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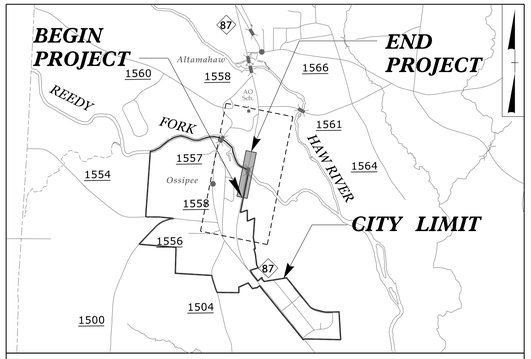
09/08/99

TIP PROJECT: B–5728

CONTRACT: C204438

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALAMANCE COUNTY

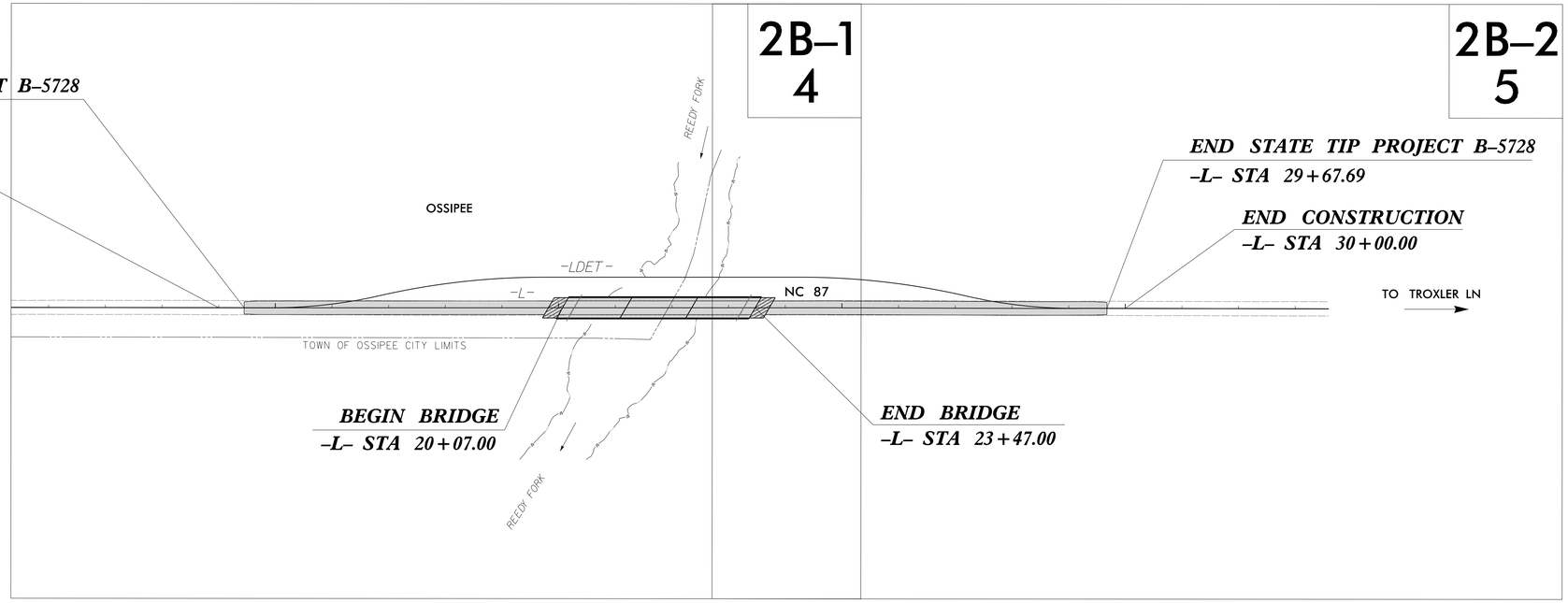
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5728	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45684.1.1	N/A	PE
45684.2.1	N/A	ROW/UT
45684.3.1	N/A	CONST

LOCATION: REPLACEMENT OF BRIDGE NO. 000112 OVER REEDY FORK ON NC 87

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

NAD 83 NA 2011



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2021 = 6,340
ADT 2041 = 7,040
K = 10 %
D = 65 %
T = 10 % *
V = 55 MPH
* TTST =3% DUAL 7%
FUNC CLASS =
MINOR ARTERIAL – REGIONAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B–5728	=	0.224 mi
LENGTH OF STRUCTURES TIP PROJECT B–5728	=	0.064 mi
LENGTH OF TIP PROJECT B–5728	=	0.288 mi

Prepared in the Office of:
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 25, 2021

LETTING DATE:
APRIL 19, 2022

TRENT HUFFMAN P.E.
PROJECT ENGINEER

GRAY MODLIN P.E.
PROJECT DESIGN ENGINEER

DAVID STUTTS, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034333 ENGINEER CAMERON M LONG

DocuSigned by: Cameron Long
SIGNATURE: P.E. 2/14/2022

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 023912 ENGINEER TRENT E HUFFMAN

DocuSigned by: Trent E Huffman
SIGNATURE: P.E. 2/14/2022

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

2/14/2022
Q:\RAN001-101\B5728\Roadway\Proj\B5728_rdy_tsh.dgn
THuffman

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5728	1A

ROADWAY DESIGN ENGINEER

DocuSigned by:
Trent E. Huffman
ACBC518...

NORTH CAROLINA PROFESSIONAL SEAL 023912 ENGINEER TRENT E. HUFFMAN

12/9/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

EFF. 01–16–2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 – EARTHWORK	
200.02	Method of Clearing – Method II
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
DIVISION 3 – PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 – MAJOR STRUCTURES	
422.01	Bridge Approach Fills – Type I Standard Approach Fill
DIVISION 5 – SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction – High Side of Superelevated Curve – Method I
DIVISION 6 – ASPHALT BASES AND APVEMENTS	
654.01	Pavement Repairs
DIVISION 8 – INCIDENTALS	
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box – 12" thru 66" Pipe
840.32	Brick Junction Box – 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
866.01	Chain Link Fence – 4', 5' and 6' High Fence
866.04	Barbed Wire Fence with Wood Posts (2 – 7 Strands)
876.02	Guide for Rip Rap at Pipe Outlets

GENERAL NOTES: 2018 SPECIFICATIONS

EFFECTIVE: 01–16–2018
REVISED:

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE–IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

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.

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE
TOWN OF OSSIPEE
AT&T
CARDINAL /WILLIAMS PIPELINE
DUKE ENERGY

RIGHT–OF–WAY MARKERS:

ALL RIGHT–OF–WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

12/9/2021
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gmellin

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5728	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

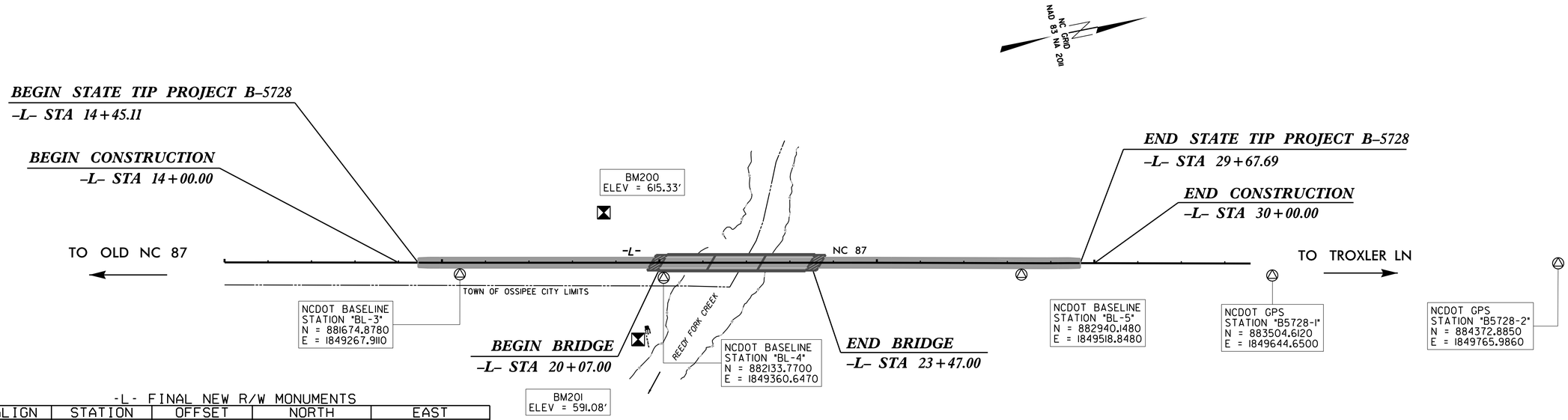
MISCELLANEOUS:

- 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.

12/01/2005

PROJECT REFERENCE NO.	SHEET NO.
B–5728	1C–1
Location and Surveys	

B–5728 SURVEY CONTROL SHEET



-L- FINAL NEW R/W MONUMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
L	19+00.00	50.00	882020.6910	1849368.7980
L	19+00.00	70.00	882016.7635	1849388.4082
L	19+00.00	-70.00	882044.2309	1849251.1291
L	19+00.00	-50.00	882040.3075	1849270.7409
L	23+53.00	50.00	882464.8893	1849457.6612
L	23+53.00	70.00	882460.9660	1849477.2726
L	24+00.00	-70.00	882534.5160	1849349.2130
L	24+00.00	-50.00	882530.5930	1849368.8240

-L- FINAL NEW PERMANENT UTILITY EASEMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
L	15+79.00	-50.00	881725.5443	1849207.7713
L	15+81.00	-99.00	881737.1177	1849160.1153
L	15+84.00	-50.00	881730.4472	1849208.7521
L	15+86.00	-99.00	881742.0206	1849161.0962
L	18+07.00	-50.00	881949.1144	1849252.4973
L	18+07.00	-82.00	881955.3918	1849221.1188
L	18+65.00	-90.00	882013.8342	1849224.6519
L	19+00.00	-90.00	882048.1542	1849231.5177
L	19+71.00	-131.00	882125.8176	1849205.2422
L	19+74.00	-70.00	882116.7931	1849265.6455
L	19+76.00	-131.00	882130.7204	1849206.2230
L	19+79.00	-70.00	882121.6959	1849266.6263

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	881148.1293	1849142.5046
PC	13+95.60	881535.9505	1849220.5768
PRC	14+45.11	881584.4683	1849230.4261
PT	14+94.62	881632.9919	1849240.2462
PC	24+40.48	882560.4752	1849425.7928
PT	25+32.85	882651.0224	1849444.0497
PC	28+66.73	882978.2151	1849510.5367
PRC	29+16.71	883027.2428	1849520.2506
PT	29+67.69	883077.2606	1849530.1432
POT	33+59.24	883461.0148	1849607.8560

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	BL STATION	OFFSET
3	DISKS-BL3	881674.8780	1849267.9110	613.47	5+00.00	0.00
4	DISKS-BL4	882133.7700	1849360.6470	606.83	9+68.17	0.00
5	DISKS-BL5	882940.1480	1849518.8480	624.38	17+89.92	0.00

NOTES

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
   HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   b5728_ls_control.txt

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

△ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5728-1" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 883504.612(ft) EASTING: 1849644.650(ft) ELEVATION: 644.41$\frac{5}{32}$(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999767531 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5728-1" TO -L- STATION 14+45.11 IS S 12°10'25" W 1,964.32' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

BENCHMARK DATA

BM200 ELEVATION - 615.33
N 882026 E 1849201
SPIKE IN 16" QUAD POPLAR

BM201 ELEVATION - 591.08
N 882071 E 1849480
SPIKE IN 28" POPLAR

NOTE: DRAWING NOT TO SCALE

$$$$$$SYSTIME$$$$$$
$$$$$$USERNAME$$$$$$

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PROJECT REFERENCE NO.	SHEET NO.
B-5728	2A-1

ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DocuSigned by: Trent E. Huffman 0C6C516F4527404... NORTH CAROLINA PROFESSIONAL SEAL 023912 ENGINEER TRENT E. HUFFMAN 12/9/2021	DocuSigned by: Clark S. Morrison B0A110DD1E004C4... NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON 12/9/2021

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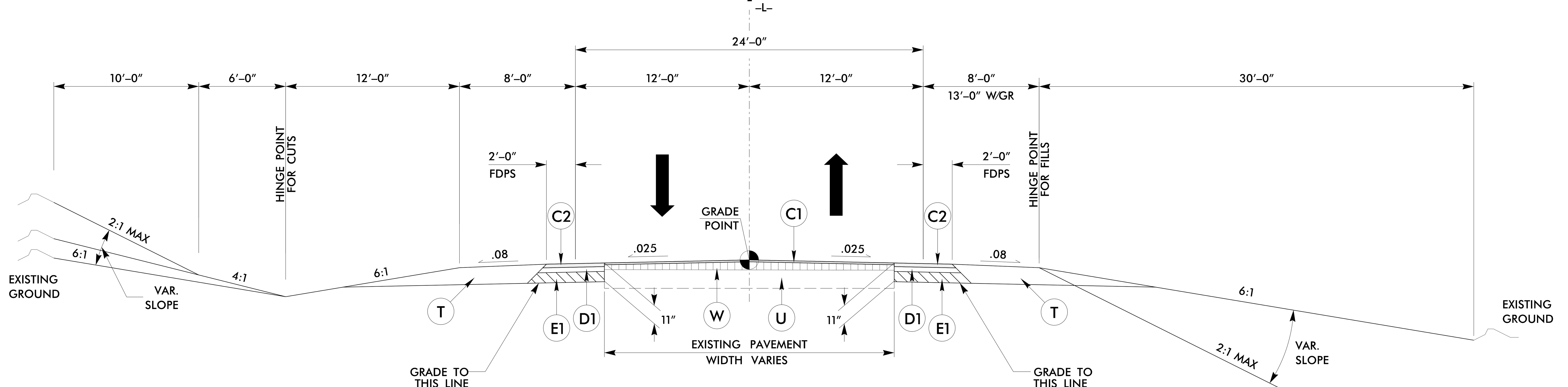
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN DATED 12/21/2020)

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165.0 LBS. PER SQ. YD.	R1	SHOULDER BERM GUTTER
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165.0 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J1	PROP. 6" AGGREGATE BASE COURSE
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
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	U	EXISTING PAVEMENT
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V	INCIDENTAL MILLING
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.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET 2A-2)

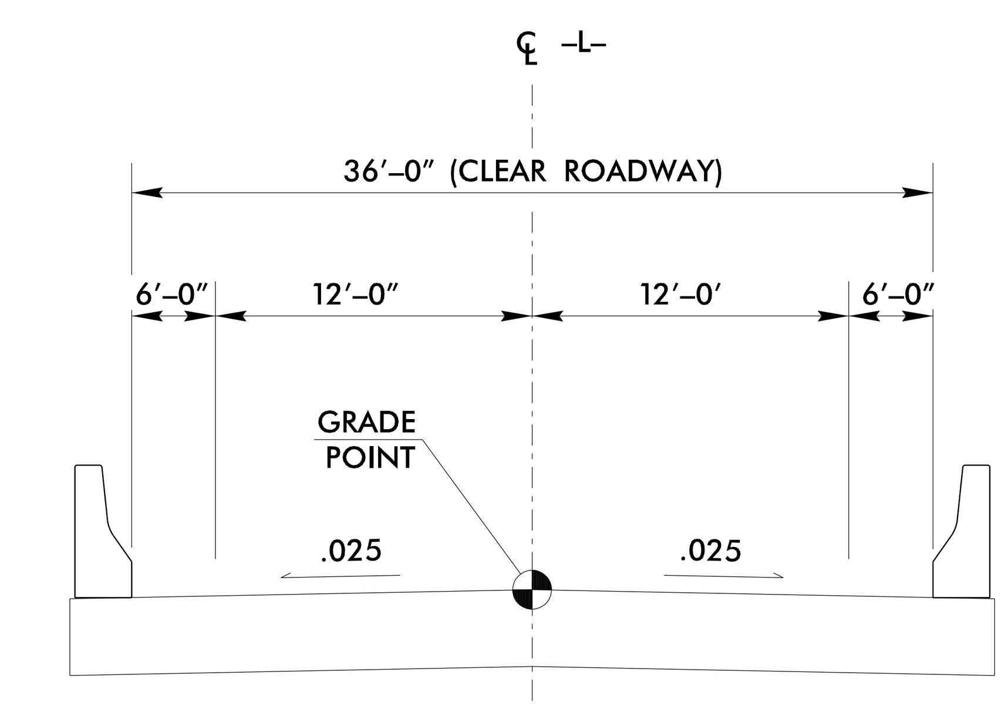
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

