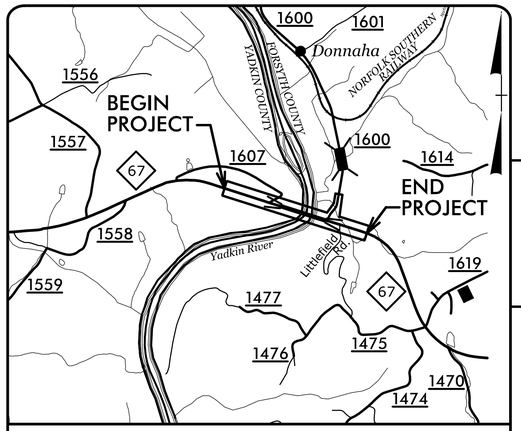
09/08/99

TIP PROJECT: B-5825

CONTRACT: C204490

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Plan Sheet Symbols
See Sheet RW01 thru RW07 For Survey Control and RIght of Way Sheets



VICINITY MAP

FINAL PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

YADKIN & FORSYTH COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5825	1	

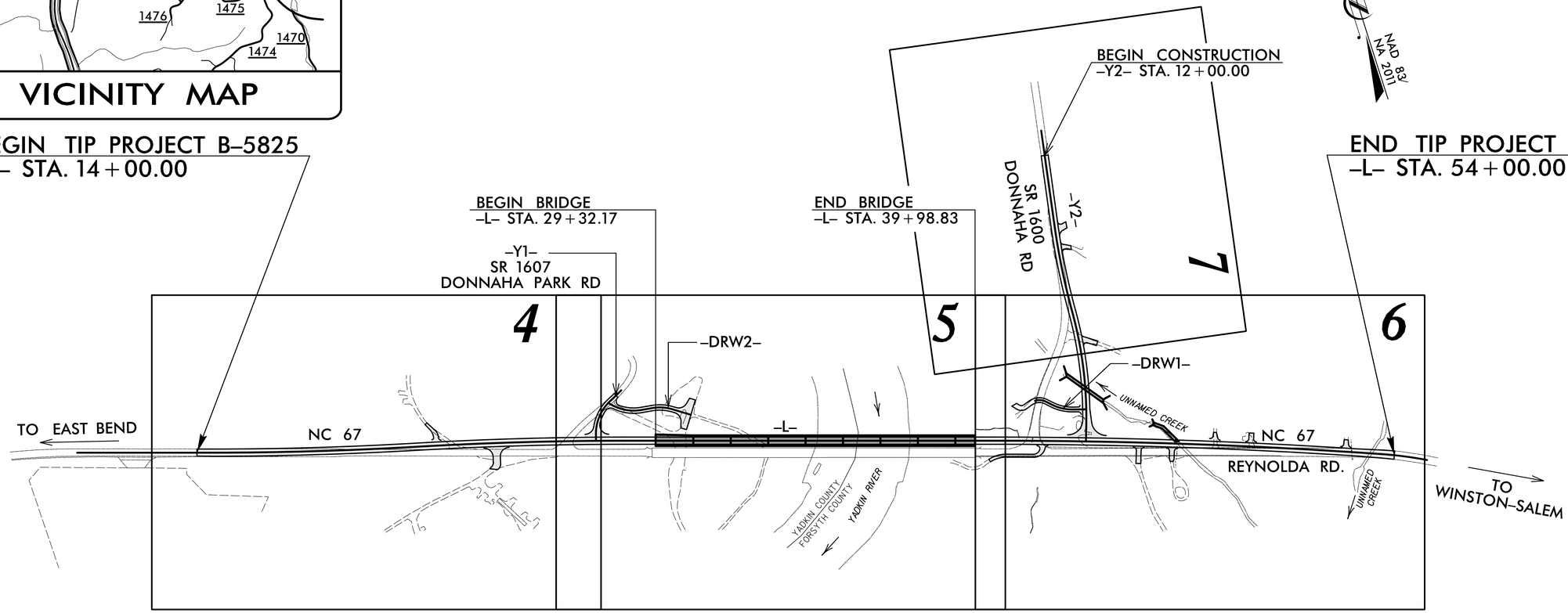
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45778.1.1	N/A	PE
45778.2.1	N/A	R/W & UTIL
45778.3.1	N/A	CONST.

LOCATION: REPLACE BRIDGE NO. 35 OVER THE YADKIN RIVER ON NC 67

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

BEGIN TIP PROJECT B-5825
-L- STA. 14+00.00

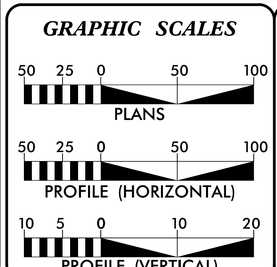
END TIP PROJECT B-5825
-L- STA. 54+00.00



DESIGN EXCEPTION
-L- LINE PAVEMENT CROSS SLOPE ON ROADWAY APPROACHES AND BRIDGE DECK

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2020 = 5100
ADT 2040 = 5600
K = 12 %
D = 80 %
T = 4 % *
V = 60 MPH
* TTST =1% DUAL 3%
FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5825	=	*0.556 mile*
LENGTH STRUCTURES TIP PROJECT B-5825	=	*0.202 mile*
TOTAL LENGTH TIP PROJECT B-5825	=	*0.758 mile*

Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

By:
TGS ENGINEERS
706 HILLSBOROUGH ST
SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 30, 2019

LETTING DATE:
FEBRUARY 16, 2021

TOMMY REGISTER, PE
PROJECT ENGINEER
V. MARCUS LOWERY, PE
PROJECT DESIGN ENGINEER
DAVID STUTTS, PE
NCDOT CONTACT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 044158 ENGINEER BENJAMIN J. HERRGAR
DocuSigned by: Benjamin J. Herrgar
P.E.
SIGNATURE: 11/12/2020 | 6:41 AM EST

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 028392 ENGINEER CLIFTON T. REGISTER
DocuSigned by: Clifton T Register, PE
P.E.
SIGNATURE: 11/11/2020 | 7:09 AM PST

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

11/11/2020
X:\NCDOT\B-5825\Roadway\Proj\b5825_rdy_tsh.dgn
User:bevans

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A–1 THRU 2A–3	PAVEMENT SCHEDULE, TYPICAL SECTIONS, DETAIL SHOWING METHOD OF WEDGING, DETAIL FOR SHOULDER BERM GUTTER, AND MILLING & RESURFACING DETAIL
2C–1	DETAIL SHEET FOR MODIFIED RAIL SECTION
2C–2	DETAIL SHEET FOR 4–SIDED OPEN THROAT CATCH BASIN
2C–3	DETAIL SHEET FOR TEMPORARY ANCHOR UNIT TYPE THRIE–BEAM
2G–1 THRU 2G–4	STANDARD TEMPORARY SHORING AND TEMPORARY WALL DETAILS
3B–1	SUMMARY OF EARTHWORK, PAVEMENT REMOVAL SUMMARY, SHOULDER BERM GUTTER SUMMARY, & GUARDRAIL SUMMARY
3D–1 THRU 3D–2	DRAINAGE SUMMARY
3G–1	GEOTECHNICAL SUMMARY
3P–1	PARCEL INDEX SHEET
04 THRU 07	PLAN SHEETS
08 THRU 10	PROFILE SHEETS
RW01 THRU RW07	SURVEY CONTROL AND RIGHT–OF–WAY SHEETS
TMP–1 THRU TMP–11	TRANSPORTATION MANAGEMENT PLANS
PMP–1 THRU PMP–5	PAVEMENT MARKING PLANS
EC–1 THRU EC–11	EROSION CONTROL PLANS
SIGN–1 THRU SIGN–8	SIGNING PLANS
UC–1 THRU UC–6	UTILITY CONSTRUCTION PLANS
UO–1 THRU UO–5	UTILITIES BY OTHERS PLANS
X–A THRU X–B	CROSS SECTION INDEX AND EARTHWORK VOLUME SUMMARY SHEETS
X–1 THRU X–43	CROSS SECTIONS
S–1 THRU S–60	STRUCTURE PLANS – BRIDGE
C1–1 THRU C1–7 & C2–1 THRU C2–6	STRUCTURE PLANS – CULVERTS

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS

EFFECTIVE: 01–16–2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE–IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 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.

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".

SUBSURFACE PLANS:

STRUCTURE SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT.

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

Water — Town of King

Power — Duke Energy; Surry/Yadkin Power

Telecommunications — Windstream; Spectrum

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

RIGHT–OF–WAY MARKERS:

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

PROJECT REFERENCE NO.	SHEET NO.
B-5825	1A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER MARCUS LOWERY

DocuSigned by: Marcus Lowery 6/4/2020 | 10:23 AM EDT

STANDARD DRAWINGS

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
225.06	Method of Grading Sight Distance at Intersections
275.01	Rock Plating
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 8 – INCIDENTALS	
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts – 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts – 15" thru 48" Pipe 90 Skew
838.80	Precast Endwalls – 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.04	Concrete Open Throat Catch Basin – 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin – 12" thru 48" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' – 12" thru 36" Pipe
840.22	Frames and Wide Slot Sag Grates
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
840.31	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
840.51	Brick Manhole – 12" thru 36" Pipe
840.52	Precast Manhole – 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base – 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
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
862.04	Anchoring End of Guardrail – B–77 and B–83 Anchor Units
866.01	Chain Link Fence – 4', 5' and 6' High Fence
866.04	Barbed Wire Fence with Wood Posts (2 – 7 Strands)
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5825	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

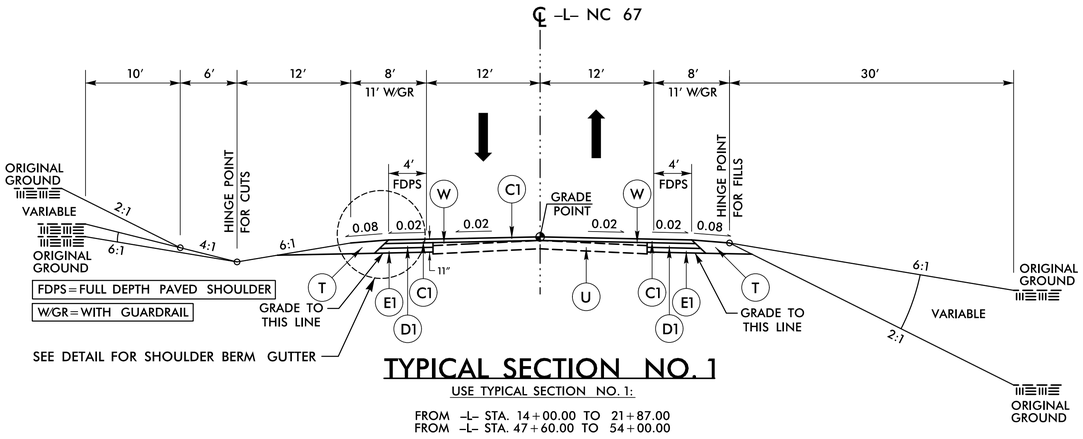
6/2/99

PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN: JUNE 18, 2019

C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	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.
C3	PROP. APPROX. 2″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
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.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 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.
J2	PROP. 6″ AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
R	CONCRETE SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	MILLING BITUMINOUS PAVEMENT (VAR. DEPTH - SEE DETAIL THIS SHEET)
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)

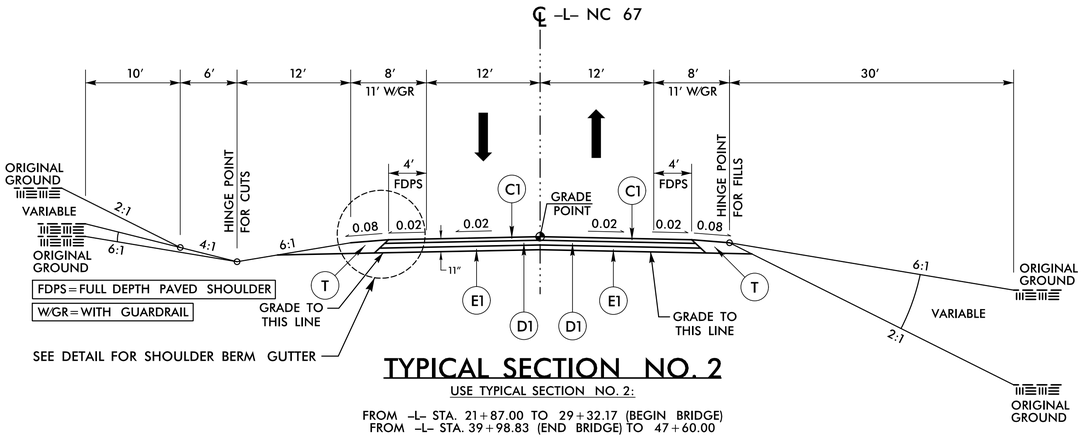
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1:

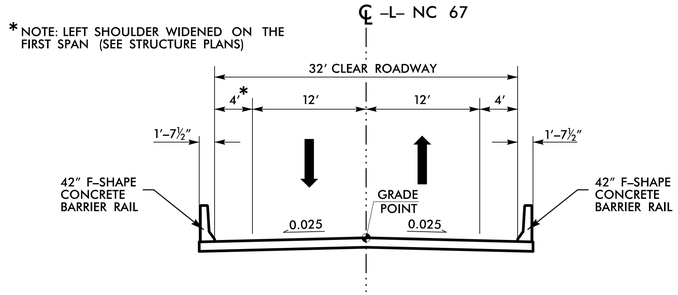
FROM –L– STA. 14+00.00 TO 21+87.00
FROM –L– STA. 47+60.00 TO 54+00.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2:

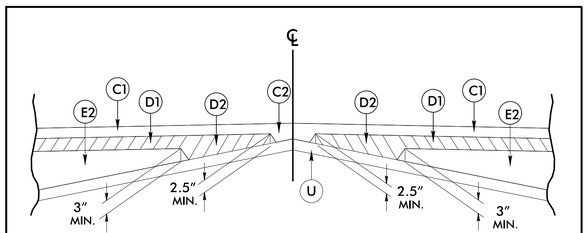
FROM –L– STA. 21+87.00 TO 29+32.17 (BEGIN BRIDGE)
FROM –L– STA. 39+98.83 (END BRIDGE) TO 47+60.00



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3:

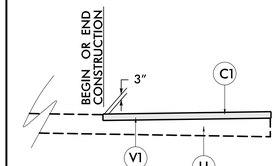
FROM –L– STA. 29+32.17 (BEGIN BRIDGE) TO STA. 39+98.83 (END BRIDGE)



Detail Showing Method of Wedging

INCIDENTAL MILLING DETAIL

NOTE: MIRROR FOR END OF CONSTRUCTION

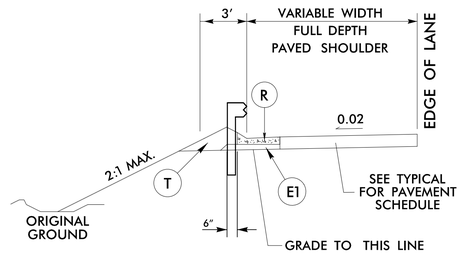


USE DETAIL AS FOLLOWS:

MILLING AND OVERLAY FOR TIE-INS:
-L- STA. 14+00.00 TO -L- STA. 15+00.00
-L- STA. 53+50.00 TO -L- STA 54+00.00
-Y2- STA. 12+00.00 TO -Y2- STA 13+00.00

DETAIL FOR SHOULDER BERM GUTTER

SEE CORRESPONDING TYPICAL SECTION FOR PAVEMENT DESIGN.
SEE TYPICAL SECTIONS AND PLANS FOR ACTUAL DIMENSIONS.



