



Special Inspection Program

**Temporary
Administrative Rules**



**City of Portland, Oregon
Bureau of Development Services**

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ADMINISTRATIVE RULES

I. Special Inspections

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A. General

1. These Rules are adopted pursuant to Section 24.20.010, Portland City Code (P.C.C.) Title 24, and are meant to control the conduct and administration of special inspections. All references to "Rules" shall denote these Administrative Rules.
2. The owner or the registered design professional in responsible charge acting as the owner's agent, **and not the contractor**, shall employ one or more approved special inspectors who shall perform structural and/or soils special inspections for the types of work specified in Chapter 17 of the State Building Code and these Rules. The owner or the registered design professional in responsible charge shall provide a copy of the special inspection checksheet form(s) to the special inspector (s). Please refer to the Appendix, attachments A – C.

Special inspection as described herein is required for materials, installation, fabrication, erection or placement of components and connections requiring expertise to ensure compliance with approved construction documents and referenced standards.

Although the special inspectors and testing agencies will fulfill their duties, such inspections and testing, as defined in these Rules, is not to be relied upon by others as a guarantee of the work, nor to be construed to relieve the contractor of its obligation and responsibilities under the construction contract, approved permit documents, and the applicable workmanship provisions of the State Building Code and referenced standards.

3. The owner shall employ a registered design professional in responsible charge to perform structural observation for the conditions listed in Chapter 17 of the State Building Code and these Rules.
4. All references to special inspector in these Rules include Class A and Class C inspectors as defined in P.C.C. Title 24.
5. All references to district building inspector shall mean the inspector employed by the Bureau of Development Services who performs inspections as required by Chapter 1 of the State Building Code.
6. When in the opinion of the Bureau of Development Services the nature of the work requires special inspection by a specialist or professional consultant having certain technical knowledge and skill in a specialized type of work, the Bureau may designate the special inspector to perform the inspections.

B. References

1. State of Oregon Structural Specialty Code (State Building Code), Latest Edition (See Chapter 17)
2. P.C.C. Title 24, (Portland City Code).

C. General Procedures

1. Statement of Special Inspections

The registered design professional of the structural design shall include on the structural drawings the special inspections and structural observations when required by Chapter 17, State Building Code **and** these Rules.

2. Preconstruction Conference

The general contractor shall convene a pre-construction conference to review the special inspection and structural observation requirements and procedures. The conference should be attended by the registered design professional, general contractor, appropriate sub-contractors, and the special inspector(s). The general contractor shall notify the Bureau of Development Services of the time and place of the conference, so that a representative may attend when determined appropriate. A copy of the conference notes shall be maintained on site throughout the duration of the project for reference by all parties. For small or simple projects a phone conference between the general contractor and the special inspector(s) and registered design professional may be held in lieu of an onsite preconstruction conference. In this case, notification to the Bureau of Development Services is not required.

3. Emergency Notification

Field problems requiring **immediate action** by the Bureau of Development Services shall be reported by telephone by the special inspector to the appropriate inspection section:

Residential	503-823-7276
Commercial	503-823-7273
Facilities	503-823-7543

Examples of field problems requiring immediate action include but are not limited to the following:

- a. Work beginning without a permit.
- b. Work that was previously done without special inspection.
- c. Work which is in progress that will cover non-conforming work.

4. Contractor Responsibilities

- a. Prior to performing the special inspections, **the special inspector** shall verify that the permit documents at the site have a Bureau of Development Services approval stamp.
- b. Unless otherwise allowed by the Bureau of Development Services in writing, work requiring special inspection shall not be commenced until the permit holder or contractor posts the inspection record card and the building permit in a conspicuous place on the premises that is accessible for sign-offs. This card shall be maintained in such place until final approval has been granted by the Bureau of Development Services.
- c. It is the duty of the **permit holder or contractor doing the work requiring inspection to notify**, either orally or in writing, **both the special inspector and the Bureau of Development Services** that the work is ready for inspection. Requests for special inspections shall be made at least one working day in advance of the inspection.
- d. It is the duty of the permit holder or contractor requesting special inspection of the work under construction to provide both access to and the means for proper inspection.
- e. It is the contractor's responsibility to review the special inspector's daily reports and the non-compliance list and to initiate corrective actions. The contractor shall schedule a re-inspection with the special inspector to verify that non-complying items have been resolved.
- f. It is the contractor's responsibility to notify the special inspector when all work requiring special inspection is complete, allowing the special inspector time to perform a review and a site visit, prior to issuance of a Final Summary Report for special inspection.

5. "Lead" Special Inspector
 - a. For major projects as determined by the Bureau of Development Services, one special inspector shall be designated to the Bureau of Development Services as "lead" special inspector.
 - b. The lead special inspector is responsible for overall coordination of all the structural special inspections.
 - c. The lead special inspector shall submit inspection reports in accordance with these Rules.
 - d. The lead special inspector need not be certified in all categories of special inspection required for the project. All special inspections must be performed by personnel certified in the applicable categories.
 - e. Prior to submitting a final summary report, the **lead special inspector** shall perform a final inspection to verify compliance with the approved permit documents and these Rules.
 - f. The Bureau of Development Services shall be notified if there is a change in lead special inspector.

D. Duties and Responsibilities

1. Authorization
 - a. No inspections shall be made unless the special inspector and/or inspection/testing agency for the job have received authorization from the owner or registered design professional. The special inspector shall obtain a copy of the special inspection checksheet form(s) from the owner or registered design professional. See Appendix, attachments A – C.
 - b. No inspections shall be made unless the special inspector is certified or approved for that particular type of inspect on activity by the Bureau of Development Services. While performing inspections the special inspector shall have in possession a card issued by the Oregon Building Official Association identifying the categories in which the special inspector is currently certified.
2. Conflict of Interest
 - a. Special inspectors shall not inspect work performed, or materials supplied, by a contractor, sub-contractor, or material vendor with whom the inspector is employed.
 - b. During the execution of the work, special inspectors shall not undertake or engage in any task or occupation which would tend to interfere with the proper performance of

their required duties of inspection.

3. Duties of Special Inspectors

- a. They shall report to the job sufficiently in advance of construction to become familiar with the approved permit documents, inspect all materials to be used or concealed within such work, and review with the contractor the special inspection procedures contained in these Rules.
- b. They shall inspect the materials, installation, fabrication, erection or placement of components and connections requiring special inspection. This does not include the contractor's safety measures or means and methods of construction.
- c. They shall inspect for compliance with the approved permit documents and revisions provided by the registered design professional.

Revisions that include re-designing of structural connections, framing, or components which requires engineering design calculations and drawings shall be submitted to the Bureau of Development Services for review and approval. The building inspector has the discretion to require any revision to be submitted to the Bureau of Development Services for review and approval.

- d. They shall notify the Bureau of Development Services of revisions and record such deviations from the approved permit documents in their reports.
- e. They are responsible for bringing to the attention of the contractor, and for recording and reporting in their inspection reports, any deviations from the Bureau of Development Services approved permit documents and deviations from the revisions provided by the registered design professional. Revisions from the Bureau of Development Services approved permit documents shall be approved in writing by the registered design professional and forwarded to the special inspector.

Verbal clarifications shall be obtained directly by the special inspector from the registered design professional and/or Bureau of Development Services.

The name of the person approving any revisions and a description of the revisions shall be recorded in the inspection report.

- f. Performance of the above duties is to be done in accordance with the provisions of these Rules. Failure to comply can result in the revocation of the authority to perform special inspection and any or all of the affected work may be stopped until such time as the extent of noncompliance has been verified by the Bureau of Development Services and the stop work order is rescinded.

4. Special Inspector Performance Report

To document that a special inspector has not performed his/her duties particularly well or that the provisions of the State Building Code or these Administrative Rules have not been followed, a Special Inspector Performance Report (See Appendix) may be submitted to the Inspection Division Manager. If necessary, the Inspection Division Manager will then perform an investigation and/or conduct an administrative hearing at which time the special inspector will have the opportunity to present information in his/her defense. The individual who submits a negative Special Inspector Performance Report should be present at the hearing. The results of this investigation/hearing will be recorded and the Inspection Division Manager will keep the Special Inspector Performance Report on file for a period of five years. Copies of investigation/hearing documentation and Special Inspector Performance Report shall be made available to the Testing Agency upon request.

