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PROIECT LENGTH			PREPARED BY :	
WAY TIP PROJECT: B-5140 = 0.098 MILES = 0.098 MILES				
CTURE TIP PROJECT: B-5140	= 0.016 MILES	2018 STANDARD SPECIFICATIONS		
TIP PROJECT: B-5140	= 0.114 MILES	LETTING DATE: MAY 15, 2018	BRIAN K. EASON, P.E. PROJECT ENGINEER PATRICK R. GALLAGHER, P.E. PROJECT DESIGN ENGINEER	



NOTE

FOR NOTES, SEE SHEET 3 OF 3.

HYDRAULIC DATA

DESIGN DISCHARGE FREQUENCY OF DESIGN FLOOD DESIGN HIGH WATER ELEVATION DRAINAGE AREA BASE DISCHARGE (Q100) BASE HIGH WATER ELEVATION

= 1900 CFS = 25 YEARS = 264.40 FT. = 8.0 SQ.MI. = 3470 CFS = 267.4 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 4660 CFS FREQUENCY OF OVERTOPPING FLOOD = 100+ YEARS OVERTOPPING FLOOD ELEVATION AT STA.12+31.70 -L-

= 268.8 FT.

DDAIEAT NIA

R 5110

		PROJE	CI NC)	D-J14(<u> </u>				
	I HEREBY CERTIFY		WAKE C							
	THESE PLANS ARE THE AS-BUILT PLANS.	STATI	ON:	13+2	5.00 –	<u>L</u>				
		SHEET 1	OF 3	REPLA	CES BRIDG	E No.195				
		DEP	stat PARTMEN	e of north ca F OF TRA raleigh	rolina NSPORTAT	ION				
	DOCUMENT NOT CONSIDERED FINAL	GENERAL DRAWING								
	UNLESS ALL SIGNATURES COMPLETED	BRIDC ON B SR	GE OVE SR 10 SETWEEN 1103 (F	R MOCO 01 (PEAI N SR 23 RANKLIN	CASIN (RCES RC 338 ANI N COUN	CREEK PAD) D NTY)				
NG	-Boothers SCINE		REVI	sions		SHEET No.				
te 217	Patrick placehoginer	No. BY:	DATE:	No. BY:	DATE:					
50 46 FRANSPORTATION	2/7/2018	2		4		SHEETS 17				
NANJFURIATION										





					TOT	'AL BILL	OF MATE	ERIAL —							
	REMOVAL OF EXISTING STRUCTURE AT STA.13+25.00 -L-	ASBESTOS ASSESSMENT	3'-O"Ø DRILLED PIERS IN SOIL	3'-0"Ø DRILLED PIERS NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION AT STA.13+25.00 -L-	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-O" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0 PRES CO BOX	″× 2′-9″ STRESSED NCRETE (BEAMS
	LUMP SUM	LUMP SUM	LIN.FT.	LIN.FT.	LUMP SUM	CU.YDS.	LUMP SUM	LBS.	LBS.	LIN.FT.	TON	SQ.YD.	LUMP SUM	No.	LIN.FT.
SUPERSTRUCTURE										160.0				11	880.00
END BENT 1			23.9	19.5		29.6		9,096	819		177	197			
END BENT 2			16.6	18.5		29.6		8,373	671		158	175			
TOTAL	LUMP SUM	LUMP SUM	40.5	38.0	LUMP SUM	59.2	LUMP SUM	17,469	1,490	160.0	335	372	LUMP SUM	11	880.00

NOTES	
ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.	INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD THE CONTRACTOR'S
THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.	ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM
THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH ``HEC 18-EVALUATING SCOUR AT BRIDGES.''	REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR WREMOVAL OF EXISTING STRUCTURE
THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.	AT STA. 13+25.00-L-''.
FOR OTHER DESIGN DATA AND GENERAL NOTES,SEE ``STANDARD NOTES''SHEET.	THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30'-O"LEFT AND 45'-O" BICHT OF CENTER THE ROADWAY AT END BENT 1 AND 30'-O"
FOR SUBMITTAL OF WORKING DRAWINGS,SEE SPECIAL PROVISIONS.	EACH SIDE OF CENTERLINE ROADWAT AT END BENT I AND 30 -0 EACH SIDE OF CENTERLINE ROADWAY AT END BENT 2, AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.	UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412
FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.	THE STANDARD SPECIFICATIONS.
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.	FLOOR ON STEEL I-BEAMS, SPANNING 36'-6", PROVIDING A
FOR ASBESTOS ASSESMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.	WITH H PILES, AND LOCATED AT STATION 13+25.00 -L- SHALL BE REMOVED.
FOR MAINTENANCE OF TRAFFIC,SEE TRAFFIC CONTROL PLANS.	THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION
FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.	THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE
ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY Quantity on roadway plans.	ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN
FOR SURVEY CONTROL SHEET, SEE ROADWAY PLANS.	ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
	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.



