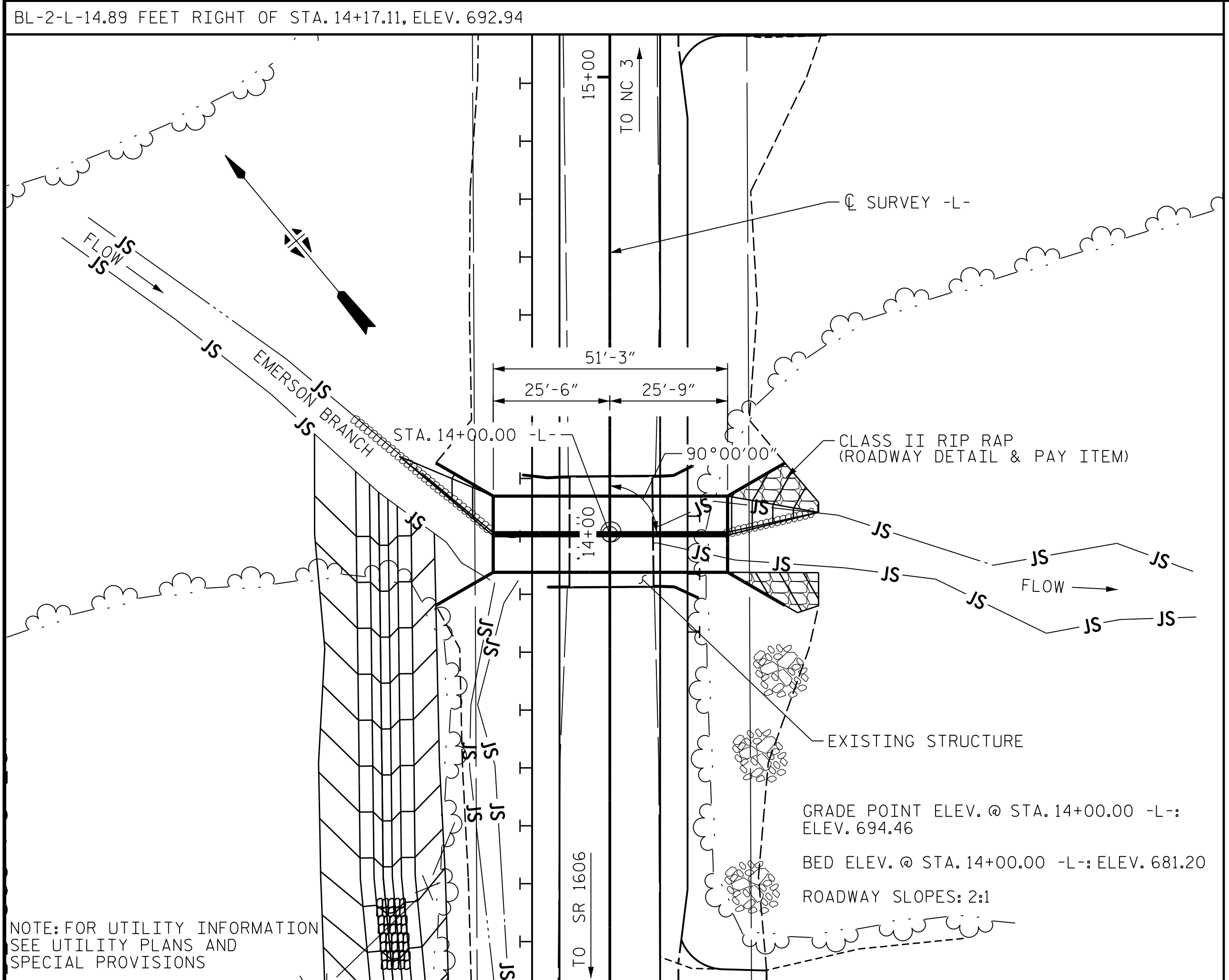


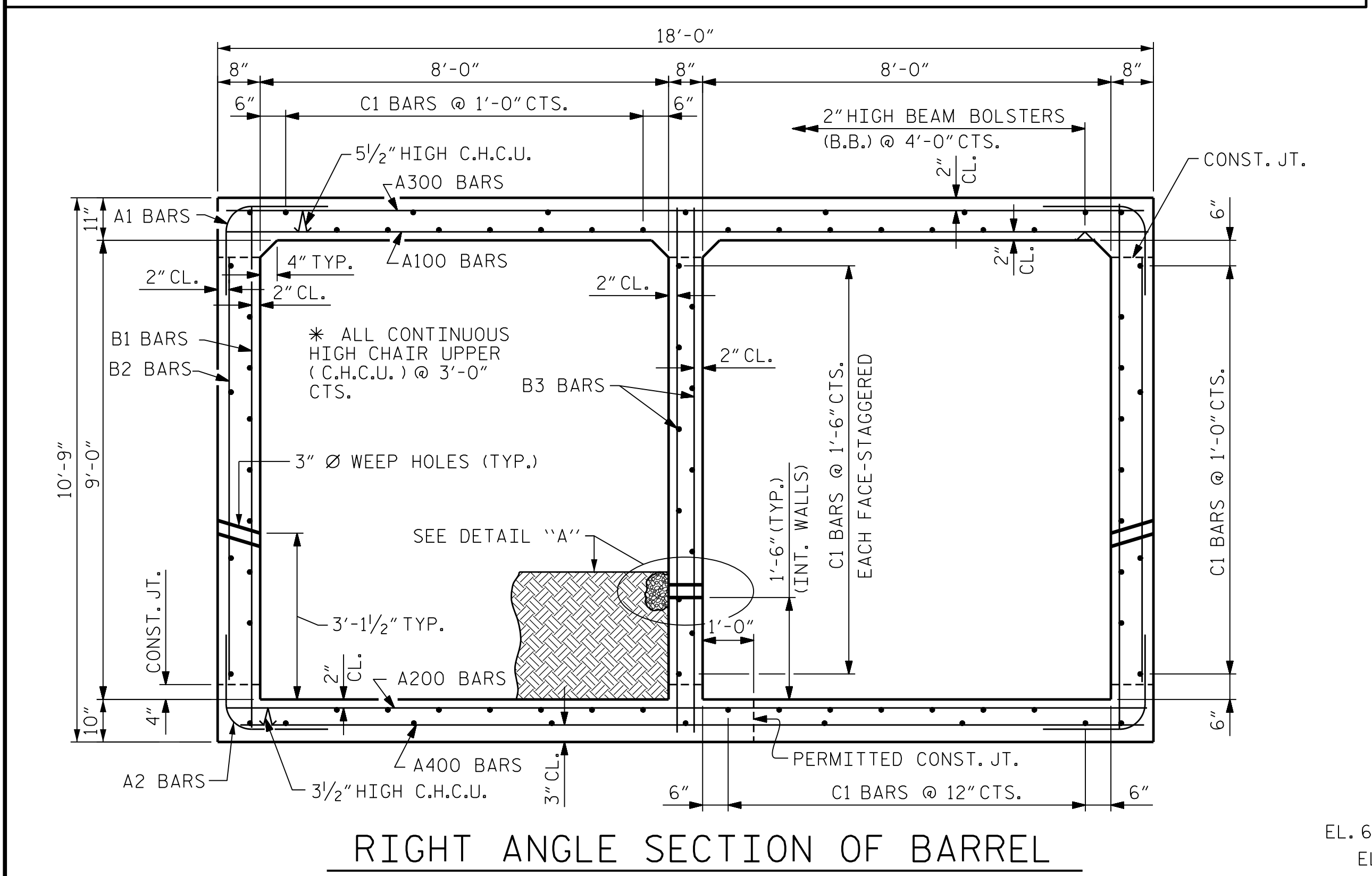
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LOCATION SKETCH



RIGHT ANGLE SECTION OF BARREL

(LOOKING DOWNSTREAM)  
THERE ARE 79 "C" BARS IN SECTION OF BARREL.

DES BY: P. ERVIN	DATE: 04/14	DWG BY: M. SELLS	DATE: 04/14
DES CHK: R. MONEY	DATE: 05/14	CHK BY: P. ERVIN	DATE: 04/14

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- DESIGN FILL = 4.33 FT.
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTES SHEET.
- 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN THE CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
  1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
  2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.
- 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 THE WING SHEETS.
- THE EXISTING STRUCTURE, LOCATED AT THE SITE OF THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING STRUCTURE CONSISTS OF ONE 24'-6" STEEL I-BEAM SPAN SUPPORTING A TIMBER DECK WITH A 19'-1" CLEAR ROADWAY ON TIMBER CAPS, POSTS AND SILLS WITH TIMBER BULKHEADS. THE TIMBER DECK IS SURFACE WITH A 3" ASPHALT WEARING SURFACE. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR 'REMOVAL OF EXISTING STRUCTURE AT STATION 14+00.00'.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- STEEL IN THE BOTTOM SLAB MAY BE SPICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES WILL BE PAID FOR BY THE CONTRACTOR.
- AT THE CONTRACTOR'S OPTION, HE MAY SPICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALLS AND BOTH FACES OF INTERIOR WALLS ABOVE THE LOWER WALL CONSTRUCTION JOINT. THE SPLICE 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.

