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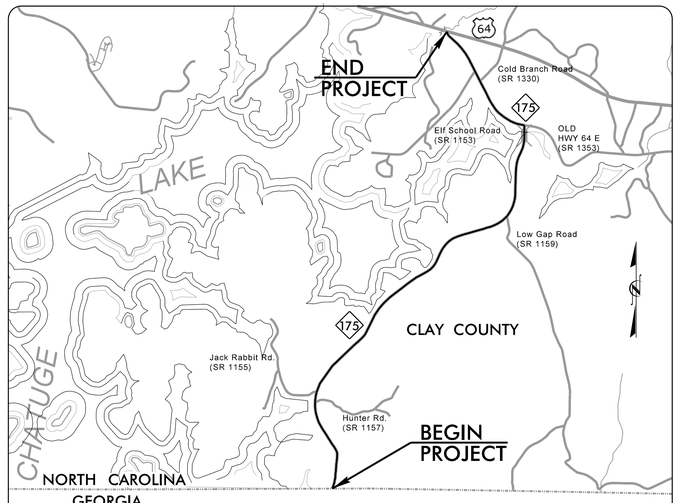
09/08/99

TIP PROJECT: R-5742

CONTRACT: C204291

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



VICINITY MAP *N.T.S.*

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLAY COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5742	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46325.1.D.1		PE
46325.2.1		R/W
46325.3.1		CONST.

LOCATION: NC 175 FROM GEORGIA STATE LINE TO US 64. UPGRADE ROADWAY

TYPE OF WORK: DRAINAGE, PAVING, GRADING, WALLS & CULVERT

NAD 83/95

–L– PT Sta. 39+55.96
–L– PC Sta. 39+51.17

BEGIN TIP PROJECT R–5742
–L– Sta. 10+75.00

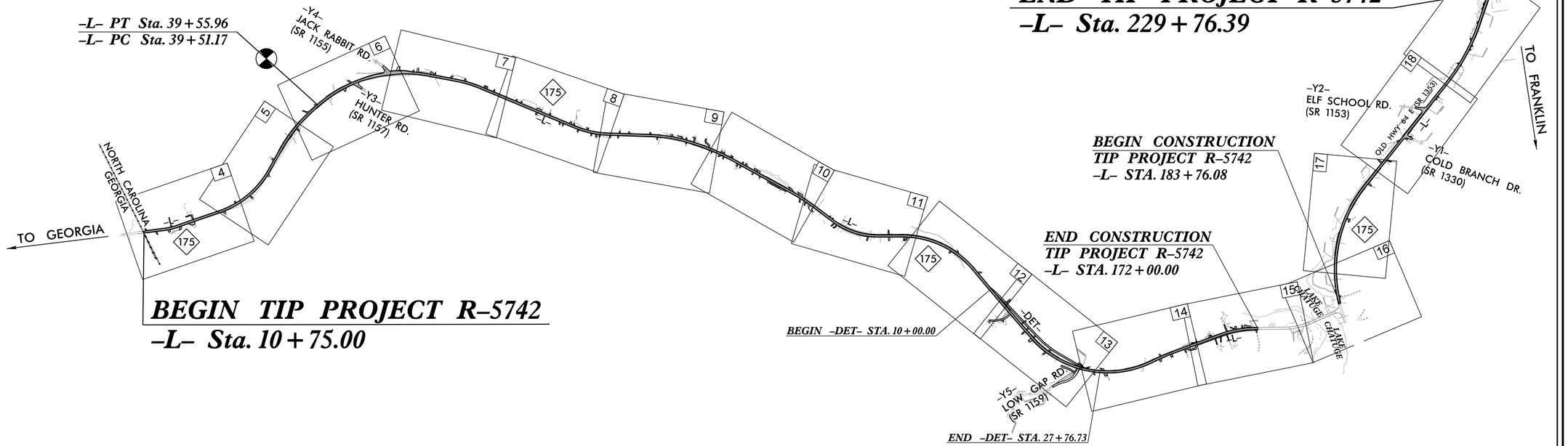
END TIP PROJECT R–5742
–L– Sta. 229+76.39

BEGIN CONSTRUCTION
TIP PROJECT R–5742
–L– STA. 183+76.08

END CONSTRUCTION
TIP PROJECT R–5742
–L– STA. 172+00.00

BEGIN –DET– STA. 10+00.00

END –DET– STA. 27+76.73



NOTES:
1. THIS IS NOT A CONTROLLED ACCESS PROJECT.

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 2019 = 2,820
ADT 2030 = 3,950
K = %
D = %
T = 6.4 % *
V = 50 MPH
* (TTST 5.2% + DUALS 2.0%)

CLASSIFICATION:
RURAL MAJOR COLLECTOR

PROJECT LENGTH

ROADWAY LENGTH TIP PROJECT R–5742.....3.925 MILES
TOTAL LENGTH TIP PROJECT R–5742.....3.925 MILES

PLANS PREPARED BY:
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112
1-888-521-4455 OR 919-878-9560
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 22, 2017

LETTING DATE: FEBRUARY 19, 2019

B. KEITH SKINNER, P.E.
PROJECT ENGINEER

BRANDON McINNIS, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: KENNETH McDOWELL
ASSISTANT DDC ENGINEER – DIVISION 14

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 041982 ENGINEER BRADLEY D. BOGGS

DocuSigned by: Bradley D. Boggs 12/21/2018
SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29470 ENGINEER BRANDON J. McINNIS

DocuSigned by: Brandon McInnis 12/21/2018
SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

12/21/2018
R:\Roadway\Proj\R-5742_Rdy_tsh.dgn
eprice

8/17/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5742	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29470 ENGINEER BRANDON J. MCINNIS

1/10/2019

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 AND 2A-2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2B-1 AND 2B-2	DETOUR PLAN AND PROFILE SHEETS
2C-1 THRU 2C-3	ROADWAY SPECIAL DETAILS
2G-1 THRU 2G-4	GEOTECHNICAL SPECIAL DETAILS
3B-1	SUMMARY OF ROADWAY QUANTITIES EARTHWORK SUMMARY, PAVEMENT REMOVAL SUMMARY
3B-2	GUARDRAIL SUMMARY SHEET
3D-1 THRU 3D-6	SUMMARY OF DRAINAGE QUANTITIES
3G-1	SUMMARY OF GEOTECHNICAL QUANTITIES SUMMARY OF SUBSURFACE DRAINAGE, SUMMARY OF AGGREGATE SUBGRADE, SUMMARY OF ROCK PLATING, SUMMARY OF REINFORCED SOIL SLOPES
3P-2	PARCEL INDEX SHEET
4 THRU 19	PLAN SHEET
20 THRU 30	PROFILE SHEET
TMP-1 THRU TMP-22	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-7	PAVEMENT MARKING PLANS
EC-1 THRU EC-39	EROSION CONTROL PLANS
RF-1 THRU RF-2	REFORESTATION PLANS
UC-1 THRU UC-26	UTILITIES PLANS
UD-1 THRU UD-17	UTILITY BY OTHERS PLANS
X-0 THRU X-160	CROSS-SECTIONS
CU-1 THRU CU-7	CULVERT PLANS
W-1 THRU W-6	WALL ENVELOPE PLANS

EFF. 01-16-2018
REV. 12-11-2018

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
240.01	Guide for Berm Ditch Construction
275.01	Rock Plating
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.02	Concrete Endwall and Sluice Gate - 15" thru 36" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
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
840.24	Frames and Narrow Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.30	Driveway Drop Inlet
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
852.01	Concrete Islands
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.03	Drainage Ditches with Class 'A' Rip Rap
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED: 12-11-2018

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 II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 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. 560.02

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. NO. 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.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS 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".

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE BLUE RIDGE MOUNTAIN EMC.

WINDSTREAM TELECOM, FRONTIER TELECOM, BALSAM COMMUNICATIONS.

CITY OF HIAWASSEE, CLAY COUNTY UTILITY AUTHORITY

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 OTHERS.

1/10/2019
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default

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
R-5742	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

6/2/99

PAVEMENT SCHEDULE

C1	PROP. APPROX. 2½″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	K	PROPOSED 12″ CLASS IV SUBGRADE STABILIZATION
C2	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	N	GEOTEXTILE FOR SOIL STABILIZATION
C3	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 LESS THAN 1½″ OR GREATER THAN 2″ IN DEPTH.	P	PRIME COAT
D1	PROP. APPROX. 2½″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R1	CONCRETE 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.	R2	EXPRESSWAY GUTTER
E1	PROP. 4″ DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	CONCRETE 8″ X 12″
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.	T	EARTH MATERIAL
J1	6″ AGGREGATE BASE COURSE	U	EXISTING PAVEMENT
J2	8″ AGGREGATE BASE COURSE	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

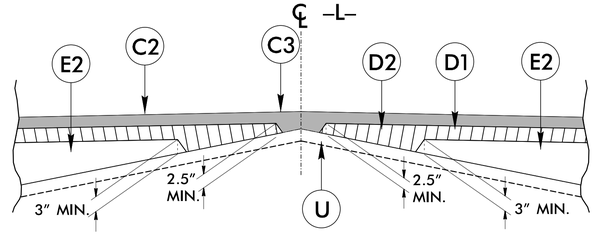
PROJECT REFERENCE NO.	SHEET NO.
R-5742	2A-1

ROADWAY DESIGN ENGINEER

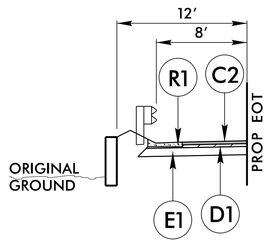
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29470 BRANDON J. MCINNIS
12/17/2018

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041709 GREGORY K. COINS
12/14/2018



Detail Showing Method of Wedging

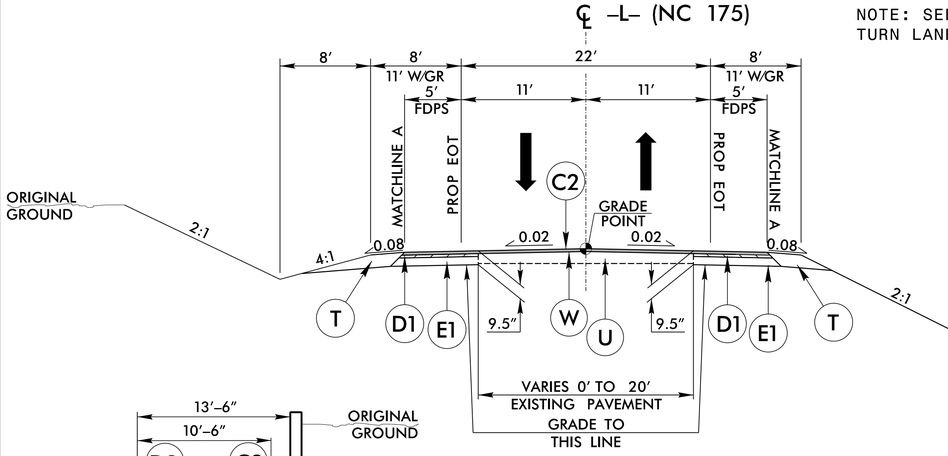


INSET 1

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

–L– STA. 111+50.00 TO 115+00.00

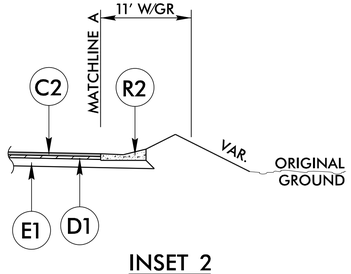
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
NOTE: SEE PLANS FOR LOCATIONS OF CONCRETE ISLANDS, TURN LANES, AND TAPERS



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

–L– STA. 10+75.00 TO 22+69.06
–L– STA. 26+41.36 TO 133+59.26
–L– STA. 148+46.98 TO 172+00.00
–L– STA. 183+76.08 TO 229+76.39

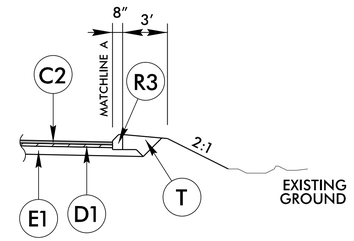


INSET 2

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

*–L– STA. 14+50.00 TO 14+99.51
–L– STA. 94+00.50 TO 95+83.29
–L– STA. 162+68.03 TO 163+67.78
–L– STA. 166+43.62 TO 166+99.67
–L– STA. 167+16.03 TO 167+85.02

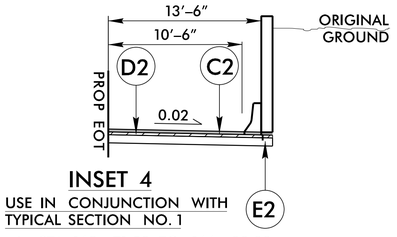
* REVERSE INSET



INSET 3

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

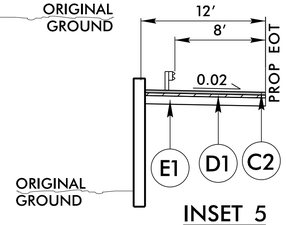
–L– STA. 103+64.21 TO 104+53.88
–L– STA. 212+61.00 TO 214+60.00



INSET 4

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

–L– STA. 163+71.50 TO 166+00.00
–L– STA. 168+25.00 TO 170+82.00

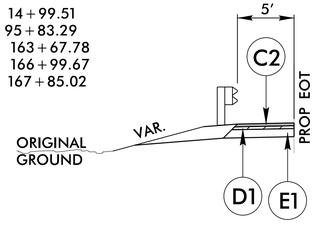


INSET 5

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

*–L– STA. 111+64.00 TO 114+10.00
–L– STA. 116+17.00 TO 117+00.00
–L– STA. 119+00.00 TO 126+00.00
–L– STA. 160+00.00 TO 160+50.00

* REVERSE INSET



INSET 6

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

–L– STA. 159+30.00 TO 163+42.50

PLANS PREPARED BY :

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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609–3960
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R:\Roadway\Proj\R-5742_rdy_typ.dgn
acoe

6/2/99

PAVEMENT SCHEDULE	
C1	2½″ S9.5C
C2	3″ S9.5C
C3	VAR. S9.5C
D1	2½″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	VAR. B25.0C
J1	6″ ABC
J2	8″ ABC
K	SUBGRADE STAB.
N	GEO. FOR SOIL STAB.
P	PRIME COAT
T	EARTH
U	EXISTING PAVEMENT
W	WEDGING

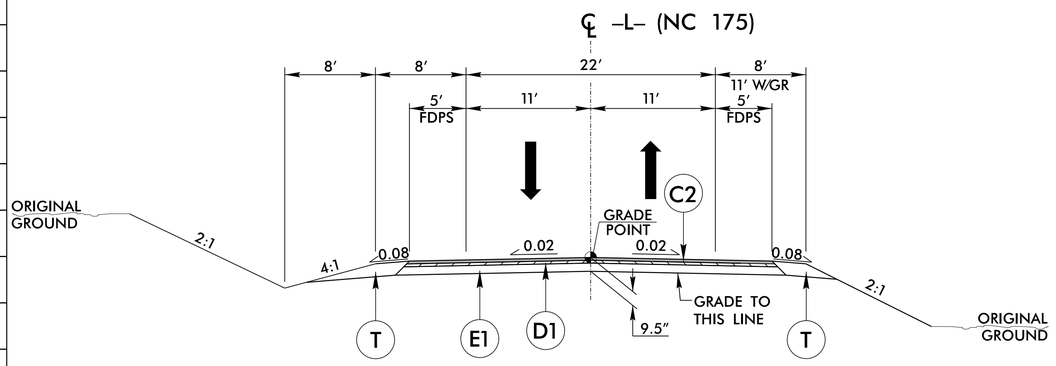
PROJECT REFERENCE NO.	SHEET NO.
R-5742	2A-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29470 ENGINEER BRANDON J. MCINNIS 12/19/2018

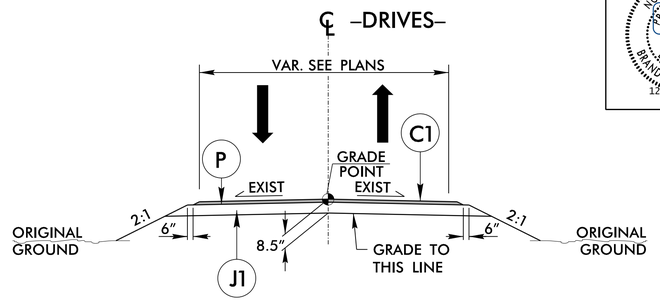
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041709 ENGINEER GREGORY K. COINS 12/19/2018



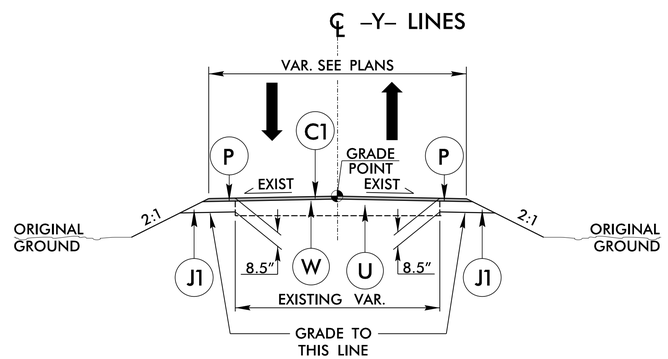
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
–L– STA. 22+69.06 TP 26+41.36
–L– STA. 133+59.26 TO 148+46.98



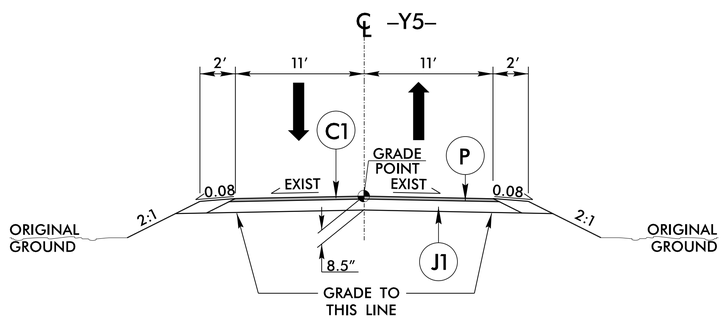
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
–DR1–, –DR2–, –DR5–. DR6–,
–DR7–, –DR16–, –DR20–, –DR21–



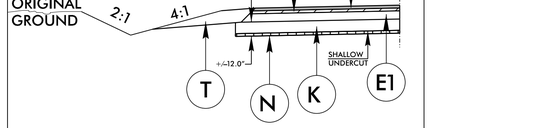
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
–Y1–, –Y2–, –Y3–, –Y4–



TYPICAL SECTION NO. 5

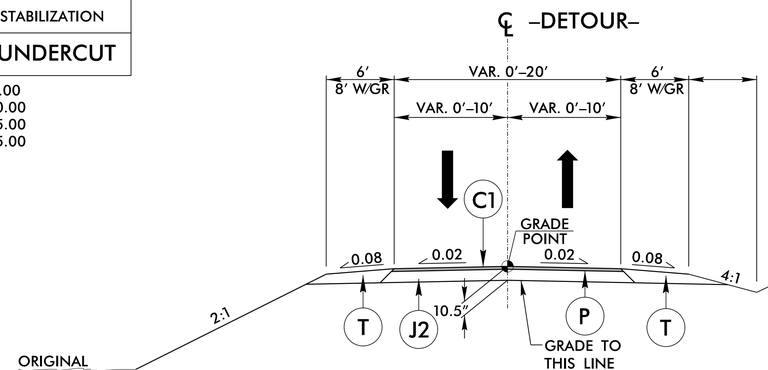
USE TYPICAL SECTION NO. 5
–Y5– STA. 10+11.00 TO 14+29.54



USE IN ALL AREAS OF SUBGRADE STABILIZATION

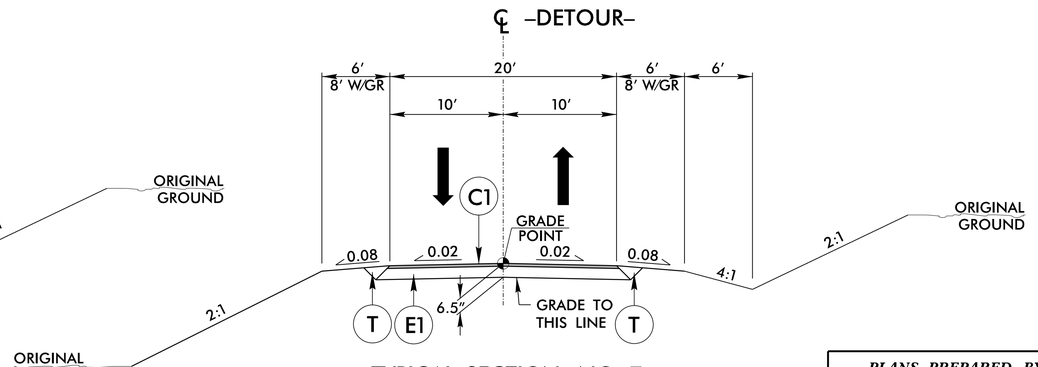
DETAIL FOR SHALLOW UNDERCUT

–L– STA. 12+00.00 TO 15+25.00
–L– STA. 24+75.00 TO 32+00.00
–L– STA. 55+75.00 TO 59+75.00
–L– STA. 72+25.00 TO 78+25.00



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6
–DET– STA. 11+59.23 TO 26+23.15



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7
–DET– STA. 11+04.25 TO 11+59.23
–DET– STA. 26+23.15 TO 28+03.51

PLANS PREPARED BY :

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mcroe

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-5742	2B-1
R/W SHEET NO.	

