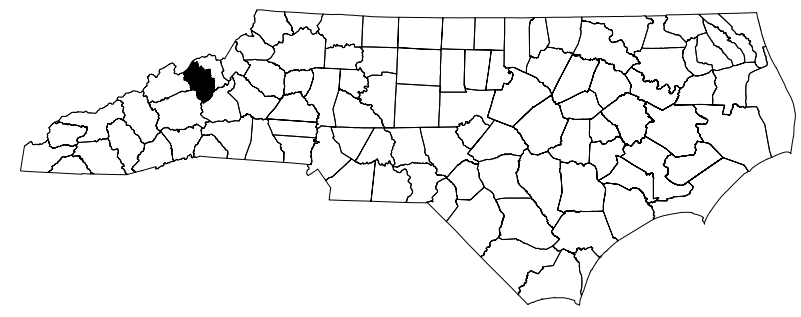


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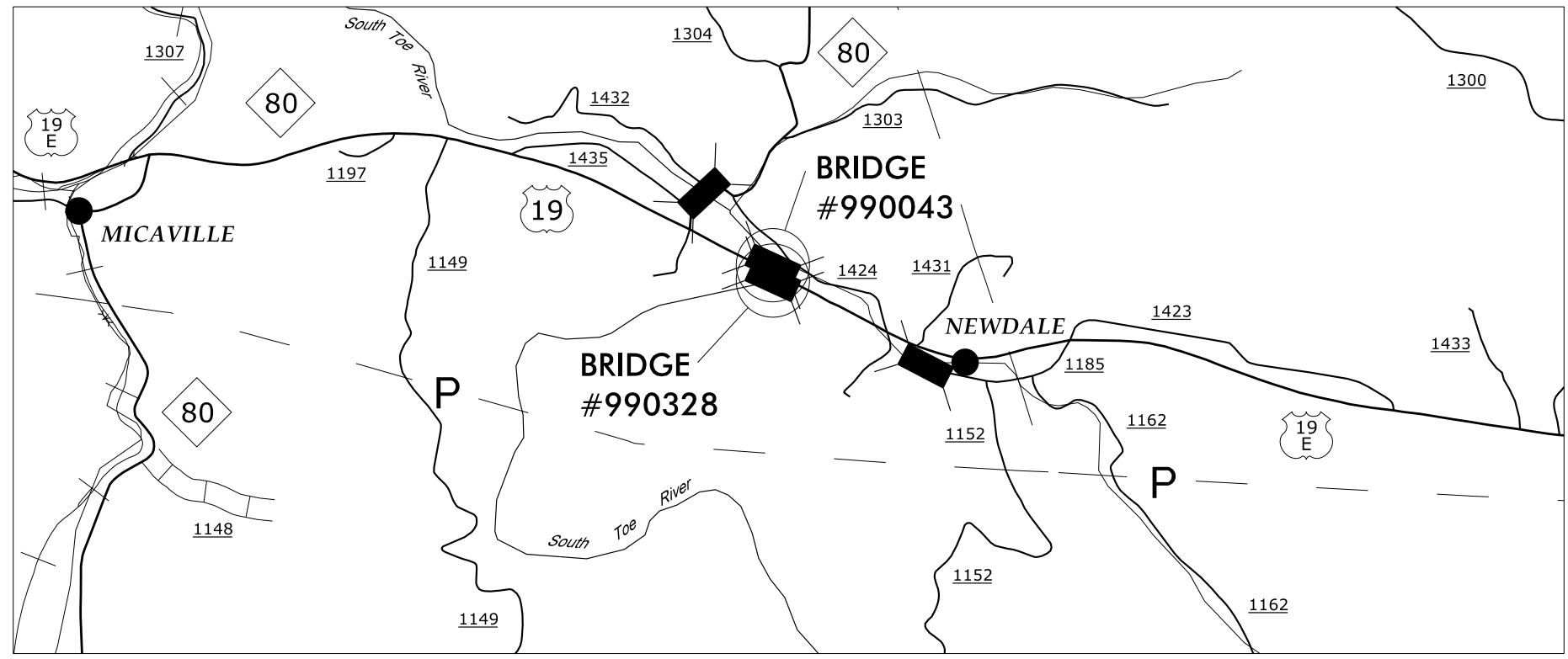


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

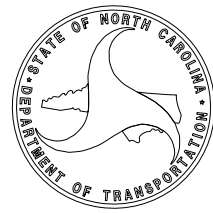
YANCEY COUNTY

LOCATION:
BRIDGE #990043 ON US 19E WBL OVER SOUTH TOE RIVER
BRIDGE #990328 ON US 19E EBL OVER SOUTH TOE RIVER
TYPE OF WORK: BRIDGE REPAIR, CURB & GUTTER, AND PAVING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	18313.1100058.PR /18313.1100090.PR /18313.1100096.PR	1	14
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
18313.1100058.PR	NA	ROADWAY REPAIR	
18313.1100090.PR	NA	BRIDGE 990043	
18313.1100096.PR	NA	BRIDGE 990328	



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



INDEX OF SHEETS

SHEET NUMBER	SHEET TITLE
1	TITLE SHEET
RD-1	ROADWAY REPAIR DETAIL
EC-2A	ONSITE CONCRETE WASHOUT DETAIL
S1-1 THRU S1-5	STRUCTURE PLANS (#990043)
S2-1 THRU S2-5	STRUCTURE PLANS (#990328)
STRUCTURE STANDARD NOTES	

NCDOT CONTACT: JOEL M. DAVIS

PLANS PREPARED BY:	PLANS PREPARED FOR:
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION 13 20 Old 74 Asheville, NC 28803
LETTING DATE: FEBRUARY 4, 2026	MARSHALL G. CHEEK, JR., PE PROJECT ENGINEER
2024 STANDARD SPECIFICATIONS	

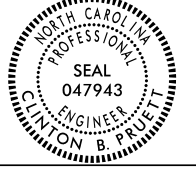
STRUCTURAL ENGINEER

12/10/2025
 Signed by: **Marshall G. Cheek, Jr.** P.E.
 SIGNATURE



ROADWAY DESIGN ENGINEER

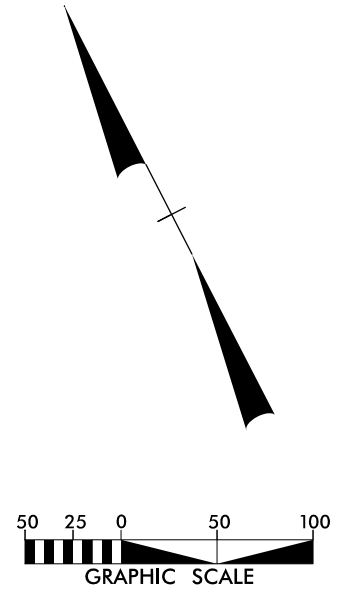
12/9/2025
 Digitally signed by: **Clinton B. Pruitt** P.E.
 SIGNATURE



8/17/99

ROADWAY REPAIR DETAIL

PROJECT REFERENCE NO. 18313.1100058.PR	SHEET NO. RD-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 201 W. MARION ST., STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

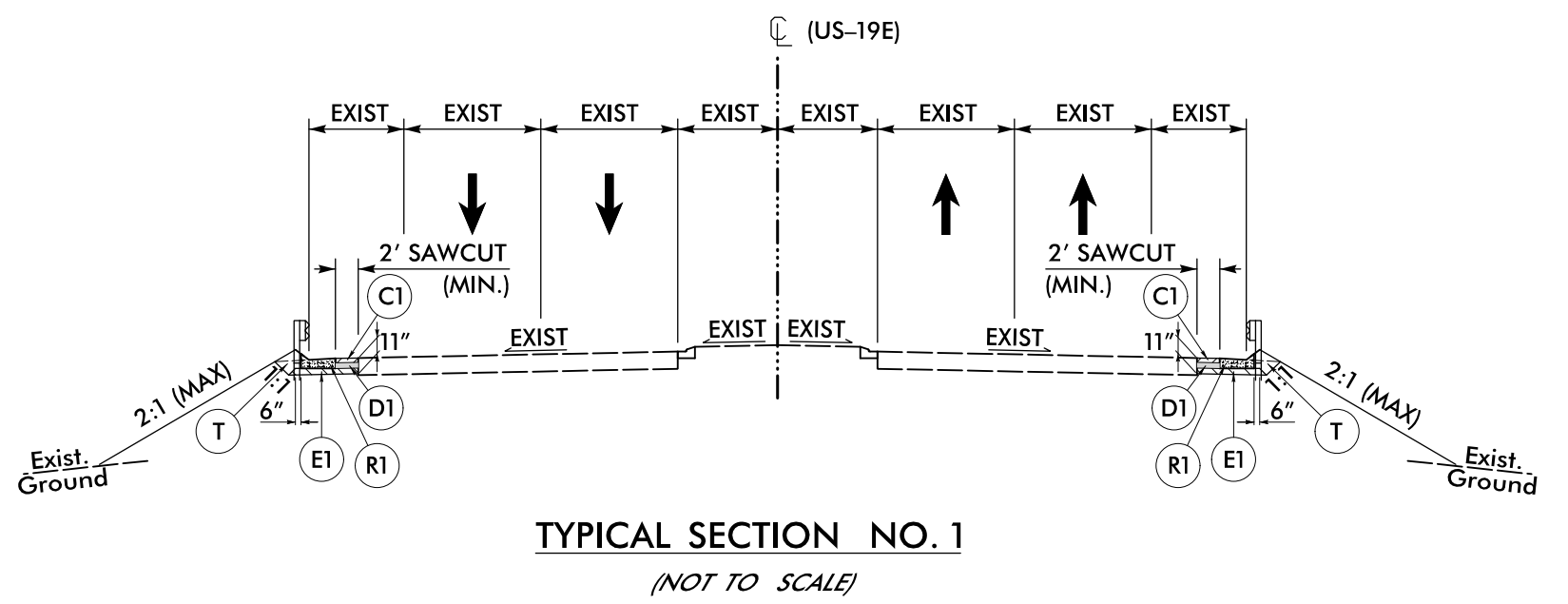


REVISIONS
 T:\14\2025\X:\NCDOT_Div 13 Bridge Repairs - Helene\Mitchell and Yancey - 2nd Round\Yancey 990328\Plans\DGNs\Roadway Detail and TSH\Yancey 43-328_Rdy_psh.dgn
 7/14/2025
 User:cmitt

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.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL

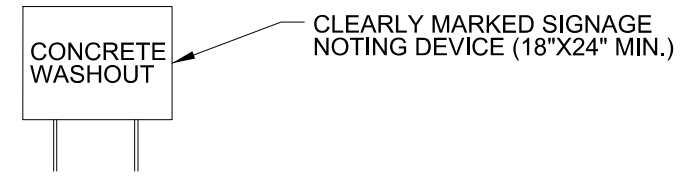
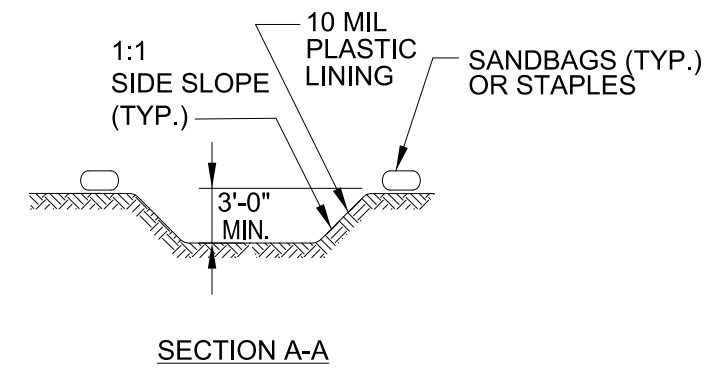
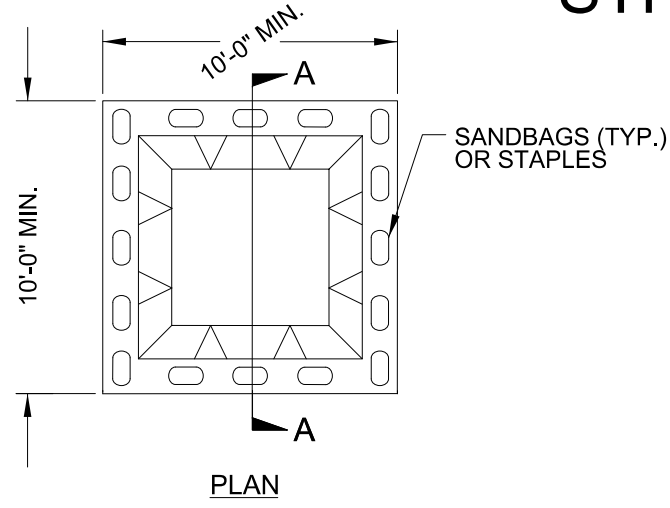
PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1
(NOT TO SCALE)

