STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.3.R.28	C-1	11

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION

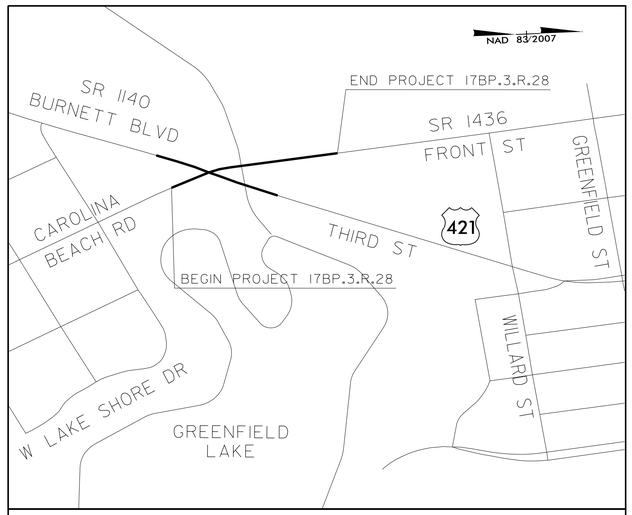
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STRUCTURE PLANS

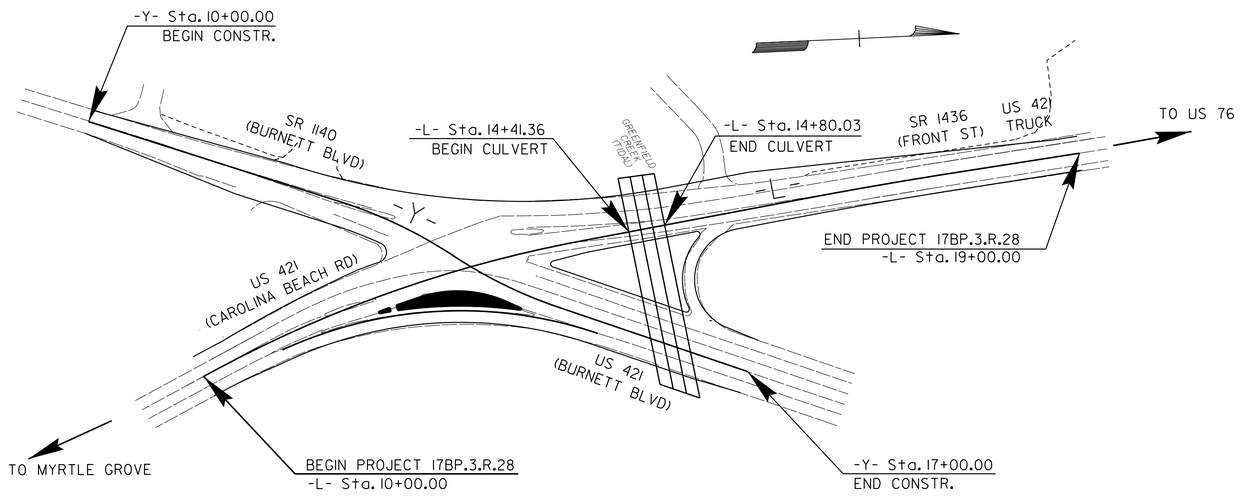
NEW HANOVER

LOCATION: ***INTERSECTION OF SR 1436 /US 421 TRUCK (FRONT STREET) AND SR 1140 (BURNETT BOULEVARD) SOUTH OF WILLARD STREET***

TYPE OF WORK: ***GRADING, DRAINAGE, PAVING, RESURFACING, STRUCTURES, SIGNING AND SIGNALS***



VICINITY MAP



CULVERT

DESIGN DATA

ADT 2012 = 20,000

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.3.R.28 = 0.163 MILES
LENGTH STRUCTURE PROJECT 17BP.3.R.28 = 0.007 MILES
TOTAL LENGTH PROJECT 17BP.3.R.28 = 0.170 MILES

NCDOT CONTACT:
TREVOR CARROLL, PE
BRIDGE MAINTENANCE ENGINEER
5501 BARBADOS BLVD
CASTLE HAYNE, NC 28429
(910)341-2000

Prepared in the Office of:
ATKINS
1616 East Millbrook Road, Raleigh, NC 27609
for the North Carolina Division of Highways

2012 STANDARD SPECIFICATIONS

LETTING DATE:
NOVEMBER 15, 2016

CLINTON MORGAN, PE
PROJECT ENGINEER

MATTHEW PAYNE, PE
PROJECT DESIGN ENGINEER

STRUCTURES ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030046 ENGINEER MATTHEW PAYNE

9/28/2016

DocuSigned by:
Matthew Payne
3C400164640F4D7...

P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

PROJECT: 17BP.3.R.28

CONTRACT: DC00078

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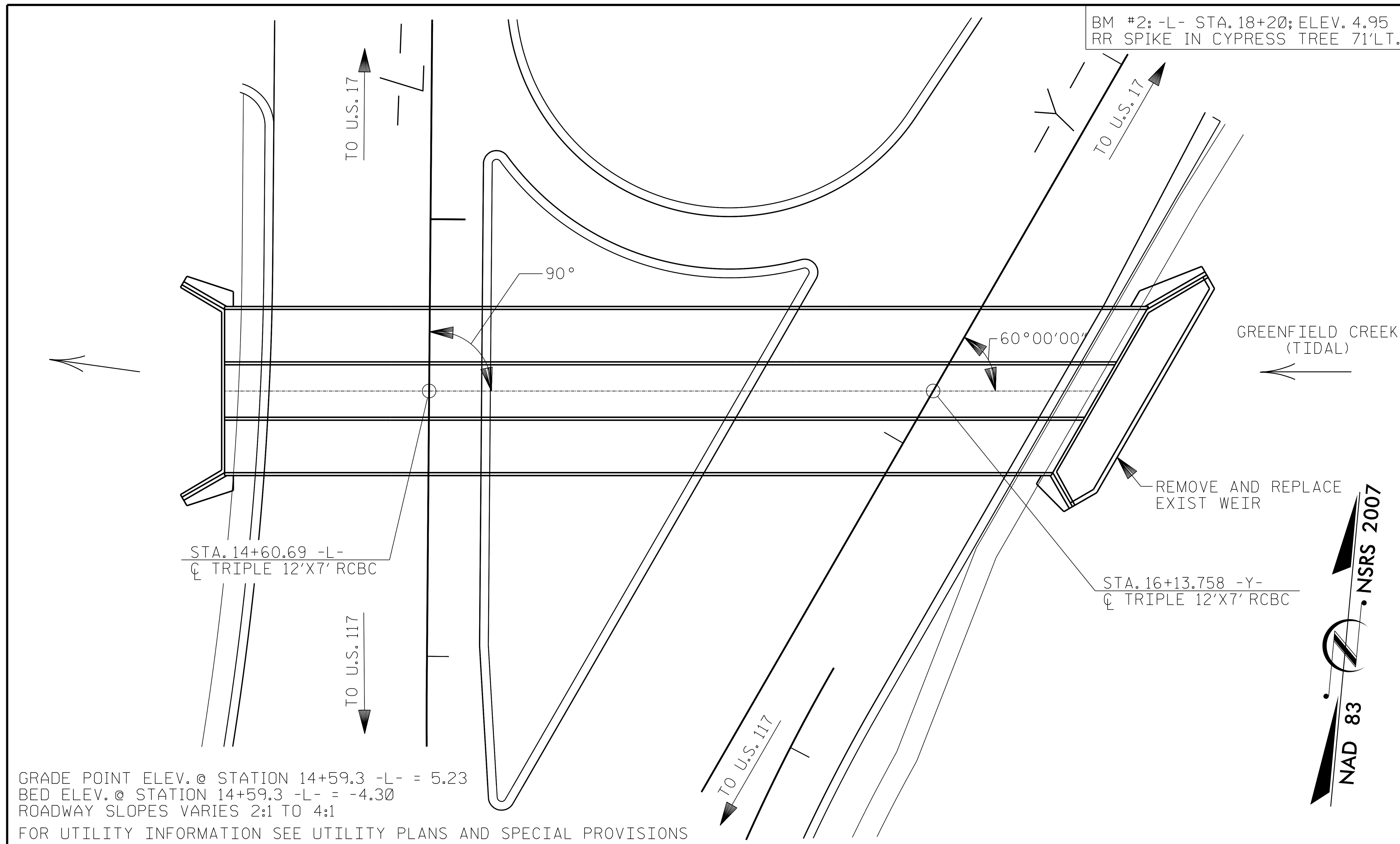
PAYNE AT LUS29033



GRADE POINT ELEV. @ STATION 14+59.3 -L- = 5.23
BED ELEV. @ STATION 14+59.3 -L- = -4.30
ROADWAY SLOPES VARIES 2:1 TO 4:1
FOR UTILITY INFORMATION SEE UTILITY PLANS AND SPECIAL PROVISIONS

LOCATION SKETCH

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @ 3.79 CY/FT	759.16	C.Y.
WING ETC.	29.53	C.Y.
TOTAL	788.69	C.Y.
REINFORCING STEEL		
BARREL	124,206	LBS.
WINGS ETC.	2229	LBS.
TOTAL	126,435	LBS.
CULVERT EXCAVATION•	1	LS
FOUNDATION CONDITIONING MATERIAL	546	TONS
RIP RAP CLASS II	31	TON
GEOTEXTILE FABRIC	28	S.Y.
1½" GALVANIZED STEEL PIPE	145	L.F.

•PAYMENT FOR REMOVAL OF EXISTING CULVERT SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR CULVERT EXCAVATION.

HYDRAULIC DATA

DESIGN DISCHARGE = 3000 CFS
FREQUENCY OF DESIGN FLOOD = 50 YR.
DESIGN HIGH WATER ELEVATION = 6.8 FT.
DRAINAGE AREA = 4.0 SQ. MI.
BASE DISCHARGE (Q100) = 3300 CFS
BASE HIGH WATER ELEVATION = 6.89 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = <1700 CFS
FREQUENCY OF OVERTOPPING FLOOD = <5 YR.
OVERTOPPING FLOOD ELEVATION = 5.4 FT.

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

DESIGN FILL = 1.5 FEET

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

THE 18 INCH DIAMETER PIPE, AND 15 INCH DIAMETER PIPE THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPES.

THE 36 INCH DIAMETER PIPE, AND 15 INCH DIAMETER PIPE THROUGH THE WING WALLS SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPES.

TRAFFIC ON FRONT STREET AND BURNETT BOULEVARD SHALL BE MAINTAINED AT VARIOUS STAGES OF CONSTRUCTION. IN ORDER TO MAINTAIN TRAFFIC, THE CULVERT SHALL BE CONSTRUCTED IN SECTIONS AS DIRECTED BY THE ENGINEER, AND IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF THE STEEL DUE TO THE SPLICES WILL BE PAID FOR BY THE CONTRACTOR.

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

ONE PERMITTED CONSTRUCTION JOINT WILL BE ALLOWED IN THE END CURTAIN WALL.

