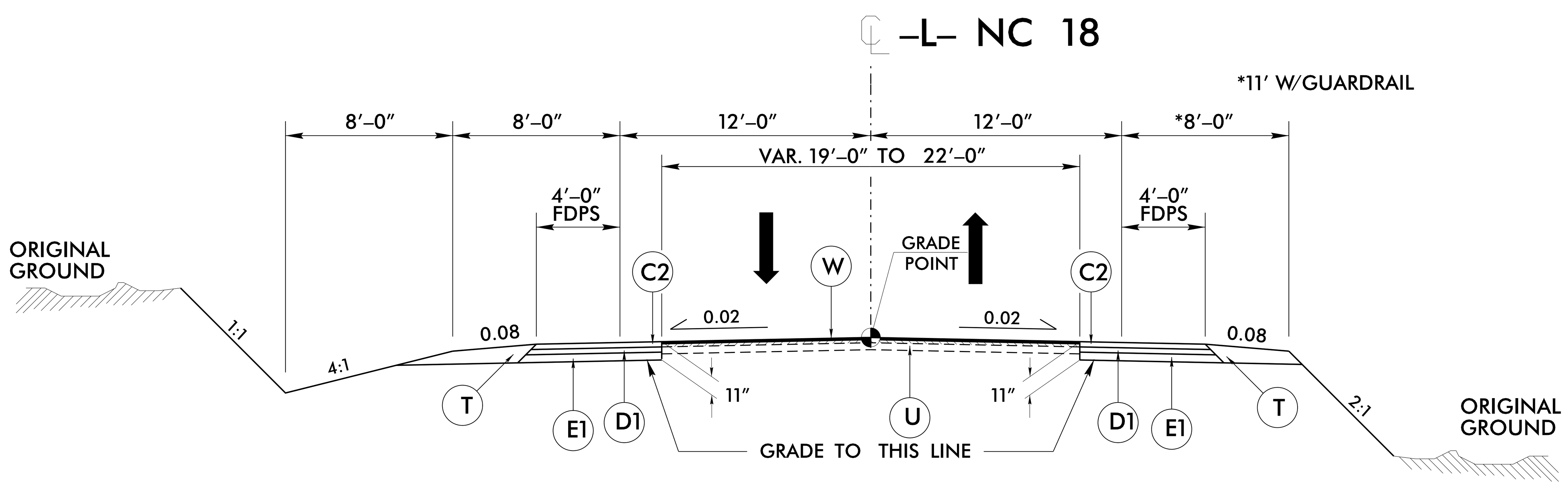
MILLING DETAIL
INCIDENTAL MILLING AT BEGIN/END FOR TIE-INS



-L- STA. 13+00.00 AND STA. 13+25.00
-L- STA. 24+55.00 AND STA. 24+80.00



Detail Showing Method of Wedging – W
-L-



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-L- STA. 16+01.36 TO 17+20.60
-L- STA. 22+36.40 TO 24+10.00

NOTE: PAVE TO FACE OF GUARDRAIL.
USE L PAVEMENT DESIGN FOR ALL WIDENING

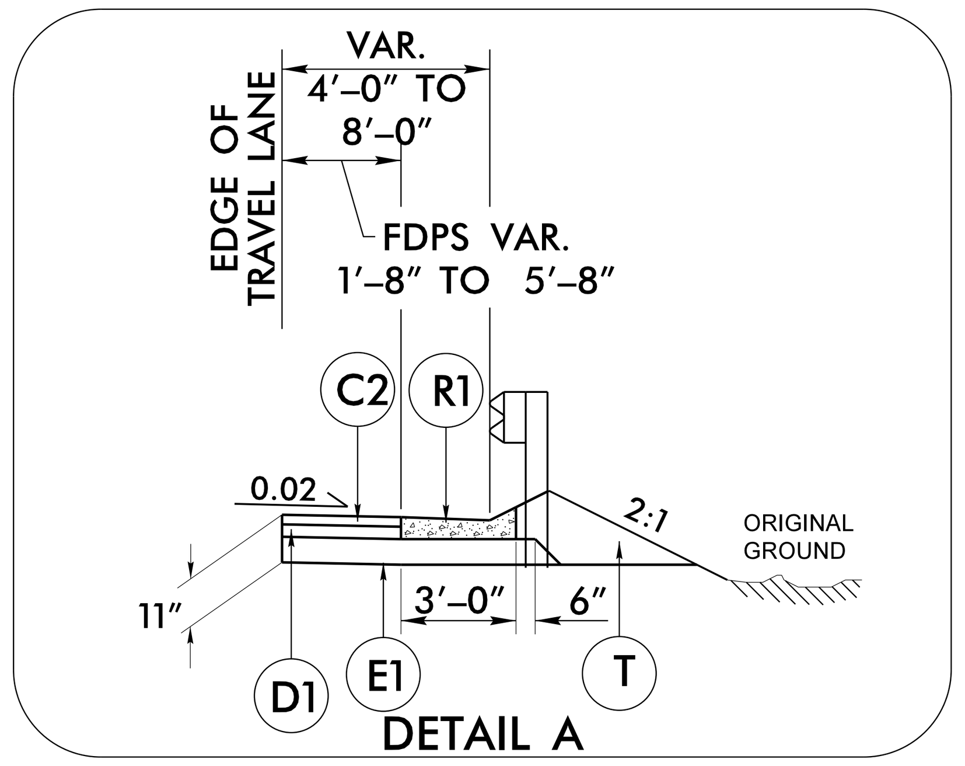
ROADWAY DESIGN ENGINEER — DAVID J. CLODGO, 035685, 11/9/2018

PAVEMENT DESIGN ENGINEER — CLARK S. MORRISON, SEAL 022896, 11/9/2018

CDM Smith — CDM Smith Inc., 5400 Glenwood Avenue, Suite 400, Raleigh, NC 27612-3228, NC COA No. F-1250

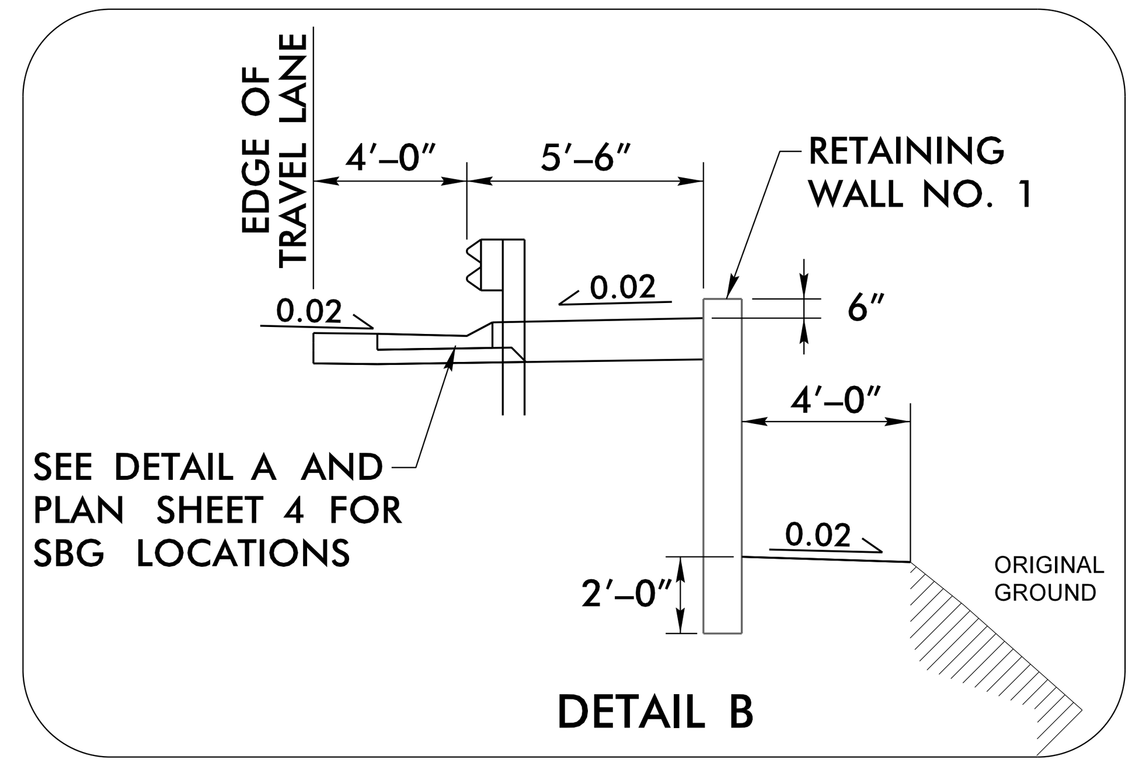
NC DEPARTMENT OF TRANSPORTATION, PAVEMENT MANAGEMENT UNIT, 1593 MAIL SERVICE CENTER, RALEIGH, NC 27699-1593

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



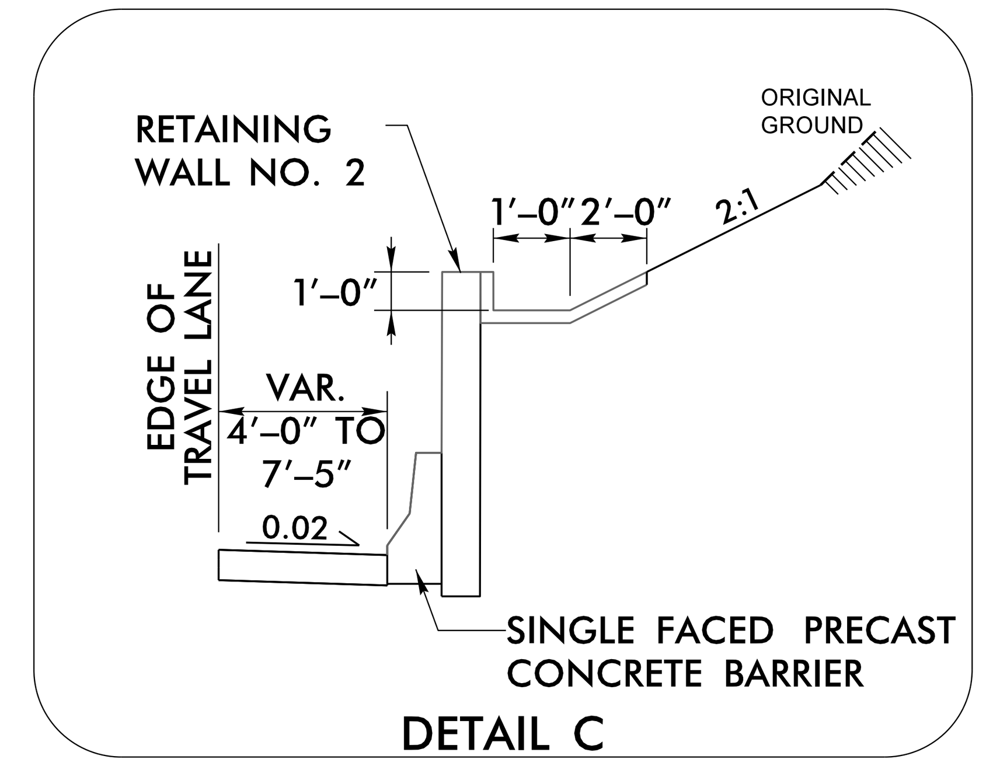
USE DETAIL A IN CONJUNCTION WITH TYPICAL SECTION NO. 3

–L– STA. 17+25.00 TO 18+00.98 (RT)
–L– STA. 17+89.00 TO 18+12.62 (LT)



USE DETAIL B IN CONJUNCTION WITH TYPICAL SECTION NO. 2 & 3

–L– STA. 16+01.36 TO 18+15.18 (RT)

