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PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-15

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 8
862D02

15'-7½" W-BEAM GUARDRAIL PANEL

NOTE: USE 5-SPACE 15'-7½" W-BEAM GUARDRAIL PANEL AT THE DOWNSTREAM END OF EXISTING GUARDRAIL THAT DOES NOT OFFSET THE W-BEAM PANEL SPLICE TO MIDSPAN

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
862D02

NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 1'-11", USE AN ADDITIONAL 12'-6" LONG SECTION OF GUARDRAIL, FOR EVERY 1" OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 2'-1" GUARDRAIL.

ELEVATION VIEW

TRANSITION FROM OR 1'-11" TO 2'-1" W-BEAM GUARDRAIL MOUNTING HEIGHT

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
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STATE OF
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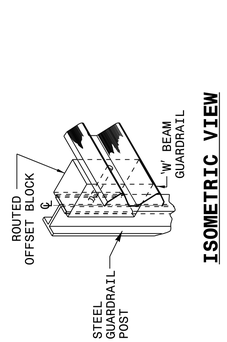
RALEIGH, N.C.

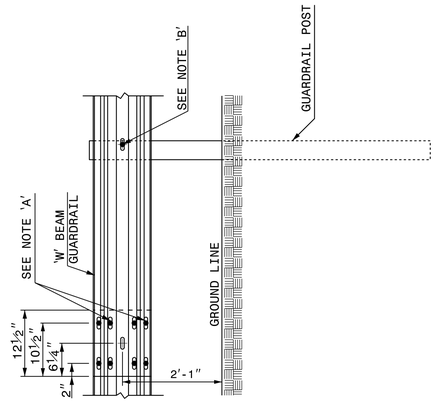
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 8
862D02

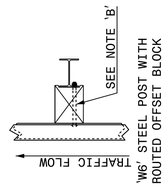
ISOMETRIC VIEW



FRONT - MID SPAN SPLICE

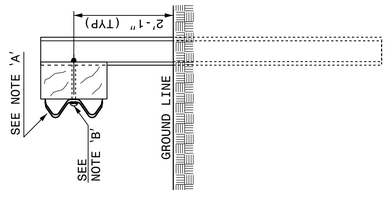


TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES



'W6' STEEL POST WITH ROUTED OFFSET BLOCK

PLAN



'W6' STEEL POST WITH ROUTED OFFSET BLOCK

SIDE

NOTES:
A - ⅝" DIA. BUTTON HEAD SPLICE BOLT 1¼" LONG (8 REQ. PER SPLICE JOINT).
B - ⅝" DIA. BUTTON HEAD BOLT 7½"/9" LONG WITH NUT FOR BOLTING 6"/8" ROUTED OFFSET BLOCK TO STEEL POSTS.
C - FIELD PUNCHING OF HOLES INTO GUARDRAIL AS DIRECTED BY THE ENGINEER.

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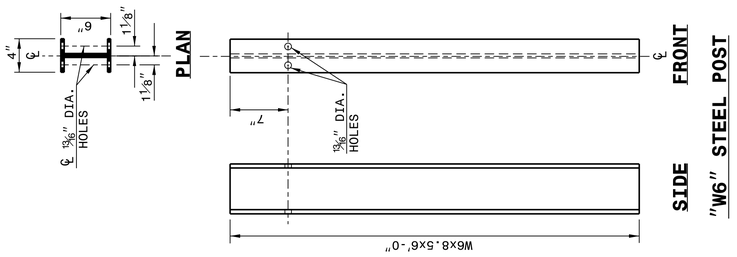
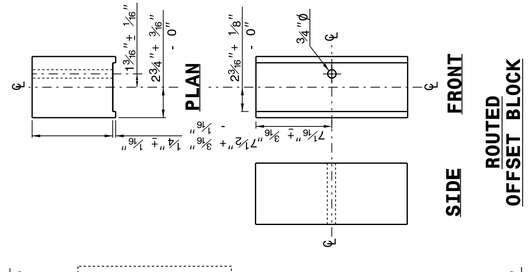
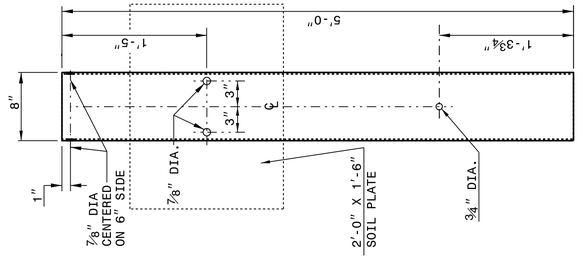
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

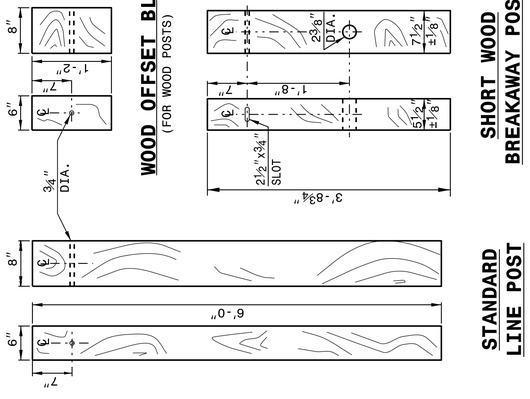
SHEET 6 OF 8
862D02

SYSTEM PARTS









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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

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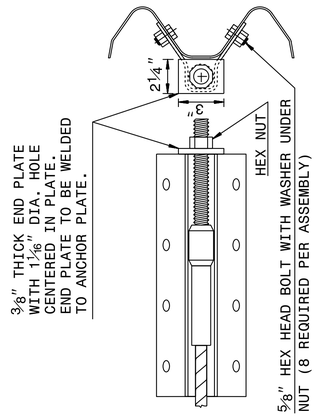
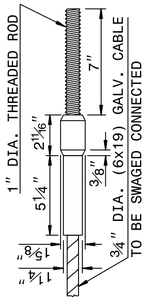


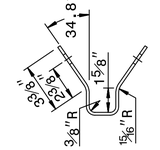
⅜" THICK END PLATE WITH 1⅛" DIA. HOLE CENTERED IN PLATE. END PLATE TO BE WELDED TO ANCHOR PLATE.

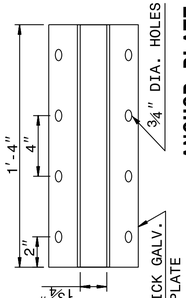
⅝" HEX HEAD BOLT WITH WASHER UNDER NUT (8 REQUIRED PER ASSEMBLY)

ANCHOR PLATE ASSEMBLY



SWAGED CABLE

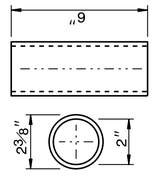




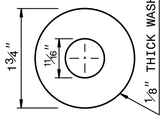
ANCHOR PLATE

CABLE ASSEMBLY

SYSTEM PARTS

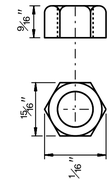


BREAKAWAY TERMINAL POST SLEEVE

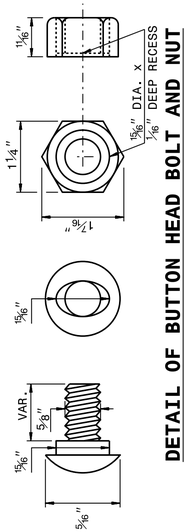


DETAIL OF STANDARD WASHER

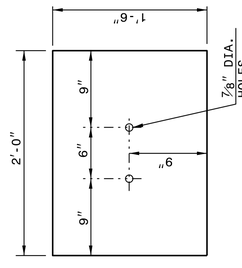
STANDARD WASHER: TYPICAL USE UNDER NUT WITH WOOD POST



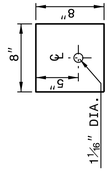
DETAIL OF STANDARD HEX BOLT AND NUT



DETAIL OF BUTTON HEAD BOLT AND NUT

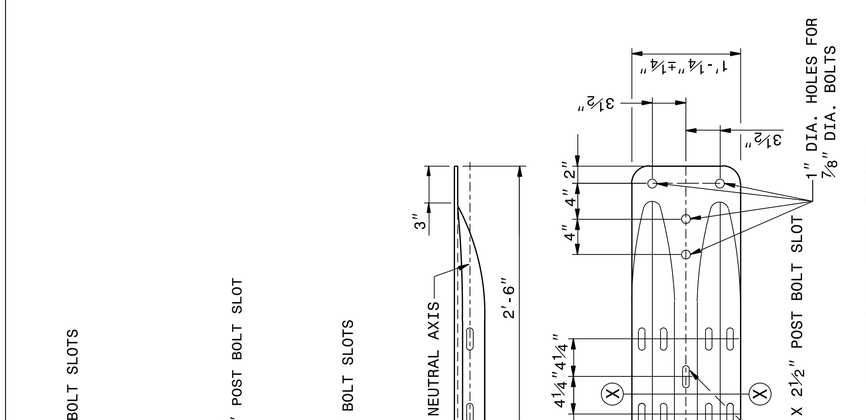


SOIL PLATE
¼" THICK PLATE

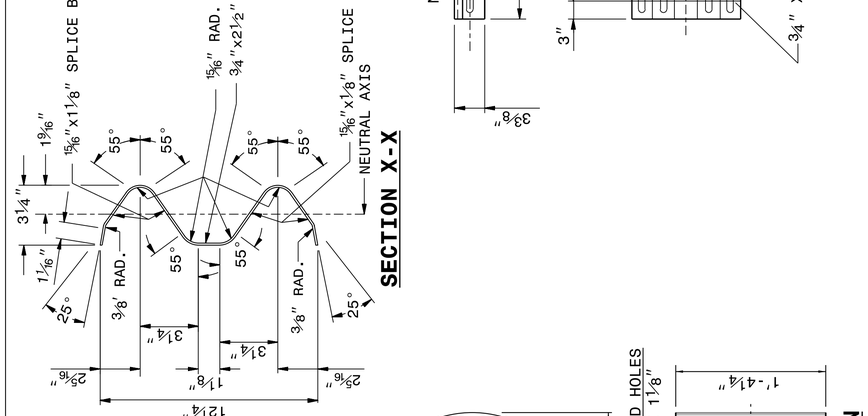


BEARING PLATE
⅝" THICK PLATE

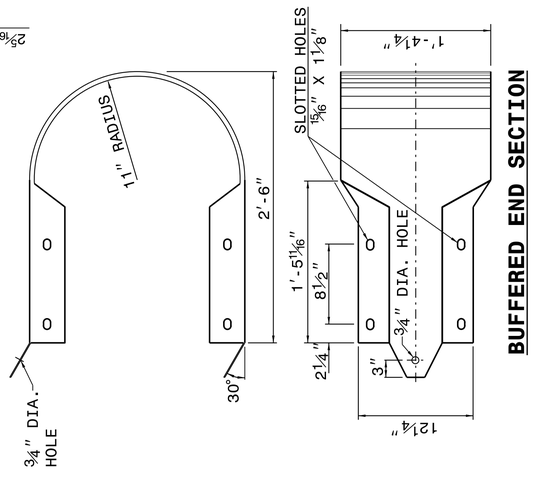
SYSTEM PARTS - GENERAL USE



TYPICAL END SHOE



SECTION X-X



BUFFERED END SECTION

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 8 OF 8
862D02

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-18

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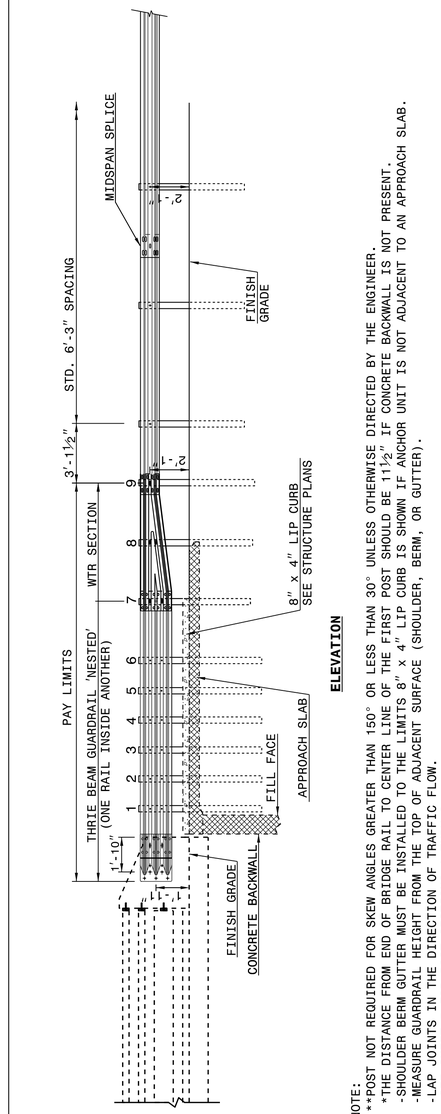
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

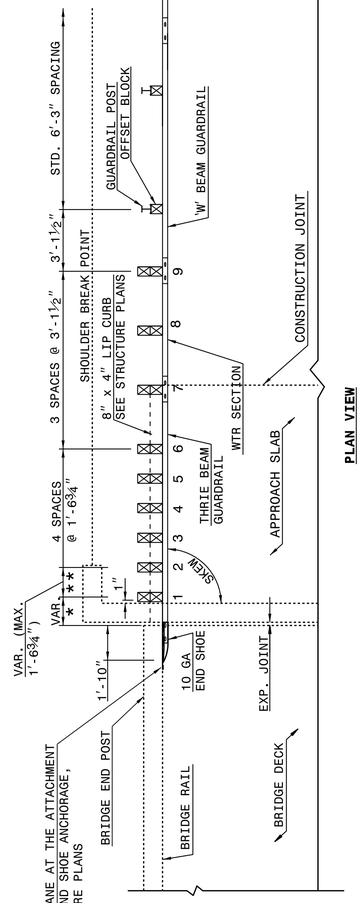
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

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

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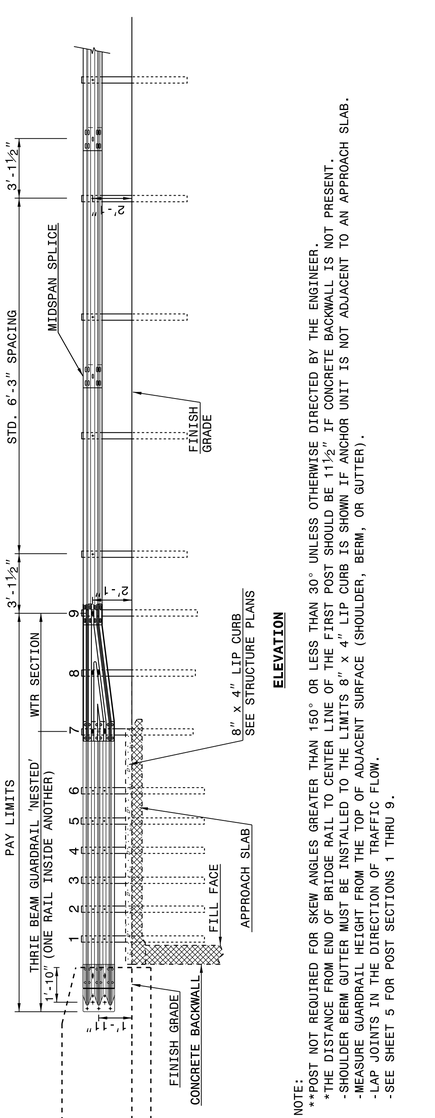
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862D03



ELEVATION

NOTE:
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-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.

PLAN VIEW

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

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

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

SHEET 2 OF 7
862D03

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jhowerton AT CSD-292595

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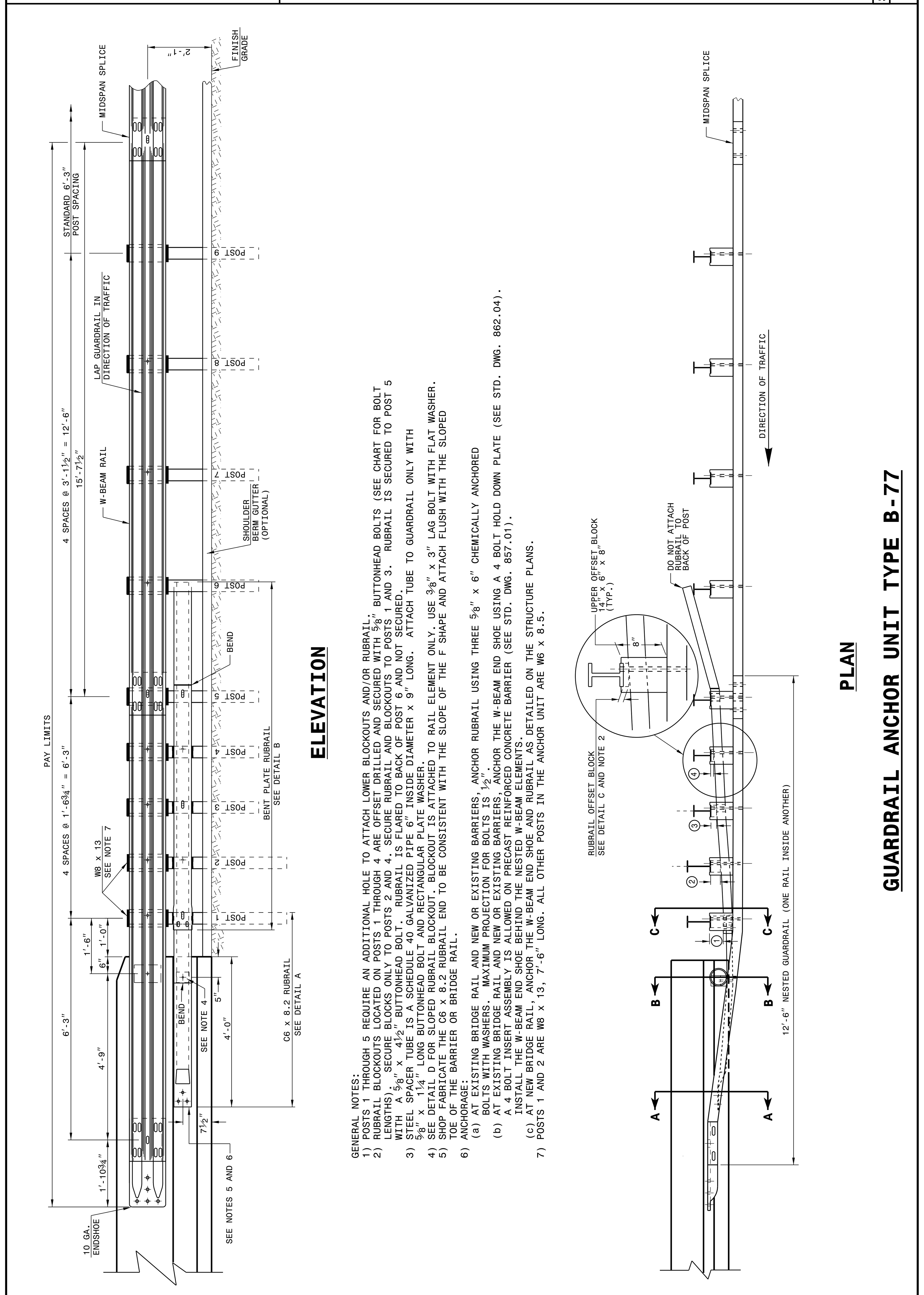

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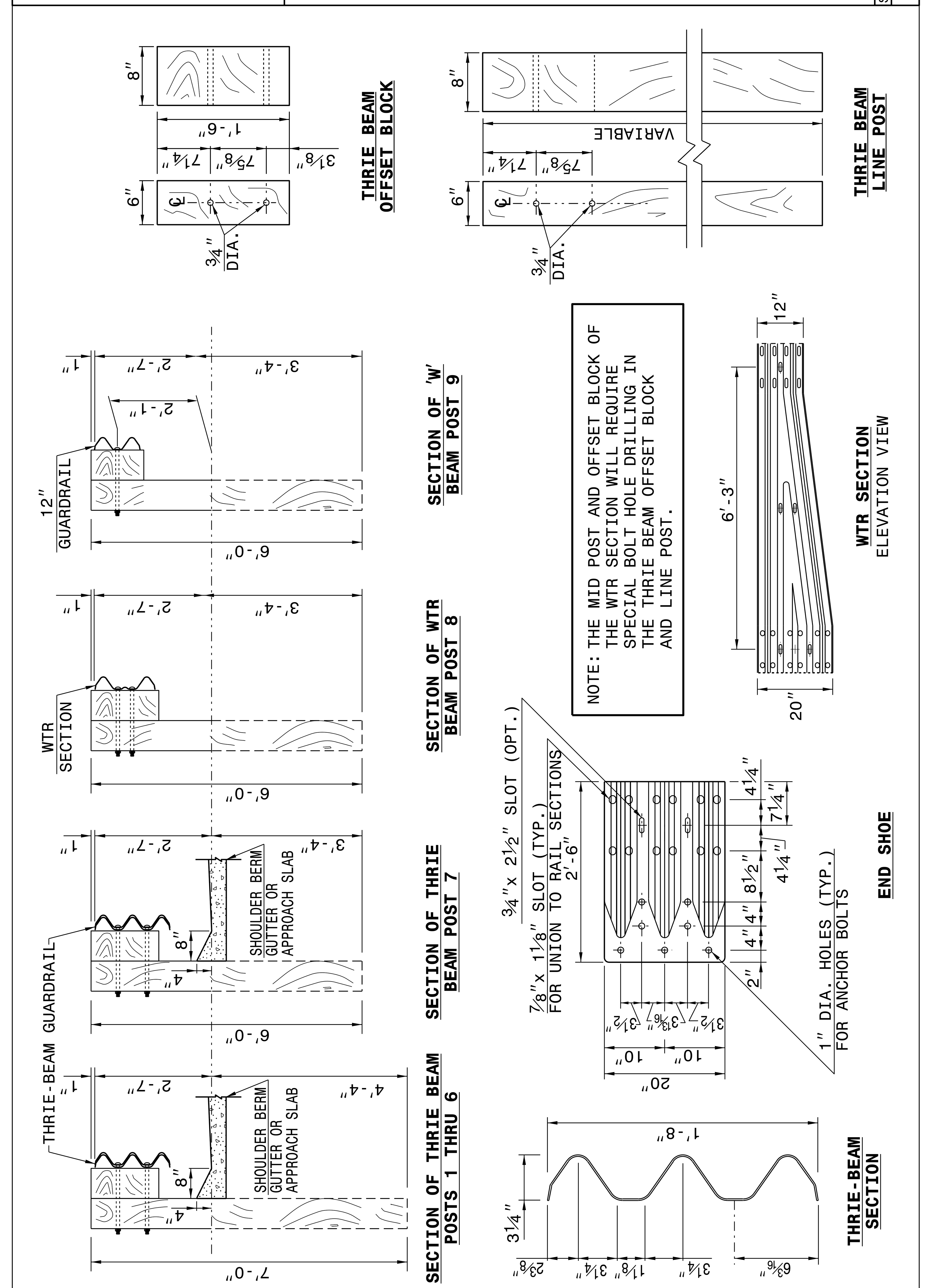
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

SHEET 4 OF 7
862D03



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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7
862D03

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Joel S. Howerton
8/11/2017

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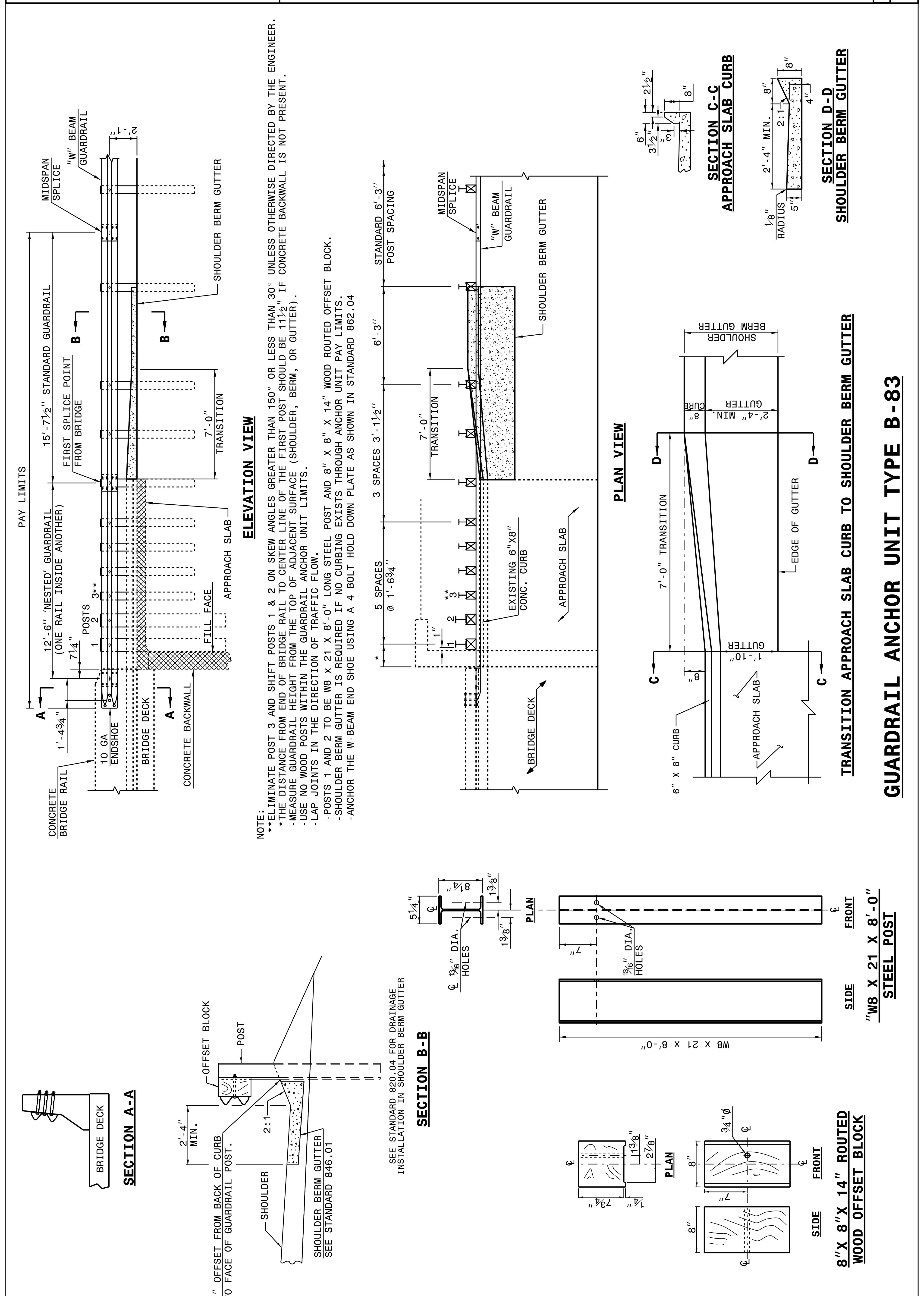
U-4751	2C-20



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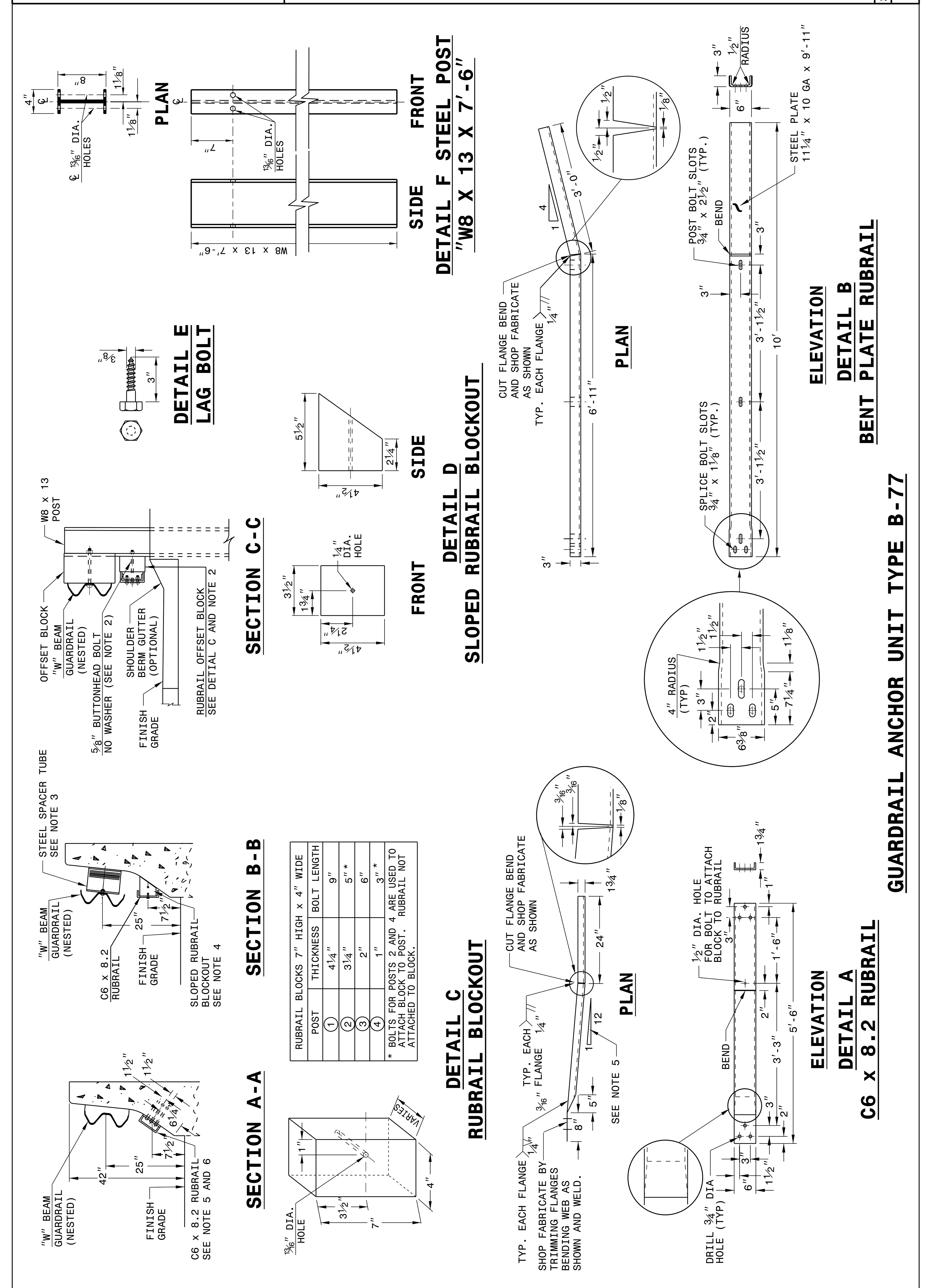
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT TYPE B-83

SHEET 6 OF 7
862D03



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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

SHEET 5 OF 7
862D03

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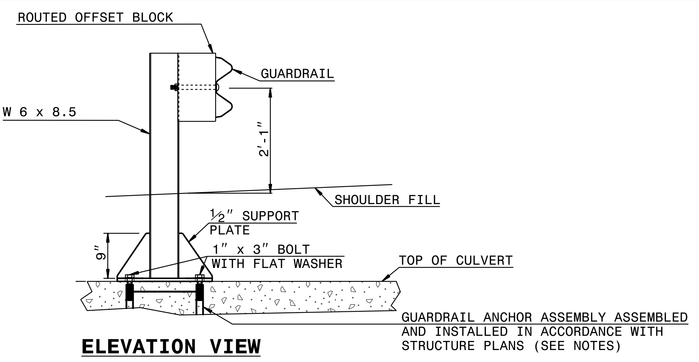
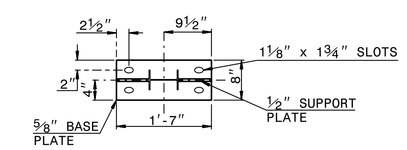
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

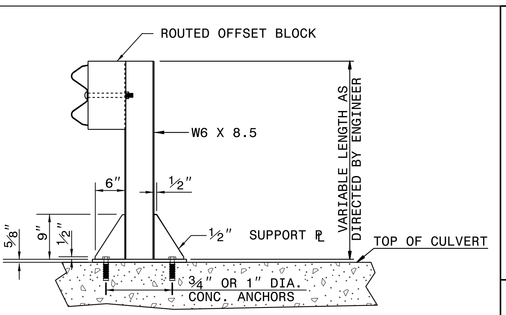
SHEET 7 OF 7
862D03



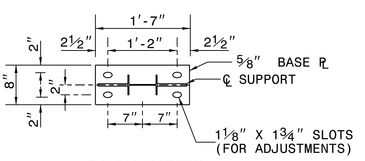
ELEVATION VIEW



PLAN VIEW



ELEVATION VIEW



PLAN VIEW

NOTES FOR:
GUARDRAIL POST ANCHORED TO STRUCTURE:
- -USE FULL LENGTH ¼" BUTT WELDS AT ALL LOCATIONS OF CONTACT BETWEEN THE BASE PLATE, SUPPORT PLATES AND STEEL POST.
- -USE POST AND POST BASE PLATES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION TO CONFORM TO A.S.T.M. A-123.

NEW STRUCTURES:
- -ATTACH POST TO INSERT ASSEMBLY UNITS (USING ANCHOR BOLTS SUPPLIED WITH INSERTS) WHICH HAVE BEEN CAST INTO THE STRUCTURE DURING CONSTRUCTION.

EXISTING STRUCTURES:
- -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 ¾" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON ¼ THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.

- -USE ANCHORS GALVANIZED IN ACCORDANCE WITH A.S.T.M. 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.

ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

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

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

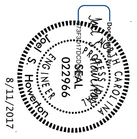
SHEET 7 OF 7
862D03

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

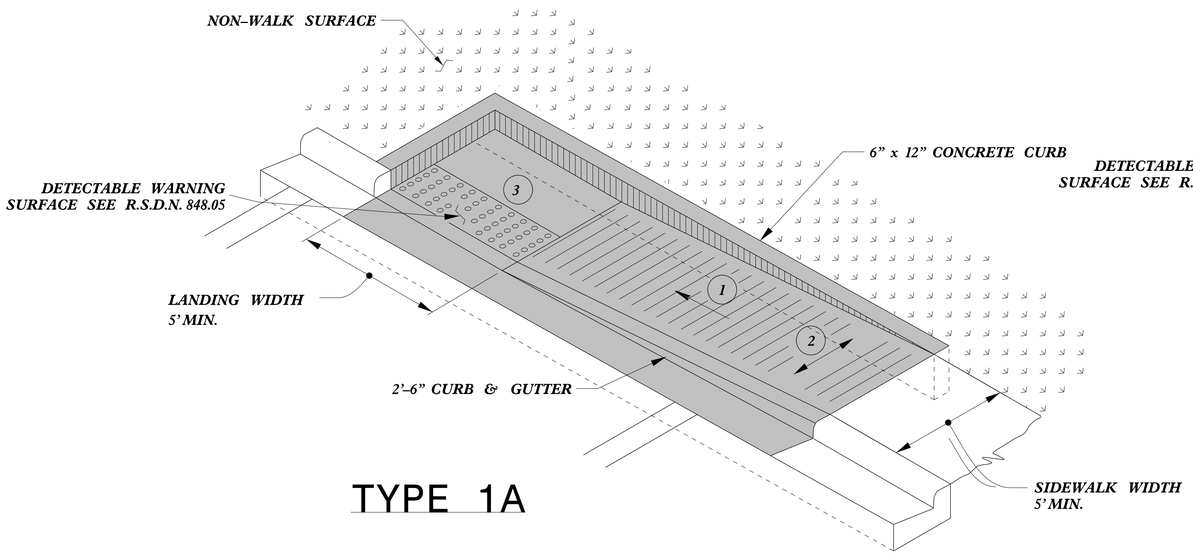
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEE TITLE BLOCK

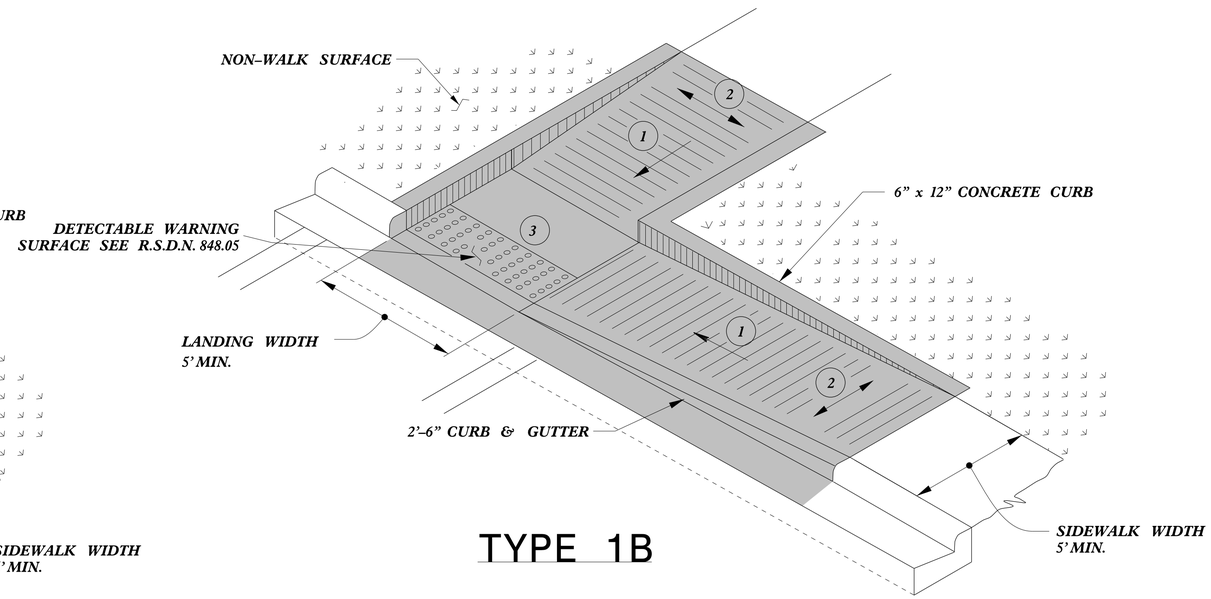
ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:



PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-21



TYPE 1A



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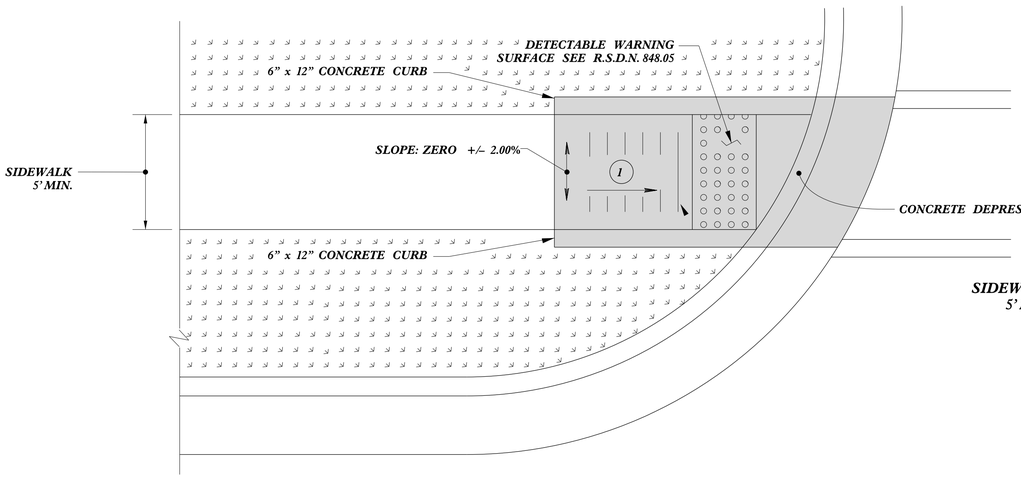

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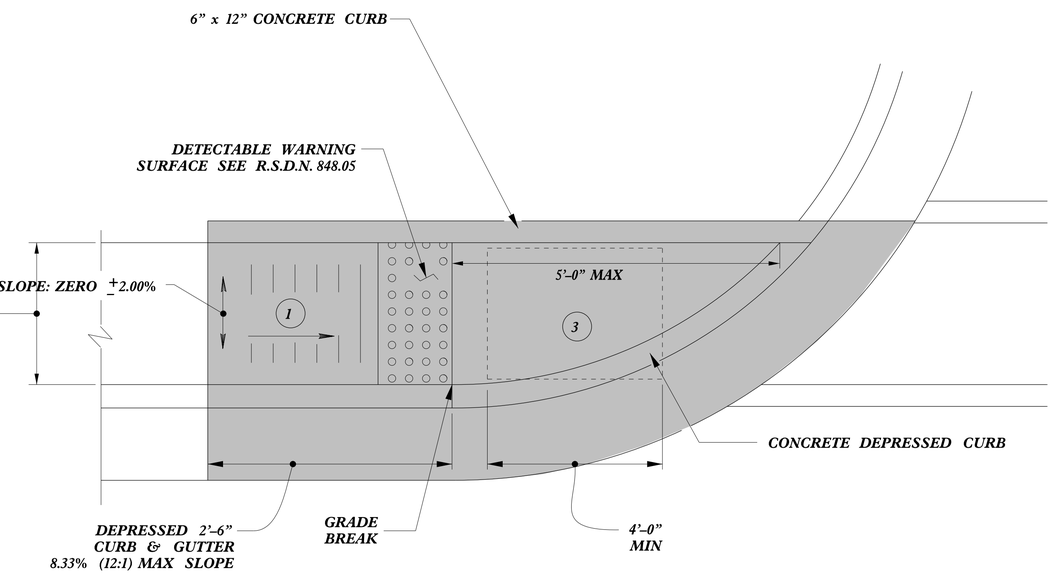

TYPE 1

① *8.33% (12:1) MAX RAMP SLOPE*

② *CROSS SLOPE: 2.00%*

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

▨ PAY LIMITS FOR 1 CURB RAMP

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

022966
Joel S. Howerton
873F3D17DCDC45F...
11/7/2017

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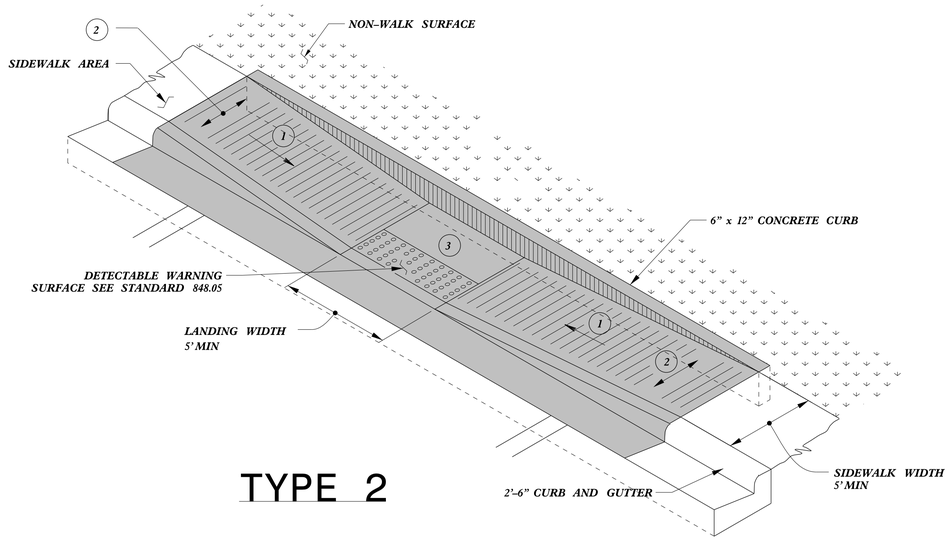
Office 919-707-6950 FAX 919-250-4119

CURB RAMPS
Directional Ramps

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

5/14/99

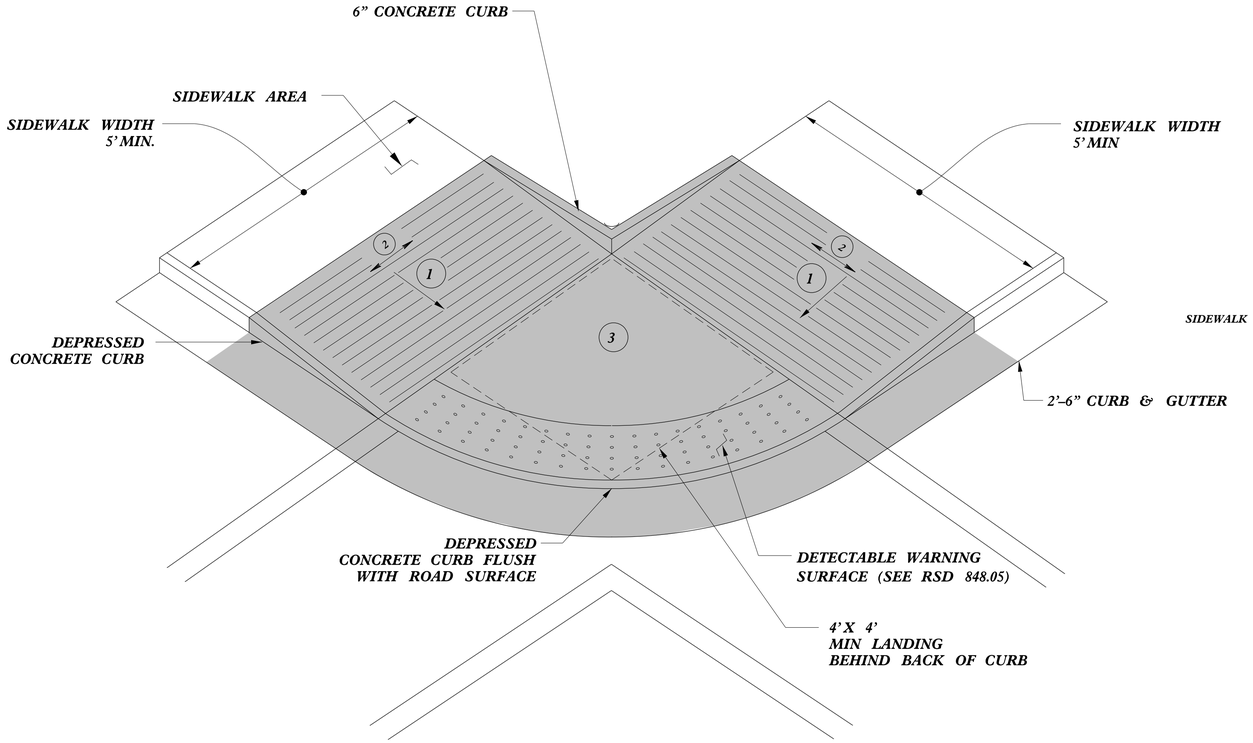
PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-23



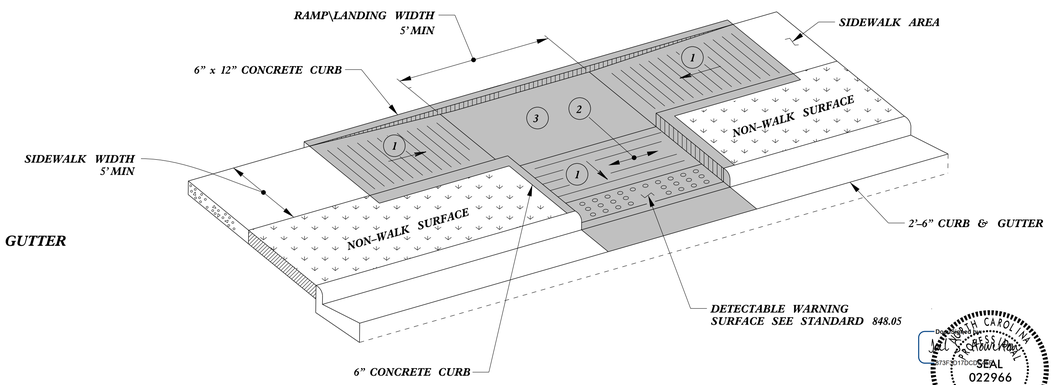
TYPE 2

PAY LIMITS FOR 1 CURB RAMP

1. *8.33% (12:1) MAX RAMP SLOPE*
2. *CROSS SLOPE: 2.00%*
3. *CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.*



TYPE 2A



TYPE 2B

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton

8/11/2017

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

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CURB RAMPS

Parallel Ramps

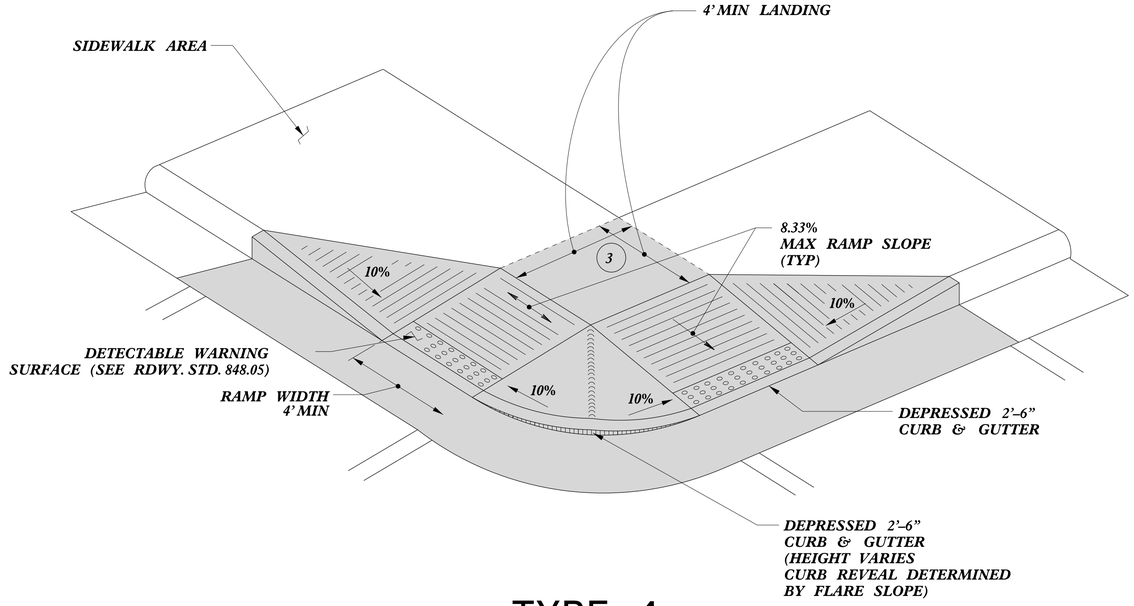
ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

$$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$USERNAME$$$$ $$$$SYSTIME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-24

PAY LIMITS FOR 2 CURB RAMPS



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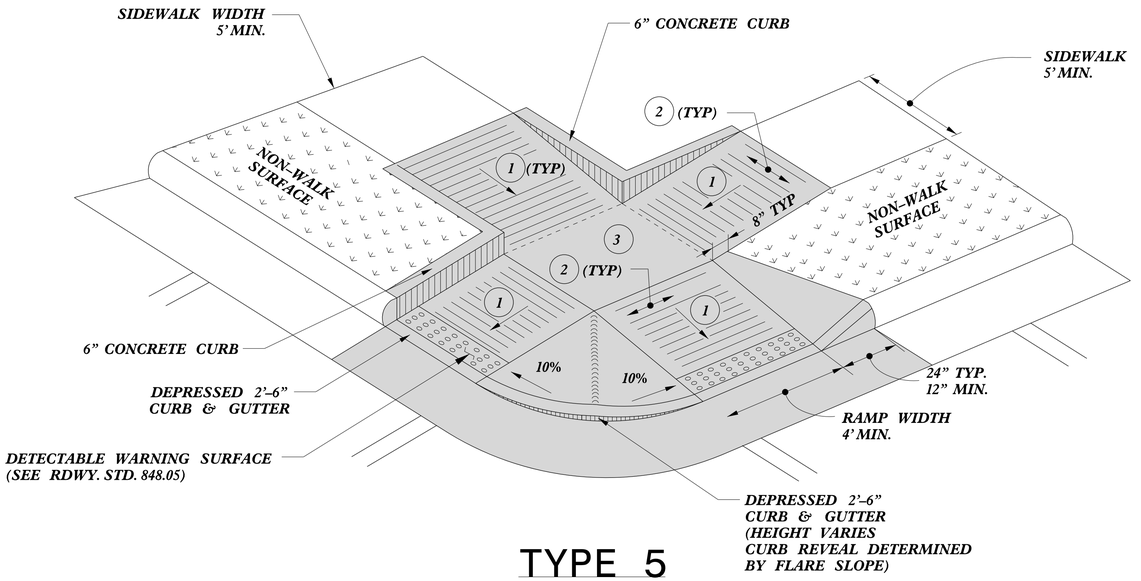
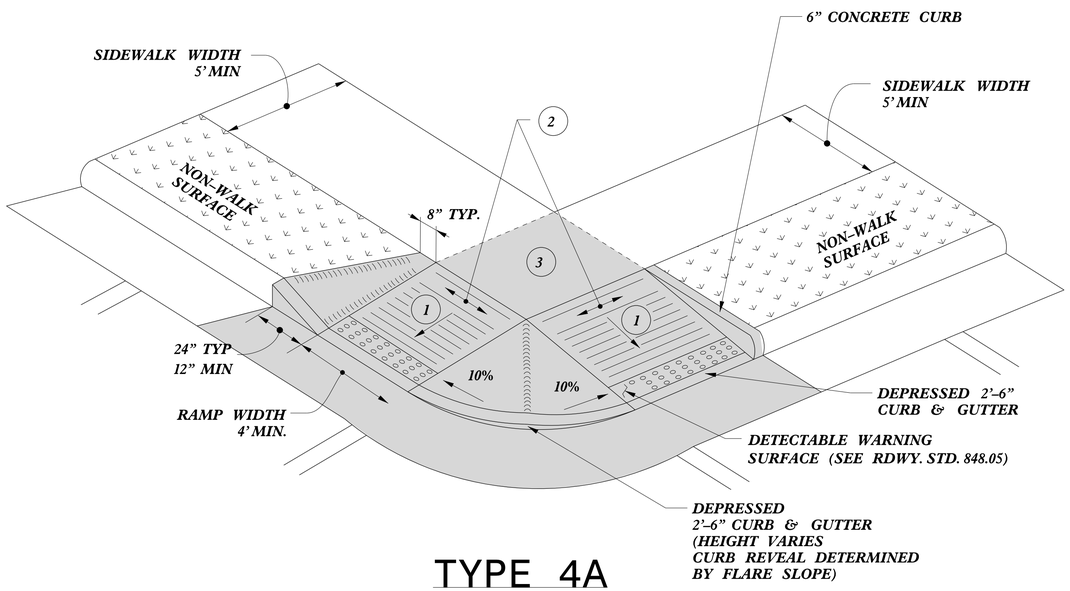


