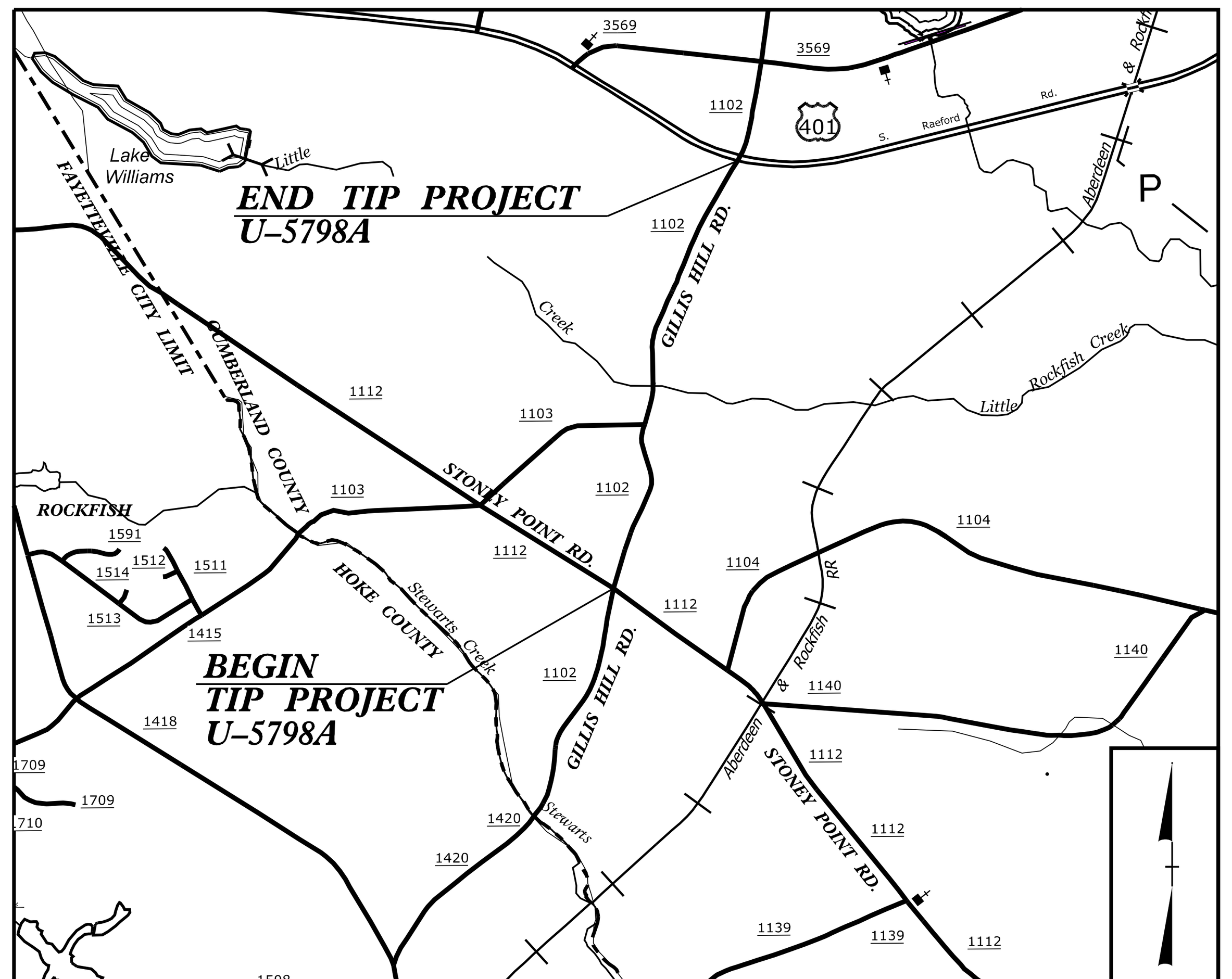
09/08/99

TIP PROJECT: U-5798A

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



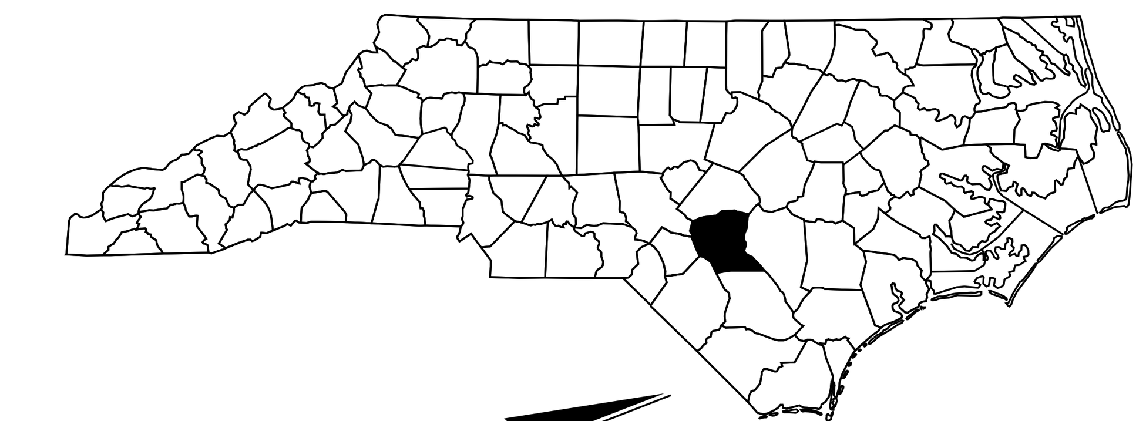
VICINITY MAP N.T.S

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

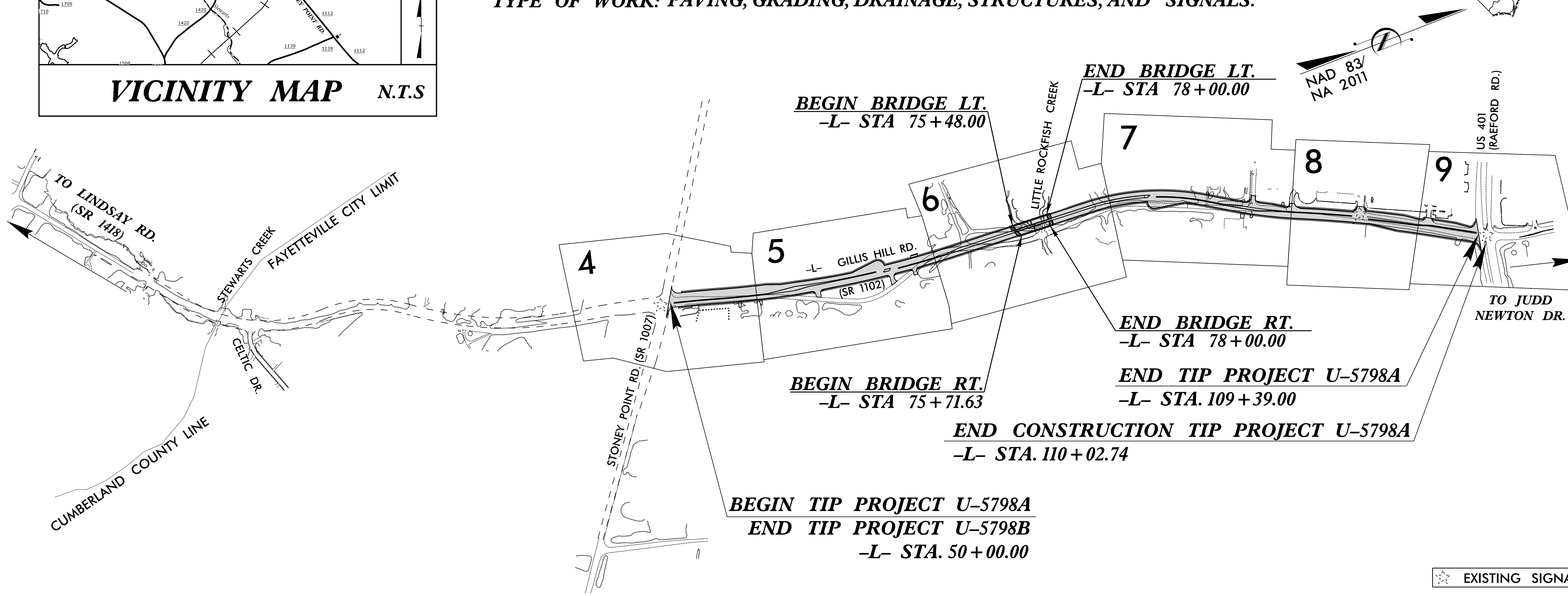
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5798A	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
44369.1.2	N/A	PE
44369.2.2	N/A	ROW
44369.2.5	N/A	UTL.
44369.3.2	N/A	CONST.



LOCATION: *SR 1102 (GILLIS HILL ROAD) FROM NORTH OF SR 1112 (STONEY POINT ROAD) TO US 401 (RAEFORD ROAD), WIDEN TO MULTI-LANES AND REPLACE BRIDGE 250075 OVER LITTLE ROCKFISH CREEK.*

TYPE OF WORK: *PAVING, GRADING, DRAINAGE, STRUCTURES, AND SIGNALS.*



☆ EXISTING SIGNAL

THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT: C204507

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2022 = 25,000
ADT 2042 = 30,700
K = 8 %
D = 60 %
T = 3 % *
V = 50 MPH
*(TTST=1 + DUAL=2)

FUNC CLASS =
MINOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5798A = 1.082 MILES
LENGTH STRUCTURE TIP PROJECT U-5798A = 0.043 MILES
TOTAL LENGTH TIP PROJECT U-5798A = 1.125 MILES

PREPARED IN THE OFFICE OF:

RS&H

8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615
NC FIRM LICENSE No: F-0493

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 27, 2020

LETTING DATE:
MARCH 15, 2022

CHARLES YOUNG, PE
PROJECT ENGINEER

CASSIE ROBINSON, EI
PROJECT DESIGN ENGINEER

NICOLE M. HACKLER, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

DocuSigned by: Cole M. Benjamin
E40C618BD04D4E7...
1/16/2022
SIGNATURE: *P.E.*

NORTH CAROLINA PROFESSIONAL SEAL 048313 ENGINEER COLE M. BENJAMIN

ROADWAY DESIGN ENGINEER

DocuSigned by: Charles J. Young
DBE5A9DECB624F1...
1/16/2022
SIGNATURE: *P.E.*

NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG

1/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	-DETOUR- DETAIL
2B-2	-L- TEMPORARY WIDENING DETAIL
2C-1	2'-9" CURB DETAIL
2C-2	TYPE III - STRUCTURE ANCHOR UNITS
2C-3	GUARDRAIL PLACEMENT
2C-4	GUARDRAIL INSTALLATION
2C-5	CURB RAMP DETAIL
~~2C-6~~	SHEET NOT USED
2C-7	EXTRA DEPTH CONCRETE CATCH BASIN DETAIL
2D-1	CHANNEL BLOCK DETAIL
2G-1	EMBANKMENT STABILIZATION DETAIL
3B-1	ROADWAY SUMMARY SHEET
3D-1 THRU 3D-4	DRAINAGE SUMMARY SHEETS
3G-1	GEOTECHNICAL SUMMARY SHEET
3P-1	PARCEL INDEX SHEET
4 THRU 9	PLAN SHEETS
10 THRU 12	PROFILE SHEETS
RW01 THRU RW9	SURVEY CONTROL SHEETS
TMP-1 THRU TMP-24	TRAFFIC CONTROL PLANS
PMP-1 THRU PMP-7	PAVEMENT MARKING PLANS
EC-1 THRU EC-15	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-9	SIGNING PLANS
SIG-1.0 THRU SIG-13.4	SIGNAL PLANS
SIG-MP1 THRU SIG-MP8	NCDOT METAL POLE STANDARDS
SCP-1 THRU SCP-21	SIGNAL COMMUNICATION PLANS
UC-1 THRU UC-14	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-7	UTILITY BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1B THRU X-1C	CROSS-SECTION EARTHWORK VOLUME SUMMARY SHEET
X-1 THRU X-28	CROSS-SECTIONS
S1-1 THRU S1-43	STRUCTURE PLANS (STR. #1)
SN	STRUCTURE STANDARD NOTES SHEET (STR. #1)
S2-1 THRU S2-43	STRUCTURE PLANS (STR. #2)
SN	STRUCTURE STANDARD NOTES SHEET (STR. #2)

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 AND 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01 AND 560.02

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

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 WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

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 LUMBEE RIVER, EMC.

CENTURYLINK, CHARTER, SEGRA, PNG, PWC POWER, PWC WATER & SEWER

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.

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
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
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
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
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 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
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
848.06	Curb Ramp - Existing Curb & Gutter
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
852.10	Median Construction - with Curb and Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	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.)

8/17/99

FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1.0″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ IN DEPTH OR GREATER THAN 2.0″ IN DEPTH.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. 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 2.5″ 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 1.0″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4.0″ IN DEPTH OR GREATER THAN 5.5″ IN DEPTH.
R1	2′-6″ CONCRETE CURB AND GUTTER.
R2	1′-6″ CONCRETE CURB AND GUTTER.
R3	5″ MONOLITHIC CONCRETE ISLAND (KEYED-IN).
S1	4″ CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING ASPHALT PAVEMENT, 0″ TO 3″
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL).

NOTE: PAVEMENT EDGES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2A-1

ROADWAY DESIGN ENGINEER

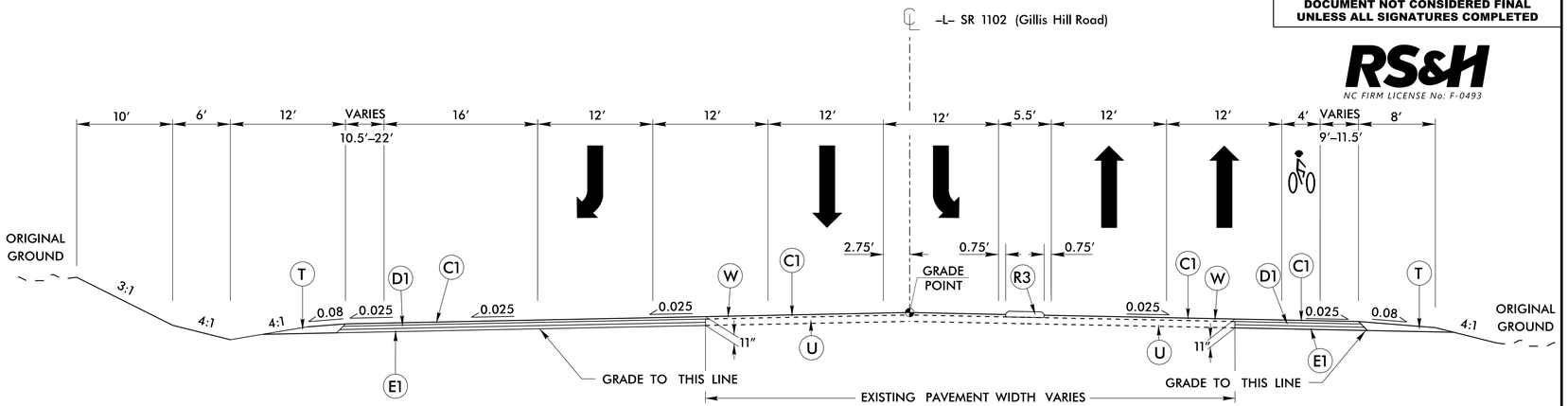
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG
1/27/2022

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044590 ANDREW D. WANGO
1/14/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

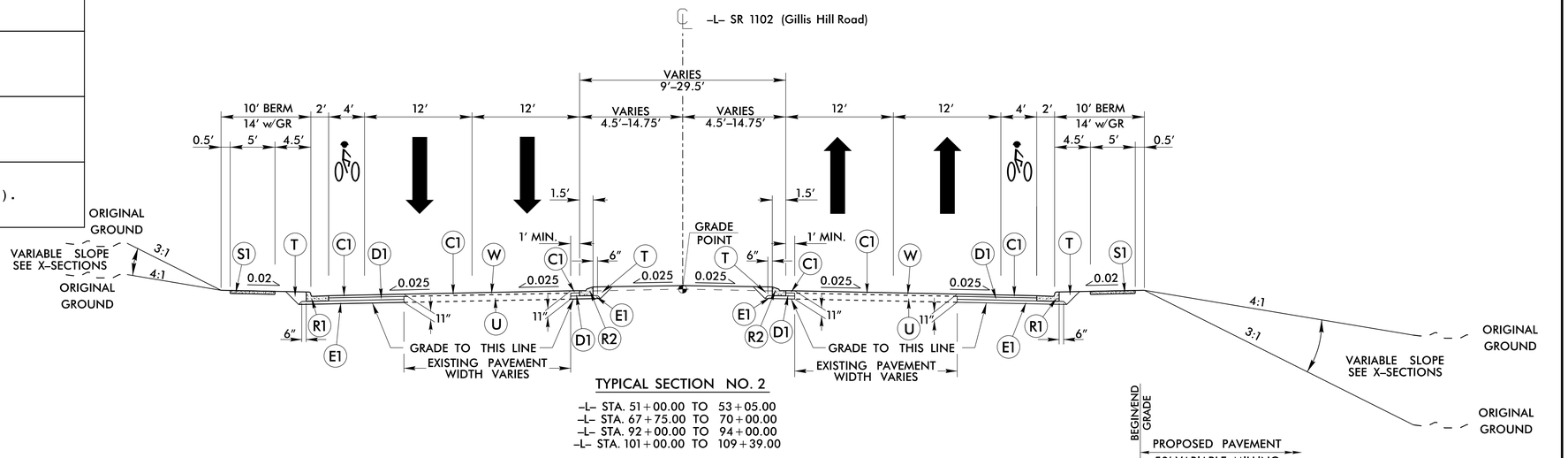
RS&H
NC FIRM LICENSE No: F-0493



TYPICAL SECTION NO. 1

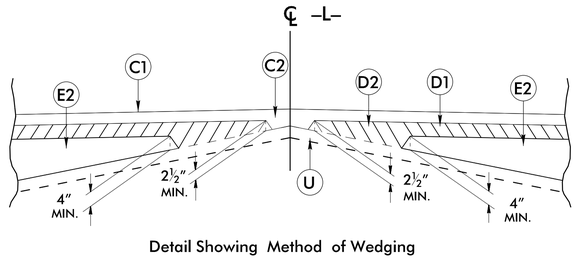
–L– STA. 50+00.00 TO 51+00.00

NOTE:
TRANSITION RIGHT SHOULDER SECTION TO C&G SECTION AT –L– STA. 50+53.84.
TRANSITION LEFT SHOULDER SECTION TO C&G SECTION AT –L– STA. 50+87.13.