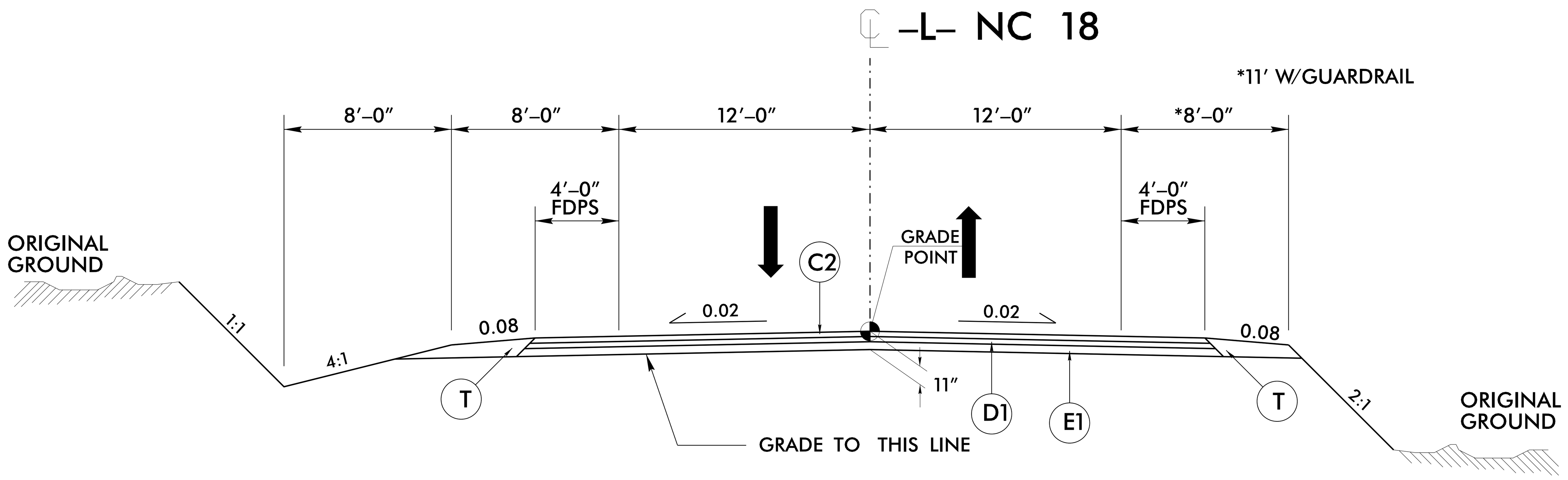


USE DETAIL C IN CONJUNCTION WITH TYPICAL SECTION NO. 2 & 3

–L– STA. 21+50.00 TO 24+00.00 (RT)

PAVEMENT SCHEDULE	
C1	2½" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	VAR. B25.0C
J1	6" ABC
P1	PRIME COAT
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE

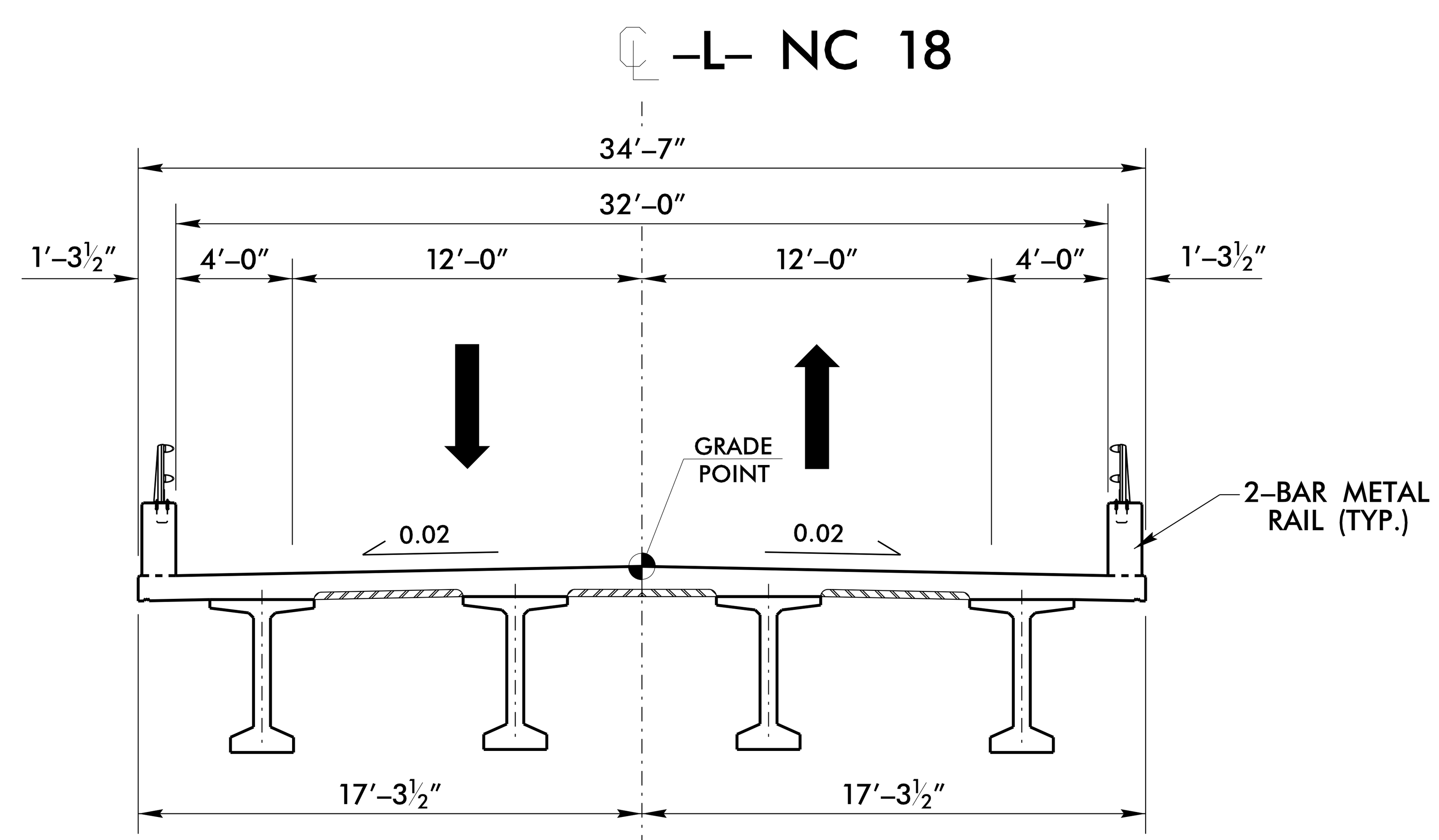


TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

–L– STA. 17+20.60 TO 18+20.60 (BEGIN BRIDGE)
–L– STA. 21+36.40 (END BRIDGE) TO 22+36.40

NOTE: PAVE TO FACE OF GUARDRAIL.



TYPICAL BRIDGE SECTION

USE TYPICAL BRIDGE SECTION

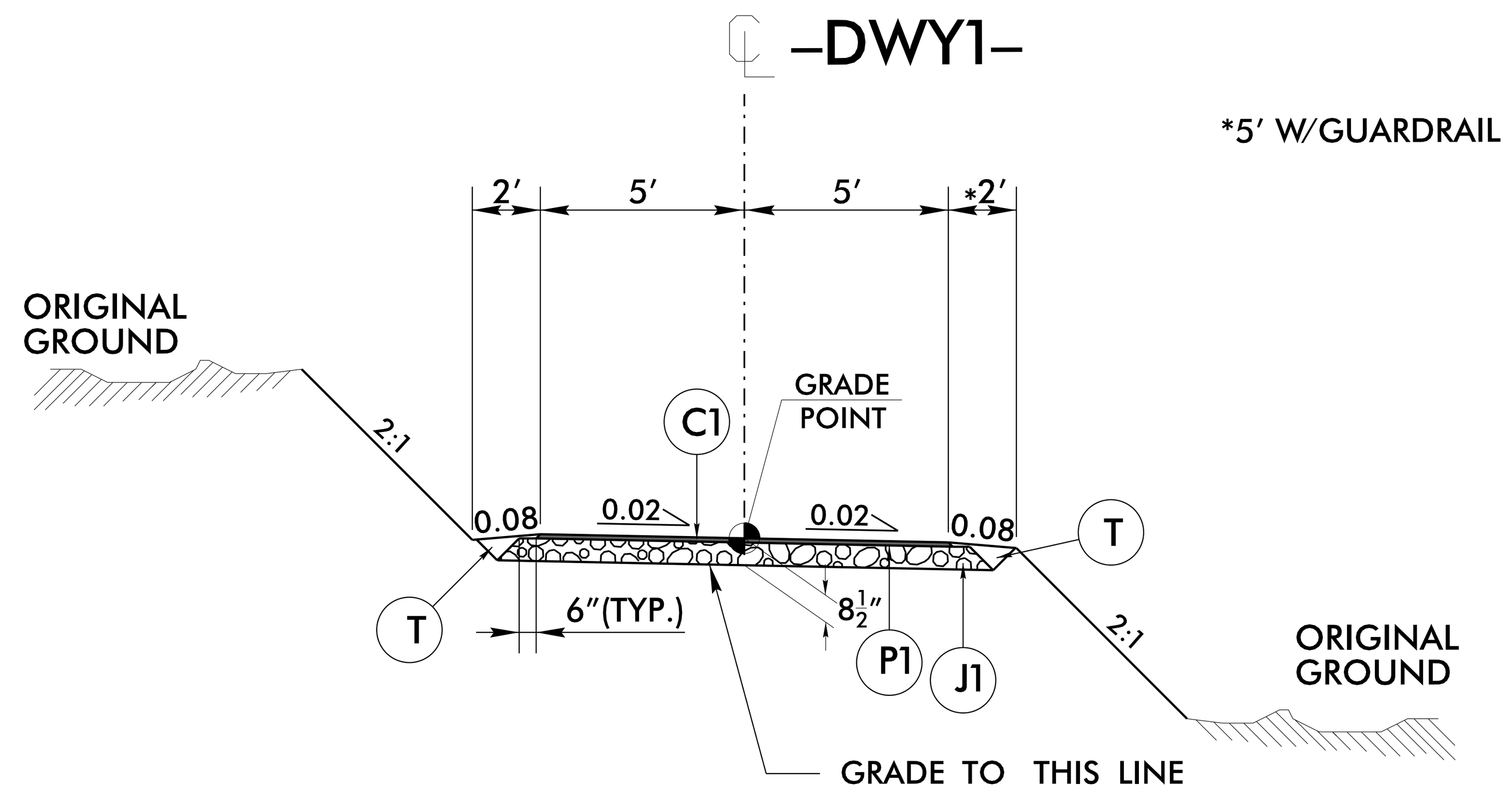
–L– STA. 18+20.60 TO 21+36.40

NOTE: NC 18 AND BRIDGE NO. 21 IS INCLUDED ON A PROPOSED RE-ROUTE OF STATE BICYCLE ROUTE NC-4 (NORTH LINE TRACE).