LINE	STATIONS
–L–	17+73.21 to 21+36.32 LT
–L–	26+71.59 to 29+08.17 RT
–L–	27+84.42 to 29+08.17 LT
–L–	40+22.83 to 42+58.97 LT
–L–	40+22.83 to 40+96.71 RT
–L–	44+88.78 to 47+31.02 LT
–Y2–	17+66.35 to 19+94.78 RT

PROJECT REFERENCE NO.	SHEET NO.
B-5825	2A-1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027418 ENGINEER MARCUS LOWERY
3/19/2020 | 11:57 AM EDT

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 ENGINEER CLARK S. MORRISON
3/20/2020 | 8:36 AM PDT

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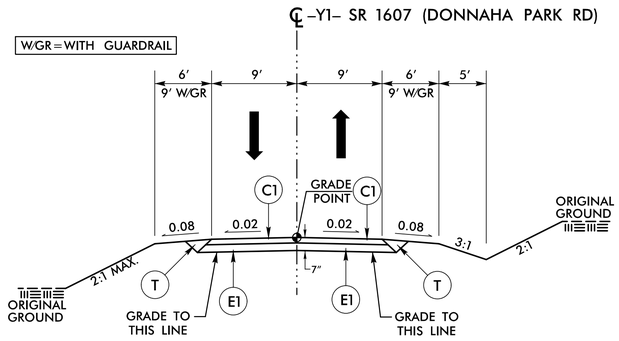
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

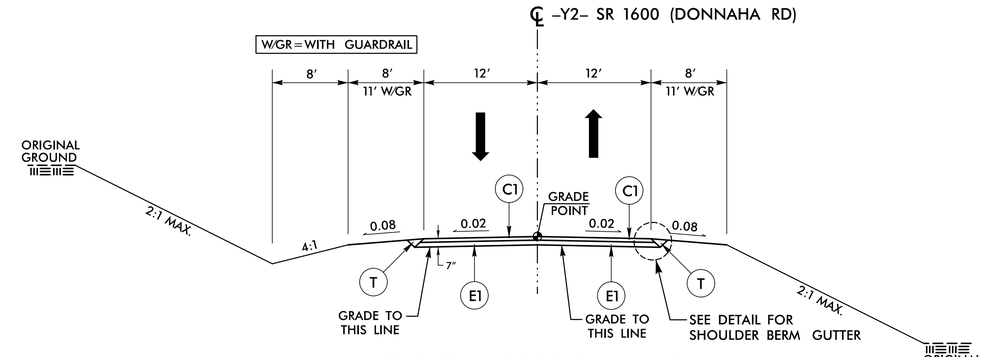
6/2/99



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4:

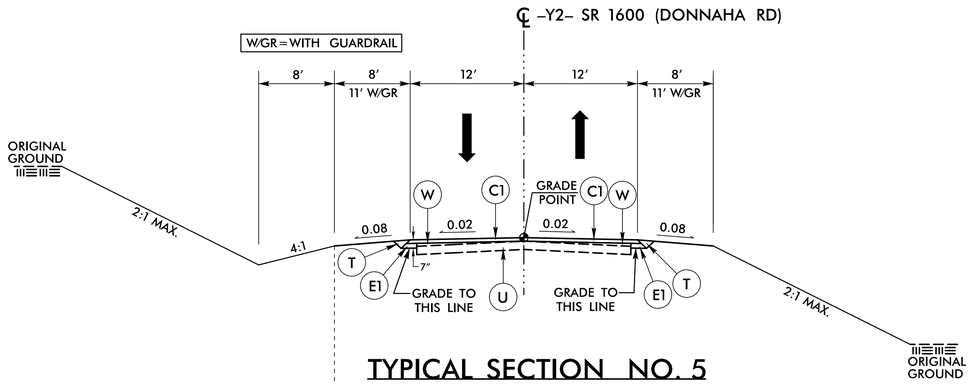
FROM –Y1– STA. 10+25.00 TO 11+75.97



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6:

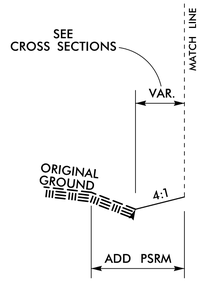
FROM –Y2– STA. 17+31.54 TO 21+46.68



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5:

FROM –Y2– STA. 12+00.00 TO 17+31.54

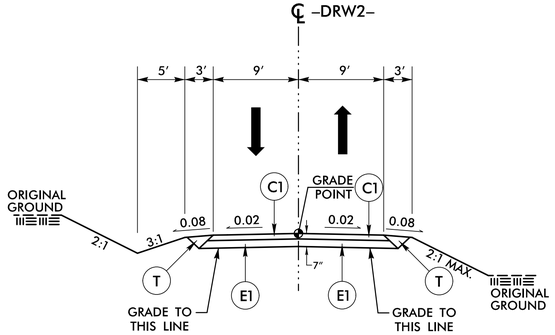


PSRM = PERMANENT SOIL REINFORCEMENT MAT (SEE PLAN SHEET 07 FOR DETAIL)

TYPICAL SECTION NO. 5A

USE TYPICAL SECTION NO. 5A:

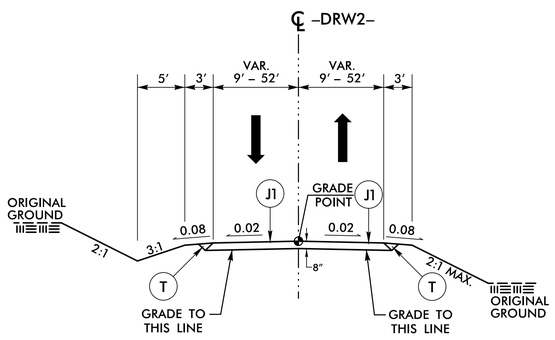
FROM –Y2– STA. 12+00.00 TO 14+25.00 LT



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7:

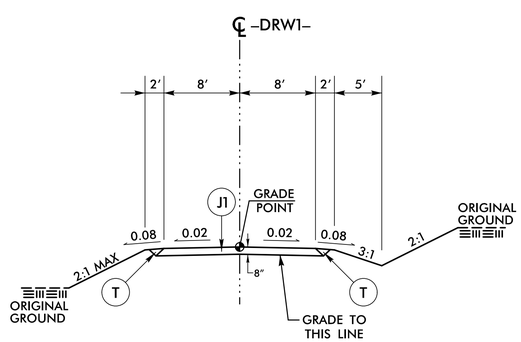
FROM –DRW2– STA. 10+09.34 TO 12+21.85



TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8:

FROM –DRW2– STA. 12+21.85 TO 12+85.31



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9:

FROM –DRW1– STA. 10+07.86 TO 11+58.04

PROJECT REFERENCE NO.	SHEET NO.
B-5825	2A-2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027418 MARCUS LOVERN
3/19/2020 | 11:57 AM EDT

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CLARK S. MORRISON
3/20/2020 | 8:36 AM PDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

C1	3″ S9.5B
C2	VAR. S9.5B
C3	2″ S9.5B
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	VAR. B25.0C
J1	8″ ABC
J2	6″ ABC
P	PRIME COAT
R	SBG
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	MILLING
W	WEDGING

3/19/2020
X:\NCDOT\B-5825\Roadway\Proj\b5825_rdy_typ.dgn
User: jpowell

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-5825	2A-3

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027418 MARCUS LOWERY

3/19/2020 | 11:57 AM EDT

PAVEMENT DESIGN ENGINEER

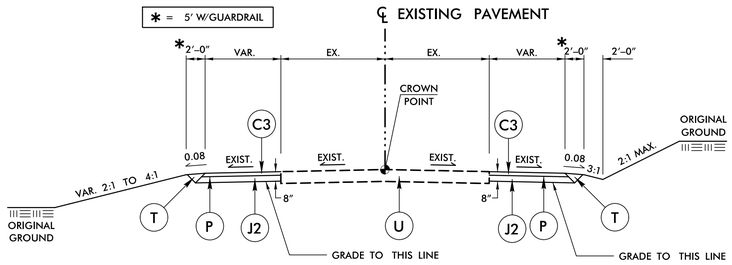
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CARRIE S. MORRISON

3/20/2020 | 8:36 AM PDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

C1	3″ S9.5B
C2	VAR. S9.5B
C3	2″ S9.5B
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	VAR. B25.0C
J1	8″ ABC
J2	6″ ABC
P	PRIME COAT
R	SBG
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	MILLING
W	WEDGING



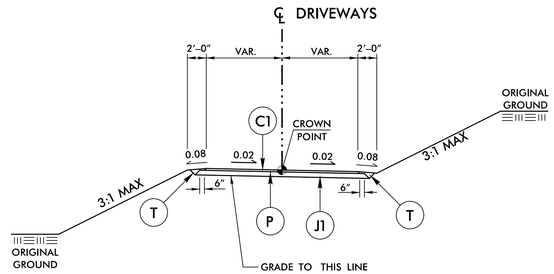
TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10:

AT TEMPORARY WIDENING LOCATIONS AS SHOWN IN THE WORK ZONE TRAFFIC CONTROL PLANS.

DIMENSIONS SHOWN ARE MINIMUMS AND SUBJECT TO CHANGE AS DIRECTED BY THE ENGINEER TO SUIT FIELD CONDITIONS.

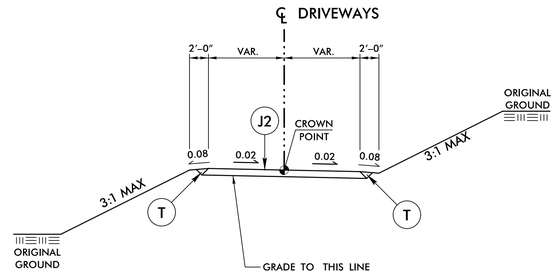
WIDENING IS SHOWN ON BOTH SIDES OF THE TYPICAL TO REFLECT THE CUT AND FILL SECTIONS, HOWEVER, ACTUAL TEMPORARY WIDENING WILL TYPICALLY OCCUR ONLY ON ONE SIDE OF THE EXISTING PAVEMENT AT ONE TIME – SEE THE TRAFFIC CONTROL PLANS FOR PHASING.



TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11:

FOR THE FOLLOWING DRIVEWAYS DESIGNATED "ASPHALT":
DRIVEWAY AT –L– STA 45+46 RT.
DRIVEWAY AT –L– STA 52+37 LT.
DRIVEWAY AT –Y2– STA 15+12 LT.



TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12:

FOR DRIVEWAYS DESIGNATED "ABC"

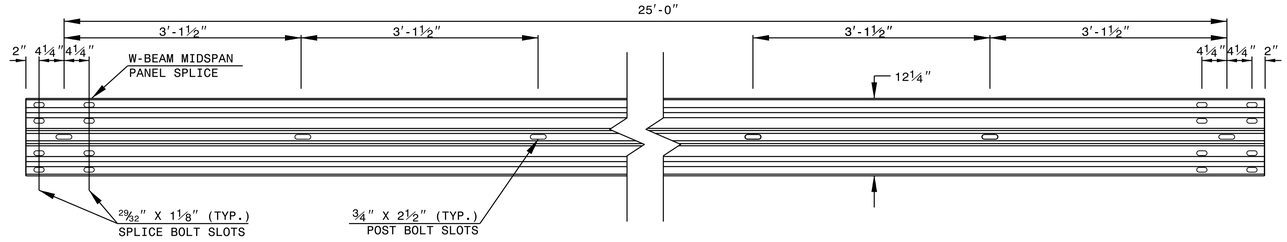
PROJECT REFERENCE NO.	SHEET NO.
B-5825	2C-1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

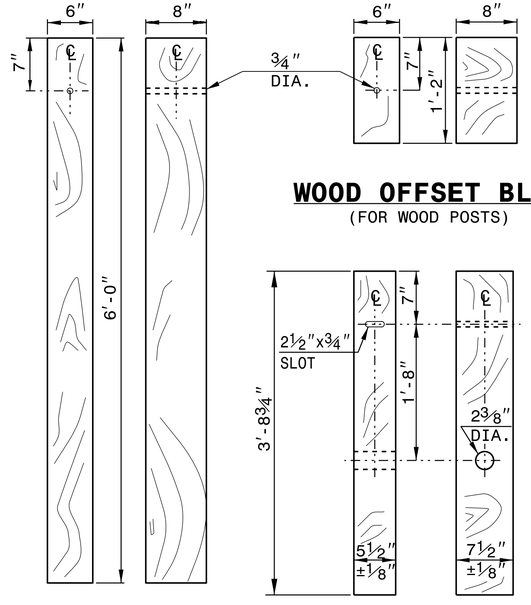
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



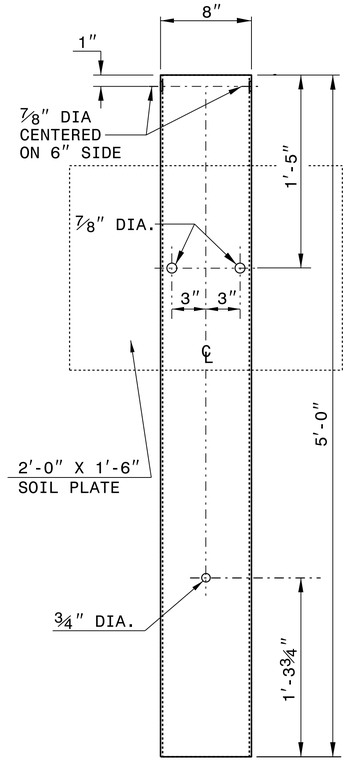
STANDARD W-BEAM GUARDRAIL



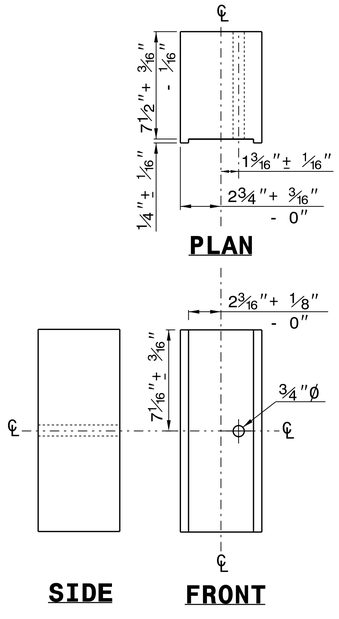
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