HYDRAULIC DATA

DESIGN DISCHARGE	= 600 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 688.8
DRAINAGE AREA	= 1.2 SQ. MI.
BASIC DISCHARGE	= 850 CFS
BASIC HIGH WATER ELEVATION	= 689.8

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1140 CFS
FREQUENCY OF OVERTOPPING FLOOD	= <500 YR.
OVERTOPPING FLOOD ELEVATION	= 693.3

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE	
BARREL @ 1.842 C.Y./FT.	94.4 C.Y.
WINGS, SILLS, ETC.	34.9 C.Y.
<b>TOTAL</b>	<b>129.3 C.Y.</b>
REINFORCING STEEL	
BARRELS, SILLS & HEADWALLS	13,709 LBS.
WINGS	2,951 LBS.
<b>TOTAL</b>	<b>16,660 LBS.</b>
CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	80 TONS
REMOVAL OF EXISTING STRUCTURE	LUMP SUM
PLACEMENT OF NATIVE MATERIAL	LUMP SUM
ASBESTOS ASSESSMENT	LUMP SUM

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.

THE REQUIRED BEARING CAPACITY AT THE BASE OF THE CULVERT IS 1 TSF. THE REQUIRED BEARING CAPACITY SHALL BE VERIFIED.

THE REINFORCED CONCRETE BOX CULVERT SHALL BE PLACED ON THE STANDARD 1.0 FOOT BLANKET OF FOUNDATION CONDITIONING MATERIAL.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

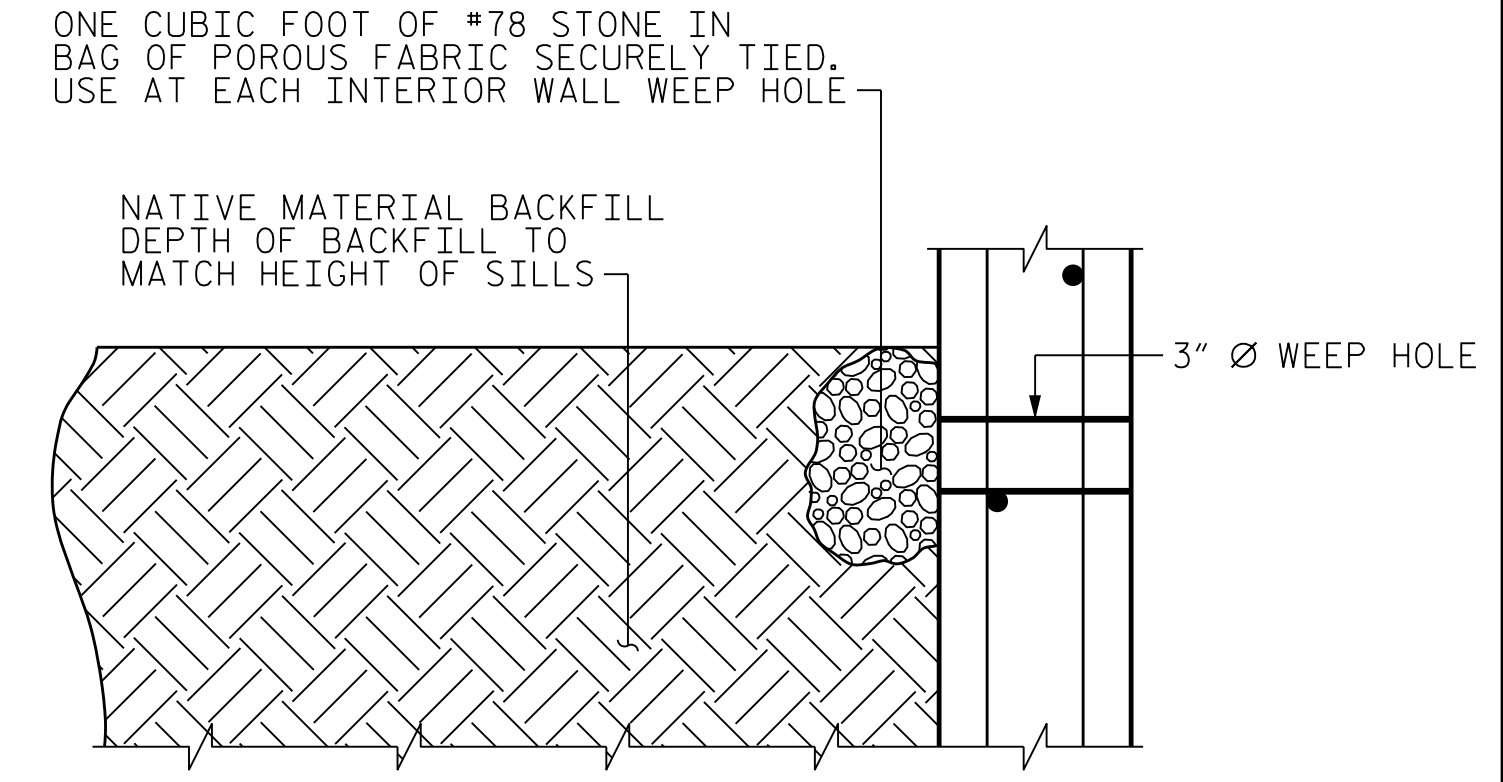
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

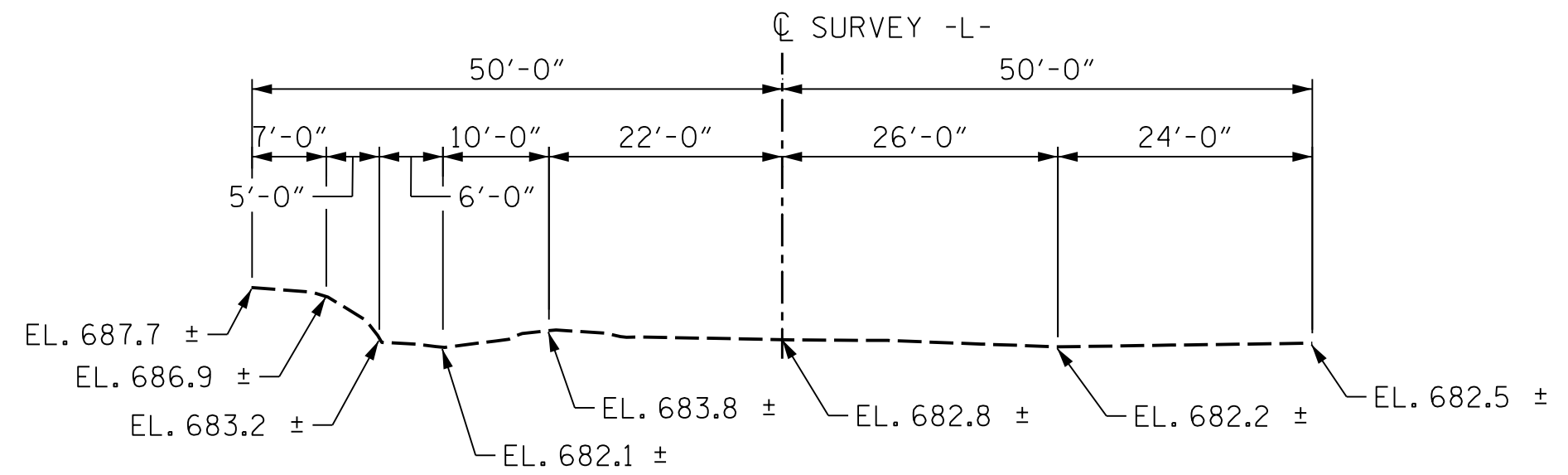
FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

NATIVE MATERIAL SHALL BE USED TO BACKFILL THE CULVERT BETWEEN THE SILLS. SEE SPECIAL PROVISIONS FOR "PLACEMENT OF NATIVE MATERIAL".