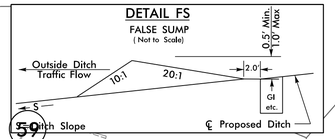
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29470 BRANDON J. MANNIS 1/7/2019

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041982 BRADLEY D. BOGGS 1/7/2019

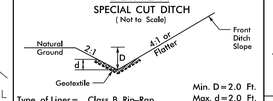
NOTE: ALL DRIVES ARE 16' WIDE WITH 10' RADIUS UNLESS OTHERWISE NOTED.

NAD 83/95

DETAIL FS
FALSE SUMP
(Not to Scale)



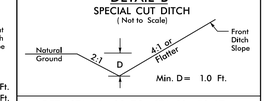
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap
Min. D=2.0 Ft.
Max. d=2.0 Ft.

–DET– STA. 13+02 TO STA. 14+02 LT

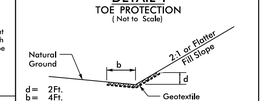
DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1.0 Ft.

–DET– STA. 10+00 TO STA. 10+50 LT
–DET– STA. 12+52 TO STA. 13+52 RT

DETAIL I
TOE PROTECTION
(Not to Scale)



d= 2Ft.
b= 4Ft.

Type of Liner= CLASS B Rip-Rap

–DET– STA. 17+24 TO STA. 18+00 LT
–DET– STA. 19+39 TO STA. 21+55 RT

58 FOWLER BRUCE & RUTH PARCEL #6499 DB 166 PG 18

59 CONNIE LYNN PHILLIPS PARCEL #2104 DB 370 PG 197

60 SMOKY MTN REAL EST DEV CORP PARCEL #9964 DB 350 PG 224

62 SMOKY MTN REAL EST DEV CORP PARCEL #9588 DB 350 PG 224

65 BEAL RONNELL & REBECCA PARCEL #5574 DB 138 PG 63

67A GEORGE WILLIAM BULLER II PARCEL #4497 DB 354 PG 191

61 GISSENDANNER FRANCES & ELTON PARCEL # 6774 DB 320 PG 17

63

64 KEVIN RAY ROBERT PARCEL #7761 DB 355 PG 173

-DET- PRC Sta. 11+01.54

-DET- PT Sta. 12+74.61

-DET- PC Sta. 19+59.61

SPECIAL CUT DITCH SEE DETAIL B

16 TONS CL B RIPRAP W/45 SY GEO FAB

SPECIAL CUT DITCH SEE DETAIL A

40 TONS CL B RIPRAP W/105 SY GEO FAB TOE PROTECTION SEE DETAIL I

2 TONS CL B RIPRAP W/7 SY GEO FAB

SPECIAL CUT DITCH SEE DETAIL B

SPECIAL CUT DITCH SEE DETAIL B

TOE PROTECTION SEE DETAIL I

113 TONS CL B RIPRAP W/299 SY GEO FAB

BEGIN CONSTRUCTION
-DET- PC Sta. 10+00.00=
-L- POC STA.132+00.00

-L- 10+00

15+00

20+00

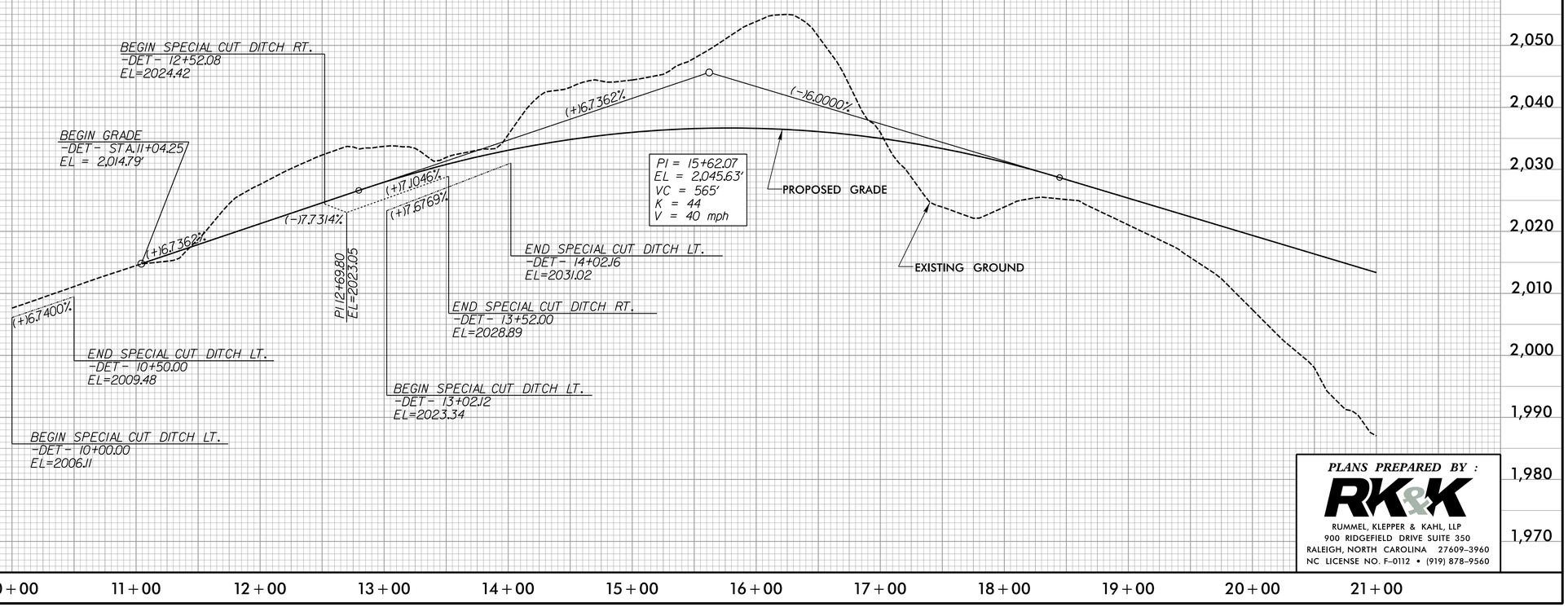
N 73° 20' 32" E

MATCHLINE -DET- STA. 21+00
SEE SHEET 2B-2

-DET-

PI Sta 10+50.95	PI Sta 11+88.22	PI Sta 21+34.35
△ = 11° 38' 08.9" (LT)	△ = 8° 15' 47.4" (RT)	△ = 16° 34' 11.7" (LT)
D = 11° 27' 33.0"	D = 4° 46' 28.7"	D = 4° 46' 28.7"
L = 101.54'	L = 173.06'	L = 347.04'
T = 50.95'	T = 86.68'	T = 174.74'
R = 500.00'	R = 1,200.00'	R = 1,200.00'
	SE = .02	SE = 0.06
	V = 40 mph	V = 40 mph

FOR R/W AND EASEMENT STATIONS/OFFSETS SEE SHEETS 12 AND 13.



PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
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12/21/2018
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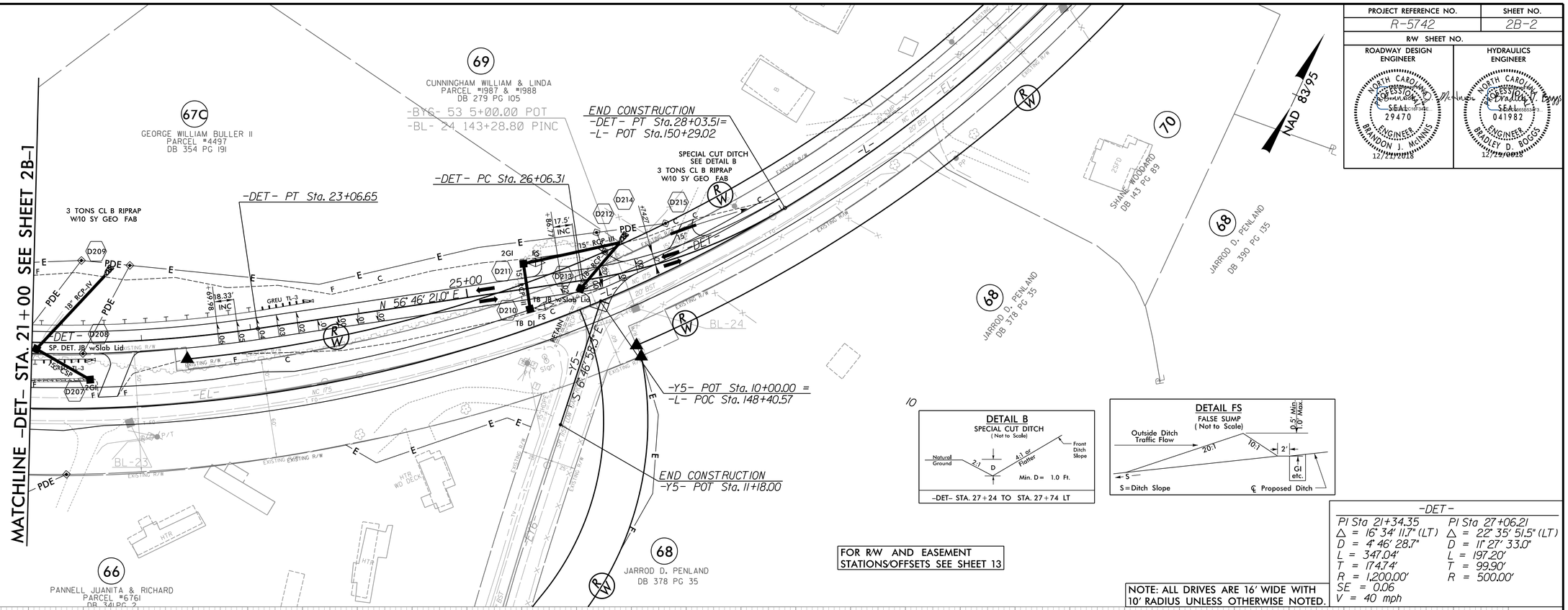
gerlee

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-5742	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29470 ENGINEER BRANDON J. MCINNIS	NORTH CAROLINA PROFESSIONAL SEAL 041982 ENGINEER BRADLEY D. BOGGS
12/21/2018	12/19/2018



DETAIL B
SPECIAL CUT DITCH
(Not to Scale)

-DET- STA. 27+24 TO STA. 27+74 LT

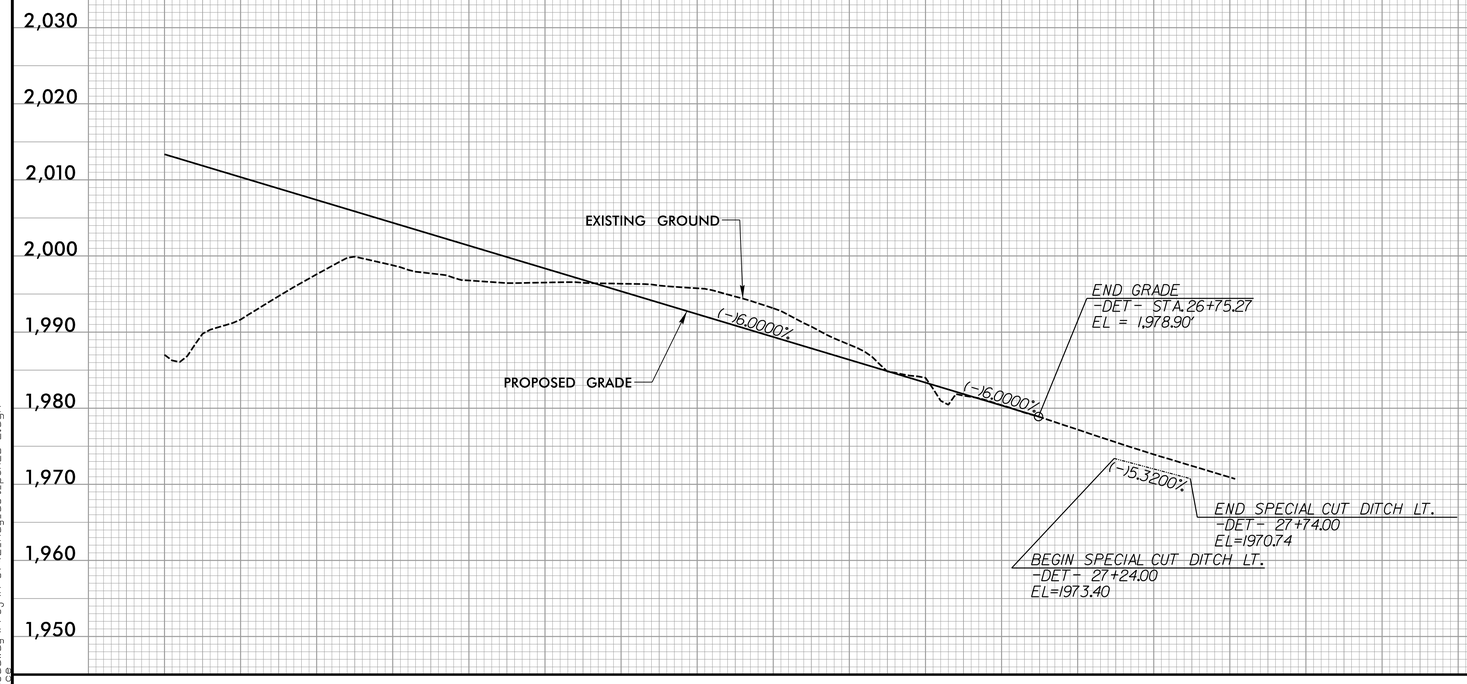
DETAIL FS
FALSE SUMP
(Not to Scale)

FOR R/W AND EASEMENT
STATIONS/OFFSETS SEE SHEET 13

NOTE: ALL DRIVES ARE 16' WIDE WITH 10' RADIUS UNLESS OTHERWISE NOTED.

-DET-

PI Sta 21+34.35	PI Sta 27+06.21
△ = 16° 34' 11.7" (LT)	△ = 22° 35' 51.5" (LT)
D = 4° 46' 28.7"	D = 11° 27' 33.0"
L = 347.04'	L = 197.20'
T = 174.74'	T = 99.90'
R = 1,200.00'	R = 500.00'
SE = 0.06	
V = 40 mph	



PLANS PREPARED BY :

RK&K

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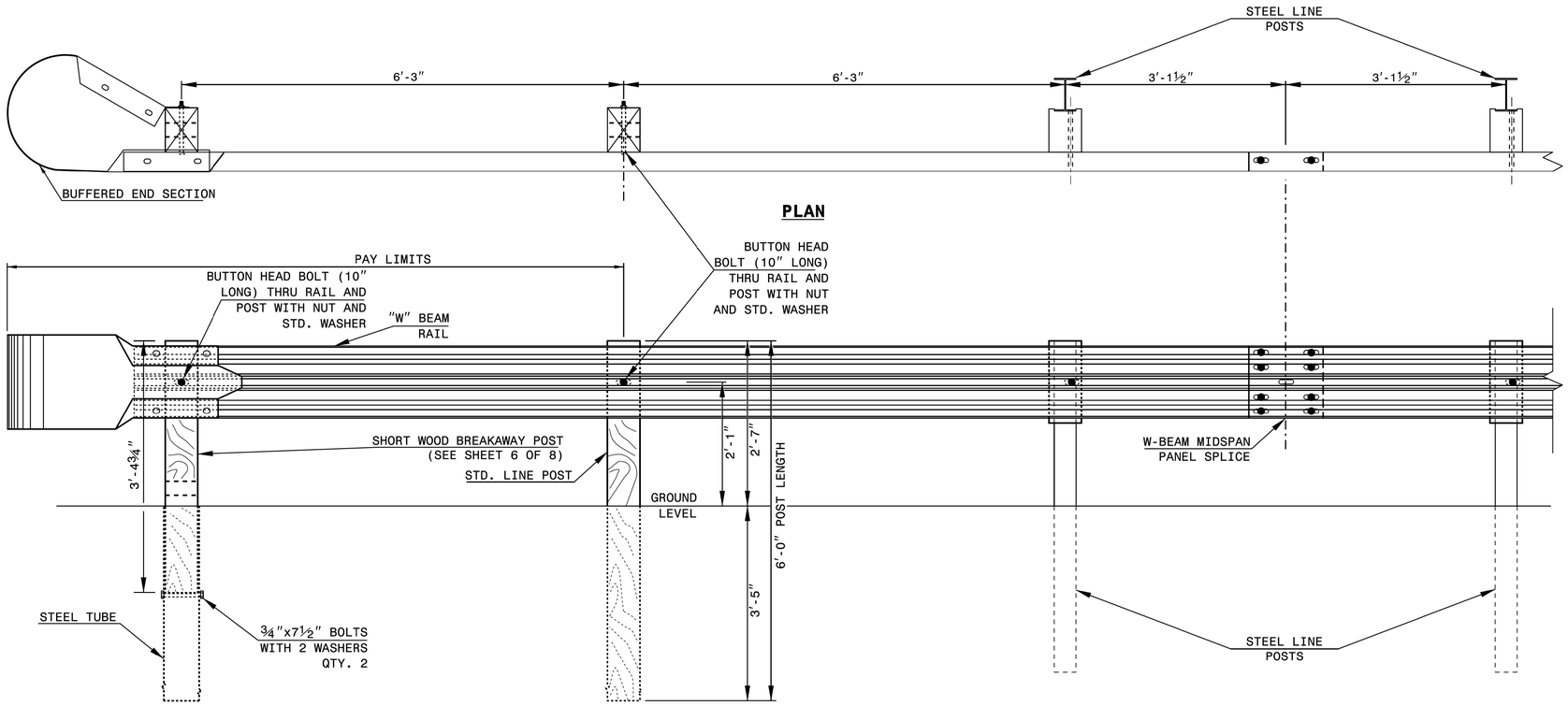
PROJECT REFERENCE NO.	SHEET NO.
R-5742	2C-1