PROJECT REFERENCE NO.	SHEET NO.
B-5388	2A-3

ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO 11/9/2018	NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON 11/9/2018
CDM Smith — CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. F-1255	NC DEPARTMENT OF TRANSPORTATION PAVEMENT MANAGEMENT UNIT 1593 MAIL SERVICE CENTER RALEIGH, NC 27699-1593

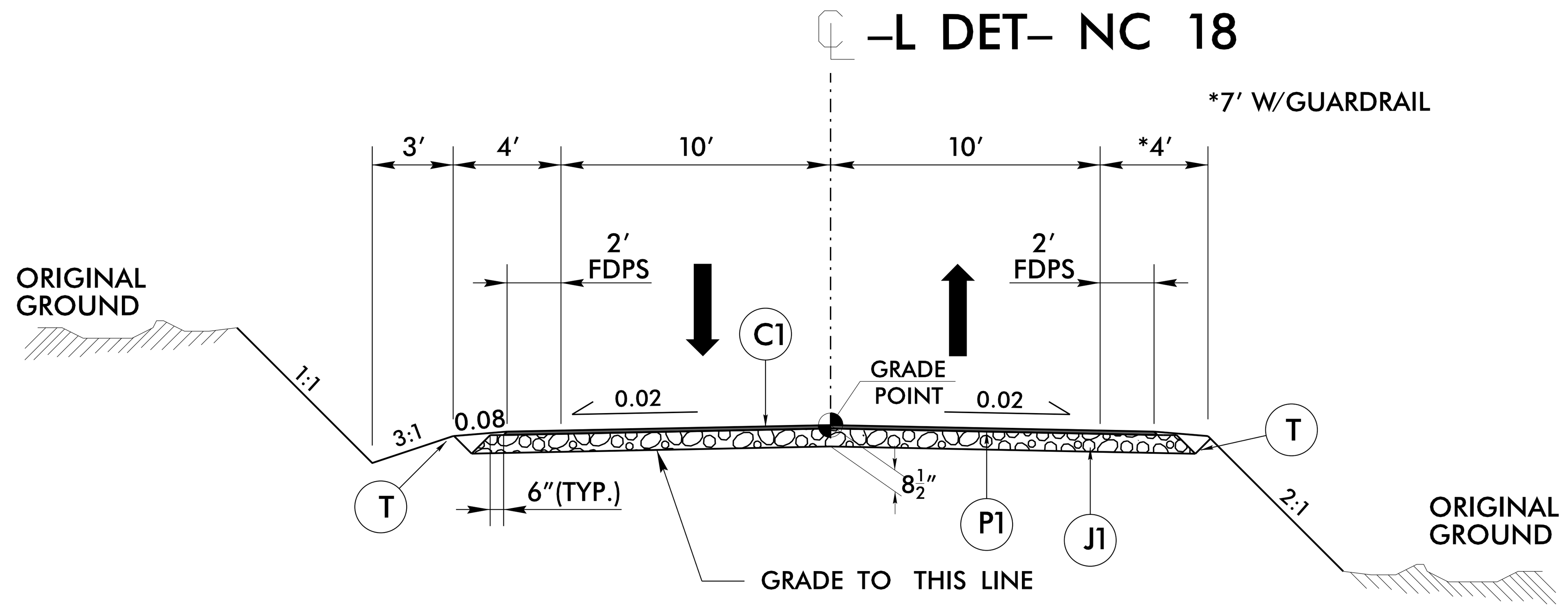
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

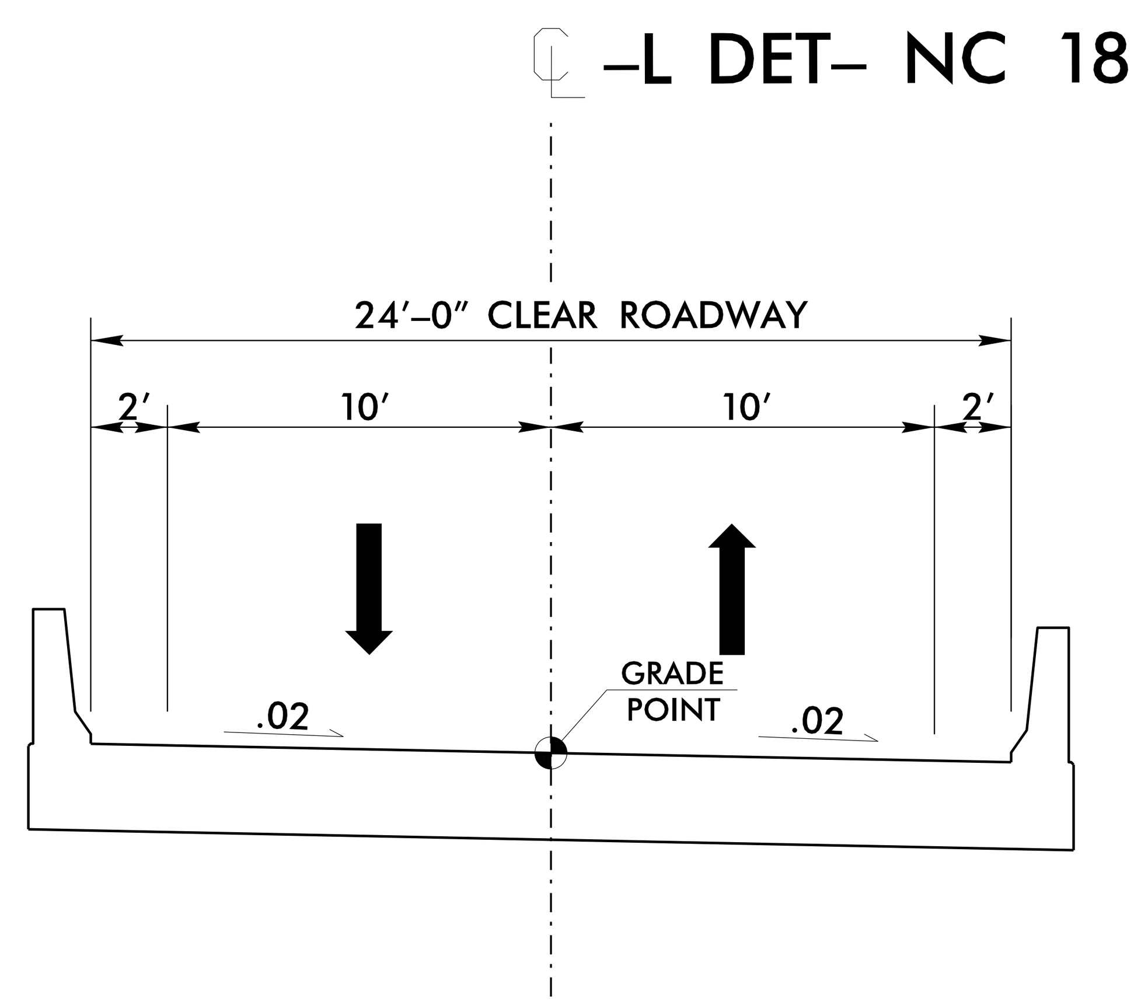
-DWY1- STA. 10+12.15 TO 11+55.00



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

-L DET- STA. 13+00.00 TO 18+20.00 (BEGIN BRIDGE)
-L DET- STA. 21+35.00 (END BRIDGE) TO 24+80.00



TYPICAL DETOUR BRIDGE SECTION

USE TYPICAL DETOUR BRIDGE SECTION

-L DET- STA. 18+20.00 TO 21+35.00

NOTE: DETOUR BRIDGE SHALL BE DESIGNED BY THE CONTRACTOR (SEE SPECIAL PROVISIONS) AND SHALL PROVIDE THE CLEAR ROADWAY WIDTH SHOWN IN THE TYPICAL SECTION.

PAVEMENT SCHEDULE	
C1	2½" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	VAR. B25.0C
J1	6" ABC
P1	PRIME COAT
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

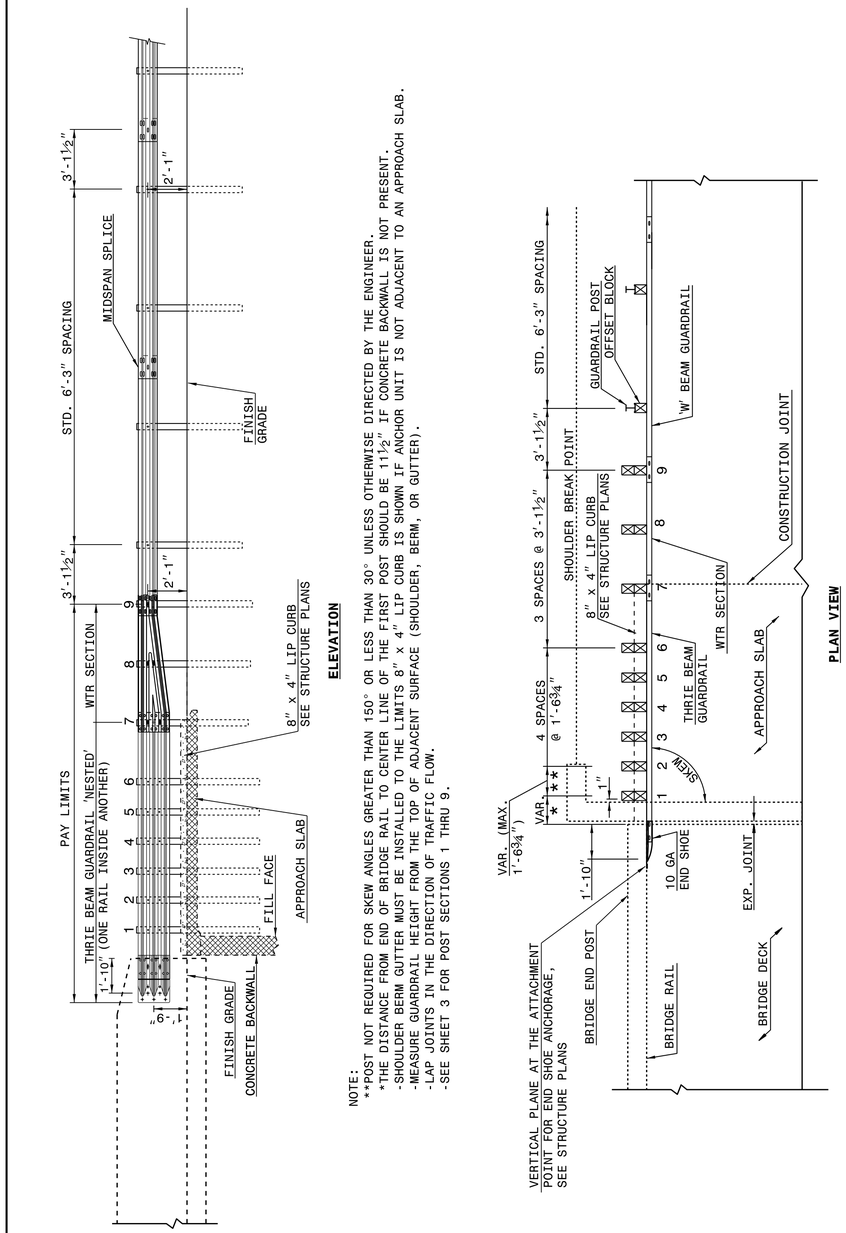
PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE

PROJECT REFERENCE NO.	SHEET NO.
B-5388	2C-1

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



ELEVATION

PLAN VIEW

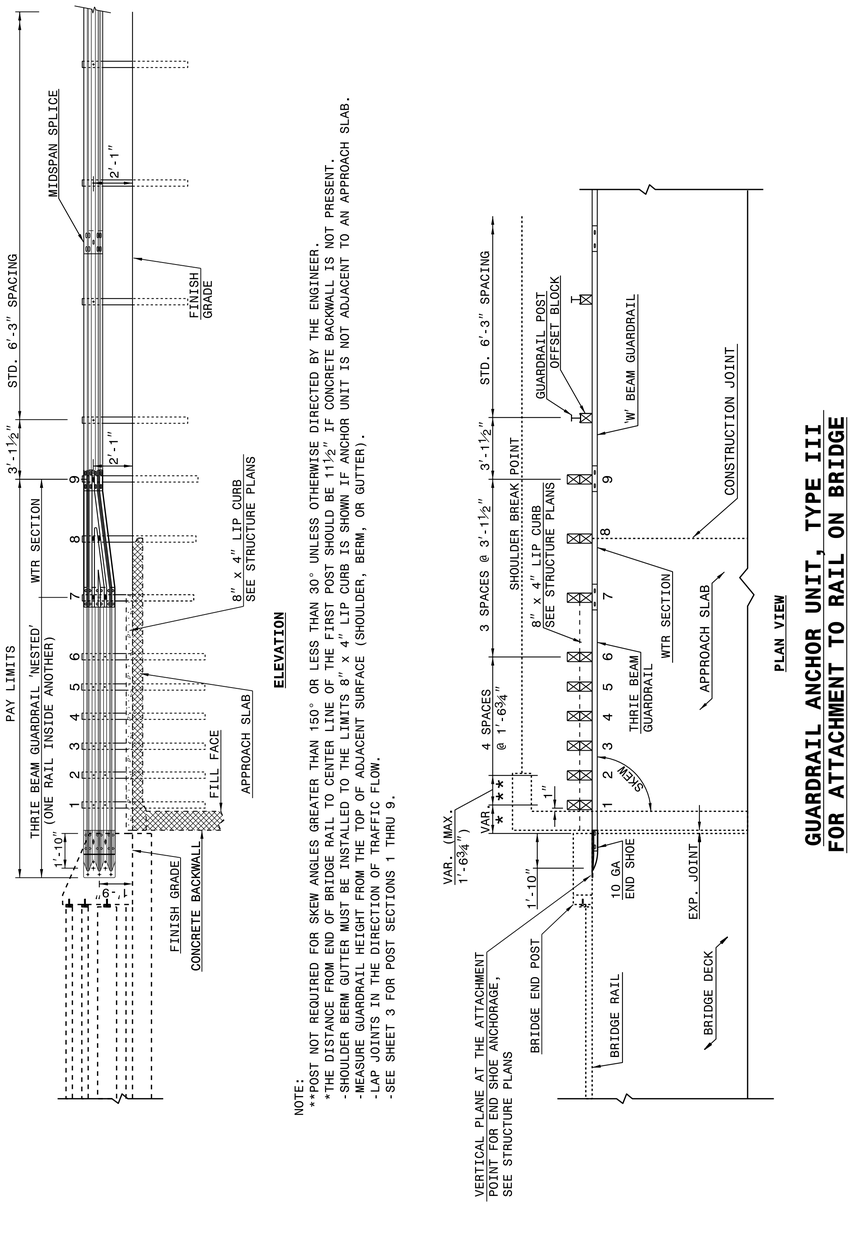
NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 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.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

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

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



ELEVATION

PLAN VIEW

NOTE:
**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.