SHORT WOOD BREAKAWAY POST



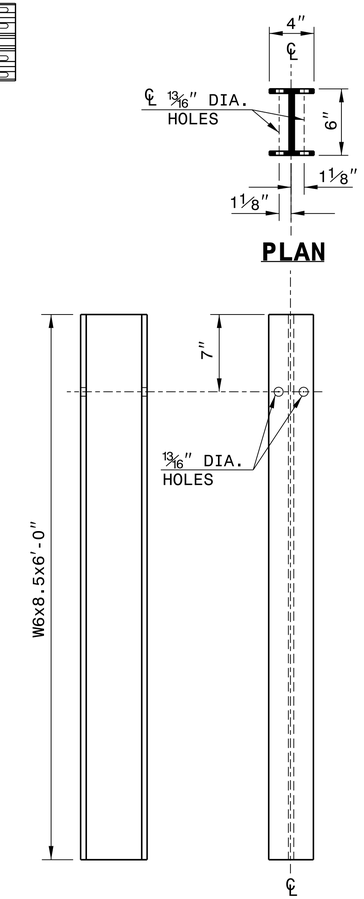
STEEL TUBE
TS 6"x8"x0.1875"



PLAN

SIDE **FRONT**

ROUTED OFFSET BLOCK



PLAN

SIDE **FRONT**

"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

3/19/2020 | 12:43 PM EDT

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.:

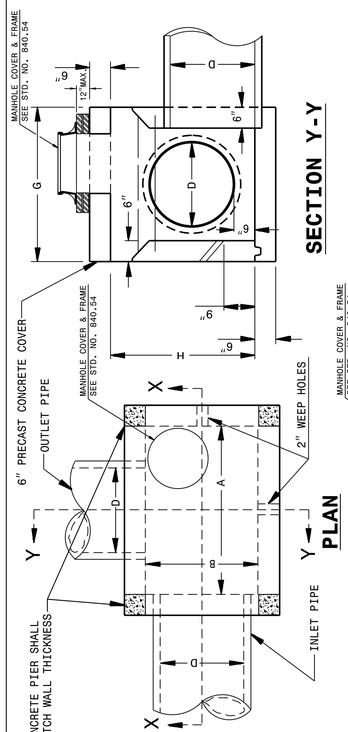
PROJECT REFERENCE NO.	SHEET NO.
B-5825	2C-2

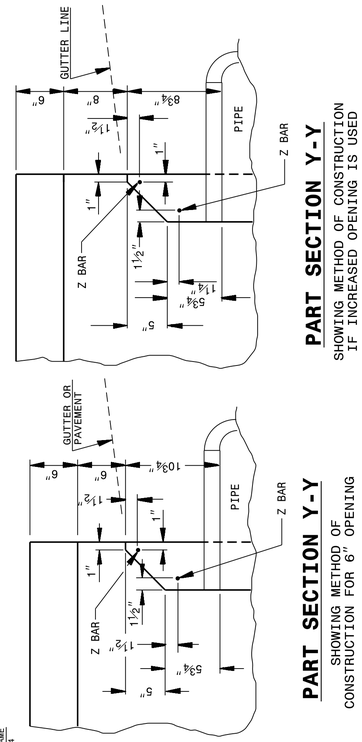
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
(3 OR 4 SIDE OPEN THROAT)
(MANHOLE OPTIONAL)

SHEET 1 OF 2 — 840D04

GENERAL NOTES:
ALL CATCH BASINS OVER 3'-6" IN DEPTH TO BE PROVIDED WITH STEPS 12" ON CENTERS. STEPS SHALL BE IN ACCORDANCE WITH STD. 840.66.
ALL EXPOSED CORNERS TO BE CHAMFERED 1".
CLASS "B" CONCRETE TO BE USED THROUGHOUT.
2" PIPE WEEPHOLES TO BE PLACED AS DIRECTED BY ENGINEER.
THE 6" OPENING SHOWN MAY BE INCREASED TO 8" MAXIMUM IF DEEMED TO BE NECESSARY BY THE ENGINEER.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #5 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STD. DWG. 840.00.
A STONE DRAIN CONSISTING OF 1 CUBIC FOOT OF NO. 78M STONE CONTAINED IN A BAG OF POROUS FABRIC SHALL BE PLACED AT EACH WEEP HOLE.
FOR 8' IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB.
OVER 8' IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. QUANTITIES TO BE ADJUSTED ACCORDINGLY.
DIMENSIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.





DIM'S OF BOX & PIPE / *MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN (BASED ON MIN. HEIGHT, H)*

PIPE D	SPAN A	WIDTH B	HEIGHT H	REINFORCING BARS – X NO.	BARS – X LENGTH	BARS – Y NO.	BARS – Y LENGTH	TOP & BOT. SLAB DIMENSIONS F	TOP & BOT. SLAB DIMENSIONS G	CU. YDS. CONC. IN BOX TOP SLAB	CU. YDS. CONC. IN BOX BOT. SLAB	CU. YDS. CONC. IN BOX WALL	TOTAL QUANTITIES BOX & SLABS LBS. REINF.	TOTAL QUANTITIES BOX & SLABS HT.	DEDUCTION ONE PIPE C.S.	DEDUCTION ONE PIPE R.C.	DED. ONE (1) THROAT OPENING YD³
12"	3'-6"	2'-3"	1'-10"	4	3'-0"	6	4'-3"	4'-6"	3'-3"	0.181	0.271	0.250	27	1.046	0.015	0.032	0.046
15"	3'-6"	2'-3"	2'-1"	4	3'-0"	6	4'-3"	4'-6"	3'-3"	0.181	0.271	0.250	27	1.108	0.023	0.036	0.046
18"	4'-0"	2'-8"	2'-4"	5	3'-5"	7	4'-9"	4'-9"	3'-8"	0.226	0.340	0.284	35	1.379	0.033	0.049	0.053
24"	4'-0"	2'-8"	2'-10"	5	3'-5"	7	4'-9"	4'-9"	3'-8"	0.226	0.340	0.284	35	1.521	0.059	0.085	0.053
30"	4'-0"	3'-6"	3'-4"	5	4'-3"	9	4'-9"	5'-3"	4'-6"	0.278	0.417	0.315	43	1.916	0.092	0.127	0.053
36"	4'-6"	4'-0"	3'-10"	5	4'-9"	10	5'-3"	5'-6"	5'-0"	0.340	0.510	0.352	51	2.390	0.132	0.178	0.059
42"	5'-0"	4'-6"	4'-4"	5	5'-3"	12	5'-9"	6'-0"	5'-6"	0.407	0.611	0.389	64	2.914	0.180	0.243	0.066
48"	5'-0"	5'-0"	4'-10"	5	5'-9"	13	5'-9"	6'-0"	6'-0"	0.444	0.666	0.407	68	3.298	0.235	0.317	0.066

STATE OF
NORTH CAROLINA
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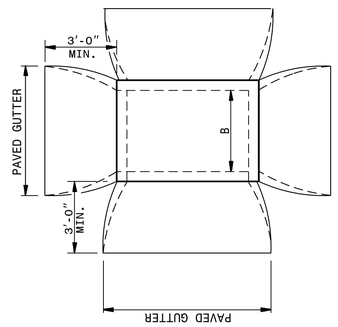
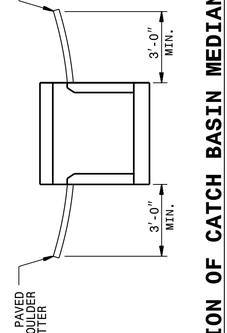
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
(3 OR 4 SIDE OPEN THROAT)
(MANHOLE OPTIONAL)

SHEET 2 OF 2 — 840D04

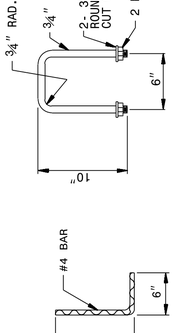


PLAN OF CATCH BASIN IN MEDIAN STRIP

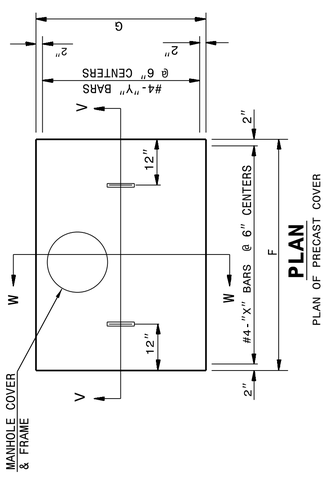


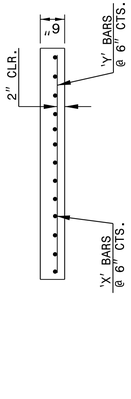
SECTION OF CATCH BASIN MEDIAN STRIP

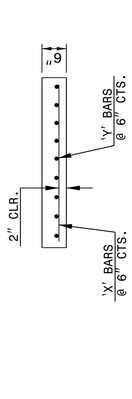
DETAIL SHOWING METHOD OF PLACING
CATCH BASIN AND PAVED SHOULDER GUTTER

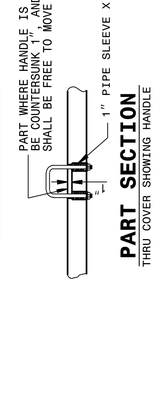


DOWEL — DETAIL OF HANDLE







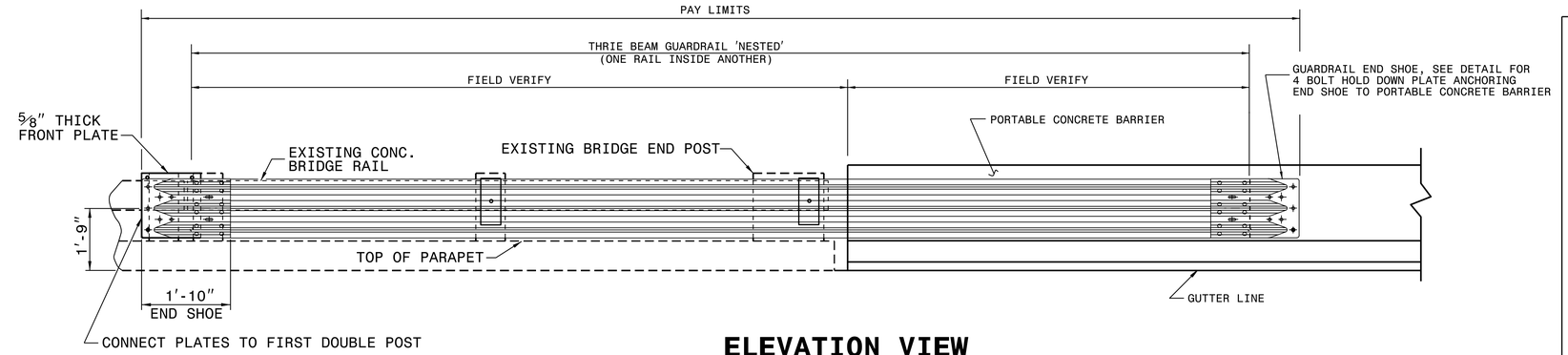


CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

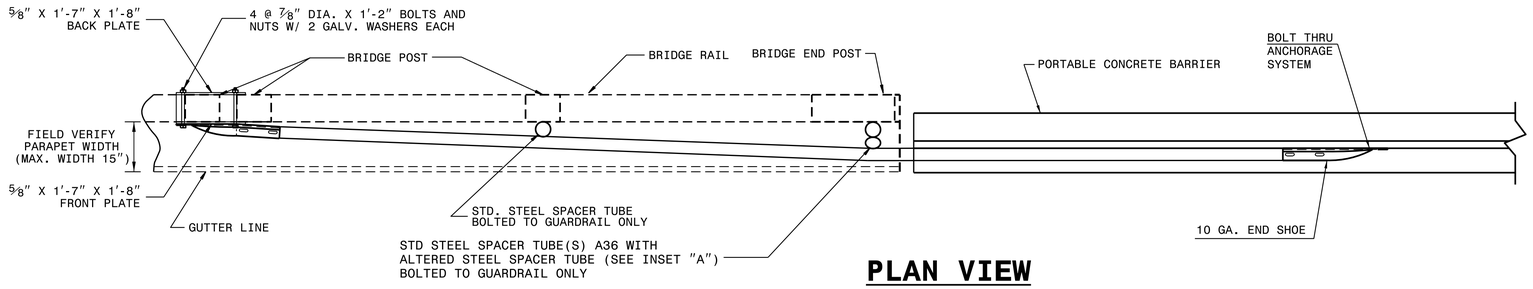
SEE PLATE FOR TITLE

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 07-03-2014
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/nbritt/english/hydro/840d04.dgn

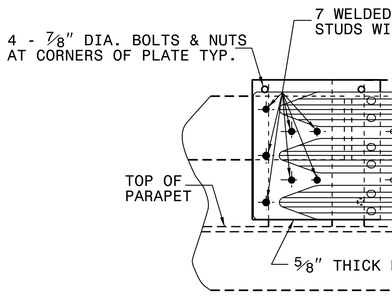
PROJECT REFERENCE NO.	SHEET NO.
B-5825	2C-3



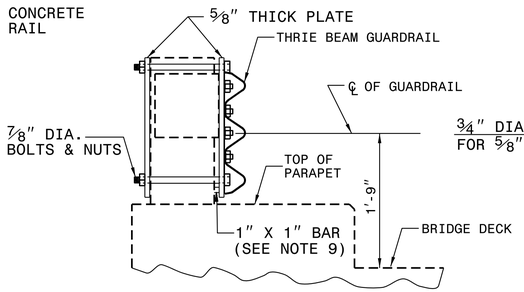
ELEVATION VIEW



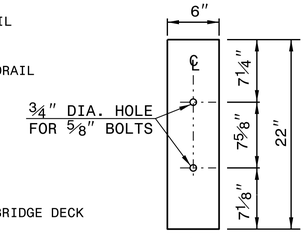
PLAN VIEW



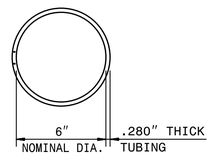
ELEVATION VIEW



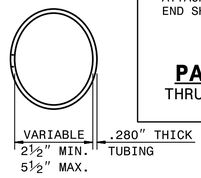
SECTION VIEW



FRONT VIEW



PLAN VIEW



PLAN VIEW INSET "A"

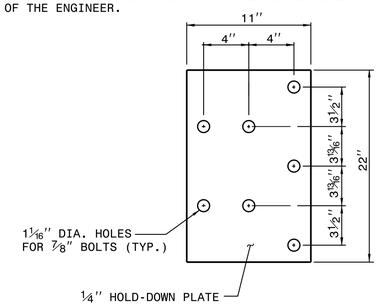
STEEL SPACER TUBE

NOTES FOR 4 BOLT HOLD DOWN PLATE

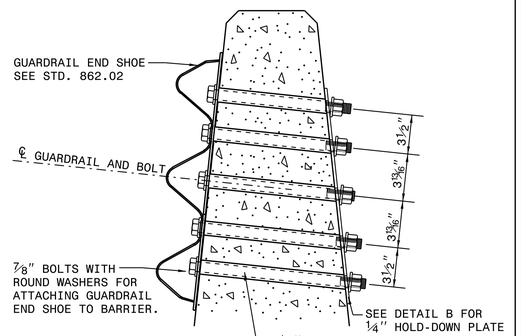
THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" DIA. BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL. THE 1 1/4" DIA. HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