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

SHEET OF

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
Joel S. Howerton
873F3D17DCDC45F...
1/17/2019

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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.: _____

12/6/2018
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PROJECT REFERENCE NO.	SHEET NO.
R-5742	2C-2

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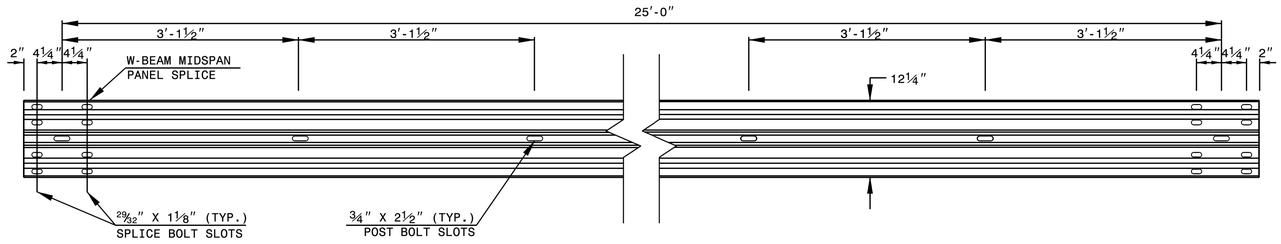
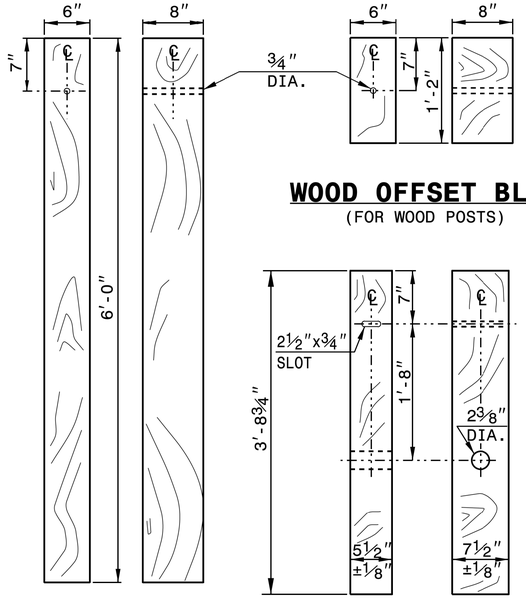
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



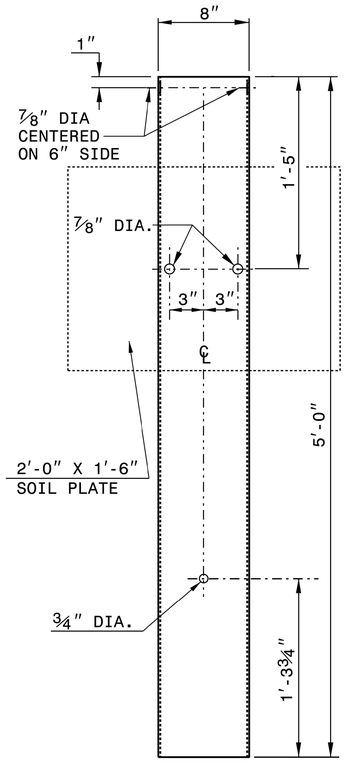
STANDARD W-BEAM GUARDRAIL



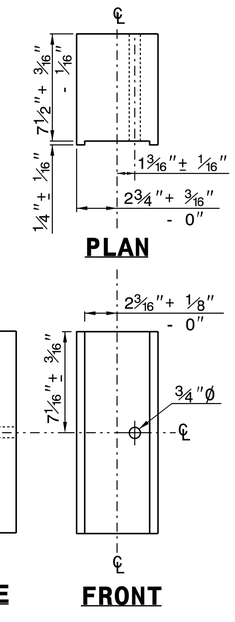
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

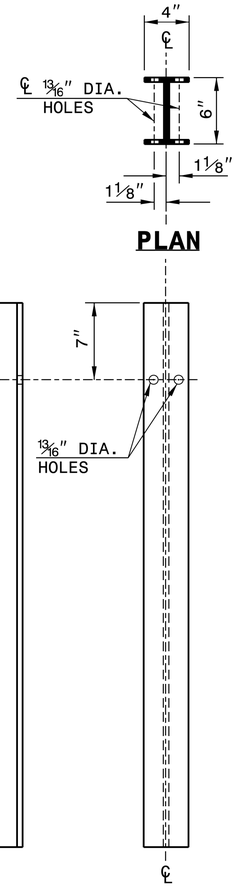
SHORT WOOD BREAKAWAY POST



STEEL TUBE
TS 6"x8"x0.1875"



ROUTED OFFSET BLOCK



"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 JOEL S. HOWERTON
Joel S. Howerton
873F3D17DCDC45F...
1/17/2019

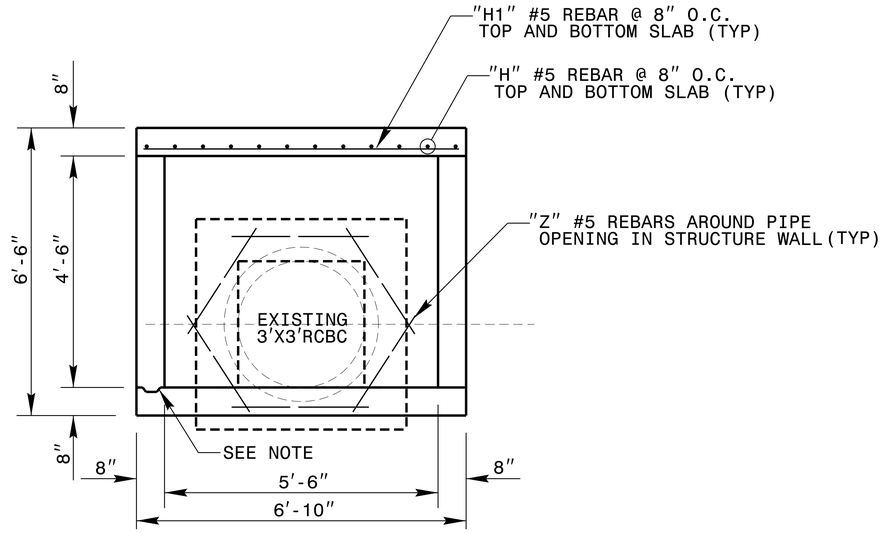
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5742	2C-3



SECTION A-A

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

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

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

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

INSTALL MANHOLE IN POSITION AS DIRECTED BY THE ENGINEER. CUT AND BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 2" MINIMUM CONCRETE COVERAGE.

CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OR BOX, ADD TO BASE AS SHOWN IN STD. NO. 840.00.

MAKE ALL ADJUSTMENTS AS DIRECTED BY THE ENGINEER

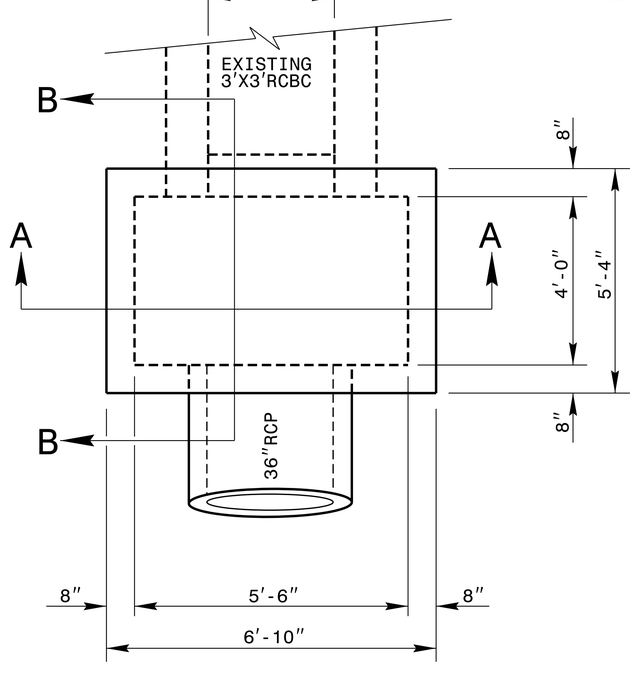
FIELD VERIFY THE DIMENSIONS FOR THE EXISTING 3'X3' RCBC

USE #5 DOWELS TO TIE JB TO 3'x3' RCBC SPACED AT 8" O.C.

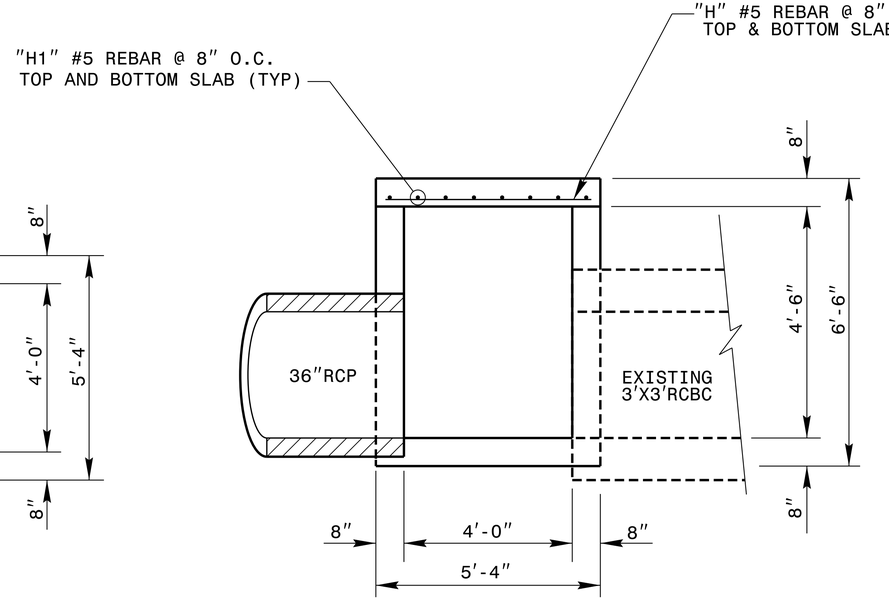
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	40	#5	4'-0"	167
H1	21	#5	6'-6"	143
V	22	#5	6'-2"	142
Z	6	#5	4'-0"	25
TOTAL REINF. STEEL (LBS.)				477
TOTAL CONC. (CU. YDS.)				4.9

* 0.30 CU. YD. DEDUCTION FOR 1-42" RC PIPE
* 0.62 CU. YD. DEDUCTION FOR 3'x3' RCBC
* NO DEDUCTION HAS BEEN MADE FOR PIPE OR CULVERT



PLAN VIEW



SECTION B-B

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NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Joel S. Howerton
873F3D17DCDC45F...
1/18/2019

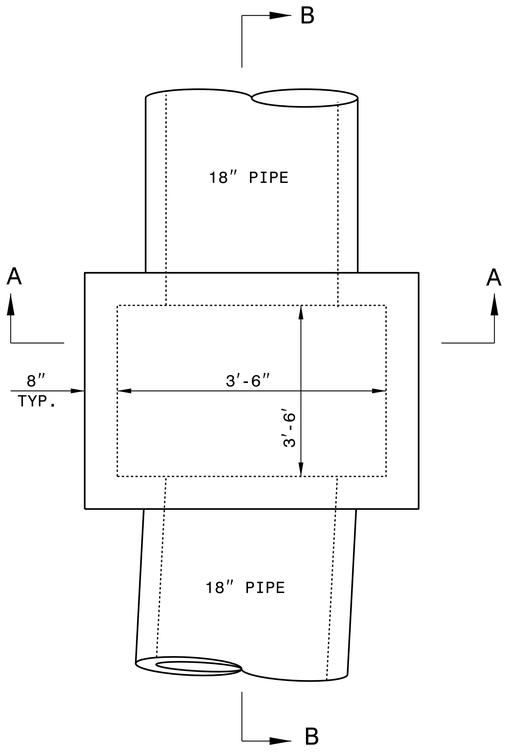
CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6950 FAX 919-250-4119

TRAFFIC BEARING JUNCTION BOX FOR EXISTING 3'X3'RCBC AND PROPOSED 42"RCP

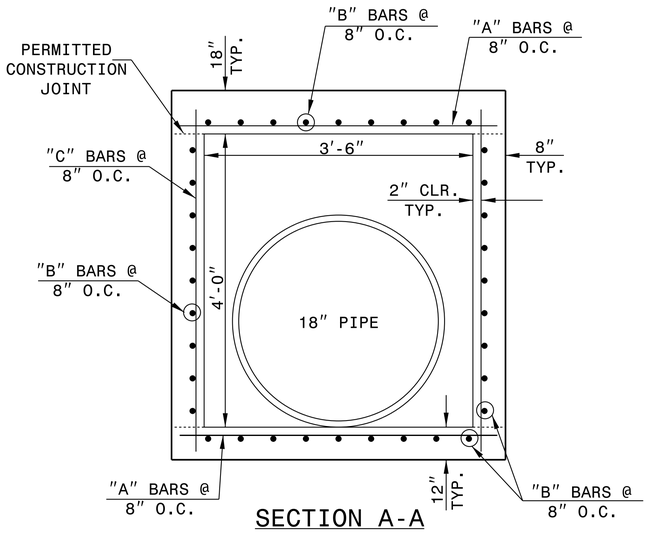
ORIGINAL BY: nbritt DATE: 07/29/14
MODIFIED BY: kkempf DATE: 01/09/19
CHECKED BY: DATE:
FILE SPEC.: detail/kkempf/english/r5742 3x3culv 36 jb.dgn

10-JAN-2019 12:0
S:\Contracts\Special Details\kkempf\english\r-5742 3x3culv 36 jb.dgn
kkempf AT CSD-292596

PROJECT REFERENCE NO.	SHEET NO.
R-5742	2C-4



PLAN



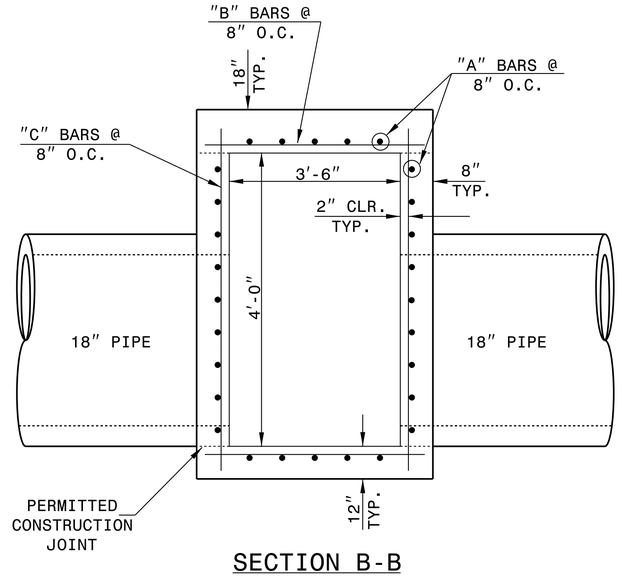
SECTION A-A

GENERAL NOTES:
-USE CLASS 'AA' CONCRETE THROUGHOUT.
-CONSTRUCTION OPTIONS: MONOLITHIC POUR; CONSTRUCTION JOINTS AT UNION OF WALLS WITH FLOOR AND/OR TOP SLAB.
-REINFORCING STEEL SHALL BE CUT, BENT OR RELOCATED TO POSITION PIPE AS DIRECTED BY THE ENGINEER.
-CHAMFER ALL EXPOSED CORNERS 1".
-SEE STD. DRAWING 840.34 FOR CONSTRUCTION OF RISER AND MANHOLE, IF REQURED.
-DIMENSIONS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	WEIGHT
A	40	#5	4'-6"	188
B	40	#5	4'-6"	188
C	34	#5	5'-0"	178
TOTAL REINF. STEEL (lbs.)				554
CLASS "B" CONC. (cu. yds.)				3.5

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES



SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton
Digitally signed by Joel S. Howerton
1/18/2019

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

DETAIL OF JB UNDER 30' OF FILL

ORIGINAL BY: E.E. WARD DATE: 1-99
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: S:\jhowerton\jb 42 inch pipe 24 feet fill.dgn

10-JAN-2019 12:11
S:\Contracts\Contracts\Special Details\jhowerton\jb 42 inch pipe 24 feet fill.dgn
kkempf AT CSD-292596

PROJECT REFERENCE NO.	SHEET NO.
R-5742	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044566 ENGINEER MATTHEW R SNYDER

DocuSigned by: Matthew Snyder 1/18/2019
9822EB64E80842E
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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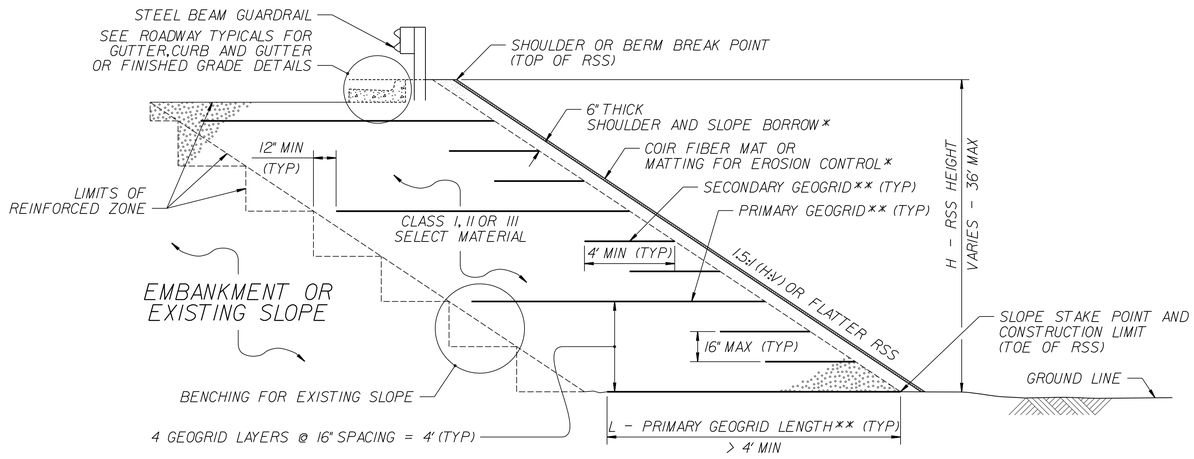
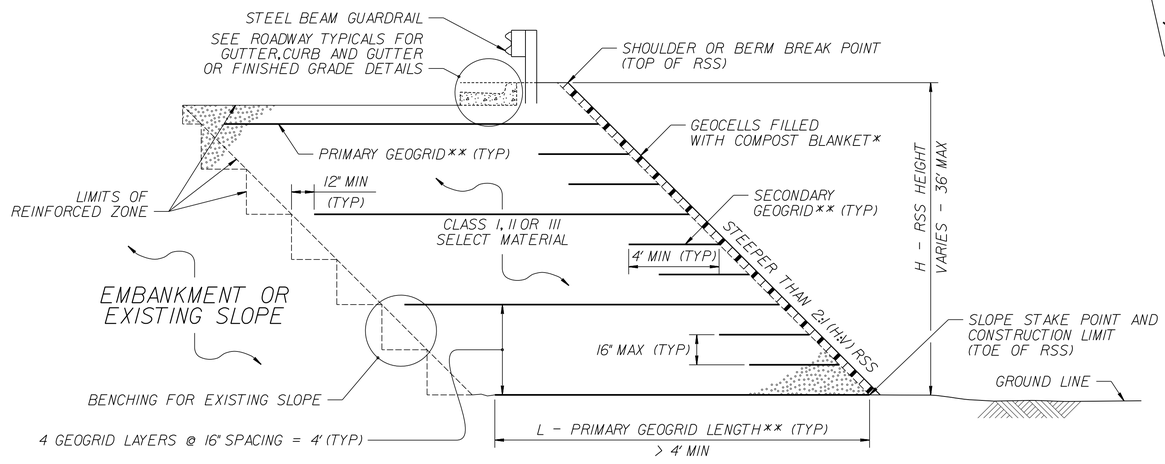


MATTING WITH SHOULDER AND SLOPE BORROW

*SEE NOTES 3 AND 11 ON SHEET 2.

