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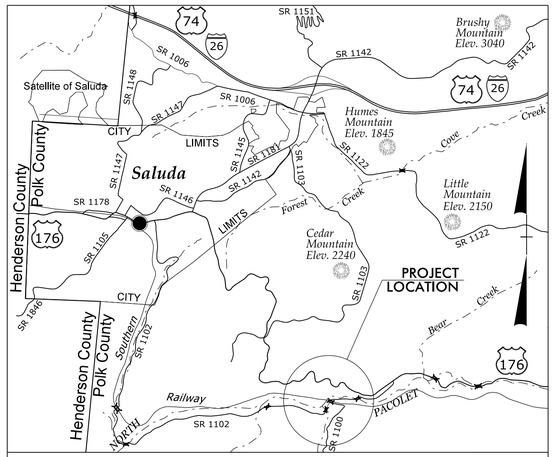
TIP NO: B–4792

CONTRACT: DN00448



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

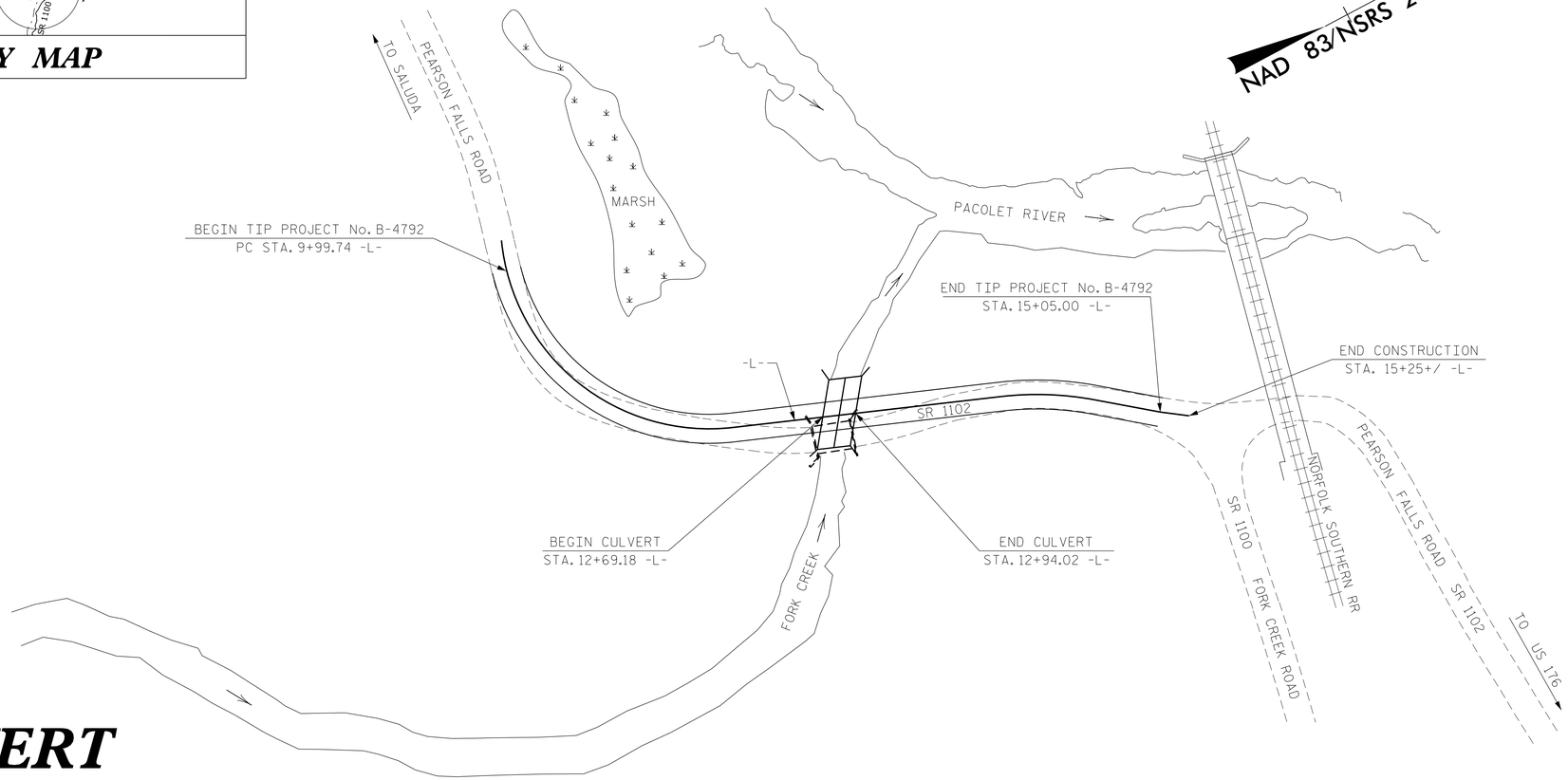
POLK COUNTY

LOCATION: BRIDGE No. 4 OVER FORK CREEK (SMALL BRANCH OF PACOLET RIVER) ON SR 1102

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4792		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38562.1.1	BRZ–1102(5)	P.E.
38562.2.1	BRZ–1102(5)	R/W, UTILITIES
38562.3.1	BRZ–1102(5)	CONSTRUCTION



CULVERT

DESIGN DATA

ADT 2014 = 100
ADT 2035 = 200
K = 25 %
D = 55 %
T = 19 % *
V = 25 MPH
* TTST = 1% DUAL 18%

FUNC CLASS = LOCAL

SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY OF F.A. PROJECT B–4792	=	0.092 MILES
LENGTH STRUCTURE OF F.A. PROJECT B–4792	=	0.004 MILES
TOTAL LENGTH OF STATE PROJECT B–4792	=	0.096 MILES

Prepared in the Office of:

DIVISION OF HIGHWAYS

STRUCTURES MANAGEMENT UNIT

1000 BIRCH RIDGE DR.

RALEIGH, N.C. 27610

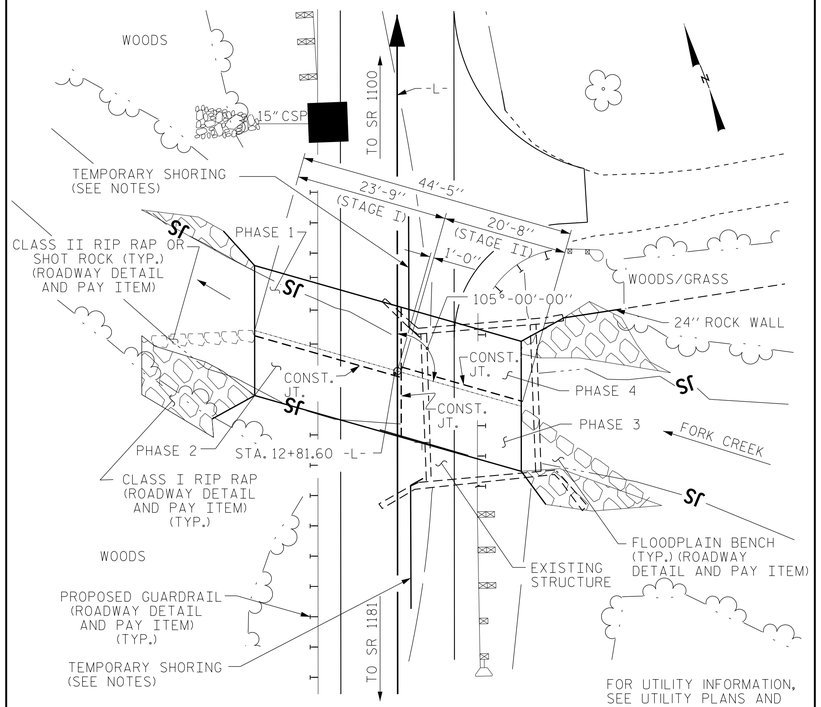
2012 STANDARD SPECIFICATIONS

LETTING DATE : MAY 10, 2016

D. R. CALHOUN, P.E.
PROJECT ENGINEER

W. S. ARAFAT, P.E.
PROJECT DESIGN ENGINEER

B.M. #2 - SPIKE SET IN BASE OF 24'' Ø POPLAR TREE,
28.09 FT. LT., STA. 14+45.31 -L-, EL. 1476.67



LOCATION SKETCH

ROADWAY DATA

GRADE POINT EL. @ STATION 12+81.60 -L- = 1484.17

BED EL. @ STATION 12+81.60 -L- = 1474.86

ROADWAY SLOPES = 2:1

HYDRAULIC DATA

DESIGN DISCHARGE _____ = 650 C.F.S

FREQUENCY OF DESIGN FLOOD_____= 25 YEARS

DESIGN HIGH WATER ELEVATION____ = 1481.50

DRAINAGE AREA = _____ = 2.09 SQ. MI.

BASE DISCHARGE (Q100) _____ = 950 C.F.S.

BASE HIGH WATER ELEVATION = _____ 1483.20

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE _____ = 900 C.F.S.

FREQUENCY OF OVERTOPPING FLOOD ___ = 50 + YEARS

OVERTOPPING FLOOD ELEVATION _____ = 1483.00±
OT OCCURS AT/NEAR DRIVE NEAR STA. 13+10 -L- RT.

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE	
STAGE I	68.6 C.Y.
STAGE II	60.2 C.Y.
TOTAL	128.8 C.Y.
REINFORCING STEEL	
STAGE I	9,218 LBS.
STAGE II	8,128 LBS.
TOTAL	17,346 LBS.
CULVERT EXCAVATION	LUMP SUM
FOUNDATION COND. MAT'L	
STAGE I	47 TONS
STAGE II	41 TONS
TOTAL	88 TONS
REMOVAL OF EXISTING STRUCTURE	LUMP SUM
CHANNEL SUBSTRATE MATERIAL	15 TONS

NOTES

ASSUMED LIVE LOAD = HL93 OR ALTERNATE LOADING.

DESIGN FILL MAX. = 3.87, MIN. = 2.74

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

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

CONCRETE IN STAGE I CULVERT TO BE POURED IN THE FOLLOWING ORDER:
1. PHASE 1 WING FOOTING AND FLOOR SLAB INCLUDING 4 INCHES OF ALL PHASE 1 VERTICAL WALLS.
2. THE REMAINING PORTIONS OF PHASE 1 WALLS AND PHASE 1 WING FULL HEIGHT.
3. PHASE 2 WING FOOTING AND FLOOR SLAB INCLUDING 4 INCHES OF PHASE 2 VERTICAL WALL
4. THE REMAINING PORTIONS OF PHASE 2 WALL AND PHASE 2 WING FULL HEIGHT.
5. ROOF SLAB AND HEADWALLS

CONCRETE IN STAGE II CULVERT TO BE POURED IN THE FOLLOWING ORDER:
1. PHASE 3 WING FOOTING AND FLOOR SLAB INCLUDING 4'' OF PHASE 3 VERTICAL WALLS.
2. THE REMAINING PORTIONS PHASE 3 WALLS AND PHASE 3 WING FULL HEIGHT.
3. PHASE 4 WING FOOTING AND FLOOR SLAB INCLUDING 4'' OF PHASE 4 VERTICAL WALL.
4. THE REMAINING PORTIONS OF PHASE 4 WALL AND PHASE 4 WING FULL HEIGHT.
5. ROOF SLAB AND HEADWALL.