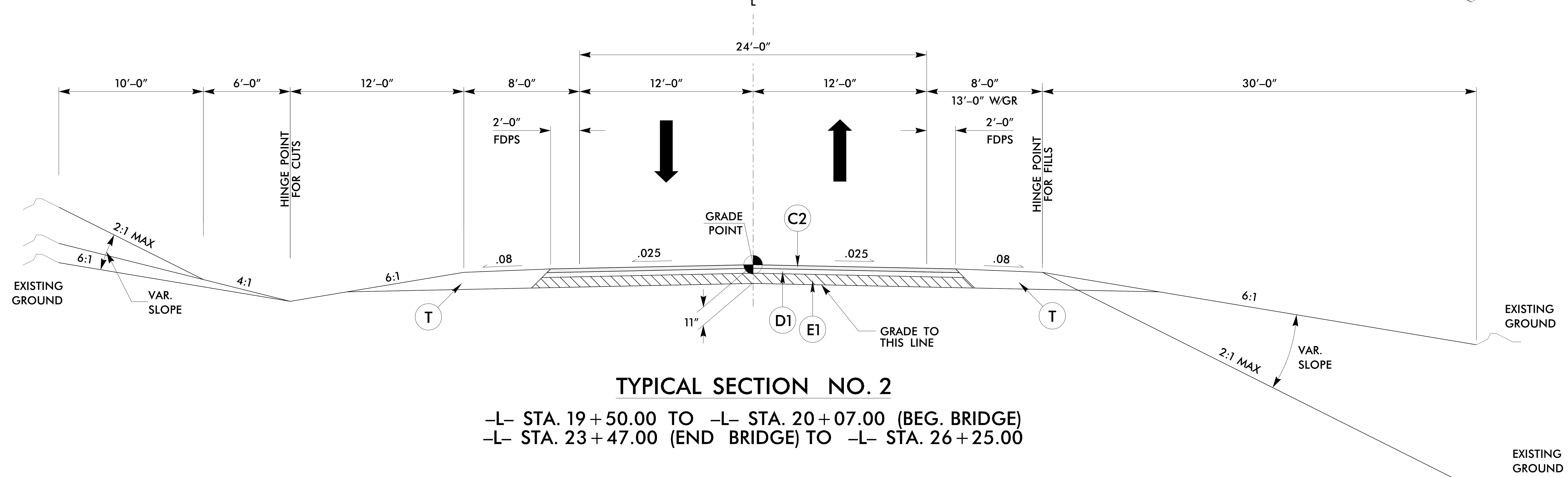
-L- STA. 14+45.11 TO -L- STA. 19+50.00
-L- STA. 26+25.00 TO -L- STA. 29+67.69

BRIDGE AT -L- STATION 21+77.00 OVER REEDY FORK CREEK



BRIDGE TYPICAL

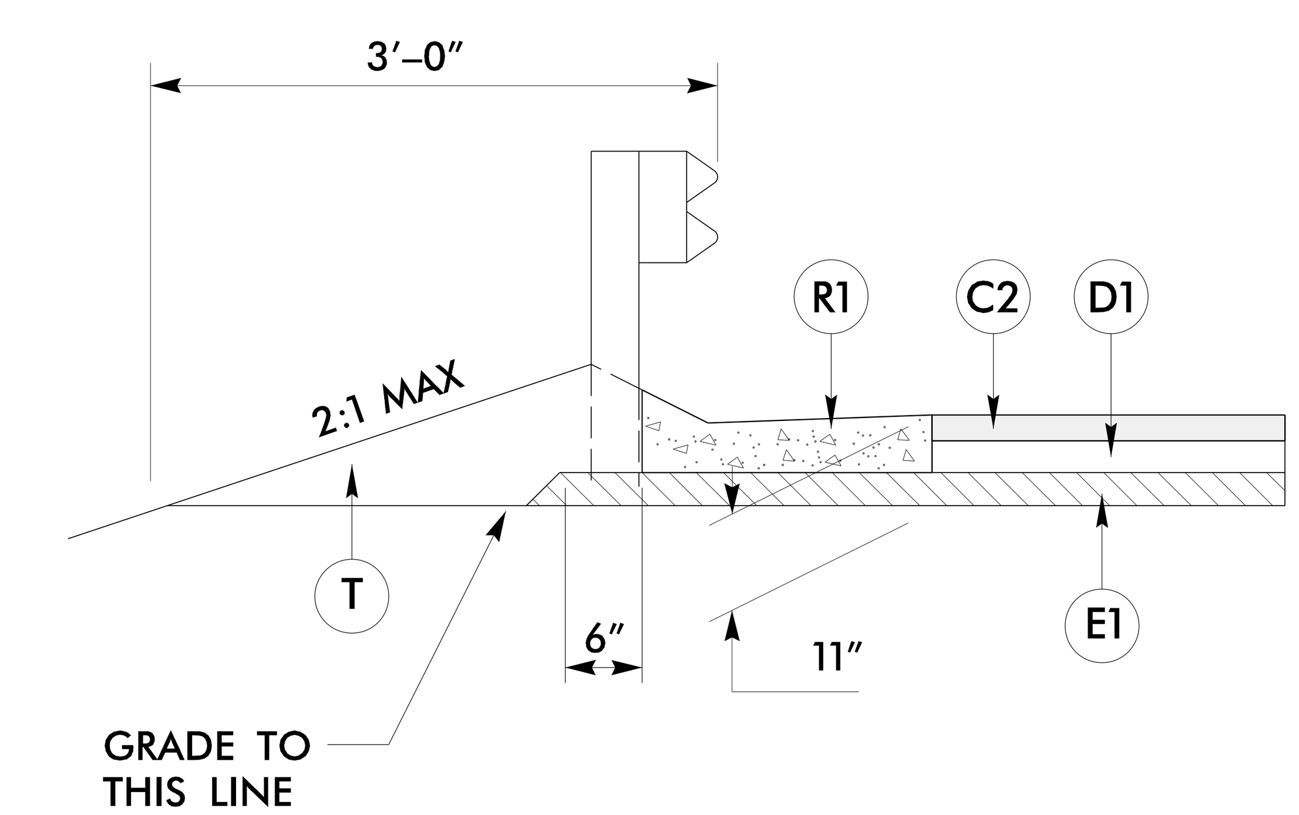
-L- STA. 20+07.00 TO -L- STA. 23+47.00



TYPICAL SECTION NO. 2

-L- STA. 19+50.00 TO -L- STA. 20+07.00 (BEG. BRIDGE)
-L- STA. 23+47.00 (END BRIDGE) TO -L- STA. 26+25.00

Detail Showing Shoulder Berm Gutter on Asphalt Base Course



INSET DETAIL

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 2 AS FOLLOWS

-L- STA. 19+50.00 TO -L- STA. 19+72.85 RT
-L- STA. 19+66.00 TO -L- STA. 19+91.19 LT

11/9/2021
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PROJECT REFERENCE NO.	SHEET NO.
B-5728	2A-2

ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
SEAL 023912 TRENT E. HUFFMAN 12/9/2021	SEAL 022896 CLARK S. MORRISON 12/9/2021

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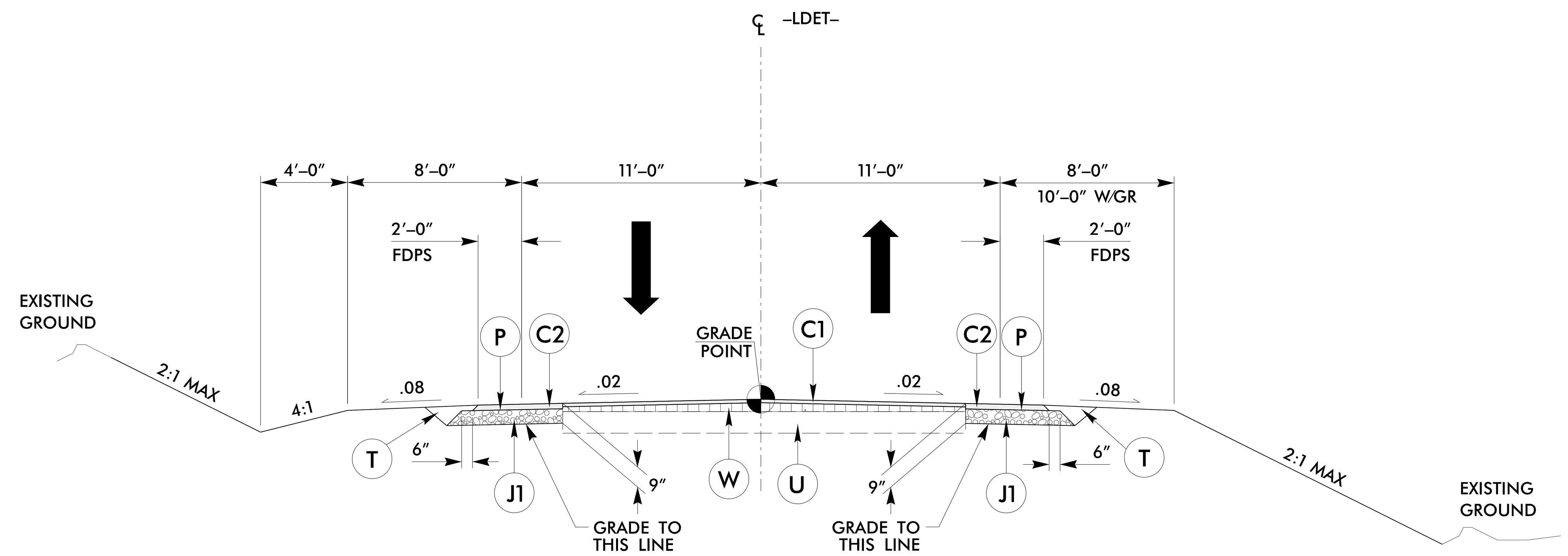
moffatt & nichol — 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX NC License NO.: F-0105

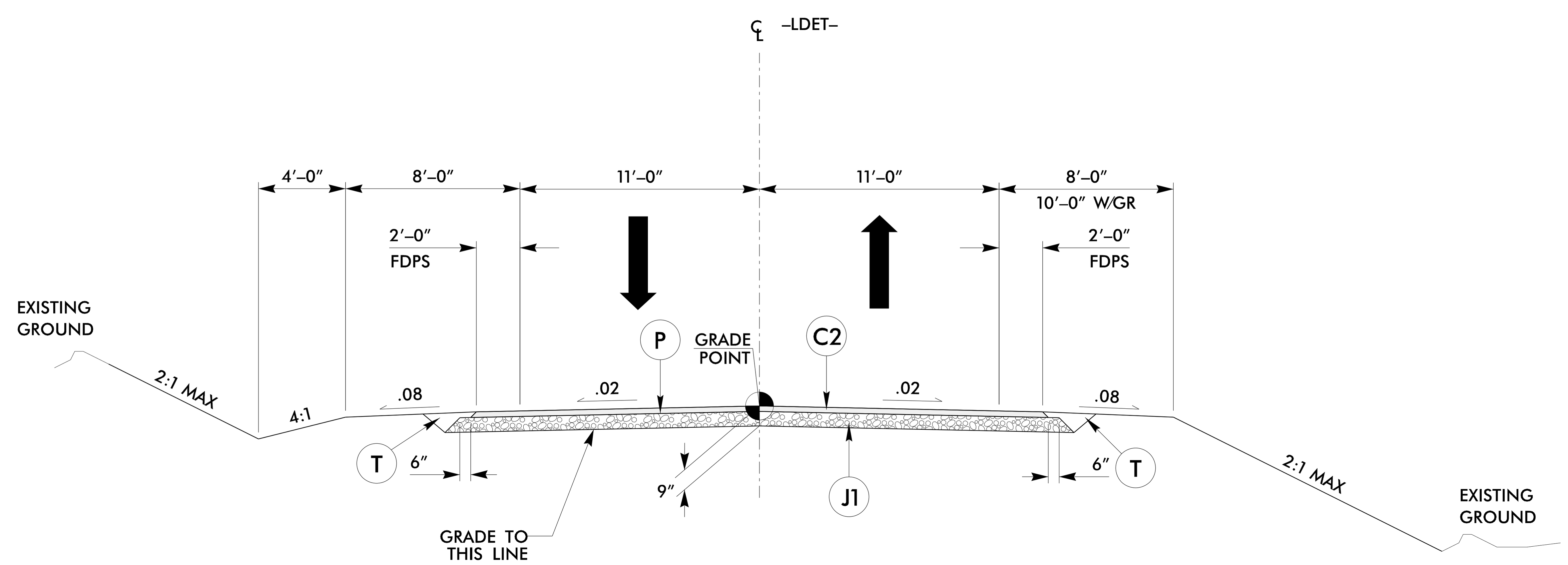
C1	1½" S9.5B
C2	3" S9.5B
C3	VARIABLE DEPTH S9.5B
D1	4" I19.0C
D2	VARIABLE DEPTH I19.0C
E1	4" B25.0C
E2	VARIABLE DEPTH B25.0C
R1	SHOULDER BERM GUTTER
J1	6" ABC
P	PRIME COAT
T	EARTH MATERIAL
U	EXIST PAVEMENT
V	INCIDENTAL MILLING
W	WEDGING

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 3

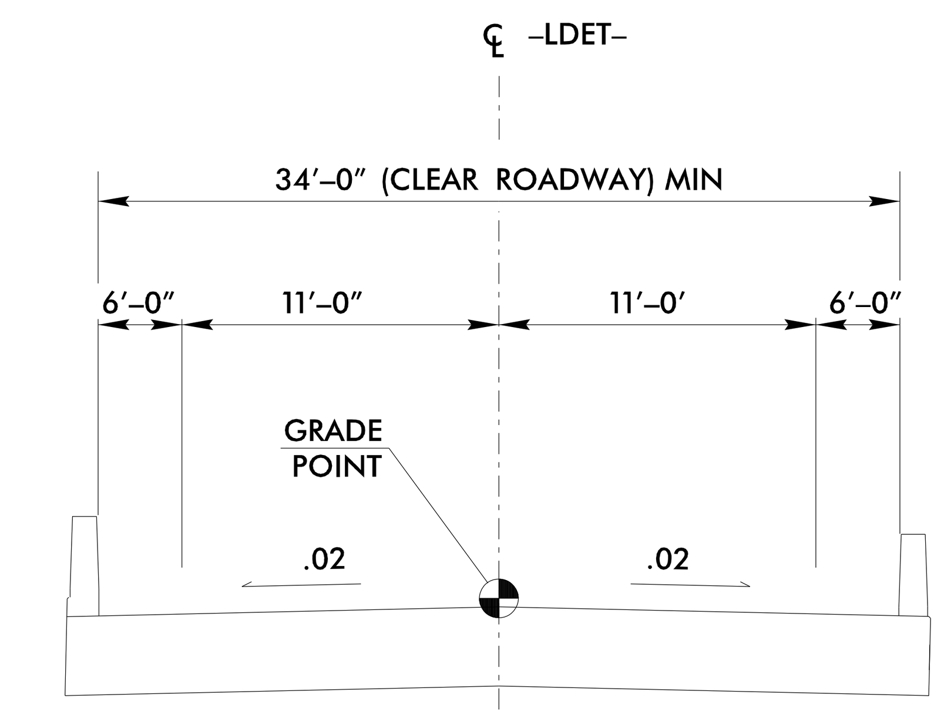
-LDET- STA. 14+94.62 TO -LDET- STA. 17+00.00
-LDET- STA. 27+15.00 TO -LDET- STA. 29+24.93