DETAIL "A"  
(NOT TO SCALE)

PROJECT NO. 17BP.10.R.53  
 CABARRUS COUNTY  
 STATION: 14+00.00 -L-  
 SHEET 1 OF 5 REPLACES BRIDGE NO. 12



PROFILE ALONG CULVERT

Designed by: Paul Stephen Ervin 4/18/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**DOUBLE BARREL  
 8 FT. X 9 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW**

REVISIONS

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas  
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601  
 N.C.B.E.L.S. License Number: F-0116

SHEET NO. S-01  
 TOTAL SHEETS 6

PLOT DRIVER: NCD07...  
 USER: ppefer...  
 FILE: ...\17BP.10.R.53\Structure\CAD\1

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (γ <sub>L</sub> )	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	1.02	--	1.75	1.23	1	BOT SLAB	8.67	1.02	1	BOT SLAB	8.67	-	
	HL-93 (OPERATING)	N/A		1.32	--	1.35	1.59	1	BOT SLAB	8.67	1.32	1	BOT SLAB	8.67	-	
	HS-20 (INVENTORY)	36.000	②	1.02	36.7	1.75	1.23	1	BOT SLAB	8.67	1.02	1	BOT SLAB	8.67	-	
	HS-20 (OPERATING)	36.000		1.32	47.5	1.35	1.59	1	BOT SLAB	8.67	1.32	1	BOT SLAB	8.67	-	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.37	31.9	1.40	2.37	1	TOP SLAB	4.67	2.46	1	TOP SLAB	8.33	-	
		SNGARBS2	20.000		2.00	40.0	1.40	2.22	1	TOP SLAB	4.67	2.00	1	BOT SLAB	8.67	-
		SNAGRIS2	22.000		1.85	40.7	1.40	2.22	1	BOT SLAB	8.67	1.85	1	BOT SLAB	8.67	-
		SNCOTTS3	27.250		1.42	38.6	1.40	1.58	1	TOP SLAB	4.67	1.42	1	BOT SLAB	8.67	-
		SNAGGRS4	34.925		1.32	46.1	1.40	1.60	1	BOT SLAB	8.67	1.32	1	BOT SLAB	8.67	-
		SNS5A	35.550		1.30	46.2	1.40	1.56	1	BOT SLAB	8.67	1.30	1	BOT SLAB	8.67	-
		SNS6A	39.950		1.22	48.7	1.40	1.44	1	BOT SLAB	8.67	1.22	1	BOT SLAB	8.67	-
		SNS7B	42.000		1.22	51.2	1.40	1.44	1	BOT SLAB	8.67	1.22	1	BOT SLAB	8.67	-
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.70	56.1	1.40	2.08	1	BOT SLAB	8.67	1.70	1	BOT SLAB	8.67	-
		TNT4A	33.075		1.39	45.9	1.40	1.62	1	BOT SLAB	8.67	1.39	1	BOT SLAB	8.67	-
		TNT6A	41.600		1.41	58.6	1.40	1.64	1	BOT SLAB	8.67	1.41	1	BOT SLAB	8.67	-
		TNT7A	42.000		1.39	58.3	1.40	1.61	1	BOT SLAB	8.67	1.39	1	BOT SLAB	8.67	-
		TNT7B	42.000		1.28	53.7	1.40	1.51	1	BOT SLAB	8.67	1.28	1	BOT SLAB	8.67	-
		TNAGRIT4	43.000		1.18	50.7	1.40	1.40	1	BOT SLAB	8.67	1.18	1	BOT SLAB	8.67	-
TNAGT5A	45.000		1.18	53.1	1.40	1.78	1	BOT SLAB	8.67	1.18	1	BOT SLAB	8.67	-		
TNAGT5B	45.000		③	1.17	52.6	1.40	1.39	1	BOT SLAB	8.67	1.17	1	BOT SLAB	8.67	-	

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.

COMMENTS:  
1.  
2.  
3.  
4.

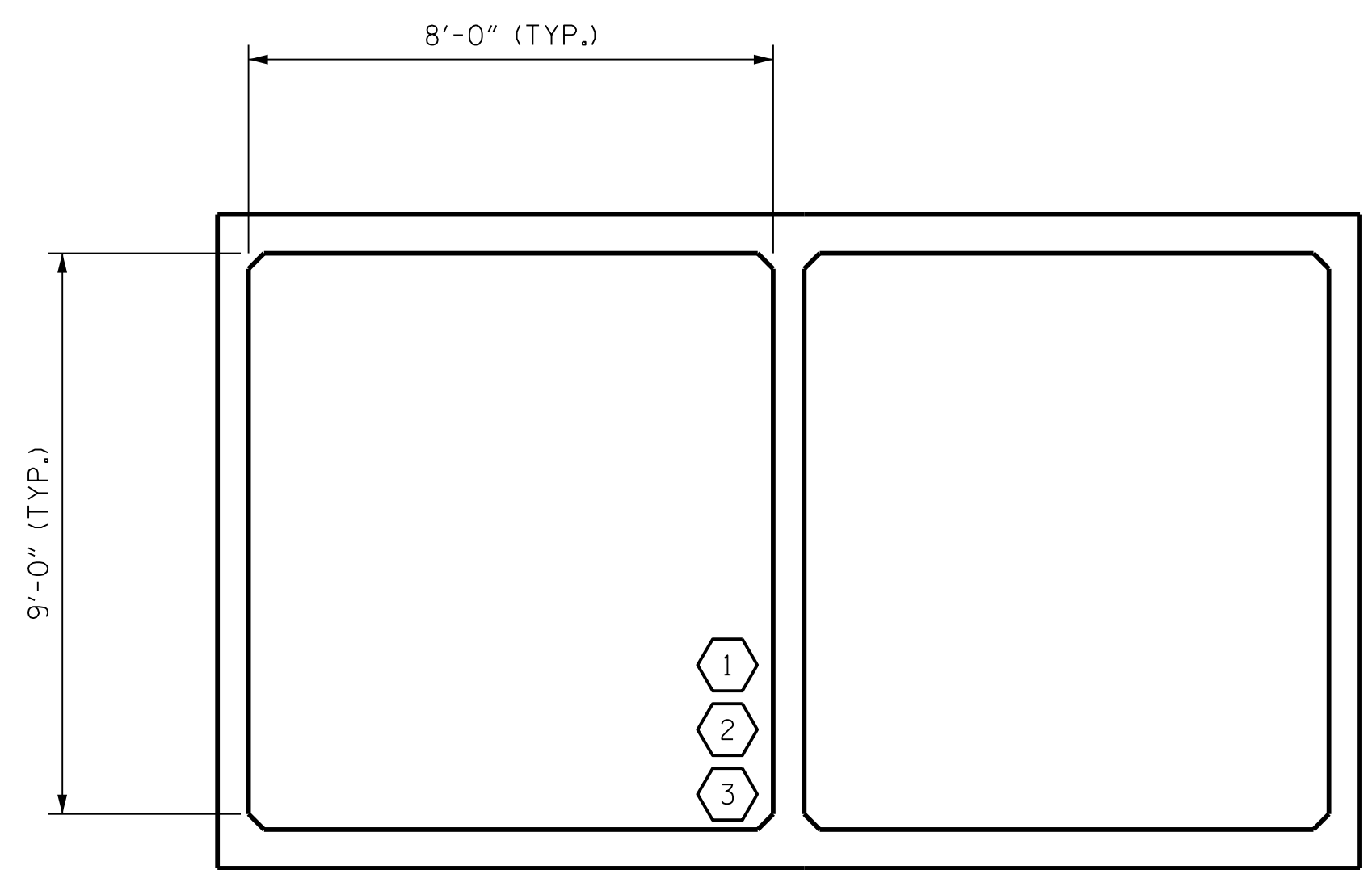
# CONTROLLING LOAD RATING

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. 17BP.10.R.53  
CABARRUS COUNTY  
 STATION: 14+00.00 -L-  
 SHEET 2 OF 5

