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TIP PROJECT: U-3633

CONTRACT: C203831

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

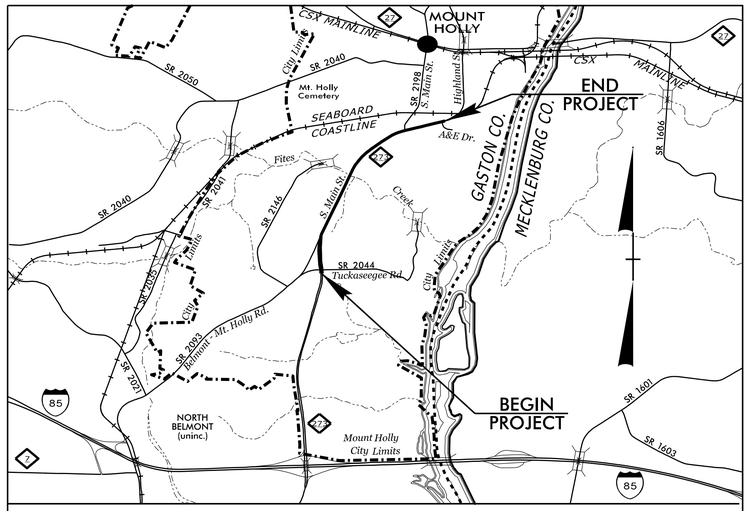
GASTON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3633		

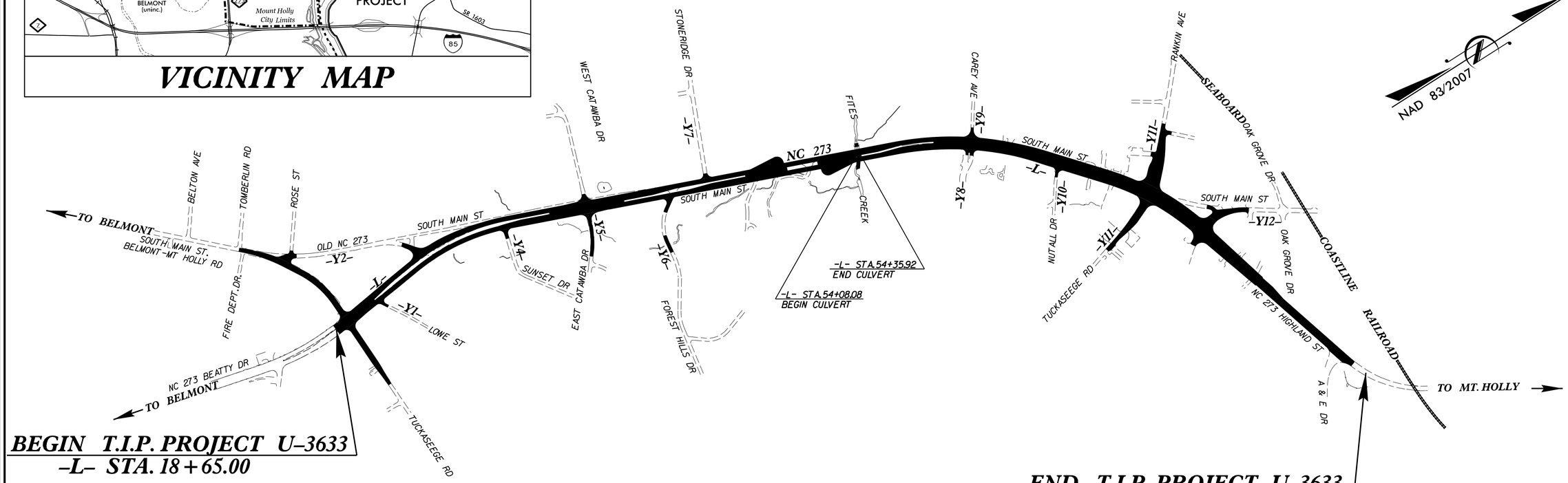
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
37649.1.1	STP-0273(1)	PE
37649.2.FR1	STP-0273(1)	R/W
37649.2.FRU1	STP-0273(1)	UTIL
37649.3.3	STP-0273(1)	CONSTR.

LOCATION: *MOUNT HOLLY – NC 273 (SOUTH MAIN STREET) FROM TUCKASEEGE ROAD AT BEATTY DRIVE TO HIGHLAND STREET AT A&E DRIVE*

TYPE OF WORK: *WIDENING, GRADING, DRAINAGE, PAVING, RESURFACING, & CULVERT.*



VICINITY MAP



BEGIN T.I.P. PROJECT U-3633
-L- STA. 18+65.00

END T.I.P. PROJECT U-3633
-L- STA. 91+00.00

CULVERT

DESIGN DATA

ADT 2014 = 26,800
ADT 2035 = 42,300
K = 10 %
D = 55 %
T = 4 % *
V = 50 MPH
* TTST = 2% DUAL 2%
FUNC. CLASS. =
URBAN COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY T.I.P. PROJECT U-3633 = 1.365 MI
LENGTH STRUCTURE T.I.P. PROJECT U-3633 = 0.005 MI
TOTAL LENGTH OF T.I.P. PROJECT U-3633 = 1.370 MI

Prepared In the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

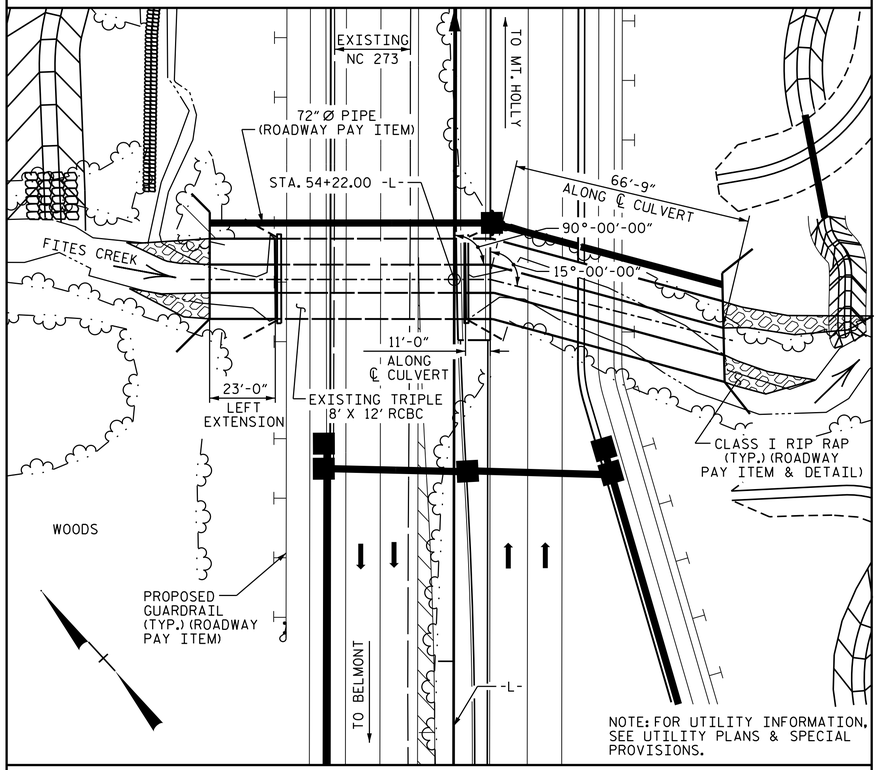
2012 STANDARD SPECIFICATIONS

LETTING DATE : JUNE 20, 2017

A. KEITH PASCHAL, P.E.
PROJECT ENGINEER

MARC G. CHEEK, P.E.
PROJECT DESIGN ENGINEER

BENCHMARK #5: RR SPIKE IN 22"Ø OAK,
169' RT. OF STA. 51+30.00 -L-, EL. 599.61



LOCATION SKETCH

ROADWAY DATA

GRADE POINT EL. @ STA. 54+22.00 -L-	= 612.72
BED ELEVATION @ STA. 54+22.00 -L-	= 587.2
ROADWAY SLOPES	= 2 :1

HYDRAULIC DATA

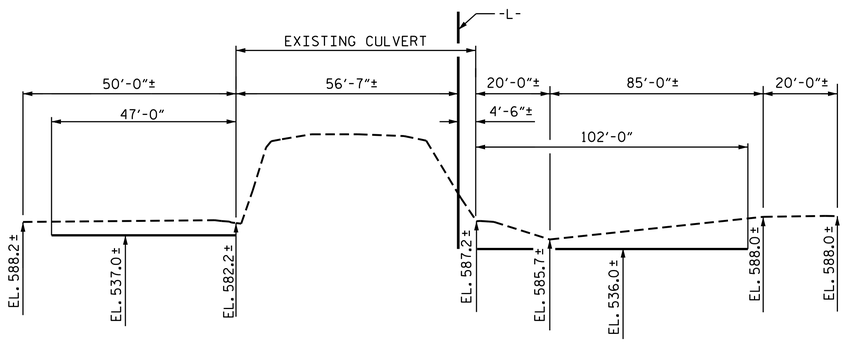
DESIGN DISCHARGE	= 2262 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 50 YRS
DESIGN HIGH WATER ELEVATION	= 599.1
DRAINAGE AREA	= 3.9 SQ. MI.
BASE DISCHARGE (Q100)	= 2842 C.F.S.
BASE HIGH WATER ELEVATION	= 600.36

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 6250 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= > 500 YRS
OVERTOPPING FLOOD ELEVATION	= 612.54

TOTAL CULVERT QUANTITIES

CLASS A CONCRETE		
LEFT EXTENSION	121.6	C.Y.
RIGHT EXTENSION	324.8	C.Y.
TOTAL	446.4	C.Y.
REINFORCING STEEL		
LEFT EXTENSION	15,142	LBS.
RIGHT EXTENSION	45,119	LBS.
TOTAL	60,261	LBS.
FOUNDATION CONDITIONING MAT'L.		
LEFT EXTENSION	52	TONS
RIGHT EXTENSION	175	TONS
TOTAL	227	TONS
CULVERT EXCAVATION		LUMP SUM



PROFILE ALONG ℄ CULVERT

F.A. PROJECT NO.: STP-0273(1)

NOTES

ASSUMED LIVE LOAD HL-93 OR ALTERNATE LOADING.

DESIGN FILL: LEFT EXTENSION = 13.64 FEET, RIGHT EXTENSION = 13.61 FEET.

FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERT EXTENSIONS TO BE POURED IN THE FOLLOWING ORDER:

PHASE I

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF PHASE I WALLS AND WING FULL HEIGHT.

PHASE II

3. FLOOR SLAB INCLUDING 4" OF VERTICAL WALL.
4. THE REMAINING PORTION OF PHASE II WALL FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

CONCRETE IN 72"Ø PIPE WINGS, FOOTINGS AND HEADWALL SHALL BE POURED IN THE FOLLOWING ORDER:

1. WINGS AND HEADWALL FOOTINGS UP TO CONSTRUCTION JOINT.
2. REMAINING PORTION OF WINGS AND HEADWALL FULL HEIGHT.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEETS.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.

IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE POURED AT LEAST 72 HOURS PRIOR TO CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. U-3633

GASTON COUNTY

STATION: 54+22.00 -L-

SHEET 1 OF 13 CULVERT No. C437

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 8 FT. X 12 FT. CONCRETE BOX CULVERT LEFT EXTENSION AND RIGHT EXTENSION WITH 72" Ø PIPE

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL
DocuSigned by: A. Keith Paschal
F8B6ADBDB2FC48F...
4/6/2017

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
DocuSigned by: Marshall G. Cheek Jr
6549D6EBAA3B405...
4/5/2017

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DRAWN BY : N.D'AIUTO DATE : 7/30/16
CHECKED BY : H. A. LOCKLEAR DATE : 8/4/16
DESIGN ENGINEER OF RECORD: H. A. LOCKLEAR DATE : 11/16

29-MAR-2017 11:58
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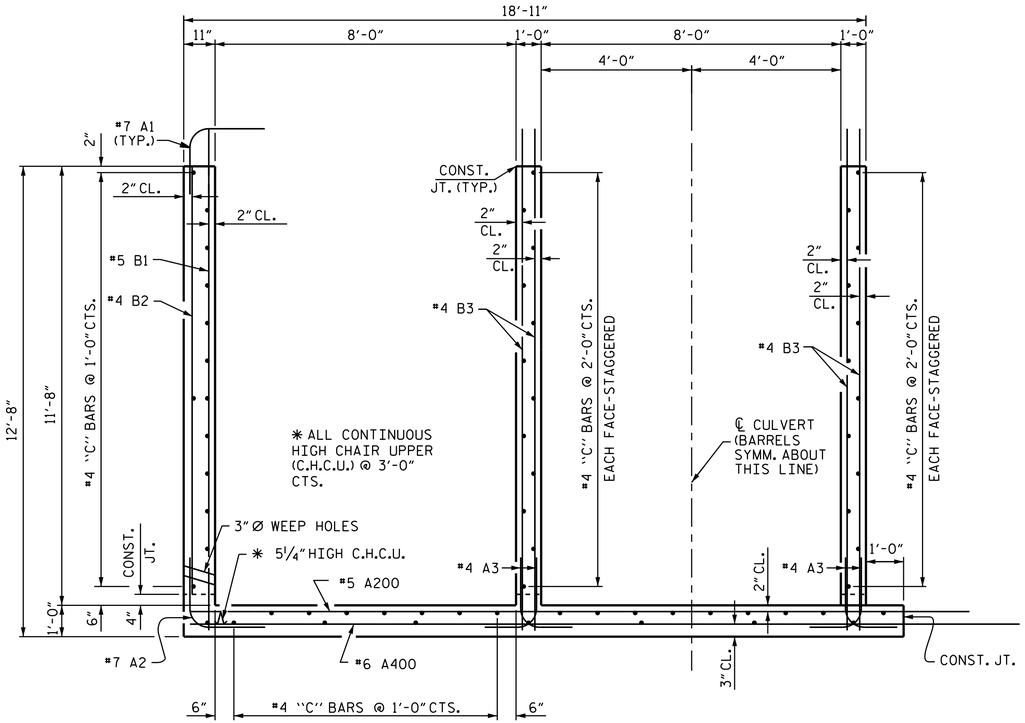
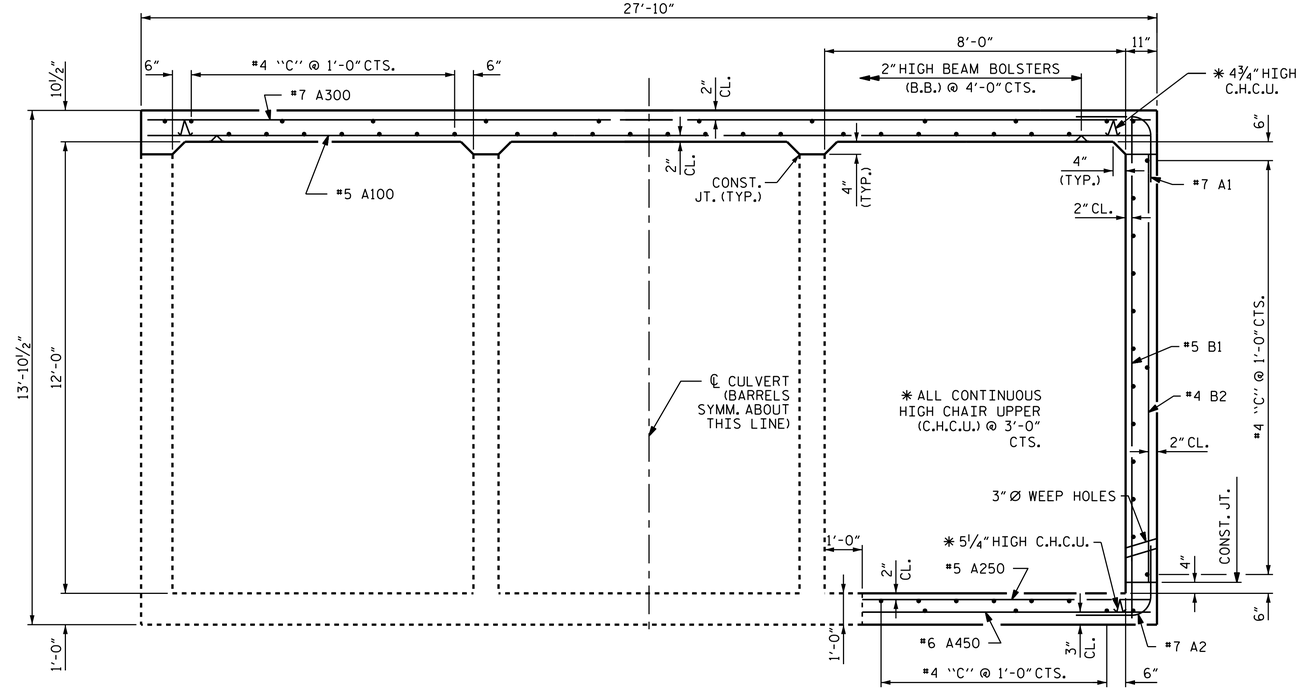
kpaschal



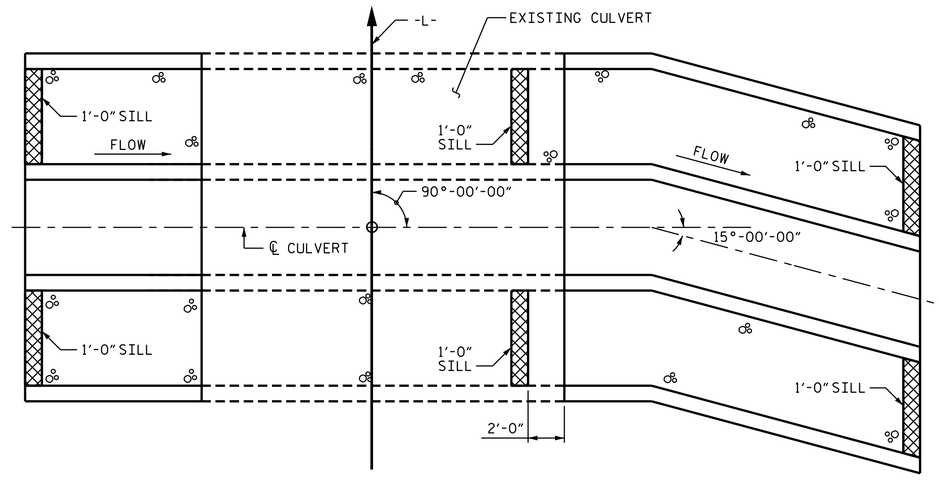
RIGHT ANGLE SECTION OF BARREL

THERE ARE 61 "C" BARS IN SECTION OF BARREL
(PHASE I - LOOKING DOWNSTREAM)

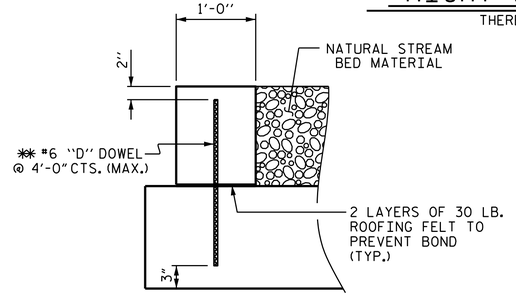


RIGHT ANGLE SECTION OF BARREL

THERE ARE 57 "C" BARS IN SECTION OF BARREL
(PHASE II - LOOKING DOWNSTREAM)



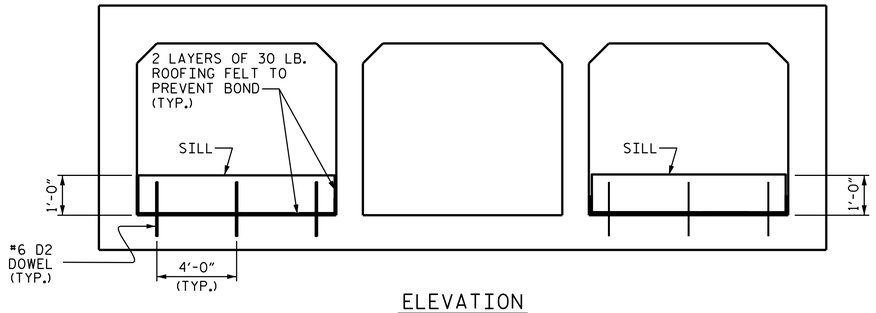
PLAN OF FLOOR SILLS



SECTION THROUGH SILL

✱✱ DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

DOWELS SHALL BE DRILLED AND GROUTED FOR SILLS LOCATED IN EXISTING CULVERT.



ELEVATION

SILL DETAILS

(LOOKING DOWNSTREAM)

NOTES

MATERIAL EXCAVATED FROM THE EXISTING BED SHALL BE STOCKPILED FOR USE IN THE PROPOSED CULVERT AS SHOWN IN THE "PLAN OF FLOOR SILLS." BED MATERIAL SHALL BE SUPPLEMENTED WITH CLASS I RIP RAP AS NECESSARY. BED MATERIAL SUBJECT TO APPROVAL BY THE ENGINEER.

THE ENTIRE COST OF WORK REQUIRED TO PLACE EXCAVATED MATERIAL OR SUPPLEMENTAL MATERIAL AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR CULVERT EXCAVATION.

THE ENTIRE COST OF WORK REQUIRED TO CONSTRUCT THE SILLS SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE STOCKPILED MATERIAL SHALL BE PLACED AS SHOWN IN THE "PLAN OF FLOOR SILLS." THE MATERIAL SHALL BE PLACED TO THE LEVEL OF THE TOP OF THE SILLS. NO MATERIAL SHALL BE PLACED IN THE MIDDLE BARREL.

PROJECT NO. U-3633
GASTON COUNTY
STATION: 54+22.00 -L-

SHEET 2 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 8 FT. X 12 FT. CONCRETE BOX CULVERT

(LEFT AND RIGHT EXTENSIONS)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Digitally signed by Marshall G. Cheek, Jr
6549D6EBAA3B405...
3/31/2017

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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			13

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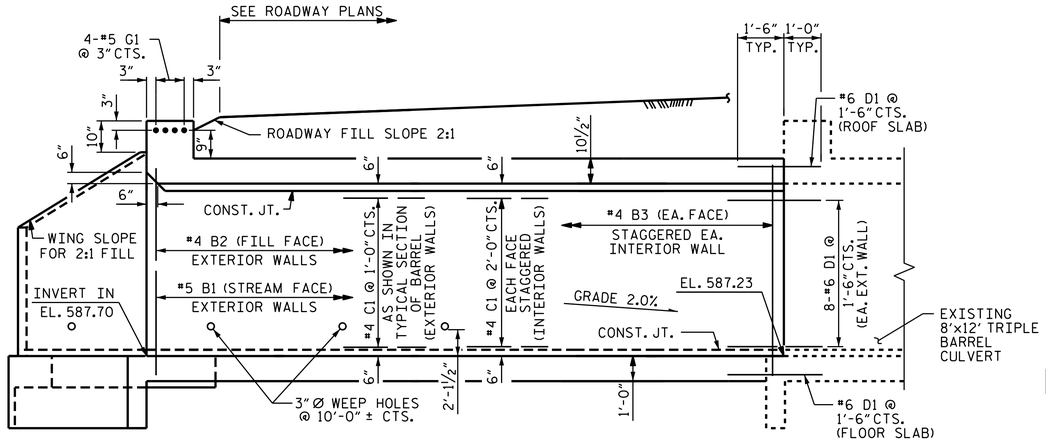
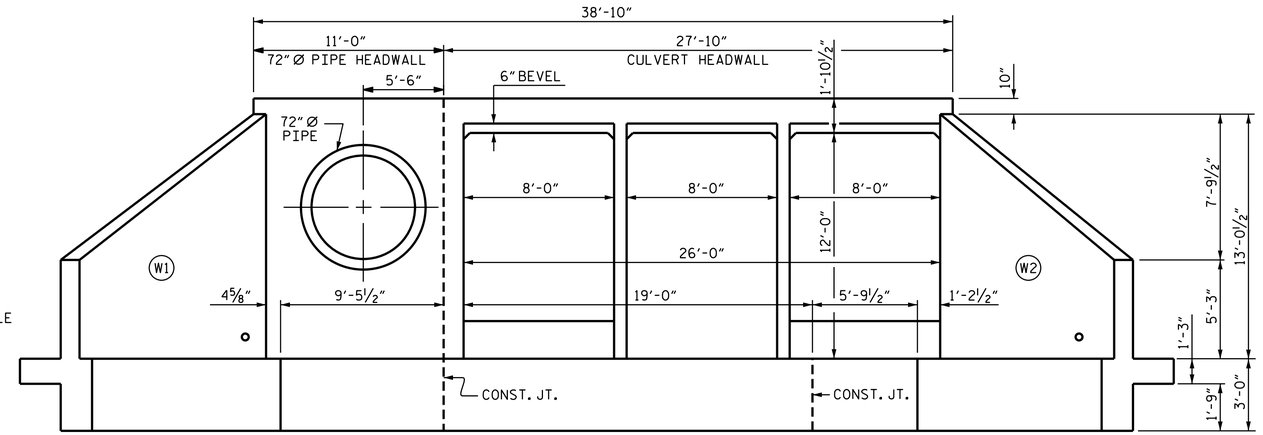
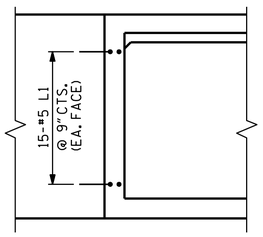
CHECKED BY : H. A. LOCKLEAR DATE : 8/4/16
DESIGN ENGINEER OF RECORD: H. A. LOCKLEAR DATE : 11/16