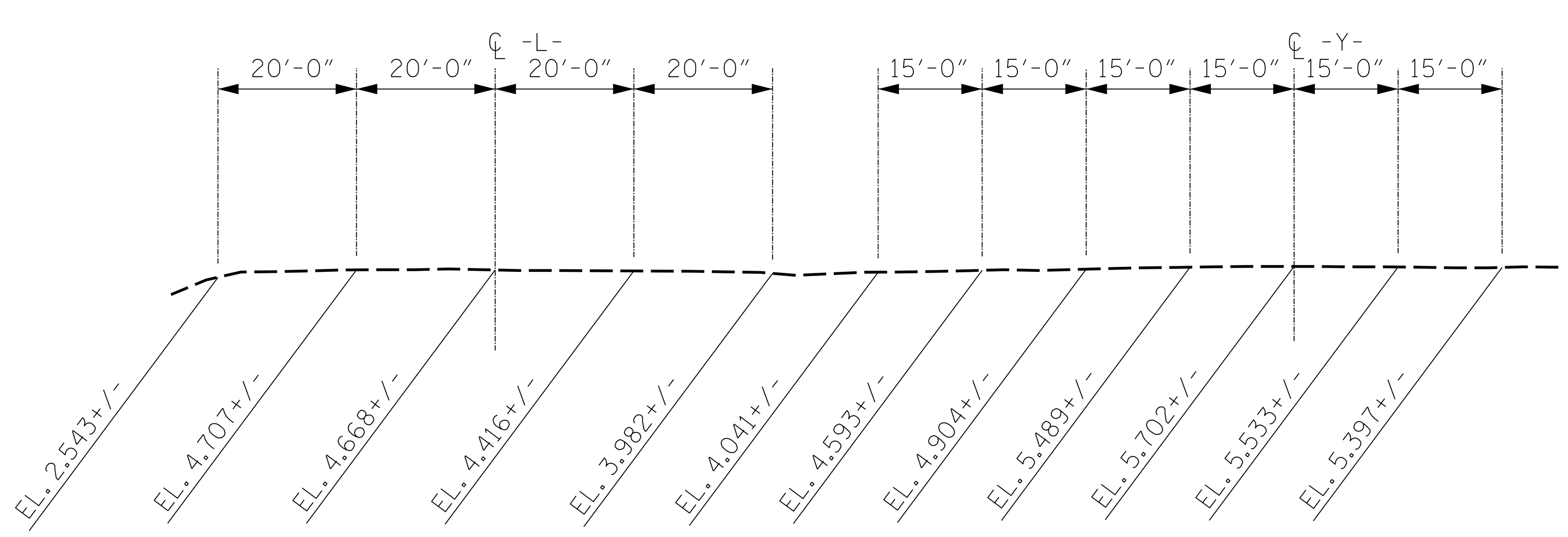
FOR CULVERT DIVERSION DETAILS AND PAY ITEMS, SEE EROSION CONTROL PLANS.

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.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

BED MATERIAL PLACED BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL BETWEEN THE LOWER SILLS. THE MATERIAL SHALL BE EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY LINE THE LOWER SILLS. RIPRAP MAY BE USED TO SUPPLEMENT NATIVE MATERIAL IN THE HIGH SILL BARREL. IF RIPRAP IS USED, NATIVE MATERIAL SHALL BE PLACED TO FILL ALL VOIDS AND PROVIDE A LEVEL SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

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



PROFILE ALONG ℄ CULVERT

NOTES (CONTINUED):

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

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

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 SCOUR CRITICAL ELEVATION IS THE AS-BUILT BOTTOM OF CULVERT FLOOR SLAB ELEVATION. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND CULVERT FLOOR SLAB INCLUDING 4 INCHES OF VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS TO FULL HEIGHT.
3. ROOF SLABS AND HEAD WALLS.
4. CONSTRUCTION JOINTS SHALL BE PERMITTED IN ORDER TO CONSTRUCT CULVERT IN ACCORDANCE WITH THE VARIOUS TRAFFIC CONTROL STAGES.

CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, A DETAILED DEMOLITION PLAN FOR THE REMOVAL OF THE EXISTING CONCRETE CULVERT.

PROJECT NO. 17BP.3.R.28
NEW HANOVER COUNTY
STATION: 14+60.69 -L-
REPLACES CULVERT NO. 640028

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 030046 ENGINEER MATTHEW PAYNE
9/28/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 7 FT. CONCRETE BOX CULVERT 90°(-L-) 60°(-Y-) SKEW

ATKINS
1616 E. MILLBROOK ROAD, SUITE #310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

DRAWN BY : C. DESROCHERS DATE : MAY 2014
CHECKED BY : M. PAYNE DATE : MAY 2014

28-SEP-2016 14:26
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PAYN5628 AT LUS290333

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
							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	1.13	--	1.75	1.28	3	TOP SLAB	38.67	1.13	3	TOP SLAB	38.67	
		HL-93 (OPERATING)	N/A		1.47	--	1.35	1.66	3	TOP SLAB	38.67	1.47	3	TOP SLAB	38.67	
		HS-20 (INVENTORY)	36.000	2	1.19	42.84	1.75	1.19	3	TOP SLAB	38.67	1.49	3	TOP SLAB	38.67	
		HS-20 (OPERATING)	36.000		1.55	55.80	1.35	1.55	3	TOP SLAB	38.67	1.93	3	TOP SLAB	38.67	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.93	39.56	1.40	2.93	3	TOP SLAB	38.67	3.61	3	TOP SLAB	38.67	
		SNGARBS2	20.000		2.27	45.40	1.40	2.27	3	TOP SLAB	38.67	3.10	3	TOP SLAB	38.67	
		SNAGRIS2	22.000		2.17	47.74	1.40	2.17	3	TOP SLAB	38.67	3.27	3	TOP SLAB	38.67	
		SNCOTTS3	27.250		1.39	37.88	1.40	1.52	3	TOP SLAB	38.67	1.39	3	TOP SLAB	38.67	
		SNAGGRS4	34.925		1.50	52.39	1.40	1.50	3	TOP SLAB	38.67	1.61	3	TOP SLAB	38.67	
		SNS5A	35.550		1.55	55.10	1.40	1.59	3	TOP SLAB	38.67	1.55	3	TOP SLAB	38.67	
		SNS6A	39.950		1.51	60.32	1.40	1.51	3	TOP SLAB	38.67	1.57	3	TOP SLAB	38.67	
		SNS7B	42.000		1.51	63.42	1.40	1.51	3	TOP SLAB	38.67	1.54	3	TOP SLAB	38.67	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.96	64.68	1.40	1.96	2	TOP SLAB	13.33	2.44	3	TOP SLAB	38.67	
		TNT4A	33.075		1.58	52.26	1.40	1.58	3	TOP SLAB	38.67	1.73	3	TOP SLAB	38.67	
		TNT6A	41.600		1.45	60.32	1.40	1.45	3	TOP SLAB	38.67	1.49	3	TOP SLAB	38.67	
		TNT7A	42.000		1.45	60.90	1.40	1.45	3	TOP SLAB	38.67	1.57	3	TOP SLAB	38.67	
		TNT7B	42.000		1.62	68.04	1.40	1.62	3	TOP SLAB	38.67	1.62	3	TOP SLAB	38.67	
		TNAGRIT4	43.000		1.38	59.34	1.40	1.38	3	TOP SLAB	38.67	1.59	3	TOP SLAB	38.67	
		TNAGT5A	45.000		1.39	62.55	1.40	1.39	3	TOP SLAB	38.67	1.57	3	TOP SLAB	38.67	
		TNAGT5B	45.000	3	1.21	54.45	1.40	1.21	3	TOP SLAB	38.67	1.54	3	TOP SLAB	38.67	

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.

CULVERT WAS DESIGNED AS SINGLE BOX FOR PHASE I CONSTRUCTION, WITH FINAL RATING BASED ON TRIPLE BARREL CONFIGURATION.

COMMENTS:

1.

2.

3.

4.

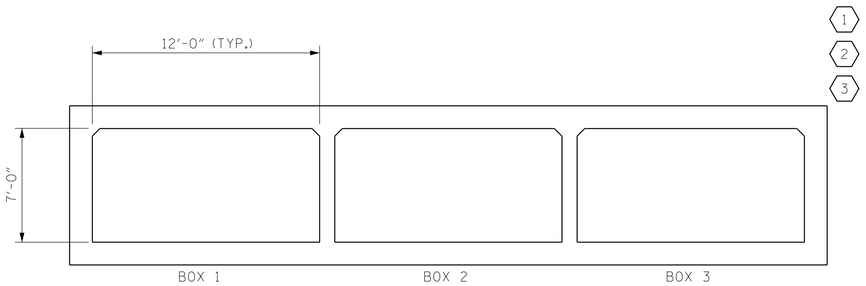
(#) CONTROLLING LOAD RATING

(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.3.R.28

NEW HANOVER COUNTY

STATION: 14+60.69 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 030046 ENGINEER MATTHEW PAYNE
Digitally signed by Matthew Payne
9/28/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS
1616 E. MILLBROOK ROAD, SUITE #310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