DRAWN BY :	K. E. LOFTON	DATE : <u>12–17</u>	1'
CHECKED BY :	P. R. GALLAGHER	DATE : <u>12–17</u>	
DESIGN ENGINEER :	D. N. PRETORIUS	DATE : <u>12–17</u>	FOR
			IUN

11	880.00						
			PROJ	ECT NC)	B-5140)
				WA	KE	C	
			стат		13 + 2	$\frac{1}{2500}$	
			51A1	ION:	10 1 2	.3.00 -	L
			SHEET	3 OF 3			
				STAT	e of north ca	ROLINA	
			DE	PARTMEN	GFTRA	NSPORTAT	ION
		T CONSIDERED FINAL					
	UNLESS ALL SIG	NATURES COMPLETED	BRID	GE OVE	R MOC	CASIN (CREEK
			ON	SR 10	01 (PEA	RCES RC	DAD)
	N. CR.TH	CAROLIN	СП		N SR 2	338 ANI	
	A got	SEAL	ЭК	1103 (F	KAINKLII		NTT)
	PP 0	42890		REVIS	SIONS		SHEET No.
5	Patrick	P.S. CARLeghier	No. BY:	DATE:	No. BY:	DATE:	S1–3
	7DC4BC8E0A 2/7/	38442 2018	1		3		TOTAL SHEETS 1 7
ORTATION					 4		

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		LOAD AN	ND RE	SIST	ANCE	FAC	TOR	RAT	ING	(LRFI	R) SL	JMMAF	RY F	OR P	REST	RESS	SED (CONC	RETE	GIF	RDERS	>	
							STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						
										MOMENT					SHEAR						MOMENT		
LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × RF	LIVE-LOAD FACTORS (Y _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD Factors (Y _{ll})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)
		HL-93 (INVENTORY)	NZA		1.155		1.750	0.273	1.720	А	EL	39.250	0.502	1.510	А	EL	7.850	0.800	0.273	1.155	А	EL	39.250
DESIGN		HL-93 (OPERATING)	NZA		1.958		1.350	0.273	2.230	А	EL	39.250	0.502	1.958	А	EL	7.850	NZA					
RATING		HS-20 (INVENTORY)	36.000	2	1.533	55.181	1.750	0.273	2.280	А	EL	39.250	0.502	1.910	А	EL	7.850	0.800	0.273	1.533	А	EL	39.250
		HS-20 (OPERATING)	36.000		2.473	89.021	1.350	0.273	2.960	А	EL	39.250	0.502	2.473	А	EL	7.850	NZA					
		SNSH	13.500		3.509	47.376	1.400	0.273	6.530	А	EL	39.250	0.502	5.730	А	EL	7.850	0.800	0.273	3.509	А	EL	39.250
		SNGARBS2	20.000		2.594	51.880	1.400	0.273	4.820	А	EL	39.250	0.502	4.060	А	EL	7.850	0.800	0.273	2.594	А	EL	39.250
	ICL	SNAGRIS2	22.000		2.448	53.850	1.400	0.273	4.550	А	EL	39.250	0.502	3.760	А	EL	7.850	0.800	0.273	2.448	А	EL	39.250
	<pre></pre>	SNCOTTS3	27.250		1.746	47.571	1.400	0.273	3.250	А	EL	39.250	0.502	2.860	А	EL	7.850	0.800	0.273	1.746	А	EL	39.250
	C C C	SNAGGRS4	34.925		1.451	50.667	1.400	0.273	2.700	А	EL	39.250	0.502	2.360	А	EL	7.850	0.800	0.273	1.451	А	EL	39.250
	INC	SNS5A	35.550		1.419	50.453	1.400	0.273	2.640	А	EL	39.250	0.502	2.380	А	EL	7.850	0.800	0.273	1.419	А	EL	39.250
		SNS6A	39.950		1.299	51.885	1.400	0.273	2.420	А	EL	39.250	0.502	2.170	А	EL	7.850	0.800	0.273	1.299	А	EL	39.250
LEGAL		SNS7B	42.000		1.237	51.941	1.400	0.273	2.300	А	EL	39.250	0.502	2.130	А	EL	7.850	0.800	0.273	1.237	А	EL	39.250
RATING	ER	TNAGRIT3	33.000		1.583	52.231	1.400	0.273	2.940	А	EL	39.250	0.502	2.590	А	EL	7.850	0.800	0.273	1.583	А	EL	39.250
	RAII	TNT4A	33.075		1.589	52.550	1.400	0.273	2.960	А	EL	39.250	0.502	2.530	А	EL	7.850	0.800	0.273	1.589	А	EL	39.250
	T-TN	TNT6A	41.600		1.296	53.907	1.400	0.273	2.410	А	EL	39.250	0.502	2.250	А	EL	7.850	0.800	0.273	1.296	А	EL	39.250
	SEN ST)	TNT7A	42.000		1.301	54.625	1.400	0.273	2.420	А	EL	39.250	0.502	2.210	А	EL	7.850	0.800	0.273	1.301	А	EL	39.250
)TOR (TT	TNT7B	42.000		1.341	56.333	1.400	0.273	2.490	А	EL	39.250	0.502	2.080	А	EL	7.850	0.800	0.273	1.341	А	EL	39.250
	TRAC	TNAGRIT4	43.000		1.279	55.001	1.400	0.273	2.380	А	EL	39.250	0.502	2.020	А	EL	7.850	0.800	0.273	1.279	Α	EL	39.250
	JCK	TNAGRT5A	45.000		1.207	54.337	1.400	0.273	2.250	Α	EL	39.250	0.502	2.000	Α	EL	7.850	0.800	0.273	1.207	Α	EL	39.250
	TRL	TNAGRT5B	45.000	$\overline{3}$	1.194	53.739	1.400	0.273	2.220	А	EL	39.250	0.502	1.920	А	EL	7.850	0.800	0.273	1.194	А	EL	39.250



