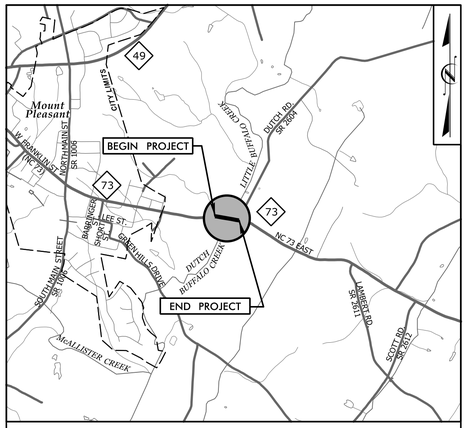
TIP PROJECT: B–5813

CONTRACT: C204417

See Sheet 1A For Index of Sheets
See Sheet 1B For Standard Symbology Sheet



VICINITY MAP N.T.S.

DESIGN EXCEPTION REQUIRED FOR SAG AND CREST FOR K FACTORS AND ASSOCIATED NIGHTTIME SSD FOR –Y– (SR 2604 DUTCH ROAD)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CABARRUS COUNTY

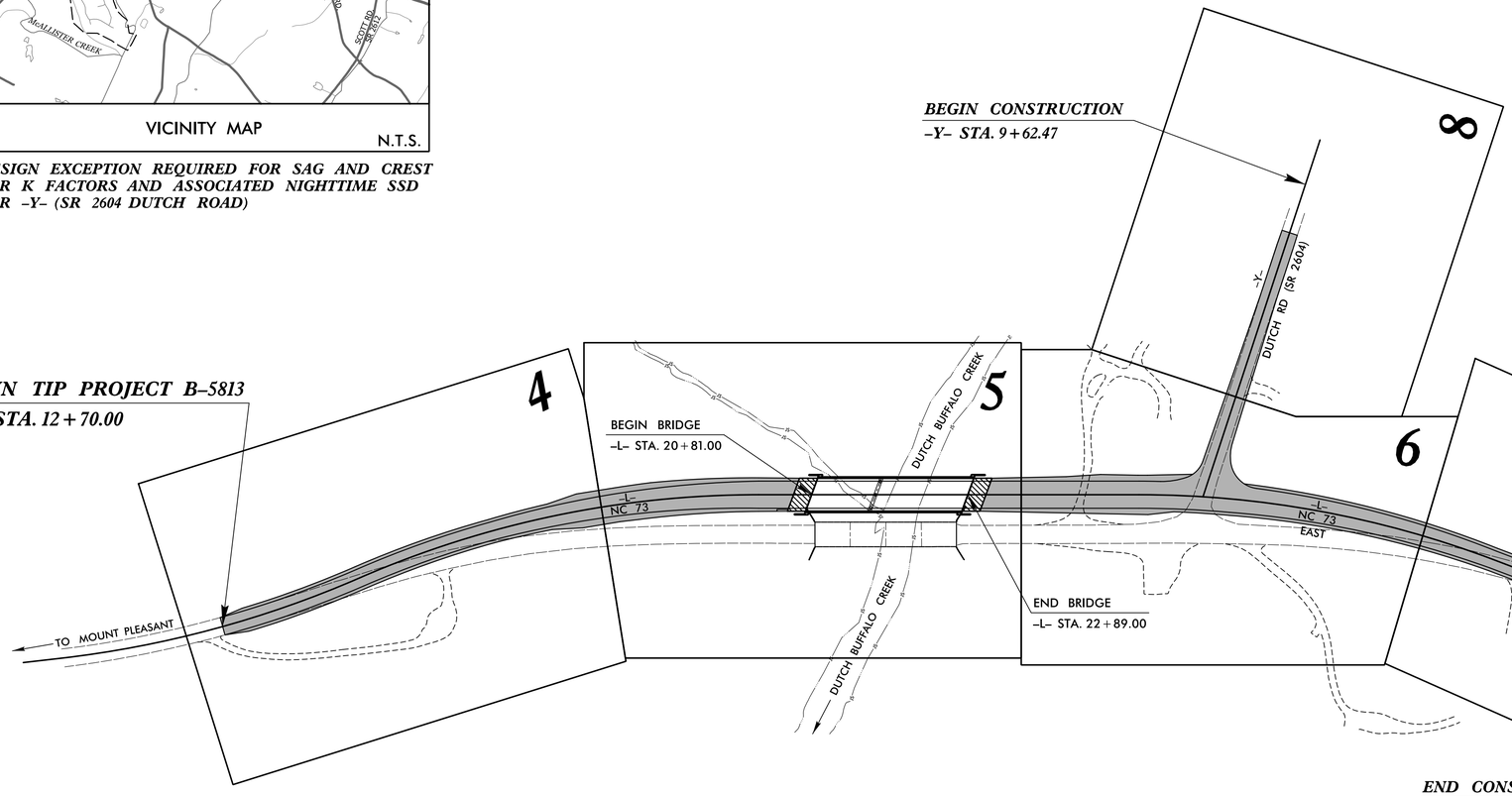
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5813	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45767.1.1		P.E.
45767.2.1		ROW / UTILITIES
45767.3.1		CONSTRUCTION

LOCATION: BRIDGE #132 OVER DUTCH BUFFALO CREEK ON NC 73

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

NAD 83 / 2011



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 20 10 0 20 40

PROFILE (HORIZONTAL): 20 10 0 20 40

PROFILE (VERTICAL): 4 2 0 4 8

DESIGN DATA

ADT 2020 = 8,600
ADT 2040 = 10,800
K = 12%
D = 60%
T = 5%*
V = 60 MPH
FUNC. CLASSIFICATION: MAJOR COLLECTOR
* (TTST 1% + DUALS 4%)
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B–5813 = 0.313 MILES

LENGTH OF STRUCTURE TIP PROJECT B–5813 = 0.039 MILES

TOTAL LENGTH OF TIP PROJECT B–5813 = 0.352 MILES

NCDOT CONTACT: KEITH PASCHAL, PE
Structure Management Unit

PLANS PREPARED FOR THE NCDOT BY:

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 14, 2019

LETTING DATE: JANUARY 18, 2022

NIKKI T. HONEYCUTT, PE
PROJECT ENGINEER

MAAMOON K. ABDELAZIZ
PROJECT DESIGNER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029388 ENGINEER EDWARD J. VANCE 10/13/2021 P.E.

DocuSigned by: Edward J. Vance
SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039234 ENGINEER NIKKI T. HONEYCUTT 10/13/2021 P.E.

DocuSigned by: Nikki T. Honeycutt
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

10/13/2021
r:\roadway\proj\SHT\B5813_rdy_psh01_tsh.dgn
MooreDS

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
B-5813	1A
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039234 3/23/2021 ENGINEER MARK T. HONEYCUTT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-2	TYPICAL SECTIONS AND DETAILS SHEET
2C-1 THRU 2C-2	GUARDRAIL DETAILS
2G-1 THRU 2G-3	GEOTECHNICAL DETAILS
3B-1	ROADWAY AND DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 8	PLAN SHEETS
9 THRU 13	PROFILE SHEETS
RW-01 THRU RW-08	SURVEY CONTROL AND RIGHT OF WAY SHEETS
TMP-1 THRU TMP-9	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-7	PAVEMENT MARKING PLANS
EC-1 THRU EC-13	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-8	SIGNING PLANS
UC-1 THRU UC-9	UTILITIES CONSTRUCTION PLANS
UO-1 THRU UO-8	UTILITIES BY OTHERS PLANS
X-1A THRU X-21	CROSS SECTIONS
S-1 THRU S-29	STRUCTURE PLANS

GENERAL NOTES

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.02 USING 3 FT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE:
WATER - TOWN OF MOUNT PLEASANT
SANITARY SEWER - WATER AND SEWER AUTHORITY OF CABARRUS COUNTY
POWER - DUKE ENERGY
TELEPHONE - WINDSTREAM
CATV - CHARTER

RIGHT-OF-WAY MARKERS:

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

STANDARD DRAWINGS

2018 ROADWAY ENGLISH STANDARD DRAWINGS EFF. January, 2018

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.03	Reinforced Bridge Approach Fills Type A Alternate Approach Fill for Integral Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.02	Subsurface Drain
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
846.01	Concrete Curb, Gutter and Curb & Gutter
848.02	Driveway Turnout - Radius Type
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5813	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 Easment 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.

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
B-5813	2A-1

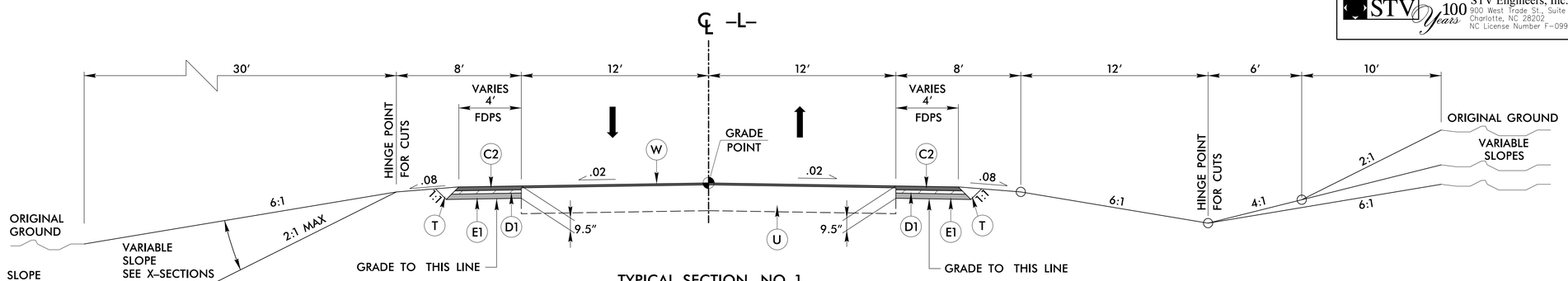
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039234 MICHAEL T. HONEYCUTT

NCDOT PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CLARK S. MORRISON

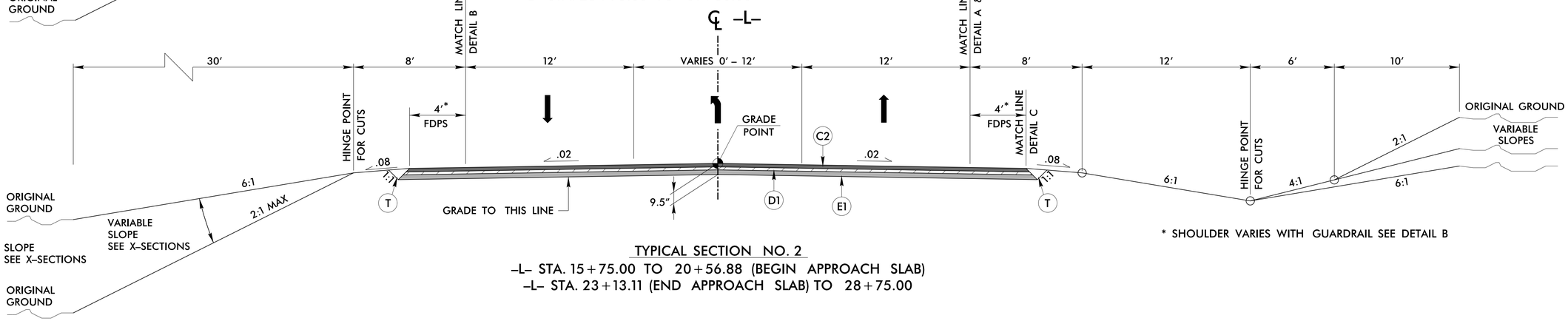
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 1

–L– STA. 12+70.00 TO 15+75.00

–L– STA. 28+75.00 TO 31+30.00



* SHOULDER VARIES WITH GUARDRAIL SEE DETAIL B

TYPICAL SECTION NO. 2

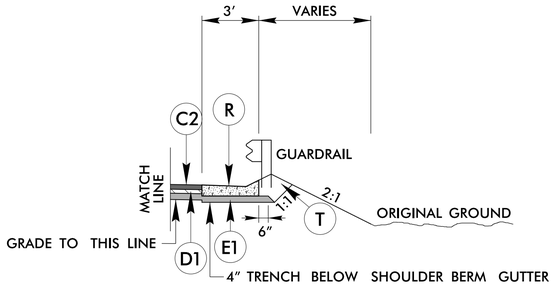
–L– STA. 15+75.00 TO 20+56.88 (BEGIN APPROACH SLAB)

–L– STA. 23+13.11 (END APPROACH SLAB) TO 28+75.00

FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.0″ IN DEPTH OR GREATER THAN 1.5″ IN DEPTH.
D1	PROP. APPROX. 2.5″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 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. 4.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3.0″ IN DEPTH OR GREATER THAN 5.5″ IN DEPTH.
J1	PROP. 6″ AGGREGATE BASE COURSE
R	CONCRETE SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	PAVEMENT WEDGING

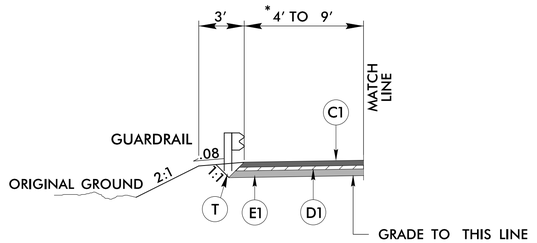
ALL PAVEMENT SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

NOTE: 8″ ABC TO BE USED FOR DRIVEWAYS



DETAIL A

–L– STA. 20+35.00 TO 20+49.73 (RT)



DETAIL B

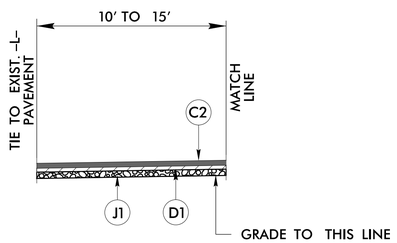
–L– STA. 17+70.30 TO 20+89.00 (LT)

–L– STA. 17+71.01 TO 20+72.99 (RT)

–L– STA. 22+97.00 TO 24+19.87 (LT)

–L– STA. 22+80.99 TO 25+29.06 (RT)

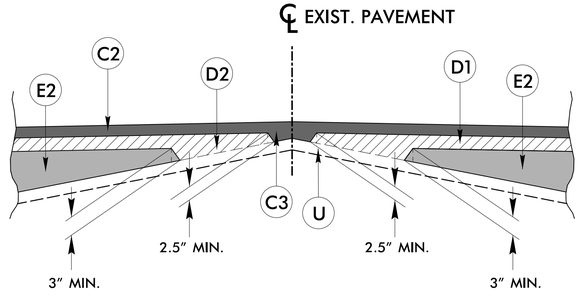
–L– STA. 24+65.72 TO 25+76.95 (LT)