SHEET NO. C-3

TOTAL SHEETS 11

DRAWN BY : C. DESROCHERS DATE : MAY 2014
CHECKED BY : M. PAYNE DATE : MAY 2014

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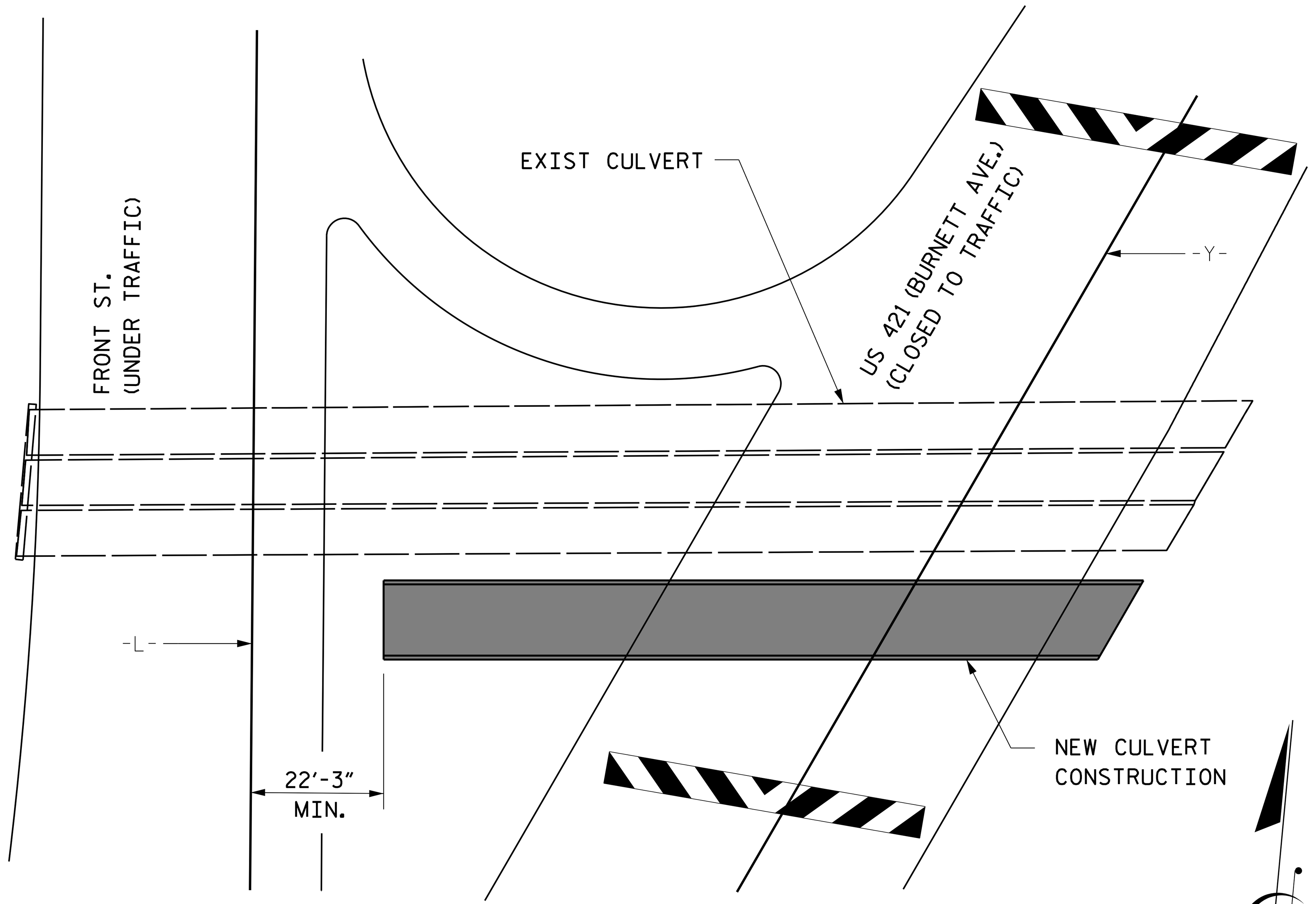
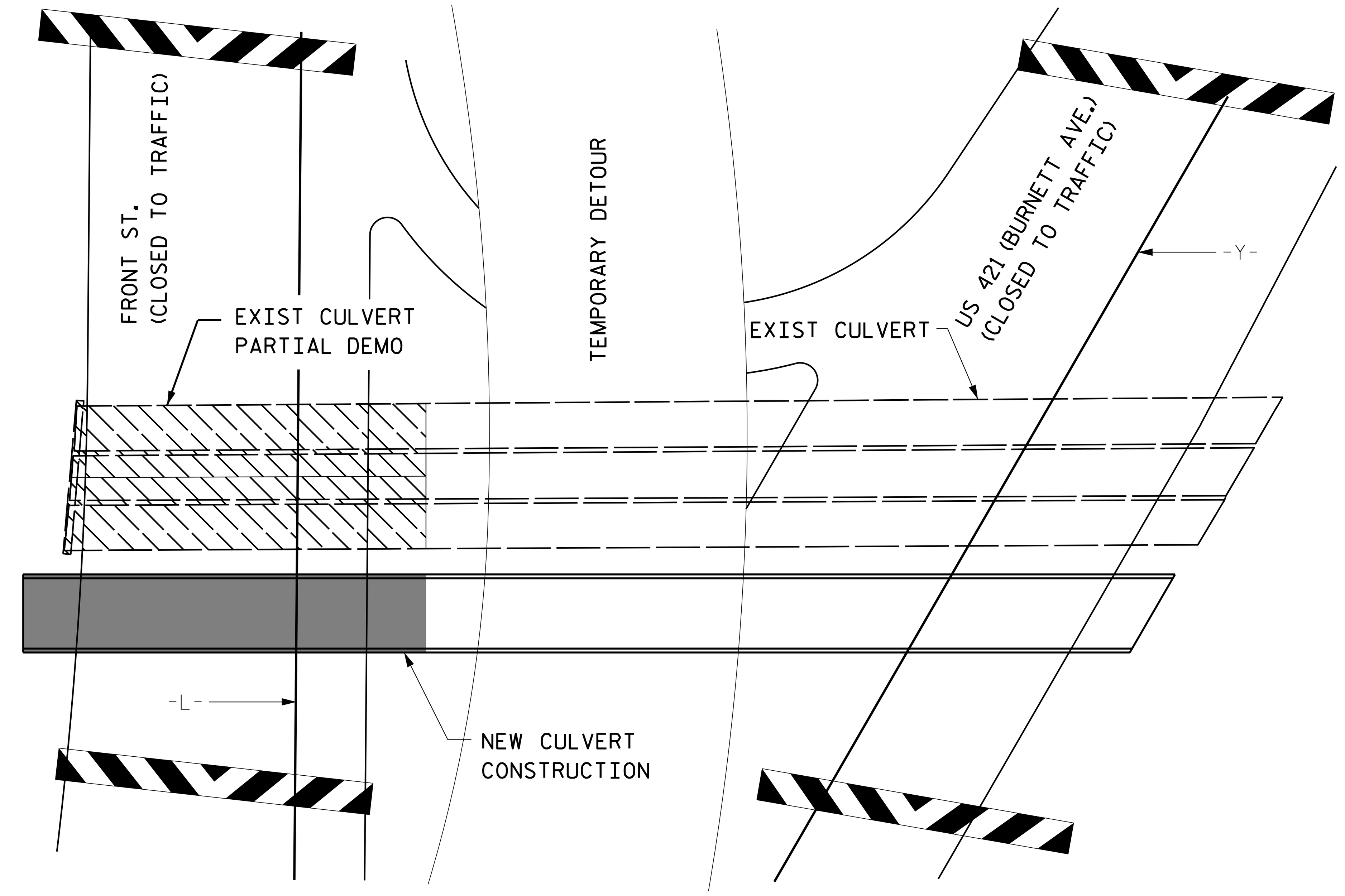
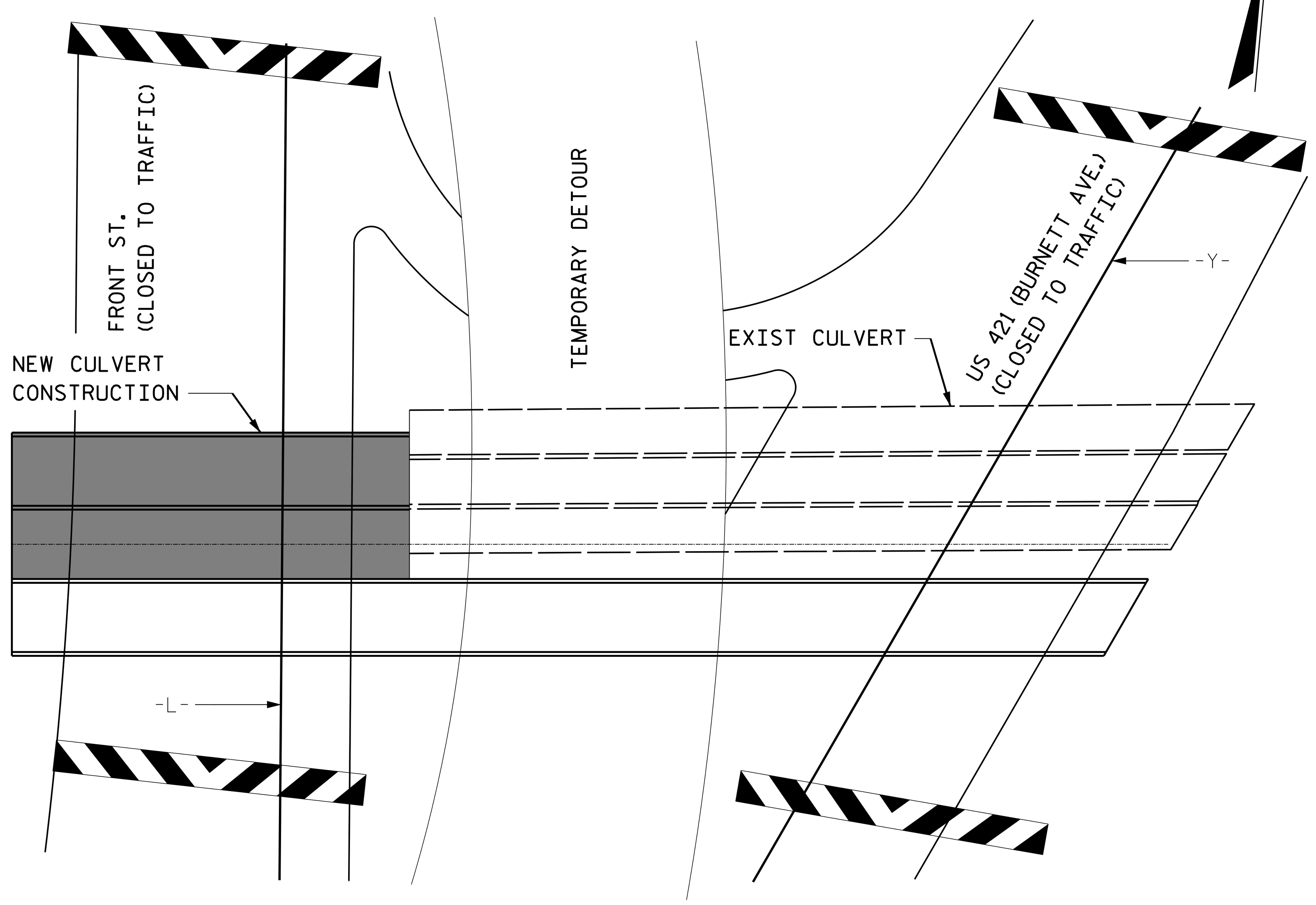
PAYN5628 AT LUS290333



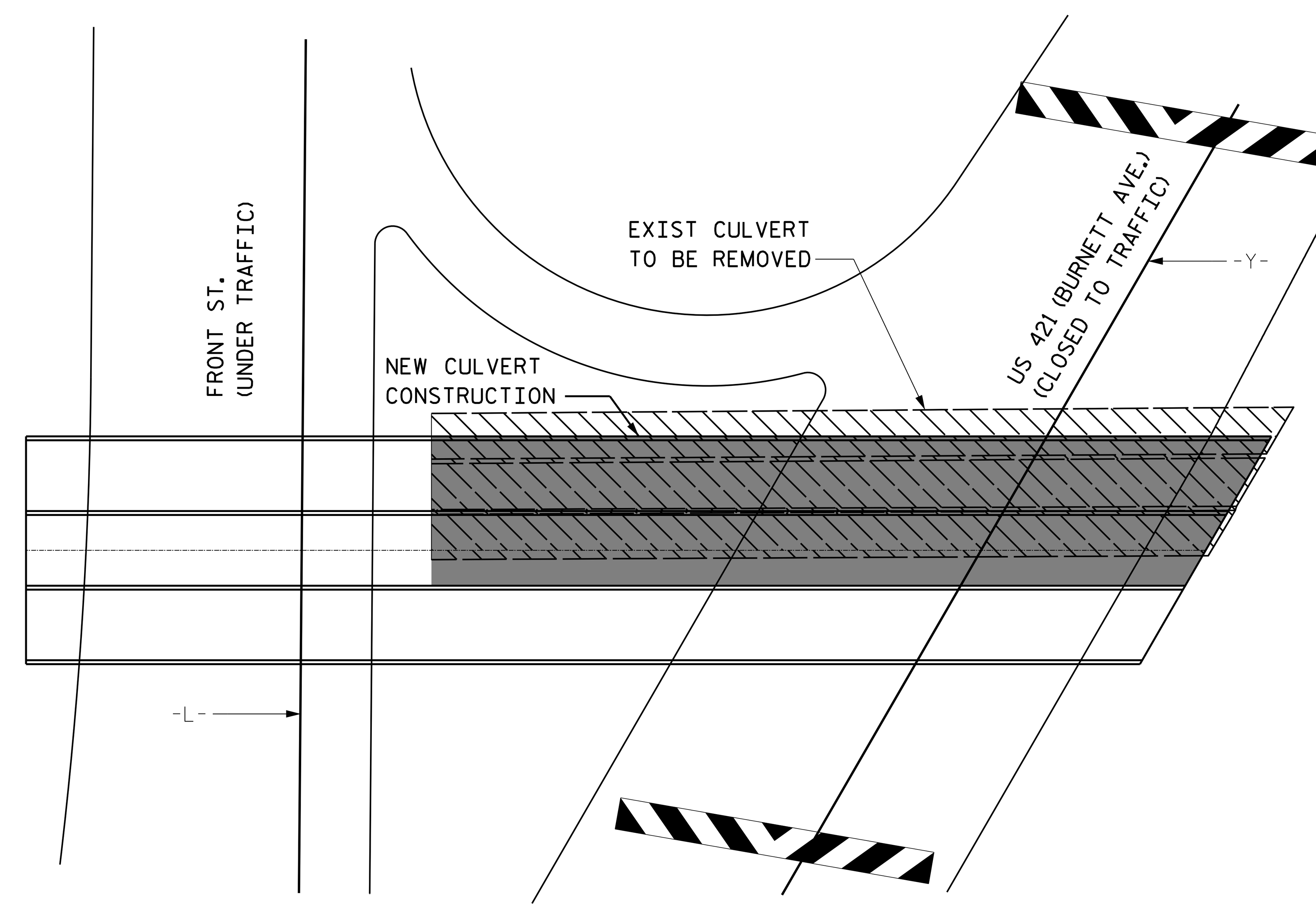
PHASE I CULVERT CONSTRUCTION



PHASE II CULVERT CONSTRUCTION AND DEMOLITION



PHASE III CULVERT CONSTRUCTION



PHASE IV CULVERT DEMOLITION AND CONSTRUCTION

PHASE I:

COMPLETE PHASE I TRAFFIC CONTROL. SEE TRAFFIC CONTROL PLANS.