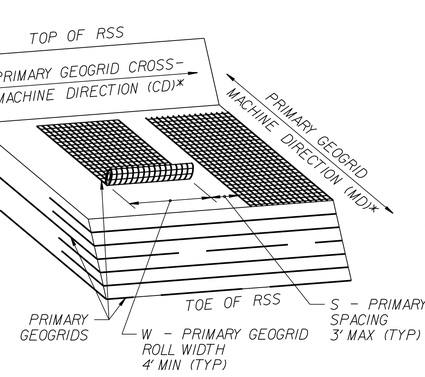


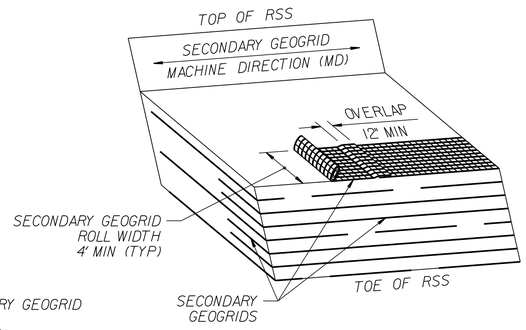
GEOCELLS WITH COMPOST BLANKET

*SEE NOTES 3 AND 11 ON SHEET 2.

STANDARD REINFORCED SOIL SLOPE (RSS)

**SEE TABLES ON SHEET 2 AND GEOGRID PLACEMENT DETAILS.





GEOGRID PLACEMENT DETAILS

(% COVERAGE = $\frac{W}{W+S}$ x 100 $\geq$ 75%)

*SEE NOTES 8 AND 9 ON SHEET 2.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.01

STANDARD
REINFORCED SOIL SLOPE (RSS)
WITH HIGH GROUNDWATER
SHEET 1 OF 2

DATE: 4-19-16

PROJECT REFERENCE NO.	SHEET NO.
R-5742	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044566 ENGINEER MATTHEW R SNYDER

DocuSigned by: Matthew Snyder 1/18/2019
S822EB64E80842E
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ENGINEER

SIGNATURE DATE

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GEOGRID TYPE, DIRECTION	H (FT)	0 - < 12		12 - 24		> 24 - 36	
	SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
PRIMARY GEOGRID, MD (SUBSTITUTE SECONDARY GEOGRID FOR PRIMARY GEOGRID FOR 2:1 (H:V) OR FLATTER RSS)	1:1 TO < 1.5:1 (H:V) RSS	900	500	1200	900	1800	1200
	1.5:1 TO 1.75:1 (H:V) RSS	500	500	900	500	1400	1000
	> 1.75:1 TO < 2:1 (H:V) RSS	500	500	600	500	1000	800
SECONDARY GEOGRID, CD	1:1 (H:V) OR FLATTER RSS	185					

LTDS – MINIMUM REQUIRED LONG-TERM DESIGN STRENGTH (LB/FT)

(LTDS IS BASED ON 100% COVERAGE FOR PRIMARY GEOGRID.
SEE NOTE 9 FOR LESS THAN 100% COVERAGE.)

NOTES:

1. SEE EROSION CONTROL AND ROADWAY PLANS AND SUMMARY SHEETS FOR REINFORCED SOIL SLOPE (RSS) AND SLOPE EROSION CONTROL LOCATIONS.

2. FOR STANDARD REINFORCED SOIL SLOPES, SEE REINFORCED SOIL SLOPES PROVISION. FOR STEEL BEAM GUARDRAIL, SEE SECTION 862 OF THE STANDARD SPECIFICATIONS.

3. FOR SHOULDER AND SLOPE BORROW, SEE ARTICLE 1019-2 OF THE STANDARD SPECIFICATIONS. FOR GEOCELLS, SEE CELLULAR CONFINEMENT SYSTEMS PROVISION. FOR COIR FIBER MAT, MATTING FOR EROSION CONTROL AND COMPOST BLANKET, SEE EROSION CONTROL PROVISIONS. SECTION 1631 OF THE STANDARD SPECIFICATIONS AND ROADWAY STANDARD DRAWING NO. 1631.01.

4. STANDARD RSS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF

5. DO NOT USE STANDARD RSS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE TOE OF RSS.

6. DO NOT USE STANDARD RSS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW RSS.

7. GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR LONG-TERM DESIGN STRENGTHS FOR A 75-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-Material.aspx
   DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SELECT MATERIAL AS FOLLOWS:

MATERIAL TYPE	SELECT MATERIAL
BORROW	CLASS I SELECT MATERIAL
FINE AGGREGATE	CLASS II OR III SELECT MATERIAL

   IF THE WEBSITE DOES NOT LIST A LONG-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID IN THE MD, DO NOT USE THE GEOGRID FOR PRIMARY GEOGRID. IF THE WEBSITE DOES NOT LIST A LONG-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID IN THE CD, USE A LONG-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 7 FOR THE SECONDARY GEOGRID.

8. DO NOT OVERLAP PRIMARY GEOGRIDS IN THE MD SO OVERLAPS ARE PARALLEL TO THE TOE OF RSS. POLYOLEFIN (e.g., HDPE OR PP) GEOGRIDS MAY BE SPLICED ONCE PER PRIMARY GEOGRID LENGTH IN ACCORDANCE WITH THE GEOGRID MANUFACTURER'S INSTRUCTIONS. USE POLYOLEFIN GEOGRID PIECES AT LEAST 4' LONG. DO NOT SPLICE POLYESTER TYPE (PET) GEOGRIDS.

9. FOR PRIMARY GEOGRIDS WITH 100% COVERAGE, PLACE PRIMARY GEOGRIDS SO GEOGRIDS ARE ADJACENT TO EACH OTHER IN THE CD. FOR PRIMARY GEOGRIDS WITH 75% TO LESS THAN 100% COVERAGE,

   MINIMUM REQUIRED LONG-TERM DESIGN STRENGTH = LTDS BASED ON 100% COVERAGE x (W + S) / W

   SEE TABLE FOR LTDS BASED ON 100% COVERAGE AND GEOGRID PLACEMENT DETAILS FOR PRIMARY GEOGRID ROLL WIDTH (W) AND SPACING (S). FOR PRIMARY GEOGRIDS WITH LESS THAN 100% COVERAGE, STAGGER PRIMARY GEOGRIDS SO GEOGRIDS ARE CENTERED OVER GAPS IN THE PRIMARY GEOGRID LAYER BELOW. DO NOT USE LESS THAN 75% COVERAGE FOR PRIMARY GEOGRIDS.

10. DO NOT PLACE ANY GEOGRIDS UNTIL EXCAVATION DIMENSIONS AND IN-SITU MATERIAL ARE APPROVED.

11. FOR SLOPE EROSION CONTROL, USE GEOCELLS OR MATTING ON SLOPE FACES OF RSS AS FOLLOWS:

RSS ANGLE	SLOPE EROSION CONTROL
1:1 TO < 1.5:1 (H:V)	GEOCELLS WITH COMPOST BLANKET
1.5:1 TO < 2:1 (H:V)	GEOCELLS WITH COMPOST BLANKET OR COIR FIBER MAT WITH SHOULDER AND SLOPE BORROW*
2:1 (H:V) OR FLATTER	MATTING FOR EROSION CONTROL WITH SHOULDER AND SLOPE BORROW

*SEE REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL SUMMARY TABLE IN THE ROADWAY SUMMARY SHEETS FOR SLOPE EROSION CONTROL ON SLOPE FACES OF RSS 1.5:1 (H:V) TO STEEPER THAN 2:1.

H (FT)	0 - < 12		12 - 24		> 24 - 36	
SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
1:1 TO < 1.5:1 (H:V) RSS	1.25	1.20	1.15	1.10	1.10	1.00
1.5:1 TO 1.75:1 (H:V) RSS	1.10	1.00	0.95	0.90	0.90	0.85
> 1.75:1 TO < 2:1 (H:V) RSS	1.00	0.85	0.80	0.75	0.75	0.70

L/H RATIO (L > 4' MIN)

(IF L ≤ 4', USE SECONDARY GEOGRID
INSTEAD OF PRIMARY GEOGRID.)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.01

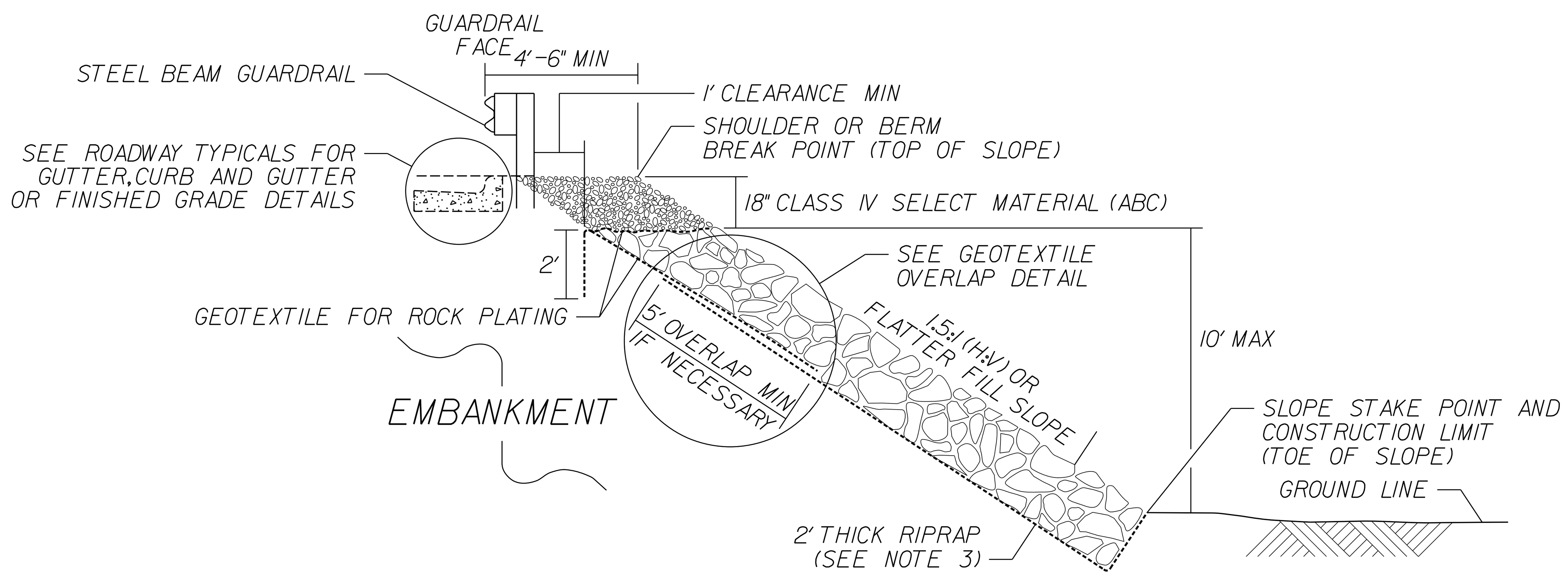
STANDARD
REINFORCED SOIL SLOPE (RSS)
WITH HIGH GROUNDWATER
SHEET 2 OF 2

DATE: 4-19-16

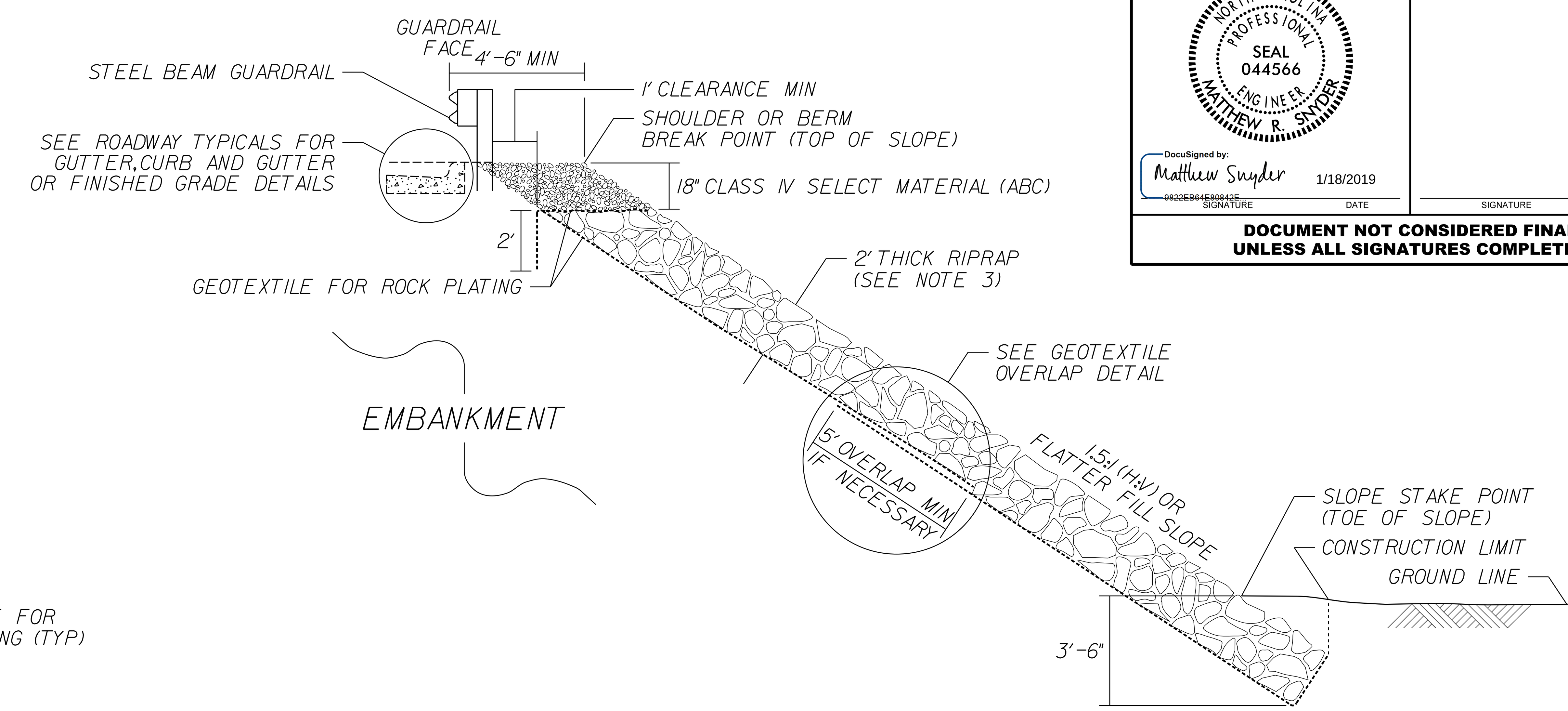
PROJECT REFERENCE NO.	SHEET NO.
R-5742	2G-3

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044566 MATTHEW R. SNYDER; DocuSigned by: Matthew Snyder 1/18/2019; SIGNATURE DATE	SIGNATURE DATE

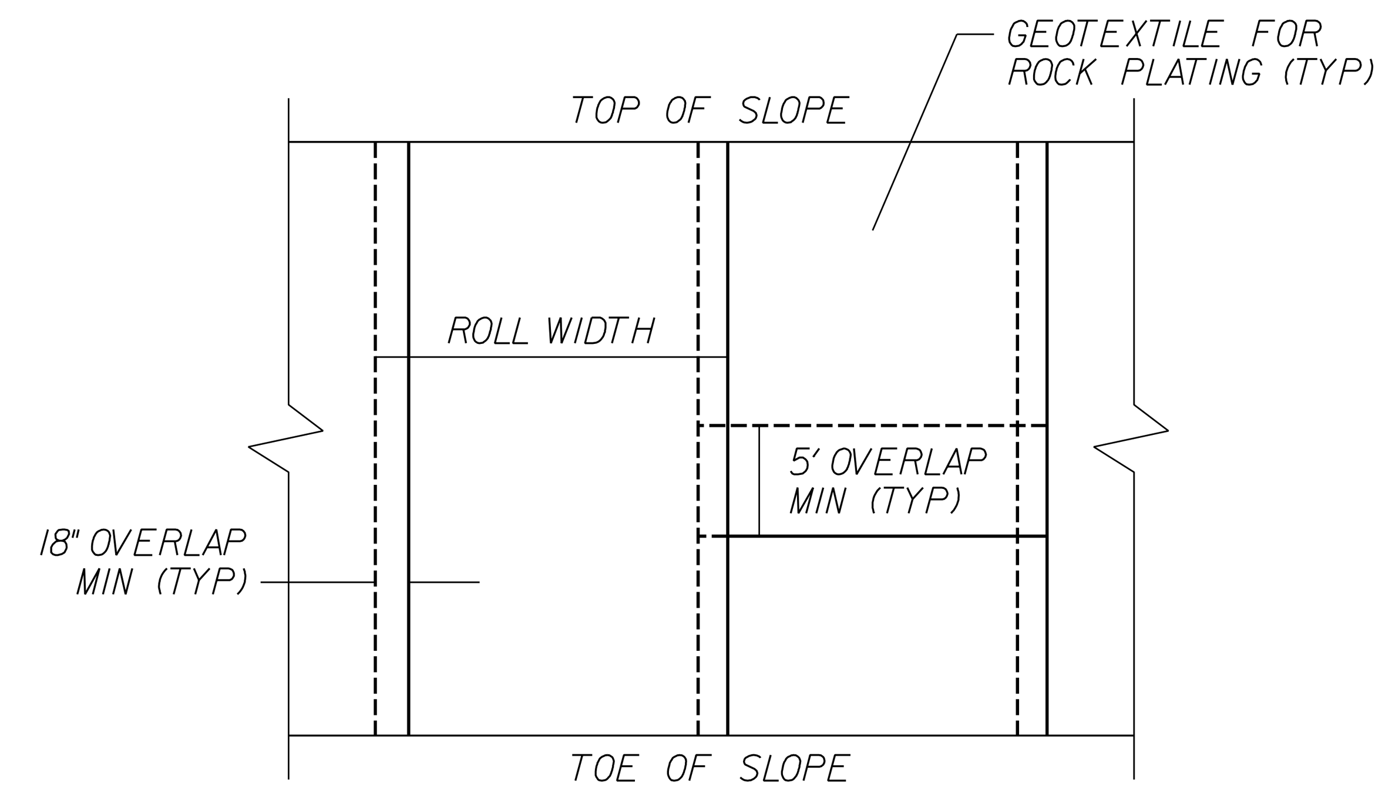
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION