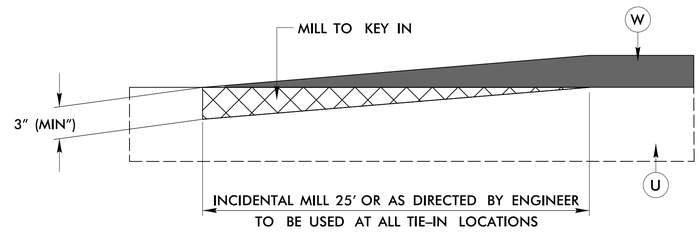
DETAIL C

TEMPORARY PAVEMENT

–L– STA. 25+45+/– TO 26+72+/–



WEDGING DETAIL D



INCIDENTAL MILLING DETAIL E

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
B-5813	2A-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039234 7/6/2021 ENGINEER MARK T. HONEYCUTT

NCDOT PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 7/7/2021 ENGINEERING CLARK S. MORRISON

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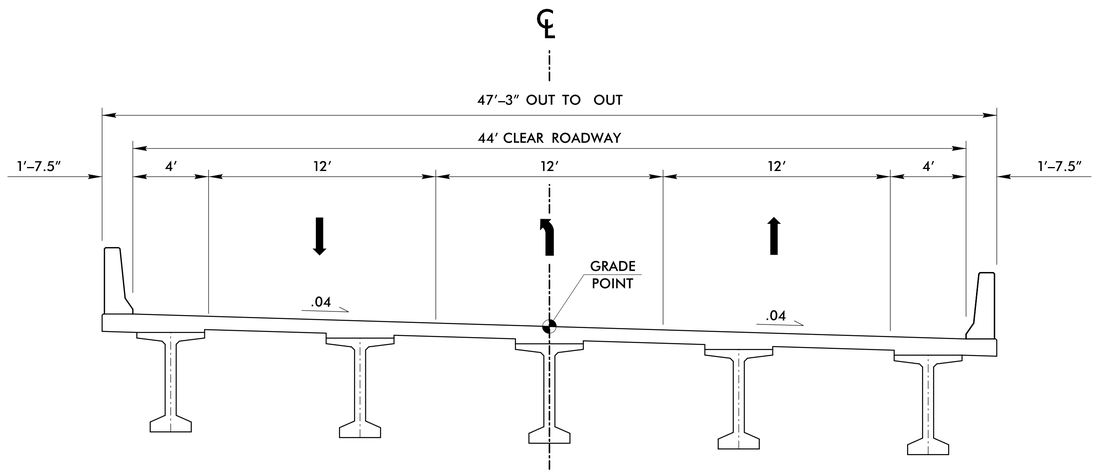
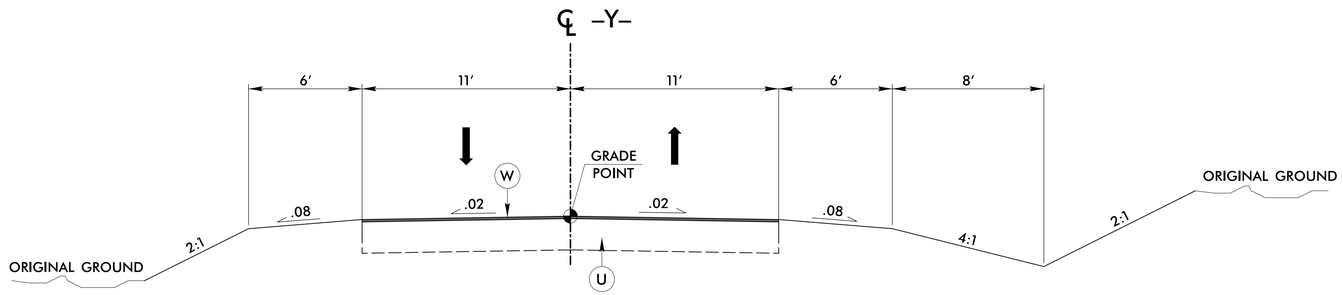


TYPICAL SECTION NO. 3
–L– STA. 20+56.88 (BEGIN APPROACH SLAB) TO 23+13.11 (END APPROACH SLAB)

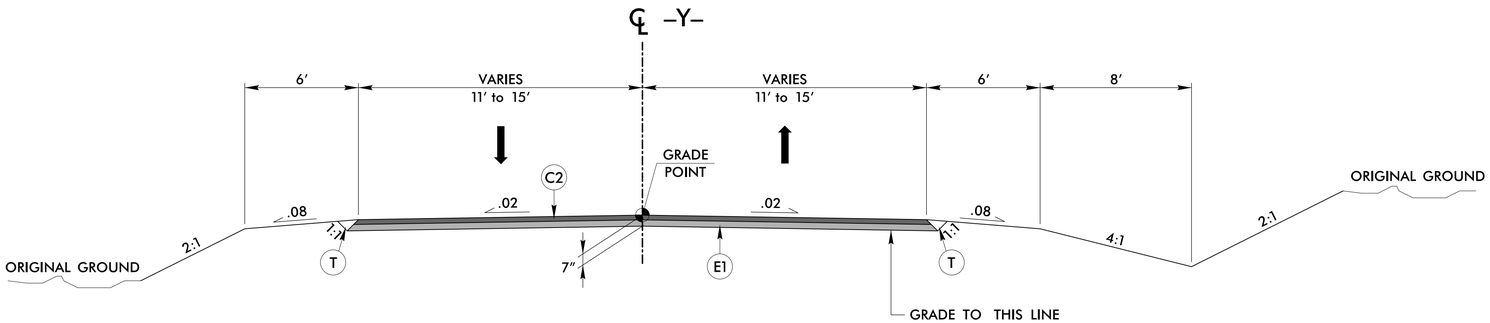


TYPICAL SECTION NO. 4
–Y– STA. 10+30.00 TO 11+20.00

PAVEMENT SCHEDULE	
C1	1.5″ S9.5B
C2	3.0″ S9.5B
C3	VAR. S9.5B
D1	2.5″ I19.0C
D2	VAR. I19.0C
E1	4.0″ B25.0C
E2	VAR. B25.0C
J1	6.0″ ABC
R	CONCRETE SBG
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	PAVEMENT WEDGING

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

NOTE: 8″ ABC TO BE USED FOR DRIVEWAYS



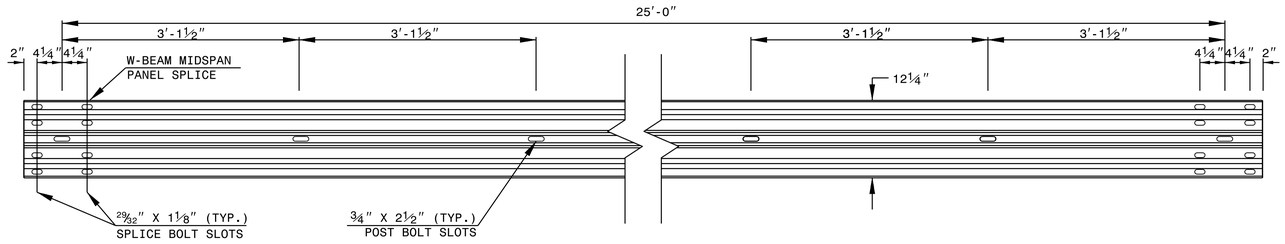
TYPICAL SECTION NO. 5
–Y– STA. 11+20.00 TO 13+81.42

PROJECT REFERENCE NO.	SHEET NO.
B-5813	2C-1
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

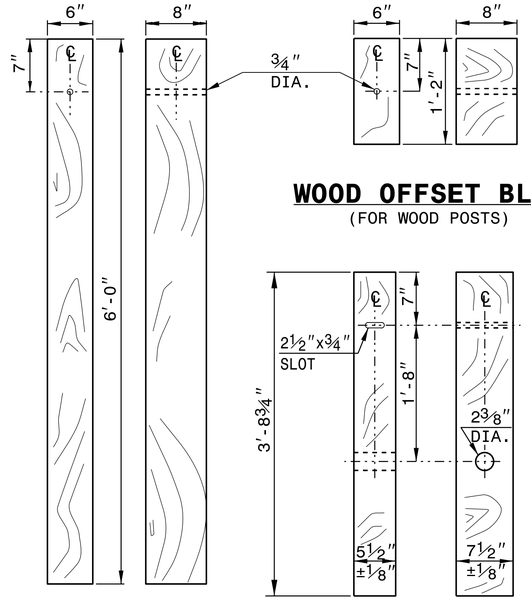
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



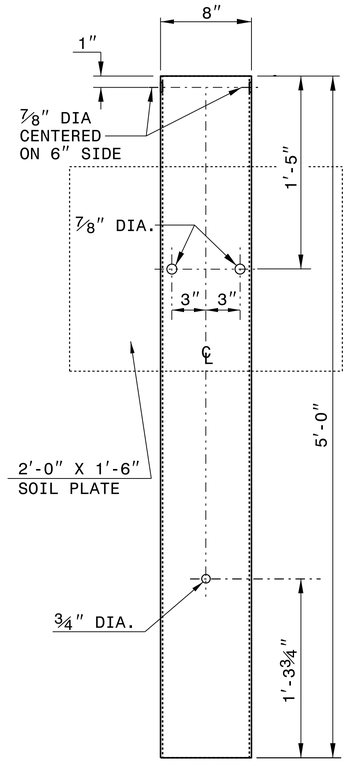
STANDARD W-BEAM GUARDRAIL



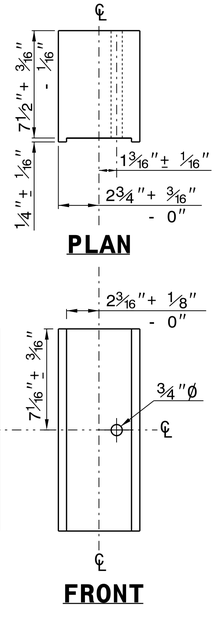
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

SHORT WOOD BREAKAWAY POST



STEEL TUBE
TS 6"x8"x0.1875"

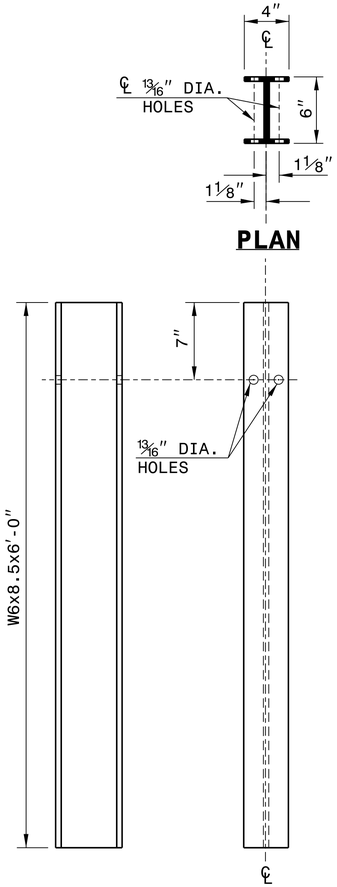


PLAN

SIDE

FRONT

ROUTED OFFSET BLOCK



SIDE

FRONT

"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

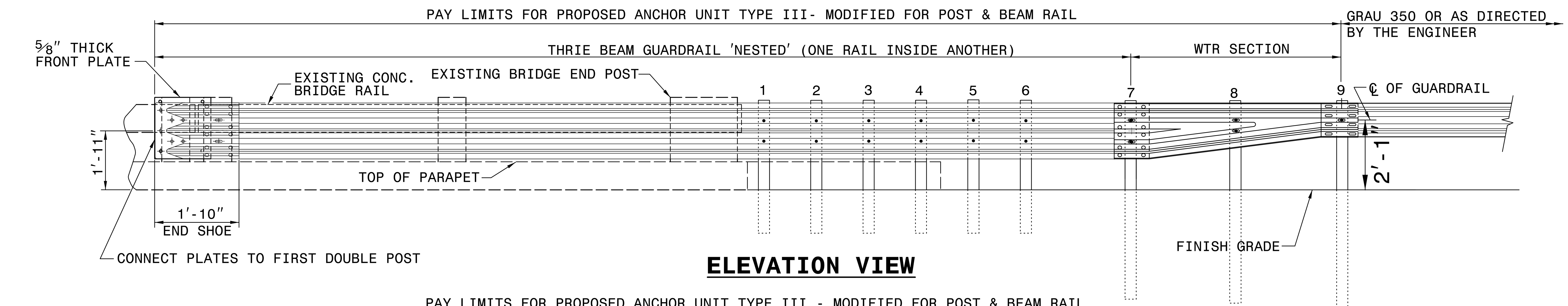
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022866 7/27/2021 JOHN S. HOWERTON