E. General Inspection Procedures

1. All special inspectors shall maintain current copies of all applicable code sections of the State Building Code, referenced standards, Portland City Code, and these Rules.
2. Inspection Check List

Prior to inspection, the special inspector shall perform the following:

- a. Check that the special inspector has the Bureau of Development Services approval to perform the inspection.
- b. Check that the permit has been issued.
 - (1) The inspection record card and the building permit shall be posted in a conspicuous place on the premises and accessible for sign-offs.
 - (2) The work to be inspected shall be included in the description of work to be done as shown on the building permit and on the approved permit documents. There is sometimes more than one permit for a given project (i.e. foundation, structural shell, etc.). The special inspector shall notify the Bureau of Development Services if the work scheduled for special inspections has progressed past the point to which it has been approved by the Bureau of Development Services.
 - (3) Drawings and specifications bearing permit numbers and the Bureau of Development Services approval stamp must be accessible at the job site and shall be used for performing the required inspections.
- c. Review the schedule of required inspections with the contractor. Questions concerning such issues as the extent of inspections and types of testing should be clarified at this time. If there are any questions at this time either party may contact the appropriate inspection section of the Bureau of Development Services for clarification.

- d. Verify that previously required special inspections have been made and immediately notify the Bureau of Development Services of any work performed for which special inspections have not been performed.

F. Inspection Reports

1. General Requirements

a. Field Reports

One copy of the field report shall be left at the job site at the completion of each inspection visit. The contractor is responsible for maintaining these reports in a file at the job site which is accessible to all interested parties. The special inspector shall send copies of these reports to the , the registered design professional, owner, and the contractor within seven calendar days of the date of the inspection.

- b. The special inspector shall send copies of the material test reports to the registered design professional, the owner, and the contractor within seven calendar days of the date of the test.

2. Minimum Requirements

All reports must provide the following minimum information (See Appendix):

- a. **Job Address.** The address provided must be as it appears on the approved building permit and inspection record card.
- b. **Permit Number.** List the permit numbers for the work performed. Note: There is sometimes more than one permit issued during the construction of large projects (i.e. foundation and superstructure under separate permits).
- c. **Location of Inspection.** For field inspections, pinpoint the exact location of the inspection using grid lines, floor numbers, or other applicable identifiers.
- d. **Identification of Materials and Methods of Construction.** Adequately identify materials and note the methods of construction, erection, placement or other use of the materials. Describe specific items that were inspected (use piece marks or other specific identifiers when available).
- e. **Testing Data.** Identify and document results of all material testing, treatment certificates, nondestructive testing, load test, sampling, welding qualifications, or other tests being utilized.
- f. **Conformance Statement.** State whether the work requiring special inspections was either in conformance or not in conformance with Title 24, the Bureau of Development Services approved permit documents, applicable workmanship provisions of the State

Building Code, and referenced standards. Identify and document any structural design changes approved by the registered design professional.

g. **Substitutions and Deviations.** All substitutions of materials or other deviations from approved permit documents and applicable standards and codes shall be immediately reported to the contractor for correction, then, if uncorrected, to the registered design professional, owner, and the Bureau of Development Services. All nonconforming items shall be fully identified on the reports.

h. **Name and Registration Number of Special Inspector**

i. **List of Individuals/Firms Receiving Copies of the Reports**

3. Non-Compliance List

a. A non-compliance item is one that deviates from the approved permit documents and/or specifications **and** has not been immediately corrected upon notification to the contractor.

b. The non-compliance list shall be maintained for large or complex projects or when specifically requested by the Bureau of Development Services. The special inspector shall complete and maintain a non-compliance list from the start of the work until the final summary report is completed.

c. The non-compliance list shall include the following (See Appendix):

(1) The date when the non-compliance items were noted in the inspection reports.

(2) A description of the non-compliance items.

(3) The date when the non-compliance items were resolved and approved with appropriate documentation recorded.

(4) Shop (fabrication) and field inspection non-compliance items.

d. The special inspector shall update the non-compliance list on a regular basis and send copies to the registered design professional, the owner, and the contractor along with their daily special inspection reports.

e. The special inspector shall post the non-compliance list adjacent to the Bureau of Development Services inspection record card.

4. Frequency of Reports

a. One report or entry is required for each day that the special inspector performs special inspection.

- b. When requested by the Bureau of Development Services, an interim report is required outlining the degree of completion and compliance of the work and recording all deviations from the approved permit documents .
- c. A final summary report is required at the completion of the work requiring special inspections. The final summary report shall state whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved permit documents and the applicable workmanship provisions of the State Building Code and referenced standards.

Prior to submitting a final summary report the special inspector shall perform a **final inspection** to verify that the work was constructed and that all required special inspections have been performed in compliance with the approved permit documents and these Rules.
- d. The special inspector shall send a copy of the final summary report to the registered design professional, the owner, the contractor and the Bureau Of Development Services.

G. Concrete Construction.

- 1. The special inspections and verifications for concrete construction shall be as required by the State Building Code, Chapter 17, and these Rules.

Exceptions:

- a. As provided in Chapter 17, State Building Code.
 - b. Special inspection for the fabrication process may be waived by the Bureau of Development Services when the work is performed on the premises of a fabricator approved by the Bureau of Development Services for precast concrete. See Section V of these Rules for procedures for approval of fabricators.
- 2. Duties of the special inspector shall include:
 - a. Verifying that the contractor has submitted the concrete mix designs to the registered design professional for approval and that a copy of the approved mix design is on site.
 - b. Verify that the ready mixed concrete delivered to the job site is of the approved mix and in conformance with ASTM C94 sections: 4 – material; 6 – tolerances in slump; 7 – air content; 8.11.5 – truck mixed; 14 – fresh properties; 15 – slump and air; 16 – batch ticket; 17 – strength verification; and 19 – test method.
 - c. Conducting or observing and supervising material tests as called for in the approved permit documents and specifications, State Building Code and referenced standards, i.e.

ASTM C 143 (slump), ASTM C 1064 (temperature), ASTM C 172 (sampling fresh concrete), ASTM C 138 (air content), etc.

- d. Verifying that the forms will result in hardened concrete of the required cross-sectional dimensions as shown on the approved permit documents. Verifying that forms are clear of debris prior to placement of the concrete.
- e. Ascertaining that the reinforcing steel is in conformance with applicable requirements of Chapter 19, State Building Code, and the approved permit documents and specifications, including the following:
 - (1) Type, grade, size, quantity, spacing and condition of reinforcing steel.
 - (2) Location of reinforcing steel, pipes, conduits and sleeves with respect to minimum concrete cover.
 - (3) Type and location of splices, length of contact laps, and minimum diameter of bends.
 - (4) Support and anchorage of reinforcing steel in the forms.
- f. Ascertaining that the method of conveying and placing concrete avoids segregation due to re-handling or flowing and that the concrete is properly consolidated.
- g. Verifying that construction procedures and workmanship are in accordance with the approved permit documents, State Building Code, and referenced standards .
- h. Ascertaining that all structural embedments in the forms conform to the approved permit documents in regard to fabrication, quantity and type. Welded embedments shall be inspected by a special inspector, registered by the Oregon Building Officials Association for Structural Steel/Welding
- i. Verifying that the maintenance of the specified curing temperatures and techniques is in accordance with approved permit documents and the State Building Code.
- j. Verifying that the welding of reinforcing steel is in accordance with Section. K. Steel Construction of these Rules.
- k. Verifying that the erection of the precast concrete components is in accordance with the approved permit documents including permanent bracing, stiffening, member locations, and joint details at connections and bearing points.

H. Prestressed Concrete Construction

- 1. The special inspections and verifications for prestressed concrete construction shall be as required by Chapter 17, State Building Code and these Rules.

Exceptions:

- a. As provided in Chapter 17, State Building Code.
 - b. Special inspection for the fabrication process may be waived by the Bureau of Development Services when the work is performed on the premises of a fabricator approved by the Bureau of Development Services for prestressed concrete. See Section V of these Rules for procedures for approval of fabricators.
2. This section includes inspection procedures for pre-tensioned and post-tensioned concrete

Definitions:

- a. Prestressed Concrete. Structural concrete in which internal stresses have been introduced to reduce potential tensile stresses in concrete resulting from loads.
 - b. Pretensioning.. Method of prestressing in which prestressing steel is tensioned before concrete is placed.
 - c. Post-tensioning. Method of prestressing in which prestressing steel is tensioned after concrete has hardened.
3. A pre-installation meeting is required for all projects when prestressed concrete is used. The meeting shall be held prior to placement of the reinforcing steel and tendons. The meeting shall be attended by the registered design professional, the general contractor, the prestress contractor, and the special inspector. The general contractor shall notify the Bureau of Development Services of the time and place of the meeting so that a Bureau Of Development Services representative may attend when determined appropriate. A copy of the meeting notes shall be maintained on the project site as noted in Section C.2 General Procedures of these Rules.
4. When a prestressed concrete inspection is required, a minimum of two (2) special inspectors shall be present during the placement of concrete. One inspector shall monitor the concrete pump truck and one shall monitor the placement of the concrete.
5. At least one inspector shall be present during the pre-stressing for each steel stressing ram being used at the project site.
6. Duties of the special inspector shall include:
- a. Those duties listed for Section G Concrete Construction of these Rules.
 - b. Verify that reinforcing steel and tendons are accurately placed and adequately supported and secured against displacement during placement of the concrete.

