

..... **DIVISION OFFICE**
1999 INSPECTION GUIDE (METRIC VERSION)
Major Structures - Steel Erection

Scope of Inspection:

Major Structures - Steel Erection

This outline is intended to aid in the review of the erection of structural steel. The Area Engineer is provided the flexibility of using the guideline in its entirety or portions depending on the job conditions and time limitations. This guide may be supplemented as deemed necessary by the Area Engineer for items distinct to the individual project.

Project Data:

Project No.:

County:

Inspection Made By:

In Company With:

Date of Inspection:

% Time Elapsed:

% Work Completed:

References:

- 1994 Specifications,
- Latest applicable Supplemental Specifications,
- Special Provisions,
- Latest applicable AASHTO Guides with Interims,
- Bridge Construction Manual

A. OFFICE PORTION

1. Documentation of Quantities and Work:

- a. In regard to quantities and work items, comment on the documentation and cross referencing in the Project Diary, Inspector's Daily Reports (IDR's), and monthly progress reports.
- b. Review plan quantities used and comment on any overruns and underruns occurring or anticipated.
- c. What reasons are attributed to the overruns or underruns?
- d. Review the Supervisor's Daily Reports and comment on how current they are being kept, on completeness of information on sources of materials, and whether these sources have been properly checked.

2. Review the information contained in the Inspector's Daily Reports (IDR's) as to the completeness of the following information items and comment.

- Location of defects such as arc-strikes, cracks, and other damage
- Condition of Paint
- Storage Facilities

- Field Welding
- Type of Bolts Used
- Number of Bolts Inspected and/or Tested

3. Material Records:

- a. Review and comment on the documentation of the following materials items:
 - Steel Certification
 - Bolt Certification - (Section 615.3.2)
 - Approved Shop Drawings - (Section 615.2.1)
 - Erection Drawings - (Section 615.2.2)
 - Mill Test and Certifications - (Section 615.1.3)
 - Charpy V-Notch Test - (Section 615.3.1)
 - Mill Orders and Shipping Statements - (Section 615.1.3)
 - Steel Identification - (Section 615.4.1)
 - Shop Assembly - (Section 615.5)
 - Welder Certification - (Section 615.5.7)
 - Paint Certification - (Section 688)
 - b. Review the quality control for painting (MP 688.02.20) & (Section -688) and comment.
4. Based on your review of the above, are the procedures used to document quantities and materials certifications adequate?

B. FIELD PORTION

1. Structural Steel:

- a. Check for the inspection acceptance stamp (Section - 615.4.1) and comment.
- b. Have the top surfaces of the flanges and the shear stud connectors received a full coat of primer?
- c. Are welds smooth and consistent in depth?
- d. Check for cracks and comment. Hairline cracks in the paint indicate that the steel is cracked.
- e. Are materials stored upright in a clean, well-drained area, supported on skids and properly shored up (Section - 615.4.2)?
- f. Has all field welding been approved and conducted under acceptable weather conditions (Section - 615.5.7)?
- g. Does the erection method overstress the members?
- h. Are the bearings properly aligned ?
- i. Has all structural steel been erected and the concrete deck placed before the backwall has been constructed?

2. Bolting:

- a. Are the bolts the size and type specified in the plans and specs?
- b. Do galvanized and zinc coated bolts have a visible lubricant (blue) on the threads? A proper snug tight fit will not be achieved unless the bolts are lubricated.

- c. Are bolts installed in all holes of a connection as required then brought to a "snug tight" condition. Snug tightening shall progress systematically from the most rigid portion of a connection to the free edge, and then the bolts shall be retightened in a similar manner as necessary until all bolts are systematically snug tight.
 - What is the required nut rotation from the snug tight position (Table - 615.5.6.3B)?
- d. Are all fasteners protected from dirt and moisture at the job site as required?
 - It is required that only bolts to be installed and tightened during a work shift shall be removed from protective storage.
- e. What method is used to ensure that the proper turn on the nut or bolt is achieved and that the element not turned remains stationary?
- f. An inspector is required to observe the installation of fasteners in the work to assure the procedure, as demonstrated in the initial testing to provide specified tension, is routinely and properly applied. Is this requirement being observed?
- g. Are three bolts of each diameter, length and grade being tested by the contractor for bolt tension at the start of work, in a device capable of measuring bolt tension (Section - 615.5.6.3)?
- h. Bolts shall be installed with a hardened washer under the bolt head or nut, whichever is the element being turned. Comment.
- i. Are the threaded ends of bolts placed on the inside, away from weather where practicable?
- j. Bolts should not be installed in a connection unless the connection will be brought to a snug tight condition during the work shift. Comment.
- k. If bolts are exposed to weather or show signs of rust they must be relubricated and a rotational capacity test reperformed. (Section 615.5.6.3)

3. Painting:

- a. Is the painting contractor certified by the Steel Structures Painting Council's (SSPC's) Painting Contractor's Certification Program?
- b. Has the contractor submitted his quality control plan for painting (MP 688.02.20) and containment and disposal (MP 688.03.20)?
- c. If removal of lead paint is required, has the contractor complied with all aspects of environmental and worker protection (688.3.3.6 & 688.3.3.7)?
- d. When steel painting is being conducted is the ambient temperature above 5°C and relative humidity under 90% (Section - 688.2.3)?
- e. Are all damaged areas cleaned, and/or repaired, and painted prior to application of intermediate coat?
- f. Is the proper surface preparation and cleaning sequence being followed as per the specifications and/or contract documents?
- g. Is all traffic, vehicular and pedestrian, protected from overspray and splatter?
- h. Are any paint runs or sags visible?
 - Under 8x magnification, are excessive bubbles or pinholes visible?
- i. Is the total dry film thickness for new structures a minimum of 75 µm for shop coat and a total thickness of the field coats a minimum of 75 µm? Thickness of paint for painting existing structures will be noted on the plans.

j. g. Is the final top coat applied after all the concrete is placed?

4. Stay-In-Place forms: (If applicable)

- a. Are forms being welded to structural steel tension areas?
- b. Have all welds been approved?
- c. Has all welding been done by a certified welder?
- d. Have all welds been painted before the concrete deck is placed?

C. Closeout Conference:

- 1. Discuss all findings and come to an agreement on corrective actions when required.
- 2. Any recommendations from the review or from the project personnel?