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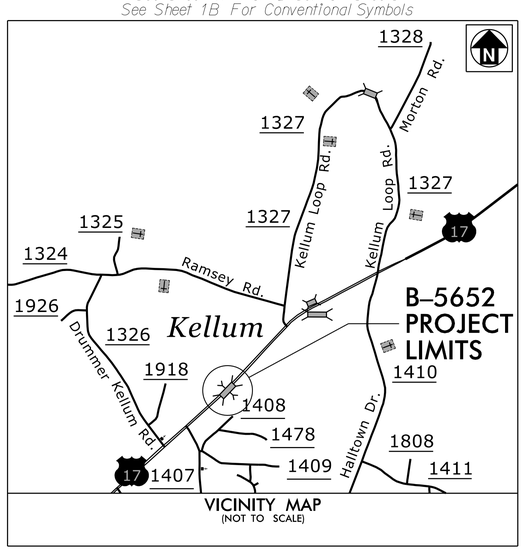
09/08/99

PROJECT: B-5652

CONTRACT: C204477

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

ONSLOW COUNTY

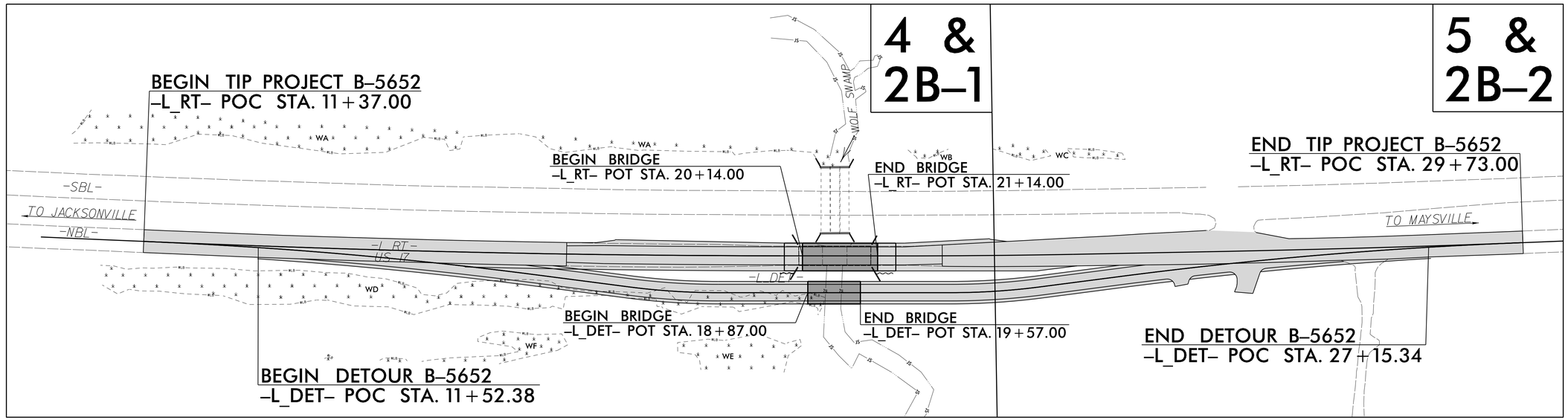
LOCATION: BRIDGE NO. 33 OVER WOLF SWAMP ON US 17

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5652	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45607.1.1		P.E.
45607.2.1		R/W, UTL
45607.3.1		CONST

NAD 83/2011



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SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSE NO. C-2521

GRAPHIC SCALES

PLANS: 50 0 50 100

PROFILE (HORIZONTAL): 50 0 50 100

PROFILE (VERTICAL): 10 0 10 20

DESIGN DATA

ADT 2022 = 16,900
ADT 2040 = 22,300
K = 9 %
D = 55 %
T = 5 %*
V = 60 MPH
V_{DET} = 50 MPH
* TTST = 2% DUAL 3%
STATEWIDE TIER
FUNC. CLASS ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT = 0.329 MILES

LENGTH STRUCTURE TIP PROJECT = 0.019 MILES

TOTAL LENGTH TIP PROJECT = 0.348 MILES

PLANS PREPARED FOR NCDOT BY:

MOTT MACDONALD
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.mottmac.com/americas
LICENSE NO. F-0669

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 23, 2021

LETTING DATE:
DECEMBER 20, 2022

MICHAEL PEKAREK, PE
PROJECT ENGINEER
PEF ENGINEER

JOSH DALTON, PE
HYDRAULIC ENGINEER
PEF ENGINEER

DAVID STUTTS, PE
NCDOT BRIDGE PROGRAM MANAGER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON

P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27391 MICHAEL PEKAREK

P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

15:42:02
R:\Roadway\Proj\B5652_rdy_tsh.dgn
RIE8413

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5652	1A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 27391 ENGINEER MICHAEL PEKAREK

MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
MOTT MACDONALD
7621 Parkway Road, Suite 115
Fuquay-Varina, NC 27526
www.mottmac.com/north-america

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 III.

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SUBSURFACE DRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE Duke Energy.

Piedmont Natural Gas, and CenturyLink

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

FINAL PAVEMENT MARKING:

NO FINAL PAVEMENT MARKING PLANS. FINAL STRIPING MATCHES ORIGINAL STRIPING.

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
DIVISION 5 - SUBGRADE, BASES, AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
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
840.66	Drainage Structure Steps
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

9/4/2024 AM
R:\Roadway\Proj\B5652_rdy_sht1A.dgn
PEKAREK

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5652	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.)

PROJECT REFERENCE NO.	SHEET NO.
B-5652	2A-1

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27391 MICHAEL PEKAREK

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CLARK S. MORRISON

MOTT MACDONALD I& E, LLC LICENSE NO. F-0669

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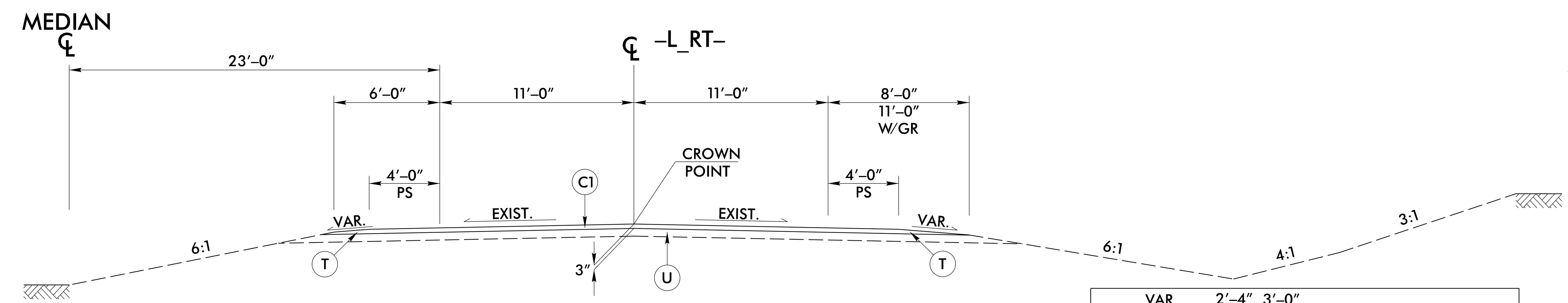
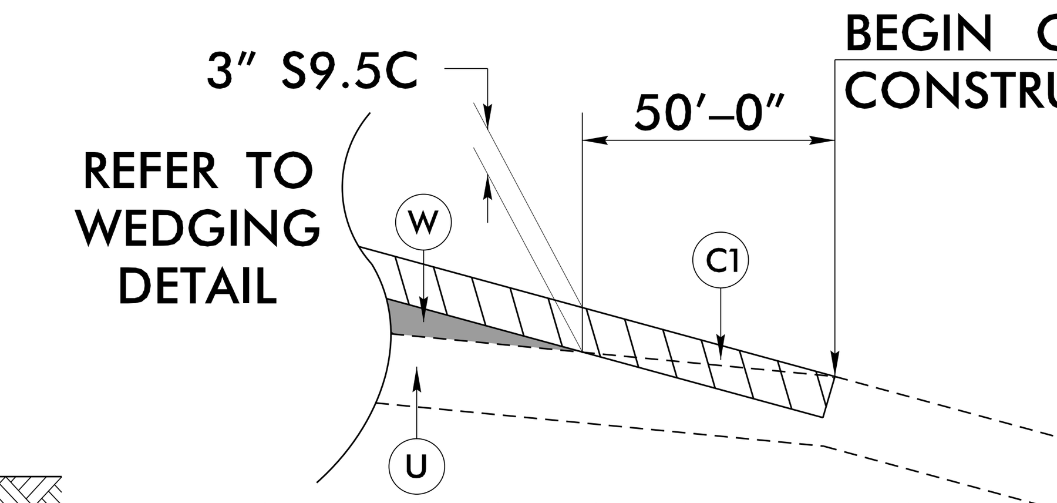