TYPICAL SECTION NO. 4

-LDET- STA. 17+00.00 TO -LDET- STA. 20+30+/- (BEG. BRIDGE)
-LDET- STA. 23+80+/- (END BRIDGE) TO -LDET- STA. 27+15.00

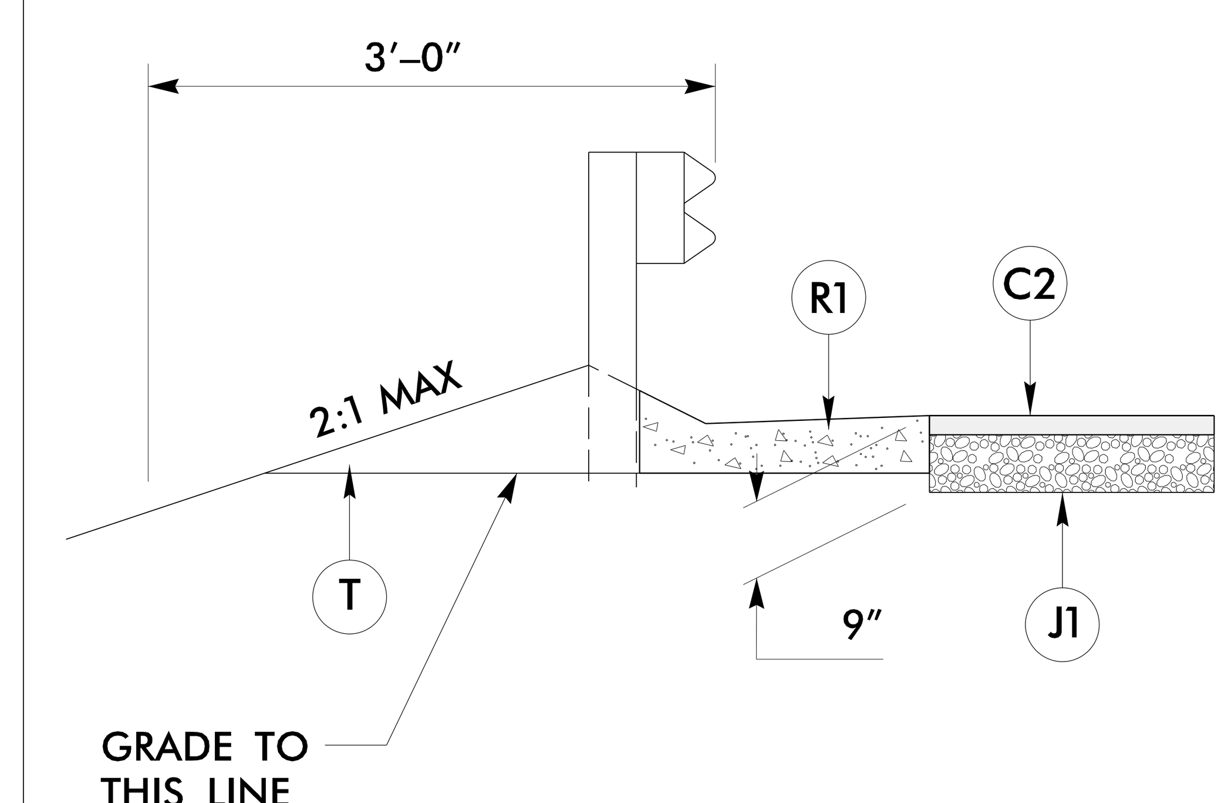
BRIDGE AT -LDET- STATION 22+05.00 OVER REEDY FORK CREEK



DETOUR BRIDGE TYPICAL

-LDET- STA. 20+30+/- TO -LDET- STA. 23+80+/-

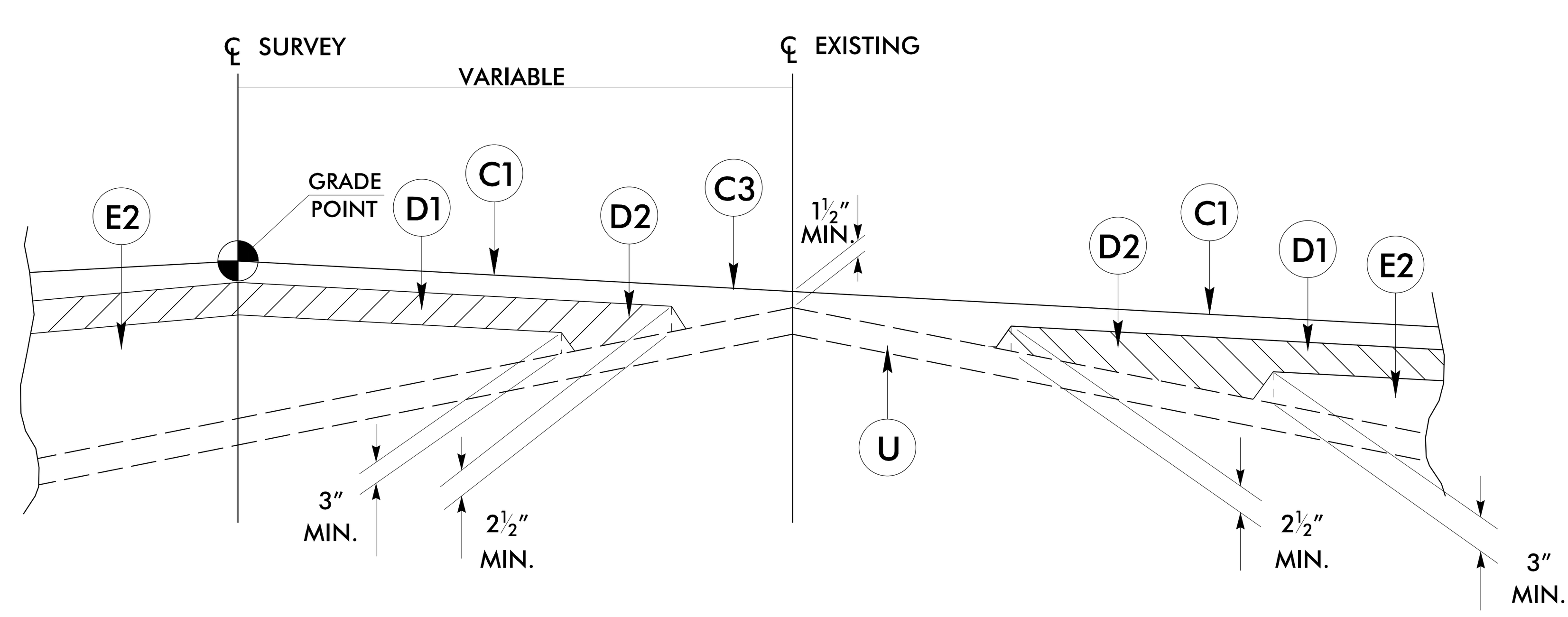
Detail Showing Shoulder Berm Gutter on Top of Subgrade



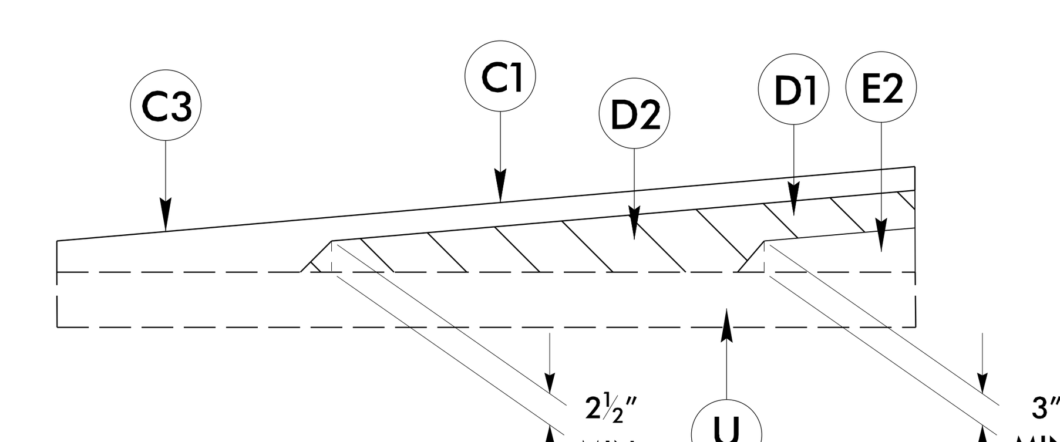
INSET DETAIL

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 4 AS FOLLOWS

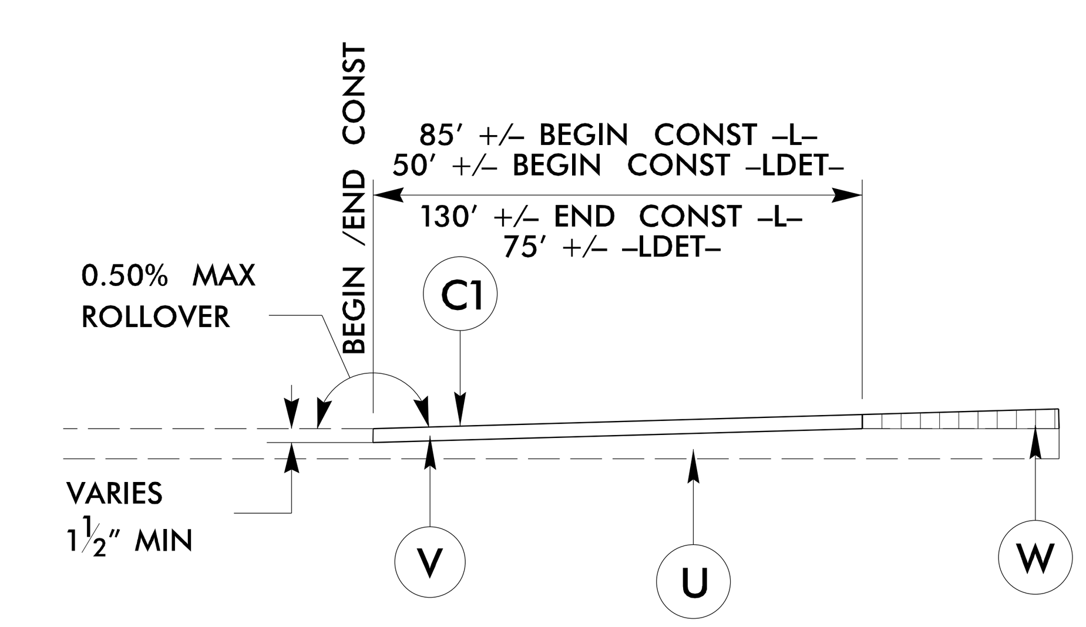
-LDET- STA. 19+99.00 TO -LDET- STA. 20+30.03 (LT & RT)



DETAIL SHOWING METHOD OF WEDGING (W)



WEDGING DETAIL FOR RESURFACING



INCIDENTAL MILLING DETAIL

11/9/2021 \RA\10011-101\B5728\Roadway\Proj\B5728_rdy_typ.dgn gmoodlin

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PROJECT REFERENCE NO.	SHEET NO.
B-5728	2B-1

R/W SHEET NO.

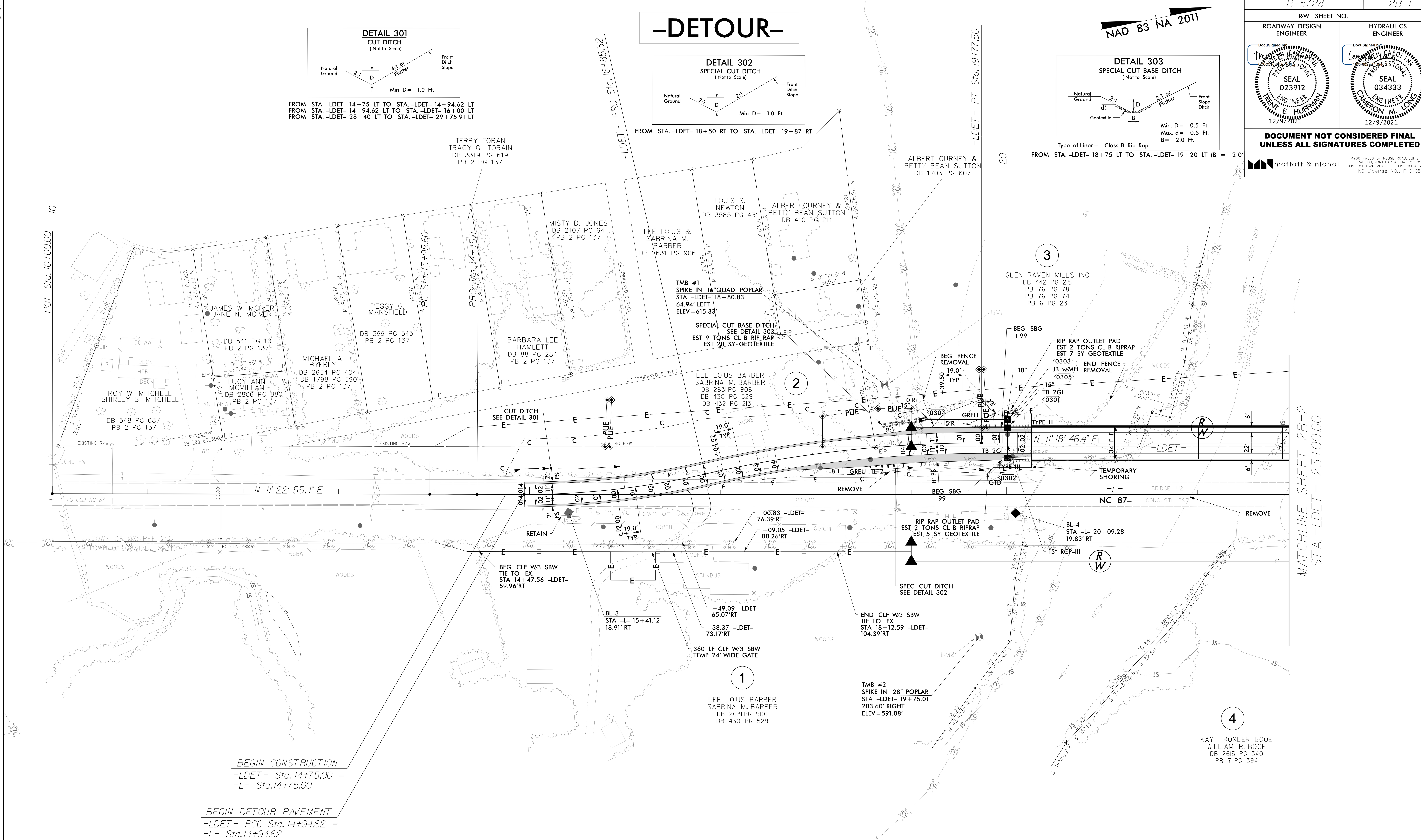
ROADWAY DESIGN ENGINEER — SEAL 023912, TRENT E. HUFFMAN, 12/9/2021