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

SHEET 1 OF 7
862D03

NORTH CAROLINA
PROFESSIONAL
SEAL
022966
ENGINEER
Joel S. Howerton
11/7/2018

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

SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
B-5388	2C-2

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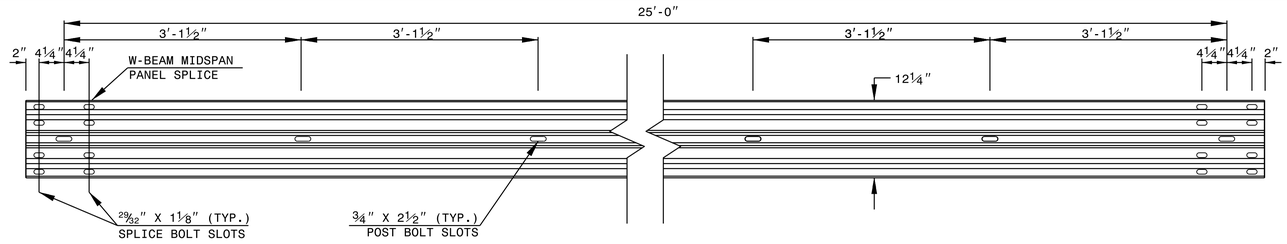
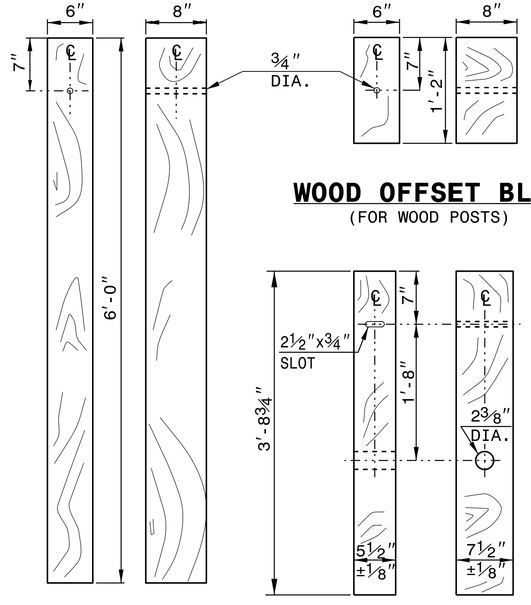
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



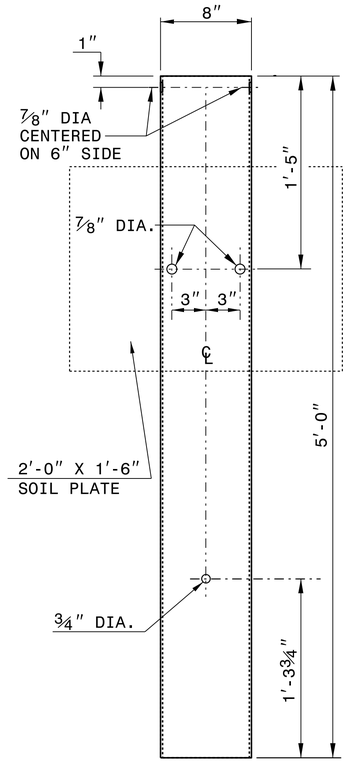
STANDARD W-BEAM GUARDRAIL



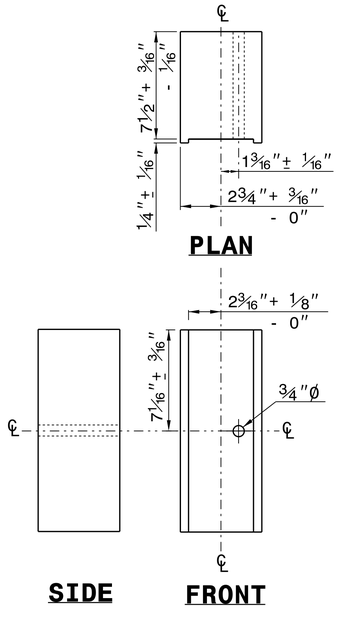
STANDARD LINE POST

SHORT WOOD BREAKAWAY POST

WOOD OFFSET BLOCK
(FOR WOOD POSTS)



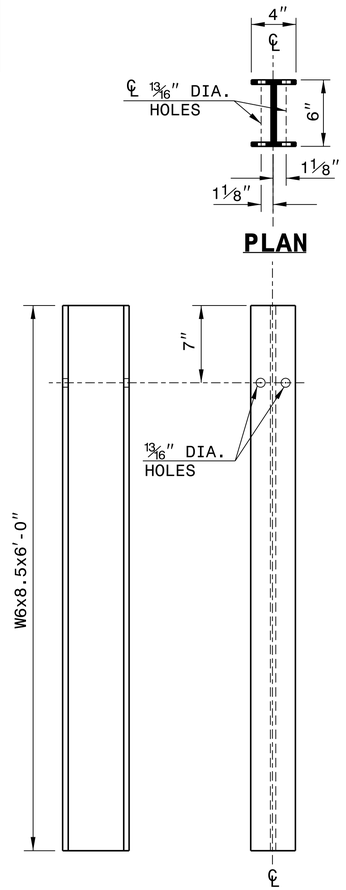
STEEL TUBE
TS 6"x8"x0.1875"



PLAN

SIDE **FRONT**

ROUTED OFFSET BLOCK



PLAN

SIDE **FRONT**

"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

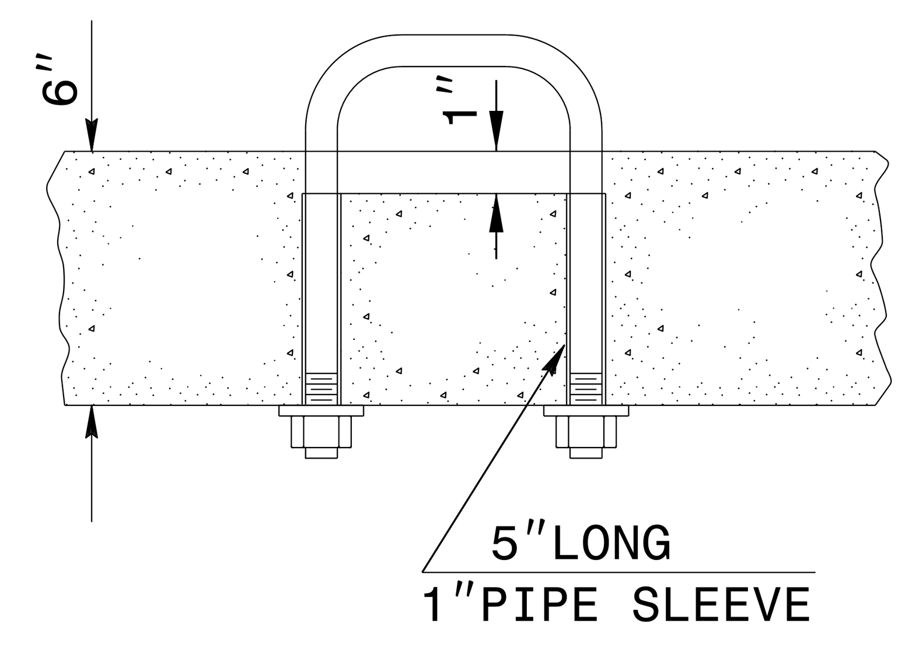
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWERTON

11/7/2018

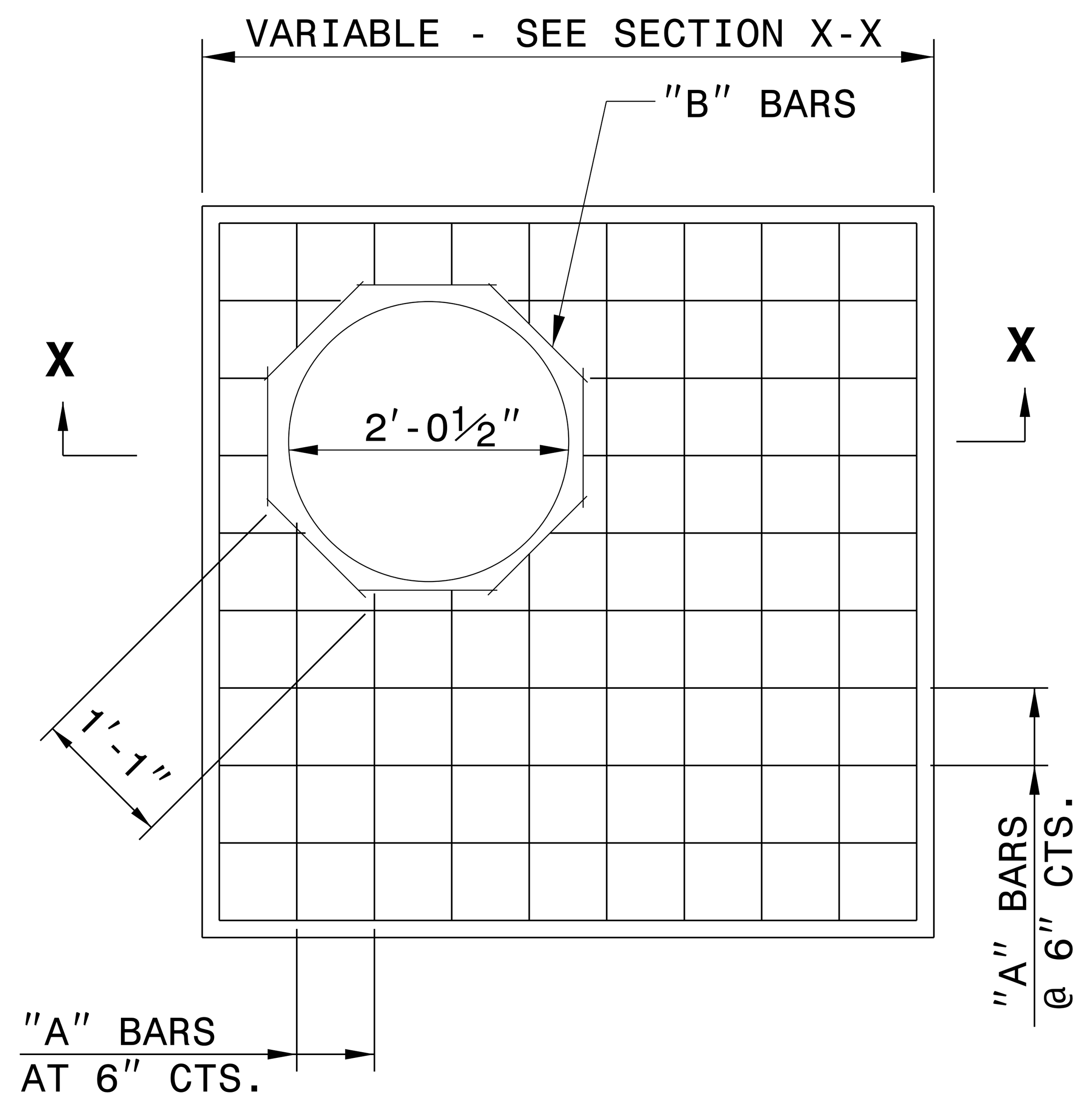
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