TYPICAL SECTION NO. 1

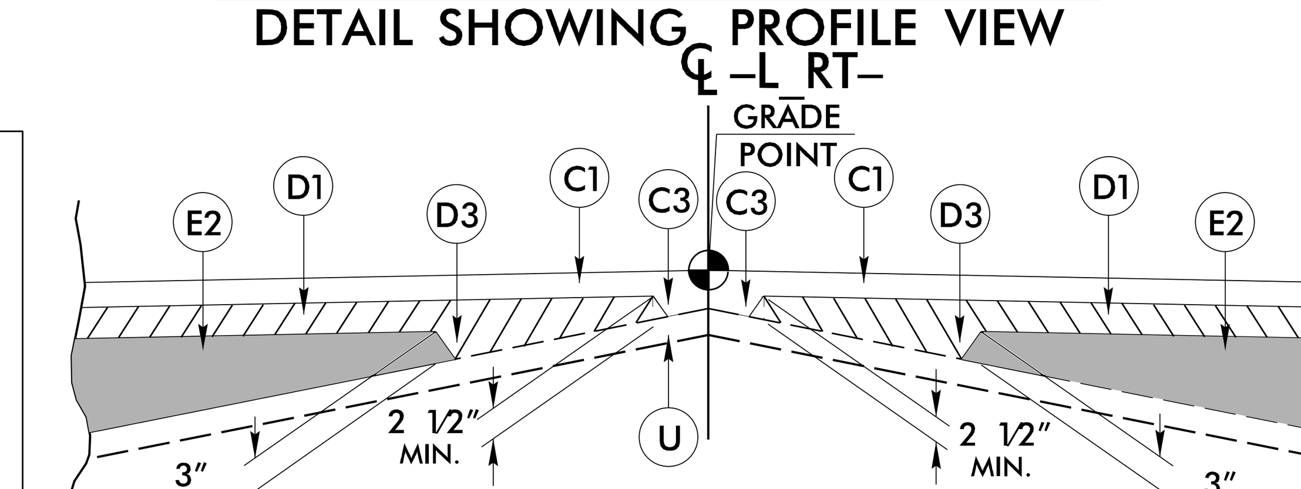
USE TYPICAL SECTION NO. 1

-L_RT- STA. 11+37.00 TO 17+50.00
-L_RT- STA 21+50.00 TO 29+73.00

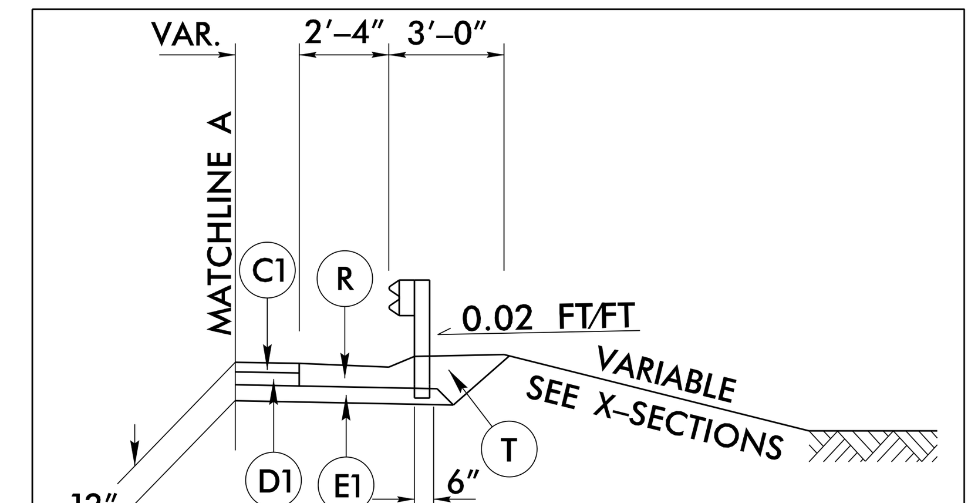


INCIDENTAL MILLING DETAIL

DETAIL SHOWING PROFILE VIEW

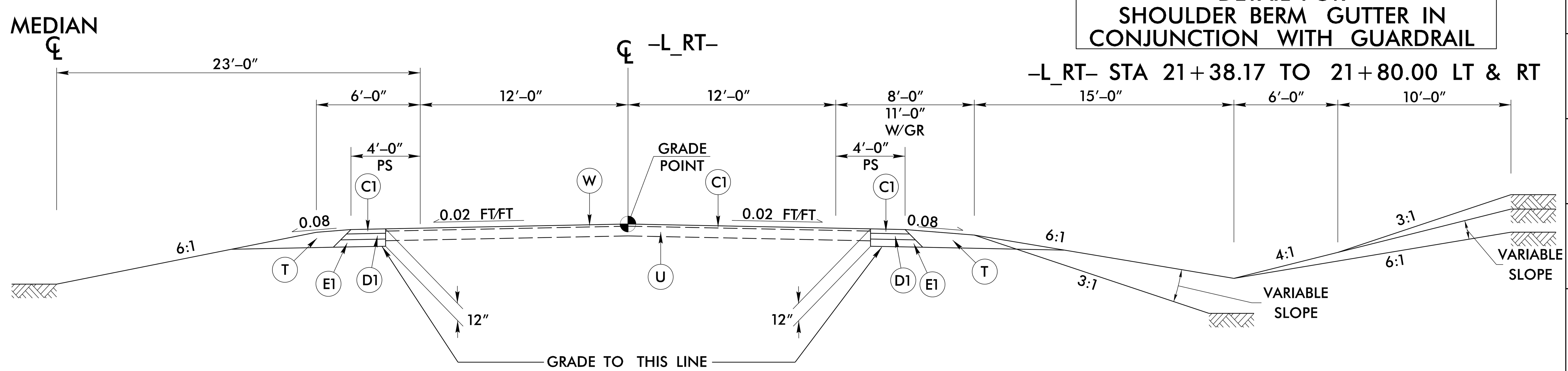


Detail Showing Method of Wedging



DETAIL FOR SHOULDER BERM GUTTER IN CONJUNCTION WITH GUARDRAIL

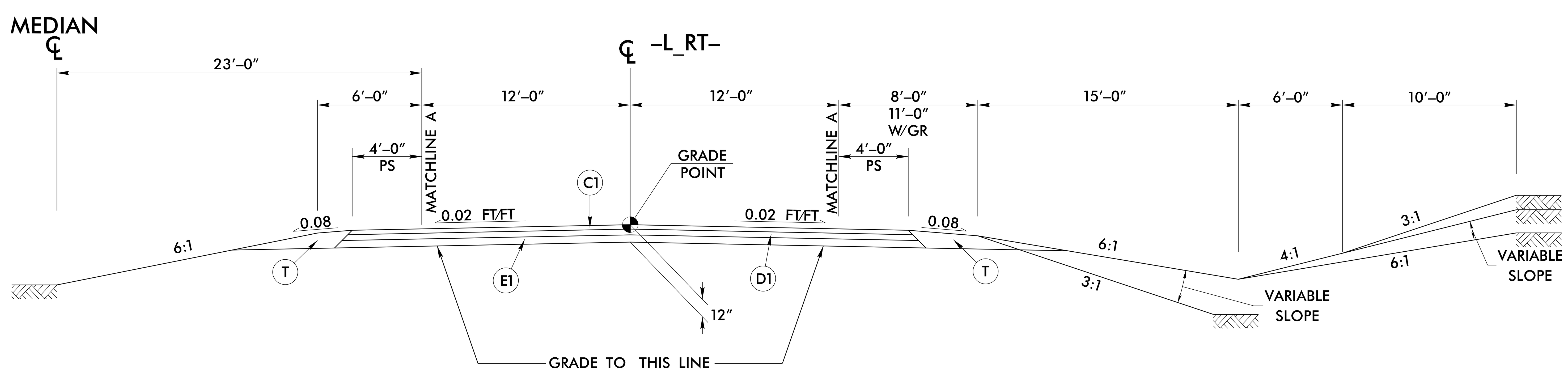
-L_RT- STA 21+38.17 TO 21+80.00 LT & RT



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-L_RT- STA. 17+50.00 TO 19+64.00



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-L_RT- STA. 19+64.00 TO 20+14.00 (BEGIN BRIDGE)
-L_RT- STA 21+14.00 (END BRIDGE) TO 21+50.00

PAVEMENT SCHEDULE

C1	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.
C2	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.
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" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D3	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.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
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.
J1	PROP. 8" AGGREGATE BASE COURSE.
P	PRIME COAT, AT AN AVERAGE RATE OF 0.35 GALLONS PER SQ. YD.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING).

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

PROJECT REFERENCE NO.	SHEET NO.
B-5652	2A-2

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27391 MICHAEL PEKAREK

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CLARK S. MORRISON

MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

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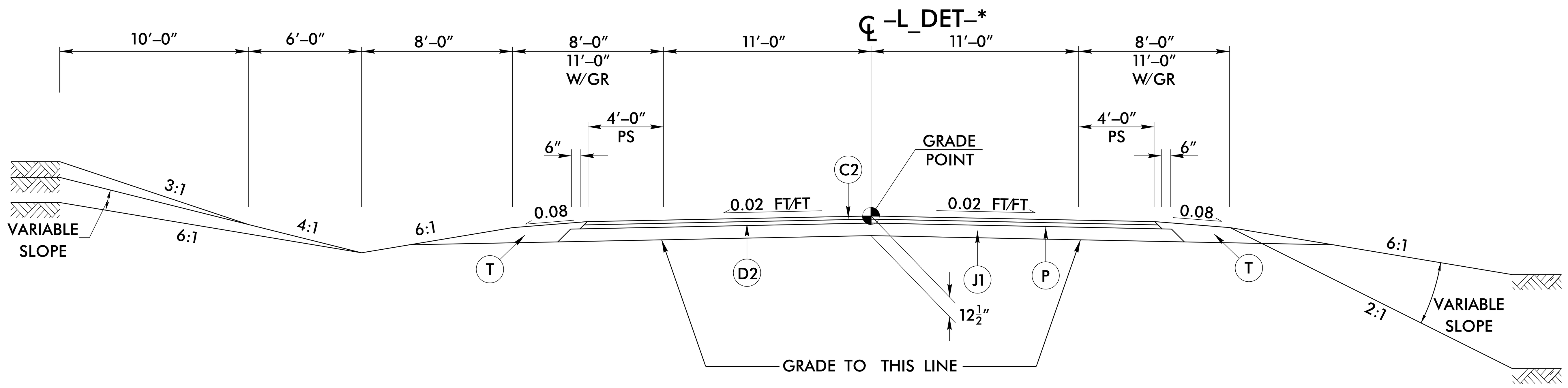
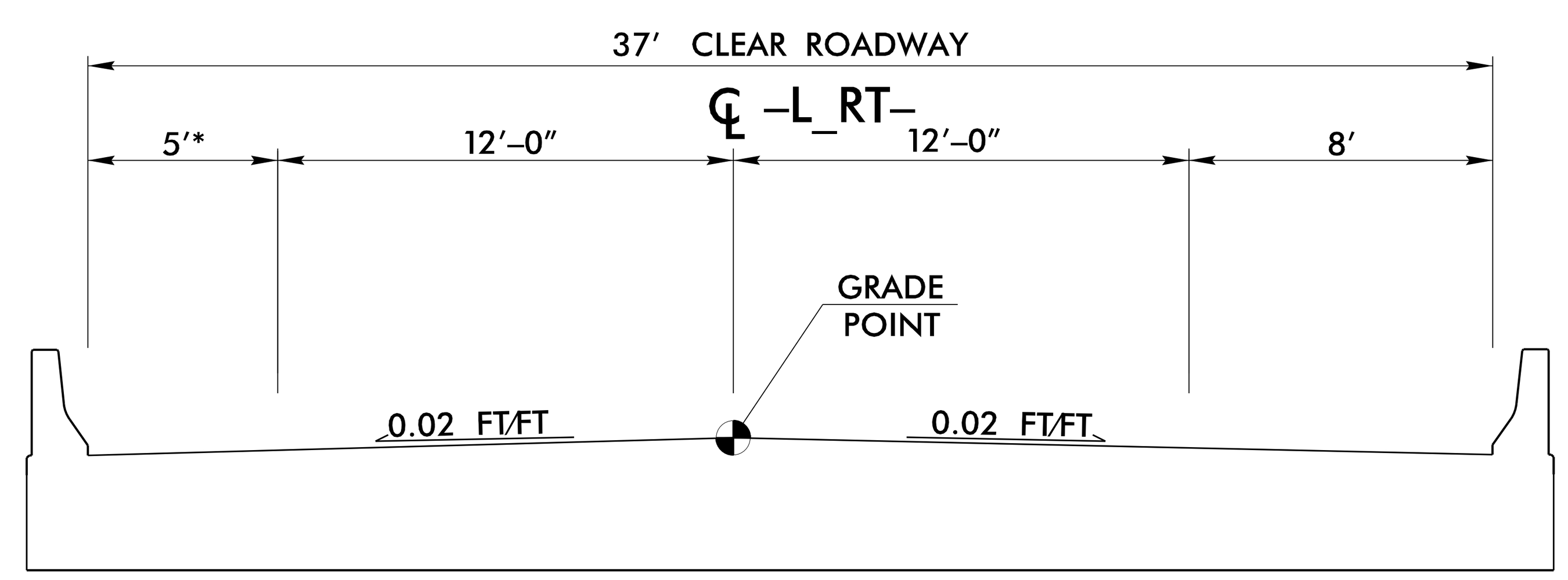


TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

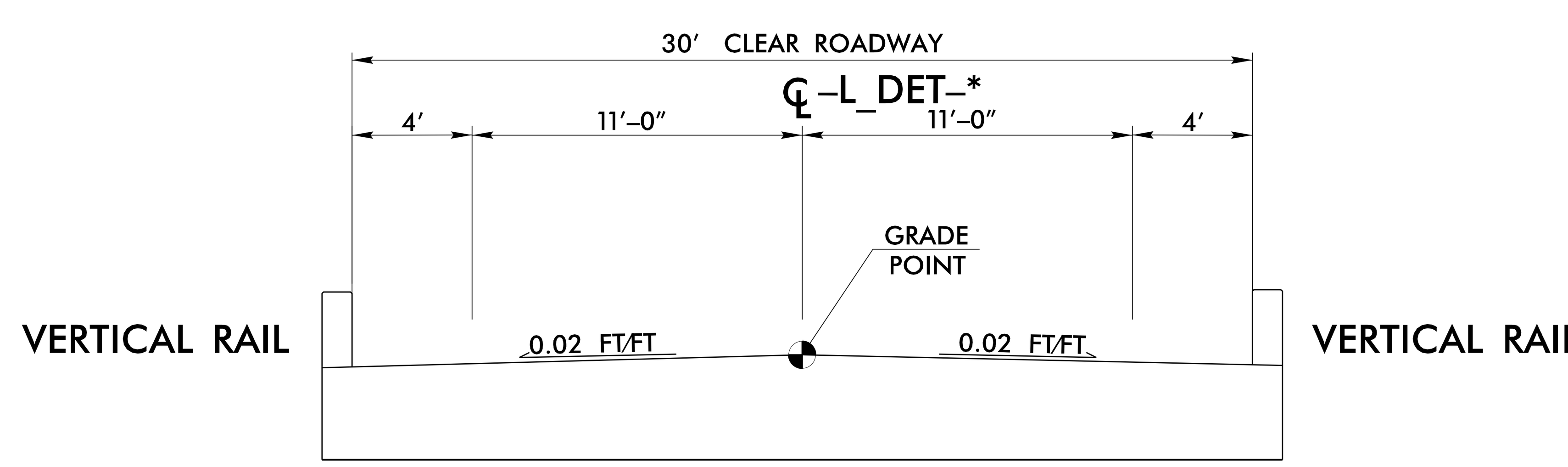
-L_DET- STA. 13+88.57 TO 18+87.00 (BEGIN BRIDGE)
-L_DET- STA. 19+57.00 (END BRIDGE) TO 24+52.10



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

-L_RT- STA. 20+14.00 (BEGIN BRIDGE) TO 21+14.00 (END BRIDGE)
* 5' REQUIRED FOR HYDRAULIC SPREAD



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6

-L_DET- STA. 18+87.00 (BEGIN BRIDGE) TO 19+57.00 (END BRIDGE)

* NOTE: V_{DET} = 50 mph

PAVEMENT SCHEDULE	
C1	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.
C2	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.
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" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D3	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.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
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J1	PROP. 8" AGGREGATE BASE COURSE.
P	PRIME COAT, AT AN AVERAGE RATE OF 0.35 GALLONS PER SQ. YD.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING).

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

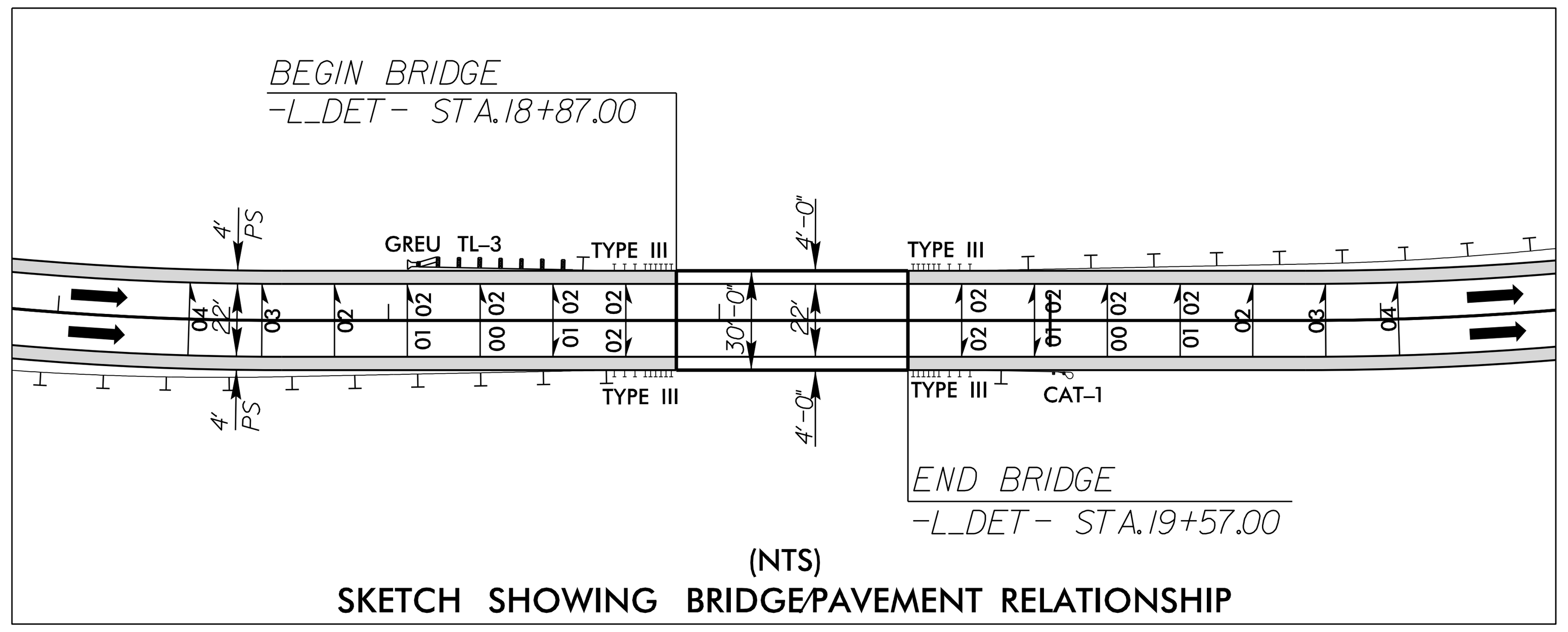
PROJECT REFERENCE NO.	SHEET NO.
B-5652	2B-1
R/W SHEET NO.	

