

NORFOLK SOUTHERN CORPORATION
SPECIFICATIONS FOR STEEL

I. STRUCTURAL STEEL

A. Scope

These specifications shall cover the furnishing, fabrication, preparation, assembly, welding, painting, and erection of all structural steel shown on the plans.

B. General Specifications

1. Except as otherwise specified hereinafter, the current AREA Specifications, Chapter 15, Steel Structures, apply to all work.

C. Structural Steel

1. Fracture Critical Members

a. All fracture critical members are identified on the plans.

b. All fracture critical members will be fabricated in accordance with the Fracture Control Plan stated in the AREA Specifications, Chapter 15, Section 1.14.

c. Fabricator shall be certified under the AISC Quality Certification Program as follows:

Welded Plate Girders Category III
Rolled Beam Bridges Category I.

d. Structural steel shall meet the current requirements of the A.S.T.M. Specifications for Structural Steel, Designation A-709, Grade 36, S84-F2, S91, S93.

S84-F2 (Fracture Critical - Charpy Test Zone 2)
S91 (Fine Austenitic Grain Size)
S93 (Limitation on Weld Repairs)

Except as noted in the AREA Fracture Control Plan.

2. Non-Fracture Critical Members

a. All primary members or components requiring improved notch toughness are identified on the plans.

b. Fabricator shall be certified under the AISC Quality Certification Program as follows:

Welded Plate Girders	Category III
Rolled Beam Bridges	Category I.

c. Structural steel shapes and plates used as primary members or components shall meet the current requirements of the A.S.T.M. Specifications for Structural Steel, Designation A-709, Grade 36, S83-T2, S91.

S83-T2 (Non-Fracture Critical -
Charpy Test Zone 2)

S91 (Fine Austenitic Grain Size)

3. Other Structural Steel

a. It is preferred that the Fabricator be certified under the AISC Quality Certification Program, Category I.

b. All structural steel shall meet the current requirements of the Specification for A.S.T.M. Designation A-36, unless specified otherwise in these specifications or on the plans.

D. Other Materials

1. High strength bolts shall meet the current requirements of the A.S.T.M. Specifications for High Strength Bolts for Structural Steel Joints, Designation A 325-91c.

2. Anchor bolts shall be threaded rods with heavy hex nut meeting the current requirements of ASTM specification for fasteners, Designation A-307.

3. Welding electrodes for arc welding shall meet the current requirements of the Specifications for mild steel arc-welding electrodes Series E70, AWS 5.1, Low Hydrogen Classification for SMAW and AWS 5.17 for SAW.

4. Preformed fabric bearing pads shall be Shock Pad Style No. 15175 as manufactured by Alert

Manufacturing and Supply Company, Chicago, Illinois, or FABREEKA Pads as manufactured by Fabreeka Products Company, 1190 Adams Street, Boston, Massachusetts, or SORBTEX Pads as manufactured by Voss Engineering, Inc., Chicago, Illinois, or approved equal.

E. Welding Processes

Only submerged arc welding (SAW) or shielded metal arc welding (SMAW) may be used. No other process will be allowed.

F. Bolted Connections

Permanent bolted connections using High Strength Bolts shall be installed and tightened using the Turn-of-the-Nut Method.

G. Paint

All steel preparation and painting shall be in accordance with Norfolk Southern Corporation Paint Specifications.

H. Shop Drawings

1. The Contractor's attention is called to the requirements for shop drawings, Chapter 15, Article 1.1.2 Shop Drawings, AREA Specifications.
2. The Contractor shall furnish three (3) complete sets of detailed shop drawings to the Company for approval prior to starting fabrication. Unchecked drawings shall not be submitted for approval. After approval of shop drawings, the Contractor shall supply the Company with one set of reproducibles of the approved drawings.
3. The rejection of or the procedure for the correction of shop drawings will not be considered as cause for delay.
4. Approval by the Engineer of the shop drawings shall not relieve the Contractor from furnishing material of proper dimensions, quantity, and quality, nor will such approval relieve the Contractor from the responsibility for errors of any sort in the shop drawings.
5. Original drawings or photographic reproducibles on mylar, or equivalent film, shall be furnished at the completion of the Contract in accordance with

Chapter 15, Article 1.1.3, AREA specifications. Reproducibles made by the diazo process are not acceptable. The plans shall be sent to:

Chief Engineer - Bridges & Structures
Norfolk Southern Corporation
99 Spring Street, SW, Box 142
Atlanta, GA 30303

I. SHOP INSPECTION & TESTING

1. The Company may arrange for inspection by an independent inspection firm under a separate contract. This inspection will be in addition to the Fabricator's Quality Control Program.
2. The Fabricator shall notify the Company and its inspector of the scheduled date for beginning fabrication and shall not begin fabrication until the Company's Inspector is present.
3. The Fabricator shall furnish copies of certified mill inspection reports to the Company for all structural steel requiring improved notch toughness.
4. The Fabricator shall meet the requirements of the AREA Fracture Control Plan described in Chapter 15, Section 1.14 for all members and components designated as fracture critical.
5. Welding Inspection shall verify that all welds and welding procedures meet the requirements of the American Welding Society (A.W.S.) Bridge Welding Code, D1.5, dated 1988.
6. All welds shall be inspected visually and by use of nondestructive testing. All nondestructive testing shall be performed by the Fabricator and witnessed by the Company's Inspector.
7. Witnessing of weld inspection shall be done in a timely manner without disruption of normal shop operations. Copies of all weld inspections and nondestructive testing reports shall be furnished to the Company.
8. The Fabricator shall perform the following weld inspection and testing:
 - (a) All transverse tension groove welds in FCM members, when allowed by the Engineer, shall be RT and UT tested 100%

In non-FCM components of FCM's all transverse groove welds shall be RT or UT tested 100%.

- (b) All flange to web welds shall be tested on both sides as follows:
 - 1. Top flange to web welds will be UT tested 100% over 10% of the length from each end and the remaining length of weld will be UT tested 10%.
 - 2. Bottom flange to web welds will be UT 100%.
- (c) All flange to web fillet welds, when allowed by the Engineer, are to be magnetic particle tested 100%.
- (d) Ten percent (10%) of all welds not mentioned above shall be magnetic particle tested.

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