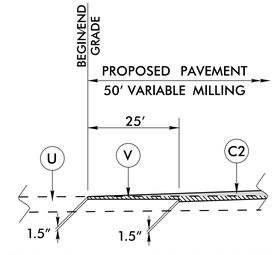


TYPICAL SECTION NO. 2

–L– STA. 51+00.00 TO 53+05.00
–L– STA. 67+75.00 TO 70+00.00
–L– STA. 92+00.00 TO 94+00.00
–L– STA. 101+00.00 TO 109+39.00



Detail Showing Method of Wedging



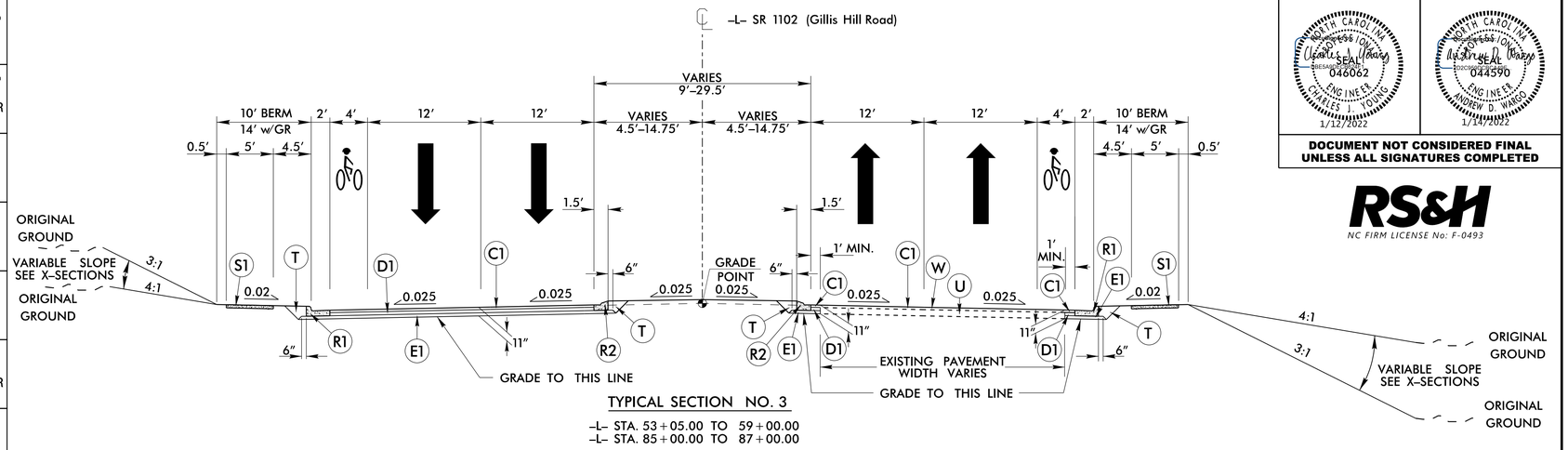
DETAIL OF MILLING AT PAVEMENT TIE-INS

–L– STA. 50+00.00 TO 50+50.00
–L– STA. 108+89.00 TO 109+39.00

8/17/99

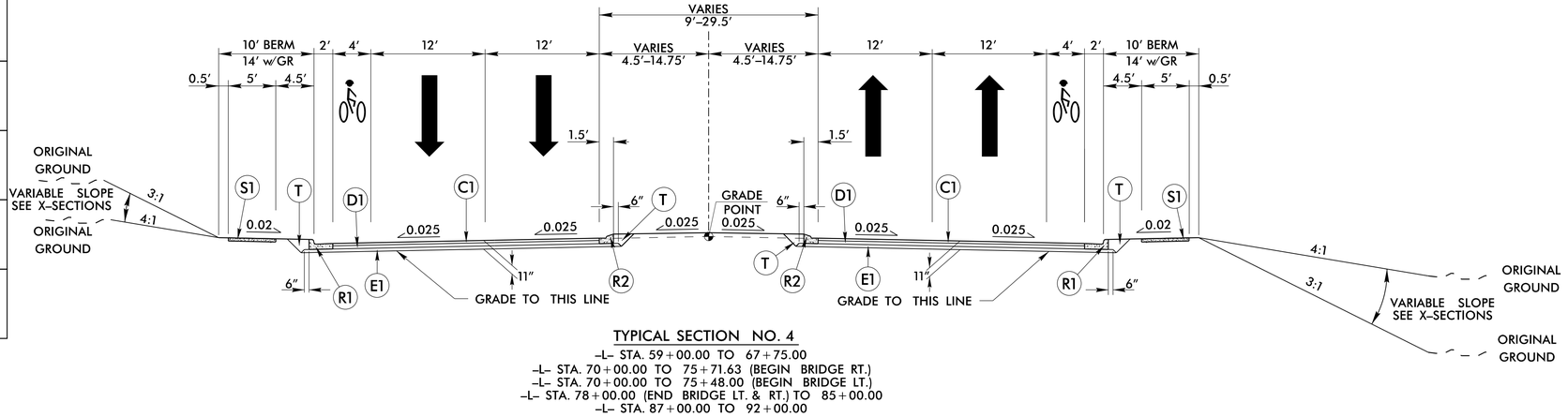
	FINAL PAVEMENT SCHEDULE
C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1.0″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ IN DEPTH OR GREATER THAN 2.0″ IN DEPTH.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. 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 2.5″ 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 1.0″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4.0″ IN DEPTH OR GREATER THAN 5.5″ IN DEPTH.
R1	2′-6″ CONCRETE CURB AND GUTTER.
R2	1′-6″ CONCRETE CURB AND GUTTER.
R3	5″ MONOLITHIC CONCRETE ISLAND (KEYED-IN).
S1	4″ CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING ASPHALT PAVEMENT, 0″ TO 3″
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL).

NOTE: PAVEMENT EDGES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 3

–L– STA. 53+05.00 TO 59+00.00
–L– STA. 85+00.00 TO 87+00.00



TYPICAL SECTION NO. 4

–L– STA. 59+00.00 TO 67+75.00
–L– STA. 70+00.00 TO 75+71.63 (BEGIN BRIDGE RT.)
–L– STA. 70+00.00 TO 75+48.00 (BEGIN BRIDGE LT.)
–L– STA. 78+00.00 (END BRIDGE LT. & RT.) TO 85+00.00
–L– STA. 87+00.00 TO 92+00.00

2′–9″ C&G LOCATIONS

–L– STA. 78+24.00 TO 85+02.82 MED. LT.
–L– STA. 91+10.00 TO 94+30.00 MED. RT.

MONOLITHIC CONCRETE ISLAND LOCATIONS

–L– STA. 50+28.00 TO 57+05.00
–L– STA. 62+05.00 TO 65+00.43
–L– STA. 65+55.44 TO 66+07.98
–L– STA. 66+63.01 TO 70+20.00
–L– STA. 85+12.82 TO 85+52.55
–L– STA. 85+97.99 TO 91+00.00
–L– STA. 94+40.00 TO 100+15.99
–L– STA. 101+36.99 TO 109+20.99

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2A-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG
1/12/2022

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO
1/11/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

8/17/99

	FINAL PAVEMENT SCHEDULE
C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1.0″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ IN DEPTH OR GREATER THAN 2.0″ IN DEPTH.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. 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 2.5″ 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 1.0″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4.0″ IN DEPTH OR GREATER THAN 5.5″ IN DEPTH.
R1	2′-6″ CONCRETE CURB AND GUTTER.
R2	1′-6″ CONCRETE CURB AND GUTTER.
R3	5″ MONOLITHIC CONCRETE ISLAND (KEYED-IN).
S1	4″ CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING ASPHALT PAVEMENT, 0″ TO 3″
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL).

NOTE: PAVEMENT EDGES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2A-3

ROADWAY DESIGN ENGINEER

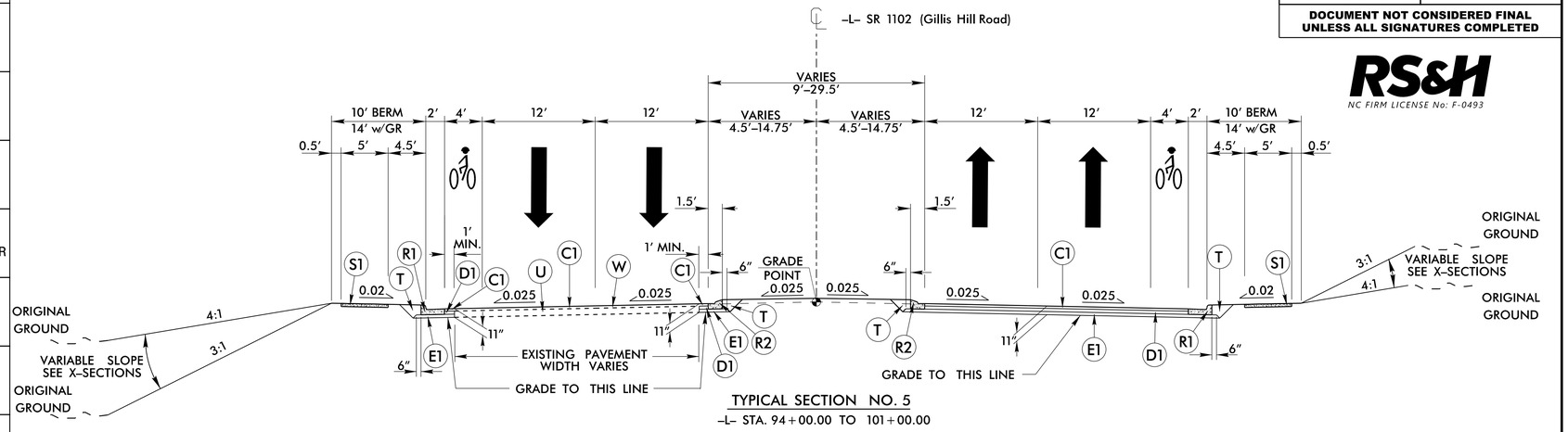
NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG
1/18/2022

PAVEMENT DESIGN ENGINEER

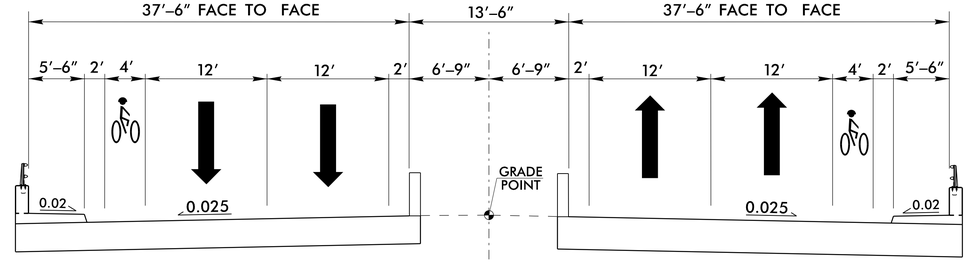
NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO
1/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

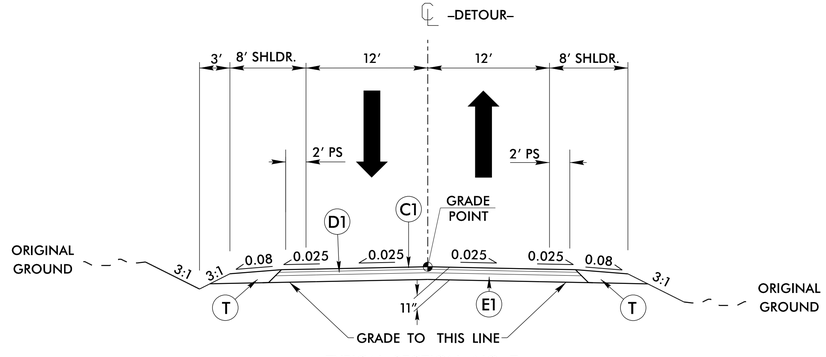
RS&H
NC FIRM LICENSE No: F-0493



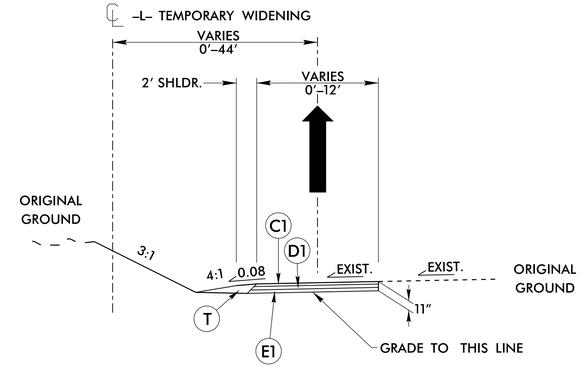
TYPICAL SECTION NO. 5
–L– STA. 94+00.00 TO 101+00.00



TYPICAL SECTION NO. 6
–L– STA. 75+71.63 TO 78+00.00 RT.
–L– STA. 75+48.00 TO 78+00.00 LT.



TYPICAL SECTION NO. 7
–DETOUR– STA. 10+05.00 TO 17+80.00



TYPICAL SECTION NO. 8
–L– TEMP. WIDEN. STA. 85+21.50 TO 92+74.25

-DETOUR- DETAIL

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2B-1

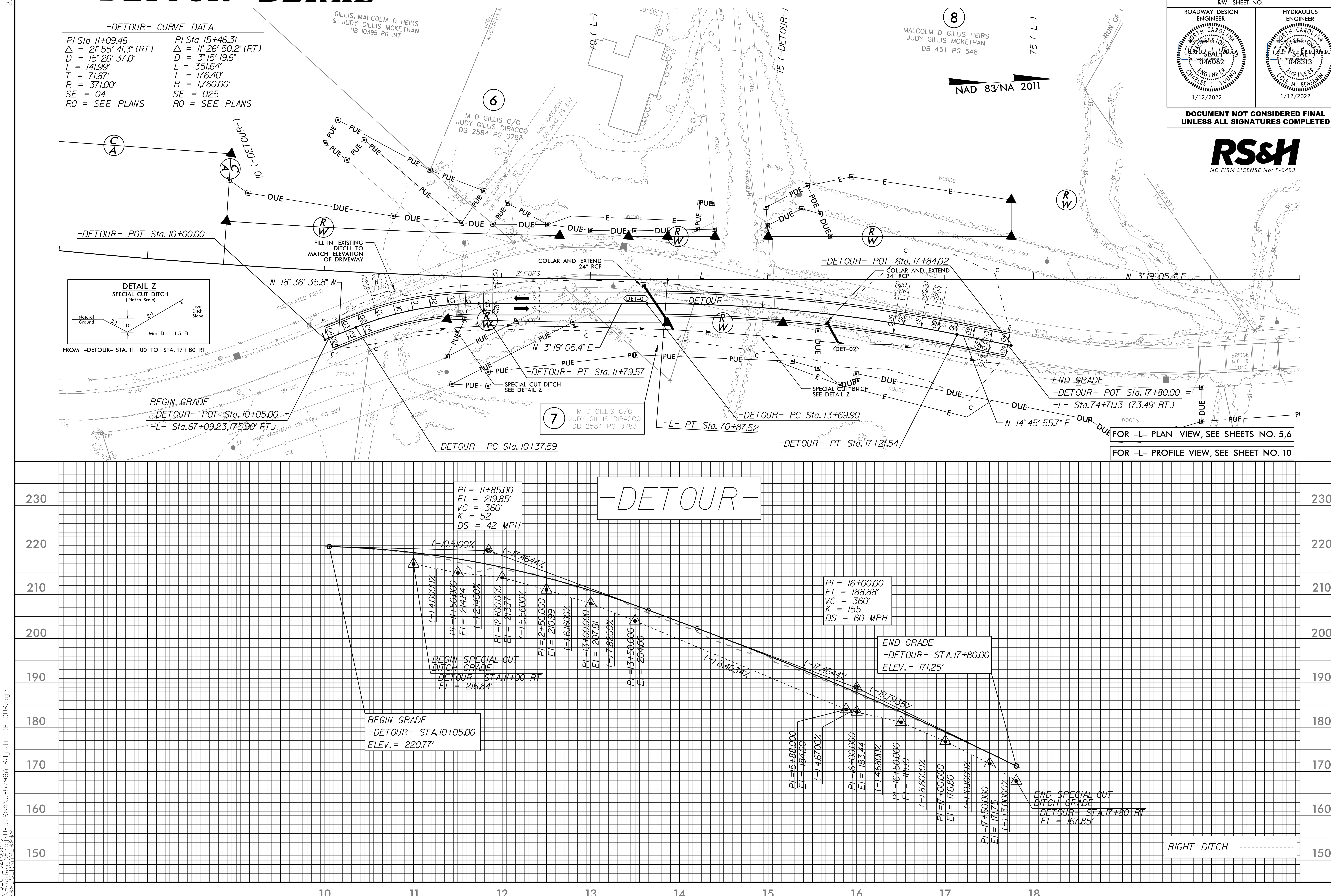
R/W SHEET NO.

ROADWAY DESIGN ENGINEER — SEAL 046062 — CHARLES J. YOUNG — 1/12/2022

HYDRAULICS ENGINEER — SEAL 048313 — COLE M. BENJAMIN — 1/12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

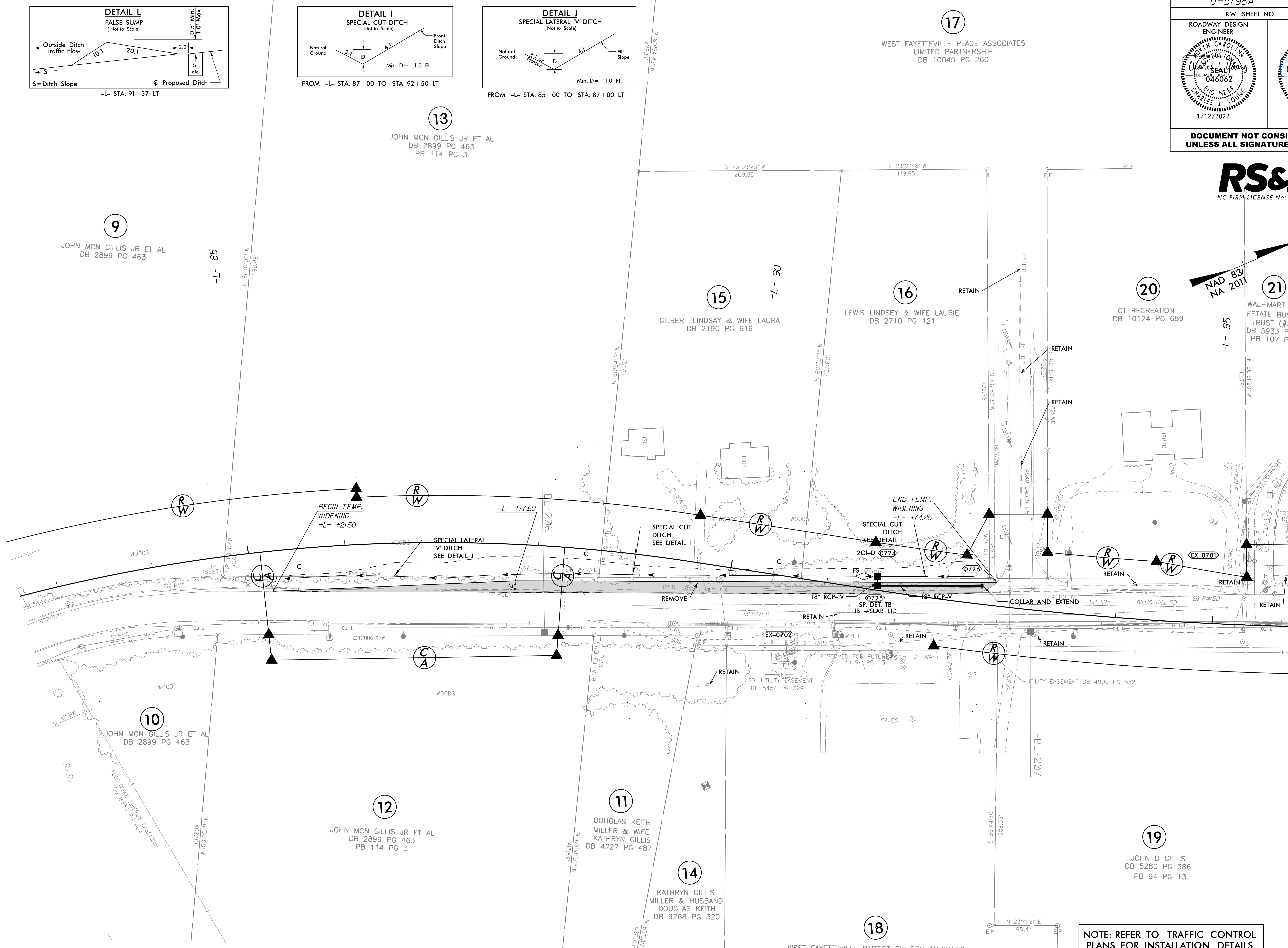


PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 046062 — CHARLES J. YOUNG — 1/12/2022	SEAL 048313 — COLE M. BENJAMIN — 1/12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493