PLACE TEMPORARY SHORING AND BEGIN CULVERT CONSTRUCTION OF SOUTHERN SINGLE BARREL, INCLUDING INLET WING WALL AND WEIR.

PROVIDE EROSION CONTROL TO PREVENT FLOW INTO EXCAVATION AND COMPLETED CULVERT, SEE EROSION CONTROL PLANS.

PHASE II:

COMPLETE PHASE II TRAFFIC CONTROL. SEE TRAFFIC CONTROL PLANS.

COMPLETE CONSTRUCTION OF SOUTHERN SINGLE BARREL CULVERT, INCLUDING OUTLET WING WALL.

PROVIDE EROSION CONTROL PER EROSION CONTROL PLANS. UPON APPROVAL BY THE ENGINEER, DIVERT FLOW INTO NEW SINGLE BARREL CULVERT.

PROVIDE ENGINEER WITH DEMOLITION PLANS, INCLUDING METHODS FOR PROTECTION OF TRAFFIC, FOR APPROVAL. UPON APPROVAL BY THE ENGINEER, BEGIN PARTIAL DEMOLITION OF EXISTING CULVERT.

PROVIDE ERROSION CONTROL TO PREVENT DEMOLITION MATERIALS FROM ENTERING ACTIVE CREEK.

PHASE III:

CONSTRUCT NEW CULVERT (NORTHERN BARRELS) TO LIMITS SHOWN, INCLUDING OUTLET WING WALLS.

PHASE IV:

COMPLETE REMOVAL OF TEMPORARY DETOUR, SEE TRAFFIC CONTROL PLANS.

COMPLETE REMOVAL OF EXISTING CULVERT IN ACCORDANCE WITH APPROVED DEMOLITION PLANS.

CONSTRUCT REMAINING PORITON OF NEW CONCRETE CULVERT, INCLUDING CONCRETE WING WALLS AND WIER.

REMOVE TEMPORARY EROSION CONTROL MEASURES AND ALLOW FLOW THROUGH COMPLETED CULVERT IN ACCORDANCE WITH THE EROSION CONTROL PLANS.

NOTE:

EXISTING STRUCTURE TO BE REMOVED

NEW CULVERT CONSTRUCTION

PROJECT NO. 17BP.3.R.28
NEW HANOVER COUNTY
STATION: 14+60.69 -L-

SEAL 030046 — NORTH CAROLINA PROFESSIONAL ENGINEER — MATTHEW PAYNE
9/28/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 7 FT. CONCRETE BOX CULVERT 90°(-L-) 60°(-Y-) SKEW

ATKINS
1616 E. MILLBROOK ROAD, SUITE #310
RALEIGH, NORTH CAROLINA 27609
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			11

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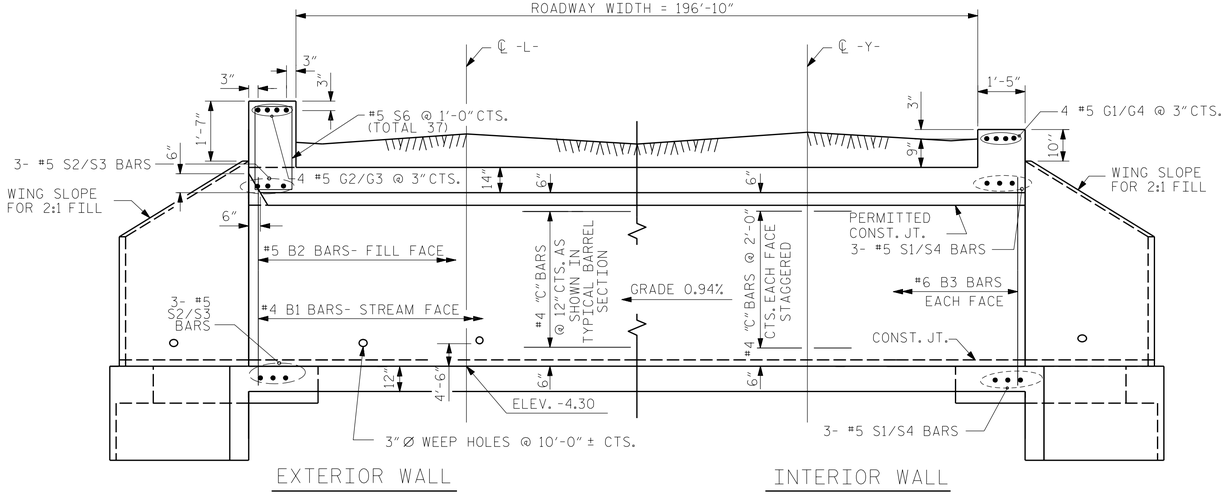
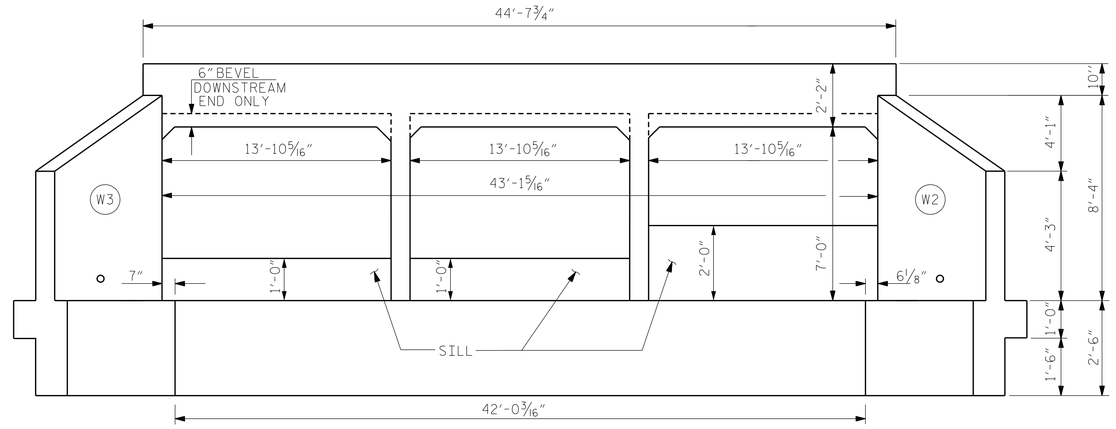


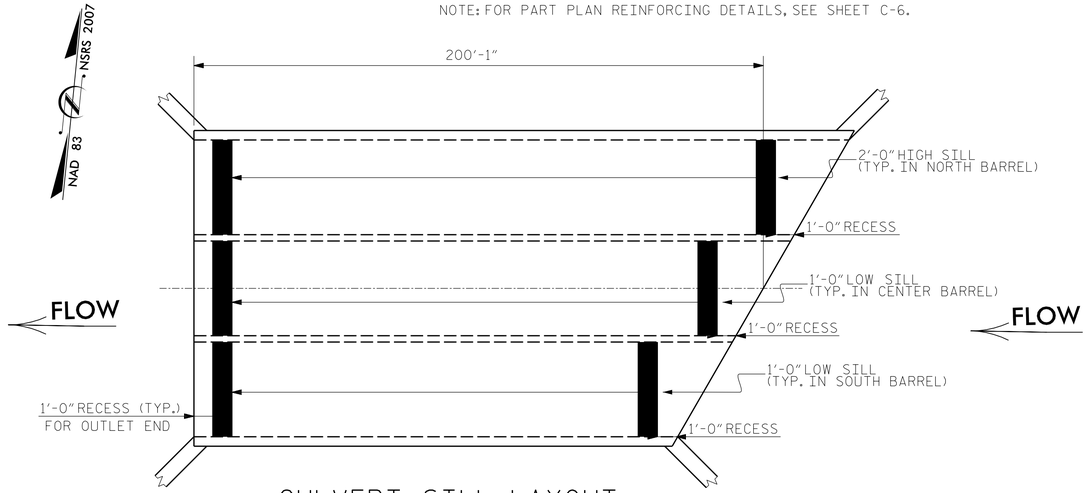
CULVERT SECTION NORMAL TO ROADWAY

NOTE: FOR PART PLAN REINFORCING DETAILS, SEE SHEET C-6.



END ELEVATION

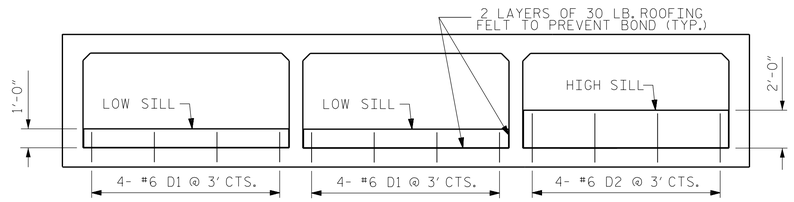
(LOOKING DOWNSTREAM)



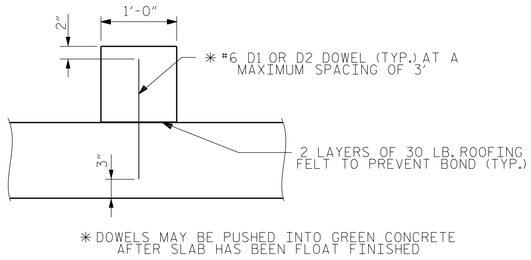
CULVERT SILL LAYOUT

SKEW TRIANGLE

REINFORCEMENT AROUND OPENINGS



ELEVATION - LOOKING DOWNSTREAM



SECTION THROUGH SILL

CULVERT SILL DETAILS

PROJECT NO. 17BP.3.R.28

NEW HANOVER COUNTY

STATION: 14+60.69 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 7 FT. CONCRETE BOX CULVERT 90°(-L-) 60°(-Y-) SKEW

NORTH CAROLINA PROFESSIONAL SEAL 030046 ENGINEER MATTHEW PAYNE
DocuSigned by: Matthew Payne
9/28/2016