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 SHEET.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACES OF THE EXTERIOR 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.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

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 EXISTING EARWALL OF THE BRIDGE SHALL BE REMOVED AS NECESSARY TO CONSTRUCT STAGE I CULVERT.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 12+81.60 -L-."

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE DESCRIBED BELOW AND LOCATED UP STREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED. 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.
EXISTING SUPERSTRUCTURE:
1 SPAN @ 27'-8'',
DOUBLE LAYERS OF TIMBER FLOORS
8 LINES OF 12'' I-BEAMS @ 2'-7'' CTS.
CLEAR ROADWAY WIDTH OF 19.17 FT.
EXISTING SUBSTRUCTURE:
RUBBLE MASONRY ABUTMENTS WIDENED WITH YOUNT MASONRY.
HELPER TIMBER BENT, POST AND SILL.

TRAFFIC ON SR 1102 SHALL BE MAINTAINED. IN ORDER TO MAINTAIN TRAFFIC THE CULVERT SHALL BE CONSTRUCTED IN SECTIONS AS SHOWN ON PLANS AND DIRECTED BY THE ENGINEER.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

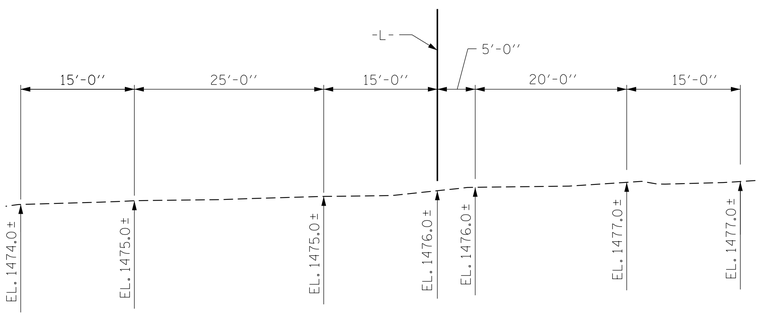
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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.

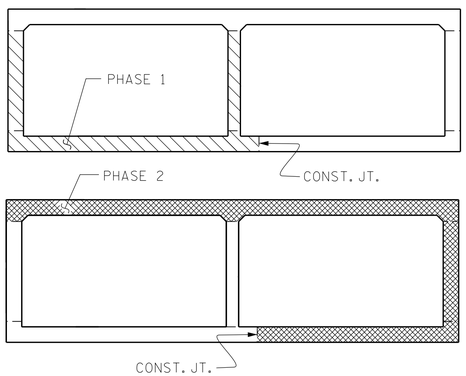
FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

FOR CHANNEL SUBSTRATE MATERIAL, SEE SPECIAL PROVISIONS.

F.A. PROJECT No. : BRZ-1102(5)



PROFILE ALONG ℄ CULVERT



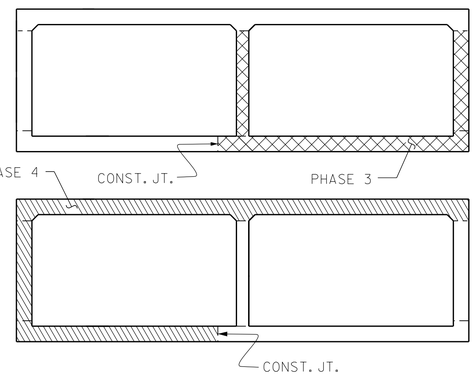
CONSTRUCTION PHASING

PHASE 1 CONSTRUCTION

PHASE 2 CONSTRUCTION

STAGE I

LOOKING UPSTREAM



CONSTRUCTION PHASING

PHASE 3 CONSTRUCTION

PHASE 4 CONSTRUCTION

STAGE II

LOOKING UPSTREAM

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
Douglas R. Calhoun
3/14/2016

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
Wael Arafat
3/14/2016

PROJECT NO. B-4792

POLK COUNTY

STATION: 12+81.60 -L-

SHEET 1 OF 13 REPLACES BRIDGE #4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 105° SKEW

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

DRAWN BY : V.X. NGUYEN DATE : 7-13-15
CHECKED BY : H.T. BARBOUR DATE : 8-3-15
DESIGN ENGINEER OF RECORD: A. M. LEE DATE : 9-15

14-MAR-2016 08:25
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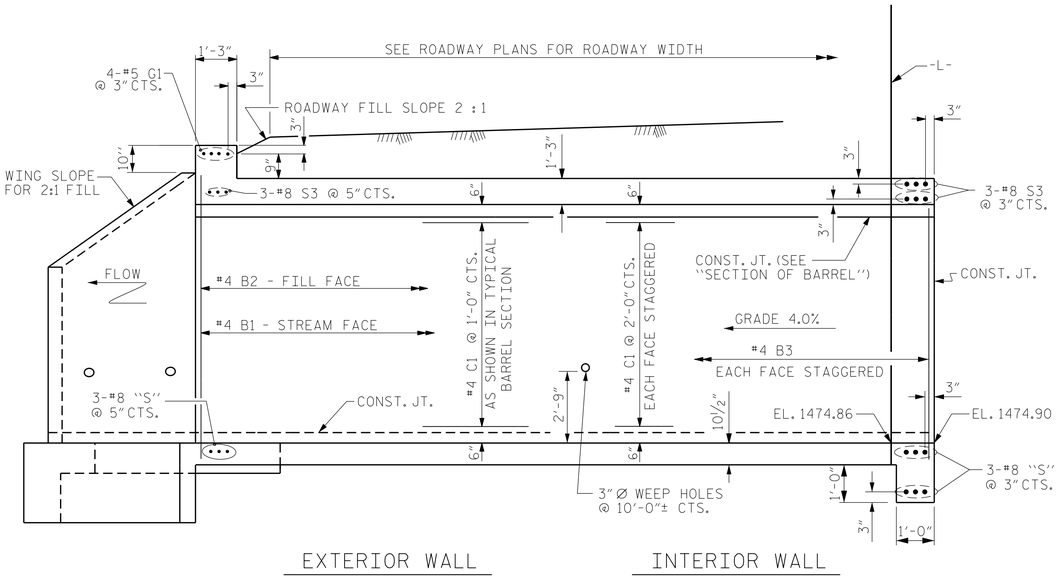
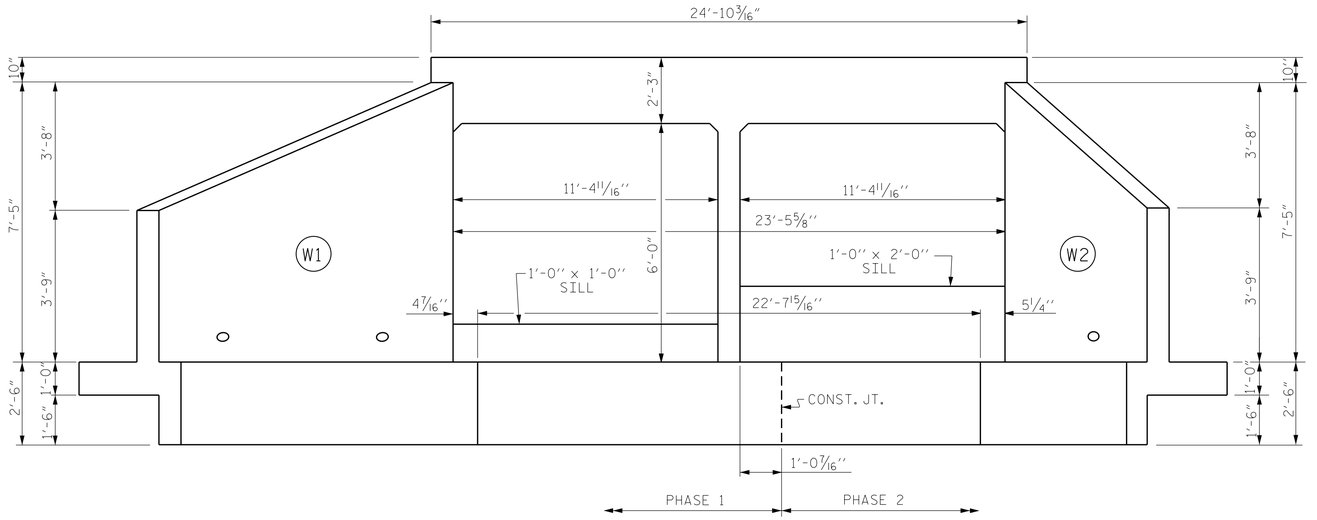
warafat AT SD-290338

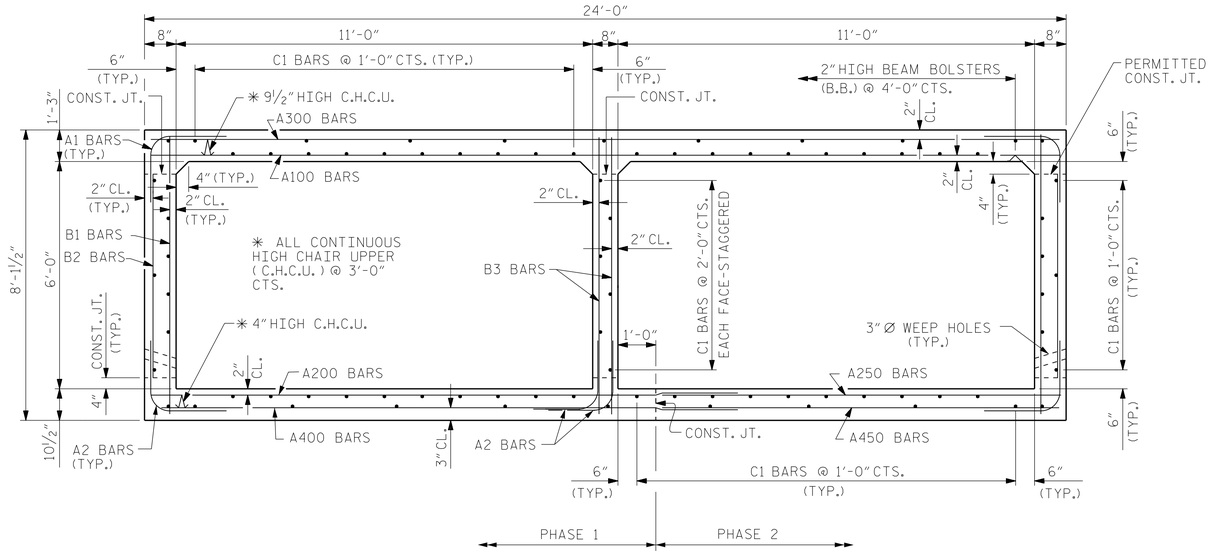


CULVERT SECTION NORMAL TO ROADWAY



OUTLET END ELEVATION NORMAL TO SKEW

LOOKING UPSTREAM



RIGHT ANGLE SECTION OF BARREL

THERE ARE 82 "C" BARS IN SECTION OF BARREL.
LOOKING UPSTREAM

PROJECT NO. B-4792

POLK COUNTY

STATION: 12+81.60 -L-

SHEET 2 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 105° SKEW STAGE I

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

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

Docusigned by: Wael Arafat 4139C12A32AB406...
3/14/2016

DRAWN BY : V.X. NGUYEN DATE : 7-7-15
CHECKED BY : H.T. BARBOUR DATE : 8-3-15
DESIGN ENGINEER OF RECORD: A. M. LEE DATE : 9-15