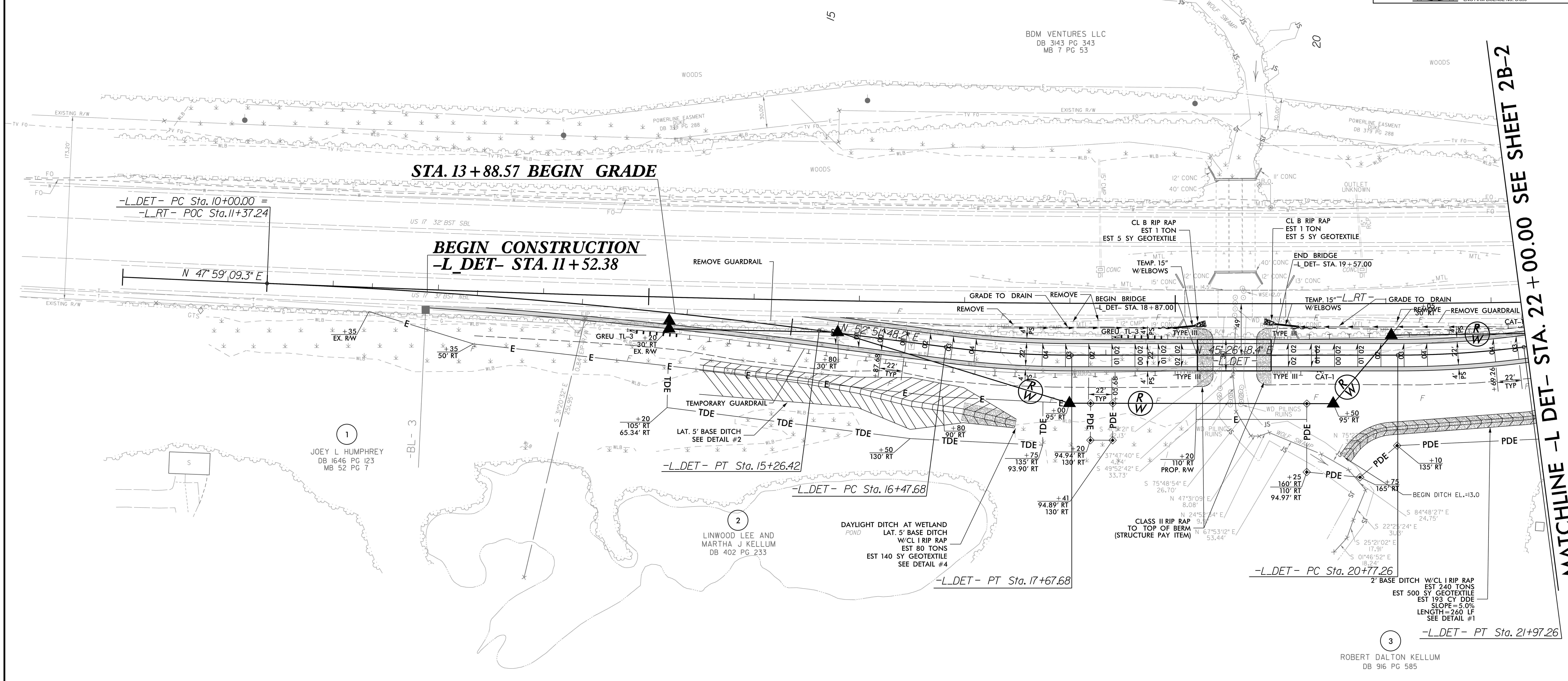
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27391 MICHAEL PEKAREK	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON
MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	SUNGATE DESIGN GROUP, P.A. LICENSE NO. C-890

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

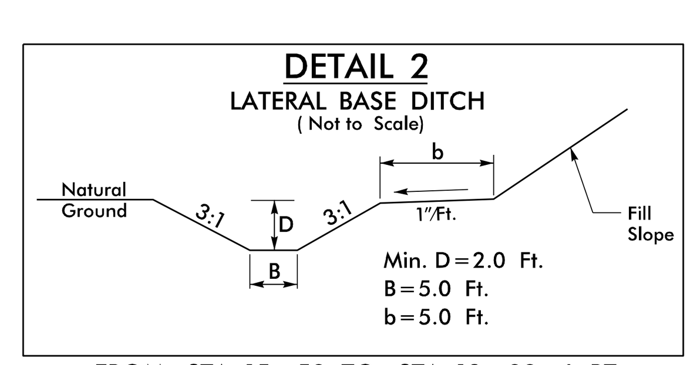
Prepared in the Office of: MOTT MACDONALD PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/americas

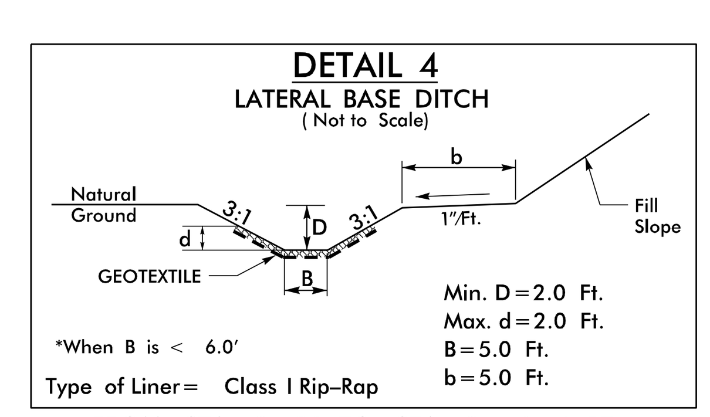
SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 TEL (919) 859-2243 ENG FIRM LICENSE NO. C-890

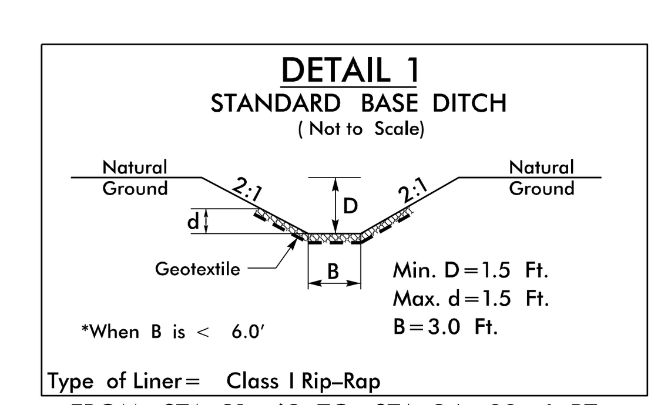




NC GRID NAD 83 NA 2011
BDM VENTURES LLC DB 3143 PG 343 MB 7 PG 53
STA. 13+88.57 BEGIN GRADE
-L_DET- PC Sta. 10+00.00 = -L_RT- POC Sta.11+37.24
BEGIN CONSTRUCTION -L_DET- STA. 11+52.38
N 47° 59' 09.3" E
REMOVE GUARDRAIL
TEMPORARY GUARDRAIL
LAT. 5' BASE DITCH SEE DETAIL #2
-L_DET- PT Sta. 15+26.42
-L_DET- PC Sta. 16+47.68
DAYLIGHT DITCH AT WETLAND LAT. 5' BASE DITCH W/CL I RIP RAP EST 80 TONS EST 140 SY GEOTEXTILE SEE DETAIL #4
-L_DET- PT Sta. 17+67.68
CL B RIP RAP EST 1 TON EST 5 SY GEOTEXTILE
TEMP. 15" W/ELBOWS
GRADE TO DRAIN
BEGIN BRIDGE -L_DET- STA. 18+87.00
END BRIDGE -L_DET- STA. 19+57.00
CLASS II RIP RAP TO TOP OF BERM (STRUCTURE PAY ITEM)
-L_DET- PC Sta. 20+77.26
2' BASE DITCH W/CL I RIP RAP EST 240 TONS EST 500 SY GEOTEXTILE EST 193 CY DDE SLOPE=5.0% LENGTH=260 LF SEE DETAIL #1
BEGIN DITCH EL.=13.0
-L_DET- PT Sta. 21+97.26
JOEY L HUMPHREY DB 1646 PG 123 MB 52 PG 7
LINWOOD LEE AND MARTHA J KELLUM DB 402 PG 233
ROBERT DALTON KELLUM DB 916 PG 585
MATCHLINE -L DET- STA. 22+00.00 SEE SHEET 2B-2







-L_DET- (V_{DET} = 50 mph)

PI Sta 12+63.38	PI Sta 17+07.76	PI Sta 21+37.35
Δ = 5° 05' 10.5" (RT)	Δ = 7° 25' 29.8" (LT)	Δ = 7° 25' 29.8" (LT)
D = 0° 57' 58.3"	D = 6° 11' 14.8"	D = 6° 11' 14.8"
L = 526.42'	L = 120.00'	L = 120.00'
T = 263.38'	T = 60.08'	T = 60.08'
R = 5,930.00'	R = 926.00'	R = 926.00'
SE = 0.02	SE = 0.04	SE = 0.04
RO = 42.00'	RO = 84.00'	RO = 84.00'

* NOTE: REMOVE ALL EXISTING PILING RUINS AS PART OF BRIDGE REMOVAL.

FOR -L_DET- PROFILE, SEE SHEET 7
FOR -L_RT- DESIGN, SEE SHEET 4 & 5

PROJECT REFERENCE NO.	SHEET NO.
B-5652	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 27391 ENGINEER MICHAEL PEKAREK	NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	SUNGATE DESIGN GROUP, P.A. LICENSE NO. C-890

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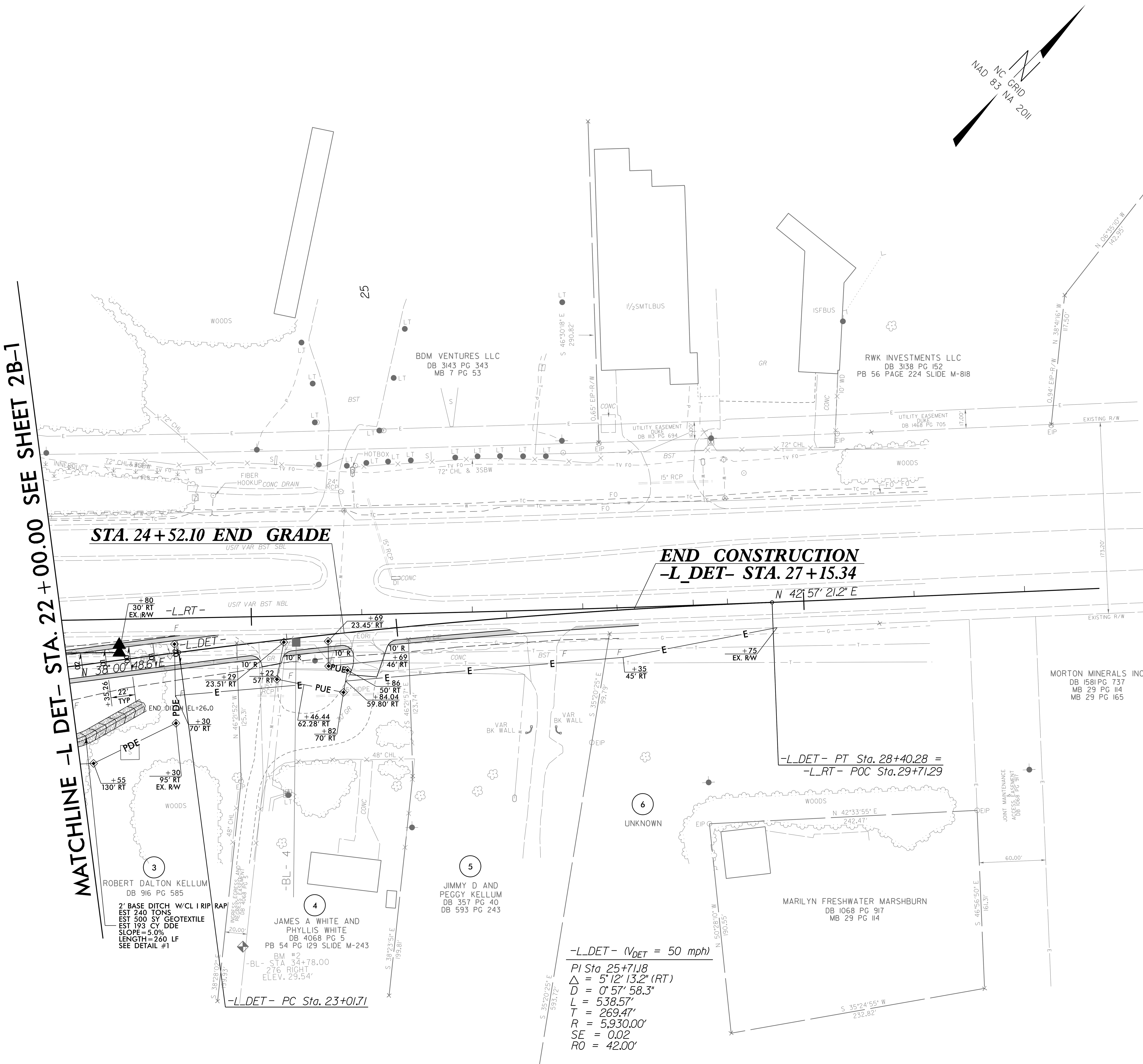
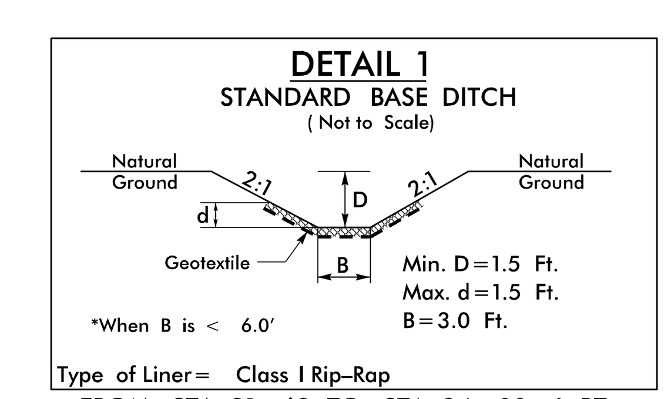
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890





FOR -L_DET- PROFILE, SEE SHEET 7
FOR -L_RT- DESIGN, SEE SHEET 4 & 5

PROJECT REFERENCE NO.	SHEET NO.