DocuSigned by:  
Paul Stephen Ervin 4/18/2016  
11502010270495

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

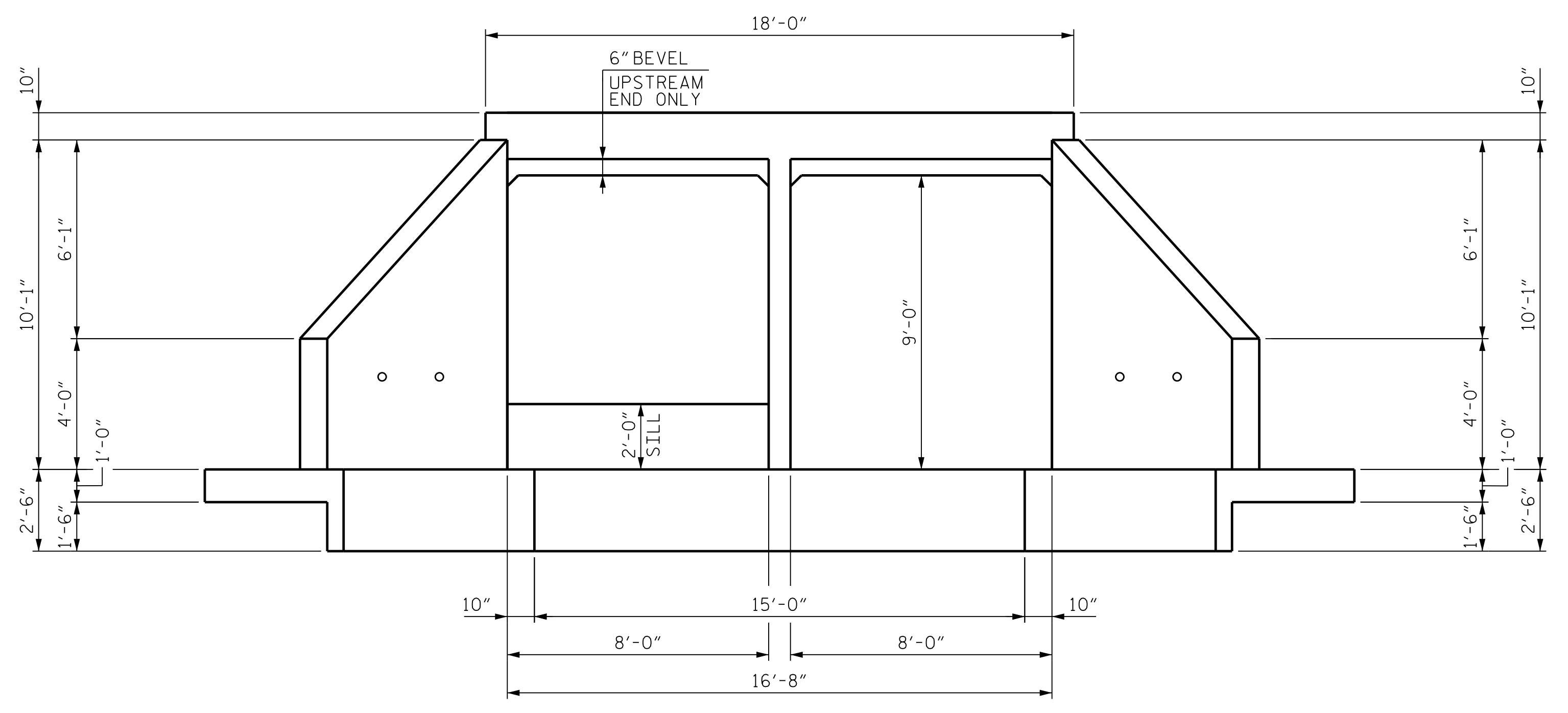
**DOUBLE BARREL  
 8 FT. X 9 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW**

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	--	--	3	--	--
2	--	--	4	--	--

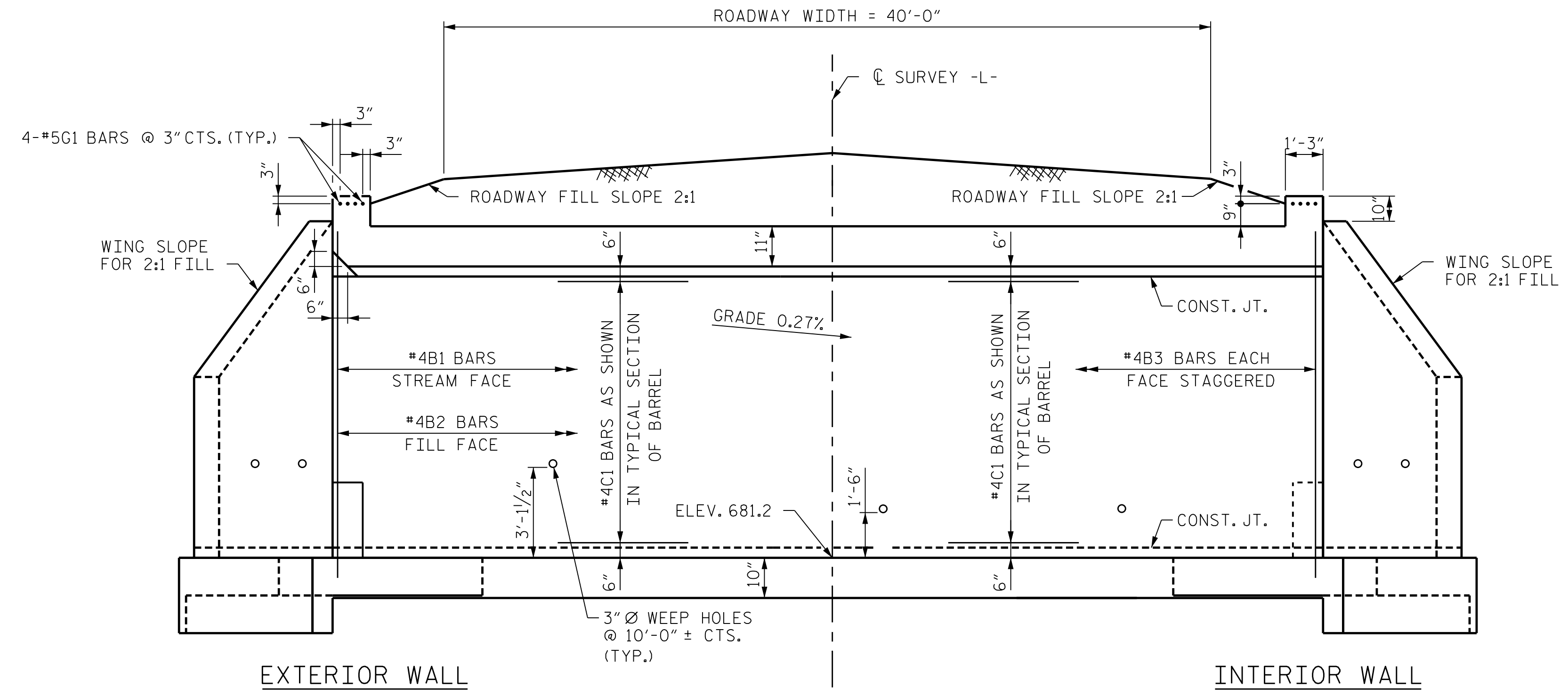
DESIGNER: P. ERVIN DATE: 04/14  
 CHECKER: R. MONEY DATE: 05/14