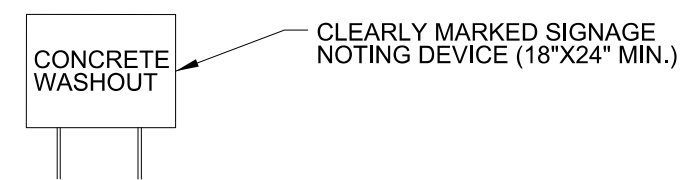
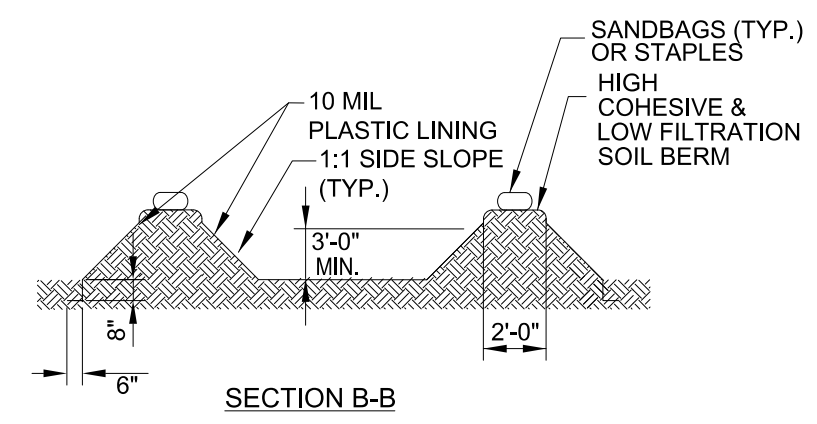
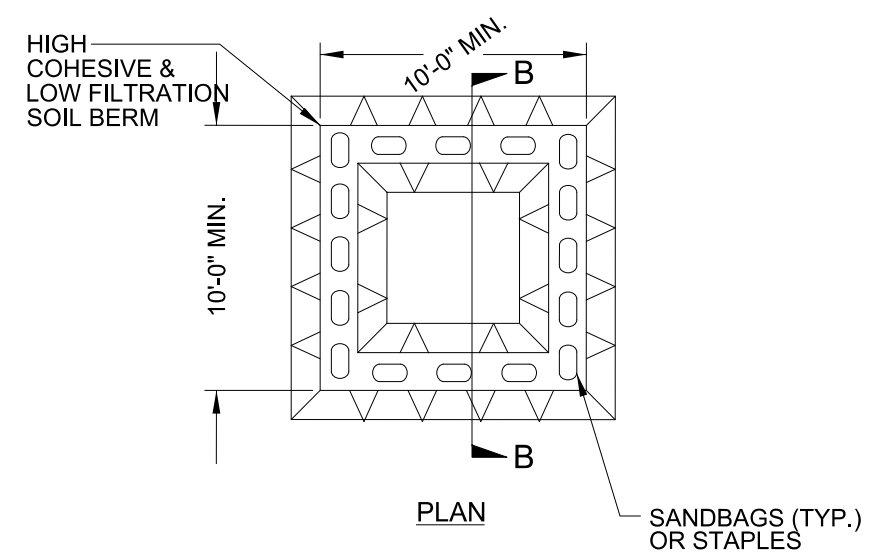
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER

PROJECT REFERENCE NO. 18313100090.PR / 18313100096.PR	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



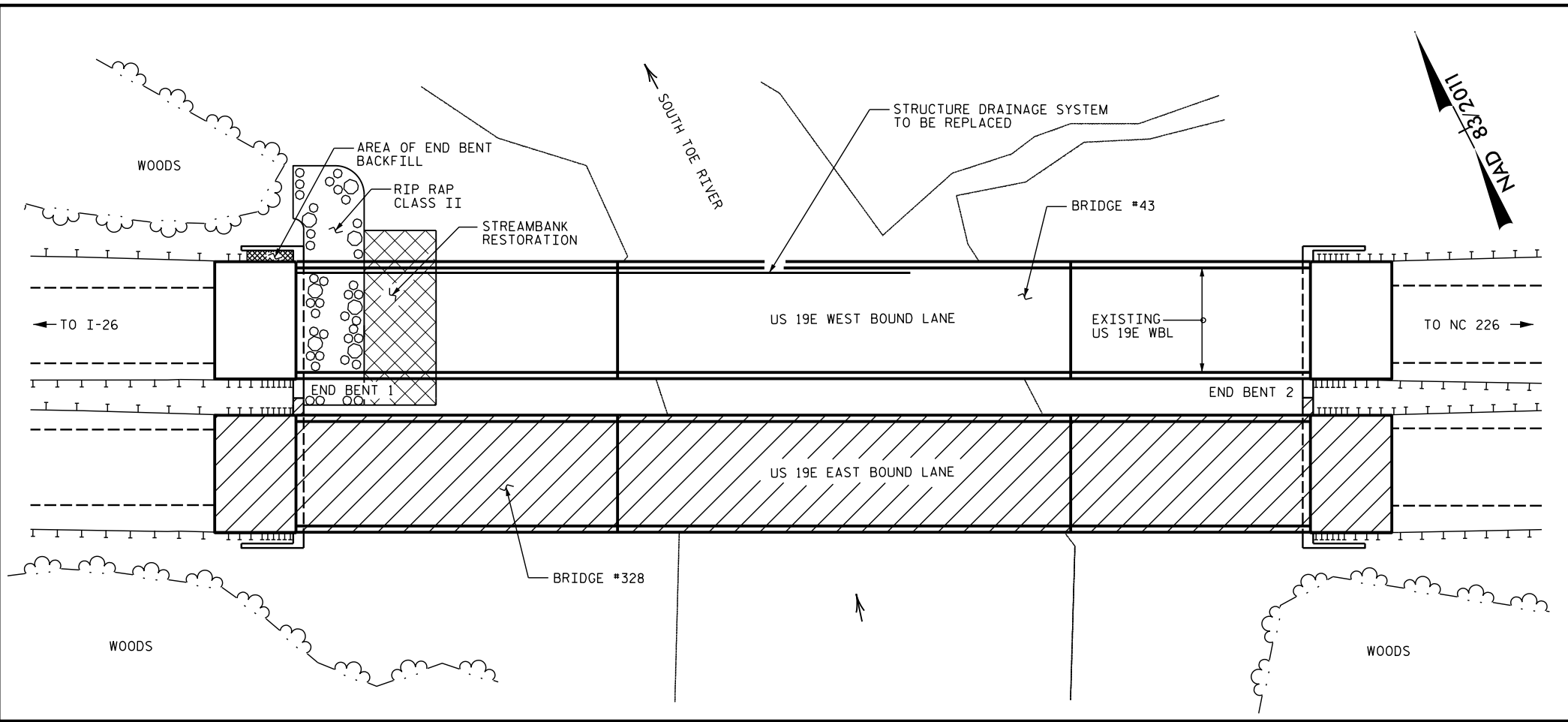
BELOW GRADE WASHOUT STRUCTURE
NOT TO SCALE

- NOTES:**
1. ACTUAL LOCATION DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
 3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.



ABOVE GRADE WASHOUT STRUCTURE
NOT TO SCALE

- NOTES:**
1. ACTUAL LOCATION DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
 3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.



LOCATION SKETCH

NOTES

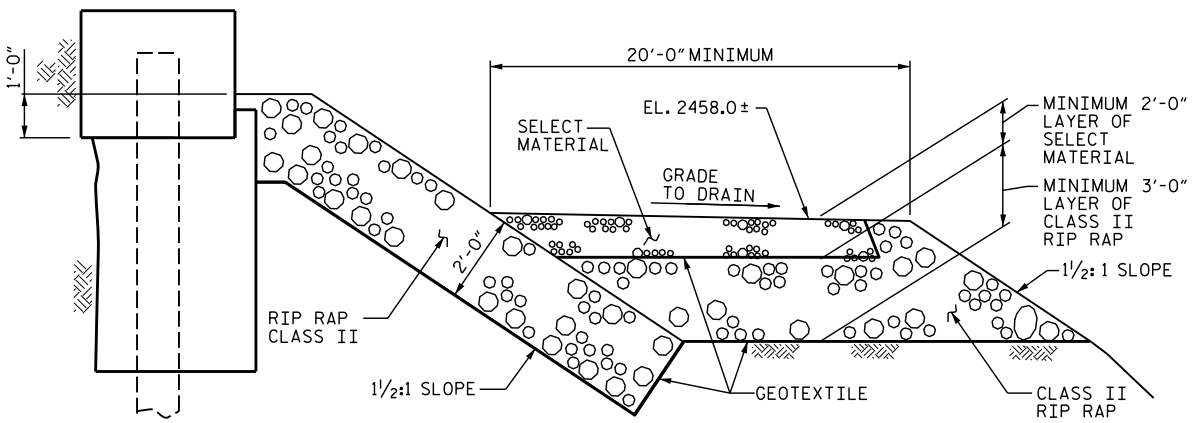
- EXISTING DIMENSIONS AND BRIDGE CONDITIONS ARE FROM THE BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THAT SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.
- FOR FLOWABLE FILL, SEE SPECIAL PROVISIONS.
- UNLESS OTHERWISE NOTED, ALL WORK SHOWN SHALL BE IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, JANUARY 2024.
- BRIDGE ORIENTATION CONFORMS TO EXISTING BRIDGE PLANS.
- FOR OTHER DESIGN DATA, SEE STANDARD NOTES SHEET.
- FOR END BENT BACKFILL, SEE SPECIAL PROVISIONS.
- THE EXISTING STRUCTURE DRAINAGE SYSTEM SHALL BE REPLACED. FOR REPLACEMENT OF STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.
- FOR STREAMBANK RESTORATION, SEE SPECIAL PROVISIONS.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

SEAL

TOTAL BILL OF MATERIAL								
ITEM	MOBILIZATION	FLOWABLE FILL	FOUNDATION EXCAVATION AT END BENT 1	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	REPLACEMENT OF STRUCTURE DRAINAGE SYSTEM	END BENT BACKFILL	STREAMBANK RESTORATION
	LUMP SUM	C.Y.	LUMP SUM	TONS	SO. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
ESTIMATED TOTALS	LUMP SUM	25	LUMP SUM	100	110	LUMP SUM	LUMP SUM	LUMP SUM

NOTE: QUANTITIES SHOWN ARE ESTIMATED FROM THE BEST INFORMATION AVAILABLE.



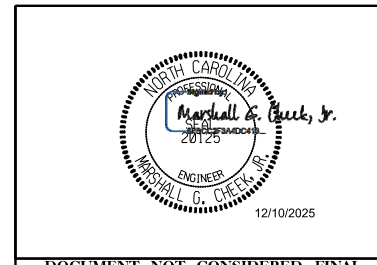
CLASS II RIP RAP & STREAMBANK RESTORATION DETAIL

CLASS II RIP RAP AT THE PROJECT SITE SHALL BE STOCKPILED FOR USE FOLLOWING THE SCOUR REPAIR. THE EXISTING RIP RAP SHALL BE SUPPLEMENTED WITH ADDITIONAL CLASS II RIP RAP AS NECESSARY. THE ENTIRE WORK TO STOCKPILE AND REPLACE THE EXISTING RIP RAP SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR FOUNDATION EXCAVATION. RIP RAP SHALL BE PLACED TO A LEVEL OF 1 FOOT ABOVE THE BOTTOM OF THE END BENT CAP OR AS DIRECTED BY THE ENGINEER.