HYDRAULICS ENGINEER — SEAL 034333, CAMERON M. LONG, 12/9/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

moffatt & nichol — 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609 — NC License No.: F-0105

–DETOUR–



NAD 83 NA 2011
DETAIL 301
CUT DITCH
(Not to Scale)
Natural Ground
Front Ditch Slope
Min. D = 1.0 Ft.
FROM STA. –LDET– 14+75 LT TO STA. –LDET– 14+94.62 LT
FROM STA. –LDET– 14+94.62 LT TO STA. –LDET– 16+00 LT
FROM STA. –LDET– 28+40 LT TO STA. –LDET– 29+75.91 LT
DETAIL 302
SPECIAL CUT DITCH
(Not to Scale)
Min. D = 1.0 Ft.
FROM STA. –LDET– 18+50 RT TO STA. –LDET– 19+87 RT
DETAIL 303
SPECIAL CUT BASE DITCH
(Not to Scale)
Geotextile
Min. D = 0.5 Ft.
Max. d = 0.5 Ft.
B = 2.0 Ft.
Type of Liner = Class B Rip-Rap
FROM STA. –LDET– 18+75 LT TO STA. –LDET– 19+20 LT (B = 2.0')
TERRY TORAN
TRACY G. TORAIN
DB 3319 PG 619
PB 2 PG 137
ALBERT GURNEY &
BETTY BEAN SUTTON
DB 1703 PG 607
MISTY D. JONES
DB 2107 PG 64
PB 2 PG 137
LOUIS S. NEWTON
DB 3585 PG 431
LEE LOIUS &
SABRINA M. BARBER
DB 2631 PG 906
JAMES W. MCIVER
JANE N. MCIVER
DB 541 PG 10
PB 2 PG 137
PEGGY G. MANSFIELD
DB 369 PG 545
PB 2 PG 137
BARBARA LEE HAMLETT
DB 88 PG 284
PB 2 PG 137
MICHAEL A. BYERLY
DB 2634 PG 404
DB 1798 PG 390
PB 2 PG 137
LUCY ANN MCMILLAN
DB 2806 PG 880
PB 2 PG 137
ROY W. MITCHELL
SHIRLEY B. MITCHELL
DB 548 PG 687
PB 2 PG 137
GLEN RAVEN MILLS INC
DB 442 PG 215
PB 76 PG 78
PB 76 PG 74
PB 6 PG 23
TMB #1
SPIKE IN 16" QUAD POPLAR
STA –LDET– 18+80.83
64.94' LEFT
ELEV = 615.33'
SPECIAL CUT BASE DITCH
SEE DETAIL 303
EST 9 TONS CL B RIP RAP
EST 20 SY GEOTEXTILE
LEE LOIUS BARBER
SABRINA M. BARBER
DB 2631 PG 906
DB 430 PG 529
DB 432 PG 213
RIP RAP OUTLET PAD
EST 2 TONS CL B RIPRAP
EST 7 SY GEOTEXTILE
CUT DITCH
SEE DETAIL 301
N 11° 22' 55.4" E
N 11° 18' 46.4" E
–LDET–
–L–
–NC 87–
TEMPORARY SHORING
BL-4
STA –L– 20+09.28
19.83' RT
BL-3
STA –L– 15+41.12
18.91' RT
BEG CLF W/3 SBW
TIE TO EX.
STA 14+47.56 –LDET–
59.96' RT
END CLF W/3 SBW
TIE TO EX.
STA 18+12.59 –LDET–
104.39' RT
360 LF CLF W/3 SBW
TEMP 24' WIDE GATE
SPEC CUT DITCH
SEE DETAIL 302
TMB #2
SPIKE IN 28" POPLAR
STA –LDET– 19+75.01
203.60' RIGHT
ELEV = 591.08'
LEE LOIUS BARBER
SABRINA M. BARBER
DB 2631 PG 906
DB 430 PG 529
KAY TROXLER BOOE
WILLIAM R. BOOE
DB 2615 PG 340
PB 71 PG 394
MATCHLINE SHEET 2B-2
STA. –LDET– 23+00.00
BEGIN CONSTRUCTION
–LDET– Sta. 14+75.00 =
–L– Sta. 14+75.00
BEGIN DETOUR PAVEMENT
–LDET– PCC Sta. 14+94.62 =
–L– Sta. 14+94.62

–LDET–

PI Sta 15+90.47	PI Sta 18+32.13	PI Sta 25+79.59	PI Sta 28+26.12
Δ = 12° 52' 06.7" (LT)	Δ = 12° 52' 06.6" (RT)	Δ = 12° 59' 48.5" (RT)	Δ = 13° 22' 56.0" (LT)
D = 6° 44' 26.4"	D = 4° 24' 26.5"	D = 4° 24' 26.5"	D = 6° 44' 26.4"
L = 190.91'	L = 291.98'	L = 294.89'	L = 198.53'
T = 95.86'	T = 146.61'	T = 148.08'	T = 99.72'
R = 850.00'	R = 1,300.00'	R = 1,300.00'	R = 850.00'
DS = 40 mph	DS = 40 mph	DS = 40 mph	
	e = 0.04	e = 0.04	
	Ro = 76.00'	Ro = 76.00'	

UTILITY OWNERS:
WATER: TOWN OF OSSIPEE
POWER: DUKE ENERGY
COMMUNICATIONS: AT&T
GAS (TRANSMISSION): CARDINAL/WILLIAMS PIPELINE

NOTE:
CONTRACTOR TO CONTACT DUKE ENERGY AND COORDINATE THE CONSTRUCTION AND EXCAVATION OF SLOPES AT NEW POLE LOCATIONS. SEE UTILITY BY OTHERS (UO) PLANS AND PROJECT SPECIAL PROVISIONS FOR INFORMATION. DUKE ENERGY CONTACT PERSON IS MARIA MENDOZA, 984-227-2504, MARIA.MENDOZA@DUKE-ENERGY.COM

FOR –LDET– PROFILE SEE SHEET NO. 2B-3
FOR –L– PLAN SEE SHEETS NO. 4 AND NO. 5

11/19/2021
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8/17/99

–DETOUR–

NAD 83 NA 2011

PROJECT REFERENCE NO.	SHEET NO.
B-5728	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

DocuSigned by: Trent E. Huffman
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023912 TRENT E. HUFFMAN
12/9/2021

HYDRAULICS ENGINEER

DocuSigned by: Cameron M. Long
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034333 CAMERON M. LONG
12/9/2021

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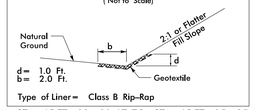
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

DETAIL 304
TOE PROTECTION
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. –LDET– 23+80 LT TO STA. –LDET– 25+95 LT
FROM STA. –LDET– 23+89 RT TO STA. –LDET– 26+00 RT

DETAIL 305
SPECIAL CUT BASE DITCH
(Not to Scale)

FROM STA. –LDET– 26+05 LT TO STA. –LDET– 26+40 LT

DETAIL 301
CUT DITCH
(Not to Scale)

FROM STA. –LDET– 14+75 LT TO STA. –LDET– 14+94.62 LT
FROM STA. –LDET– 14+94.62 LT TO STA. –LDET– 16+00 LT
FROM STA. –LDET– 28+40 LT TO STA. –LDET– 29+75.91 LT

UTILITY OWNERS:
WATER: TOWN OF OSSIPEE
POWER: DUKE ENERGY
COMMUNICATIONS: AT&T
GAS (TRANSMISSION): CARDINAL/WILLIAMS PIPELINE

NOTE:
CONTRACTOR TO CONTACT DUKE ENERGY AND COORDINATE THE CONSTRUCTION AND EXCAVATION OF SLOPES AT NEW POLE LOCATIONS. SEE UTILITY BY OTHERS (UO) PLANS AND PROJECT SPECIAL PROVISIONS FOR INFORMATION. DUKE ENERGY CONTACT PERSON IS MARIA MENDOZA, 984-227-2504, MARIA.MENDOZA@DUKE-ENERGY.COM

FOR –LDET– PROFILE SEE SHEET NO. 2B-3
FOR –L– PLAN SEE SHEETS NO. 4 AND NO. 5

11/9/2021
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amadlin

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-5728	2B-3

ROADWAY DESIGN ENGINEER — SEAL 023912, NORTH CAROLINA PROFESSIONAL ENGINEER, TRENT E. HUFFMAN, 12/9/2021

HYDRAULICS ENGINEER — SEAL 034333, NORTH CAROLINA PROFESSIONAL ENGINEER, CAMERON M. LONG, 12/9/2021

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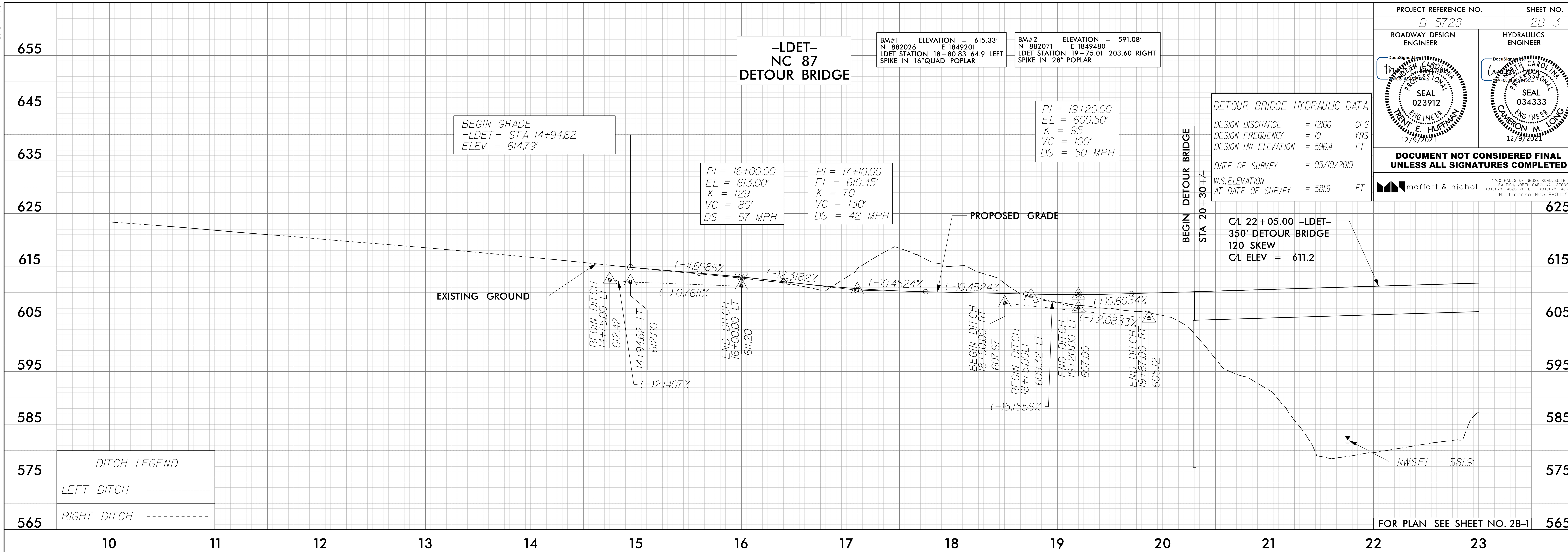
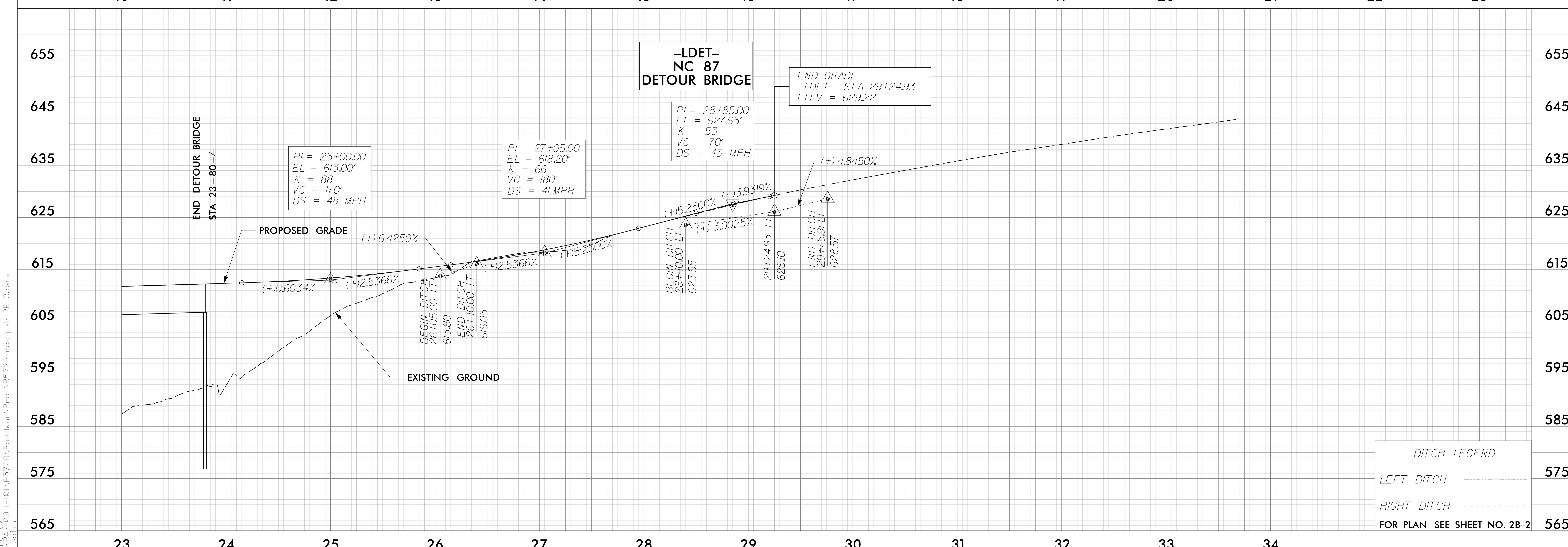


–LDET–
NC 87
DETOUR BRIDGE
BM#1 ELEVATION = 615.33′
N 882026 E 1849201
LDET STATION 18+80.83 64.9 LEFT
SPIKE IN 16″QUAD POPLAR
BM#2 ELEVATION = 591.08′
N 882071 E 1849480
LDET STATION 19+75.01 203.60 RIGHT
SPIKE IN 28″ POPLAR
BEGIN GRADE
-LDET- STA 14+94.62
ELEV = 614.79′
PI = 16+00.00
EL = 613.00′
K = 129
VC = 80′
DS = 57 MPH
PI = 17+10.00
EL = 610.45′
K = 70
VC = 130′
DS = 42 MPH
PI = 19+20.00
EL = 609.50′
K = 95
VC = 100′
DS = 50 MPH
DETOUR BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 12100 CFS
DESIGN FREQUENCY = 10 YRS
DESIGN HW ELEVATION = 596.4 FT
DATE OF SURVEY = 05/10/2019
W.S.ELEVATION AT DATE OF SURVEY = 581.9 FT
BEGIN DETOUR BRIDGE
STA 20+30 +/–
C/L 22+05.00 –LDET–
350′ DETOUR BRIDGE
120 SKEW
C/L ELEV = 611.2
PROPOSED GRADE
EXISTING GROUND
(–)1.6986%
(–)2.3182%
(–)0.4524%
(–)0.4524%
(+)0.6034%
(–)2.0833%
(–) 0.7611%
(–)2.1407%
(–)5.1556%
BEGIN DITCH 14+75.00 LT 612.42
14+94.62 LT 612.00
END DITCH 16+00.00 LT 611.20
BEGIN DITCH 18+50.00 RT 607.97
BEGIN DITCH 18+75.00LT 609.32 LT
END DITCH 19+20.00 LT 607.00
END DITCH 19+87.00 RT 605.12
NWSEL = 581.9′
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
FOR PLAN SEE SHEET NO. 2B-1
655
645
635
625
615
605
595
585
575
565
10
11
12
13
14
15
16
17
18
19
20
21
22
23