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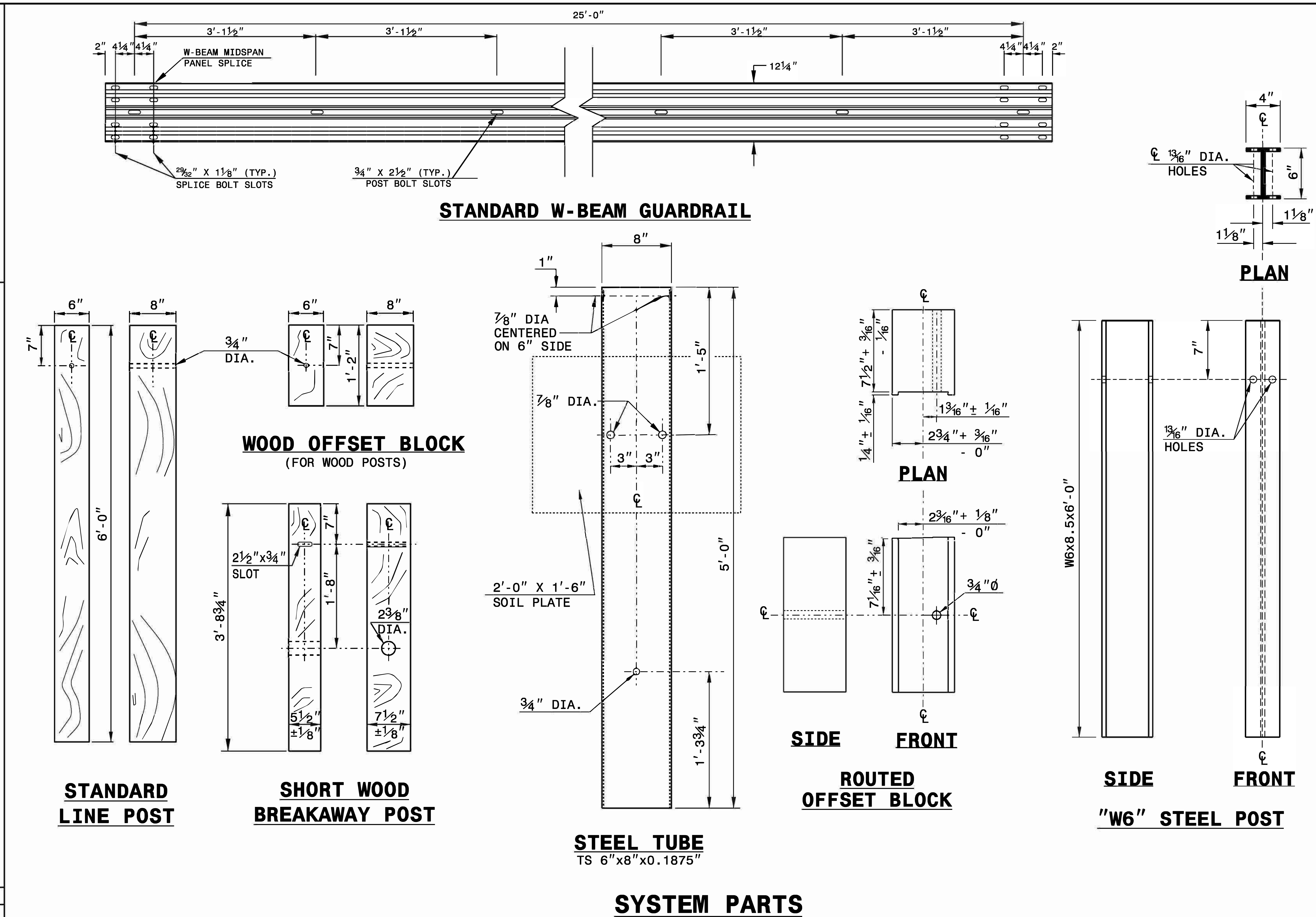
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



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 ENGINEER SEAL 33144 NICOLE M. HACKLER

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

SEE TITLE BLOCK

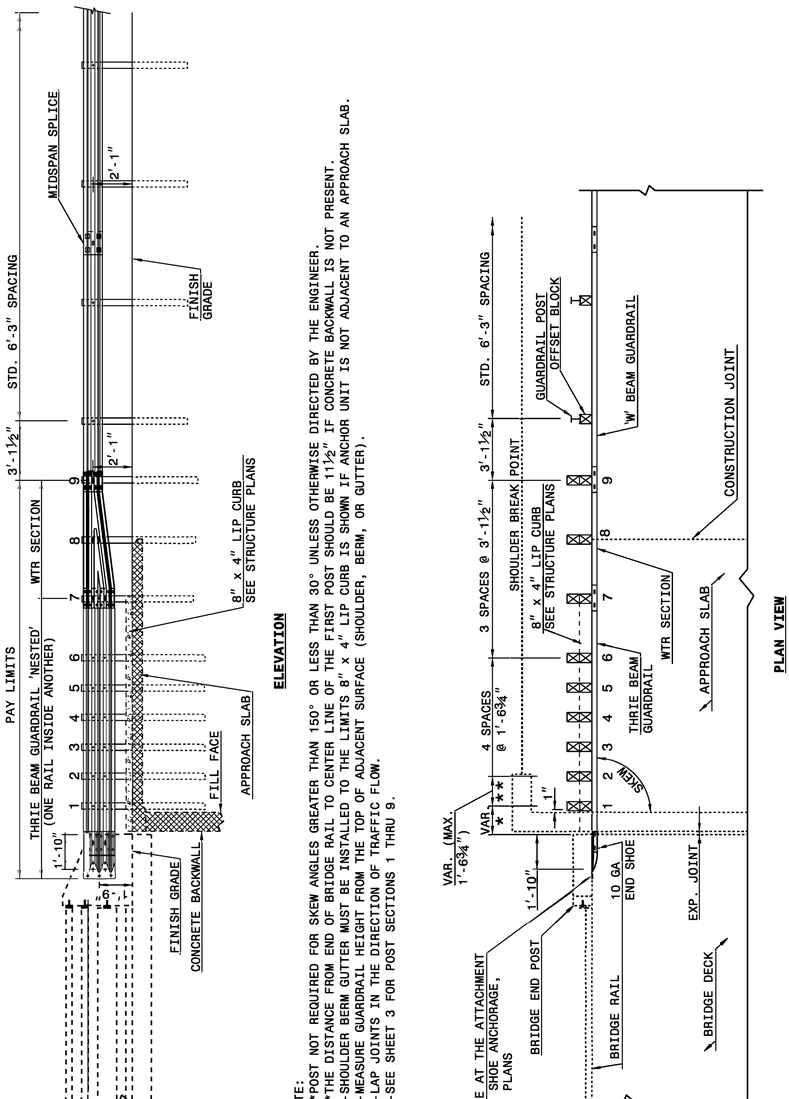
ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.

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

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

SHEET 1 OF 7
862D03



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

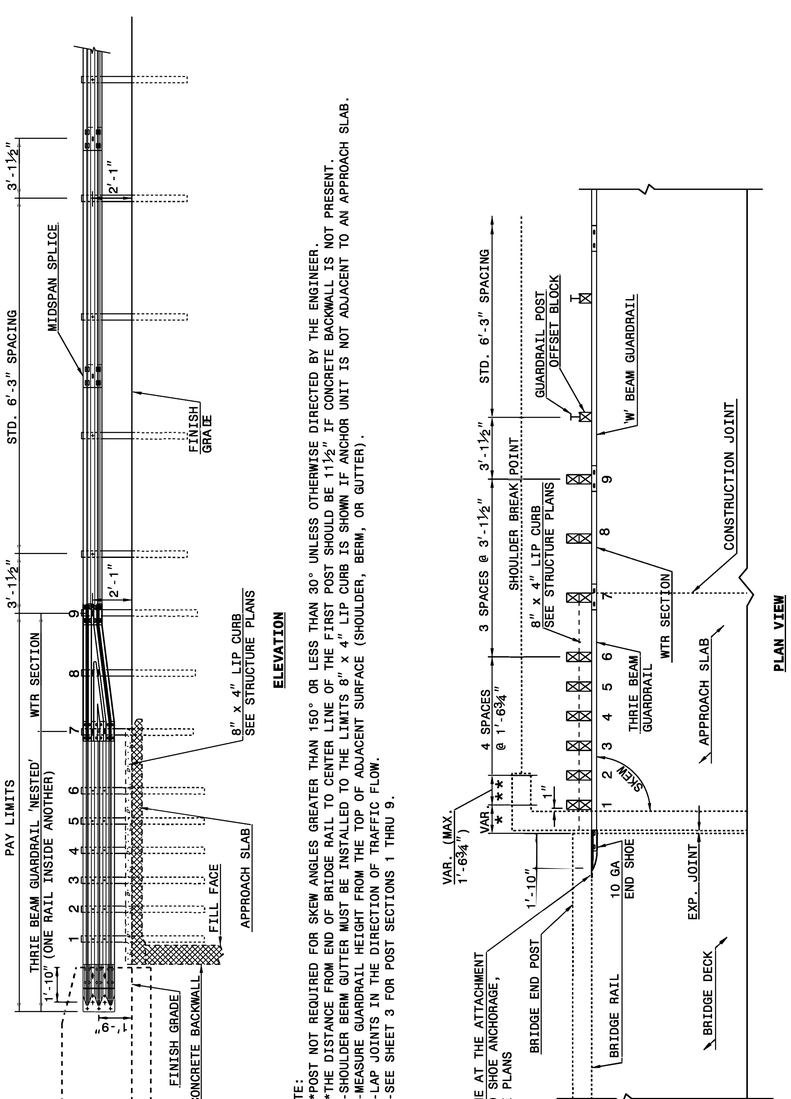
PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

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

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

SHEET 2 OF 7
862D03



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

PLAN VIEW

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

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

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

14-DEC-2017 10:36
S:\Contracts\Contracts\Special Details\jhowerton\Standard Drawings\2018 Standard Drawings\Details in Lieu of Standards\Division 8\0862d0301.dgn
jhowerton AT CSD-2925595

PROJECT REFERENCE NO.	SHEET NO.
B-5652	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 10/20/2022 F760CAEB96FC4D3...