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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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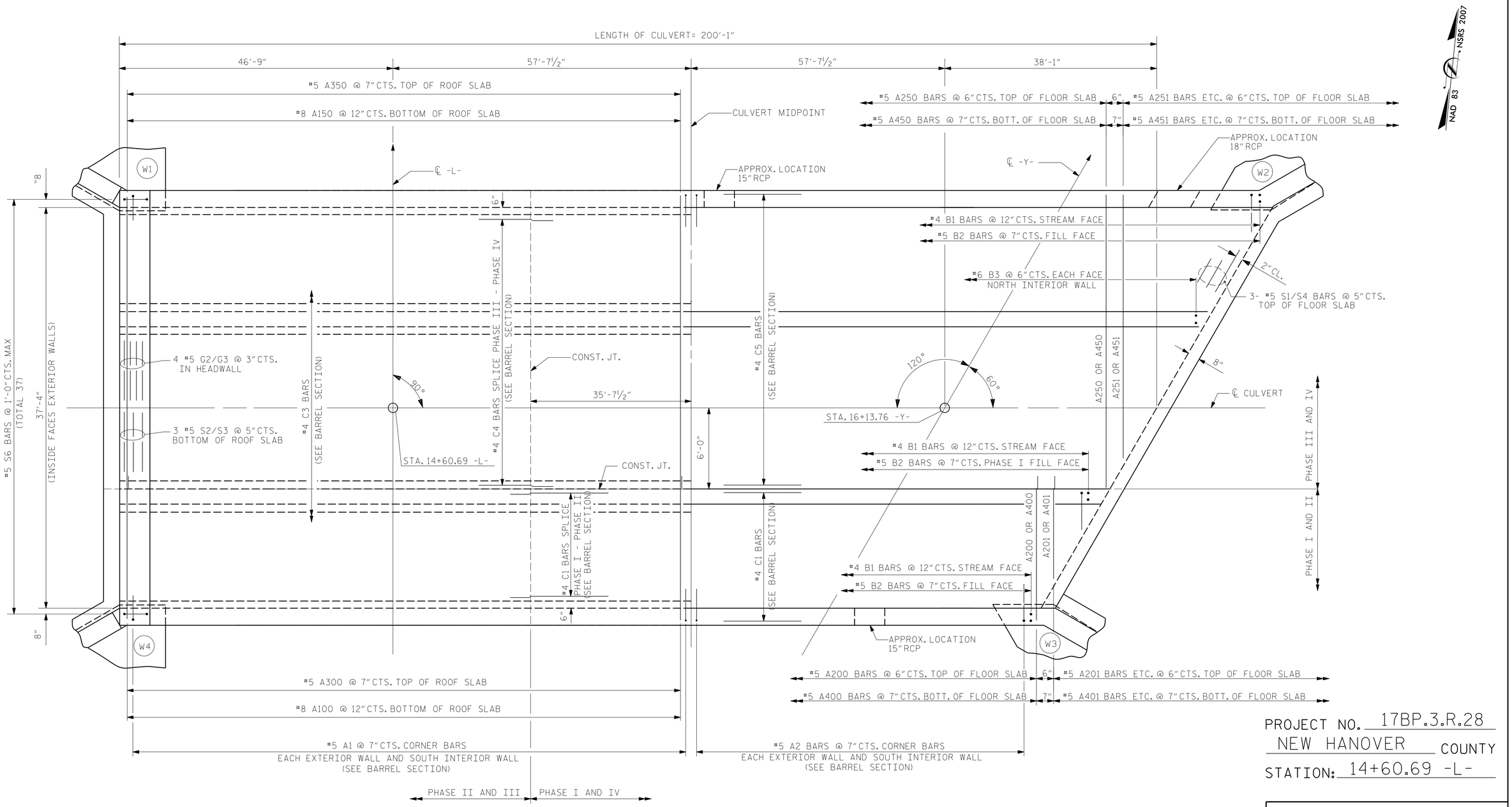
PAYN5628 AT LUS290333



PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

PROJECT NO. 17BP.3.R.28

NEW HANOVER COUNTY

STATION: 14+60.69 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 7 FT. CONCRETE BOX CULVERT 90°(-L-) 60°(-Y-) SKEW

NORTH CAROLINA PROFESSIONAL SEAL 030046 ENGINEER MATTHEW PAYNE
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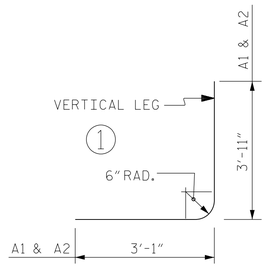
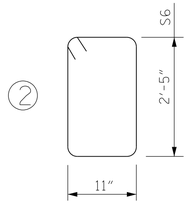
PAYN5628 AT LUS290333

BAR TYPES

BAR DIMENSIONS ARE OUT TO OUT





SPLICE LENGTH CHART	
BAR	SPLICE LENGTH
#4	2'-0"
#5	2'-7"
#8	7'-7"

NOTES

1. BAR DIMENSIONS ARE OUT TO OUT
2. ALL REINFORCING STEEL AND BAR SUPPORTS SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. C2 BARS ARE THE LONGITUDINAL EXTENSION FOR PHASE I INTO PHASE II.

PHASE I

REINFORCING STEEL BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	422	5	1	7'-0"	3081
A2	422	5	1	7'-0"	3081
A100	121	8	STR	16'-9"	5411
A101	1	8	STR	15'-0"	40
A102	1	8	STR	13'-3"	35
A103	1	8	STR	11'-6"	31
A104	1	8	STR	9'-9"	26
A105	1	8	STR	8'-1"	22
A106	1	8	STR	6'-4"	17
A200	241	5	STR	16'-2"	4064
A201	1	5	STR	15'-3"	16
A202	1	5	STR	14'-5"	15
A203	1	5	STR	13'-6"	14
A204	1	5	STR	12'-8"	13
A205	1	5	STR	11'-10"	12
A206	1	5	STR	10'-11"	11
A207	1	5	STR	10'-1"	11
A208	1	5	STR	9'-2"	10
A209	1	5	STR	8'-4"	9
A210	1	5	STR	7'-6"	8
A211	1	5	STR	6'-7"	7
A212	1	5	STR	5'-9"	6
A300	206	5	STR	16'-2"	3474
A301	1	5	STR	15'-1"	16
A302	1	5	STR	14'-1"	15
A303	1	5	STR	13'-1"	14
A304	1	5	STR	12'-1"	13
A305	1	5	STR	11'-1"	12
A306	1	5	STR	10'-1"	11
A307	1	5	STR	9'-1"	9
A308	1	5	STR	8'-1"	8
A309	1	5	STR	7'-0"	7
A310	1	5	STR	6'-0"	6
A400	206	5	STR	16'-2"	3474
A401	1	5	STR	15'-1"	16
A402	1	5	STR	14'-1"	15
A403	1	5	STR	13'-1"	14
A404	1	5	STR	12'-1"	13
A405	1	5	STR	11'-1"	12
A406	1	5	STR	10'-1"	11
A407	1	5	STR	9'-1"	9
A408	1	5	STR	8'-1"	8
A409	1	5	STR	7'-0"	7
A410	1	5	STR	6'-0"	6
B1	248	4	STR	7'-6"	1242
B2	424	5	STR	6'-8"	2948
C1	250	4	STR	27'-2"	4606
D1	4	6	STR	1'-7"	10
G1	4	5	STR	18'-8"	78
S1	6	5	STR	18'-8"	117
U1	8	5	STR	4'-3"	34

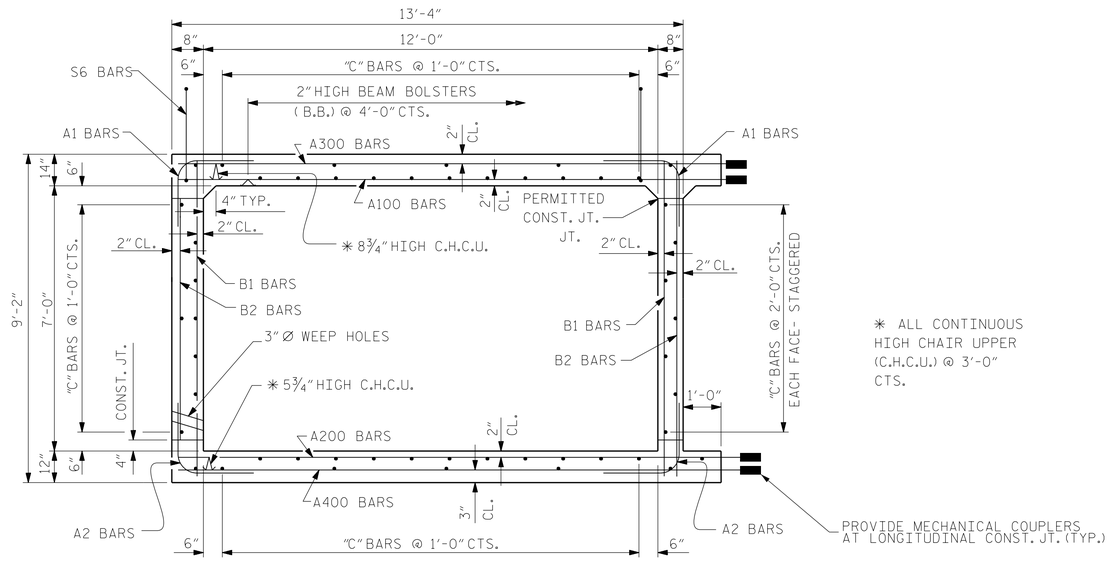
PHASE I TOTAL
REINFORCING STEEL = 32,145 LBS

PHASE II

REINFORCING STEEL BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	236	5	1	7'-0"	1723
A2	236	5	1	7'-0"	1723
A100	68	8	STR	16'-9"	3041
A200	137	5	STR	16'-2"	2310
A300	118	5	STR	16'-2"	1990
A400	118	5	STR	16'-2"	1990
B1	136	4	STR	7'-6"	681
B2	236	5	STR	6'-8"	1641
C3	150	4	STR	24'-3"	2430
D1	4	6	STR	1'-7"	10
G2	4	5	STR	16'-2"	67
S2	6	5	STR	16'-2"	101
S6	12	5	2	6'-8"	83

PHASE II TOTAL
REINFORCING STEEL = 17,790 LBS



* ALL CONTINUOUS HIGH CHAIR UPPER (C.H.C.U.) @ 3'-0" CTS.

RIGHT ANGLE SECTION OF BARREL FOR PHASE I AND II

THERE ARE 50 "C" BARS IN SECTION OF BARREL.