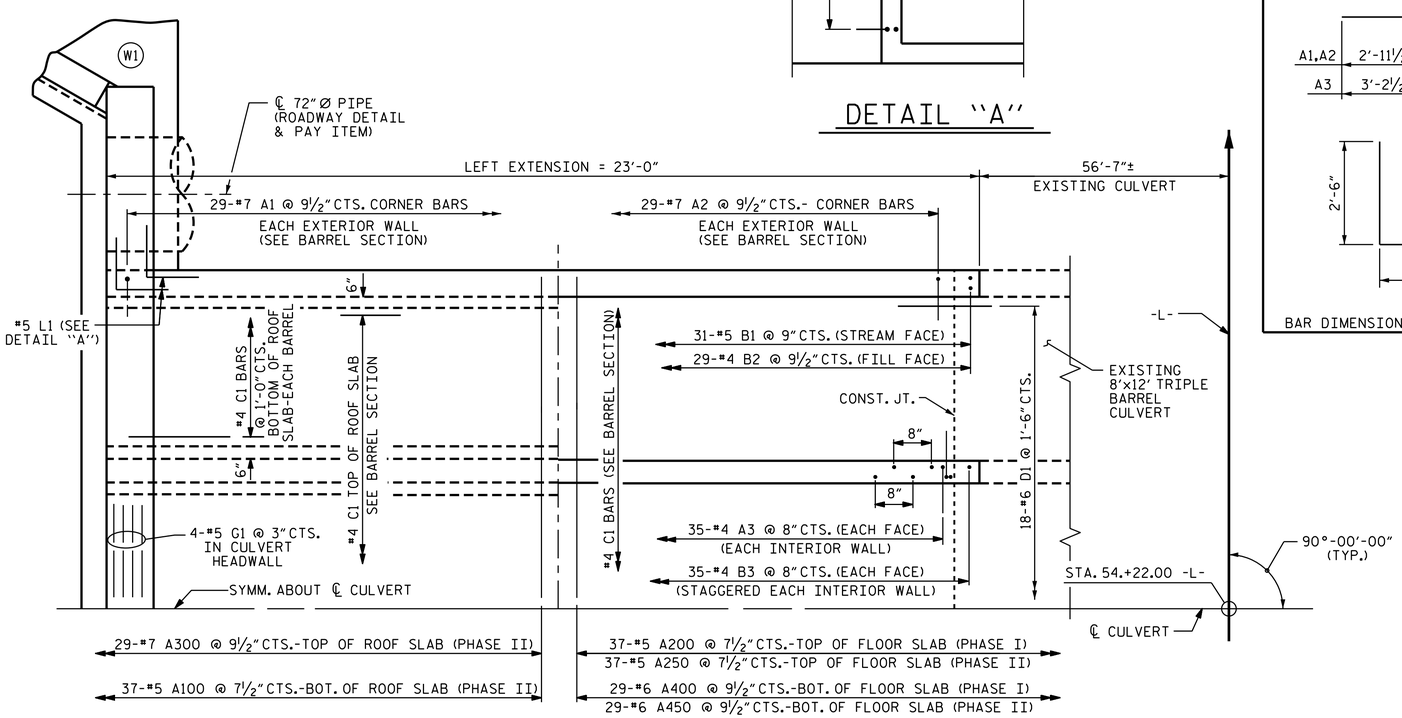


LEFT EXTENSION - NORMAL TO ROADWAY

LEFT END ELEVATION NORMAL TO SKEW



DETAIL "A"

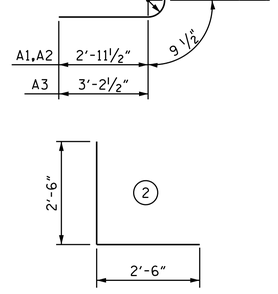


PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

FOR REINFORCING STEEL IN 72" Ø PIPE HEADWALL, SEE SHEET 4 OF 13.

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT.

BAR SCHEDULE - LEFT EXTENSION

PHASE I						PHASE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	29	#7	1	6'-11"	410	A1	29	#7	1	6'-11"	410
A2	29	#7	1	7'-0"	415	A2	29	#7	1	7'-0"	415
A3	140	#4	1	5'-11"	553						
						A100	37	#5	STR	27'-5"	1058
A200	37	#5	STR	21'-8"	836						
						A250	37	#5	STR	7'-8"	296
A400	29	#6	STR	22'-2"	966						
						A300	29	#7	STR	27'-5"	1625
B1	31	#5	STR	13'-4"	431						
B2	29	#4	STR	11'-4"	220	A450	29	#6	STR	7'-8"	334
B3	140	#4	STR	13'-4"	1247						
						B1	31	#5	STR	13'-4"	431
C1	61	#4	STR	22'-8"	924	B2	29	#4	STR	11'-4"	220
D1	34	#6	STR	2'-6"	128	C1	57	#4	STR	22'-8"	863
D2	3	#6	STR	1'-7"	7						
						D1	18	#6	STR	2'-6"	68
						D2	3	#6	STR	1'-7"	7
L1	30	#5	2	5'-0"	156						
						G1	4	#5	STR	27'-6"	115
REINFORCING STEEL LBS.					6,293	REINFORCING STEEL LBS.					5,842

SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
A200	#5	1'-9"
A400	#6	2'-3"
B1	#5	1'-9"
B3	#4	1'-9"
C1	#4	1'-11"

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Documents by: Marshall G. Cheek, Jr
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3/31/2017

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PROJECT NO. U-3633
GASTON COUNTY
STATION: 54+22.00 -L-

SHEET 3 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 8 FT. X 12 FT. CONCRETE BOX CULVERT

(LEFT EXTENSION)

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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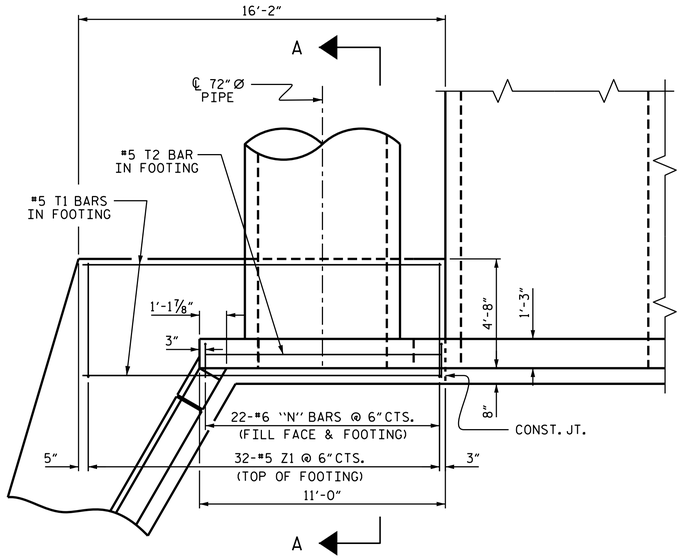
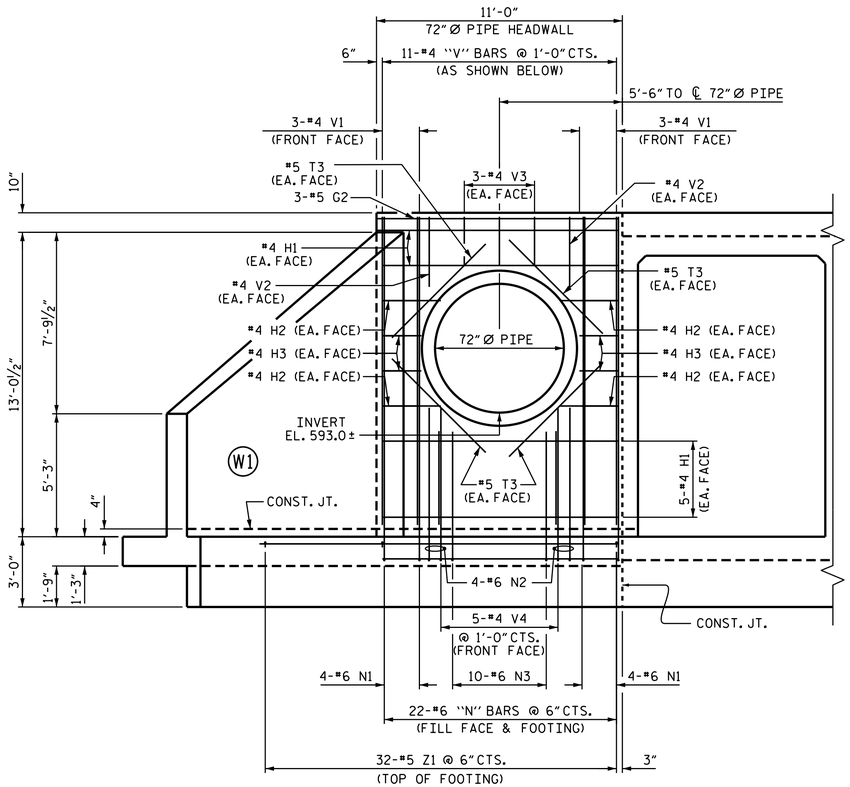
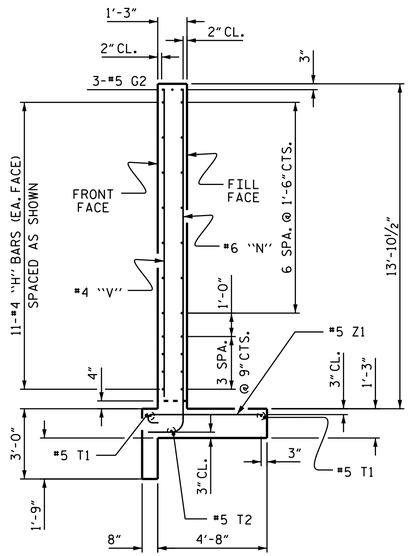


PLAN - 72"Ø PIPE HEADWALL

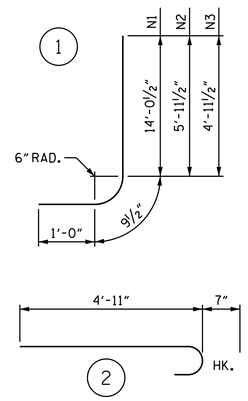


ELEVATION - 72"Ø PIPE HEADWALL



SECTION A-A

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	14	#4	STR	10'-8"	100
H2	8	#4	STR	2'-6"	13
H3	8	#4	STR	1'-8"	9
G2	3	#5	STR	10'-8"	33
N1	8	#6	1	15'-10"	190
N2	4	#6	1	7'-9"	47
N3	10	#6	1	6'-9"	101
T1	2	#5	STR	16'-2"	34
T2	1	#5	STR	10'-6"	11
T3	8	#5	STR	6'-2"	51
V1	6	#4	STR	13'-2"	53
V2	4	#4	STR	3'-0"	8
V3	6	#4	STR	1'-8"	7
V4	5	#4	STR	4'-0"	13
Z1	32	#5	2	5'-6"	184
REINFORCING STEEL (72"Ø PIPE HEADWALL)				LBS.	854
CLASS A CONCRETE (72"Ø PIPE HEADWALL)				C.Y.	5.8

LEFT EXTENSION QUANTITIES

CLASS A CONCRETE

PHASE I BARRELS @	1.998	CY/FT	46.0	C.Y.
PHASE II BARREL @	1.651	CY/FT	38.0	C.Y.
72"Ø PIPE HEADWALL			5.8	C.Y.
WING W1, ETC.			16.6	C.Y.
WING W2, ETC.			15.2	C.Y.
TOTAL			121.6	C.Y.