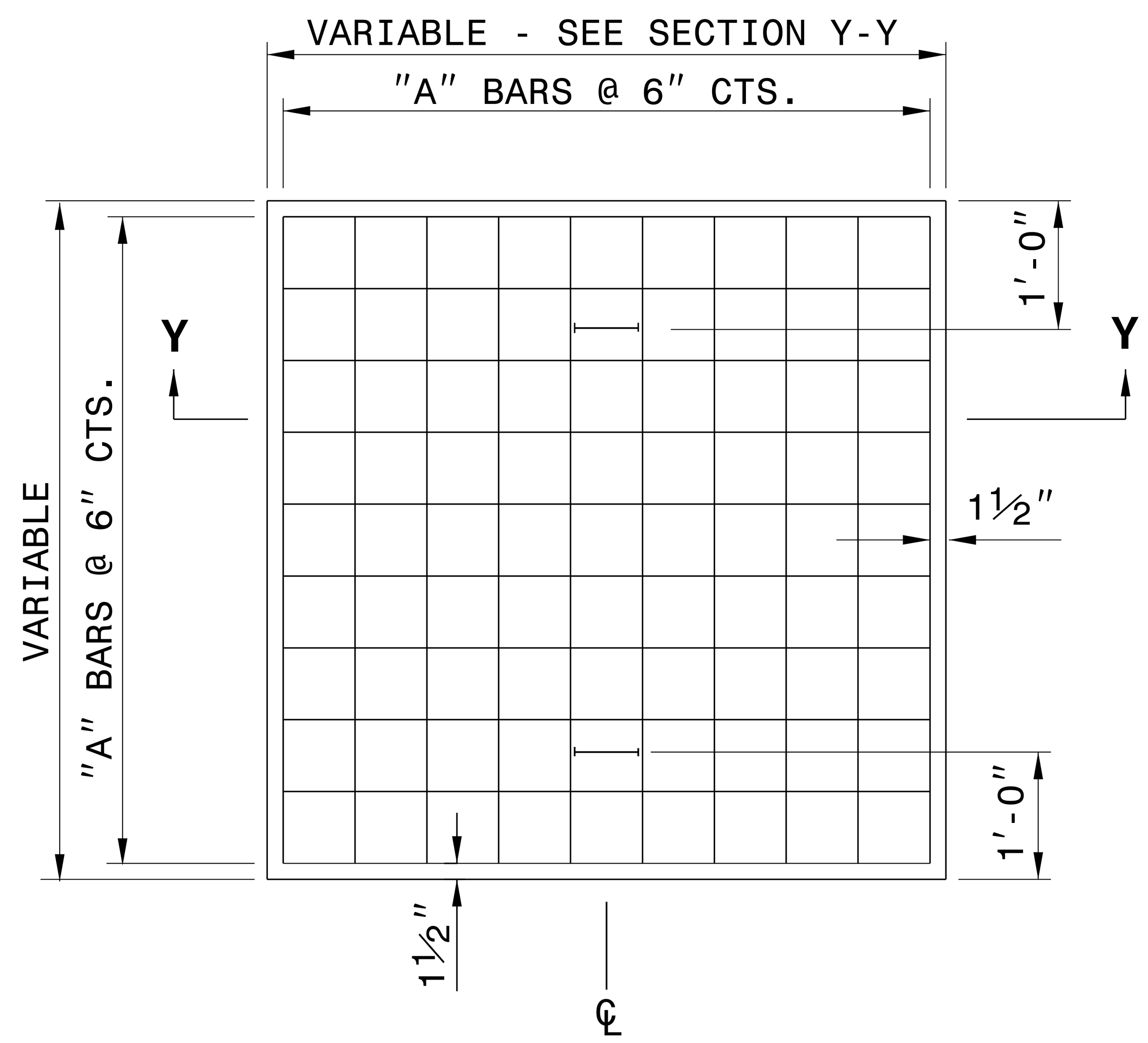
ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:



PARTIAL SECTION



PLAN



PLAN

GENERAL NOTES:

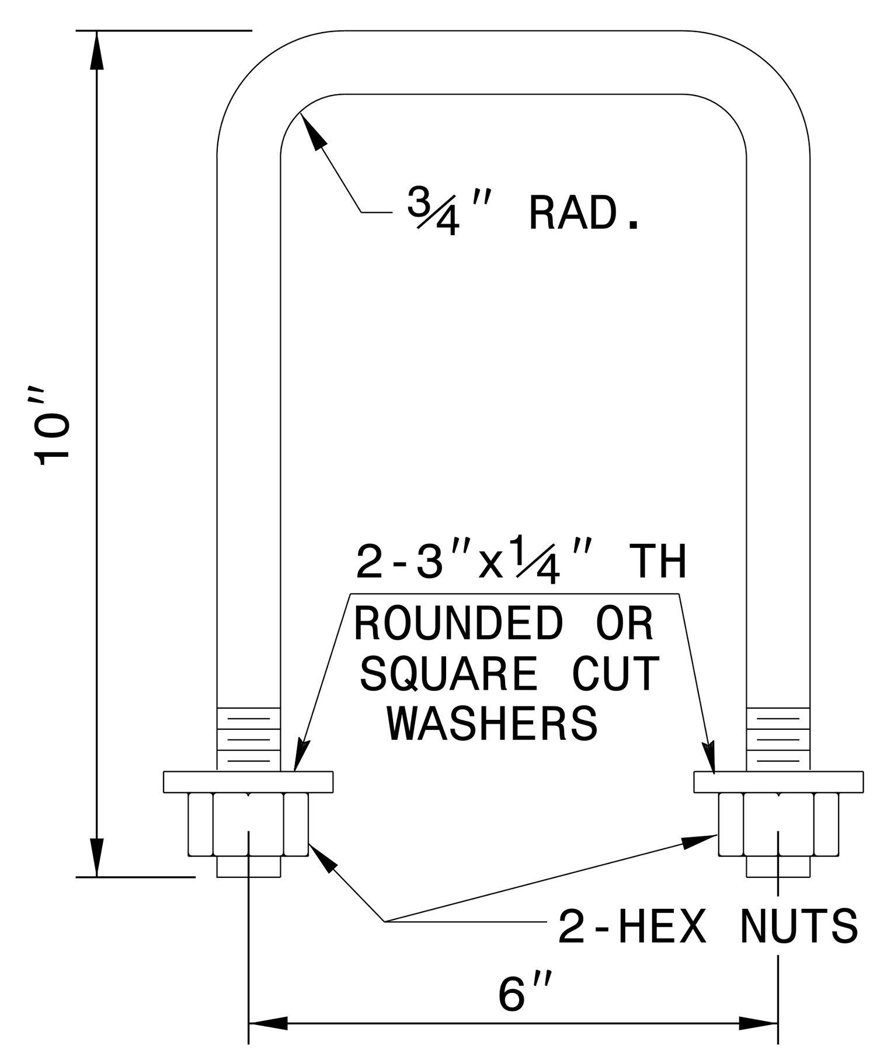
CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

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

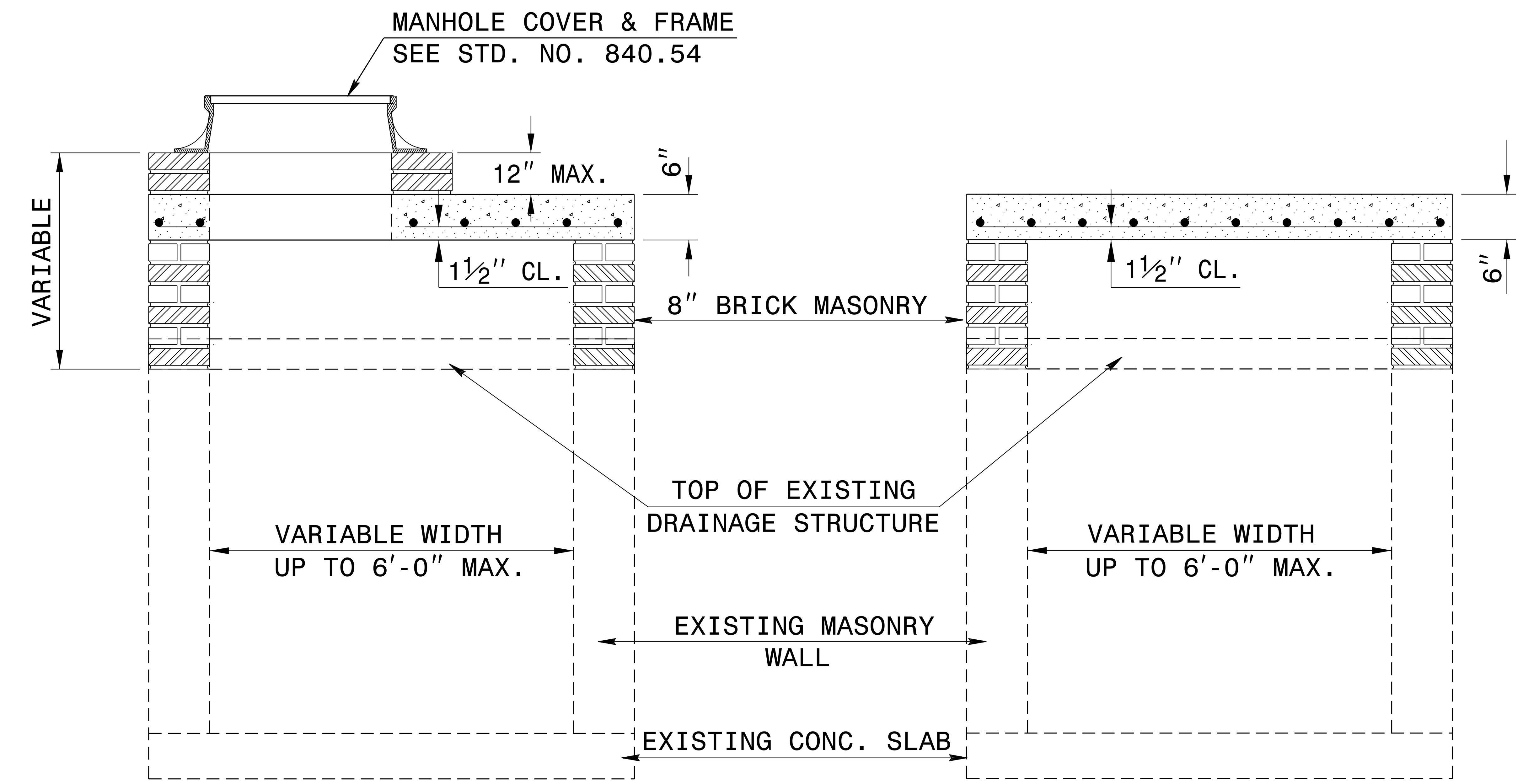
DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

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.