PROJECT NO. 17BP.3.R.28
NEW HANOVER COUNTY
STATION: 14+60.69 -L-

NORTH CAROLINA PROFESSIONAL SEAL 030046 ENGINEER MATTHEW PAYNE
9/28/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 7 FT. CONCRETE BOX CULVERT 90°(-L-) 60°(-Y-) SKEW

ATKINS
1616 E. MILLBROOK ROAD, SUITE #310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

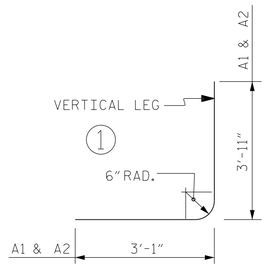
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			11

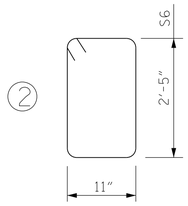
DRAWN BY : C. DESROCHERS DATE : MAY 2014
CHECKED BY : M. PAYNE DATE : MAY 2014

28-SEP-2016 14:26
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
PAYN5628 AT LUS290333

BAR TYPES

BAR DIMENSIONS ARE OUT TO OUT





PHASE III

REINFORCING STEEL BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	118	5	1	7'-0"	862
A2	118	5	1	7'-0"	862
A150	68	8	STR	25'-0"	4539
A250	137	5	STR	25'-0"	3572
A350	118	5	STR	25'-0"	3077
A450	118	5	STR	25'-0"	3077
B1	68	4	STR	7'-6"	341
B2	118	5	STR	6'-8"	820
B3	274	6	STR	8'-9"	3601
C3	156	4	STR	24'-3"	2527
C4	78	4	STR	26'-3"	1368
D1	4	6	STR	1'-7"	10
D2	4	6	STR	2'-7"	16
G3	4	5	STR	25'-0"	104
S3	6	5	STR	25'-0"	156
S6	25	5	2	6'-8"	174

PHASE III TOTAL
REINFORCING STEEL = 25,106 LBS

A450	219	5	STR	25'-0"	5710
A451	1	5	STR	24'-3"	25
A452	1	5	STR	23'-2"	24
A453	1	5	STR	22'-2"	23
A454	1	5	STR	21'-2"	22
A455	1	5	STR	20'-2"	21
A456	1	5	STR	19'-2"	20
A457	1	5	STR	18'-2"	19
A458	1	5	STR	17'-2"	18
A459	1	5	STR	16'-2"	17
A460	1	5	STR	15'-2"	16
A461	1	5	STR	14'-2"	15
A462	1	5	STR	13'-1"	14
A463	1	5	STR	12'-1"	13
A464	1	5	STR	11'-1"	12
A465	1	5	STR	10'-1"	11
A466	1	5	STR	9'-1"	9
A467	1	5	STR	8'-0"	8
A468	1	5	STR	7'-0"	7
A469	1	5	STR	6'-0"	6
A470	1	5	STR	5'-0"	5
A471	1	5	STR	4'-0"	4
A472	1	5	STR	3'-0"	3
B1	141	4	STR	7'-6"	706
B2	243	5	STR	6'-8"	1690
B3	540	6	STR	8'-9"	7097
C5	390	4	STR	29'-3"	7620
D1	4	6	STR	1'-7"	10
D2	4	6	STR	2'-7"	16
G4	4	5	STR	28'-11"	121
S4	6	5	STR	28'-11"	181
U2	16	5	STR	4'-9"	80

PHASE IV

REINFORCING STEEL BAR SCHEDULE

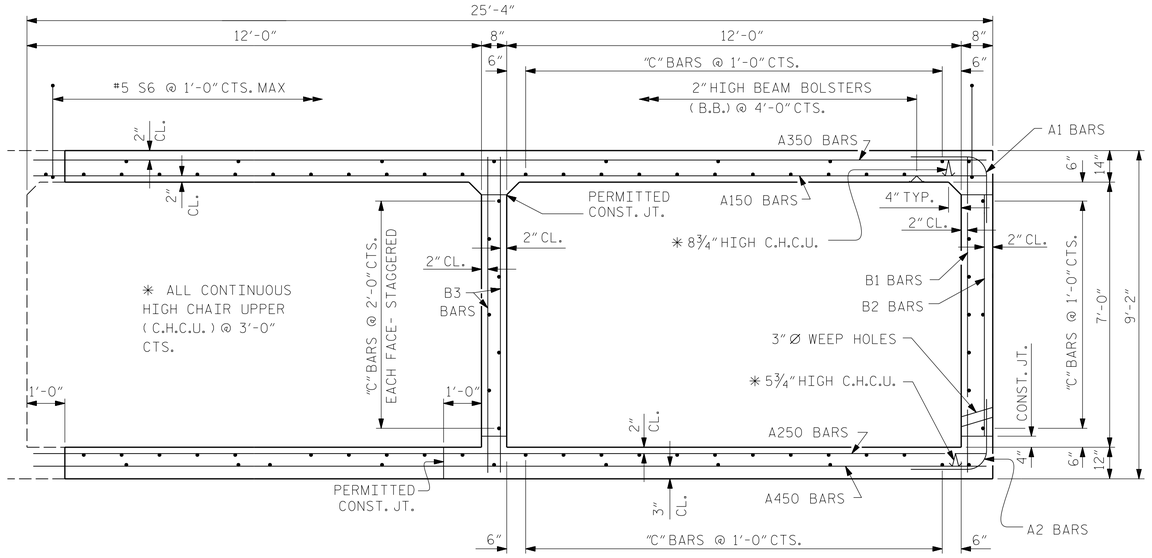
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	241	5	1	7'-0"	1760
A2	241	5	1	7'-0"	1760
A150	128	8	STR	25'-0"	8544
A151	1	8	STR	24'-6"	65
A152	1	8	STR	22'-9"	61
A153	1	8	STR	21'-1"	56
A154	1	8	STR	19'-4"	52
A155	1	8	STR	17'-7"	47
A156	1	8	STR	15'-10"	42
A157	1	8	STR	14'-1"	38
A158	1	8	STR	12'-5"	33
A159	1	8	STR	10'-8"	28
A160	1	8	STR	8'-11"	24
A161	1	8	STR	7'-2"	19
A162	1	8	STR	5'-5"	14
A163	1	8	STR	3'-9"	10
A250	256	5	STR	25'-0"	6675
A251	1	5	STR	24'-6"	26
A252	1	5	STR	23'-8"	25
A253	1	5	STR	22'-9"	24
A254	1	5	STR	21'-11"	23
A255	1	5	STR	21'-1"	22
A256	1	5	STR	20'-2"	21
A257	1	5	STR	19'-4"	20
A258	1	5	STR	18'-5"	19
A259	1	5	STR	17'-7"	18
A260	1	5	STR	16'-9"	17
A261	1	5	STR	15'-10"	17
A262	1	5	STR	15'-0"	16
A263	1	5	STR	14'-1"	15
A264	1	5	STR	13'-3"	14
A265	1	5	STR	12'-5"	13
A266	1	5	STR	11'-6"	12
A267	1	5	STR	10'-8"	11
A268	1	5	STR	9'-9"	10
A269	1	5	STR	8'-11"	9
A270	1	5	STR	8'-1"	8
A271	1	5	STR	7'-2"	7
A272	1	5	STR	6'-4"	7
A273	1	5	STR	5'-5"	6
A274	1	5	STR	4'-7"	5
A275	1	5	STR	3'-9"	4
A276	1	5	STR	2'-10"	3
A350	219	5	STR	25'-0"	5710
A351	1	5	STR	24'-3"	25
A352	1	5	STR	23'-2"	24
A353	1	5	STR	22'-2"	23
A354	1	5	STR	21'-2"	22
A355	1	5	STR	20'-2"	21
A356	1	5	STR	19'-2"	20
A357	1	5	STR	18'-2"	19
A358	1	5	STR	17'-2"	18
A359	1	5	STR	16'-2"	17
A360	1	5	STR	15'-2"	16
A361	1	5	STR	14'-2"	15
A362	1	5	STR	13'-1"	14
A363	1	5	STR	12'-1"	13
A364	1	5	STR	11'-1"	12
A365	1	5	STR	10'-1"	11
A366	1	5	STR	9'-1"	19
A367	1	5	STR	8'-0"	8
A368	1	5	STR	7'-0"	7
A369	1	5	STR	6'-1"	6
A370	1	5	STR	5'-0"	5
A371	1	5	STR	4'-0"	4
A372	1	5	STR	3'-0"	3

PHASE IV TOTAL
REINFORCING STEEL = 49,165 LBS

SPLICE LENGTH CHART	
BAR	SPLICE LENGTH
#4	2'-0"
#5	2'-7"
#8	7'-7"

NOTES

1. BAR DIMENSIONS ARE OUT TO OUT
2. ALL REINFORCING STEEL AND BAR SUPPORTS SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. C4 BARS ARE THE LONGITUDINAL EXTENSION FOR PHASE III INTO PHASE IV.



PHASE III AND IV
RIGHT ANGLE SECTION OF BARREL

THERE ARE 78 "C" BARS IN SECTION OF BARREL.

PROJECT NO. 17BP.3.R.28
NEW HANOVER COUNTY
STATION: 14+60.69 -L-

NORTH CAROLINA PROFESSIONAL SEAL 030046 ENGINEER MATTHEW PAYNE
DocuSigned by: Matthew Payne
9/28/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ATKINS
1616 E. MILLBROOK ROAD, SUITE #310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 7 FT. CONCRETE BOX CULVERT 90°(-L-) 60°(-Y-) SKEW

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

SHEET NO. C-8
TOTAL SHEETS 11

DRAWN BY : C. DESROCHERS DATE : MAY 2014
CHECKED BY : M. PAYNE DATE : MAY 2014

28-SEP-2016 14:26
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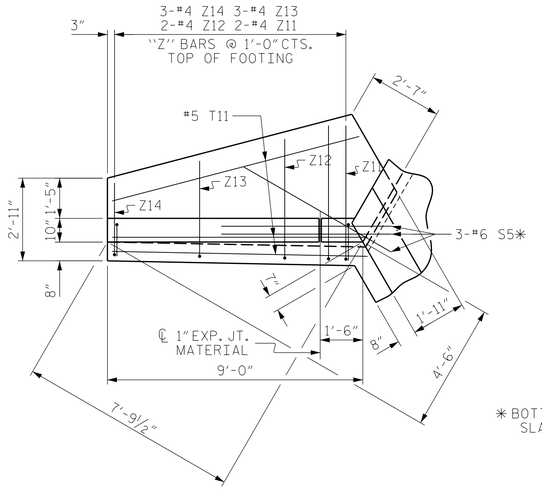
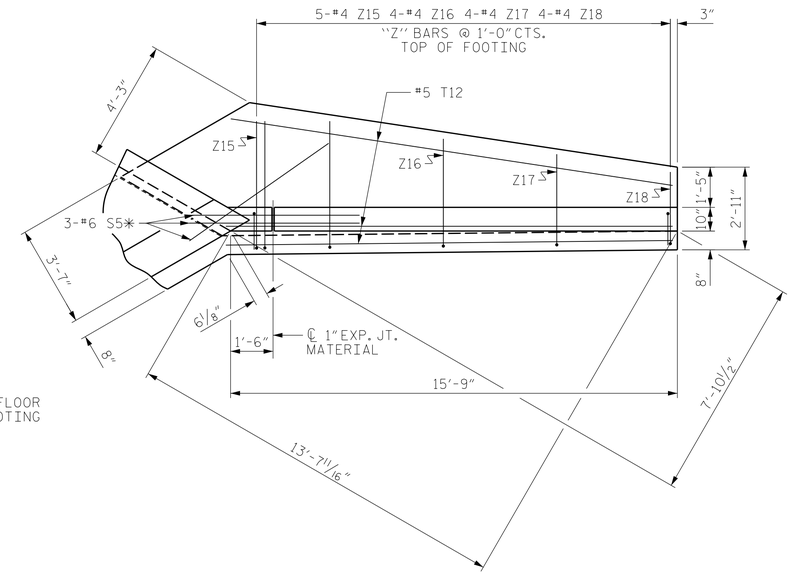
PAYN5628 AT LUS290333



