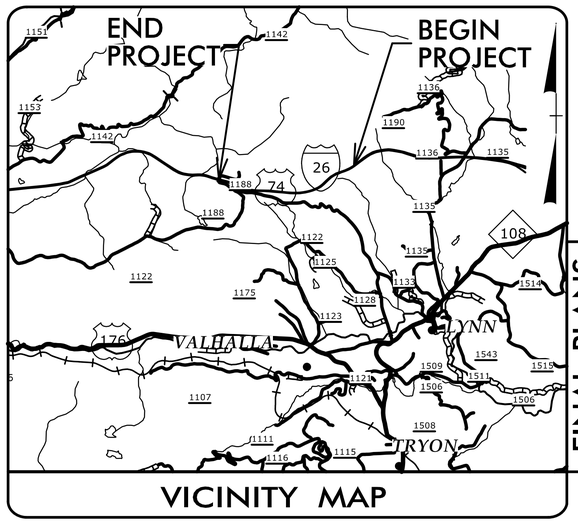
09/08/99

PROJECT: 15614.1075010

CONTRACT: C204638

See Sheet 1A For Index of Sheets



VICINITY MAP

FINAL PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

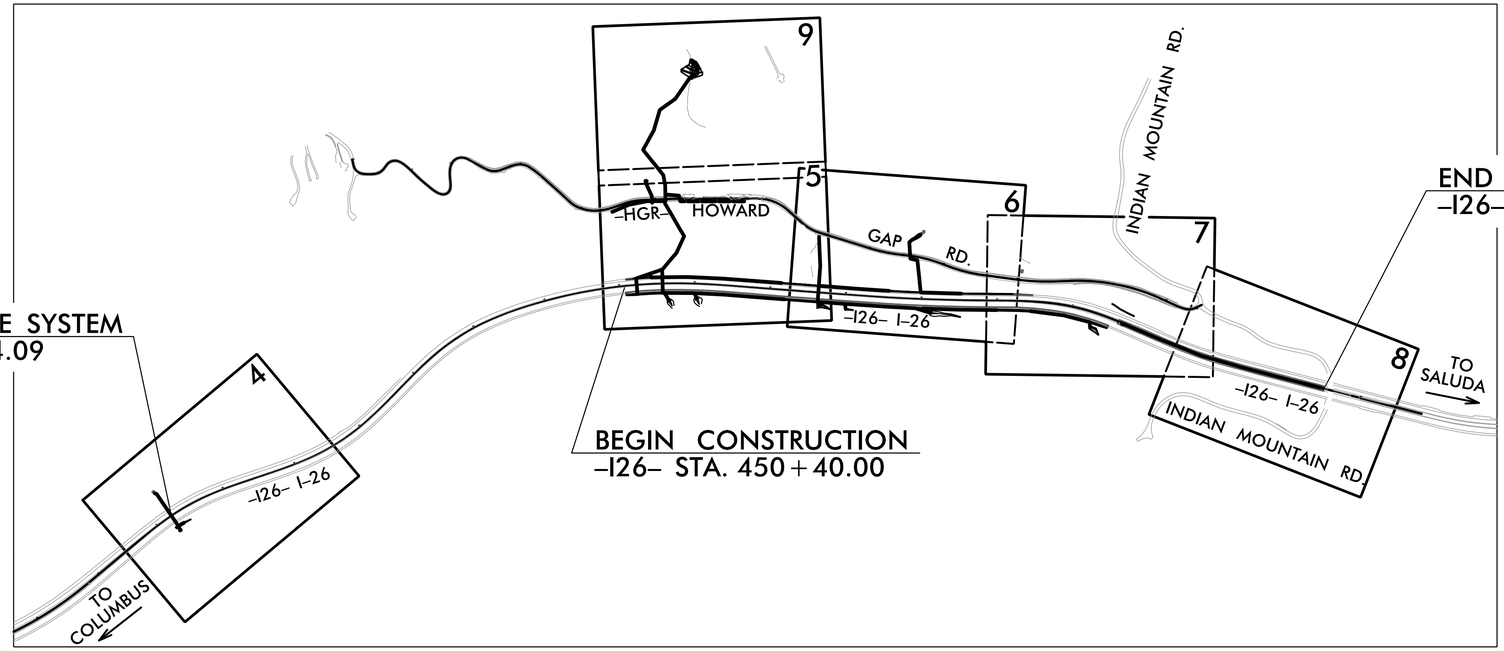
POLK COUNTY

LOCATION: I–26 (FROM APPROX. MM 64 TO APPROX. MM 62.5)
TYPE OF WORK: GRADING, DRAINAGE AND PAVING

NAD 83/2011

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15614.1075010	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
15614.1075010	N/A	PE
15614.1075010	N/A	R/W & UTIL
15614.1075010	N/A	CONST.



THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

DESIGN DATA

ADT 2019 = 44,000
V = 70 MPH
FUNC CLASS = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT I–26 = 0.892 MILES
TOTAL LENGTH PROJECT I–26 = 0.892 MILES

NCDOT CONTACT: JEANETTE L. WHITE, PE

PLANS PREPARED BY:

TGS ENGINEERS
201 W. MARION ST.
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PLANS PREPARED FOR:

NORTH CAROLINA DEPARTMENT OF TRANSPORATION
DIVISION 14
253 WEBSTER RD
SYLVA, NC 28779

RIGHT OF WAY DATE: MAR. 01, 2021

LETTING DATE: JUNE 15, 2021

2018 STANDARD SPECIFICATIONS

JIMMY L. TERRY, PE
PROJECT ENGINEER

CLINTON B. PRUETT, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044158 ENGINEER BENJAMIN J. HENEGAR
5/10/2021
DocuSigned by: Benjamin J. Henegar
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047943 ENGINEER CLINTON B. PRUETT
5/10/2021
DocuSigned by: Clinton Pruett
SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

5/10/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Roadway\Proj\I-26-Howard Gap_Rdy_tsh.dgn
User:cpruett

8/17/99

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	PROJECT REFERENCE NO.	SHEET NO.
	15614.1075010	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047943 ENGINEER CLINTON B. PRIVETT
5/11/2021

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	SPECIAL DETAIL - GUARDRAIL INSTALLATION (W BEAM RAIL SECTION)
2C-2	SPECIAL DETAIL - 8' GUARDRAIL POST
2D-1 THRU 2D-3	DRAINAGE DETAIL - ENERGY DISSIPATOR JUNCTION BOX
2D-4 THRU 2D-7	DRAINAGE DETAIL - SPLITTER BOX
2D-8 THRU 2D-10	DRAINAGE DETAIL - SPECIAL DESIGN JUNCTION BOX
2D-11	DRAINAGE DETAIL - SPECIAL DESIGN PIPE CONNECTION
2D-12	DRAINAGE DETAIL - EXTRA DEPTH 2GI
2D-13	DRAINAGE DETAIL - VARIABLE WIDTH BASE DITCH
2D-14 THRU 2D-16	DRAINAGE DETAIL - ENERGY DISSIPATOR BASIN
2D-17 THRU 2D-18	DRAINAGE DETAIL - FOREBAY #1
2D-19 THRU 2D-20	DRAINAGE DETAIL - FOREBAY #2
2D-21 THRU 2D-23	DRAINAGE DETAIL - FOREBAY #3
2D-24 THRU 2D-26	DRAINAGE DETAIL - FOREBAY #4
2D-27 THRU 2D-29	DRAINAGE DETAIL - FOREBAY #5
2D-30	DRAINAGE DETAIL - PIPE PROFILE (0409 TO 0401)
2D-31	DRAINAGE DETAIL - PIPE PROFILE (0539 TO 0522)
2D-32	DRAINAGE DETAIL - PIPE PROFILE (0504 TO 0506)
2D-33 THRU 2D-34	DRAINAGE DETAIL - PIPE PROFILE (0901 TO 0525)
2D-35	DRAINAGE DETAIL - PIPE PROFILE (0542 TO 0607)
2D-36	DRAINAGE DETAIL - PIPE PROFILE (0614 TO 0622)
3B-1	EARTHWORK SUMMARY, PAVEMENT REMOVAL SUMMARY, SHOULDER BERM GUTTER SUMMARY, AND GUARDRAIL SUMMARY
3D-1 THRU 3D-7	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 9	PLAN SHEETS
RW01THRU RW09	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES
TMP-1 THRU TMP-8	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-15	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
UO-1 THRU UO-4	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-46	CROSS-SECTIONS

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. 225.05 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. 560.02

SUBSURFACE DRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY TRANSMISSION, SPECTRUM, WINDSTREAM, TOWN OF TRYON, AND RIVERSTREET NETWORKS.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.05	Method of Obtaining Superelevation - Divided Highways
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
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
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.01	Concrete Paved Ditches
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
862.01	Guardrail Placement
862.02	Guardrail Installation (Special Detail for Sheet 6 of 8)
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

5/10/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Roadway\Proj\I-26-Howard Gap_Rdy_tsh.dgn
jsarchuleta

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
15614J075010	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.

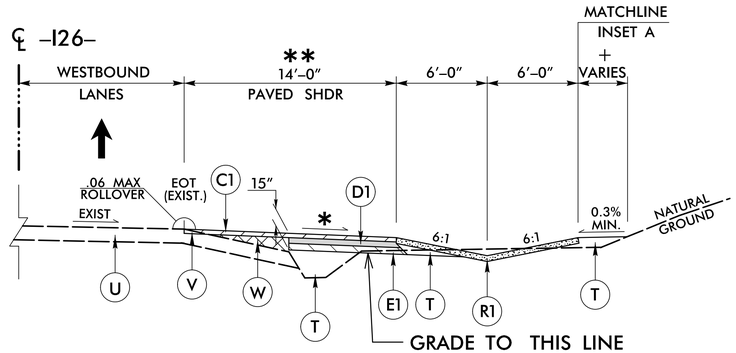
8/17/99

REVISIONS

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″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2″ IN DEPTH.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.
E1	PROP. APPROX. 8″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
R1	4″ CONCRETE DITCH.
R2	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING EXISTING PAVEMENT (0 TO 3″).
W	WEDGING EXISTING PAVEMENT, SEE WEDGING DETAILS.

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

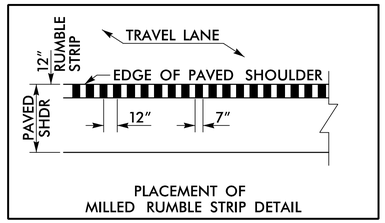


TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

–I26– STA. 450+90.00 TO –I26– STA. 482+15.00, RT

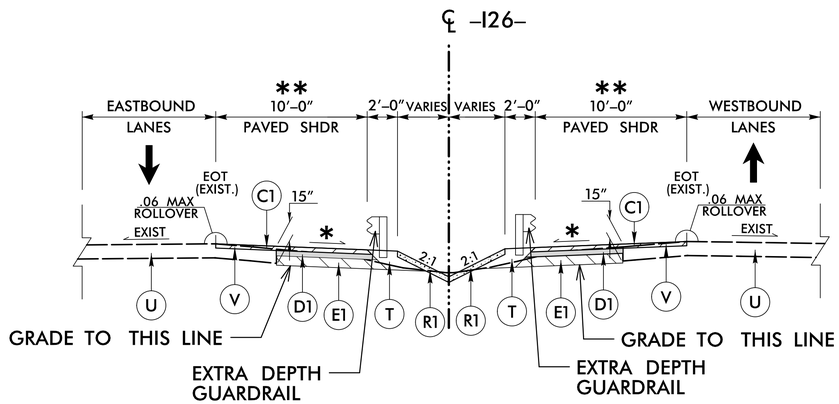
NOTE: TRANSITION BETWEEN EXISTING AND TYP. SECT. NO 1 AS FOLLOWS:
–I26– STA. 450+40.00 TO –I26– STA. 450+90.00, RT
–I26– STA. 482+15.00 TO –I26– STA. 482+65.00, RT



PLACEMENT OF
MILLED RUMBLE STRIP DETAIL

** USE DETAIL AS FOLLOWS:

–I26– STA. 450+40.00 TO –I26– STA. 482+65.00, RT
–I26– STA. 483+18.56 TO –I26– STA. 497+50.00, CL (LT & RT)



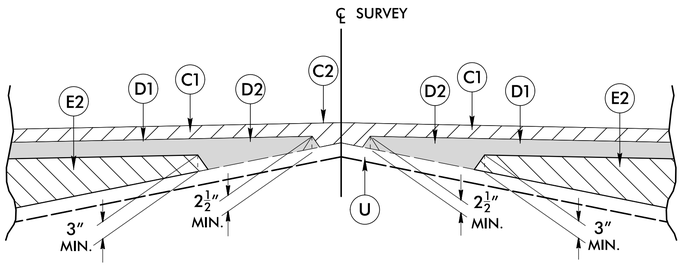
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

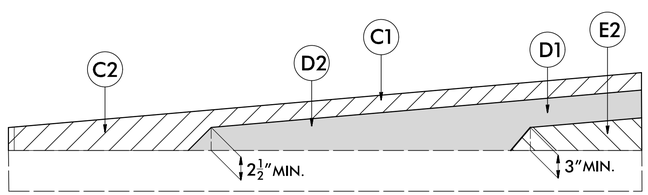
–I26– STA. 483+95.00 TO –I26– STA. 497+50.00, LT
–I26– STA. 484+66.44 TO –I26– STA. 497+50.00, RT

NOTE: TRANSITION BETWEEN EXISTING AND TYP. SECT. NO 3 AS FOLLOWS:
–I26– STA. 483+18.56 TO –I26– STA. 483+95.00, LT
–I26– STA. 483+18.56 TO –I26– STA. 484+66.44, RT

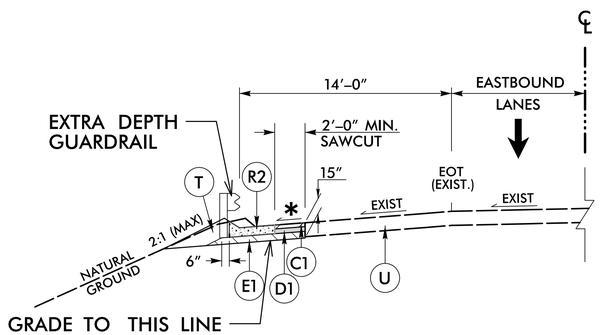
NOTE: PAVE FULL WIDTH MEDIAN:
–I26– STA. 483+18.56 TO –I26– STA. 483+95.00



Detail Showing Method of Wedging



Wedging Detail For Resurfacing



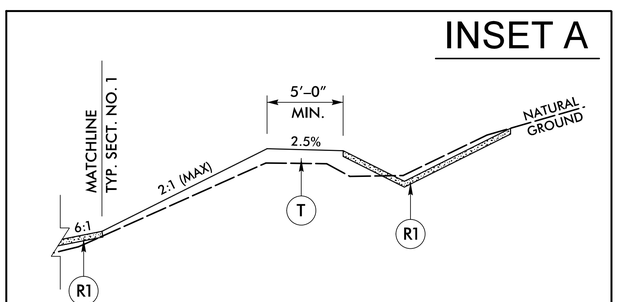
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

–I26– STA. 451+00.00 TO –I26– STA. 476+00.00, LT

NOTE: TRANSITION BETWEEN EXISTING AND TYP. SECT. NO 2 AS FOLLOWS:
–I26– STA. 450+50.00 TO –I26– STA. 451+00.00, LT
–I26– STA. 476+00.00 TO –I26– STA. 477+31.25, LT

INSET A



USE INSET A

–I26– STA. 471+50.00 TO –I26– STA. 475+00.00, RT

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2A-1
R/W SHEET NO.	

ROADWAY DESIGN & PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047943 CLINTON B. PRUETT 5/11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

* REFER TO STD. 560.02, SHEET 2 OF 2 IN THE 2018 ROADWAY STANDARD DRAWINGS FOR SUPERELEVATION RATES ON PAVED AND TURF SHOULDERS.

\+ TIE SLOPE INTO EXISTING GROUND AND GRADE TO DRAIN INTO CONCRETE DITCH. SEE XSC FOR ADDITIONAL INFORMATION ON SLOPE VARIATIONS BEYOND MINIMUM.

3/26/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Roadway\Proj\I-26-Howard Gap_Rdy_typ.dgn
User:cbruett

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2C-1

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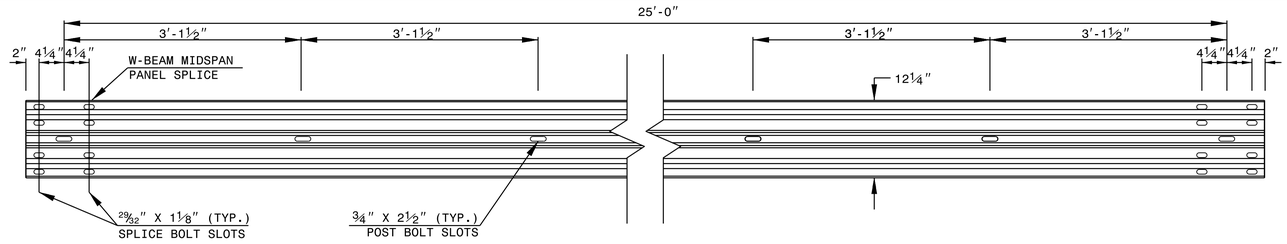
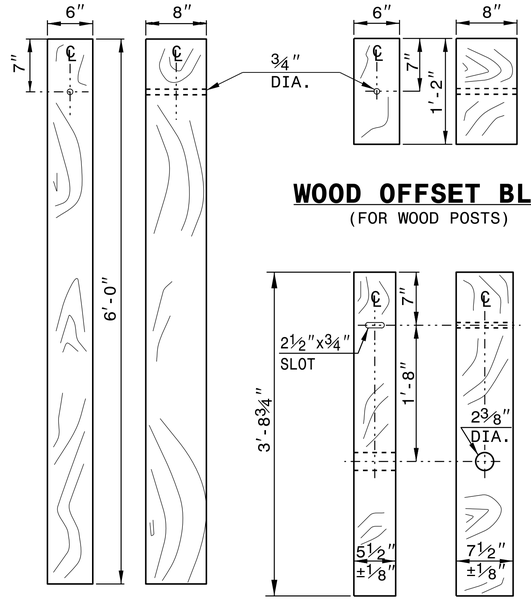
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



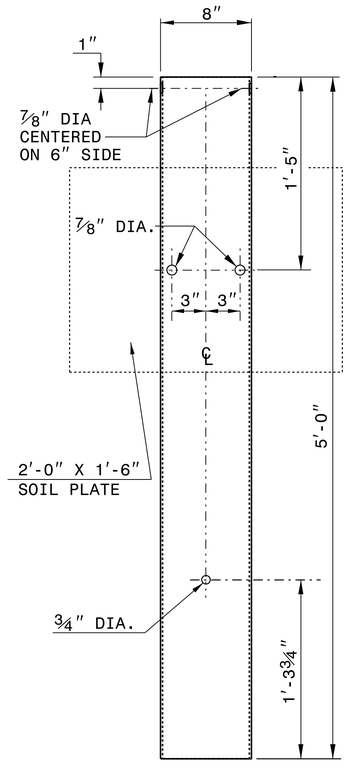
STANDARD W-BEAM GUARDRAIL



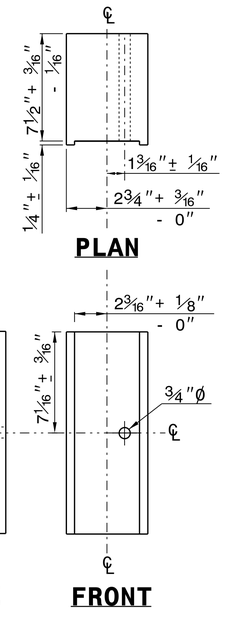
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

SHORT WOOD BREAKAWAY POST



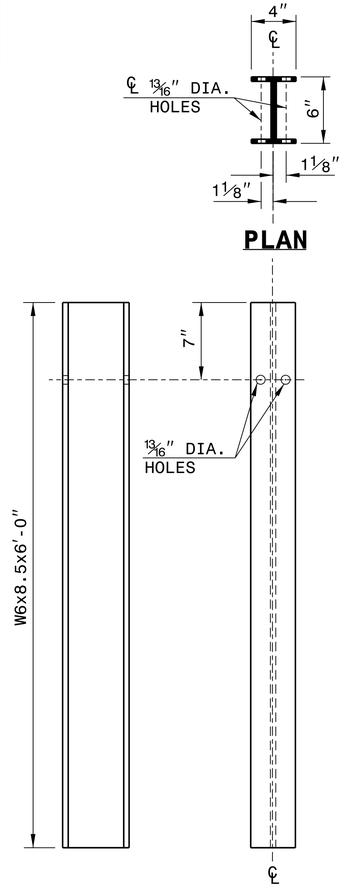
STEEL TUBE
TS 6"x8"x0.1875"



PLAN

SIDE **FRONT**

ROUTED OFFSET BLOCK



PLAN

SIDE **FRONT**

"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

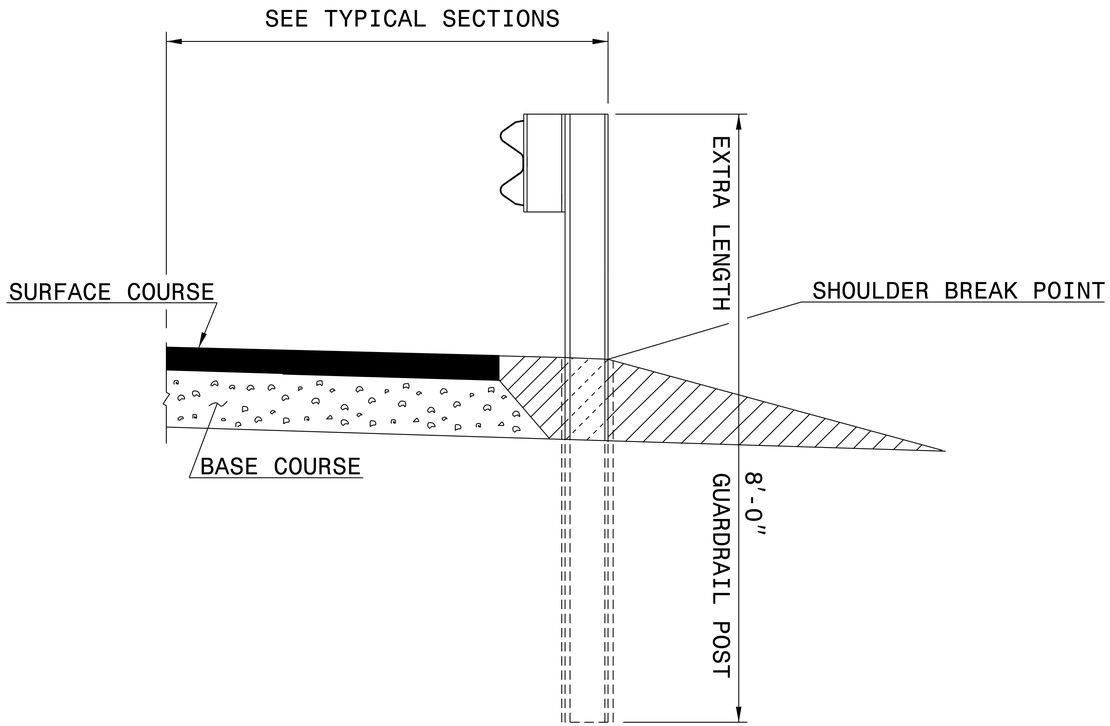
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 JOHN S. HOWERTON
5/11/2021

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

SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2C-2



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

8′ GUARDRAIL POST

ORIGINAL BY: L. Robinson DATE: 1995
MODIFIED BY: L. Robinson DATE: Feb. 1996
CHECKED BY: DATE:
FILE SPEC.: s:7'postguardrail.dgn

09-MAY-2018 14:21
S:\Contracts\Contracts\Special Details\jhowerton\7'postguardrail.dgn
jhowerton AT CSD-242595

PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-1

5/12/2021

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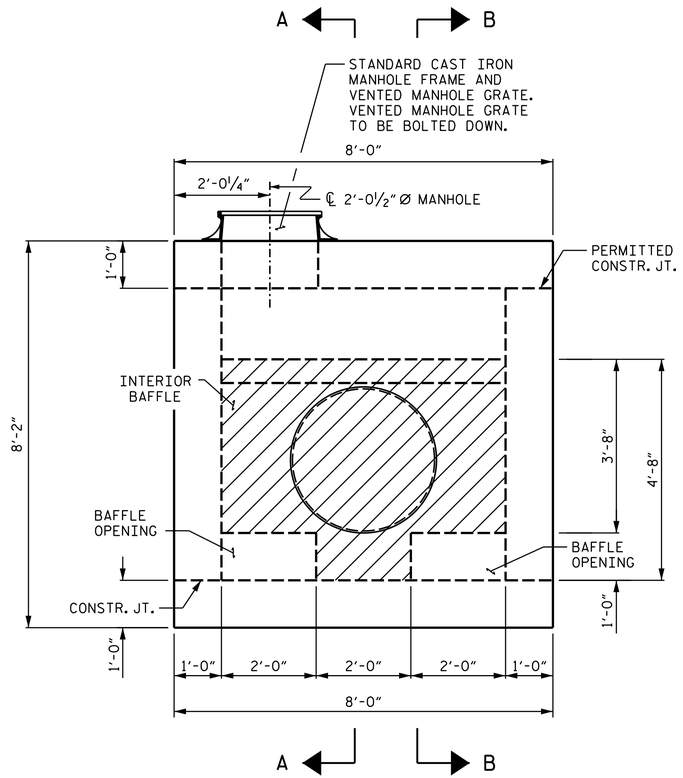
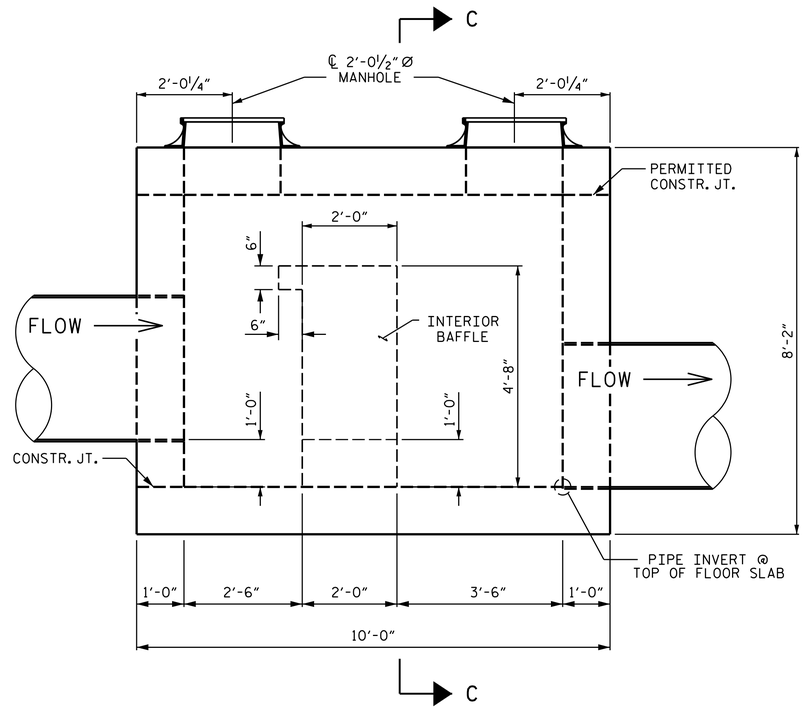
TGS ENGINEERS
706 HILLSBOROUGH STREET
SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275



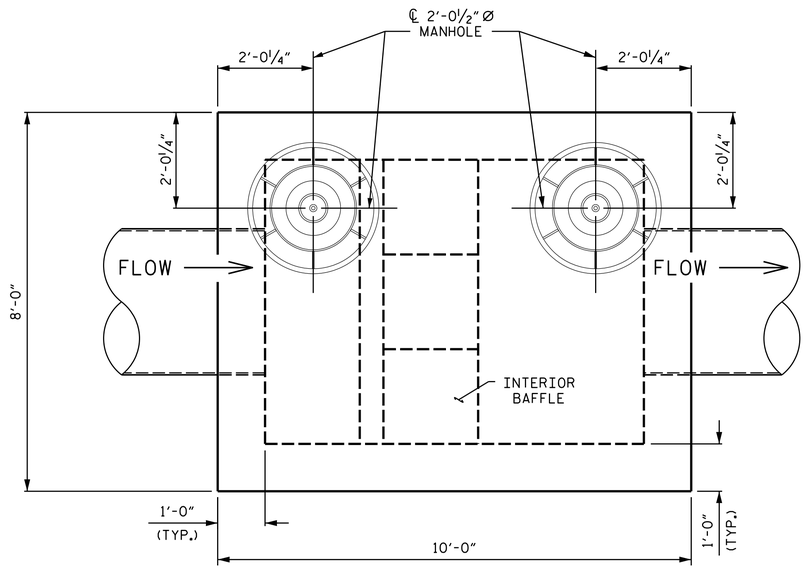
END ELEVATION

FOR SECTION A-A & B-B, SEE SHEET 2 OF 3.



SIDE ELEVATION

FOR SECTION C-C, SEE SHEET 2 OF 3.



PLAN VIEW

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ENERGY DISSIPATOR JUNCTION BOX

DRAWN BY : STM DATE : 01/21
CHECKED BY : MGC DATE : 03/21

4/13/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Structures\Energy Dissipator\I-26_SMU_ ED.dgn
User:smassinople

PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-2

5/12/2021

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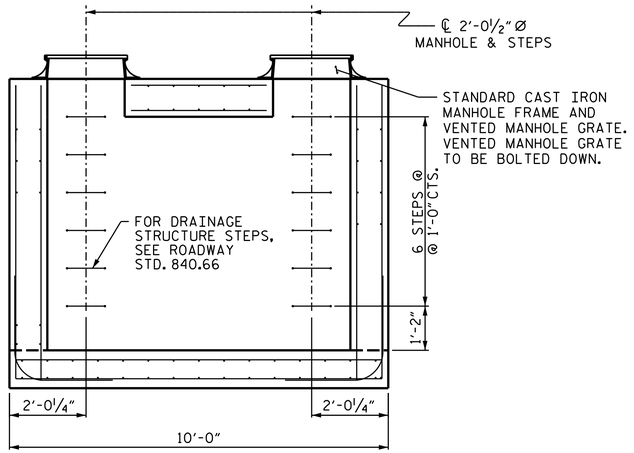
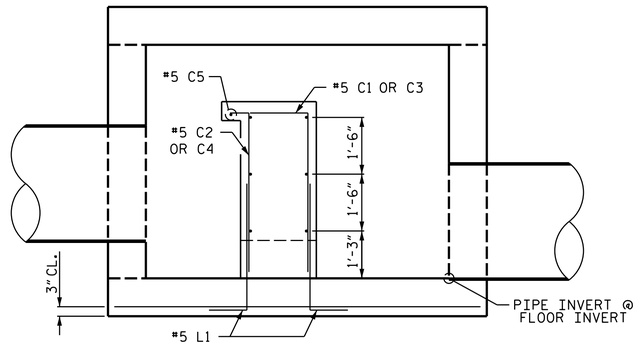
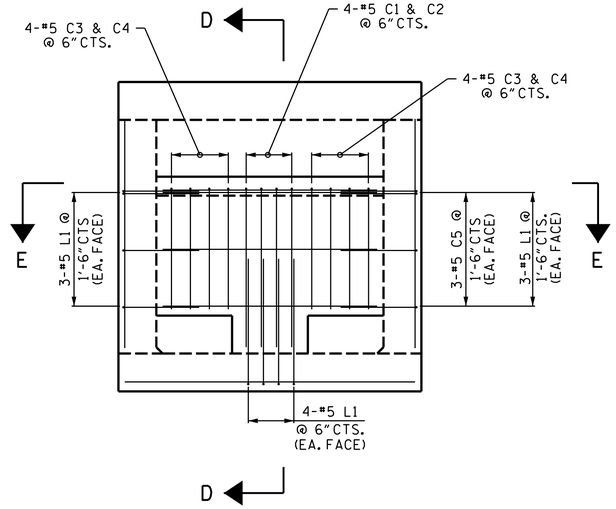
CORP. LICENSE NO.: C-0275



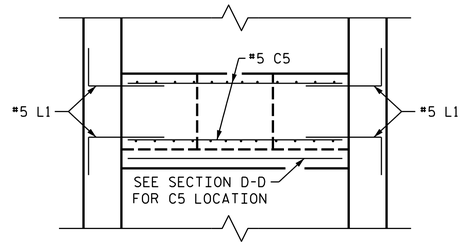
SECTION A-A



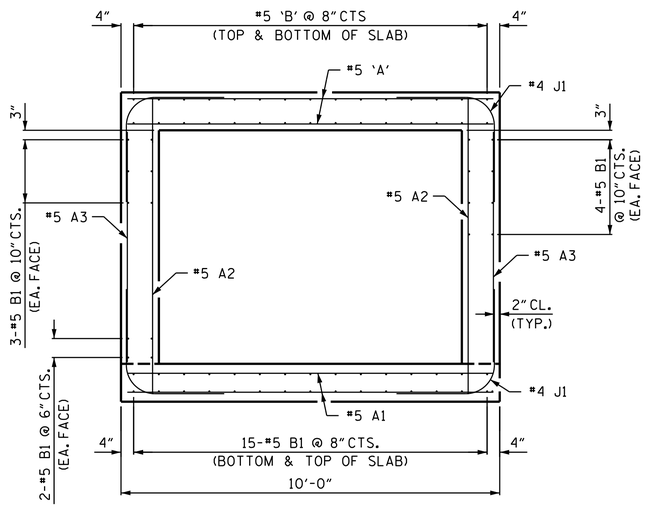
SECTION D-D



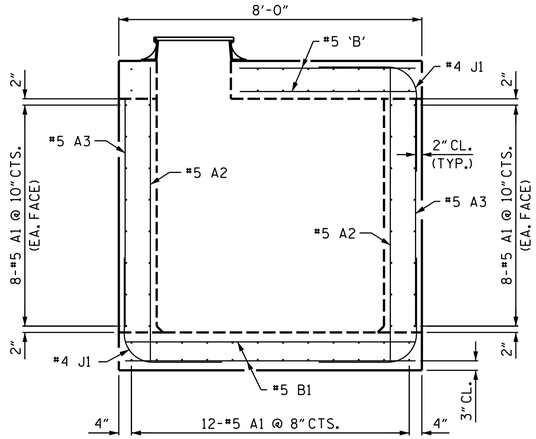
INTERIOR BAFFLE DETAIL



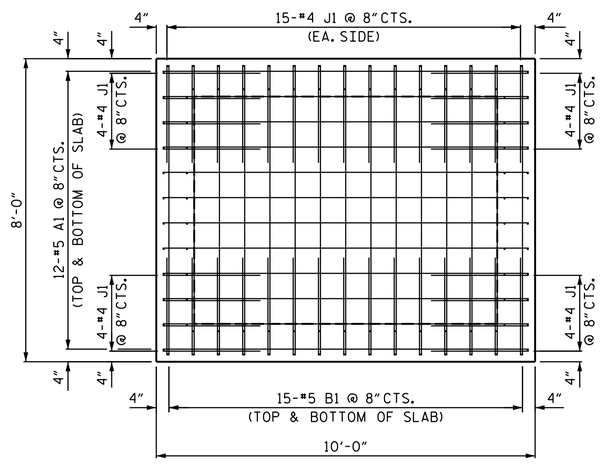
SECTION E-E



SECTION B-B



SECTION C-C



FLOOR SLAB

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ENERGY DISSIPATOR JUNCTION BOX

DRAWN BY : STM DATE : 01/21
CHECKED BY : MGC DATE : 03/21

4/13/2021
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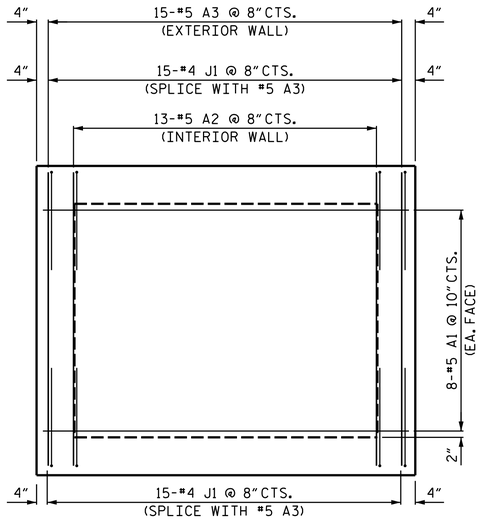
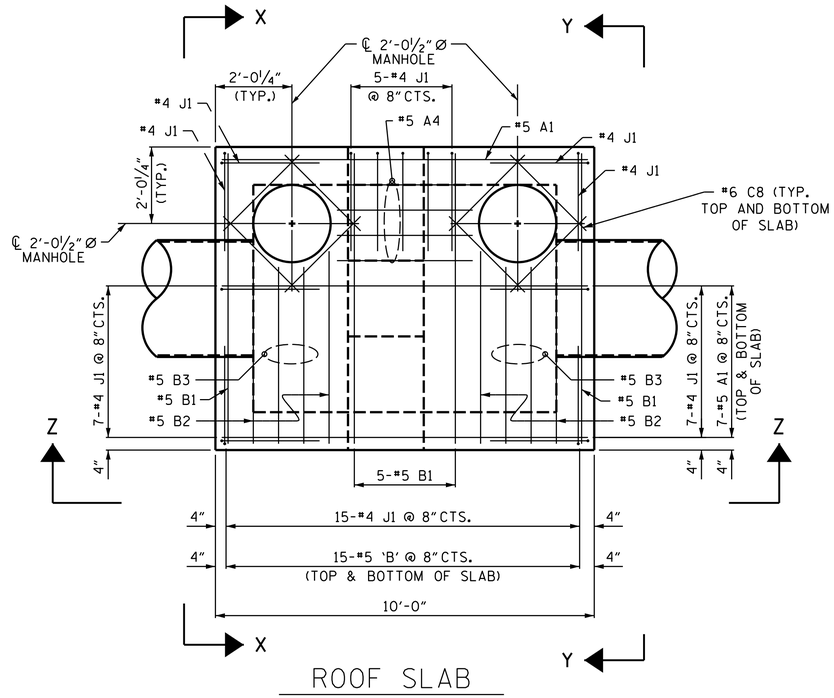
User:smassinople

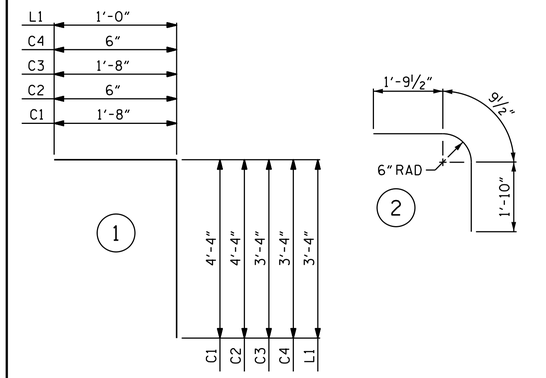


VIEW Z-Z



ROOF SLAB

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-3

BILL OF MATERIAL

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
A1	72	#5	STR	9'-8"	726
A2	44	#5	STR	7'-9"	356
A3	54	#5	STR	6'-1"	343
A4	8	#5	STR	3'-6"	29
B1	62	#5	STR	7'-8"	496
B2	8	#5	STR	5'-1"	42
B3	8	#5	STR	4'-6"	38
C1	4	#5	1	6'-0"	25
C2	4	#5	1	4'-10"	20
C3	8	#5	1	5'-0"	42
C4	8	#5	1	3'-10"	32
C5	7	#5	STR	5'-8"	41
C7	12	#6	STR	4'-11"	89
C8	16	#6	STR	2'-10"	68
J1	84	#4	2	4'-5"	248
L1	20	#5	1	4'-4"	90
REINFORCING STEEL					2685 LBS.
CLASS B CONCRETE					14.6 C.Y.