DETAIL L
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
10:1
20:1
2.0'
0.5' Min. 1.0' Max
S = Ditch Slope
Proposed Ditch
-L- STA. 91+37 LT
DETAIL I
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
Front Ditch Slope
Min. D = 1.0 Ft.
FROM -L- STA. 87+00 TO STA. 92+50 LT
DETAIL J
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
3:1 or Flatter
Fill Slope
Min. D = 1.0 Ft.
FROM -L- STA. 85+00 TO STA. 87+00 LT
13
JOHN MCN GILLIS JR ET AL
DB 2899 PG 463
PB 114 PG 3
17
WEST FAYETTEVILLE PLACE ASSOCIATES
LIMITED PARTNERSHIP
DB 10045 PG 260
9
JOHN MCN GILLIS JR ET AL
DB 2899 PG 463
15
GILBERT LINDSAY & WIFE LAURA
DB 2190 PG 619
16
LEWIS LINDSEY & WIFE LAURIE
DB 2710 PG 121
20
GT RECREATION
DB 10124 PG 689
21
WAL-MART REAL
ESTATE BUSINESS
TRUST (#3595)
DB 5933 PG 307
PB 107 PG 17
NAD 83/NA 2011
BEGIN TEMP. WIDENING
-L- +21.50
SPECIAL LATERAL 'V' DITCH
SEE DETAIL J
-L- +77.60
-BL-206
SPECIAL CUT DITCH
SEE DETAIL I
END TEMP. WIDENING
-L- +74.25
SPECIAL CUT DITCH
SEE DETAIL I
2GI-D 0724
0726
18" RCP-IV
0725
SP. DET. TB
JB w/SLAB LID
18" RCP-V
COLLAR AND EXTEND
REMOVE
RETAIN
EX-0701
EX-0702
SR 1102 GILLIS HILL RD
23' PAVED
26' PAVED
WOODS
30' UTILITY EASEMENT
DB 5454 PG 329
UTILITY EASEMENT DB 4900 PG 552
RESERVED FOR FUTURE RIGHT OF WAY
PB 94 PG 13
-BL-207
10
JOHN MCN GILLIS JR ET AL
DB 2899 PG 463
12
JOHN MCN GILLIS JR ET AL
DB 2899 PG 463
PB 114 PG 3
11
DOUGLAS KEITH
MILLER & WIFE
KATHRYN GILLIS
DB 4227 PG 487
14
KATHRYN GILLIS
MILLER & HUSBAND
DOUGLAS KEITH
DB 9268 PG 320
18
WEST FAYETTEVILLE BAPTIST CHURCH TRUSTEES
DB 9240 PG 512
PB 132 PG 190
19
JOHN D GILLIS
DB 5280 PG 386
PB 94 PG 13
100' DUKE ENERGY EASEMENT
DB 8358 PG 604
-L- 85
-L- 90
-L- 95

NOTE: REFER TO TRAFFIC CONTROL PLANS FOR INSTALLATION DETAILS

REVISIONS

8/17/99

03-DEC-2021 12:59
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-L- TEMPORARY WIDENING DETAIL

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2C-1

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

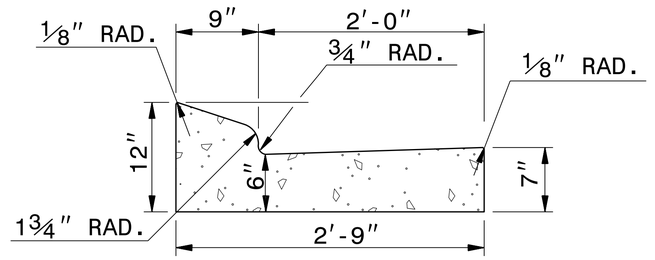
ENGLISH DETAIL DRAWING FOR

2′-9″ CONCRETE CURB & GUTTER

SHEET 1 OF 1

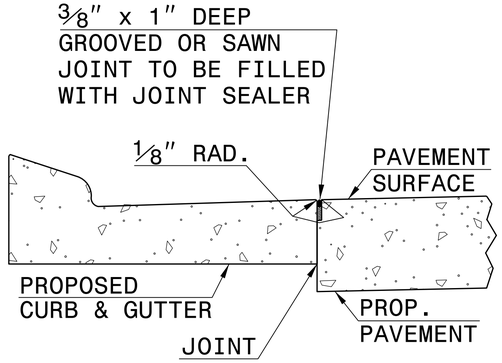
846D01

GENERAL NOTES:
- -PLACE CONTRACTION JOINTS AT 10′ INTERVALS, EXCEPT THAT A 15′ SPACING MAY BE USED WHEN A MACHINE IS USED OR WHEN SATISFACTORY SUPPORT FOR THE FACE FORM CAN BE OBTAINED WITHOUT THE USE OF TEMPLATES AT 10′ INTERVALS.
- -JOINT SPACING MAY BE ALTERED IF REQUIRED BY THE ENGINEER.
- -CONTRACTION JOINTS MAY BE INSTALLED WITH THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. MAKE NON-TEMPLATE FORMED JOINTS A MIN. OF 1½″ DEEP.
- -FILL ALL CONSTRUCTION JOINTS WITH JOINT FILLER AND SEALER.
- -SPACE EXPANSION JOINTS AT 90′ INTERVALS AND ADJACENT TO ALL RIGID OBJECTS.
- -SEE RDWY. STD. DWG. NO. 846.01, SHEET 2 OF 3 FOR PLACEMENT IN SUPERELEVATIONS. (USE 2′-6″ CURB AND GUTTER RATES)

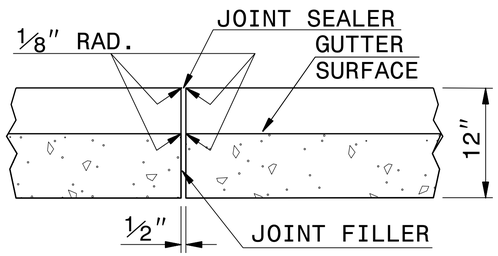


2′-9″ CURB AND GUTTER

SECTION VIEW OF CURB AND GUTTER



LONGITUDINAL JOINT



TRANSVERSE EXPANSION JOINT IN CURB AND GUTTER

SECTION VIEW OF JOINTS

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

ENGLISH DETAIL DRAWING FOR

2′-9″ CONCRETE CURB & GUTTER

SHEET 1 OF 1

846D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton

1/12/2022

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

SEE PLATE FOR TITLE

ORIGINAL BY: STD. 846.01 DATE:
MODIFIED BY: E.E. WARD DATE: 8-15-00
CHECKED BY: DATE:
FILE SPEC.: /usr/details/stand/c&g2′-9″.dgn

10-AUG-2017 11:46
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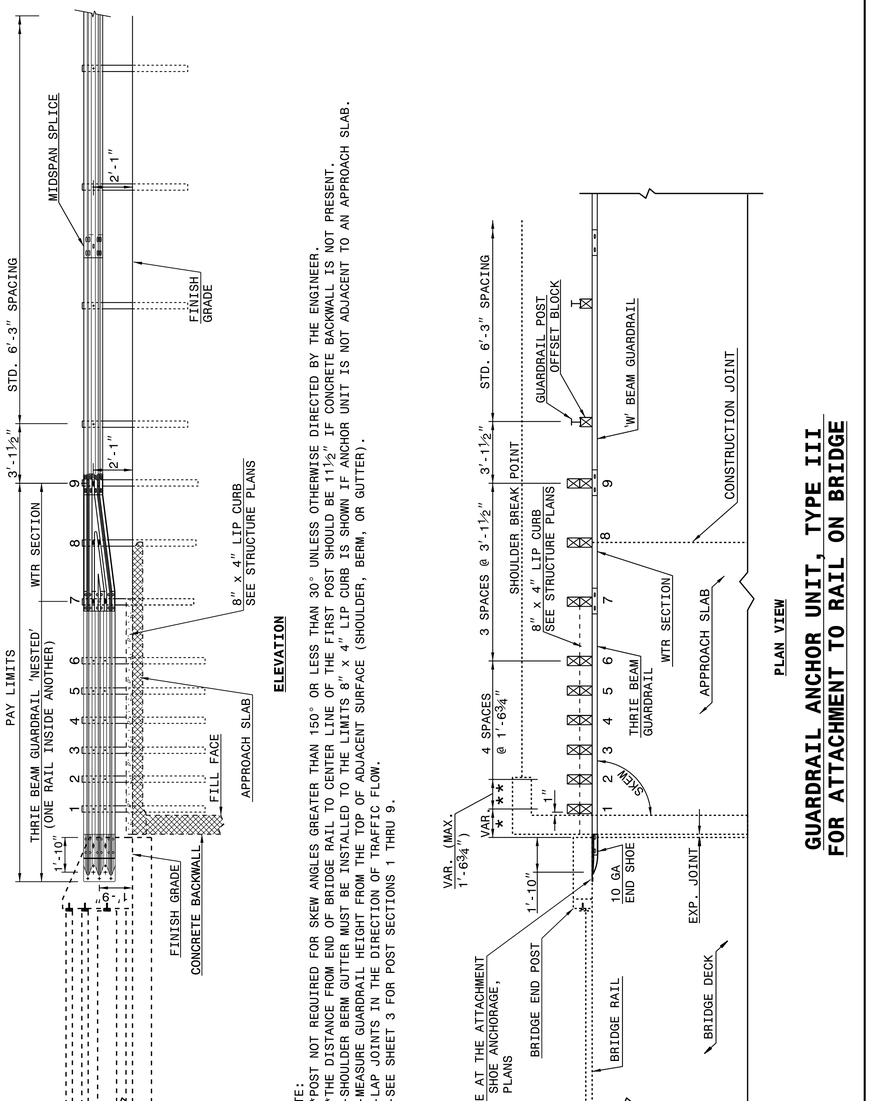
jhowerton AT CSD-242595

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2C-2

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

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

SHEET 1 OF 7
862D03



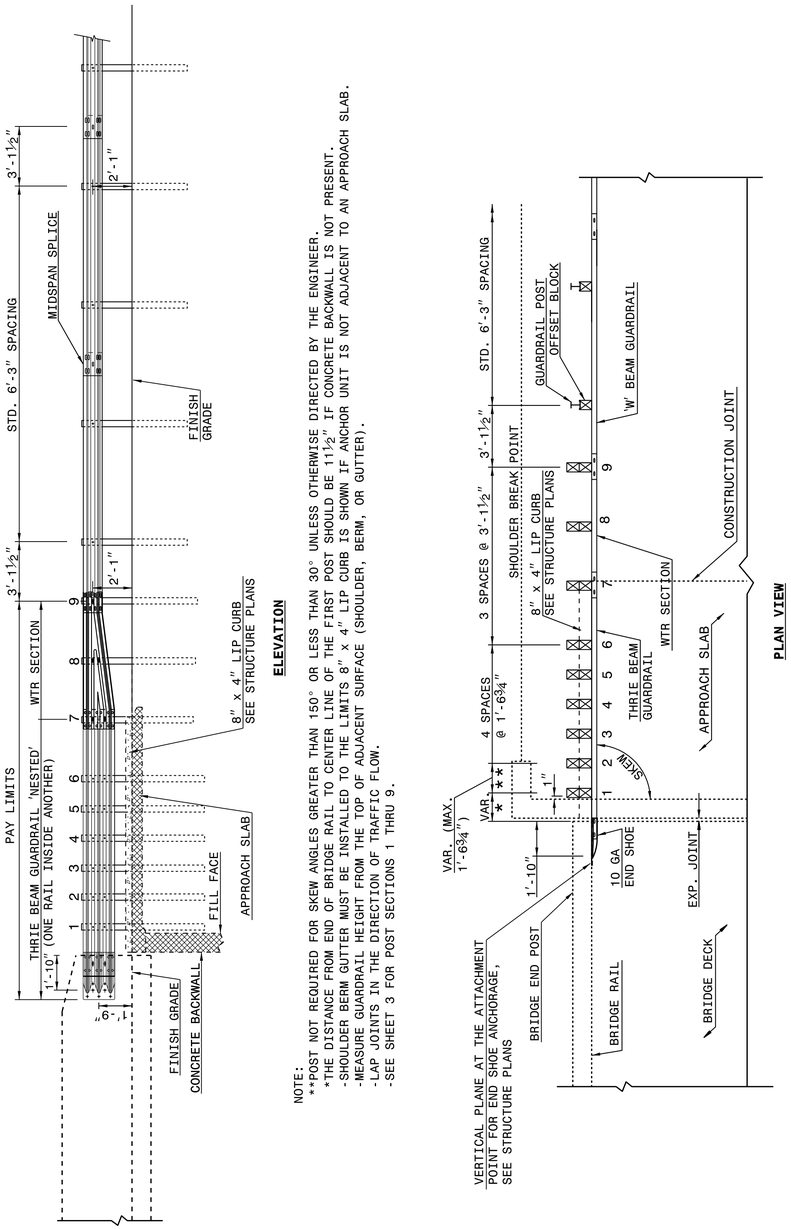
NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x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

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

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

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

SHEET 2 OF 7
862D03



NOTE:
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*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
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-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

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

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SEAL
022966
ENGINEER
Joel S. Howerton
1/12/2022

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

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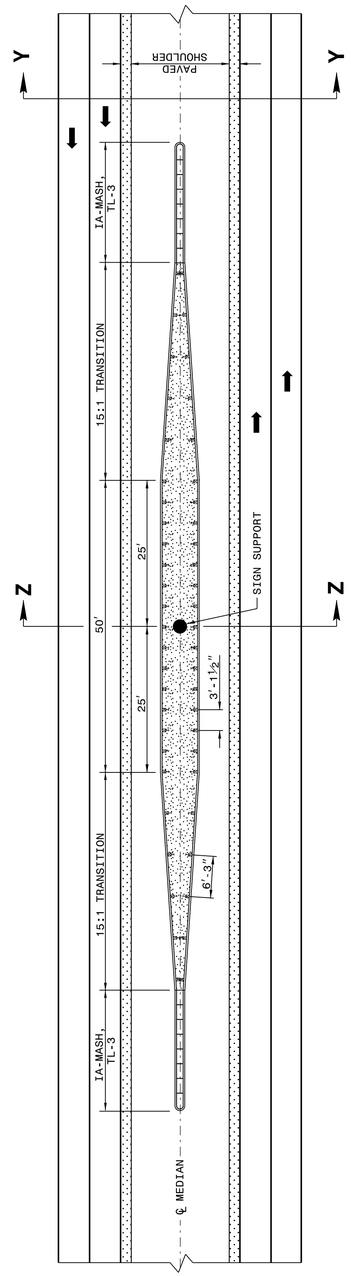
PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2C-3

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

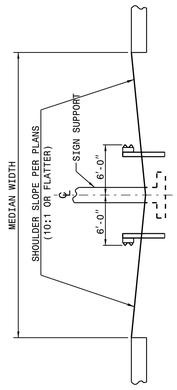
SHEET 2 OF 11
862D01



NOTE SPECIAL LAYER OF PAVEMENT .....

USE 3'-1½" POST SPACING ON THE 50' OF GUARDRAIL PARALLEL TO LANES AND 6'-3" POST SPACING ON 15:1 TRANSITION SECTIONS.
GRADE MEDIAN IN THE VICINITY OF THE SIGN SUPPORT AS ILLUSTRATED IN THE ROADWAY STANDARD DRAWINGS (STARDARD 862.01 SHEET 1 OF 12).

SECT. YY



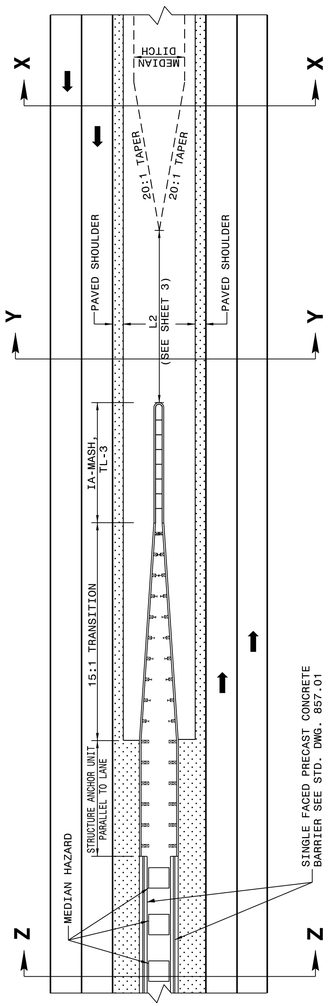
SECT. ZZ

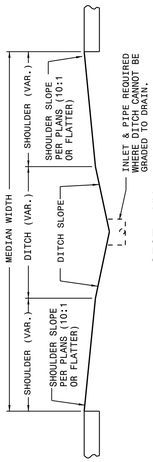
DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

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

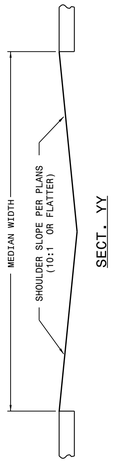
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01

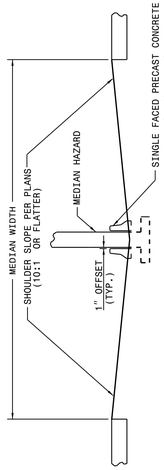




SECT. XX



SECT. YY



SECT. ZZ

DETAIL OF MEDIAN TREATMENT AT UNDERPASS

NOTE: WHEN OFFSET DISTANCE FROM FACE OF OBSTRUCTION TO FACE OF GUARDRAIL IS BETWEEN 3'-6" AND 5'-6", BEGIN 3'-1½" POST SPACING AT A POINT 25' BEFORE REACHING THE OBSTRUCTION AND CARRY THROUGHOUT ITS LENGTH. IF THE OFFSET IS LESS THAN 3'-6" USE CONCRETE BARRIER.

DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022986 Joel S. Howerton
1/12/2022

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CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2C-4
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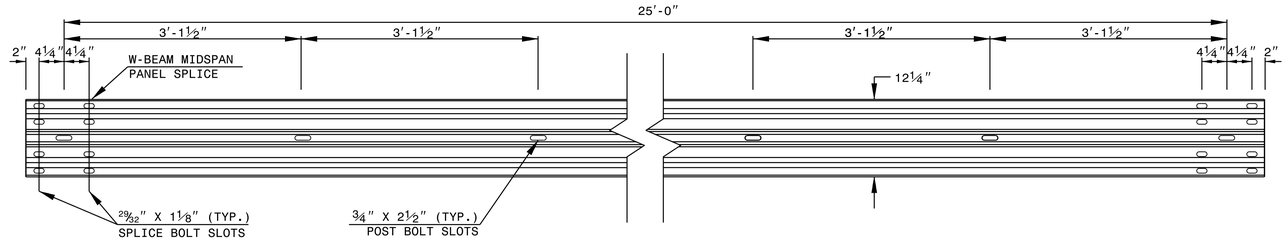
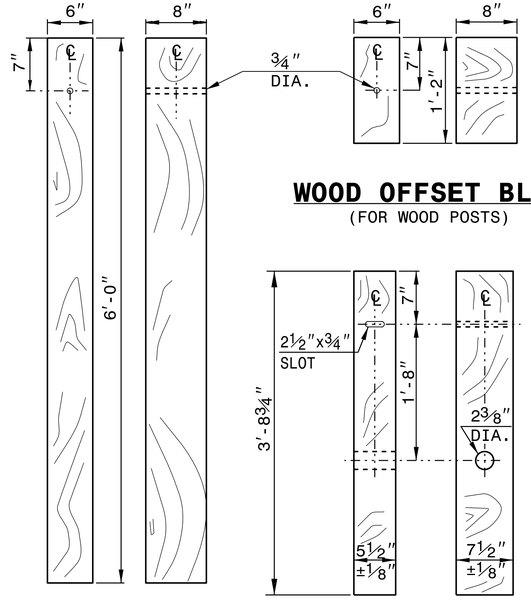
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



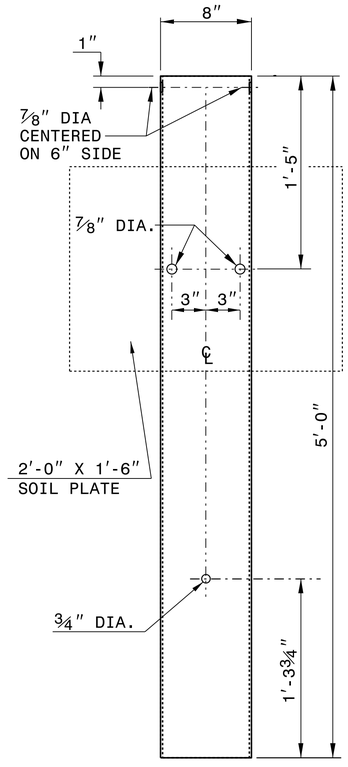
STANDARD W-BEAM GUARDRAIL



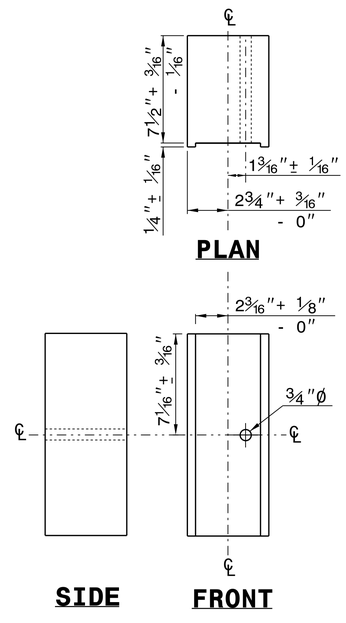
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