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

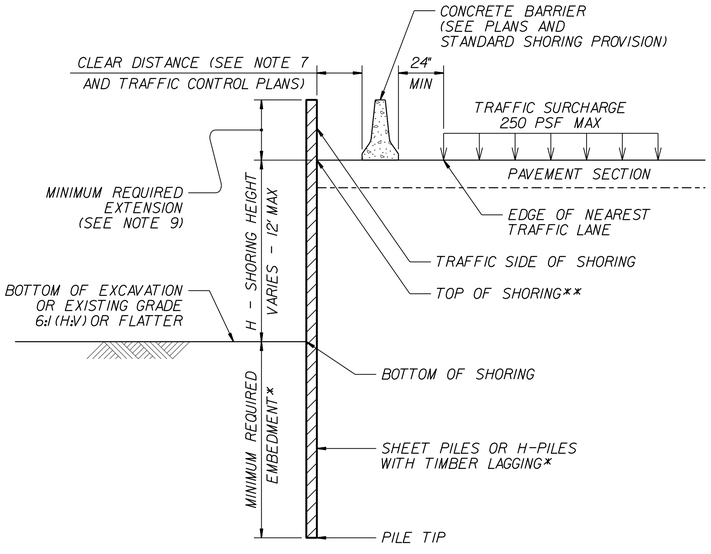
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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

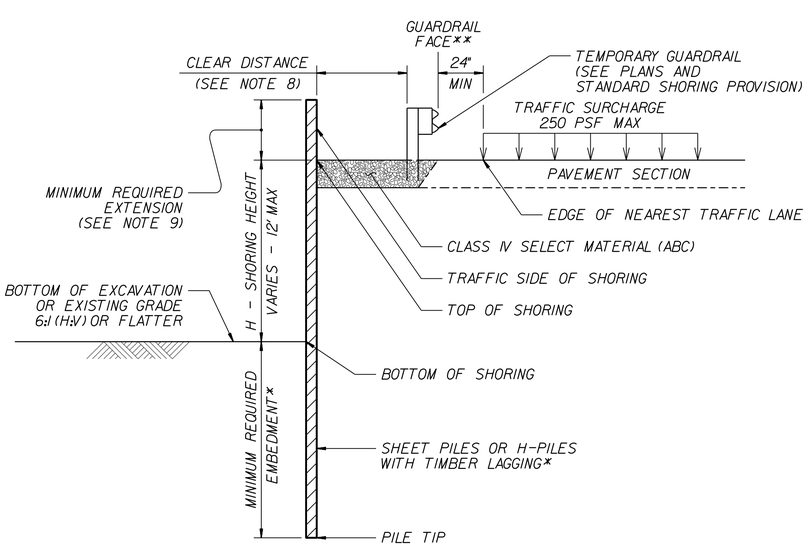
NOTES:

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



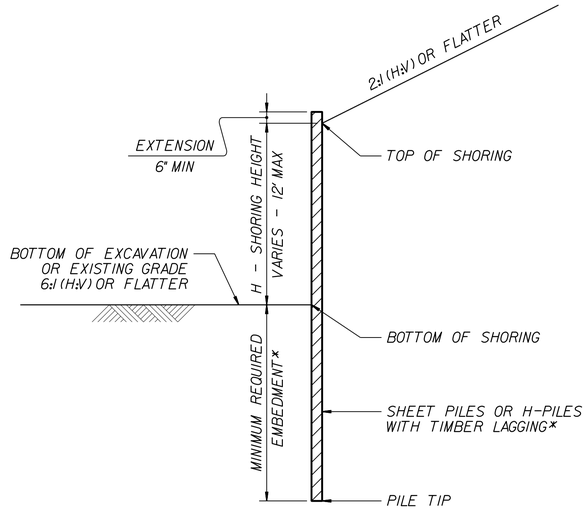
CONCRETE BARRIER

**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)

*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)

*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
B-5652	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 10/20/2022
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SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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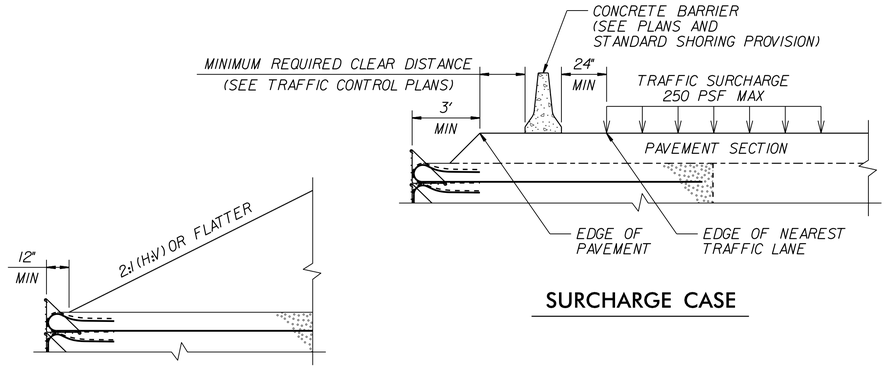
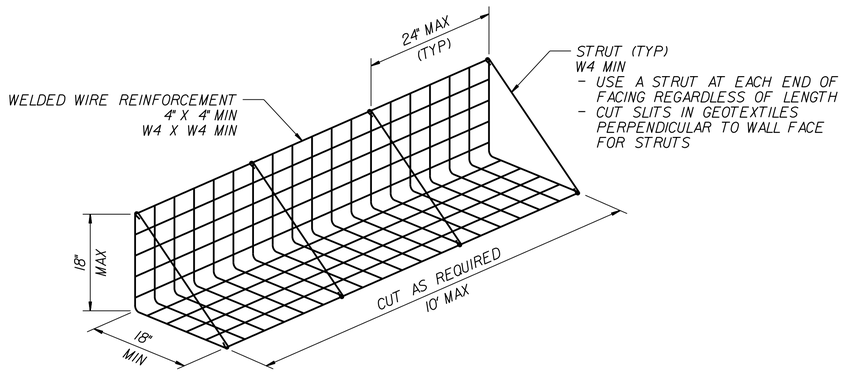
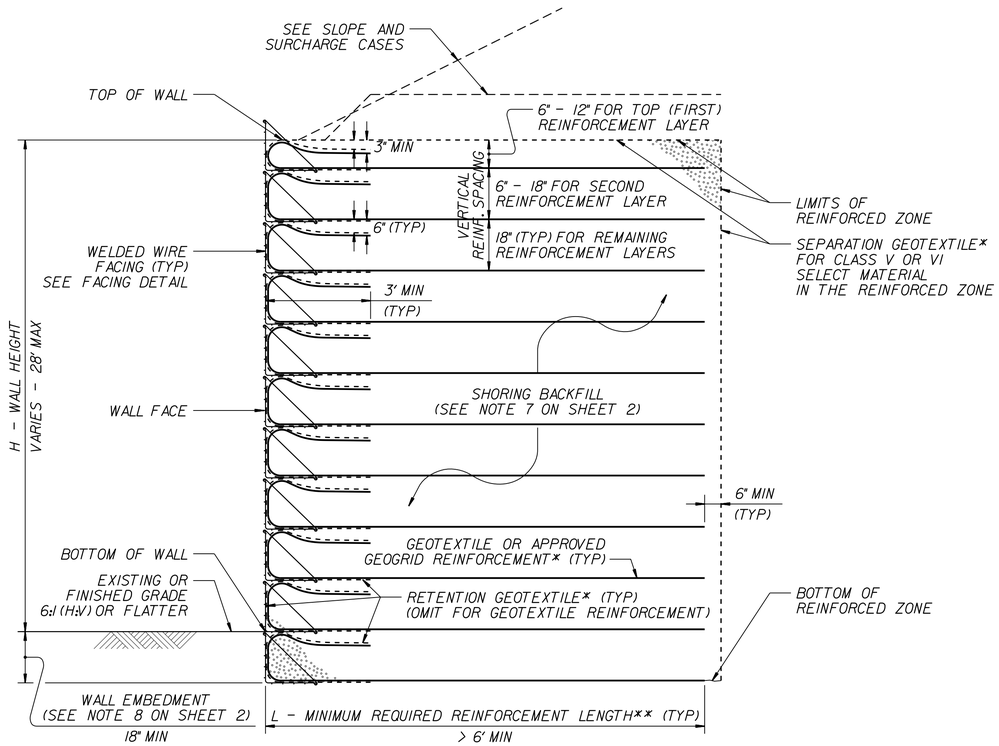


SURCHARGE CASE

SLOPE CASE

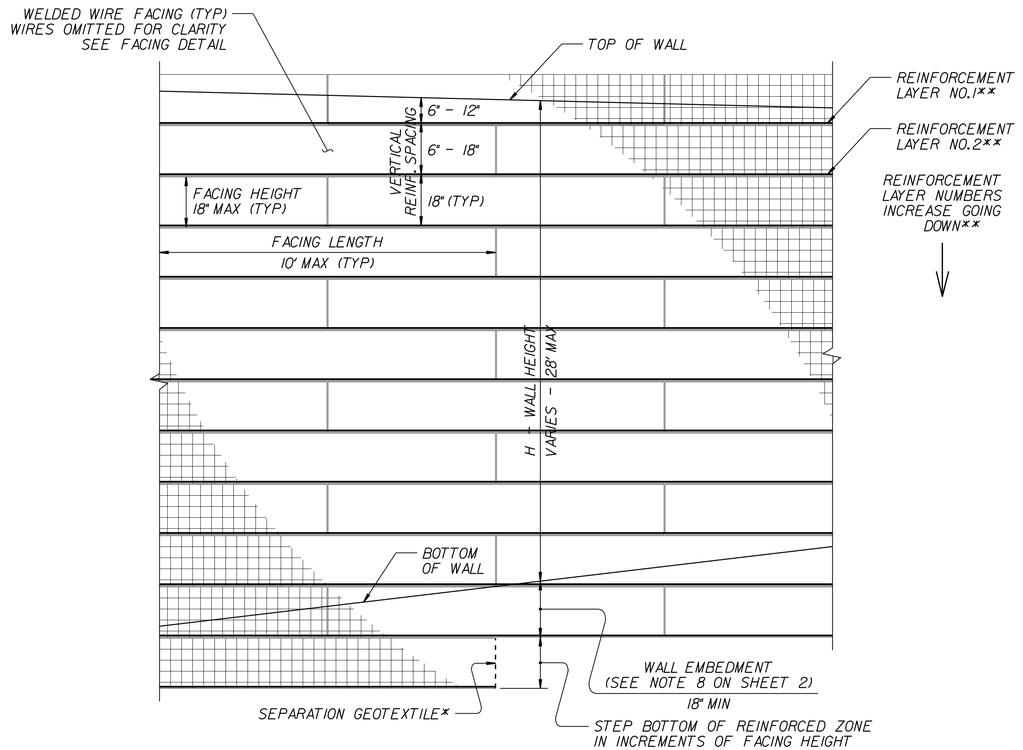


FACING DETAIL



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-5652	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden F760CAEB96FC4D3... 10/20/2022 SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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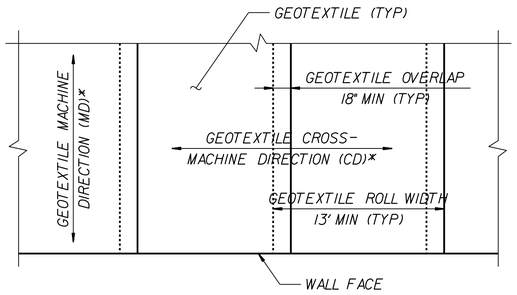
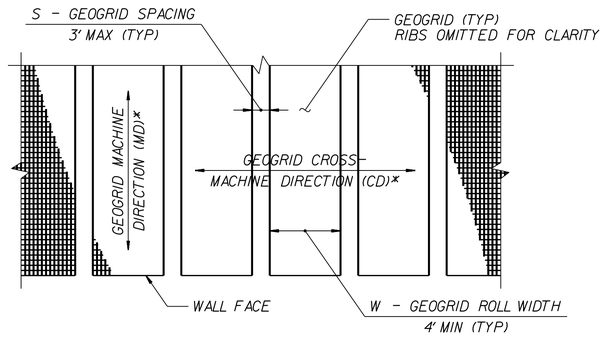


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

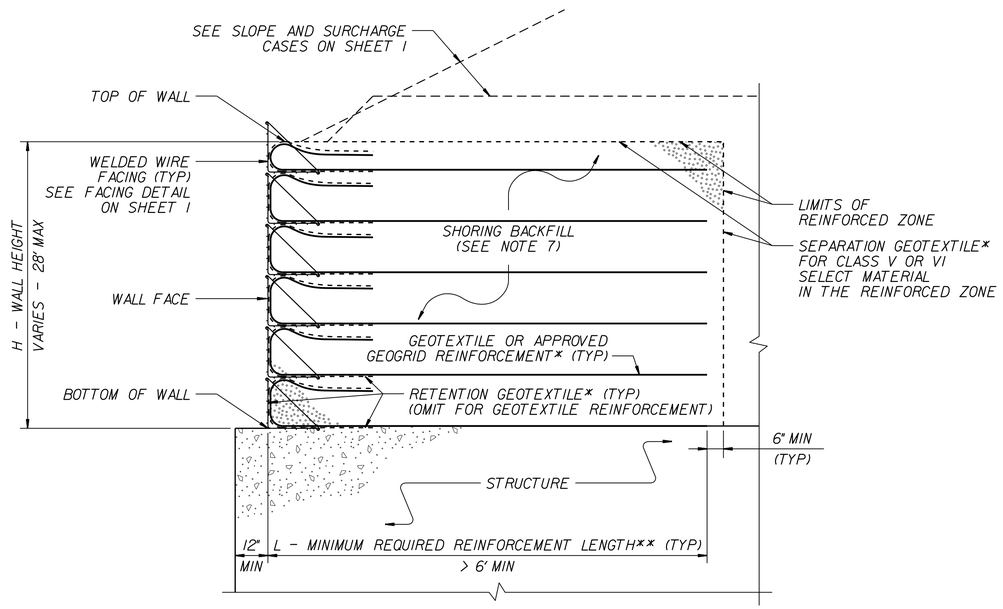


GEOGRID PLACEMENT

(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-5652	2G-4

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 10/20/2022
F760CAEB96FC4D3...
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

"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			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS			EXISTING GUARDRAIL REMOVAL	IMPACT ATTENUATOR TYPE 350			REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU, TL-3	TYPE B-77	CAT-1		NO.	PERMITTED G	PERMITTED NG	
-L_RT-	15+64.00	20+14.00	RT	450.00'			20+14.00		8'	11'	50'		1'		1	1		450'				
-L_RT-	17+64.00	20+14.00	LT	250.00'			20+14.00		5'	8'	227.125'		4.5'		1	1		200'				
-L_RT-	21+14.00	23+26.50	RT	212.50'				21+14.00	8'	11'						1	1	225'				
-L_RT-	21+14.00	22+64.00	LT	150.00'				21+14.00	5'	8'		50'		1'	1	1		150'				
		SUBTOTAL		1062.50'																		
		LESS ANCHOR DEDUCTIONS																				
		CAT-1 1 x 6.25' =		-6.25'																		
		GREU, TL-3 3 x 50.00' =		-150.00'																		
		B-77 4 x 22.875' =		-91.50'																		
		ADDITIONAL POSTS: 5																				
		TOTAL		814.75'											3	4	1	1025'				
		SAY		825.00'											3	4	1	1025'				

