2010 CBC
STANDARD
SUSPENDED CEILING
DETAILS
FOR
ACOUSTICAL TILE OR
LAY-IN PANEL CEILINGS
CLX DRAWING INDEX, NARRATIVE AND FLOWCHART

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REVIEWED IN ACCORDANCE WITH
THE REQUIREMENTS OF T24 CCR

APPROVED -

Office of Statewide Health
Planning & Development
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NARRATIVE

2010 California Building Code (2010 CBC) Standard Ceiling Details document contains OSHPD Pre-Approved Details (OPD), which may be incorporated into construction documents. These details have been reviewed for compliance with the 2010 CBC and, when used as shown, without modifications, are deemed to comply with code. They are intended to cover common conditions that occur on many projects. It is anticipated that use of these details will facilitate the design, review, and construction process.

The Narrative and supporting Flowchart, which follows the Narrative, are provided to assist in selecting applicable details from the OPD for incorporation into the construction documents. It is to be used only as a guide and does not provide complete step-by-step instructions for use of the OPD. Narrative comment numbers correspond to the numbered items on the Flowchart.

The following steps apply to use of OPD:

1. Define Project Parameters

   A. Short Period Spectral Response Acceleration (Sos) for project site.

      i. The (Sos) identified for use with the OPD shall not be lower than the Sos documented in the project General Notes and/or Specifications.

   B. Type of construction.

      i. The Registered Design Professional (RDP) in responsible charge shall identify the floor and/or roof framing materials which apply to the use of the OPD under consideration (e.g. wood, concrete, metal deck).

   C. Project specific geometry and other conditions.

      i. The RDP in responsible charge shall identify the geometry which applies to the use of the OPD under consideration (e.g. floor-to-ceiling height, etc).

      ii. The RDP in responsible charge shall identify other unique conditions which apply to the use of the OPD under consideration (e.g. mechanical duct conflicts and other obstructions).

2. Verify Applicability of OPD

   Refer to PIN 51.

OPD allow design professionals to incorporate pre-approved details into their construction documents. Projects that utilize OPD shall satisfy the following conditions.

   A. The RDP in responsible charge shall verify the applicability of the OPD for their specific project conditions. For example, when designing a fire-rated ceiling, use of ceiling details OPD are acceptable provided the OPD are compatible with the construction requirements for the fire rated assembly.

   B. The details must be directly applicable to the project conditions. For example, OPD for attachment of a ceiling below a steel deck with concrete fill are not applicable to wood frame construction.

   C. Substitutions of items shown in the OPD are not permitted, unless specifically allowed by the OPD. For example, a power-actuated fastener (PAF) may not be substituted in a connection detail that specifies an expansion anchor, unless the OPD specifically permits it. Use of post-installed anchors from different manufacturers is permitted, provided the substituted anchors meet the installation criteria and Allowable Strengths as specified in the OPD.

   D. Changes to the OPD to accommodate project conditions are not permitted. In such cases, project specific details are required.

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CLX.02
3. Select Appropriate Details from OPD
Review OPD General Notes before the start of OPD selection process.

A. The GENERAL NOTES section of this OPD document provides detailed specification of the materials and the workmanship associated with the details. The RDP in responsible charge shall confirm the applicability of the OPD details and the specifications noted in this section (CL0.00, CL0.01, CL0.02, CL0.03, CL0.04). Refer to CL2.1 to confirm general configuration requirements.

B. Typical geometric conditions shall be verified from CL2.2X. Refer to Section 10 of the GENERAL NOTES for system component requirements.

C. Ceiling boundary condition shall be provided in conformance with the requirements detailed on CL2.5 and CL2.6. Refer to Section 11 of the GENERAL NOTES for system installation requirements.

D. Detailing requirements needed to comply with the requirements for both slip and fixed conditions in corridor ceilings are shown on CL2.3, CL2.4, CL2.5 and CL2.6. Refer to Section 12 of the GENERAL NOTES.

E. CL2.7 and CL2.8 show the necessary detailing requirements for the support of Curtain Tracks, Air Terminals, and Light Fixtures suspended directly from the ceiling system. Refer to Section 15 of the GENERAL NOTES.

F. Hanger and Bracing Wire specifications are shown in Section 9 of the GENERAL NOTES. CL4.1 graphically illustrates the requirements of the specifications at the terminal ends of the wire.

G. Compression Strut requirements are detailed in CL3.X. Channel and Electrical Metallic Tubing (EMT) are the two types of Compression Struts that are included within the scope of this OPD. Refer to Section 13 of the GENERAL NOTES for system installation requirements.
   1. Channel Type Compression Strut details are shown on CL3.1.
   2. Electrical Metallic Tubing (EMT) Compression Strut details are shown on CL3.2.