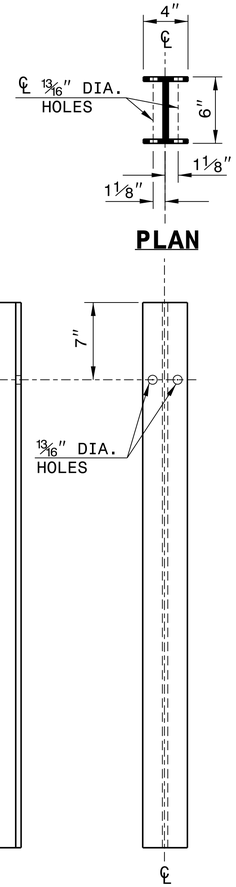
SHORT WOOD BREAKAWAY POST



STEEL TUBE
TS 6"x8"x0.1875"



ROUTED OFFSET BLOCK



"W6" STEEL POST

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

SYSTEM PARTS

1/12/2022

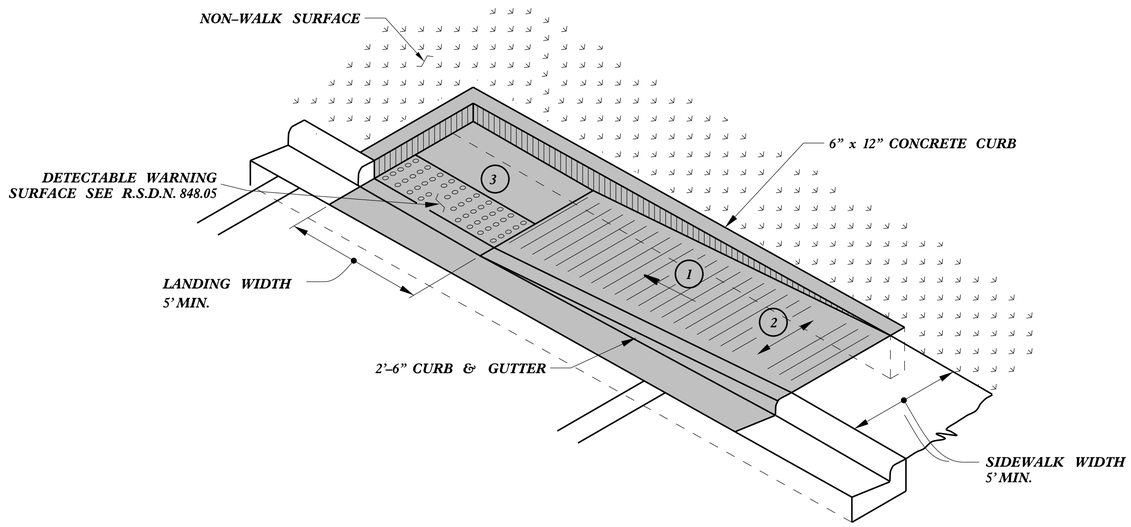
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

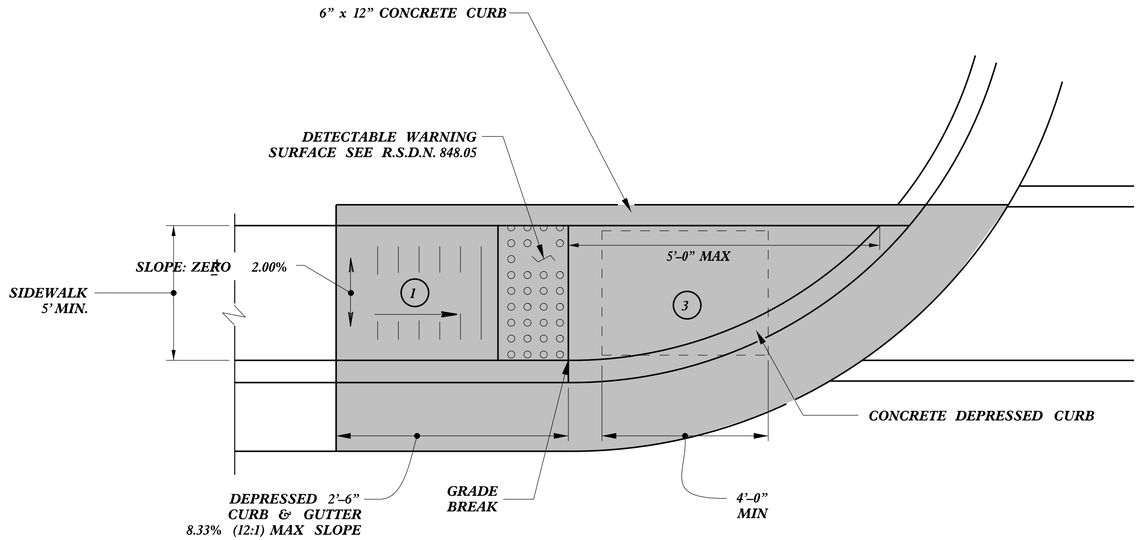
ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2C-5

PAY LIMITS FOR CURB RAMP



TYPE 1A



TYPE 1

(1) *8.33% (12:1) MAX RAMP SLOPE*

(2) *CROSS SLOPE: 2.00%*

(3) *CURB RAMPS REQUIRE A (4'–0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.*

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

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

CURB RAMPS

Directional Ramps

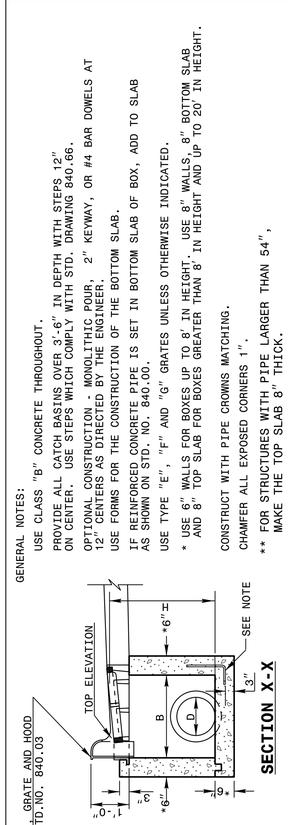
ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

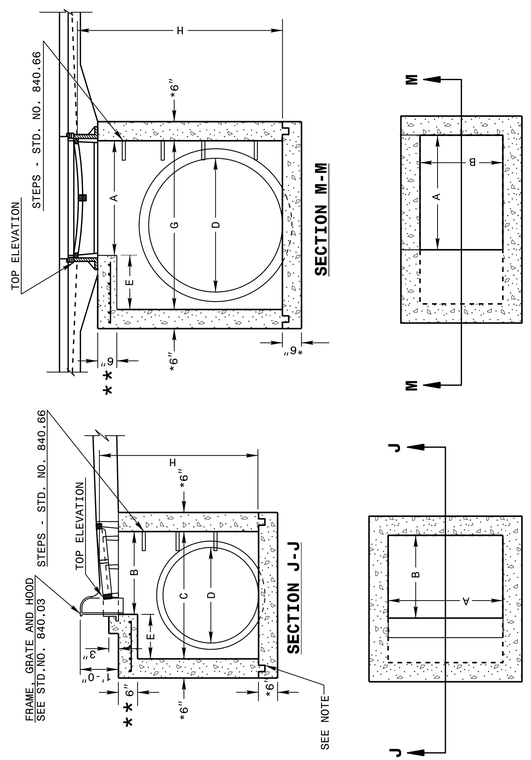
5/14/99

22-MAR-2012 15:06
S:\Contracts\Special Details\Jhowerton\Standard Drawings\2012 Standard Drawings\2012 Curb Ramp Special Details\Curb Ramp Details.dgn
Jhowerton
AT CSD237601

5/14/99

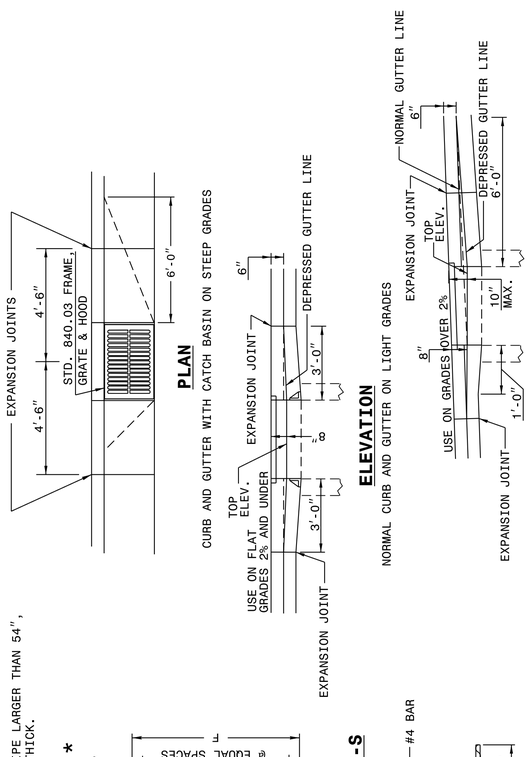
GENERAL NOTES:
USE CLASS "B" CONCRETE THROUGHOUT.
PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.
* USE 6" WALLS FOR BOXES UP TO 8' IN HEIGHT, USE 8" WALLS, 8" BOTTOM SLAB AND 8" TOP SLAB FOR BOXES GREATER THAN 8' IN HEIGHT AND UP TO 20' IN HEIGHT.
CONSTRUCT WITH PIPE CROWNS MATCHING.
CHAMFER ALL EXPOSED CORNERS 1".
** FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.

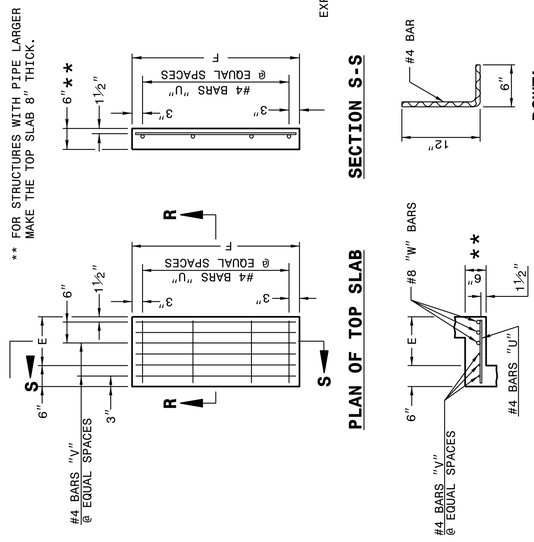




STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **EXTRA DEPTH CONCRETE CATCH BASIN** 12" THRU 84" PIPE	SHEET 1 OF 2 **840D02**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **EXTRA DEPTH CONCRETE CATCH BASIN** 12" THRU 84" PIPE	SHEET 1 OF 2 **840D02**





* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *

PIPE	DIMENSIONS OF BOX AND PIPE						COVER DIMENSION		BARS-U			BARS-V			BARS-W		TOTAL LBS.	CU.YDS. CONC. IN BOX		DEDUCTIONS ONE PIPE	
D	SPAN A	WIDTH B	WIDTH C	SPAN G	MIN. HEIGHT H		E	F	NO.	LENGTH		NO.	LENGTH		NO.	LENGTH		TOP SLAB	BOTTOM SLAB	TOT. CONC. FOR MINIMUM HEIGHT H	C.M.	R.C.
12"	3'-0"	2'-2"	--	--	2'-0"		--	--	--	--		--	--		--	--		--	0.235	0.772	0.015	0.026
15"	3'-0"	2'-2"			2'-3"														0.235	0.829	0.023	0.036
18"	3'-0"	2'-2"			2'-6"														0.235	0.887	0.033	0.049
24"	3'-0"	2'-2"			3'-1"														0.235	1.001	0.059	0.085
30"	3'-0"	2'-2"	3'-4"	3'-4"	3'-10"		1'-2"	4'-4"	4	1'-5"		2	4'-1"		3	4'-1"	39	0.123	0.347	1.433	0.092	0.127
36"	3'-0"	2'-2"	3'-10"	3'-10"	4'-6"		1'-8"	4'-10"	4	1'-11"		3	4'-7"		3	4'-7"	43	0.161	0.432	1.714	0.132	0.178
42"	3'-0"	2'-2"	4'-5"	4'-5"	4'-11"		2'-2"	5'-5"	5	2'-5"		4	5'-2"		3	5'-2"	47	0.200	0.543	1.738	0.160	0.243
48"	3'-0"	2'-2"	5'-0"	5'-0"	5'-6"		2'-10"	6'-0"	5	3'-1"		4	5'-9"		3	5'-9"	51	0.235	0.667	2.052	0.235	0.317
54"	3'-0"	2'-2"	5'-7"	5'-7"	6'-0"		3'-5"	6'-7"	6	3'-8"		5	6'-4"		3	6'-4"	56	0.289	0.802	2.387	0.297	0.401
60"	3'-0"	2'-2"	6'-3"	6'-3"	6'-6"		4'-1"	7'-3"	6	4'-4"		5	7'-0"		3	7'-0"	61	0.340	0.973	2.722	0.363	0.546
66"	3'-0"	2'-2"	6'-11"	6'-11"	7'-0"		4'-9"	7'-11"	7	5'-0"		6	7'-8"		3	7'-8"	66	0.391	1.160	3.057	0.440	0.655
72"	3'-0"	2'-2"	7'-6"	7'-6"	7'-6"		5'-3"	8'-6"	7	5'-6"		6	8'-3"		3	8'-3"	72	0.442	1.340	3.392	0.524	0.774
78"	3'-0"	2'-2"	8'-1"	8'-1"	8'-0"		5'-11"	9'-1"	8	6'-2"		7	8'-10"		3	8'-10"	78	0.493	1.530	3.727	0.615	0.893
84"	3'-0"	2'-2"	8'-9"	8'-9"	8'-6"		6'-7"	9'-9"	8	6'-10"		7	9'-6"		3	9'-6"	84	0.544	1.760	4.062	0.713	1.010

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **EXTRA DEPTH CONCRETE CATCH BASIN** 12" THRU 84" PIPE	SHEET 2 OF 2 **840D02**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **EXTRA DEPTH CONCRETE CATCH BASIN** 12" THRU 84" PIPE	SHEET 2 OF 2 **840D02**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 Std.840.01 DATE:
MODIFIED BY: E.E. WARD DATE: 3-1-02
CHECKED BY: DATE:
FILE SPEC.: jhowerton/840d02 Extra Depth CB.dgn

16-APR-2018 11:44
S:\Contracts\Contracts\Special Details\jhowerton\840d02 Extra Depth CB.dgn
jhowerton AT CSD-292595

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2D-1
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 048313 ENGINEER LOUIS M. BENJAMIN
1/12/2022

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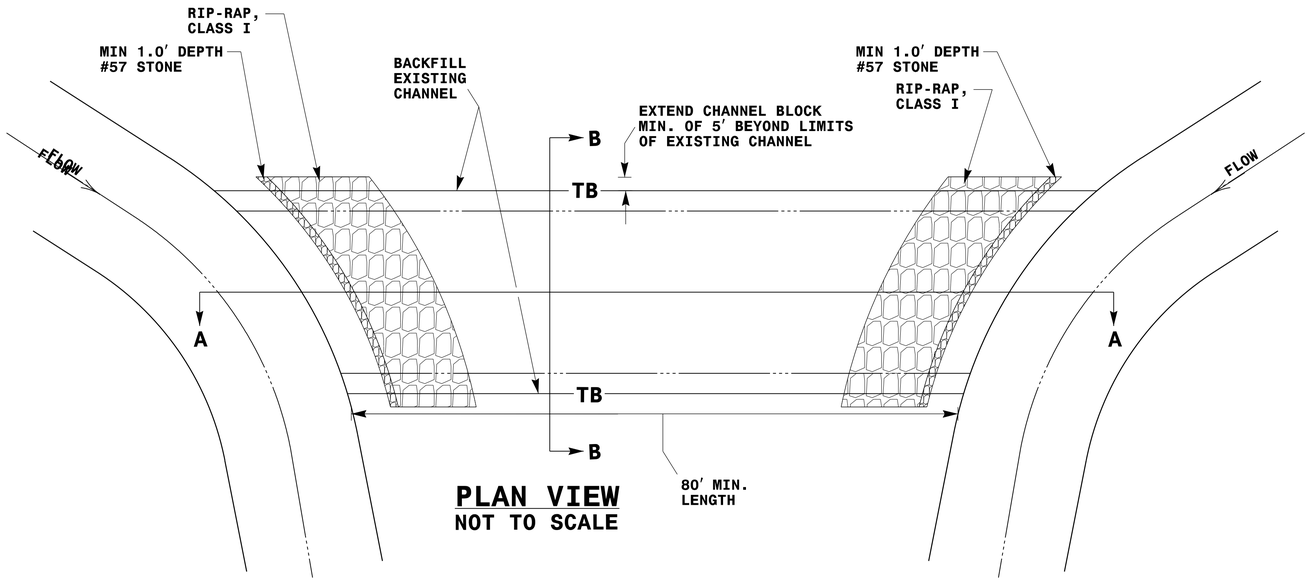
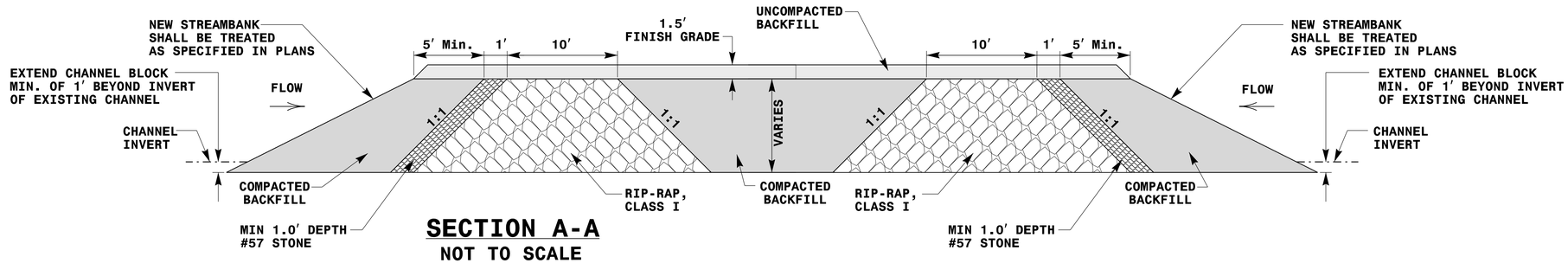
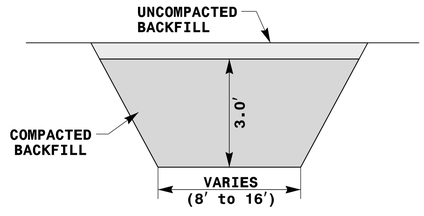
RS&H
NC FIRM LICENSE No: F-0493