TEMPORARY GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS			IMPACT ATTENUATOR TYPE 350			REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU, TL-3	TYPE III	CAT-1	NO.	PERMITTED G	PERMITTED NG	
-L_DET-	13+43.25	18+87.00	RT	543.75'			18+87.00		8'	11'	50'	200'	1'	4'	1	1					
-L_DET-	18+05.75	18+87.00	LT	81.25'			18+87.00		4'	11'	50'		1'		1	1					
-L_DET-	19+57.00	20+07.00	RT	50.00'				19+57.00	4'	11'						1	1				
-L_DET-	19+57.00	21+94.50	LT	237.50'				19+57.00	8'	11'		200'		4'		1	1				
		SUBTOTAL		912.50'																	
		LESS ANCHOR DEDUCTIONS																			
		CAT-1 2 x 6.25' =		-12.50'																	
		GREU, TL-3 2 x 50.00' =		-100.00'																	
		TYPE III 4 x 18.75' =		-75.00'																	
		ADDITIONAL POSTS: 5																			
		TOTAL		725.00'											2	4	2				

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-L_RT-	19+64	20+09.11	CL	128.93
-L_RT-	21+04.96	21+50	CL	126.59
-L_DET-	11+52.38	15+44.63	CL	577.06
-L_DET-	15+44.63	18+81.00	CL	1121.23
-L_DET-	19+61.00	23+04.37	CL	1144.57
-L_DET-	23+04.37	27+18.58	CL	537.49
			TOTAL:	3635.87
			SAY:	3,820

SUMMARY OF SHOULDER BERM GUTTER

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LENGTH
-L_RT-	21+38.17	21+80.00	RT	128.93
-L_RT-	21+38.17	21+80.00	LT	126.59
			TOTAL:	83.66
			SAY:	90

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L_RT- 17+00.00 TO 20+14.00 (BEGIN BRIDGE)	655		335		320
-L_RT- 21+14.00 (END BRIDGE) TO 22+00.00	174		119		55
-L_DET- 11+52.38 TO 18+87.00 (BEGIN BRIDGE)	54		7,406	7,352	
-L_DET- 19+57.00 (END BRIDGE) TO 27+15.34	81		4,436	4,355	
SUBTOTAL	964		12,296	11,707	375
EST. SHOULDER MATERIAL			525	525	
DETOUR REMOVAL	4,802				4,802
PROJECT TOTAL	5,766		12,821	12,232	5,177
EST. 5% FOR REPLACING TOPSOIL ON BORROW PITS				612	
GRAND TOTAL	5,766			12,844	5,177
SAY	6,100			13,500	

NOTE: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing and Removal of Existing Asphalt Pavement will be paid for at the contract Lump Sum price for "Grading".

CONTINGENCY UNDERCUT = 300 CY
CONTINGENCY SELECT GRANULAR MATERIAL = 300 CY
ESTIMATED DDE = 1688 CY

COMPUTED BY: J. DALTON DATE: 02-24-2022
CHECKED BY: B. ELAM DATE: 02-24-2022

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5652	3D-1

SUB-REGIONAL & REGIONAL LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)											
SIZE								12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE PVC	DO NOT USE CAAP	DO NOT USE HDPE
THICKNESS OR GAUGE																			
21+77 L_RT	RT	401		30.7															
		401	404		24.5	15.0													
21+77 L_RT	LT	402		30.8															
		402	401		24.8	24.5													
21+77 L_RT	LT	403		27.7															
		403	402		24.9	24.8													
19+29 L_RT	LT	405		28.4															
		405	406		25.6	17.0													
21+77 L_RT	LT																		
19+29 L_RT	LT																		
18+74 DET	LT								20'							X			
19+73 DET	LT								24'							X			
TOTAL									44'										

STATION	C.S. PIPE							R.C. PIPE (CLASS III)							R.C. PIPE (CLASS IV)							
SIZE	12"	15"	18"	24"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE	.064	.064	.064	.064	.079	.109	.109															
21+77 L_RT																						
																104'						
21+77 L_RT																						
																36'						
21+77 L_RT																						
																16'						
19+29 L_RT																						
																144'						
21+77 L_RT																						
19+29 L_RT																						
18+74 DET																						
19+73 DET																						
TOTAL																300'						

STATION	**" R. C. PIPE (CLASS V)	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	G.D.I. TYPE 'D' STD 840.19, STD. 840.28, OR STD. 840.45	G.D.I. TYPE 'B' STD. 840.18, STD. 840.27, OR STD. 840.45	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35 OR STD. 840.46	DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	FLOWABLE FILL C.Y.	PIPE REMOVAL LIN.FT.	REMARKS
21+77 L_RT								1	1.2													1	1					
21+77 L_RT								1	1.0													1	1					
21+77 L_RT								1											1		1							
19+29 L_RT								1											1		1							
																											52'	REMOVE EXIST. 12" CMP – 4 PIPES
21+77 L_RT																										5.3		FLOWABLE FILL EXIST. 15" CMP
19+29 L_RT																										4.8		FLOWABLE FILL EXIST. 15" RCP
18+74 DET																								2 – 15"			20'	REMOVE TEMP. PIPES
19+73 DET																								2 – 15"			24'	REMOVE TEMP. PIPES
TOTAL								4	2.2										2		2	2	2	4 – 15"		10.1	96'	

ABBREVIATIONS

- C.B. CATCH BASIN
- N.D.I. NARROW DROP INLET
- D.I. DROP INLET
- G.D.I. GRATED DROP INLET
- G.D.I. (N.S.) GRATED DROP INLET (NARROW SLOT)
- J.B. JUNCTION BOX
- M.H. MANHOLE
- T.B.D.I. TRAFFIC BEARING DROP INLET
- T.B.J.B. TRAFFIC BEARING JUNCTION BOX

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

COMPUTED BY: Tyler C. Bottoms DATE: 4/3/19	3/27/2019
CHECKED BY: Thein Tun Zan DATE: 4/17/19	

(5-15-18)

PROJECT NO.	SHEET NO.
B-5652	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

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

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

PROJ. REFERENCE NO.	SHEET NO.
B-5652	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	JOEY L HUMPHREY
2	4	LINWOOD LEE AND MARTHA J KELLUM
3	4,5	ROBERT DALTON KELLUM
4	5	JAMES A WHATE AND PHYLLIS WHITE
5	5	JIMMY D AND PEGGY KELLUM
6	5	UNKNOWN
7	5	Removed

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

PROJECT REFERENCE NO.	SHEET NO.
B-5652	4
R/W SHEET NO.	

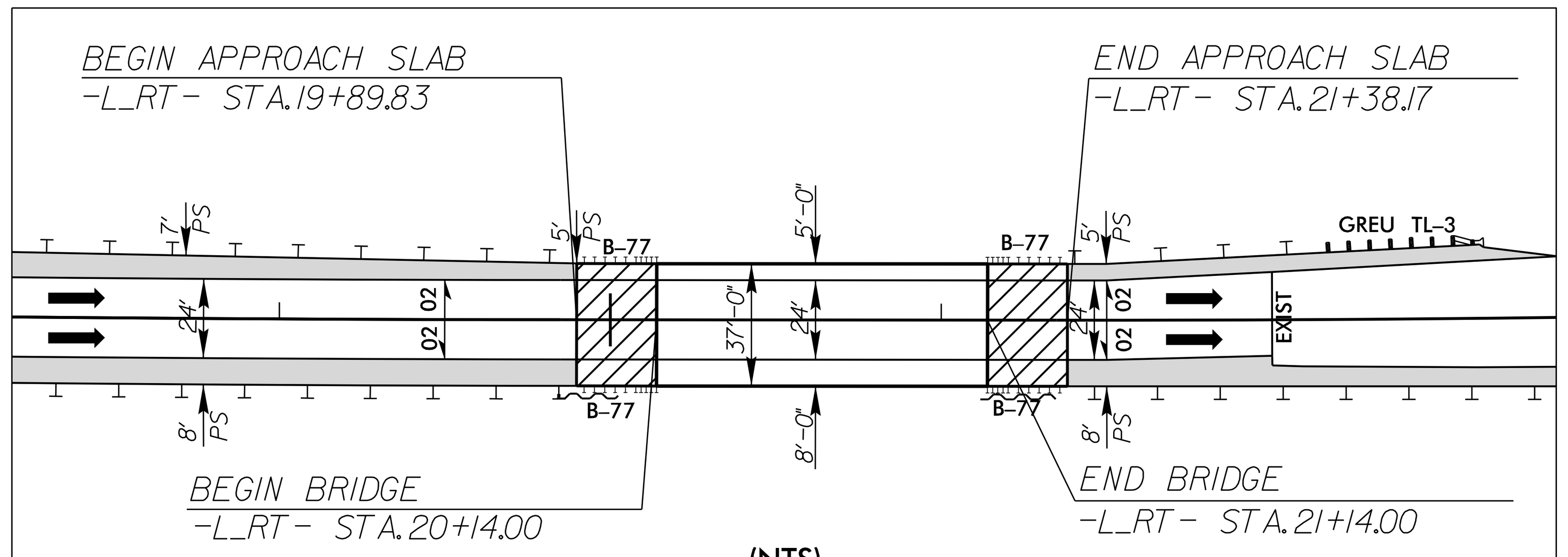
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27391 MICHAEL PEKAREK — MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON — SUNGATE DESIGN GROUP, P.A. LICENSE NO. C-890

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

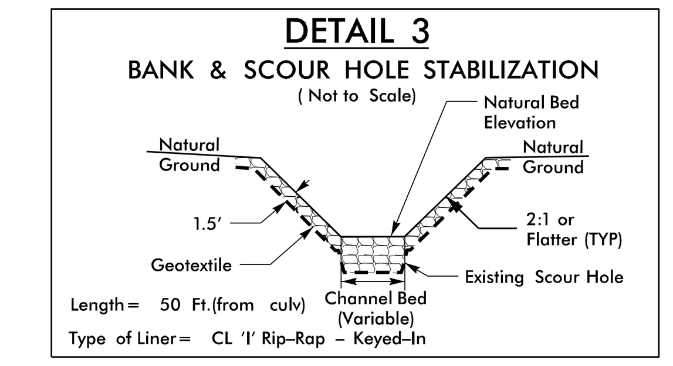
Prepared in the Office of: MOTT MACDONALD, 7621 Purfoy Road; Suite 115, Fuquay-Varina, NC 27526, www.mottmac.com/north-america

SUNGATE DESIGN GROUP, P.A., 905 JONES FRANKLIN ROAD, RALEIGH, NORTH CAROLINA 27606, TEL (919) 859-2243, ENG FIRM LICENSE NO. C-890