TYPE 5



TYPE 4A

8/11/2017

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

(2) CROSS SLOPE: 2.00%

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

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

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CURB RAMPS

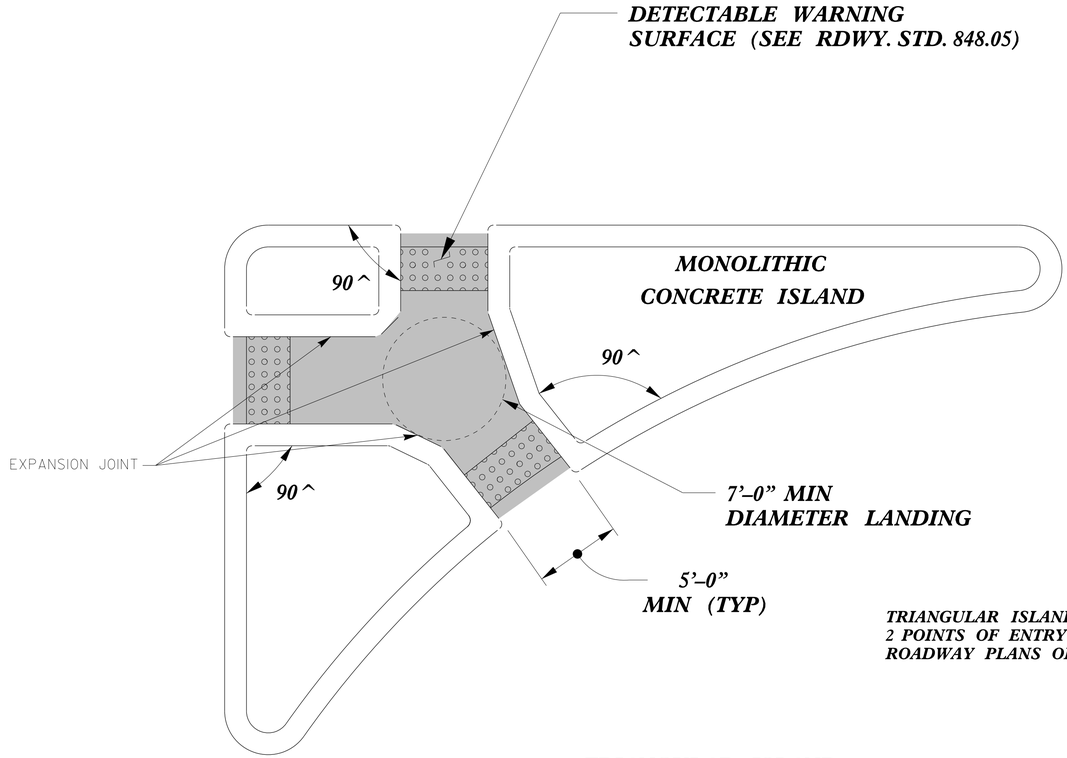
Shared Landing

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

$$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$DGN$$$$

5/14/99

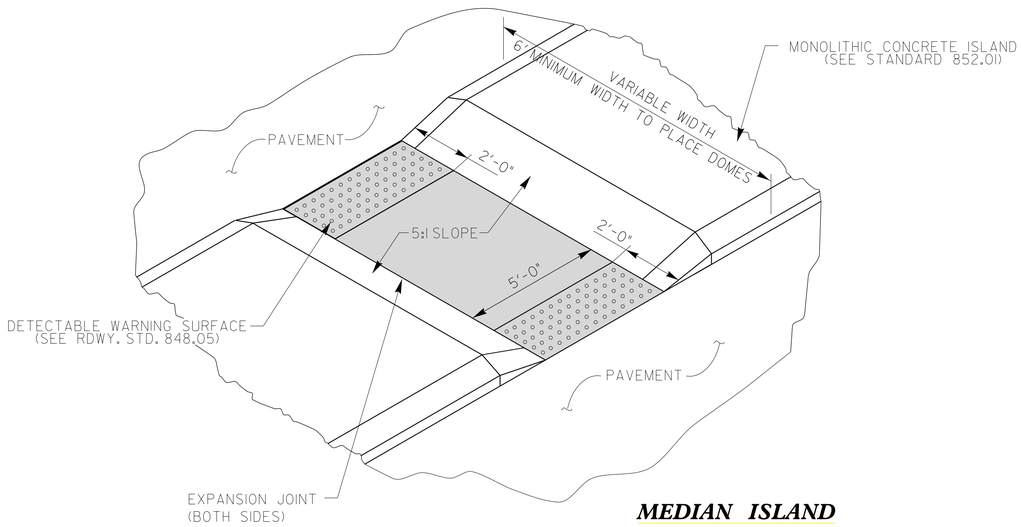
PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-25



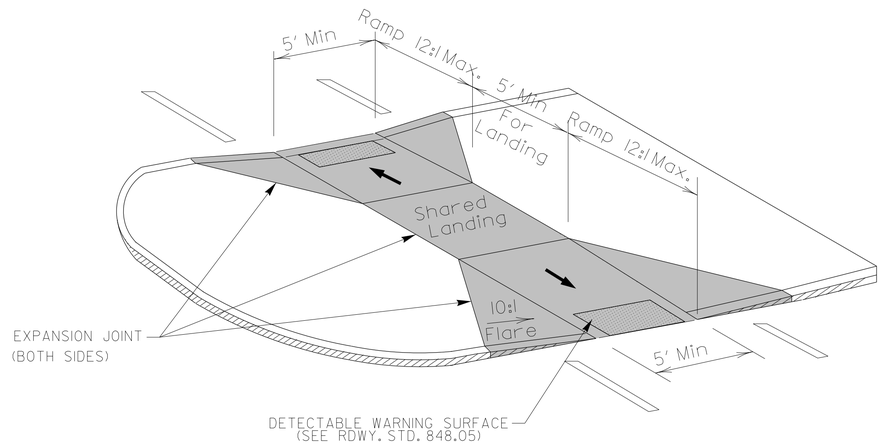
PAY LIMITS FOR 2 OR 3 CURB RAMPS (CALCULATE BASED ON NUMBER OF SETS OF TRUNCATED DOMES)

TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

TRIANGULAR ISLAND WITH CUT THROUGH



MEDIAN ISLAND WITH CUT THROUGH



MEDIAN ISLAND CURB RAMPS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 John S. Howerton

8/11/2017

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CURB RAMPS

Median or Turn Lane Islands

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

$$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$SYSTIME$$$$ $$$$USERNAME$$$$

DocuSign Envelope ID: 1ACE3258-B4E6-41D5-8054-E6A64965A6D0

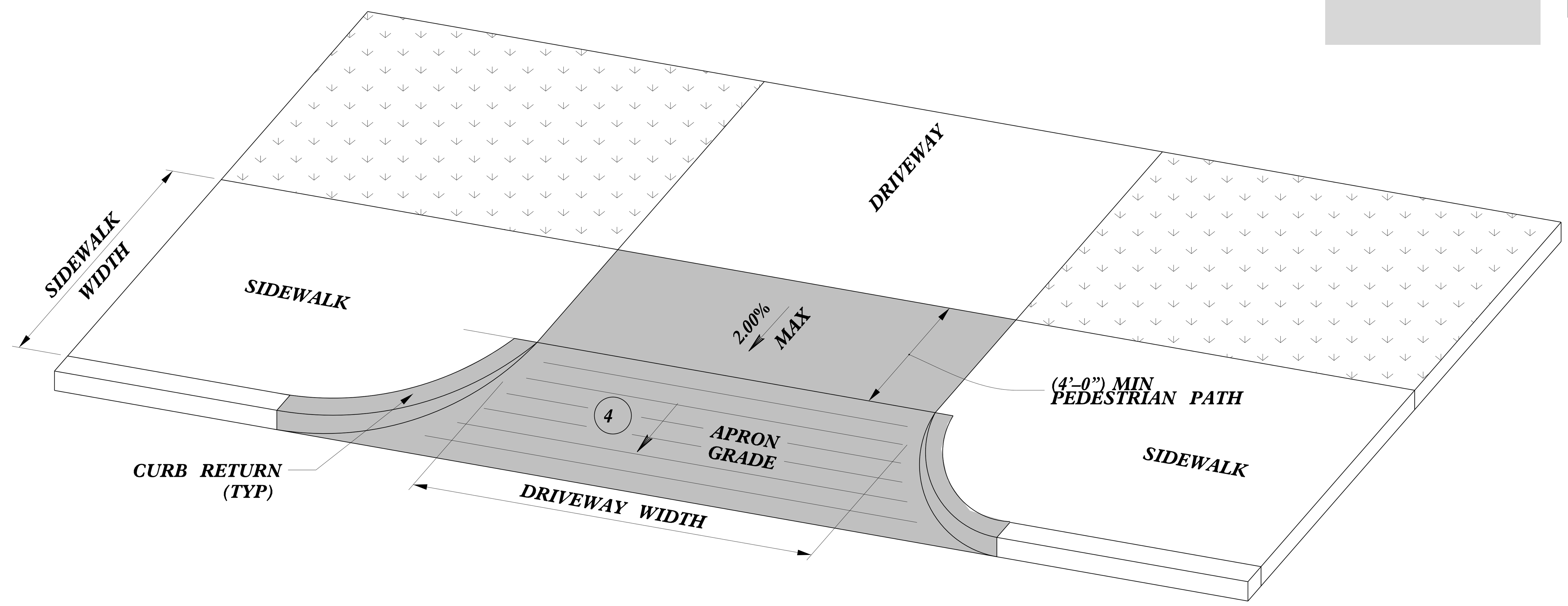
PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-26

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

(2) *CROSS SLOPE: 2.00%*

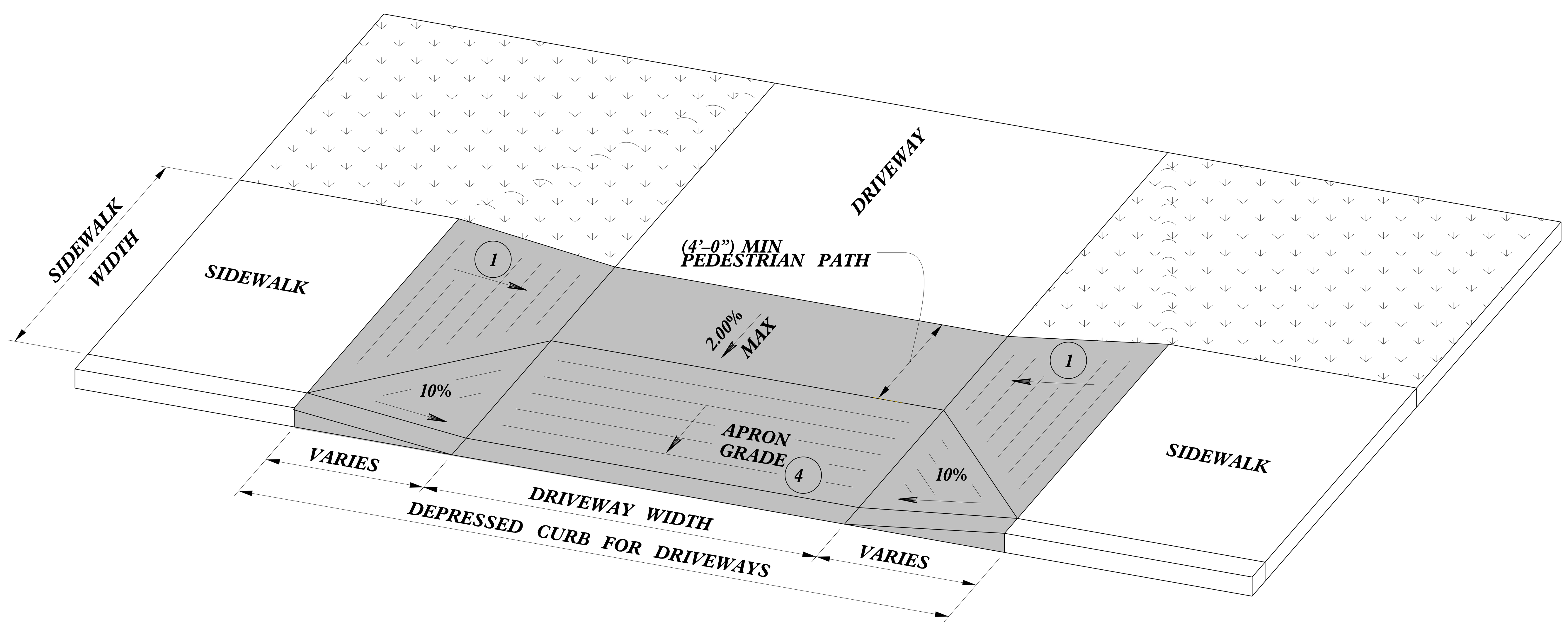
(4) *8.00% MAX CHANGE IN GRADE BETWEEN ROAD SURFACE AND DRIVEWAY*

PAY LIMITS FOR 1 CURB RAMP



DRIVEWAY APRON

OPTION 1



–SEE ROADWAY DETAIL DRAWING 848.05 FOR DETECTABLE WARNING SURFACE AND FOR RAMP NOTES.

–SEE ROADWAY STANDARD DRAWING 848.02 FOR CONCRETE DRIVEWAYS.

DRIVEWAY APRON

OPTION 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton
8/11/2017

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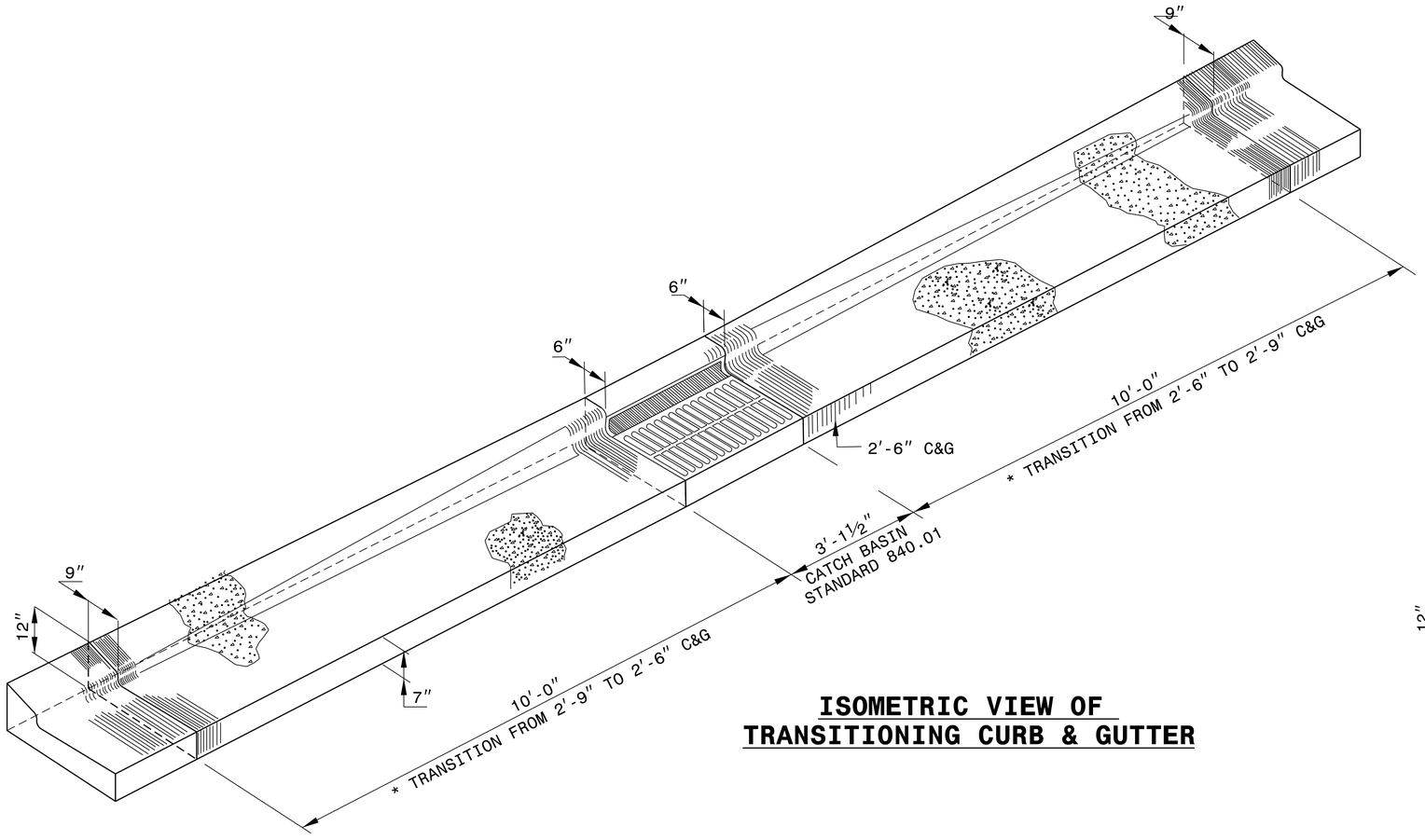
CURB RAMPS

@ DRIVEWAY OPENINGS

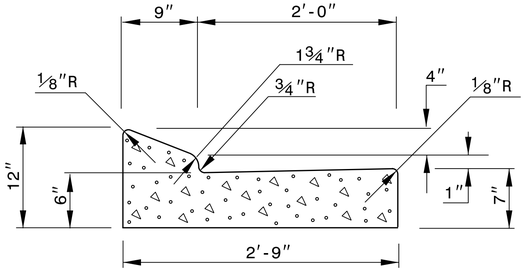
ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-27

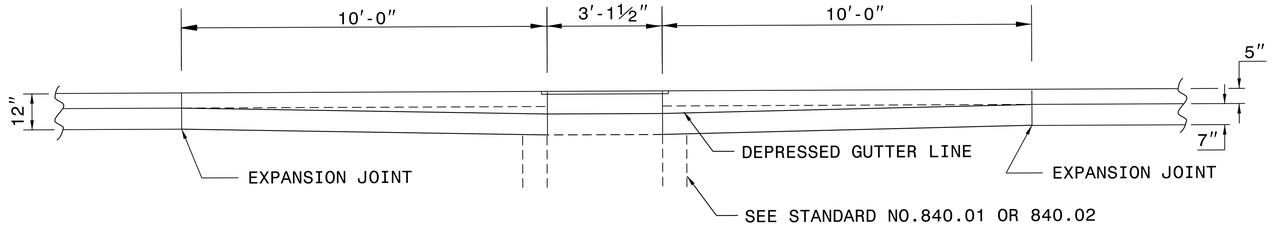
NOTE: SEE STD.DWG. 846.01 FOR 2′-6″ CURB AND GUTTER INFORMATION.



ISOMETRIC VIEW OF TRANSITIONING CURB & GUTTER



PROPOSED 2′-9″ CURB & GUTTER



ELEVATION

* MAINTAIN THE EDGE OF PAVEMENT. TRANSITION THE CURB ALONG THE BACK OF THE CURB.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton
8/11/2017

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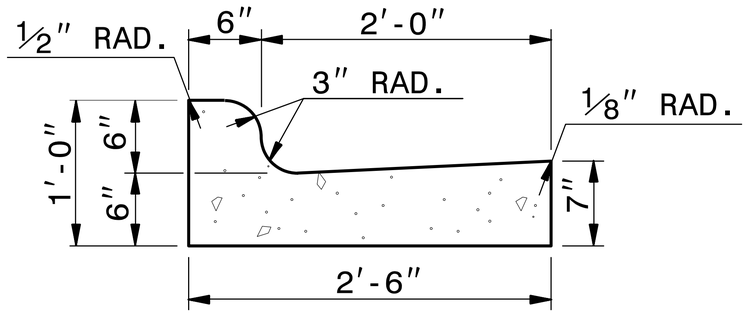
DETAIL OF 2′-9″ TO 2′-6″ CURB & GUTTER TRANSITION SECTION

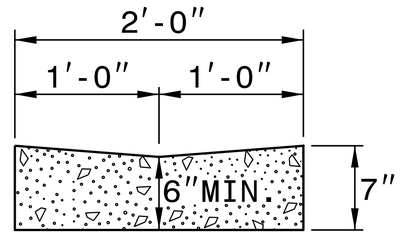
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: tspell DATE: july 14,2009
CHECKED BY: _____ DATE: _____
FILE SPEC.: s:eric/usr/details/stand/cgtranst.dgn

27-JUN-2017 10:04
S:\Contracts\Special Details\Ericward\usr\details\stand\c&g transition sectionsdgn
jhowerton AT CSD-292595

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-28

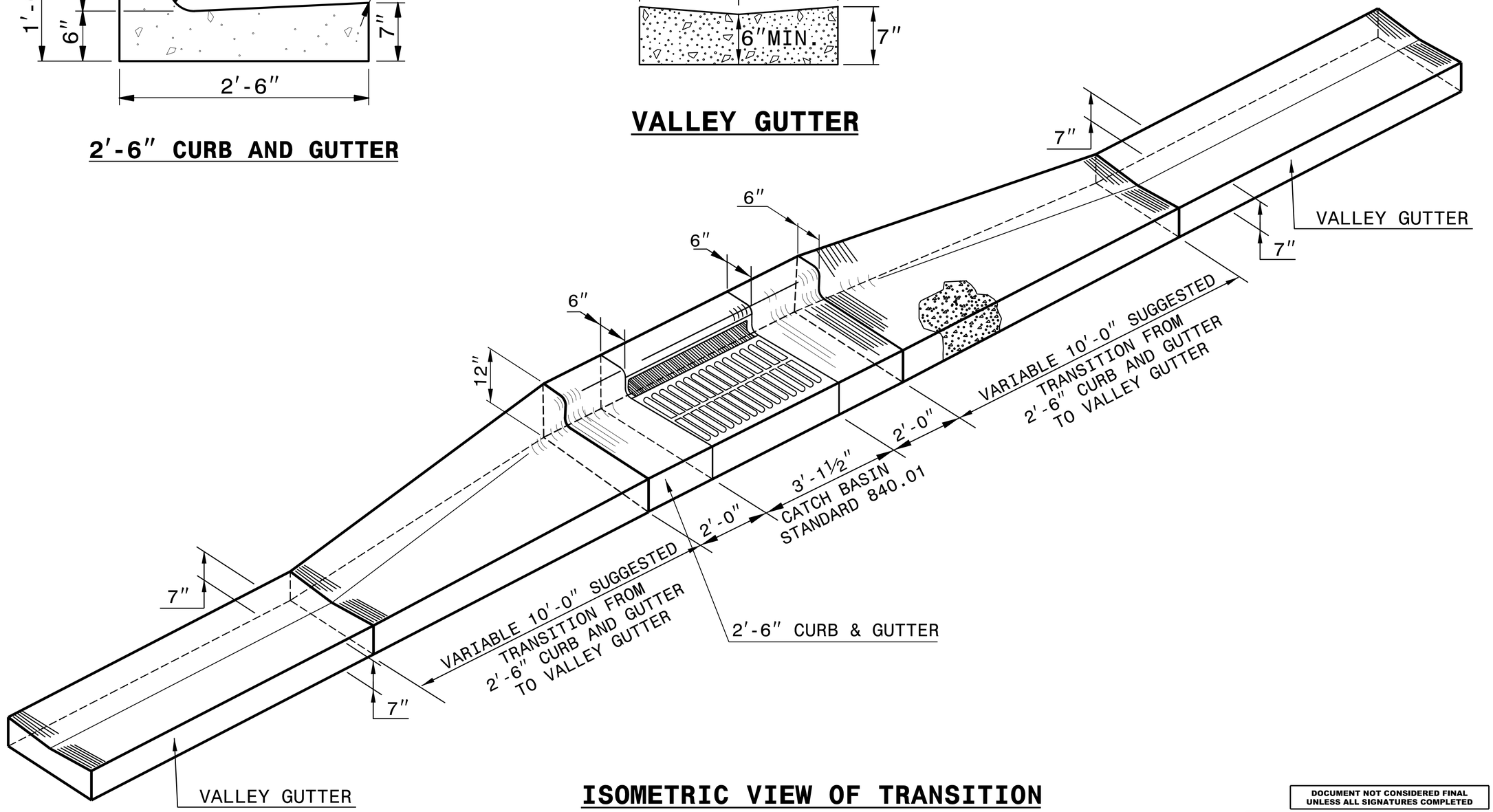


2'-6" CURB AND GUTTER



VALLEY GUTTER

*NOTE: SEE STD. DWG. 846.01 FOR GENERAL NOTES



ISOMETRIC VIEW OF TRANSITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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TRANSITION FROM 2'-6" CURB AND GUTTER TO VALLEY GUTTER

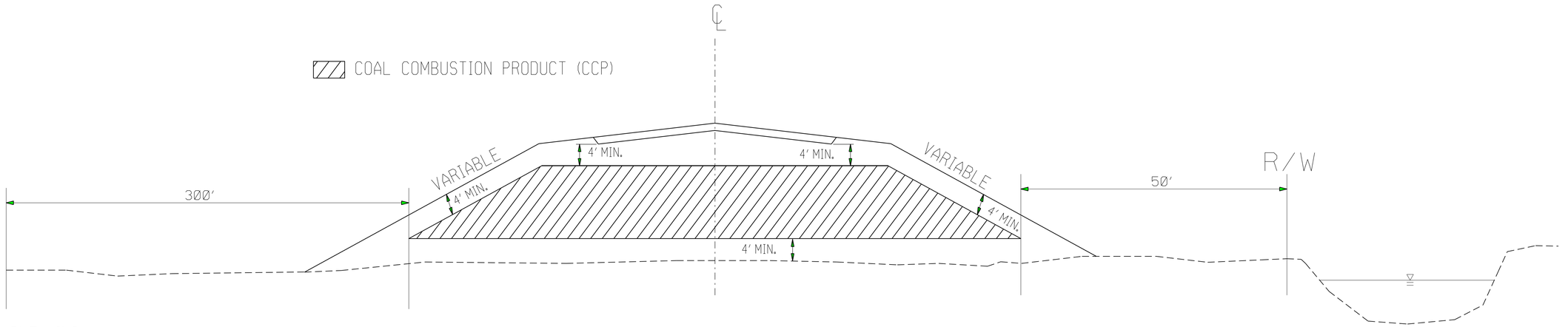
ORIGINAL BY: K.A.KEMPF DATE: JUN.29.2017
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: ericward/usr/details/stand/c&g transition.dgn

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 JOHN S. HOWINGTON
8/11/2017

$$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-29

COAL COMBUSTION PRODUCT PLACEMENT



*(OBTAIN PERMISSION FROM ARMY CORPS OF ENGINEERS)

PLACE CCP IN HATCHED AREA IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS

PLACE CCP A MINIMUM OF 5' ABOVE SEASONAL HIGH GROUND WATER

PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

PLACE SOIL BORROW MATERIAL ON THE OUTSIDE OF CCP AS EACH LIFT OF CCP IS PLACED

NORTH CAROLINA
Joel S. Howerton
SEAL
022966
ENGINEER
Joel S. Howerton
8/11/2017

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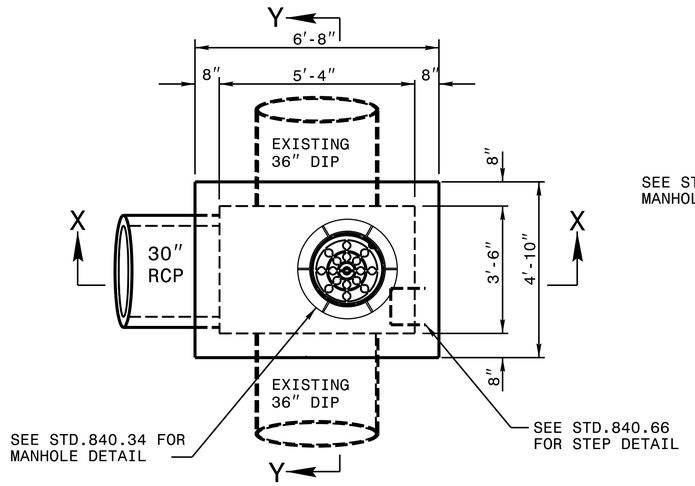
COAL COMBUSTION PRODUCT PLACEMENT DETAIL

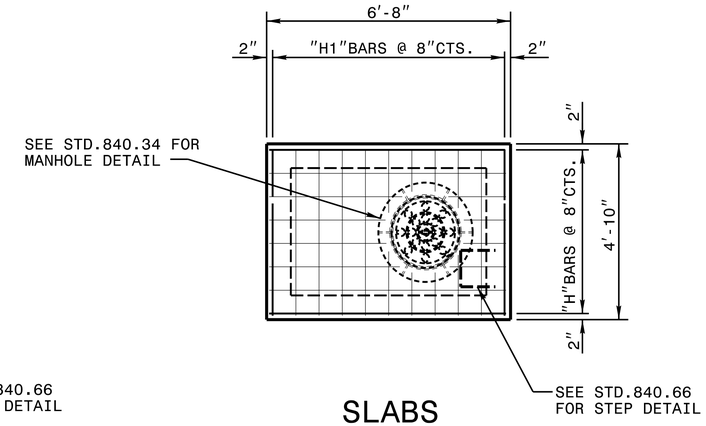
ORIGINAL BY: J.S.H. DATE: 3/16/15
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: joel/coal combustion material detail.dgn

29-JUN-2017 14:09
S:\Contracts\Special Details\jhowerton\Coal Combustion Product Detail.dgn
jhowerton AT CSD-292595

PROJ. REFERENCE NO.	SHEET NO.
U-4751	2C-30



PLAN VIEW



SLABS

GENERAL NOTES:

-THE BASE SLAB TO BE CONSTRUCTED BY FORMING.

-SEE STD. DWG. 840.00 FOR CONSTRUCTION OF BASE SLAB

-CLASS 'AA' CONCRETE TO BE USED THROUGHOUT.

-CONSTRUCTION OPTIONS: MONOLITHIC POUR; 2" KEYWAY OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

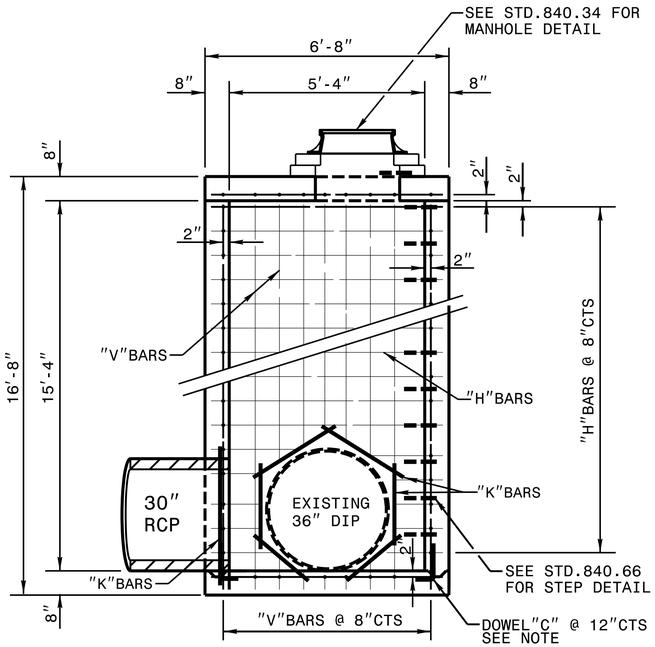
-REINFORCING STEEL TO BE CUT, BENT OR RELOCATED TO POSITION PIPE AS DIRECTED BY THE ENGINEER.

-ALL EXPOSED CORNERS TO BE CHAMFERED 1".

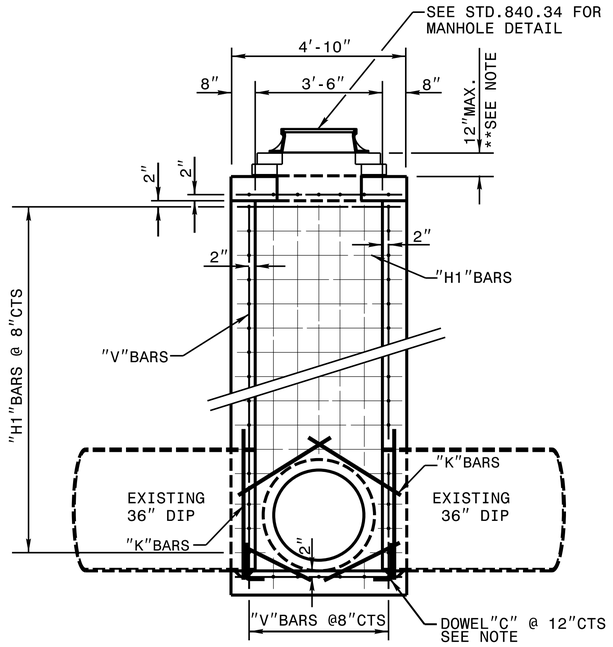
-SEE STD. DRAWING 840.34 FOR CONSTRUCTION OF RISER AND MANHOLE.

-JUNCTION BOXES OVER 3'-6" IN DEPTH WITH MANHOLES WILL REQUIRE STEPS TO BE PLACED ON 12" CTRS. REFERENCE STD. NO. 840.66.

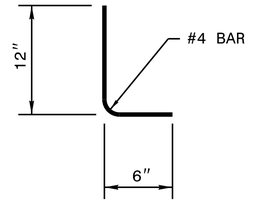
-MAINTAIN 2" MINIMUM CONCRETE COVERAGE ON ALL STEEL.



SECTION X-X



SECTION Y-Y



DOWEL "C"

BILL OF MATERIAL

CODE	BAR#	LENGTH	LBS/FT.	QTY.	LBS
H	4	6'-4"	0.668	76	322
H1	4	4'-6"	0.668	82	247
V	4	15'-8"	0.668	32	335
K	4	3'-0"	0.668	16	32
C	4	1'-6"	0.668	20	20
		TOTAL WEIGHT STEEL			956
		MASONARY QUANTITIES			
CLASS "B" CONCRETE					9.2 CU.YDS.
PIPE DEDUCTIONS					
1-30" RCP					-0.3 CU.YD.
2-36" DIP					-0.6 CU.YD.
TOTAL CLASS "B" CONCRETE					8.3 CU.YDS.

** 0.30 CU.YD. PER FOOT OF RISER HEIGHT.

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CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
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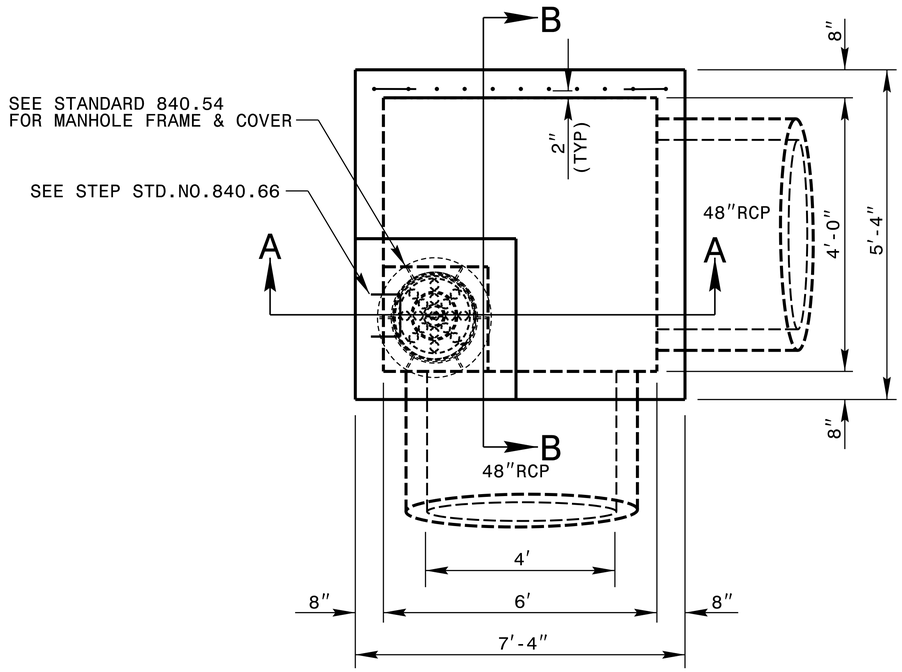
SPECIAL TRAFFIC BEARING JUNCTION BOX

ORIGINAL BY: rnbritt DATE: 07-26-11
MODIFIED BY: kakempf DATE: 06-28-17
CHECKED BY: DATE:
FILE SPEC.: kkempf/english/Extra Depth TBJB 36in Pipe.dgn

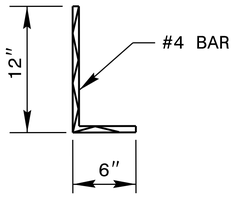
8/11/2017

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-31



PLAN VIEW



DOWEL

GENERAL NOTES:

USE CLASS "AA" CONCRETE THROUGHOUT.

PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

MANHOLE IS OPTIONAL, SEE ROADWAY PLANS.

INSTALL MANHOLE IN POSITION AS DIRECTED BY THE ENGINEER. CUT AND BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 2" MINIMUM CONCRETE COVERAGE.

CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OR BOX, ADD TO BASE AS SHOWN IN STD. NO. 840.00.

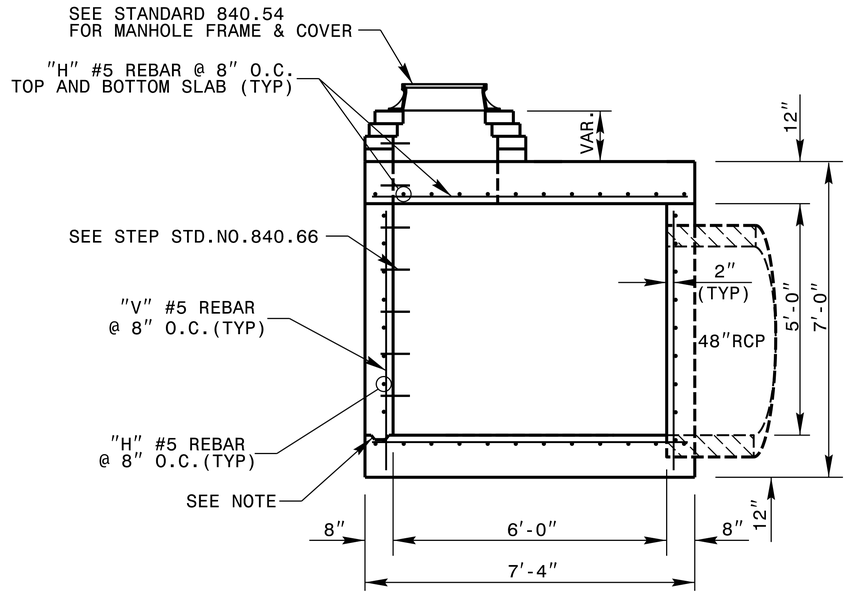
MAKE ALL ADJUSTMENTS AS DIRECTED BY THE ENGINEER

BILL OF MATERIALS

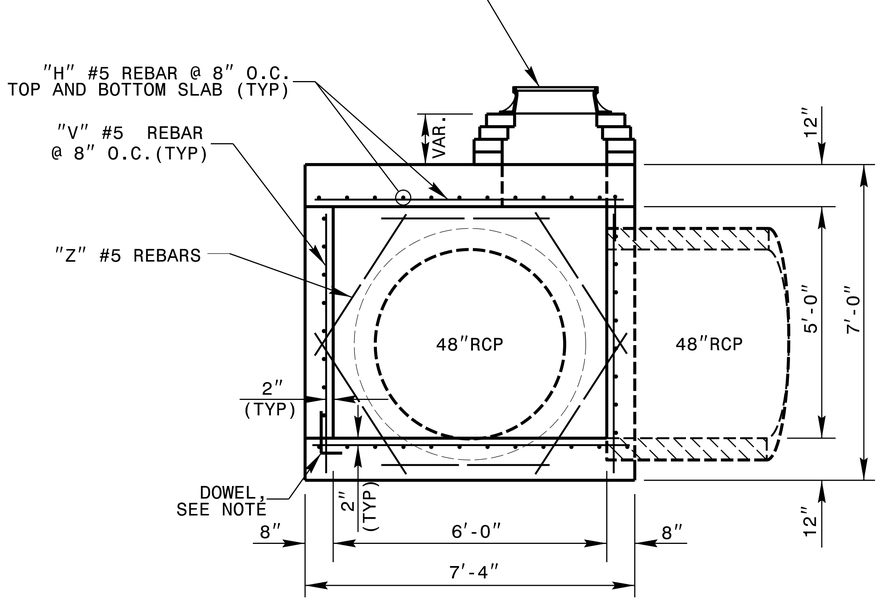
BAR	NO.	SIZE	LENGTH	WEIGHT
H	76	#5	7'-0"	555
V	44	#5	5'-6"	252
Z	12	#5	4'-0"	50
TOTAL REINF. STEEL (LBS.)				857
TOTAL CONC. (CU. YDS.)				7.3

* 0.30 CU. YD. PER FOOT OF RISER HEIGHT
* 0.50 CU. YD. DEDUCTION FOR 1-48" RC PIPE

* NO DEDUCTION HAS BEEN MADE FOR PIPE OR CULVERT



SECTION A-A



SECTION B-B

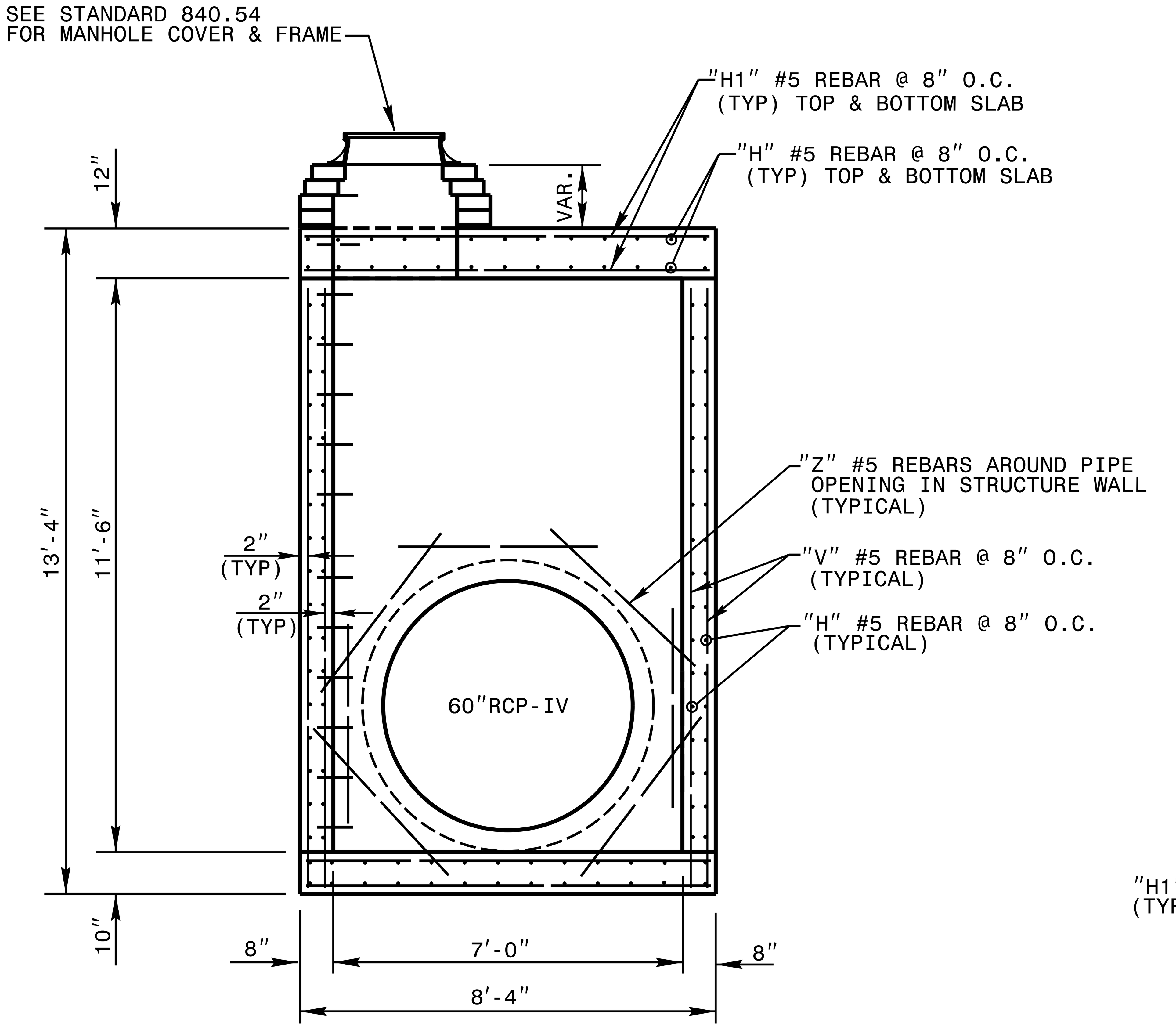
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRAFFIC BEARING JUNCTION BOX FOR 48"RCP

ORIGINAL BY:		DATE:	
MODIFIED BY:	kkempf	DATE:	07/12/2017
CHECKED BY:		DATE:	
FILE SPEC.:	detail/kkempf/english/u4751 tbjb 48rcp.dgn		

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2C-32



SECTION X-X

GENERAL NOTES:

USE CLASS "AA" CONCRETE THROUGHOUT.

PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

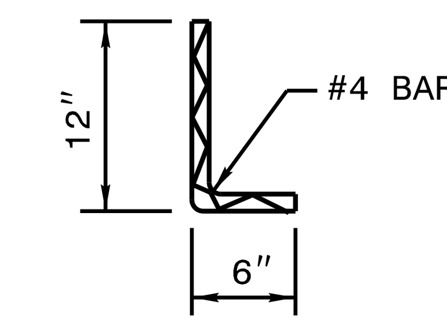
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

INSTALL MANHOLE IN POSITION AS DIRECTED BY THE ENGINEER. CUT AND BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 2" MINIMUM CONCRETE COVERAGE.

CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

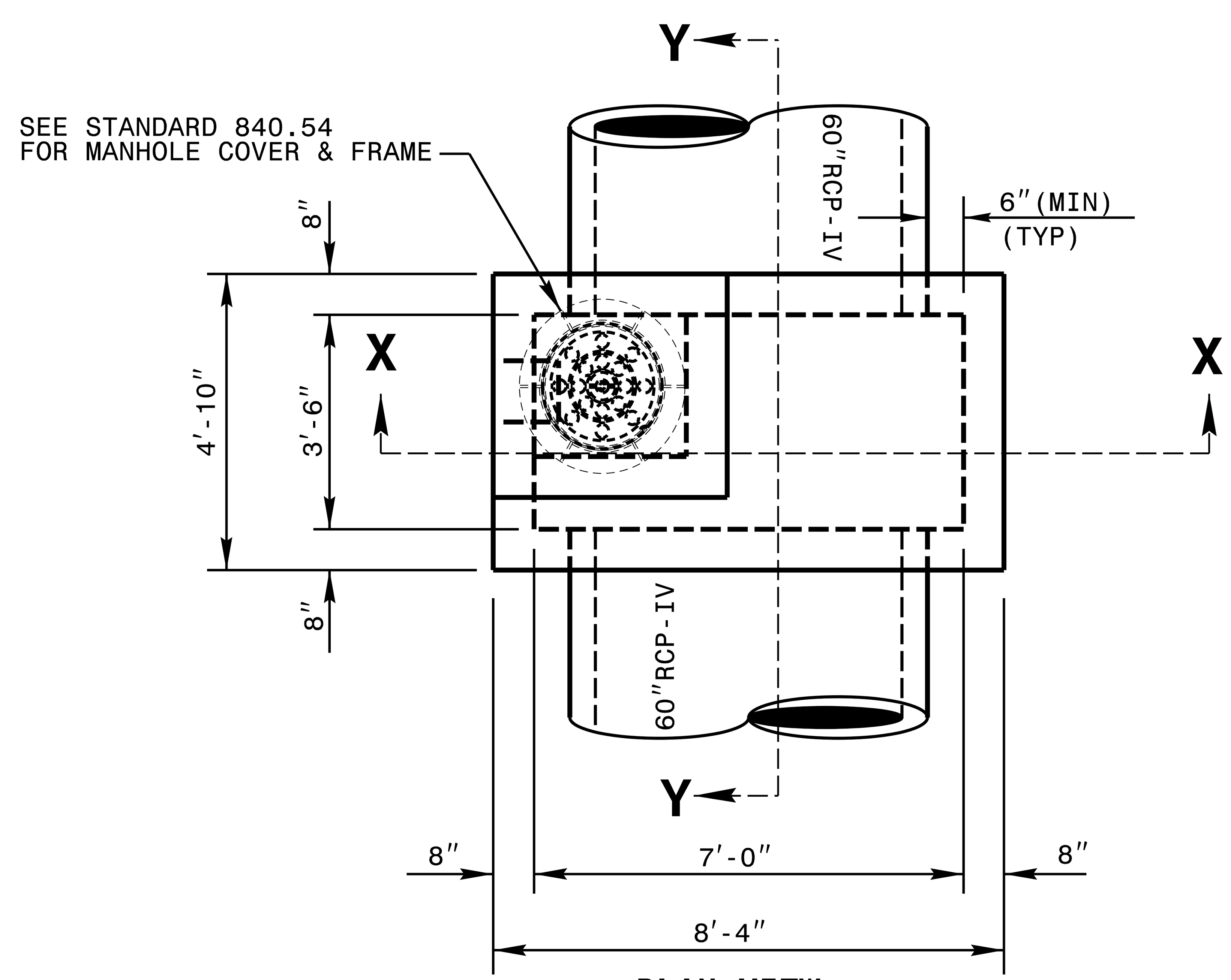


DOWEL

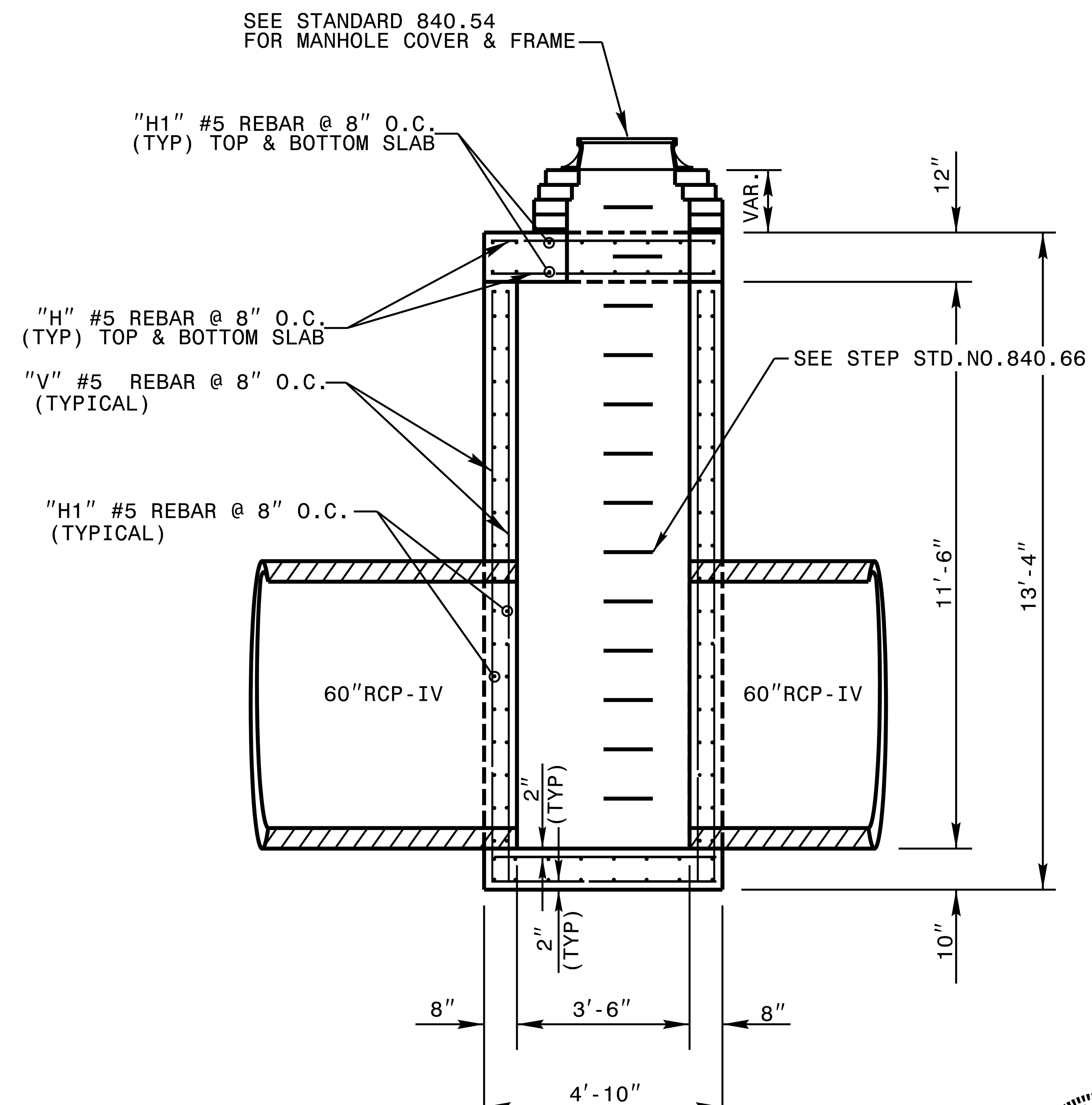
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	120	#5	4'-6"	563
H1	100	#5	8'-0"	834
V	76	#5	12'-0"	951
Z	28	#5	4'-0"	117
TOTAL REINF. STEEL (LBS.)				2465
TOTAL CONC. (CU. YDS.)				9.5

* 0.30 CU. YD. PER FOOT OF RISER HEIGHT
* 1.30 CU. YD. DEDUCTION FOR 2-60" RC PIPE
* NO DEDUCTION HAS BEEN MADE FOR PIPES



PLAN VIEW



SECTION Y-Y

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOE S. HOWERTON 8/11/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRAFFIC BEARING JUNCTION BOX FOR 60"RCP-IV

ORIGINAL BY: ______ DATE: ______
MODIFIED BY: kkempf DATE: 07/13/17
CHECKED BY: ______ DATE: ______
FILE SPEC.: detail/kkempf/english/U4751_60-tbjb-mh.dgn

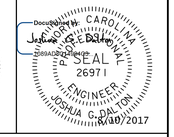
$$$$$$SYSTIME$$$$$$ $$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$ $$$$$$USERNAME$$$$$$

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

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2D-1
R/W SHEET NO.	

