

STATE OF OREGON

Interpretation

BUILDING CODES DIVISION

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**TO: ELECTRICAL INSPECTORS AND INDUSTRY**

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**SUBJECT: WIRING METHODS UTILIZING SUSPENDED CEILINGS (REVISED)**

Standard 25-2 of the Oregon Structural Specialty Code specifies the construction requirements for metal suspension systems for acoustical tile and for lay-in panel ceilings. This revised memorandum sets forth the construction limitations for the use of ceiling structural members as a means of support for electrical equipment. The revision is based on the ANSI recommended practices for supporting cables.

The structural performance required from a ceiling suspension system shall be in accordance with its structural classification. The classifications are:

- **Light-duty systems.** Used primarily for residential and light commercial structures where ceiling loads other than acoustical tile or lay-in panels are not anticipated.
- **Intermediate-duty systems.** Used primarily for ordinary commercial structures where some ceiling loads, due to light fixtures and air diffusers, are anticipated.
- **Heavy-duty systems.** Used primarily for commercial structures in which the quantities and weights of ceiling fixtures (lights, air diffusers, etc.) are greater than those for an ordinary commercial structure.

#### **RECESSED FLUORESCENT LIGHTING FIXTURES**

##### **Light-duty systems.**

Ceiling systems classified as Light-duty shall not be used for the support of lighting fixtures. Recessed fluorescent lighting fixtures may be installed in light-duty ceilings provided:

- A number 12 hanger wire is attached from each corner of the fixture to the structure above; and

- Fixtures shall be positively and securely attached within 6 inches of each corner to the suspended ceiling framing member by mechanical means, such as bolts, screws or rivets. Clips identified for use with the type of framing members and fixtures shall also be permitted.

#### **Intermediate-duty systems.**

Intermediate-duty ceilings may be used for the support of recessed lighting fixtures provided:

- Fixtures shall be positively and securely attached within 6 inches of each corner to the suspended ceiling framing member by mechanical means, such as bolts, screws or rivets. Clips identified for use with the type of framing members and fixtures shall also be permitted; and
- Number 12 gauge hanger wires shall be attached to the grid members within 3 inches of each corner of each fixture. Tandem fixtures may utilize common wires; and
- Lighting fixtures weighing less than 56 pounds shall have two number 12 gauge slack wires connected from the fixtures housing to the structure above; or
- Lighting fixtures weighing 56 pounds or more shall be supported directly from the structure above by approved hangers attached to each corner of the fixture.

#### **Heavy-duty systems.**

- Fixtures shall be positively and securely attached within 6 inches of each corner to the suspended ceiling framing member by mechanical means, such as bolts, screws or rivets. Clips identified for use with the type of framing members and fixtures shall also be permitted; and
- Lighting fixtures weighing less than 56 pounds shall have two number 12 gauge slack wires connected from the fixtures housing to the structure above; or
- Lighting fixtures weighing 56 pounds or more shall be supported directly from the structure above by approved hangers attached to each corner of the fixture.

#### **RECESSED INCANDESCENT LIGHTING FIXTURES**

- Recessed incandescent lighting fixtures installed in light-duty, intermediate-duty and heavy-duty classified ceilings shall be positively and securely attached to brackets that are secured to the suspended ceiling framing member by mechanical means, such as bolts, screws, rivets or tie wire; and
- At least one number 12 gauge hanger wire shall be connected from the fixture housing to the structure above. The hanger wire may be slack for intermediate and heavy duty rated ceilings.

## **SURFACE MOUNTED LIGHTING FIXTURES AND LIGHTING TRACK**

- Surface mounted lighting fixtures and lighting track shall be positively and securely attached to the suspended ceiling framing member by mechanical means, such as bolts, screws, rivets or clips; and
- Number 12 gauge hanger wires shall be installed to connect the fixture housing or lighting track to the structure above. The number of hanger wires shall be the same as the number of attachment points required if installed on a structural ceiling. Tandem fixtures may utilize common wires.
- Pendant-hung lighting fixtures shall be supported directly from the structure above with a number 9 hanger wire or approved alternate support without using the ceiling suspension system for direct support.