7:26:41 PM		
5/2018	ASSEMBLED BY : K.E.LOFTON CHECKED BY : P.R.GALLAGHER	DATE : 12-17 DATE : 12-17
DATE: 22	DRAWN BY : TMG 11/11 CHECKED BY : AAC 11/11	

LRFR SUMMARY

			PLANS PREF
			PARS
DRAWN BY :	K. E. LOFTON	DATE : <u>12–17</u>	5540 Centerview
CHECKED BY :	P. R. GALLAGHER	DATE : <u>12–17</u>	Raleigh, NC
DESIGN ENGINEER	: D. N. PRETORIUS	DATE : <u>12–17</u>	
			FUR NURTH CARULINA DEPAR

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DAD FACTORS

DESIGN LOAD RATING	LIMIT STATE	γ_{DC}	$\gamma_{\sf DW}$
	STRENGTH I	1.25	1.50
FACTORS	SERVICE III	1.00	1.00

NOTES

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES. ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS

- 2.

(#) CONTROLLING LOAD RATING
1 DESIGN LOAD RATING (HL-93)
2 DESIGN LOAD RATING (HS-20)
<pre>3 LEGAL LOAD RATING **</pre>
* * SEE CHART FOR VEHICLE TYPE
GIRDER LOCATION
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER

B-5140 PROJECT NO. WAKE COUNTY 13 + 25.00 - L -STATION: ____ STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED LRFR SUMMARY FOR 80' BOX BEAM UNIT 90° SKEW TH CARO Q. FESSION (NON-INTERSTATE TRAFFIC) SEAL 92890 042890 EPARED BY : SONS ew Drive, Suite 217 C 27606-3386 ISE No. F-0246 PARTMENT OF TRANSPORTATIC REVISIONS SHEET No. S1–4 MERP Stopped DATE: DATE: No. BY: BY: total sheets **17** 3 DC4BC8E0A38442... 2/7/2018 4

STD. No. 33LRFR1_90S_80L



ASSEMBLED BY : K.E.LOFTON DATE : 12-17 CHECKED BY : P.R.GALLAGER DATE : 12-17 DRAWN BY : DGE 8/11 CHECKED BY : TMG 11/11 REV. 9/14 MAA/TMG	structures/plans/tinal/B–DI 7:26:50 PM					
DRAWN BY: DGE 8/11 CHECKED BY: TMG 11/11 REV. 9/14 MAA/TMG	b-5140\ 5/2018	ASSEMBLED BY : K.E. CHECKED BY : P.R.	.LOFT GALLA	ON GER	DATE : DATE :	12-17 12-17
	HLE: I:\ DATE: 22	DRAWN BY : DGE CHECKED BY : TMG 1	8/11 1/11	REV.	9/14	МАА/ТМС