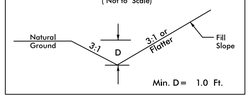
HYDRAULICS ENGINEER

HYDRAULICS ENGINEER



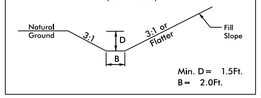
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



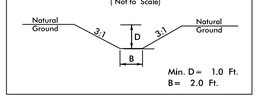
FROM STA. 17+70 TO STA. 19+60 –L– RT
FROM STA. 38+81 TO STA. 40+04 –L– LT
FROM STA. 36+98 TO STA. 38+07 –Y1– LT
FROM STA. 10+00 TO STA. 23+90 –Y1LPB– LT
FROM STA. 31+50 TO STA. 34+19 –Y1RPD– LT

DETAIL 2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



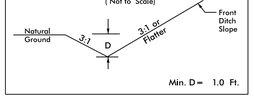
FROM STA. 11+76 TO STA. 16+88 –L– RT

DETAIL 3
STANDARD BASE DITCH
(Not to Scale)



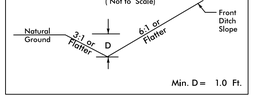
FROM STA. 10+00 TO STA. 19+10.00 –TD1–

DETAIL 4
SPECIAL CUT DITCH
(Not to Scale)



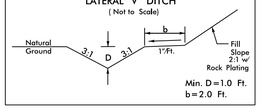
FROM STA. 11+30 TO STA. 15+50 –SR1– LT
FROM STA. 11+30 TO STA. 18+19 –SR1– RT
FROM STA. 17+50 TO STA. 18+50 –SR1– LT
FROM STA. 81+00 TO STA. 84+50 –Y1– LT

DETAIL 5
SPECIAL CUT DITCH
(Not to Scale)



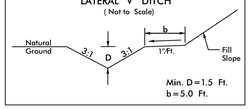
FROM STA. 12+18 TO STA. 14+50 –Y1RPA– LT
FROM STA. 14+50 TO STA. 20+39 –Y1RPA– RT
FROM STA. 14+50 TO STA. 21+89 –Y1RPA– LT
FROM STA. 28+50 TO STA. 32+12 –Y1RPB– RT
FROM STA. 16+00 TO STA. 31+50 –Y1RPD– LT

DETAIL 6
LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 97+85 TO STA. 102+00 –L– LT

DETAIL 7
LATERAL 'V' DITCH
(Not to Scale)

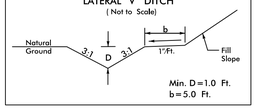


FROM STA. 97+00 TO STA. 98+05 –L– RT
FROM STA. 100+30 TO STA. 101+50 –L– RT
FROM STA. 199+45 TO STA. 205+75 –L– LT

DETAIL 8
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

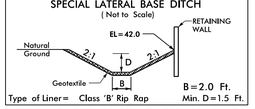
FROM STA. 93+15 TO STA. 97+80 –L– LT

DETAIL 9
LATERAL 'V' DITCH
(Not to Scale)



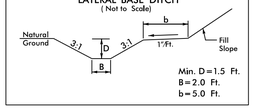
FROM STA. 98+10 TO STA. 99+25 –L– RT
FROM STA. 13+25 TO STA. 14+20 –Y4– RT

DETAIL 10
SPECIAL LATERAL BASE DITCH
(Not to Scale)



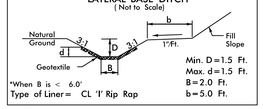
FROM STA. 128+50 TO STA. 135+50 –L– LT

DETAIL 11
LATERAL BASE DITCH
(Not to Scale)



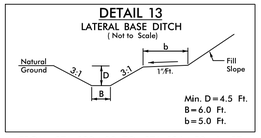
FROM STA. 108+91 TO STA. 110+35 –L– LT
FROM STA. 117+50 TO STA. 119+50 –L– RT
FROM STA. 126+40 TO STA. 127+60 –L– LT

DETAIL 12
LATERAL BASE DITCH
(Not to Scale)



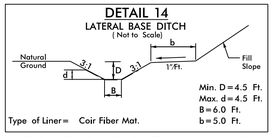
FROM STA. 117+15 TO STA. 117+50 –L– RT

DETAIL 13
LATERAL BASE DITCH
(Not to Scale)



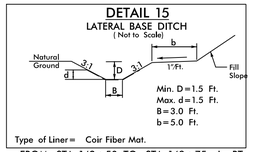
FROM STA. 129+00 TO STA. 136+50 –L– RT

DETAIL 14
LATERAL BASE DITCH
(Not to Scale)



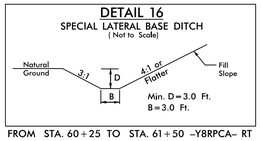
FROM STA. 136+50 TO STA. 138+00 –L– RT

DETAIL 15
LATERAL BASE DITCH
(Not to Scale)



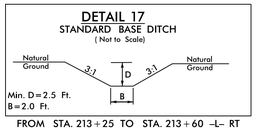
FROM STA. 142+50 TO STA. 143+75 –L– RT
FROM STA. 149+25 TO STA. 150+25 –L– RT

DETAIL 16
SPECIAL LATERAL BASE DITCH
(Not to Scale)



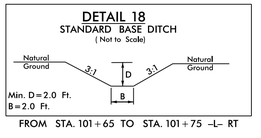
FROM STA. 60+25 TO STA. 61+50 –Y8RPCA– RT

DETAIL 17
STANDARD BASE DITCH
(Not to Scale)



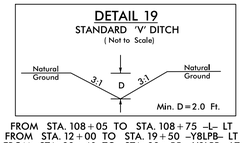
FROM STA. 213+25 TO STA. 213+60 –L– RT

DETAIL 18
STANDARD BASE DITCH
(Not to Scale)



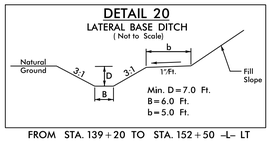
FROM STA. 101+65 TO STA. 101+75 –L– RT

DETAIL 19
STANDARD 'V' DITCH
(Not to Scale)



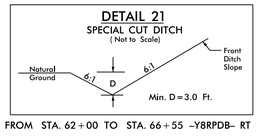
FROM STA. 108+05 TO STA. 108+75 –L– LT
FROM STA. 12+00 TO STA. 19+50 –Y8LPB– LT
FROM STA. 22+40 TO STA. 22+55 –Y8LPB– LT

DETAIL 20
LATERAL BASE DITCH
(Not to Scale)



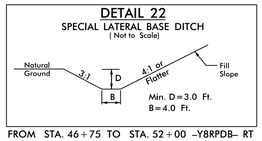
FROM STA. 139+20 TO STA. 152+50 –L– LT

DETAIL 21
SPECIAL CUT DITCH
(Not to Scale)



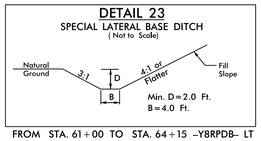
FROM STA. 62+00 TO STA. 66+55 –Y8RPDB– RT

DETAIL 22
SPECIAL LATERAL BASE DITCH
(Not to Scale)



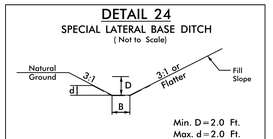
FROM STA. 46+75 TO STA. 52+00 –Y8RPDB– RT

DETAIL 23
SPECIAL LATERAL BASE DITCH
(Not to Scale)



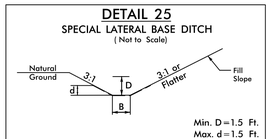
FROM STA. 61+00 TO STA. 64+15 –Y8RPDB– LT

DETAIL 24
SPECIAL LATERAL BASE DITCH
(Not to Scale)



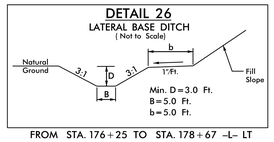
FROM STA. 23+00 TO STA. 27+00 –SR4– RT

DETAIL 25
SPECIAL LATERAL BASE DITCH
(Not to Scale)



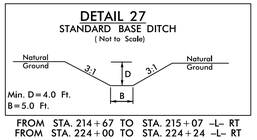
FROM STA. 27+00 TO STA. 30+00 –SR4– RT

DETAIL 26
LATERAL BASE DITCH
(Not to Scale)



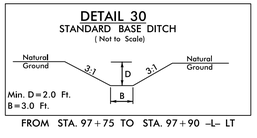
FROM STA. 176+25 TO STA. 178+67 –L– LT

DETAIL 27
STANDARD BASE DITCH
(Not to Scale)



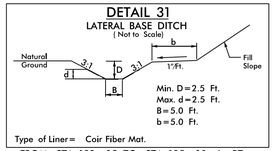
FROM STA. 214+67 TO STA. 215+07 –L– RT
FROM STA. 224+00 TO STA. 224+24 –L– RT

DETAIL 30
STANDARD BASE DITCH
(Not to Scale)



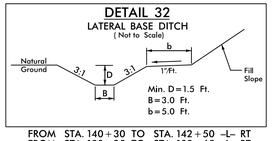
FROM STA. 97+75 TO STA. 97+90 –L– LT

DETAIL 31
LATERAL BASE DITCH
(Not to Scale)



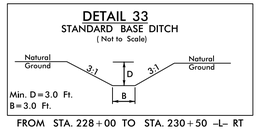
FROM STA. 182+05 TO STA. 185+00 –L– RT

DETAIL 32
LATERAL BASE DITCH
(Not to Scale)



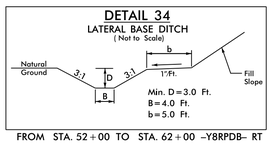
FROM STA. 140+30 TO STA. 142+50 –L– RT
FROM STA. 198+25 TO STA. 198+65 –L– RT

DETAIL 33
STANDARD BASE DITCH
(Not to Scale)



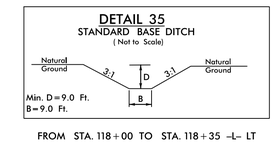
FROM STA. 228+00 TO STA. 230+50 –L– RT

DETAIL 34
LATERAL BASE DITCH
(Not to Scale)



FROM STA. 52+00 TO STA. 62+00 –Y8RPDB– RT

DETAIL 35
STANDARD BASE DITCH
(Not to Scale)



FROM STA. 118+00 TO STA. 118+35 –L– LT

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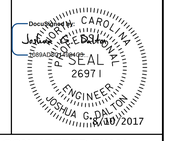
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2D-2
R/W SHEET NO.	

HYDRAULICS ENGINEER

HYDRAULICS ENGINEER

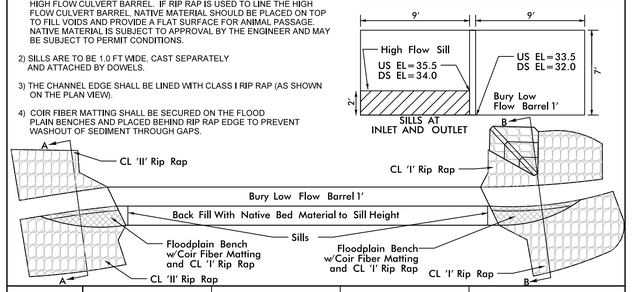


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 36

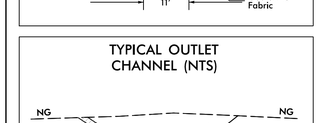
MULTI-BARREL CULVERT, LOW FLOW CHANNEL, HIGH FLOW SILLS, AND FLOOD PLAIN BENCH

*NOTES:
1) NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.
2) SILLS ARE TO BE 1.0 FT WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.
3) THE CHANNEL EDGE SHALL BE LINED WITH CLASS I RIP RAP (AS SHOWN ON THE PLAN VIEW).
4) COIR FIBER MATTING SHALL BE SECURED ON THE FLOOD PLAIN BENCHES AND PLACED BEHIND RIP RAP EDGE TO PREVENT WASHOUT OF SEDIMENT THROUGH GAPS.



QUANTITIES:	COIR FIBER MAT. = 60 SQ YD	GEOTEXTILE = 460 SQ YD	CL 'I' RIP RAP = 187 TONS	CL 'II' RIP RAP = 204 TONS

SECTION A–A



SECTION B–B

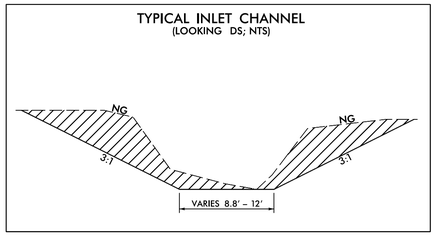
CL STA. = 117 + 49 –L–

DETAIL 39

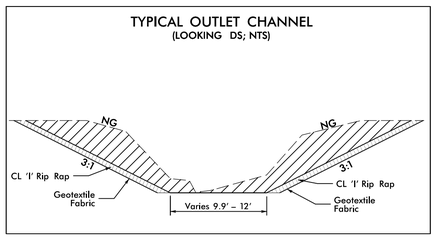
SINGLE BARREL RCBC TYPICAL INLET AND OUTLET CHANNELS

*CULVERT TO BE BACKFILLED WITH NATIVE MATERIAL TO A DEPTH OF 1.0'. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

TYPICAL INLET CHANNEL (LOOKING DS; NTS)



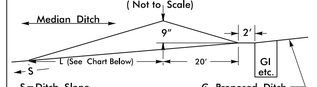
TYPICAL OUTLET CHANNEL (LOOKING DS; NTS)



CL STA. = 42 + 78 –Y8RPDB–

DETAIL 60

FALSE SUMP (Not to Scale)



S = Ditch Slope ℄ Proposed Ditch

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 187 + 35 –L–
STA. 195 + 16 –L–
STA. 198 + 16 –L–
STA. 200 + 35 –L–
STA. 203 + 85 –L–
STA. 209 + 66 –L–
STA. 212 + 16 –L–
STA. 214 + 85 –L–
STA. 217 + 85 –L–
STA. 220 + 44 –L–
STA. 222 + 82 –L–

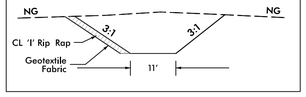
DETAIL 37

SINGLE BARREL RCBC TYPICAL INLET AND OUTLET CHANNELS

*CULVERT TO BE BACKFILLED WITH NATIVE MATERIAL TO A DEPTH OF 1.0'. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

TYPICAL INLET CHANNEL (NTS)

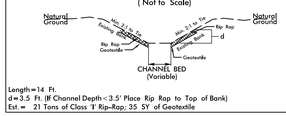
TYPICAL OUTLET CHANNEL (NTS)



CL STA. = 138 + 59 –L–

DETAIL 40

42" PIPE OUTLET CHANNEL (Not to Scale)

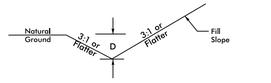


Length = 14 Ft.
d = 3.5 Ft. (If Channel Depth < 3.5' Place Rip Rap to Top of Bank)
Est. = 21 Tons of Class 'I' Rip-Rap; 35 SY of Geotextile

STA. 110 + 45 –L– RT
STA. 211 + 05 –L– RT
STA. 33 + 85 –Y8RPDB– LT

DETAIL 41

SPECIAL LATERAL 'V' DITCH (Not to Scale)

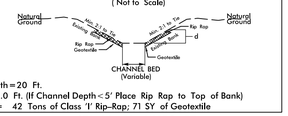


Min. D = 1.0 Ft.

FROM STA. 18 + 25 TO STA. 23 + 50 –Y1RPB– LT

DETAIL 42

60" PIPE OUTLET CHANNEL (Not to Scale)

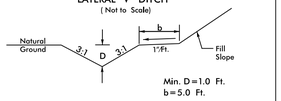


Length = 20 Ft.
d = 5.0 Ft. (If Channel Depth < 5' Place Rip Rap to Top of Bank)
Est. = 42 Tons of Class 'I' Rip-Rap; 71 SY of Geotextile

STA. 26 + 50 –Y8RPC– RT

DETAIL 43

LATERAL 'V' DITCH (Not to Scale)



Min. D = 1.0 Ft.
b = 5.0 Ft.

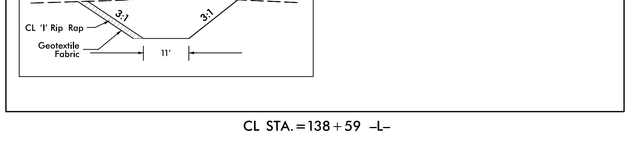
FROM STA. 24 + 00 TO STA. 28 + 50 –Y1RPB– RT

DETAIL 38

(NOT TO SCALE)

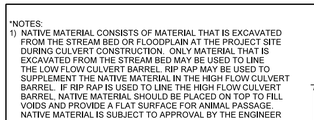
MULTI-BARREL CULVERT, LOW FLOW CHANNEL, HIGH FLOW SILLS, AND FLOOD PLAIN BENCH

*NOTES:
1) NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.
2) SILLS ARE TO BE 1.0' WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.
3) THE CHANNEL EDGE SHALL BE LINED WITH CLASS I RIP RAP (AS SHOWN ON THE PLAN VIEW).
4) COIR FIBER MATTING SHALL BE SECURED ON THE FLOOD PLAIN BENCHES AND PLACED BEHIND RIP RAP EDGE TO PREVENT WASHOUT OF SEDIMENT THROUGH GAPS.

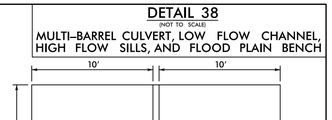


QUANTITIES:	EST CL 'I' RIP RAP: 10 TONS	EST COIR FIBER MATTING: 50 SY

SECTION A–A



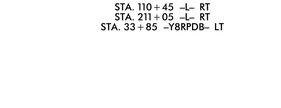
SECTION B–B



CL STA. = 151 + 41 –L–

DETAIL 44

LATERAL BASE DITCH (Not to Scale)



Min. D = 1.0 Ft.
B = 4.0 Ft.
b = 5.0 Ft.

FROM STA. 19 + 92 TO STA. 24 + 00 –Y1RPB– RT

DETAIL 45

SPECIAL CUT DITCH (Not to Scale)

Min. D = 1.0 Ft.

FROM STA. 21 + 50 TO STA. 22 + 00 –Y1RPD– RT

DETAIL 48

LATERAL 'V' DITCH (Not to Scale)

Min. D = 1.0 Ft.
b = 5.0 Ft.

FROM STA. 31 + 88 TO STA. 35 + 50 –L– LT

DETAIL 49

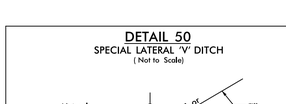
STANDARD 'V' DITCH (Not to Scale)

Type of Liner = Class 'B' Rip Rap
Min. D = 1 Ft.
Max. d = 1 Ft.

FROM STA. 45 + 75 –L– RT TO STA. 15 + 92 –Y1RPA– RT

DETAIL 50

SPECIAL LATERAL 'V' DITCH (Not to Scale)



Min. D = 2.5 Ft.

FROM STA. 11 + 43 TO STA. 14 + 25 –L– LT
FROM STA. 15 + 39 TO STA. 16 + 00 –L– LT

DETAIL 51

LATERAL BASE DITCH (Not to Scale)

*When B is < 6.0'
Type of Liner = Class 'B' Rip Rap
Min. D = 3.0 Ft.
Max. d = 3.0 Ft.
B = 5.0 Ft.
b = 5.0 Ft.

FROM STA. 175 + 29 TO STA. 176 + 25 –L– LT

DETAIL 52

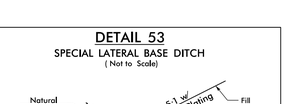
LATERAL BASE DITCH (Not to Scale)

*When B is < 6.0'
Type of Liner = Class 'I' Rip Rap
Min. D = 3.0 Ft.
Max. d = 3.0 Ft.
B = 5.0 Ft.
b = 5.0 Ft.

FROM STA. 178 + 45 TO STA. 178 + 67 –L– LT

DETAIL 53

SPECIAL LATERAL BASE DITCH (Not to Scale)

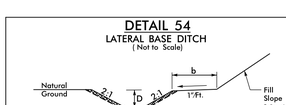


Type of Liner = Class 'B' Rip Rap
Min. D = 1.0 Ft.
B = 2.0 Ft.

FROM STA. 103 + 00 TO STA. 106 + 80 –L– LT

DETAIL 54

LATERAL BASE DITCH (Not to Scale)

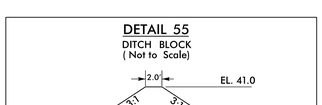


*When B is < 6.0'
Type of Liner = Class 'B' Rip Rap
Min. D = 1.5 Ft.
B = 2.0 Ft.
b = 5.0 Ft.

FROM STA. 104 + 25 TO STA. 110 + 35 –L– RT

DETAIL 55

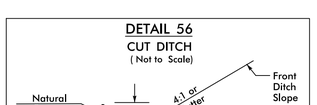
DITCH BLOCK (Not to Scale)



STA. 56 + 60 –Y8RPDB– RT
STA. 60 + 18 –Y8RPDB– RT
STA. 63 + 64 –Y8RPDB– RT

DETAIL 56

CUT DITCH (Not to Scale)



Min. D = 1.0 Ft.

FROM STA. 32 + 50 TO STA. 34 + 50 –SR4– LT

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Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2D-3
R/W SHEET NO.	

HYDRAULICS ENGINEER

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DETAIL 57

WET DETENTION BASIN OUTLET STRUCTURE

NOT TO SCALE

SEE PLAN SHEET 6

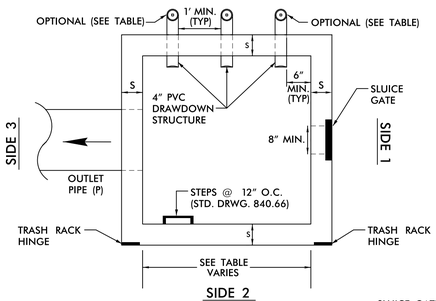
NOTES:
1. TOP ELEVATION OF CONTROL STRUCTURE (WEIR ELEVATION) SHOULD BE SET AT THE WQv ELEVATION.
2. SET DRAWDOWN DEVICE INLET PIPE INVERT (MIDDLE PRONG OF 4" PVC TEE) AT THE PERMANENT POOL ELEVATION
3. 15" MINIMUM DIAMETER FOR OUTLET PIPE.
4. 2" MINIMUM DIAMETER ORIFICE.
5. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
6. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION. A GATE VALVE MAY BE USED IN LIEU OF THE 8" SLUICE GATE.
7. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
8. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND ORIFICE TRASH RACK WIDTH.
9. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
10. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTATION.
11. TRASH RACK IS INCIDENTAL TO THE MASONRY DRAINAGE STRUCTURE.

MINIMUM DIMENSIONS FOR WET DETENTION BASIN OUTLET STRUCTURE

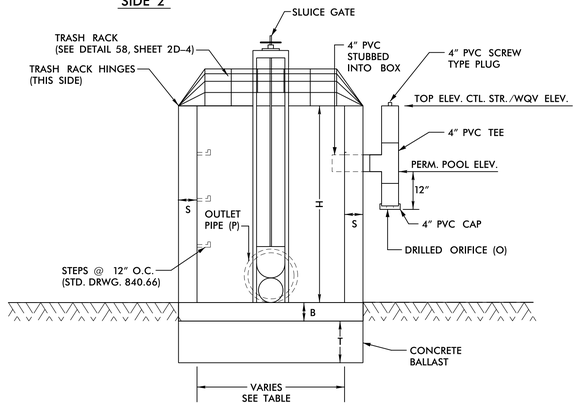
STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	PERM. POOL ELEVATION (FEET)	TOP ELEV. CTL. STR./ WQV ELEV. (FEET)	INV. ELEV. CTL. STR. (FEET)	CTL. STR. DIMENSIONS (W x L x H) (FEET)	CONCRETE BALLAST THICKNESS (T) (INCHES)	ORIFICE DIAMETER (O) (INCHES)	ORIFICE INV. ELEV. (FEET)	NUMBER OF DRAWDOWN DEVICES	OUTLET PIPE DIAMETER(P) (INCHES)
–L– 37+16 RT	0697	6	6	39.20	40.70	**35.00**	4 x 4 x 5.7	12	3	**39.20**	3	30

PLAN VIEW

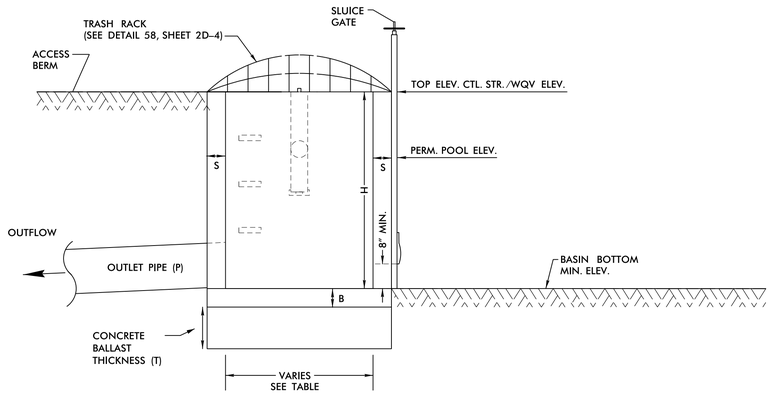
TRASH RACK NOT SHOWN FOR CLARITY



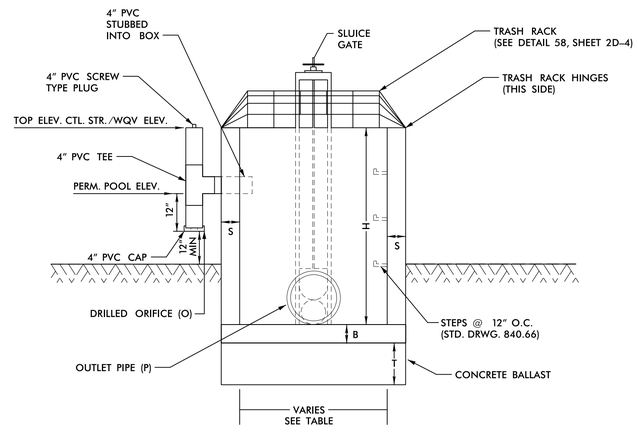
SIDE 2



SIDE 1



SIDE 2



SIDE 3

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Charlotte, NC 28202
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029388 ENGINEER EDWARD J. VANCE 8/4/2017

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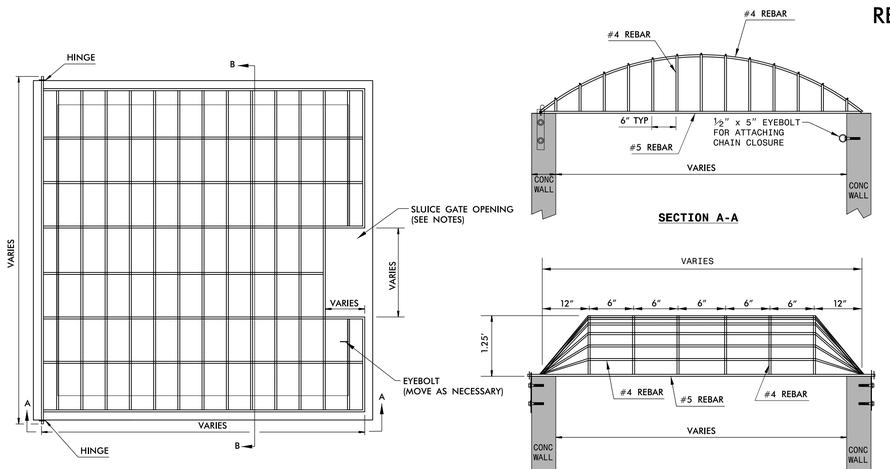
DETAIL 58

REMOVABLE ORIFICE TRASH RACK

NOT TO SCALE

SEE PLAN SHEET 6 & 2D-3 FOR DETAIL



PLAN

SECTION A-A

SECTION B-B

REBAR TRASH RACK
NOT TO SCALE

RISER TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A-153.
5. PROVIDE OPENING IN TRASH RACK TO ACCOMODATE SLUICE GATE ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
6. TRASH RACK IS INCIDENTAL TO THE MASONRY DRAINAGE STRUCTURE.

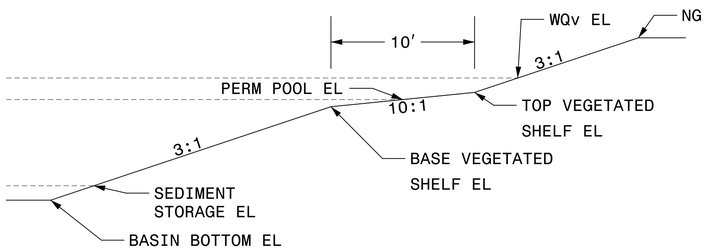
DETAIL 59

WET DETENTION BASIN

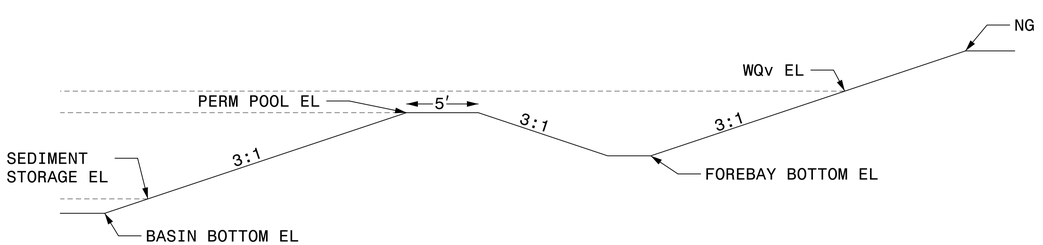
NOT TO SCALE

SEE PLAN SHEET 6

TYPICAL BASIN X-SEC



TYPICAL BASIN X-SEC W/ FOREBAY



WET DETENTION BASIN QUANTITES												
STATION	BASIN BOTTOM EL	SEDIMENT STORAGE EL	PERMANENT POOL EL	WQv EL	BASE VEGETATED SHELF EL	TOP VEGETATED SHELF EL	FOREBAY BOTTOM EL	BASIN BOTTOM DIMENSIONS (LXW)	FOREBAY BOTTOM DIMENSIONS (LXW)	WQ VOLUME (CF)	PERM POOL VOLUME (CF)	PERM POOL SURFACE AREA (SF)
-Y1- 45+42 RT	35.00	36.00	39.20	40.70	38.70	39.70	35.00	138.0 X 86.0	63.0 X 5.0	35,114	59,246	21,048
-Y1- 48+20 RT	35.00	36.00	39.20	40.70	38.70	39.70	N/A	256.0 X 57.0	N/A	42,359	79,453	25,291

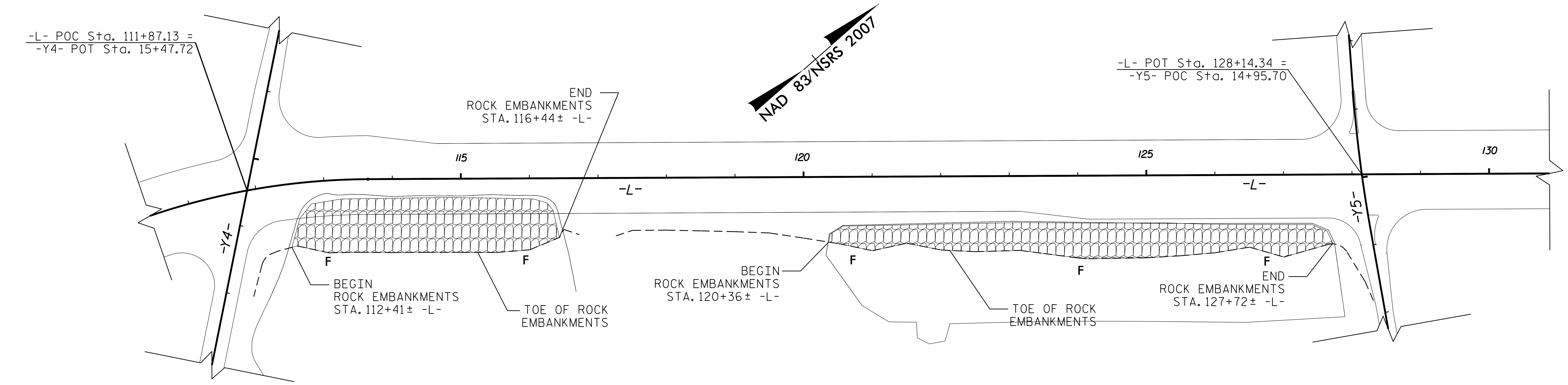
NOTE: ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.

8/8/2017
R:\Design\Proj\SHT\U4751_RDY_psh02D-04.dgn
stephens

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2G-1

GEOTECHNICAL ENGINEER — SEAL 032171, NORTH CAROLINA PROFESSIONAL ENGINEER, JINYOUNG PARK — DocuSigned by: 3/10/2017

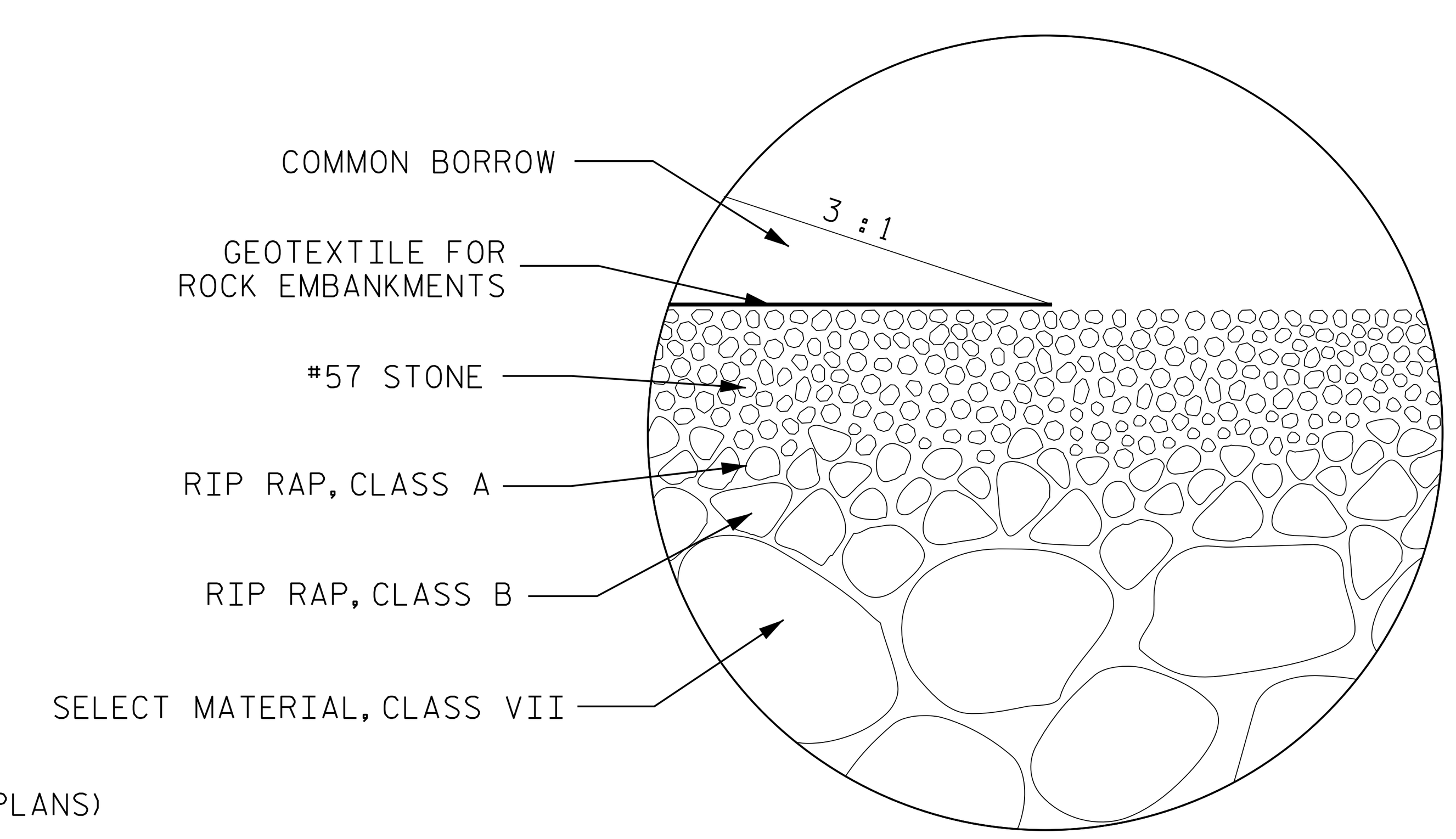
ENGINEER



PLAN VIEW FOR LIMITS OF ROCK EMBANKMENTS

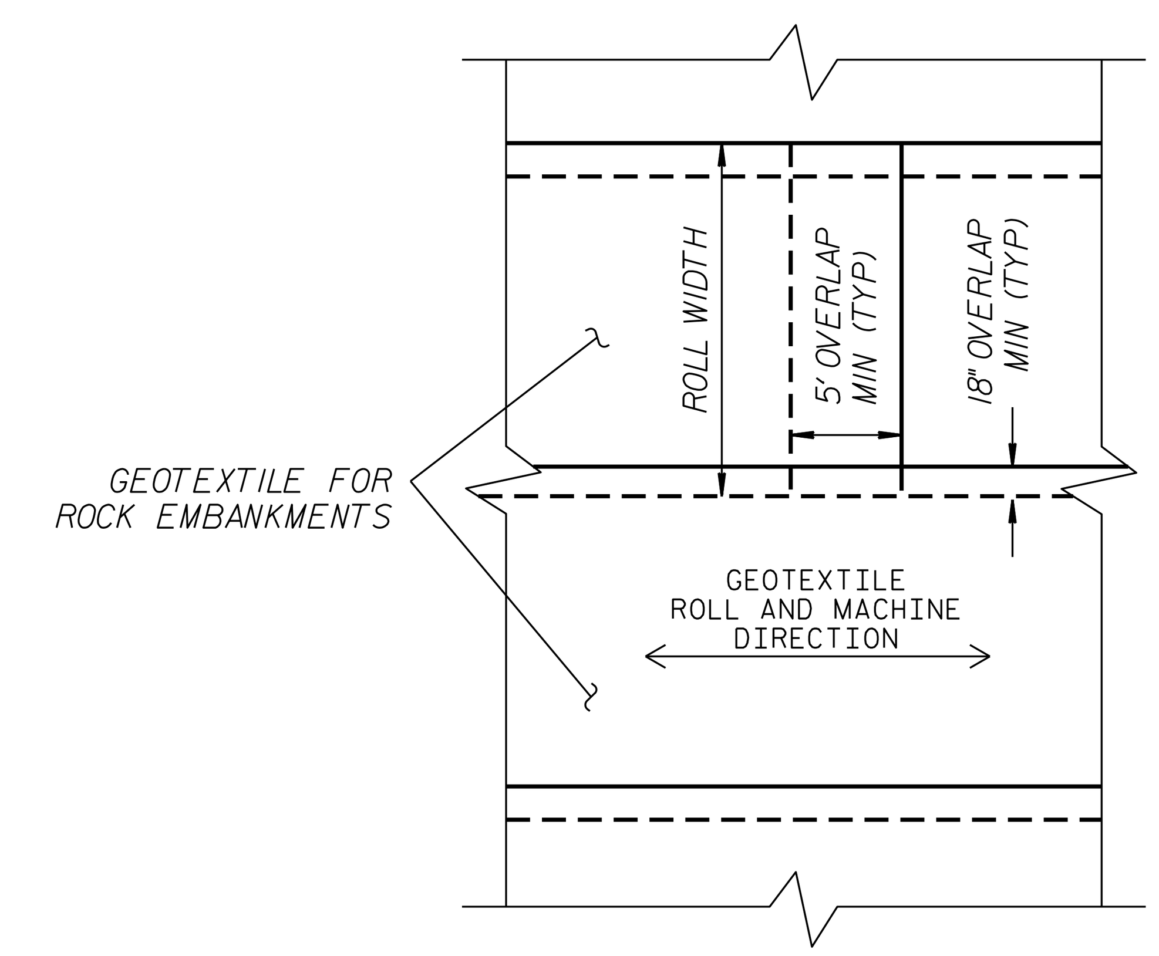
N.T.S.

ESTIMATED QUANTITIES	
ROCK EMBANKMENTS (SELECT MATERIAL, CLASS VII)	11,750 TONS
RIP RAP, CLASS A	550 TONS
RIP RAP, CLASS B	550 TONS
#57 STONE	570 TONS
GEOTEXTILE FOR ROCK EMBANKMENTS	1,930 SY



DETAIL A

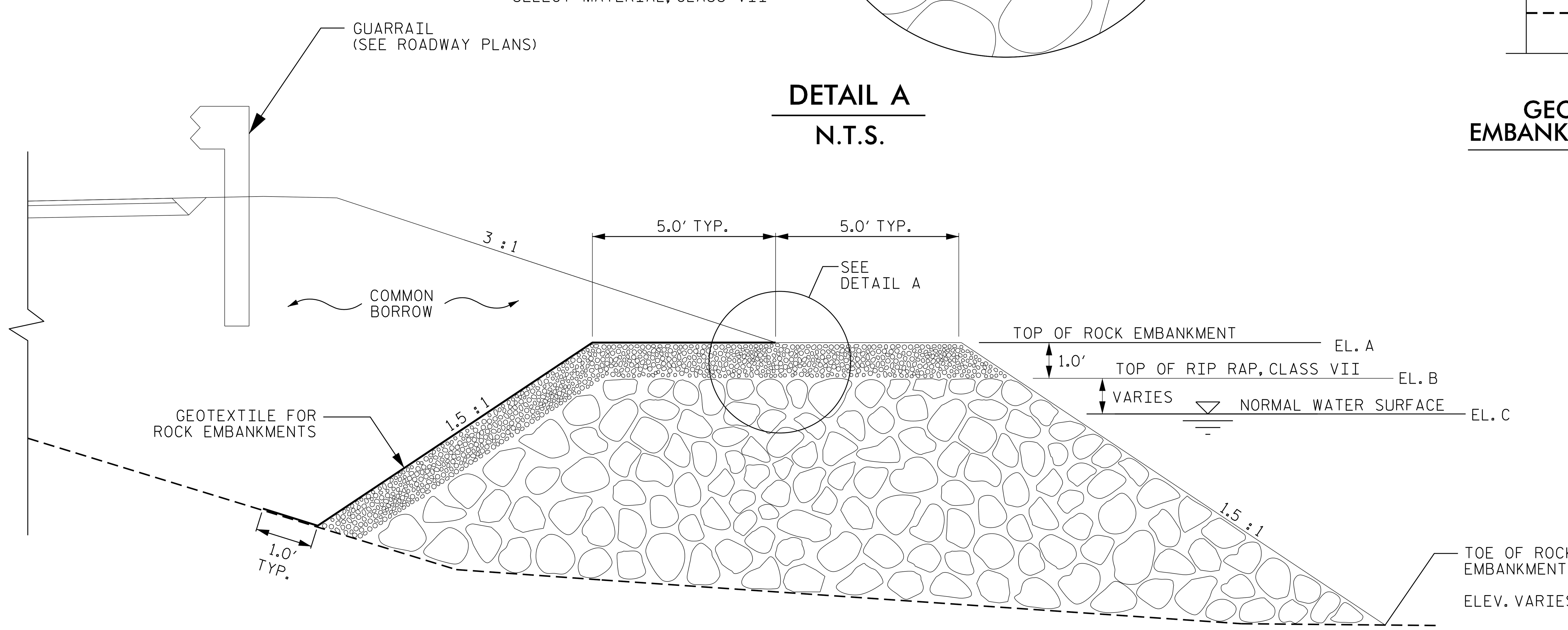
N.T.S.



GEOTEXTILE FOR ROCK EMBANKMENTS OVERLAP DETAIL

(PLAN VIEW)

ROCK EMBANKMENT ELEVATIONS			
LOCATIONS	EL. A	EL. B	EL. C
FROM 112+41± -L- TO 116+44± -L-	41.3 FT.	40.3 FT.	36.4 FT.
FROM 120+36± -L- TO 127+72± -L-	40.8 FT.	39.8 FT.	36.3 FT.



ROCK EMBANKMENTS – TYPICAL SECTION A-A

N.T.S.

NOTES

FOR ROCK EMBANKMENTS, SEE ROCK EMBANKMENT SPECIAL PROVISION.

THE ESTIMATED QUANTITIES OF ROCK EMBANKMENTS (RIP RAP, CLASS VII) INCLUDES AN ADDITIONAL TONNAGE FOR SETTLEMENTS.

THE ESTIMATED QUANTITIES OF RIPRAP, CLASS A, RIP RAP, CLASS B AND #57 STONE INCLUDE ADDITIONAL TONNAGES FOR FILLING GAPS BETWEEN MATERIALS UNDERNEATH.

PREPARED BY: J. PARK	DATE: 03 / 2017
REVIEWED BY: J. BATTS	DATE: 03 / 2017

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

ROCK EMBANKMENT DETAILS

REVISIONS

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

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2G-2

GEOTECHNICAL ENGINEER

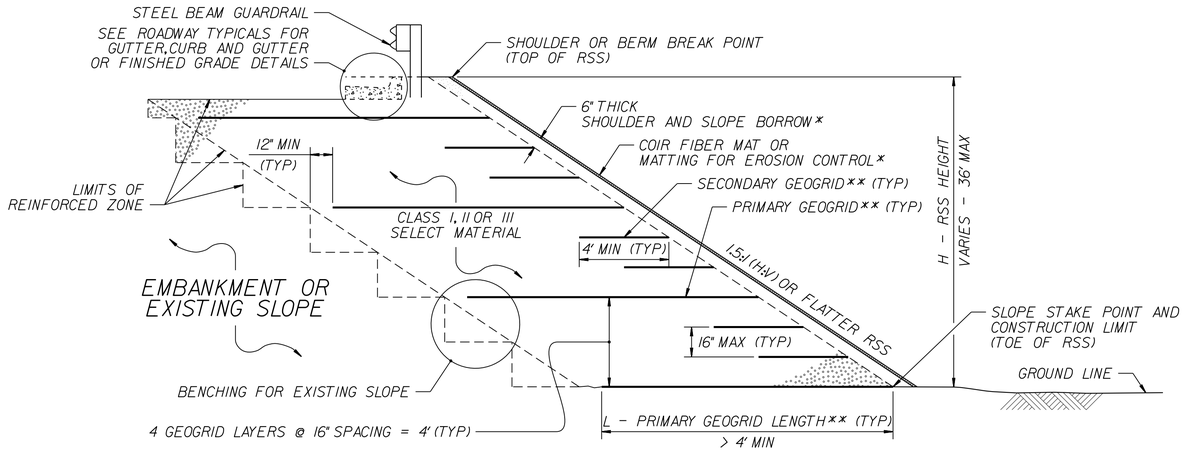
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden F760CAE89BFC4D9... 6/7/2017 SIGNATURE DATE

ENGINEER

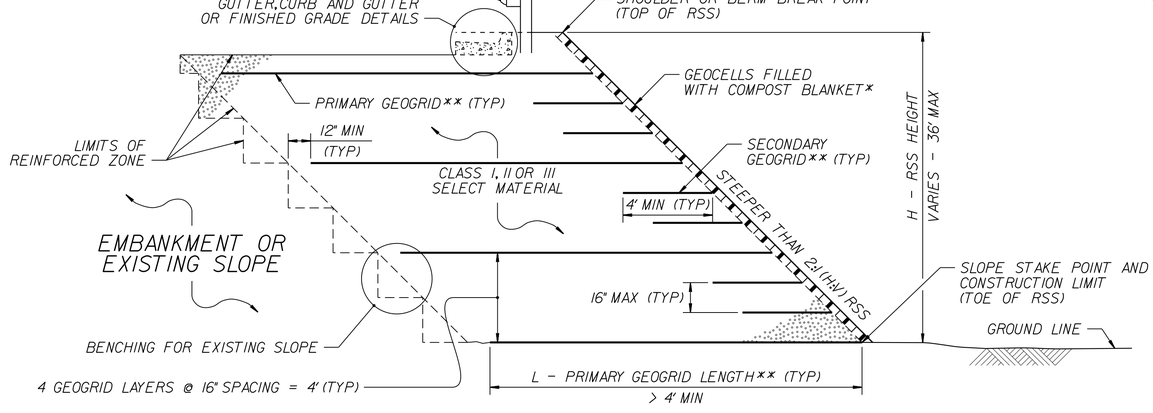
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



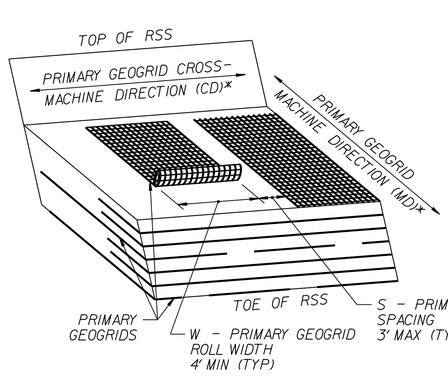
MATTING WITH SHOULDER AND SLOPE BORROW

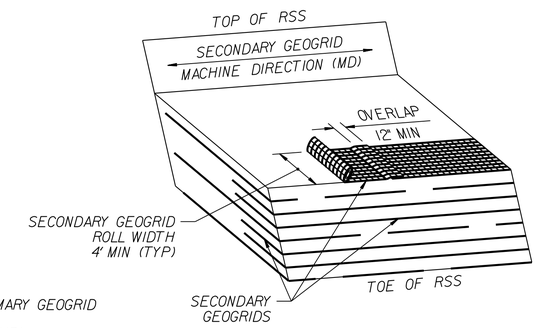
*SEE NOTES 3 AND 11 ON SHEET 2.



GEOCELLS WITH COMPOST BLANKET

*SEE NOTES 3 AND 11 ON SHEET 2.





GEOGRID PLACEMENT DETAILS

(% COVERAGE = $\frac{W}{W+S}$ x 100 $\geq$ 75%)

*SEE NOTES 8 AND 9 ON SHEET 2.

STANDARD REINFORCED SOIL SLOPE (RSS)

**SEE TABLES ON SHEET 2 AND GEOGRID PLACEMENT DETAILS.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1803.01

STANDARD REINFORCED SOIL SLOPE (RSS) WITH HIGH GROUNDWATER SHEET 1 OF 2

DATE: 4-19-16

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 6/7/2017
SIGNATURE DATE

ENGINEER
SIGNATURE DATE

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GEOGRID TYPE,DIRECTION	H (FT)	0 - < 12		12 - 24		> 24 - 36	
	SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
PRIMARY GEOGRID,MD (SUBSTITUTE SECONDARY GEOGRID FOR PRIMARY GEOGRID FOR 2:1 (H:V) OR FLATTER RSS)	1:1 TO < 1.5:1 (H:V) RSS	900	500	1200	900	1800	1200
	1.5:1 TO 1.75:1 (H:V) RSS	500	500	900	500	1400	1000
	> 1.75:1 TO < 2:1 (H:V) RSS	500	500	600	500	1000	800
SECONDARY GEOGRID,CD	1:1 (H:V) OR FLATTER RSS	185					

LTDS – MINIMUM REQUIRED LONG-TERM DESIGN STRENGTH (LB/FT)

(LTDS IS BASED ON 100% COVERAGE FOR PRIMARY GEOGRID. SEE NOTE 9 FOR LESS THAN 100% COVERAGE.)

NOTES:

1. SEE EROSION CONTROL AND ROADWAY PLANS AND SUMMARY SHEETS FOR REINFORCED SOIL SLOPE (RSS) AND SLOPE EROSION CONTROL LOCATIONS.
2. FOR STANDARD REINFORCED SOIL SLOPES, SEE REINFORCED SOIL SLOPES PROVISION. FOR STEEL BEAM GUARDRAIL, SEE SECTION 862 OF THE STANDARD SPECIFICATIONS.
3. FOR SHOULDER AND SLOPE BORROW, SEE ARTICLE 1019-2 OF THE STANDARD SPECIFICATIONS. FOR GEOCELLS, SEE CELLULAR CONFINEMENT SYSTEMS PROVISION. FOR COIR FIBER MAT, MATTING FOR EROSION CONTROL AND COMPOST BLANKET, SEE EROSION CONTROL PROVISIONS, SECTION 1631 OF THE STANDARD SPECIFICATIONS AND ROADWAY STANDARD DRAWING NO.1633.01.
4. STANDARD RSS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 LB/CF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 LB/SF
5. DO NOT USE STANDARD RSS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE TOE OF RSS.
6. DO NOT USE STANDARD RSS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW RSS.
7. GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR LONG-TERM DESIGN STRENGTHS FOR A 75-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM:
   connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx
   DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SELECT MATERIAL AS FOLLOWS:

MATERIAL TYPE	SELECT MATERIAL
BORROW	CLASS I SELECT MATERIAL
FINE AGGREGATE	CLASS II OR III SELECT MATERIAL

   IF THE WEBSITE DOES NOT LIST A LONG-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID IN THE MD, DO NOT USE THE GEOGRID FOR PRIMARY GEOGRID. IF THE WEBSITE DOES NOT LIST A LONG-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID IN THE CD, USE A LONG-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 7 FOR THE SECONDARY GEOGRID.

8. DO NOT OVERLAP PRIMARY GEOGRIDS IN THE MD SO OVERLAPS ARE PARALLEL TO THE TOE OF RSS. POLYOLEFIN (e.g., HDPE OR PP) GEOGRIDS MAY BE SPLICED ONCE PER PRIMARY GEOGRID LENGTH IN ACCORDANCE WITH THE GEOGRID MANUFACTURER'S INSTRUCTIONS. USE POLYOLEFIN GEOGRID PIECES AT LEAST 4' LONG. DO NOT SPLICE POLYESTER TYPE (PET) GEOGRIDS.
9. FOR PRIMARY GEOGRIDS WITH 100% COVERAGE, PLACE PRIMARY GEOGRIDS SO GEOGRIDS ARE ADJACENT TO EACH OTHER IN THE CD. FOR PRIMARY GEOGRIDS WITH 75% TO LESS THAN 100% COVERAGE,

   MINIMUM REQUIRED LONG-TERM DESIGN STRENGTH = LTDS BASED ON 100% COVERAGE x (W + S) / W

   SEE TABLE FOR LTDS BASED ON 100% COVERAGE AND GEOGRID PLACEMENT DETAILS FOR PRIMARY GEOGRID ROLL WIDTH (W) AND SPACING (S). FOR PRIMARY GEOGRIDS WITH LESS THAN 100% COVERAGE, STAGGER PRIMARY GEOGRIDS SO GEOGRIDS ARE CENTERED OVER GAPS IN THE PRIMARY GEOGRID LAYER BELOW. DO NOT USE LESS THAN 75% COVERAGE FOR PRIMARY GEOGRIDS.
10. DO NOT PLACE ANY GEOGRIDS UNTIL EXCAVATION DIMENSIONS AND IN-SITU MATERIAL ARE APPROVED.
11. FOR SLOPE EROSION CONTROL, USE GEOCELLS OR MATTING ON SLOPE FACES OF RSS AS FOLLOWS:

RSS ANGLE	SLOPE EROSION CONTROL
1:1 TO < 1.5:1 (H:V)	GEOCELLS WITH COMPOST BLANKET
1.5:1 TO < 2:1 (H:V)	GEOCELLS WITH COMPOST BLANKET OR COIR FIBER MAT WITH SHOULDER AND SLOPE BORROW*
2:1 (H:V) OR FLATTER	MATTING FOR EROSION CONTROL WITH SHOULDER AND SLOPE BORROW

*SEE REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL SUMMARY TABLE IN THE ROADWAY SUMMARY SHEETS FOR SLOPE EROSION CONTROL ON SLOPE FACES OF RSS 1.5:1 (H:V) TO STEEPER THAN 2:1.

H (FT)	0 - < 12		12 - 24		> 24 - 36	
SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
1:1 TO < 1.5:1 (H:V) RSS	1.25	1.20	1.15	1.10	1.10	1.00
1.5:1 TO 1.75:1 (H:V) RSS	1.10	1.00	0.95	0.90	0.90	0.85
> 1.75:1 TO < 2:1 (H:V) RSS	1.00	0.85	0.80	0.75	0.75	0.70

L/H RATIO (L > 4' MIN)

(IF L $\leq$ 4', USE SECONDARY GEOGRID INSTEAD OF PRIMARY GEOGRID.)