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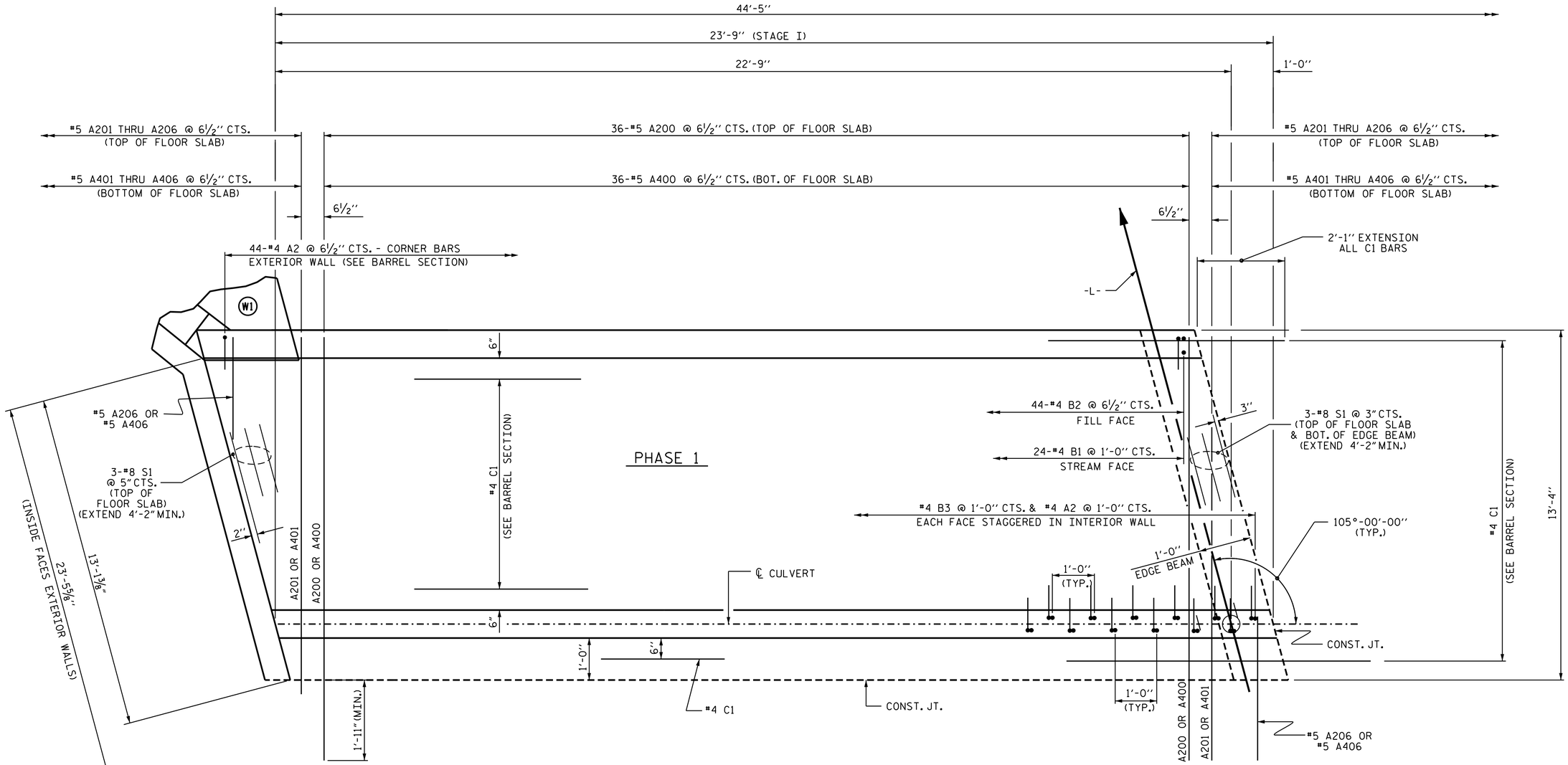
warafat AT SD-290338



FIELD BEND C1 BARS AS NECESSARY

PLAN OF FLOOR SLAB

STAGE I - PHASE 1

PROJECT NO. B-4792

POLK COUNTY

STATION: 12+81.60 -L-

SHEET 3 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 105°-00'-00" SKEW
STAGE I - PHASE 1

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

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

Docusigned by: Wael Arafat 4130C12A32AB406...
10/29/2015

DRAWN BY : V.X. NGUYEN DATE : 7-9-15
CHECKED BY : H.T. BARBOUR DATE : 8-3-15
DESIGN ENGINEER OF RECORD: A. M. LEE DATE : 9-15

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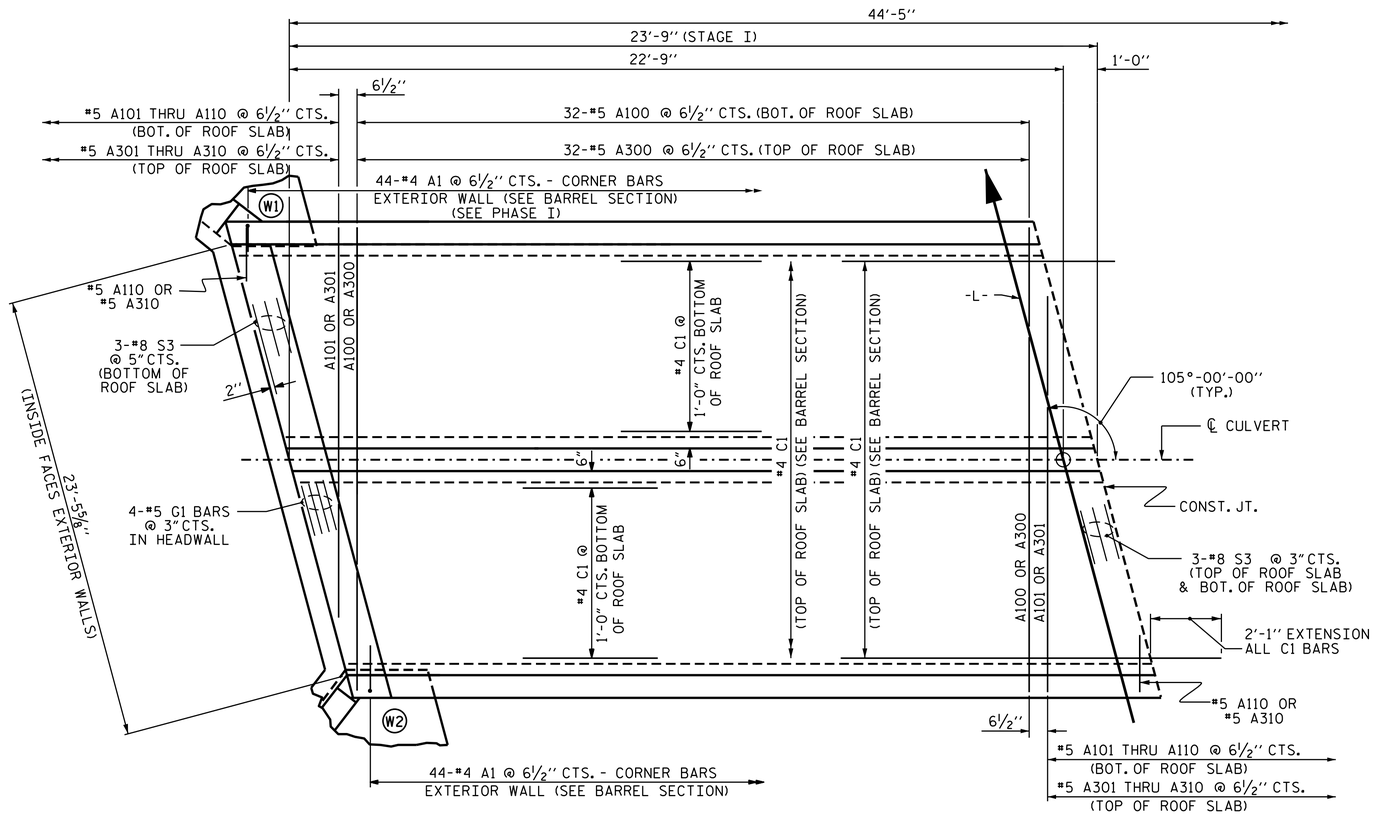
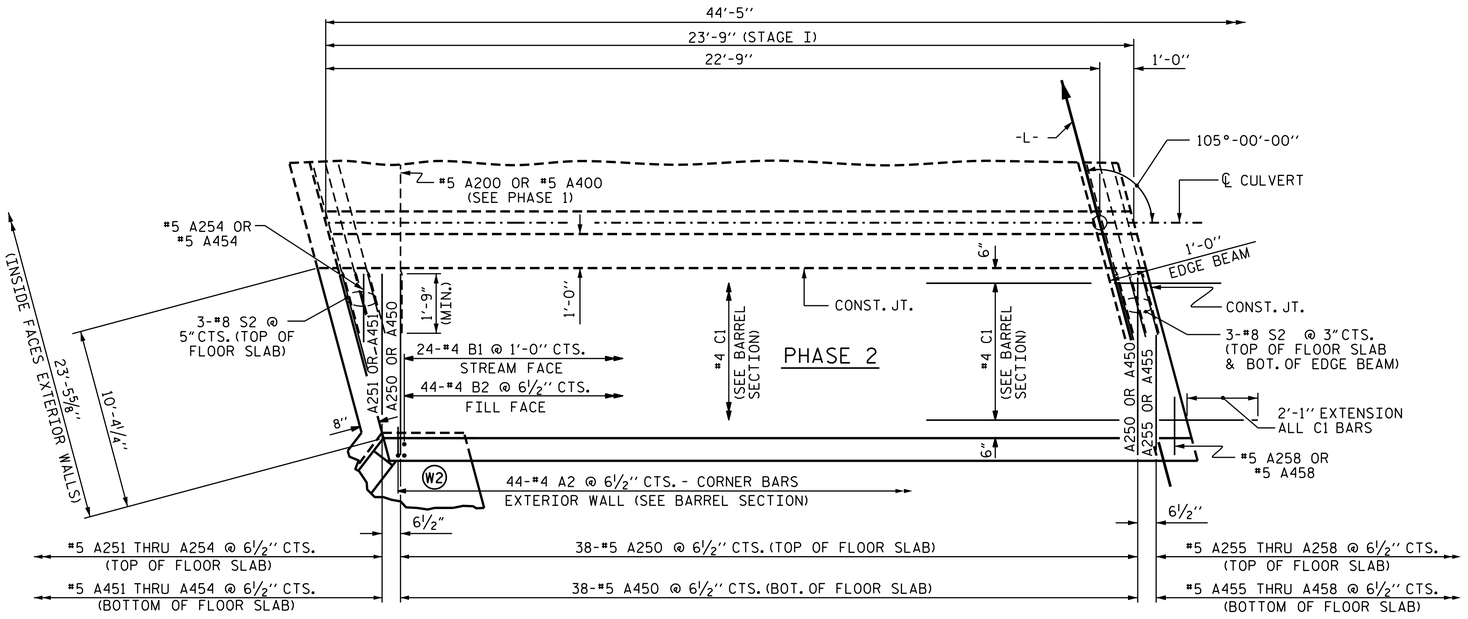
warafat