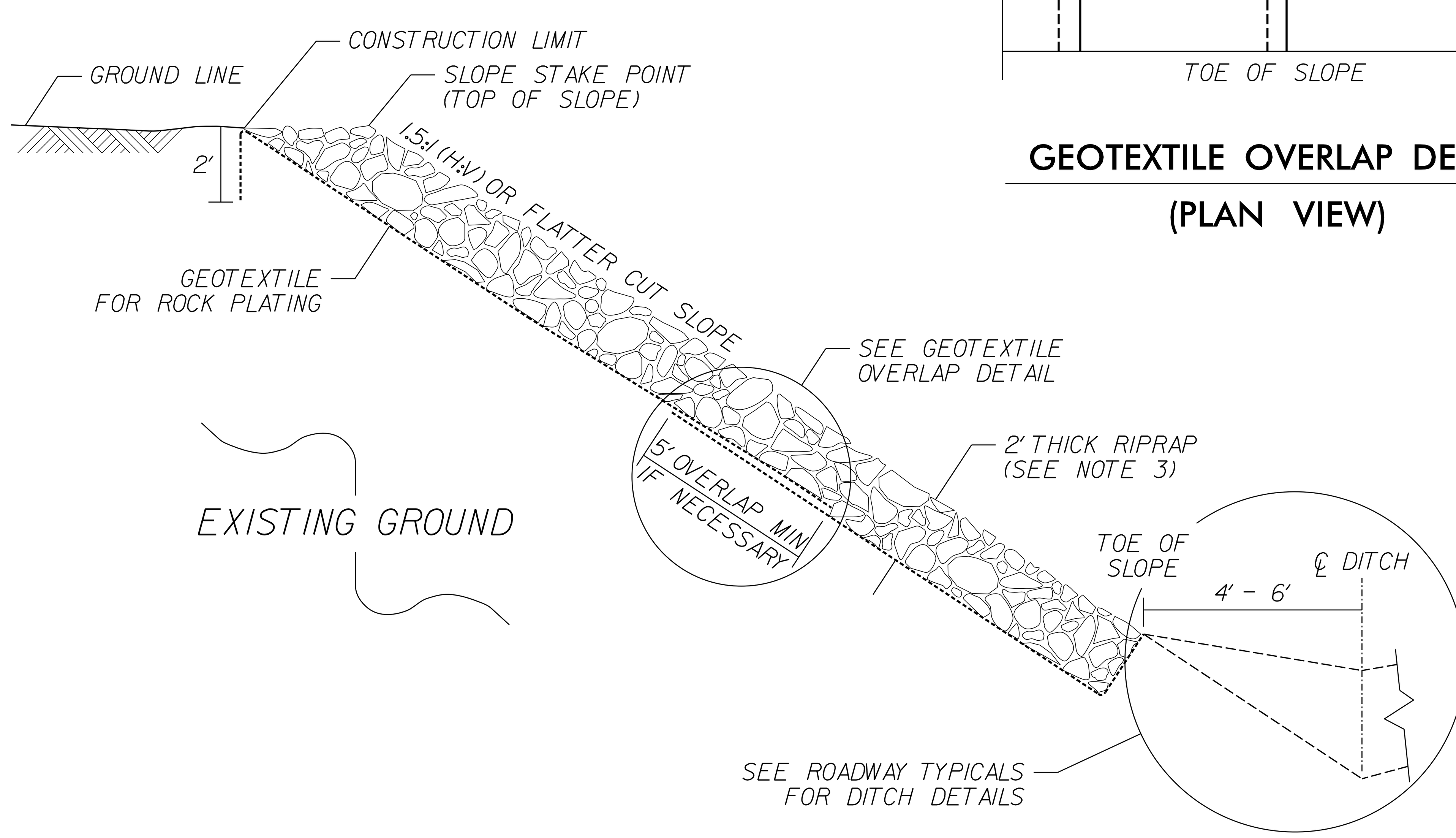


ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION

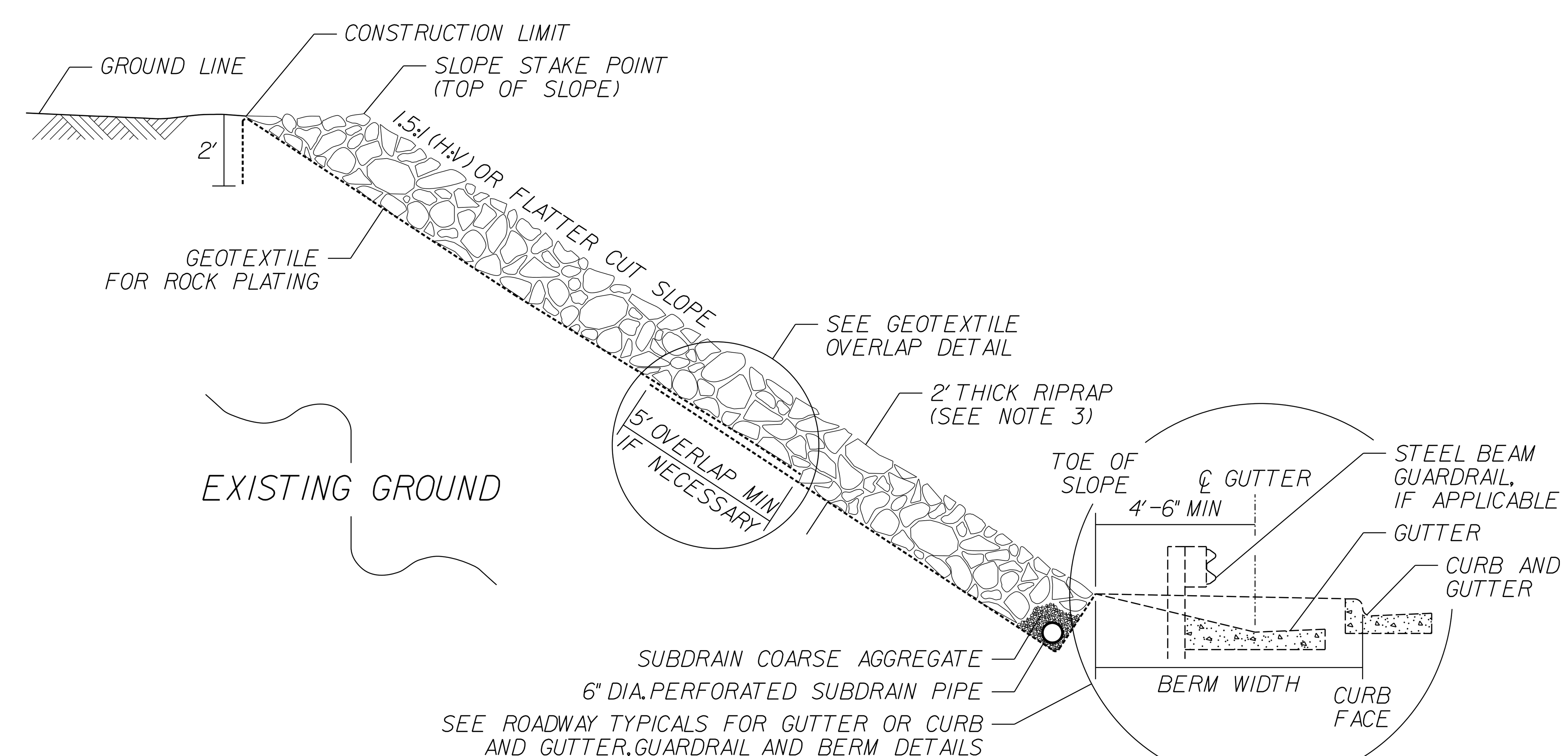


GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)



ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION



ROCK PLATING DETAIL NO. 4 – TYPICAL SECTION

NOTES:

1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
2. FOR STANDARD ROCK PLATING,SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
3. USE CLASS 1,2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.01

STANDARD ROCK PLATING

DATE: 2-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-5742	2G-4

GEOTECHNICAL ENGINEER

SEAL 044566 — NORTH CAROLINA PROFESSIONAL ENGINEER — MATTHEW R. SNYDER

DocuSigned by: Matthew Snyder 1/18/2019

9822EB84E808426... SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

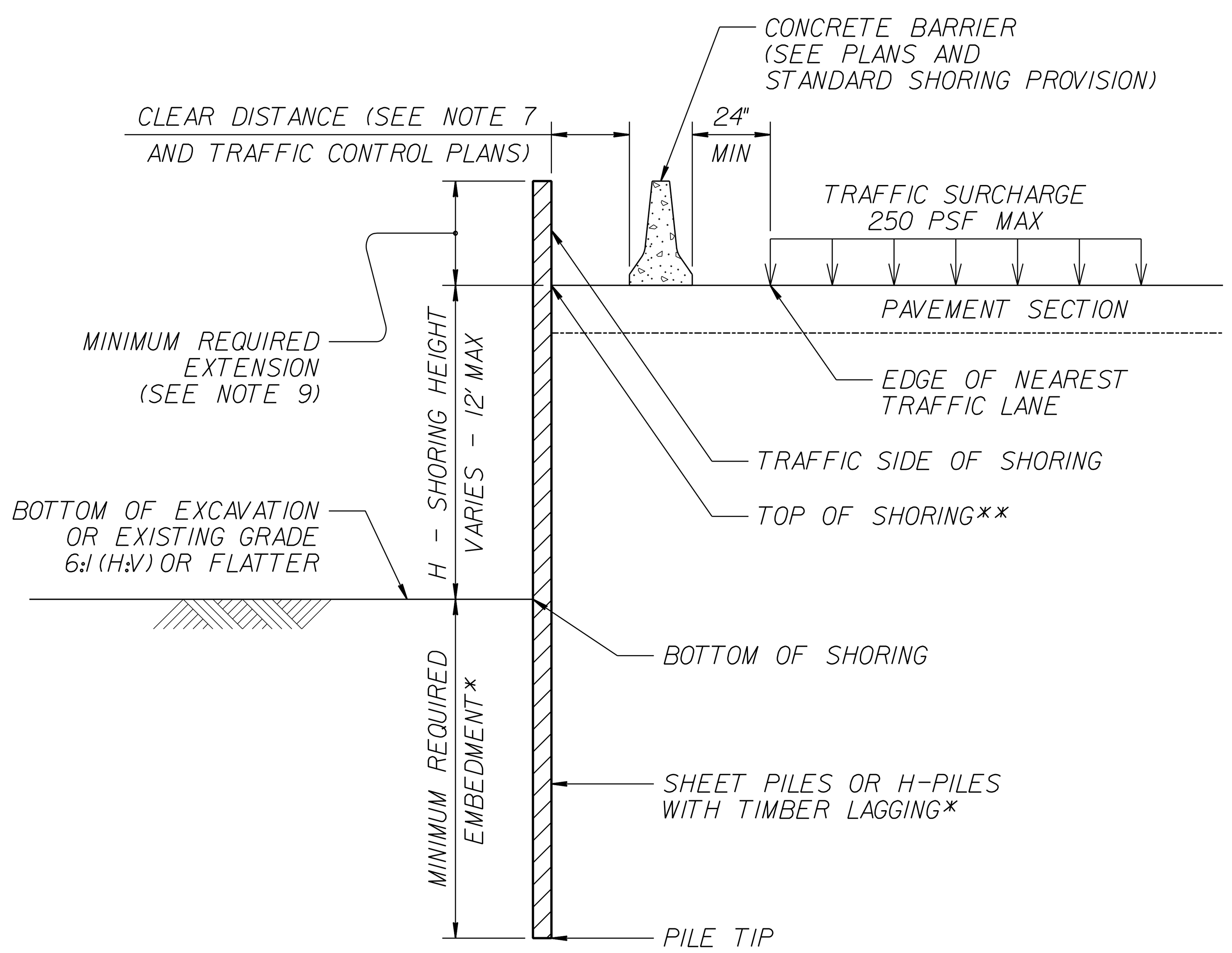
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (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 "--".

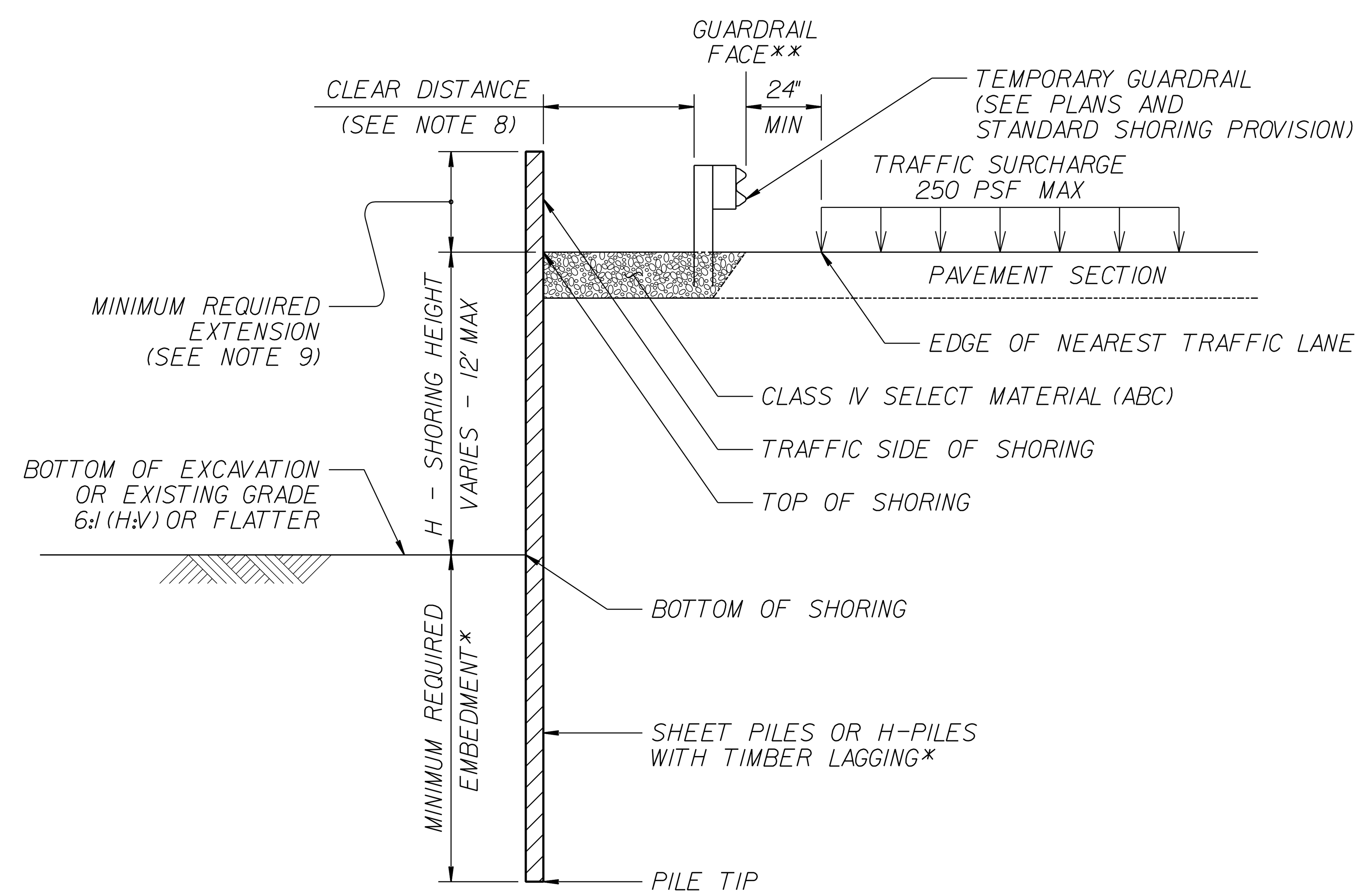
NOTES:

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



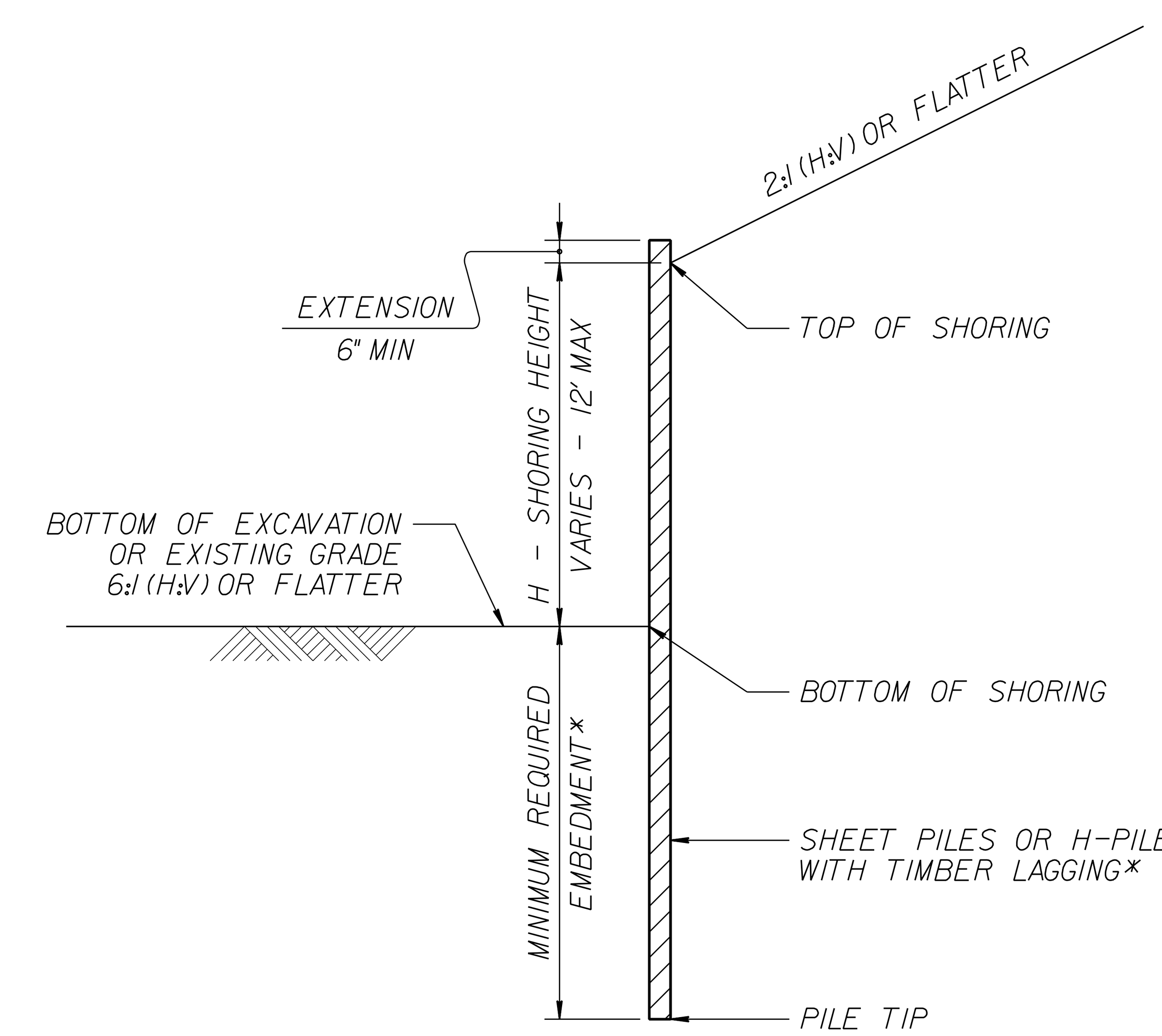
TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)

*SEE TABLE ABOVE.