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1803.01

STANDARD REINFORCED SOIL SLOPE (RSS) WITH HIGH GROUNDWATER SHEET 2 OF 2

DATE: 4-19-16

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2G-4

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden F760CAE89EC4D3... SIGNATURE 6/22/2017 DATE

ENGINEER

SIGNATURE DATE

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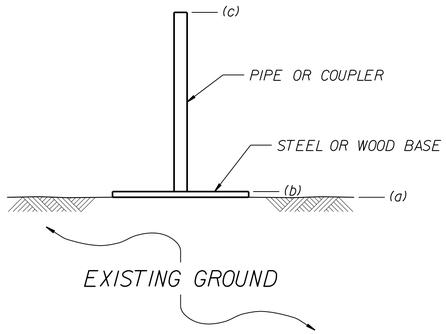
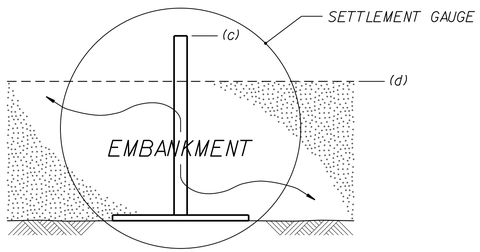
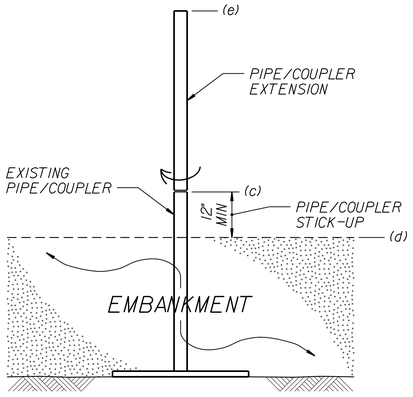
EMBANKMENT MONITORING SEQUENCE



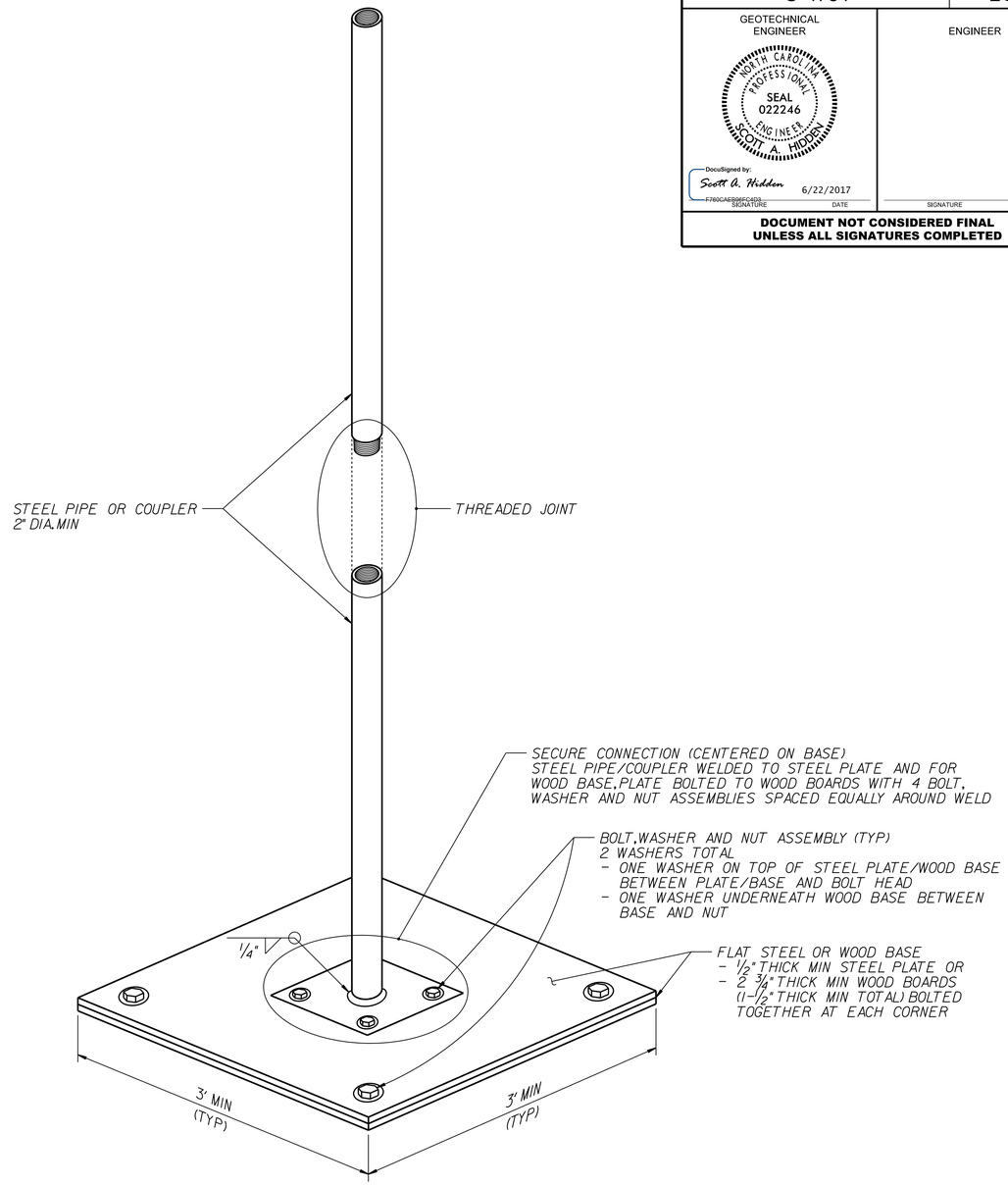
1. PLACE STEEL/WOOD BASE AT APPROXIMATE GAUGE LOCATIONS SHOWN IN THE PLANS AS DETERMINED BY THE ENGINEER.
2. SET BASE ON LEVEL GROUND SO PIPE/COUPLER IS PLUMB.
3. BEFORE CONSTRUCTING EMBANKMENT, NOTIFY ENGINEER TO SURVEY AND RECORD THE FOLLOWING:
   (a) EXISITING GROUND ELEVATION,
   (b) TOP OF BASE ELEVATION AND
   (c) TOP OF PIPE ELEVATION.



4. MAKE SETTLEMENT GAUGE HIGHLY VISIBLE SO GAUGE IS NOT HIT OR DAMAGED.
5. PLACE AND COMPACT FILL MATERIAL AROUND SETTLEMENT GAUGE WITHOUT DISTURBING GAUGE.
6. NOTIFY ENGINEER WEEKLY TO SURVEY AND RECORD THE FOLLOWING:
   (c) TOP OF PIPE ELEVATION AND
   (d) EMBANKMENT ELEVATION.



7. CONNECT PIPE/COUPLER EXTENSION TO EXISTING PIPE/COUPLER AS NEEDED TO MAINTAIN A PIPE/COUPLER STICK-UP OF AT LEAST 12" WHILE MONITORING SETTLEMENT.
8. SCREW PIPES/COUPLERS TOGETHER HAND TIGHT AND THEN TIGHTEN 2 TO 3 FULL TURNS WITH A WRENCH.
9. NOTIFY ENGINEER TO SURVEY AND RECORD THE FOLLOWING:
   (c) TOP OF PIPE ELEVATION,
   (d) EMBANKMENT ELEVATION AND
   (e) TOP OF EXTENSION ELEVATION.
10. RETURN TO STEP 4 WITH NEW TOP OF PIPE ELEVATION EQUAL TO TOP OF EXTENSION ELEVATION.



SETTLEMENT GAUGE

NOTES:

1. SEE ROADWAY SUMMARY SHEETS FOR APPROXIMATE SETTLEMENT GAUGE LOCATIONS.
2. FOR STANDARD EMBANKMENT MONITORING, SEE EMBANKMENT SETTLEMENT GAUGES PROVISION.
3. INSTALL SETTLEMENT GAUGES AFTER CLEARING AND GRUBBING GAUGE LOCATIONS AND BEFORE CONSTRUCTING EMBANKMENTS WITH EMBANKMENT MONITORING.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1804.01

STANDARD EMBANKMENT MONITORING

DATE: 2-19-13

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2G-5

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032171 ENGINEER HYOUNG PARK

DocuSigned by: 11/3/2017
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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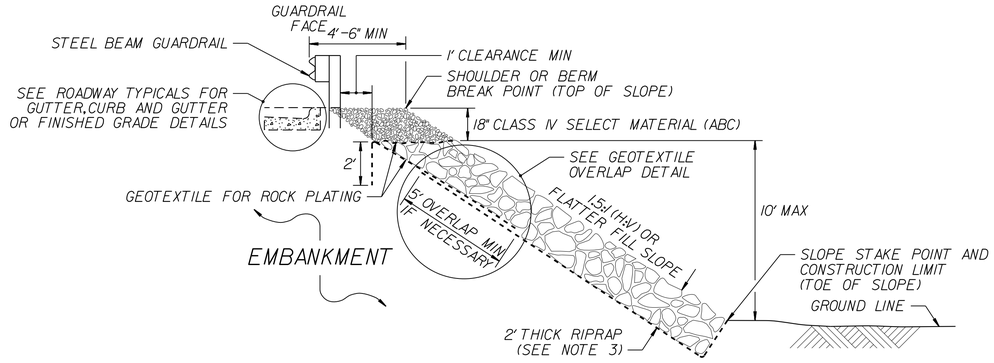
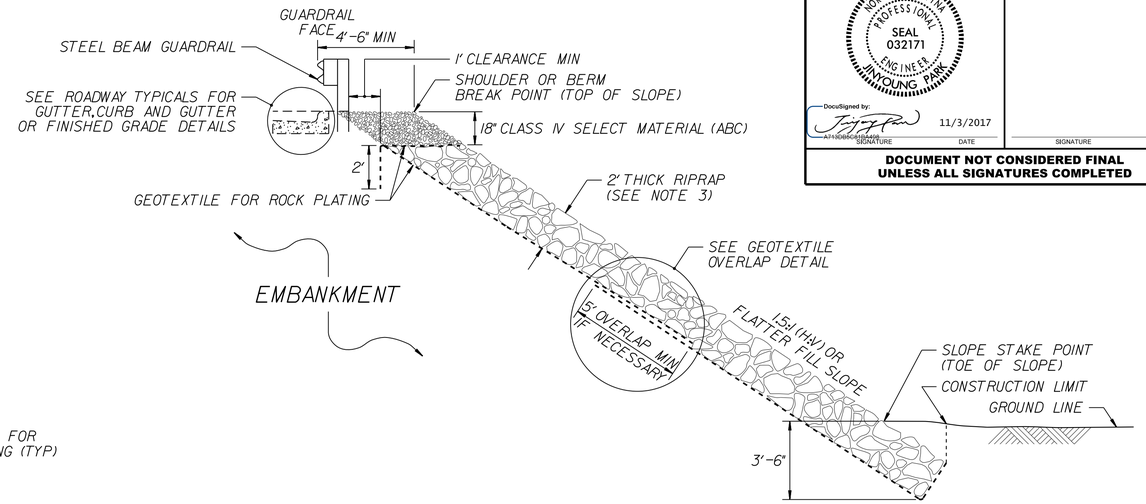
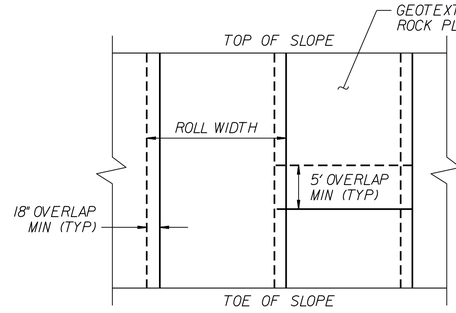


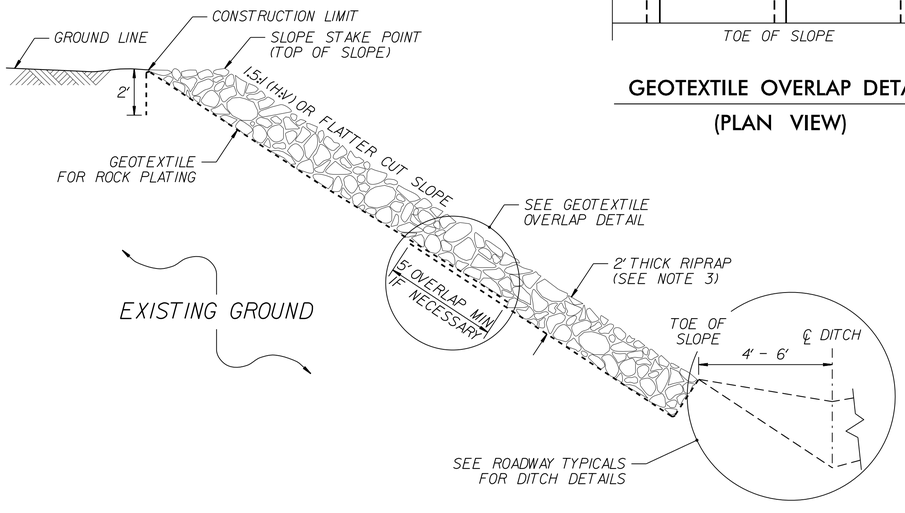
ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION



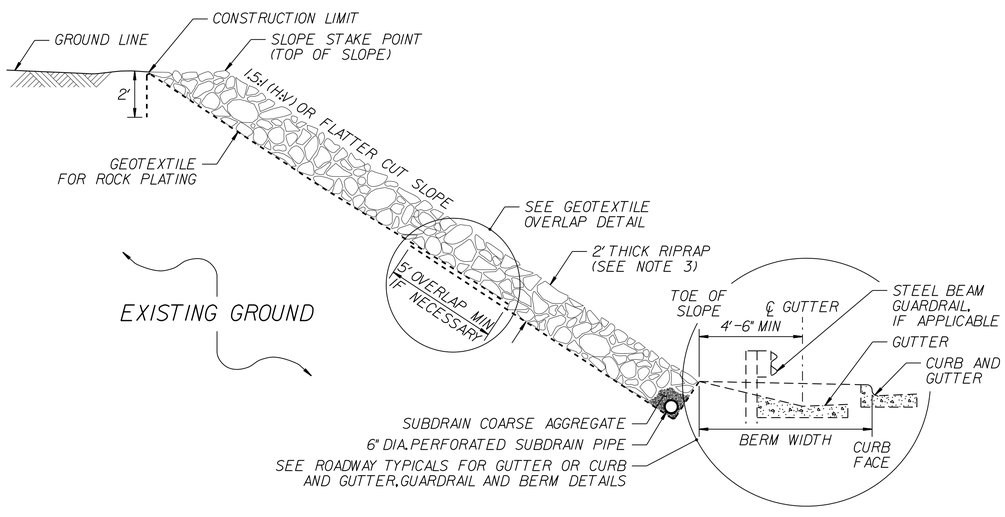
ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION



GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)



ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION



ROCK PLATING DETAIL NO. 4 – TYPICAL SECTION

NOTES:

1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
2. FOR STANDARD ROCK PLATING,SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
3. USE CLASS I,2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.01

STANDARD
ROCK PLATING

DATE: 2-19-13

PROJECT REFERENCE NO.	SHEET
U-4751	2H-1

GEOENVIRONMENTAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 31499 ENGINEER CYRUS F. PARKER

DocuSigned by: Cyrus Parker C96492AF5E824DF... 3/23/2017

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

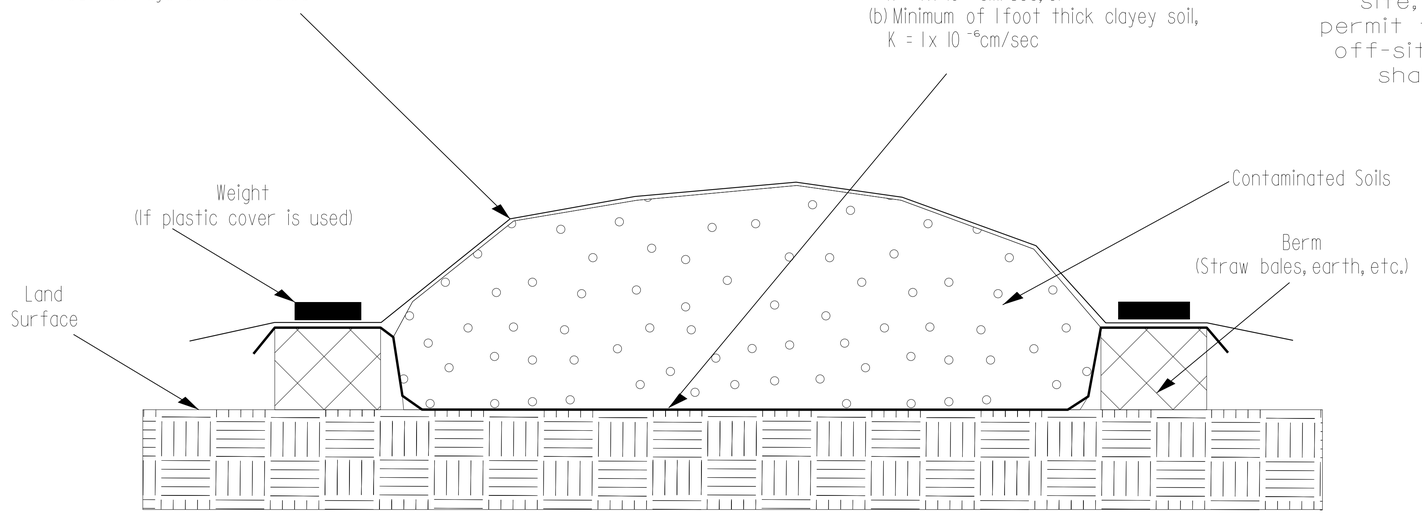
Detail for Temporary Containment of Contaminated Soil

Cross-Section View

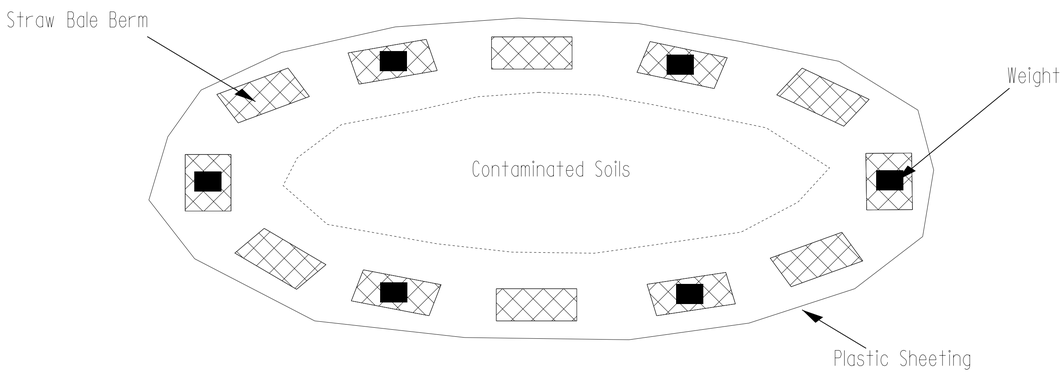
Top Plastic Cover Sheeting
(1 Layer, minimum: 10 mil thick)
Not necessary if leachate collection & treatment system is installed

Underliner:
(a) Minimum of 1 Layer, 10 mil thick plastic, $K = 1 \times 10^{-7}$ cm/sec, or
(b) Minimum of 1 foot thick clayey soil, $K = 1 \times 10^{-6}$ cm/sec

NOTE:
The Contractor shall stockpile all contaminated soil excavated from a property in a location within the property boundaries of the source parcel. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDEQ UST Section for off-site temporary storage. Stockpile shall be removed within 45 days.



Map View



PREPARED BY:	DATE:
REVIEWED BY:	DATE:

GEOTECHNICAL ENGINEERING UNIT

☐ EASTERN REGIONAL OFFICE
☐ WESTERN REGIONAL OFFICE
☒ CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STOCKPILE CONTAINMENT DETAIL

REVISIONS

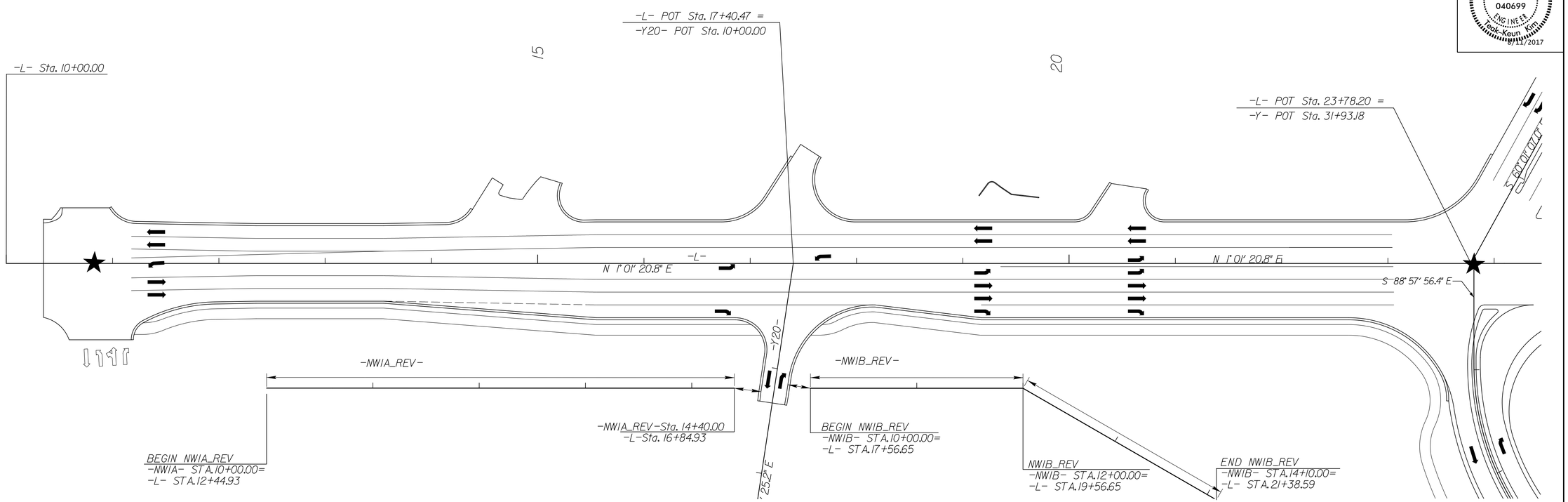
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

8/6/13

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-1

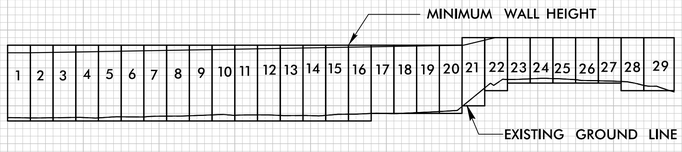
EAU ENGINEER

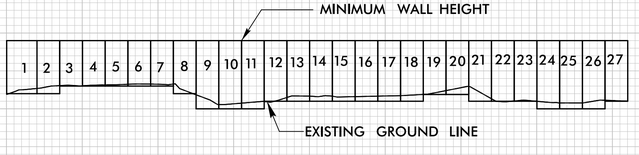
PLAN AND PROFILE OF NWIA_REV /NWIB_REV



NWIA_REV DESIGN DATA		
PANEL NUMBER	1-20	21-29
TOP ELEVATION	38'	39'
PANEL LENGTH	300'	140'

NWIB_REV DESIGN DATA	
PANEL NUMBER	1-27
TOP ELEVATION	39'
PANEL LENGTH	410'





40 30 20

10 11 12 13 14

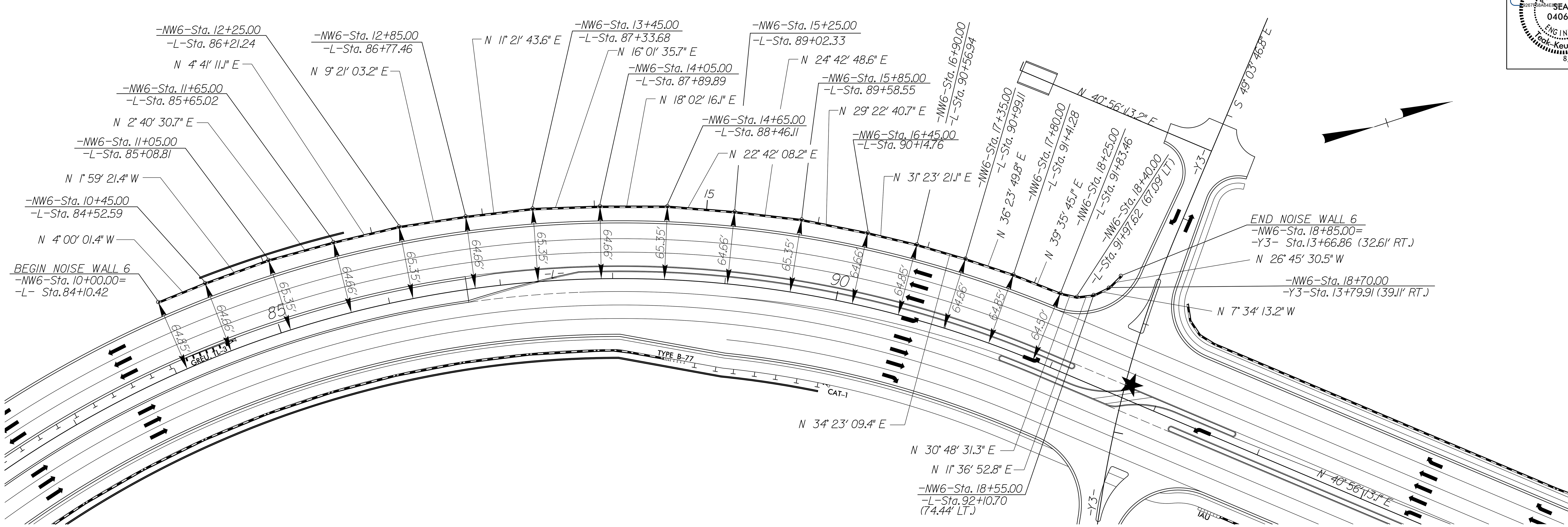
8/1/2017
K:\Structures\Noise Walls\U4751_HES_NW1A&1B_RV_psh01_03102016.dgn
Gamble

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-2

EAU ENGINEER

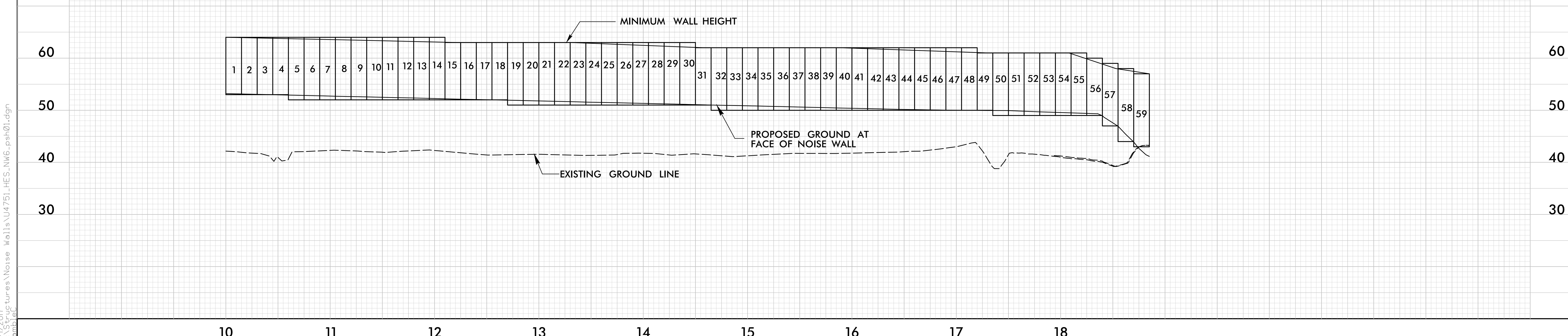
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040699 Teek-Keun Kim 8/11/2017

PLAN AND PROFILE OF NOISE WALL 6



NOISE WALL 6 DESIGN DATA

PANEL NUMBER	1-14	15-30	31-48	49-55	56	57	58	59
TOP ELEVATION	64'	63'	62'	61'	60'	59'	58'	57'
PANEL LENGTH	210'	240'	270'	105'	15'	15'	15'	15'



8/6/13

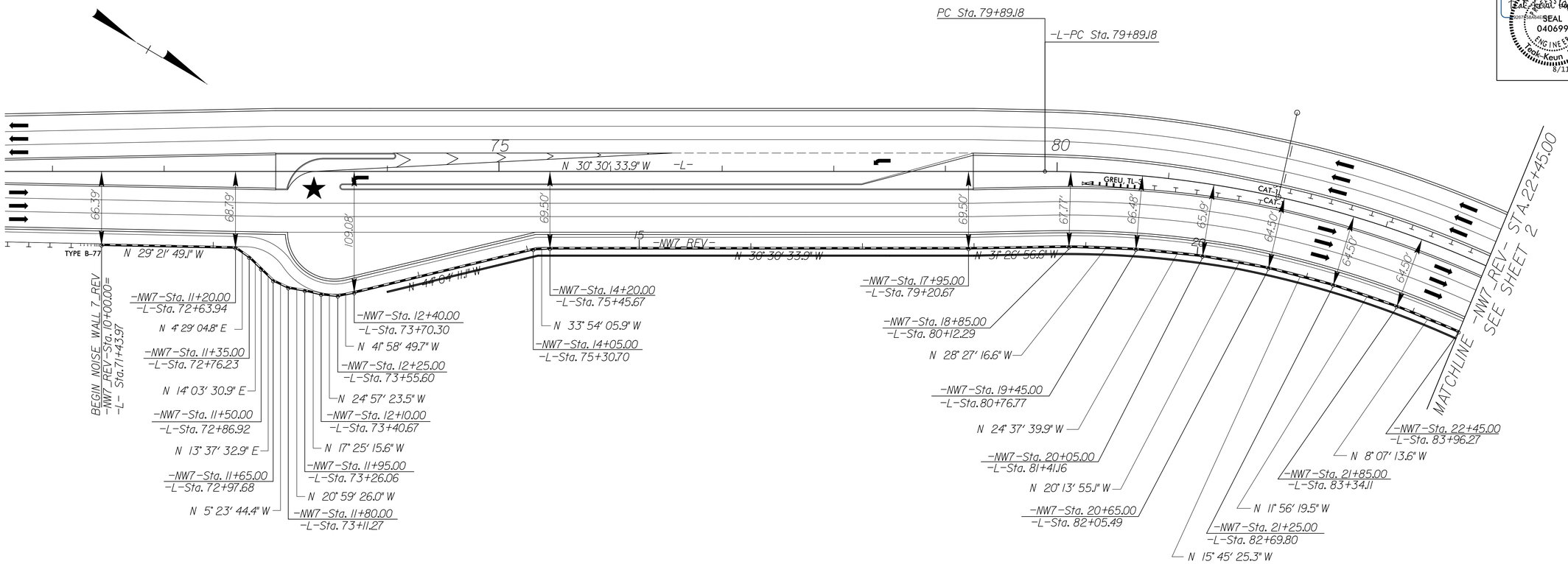
PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-3

EAU ENGINEER

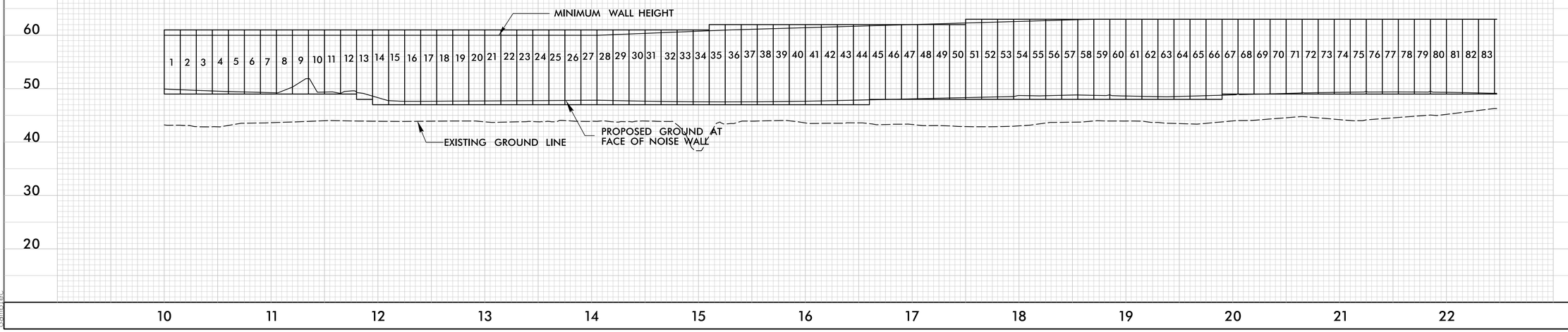
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040699 ENGINEER Teak-Keun Kim

8/11/2017

PLAN AND PROFILE OF NOISE WALL 7_REV



NOISE WALL 7_REV DESIGN DATA			
PANEL NUMBER	1-34	35-50	51-83
TOP ELEVATION	61'	62'	63'
PANEL LENGTH	510'	240'	495'



8/6/2017
R:\Structures\Noise Walls\U4751_HES_NW7_REV_psh01.dgn
Gamble

8/6/13

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-4

EAU ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040699 Teak-Keun Kim
8/11/2017

PLAN AND PROFILE OF NOISE WALL 7_REV

MATCHLINE -NW7_REV- STA 22+45.00
SEE SHEET 1

85 90

-L-

GRADE 1:3

64.50' 64.50' 64.50' 64.50' 64.50' 64.50' 70.86'

25

-NW7_REV-

PE B-77

CAT-1
Shortened due to sight distance issue

-73-

IAU

END NOISE WALL 7_REV
-NW7-Sta. 26+65.00=
-L- Sta.88+48.25

N 28° 14' 40.8" E

-NW7-Sta. 26+35.00
-L-Sta. 88+16.32

N 25° 06' 10.8" E

-NW7-Sta. 26+20.00
-L-Sta. 88+00.35

N 17° 10' 32.7" E

-NW7-Sta. 26+05.00
-L-Sta. 87+84.27

N 14° 47' 21.8" E

-NW7-Sta. 25+45.00
-L-Sta. 87+19.96

N 10° 58' 15.9" E

-NW7-Sta. 24+85.00
-L-Sta. 86+55.66

N 7° 09' 10.0" E

-NW7-Sta. 24+25.00
-L-Sta. 85+91.35

N 3° 20' 04.1" E

-NW7-Sta. 23+65.00
-L-Sta. 85+27.04

N 0° 29' 01.8" W

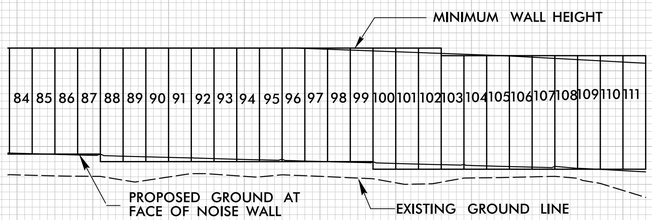
-NW7_REV-Sta. 23+05.00
-L-Sta. 84+62.73

N 4° 18' 07.7" W

-NW7-Sta. 22+45.00
-L-Sta. 84+00.57

NOISE WALL 7_REV DESIGN DATA

PANEL NUMBER	84-102	103-111	
TOP ELEVATION	63'	62'	
PANEL LENGTH	285'	135'	



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22 23 24 25 26

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Gamble

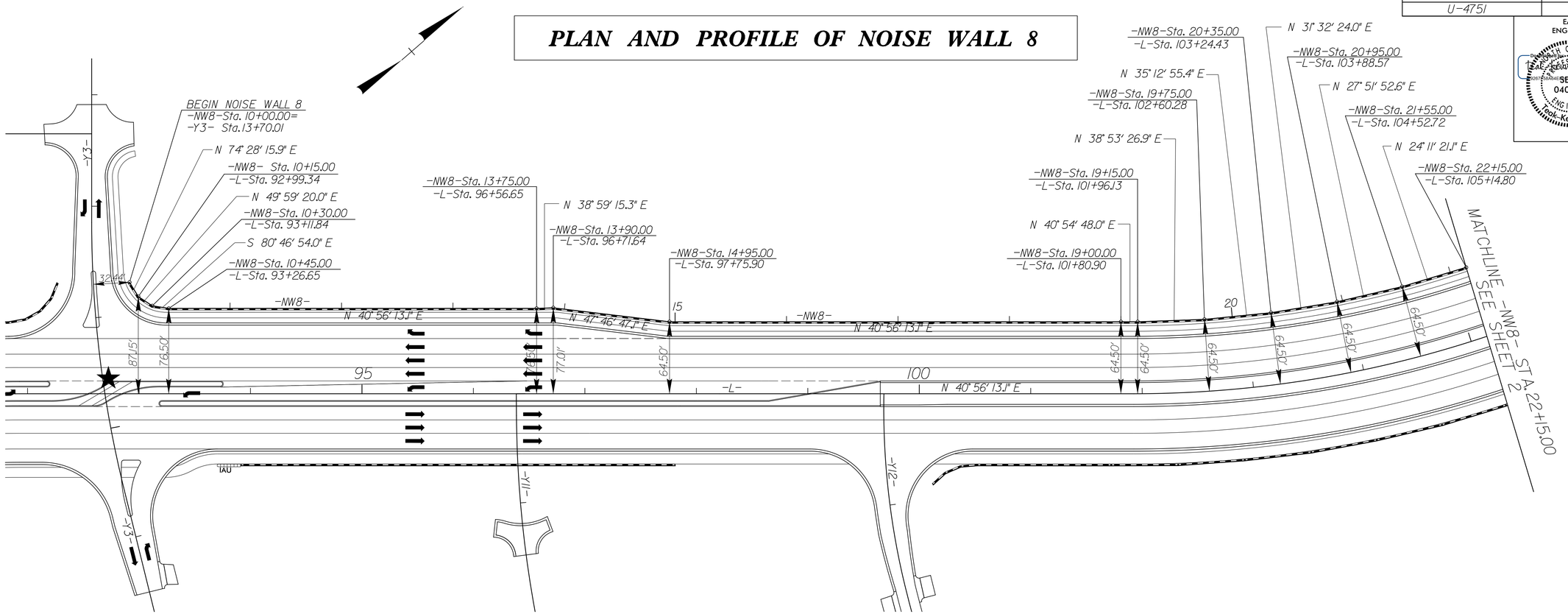
8/6/13

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-5

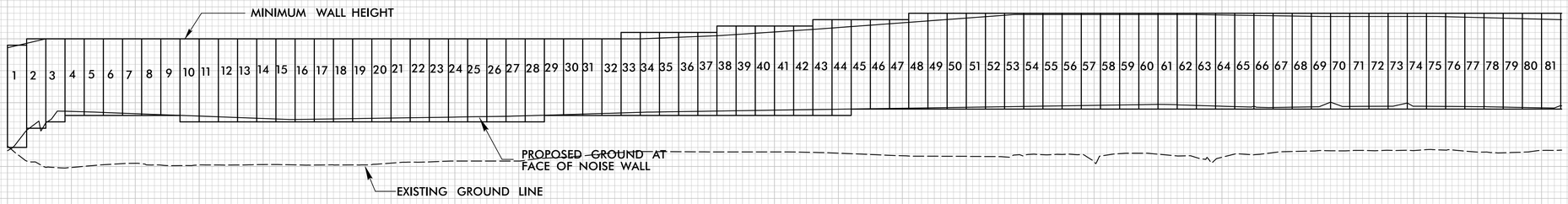
EAU ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040699 Teak-Keun Kim 8/11/2017

PLAN AND PROFILE OF NOISE WALL 8



NOISE WALL 8 DESIGN DATA						
PANEL NUMBER	1	2-32	33-37	38-42	43-47	48-81
TOP ELEVATION	59'	60'	61'	62'	63'	64'
PANEL LENGTH	15'	465'	75'	75'	75'	510'



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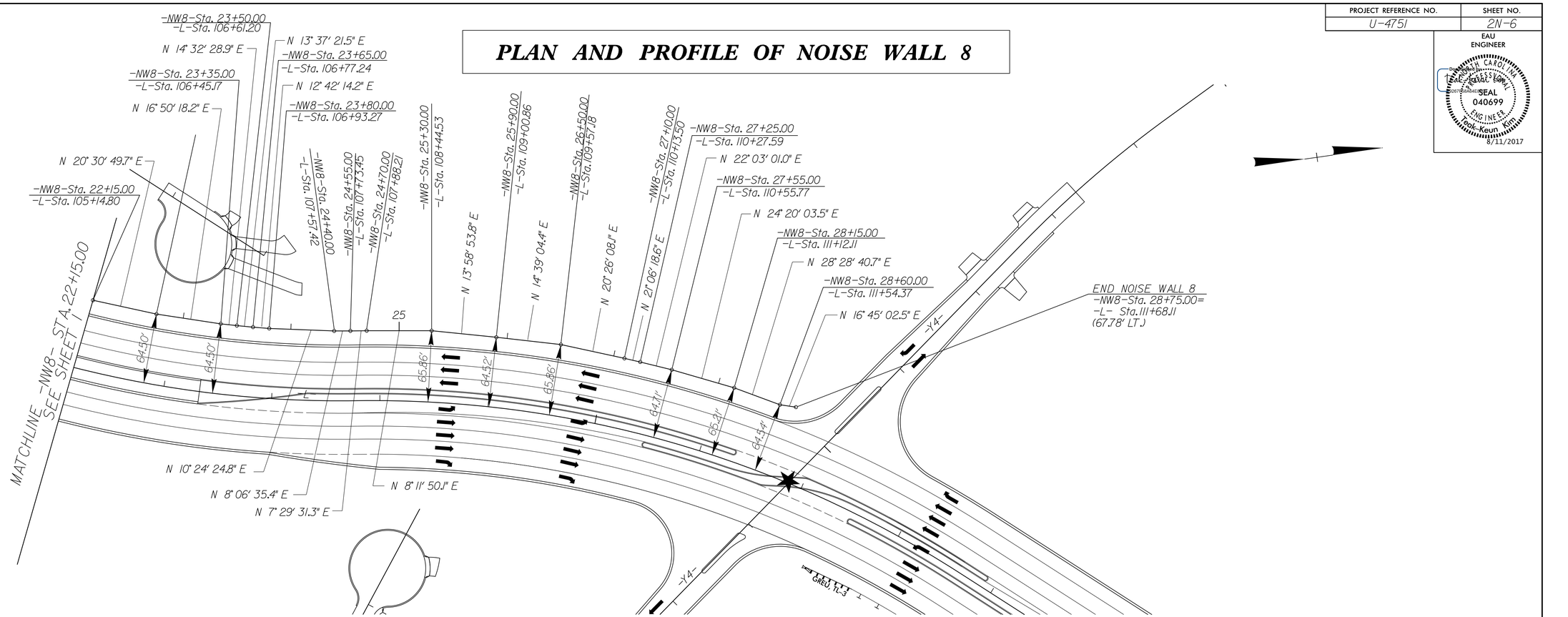
PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-6

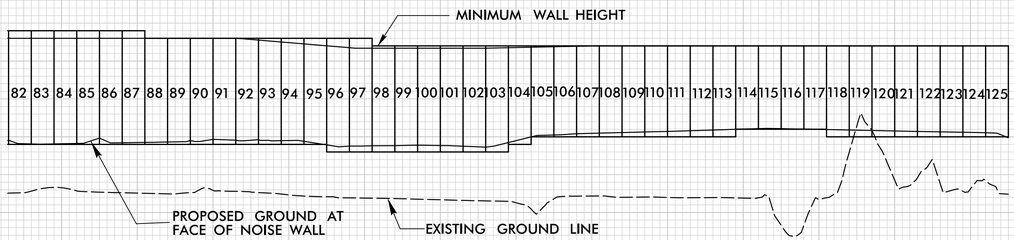
EAU ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040699 Teak-Keun Kim 8/11/2017

PLAN AND PROFILE OF NOISE WALL 8



NOISE WALL 8 DESIGN DATA			
PANEL NUMBER	82-87	88-97	98-125
TOP ELEVATION	64'	63'	62'
PANEL LENGTH	90'	150'	420'



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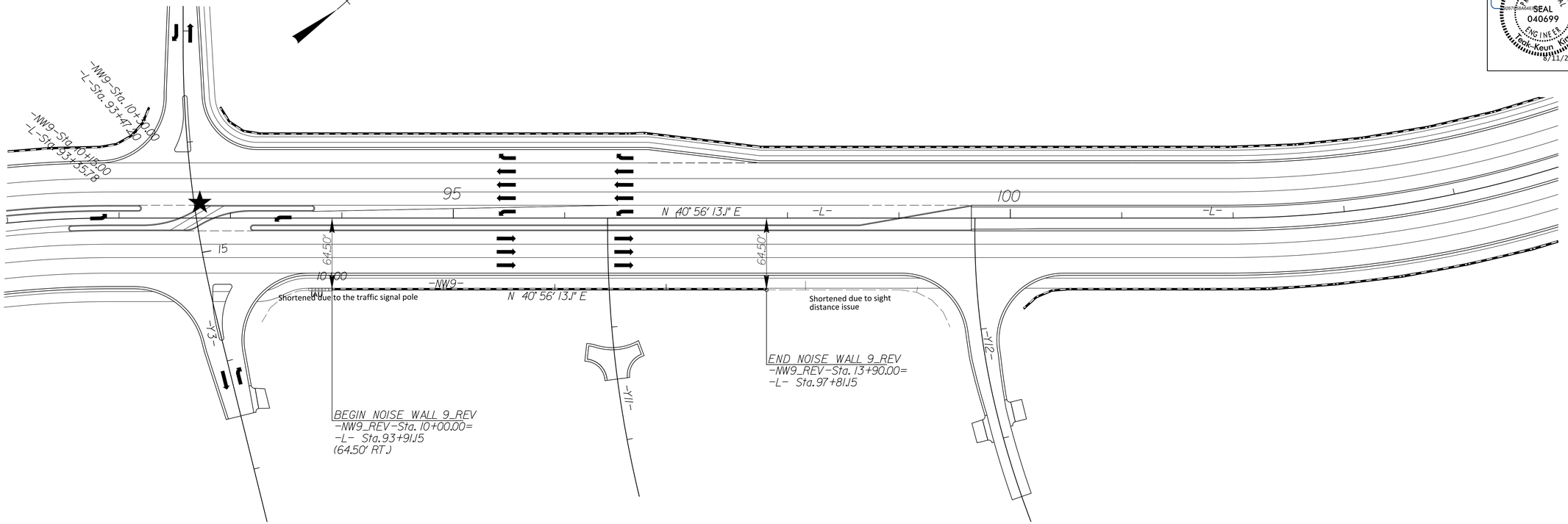
PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-7

EAU ENGINEER

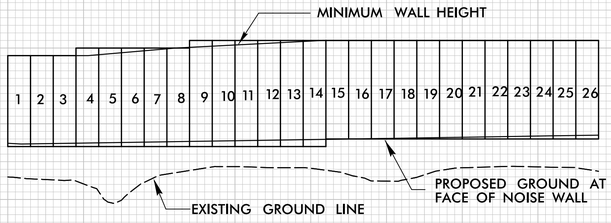
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040699 Teak-Keun Kim 8/11/2017

PLAN AND PROFILE OF NOISE WALL 9_REV



NOISE WALL 9_REV DESIGN DATA

PANEL NUMBER	1-3	4-8	9-26
TOP ELEVATION	59'	60'	61'
PANEL LENGTH	45"	75'	270'



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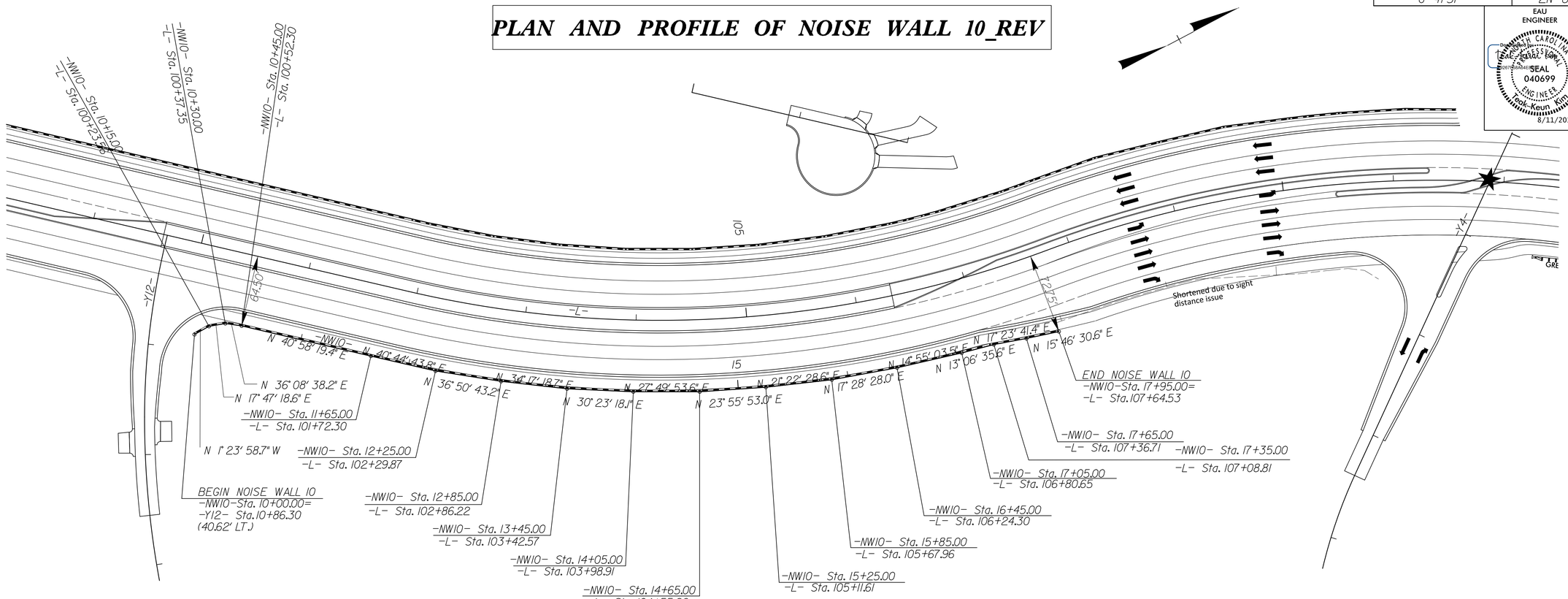
PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-8

EAU ENGINEER

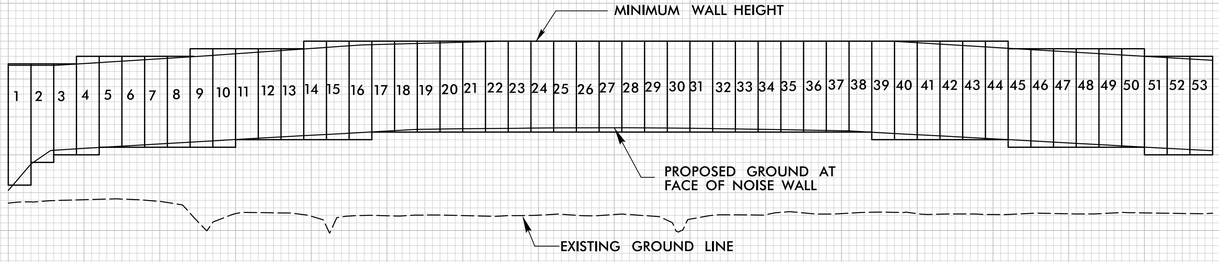
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040699 ENGINEER Teak-Keun Kim 8/11/2017

PLAN AND PROFILE OF NOISE WALL 10_REV



NOISE WALL 10 DESIGN DATA

PANEL NUMBER	1-3	4-8	9-13	14-44	45-50	51-53
TOP ELEVATION	62'	63'	64'	65'	64'	63'
PANEL LENGTH	45'	75'	75'	465'	90'	45'



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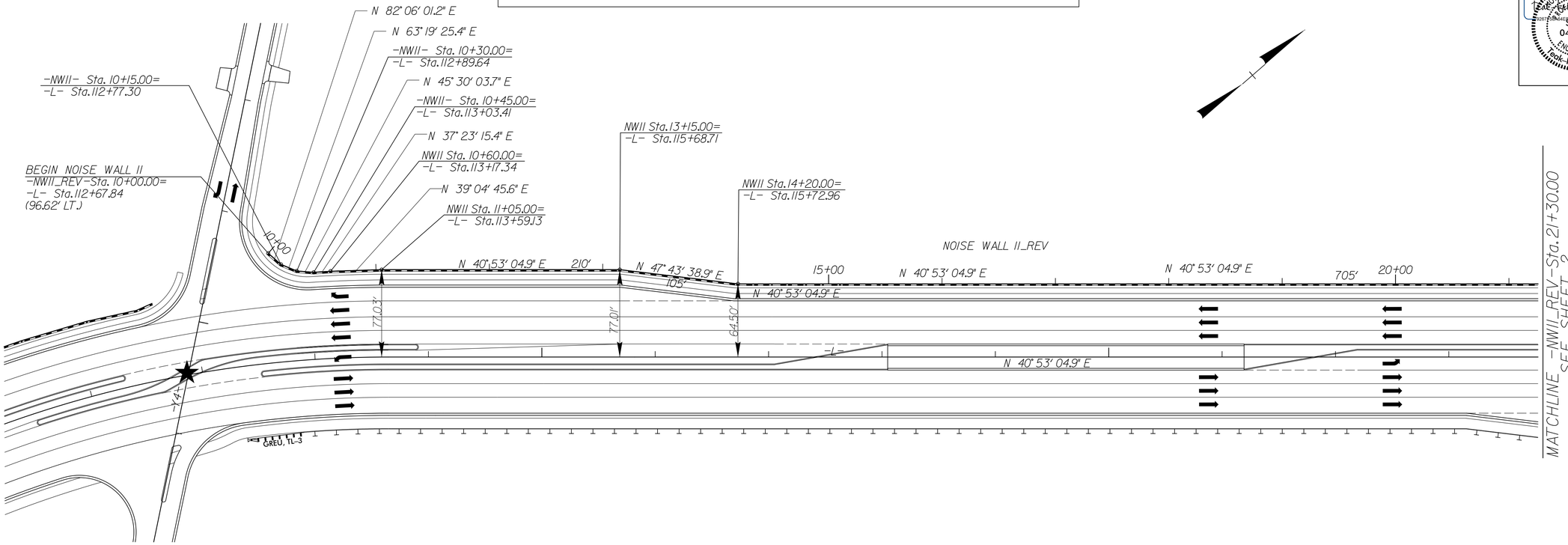
8/6/13

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-9

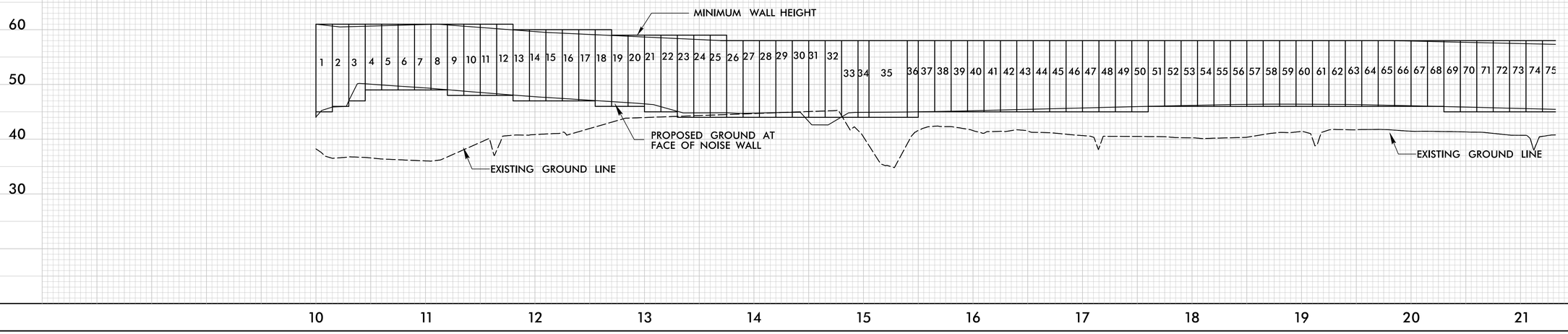
EAU ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040699 ENGINEER Teak-Keun Kim
8/11/2017

PLAN AND PROFILE OF NOISE WALL 11_REV



NOISE WALL 11_REV DESIGN DATA				
PANEL NUMBER	1-12	13-18	19-25	26-74
TOP ELEVATION	61'	60'	59'	58'
PANEL LENGTH	180'	90'	105'	755'



