TOTAL BILL OF MATERIALS

	TEMPORARY RAILROAD SHORING	REMOVAL OF EXISTING STRUCTURES	4'-6" DIA. DRILLED PIER IN SOIL (LFD)	4'-0" DIA. DRILLED PIER IN SOIL (LFD)	4'-6" DIA. DRILLED PIER NOT IN SOIL (LFD)	4'-0" DIA. DRILLED PIER NOT IN SOIL (LFD)	SID INSPECTIONS (LFD)	SPT TESTING (LFD)	CSL TESTING (LFD)	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	CONCRETE	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 755,000 LBS. STRUCTURAL STEEL	PAINTING OF STRUCTURAL STEEL	HP12X53 STEEL PILES (LFD)		1'-0" x 2'-0" CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	STRUCTURE DRAINAGE SYSTEM
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SQ. FT.	CU. YDS.	LBS.	LBS.	LUMP SUM	LUMP SUM	NO.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE											8,278				LUMP SUM	LUMP SUM			328.3		LUMP SUM
ABUTMENT 1				86.5		35		5	5			83.0	30,164	5,549						233	
PIER 1			18.5		48				5			75.8	22,468	6,094							
PIER 2			70.5		45			5	5			75.5	26,633	8,386							
PIER 3			57.5		40				5			75.2	25,103	7,494							
ABUTMENT 2												90.8	14,367				28	840		233	
TOTAL	LUMP SUM	LUMP SUM	146.5	86.5	133	35	20	10	20	LUMP SUM	8,278	400.3	118,735	27,523	LUMP SUM	LUMP SUM	28	840	328.3	466	LUMP SUM