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STD. No. 33PCBB_33_90S





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GRADE 270 S	TRANDS
	0.6″ØL.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS.PER STRAND)	58,600
APPLIED PRESTRESS (LBS.PER STRAND)	43,950

I, INTERIOR U 5 #5S5 BARS.	NIT							
PHRAGMS, SEE T 2 OF 5.		Ρ	ROJE)		B-514	0
S,SEE ``THREA T 1 OF 5.	DED				<u>KE</u> 1:	3+2	C 5 00 -	OUNTY -I
EL IN DIAPHF GM DETAILS'',	RAGMS,		HEET 3	OF 5			0.00	
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		def PRE	STRES	STA -O" SSE BE 90°	NORTH CAR F TRAN RALEIGH NDAR NDAR X 2' D C AM SKE	olina NSPORTA D Z-9" CONCF UNIT W	
NNS	DOD NGINE			REV	isions/			SHEET No.
Drive, Suite 217	Patrick R Ballaginer	No.	BY:	DATE:	N₀. 2	BY:	DATE:	SI-7 TOTAL
No. F-0246	2/7/2018	2			4			SHEETS
				STD.N	10.3	3PCBB4	1_90S_80	L









DEAD LOAD DEFLECTION AND CAMBER 3'-0"× 2'-9" 0.6″ØL.R. STRAND SPAN A 1³⁄4″ CAMBER (SLAB ALONE IN PLACE) ** DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD !∕₂″ ∳ 1[|]/4″ FINAL CAMBER

* * INCLUDES FUTURE WEARING SURFACE



DRAWN BY <u>K. E. LOFTON</u> DATE : <u>12–17</u> P. R. GALLAGHER DATE : 12-17 CHECKED BY DESIGN ENGINEER : D. N. PRETORIUS DATE : 12-17





GROUTED RECESS AT END OF POST-TENSIONED STRANDS - BOX BEAM

	PROJECT NC WA STATION:	o. <u>B–51</u> KE 13 + 25.00	40 COUNTY _L_
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	STAT DEPARTMENT 3'- PRESTRES BOX 9	E OF NORTH CAROLINA OF TRANSPORT RALEIGH STANDARD O'' x 2'-9'' SED CONO BEAM UN O° SKEW	CRETE
	REVI	sions	SHEET No.
Suite 217 3386	No. BY: DATE: 1	No. BY: DATE:	TOTAL
-0246 2/7/2018 OF TRANSPORTATION	2	4	SHEETS
	S	TD.No.33PCBB5_	905

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GUTTERLINE ASPHALT WEARING SURFACE THICKNESS AND RAIL HEIGHT AT MID–SPAN				
	ASPHALT WEARING SURFACE THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN		
LEFT	21/4″	3'-81/4"		
RIGHT	21/4″	3′-81/4″		

BC	DX BEAMS	6 REQUIR	ED
SPAN A	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR BOX BEAM	2	80'-0"	160'-0"
INTERIOR BOX BEAM	9	80'-0"	720′-0″
TOTAL	11		880'-0"

NOTE: FOR ASPHALT WEARING SURFACE THICKNESS AND RAIL HEIGHT AT END BENTS, SEE TYPICAL SECTION, SHEET 1 OF 5.



:tructures\plans\tinal\B-5140_Div_5_910195_smu_t 7:27:04_PM			
b–5140\: 5/2018	ASSEMBLED BY : K.E.LOFTON DAT CHECKED BY : P.R.GALLAGER DAT	Е: Е:	12-17 12-17
FILE: j:\ DATE: 2/3	DRAWN BY: DGE 10/11 REV. 4/15 CHECKED BY: TMG 11/11		MAA/TMG

В	ILL OF MATERIAL FOR ONE VERT		VCRETE	BARR	IER RA	IL
BAR	BARS PER ONE EXTERIOR UNITS	TOTAL No.	SIZE	TYPE	LENGTH	WEIGHT
	80'-0" UNIT					
₩ B8	36	36	#5	STR	26'- 3"	986
* S6	111	111	#5	1	7'- 2"	830
₩ EPOX	* EPOXY COATED REINFORCING STEEL (PER EXTERIOR UNIT) 1,816 LBS.					
CLAS	CLASS AA CONCRETE (PER EXTERIOR UNIT) 10.3 CU.YDS.					
VERTICAL CONCRETE BARRIER RAIL (PER EXTERIOR UNIT) 80.0 LIN.FT.						