DWG BY: M. SELLS DATE: 04/14  
 CHK BY: P. ERVIN DATE: 04/14

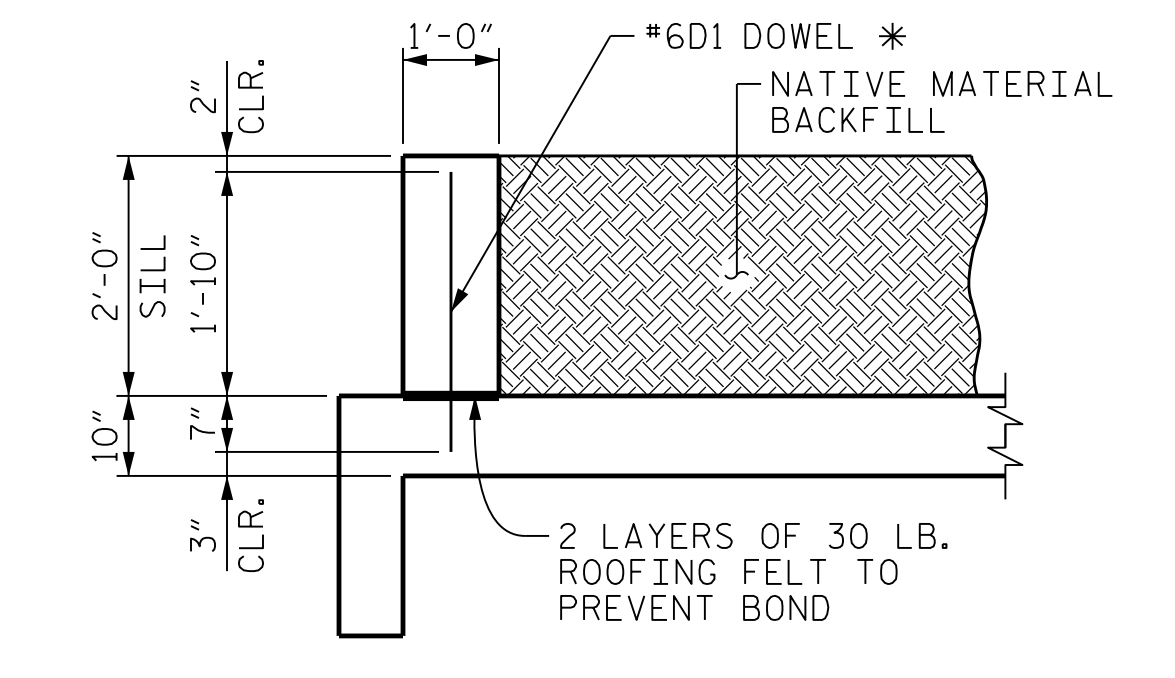
SHEET NO. S-02  
 TOTAL SHEETS 6



**END ELEVATION**  
(LOOKING DOWNSTREAM)

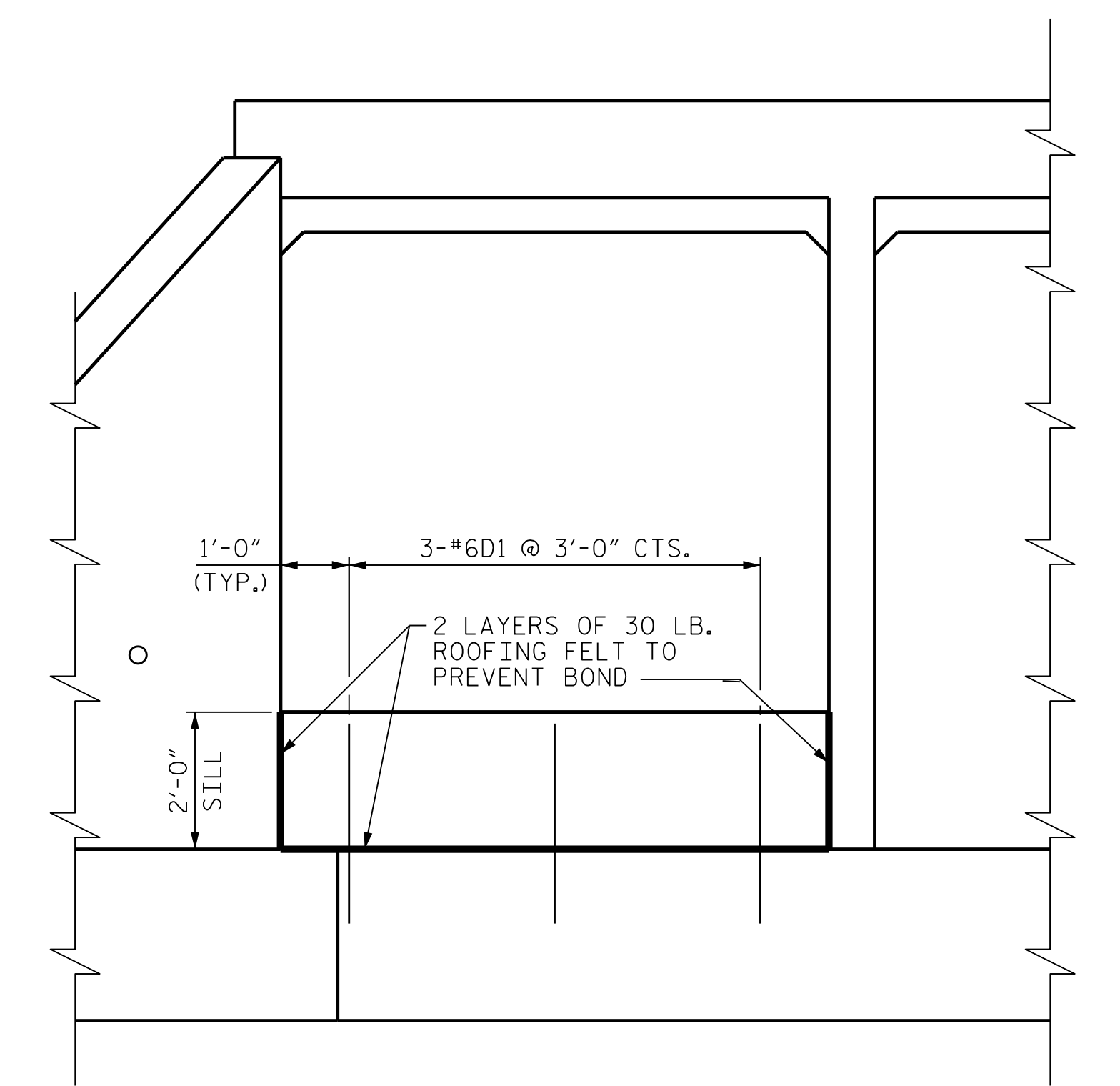


**CULVERT SECTION NORMAL TO ROADWAY**



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

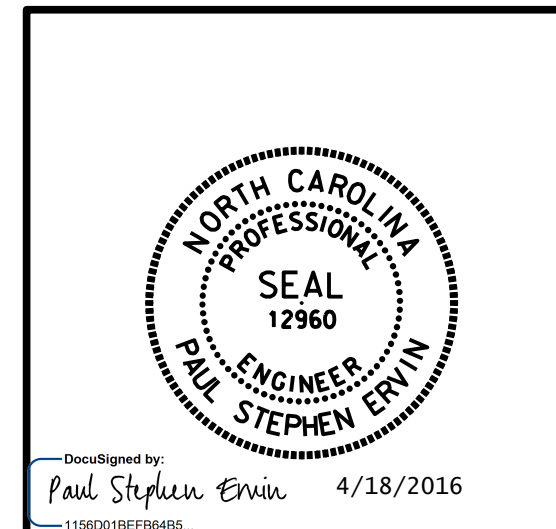
**SECTION THRU SILL**



**END ELEVATION**  
(LOOKING DOWNSTREAM)

**CULVERT SILL DETAILS**

PROJECT NO. 17BP.10.R.53  
CABARRUS COUNTY  
 STATION: 14+00.00 -L-  
 SHEET 3 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**DOUBLE BARREL**  
**8 FT. X 9 FT.**  
**CONCRETE BOX CULVERT**  
**90° SKEW**

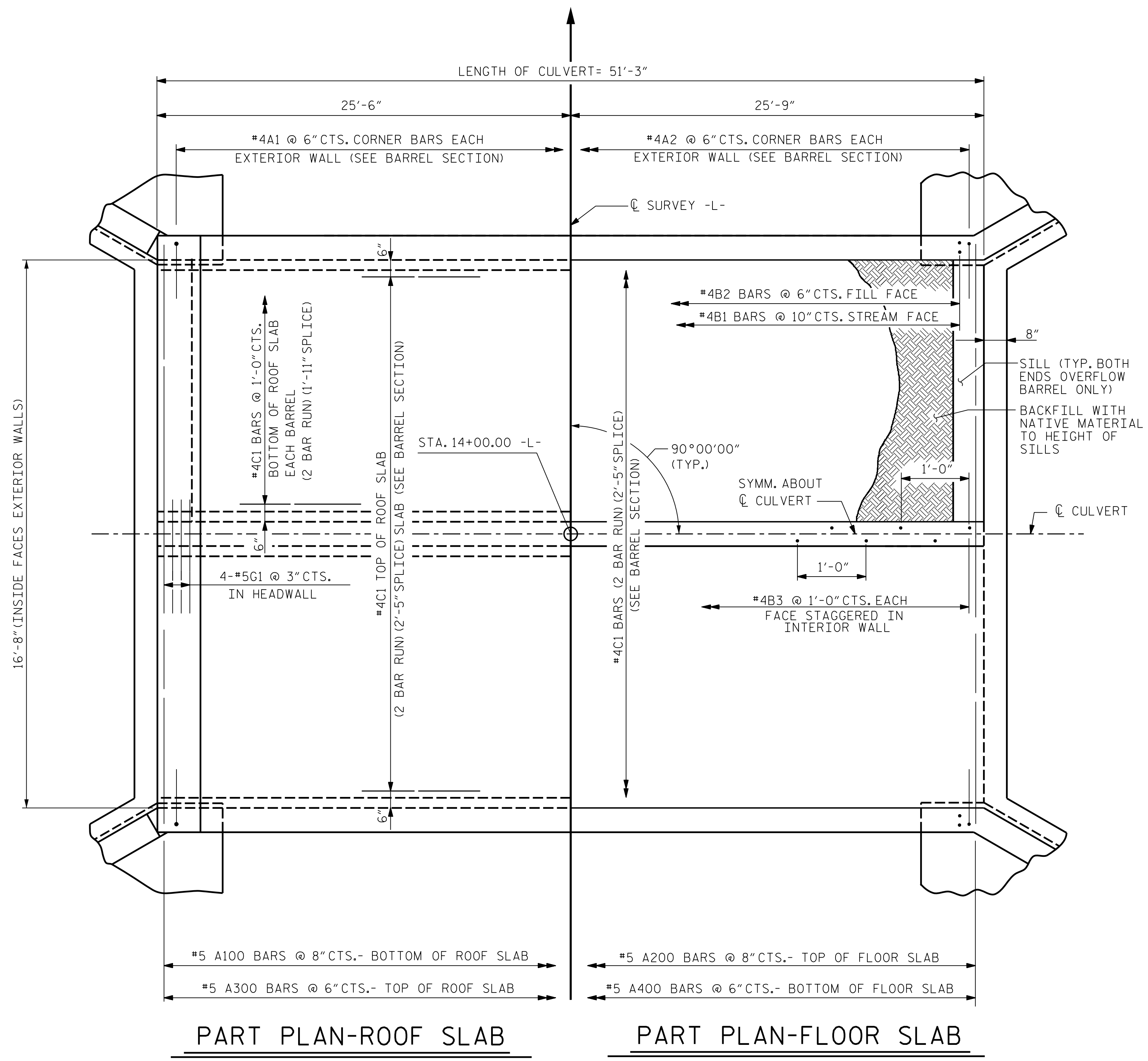
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PLOT DRIVER: NCD07.pdfr\_mono\_eng\_50.ppt  
 USER: ppe@erso DATE: 4/18/2016 TIME: 8:55:52 AM  
 FILE: ...\\17BP.10.R.53\Structures\CAD\3