PLAN VIEW
NOT TO SCALE



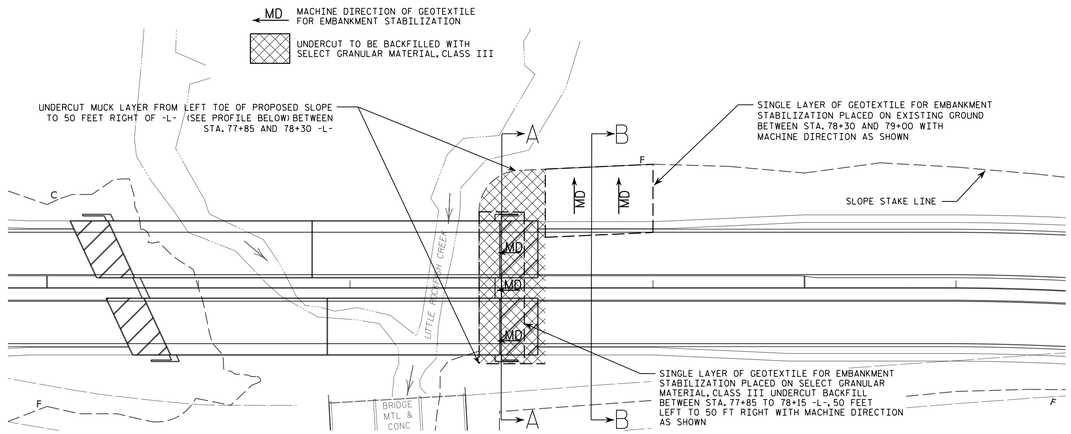
SECTION A-A
NOT TO SCALE



SECTION B-B
NOT TO SCALE

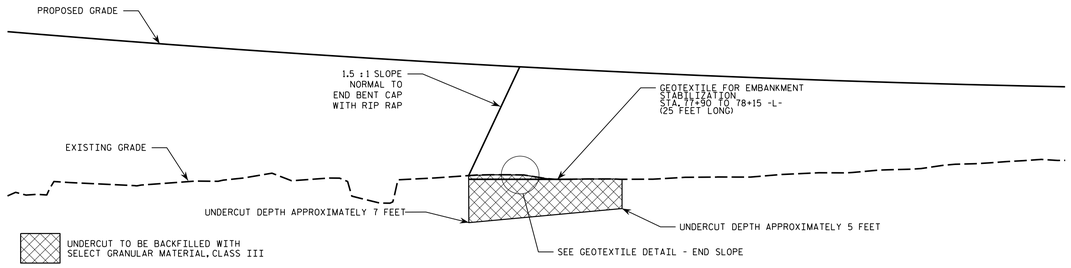
NOTES:
1) CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2) BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3) BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 1′ BELOW THE INVERT OF THE EXISTING CHANNEL.
4) BLOCK SHOULD EXTEND A MINIMUM OF 5′ BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5) INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

CHANNEL BLOCK
NOT TO SCALE



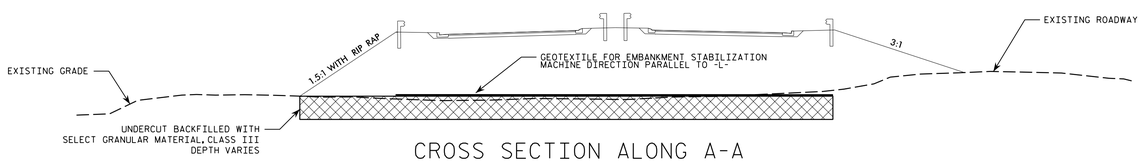
PLAN VIEW FOR LIMITS OF EMBANKMENT STABILIZATION

NOT TO SCALE



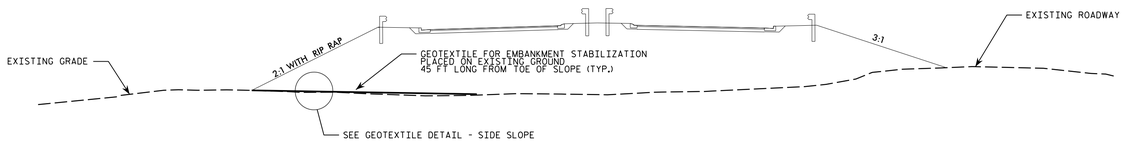
PROFILE ALONG CENTER LINE

SEE GEOTEXTILE DETAIL - END SLOPE
NOT TO SCALE



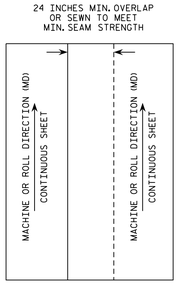
CROSS SECTION ALONG A-A

NOT TO SCALE



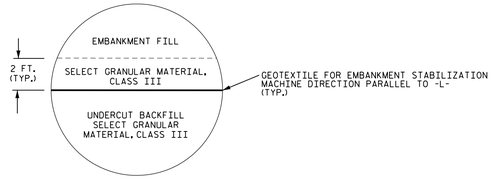
CROSS SECTION ALONG B-B

NOT TO SCALE



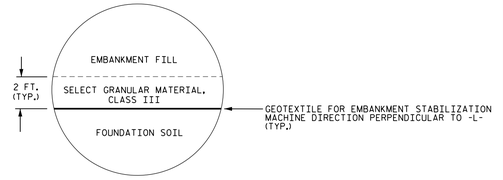
GEOTEXTILE OVERLAP DETAIL

NOT TO SCALE



GEOTEXTILE DETAIL - END SLOPE

NOT TO SCALE



GEOTEXTILE DETAIL - SIDE SLOPE

NOT TO SCALE

ESTIMATED QUANTITIES

UNDERCUT FOR EMBANKMENT STABILITY	1,310 CY
SELECT GRANULAR MATERIAL, CLASS III	1,740 CY
GEOTEXTILE FOR EMBANKMENT STABILIZATION*	710 SY

* GEOTEXTILE FOR EMBANKMENT STABILIZATION ESTIMATED QUANTITY DOES NOT INCLUDE OVERLAPS OR WASTE.

NOTES

1. GEOTEXTILE FOR EMBANKMENT STABILIZATION SHALL BE PLACED ON EXISTING GROUND OR ON UNDERCUT BACKFILL AS SHOWN.
2. PLACE GEOTEXTILE FOR EMBANKMENT STABILIZATION WITH THE MACHINE DIRECTION AS SHOWN IN THE PLANS.
3. PLACE THE GEOTEXTILE FOR EMBANKMENT STABILIZATION WITHOUT ANY WRINKLES OR CREASES.
4. NO SEAMS OR JOINTS ARE ALLOWED PERPENDICULAR TO THE MACHINE DIRECTION OF THE GEOTEXTILE FOR EMBANKMENT STABILIZATION.
5. THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.
6. ALL JOINTS IN THE CROSS MACHINE DIRECTION MUST BE OVERLAPPED A MINIMUM OF 24 INCHES OR SEWN.
7. FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION, SEE GEOTEXTILE FOR EMBANKMENT STABILIZATION SPECIAL PROVISION.
8. PLACE A MINUMUM OF 2 FEET OF SELECT GRANULAR MATERIAL, CLASS III OVER GEOTEXTILE FOR EMBANKMENT STABILIZATION.

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040231 MATHEW J ALEXANDER

9/27/2021

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY: ALEXANDER, M. J.	DATE: 9/22/21
REVIEWED BY: RIGGS, A. F.	DATE: 9/22/21

Prepared in the Office of:
Terracon
Consulting Engineers and Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
NC REGISTERED ENGINEERING FIRM: F-0869
NC REGISTERED GEOLOGIC FIRM: C-367

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

EMBANKMENT STABILIZATION

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

12/30/21

COMPUTED BY: CLR DATE: 11/15/2021
CHECKED BY: CJY DATE: 12/29/2021

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	3B-1

RS&H
NC FIRM LICENSE No: F-0493

SUMMARY OF EARTHWORK IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	UNDERCUT EXCAV.	EMBANK.	BORROW	WASTE
PHASE I						
-DETOUR- 10+05.00	-DETOUR- 17+80.00	3,577	159	251		3,485
TEMP. WIDEN. -L- 85+50.00	TEMP. WIDEN. -L- 92+50.00	806	68	58		817
SUBTOTALS:		4,383	227	309		4,301
PHASE II						
-L- 50+00.00 LT.	-L- 75+48.00 LT.	12,009	1,902	13,293	1,303	1,921
-L- 78+00.00 LT.	-L- 108+00.00 LT.	3,052	326	30,804	27,927	501
-L- 108+00.00 LT.	-L- 109+39.00 LT.	2		178	176	
SUBTOTALS:		15,063	2,228	44,274	29,405	2,422
PHASE III						
-L- 50+00.00 RT.	-L- 75+71.63 RT.	281	100	4,078	3,797	100
-L- 78+00.00 RT.	-L- 108+00.00 RT.	875	635	7,006	6,173	677
-L- 108+00.00 RT.	-L- 109+39.00 RT.	17		1,120	1,103	
SUBTOTALS:		1,173	735	12,204	11,073	777
PHASE IV						
-L- 50+00.00	-L- 54+00.00	52		78	26	
-L- 92+50.00	-L- 108+00.00	497	69	140		426
-L- 108+00.00	-L- 109+39.00	16				16
SUBTOTALS:		565	69	218	26	442
-DETOUR- 10+05.00	-DETOUR- 11+00.00	90				90
(REMOVAL)						
-DETOUR- 16+00.00	-DETOUR- 17+80.00	137		9		128
(REMOVAL)						
SUBTOTALS:		227		9		218
TOTAL		21,411	3,259	57,013	40,503	8,161
LOSS DUE TO CLEARING & GRUBBING		-1,750			1,750	
ADDITIONAL UNDERCUT			1,100	1,375	1,375	1,100
SHOULDER MATERIAL FOR CONSTRUCTION				363	363	
WASTE IN LIEU OF BORROW					-4,652	-4,652
PROJECT TOTALS:		19,661	4,359	58,750	39,339	4,609
EST. 5% REPLACE TOP SOIL ON BORROW PIT					1,967	
GRAND TOTALS:		19,661	4,359	58,750	41,306	4,609
SAY:		19,700	4,400		41,400	

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

SELECT GRANULAR MATERIAL, CLASS III = 2,740 CY
GEOTEXTILE FOR SOIL STABILIZATION = 18,525 SY
CLASS IV SUBGRADE STABILIZATION = 10,500 TONS
CLASS IV AGGREGATE STABILIZATION = 300 TONS
DRAINAGE DITCH EXCAVATION = 1,270 CY

ACCEPTABLE UNCLASSIFIED EXCAVATION NOT TO BE USED IN THE TOP 3' OF EMBANKMENTS: 35 CUBIC YARDS

LINE	STATIONS
-L-	69+25 TO 69+75
-L-	104+25 TO 105+25
-DETOUR-	12+25.00 TO 12+75

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-L-	58+27	59+75	RT	272.28
-L-	66+93	67+55	RT	162.27
-L-	74+77	76+87	RT	439.73
-L-	77+79	82+20	RT	471.34
-L-	84+20	85+18	RT	76.90
-L-	87+30	89+63	RT	247.57
-DETOUR-	10+19	17+80	CL	2290.10
-L- TEMP WIDEN	85+22	92+74	RT	816.97
			TOTAL:	4,777.17
			SAY	5,300

SUMMARY OF BREAKING EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-L-	53+58	58+65	RT	1,490.41
-L-	69+34	72+57	CL	1,061.52
-L-	82+10	82+69	RT	24.00
-L-	83+06	84+75	RT	141.07
-L-	85+35	86+54	RT	358.02
-L-	96+76	97+63	LT	270.43
			TOTAL:	3,345.44
			SAY:	3,700

"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 (FT)			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH (FT)		W		ANCHORS						IMPACT ATTENUATOR TYPE 350		SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TL-3	CAT-1	TYPE-III				IA-MASH, TL-3	G	NG				
-L-	72+93.14	75+80.64	RT	287.50			73+00.00	75+80.64	14	17	50		1		1		1								297		
-L-	78+00.00	79+00.00	RT	100.00				79+00.00	9.5	12.5						1	1								287		
-L-	72+03.31	75+53.31	MED RT	350.00				75+62.96	VARIES	VARIES							1				1		1				
-L-	78+09.00	81+34.00	MED RT	325.00			78+00.00		VARIES	VARIES							1				1		1				
-L-	72+10.27	75+47.77	MED LT	337.50				75+56.67	VARIES	VARIES							1										
-L-	78+09.00	81+34.00	MED LT	325.00			78+00.00		VARIES	VARIES							1										
-L-	74+76.86	75+39.36	LT	62.50			75+39.36		7.5	10.5						1	1										
-L-	78+00.00	86+12.50	LT	812.50			78+00.00	85+75.00	14	17		50		1	1		1										
-L-	60+10.00		RT	12.50																						GUARDRAIL USED TO DEAD END EXISTING ROAD
-L-	66+88.00		RT	12.50																						GUARDRAIL USED TO DEAD END EXISTING ROAD
			SUBTOTALS	2625.00											2	2	8				2				584		
			ANCHOR DEDUCTION	312.50																						
			TOTAL	2312.50																						
			SAY	2325.00																						

ANCHOR DEDUCTION
TYPE III: 8 @ 18.75' = 150'
TYPE TL-3: 2 @ 50' = 100'
TYPE CAT-1: 2 @ 6.25' = 12.50'
IA-MASH, TL-3: 2 @ 25' = 50'
GRAND TOTAL = 312.50'
ADDITIONAL GUARDRAIL POSTS = 5

TEMP GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH (FT)			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH (FT)		W		ANCHORS						IMPACT ATTENUATOR TYPE 350		SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TL-3	CAT-1	TYPE-III				IA-MASH, TL-3	G	NG				
-L-	73+83.11	75+39.36	LT	156.25			75+39.36		7.5	10.5					1												INSTALL IN TMP PHASE II; REM. IN PHASE IV, INSTALL PERM. GRAIL
-L-	72+10.27	75+47.77	MED LT	337.50				75+56.67	VARIES	VARIES					1												GUARDRAIL TO BE LAPPED FOR 2LN-2WAY PATTERN; REMOVE TEMP GREU TL-3, RELAP FOR FINAL CONDITION, INSTALL PERM. IA-MASH TL-3
-L-	78+09.00	81+34.00	MED LT	325.00			78+00.00		VARIES	VARIES					1												
			SUBTOTALS	818.75											3												
			ANCHOR DEDUCTION	150																							
			TOTAL	668.75																							
			SAY	687.5																							

TEMPORARY QUANTITIES
GUARDRAIL = 687.5'
TYPE TL-3: 3 @ 50' = 150'
RELAP GUARDRAIL = 525'

RD248621

COMPUTED BY: BJF DATE: 11/10/2021

CHECKED BY: CMB DATE: 12/21/2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-5798A	3D-1

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

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

LINE & STATION (SIZE / THICKNESS OR GAUGE)	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	R.C. PIPE CLASS IV 12	R.C. PIPE CLASS IV 15	R.C. PIPE CLASS IV 18	R.C. PIPE CLASS IV 24	R.C. PIPE CLASS IV 30	R.C. PIPE CLASS IV 36	R.C. PIPE CLASS IV 42	R.C. PIPE CLASS IV 48	R.C. PIPE CLASS V 12	R.C. PIPE CLASS V 15	R.C. PIPE CLASS V 18	R.C. PIPE CLASS V 24	R.C. PIPE CLASS V 30	R.C. PIPE CLASS V 36	R.C. PIPE CLASS V 42	R.C. PIPE CLASS V 48
L 51+00	57 LT	401		222.35																			
		401	405		219.35	218.80			108														
L 51+18	11 RT	402		223.62																			
		402	403		220.00	219.76			32														
L 51+18	45 RT	403		222.66																			
		403	404		219.66	219.20			116														
L 52+38	45 RT	404		222.95																			
		404	407		219.10	217.60			300														
L 52+07	57 LT	405		222.56																			
		405	406		218.70	218.10			112														
L 53+15	57 LT	406		222.88																			
		406	408		218.00	216.90			216														
L 55+36	45 RT	407		222.95																			
		407	506		217.50	215.26			284														
L 55+32	57 LT	408		222.69																			
		408	501		216.80	215.60			224														
L 49+99	103 LT	409			217.86	217.60						136											
L 52+72	11 RT	411		224.02																			
		411	402		220.85	220.10			152														
L 57+54	51 LT	501		219.19																			
		501	502		215.50	214.19			132														
L 58+85	45 LT	502		217.19																			
		502	503		213.94	213.42				108													
L 59+93	43 LT	503		216.67																			
		503	507		210.92	210.40																	88
		504	505		212.80	212.20			120														
L 62+09	39 LT	504		218.73																			
		505	519		211.95	210.45				188													
L 63+26	39 LT	505		220.43																			
L 58+15	45 RT	506		218.16																			
		506	510		215.16	214.06			100														
L 59+93	43 RT	507		216.67																			
		507	513		210.30	210.00									16								
		508	509		214.17	213.60			116														
L 60+95	42 RT	508		217.17																			
		509	517		213.50	213.20											44						
L 62+09	39 RT	509		218.79																			
L 59+10	45 RT	510		216.96																			
		510	507		213.96	213.05			84														
		512	503		211.30	211.02									24								
L 59+91	59 RT	513		216.00																			
		513	511		209.85	209.80									8								
		514	513		213.90	212.35				100													
L 66+08	98 RT	515			218.60	218.50				68													
		517	504		213.10	212.90											36						
L 62+09	5 LT	517		219.75																			
L 69+12	39 LT	518		214.97																			
		518	622		206.40	205.60					104												
L 69+12	39 LT	518		214.97																			
		519	520		210.35	209.70				76													
						SHEET TOTAL			**2096**	**540**	**104**	**136**			**48**		**80**						**88**

STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	ENDWALLS STD. 838.01 OR STD.838.11 (UNLESS OTHERWISE NOTED) CY	REINFORCED ENDWALLS CY	MASONRY DRAINAGE STRUCTURE CY	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN.FT. A 5.0' THRU 10.0'	LIN.FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	CONCRETE TRANSITIONAL SECTION C.B. STD. 852.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	PIPE REMOVAL LIN. FT.	REMARKS
401									1			1	1										
401	405																						
402									1							1		1	1				
402	403																						
403									1			1	1										
403	404																						
404									1			1			1							21	REMOVE 21 LF OF 10" HDPE
404	407																						
405									1			1		1									
405	406																						
406									1			1		1									
406	408																						
407									1	0.45		1		1									
407	506																						
408									1	0.89		1			1								
408	501																						
409																						89	REMOVE 89 LF OF EXIST. 24" RCP
411									1							1		1	1				
411	402																						
501									1			1			1								
501	502																						
502									1			1			1								
502	503																						
503									1	0.75		1	1										
503	507																						
504	505																						
504									1	0.93		1		1									
505	519																						
505									1	3.48		1		1									
506									1			1		1								21	REMOVE 21 LF OF EXIST. 15" RCP
506	510																						
507									1	1.37		1	1										
507	513																						
508	509																						
508									1			1			1								
509	517																						
509									1	0.29		1			1								
510									1			1		1									
510	507																						
512	503						6																HEADWALL
513									1	1.15										1	1	94	REMOVE 94 LF OF EXIST. 36" RCP
513	511																						
514	513																						OEP
515																							15" DW PIPE
517	504																						
517									1	1.65						1		1	1				
518									1			1			1								
518	622																						
518									1	3.57		1			1								
519	520																						
SHEET TOTAL							**6**		**23**	**15**		**19**	**4**	**7**	**8**	**3**		**3**	**3**	**1**	**1**	**225**	

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	C.S. PIPE 12 (0.064)	15 (0.064)	18 (0.064)	24 (0.064)	30 (0.079)	36 (0.079)	42 (0.109)	48 (0.109)	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	T.B. G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 3 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	T.B. J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	STEEL FRAME AND TWO GRATES STD. 840.37	STEEL FRAME AND GRATE STD. 840.37	M.H. STD. 840.51, STD. 840.52, OR STD.53	CONCRETE OPEN THROAT CB STD. 840.04	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO 2 G.I.	CONVERT C.B. TO D.I.	ADJUST EXISTING MANHOLE	ADJUST EXISTING C.B.	ADJUST D.I.	ADJUST 2GI	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	42" C.S. ELBOW	48" C.S. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	BERM DITCH OUTLET STD. 850.11 (PER EACH)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	FLOWABLE FILL, C.Y.	CONC. & BRICK PLUG, C.Y. STD. 840.71

ABBREVIATIONS

C.A.A - CORRUGATED ALUMINUM INLET
C.B - CATCH BASIN
C.S. - CORRUGATED STEEL
D.I. - DROP INLET
G.D.I. - GRATED DROP INLET
P.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

RD248621

COMPUTED BY:	BJF	DATE:	11/10/2021
CHECKED BY:	CMB	DATE:	12/21/2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-5798A	3D-2