–LDET–
NC 87
DETOUR BRIDGE
END GRADE
-LDET- STA 29+24.93
ELEV = 629.22′
PI = 28+85.00
EL = 627.65′
K = 53
VC = 70′
DS = 43 MPH
PI = 27+05.00
EL = 618.20′
K = 66
VC = 180′
DS = 41 MPH
PI = 25+00.00
EL = 613.00′
K = 88
VC = 170′
DS = 48 MPH
END DETOUR BRIDGE
STA 23+80 +/–
PROPOSED GRADE
EXISTING GROUND
(+) 4.8450%
(+)5.2500%
(+)3.9319%
(+) 3.0025%
(+) 6.4250%
(+)2.5366%
(+)5.2500%
(+)0.6034%
(+)2.5366%
BEGIN DITCH 26+05.00 LT 613.80
END DITCH 26+40.00 LT 616.05
BEGIN DITCH 28+40.00 LT 623.55
29+24.93 LT 626.10
END DITCH 29+75.91 LT 628.57
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
FOR PLAN SEE SHEET NO. 2B-2
655
645
635
625
615
605
595
585
575
565
23
24
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11/19/2021
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PROJECT REFERENCE NO.	SHEET NO.
B-5728	2C-1

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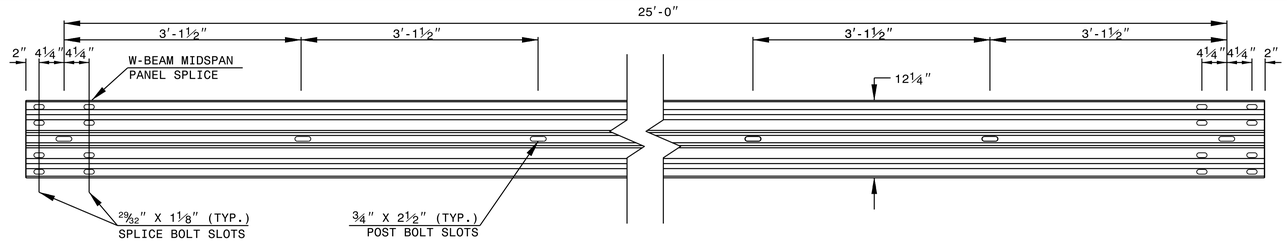
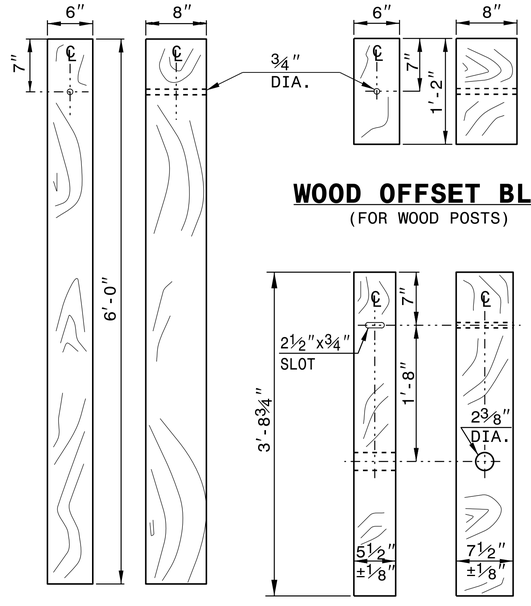
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



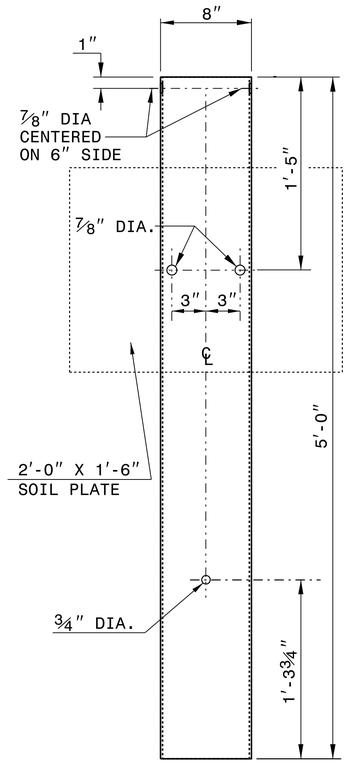
STANDARD W-BEAM GUARDRAIL



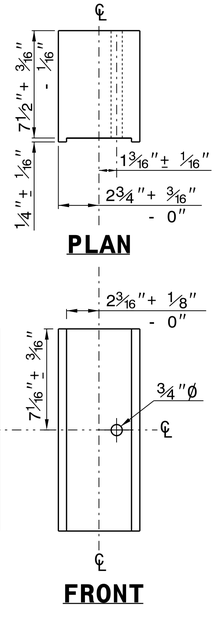
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

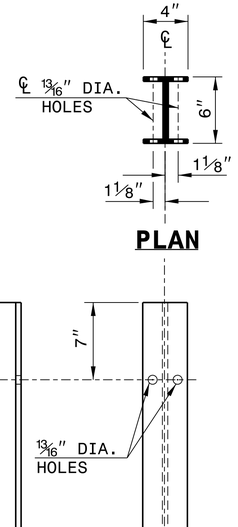
SHORT WOOD BREAKAWAY POST

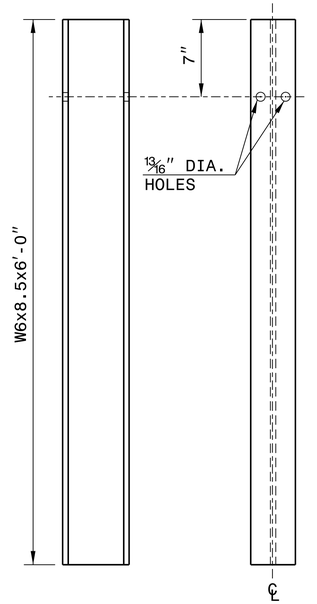


STEEL TUBE
TS 6"x8"x0.1875"



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

DocuSigned by: Joel Howerton
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
12/8/2021

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.: _____

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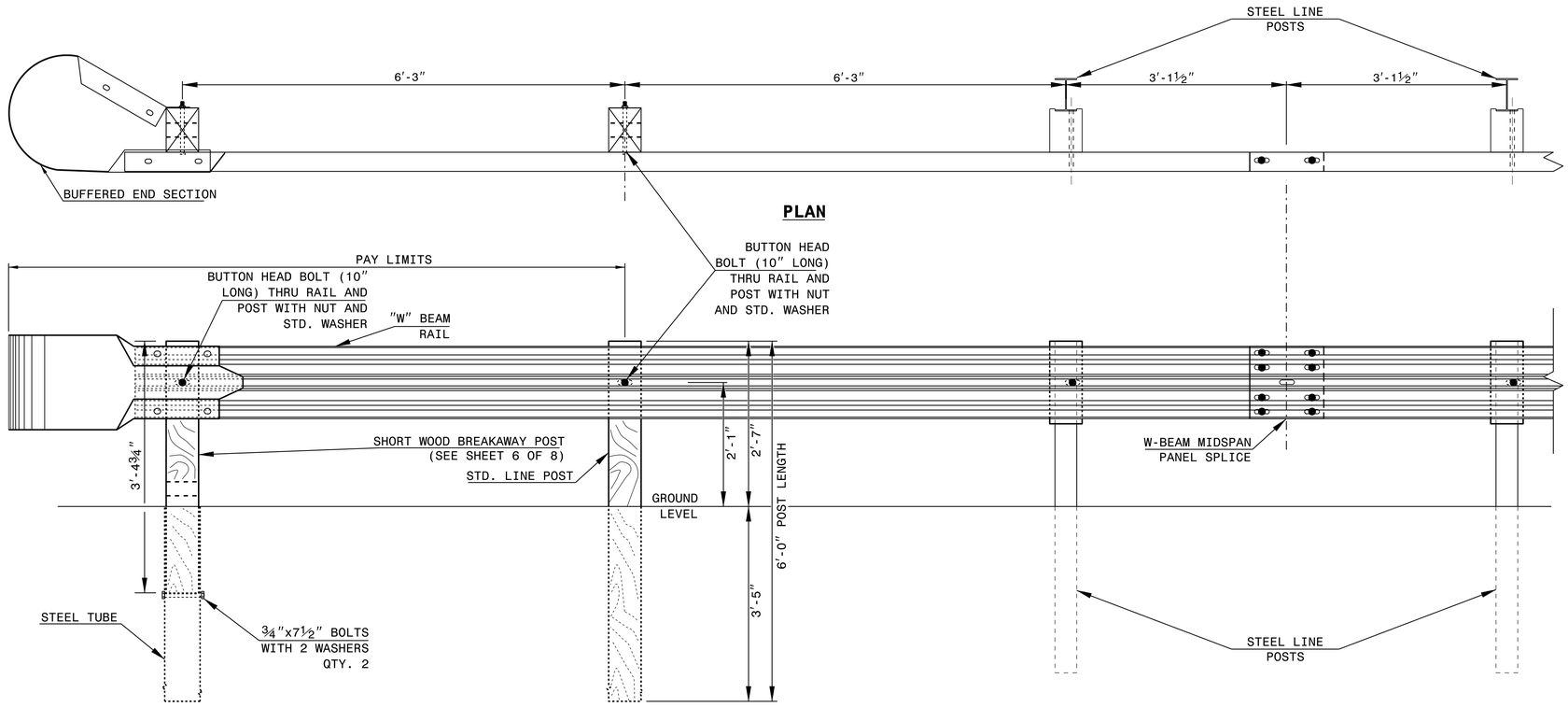
B-5728	2C-2

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

DocuSigned by:
Joel Howerton
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 JOEL S. HOWERTON
12/8/2021