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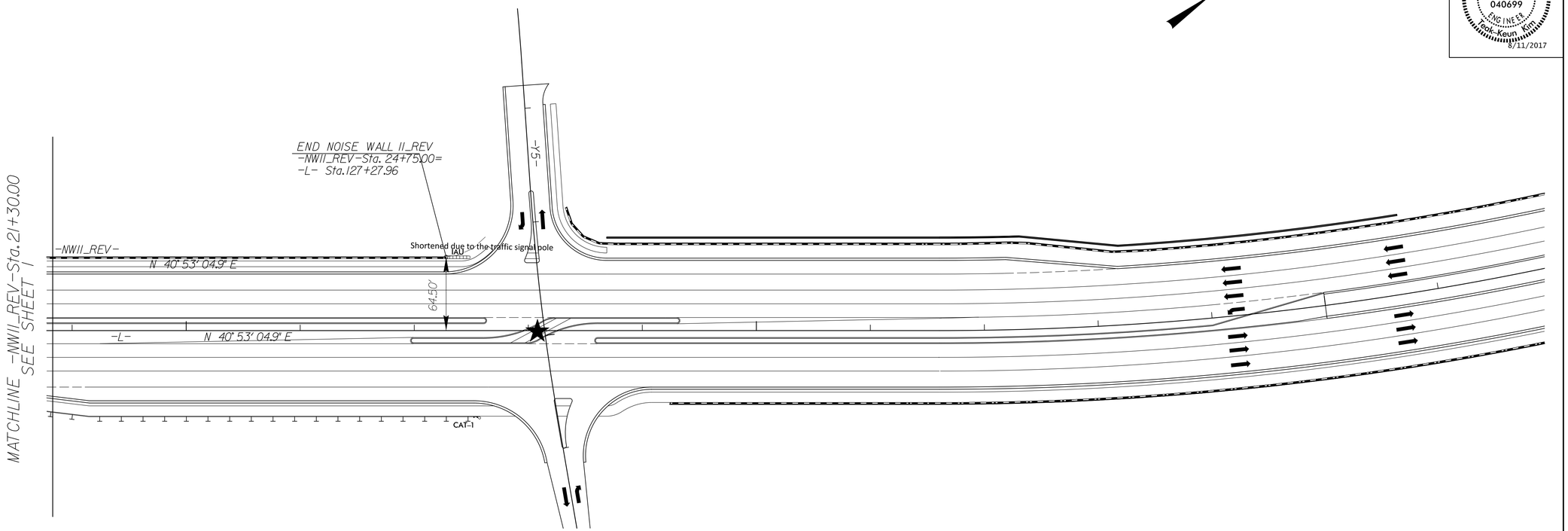
PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-10

EAU ENGINEER

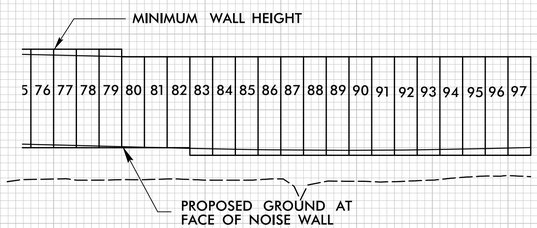
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040699 ENGINEER Teak-Keun Kim 8/11/2017

PLAN AND PROFILE OF NOISE WALL 11_REV



NOISE WALL 11_REV DESIGN DATA

PANEL NUMBER	75-79	80-97
TOP ELEVATION	58'	57'
PANEL LENGTH	75'	270'



60 50 40 30

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Gamble

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-11

PLAN AND PROFILE OF NOISE WALL 13_REV

EAU ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040699 Teak-Keun Kim

8/11/2017

BEGIN NOISE WALL 13
-NW13- Sta. 10+00.00=
-Y5- Sta.13+89.23

S 67° 59' 59.1" E

-NW13- Sta. 10+15.00
-L- Sta. 128+38.61

N 88° 44' 33.3" E

-NW13- Sta. 10+30.00
-L- Sta. 128+48.67

N 63° 43' 54.6" E

-NW13- Sta. 10+45.00
-L- Sta. 128+62.49

N 42° 47' 41.4" E

-NW13- Sta. 10+60.00
-L- Sta. 128+77.49

-NW13- Sta. 13+30.00
-L- Sta. 131+47.49
N 40° 52' 35.4" E
-NW13- Sta. 13+45.00
-L- Sta. 131+62.55
N 40° 38' 25.9" E
-NW13- Sta. 13+60.00
-L- Sta. 131+78.00
N 39° 39' 43.7" E
-NW13- Sta. 14+05.00
-L- Sta. 132+24.36
N 42° 14' 20.8" E
-NW13- Sta. 14+20.00
-L- Sta. 132+39.80

-NW13- Sta. 14+95.00
-L- Sta. 133+16.06

-L-PC Sta. 131+60.53

-NW13-Sta. 15+25.00
-L-Sta. 133+46.82
-NW13-Sta. 15+00.00
-L-Sta. 133+77.58
-NW13-Sta. 15+55.00
-L-Sta. 134+08.34
-NW13-Sta. 15+85.00
-L-Sta. 134+39.10
-NW13-Sta. 16+15.00
-L-Sta. 134+69.86
-NW13-Sta. 16+45.00
-L-Sta. 135+00.62
-NW13-Sta. 16+75.00
-L-Sta. 135+31.38
-NW13-Sta. 17+05.00
-L-Sta. 135+62.14
-NW13-Sta. 17+35.00
-L-Sta. 135+92.90
-NW13-Sta. 17+65.00
-L-Sta. 136+23.66
-NW13-Sta. 17+95.00
-L-Sta. 136+54.42
-NW13-Sta. 18+25.00
-L-Sta. 136+85.18
-NW13-Sta. 18+55.00
-L-Sta. 137+15.94
-NW13-Sta. 18+85.00
-L-Sta. 137+46.70
-NW13-Sta. 19+15.00
-L-Sta. 137+77.46
-NW13-Sta. 19+45.00
-L-Sta. 138+08.22
-NW13-Sta. 19+75.00
-L-Sta. 138+38.98
-NW13-Sta. 20+05.00
-L-Sta. 138+69.74
-NW13-Sta. 20+35.00
-L-Sta. 138+99.37
-NW13-Sta. 20+60.00
-L-Sta. 139+26.13
-NW13-Sta. 20+90.00
-L-Sta. 139+56.89
-NW13-Sta. 21+20.00
-L-Sta. 139+87.65
-NW13-Sta. 21+50.00
-L-Sta. 140+49.17
-NW13-Sta. 22+10.00

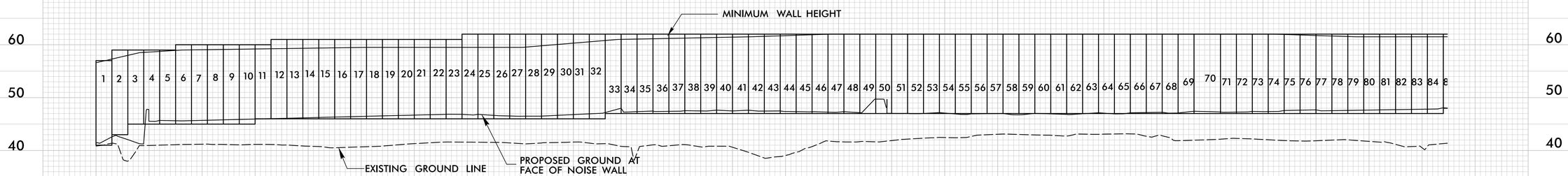
N 38° 29' 05.1" E
N 36° 25' 39.3" E
N 35° 52' 45.1" E
N 35° 04' 37.4" E
N 34° 24' 06.4" E
N 33° 43' 35.5" E
N 33° 03' 04.5" E
N 32° 31' 46.7" E
N 31° 42' 02.6" E
N 31° 01' 31.7" E
N 30° 21' 00.7" E
N 29° 45' 02.7" E
N 28° 59' 58.8" E
N 28° 19' 27.9" E
N 27° 38' 56.9" E
N 27° 05' 44.0" E
N 26° 17' 55.0" E
N 25° 37' 24.1" E
N 25° 00' 15.7" E
N 24° 31' 46.2" E
N 23° 42' 36.4" E
N 23° 02' 05.4" E
N 22° 01' 19.0" E
N 20° 44' 57.2" E

MATCHLINE -NW13-Sta.22+70.00 SEE SHEET 2

-Y5-
10+00
30.66'
J
NW13
N 40° 53' 04.9" E
15+00
N 46° 41' 29.3" E
64.52'
20+00
299.7'
299.7'
65.17'
N 40° 53' 04.9" E
-L-

NOISE WALL 13_REV DESIGN DATA

PANEL NUMBER	1	2-5	6-11	12-23	24-84
TOP ELEVATION	57'	59'	60'	61'	62'
PANEL LENGTH	15'	60'	90'	180'	925'



10 11 12 13 14 15 16 17 18 19 20 21 22

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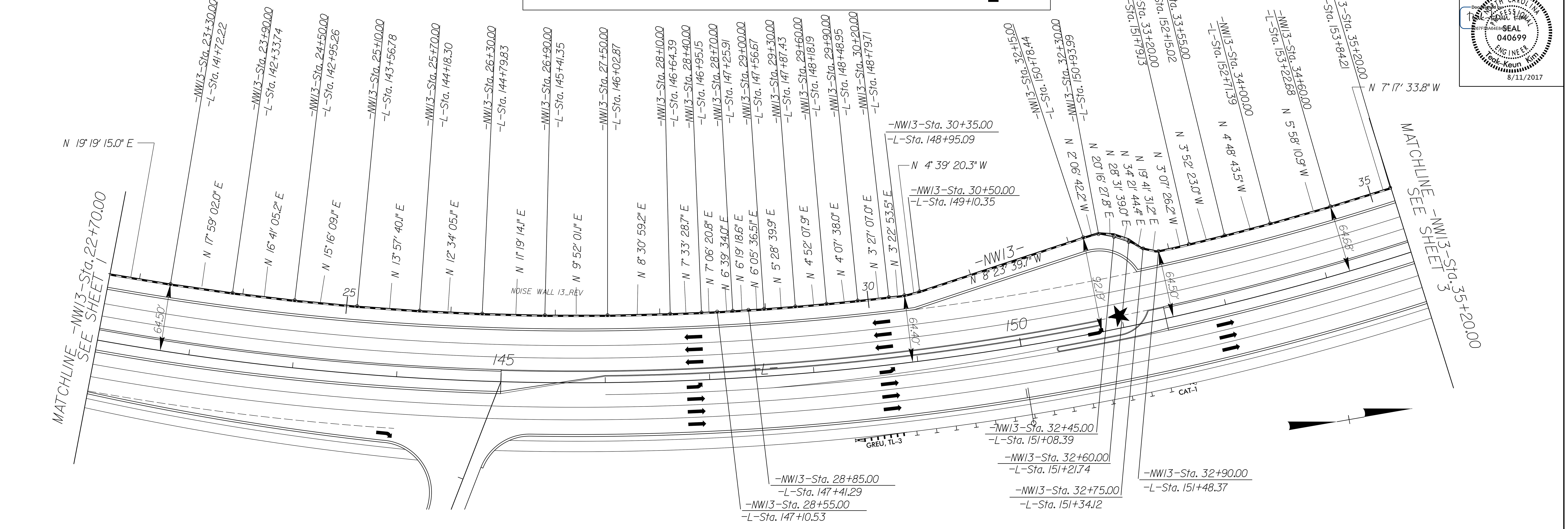
Gamblel

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-12

EAU ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040699 ENGINEER Teak-Keun Kim 8/11/2017

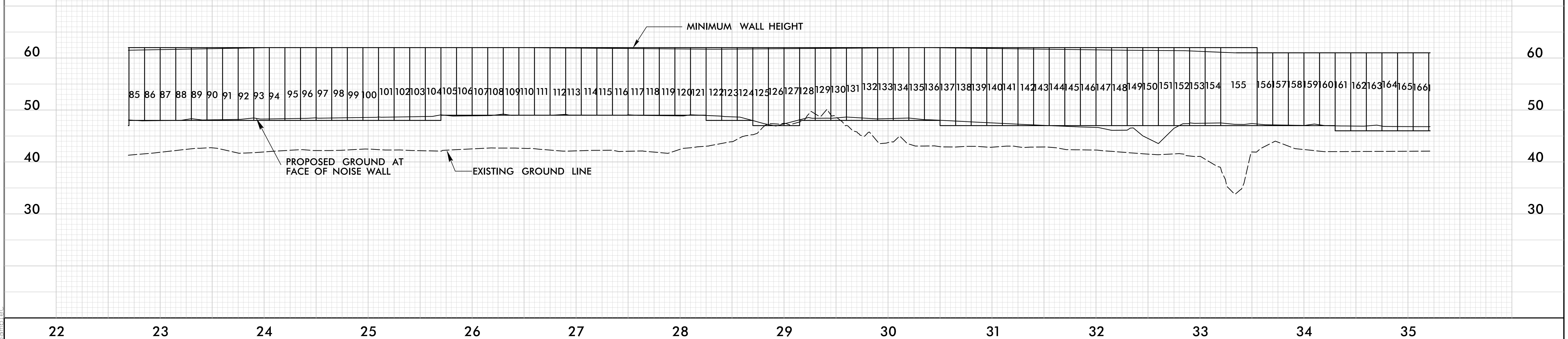
PLAN AND PROFILE OF NOISE WALL 13_REV



MATCHLINE -NW13-Sta. 22+70.00 SEE SHEET 1
MATCHLINE -NW13-Sta. 35+20.00 SEE SHEET 3
N 19° 19' 15.0" E
-NW13-Sta. 23+30.00 -L-Sta. 141+72.22
-NW13-Sta. 23+90.00 -L-Sta. 142+33.74
-NW13-Sta. 24+50.00 -L-Sta. 142+95.26
-NW13-Sta. 25+10.00 -L-Sta. 143+56.78
-NW13-Sta. 25+70.00 -L-Sta. 144+18.30
-NW13-Sta. 26+30.00 -L-Sta. 144+79.83
-NW13-Sta. 26+90.00 -L-Sta. 145+41.35
-NW13-Sta. 27+50.00 -L-Sta. 146+02.87
-NW13-Sta. 28+10.00 -L-Sta. 146+64.39
-NW13-Sta. 28+40.00 -L-Sta. 146+95.15
-NW13-Sta. 28+70.00 -L-Sta. 147+25.91
-NW13-Sta. 29+00.00 -L-Sta. 147+56.67
-NW13-Sta. 29+30.00 -L-Sta. 147+87.43
-NW13-Sta. 29+60.00 -L-Sta. 148+18.19
-NW13-Sta. 29+90.00 -L-Sta. 148+48.95
-NW13-Sta. 30+20.00 -L-Sta. 148+79.71
-NW13-Sta. 30+35.00 -L-Sta. 148+95.09
N 4° 39' 20.3" W
-NW13-Sta. 30+50.00 -L-Sta. 149+10.35
-NW13-Sta. 32+15.00 -L-Sta. 150+78.44
-NW13-Sta. 32+30.00 -L-Sta. 150+93.99
-NW13-Sta. 33+20.00 -L-Sta. 151+79.13
-NW13-Sta. 33+55.00 -L-Sta. 152+15.02
-NW13-Sta. 34+00.00 -L-Sta. 152+71.39
-NW13-Sta. 34+60.00 -L-Sta. 153+22.68
-NW13-Sta. 35+20.00 -L-Sta. 153+84.21
N 7° 17' 33.8" W
N 17° 59' 02.0" E
N 16° 41' 05.2" E
N 15° 16' 09.1" E
N 13° 57' 40.1" E
N 12° 34' 05.1" E
N 11° 19' 14.1" E
N 9° 52' 01.1" E
N 8° 30' 59.2" E
N 7° 33' 28.7" E
N 7° 06' 20.8" E
N 6° 39' 34.0" E
N 6° 19' 18.6" E
N 6° 05' 36.5" E
N 5° 28' 39.9" E
N 4° 52' 07.9" E
N 4° 07' 38.0" E
N 3° 27' 07.0" E
N 3° 22' 53.5" E
N 8° 23' 39.7" W
N 2° 06' 42.2" W
N 20° 16' 27.8" E
N 28° 31' 39.0" E
N 34° 21' 44.4" E
N 19° 41' 31.2" E
N 3° 07' 26.2" W
N 3° 52' 23.0" W
N 4° 48' 43.5" W
N 5° 58' 10.9" W
-NW13-
NOISE WALL 13_REV
25
30
35
145
150
-L-
64.50'
64.40'
92.19'
64.50'
64.68'
GREU, TL-3
CAT-1
-NW13-Sta. 28+85.00 -L-Sta. 147+41.29
-NW13-Sta. 28+55.00 -L-Sta. 147+10.53
-NW13-Sta. 32+45.00 -L-Sta. 151+08.39
-NW13-Sta. 32+60.00 -L-Sta. 151+21.74
-NW13-Sta. 32+75.00 -L-Sta. 151+34.12
-NW13-Sta. 32+90.00 -L-Sta. 151+48.37

NOISE WALL 13_REV DESIGN DATA

PANEL NUMBER	85-155	156-166
TOP ELEVATION	62'	61'
PANEL LENGTH	1,085'	165'

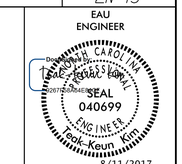


MINIMUM WALL HEIGHT
PROPOSED GROUND AT FACE OF NOISE WALL
EXISTING GROUND LINE
60
50
40
30
85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166
22 23 24 25 26 27 28 29 30 31 32 33 34 35

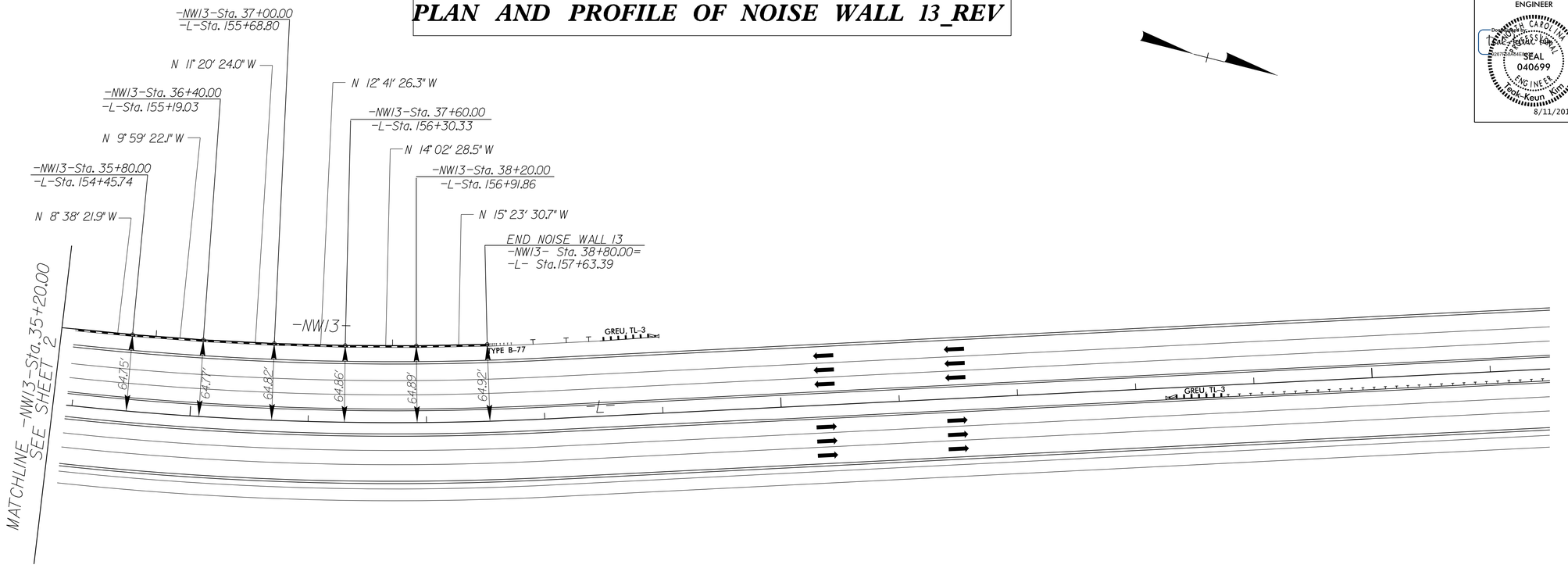
8/6/13

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-13

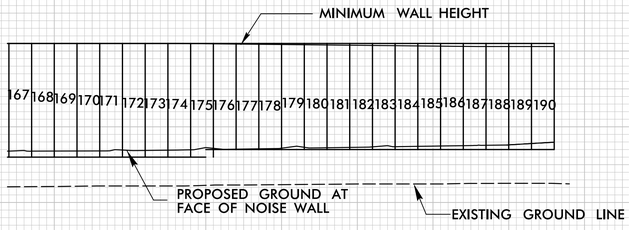
EAU ENGINEER



PLAN AND PROFILE OF NOISE WALL 13_REV



NOISE WALL 13_REV DESIGN DATA		
PANEL NUMBER	167-190	
TOP ELEVATION	61'	
PANEL LENGTH	360'	



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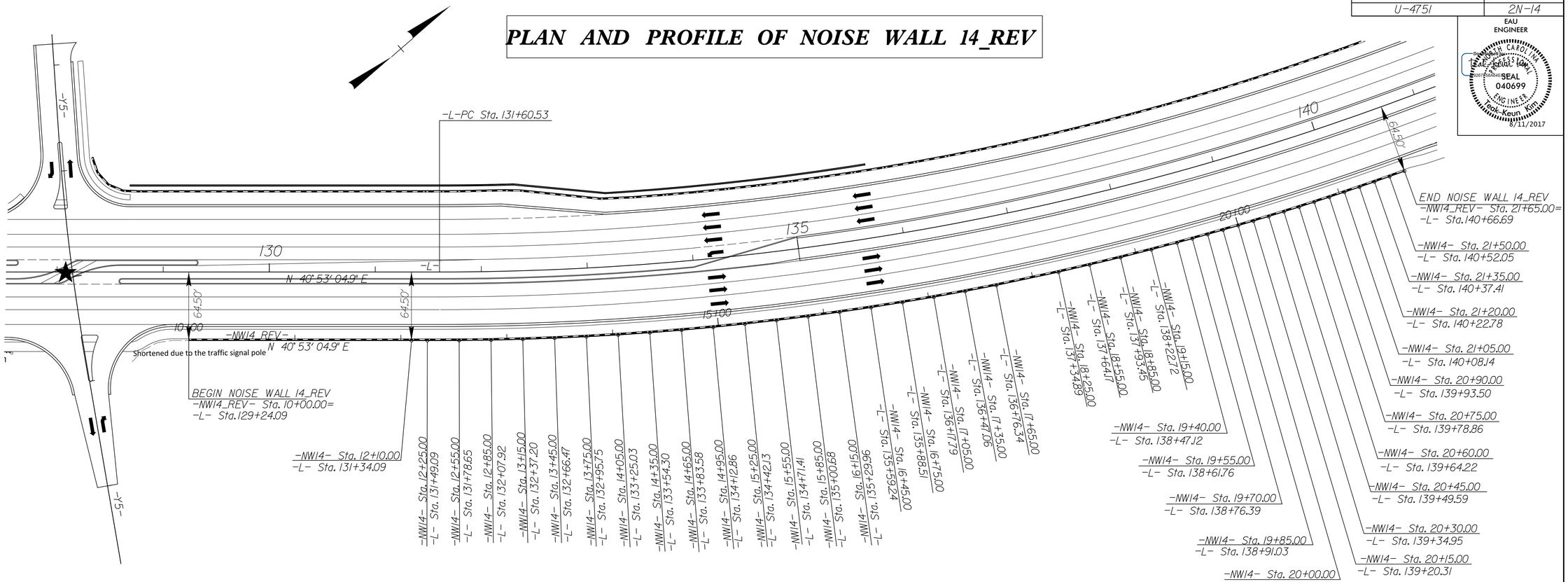
8/6/13

PROJECT REFERENCE NO.	SHEET NO.
U-4751	2N-14

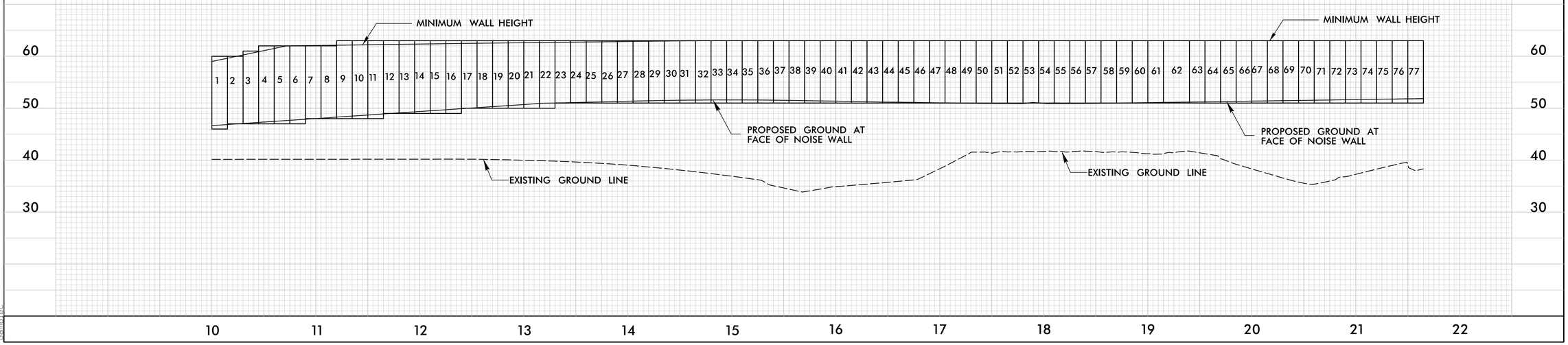
EAU ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040699 Teak-Keun Kim 8/11/2017

PLAN AND PROFILE OF NOISE WALL 14_REV



NOISE WALL 14_REV DESIGN DATA				
PANEL NUMBER	1-2	3	4-8	9-77
TOP ELEVATION	60'	61'	62'	63'
PANEL LENGTH	30'	15'	75'	1045'



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COMPUTED BY: SCS DATE: 7-10-17

CHECKED BY: GAM DATE: 7-10-17

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-4751	3B-1

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

SUMMARY OF EARTHWORK

In Cubic Yards

Chain	Station	Station	Uncl. Excav.	Undercut	Embank. +%	Borrow	Waste
-Y1-	47+00.00 (RT)	53+00.00 (RT)	234		508	274	0
-Y16-	10+47.65	13+00.00	715		131	0	584
-Y24-	10+55.00	16+64.43	1,075		0	0	1,075
-Y1RPD-	10+39.00	35+18.82	3,995	4,700	49,403	47,800	7,092
		SUBTOTAL 1	6,019	4,700	50,042	48,074	8,751
-L-	10+35.00 (LT)	24+85.00 (LT)	914		709	0	205
-Y1-	12+00.00 (LT)	42+00.00 (LT)	1,517		1,988	471	0
-Y-	10+95.00	21+41.15	521		50	0	471
-Y-	22+67.47	24+35.00	141		35	0	106
-SR1-	11+25.00	18+75.88	1,173		778	0	396
-Y20-	10+51.58	11+32.70	15		17	2	0
		SUBTOTAL 2	4,281		3,576	473	1,178
-L-	10+35.00 (RT)	24+85.00 (RT)	1,395		776	0	619
-Y1-	12+00.00 (RT)	42+00.00 (RT)	598		3,837	3,239	0
-Y25-	10+47.96	11+60.78	21		107	86	0
		SUBTOTAL 3	2,014		4,720	3,325	619
-L-	24+85.00	38+05.70 (Begin Bridge)	617	253	73,914	73,297	253
-Y1-	42+00.00 (RT)	47+00.00 (RT)	211		443	232	0
-Y1-	53+00.00 (RT)	72+00.00 (RT)	298		2,274	1,976	
-Y10-	10+47.50	12+50.00	0		413	413	0
		SUBTOTAL 4	1,126	253	77,044	75,918	253
-Y1-	72+00.00 (RT)	84+95.00 (RT)	674		219	0	455
-Y13-	23+91.69	25+54.37	73		79	6	0
		SUBTOTAL 5	747		298	6	455
-L-	39+94.45 (End Bridge)	40+50.00	148		10,420	10,272	0
-Y1-	42+00.00 (LT)	72+00.00 (LT)	1,529		2,934	1,405	0
		SUBTOTAL 6	1,677		13,354	11,677	0
		SUBTOTALS 1 THRU 6	15,864	4,953	149,035	139,473	11,256

Chain	Station	Station	Uncl. Excav.	Undercut	Embank. +%	Borrow	Waste
-Y1-	72+00.00 (LT)	84+95.00 (LT)	563		241	0	322
-Y13-	21+90.00	23+08.69	41		47	6	0
		SUBTOTAL 7	604		288	6	322
-L-	40+50.00	62+51.85 (Begin Bridge)	299	9,488	192,674	192,383	9,496
-Y1RPB-	10+00.00	32+12.98	1,568	71	22,088	20,520	71
-Y1RPA-	10+00.00	21+89.44	1,752		1,199	0	553
-Y1LPB-	10+00.00	24+40.21	1,148		16,993	15,845	0
-Y2-	13+80.00	15+90.00	14		8	0	7
		SUBTOTAL 8	4,781	9,559	232,961	228,748	10,127
-L-	63+57.85 (End Bridge)	91+85.00	1,900	12,649	179,734	179,734	14,549
		SUBTOTAL 9	1,900	12,649	179,734	179,734	14,549
-L-	100+50.00	127+25.00	2,269	56,032	176,863	176,829	58,267
-Y4-	11+70.00	14+94.60	158	719	7,088	7,079	868
-Y4-	16+01.27	18+40.00	5	529	2,007	2,002	529
-Y21-	10+00.00	12+40.76	234		0	0	234
-Y22-	10+00.00	12+45.37	102		3	0	100
		SUBTOTAL 10	2,768	57,280	185,961	185,910	59,998
-L-	129+10.00	159+10.00	11,802	33,309	191,329	191,289	45,071
-Y6-	10+52.51	13+40.00	16	213	5,515	5,515	229
		SUBTOTAL 11	11,818	33,522	196,844	196,804	45,300

Chain	Station	Station	Uncl. Excav.	Undercut	Embank. +%	Borrow	Waste
-L-	159+10.00	189+10.00	1,217	462	136,604	136,604	1,679
-SR4-	10+54.50	34+59.06	605	3,144	22,645	22,479	3,583
		SUBTOTAL 12	1,822	3,606	159,249	159,083	5,262
-L-	189+10.00	219+10.00	750	257	158,425	158,425	1,007
-Y8RPC-	10+00.00	34+66.23	0		94,920	94,920	0
-Y8RPD-	10+00.00	30+18.70	0		89,064	89,064	0
-Y8RPCA-	47+34.00 (End Const.)	68+92.88	260	864	52,420	52,420	1,124
-Y8RPDB-	10+00.00	34+04.05 (Begin Bridge)	0		197,079	197,079	0
		SUBTOTAL 13	1,010	1,121	591,908	591,908	2,131
		SUBTOTALS 7 THRU 13	24,703	117,737	1,546,945	1,542,193	137,688

Chain	Station	Station	Uncl. Excav.	Undercut	Embank. +%	Borrow	Waste
-Y8-	44+90.00 (TEMP RT)	74+10.00 (TEMP RT)	249		888	639	0
-Y8-	49+11.36 (RT)	69+87.83 (RT)	732	657	7,999	7,267	657
-L-	219+10.00	224+90.53 (Begin Bridge)	0		121,552	121,552	0
		SUBTOTAL 14	981	657	130,439	129,458	657
-Y8-	84+70.00 (TEMP RT)	126+20.00 (TEMP RT)	314		1,925	1,611	0
-Y8-	88+90.00 (RT)	94+75.00 (RT)	326		299	0	27
-Y8-	97+35.00 (RT)	102+30.00 (RT)	252		283	31	0
-Y8-	109+34.55 (RT)	121+98.08 (RT)	619		2,325	1,706	0
		SUBTOTAL 15	1,511		4,832	3,348	27
-Y8-	30+90.00 (TEMP LT)	61+20.00 (TEMP LT)	284		893	609	0
-Y8-	31+20.00 (LT)	61+20.00 (LT)	1,663		5,240	3,577	0
		SUBTOTAL 16	1,947		6,133	4,186	0
-Y8-	61+20.00 (TEMP LT))	76+05.00 (TEMP LT)	170		205	35	0
-Y8-	61+20.00 (LT)	73+27.57 (LT)	773	1,789	6,108	5,381	1,835
		SUBTOTAL 17	943	1,789	6,313	5,416	1,835
-Y8-	76+05.00 (TEMP LT)	106+05.00 (TEMP LT)	286		890	604	0
-Y8-	85+80.13 (LT)	101+85.00 (LT)	975		2,178	1,203	0
-L-	226+96.64 (End Bridge)	231+00.00 (End Const.)	2		101,708	101,706	0
-Y8RPDB-	36+17.30 (End Bridge)	69+87.19	4,669	4,756	117,139	117,047	9,333
-Y8LPB-	10+00.00	25+07.33	0	3,061	119,420	119,420	3,061
		SUBTOTAL 18	5,932	7,817	341,335	339,980	12,394
-L-	91+85.00	100+50.00	543	178	26,463	26,463	721
-L-	127+25.00	129+10.00	194	3,152	8,420	8,420	3,346
-Y3-	12+08.79	14+18.78	9		1,619	1,610	0
-Y3-	15+19.01	16+50.90	13		183	170	
-Y5-	12+80.00	14+45.84	2	163	529	529	165
-Y5-	15+45.72	17+00.00	6	137	474	474	143
-Y12-	10+49.52	12+55.00	0	37	1,317	1,317	37
		SUBTOTAL 19	767	3,667	39,005	38,983	4,412
		SUBTOTALS 14 THRU 19	12,081	13,930	528,057	521,371	19,325

SUBTOTALS 1 THRU 6	15,864	4,953	149,035	139,473	11,256
SUBTOTALS 7 THRU 13	24,703	117,737	1,546,945	1,542,193	137,688
SUBTOTALS 14 THRU 19	12,081	13,930	528,057	521,371	19,325
SUBTOTALS 1 THRU 19	52,648	136,620	2,224,037	2,203,037	168,269
MATERIAL FOR SHOULDER CONSTRUCTION			13,600	13,600	
ADDITIONAL UNDERCUT		11,000	13,750	13,750	11,000
WASTE IN LIEU OF BORROW				-5,153	-5,153
ADJUSTMENT FOR DETENTION BASIN CONSTRUCTION	43,250				43,250
REDUCTION OF BORROW DUE TO SELECT MATERIAL			-25,500	-25,500	
PROJECT TOTAL	95,898	147,620	2,225,887	2,199,734	217,366
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				109,987	
GRAND TOTAL	95,898	147,620		2,309,721	
SAY	**100,000**	**150,000**		**2,310,000**	
L, SR1, Y, Y16, Y21, Y22, Y24 PAVEMENT STRUCTURE VOLUME = 1,800 CY					

DRAINAGE DITCH EXCAVATION = 41,460 CY
CLASS IV SUBGRADE STABILIZATION = 950 TONS
6" PERFORATED SUBDRAIN PIPE = 1,000 LF
SELECT GRANUALAR MATERIAL = 49,000 CY

COMPUTED BY: *P. LIVINGSTON* DATE: *6/25/2017*
CHECKED BY: *S. STEPHENS* DATE: *6/29/2017*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
U-4751	*3B-2*

"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

GUARDRAIL SUMMARY

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS					IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	DOUBLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU, TL-3	TEMP GREU, TL-3	CAT-1	AT-1	B-77	G	NG					
L	28+62.50	37+57.00	LT	137.50				30+00.00	10.00	10' BERM							1		1			757.00				
L	29+08.35	38+41.00	RT	493.75			30+75.00		10.00	13.00	50.00		1.00		1				1			441.00				
L	35+31.00	36+46.00	RT																					128.00		
L	39+55.00	41+77.05	LT	218.75			39+55.00		8.00	10' BERM	50.00		1.00		1				1							
Y1	41+21.38	44+48.00	RT	193.75			43+15.00		12.00	12' BERM	50.00		1.00		1				1			133.00				
Y1	40+65.54	44+96.78	MED RT	431.25			42+50.00	44+90.00	0.75	10.75	50.00		1.00		1		1							98.00		
Y1	42+43.75	46+75.00	MED LT	431.25			44+90.00	42+50.00	0.75	10.75	50.00		1.00		1		1									
Y1	43+11.00	48+23.74	LT	143.75			46+80.00		12.00	12' BERM	50.00		1.00		1				1			369.00				
Y1	49+85.00	51+07.00	RT																					128.00		
Y1	50+67.00	52+09.00	LT																					142.00		
Y1	50+43.75	52+00.00	LT	131.25			50+50.00		12.00	12' BERM					1		1									
Y1LPB	17+73.26	19+93.57	RT						6.25	12.00											2		230.00			T-TYPE
L	52+63.00	55+56.25	MED RT	293.75			55+50.00		0.75	10' BERM	50.00		1.00		1		1									
L	55+43.75	55+56.25	MED LT	281.25			55+50.00		0.75	10' BERM	50.00		1.00		1		1									
L	54+11.84	58+25.00	LT	875.00				57+00.00	10.00	13.00							1		1							
L	56+42.62	62+23.87	RT	581.25			57+60.00		10.00	13.00	50.00		1.00		1				1							
L	63+26.87	68+76.87	RT	550.00				68+65.00	10.00	13.00							1		1							
L	63+88.83	68+82.57	LT	493.75			68+50.00		10.00	13.00	50.00		1.00		1				1							
L	70+00.22	90+10.60	RT	293.75			71+44.00	90+00.00	13.50	18.5' BERM					1		1		2			1666.00				
L	80+23.57	82+06.25	MED RT	181.25			82+00.00		0.75	10' BERM	50.00		1.00		1		1									
L	81+93.75	84+60.43	MED LT	268.75			82+00.00		2.00	10' BERM	50.00		1.00		1		1									
L	84+10.40	92+26.33	LT						13.50	16' BERM												901.00				
L	92+91.45	111+68.11	LT						13.50	16' BERM												1876.00				
L	93+91.15	97+81.15	RT						13.50	16' BERM											1	390.00				
L	100+12.47	107+64.53	RT						13.50	16' BERM												795.00				
L	112+31.70	127+58.00	RT	1518.75					14.00	16' BERM	50.00		1.00		1		1									
L	112+67.84	127+27.96	LT						13.50	16' BERM											1	1476.00				
L	128+33.75	158+98.34	LT	143.75			157+54.96		14.00	16' BERM	50.00		1.00		1				1			2882.00				
L	129+24.09	140+66.69	RT						13.50	16' BERM												1143.00				
L	148+33.12	151+56.09	RT	331.25			149+40.00	150+70.00	16.50	16.5' BERM	50.00		1.00		1		1									
L	163+25.00	167+56.25	MED RT	431.25			167+50.00		0.75	10' BERM	50.00		1.00		1		1									
L	167+46.25	169+65.00	MED LT	218.75			167+50.00		0.75	10' BERM	50.00		1.00		1		1									
Y18	12+85.87			12.50																						
Y18	17+80.56			50.00																						2 - TERMINAL END SECTIONS
Y19	20+96.85			37.50																						2 - TERMINAL END SECTIONS
L	222+85.46	224+90.61	MED LT	193.75				224+90.61	4.00	14.00		162.50		6.90	1				1							
L	226+93.28	228+21.99	LT	131.25			226+93.28		6.00	16.00	50.00		1.00		1				1							
L	226+96.96	229+26.88	MED LT	218.75			226+96.96		4.00	23.00	187.50		16.00		1				1							
Y8RPC	23+93.75	33+50.00	LT	956.25			32+30.00	23+93.75	14.00	17.00	50.00		1.00		1		1									
Y8RPD	10+46.63	22+08.28	RT	1143.75			12+00.00	22+00.00	14.00	17.00	50.00		1.00		1		1									
Y8RPDB	32+46.97	34+00.67	RT	156.25			34+00.67		4.00	7.00	137.50		2.75		1				1							
Y8RPDB	32+49.12	34+08.88	LT	156.25			34+08.88		10.00	13.00	137.50		4.35		1				1							
Y8	90+42.82	93+57.50	MED RT	243.75			91+20.00	93+50.00	19.50	23.00	37.50	125.00	2.25	7.50			1		2	1		50.00				
Y8	90+42.82	96+13.75	MED LT	500.00			93+50.00	99+40.00	19.50	23.00	125.00	37.50	7.50	2.25	1				2			50.00				
Y8	98+62.82	100+67.18	MED	225.00			99+40.00	99+90.00	19.50	23.00	37.50	37.50	2.25	2.25					4	2		100.00				
			SUBTOTAL	12668.75																						
LESS ANCHOR DEDUCTIONS		GREU, TL3 (27 @ 50.00')		-1350.00																						
		CAT-1 (18 @ 6.25')		-112.50																						
		B-77 (25 @ 18.75')		-468.75																						
			TOTAL	**10737.50**											27		18		25	3	4	13029.00	230.00	496.00		
			SAY	**10737.50**																						
10 ADDITIONAL GUARDRAIL POSTS																										
TEMPORARY GUARDRAIL																										
Y2	12+70.00	16+50.00	RT	380.00			13+98.00	15+36.00	4.33	0.00	50.00	50.00	1.00	1.00		2										
Y2	13+00.00	16+95.00	LT	395.00			14+20.00	15+49.00	4.91	4.00	50.00	50.00	1.00	1.00		2										
			SUBTOTAL	775.00																						
LESS ANCHOR DEDUCTIONS		GREU, TL3 (4 @ 50.00')		-200.00																						
			TOTAL	**575.00**																						
			SAY	**575.00**												4										

MJBBM60

COMPUTED BY: *NP* DATE: *04/08/2017*

CHECKED BY: *SCS* DATE: *04/10/2017*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
U-4751	*3B-3*

GUIDERAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH DOUBLE FACED CABLE GUIDERAIL	END ANCHOR UNIT	INTERMEDIATE ANCHOR UNIT	COMMENTS	REMOVE EXISTING GUIDERAIL				
L	182+35	207+80	MED	**2,500.00**	2							
Y8	90+02	94+00	MED		2			398				
Y8	98+23	101+07	MED		2			284				
				Totals	**2,500.00**	**6**	**0**		682				
Less End Anchor Units												
Number of End Anchor Units			**6**	at 25' per End Anchor Unit	150	amount to deduct						
Total Guiderail length before End Anchor Unit dedcution				**2,500.00**								
				Deduct for End Anchor Units	150							
				Total Guiderail length (LF)	**2,350.00**							
				Total End Anchor Units (E)	**6**							
				Total Intermediate Anchor Units (E)	**0**							
10 ADDITIONAL GUIDERAIL POSTS												

COMPUTED BY: SCS DATE: 04-15-2017
CHECKED BY: GAM DATE: 04-19-2017

PROJECT NO.	SHEET NO.
U-4751	3B-4

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP
L	31+03	31+51	LT	89	
L	31+51	35+02	LT	405	
L	34+32	37+37	RT	446	
Y1	19+47	25+25	CL	1,756	
Y1	32+09	35+84	CL	1,171	
Y1	40+59	57+32	CL	5,017	
Y1	45+15	49+65	RT	1,653	
Y1	65+26	72+74	CL	2,245	
Y1RPB	26+89	30+97	CL	1,454	
SR1	12+50	13+73	CL	307	
Y4	16+34	16+76	LT	12	
Y4	17+00	18+40	CL	308	
Y5	15+80	16+15	CL	76	
Y8	31+20	73+28	LT	4,487	
Y8	49+11	69+88	RT	2,103	
Y8	85+80	101+85	LT	1,645	
Y8	88+90	94+75	RT	584	
Y8	97+35	102+30	RT	481	
Y8	109+35	121+98	RT	1,261	
Y21	11+40	End of Culdesac	CL	433	
Y22	10+56	11+15	CL	99	
Y24	12+07	11+33	CL	109	
L	29+00	36+40	RT		2,585
L	29+50	34+67	LT		1,281
L	92+24	100+01	CL		2,410
L	111+98	112+40	CL		167
L	127+95	128+33	CL		278
Y3	13+00	14+12	CL		336
Y3	15+25	15+50	CL		62
Y4	15+83	17+00	LT		236
Y5	13+75	14+39	CL		194
Y5	15+53	15+80	CL		60
Y12	15+02	15+39	CL		184
Y12 (TEMPORARY)	11+03	11+43	CL	249	
		TOTAL:		26,389	7,791
		SAY:		**26,400**	**7,800**

SHOULDER BERM GUTTER SUMMARY

LINE	Station	Station	LOCATION LT/RT/CL	LENGTH
L	54+17.84	62+61.96	LT	844.12
L	56+92.62	62+01.25	RT	508.63
L	63+50.73	68+70.62	RT	519.89
L	64+11.44	68+32.58	LT	421.14
L	223+35.21	224+66.71	LT	131.50
Y8RPC	24+00.00	33+00.00	RT	900.00
Y8RPD	11+00.00	22+08.89	RT	1,108.89
Y8RPDB	36+50.55	36+82.81	LT	32.26
			TOTAL:	4,466.43
			SAY:	4,500

WOVEN WIRE FENCE, 47" FABRIC

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS
L	138+20.00	143+80.00	RT	610.37	2	4	0	35	16
L	145+35.00	150+34.35	RT	608.72	2	5	0	33	19
L	150+84.37	175+50.40	RT	2,558.24	2	6	6	161	40
L	138+38.64	202+94.01	LT	6,590.93	2	13	17	419	94
L	176+55.00	200+00.00	RT	2,395.00	1	4	6	154	32
L	-L- END	235+55.00		1,218.43	0	0	3	82	9
Y8	63+00.00	64+03.66	RT	105.48	1			6	2
Y8	40+09.39	40+62.49	LT	69.67		3		0	9
Y8RPA	15+00.00	33+72.99	LT	1,754.54	1	2	4	114	20
Y8RPB	27+60.00	33+03.84	RT	532.20		1	2	33	9
Y8RPC	10+00.00	34+66.23	LT	2,441.94		2	7	160	27
Y8RPCA	52+33.79	68+92.88	LT	1,638.24		0	5	109	15
Y8RPD	10+00.00	27+93.10	RT	1,702.36	1	1	5	111	20
Y8RPDB	10+04.74	22+93.35	RT	1,264.86		2	3	82	15
Y8RPDB	55+79.90	68+50.00	RT	1,229.85	1	1	3	80	14
		TOTAL:		24,720.83				1,579	341
		SAY:		**24,730**				**1,580**	**341**

CHAIN LINK FENCE, 48" FABRIC

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS
Y1RPD	11+57.92	52+50.00	RT	2,857.11	2	5	6	240	13
L	27+00.00	30+00.00	LT	323.45	2	3	0	27	5
Y1	37+15.00	62+85.83	LT	3,058.95	2	6	7	257	15
Y1	51+96.54	62+23.87	RT	2,367.33	2	3	6	198	11
L	63+88.83	84+10.42	LT	2,148.82	2	4	5	180	11
Y2	15+22.01	16+05.22	LT	75.74	2			6	2
L	62+89.54	74+00.00	RT	1,193.93	1	4	3	100	8
L	90+00.00	92+45.00	RT	241.72	2	1	0	20	3
L	93+15.20	102+19.72	LT	911.81	2	1	2	76	5
L / Y12	97+81.15	11+54.84	RT	251.09	2	2		21	4
Y12	10+86.30	11+26.91	LT	38.33	2			3	2
L / Y4	107+64.53	18+21.29	RT	382.21	2	3	0	32	5
Y4 / L	17+16.97	116+68.00	LT/RT	546.86	2	2	1	46	5
L / Y5	111+27.00	16+30.00	RT	1,122.34	2	3	2	94	7
Y5 / L	13+66.58	138+38.64	LT	1,047.75	2	2	1	87	5
Y5 / L	16+72.26	138+20.00	LT/RT	996.85	2		3	83	5
		TOTAL:		17,564.29				1471	106
		SAY:		**17,565**				**1472**	**106**

CHAIN LINK FENCE, 72" FABRIC

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS
L	33+27.86	38+50.51	RT	1045.73	2	3	1	87.48	6
L	93+15.20	102+20.02	LT	911.81	2	1	2	76.15	5
L	128+36.55	134+59.03	LT	621.50	2	1	1	51.79	4
Y1RPD	20+97.79	34+90.71	LT	2056.65	1	7	2	172.72	10
		TOTAL:		4,635.69				388.14	25
		SAY:		**4,636**				**389**	**25**

TICIVILWORK717

COMPUTED BY: MSP **DATE:** 6/30/2017
CHECKED BY: EV **DATE:** 6/30/2017

PROJECT NO.	SHEET NO.
U-4751	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)

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

LINE & STATION	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE		FROM	TO					12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12	15	18	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48			MASONRY	0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE		GRATE TYPE E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															
THICKNESS OR GAUGE				FT.	FT.	FT.	%										.064	.064	.064																									CY	CY	CY	EACH	LIN. FT.	LIN. FT.																																			CY	CY	CY	LIN. FT.	
L 19+42	28 LT	0401																																																																																		0.3990			PIPE COLLAR
		0401	0402		31.5	31.4																							12																																																											
L 19+42	41 LT	0402		34.0																																											1			1		1						1																														Clean Out Ex. 15"RCP
		0402	0417		29.5	28.6																										172																																																								
L 12+10	38 RT	0404		31.1																																											1			1			1																																			
		0404	0410		27.9	26.2																							36																																																											
L 13+90	40 RT	0405		31.7																																											1			1			1																																			
		0405	0411		28.4	26.8																							36																																																											
L 15+85	53 RT	0406		32.5																																											1			1			1																																			
		0406	0412		28.7	27.4																							36																																																											
L 18+20	41 RT	0407		33.1																																											1			1			1																																			
		0407	0439		29.9	29.0																							140																																																											
L 19+60	53 RT	0408		33.7																																											1			1			1																																			
		0408	0414		29.5	28.9																							36																																																											
L 17+15	65 LT	0416		34.3																																											1	1.3		1		1																																					
		0416	0415		28.0	27.0																											116																																																							
L 17+70	54 LT	0417		33.6																																											1	0.5		1		1																																					
		0417	0416		28.1	28.0																											56																																																							
L 16+60	41 LT	0419		32.7																																											1			1		1																																					
		0419	0420		28.4	28.1																							104																																																											
L 15+55	41 LT	0420		32.7																																											1			1		1																																					
		0420	0418		28.1	26.8																							32																																																											
L 13+85	38 LT	0421		31.9																																											1			1		1																																					
		0421	0425		28.7	26.3																							32																																																												
L 11+75	39 LT	0422		31.3																																											1			1		1																																					
		0422	0426		28.1	25.7																							28																																																											
L 17+77	73 LT	0424																																																																																						RETAIN EXIST. OUTLET CONTROL STR.
L 11+43	65 LT	0427																																										4.500																																													
		0427	0428		25.6	25.2																												12																																																						
L 11+42	55 LT	0428																																																																																			0.8856			PIPE COLLAR
L 11+76	72 RT	0432																																																																																							OPEN END PIPE
		0432	0429		26.1	21.3																										48																																																								RETAIN JB
L 16+80	53 RT	0439		32.3																																											1			1			1																																			
		0439	0406		29.0	28.7																							96																																																											
L 20+93	41 LT	0501		35.3																																											1			1		1																																					
		0501	0402		30.3	29.5																										148																																																								
L 23+29	42 LT	0503		37.5																																											1	0.7		1		1																																					
		0503	0501		31.8	30.3																									232																																																										
L 23+38	64 LT	0504		36.6																																											1															1								1																				
		0504	0503		31.9	31.8																									24																																																										
Y 31+13	34 RT	0506		36.9																																											1			1	1							2																														Clean Out Ex. 15",12"RCP
		0506	0504		32.4	31.9																									52																																																										
Y 31+03	5 LT	0507		37.5																																																																												1									
Y 30+55	48 LT	0508		36.5																																											1			1	1																																						
		0508	0507		34.7	33.5																				64																																																																	
L 25+05	10 RT	0512		38.7																																											1								1				1	1																													
		0512	0555		35.5	35.3																					60																																																															
L 26+90	2 RT	0513		40.0																																											1								1				1	1																													
		0513	0520		35.8	35.2																					88																																																															
L 28+25	45 LT	0515		41.3																																											1	2.3		1		1																																					
SHEET TOTALS																												64	736		308	368	172	12										4.500			21	4.8		18	2	10	6		2			3	2	2	1								1									1						1.2846			

TICIVILWORK717

COMPUTED BY:	MSP	DATE:	6/30/2017
CHECKED BY:	EV	DATE:	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

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

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

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V							
		FROM	TO	FT.	FT.	FT.	%	12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12	15	18	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48
																	.064	.064	.064																								
L 29+00	45 LT	0516		42.3																																							
		0516	0515		37.8	36.5																								76													
L 20+15	53 RT	0517		34.1																																							
		0517	0408		29.9	29.5																							56														
L 22+45	53 RT	0519		35.9																																							
		0519	0529		32.6	30.0																							36														
L 26+00	9 RT	0520		39.2																																							
		0520	0521		35.2	35.1																							16														
L 26+03	24 RT	0521		38.8																																							
		0521	0535		32.7	32.5																													48								
L 28+27	17 RT	0522		41.5																																							
L 29+67	17 RT	0523		44.8																																							
L 31+53	23 RT	0524		52.4																																							
L 32+60	10 RT	0526		56.7																																							
		0526	0552		52.2	51.4																							52														
L 20+98	68 LT	0528																																									
		0528	0501		33.7	31.9																						24															
L 22+54	89 RT	0529		32.2																																							
		0529	0530		30.0	29.5																							56														
L 28+26	21 LT	0533		41.5																																							
Y1RPD 15+00	42 RT	0538		32.3																																							
		0538	0554		30.0	29.6																							36														
Y1RPD 11+40	2 RT	0540		36.6																																							
		0540	0542		32.3	31.4																							52														
Y1RPD 13+45	2 RT	0541		35.8																																							
		0541	0543		31.5	30.0																							44														
L 31+50	42 LT	0550		51.3																																							
		0550	0553		46.8	41.2																								144													
L 31+74	60 LT	0551																																									
		0551	0524		37.0	36.1																										84											
L 32+60	44 LT	0552		55.6																																							
		0552	0550		51.4	47.0																							108														
L 30+05	42 LT	0553		45.7																																							
		0553	0516		41.2	37.8																								104													
L 25+65	7 RT	0555		39.0																																							
		0555	0520		35.3	35.2																							32														
L 27+35	2 RT	0556		39.8																																							
		0556	0513		36.3	35.8																							44														
L 28+25	58 LT	0572																																									
		0572	0515		34.8	34.0																													8								
L 32+41	80 LT	0558		41.4																																							
		0558	0559		38.5	38.2																									60												
Y1 34+60	74 LT	0601		46.8																																							
		0601	0602		42.2	41.8																									148												
Y1 36+11	74 LT	0602		46.4																																							
		0602	0605		41.8	41.2																									176												
Y1 36+22	129 LT	0603																																									
		0603	0602		42.9	42.3																								56													
Y1RPA 20+90	44 LT	0604																																									
		0604	0671		41.1	40.8																								92													
SHEET TOTALS																												24	532	472	384	84			56								