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
L 65+09	85 LT	519		221.53			
		520	518		209.20	206.50	
L 65+71	41 LT	520		222.63			
		521	505		212.55	212.05	
L 63+25	64 LT	521		218.40			
		522	504		213.83	213.00	
L 60+43	42 LT	522		216.83			
L 72+09	39 LT	601		197.26			
		601	602		194.01	193.40	
L 72+09	39 RT	602		197.26			
		602	604		192.90	172.50	
L 75+12	39 LT	603		177.00			
		603	604		173.25	172.50	
L 75+12	39 RT	604		177.00			
		604	610		172.40	164.21	
L 78+60	39 LT	605		163.65			
		605	617		160.65	160.07	
L 78+62	39 RT	606		163.62			
		606	607		160.62	156.51	
L 80+55	39 RT	607		161.67			
		607	611		154.76	154.50	
L 81+35	39 RT	608		161.64			
		608	607		157.39	155.26	
L 80+55	9 LT	609		162.94			
		609	607		158.55	156.26	
L 81+31	9 LT	612		163.31			
		612	618		160.56	160.30	
L 80+09	39 LT	613		163.08			
		613	615		159.50	159.30	
L 72+09	62 LT	614		199.00			
		614	601		196.30	194.26	
L 80+10	9 LT	615		162.95			
		615	616		159.20	159.00	
L 80+44	9 LT	616		162.92			
		616	609		158.90	158.80	
L 79+36	39 LT	617		162.97			
		617	613		159.97	159.60	
L 80+98	9 LT	618		163.04			
		618	609		160.20	158.80	
L 71+53	63 LT	619		201.00			
		619	614		198.92	196.40	
L 70+16	39 RT	620		209.86			
		620	602		204.60	193.65	
		621	620		205.00	204.70	
L 70+16	5 RT	621		210.82			
		622	621		205.50	205.10	
L 70+16	39 LT	622		209.86			
L 95+38	39 LT	701		207.87			
		701	702		204.87	200.15	
L 93+49	51 LT	702		203.23			

SIZE / THICKNESS OR GAUGE — DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) and C.S. PIPE

FROM	TO	DRAINAGE PIPE 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE 12 (0.064)	15 (0.064)	18 (0.064)	24 (0.064)	30 (0.079)	36 (0.079)	42 (0.109)	48 (0.109)
604	610																68				
SHEET TOTAL																	68				

R.C. PIPE CLASS IV and R.C. PIPE CLASS V

FROM	TO	CLASS IV 12	15	18	24	30	36	42	48	CLASS V 12	15	18	24	30	36	42	48
520	518				340												
521	505			28													
522	504		168														
601	602											76					
602	604				300												
603	604										80						
604	610																
605	617		76														
606	607		196														
607	611						52										
608	607					80											
609	607											48					
612	618		32														
613	615										28						
614	601		24														
615	616		32														
616	609		8														
617	613		72														
618	609		40														
619	614		56														
620	602				192												
621	620												32				
622	621												44				
701	702		188														
SHEET TOTAL			892	28	832	80	52				108	124	76				

ENDWALLS, SIDE DRAIN PIPE, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD

LINE & STATION	FROM	ENDWALLS STD. 838.01 OR STD.838.11 (UNLESS OTHERWISE NOTED) CY	REINFORCED ENDWALLS CY	MASONRY DRAINAGE STRUCTURE CY	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0')	LIN.FT. A 5.0' THRU 10.0'	LIN.FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
L 65+09	519								1	5.00	1.18	1		1	
L 65+71	520								1	5.00	3.43	1			1
L 63+25	521								1	0.85					
L 60+43	522								1			1		1	
L 72+09	601								1			1			1
L 72+09	602								1			1		1	
L 75+12	603								1			1			1
L 75+12	604								1			1		1	
L 78+60	605								1			1			1
L 78+62	606								1			1		1	
L 80+55	607								1	1.91		1	1		
L 81+35	608								1			1			1
L 80+55	609								1						
L 81+31	612								1						
L 80+09	613								1			1	1		
L 72+09	614								1						
L 80+10	615								1						
L 80+44	616								1						
L 79+36	617								1			1			1
L 80+98	618								1						
L 71+53	619								1						
L 70+16	620								1			1		1	
L 70+16	621								1	0.82					
L 70+16	622								1			1			1
L 95+38	701								1			1		1	
L 93+49	702								1			1		1	
SHEET TOTAL									26	14	5	17	2	8	7

CONCRETE TRANSITIONAL SECTION, INLETS, FRAMES, JUNCTION BOXES, MANHOLES, CONVERSIONS AND ADJUSTMENTS

LINE & STATION	FROM	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	D.I. STD. 840.14 OR STD. 840.15	D.I FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	T.B. G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 3 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	STEEL FRAME AND TWO GRATES STD. 840.37	STEEL FRAME AND GRATE STD. 840.37	M.H. STD. 840.51, STD. 840.52, OR STD.53	M.H. FRAME AND COVER STD. 840.54	CONCRETE OPEN THROAT CB STD. 840.04	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO 2 G.I.	CONVERT C.B. TO D.I.	ADJUST EXISTING MANHOLE	ADJUST EXISTING C.B.	ADJUST D.I.	ADJUST 2GI
L 63+25	521						1						1																
L 80+55	609								1							1													
L 81+31	612								1							1													
L 72+09	614																				1								
L 80+10	615								1							1													
L 80+44	616								1							1													
L 80+98	618								1							1													
L 71+53	619																				1								
L 70+16	621	1		1	1																								
SHEET TOTAL		1		1	1		1		5				1			5					2								

ELBOWS, MISCELLANEOUS AND REMARKS

FROM	TO	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	42" C.S. ELBOW	48" C.S. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	BERM DITCH OUTLET STD. 850.11 (PER EACH)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	FLOWABLE FILL, C.Y.	CONC. & BRICK PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
520															SPECIAL DESIGN CB (EXTRA DEPTH) SEE 2D-2
602														79	REMOVE 21 LF OF EXIST. 18" RCP & 58 LF OF EXIST. 24" RCP
604	610			2											
701														33	REMOVE 33 LF OF EXIST. 15" RCP & REMOVE EXIST. DI
702														235	REMOVE 235 LF OF EXIST. 18" RCP & REMOVE EXIST. HW
SHEET TOTAL				2										347	

ABBREVIATIONS

C.A.A - CORRUGATED ALUMINUM INLET
C.B - CATCH BASIN
C.S. - CORRUGATED STEEL
D.I. - DROP INLET
G.D.I. - GRATED DROP INLET
P.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: BJF DATE: 11/10/2021

CHECKED BY: CMB DATE: 12/21/2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-5798A	3D-3

R0248621

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 | INVERT ELEVATION | INVERT ELEVATION | MINIMUM REQUIRED SLOPE | DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE | DRAINAGE PIPE THICKNESS OR GAUGE | C.S. PIPE SIZE | C.S. PIPE THICKNESS OR GAUGE | R.C. PIPE CLASS IV SIZE | R.C. PIPE CLASS V SIZE | ENDWALLS STD. 838.01 OR STD.838.11 (UNLESS OTHERWISE NOTED) CY | REINFORCED ENDWALLS CY | MASONRY DRAINAGE STRUCTURE CY | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P. | ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0') | QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN.FT. A (5.0' THRU 10.0') | QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN.FT. B (10.0' AND ABOVE) | FRAME, GRATES, AND HOOD STANDARD 840.03 C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.06 OR STD. 852.02 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | T.B. G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 3 GRATES STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 3 GRATES STD. 840.24 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 | T.B. J.B. STD. 840.34 | T.B.G.D.I. STD. 840.35 | STEEL FRAME AND TWO GRATES STD. 840.37 | STEEL FRAME AND GRATE STD. 840.37 | M.H. STD. 840.51, STD. 840.52, OR STD.53 | M.H. FRAME AND COVER STD. 840.54 | CONCRETE OPEN THROAT CB STD. 840.04 | CONVERT EXISTING C.B. TO J.B. | CONVERT EXISTING D.I. TO J.B. | CONVERT EXISTING J.B. TO 2 G.I. | CONVERT C.B. TO D.I. | ADJUST EXISTING MANHOLE | ADJUST EXISTING C.B. | ADJUST D.I. | ADJUST 2GI | 15" C.S. ELBOW | 18" C.S. ELBOW | 24" C.S. ELBOW | 30" C.S. ELBOW | 36" C.S. ELBOW | 42" C.S. ELBOW | 48" C.S. ELBOW | BERM DITCH OUTLET STD. 850.10 (PER EACH) | BERM DITCH OUTLET STD. 850.11 (PER EACH) | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | FLOWABLE FILL, C.Y. | CONC. & BRICK PLUG, C.Y. STD. 840.71 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---

COMPUTED BY: BJF DATE: 11/10/2021

CHECKED BY: CMB DATE: 12/29/2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-5798A	3D-4

RD248621

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
								THICKNESS OR GAUGE											
		803	804		209.60	208.40													
L 98+46	39 RT	804		212.05															
		804	811		208.30	207.06													
L 96+72	39 RT	805		210.61															
		805	806		206.30	205.80													
L 96+72	6 LT	806		211.01															
		806	813		205.70	205.10													
L 102+74	51 LT	807		216.57															
		807	808		213.57	212.04													
L 101+37	51 LT	808		215.04															
		808	809		211.79	210.74													
L 100+20	40 LT	809		214.03															
		809	803		210.64	210.10													
L 96+52	39 LT	810		209.76															
		810	701		206.30	204.97													
L 97+28	39 RT	811		210.71															
		811	805		206.96	206.40													
L 96+50	55 LT	812		208.48															
		812	810		206.56	206.40													
L 96+02	6 LT	813		209.96															
		813	718		205.00	203.43													
L 104+47	44 LT	814		218.35															
		814	807		215.35	213.67													
L 104+50	57 LT	815		218.47															
		815	814		215.72	215.45													
L 101+43	5 RT	816		216.35															
		816	817		213.18	212.49													
L 101+43	39 RT	817		215.39															
		817	803		212.39	210.90													
L 106+73	51 LT	901		220.74															
		901	904		216.80	215.88													
L 106+73	5 LT	902		222.01															
		902	901		218.84	216.90													
L 105+67	63 RT	903		218.73															
		903	801		215.73	215.10													
L 105+08	39 LT	904		218.78															
		904	814		215.78	215.45													
L 106+73	67 LT	905		220.00															
		905	901		217.00	216.90													
L 106+71	63 RT	908		220.43															
		908	903		217.43	215.83													
DETOUR 13+80	CL	DET-01			202.87	199.80													
DETOUR 15+75	10 RT	DET-02			185.25	184.00													
SHEET TOTAL											68								
PROJECT TOTAL											68								
SAY TOTAL											68								

THICKNESS OR GAUGE	12	15	18	24	30	36	42	48
	0.064	0.064	0.064	0.064	0.079	0.079	0.109	0.109

COMPUTED BY: A. F. Riggs, Jr. DATE: March 2021
CHECKED BY: A. A. Nash DATE: March 2021

(12-17-19)

PROJECT NO.	SHEET NO.
U-5798A	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	500
				TOTAL LF:	500

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
-L-	50+25	69+75	ASU (1)	12	2110	6325	10025		
-L-	86+25	86+75	ASU (1)	12	135	315	490		
-L-	92+25	95+40	ASU (1)	12	415	995	1560		
-L-	101+25	105+75	ASU (1)	12	600	1365	2150		
CONTINGENCY			ASU (1)	12	250	500	2000		
			TOTAL CY/TONS/SY:		3510	9500	16225	0	0

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

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4,5	JOHN D GILLIS
2	4,5	W K GILLIS
3	5	ROBERT LEWIS GILLIS & WIFE JUNE MONTGOMERY
4	5	DAVID MILLER GILLIS & JOHN DAVIS II
5	5,6	JOHN D GILLIS
6	5,6	M D GILLIS C/O, JUDY GILLIS DIBACCO
7	6	M D GILLIS C/O, JUDY GILLIS DIBACCO
8	6	MALCOM D GILLIS HEIRS, JUDY GILLIS MCKETHAN
9	6,7	JOHN MCN GILLIS JR ET AL
10	6,7	JOHN MCN GILLIS JR ET AL
11	6,7	DOUGLAS KEITH MILLER & WIFE KATHRYN GILLIS
12	7	JOHN MCN GILLIS JR ET AL
13	7	JOHN MCN GILLIS JR ET AL
14	7	KATHRYN GILLIS MILLER & HUSBAND DOUGLAS KEITH
15	7	GILBERT LINDSAY & WIFE LAURA
16	7	LEWIS LINDSEY & WIFE LAURIE
17	7	WEST FAYETTEVILLE PLACE ASSOCIATES
18	7	WEST BAPTIST CHURCH TRUSTEES
19	7,8	JOHN D GILLIS
20	7	GT RECREATION
21	7,8,9	WAL-MART REAL ESTATE BUSINESS
22	8,9	BARKER PARTNERS LLC
23	9	CUMBERLAND COUNTY ABC BOARD

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG
1/12/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048313 COLE M. BENJAMIN
1/12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

-L- CURVE DATA

PI Sta 48+37.98
△ = 7° 01' 28.2" (RT)
D = 0° 40' 26.6"
L = 1,042.10'
T = 521.71'
R = 8,500.00'
SE = NC

PI Sta 62+27.11
△ = 13° 43' 19.0" (LT)
D = 0° 47' 36.9"
L = 1,729.14'
T = 868.73'
R = 7,220.00'
SE = NC

U-5798B -L- PRC Sta. 43+16.28

BM #7

JOHN MCNATT GILLIS, MARY ALMA GILLIS
MALCOLM D GILLIS HEIRS ET AL
MALCOLM GILLIS HEIRS
JUDY GILLIS MCKETHAN
DB 4093 PG 287 (TRACT 6C)

JOHN MCNATT GILLIS, MARY ALMA GILLIS
MALCOLM D GILLIS HEIRS ET AL
MALCOLM GILLIS HEIRS
JUDY GILLIS MCKETHAN
DB 4093 PG 287 (TRACT 6C)

1
JOHN D GILLIS
DB 4810 PG 586

2
W K GILLIS
DB 2749 PG 305
DB 2799 PG 629
DB 9583 PG 800 (NCDOT R/W)

NAD 83/NA 2011

-L- STA. 56+25.00

MATCHLINE SHEET 5 -L- STA. 56+25.00

GILLIS HILL RD.

STONEY POINT RD.

U-5798B FUTURE WORK TO BE DONE BY OTHERS

BEGIN PROJECT U-5798A
END PROJECT U-5798B
-L- Sta. 50+00.00

-L- PRC Sta. 53+58.38

30" RCP-IV

REMOVE

15" RCP-IV

575' STORAGE

600' LANE SHIFT

675' STORAGE

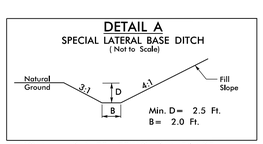
PUE

DUE

RETAIN

SPECIAL LATERAL BASE DITCH SEE DETAIL A

DETAIL A
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM -L- STA. 50+50 TO STA. 56+25 LT

TRAFFIC VOLUME DATA

		6,476 / 11,238	STONEY POINT RD.	
13,176 / 15,938	748 / 1,224	2,110 / 4,205		23,829 / 30,114
GILLIS HILL RD.	210 / 305	9,500 / 11,500		GILLIS HILL RD.
		13,329 / 17,614	STONEY POINT RD.	

2022 / 2042

EXISTING SIGNAL

FOR -L- PROFILE, SEE SHEET NO. 10

28-DEC-2021 16:46
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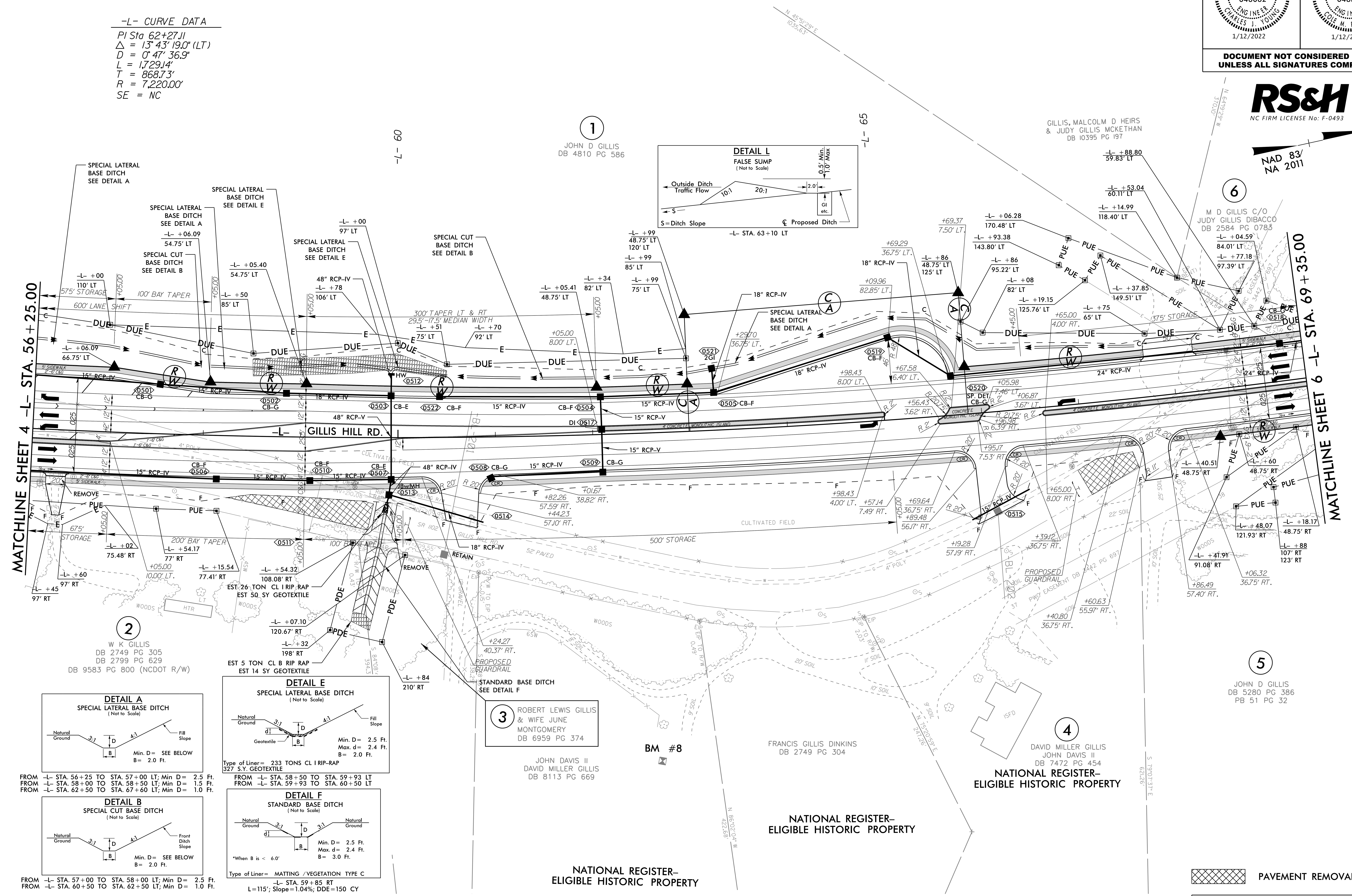
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 046062 CHARLES J. YOUNG 1/12/2022	SEAL 048313 COLE M. BENJAMIN 1/12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

-L- CURVE DATA
PI Sta 62+27.11
Δ = 13° 43' 19.0" (LT)
D = 0° 47' 36.9"
L = 1,729.14'
T = 868.73'
R = 7,220.00'
SE = NC



NAD 83/ NA 2011
MATCHLINE SHEET 4 -L- STA. 56+25.00
MATCHLINE SHEET 6 -L- STA. 69+35.00
-L- GILLIS HILL RD.
1 JOHN D GILLIS DB 4810 PG 586
2 W K GILLIS DB 2749 PG 305 DB 2799 PG 629 DB 9583 PG 800 (NCDOT R/W)
3 ROBERT LEWIS GILLIS & WIFE JUNE MONTGOMERY DB 6959 PG 374
4 DAVID MILLER GILLIS JOHN DAVIS II DB 7472 PG 454
5 JOHN D GILLIS DB 5280 PG 386 PB 51 PG 32
6 M D GILLIS C/O JUDY GILLIS DIBACCO DB 2584 PG 0783
GILLIS, MALCOLM D HEIRS & JUDY GILLIS MCKETHAN DB 10395 PG 197
JOHN DAVIS II DAVID MILLER GILLIS DB 8113 PG 669
FRANCIS GILLIS DINKINS DB 2749 PG 304
NATIONAL REGISTER– ELIGIBLE HISTORIC PROPERTY
BM #8
DETAIL L FALSE SUMP (Not to Scale)
-L- STA. 63+10 LT
DETAIL A SPECIAL LATERAL BASE DITCH (Not to Scale)
Min. D= SEE BELOW B= 2.0 Ft.
FROM -L- STA. 56+25 TO STA. 57+00 LT; Min D= 2.5 Ft.
FROM -L- STA. 58+00 TO STA. 58+50 LT; Min D= 1.5 Ft.
FROM -L- STA. 62+50 TO STA. 67+60 LT; Min D= 1.0 Ft.
DETAIL B SPECIAL CUT BASE DITCH (Not to Scale)
Min. D= SEE BELOW B= 2.0 Ft.
FROM -L- STA. 57+00 TO STA. 58+00 LT; Min D= 2.5 Ft.
FROM -L- STA. 60+50 TO STA. 62+50 LT; Min D= 1.0 Ft.
DETAIL E SPECIAL LATERAL BASE DITCH (Not to Scale)
Min. D= 2.5 Ft. Max. d= 2.4 Ft. B= 2.0 Ft.
Type of Liner= 233 TONS CL I RIP-RAP 327 S.Y. GEOTEXTILE
FROM -L- STA. 58+50 TO STA. 59+93 LT
FROM -L- STA. 59+93 TO STA. 60+50 LT
DETAIL F STANDARD BASE DITCH (Not to Scale)
Min. D= 2.5 Ft. Max. d= 2.4 Ft. B= 3.0 Ft.
Type of Liner= MATTING /VEGETATION TYPE C
-L- STA. 59+85 RT
L=115'; Slope=1.04%; DDE=150 CY
EST 26 TON CL I RIP RAP EST 50 SY GEOTEXTILE
EST 5 TON CL B RIP RAP EST 14 SY GEOTEXTILE
PAVEMENT REMOVAL