STANDARD TEMPORARY SHORING

(SLOPE 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

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-5742	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

CHAIN	STATION	STATION	EXCAVATION		EMBANKMENT		WASTE
			TOTAL UNCLASS.	UNDERCUT	+%	BORROW	
SUMMARY 1							
-DET-	10+00.00	28+03.51	15,158		15,464	306	
SUBTOTAL			**15,158**		**15,464**	**306**	
SUMMARY 2							
-L-	10+75.00	40+75.00	7,634	939	5,983		2,590
-L-	40+75.00	70+75.00	8,604	276	5,510		3,370
-L-	70+75.00	100+75.00	5,558	807	3,495		2,870
-L-	100+75.00	130+75.00	9,453	538	3,348		6,643
-L-	130+75.00	160+75.00	20,223	707	15,052		5,878
-L-	160+75.00	172+00.00	3,311		745		2,566
SUBTOTAL			**54,783**	**3,267**	**34,133**		**23,917**
SUMMARY 3							
-L-	183+76.08	213+76.08	27,225	400	3,226		24,399
-L-	213+76.08	229+76.39	4,856		2,780		2,076
SUBTOTAL			**32,081**	**400**	**6,005**		**26,476**
SUMMARY 4							
-DET- REMOVAL	10+00.00	28+03.51	3,658		14,081	10,423	
SUBTOTAL			**3,658**		**14,081**	**10,423**	
TOTALS			**105,680**	**3,667**	**69,683**	**10,729**	**50,393**
LOSS DUE TO CL & GR							
ROCK WASTE TO REPLACE BORROW						-4,194	-4,194
ADJUST FOR ROCK SWELL					-1,258	-1,258	
ADDITIONAL UNDERCUT CONTINGENCY				1,200	1,380	1,380	1,200
WASTE IN LIEU OF BORROW						**-6,657**	**-6,657**
TOTALS			**105,680**	**4,867**	**69,805**		**40,742**
SAY			**111,000**	**5,200**			

SHOULDER BORROW: 7,620 CY

PAVEMENT STRUCTURE VOLUME: 27,618.83 CY

EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL UNIT.

ASPHALT PAVEMENT REMOVAL SUMMARY

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
DET	11+20.00	26+50.00	MED	1530.00	22.58	3838.60
L	22+54	26+57	RT	5969.71		663.30
Y5	11+01	12+97	RT	2779.85		308.87
TEMPORARY PAVEMENT:						
L	66+25.00	68+50.00	RT	225	7.76	194.00
L	76+00.00	76+89.00	RT	89	7.76	76.74
L	68+50.00	76+00.00	RT	750	12.26	1021.67
					TOTAL	4,810.77
					SAY	**4,820**

PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

12/21/2018
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sruiz

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-5742	3B-2

COMPUTED BY: GRM DATE: 8/7/18
CHECKED BY: DATE:
REVISED BY: EBS DATE: 9/11/18
CHECKED BY: ESP DATE: 12/4/18

"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 GUARDRAIL TO END OF GUARDRAIL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			ANCHORS									IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	XI MOD	XI	GREU TL-3	AT-1	XIII	CAT-1	VI MOD	BIC	B-77	G	NG				
-L-	31+95.14	36+34.20	LT	450.00					2												
-L-	32+09.40	35+13.07	RT	312.50					2												
-L-	41+23.89	43+26.11	LT	212.50					2												
-L-	39+22.69	43+10.19	RT	387.50					2												
-L-	89+63.55	92+01.05	RT	237.50					2												
-L-	100+00.00	103+00.00	LT	300.00					2												
-L-	110+96.05	114+71.05	RT	375.00					2												
-L-	111+00.00	117+37.50	LT	637.50					2												
-L-	117+75.00	126+50.00	LT	875.00					2												
-L-	126+20.04	128+20.04	RT	200.00					2												
-L-	140+74.73	145+25.81	LT	450.00					2												
L	141+50.00	143+37.50	RT	187.50					2												
-L-	154+24.19	158+25.00	LT	400.00					2												
-L-	159+30.00	163+42.50	LT	412.50					2												
-DR16-	10+13.74	10+34.78	LT		31.25					1											
-L-	164+10.00	165+99.43	RT															189.43			
-L-	165+99.43	166+28.17	RT	22.88	31.25					1					1						
-L-	168+03.24	168+25.20	RT		43.75					1											
-L-	168+25.20	170+82.12	RT															256.92			
-L-	170+82.12	171+63.92	RT	85.38					1						1						
-L-	196+50.00	202+00.00	LT	562.50					2												
-L-	196+49.91	199+50.09	RT	300.00					2												
-L-	200+50.10	202+50.10	RT	200.00					2												
-L-	207+75.01	211+25.00	LT	350.00					2												
-L-	209+25.00	213+00.00	RT	375.00					2												
-L-	223+25.87	229+42.45	RT	500.00	125.00				1												
-L-	227+95.59	229+69.53	LT	175.00	75.00				1												tie to existing guardrail
-L-	183+78.95	184+28.95	LT	50.00					1												tie to existing guardrail
SUBTOTAL:				**7083.25**	**306.25**		**0**	**0**	**42**	**3**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**446.35**			
ANCHOR UNIT DEDUCTIONS:																					
GREU TL-3 @ 50' Each				-2100																	
M-350 @ 37.5' Each																					
CAT-1 @ 6.25' Each																					
TYPE III @ 18.75' Each																					
B-77 @ 22.875' Each				-45.75																	
AT-1 @ 6.25' Each					-18.75																
PROJECT TOTAL:				**4937.50**	**287.50**		**0**	**0**	**42**	**3**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**446.35**			
ADDITIONAL GUARDRAIL POSTS:					10																

TEMPORARY GUARDRAIL

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			ANCHORS									IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	XI MOD	XI	GREU TL-3	AT-1	XIII	CAT-1	VI MOD	BIC	B-77	G	NG				
-DET-	18+73.02	23+60.52	LT	487.5					2												Phase 1
-DET-	19+81.00	21+08.00	RT						2												Phase 1
-L-	111+50.00	115+10.00	LT	362.50					1												Phase 1A
-L-	111+69.00	114+21.00	RT	262.50					2												Phase 1
-L-	115+10.00	116+88.00	LT	187.50					2												Phase 1
-L-	118+25.00	125+99.00	LT	775.00					2												Phase 1
-L-	126+70.00	127+70.00	RT	0.00					2												Phase 1
-L-	164+05.00	166+16.00	RT	200.00	18.75					1											Phase 1
-L-	168+12.00	170+82.00	RT	250.00	18.75				1	1											Phase 1
SUBTOTAL:				**2525.00**	**37.50**		**0**	**0**	**14**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			
ANCHOR UNIT DEDUCTIONS:																					
GREU TL-3 @ 50' Each				-700																	
M-350 @ 37.5' Each																					
CAT-1 @ 6.25' Each																					
TYPE III @ 18.75' Each																					
B-77 @ 18.75' Each																					
AT-1 @ 6.25' Each					-12.5																
PROJECT TOTAL:				**1825.00**	**25.00**		**0**	**0**	**14**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

COMPUTED BY:	RKK-BDB	DATE:	9/5/2018
CHECKED BY:	RKK-CJP	DATE:	9/18/2018

PROJECT NO.	SHEET NO.
R-5742	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 15 (.064)	18 (.064)	24 (.064)	
L 16+56	32	RT	0401		1965.1																	
			0401	0402		1961.1	1958.7	0.5														
L 17+36	42	RT	0402		1963.9																	
			0402	0403		1958.7	1957.9	0.6														
			0404	0403						72												
L 12+32			0405							36												
L 15+32			0406									36										
L 21+29			0407									44										
L 16+00	42	RT	0408		1968.0																	
			0408	0401		1965.2	1961.6	0.3														
L 23+07			0501							36												
L 25+13			0502									28										
L 28+59			0503										44									
L 30+54			0504								36											
L 41+50	49	RT	0601		1932.0																	
			0601	0602		1924.1	1922.0															
L 41+66	33	RT	0602		1927.8																	
L 41+40	48	RT	0603		1929.0																	
			0603	0604		1924.1	1922.3															
L 41+58	32	RT	0604		1928.0																	
L 39+27			0607							48												
L 43+54			0608							56												
Y3 10+38	27	RT	0609		1933.0																	
			0609	0609A		1929.5	1929.2															
L 49+28	44	RT	0610		1932.0																	
			0610	0611		1925.8	1925.2															
L 49+13	20	RT	0611		1930.9																	
L 48+81	6	LT	0612		1930.5																	
			0612	0613		1924.7	1924.4															
L 49+33	43	RT	0614		1932.0																	
			0614	0615		1925.8	1925.3															
L 49+21	20	RT	0615		1931.1																	
L 48+91	7	LT	0616		1930.4																	
			0616	0617		1924.6	1924.4															
Y4 11+29	55	LT	0618		1935.0																	
			0618	0618A		1928.5	1926.0															
L 42+27	33	LT	0619		1927.0																	
			0619	0620		1919.2	1919.1															
L 42+18	32	LT	0621		1927.0																	
			0621	0622		1919.2	1919.1															
L 52+62			0701									32										
L 53+19			0702									48										
L 55+53	38	LT	0703		1940.0																	
			0703	0703A		1934.3	1933.7															
L 57+46			0704									48										
L 59+25			0705								52											
L 64+00	43	LT	0706		1960.0																	
			0706	0706A		1953.1	1952.7	0.4														
L 62+03			0707							56												
L 50+78			0708									60										
SHEET TOTALS										304	88	296	44									

FROM	TO	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54		R. C. PIPE CLASS V 12	15	18	24	30		15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	
0401																													
0401	0402					80																							
0402																													
0402	0403					128																							
0404	0403																												
0405																													
0406																													
0407																													
0408																													
0408	0401				56																								
0501																													
0502																													
0503																													
0504																													
0601																													
0601	0602								24																				
0602																													
0603																													
0603	0604								24																				
0604																													
0607																													
0608																													
0609																													
0609	0609A			64																									
0610																													
0610	0611								28																				
0611																													
0612																													
0612	0613								68																				
0614																													
0614	0615								24																				
0615																													
0616																													
0616	0617								68																				
0618																													
0618	0618A						100																						
0619																													
0619	0620								12																				
0621																													
0621	0622								16																				
0701																													
0702																													
0703																													
0703	0703A													80															
0704																													
0705																													
0706																													
0706	0706A													96															
0707																													
0708																													
SHEET TOTALS				64	56	208	100		264					176															

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.	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. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	15" PIPE END SECTION	18" PIPE END SECTION	24" PIPE END SECTION	30" PIPE END SECTION		ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0401					1			1																															
0401	0402																																						
0402					1	0.3						1			1																								
0402	0403																																						
0404	0403																																						
0405																						1																30	
0406																								1															
0407																								1														40	
0408																																							
0408	0401																							1														275	
0501																						1																	
0502																								1															
0503																									1													41	
0504																							1															99	
0601																																							
0601	0602	8.000																																					
0602					1	0.8												1																					SLAB LID
0603																																							
0603	0604																																						
0604					1	0.8												1																					
0607																						1																	
0608																						1																127	
0609																																						51	
0609	0609A																																						
0610																																							
0610	0611	8.000																																					
0611					1	0.8													1																				
0612					1	0.8													1																				
0612	0613	8.000																																					
0614																																							
0614	0615																																						
0615					1	0.8													1																				
0616					1	0.8													1																			109	
0616	0617																																						
0618																																							
0618	0618A	3.400																																					
0619					1	2.8												1																					SLAB LID
0619	0620																																						
0621					1	2.8												1																					SLAB LID
0621	0622	8.000																																					
0701																								1														30	
0702																								1														54	
0703																																						27	
0703	0703A																																						
0704																								1														46	
0705																							1															41	
0706																																						20	
0706	0706A																																						
0707																						1												2		0.090	26	
0708																								1															
SHEET TOTALS		35.400			10	10.7		1				1			1			4	4				5	2	8	1									2		0.090	1016	

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

HUSKEYB

BOGGSB

COMPUTED BY: RKK-BDB DATE: 9/5/2018

CHECKED BY: RKK-CJP DATE: 9/18/2018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-5742	3D-2

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12	15	18	24	30	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE SIZE 15	18	24	C. S. PIPE THICKNESS OR GAUGE .064	.064	.064	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54	R. C. PIPE CLASS V 12	15	18	24	30
L 66+24		0801								32																																		
L 66+93		0802								36																																		
L 70+88		0803						36																																				
L 72+38		0804								36																																		
L 74+62	30 LT	0805		1965.0																																							
		0805	0807		1961.2	1960.1																		24																				
L 74+50	41 RT	0806		1965.0																																							
		0806	0807		1960.3	1959.8																																						
L 74+39	35 LT	0807		1963.2																																							
		0807	0808		1959.8	1959.6																																						
L 74+36	59 LT	0808		1962.8																																							
L 76+45	27 RT	0809		1966.5																																							
		0809	0810		1963.4	1957.0	0.5																																					
L 77+10	27 RT	0810		1962.2																																							
		0810	0811		1957.0	1956.0	0.5																																					
L 77+50	27 RT	0811		1961.3																																							
		0811	0901		1956.0	1951.1	0.6																																					
L 76+06		0812							44																																			
L 72+90		0813							32																																			
L 73+73		0814									48																																	
L 78+75	27 RT	0901		1956.4																																							
		0901	0902		1951.1	1945.4	0.7																																					
L 79+80	27 RT	0902		1950.6																																							
		0902	0904		1945.4	1944.8	0.7																																					
L 80+23	27 RT	0904		1950.0																																							
		0904	0903		1944.8	1943.1	0.7																																					
L 85+03		0905									28																																	
L 85+42	37 RT	0906		1940.0																																							
		0906	0906A		1930.6	1927.0																																						
		0906B	0906C																																								
L 88+84		0908							32																																			
L 90+93	32 RT	0909		1945.0																																							
		0909	0912		1937.2	1936.9																																						
L 80+22		0910							24																																			
L 92+45	27 RT	0911		1944.1																																							
		0911	0912		1939.4	1936.9	0.6																																					
L 90+93	23 RT	0912		1942.5																																							
		0912	0913		1936.9	1934.6	0.5																																					
L 96+10	27 RT	1001		1950.8																																							
		1001	1002		1949.3	1947.3																																						
L 94+50	14 RT	1002		1950.0																																								
		1002	1003		1947.3	1946.8																																						
L 94+16	14 RT	1003		1949.6																																								
		1003	1004		1946.8	1943.5																																						
L 93+70	27 RT	1004		1946.5																																								
		1004	0911		1942.8	1939.4	0.5																																					
L 98+82	35 RT	1005		1952.0																																							
		1005	1005A		1945.8	1941.9																																						
L 100+25	27 RT	1006		1947.6																																								
		1006	1007		1946.1	1942.0																																						
SHEET TOTALS									168	152	28													448		276	420	84						156		84	84						80	

LINE & STATION	OFFSET	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A 0' THRU 5' EACH	B 5' THRU 10' LIN. FT.	10' AND ABOVE LIN. FT.	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. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	15" PIPE END SECTION	18" PIPE END SECTION	24" PIPE END SECTION	30" PIPE END SECTION	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 66+24																														1											21	
L 66+93																														1											31	
L 70+88																																											
L 72+38																														1											30	
L 74+62	30 LT																																									48	
																													1												
L 74+50	41 RT																																									33	
L 74+39	35 LT								1								1		1																							
L 74+36	59 LT								1								1		1																							
L 76+45	27 RT																																								51	
																														1											
L 77+10	27 RT								1	0.3							1		1																							74	
L 77+50	27 RT								1	0.3							1		1																							25	
L 76+06																														1											
L 72+90																														1											34	
L 73+73																															1										36	
L 78+75	27 RT								1	0.3							1		1																							30	
L 79+80	27 RT								1	0.3							1		1																							21	
L 80+23	27 RT								1	0.3							1		1																							37	
L 85+03																																									20	
L 85+42	37 RT																																								112	
							8.000																																			
							8.000																																			
L 88+84																														1											
L 90+93	32 RT																																									
							3.400																																			
L 80+22																														1											51	
L 92+45	27 RT								1								1		1																							51	
L 90+93	23 RT								1	0.6														1		1	1															50	
L 96+10	27 RT																																									
L 94+50	14 RT								1															1		1															
L 94+16	14 RT								1															1		1															
L 93+70	27 RT								1			1																													59	
L 98+82	35 RT																																								39	
L 100+25	27 RT																																									
																														1											
							19.400		12	2.1		1					6	2		8		2	1		2	1	1	7	3	1	1										853	

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

HUSKEYB

COMPUTED BY:	RKK-BDB	DATE:	9/5/2018
CHECKED BY:	RKK-CJP	DATE:	9/18/2018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-5742	3D-3

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 15 (.064)	18 (.064)	24 (.064)	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48
L 102+00	25 RT	1007		1944.2																								
		1007	1008		1941.7	1939.1	1.1																136					
L 103+35	27 RT	1008		1943.1																								
		1008	1009		1939.1	1937.9	0.7																	88				
L 104+91	32 RT	1010		1942.0																								
		1010	1011		1940.0	1937.8																60						
L 105+50	26 RT	1011		1940.5																								
		1011	1012		1937.0	1934.2																		52				
L 106+00	34 RT	1012		1939.0																								
		1012	1115		1934.2	1933.0	0.6																	116				
L 98+01	26 LT	1013		1951.0																								
		1013	1014		1947.0	1943.8																52						
L 98+52	29 LT	1014		1946.0																								
		1014	1015		1943.8	1941.9																52						
L 98+20		1016									40																	
L 110+78		1102							38																			
L 116+51	42 RT	1103		1936.0																								
		1103	1103A		1928.7	1923.9																					68	
L 119+80	27 RT	1104		1943.1																								
		1104	1108		1940.1	1939.0																	60					
L 120+17	27 RT	1105		1944.9																								
		1105	1104		1942.1	1940.1	0.6															40						
L 114+94		1106							44																			
		1107	1105		1953.0	1942.1												24										
L 110+31		1109							32																			
L 112+92	18 LT	1110		1933.3																								
		1110	1114		1930.5	1930.3																40						
L 111+30	15 LT	1111		1934.3																								
		1111	1112		1929.7	1926.5												24										
L 117+63		1113							36																			
L 112+50	18 LT	1114		1933.3																								
		1114	1111		1930.3	1929.7																120						
L 107+15	27 RT	1115		1938.6																								
		1115	1116		1933.0	1928.0	0.6																	152				
L 126+59	33 RT	1201		1970.0																								
		1205								28																		
		1201	1201A		1963.0	1960.5																						
L 126+69		1202							52																			
L 130+41		1203							40																			
L 134+60	35 LT	1204		2025.0																								
		1204	1204A		2020.0	2019.7																						
L 135+63		1301							76																			
L 138+89		1303							28																			
L 139+50	27 RT	1304		2029.7																								
		1304	1305		2026.7	2023.9																	76					
L 142+75	35 RT	1306		2002.8																								
		1307	1306		2001.0	1999.5	0.9																48					
L 143+12	54 LT	1308		1989.3																								
		1308	1309		1986.0	1984.0	0.9																28					
L 141+50		1310							124																			
						SHEET TOTALS			470	28	40							48				364	348	408			68	

