

SECTION 17

SHEAR WALLS AND FLOOR SYSTEMS USED AS HIGH LOAD DIAPHRAGMS

OBJECTIVE

The California Building Code is now requiring special inspection during the construction of the wood structural panel sheathing (plywood) shear walls and floor systems used as high load (shear) diaphragms. These are critically important elements to the structural integrity of the building, and are therefore considered appropriate for special inspection.

This guideline is intended for use in site-built structural wood assemblies. Prefabricated wood structural elements and assemblies require special inspection as specified in CBC Section 1704.2.

The Statement of Special Inspections, 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.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and other appropriate project documents.
2. Review applicable sections of referenced codes and standards, particularly the Timber Construction Manual by the American Institute of Timber Construction (AITC) and the California Building Code (CBC).

B. Materials

1. Verify material grades.
2. Verify nail type and size.

C. Sampling of Materials

1. Sample and deliver to the laboratory for testing the following materials when required by project specifications:
 - a) Structural panel sheathing (i.e., plywood, gypsum, fiberboard, or particleboard)
 - b) Framing lumber
 - c) Fasteners used in attaching the sheathing including nails and screws.

E. Observation Procedures

1. Check nail spacing, penetration, and edge distance, and verify nail size.
2. Check for proper plywood thickness and grade.
3. Check for installation of blocking, when blocked edges are required.
4. Check the receiving members for spacing, size, and resistance to splitting.
5. Check for proper plywood layout per project requirements.
6. Check for “shiners” (nails penetrating structural panel sheathing only).
7. Verify that critical members have received the nail specified.

F. Gluing Operations

1. Materials
 - a) Verify certifications on lumber grading, adhesives, and preservatives.
 - b) Verify lumber grade marks on the pieces being used.
2. Observation Requirements - Preliminary
 - a) Verify that spacing of joints meets job and code requirements.
 - b) Measure moisture content of lumber and verify with acceptance range specified.
 - c) Check appearance grade requirements.
 - d) Verify preservative treatment requirements.
3. Observation of Sub-Assemblies
 - a) Verify lumber grade at end joints.
 - b) Gluing and curing procedure, verification of following:
 - Lumber moisture, temperature, and cross-section
 - Workroom humidity and temperature
 - Adhesive certification, lot, and
 - temperature
 - Joint match and separation
 - Assembly temperature, pressure, and time
4. Laminating (Gluing)
 - a) Recheck lumber grades, combinations and faces, moisture, and temperature.
 - b) Record workroom temperature and humidity.
 - c) Adhesive certification, lot verification, and temperature.
 - d) Gluing and curing:
 - Observe glue spread and check for skips.
 - Record open time prior to clamping.
 - Record clamping pressure.
 - Record curing temperature and time.

G. 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.