- c. Verify that the steel stressing ram is properly calibrated.
- d. Verify that the tendons (strands) are prestressed only after the concrete has achieved the proper strength and in the proper sequence.
- e. Verify that the final prestressing steel tension forces and final elongations are in compliance with the project specifications .
- f. Ascertain that the required strength is obtained by field cured compression cylinders called for in the approved concrete mix design and approved permit documents and specifications prior to tensioning the tendons.
- g. Verify grouting of bonded prestressing tendons in the seismic-force-resisting system.
- h. Perform inspections in accordance with the applicable provisions of the Post Tensioning Institute's Specification for Unbonded Single Strand Tendons and the Field Procedures Manual, including but not limited to:
 - (1) Verify that certified mill test reports have been furnished by a certified Post Tensioning Institute plant for each coil or pack of strand delivered.
 - (2) Verify that only nylon slings are used to lift tendons; no metal chokers or chains are allowed.
 - (3) Verify the stressing jack and gage calibration certificates (jack and gage calibrated to each other) and verify that a back-up gage and jack are available.
 - (4) Verify tendon coating and sheathing (lubrication between strand and sheathing) and sheathing (polyethylene or polypropylene) are in conformance with the project specifications and verify that damaged areas are repaired in conformance with approved methods.
 - (5) Verify when an encapsulated system (aggressive environment) is required and that all necessary components of the system are in place. The minimum concrete cover from exterior edge of concrete to wedge cavity area of anchor is 1-1/2 inch. (nonaggressive) or 2 inch (aggressive).
 - (6) Verify that tendon support shall not exceed intervals of 4 feet. Uniform tendons, single or grouped (usually perpendicular to banded tendons), should be spaced no more than 8 times the slab thickness or 5 feet.
 - (7) Verify that vertical deviations in tendons are kept to +/- 1/4 inch in concrete depths up to 8 inch, and +/- 3/8 inch in concrete with depths between 8 inch to 2 feet.
 - (8) Record the number and location of banded and uniform tendons.

- (9) Verify that the tendon tail shall not be cut until acceptance of measured elongation has been given by the registered design professional, and verify that the tendon tail shall protrude $\frac{1}{2}$ to $\frac{3}{4}$ inch beyond the wedges after cutting.

I. Shotcrete Construction

1. Inspection shall be required during the taking of test specimens, the placing of all shotcrete including preconstruction test panels), the placing of reinforcing steel, and as required by the State Building Code, Chapter 19.

2. Pre-Installation Meeting

A pre-installation meeting is required for all projects when structural shotcrete is used. The meeting shall be held after the registered design professional has designated areas to be shotcreted and after the shotcrete contractor has been selected. Those present shall discuss the number of nozzlers and helpers required for the project, the number of pre-construction test panels, areas where sacrificial steel may be located, the number of cores from in-place work to be taken or test panels, the schedule of placing shotcrete and taking cores from in-place work or test panels, and acceptance criteria. The meeting shall be attended by the registered design professional, the general contractor, the shotcrete contractor, and the special inspector. A copy of the meeting notes shall be maintained on the project site as noted in Section C.2 General Procedures of these Rules.

3. The special inspector shall be thoroughly familiar with the inspection and testing requirements for shotcrete as stated in the State Building Code, these Administrative Rules, and other referenced standards, and shall be registered by the Oregon Building Officials Association for shotcrete construction.

4. Approval required by Bureau of Development Services

Approval of the shotcrete procedure by the registered design professional and Bureau of Development Services is required prior to application of shotcrete on any project. This procedure shall include specifications for the design mix, slump, requirements for nozzle qualification including test panels, preconstruction testing for compressive strength, cores from the structure or test panels to verify reinforcing steel embedment and bond, and testing for compressive strength during construction and curing procedures. The approved shotcrete procedure shall be documented by the contractor and made available to the special inspectors.

Areas of the structure which are to be shotcreted shall be shown on the permit documents. As an alternative, a written description reviewed and signed by the registered design professional may be submitted to the Bureau of Development Services for approval.

5. Pre-Installation Testing

- a. A mock-up test panel shall be shot, cured, cored or sawn, and tested prior to

commencement of the project in order to demonstrate each nozzle's ability to do the work. The mock-up panel shall be representative of the project and simulate job conditions as closely as possible.

The mock-up test panel thickness and reinforcing steel shall reproduce the thickness and most congested area specified in the structural design including lap splices, ties, couplers, diagonal bars, etc. This condition shall be identified by the registered design professional and a sketch shall be provided to the special inspector showing the required reinforcing in the mock-up test panel.

It shall be shot at the same angle, using the same nozzle, and with the same concrete mix design that will be used on the project. Shotcrete on the project shall not be placed above shoulder height unless a mock-up panel was shot in this condition.

The mock-up panel shall be shot using the same equipment and the same concrete mix from the same concrete supplier as will be used on the actual project. The slump of concrete on the actual project shall be within +/- 2" as the slump of concrete used for the mock-up panel.

The requirement to pass a mock-up panel for a specific project may be waived by the Bureau of Development Services provided that all of the following conditions have been met:

- (1) All reinforcing bars are #5 or smaller.
- (2) The minimum clearance and spacing for reinforcing bars is met as specified in the State Building Code.
- (3) Non-contact lap splices are used with at least two inches clearance between bars, but not more than 1/5th the lap length or not more than six inches.
- (4) There are no pilasters, columns, beams, or other complicated members included in the proposed shotcrete work.
- (5) There are no overhead or other especially difficult shooting positions required.
- (6) The nozzlers who will do the work have been qualified by passing a test panel within the past year, or have successfully shot a project (verified by a minimum of three cores taken from the actual structure) within the past year. The nozzlers must produce test reports from an approved testing agency to verify compliance.

The determination that the above criteria for the exceptions have been met shall be made by the registered design professional and Bureau of Development Services and documented prior to the shotcrete pre-installation meeting .

- b. The mock-up test panel cores or sawn surface shall be reviewed and the findings documented by the special inspector, and approved by the registered design professional and Bureau of Development Services .

Evaluation of cores shall be in accordance with criteria of ACI 506.2 (or current edition). An average grade of 2.5 or less is required for a minimum of three cores taken through the most congested areas of reinforcing steel in the panel for the nozzle to be allowed to place shotcrete on the project. Individual shotcrete cores with a grade greater than 3 are unacceptable and will be cause for failure of the test panel.

- c. Concrete Strength Tests

Strength tests are required at the time and from the same batch of concrete as the nozzle's qualification panels.

Exception: When the shotcrete mix has a minimum of seven sacks of cement per cubic yard, and provided the strength specified is 4000 psi or less, no compressive strength tests are required prior to construction.

6. Cores From The Structure For Visual Examination

- a. Cores shall be taken from the structure during construction for visual examination of the shotcrete, specifically to verify reinforcing steel embedment and bond of the shotcrete. The core shall be reviewed by the special inspector and registered design professional. Evaluation and grading and reporting requirements for cores taken from the structure shall be the same as for mock-up test panels.

The number of cores required and the stages of work from which they are to be taken shall be determined by the registered design professional . The number of cores required shall not be less than three for any given project. Sacrificial steel shall be placed in locations designated by the registered design professional and cores shall be located at intersections of the sacrificial steel.

Exception: On projects where nozzlers are approved based on the exception to Section 5(a), and when in the opinion of the Bureau of Development Services no special hazard exists, cores from the structure may be waived.

- b. Concrete strength tests for shotcrete shall be made by the special inspector in accordance with the State Building Code and referenced standards.

7. Duties of the Special Inspector Shall Include:

- a. Verifying procedures used for mock-up panels for nozzle qualification. This includes recording the name of the nozzle and assistant for each panel; recording how the panels are reinforced, noting the type of splices used (contact, non-contact, mechanical couplers, etc.); recording the slump of the concrete used; and recording and marking

the location of the principal reinforcing steel in the test panel so that cores can be taken from these locations.