FIELD BEND C1 BARS AS NECESSARY

PLAN OF ROOF SLAB

STAGE I - PHASE 2



PLAN OF FLOOR SLAB

STAGE I - PHASE 2

PROJECT NO. B-4792

POLK COUNTY

STATION: 12+81.60 -L-

SHEET 4 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 105°-00'-00" SKEW

STAGE I - PHASE 2

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 10/29/2015

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

DRAWN BY : V.X. NGUYEN DATE : 7-10-15
CHECKED BY : H.T. BARBOUR DATE : 8-3-15
DESIGN ENGINEER OF RECORD: A.M. LEE DATE : 9-15

28-OCT-2015 16:15
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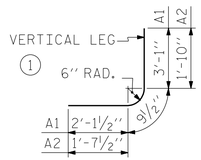
SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
A200 & A400	5	1'-9''
B1 & B3	4	1'-5''
C1	4	1'-11''
S1, S2 & S3	8	4'-0''

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT

STAGE I QUANTITIES

CLASS A CONCRETE
BARREL @ 2.342 CY/FT 55.6 CY
WINGS, ETC. 10.6 CY
SILLS 2.4 CY
TOTAL 68.6 CY

REINFORCING STEEL
BARREL & SILLS 8752 LBS.
WINGS, ETC. 466 LBS.
TOTAL 9218 LBS.

CULVERT EXCAVATION --------- LUMP SUM
FOUNDATION COND. MAT'L -------- 47 TONS

BAR SCHEDULE

STAGE I - PHASE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	44	4	1	6'-0''	176
A2	91	4	1	4'-3''	258
A200	36	5	STR	15'-1''	566
A201	2	5	STR	13'-9''	29
A202	2	5	STR	11'-9''	25
A203	2	5	STR	9'-9''	20
A204	2	5	STR	7'-8''	16
A205	2	5	STR	5'-8''	12
A206	2	5	STR	3'-8''	8
A400	36	5	STR	15'-1''	566
A401	2	5	STR	13'-9''	29
A402	2	5	STR	11'-9''	25
A403	2	5	STR	9'-9''	20
A404	2	5	STR	7'-8''	16
A405	2	5	STR	5'-8''	12
A406	2	5	STR	3'-8''	8
B1	24	4	STR	7'-7''	122
B2	44	4	STR	5'-4''	157
B3	47	4	STR	7'-7''	238
C1	30	4	STR	25'-8''	514
D1	6	6	STR	1'-5''	13
S1	9	8	STR	17'-10''	429

REINFORCING STEEL = 3259 LBS.

STAGE I - PHASE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	44	4	1	6'-0''	176
A2	44	4	1	4'-3''	125
A100	32	5	STR	23'-8''	790
A101	2	5	STR	22'-1''	46
A102	2	5	STR	20'-1''	42
A103	2	5	STR	18'-1''	38
A104	2	5	STR	16'-1''	34
A105	2	5	STR	14'-0''	29
A106	2	5	STR	12'-0''	25
A107	2	5	STR	10'-0''	21
A108	2	5	STR	8'-0''	17
A109	2	5	STR	5'-11''	12
A110	2	5	STR	3'-11''	8
A250	38	5	STR	10'-4''	410
A251	1	5	STR	8'-6''	9
A252	1	5	STR	6'-6''	7
A253	1	5	STR	4'-6''	5
A254	1	5	STR	2'-6''	3
A255	1	5	STR	10'-3''	11
A256	1	5	STR	8'-2''	9
A257	1	5	STR	6'-2''	6
A258	1	5	STR	4'-2''	4
A300	32	5	STR	23'-8''	790
A301	2	5	STR	22'-1''	46
A302	2	5	STR	20'-1''	42
A303	2	5	STR	18'-1''	38
A304	2	5	STR	16'-1''	34
A305	2	5	STR	14'-0''	29
A306	2	5	STR	12'-0''	25
A307	2	5	STR	10'-0''	21
A308	2	5	STR	8'-0''	17
A309	2	5	STR	5'-11''	12
A310	2	5	STR	3'-11''	8

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A450	38	5	STR	10'-4''	410
A451	1	5	STR	8'-6''	9
A452	1	5	STR	6'-6''	7
A453	1	5	STR	4'-6''	5
A454	1	5	STR	2'-6''	3
A455	1	5	STR	10'-3''	11
A456	1	5	STR	8'-2''	9
A457	1	5	STR	6'-2''	6
A458	1	5	STR	4'-2''	4
B1	24	4	STR	7'-7''	122
B2	44	4	STR	5'-4''	157
C1	52	4	STR	25'-8''	892
D2	6	6	STR	2'-5''	22
G1	4	5	STR	24'-6''	102
S2	9	8	STR	10'-8''	256
S3	9	8	STR	24'-6''	589

REINFORCING STEEL = 5493 LBS.

PROJECT NO. B-4792
POLK COUNTY
STATION: 12+81.60 -L-

SHEET 5 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 105°-00'-00" SKEW
STAGE I - PHASES 1 & 2

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 4139C12A32AB406...
3/14/2016

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

DRAWN BY : V.X. NGUYEN DATE : 7-10-15
CHECKED BY : H.T. BARBOUR DATE : 8-3-15
DESIGN ENGINEER OF RECORD: A. M. LEE DATE : 9-15

14-MAR-2016 08:32
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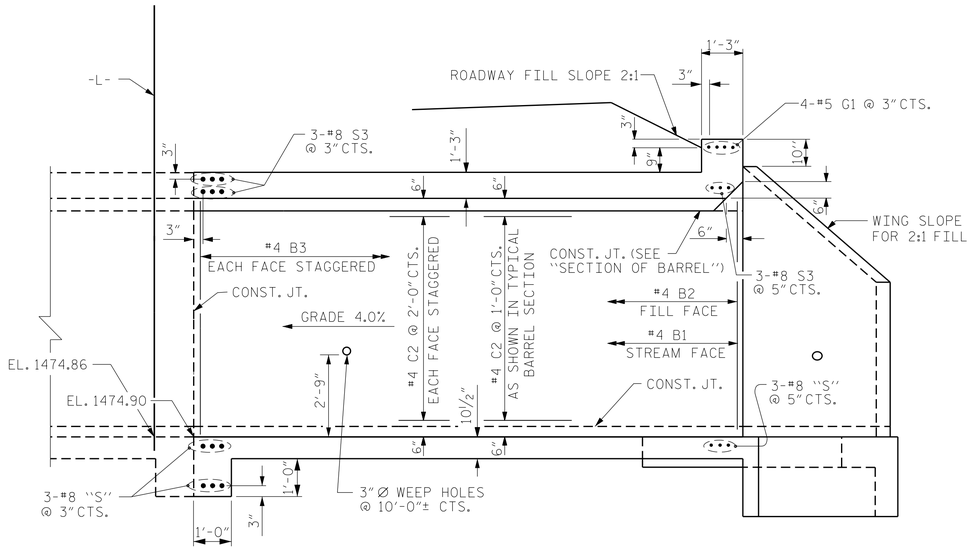
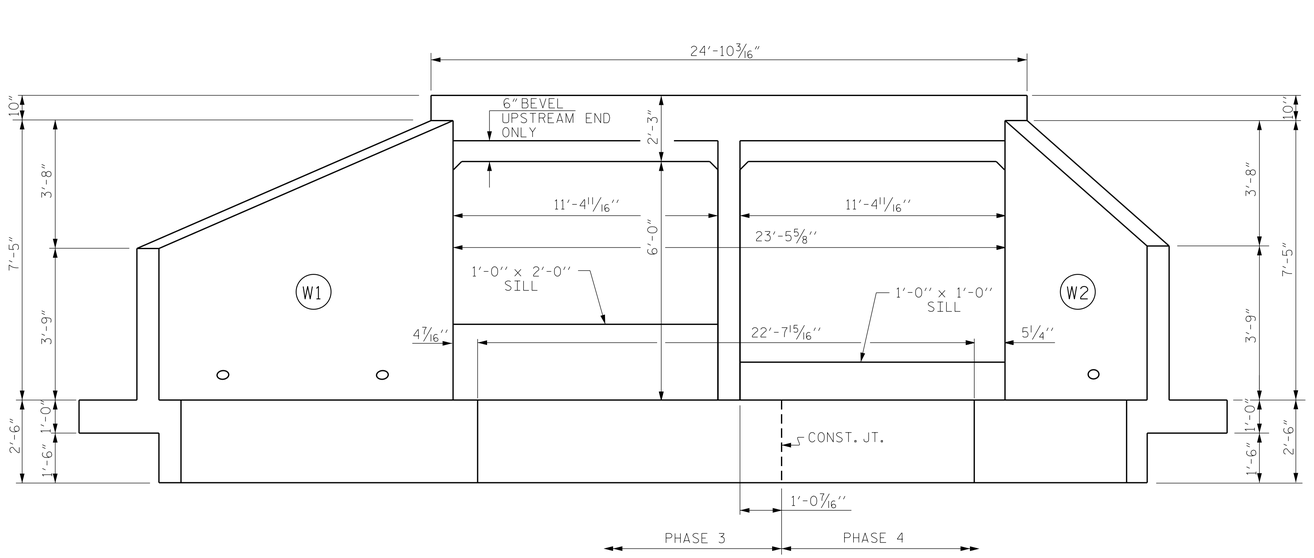
warafat AT SD-290338

