

STRUCTURAL STEEL NOTES

STRUCTURAL STEEL: ALL STRUCTURAL STEEL SHAPES, PLATES AND BARS SHALL BE ASTM A709, GRADE 50 OR 50W, UNLESS NOTED OTHERWISE. FRACTURE CRITICAL MEMBERS SHALL BE ASTM A709, GRADE 50F2 OR 50WF2 (SUPPLEMENTAL REQUIREMENT S84 AND S29 SHALL APPLY). NON-FRACTURE CRITICAL MEMBERS SHALL BE ASTM A709, GRADE 50T2 OR 50WT2 (SUPPLEMENTAL REQUIREMENTS S83 SHALL APPLY). ALL STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND THE FOLLOWING REQUIREMENTS:

1. THE MATERIAL SUPPLIED SHALL BE OTHER THAN RIMMED OR CAPPED STEEL.
2. THE MATERIAL SUPPLIED SHALL BE SILICONE KILLED, FINE GRAIN PRACTICE.
3. CERTAIN ELEMENTS OF THE STRUCTURE ARE NOTED AS "FRACTURE CRITICAL MEMBERS" (FCM) AND SHALL MEET THE REQUIREMENTS FOR "FRACTURE CONTROL PLAN FOR FRACTURE CRITICAL MEMBERS" (AREMA CHAPTER 15, SECTION 1.14.) THE IMPACT REQUIREMENTS FOR FRACTURE CRITICAL MEMBERS SHALL BE AS REQUIRED FOR ZONE 2 SERVICE TEMPERATURE. TEST RESULTS SHALL BE FURNISHED TO THE ENGINEER OR AUTHORIZED REPRESENTATIVE.
4. ALL NON-FRACTURE CRITICAL MEMBERS OF THE STRUCTURE SHALL CONFORM TO THE SUPPLEMENTAL REQUIREMENTS FOR NON-FRACTURE CRITICAL IMPACT TEST NOTED IN AREMA CHAPTER 15, SECTION 1.2.1, TABLE 15-1-2 FOR ZONE 2 SERVICE TEMPERATURE. TEST RESULTS SHALL BE FURNISHED TO ENGINEER OR AUTHORIZED REPRESENTATIVE.

ALL STEEL MATERIAL SHALL BE STRAIGHT AND FREE FROM SHARP KINKS AND BENDS. ANY STEEL MATERIAL EXHIBITING SUCH DEFICIENCIES SHALL BE CAUSE FOR THE REJECTION OF THE MATERIAL. STRAIGHTENING OF THE MATERIAL SHALL NOT BE ACCEPTABLE.

MATERIAL AND WORKMANSHIP: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PROJECT PLANS OR SPECIFICATIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA) MANUAL FOR RAILWAY ENGINEERING. PROJECT SHALL ALSO ADHERE TO STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) STANDARD SPECIFICATIONS, 2012 REVISION. IN THE EVENT OF CONFLICTS THE MORE STRINGENT SHALL APPLY.

SPECIFICATIONS: CURRENT EDITION, AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA) MANUAL FOR RAILWAY ENGINEERING, NORFOLK SOUTHERN UNDERPASS GRADE SEPARATION DESIGN CRITERIA, STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) STANDARD SPECIFICATIONS, 2012 REVISION.

ALL W-SHAPE BEAMS SHALL BE FABRICATED WITH THE NATURAL MILL CAMBER OF THE BEAM "UP".

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.

MILL TEST REPORTS: NORFOLK SOUTHERN RAILWAY COMPANY SHALL BE FURNISHED COPIES OF MILL TEST REPORTS FOR ALL MATERIALS EXCEPT MISCELLANEOUS PLATES AND SHAPES. REPORTS SHALL INDICATE COMPLIANCE WITH ALL SPECIFIED REQUIREMENTS.