DRAWN BY : NMW DATE : 5/25
 CHECKED BY : MCC DATE : 5/25

PROJECT NO. 18313.1100090.PR
 YANCEY COUNTY
 BRIDGE NO. 43

SHEET 1 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE #43 ON US 19E
 OVER SOUTH TOE RIVER
 BETWEEN I-26 AND NC 226

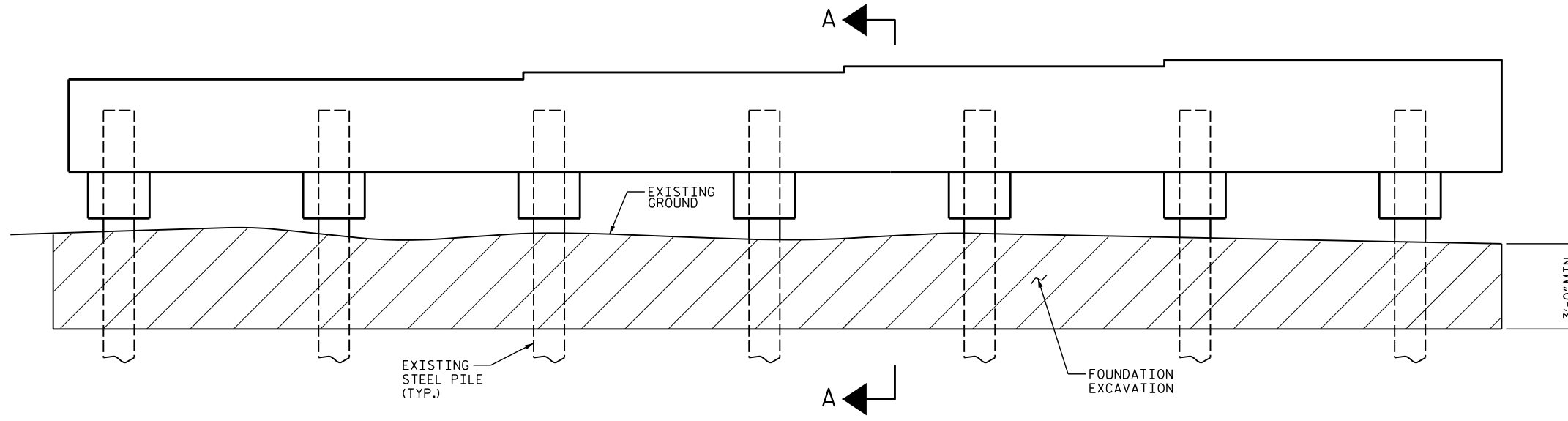
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-1
1			3			TOTAL SHEETS
2			4			5

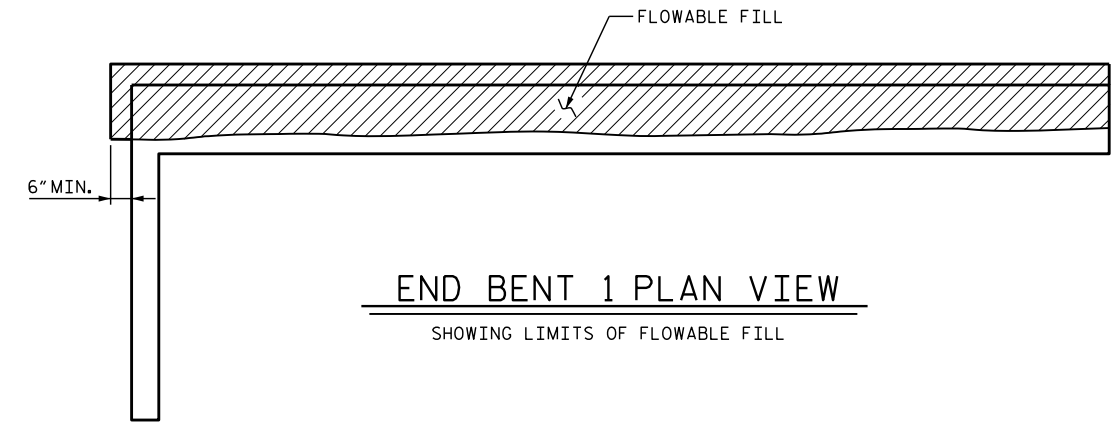
NOTES

TEMPORARILY DEWATER AS NECESSARY TO PROVIDE ACCESS TO END BENT SCOUR AREAS.
 THE MINIMUM EXCAVATION FOR PLACEMENT OF THE FLOWABLE FILL IS INDICATED. SHOULD ADDITIONAL EXCAVATION BE REQUIRED, DETERMINATION OF PAYMENT WILL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR FOUNDATION EXCAVATION.



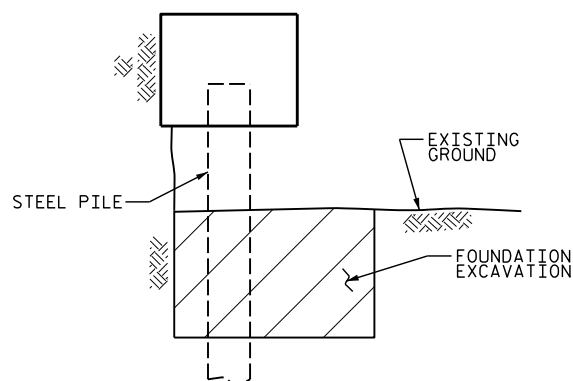
END BENT 1 ELEVATION

WINGS NOT SHOWN IN ELEVATION FOR CLARITY.



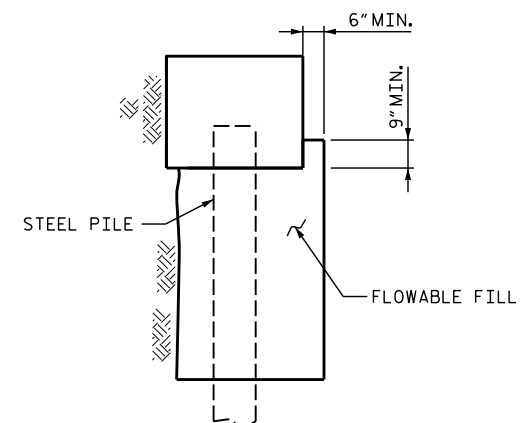
END BENT 1 PLAN VIEW

SHOWING LIMITS OF FLOWABLE FILL



SECTION A-A

SHOWING LIMITS OF FOUNDATION EXCAVATION

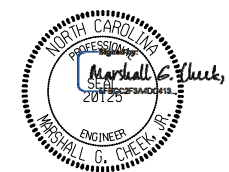


SECTION A-A

SHOWING LIMITS OF FLOWABLE FILL

PROJECT NO. 18313.1100090.PR
YANCEY COUNTY
 BRIDGE NO. 43

SHEET 2 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE #43 ON US 19E
 OVER SOUTH TOE RIVER
 BETWEEN I-26 AND NC 226

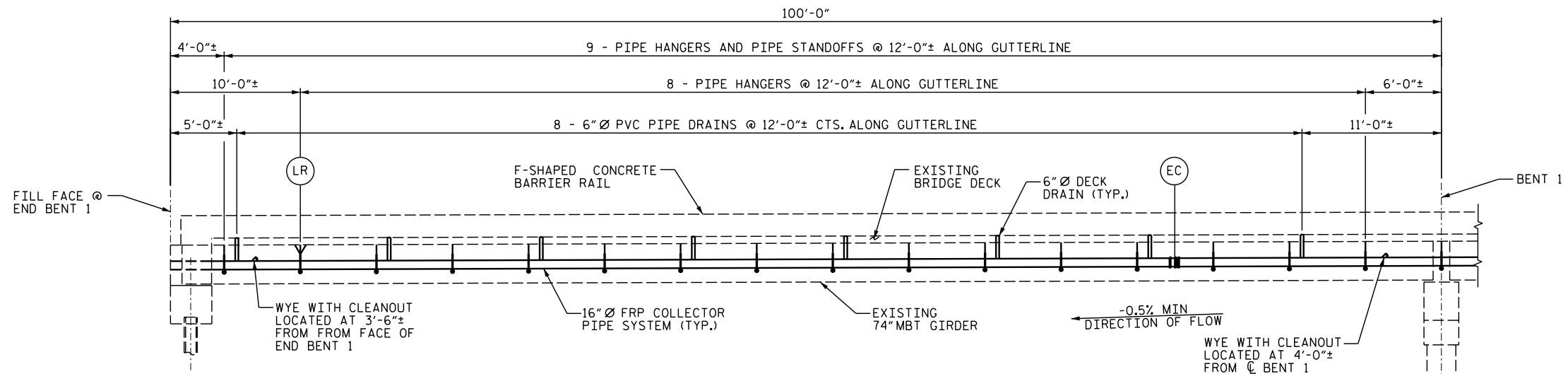
DOCUMENT NOT CONSIDERED FINAL
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TGS ENGINEERS
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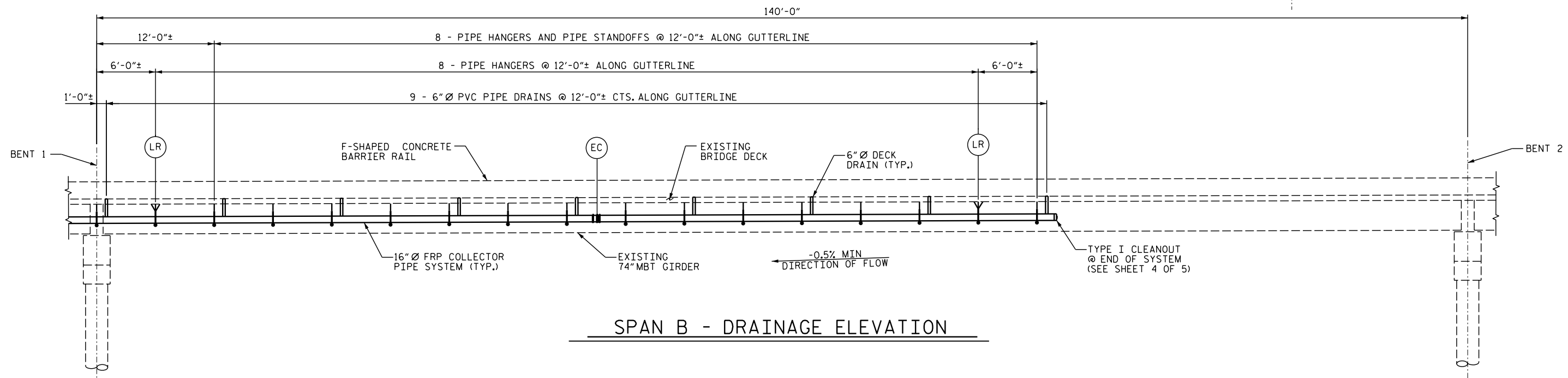
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NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.
S1-2
TOTAL SHEETS
5

DRAWN BY : NMW DATE : 5/25
 CHECKED BY : MGC DATE : 5/25



SPAN A - DRAINAGE ELEVATION



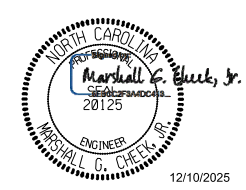
SPAN B - DRAINAGE ELEVATION

NOTES

EC = EXPANSION COUPLER (SEE SHEET 5 OF 5)
 LR = LONGITUDINAL RESTRAINT (SEE SHEET 4 OF 5)
 DISTANCE BETWEEN THE LONGITUDINAL RESTRAINT AND EXPANSION COUPLER SHALL NOT EXCEED 120'-0".

PROJECT NO. 18313.1100090.PR
 YANCEY COUNTY
 BRIDGE NO. 43

SHEET 3 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE #43 ON US 19E
 OVER SOUTH TOE RIVER
 BETWEEN I-26 AND NC 226

DRAWN BY : NMW DATE : 6/25
 CHECKED BY : MGC DATE : 6/25

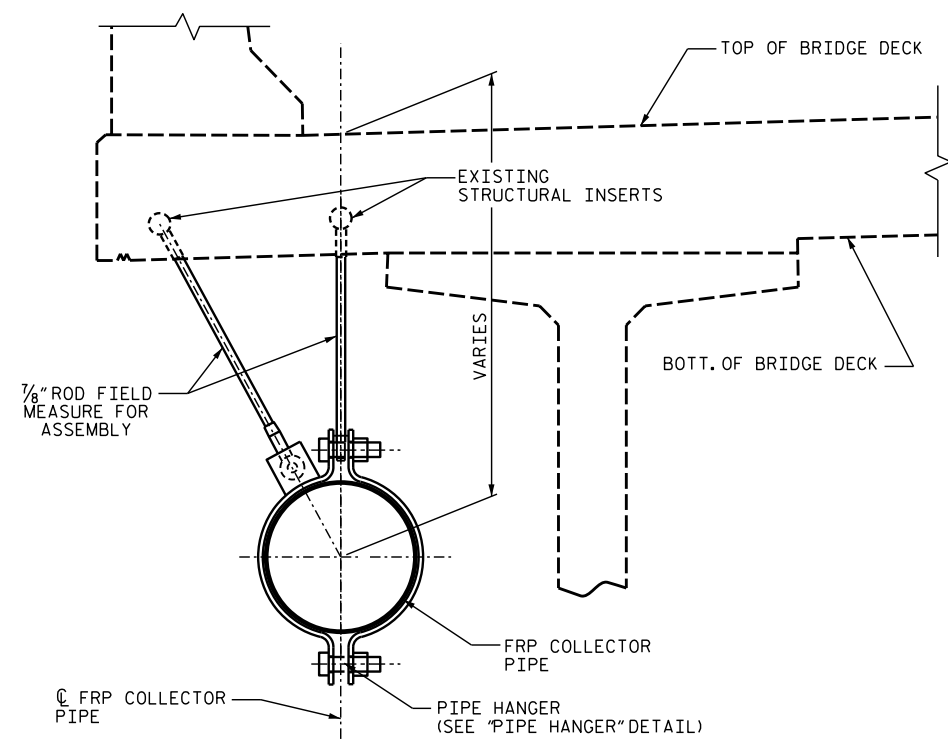
DOCUMENT NOT CONSIDERED FINAL
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TGS ENGINEERS
 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-3
1			3			TOTAL SHEETS
2			4			5