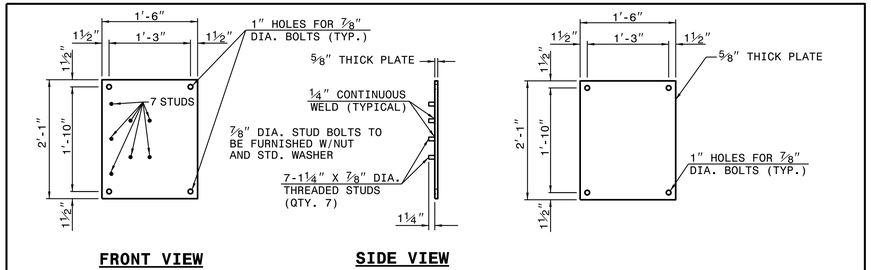


7 BOLT HOLD DOWN PLATE



PART SECTION OF BARRIER OR RAIL
THRU END SHOE SECTION AND 7 BOLT HOLD DOWN PLATE

GENERAL NOTES:
1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
2. TAP NUTS FOR THE 7/8" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
3. USE PLATES AND TUBES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
7. USE THIS DETAIL ONLY FOR BRIGES WITH POST AND BEAM TYPE RAIL.
8. ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH 1/4" WELDS ALL AROUND.
9. 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.
10. PROVIDE SHOP DRAWINGS OF THE PLATES TO THE ENGINEER FOR APPROVAL BEFORE FABRICATING THE PLATES.
11. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
12. SEE ROADWAY STANDARD DRAWING 862.03 SHEET 3 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT



BRIDGE PLATES

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

TEMPORARY ANCHOR UNIT TYPE THRIE-BEAM

ORIGINAL BY:	E.E. WARD	DATE:	01-03
MODIFIED BY:	KA Kempf	DATE:	10-19
CHECKED BY:		DATE:	
FILE SPEC.:	s:details\stand\bpiii originial.dgn		

PROJECT REFERENCE NO.	SHEET NO.
B-5825	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 3/4/2020
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SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

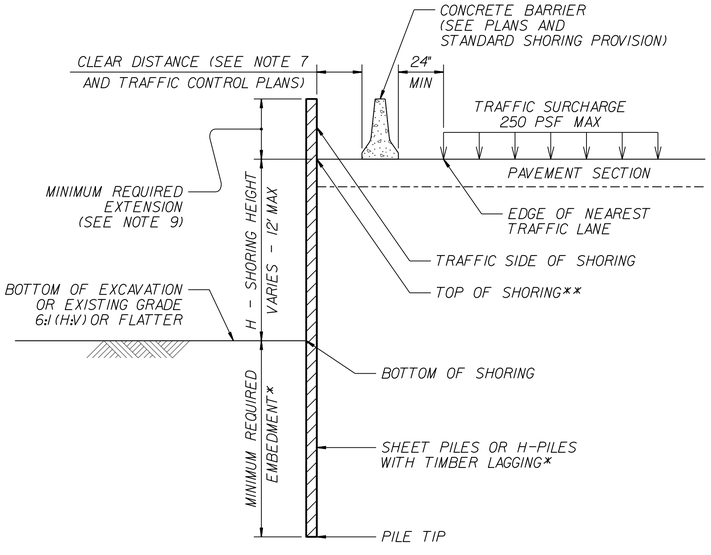
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

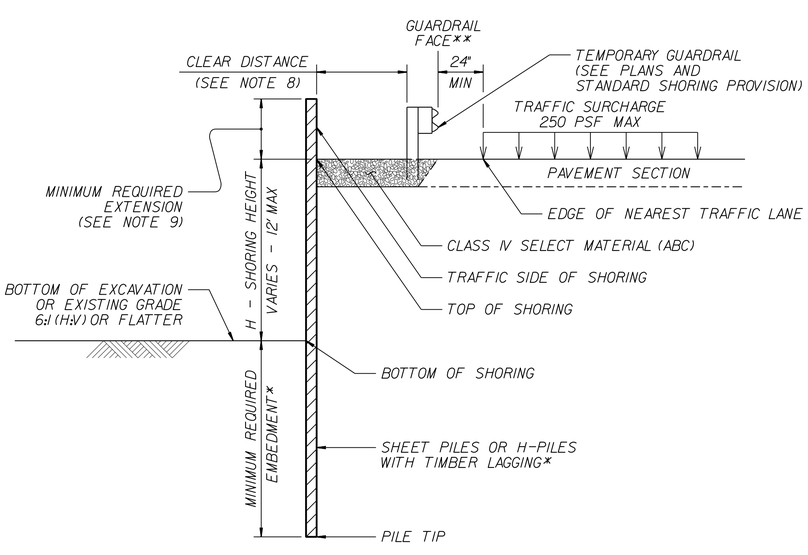
NOTES:

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.



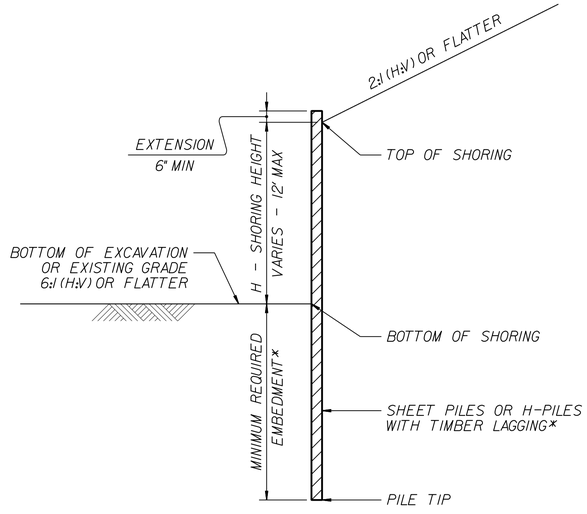
CONCRETE BARRIER

**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-5825	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 3/4/2020
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ENGINEER

SIGNATURE DATE

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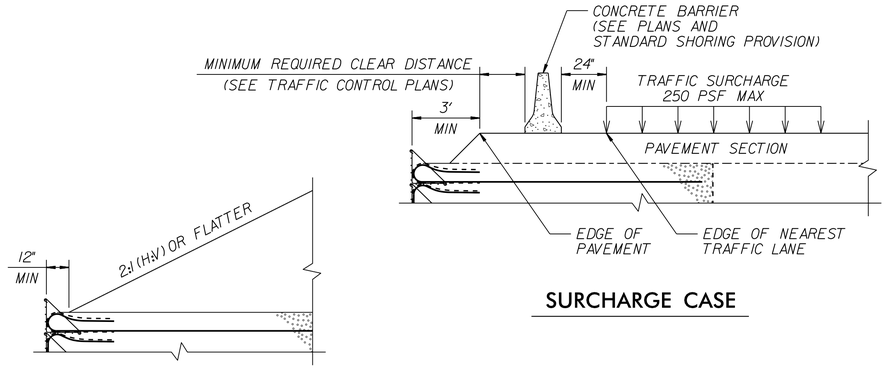
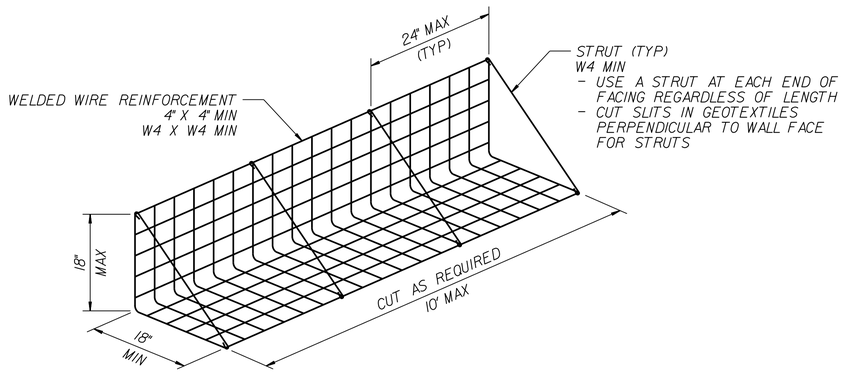
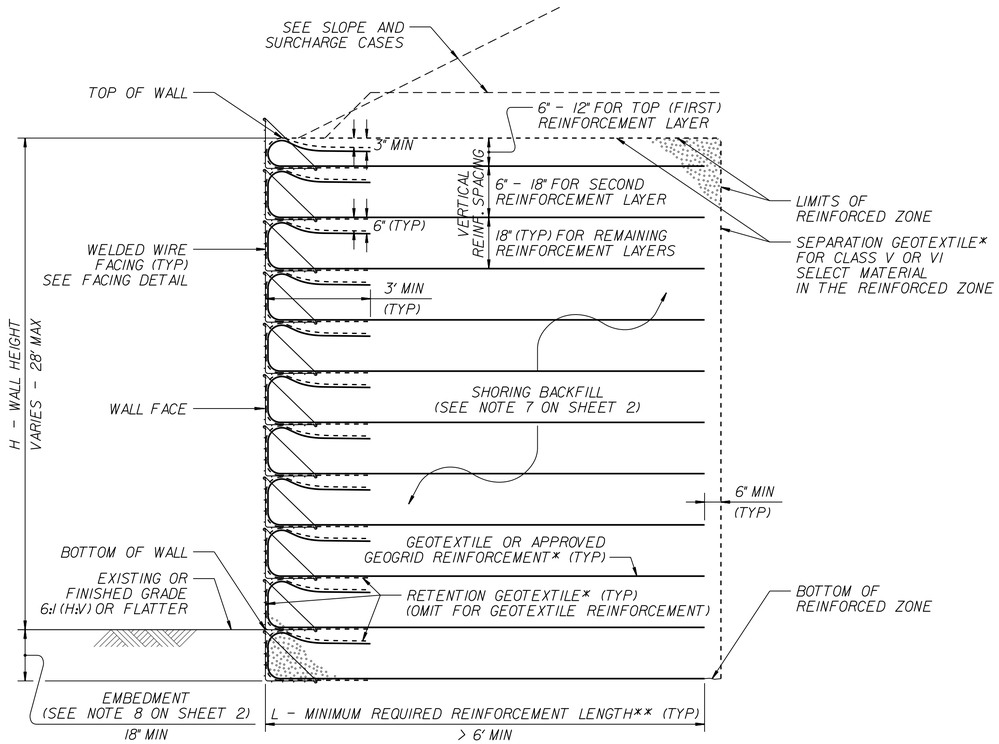


SURCHARGE CASE

SLOPE CASE

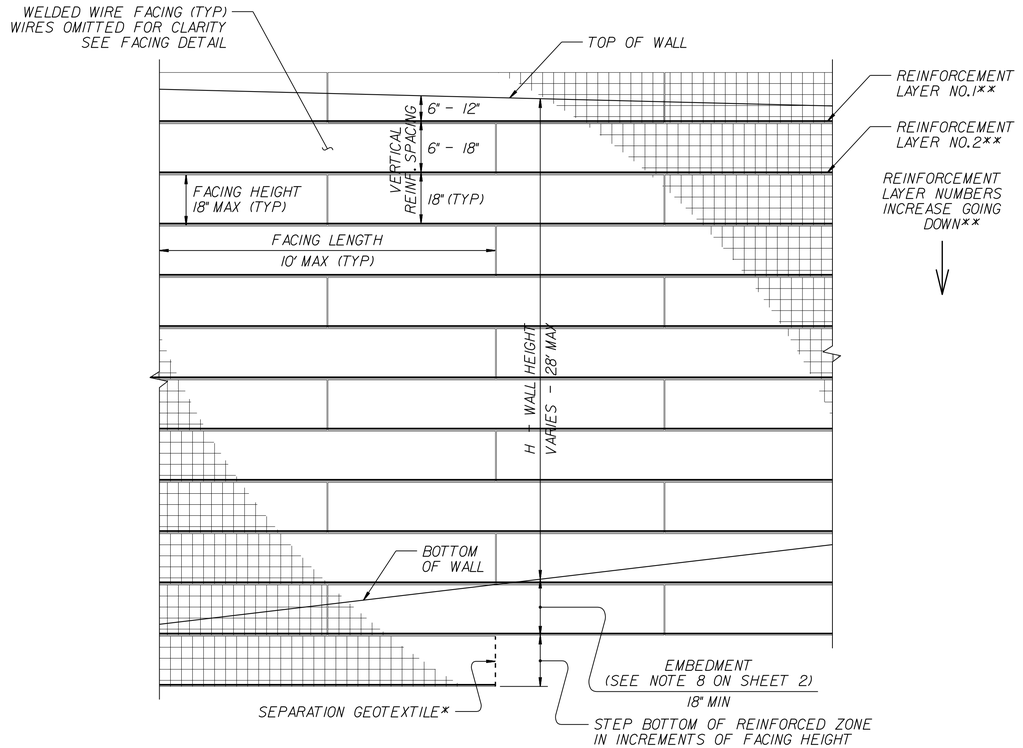


FACING DETAIL



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-5825	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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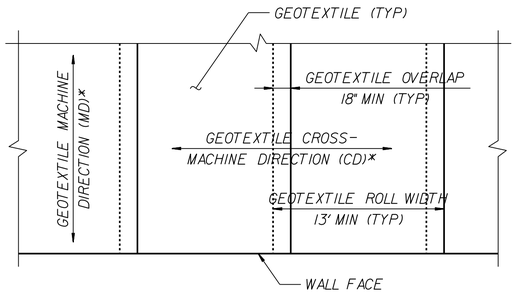
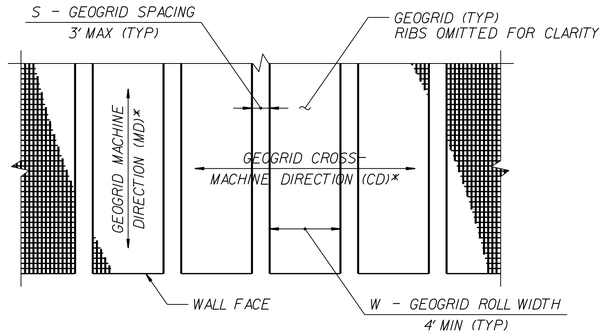