LINE & STATION	STRUCTURE NUMBER		ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	PIPE CLEAN OUT	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 W/ 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/ 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	ADJUST M.H.	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
	FROM	TO	CY	CY	MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																											CY	CY	CY	LIN. FT.	
L 29+00	0516					1			1		1						2																													Clean out Ex. 48" RCP
	0516	0515																																												
L 20+15	0517					1			1			1																																		
	0517	0408																																												
L 22+45	0519					1			1			1																																		
	0519	0529																																												
L 26+00	0520					1																									1				1											
	0520	0521																																												
L 26+03	0521					1	1.1																																							SPECIAL T.B.J.B., SLAB LID
	0521	0535																																												
L 28+27	0522					1	2.7										3																		1											SPECIAL TBJB w/ MHClean out Ex. 48",30" RCP
L 29+67	0523					1	5.0	0.1																								1			1											
L 31+53	0524					1	5.0	6.8									1																		1											SPECIAL T.B.J.B., Clean out Ex. 36" DIP
L 32+60	0526					1			1		1																																			
	0526	0552																																												
L 20+98	0528																																													RETAIN EXIST. RISER
	0528	0501																																												
L 22+54	0529					1												1	1																											
	0529	0530																																												
L 28+26	0533					1	2.6																																							SPECIAL T.B.J.B., SLAB LID
Y1RPD 15+00	0538					1														1						1																				
	0538	0554																																												
Y1RPD 11+40	0540					1								1				1	1																											
	0540	0542																																												
Y1RPD 13+45	0541					1								1				1	1																											
	0541	0543																																												
L 31+50	0550					1																		1									1													
	0550	0553																																												
L 31+74	0551																																													OPEN END PIPE
	0551	0524																																												
L 32+60	0552					1																		1									1													
	0552	0550																																												
L 30+05	0553					1																		1									1													
	0553	0516																																												
L 25+65	0555					1								1				1	1																											
	0555	0520																																												
L 27+35	0556					1			1			1			1																															
	0556	0513																																												
L 28+25	0572																																									1.0126			COLLAR AND EXTEND
	0572	0515																																												
L 32+41	0558					1			1		1																																			
	0558	0559																																												
Y1 34+60	0601					1			1			1																																		
	0601	0602																																												
Y1 36+11	0602					1			1			1																																		
	0602	0605																																												
Y1 36+22	0603																																													OPEN END PIPE
	0603	0602																																												
Y1RPA 20+90	0604																																													OPEN END PIPE
	0604	0671																																												
SHEET TOTALS						22	16.4	6.9	8		3	5		3	1		6	4	4	1				3		1				1	1	3		4								1.0126			

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:	MSP	DATE:	6/30/2017
CHECKED BY:	EV	DATE:	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	15 .064	18 .064	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' 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	CONCRETE TRANSITIONAL SECTION C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
Y1 37+87	64 LT	0605		46.1																																											1	0.4		1			1																																		
		0605	0668		40.7	40.6																										60																																																							
Y1 40+00	50 LT	0606		45.9																																											1			1	1																																				
		0606	0681		42.7	42.5																							60																																																										
Y1 40+50	50 LT	0607		46.0																																											1			1		1																																			
		0607	0652		42.4	40.7																								148																																																									
Y1 44+18	62 LT	0608		45.6																																											1	1.1		1			1																																		
		0608	0609		39.5	39.3																										124																																																							
Y1 45+42	62 LT	0609		45.4																																											1	1.1		1	1																																				
		0609	0626		39.3	39.0																												108																																																					
Y1 47+00	62 LT	0610		45.8																																											1	1.2		1		1																																			
		0610	0609		39.6	39.3																										156																																																							
Y1 49+70	50 LT	0611		46.1																																											1			1			1																																		
		0611	0612		42.6	42.4																								80																																																									
Y1 50+52	62 LT	0612		45.7																																											1			1			1																																		
		0612	0613		41.9	41.6																									96																																																								
Y1 51+46	62 LT	0613		45.1																																											1			1			1																																		
		0613	0614		41.6	41.1																									96																																																								
Y1 52+42	62 LT	0614		44.9																																											1			1	1																																				
		0614	0635		40.6	40.4																										108																																																							
Y1 53+50	51 LT	0615		45.5																																											1			1		1																																			
		0615	0614		41.4	41.1																								108																																																									
Y1 57+80	49 LT	0616		45.7																																											1	0.4		1			1																																		
		0616	0617		40.3	40.0																								92																																																									
Y1 58+74	50 LT	0617		45.5																																											1	1.0		1	1																																				
		0617	0618		39.5	39.0																									124																																																								
Y1 60+00	50 LT	0618		45.7																																											1	1.7		1		1																																			
		0618	2801		39.0	38.1																									300																																																								
Y1 35+80	49 RT	0619		47.1																																											1	0.8		1		1																																			
		0619	0620		41.3	40.9																									156																																																								
Y1 37+35	49 RT	0620		46.6																																											1	1.2		1		1																																			
		0620	0621		40.4	40.1																										108																																																							
Y1 38+45	49 RT	0621		46.3																																											1	1.2		1		1																																			
		0621	0677		40.1	39.5																										68																																																							
Y1 40+00	49 RT	0623		45.9																																											1			1	1																																				
		0623	0621		42.7	41.3																							156																																																										
Y1 41+50	49 RT	0624		46.2																																											1			1			1																																		
		0624	0625		42.0	41.3																							224																																																										
Y1 43+75	49 RT	0625		46.1																																											1			1		1																																			
		0625	0626		41.3	40.8																							168																																																										
Y1 45+42	49 RT	0626		45.7																																											1	1.7		1	1																																				
		0626	0690		39.0	38.9																												48																																																					
Y1 46+40	49 RT	0628		45.9																																											1	1.7		1			1																																		
		0628	0626		39.2	39.0																											96																																																						
Y1 47+30	49 RT	0631		46.2																																											1	1.8		1			1																																		
		0631	0628		39.4	39.2																											88																																																						
Y1RPD 34+19	24 LT	0632		45.1																																											1			1	1																																				
		0632	0695		40.5	40.4																								20																																																									
Y1RPD 34+19	24 RT	0633		45.1																																											1			1	1																																				
		0633	0632		40.6	40.5																								48																																																									
SHEET TOTALS																													608	496	772	624	184	156													25	15.3		25	8	8	9																																		

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

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TICIVILWORK717

COMPUTED BY:	MSP	DATE:	6/30/2017
CHECKED BY:	EV	DATE:	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-4

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	15 .064	18 .064	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' 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	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
Y1 51+00	49 RT	0634		45.6																																											1	0.4		1		1																																	
		0634	0631		40.2	39.4																											368																																																						
Y1 52+42	49 RT	0635		45.2																																											1			1	1																																		
		0635	0634		40.4	40.2																										140																																																							
Y1 53+50	49 RT	0636		45.6																																											1			1			1																																
		0636	0635		42.3	41.7																								108																																																												
Y1 57+00	49 RT	0637		45.9																																											1			1		1																																	
		0637	0638		41.7	41.4																								108																																																												
Y1 58+10	49 RT	0638		45.6																																											1			1		1																																	
		0638	0639		41.4	41.2																								64																																																											
Y1 58+74	49 RT	0639		45.5																																											1			1	1																																		
		0639	0640		40.9	40.5																									124																																																										
Y1 60+00	50 RT	0640		45.7																																											1	0.2		1			1																																
		0640	2809		40.5	39.6																									300																																																											
L 33+25	10 RT	0641		59.4																																											1			1		1																																	
		0641	0526		54.9	52.2																								64																																																												
L 34+00	10 RT	0642		62.5																																											1			1		1																																	
		0642	0641		58.0	54.9																								72																																																												
L 36+00	10 RT	0643		69.6																																											1			1		1																																	
		0643	0642		65.1	58.0																								200																																																												
L 41+50	10 RT	0644		69.4																																											1	0.6		1			1																																
		0644	0645		63.8	53.4																									304																																																										
L 44+50	10 RT	0645		58.2																																											1			1			1																																
		0645	0646		53.4	49.2																									128																																																											
L 45+75	10 RT	0646		54.0																																											1			1			1																																
		0646	0622		49.2	46.7																									68																																																											
L 40+50	56 LT	0647		68.8																																											1			1			1																																
		0647	0684		64.3	64.1																									64																																																											
Y1LPB 12+60	15 LT	0648		60.4																																											1			1			1																																
		0648	0627		56.0	42.4											88																																																																											
Y1LPB 16+00	14 LT	0649		47.9																																											1			1			1																																
		0649	0686		44.6	43.4																								32																																																													
Y1LPB 19+50	14 LT	0650		46.1																																											1			1			1																																
		0650	0688		42.9	42.3																								28																																																												
Y1LPB 22+86	14 LT	0651		44.6																																											1			1	1																																		
		0651	0652		41.4	41.0																								28																																																												
Y1 42+00	54 LT	0652		47.0																																											1	1.8																									1	1													4' DIA STRUCTURE
		0652	0691		40.2	39.9																										100																																																									
Y1 56+50	71 LT	0653		45.2																																											1			1	1																																		
		0653	0663		42.2	41.8																								20																																																												
L 39+90	56 LT	0654		70.0																																											1			1			1																																
		0654	0647		65.7	64.6																								56																																																												
Y1RPD 31+00	2 RT	0655		49.3																																											1								1				1	1																											
		0655	0656		45.1	44.5																								48																																																													
Y1RPD 31+50	2 RT	0656		48.7																																											1								1				1	1																											
		0656	0674		44.5	43.2																								40																																																												
Y1RPD 33+00	24 RT	0657		46.1																																											1			1		1																																	
		0657	0633		41.3	40.6																									120																																																										
Y1 34+80	49 RT	0658		47.4																																											1	0.8		1		1																																	
		0658	0619		41.6	41.3																										100																																																									
						SHEET TOTALS												88												868	1108	200	140	368															25	3.8		22	4	8	10		2				2	2														1	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
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T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TICIVILWORK717

COMPUTED BY: MSP DATE: 6/30/2017
CHECKED BY: EV DATE: 6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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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 %
Y1 35+11	76 RT	0659		44.8			
		0659	0661		42.0	41.9	
Y1 37+90	88 LT	0660					
		0660	0605		42.0	41.7	
Y1 35+60	76 RT	0661		44.7			
		0661	0662		41.9	41.8	
Y1 35+91	87 RT	0662		45.3			
		0662	0675		41.8	41.6	
Y1 56+50	50 LT	0663		46.1			
		0663	0616		41.8	40.6	
Y1 57+80	74 LT	0664		42.9			
		0664	0616		40.7	40.6	
Y1 51+00	78 RT	0665		44.1			
		0665	0634		41.6	40.3	
Y1 58+24	7 LT	0666		46.8			
		0666	0667		42.6	42.4	
Y1 58+74	7 RT	0667		46.8			
		0667	0639		42.4	41.2	
Y1 38+47	74 LT	0668		47.0			
		0668	0679		40.6	40.4	
L 37+85	10 RT	0669		72.9			
		0669	0694		68.3	66.5	
Y1 47+00	90 LT	0670		45.5			
		0670	0610		39.6	39.6	
Y1 48+93	98 LT	0671		43.8			
		0671	0670		40.3	39.8	
Y1 51+46	80 LT	0672		44.9			
		0672	0613		42.7	42.3	
Y1 40+50	68 LT	0673					
		0673	0607		42.5	42.4	
Y1RPD 31+50	42 RT	0674		45.9			
		0674	0657		43.2	41.6	
Y1LPB 23+90	40 LT	0676					
		0676	0691		41.0	39.9	
Y1 39+08	7 LT	0678		47.4			
		0678	0679		43.0	41.6	
Y1 38+45	7 LT	0679		47.6			
		0679	0621		40.4	40.1	
Y1 39+40	50 LT	0681		46.0			
		0681	0668		42.5	41.8	
L 37+27	51 LT	0682		70.0			
		0682	0694		66.7	66.5	
L 34+00	47 LT	0683		60.5			
		0683	0552		56.3	51.4	
L 40+50	9 RT	0684		71.6			
		0684	0644		64.1	63.8	
Y1 39+67	4 RT	0685		47.4			
		0685	0678		43.2	43.0	
Y1 34+60	91 LT	0689		47.0			
		0689	0601		43.9	43.0	

FROM	TO	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V							
		12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12	15	18	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48
											.064	.064	.064																								
0659																																					
0659	0661																					48															
0660																																					
0660	0605																							28													
0661																																					
0661	0662																					32															
0662																																					
0662	0675																					40															
0663																																					
0663	0616																						128														
0664																																					
0664	0616																						24														
0665																																					
0665	0634																							28													
0666																																					
0666	0667																						52														
0667																																					
0667	0639																						40														
0668																																					
0668	0679																									68											
0669																																					
0669	0694																						56														
0670																																					
0670	0610																									28											
0671																																					
0671	0670																								192												
0672																																					
0672	0613																						20														
0673																																					
0673	0607																							20													
0674																																					
0674	0657																						148														
0676																																					
0676	0691																								24												
0678																																					
0678	0679																						60														
0679																																					
0679	0621																									56											
0681																																					
0681	0668																							96													
0682																																					
0682	0694																						60														
0683																																					
0683	0552																						136														
0684																																					
0684	0644																							100													
0685																																					
0685	0678																						60														
0689																																					
0689	0601																						16														
SHEET TOTALS																						120	800	272	216	152											

FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B))			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 2 GRATES STD. 840.29
				MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05														
0659					1			1			1																	
0659	0661																											
0660																												
0660	0605																											
0661					1			1	1																			
0661	0662																											
0662					1																							
0662	0675																											
0663					1			1			1																	
0663	0616																											
0664					1												1	1										
0664	0616																											
0665					1												1	1										
0665	0634																											
0666					1								1				1	1										
0666	0667																											
0667					1								1				1	1										
0667	0639																											
0668					1	1.4																						
0668	0679																											
0669					1			1		1																		
0669	0694																											
0670					1	0.9													1						1			
0670	0610																											
0671					1														1						1			
0671	0670																											
0672					1												1	1										
0672	0613																											
0673																												
0673	0607																											
0674					1															1							1	
0674	0657																											
0676																												
0676	0691																											
0678					1								1				1	1										
0678	0679																											
0679					1	2.2							1				1	1										
0679	0621																											
0681					1			1			1																	
0681	0668																											
0682					1																		1					
0682	0694																											
0683					1																		1					
0683	0552																											
0684					1	2.5		1			1																	
0684	0644																											
0685					1								1				1	1										
0685	0678																											
0689					1												1	1										
0689	0601																											
SHEET TOTALS					22	7.0		6	1	1	4		5				9	9	2	1			2		2		1	

FROM	TO	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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
0659																		
0659	0661																	
0660																		OPEN END PIPE
0660	0605																	
0661																		
0661	0662																	
0662		1				1												
0662	0675																	RETAIN EXIST. MH
0663																		
0663	0616																	
0664																		
0664	0616																	
0665																		
0665	0634																	
0666																		
0666	0667																	
0667																		
0667	0639																	
0668		1				1												
0668	0679																	
0669																		
0669	0694																	
0670																		
0670	0610																	
0671																		
0671	0670																	
0672																		
0672	0613																	
0673																		OPEN END PIPE
0673	0607																	
0674																		
0674	0657																	
0676																		OPEN END PIPE
0676	0691																	
0678																		
0678	0679																	
0679																		
0679	0621																	
0681																		
0681	0668																	
0682				1														
0682	0694																	
0683				1														
0683	0552																	
0684																		
0684	0644																	
0685																		
0685	0678																	
0689																		
0689	0601																	
SHEET TOTALS		2		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

TICIVILWORK717

COMPUTED BY:	MSP	DATE:	6/30/2017
CHECKED BY:	EV	DATE:	6/30/2017

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-4751	3D-6

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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V							
SIZE								12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12	15	18	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%										.064	.064	.064																								
Y1LPB 23+90	18 LT	0691		46.2																																							
		0691	0608		39.7	39.5																										116											
Y1 58+74	73 RT	0692		44.4																																							
		0692	0639		41.5	41.2																							24														
Y1 58+74	91 RT	0693		44.4																																							
		0693	0692		41.6	41.5																							16														
L 37+27	10 RT	0694		72.2																																							
		0694	0643		66.5	65.1																							128														
Y1RPD 34+19	44 LT	0695		43.6																																							
		0695	0680		40.4	40.0																								56													
L 35+04	73 RT	0696		42.7																																							
		0696	2716		34.0	29.0						456		X	X	X																											
L 37+16	134 RT	0697																																									
		0697	0696		35.0	34.0						256		X	X	X																											
L 54+28	81 LT	0701		51.7																																							
		0701	0714		47.5	44.6												28																									
L 56+00	69 LT	0702		53.3																																							
		0702	0715		49.0	44.5												32																									
L 57+80	56 LT	0703		57.5																																							
		0703	0716		53.2	44.2												48																									
L 57+00	56 RT	0706		55.4																																							
		0706	0719		51.2	45.4												36																									
L 57+45	56 RT	0721		56.5																																							
		0721	0706		52.3	51.2																							44														
L 59+50	56 LT	0801		63.3																																							
		0801	0821		59.1	44.8												60																									
L 61+30	56 LT	0802		67.7																																							
		0802	0822		63.5	44.5												76																									
L 64+80	56 LT	0803		67.6																																							
		0803	0823		63.4	44.0												76																									
L 66+55	56 LT	0804		63.2																																							
		0804	0824		59.0	44.6												60																									
L 68+30	56 LT	0805		56.8																																							
		0805	0825		52.5	45.3												40																									
L 59+55	56 RT	0806		63.5																																							
		0806	0826		59.3	44.4												64																									
L 61+25	56 RT	0807		67.7																																							
		0807	0827		63.4	44.4												76																									
L 64+80	56 RT	0808		67.6																																							
		0808	0831		63.4	46.7												56																									
L 66+55	56 RT	0809		63.2																																							
		0809	0819		59.0	46.2												44																									
L 68+30	56 RT	0810		56.8																																							
		0810	0820		52.5	45.6												28																									
L 66+55	101 RT	0819		49.9																																							
		0819	0829		46.2	44.2												32																									
L 68+30	83 RT	0820		49.3																																							
		0820	0830		45.6	43.6												32																									
L 64+80	114 RT	0831		50.4																																							
		0831	0828		46.7	44.7												32																									
							SHEET TOTALS					712						820											212	56		116											

STRUCTURE NUMBER FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	PIPE CLEAN OUT	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 W/ 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/ 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	ADJUST M.H.	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
				MASONRY	0' THRU 5'	5' THRU 10' A	10' AND ABOVE B		GRATE TYPE				D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															
		CY	CY	CY	EACH	LIN. FT.	LIN. FT.		E	F	G																													CY	CY	CY	LIN. FT.	
0691					1	1.5																										1	1												4' DIA STRUCTURE
0691	0608																																												
0692					1			1	1																																				
0692	0639																																												
0693					1			1	1																																				
0693	0692																																												
0694					1	0.7		1		1																																			
0694	0643																																												
0695					1															1							1																		
0695	0680																																												
0696					1	3.7																							1				1												
0696	2716																																												
0697					1	2.2																																	1						POND OUTLET STRUCTURE
0697	0696																																												
0701					1															1			1																						
0701	0714																																												
0702					1															1			1																						
0702	0715																																												
0703					1															1			1																						
0703	0716																																												
0706					1															1			1																						
0706	0719																																												
0721					1															1			1																						
0721	0706																																												
0801					1															1			1																						
0801	0821																																												
0802					1															1			1																						
0802	0822																																												
0803					1															1			1																						
0803	0823																																												
0804					1															1			1																						
0804	0824																																												
0805					1															1			1																						
0805	0825																																												
0806					1															1			1																						
0806	0826																																												
0807					1															1			1																						
0807	0827																																												
0808					1															1			1																						
0808	0831																																												
0809					1															1			1																						
0809	0819																																												
0810					1															1			1																						
0810	0820																																												
0819					1																								1				1												
0819	0829																																												
0820					1																								1				1												
0820	0830																																												
0831					1																								1				1												
0831	0828																																												
SHEET TOTALS					25	8.1		3	2	1										16			15				1		4			1	5						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

TICIVILWORK717

COMPUTED BY: MSP **DATE:** 6/30/2017

CHECKED BY: EV **DATE:** 6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-7

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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)						DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V							
SIZE									12	15	18	24	30	36				12	15	18	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48
THICKNESS OR GAUGE			FROM	TO	FT.	FT.	FT.	%										.064	.064	.064																								
L 71+00	53	LT	0901		49.5																																							
			0901	0925		45.3	44.0												32																									
L 72+50	56	LT	0902		48.3																																							
			0902	0926		44.0	43.5												28																									
L 74+00	56	LT	0903		47.5																																							
			0903	0927		44.5	43.3												28																									
L 75+50	56	LT	0904		46.8																																							
			0904	0928		42.9	42.9												24																									
L 79+30	14	LT	0908		49.3																																							
			0908	0917		44.8	42.8																								68													
L 80+50	12	LT	0909		50.1																																							
			0909	0908		45.6	44.8																								120													
L 71+00	53	RT	0910		49.5																																							
			0910	0929		45.3	43.5												40																									
L 73+00	57	RT	0911		48.0																																							
			0911	0912		44.8	43.7																								64													
L 73+50	98	RT	0912		46.7																																							
			0912	0930		43.7	43.7												28																									
L 74+50	76	RT	0913		46.8																																							
			0913	0914		43.6	43.3																									100												
L 75+50	57	RT	0914		46.8																																							
			0914	0904		43.3	43.0																									112												
L 76+52	57	RT	0915		46.6																																							
			0915	0920		43.4	42.0																								120													
L 77+75	57	RT	0916		46.9																																							
			0916	0915		41.5	39.8																									124												
L 79+30	56	RT	0917		47.6																																							
			0917	0916		42.8	42.0																									152												
L 80+50	54	RT	0918		47.6																																							
			0918	0917		43.4	43.0																								116													
L 74+00	12	LT	0919		48.9																																							
			0919	0903		44.7	44.5																								44													
L 77+75	57	LT	0921		47.7																																							
			0921	0920		39.8	39.5																										68											
L 76+52	56	LT	0924		46.6																																							
			0924	0922		43.3	38.0												64																									
L 85+70	10	LT	1001		49.8																																							
			1001	1011		45.3	43.1																								60													
L 87+75	10	LT	1002		48.8																																							
			1002	1012		44.8	41.3																								60													
L 90+00	11	LT	1003		47.9																																							
			1003	1013		43.7	40.7																								72													
L 91+24	11	LT	1004		47.6																																							
			1004	1014		41.0	39.3																										72											
Y3 12+78	14	RT	1005		43.9																																							
			1005	1025		40.1	39.8																								120													
Y3 12+78	14	LT	1006		43.9																																							
			1006	1005		40.2	40.1																								28													
L 94+45	7	RT	1008		47.9																																							
			1008	1032		42.8	42.4																								108													
						SHEET TOTALS													244												980	488	140												

LINE & STATION	STRUCTURE NUMBER		ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
					MASONRY		A	B		GRATE TYPE				D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															
	FROM	TO	CY	CY	CY	0' THRU 5' EACH	5' THRU 10' LIN. FT.	10' AND ABOVE LIN. FT.		E	F	G																														CY	CY	CY	LIN. FT.	
L 71+00	0901					1			1			1																																		
	0901	0925																																												
L 72+50	0902					1			1			1																																		
	0902	0926																																												
L 74+00	0903					1			1			1																																		
	0903	0927																																												
L 75+50	0904					1			1			1																																		
	0904	0928																																												
L 79+30	0908					1			1			1																																		
	0908	0917																																												
L 80+50	0909					1			1			1																																		
	0909	0908																																												
L 71+00	0910					1			1		1																																			
	0910	0929																																												
L 73+00	0911					1			1		1																																			
	0911	0912																																												
L 73+50	0912					1			1		1																																			
	0912	0930																																												
L 74+50	0913					1			1		1																																			
	0913	0914																																												
L 75+50	0914					1			1		1																																			
	0914	0904																																												
L 76+52	0915					1			1	1																																				
	0915	0920																																												
L 77+75	0916					1			1			1																																		
	0916	0915																																												
L 79+30	0917					1			1			1																																		
	0917	0916																																												
L 80+50	0918					1			1			1																																		
	0918	0917																																												
L 74+00	0919					1								1				1	1																											
	0919	0903																																												
L 77+75	0921					1	2.9		1		1																																			
	0921	0920																																												
L 76+52	0924					1			1	1																																				
	0924	0922																																												
L 85+70	1001					1			1		1																																			
	1001	1011																																												
L 87+75	1002					1								1				1	1																											
	1002	1012																																												
L 90+00	1003					1								1				1	1																											
	1003	1013																																												
L 91+24	1004					1	1.6							1				1	1																											
	1004	1014																																												
Y3 12+78	1005					1			1			1																																		
	1005	1025																																												
Y3 12+78	1006					1			1		1																																			
	1006	1005																																												
L 94+45	1008					1	0.1							1				1	1																											
	1008	1032																																												
SHEET TOTALS						25	4.6		20	2	8	10		5				5	5																											

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

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COMPUTED BY: MSP **DATE:** 6/30/2017

CHECKED BY: EV **DATE:** 6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-8

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)

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

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	Side Drain Pipe 15	Side Drain Pipe 18	Side Drain Pipe 24	Side Drain Pipe 30	Side Drain Pipe 36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	CAAP 15 .064	CAAP 18 .064	R. C. PIPE CLASS III 12	R. C. PIPE CLASS III 15	R. C. PIPE CLASS III 18	R. C. PIPE CLASS III 24	R. C. PIPE CLASS III 30	R. C. PIPE CLASS III 36	R. C. PIPE CLASS III 42	R. C. PIPE CLASS III 48	R. C. PIPE CLASS IV 12	R. C. PIPE CLASS IV 15	R. C. PIPE CLASS IV 18	R. C. PIPE CLASS IV 24	R. C. PIPE CLASS IV 30	R. C. PIPE CLASS IV 36	R. C. PIPE CLASS IV 42	R. C. PIPE CLASS IV 48	R. C. PIPE CLASS V 12	R. C. PIPE CLASS V 15	R. C. PIPE CLASS V 18	R. C. PIPE CLASS V 24	R. C. PIPE CLASS V 30	R. C. PIPE CLASS V 36	R. C. PIPE CLASS V 42	R. C. PIPE CLASS V 48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' 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	CONCRETE TRANSITIONAL SECTION C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
L 94+45	63 LT	1009		46.9																																											1			1		1																																	
		1009	1008		43.0	42.8																							68																																																								
L 95+30	64 LT	1010		46.5																																											1			1		1																																	
		1010	1009		43.2	43.0																							84																																																							
L 85+70	51 RT	1011		47.3																																											1			1		1																																	
		1011	1012		43.1	41.3																							192																																																								
L 87+75	52 RT	1012		46.3																																											1			1		1																																	
		1012	1013		41.3	40.7																									212																																																				
L 90+00	64 RT	1013		44.7																																											1			1		1																																	
		1013	1016		40.7	40.3																									104																																																					
L 91+24	63 RT	1014		44.4																																											1	0.1		1	1																																		
		1014	1016		39.3	39.3																										12																																																			
L 93+15	105 LT	1015																																																																																				OPEN END PIPE
		1015	1025		39.9	39.5																								100																																																					
L 91+12	63 RT	1016		44.6																																											1	0.3		1	1																																		
		1016	1022		39.3	38.7																											132																																																		
L 93+75	52 RT	1020		46.3																																											1	1.6		1			1																																
		1020	1014		39.7	39.3																									244																																																				
L 94+60	52 RT	1021		46.6																																											1	1.8		1			1																																
		1021	1020		39.8	39.7																									84																																																				
L 91+04	65 LT	1022		48.7																																											1	5.0																								1				1													
		1022	1023		38.7	38.5																											32																																																		
L 92+15	74 LT	1025		46.8																																											1	2.3																								1				1													
		1025	1022		39.5	39.2																								116																																																						
L 91+15	98 RT	1026																																										3.400																																											HEADWALL
		1026	1016		39.5	39.3																											36																																																		
L 94+63	86 RT	1027																																																																																					OPEN END PIPE
		1027	1021		39.9	39.8																									36																																																				
L 91+73	7 RT	1031		47.1																																											1	0.4							1				1	1																													
		1031	1004		41.7	41.6																								52																																																						
L 93+35	8 RT	1032		47.5																																											1	0.1							1				1	1																													
		1032	1031		42.4	42.0																							160																																																									
Y1 13+77	37 LT	2401		46.1																																											1			1		1																																	
		2401	2415		41.6	41.5	0.3																							52																																																								
Y1 15+75	39 LT	2402		47.0																																											1			1		1																																	
		2402	2412		42.7	42.2																							144																																																								
Y1 17+00	42 LT	2403		47.3																																											1			1		1																																	
		2403	2402		43.0	42.7																							124																																																									
Y1 18+86	45 LT	2404		47.8																																											1			1		1																																	
		2404	2405		44.5	44.1																							120																																																									
Y1 20+14	48 LT	2405		47.8																																											1			1		1																																	
		2405	2501		44.1	43.4																							120																																																									
Y1 14+31	38 RT	2406		46.3																																											1	1.1		1			1																																
		2406	2424		40.3	39.9																									84																																																					
Y1 16+28	49 RT	2407		46.9																																											1			1			1																																
		2407	2406		42.1	40.8																								196																																																							
Y1 17+40	49 RT	2408		47.2																																											1			1			1																																
		2408	2407		42.7	42.1																								112																																																							
Y1 19+38	49 RT	2409		49.8																																											1			1			1																																
		2409	2408		44.8	42.9																							196																																																								
SHEET TOTALS																													1208	628	764	12	200											3.400			22	12.7		18	2	10	6		2				2	2											2				2													

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COMPUTED BY: MSP **DATE:** 6/30/2017

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PROJECT NO.	SHEET NO.
U-4751	3D-9

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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)	A	B	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE / THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%	12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12 .064	15 .064	18 .064	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	CY	CY	MASONRY CY	0' THRU 5' EACH	5' THRU 10' LIN. FT.	10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																											CY	CY	CY	LIN. FT.	
Y1 19+38	10 RT	2410		49.4																																											1								1				1	1																											
		2410	2409		45.1	44.8																							40																																																											
Y1 19+90	9 RT	2411		49.5																																											1			1		1																																		
		2411	2410		45.2	45.1																							52																																																											
Y1 14+31	38 LT	2412		46.4																																											1			1		1																																		OPEN END PIPE
		2412	2401		41.9	41.6																								52																																																											
		2412	OUT																											24																																																											
Y1 13+24	42 LT	2415		44.9																																											1												1	1																											
		2415	2416		41.5	40.7	0.4																							152																																																												
Y1 11+71	48 LT	2416		43.0																																											1												1	1																											
Y25 10+68	27 RT	2418																																											1			1			1																																	
		2418	2406		42.5	41.0																							84																																																													
Y1 15+75	7 RT	2419		48.0																																											1								1				1	1																											
		2419	2402		43.8	42.7																							44																																																													
Y1 14+25	54 LT	2420		44.9																																																																																							OPEN END PIPE
		2420	2412		43.4	42.9																								20																																																											
Y25 11+37	14 RT	2421		45.9																																											1			1		1																																		
		2421	2418		42.7	42.5																							68																																																													
Y1 11+98	41 RT	2422		42.8																																											1												1	1																											
Y1 13+47	36 RT	2424		45.9																																											1	1.0		1			1																																	
		2424	2428		39.9	39.5																									128																																																								
Y1 20+65	9 RT	2427		49.8																																											1			1		1																																		
		2427	2411		45.6	45.2																							76																																																													
Y1 12+17	35 RT	2428		44.4																																											1			1			1																																	
		2428	2422		39.5	39.5																									20																																																										
Y1 21+40	50 LT	2501		47.7																																											1			1		1																																		
		2501	2522		43.2	42.4																								24																																																											
Y1 24+48	50 LT	2502		49.3																																											1			1		1																																		
		2502	2501		45.1	43.4																							292																																																													
Y1 26+10	53 LT	2503		49.9																																											1			1		1																																		
		2503	2502		45.6	45.1																							160																																																													
Y1 32+26	77 LT	2507		47.4																																											1			1			1																																	
		2507	2508		43.7	43.6																							56																																																													
Y1 32+82	76 LT	2508		47.3																																											1			1			1																																	
		2508	2509		43.3	43.1																								84																																																											
Y1 33+60	74 LT	2509		47.1																																											1			1			1																																	
		2509	0601		43.1	42.7																								104																																																											
Y1 21+65	9 RT	2510		50.1																																											1			1		1																																		
		2510	2427		45.9	45.6																							100																																																													
Y1 23+60	9 RT	2511		50.7																																											1			1		1																																		
		2511	2512		47.5	47.2																							84																																																													
Y1 24+45	9 RT	2512		50.8																																											1								1				1	1																											
		2512	2513		47.2	47.1																							48																																																													
Y1 24+68	51 RT	2513		49.7																																											1			1			1																																	
		2513	2514		47.1	46.6																							168																																																													
Y1 26+38	49 RT	2514		50.5																																											1			1			1																																	
		2514	2515		46.6	46.0																							128																																																													
Y1 27+65	63 RT	2515		49.7																																											1			1		1																																		
		2515	2516		46.0	44.5																								108																																																												
Y1 28+73	63 RT	2516		49.1																																											1			1		1																																		
					SHEET TOTALS																								1400	568	148																	25	1.0		19		11	8		3				6	6																											

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

TICIVILWORK717

COMPUTED BY:	MSP	**DATE:**	6/30/2017
CHECKED BY:	EV	**DATE:**	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-10

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	CAAP 15 .064	CAAP 18 .064	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) A 0' THRU 5' EACH	B 5' THRU 10' LIN. FT.	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	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
		2516	2517		44.5	44.1																						116																																																										
Y1 29+90	63 RT	2517		48.5																																															1			1		1																																				
		2517	2518		43.6	42.0																									368																																																								
Y1 33+60	50 RT	2518		47.7																																															1	0.7		1		1																																				
		2518	0658		42.0	41.6																									120																																																								
Y1 29+90	76 RT	2519		47.3																																															1			1	1																																					
		2519	2517		44.4	44.3																					12																																																											
Y1 28+73	76 RT	2520		48.0																																															1			1	1																																					
		2520	2516		44.8	44.7																					12																																																											
Y 24+23	4 RT	2533		47.7																																																																													1									
Y 24+26	34 RT	2534		47.2																																																										1																			1										Clean Out Ex. 15" RCP
Y 26+37	33 LT	2536		44.8																																															1			1			1						2																												Clean Out Ex. 15",12" RCP
Y 26+30	6 LT	2537		45.8																																																																												1										
Y 24+23	33 LT	2540		46.9																																															1			1			1																																			
		2540	2536		43.2	42.3																					212																																																											
Y1 30+00	64 LT	2542		48.5																																															1			1			1																																			
		2542	2563		45.2	44.5																					68																																																											
Y 19+04	45 RT	2543		46.8																																															1			1			1																																			
		2543	2633		43.5	43.2																						100																																																										
Y 19+04	54 RT	2553																																																																																								0.3528			COLLAR & EXTEND
		2553	2543		44.3	43.8																					12																																																												
Y1 31+53	95 LT	2560		47.2																																															1			1			1																																			
		2560	2507		44.0	43.7																					72																																																											
Y1 28+50	53 LT	2561		49.4																																															1			1			1																																			
		2561	2562		46.2	45.7																					88																																																											
Y1 29+37	53 LT	2562		49.0																																															1			1			1																																			
		2562	2542		45.7	45.2																					64																																																											
Y 20+80	52 RT	2563		47.8																																															1			1	1																																					
		2563	2564		44.3	43.8																						88																																																										
Y 19+90	43 RT	2564		47.4																																															1																									1															SPECIAL TBJB w/ SLAB TOP LID
		2564	2543		43.8	43.5																						84																																																										
Y 19+91	63 RT	2565		47.4																																															1			1		1						1																												Clean out Ex. 12" HDPE
		2565	2564		44.2	44.0																					20																																																												
Y1 33+82	61 RT	2566		45.8																																															1																								1			1													
		2566	2567				0.3																					8																																																												
Y1 33+86	71 RT	2567																																																																																								0.3528			COLLAR & EXTEND
Y1 28+12	77 LT	2571		48.2																																															1																									1			1											
		2571	2572		43.8	43.7		16						X	X	X																																																																													
Y1 28+29	67 LT	2572		48.5																																															1			1	1																																					
Y1 29+37	67 LT	2573		48.6																																															1			1	1																																					
		2573	2574		44.4	44.2		28						X	X	X																																																																													
Y1 29+67	63 LT	2574		49.0																																															1									1													1				1												Clean out Ex. 12" HDPE
Y 17+42	46 RT	2602		46.4																																															1			1	1																																					
		2602	2634		42.5	42.5																							12																																																									
Y 14+35	36 RT	2603		46.7																																															1			1			1																																			
		2603	2604		43.5	42.7																					136																																																											
Y 13+00	36 RT	2604		46.0																																															1			1			1																																			
		2604	2625		42.7	42.3																					164																																																											
Y 11+52	40 LT	2622		45.7																																															1			1		1						2																												Clean Out Ex. 24" RCP
Y 11+34	32 RT	2625		45.7																																															1			1		1																																				
SHEET TOTALS								44																				40	828	388	500																					24	0.7		20	6	5	9					7											1	1	2	1		2		2	1							0.7056			

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

TICIVILWORK717

COMPUTED BY:	MSP	**DATE:**	6/30/2017
CHECKED BY:	EV	**DATE:**	6/30/2017

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-4751	3D-11

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP		
SIZE								12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12	15	18
THICKNESS OR GAUGE																	.064	.064	.064
		2625	2622		42.1	41.9													
Y 17+66	82 RT	2632		46.2															
		2632	2637		42.9	42.7													
Y 18+05	45 RT	2633		47.1															
		2633	2602		43.2	43.0													
Y 17+41	32 RT	2634																	
Y 15+58	36 RT	2635		46.9															
		2635	2636		43.2	43.1													
Y 15+58	30 RT	2636																	
Y 17+40	64 RT	2637		45.7															
		2637	2602		42.7	42.5													
Y1RPD 21+68	42 RT	2701		31.7															
		2701	2702		24.9	24.6													
Y1RPD 21+75	60 LT	2703																	
		2703	2701		28.2	24.9													
Y1RPD 23+40	2 RT	2706		36.5															
		2706	2711		32.2	31.0													
Y1RPD 25+40	2 RT	2707		39.6															
		2707	2712		35.4	34.6													
Y1RPD 27+40	2 RT	2708		45.2															
		2708	2713		41.0	38.1													
Y1RPD 24+50	2 RT	2715		37.5															
		2715	2706		33.2	32.2													
Y1RPD 19+64	243 LT	2716		34.0															
		2716	2717		29.0	28.3						232		X	X	X			
Y1RPD 21+24	78 LT	2717		32.6															
		2717	2718		28.3	28.2						44		X	X	X			
Y1 63+00	50 LT	2801		45.4															
		2801	2802		38.1	37.7													
Y1 64+45	50 LT	2802		44.8															
		2802	2803		37.2	36.9													
Y1 65+50	50 LT	2803		44.3															
		2803	2804		36.9	36.3													
Y1 67+40	50 LT	2804		43.3															
		2804	2805		36.3	35.9													
Y1 68+85	50 LT	2805		42.6															
		2805	2806		35.9	33.4													
Y1 70+45	50 LT	2806		41.8															
		2806	2814		31.9	30.9													
Y1 72+04	50 LT	2807		41.2															
		2807	2851		36.7	36.6													
Y1 74+00	50 LT	2808		41.7															
		2808	2807		37.2	36.7													
Y1 63+00	49 RT	2809		45.4															
		2809	2810		39.1	38.6													
Y1 64+58	49 RT	2810		44.8															
		2810	2811		38.6	38.3													
Y1 65+60	49 RT	2811		44.3															
		2811	2812		38.3	37.8													
Y1 67+30	49 RT	2812		43.4															
SHEET TOTALS												276							

LINE & STATION	FROM	TO	R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V							
SIZE			12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48
	2625	2622											72													
Y 17+66	2632																									
	2632	2637										32														
Y 18+05	2633																									
	2633	2602											64													
Y 17+41	2634																									
Y 15+58	2635																									
	2635	2636										8														
Y 15+58	2636																									
Y 17+40	2637																									
	2637	2602										20														
Y1RPD 21+68	2701																									
	2701	2702																48								
Y1RPD 21+75	2703																									
	2703	2701																104								
Y1RPD 23+40	2706																									
	2706	2711										64														
Y1RPD 25+40	2707																									
	2707	2712										64														
Y1RPD 27+40	2708																									
	2708	2713										72														
Y1RPD 24+50	2715																									
	2715	2706										108														
Y1RPD 19+64	2716																									
	2716	2717																								
Y1RPD 21+24	2717																									
	2717	2718																								
Y1 63+00	2801																									
	2801	2802												144												
Y1 64+45	2802																									
	2802	2803													104											
Y1 65+50	2803																									
	2803	2804													188											
Y1 67+40	2804																									
	2804	2805													144											
Y1 68+85	2805																									
	2805	2806													160											
Y1 70+45	2806																									
	2806	2814																100								
Y1 72+04	2807																									
	2807	2851											24													
Y1 74+00	2808																									
	2808	2807											196													
Y1 63+00	2809																									
	2809	2810												156												
Y1 64+58	2810																									
	2810	2811												100												
Y1 65+60	2811																									
	2811	2812												168												
Y1 67+30	2812																									
SHEET TOTALS												368	356	568	596			252								

LINE & STATION	FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' 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	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
	2625	2622																																												
Y 17+66	2632					1												1	1																											
	2632	2637																																												
Y 18+05	2633					1			1			1																																		
	2633	2602																																												
Y 17+41	2634																																										0.5526			PIPE COLLAR
Y 15+58	2635					1			1			1																																		
	2635	2636																																												
Y 15+58	2636																																										0.3990			PIPE COLLAR
Y 17+40	2637					1												1	1																											
	2637	2602																																												
Y1RPD 21+68	2701					1	1.8													1								1																		
	2701	2702																																												
Y1RPD 21+75	2703		6.000																																											HEADWALL
	2703	2701																																												
Y1RPD 23+40	2706					1								1				1	1																											
	2706	2711																																												
Y1RPD 25+40	2707					1								1				1	1																											
	2707	2712																																												
Y1RPD 27+40	2708					1								1				1	1																											
	2708	2713																																												
Y1RPD 24+50	2715					1								1				1	1																											
	2715	2706																																												
Y1RPD 19+64	2716					1																								1				1												
	2716	2717																																												
Y1RPD 21+24	2717					1																								1				1												
	2717	2718																																												
Y1 63+00	2801					1	2.3		1			1																																		
	2801	2802																																												
Y1 64+45	2802					1	2.6		1			1																																		
	2802	2803																																												
Y1 65+50	2803					1	2.4		1			1																																		
	2803	2804																																												
Y1 67+40	2804					1	2.0		1			1																																		
	2804	2805																																												
Y1 68+85	2805					1	1.7		1			1																																		
	2805	2806																																												
Y1 70+45	2806					1	4.9		1			1																																		
	2806	2814																																												
Y1 72+04	2807					1			1	1																																				
	2807	2851																																												
Y1 74+00	2808					1			1		1																																			
	2808	2807																																												
Y1 63+00	2809					1	1.3		1		1																																			
	2809	2810																																												
Y1 64+58	2810					1	1.2		1		1																																			
	2810	2811																																												
Y1 65+60	2811					1	1.0		1		1																																			
	2811	2812																																												
Y1 67+30	2812					1	0.6		1		1																																			
SHEET TOTALS			6.000			23	21.8		14	1	5	8		4				6	6	1								1		2				2									0.9516			

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

TICIVILWORK717

COMPUTED BY:	MSP	DATE:	6/30/2017
CHECKED BY:	EV	DATE:	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-12

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	CAAP 15 .064	CAAP 18 .064	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) A 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	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	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
			2812	2813		37.8	37.4																									120																																																									
Y1 68+50	49	RT	2813		42.8																																											1	0.4		1		1																																		
			2813	2814		37.4	36.9																									164																																																									
Y1 70+17	49	RT	2814		41.9																																											1	5.0	1.0	1		1																																		
			2814	2846		30.9	27.6																													76																																																							
Y1 72+04	49	RT	2815		41.2																																											1			1	1																																			
			2815	2849		37.2	37.1																									28																																																									
Y1 73+50	49	RT	2816		41.5																																											1			1			1																																	
			2816	2850		37.6	37.2																									120																																																									
Y1 63+66	75	RT	2817		45.3																																											1			1	1																																			
			2817	2818		42.3	41.2																							88																																																										
Y1 64+58	75	RT	2818		45.3																																											1			1	1																																			
			2818	2810		41.2	39.4																							28																																																								
Y1 65+11	74	RT	2819		45.3																																											1			1	1																																			
			2819	2818		41.7	41.2																							52																																																								
Y1 70+78	64	LT	2823		41.1																																											1	3.1																							1				1												
			2823	2806		33.0	31.9																													36																																																							
Y1 65+43	67	RT	2824		44.0																																											1														1									1																	
			2824	2819		41.8	41.7																							32																																																								
Y1 72+04	61	LT	2847		41.2																																											1												1	1																											
			2847	2807		37.2	36.8																							12																																																									
Y1 64+45	66	LT	2848		44.2																																											1												1	1																											
			2848	2802		39.2	38.2																								16																																																								
Y1 71+76	49	RT	2849		41.2																																											1			1		1																																		
			2849	2814		37.1	36.6																									160																																																									
Y1 72+30	49	RT	2850		41.2																																											1			1	1																																			
			2850	2815		37.2	37.2																									24																																																								
Y1 71+80	50	LT	2851		41.2																																											1			1			1																																	
			2851	2823		36.2	35.0																									104																																																									
Y1 64+50	7	LT	2852		46.0																																											1								1				1	1																											
			2852	2853		41.8	41.7																							20																																																								
Y1 64+58	11	RT	2853		46.0																																											1								1				1	1																											
			2853	2810		41.7	39.4																							36																																																								
Y1 76+00	50	LT	2901		43.9																																											1			1		1																																		
			2901	2808		39.6	37.5																							200																																																								
Y1 77+40	50	LT	2902		45.3																																											1			1		1																																		
			2902	2901		41.0	39.6																							140																																																								
Y13 22+48	50	LT	2903		46.3																																											1	0.4											1	1																											
			2903	2916		40.9	40.8																									24																																																									
Y1 79+57	74	LT	2904		46.2																																											1	0.2											1	1																											
			2904	2903		41.0	40.9																									48																																																									
Y1 79+57	50	LT	2905		46.2																																											1			1	1																																			
			2905	2904		42.2	41.8																							24																																																								
Y1 76+00	49	RT	2906		43.9																																											1			1			1																																	
			2906	2816		38.9	38.1																								248																																																									
Y1 77+48	50	RT	2907		45.3																																											1	0.2		1			1																																	
			2907	2906		40.1	39.1																							148																																																								
Y13 25+40	28	RT	2908		45.0																																											1			1		1																																		
			2908	2909		41.2	41.1																							60																																																								
Y13 25+40	32	LT	2909		44.7																																											1			1			1																																	
						SHEET TOTALS																							840	264	792				112												25	9.3	1.0	17	6	6	5		2				6	6	1									1	1				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

TICIVILWORK717

COMPUTED BY:	MSP	DATE:	6/30/2017
CHECKED BY:	EV	DATE:	6/30/2017

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-4751	3D-13

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	Side Drain Pipe 15	Side Drain Pipe 18	Side Drain Pipe 24	Side Drain Pipe 30	Side Drain Pipe 36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	CAAP 15 .064	CAAP 18 .064	R. C. PIPE CLASS III 12	CLASS III 15	CLASS III 18	CLASS III 24	CLASS III 30	CLASS III 36	CLASS III 42	CLASS III 48	R. C. PIPE CLASS IV 12	CLASS IV 15	CLASS IV 18	CLASS IV 24	CLASS IV 30	CLASS IV 36	CLASS IV 42	CLASS IV 48	R. C. PIPE CLASS V 12	CLASS V 15	CLASS V 18	CLASS V 24	CLASS V 30	CLASS V 36	CLASS V 42	CLASS V 48
		2909	2910		41.1	40.8																							80														
Y13 24+65	32 LT	2910		45.7																																							
		2910	2921		40.8	40.6																							60														
Y1 80+00	38 RT	2911		46.5																																							
		2911	2921		42.5	40.6																							100														
Y1 77+85	50 LT	2914		45.6																																							
		2914	2902		41.3	41.0																							44														
Y13 22+49	24 RT	2915		45.7																																							
Y13 22+48	24 LT	2916		46.6																																							
Y13 20+42	24 LT	2918		45.9																																							
		2918	2919		40.4	40.4																										20											
Y13 20+22	25 LT	2919		45.8																																							
		2919	2939		40.4	40.3																										16											
Y1 79+00	48 RT	2921		46.4																																							
		2921	2907		40.6	40.1																							152														
Y13 20+17	12 LT	2939		42.8																																							
Y13 19+43	66 LT	2940		43.0																																							
		2940	2919		41.0	40.4																									84												
Y13 21+95	24 LT	2953		46.4																																							
		2953	2918		40.7	40.4																										152											
L 17+19	83 RT	0434			28.4	27.7				84				X	X	X																											
L 14+70	68 LT	0437			26.8	26.4							116	X	X	X																											
Y1 81+65	54 LT	2935							48					X	X	X																											
Y1 82+70	53 LT	2930							56					X	X	X																											
Y1 83+43	49 LT	2937							40					X	X	X																											
Y1 84+68	42 LT	2933								40				X	X	X																											
Y1RPD 15+07	0 CL	0544			30.1	27.0																													140								
Y1RPD 12+50	0 CL	0565			30.5	29.9																										128											
Y1RPD 14+00	0 CL	0566			30.1	29.8																										128											
Y16 11+77	0 CL	0630			36.0	36.0							416	X	X	X																											
Y1RPB 20+22	0 CL	0699			42.0	40.4																											140										
L 49+23	0 CL	0707			43.0	42.0																										308											
L 54+03	0 CL	0726			45.0	44.7																											192										
L 57+55	0 CL	0728			45.1	44.3																											200										
L 60+00	0 CL	0841			45.0	44.1																											248										
L 67+50	0 CL	0843			44.4	44.0																											232										
L 70+50	0 CL	0931			44.0	43.6																											176										
Y23 10+15	0 CL	1028			38.8	38.7																										48											
Y23 10+20	0 CL	1029			38.8	38.7																										48											
Y1 38+26	428 LT																																										
Y1 33+82	62 RT																																										
Y1 34+11	124 RT																																										
Y1 35+12	61 RT																																										
Y1 34+47	121 RT																																										
Y1 67+71	124 RT																																										
L 11+62	72 RT																																										
L 12+11	50 RT																																										
L 13+92	65 RT																																										
L 15+85	52 RT																																										
L 17+30	79 RT																																										
							SHEET TOTALS		144	124			532																436		84	848	1188		140								

LINE & STATION	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' 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	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
	2909	2910																																												
Y13 24+65	2910					1			1			1																																		
	2910	2921																																												
Y1 80+00	2911					1			1			1																																		
	2911	2921																																												
Y1 77+85	2914					1			1		1																																			
	2914	2902																																												
Y13 22+49	2915																																			1										
Y13 22+48	2916					1	0.8																								1			1												
Y13 20+42	2918					1	0.4		1		1																																			
	2918	2919																																												
Y13 20+22	2919					1	0.4		1		1																																			
	2919	2939																																												
Y1 79+00	2921					1	0.8																								1			1												
	2921	2907																																												
Y13 20+17	2939																																													
Y13 19+43	2940																																													
	2940	2919																																												
Y13 21+95	2953					1	0.7		1			1																																		
	2953	2918																																												
L 17+19	0434																																													
L 14+70	0437																																													
Y1 81+65	2935																																													DRIVE PIPE
Y1 82+70	2930																																													DRIVE PIPE
Y1 83+43	2937																																													DRIVE PIPE
Y1 84+68	2933																																													DRIVE PIPE
Y1RPD 15+07	0544		6.000																																											CULVERT
Y1RPD 12+50	0565																																													EQ. PIPE
Y1RPD 14+00	0566																																													EQ. PIPE
Y16 11+77	0630																																													EQ. PIPE
Y1RPB 20+22	0699		3.400																																											CULVERT
L 49+23	0707		2.300																																											CULVERT
L 54+03	0726																																													EQ. PIPE
L 57+55	0728																																													EQ. PIPE
L 60+00	0841																																													EQ. PIPE
L 67+50	0843																																													EQ. PIPE
L 70+50	0931																																													EQ. PIPE
Y23 10+15	1028																																													CULVERT
Y23 10+20	1029																																													CULVERT
Y1 38+26																																												0.065		
Y1 33+82																																												0.029		
Y1 34+11																																										2				
Y1 35+12																																												0.029		
Y1 34+47																																										3				
Y1 67+71																																												0.065		
L 11+62																																													48	
L 12+11																																													28	
L 13+92																																													32	
L 15+85																																													27	
L 17+30																																													72	
SHEET TOTALS			11.700			8	3.1		6		3	3																			2			2		1						5		0.188	207	

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

TICIVILWORK717

COMPUTED BY:	MSP	DATE:	6/30/2017
CHECKED BY:	EV	DATE:	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-14

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	15 .064	18 .064	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) 0' THRU 5' 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	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
L 17+82	57	RT																																																																																				26	
L 19+60	50	RT																																																																																				26	
L 19+84	39	RT																																																																																				53	
L 14+89	62	LT																																																																																				95	
L 16+80	63	LT																																																																																				78	
L 17+41	56	LT																																																																																				52	
L 18+53	40	LT																																																																																				174	
L 19+80	33	LT																																																																																				153	
L 20+93	40	LT																																																																																				27	
L 21+83	37	LT																																																																																				232	
L 23+35	53	LT																																																																																				25	
L 23+64	74	LT																																																																																				52	
L 24+56	87	LT																																																																																				53	
L 24+56	16	RT																																																																																				41	
L 24+51	59	RT																																																																																				23	
L 26+01	9	RT																																																																																				53	
L 29+66	0	CL																																																																																				41	
L 31+63	17	RT																																																																																				40	
L 31+62	17	LT																																																																																				41	
L 32+09	59	LT																																																																																				50	
L 32+38	69	LT																																																																																				23	
L 32+23	30	RT																																																																																				248	
L 34+29	30	RT																																																																																				46	
L 34+59	0	CL																																																																																				66	
L 34+04	58	RT																																																																																				25	
L 34+75	64	RT																																																																																				160	
L 35+93	100	RT																																																																																				99	
L 36+46	98	RT																																																																																				41	
L 36+98	147	RT																																																																																				158	
L 38+02	207	RT																																																																																				82	
L 37+91	157	RT																																																																																				71	
L 37+78	109	LT																																																																																				78	
L 38+37	131	LT																																																																																				61	
L 38+68	124	LT																																																																																				14	
L 38+71	157	RT																																																																																				36	
L 92+58	75	LT																																																																																				52	
L 92+96	46	LT																																																																																				43	
Y1 13+67	42	LT																																																																																				101	
Y1 14+24	47	LT																																																																																				11	
Y1 14+49	42	LT																																																																																				63	
Y1 19+86	42	LT																																																																																				75	
Y1 20+78	46	LT																																																																																				95	
Y1 21+36	51	LT																																																																																				14	
Y1 22+04	54	LT																																																																																				96	
Y1 23+44	47	LT																																																																																				63	
Y1 24+86	42	LT																																																																																				74	
Y1 25+66	42	LT																																																																																				98	
Y1 28+23	67	LT																																																																																				15	
Y1 28+28	66	LT																																																																																				6	
Y1 30+06	48	LT																																																																																				74	
SHEET TOTALS																																																																																						3423	