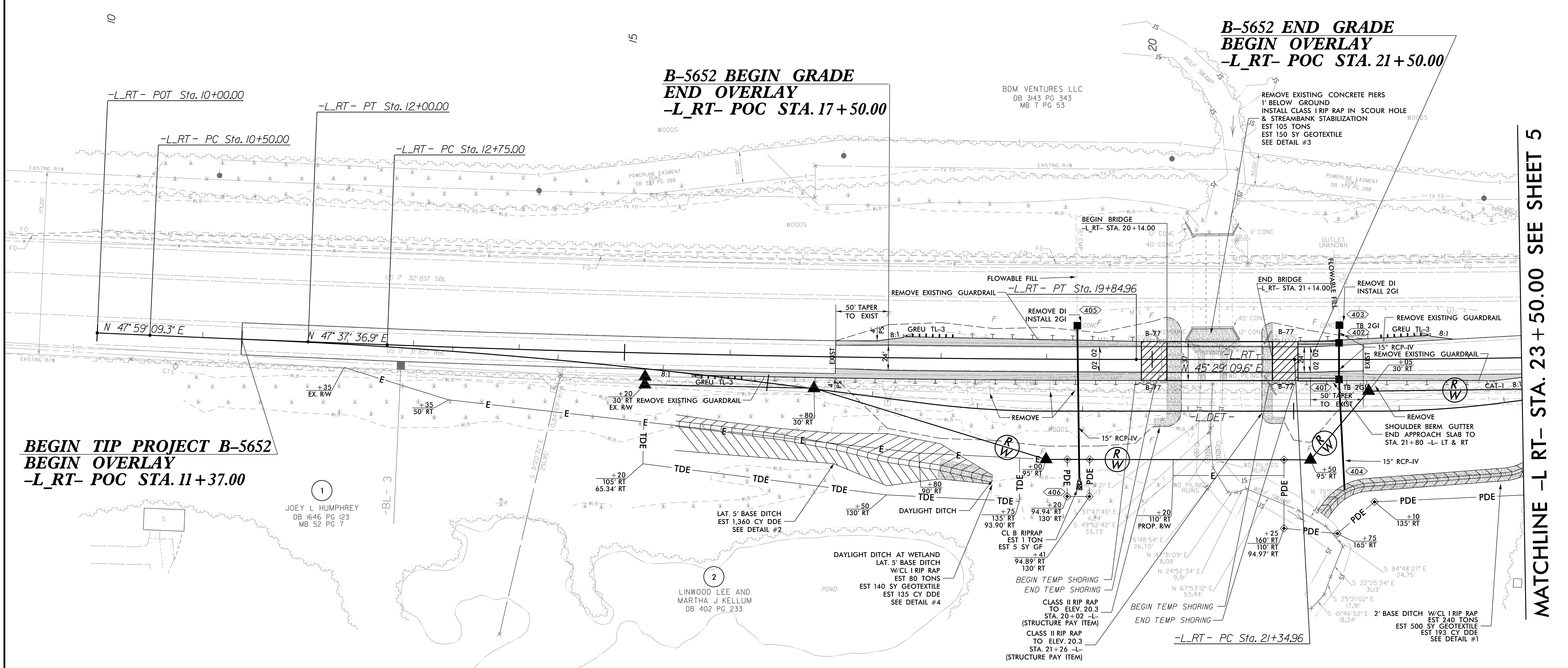


(NTS)
SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP

NC GRID NAD 83 NA 2011



STA. 20+57 -L_RT-



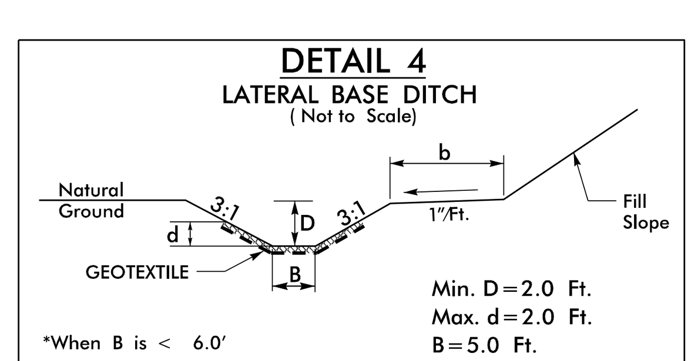
B-5652 END GRADE
BEGIN OVERLAY
-L_RT- POC STA. 21+50.00
B-5652 BEGIN GRADE
END OVERLAY
-L_RT- POC STA. 17+50.00
-L_RT- POT Sta. 10+00.00
-L_RT- PC Sta. 10+50.00
-L_RT- PT Sta. 12+00.00
-L_RT- PC Sta. 12+75.00
BDM VENTURES LLC
DB 3143 PG 343
MB 7 PG 53
REMOVE EXISTING CONCRETE PIERS 1' BELOW GROUND
INSTALL CLASS I RIP RAP IN SCOUR HOLE & STREAMBANK STABILIZATION
EST 105 TONS
EST 150 SY GEOTEXTILE
SEE DETAIL #3
BEGIN BRIDGE -L_RT- STA. 20+14.00
END BRIDGE -L_RT- STA. 21+14.00
FLOWABLE FILL
REMOVE EXISTING GUARDRAIL
-L_RT- PT Sta. 19+84.96
REMOVE DI INSTALL 2GI
50' TAPER TO EXIST
N 47° 59' 09.3" E
N 47° 37' 36.9" E
N 45° 29' 09.6" E
15" RCP-IV
REMOVE EXISTING GUARDRAIL
REMOVE
SHOULDER BERM GUTTER END APPROACH SLAB TO STA. 21+80 -L- LT & RT
BEGIN TIP PROJECT B-5652
BEGIN OVERLAY
-L_RT- POC STA. 11+37.00
JOEY L HUMPHREY
DB 1646 PG 123
MB 52 PG 7
LAT. 5' BASE DITCH
EST 1,360 CY DDE
SEE DETAIL #2
DAYLIGHT DITCH
DAYLIGHT DITCH AT WETLAND
LAT. 5' BASE DITCH
W/CL I RIP RAP
EST 80 TONS
EST 140 SY GEOTEXTILE
EST 135 CY DDE
SEE DETAIL #4
LINWOOD LEE AND MARTHA J KELLUM
DB 402 PG 233
CL B RIPRAP
EST 1 TON
EST 5 SY GF
BEGIN TEMP SHORING
END TEMP SHORING
CLASS II RIP RAP TO ELEV. 20.3 STA. 20+02 -L- (STRUCTURE PAY ITEM)
CLASS II RIP RAP TO ELEV. 20.3 STA. 21+26 -L- (STRUCTURE PAY ITEM)
-L_RT- PC Sta. 21+34.96
2' BASE DITCH W/CL I RIP RAP
EST 240 TONS
EST 500 SY GEOTEXTILE
EST 193 CY DDE
SEE DETAIL #1
MATCHLINE -L RT- STA. 23+50.00 SEE SHEET 5

-L_RT-

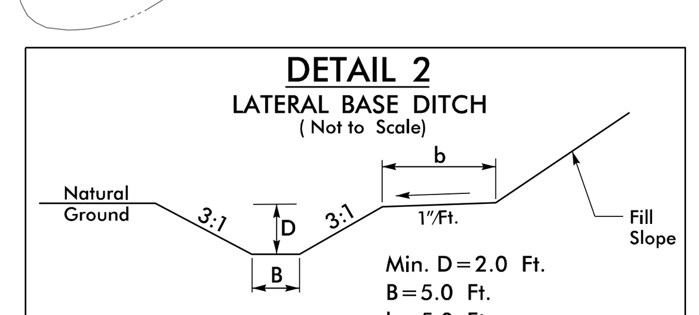
PI Sta 11+25.00	PI Sta 16+30.02	PI Sta 22+54.50
Δ = 0° 21' 32.4" (LT)	Δ = 2° 08' 27.3" (LT)	Δ = 1° 07' 55.5" (LT)
D = 0° 14' 21.6"	D = 0° 18' 05.6"	D = 0° 28' 24.7"
L = 150.00'	L = 709.96'	L = 239.08'
T = 75.00'	T = 355.02'	T = 119.54'
R = 23,940.00'	R = 19,000.00'	R = 12,100.00'
	SE = NC	SE = NC

ROBERT DALTON KELLUM
DB 916 PG 585

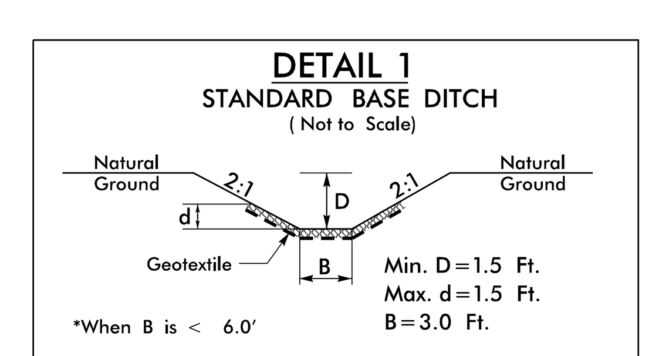
* NOTE: REMOVE ALL EXISTING PILING RUINS AS PART OF BRIDGE REMOVAL.



FROM STA. 18+00 TO STA. 18+50 -L_RT-



FROM STA. 15+50 TO STA. 18+00 -L_RT-



FROM STA. 21+62 TO STA. 24+00 -L_RT-

FOR -L_RT- PROFILE, SEE SHEET 6
FOR DETOUR DESIGN, SEE SHEETS 2B-1 & 2B-2
FOR TEMPORARY SHORING LOCATIONS, SEE TRAFFIC MANAGEMENT PLANS

PROJECT REFERENCE NO.	SHEET NO.
B-5652	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — MOTT MACDONALD I& E, LLC LICENSE NO. F-0669

HYDRAULICS ENGINEER — SUNGATE DESIGN GROUP, P.A. LICENSE NO. C-890

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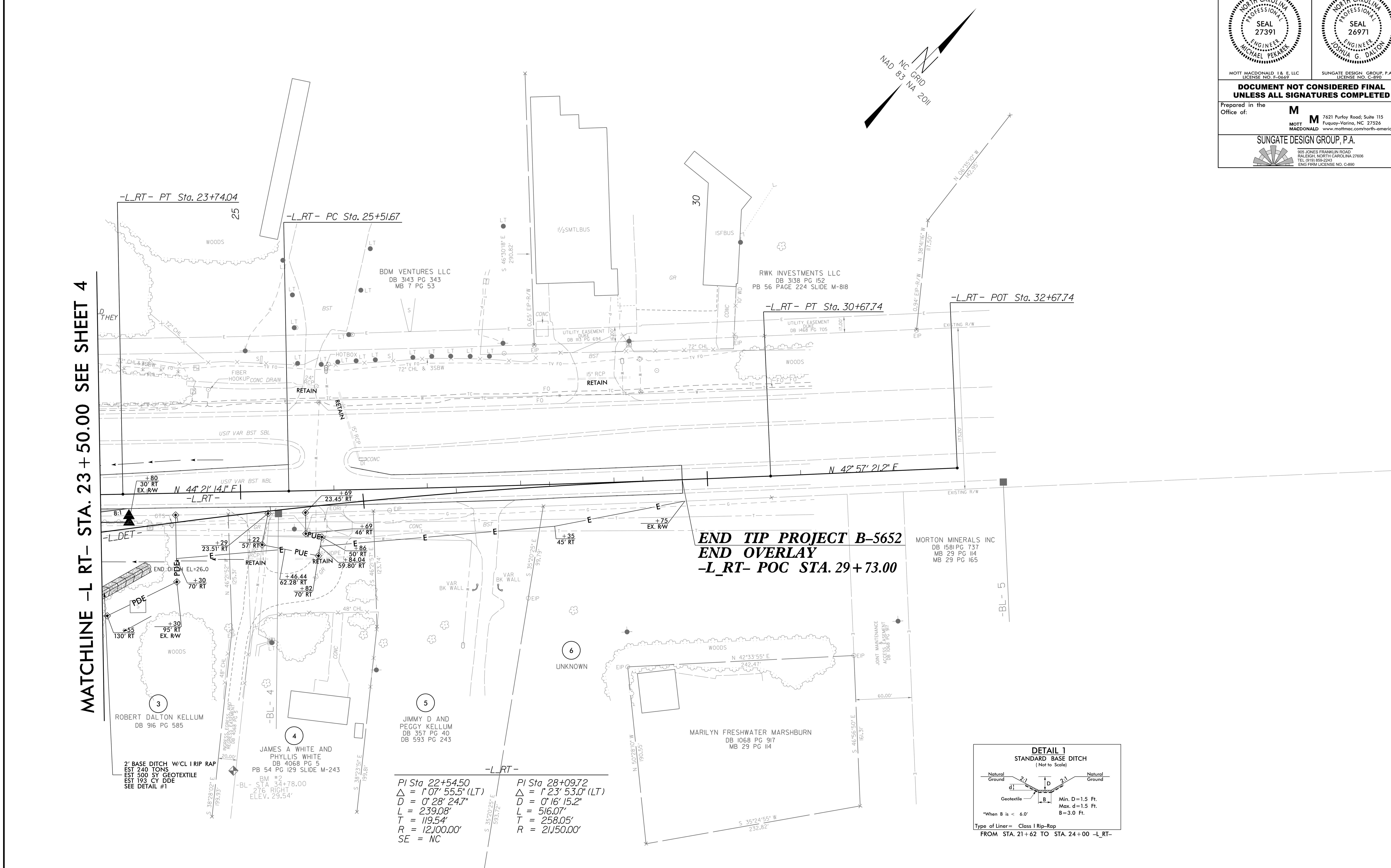
Prepared in the Office of: MOTT MACDONALD 7621 Purfoy Road; Suite 115 Fuquay-Varina, NC 27526 www.mottmac.com/north-america

SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 TEL (919) 859-2243 ENG FIRM LICENSE NO. C-890



NC GRID NAD 83 NA 2011
MATCHLINE -L RT- STA. 23+50.00 SEE SHEET 4
-L_RT- PT Sta. 23+74.04
-L_RT- PC Sta. 25+51.67
-L_RT- PT Sta. 30+67.74
-L_RT- POT Sta. 32+67.74
N 44° 21' 14.1" E
N 42° 57' 21.2" E
-L_RT-
-L_DET-
BDM VENTURES LLC
DB 3143 PG 343
MB 7 PG 53
RWK INVESTMENTS LLC
DB 3138 PG 152
PB 56 PAGE 224 SLIDE M-818
END TIP PROJECT B-5652
END OVERLAY
-L_RT- POC STA. 29+73.00
MORTON MINERALS INC
DB 1581 PG 737
MB 29 PG 114
MB 29 PG 165
-BL- 5
-BL- 4
RETAIN
PUE
PDE
WOODS
3
ROBERT DALTON KELLUM
DB 916 PG 585
4
JAMES A WHITE AND
PHYLLIS WHITE
DB 4068 PG 5
PB 54 PG 129 SLIDE M-243
5
JIMMY D AND
PEGGY KELLUM
DB 357 PG 40
DB 593 PG 243
6
UNKNOWN
MARILYN FRESHWATER MARSHBURN
DB 1068 PG 917
MB 29 PG 114
2' BASE DITCH W/CL I RIP RAP
EST 240 TONS
EST 500 SY GEOTEXTILE
EST 193 CY DDE
SEE DETAIL #1
-L_RT-
PI Sta 22+54.50
Δ = 1° 07' 55.5" (LT)
D = 0° 28' 24.7"
L = 239.08'
T = 119.54'
R = 12,100.00'
SE = NC
PI Sta 28+09.72
Δ = 1° 23' 53.0" (LT)
D = 0° 16' 15.2"
L = 516.07'
T = 258.05'
R = 21,150.00'
DETAIL 1
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Geotextile
Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=3.0 Ft.
Type of Liner= Class I Rip-Rap
FROM STA. 21+62 TO STA. 24+00 -L_RT-

FOR -L_RT- PROFILE, SEE SHEET 6

FOR DETOUR DESIGN, SEE SHEETS 2B-1 & 2B-2

PROJECT REFERENCE NO.	SHEET NO.
B-5652	6

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27391 MICHAEL PEKAREK
MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON
SUNGATE DESIGN GROUP, P.A. LICENSE NO. C-890