- b. Verifying that concrete truck delivery tickets show that the mix delivered is the same as the approved mix. Check concrete visually for obvious problems such as wrong size aggregate, high slump, etc.
- c. Verifying that the reinforcing steel conforms to project specifications and the State Building Code. When applicable, verify that no portion of the work to be shotcreted has reinforcing steel more congested or is otherwise significantly more difficult to shoot than the "worst case" represented by the nozzle's qualifying panel. Also verify that reinforcement splices being used on the structure are of the same type that were used on the qualifying panel, and that the nozzle, pump, air compressor, and nozzle are approved for the project.
- d. Checking surface to be shot against to insure it is free of dirt, standing water, oil, grease, debris, rebound, or any other material that could interfere with the bonding of the shotcrete. Checking to see that the surface to be shot against is thoroughly wetted before application of shotcrete, and that free water does not remain on the surface. Verifying that ground wires are set at specified thicknesses and are located at intervals sufficient to assure proper thickness throughout, and that they are maintained tight.
- e. Verifying that the nozzle's assistant is in continuous attendance and keeps rebound away so it is not incorporated into the work. Verify that reinforcing steel does not move during application of shotcrete.
- f. Verifying that any area which sloughs off is removed and reshot.
- g. Verifying that samples for compressive strength tests are shot and stored in accordance with the State Building Code and referenced standards. Verify that cores or test panels are drilled in accordance with the approved shotcrete procedures and in the locations specified by the registered design professional.
- h. Verifying that cores are taken from the in-place shotcrete for visual examination by the registered design professional.
- i. Verifying that water is not added to the concrete mix except as allowed by ASTM C 94. When the concrete first arrives at the jobsite water may be added to adjust the slump.
- j. Verifying that a procedure is in place for shotcrete to be moist-cured in accordance with the State Building Code and referenced standards.

J. Masonry Construction

- 1. Masonry construction shall be inspected and evaluated in accordance with the requirements of the State Building Code and these Rules.

Exceptions:

- a. As provided in the State Building Code, Chapter 17.
 - b. Special inspection for the fabrication process may be waived by the Bureau of Development Services when the work is performed on the premises of a fabricator approved by the Bureau of Development Services for precast masonry. See Section V for procedures for approval of fabricators.
2. Duties of the special inspector shall include:
- a. Checking masonry units, reinforcement, mortar joints, material certifications, bills of materials or other documentation, cement, lime, aggregate, and additives of masonry for compliance with the approved permit documents.
 - b. Verifying that cement, lime, block, and brick are supported on pallets and covered to protect from exposure to excessive moisture or drying.
 - c. Verifying that mortar and grout are properly mixed using specified ingredients and proportions. The method of measuring materials shall be such that proportions are controlled. Mortar and grout shall not be used after the maximum allowable elapsed time after the initial addition of mixing water. Ready mixed grout shall conform to the approved mix design.
 - d. Verifying that construction details, procedures, and workmanship are in accordance with the approved permit documents and the State Building Code.
 - e. Verify the placement of masonry units and construction of mortar joints.
 - f. Verify the size and location of structural elements.
 - g. Verify that cleanouts are provided when required by code or the project documents.
 - h. Verifying that welding of reinforcing steel is in accordance with Section. I. Steel of these Rules.
 - i. Verify that the protection of masonry during cold weather (temperature below 40 degrees F) or hot weather (temperature above 90 degrees F) is in accordance with the State Building Code and referenced standards.
 - j. Inspecting reinforcing steel for size, grade, spacing, length of lap splices, clearances between bars, and clearances to masonry units and outside faces of walls.
 - k. Verifying which method is being used on the job to verify compliance with f'm (masonry prism testing, masonry prism test record or unit strength method) and

whether any required preconstruction testing has been performed.

- l. Conducting or observing and supervising material tests including those required prior to construction. Verify that test prisms contain the same masonry units, grout, mortar, and workmanship as those used in the building.
- m. Verifying that all structural embedments in the masonry construction conform to the approved permit documents in regard to fabrication, quantity and type. Welded embedments shall be inspected by a special inspector certified for structural steel. Verifying type, size and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction.
- n. Prior to grouting, verify that the minimum dimensions of spaces provided for the placement of grout are in accordance with the State Building Code and referenced standards. Prior to grouting, verify that the grout space is clean and observe grout placement to verify compliance with code and construction document provisions. Verify that grout is consolidated (and re-consolidated when required) in accordance with the State Building Code and referenced standards.

K. Steel Construction

1. The special inspections for steel elements shall be as required by the State Building Code and these Rules. The requirements of this section are applicable to steel and structural steel as referenced in Chapter 17 of the State Building Code.

Exception: Special inspection for the fabrication process may be waived by the Bureau of Development Services when the work is performed on the premises of a fabricator approved by the Bureau of Development Services as an approved steel fabricator. See Section V for the procedures for approval of fabricators.

For steel construction, special inspectors may perform inspections only in accordance with their registration with the Oregon Building Officials Association.

2. Prior to commencement of any fabrication and/or erection the contractor shall notify the inspector that such work is ready to begin.
3. For the purposes of special inspections, steel construction includes, but is not limited to the following items that are detailed or required to be detailed on the approved permit documents:
 - a. Fabrication and erection of steel and other metal items as defined in Section 2.1 and 2.2 of the AISC Code of Standard Practice For Steel Buildings and Bridges that are detailed or required to be detailed on the approved permit documents.
 - b. Fabrication of welded components of connectors intended for wood-to-wood or wood-to-concrete connections.

- c. Miscellaneous welding, for example, welding of steel wall studs, erection of curtain walls, welding of reinforcing steel, cold-formed steel framing, etc.

Exception: Fabrication shop inspection of steel stairs and landings is not required unless otherwise noted on the approved permit documents.

- 4. In accordance with Chapter 17, State Building Code, the special inspector shall verify that the fabricator maintains detailed shop fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards. The special inspector shall verify that the fabricator has in place quality control procedures to verify structural member sizes.

- 5. Duties of the special inspector shall include:

- a. Verifying that the steel material is in compliance with the approved permit documents and the applicable codes and standards, by reviewing random samples of the mill test reports, steel identification markings or other documentation, and supervising of such tests if required by the Bureau of Development Services.
- b. Verifying for weld filler materials by reviewing identification markings to conform with AWS specifications in the approved construction documents and the applicable welding procedure specifications and the manufacturer's certificate of compliance.
- c. Checking steel members to see that they are fabricated and erected according to the workmanship and tolerances required by the State Building Code and referenced standards.
- d. Checking to see that welded studs and structural connections are installed as shown on the approved permit documents plan.
- e. Inspection of high strength bolts and fasteners shall be in accordance with approved permit documents and project specifications, State Building Code Chapter 17, and AISC Chapter 5 specifications for structural joints.
- f. Inspecting the quality of welds produced by welders, welding operators, and tackers as required by State Building Code, Chapter 17.

Exception: Inspection may be periodic in the instances allowed by State Building Code, Chapter 17, provided that the materials, welding procedures and qualifications of welders are verified prior to the start of work; periodic inspection is made of work in progress; and visual inspection of all welds is made prior to shipment of shop welding and upon completion of the welding.

This includes:

- (1) Verifying that welders and welding operators are currently certified in accordance with AWS standards and Section III of these Rules. The special inspector shall note on his/her report the name(s) and certification number(s) of the individual(s) performing the welding.
 - (2)
 - a) Verifying that the contractor's Welding Procedure Specifications are in conformance with AWS requirements, and
 - b) Verifying that the essential variables outlined in the Welding Procedure Specification such as joint design, travel speed, shielding, base metals, filler metals, position, electrical characteristics, number of passes, preheat and interpass temperatures and welding technique are employed during execution of the work.
 - c) Verifying the weldability of reinforcing steel other than ASTM A 706.
 - (3) When required, overseeing the nondestructive testing of structural welds. When nondestructive testing other than visual is to be required, it is to be so stated in the permit documents . This information shall designate the welds to be tested, the extent of testing of each weld, and the method of testing. Testing personnel performing the interpreting nondestructive testing shall be qualified in accordance with the current edition of American Society of Nondestructive Testing Recommended Practice No. SNT-TCIA.
- g. Indicating in the special inspection report whether inspection is continuous or periodic. If inspection is periodic, the criteria from State Building Code, Chapter 17 which allows the periodic inspection and the point that the fabrication process is at shall be clearly stated.
- h. Inspection of steel frame joint details for compliance with approved permit documents and referenced standards:
- (1) Details such as bracing and stiffening.
 - (2) Member locations.
 - (3) Application of joint details at each connection.

L. Wood Construction

1. Special Inspection is required:
 - a. For Wood and Structural Wood Construction as defined in the State Building Code, Chapter 17.
 - b. When so designated by the registered design professional; or
 - c. When such special inspection is specifically required by the Bureau of Development Services

2. Duties of the special inspector shall include:
 - a. Verifying the grade, species and size of lumber, and the grade and thickness of wood structural panels used in the vertical and horizontal diaphragms.
 - b. Confirming that wood structural panels are manufactured with exterior glue.
 - c. Verifying the nail or staple diameter and length, the number of fastener lines, and that spacing between fasteners in each line and at edge margins is in compliance with the approved permit documents.
 - d. Verifying the approximate length and location of all shear walls.
 - e. Checking hold down installations at all shear walls.
 - f. Verifying diaphragm chord, drag strut, braces, and related details.
 - g. Verifying the connection of blocking to wall top plates.
 - h. Confirming that pneumatic or mechanically driven fasteners are manufactured by a member of the International Staple, Nail and Tool Association or in accordance with another approved national standard.
 - i. Verifying that when pneumatic or mechanically driven fasteners are substituted for common (or other specified) nails, that requirements for minimum diameter and penetration into the framing member are met, and notifying the registered design professional.
 - j. Confirming that nail heads are driven flush without penetrating the surface ply of the wood structural panel.
 - k. Verifying that the installation of baseplate bolting is in conformance with the approved permit documents. Foundation plates or sills which rest on concrete foundations shall be treated wood or Foundation redwood, all marked or branded by an approved agency.