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

T/CIVIL/WORK/717

COMPUTED BY: MSP DATE: 6/30/2017

CHECKED BY: EV DATE: 6/30/2017

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-4751	3D-15

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC
									THICKNESS OR GAUGE								
Y1 30+38	34	LT															
Y1 33+50	48	LT															
Y1 23+66	46	RT															
Y1 26+11	40	RT															
Y1 27+67	41	RT															
Y1 28+66	44	RT															
Y1 29+42	41	RT															
Y1 30+13	45	RT															
Y1 31+72	43	RT															
Y1 33+81	43	RT															
Y1 34+50	47	LT															
Y1 34+66	18	LT															
Y1 35+12	43	LT															
Y1 35+42	45	LT															
Y1 35+90	39	LT															
Y1 36+38	42	LT															
Y1 36+87	37	LT															
Y1 37+43	42	LT															
Y1 37+32	44	LT															
Y1 37+83	38	LT															
Y1 38+37	37	LT															
Y1 38+94	38	LT															
Y1 39+93	40	LT															
Y1 40+50	46	LT															
Y1 40+79	39	LT															
Y1 41+06	45	LT															
Y1 42+79	37	LT															
Y1 43+45	32	LT															
Y1 43+89	49	LT															
Y1 44+10	43	LT															
Y1 44+80	36	LT															
Y1 45+99	37	LT															
Y1 46+14	43	LT															
Y1 46+63	37	LT															
Y1 46+98	46	LT															
Y1 49+72	35	LT															
Y1 49+88	42	LT															
Y1 50+63	32	LT															
Y1 51+49	38	LT															
Y1 51+59	0	CL															
Y1 35+24	44	RT															
Y1 36+91	43	RT															
Y1 35+88	76	RT															
Y1 38+47	0	CL															
Y1 38+51	32	RT															
Y1 38+47	37	RT															
Y1 38+46	51	RT															
Y1 39+36	42	RT															
Y1 40+33	36	RT															
Y1 40+82	42	RT															
SHEET TOTALS																	

LINE & STATION	CAAP SIZE 12	.064	15	.064	18	.064	R. C. PIPE CLASS III SIZE 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV SIZE 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V SIZE 12	15	18	24	30	36	42	48
	THICKNESS OR GAUGE																													
Y1 30+38																														
Y1 33+50																														
Y1 23+66																														
Y1 26+11																														
Y1 27+67																														
Y1 28+66																														
Y1 29+42																														
Y1 30+13																														
Y1 31+72																														
Y1 33+81																														
Y1 34+50																														
Y1 34+66																														
Y1 35+12																														
Y1 35+42																														
Y1 35+90																														
Y1 36+38																														
Y1 36+87																														
Y1 37+43																														
Y1 37+32																														
Y1 37+83																														
Y1 38+37																														
Y1 38+94																														
Y1 39+93																														
Y1 40+50																														
Y1 40+79																														
Y1 41+06																														
Y1 42+79																														
Y1 43+45																														
Y1 43+89																														
Y1 44+10																														
Y1 44+80																														
Y1 45+99																														
Y1 46+14																														
Y1 46+63																														
Y1 46+98																														
Y1 49+72																														
Y1 49+88																														
Y1 50+63																														
Y1 51+49																														
Y1 51+59																														
Y1 35+24																														
Y1 36+91																														
Y1 35+88																														
Y1 38+47																														
Y1 38+51																														
Y1 38+47																														
Y1 38+46																														
Y1 39+36																														
Y1 40+33																														
Y1 40+82																														
SHEET TOTALS																														

LINE & STATION	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A: 0' THRU 5' EACH	B: 5' THRU 10' LIN. FT.	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	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
Y1 30+38																																							52	
Y1 33+50																																							140	
Y1 23+66																																							12	
Y1 26+11																																							59	
Y1 27+67																																							224	
Y1 28+66																																							7	
Y1 29+42																																							147	
Y1 30+13																																							6	
Y1 31+72																																							349	
Y1 33+81																																							115	
Y1 34+50																																							54	
Y1 34+66																																							51	
Y1 35+12																																							67	
Y1 35+42																																							6	
Y1 35+90																																							95	
Y1 36+38																																							11	
Y1 36+87																																							107	
Y1 37+43																																							7	
Y1 37+32																																							22	
Y1 37+83																																							84	
Y1 38+37																																							19	
Y1 38+94																																							100	
Y1 39+93																																							103	
Y1 40+50																																							7	
Y1 40+79																																							55	
Y1 41+06																																							16	
Y1 42+79																																							14	
Y1 43+45																																							136	
Y1 43+89																																							30	
Y1 44+10																																							22	
Y1 44+80																																							130	
Y1 45+99																																							71	
Y1 46+14																																							15	
Y1 46+63																																							80	
Y1 46+98																																							17	
Y1 49+72																																							30	
Y1 49+88																																							16	
Y1 50+63																																							161	
Y1 51+49																																							18	
Y1 51+59																																							68	
Y1 35+24																																							91	
Y1 36+91																																							177	
Y1 35+88																																							67	
Y1 38+47																																							69	
Y1 38+51																																							10	
Y1 38+47																																							10	
Y1 38+46																																							19	
Y1 39+36																																							187	
Y1 40+33																																							10	
Y1 40+82																																							99	
SHEET TOTALS																																							3462	

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

TICIVILWORK717

COMPUTED BY:	MSP	DATE:	6/30/2017
CHECKED BY:	EV	DATE:	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-16

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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)	A	B	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE THICKNESS OR GAUGE			FROM	TO	FT.	FT.	FT.	%	12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12 .064	15 .064	18 .064	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	CY	CY	MASONRY CY	0' THRU 5' EACH	5' THRU 10' LIN. FT.	10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																											CY	CY	CY	LIN. FT.	
Y1 41+32	38	RT																																																																																				9	
Y1 41+59	43	RT																																																																																				50	
Y1 41+82	47	RT																																																																																				9	
Y1 43+84	46	RT																																																																																				56	
Y1 44+58	41	RT																																																																																				82	
Y1 45+13	55	RT																																																																																				39	
Y1 45+28	82	RT																																																																																				36	
Y1 45+25	26	RT																																																																																				74	
Y1 45+33	20	LT																																																																																			39	
Y1 46+99	27	RT																																																																																			30	
Y1 47+02	50	RT																																																																																				14	
Y1 47+54	48	RT																																																																																			106	
Y1 51+58	35	RT																																																																																			27	
Y1 51+30	65	RT																																																																																				67	
Y1 64+97	37	LT																																																																																			73	
Y1 65+36	40	LT																																																																																			4	
Y1 66+49	37	LT																																																																																			262	
Y1 70+15	40	LT																																																																																			110	
Y1 70+77	56	LT																																																																																			19	
Y1 70+47	0	CL																																																																																				109	
Y1 71+24	43	LT																																																																																			104	
Y1 72+43	43	LT																																																																																			137	
Y1 64+74	64	RT																																																																																			12	
Y1 64+95	67	RT																																																																																			28	
Y1 65+23	70	RT																																																																																				32	
Y1 66+04	39	RT																																																																																				100	
Y1 66+62	39	RT																																																																																				11	
Y1 67+07	39	RT																																																																																				86	
Y1 73+21	38	RT																																																																																				35	
Y1 81+68	37	LT																																																																																				48	
Y1 84+62	38	LT																																																																																				40	
Y 21+17	54	RT																																																																																			49	
Y 20+48	43	RT																																																																																			232	
Y 19+87	48	RT																																																																																			7	
Y 19+03	47	RT																																																																																			5	
Y 18+59	19	RT																																																																																			49	
Y 18+01	38	RT																																																																																			115	
Y 17+69	58	RT																																																																																				48	
Y 17+55	33	RT																																																																																				30	
Y 17+36	43	RT																																																																																				24	
Y 11+34	24	RT																																																																																				11	
Y1RPB 29+57	137	RT																																																																																				211	
Y1RPB 28+78	157	RT																																																																																				20	
Y1RPB 29+92	52	LT																																																																																				41	
Y1RPB 20+62	56	LT																																																																																				38	
SR1 15+00	0	CL																																																																																				134	
Y16 11+53	0	CL																																																																																				44	
Y16 11+21	9	LT																																																																																				62	
Y16 11+40	55	LT																																																																																				90	
Y16 10+92	29	LT																																																																																				18	
SHEET TOTALS																																																																																							3076	

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

TICIVILWORK717

COMPUTED BY: MSP **DATE:** 6/30/2017

CHECKED BY: EV **DATE:** 6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-17

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)

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

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	Side Drain Pipe 15	Side Drain Pipe 18	Side Drain Pipe 24	Side Drain Pipe 30	Side Drain Pipe 36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	CAAP 15 .064	CAAP 18 .064	R. C. PIPE CLASS III 12	CLASS III 15	CLASS III 18	CLASS III 24	CLASS III 30	CLASS III 36	CLASS III 42	CLASS III 48	R. C. PIPE CLASS IV 12	CLASS IV 15	CLASS IV 18	CLASS IV 24	CLASS IV 30	CLASS IV 36	CLASS IV 42	CLASS IV 48	R. C. PIPE CLASS V 12	CLASS V 15	CLASS V 18	CLASS V 24	CLASS V 30	CLASS V 36	CLASS V 42	CLASS V 48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' 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	PIPE CLEAN OUT	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 W/ 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/ 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	ADJUST M.H.	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	CONC. FLUME	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
Y1RPD 34+71	22	LT																																																																																				43	
Y1RPD 34+67	64	LT																																																																																					41	
Y1RPD 34+57	89	LT																																																																																				11	
Y10 10+53	35	RT																																																																																					34	
Y10 10+96	25	RT																																																																																					53	
Y13 22+67	28	LT																																																																																					43	
Y13 12+90	18	RT																																																																																					71	
Y15 10+35	46	LT																																																																																					27	
Y15 10+40	28	LT																																																																																					21	
Y15 10+68	10	LT																																																																																					71	
Y15 11+09	68	LT																																																																																					72	
Y15 11+39	30	RT																																																																																					61	
Y3 13+93	0	CL																																																																																					52	
Y3 16+26	15	RT																																																																															1					
Y3 16+05	17	LT																																																																														1					
L 97+00	52	RT	1101		47.3																																											1			1			1																																					
			1101	1132		43.0	41.1			44					X	X	X																																																																								
L 97+00	61	LT	1102		47.1																																											1			1		1																																						
			1102	1101		43.3	43.0																							112																																																													
L 99+00	52	LT	1103		47.9																																											1			1		1																																						
			1103	1104		44.2	43.6																							192																																																														
L 100+93	52	LT	1104		48.5																																											1			1		1																																						
			1104	1105		43.6	43.4																							68																																																															
L 101+23	10	RT	1105		50.2																																											1	1.8													1									1																		
			1105	1110		43.4	43.2																							60																																																															
L 105+00	10	RT	1106		50.9																																											1	1.7													1									1																		
			1106	1109		44.1	43.4																							232																																																																	
L 105+39	51	LT	1107		48.1																																											1			1	1																																							
			1107	1106		44.4	44.1																							72																																																															
L 102+73	51	LT	1108		48.3																																											1			1	1																																							
			1108	1109		44.6	43.4																							60																																																															
L 102+73	10	RT	1109		50.9																																											1	2.7													1									1																		
			1109	1110		43.2	42.9																								92																																																														
L 101+83	10	RT	1110		50.6																																											1	3.2												1										1																		
			1110	1111		42.4	41.5																									76																																																													
L 101+83	85	RT	1111		47.4																																											1	0.9																								1				1													
			1111	1112		41.5	39.9					20			X																																																																																			
Y12 11+70	24	RT	1116		43.0																																											1												1	1																														
			1116	1117		40.8	40.6			56					X	X	X																																																																									
Y12 11+19	14	RT	1117		44.6																																											1			1		1																																						
			1117	1118		40.6	40.5																							28																																																															
Y12 11+19	14	LT	1118		44.6																																											1			1			1																																					
			1118	1119		40.5	40.3			44					X																																																																													
L 105+99	52	LT	1120		48.4																																											1			1		1																																						
			1120	1121		44.6	44.4																							84																																																																
L 106+89	52	LT	1121		48.8																																											1			1		1																																						
			1121	1123		44.4	44.2																							52																																																																
L 106+29	10	RT	1122		50.2																																											1																1									1																		
			1122	1123		46.4	44.2																							64																																																															
L 106+89	10	RT	1123		49.8																																											1	0.6							1				1	1																													
							SHEET TOTALS			144			20																	1024	92	76																		18	10.9		10	2	6	2		1				2	2	1	4								5	1				1							2				600	

COMPUTED BY: MSP DATE: 6/30/2017
CHECKED BY: EV DATE: 6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-18

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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE		FROM	TO	FT.	FT.	FT.	%	12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12	15	18	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	CY	CY	MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																											CY	CY	CY	LIN. FT.	
THICKNESS OR GAUGE																	.064	.064	.064																																																																						
		1123	1124		44.2	40.5																							204																																																										
L 108+90	9 LT	1124		49.1																																											1	3.8							1				1	1																												
		1124	1128		40.3	38.5	0.7																							100																																																								
L 106+80	83 LT	1125		40.1																																																																																					
		1125	1126		40.1	39.7				48				X	X	X																																																																								
L 107+29	72 LT	1126		48.1																																											1	3.3																								1				1													
		1126	1127		39.8	39.3				80				X	X	X																																																																									
L 97+81	85 LT	1129		40.0																																																																																					
		1129	1129A		40.0	39.8																								188																																																									
L 97+84	85 LT	1130		40.0																																																																																					
		1130	1130A		40.0	39.8																								188																																																								
L 108+29	122 RT	1133		42.6																																											1			1	1																																								
		1133	1134		39.6	39.1			24					X																																																																								
L 110+50	63 RT	1201		45.4																																											1			1		1																																						
		1201	1202		41.7	41.4																							92																																																									
L 109+50	58 RT	1202		46.8																																											1	0.6		1		1																																						
		1202	1205		41.2	41.0																								72																																																								
L 110+95	10 LT	1203		48.4																																											1								1				1	1																												
		1203	1204		44.7	44.4																							80																																																									
L 110+19	10 LT	1204		48.7																																											1								1				1	1																												
		1204	1205		44.4	41.2																							72																																																									
L 109+50	9 LT	1205		48.9																																											1	3.0							1				1	1																												
		1205	1124		40.9	40.3																								64																																																								
Y4 17+49	15 RT	1209		42.6																																											1			1		1																																						
		1209	1210		38.8	38.7																							28																																																										
Y4 17+50	15 LT	1210		42.6																																											1			1			1																																					
		1210	1211		38.5	37.8	0.8			68				X																																																																											
L 112+18	6 LT	1212		47.8																																											1	3.3							1				1	1																												
		1212	1220		39.4	39.2																								92																																																									
L 112+85	52 RT	1213		44.9																																											1			1	1																																							
		1213	1220		41.2	39.4			96					X	X	X																																																																									
L 113+14	9 LT	1214		47.4																																											1	2.7											1	1																												
		1214	1233		39.7	39.6																								52																									1																																			
L 113+60	9 LT	1215		47.2																																											1	2.1							1				1	1																												
		1215	1214		40.1	40.0																							48																																																										
L 114+05	8 RT	1216		46.5																																											1	1.3							1				1	1																												
		1216	1215		40.2	40.1																							52																																																											
L 114+65	51 RT	1217		44.9																																											1			1		1																																						
		1217	1218		40.6	40.4																							44																																																											
L 114+65	8 RT	1218		46.3																																											1	0.8							1				1	1																												
		1218	1216		40.4	40.2																							64																																																											
L 115+50	51 RT	1219		44.6																																											1			1		1																																						
		1219	1217		40.8	40.6																							84																																																											
L 111+86	78 RT	1220		46.1																																											1	2.0																								1				1													
		1220	1210		39.2	38.5	0.4			132				X	X	X																																																																							
L 116+75	52 LT	1221		44.0																																											1			1			1																																					
		1221	1222		41.0	40.8																							68																																																											
L 117+42	52 LT	1222		43.9																																											1			1	1																																							
		1222	1223		40.8	40.5																							108																																																										
L 118+50	52 LT	1223		44.2																																											1			1		1																																						
SHEET TOTALS									120	328																			944	756																	22	22.9		11	3	6	2		9				9	9												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:	MSP	DATE:	6/30/2017
CHECKED BY:	EV	DATE:	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-19

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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%	12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12 .064	15 .064	18 .064	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	CY	CY	MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																											CY	CY	CY	LIN. FT.	
		1223	1224		40.2	39.6																								100																																																											
L 118+50	51 RT	1224		44.2																																											1	0.1		1			1																																			
		1224	1227		39.1	38.8																									100																																																										
L 117+42	51 RT	1225		43.9																																											1			1	1																																					
		1225	1224		40.2	39.9																					108																																																												
L 119+50	51 RT	1227		44.7																																											1	0.9		1			1																																	
		1227	1228		38.8	38.2					44			X	X	X																																																																											
Y4 13+25	15 LT	1229		44.8																																											1			1		1																																				
		1229	1230		41.0	40.9																					28																																																												
Y4 13+25	15 RT	1230		44.8																																											1			1			1																																		
		1230	1231		40.9	40.8			36					X																																																																												
L 112+66	9 LT	1233		47.6																																											1	3.1							1				1	1																													
		1233	1212		39.6	39.4																						52																																																											
L 110+38	98 LT	1234		36.2																																								6.000																																															
		1234	1236		36.2	36.2																										212																																																							
L 110+41	98 LT	1235		36.2																																																																																								
		1235	1242		36.2	36.2																										208																																																									
Y4 14+18	59 RT	1238		35.6																																								4.500																																															
		1238	1237		35.6	35.2																										132																																																								
Y4 17+39	39 RT	1240		36.2																																								6.000																																															
		1240	1243		36.2	36.2																										108																																																									
Y4 17+37	36 RT	1241		36.2																																																																																									
		1241	1244		36.2	36.2																										108																																																									
L 124+50	64 RT	1301		43.9																																											1			1		1																																				
		1301	1325		40.2	39.4																					100																																																												
L 125+00	52 LT	1302		44.0																																											1			1			1																																		
		1302	1307		40.2	39.9																					100																																																												
L 125+00	8 LT	1303		45.3																																											1								1				1	1																													
		1303	1302		41.6	40.2																					44																																																													
L 126+50	64 RT	1304		43.5																																											1			1			1																																		
		1304	1305		38.9	39.0																					48																																																												
		1304	1311		38.4	37.6																							260																																																										
L 126+00	63 RT	1305		43.4																																											1			1	1																																					
		1305	1325		39.0	39.2																					48																																																												
L 126+50	52 LT	1306		43.8																																											1			1		1																																				
		1306	1307		40.0	39.9																					48																																																												
L 126+00	52 LT	1307		43.7																																											1			1	1																																					
		1307	1327		39.9	37.0	0.7		60					X	X	X																																																																								
L 126+00	8 LT	1308		45.1																																											1								1				1	1																													
		1308	1307		41.3	39.9																					44																																																													
L 128+72	64 LT	1309		44.5																																											1			1		1																																				
		1309	1310		40.8	40.7																					40																																																												
L 129+11	64 LT	1310		44.7																																											1			1		1																																				
		1310	1312		40.7	40.4																					72																																																													
L 129+11	51 RT	1311		45.5																																											1			1			1																																		
		1311	1312		38.3	40.4																					44																																																													
		1311	1326		37.6	35.5					60			X	X	X																																																																								
L 129+11	8 RT	1312		46.4																																											1	1.2							1				1	1																													
		1312	1324		40.2	39.7																						152																																																												
L 131+20	9 RT	1313		47.8																																											1	3.2							1				1	1																													
SHEET TOTALS									96		104																		724	304	360			768										16.500			19	8.5		14	3	5	6		5				5	5																											

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

TICIVILWORK717

COMPUTED BY:	MSP	DATE:	6/30/2017
CHECKED BY:	EV	DATE:	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-20

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	Side Drain Pipe 15	Side Drain Pipe 18	Side Drain Pipe 24	Side Drain Pipe 30	Side Drain Pipe 36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	CAAP 15 .064	CAAP 18 .064	R. C. PIPE CLASS III 12	CLASS III 15	CLASS III 18	CLASS III 24	CLASS III 30	CLASS III 36	CLASS III 42	CLASS III 48	R. C. PIPE CLASS IV 12	CLASS IV 15	CLASS IV 18	CLASS IV 24	CLASS IV 30	CLASS IV 36	CLASS IV 42	CLASS IV 48	R. C. PIPE CLASS V 12	CLASS V 15	CLASS V 18	CLASS V 24	CLASS V 30	CLASS V 36	CLASS V 42	CLASS V 48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' 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	GRATE TYPE F	GRATE TYPE G		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	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
		1313	1314		43.5	43.3																								64																																																									
L 131+80	10 RT	1314		48.2																																											1	3.8							1				1	1																											
		1314	1316		43.3	41.5																								64																																																									
L 132+41	61 LT	1315		45.5																																											1			1	1																																								
		1315	1316		41.8	41.5																							72																																																										
L 132+41	10 RT	1316		48.6																																											1	4.9							1				1	1																											
		1316	1317		41.3	40.6																									72																																																						
L 133+10	10 RT	1317		48.9																																											1	5.0	0.4						1				1	1																											
		1317	1320		40.6	34.8																									112																																																						
Y5 13+78	1 LT	1321		42.0																																											1												1	1																											
		1321	1322		38.2	37.6																							20																																																									
Y5 13+78	18 RT	1322		41.3																																											1			1			1																																		
		1322	1323		37.6	37.0			28					X																																																																							
L 130+60	9 RT	1324		47.4																																											1	2.7							1				1	1																											
		1324	1313		43.7	43.5																								64																																																									
L 125+50	64 RT	1325		43.6																																											1			1		1																																			
Y5 13+99	46 LT	1328		37.3																																																																																					
		1328	1328A		37.3	37.0																								92																																																									
L 136+25	10 RT	1401		48.6																																											1															1								1																	
		1401	1402		44.8	42.9																							60																																																										
L 136+25	52 LT	1402		45.9																																											1			1			1																																
		1402	1403		42.9	42.7																							76																																																										
L 137+04	52 LT	1403		45.8																																											1			1	1																																								
		1403	1406		42.5	42.2																								68																																																								
L 137+04	10 RT	1404		48.3																																											1															1								1																	
		1404	1405		44.5	44.3																							72																																																										
L 137+75	10 RT	1405		48.5																																											1															1								1																	
		1405	1406		44.3	42.5																							60																																																										
L 137+75	52 LT	1406		45.9																																											1			1		1																																			
		1406	1408		41.7	41.4																									120																																																						
L 139+00	10 RT	1407		48.9																																											1															1								1																	
		1407	1408		45.2	42.1																							60																																																										
L 139+00	51 LT	1408		46.3																																											1			1		1																																			
		1408	1423		41.4	41.0																									128																																																						
L 141+65	10 RT	1409		49.7																																											1															1								1																	
		1409	1410		46.0	43.3																							60																																																										
L 141+65	51 LT	1410		47.1																																											1			1		1																																			
		1410	1423		43.3	41.7	0.8																						132																																																											
L 143+00	51 LT	1411		47.5																																											1			1		1																																			
		1411	1410		43.8	43.3	0.3																						132																																																											
L 143+00	10 RT	1412		50.1																																											1															1								1																	
		1412	1411		46.3	43.8																							64																																																											
L 146+02	8 LT	1416		50.0																																											1								1				1	1																											
		1416	1417		46.3	46.1																							76																																																											
L 146+75	8 LT	1417		49.9																																											1								1				1	1																											
		1417	1419		46.1	43.8																							76																																																											
L 147+50	52 LT	1418		47.6																																											1			1			1																																	
		1418	1419		43.9	43.8																							44																																																											
L 147+50	8 LT	1419		49.6																																											1	1.1							1				1	1																											
		1419	1501		43.5	43.3																								76																																																									
SHEET TOTALS									28																				1004	428	432																24	17.5	0.4	10	2	5	3		7				8	8		6								6																	

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

TICIVILWORK717

COMPUTED BY: MSP **DATE:** 6/30/2017
CHECKED BY: EV **DATE:** 6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-21

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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V							
SIZE								12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12	15	18	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%										.064	.064	.064																								
L 135+25	10 RT	1420		48.9																																							
		1420	1401		45.1	44.8																							104														
L 144+00	10 RT	1421		50.4																																							
		1421	1412		46.7	46.3																							104														
L 140+30	10 RT	1422		49.3																																							
		1422	1415		40.3	38.5																											104										
L 140+30	51 LT	1423		46.7																																							
		1423	1422		40.5	40.3																											64										
L 139+29	105 RT	1424		41.0																																							
		1424	1425		37.1	34.9				100				X	X	X																											
Y6 11+55	84 RT	1426		37.0																																							
		1426	1426A		37.0	35.5	0.3																										120										
L 148+25	8 LT	1501		49.4																																							
		1501	1506		43.3	40.8																								76													
L 150+85	79 LT	1502		45.5																																							
		1502	1503		41.8	41.6																							72														
L 150+74	8 LT	1503		48.7																																							
		1503	1505		41.6	41.3																							100														
L 149+75	64 LT	1504		46.5																																							
		1504	1505		42.7	41.3																							56														
L 149+75	8 LT	1505		49.0																																							
		1505	1506		41.0	40.8																								76													
L 149+00	8 LT	1506		49.2																																							
		1506	1507		40.3	40.0																									104												
L 149+00	96 RT	1507		47.8																																							
		1507	1509		40.0	38.4					32			X																													
L 151+75	10 RT	1510		49.0																																							
		1510	1511		45.2	44.8																							136														
L 153+10	10 RT	1511		48.6																																							
		1511	1515		44.8	42.2																							60														
L 154+00	10 RT	1512		48.5																																							
		1512	1516		44.7	42.2																							60														
L 154+90	10 RT	1513		48.6																																							
		1513	1514		44.5	42.2																							60														
L 154+90	51 LT	1514		46.0																																							
		1514	1526		42.2	42.1			32					X	X	X																											
L 153+10	51 LT	1515		46.0																																							
		1515	1525		42.2	42.0	0.3		32					X	X	X																											
L 154+00	51 LT	1516		45.8																																							
		1516	1517		42.2	42.1			32					X	X	X																											
L 157+00	10 RT	1518		49.2																																							
		1518	1521		45.5	42.8																							60														
L 158+13	10 RT	1519		49.4																																							
		1519	1520		45.4	44.0																							60														
L 158+13	52 LT	1520		47.7																																							
		1520	1521		44.0	42.8																							112														
L 157+00	51 LT	1521		46.6																																							
		1521	1522		42.6	42.5				32				X	X	X																											
L 160+83	52 RT	1523		48.8																																							
		1523	1602		45.0	44.8																							28														
							SHEET TOTALS		96	132	32																		1012	152	104	288											

STRUCTURE NUMBER FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
					0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															
1420					1															1								1																	
1420	1401																																												
1421					1															1								1																	
1421	1412																																												
1422					1	4.0													1									1																	
1422	1415																																												
1423					1	1.2		1		1																																			
1423	1422																																												
1424					1										1																														
1424	1425																																												
1426																																													
1426	1426A																																												
1501					1	1.1							1				1	1																											
1501	1506																																												
1502					1			1	1																																				
1502	1503																																												
1503					1	2.1							1				1	1																											
1503	1505																																												
1504					1			1			1																																		
1504	1505																																												
1505					1	2.9							1				1	1																											
1505	1506																																												
1506					1	3.9							1				1	1																											
1506	1507																																												
1507					1	2.8																							1				1												
1507	1509																																												
1510					1															1								1																	
1510	1511																																												
1511					1															1								1																	
1511	1515																																												
1512					1															1								1																	
1512	1516																																												
1513					1															1								1																	
1513	1514																																												
1514					1			1		1																																			
1514	1526																																												
1515					1			1			1																																		
1515	1525																																												
1516					1			1	1																																				
1516	1517																																												
1518					1															1								1																	
1518	1521																																												
1519					1															1								1																	
1519	1520																																												
1520					1			1		1																																			
1520	1521																																												
1521					1			1		1																																			
1521	1522																																												
1523					1			1		1																																			
1523	1602																																												
SHEET TOTALS					24	18.0		9	2	5	2		4		1		4	4	1	8								9	1				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

TICIVILWORK717

COMPUTED BY:	MSP	**DATE:**	6/30/2017
CHECKED BY:	EV	**DATE:**	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-22

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY
								12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12 .064	15 .064	18 .064	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48		
L 155+65	10 RT	1524		48.5																																									
		1524	1513		44.8	44.5																							76																
L 158+73	10 RT	1527		49.3																																									
		1527	1519		45.6	45.4																							60																
L 156+50	82 LT	1528		42.5																																									
		1528	1528A		42.5	42.1																																		180					
L 160+00	88 LT	1529		42.4																																									
		1529	1529A		42.4	42.0																											180												
L 162+00	52 RT	1601		48.9																																									
		1601	1602		45.1	44.8																							88																
L 161+13	51 RT	1602		48.6																																									
		1602	1603		44.8	42.8	0.3		40					X																															
L 161+13	52 LT	1604		48.6																																									
		1604	1605		44.9	42.5			40					X	X	X																													
L 166+00	52 LT	1606		48.9																																									
		1606	1607		45.1	44.8																							100																
L 166+00	51 RT	1607		48.9																																									
		1607	1609		44.8	44.0																							248																
L 168+50	54 LT	1608		48.1																																									
		1608	1609		44.3	44.0																							108																
L 168+50	54 RT	1609		48.1																																									
		1609	1610		44.0	41.9	1.2		40					X																															
L 171+00	57 LT	1611		47.2																																									
		1611	1612		43.5	42.9																							136																
L 171+00	80 RT	1612		46.7																																									
		1612	1613		42.9	42.6																							84																
L 170+18	99 RT	1613		46.4																																									
		1613	1614		42.4	42.3																								24															
L 169+93	91 RT	1614		46.7																																									
		1614	1615		42.3	42.1	0.3			32				X																															
L 172+00	57 LT	1616		46.9																																									
		1616	1622		43.2	42.9																							84																
L 173+80	57 RT	1617		47.0																																									
		1617	1618		43.2	42.5																							92																
L 172+87	57 RT	1618		46.8																																									
		1618	1624		42.2	42.1				36				X																															
L 173+25	13 RT	1619		48.2																																									
		1619	1620		44.4	44.3																							40																
L 172+87	13 RT	1620		48.2																																									
		1620	1618		44.3	42.5																							44																
L 173+25	57 LT	1621		46.8																																									
		1621	1622		43.1	42.9																							36																
L 172+87	57 LT	1622		46.8																																									
		1622	1623		42.9	42.0	0.6		28					X																															
L 166+06	91 RT	1626		38.0																																								6.000	
		1626	1625		38.0	37.7																													200										
L 166+46	92 RT	1628		37.4																																								6.000	
		1628	1627		37.4	36.9																													204										
L 163+00	90 RT	1629		42.6																																									
		1629	1629A		42.6	42.0																											176												
SHEET TOTALS									148	68																			1196	24			356		404					180				12.000	

LINE & STATION	FROM	TO	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
			MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															
L 155+65	1524			1															1								1																	
	1524	1513																																										
L 158+73	1527			1															1								1																	
	1527	1519																																										
L 156+50	1528																																											
	1528	1528A																																										
L 160+00	1529																																											
	1529	1529A																																										
L 162+00	1601			1			1			1																																		
	1601	1602																																										
L 161+13	1602			1			1	1																																				
	1602	1603																																										
L 161+13	1604			1			1		1																																			
	1604	1605																																										
L 166+00	1606			1			1			1																																		
	1606	1607																																										
L 166+00	1607			1			1		1																																			
	1607	1609																																										
L 168+50	1608			1			1			1																																		
	1608	1609																																										
L 168+50	1609			1			1		1																																			
	1609	1610																																										
L 171+00	1611			1			1			1																																		
	1611	1612																																										
L 171+00	1612			1			1			1																																		
	1612	1613																																										
L 170+18	1613			1			1	1																																				
	1613	1614																																										
L 169+93	1614			1			1		1																																			
	1614	1615																																										
L 172+00	1616			1			1			1																																		
	1616	1622																																										
L 173+80	1617			1			1			1																																		
	1617	1618																																										
L 172+87	1618			1			1	1																																				
	1618	1624																																										
L 173+25	1619			1								1				1	1																											
	1619	1620																																										
L 172+87	1620			1								1				1	1																											
	1620	1618																																										
L 173+25	1621			1			1		1																																			
	1621	1622																																										
L 172+87	1622			1			1	1																																				
	1622	1623																																										
L 166+06	1626																																											
	1626	1625																																										
L 166+46	1628																																											
	1628	1627																																										
L 163+00	1629																																											
	1629	1629A																																										
SHEET TOTALS				20			16	4	5	7		2				2	2		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:	MSP	**DATE:**	6/30/2017
CHECKED BY:	EV	**DATE:**	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-23

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	Side Drain Pipe 15	Side Drain Pipe 18	Side Drain Pipe 24	Side Drain Pipe 30	Side Drain Pipe 36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	CAAP 15 .064	CAAP 18 .064	R. C. PIPE CLASS III 12	CLASS III 15	CLASS III 18	CLASS III 24	CLASS III 30	CLASS III 36	CLASS III 42	CLASS III 48	R. C. PIPE CLASS IV 12	CLASS IV 15	CLASS IV 18	CLASS IV 24	CLASS IV 30	CLASS IV 36	CLASS IV 42	CLASS IV 48	R. C. PIPE CLASS V 12	CLASS V 15	CLASS V 18	CLASS V 24	CLASS V 30	CLASS V 36	CLASS V 42	CLASS V 48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' 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	GRATE TYPE F	GRATE TYPE G		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	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
L 177+00	57 RT	1701		48.2																																											1			1			1																																	
		1701	1702		44.5	44.3																							28																																																										
L 176+70	57 RT	1702		48.1																																											1			1			1																																	
		1702	1705		44.3	44.1																							72																																																									
L 179+00	57 RT	1703		49.0																																											1			1			1																																	
		1703	1704		45.2	45.0																							68																																																								
L 179+00	13 LT	1704		50.3																																											1	0.3							1				1	1																														
		1704	1705		45.0	44.1																							248																																																								
L 176+54	13 LT	1705		49.4																																											1	0.5							1				1	1																														
		1705	1706		43.9	43.8																								44																																																							
L 176+54	57 LT	1706		48.0																																											1			1		1																																			
		1706	1715		43.8	38.4	2.3												48																																																													2							
L 174+50	57 LT	1707		47.2																																											1			1		1																																			
		1707	1621		43.5	43.1																							124																																																								
L 181+50	92 LT	1708		48.8																																											1			1			1																																	
		1708	1709		45.1	44.9																							32																																																									
L 181+82	99 LT	1709		48.6																																											1			1	1																																				
		1709	1710		44.9	44.5																							112																																																									
L 182+00	12 RT	1710		51.0																																											1	1.5							1				1	1																														
		1710	1711		44.5	44.4																							56																																																									
L 182+33	56 RT	1711		49.5																																											1	0.1		1		1																																			
		1711	1712		44.4	39.1	1.3											52																																																														2								
L 186+14	0 CL	1713		47.5																																											1															1					1																						
		1713	1714		44.2	42.4	0.4																						92																																																									
SR4 12+00	36 RT	1718		42.7																																																																																						
		1718	1718A		42.7	42.2																											72																																																								
SR4 15+00	29 LT	1719		42.6																																																																																						
		1719	1719A		42.6	42.1																											64																																																							
SR4 18+00	29 RT	1720		42.6																																																																																							
		1720	1720A		42.6	42.4																											64																																																							
L 187+50	0 CL	1801		47.6																																											1															1					1																						
		1801	1713		44.9	44.2			140					X																																																																										
L 195+00	0 CL	1802		47.6																																											1															1					1																						
		1802	1803		44.8	43.7			304					X																																																																										
L 198+00	0 CL	1803		46.5																																											1															1					1																						
		1803	1804		43.7	42.8																							88																																																								
L 199+41	0 CL	1805		46.1																																											1															1					1																						
		1805	1902		43.4	42.8			112					X																																																																										
L 198+70	91 RT	1807		37.0																																									6.000																																																	
		1807	1806		37.0	36.3																													212																																																							
L 190+00	91 LT	1808		43.1																																																																																							
		1808	1808A		43.1	42.4																											184																																																								
L 193+00	93 LT	1809		42.3																																																																																							
		1809	1809A		42.3	42.3																											188																																																								
Y18 18+68	10 RT	1810		40.0																																																																																								
		1810	1810A		40.0	39.4																																	48																																																						
L 204+00	0 CL	1901		48.4																																											1															1					1																						
		1901	1913		45.6	40.1																							104																																																								
L 200+50	0 CL	1902		46.3																																											1															1					1																						
		1902	1903		42.8	38.9																							104																																																							
						SHEET TOTALS			556									52	48										1128	44			572		212				48					6.000			18	2.4		8	1	3	4		3				3	3		7					7												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

DocuSign Envelope ID: 1ACE3258-B4E6-41D5-8054-E6A64965A6D0

TICIVILWORK717

COMPUTED BY:	MSP	**DATE:**	6/30/2017
CHECKED BY:	EV	**DATE:**	6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-24

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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP		
SIZE									12	15	18	24	30	36				12	15	18
THICKNESS OR GAUGE			FROM	TO	FT.	FT.	FT.	%							DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	.064	.064	.064
L 209+50	0	CL	1904		48.9															
			1904	1905		46.1	44.1			252					X					
L 212+00	0	CL	1905		46.9															
			1905	2002		44.1	43.5	0.3		164					X					
L 205+95	118	LT	1907		37.0															
			1907	1914		37.0	36.8													
Y8RPDB 18+50	36	RT	1908		43.6															
			1908	1908A		43.6	43.4													
Y8RPDB 20+00	38	RT	1909		43.4															
			1909	1909A		43.4	42.4													
Y8RPDB 21+24	45	RT	1911		37.6															
			1911	1910		37.6	37.6													
Y8RPC 19+50	68	RT	1912		40.9															
			1912	1912A		40.9	40.5													
L 208+53	0	CL	1914		49.9															
			1914	1906		36.8	36.6													
L 215+00	0	CL	2001		46.8															
			2001	2002		44.0	43.5			140					X					
L 213+60	0	CL	2002		46.2															
			2002	2003		43.2	39.5	0.7												
Y8RPC 25+50	25	LT	2004		56.3															
			2004	2005		52.6	50.0			144					X					
Y8RPC 24+07	25	LT	2005		53.7															
			2005	2006		50.0	41.6													
Y8RPD 14+04	25	RT	2007		58.2															
			2007	2008		54.4	51.1			152					X					
Y8RPD 12+50	25	RT	2008		54.9															
			2008	2009		51.1	47.8			144					X					
Y8RPD 11+07	25	RT	2009		51.5															
			2009	2010		47.8	42.2	1.9											36	
L 218+00	0	CL	2011		51.3															
			2011	2012		48.5	41.2	1.5												
L 224+50	20	LT	2013		70.3															
			2013	2016		66.5	64.1													
L 223+00	0	CL	2014		65.2															
			2014	2015		62.5	55.5	0.3		240					X					
L 220+60	0	CL	2015		58.3															
			2015	2035		55.5	55.2	0.8		36					X					
L 223+45	18	LT	2016		67.8															
			2016	2014		64.1	62.5			52					X					
Y8 100+75	0	CL	2017		43.4															
			2017	2018		40.7	40.4			96					X					
Y8 99+83	13	RT	2018		45.1															
			2018	2036		40.4	39.2			380					X					
Y8 90+35	0	CL	2019		44.5															
			2019	2020		41.8	41.5			92					X					
Y8 91+26	12	RT	2020		46.1															
			2020	2021		41.5	38.8			316					X					
Y8 94+41	0	CL	2021		43.2															
L 227+58	0	CL	2022		71.7															
SHEET TOTALS										2208									36	

LINE & STATION	FROM	TO	R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE MASONRY
SIZE			12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	CY	CY	CY
L 209+50	1904																												
	1904	1905																											
L 212+00	1905																												
	1905	2002																											
L 205+95	1907																										4.500		
	1907	1914															288												
Y8RPDB 18+50	1908																												
	1908	1908A																					92						
Y8RPDB 20+00	1909																												
	1909	1909A																						100					
Y8RPDB 21+24	1911																										3.400		
	1911	1910														128													
Y8RPC 19+50	1912																												
	1912	1912A														128													
L 208+53	1914																												
	1914	1906															268												
L 215+00	2001																												
	2001	2002																											
L 213+60	2002																												
	2002	2003											84																
Y8RPC 25+50	2004																												
	2004	2005																											
Y8RPC 24+07	2005																												
	2005	2006										92																	
Y8RPD 14+04	2007																												
	2007	2008																											
Y8RPD 12+50	2008																												
	2008	2009																											
Y8RPD 11+07	2009																												
	2009	2010																											
L 218+00	2011																												
	2011	2012										108																	
L 224+50	2013																												
	2013	2016										108																	
L 223+00	2014																												
	2014	2015																											
L 220+60	2015																												
	2015	2035																											
L 223+45	2016																												
	2016	2014																											
Y8 100+75	2017																												
	2017	2018																											
Y8 99+83	2018																												
	2018	2036																											
Y8 90+35	2019																												
	2019	2020																											
Y8 91+26	2020																												
	2020	2021																											
Y8 94+41	2021																												
L 227+58	2022																												
SHEET TOTALS												308	84			256	556						92	100			7.900		

LINE & STATION	FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE	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	Pipe Clean Out	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 W/ 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/ 2 GRATES STD. 840.29
			EACH	LIN. FT.	LIN. FT.																					
L 209+50	1904		1															1					1			
	1904	1905																								
L 212+00	1905		1															1					1			
	1905	2002																								
L 205+95	1907																									
	1907	1914																								
Y8RPDB 18+50	1908																									
	1908	1908A																								
Y8RPDB 20+00	1909																									
	1909	1909A																								
Y8RPDB 21+24	1911																									
	1911	1910																								
Y8RPC 19+50	1912																									
	1912	1912A																								
L 208+53	1914		1	5.0	3.1																					
	1914	1906																								
L 215+00	2001		1															1					1			
	2001	2002																								
L 213+60	2002		1															1					1			
	2002	2003																								
Y8RPC 25+50	2004		1															1			1					
	2004	2005																								
Y8RPC 24+07	2005		1															1			1					
	2005	2006																								
Y8RPD 14+04	2007		1															1			1					
	2007	2008																								
Y8RPD 12+50	2008		1															1			1					
	2008	2009																								
Y8RPD 11+07	2009		1															1			1					
	2009	2010																								
L 218+00	2011		1															1					1			
	2011	2012																								
L 224+50	2013		1															1			1					
	2013	2016																								
L 223+00	2014		1															1					1			
	2014	2015																								
L 220+60	2015		1															1					1			
	2015	2035																								
L 223+45	2016		1															1			1					
	2016	2014																								
Y8 100+75	2017		1															1					1			
	2017	2018																								
Y8 99+83	2018		1																							
	2018	2036																								
Y8 90+35	2019		1															1					1			
	2019	2020																								
Y8 91+26	2020		1																							
	2020	2021																								
Y8 94+41	2021		1	1.7														1					1			
L 227+58	2022		1															1					1			
SHEET TOTALS			21	6.7	3.1													18			7		11			

LINE & STATION	FROM	TO	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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
															CY	CY	CY	LIN. FT.	
L 209+50	1904																		
	1904	1905																	
L 212+00	1905																		
	1905	2002																	
L 205+95	1907																		
	1907	1914																	
Y8RPDB 18+50	1908																		
	1908	1908A																	
Y8RPDB 20+00	1909																		
	1909	1909A																	
Y8RPDB 21+24	1911																		
	1911	1910																	
Y8RPC 19+50	1912																		
	1912	1912A																	
L 208+53	1914					1	1												
	1914	1906																	
L 215+00	2001																		
	2001	2002																	
L 213+60	2002																		
	2002	2003																	
Y8RPC 25+50	2004																		
	2004	2005																	
Y8RPC 24+07	2005																		
	2005	2006																	
Y8RPD 14+04	2007																		
	2007	2008																	
Y8RPD 12+50	2008																		
	2008	2009																	
Y8RPD 11+07	2009																		
	2009	2010									2								
L 218+00	2011																		
	2011	2012																	
L 224+50	2013																		
	2013	2016																	
L 223+00	2014																		
	2014	2015																	
L 220+60	2015																		
	2015	2035																	
L 223+45	2016																		
	2016	2014																	
Y8 100+75	2017																		
	2017	2018																	
Y8 99+83	2018		1				1												
	2018	2036																	
Y8 90+35	2019																		
	2019	2020																	
Y8 91+26	2020		1				1												
	2020	2021																	
Y8 94+41	2021																		
L 227+58	2022																		
SHEET TOTALS			2			1	3				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

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TICIVILWORK717

COMPUTED BY: MSP **DATE:** 6/30/2017

CHECKED BY: EV **DATE:** 6/30/2017

PROJECT NO.	SHEET NO.
U-4751	3D-25

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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	CAAP 12 .064	CAAP 15 .064	CAAP 18 .064
			2022	2023		69.0	68.4			192					X					
L 229+50	0	CL	2023		73.3															
			2023	2024		68.4	68.1													
Y8LPB 11+98	14	LT	2024		77.6															
			2024	2025		68.1	39.0	0.8											164	
Y8 95+03	0	CL	2026		42.5															
Y8RPDB 36+75	21	LT	2027		66.7															
			2027	2028		62.9	40.9	0.5											112	
Y8LPB 18+50	14	LT	2029		49.4															
			2029	2030		45.7	41.1													
Y8LPB 22+51	14	LT	2031		45.1															
			2031	2034		41.3	39.0			40					X					
Y8LPB 23+00	14	LT	2032		45.3															
			2032	2031		41.5	41.3													
Y8LPB 22+00	14	LT	2033		45.3															
			2033	2031		41.5	41.3													
L 220+26	9	LT	2035		58.8															
			2035	2011		55.2	48.5	0.8		228					X					
Y8 96+05	11	RT	2036		44.7															
			2036	2026		39.2	38.4			104					X					
L 224+42	201	LT	2038		37.3															
			2038	2037		37.3	36.7													
Y8RPC 21+50	62	RT	2039		42.5															
			2039	2039A		42.5	42.2													
Y8RPDB 50+63	236	LT	2040		37.9															
			2040	2040A		37.9	36.9	0.3												
Y8 94+44	88	RT	2044		37.0															
			2044	2045		37.0	36.9	0.3												
Y8 94+44	79	RT	2045		36.9															
Y8RPDB 22+50	55	LT	2046		42.7															
			2046	2046A		42.7	42.3													
Y8RPDB 24+93	89	RT	2047		42.1															
			2047	2047A		42.1	41.7													
Y8RPD 15+00	197	LT	2048		42.0															
			2048	2048A		42.0	42.0													
Y8RPC 32+00	25	LT	2101		54.8															
			2101	2102		51.1	49.2			96					X					
Y8RPC 32+93	25	LT	2102		52.9															
			2102	2103		49.2	41.7												40	
Y8RPCA 62+83	43	RT	2104		43.7															
			2104	2105		38.4	37.9						140		X					
Y8RPCA 51+00	62	RT	2108		42.6															
			2108	2108A		42.6	41.7													
Y8RPCA 53+50	64	RT	2109		41.4															
			2109	2109A		41.4	41.2													
Y8RPCA 56+00	61	RT	2110		41.4															
			2110	2110A		41.4	41.3													
Y8RPCA 58+50	61	RT	2111		41.3															
			2111	2111A		41.3	41.1													
Y8RPCA 63+37	36	LT	2112		38.1															
SHEET TOTALS										660			140						316	

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY
	2022	2023																											
L 229+50	2023																												
	2023	2024										84																	
Y8LPB 11+98	2024																												
	2024	2025																											
Y8 95+03	2026																												
Y8RPDB 36+75	2027																												
	2027	2028																											
Y8LPB 18+50	2029																												
	2029	2030										72																	
Y8LPB 22+51	2031																												
	2031	2034																											
Y8LPB 23+00	2032																												
	2032	2031										48																	
Y8LPB 22+00	2033																												
	2033	2031										48																	
L 220+26	2035																												
	2035	2011																											
Y8 96+05	2036																												
	2036	2026																											
L 224+42	2038																											3.400		
	2038	2037																								392				
Y8RPC 21+50	2039																												
	2039	2039A														116													
Y8RPDB 50+63	2040																												
	2040	2040A													324														
Y8 94+44	2044																											4.500		
	2044	2045															12												
Y8 94+44	2045																												
Y8RPDB 22+50	2046																												
	2046	2046A														112													
Y8RPDB 24+93	2047																												
	2047	2047A														168													
Y8RPD 15+00	2048																												
	2048	2048A														284													
Y8RPC 32+00	2101																												
	2101	2102																											
Y8RPC 32+93	2102																												
	2102	2103																											
Y8RPCA 62+83	2104																												
	2104	2105																											
Y8RPCA 51+00	2108																												
	2108	2108A														144													
Y8RPCA 53+50	2109																												
	2109	2109A														124													
Y8RPCA 56+00	2110																												
	2110	2110A														108													
Y8RPCA 58+50	2111																												
	2111	2111A														104													
Y8RPCA 63+37	2112																												
SHEET TOTALS												252			324	1160	12							392			7.900		

LINE & STATION	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	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	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
	2022	2023																																									
L 229+50	2023		1															1						1																			
	2023	2024																																									
Y8LPB 11+98	2024		1	4.5		1		1																																			
	2024	2025																																		2								
Y8 95+03	2026		1	3.4														1						1																			
Y8RPDB 36+75	2027		1															1			1																						
	2027	2028																																		2								
Y8LPB 18+50	2029		1			1			1																																		
	2029	2030																																									
Y8LPB 22+51	2031		1			1	1																																				
	2031	2034																																									
Y8LPB 23+00	2032		1			1		1																																			
	2032	2031																																									
Y8LPB 22+00	2033		1			1			1																																		
	2033	2031																																									
L 220+26	2035		1																									1				1											
	2035	2011																																									
Y8 96+05	2036		1	0.5																								1				1											
	2036	2026																																									
L 224+42	2038																																										
	2038	2037																																									
Y8RPC 21+50	2039																																										
	2039	2039A																																									
Y8RPDB 50+63	2040																																										
	2040	2040A																																									
Y8 94+44	2044																																										
	2044	2045																																									
Y8 94+44	2045																																							0.8856			
Y8RPDB 22+50	2046																																										
	2046	2046A																																									
Y8RPDB 24+93	2047																																										
	2047	2047A																																									
Y8RPD 15+00	2048																																										
	2048	2048A																																									
Y8RPC 32+00	2101		1															1			1																						
	2101	2102																																									
Y8RPC 32+93	2102		1															1			1																						
	2102	2103																																		2								
Y8RPCA 62+83	2104		1	0.3													1							1																			
	2104	2105																																									
Y8RPCA 51+00	2108																																										
	2108	2108A																																									
Y8RPCA 53+50	2109																																										
	2109	2109A																																									
Y8RPCA 56+00	2110																																										
	2110	2110A																																									
Y8RPCA 58+50	2111																																										
	2111	2111A																																									
Y8RPCA 63+37	2112																																										
SHEET TOTALS			13	8.7		5	1	2	2								1	5			3		3					2				2				6						0.8856			

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

TICIVILWORK717

COMPUTED BY:	MSP	**DATE:**	6/30/2017
CHECKED BY:	EV	**DATE:**	6/30/2017

PROJECT NO.	**SHEET NO.**
U-4751	3D-26

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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	Pipe Clean Out	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 W/ 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/ 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	SPECIAL TBJB W/MH	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	MODIFIED CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%	12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12 .064	15 .064	18 .064	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	CY	CY	MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																											CY	CY	CY	LIN. FT.	
		2112	2112A		38.1	37.6																									336																																																						
Y8RPDB 60+97	53 LT	2113		38.6																																																																																		
		2113	2113A		38.6	37.3																									144																																																						
Y8RPDB 60+94	53 LT	2114		38.6																																																																																		
		2114	2114A		38.6	37.3																									144																																																						
Y8RPDB 57+32	60 LT	2115		38.6																																																																																		
		2115	2115A		38.6	37.3																								156																																																							
Y8RPDB 53+73	64 LT	2116		38.3																																																																																		
		2116	2116A		38.3	37.1																									172																																																						
Y8RPD 20+93	25 RT	2201		57.8																																										1														1			1																					
		2201	2202		54.0	42.2											52																																																												2							
Y8RPDB 33+26	167 RT	2203		37.8																																							4.500																																										
		2203	2049		37.8	37.6																																			340																																												
Y8RPD 20+00	83 RT	2204		42.7																																																																																		
		2204	2204A		42.7	41.2																										188																																																					
Y8RPD 24+85	39 RT	2206		37.2																																							4.500																																										
		2206	2205		37.2	36.8																											340																																																				
Y8 40+53	83 LT	3102		34.9																																																																															1.0126			
		3102	3101		34.9	34.7	0.7																											20																																																			
Y8 53+63	82 LT	3206		39.7																																																																															0.5526			
		3206	3205		39.7	39.6																								20																																																							
Y8 55+55	87 LT	3208		39.8																																																																															0.5526			
		3208	3207		39.8	39.7																								16																																																							
Y8 53+62	87 RT	3209		39.9																																																																																		
		3209	3210		39.9	39.9																								12																																																							
Y8 53+62	79 RT	3210		39.9																																																																															0.5526			
Y8 55+55	89 RT	3211	3212		40.1	40.1																								8																																																				0.5526			
Y8 57+55	84 LT	3302		39.7																																																																															0.5526			
		3302	3301		39.7	39.6																								20																																																							
Y8 59+55	86 LT	3304		39.8																																																																															0.5526			
		3304	3303		39.8	39.7																								20																																																							
Y8 61+51	87 LT	3306		39.8																																																																															0.5526			
		3306	3307		39.8	39.7																								20																																																							
Y8 63+47	81 LT	3308		40.9																																																																															0.4465			
		3308	3309		40.9	40.8																							24																																																								
Y8 57+55	93 RT	3311	3310		40.0	40.0																								8																																																				0.5526			
Y8 59+55	88 RT	3313	3312		40.5	40.5																								8																																																				0.5526			
Y8 61+51	90 RT	3315	3314		39.9	39.9																								12																																																				0.5526			
Y8 63+47	88 RT	3317	3316		40.7	40.7																							8																																																					0.4465			
Y8 113+27	83 RT	3401		37.7																																							6.000																																										
Y8 114+66	87 RT	3403		39.8																																																																															0.4465			
		3403	3402		39.8	39.7																							4																																																								
L 117+95	226 LT	0000																																																																																					35	
L 118+10	150 LT	0000																																																																																					100	
L 118+55	229 LT	0000																																																																																					41	
Y5 16+85	0 CL	0000																																																																																					51	
Y5 16+60	23 LT	0000																																																																																					44	
L 128+00	39 RT	0000																																																																																					100	
L 128+00	48 RT	0000																																																																																					100	
L 128+00	83 LT	0000																																																																																					48	
SHEET TOTALS																	52											36	300	796	188	340	20							340		15.000			1														1			1													2					7.8781		519	

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

TICIVILWORK717

COMPUTED BY: MSP	DATE: 6/30/2017
CHECKED BY: EV	DATE: 6/30/2017

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-4751	3D-27

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)