INSPECTION: SHOP INSPECTION BY NORFOLK SOUTHERN RAILWAY COMPANY OR ITS AUTHORIZED AGENT, SEE "NS SPECIFICATIONS FOR STRUCTURAL STEEL" SPECIAL PROVISION FOR ADDITIONAL WELDING INSPECTION OF FLANGE PLATE TO WEB PLATES WELDS.

SHOP AND FIELD PAINT: ALL NEW STRUCTURAL STEEL MEMBERS, EXCEPT FAYING SURFACES, SHALL BE PAINTED IN ACCORDANCE WITH "NS SPECIFICATIONS FOR PAINTING SHOP FABRICATED BRIDGE STEEL" SPECIAL PROVISION. THE SYSTEM TO BE USED SHALL BE AN INORGANIC ZINC-ACRYLIC SYSTEM. TOP COAT SHALL BE APPLIED IN THE FIELD.

SHOP DRAWINGS: SHOP DRAWINGS SHALL BE APPROVED BY THE CHIEF ENGINEER BRIDGES & STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, GEORGIA. MATERIAL SHALL NOT BE FABRICATED UNTIL DRAWINGS HAVE BEEN APPROVED. COPIES OF APPROVED SHOP DRAWINGS ARE TO BE FURNISHED TO THE ENGINEER. SHOP DRAWINGS SHALL BE LABELED "NORFOLK SOUTHERN M.P. H-56.10".

HOLES: OPEN HOLES AS NOTED.

ANCHOR BOLTS SHALL BE GROUTED IN FORMED HOLES AFTER GIRDERS ARE ERECTED.

FOR PROTECTION OF PAINTED STEEL, SEE "NS SPECIFICATIONS FOR PAINTING SHOP FABRICATED BRIDGE STEEL" SPECIAL PROVISION.

FOR STRUCTURAL STEEL, SEE SPECIAL PROVISION "NS SPECIFICATIONS FOR STRUCTURAL STEEL".

WELDING: WELDING SHALL BE IN ACCORDANCE WITH AASHTO/ AWS-D1.5:2012 AND AMERICAN NATIONAL STANDARD, INCLUDING INTERIMS, AS MODIFIED OR SUPPLEMENTED BY THE AREMA MANUAL FOR RAILWAY ENGINEERING.

ALL WELDS SHALL BE MADE WITH E7018 ELECTRODES. WELDING SHALL BE PERFORMED WITH THE SUBMERGED ARC WELDING (SAW) OR SHIELDED METAL ARC WELDING (SMAW) PROCESS. FRACTURE-CRITICAL MEMBER FLANGE TO WEB WELDS SHALL BE MADE BY THE SUBMERGED ARC WELDING (SAW) PROCESS.

ALL WELDS ARE TO BE SHOP WELDS, UNLESS NOTED OTHERWISE. WELDING PROCEDURE AND SIZES SHALL BE AS SHOWN IN THE PROJECT PLANS.

THERE SHALL BE THOROUGH FUSION BETWEEN WELD METAL AND BASE METAL AND BETWEEN SUCCESSIVE PASSES OF THE WELD. ALL CRATERS SHALL BE FILLED TO THE FULL CROSS SECTION OF THE WELD.

PRIOR TO WELDING, EACH WELDER SHALL HAVE BEEN CERTIFIED IN ACCORDANCE WITH AWS REQUIREMENTS DURING A PERIOD OF ONE (1) YEAR PRIOR TO WORK ON THE BRIDGE. THE FABRICATOR SHALL FURNISH THE ENGINEER OR AUTHORIZED REPRESENTATIVE WITH AN AWS CERTIFICATE FOR EACH WELDER, COVERING THEIR ABILITY TO MAKE A COMPLETE AND SATISFACTORY WELD OF EACH KIND TO BE USED ON THE PROJECT.