- l. Confirming that panel edges bear on framing members and butt along their center lines (with the 1/8" spacing between panel edge and end joints as recommended by the APA), that nails are placed not less than 3/8 inch in from the panel edge, and that framing members or blocking are provided at edges of all sheets in shear walls.
- m. Verifying that 3" nominal framing members are provided and that nails are staggered where shown on the approved permit documents.
- n. Verifying that lag bolts, when part of the lateral force resisting system, have properly sized clearance holes for their shanks and lead holes for their threaded portions. Installation is to be done by turning with a wrench, and soap or other lubricant is to be provided to ease installation.
- o. Confirming that bolt holes are a minimum of 1/32" and a maximum of 1/16" larger than the bolt diameter.
- p. Checking that shear walls of gypsum sheathing board and/or gypsum wall board in combination with wood framing conform to the applicable requirements of the State Building Code, Chapter 23.

M. Sprayed Fire-Resistant Materials (SFRM)

1. General Requirements

a. Authorization

Inspections of sprayed fire-resistant materials (SFRM) shall be made only by a special inspector registered by the Oregon Building Officials Association for Spray-applied Fireproofing. Personnel performing these inspections and/or tests shall be trained in the test methods and shall be experienced in field or laboratory testing procedures.

b. Approval of SFRM.

(1) SFRM is to be approved by the Bureau of Development Services either,

- (a) prior to the issuance of the building permit for which the SFRM is required or,
- (b) through the Bureau of Development Services deferred submittal approval process.

In either case, approval shall be obtained prior to the start of any SFRM application.

(2) A SFRM schedule shall be provided that indicates:

- (a) the SFRM product to be used.
- (b) the structural member to be fireproofed.
- (c) the hour rating that the structural member is required to have.
- (d) the required SFRM thickness for the member.

2. Inspection/Testing Procedures for SFRM

a. General

Inspection and test procedures shall be based on the State Building Code, Chapter 17, and referenced standards.

b. Duties of the special inspector shall include:

- (1) Verifying that all inspections of steel construction has been completed and approved before SFRM application is started.
- (2) Verifying that the SFRM material used is the same as shown on the approved permit documents.
- (3) Verifying that the substrate to receive the SFRM is free of dirt, oil, grease, loose scale or paint, primers, or other materials that may prevent adequate adhesion.
- (4) Verifying a minimum ambient substrate temperature before and after application as specified in the manufacturer's written instructions
- (5) Measuring thickness in accordance with State Building Code, Chapter 17, and referenced standards.
- (6) Taking density test specimens in accordance with State Building Code, Chapter 17, and referenced standards.
- (7) Taking cohesion/adhesion tests in accordance with State Building Code, Chapter 17, and referenced standards.
- (8) Verifying that SFRM, upon complete drying or curing, does not exhibit deep or wide cracks, voids, spalls, delamination, or any exposure of the substrate. Minor surface irregularities are acceptable.

N. Proprietary Anchors – Adhesive (Chemical) and Expansion (Mechanical)

1. The special inspector shall be certified by the Oregon Building Officials Association for proprietary anchors.
2. Inspections shall be required during the installation of the proprietary anchors.
3. Unless approved otherwise by the Bureau of Development Services, propriety anchors shall be tested by an approved agency (e.g. National Evaluation Service, Inc, SBCCI-ES, ICBO Evaluation Service Inc, ICC Evaluation Service Inc, etc). The proprietary anchors shall be installed and inspected in accordance with the approved agency's issued evaluation report.
4. Duties of the special inspector shall include:
 - a. Reviewing the evaluation report on the propriety anchors and being thoroughly versed on the installation and inspection requirements.

The contractor shall provide to the special inspector a copy of the evaluation report.
 - b. Verifying that the manufacturer's identification for the anchors used conforms to the approved permit documents and evaluation report.
 - c. Verifying that the minimum embedment depth of the anchors conforms to the approved permit documents.
 - d. Verifying that the installation of the anchors conforms with the approved permit documents, manufacturer's installation instructions, and evaluation reports.
 - e. Recording the evaluation report number and the name of the product on the inspection report.

O. Curtainwall Systems

1. Special Inspection is required:
 - a. For curtainwall systems when so required by the Bureau of Development Services in accordance with the State Building Code, Chapter 17; or
 - b. For curtainwall systems when so required by the registered design professional.
2. The special inspector for proprietary anchors or other fasteners shall be certified by the Oregon Building Officials Association.
3. The special inspector for welding shall be certified by the Oregon Building Officials Association Structural Steel/Welding.
4. Inspections shall be made during the erection and fastening of the curtainwall anchorage system and attachment to the structure's framing members.

5. Duties of the special inspector shall include:
 - a. Ascertaining whether all structural embeddings in or on the structure's framing members conform to the approved permit documents.
 - b. Ascertaining whether the curtainwall anchorage system and attachment to the structure's framing members conforms with the approved permit documents; for example, type of fasteners used and number and location of fasteners.

P. Soils

1. Background

Soils special inspections shall be performed by the registered design professional who prepared the geotechnical report for the project, or a qualified individual working under the supervision and control of the registered design professional, or an approved testing agency under the direction of the registered design professional. If circumstances require it, the owner shall designate a substitute registered design professional who shall perform the duties required of the original registered design professional. In this case, the substituted registered design professional shall indicate in writing that they have the geotechnical report in their possession, they have reviewed the geotechnical report, they concur with the conclusions and recommendations contained in the geotechnical report or have provided alternative conclusions and recommendations, and they will assume responsibility as the registered design professional for the project (see Appendix). Work requiring special inspection shall be determined in accordance with the State Building Code, Chapter 17, and Portland City Code C.), Title 24.

2. Soils Special Inspection Schedule

The Bureau of Development Services will determine the required soils special inspection schedule (see Appendix).

- a. Grading and Site Preparation

Inspection shall be required during grading and earthwork activities. Duties of the special inspector shall include:

- (1) Observing graded areas and determining that permanent slopes are constructed in accordance with the approved permit documents and geotechnical report.
- (2) Determining that exposed soils are consistent with the subsurface conditions described in the approved permit documents and geotechnical report.
- (3) Determining that subgrade areas to receive fill have been stripped of vegetation, non-complying fill, top-soil, and other unsuitable material, and that the subgrade is acceptable to receive fill in accordance with approved permit

documents and geotechnical report.

- (4) Determining that the subgrade areas to receive fill that slope greater than 5H:1V (horizontal to vertical) are benched into suitable subgrade material.

b. Fill Placement and Compaction

Inspection shall be required during placement and compaction of fill materials. Duties of the special inspector shall include:

- (1) Observing subgrade areas to receive fill and verifying that the subgrade soils are consistent with the subsurface conditions described in the approved permit documents and geotechnical report.
- (2) Evaluating subgrade areas by probing, proofrooling, or as otherwise described in the approved permit documents and geotechnical report.
- (3) Determining that the subgrade is firm and unyielding or otherwise acceptable to receive fill in accordance with the approved permit documents and geotechnical report.
- (4) Determining that fill materials conform to the approved permit documents, specifications, and geotechnical report. Conduct particle-size analysis (e.g. ASTM D 422) and other tests, as necessary, to evaluate whether fill materials conform to the specifications.
- (5) Observing the placement and compaction of fill as necessary to determine that the placement and compaction methods are in accordance with the approved permit documents and geotechnical report.
- (6) Obtaining samples of fill materials and conduct laboratory moisture-density relationship (proctor) tests (e.g. ASTM D 1557) to ascertain optimum moisture and maximum dry-density values.
- (7) Conducting in-place density tests (e.g. ASTM D 2922, ASTM D 2937 and ASTM D 1556) and determining that fill materials are compacted to the relative dry-density required in the approved permit documents and geotechnical report.

c. Shallow Foundation Subgrade Preparation

Inspection shall be required prior to placement of foundation reinforcing steel and formwork. Duties of the special inspector shall include:

- (1) Observing foundation subgrade areas and determining that the subgrade soils are consistent with the subsurface conditions described in the approved permit

documents and geotechnical report.