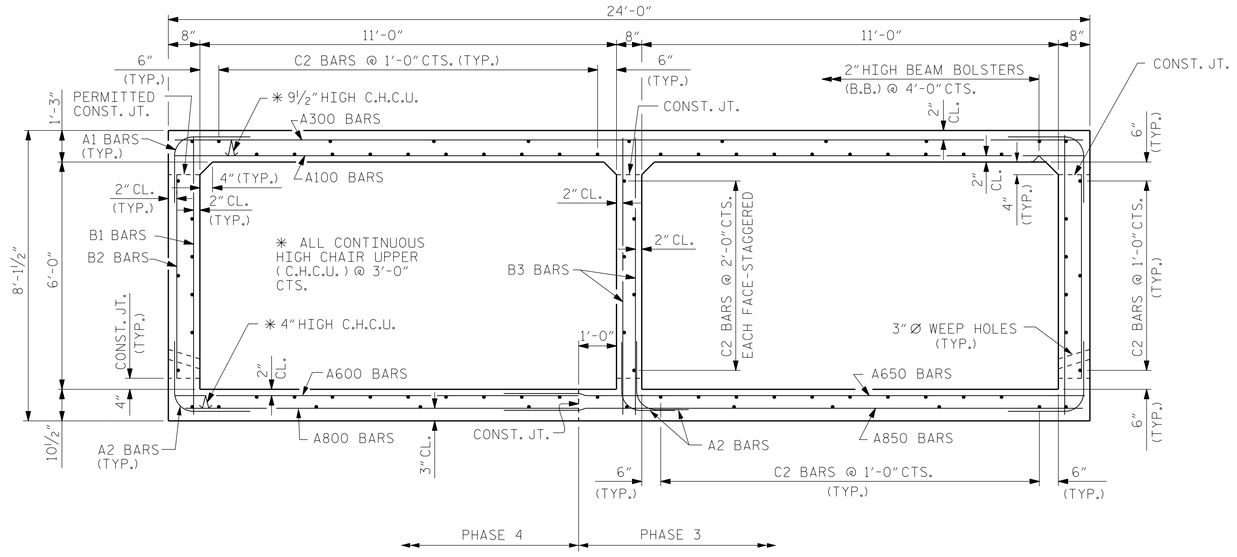


CULVERT SECTION NORMAL TO ROADWAY



INLET END ELEVATION NORMAL TO SKEW

LOOKING DOWNSTREAM



RIGHT ANGLE SECTION OF BARREL

THERE ARE 82 "C" BARS IN SECTION OF BARREL.
LOOKING UPSTREAM

PROJECT NO. B-4792

POLK COUNTY

STATION: 12+81.60 -L-

SHEET 6 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 105° SKEW STAGE II

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

Docusigned by: Wael Arafat 4139C12A32AB406...
3/14/2016

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
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CHECKED BY : H.T. BARBOUR DATE : 8-3-15
DESIGN ENGINEER OF RECORD: A. M. LEE DATE : 9-15

14-MAR-2016 08:34
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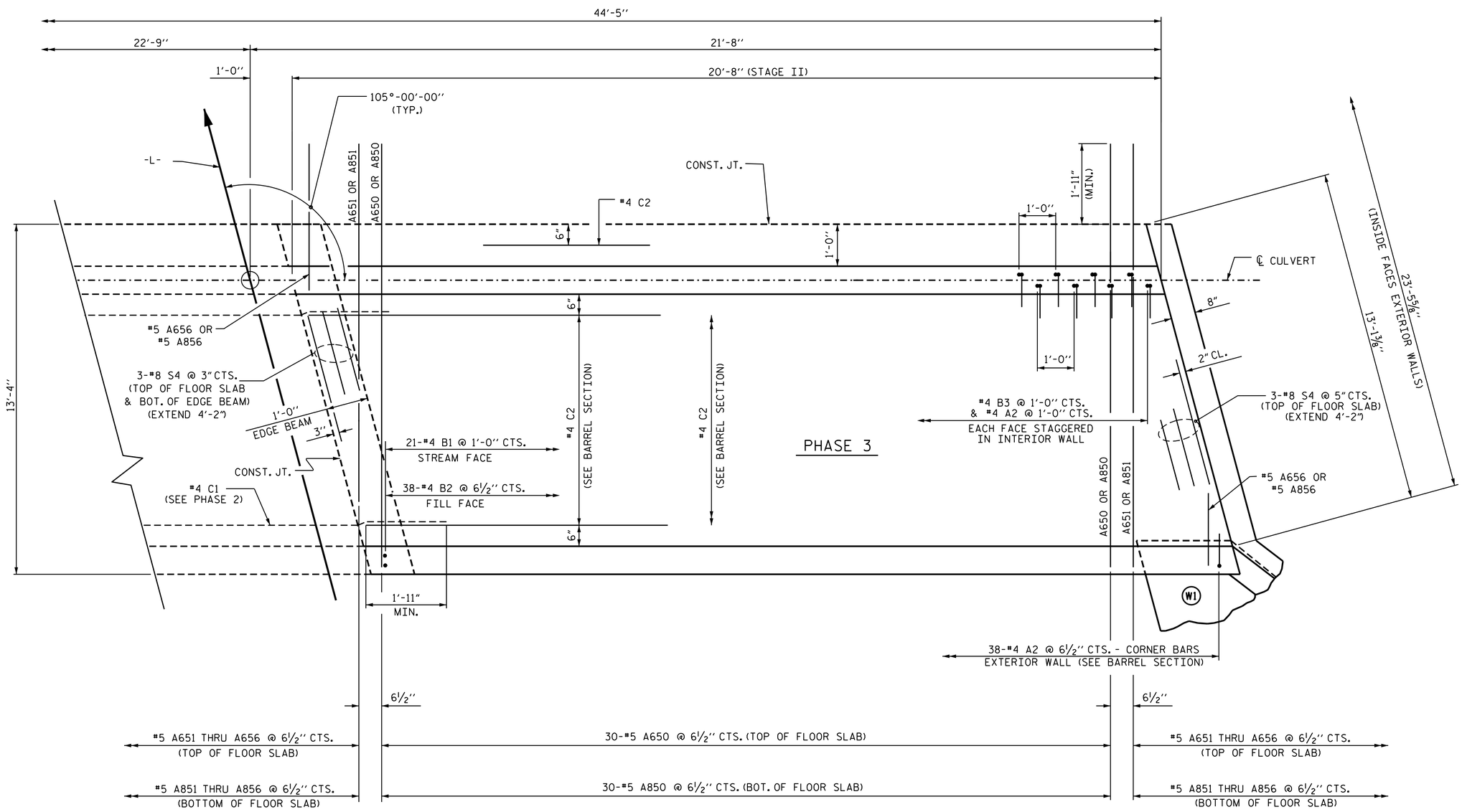
warafat AT SD-290338



PLAN OF FLOOR SLAB

STAGE II - PHASE 3

PROJECT NO. B-4792

POLK COUNTY

STATION: 12+81.60 -L-

SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT
105°-00'-00" SKEW
STAGE II - PHASE 3

REVISIONS						SHEET NO.
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2			4			13

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 10/29/2015

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DESIGN ENGINEER OF RECORD: A. M. LEE DATE : 9-15

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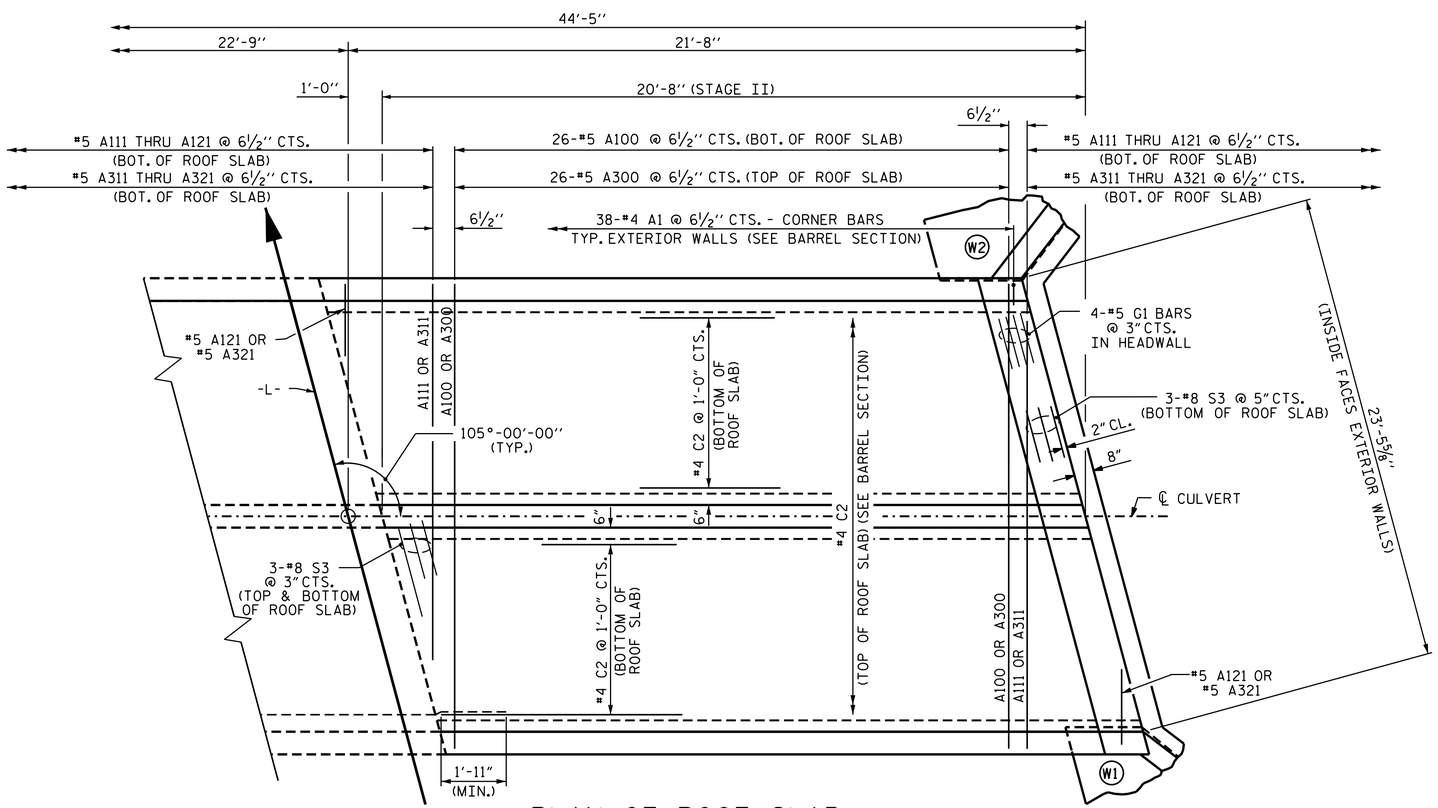
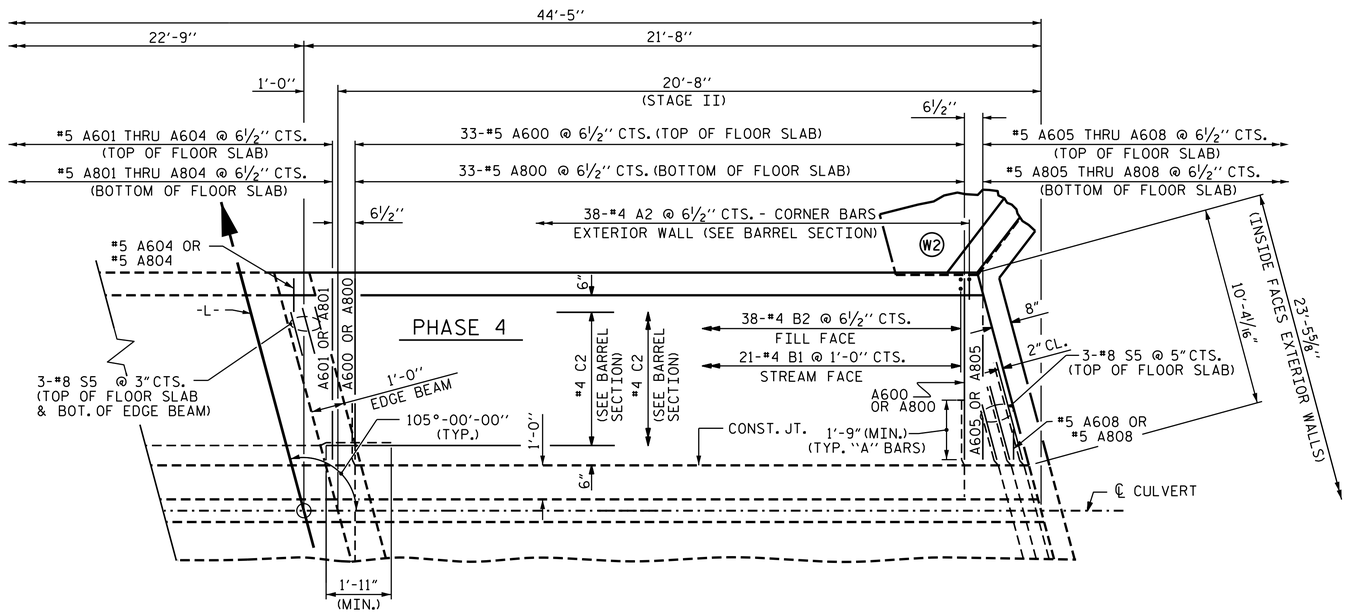
warafat