REINFORCING STEEL

PHASE I BARRELS	6,293	LBS.
PHASE II BARREL	5,842	LBS.
72"Ø PIPE HEADWALL	854	LBS.
WING W1, ETC.	1,241	LBS.
WING W2, ETC.	912	LBS.
TOTAL	15,142	LBS.
FOUNDATION CONDITIONING MAT'L.	52	TONS
CULVERT EXCAVATION		LUMP SUM

PROJECT NO. U-3633

GASTON COUNTY

STATION: 54+22.00 -L-

SHEET 4 OF 13

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr

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3/31/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72"Ø PIPE HEADWALL

(LEFT EXTENSION)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			13

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DRAWN BY :	H.A. LOCKLEAR	DATE :	3/31/16
CHECKED BY :	K. D. LAYNE	DATE :	8/4/16
DESIGN ENGINEER OF RECORD:	H.A. LOCKLEAR	DATE :	11/16

29-MAR-2017 11:58
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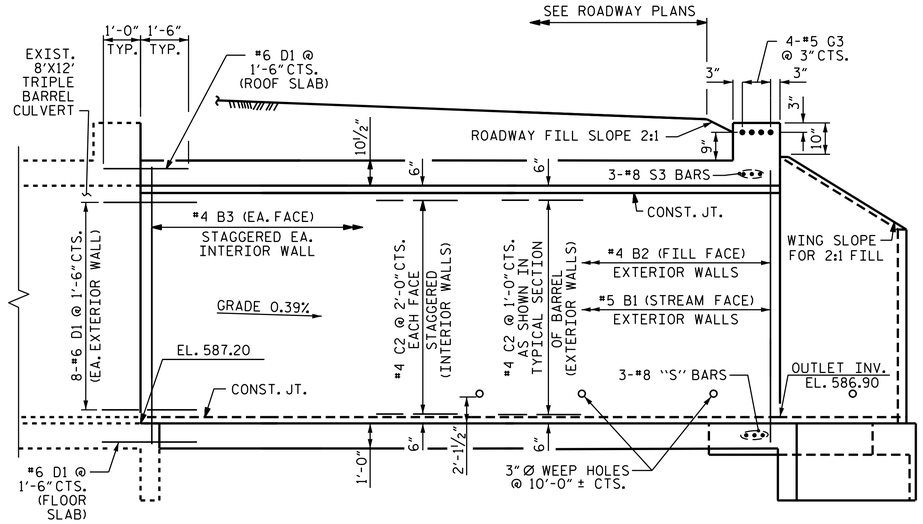
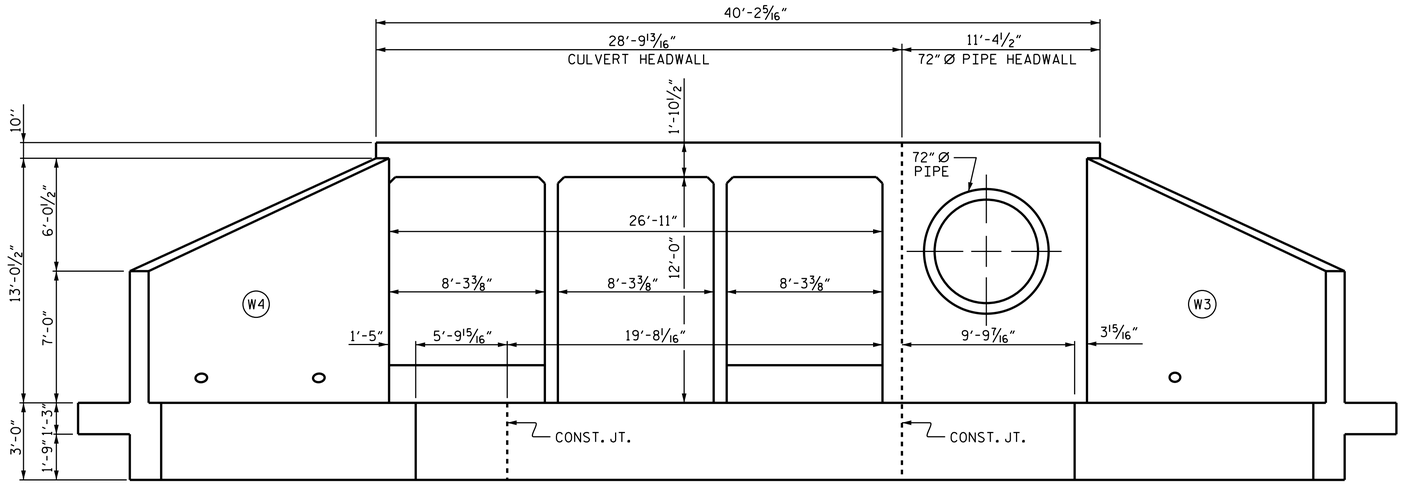
kpaschal



RIGHT EXTENSION - NORMAL TO ROADWAY



RIGHT END ELEVATION NORMAL TO SKEW

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. U-3633

GASTON COUNTY

STATION: 54+22.00 -L-

SHEET 5 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 8 FT. X 12 FT. CONCRETE BOX CULVERT

(RIGHT EXTENSION)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Document: Marshall G. Cheek, Jr
6549D6EBAA3B405...

3/31/2017

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			13

DRAWN BY : N.D'AIUTO DATE : 7/30/16
CHECKED BY : H. A. LOCKLEAR DATE : 8/4/16
DESIGN ENGINEER OF RECORD: H. A. LOCKLEAR DATE : 11/16

29-MAR-2017 11:58
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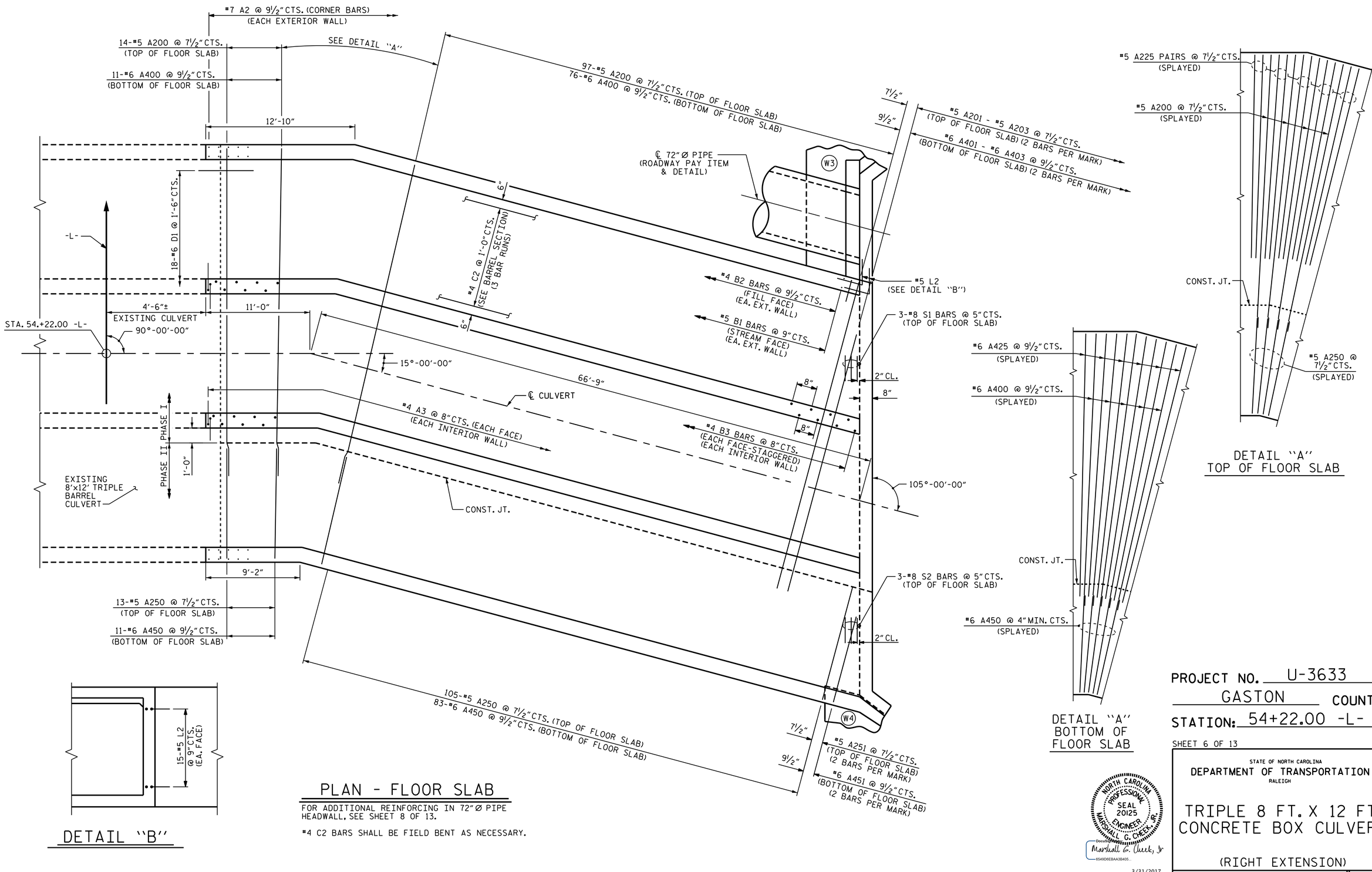
kpaschal



PLAN - FLOOR SLAB

FOR ADDITIONAL REINFORCING IN 72" Ø PIPE HEADWALL, SEE SHEET 8 OF 13.

#4 C2 BARS SHALL BE FIELD BENT AS NECESSARY.

DETAIL "B"

DETAIL "A"
TOP OF FLOOR SLAB

DETAIL "A"
BOTTOM OF FLOOR SLAB

PROJECT NO. U-3633

GASTON COUNTY

STATION: 54+22.00 -L-

SHEET 6 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 8 FT. X 12 FT. CONCRETE BOX CULVERT

(RIGHT EXTENSION)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr
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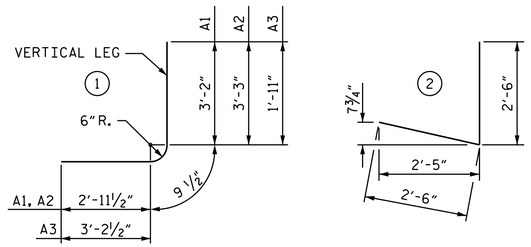
SPLICE LENGTH CHART		
BAR	SIZE	SPLICE LENGTH
A200	#5	1'-9"
A400	#6	2'-3"
B1	#5	1'-9"
B3	#4	1'-9"
C1	#4	1'-11"
S1	#8	4'-1"

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT.