LINE & STATION	FROM	TO	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54	R. C. PIPE CLASS V 12	15	18	24	30	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.
L 102+00	1007																						1		
	1007	1008																							
L 103+35	1008																						1		
	1008	1009																							
L 104+91	1010																								
	1010	1011																							
L 105+50	1011																						1		
	1011	1012																							
L 106+00	1012																						1		
	1012	1115																							
L 98+01	1013																								
	1013	1014																							
L 98+52	1014																						1		
	1014	1015																							
L 98+20	1016																								
L 110+78	1102																								
L 116+51	1103																								
	1103	1103A																		4.500					
L 119+80	1104																						1		
	1104	1108																							
L 120+17	1105																						1		
	1105	1104																							
L 114+94	1106																								
	1107	1105																							
L 110+31	1109																								
L 112+92	1110																						1		
	1110	1114																							
L 111+30	1111																						1		
	1111	1112																							
L 117+63	1113																								
L 112+50	1114																						1		
	1114	1111																							
L 107+15	1115																						1	0.6	
	1115	1116																							
L 126+59	1201																								
	1205																								
	1201	1201A									92										5.200				
L 126+69	1202																								
L 130+41	1203																								
L 134+60	1204																								
	1204	1204A			72																				
L 135+63	1301																								
L 138+89	1303																								
L 139+50	1304																						1		
	1304	1305																							
L 142+75	1306																						1		
	1307	1306																							
L 143+12	1308																						1		
	1308	1309																							
L 141+50	1310																								
SHEET TOTALS					72						92									4.500	5.200		14	0.6	

LINE & STATION	FROM	TO	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. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	15" PIPE END SECTION	18" PIPE END SECTION	24" PIPE END SECTION	30" PIPE END SECTION	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 102+00	1007				1	1																											
	1007	1008																															
L 103+35	1008							1		1																							
	1008	1009																															
L 104+91	1010																																
	1010	1011																															
L 105+50	1011						1			1																						129	
	1011	1012																															
L 106+00	1012						1			1																							
	1012	1115																															
L 98+01	1013																																
	1013	1014																															
L 98+52	1014				1	1																											
	1014	1015																1															
L 98+20	1016																			1													
L 110+78	1102																	1															
L 116+51	1103																															61	
	1103	1103A																															
L 119+80	1104							1		1																							
	1104	1108																														44	
L 120+17	1105							1		1																						32	
	1105	1104																															
L 114+94	1106																	1															
	1107	1105																						2			1						
L 110+31	1109																	1														21	
L 112+92	1110							1				1																					
	1110	1114																															
L 111+30	1111													1			1																
	1111	1112																						2									
L 117+63	1113																																
L 112+50	1114							1				1																					
	1114	1111																															
L 107+15	1115						1			1																							
	1115	1116																															
L 126+59	1201																																
	1205																																
	1201	1201A																											23		0.930		
L 126+69	1202																	1														27	
L 130+41	1203																	1											7		0.364	15	
L 134+60	1204																												3		0.090		
	1204	1204A																															
L 135+63	1301																	1															
L 138+89	1303																	1															
L 139+50	1304							1		1																						52	
	1304	1305																															
L 142+75	1306													1																			SPECIAL DETAIL
	1307	1306																															
L 143+12	1308													1																			SPECIAL DETAIL
	1308	1309																															
L 141+50	1310																	1															
SHEET TOTALS					2	2	3	6		7		2		3			1	9		1				4			1		33		1.384	381	

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

BOGGSB

COMPUTED BY:	RKK-BDB	DATE:	9/5/2018
CHECKED BY:	RKK-CJP	DATE:	9/18/2018

PROJECT NO.	SHEET NO.
R-5742	3D-4

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

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

Row headings: LINE & STATION / SIZE / THICKNESS OR GAUGE

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 15 (.064)	18 (.064)	24 (.064)		R. C. PIPE CLASS III 12	15	18	24	30	36	42	48
L 147+75	45	RT	1311		1984.0																									
			1311	1312		1981.0	1979.2	0.5																	100					
L 148+40	27	LT	1312		1982.2																									
			1312	1314		1979.2	1978.5	0.6																	36					
L 147+90	27	LT	1313		1988.0																									
			1313	1312		1985.5	1979.5			52																				
L 148+56			1314																											
Y5 11+10	34	RT	1315		1987.2																									
			1315	1311		1983.5	1981.3	0.5																52						
DR11 13+11	12	LT	1316		2083.0																									
			1316	1317		2081.0	2050.1												164											
DR11 11+50	16	LT	1317		2053.6																									
			1317	1318		2050.1	2027.7	1.1											132											
L 137+25	27	RT	1318		2029.6																									
			1318	1319		2027.7	2027.0	0.5																128						
L 160+41			1402								40																			
L 156+36	46	RT	1403		1935.0																									
			1403	1404		1928.6	1927.4	0.4																					28	
L 156+51	25	RT	1404		1933.3																									
L 156+94	30	LT	1405		1931.8																									
			1405	1406		1925.9	1925.8	0.4																					16	
L 158+85			1407							36																				
L 162+75	13	RT	1408		1940.3																									
			1408	1409		1936.3	1936.2																	36						
L 162+42	27	RT	1409		1938.4																									
			1409	1410		1936.2	1936.0	0.4																	36					
L 151+41			1411							44																				
L 170+75	27	RT	1501		1958.0																									
			1501	1502		1947.0	1946.6																	84						
L 171+60	34	RT	1502		1949.7																									
			1502	1503		1946.6	1944.9	0.4																44						
L 168+35	27	RT	1504		1957.5																									
			1504	1505		1947.0	1946.6																	20						
L 168+15	28	RT	1505		1949.4																									
			1505	1507		1946.6	1946.2																	88						
L 168+07	81	RT	1506		1967.0																									
			1506	1505		1965.0	1946.6												56											
L 167+27	22	RT	1507		1948.4																									
			1507	1508		1945.4	1945.3	0.4																16						
L 167+17	34	RT	1508		1949.8																									
			1508	1509		1944.6	1939.1	0.4																		60				
L 166+60	22	RT	1509		1947.3																									
			1509	1511		1939.1	1938.5	0.4																		64				
L 166+15	28	RT	1510		1945.6																									
			1510	1509		1939.8	1939.1																	48						
L 164+15	22	RT	1512		1942.6																									
			1512	1514		1939.9	1938.9																	20						
L 164+06	34	RT	1513		1947.5																									
			1513	1514		1937.4	1937.0																	12						
L 164+00	28	RT	1514		1941.6																									
SHEET TOTALS										132	40								352					548	172	124			44	

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

FROM	TO	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54		R. C. PIPE CLASS V 12	15	18	24	30		15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE		ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.
1311																									1		
1311	1312																										
1312																									1		
1312	1314																										
1313																											
1313	1312																										
1314																											
1315																											
1315	1311																										
1316																											
1316	1317																										
1317																									1		
1317	1318																										
1318																									1		
1318	1319																										
1402																											
1403																											
1403	1404																					4.500					
1404																									1	0.9	
1405																									1	0.9	
1405	1406																										
1407																											
1408																									1		
1408	1409																										
1409																									1		
1409	1410																										
1411																											
1501																									1	5.0	1.0
1501	1502																										
1502																									1		
1502	1503																										
1504																									1	5.0	0.5
1504	1505																										
1505																									1		
1505	1507																										
1506																											
1506	1505																										
1507																									1		
1507	1508																										
1508																									1	0.2	
1508	1509																										
1509																									1	3.2	
1509	1511																										
1510																									1	0.8	
1510	1509																										
1512																									1		
1512	1514																										
1513																									1	5.0	0.1
1513	1514																										
1514																									1		
SHEET TOTALS																						4.500			19	21.0	1.6

FROM	TO	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. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	15" PIPE END SECTION	18" PIPE END SECTION	24" PIPE END SECTION	30" PIPE END SECTION		ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
1311							1		1																							51	
1311	1312																																
1312							1		1																								
1312	1314																																
1313																																	
1313	1312																																
1314																																17	
1315																																41	
1315	1311																																
1316																																40	
1316	1317																							2									
1317							1		1																							71	
1317	1318																							2									
1318								1	1																								
1318	1319																1															101	
1402																		1														61	REMOVE DI
1403																																	
1403	1404																																
1404												1																					SLAB LID
1405												1																					SLAB LID
1405	1406																																
1407																	1																
1408							1				1																						
1408	1409																															21	
1409							1		1																								
1409	1410																															31	
1411																	1																
1501							1		1																								
1501	1502																																
1502							1		1																								
1502	1503																															38	
1504							1		1																								250 LF CONCRETE DITCH
1504	1505																																
1505							1		1																							20	
1505	1507																																
1506																																	
1506	1505																																
1507							1				1																						
1507	1508																																
1508								1	1																							24	
1508	1509																																
1509						1					1																					22	
1509	1511																															43	
1510							1		1																								
1510	1509																																
1512							1				1																						
1512	1514																															29	
1513							1		1																								190 LF OF CONCRETE DITCH
1513	1514																																
1514							1		1																								
SHEET TOTALS						1	14	2	13		4	2					3	1						4								610	

BOGGSB

COMPUTED BY: RKK-BDB DATE: 9/5/2018

CHECKED BY: RKK-CJP DATE: 9/18/2018

PROJECT NO.	SHEET NO.
R-5742	3D-5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION (SIZE / THICKNESS OR GAUGE)	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 15 .064	18 .064	24 .064		R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54		R. C. PIPE CLASS V 12	15	18	24	30		15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	
		1514	1408		1937.0	1936.3																	128																										
L 168+35	22 RT	1515		1950.5																																													
		1515	1504		1947.8	1947.8																	8																										
L 184+74		1601							36																																								
L 202+00	30 RT	1701		1935.3																																													
		1701	1702		1932.6	1927.0	4.4											32																															
L 194+63	33 RT	1703		1934.0																																													
		1703	1703A		1931.7	1929.5	0.5																										76																
		1704	1705		1959.5	1935.9	1.4											60																															
L 189+44	27 RT	1705		1938.7																																													
		1705	1706		1935.7	1933.9	0.4																	88																									
L 215+23	81 LT	1801		1995.7																																													
		1801	1802		1993.0	1992.1																	172																										
L 213+51	83 LT	1802		1997.6																																													
		1802	1803		1992.1	1987.8																	88																										
L 212+67	77 LT	1803		1991.0																																													
		1803	1806		1987.8	1961.9	0.3											56																															
L 213+50	27 LT	1804		1965.8																																													
		1804	1805		1963.1	1960.8																	104																										
L 212+50	27 LT	1805		1963.6																																													
		1805	1806		1960.8	1960.6																	40																										
Y2 11+65	28 LT	1806		1965.5																																													
		1806	1807		1959.1	1956.1	0.3																	72																									
L 208+93	27 LT	1808		1954.0																																													
		1808	1809		1944.0	1942.8																					20																						
Y2 11+00	19 LT	1810		1962.5																																													
		1810	1806		1959.8	1959.4																	72																										
L 214+50	27 RT	1812		1970.0																																													
		1812	1816		1967.5	1965.1																	32																										
L 204+03		1813							32																																								
L 203+31		1814								52																																							
L 207+67		1815							36																																								
L 214+16	27 RT	1816		1967.0																																													
		1816	1811		1965.1	1964.8																	68																										
L 224+50	37 LT	1901		1951.9																																													
		1901	1901A		1951.9	1946.6																												96															
L 219+00	34 LT	1902		1968.0																																													
		1902	1902A		1965.8	1964.6																											84																
L 219+32		1903								44																																							
L 222+81		1904							40																																								
DET 12+82		D201			2023.3	2023.1																										48																	
DET 13+70		D202							56																																								
DET 14+54		D203							36																																								
DET 17+05		D204							40																																								
DET 17+46	25 RT	D205		2026.9																																													
		D205	D206		2023.9	2019.5																	72																										
DET 19+20		D216							32																																								
DET 21+52	34 RT	D207		2002.0																																													
		D207	D208		1999.3	1986.0												60																															
DET 21+04	6 RT	D208		1989.3																																													
						SHEET TOTALS			308	96								208					784	160			20					48	160	96															

LINE & STATION	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.	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. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	15" PIPE END SECTION	18" PIPE END SECTION	24" PIPE END SECTION	30" PIPE END SECTION		ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
	1514	1408																																						
L 168+35	1515					1								1				1																						
	1515	1504																																						
L 184+74	1601																							1															69	
L 202+00	1701					1								1		1																								
	1701	1702																													2									ROD & LUG
L 194+63	1703																																						64	
	1703	1703A																																						
	1704	1705																													2			1						ROD & LUG
L 189+44	1705					1								1		1																								
	1705	1706																																					74	
L 215+23	1801					1								1		1																								
	1801	1802																																						
L 213+51	1802					1	0.5					1																												
	1802	1803																																						
L 212+67	1803					1						1																												
	1803	1806																													2									
L 213+50	1804					1								1		1																								
	1804	1805																																						
L 212+50	1805					1								1		1																								
	1805	1806																																						
Y2 11+65	1806					1	1.4													1			1																	
	1806	1807																																					53	
L 208+93	1808					1	5.0												1				1																	SPECIAL DETAIL
	1808	1809																																						
Y2 11+00	1810					1										1					1																			
	1810	1806																																						
L 214+50	1812																																							
	1812	1816																																						
L 204+03	1813																							1															23	
L 203+31	1814																								1														52	
L 207+67	1815																							1															26	
L 214+16	1816					1									1	1																								
	1816	1811																						1																
L 224+50	1901																																						51	
	1901	1901A																																						
L 219+00	1902																																						56	
	1902	1902A																																						
L 219+32	1903																								1														40	
L 222+81	1904																																						21	
DET 12+82	D201																																							
DET 13+70	D202																																							
DET 14+54	D203																																							
DET 17+05	D204																																							
DET 17+46	D205					1								1		1																								
	D205	D206																																						
DET 19+20	D216																																							
DET 21+52	D207					1								1		1																								
	D207	D208																																						
DET 21+04	D208					1														1																				SPECIAL DETAIL
SHEET TOTALS						15	6.9					2		8	1	9		1	1	2	1		2	4	2						6			1					529	

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:	RKK-BDB	DATE:	9/5/2018
CHECKED BY:	RKK-CJP	DATE:	9/18/2018

PROJECT NO.	SHEET NO.
R-5742	3D-6

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 15 (.064)	18 (.064)	24 (.064)	
		D208	D209		1985.8	1979.0															
DET 25+55	20 RT	D210		1983.8																	
		D210	D211		1981.0	1980.8															
DET 25+55	23 LT	D211		1984.1																	
		D211	D212		1980.8	1978.4															
DET 26+03	7 RT	D213		1982.4																	
		D213	D214		1979.2	1978.4			28												
DET 27+09		D215							28												
SHEET TOTALS									56												
PROJECT TOTALS								1438	404	364	44							608			

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54		R. C. PIPE CLASS V 12	15	18	24	30	
	D208	D209											92													
DET 25+55	D210																									
	D210	D211		44																						
DET 25+55	D211																									
	D211	D212		92																						
DET 26+03	D213																									
	D213	D214											56													
DET 27+09	D215																									
SHEET TOTALS				136									148													
PROJECT TOTALS			2280	744	864	628	204	112	264				268	160	428		84	84	92						80	

LINE & STATION	FROM	TO	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE		ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.
	D208	D209										
DET 25+55	D210									1		
	D210	D211										
DET 25+55	D211									1		
	D211	D212										
DET 26+03	D213									1		
	D213	D214										
DET 27+09	D215											
SHEET TOTALS										3		
PROJECT TOTALS							63.800	5.200		73	43.4	

LINE & STATION	FROM	TO	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. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35
	D208	D209													
DET 25+55	D210											1			1
	D210	D211													
DET 25+55	D211							1		1					
	D211	D212													
DET 26+03	D213													1	
	D213	D214													
DET 27+09	D215														
SHEET TOTALS								1		1		1		1	1
PROJECT TOTALS			2		2	4	11	31	3	39		10	8	10	4

LINE & STATION	FROM	TO	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	15" PIPE END SECTION	18" PIPE END SECTION	24" PIPE END SECTION	30" PIPE END SECTION		ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	ENERGY DISSIPATION BASIN
	D208	D209														
DET 25+55	D210															
	D210	D211														
DET 25+55	D211															
	D211	D212														
DET 26+03	D213															
	D213	D214														
DET 27+09	D215															
SHEET TOTALS																
PROJECT TOTALS			1	4	28	8	10	2				14			2	

LINE & STATION	FROM	TO	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
	D208	D209					
DET 25+55	D210						
	D210	D211					
DET 25+55	D211						
	D211	D212					
DET 26+03	D213						
	D213	D214					
DET 27+09	D215						
SHEET TOTALS							
PROJECT TOTALS			34		1.474	3389	

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
L	30+00	32+50	LT	SD	260
L	43+00	45+00	LT	SD	220
L	51+00	53+00	RT	SD	215
L	72+50	75+00	LT	SD	260
L	82+00	84+00	LT	SD	215
L	87+00	90+00	LT	SD	315
L	214+00	217+00	LT	SD	315
CONTINGENCY				SD	500
				TOTAL LF:	2300

*UD = UNDERDRAIN
BD = BLIND DRAIN
SD = SUBSURFACE DRAIN

SUMMARY OF AGGREGATE SUBGRADE

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
L	12+00	15+25	ASU	12 to 24	180	400	550		
L	24+75	32+00	ASU	12 to 24	680	1575	2150		
L	55+75	59+75	ASU	12 to 24	240	600	800		
L	72+25	78+25	ASU	12 to 24	700	1925	1800		
CONTINGENCY			ASU	18	500	1000	2100		
			TOTAL CY/TONS/SY:		2300	5500**	7400**	0	0

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

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
L	1.3:1	52+25	1:1	53+75	RT	1	B	100
L	1.8:1	99+75	1.5:1	102+25	LT	1	B	550
L	1.5:1	126+75	1.5:1	127+25	RT	1	B	150
L	1.5:1	196+00	1.5:1	201+50	LT	1	B	600
L	1.9:1	200+50	1.8:1	201+00	RT	1	B	50
L	1.5:1	212+70	1.5:1	216+00	LT	3	B	1050
							TOTAL SY:	2500

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

SUMMARY OF REINFORCED SOIL SLOPES

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
L	1:1	161+50	1:1	163+25	LT	250	250		
					TOTAL SY:	250	250	0*	0**

*Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.
**Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-5742	3P-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