PLAN OF ROOF SLAB

STAGE II - PHASE 4



PLAN OF FLOOR SLAB

STAGE II - PHASE 4

PROJECT NO. B-4792

POLK COUNTY

STATION: 12+81.60 -L-

SHEET 8 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 105°-00'-00" SKEW

STAGE II - PHASE 4

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NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

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DESIGN ENGINEER OF RECORD:	A. M. LEE	DATE :	9-15

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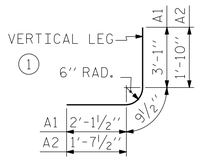
SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
A650 & A850	5	1'-9''
B1 & B3	4	1'-5''
C2	4	1'-11''
S3, S4 & S5	8	4'-0''

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT

STAGE II QUANTITIES

CLASS A CONCRETE

BARREL @ 2.342 CY/FT ____ 48.4 CY

WINGS, ETC. ____ 10.6 CY

SILLS ____ 1.2 CY

TOTAL ____ 60.2 CY

REINFORCING STEEL

BARREL & SILLS ____ 7662 LBS.

WINGS, ETC. ____ 466 LBS.

TOTAL ____ 8128 LBS.

CULVERT EXCAVATION ---------- LUMP SUM

FOUNDATION COND. MAT'L -------- 41 TONS

BAR SCHEDULE

STAGE II - PHASE 3

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	38	4	1	6'-0''	152
A2	79	4	1	4'-3''	224
A650	30	5	STR	15'-1''	472
A651	2	5	STR	13'-11''	29
A652	2	5	STR	12'-1''	25
A653	2	5	STR	10'-1"	21
A654	2	5	STR	8'-1"	17
A655	2	5	STR	6'-0"	13
A656	2	5	STR	4'-0"	8
A850	30	5	STR	15'-1''	472
A851	2	5	STR	13'-11''	29
A852	2	5	STR	12'-1''	25
A853	2	5	STR	10'-1"	21
A854	2	5	STR	8'-1"	17
A855	2	5	STR	6'-0"	13
A856	2	5	STR	4'-0"	8
B1	21	4	STR	7'-7''	106
B2	38	4	STR	5'-4''	135
B3	41	4	STR	7'-7''	208
C2	30	4	STR	20'-4''	407
D2	3	6	STR	2'-5''	11
S4	9	8	STR	17'-10''	429

REINFORCING STEEL = 2842 LBS.

STAGE II - PHASE 4

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	38	4	1	6'-0''	152
A2	38	4	1	4'-3''	108
A100	26	5	STR	23'-8''	642
A111	2	5	STR	22'-5''	47
A112	2	5	STR	20'-5''	43
A113	2	5	STR	18'-5''	38
A114	2	5	STR	16'-4''	34
A115	2	5	STR	14'-4''	30
A116	2	5	STR	12'-4''	26
A117	2	5	STR	10'-4''	22
A118	2	5	STR	8'-3''	17
A119	2	5	STR	6'-3''	13
A120	2	5	STR	4'-3''	9
A121	2	5	STR	2'-2''	5
A300	26	5	STR	23'-8''	642
A311	2	5	STR	22'-5''	47
A312	2	5	STR	20'-5''	43
A313	2	5	STR	18'-5''	38
A314	2	5	STR	16'-4''	34
A315	2	5	STR	14'-4''	30
A316	2	5	STR	12'-4''	26
A317	2	5	STR	10'-4''	22
A318	2	5	STR	8'-3''	17
A319	2	5	STR	6'-3''	13
A320	2	5	STR	4'-3''	9
A321	2	5	STR	2'-2''	5
A600	33	5	STR	10'-4''	356
A601	1	5	STR	8'-6''	9
A602	1	5	STR	6'-6''	7
A603	1	5	STR	4'-5''	5
A604	1	5	STR	2'-5''	3
A605	1	5	STR	8'-10''	9
A606	1	5	STR	6'-10"	7
A607	1	5	STR	4'-10"	5
A608	1	5	STR	2'-10"	3

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A800	33	5	STR	10'-4''	356
A801	1	5	STR	8'-6''	9
A802	1	5	STR	6'-6''	7
A803	1	5	STR	4'-5''	5
A804	1	5	STR	2'-5''	3
A805	1	5	STR	8'-10''	9
A806	1	5	STR	6'-10"	7
A807	1	5	STR	4'-10"	5
A808	1	5	STR	2'-10"	3
B1	21	4	STR	7'-7''	106
B2	38	4	STR	5'-4''	135
C2	52	4	STR	20'-4''	706
D1	3	6	STR	1'-5''	6
G1	4	5	STR	24'-6''	102
S3	9	8	STR	24'-6''	589
S5	9	8	STR	10'-8''	256

REINFORCING STEEL = 4820 LBS.

PROJECT NO. B-4792

POLK COUNTY

STATION: 12+81.60 -L-

SHEET 9 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 105°-00'-00" SKEW

STAGE II - PHASES 3 & 4

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 413BC12A32AB406...
3/14/2016

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NO.	BY:	DATE:	NO.	BY:	DATE:	C-9
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DESIGN ENGINEER OF RECORD: A.M. LEE DATE : 9-15

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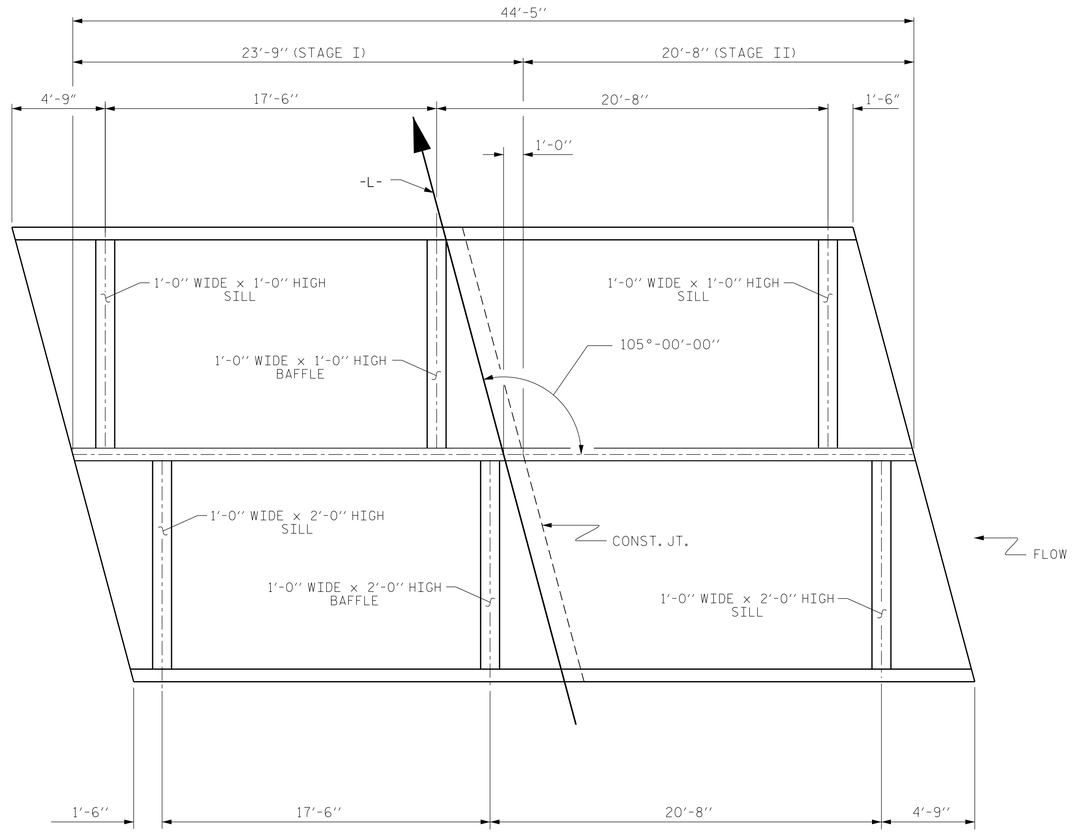
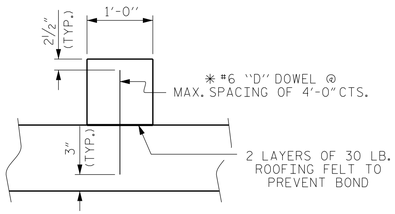
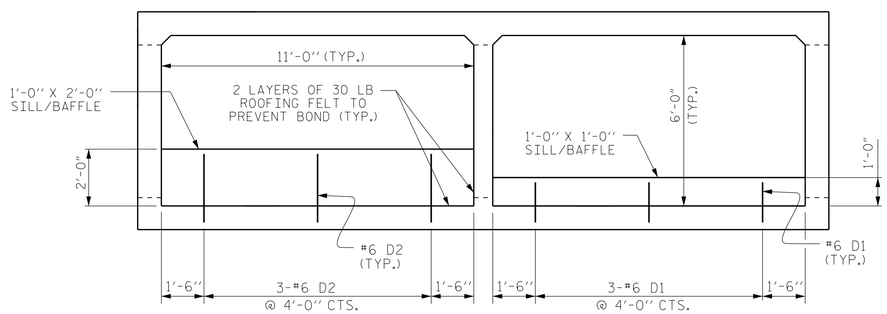


FLOOR SILL/BAFFLE LAYOUT



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

SECTION THRU SILL/BAFFLE



ELEVATION
(LOOKING DOWNSTREAM)

NOTES

MATERIAL EXCAVATED FROM THE EXISTING BED SHALL BE STOCKPILED FOR USE IN THE PROPOSED CULVERT AS SHOWN IN THE FLOOR SILL LAYOUT. BED MATERIAL SHALL BE SUPPLEMENTED WITH CHANNEL SUBSTRATE MATERIAL AS NECESSARY. BED MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER. FOR CHANNEL SUBSTRATE MATERIAL, SEE SPECIAL PROVISIONS.