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

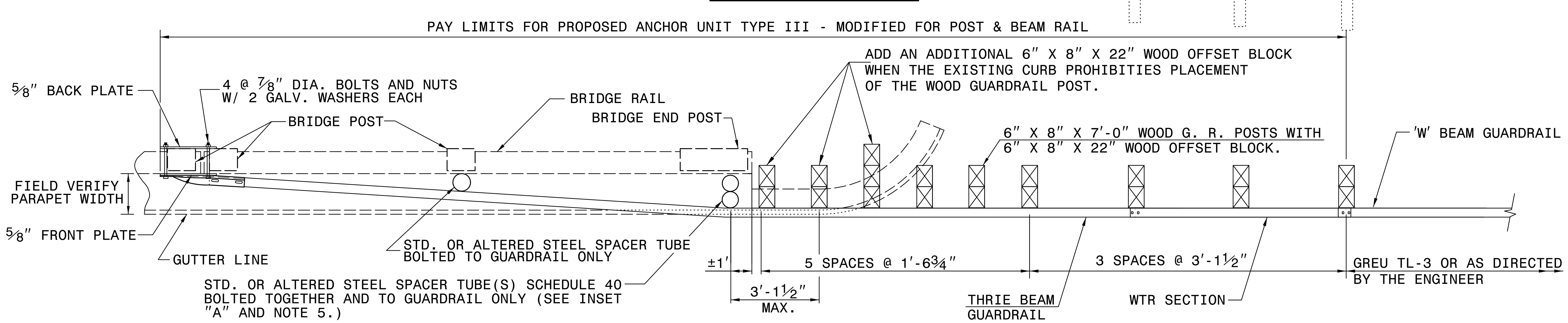
SEE TITLE BLOCK

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

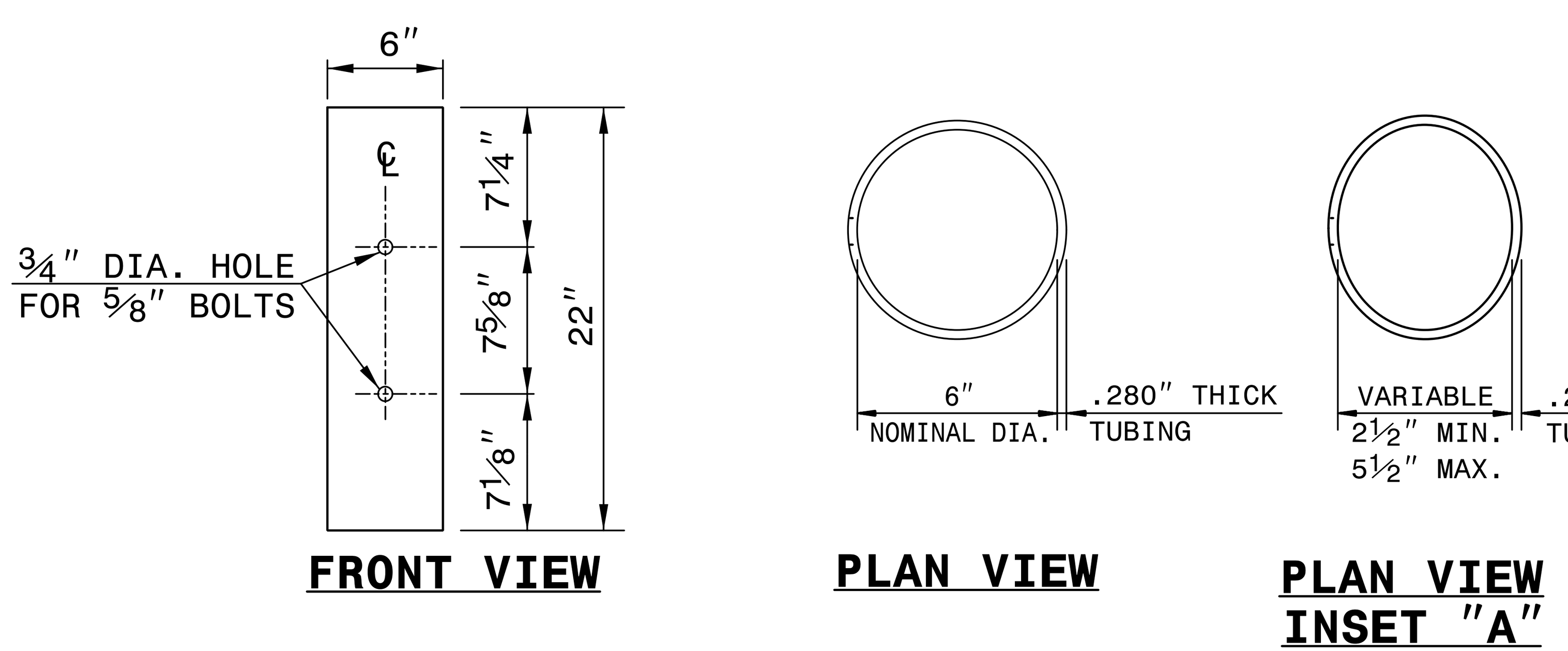
PROJECT REFERENCE NO.	SHEET NO.
B-5813	2C-2



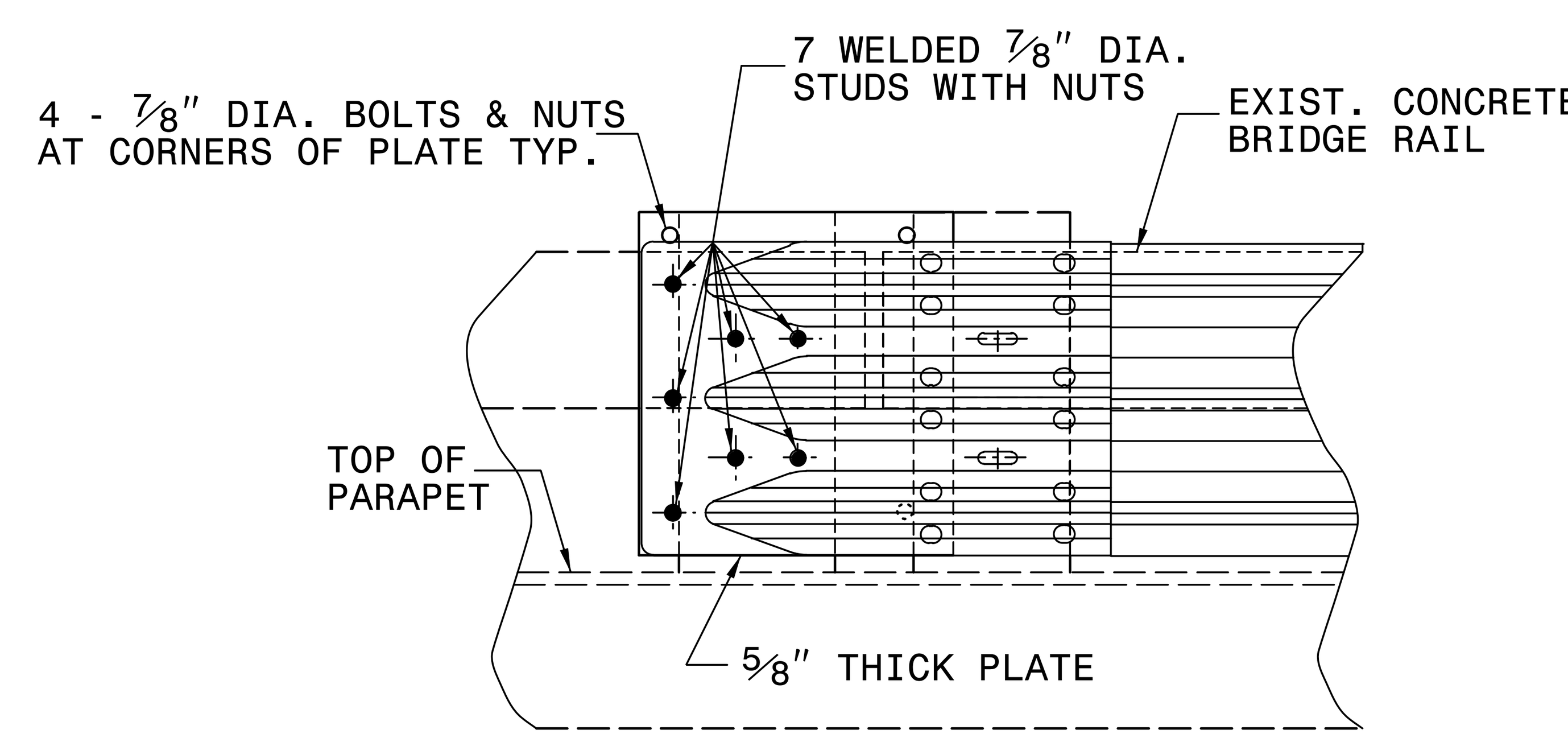
ELEVATION VIEW



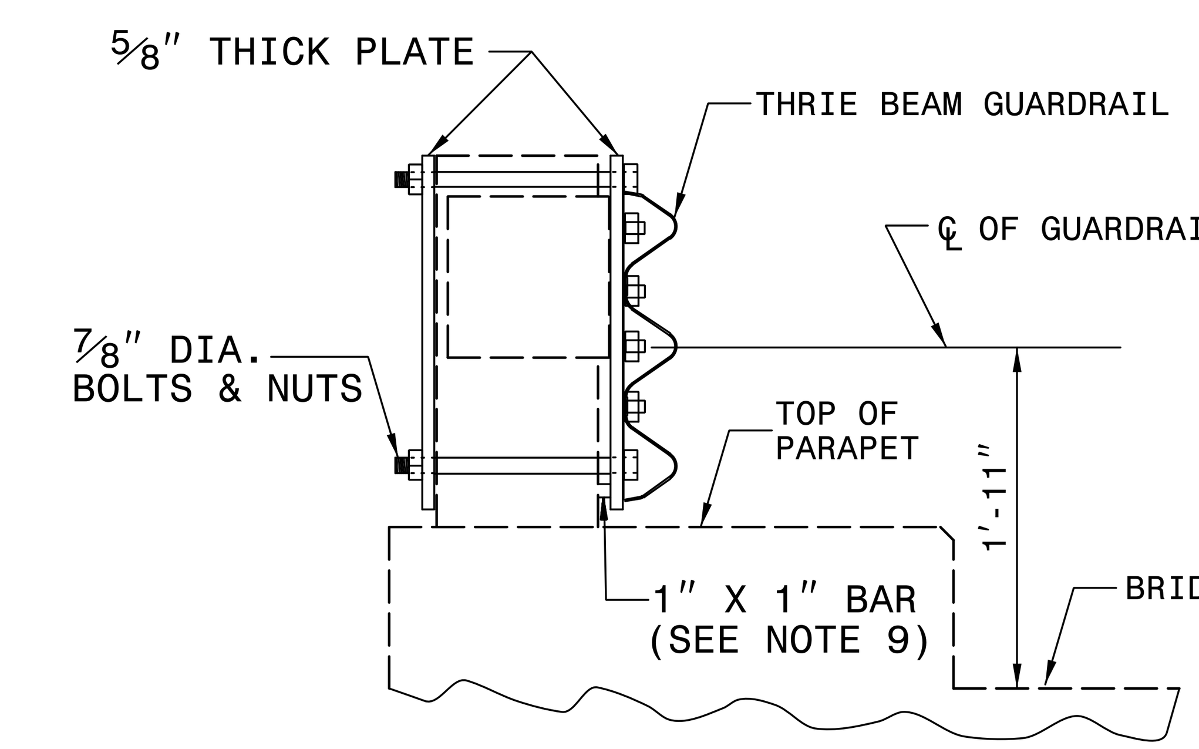
PLAN VIEW



STEEL SPACER TUBE



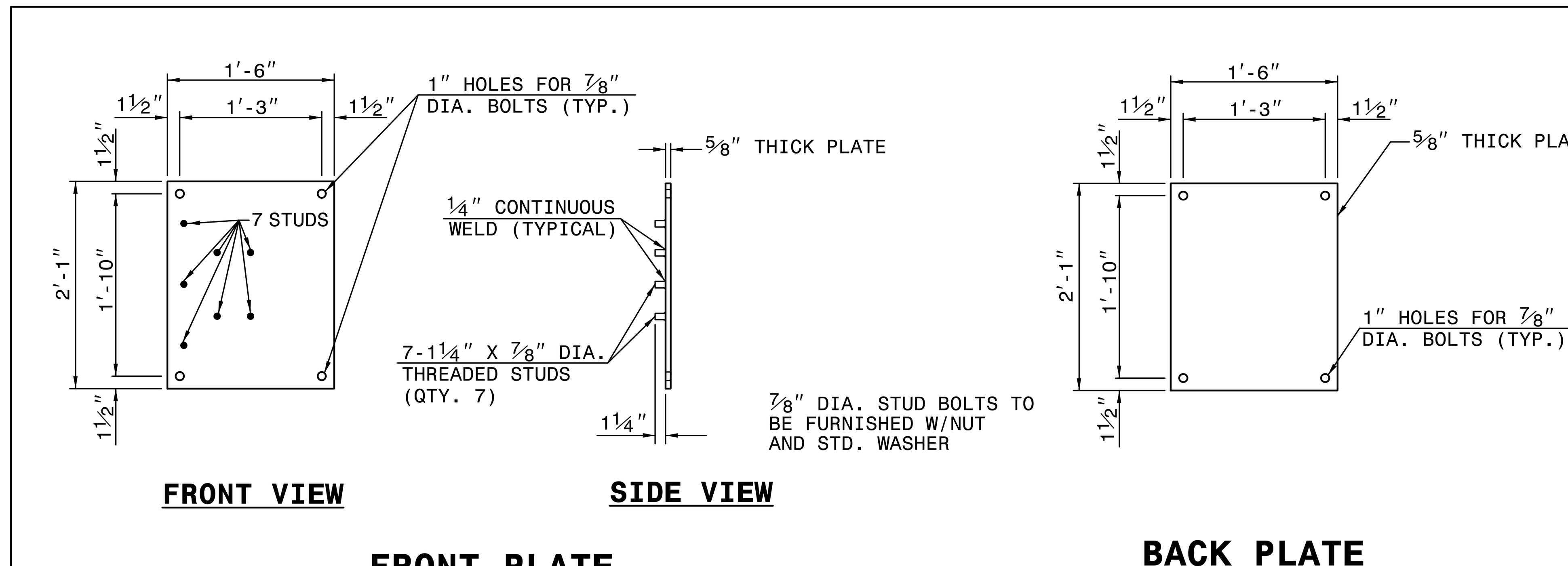
ELEVATION VIEW



SECTION VIEW

GENERAL NOTES:

1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
2. TAP NUTS FOR THE 7⁄8" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
3. USE PLATES AND TUBES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
7. USE THIS DETAIL ONLY FOR BRIGES WITH POST AND BEAM TYPE RAIL.
8. ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH ¼" WELDS ALL AROUND.
9. 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.
10. PROVIDE SHOP DRAWINGS OF THE PLATES TO THE ENGINEER FOR APPROVAL BEFORE FABRICATING THE PLATES.
11. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
12. SEE ROADWAY STANDARD DRAWING 862.03 SHEET 3 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT



BRIDGE PLATES

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton 3/24/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TYPE III MODIFIED FOR POST AND BEAM RAIL

ORIGINAL BY: E.E. WARD DATE: 01-03
MODIFIED BY: E.E. WARD DATE: 05-17
CHECKED BY: DATE:
FILE SPEC.: s:details\stand\bpiii original.dgn

PROJECT REFERENCE NO.	SHEET
B-5813 (45767.1.1)	2G-1

GEOTECHNICAL ENGINEER

SEAL 031361 — NORTH CAROLINA PROFESSIONAL ENGINEER — SHIPING YANG

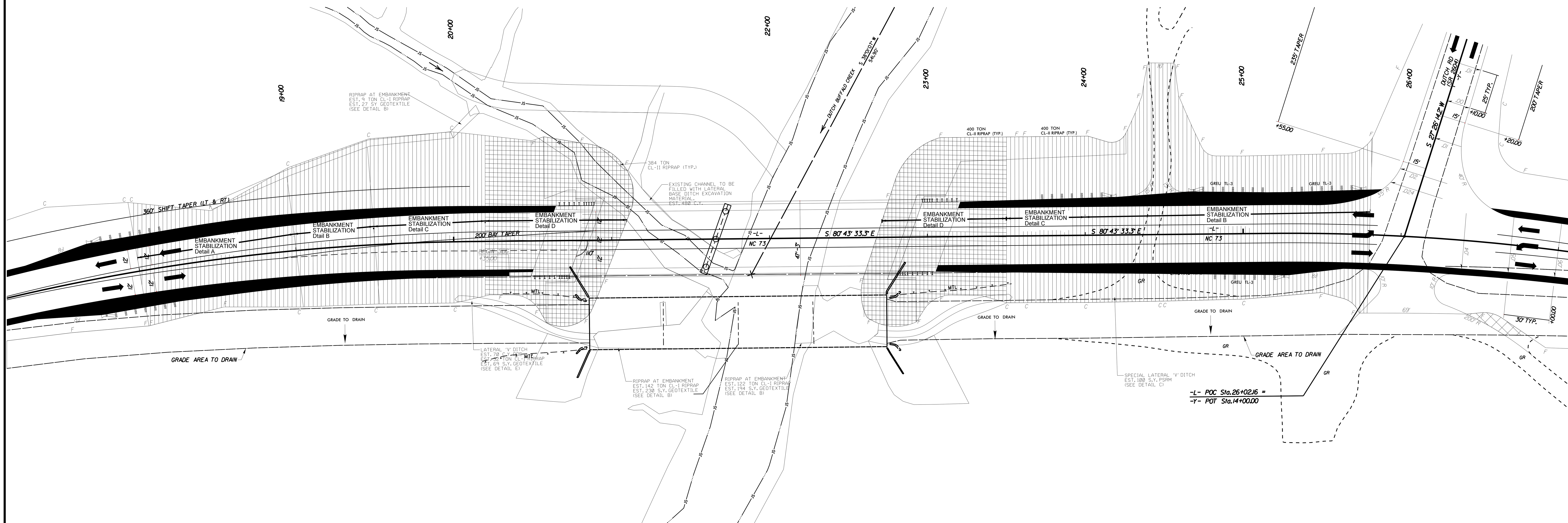
DocuSigned by: Shiping Yang

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SITE PLAN

SINGLE LAYER (6,000 SQ YDS)