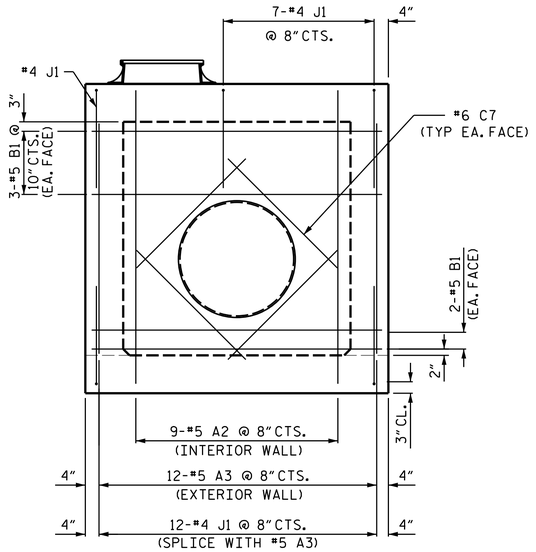
NOTES

DIMENSIONS MAY BE FIELD ADJUSTED AS DIRECTED BY THE ENGINEER.

CHAMFER ALL EXPOSED CORNERS 1".

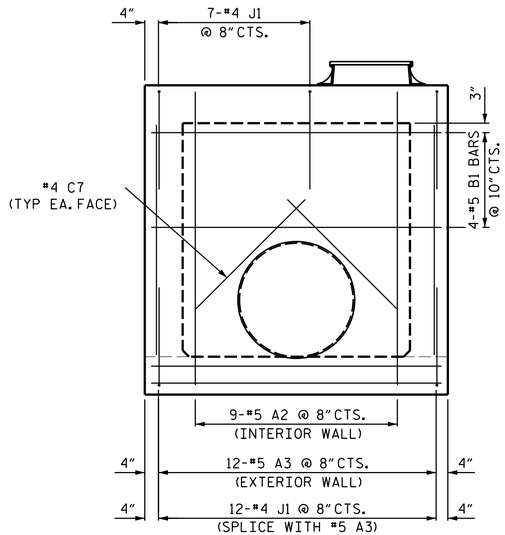
CORRUGATED STEEL PIPES SHALL BE LOCATED BY THE ENGINEER.

FOR MANHOLE FRAME AND VENTED MANHOLE GRATE, SEE SPECIAL PROVISIONS.



VIEW X-X

#5 A BARS SHALL BE FIELD CUT AS NECESSARY FOR INSTALLATION OF THE PIPE



VIEW Y-Y

#5 A BARS SHALL BE FIELD CUT AS NECESSARY FOR INSTALLATION OF THE PIPE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 — MARSHALL G. CHEEK, JR. — 5/12/2021

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SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ENERGY DISSIPATOR JUNCTION BOX

DRAWN BY : STM DATE : 02/21
CHECKED BY : MGC DATE : 03/21

4/13/2021
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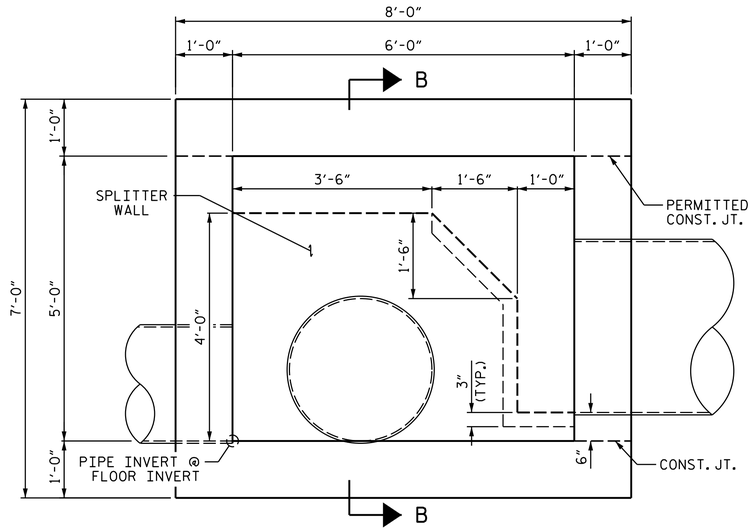
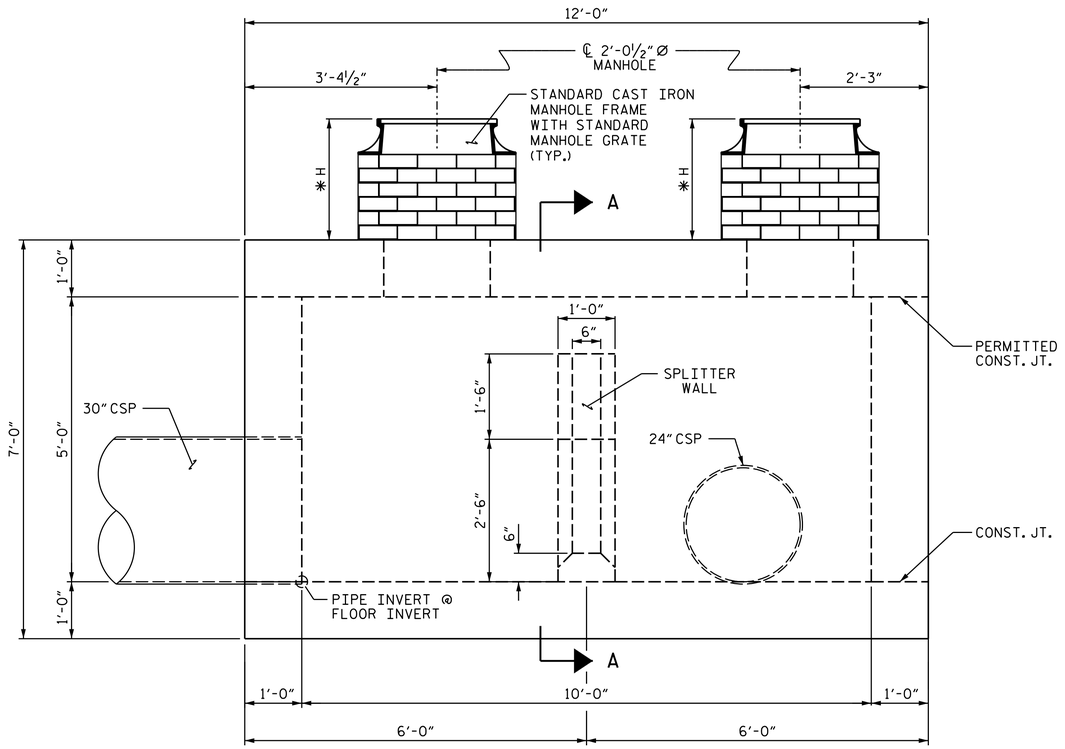
User:smassinople

PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-4



SIDE ELEVATION

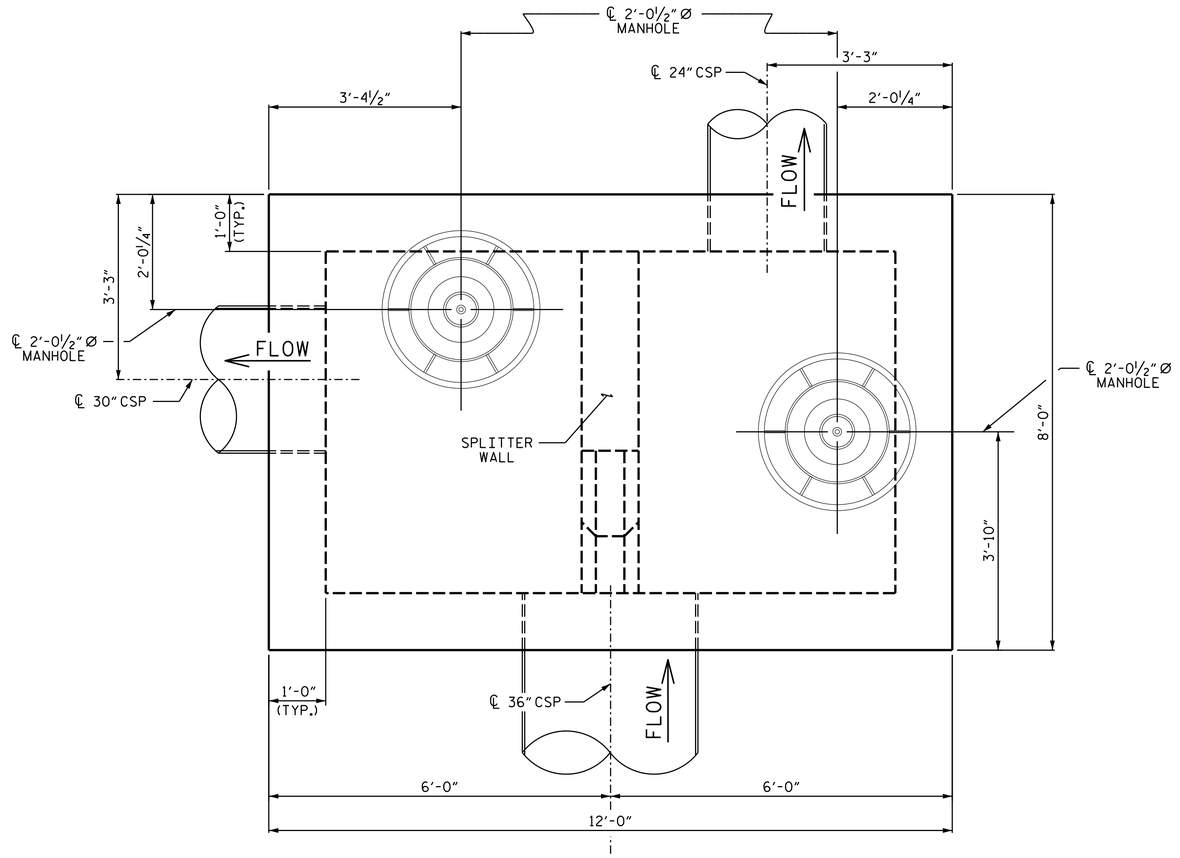
FOR SECTION B-B, SEE SHEET 3 OF 4.



FRONT ELEVATION

FOR SECTION A-A, SEE SHEET 3 OF 4.

* H TO BE DETERMINED BY CONTRACTOR TO ENSURE MANHOLE COVER WILL BE AT FINISHED GRADE.



PLAN VIEW

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
SIGNATURE 34ADC413...
5/12/2021

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CORP. LICENSE NO.: C-0275

SHEET 1 OF 4

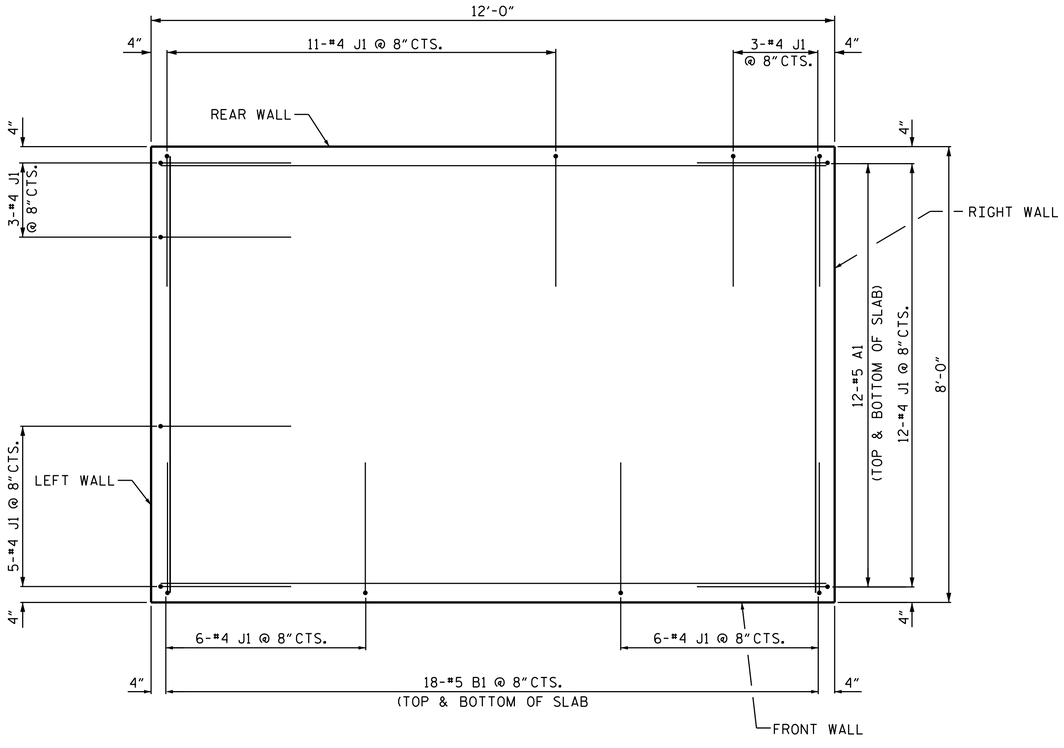
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SPLITTER BOX

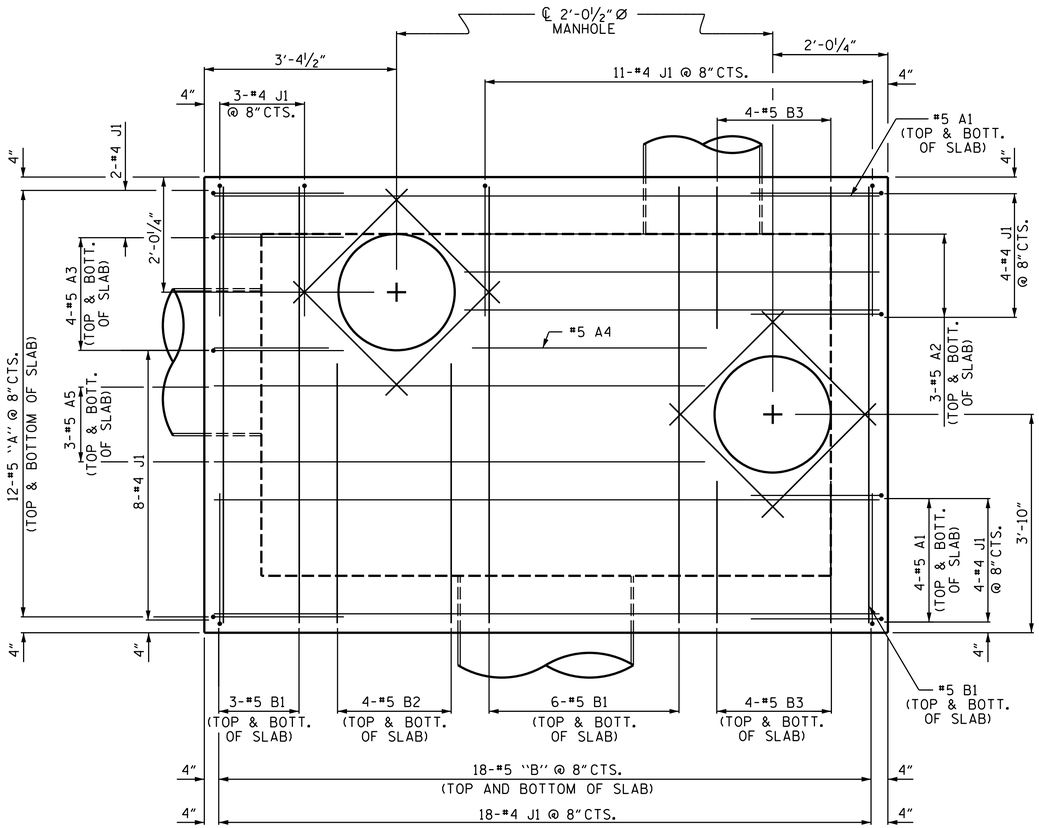
DRAWN BY : STM DATE : 02/21
CHECKED BY : MGC DATE : 03/21

4/8/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Structures\Splitter Box\I-26_SMU_SB.dgn
User:smassinople

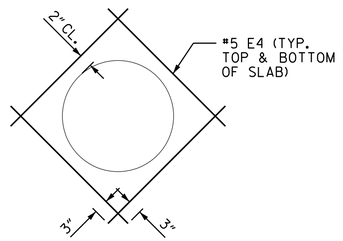
PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-5



FLOOR SLAB



ROOF SLAB



MANHOLE REINFORCEMENT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR. 5/12/2021
6FBCC2F3A4DC413...

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SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SPLITTER BOX

DRAWN BY : STM DATE : 02/21
CHECKED BY : MGC DATE : 03/21

4/6/2021
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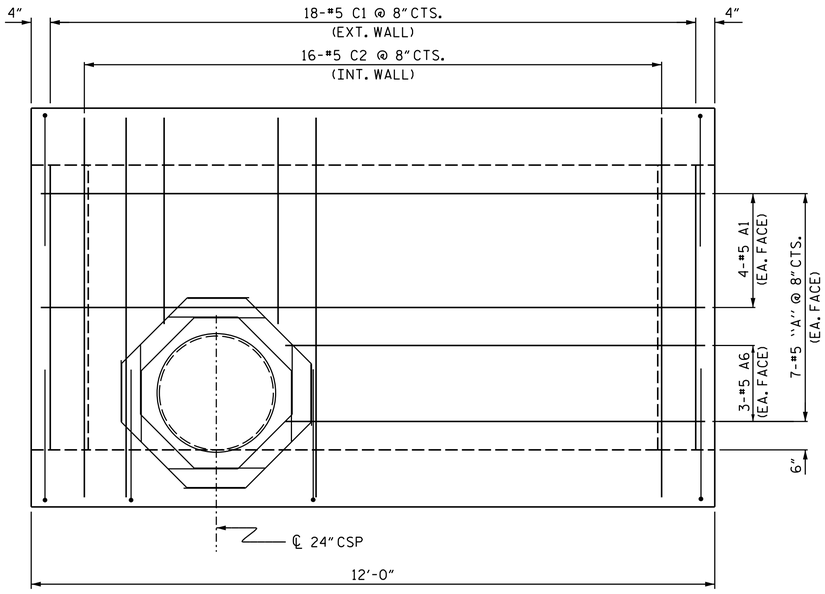
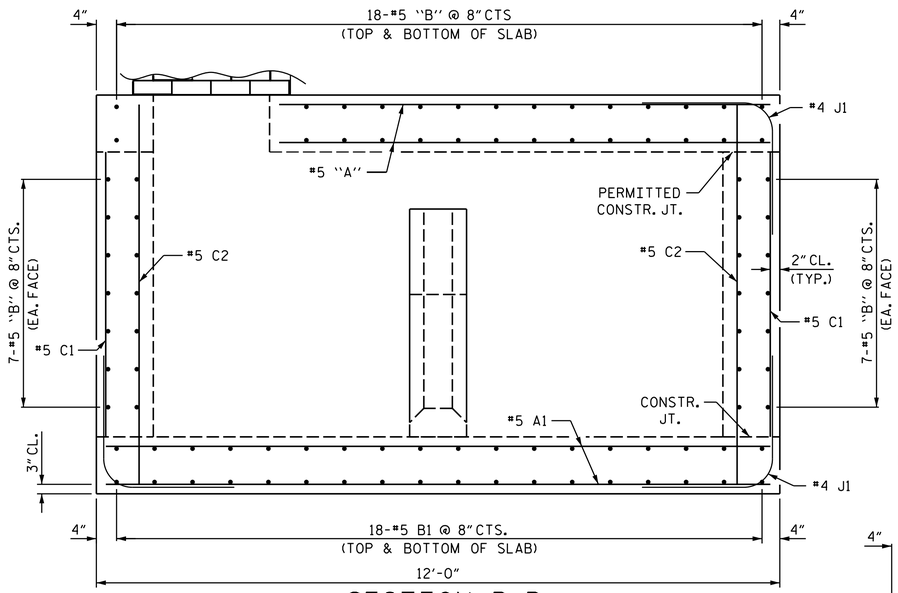
PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-6

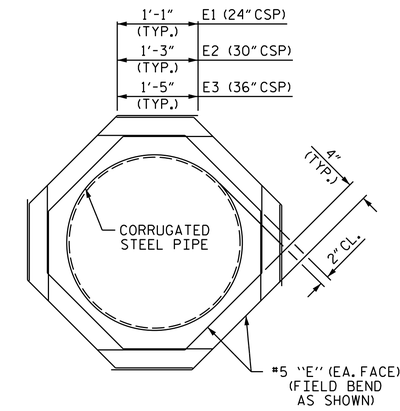


REAR WALL

SEE "DETAIL A" FOR 24"CSP REINFORCEMENT.
#5 "C" BARS SHALL BE FIELD CUT AS NECESSARY
FOR INSTALLATION OF THE 24"CSP.

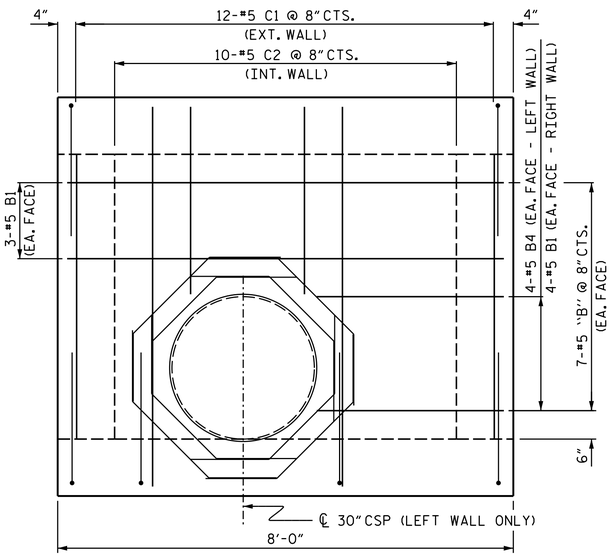


SECTION B-B



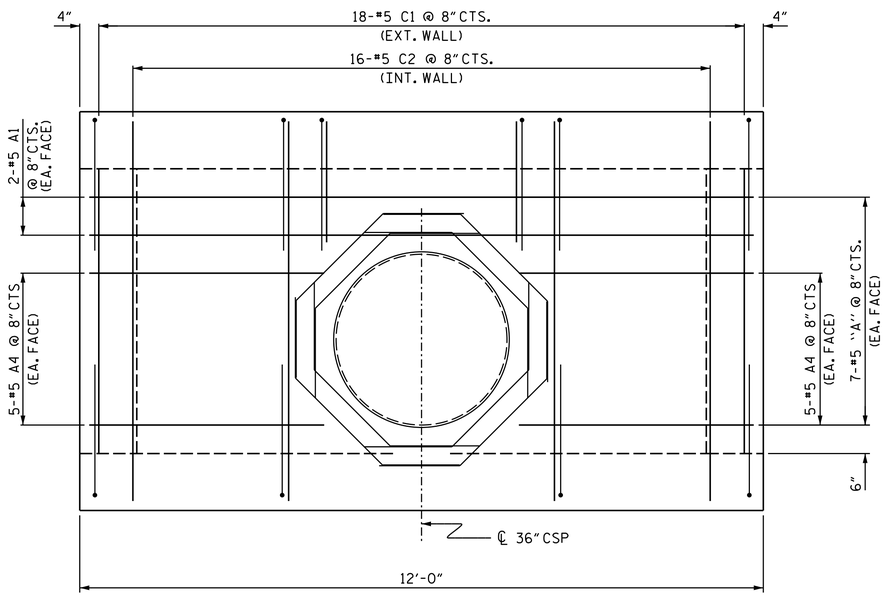
DETAIL "A"

THE PIPE THROUGH THE WALL OF THE SPLITTER BOX WILL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL WILL BE CUT & FIELD BENT AS NECESSARY TO CLEAR THE PIPE



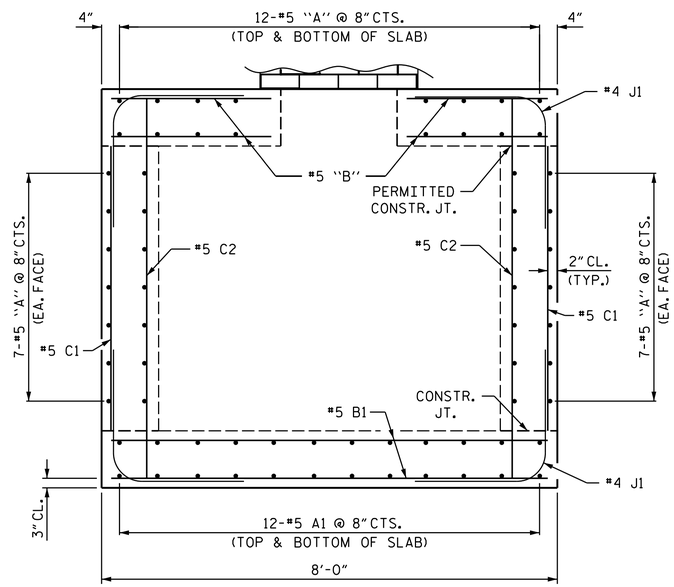
LEFT/RIGHT WALL

SEE "DETAIL A" FOR 30"CSP REINFORCEMENT.
#5 "C" BARS SHALL BE FIELD CUT AS NECESSARY
FOR INSTALLATION OF THE 30"CSP.



FRONT WALL

SEE "DETAIL A" FOR 36"CSP REINFORCEMENT.
#5 "C" BARS SHALL BE FIELD CUT AS NECESSARY
FOR INSTALLATION OF THE 36"CSP.



SECTION A-A

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR. ENGINEER
SEPCC2F3A40C413...
5/12/2021

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706 HILLSBOROUGH STREET
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RALEIGH, NC 27603
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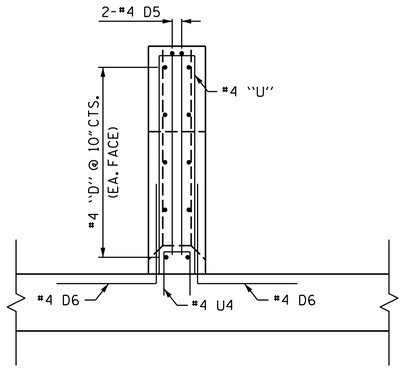
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

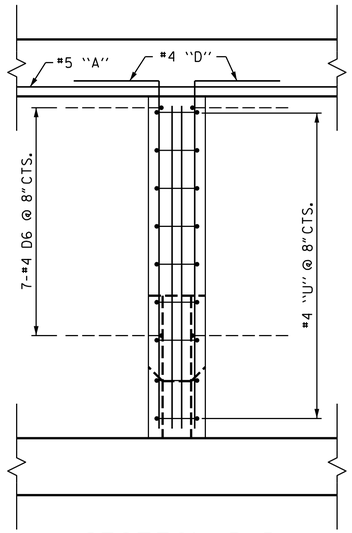
SPLITTER BOX

DRAWN BY : STM DATE : 02/21
CHECKED BY : MGC DATE : 03/21

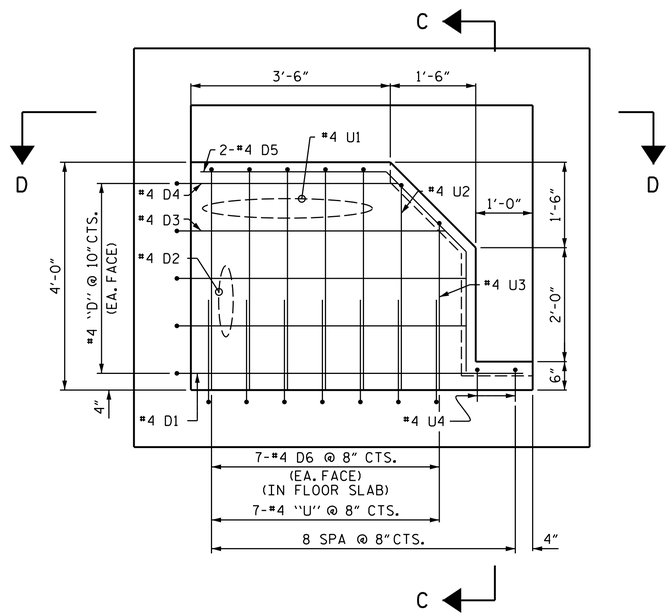
4/8/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Structures\Splitter Box\I-26_SMU_ SB.dgn
User:smassinople



SECTION C-C



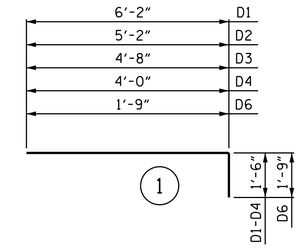
SECTION D-D

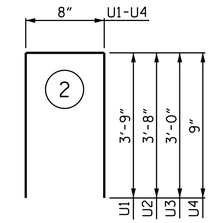


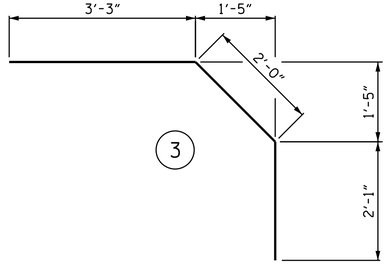
SPLITTER WALL DETAILS

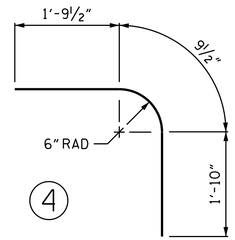
#4 U4 BARS MAY BE PLACED INTO GREEN CONCRETE.

BAR TYPES

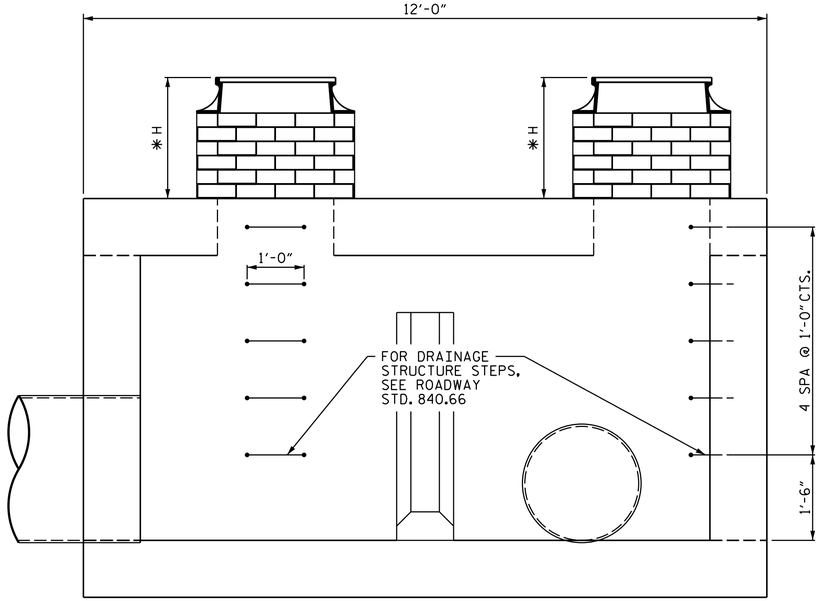








ALL BAR DIMENSIONS ARE OUT TO OUT.



MANHOLE STEP DETAILS

* H TO BE DETERMINED BY CONTRACTOR TO ENSURE MANHOLE COVER WILL BE AT FINISHED GRADE.

PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-7

BILL OF MATERIAL

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
A1	46	#5	STR	11'-8"	560
A2	6	#5	STR	7'-4"	46
A3	8	#5	STR	2'-0"	17
A4	22	#5	STR	4'-1"	94
A5	6	#5	STR	8'-4"	52
A6	6	#5	STR	7'-5"	46
B1	76	#5	STR	7'-8"	608
B2	8	#5	STR	4'-5"	37
B3	16	#5	STR	2'-5"	40
B4	8	#5	STR	3'-1"	26
C1	60	#5	STR	4'-10"	302
C2	52	#5	STR	6'-6"	353
D1	2	#4	1	7'-8"	10
D2	6	#4	1	6'-8"	27
D3	2	#4	1	6'-2"	8
D4	2	#4	1	5'-6"	7
D5	2	#4	3	7'-4"	10
D6	14	#4	1	3'-6"	33
E1	16	#5	STR	3'-10"	64
E2	16	#5	STR	4'-5"	74
E3	16	#5	STR	5'-1"	85
E4	16	#5	STR	3'-0"	50
J1	96	#4	4	4'-5"	283
U1	5	#4	2	8'-2"	28
U2	1	#4	2	8'-0"	5
U3	1	#4	2	6'-8"	4
U4	2	#4	2	2'-2"	3

REINFORCING STEEL	2872 LBS.
CLASS B CONCRETE	14.0 C.Y.

NOTES

DIMENSIONS MAY BE FIELD ADJUSTED AS DIRECTED BY THE ENGINEER.

CHAMFER ALL EXPOSED CORNERS 1".