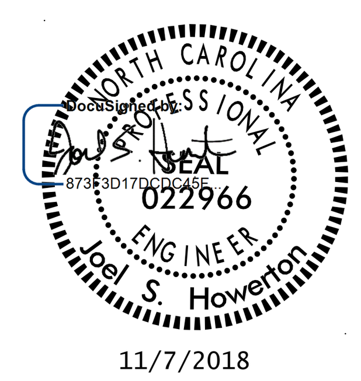


DETAIL OF HANDLE



SECTION X-X

SECTION Y-Y



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

PROJECT REFERENCE NO.	SHEET NO.
B-5388	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 9/21/2018
F760CAEB96EC4D3... SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

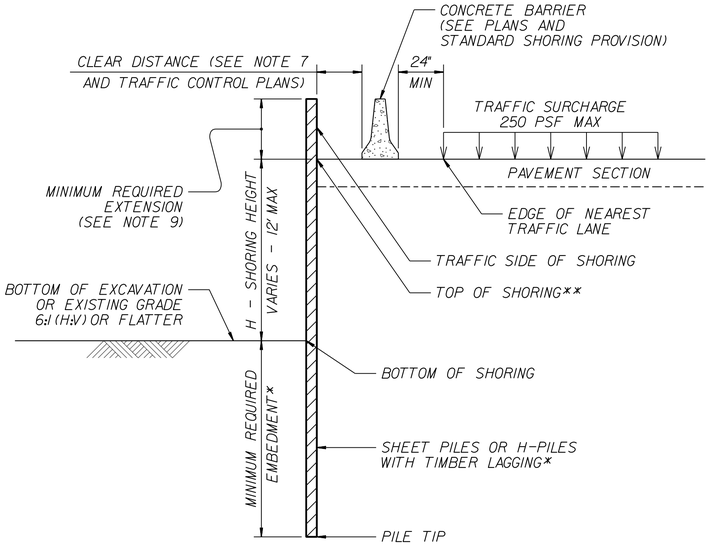
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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

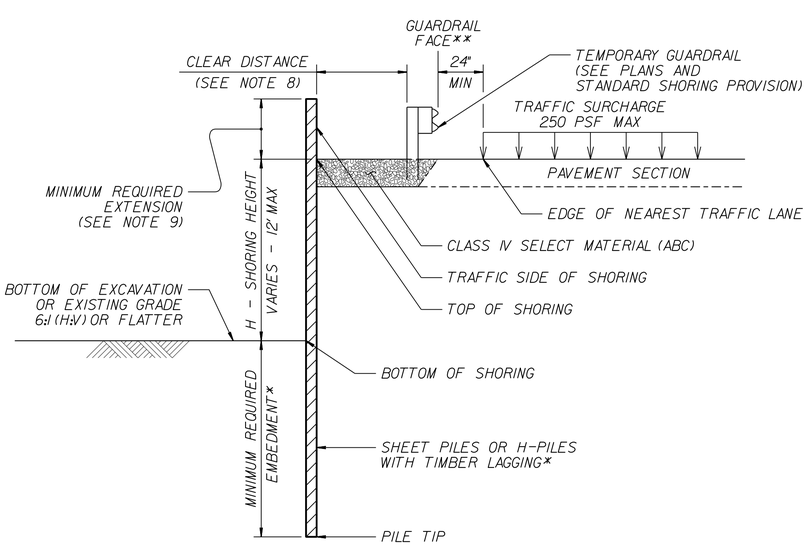
NOTES:

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



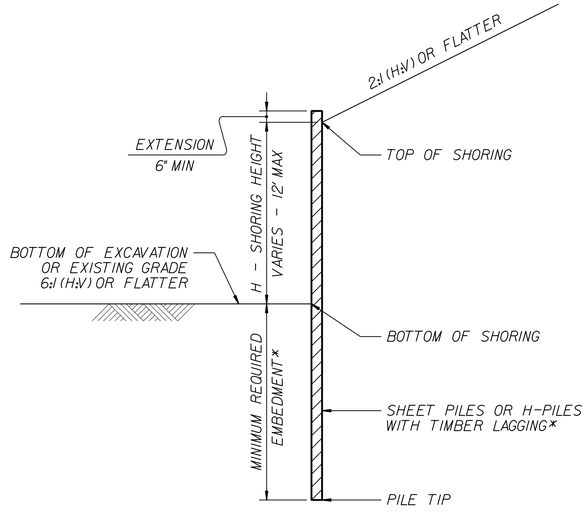
CONCRETE BARRIER

**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

COMPUTED BY: H. HARKENRIDER	DATE: 9/18/2018
CHECKED BY: K. PERSIANI	DATE: 9/20/2018

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5388	3B-1

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS AT-1	ANCHORS III	ANCHORS GREU TL-2	ANCHORS GREU TL-3	ANCHORS B-77	ANCHORS TEMP AT-1	ANCHORS TEMP GREU TL-2	ANCHORS TEMP B-77	IMPACT ATTENUATOR TYPE 350 EA	IMPACT ATTENUATOR TYPE 350 G	IMPACT ATTENUATOR TYPE 350 NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	15+71.03	18+14.78	RT	243.75'				18+14.78	4.00	11.00				1.00		1											248.00'		TIE TO EXISTING GUARDRAIL
-L-	24+00.00	24+85.38	RT	85.375'			24+00.00		7.40	11.00		50.00	1.00					1	1								36.00'		
-L-	17+07.67	18+26.42	LT	118.75'				18+26.42	4.00	7.00	50.00		1.00			1		1									78.50'		
-L-	21+42.22	23+35.97	LT	193.75'			21+42.22		4.00	7.00		175.00		3.50		1		1									38.00'		
-L DET-	23+55.20	24+80.00	LT	118.75'	12.50'				4.00	7.00					1												102.00'		TIE TO EXISTING GUARDRAIL
			SUBTOTAL	760.375'	12.50'										1	3		3	1								502.50'		
		LESS DEDUCTIONS FOR ANCHORS																											
			AT-1, 1@6.25'	-6.25'																									
			TYPE B-77, 1@22.875'	-22.875'																									
			TYPE III, 3@18.75'	-56.25'																									
			GREU TL-3, 3@50.00'	-150.00'																									
			PROJECT TOTAL	525.00'	12.50'										1	3		3	1								502.50'		
			SAY	525.00'	12.50'										1	3		3	1								510.00'		
	ADDITIONAL GUARDRAIL POSTS = 10 EA																												
TEMPORARY GUARDRAIL																													
-L DET-	17+22.12	18+20.00	LT	97.875'				18+20.00	2.00	5.00		25.00		0.50							1	1							
-L DET-	21+35.00	21+95.38	LT	60.375'			21+35.00		2.00	5.00	25.00		0.50								1	1							
			SUBTOTAL	158.25'																	2	2							
		LESS DEDUCTIONS FOR ANCHORS																											
			TEMP TYPE B-77, 2@22.875'	-45.75'																									
			TEMP GREU TL-2, 2@25.00'	-50.00'																									
			PROJECT TOTAL	62.50'																	2	2							
			SAY	62.50'																	2	2							

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L DET- 13+00.00	-L DET- 18+20.00	8,541	784		7,757
-L DET- 21+35.00	-L DET- 24+68.39	6,544	153		6,391
SUBTOTALS:		15,085	937		14,148
-L- 13+00.00	-L- 18+20.60	904	248		656
-L- 21+36.40	-L- 24+80.00	516	143		373
SUBTOTALS:		1,420	391		1,029
-DWY- 10+12.15	-DWY- 11+55.00	1,282	5		1,277
SUBTOTALS:		1,282	5		1,277
PROJECT TOTALS:		17,787	1,333		16,454
MATERIAL FOR SHOULDER CONSTRUCTION					
LOSS DUE TO CLEARING & GRUBBING		-250			-250
ADDITIONAL UNDERCUT					
ROCK WASTE TO REPLACE BORROW					
ADJUST FOR ROCK WASTE					3,566
WASTE IN LIEU OF BORROW					
PROJECT TOTAL		17,537	1,333		19,769
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					
GRAND TOTALS:		17,537	1,333		19,769
SAY:		18,000			

EST. SHALLOW UNDERCUT = 100 CUBIC YARDS
CLASS IV SUBGRADE STABILIZATION = 200 TONS
EST. UNDERCUT EXCAVATION = 450 CUBIC YARDS
EST. SHOULDER BORROW = 180 CUBIC YARDS

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.

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
L (RT)	17+25.00	18+00.98	75.98
L (LT)	17+89.00	18+12.62	23.62
		TOTAL:	99.60
		SAY:	100

SUMMARY OF REMOVAL EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
L	17+20.60	18+20.60	CL	233
L	21+36.40	22+36.40	CL	233
L DET	14+70.00	18+20.00	CL	934
L DET	21+35.00	23+90.00	CL	680
			TOTAL:	2,080
			SAY:	2,080

DL-6N43ZM2

COMPUTED BY:	Gregory R. Cols	DATE:	6/10/18
CHECKED BY:	Andrew Nottinghma	DATE:	09/17/2018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-5388	3D-1

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
L 14+98	21	LT	0401			2436.3		
L 17+28	16	RT	0402		2443.3			
			0402	0403		2441.4	2440.6	
L 17+94	16	RT	0403		2444.3			
			0403	0404		2440.6	2437.9	
L 17+94	16	LT	0404		2444.3			
			0404	0405		2437.9	2437.8	
L 17+94	25	LT	0405		2444.3			
L 22+54	16	RT	0406		2454.2			
			0406	0407		2452.3	2450.7	
L 21+72	16	RT	0407		2452.6			
			0407	0408		2450.7	2449.7	
L 21+63	16	RT	0408		2452.4			
			0408	0508		2449.7	2448.8	
L 21+63	21	LT	0409					
L 21+46	56	LT	0410					
L 24+50	29	RT	0411		2456.5			
			0411	0412		2453.5	2452.5	
L 24+51	19	LT	0412		2459.4			
			0412	0413		2452.5	2442.0	
L_DET 15+00	17	LT	0501		2438.6			
			0501	0502		2436.4	2436.1	
L_DET 14+97	26	RT	0502		2441.6			
			0502	0503		2436.1	2421.0	
L_DET 16+79	18	RT	0504		2440.9			
			0504	0505		2439.0	2438.5	
L_DET 16+79	12	RT	0505		2441.2			
			0505	0506		2438.5	2437.8	
L_DET 17+93	12	RT	0506		2444.3			
			0506	0507		2437.8	2433.5	
L_DET 21+59	12	RT	0508		2452.8			
			0508	0509		2448.8	2448.6	

FROM	TO	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54	60	R. C. PIPE CLASS V 12	15	18	24	30
0401																											
0402																											
0402	0403													68													
0403																											
0403	0404													32													
0404																											
0404	0405													8													
0405																											
0406																											
0406	0407													84													
0407																											
0407	0408													8													
0408																											
0408	0508																							40			
0409																											
0410																											
0411																											
0411	0412														52												
0412																											
0412	0413			32																							
0501																											
0501	0502														44												
0502																											
0502	0503			40																							
0504																											
0504	0505		6					X		X	X	X															
0505																											
0505	0506		110					X		X	X	X															
0506																											
0506	0507		48					X		X	X	X															
0508																											
0508	0509		40					X		X	X	X															
SHEET TOTALS			204	72										200	96									40			
PROJECT TOTALS			204	72										200	96									40			

FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29
0401																													
0402					1																								1
0402	0403																												
0403					1																								1
0403	0404																												
0404					1	1.4																							1
0404	0405																												
0405																													
0406					1																								1
0406	0407																												
0407					1																								1
0407	0408																												
0408					1																								1
0408	0508																												
0409																													
0410																													
0411					1															1							1		
0411	0412																												
0412					1	1.9																							
0412	0413																												
0501					1																1						1		
0501	0502																												
0502					1	0.5																							
0502	0503																												
0504					1																1								1
0504	0505																												
0505					1																								1
0505	0506																												
0506					1	1.5																							1
0506	0507																												
0508					1																								1
0508	0509																												
SHEET TOTALS					14	5.3														1	2						2		10
PROJECT TOTALS					14	5.3														1	2						2		10

FROM	TO	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41		M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54		CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	ADJUST C.B.	ADJUST D.I.		18" DRAINAGE PIPE ELBOW	##" DRAINAGE PIPE ELBOW	##" DRAINAGE PIPE ELBOW	##" R.C. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	BERM DITCH OUTLET STD. 850.11 (PER EACH)	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0401																													7	Remove 7LF Temp 18" RCP
0402							1																							
0402	0403																													
0403							1																							
0403	0404																													
0404							1																							
0404	0405																													
0405															1			1												Convert 0506 to TB MH w/ JB.
0406							1																							
0406	0407																													
0407							1																							
0407	0408																													
0408							1																							
0408	0508																													
0409															1			1												Convert 0508 to TB MH w/ JB
0410																														
0411																														
0411	0412																													
0412						1									1															
0412	0413																					2								
0501																														Temporary for Detour (remove 2GI)
0501	0502																													
0502						1									1															
0502	0503																					2								
0504																														Temporary for Detour (remove 2GI)
0504	0505																												6	Temporary for Detour (remove 6' of 15" CSP)
0505							1																							Temporary for Detour (remove 2GI)
0505	0506																												110	Temporary for Detour (remove 110' of 15" CSP)
0506							1																							
0506	0507																													
0508							1																							
0508	0509																												27	Temporary for Detour (remove 27' of 15" CSP)
SHEET TOTALS						2	9								4			2				4							150	
PROJECT TOTALS						2	9								4			2				4							150	

ABBREVIATIONS

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

COMPUTED BY: ____DMM_____ DATE: ___4/12/18__
CHECKED BY: ___SCC_____ DATE: __4/12/18__

(5-15-18)

PROJECT NO.	SHEET NO.
B-5388	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	200
				TOTAL LF:	200

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

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			ASU		100	200	200		
			TOTAL CY/TONS/SY:		100	200**	200**	0	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.**

PROJECT REFERENCE NO.	SHEET NO.
B-5388	4
RW SHEET NO.	