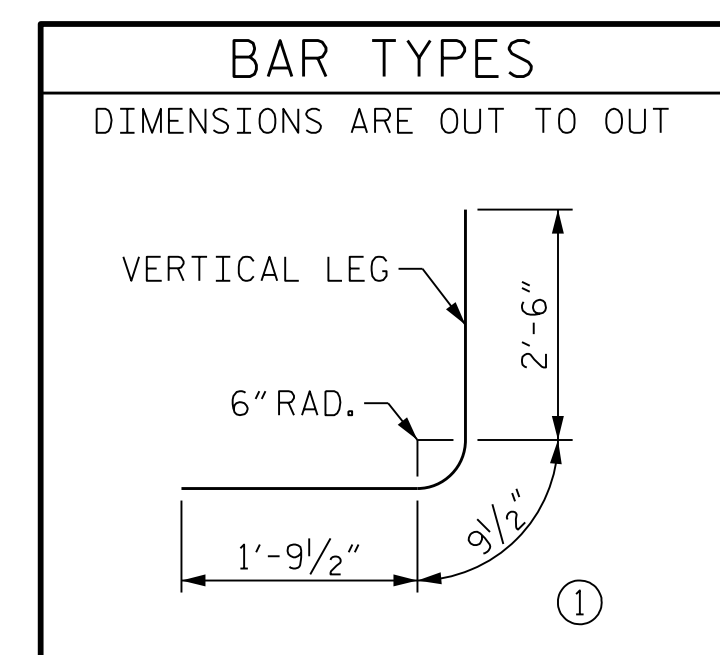
DES BY: <u>P. ERVIN</u>	DATE: <u>04/14</u>	DWG BY: <u>M. SELLS</u>	DATE: <u>04/14</u>
DES CHK: <u>R. MONEY</u>	DATE: <u>05/14</u>	CHK BY: <u>P. ERVIN</u>	DATE: <u>04/14</u>

HDR Engineering, Inc. of the Carolinas  
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601  
 N.C.B.E.L.S. License Number: F-0116

SHEET NO. S-03  
 TOTAL SHEETS 6



REINFORCING STEEL BAR SCHEDULE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	206	#4	1	5'-1"	700
A2	206	#4	1	5'-1"	700
A100	77	#5	STR.	17'-8"	1419
A200	77	#5	STR.	17'-8"	1419
A300	103	#5	STR.	17'-8"	1898
A400	103	#5	STR.	17'-8"	1898
B1	124	#4	STR.	10'-4"	856
B2	206	#4	STR.	8'-2"	1124
B3	103	#4	STR.	10'-4"	711
C1	158	#4	STR.	26'-8"	2815
D1	6	#6	STR.	2'-5"	22
G1	8	#5	STR.	17'-8"	147
REINFORCING STEEL				LBS.	13,709



SPLICE LENGTH CHART		
BAR	SIZE	SPLICE LENGTH
A200	5	2'-2"
A400	5	1'-9"
C1	4	2'-5"
B1	4	1'-9"
B3	4	1'-9"

PROJECT NO. 17BP.10.R.53  
CABARRUS COUNTY  
 STATION: 14+00.00 -L-  
 SHEET 4 OF 5

DocuSigned by:  
Paul Stephen Ervin 4/18/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**DOUBLE BARREL  
 8 FT. X 9 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW**