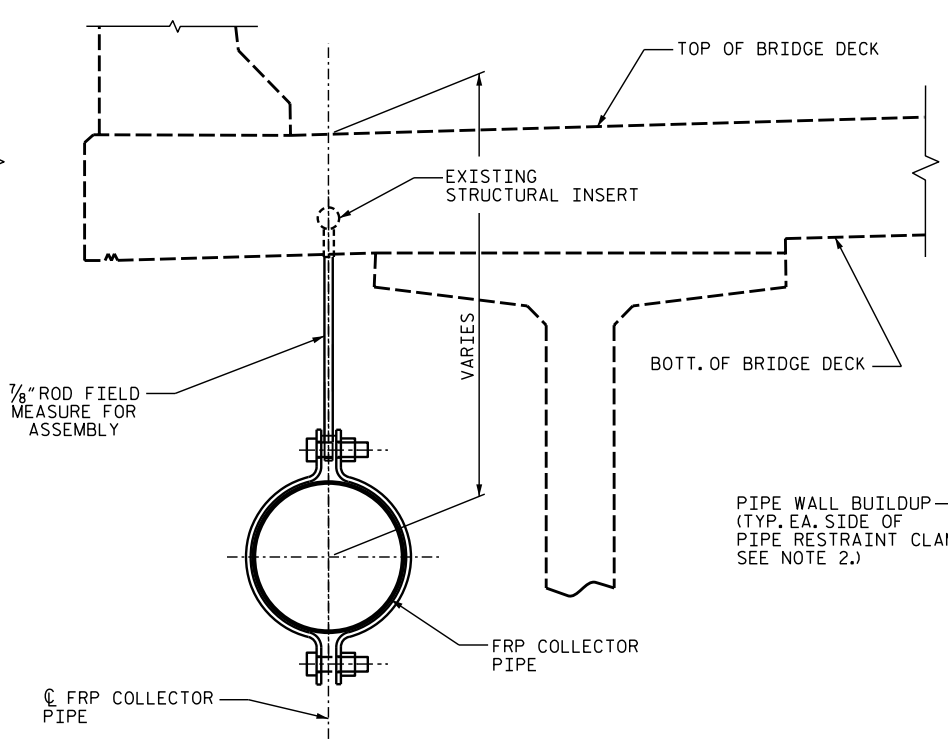
NOTES

- FOR ADDITIONAL NOTES , SEE SHEET 5 OF 5.
- CONTRACTOR SHALL ENSURE PIPE WALL BUILDUP IS SUFFICIENT TO ENGAGE PIPE RESTRAINT CLAMP AT LONGITUDINAL RESTRAINT LOCATIONS.



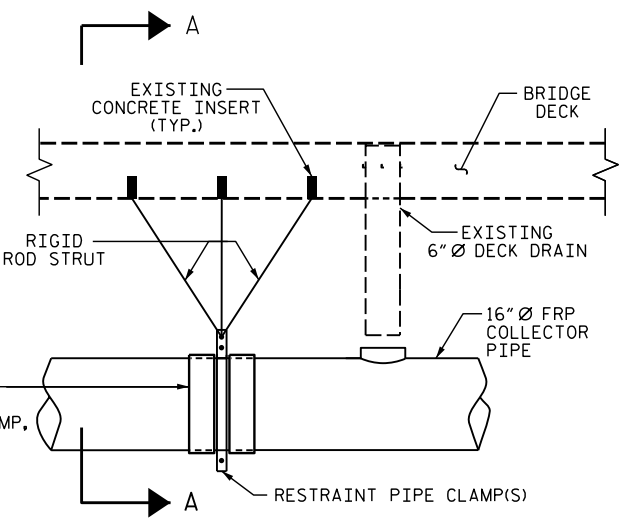
PIPE HANGER AND PIPE STANDOFF

ALL COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION.

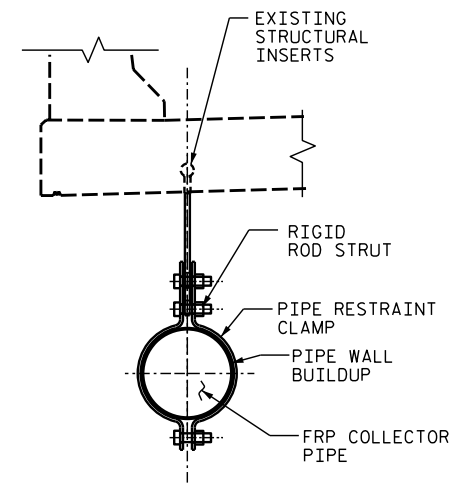


PIPE HANGER

ALL COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION.



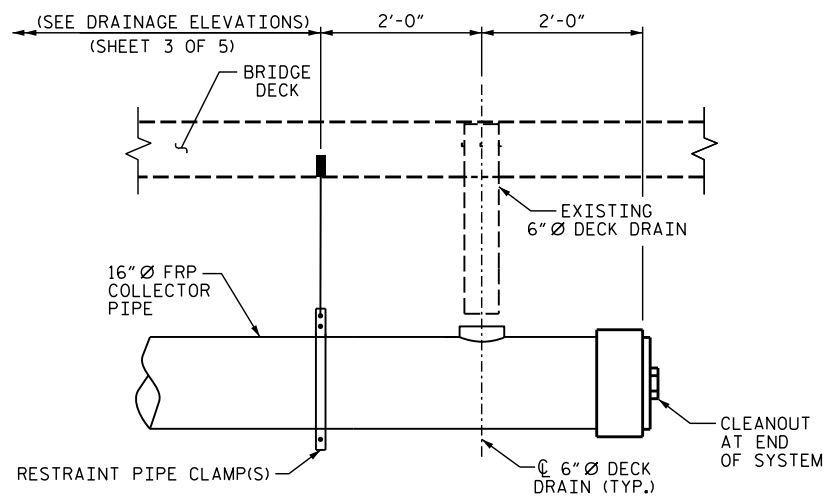
ELEVATION VIEW



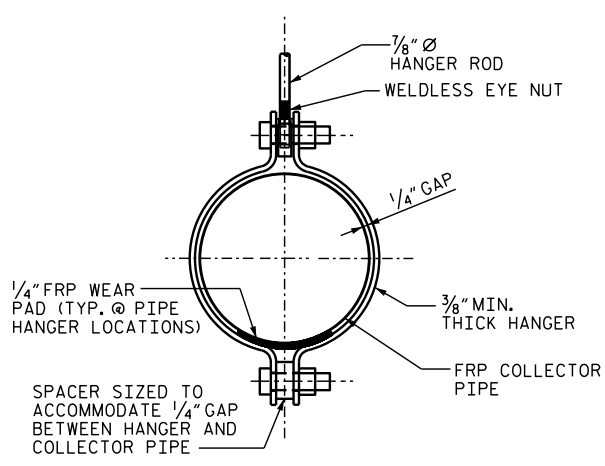
SECTION A-A

LONGITUDINAL RESTRAINT DETAIL

* STANDOFF NOT REQUIRED AT LONGITUDINAL RESTRAINT

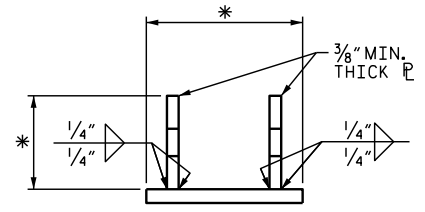
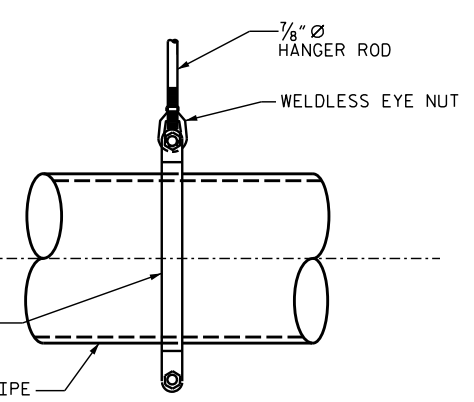
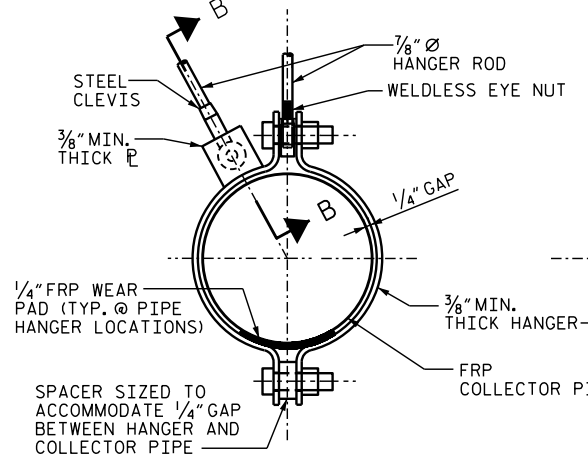


TYPE I SYSTEM END DETAIL



PIPE HANGER DETAILS

ALL COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION.



SECTION B-B

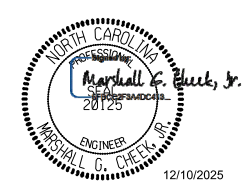
(STEEL CLEVIS & 7/8" HANGER ROD NOT SHOWN FOR CLARITY)

* DIMENSIONS TO BE DETERMINED BY MANUFACTURER

PROJECT NO. 18313.110090.PR
YANCEY COUNTY

BRIDGE NO. 43

SHEET 4 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

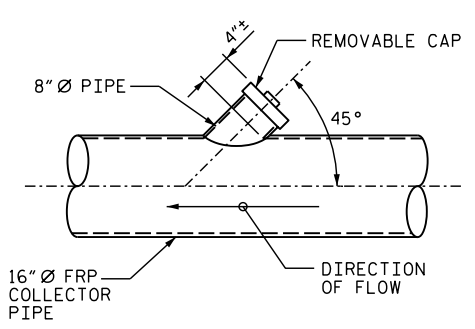
BRIDGE #43 ON US 19E
OVER SOUTH TOE RIVER
BETWEEN I-26 AND NC 226

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:				
1			3			S1-4			
2			4			TOTAL SHEETS 5			

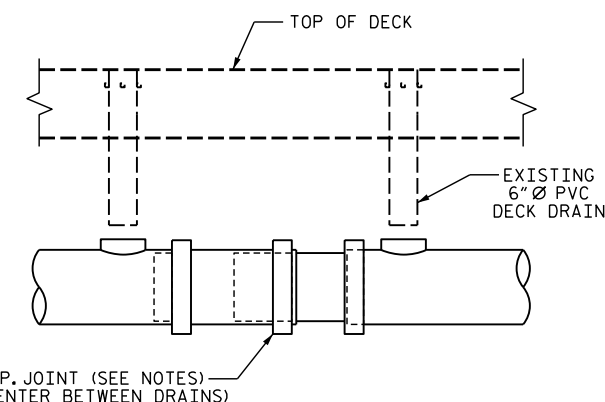
DRAWN BY : NMW DATE : 6/25
CHECKED BY : MGC DATE : 6/25

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

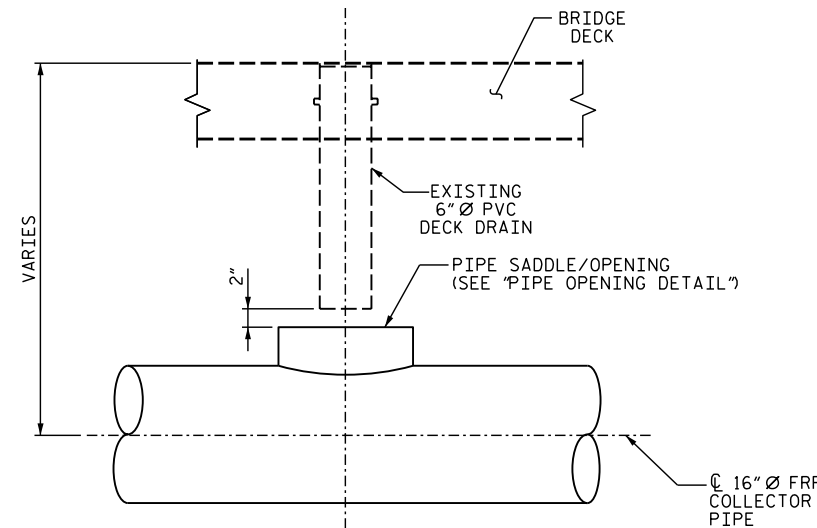
DRAINAGE SYSTEM NOTES



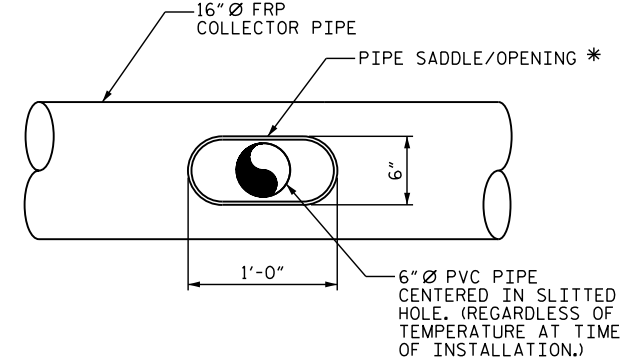
CLEANOUT DETAIL



EXPANSION COUPLER



DRAIN PIPE AND PIPE CONNECTOR



PIPE OPENING DETAIL

* FABRICATOR SHALL DETERMINE PIPE SADDLE/REINFORCEMENT FOR OPENING SIZE INDICATED. FABRICATOR SHALL SUBMIT SHOP DRAWINGS OF PIPE SADDLE/OPENING FOR REVIEW PRIOR TO BEGINNING FABRICATION.

