

SECTION 11

STRUCTURAL STEEL

OBJECTIVE

The customary practice of fabrication of steel in the shop prior to erection conveniently allows division of observation of structural steel into two basic categories, shop and field. While the purpose is to assure that proper quality control is exercised at each location, the environment differs. Often the shop is fabricating other projects concurrently and may operate two or three shifts per day. The shop work is closely related to mass production, while the fieldwork relates closer to handcrafting. Proper scheduling and coordination by the general contractor is paramount to proper inspections in both venues.

The Statement of Special Inspections (SSI), prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective. To better achieve the objective of quality assurance, it is wise to use only one agency to fulfill the duties of both shop and field observation.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans and specifications, and review the approved shop drawings.
2. Review applicable sections of referenced codes, particularly the American Welding Society Structural Welding Code (AWS D1.1) and the Manual and Specifications of the American Institute of Steel Construction (AISC).
3. Review all welding procedures (qualified and prequalified) per governing code.

B. Mill Test Reports

1. Review mill test reports and check heat numbers with material as received. Verify that proper identification of steel is maintained during fabrication.

C. Sampling and Testing

1. When required by project specifications, mark sample location with steel stamp on each piece tested.
2. Record sample number and location and check that sample identification is maintained as samples are delivered to laboratory and tested.
3. When steel members are delivered to finish length and no "crop ends" are available for sample cutting, coordinate cutting and patching requirements with architect/engineer and fabricator.

D. Welding Observation (Applicable to Shop and Field)

1. Check all welders' certifications and verify that they work only as covered by their certification.
2. Keep a written record of all welders by name, their identifying steel mark, and the percentage of rejectable welds.
3. Upon detection of a rejectable weld (either visually or by nondestructive test), the inspector will notify the foreman for verification of defect. The inspector will observe removal of defects and

repairs to check whether acceptable procedures were used.

4. Inspect joints for proper preparation, including bevel, root faces, root opening, etc.
5. Check the type and size of electrodes to be used for the various joints and positions. Check the storage facilities to see if they are adequate to keep the electrodes dry.
6. Observe the technique of each welder periodically with the use of a welding inspection shield.
7. Verify the use of Welding Procedure Specifications (WPS).
8. Observe multi-pass welds continuously. Continuous observation is defined as follows: The inspector is present in the welding area at all times. The extent of inspection of individual welds will depend on the number of operators welding.
9. Observe single pass fillet welds periodically (in accordance with CBC Section 1704.3.2), after determining that the operator is capable of producing the welds required.
10. If straightening or restraining of weldments is necessary, verify that approved methods will be used.
11. Tag or stamp accepted weldments with the inspector's identification stamp.

E. Workmanship

1. Check straightening and bending procedures.
2. Check cut edges, including those flame cut, sheared, or milled.
3. Check bolt holes for diameter size in major connections.

F. Additional Duties (if required by the SSI)

1. Verify that the welding sequence complies with approved construction documents.
2. Check steel frame joint details for compliance with approved construction documents, including details such as bracing and stiffening, member locations, and application of joint details at each connection.
3. During adverse weather conditions, check that adequate steps are taken to prevent moisture penetration at welding location.

F. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.