GENERAL NOTES

1. ASSUMED LIVE LOAD: AREMA E80 OR ALTERNATE LIVE LOAD.
2. FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
3. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND NORFOLK SOUTHERN CORPORATION'S "GUIDELINES FOR DESIGN OF HIGHWAY SEPARATION STRUCTURES UNDER RAILROAD (UNDERPASS GRADE SEPARATION)".
4. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC ZONE 1.
5. REINFORCING STEEL SHALL BE ASTM 615, GRADE 60. ALL DIMENSIONS RELATING TO BAR SPACING ARE TO BAR CENTERS UNLESS NOTED OTHERWISE. FABRICATION IS TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", ACI 315-80. ALL REINFORCING IN THE CONCRETE DECK SLAB AND PARAPETS SHALL BE EPOXY COATED.
6. EXPANSION JOINT MATERIAL SHALL BE EITHER RUBBER OR CORK CONFORMING WITH AASHTO SPECIFICATIONS M-153-84 EXCEPT AS SHOWN ON THE PLANS OR IN THE SPECIAL PROVISIONS. CELLULAR AND BULB TYPE WATERSTOPS AND RUBBER JOINT COMPOUNDS SHALL BE SHOWN ON THE PLANS AND IN THE SPECIAL PROVISIONS.
7. STRUCTURE DRAINAGE SYSTEM: METAL DRAINS BEHIND ABUTMENTS AND DUCTILE IRON PIPE COLLECTOR SYSTEM SHALL BE AS SHOWN ON THE PLANS AND OUTLINED IN THE SPECIAL PROVISIONS. DETAILS OF THE DRAINAGE SYSTEM SHALL BE SUBMITTED TO THE CHIEF ENGINEER, BRIDGES AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, GA FOR APPROVAL.
8. DAMPPROOFING: PIER COLUMNS UP TO THE GROUND LINE, BACK OF BACKWALLS, ABUTMENT SEATS AND BACK OF WINGS SHALL BE DAMPPROOFED, IN ACCORDANCE WITH AREMA CHAPTER 8, PART 29. SEE SPECIAL PROVISIONS FOR NS SPECIFICATIONS FOR CAST-IN-PLACE CONCRETE.
9. WATERPROOFING: ALL CONSTRUCTION JOINTS AND ANY SHRINKAGE CRACKS WHICH WILL BE COVERED BY FILL, SHALL BE WATERPROOFED WITH A TWO PART WATERPROOFING SYSTEM, CONSISTING OF A MEMBRANE LAYER AND A PROTECTIVE COURSE. STRIPS OF WATERPROOFING NO LESS THAN 2 FEET WIDE SHALL BE PLACED SYMMETRICALLY OVER JOINTS. THE ENTIRE BRIDGE DECK SHALL BE WATERPROOFED WITH A TWO PART WATERPROOFING SYSTEM, CONSISTING OF A MEMBRANE LAYER AND A 1 INCH THICK ASPHALT PLANKING OR OTHER RAILWAY APPROVED PROTECTION MATERIAL. ALL WATERPROOFING MATERIALS SHALL CONFORM TO THE RECOMMENDED PRACTICES IN THE AREMA MANUAL OF RAILWAY ENGINEERING CHAPTER 8, PART 29.
10. FOR WATERPROOFING, SEE SPECIAL PROVISIONS.
11. FOR WATERSTOPS, SEE SPECIAL PROVISIONS.
12. 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.
13. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2012, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE ON PLANS, OR IN THE SPECIAL PROVISIONS. STRUCTURAL STEEL IN ACCORDANCE WITH CURRENT AREMA SPECIFICATIONS AND NORFOLK SOUTHERN'S "SPECIFICATIONS FOR STEEL".
14. ALL CONCRETE USED IN THE SUPERSTRUCTURE (DECK AND CURBS) SHALL BE MIN. 5,000 PSI CONCRETE AND ALL CONCRETE USED IN THE SUBSTRUCTURE SHALL BE MIN. 4,000 PSI CONCRETE, WITH NO.57 OR 67 COARSE AGGREGATE AND SHALL BE AIR-ENTRAINED. MINIMUM CEMENT PER CUBIC YARD OF CONCRETE SHALL BE 6.5 BAGS. NO SUBSTITUTION OF FLY ASH, BLAST FURNACE SLAG OR OTHER MATERIAL WILL BE PERMITTED IN MEETING THIS MINIMUM CEMENT REQUIREMENT. CHAMFER ALL EXPOSED EDGES AND CORNERS ¾" EXCEPT AS NOTED ON THE PLANS. THE USE OF GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED IN THIS STRUCTURE.
15. CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILWAY STRUCTURE SHALL BE PERFORMED SATISFACTORY TO THE ENGINEER AND/OR NORFOLK SOUTHERN RAILWAY COMPANY. ALL METHODS OF HANDLING THE WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY COMPANY BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. RAIL TRAFFIC SHALL, AT ALL TIMES, BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL NOT AT ANY TIME DELAY OR INTERFERE WITH RAIL OPERATIONS.
16. NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
17. FOR SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.
18. FOR CONDUITS IN PARAPETS, SEE SPECIAL PROVISIONS.
19. FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.
20. FOR FINE AND COARSE AGGREGATE, SEE SPECIAL PROVISIONS.
21. SEE "STRUCTURAL STEEL NOTES" SHEET FOR ADDITIONAL NOTES.
22. FOR RUBBER JOINT COMPOUNDS, SEE SPECIAL PROVISIONS.
23. FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.
24. FOR RAILROAD TRACKWORK, SEE RAILROAD TRACKWORK PLANS.
25. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
26. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
27. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
28. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
29. FOR CAST-IN-PLACE CONCRETE, SEE "NS SPECIFICATIONS FOR CAST-IN-PLACE CONCRETE" SPECIAL PROVISION.
30. WORK SHALL NOT BEGIN ON THIS BRIDGE UNTIL THE TEMPORARY SHORING HAS BEEN INSTALLED AND APPROVED, THE SITE EXCAVATED TO THE APPROVED TEMPORARY GRADE ELEVATIONS, AND THE NECESSARY TEMPORARY EROSION CONTROL AND SEDIMENT CONTROL MEASURES INSTALLED AND ACCEPTED.
31. FOR TEMPORARY RAILROAD SHORING, SEE SPECIAL PROVISIONS.
32. FOR BACKFILL BEHIND ABUTMENTS AND OTHER BACKFILL AROUND THE STRUCTURE, SEE SPECIAL PROVISION "BACKFILLING AROUND STRUCTURES".
33. FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS FOR "NS SPECIFICATIONS FOR PAINTING SHOP FABRICATED BRIDGE STEEL".
34. FOR ELASTOMERIC FLASHING, SEE SPECIAL PROVISIONS.
35. FOR PROTECTION OF RAILWAY INTERESTS, SEE SPECIAL PROVISIONS.
36. FOR RAILROAD ROADBED, SEE RAILROAD ROADBED SPECIAL PROVISIONS.
37. FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
38. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL BILL OF MATERIALS CONT'D.