FOR -L- PROFILE, SEE SHEETS NO. 10

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 046062 – CHARLES J. YOUNG – 2/2/2022	SEAL 048313 – COLE M. BENJAMIN – 2/2/2022

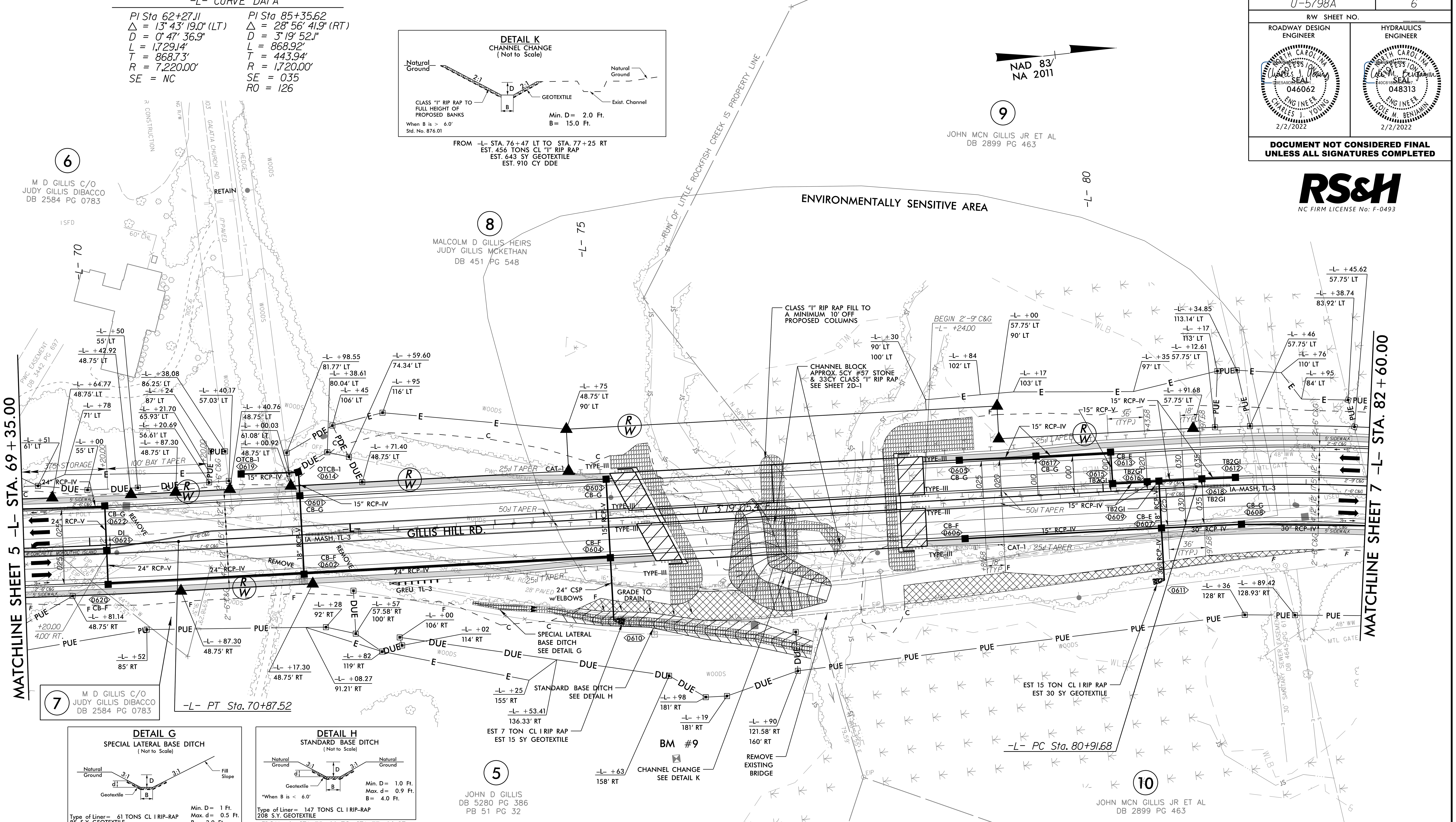
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

-L- CURVE DATA

PI Sta 62+27.11	PI Sta 85+35.62
Δ = 13° 43′ 19.0″ (LT)	Δ = 28° 56′ 41.9″ (RT)
D = 0° 47′ 36.9″	D = 3° 19′ 52.1″
L = 1,729.14′	L = 868.92′
T = 868.73′	T = 443.94′
R = 7,220.00′	R = 1,720.00′
SE = NC	SE = .035
	RO = 126

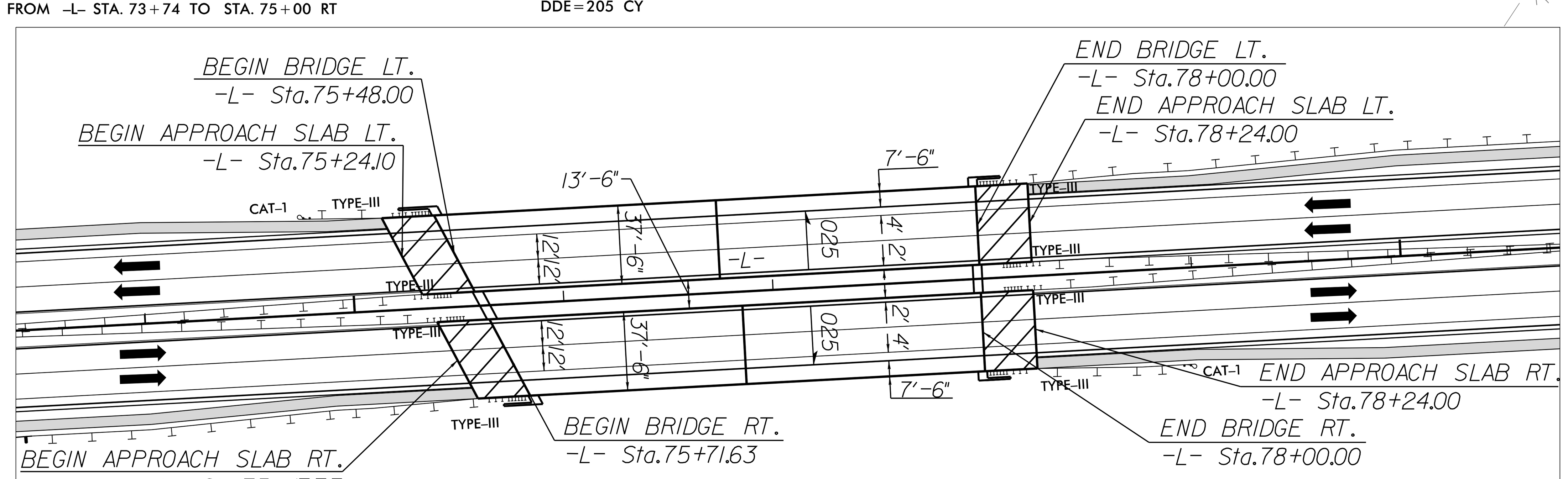
DETAIL K
CHANNEL CHANGE
(Not to Scale)
Natural Ground; 2:1; D; B; GEOTEXTILE; Exist. Channel
CLASS "I" RIP RAP TO FULL HEIGHT OF PROPOSED BANKS
When B is > 6.0′
Std. No. 876.01
Min. D = 2.0 Ft.
B = 15.0 Ft.
FROM -L- STA. 76+47 LT TO STA. 77+25 RT
EST. 456 TONS CL "I" RIP RAP
EST. 643 SY GEOTEXTILE
EST. 910 CY DDE



NAD 83 NA 2011
ENVIRONMENTALLY SENSITIVE AREA
GILLIS HILL RD.
MATCHLINE SHEET 5 -L- STA. 69+35.00
MATCHLINE SHEET 7 -L- STA. 82+60.00
6 M D GILLIS C/O JUDY GILLIS DIBACCO DB 2584 PG 0783
7 M D GILLIS C/O JUDY GILLIS DIBACCO DB 2584 PG 0783
8 MALCOLM D GILLIS HEIRS JUDY GILLIS MCKETHAN DB 451 PG 548
9 JOHN MCN GILLIS JR ET AL DB 2899 PG 463
5 JOHN D GILLIS DB 5280 PG 386 PB 51 PG 32
10 JOHN MCN GILLIS JR ET AL DB 2899 PG 463
11 DOUGLAS KEITH MILLER & WIFE KATHRYN GILLIS DB 4227 PG 487
RUN OF LITTLE ROCKFISH CREEK IS PROPERTY LINE
-L- PT Sta. 70+87.52
-L- PC Sta. 80+91.68
CLASS "I" RIP RAP FILL TO A MINIMUM 10′ OFF PROPOSED COLUMNS
CHANNEL BLOCK APPROX. 5CY #57 STONE & 33CY CLASS "I" RIP RAP SEE SHEET 2D-1
SPECIAL LATERAL BASE DITCH SEE DETAIL G
STANDARD BASE DITCH SEE DETAIL H
EST 7 TON CL I RIP RAP EST 15 SY GEOTEXTILE
EST 15 TON CL I RIP RAP EST 30 SY GEOTEXTILE
CHANNEL CHANGE SEE DETAIL K
REMOVE EXISTING BRIDGE
GRADE TO DRAIN
BM #9
24″ CSP w/ELBOWS
BEGIN 2′-9″ C&G -L- +24.00

DETAIL G
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground; 3:1; D; d; B; Geotextile; Fill Slope
Min. D = 1 Ft.
Max. d = 0.5 Ft.
B = 3.0 Ft.
Type of Liner = 61 TONS CL I RIP-RAP
85 S.Y. GEOTEXTILE
FROM -L- STA. 73+74 TO STA. 75+00 RT

DETAIL H
STANDARD BASE DITCH
(Not to Scale)
Natural Ground; 3:1; D; d; B; Geotextile
*When B is < 6.0′
Min. D = 1.0 Ft.
Max. d = 0.9 Ft.
B = 4.0 Ft.
Type of Liner = 147 TONS CL I RIP-RAP
208 S.Y. GEOTEXTILE
FROM -L- STA. 75+00 TO STA. 77+06 RT;
DDE = 205 CY



BEGIN BRIDGE LT. -L- Sta.75+48.00
BEGIN APPROACH SLAB LT. -L- Sta.75+24.10
END BRIDGE LT. -L- Sta.78+00.00
END APPROACH SLAB LT. -L- Sta.78+24.00
END APPROACH SLAB RT. -L- Sta.78+24.00
END BRIDGE RT. -L- Sta.78+00.00
BEGIN BRIDGE RT. -L- Sta.75+71.63
BEGIN APPROACH SLAB RT. -L- Sta.75+47.73

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

APPROACH SLAB

PAVEMENT REMOVAL

FOR -L- PROFILE, SEE SHEETS NO. 10, 11

FOR LEFT LANE STRUCTURE PLANS, SEE SHEETS S1-1 THRU S1-43

FOR RIGHT LANE STRUCTURE PLANS, SEE SHEETS S2-1 THRU S2-43

02-FEB-2022 07:34
R:\Roadway\Proj\U-5798A\U-5798A_Rdy_psh_6.dgn
$$$$USERNAME$$$$

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG
2/2/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048313 COLE M. BENJAMIN
2/2/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

-L- CURVE DATA

PI Sta 85+35.62	PI Sta 93+91.02
Δ = 28° 56' 41.9" (RT)	Δ = 8° 17' 55.2" (LT)
D = 3° 19' 52.1"	D = 1° 40' 48.8"
L = 868.92'	L = 493.90'
T = 443.94'	T = 247.38'
R = 1,720.00'	R = 3,410.00'
SE = 035	SE = RC
RO = 126	

MATCHLINE SHEET 6 -L- STA. 82+60.00

MATCHLINE SHEET 8 -L- STA. 95+80.00

-L- PC Sta. 91+43.64

-L- PT Sta. 89+60.59

GILLIS HILL RD

SR 1102

9 JOHN MCN GILLIS JR ET AL DB 2899 PG 463

10 JOHN MCN GILLIS JR ET AL DB 2899 PG 463

11 DOUGLAS KEITH MILLER & WIFE KATHRYN GILLIS DB 4227 PG 487

12 JOHN MCN GILLIS JR ET AL DB 2899 PG 463 PB 114 PG 3

13 JOHN MCN GILLIS JR ET AL DB 2899 PG 463 PB 114 PG 3

14 KATHRYN GILLIS MILLER & HUSBAND DOUGLAS KEITH DB 9268 PG 320

15 GILBERT LINDSAY & WIFE LAURA DB 2190 PG 619

16 LEWIS LINDSEY & WIFE LAURIE DB 2710 PG 121

17 WEST FAYETTEVILLE PLACE ASSOCIATES LIMITED PARTNERSHIP DB 10045 PG 260

18 WEST FAYETTEVILLE BAPTIST CHURCH TRUSTEES DB 9240 PG 512 PB 132 PG 190

19 JOHN D GILLIS DB 5280 PG 386 PB 94 PG 13

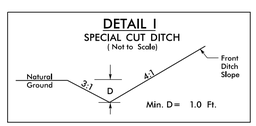
20 GT RECREATION DB 10124 PG 689

21 WAL-MART REAL ESTATE BUSINESS TRUST (#3595) DB 5933 PG 307 PB 107 PG 17

BM #10

NAD 83/NA 2011

DETAIL I
SPECIAL CUT DITCH
(Not to Scale)



FROM -L- STA. 90+10 TO STA. 92+50 LT
FROM -L- STA. 93+50 TO STA. 95+00 LT

PAVEMENT REMOVAL

FOR -L- PROFILE, SEE SHEET NO. 11

8/17/99

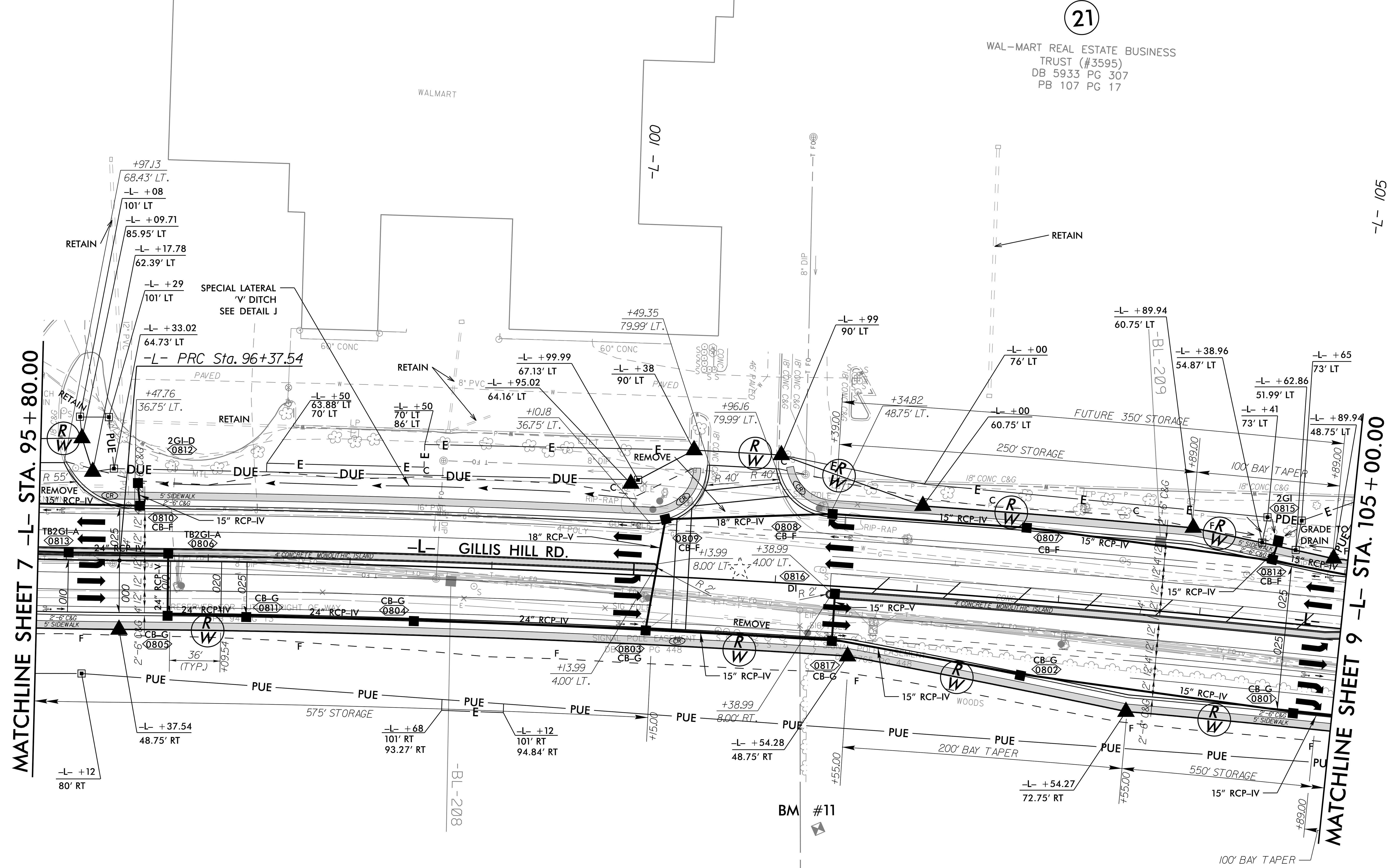
PROJECT REFERENCE NO.	SHEET NO.
U-5798A	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 046062 — CHARLES J. YOUNG — 1/12/2022	SEAL 048313 — COLE M. BENJAMIN — 1/12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