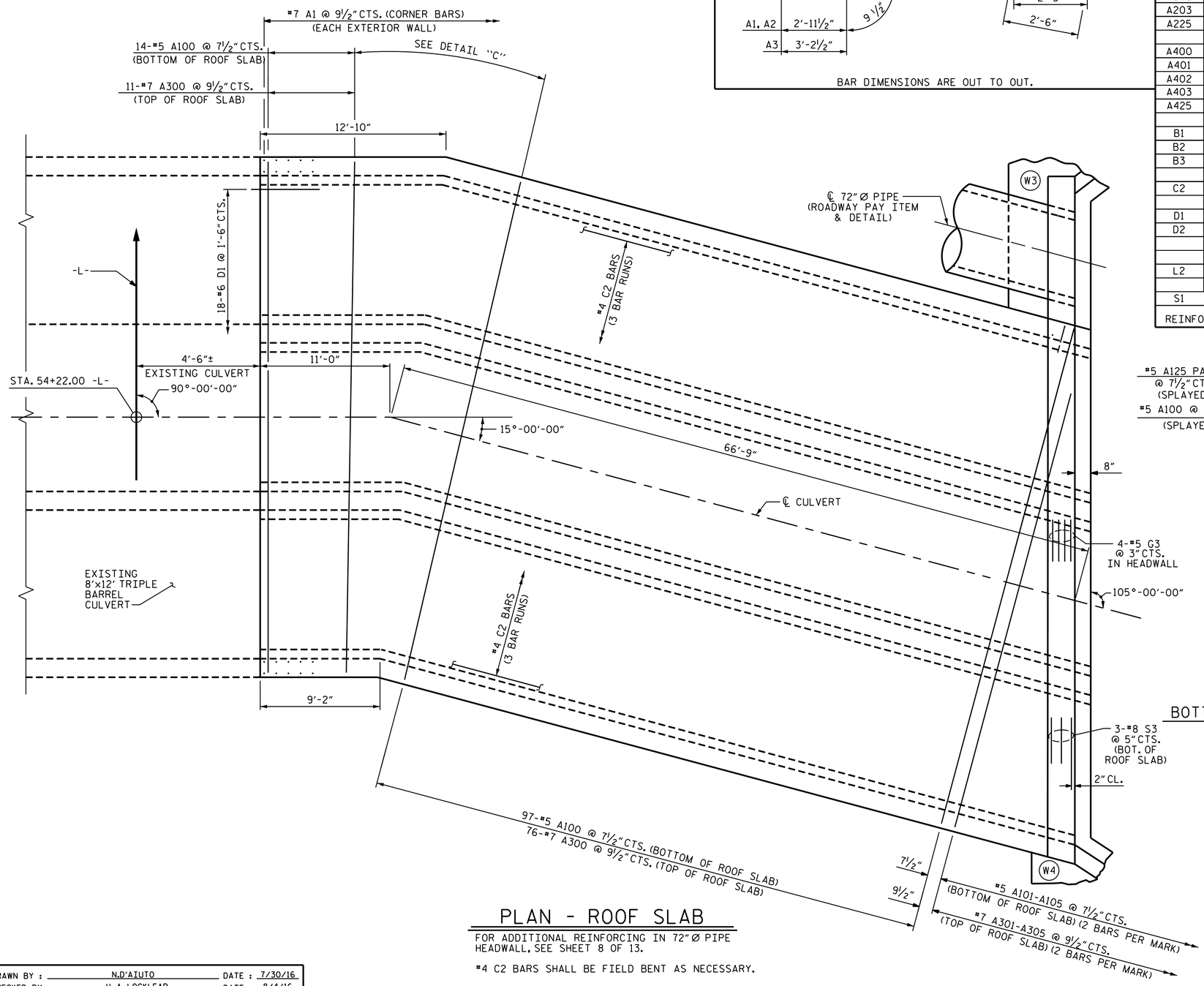
BAR SCHEDULE-RIGHT EXTENSION

PHASE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	98	#7	1	6'-11"	1385
A2	98	#7	1	7'-0"	1402
A3	464	#4	1	5'-11"	1834
A200	115	#5	STR	21'-8"	2599
A201	2	#5	STR	18'-0"	38
A202	2	#5	STR	12'-3"	26
A203	2	#5	STR	6'-5"	13
A225	10	#5	STR	15'-8"	163
A400	92	#6	STR	22'-2"	3063
A401	2	#6	STR	18'-6"	56
A402	2	#6	STR	12'-9"	38
A403	2	#6	STR	6'-11"	21
A425	6	#6	STR	19'-11"	179
B1	104	#5	STR	13'-4"	1446
B2	98	#4	STR	11'-4"	742
B3	464	#4	STR	13'-4"	4133
C2	183	#4	STR	27'-8"	3382
D1	34	#6	STR	2'-6"	128
D2	6	#6	STR	1'-7"	14
L2	30	#5	2	5'-0"	156
S1	3	#8	STR	24'-8"	198
REINFORCING STEEL				LBS.	21,016

PHASE II

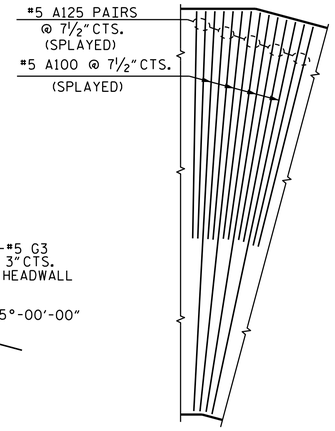
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	102	#7	1	6'-11"	1442
A2	102	#7	1	7'-0"	1459
A100	115	#5	STR	27'-5"	3288
A101	2	#5	STR	22'-8"	47
A102	2	#5	STR	18'-0"	38
A103	2	#5	STR	13'-4"	28
A104	2	#5	STR	8'-8"	18
A105	2	#5	STR	4'-0"	8
A125	10	#5	STR	15'-8"	163
A300	92	#7	STR	27'-5"	5156
A301	2	#7	STR	23'-8"	97
A302	2	#7	STR	17'-11"	73
A303	2	#7	STR	12'-1"	49
A304	2	#7	STR	6'-4"	26
A305	2	#7	STR	3'-5"	14
A325	6	#7	STR	20'-4"	249
A250	122	#5	STR	7'-8"	976
A251	2	#5	STR	4'-0"	8
A450	99	#6	STR	7'-8"	1140
A451	2	#6	STR	3'-5"	10
B1	107	#5	STR	13'-4"	1488
B2	101	#4	STR	11'-4"	765
C2	171	#4	STR	27'-8"	3160
D1	18	#6	STR	2'-6"	68
D2	6	#6	STR	1'-7"	14
G3	4	#5	STR	28'-5"	119
S2	3	#8	STR	7'-10"	63
S3	3	#8	STR	28'-5"	228
REINFORCING STEEL				LBS.	20,194



PLAN - ROOF SLAB

FOR ADDITIONAL REINFORCING IN 72" Ø PIPE HEADWALL, SEE SHEET 8 OF 13.

#4 C2 BARS SHALL BE FIELD BENT AS NECESSARY.



DETAIL "C"
BOTTOM OF ROOF SLAB

DETAIL "C"
TOP OF ROOF SLAB

U-3633

GASTON COUNTY

STATION: 54+22.00 -L-

SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 8 FT. X 12 FT. CONCRETE BOX CULVERT

(RIGHT EXTENSION)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL C. CHEEK, JR.

DocuSigned by: Marshall C. Cheek, Jr
6540D6EBAA3B405...

3/31/2017

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DESIGN ENGINEER OF RECORD: H. A. LOCKLEAR DATE : 11/16

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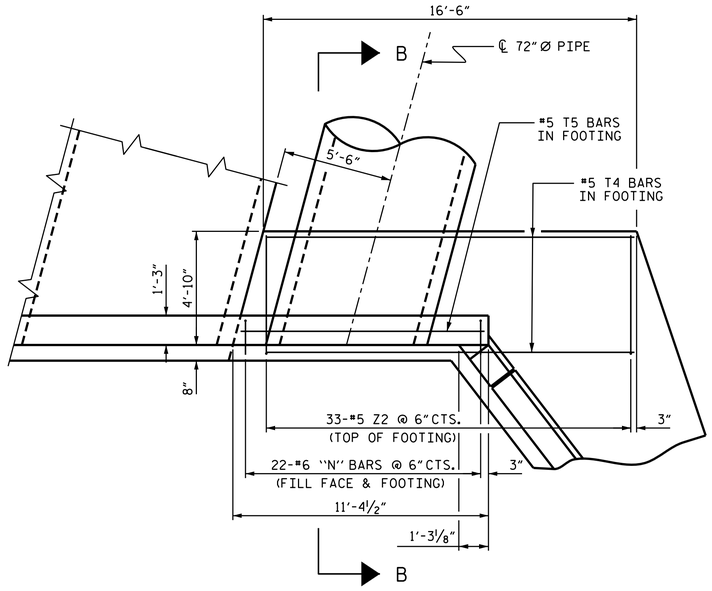
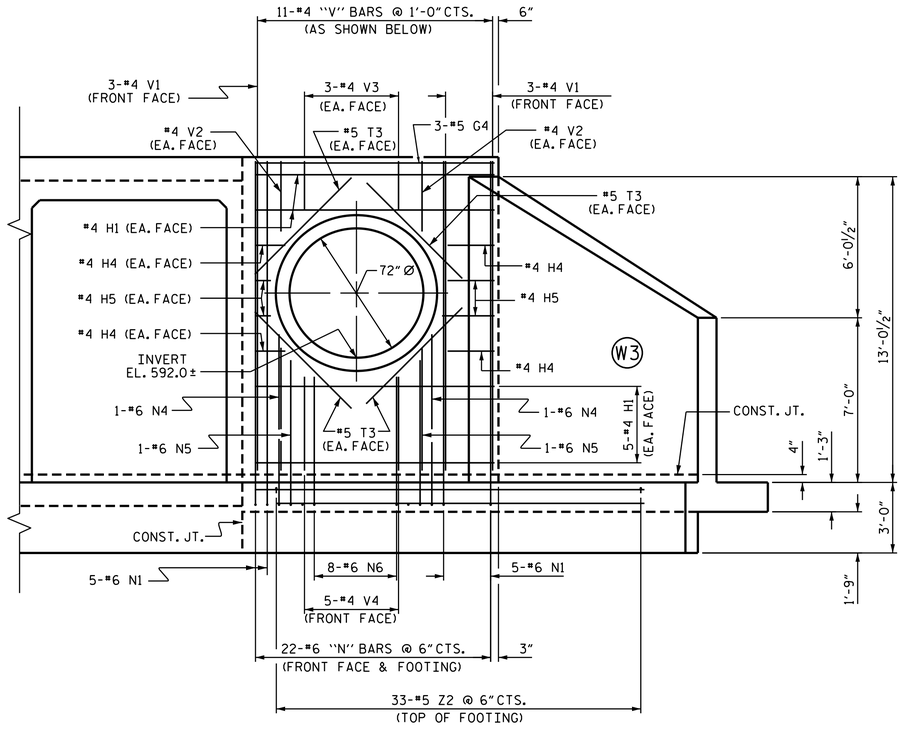
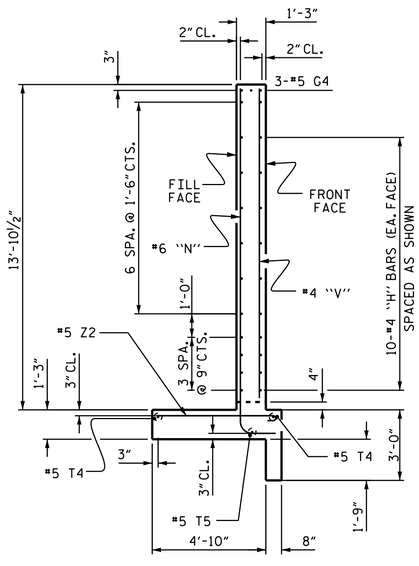


PLAN - 72" Ø PIPE HEADWALL

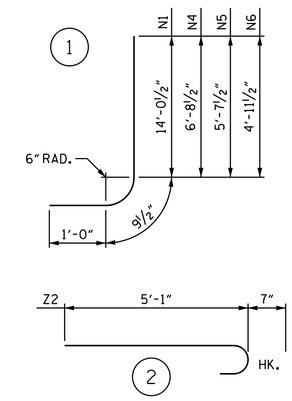


ELEVATION - 72" Ø PIPE HEADWALL



SECTION B-B

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	14	#4	STR	10'-8"	100
H4	8	#4	STR	2'-3"	12
H5	8	#4	STR	1'-9"	9
G4	3	#5	STR	10'-8"	33
N1	10	#6	1	15'-10"	238
N4	2	#6	1	8'-6"	26
N5	2	#6	1	7'-5"	22
N6	8	#6	1	6'-9"	81
T3	8	#5	STR	6'-2"	51
T4	2	#5	STR	16'-2"	34
T5	1	#5	STR	10'-8"	11
V1	6	#4	STR	13'-2"	53
V2	4	#4	STR	3'-0"	8
V3	6	#4	STR	2'-3"	9
V4	5	#4	STR	4'-0"	13
Z2	33	#5	2	5'-8"	195

REINFORCING STEEL (72" Ø PIPE HEADWALL)	LBS.	895
CLASS A CONCRETE (72" Ø PIPE HEADWALL)	C.Y.	6.0

RIGHT EXTENSION QUANTITIES

CLASS A CONCRETE

PHASE I BARRELS @	1.998 CY/FT	155.3	C.Y.
PHASE II BARREL @	1.651 CY/FT	128.4	C.Y.
72" Ø PIPE HEADWALL		6.0	C.Y.
WING W3, ETC.		15.7	C.Y.
WING W4, ETC.		19.4	C.Y.
TOTAL		324.8	C.Y.

REINFORCING STEEL

PHASE I BARRELS	21,016	LBS.
PHASE II BARREL	20,194	LBS.
72" Ø PIPE HEADWALL	895	LBS.
WING W3, ETC.	1,392	LBS.
WING W4, ETC.	1,622	LBS.
TOTAL	45,119	LBS.