MULTIPLE LAYER (7,000 SQ YDS)

SEE DETAILS ON 2G-2 AND 2G-3 FOR ADDITIONAL INFORMATION AND LAYOUT

PREPARED BY: SHIPING YANG	DATE: 09/20
REVIEWED BY: S. CLARK	DATE: 09/20

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

EMBANKMENT STABILIZATION LAYOUT

REVISIONS

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

PROJECT REFERENCE NO.	SHEET
B-5813 (45767.1.1)	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 031361 ENGINEER SHIPING YANG

DocuSigned by: Shiping Yang Dec 7, 2021

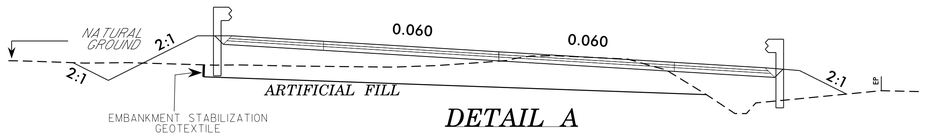
DOCSIGNED SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOT TO SCALE

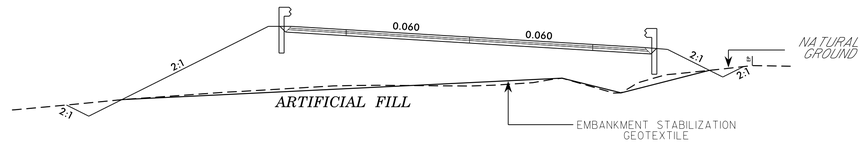


DETAIL A

I8+00 TO I9+00 -L-

NOTES

1. FOR EMBANKMENT OR ROADWAY WITH LESS THAN 3 FEET OF STRUCTURAL FILL BELOW THE PROPOSED PAVEMENT SUBGRADE.
2. PLACE ALL GEOTEXTILE WITH THE MACHINE DIRECTION PERPENDICULAR TO THE SLOPE FACE.
3. THE CONTRACTOR TO SUBMIT DETAIL OF GEOTEXTILE LAYOUT IN TRANSITION ZONES FOR APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION. IT WILL BE NECESSARY TO PROVIDE SIGNIFICANT GEOTEXTILE OVERLAP IN TRANSITION ZONES.
4. UNDERCUT TO A DEPTH OF 3' BELOW SUBGRADE, EDGE OF PAVEMENT TO EDGE OF PAVEMENT. PLACE GEOTEXTILE IN BOTTOM OF EXCAVATION AND BACKFILL WITH CLASS III SELECT MATERIAL.
5. EXCAVATED MATERIALS CAN BE REUSED. DO NOT COMPUTE AS WASTE.

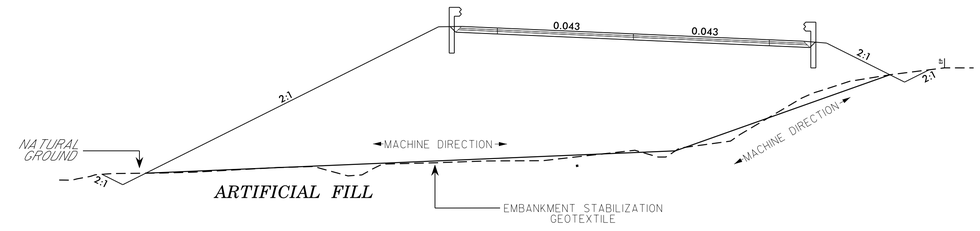


DETAIL B

I9+00 TO I9+50 -L- AND 24+00 TO 25+80 -L-

NOTES

1. FOR ROADWAY EMBANKMENTS WHICH REQUIRE A MINIMUM OF 3 FEET OF STRUCTURAL FILL BELOW THE PAVEMENT SUBGRADE.
2. PLACE ALL GEOTEXTILE WITH THE MACHINE DIRECTION PERPENDICULAR TO THE SLOPE FACE.
3. THE CONTRACTOR TO SUBMIT DETAIL OF FABRIC LAYOUT IN TRANSITION ZONES FOR APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION. IT WILL BE NECESSARY TO PROVIDE SIGNIFICANT FABRIC OVERLAP IN TRANSITION ZONES.
4. GEOTEXTILE FOR EMBANKMENT STABALIZATION SHALL BE PLACED FROM TOE OF PROPOSED SLOPE LEFT TO TOE OF PROPOSED SLOPE RIGHT.

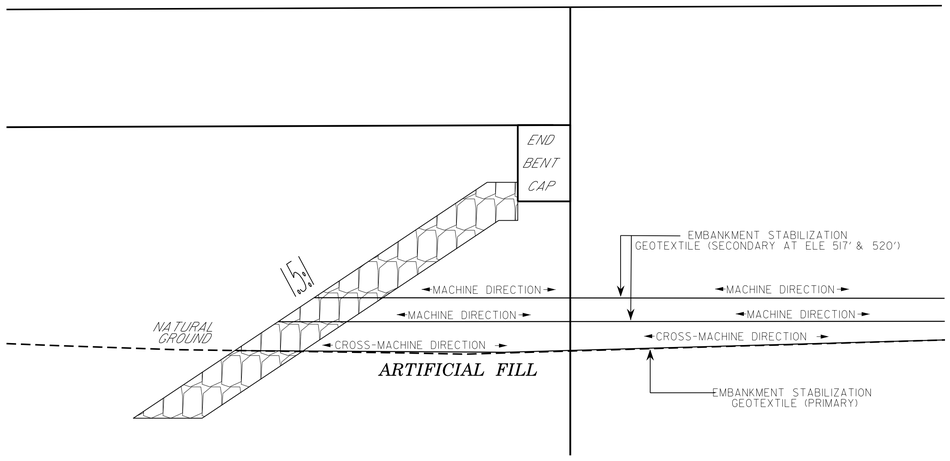


DETAIL C

I9+50 TO 20+20 -L- AND 23+50 TO 24+00 -L-

NOTES

1. FOR EMBANKMENT STABILIZATION ON SLOPE.
2. PLACE ALL FABRIC WITH THE MACHINE DIRECTION PERPENDICULAR TO THE SLOPE FACE.
3. THE CONTRACTOR TO SUBMIT DETAIL OF FABRIC LAYOUT IN TRANSITION ZONES FOR APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION. IT WILL BE NECESSARY TO PROVIDE SIGNIFICANT FABRIC OVERLAP IN TRANSITION ZONES.
4. PLACE GEOTEXTILE FROM TOE OF PROPOSED FILL SLOPE TO EXISTING SLOPE FACE.



DETAIL D

20+20 TO 2I+00 -L- AND 22+70 TO 23+50 -L-

NOTES

1. FOR EMBANKMENT STABILIZATION AT AND NEAR END BENTS.
2. PLACE PRIMARY FABRIC WITH THE MACHINE DIRECTION PERPENDICULAR TO THE SLOPE FACE; PLACE SECONDARY FABRIC WITH THE MACHINE DIRECTION PEPENDICULAR TO THE END BENT SLOPE FACE.
3. THE CONTRACTOR TO SUBMIT DETAIL OF FABRIC LAYOUT IN TRANSITION ZONES FOR APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION. IT WILL BE NECESSARY TO PROVIDE SIGNIFICANT FABRIC OVERLAP IN TRANSITION ZONES.
4. PLACE PRIMARY GEOTEXTILE FROM TOE OF PROPOSED FILL SLOPE TO EXISTING SLOPE FACE.
5. PLACE SECONDARY GEOTEXTILE AT ELEVATIONS OF 517 FEET AND 520 FEET FROM EDGE OF PROPOSED FILL SLOP TO EXISTING SLOPE FACE.

PREPARED BY:	SHIPING YANG	DATE:	09/20
REVIEWED BY:	S. CLARK	DATE:	09/20

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

EMBANKMENT STABILIZATION DETAILS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	SHIPING YANG	12/21	3		
2			4		

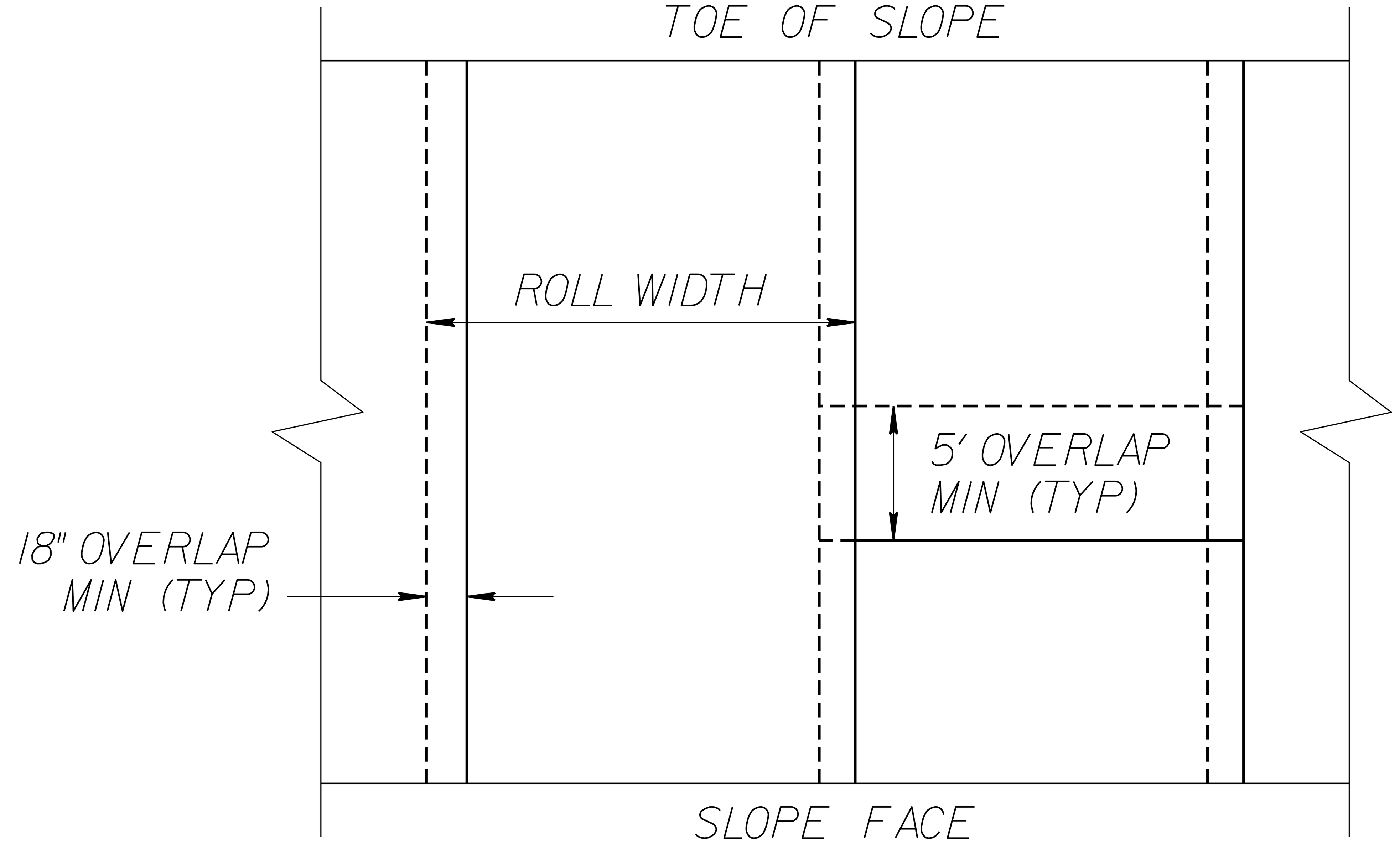
PROJECT REFERENCE NO.	SHEET
B-5813 (45767.1.1)	2G-3

GEOTECHNICAL ENGINEER — SEAL: NORTH CAROLINA PROFESSIONAL SEAL 031361 ENGINEER SHIPING YANG — DocuSigned by: Shiping Yang