CORRUGATED STEEL PIPES SHALL BE LOCATED BY THE ENGINEER.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR.
SFDCC2F3A40C413...
9/12/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SPLITTER BOX

DRAWN BY : STM DATE : 02/21
CHECKED BY : MGC DATE : 03/21

4/8/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Structures\Splitter Box\I-26_SMU_ SB.dgn
User:smassinople

PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-8

5/12/2021

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SUITE 200
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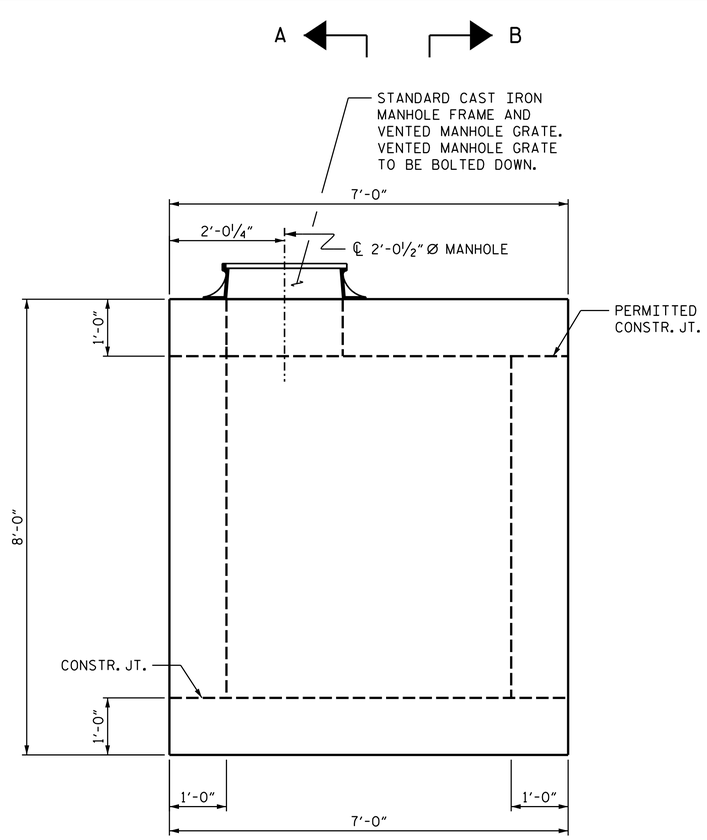
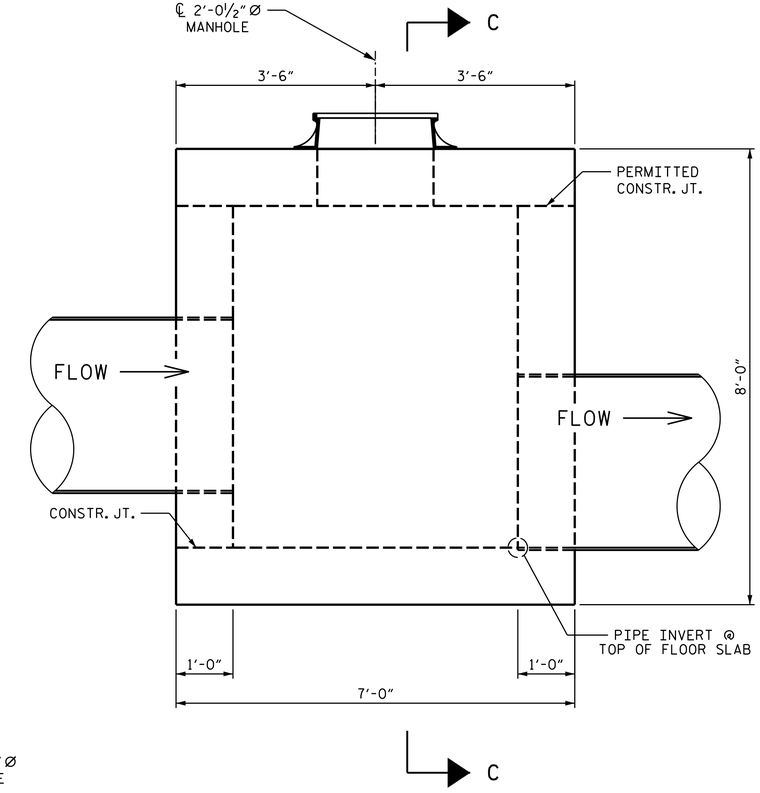
CORP. LICENSE NO.: C-0275



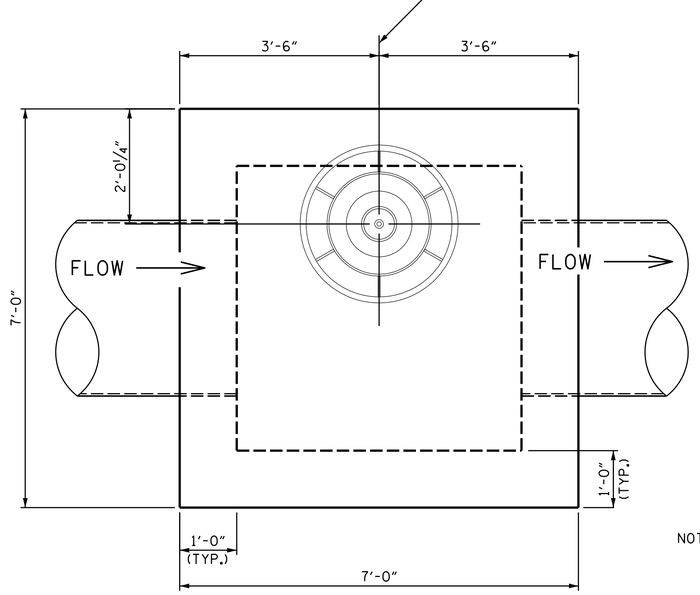
END ELEVATION

FOR SECTION A-A & B-B, SEE SHEET 2 OF 3.



SIDE ELEVATION

FOR SECTION C-C, SEE SHEET 2 OF 3.



PLAN VIEW

NOTE: PLAN VIEW TYPICAL FOR ALL SPECIAL DESIGN JUNCTION BOX LOCATIONS, EXCEPT STRUCTURE 0539. STRUCTURE 0539 HAS AN ADDITIONAL INLET PIPE.

SHEET 1 OF 3

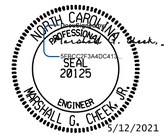
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SPECIAL DESIGN JUNCTION BOX

DRAWN BY : STM DATE : 03/21
CHECKED BY : MGC DATE : 03/21

X:\NCDOT\I-26 Howard Gap Rd Rehab\Structures\Special Design Junction Box\I-26_SMU_SDJB.dgn
User:smassinople

PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-9



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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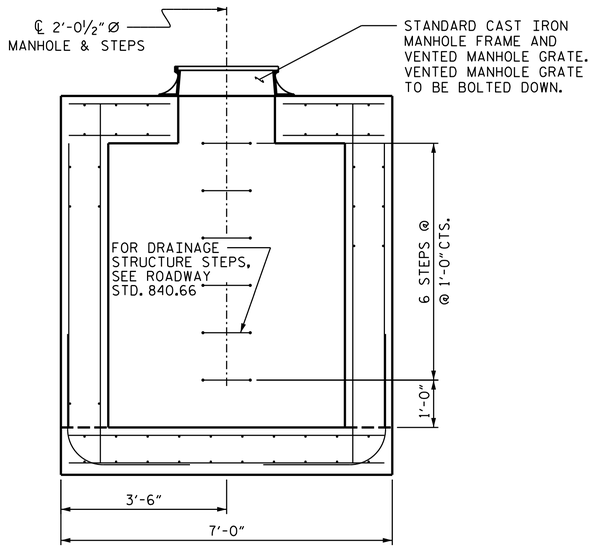
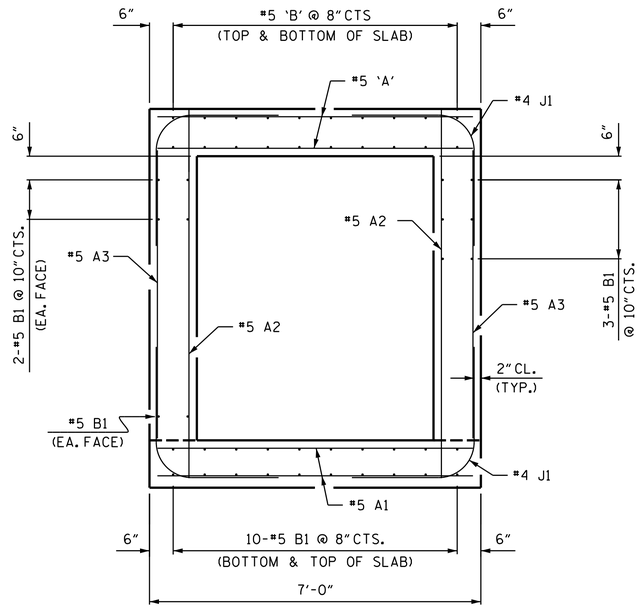
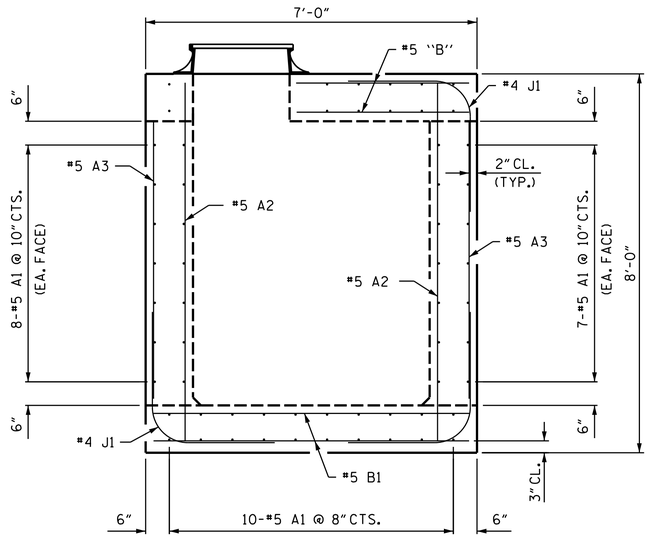


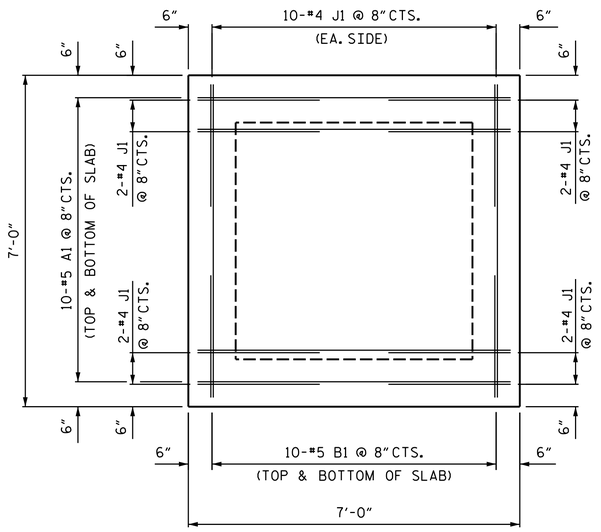
SECTION A-A



SECTION B-B



SECTION C-C



FLOOR SLAB

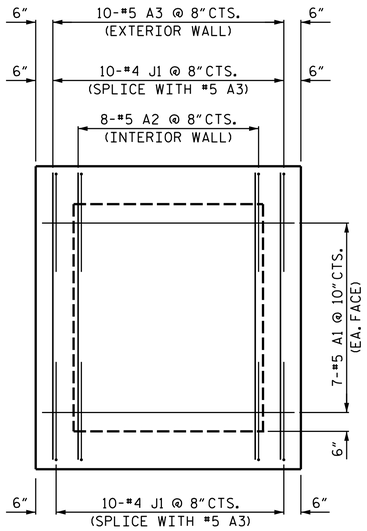
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

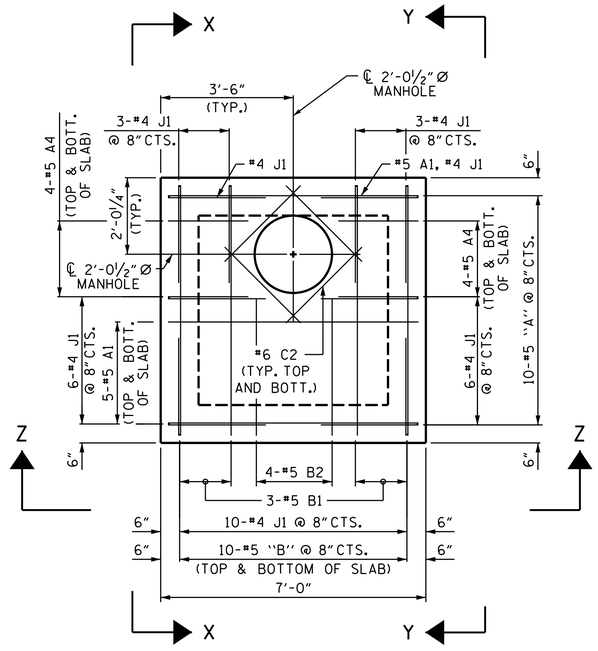
SPECIAL DESIGN JUNCTION BOX

DRAWN BY : STM DATE : 03/21
CHECKED BY : MGC DATE : 03/21

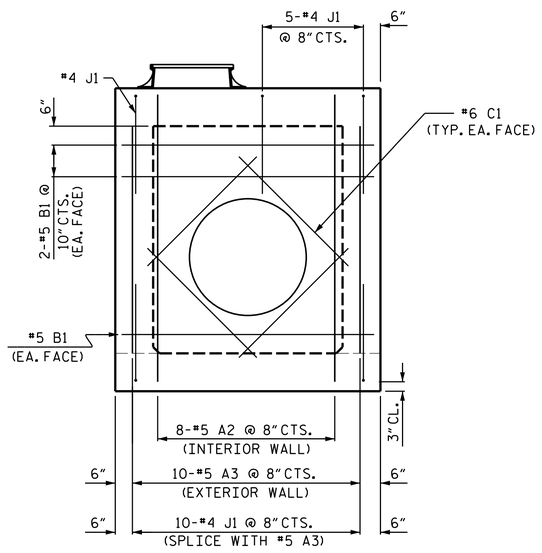
4/13/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Structures\SpecialDesign Junction Box\I-26_SMU_ SDJB.dgn
User:smassinople



VIEW Z-Z

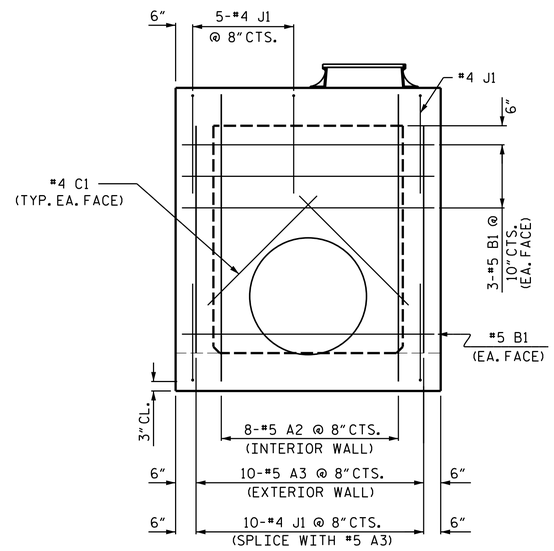


ROOF SLAB



VIEW X-X

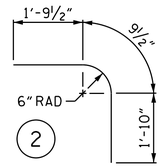
#5 A BARS SHALL BE FIELD CUT AS NECESSARY FOR INSTALLATION OF THE PIPE



VIEW Y-Y

#5 A BARS SHALL BE FIELD CUT AS NECESSARY FOR INSTALLATION OF THE PIPE

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-10

BILL OF MATERIAL

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
A1	60	#5	STR	6'-6"	407
A2	32	#5	STR	7'-7"	253
A3	40	#5	STR	6'-0"	250
A4	16	#5	STR	2'-2"	36
B1	44	#5	STR	6'-6"	298
B2	8	#5	STR	2'-2"	18
C1	12	#6	STR	4'-11"	89
C2	8	#6	STR	2'-10"	34
J1	58	#4	2	4'-5"	171
REINFORCING STEEL					1556 LBS.
CLASS B CONCRETE					9.0 C.Y.

NOTES

DIMENSIONS MAY BE FIELD ADJUSTED AS DIRECTED BY THE ENGINEER.

CHAMFER ALL EXPOSED CORNERS 1".

CORRUGATED STEEL PIPES SHALL BE LOCATED BY THE ENGINEER.

FOR MANHOLE FRAME AND VENTED MANHOLE GRATE, SEE SPECIAL PROVISIONS.

STRUCTURE 0539 HAS AN ADDITIONAL INLET PIPE. REINFORCING STEEL IN WALL AT LOCATION OF PIPE SHALL BE FIELD CUT AS NECESSARY FOR THE INSTALLATION OF THE PIPE. PROVIDE ADDITIONAL #4 C1 BARS AROUND PIPE.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR. ENGINEER
6E8EC2F3A40DC413...
5/12/2021

SHEET 3 OF 3

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SPECIAL DESIGN JUNCTION BOX

DRAWN BY : STM DATE : 03/21
CHECKED BY : MGC DATE : 03/21

4/13/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Structures\Special Design Junction Box\I-26_SMU_ SDJB.dgn
User:smassinople

PROJECT REFERENCE NO.	SHEET NO.
15614J075010	2D-11

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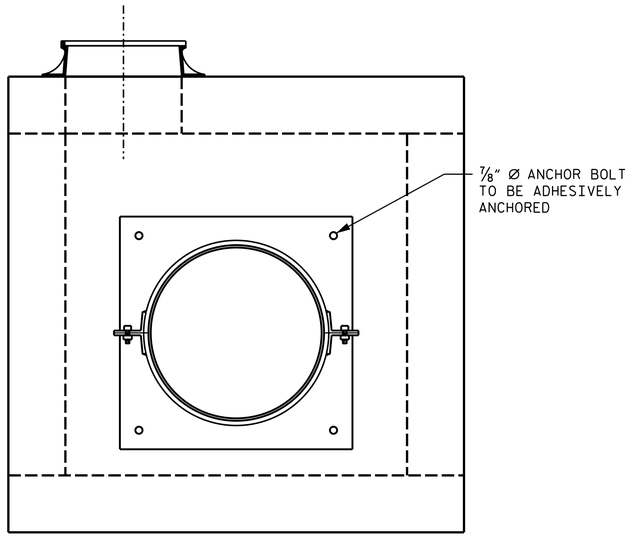
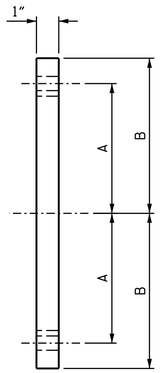
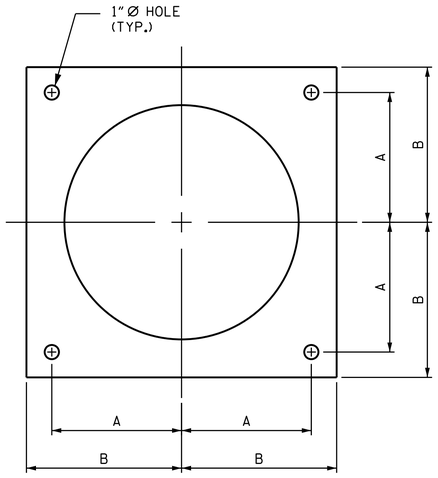
CORP. LICENSE NO.: C-0275



END ELEVATION



	18" CSP	24" CSP	30" CSP	36" CSP
DIM. A	12"	15"	18"	21"
DIM. B	15"	18"	21"	24"



MOUNTING PLATE

NOTES

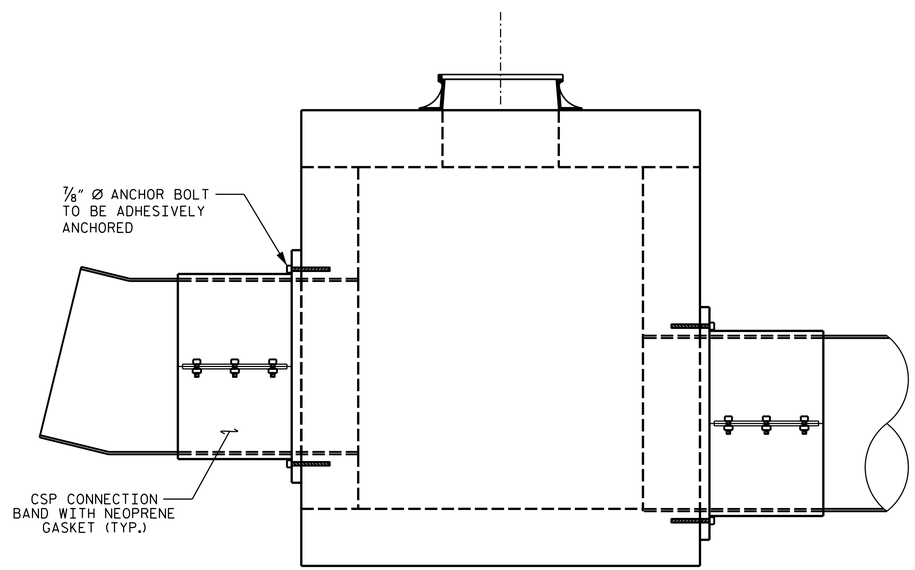
MOUNTING PLATE SHALL BE AASHTO M270 GRADE 36.

MOUNTING PLATE SURFACES SHALL BE SMOOTH AND STRAIGHT.

ADHESIVELY ANCHORED BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS GUIDELINES.

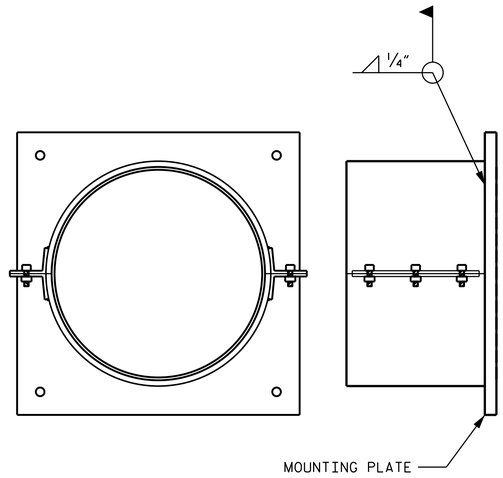
FOR SPECIAL DESIGN PIPE CONNECTION, SEE SPECIAL PROVISIONS.

ADHESIVELY ANCHORED BOLTS SHALL BE LEVEL 1 FIELD TESTED AND THE YIELD LOAD OF THE 7/8" Ø BOLT SHALL BE 4 KIPS.



SIDE ELEVATION

ELEVATION SHOWN FOR ILLUSTRATIVE PURPOSES. FOR LOCATIONS OF REQUIRED SPECIAL DESIGN PIPE CONNECTIONS, SEE DRAINAGE SUMMARY SHEETS.



CONNECTION BOND TO MOUNTING PLATE WELD DETAIL

DRAWN BY : STM DATE : 03/21
CHECKED BY : MGC DATE : 03/21

4/8/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Structures\Angle Connector\I-26_SMU_ AC.dgn
User:smassinople

SHEET 1 OF 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SPECIAL DESIGN PIPE CONNECTION

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-12

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

ENGLISH DETAIL DRAWING FOR

CONCRETE MEDIAN DROP INLET TYPE 'A' EXTRA DEPTH OVER 12' TO 25'

12" THRU 72" PIPE

SHEET 1 OF 2 — 840D17

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE DROP INLETS 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.

WHEN PAYMENT FOR THE DROP INLET IS MADE ON A PER EACH BASIS, THE CONCRETE APRON WILL BE CONSIDERED PART OF THE DROP INLET.

CONSTRUCT WITH PIPE CROWNS MATCHING.

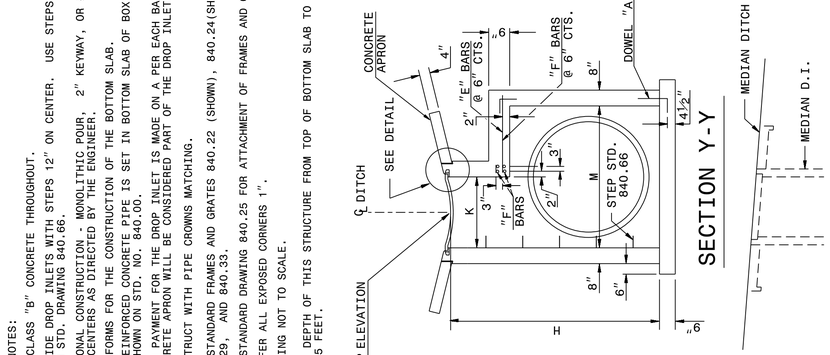
USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20, 840.29, AND 840.33.

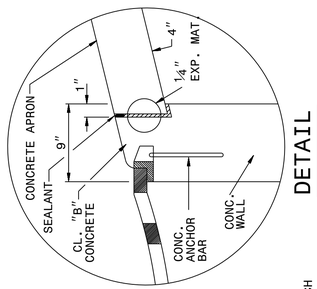
SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.

CHAMFER ALL EXPOSED CORNERS 1".

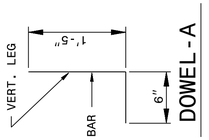
DRAWING NOT TO SCALE.

MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 25 FEET.

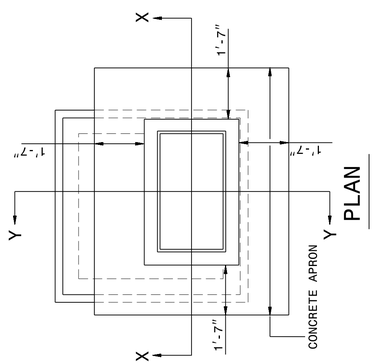


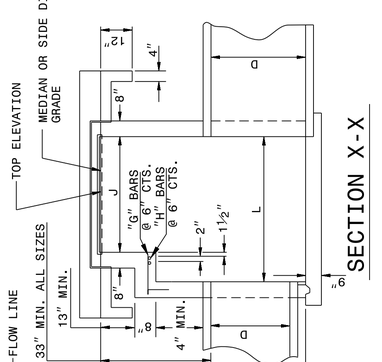


DETAIL
(APRON SUPPORT NOTCH)



DOWEL-A





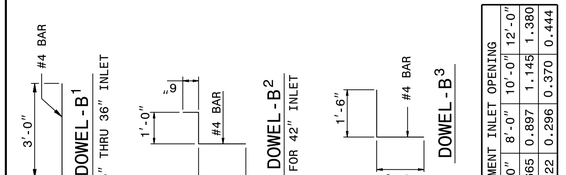
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

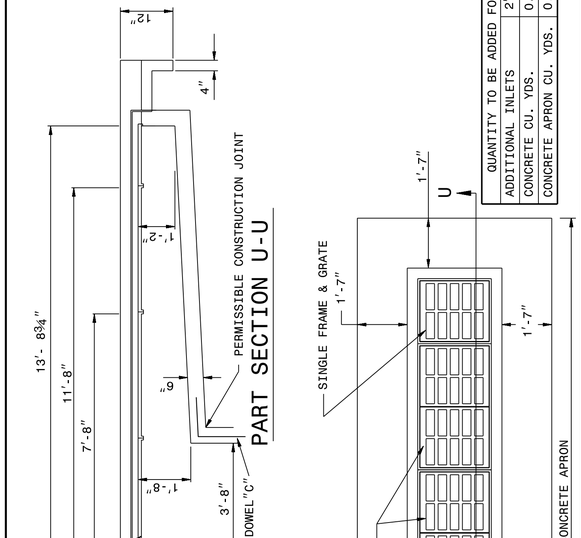
ENGLISH DETAIL DRAWING FOR

CONCRETE MEDIAN DROP INLET TYPE 'A' EXTRA DEPTH OVER 12' TO 25'

12" THRU 72" PIPE

SHEET 2 OF 2 — 840D17





QUANTITY TO BE ADDED FOR EACH 2' INCREMENT INLET OPENING

	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	12'-0"
ADDITIONAL INLETS						
CONCRETE CU. YDS.	0.191	0.417	0.665	0.897	1.145	1.380
CONCRETE APRON CU. YDS.	0.074	0.148	0.222	0.296	0.370	0.444

MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE GRATED DROP INLET(BASED ON MIN. HEIGHT, H)

DIMENSIONS OF BOX AND PIPE						REINFORCING STEEL - NO. 4 BARS									CU YDS CONC. IN BOX			DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	SPAN	WIDTH	HEIGHT	BARS E		BARS F		BARS G		BARS H		TOTAL LBS.	BOTTOM SLAB	H TOTAL	H PER FT HT	APRON	TOTAL	C.S.	R.C.
D	J	K	L	M	H	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH								
12"	3'-8"	2'-0"	3'-8"	2'-0"	3'-9"	—	—	—	—	—	—	—	—	—	0.362	0.926	0.247	0.395	1.683	0.015	0.024
15"	3'-8"	2'-0"	3'-8"	2'-0"	4'-0"	—	—	—	—	—	—	—	—	—	0.362	0.988	0.247	0.395	1.745	0.023	0.036
18"				2'-0"	4'-3"	—	—	—	—	—	—	—	—	—	0.362	1.050	0.247		1.807	0.033	0.049
24"				2'-10"	4'-9"	8	1'-5"	6	4'-9"	—	—	—	—	27	0.444	1.362	0.278		2.201	0.059	0.085
30"			3'-8"	3'-5"	5'-3"	8	2'-0"	7	4'-9"	—	—	—	—	33	0.502	1.644	0.288		2.541	0.092	0.127
36"			4'-0"	4'-0"	5'-9"	8	2'-5"	8	4'-11"	4	0'-9"	2	4'-11"	47	0.560	1.931	0.321		2.920	0.132	0.178
42"			4'-10"	4'-10"	6'-3"	10	3'-1"	9	5'-7"	3	1'-5"	3	5'-7"	67	0.704	2.500	0.370		3.677	0.180	0.243
48"			5'-4"	5'-4"	6'-9"	11	3'-7"	10	6'-1"	4	1'-11"	4	6'-1"	87	0.823	3.013	0.407		4.315	0.235	0.317
54"			6'-0"	6'-0"	7'-3"	12	4'-1"	11	6'-7"	5	2'-5"	5	6'-7"	107	0.951	3.589	0.444		5.072	0.297	0.401
60"			6'-6"	6'-6"	7'-9"	13	4'-9"	12	7'-3"	6	3'-1"	6	7'-3"	135	1.311	4.539	0.494		6.170	0.367	0.495
66"			7'-2"	7'-2"	8'-3"	14	5'-4"	14	7'-10"	7	3'-7"	7	7'-10"	168	1.136	5.061	0.537		6.901	0.444	0.599
72"	3'-8"	2'-0"	7'-8"	7'-8"	8'-9"	15	5'-11"	15	8'-5"	4	4'-3"	8	8'-5"	199	1.500	5.860	0.580	0.395	7.868	0.528	0.713

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

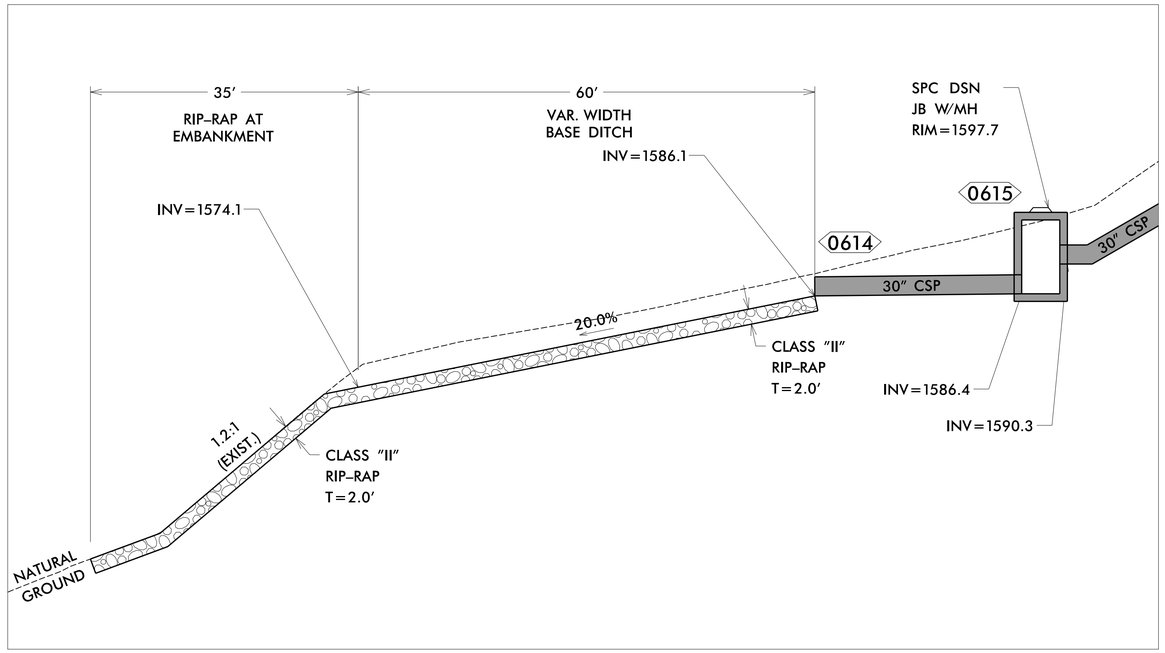
SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD.840.17 DATE:
MODIFIED BY: K.A. KEMPF DATE: 07-06-09
CHECKED BY: DATE:
FILE SPEC.: /stand/840d17 Extra Depth 2GI.dgn

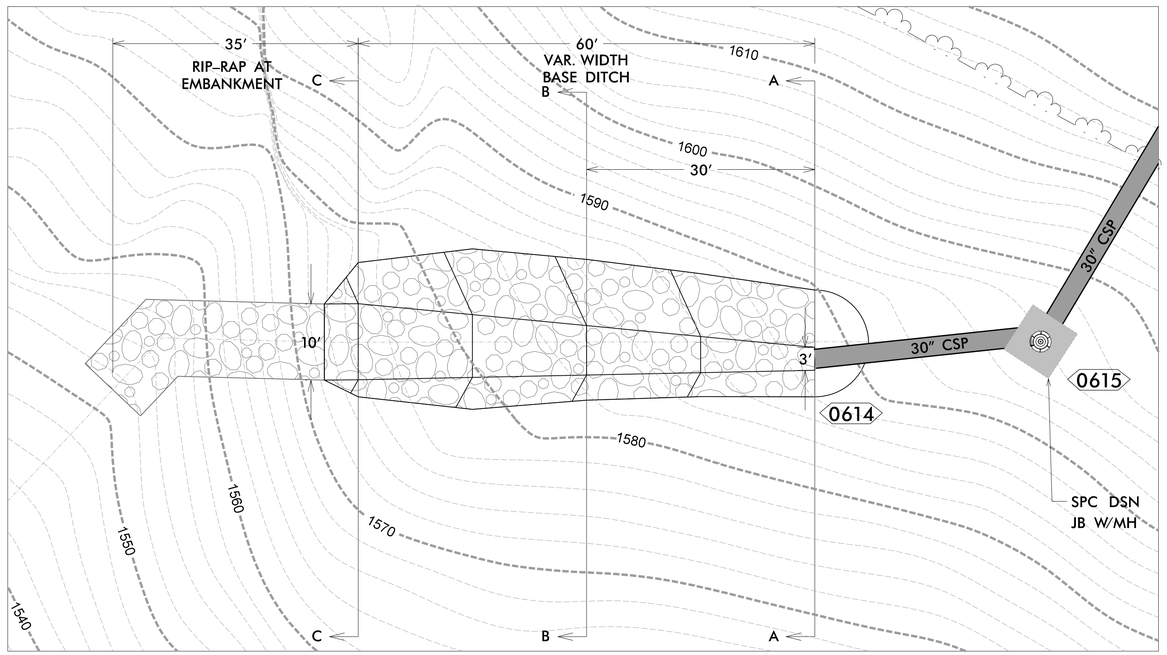
01-MAR-2018 07:39
S:\Contracts\Special Details\erickard\usr\details\stand\840d17 Extra Depth 2GI.dgn
jhowerton AT CSD-292995

VARIABLE WIDTH BASE DITCH –HGR– 52+75 LT

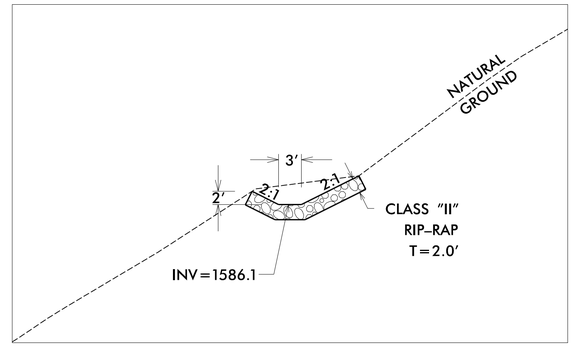
(NOT TO SCALE)



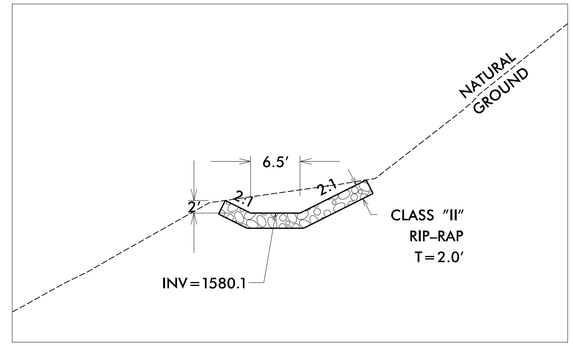
PROFILE VIEW



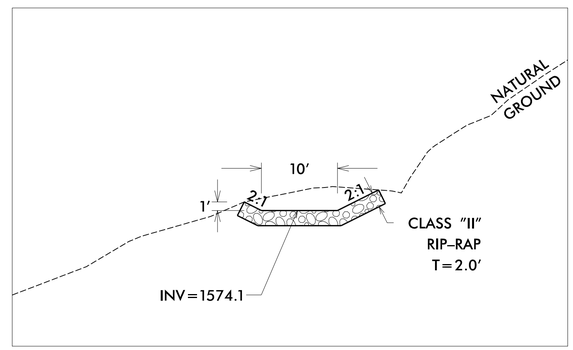
PLAN VIEW



SECTION A–A



SECTION B–B



SECTION C–C

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-13
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