ROADWAY DESIGN ENGINEER — DAVID J. CLODGO, 11/8/2018
HYDRAULICS ENGINEER — A.T. NOTTINGHAM, 11/8/2018

CDM Smith — CDM Smith Inc., 5400 Glenwood Avenue, Suite 400, Raleigh, NC 27612-3228, NC COA No. F-1255
MI Engineering, PLLC, 1011 Schaub Drive, Suite 100, Raleigh, NC 27606, NC COA No.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83 / NA 2011

BRIDGE PAVEMENT RELATIONSHIP SKETCH

(NOT TO SCALE)

SBG = SHOULDER BERM GUTTER

BEGIN BRIDGE -L- POT STA. 18+20.60; END BRIDGE -L- POT STA. 21+36.40; BEGIN APPROACH SLAB -L- POT STA. 18+06.80; END APPROACH SLAB -L- POT STA. 21+50.20

NOTE: PLACE SBG FROM 17+89.00 TO 18+11.78 LT

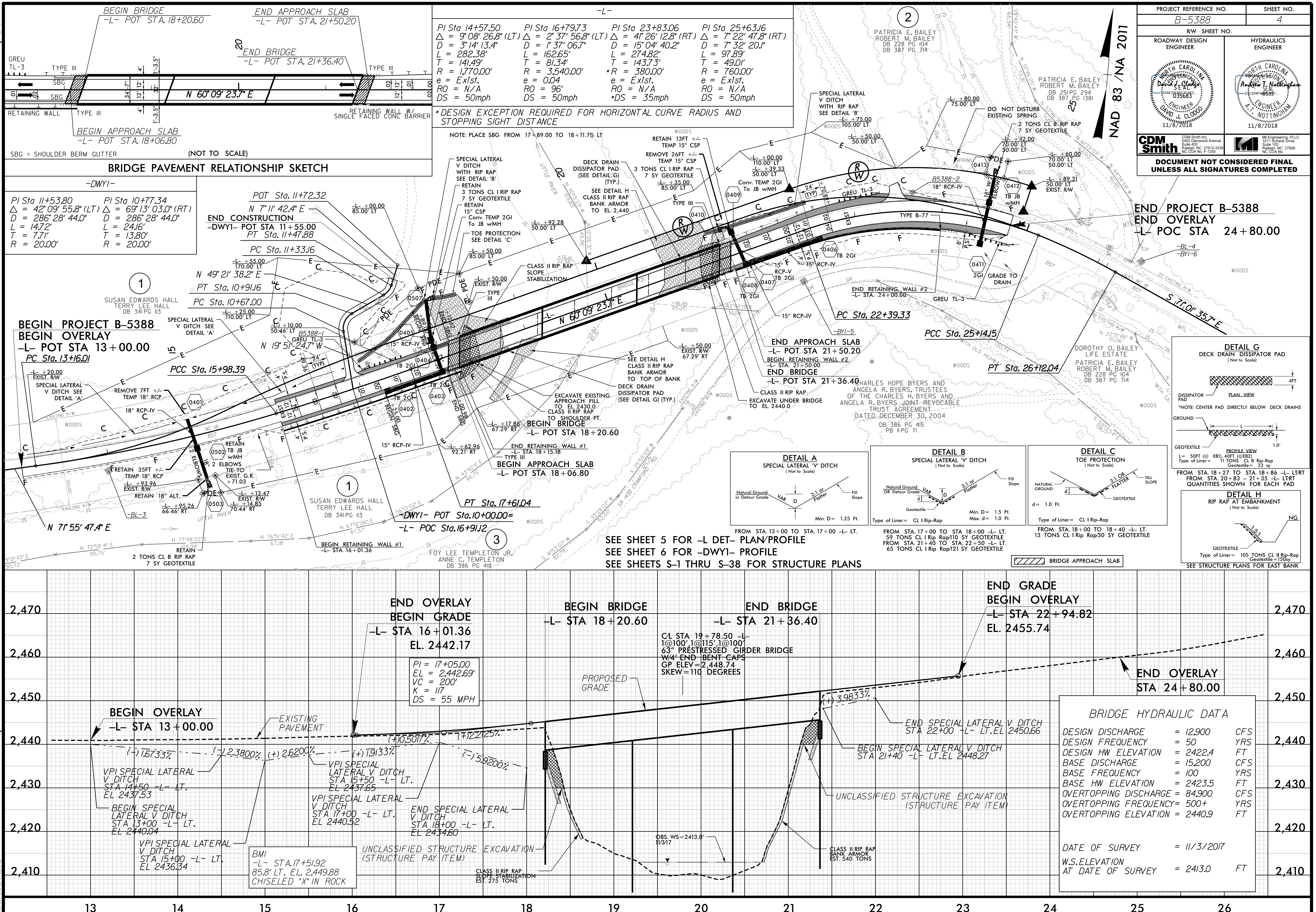
-L-

PI Sta 14+57.50	PI Sta 16+79.73	PI Sta 23+83.06	PI Sta 25+63.16
△ = 9° 08' 26.8" (LT)	△ = 2° 37' 56.8" (LT)	△ = 41° 26' 12.8" (RT)	△ = 7° 22' 47.8" (RT)
D = 3° 14' 13.4"	D = 1° 37' 06.7"	D = 15° 04' 40.2"	D = 7° 32' 20.1"
L = 282.38'	L = 162.65'	L = 274.82'	L = 97.89'
T = 141.49'	T = 81.34'	T = 143.73'	T = 49.01'
R = 1,770.00'	R = 3,540.00'	*R = 380.00'	R = 760.00'
e = Exist.	e = 0.04	e = Exist.	e = Exist.
RO = N/A	RO = 96'	RO = N/A	RO = N/A
DS = 50mph	DS = 50mph	*DS = 35mph	DS = 50mph

*DESIGN EXCEPTION REQUIRED FOR HORIZONTAL CURVE RADIUS AND STOPPING SIGHT DISTANCE

-DWY1-

PI Sta 11+53.80	PI Sta 10+77.34
△ = 42° 09' 55.8" (LT)	△ = 69° 13' 03.0" (RT)
D = 286° 28' 44.0"	D = 286° 28' 44.0"
L = 14.72'	L = 24.16'
T = 7.71'	T = 13.80'
R = 20.00'	R = 20.00'



BEGIN PROJECT B-5388
BEGIN OVERLAY
-L- POT STA 13+00.00
END PROJECT B-5388
END OVERLAY
-L- POC STA 24+80.00
PC Sta. 13+16.01
PCC Sta. 15+98.39
POT Sta. 11+72.32
END CONSTRUCTION -DWY1- POT STA 11+55.00
PT Sta. 11+47.88
PC Sta. 11+33.16
PT Sta. 10+91.16
PC Sta. 10+67.00
N 60° 09' 23.7" E
N 71° 55' 47.4" E
S 71° 01' 35.7" E
PC Sta. 22+39.33
PCC Sta. 25+14.15
PT Sta. 26+12.04
PT Sta. 17+61.04
-DWY1- POT Sta. 10+00.00= -L- POC Sta. 16+91.12
BEGIN BRIDGE -L- POT STA 18+20.60
BEGIN APPROACH SLAB -L- POT STA 18+06.80
END APPROACH SLAB -L- POT STA 21+50.20
END BRIDGE -L- POT STA 21+36.40
SUSAN EDWARDS HALL
TERRY LEE HALL
DB 341 PG 113
PATRICIA E. BAILEY
ROBERT M. BAILEY
DB 228 PG 104
DB 387 PG 714
CHARLES HOPE BYERS AND ANGELA R. BYERS, TRUSTEES OF THE CHARLES H. BYERS AND ANGELA R. BYERS JOINT REVOCABLE TRUST AGREEMENT DATED DECEMBER 30, 2004
DB 386 PG 415
PB 11 PG 71
DOROTHY O. BAILEY LIFE ESTATE
FOY LEE TEMPLETON JR.
ANNE C. TEMPLETON
DB 386 PG 418
LITTLE RIVER
END OVERLAY BEGIN GRADE -L- STA 16+01.36 EL. 2442.17
BEGIN BRIDGE -L- STA 18+20.60
END BRIDGE -L- STA 21+36.40
END GRADE BEGIN OVERLAY -L- STA 22+94.82 EL. 2455.74
END OVERLAY STA 24+80.00
BEGIN OVERLAY -L- STA 13+00.00
PI = 17+05.00
EL = 2,442.69'
VC = 200'
K = 117
DS = 55 MPH
CL STA 19+78.50 -L-
1@100',1@115',1@100'
63" PRESTRESSED GIRDER BRIDGE
W/4' END BENT CAPS
GP ELEV = 2,448.74
SKEW = 110 DEGREES
PROPOSED GRADE
EXISTING PAVEMENT
UNCLASSIFIED STRUCTURE EXCAVATION (STRUCTURE PAY ITEM)
CLASS II RIP RAP BANK ARMOR EST. 540 TONS
CLASS II RIP RAP SLOPE STABILIZATION EST. 275 TONS
OBS. WS = 2413.0' 11/3/17
BMI -L- STA. 17+51.92 85.8' LT. EL. 2,449.88 CHISELED "X" IN ROCK

DETAIL A
SPECIAL LATERAL 'V' DITCH (Not to Scale)
Min. D = 1.25 Ft.
FROM STA. 13+00 TO STA. 17+00 -L- LT.

DETAIL B
SPECIAL LATERAL 'V' DITCH (Not to Scale)
Min. D = 1.5 Ft. Max. d = 1.0 Ft.
Type of Liner = CL I Rip-Rap
FROM STA. 17+00 TO STA 18+00 -L- LT. 59 TONS CL I Rip Rap/110 SY GEOTEXTILE
FROM STA. 21+40 TO STA. 22+50 -L- LT. 65 TONS CL I Rip Rap/121 SY GEOTEXTILE

DETAIL C
TOE PROTECTION (Not to Scale)
d = 1.0 Ft.
Type of Liner = CL I Rip-Rap
FROM STA. 18+00 TO 18+40 -L- LT. 13 TONS CL I Rip Rap/30 SY GEOTEXTILE

DETAIL G
DECK DRAIN DISSIPATOR PAD (Not to Scale)
*NOTE: CENTER PAD DIRECTLY BELOW DECK DRAINS
L = 50FT (@ EB1), 40FT (@EB2)
Type of Liner = 11 TONS CL B Rip-Rap
Geotextile = 23 sy
FROM STA. 18+27 TO STA. 18+86 -L- LT/RT
FROM STA. 20+83 - 21+35 -L- LT/RT
QUANTITIES SHOWN FOR EACH PAD

DETAIL H
RIP RAP AT EMBANKMENT (Not to Scale)
Type of Liner = 105 TONS CL II Rip-Rap
Geotextile = 150sy
SEE STRUCTURE PLANS FOR EAST BANK

SEE SHEET 5 FOR -L DET- PLAN/PROFILE
SEE SHEET 6 FOR -DWY1- PROFILE
SEE SHEETS S-1 THRU S-38 FOR STRUCTURE PLANS

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 12,900	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 2422.4	FT
BASE DISCHARGE	= 15,200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2423.5	FT
OVERTOPPING DISCHARGE	= 84,900	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 2440.9	FT
DATE OF SURVEY	= 11/3/2017	
W.S. ELEVATION AT DATE OF SURVEY	= 2413.0	FT

REVISIONS
ROW REV. August 3, 2018 – ADDED PROPERTY OWNER AND REVISED EXIST. PROPERTY LINE FOR PARCEL 1. (HMH)
ROW REV. November 1, 2018 – UPDATED PROPERTY OWNER FOR PARCELS 1 AND 2. (KAP)

PROJECT REFERENCE NO.	SHEET NO.
B-5388	5

RW SHEET NO.

ROADWAY DESIGN ENGINEER — David J. Clodgo, North Carolina Professional Engineer Seal 035683, 11/8/2018

HYDRAULICS ENGINEER — Andrew T. Nottingham, North Carolina Professional Engineer Seal 53351, 11/8/2018

CDM Smith Inc., 5400 Glenwood Avenue, Suite 400, Raleigh, NC 27612-3228, NC COA No. F-1255

MI Engineering, PLLC, 1011 Schaub Drive, Suite 100, Raleigh, NC 27606, NC COA No.