FOUNDATION CONDITIONING MAT'L.	175	TONS
CULVERT EXCAVATION		LUMP SUM

PROJECT NO. U-3633

GASTON COUNTY

STATION: 54+22.00 -L-

SHEET 8 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" Ø PIPE HEADWALL

(RIGHT EXTENSION)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Documents Marshall G. Cheek, Jr
8549C6EBAA3B405...
3/31/2017

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NO.	BY:	DATE:	NO.	BY:	DATE:	C-8
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CHECKED BY : K. D. LAYNE DATE : 8/4/16
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 11/16

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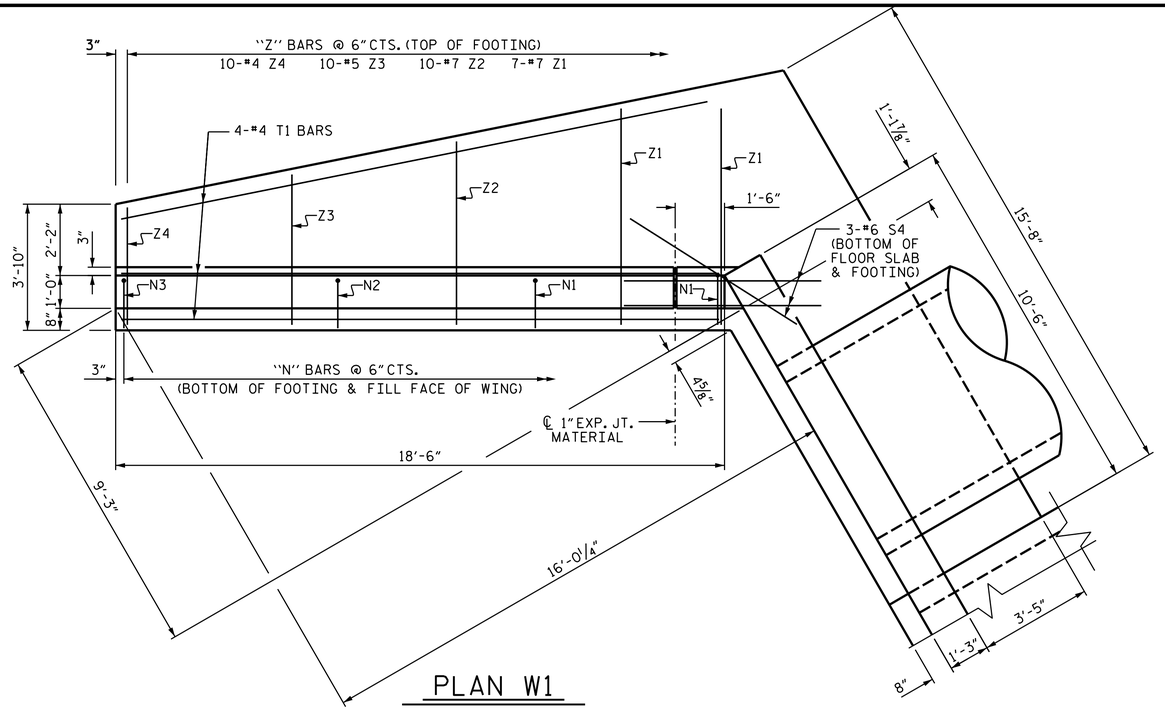
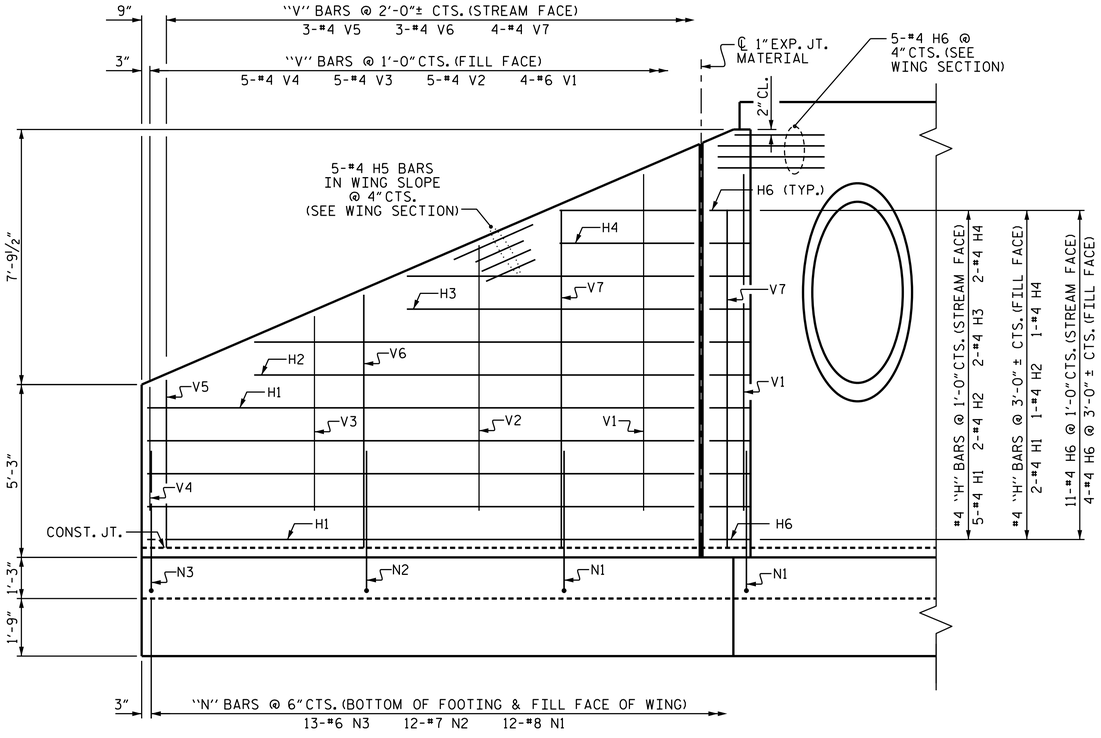
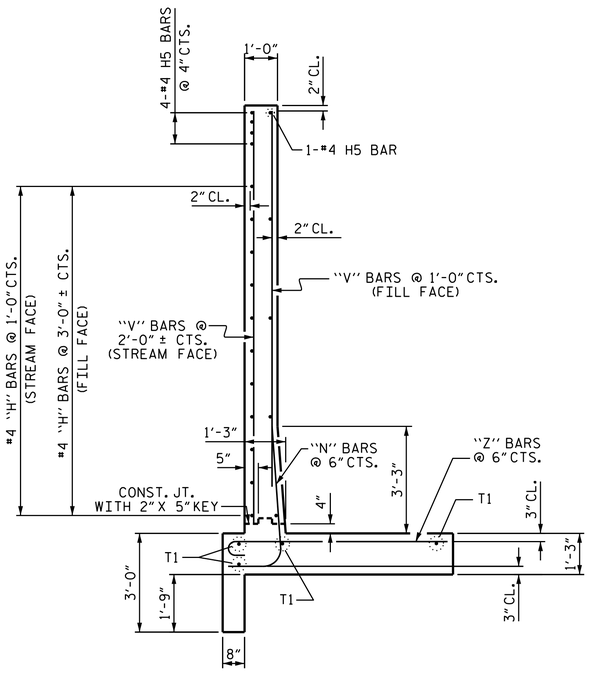


PLAN W1

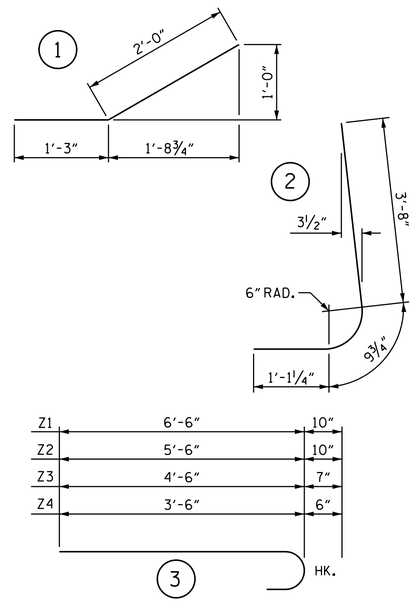


ELEVATION W1



TYPICAL WING SECTION

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	7	#4	STR	16'- 7"	78
H2	3	#4	STR	13'- 4"	27
H3	2	#4	STR	8'- 8"	12
H4	3	#4	STR	3'-11"	8
H5	5	#4	STR	18'- 1"	60
H6	20	#4	1	3'- 3"	43
N1	12	#8	2	5'- 7"	179
N2	12	#7	2	5'- 7"	137
N3	13	#6	2	5'- 7"	109
S4	3	#6	STR	6'- 0"	27
T1	4	#5	STR	18'- 2"	76
V1	4	#6	STR	10'- 1"	61
V2	5	#4	STR	7'-11"	26
V3	5	#4	STR	5'- 10"	19
V4	5	#4	STR	3'- 9"	13
V5	3	#4	STR	4'-11"	10
V6	3	#4	STR	7'- 6"	15
V7	4	#4	STR	10'- 1"	27
Z1	7	#7	3	7'- 4"	105
Z2	10	#7	3	6'- 4"	129
Z3	10	#5	3	5'- 1"	53
Z4	10	#4	3	4'- 0"	27

REINFORCING STEEL FOR WING W1 LBS. 1241

CLASS A CONCRETE
WING W1 C.Y. 15.8
CURTAIN WALL C.Y. .8
TOTAL C.Y. 16.6

NOTE: A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

DRAWN BY : H. A. LOCKLEAR DATE : 3-24-16
CHECKED BY : K. D. LAYNE DATE : 8/4/16
DESIGN ENGINEER OF RECORD: H. A. LOCKLEAR DATE : 11/16

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GASTON COUNTY
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SHEET 9 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WING W1 FOR CONCRETE BOX CULVERT
(LEFT EXTENSION)

H=12'-0" 90° SKEW SLOPE=2:1

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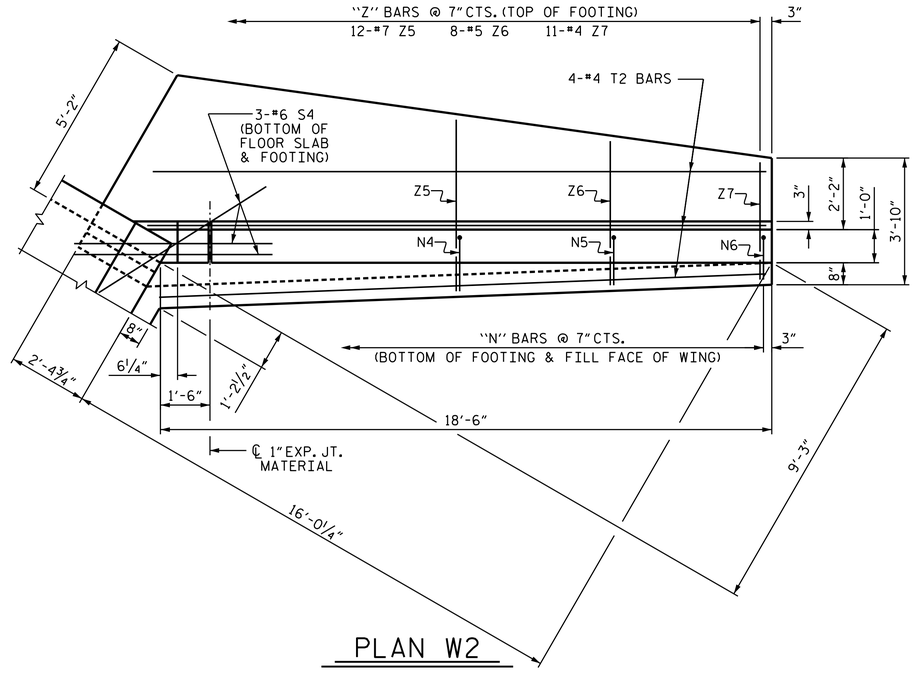
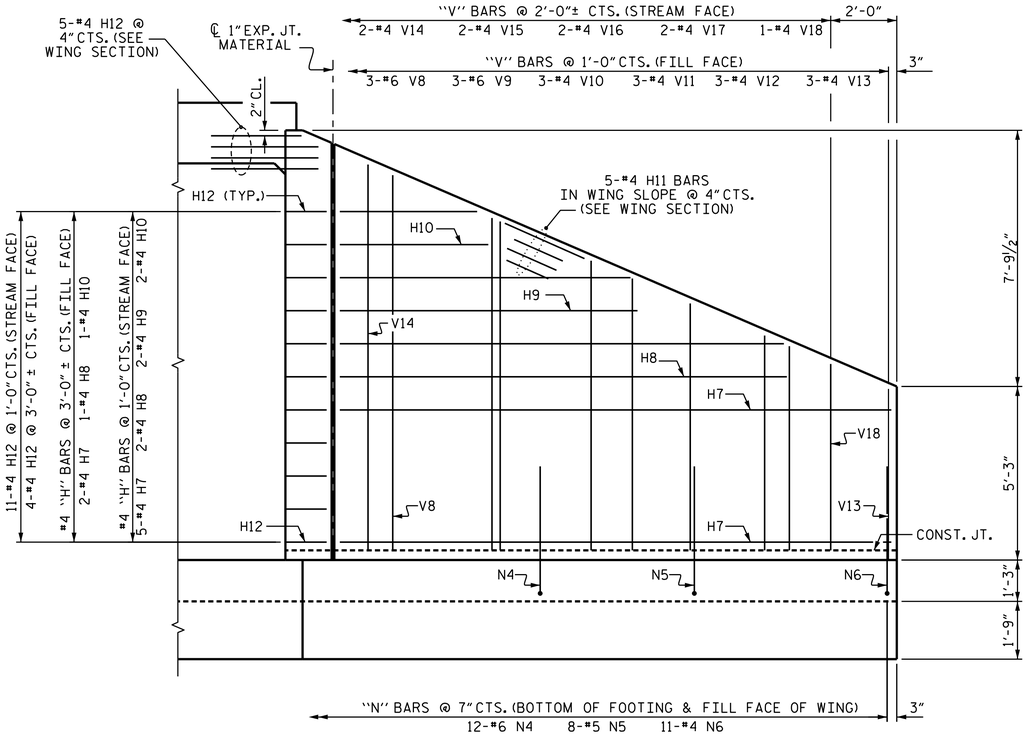
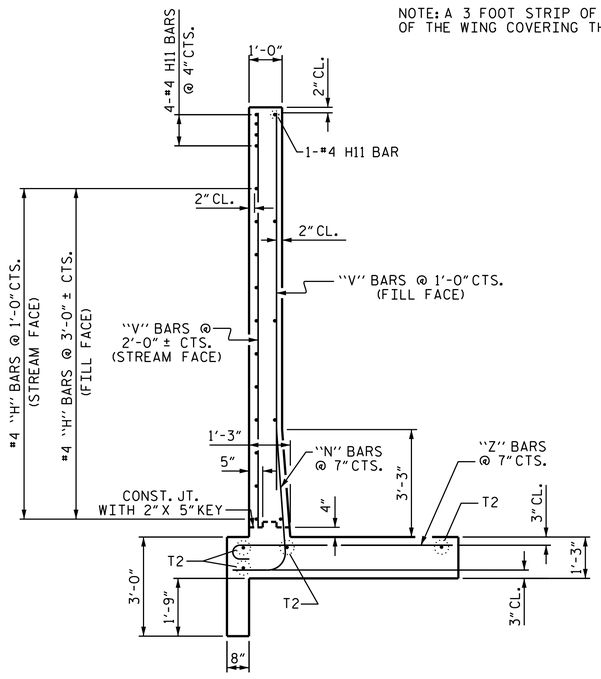