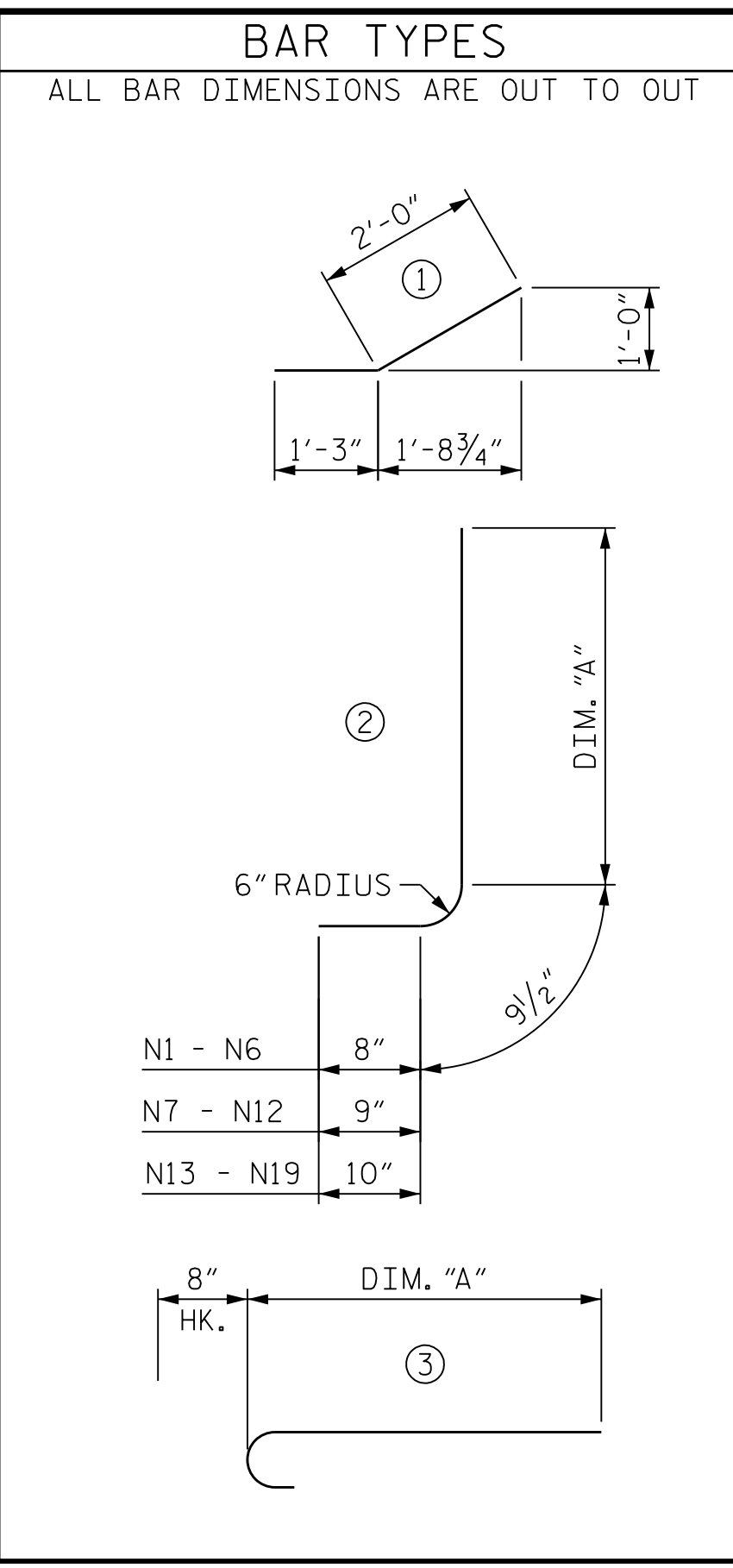
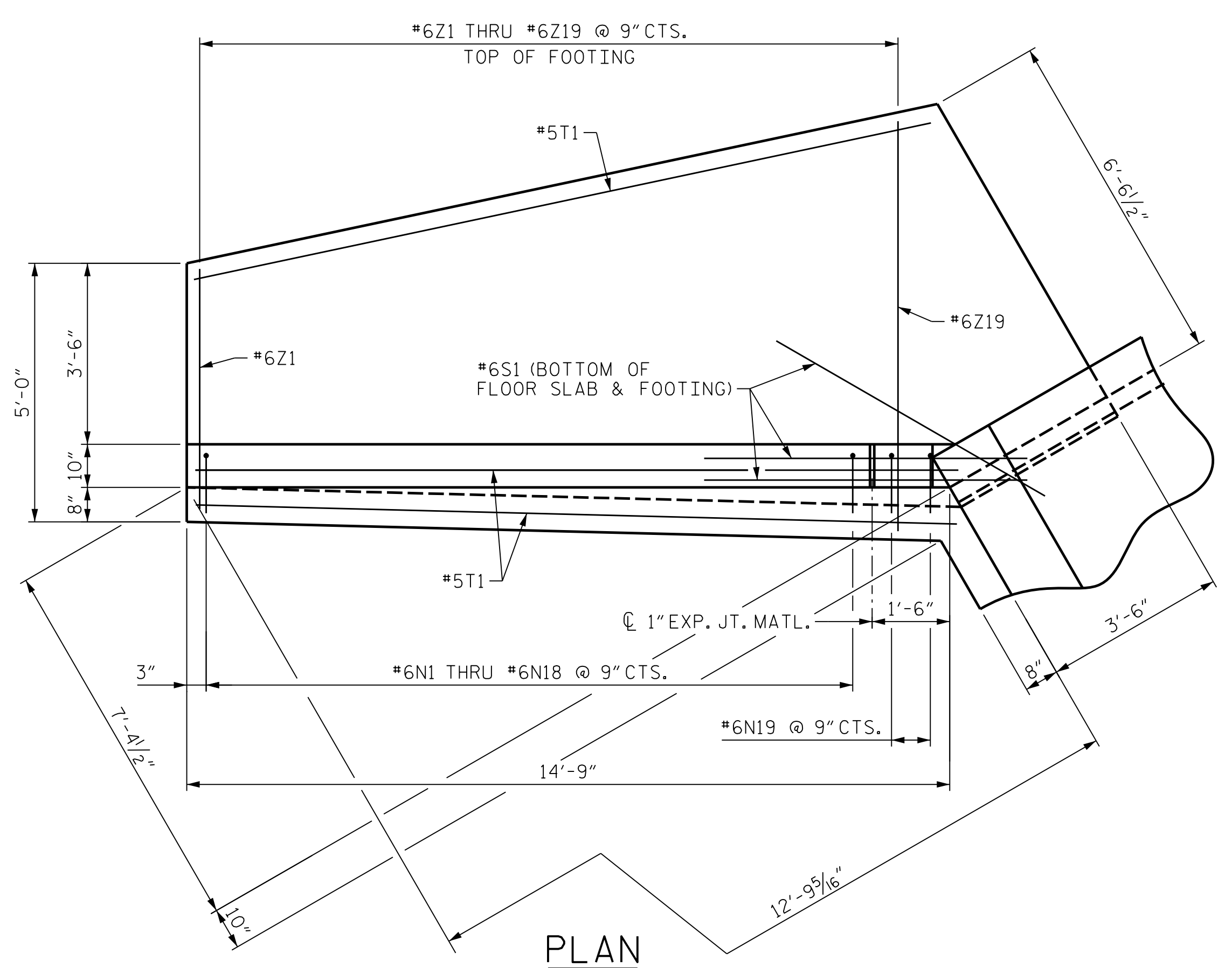
REVISIONS					
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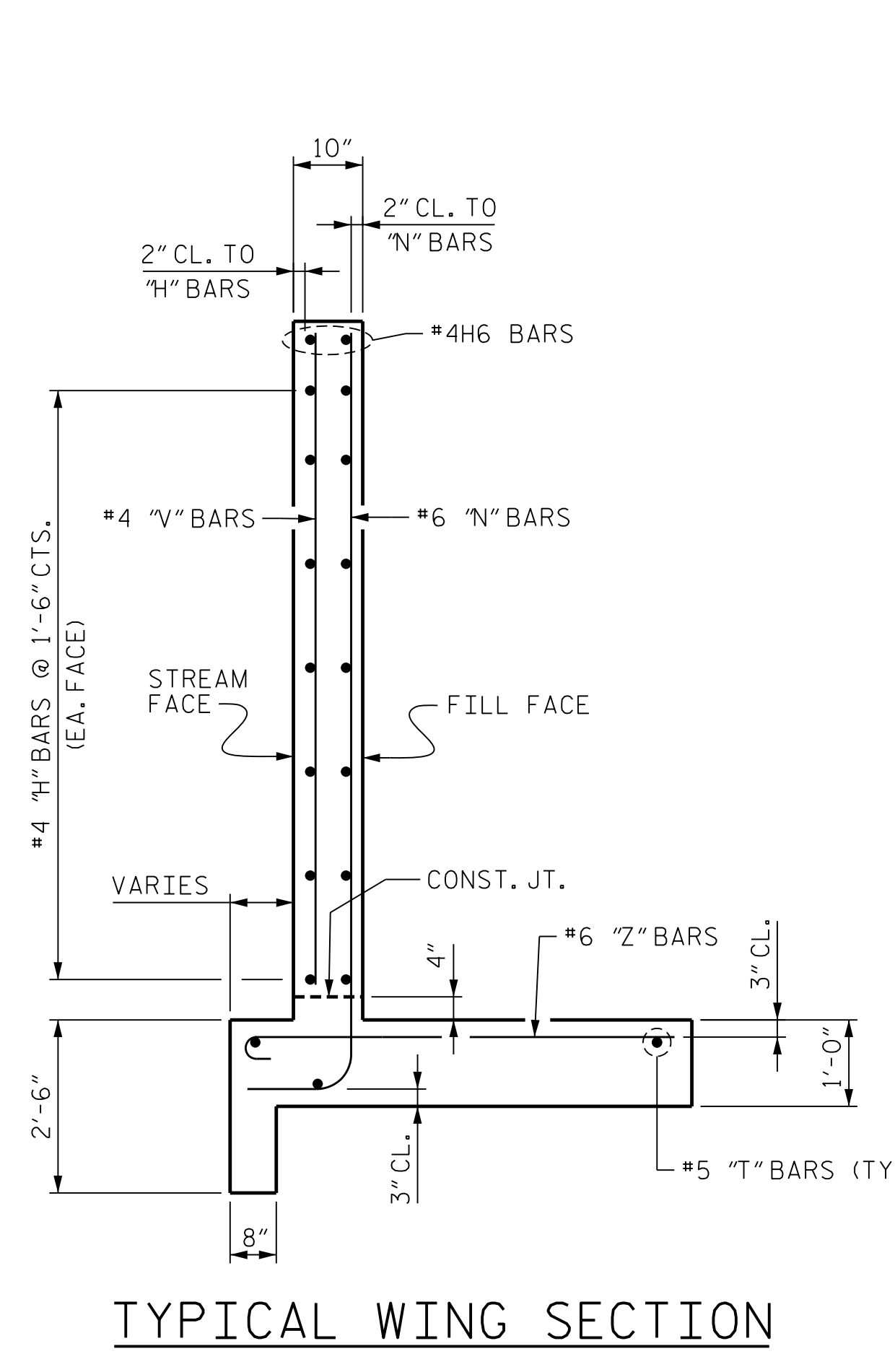
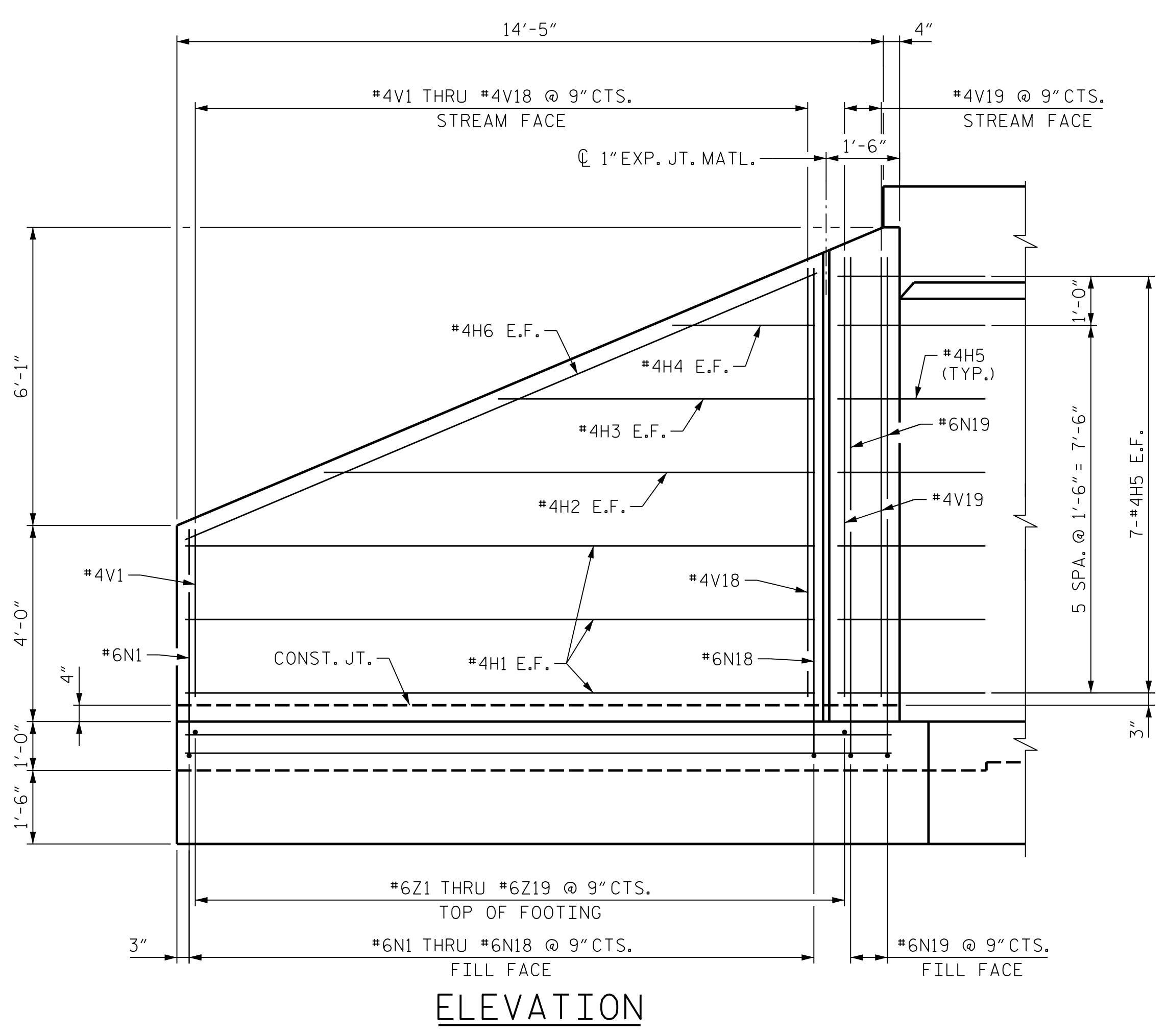
SHEET NO. S-04  
 TOTAL SHEETS 6