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

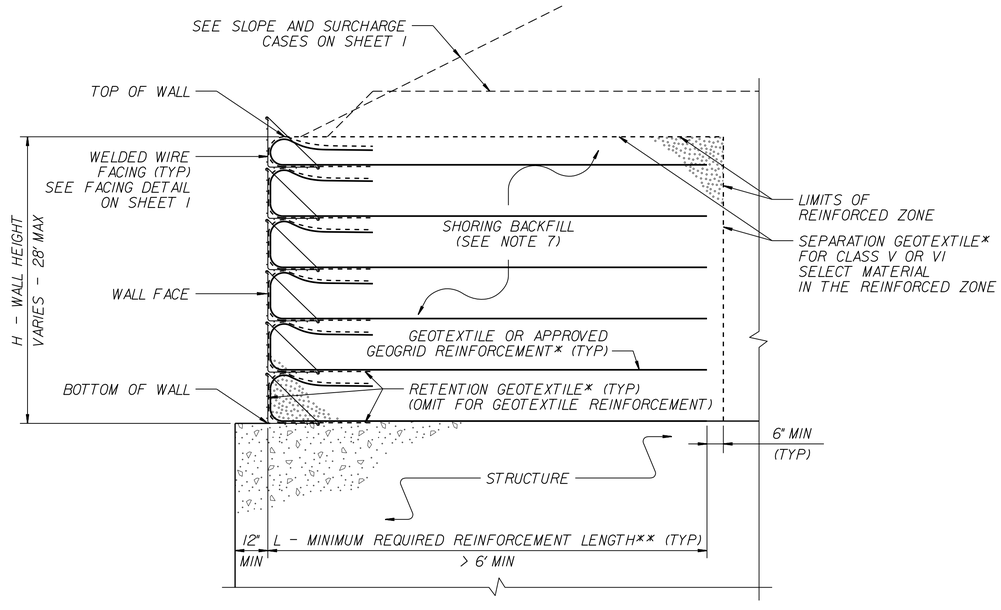


GEOGRID PLACEMENT

(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 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. 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 ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Manual.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

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

    IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
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: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
B-5825	2G-4

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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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) + 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: VML	DATE: 19 MAR 2020
CHECKED BY: DBE	DATE: 19 MAR 2020

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5825	3B-1

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- 14+00.00 TO -L- 29+31.67	9757		13194	3437	
BRIDGE					
-L- 39+98.33 TO -L- 54+00.00	5013		14713	9700	
-Y1- 10+25.00 TO -Y1- 11+75.97	15		874	859	
-Y2- 12+00.00 TO -Y2- 21+46.68	3062		12128	9066	
-DRW2- 10+09.34 TO -DRW2- 12+85.31	221		167		54
-DRW1- 10+07.86 TO -DRW1- 11+58.04	295		33		262
SUBTOTAL	18363		41109	23062	316
MATERIAL FOR SHOULDER CONSTRUCTION			1134	1134	
LOSS DUE TO CLEARING & GRUBBING	-1175			1175	
WASTE IN LIEU OF BORROW				-316	-316
PROJECT TOTAL	17188		42243	25055	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				1253	
GRAND TOTAL	17188		42243	26308	
SAY	18050			27630	

DDE = 4190 CY

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

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-L-	14+00	29+19	RT	2680
-L-	14+00	15+59	LT	2
-L-	40+03	54+00	RT	3464
-L-	46+99	50+23	RT/LT	60
-L-	52+64	53+99	LT	7
-Y1-	10+25	11+98	RT/LT	485
-Y2-	12+55	21+68	RT	1523
-DRW2-	10+10	10+59	LT/RT	126
			TOTAL:	8347
			SAY:	8350

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION	LENGTH (LF)
-L-	17+73.21	21+36.32	LT	363.1
-L-	26+71.59	29+08.17	RT	236.6
-L-	27+84.42	29+08.17	LT	123.8
-L-	40+22.83	42+58.97	LT	236.1
-L-	40+22.83	40+96.71	RT	73.9
-L-	44+88.78	47+31.02	LT	242.2
-Y2-	17+66.35	19+94.78	RT	228.4
			TOTAL:	1504.1
			SAY:	1505

"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 SHOUL. WIDTH	FLARE LENGTH		W	
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END
-L-	17+23.13	21+86.23	LT	462.50'			21+50.00	18+50.00	8'	11'	50'	50'	1'	1'
-L-	17+75.09	21+74.54	RT	400.00'			19+00.00	20+50.00	8'	11'	50'	50'	1'	1'
-L-	26+21.51	29+32.17	RT	310.375'			26+32.17	29+32.17	VAR. 4'-8'	VAR. 7'-11'	50'		1'	
-Y1- /-L-	-Y1- 10+88.19	-L- 29+32.17	LT	185.375'	56.25'		-L- 29+32.17	-Y1- 10+88.19	VAR. 6'-10'	VAR. 9'-13'		25'		0.5'
-L-	39+98.83	43+08.91	LT	310.375'			42+98.83	39+98.83	VAR. 4-8'	VAR. 7'-11'	50'		1'	
-L-	39+98.83	41+46.76	RT	147.875'			39+98.83	41+35.83	VAR. 4-5.5'	VAR. 7'-8.5'		50'		1'
-Y2- /-L-	-Y2- 18+52.90	-L- 47+80.96	LT	612.50'	50.00'		-L- 46+50.00	-Y2- 19+50.00	8'	11'	50'	50'	1'	1'
-Y2-	17+15.95	20+45.55	RT	325.00'			18+50.00	20+00.00	8'	11'	50'	50'	1'	1'
		SUBTOTAL (LF)		2754.00'	106.25'									
		LESS ANCHORS (LF)		666.50'										
		TOTAL GUARDRAIL (LF)		2087.50'	106.25'									
		SAY GUARDRAIL (LF)		2087.50'	112.50'		ADDITIONAL GUARDRAIL POSTS: SAY 10 EA							

SURVEY LINE	ANCHORS									IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
	TYPE GREU, TL-3	CAT-1	AT-1	TYPE III	B-77	TYPE GREU, TL-2	.	.	.	EA	G	NG				
-L-	2															
-L-	2															
-L-	1				1											
-Y1- /-L-					1	1										RADIUS = 30'
-L-	1				1											
-L-	1				1											
-Y2- /-L-	2															RADIUS = 42'
-Y2-	2															
TOTAL ANCHORS OR ATTENUATORS (EA)	11				4	1										
ANCHOR UNIT LENGTH (LF)	50'	6.25'	6.25'	18.75'	22.875'	25'										
DEDUCTION PER TYPE (LF)	550'				91.5'	25'										
TOTAL DEDUCTION (LF)	666.50'															

12/06/07

4/8/2020
C:\Projects\B-5825\Roadway\Proj\b5825_rdy_psh_3b-1.dgn

TGSBEN-LAPTOP

COMPUTED BY: BAJ DATE: 3/18/20

CHECKED BY: BJH DATE: 3/18/20

PROJECT NO.	SHEET NO.
B-5825	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 | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. S. PIPE THICKNESS OR GAUGE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.500" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.500" THICK, GRADE B NOT IN SOIL | 36" WELDED STEEL PIPE 0.500" THICK, GRADE B IN SOIL | 36" WELDED STEEL PIPE 0.500" THICK, GRADE B NOT IN SOIL | 42" WELDED STEEL PIPE 0.625" THICK, GRADE B IN SOIL | 42" WELDED STEEL PIPE 0.625" THICK, GRADE B NOT IN SOIL | 15" SIDE DRAIN PIPE | ENDWALLS STD. 826.01 OR STD. 828.11 (UNLESS NOTED OTHERWISE) CY | QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) 0' THRU 5' EACH | A 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | OPEN THROAT C.B. STD. 840.04 OR STD. 840.05 | 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, 840.27, OR 840.45 | 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. FLAT) FRAME W/ GRATE STD. 840.22 | 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 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31, 840.32, OR 840.45 | ANGLED VANE GRATES AND FRAMES STD. 840.33 | T.B.J.B. STD. 840.34 OR 840.46 | T.B.D.I. STD. 840.35 OR 840.46 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | 15" C.S. ELBOW | 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 |
|---|---|---

COMPUTED BY:	BAJ	DATE:	3/18/20
CHECKED BY:	BJH	DATE:	3/18/20

TGSBEN-LAPTOP

PROJECT NO.	SHEET NO.
B-5825	3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

Line & Station	Offset		Structure Number From	Structure Number To	Top Elevation (FT.)	Invert Elevation (FT.)	Invert Elevation (FT.)	Minimum Required Slope (%)	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	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)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	R. C. Pipe Class IV 12	15	18	24	30	36	42	48
Y2 19+23	20	RT	0619		762.6																																
			0619	0618		752.8	738.5	0.6															40														
Y2 18+47	20	RT	0620		760.7																																
			0620	0619		753.5	752.8																								72						
Y2 17+80	20	RT	0621		759.6																																
			0621	0620		754.1	753.5																								64						
Y2 17+80	28	LT	0622		757.4																																
			0622	0621		754.6	754.1																								48						
L 50+01	41	RT	0625		773.0																																
			0625	0624		770.0	761.6																84														
L 48+20	32	LT	0626		769.8																																
			0626	0627		767.0	765.0																								128						
L 50+00	32	LT	0630		773.2																																
			0630	0629		770.2	767.2																								52						
L 46+64	79	LT	0631		760.0																																
			0631	0632		753.0	751.0																										40				
Y2 14+24	26	LT	0702		753.3																																
			0702	0701		748.7	747.1																										64				
Y2 14+66	28	LT	0703		753.0																																
			0703	0702		750.0	749.2																									40					
Y2 15+50	28	LT	0704																																		
			0704	0703		753.4	750.0																									84					
Y1 11+15	17	RT																																			
L 19+77	15	RT																																			
L 21+75	26	RT																																			
L 21+80	59	LT																																			
L 46+56	55	RT																																			
L 49+45	18	RT																																			
Y2 18+01	2	RT																																			
Y2 18+08	18	RT																																			
Y2 18+90	91	RT																																			
Y2 15+01	19	LT																																			
Y2 14+46	22	LT																																			
Y2 14+27	7	RT																																			
L 41+73	30	RT																																			
L 42+04	112	RT																																			
L 48+01	1	LT																																			
L 18+50	49	LT																																			
L 18+88	59	RT																																			
L 21+79	44	LT																																			
L 21+76	15	LT																																			
SHEET TOTALS																							124								364	124	104				
PROJECT TOTALS																							644	144	40						1216	124	176		68		

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

FRAME, GRATES, AND HOOD STD. 840.03

Line & Station	From	To	24" Welded Steel Pipe 0.500" Thick, Grade B in Soil	24" Welded Steel Pipe 0.500" Thick, Grade B Not in Soil	36" Welded Steel Pipe 0.500" Thick, Grade B in Soil	36" Welded Steel Pipe 0.500" Thick, Grade B Not in Soil	42" Welded Steel Pipe 0.625" Thick, Grade B in Soil	42" Welded Steel Pipe 0.625" Thick, Grade B Not in Soil	15" Side Drain Pipe	Endwalls Std. 838.01 or Std. 838.11 (Unless Noted Otherwise) CY	A: 0' Thru 5' (Each)	A: 5' Thru 10' (Lin. Ft.)	B: 10' and Above (Lin. Ft.)	C.B. Std. 840.01 or Std. 840.02	Grate Type E	Grate Type F	Grate Type G		D.I. Std. 852.04 or Std. 852.06	C.B. Std. 852.05
Y2 19+23	0619										1	4.8								
	0619	0618																		
Y2 18+47	0620										1	2.2								
	0620	0619																		
Y2 17+80	0621										1	0.5								
	0621	0620																		
Y2 17+80	0622										1									
	0622	0621																		
L 50+01	0625										1									
	0625	0624																		
L 48+20	0626										1									
	0626	0627																		
L 50+00	0630										1									
	0630	0629																		
L 46+64	0631										1	2.0								
	0631	0632																		
Y2 14+24	0702										1									
	0702	0701																		
Y2 14+66	0703										1									
	0703	0702																		
Y2 15+50	0704																			
	0704	0703																		
Y1 11+15																				
L 19+77																				
L 21+75																				
L 21+80																				
L 46+56																				
L 49+45																				
Y2 18+01																				
Y2 18+08																				
Y2 18+90																				
Y2 15+01																				
Y2 14+46																				
Y2 14+27																				
L 41+73																				
L 42+04																				
L 48+01																				
L 18+50																				
L 18+88																				
L 21+79																				
L 21+76											1									
SHEET TOTALS											11	9.5								
PROJECT TOTALS			60	60	60	60	90	90	64	9.000	30	31.3								

Line & Station	From	To	Open Throat C.B. Std. 840.04 or Std. 840.05	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, 840.27, or 840.45	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	Driveway D.I. Std. 840.30	Frame w/ Grate for Driveway Std. 840.30	J.B. Std. 840.31, 840.32, or 840.45	Angled Vane Grates and Frames Std. 840.33	T.B.J.B. Std. 840.34 or 840.46	T.B.D.I. Std. 840.35 or 840.46	T.B.D.I. for Steel Grates Std. 840.36	Steel Frame with Two Grates Std. 840.37	Temp Steel Plate Cover Masonry Drainage	M.H. Std. 840.51, Std. 840.52, or Std. 840.53	M.H. Frame and Cover Std. 840.54	15" C.S. Elbow	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
Y2 19+23	0619															1						1													TRAFFIC BEARING 2GI
	0619	0618																										2							ROD & LUG, GASKETS, & ELBOWS
Y2 18+47	0620															1						1													TRAFFIC BEARING 2GI
	0620	0619																																	
Y2 17+80	0621															1						1													TRAFFIC BEARING 2GI
	0621	0620																																	
Y2 17+80	0622						1							1																					
	0622	0621																																	
L 50+01	0625						1							1																					
	0625	0624																										2							ROD & LUG, GASKETS, & ELBOWS
L 48+20	0626						1							1																					
	0626	0627																																	
L 50+00	0630						1							1																					
	0630	0629																																	
L 46+64	0631		1																																OTCB - 4-SIDED OPENING
	0631	0632																																	
Y2 14+24	0702						1					1																							
	0702	0701																																	
Y2 14+66	0703						1					1																							
	0703	0702																																	
Y2 15+50	0704																																		
	0704	0703																																	
Y1 11+15																																		35	REMOVE EXIST. 24" CMP
L 19+77																															18				FILL EXIST. 24" RCP
L 21+75																															5				FILL EXIST. 18" RCP
L 21+80																																		28	REMOVE EXIST. 18" RCP
L 46+56																																		19	REMOVE EXIST. 15" RCP
L 49+45																															5				FILL EXIST. 18" RCP
Y2 18+01																																		21	REMOVE EXIST. 15" RCP
Y2 18+08																																		32	REMOVE EXIST. 15" RCP
Y2 18+90																																		95	REMOVE EXIST. 72" CMP
Y2 15+01																																		55	REMOVE EXIST. 15" RCP
Y2 14+46																																		43	REMOVE EXIST. 15" CMP
Y2 14+27																																		56	REMOVE EXIST. PIPE
L 41+73																															17				FILL EXIST. 30" RCP
L 42+04																																		86	REMOVE EXIST. 30" RCP
L 48+01																																		21	REMOVE EXIST. 18" CMP
L 18+50																																			TEMP. PIPE FOR EROSION CONTROL, L=110 LF
L 18+88																																			TEMP. PIPE FOR EROSION CONTROL, L=180 LF
L 21+79																																			TEMP. PIPE FOR EROSION CONTROL, L=60 LF
L 21+76																			1																TEMP. JB FOR EROSION CONTROL
SHEET TOTALS			1				6					2		4		3			1			3						4			45			491	
PROJECT TOTALS			1				11					4		7		16			1			16				1	1	16			45			491	

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: PAS DATE: 5/24/19
CHECKED BY: VML DATE: 6/1/20

(5-15-18)

PROJECT NO.	SHEET NO.
B-5825	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
-L-	1.5:1	45+00	1.5:1	45+90	LT	2	2	380
							TOTAL SY:	380

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

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 (1)	18	200	400	400		
				TOTAL CY/TONS/SY:		200	400**	400**		

*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.