ENGINEER

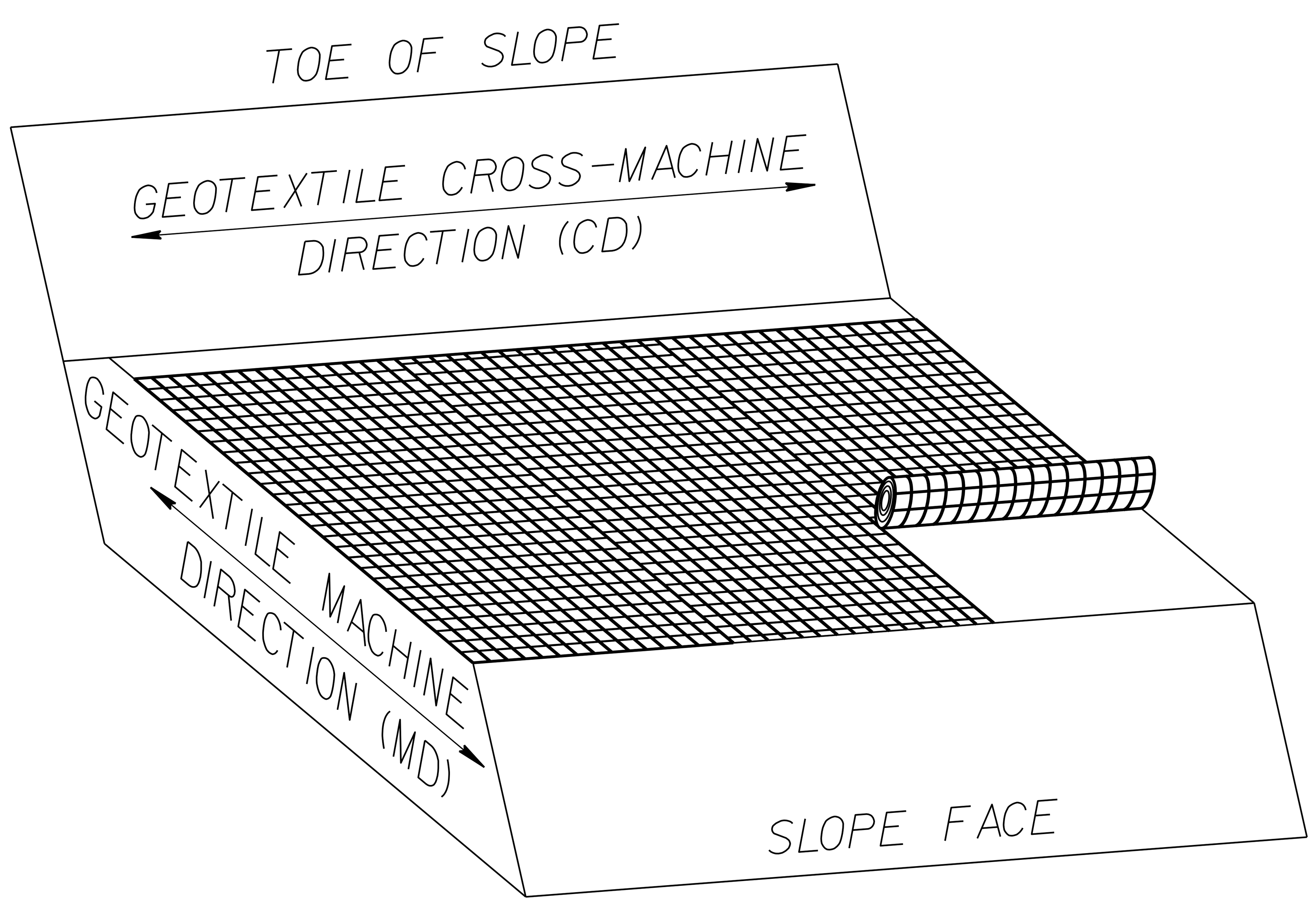
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOT TO SCALE

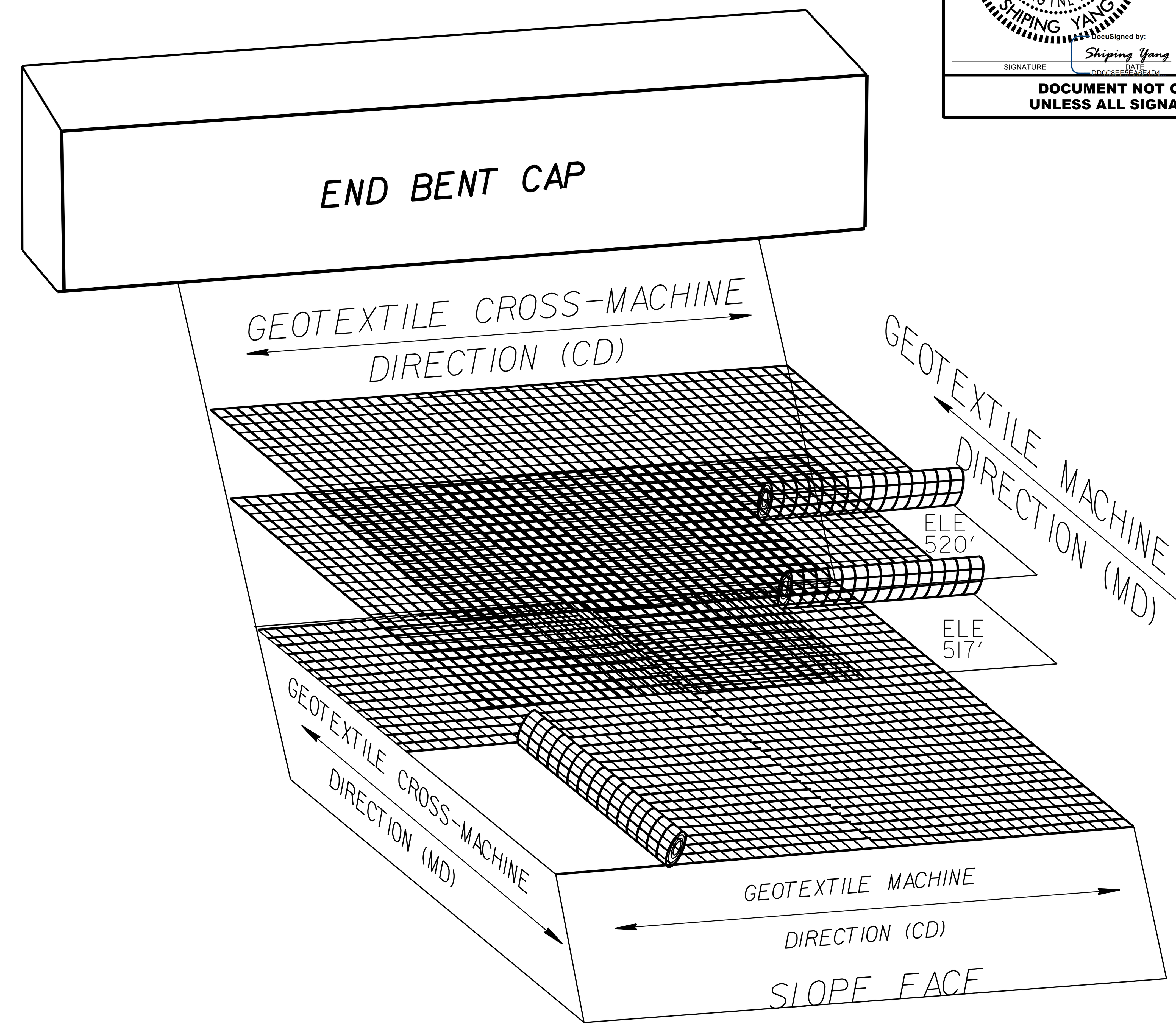


GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)



GEOTEXTILE PLACEMENT DETAIL AT OTHER LOCATIONS



GEOTEXTILE PLACEMENT DETAIL AT AND NEAR END BENTS

PREPARED BY:	SHIPING YANG	DATE:	09/20
REVIEWED BY:	S. CLARK	DATE:	09/20

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

EMBANKMENT STABILIZATION GEOTEXTILE PLACEMENT DETAILS

REVISIONS

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

EARTHWORK SUMMARY (IN CUBIC YARDS)

CHAIN	FROM STATION	TO STATION	SIDE	UNCL. EXCAVATION	EMBT+%	BORROW	WASTE
–L–	12+70.00	20+81.00	LT & RT	2,591	8,722	6,131	
–L–	22+89.00	31+30.00	LT & RT	410	11,162	10,752	
–Y–	10+30.00	13+81.42	LT & RT	93	2,086	1,993	
TOTAL				3,094	21,970	18,876	
SELECT MATERIAL IN LIEU OF BORROW					–9,000	–9,000	
PROJECT TOTAL				3,094	12,970	9,876	
ESTIMATE 5% FOR TOPSOIL ON BORROW PITS						494	
GRAND TOTAL				3,094	12,970	10,369	
SAY				3,100		10,500	

CONTINGENCY UNDERCUT: 450 CY
CONTINGENCY SELECT GRANULAR MATERIAL: 400 CY
DDE = 1600 CY

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

EARTHWORK QUANTITIES ARE CALCULATED BY USING NCDOT – ROADWAY DESIGN GUIDELINES. THESE QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
–L–	15+80.22	20+85.42	RT	1076
–L–	22+73.76	25+75.19	RT	735
–L–	26+45.63	26+87.01	RT	25
–L–	29+93.04	30+04.28	RT	1
			TOTAL:	1,837
			SAY:	1,840

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, OR PVC) 12"	15"	18"	24"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EA	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 825.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME WITH TWO GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME WITH GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME WITH GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME WITH TWO GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME WITH GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VAN GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	18" DRAINAGE PIPE ELBOW	CONC. & BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN.FT.	REMARKS
–L– STA. 20+40.5	RT	502		530.3																															1																							1						1				
		502	501		527.0	522.3				28		X																																																					2			
–Y– STA. 12+58	LT	801			526.7	523.5												44																																																		
–L– STA. 31+05	RT	701			544.5	544.8																				32																																										
–Y– STA. 12+41	LT																																																																	21	
TOTAL										28								44								32									1																							1						1	2		21	

ABBREVIATIONS

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

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	B-77	GREU TL-3	TEMP GREU TL-3	TEMP TYPE III MOD.	CAT-1	TEMP GREU TL-2	TEMP TYPE III	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
–L–	17+70.30	20+89.00	LT	322.875				20+89.00	4.0 – 9.0	7.0 – 12.0		250.00		5.0		1	1													
–L–	17+71.01	20+72.99	RT	297.875			20+72.99		4.0 – 9.0	7.0 – 12.0	250.00		5.0			1	1											119.00		
–L–	22+97.00	24+19.86	LT	122.875			22+97.00		4.0 – 6.0	7.0 – 9.0	100.00		2.0			1	1													
–L–	24+65.72	25+76.99	LT	112.500			22+97.00		9.0 – 10.4	12.0 – 13.4	100.00		1.4				2													
–L–	22+80.99	25+29.06	RT	247.875				22+89.00	4.0 – 8.4	7.0 – 11.4		225.00		4.4		1	1											130.00		
TOTAL:				1104.00												4	6											249.00		
DEDUCTION FOR ANCHOR UNITS:																														
(4 B-77 @ 22.875')				–91.50																										
(6 GREU TL-3 @ 50')				–300.00																										
TOTAL GUARDRAIL LENGTH:				712.50																										
SAY:				712.50 LF																								250.00 LF		
ADDITIONAL GUARDRAIL POSTS = 5 EA																														
TEMPORARY GUARDRAIL																														
–L–	16+96+/–	20+85+/–	RT	389.00														1	1											
–L–	22+74+/–	25+05+/–	RT	231.00														1	1											
TOTAL:				620.00														2	2											
DEDUCTION FOR ANCHOR UNITS:																														
(2 TEMP TYPE III MOD. @ 18.75')				–37.50																										
(2 TEMP GREU TL-3 @ 50')				–100.00																										
TOTAL GUARDRAIL LENGTH:				482.50																										
SAY:				487.50 LF																										

COMPUTED BY: Kevin Miller, PG DATE: March 2, 2020
CHECKED BY: Shiping Yang, PHD, PE DATE: March 2, 2020

(5-15-18)

PROJECT NO.	SHEET NO.
B-5813 (45767.1.1)	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF GEOTEXTILE FOR EMBANKMENT STABILIZATION

LINE	Station	Station	Geotextile for Embankment Stabilization SY	Class III Select Granular Material, CY
-L-	18+00	21+00	6600	4500
-L-	22+70	25+80	6400	4500
CONTINGENCY			200	400
		TOTAL SY/CY:	13200	9400

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU	18	100	200	500		
			TOTAL CY/TONS/SY:		100	200**	500**	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.

SUMMARY OF EMBANKMENT WAITING PERIODS

LINE	Station	Station	MONTHS
-L-	18+00	21+00	3
-L-	22+70	25+80	3

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
Bridge No.132 on NC 73 over Dutch Buffalo Creek	1	3
	2	3

PROJECT REFERENCE NO.	SHEET NO.
B-5813	3P-1

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNER NAME
1	4 & 5	DON M. RITCHIE
2	5 & 6	MITCHELL S. RAMSEY
3	5 & 6	MOUNT PLEASANT HWY 73 LLC
4	5, 6, & 8	MARY S. ARAZIE
5	6, 7, & 8	ITAC 359 LLC
6	6 & 7	FRANK A. JAMES
7	7	BARBRA H. HARTLEY

6/2/99

3/1/2021
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MooreDS

8/17/99

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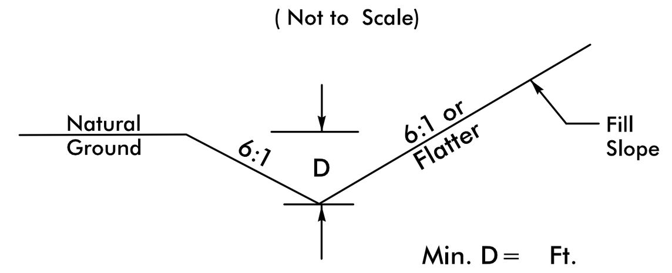
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
B-5813	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 039234 7/9/2021 ENGINEER NIKKI T. HONEYCUTT	SEAL 029388 7/9/2021 ENGINEER EDWARD J. VANCE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

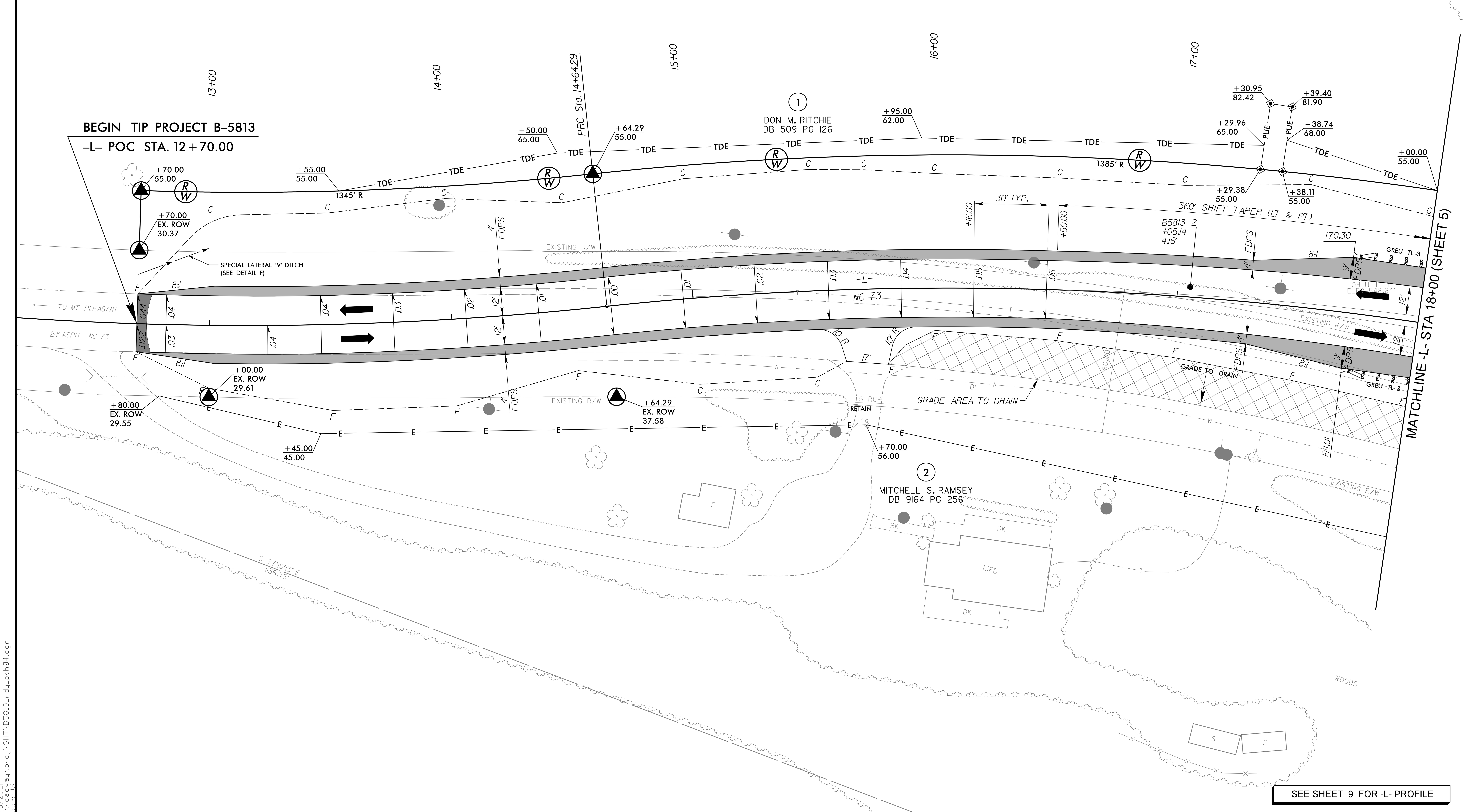
DETAIL F
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 12+70 LT TO STA. 13+00 LT