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.: _____

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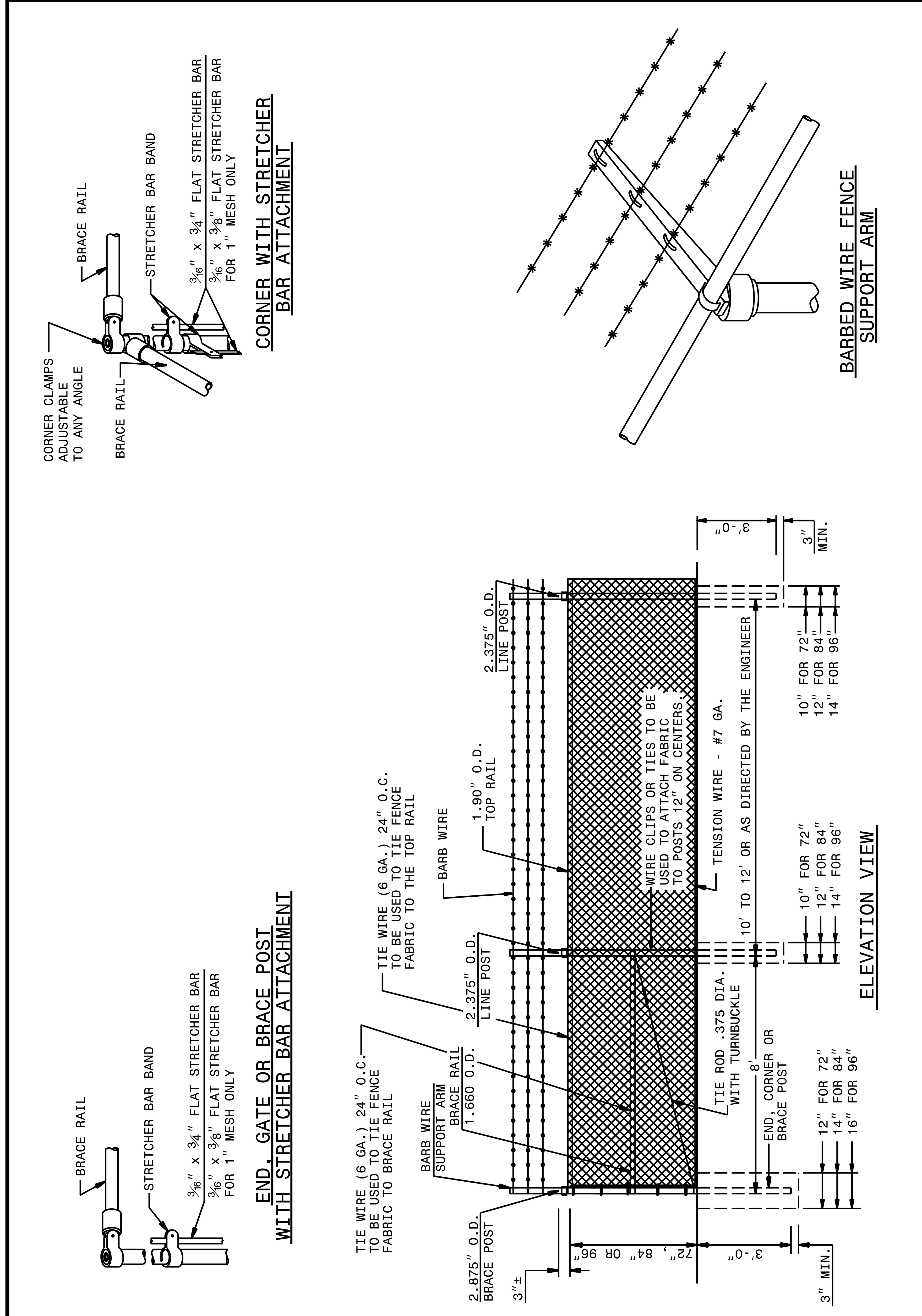
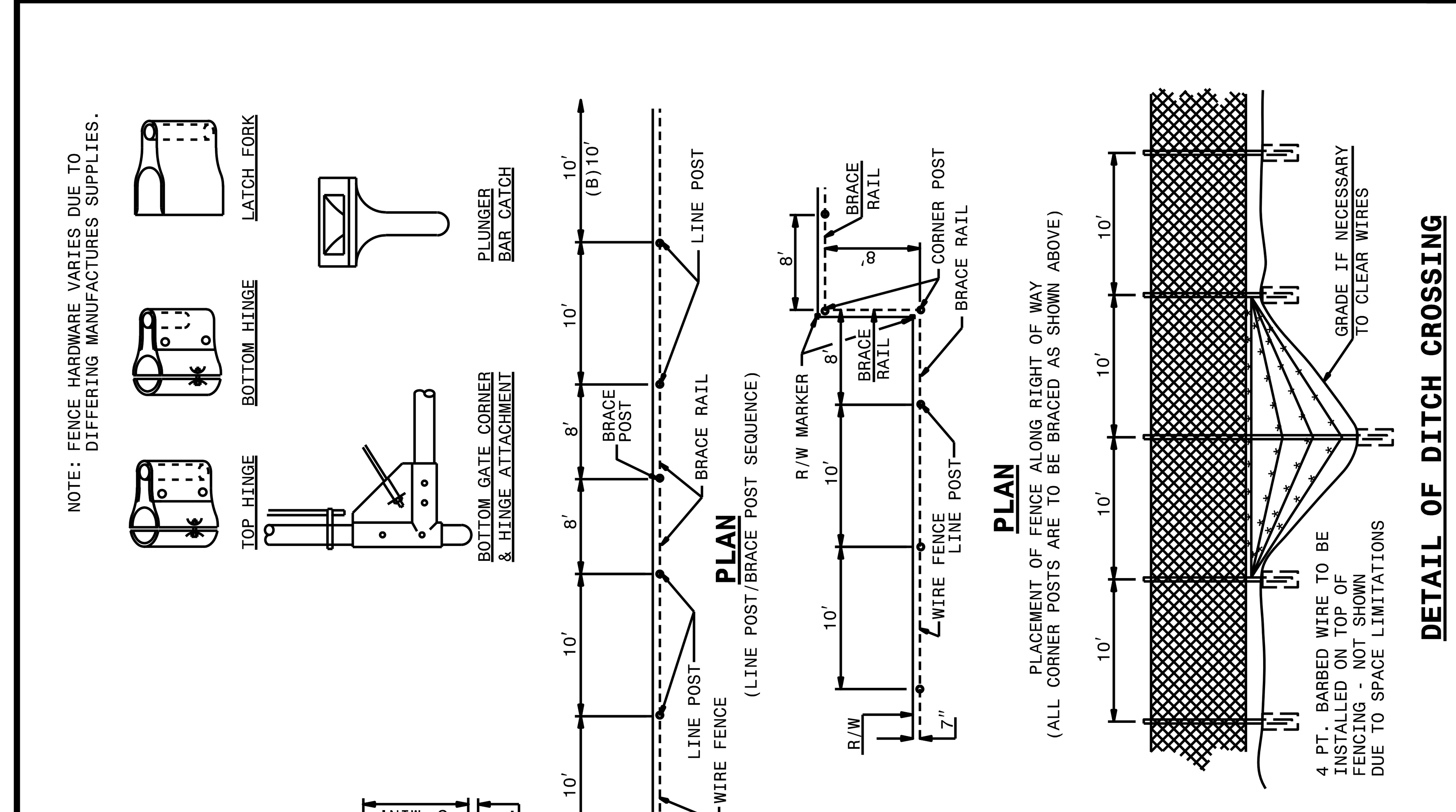
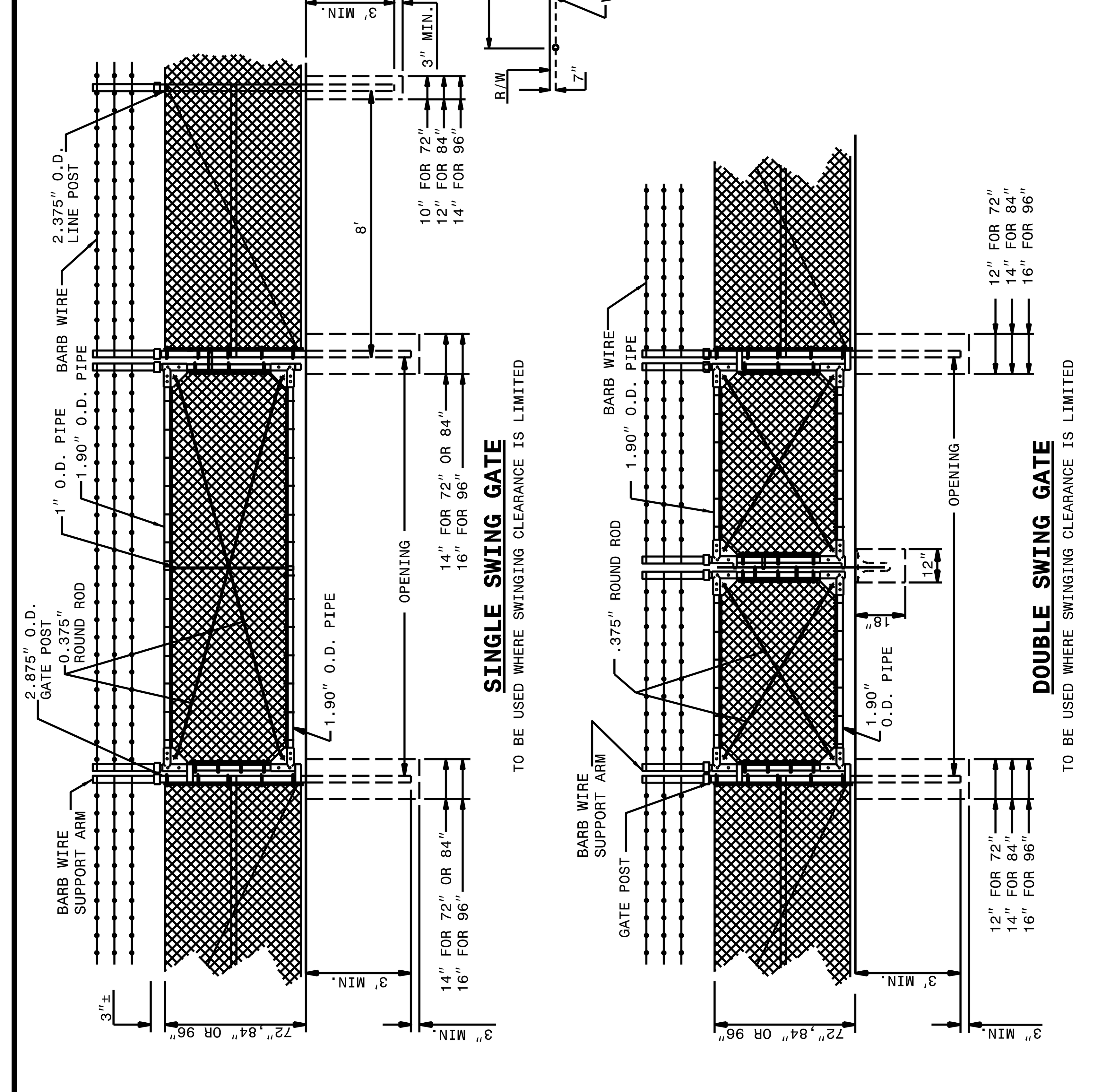
PROJECT REFERENCE NO.	SHEET NO.
B-5728	2C-3

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ENGLISH DETAIL DRAWING FOR CHAIN LINK FENCE WITH BARBED WIRE 6', 7' AND 8' HEIGHT — SHEET 1 OF 2 fence4c1
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ENGLISH DETAIL DRAWING FOR CHAIN LINK FENCE WITH BARBED WIRE 6', 7' AND 8' HEIGHT — SHEET 2 OF 2 fence4c1



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **CHAIN LINK FENCE WITH BARBED WIRE** 6′, 7′ AND 8′ HEIGHT	SHEET 1 OF 2	**fence4c1**





MAXIMUM WIRE SPACING TO BE 6".
MAXIMUM CLEARANCE BETWEEN LOWEST STRAND AND GROUND TO BE 6".
BRACE POSTS SHALL BE ERECTED BETWEEN END, CORNER OR GATE POSTS AT INTERVALS NOT EXCEEDING 700' ON TANGENTS OR 350' ON SHORT RADIUS CURVES.
ADDTIONAL BRACE POSTS SHALL BE ERECTED IF SO DIRECTED BY THE ENGINEER.
BRACE POSTS SHALL BE BRACED FROM BOTH SIDES OF POST.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **CHAIN LINK FENCE WITH BARBED WIRE** 6′, 7′ AND 8′ HEIGHT	SHEET 2 OF 2	**fence4c1**

DocuSigned by: Joel S. Howerton 873F3D...
SEAL 022966 NORTH CAROLINA PROFESSIONAL ENGINEER Joel S. Howerton
12/8/2021

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

SEE PLATE FOR TITLE

ORIGINAL BY: **N.T. KEGLERS** DATE: **MAR.11, 1996**
MODIFIED BY: ______ DATE: ______
CHECKED BY: ______ DATE: ______
FILE SPEC.: ______

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

PROJECT REFERENCE NO.	SHEET NO.
B-5728	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 11/18/2021
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ENGINEER

SIGNATURE DATE

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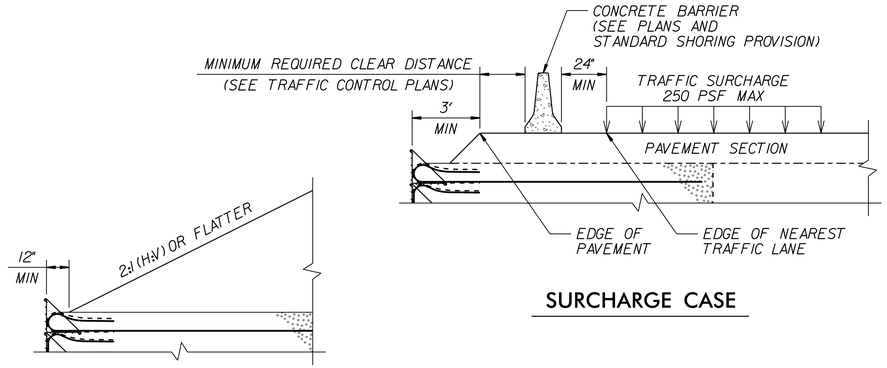
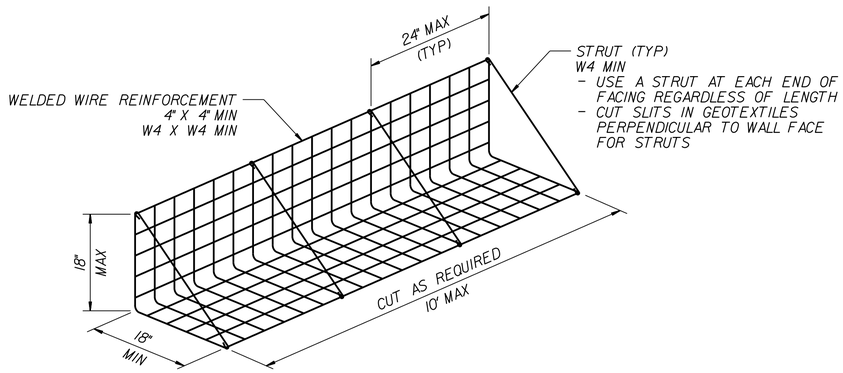
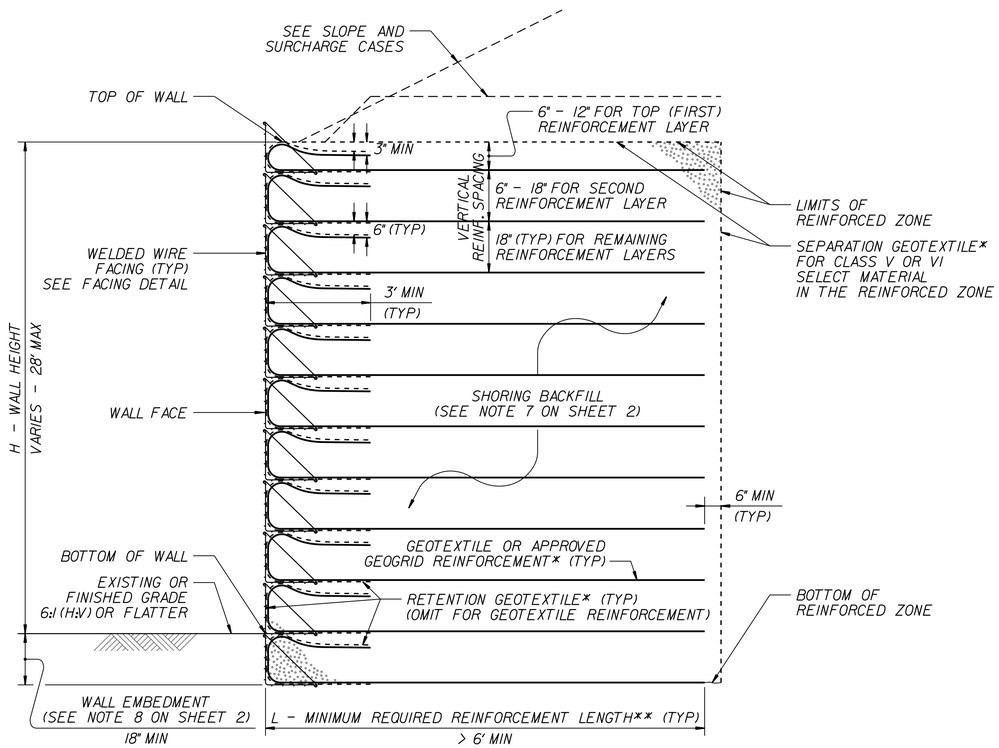


SURCHARGE CASE

SLOPE CASE

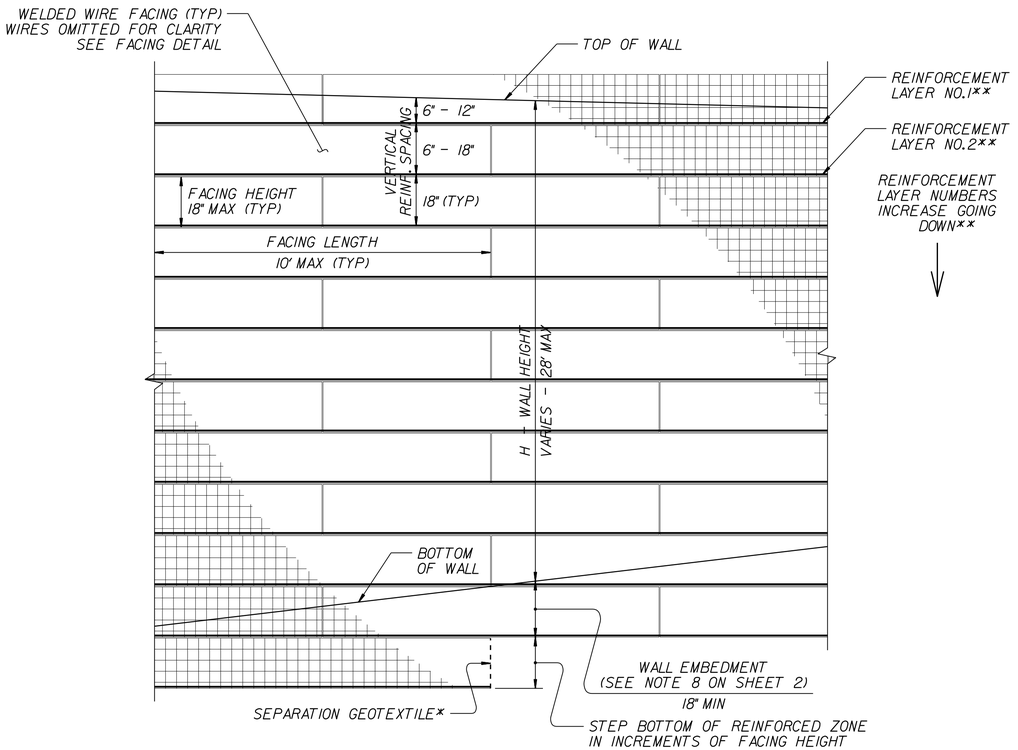


FACING DETAIL



STANDARD TEMPORARY WALL

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



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

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

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
B-5728	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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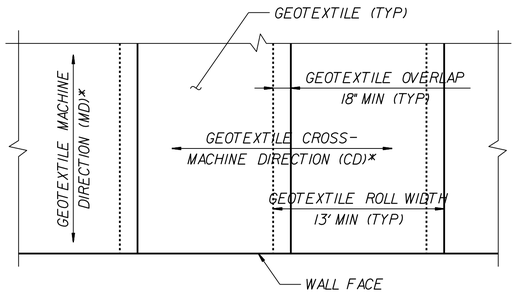
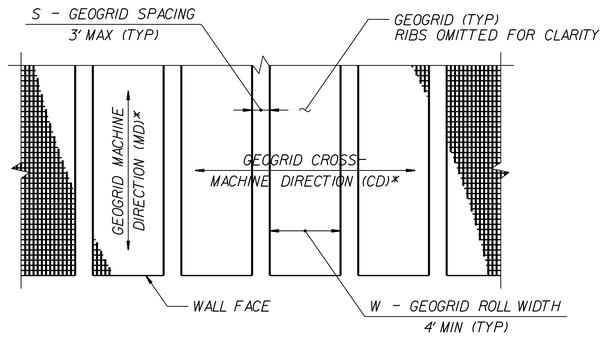