- (2) Evaluating foundation subgrade areas by probing, proofrolling, or as otherwise described in the approved permit documents and geotechnical report.
- (3) Determine that the foundation subgrade is firm and unyielding or otherwise acceptable to support the design bearing pressures in accordance with the approved permit documents and geotechnical report.

d. Deep Foundations

Inspection shall be required during installation of deep foundations. Duties of the special inspector shall include:

- (1) Determining that pile types and dimensions are in accordance with the approved permit documents and geotechnical report.
- (2) Determining that soils cuttings or driving resistance is consistent with the subsurface conditions described in the approved permit documents and geotechnical report.
- (3) Determining that installation methods and equipment are in accordance with the approved permit documents and geotechnical report.
- (4) Determining that installation is in accordance with criteria established in the approved permit documents and geotechnical report. Installation criteria may include minimum tip elevation, terminal driving resistance, and/or minimum grout volume.

e. Soil Anchor (Installation and Load Testing)

Inspection shall be required during installation and load testing. Duties of the special inspector include:

- (1) Determining that anchor materials and dimensions are in accordance with the approved permit documents and geotechnical report.
- (2) Determining that soil cuttings and drilling resistance are consistent with the subsurface conditions described in the approved permit documents and geotechnical report.
- (3) Determining that installation is in accordance with criteria established in the approved permit documents and geotechnical report. Installation criteria may include minimum anchor embedment, declination, and/or terminal installation torque resistance.
- (4) Observing anchor load tests and verifying that equipment, calibration, and

procedures are in accordance with the approved permit documents and geotechnical report. Recording anchor test loads, load hold times and anchor displacement. Determining that anchor load test results conform to the acceptance criteria established in the approved permit documents and geotechnical report.

f. Mechanically Stabilized Earth (MSE) Retaining Walls

Inspection shall be required prior to foundation placement and during geotextile reinforcement and backfill placement. Duties of the special inspector shall include:

- (1) Determining that there are suitable foundation subgrade conditions in accordance with the "Shallow Foundation Subgrade Preparation" Section C.
- (2) Determining that wall excavation (e.g. back-cut slope) is in accordance with approved permit documents, specifications, and geotechnical reports.
- (3) Determining that the MSE wall materials (i.e. modular block units, connections, geotextile reinforcement, etc.), dimensions, and face batter are in accordance with the approved permit documents and geotechnical reports.
- (4) Determining that backfill material, placement, and compaction is in accordance with the "Fill Placement and Compaction" Section B.

g. Rockery Retaining Walls

Inspection shall be required prior to foundation placement and during rock face and backfill placement and compaction. Duties of the special inspector shall include:

- (1) Determining that foundation subgrade conditions are in accordance with the "Shallow Foundation Subgrade Preparation" Section C.
- (2) Determining that wall excavation (e.g. back-cut slope) is in accordance with approved permit documents and geotechnical reports.
- (3) Determining that rockery wall materials (e.g. boulders), dimensions, shape, and face batter are in accordance with the approved permit documents, specifications, and geotechnical reports.
- (4) Determining that backfill material, placement, and compaction is in accordance with the "Fill Placement and Compaction" Section B.

h. Temporary Cut Slope Excavation

Inspection of temporary cut slopes designed to protect adjacent property or structures may be required for some permits. In these cases, inspection shall be required during

excavation of temporary cut slopes and periodically after excavation until the temporary excavation is backfilled. Duties of the special inspector shall include:

- (1) Observing soils exposed in the cut slope and determining that the soils are consistent with the subsurface conditions described in the approved permit documents and geotechnical reports.
- (2) Determining that cut slope inclination and height are in accordance with the approved permit documents and geotechnical reports.
- (3) Observing cut slopes for evidence of potential instability, such as groundwater seepage, sloughing, raveling, ground cracks, and toe bulges.

i. Settlement/Movement Monitoring

Inspection shall be required prior to and during construction activities which may cause settlement and/or movement of structures, shoring systems, grades, etc. Duties of the special inspector shall include:

- (1) Determining that that settlement/movement survey monuments have been installed and an initial survey of elevation and/or horizontal position has been conducted prior to construction as indicated in the approved permit documents and geotechnical reports.
- (2) Determining that subsequent surveys of monuments are conducted at intervals in accordance with the approved permit documents and geotechnical reports.
- (3) Evaluating survey data and determining that settlement and/or movement is within acceptable tolerances or as otherwise indicated in the approved permit documents and geotechnical reports.

j. Pavement Subgrade, Base Rock, and Asphaltic Concrete Placement and Compaction

Inspection shall be required prior to and during base rock and asphaltic concrete placement and compaction. Duties of the special inspector shall include:

- (1) Observing pavement subgrade areas and determining that the subgrade soils are consistent with the subsurface conditions or structural fill requirements described in the approved permit documents and geotechnical reports.
- (2) Evaluating subgrade areas by probing, proofrolling, or as otherwise described in the approved permit documents and geotechnical reports.
- (3) Determining that the subgrade is firm and unyielding, or otherwise acceptable to receive base rock in accordance with the approved permit documents and geotechnical reports.

- (4) Determining that the base rock and asphaltic concrete materials conform to the approved permit documents and geotechnical reports. Conducting particle-size analysis (e.g. ASTM D 422) and other tests, as necessary, to evaluate whether base rock and asphaltic concrete materials conform to the approved permit documents and geotechnical reports.
- (5) Obtaining samples of base rock materials; conducting laboratory moisture-density relationship (proctor) tests (e.g. , ASTM D 1557) to determine optimum moisture and/or maximum density values; and conducting in-place density tests (e.g. ASTM D 2922, and ASTM D 1556); proofing and determining that base rock materials are compacted to the relative density required in the approved permit documents and geotechnical report.
- (5) Obtaining samples of asphaltic concrete materials; conducting laboratory density tests (e.g. ASTM D 2041) to determine the theoretical maximum density values; and conducting in-place density tests (e.g. ASTM D 1188, ASTM D 2950 and ASTM D 2726) and determining that asphaltic concrete materials are compacted to the relative density required in the approved permit documents and geotechnical reports.

II. Structural Observation

Sections

- A. Objective
- B. References
- C. Definition
- D. General
- E. Duties and Responsibilities

A. Objective

1. To define the scope of requirements and responsibilities of the registered design professional (RDP) for structural observation when required by the State Building Code or the Bureau of Development Services, according to the provisions of the State Building Code, Chapter 17.
2. These requirements and responsibilities are not the same as those of special inspectors for concrete construction, masonry construction, steel construction, etc. as set forth in these Rules.

B. References

Structural Observation, State Building Code, Chapter 17

C. Definition

1. Structural observation means the visual observation of the structural system, for general conformance to the approved permit documents, at significant construction stages and at completion of the structural system. Structural observation does not include nor waive the responsibility for the inspections required by State Building Code Chapter 1 (building inspections) and Chapter 17 (special inspections).
2. Structural observation as defined in this section is not to be relied upon by others as a guarantee of the work, nor to be construed to relieve the contractor of its obligations and responsibilities under the construction contract, approved permit documents, and applicable workmanship provisions of the State Building Code and standards referenced by the approved permit documents.
3. Structural observation does not include responsibility for the inspection or superintendence of construction processes, site conditions, operations, equipment, personnel, or the maintenance of a safe place to work or any safety in, on, or about the work site.

D. General

According to State Building Code Section Chapter 17, the owner shall employ a RDP to perform structural observation when required by the State Building Code, Chapter 17.

E. Duties and Responsibilities

1. The general report procedures of Section I.F. of these Rules are also required of the RDP. At the conclusion of the work the RDP shall submit a statement in writing to the Bureau of Development Services stating that the site visits have been made and whether or not any observed deficiencies have been corrected to conform to the approved permit documents and specifications, or to revised details approved by the Bureau of Development Services .
2. Structural observation of construction does not necessarily have to be "continuous" but should be performed so that close coordination exists among the RDP, the contractor, the inspection/testing agency (where applicable), and the Bureau of Development Services. In addition to the Statement of Special Inspections required by Ch. 17, OSSC, the RDP shall provide a schedule of anticipated visits to the jobsite when structural observation are required.

III. Welder Certification

Sections

- A. Purpose
- B. Scope
- C. References
- D. Welder Qualifying Agencies
- E. General Requirements
- F. Welder Certification Card

A. Purpose

1. The purpose of these procedures is to provide a method for qualifying welders of steel and to certify the ability of the welder to produce sound welds in accordance with the requirements of the State Building Code and referenced standards.
2. The qualification tests are not intended to be used as a guide for welding during actual construction. Construction welding shall be performed in accordance with the requirements of the approved permit specifications, State Building Code, and the current edition of American Welding Society (AWS) D 1.1, D 1.3 and D 1.4.

B. Scope

These procedures shall apply to the certification of welders performing work that is regulated by the State Building Code and Title 24 of the Portland City Code.