THE CONTRACTOR SHALL REPLACE THE STRUCTURE DRAINAGE SYSTEM IN KIND, INCLUDING ALL FRP COLLECTOR PIPE, PIPE SUPPORT AND PIPE HANGERS AS DETAILED ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THE ENTIRE COST FOR LABOR AND MATERIALS NECESSARY TO FABRICATE AND INSTALL THE REPLACEMENT COMPONENTS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR "REPLACEMENT OF STRUCTURE DRAINAGE SYSTEM". FOR REPLACEMENT OF STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL REPLACE ALL BROKEN DOWNSPOUTS AS DIRECTED BY THE ENGINEER. THE METHOD OF REPAIR SHALL BE APPROVED BY THE ENGINEER.

CARE SHALL BE TAKEN DURING REMOVAL AND REPLACEMENT OF THE EXISTING STRUCTURE DRAINAGE SYSTEM TO AVOID DAMAGING THE EXISTING STRUCTURE. DAMAGE TO THE EXISTING STRUCTURE SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE DEPARTMENT. THE METHOD OF REPAIR SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

ALL COLLECTOR PIPES, ELBOWS, COUPLERS, AND TEES SHALL BE FIBERGLASS REINFORCED PLASTIC PIPE MEETING THE SPECIFICATIONS OF ASTM D2996 AND THE ACCELERATED UV WEATHERING PERFORMANCE REQUIREMENTS OF ASTM D4329-05 PER PROCEDURE ASTM G154.

EACH PIPE SECTION SHALL HAVE A MINIMUM OF TWO HANGERS.

COLLECTOR PIPE SECTIONS SHALL BE SUPPORTED FROM THE EXISTING 7/8" INSERTS EMBEDDED IN THE CONCRETE DECK SLAB, NO ATTACHMENT TO THE GIRDERS WILL BE PERMITTED.

CONTRACTOR SHALL PROVIDE FRP COUPLINGS CAPABLE OF HANDLING THE ANTICIPATED MOVEMENTS. ADDITIONALLY FRP COUPLINGS SHALL PROVIDE HORIZONTAL ALIGNMENT TOLERANCES SUCH THAT THE 16" Ø FRP COLLECTOR PIPE AND COUPLINGS CAN CLOSELY FOLLOW THE VERTICAL CURVE OF THE STRUCTURE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL ALIGNMENT OF THE DRAINAGE SYSTEM USING NECESSARY FITTINGS, TEES, AND WYES TO PROVIDE A CONTINUOUS DRAINAGE SYSTEM.

DECK DRAIN PIPE SHALL BE ASTM D1785, SCHEDULE 40. ALL PVC FITTINGS SHALL BE MINIMUM ASTM D2655, SCHEDULE 40.

EXPANSION JOINT COUPLERS IN THE COLLECTOR PIPE SHALL HAVE A MINIMUM CAPACITY TO ACCOMMODATE 6 INCHES OF TOTAL MOVEMENT (3 INCHES EXPANSION/3 INCHES CONTRACTION.)

COLLECTOR PIPE SUPPORTS SHALL BE LOCATED WITHIN 12 INCHES, ± 4 INCHES, OF A COLLECTOR PIPE JOINT.

DECK DOWN-DRAIN PIPES SHALL BE CENTERED IN SLOTTED OPENING IN COLLECTOR PIPE REGARDLESS OF TEMPERATURE AT TIME OF INSTALLATION.

HANGER RODS SHALL BE ASTM A193, GRADE B7 OR CARBON STEEL ALL-THREAD HANGER RODS.

NUTS SHALL BE ASTM A194, GRADE 2H, HEAVY HEX NUTS.

THE DETAILS OF ALL PIPING, HARDWARE, OR OTHER MATERIAL SHALL BE PROVIDED BY THE CONTRACTOR AND IS SUBJECT TO THE APPROVAL OF THE ENGINEER.

WORKING DRAWINGS FOR THE DRAINAGE SYSTEM AND LAYOUT PLANS INCLUDING, BUT NOT LIMITED TO, PIPE SUPPORT BRACKETS, PIPE ALIGNMENT, PIPE LENGTHS, AND ALL NECESSARY FITTINGS, ELBOWS, WYES, ADAPTERS, GUIDES, RESTRAINTS, WEAR PADS, COUPLERS AND JOINTS SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN NORTH CAROLINA AND SUBMITTED FOR APPROVAL PRIOR TO ORDERING MATERIALS.

PIPE MANUFACTURER SHALL ENSURE THE PIPE AND THE PIPE SUPPORT BEARING AREA IS DESIGNED IN ACCORDANCE WITH THE HANGER SPACING PROVIDED IN THESE PLANS.

PIPE DESIGN MUST ALLOW VERTICAL FLEXURE FROM THE SUPERSTRUCTURE.

THE COLLECTOR PIPE SHALL CLOSELY FOLLOW THE LONGITUDINAL GRADE OF THE STRUCTURE WHILE MAINTAINING A MINIMUM OF 5% SLOPE AT ALL TIMES.

COUPLERS SHALL BE DESIGNED TO ACCOMMODATE A TURN AT EACH BENT IN ORDER TO FOLLOW THE HORIZONTAL AND VERTICAL CURVATURE OF THE BRIDGE OVERHANG.

THE PIPE MANUFACTURER SHALL ENSURE THE FRICTIONAL FORCE REQUIRED TO ACTIVATE THE EXPANSION COUPLERS DOES NOT OVERSTRESS THE COUPLER WALL BUILD-UP, DRAINAGE SYSTEM BRACKETS SUPPORTS OR LATERAL RESTRAINTS.

WASHERS SHALL BE ASTM F436 OR APPROVED EQUAL.

BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

BOLT THREADS SHALL BE BURRED TO PREVENT LOOSENING.

PVC PIPE SHALL BE PAINTED TO MATCH THE SURFACE FINISH OF THE STRUCTURE WITH TWO COATS OF AN ACRYLIC OR LATEX PAINT THAT IS CHEMICALLY COMPATIBLE WITH PVC PRODUCTS AND MEETS THE REQUIREMENTS OF ARTICLE 1080-12 OF THE STANDARD SPECIFICATIONS. EACH COAT SHALL BE 2 DRY MILS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING.

ALL METALLIC COMPONENTS IN THE DRAINAGE SYSTEM, EXCEPT STAINLESS STEEL AND MALLEABLE IRON PARTS, ARE REQUIRED TO BE HOT-DIPPED GALVANIZED PER NCDOT STANDARD SPECIFICATIONS. ELECTRO-PLATE COATING ON STEEL RODS, STEEL YOKE TYPE PIPE ROLLS, BRACKETS, OTHER STEEL HARDWARE IS CONSIDERED BY NCDOT AS TOO THIN FOR OUTDOOR APPLICATIONS.

ALL FRP AND PVC PIPE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

ALL STRUCTURAL STEEL SHALL BE ASTM A36 OR APPROVED EQUAL UNLESS NOTED OTHERWISE.

THE GALVANIZED SURFACE SHALL BE CLEANED TO (SSPC SP-1) PRIOR TO COATING.

ALL FABRICATION SHALL CONFORM TO THE APPLICABLE SECTION OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

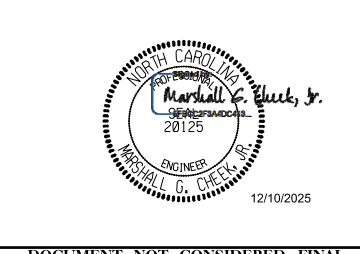
ALL FRP SHALL BE PIGMENTED TO MATCH THE SURFACE FINISH OF THE STRUCTURE.

ALL FRP PIPE SIZES ARE SHOWN AS INSIDE DIAMETER SIZES.

FRP = FIBERGLASS REINFORCED PLASTIC.

PROJECT NO. 18313.1100090.PR
 YANCEY COUNTY
 BRIDGE NO. 43

SHEET 5 OF 5



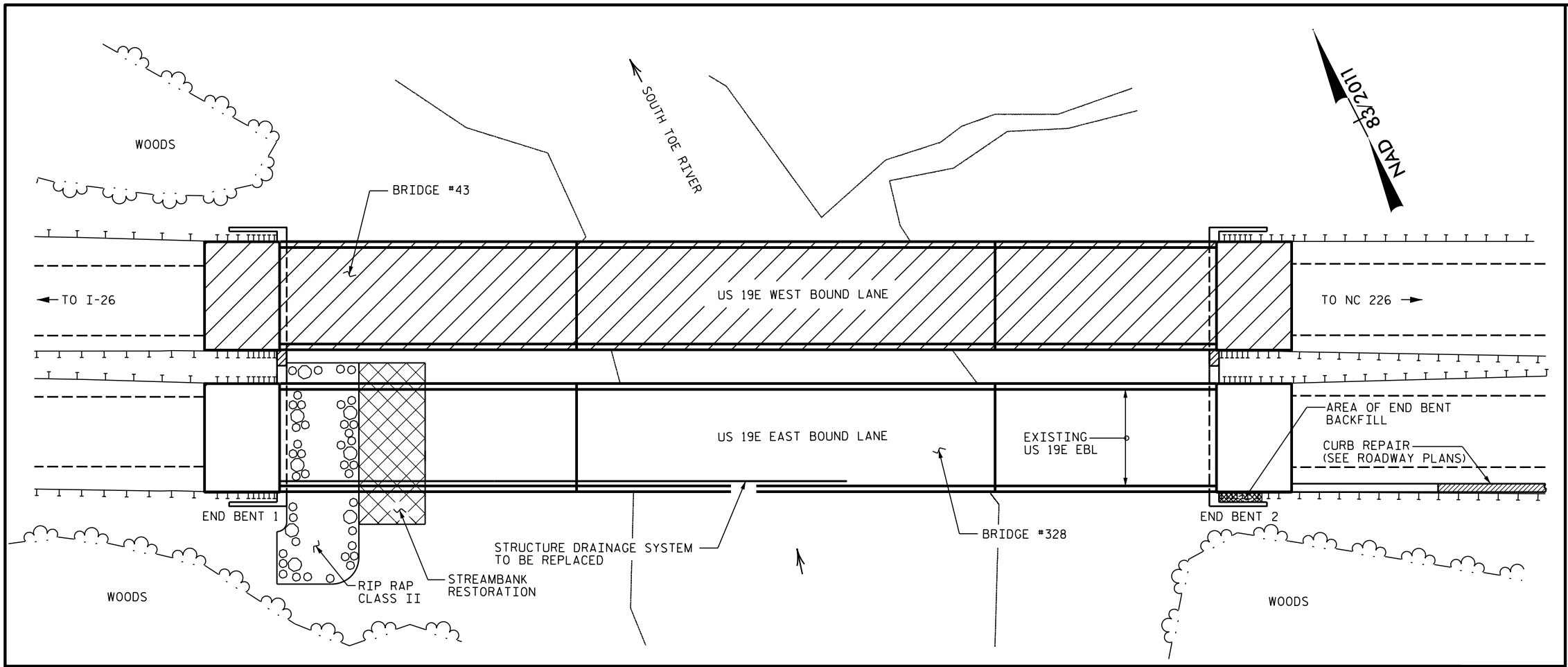
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE #43 ON US 19E
 OVER SOUTH TOE RIVER
 BETWEEN I-26 AND NC 226

DRAWN BY : NMW DATE : 6/25
 CHECKED BY : MGC DATE : 6/25

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 TGS ENGINEERS
 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5
1			3			TOTAL SHEETS
2			4			5