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REVISIONS

BRIDGE PAVEMENT RELATIONSHIP SKETCH

(NOT TO SCALE)

BEGIN BRIDGE -L DET- POT STA. 18+20.00

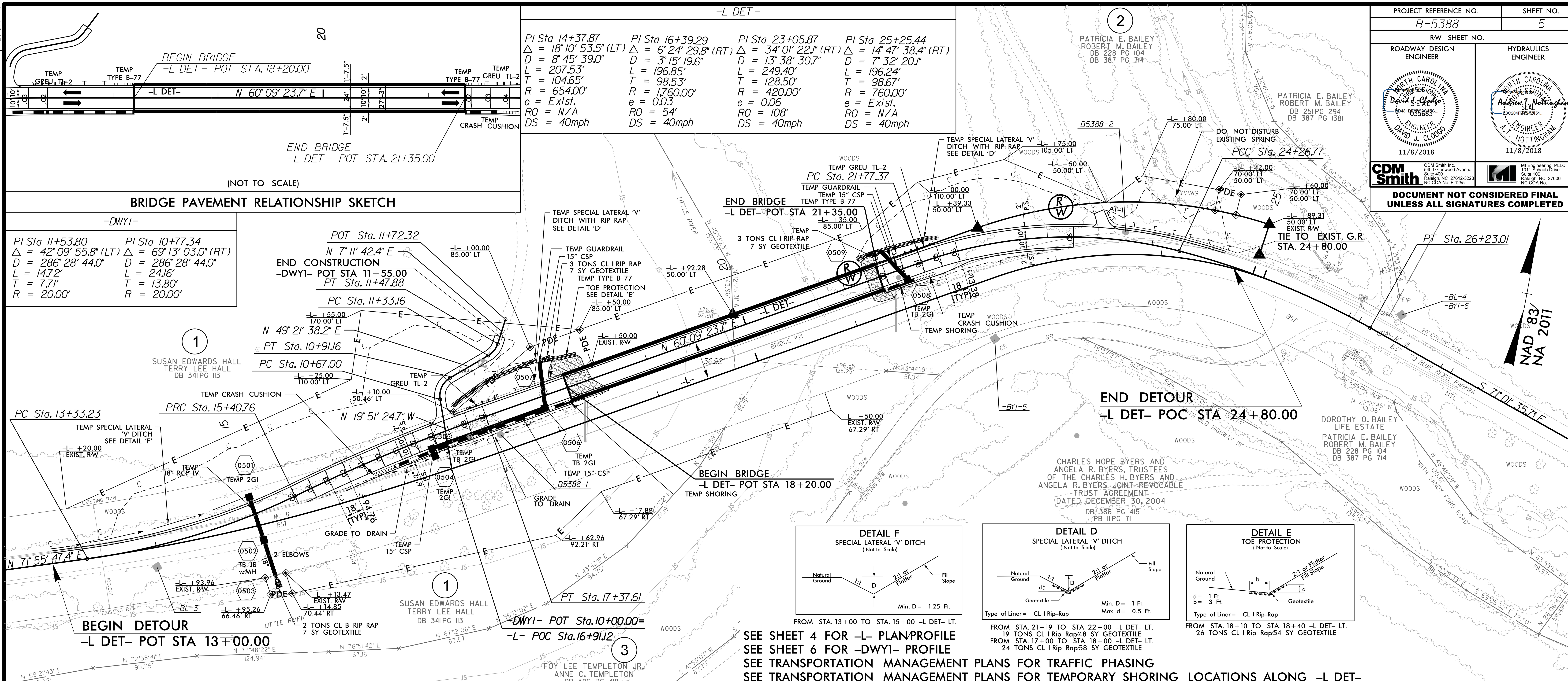
END BRIDGE -L DET- POT STA. 21+35.00

-L DET-

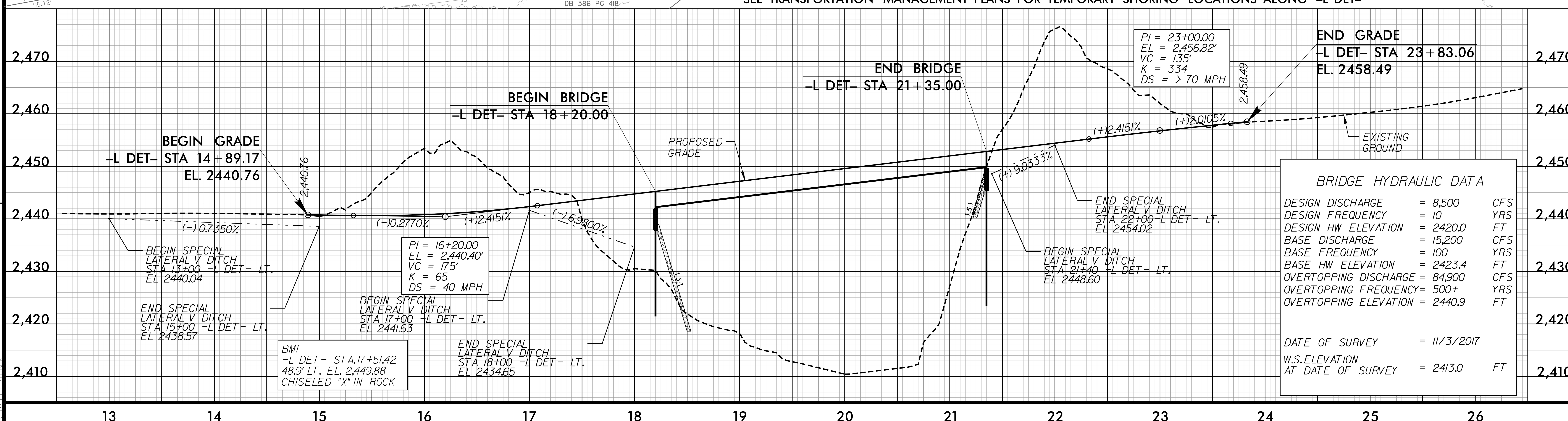
PI Sta 14+37.87	PI Sta 16+39.29	PI Sta 23+05.87	PI Sta 25+25.44
△ = 18° 10' 53.5" (LT)	△ = 6° 24' 29.8" (RT)	△ = 34° 01' 22.1" (RT)	△ = 14° 47' 38.4" (RT)
D = 8° 45' 39.0"	D = 3° 15' 19.6"	D = 13° 38' 30.7"	D = 7° 32' 20.1"
L = 207.53'	L = 196.85'	L = 249.40'	L = 196.24'
T = 104.65'	T = 98.53'	T = 128.50'	T = 98.67'
R = 654.00'	R = 1,760.00'	R = 420.00'	R = 760.00'
e = Exist.	e = 0.03	e = 0.06	e = Exist.
RO = N/A	RO = 54'	RO = 108'	RO = N/A
DS = 40mph	DS = 40mph	DS = 40mph	DS = 40mph

-DWY1-

PI Sta 11+53.80	PI Sta 10+77.34
△ = 42° 09' 55.8" (LT)	△ = 69° 13' 03.0" (RT)
D = 286° 28' 44.0"	D = 286° 28' 44.0"
L = 14.72'	L = 24.16'
T = 7.71'	T = 13.80'
R = 20.00'	R = 20.00'



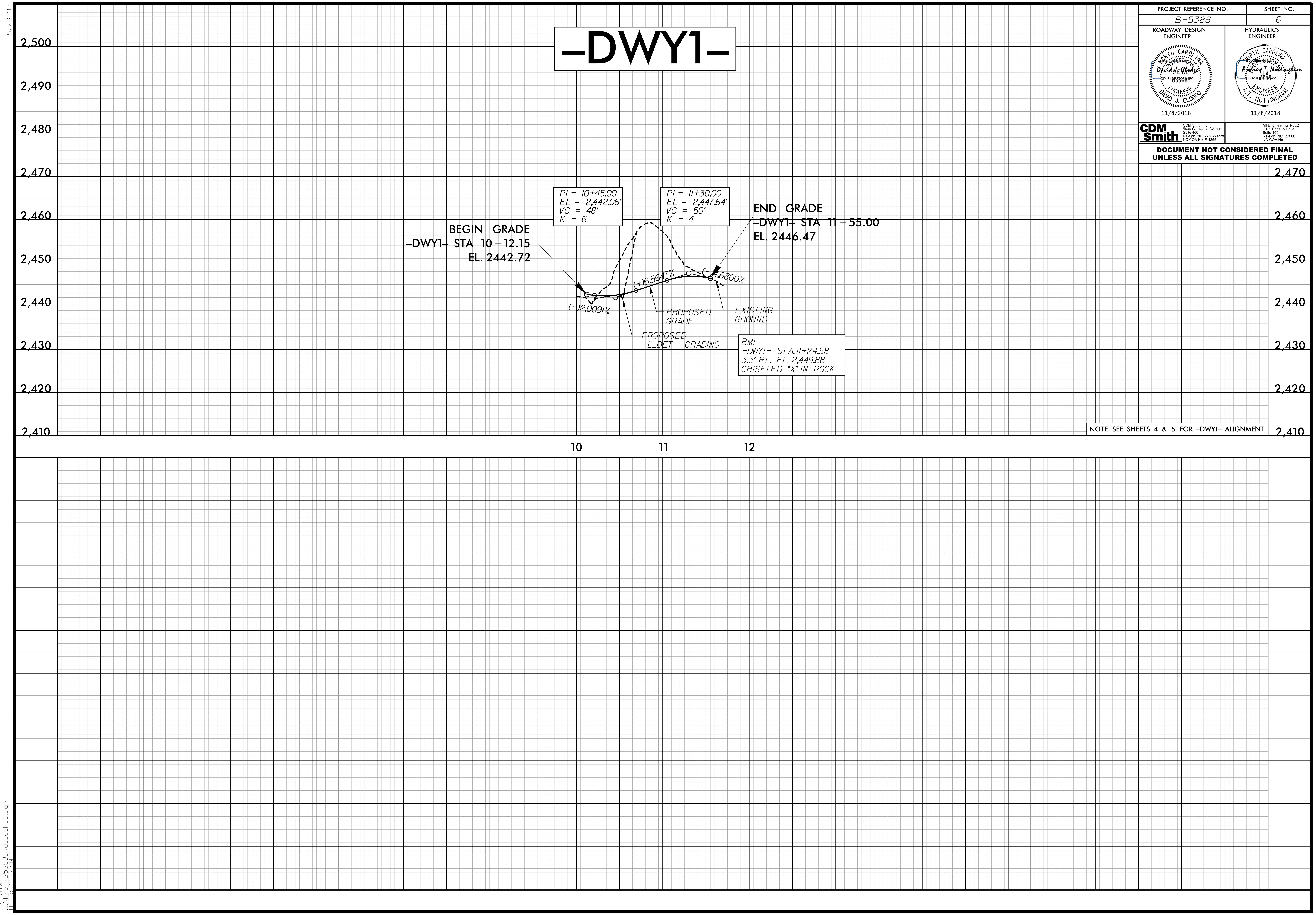
SEE SHEET 4 FOR -L- PLAN/PROFILE
SEE SHEET 6 FOR -DWY1- PROFILE
SEE TRANSPORTATION MANAGEMENT PLANS FOR TRAFFIC PHASING
SEE TRANSPORTATION MANAGEMENT PLANS FOR TEMPORARY SHORING LOCATIONS ALONG -L DET-



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 8,500	CFS
DESIGN FREQUENCY	= 10	YRS
DESIGN HW ELEVATION	= 2420.0	FT
BASE DISCHARGE	= 15,200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2423.4	FT
OVERTOPPING DISCHARGE	= 84,900	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 2440.9	FT
DATE OF SURVEY	= 11/3/2017	
W.S. ELEVATION AT DATE OF SURVEY	= 2413.0	FT

-DWY1-



PROJECT REFERENCE NO.	SHEET NO.
B-5388	6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035685 ENGINEER DAVID J. CLODGO

DocuSigned by: David J. Clodgo DD481DE87C3C4FC...

11/8/2018

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18535 ENGINEER A.T. NOTTINGHAM

DocuSigned by: Andrew T. Nottingham E3C204F94D43451...

11/8/2018

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