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

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

THE STOCKPILED MATERIAL SHALL BE PLACED IN THE CULVERT BARREL TO A DEPTH OF 2'-0" IN THE HIGH FLOW BARREL AND 1'-0" IN THE LOW FLOW BARREL.

CULVERT SILL/BAFFLE DETAILS

DRAWN BY : V.X. NGUYEN DATE : 7-13-15
CHECKED BY : H.T. BARBOUR DATE : 8-3-15
DESIGN ENGINEER OF RECORD: A. M. LEE DATE : 9-15

14-MAR-2016 08:38
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warafat AT SD-290338

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
Docusigned by: Wael Arafat 4139C12A32AB406...
3/14/2016

PROJECT NO. B-4792
POLK COUNTY
STATION: 12+81.60 -L-

SHEET 10 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 105°-00'-00" SKEW

REVISIONS						SHEET NO.
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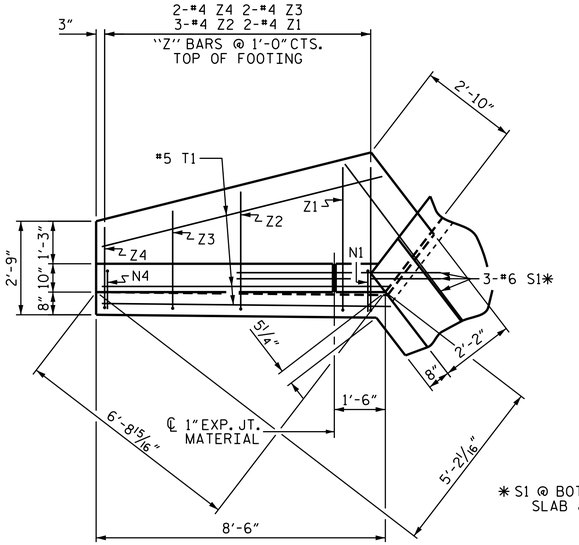
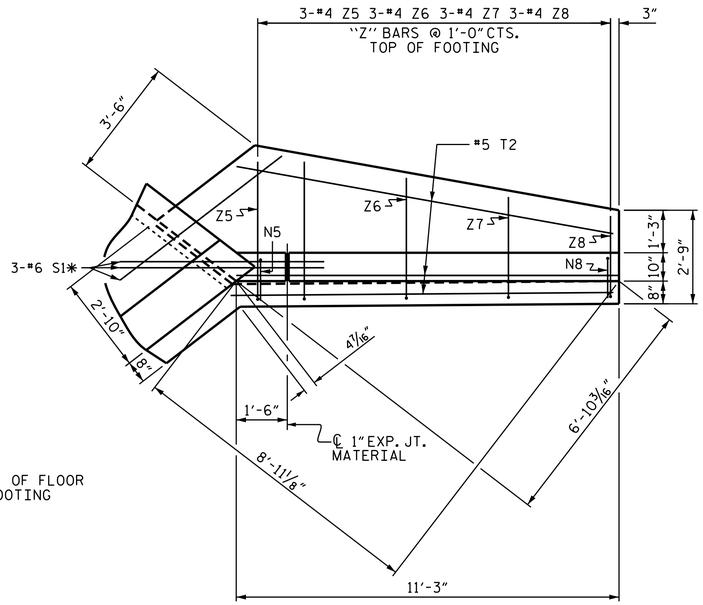
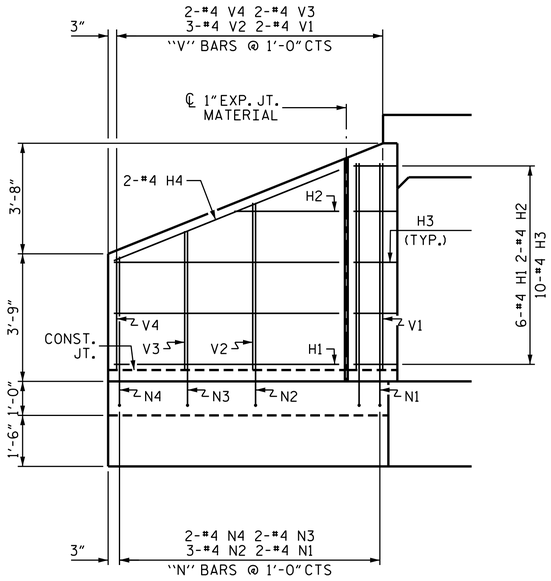


PLAN W2

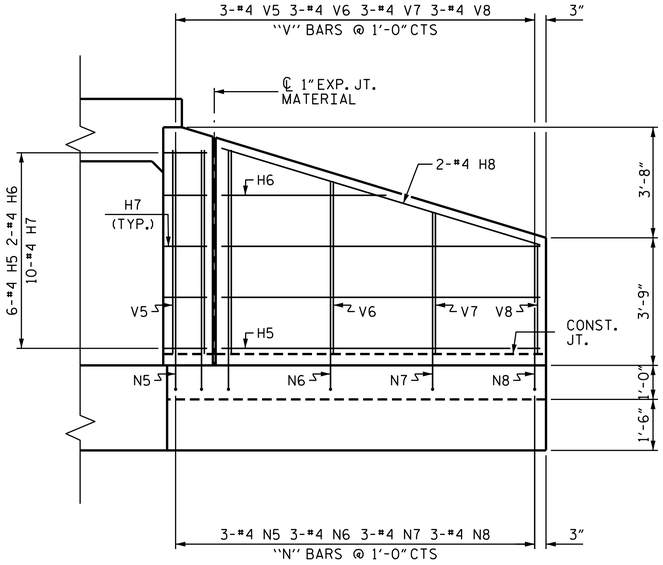


PLAN W1

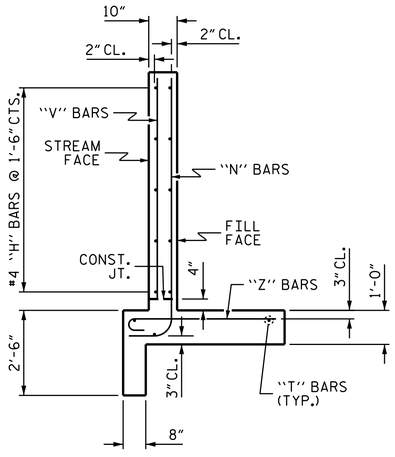
* S1 @ BOTTOM OF FLOOR SLAB & FOOTING



ELEVATION W2



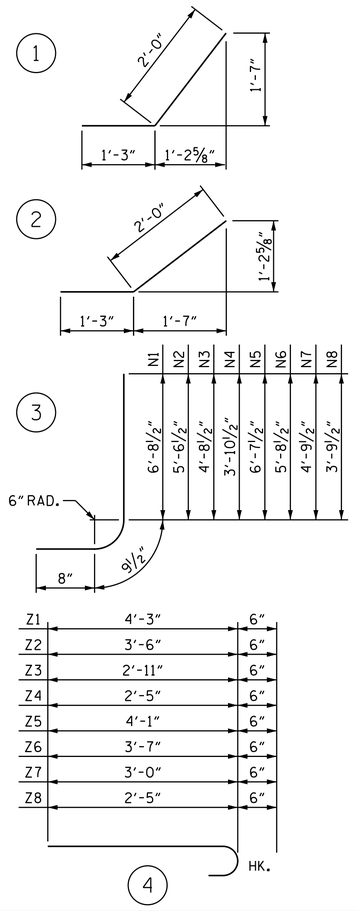
ELEVATION W1



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



Z1	4'-3" + 6"
Z2	3'-6" + 6"
Z3	2'-11" + 6"
Z4	2'-5" + 6"
Z5	4'-1" + 6"
Z6	3'-7" + 6"
Z7	3'-0" + 6"
Z8	2'-5" + 6"

4 — HK.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	6'-7"	26
H2	2	#4	STR	3'-1"	4
H3	10	#4	1	3'-3"	22
H4	2	#4	STR	7'-1"	9
H5	6	#4	STR	9'-4"	37
H6	2	#4	STR	4'-10"	6
H7	10	#4	2	3'-3"	22
H8	2	#4	STR	9'-9"	13
N1	2	#4	3	8'-2"	11
N2	3	#4	3	7'-1"	14
N3	2	#4	3	6'-2"	8
N4	2	#4	3	5'-4"	7
N5	3	#4	3	8'-1"	16
N6	3	#4	3	7'-2"	14
N7	3	#4	3	6'-3"	13
N8	3	#4	3	5'-3"	11
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	8'-6"	27
T2	3	#5	STR	11'-3"	35
V1	2	#4	STR	6'-1"	8
V2	3	#4	STR	4'-11"	10
V3	2	#4	STR	4'-1"	5
V4	2	#4	STR	3'-4"	4
V5	3	#4	STR	6'-0"	12
V6	3	#4	STR	5'-1"	10
V7	3	#4	STR	4'-2"	8
V8	3	#4	STR	3'-3"	7
Z1	2	#4	4	4'-9"	6
Z2	3	#4	4	4'-0"	8
Z3	2	#4	4	3'-5"	5
Z4	2	#4	4	2'-11"	4
Z5	3	#4	4	4'-7"	9
Z6	3	#4	4	4'-1"	8
Z7	3	#4	4	3'-6"	7
Z8	3	#4	4	2'-11"	6

REINFORCING STEEL FOR 2 WINGS — 466 LBS

CLASS A CONCRETE

2 WINGS	7.1	CY
1 HEADWALL	1.2	CY
1 END CURTAIN WALL	1.4	CY
1 EDGE BEAM	.9	CY
TOTAL	10.6	CY

PROJECT NO. B-4792

POLK COUNTY

STATION: 12+81.60 -L-

SHEET 11 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD WINGS FOR CONCRETE BOX CULVERT