PLOT DRIVER: NCD07.pdfr\_mono\_eng\_50.ppt  
 USER: ppeferiso DATE: 4/18/2016  
 FILE: ...\\17BP.10.R.53\Structure\CAD\4

DES BY: <u>P. ERVIN</u>	DATE: <u>04/14</u>	DWG BY: <u>M. SELLS</u>	DATE: <u>04/14</u>
DES CHK: <u>R. MONEY</u>	DATE: <u>05/14</u>	CHK BY: <u>P. ERVIN</u>	DATE: <u>04/14</u>



REINFORCING STEEL BAR SCHEDULE													
BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT
H1	24	#4	STR	--	12'-11"	207	Z1	4	#6	3	4'-8"	5'-4"	32
H2	8	#4	STR	--	10'-2"	54	Z2	4	#6	3	4'-10"	5'-6"	33
H3	8	#4	STR	--	6'-6"	35	Z3	4	#6	3	5'-0"	5'-8"	34
H4	8	#4	STR	--	2'-10"	15	Z4	4	#6	3	5'-2"	5'-10"	35
H5	56	#4	1	--	3'-3"	122	Z5	4	#6	3	5'-4"	6'-0"	36
H6	8	#4	STR	--	13'-11"	74	Z6	4	#6	3	5'-5"	6'-1"	37
							Z7	4	#6	3	5'-7"	6'-3"	38
N1	4	#6	2	4'-1 1/2"	5'-7"	34	Z8	4	#6	3	5'-9"	6'-5"	39
N2	4	#6	2	4'-5 1/2"	5'-11"	36	Z9	4	#6	3	5'-11"	6'-7"	40
N3	4	#6	2	4'-8 1/2"	6'-2"	37	Z10	4	#6	3	6'-1"	6'-9"	41
N4	4	#6	2	5'-1 1/2"	6'-6"	39	Z11	4	#6	3	6'-3"	6'-11"	42
N5	4	#6	2	5'-4 1/2"	6'-10"	41	Z12	4	#6	3	6'-5"	7'-1"	43
N6	4	#6	2	5'-7 1/2"	7'-1"	43	Z13	4	#6	3	6'-7"	7'-3"	44
N7	4	#6	2	5'-11 1/2"	7'-6"	45	Z14	4	#6	3	6'-8"	7'-4"	44
N8	4	#6	2	6'-3 1/2"	7'-10"	47	Z15	4	#6	3	6'-10"	7'-6"	45
N9	4	#6	2	6'-7 1/2"	8'-2"	49	Z16	4	#6	3	7'-0"	7'-8"	46
N10	4	#6	2	6'-10 1/2"	8'-5"	51	Z17	4	#6	3	7'-2"	7'-10"	47
N11	4	#6	2	7'-2 1/2"	8'-9"	53	Z18	4	#6	3	7'-4"	8'-0"	48
N12	4	#6	2	7'-6 1/2"	9'-1"	55	Z19	4	#6	3	7'-5"	8'-1"	49
N13	4	#6	2	7'-9 1/2"	9'-5"	57							
N14	4	#6	2	8'-1 1/2"	9'-9"	59							
N15	4	#6	2	8'-5 1/2"	10'-1"	61							
N16	4	#6	2	8'-9 1/2"	10'-5"	63							
N17	4	#6	2	9'-0 1/2"	10'-8"	64							
N18	4	#6	2	9'-4 1/2"	11'-0"	66							
N19	8	#6	2	9'-6 1/2"	11'-2"	134							
S1	12	#6	STR	--	6'-0"	108							
T1	12	#5	STR	--	14'-9"	185							
V1	4	#4	STR	--	3'-6"	9							
V2	4	#4	STR	--	3'-10"	10							
V3	4	#4	STR	--	4'-2"	11							
V4	4	#4	STR	--	4'-6"	12							
V5	4	#4	STR	--	4'-9"	13							
V6	4	#4	STR	--	5'-1"	14							
V7	4	#4	STR	--	5'-5"	14							
V8	4	#4	STR	--	5'-8"	15							
V9	4	#4	STR	--	6'-0"	16							
V10	4	#4	STR	--	6'-4"	17							
V11	4	#4	STR	--	6'-8"	18							
V12	4	#4	STR	--	6'-11"	18							
V13	4	#4	STR	--	7'-3"	19							
V14	4	#4	STR	--	7'-7"	20							
V15	4	#4	STR	--	7'-10"	21							
V16	4	#4	STR	--	8'-2"	22							
V17	4	#4	STR	--	8'-6"	23							
V18	4	#4	STR	--	8'-10"	24							
V19	8	#4	STR	--	9'-0"	48							



REINFORCING STEEL	2,951 LBS.
CLASS A CONCRETE	
4 WINGS	30.8 CY
2 HEADWALLS	1.7 CY
4 CULVERT SILLS	1.2 CY
2 END CURTAIN WALLS	1.2 CY
<b>TOTAL:</b>	<b>34.9 CY</b>

**NOTES**  
 A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FULL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

PROJECT NO. 17BP.10.R.53  
CABARRUS COUNTY  
 STATION: 14+00.00 -L-  
 SHEET 5 OF 5

DocuSigned by:  
Paul Stephen Ervin 4/18/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**DOUBLE BARREL  
 8 FT. X 9 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW**

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	--	--	3	--	--
2	--	--	4	--	--

DES BY: P. ERVIN DATE: 04/14  
 DES CHK: R. MONEY DATE: 05/14

DWG BY: M. SELLS DATE: 04/14  
 CHK BY: P. ERVIN DATE: 04/14

PLOT DRIVER: NCD07.pdf\_mono\_eng\_50.ppt  
 USER: ppeferiso DATE: 4/18/2016 TIME: 8:56:09 AM  
 FILE: ...\\17BP.10.R.53\Structure\CAD\5

## STANDARD NOTES

### DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	HL 93
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 1/2" 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 3/4" 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 3/16" 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" 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.

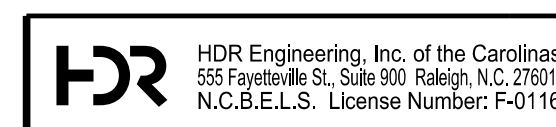
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE 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.

PROJECT NO. 17BP.10.R.53  
CABARRUS COUNTY  
 STATION: 14+00.00 -L-

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
STANDARD NOTES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	--	--	3	--	--
2	--	--	4	--	--
					SHEET NO. S-06
					TOTAL SHEETS 6



DES BY: <u>P. ERVIN</u>	DATE: <u>05/14</u>	DWG BY: <u>M. SELLS</u>	DATE: <u>05/14</u>
DES CHK: <u>R. MONEY</u>	DATE: <u>05/14</u>	CHK BY: <u>P. ERVIN</u>	DATE: <u>05/14</u>

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 USER: ppeferiso DATE: 4/18/2016  
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