LOCATION SKETCH

NOTES

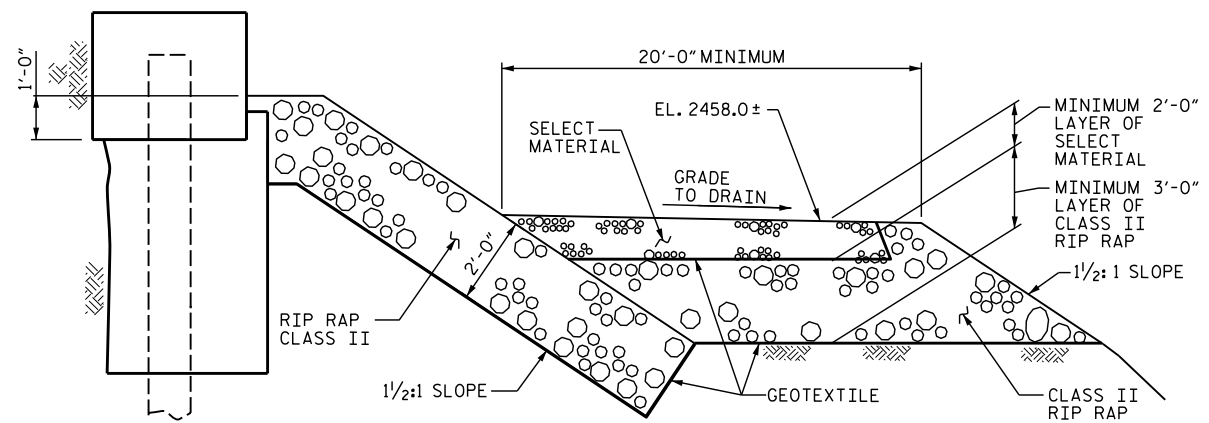
- EXISTING DIMENSIONS AND BRIDGE CONDITIONS ARE FROM THE BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THAT SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.
- FOR FLOWABLE FILL, SEE SPECIAL PROVISIONS.
- UNLESS OTHERWISE NOTED, ALL WORK SHOWN SHALL BE IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, JANUARY 2024.
- BRIDGE ORIENTATION CONFORMS TO EXISTING BRIDGE PLANS.
- FOR OTHER DESIGN DATA, SEE STANDARD NOTES SHEET.
- FOR END BENT BACKFILL, SEE SPECIAL PROVISIONS.
- THE EXISTING STRUCTURE DRAINAGE SYSTEM SHALL BE REPLACED. FOR REPLACEMENT OF STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.
- FOR STREAMBANK RESTORATION, SEE SPECIAL PROVISIONS.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

SEAL

TOTAL BILL OF MATERIAL								
ITEM	MOBILIZATION	FLOWABLE FILL	FOUNDATION EXCAVATION AT END BENT 2	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	REPLACEMENT OF STRUCTURE DRAINAGE SYSTEM	END BENT BACKFILL	STREAMBANK RESTORATION
	LUMP SUM	C.Y.	LUMP SUM	TONS	SO. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
ESTIMATED TOTALS	LUMP SUM	15	LUMP SUM	100	110	LUMP SUM	LUMP SUM	LUMP SUM

NOTE: QUANTITIES SHOWN ARE ESTIMATED FROM THE BEST INFORMATION AVAILABLE.

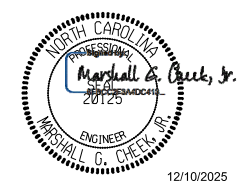


CLASS II RIP RAP & STREAMBANK RESTORATION DETAIL

CLASS II RIP RAP AT THE PROJECT SITE SHALL BE STOCKPILED FOR USE FOLLOWING THE SCOUR REPAIR. THE EXISTING RIP RAP SHALL BE SUPPLEMENTED WITH ADDITIONAL CLASS II RIP RAP AS NECESSARY. THE ENTIRE WORK TO STOCKPILE AND REPLACE THE EXISTING RIP RAP SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR FOUNDATION EXCAVATION. RIP RAP SHALL BE PLACED TO A LEVEL OF 1 FOOT ABOVE THE BOTTOM OF THE END BENT CAP OR AS DIRECTED BY THE ENGINEER.

PROJECT NO. 18313.1100096.PR
 YANCEY COUNTY
 BRIDGE NO. 328

SHEET 1 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

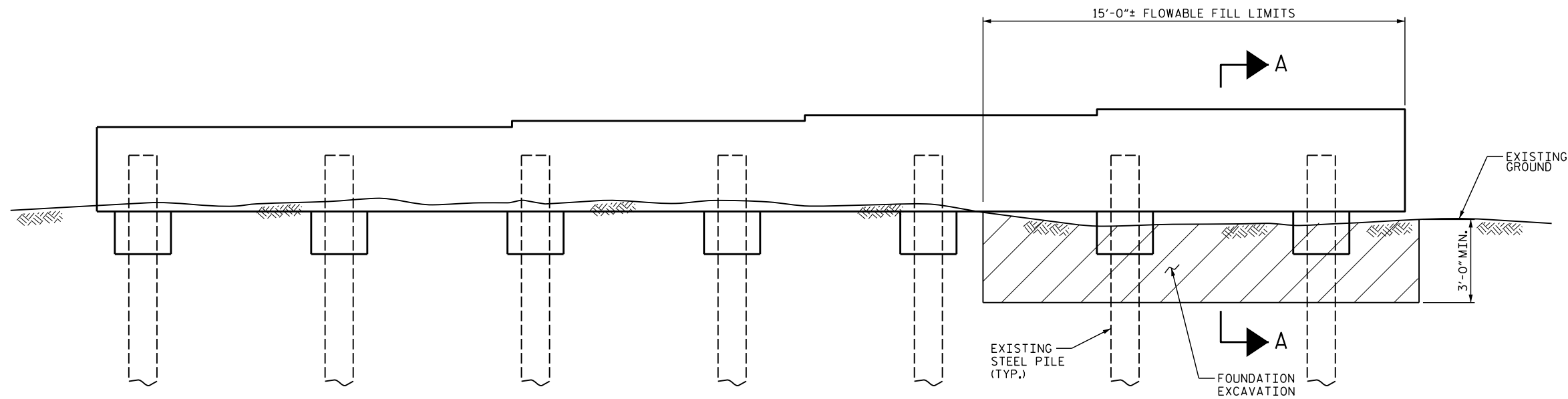
BRIDGE #328 ON US 19E
 OVER SOUTH TOE RIVER
 BETWEEN I-26 AND NC 226

DRAWN BY : NMW DATE : 4/25
 CHECKED BY : MGC DATE : 5/25

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275						NO.	BY:	DATE:	TOTAL SHEETS
						1			5
						2			

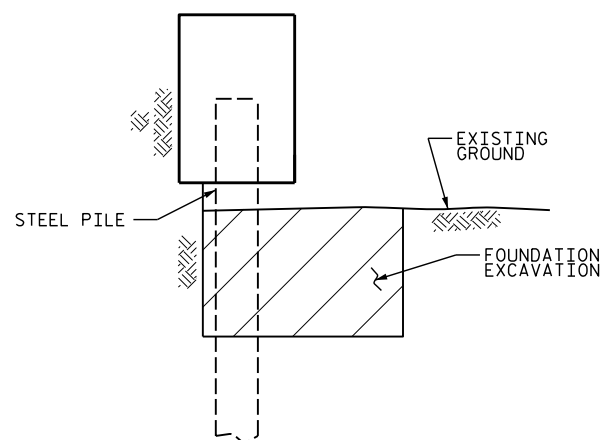
NOTES

TEMPORARILY DEWATER AS NECESSARY TO PROVIDE ACCESS TO END BENT SCOUR AREAS.
 THE MINIMUM EXCAVATION FOR PLACEMENT OF THE FLOWABLE FILL IS INDICATED. SHOULD ADDITIONAL EXCAVATION BE REQUIRED, DETERMINATION OF PAYMENT WILL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR FOUNDATION EXCAVATION.



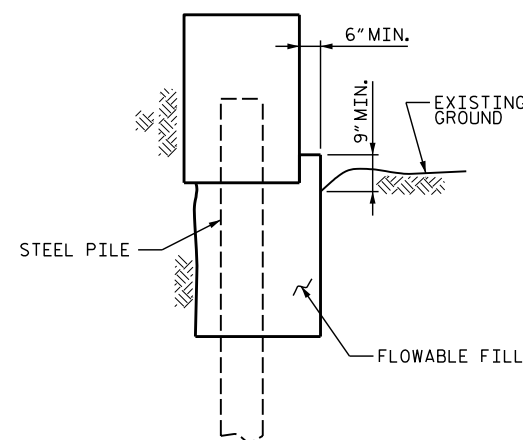
END BENT 2 ELEVATION

WINGS NOT SHOWN IN ELEVATION FOR CLARITY.



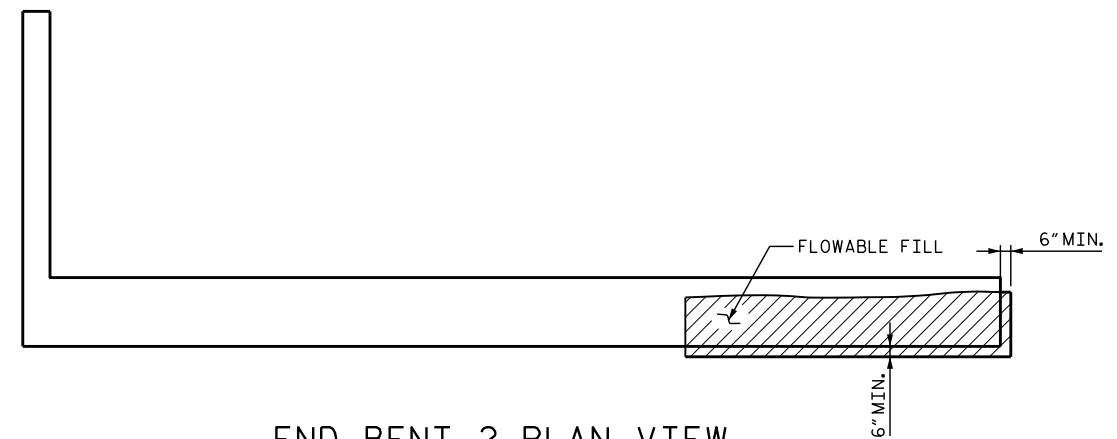
SECTION A-A

SHOWING LIMITS OF FOUNDATION EXCAVATION



SECTION A-A

SHOWING LIMITS OF FLOWABLE FILL



END BENT 2 PLAN VIEW

SHOWING LIMITS OF FLOWABLE FILL

PROJECT NO. 18313.1100096.PR

YANCEY COUNTY

BRIDGE NO. 328

SHEET 2 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

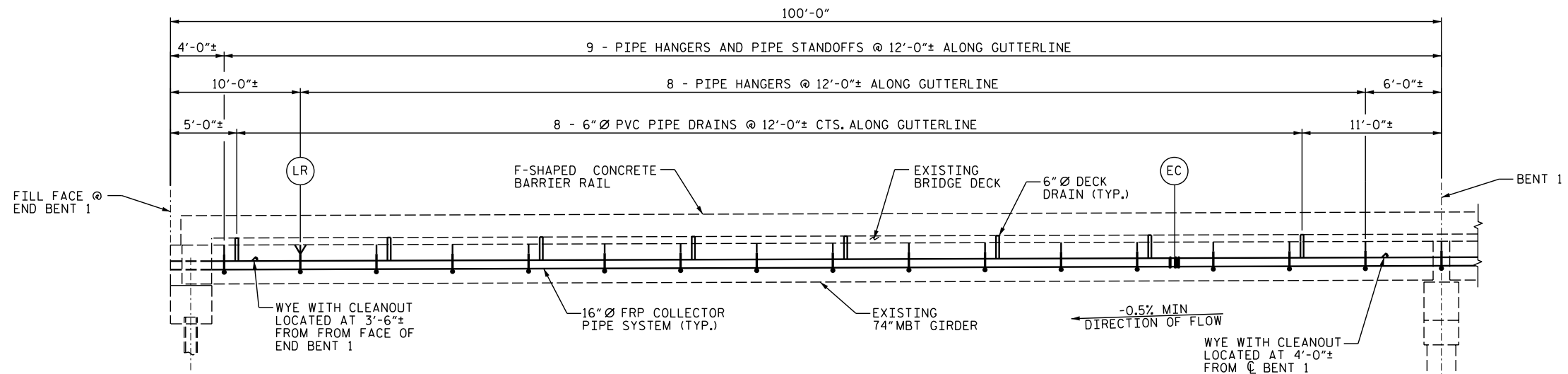
BRIDGE #328 ON US 19E
 OVER SOUTH TOE RIVER
 BETWEEN I-26 AND NC 226

DRAWN BY : NMW DATE : 5/25
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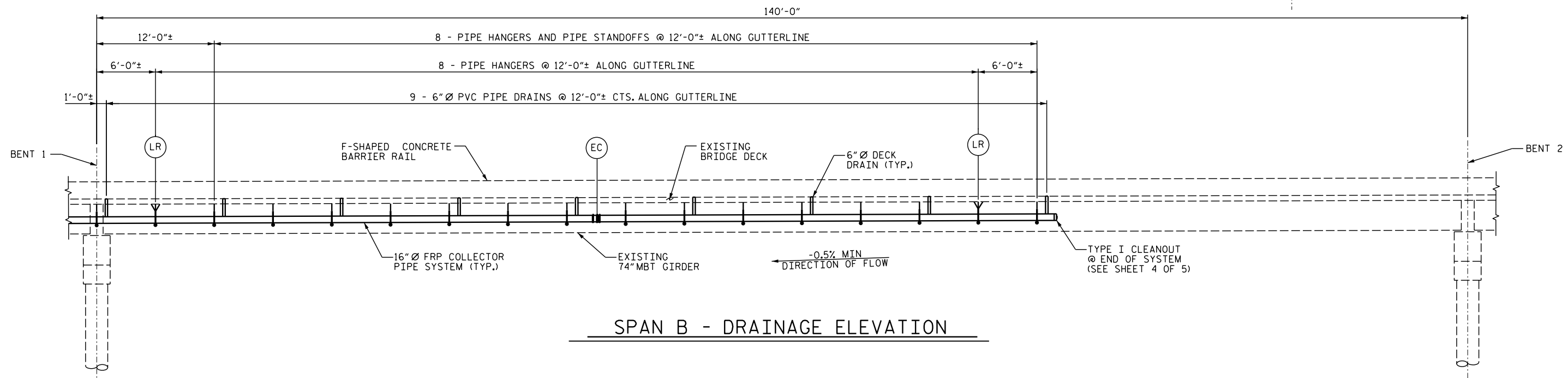
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5
2			4			



SPAN A - DRAINAGE ELEVATION



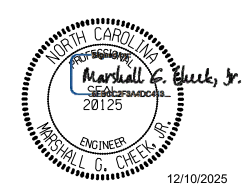
SPAN B - DRAINAGE ELEVATION

NOTES

EC = EXPANSION COUPLER (SEE SHEET 5 OF 5)
 LR = LONGITUDINAL RESTRAINT (SEE SHEET 4 OF 5)
 DISTANCE BETWEEN THE LONGITUDINAL RESTRAINT AND EXPANSION COUPLER SHALL NOT EXCEED 120'-0".