9/11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

REVISIONS

8/17/99

4/6/2021
X:\NCDOT\11-26 Howard Gap Rd Rehab\Drainage\11-26 Howards Gap_Hyd_Var_Base_Ditch_PSH.dgn
User:benhenegar

8/17/99

ENERGY DISSIPATOR BASIN #1 –HGR– 37+50 LT

SHEET 1 OF 3

(NOT TO SCALE)

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-14
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

4/1/2021

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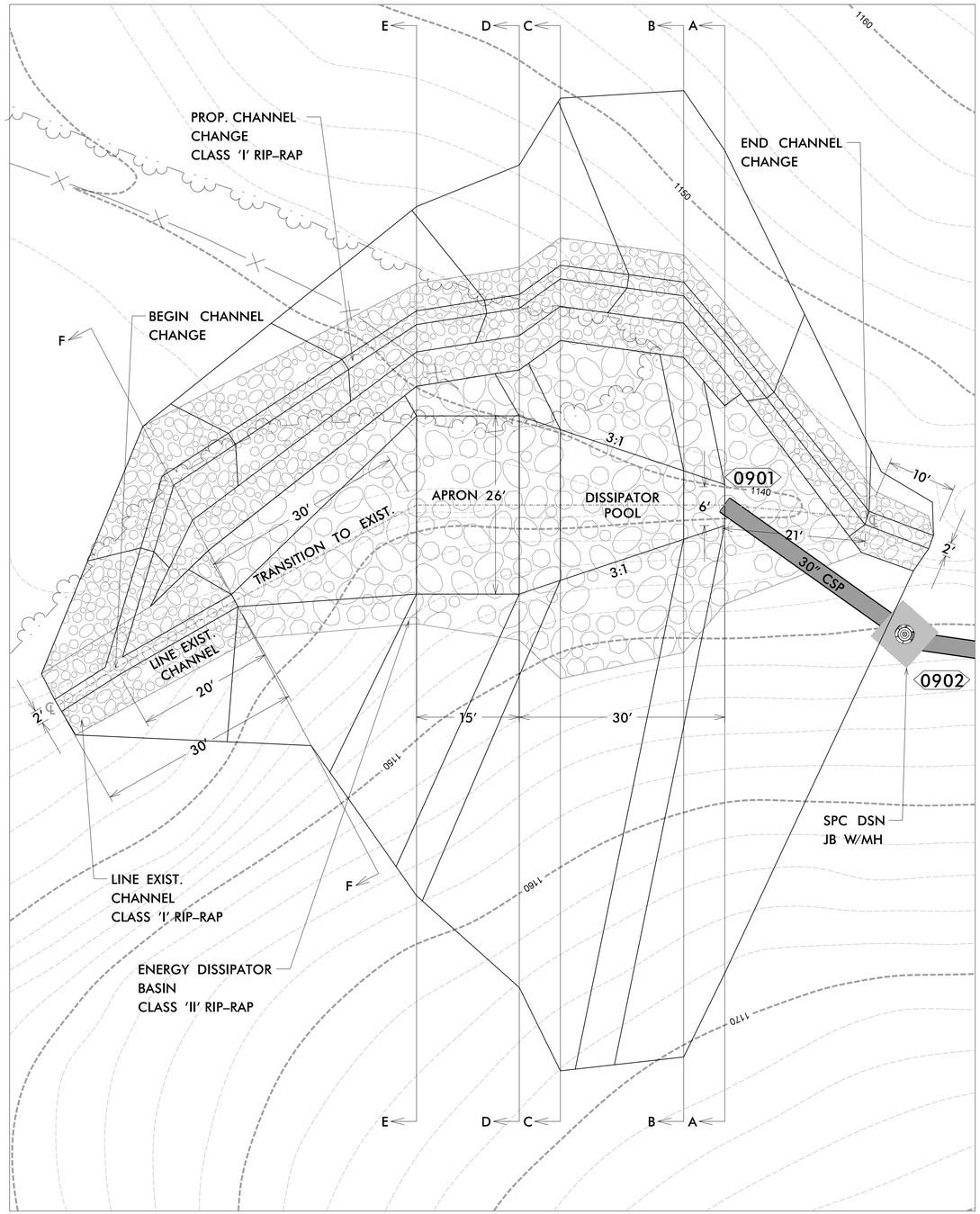
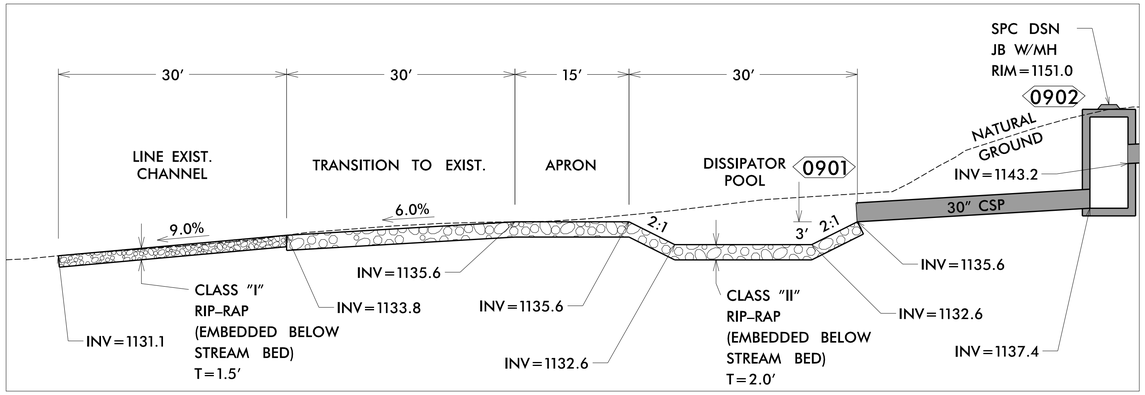
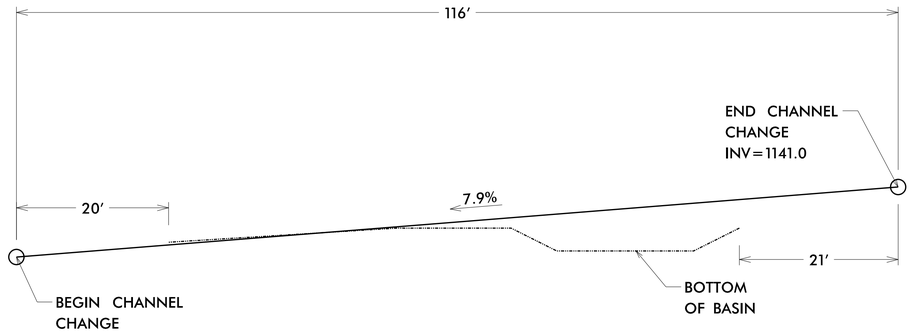
TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



PLAN VIEW



PROFILE VIEW



NOTES:

1. A 2' BASE CHANNEL WILL BE FORMED AROUND THE BASIN AND LINED WITH CLASS 'I' RIP-RAP (EMBEDDED BELOW THE PROPOSED STREAM BED).
2. DISTANCES SHOWN ABOVE ARE MEASURED ALONG THE CENTERLINE OF THE BASIN.

PROPOSED CHANNEL CHANGE PROFILE

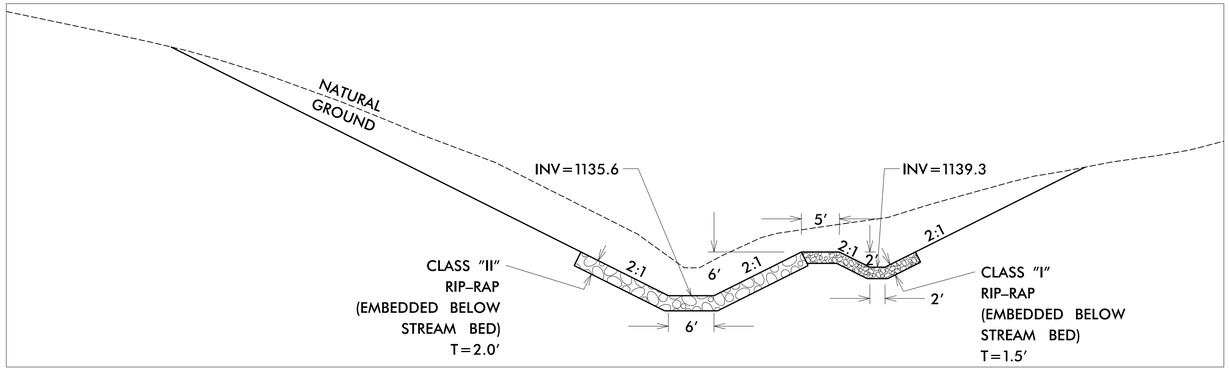
4/6/2021
X:\NC001\1-26 Howard Gap Rd Rehab\Drainage\1-26 Howards Gap_Hyd_Basin_1_PSH.dgn
User:bhenegar

8/17/99

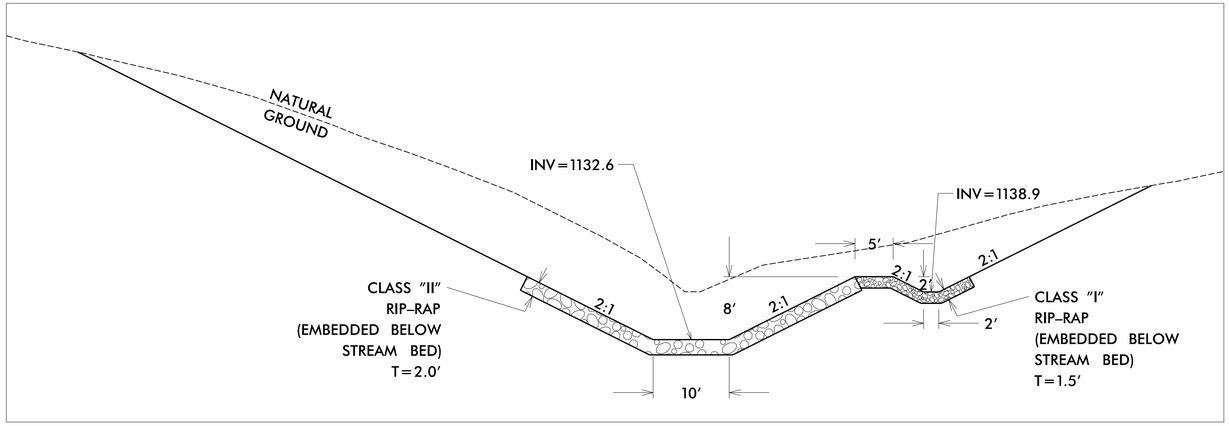
ENERGY DISSIPATOR BASIN #1 –HGR– 37+50 LT

SHEET 2 OF 3

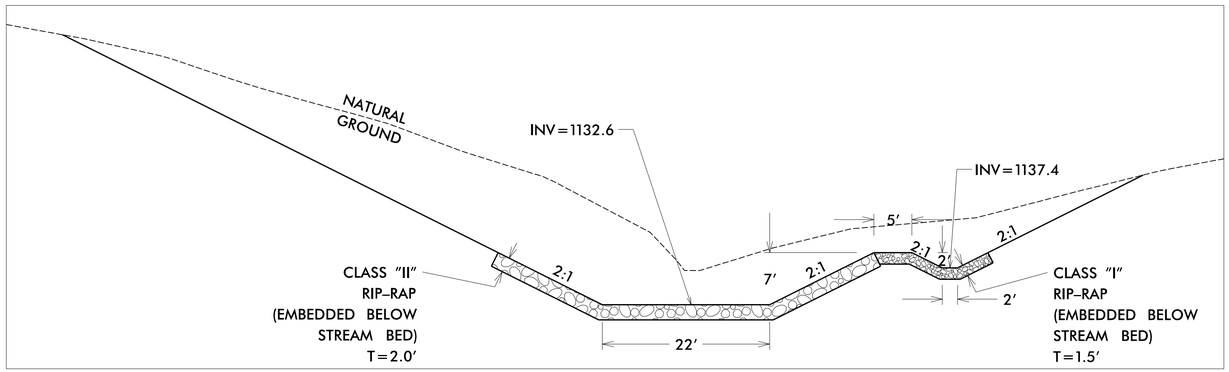
(NOT TO SCALE)



SECTION A–A



SECTION B–B



SECTION C–C

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-15
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

4/21/2021

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TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

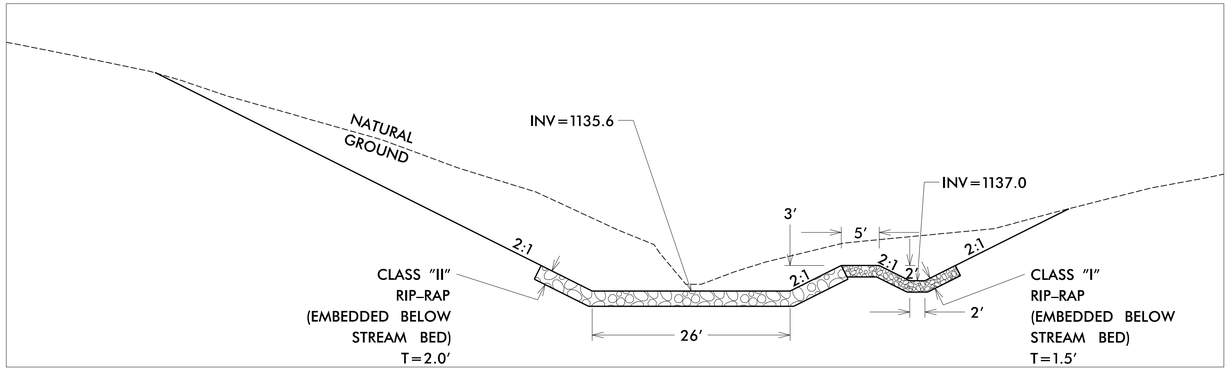
4/6/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_Basin_1_PSH.dgn
bjhenegar

8/17/99

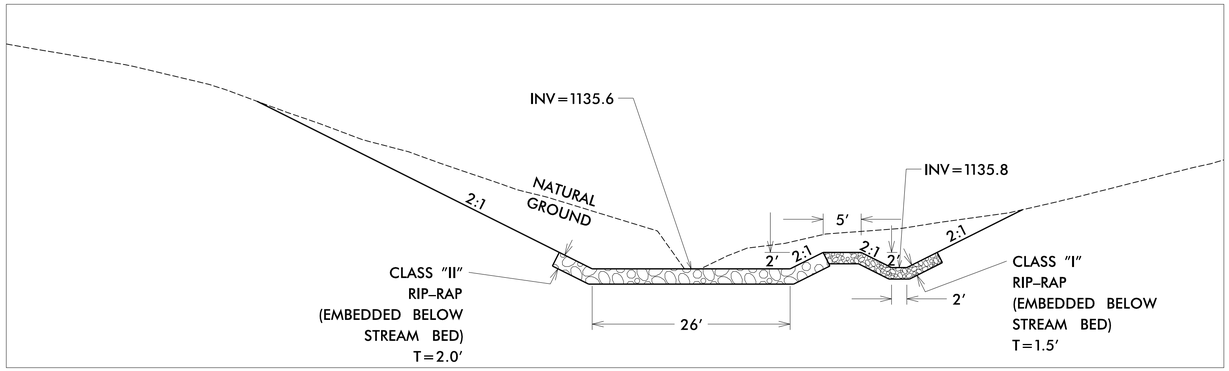
ENERGY DISSIPATOR BASIN #1 –HGR– 37+50 LT

SHEET 3 OF 3

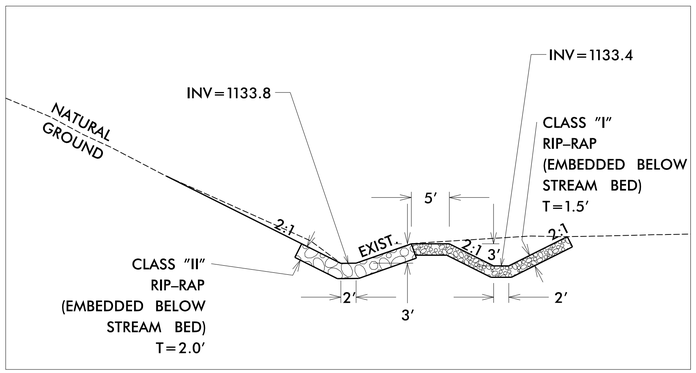
(NOT TO SCALE)



SECTION D–D



SECTION E–E



SECTION F–F

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-16
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

Benjamin J. Henegar

9/11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

4/7/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_Basin_1_PSH.dgn
User:bhenegar

8/17/99

FOREBAY #1 –I26– 453+30 RT

SHEET 1 OF 2
(NOT TO SCALE)

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-17
R/W SHEET NO.	

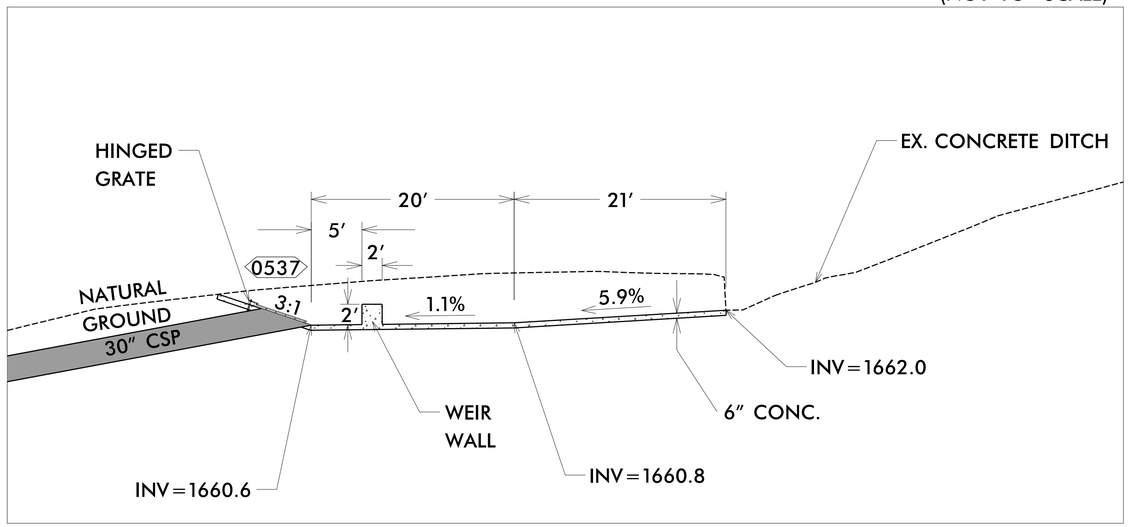
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 BENJAMIN J. HENEGAR

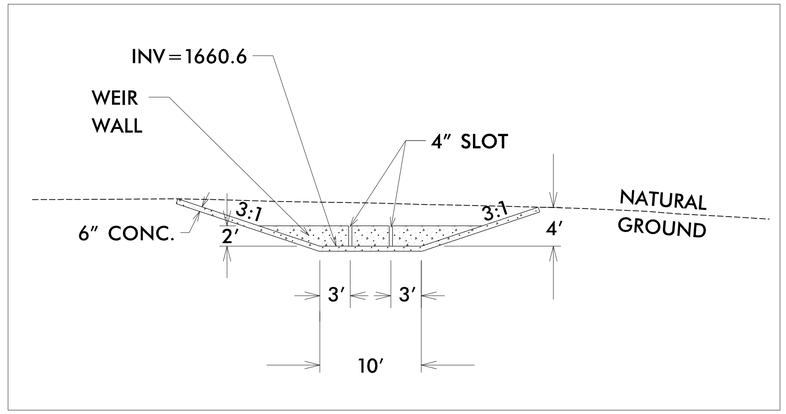
Benjamin J. Henegar
4/7/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

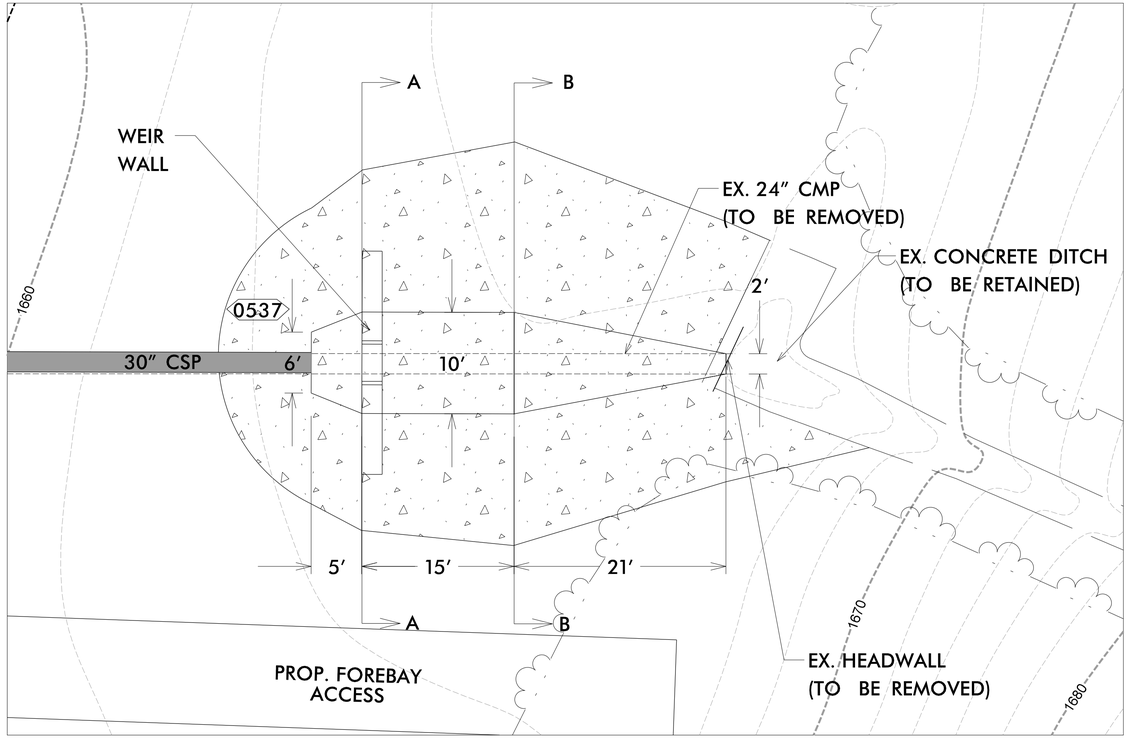
TGS ENGINEERS
804–C N LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275



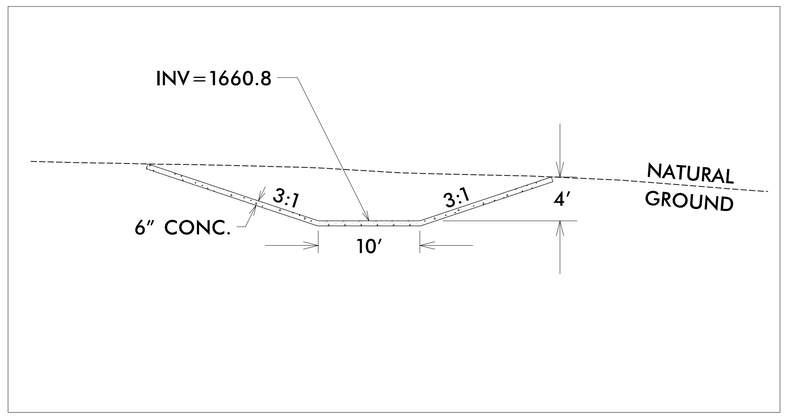
PROFILE VIEW



SECTION A–A



PLAN VIEW



SECTION B–B

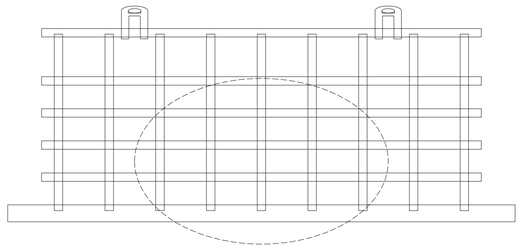
4/7/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_Forebay_1.PSH.dgn
bjhenegar

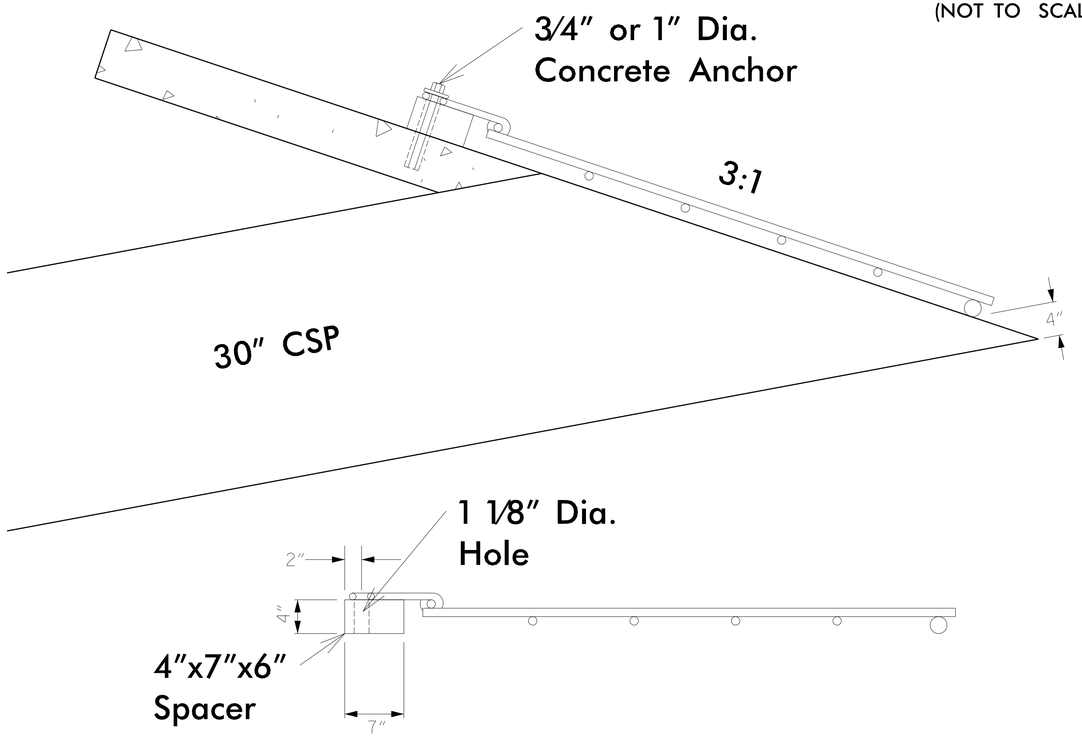
8/17/99

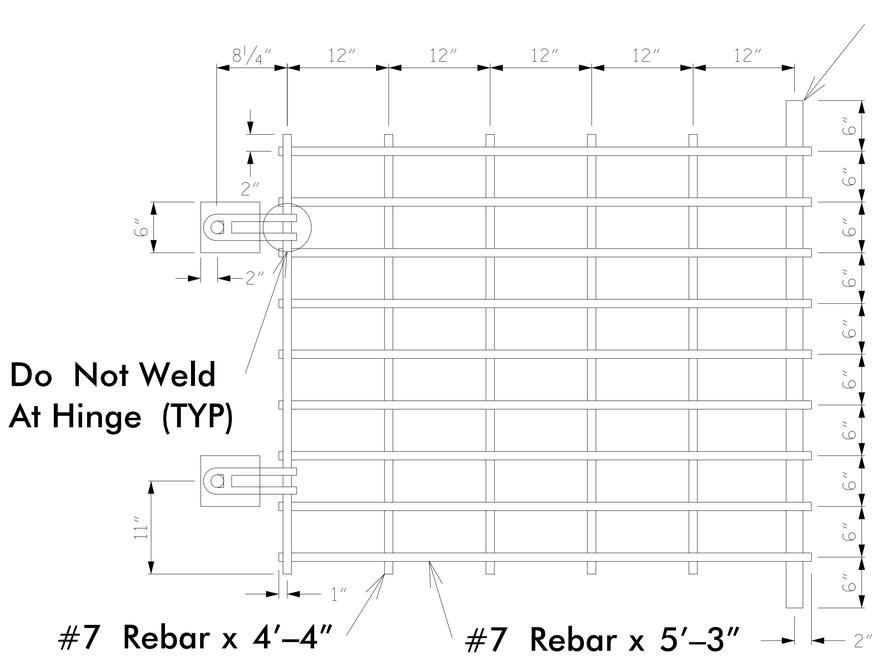
FOREBAY #1 –I26– 453+30 RT

SHEET 2 OF 2
(NOT TO SCALE)

Hinged Grate
30" Pipe
3:1 Slope







HINGED GRATE NOTES:

1. ALL JOINTS, EXCEPT AS NOTED, SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. GRATE SHALL BE REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A–153.
3. SPACER SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, HOT–DIP GALVANIZE SPACER IN ACCORDANCE WITH AASHTO M111.
4. USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A 3/4" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.
5. USE ANCHORS GALVANIZED IN ACCORDANCE WITH ASTM A–153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.
6. FOR HINGED GRATE, SEE SPECIAL PROVISIONS.

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-18
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA ENGINEERING SEAL 044158 BENJAMIN J. HENEGAR

4/12/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

8/17/99

FOREBAY #2 –I26– 455+20 RT

SHEET 1 OF 2

(NOT TO SCALE)

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-19
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

5/11/2021

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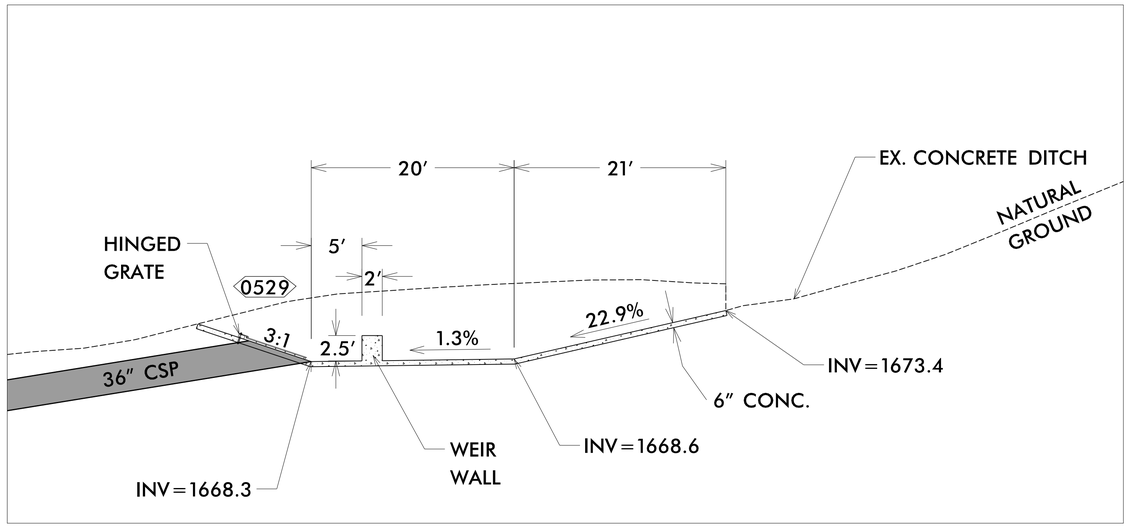
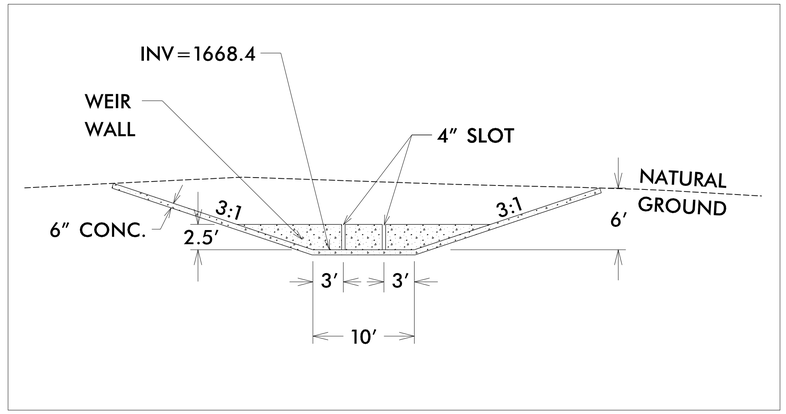
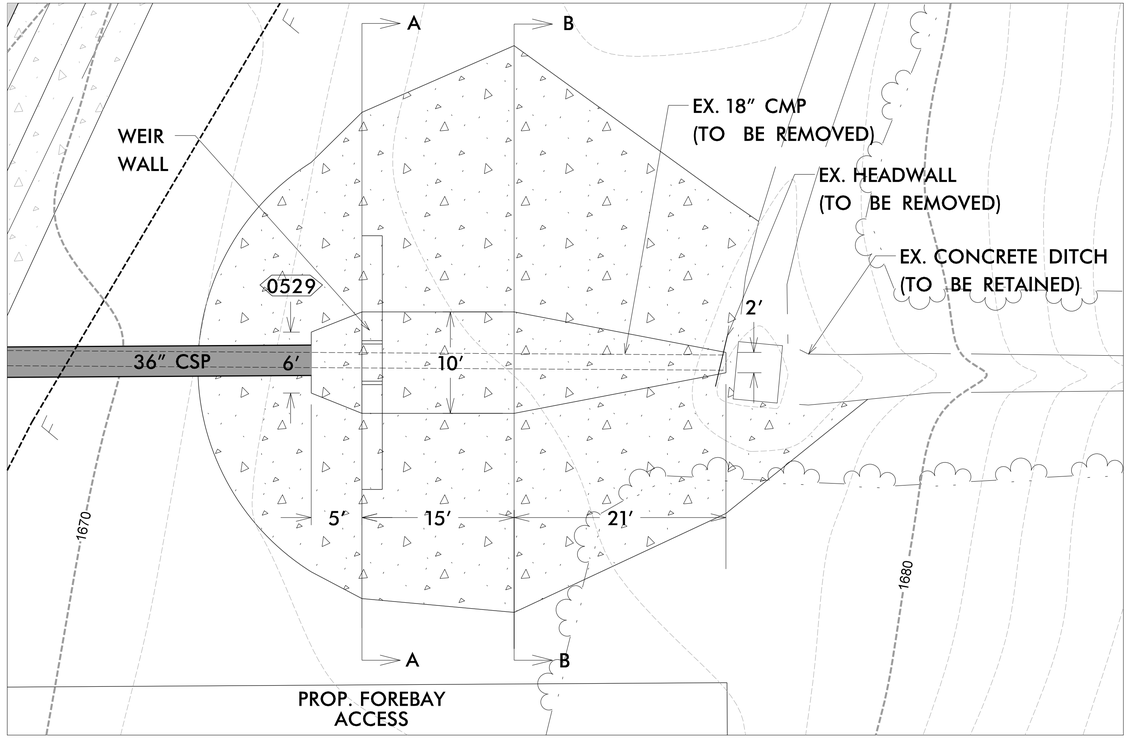
TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275



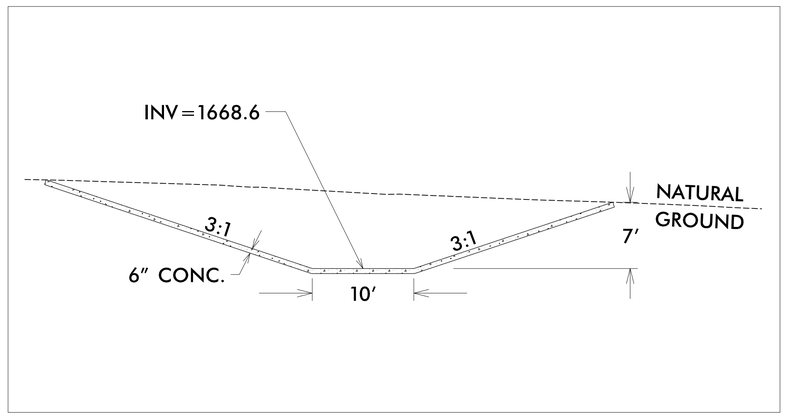
PROFILE VIEW



SECTION A–A



PLAN VIEW



SECTION B–B

4/7/2021
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jsorrisengar

8/17/99

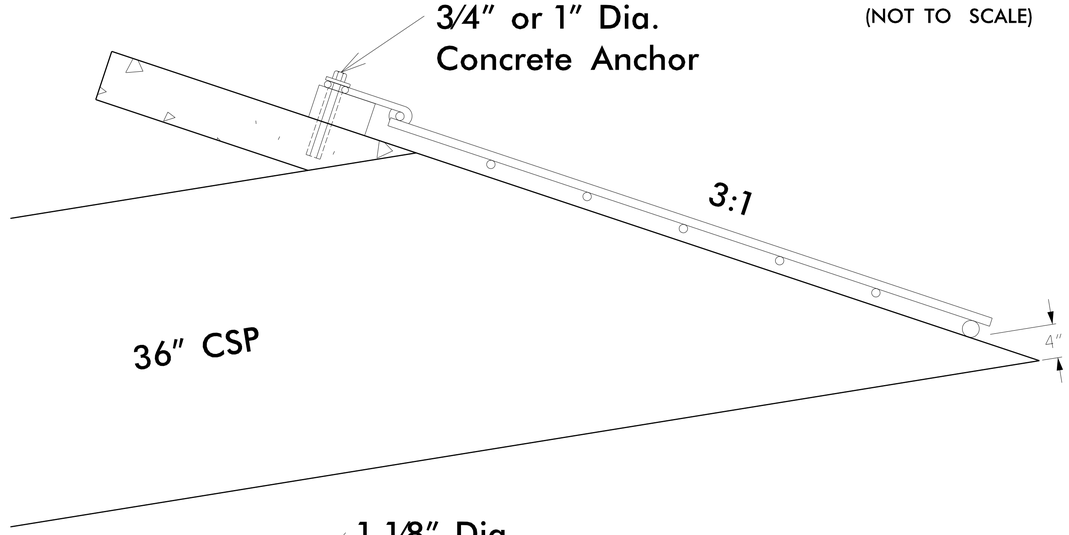
FOREBAY #2 –I26– 455+20 RT

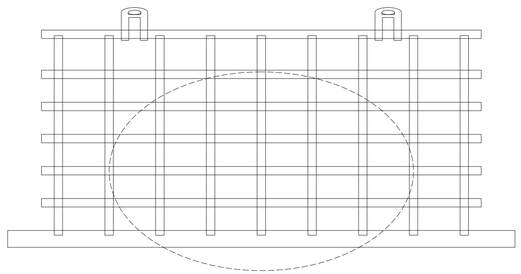
SHEET 2 OF 2

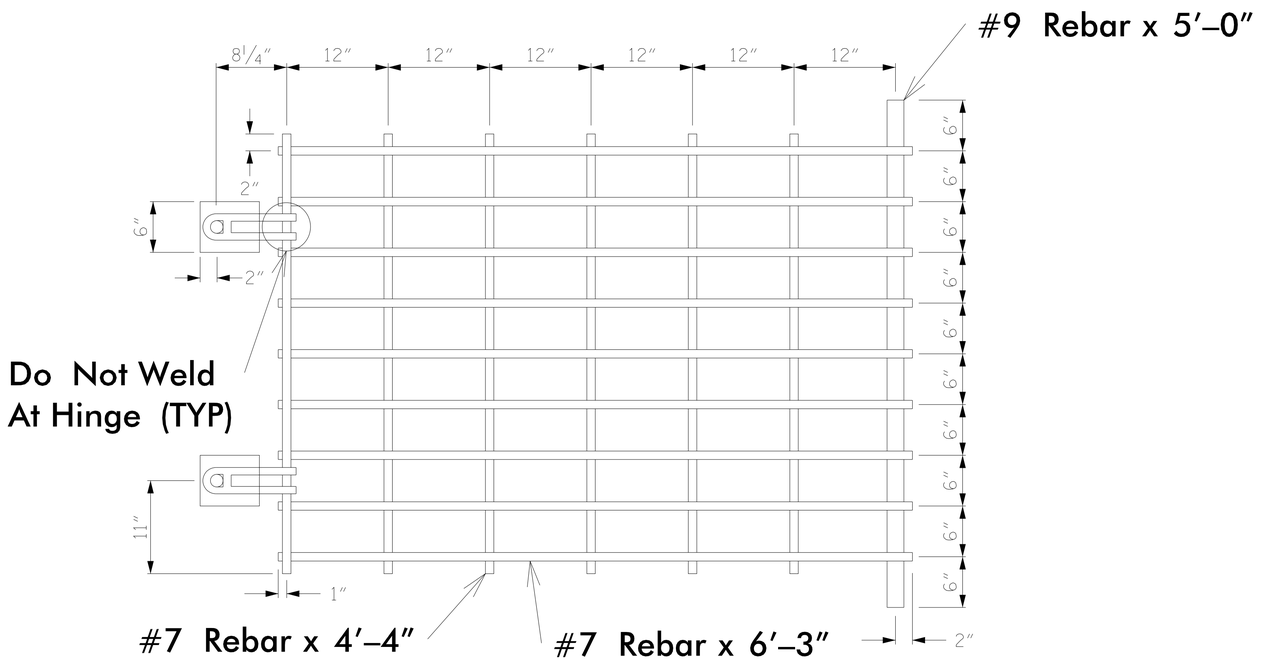
(NOT TO SCALE)

Hinged Grate

36" Pipe
3:1 Slope







HINGED GRATE NOTES:

1. ALL JOINTS, EXCEPT AS NOTED, SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. GRATE SHALL BE REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A–153.
3. SPACER SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, HOT–DIP GALVANIZE SPACER IN ACCORDANCE WITH AASHTO M111.
4. USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A 3/4" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.
5. USE ANCHORS GALVANIZED IN ACCORDANCE WITH ASTM A–153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.
6. FOR HINGED GRATE, SEE SPECIAL PROVISIONS.