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
Bridge No. 35 over the Yadkin River on NC 67	EB No. 2	3

PROJ. REFERENCE NO.	SHEET NO.
B-5825	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	04	DONNA B. LOVE
1A	04	DONNA B. LOVE
2	04	ALTON GEORGE
3	04	G & E WHITE LLC
4	04, 05	HUBBARD REALTY OF WINSTON SALEM INC
5	04, 05	STATE OF NORTH CAROLINA
6	05, 06, 07	M. KEITH BUTNER
7	05, 06	STEPHEN A. HUBBARD, SUSAN K. HUBBARD
8	06	DONNAHA MART LLC
9	06, 07	JASHUA COX
10	06	FRANCIS HOSTETTER
11	06	CRAY EDGAR VADEN
12	06	PAMELA W. MEADOWS
13	06	BEECHNUT PROPERTIES LLC
14	07	JANIE W. MCMAHON & FRANK J. MCMAHON, JR.
15	07	LEONARD GRAY SALMONS, DEBORAH STANLEY SALMONS
16	06	ERIC W. COBB

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

PROJECT REFERENCE NO.	SHEET NO.
B-5825	04
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027418 MARCUS LOWDER
6/4/2020 | 10:23 AM EDT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 BENJAMIN J. HENEGAR
6/4/2020 | 7:58 AM PDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

8/17/99

REVISIONS

BEGIN TIP PROJECT B-5825
-L- POT Sta. 14+00.00

-L-
PI Sta 17+89.96
Δ = 3° 18' 30.4" (LT)
D = 0° 28' 38.9"
L = 692.92'
T = 346.55'
R = 12,000.00'
SE = NC

-L-
PI Sta 24+82.87
Δ = 3° 18' 30.4" (RT)
D = 0° 28' 38.9"
L = 692.92'
T = 346.55'
R = 12,000.00'
SE = NC

NAD 83 NA 2011

-L- PC Sta. 14+43.40

-L- PRC Sta. 21+36.32

-L- PT Sta. 26+50.00

MATCHLINE -L- STA. 26+50.00 SEE SHEET 05

1 DONNA B LOVE DB 547 PG 146 PB 2 PG 36

1A DONNA B LOVE DB 547 PG 148 PB 2 PG 36

2 ALTON GEORGE DB 1155 PG 72

3 G & E WHITE LLC DB 1242 PG 494

4 HUBBARD REALTY OF WINSTON SALEM INC DB 116 PG 727 PB 2 PG 36

5 STATE OF NORTH CAROLINA DB 71 PG 589

TIE EXIST. DITCH TO TYP. CUT DITCH S=3.5% L=50'

TIE EXIST. DITCH TO TYP. CUT DITCH S=3.0% L=50'

4' STD. BASE DITCH SEE DETAIL 5 CLASS 'I' RIP-RAP EST. 50 TONS GEOTEXTILE EST. 90 SY S=4.0% L=40' EST. 30 CY DDE

2' LAT. BASE DITCH SEE DETAIL 2 CLASS 'I' RIP-RAP EST. 180 TONS GEOTEXTILE EST. 340 SY EST. 650 CY DDE

2' LAT. BASE DITCH SEE DETAIL 2 CLASS 'I' RIP-RAP EST. 30 TONS GEOTEXTILE EST. 60 SY EST. 60 CY DDE

VAR. WIDTH BASE DITCH SEE DETAIL 4 CLASS 'I' RIP-RAP EST. 40 TONS GEOTEXTILE EST. 70 SY S=1.0% L=30' EST. 30 CY DDE

BEGIN SBG -L- 17+73.21 LT

END SBG -L- 21+36.32 LT

18" CSP W/ROD & LUG, GASKETS & 2 ELBOWS

15" CSP W/ROD & LUG, GASKETS, & 2 ELBOWS

15" CSP W/ROD & LUG, GASKETS, & 2 ELBOWS

REMOVE CONC. DITCH

REMOVE CONC. DITCH

REMOVE HW

FALSE SUMP SEE DETAIL 6

FALSE SUMP SEE DETAIL 7

TRENCHLESS CONSTRUCTION

APPROX. 300 LF 72" CHL W/RZR WIRE FENCE RESET

TIE TYP. CUT DITCH TO EXIST. DITCH S=2.0% L=70'

S 72° 19' 29.2" E

NC HIGHWAY 67 22' BST

NC HIGHWAY 67 23' BST

GREU, TL-3

4'FDPS

12" RCP

42" WSP

72"CHL RZR WIRE

GPS B5825-I

WOODS

GR

HTR

WD DECK

CONC

S

WELL

SEPTIC TANK

A/C PAD

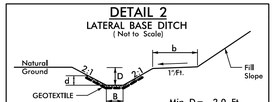
U/G SEPTIC TANK

GTD = GRADE TO DRAIN

DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED

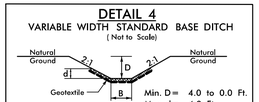
SEE SHEET 08 FOR -L- PROFILE

DETAIL 2
LATERAL BASE DITCH
(Not to Scale)



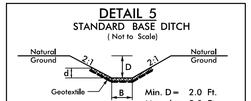
*When B is < 6.0'
Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 2.0 Ft.
b= 5.0 Ft.
Type of Liner= Class 'I' Rip-Rap
FROM -L- STA. 19+00 TO STA. 21+50 LT
FROM -L- STA. 19+75 TO STA. 20+19 RT

DETAIL 4
VARIABLE WIDTH STANDARD BASE DITCH
(Not to Scale)



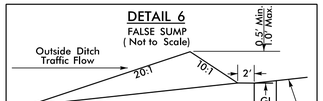
Min. D= 4.0 to 0.0 Ft.
Max. d= 4.0 Ft.
B= 4.0 to 8.0 Ft.
Type of Liner= Class 'I' Rip-Rap
-L- STA. 20+19 RT

DETAIL 5
STANDARD BASE DITCH
(Not to Scale)



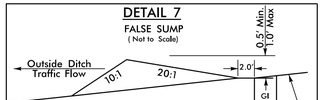
*When B is < 6.0'
Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 4.0 Ft.
Type of Liner= Class 'I' Rip-Rap
-L- STA. 19+25 LT

DETAIL 6
FALSE SUMP
(Not to Scale)



-L- STA. 17+83 LT

DETAIL 7
FALSE SUMP
(Not to Scale)



-L- STA. 17+65 RT

8/17/99

REVISIONS

-L-	-Y1-		-DRW2-	
PI Sta 24+82.87	PI Sta 10+24.48	PI Sta 11+16.51	PI Sta 10+68.07	PI Sta 11+87.57
△ = 3°18' 30.4" (RT)	△ = 4° 40' 23.7" (RT)	△ = 48° 29' 54.2" (LT)	△ = 38° 20' 58.2" (LT)	△ = 26° 40' 38.3" (RT)
D = 0°28' 38.9"	D = 9° 32' 57.5"	D = 38° 11' 49.9"	D = 38° 11' 49.9"	D = 38° 11' 49.9"
L = 692.92'	L = 48.94'	L = 126.97'	L = 100.40'	L = 69.84'
T = 346.55'	T = 24.48'	T = 67.57'	T = 52.16'	T = 35.57'
R = 12,000.00'	R = 600.00'	R = 150.00'	R = 150.00'	R = 150.00'
SE = NC	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS
		V = 25 MPH		

DETAIL 1
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, Natural Ground, Geotextile, B

*When B is < 6.0'

Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2.0 Ft.

Type of Liner = Class 'I' Rip-Rap

-Y1- STA. 11+07 LT

DETAIL 2
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, b, 1':1Ft., Fill Slope, Geotextile, B

*When B is < 6.0'

Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.

Type of Liner = Class 'I' Rip-Rap

FROM -L- STA. 28+05 TO STA. 29+75 LT

DETAIL 3
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, Natural Ground, Geotextile, B

*When B is < 6.0'

Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.

Type of Liner = Class 'I' Rip-Rap

-L- 29+75 LT & RT

DETAIL 8
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, b, 1':1Ft., Fill Slope, B

*When B is < 6.0'

Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 3.0 Ft.
b = 5.0 Ft.

Type of Liner = Class 'I' Rip-Rap

FROM -L- STA. 40+00 TO STA. 40+50 LT

DETAIL 9
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, Natural Ground, B

*When B is < 6.0'

Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 3.0 Ft.

Type of Liner = Class 'I' Rip-Rap

FROM -L- STA. 37+85 TO STA. 40+00 LT

DETAIL 10
BANK STABILIZATION
(Not to Scale)

10'min., Ditch Grade, 1.5'

Type of Liner = Class 'I' Rip-Rap

FROM -L- STA. 37+70 TO STA. 37+85 LT

NAD 83 NA 2011

PROJECT REFERENCE NO.	SHEET NO.
B-5825	05

R/W SHEET NO.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027418 MARCUS LOWMEN
4/8/2020 | 1:04 PM EDT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 BENJAMIN J. HENEGAR
4/8/2020 | 10:04 AM EDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

-Y1- PC Sta. 10+00.00
BEGIN CONSTRUCTION
-Y1- POT Sta.10+25.00
-Y1- PRC Sta. 10+48.94
-Y1- POC Sta.10+61.9=
-DRW2- POT Sta. 10+00.00

HUBBARD REALTY OF WINSTON SALEM INC
DB 116 PG 727
PB 2 PG 36

4

2' STD. BASE DITCH
SEE DETAIL 1
CLASS 'I' RIP-RAP
EST. 20 TONS
GEOTEXTILE
EST. 40 SY
S=15.0%
L=30'
EST. 10 CY DDE

CLASS 'I' RIP-RAP IN TYPICAL CUT DITCH
10+50 TO 11+50
d=1.5'
EST. 60 TONS
GEOTEXTILE
EST. 120 SY

SPEC. LAT. 'V' DITCH
SEE DETAIL 11
CLASS 'I' RIP-RAP
EST. 40 TONS
GEOTEXTILE
EST. 80 SY

JOHN J O'CONNOR JR REVOCABLE TRUST
DATED 5-17-2000 AMENDED
PATRICIA M O'CONNOR REVOCABLE TRUST
DATED 5-17-2000 AMENDED
DB 787 PG 6
DB 900 PG 375
PB 2 PG 36

-Y1- PT Sta. 11+75.91
S 17° 12' 56.7" W
-DRW2- PC Sta. 10+15.91
-DRW2- PT Sta. 11+16.31
-DRW2- PC Sta. 11+52.01
S 43° 57' 56.8" E
-DRW2- PT Sta. 12+21.85
END ASPHALT PAVING
END CONSTRUCTION
-DRW2- POT Sta.12+85.31
S 72° 18' 55.0" E
S 55° 38' 16.1" E

5
STATE OF NORTH CAROLINA
DB 71PG 589

2' LAT. BASE DITCH
SEE DETAIL 2
CLASS 'I' RIP-RAP
EST. 160 TONS
GEOTEXTILE
EST. 320 SY
EST. 230 CY DDE

BEGIN SBG
-L- P7+84.42 LT

END SBG
-L- 29+08.17 LT

2' STD. BASE DITCH
SEE DETAIL 3
CLASS 'I' RIP-RAP
EST. 65 TONS
GEOTEXTILE
EST. 140 SY
S=0.7%
L=130'
EST. 20 CY DDE

REMOVE EXISTING STRUCTURE

BEGIN SBG
-L- 26+71.59 RT

-L- POC Sta.27+33.00=
-Y1- POT Sta. 11+97.97

-L- PT Sta. 28+29.24

GTD = GRADE TO DRAIN

DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED

SEE SHEET 08 FOR -L- PROFILE

SEE SHEET 09 FOR -Y1- & -DRW2- PROFILES

FOR STRUCTURE PLANS-BRIDGE, SEE SHEETS S-1 THRU S-60

BEGIN BRIDGE
-L- POT 29+32.17

5
STATE OF NORTH CAROLINA
DB 71PG 589

6
M. KEITH BUTNER
DB 2829 PG 2942
DB 2829 PG 2936

3' LAT. BASE DITCH
SEE DETAIL 8
CLASS 'I' RIP-RAP
EST. 50 TONS
EST. 80 CY DDE

BEGIN SBG
-L- 40+22.83 LT

3' STD. BASE DITCH
SEE DETAIL 9
CLASS 'I' RIP-RAP
EST. 180 TONS
EST. 200 CY DDE

BANK STABILIZATION
SEE DETAIL 10
CLASS 'I' RIP-RAP
EST. 30 TONS

S 72°19' 29.2" E
-L-

40' OFFSET
FROM -EL- TO -L-

-EL-

BANK STABILIZATION
SEE DETAIL 14
CLASS 'II' RIP-RAP
EST. 280 TONS

BANK STABILIZATION
SEE DETAIL 14
CLASS 'II' RIP-RAP
EST. 330 TONS

BEGIN SBG
-L- 40+22.83 RT

7
STEPHEN A HUBBARD
SUSAN K HUBBARD
DB 1822 PG 2457

DETAIL 14
BANK STABILIZATION
(Not to Scale)

TOP OF BANK, 2.0' KEYED-IN, RIVER BED, CLASS 'II' RIP-RAP

-L- STA. 34+50 LT & RT
-L- STA. 38+00 LT & RT

DETAIL 11
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 4:1 or Flatter, Fill Slope, Geotextile

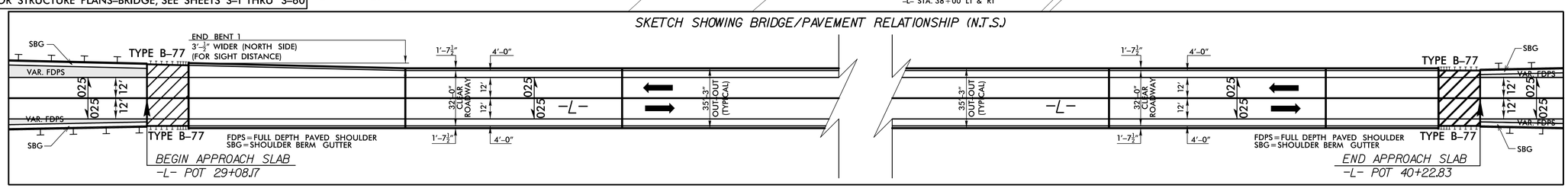
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.

Type of Liner = Class 'I' Rip-Rap

FROM -DRW2- STA. 11+50 TO STA. 12+00 LT

END BRIDGE
-L- POT 39+98.83

SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP (N.T.S.)