## **PULL AND JUNCTION BOXES**

Pull and junction boxes shall be installed as follows:

### **Framing members**

Pull and junction boxes within the cavity of a suspended ceiling that is not a fire rated assembly may attach to the suspended ceiling framing members provided:

- The installation complies with the ceiling system manufacturer's instructions; and
- The pull or junction box is not larger than 100 cubic inches; and
- The box is supported to the main runner with two fastening devices that are designed for framing member application and positively attach or lock to the member; and
- The box serves branch circuits and associated equipment in the area; and
- The box is within 6 feet of the lighting fixtures being supplied; and
- The framing members are not rotated more than 2 degrees after installation.

### **Support Wires**

Pull and junction boxes within the cavity of a suspended ceiling that is a fire rated or a non-fire rated assembly may attach to independent supporting wires according to the following:

- Independent support wires shall be taut and connected at both ends, one end to the ceiling framing member and the other end to the structure above; and

- The pull or junction box shall not be larger than 100 cubic inches; and
- Boxes shall be secured to the independent supporting wires by two fastening devices that are designed for the application; and
- Independent support wires in a fire rated ceiling shall be distinguishable by color, tagging or other effective means from those that are part of the fire rated design.

Pull boxes, junction boxes and other enclosures larger than 100 cubic inches shall not be attached to ceiling support wires. They may be securely supported to the structure above or securely mounted to steel strut or channeling and seimically braced. Boxes and enclosures not larger than 100 cubic inches may be secured to 1/4 inch rods provided the assembly is rigid.

Access shall be provided to pull and junction boxes that are installed above a concealed spline acoustical tile type suspended ceiling. One method of providing access is to permanently identify those tiles directly below pull and junction box areas so they can be easily removed.

### **Boxes and Enclosures for Flush Mounted Ceiling Devices and Equipment**

Boxes and enclosures intended to enclose receptacle outlets, support lighting fixtures and enclose speakers flush with the under side of the ceiling shall be attached to brackets that are secured to the main framing member. In addition, there shall be a number 12 support wire that is attached from the box or enclosure to the structure above.

Boxes and enclosures for light weight surface mounted devices such as smoke detectors, visual fire alarm devices and burglar alarm devices are not required to have an additional support wire unless required by their listing installation instructions.

### **CABLES AND RACEWAYS**

Cables and raceways may be supported by the following means:

#### **Support Wires**

Cables and raceways within the cavity of a suspended ceiling that is a fire rated or non-fire rated assembly may be attached to independent support wires according to the following:

- Independent support wires shall be taut and connected at both ends, one end to the ceiling framing member and the other end to the structure above; and
- Raceways shall not be larger than one inch trade size and cables and bundled cables shall not be larger than one inch diameter including insulation; and

- Not more than 3 raceways or cables may be supported by any independent support wire and shall be supported within the top or bottom 12 inches of the supporting wire hanger; and
- Cables for telecommunication, data processing, Class 2 power limited signaling systems, fiber optics and other power limited systems shall be securely fastened within two feet of each termination and at intervals not to exceed five feet or according to the manufacturer's installation instructions; and
- Raceways shall be secured at intervals required for the type of raceway installed; and
- Cables and raceways shall be secured to independent support wires by fastening devices and clips designed for the purpose. One cable shall be permitted to be secured to an independent support wire by means of a nonmetallic tie wrap approved for the environment; and
- Independent support wires in a fire rated ceiling shall be distinguishable by color, tagging or other effective means from those that are part of the fire rated design.

### **Framing members**

Cables and raceways shall not be supported by framing members of a suspended ceiling unless it is permitted by the ceiling system manufacturer's instructions.

### **Trapeze Support**

Trapezes constructed of steel rods and steel channels may support cables and raceways within the cavity of a suspended ceiling.

- The size of the rods, channel and fastening devices shall be suitable for the anticipated weight.
- The spacing of trapezes shall be that required for the type of raceway installed.
- Cables and raceways shall be secured to a trapeze by straps designed for the purpose except for electrical metal tubing (EMT), rigid metal conduit, intermediate rigid metal conduit, armor cable and metal clad cable in trade sizes up 3/4 inch inclusive which may be secured with tie wire.
- Cables and raceways shall not support other raceways or cables. A Class 2 control cable may be supported to the associated raceway containing power supply conductors for the equipment being controlled such as a thermostat cable attached to the air conditioner supply raceway.
- An appropriately sized seismic bracing system shall be installed to trapezes where required.