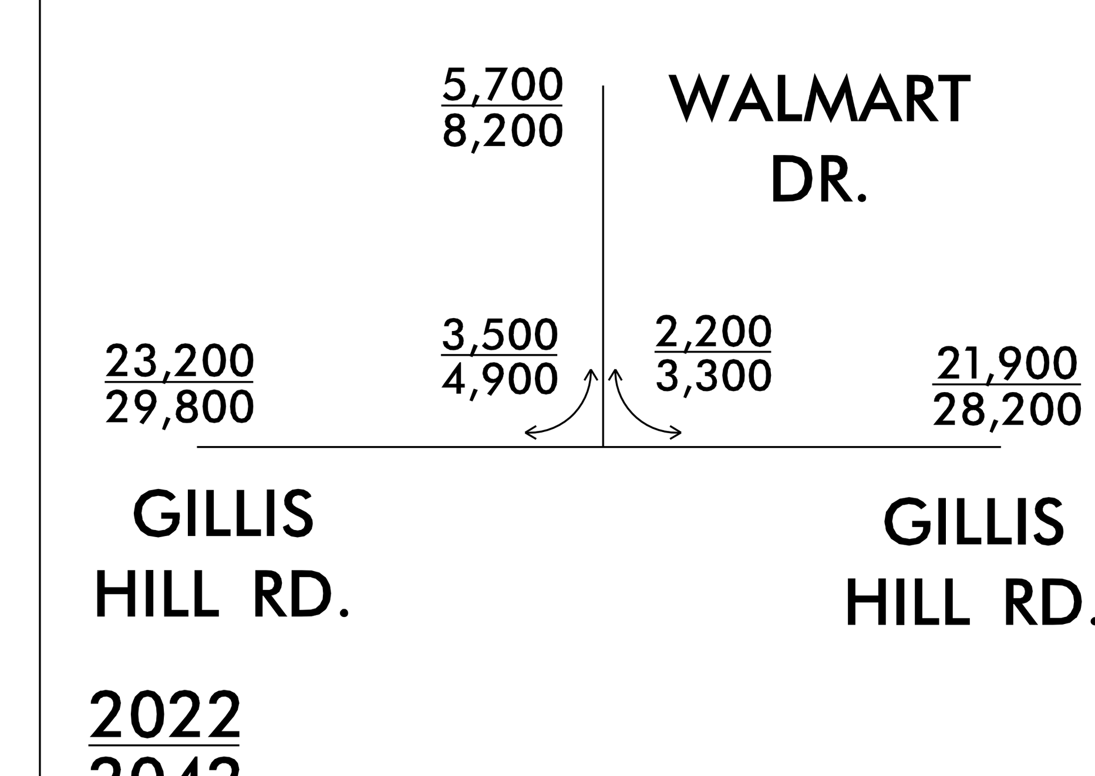
RS&H
NC FIRM LICENSE No: F-0493

-L- CURVE DATA

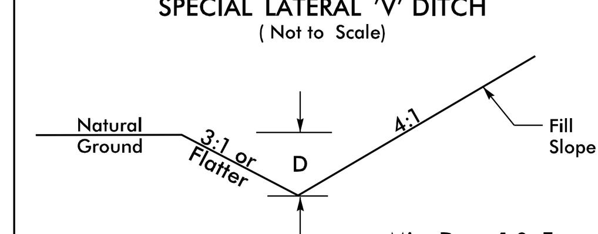
PI Sta 93+91.02	PI Sta 101+25.50
Δ = 8° 17′ 55.2″ (LT)	Δ = 6° 12′ 24.4″ (RT)
D = 1° 40′ 48.8″	D = 0° 38′ 11.8″
L = 493.90′	L = 974.96′
T = 247.38′	T = 487.96′
R = 3,410.00′	R = 9,000.00′
SE = RC	SE = NC



TRAFFIC VOLUME DATA



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



FROM -L- STA. 96+50 TO STA. 100+00 LT

EXISTING SIGNAL

FOR -L- PROFILE, SEE SHEETS NO. 11

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PROJECT REFERENCE NO.	SHEET NO.
U-5798A	9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG 1/16/2022	NORTH CAROLINA PROFESSIONAL SEAL 048313 ENGINEER COLE M. BENJAMIN 1/16/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

-L- CURVE DATA
PI Sta 111+73.23
Δ = 19° 25' 26.6" (LT)
D = 6° 11' 14.8"
L = 313.93'
T = 158.48'
R = 926.00'

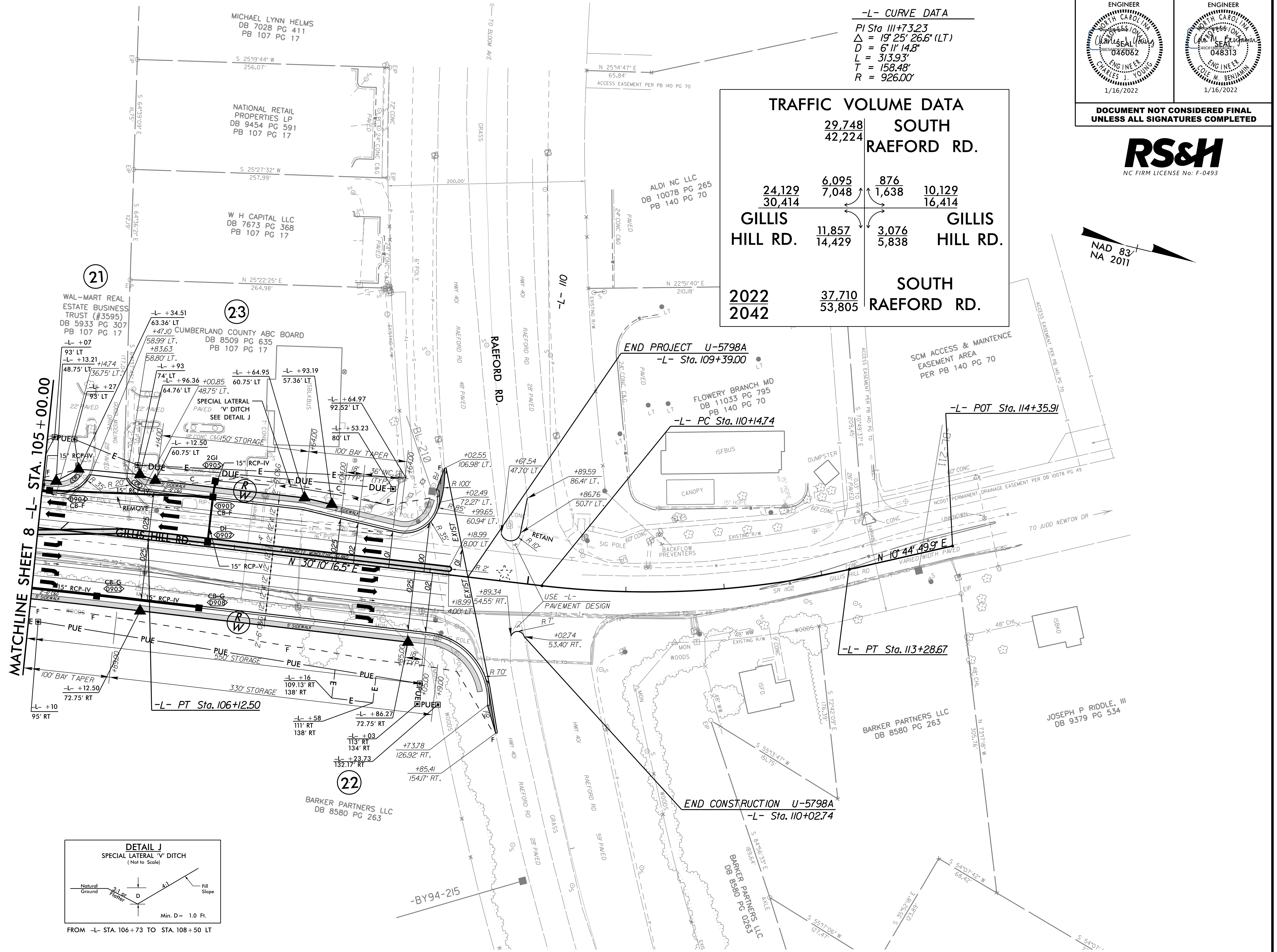
TRAFFIC VOLUME DATA

SOUTH RAEFORD RD. (north leg): 29,748 / 42,224
Left turn 6,095 / 7,048; Right turn 876 / 1,638

GILLIS HILL RD. (west leg): 24,129 / 30,414; 11,857 / 14,429
GILLIS HILL RD. (east leg): 10,129 / 16,414; 3,076 / 5,838

SOUTH RAEFORD RD. (south leg): 37,710 / 53,805

2022
2042



DETAIL J
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
3:1 or Flatter
D
Fill Slope
Min. D= 1.0 Ft.
FROM -L- STA. 106+73 TO STA. 108+50 LT

☆ EXISTING SIGNAL

FOR -L- PROFILE, SEE SHEETS NO. 12

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	10

ROADWAY DESIGN ENGINEER — SEAL 046062 — Charles J. Young — 1/12/2022

HYDRAULICS ENGINEER — SEAL 048313 — Cole M. Benjamin — 1/12/2022

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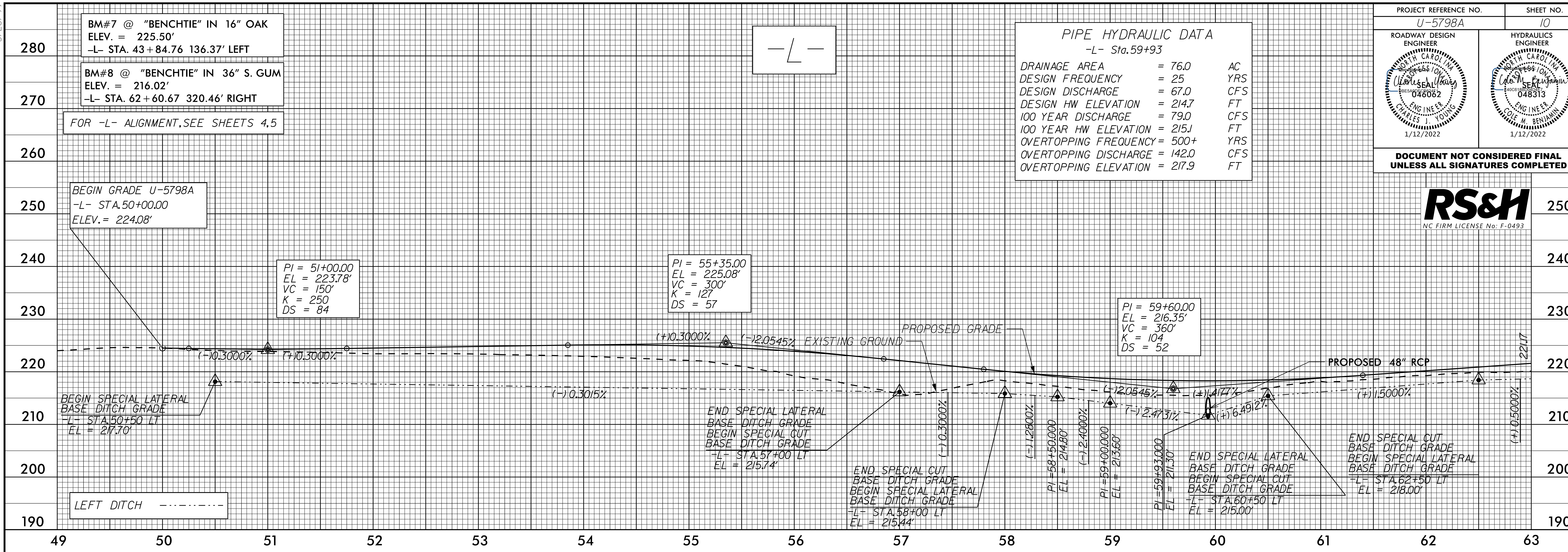
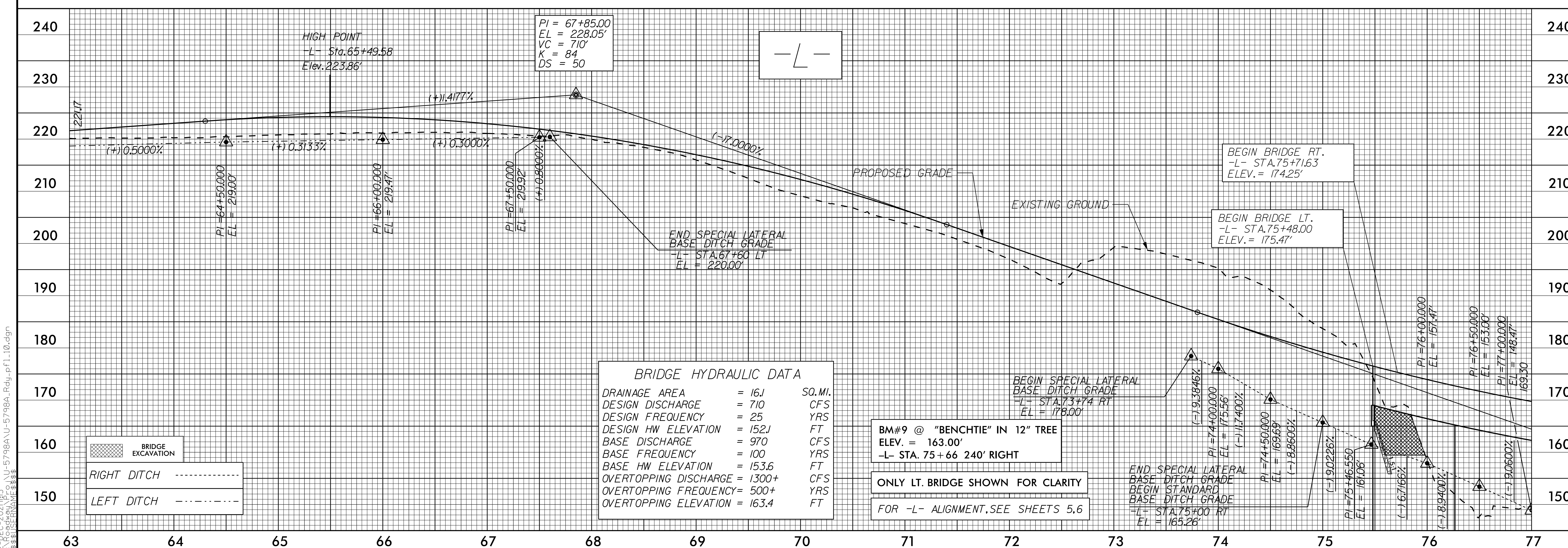
RS&H — NC FIRM LICENSE No: F-0493



PIPE HYDRAULIC DATA

-L- Sta.59+93

DRAINAGE AREA	= 76.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 67.0	CFS
DESIGN HW ELEVATION	= 214.7	FT
100 YEAR DISCHARGE	= 79.0	CFS
100 YEAR HW ELEVATION	= 215.1	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 142.0	CFS
OVERTOPPING ELEVATION	= 217.9	FT



BRIDGE HYDRAULIC DATA

DRAINAGE AREA	= 16.1	SQ.MI.
DESIGN DISCHARGE	= 710	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 152.1	FT
BASE DISCHARGE	= 970	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 153.6	FT
OVERTOPPING DISCHARGE	= 1300+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 163.4	FT

5/28/99

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-5798A	11

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 ENGINEER CHARLES T. YOUNG
1/12/2022

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048313 ENGINEER COLE M. BENJAMIN
1/12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

BRIDGE HYDRAULIC DATA

DRAINAGE AREA	= 16.1	SQ.MI.
DESIGN DISCHARGE	= 710	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 152.1	FT
BASE DISCHARGE	= 970	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 153.6	FT
OVERTOPPING DISCHARGE	= 1300+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 163.4	FT

-L-

END STANDARD BASE DITCH GRADE
-L- STA.77+06 RT
EL = 148.00'

END BRIDGE RT.
-L- STA.78+00.00
ELEV.= 165.51'

END BRIDGE LT.
-L- STA.78+00.00
ELEV.= 165.51'

PI = 80+00.00
EL = 143.00'
VC = 1,240'
K = 96
DS = 50

169.30

PI =77+00.000
EL = 148.47'

(-)7.8333%

(-)7.0000%

EXISTING GROUND

PROPOSED GRADE

(+)5.8530%

PI = 87+80.00
EL = 188.65'
VC = 320'
K = 102
DS = 53

BEGIN SPECIAL CUT DITCH GRADE
-L- STA.90+10.00 LT
EL = 194.39'

(+)12.7222%

(+)2.4410%

(+)1.7700%

197.44

PI =90+50.000
EL = 195.36'

PI = 90+50.00
EL = 196.00'
VC = 220'
K = 1388
DS > 80

ONLY LT. BRIDGE SHOWN FOR CLARITY

UNDERCUT EXCAVATION

RIGHT DITCH ----------

LEFT DITCH —·—·—·—·—

BM#10 @ "BENCHTIE" IN 18" PINE
ELEV. = 192.14'
-L- STA. 89+64.02 164.92' RIGHT

FOR -L- ALIGNMENT, SEE SHEETS 6,7

-L-

(+)2.8807%

(+) 2.7700%

PI =91+50.000
EL = 197.13'

(+)1.7700%

END SPECIAL CUT DITCH GRADE
-L- STA.92+50.00 LT
EL = 199.90'

BEGIN SPECIAL CUT DITCH GRADE
-L- STA.93+50.00 LT
EL = 202.46'

(+) 2.5400%

PI = 95+15.00
EL = 209.40'
VC = 400'
K = 228
DS = 68

(+)2.8807%

(+)1.1295%

PI =94+50.000
EL = 205.00'

(+) 1.2000%

END SPECIAL CUT DITCH GRADE
-L- STA.95+00.00 LT
EL = 206.00'

EXISTING GROUND

PROPOSED GRADE

(+)1.0667%

(+) 2.3200%

PI =97+00.000
EL = 209.96'

(+) 0.3200%

PI =97+50.000
EL = 209.80'

BEGIN SPECIAL LATERAL 'V' DITCH GRADE
-L- STA.96+50.00 LT
EL = 208.48'

PI =99+00.000
EL = 211.40'

(+) 0.6000%

PI =99+50.000
EL = 211.70'

(+) 2.8200%

END SPECIAL LATERAL 'V' DITCH GRADE
-L- STA.100+00.00 LT
EL = 213.11'

PI = 104+00.00
EL = 219.39'
VC = 160'
K = 225
DS = 68

(+)11.1295%

(+)0.4169%

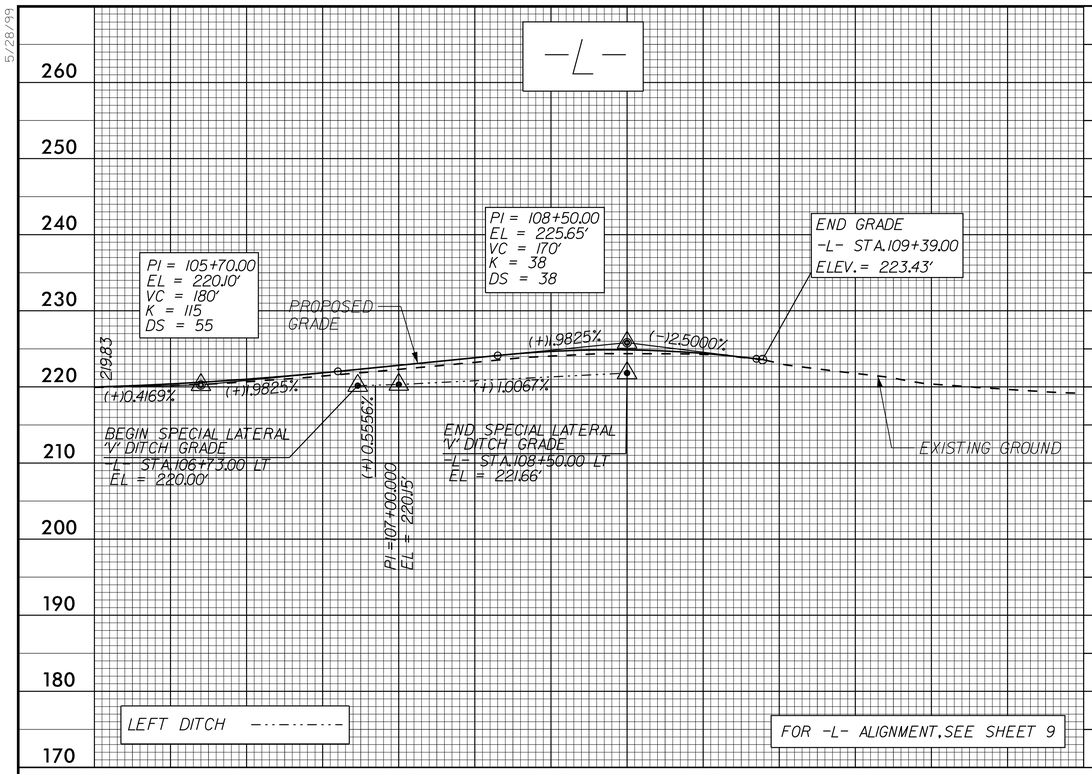
219.83

LEFT DITCH —·—·—·—·—

BM#11 @ "BENCHTIE" IN 12" PINE
ELEV. = 211.54'
-L- STA. 101+27.27 171.50' RIGHT

FOR -L- ALIGNMENT, SEE SHEETS 7,8

5/28/99



PROJECT REFERENCE NO.	SHEET NO.
U-5798A	12

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG ENGINEER
Charles J. Young
1/12/2022

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048313 COLE M. BENJAMIN ENGINEER
Cole M. Benjamin
1/12/2022

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RS&H
NC FIRM LICENSE No: F-0493

22-DEC-2021 14:4
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