PLAN W3

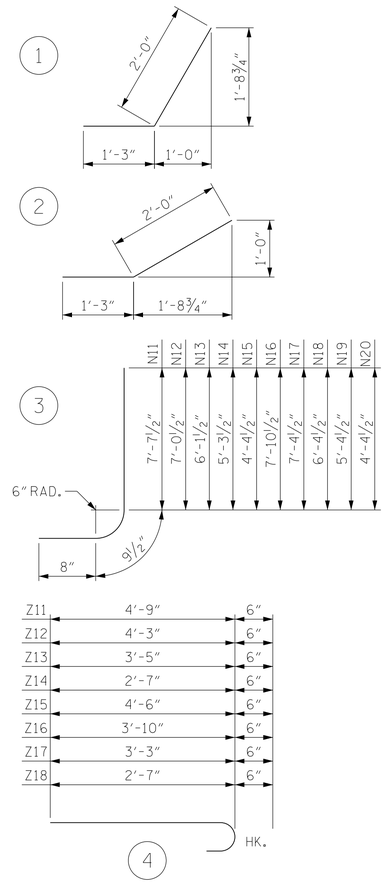


PLAN W2

* BOTTOM OF FLOOR SLAB & FOOTING

BAR TYPES

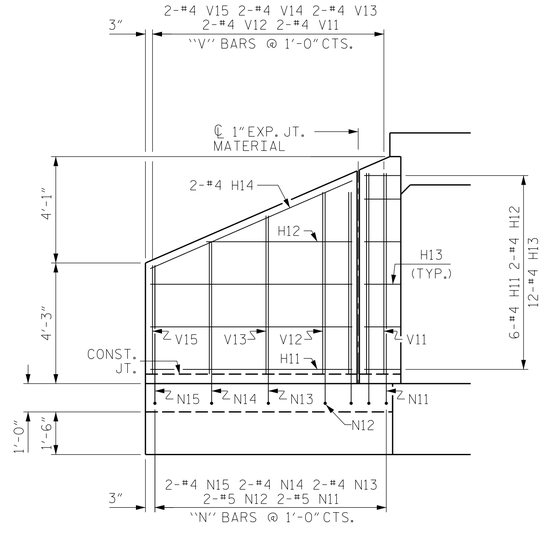
ALL BAR DIMENSIONS ARE OUT TO OUT.



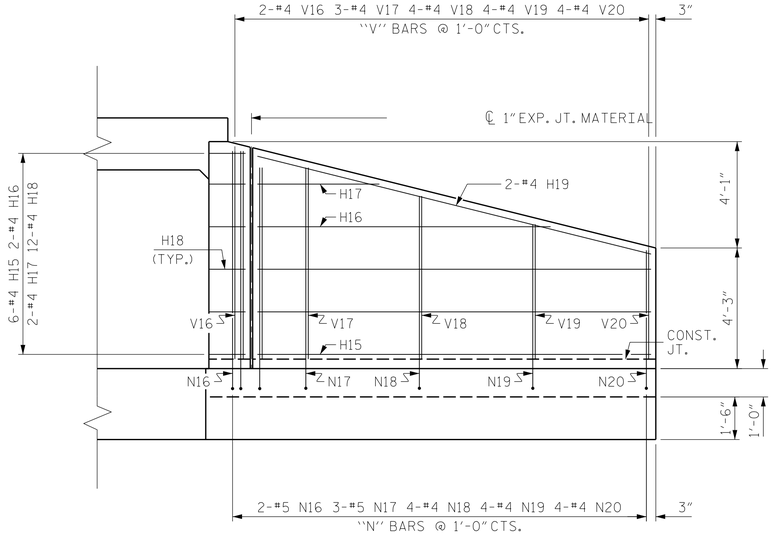
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H11	6	#4	STR	7'-1"	28
H12	2	#4	STR	5'-2"	7
H13	12	#4	1	3'-3"	26
H14	2	#4	STR	7'-9"	10
H15	6	#4	STR	13'-10"	55
H16	2	#4	STR	10'-4"	14
H17	2	#4	STR	4'-3"	6
H18	12	#4	2	3'-3"	26
H19	2	#4	STR	14'-3"	19
N11	2	#5	3	9'-1"	19
N12	2	#5	3	8'-6"	18
N13	2	#4	3	7'-7"	10
N14	2	#4	3	6'-9"	9
N15	2	#4	3	5'-10"	8
N16	2	#5	3	9'-4"	19
N17	3	#5	3	8'-10"	28
N18	4	#4	3	7'-10"	21
N19	4	#4	3	6'-10"	18
N20	4	#4	3	5'-10"	16
S5	6	#6	STR	6'-0"	54
T11	3	#5	STR	9'-0"	28
T12	3	#5	STR	15'-9"	49
V11	2	#4	STR	7'-1"	9
V12	2	#4	STR	6'-5"	9
V13	2	#4	STR	5'-7"	7
V14	2	#4	STR	4'-8"	6
V15	2	#4	STR	3'-10"	5
V16	2	#4	STR	7'-4"	10
V17	3	#4	STR	6'-9"	14
V18	4	#4	STR	5'-9"	15
V19	4	#4	STR	4'-9"	13
V20	4	#4	STR	3'-10"	10
Z11	2	#4	4	5'-3"	7
Z12	2	#4	4	4'-9"	6
Z13	3	#4	4	3'-11"	8
Z14	3	#4	4	3'-1"	6
Z15	5	#4	4	5'-0"	17
Z16	4	#4	4	4'-4"	12
Z17	4	#4	4	3'-9"	10
Z18	4	#4	4	3'-1"	8

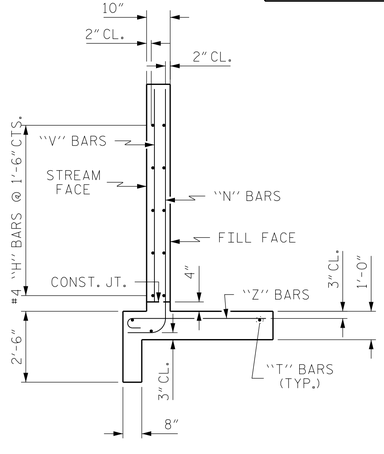
REINFORCING STEEL FOR 2 WINGS	660	LBS
CLASS A CONCRETE		
2 WINGS	9.9	CY
1 HEADWALLS	1.4	CY
1 END CURTAIN WALLS	2.6	CY
TOTAL	14.1	CY



ELEVATION W3



ELEVATION W2



TYPICAL WING SECTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 030046 ENGINEER MICHAEL PAYNE
DocuSigned by: Michael Payne
9/28/2016

PROJECT NO. 17BP.3.R.28
NEW HANOVER COUNTY
STATION: 14+60.69 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD WINGS FOR CONCRETE BOX CULVERT

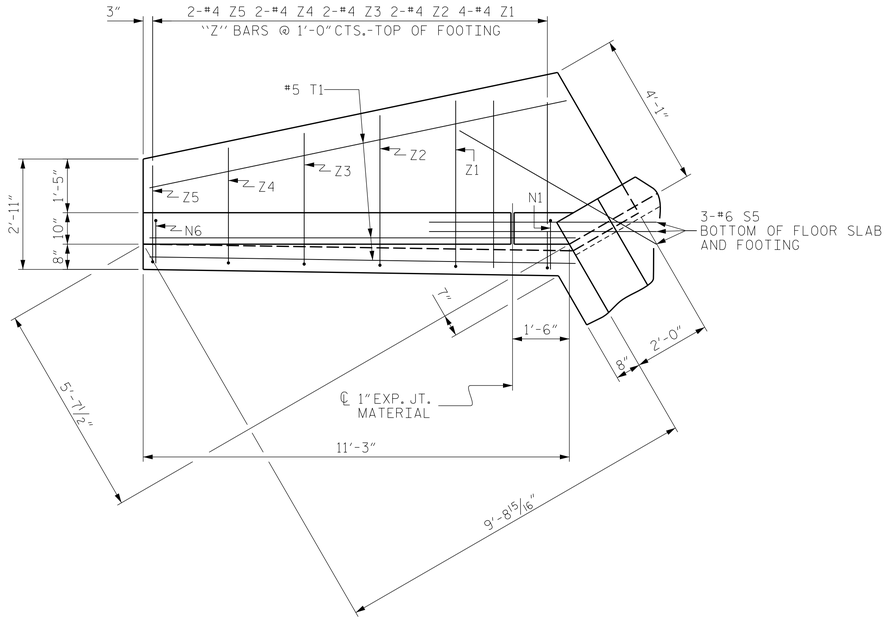
H = 7'-0" SLOPE = 2:1
60° SKEW

ASSEMBLED BY : C. DESROCHERS	DATE : MAY 2014
CHECKED BY : M. PAYNE	DATE : MAY 2014
DRAWN BY : CCJ 11/99	
CHECKED BY : RWW 03/00	

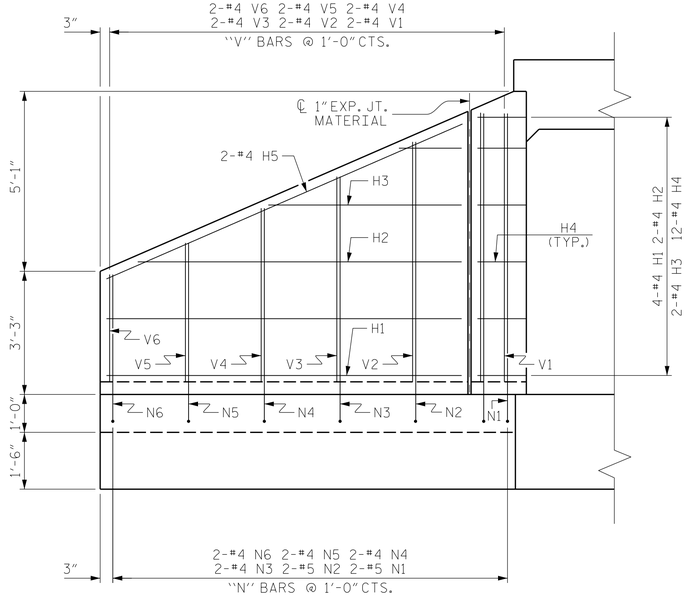
ATKINS
1616 E. MILLBROOK ROAD, SUITE #310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-9
1			3			TOTAL SHEETS
2			4			11

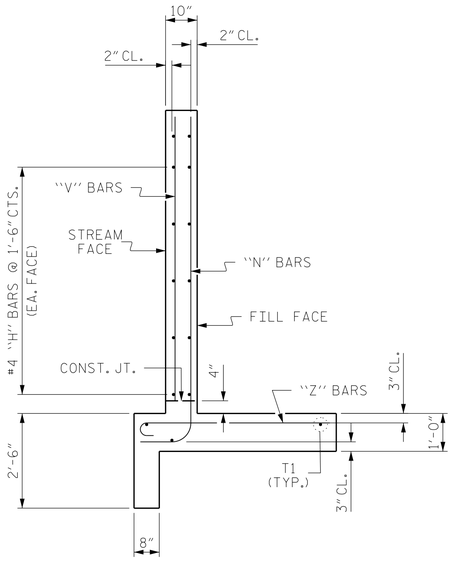
STD. NO. CW6007



PLAN W1, W4



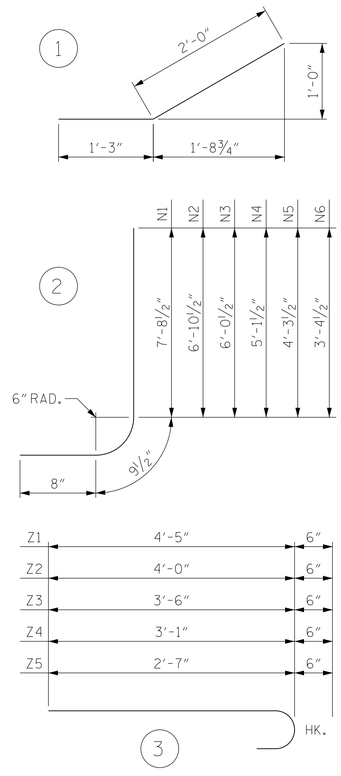
ELEVATION W1, W4



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	8	#4	STR	9'-4"	50
H2	4	#4	STR	8'-6"	23
H3	4	#4	STR	5'-1"	14
H4	24	#4	1	3'-3"	52
H5	4	#4	STR	10'-3"	27
N1	4	#5	2	9'-2"	38
N2	4	#5	2	8'-4"	35
N3	4	#4	2	7'-6"	20
N4	4	#4	2	6'-7"	18
N5	4	#4	2	5'-9"	15
N6	4	#4	2	4'-10"	13
S5	6	#6	STR	6'-0"	54
T1	6	#5	STR	11'-3"	70
V1	4	#4	STR	7'-1"	19
V2	4	#4	STR	6'-4"	17
V3	4	#4	STR	5'-5"	14
V4	4	#4	STR	4'-7"	12
V5	4	#4	STR	3'-8"	10
V6	4	#4	STR	2'-10"	8
Z1	8	#4	3	4'-11"	26
Z2	4	#4	3	4'-6"	12
Z3	4	#4	3	4'-0"	11
Z4	4	#4	3	3'-7"	10
Z5	4	#4	3	3'-1"	8