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-20
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

5/11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

4/7/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_Forebay_2_PSH.dgn
User:benegar

8/17/99

FOREBAY #3 –I26– 463+30 RT

SHEET 1 OF 3
(NOT TO SCALE)

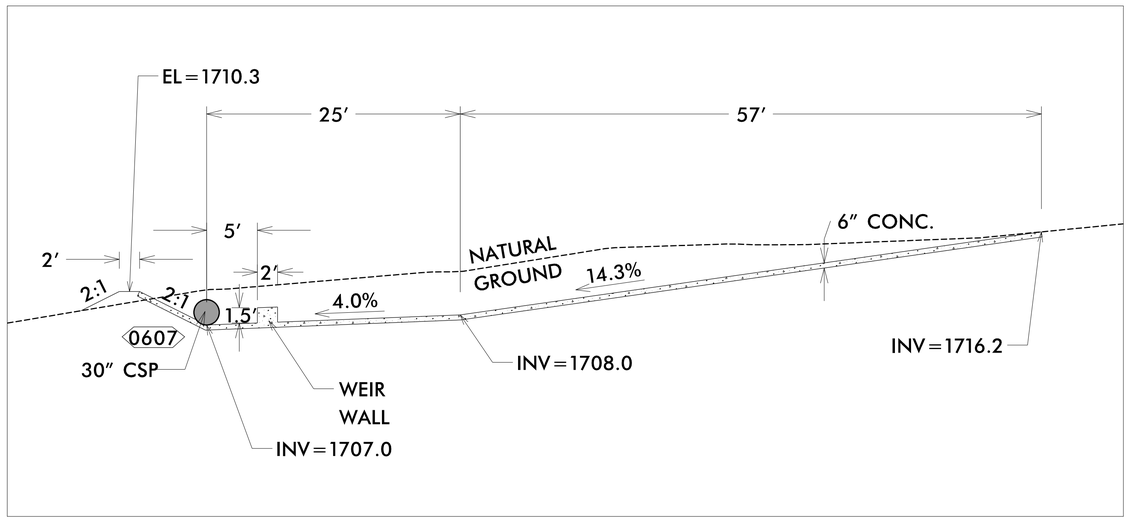
PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-21
R/W SHEET NO.	

HYDRAULICS ENGINEER

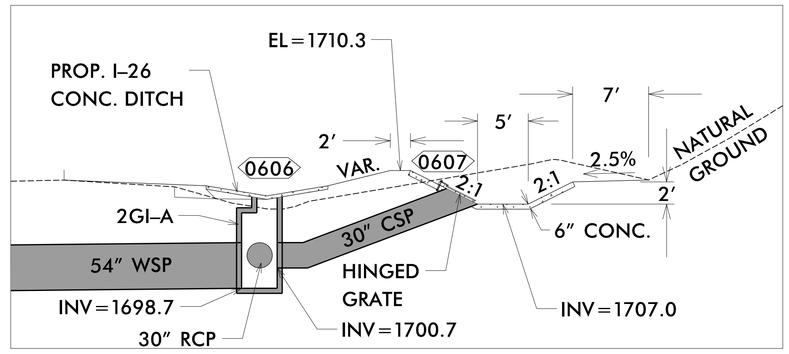
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR
4/21/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

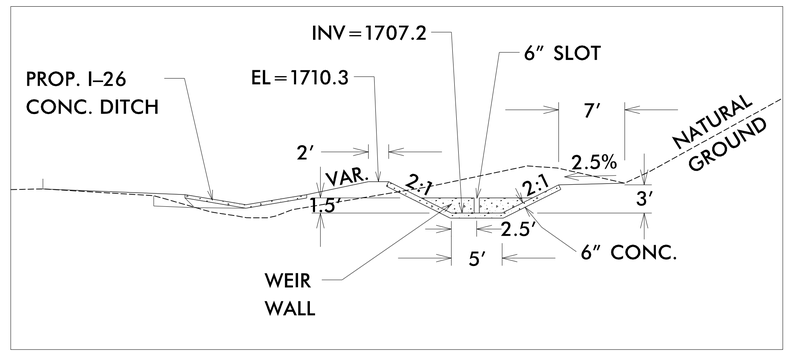
TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275



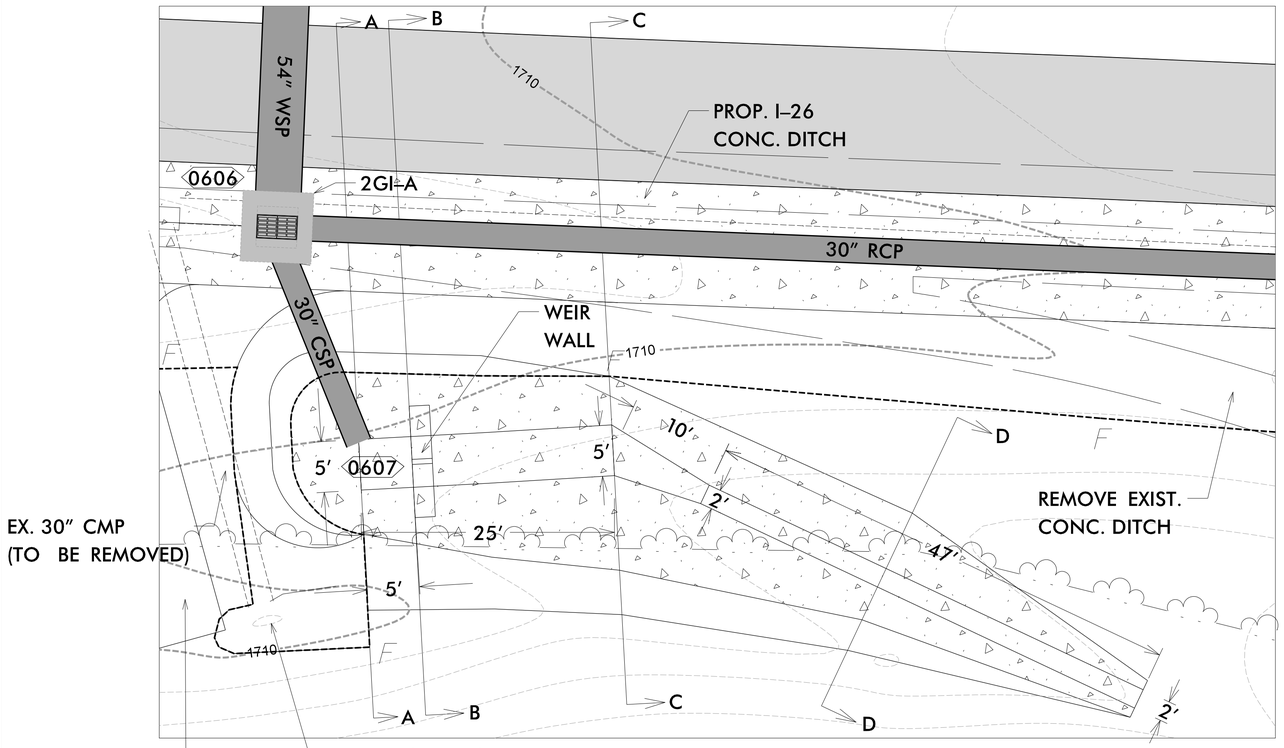
PROFILE VIEW



SECTION A–A



SECTION B–B



PLAN VIEW

8/17/99

FOREBAY #3 –I26– 463+30 RT

SHEET 2 OF 3
(NOT TO SCALE)

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-22
R/W SHEET NO.	

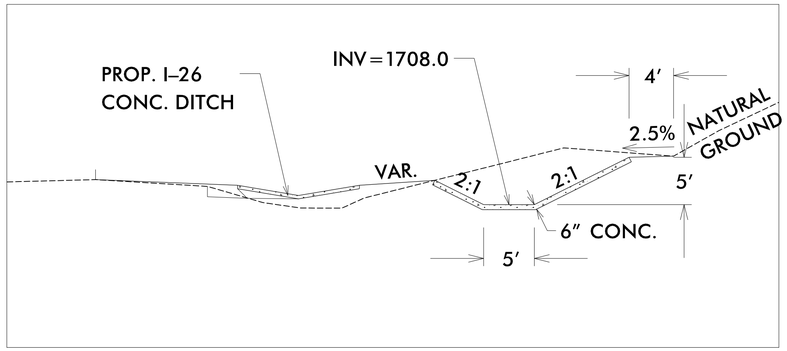
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

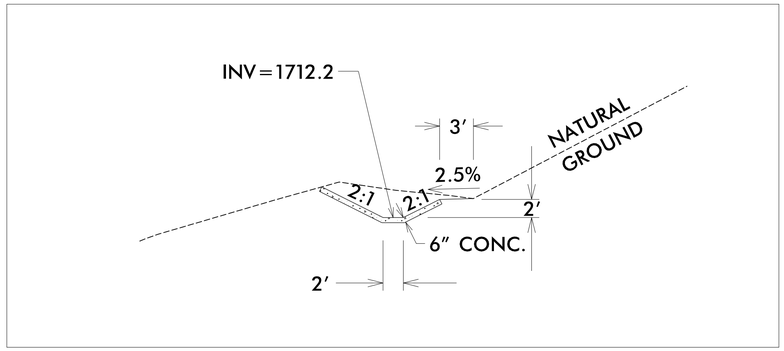
7/12/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275



SECTION C–C



SECTION D–D

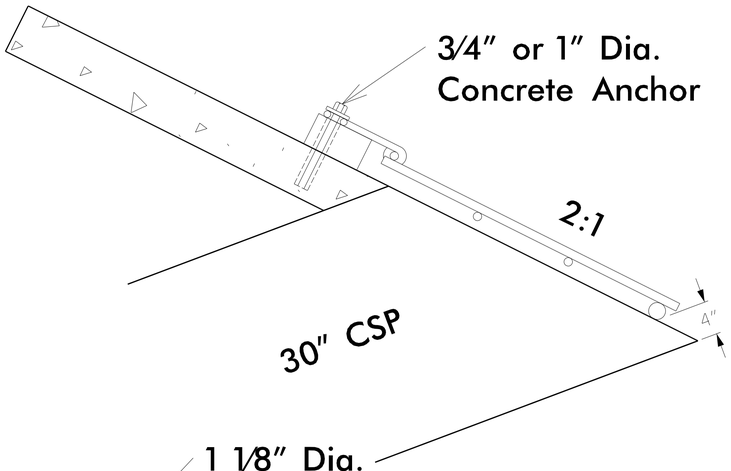
4/1/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_Forebay_3_PSH.dgn
User:bhenegar

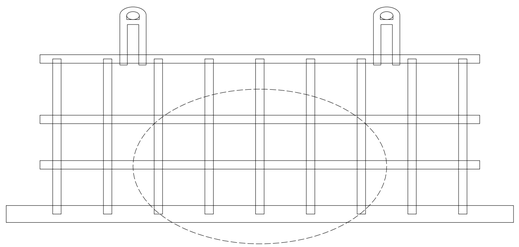
8/17/99

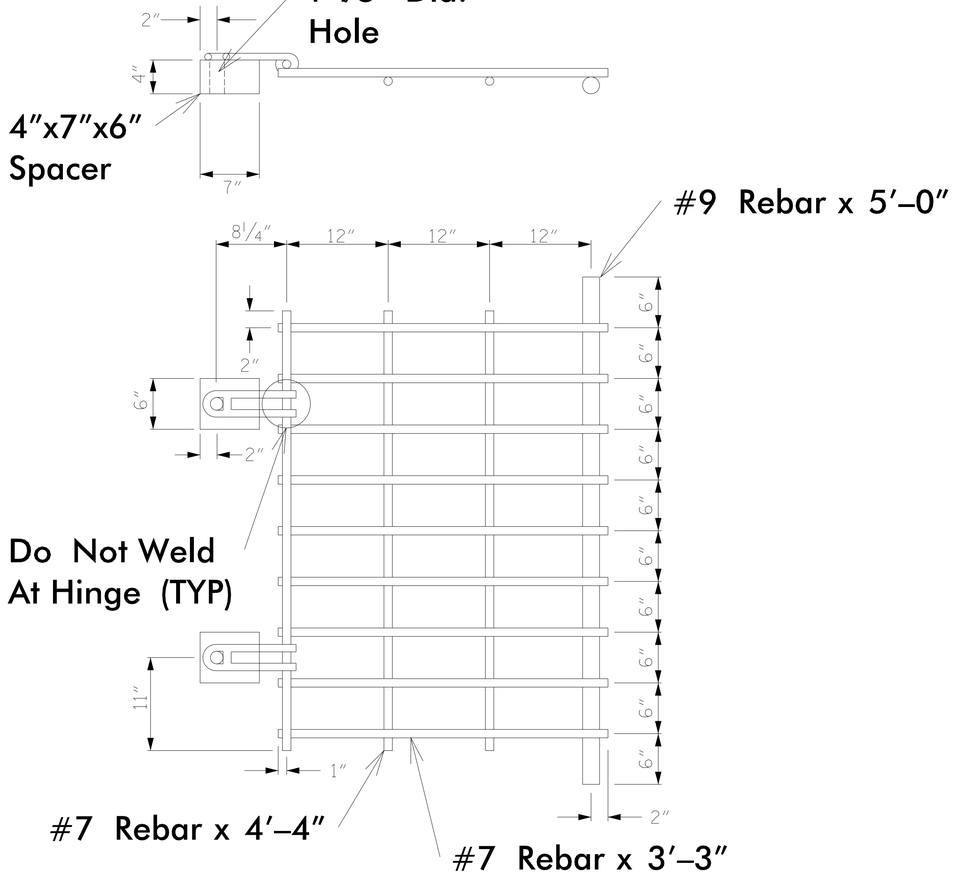
FOREBAY #3 –I26– 463+30 RT

SHEET 3 OF 3
(NOT TO SCALE)

Hinged Grate
30" Pipe
2:1 Slope







HINGED GRATE NOTES:

1. ALL JOINTS, EXCEPT AS NOTED, SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. GRATE SHALL BE REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A–153.
3. SPACER SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, HOT–DIP GALVANIZE SPACER IN ACCORDANCE WITH AASHTO M111.
4. USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A 3/4" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.
5. USE ANCHORS GALVANIZED IN ACCORDANCE WITH ASTM A–153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.
6. FOR HINGED GRATE, SEE SPECIAL PROVISIONS.

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-23
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

5/11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-24
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

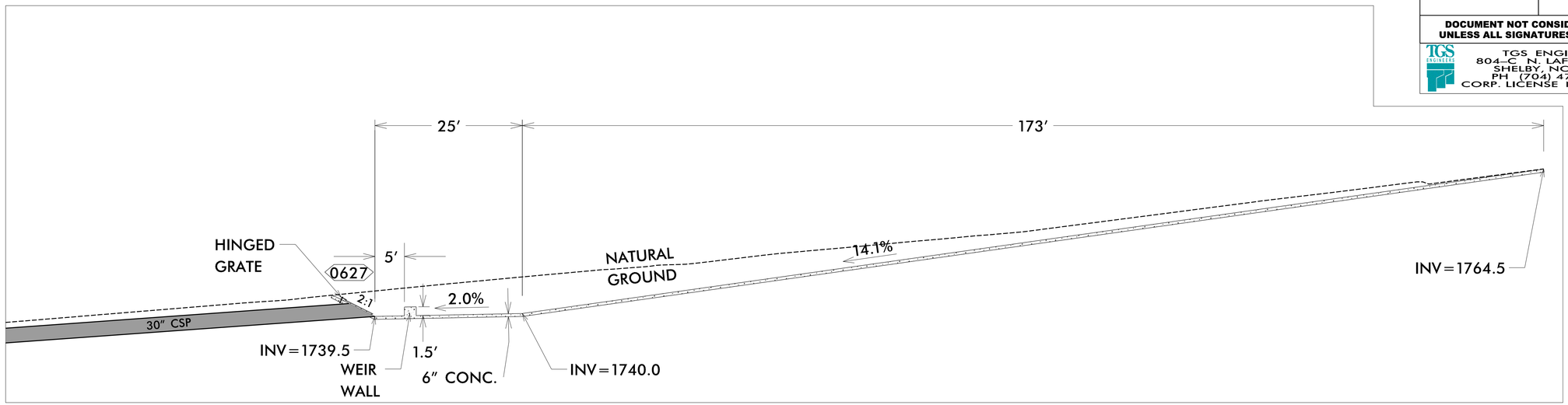
4/7/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

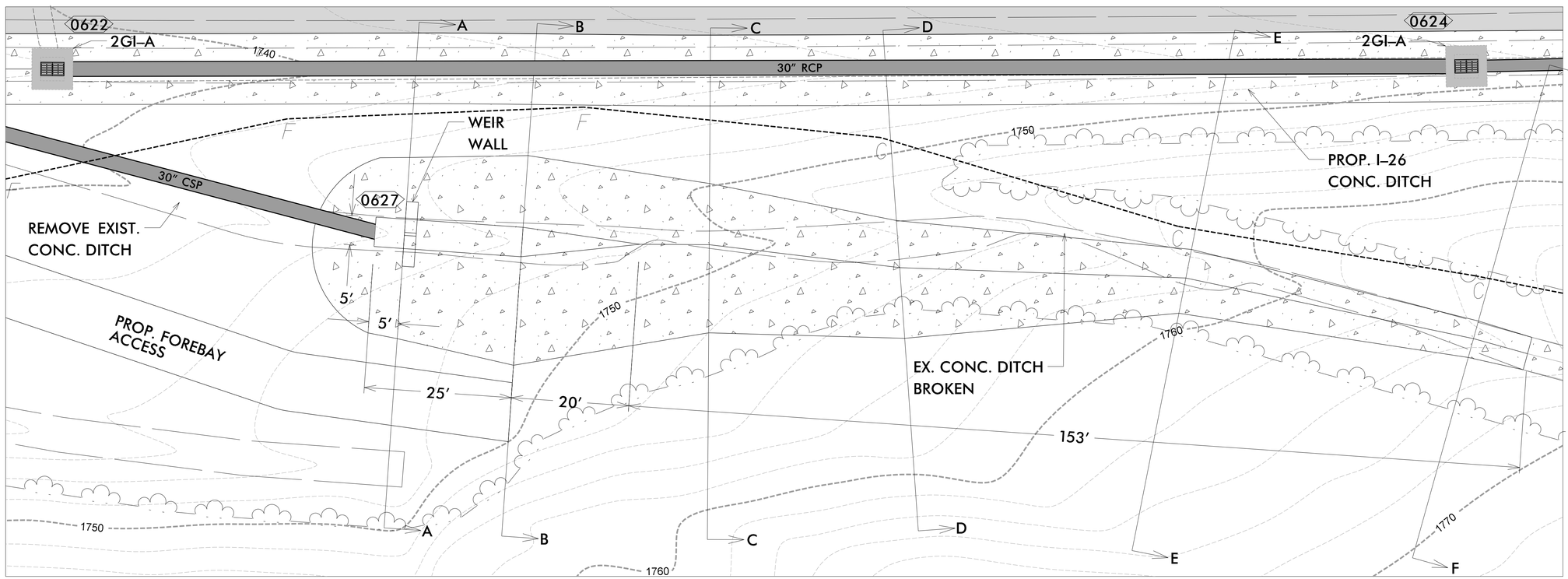
TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

FOREBAY #4 –I26– 470+65 RT

SHEET 1 OF 3
(NOT TO SCALE)



PROFILE VIEW



PLAN VIEW

4/7/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_Forebay_4_PSH.dgn
User:bhenegar

8/17/99

FOREBAY #4 –I26– 470+65 RT

SHEET 2 OF 3
(NOT TO SCALE)

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-25
R/W SHEET NO.	

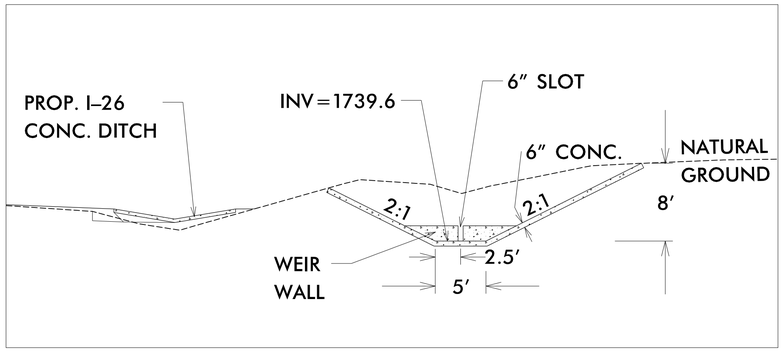
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

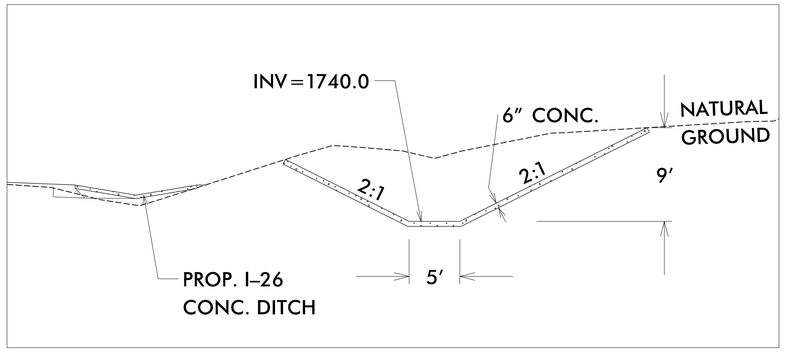
4/21/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

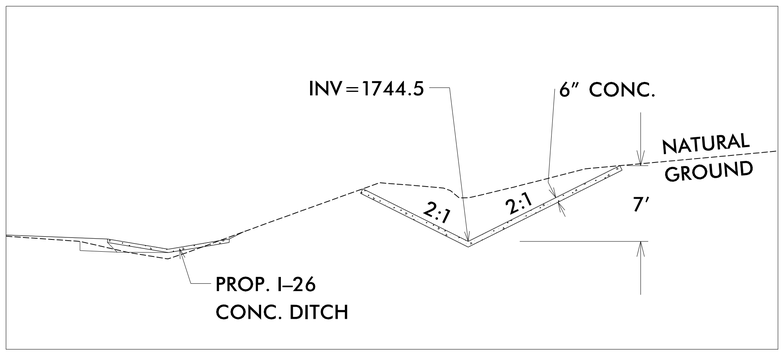
TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275



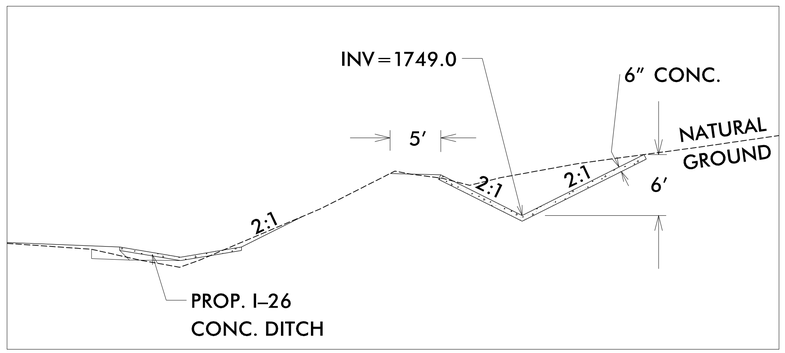
SECTION A–A



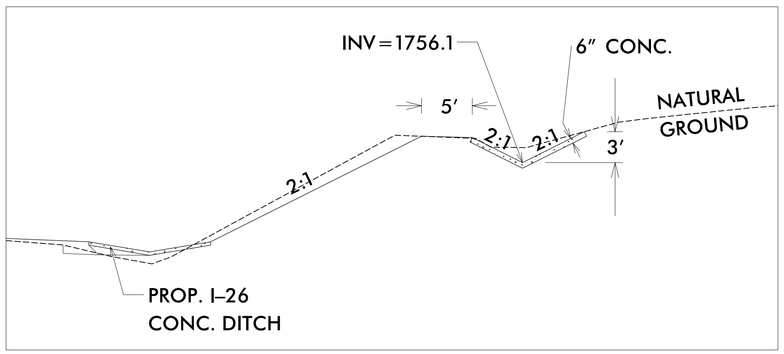
SECTION B–B



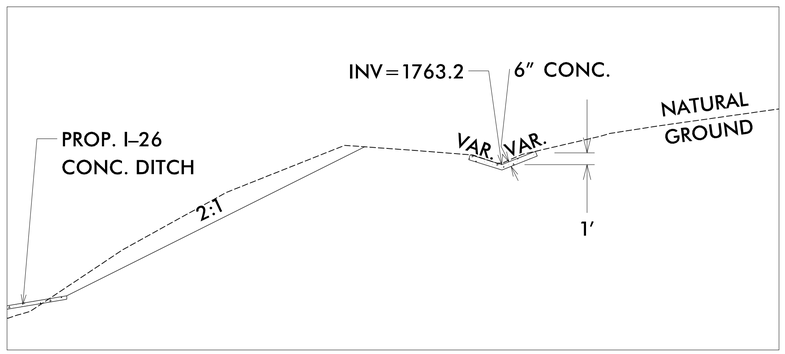
SECTION C–C



SECTION D–D



SECTION E–E



SECTION F–F

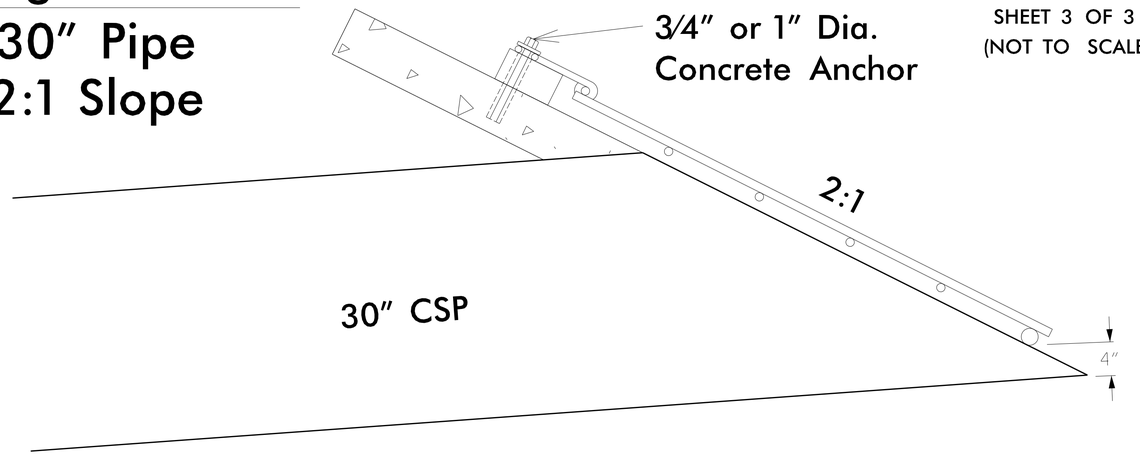
8/17/99

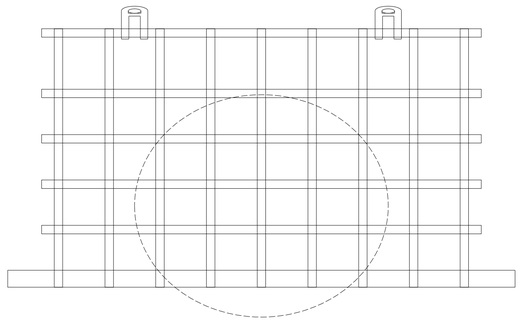
Hinged Grate

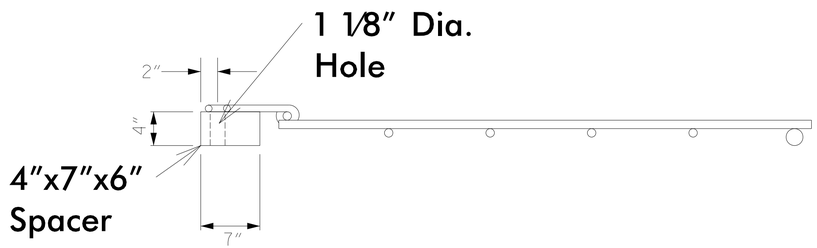
30″ Pipe
2:1 Slope

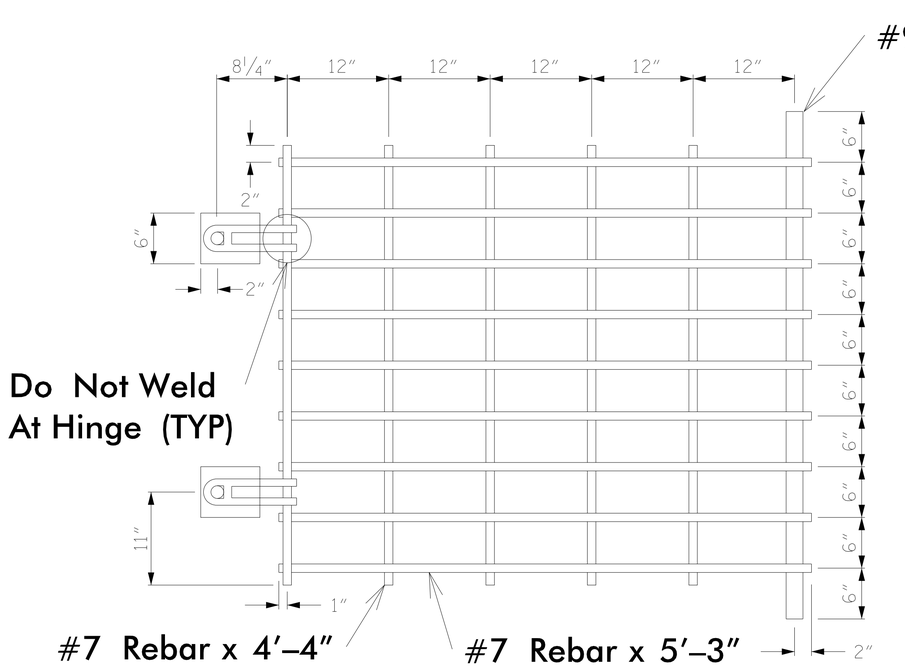
FOREBAY #4 –I26– 470+65 RT

SHEET 3 OF 3
(NOT TO SCALE)









HINGED GRATE NOTES:

1. ALL JOINTS, EXCEPT AS NOTED, SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4″ BEAD.
2. GRATE SHALL BE REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A–153.
3. SPACER SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, HOT–DIP GALVANIZE SPACER IN ACCORDANCE WITH AASHTO M111.
4. USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A 3/4″ OR 1″ DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.
5. USE ANCHORS GALVANIZED IN ACCORDANCE WITH ASTM A–153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.
6. FOR HINGED GRATE, SEE SPECIAL PROVISIONS.