	DAMPPROOFING (RAILROAD STRUCTURES)	TWO PART MEMBRANE WATER PROOFING SYSTEM	MEMBRANE LAYER WATER PROOFING SYSTEM FOR DECK	1" ASPHALT PLANKING PROTECTIVE COURSE FOR DECK	HANDRAIL AND FENCE	SELF-LUBRICATING EXPANSION BEARING ASSEMBLES	CONDUIT IN PARAPET	ASBESTOS ASSESSMENT
	SQ. YDS.	SQ. YDS.	SQ. YDS.	SQ. YDS.	LIN. FT.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			913	913	326.0	LUMP SUM	LUMP SUM	
ABUTMENT 1	84	18.8			22.1			
PIER 1	21							
PIER 2	12							
PIER 3	21							
ABUTMENT 2	84	18.8			22.1			
TOTAL	222	37.6	913	913	370.2	LUMP SUM	LUMP SUM	LUMP SUM

39. ALL CONSTRUCTION JOINTS SHOWN ON THESE PLANS SHALL BE REQUIRED UNLESS SHOWN OPTIONAL. CONSTRUCTION JOINTS SHALL NOT BE PERMITTED EXCEPT AS SHOWN ON THE PLANS, OR WHERE WRITTEN APPROVAL HAS BEEN OBTAINED.
40. BENCHMARK: SEE LOCATION SKETCH.
41. DIRECT TENSION INDICATORS (DTI) WILL NOT BE PERMITTED. USE THE TURN-OF-NUT METHOD FOR INSTALLING AND TIGHTENING HIGH STRENGTH BOLTS.
42. THE RAILROAD TRACK TOP OF RAIL ELEVATIONS ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
43. FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.
44. THE CONTRACTOR IS REMINDED THAT WORK ON THIS PROJECT REQUIRES WORKING NEAR EXISTING STRUCTURES. EVERY EFFORT HAS BEEN MADE TO IDENTIFY DISCREPANCIES AND ENSURE THAT THE DETAILS ARE DEPICTED CORRECTLY. HOWEVER, SINCE THE PROJECT INVOLVES WORKING NEAR EXISTING STRUCTURES, THE CONTRACTOR CAN EXPECT AND SHOULD PLAN ON ENCOUNTERING VARIANCES AND DEVIATIONS BETWEEN THE INFORMATION FOUND IN THESE DRAWINGS AND THE EXISTING CONDITIONS. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS IN CONSTRUCTION DETAILS AND QUANTITIES. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL DETAILS INCLUDING GEOMETRY AND ELEVATIONS PRIOR TO THE INSTALLATION OF ANY MATERIAL. THE CONTRACTOR SHALL SUBMIT TO NCDOT AND NORFOLK SOUTHERN COPIES OF FIELD SURVEYS AND VERIFICATIONS FOR INCLUSION INTO THE CONSTRUCTION RECORDS FOR THE PROJECT.
45. FOR REINFORCED CONCRETE DECK SLAB, SEE SPECIAL PROVISION FOR NS SPECIFICATIONS FOR CAST-IN-PLACE CONCRETE. FOR MEASUREMENT AND PAYMENT OF REINFORCED CONCRETE DECK SLAB, SEE THE STANDARD SPECIFICATIONS.
46. FOR STRUCTURAL STEEL, SEE SPECIAL PROVISIONS FOR NS SPECIFICATIONS FOR STRUCTURAL STEEL.
47. AFTER SERVING AS TEMPORARY STRUCTURES, THE THREE EXISTING STRUCTURES CONSISTING OF 3 SPANS WITH TWO STEEL BEAMS AND TIMBER RAIL TIES AND A BUILT-UP STEEL LATTICE FRAME SUBSTRUCTURE AND LOCATED APPROXIMATELY AT THE LOCATION OF THE NEW BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
48. THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 31'-0" TO THE RIGHT OF -NSN- AND 29'-2" TO THE LEFT OF -NSN- AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
49. 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.
50. FOR HANDRAIL AND FENCE, SEE SPECIAL PROVISIONS.
51. 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 STA. 24+09.63 -LALT-.
52. THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT BELOW THE GROUND LINE.
53. FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

PROJECT NO. U-3308
DURHAM COUNTY
STATION: POT 24+09.63 -LALT-
POT 21+11.43 -NSN-

SHEET 4 OF 4 M.P. H-56.10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING TOTAL BILL OF MATERIAL & GENERAL NOTES

FOR BRIDGE ON NSRR OVER NC 55 (ALSTON AVE.) BETWEEN NC 147 & ANGIER AVE.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-4
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 19765 ENGINEER PAUL E. KELLY, JR. 4/29/2016

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Charlotte, NC 28202
NC License No. F-0991

DRAWN BY : NMC DATE : 06-14
CHECKED BY : DJM DATE : 06-14

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