(TYPE II - 22 REQUIRED)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.







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BOL CONF BE AND NUTS REQU THE	TS SI FORM GALV WAS S AN JIREI ENGI	HAI AN HE D ME IN[
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RDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

			PLANS PREPA
			PARS
DRAWN BY :	K. E. LOFTON	DATE : <u>12–17</u>	5540 Centerview
CHECKED BY :	P. R. GALLAGHER	DATE : <u>12–17</u>	Raleigh, NC 27
DESIGN ENGINEER :	D. N. PRETORIUS	DATE : <u>12–17</u>	
			FOR NORTH CAROLINA DEPART

DRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A $\frac{1}{4}$ " hold down plate and BOLTS WITH NUTS AND WASHERS.

DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER ION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE HTO M111.

ALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL NIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS ERS MAY BE USED AS AN ALTERNATE FOR THE $\frac{7}{8}$ " Ø GALVANIZED BOLTS, WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL ENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY IEER.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.



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BAGGED ST OF END BE STEEL, COR PIPE WILL BAGGED ST THAT IT E SILT ACCL ENGINEER. DETERMINE

NO SEPARA OF THIS W SEVERAL P

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DRAWN BY :	K. E. LOFTON	DATE : <u>12–17</u>	
CHECKED BY :	P. R. GALLAGHER	DATE : <u>12–17</u>	
DESIGN ENGINEER :	D. N. PRETORIUS	DATE : <u>12–17</u>	FOR NORTH

NIMUM OF 3 - ONE CUBIC FOOT B BAGS SHALL BE OF POROUS FABRIC	AGS OF #78M STONE. C, SECURELY TIED.
WORK	
	FOR DRAINAGE
GRADE TO DRAIN	GRADE TO DRAIN
	TOE OF SLOPE_
TONE AND PIPE SHALL BE PLACED ENT EXCAVATION. PIPE MAY BE EI RRUGATED ALUMINUM ALLOY,OR CO L NOT BE ALLOWED.	IMMEDIATELY AFTER COMPLETION THER CONCRETE, CORRUGATED RRUGATED PLASTIC. PERFORATED
TONE SHALL REMAIN IN PLACE UN BE REMOVED. THE CONTRACTOR SHA UMULATIONS AT BAGGED STONE WH BAGS SHALL BE REMOVED AND REF	IL THE ENGINEER DIRECTS ALL REMOVE AND DISPOSE OF EN SO DIRECTED BY THE ALACED WHENEVER THE ENGINEER
ATE PAYMENT SHALL BE MADE FOR	THIS WORK AND ENTIRE COST
WORK SHALL BE INCLUDED IN HE U PAY ITEMS.	NII CONTRACT PRICE FOR THE
PORARY DRAINAGE A	T END BENT
	project no. <u>B-5140</u>
	WAKE COUNTY
	STATION: <u>13+25.00</u> –L–
	SHEET 3 OF 4
	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH
DOCUMENT NOT CONSIDERED FIN	
	END BENT DETAILS
SEESSION NAT	
ARED BY	REVISIONS SHEET No.
Drive, Suite 217 27606-3386 No. E-0246 2/7/2018	No. BY: DATE: No. BY: DATE: S1-13 1 3 3 TOTAL SHEETS
MENT OF TRANSPORTATION	2 4 17



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BAR TYPES

BLE OF D R REINFO	DRILLED PIER LENGTH		
LED PIER			
1-1	SP1	M1	13′-5 /2″
1-2	SP2	M2	14'-5 /2"
1-3	SP3	М3	15′-5 /2″
2-1	SP4	M4	11′-8 <mark>¾</mark> ″
2-2	SP4	M4	11′-8 <mark>¾</mark> ″
2-3	SP4	M4	11′-8 ³ ⁄/8″







DRAWN BY :	K. E. LOFTON	DATE : <u>12–17</u>	
CHECKED BY :	P. R. GALLAGHER	DATE : 12–17	
DESIGN ENGINEER :	D. N. PRETORIUS	DATE : <u>12–17</u>	