PLAN W2

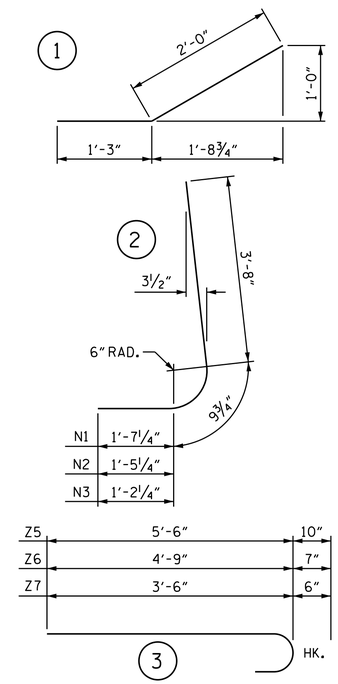


ELEVATION W2



TYPICAL WING SECTION

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H7	7	#4	STR	16'- 7"	78
H8	3	#4	STR	13'- 4"	27
H9	2	#4	STR	8'- 7"	11
H10	3	#4	STR	3'-11"	8
H11	5	#4	STR	17'- 6"	58
H12	20	#4	1	3'- 3"	43
N4	12	#6	2	6'- 1"	110
N5	8	#5	2	5'-11"	49
N6	11	#4	2	5'- 8"	42
S4	3	#6	STR	6'- 0"	27
T2	4	#4	STR	18'- 6"	49
V8	3	#6	STR	10'- 1"	45
V9	3	#6	STR	8'- 9"	39
V10	3	#4	STR	7'- 6"	15
V11	3	#4	STR	6'- 3"	13
V12	3	#4	STR	5'- 0"	10
V13	3	#4	STR	3'- 9"	8
V14	2	#4	STR	11'- 3"	15
V15	2	#4	STR	9'- 7"	13
V16	2	#4	STR	7'-11"	11
V17	2	#4	STR	6'- 3"	8
V18	1	#4	STR	5'- 5"	4
Z5	12	#7	3	6'- 4"	155
Z6	8	#5	3	5'- 4"	45
Z7	11	#4	3	4'- 0"	29

REINFORCING STEEL FOR WING W2	LBS.	912
CLASS A CONCRETE		
WING W2	C.Y.	12.0
CURTAIN WALL	C.Y.	1.9
CULVERT HEADWALL	C.Y.	1.3
TOTAL	C.Y.	15.2

NOTE: A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

PROJECT NO. U-3633

GASTON COUNTY

STATION: 54+22.00 -L-

SHEET 10 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WING W2 FOR CONCRETE BOX CULVERT (LEFT EXTENSION)

H=12'-0" 90° SKEW SLOPE=2:1

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 65490E0EBAA3B405...

11/21/2016

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1			3			TOTAL SHEETS
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ASSEMBLED BY :	H. A. LOCKLEAR	DATE :	3-24-16
CHECKED BY :	K. D. LAYNE	DATE :	8/4/16
DRAWN BY :	CCJ 01/00		
CHECKED BY :	RWW 03/00		

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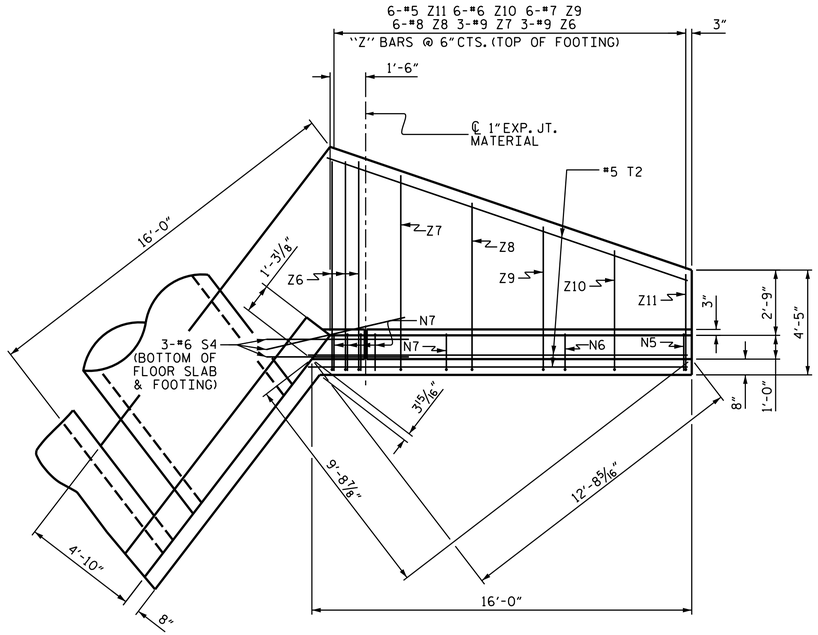
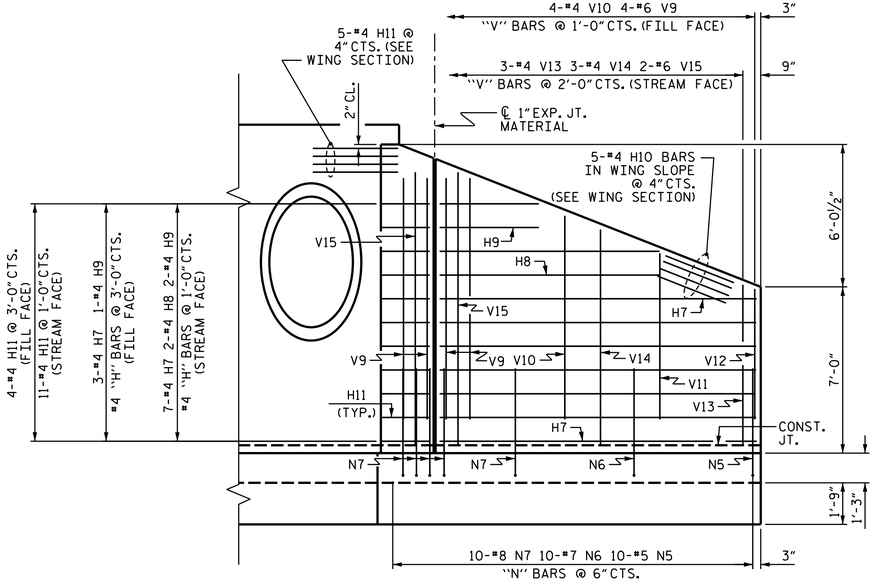


PLAN W3



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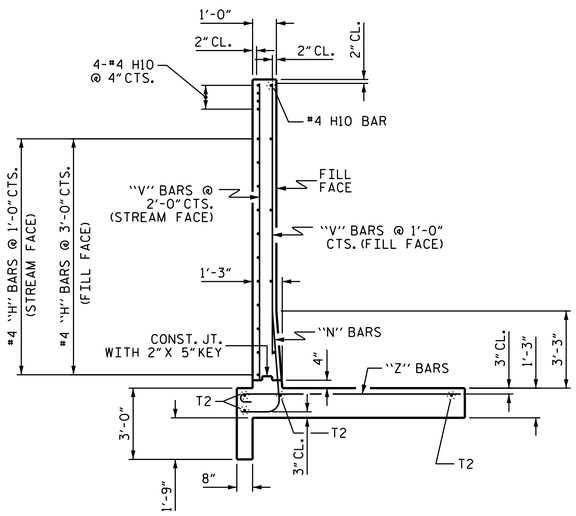
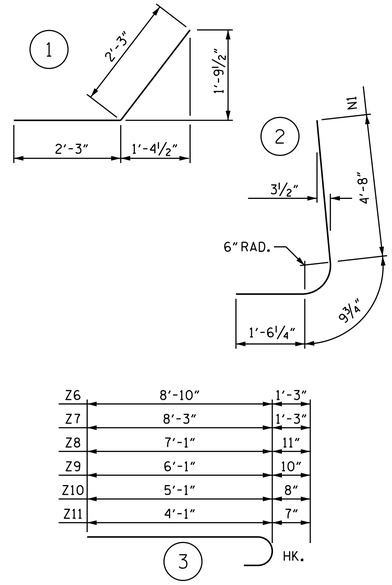


TYPICAL WING SECTION

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H7	10	#4	STR	14'- 1"	94
H8	2	#4	STR	9'-10"	13
H9	3	#4	STR	4'- 8"	9
H10	5	#4	STR	14'- 4"	48
H11	20	#4	1	4'- 6"	60
N5	10	#5	2	7'- 0"	73
N6	10	#7	2	7'- 0"	143
N7	10	#8	2	7'- 0"	187
S4	3	#6	STR	6'- 0"	27
T2	4	#5	STR	16'- 0"	67
V9	4	#6	STR	9'- 9"	59
V10	4	#4	STR	8'- 3"	22
V11	4	#4	STR	6'- 9"	18
V12	4	#4	STR	5'- 3"	14
V13	3	#4	STR	6'- 7"	13
V14	3	#4	STR	8'-10"	18
V15	2	#6	STR	11'- 1"	33
Z6	3	#9	3	10'- 1"	103
Z7	3	#9	3	9'- 6"	97
Z8	6	#8	3	8'- 0"	128
Z9	6	#7	3	6'-11"	85
Z10	6	#6	3	5'- 9"	52
Z11	6	#5	3	4'- 8"	29

REINFORCING STEEL FOR WING W3	LBS.	1,392
CLASS A CONCRETE		
WING W3	C.Y.	15.0
CURTAIN WALL	C.Y.	.7
TOTAL	C.Y.	15.7

NOTE: A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

PROJECT NO. U-3633

GASTON COUNTY

STATION: 54+22.00 -L-

SHEET 11 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WING W3 FOR CONCRETE BOX CULVERT
(RIGHT EXTENSION)

H=12'-0" 105° SKEW SLOPE=2:1

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

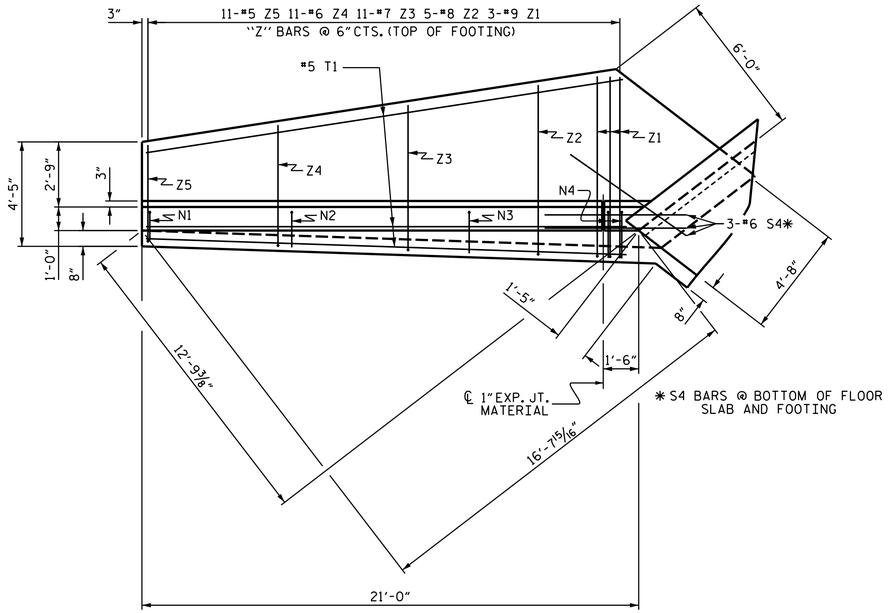
DocuSigned by: Marshall G. Cheek, Jr. 65490BEBAA3B405...