C. References

1. State Building Code
2. Portland City Code (P.C.C.) 24.20
3. Latest edition of Structural Welding Code--ANSI/AWS D 1.1, D 1.3 and D 1.4

D. Welder Qualifying Agencies

1. General
 - a. The Bureau of Development Services will accept only welding performance qualification tests performed by the following approved welder qualifying agencies:
 - (1) Professional Service Industries (PSI)
 - (2) Carlson Testing Inc.
 - (3) Ironworkers Local 29 - Apprentice & Training Committee
 - (4) Willamette Carpenter's Training Center
 - (5) Sheet Metal Workers' Local 16
 - (6) ACS Testing, Inc
 - (7) IMR KHA-Portland

Welder Qualifying Agencies shall submit a quality assurance manual which outlines the welder certification process. Manuals shall include but not be limited to the following information:

1. A copy of the facility floor plan; indicate the location of weld equipment, weld electrodes, test coupon materials, and coupon test equipment.
2. A sample copy of a (welder) application that requires weld history, an outline of procedures used for qualification, retest, renewal, and required fees.
3. Equipment calibration certification and details of a maintenance policy.
4. Certified mill test reports shall be kept on file. Base metal for test coupons and test samples order, as welder are successfully qualified.
5. A log of City certified welder numbers will be maintained and issued in sequential order, as welders are successfully qualified. Numbers cannot be reused.
6. A statement to the effect that certifications are issued to the individual welder, not a company. Include an expiration policy.

7. Include a statement indicating that the welding of all specimens (coupons) must be witnessed in accordance with AWS and the City of Portland Administrative Rules. A signed qualification test record must accompany the sample. A facility may have a second or back-up policy indicating a **NON**-City certification policy.
8. Records shall be made available and maintained for five years. Records must include applicable WPS, PQR'S, calculations, derived data, and final results.
9. A list of qualified instructors responsible for the program. Include their resumes.
10. A sample copy of a welder certification card that will be issued by the facility, indicating City of Portland certification.

Exception: As proof of qualification, certified welder cards from the Washington Association of Building Officials will be accepted in lieu of reports from the above agencies.

- b. The fabrication of all test specimens shall be witnessed by an AWS-certified welding inspector from one of the above agencies. However, the test specimens can be made where the welder is employed.

Exception: The fabrication of test coupons may be witnessed by one of the following individuals:

- (1) An instructor from an educational program approved by the Bureau of Development Services. Instructors shall submit a resume of qualifications for acceptance by the Bureau of Development Services.
 - (2) A quality control representative from a City of Portland "approved steel fabricator" that has obtained prior approval from the Bureau of Development Services.
 - (3) An AWS Certified Welder Inspector (CWI) qualified and certified in accordance with the provisions of AWS QCI, Standard for Qualification and Certification of Welding Inspectors.
- c. After witnessing the fabrication, the above individuals shall submit the test coupons to one of the above approved welder qualifying agencies for the purpose of conducting the mechanical or radiographic tests and visual inspection.

2. Agency Personnel

- a. Testing personnel witnessing the tests, conducting the mechanical tests, and approving the mechanical and visual test specimens must work under the supervision of an AWS

Certified Welder Inspector (CWI) qualified and certified in accordance with the provisions of AWS QCI, Standard for Qualification and Certification of Welding Inspectors.

- b. Testing personnel performing and interpreting radiographic testing shall be qualified in accordance with the current edition of American Society for Nondestructive Testing Recommended Practice No. SNT-TC-1A.

E. General Requirements

1. Welders may become certified by the Bureau of Development Services in one or more of the following categories by satisfactory completion of the applicable qualification tests in accordance with the current editions of the American Welding Society Standards: Structural Steel (Standard D1.1), Light Gage (Standard D1.3), Reinforcing Steel (Standard D1.4).
2. **Renewal.** Welder certifications are issued for a period of one year. Renewals are administered by the welder-qualifying agencies listed in Section D.1 of these procedures. Please contact these agencies for renewal procedures and fees.
If (1) the welder is not engaged in a given process of welding for which the welder or welding operator is qualified for a period exceeding six months, or (2) there is some specific reason to question a welder's or a welder operator's ability, the welder shall be re-qualified by the applicable tests required by AWS D1.1. Verification that there has been no six-month period when the welder has not been engaged in a given process is usually provided through documentation from the welder's employer (or employers). Acceptance of this type of documentation is at the discretion of the welder-qualification agency.
3. **Critical Welds.** When deemed appropriate or identified on the approved permit documents and specifications for critical welds, the Bureau of Development Services or registered design professional may require the welder to complete a requalification test to determine the welder's ability to produce sound welds.

F. Welder Certification Card.

Certified welder cards shall be issued by the welder-qualifying agencies as proof of qualification. Welders shall carry their certified cards at all times while performing welding. Certified welder cards must also indicate the weld process in which the welder is qualified and expiration date.

IV. Special Inspector Certification

(The COP has discontinued it's special inspector certification program.)

As proof of qualification for special inspectors the City of Portland requires that special inspectors be registered with Oregon Building Officials Association. Please visit the OBOA website for more information.

<http://www.oboonline.org/displaycommon.cfm?an=1&subarticlenbr=30>

Special inspectors performing welding inspections on a Seismic Load Resisting System (SLRS) (as defined by AISC 341, Seismic Design Manual) such as a braced frame system or moment frame system shall be qualified in accordance with AWS QC1 – Standard for AWS Certification of Welding Inspectors. <http://files.aws.org/certification/docs/qc1-07.pdf>

Inspection of Non-Local Fabrication

1. For fabrication that takes place outside of the Portland area, permission may be granted by the Bureau of Development Services on a project-by-project basis for a non-approved testing agency located near the place of fabrication to provide special inspection.
2. Approval shall be requested by the approved agency that is employed by the owner or the registered design professional acting as the owner's agent to provide special inspection for the project.
3. Information as outlined in Appendix, "Request for Approval to Provide Special Inspection of Non-Local Fabrication," must be provided to the Bureau of Development Services and approved prior to the beginning of fabrication.
4. The inspections must be performed by the "Primary Special Inspector" as identified on the Request for Approval form. If the Primary Special Inspector is unable to perform the inspections due to illness or other unforeseen circumstances, the inspection shall be performed

by the "Back-up Special Inspector."

5. The requirements for distribution of inspection reports for non-local testing agencies approved to provide special inspection of non-local fabrication shall be as outlined in these Rules in section I.F Inspection Reports.
6. The approved agency that is providing special inspection for the project shall verify, by reviewing inspection reports of the fabrication, that all components have been inspected and accepted by the non-local testing agency prior to being erected.
7. The Bureau of Development Services may revoke or suspend these approvals for failure to abide by the requirements of these Rules and/or any conditions set forth at the time of approval.

V. Approved Fabricators

Sections

- A. Purpose
- B. Categories of Fabricator Approval
- C. Application

A. Purpose

In accordance with section 1704.2.2, OSSC, special inspections required by the code are not required where the work is done on the premises of a fabricator registered and approved to perform such work without special inspections. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by a nationally recognized accrediting authority.

The purpose of these Rules is to establish procedures for fabricators to be approved in accordance with section 1704.2.2, OSSC.

Work performed by an approved fabricator in accordance with this section may be subject to periodic special inspections as deemed necessary by the registered design professional or Bureau of Development Services.

B. Categories of Fabricator Approval

Categories of fabricator approval are:

- Pre-Manufactured Metal Buildings
- Steel joists/girders
- Roof and floor trusses

Structural steel
Precast/Pre-stressed Concrete

1. Pre-manufactured Metal Buildings- fabricators certified by (a) American Institute of Steel Construction (AISC), (b) International Accreditation Service (IAS), or (c) other nationally recognized accreditation agency approved by the Bureau of Development Services are considered approved in accordance with section 1704.2.2, OSSC.
2. Steel joists/girders – fabricators listed by Steel Joist Institute (SJI) are considered approved in accordance with section 1704.2.2, OSSC.
3. Roof or floor trusses – fabricators listed by International Accreditation Service (IAS) are considered approved in accordance with section 1704.2.2, OSSC.
4. Structural steel- fabricators audited and approved by International Accreditation Service (IAS) or American Institute of Steel Construction (AISC) are considered approved in accordance with section 1704.2.2, OSSC.
5. Precast/Pre-stressed Concrete- fabricators audited and approved by Precast Concrete Institute (PCI) and American Precast Association (APA) are considered approved in accordance with section 1704.2.2, OSSC.