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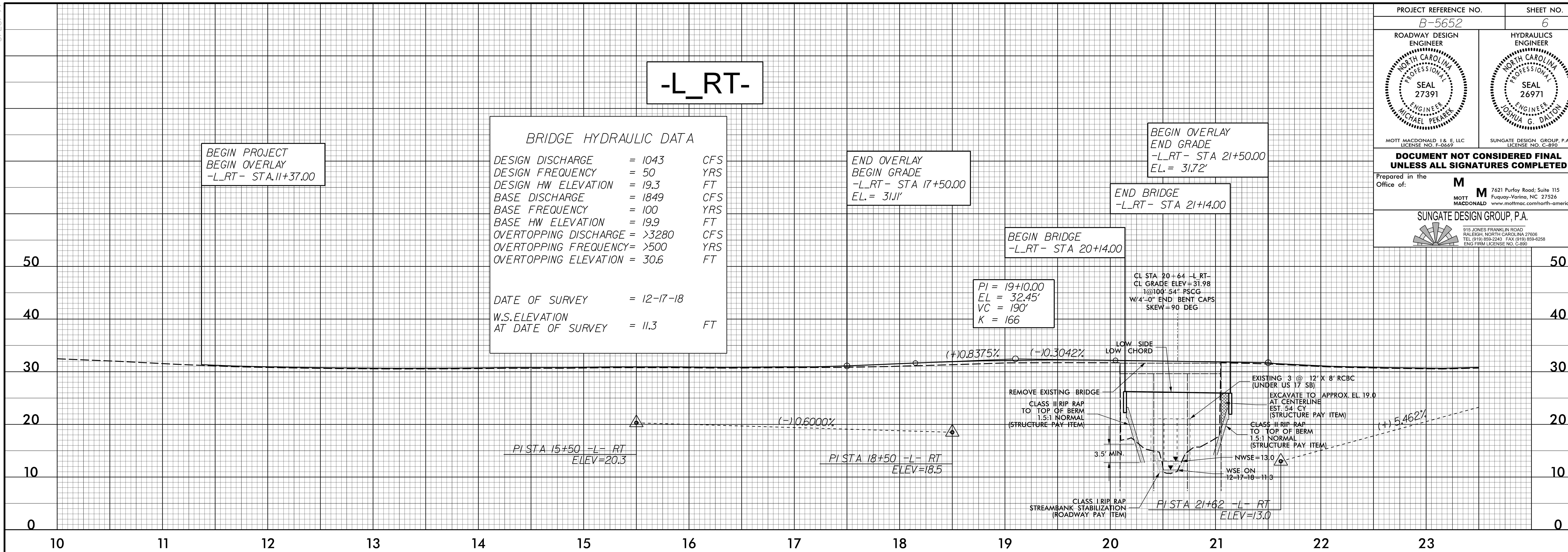
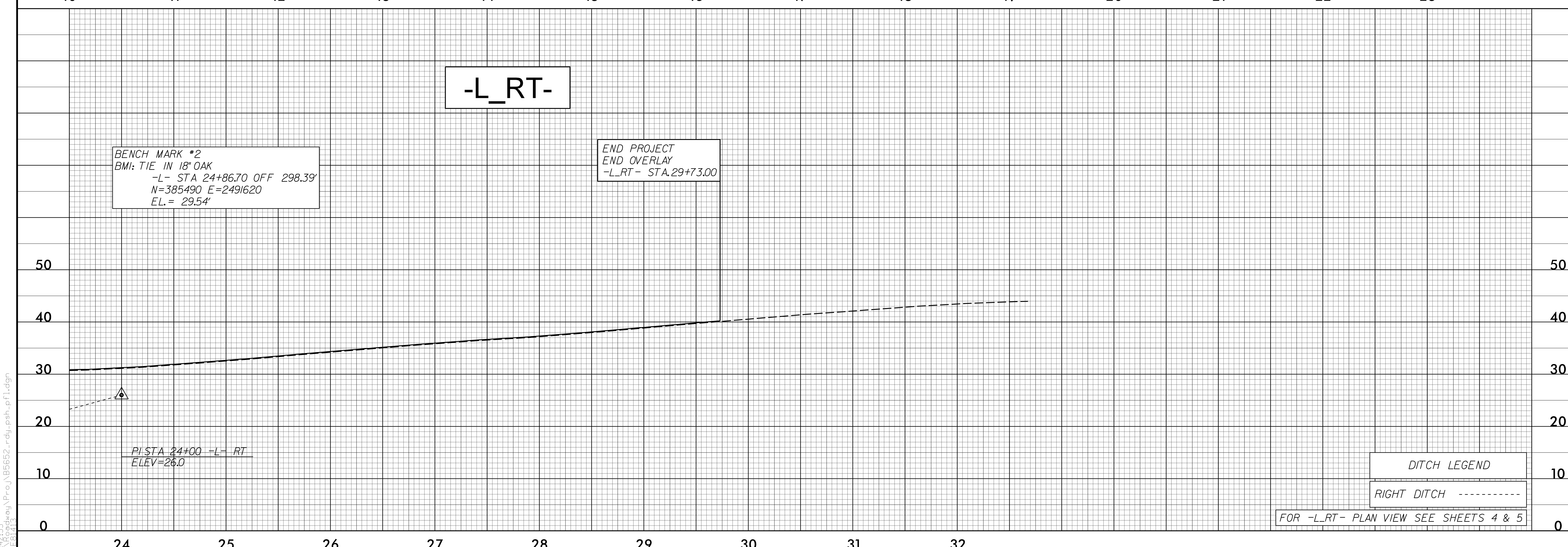
SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890



-L_RT-
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 1043 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 19.3 FT
BASE DISCHARGE = 1849 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 19.9 FT
OVERTOPPING DISCHARGE = >3280 CFS
OVERTOPPING FREQUENCY= >500 YRS
OVERTOPPING ELEVATION = 30.6 FT
DATE OF SURVEY = 12-17-18
W.S.ELEVATION AT DATE OF SURVEY = 11.3 FT
BEGIN PROJECT
BEGIN OVERLAY
-L_RT- STA.11+37.00
END OVERLAY
BEGIN GRADE
-L_RT- STA 17+50.00
EL.= 31.11'
BEGIN OVERLAY
END GRADE
-L_RT- STA 21+50.00
EL.= 31.72'
END BRIDGE
-L_RT- STA 21+14.00
BEGIN BRIDGE
-L_RT- STA 20+14.00
PI = 19+10.00
EL = 32.45'
VC = 190'
K = 166
CL STA 20+64 -L_RT-
CL GRADE ELEV=31.98
1@100' 54" PSCG
W/4'-0" END BENT CAPS
SKEW=90 DEG
(+)0.8375%
(-)0.3042%
LOW SIDE
LOW CHORD
REMOVE EXISTING BRIDGE
CLASS II RIP RAP
TO TOP OF BERM
1.5:1 NORMAL
(STRUCTURE PAY ITEM)
EXISTING 3 @ 12' X 8' RCBC
(UNDER US 17 SB)
EXCAVATE TO APPROX. EL. 19.0
AT CENTERLINE
EST. 54 CY
(STRUCTURE PAY ITEM)
CLASS II RIP RAP
TO TOP OF BERM
1.5:1 NORMAL
(STRUCTURE PAY ITEM)
3.5' MIN.
NWSE=13.0
WSE ON
12-17-18 - 11.3
CLASS I RIP RAP
STREAMBANK STABILIZATION
(ROADWAY PAY ITEM)
PI STA 21+62 -L- RT
ELEV=13.0
(-)0.6000%
(+) 5.462%
PI STA 15+50 -L- RT
ELEV=20.3
PI STA 18+50 -L- RT
ELEV=18.5
50
40
30
20
10
0
10
11
12
13
14
15
16
17
18
19
20
21
22
23



FOR -L_RT- PLAN VIEW SEE SHEETS 4 & 5

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 27391 ENGINEER MICHAEL PEKAREK
MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
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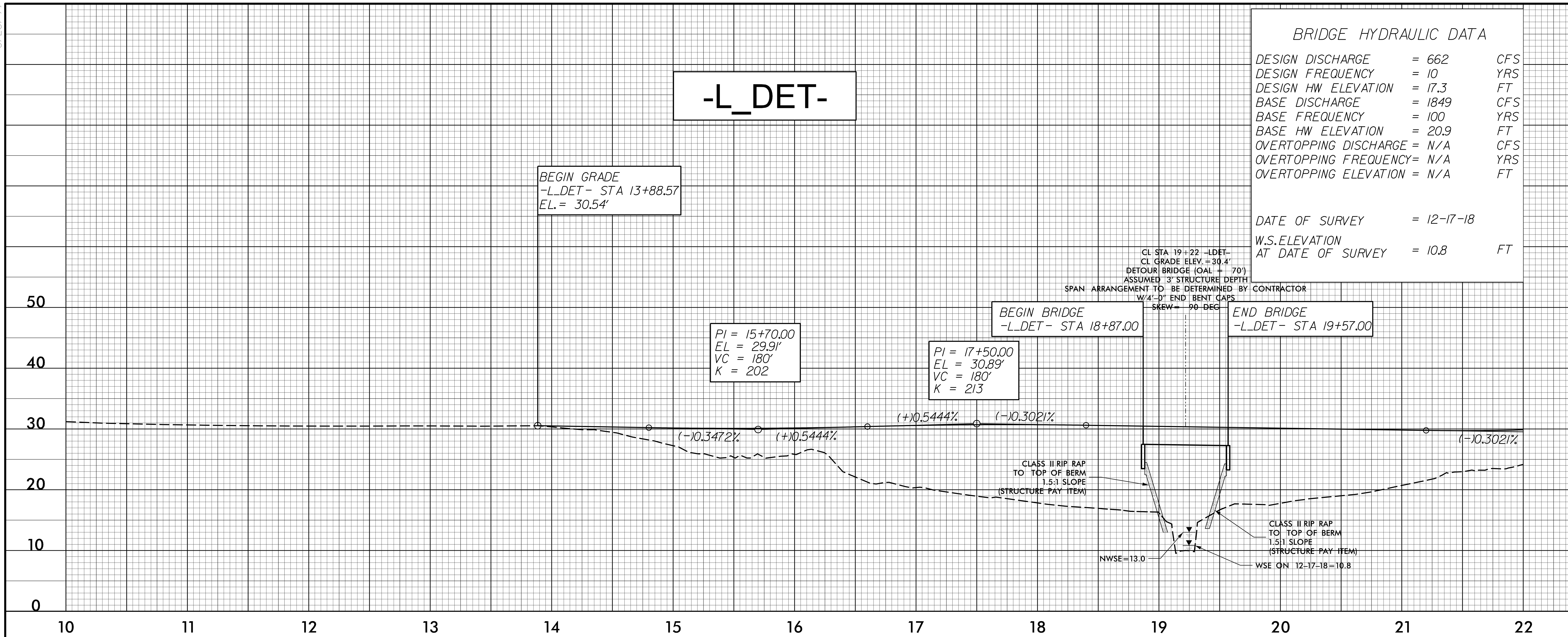
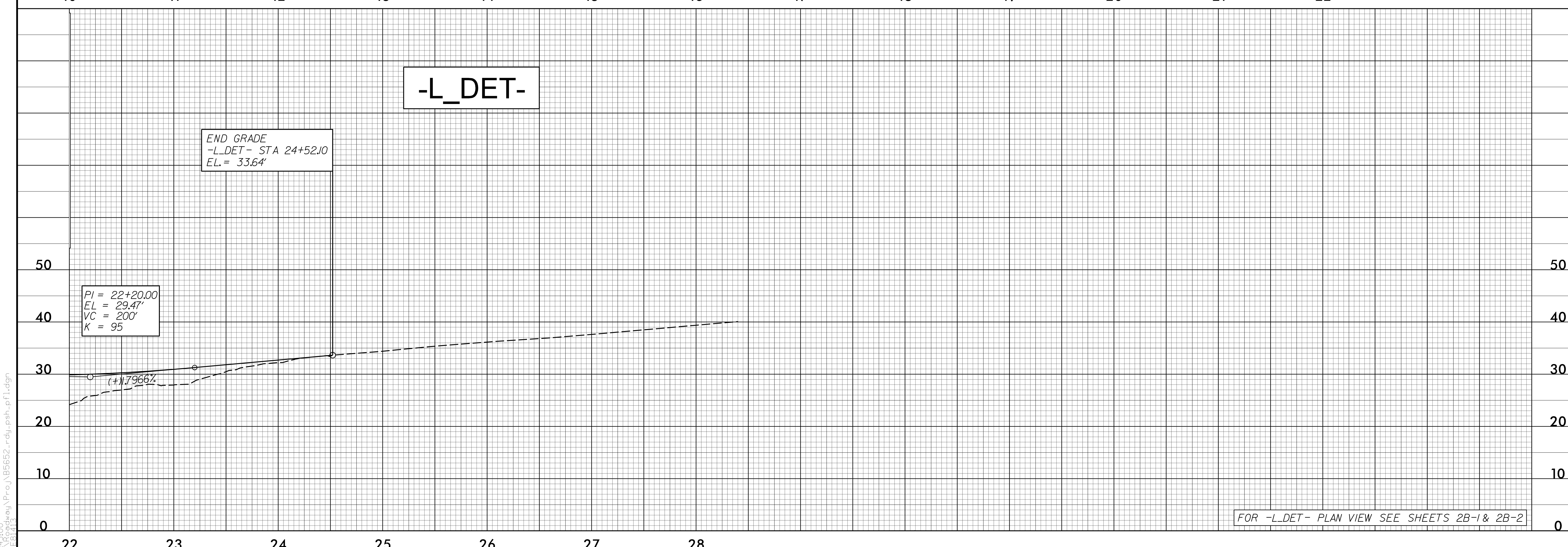
ENG FIRM LICENSE NO. C-890

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 662	CFS
DESIGN FREQUENCY	= 10	YRS
DESIGN HW ELEVATION	= 17.3	FT
BASE DISCHARGE	= 1849	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 20.9	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= N/A	YRS
OVERTOPPING ELEVATION	= N/A	FT
DATE OF SURVEY	= 12-17-18	
W.S.ELEVATION AT DATE OF SURVEY	= 10.8	FT





FOR -L_DET- PLAN VIEW SEE SHEETS 2B-1 & 2B-2