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-26
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR
4/1/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

FOREBAY #5 –I26– 481+70 RT

SHEET 1 OF 3
(NOT TO SCALE)

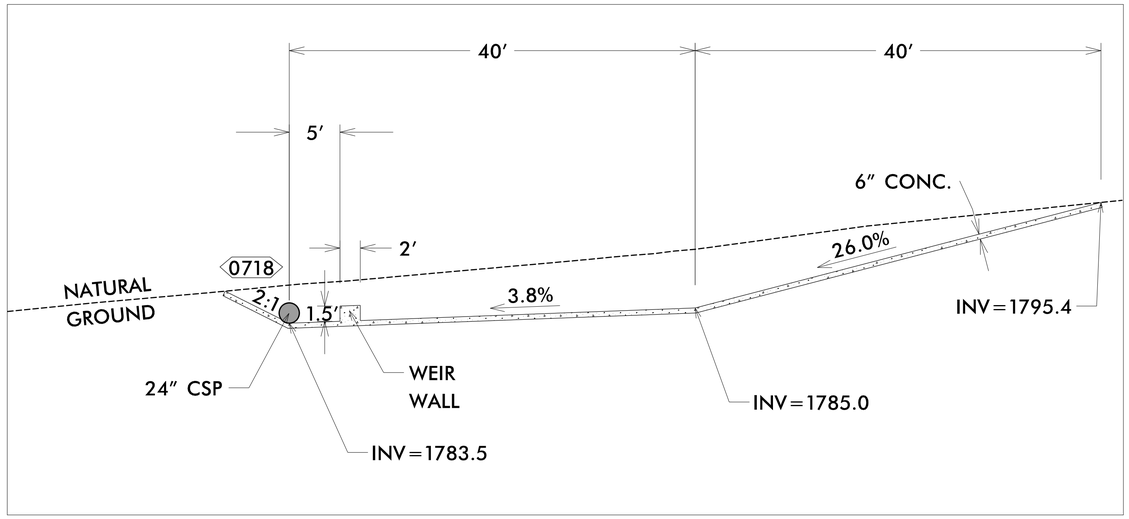
PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-27
R/W SHEET NO.	

HYDRAULICS ENGINEER

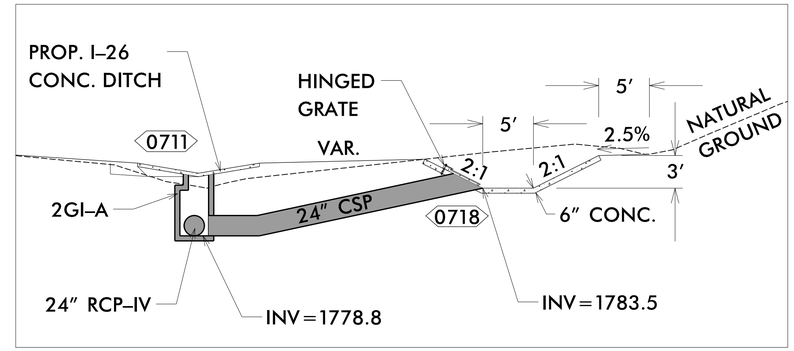
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR
8/21/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

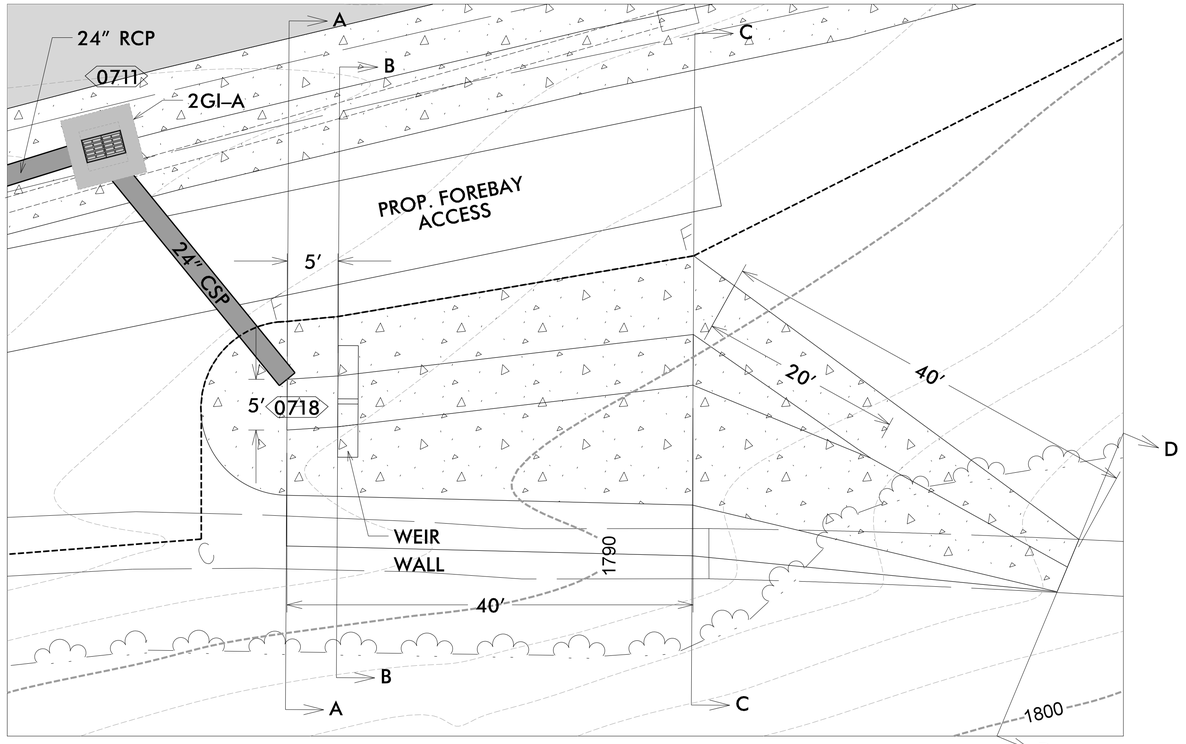
TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275



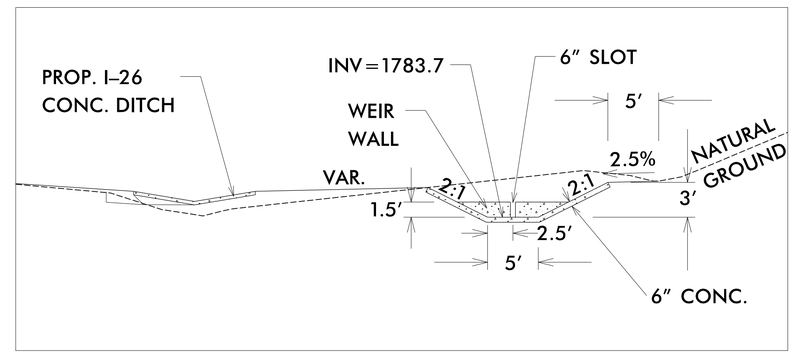
PROFILE VIEW



SECTION A–A



PLAN VIEW



SECTION B–B

REVISIONS

8/17/99

4/7/2021
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jsorrohinegar

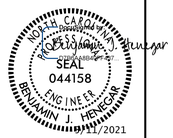
8/17/99

FOREBAY #5 –I26– 481+70 RT

SHEET 2 OF 3
(NOT TO SCALE)

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-28
R/W SHEET NO.	

HYDRAULICS ENGINEER



9/11/2021

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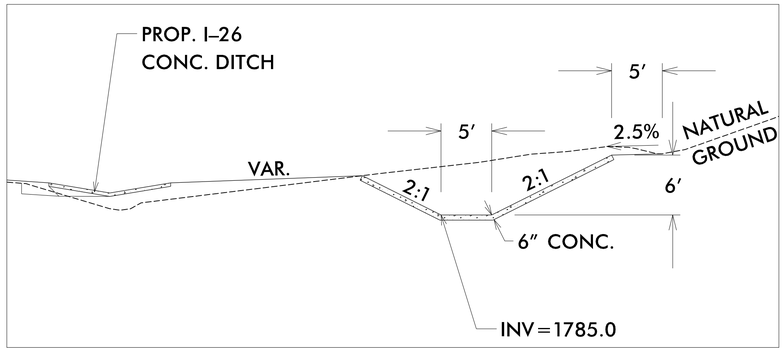
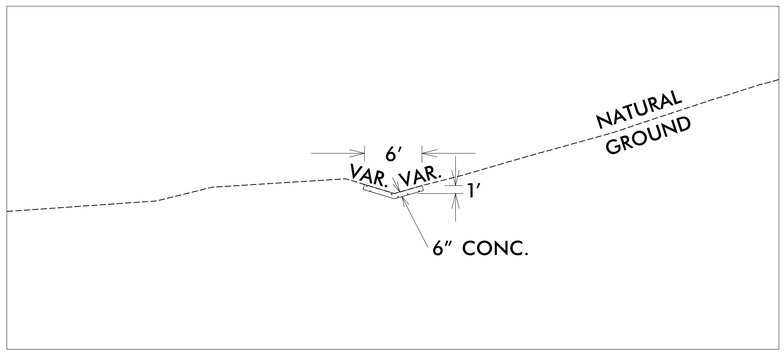
TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275



SECTION C–C



SECTION D–D

4/1/2021
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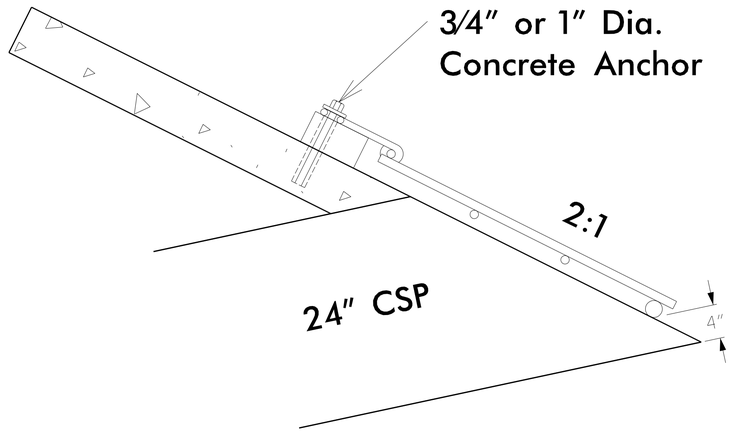
User:bhenegar

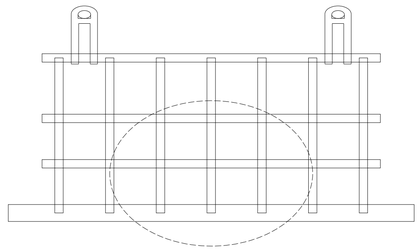
8/17/99

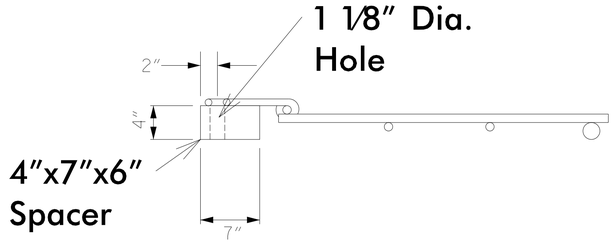
FOREBAY #5 –I26– 481+70 RT

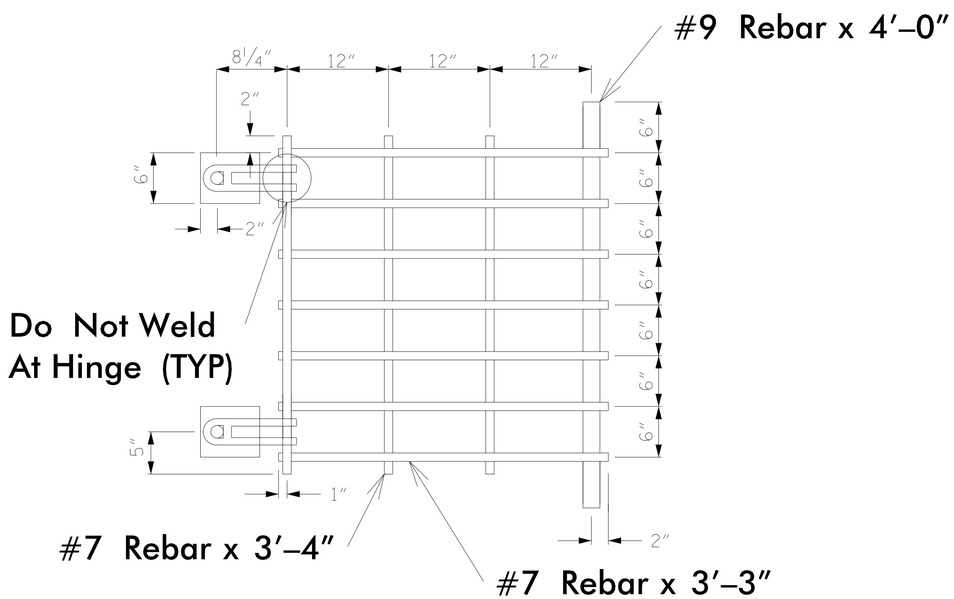
SHEET 3 OF 3
(NOT TO SCALE)

Hinged Grate
24" Pipe
2:1 Slope









HINGED GRATE NOTES:

1. ALL JOINTS, EXCEPT AS NOTED, SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. GRATE SHALL BE REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A–153.
3. SPACER SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, HOT–DIP GALVANIZE SPACER IN ACCORDANCE WITH AASHTO M111.
4. USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A 3/4" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.
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6. FOR HINGED GRATE, SEE SPECIAL PROVISIONS.

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-29
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR
Benjamin J. Henegar
5/11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804–C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

4/7/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_Forebay_5_PSH.dgn
User:benegar

5/14/99

PIPE PROFILE – 0409 TO 0401

SCALE
1″ = 30′ HORIZONTAL
1″ = 30′ VERTICAL

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-30

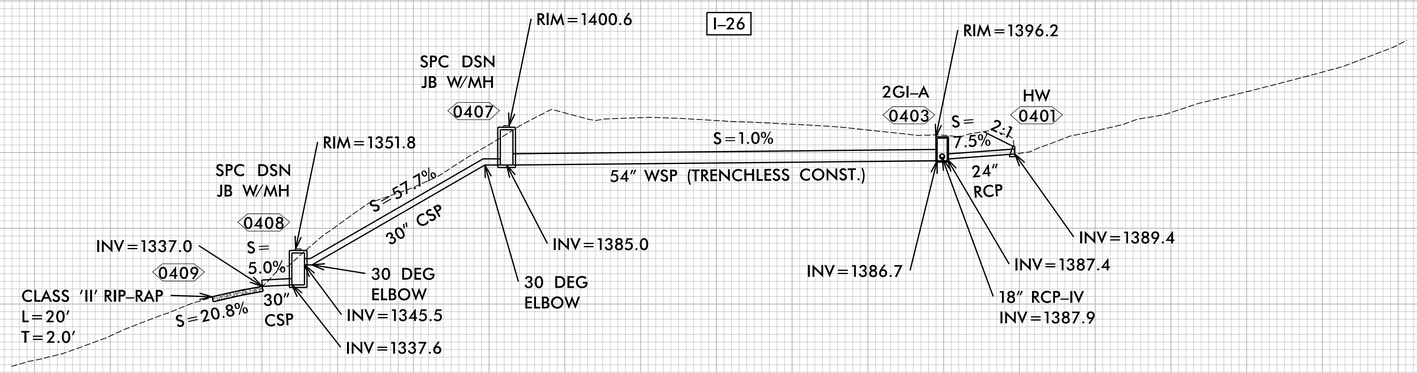
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

4/30/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



1480 1450 1420 1390 1360 1330 1300 1270 1240 1210 1180 1150

120′ 60′ 0′ 60′ 120′ 180′ 240′ 300′ 360′ 420′ 480′

4/7/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_PFL Layout_0409_PSH01.dgn
User:bhenegar

5/14/99

PIPE PROFILE – 0539 TO 0522

SCALE
1″ = 30′ HORIZONTAL
1″ = 30′ VERTICAL

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-31

HYDRAULICS ENGINEER

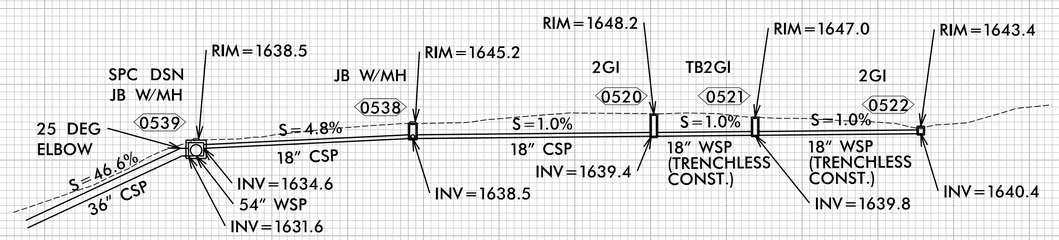
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

9/13/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

I-26



1840 1810 1780 1750 1720 1690 1660 1630 1600 1570 1540 1510 1480 1450 1420

120′ 60′ 0′ 60′ 120′ 180′ 240′ 300′ 360′

4/7/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_PFL Layout_0539_PSH01.dgn
User:bhenegar

5/14/99

PIPE PROFILE – 0504 TO 0506

SCALE
1″ = 30′ HORIZONTAL
1″ = 30′ VERTICAL

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-32

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

5/14/2021

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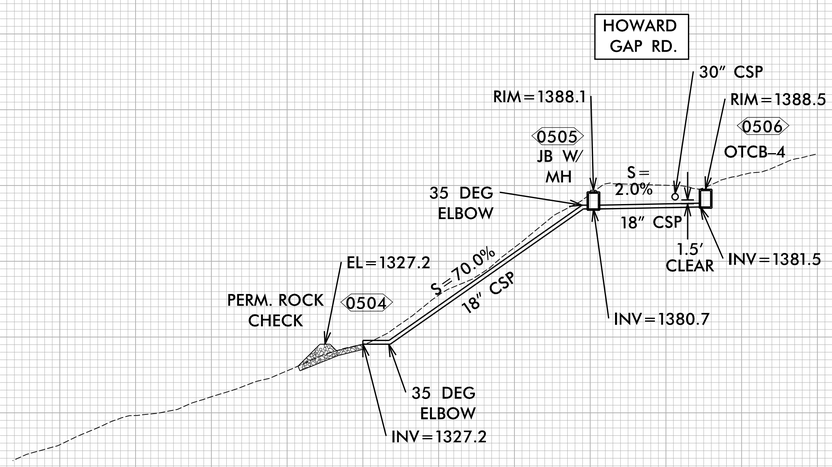
TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



1480 1450 1420 1390 1360 1330 1300 1270 1240 1210 1180 1150

360′ 300′ 240′ 180′ 120′ 60′ 0′ 60′ 120′ 180′ 240′ 300′ 360′

4/7/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_PFL Layout_0504_PSH01.dgn
User:bhenegar

5/14/99

PIPE PROFILE – 0901 TO 0525

SHEET 1 OF 2

SCALE
1″ = 30′ HORIZONTAL
1″ = 30′ VERTICAL

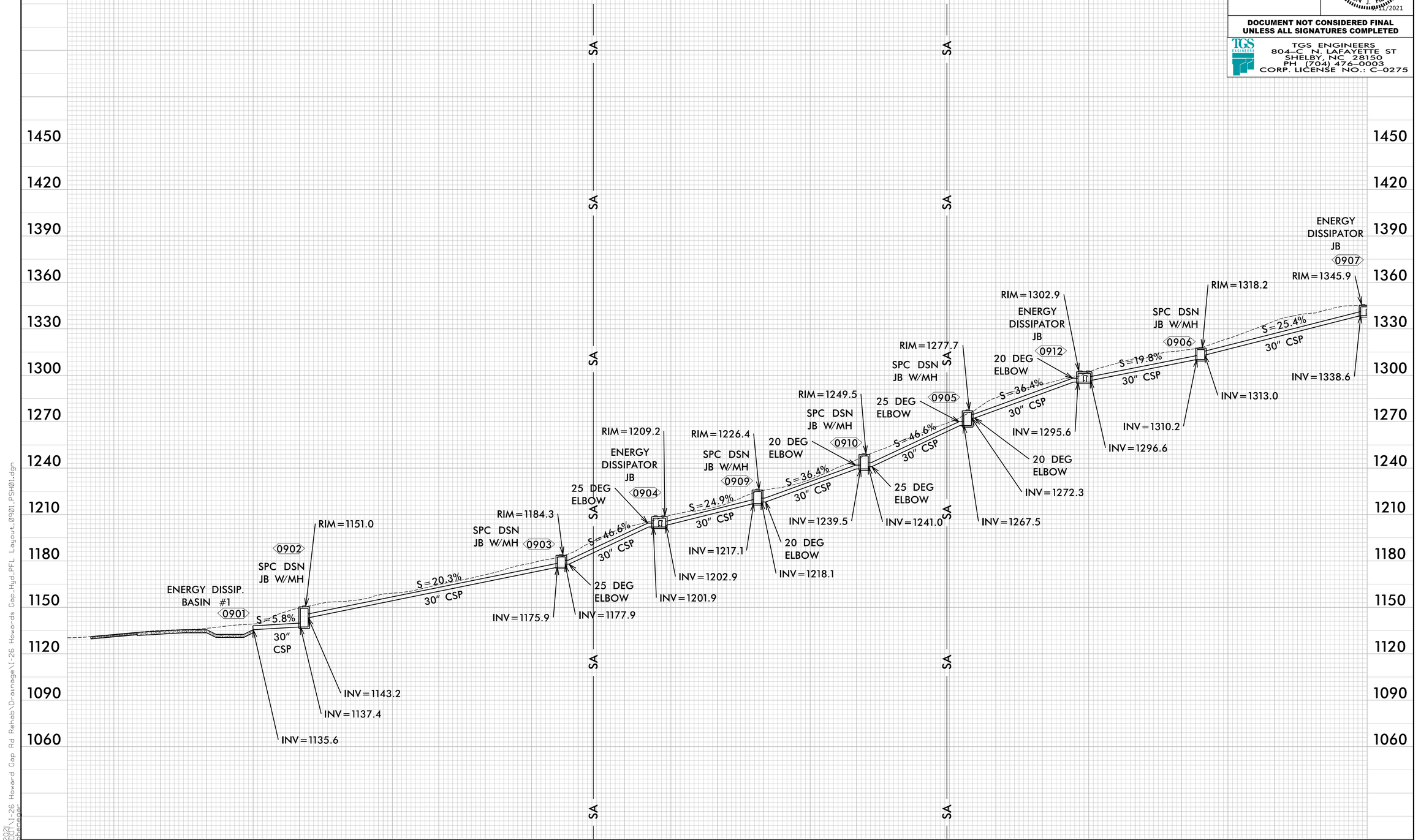
PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-33

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 BENJAMIN J. HENEGAR
9/13/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



5/14/99

PIPE PROFILE – 0901 TO 0525

SHEET 2 OF 2

SCALE
1″ = 30′ HORIZONTAL
1″ = 30′ VERTICAL

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-34

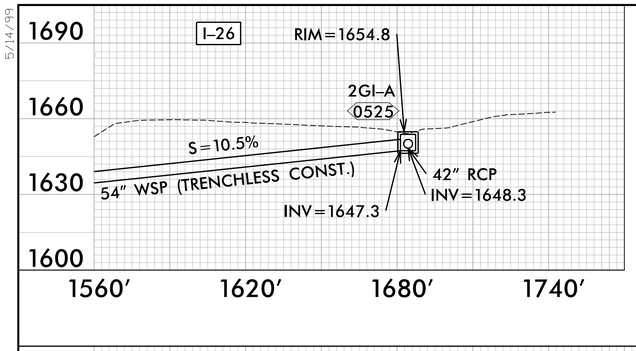
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR

5/12/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



4/15/2021
X:\CDOT\I-26 Howard Gap Rd Rehab\Drainage\I-26 Howards Gap_Hyd_PFL Layout_0901_PSH02.dgn
User:bhenegar

5/14/99

PIPE PROFILE – 0542 TO 0607

SCALE
1″ = 30′ HORIZONTAL
1″ = 30′ VERTICAL

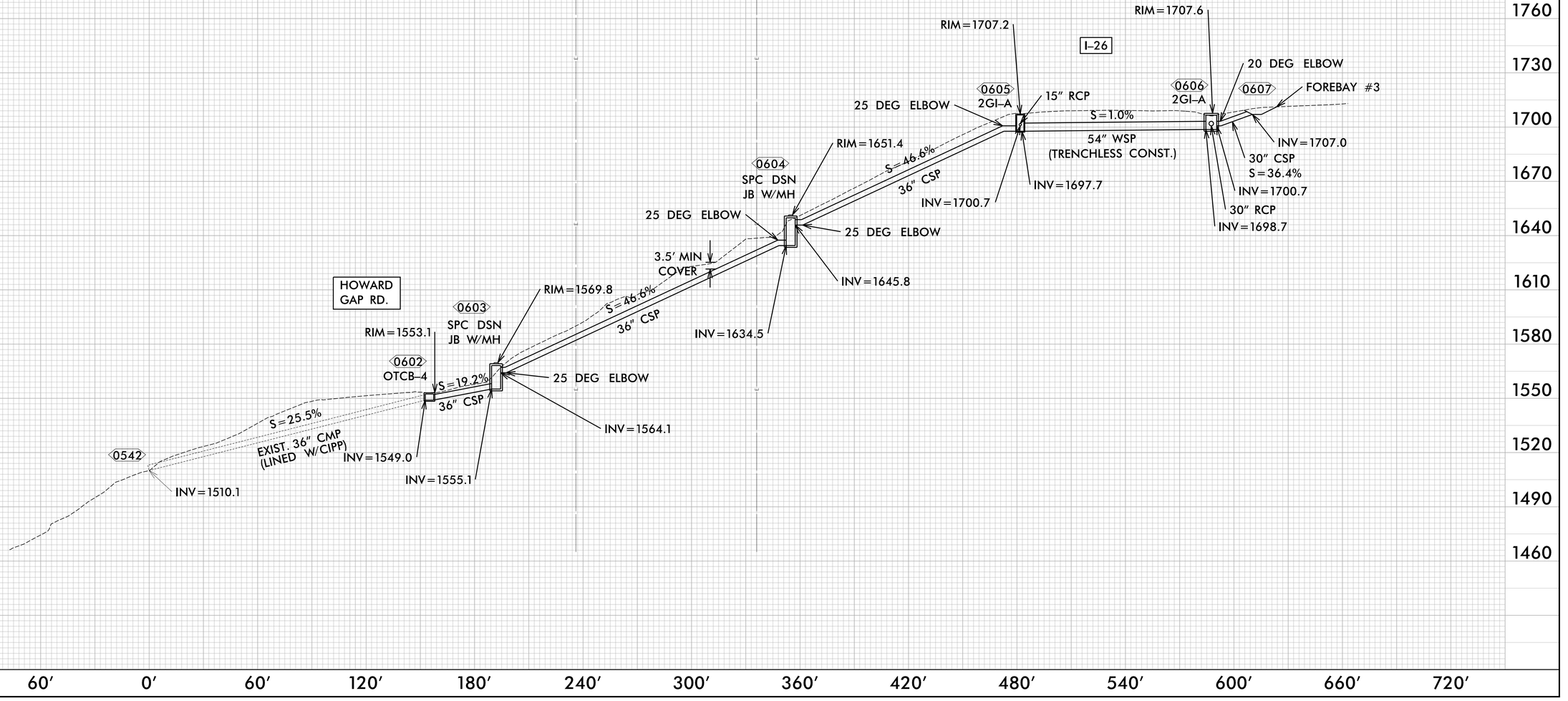
PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-35

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN J. HENEGAR
4/7/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



4/7/2021
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User:bhenegar

5/14/99

PIPE PROFILE – 0614 TO 0622

SCALE
1″ = 30′ HORIZONTAL
1″ = 30′ VERTICAL

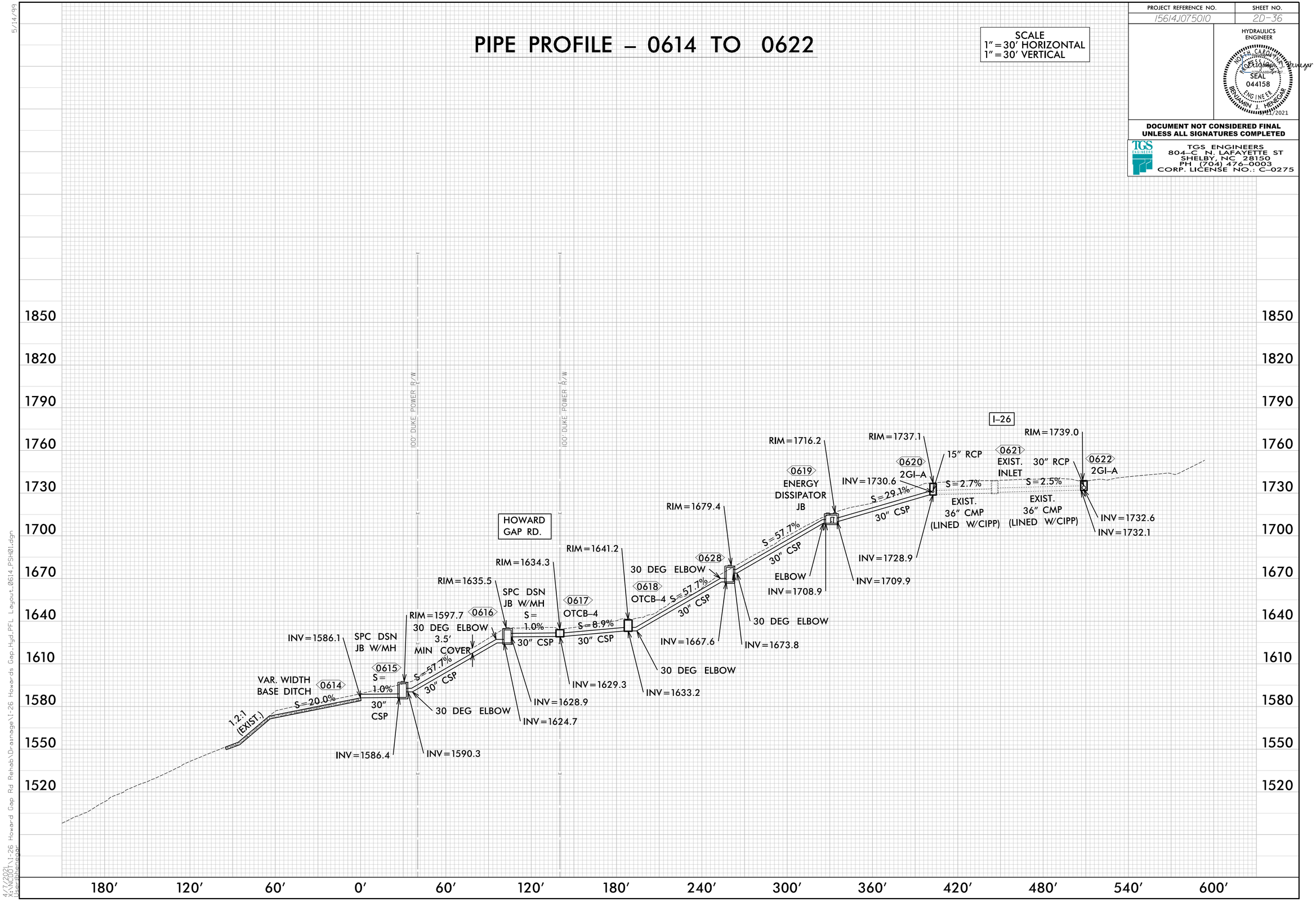
PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	2D-36

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 ENGINEER BENJAMIN I. HENEGAR
5/14/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



4/7/2021
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User:bhenegar

COMPUTED BY: CBP DATE: 3/18/2021
CHECKED BY: JLT DATE: 5/2/2018

PROJECT NO.	SHEET NO.
15614.1075010	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-l26- 450+50.00, LT	-l26- 477+31.25, LT	1,137	9	0	1,128
-l26- 450+40.00, RT	-l26- 482+65.00, RT	1,653	1,068	0	585
-l26- 483+18.56, CL	-l26- 497+50.00, CL	1,120	115	0	1,005
TOTALS:		3,910	1,192	0	2,718
MATERIAL FOR SHOULDER CONST.					
LOSS DUE TO CLEARING & GRUBBING					
WASTE IN LIEU OF BORROW					
PROJECT TOTALS:		3,910	1,192	0	2,718
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				0	
GRAND TOTALS:		3,910	1,192	0	2,718
SAY:		**4,400**		**0**	

Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

Survey Line	Station	Station	Location LT/RT/CL	Asphalt Removal	Asphalt Breakup	Concrete Removal	Concrete Breakup
-l26-	450+50	477+31.25	LT	1043.92			
-l26-	450+40	482+65	RT	3865.33			
-l26-	483+18.56	497+50	CL	1664.71			
			TOTAL	6,573.96			
			SAY	**6,580**			

SHOULDER BERM GUTTER SUMMARY

IN FEET

LINE	STATION	STATION	LOCATION	LENGTH
-l26-	451+00	476+00	LT	2,500.00
			TOTAL	2,500.00
			SAY	**2,500**

EST. DDE = 3,190 CUBIC YARDS
EST. SHALLOW UNDERCUT: 100 CY
EST.SELECT GRANULAR MATERIAL: 400 CY
GEOTEXTILE FOR SOIL STABILIZATION: 700 SY
CLASS IV SUBGRADE STABILIZATION: 200 TONS
PER GEOTECH RECOMMENDATION, ESTIMATED 400 CUBIC YARDS OF UNDERCUT TO BE USED AT THE DISCRETION OF THE RESIDENT ENGINEER.