TOTAL REINFORCING STEEL
FOR 2 WINGS 572 LBS

CLASS A CONCRETE
2 WINGS 8.6 CY
1 HEADWALLS 1.4 CY
1 END CURTAIN WALLS 2.3 CY
TOTAL 12.3 CY

PROJECT NO. 17BP.3.R.28
NEW HANOVER COUNTY
STATION: 14+60.69 -L-

NORTH CAROLINA PROFESSIONAL SEAL 030046 ENGINEER MATTHEW PAYNE
DocuSigned by: Matthew Payne
9/28/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD WINGS FOR CONCRETE BOX CULVERT

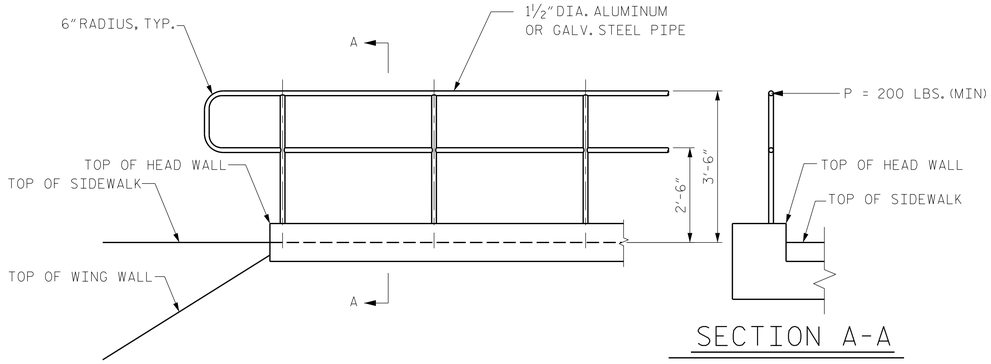
H = 7'-0" SLOPE = 2:1
90° SKEW

ASSEMBLED BY : C. DESROCHERS	DATE : MAY 2014
CHECKED BY : M. PAYNE	DATE : MAY 2014
DRAWN BY : CCJ 10/99	
CHECKED BY : RWW 03/00	

ATKINS
1616 E. MILLBROOK ROAD, SUITE #310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-10
1			3			TOTAL SHEETS
2			4			11

STD. NO. CW9007



SECTION A-A

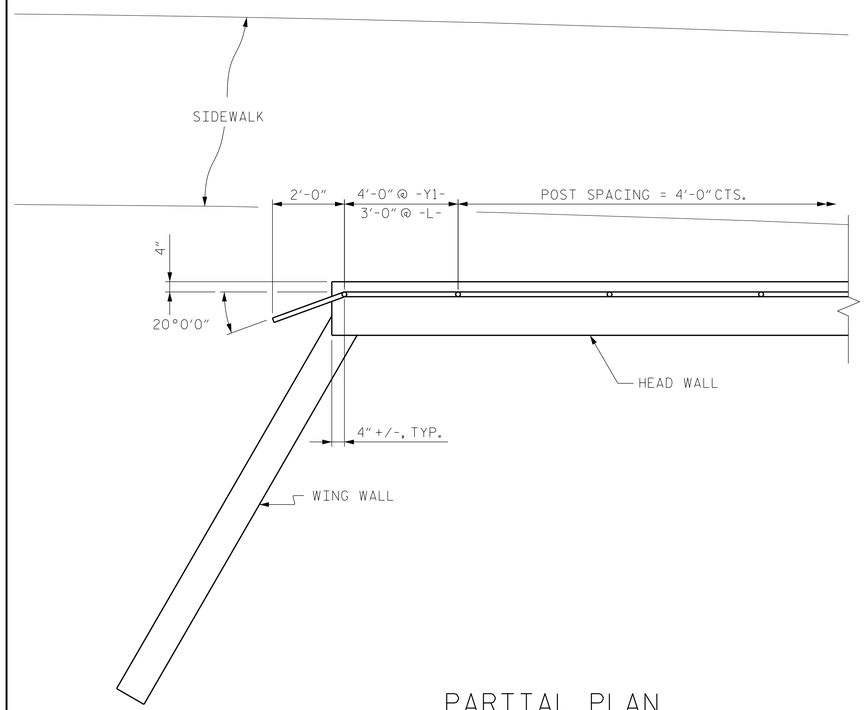
RAILING ELEVATION

NOTES:
CONTRACTOR SHALL PROVIDE DESIGN OF 1½" GALVANIZED STEEL RAILING TO MEET DIMENSIONS SHOWN. DESIGN SHALL INCLUDE CONNECTION TO HEADWALL TO RESIST AN APPLIED LOAD OF 200 LBS. AT ANY LOCATION ALONG THE RAILING. SUBMIT FINAL DESIGN TO ENGINEER FOR APPROVAL.

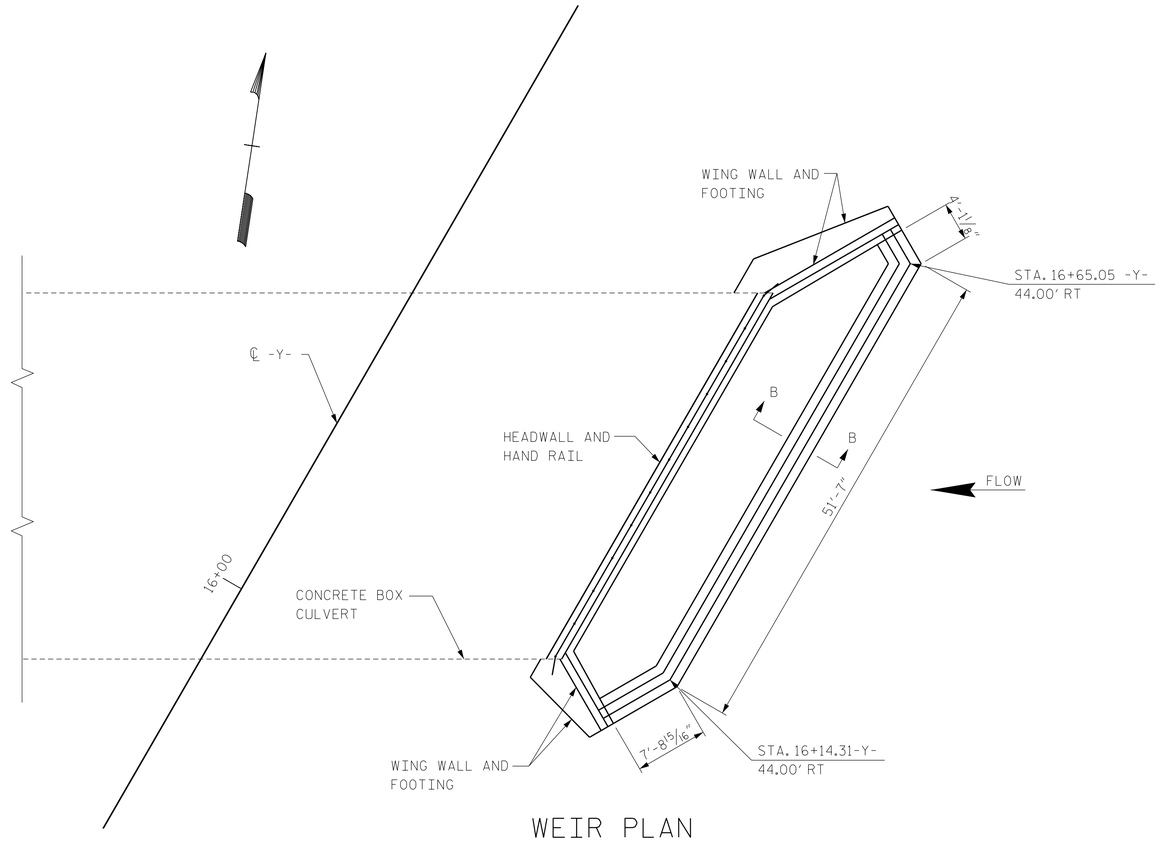
PAINT RAILING WITH ONE COAT OF PRIMER PAINT AND TWO COATS OF APPROVED PAINT (BLACK) TO BE APPROVED BY THE ENGINEER. APPLY FINAL COAT AFTER RAILING INSTALLATION.

RAILING SHOULD BE LOCATED AT BOTH OUTLET AND INLET ENDS OF THE CULVERT.

PAYMENT AT THE CONTRACT UNIT PRICE FOR ALL ITEMS ASSOCIATED WITH THE DESIGN AND INSTALLATION OF 1½" GALVANIZED STEEL PIPE WILL BE FULL COMPENSATION FOR ALL WORK COVERED AS DESCRIBED ABOVE.

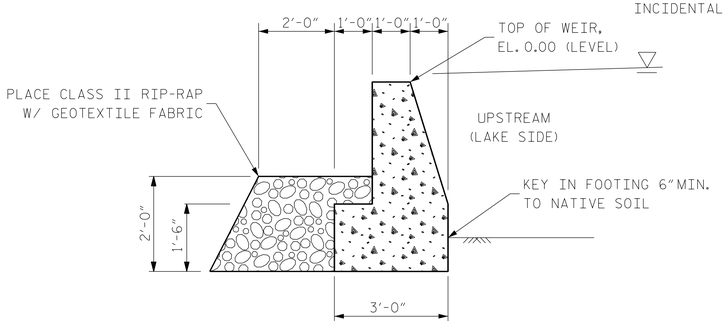


PARTIAL PLAN



WEIR PLAN

NOTE:
CONCRETE DRAINAGE WEIR SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS, AND SHALL BE CONSIDERED INCIDENTAL TO CLASS A CONCRETE FOR THE CONCRETE BOX CULVERT PAY ITEM.



WEIR SECTION B-B

PROJECT NO. 17BP.3.R.28
NEW HANOVER COUNTY
STATION: 14+60.69 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MISCELLANEOUS DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 030046 ENGINEER MATTHEW PAYNE
DocuSigned by: Matthew Payne
9/28/2016

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

DRAWN BY : C. DESROCHERS DATE : MAY 2014
CHECKED BY : M. PAYNE DATE : MAY 2014

28-SEP-2016 14:26
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PAYN5628 AT LUS290333

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.

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

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ENGLISH

JANUARY, 1990

STD. NO. SN