H = 6'-0" SLOPE = 2:1

105° SKEW

STAGE I OR II

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

Docusigned by: Wael Arafat 4139C12A32AB406... 10/29/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-11
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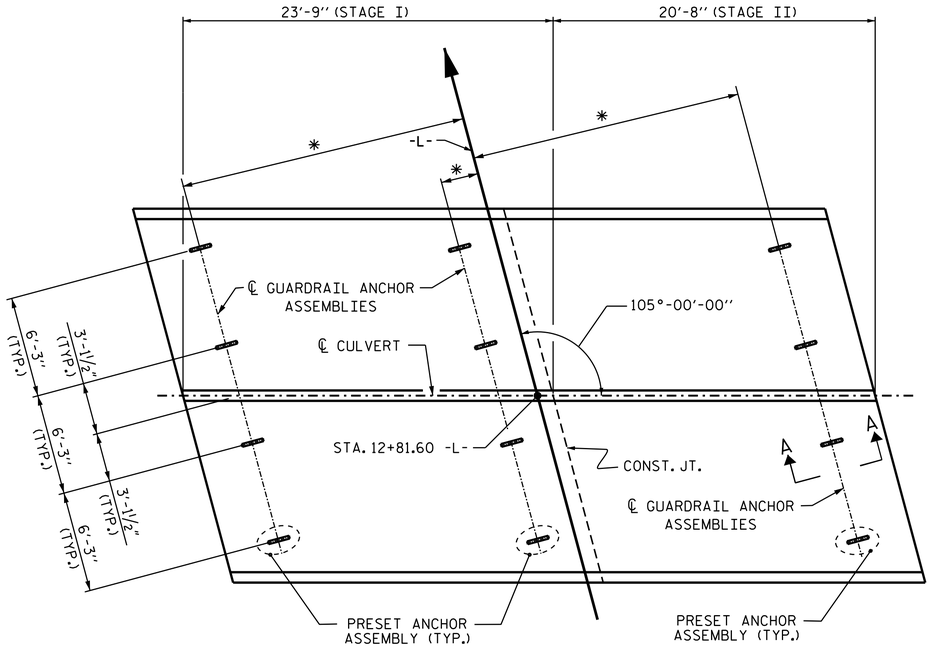
2			4			13

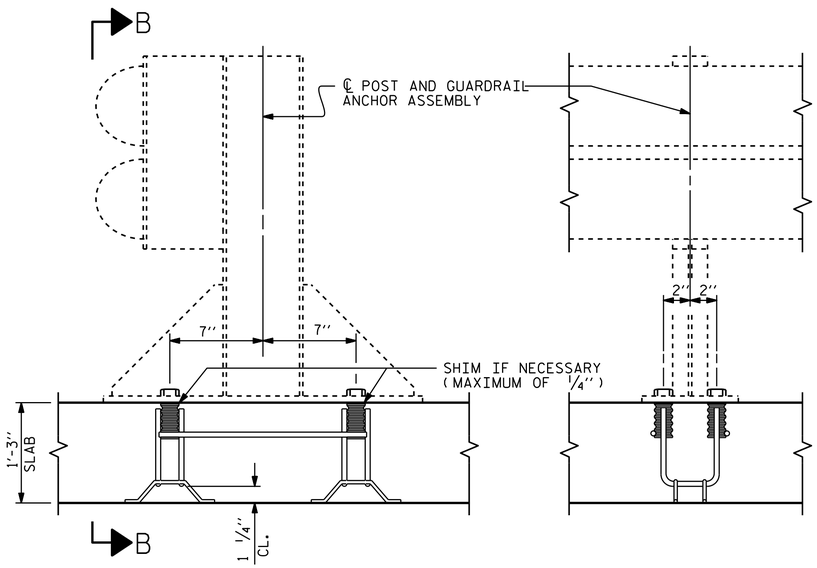
STD. NO. CW7506

ASSEMBLED BY :	V.X. NGUYEN	DATE :	7-13-15
CHECKED BY :	H.T. BARBOUR	DATE :	8-3-15
DRAWN BY :	CCJ		12/99
CHECKED BY :	RWW		03/00



PLAN

SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.
* THESE DIMENSION TO BE FURNISHED BY THE ENGINEER



SECTION A-A

SECTION B-B

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½".

B. 4 - 1'' Ø X 2 ¼'' BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1'' Ø X 2¼'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

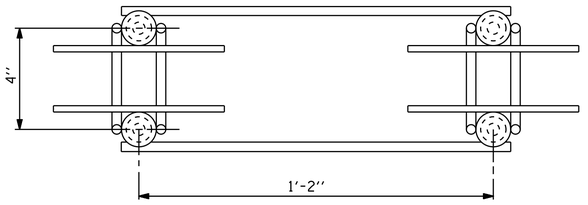
AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

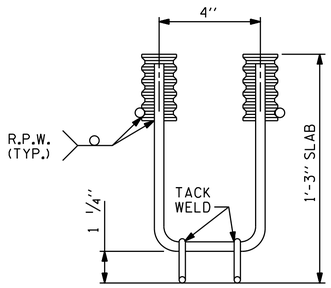
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

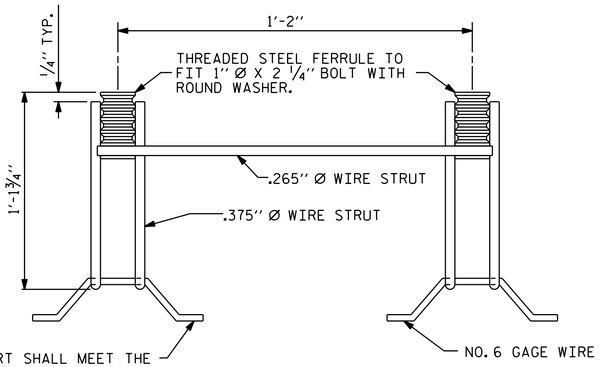
TEMPORARY GUARDRAIL IS REQUIRED FOR TRAFFIC ON STAGE I CULVERT. GUARDRAIL ANCHOR ASSEMBLIES SHALL BE USED FOR TEMPORARY ANCHORED GUARDRAIL. AFTER THE REMOVAL OF THE TEMPORARY GUARDRAIL, THE FERRULES SHALL BE FILLED WITH GROUT. ADHESIVELY ANCHORED ANCHOR BOLTS SHALL NOT BE USED FOR THE TEMPORARY GUARDRAIL.



PLAN



ELEVATION



SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

ASSEMBLED BY : V.X. NGUYEN	DATE : 7-13-15		
CHECKED BY : H.T. BARBOUR	DATE : 8-3-15		
DRAWN BY : FCJ 6/88	REV. 5/7/03	RWW/JTE	
CHECKED BY : ARB 6/88	REV. 5/1/06R	KMM/GM	
	REV. 10/1/11	MAA/GM	

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NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 10/29/2015

PROJECT NO. B-4792
POLK COUNTY
STATION: 12+81.60 -L-

SHEET 12 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

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

STD. NO. GRA1

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 × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS $\gamma_{(LL)}$	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	1.04	--	1.75	1.42	1	TOP SLAB	4.67	1.04	1	TOP SLAB	10.38	
		HL-93 (OPERATING)	N/A		1.34	--	1.35	1.85	1	TOP SLAB	4.67	1.34	1	TOP SLAB	10.38	
		HS-20 (INVENTORY)	36.000	2	1.11	39.92	1.75	1.56	1	TOP SLAB	4.96	1.11	1	BOTTOM SLAB	10.70	
		HS-20 (OPERATING)	36.000		1.44	51.74	1.35	2.02	1	TOP SLAB	4.96	1.44	1	BOTTOM SLAB	10.70	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.35	31.71	1.40	2.85	1	TOP SLAB	4.96	2.35	1	TOP SLAB	10.38	
		SNGARBS2	20.000		2.20	43.92	1.40	2.66	1	TOP SLAB	4.96	2.20	1	TOP SLAB	10.38	
		SNAGRIS2	22.000		2.02	44.47	1.40	2.84	1	TOP SLAB	4.96	2.02	1	BOTTOM SLAB	10.70	
		SNCOTTS3	27.250		1.30	35.34	1.40	1.78	1	TOP SLAB	4.67	1.30	1	TOP SLAB	10.38	
		SNAGGRS4	34.925		1.27	44.53	1.40	1.89	1	BOTTOM SLAB	10.79	1.27	1	BOTTOM SLAB	10.70	
		SNS5A	35.550		1.27	45.32	1.40	1.87	1	BOTTOM SLAB	10.79	1.27	1	BOTTOM SLAB	10.70	
		SNS6A	39.950		1.26	50.23	1.40	1.89	1	BOTTOM SLAB	10.79	1.26	1	BOTTOM SLAB	10.70	
		SNS7B	42.000		1.18	49.41	1.40	1.82	1	BOTTOM SLAB	10.79	1.18	1	BOTTOM SLAB	10.70	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.36	44.89	1.40	2.08	1	BOTTOM SLAB	10.79	1.36	1	BOTTOM SLAB	10.70	
		TNT4A	33.075		1.49	49.20	1.40	2.12	1	TOP SLAB	4.67	1.49	1	BOTTOM SLAB	10.70	
		TNT6A	41.600		1.25	52.13	1.40	2.02	1	BOTTOM SLAB	10.79	1.25	1	BOTTOM SLAB	10.70	
		TNT7A	42.000		1.21	50.72	1.40	1.87	1	BOTTOM SLAB	10.79	1.21	1	BOTTOM SLAB	10.70	
		TNT7B	42.000		1.31	55.08	1.40	1.93	1	BOTTOM SLAB	10.79	1.31	1	BOTTOM SLAB	10.70	
		TNAGRIT4	43.000		1.18	50.75	1.40	1.78	1	BOTTOM SLAB	10.79	1.18	1	BOTTOM SLAB	10.70	
		TNAGT5A	45.000		1.16	52.11	1.40	1.75	1	BOTTOM SLAB	10.79	1.16	1	BOTTOM SLAB	10.70	
		TNAGT5B	45.000	3	1.06	47.86	1.40	1.63	1	BOTTOM SLAB	10.79	1.06	1	BOTTOM SLAB	10.70	

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	--

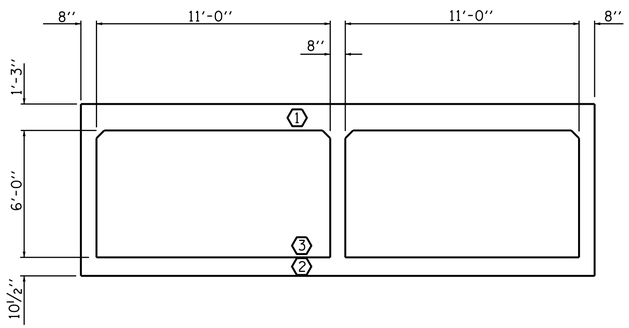
(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

PROJECT NO. B-4792

POLK COUNTY

STATION: 12+81.60 -L-

SHEET 13 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 10/29/2015

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

STD. NO. LRFR5

ASSEMBLED BY :	V.X. NGUYEN	DATE :	9-15-15
CHECKED BY :	H.T. BARBOUR	DATE :	9-17-15
DRAWN BY : WMC 7/11	REV. 10/1/11		MAA/GM
CHECKED BY : GM 7/11			

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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 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 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.

ENGLISH

JANUARY, 1990

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
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