"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

IN FEET

LINE	BEG. STA.	END STA.	LOC.	LENGTH (LF) STRAIGHT	LENGTH (LF) SHOP CURVED	LENGTH (LF) DOUBLE FACED	WARRANT POINT APPR. END	WARRANT POINT TRAIL. END	"N" DIST. FROM E.O.L.	TOTAL SHLDR WIDTH	FLAIR LENGTH APPR. END	FLAIR LENGTH TRAIL. END	W APPR. END	W TRAIL. END	ANCHORS (EA) CAT-1	ANCHORS (EA) B-77	IMP. ATTEN. TYPE TL-3 EA	IMP. ATTEN. TYPE TL-3 G	IMP. ATTEN. TYPE TL-3 NG	REMOVE EXISTING GUARDRAIL (LF)	EXTRA LENGTH POSTS (EA)	REMARKS
-I26-	450+50.00	477+31.25	LT	2,681.25					14'											2681.25	430	Shoulder Berm Gutter; Use Extra Depth Posts
-I26-	483+18.56	497+50.00	CL, LT	1,431.44					10'						1					1431.44	230	Use Extra Depth Posts
-I26-	483+18.56	497+50.00	CL, RT	1,431.44					10'		125'		2.5'			1				1431.44	230	Use Extra Depth Posts
-HGR-	34+25.00	36+00.00	LT	175.00																175		
-HGR-	52+00.00	53+25.00	LT	125.00																125		
SUB-TOTALS				5,844.13											1	1				5844.13	890	
LESS ANCHOR DEDUCTIONS																						
	CAT-1	1@6.25 ft		6.25																		
	B-77	1@22.875 ft		22.88																		
ANCHOR TOTALS				29.13																		
GRAND-TOTALS				**5,815.01**											**1**	**1**				**5844.13**	**890**	
SAY				**5,825**																**5850**	**890**	

ADDITIONAL GUARDRAIL POSTS = 5 EA

TGSBEN-LAPTOP

COMPUTED BY: BAC DATE: 04-20-21

CHECKED BY: BJH DATE: 04-20-21

PROJECT NO.	SHEET NO.
15614.1075010	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	C. S. PIPE (ALUMINIZED TYPE 2) 12 (0.079)	C. S. 15 (0.079)	C. S. 18 (0.079)	C. S. 24 (0.109)	C. S. 30 (0.138)	C. S. 36 (0.138)	C. S. 42 (0.168)	C. S. 48 (0.168)	R. C. PIPE CLASS IV 12	R. C. 15	R. C. 18	R. C. 24	R. C. 30	R. C. 36	R. C. 42	R. C. 48	15" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITATION SMOOTH WALL STEEL SLIP LINER (0.5" THICK)	24" PIPE REHABILITAION CIPP LINER	30" PIPE REHABILITAION CIPP LINER	36" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION SOLID WALL THERMOPLASTIC SLIP LINER	18" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY
I26 416+09	113 RT	0401																																1.500
		0401	0403		1389.4	1387.4													32															
I26 416+00	84 RT	0402		1393.4																														
		0402	0403		1388.0	1387.9												12																
I26 416+60	85 RT	0404																																
		0404	0403		1397.3	1387.4	1.0				44																							
I26 415+78	2 LT	0405																																
		0405	0402																						88									
I26 415+73	52 LT	0406																																
		0406	0405																						52									
		0407	0408		1385.0	1345.5	1.4					80																						
I26 416+15	171 LT	0408		1351.8																														
		0408	0409		1337.6	1337.0	1.4					16																						
HGR 31+99	26 RT	0501		1350.5																														
		0501	0541																										68					
HGR 33+19	17 RT	0502		1368.5																														
		0502	0501		1364.0	1347.3	1.6						120																					
HGR 34+46	8 RT	0503		1385.9																														
		0503	0502		1380.5	1364.5	3.7					124																						
HGR 34+78	22 LT	0505		1388.1																														
		0505	0504		1380.7	1327.2	1.2			92																								
HGR 34+78	22 RT	0506		1388.5																														
		0506	0505		1381.5	1380.7	1.2			44																								
HGR 35+69	89 LT	0507		1367.6																														
		0507	0908		1360.3	1352.9	4.3					68																						
HGR 35+67	31 LT	0508		1400.6																														
		0508	0507		1392.0	1361.3	4.3					56																						
HGR 35+63	14 RT	0509		1401.2																														
		0509	0508		1394.6	1392.5					44																							
		0509	0503		1394.6	1380.5						112																						
HGR 35+63	29 RT	0510		1409.8																														
		0510	0509		1395.7	1395.1	3.8						12																					
HGR 36+12	120 RT	0515		1464.9																														
		0515	0540		1453.3	1406.5	3.8						80																					
I26 453+92	372 LT	0516		1513.7																														
		0516	0515		1503.6	1458.6	3.8						76																					
I26 454+25	311 LT	0517		1555.0																														
		0517	0516		1545.3	1505.7	3.8						68																					
I26 453+79	201 LT	0518		1583.2																														
		0518	0517		1570.2	1545.3	3.8						120																					
I26 453+34	146 LT	0519		1609.9																														
		0519	0518		1602.1	1574.2	3.8						72																					
I26 451+17	43 LT	0520		1648.2																														
		0520	0538		1639.4	1638.5				96																								
I26 451+17	1 LT	0521		1647.0																														
		0521	0520		1639.8	1639.4																										20	20	
I26 451+16	63 RT	0522		1643.4																														
		0522	0521		1640.4	1639.8																										32	32	
I26 452+14	42 LT	0523		1654.6																														
		0523	0538		1651.0	1638.5	0.6			24																								
SHEET TOTALS										256	88	456	548					12	32						140				68			52	52	1.500

FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND VENTED M.H. GRATE	ENERGY DISSIPATOR J.B. SEE DETAIL 2D-1	SPITTER BOX SEE DETAIL 2D-4	SPECIAL DESIGN J.B. W/ MH SEE DETAIL 2D-8	HINGED GRATE	G.D.I. TYPE "A" EXTRA DEPTH, SEE DETAIL 2D-12	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.
0401																																									
0401	0403																																								
0402		1	0.4														1					1																			
0402	0403																																								
0404																																									
0404	0403																																								
0405																																									
0405	0402																																								
0406																																									
0406	0405																																								
0407	0408																																								
0408		1	5.0	4.2																												1			1						
0408	0409																																								
0501		1										1																													
0501	0541																																								
0502		1										1																													
0502	0501																																								
0503		1	0.4																									1			1										
0503	0502																																								
0505		1	2.4																								1				1										
0505	0504																																								
0506		1	2.0									1																													
0506	0505																																								
0507		1	2.3																													2	1								
0507	0908																																								
0508		1	3.6																													1			1						
0508	0507																																								
0509		1	1.6																												2			1							
0509	0508																																								
0509	0503																																								
0510		1	5.0	4.1																												1			1						
0510	0509																																								
0515		1	5.0	1.6																												1			1						
0515	0540																																								
0516		1	5.0	0.1																												1			1						
0516	0515																																								
0517		1	4.7																													1			1						
0517	0516																																								
0518		1	5.0	3.0																												1			1						
0518	0517																																								
0519		1	2.8																													2	1								
0519	0518																																								
0520		1	3.8														1			1																					
0520	0538																																								
0521		1	2.2																	1									1												
0521	0520																																								
0522		1															1					1																			
0522	0521																																								
0523		1															1			1																					
0523	0538																																								
SHEET TOTALS		20	51.2	13.0								3					4			3		2					1	1	1		4	11	2	1	7						

FROM	TO	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	SPEC. DSN. PIPE CONNECTION, SEE DETAIL 2D-11	BERM DITCH OUTLET STD. 850.11 (PER EACH)	PIPE CLEANOUT EA	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0401														
0401	0403													
0402														
0402	0403													
0404								1						24" BDO
0404	0403			1			1							ROD & LUG W/ GASKETS & ELBOW, 12 GAGE SPC. DSN. PIPE CONNECTION - 0403
0405														
0405	0402													RETAIN AND LINE W/ CIPP
0406														
0406	0405													RETAIN AND LINE W/ CIPP
0407	0408				2		2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0407 & 0408
0408														SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0408	0409						1							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0408
0501														OTCB-4
0501	0541													RETAIN AND LINE W/ CIPP
0502														OTCB-4
0502	0501						2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0502 & 0501
0503														TRAFFIC BEARING JB W/ MH
0503	0502						2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0503 & 0502
0505														JB W/ MH
0505	0504		2				1							ROD & LUG W/ GASKETS & 2 ELBOWS, 14 GAGE SPC. DSN. PIPE CONNECTION - 0505
0506														OTCB-4
0506	0505						2							ROD & LUG W/ GASKETS, 14 GAGE SPC. DSN. PIPE CONNECTION - 0506 & 0505
0507														ENERGY DISSIPATOR JB, VENTED MH'S (BOLTED)
0507	0908						2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0507 & 0908
0508														SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0508	0507				2		2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0508 & 0507
0509														SPLITTER BOX W/ MH'S
0509	0508						2							ROD & LUG W/ GASKETS, 12 GAGE SPC. DSN. PIPE CONNECTION - 0509 & 0508
0509	0503						2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0509 & 0503
0510														SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0510	0509						2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0510 & 0509
0515														SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0515	0540					2	2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0515 & 0540
0516														SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0516	0515					2	2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0516 & 0515
0517														SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0517	0516					2	2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0517 & 0516
0518														SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0518	0517						2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0518 & 0517
0519														ENERGY DISSIPATOR JB, VENTED MH'S (BOLTED)
0519	0518					2	2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0519 & 0518
0520														
0520	0538						2							ROD & LUG W/ GASKETS, 14 GAGE SPC. DSN. PIPE CONNECTION - 0520 & 0538
0521														TRAFFIC BEARING 2GI
0521	0520													TRENCHLESS CONSTRUCTION, L=40'
0522														
0522	0521													TRENCHLESS CONSTRUCTION, L=64'
0523														
0523	0538		2				2							ROD & LUG W/ GASKETS & 2 ELBOWS, 14 GAGE SPC. DSN. PIPE CONNECTION - 0523 & 0538
SHEET TOTALS			4	1	4	8	35	1						

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSBEN-LAPTOP

COMPUTED BY:	BAC	DATE:	04-20-21
CHECKED BY:	BJH	DATE:	04-20-21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
15614.1075010	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)

SIZE / THICKNESS OR GAUGE

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	C. S. PIPE (ALUMINIZED TYPE 2) 12 (0.079)	15 (0.079)	18 (0.079)	24 (0.109)	30 (0.138)	36 (0.138)	42 (0.168)	48 (0.168)	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48
I26 453+20	2	LT	0524																					
			0524	0526																				
I26 453+00	63	RT	0526		1655.6																			
			0526	0525		1649.1	1648.3	0.3															8	
I26 454+50	43	LT	0527		1668.7																			
			0527	0523		1665.2	1651.2												236					
I26 455+01	63	RT	0528		1668.1																			
			0528	0526		1662.3	1649.6	0.3														196		
I26 455+18	98	RT	0529																					
			0529	0528		1668.3	1662.3	0.8						40										
I26 457+05	43	LT	0530		1681.0																			
			0530	0527		1668.9	1665.2												256					
I26 457+07	3	LT	0531																					
			0531	0530																				
I26 457+72	43	LT	0532		1684.0																			
			0532	0530		1679.3	1676.2											64						
I26 457+13	62	RT	0533		1680.8																			
			0533	0528		1673.7	1662.8														208			
I26 459+01	63	RT	0534		1689.7																			
			0534	0533		1682.9	1673.7														184			
I26 460+72	43	LT	0535		1696.4																			
			0535	0532		1693.2	1679.3											296						
I26 460+99	63	RT	0536		1698.3																			
			0536	0534		1691.5	1682.9														196			
I26 453+29	113	RT	0537																					
			0537	0526		1660.6	1650.1	0.7					60											
I26 452+07	67	LT	0538		1645.2																			
			0538	0539		1638.5	1634.6	1.7			84													
			0539	0519		1631.6	1603.1	3.8						72										
HGR 35+74	49	RT	0540		1413.3																			
			0540	0510		1405.5	1402.5	3.8						20										
HGR 46+56	26	RT	0602		1553.1																			
			0602	0542																				
HGR 46+69	60	RT	0603		1569.8																			
			0603	0602		1555.1	1549.0	2.7						36										
I26 463+18	169	LT	0604		1651.4																			
			0604	0603		1634.5	1564.1	2.7						164										
			0605	0604		1697.7	1645.8	2.7						124										
I26 463+27	84	RT	0607																					
			0607	0606		1707.0	1700.7	1.2					24											
I26 465+49	43	LT	0608		1717.6																			
			0608	0605		1714.4	1700.7											228						
I26 465+10	1	LT	0609																					
			0609	0610																				
I26 465+00	63	RT	0610		1715.8																			
			0610	0606		1708.9	1700.2	0.5													180			
I26 467+85	43	LT	0611		1728.2																			
			0611	0608		1725.0	1714.4											232						
I26 467+59	1	RT	0612																					
			0612	0613																				
								SHEET TOTALS			84		84	456				820	492		768	196	8	

FROM	TO	15" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITATION SMOOTH WALL STEEL SLIP LINER (0.5" THICK)	24" PIPE REHABILITAION CIPP LINER	30" PIPE REHABILITAION CIPP LINER	36" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION SOLID WALL THERMOPLASTIC SLIP LINER	18" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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
0524																										
0524	0526		68																							
0526													1	1.5												
0526	0525																									
0527													1													
0527	0523																									
0528													1	0.8												
0528	0526																									
0529																										
0529	0528																									
0530													1	5.0	2.1											
0530	0527																									
0531																										
0531	0530			40																						
0532													1													
0532	0530																									
0533													1	2.1												
0533	0528																									
0534													1	1.8												
0534	0533																									
0535													1													
0535	0532																									
0536													1	1.8												
0536	0534																									
0537																										
0537	0526																									
0538													1	1.7												
0538	0539																									
0539	0519																									
0540													1	2.8												
0540	0510																									
0602													1										1			
0602	0542						156																			
0603													1	5.0	4.7											
0603	0602																									
0604													1	5.0	6.9											
0604	0603																									
0605	0604																									
0607																										
0607	0606																									
0608													1													
0608	0605																									
0609																										
0609	0610		64																							
0610													1	1.9												
0610	0606																									
0611													1													
0611	0608																									
0612																										
0612	0613		60																							
SHEET TOTALS			192	40			156						17	29.4	13.7								1			

FROM	TO	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54
0524																	
0524	0526																
0526		1						1									
0526	0525																
0527			1			1											
0527	0523																
0528		1						1									
0528	0526																
0529																	
0529	0528																
0530						1											
0530	0527																
0531																	
0531	0530																
0532			1			1											
0532	0530																
0533		1						1									
0533	0528																
0534		1						1									
0534	0533																
0535			1			1											
0535	0532																
0536		1						1									
0536	0534																
0537																	
0537	0526																
0538													1				1
0538	0539																
0539	0519																
0540																	
0540	0510																
0602																	
0602	0542																
0603																	
0603	0602																
0604																	
0604	0603																
0605	0604																
0607																	
0607	0606																
0608			1			1											
0608	0605																
0609																	
0609	0610																
0610		1						1									
0610	0606																
0611			1			1											
0611	0608																
0612																	
0612	0613																
SHEET TOTALS		6	5			6		6					1				1

FROM	TO	M.H. FRAME AND VENTED M.H. GRATE	ENERGY DISSIPATOR J.B. SEE DETAIL 2D-1	SPITTER BOX SEE DETAIL 2D-4	SPECIAL DESIGN J.B. W/ MH SEE DETAIL 2D-8	HINGED GRATE	G.D.I. TYPE "A" EXTRA DEPTH, SEE DETAIL 2D-12	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	SPEC. DSN. PIPE CONNECTION, SEE DETAIL 2D-11	BERM DITCH OUTLET STD. 850.11 (PER EACH)	PIPE CLEANOUT EA	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0524																								
0524	0526																							RETAIN AND LINE W/ CIPP
0526																								
0526	0525																							
0527																								
0527	0523																							
0528																								
0528	0526																							
0529						1																		FOREBAY #2, SEE DETAIL 2D-20
0529	0528															1	1							ROD & LUG W/ GASKETS & ELBOW, 10 GAGE SPC. DSN. PIPE CONNECTION - 0528
0530							1																	2GI-A SPECIAL DESIGN
0530	0527																							
0531																								
0531	0530																							RETAIN AND LINE W/ 18" WSP
0532																								
0532	0530																							
0533																								
0533	0528																							
0534																								
0534	0533																							
0535																								
0535	0532																							
0536																								
0536	0534																							
0537						1																		FOREBAY #1, SEE DETAIL 2D-18
0537	0526														1		1							ROD & LUG W/ GASKETS & ELBOW, 10 GAGE SPC. DSN. PIPE CONNECTION - 0526
0538																								JB W/ MH
0538	0539																2							ROD & LUG W/ GASKETS, 14 GAGE SPC. DSN. PIPE CONNECTION - 0538 & 0539
0539	0519															2	2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONECTION - 0539 & 0519
0540		2	1																					ENERGY DISSIPATOR JB, VENTED MH'S (BOLTED)
0540	0510																2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0540 & 0510
0602																								OTCB-4
0602	0542																							RETAIN AND LINE W/ CIPP
0603		1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0603	0602																2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0603 & 0602
0604		1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0604	0603															2	2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0604 & 0603
0605	0604															2	2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0605 & 0604
0607						1																		FOREBAY #3, SEE DETAIL 2D-23
0607	0606														1		1							ROD & LUG W/ GASKETS & ELBOW, 10 GAGE SPC. DSN. PIPE CONNECTION - 0606
0608																								
0608	0605																							
0609																								
0609	0610																							RETAIN AND LINE W/ CIPP
0610																								
0610	0606																							
0611																								
0611	0608																							
0612																								
0612	0613																							RETAIN AND LINE W/ CIPP
SHEET TOTALS		4	1		2	3	1								2	7	15							

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSBEN-LAPTOP

COMPUTED BY: BAC DATE: 04-20-21

CHECKED BY: BJH DATE: 04-20-21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
15614.1075010	3D-3

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 %	C. S. PIPE (ALUMINIZED TYPE 2) 12 (0.079)	15 (0.079)	18 (0.079)	24 (0.109)	30 (0.138)	36 (0.138)	42 (0.168)	48 (0.168)	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48
I26 467+50	62 RT	0613		1727.9																			
		0613	0610		1720.1	1708.9														248			
HGR 52+55	90 LT	0615		1597.7																			
		0615	0614		1586.4	1586.1	1.6					32											
HGR 52+68	18 LT	0616		1635.5																			
		0616	0615		1624.7	1590.3	1.6					72											
HGR 52+75	18 RT	0617		1634.3																			
		0617	0616		1629.3	1628.9	1.6					36											
HGR 53+24	21 RT	0618		1641.2																			
		0618	0617		1633.2	1629.3	1.6					48											
I26 469+83	113 LT	0619		1716.2																			
		0619	0628		1708.4	1673.8						72											
I26 469+93	43 LT	0620		1737.1																			
		0620	0619		1728.9	1709.4						68											
I26 470+00	1 RT	0621																					
		0621	0620																				
I26 470+10	63 RT	0622		1739.0																			
		0622	0621																				
I26 472+63	43 LT	0623		1748.6																			
		0623	0620		1745.4	1730.6											268						
I26 472+49	64 RT	0624		1748.5																			
		0624	0622		1743.1	1732.6														236			
I26 465+06	97 RT	0625																					
		0625	0610		1715.5	1709.4	0.4				36												
I26 469+58	63 RT	0626		1736.8																			
		0626	0613		1731.5	1720.1														208			
I26 470+65	90 RT	0627																					
		0627	0626		1739.5	1731.5	0.7					112											
I26 469+73	183 LT	0628		1679.4																			
		0628	0618		1667.6	1633.2						72											
HGR 60+23	20 RT	0703																					
		0703	0702																				
		0704																					
I26 476+70	69 LT	0704	0703																				
I26 475+63	2 LT	0705																					
		0705	0706																				
I26 475+00	64 RT	0706		1758.5																			
		0706	0624		1753.7	1743.6													248				
I26 477+22	65 RT	0707		1767.4																			
		0707	0704																				
I26 479+50	2 RT	0708																					
		0708	0709																				
I26 479+49	69 RT	0709		1774.8																			
		0709	0707		1768.8	1761.2	0.7												216				
I26 482+45	92 LT	0710		1791.2																			
		0710	0701																				
I26 481+38	70 RT	0711		1783.6																			
		0711	0709		1778.8	1768.8	0.3												176				
I26 484+00	2 RT	0712		1797.9																			
		0712	0717		1781.5	1779.3	0.5															56	
						SHEET TOTALS					36	512					268		640	692		56	

FROM	TO	15" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITATION SMOOTH WALL STEEL SLIP LINER (0.5" THICK)	24" PIPE REHABILITAION CIPP LINER	30" PIPE REHABILITAION CIPP LINER	36" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION SOLID WALL THERMOPLASTIC SLIP LINER	18" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	
0613													1	2.8						
0613	0610																			
0615													1	5.0	1.3					
0615	0614																			
0616													1	5.0	0.8					
0616	0615																			
0617													1							
0617	0616																			
0618													1	3.0						
0618	0617																			
0619													1	2.8						
0619	0628																			
0620													1	3.2						
0620	0619																			
0621																				
0621	0620						44													
0622													1	1.9						
0622	0621						64													
0623													1							
0623	0620																			
0624													1	0.4						
0624	0622																			
0625																				
0625	0610																			
0626													1	0.3						
0626	0613																			
0627																				
0627	0626																			
0628													1	5.0	1.8					
0628	0618																			
0703																				
0703	0702					68														
0704																				
0704	0703					52														
0705																				
0705	0706	92																		
0706													1							
0706	0624																			
0707													1	1.7						
0707	0704					142														
0708																				
0708	0709		68																	
0709													1	1.0						
0709	0707																			
0710													1	5.0	7.6					
0710	0701								604											
0711													1							
0711	0709																			
0712													1	5.0	6.4					
0712	0717																			
SHEET TOTALS		92	68			262	108		604				18	42.1	17.9					

FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	CONCRETE TRANSITIONAL SECTION C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35
0613								1						1							
0613	0610																				
0615																					
0615	0614																				
0616																					
0616	0615																				
0617				1																	
0617	0616																				
0618				1																	
0618	0617																				
0619																					
0619	0628																				
0620								1				1									
0620	0619																				
0621																					
0621	0620																				
0622								1						1							
0622	0621																				
0623									1			1									
0623	0620																				
0624								1						1							
0624	0622																				
0625																					
0625	0610																				
0626								1						1							
0626	0613																				
0627																					
0627	0626																				
0628																					
0628	0618																				
0703																					
0703	0702																				
0704																					
0704	0703																				
0705																					
0705	0706																				
0706								1						1							
0706	0624																				
0707								1						1							
0707	0704																				
0708																					
0708	0709																				
0709								1						1							
0709	0707																				
0710														1							
0710	0701																				
0711								1						1							
0711	0709																				
0712														1							
0712	0717																				
SHEET TOTALS				2				9	1			2		10							

FROM	TO	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND VENTED M.H. GRATE	ENERGY DISSIPATOR J.B. SEE DETAIL 2D-1	SPITTER BOX SEE DETAIL 2D-4	SPECIAL DESIGN J.B. W/ MH SEE DETAIL 2D-8	HINGED GRATE	G.D.I. TYPE "A" EXTRA DEPTH, SEE DETAIL 2D-12	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	SPEC. DSN. PIPE CONNECTION, SEE DETAIL 2D-11	BERM DITCH OUTLET STD. 850.11 (PER EACH)	PIPE CLEANOUT EA	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0613																										
0613	0610																									
0615				1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0615	0614																		1							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0615
0616				1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0616	0615																2		2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0616 & 0615
0617																										OTCB-4
0617	0616																		2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0617 & 0616
0618																										OTCB-4
0618	0617																		2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0618 & 0617
0619				2	1																					ENERGY DISSIPATOR JB, VENTED MH'S (BOLTED)
0619	0628																2		2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0619 & 0628
0620																										
0620	0619																		2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0620 & 0619
0621																										
0621	0620																									RETAIN AND LINE W/ CIPP
0622																										
0622	0621																									RETAIN AND LINE W/ CIPP
0623																										
0623	0620																									
0624																										
0624	0622																									
0625																				1						24" BDO
0625	0610															1			1							ROD & LUG W/ GASKETS & ELBOW, 12 GAGE SPC. DSN. PIPE CONNECTION - 0610
0626																										
0626	0613																									
0627								1																		FOREBAY #4, SEE DETAIL 2D-26
0627	0626																		1							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0626
0628				1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0628	0618																2		2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0628 & 0618
0703																										
0703	0702																									RETAIN AND LINE W/ CIPP
0704																										
0704	0703																									RETAIN AND LINE W/ CIPP
0705																										
0705	0706																									RETAIN AND LINE W/ CIPP
0706																										
0706	0624																									
0707																										
0707	0704																									RETAIN AND LINE W/ CIPP
0708																										
0708	0709																									RETAIN AND LINE W/ CIPP
0709																										
0709	0707																									
0710									1																	2GI-A SPECIAL DESIGN
0710	0701																									RETAIN AND LINE W/ SLIP LINER
0711																										
0711	0709																									
0712									1																	2GI-A SPECIAL DESIGN
0712	0717																									
SHEET TOTALS				5	1		3	1	2							1	6		15	1						

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSBEN-LAPTOP

COMPUTED BY:	BAC	DATE:	04-20-21
CHECKED BY:	BJH	DATE:	04-20-21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
15614.1075010	3D-4

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	C. S. PIPE(ALUMINIZED TYPE 2)								R. C. PIPE CLASS IV							
SIZE									12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48
THICKNESS OR GAUGE					FT.	FT.	FT.	%	0.079	0.079	0.079	0.109	0.138	0.138	0.168	0.168								
I26 484+20	71	RT	0714																					
			0714	0719																				
I26 486+51	59	LT	0715																					
			0715	0716																				
I26 486+20	0	CL	0716		1807.0																			
			0716	0712		1791.9	1781.5	0.5															216	
I26 483+45	3	RT	0717		1796.5																			
			0717	0710																				
I26 481+51	96	RT	0718																					
			0718	0711		1783.5	1778.8	0.8				32												
I26 483+52	10	RT	0719		1785.1																			
			0719	0717		1781.1	1780.4													8				
I26 489+24	59	LT	0801																					
			0801	0802																				
I26 489+07	1	LT	0802		1819.3																			
			0802	0716		1805.0	1792.4	0.5														284		
I26 489+30	71	RT	0803																					
			0803	0802																				
I26 491+63	0	CL	0804		1829.7																			
			0804	0802		1820.8	1805.5	0.3													252			
I26 491+87	71	RT	0805																					
			0805	0804																				
I26 494+71	59	LT	0806																					
			0806	0807																				
I26 494+53	1	RT	0807		1838.8																			
			0807	0804		1831.4	1820.8														288			
I26 494+98	71	RT	0808																					
			0808	0807																				
I26 497+20	59	LT	0809																					
			0809	0810																				
I26 497+24	1	RT	0810		1846.0																			
			0810	0807		1838.1	1831.4														268			
I26 497+71	71	RT	0811																					
			0811	0810																				
HGR 37+28	796	LT	0902		1151.0																			
			0902	0901		1137.4	1135.6	4.3					32											
HGR 36+45	660	LT	0903		1184.3																			
			0903	0902		1175.9	1143.2	4.3					164											
HGR 36+04	624	LT	0904		1209.2																			
			0904	0903		1201.9	1177.9	4.3					64											
HGR 35+11	461	LT	0905		1277.7																			
			0905	0910		1267.5	1241.0	4.3					68											
HGR 34+33	331	LT	0906		1318.2																			
			0906	0912		1310.2	1296.6	4.3					72											
HGR 34+96	245	LT	0907		1345.9																			
			0907	0906		1338.6	1313.0	4.3					108											
HGR 35+60	158	LT	0908		1358.7																			
			0908	0907		1350.7	1339.6	4.3					108											
HGR 35+54	589	LT	0909		1226.4																			
			0909	0904		1217.1	1202.9	4.3					64											
SHEET TOTALS												32	680							8	808	284	216	

LINE & STATION	FROM	TO	15" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITATION SMOOTH WALL STEEL SLIP LINER (0.5" THICK)	24" PIPE REHABILITAION CIPP LINER	30" PIPE REHABILITAION CIPP LINER	36" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION SOLID WALL THERMOPLASTIC SLIP LINER	18" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	
I26 484+20	0714																				
	0714	0719				92															
I26 486+51	0715																				
	0715	0716		68																	
I26 486+20	0716													1	5.0	5.1					
	0716	0712																			
I26 483+45	0717													1	5.0	7.6					
	0717	0710							140												
I26 481+51	0718																				
	0718	0711																			
I26 483+52	0719													1							
	0719	0717																			
I26 489+24	0801																				
	0801	0802				60															
I26 489+07	0802													1	5.0	4.3					
	0802	0716																			
I26 489+30	0803																				
	0803	0802				76															
I26 491+63	0804													1	3.9						
	0804	0802																			
I26 491+87	0805																				
	0805	0804				76															
I26 494+71	0806																				
	0806	0807		64																	
I26 494+53	0807													1	2.4						
	0807	0804																			
I26 494+98	0808																				
	0808	0807		72																	
I26 497+20	0809																				
	0809	0810				60															
I26 497+24	0810													1	2.9						
	0810	0807																			
I26 497+71	0811																				
	0811	0810		84																	
HGR 37+28	0902													1	5.0	3.6					
	0902	0901																			
HGR 36+45	0903													1	3.4						
	0903	0902																			
HGR 36+04	0904													1	2.3						
	0904	0903																			
HGR 35+11	0905													1	5.0	0.2					
	0905	0910																			
HGR 34+33	0906													1	3.0						
	0906	0912																			
HGR 34+96	0907													1	2.3						
	0907	0906																			
HGR 35+60	0908													1	3.0						
	0908	0907																			
HGR 35+54	0909													1	4.3						
	0909	0904																			
SHEET TOTALS				288		364			140					15	52.5	20.8					

LINE & STATION	FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	CONCRETE TRANSITIONAL SECTION C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35
I26 484+20	0714																					
	0714	0719																				
I26 486+51	0715																					
	0715	0716																				
I26 486+20	0716														1							
	0716	0712																				
I26 483+45	0717																					
	0717	0710																				
I26 481+51	0718																					
	0718	0711																				
I26 483+52	0719																				1	
	0719	0717																				
I26 489+24	0801																					
	0801	0802																				
I26 489+07	0802														1							
	0802	0716																				
I26 489+30	0803																					
	0803	0802																				
I26 491+63	0804								1						1							
	0804	0802																				
I26 491+87	0805																					
	0805	0804																				
I26 494+71	0806																					
	0806	0807																				
I26 494+53	0807								1						1							
	0807	0804																				
I26 494+98	0808																					
	0808	0807																				
I26 497+20	0809																					
	0809	0810																				
I26 497+24	0810								1						1							
	0810	0807																				
I26 497+71	0811																					
	0811	0810																				
HGR 37+28	0902																					
	0902	0901																				
HGR 36+45	0903																					
	0903	0902																				
HGR 36+04	0904																					
	0904	0903																				
HGR 35+11	0905																					
	0905	0910																				
HGR 34+33	0906																					
	0906	0912																				
HGR 34+96	0907																					
	0907	0906																				
HGR 35+60	0908																					
	0908	0907																				
HGR 35+54	0909																					
	0909	0904																				
SHEET TOTALS									3						5						1	

LINE & STATION	FROM	TO	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND VENTED M.H. GRATE	ENERGY DISSIPATOR J.B. SEE DETAIL 2D-1	SPITTER BOX SEE DETAIL 2D-4	SPECIAL DESIGN J.B. W/ MH SEE DETAIL 2D-8	HINGED GRATE	G.D.I. TYPE "A" EXTRA DEPTH, SEE DETAIL 2D-12	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	SPEC. DSN. PIPE CONNECTION, SEE DETAIL 2D-11	BERM DITCH OUTLET STD. 850.11 (PER EACH)	PIPE CLEANOUT EA	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
I26 484+20	0714																										
	0714	0719																									RETAIN AND LINE W/ CIPP
I26 486+51	0715																										
	0715	0716																									RETAIN AND LINE W/ CIPP
I26 486+20	0716									1																	2GI-A SPECIAL DESIGN
	0716	0712																									
I26 483+45	0717		1	1																							MH (6' DIA.) STD. 840.52 (PRECAST)
	0717	0710																									RETAIN AND LINE W/ CIPP
I26 481+51	0718								1																		FOREBAY #5, SEE DETAIL 2D-29
	0718	0711															1			1							ROD & LUG W/ GASKETS & ELBOW, 12 GAGE SPC. DSN. PIPE CONNECTION - 0711
I26 483+52	0719																										TRAFFIC BEARING JB W/ SLAB LID
	0719	0717																									
I26 489+24	0801																										
	0801	0802																									RETAIN AND LINE W/ CIPP
I26 489+07	0802									1																	2GI-A SPECIAL DESIGN
	0802	0716																									
I26 489+30	0803																										
	0803	0802																									RETAIN AND LINE W/ CIPP
I26 491+63	0804																										
	0804	0802																									
I26 491+87	0805																										
	0805	0804																									RETAIN AND LINE W/ CIPP
I26 494+71	0806																										
	0806	0807																									RETAIN AND LINE W/ CIPP
I26 494+53	0807																										
	0807	0804																									
I26 494+98	0808																										
	0808	0807																									RETAIN AND LINE W/ CIPP
I26 497+20	0809																										
	0809	0810																									RETAIN AND LINE W/ CIPP
I26 497+24	0810																										
	0810	0807																									
I26 497+71	0811																										
	0811	0810																									RETAIN AND LINE W/ CIPP
HGR 37+28	0902				1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
	0902	0901																		1							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0902
HGR 36+45	0903				1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
	0903	0902																		2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0903 & 0902
HGR 36+04	0904				2	1																					ENERGY DISSIPATOR JB, VENTED MH'S (BOLTED)
	0904	0903																2		2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0904 & 0903
HGR 35+11	0905				1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
	0905	0910																2		2							ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0905 & 0910
HGR 34+33	0906				1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
	0906	0912																		2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0906 & 0912
HGR 34+96	0907				2	1																					ENERGY DISSIPATOR JB, VENTED MH'S (BOLTED)
	0907	0906																		2							ROD & LUG W/ GASKETS,10 GAGE SPC. DSN. PIPE CONNECTION - 0907 & 0906
HGR 35+60	0908				1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
	0908	0907																		2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0908 & 0907
HGR 35+54	0909				1			1																			SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
	0909	0904																		2							ROD & LUG W/ GASKETS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0909 & 0904
SHEET TOTALS			1	1	10	2		6	1	2							1	4		16							

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSBEN-LAPTOP

COMPUTED BY: BAC DATE: 04-20-21

CHECKED BY: BJH DATE: 04-20-21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
15614.1075010	3D-5

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 %	C. S. PIPE (ALUMINIZED TYPE 2) 12 (0.079)	15 (0.079)	18 (0.079)	24 (0.109)	30 (0.138)	36 (0.138)	42 (0.168)	48 (0.168)	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48
HGR 35+32	524	LT	0910		1249.5																			
			0910	0909		1239.5	1218.1	4.3					68											
HGR 34+71	394	LT	0912		1302.9																			
			0912	0905		1295.6	1272.3	4.3					76											
I26 469+81	126	LT																						
HGR 34+74	30	RT																						
HGR 31+99	38	RT																						
HGR 31+99	33	RT																						
HGR 34+72	26	RT																						
HGR 34+65	9	LT																						
HGR 39+22	31	RT																						
I26 450+90	50	LT																						
I26 457+05	55	LT																						
I26 457+72	54	LT																						
I26 450+94	26	LT																						
I26 451+00	30	RT																						
I26 460+71	49	LT																						
I26 460+70	54	LT																						
I26 460+00	62	RT																						
I26 458+07	62	RT																						
I26 457+10	30	RT																						
I26 455+18	99	RT																						
I26 454+01	64	RT																						
I26 452+01	64	RT																						
I26 457+05	50	LT																						
I26 457+72	49	LT																						
I26 462+86	50	LT																						
I26 462+96	6	RT																						
I26 463+12	82	RT																						
I26 464+03	62	RT																						
I26 466+25	62	RT																						
I26 467+85	49	LT																						
I26 465+49	48	LT																						
I26 463+10	49	LT																						
I26 463+09	54	LT																						
I26 465+49	53	LT																						
I26 467+85	54	LT																						
I26 470+24	48	LT																						
I26 470+24	53	LT																						
I26 472+63	48	LT																						
I26 472+63	53	LT																						
I26 471+30	63	RT																						
I26 473+74	63	RT																						
I26 487+63	3	LT																						
I26 483+57	7	RT																						
I26 484+84	5	RT																						
I26 490+35	2	LT																						
I26 493+08	0	CL																						
I26 495+89	0	CL																						
I26 453+25	107	RT																						
SHEET TOTALS													144											

LINE & STATION	15" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITATION SMOOTH WALL STEEL SLIP LINER (0.5" THICK)	24" PIPE REHABILITAION CIPP LINER	30" PIPE REHABILITAION CIPP LINER	36" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION SOLID WALL THERMOPLASTIC SLIP LINER	18" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05
HGR 35+32												1	5.0								
HGR 34+71												1	2.3								
SHEET TOTALS												2	7.3								

LINE & STATION	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND VENTED M.H. GRATE	ENERGY DISSIPATOR J.B. SEE DETAIL 2D-1	SPITTER BOX SEE DETAIL 2D-4	SPECIAL DESIGN J.B. W/ MH SEE DETAIL 2D-8	HINGED GRATE	G.D.I. TYPE "A" EXTRA DEPTH, SEE DETAIL 2D-12	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	SPEC. DSN. PIPE CONNECTION, SEE DETAIL 2D-11	BERM DITCH OUTLET STD. 850.11 (PER EACH)
HGR 35+32																					1			1													
																																		2		2	
HGR 34+71																					2	1															
																																		2		2	
SHEET TOTALS																					3	1		1										4		4	

LINE & STATION	PIPE CLEANOUT EA	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
HGR 35+32						SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
						ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0910 & 0909
HGR 34+71						ENERGY DISSIPATOR JB, VENTED MH'S (BOLTED)
						ROD & LUG W/ GASKETS & 2 ELBOWS, 10 GAGE SPC. DSN. PIPE CONNECTION - 0912 & 0905
I26 469+81					214	REMOVE EXIST. 36" CMP
HGR 34+74				0.116		PLUG EXIST. 24" CMP
HGR 31+99				0.182		PLUG EXIST. 30" CMP
HGR 31+99					10	REMOVE EXIST. 30" CMP (PARTIAL)
HGR 34+72					10	REMOVE EXIST. 24" CMP (PARTIAL)
HGR 34+65		7				FILL EXIST. 24" CMP
HGR 39+22				0.262		PLUG EXIST. 36" CMP
I26 450+90				0.356		PLUG EXIST. 42" CMP
I26 457+05				0.262		PLUG EXIST. 36" CMP
I26 457+72				0.029		PLUG EXIST. 8" CMP
I26 450+94		17				FILL EXIST. 42" CMP
I26 451+00		17				FILL EXIST. 36" CMP
I26 460+71					10	REMOVE EXIST. 8" CMP (PARTIAL)
I26 460+70				0.029		PLUG EXIST. 8" CMP
I26 460+00					195	REMOVE EXIST. 30" CMP
I26 458+07					183	REMOVE EXIST. 30" CMP
I26 457+10		17				FILL EXIST. 36" CMP
I26 455+18					79	REMOVE EXIST. 18" CMP
I26 454+01					194	REMOVE EXIST. 18" CMP
I26 452+01					192	REMOVE EXIST. 24" CMP
I26 457+05					10	REMOVE EXIST. 36" CMP (PARTIAL)
I26 457+72					10	REMOVE EXIST. 18" CMP (PARTIAL)
I26 462+86				0.182		PLUG EXIST. 30" CMP
I26 462+96		21				FILL EXIST. 30" CMP
I26 463+12					38	REMOVE EXIST. 30" CMP
I26 464+03					190	REMOVE EXIST. 30" CMP
I26 466+25					248	REMOVE EXIST. 24" CMP
I26 467+85					10	REMOVE EXIST. 8" CMP (PARTIAL)
I26 465+49					10	REMOVE EXIST. 8" CMP (PARTIAL)
I26 463+10					10	REMOVE EXIST. 8" CMP (PARTIAL)
I26 463+09				0.029		PLUG EXIST 8" CMP
I26 465+49				0.029		PLUG EXIST 8" CMP
I26 467+85				0.029		PLUG EXIST 8" CMP
I26 470+24					10	REMOVE EXIST. 8" CMP (PARTIAL)
I26 470+24				0.029		PLUG EXIST 8" CMP
I26 472+63					10	REMOVE EXIST. 8" CMP (PARTIAL)
I26 472+63				0.029		PLUG EXIST 8" CMP
I26 471+30					237	REMOVE EXIST. 30" CMP
I26 473+74					248	REMOVE EXIST. 24" CMP
I26 487+63					284	REMOVE EXIST. 36" CMP
I26 483+57					13	REMOVE EXIST. 15" CMP
I26 484+84					267	REMOVE EXIST. 42" CMP
I26 490+35					252	REMOVE EXIST. 30" CMP
I26 493+08					286	REMOVE EXIST. 30" CMP
I26 495+89					267	REMOVE EXIST. 30" CMP
I26 453+25					99	REMOVE EXIST. 24" CMP
SHEET TOTALS		79		1.563	3586	