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

LINE & STATION	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)									CAAP			R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	PIPE CLEAN OUT	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 W/ 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/ 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	ADJUST M.H.	ADJUST C.B.	ADJUST D.I.	15" CAAP ELBOW	18" CAAP ELBOW	8" SLUICE GATE	CONC. FLUME	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE		FROM	TO					12	15	18	24	30	36	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	12	15	18	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48			MASONRY	0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE		E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															
THICKNESS OR GAUGE																	.064	.064	.064																																																																					
				FT.	FT.	FT.	%																																					CY	CY	CY	EACH	LIN. FT.	LIN. FT.																																		CY	CY	CY	LIN. FT.	
L 139+30	94 RT	0000																																																																																				16	
L 140+53	56 RT	0000																																																																																				30	
L 140+87	20 RT	0000																																																																																				21	
L 169+55	65 RT	0000																																																																																				21	
L 184+20	122 RT	0000																																																																																				31	
L 184+89	37 LT	0000																																																																																				21	
L 198+25	45 RT	0000																																																																																				17	
L 206+85	128 LT	0000																																																																																				25	
L 210+03	38 RT	0000																																																																																				25	
L 214+85	188 RT	0000																																																																																				42	
Y8RPC 25+35	165 RT	0000																																																																																				20	
Y8RPC 25+75	167 RT	0000																																																																																				41	
Y8RPC 26+20	176 RT	0000																																																																																				21	
Y8RPC 30+25	90 LT	0000																																																																																			18	
L 219+43	205 LT	0000																																																																																				25	
L 219+60	203 LT	0000																																																																																				42	
L 224+10	322 RT	0000																																																																																				22	
L 234+00	150 RT	0000																																																																																				48	
Y8 70+15	73 RT	0000																																																																																				8	
Y8 53+62	79 RT	0000																																																																																				8	
L 74+00	13 LT	0923		48.9																																								1								1				1	1																											
		0923	0919		44.5	44.7																						28																																																										
L 11+27	72 RT																																																							3																													Clean out Ex. 48",42",18" RCP Pipe
Y 26+36	33 RT																																																							4																													Clean out Ex. 15",12" RCP Pipe
Y25 11+58	20 LT																																																							1																													Clean out Ex. 15" RCP Pipe
Y 28+93	8 RT																																																							2																													Clean out Ex. 15",12" RCP Pipe
Y 17+35	32 LT																																																							3																													Clean out Ex. 24",15" RCP Pipe
Y 15+56	31 LT																																																							4																													Clean out Ex. 24",15",12" RCP Pipe
Y8 53+65	0																																																							3																													Clean out Ex. 24" RCP Pipe
Y8 57+55	0																																																							1																													Clean out Ex. 24" RCP Pipe
Y8 59+55	0																																																							1																													Clean out Ex. 24" RCP Pipe
Y8 61+50	0																																																							1																													Clean out Ex. 24" RCP Pipe
Y8 63+45	0																																																							1																													Clean out Ex. 18" RCP Pipe
Y8 75+45	0																																																							1																													Clean out Ex. 24" RCP Pipe
Y8 78+40	0																																																							1																													Clean out Ex. 24" RCP Pipe
L 107+00	98 RT	1136	1134		38.7	38.3					144			X																																																																										
L 108+40	101 RT	1134		44.0																																												1																									1				1												
		1134	1245								100			X																																																																												
L 109+50	101 RT	1245																																														1																									1				1												
		1245	1246								80			X																																																																													
SHEET TOTALS											324																		28																		3								1			26	1	1											2				2											502	
PROJECT TOTALS								44	4200	652	480	1128	532					1608	48									248	17436	7016	6148	4348	4644	1844	1196				48	272	492	340		90.900			475	219.0		279	52	116	111		60	1	1	42	76	76	9	68			31		24		4	24	23	5	6	3	32		3	2	12	2	1	2	5	12.7181	0.188	11789	

TICIVILWORK717

COMPUTED BY: MSP DATE: 6/30/2017

CHECKED BY: EV DATE: 6/30/2017

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-4751	3D-28

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	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE: 12	15	18	24	30	THICKNESS OR GAUGE	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC
L 58+62	0 CL	0905			38.3	37.8										
L 178+67	101 LT	1716		37.5												
L 182+07	99 RT	1717		38.0												
		1717	1723		38.0	37.7										
SR4 22+23	54 LT	1721		38.3												
SR4 23+00	26 RT	1722		38.6												
		1722	1721		38.6	38.3										
L 180+29	6 LT	1723		51.0												
		1723	1716		37.7	37.5										
L 215+99	103 LT	2041		36.5												
		2041	2042		36.5	35.8										
L 215+28	85 RT	2042		35.8												
Y8RPC 26+53	104 RT	2106		36.0												
Y8RPC 30+20	87 LT	2107		36.3												
		2107	2106		36.3	36.0										
SHEET TOTALS																
PROJECT TOTALS																

	CAAP			R. C. PIPE CLASS III									R. C. PIPE CLASS IV										R. C. PIPE CLASS V										ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE
	12	15	18	12	15	18	24	30	36	42	48	54	60	12	15	18	24	30	36	42	48	54	60	12	15	18	24	30	36	42	48	54			
THICKNESS OR GAUGE	.064	.064	.064																																
CY																																	CY	CY	CY
L 58+62													188																						
L 178+67																																		5.600	
L 182+07																																		5.600	
													208																						
SR4 22+23																																		5.000	
SR4 23+00																																		5.000	
													104																						
L 180+29																																			
													188																						
L 215+99																																		5.600	
													204																						
L 215+28																																		5.600	
Y8RPC 26+53																																		5.600	
Y8RPC 30+20																																		5.600	
													416																						
SHEET TOTALS													104	1204																				43.600	
PROJECT TOTALS													104	1204																				43.600	

	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			CONCRETE TRANSITIONAL SECTION		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	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. FLAT) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	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	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
	0' THRU 5'	5' THRU 10'	10' AND ABOVE		E	F	G																											
	EACH	LIN. FT.	LIN. FT.		GRATE TYPE																														
L 58+62																																		CULVERT
L 178+67																																		
L 182+07																																		
SR4 22+23																																		
SR4 23+00																																		
L 180+29	1	5.0	3.3																										1	1				
L 215+99																																		
L 215+28																																		
Y8RPC 26+53																																		
Y8RPC 30+20																																		
SHEET TOTALS	1	5.0	3.3																										1	1				
PROJECT TOTALS	1	5.0																											1	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

COMPUTED BY: SCS DATE: 7-10-17	DATE: 3-6-17
CHECKED BY: GAM DATE: 7-10-17	DATE: 7-3-17

(2-16-16)

PROJECT NO.	SHEET NO.
U-4751	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAY

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	1,000
				TOTAL LF:	1,000

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU/AST/ASU	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
VARIES			AST	3					10,000
CONTINGENCY			ASU	12	500	950	1,500		
			TOTAL CY/TONS/SY:		500	950	1500**	0	10,000

*ASU = Aggregate Subgrade
*AST = Aggregate Stabilization
**Total square yards of "Geotextile for Soil Stabilization" is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
-L-	2:1	93+25	2:1	94+75	LT	1		180
-L-	2:1	102+75	2:1	106+75	LT	1		480
							TOTAL SY:	660

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

SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
-L-	2:1	94+75	2.5:1	102+25	LT	1290		1290	
-L-	2.5:1	104+25	2.5:1	106+75	RT	960		960	
					TOTAL SY:	2250	0	2250*	0**

*Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.
**Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
Bridge No. 201 on -L- over -Y1- at -L- 38+94.20	End Bent 1	6
Bridge No. 201 on -L- over -Y1- at -L- 38+94.20	End Bent 2	6
Bridge No. 202 on -L- over -Y2- at -L- 62+99.00	End Bent 1	2
Bridge No. 202 on -L- over -Y2- at -L- 62+99.00	End Bent 2	2
Bridge No. 203 on -L- over -Y8- at -L- 225+92.26	End Bent 1	4
Bridge No. 203 on -L- over -Y8- at -L- 225+92.26	End Bent 2	4
Bridge No. 204 on -Y8RPDB- over -Y8- at -Y8RPDB- 35+12.05	End Bent 1	4
Bridge No. 204 on -Y8RPDB- over -Y8- at -Y8RPDB- 35+12.05	End Bent 2	6

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
1	-L- 37+55	50	LT
2	-L- 37+95	5	LT
3	-L- 38+35	40	RT
4	-L- 39+60	60	LT
5	-L- 39+95	7	LT
6	-L- 40+30	45	RT
7	-L- 224+60	65	RT
8	-L- 224+60	55	RT
9	-L- 237+25	65	LT
10	-L- 227+25	55	RT
11	-Y8RPDB- 33+84	22	LT
12	-Y8RPDB- 33+77	16	RT
13	-Y8RPDB- 36+52	22	LT
14	-Y8RPDB- 36+34	16	RT
	TOTAL GAUGES (EACH):		14

PROJ. REFERENCE NO.	SHEET NO.
U-4751	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	PEACE BAPTIST CHURCH, INC OF WILMINGTON, NC
2	4,25	WILLIAM TOWLES, ET UX
3	4,5,25	ODGEN PLAZA, LLC.
4	4	PEBBLE COVE HOA, INC.
8	5,6,25	ZP NO. 173, LLC.
8A	5,6	BAY FOODS, INC.
9	4,5	OGDEN VOLUNTEER RESCUE
10	5	JOSEPH L. JOHNSON ET UX, ET AL
10A	5	JAMES L. BATEY, ET UX
12	5,6,27	ANGELINE B. SAFFO
13	6,27	EMMA Y. MURRY ET AL (TRUSTEES OF PROSPECT CEMETERY ASSOCIATION)
15	6	STOVHORT, INC.
16	6	R. TERRELL HORTON, III
17	6	G&I VI CAPE HARBOR LP
18	6	B T IMPORTS, INC
19	6	ENOCH CHAPEL MISSIONARY BAPTIST CHURCH
20	6	ALVARO CERVANTES, ET UX
21	6	CORNELIUS NIXON TRUST
21A	6	RONALD NIXON
22	6	JWC, LLC
23	6	SAM MCCALL FAMILY LIMITED PARTNERSHIP
24	6	LEES CUT INVESTMENTS, LLC
26	6	C310 CAMPUS PROPERTIES, LLC.
27	6	WILLIAM T JR & MARY EVANS
28	6	CARDINAL LANES, INC.
29	6	MILDRED EVANS SPENCER
30	6	WILLIE BLANCHE EVANS LIFE EST C/O ROBERT EVENS
31	6	SLAGLE HOLDINGS, LLC.
32	6	NANCY M. MITCHELL
33	6	GEORGE A. SPICER
34	6,28	ROBERT LOUISE WILLIAMS
35	6,28	EDNA F. DUPREE
36	7	CAROLINA POWER AND LIGHT CO
37	7,8,9	NEW HANOVER COUNTY (PARKS & REC.)
38	8,9	HOLLY FIELD AT WESTBAY ESTATES HOA DEDICATED OPEN SPACE
39	9	CFPUA
40	9	COWELL NICHOLAS ETAL
41	9	TORCHWOOD DEVELOPMENT COMPANY
42	9	BAIN BRANDON C ETAL
43	9	LALOMIA BARRY P
44	9	TRUONG TOMMY V ETAL
45	9	EVANS DAVID L & ELIZABETH
46	9	STEVENS BUILDING CO
47	9	STEVENS BUILDING CO
48	9	STEVENS BUILDING CO
49	9	BROWN KASEY SARAH
50	9,10	BENTON KENNETH H JR
51	9,10	TORCHWOOD DEVELOPMENT
52	10	CANNADY WILLIAM B III & SHEENA M
53	10	DUFFY TARALYN ETAL
54	10	STEVENS BUILDERS CO
56	10	STEVENS BUILDERS CO
57	10	HOLLY FIELD @ WEST BAY HOA
58	10	TORCHWOOD DEVELOPMENT
59	10	TORCHWOOD DEVELOPMENT COMPANY
62	10	TORCHWOOD DEVELOPMENTS
63	10	SHAWN BELSCHNER
64	10	ROGER A WOOD
65	10	STEVENS BUILDING CO
66	10	ELIZABETH A WRIGHT
67	10	STEVENS BUILDING CO

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
68	10	DAVID S FLOYD JR
69	10	RYAN D BIRTLES
70	10	DENNIS G STOKLEY
71	10	MICHAEL D McGARRY
72	10	TASHA L COLEY
73	10,11	LISA ANN SAVIANO
74	10,11	DAVID P HEIDENREICH
75	10,11	MICHAEL K McGARRY
76	11	C ROBERT STROUD JR
77	11	DAMIEL E DAVIS
78	11	EDWARD E BENTON, SR
79	11	MARY ELLEN DOSS
80	11	DANA L BRITTLE
81	11	JOYCE E KAYLOR
82	11	TIMOTHY J BERRYHILL
83	11	NOAH S BOATRIGHT
84	11	KENNETH R CURLEY
85	11	ROBERT HARRISON
86	11	WESLEY R SLAYTON
87	11	THOMAS P MACNEISH
88	11	FRANKLIN H PHILLIPS III
89	11	MATTHEW M HAYDEN
90	11	BARBARA E MILLER REVOCABLE TRUST
91	11	WEST BAY NEIGHBROHOODS EST HOA
92	11	DANIEL W PATTERSON
93	11	JOSEPH M VADINO
94	11	JEREMY AKIN
95	11	JOHN ROWLEY
96	11	ROBERT HARRISON
97	11	CHARLES S LINDSEY
98	11	CARRIE L CHEATHAM
99	11	NICHOLAS PATELLA
100	11	TIMOTHY L ALLENSWORTH
101	11	DEBORAH GODFREY
102	11	SANDRA ORSA
103	11,12	CHRISTOPHER M SMITH
104	12	WHITNEY PINES HOA
105	12	DEAN K KITTLESON
106	12	LORAN H SMITH
107	12	LE H NGUYEN
108	12	AUSTIN TYLER MOZINGO
112	12	HOLLY FIELD @ WEST BAY EST HOA
114	12,13	COURTNEY PINES HOA
115	12,13	TORCHWOOD DEVELOPMENT CO INC
116	13	FIRST TROY SPE LLC
117	13	MORGAN B JOHNSON
118	13	KRISTEN L GAMBILL
119	13	FELICE FURINO
120	13	THINH HUU PHAN
121	13	STACEY S SEARS
122	13	DAVID K MULKEY
123	13	RANDY W CHANDLER
124	13	JASON G HERANDEZ
125	13	JOSHUA T FORYSTEK
126	13	MATTHEW KYLE HOLLOWAY
127	13	BENJAMIN OVERTON
128	13	AMBER HODGE
129	13	PATRICIA BARKER
130	13	JEFFREY C BASS
131	13	BRIAN S HUNT
132	13	DANIEL E CLEMENTS

PROJ. REFERENCE NO.	SHEET NO.
U-4751	3P-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
133	13	MICHAEL C MACGOVERN
134	13,14	GREG L BRYANT
135	13	THOMAS D HUGHES
136	13,14	AMY R KROEPLIN
137	13,14	COURTNEY PINES HOA
138	14	JOHN HOLT
139	14	MARY ANNE MUNTO
140	14	GEORGE A SCHMITT
141	14	RROBERT THRONE
142	14	AMANDA MARSHALL
143	14	FRANKLIN HOWARD
144	14	BRADLEY R CARTER
145	14	NEW HANOVER COUNTY
146	15	ANDREW M. GALLACHER
147	15	BOBBY R. CHESTER
148	15,16,17,18	HANOVER LAND, LLC
149	15,16	ROMEO A. MISIERA
150	16	FOY S. THORNTON TRUST B, ET AL
151	17	MY THI TROUT
152	17	MANSEL S. ARMSTRONG, ET AL
153	17,18	SYLVIA WHALEY LEWIS & KAREN WHALEY COBB
154	18	KENNETH R. PARKER, SR., ET UX
155	18	HANH THI BICH LA
156	18,19	EDWARD C. DRAPALA
157	19	EDWARD C. DRAPALA
158	19	DENNIS R. SMITH
159	19	MARGARET M. LANGLEY, HEIRS
160	19,20	CHARLES M. MAINLAND
161	20,21	MARK F. HOLLIFIELD
162	20,21	JOHN MAFFETORE
163	20	TEX ALLEN ANDERSON
165	20	JEFFREY SCOTT DAVIS
166	20	OUT ISLAND, LLC
167	20	ELEANOR G. BOZIK
168	20	STEVE GALE
169	20,22	FOY SHELTON THORNTON
169A	20,21,22,33,34	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
170	20,21,22,31,32,33,34	CORBETT INDUSTRIES INC.
171	21	LENIER FURR
172	21	ETTA P WILSON, HEIRS
173	21	KENNETH WAYNE BARROW
174	21	KAY A. LEE
175	21,33	ALEJANDRO ILINAS
176	22	DIANE THI MINH CHAU TA
177	24	TRINITY GROUP OF WILMINGTON, INC.
178	24	H&S FAMILY HOLDINGS, LLC.
178A	24	STATE OF NORTH CAROLINA
179	24	ROBERT L. YUNASKA
180	24	NORTH MARKET COMMERCIAL PARK POA, INC.
181	24	ANN F. HOWARD REVOCABLE TRUST, ET AL
182	24	EUGENE N. FLOYD, FAMILY TRUST
183	24,25	SUN TU III, LLC.
184	24,25	CHRISTOPHER E. FLOYD, ET UX
185	25	MICHAEL L. MERRITT, ET UX
186	25	W-3 SECURCARE PROPERTIES I, LLC.
187	25	RAYMOND C. MILLER, ET UX
188	25	3BS,LLC.
189	25	MILTED, LLC.
190	25	WILLIAM P. SAFFO, HEIRS, ETAL
191	25	WILKINSON PROPERTIES

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
192	25	SBBH INVESTMENTS, LLC.
193	25	OGDEN ASSOCIATES, LLC.
194	6,25	OLEARY PROPERTIES, LLC.
199	26	C H REAL ESTATE, LLC.
200	27	CORNELIUS NIXON, TRUSTEE
201	28	EDWARD FOYLES, HEIRS
202	28	MT ARARAT AME CHURCH
203	28	GREGORY LEW, ET UX
204	28	BELLA HIGHSMITH CEMETERY
204A	28	ROSS WASHINGTON, HEIRS
205	28	K&J HOLDINGS, LLC.
206	28	ROWAN ASSET COMPANY, LLC.
207	28	ODGEN BAPTIST CHURCH OF WILMINGTON
208	28	JOSEPH H. JOHNSON, JR.
209	28	FRED J. MATT
210	28	GATEWAY WILMINGTON, LLC
211	28,29	CECIL THOMAS COVIL, ET AL
212	29	BOJO OGDEN, LLC
213	29	DEBORAH C. SASSER
214	29	ENT WORSLEY REAL ESTATE, LLC
215	29	SS REALTY, LLC
216	29	ATRIUM AT MIDDLE SOUND LAND
217	29,30	JR DEVELOPERS, LLC.
218	29	J.W. COVIL, ET UX
219	29	OCEANS 3, LLC.
220	29,30	DELORIS RYALS
221	29	BERTHA R. MARTIN
222	29	5 J's HOLDINGS, LLC
223	29	MARY J. SHANNON, HEIRS
224	30	COSWALD, LLC
225	30	OGDEN BUSINESS PARK, LLC
226	30	SUNTRUST BANK
227	29,30	JOSEPH E. SHANNON
901	6,27	NCDOT
903	6	6943 MARKET, LLC.
904	6,7	NIXON ASSOCIATES, LLC.
905	10,11,12,13,14	NCDOT
906	6	MID STATE PETROLEUM REALITY, LLC.
907	5,27	B. P. A.
908	6	NCDOT
909	6	NCDOT
910	14,15	SAVANA LAND COMPANY, LLC
911	6	NIXON ASSOCIATES, LLC.
912	20	WAYNE J. WATKINS
913	6	CARL SHEPARD, ET UX
914	6	GOULD INVESTMENTS, LLC.
915	18,19	NCDOT
916	20	RICHARD EASON, ET AL
917	6	COASTAL STORAGE, INC.
918	11	NCDOT
925	10	NCDOT
930	6	McINNIS FAMILY LIVING TRUST

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

PROJECT REFERENCE NO.	SHEET NO.
U-4751	4
RW SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043891 STEVEN C. STEPHENS
8/31/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029388 EDWARD L. VANCE
8/31/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

1 PEACE BAPTIST CHURCH, INC OF WILMINGTON, NC
DB 4922 PG 672
DB 1100 PG 468
DB 1887 PG 495
DB 2605 PG 674
MB 45 PG 388

ARBOR COURT, HOA.
DB 2644 PG 565
DB 4309 PG 268
DB 4157 PG 121
DB 3343 PG 158
DB 2756 PG 695
DB 2605 PG 696
MB 11 PG 324

STATE OF NORTH CAROLINA
DB 4907 PG 2541

2A W. ESTATES I, LLC.
DB 5999 PG 216
DB 2914 PG 1131
DB 2419 PG 452
DB 2444 PG 474
DB 2568 PG 074
DB 2620 PG 212
DB 4074 PG 766

3 ODGEN PLAZA, LLC.
DB 2690 PG 425
DB 5443 PG 901
DB 4157 PG 115
DB 2689 PG 525
DB 2664 PG 677
DB 2615 PG 512
MB 4 PG 96

KEY COLONY AT COVIL ESTATES HOA, INC.
DB 4594 PG 437
MB 45 PG 122

THE LANDFALL COUNCIL OF ASSOCIATIONS, INC.
DB 2535 PG 598
DB 4134 PG 672
MB 36 PG 33

4Z PEBBLE COVE HOA, INC.
DB 4853 PG 28
DB 4544 PG 978
MB 45 PG 122
MB 33 PG 190

9Z OGDEN VOLUNTEER RESCUE
DB 4034 PG 732
DB 1145 PG 1873
MB 4 PG 96

BEGIN TIP PROJECT U-4751
-L- POT STA. 10+35.00

END CONSTRUCTION
-Y20- POT STA. 11+32.70

MATCHLINE -L- STA 20+00 (SHEET 5)

SEE SHEET 35 FOR -L- PROFILE
SEE SHEET 62 FOR -Y20- PROFILE
SEE SHEET 2B-8 FOR CURVE DATA
SEE SHEETS 2D-1 & 2D-2 FOR DITCH DETAILS
SEE SHEETS 2N-1 & NW-1 FOR NOISE WALL 1A PLANS
SEE SHEETS 2N-2 & NW-2 FOR NOISE WALL 1B DETAILS

7/24/2017
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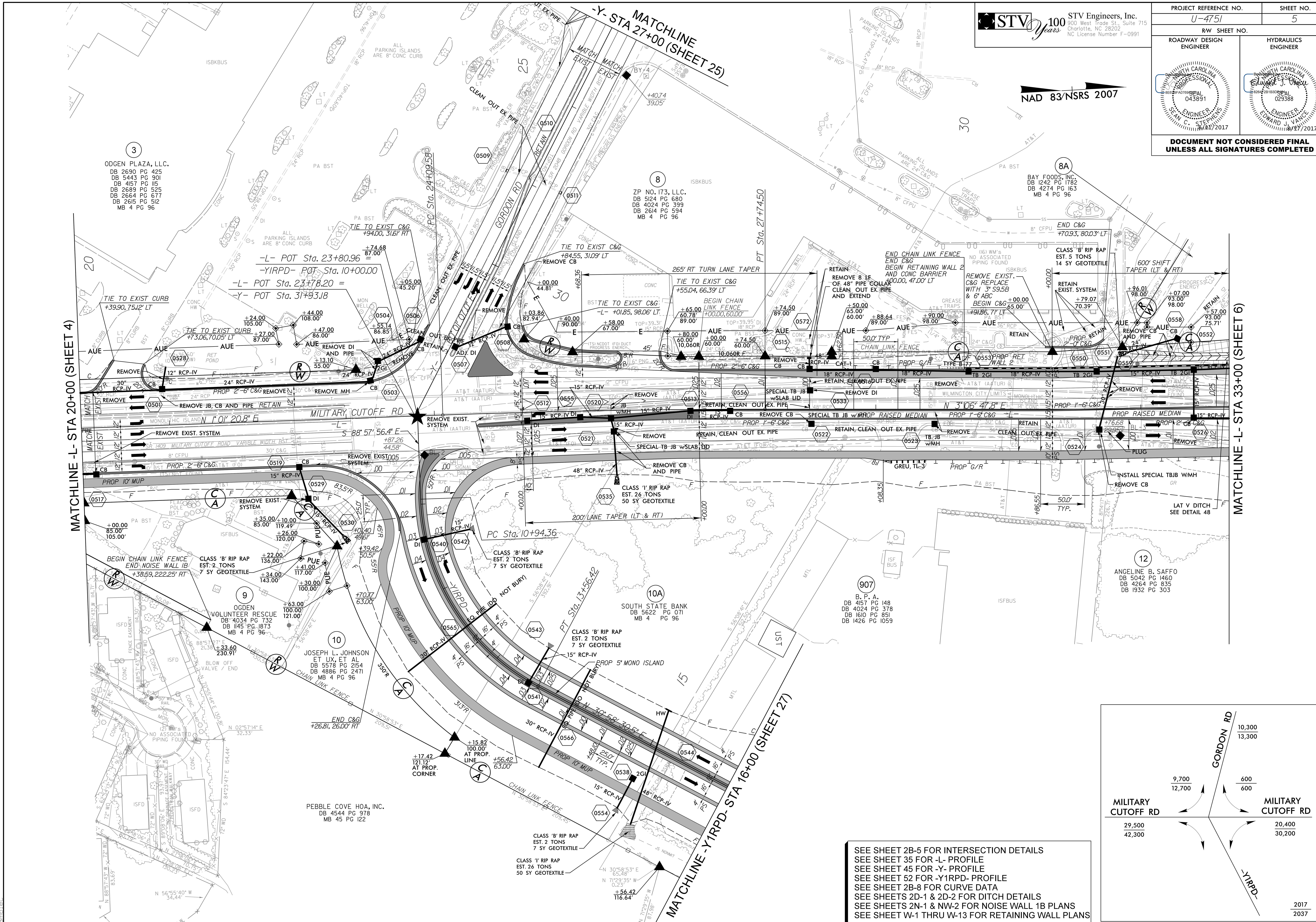
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
U-4751	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 043891 — SEAN C. STEPHENS — 7/21/2017	SEAL 029388 — EDWARD J. VANCE — 7/21/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NAD 83/NSRS 2007
MATCHLINE -Y- STA 27+00 (SHEET 25)
MATCHLINE -L- STA 20+00 (SHEET 4)
MATCHLINE -L- STA 33+00 (SHEET 6)
MATCHLINE -Y1RPD- STA 16+00 (SHEET 27)
MILITARY CUTOFF RD
GORDON RD
-L- POT Sta. 23+80.96 =
-YIRPD- POT Sta. 10+00.00
-L- POT Sta. 23+78.20 =
-Y- POT Sta. 31+93.18
N 1°01' 20.8" E
S 88°57' 56.4" E
N 3°06' 47.8" E
PC Sta. 24+09.50
PC Sta. 10+94.36
PT Sta. 13+56.42
PT Sta. 27+74.50
3
OGDEN PLAZA, LLC.
DB 2690 PG 425
DB 5443 PG 901
DB 4157 PG 115
DB 2689 PG 525
DB 2664 PG 677
DB 2615 PG 512
MB 4 PG 96
8
ZP NO. 173, LLC.
DB 5124 PG 680
DB 4024 PG 399
DB 2614 PG 594
MB 4 PG 96
8A
BAY FOODS, INC.
DB 1242 PG 1782
DB 4274 PG 163
MB 4 PG 96
9
OGDEN VOLUNTEER RESCUE
DB 4034 PG 732
DB 1145 PG 1873
MB 4 PG 96
10
JOSEPH L. JOHNSON ET UX, ET AL
DB 5578 PG 2154
DB 4886 PG 2471
MB 4 PG 96
10A
SOUTH STATE BANK
DB 5622 PG 071
MB 4 PG 96
907
B. P. A.
DB 4157 PG 148
DB 4024 PG 378
DB 1610 PG 851
DB 1426 PG 1059
12
ANGELINE B. SAFFO
DB 5042 PG 1460
DB 4264 PG 835
DB 1932 PG 303
PEBBLE COVE HOA, INC.
DB 4544 PG 978
MB 45 PG 122
265' RT TURN LANE TAPER
200' LANE TAPER (LT & RT)
600' SHIFT TAPER (LT & RT)
PROP 10' MUP
PROP RAISED MEDIAN
PROP 2'-6" C&G
PROP 1'-6" C&G
CLASS 'B' RIP RAP EST. 2 TONS 7 SY GEOTEXTILE
CLASS 'I' RIP RAP EST. 26 TONS 50 SY GEOTEXTILE
CLASS 'B' RIP RAP EST. 5 TONS 14 SY GEOTEXTILE
LAT V DITCH SEE DETAIL 48
MILITARY CUTOFF RD
GORDON RD
-Y1RPD-
10,300
13,300
9,700
12,700
600
600
29,500
42,300
20,400
30,200
2017
2037

SEE SHEET 2B-5 FOR INTERSECTION DETAILS
SEE SHEET 35 FOR -L- PROFILE
SEE SHEET 45 FOR -Y- PROFILE
SEE SHEET 52 FOR -Y1RPD- PROFILE
SEE SHEET 2B-8 FOR CURVE DATA
SEE SHEETS 2D-1 & 2D-2 FOR DITCH DETAILS
SEE SHEETS 2N-1 & NW-2 FOR NOISE WALL 1B PLANS
SEE SHEET W-1 THRU W-13 FOR RETAINING WALL PLANS

7/24/2017
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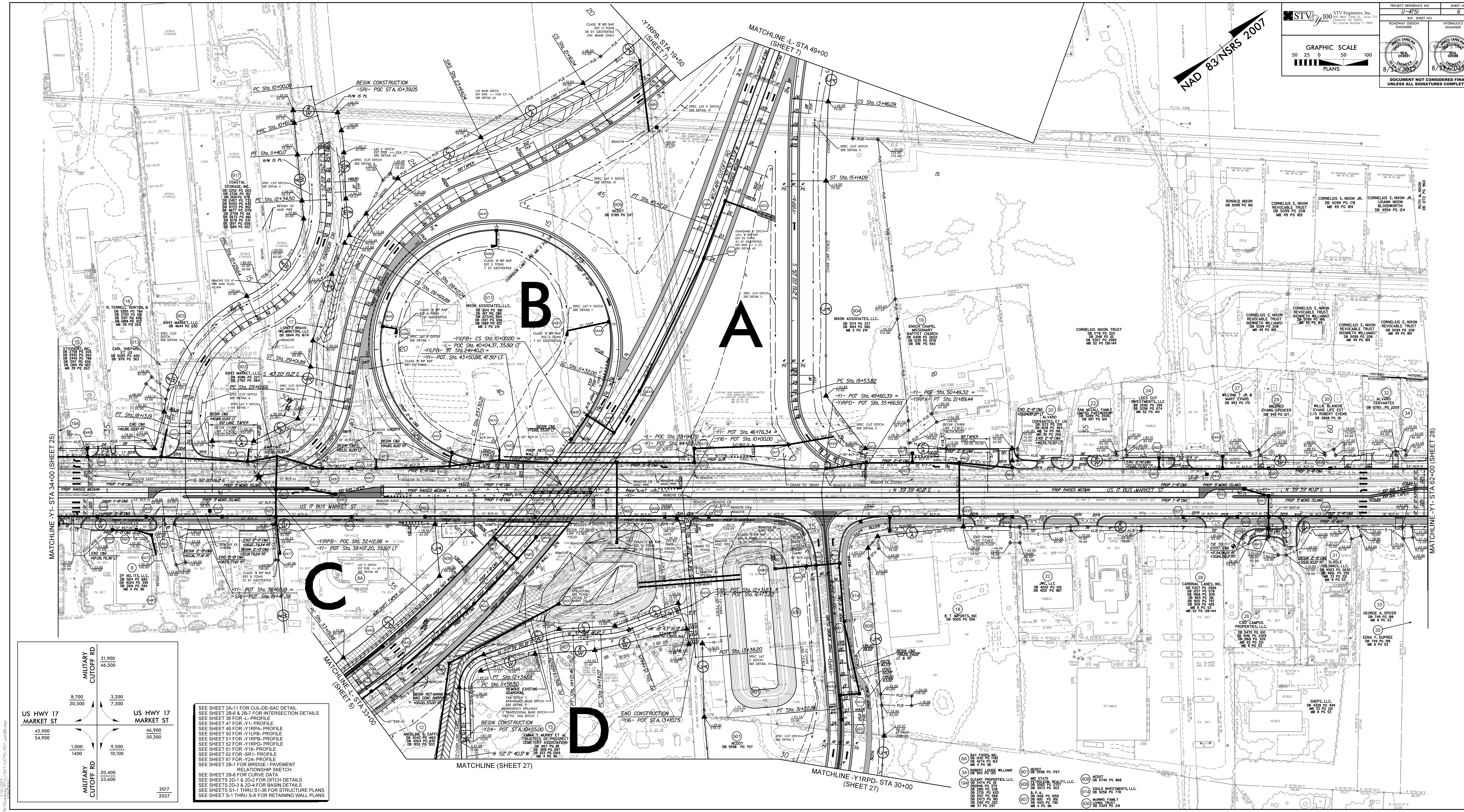

SEE SHEET 2A-11 FOR CUL-DE-SAC DETAIL
SEE SHEET 2B-6 & 2B-7 FOR INTERSECTION DETAILS
SEE SHEET 36 FOR -L- PROFILE
SEE SHEET 47 FOR -Y1- PROFILE
SEE SHEET 49 FOR -Y1RPA- PROFILE
SEE SHEET 50 FOR -Y1LPB- PROFILE
SEE SHEET 51 FOR -Y1RPB- PROFILE
SEE SHEET 52 FOR -Y1RPD- PROFILE
SEE SHEET 61 FOR -Y16- PROFILE
SEE SHEET 62 FOR -SR1- PROFILE
SEE SHEET 67 FOR -Y24- PROFILE
SEE SHEET 2B-1 FOR BRIDGE / PAVEMENT RELATIONSHIP SKETCH
SEE SHEET 2B-8 FOR CURVE DATA
SEE SHEETS 2D-1 & 2D-2 FOR DITCH DETAILS
SEE SHEETS 2D-3 & 2D-4 FOR BASIN DETAILS
SEE SHEETS S1-1 THRU S1-36 FOR STRUCTURE PLANS
SEE SHEET S-1 THRU S-X FOR RETAINING WALL PLANS

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

PROJECT REFERENCE NO.	SHEET NO.
U-4751	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 043891 ENGINEER SEAN C. STEPHENS 8/11/2017	NORTH CAROLINA PROFESSIONAL SEAL 029388 ENGINEER EDWARD J. VANCE 8/11/2017

GRAPHIC SCALE
50 25 0 50 100
PLANS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/12/2017
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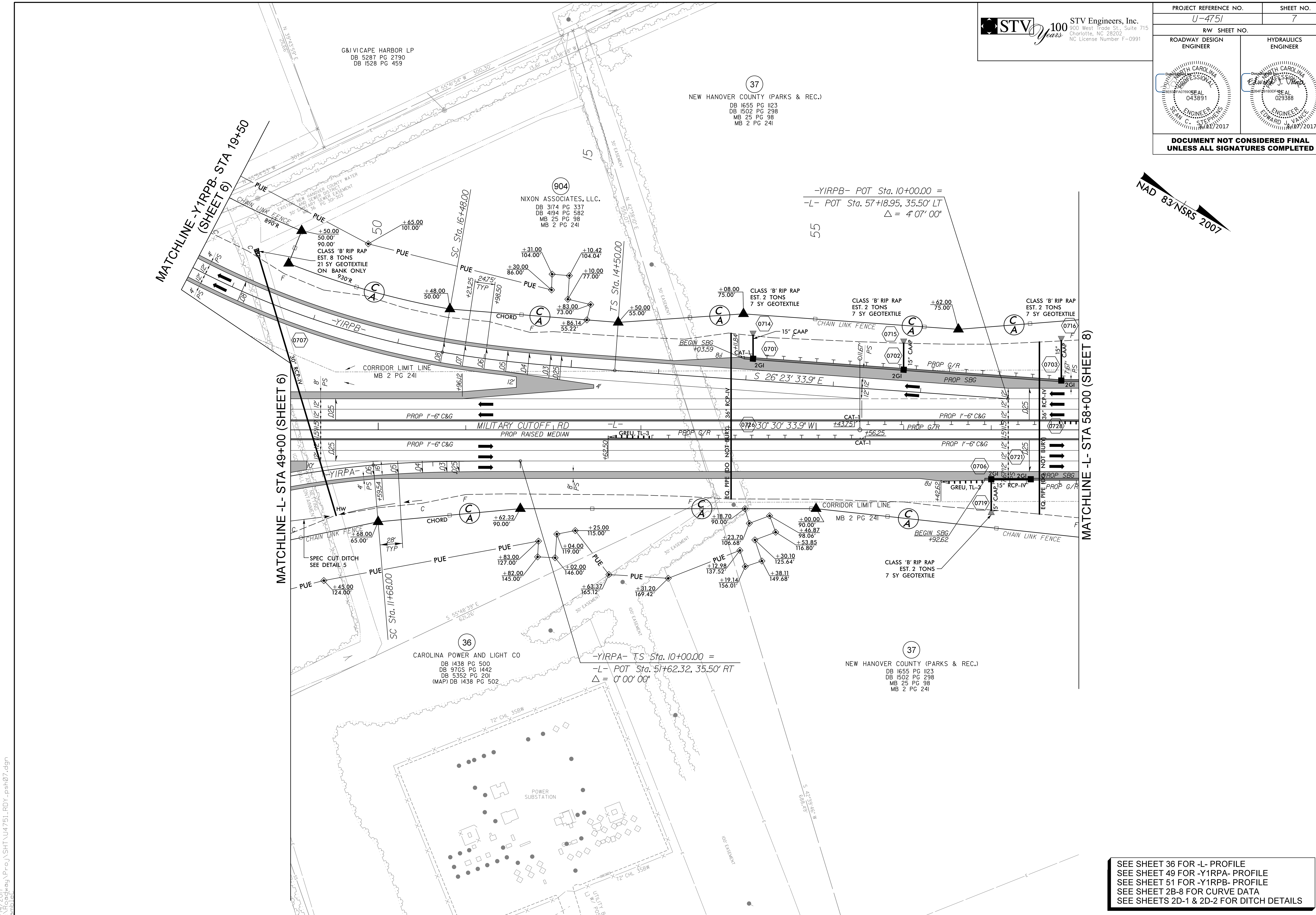
stephesc

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

PROJECT REFERENCE NO.	SHEET NO.
U-4751	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 043891 — SEAN C. STEPHENS — 8/21/2017	SEAL 029388 — EDWARD J. VANCE — 8/17/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NAD 83/NSRS 2007
MATCHLINE -Y1RPB- STA 19+50 (SHEET 6)
MATCHLINE -L- STA 49+00 (SHEET 6)
MATCHLINE -L- STA 58+00 (SHEET 8)
G&I VI CAPE HARBOR LP
DB 5287 PG 2790
DB 1528 PG 459
37
NEW HANOVER COUNTY (PARKS & REC.)
DB 1655 PG 1123
DB 1502 PG 298
MB 25 PG 98
MB 2 PG 241
904
NIXON ASSOCIATES, LLC.
DB 3174 PG 337
DB 4194 PG 582
MB 25 PG 98
MB 2 PG 241
-Y1RPB- POT Sta. 10+00.00 =
-L- POT Sta. 57+18.95, 35.50' LT
△ = 4°07'00"
SC Sta. 16+48.00
TS Sta. 14+50.00
CLASS 'B' RIP RAP
EST. 8 TONS
21 SY GEOTEXTILE
ON BANK ONLY
CLASS 'B' RIP RAP
EST. 2 TONS
7 SY GEOTEXTILE
CHAIN LINK FENCE
CORRIDOR LIMIT LINE
MB 2 PG 241
-Y1RPB-
S 26°23'33.9" E
MILITARY CUTOFF RD
-L-
N 30°30'33.9" W
PROP RAISED MEDIAN
PROP 1'-6" C&G
PROP G/R
PROP SBG
BEGIN SBG
GREU, TL-3
EQ. PIPE (DO NOT BURY)
15" CAAP
36" RCP-IV
-Y1RPA-
SPEC CUT DITCH
SEE DETAIL 5
SC Sta. 11+68.00
36
CAROLINA POWER AND LIGHT CO
DB 1438 PG 500
DB 97GS PG 1442
DB 5352 PG 201
(MAP) DB 1438 PG 502
-Y1RPA- TS Sta. 10+00.00 =
-L- POT Sta. 51+62.32, 35.50' RT
△ = 0°00'00"
POWER SUBSTATION
37
NEW HANOVER COUNTY (PARKS & REC.)
DB 1655 PG 1123
DB 1502 PG 298
MB 25 PG 98
MB 2 PG 241

SEE SHEET 36 FOR -L- PROFILE
SEE SHEET 49 FOR -Y1RPA- PROFILE
SEE SHEET 51 FOR -Y1RPB- PROFILE
SEE SHEET 2B-8 FOR CURVE DATA
SEE SHEETS 2D-1 & 2D-2 FOR DITCH DETAILS

7/14/2017
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STV 100 Years — STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
U-4751	9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043891 — ENGINEER STEPHEN C. STEPHENS — 8/14/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029388 — ENGINEER EDWARD J. VANCE — 8/14/2017

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NAD 83/NSRS 2007

MATCHLINE -L- STA 70+00 (SHEET 8)

MATCHLINE -L- STA 83+00 (SHEET 10)

37
NEW HANOVER COUNTY (PARKS & REC.)
DB 1655 PG 1123
DB 1502 PG 298
MB 2 PG 241

38
HOLLY FIELD AT WESTBAY ESTATES, HOA
DB 2179 PG 465
DB 3361 PG 956
DB 4385 PG 656

39
TORCHWOOD DEVELOPMENT COMPANY, INC.
DB 5482 PG 1416
DB 5497 PG 2737
DB 5705 PG 735
DB 5665 PG 1055
MB 57 PG 245
MB 2 PG 241

40
COWELL
NICHOLAS ETAL

41
TORCHWOOD DEVELOPMENT CO. LLC.
DB 5665 PG 1055
MB 59 PG 88-90

41A
STEVENS BUILDING, CO.
DB 5861 PG 2384
MB 59 PG 88-90

41B
LOT 48
TORCHWOOD DEVELOPMENT CO. LLC.
DB 5665 PG 1055
MB 59 PG 88-90

41C
LOT 49
TORCHWOOD DEVELOPMENT CO. LLC.
DB 5665 PG 1055
MB 59 PG 88-90

41D
LOT 46
TORCHWOOD DEVELOPMENT CO. LLC.
DB 5665 PG 1055
MB 59 PG 88-90

42
BAIN
BRANDON C ETAL
DB 5666 PG 598
MB 56 PG 170

43
LALOMIA
BARRY P
DB 5625 PG 2847
MB 56 PG 170

44
TRUONG
TOMMY V ETAL
DB 5684 PG 1444
MB 56 PG 170

45
EVANS DAVID L & ELIZABETH
DB 5733 PG 1010
MB 56 PG 170

46
ANTWAN ROBINSON DALY
DB 5772 PG 85
MB 56 PG 170

47
TREVOR HUGHES
DB 5797 PG 1258
MB 56 PG 170

48
TIMOTHY TYRONE WILSON
DB 5839 PG 1183
MB 56 PG 170

49
BROWN
KASEY SARAH
DB 5663 PG 1515
MB 56 PG 170

50
BENTON
KENNETH H JR
DB 5696 PG 1967
MB 56 PG 170

KOSSLOW
ZACHARY W
DB 5643 PG 1693
MB 56 PG 170

HILL
ABBY GLOVER
RONALD RAHIM III
DB 5649 PG 2178
MB 56 PG 170

PROGRESS ENERGY EASEMENT
DB 5508 PG 2302
CORRIDOR LIMIT LINE MB 2 PG 241

PC Sta. 79+89.18

MILITARY CUTOFF RD

SUNCOAST DRIVE

MITIGATION RESERVED AREA
MB 56 PG 170

SEE SHEET 2A-10 FOR U-TURN BULB-OUT DETAIL
SEE SHEET 2B-8 FOR CURVE DATA
SEE SHEET 37 FOR -L- PROFILE
SEE SHEETS 2N-3 & NW-7 FOR NOISE WALL 7 PLANS
SEE SHEET W-1 THRU W-13 FOR RETAINING WALL PLANS

7/24/2017
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Combined

PROJECT REFERENCE NO.	SHEET NO.
U-4751	10
RW SHEET NO.	

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

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 043891 ENGINEER KEVIN C. STEPHENS
DocuSigned by: 8/14/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029388 ENGINEER EDWARD J. VANCE
DocuSigned by: 8/14/2017

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NAD 83/NSRS 2007

MATCHLINE -L- STA 96+00 (SHEET 11)

MATCHLINE -L- STA 83+00 (SHEET 9)

50 BENTON KENNETH H JR DB 5696 PG 1967 MB 56 PG 170

52 CANNADY WILLIAM B III & SHEENA M DB 5652 PG 796 MB 56 PG 170

53 DUFFY TARALYN ETAL DB 5664 PG 689 MB 56 PG 170

54 KATHY EPPERSON DB 5760 PG 2817 MB 56 PG 170

56 STEVEN SHADE DB 5733 PG 2080 MB 56 PG 170

39 TORCHWOOD DEVELOPMENT COMPANY, INC. DB 5482 PG 1416 DB 5497 PG 2737 DB 5705 PG 735 DB 5665 PG 1055 MB 57 PG 245 MB 2 PG 241

58 MICHAEL J. JAEB DB 5764 PG 2262 MB 56 PG 170

39 TORCHWOOD DEVELOPMENT COMPANY DB 5644 PG 1291 MB 55 PG 165

62 CHRISTOPHER MCCONNELL AND REBECCA MCCONNELL DB 5839 PG 2910

63 SHAWN BELSCHNER DB 5051 PG 1822 MB 48 PG 61

64 ROGER A WOOD DB 5432 PG 1118 MB 48 PG 61

65 NCDOT DB 5878 PG 165 MB 48 PG 61

66 ELIZABETH A WRIGHT DB 5284 PG 1338 MB 48 PG 61

39A SAVANA LAND COMPANY, LLC DB 4885 PG 1389 MB 59 PG 164-165

67 NCDOT DB 5878 PG 165 MB 48 PG 61

68 STEVEN A. KING DB 5841 PG 1962 MB 48 PG 61

69 RYAN D BIRTLES DB 5501 PG 595 MB 48 PG 61

70 DENNIS G STOKLEY DB 5064 PG 2518 MB 46 PG 248

71 SARA ROBIN TOOTHMAN DB 5802 PG 2059 MB 46 PG 248

72 TASHA L COLEY DB 5477 PG 2963 MB 46 PG 248

73 CINDY B. GASKINS DB 5696 PG 1672 MB 45 PG 206

74 MARY RADER HEINDENRICH, WIDOW DB 5718 PG 978 MB 45 PG 206

75 KIMBERLY D. MALDONADO DB 5811 PG 1422 MB 46 PG 248

925 NCDOT DB 5168 PG 1727 MB 48 PG 61

SEE SHEET 38 FOR -L- PROFILE
SEE SHEET 59 FOR -Y3- PROFILE
SEE SHEET 2B-8 FOR CURVE DATA
SEE SHEET 2B-5 FOR INTERSECTION DETAILS
SEE SHEETS 2D-1 & 2D-2 FOR DITCH DETAILS
SEE SHEETS 2N-2 & NW-6 FOR NOISE WALL 6 PLANS
SEE SHEETS 2N-3 THRU 2N-4 & NW-7 FOR NOISE WALL 7 PLANS
SEE SHEETS 2N-5 & NW-8 FOR NOISE WALL 8 PLANS
SEE SHEETS 2N-7 & NW-9 FOR NOISE WALL 9 PLANS
SEE SHEETS W-1 THRU W-13 FOR RETAINING WALL PLANS

	MILITARY CUTOFF RD	BRADFIELD CT
MILITARY CUTOFF RD	21,900 / 46,500	1,200 / 1,500
BRADFIELD CT	1,600 / 1,800	4,300 / 5,100
PUTNAM DR	900 / 1,200	1,600 / 2,400
PUTNAM DR	23,100 / 47,900	4,000 / 5,300

2017 / 2037

(73) CINDY B. GASKINS DB 5696 PG 1672 MB 45 PG 206
(74) MARY RADER HEINDENRICH, WIDOW DB 5718 PG 978 MB 45 PG 206
(75) KIMBERLY D. MALDONADO DB 5811 PG 1422 MB 46 PG 248
(76) C ROBERT STROUD JR DB 5207 PG 1831 MB 46 PG 248
(77) HOLLY M. BANKS DB 5716 PG 38 MB 46 PG 248
(78) EDWARD E BENTON, SR DB 4930 PG 2279 MB 45 PG 206
(79) MARY ELLEN DOSS DB 4895 PG 386 MB 45 PG 206 MB 44 PG 194
(80) DANA L BRITTLE DB 4768 PG 861 MB 46 PG 248
(81) JOYCE E KAYLOR DB 5490 PG 2146 MB 46 PG 248
(82) CHERI HUNT STAMM DB 5655 PG 1187 MB 45 PG 206
(83) NOAH S BOATRIGHT DB 5127 PG 1126 MB 47 PG 206 MB 44 PG 194
(84) KENNETH R CURLEY DB 4515 PG 745 MB 44 PG 194 MB 45 PG 206
(85) ROBERT HARRISON DB 5490 PG 2146 MB 46 PG 248
(86) WESLEY R SLAYTON DB 5181 PG 458 MB 46 PG 248
(87) THOMAS P MACNEISH DB 4395 PG 827 MB 44 PG 194 MB 45 PG 206
(88) FRANKLIN H PHILLIPS III DB 5379 PG 2473 MB 46 PG 248
(89) MATTHEW M HAYDEN DB 4701 PG 665 MB 46 PG 248
(90) AMERICAN RESIDENTIAL LEASING COMPANY, LLC DB 5786 PG 1180 MB 52 PG 323
(92) DANIEL W PATTERSON DB 4942 PG 1864 MB 46 PG 248
(93) JOSEPH M VADINO DB 4872 PG 698 MB 47 PG 380 MB 46 PG 248
(94) JEREMY AKIN DB 5444 PG 1484 MB 52 PG 323
(95) BONITA ROWLEY, WIDOW DB 5450 PG 1884 MB 52 PG 323
(96) DERRICK SAUL DB 5452 PG 1614 MB 52 PG 323
(97) CHARLES S LINDSEY DB 5468 PG 2497 MB 52 PG 323
(98) CARRIE L CHEATHAM DB 5472 PG 678 MB 52 PG 323
(99) AMERICAN RESIDENTIAL LEASING COMPANY, LLC DB 5751 PG 2050 MB 52 PG 323
(100) TIMOTHY L ALLENSWORTH DB 5478 PG 375 MB 52 PG 323
(101) SANTOS MURGUIA III DB 5888 PG 2965 MB 52 PG 323
(102) LESLIE HOWARD PARRIS DB 5762 PG 553 MB 52 PG 323
(103) CHRISTOPHER M SMITH DB 5485 PG 970 MB 52 PG 323
(918) NCDOT DB 5641 PG 2834
(91A) THE NEIGHBORHOODS OF WEST BAY ESTATES, INC
(91B) SAVANA LAND COMPANY, LLC DB 4885 PG 1389
(39A) SAVANA LAND COMPANY, LLC DB 4885 PG 1389 MB 59 PG 164-165

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

PROJECT REFERENCE NO.	SHEET NO.
U-4751	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 043891 ENGINEER SEAN C. STEPHENS 7/24/2017

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA C. DALTON 7/24/2017

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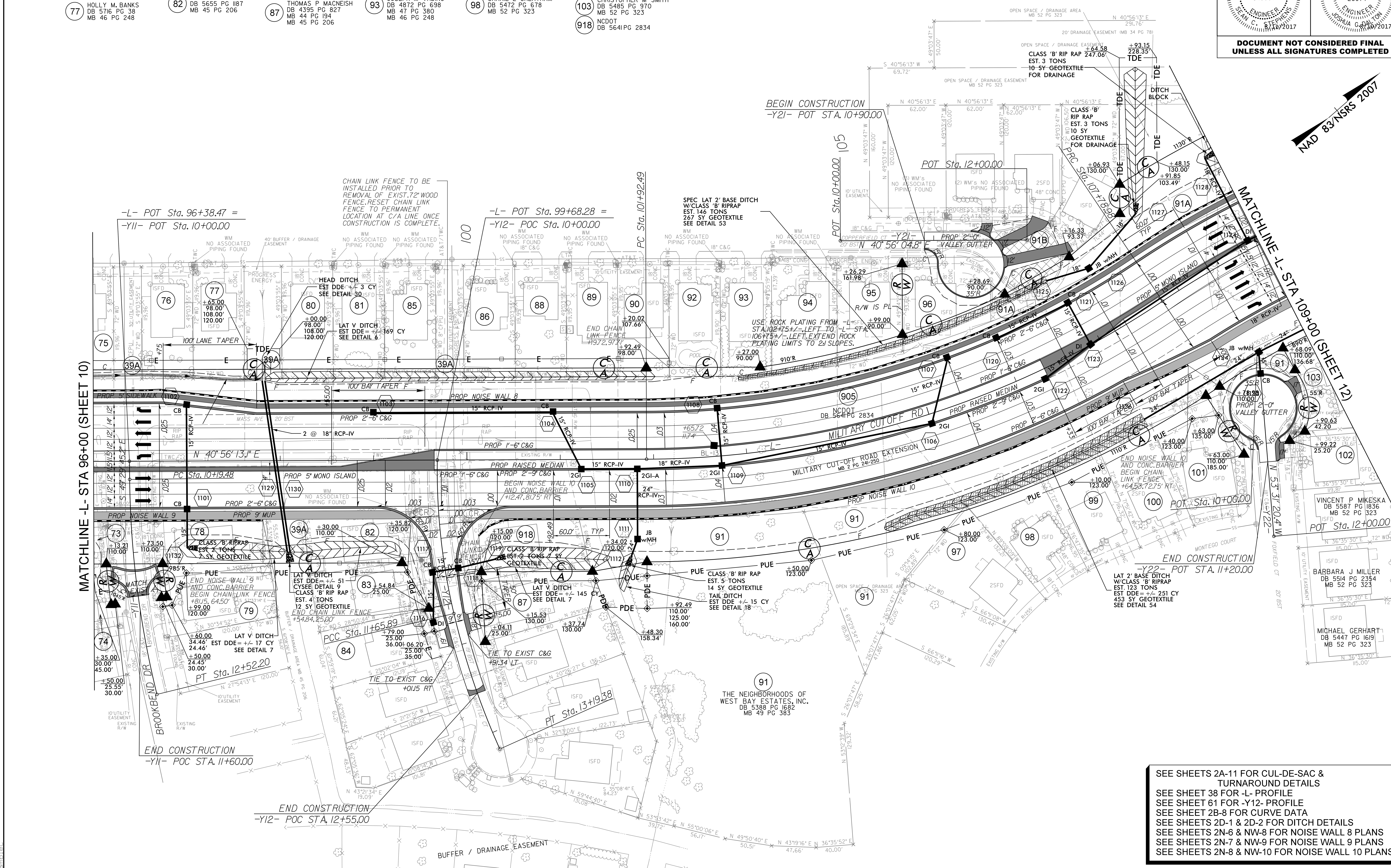

SEE SHEETS 2A-11 FOR CUL-DE-SAC & TURNAROUND DETAILS
SEE SHEET 38 FOR -L- PROFILE
SEE SHEET 61 FOR -Y12- PROFILE
SEE SHEET 2B-8 FOR CURVE DATA
SEE SHEETS 2D-1 & 2D-2 FOR DITCH DETAILS
SEE SHEETS 2N-6 & NW-8 FOR NOISE WALL 8 PLANS
SEE SHEETS 2N-7 & NW-9 FOR NOISE WALL 9 PLANS
SEE SHEETS 2N-8 & NW-10 FOR NOISE WALL 10 PLANS

7/24/2017 R:\Roadway\Proj\SHT\U4751_RDY_psh11.dgn