PROJECT NO. 18313.1100096.PR
 YANCEY COUNTY
 BRIDGE NO. 328

SHEET 3 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

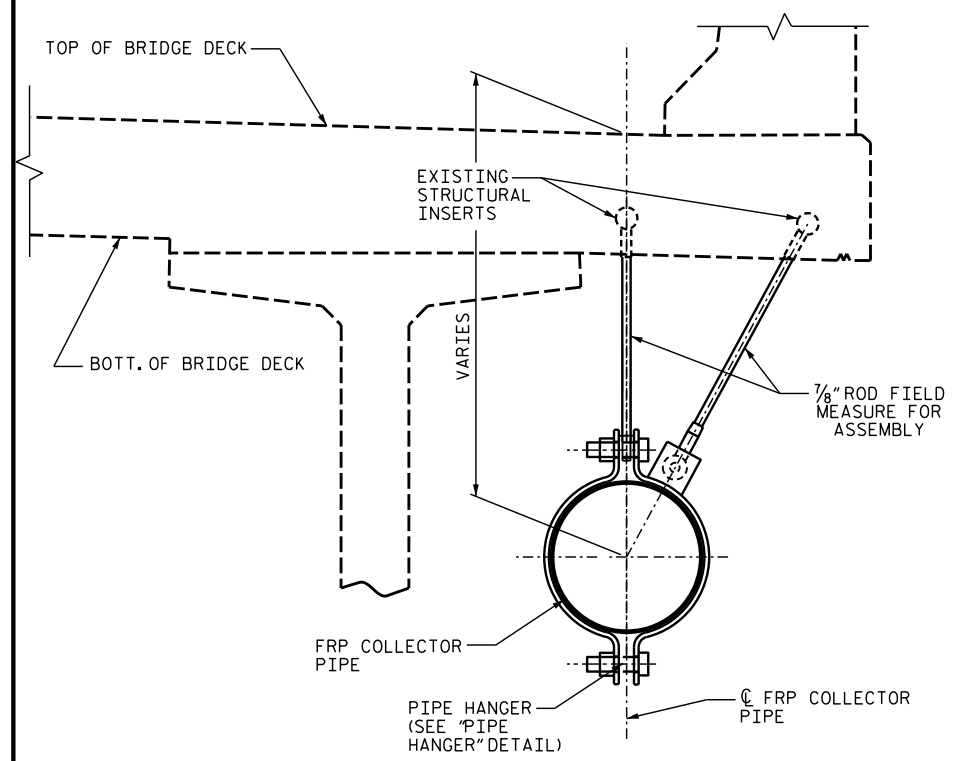
BRIDGE #328 ON US 19E
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DRAWN BY : NMW DATE : 6/25
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						SHEET NO. S2-3	
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275						TOTAL SHEETS 5	
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NO.	BY:	DATE:	NO.	BY:	DATE:		
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2			4				

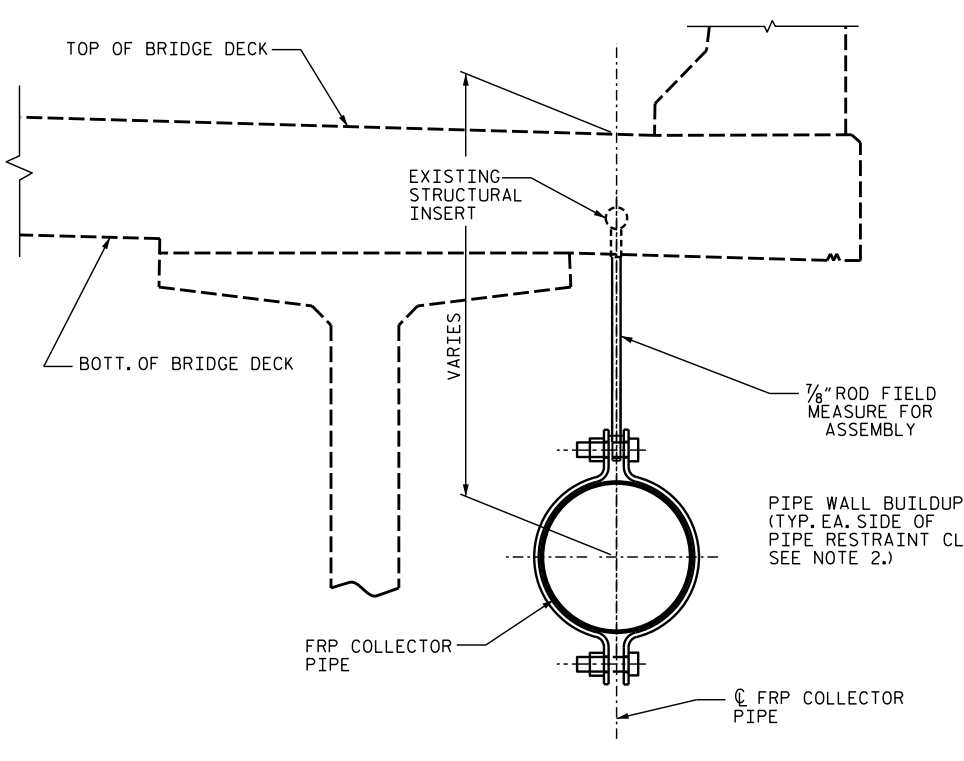
NOTES

1. FOR ADDITIONAL NOTES , SEE SHEET 5 OF 5.
2. CONTRACTOR SHALL ENSURE PIPE WALL BUILDUP IS SUFFICIENT TO ENGAGE PIPE RESTRAINT CLAMP AT LONGITUDINAL RESTRAINT LOCATIONS.



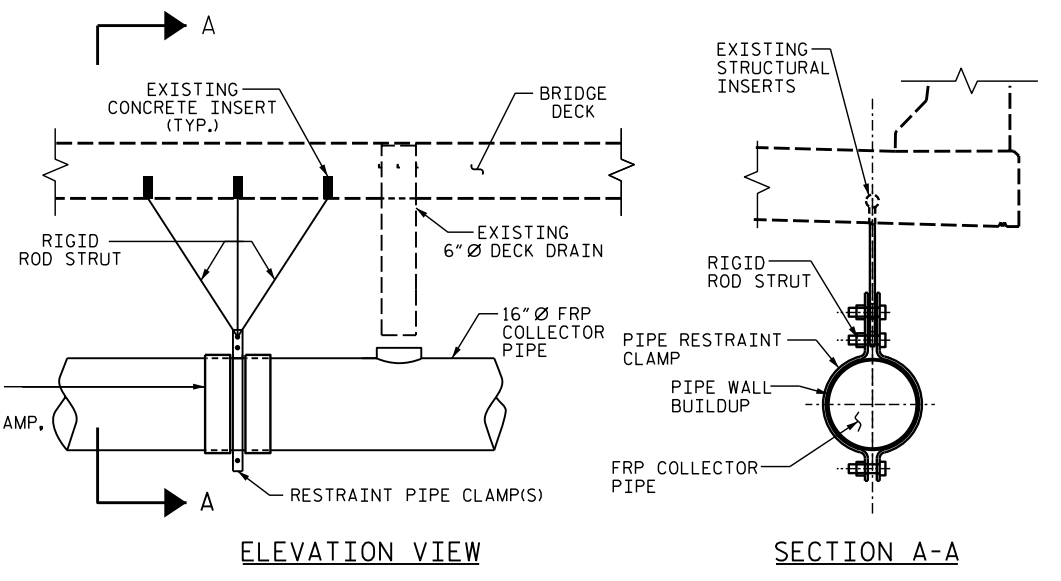
PIPE HANGER AND PIPE STANDOFF

ALL COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION.



PIPE HANGER

ALL COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION.

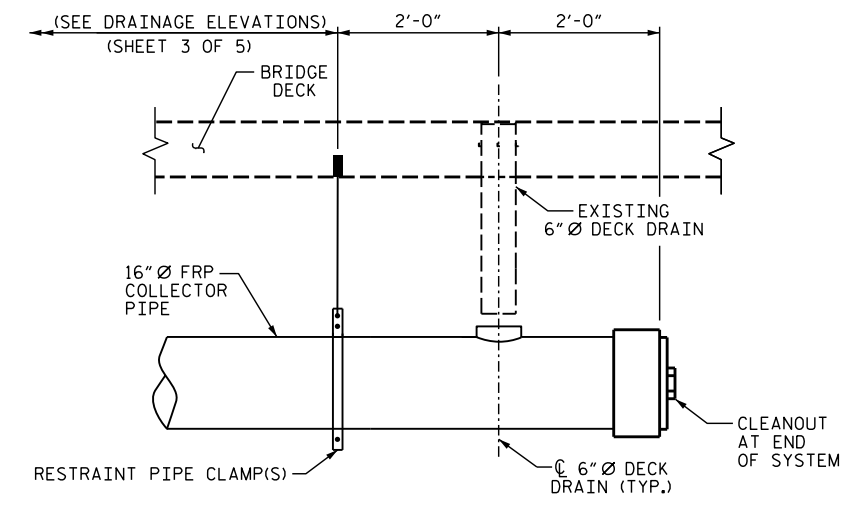


ELEVATION VIEW

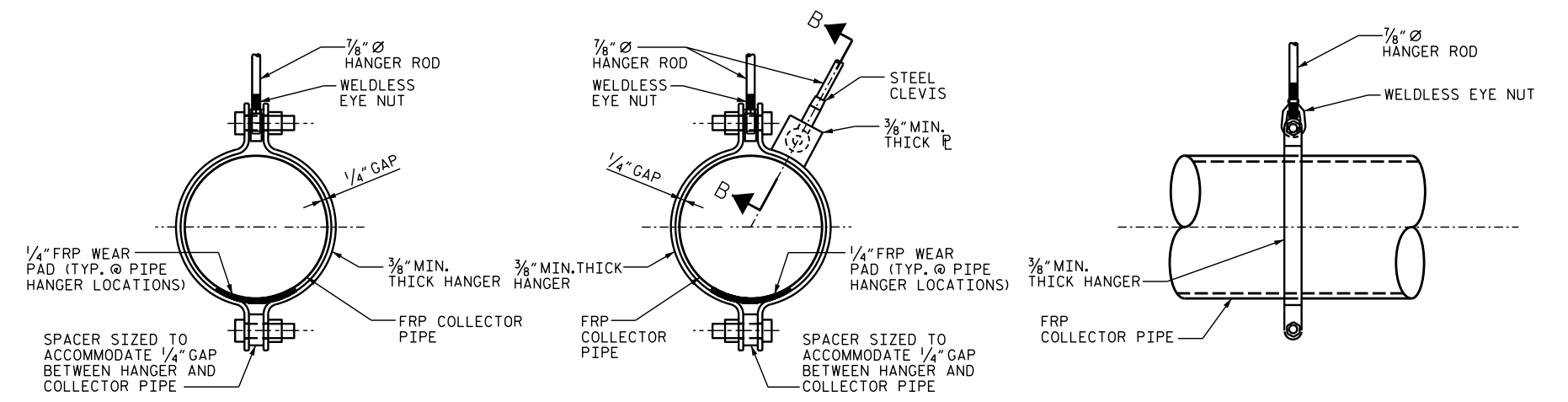
SECTION A-A

LONGITUDINAL RESTRAINT DETAIL

* STANDOFF NOT REQUIRED AT LONGITUDINAL RESTRAINT

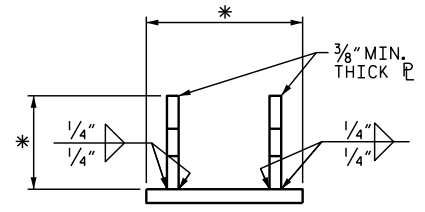


TYPE I SYSTEM END DETAIL



PIPE HANGER DETAILS

ALL COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION.