MATCHLINE -L- STA. 26+50.00 SEE SHEET 04

MATCHLINE -L- STA. 40+50.00 SEE SHEET 06

4/8/2020
C:\Projects\B-5825\Roadway\Proj\b5825_rdy_psh_05.dgn
User:mlowen

PROJECT REFERENCE NO.	SHEET NO.
B-5825	06
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA — PROFESSIONAL — MARCUS LOWERY — SEAL 027418 — ENGINEER — MARCUS LOWERY
4/8/2020 | 1:04 PM EDT

HYDRAULICS ENGINEER — NORTH CAROLINA — PROFESSIONAL — BENJAMIN J. HERRING — SEAL 044158 — ENGINEER — BENJAMIN J. HERRING
4/8/2020 | 10:04 AM PDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

8/17/99

REVISIONS

MATCHLINE -Y2- STA. 17+00.00 SEE SHEET 07

MATCHLINE -L- STA. 40+50.00 SEE SHEET 05

-L- PC Sta. 40+70.01

-DRW1- PT Sta. 11+33.19
-DRW1- PC Sta. 10+59.70
-DRW1- PT Sta. 10+38.32
-DRW1- PC Sta. 10+00.00
BEGIN "ABC" SURFACING

-Y2- PRC Sta. 17+31.40

-Y2- POC Sta. 20+60.25= -DRW1- POT Sta. 11+77.21

-Y2- PT Sta. 21+07.06

-L- POC Sta. 43+69.13= -Y2- POT Sta. 21+67.68

END TIP PROJECT B-5825
-L- POC Sta. 54+00.00

-L- PCC Sta. 53+57.99

NAD 83 NA 2011

-L-
PI Sta 47+14.26
Δ = 3° 59' 20.3" (RT)
D = 0° 18' 34.9"
L = 1,287.98'
T = 644.25'
R = 18,500.00'
SE = NC

PI Sta 54+34.32
Δ = 6° 59' 19.1" (RT)
D = 4° 35' 01.2"
L = 152.47'
T = 76.33'
R = 1,250.00'
SE = SEE PLANS

-Y2-
PI Sta 15+83.03
Δ = 7° 18' 25.5" (LT)
D = 2° 27' 32.6"
L = 297.15'
T = 148.78'
R = 2,330.00'
SE = 0.05
Lr = 150'

PI Sta 19+20.49
Δ = 16° 10' 59.2" (RT)
D = 4° 18' 28.6"
L = 375.66'
T = 189.09'
R = 1,330.00'
SE = 0.06
Lr = 180'

-DRW1-
PI Sta 10+20.16
Δ = 43° 54' 40.0" (RT)
D = 114° 35' 29.6"
L = 38.32'
T = 20.16'
R = 50.00'
SE = SEE PLANS

PI Sta 10+97.20
Δ = 28° 04' 21.9" (LT)
D = 38° 11' 49.9"
L = 73.49'
T = 37.50'
R = 150.00'
SE = SEE PLANS

(8) = DONNAHA MART LLC DB 3080 PG 219

(9) JASHUA COX DB 3417 PG 4360

(6) M. KEITH BUTNER DB 2829 PG 2942 DB 2829 PG 2936

(11) CRAY EDGAR VADEN DB 3352 PG 668

(13) BEECHNUT PROPERTIES LLC DB 3119 PG 1618

(12) PAMELA W. MEADOWS DB 1339 PG 1087

(10) FRANCIS HOSTETTER DB 2105 PG 3189

(16) ERIC W COBB DB 2484 PG 1235

(7) STEPHEN A HUBBARD SUSAN K HUBBARD DB 1822 PG 2457

GTD = GRADE TO DRAIN

DETAIL 6 FALSE SUMP (Not to Scale)
Outside Ditch Traffic Flow — 20:1 — 10:1 — 2' — 0.5' Min. 1.0' Max — GI etc. — S = Ditch Slope — ℄ Proposed Ditch
-L- STA. 49+86 LT

DETAIL 7 FALSE SUMP (Not to Scale)
Outside Ditch Traffic Flow — 10:1 — 20:1 — 2.0' — 0.5' Min. 1.0' Max — GI etc. — S = Ditch Slope — ℄ Proposed Ditch
-Y2- STA. 17+65 LT
-L- STA. 47+10 RT
-L- STA. 49+85 RT

DETAIL 12 CULVERT CHANNEL IMPROVEMENTS (Not to Scale)
EXISTING 72" CSP (TO BE REMOVED) — PROPOSED TOP OF BANK — PROP. EXCAVATION — 6' — 5' BENCH — 9' PROP. CHANNEL BED — 1.5' MIN — CLASS 'I' RIP-RAP
LENGTH = 145' (FROM CULVERT FACE)
EST. 2,200 CY EXCAVATION
EST. 380 TONS CLASS "I" RIP-RAP
-Y2- STA. 19+35 RT

DETAIL 20 PROP. FILL OVER CULVERT EXTENSION (Not to Scale)
2' MIN. FILL OVER PROP. CULVERT — PROP. FILL — 40:1 — 2:1 — PROPOSED 9'x9' RCBC EXTENSION — NATURAL GROUND
FROM -L- STA. 46+00 TO STA. 46+35 LT

DETAIL 8 LATERAL BASE DITCH (Not to Scale)
Natural Ground — 2:1 — d — D — 2:1 — B — b — 1'/Ft. — Fill Slope
Min. D = 2.0 Ft. Max. d = 2.0 Ft. B = 3.0 Ft. b = 5.0 Ft.
*When B is < 6.0'
Type of Liner = Class 'I' Rip-Rap
FROM -L- STA. 40+50 TO STA. 40+86.5 LT

DETAIL 9 STANDARD BASE DITCH (Not to Scale)
Natural Ground — 2:1 — d — D — 2:1 — Natural Ground — B
Min. D = 2.0 Ft. Max. d = 2.0 Ft. B = 3.0 Ft.
*When B is < 6.0'
Type of Liner = Class 'I' Rip-Rap
-L- STA. 42+08 RT

DETAIL 13 TOE PROTECTION (Not to Scale)
NATURAL GROUND — d — 2:1 OR FLATTER — FILL SLOPE — GEOTEXTILE
d = Ft.
Type of Liner = Class 'I' Rip-Rap
FROM -Y2- STA. 19+00 TO STA. 20+25 LT
FROM -Y2- STA. 18+50 TO STA. 19+10 RT
FROM -Y2- STA. 19+50 TO STA. 20+00 RT
FROM -L- STA. 45+90 TO STA. 47+00 LT

DETAIL 21 STANDARD 'V' DITCH (Not to Scale)
Natural Ground — 2:1 — D — 2:1 — Natural Ground
Min. D = 1.5 Ft.
-L- STA. 42+50 LT

DETAIL 15 BANK STABILIZATION (Not to Scale)
PROP. PIPE — CLASS 'I' RIP-RAP WIDTH = 10' — STREAMBED — 1.5'
-L- STA. 47+50 RT

DETAIL 10 BANK STABILIZATION (Not to Scale)
10' min. — Ditch Grade — 1.5'
Type of Liner = Class 'I' Rip-Rap
FROM -L- STA. 47+75 TO STA. 47+90 RT

DETAIL 16 BANK STABILIZATION (Not to Scale)
PROPOSED 9'x9' RCBC EXTENSION — NATURAL GROUND — CLASS 'I' RIP RAP T = 1.5' — CLASS 'I' RIP RAP T = 1.5'
CLASS 'I' RIP-RAP EST. 50 TONS
LENGTH = 31 FT (FROM CULVERT FACE)
FROM -L- STA. 45+75 LT

DETAIL 18 STANDARD BASE DITCH (Not to Scale)
Natural Ground — 2:1 — d — D — 2:1 — Natural Ground — Geotextile — B
Min. D = 2.0 Ft. Max. d = 3.0 Ft. B = 2.0 Ft.
*When B is < 6.0'
Type of Liner = Class 'I' Rip-Rap
FROM -L- STA. 47+90 TO STA. 49+23 RT
-L- STA. 46+80 LT
-L- STA. 49+55 LT

DETAIL 17 SPECIAL LATERAL 'V' DITCH (Not to Scale)
Natural Ground — 2:1 — D — 3:1 — Fill Slope
Min. D = 1.5 Ft.
FROM -DRW1- STA. 10+50 TO STA. 11+00 RT

-Y2-
DONNAHA RD
1,933 / 2,100
1,217 / 1,300 — 717 / 800
-L- NC 67 — 5,100 / 5,600 — 4,600 / 5,100 — -L- NC 67
2020 / 2040 ADT

DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED

SEE SHEET 10 FOR -Y2- PROFILE
SEE SHEET 09 FOR -L- & -DRW1- PROFILES

FOR STRUCTURE PLANS-CULVERTS, SEE SHEETS C1-1 THRU C1-7 & C2-1 THRU C2-6

DocuSign Envelope ID: 09BFB422-8B4B-4E1C-AB2D-5D65EE7F5E2B

PROJECT REFERENCE NO.	SHEET NO.
B-5825	07
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER V. MARCUS LOWERY 3/19/2020 | 11:57 AM EDT	NORTH CAROLINA PROFESSIONAL SEAL 044158 ENGINEER BENJAMIN J. HENEGAR 3/19/2020 | 8:57 AM PDT

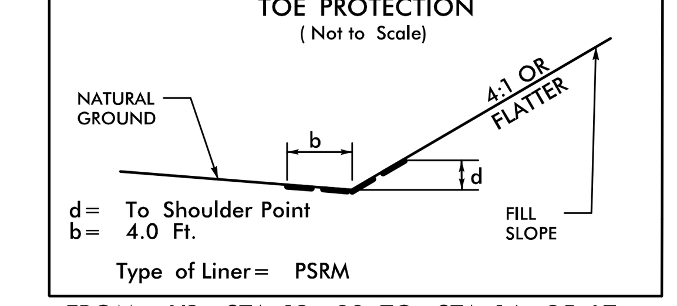
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

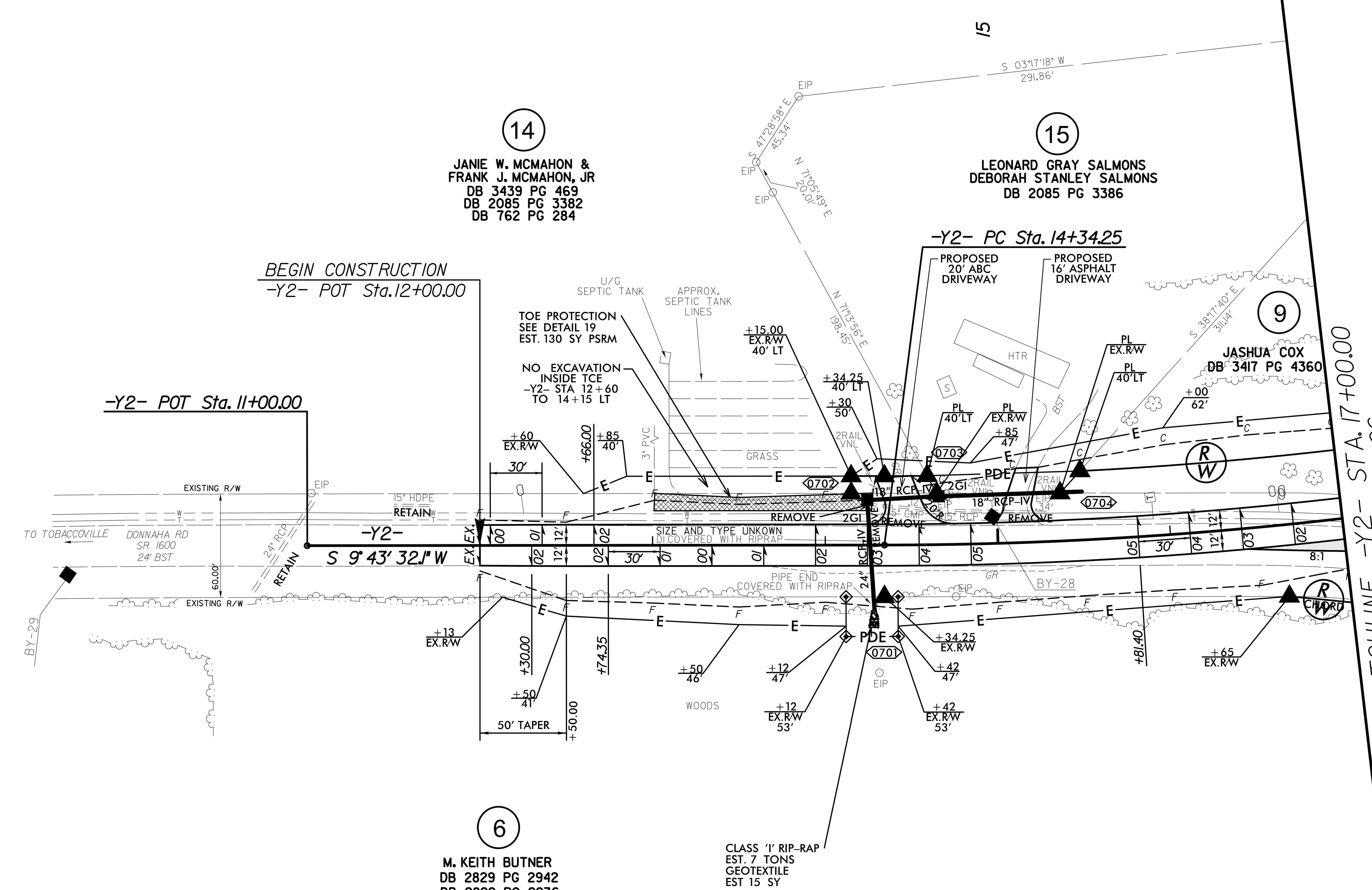
-Y2-
PI Sta 15+83.03
Δ = 7° 18' 25.5" (LT)
D = 2° 27' 32.6"
L = 297.15'
T = 148.78'
R = 2,330.00'
SE = 0.05
Lr = 150'

NAD 83
NA 2011

DETAIL 19
TOE PROTECTION
(Not to Scale)