-L-	
PI Sta 12+58.67	PI Sta 17+41.31
△ = 16° 57' 18.1" (LT)	△ = 23° 31' 52.9" (RT)
D = 4° 05' 33.2"	D = 4° 18' 28.6"
L = 414.29'	L = 546.23'
T = 208.67'	T = 277.02'
R = 1,400.00'	R = 1,330.00'
RUNOFF = 180'	RUNOFF = 180'
SE = 6%	SE = 6%

NAD 83 / 2011



BEGIN TIP PROJECT B-5813
-L- POC STA. 12+70.00
13+00
14+00
15+00
16+00
17+00
PRC Sta. 14+64.29
DON M. RITCHIE
DB 509 PG 126
MITCHELL S. RAMSEY
DB 9164 PG 256
SPECIAL LATERAL 'V' DITCH (SEE DETAIL F)
TO MT PLEASANT
24' ASPH NC 73
NC 73
-L-
EXISTING R/W
30' TYP.
360' SHIFT TAPER (LT & RT)
B5813-2 +05.14 4.16'
GREU TL-3
GRADE AREA TO DRAIN
GRADE TO DRAIN
RETAIN
1345' R
1385' R
+70.00 55.00
+70.00 EX. ROW 30.37
+55.00 55.00
+50.00 65.00
+64.29 55.00
+95.00 62.00
+30.95 82.42
+39.40 81.90
+29.96 65.00
+38.74 68.00
+29.38 55.00
+38.11 55.00
+00.00 55.00
+70.30
+00.00 EX. ROW 29.61
+80.00 EX. ROW 29.55
+45.00 45.00
+64.29 EX. ROW 37.58
+70.00 56.00
+16.00
+50.00
+71.01
WOODS
S 77°15'13" E 1136.75'
MATCHLINE -L- STA 18+00 (SHEET 5)

SEE SHEET 9 FOR -L- PROFILE

7/9/2021
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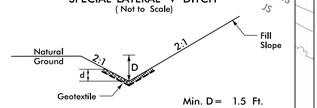
8/17/99

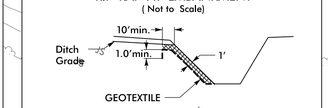
DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= CL-B Rip-Rap
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.

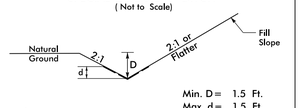
FROM STA. 18+50 LT TO STA. 20+00 LT

DETAIL B
RIP RAP AT EMBANKMENT
(Not to Scale)



FROM STA. 20+00 LT TO STA. 20+20 LT
FROM STA. 20+91 RT TO STA. 21+75 RT
FROM STA. 22+15 RT TO STA. 22+68 RT

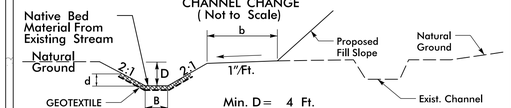
DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= PSRM
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.

FROM STA. 18+50 RT TO STA. 20+00 RT

DETAIL D
CHANNEL CHANGE
(Not to Scale)



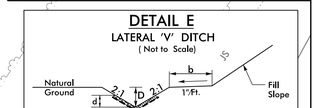
Type of Liner= CL-II Rip-Rap (Banks Only)
Min. D= 4 Ft.
Max. d= 4 Ft.
B= 9 Ft.
b= Varies

FROM STA. 20+35 LT TO STA. 22+09 LT

NAD 83 / 2011

-L-
PI Sta 17+41.31
Δ = 23° 31' 52.9" (RT)
D = 4° 18' 28.6"
L = 546.23'
T = 277.02'
R = 1,330.00'
RUNOFF = 180'
SE = 6%

DETAIL E
LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= CL-I Rip-Rap
Min. D=1.5 Ft.
Max. d=1.5 Ft.
b= Varies

FROM STA. 20+00 RT TO STA. 20+91 RT
FROM STA. 22+68 RT TO STA. 23+50 RT

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PROJECT REFERENCE NO.	SHEET NO.
B-5813	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036234 NIKKI T. HONEYCUTT
SEAL 036234 7/9/2021 ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029388 EDWARD J. VANCE
SEAL 029388 7/9/2021 ENGINEER

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(1) DON M. RITCHIE
DB 509 PG 126

(2) MITCHELL S. RAMSEY
DB 9164 PG 256

(3) MOUNT PLEASANT HWY 73 LLC
DB 6201 PG 297

(4) DARIN H. BURNS
DB 12881 PG 143

RIPRAP AT EMBANKMENT
EST. 9 TON CL-II RIPRAP
EST. 27 SY GEOTEXTILE
(SEE DETAIL B)

SPECIAL LATERAL V DITCH
EST. 23 TON CL-B RIPRAP
EST. 114 SY GEOTEXTILE
(SEE DETAIL A)

CHANNEL CHANGE
EST. 1430 CY DDE
EST. 220 TON CL-II RIPRAP
EST. 520 S.Y. GEOTEXTILE
(SEE DETAIL D)

384 TON CL-II RIPRAP (TYP.)

400 TON CL-II RIPRAP (TYP.)

EXISTING CHANNEL TO BE FILLED WITH LATERAL BASE DITCH EXCAVATION MATERIAL. EST. 480 C.Y.

PT Sta. 20+10.52
BEGIN BRIDGE -L- STA. 20+81.00
BEGIN APPROACH SLAB -L- STA. 20+56.88
END APPROACH SLAB -L- STA. 23+13.11
END BRIDGE -L- STA. 22+89.00

360' SHIFT TAPER (LT & RT)
200' BAY TAPER
BEGIN SBG +35.00

85' SPAN 63" MBT GIRDER
123' SPAN 63" MBT GIRDER
S 80° 43' 33.3" E
NC 73
110'
47'-3"

TB 2GI 0502
TYPE B-77
SBG 8 +35.00
MTL 0501

CONC DECK ASPH OVERLAY
EXISTING BRIDGE TO BE REMOVED

GRADE TO DRAIN
GRADE AREA TO DRAIN
30' TYP.
+80.00

SPECIAL LATERAL 'V' DITCH
EST. 120 SY PSRM
(SEE DETAIL C)

LATERAL 'V' DITCH
EST. 70 C.Y. DDE
EST. 32 TON CL-I RIPRAP
EST. 69 S.Y. GEOTEXTILE
(SEE DETAIL E)

RIPRAP AT EMBANKMENT
EST. 142 TON CL-II RIPRAP
EST. 230 S.Y. GEOTEXTILE
(SEE DETAIL B)

RIPRAP AT EMBANKMENT
EST. 122 TON CL-II RIPRAP
EST. 194 S.Y. GEOTEXTILE
(SEE DETAIL B)

FLOODPLAIN EXCAVATION
TO ELEV: 515'
EST. 190 CY

LATERAL 'V' DITCH
EST. 95 C.Y. DDE
EST. 31 TON CL-I RIPRAP
EST. 67 S.Y. GEOTEXTILE
(SEE DETAIL E)

FLOODPLAIN EXCAVATION
TO ELEV: 515'
EST. 220 CY

DUTCH BUFFALO CREEK
STONE WALL
WOODS
GREU TL-3
EXISTING R/W
MTL
EOI
BL-5 +24.42 68.98'
S 38°01'07" W 544.30'
S 29°10'34" W 228.94'

+70.00 55.00
+95.00 115.00
+99.25 74.04
+98.16 55.00
+10.52 55.00
+27.69 55.00
+27.94 59.91
+30.00 130.00
+60.53 129.00
+83.53 149.43
+03.45 127.00
+60.00 125.00
+96.00 100.80
+10.00 120.00
+32.00 108.00
+21.00 84.00
+86.00 84.00
+98.00 73.00
+80.00 55.00
+54.00 55.00
+15.00 55.00
+79.77 EX. ROW 77.54
+10.52 EX. ROW 82.77
+60.00 92.00
+76.43 98.85
+27.98 124.74
+36.87 125.47
+27.26 135.23
+36.13 135.86
+15.00 124.59
+15.00 140.00
+56.15 124.13
+52.22 140.00
+70.66 122.84
+79.58 121.83
+71.92 133.66
+80.98 132.74

20+00
19+00
21+00
22+00
23+00

MATCHLINE -L- STA 18+00 (SHEET 4)
MATCHLINE -L- STA 23+60 (SHEET 6)

SEE SHEET 10 FOR -L- PROFILE

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5813	6
R/W SHEET NO.	

STV 100 Years — STV Engineers, Inc. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-0991

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039234 7/9/2021 ENGINEER NIKKI T. HONEYCUTT	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029388 7/9/2021 ENGINEER EDWARD J. VANCE

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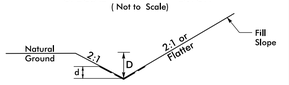
NAD 83 / 2011

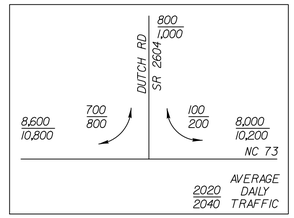
DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



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

Type of Liner = PSRM

-Y- FROM STA. 10+30 LT TO STA. 12+18 LT
-Y- FROM STA. 12+58 LT TO STA. 13+50 LT
-L- FROM STA. 23+50 RT TO STA. 25+50 RT



MATCHLINE -Y- STA 12+60 (SHEET 8)

MATCHLINE -L- STA 23+60 (SHEET 5)

MATCHLINE -L- STA 29+00 (SHEET 7)

4 DARIN H. BURNS DB 12881 PG 143

5 ITAC 359 LLC DB 12023 PG 109

3 MOUNT PLEASANT HWY 73 LLC DB 6201 PG 297

6 FRANK A JAMES DB 497 PG 161

H & H TOWING INC DB 8831 PG 131

-L- PI Sta 27+60.70
Δ = 20° 45' 22.6" (RT)
D = 4° 18' 28.6"
L = 481.81'
T = 243.58'
R = 1,330.00'
RUNOFF = 180'
SE = 6%

-L- POC Sta.26+02.16 =
-Y- POT Sta.14+00.00

SPECIAL LATERAL V DITCH EST. 21 SY PSRM (SEE DETAIL C)

SPECIAL LATERAL 'V' DITCH EST. 100 S.Y. PSRM (SEE DETAIL C)

GRADE TO DRAIN

GRADE AREA TO DRAIN

400 TON CL-II RIPRAP (TYP.)

GREU TL-3

360' SHIFT TAPER (LT & RT)

SEE SHEET 11 FOR -L- PROFILE
SEE SHEET 13 FOR -Y- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
B-5813	7
R/W SHEET NO.	

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 039234 7/9/2021 ENGINEER NIKKI T. HONEYCUTT	NORTH CAROLINA PROFESSIONAL SEAL 029388 7/9/2021 ENGINEER EDWARD J. VANCE

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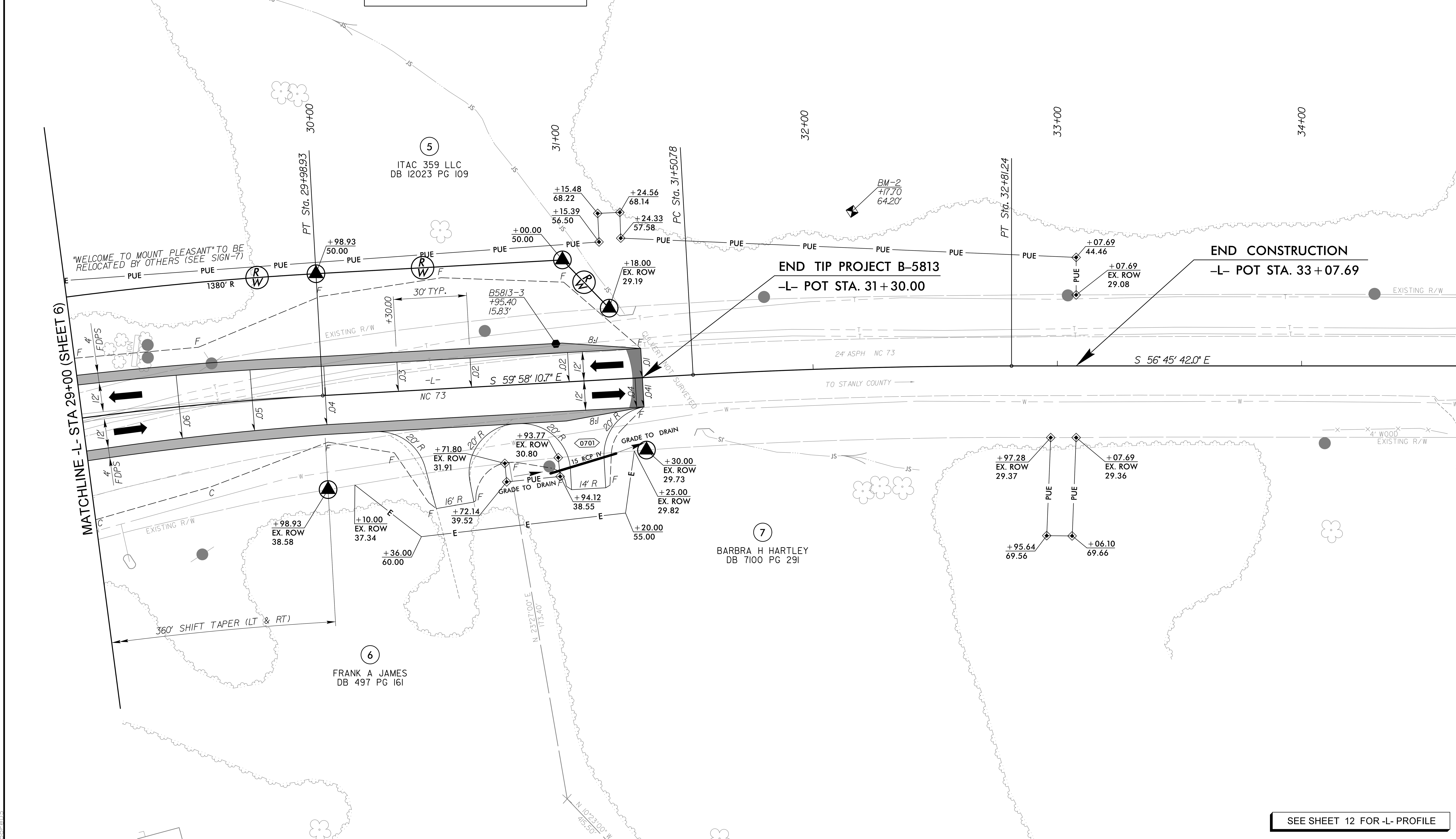
-L-	
PI Sta 27+60.70	PI Sta 32+16.03
Δ = 20° 45' 22.6" (RT)	Δ = 3° 12' 28.7" (RT)
D = 4° 18' 28.6"	D = 2° 27' 32.6"
L = 481.81'	L = 130.46'
T = 243.58'	T = 65.24'
R = 1,330.00'	R = 2,330.00'
RUNOFF = 180'	
SE = 6%	