SURFACES AND EDGES TO BE WELDED SHALL BE SMOOTH, UNIFORM AND FREE FROM FINS, TEARS, CRACKS, OR OTHER DEFICIENCIES WHICH WOULD ADVERSELY AFFECT THE QUALITY OR STRENGTH OF THE WELD. SURFACES TO BE WELDED AND SURFACES ADJACENT TO A WELD SHALL ALSO BE FREE OF ANY SCALE, SLAG, RUST, MOISTURE, GREASE OR OTHER FOREIGN MATERIAL THAT WILL INHIBIT PROPER WELDING.

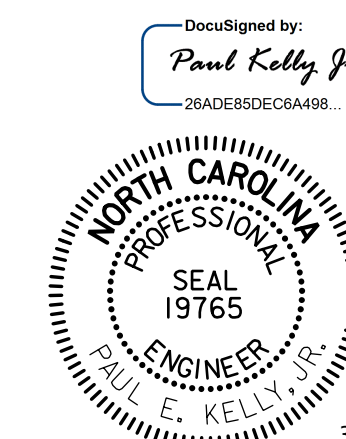
NON-DESTRUCTIVE TESTING OF THE FRACTURE CRITICAL MEMBERS IS TO BE PERFORMED BY AN INDEPENDENT TESTING COMPANY APPROVED BY THE ENGINEER AND CONTRACTED BY THE FABRICATOR. PERSONAL QUALIFICATIONS AND CERTIFICATION ARE TO BE IN ACCORDANCE WITH THE CURRENT AREMA MANUAL CHAPTER 15 FOR FRACTURE CRITICAL MEMBERS. COPIES OF THE TEST ARE TO BE FURNISHED TO THE ENGINEER OR AUTHORIZED REPRESENTATIVE FOR INCLUSION IN THEIR PROJECT FILE.

BOLTS: ALL BOLTED CONNECTIONS SHALL BE MADE WITH 7/8" DIA. ASTM A325, TYPE 3 BOLTS UNLESS NOTED OTHERWISE. NUTS AND WASHER SHALL BE A563, GRADE C3, AND F436, TYPE 3 RESPECTIVELY. ALL BOLTS, NUTS, AND WASHERS SHALL BE MECHANICALLY GALVANIZED UNLESS NOTED OTHERWISE. OPEN HOLES SHALL BE 1 5/16" DIA. UNLESS NOTED OTHERWISE. ALL BOLTS, NUTS, AND WASHERS WILL BE SUPPLIED FROM A SINGLE SOURCE WITH DOCUMENTATION OF THEIR SOURCE AND QUALITY CERTIFICATION. ALL HIGH STRENGTH BOLTS SHALL BE TIGHTENED BY THE "TURN-OF-NUT METHOD" IN ACCORDANCE WITH AREMA MANUAL CHAPTER 15, SECTION 3.2.3 - INSTALLATION OF HIGH STRENGTH BOLTS. ANY BOLTS THAT REQUIRE REMOVAL AFTER BEING TIGHTENED SHALL BE DISCARDED AND A NEW BOLT INSTALLED, UNLESS OTHERWISE NOTED.

ALL BOLT HOLES SHALL BE SUB-DRILLED AND REAMED OR DRILLED FROM THE SOLID. AT NO TIME ARE HOLES TO BE SUB-PUNCHED AND REAMED OR PUNCHED FULL SIZE.

BOLTS SHALL BE INSTALLED WITH THE BOLT HEADS EXPOSED TO THE WEATHER. THE SPECIFIED WASHERS SHALL BE INSTALLED BENEATH THE TURNING ELEMENT. VERTICALLY POSITIONED BOLTS WHICH HAVE BOTH THE HEAD AND NUT EXPOSED TO WEATHER SHALL HAVE THE HEAD PLACED ABOVE THE NUT. HORIZONTAL POSITIONED NUTS SHALL HAVE THE HEADS ON THE VISIBLE SIDE OF THE CONNECTION.

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



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STRUCTURAL STEEL NOTES

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

TOTAL SHEETS	44
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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