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

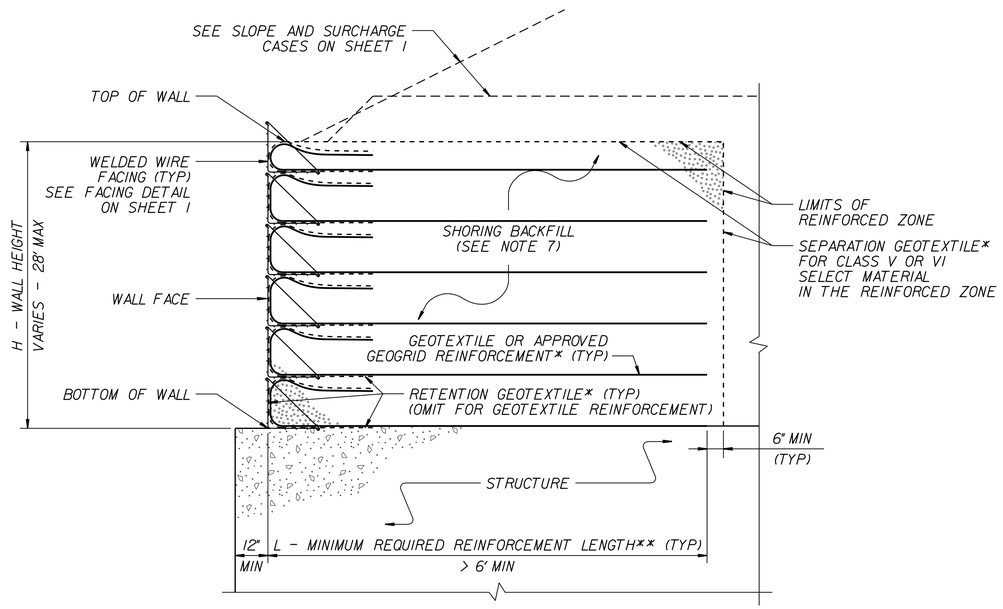


GEOGRID PLACEMENT

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

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

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

NOTES:

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

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

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 2 OF 3

DATE: 10-19-21

PROJECT REFERENCE NO.	SHEET NO.
B-5728	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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ENGINEER

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

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

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

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

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

GEOGRID REINFORCEMENT
SHORT–TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

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

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

COMPUTED BY: Z.LIU	DATE: 9/8/2020
CHECKED BY: G. MODLIN	DATE: 9/8/2020

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5728	3B-1

Note: Approximate quantities only.
Borrow Excavation, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

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

NOTE: EMBANKMENT QUANTITIES DO NOT INCLUDE BACKFILL FOR UNDERCUT

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	UNDERCUT	EMBANK. +%	BORROW	WASTE
-LDET-						
14+75	20+30	4,241		440		3,801
23+80	29+75.91	738		4,253	3,515	
SUBTOTALS:		4,979		4,693	3,515	3,801
-L-						
14+00	20+07	1,875		1,379		496
23+48	30+00	2,003	75	3,217	1,214	75
SUBTOTALS:		3,878	75	4,596	1,214	571
TOTAL:		8,857	75	9,289	4,729	4,372
MATERIAL FOR SHOULDER CONSTRUCTION				396	396	
ADDITIONAL UNDERCUT			400	480	480	400
WASTE IN LIEU OF BORROW					-4,297	-4,297
PROJECT TOTALS:		8,857	475	10,165	1,308	475
EST 5% TO REPLACE TOP SOIL ON BORROW PIT					65	
-LDET- DETOUR REMOVAL						
14+75	20+30	232				232
23+80	29+75.91	2,521				2,521
GRAND TOTALS:		11,610	475	10,165	1,373	3,228
SAY:		12,000	500		1,500	

*UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NO TO BE USED IN TOP 3' OF EMBANKMENT OR BACKFILL -L- 14+45.11 TO 17+50 LT and RT -L- 26+00 to 26+50 LT (680 CY) PER GEOTECH

CONTINGENCY ITEMS
SHALLOW UNDERCUT = 50 CY
GEOTEXTILE FOR SOIL STABILIZATION = 400 SY
SELECT GRANULAR MATERIAL, CLASS III = 300 CY
SELECT GRANULAR MATERIAL, CLASS IV = 150 TONS

SUMMARY OF BREAKING EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-L-	23+97	26+90	CL	832.42
			TOTAL:	832.42
			SAY:	840.00

SUMMARY OF REMOVAL EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-L-	19+50	20+27	CL	216.12
-L-	23+27	23+97	CL	196.94
-LDET-	15+36	20+30	CL	1,328.77
-LDET-	23+80	29+80	CL	1,424.68
			TOTAL:	3,166.50
			SAY:	3,170

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- LT	19+66.00	19+91.19	25.2 LF
-L- RT	19+50.00	19+72.85	22.8 LF
-LDET- LT	19+99.00	20+30.03	31.0 LF
-LDET- RT	19+99.00	20+30.03	31.0 LF
		TOTAL:	110.1 LF
		SAY:	111 LF

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS GREU TL-2	ANCHORS GREU TL-3	ANCHORS B-77	ANCHORS AT-1	ANCHORS TYPE III	ANCHORS TEMPORARY CRASH CUSHION	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	19+77.31	20+07	LT	60.375'	50.00'			20+07	6'	9'							1	1							12.50'		BRIDGE - SHOULDER VARIES TO MATCH GR TAPER
-L-	23+47	26+13.625	LT	266.625'			23+47		6'	9'		237.50'		3.0'		1	1								237.50'		BRIDGE - SHOULDER VARIES TO MATCH GR TAPER
-L-	17+40.375	20+07	RT	266.625'			20+07		6'	9'	237.50'		3.0'			1	1								125.00'		BRIDGE - SHOULDER VARIES TO MATCH GR TAPER
-L-	23+47	25+26.125	RT	179.125'				23+47	6'	9'		150.00'		3.0'		1	1								200.00'		BRIDGE - SHOULDER VARIES TO MATCH GR TAPER
																									389.00'		
TOTAL				772.75'	50.00'											3	4	1							964.00'		
LESS ANCHOR DEDUCTIONS																											
GREU TL-3			3 @ 50.00'	-150.00'																							
AT-1			1 @ 6.25'	-6.25'																							
B-77			4 @ 22.875'	-91.50'																							
SUB TOTAL				525.00'	50.00'																						
SAY				525.00'	50.00'											3	4	1							964.00'		
ADDITIONAL GUARDRAIL POSTS			5																								

TEMPORARY GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS GREU TL-2	ANCHORS GREU TL-3	ANCHORS CAT-1	ANCHORS AT-1	ANCHORS TYPE III	ANCHORS TEMPORARY CRASH CUSHION	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-LDET-	19+80	20+30	LT	56.25'				20+30	6'	8'		25.0'		0.5'	1				1								DETOUR BRIDGE - SHOULDER VARIES TO MATCH GR TAPER
-LDET-	23+80	26+11.25	LT	231.25'			25+30		6'	8'	25.0'		0.5'		1				1								FILL WARRANT - SHOULDER VARIES TO MATCH GR TAPER
-LDET-	18+61.25	20+30	RT	168.75'			20+30		6'	8'	150.00'		2.5'		1				1								DETOUR BRIDGE - SHOULDER VARIES TO MATCH GR TAPER
-LDET-	23+80	25+11.25	RT	131.25'				24+30	6'	8'		150.00'		2.5'	1				1								FILL WARRANT - SHOULDER VARIES TO MATCH GR TAPER
TOTAL				587.50'											4				4								
LESS ANCHOR DEDUCTIONS																											
GREU TL-2			4 @ 25.00'	-100.00'																							
TYPE III			4 @ 18.75'	-75.00'																							
SUB TOTAL				412.50'																							
SAY				412.50'											4				4								
ADDITIONAL GUARDRAIL POSTS			5																								

RI-2438

COMPUTED BY: John Burgess	**DATE:** 06/02/2021	**PROJECT NO.**	**SHEET NO.**
CHECKED BY: Justin Davenport	**DATE:** 06/02/2021	B-5728	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	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	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	15 .064	18 .064		R. C. PIPE CLASS III 12	15	18		R. C. PIPE CLASS IV 12	15	18		R. C. PIPE CLASS V 12	15	
LDET 20+05	17 LT	0301		609.7																											
		0301	0305		605.8	605.1			8			1																			
LDET 20+05	17 RT	0302		609.7																											
		0302	0301		605.9	605.8																32									
LDET 19+20	26 LT	0304		608.5																											
		0304	0305		606.8	604.8			88						1	1															
LDET 20+05	24 LT	0305		608.9																											
		0305	0303		604.8	604.7				8																					
		0401	0403		606.5	591.7												44													
L 19+59	17 RT	0401		609.9																											
		0402	0401		606.7	606.5																				36					
L 19+76	17 LT	0402		610.0																											
L 16+18	32 RT	0404							32																						
L 19+32	38 LT	0405								108																					
L 25+62	35 LT	0501							28																						
L 15+44	23 RT	0000																													
L 19+32	27 LT	0000																													
L 23+38	31 RT	0000																													
L 23+57	30 LT	0000																													
L 29+09	21 RT	0000																													
L 25+58	22 RT	0000																													
L 20+01	23 RT	0000																													
LDET 20+05	0 RT	0000																													
LDET 20+05	20 LT	0000																													
LDET 20+05	29 LT	0000																													
LDET 19+61	25 LT	0000																													
SHEET TOTALS									156	116		1			1	1		44				32				36					
PROJECT TOTALS									156	116		1			1	1		44				32				36					

LINE & STATION / STRUCTURE	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	5' THRU 10' A LIN. FT.	10' AND ABOVE B LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29
LDET 20+05 / 0301				1																								1
0301–0305																												
LDET 20+05 / 0302				1																								1
0302–0301																												
LDET 19+20 / 0304																												
0304–0305																												
LDET 20+05 / 0305				1																								
0305–0303																												
0401–0403																												
L 19+59 / 0401				1																								1
0402–0401																												
L 19+76 / 0402				1																								1
SHEET TOTALS				5																								4
PROJECT TOTALS				5																								4

LINE & STATION / STRUCTURE	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41		M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54			15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (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
LDET 20+05 / 0301						1																							Temp TB 2GI
0301–0305																												8	Temp 15"
LDET 20+05 / 0302						1																							Temp TB 2GI
0302–0301																												32	Temp 15"
LDET 19+20 / 0304																													
0304–0305																												88	Temp 15"
LDET 20+05 / 0305			1											1															Temp. JBw/MH
0305–0303																												8	Temp. 18"
0401–0403																	2												
L 19+59 / 0401						1																							
0402–0401																													
L 19+76 / 0402						1																							
L 16+18 / 0404																													
L 19+32 / 0405																													
L 25+62 / 0501																													
L 15+44 / 0000																												22	
L 19+32 / 0000																												149	
L 23+38 / 0000																												21	
L 23+57 / 0000																												21	
L 29+09 / 0000																												22	
L 25+58 / 0000																												24	
L 20+01 / 0000																												7	
LDET 20+05 (0 RT) / 0000																												29	
LDET 20+05 (20 LT) / 0000																												6	
LDET 20+05 (29 LT) / 0000																												6	
LDET 19+61 / 0000																												85	
SHEET TOTALS			1			4								1			2											528	
PROJECT TOTALS			1			4								1			2											528	

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: _J. McCray, L.G.___ DATE: _09/29/2021_
CHECKED BY: _D. Teague, P.E._ DATE: 09/29/2021_

(12-17-19)

PROJECT NO.	SHEET NO.
B-5728	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU	12	50	75	100		
			TOTAL CY/TONS/SY:		50	75**	100**	0	0

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

PROJ. REFERENCE NO.	SHEET NO.
B-5728	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	LEE LOUIS BARBER & SABRINA M. BARBER
2	4	LEE LOUIS BARBER & SABRINA M. BARBER
3	4	GLEN RAVEN MILLS INC
4	4	KAY TROXLER BOOE & WILLIAM R. BOOE
5	5	TROXLER REAL ESTATE & JOSEPH H. TROXLER HEIRS
6	5	WILLIAM R. BOOE & KATHRYN T. BOOE

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

DocuSign Envelope ID: B996BE44-C238-4E77-91D9-8E6E758C94CF

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5728	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

DocuSigned by: Trent E. Huffman
NORTH CAROLINA PROFESSIONAL SEAL 023912 ENGINEER TRENT E. HUFFMAN
12/9/2021

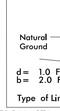
HYDRAULICS ENGINEER

DocuSigned by: Cameron Long
NORTH CAROLINA PROFESSIONAL SEAL 034333 ENGINEER CAMERON M. LONG
12/9/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

DETAIL 401
TOE PROTECTION
(Not to Scale)



Type of Liner= Class B Rip-Rap

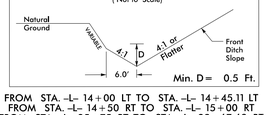
FROM STA. –L– 18+50 RT TO STA. –L– 19+70 RT
FROM STA. –L– 23+50 RT TO STA. –L– 26+00 RT

DETAIL 402
RIP RAP AT EMBANKMENT
(Not to Scale)

Type of Liner= 380 TONS CL II Rip-Rap
Geotextile= 384 sy

FROM STA. –L– 22+45 TO STA. –L– 22+90

DETAIL 501
SPECIAL CUT DITCH wHINGE
(Not to Scale)



FROM STA. –L– 14+00 LT TO STA. –L– 14+45.11 LT
FROM STA. –L– 14+50 RT TO STA. –L– 15+00 RT
FROM STA. –L– 25+75 RT TO STA. –L– 29+67.69 RT
FROM STA. –L– 29+67.69 LT TO STA. –L– 30+00 LT

NAD 83 NA 2011

-L- PC Sta. 13+95.60
-L- PT Sta. 14+94.62
15
20

TERRY TORAN
TRACY G. TORAIN
DB 3319 PG 619
PB 2 PG 137

MISTY D. JONES
DB 2107 PG 64
PB 2 PG 137

LOUIS S. NEWTON
DB 3585 PG 431

ALBERT GURNEY & BETTY BEAN SUTTON
DB 410 PG 211

LEE LOUIS & SABRINA M. BARBER
DB 2631 PG 906

ALBERT GURNEY & BETTY BEAN SUTTON
DB 1703 PG 607

BM#1
SPIKE IN 16"QUAD POPLAR
STA –L– 18+69.15
115' LEFT
ELEV=615.33'