NAD 83 / 2011
MATCHLINE -L- STA 29+00 (SHEET 6)
30+00
31+00
32+00
33+00
34+00
PT Sta. 29+98.93
PC Sta. 31+50.78
PT Sta. 32+81.24
END TIP PROJECT B-5813
-L- POT STA. 31+30.00
END CONSTRUCTION
-L- POT STA. 33+07.69
ITAC 359 LLC
DB 12023 PG 109
FRANK A JAMES
DB 497 PG 161
BARBRA H HARTLEY
DB 7100 PG 291
"WELCOME TO MOUNT PLEASANT" TO BE RELOCATED BY OTHERS (SEE SIGN-7)
BM-2
+17.70
64.20'
B5813-3
+95.40
15.83'
S 59° 58' 10.7" E
S 56° 45' 42.0" E
NC 73
24' ASPH NC 73
TO STANLY COUNTY
EXISTING R/W
360' SHIFT TAPER (LT & RT)
30' TYP.
1380' R
GRADE TO DRAIN
15" RCP IV
4' WOOD
CULVERT NOT SURVEYED
N 23°21'00" E
N 10°23'00" W
+98.93 50.00
+00.00 50.00
+15.48 68.22
+15.39 56.50
+24.56 68.14
+24.33 57.58
+18.00 EX. ROW 29.19
+07.69 44.46
+07.69 EX. ROW 29.08
+71.80 EX. ROW 31.91
+93.77 EX. ROW 30.80
+72.14 39.52
+94.12 38.55
+30.00 EX. ROW 29.73
+25.00 EX. ROW 29.82
+20.00 55.00
+98.93 EX. ROW 38.58
+10.00 EX. ROW 37.34
+36.00 60.00
+97.28 EX. ROW 29.37
+07.69 EX. ROW 29.36
+95.64 69.56
+06.10 69.66

SEE SHEET 12 FOR -L- PROFILE

8/17/99
7/9/2021
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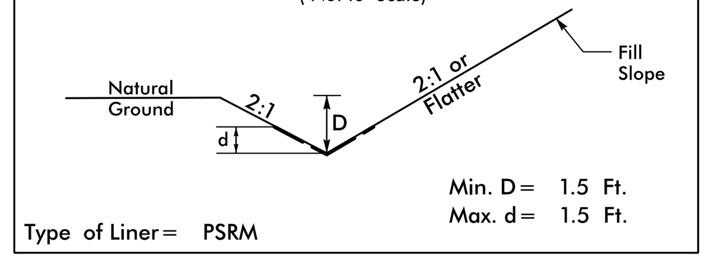
DETAIL C

SPECIAL LATERAL 'V' DITCH

(Not to Scale)



-Y- FROM STA. 10+30 TO STA. 12+18 LT
-Y- FROM STA. 12+58 TO STA. 13+50 LT

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

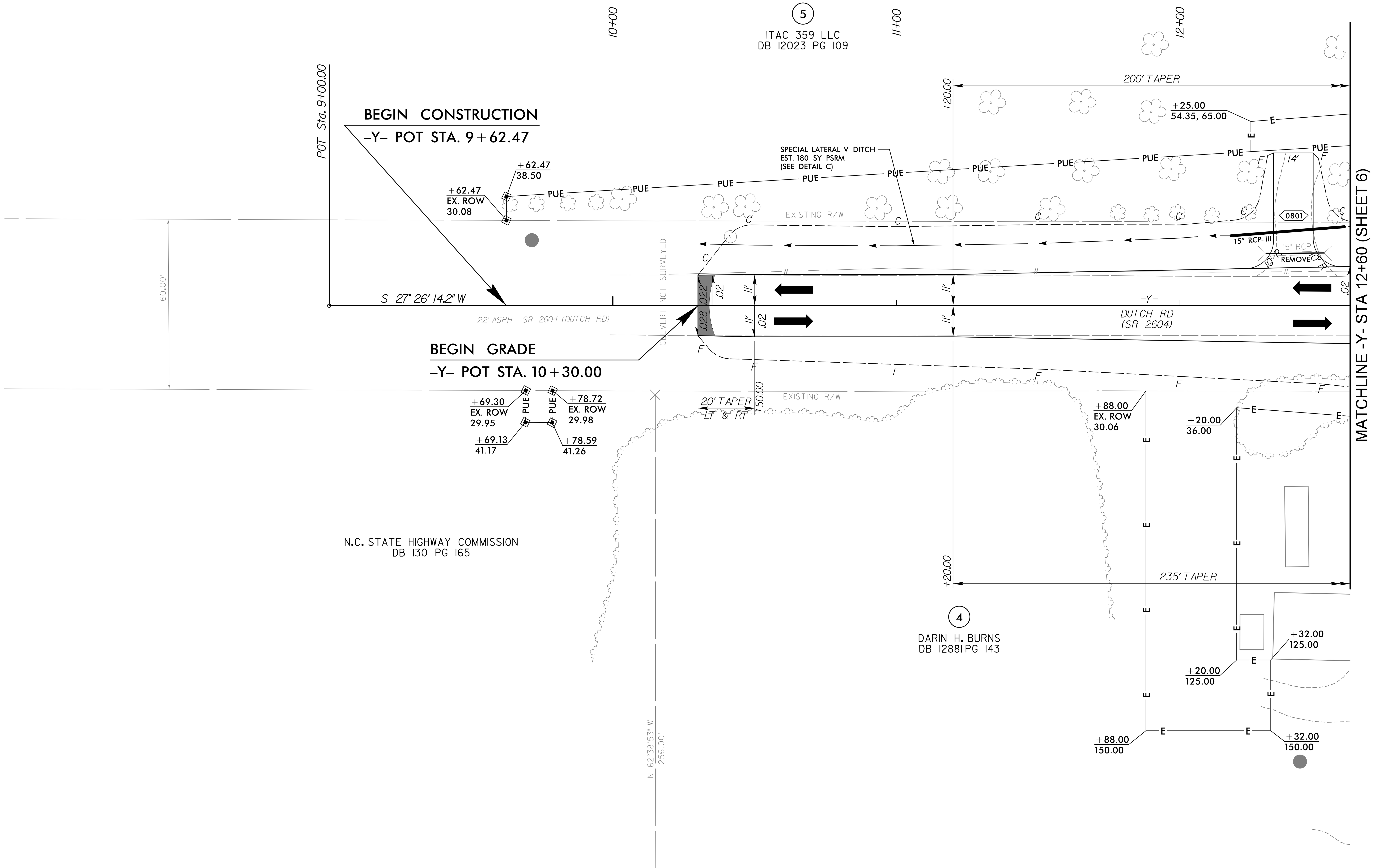
PROJECT REFERENCE NO.	SHEET NO.
B-5813	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039234 7/9/2021 ENGINEER NIKKI T. HONEYCUTT

NORTH CAROLINA PROFESSIONAL SEAL 029388 7/9/2021 ENGINEER EDWARD J. VANCE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83 / 2011



BEGIN CONSTRUCTION
-Y- POT STA. 9+62.47
POT Sta. 9+00.00
BEGIN GRADE
-Y- POT STA. 10+30.00
10+00
11+00
12+00
ITAC 359 LLC
DB 12023 PG 109
200' TAPER
235' TAPER
20' TAPER LT & RT
SPECIAL LATERAL V DITCH
EST. 180 SY PSRM
(SEE DETAIL C)
EXISTING R/W
S 27° 26' 14.2" W
22' ASPH SR 2604 (DUTCH RD)
DUTCH RD
(SR 2604)
-Y-
15" RCP-III
15" RCP
REMOVE
0801
CULVERT NOT SURVEYED
N.C. STATE HIGHWAY COMMISSION
DB 130 PG 165
DARIN H. BURNS
DB 12881 PG 143
N 62°38'53" W 256.00'
MATCHLINE -Y- STA 12+60 (SHEET 6)
+62.47 EX. ROW 30.08
+62.47 38.50
+69.30 EX. ROW 29.95
+69.13 41.17
+78.72 EX. ROW 29.98
+78.59 41.26
+25.00 54.35, 65.00
+88.00 EX. ROW 30.06
+20.00 36.00
+20.00 125.00
+32.00 125.00
+88.00 150.00
+32.00 150.00
60.00'

SEE SHEET 13 FOR -Y- PROFILE

7/9/2021
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8/17/99

5/14/99

-L-

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
B-5813	9

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038234 3/2/2021 ENGINEER NIKKI T. HONEYCUTT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029388 3/1/2021 ENGINEER EDWARD J. VANCE

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562
558
554
550
546
542
538
534
530
526
522
518

BEGIN GRADE
-L- STA 12+70.00
EL = 549.46'

PI = 13+30.00
EL = 547.25'
VC = 120'
K = 215
DS = 65 MPH

EXISTING PAVEMENT (-)14.1489 %

(-)13.6833%

(-)14.2414%

(-)15.17%

END DITCH LT
PI=13+00.00
EL=545.38'

BEGIN DITCH LT
PI=12+70.00
EL=546.93'

PI = 14+75.00
EL = 541.10'
VC = 170'
K = 158
DS = 65 MPH

PROPOSED GRADE

(-)14.2414%

(-)13.1642%

EXISTING GROUND

(-)13.1642%

SEE SHEET 4 FOR -L- PLAN

13+00 14+00 15+00 16+00 17+00 18+00

3/1/2021
c:\projects\proj\sht\B5813_rdy_psh09.pfl.dgn
Modified by

5/14/99

-L-

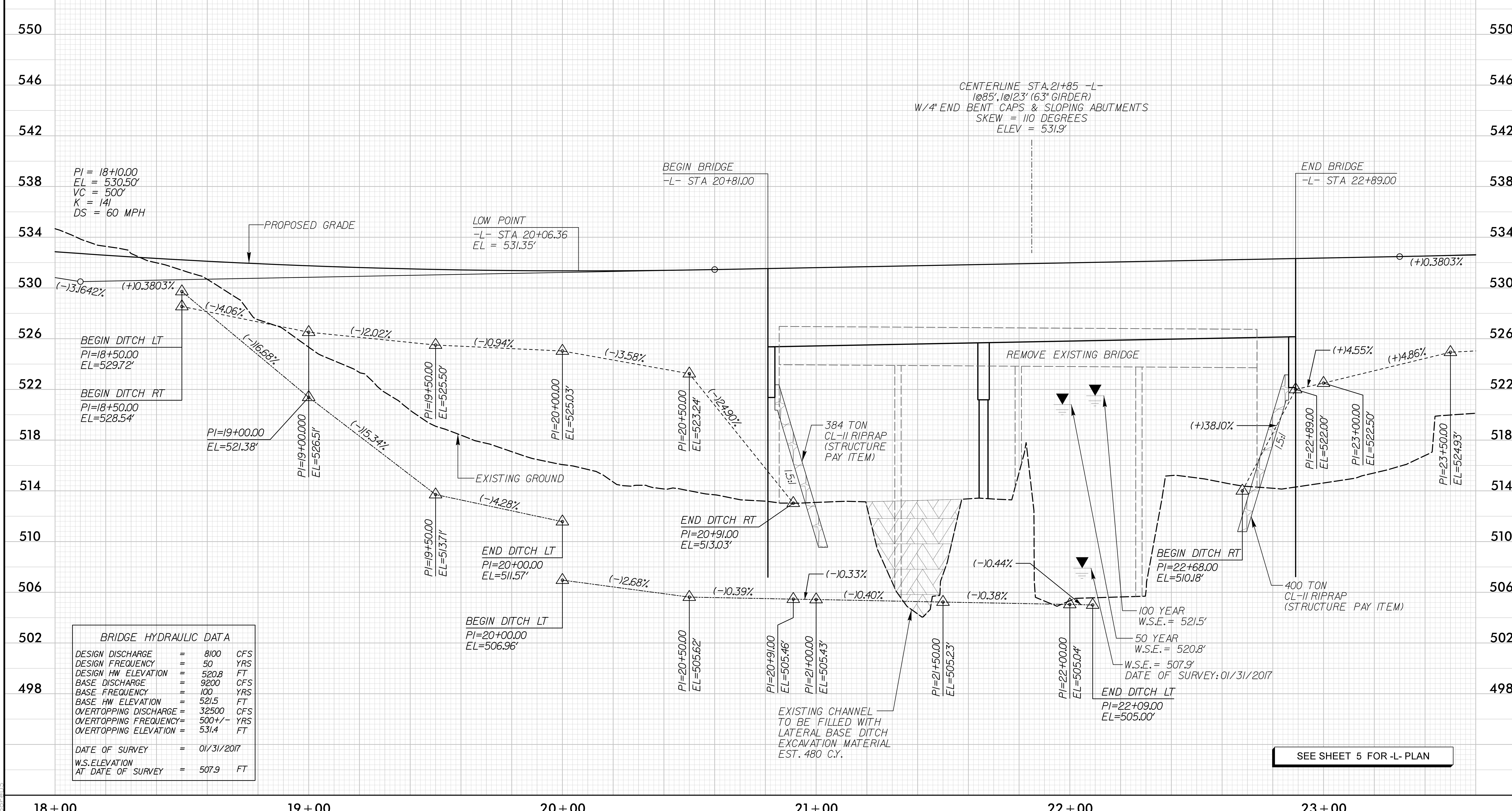
STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
B-5813	10

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 039234 ENGINEER NIKKI T. HONEYCUTT 3/2/2021