ABBREVIATIONS	
C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSBEN-LAPTOP

COMPUTED BY:	BAC	DATE:	04-20-21
CHECKED BY:	BJH	DATE:	04-20-21

PROJECT NO.	SHEET NO.
15614.1075010	3D-6

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	C. S. PIPE(ALUMINIZED TYPE 2) 12	15	18	24	30	36	42	48
THICKNESS OR GAUGE									0.079	0.079	0.079	0.109	0.138	0.138	0.168	0.168
HGR 53+24	17	RT														
I26 416+05	72	LT														
I26 416+04	5	RT														
I26 416+06	103	RT														
I26 489+25	86	LT														
I26 494+62	29	LT														
SHEET TOTALS																
PROJECT TOTALS											340	156	1876	1004		

LINE & STATION	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	15" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITAION CIPP LINER	18" PIPE REHABILITATION SMOOTH WALL STEEL SLIP LINER (0.5" THICK)	24" PIPE REHABILITAION CIPP LINER	30" PIPE REHABILITAION CIPP LINER	36" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION CIPP LINER	42" PIPE REHABILITAION SOLID WALL THERMOPLASTIC SLIP LINER	18" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.
HGR 53+24																						
I26 416+05																						
I26 416+04																						
I26 416+06																						
I26 489+25																						
I26 494+62																						
SHEET TOTALS																						
PROJECT TOTALS		1088	504	680	2268	480	280		92	688	40	364	262	332	140	604	52	52	1.500	72	267.5	

LINE & STATION	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29
HGR 53+24																						
I26 416+05																						
I26 416+04																						
I26 416+06																						
I26 489+25																						
I26 494+62																						
SHEET TOTALS																						
PROJECT TOTALS								6				18	10			11		23				

LINE & STATION	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND VENTED M.H. GRATE	ENERGY DISSIPATOR J.B. SEE DETAIL 2D-1	SPITTER BOX SEE DETAIL 2D-4	SPECIAL DESIGN J.B. W/ MH SEE DETAIL 2D-8	HINGED GRATE	G.D.I. TYPE "A" EXTRA DEPTH, SEE DETAIL 2D-12	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	SPEC. DSN. PIPE CONNECTION, SEE DETAIL 2D-11	BERM DITCH OUTLET STD. 850.11 (PER EACH)	PIPE CLEANOUT EA	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
HGR 53+24																										0.262		PLUG EXIST. 36" CMP
I26 416+05																										0.116		PLUG EXIST. 24" CMP
I26 416+04																								18				FILL EXIST. 24" CMP
I26 416+06																											20	REMOVE EXIST. 24" CMP
I26 489+25																							1					CLEANOUT EXIST. 18" CMP
I26 494+62																							1					CLEANOUT EXIST. 18" CMP
SHEET TOTALS																							2	18		0.378	20	
PROJECT TOTALS	2	2	1	1	6	33	7	1	19	5	5						4	3	20	15	85	2	2	97		1.941	3606	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY:	BAC	**DATE:**	04-20-21
CHECKED BY:	BJH	**DATE:**	04-20-21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
15614.1075010	3D-7

**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 54 INCHES & OVER)

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 %	C. S. PIPE (ALUMINIZED TYPE 2) 54 / 0.168	C.S. 60 / 0.168	C.S. 66 / 0.168	C.S. 72 / 0.168	C.S. 78 / 0.168	C.S. 84 / 0.168	R. C. PIPE CLASS IV 54	R.C. 60	R.C. 66	R.C. 72	R.C. 78	R.C. 84	54" WELDED STEEL PIPE 0.750" THICK, GRADE B IN SOIL	54" WELDED STEEL PIPE 0.750" THICK, GRADE B NOT IN SOIL	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY
I26 416+14	84 RT	0403		1396.2																			5.800
		0403	0407		1386.7	1385.0														86	86		
I26 416+15	88 LT	0407		1400.6																			9.000
I26 452+88	63 RT	0525		1654.8																			5.000
		0525	0539		1647.3	1631.6	0.4													78	78		
I26 452+88	92 LT	0539		1638.5																			9.000
I26 463+18	63 RT	0606		1707.6																			5.600
		0606	0605		1698.7	1697.7														54	54		
I26 463+18	43 LT	0605		1707.2																			5.600
							SHEET TOTALS													218	218		40.000
							PROJECT TOTALS													218	218		40.000

FROM	TO	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	SPRING BOX STD. 840.41
0403												1						1														
0403	0407																															
0407																																
0525												1						1														
0525	0539																															
0539																																
0606												1						1														
0606	0605																															
0605												1				1																
SHEET TOTALS												4				1		3														
PROJECT TOTALS												4				1		3														

FROM	TO	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	M.H. FRAME AND VENTED M.H. GRATE	SPECIAL DESIGN J.B. W/ MH SEE DETAIL 2D-8	BERM DITCH OUTLET STD. 850.10 (PER EACH)	BERM DITCH OUTLET STD. 850.11 (PER EACH)	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	ENERGY DISSIPATION BASIN	PIPE CLEANOUT EA	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0403																						
0403	0407																					TRENCHLESS CONSTRUCTION, L=172'
0407										1	1											SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0525																						
0525	0539																					TRENCHLESS CONSTRUCTION, L=156'
0539										1	1											SPECIAL DESIGN JB W/ VENTED MH (BOLTED)
0606																						
0606	0605																					TRENCHLESS CONSTRUCTION, L=108'
0605																						
SHEET TOTALS										2	2											
PROJECT TOTALS										2	2											

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY: __ JCK Jan-21	
CHECKED BY: ___ SCC Jan-21	

(5-15-18)

PROJECT NO.	SHEET NO.
15614.1075010	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
L	453+00	461+00	RT	SD	800
L	452+00	460+75	LT	SD	875
L	463+00	468+00	LT	SD	500
L	463+00	475+00	RT	SD	1200
L	470+00	472+75	LT	SD	275
L	477+00	481+50	RT	SD	450
L	483+00	497+00	CL	SD	1400
CONTINGENCY				SD	200
				TOTAL LF:	5700

*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
CONTINGENCY			1	12	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.

PROJ. REFERENCE NO.	SHEET NO.
15614.1075010	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	5, 6 & 9	ELIZABETH F. HORNE & DAVID W. FOSTER
2	5 & 9	JOHN BARNES, III & ELIZABETH H. BARNES LIVING TRUST
3	5	BOARD OF TRANSPORTATION

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

8/17/99

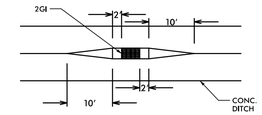
REVISIONS

NOTE: ALL CSP GASKETS ARE TO BE SLEEVE GASKETS.

-I26- CURVE DATA

PIs Sta 415+45.24	PI Sta 417+47.11	PIs Sta 419+49.38
Θs = 8° 00' 00.0"	Δ = 5° 30' 00.0" (RT)	Θs = 8° 00' 00.0"
Ls = 400.00'	D = 4° 00' 00.0"	Ls = 400.00'
LT = 266.94'	L = 137.50'	LT = 266.94'
ST = 133.58'	T = 68.80'	ST = 133.58'
	R = 1,432.40'	
PIs Sta 425+36.75	PI Sta 428+13.63	PIs Sta 430+90.06
Θs = 8° 00' 00.0"	Δ = 11° 28' 00.0" (LT)	Θs = 8° 00' 00.0"
Ls = 400.00'	D = 4° 00' 00.0"	Ls = 400.00'
LT = 266.94'	L = 286.67'	LT = 266.94'
ST = 133.58'	T = 143.81'	ST = 133.58'
	R = 1,432.40'	

DETAIL 2
INSTALLATION OF 2GI IN CONCRETE DITCH



NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047943 CLINTON B. PRUITT
11/17/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 BENJAMIN J. HENEGAR
11/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

SA — SENSITIVE AREA

LANDSLIDE OUTLINES – ACTIVE

-I26- TS 412+78.30

415+00

CLASS 'II' RIP-RAP L=20' THICKNESS=2.0' EST. 40 TONS

WOODS

30" CSP (10 GAGE) ROD & LUG W/GASKETS S=5.0%

SEE DETAIL SHEET 2D-30 FOR PIPE PROFILE

0409 SPC DSN JB W/MH

0408

-I26- SC 416+78.30

30" CSP (10 GAGE) ROD & LUG W/GASKETS & 2 ELBOWS S=57.7%

PLUG & ABANDON 0407

FLOWABLE FILL

SPC DSN JB W/MH

RETAIN 0406

RETAIN & LINE W/CIPP

RETAIN

CB 2'X3'

0405

54" WSP (TRENCHLESS CONSTRUCTION) DN. 0.750" THICK)

CONC BARRIER

INSTALL DRAINAGE SYSTEM
-I26- STA 416+14.09

RETAIN & LINE W/CIPP

18" RCP-IV

REPLACE CONC. DITCH L=50'

2GI 0402

24" CMP

0403

2GI-A

BDO 0404

REPLACE CONC. DITCH L=50'

REMOVE

REMOVE

REMOVE HW

HW 0401

BL-31

DAMAGED 72" CONC

CONC HW

EXISTING R/W

WOODS

24" CSP (12 GAGE) ROD & LUG W/ GASKETS & ELBOW S=17.6%

REMOVE EX. CONC. DITCH -I26- 416+30 TO 416+60 RT

48" WW2SBW

I-26 EAST BST

I-26 WEST 36' BST

DI 2GI

18" CMP

30" CMP

72" CONC

MTL

I26-3

-I26- CS 418+15.80

420+00

-I26- ST 422+15.80

-I26- TS 422+69.81

-I26- SC 426+69.81

425+00

S 72° 23' 00.0" W

6' BST

10' BST

16' BST

5' BST

CONC BARRIER

BL-32

4/8/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Roadway\Proj\I-26-Howard Gap_Rdy_psh_04.dgn
User:cbpruitt

MATCH LINE
MATCH TO SHEET NO. 9

SA SENSITIVE AREA

LANDSLIDE OUTLINES – ACTIVE

NOTES: 1.) 0511, 0512, 0513, & 0514 ARE FUTURE DRAINAGE STRUCTURES TO BE CONSTRUCTED DURING THE REPAIR OF HOWARD GAP RD (FUTURE PROJECT).

2.) ALL CSP GASKETS ARE TO BE SLEEVE GASKETS.

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: SEAL 047943 ENGINEER CLINTON B. PRUITT — 9/17/2021

HYDRAULICS ENGINEER: SEAL 044158 ENGINEER BENJAMIN J. HENEGAR — 9/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS 8/17/99

2 JOHN BARNES, III AND ELIZABETH H. BARNES LIVING TRUST DB 306 PG 1841 MAP CARD FILE B PG 1235

3 BOARD OF TRANSPORTATION DB 163 PG 1846

1 ELIZABETH F. HORNE DAVID W. FOSTER DB 232 PG 1195 MAP CARD FILE C PG 742

1 ELIZABETH F. HORNE DAVID W. FOSTER DB 232 PG 1195 MAP CARD FILE C PG 742

1 ELIZABETH F. HORNE DAVID W. FOSTER DB 232 PG 1195 MAP CARD FILE C PG 742

BOARD OF TRANSPORTATION DB 163 PG 1846

CONSERVATION EASEMENT TO PACOLET AREA CONSERVANCY, INC. IN DB 216 PG 178

CONSERVATION EASEMENT TO PACOLET AREA CONSERVANCY, INC. IN DB 216 PG 178

-HGR- PT 32+20.99

-HGR- PC 32+95.50

-HGR- PT 34+13.35

-HGR- PT 36+84.19

-HGR- PC 41+73.29

-HGR- PT 43+90.32

-HGR- PC 45+24.76

S 71° 32' 45.0" W

S 18° 25' 37.1" W

N 89° 12' 53.1" W

N 84° 45' 55.6" W

N 84° 49' 00.0" W

S 29° 47' 18" E 283.59'

-126- CS 454+20.88

-126- ST 458+20.88

BEGIN CONSTRUCTION
-126- STA 450+40.00

50' TAPER TO EXIST. 00+

+00 BEGIN SBG

+50 TIE TO EXIST. GUARDRAIL BEGIN FDPS (2' MIN. SAWCUT)

+90 BEGIN 12' CONC. DITCH BEGIN 14' FDPS

+40 BEGIN MILLED RUMBLE STRIPS

50' TAPER TO EXIST. 00+

DETAIL 1
PERMANENT ROCK CHECK
(Not to Scale)

DETAIL 2
INSTALLATION OF 2GI IN CONCRETE DITCH

SEE DETAIL SHEET 2D-32 FOR PIPE PROFILE

SEE DETAIL SHEET 2D-34 FOR PIPE PROFILE

SEE DETAIL SHEET 2D-31 FOR PIPE PROFILE

SEE DETAIL SHEET 2D-35 FOR PIPE PROFILE

CONTRACTOR TO REMOVE AND REPLACE APPROX. 125 LF OF GUARDRAIL FOR DRAINAGE PIPE INSTALLATION AS DIRECTED BY THE ENGINEER.

CONTRACTOR TO REMOVE AND RESET APPROX. 50 LF OF CONTROL OF ACCESS FENCE AS DIRECTED BY THE ENGINEER.

CONTRACTOR TO INSTALL CONCRETE BARRIER AROUND DUKE ENERGY TRANSMISSION STRUCTURES (NO CLOSER THAN 10') WHENEVER CONSTRUCTION EQUIPMENT IS WITHIN 25' OF STRUCTURE AND/OR TO THE LIMITS AS DIRECTED BY THE ENGINEER.

CONTRACTOR TO INSTALL CONCRETE BARRIER AROUND DUKE ENERGY TRANSMISSION STRUCTURES (NO CLOSER THAN 10') WHENEVER CONSTRUCTION EQUIPMENT IS WITHIN 25' OF STRUCTURE AND/OR TO THE LIMITS AS DIRECTED BY THE ENGINEER.

ALL DUKE TRANSMISSION LINES ARE TO BE TREATED WITH CLEARANCE AND OFFSET GUIDELINES AS ESTABLISHED FOR 100kV POWERED RATING.

-126- CURVE DATA

PI Sta 449+08.00	PIs Sta 455+54.26
Δ = 18° 06' 10.4" (RT)	Θs = 3° 30' 00.0"
D = 1° 45' 00.0"	Ls = 400.00'
L = 1,034.45'	LT = 266.72'
T = 521.57'	ST = 133.38'
R = 3,274.05'	

-HGR- CURVE DATA

PI Sta 31+76.32	PI Sta 33+54.86	PI Sta 36+36.86	PI Sta 42+86.80	PI Sta 45+86.42
Δ = 11° 24' 40.2" (LT)	Δ = 16° 52' 52.1" (RT)	Δ = 2° 21' 29.9" (RT)	Δ = 41° 26' 57.4" (RT)	Δ = 24° 00' 28.0" (LT)
D = 12° 43' 56.6"	D = 14° 19' 26.2"	D = 2° 29' 28.0"	D = 19° 05' 54.9"	D = 19° 45' 25.8"
L = 89.62'	L = 117.85'	L = 94.67'	L = 217.03'	L = 121.51'
T = 44.96'	T = 59.36'	T = 47.34'	T = 113.51'	T = 61.66'
R = 450.00'	R = 400.00'	R = 2,300.00'	R = 300.00'	R = 290.00'

MATCH LINE STA. -126- 462+00
MATCH TO SHEET NO. 6

MATCH LINE STA. -HGR- 46+00
MATCH TO SHEET NO. 6

NAD 83/2011

4/8/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Roadway\Proj\I-26-Howard Gap_Rdy_psh_05.dgn
User:cbpruitt

8/17/99

REVISIONS

SA SENSITIVE AREA

LANDSLIDE OUTLINES – ACTIVE

ALL DUKE TRANSMISSION LINES ARE TO BE TREATED WITH CLEARANCE AND OFFSET GUIDELINES AS ESTABLISHED FOR 100kV POWERED RATING.

–HGR– CURVE DATA

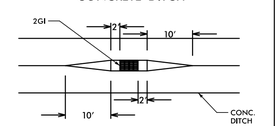
PI Sta 45+86.42	PI Sta 50+90.24	PI Sta 53+74.76	PI Sta 56+52.71
Δ = 24° 00' 28.0" (LT)	Δ = 10° 08' 44.8" (LT)	Δ = 13° 18' 26.3" (RT)	Δ = 12° 50' 07.5" (LT)
D = 19° 45' 25.8"	D = 5° 06' 56.5"	D = 6° 44' 26.4"	D = 5° 37' 02.0"
L = 121.51'	L = 198.33'	L = 197.42'	L = 228.50'
T = 61.66'	T = 99.42'	T = 99.16'	T = 114.73'
R = 290.00'	R = 1,120.00'	R = 850.00'	R = 1,020.00'

–I26– CURVE DATA

PIs Sta 466+13.01	PI Sta 469+36.39	PIs Sta 472+59.68
Θs = 0° 30' 00.0"	Δ = 2° 34' 00.0" (LT)	Θs = 0° 30' 00.0"
Ls = 200.00'	D = 0° 30' 00.0"	Ls = 200.00'
LT = 133.33'	L = 513.33'	LT = 133.33'
ST = 66.67'	T = 256.71'	ST = 66.67'
	R = 11,459.16'	

NOTE: ALL CSP GASKETS ARE TO BE SLEEVE GASKETS.

DETAIL 2
INSTALLATION OF 2GI IN CONCRETE DITCH



PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044743 CLINTON B. PRUETT
11/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 BENJAMIN J. HENEGAR
11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

MATCH LINE STA. –HGR– 46+00
MATCH TO SHEET NO. 5

MATCH LINE STA. –I26– 462+00
MATCH TO SHEET NO. 5

MATCH LINE STA. –I26– 475+00
MATCH TO SHEET NO. 7

MATCH LINE STA. –HGR– 58+70
MATCH TO SHEET NO. 7

NAD 83/2011

ELIZABETH F. HORNE
DAVID W. FOSTER
DB 232 PG 1195
MAP CARD FILE C PG 742

CONSERVATION EASEMENT TO PACOLET AREA CONSERVANCY, INC. IN DB 216 PG 178

–HGR– PT 46+46.27
–HGR– PC 49+90.82
–HGR– PT 51+89.15
–HGR– PC 52+75.61
–HGR– PT 54+73.02
–HGR– PC 55+37.98
–HGR– PT 57+66.48
–I26– SC 466+79.68
–I26– TS 464+79.68
–I26– CS 471+93.01
–I26– ST 473+93.01

50+00
55+00
465+00

N 71° 46' 23.6" W
N 81° 55' 08.4" W
N 68° 36' 42.1" W
N 81° 26' 49.8" W
N 88° 23' 00.0" W
N 84° 49' 00.0" W

SR 1102 (HOWARD GAP RD)

WOODS
BROKEN CONC
MTL
EXISTING R/W
PDE
69.49 116.56'
+13.00 213.00'
+58.00 153.51'
+64.00 186.00'
+19.00 115.88'
LOW WIRE EL=1694.13'
LOW WIRE EL=1695.50'
LOW WIRE EL=1684.91'
LOW WIRE EL=1684.87'
WATER PUMP STATION
BRUSH
END NOT FOUND
ABANDON
REMOVE
PLUG & ABANDON
PIPE IS SEPERATED NEAR R/W FENCE
RETAIN LINE W/RIP
RIP-RAP AT EMBANKMENT CLASS "II" RIP-RAP EST. 40 TONS L=35' FT
VAR. WIDTH BASE DITCH SEE DETAIL SHEET 2D-13 CLASS "II" RIP-RAP EST. 120 TONS EST. 170 CY DDE L=60' FT S=20.0%
CONTRACTOR TO REMOVE AND REPLACE APPROX 125 LF OF GUARDRAIL FOR DRAINAGE PIPE INSTALLATION AS DIRECTED BY THE ENGINEER.
SEE DETAIL SHEET 2D-35 FOR PIPE PROFILE
SEE DETAIL SHEET 2D-36 FOR PIPE PROFILE
CONTRACTOR TO INSTALL CONCRETE BARRIER AROUND DUKE ENERGY TRANSMISSION STRUCTURES (NO CLOSER THAN 10') WHENEVER CONSTRUCTION EQUIPMENT IS WITHIN 25' OF STRUCTURE AND/OR TO THE LIMITS AS DIRECTED BY THE ENGINEER.
CONTRACTOR TO REMOVE AND RESET APPROX. 50 LF OF CONTROL OF ACCESS FENCE AS DIRECTED BY THE ENGINEER.
CONTRACTOR TO REMOVE AND RESET APPROX. 50 LF OF CONTROL OF ACCESS FENCE AS DIRECTED BY THE ENGINEER.
REMOVE 10' EX. PIPE, PLUG, & ABANDON
PROP. SBG
PROP. FDPS (2' MIN. SAWCUT)
PROP GUARDRAIL (EXTRA DEPTH)
PROP. GUARDRAIL (EXTRA DEPTH)
PROP. 14' FDPS
PROP. 12' CONC. DITCH
PROP. FOREBAY ACCESS
FOREBAY #3 SEE DETAIL SHEET 2D-21 EST. 130 SY CONC. EST. 115 CY DDE
FOREBAY #4 SEE DETAIL SHEET 2D-24 EST. 443 SY CONC. EST. 450 CY DDE
REMOVE EX. CONC. DITCH –I26– 463+80 TO 465+00 RT
REMOVE EX. CONC. DITCH –I26– 469+75 TO 470+50 RT
REPLACE CONC. DITCH L=50'
REPLACE CONC. DITCH (–I26– STA. 472+55 TO 475+00 RT) L=245' EST. 65 CY DDE
RETAIN CONC. DITCH (CLEAR 15' EASEMENT NORTH SIDE)
RETAIN & LINE W/CIPP
RETAIN
I26-5
T-132
BY12-45
BY12-46
BY12-47
0602 0603 0604 0605 0606 0607 0608 0609 0610 0611 0612 0613 0614 0615 0616 0617 0618 0619 0620 0621 0622 0623 0624 0625 0626 0627 0628
OTCB-4
SPC DSN JB W/MH
CB 2'x3'
2GI
2GI-A
2I
2I-A
36" CSP (10 GAGE) ROD & LUG W/GASKETS S=19.2%
36" CSP (10 GAGE) ROD & LUG W/GASKETS & 2 ELBOWS S=46.6%
30" CSP (10 GAGE) ROD & LUG W/GASKETS & ELBOW S=36.4%
30" CSP (10 GAGE) ROD & LUG W/GASKETS S=57.7%
30" CSP (10 GAGE) ROD & LUG W/GASKETS S=8.9%
30" CSP (10 GAGE) ROD & LUG W/GASKETS & 2 ELBOWS S=57.7%
30" CSP (10 GAGE) ROD & LUG W/GASKETS S=25.7%
24" CSP (12 GAGE) ROD & LUG W/ GASKETS & ELBOW S=17.6%
10" PVC (DATUR) 30" CSP (10 GAGE) ROD & LUG W/GASKETS S=1.0%
54" WSP (THICKNESS CONSTRUCTION 0.750" THICK)
FLOWABLE FILL
30" RCP-IV
24" RCP-IV
30" CMP
36" CMP
24" CMP
8' CMP
18" CMP
24" HDPE
72" CONC
6" CONC
4' CONC
2' CONC
I-26 EAST
I-26 WEST
6' BST
7' BST CONC BARRIER
8' BST CONC. BARRIER
10' BST
13' BST
14' BST
24' BST
30' BST
34' BST
36' BST
VAR WIDTH SOIL & GR
48" MTL
48"WW W/ 2SBW
15" RCP-IV

4/8/2021
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User:rbrust

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047943 CLINTON B. PRUETT

11/11/2021

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 BENJAMIN J. HENEGAR

11/11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

NAD 83/2011

-I26- CURVE DATA

PIs Sta 477+79.15	PI Sta 479+97.10	PIs Sta 482+15.38	PIs Sta 487+91.25
Θs = 8° 00' 00.0"	Δ = 6° 47' 00.0" (RT)	Θs = 8° 00' 00.0"	Θs = 4° 30' 00.0"
Ls = 400.00'	D = 4° 00' 00.0"	Ls = 400.00'	Ls = 300.00'
LT = 266.94'	L = 169.58'	LT = 266.94'	LT = 200.06'
ST = 133.58'	T = 84.89'	ST = 133.58'	ST = 100.06'
	R = 1,432.39'		

-HGR- CURVE DATA

PI Sta 61+19.38	PI Sta 66+64.68	PI Sta 71+11.33	PI Sta 71+73.19
Δ = 9° 40' 19.5" (LT)	Δ = 26° 18' 14.6" (RT)	Δ = 10° 00' 42.7" (LT)	Δ = 39° 18' 35.0" (LT)
D = 3° 53' 51.6"	D = 4° 22' 25.4"	D = 19° 05' 54.9"	D = 57° 17' 44.8"
L = 248.15'	L = 601.41'	L = 52.42'	L = 68.61'
T = 124.37'	T = 306.10'	T = 26.28'	T = 35.72'
R = 1,470.00'	R = 1,310.00'	R = 300.00'	R = 100.00'

MATCH LINE STA. -HGR- 58+70
MATCH TO SHEET NO. 6

MATCH LINE STA. -I26- 475+00
MATCH TO SHEET NO. 6

MATCH LINE STA. -I26- 488+00
MATCH TO SHEET NO. 8

-HGR- PT 62+43.16
-HGR- PC 59+95.01
-HGR- PC 63+58.58
-HGR- PT 72+06.09
-HGR- POT 72+52.45
-HGR- PT 69+59.99
-HGR- PC 70+85.06
-HGR- PCC 71+37.48
-I26- TS 475+12.21
-I26- SC 479+12.21
-I26- CS 480+81.80
-I26- ST 484+81.80
-I26- TS 485+91.18

NCGS ROUND (I26-6)

N 81° 26' 49.6" W
S 88° 52' 50.9" W
N 64° 48' 54.5" W
S 65° 51' 47.8" W
N 65° 36' 00.0" W

60+00
65+00
70+00
480+00
485+00

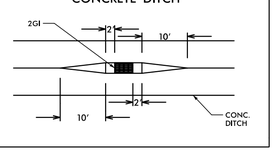
BYI2-48
BYI2-49
BYI2-50
BYI2-51

BL-39
BL-40

WOODS
MTL
BRUSH
RIP RAP
CONC BARRIER
SR 1122 (HOWARD GAP RD)
I-26 EAST
I-26 WEST
VAR WIDTH SOIL

CLASS 'II' RIP-RAP L=20' THICKNESS=2.0' EST. 35 TONS
133.25' TAPER TO EXIST.
50:1
125' TAPER
150' TAPER TO EXIST.
+00 END SBG
+31.25 TIE TO EXIST. GUARDRAIL END FDPS (2' MIN. SAWCUT)
+18.56 BEGIN GUARDRAIL (EXTRA DEPTH) BEGIN MILLED RUMBLE STRIPS
+65 END MILLED RUMBLE STRIPS
+18.56 TIE GUARDRAIL TO EXIST. CONC. BARRIER BEGIN MILLED RUMBLE STRIPS
+15 END 12' CONC. DITCH END 14' FDPS
+95 BEGIN 10' FDPS
+66.44 BEGIN 10' FDPS
+25 BEGIN CONC. DITCH
+41.44
RETAIN
RETAIN EX. RIPRAP
RETAIN & LINE W/CIPP 30" CMP
RETAIN & LINE W/CIPP 15" CMP
RETAIN & LINE W/CIPP 18" CMP
RETAIN & LINE W/CIPP & 24" CMP
RETAIN & LINE W/CIPP & 42" CMP
RETAIN CONC. DITCH
RETAIN CONC. DITCH (CLEAR 15' EASEMENT NORTH SIDE)
REMOVE
REMOVE CONC. DITCH
REMOVE EX. CONC. DITCH -I26- 479+75 TO 482+25 RT
CONTRACTOR TO REMOVE AND RESET APPROX. 50 LF OF CONTROL OF ACCESS FENCE AS DIRECTED BY THE ENGINEER.
REPLACE CONC. DITCH (-I26- STA. 482+40 TO 484+00 LT) L=160'
PAVE FULL DEPTH MEDIAN FROM -I26- STA. 483+18.56 TO -I26- STA. 483+95.00
PROP. 14' FDPS
PROP. 12' CONC. DITCH
PROP. FOREBAY ACCESS
FOREBAY #5 SEE DETAIL SHEET 2D-27 EST. 168 SY CONC. EST. 205 CY DDE
24" CSP (12 GAGE) ROD & LUG W/ GASKETS & ELBOW S=17.6%
24" RCP-IV
36" RCP-IV
42" CMP W/SLIP LINER
CAT-1 TYPE B-77 MH 48" DIA.
TBJB /W/ SLAB LID
2GI-A SPC DSN
2GI
2GI-A
2GI-A 10' BST
2GI-A 24' BST
2GI-A 32' BST
2GI-A 36' BST
CB 2'x3'
DI 2'x3'
DI
WATER SUPPLY STATION
CORNER BARRIER
END BARRIER
10 "PVC (DATUM)
72" CHL3SBW
48"WW W/ 2SBW
4' CONC
6" CONC
72" CONC
48" CONC
24" BST
34' BST
38' BST
32' BST
26' BST
15' BST
7' BST
12" BST
4' BST
END NOT FOUND

DETAIL 2
INSTALLATION OF 2GI IN CONCRETE DITCH



SA SENSITIVE AREA

LANDSLIDE OUTLINES – ACTIVE

NOTE: ALL CSP GASKETS ARE TO BE SLEEVE GASKETS.

4/8/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Roadway\Proj\I-26-Howard Gap_Rdy_psh_07.dgn
jsarrington

8/17/99

REVISIONS

MATCH LINE STA. –I26– 488+00
MATCH TO SHEET NO. 7

–I26– CURVE DATA

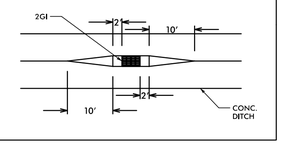
PIs Sta 487+91.25	PI Sta 488+92.02	PIs Sta 489+92.91
Θs = 4° 30' 00.0"	Δ = 0° 03' 00.0" (LT)	Θs = 4° 30' 00.0"
Ls = 300.00'	D = 3° 00' 00.0"	Ls = 300.00'
LT = 200.06'	L = 1.67'	LT = 200.06'
ST = 100.06'	T = 0.83'	ST = 100.06'
	R = 1,909.86'	

NAD 83/2011

SA SENSITIVE AREA

LANDSLIDE OUTLINES – ACTIVE

DETAIL 2
INSTALLATION OF 2GI IN CONCRETE DITCH



PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047943 CLINTON B. PRUITT
4/11/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 BENJAMIN J. HENEGAR
4/11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

490+00 495+00 500+00

WOODS

SR 1188 (INDIAN MTN RD) 21' BST

24" CMP

BY10-52

BY10-53

MTL

RIP RAP MTL

RIP RAP

CLEANOUT EXIST. PIPE

48"WW W/ 2SBW

RETAIN

RETAIN CONC. DITCH

72" CONC

CLEANOUT & RETAIN

RETAIN & LINE W/CIPP

18" CMP

24" CMP

0801 0802 0803 0804 0805 0806 0807 0808 0810 0811

2GI-A

30" RCP IV

REMOVE

12" CMP

36" RCP IV BST

SPC DSN

GRAVEL

BROKEN CONC.

BL-41

BL-42

I-26 EAST 24' BST

I-26 WEST 36' BST

11' BST

10' BST

RETAIN & LINE W/CIPP & UNDERDRAIN

30" RCP IV GRASS

12" CMP GRASS

4 SPAN CONC W/STL BEAMS

N 74° 39' 00.0" W

+50
END 10' FDPS
END CONC. DITCH
END MILLED RUMBLE STRIPS
TIE TO EXIST. GUARDRAIL

END CONSTRUCTION
–I26– STA 497+50.00

CONC HW

48"CHL W/ 2SBW

+/- 28' BST

GR

PWR METER

SR 1188 (INDIAN MTN RDJ 20' BST

4/8/2021
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User:hgriest

8/17/99

REVISIONS

ALL EASEMENTS ON THIS SHEET ARE MEASURED FROM –HGR– ALIGNMENT.

NOTE: ALL CSP GASKETS ARE TO BE SLEEVE GASKETS.

NAD 83/2011

SA — SENSITIVE AREA

LANDSLIDE OUTLINES – ACTIVE

APPROXIMATE CLEARING LIMITS WITHIN AND NEAR THE SENSITIVE AREA (SEE EC PLANS FOR ADDITIONAL INFORMATION). FINAL LIMITS TO BE SET AS DIRECTED BY THE ENGINEER.

PROJECT REFERENCE NO.	SHEET NO.
15614.1075010	9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047943 CLINTON B. PRUETT ENGINEER

5/11/2021

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044158 BENJAMIN J. HENEGAR ENGINEER

5/11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

ENERGY DISSIPATOR BASIN #1
SEE DETAIL SHEET 2D-14
CLASS "II" RIP-RAP
EST. 310 TONS
EST. 1350 CY DDE
L=75 FT

LINE EXISTING CHANNEL
CLASS "I" RIP-RAP
SEE DETAIL SHEET 2D-14
EST. 35 TONS
L=30 FT

PROPOSED CHANNEL CHANGE
SEE DETAIL SHEET 2D-14
CLASS "I" RIP-RAP
EST. 165 TONS
EST. 350 CY DDE
L=165 FT

30" CSP (10 GAGE)
ROD & LUG W/GASKETS
S=5.8%

30" CSP (10 GAGE) ROD & LUG W/GASKETS S=20.3%

30" CSP (10 GAGE) ROD & LUG W/GASKETS & 2 ELBOWS S=46.6%

30" CSP (10 GAGE) ROD & LUG W/GASKETS & 2 ELBOWS S=24.9%

30" CSP (10 GAGE) ROD & LUG W/GASKETS & 2 ELBOWS S=36.4%

30" CSP (10 GAGE) ROD & LUG W/GASKETS & 2 ELBOWS S=46.6%

30" CSP (10 GAGE) ROD & LUG W/GASKETS S=19.8%

30" CSP (10 GAGE) ROD & LUG W/GASKETS S=22.4%

30" CSP (10 GAGE) ROD & LUG W/GASKETS S=11.0%

SEE DETAIL SHEET 2D-33 FOR PIPE PROFILE

SEE DETAIL SHEET 2D-34 FOR PIPE PROFILE

SPC DSN JB W/MH

ENERGY DISSIPATOR JB

CONTRACTOR TO INSTALL SAFETY FENCE WITHIN SA AS SHOWN ON THE PLANS AND/OR AS DIRECTED BY THE ENGINEER.

BY12A-58
BY12A-57
BY12A-56
BY12A-55

+35.00 959.00
+15.00 962.00
+57.00 856.00
+63.00 861.00
+42.00 746.00
+84.00 672.00
+08.00 577.31
+89.00 470.00
+91.00 516.00
+17.00 431.00
+26.00 422.00
+10.00 439.00
+04.00 330.00
+57.00 333.00
+21.00 250.00
+98.00 184.00

S 12°07'38" E 504.37'
S 50°27'49" W 377.79'
S 15°04'00" E 377.71'
S 56°35'47" E 360.32'

1
ELIZABETH F. HORNE
DAVID W. FOSTER
DB 232 PG 1195
MAP CARD FILE C PG 742

2
JOHN BARNES, III
AND ELIZABETH H. BARNES
LIVING TRUST
DB 306 PG 1841
MAP CARD FILE B PG 1235

BOARD OF TRANSPORTATION
DB 163 PG 1846

WOODS
WDDK
WD RAMP
2SFD
WD FOOT BRIDGE
WD DK
WD RK
POOL
WD GAZEBO
STONE
WD DK
GR
CONC
RK
24" RCP
RK HW
RK HW
SOIL TRAIL
W
MTL
100.00'
BST
WD DK
G
18" RCP
OUTSIDE EASEMENT
MORE EASEMENT

MATCH LINE
MATCH TO SHEET NO. 5

5/10/2021
X:\NCDOT\I-26 Howard Gap Rd Rehab\Roadway\ProjI-26-Howard Gap_Rdy_psh_09.dgn
User:cbpruett