3
GLEN RAVEN MILLS INC
DB 442 PG 215
PB 76 PG 78
PB 76 PG 74
PB 6 PG 23

TROXLER REAL ESTATE
JOSEPH H. TROXLER HEIRS
DB 72 PG 488
WILL BOOK 15 PG 50

JAMES W. MCIVER
JANE N. MCIVER
DB 541 PG 16
PB 2 PG 137

PEGGY G. MANSFIELD
DB 369 PG 545
PB 2 PG 137

MICHAEL A. BYERLY
DB 2634 PG 404
DB 1798 PG 390
PB 2 PG 137

BARBARA LEE HAMLETT
DB 88 PG 284
PB 2 PG 137

LUCY ANN MCMILLAN
DB 2806 PG 880
PB 2 PG 137

ROY W. MITCHELL
SHIRLEY B. MITCHELL
DB 548 PG 687
PB 2 PG 137

20' UNOPENED STREET

LEE LOUIS BARBER
SABRINA M. BARBER
DB 2631 PG 906
DB 430 PG 529
DB 432 PG 213

2
LEE LOUIS BARBER
SABRINA M. BARBER
DB 2631 PG 906
DB 430 PG 529

1
LEE LOUIS BARBER
SABRINA M. BARBER
DB 2631 PG 906
DB 430 PG 529

4
KAY TROXLER BOOE
WILLIAM R. BOOE
DB 2615 PG 340
PB 71 PG 394

RIP RAP OUTLET PAD
EST 3 TONS CL B RIPRAP
EST 10 SY GEOTEXTILE

BEGIN APPROACH SLAB
STA –L– 19+82
CLASS II RIPRAP TO ELEV. 602.2'
STRUCTURE PAY ITEM

CLASS II RIPRAP TO ELEV. 607.3'
STRUCTURE PAY ITEM
END APPROACH SLAB
STA –L– 23+72
END BRIDGE
STA –L– 23+47

BEGIN BRIDGE
STA –L– 20+07

RIP RAP AT EMBANKMENT
SEE DETAIL 402
ROADWAY PAY ITEM

SPEC CUT DITCH wHINGE
SEE DETAIL 501

BEGIN CONSTRUCTION
-L- STA 14+00.00

BEGIN TIP PROJECT B-5728
-L- PRC STA 14+45.11

N 11° 22' 55.4" E
-L-

N 11° 18' 46.4" E
-L-

TO OLD NC 87
RETAIN

-NC 87-

BEG CLF RESET
STA 14+47.78 –L–
50.00'RT

BL-3
STA –L– 15+41.12
18.91' RT

RESET CLF W/3 SBW INSTALLED DURING DETOUR CONSTRUCTION AND TWO (2) 12' SWING GATES

DO NOT DISTURB CONC. PAD

TOE PROTECTION
SEE DETAIL 401
EST 26 TONS CL B RIPRAP
EST 58 SY GEOTEXTILE

END CLF RESET
STA 18+31.82
50.00'RT

RIP RAP OUTLET PAD
EST 1 TONS CL B RIPRAP
EST 5 SY GEOTEXTILE

BM#2
SPIKE IN 28" POPLAR
STA –L– 19+71.35
149.60' RIGHT
ELEV=591.08'

BEG SBG +66.00
15" RCP-IV
TB 2GI

BEG SBG +50.00
15" CSP w/ELBOWS

BL-4
STA –L– 20+09.28
19.83' RT

EXCAVATION ELEV.=590.0'
STRUCTURE PAY ITEM

EXCAVATION ELEV. 593.0'
STRUCTURE PAY ITEM

CLASS II RIPRAP TO ELEV. 599.0'
STRUCTURE PAY ITEM

CLASS II RIPRAP TO ELEV. 599.0'
STRUCTURE PAY ITEM

250 LF WWF
+52.00 –L–
50.00'RT
70.00'RT

BEG WWF
STA 22+20.96 –L–
70.00'RT

BRIDGE #82
CONC. STL BS

MATCHLINE SHEET 5
-L- STA 24+00.00

-L-

PI Sta 14+20.36	PI Sta 14+69.86
△ = 0° 11' 12.1" (RT)	△ = 0° 15' 21.1" (LT)
D = 0° 22' 37.7"	D = 0° 31' 00.6"
L = 49.51'	L = 49.51'
T = 24.75'	T = 24.75'
R = 15,192.72'	R = 11,085.86'
	DS = 55 MPH
	e = NC

UTILITY OWNERS:
WATER: TOWN OF OSSIPEE
POWER: DUKE ENERGY
COMMUNICATIONS: AT&T
GAS (TRANSMISSION): CARDINAL/WILLIAMS PIPELINE

NOTE:
CONTRACTOR TO CONTACT DUKE ENERGY AND COORDINATE THE CONSTRUCTION AND EXCAVATION OF SLOPES AT NEW POLE LOCATIONS. SEE UTILITY BY OTHERS (UO) PLANS AND PROJECT SPECIAL PROVISIONS FOR INFORMATION. DUKE ENERGY CONTACT PERSON IS MARIA MENDOZA, 984-227-2504, MARIA.MENDOZA@DUKE-ENERGY.COM

FOR ON-SITE DETOUR SEE SHEET NO. 2B-1 AND NO. 2B-2
FOR STRUCTURE PLANS SEE S-1 THRU S-33
FOR -L- PROFILE SEE SHEET NO. 6

12/3/2021
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5728	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

DocuSigned by: TRENT HUFFMAN — NORTH CAROLINA PROFESSIONAL SEAL 023912 ENGINEER TRENT E. HUFFMAN — 12/9/2021

HYDRAULICS ENGINEER

DocuSigned by: CAMERON LONG — NORTH CAROLINA PROFESSIONAL SEAL 034333 ENGINEER CAMERON M. LONG — 12/9/2021

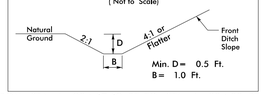
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

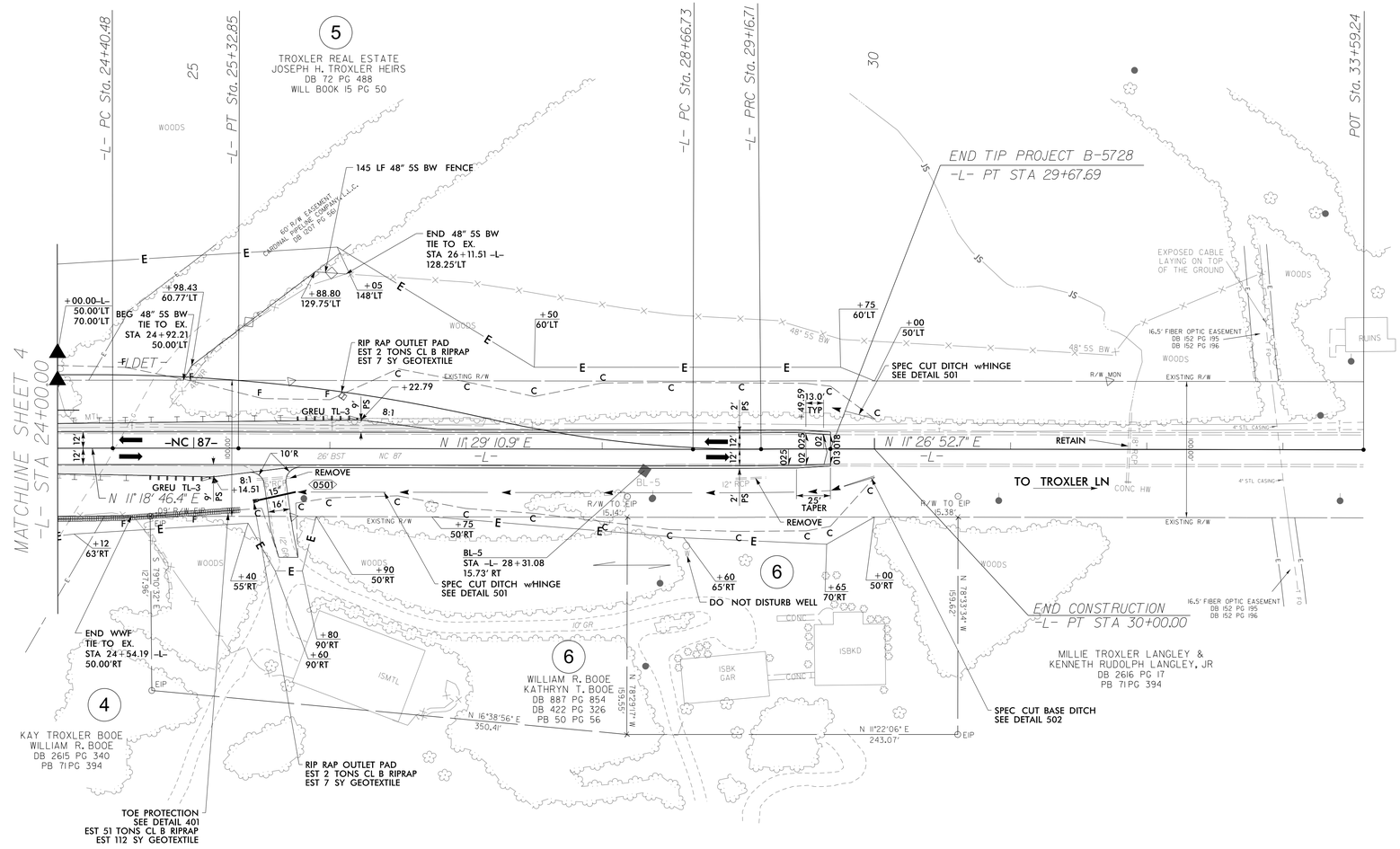
NAD 83 NA 2011

-L-		
PI Sta 24+86.66	PI Sta 28+91.72	PI Sta 29+42.20
△ = 0° 10' 24.5" (RT)	△ = 0° 33' 32.0" (LT)	△ = 0° 31' 13.7" (RT)
D = 0° 11' 16.0"	D = 1° 07' 05.5"	D = 1° 01' 15.0"
L = 92.37'	L = 49.98'	L = 50.99'
T = 46.18'	T = 24.99'	T = 25.49'
R = 30,510.61'	R = 5,123.96'	R = 5,612.71'
DS = 55 MPH	DS = 55 MPH	DS = 55 MPH
e = NC	e = NC	e = NC

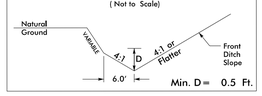
DETAIL 502
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA. -L- 29+67.69 RT TO STA. -L- 30+00 RT

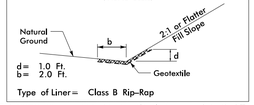


DETAIL 501
SPECIAL CUT DITCH wHINGE
(Not to Scale)



FROM STA. -L- 14+00 RT TO STA. -L- 14+45.11 RT
FROM STA. -L- 14+00 LT TO STA. -L- 14+45.11 LT
FROM STA. -L- 25+75 RT TO STA. -L- 29+67.69 RT
FROM STA. -L- 29+67.69 LT TO STA. -L- 30+00 LT

DETAIL 401
TOE PROTECTION
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. -L- 18+50 RT TO STA. -L- 19+70 RT
FROM STA. -L- 23+50 RT TO STA. -L- 25+30 RT

UTILITY OWNERS:
WATER: TOWN OF OSSIPEE
POWER: DUKE ENERGY
COMMUNICATIONS: AT&T
GAS (TRANSMISSION): CARDINAL/WILLIAMS PIPELINE

NOTE:
CONTRACTOR TO CONTACT DUKE ENERGY AND COORDINATE THE CONSTRUCTION AND EXCAVATION OF SLOPES AT NEW POLE LOCATIONS. SEE UTILITY BY OTHERS (UO) PLANS AND PROJECT SPECIAL PROVISIONS FOR INFORMATION. DUKE ENERGY CONTACT PERSON IS MARIA MENDOZA, 984-227-2504, MARIA.MENDOZA@DUKE-ENERGY.COM

FOR ON-SITE DETOUR SEE SHEET NO. 2B-1 AND NO. 2B-2
FOR -L- PROFILE SEE SHEET 6

12/3/2021
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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-5728	6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 023912 ENGINEER BRENT E. HUFFMAN
12/9/2021

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034333 ENGINEER CAMERON M. LONG
12/9/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License No.: F-0105

–L– NC 87 BRIDGE 112

BM#1 ELEVATION = 615.33'
N 882026 E 1849201
L STATION 18+69.15 115 LEFT
SPIKE IN 16"QUAD POPLAR

BM#2 ELEVATION = 591.08'
N 882071 E 1849480
L STATION 19+71.35 149.60 RIGHT
SPIKE IN 28" POPLAR

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 18300	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 597.4	FT
BASE DISCHARGE	= 20900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 598.7	FT
OVERTOPPING DISCHARGE	= 83000	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 609.8	FT
DATE OF SURVEY	= 05/10/2019	
W.S. ELEVATION AT DATE OF SURVEY	= 581.9	FT

BEGIN GRADE
-L- STA 14+45.11
ELEV = 615.81'

PI = 18+00.00
EL = 609.60'
K = 117
VC = 260'
DS = 55 MPH

PROPOSED GRADE

BEGIN DITCH
14+00.00 LT
613.87

(–) 1.5961%

END DITCH
14+45.11 LT
613.15

BEGIN DITCH
14+50.00 RT
614.49

(–) 4.9368%

END DITCH
15+00.00 RT
612.02

(–)1.7498%

(+)0.4675%

BEGIN BRIDGE STA 20+07

END BRIDGE STA 23+47

C/L 21+77.00 –L–
1@112' 63" GIRDER,
1@116' 63" GIRDER,
1@112' 63" GIRDER,
120 SKEW
C/L ELEV = 611.4

EXISTING GROUND

UNCLASSIFIED STRUCTURE EXCAVATION STRUCTURE PAY ITEM

CLASS II RIP RAP SLOPE PROTECTION STRUCTURE PAY ITEM

4'–0" CAP

1.5:1

EXCAVATION ELEVATION = 593.0'

NWSEL = 581.9'

REMOVE EXISTING BRIDGE

UNCLASSIFIED STRUCTURE EXCAVATION STRUCTURE PAY ITEM

EXCAVATION ELEVATION = 590.0'

CLASS II RIP RAP SLOPE PROTECTION STRUCTURE PAY ITEM

4'–0" CAP

1.5:1

DITCH LEGEND	
LEFT DITCH	---·---·---
RIGHT DITCH	----------

FOR PLAN SEE SHEETS NO.4 AND NO.5

–L– NC 87 BRIDGE 112

END GRADE
-L- STA 29+67.69
ELEV = 631.29'

PI = 29+05.00
EL = 628.95'
K = 124
VC = 120'
DS = 56 MPH

PI = 25+70.00
EL = 613.20'
K = 116
VC = 490'
DS = 55 MPH

PROPOSED GRADE

(+)0.4675%

BEGIN DITCH
25+75.00 RT
613.09

UNDERCUT

(+)4.7015%

(+) 3.5550%

(+)4.7015%

(+)3.7327%

29+67.69 RT
627.05

BEGIN DITCH
29+67.69 LT
628.59

(+) 4.1473%

END DITCH
30+00.00 RT
630.36

END DITCH
30+00.00 LT
629.93

(+) 10.2445%

EXISTING GROUND

DITCH LEGEND	
LEFT DITCH	---·---·---
RIGHT DITCH	----------

FOR PLAN SEE SHEET NO.5

12/3/2021
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dmoulton