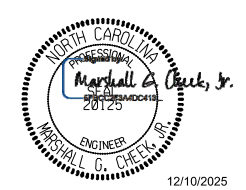
SECTION B-B

(STEEL CLEVIS & 7/8" HANGER ROD NOT SHOWN FOR CLARITY)

* DIMENSIONS TO BE DETERMINED BY MANUFACTURER

PROJECT NO. 18313.1100096.PR
 YANCEY COUNTY
 BRIDGE NO. 328

SHEET 4 OF 5



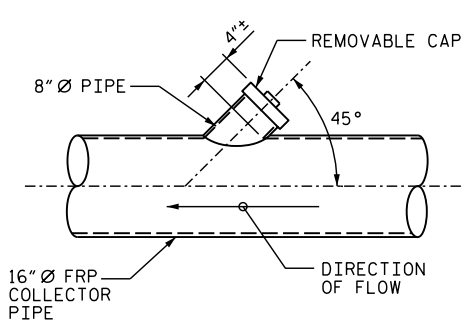
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 BRIDGE #328 ON US 19E
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DRAWN BY : NMW DATE : 6/25
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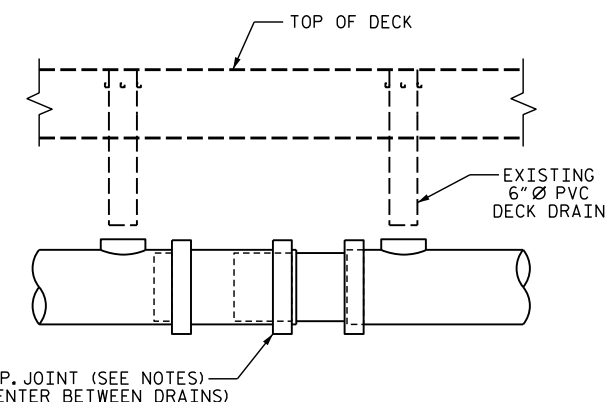
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:				
1			3			S2-4			
2			4			TOTAL SHEETS 5			

TGS ENGINEERS
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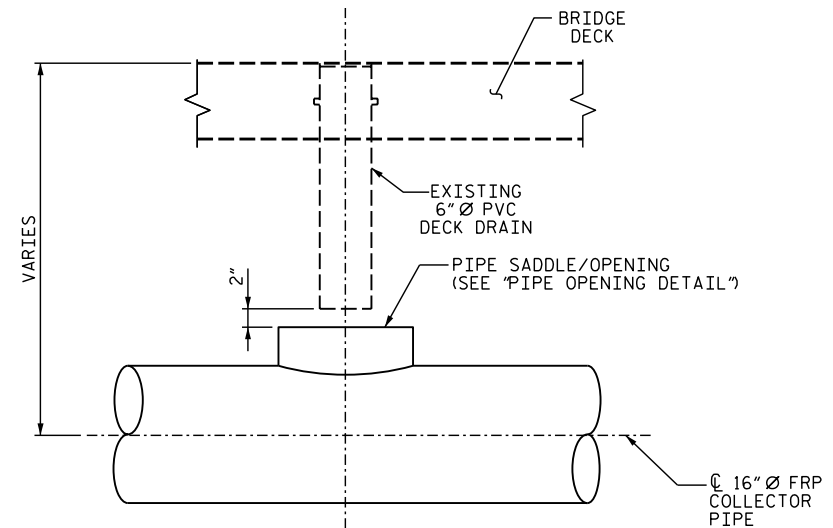
DRAINAGE SYSTEM NOTES



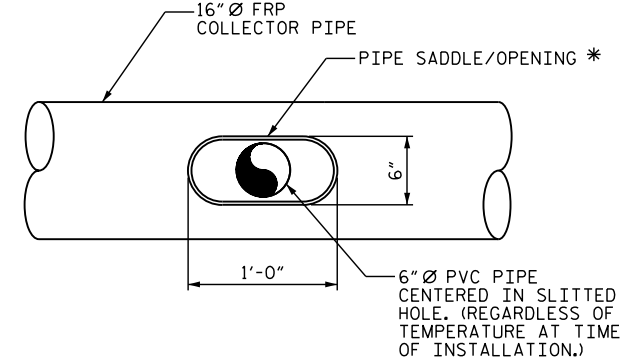
CLEANOUT DETAIL



EXPANSION COUPLER



DRAIN PIPE AND PIPE CONNECTOR



PIPE OPENING DETAIL

* FABRICATOR SHALL DETERMINE PIPE SADDLE/REINFORCEMENT FOR OPENING SIZE INDICATED. FABRICATOR SHALL SUBMIT SHOP DRAWINGS OF PIPE SADDLE/OPENING FOR REVIEW PRIOR TO BEGINNING FABRICATION.

THE CONTRACTOR SHALL REPLACE THE STRUCTURE DRAINAGE SYSTEM IN KIND, INCLUDING ALL FRP COLLECTOR PIPE, PIPE SUPPORT AND PIPE HANGERS AS DETAILED ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THE ENTIRE COST FOR LABOR AND MATERIALS NECESSARY TO FABRICATE AND INSTALL THE REPLACEMENT COMPONENTS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR "REPLACEMENT OF STRUCTURE DRAINAGE SYSTEM". FOR REPLACEMENT OF STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL REPLACE ALL BROKEN DOWNSPOUTS AS DIRECTED BY THE ENGINEER. THE METHOD OF REPAIR SHALL BE APPROVED BY THE ENGINEER.

CARE SHALL BE TAKEN DURING REMOVAL AND REPLACEMENT OF THE EXISTING STRUCTURE DRAINAGE SYSTEM TO AVOID DAMAGING THE EXISTING STRUCTURE. DAMAGE TO THE EXISTING STRUCTURE SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE DEPARTMENT. THE METHOD OF REPAIR SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

ALL COLLECTOR PIPES, ELBOWS, COUPLERS, AND TEES SHALL BE FIBERGLASS REINFORCED PLASTIC PIPE MEETING THE SPECIFICATIONS OF ASTM D2996 AND THE ACCELERATED UV WEATHERING PERFORMANCE REQUIREMENTS OF ASTM D4329-05 PER PROCEDURE ASTM G154.

EACH PIPE SECTION SHALL HAVE A MINIMUM OF TWO HANGERS.

COLLECTOR PIPE SECTIONS SHALL BE SUPPORTED FROM THE EXISTING 7/8" INSERTS EMBEDDED IN THE CONCRETE DECK SLAB, NO ATTACHMENT TO THE GIRDERS WILL BE PERMITTED.

CONTRACTOR SHALL PROVIDE FRP COUPLINGS CAPABLE OF HANDLING THE ANTICIPATED MOVEMENTS. ADDITIONALLY FRP COUPLINGS SHALL PROVIDE HORIZONTAL ALIGNMENT TOLERANCES SUCH THAT THE 16" Ø FRP COLLECTOR PIPE AND COUPLINGS CAN CLOSELY FOLLOW THE VERTICAL CURVE OF THE STRUCTURE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL ALIGNMENT OF THE DRAINAGE SYSTEM USING NECESSARY FITTINGS, TEES, AND WYES TO PROVIDE A CONTINUOUS DRAINAGE SYSTEM.

DECK DRAIN PIPE SHALL BE ASTM D1785, SCHEDULE 40. ALL PVC FITTINGS SHALL BE MINIMUM ASTM D2655, SCHEDULE 40.

EXPANSION JOINT COUPLERS IN THE COLLECTOR PIPE SHALL HAVE A MINIMUM CAPACITY TO ACCOMMODATE 6 INCHES OF TOTAL MOVEMENT (3 INCHES EXPANSION/3 INCHES CONTRACTION.)

COLLECTOR PIPE SUPPORTS SHALL BE LOCATED WITHIN 12 INCHES, ± 4 INCHES, OF A COLLECTOR PIPE JOINT.

DECK DOWN-DRAIN PIPES SHALL BE CENTERED IN SLOTTED OPENING IN COLLECTOR PIPE REGARDLESS OF TEMPERATURE AT TIME OF INSTALLATION.

HANGER RODS SHALL BE ASTM A193, GRADE B7 OR CARBON STEEL ALL-THREAD HANGER RODS.

NUTS SHALL BE ASTM A194, GRADE 2H, HEAVY HEX NUTS.

THE DETAILS OF ALL PIPING, HARDWARE, OR OTHER MATERIAL SHALL BE PROVIDED BY THE CONTRACTOR AND IS SUBJECT TO THE APPROVAL OF THE ENGINEER.

WORKING DRAWINGS FOR THE DRAINAGE SYSTEM AND LAYOUT PLANS INCLUDING, BUT NOT LIMITED TO, PIPE SUPPORT BRACKETS, PIPE ALIGNMENT, PIPE LENGTHS, AND ALL NECESSARY FITTINGS, ELBOWS, WYES, ADAPTERS, GUIDES, RESTRAINTS, WEAR PADS, COUPLERS AND JOINTS SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN NORTH CAROLINA AND SUBMITTED FOR APPROVAL PRIOR TO ORDERING MATERIALS.

PIPE MANUFACTURER SHALL ENSURE THE PIPE AND THE PIPE SUPPORT BEARING AREA IS DESIGNED IN ACCORDANCE WITH THE HANGER SPACING PROVIDED IN THESE PLANS.

PIPE DESIGN MUST ALLOW VERTICAL FLEXURE FROM THE SUPERSTRUCTURE.

THE COLLECTOR PIPE SHALL CLOSELY FOLLOW THE LONGITUDINAL GRADE OF THE STRUCTURE WHILE MAINTAINING A MINIMUM OF 5% SLOPE AT ALL TIMES.

COUPLERS SHALL BE DESIGNED TO ACCOMMODATE A TURN AT EACH BENT IN ORDER TO FOLLOW THE HORIZONTAL AND VERTICAL CURVATURE OF THE BRIDGE OVERHANG.

THE PIPE MANUFACTURER SHALL ENSURE THE FRICTIONAL FORCE REQUIRED TO ACTIVATE THE EXPANSION COUPLERS DOES NOT OVERSTRESS THE COUPLER WALL BUILD-UP, DRAINAGE SYSTEM BRACKETS SUPPORTS OR LATERAL RESTRAINTS.

WASHERS SHALL BE ASTM F436 OR APPROVED EQUAL.

BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

BOLT THREADS SHALL BE BURRED TO PREVENT LOOSENING.

PVC PIPE SHALL BE PAINTED TO MATCH THE SURFACE FINISH OF THE STRUCTURE WITH TWO COATS OF AN ACRYLIC OR LATEX PAINT THAT IS CHEMICALLY COMPATIBLE WITH PVC PRODUCTS AND MEETS THE REQUIREMENTS OF ARTICLE 1080-12 OF THE STANDARD SPECIFICATIONS. EACH COAT SHALL BE 2 DRY MILS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING.

ALL METALLIC COMPONENTS IN THE DRAINAGE SYSTEM, EXCEPT STAINLESS STEEL AND MALLEABLE IRON PARTS, ARE REQUIRED TO BE HOT-DIPPED GALVANIZED PER NCDOT STANDARD SPECIFICATIONS. ELECTRO-PLATE COATING ON STEEL RODS, STEEL YOKE TYPE PIPE ROLLS, BRACKETS, OTHER STEEL HARDWARE IS CONSIDERED BY NCDOT AS TOO THIN FOR OUTDOOR APPLICATIONS.

ALL FRP AND PVC PIPE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

ALL STRUCTURAL STEEL SHALL BE ASTM A36 OR APPROVED EQUAL UNLESS NOTED OTHERWISE.

THE GALVANIZED SURFACE SHALL BE CLEANED TO (SSPC SP-1) PRIOR TO COATING.

ALL FABRICATION SHALL CONFORM TO THE APPLICABLE SECTION OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

ALL FRP SHALL BE PIGMENTED TO MATCH THE SURFACE FINISH OF THE STRUCTURE.

ALL FRP PIPE SIZES ARE SHOWN AS INSIDE DIAMETER SIZES.

FRP = FIBERGLASS REINFORCED PLASTIC.

PROJECT NO. 18313.1100096.PR
 YANCEY COUNTY
 BRIDGE NO. 328

SHEET 5 OF 5

		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SHEET NO.
		BRIDGE #328 ON US 19E OVER SOUTH TOE RIVER BETWEEN I-26 AND NC 226		S2-5
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		REVISIONS		TOTAL SHEETS
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	NO. 1 BY: [] DATE: []	NO. 3 BY: [] DATE: []	NO. 4 BY: [] DATE: []	5

DRAWN BY : NMW DATE : 6/25
 CHECKED BY : MGC DATE : 6/25