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029388 ENGINEER EDWARD J. VANCE 3/1/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	8100	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	520.8	FT
BASE DISCHARGE	=	9200	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	521.5	FT
OVERTOPPING DISCHARGE	=	32500	CFS
OVERTOPPING FREQUENCY	=	500+/-	YRS
OVERTOPPING ELEVATION	=	531.4	FT
DATE OF SURVEY	=	01/31/2017	
W.S.ELEVATION AT DATE OF SURVEY	=	507.9	FT

SEE SHEET 5 FOR -L- PLAN

3/1/2021
r:\roadway\proj\sht\B5813_rdy_psh10_pfl.dgn

-L-

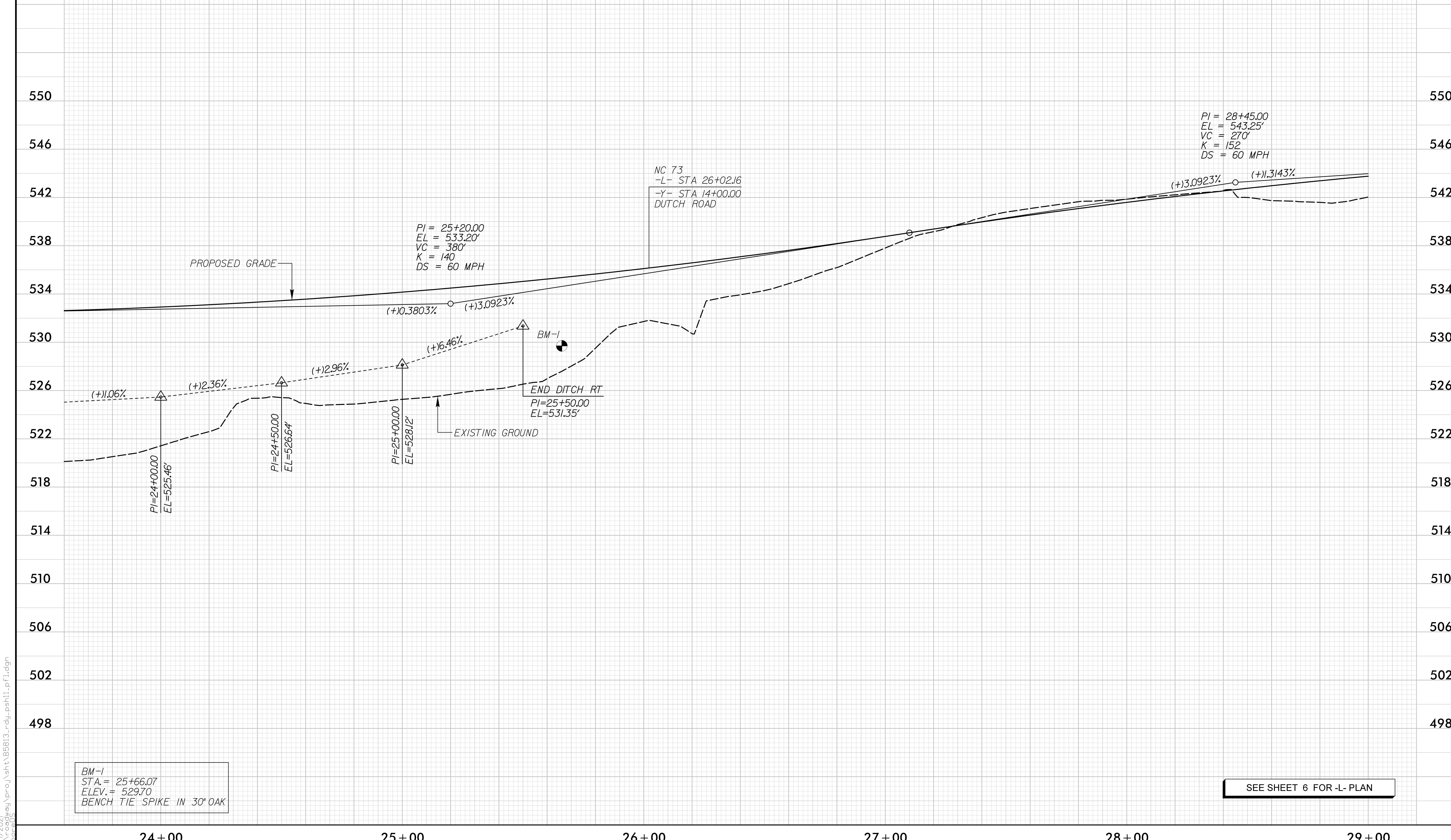
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
B-5813	11

ROADWAY DESIGN ENGINEER — SEAL 039234, 3/2/2021, NIKKI T. HONEYCUTT

HYDRAULICS ENGINEER — SEAL 029388, 3/1/2021, EDWARD J. VANCE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 6 FOR -L- PLAN

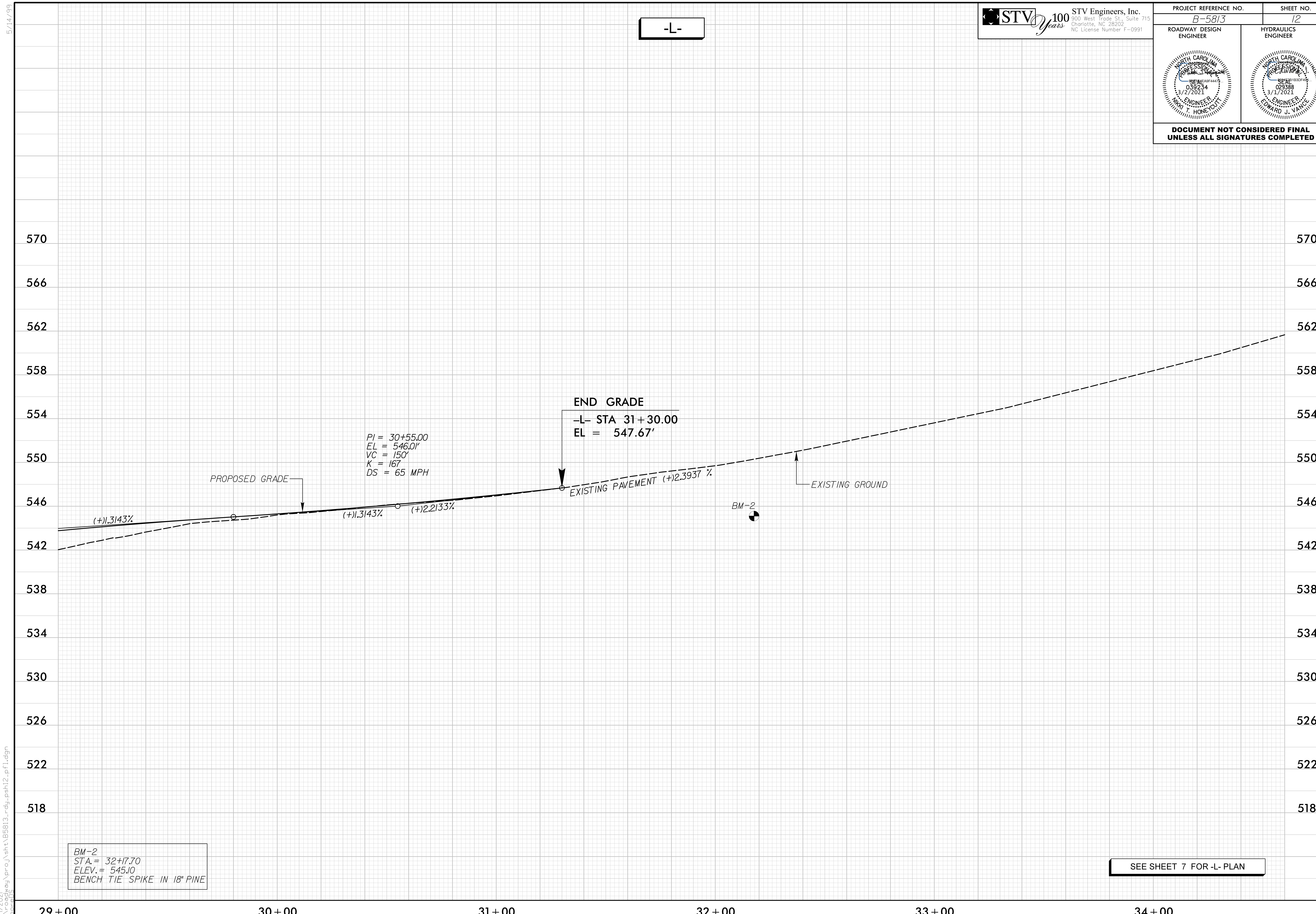
PROJECT REFERENCE NO.	SHEET NO.
B-5813	12

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

ROADWAY DESIGN ENGINEER — SEAL 039234, 3/2/2021, NIKKI T. HONEYCUTT

HYDRAULICS ENGINEER — SEAL 029388, 3/1/2021, EDWARD J. VANCE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 7 FOR -L- PLAN

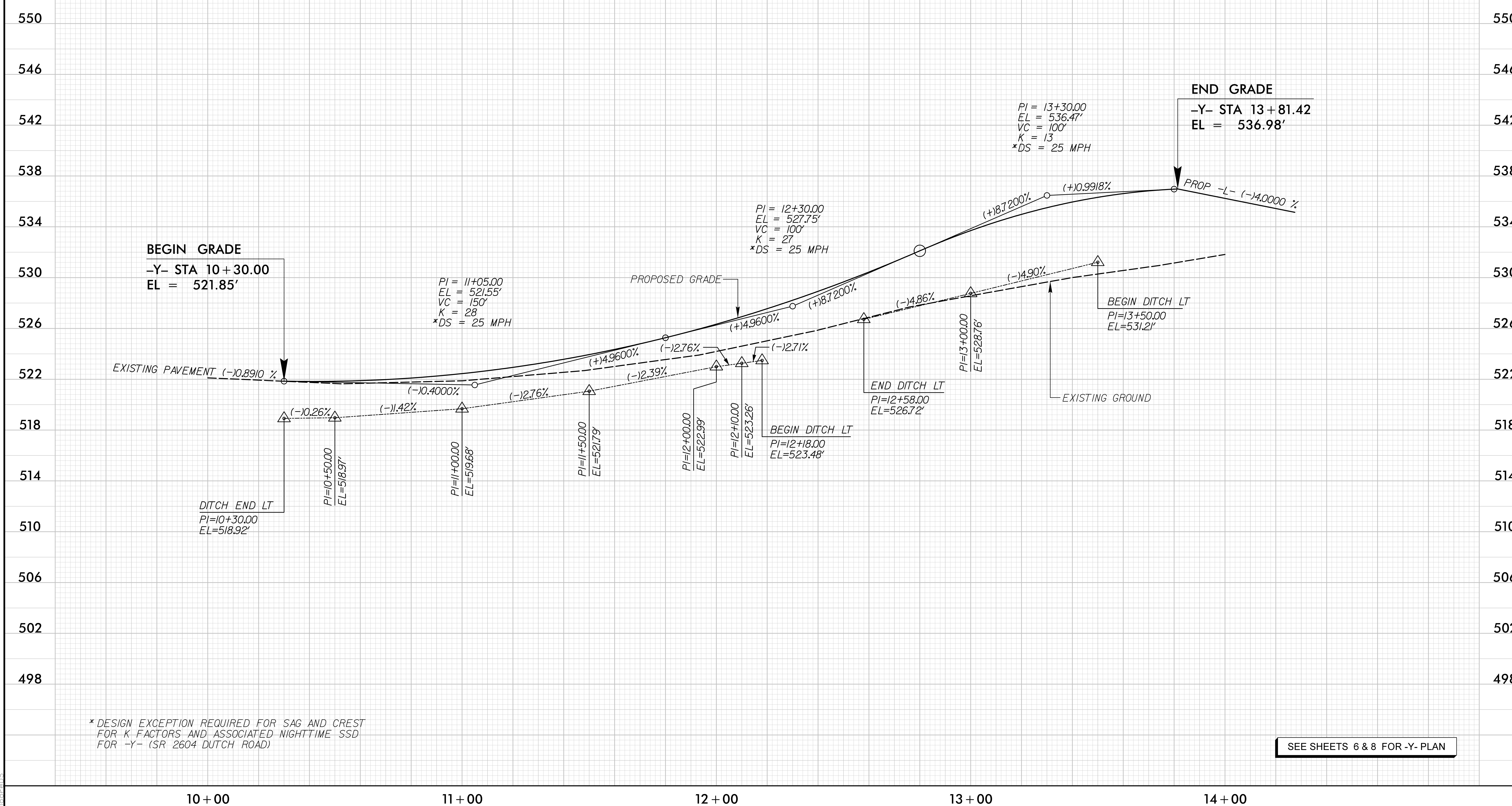
5/14/99

-Y-

STV 100 Years — STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
B-5813	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 039234 ENGINEER NIKKI T. HONEYCUTT 3/2/2021	NORTH CAROLINA PROFESSIONAL SEAL 029388 ENGINEER EDWARD J. VANCE 3/1/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



550
546
542
538
534
530
526
522
518
514
510
506
502
498
BEGIN GRADE
-Y- STA 10+30.00
EL = 521.85'
END GRADE
-Y- STA 13+81.42
EL = 536.98'
EXISTING PAVEMENT (-)0.8910 %
PI = 11+05.00
EL = 521.55'
VC = 150'
K = 28
*DS = 25 MPH
PI = 12+30.00
EL = 527.75'
VC = 100'
K = 27
*DS = 25 MPH
PI = 13+30.00
EL = 536.47'
VC = 100'
K = 13
*DS = 25 MPH
(-)0.4000%
(+)4.9600%
(+)4.9600%
(+)8.7200%
(+)8.7200%
(+)0.9918%
PROP -L- (-)4.0000 %
PROPOSED GRADE
EXISTING GROUND
(-)0.26%
(-)1.42%
(-)2.76%
(-)2.39%
(-)2.76%
(-)2.71%
(-)4.86%
(-)4.90%
DITCH END LT
PI=10+30.00
EL=518.92'
PI=10+50.00
EL=518.97'
PI=11+00.00
EL=519.68'
PI=11+50.00
EL=521.79'
PI=12+00.00
EL=522.99'
PI=12+10.00
EL=523.26'
BEGIN DITCH LT
PI=12+18.00
EL=523.48'
END DITCH LT
PI=12+58.00
EL=526.72'
PI=13+00.00
EL=528.76'
BEGIN DITCH LT
PI=13+50.00
EL=531.21'
10+00
11+00
12+00
13+00
14+00

* DESIGN EXCEPTION REQUIRED FOR SAG AND CREST FOR K FACTORS AND ASSOCIATED NIGHTTIME SSD FOR -Y- (SR 2604 DUTCH ROAD)

SEE SHEETS 6 & 8 FOR -Y- PLAN

3/1/2021 r:\roadway\proj\sht\B5813_rdy_psh13_pfl.dgn