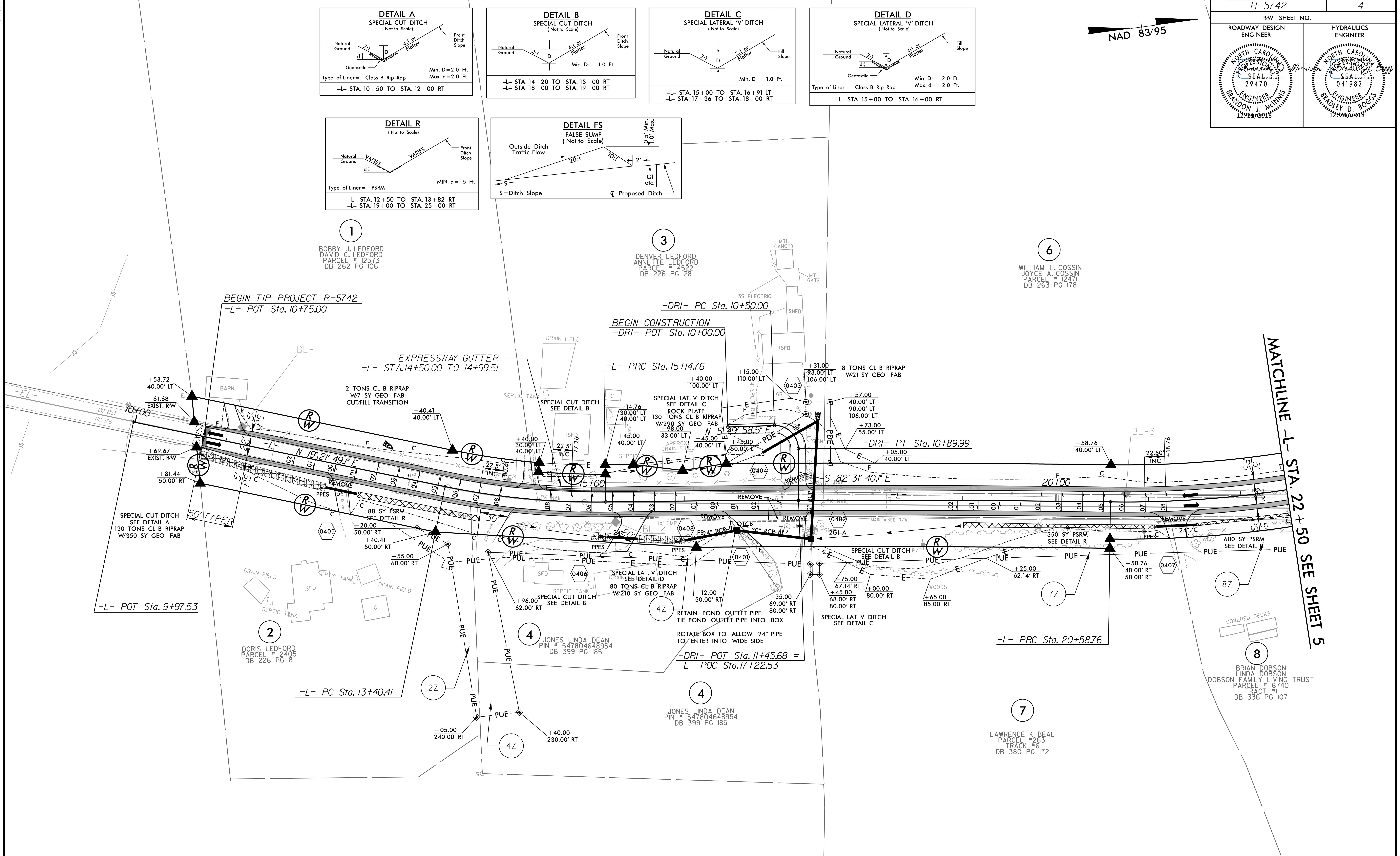
PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	Bobby J Ledford / David C Ledford
2	4	Doris Ledford
3	4	Denver Ledford / Annette Ledford
4	4	Jones Linda Dean
6	4 & 5	William L Cossin / Joyce A Cossin
7	4	Lawrence K Beal
8	4 & 5	Brian Dobson / Linda Dobson
9	5	Lisa Anderson
9A	5	Lisa Anderson
10	5	Charlene Hogsed
10A	5 & 6	Everett Sharon Hogsed
11	5 & 6	Wade M. Hogsed
13	6	Sharon Hogsed Everett
14	6	James D Hogsed
15	6	Schrader Drake, LLC
16	7 & 8	James Mitchell Nichols
16B	6 & 7	James Mitchell Nichols
16C	6	James Mitchell Nichols
16A	8	James Mitchell Nichols
17	6 & 7	Joyce Galloway Curtis
18	7	Brenda G Waldroup Franklin
19	7	Anna Lee / Jerome Lee
20	7	Avril Long Life Estate
21	7	Fairley & Kathy Holden
22	7 & 8	Phillip Hollifield / Patricia Hollifield
23	7 & 8	Floyd R Shook / Faye I Shook
24	8	Emerald Bay Capital
25	8	Scott Newton
26	8	James Mitchell Nichols / Susan W Nichols
27	8	Robert Hollifield
28	8	Robert Hollifield / Ruth Hollifield
29	8 & 9	James Allen
30	8	Jerry L Morgan / Phyllis J Morgan
31	8 & 9	Gary Nichols
32	8	Richard Lee Cline / Jennifer Sutherland
33	8 & 9	W.T. Greene
34	9	W.T. Greene
35	9	Dealos Stevens / Teresa Stevens
36	9	Thelma Ballard
37	9	W.T.Greene

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
38	9	Calam Properties LLC
39	9	Jimmy R Smith / Anna L Smith
41	9	Reginald Q Nichoson
42	8 & 9	Gary Mease
43	9 & 10	C.M. Dowdle / Judith B Dowdle
45	10	Elliot Arrowood / Pamela M Arrowood
45 A	10	Mary Ann Nutter
46	9	W.T. Greene
47	10	Thomas K & Tracy J Hagan
48	10	Chatuge Cove Marina, LLP
49	10	Thomas C. Borich
51	10 & 11	Marvin Howell McCracken
54	11	Hugh Williams / Patsy Williams
55	11	Robert S Penland
56	11 & 12	Margaret Delenia / P Sewell
58	12	Fowler Bruce & Ruth
59	12	Connie Lynn Phillips
60	12 & 13	Smoke Mtn Real Est Dev Corp
61	12 & 13	Gissandanner Frances & Elton
62	12 & 13	Smokey Mtn Real Est Dev Corp
63	13	Amanda Lee Hope Harper
63A	12 & 13	Dennis C. Stevens
64	13	Robert Kevin Ray
65	13 & 14	Beal Ronnell & Rebecca
66	13	Pannel Juanita & Richard
67A	13	George William Buller II
67B	13	George William Buller II
67C	13 & 14	George William Buller II
67D	13 & 14	George William Buller II
68	13 & 14	Jarrod D Penland
69	13 & 14	Cunningham William & Linda
70	14	Shane Woodward
71	14	Catherine C Moore & James Harrell Moore Jr
72	14	Harold A & Carolyn H Huscusson
74	14 & 15	Gay Harold & Linda T
75	15	Huscusson Peggy Ruanne
76	15	Warwick, Thomas ET ALS
77	15	IDA Adele Powell
78	15	James E Patterson / Margaret Patterson
79	15	James Edward Patterson

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

12/21/2018
K:\Roadway\Proj\R-5742_Rdy_psh\03P_2.dgn
eallen

PROJECT REFERENCE NO.	SHEET NO.
R-5742	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29470 ENGINEER BRANDON J. McINNIS	NORTH CAROLINA PROFESSIONAL SEAL 041982 ENGINEER BRADLEY D. BOGGS



NAD 83/95
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)
Type of Liner= Class B Rip-Rap
Min. D=2.0 Ft.
Max. d=2.0 Ft.
-L- STA. 10+50 TO STA. 12+00 RT
DETAIL B
SPECIAL CUT DITCH
(Not to Scale)
Min. D= 1.0 Ft.
-L- STA. 14+20 TO STA. 15+00 RT
-L- STA. 18+00 TO STA. 19+00 RT
DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Min. D= 1.0 Ft.
-L- STA. 15+00 TO STA. 16+91 LT
-L- STA. 17+36 TO STA. 18+00 RT
DETAIL D
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Type of Liner= Class B Rip-Rap
Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
-L- STA. 15+00 TO STA. 16+00 RT
DETAIL R
(Not to Scale)
Type of Liner= PSRM
MIN. d=1.5 Ft.
-L- STA. 12+50 TO STA. 13+82 RT
-L- STA. 19+00 TO STA. 25+00 RT
DETAIL FS
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
S=Ditch Slope
℄ Proposed Ditch
BOBBY J. LEDFORD
DAVID C. LEDFORD
PARCEL # 12573
DB 262 PG 106
DENVER LEDFORD
ANNETTE LEDFORD
PARCEL # 4522
DB 226 PG 28
WILLIAM L. COSSIN
JOYCE A. COSSIN
PARCEL # 12471
DB 263 PG 178
BEGIN TIP PROJECT R-5742
-L- POT Sta. 10+75.00
-DRI- PC Sta. 10+50.00
BEGIN CONSTRUCTION
-DRI- POT Sta. 10+00.00
EXPRESSWAY GUTTER
-L- STA. 14+50.00 TO 14+99.51
-L- PRC Sta. 15+14.76
-DRI- PT Sta. 10+89.99
N 19° 21' 49.1" E
S. 82° 31' 40.1" E
MATCHLINE -L- STA. 22+50 SEE SHEET 5
SPECIAL CUT DITCH
SEE DETAIL A
130 TONS CL B RIPRAP
W/350 SY GEO FAB
-L- POT Sta. 9+97.53
DORIS LEDFORD
PARCEL # 2405
DB 226 PG 8
JONES LINDA DEAN
PIN # 547804648954
DB 399 PG 185
-L- PC Sta. 13+40.41
RETAIN POND OUTLET PIPE
TIE POND OUTLET PIPE INTO BOX
ROTATE BOX TO ALLOW 24" PIPE
TO ENTER INTO WIDE SIDE
-DRI- POT Sta. 11+45.68 =
-L- POC Sta. 17+22.53
-L- PRC Sta. 20+58.76
LAWRENCE K BEAL
PARCEL #2631
TRACK #6
DB 380 PG 172
BRIAN DOBSON
LINDA DOBSON
DOBSON FAMILY LIVING TRUST
PARCEL # 6740
TRACT #1
DB 336 PG 107

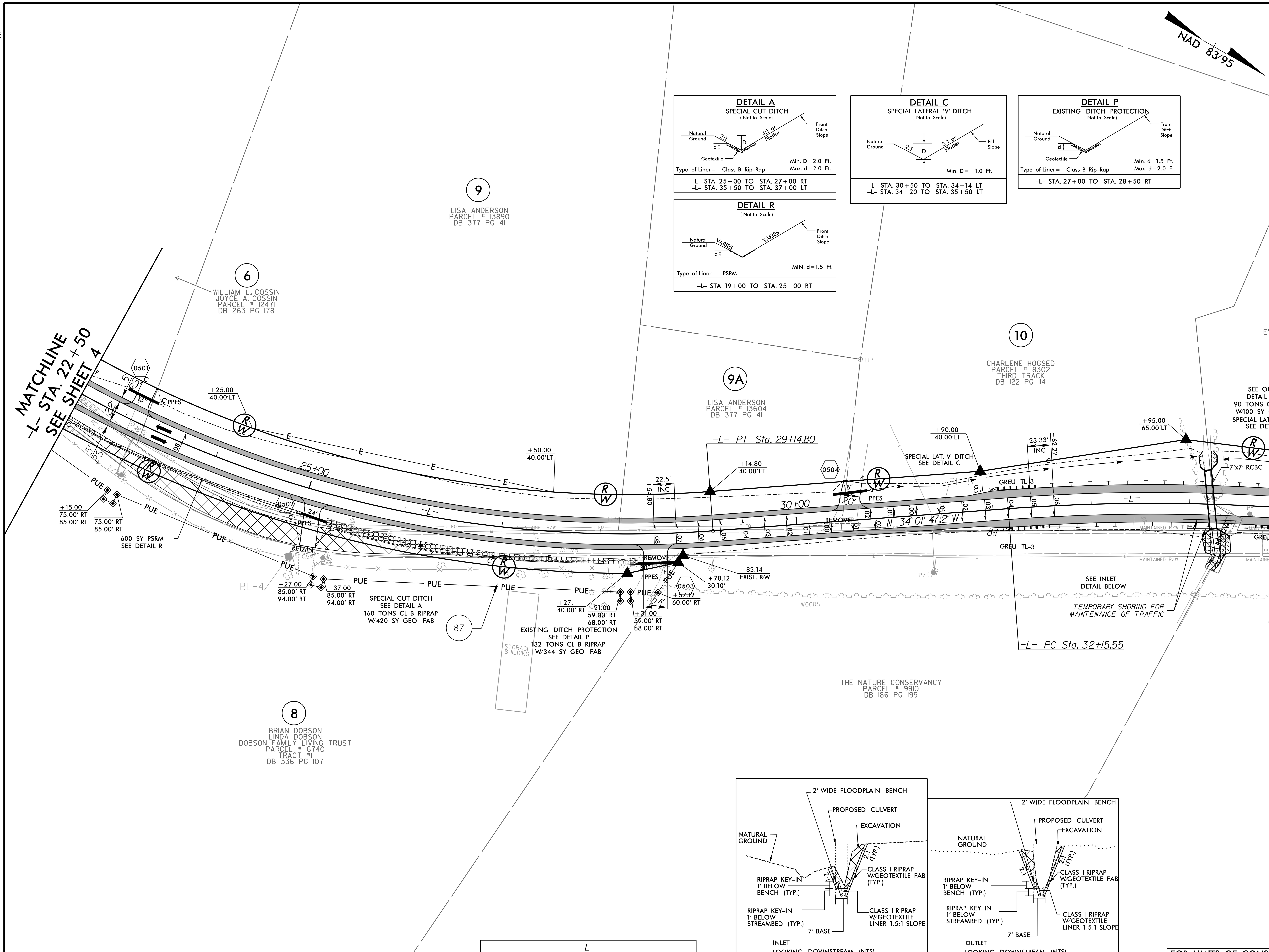
-L-			-DRI-
PI Sta 14+27.93	PI Sta 17+86.78	PI Sta 24+58.07	PI Sta 10+75.73
Δ = 12° 29' 12.0" (LT)	Δ = 1° 33' 30.5" (RT)	Δ = 38° 08' 32.2" (LT)	Δ = 91° 38' 21.4" (RT)
D = 7° 09' 43.1"	D = 0° 17' 11.3"	D = 4° 57' 38.4"	D = 229° 10' 59.2"
L = 174.35'	L = 544.01'	L = 768.89'	L = 39.99'
T = 87.52'	T = 272.02'	T = 399.30'	T = 25.73'
R = 800.00'	R = 20,000.00'	R = 1,170.00'	R = 25.00'
SE = 0.08	SE = NC	SE = 0.08	
V = 50 mph	V = 50 mph	V = 50 mph	

FOR -L- PROFILE SEE SHT. 20
FOR -DR1- PROFILE SEE SHT. 28

NOTE: ALL DRIVEWAY WIDTHS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

PROJECT REFERENCE NO.	SHEET NO.
R-5742	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
12/21/2018	12/21/2018


NAD 83/95
MATCHLINE -L- STA. 22+50 SEE SHEET 4
MATCHLINE -L- STA. 36+50 SEE SHEET 6
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)
Type of Liner= Class B Rip-Rap
Min. D=2.0 Ft.
Max. d=2.0 Ft.
-L- STA. 25+00 TO STA. 27+00 RT
-L- STA. 35+50 TO STA. 37+00 LT
DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Min. D= 1.0 Ft.
-L- STA. 30+50 TO STA. 34+14 LT
-L- STA. 34+20 TO STA. 35+50 LT
DETAIL P
EXISTING DITCH PROTECTION
(Not to Scale)
Type of Liner= Class B Rip-Rap
Min. d=1.5 Ft.
Max. d=2.0 Ft.
-L- STA. 27+00 TO STA. 28+50 RT
DETAIL R
(Not to Scale)
Type of Liner= PSRM
MIN. d=1.5 Ft.
-L- STA. 19+00 TO STA. 25+00 RT
9
LISA ANDERSON
PARCEL # 13890
DB 377 PG 41
6
WILLIAM L. COSSIN
JOYCE A. COSSIN
PARCEL # 12471
DB 263 PG 178
9A
LISA ANDERSON
PARCEL # 13604
DB 377 PG 41
10
CHARLENE HOGSED
PARCEL # 8302
THIRD TRACK
DB 122 PG 114
10A
EVERETT SHARON HOGSED
FIRST TRACK
DB 311 PG 15
8
BRIAN DOBSON
LINDA DOBSON
DOBSON FAMILY LIVING TRUST
PARCEL # 6740
TRACT #1
DB 336 PG 107
THE NATURE CONSERVANCY
PARCEL # 9910
DB 186 PG 199
11
WADE M. HOGSED
PARCEL # 2245
DB 299 PG 12
-L- PT Sta. 29+14.80
-L- PC Sta. 32+15.55
N 34° 01' 47.2" W
600 SY PSRM
SEE DETAIL R
SPECIAL CUT DITCH
SEE DETAIL A
160 TONS CL B RIPRAP
W/420 SY GEO FAB
EXISTING DITCH PROTECTION
SEE DETAIL P
132 TONS CL B RIPRAP
W/344 SY GEO FAB
SPECIAL LAT. V DITCH
SEE DETAIL C
SEE OUTLET
DETAIL BELOW
90 TONS CL I RIPRAP
W/100 SY GEO FAB
SPECIAL LAT. V DITCH
SEE DETAIL C
SPECIAL CUT DITCH
SEE DETAIL A
7'x7' RCBC
SEE INLET
DETAIL BELOW
TEMPORARY SHORING FOR
MAINTENANCE OF TRAFFIC
GREU TL-3
STORAGE BUILDING
GARAGE
WOODS
2' WIDE FLOODPLAIN BENCH
PROPOSED CULVERT
EXCAVATION
NATURAL GROUND
RIPRAP KEY-IN 1' BELOW BENCH (TYP.)
RIPRAP KEY-IN 1' BELOW STREAMBED (TYP.)
CLASS I RIPRAP W/GEOTEXTILE FAB (TYP.)
CLASS I RIPRAP W/GEOTEXTILE LINER 1.5:1 SLOPE
7' BASE
INLET
LOOKING DOWNSTREAM (NTS)
LENGTH=43'
OUTLET
LOOKING DOWNSTREAM (NTS)
LENGTH=20'
PAVEMENT REMOVAL

-L-

PI Sta 25+07.51	PI Sta 35+47.44
Δ = 42° 27' 54.8" (LT)	Δ = 19° 19' 05.9" (RT)
D = 4° 57' 38.4"	D = 2° 56' 17.7"
L = 856.04'	L = 657.48'
T = 448.75'	T = 331.89'
R = 1,155.00'	R = 1,950.00'
SE = 0.08	SE = 0.06
V = 50 mph	V = 50 mph

FOR LIMITS OF CONSTRUCTION
FOR MAINTENANCE OF TRAFFIC,
SEE TRAFFIC CONTROL PLANS

FOR -L- PROFILE SEE SHT. 20
FOR -DET_1- PLAN/PROFILE SEE SHT. 2B-1
FOR CULVERT SEE SHT CU-1 THRU CU-8

NOTE: ALL DRIVEWAY WIDTHS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.

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