BII	BILL OF MATERIAL						
	END BENT 1	END BENT 2					
HOOK	BAR No. SIZE TYPE LENGTH WEIGHT B1 10 #10 3 41'-6" 1,786 B2 20 #4 STR 20'-7" 275	BAR NO. SIZE TYPE LENGTH WEIGHT B1 10 #10 3 41'-6" 1,786 B2 20 #4 STR 20'-7" 275					
<u> </u>	D1 22 #8 STR 2'- 3" 132	D1 22 # 8 STR 2'- 3" 132					
	H1 48 #4 6 11'- 4" 363	H1 48 #4 6 11'- 4" 363					
	K1 12 #4 STR 20'-7" 165	K1 12 #4 STR 20'-7" 165					
	M1 16 #11 1 19'- 8" 1,672 M2 16 #11 1 20'- 8" 1,757 M3 16 #11 1 21'- 8" 1,842	M4 48 #11 1 17'-10" 4,548 U1 6 #4 4 6'-7" 26					
	U1 6 #4 4 6'-7" 26 U2 33 #4 4 3'-4" 73	U_2 35 #4 4 3'-4" (3 S1 48 #4 5 4'-1" 131					
-1	S1 48 #4 5 4'-1" 131 S2 48 #4 2 11' 4" 767	S2 48 #4 2 11'- 4" 363					
	SZ 48 "4 Z 11-4 363 V1 60 #4 STR 7'-3" 291	V2 66 #4 STR 5'-0" 220					
	V2 66 #4 STR 5'-0" 220	REINFORCING STEEL 8,373 LBS.					
	REINFORCING STEEL 9,096 LBS.	SP4 3 *** 7 214'-7" 671					
	SP11***7244'-10"255SP21***7262'-1"273SP31***7279'-4"291	SPIRAL COLUMN REINFORCING STEEL 671 LBS.					
	SPIRAL COLUMN REINFORCING STEEL 819 LBS.	CLASS A CONCRETE					
	CLASS A CONCRETE	POUR 3 BACKWALL AND UPPER WINGS 5.5 CU.YDS.					
	POUR 3 BACKWALL AND UPPER WINGS 5.5 CU.YDS.	POUR 2 CAP AND Lower Wings 24.1 cu.yds.					
	POUR 2 CAP AND	TOTAL 29.6 CU.YDS.					
	LOWER WINGS 24.1 CU. YDS.	DRILLED PIER CONCRETE					
	TOTAL 29.6 CU.YDS.	POUR 1 9.2 CU. YDS.					
	DRILLED PIER CONCRETE POUR 1 11.4 CU.YDS.	3'-O"Ø DRILLED PIER IN SOIL 16.6 LIN.FT.					
	3'-O"Ø DRILLED PIER IN SOIL 23.9 LIN.FT.	3'-O"Ø DRILLED PIER NOT IN SOIL 18.5 LIN.FT.					
	3'-O"Ø DRILLED PIER NOT IN SOIL 19.5 LIN.FT.	<pre>*** THE SP4 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN</pre>					
	* * * THE SP1, SP2 AND SP3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR	OR DEFORMED BAR.					
	UR "O PLAIN UR DEFURMED BAR.						
		ECT NO. B-5140					
STATION: 13+25.00 -L-							
SHEET 4 OF 4							
	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION						
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	SUBSTRUCTURE					
	WITH CAROUS	END BENT DETAILS					
	SEAL						

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Patricka Spanlagher	No.	BY:	DATE:	No.	BY:
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2/7/2018	2			4	

SHEET No. S1–14

total sheets **17**

DATE:



ESTIMATED QUANTITIES					
RIDGE @ 13+25.00 -L-	RIP RAP CLASS II (2'-O" THICK) (TONS)	GEOTEXTILE FOR DRAINAGE (SQUARE YARDS)			
BENT 1	177	197			
BENT 2	158	175			

PLANS PREPA
PARS
5540 Centerview [
Raleigh, NC 27
NC LICENSE N
FOR NORTH CAROLINA DEPARTM

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DESIGN ENGINEER :	D. N. PRETORIUS	DATE : <u>12–17</u>	





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-5140\structures\plans\final\B-5140_Div_5_910195

STD. No. BAS_BB_33_90S

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 2018 ``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 $\frac{3}{4}$ "with the following exceptions: TOP CORNERS OF CURBS MAY BE ROUNDED TO 11/2" 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 $\frac{1}{4}$ RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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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.

STANDARD NOTES

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 $\frac{7}{8}$ " Ø SHEAR STUDS FOR THE $\frac{3}{4}$ " 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 $\frac{7}{8}$ " Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 1/8" Ø STUDS FOR 4 - $\frac{3}{4}$ " Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-O".

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 $\frac{5}{16}$ " 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.

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.



HANDRAILS AND POSTS:

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PROJECT NO.

TOTAL SHEETS

B–5140