C. Application

1. Prior to commencement of fabrication operations, copies of documents confirming that the fabricator has been audited, listed, accredited or certified in accordance with the criteria in Section B above, shall be approved by the Bureau of Development Services.
2. For structural steel fabricators the name of the quality control supervisor shall be forwarded to the Bureau of Development Services. The Bureau will review and approve the capability of the fabricator to perform non-destructive testing when required by the approved permit documents.
3. For precast/pre-stressed concrete fabricators the name of the quality control supervisor shall be forwarded to the Bureau of Development Services. The Bureau will review and approve the capability of the fabricator to perform quality control inspections of steel weldments.
4. Please forward copies of the documents with the appropriate project application/permit number to:

Special Inspection Section
Bureau of Development Services
1900 SW 4th Ave, Suite 5000
Portland, OR 97201

VI. Testing Agency Certification

Sections:

- A. Purpose
- B. Standards
- C. Management and Supervision
- D. Subcontracting of Work
- E. Inspection of the Testing Agency
- F. Applications
- G. Certification
- H. Notification of Change
- I. Annual Renewal
- J. Modifications
- K. Revocation

A. Purpose

The purpose of these Rules is to define minimum standards and procedures for certification of testing agencies engaged in the inspection and testing of concrete, steel, masonry, and other structural systems or critical building components pursuant to Chapter 17 of the State Building Code, the Portland City Code, and these Administrative Rules.

B. Standards

1. The provisions of ASTM E329 (latest edition), "Standard Practice for Use in the Evaluation of Testing and Inspection Agencies as Used in Construction," are hereby adopted by reference and shall apply equally with the provisions set forth in these Rules except where specifically amended or superseded.
2. Approved testing agencies performing welding certification and weld testing shall comply with Section III of these Rules and the American Society for Nondestructive Testing Recommended Practice No. SNT-TC-1A.

C. Management and Supervision

1. Agency Manager

The inspection and testing services of the agency shall be under the direction of a person charged with engineering managerial responsibility. That person shall be a professional engineer registered in the State of Oregon and a full-time employee of that agency.

Exception: A person who is not a registered engineer may be acceptable in the managerial capacity if all of the following requirements are met:

- a. The candidate must have at least eight years of experience in special inspections and the testing of construction and materials.
- b. A detailed resume shall be submitted which specifically outlines the extent of the experience of the person in all aspects of special inspections as defined by Chapter 17 of the State Building Code.
- c. Letters of recommendation shall be submitted from at least three professional engineers who are registered in the State of Oregon. These letters must attest to the competence of the individual to hold a position with managerial responsibility in the special inspection and testing of construction and materials. No more than one recommendation may be submitted from an engineer employed by the applicant.

2. Supervising Laboratory Technician

The agency shall have at least one full-time supervising laboratory technician. That person shall have at least five years experience performing tests on construction materials. The supervising laboratory technician shall be able to provide evidence of experience by submission of a resume with experience references.

3. Supervising Field Technician

The agency shall have at least one full-time supervising field technician. That person shall have at least five years inspection experience in the kind of work involved on construction projects. This person must be a special inspector registered in the City of Portland in all areas in which they will be supervising. The agency must have a supervising field technician responsible for each area in which it will be providing inspection services. The supervising field technician shall be able to provide evidence of experience by submission of a resume with experience references.

4. Responsibilities

It is both the management's and the supervisor's responsibility to insure that those persons which they employ are abiding by the Rules and regulations concerning special inspections in the City of Portland.

D. Subcontracting of Work

Subcontracting may be allowed as well as the loaning of inspectors from one agency to another, but this is allowed on a very limited scope for special circumstances and only when specifically approved by the Bureau of Development Services. See Appendix.

E. Inspection of the Testing Agency

Each testing agency shall have its facilities and procedures inspected at intervals of not more than three years by an inspection agency acceptable to the Bureau of Development Services and shall be accredited to ASTM E329.

F. Applications

1. The applicant shall submit a manual describing the agency's facilities for testing and inspections. The manual shall be submitted in a bound binder with tabs that are consistent with a table of contents outlining areas of operation. The manual must bear the date, name, and signature of an officer of the company and the person charged with managerial responsibility and include the following minimum information:
 - a. Organization and Personnel
 - (1) The legal name and address of the agency
 - (2) The name and address of the owner of the agency.
 - (3) Signatures of key personnel authorized to sign for the company.
 - (4) A current organization chart showing the relationship between administration, operation, and quality control.
 - (5) A roster of current full-time employees which includes a resume of each employee's education, experience, and qualifications related to special inspection and testing.
 - (6) External and subcontracted technical services used by the agency and the names and addresses of suppliers of subcontracted technical services.
 - (7) A list of the categories of special inspections for which approval is being requested.

b. Facilities and Equipment

- (1) A floor plan of the laboratory. Show the facilities for storage, handling, and conditioning of samples.
- (2) A list of the serial numbers, model numbers, and makes of mechanical testing equipment. Provide a copy of the latest calibration check for each piece of testing equipment. The name of the reviewing agency and the date of the most recent calibration check shall be included.

c. Test Methods and Procedures

- (1) A Standard Operating Procedure (S.O.P.) for methods of dispatching certified staff.
- (2) A copy of the test standards and procedures pertinent to the scope of the special inspections and testing for which approval is being applied. An affidavit of compliance from an approved inspection agency that demonstrates the agency's competence to perform the tests and states that any deficiencies noted during inspection have been remedied in a satisfactory manner.
- (3) A copy of the most commonly used data sheets, test reports, and certifications.
- (4) A statement regarding the location and procedures for the safe-keeping of records and files.
- (5) Evidence of an in-house quality assurance program.
- (6) A procedure for periodic revision of the manual.
- (7) Provide an S.O.P. for subcontracting work to or from other certified testing agencies.
- (8) An SOP on the agency's policy of inspector supervision in the laboratory and field.

G. Certification

1. Once the certification process is completed, if approved, the applicant's name shall be entered on the list of approved testing agencies. Agencies will be notified in writing if the application is not approved.
2. Certification applies only to the agency listed and is not transferable. The testing agency is subject to random, unannounced inspections of the facilities to verify compliance with the terms and conditions of approval. If the application is denied the testing agency may request a review by the Advisory Board for Special Inspections.

H. Notification of Change

Testing agencies approved under these Rules shall notify the Bureau of Development Services in writing within thirty (30) days of any of the following occurrences:

1. The company name and/or address is changed.
2. There are changes in testing equipment certification procedures or to the information submitted under Sections c(1)(2) and (3) & F.
3. A new testing or branch facility is established.
4. There is a change in principal officers and key supervisory and responsible personnel of the company.

I. Annual Renewal

1. To maintain approval, the testing agency shall each year submit a renewal application and fee to the Bureau of Development Services.
2. The renewal application shall include a copy of the latest affidavit of compliance from an approved inspection agency (see Appendix).

J. Modifications

1. Major Modification

A major modification is a relocation of the agency; change in corporate structure or key personnel, i.e. agency manager or technical director; or as deemed a major modification by the Bureau of Development Services because a significant change of inspection or testing methods has occurred.

2. Minor Modification

A minor modification is one that is not categorized as a major modification, such as notification of a new laboratory or field supervisor, new testing or inspection equipment (required), updating of quality control manuals, etc.

K. Revocation

1. Any certification can be revoked, suspended or denied approval for – but not limited to –the following reasons:

- a. Failure to abide by all requirements of these Rules and the Portland City Code or the conditions of approval set forth in the Bureau of Building's letter of approval.
 - b. Failure to notify the City of any changes as required by Section H.
 - c. Failure to insure that those persons whom they employ are abiding by these Rules and the Portland City Code.
 - d. Failure to maintain a current inspection agency certification.
 - e. Failure to keep the testing equipment calibrated.
 - f. Failure to submit a complete application.
 - g. Failure to employ management and supervision staff that comply with the requirements of Section C and approved by the Bureau of Development Services.
 - h. Submission of an application which contains intentionally misrepresented facts and information.
2. If the Director determines that there is cause to revoke, suspend, or deny renewal of a testing agency's certification, the Director shall hold a hearing on the matter. The Director will give notice of this hearing to the testing agency at least 10 days prior to the time set for a hearing. The notice shall include a list of the allegations, as well as the time, date, and place set for the hearing, when the testing agency shall have an opportunity to be heard and present matter in their defense. Not later than 10 days following the hearing, the Director shall issue a decision along with the type of action, if any, that may be taken.
 3. A testing agency adversely affected by the Director's determination may have review pursuant to ORS 34.010 to 34.100.

VII. Appendix

- Attachment A -- Structural Special Inspection and Observation Program Checksheet
- Attachment B -- Soils Special Inspections Program Checksheet
- Attachment C -- Life Safety Special Inspection and Observation Checksheet
- Attachment D -- Change of Geotechnical Special Inspector Form
- Attachment E -- Agreement to Complete Elevation Certificate
- Attachment F -- Daily Field Report
- Attachment G -- Non-Compliance List
- Attachment H -- Final Summary Report
- Attachment I -- Request for Approval to Provide Special Inspection of Non-Local Fabrication
- Attachment J -- Special Inspector Performance Report
- Attachment K -- Contractor's Statement of Responsibility
- Attachment L -- Fabricator's Certificate of Compliance