FROM -Y2- STA. 13+00 TO STA. 14+25 LT



SEE SHEET 10 FOR -Y2- PROFILE

DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED

REVISIONS

8/17/99

3/19/2020
X:\NCDOT\B-5825\Roadway\Proj\b5825_rdy_psh_07.dgn

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.	SHEET NO.
B-5825	08

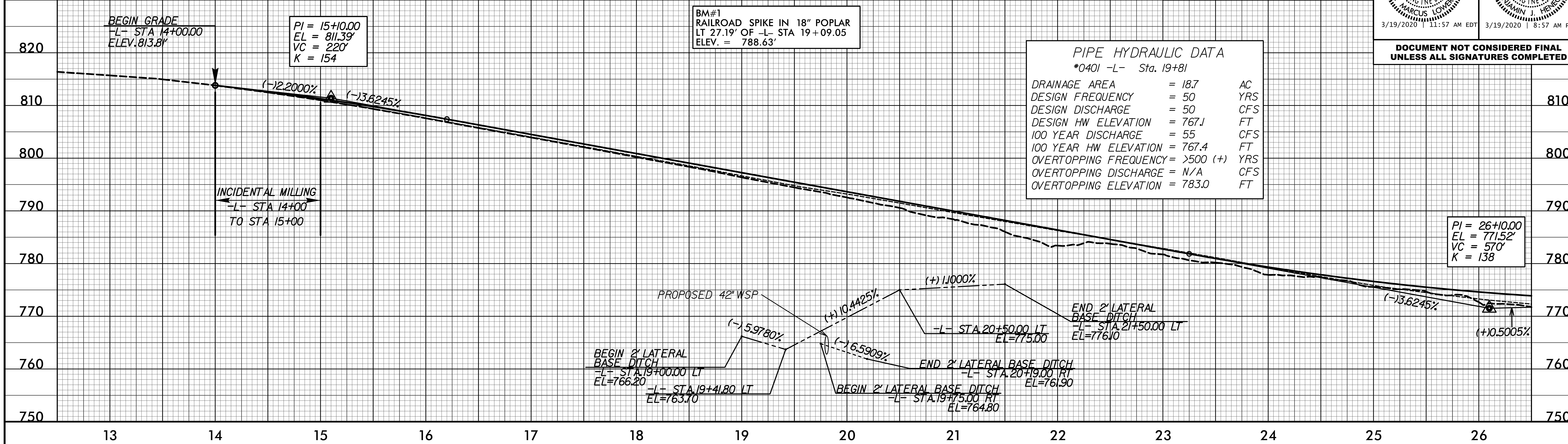
ROADWAY DESIGN ENGINEER — SEAL 027418 — V. MARCUS LOWERY — 3/19/2020 | 11:57 AM EDT

HYDRAULICS ENGINEER — SEAL 044158 — BENJAMIN J. HENEGAR — 3/19/2020 | 8:57 AM PDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EXISTING GROUND	
PROPOSED GRADE	
LEFT DITCH GRADE	
RIGHT DITCH GRADE	

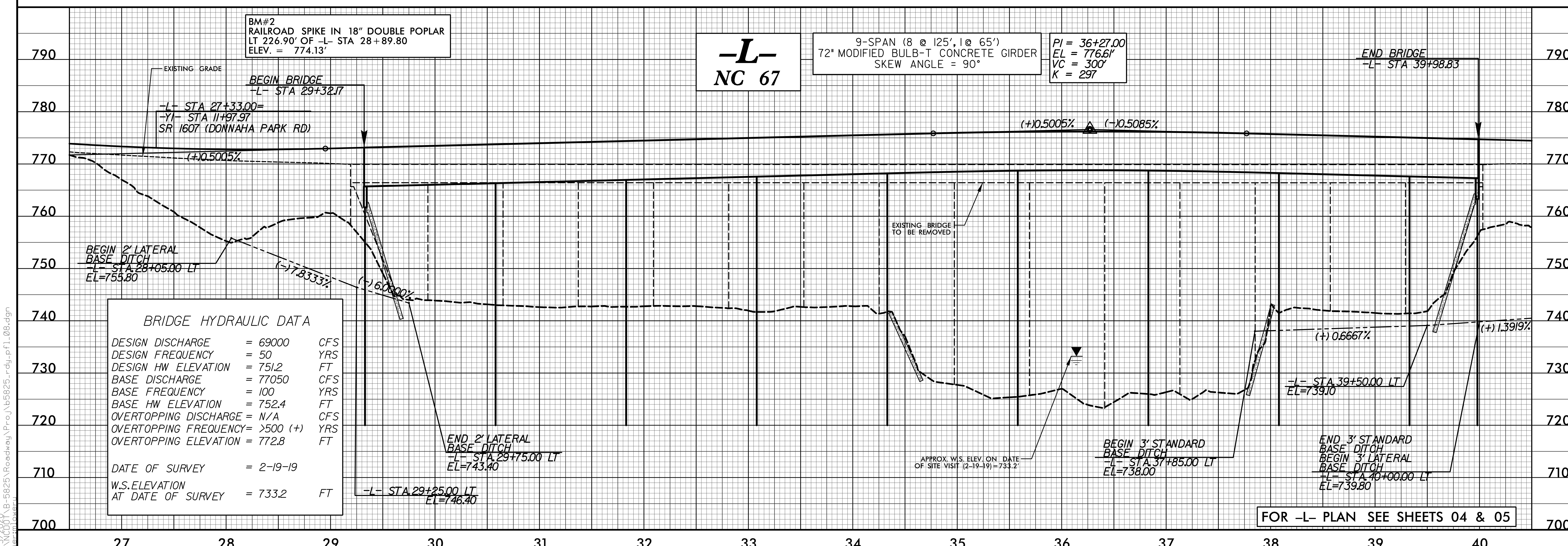
-L- NC 67



PIPE HYDRAULIC DATA
*0401 -L- Sta. 19+81

DRAINAGE AREA	= 18.7	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 50	CFS
DESIGN HW ELEVATION	= 767.1	FT
100 YEAR DISCHARGE	= 55	CFS
100 YEAR HW ELEVATION	= 767.4	FT
OVERTOPPING FREQUENCY	= >500 (+)	YRS
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING ELEVATION	= 783.0	FT

-L- NC 67



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 69000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 751.2	FT
BASE DISCHARGE	= 77050	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 752.4	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= >500 (+)	YRS
OVERTOPPING ELEVATION	= 772.8	FT
DATE OF SURVEY	= 2-19-19	
W.S. ELEVATION AT DATE OF SURVEY	= 733.2	FT

FOR -L- PLAN SEE SHEETS 04 & 05

5/28/99

PIPE HYDRAULIC DATA
EXIST. -L- Sta. 41+65

DRAINAGE AREA	= 13.7	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 36	CFS
DESIGN HW ELEVATION	= 766.3	FT
100 YEAR DISCHARGE	= 38	CFS
100 YEAR HW ELEVATION	= 766.4	FT
OVERTOPPING FREQUENCY	= >500(+)	YRS
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING ELEVATION	= 769.0	FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 500	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 757.2	FT
BASE DISCHARGE	= 600	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 758.2	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= >500(+)	YRS
OVERTOPPING ELEVATION	= 771.5	FT

-L-
NC 67

PIPE HYDRAULIC DATA
*0615 -L- Sta. 49+38

DRAINAGE AREA	= 4.8	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 14	CFS
DESIGN HW ELEVATION	= 769.3	FT
100 YEAR DISCHARGE	= 15	CFS
100 YEAR HW ELEVATION	= 769.4	FT
OVERTOPPING FREQUENCY	= >500 (+)	YRS
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING ELEVATION	= 771.0	FT

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EXISTING GROUND
PROPOSED GRADE
LEFT DITCH GRADE
RIGHT DITCH GRADE

PROJECT REFERENCE NO.	SHEET NO.
B-5825	09

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER MARCUS LOWERY
3/19/2020 | 11:57 AM EDT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 044158 ENGINEER BENJAMIN J HENEGAR
3/19/2020 | 8:57 AM PDT

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PI = 52+10.00
EL = 782.71'
VC = 190'
K = 126
V = 55 MPH

END GRADE
-L- STA 54+00.00
ELEV.786.57'

PI = 48+60.00
EL = 770.34'
VC = 510'
K = 126
V = 55 MPH

EXISTING GRADE
(-)0.5085%
(+)3.5343%
(+)2.0316%
(+)3.5343%
(-)0.5085%
PROPOSED 24" WSP
(+)8.0381%
(+)7.0667%
END 2' STANDARD BASE DITCH
-L- STA.49+23.40 RT
EL=761.60
-L- STA.48+50.00 RT
EL=755.70
BEGIN 2' STANDARD BASE DITCH
-L- STA.47+75.00 RT
EL=750.40
PROPOSED 36" WSP
(+)1.3919%
END 3' LATERAL BASE DITCH
-L- STA.40+86.50 LT
EL=741.00
-L- STA 43+69.13=
-Y2- STA 21+67.88
SR 1600 (DONNAHA RD)
EXISTING I @ 9' X 9' RCBC
EXTENDED DOWNSTREAM W\
PROPOSED I @ 9' X 9' RCBC
EXISTING I @ 8' X 6' RCBC
Q50 HW/D=1.1
INCIDENTAL MILLING
-L- STA 53+50
TO STA 54+00
FOR -L- PLAN SEE SHEET 06

-Y1-
SR 1607

BEGIN GRADE
-Y1- STA 10+25.00
ELEV.771.14'
END GRADE
-Y1- STA 11+75.97=
-L- STA 27+33.00
(22' LT)
ELEV.772.65'
PI = 11+00.00
EL = 769.50'
VC = 150'
K = 24
(+)2.0000%
(-)2.1867%
(+)4.1484%
PROPOSED 24" RCP
-Y1- STA 10+61.09=
-DRW2- STA 10+00.00
-Y1- STA 11+97.97=
-L- STA 27+33.00
ELEV.773.09'

PIPE HYDRAULIC DATA
*0501 -Y1- Sta. 11+07

DRAINAGE AREA	= 5.9	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 16	CFS
DESIGN HW ELEVATION	= 769.1	FT
100 YEAR DISCHARGE	= 18	CFS
100 YEAR HW ELEVATION	= 769.3	FT
OVERTOPPING FREQUENCY	= >500 (+)	YRS
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING ELEVATION	= 771.0	FT

FOR -Y1- PLAN SEE SHEET 5

-DRW2-

BEGIN GRADE
-DRW2- STA 10+09.34=
-Y1- STA 10+58.62
(9' LT)
ELEV.770.19'
-DRW2- VPI = 10+15.34
EL = 769.71'
PI = 11+20.00
EL = 753.94'
VC = 200'
K = 20
BEGIN LATERAL 'V' DITCH
-DRW2- STA.11+50.00 LT
EL=751.90
(-)8.0000%
(-)4.7109%
(-)15.0678%
END GRADE
-DRW2- STA 12+85.31=
ELEV.745.74'
(-)4.9604%
(-)9.0000%
-DRW2- STA 10+00.00=
-Y1- STA 10+61.9
ELEV.770.63'
END LATERAL 'V' DITCH
-DRW2- STA.12+00.00 LT
EL=747.40

FOR -DRW2- PLAN SEE SHEET 5

-DRW1-

BEGIN GRADE
-DRW1- STA 10+07.86=
ELEV.763.83'
-DRW1- VPI = 10+27.50
EL = 763.71'
END GRADE
-DRW1- STA 11+58.04=
-Y2- STA 20+65.25
(19.17' RT)
ELEV.768.51'
(-)0.6110%
(+)5.0000%
(+)3.6710%
(+)2.3474%
DRW1- STA 11+77.21=
-Y2- STA 20+65.25
ELEV.768.96'
END SPECIAL LATERAL 'V' DITCH
-DRW1- STA.11+00.00 RT
EL=764.80
BEGIN SPECIAL LATERAL 'V' DITCH
-DRW1- STA.10+50.00 RT
EL=762.30

FOR -DRW1- PLAN SEE SHEET 6

TGS ENGINEERS
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PROJECT REFERENCE NO.	SHEET NO.
B-5825	10

ROADWAY DESIGN ENGINEER — SEAL 027418 — V. MARCUS LOWERY — 3/19/2020 | 11:57 AM EDT

HYDRAULICS ENGINEER — SEAL 044158 — BENJAMIN J. HENEGAR — 3/19/2020 | 8:57 AM PDT

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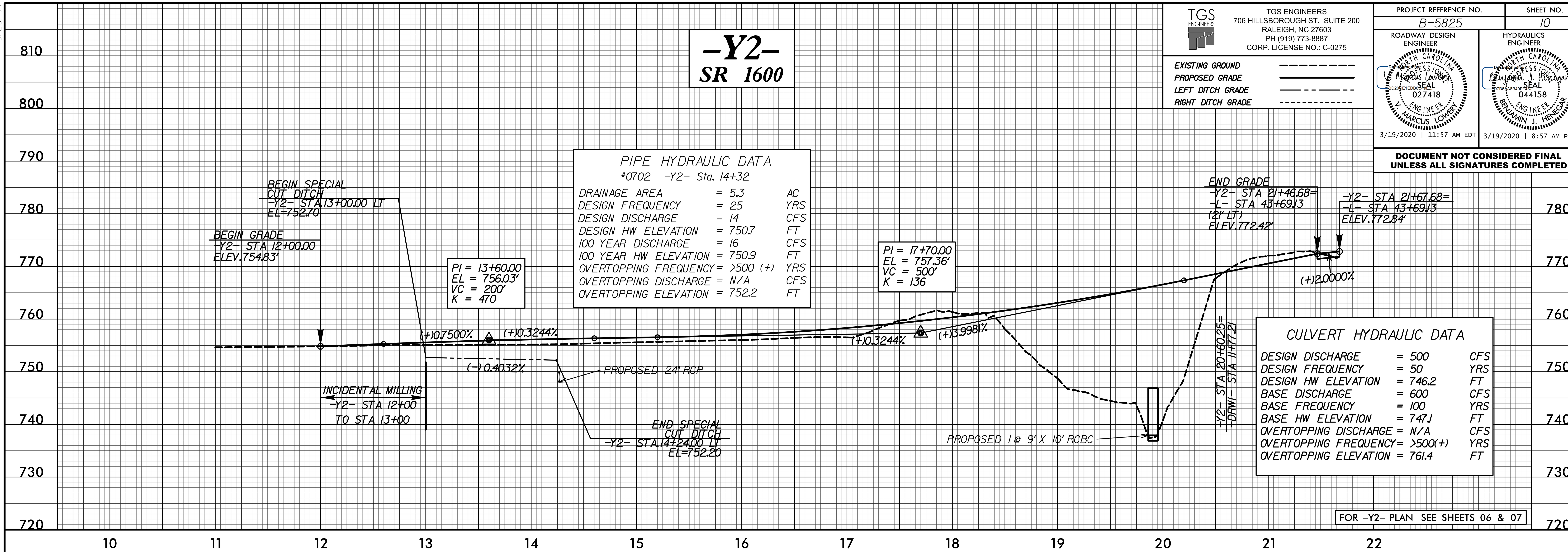
-Y2-
SR 1600

EXISTING GROUND
PROPOSED GRADE
LEFT DITCH GRADE
RIGHT DITCH GRADE



PIPE HYDRAULIC DATA

*0702 -Y2- Sta. 14+32

DRAINAGE AREA	=	5.3	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	14	CFS
DESIGN HW ELEVATION	=	750.7	FT
100 YEAR DISCHARGE	=	16	CFS
100 YEAR HW ELEVATION	=	750.9	FT
OVERTOPPING FREQUENCY	=	>500 (+)	YRS
OVERTOPPING DISCHARGE	=	N/A	CFS
OVERTOPPING ELEVATION	=	752.2	FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	500	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	746.2	FT
BASE DISCHARGE	=	600	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	747.1	FT
OVERTOPPING DISCHARGE	=	N/A	CFS
OVERTOPPING FREQUENCY	=	>500(+)	YRS
OVERTOPPING ELEVATION	=	761.4	FT