11/21/2016

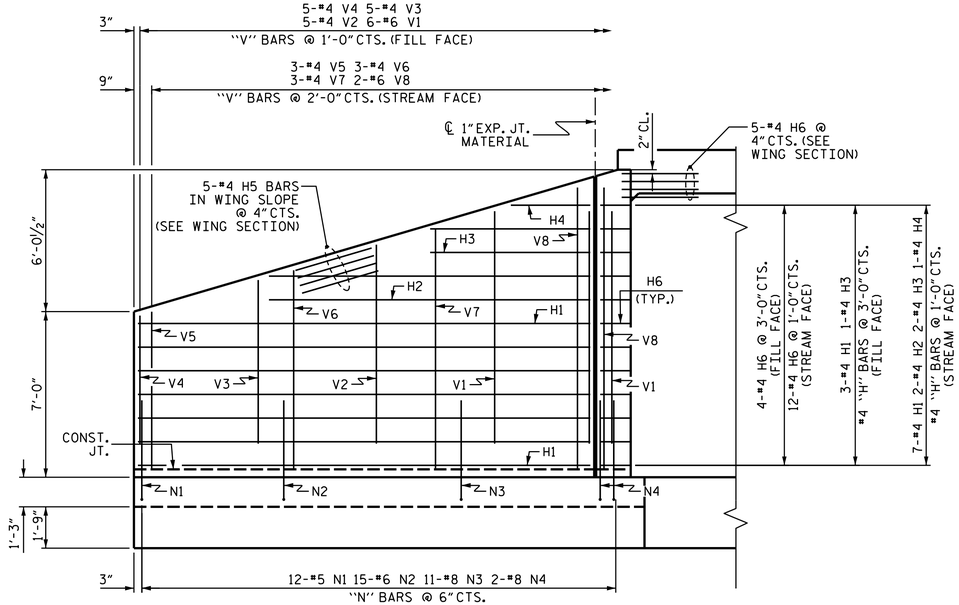
DRAWN BY : H.A. LOCKLEAR DATE : 3-31-16
CHECKED BY : K. D. LAYNE DATE : 8/4/16
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 11/16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

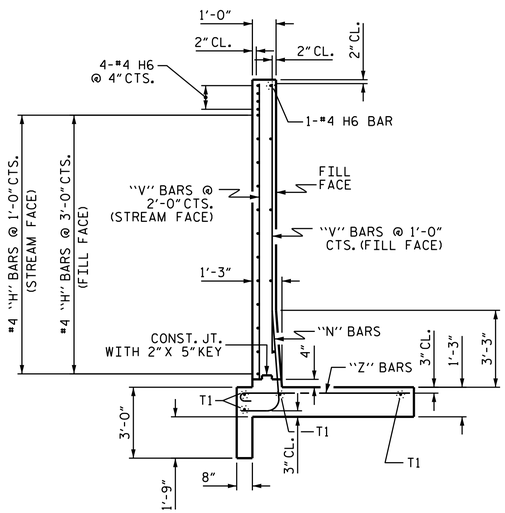
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-11
1			3			TOTAL SHEETS
2			4			13



PLAN W4

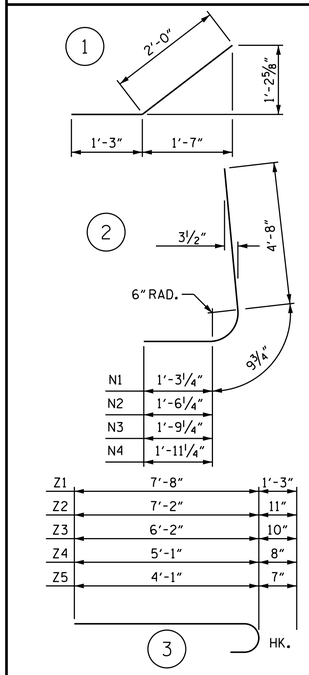


ELEVATION W4



TYPICAL WING SECTION

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	10	#4	STR	19'- 1"	127
H2	2	#4	STR	13'- 7"	18
H3	3	#4	STR	6'- 7"	13
H4	1	#4	STR	3'- 2"	2
H5	5	#4	STR	19'-11"	67
H6	21	#4	1	3'- 3"	46
N1	12	#5	2	6'- 9"	84
N2	15	#6	2	7'- 0"	158
N3	11	#8	2	7'- 3"	213
N4	2	#8	2	7'- 5"	40
S4	3	#6	STR	6'- 0"	27
T1	4	#5	STR	20'- 4"	85
V1	6	#6	STR	9'- 6"	86
V2	5	#4	STR	8'- 1"	27
V3	5	#4	STR	6'- 8"	22
V4	5	#4	STR	5'- 2"	17
V5	3	#4	STR	6'- 7"	13
V6	3	#4	STR	8'- 4"	17
V7	3	#4	STR	10'- 1"	20
V8	2	#6	STR	11'- 9"	35
Z1	3	#9	3	8'-11"	91
Z2	5	#8	3	8'- 1"	108
Z3	11	#7	3	7'- 0"	157
Z4	11	#6	3	5'- 9"	95
Z5	11	#5	3	4'- 8"	54

REINFORCING STEEL FOR WING W4 LBS. 1,622

CLASS A CONCRETE

WING W4	C.Y.	16.1
CURTAIN WALL	C.Y.	2.0
CULVERT HEADWALL	C.Y.	1.3
TOTAL	C.Y.	19.4

NOTE: A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

PROJECT NO. U-3633

GASTON COUNTY

STATION: 54+22.00 -L-

SHEET 12 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WING W4 FOR CONCRETE BOX CULVERT

(RIGHT EXTENSION)

H=12'-0" 105° SKEW SLOPE=2:1

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Documents Marshall G. Cheek, Jr.
8549D6EBAA3B405...
11/21/2016

ASSEMBLED BY : H. A. LOCKLEAR	DATE : 3-24-16
CHECKED BY : K. D. LAYNE	DATE : 8/4/16
DRAWN BY : CCJ 01/00	
CHECKED BY : RWW 03/00	

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-12
1			3			TOTAL SHEETS
2			4			13

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERT

LEVEL		VEHICLE	WEIGHT (W) (TONS)	(#) CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	(1)	**1.67**	--	1.75	**2.49**	1	EXTERIOR WALL	**6.47**	1.67	1	EXTERIOR WALL	11.78	
		HL-93 (OPERATING)	N/A		2.16	--	1.35	3.23	1	EXTERIOR WALL	6.47	2.16	1	EXTERIOR WALL	11.78	
		HS-20 (INVENTORY)	36.000	(2)	**1.70**	61.08	1.75	2.49	1	EXTERIOR WALL	6.47	**1.70**	1	EXTERIOR WALL	**11.78**	
		HS-20 (OPERATING)	36.000		2.20	79.18	1.35	3.23	1	EXTERIOR WALL	6.47	2.20	1	EXTERIOR WALL	11.78	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.16	29.10	1.40	3.10	1	EXTERIOR WALL	6.47	2.16	1	EXTERIOR WALL	11.78	
		SNGARBS2	20.000		2.15	43.10	1.40	3.10	1	EXTERIOR WALL	6.47	2.15	1	EXTERIOR WALL	11.78	
		SNAGRIS2	22.000		2.16	47.42	1.40	3.10	1	EXTERIOR WALL	6.47	2.16	1	EXTERIOR WALL	11.78	
		SNCOTTS3	27.250		2.11	57.58	1.40	3.10	1	EXTERIOR WALL	6.47	2.11	1	EXTERIOR WALL	11.78	
		SNAGGRS4	34.925		2.12	73.95	1.40	3.10	1	EXTERIOR WALL	6.47	2.12	1	EXTERIOR WALL	11.78	
		SNS5A	35.550	(3)	**2.11**	75.02	1.40	3.10	1	EXTERIOR WALL	6.47	2.11	1	EXTERIOR WALL	11.78	
		SNS6A	39.950		2.11	84.33	1.40	3.10	1	EXTERIOR WALL	6.47	2.11	1	EXTERIOR WALL	11.78	
		SNS7B	42.000		2.11	88.64	1.40	3.10	1	EXTERIOR WALL	6.47	2.11	1	EXTERIOR WALL	11.78	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.12	69.92	1.40	3.10	1	EXTERIOR WALL	6.47	2.12	1	EXTERIOR WALL	11.78	
		TNT4A	33.075		2.12	70.10	1.40	3.10	1	EXTERIOR WALL	6.47	2.12	1	EXTERIOR WALL	11.78	
		TNT6A	41.600		2.11	87.88	1.40	3.10	1	EXTERIOR WALL	6.47	2.11	1	EXTERIOR WALL	11.78	
		TNT7A	42.000		2.12	88.84	1.40	3.10	1	EXTERIOR WALL	6.47	2.12	1	EXTERIOR WALL	11.78	
		TNT7B	42.000		2.11	88.73	1.40	3.10	1	EXTERIOR WALL	6.47	2.11	1	EXTERIOR WALL	11.78	
		TNAGRIT4	43.000		2.12	91.10	1.40	3.10	1	EXTERIOR WALL	6.47	2.12	1	EXTERIOR WALL	11.78	
		TNAGT5A	45.000		2.11	95.17	1.40	3.10	1	EXTERIOR WALL	6.47	**2.11**	1	EXTERIOR WALL	**11.78**	
		TNAGT5B	45.000		2.11	95.03	1.40	3.10	1	EXTERIOR WALL	6.47	2.11	1	EXTERIOR WALL	11.78	

LOAD FACTORS

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTE

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

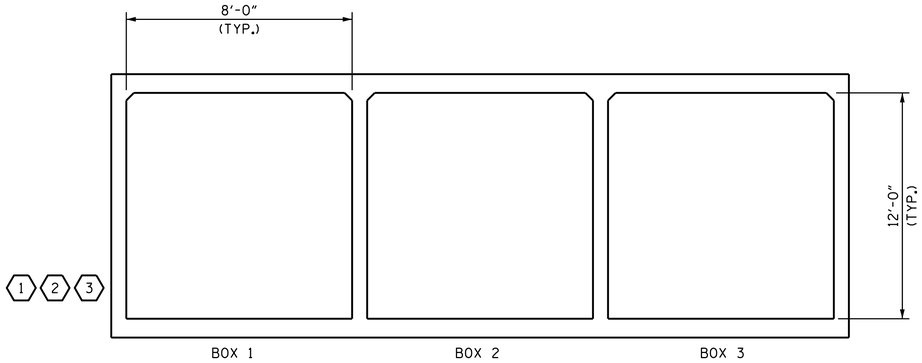
(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

LOOKING DOWNSTREAM

PROJECT NO. U-3633

GASTON COUNTY

STATION: 54+22.00 -L-

SHEET 13 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERT
(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr.
6549D6EBAA3B405...

11/21/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-13
1			3			TOTAL SHEETS
2			4			13

ASSEMBLED BY : M.K. BEARD DATE : 10/4/16
CHECKED BY : H.A. LOCKLEAR DATE : 10/4/16

DRAWN BY : WMC 7/11
CHECKED BY : GM 7/11

REV. 10/1/11 MAA/GM

STD. NO. LRFR5

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF	
STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION	
GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR	
UNTREATED - EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

REV. 6-16-95 EEM (W) RGW REV. 5-7-03 RWW (W) JTE REV. 10-1-11 MAA (W) GM
REV. 8-16-99 RWW (W) LES REV. 5-1-06 TLA (W) GM

ENGLISH

JANUARY, 1990

STD. NO. SN