H. Requirements for detailing at obstructions between the ceiling and the support structure are illustrated in CL6.X. Different obstruction types require special detailing of Hanger Wires, Bracing Wires, and Compression Struts. Refer to Section 14 of the GENERAL NOTES for system installation requirements.
   1. Requirements for detailing at obstructions at Hanger and Bracing Wires are shown on CL6.1, CL6.2, CL6.4, CL6.6, CL6.7.
   2. Requirements for detailing at obstructions at Compression Struts are shown on CL6.2, CL6.3, CL6.5.

I. Connection detail requirements for the connection of Hanger and Bracing Wire to support structure are illustrated in Details CL4.X. Detail requirements for attachment to various structural materials and systems are included in these details. Refer to Section 14 of the GENERAL NOTES for system installation requirements. Refer to Details CL1.X for fastener design capacities and component properties.

J. Connection detail requirements for the connection of Compression Strut to support structure are illustrated in Details CL5.X. Detail requirements for attachment to various structural materials and systems are included in these details. Refer to Section 14 of the GENERAL NOTES for system installation requirements. Refer to Details CL1.X for fastener design capacities and component properties.
4. Implementation and Use of OPD During Plan Review
   Refer to PIN 51.

5. Implementation and Use of OPD During Construction Process
   Refer to PIN 51.

   A. During construction, OPD are treated as any other detail in the approved documents.
   
   B. Pre-approved details submitted after the construction documents have been approved and a building permit has been issued shall be used and/or processed in accordance with Code Application Notice 2-107.4 "Amended Construction Documents." Pre-approved details may be applied as alternates to the approved details shown on the permitted construction documents only on a one for one basis and with written consent of the registered design professional and the registered design professional in responsible charge and in concurrence with OSHPD field staff. Pre-approved details will not be subject to additional plan review provided they are incorporated without any modification. Pre-approved details are subject to field confirmation during which the applicability of pre-approved details for specific project conditions shall be evaluated.
   
   C. Changing the scope of a project (adding additional ceilings, for example) does constitute a material alteration to the project, even if OPD can be used for all conditions. In such a case, an Amended Construction Document must be submitted to OSHPD field staff for review.
From CLX.07 and CLX.06

Connection to Structure

3.1 Hanger & Brace Wires CL4.X

3.1 Structural Concrete Filled Metal Deck CL4.3 & CL4.4

3.1 Concrete Slab, Beam, or Joint CL4.5

3.1 Structural Steel CL4.6

3.1 Timber CL4.7

3.1 Metal Stud Wall CL4.8 CL4.9 CL4.10

3.3 Compression Strut CL5.X

3.3 Concrete Filled Metal Deck CL5.2

3.3 Concrete Slab, Beam, or Joint CL5.4

3.3 Structural Steel CL5.5

3.3 Timber (cf. Gypsum) CL5.6

3.3 Timber (cf. Gypsum) CL5.7

End

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FACILITIES DEVELOPMENT DIVISION

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Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: FLOWCHART - CONNECTIONS TO STRUCTURE

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GENERAL NOTES

1. CONSTRUCTION, WORKMANSHIP AND MATERIAL SHALL CONFORM TO THE 2010 CALIFORNIA BUILDING CODE (CBC 2010).

2. THE CONTRACTOR SHALL NOTIFY OSHPD AND THE REGISTERED DESIGN PROFESSIONAL (RDP) IN RESPONSIBLE CHARGE WHERE A CONFLICT OR DISCREPANCY OCCURS BETWEEN THE CONSTRUCTION DRAWINGS AND ANY OTHER PORTION OF THE CONSTRUCTION DOCUMENTS, FIELD CONDITIONS, OR WHERE ANY CONDITIONS ARISE NOT COVERED BY THESE DOCUMENTS WHEREIN WORK WILL NOT COMPLY WITH CODE REQUIREMENTS.


4. GALVANIZED METAL STUDS, TRACKS AND SHEET STEEL SHALL CONFORM TO ASTM A653-09a MATERIAL, OR OTHER EQUIVALENT ASTM LISTED MATERIALS IN SECTION A2.1 OF THE AISI S100-07/08-10, NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS WITH SUPPLEMENT 2, DATED 2010, WITH A MINIMUM YIELD STRENGTH OF 33 KSI FOR 43 MIL (18 GAGE) AND LIGHTER AND MINIMUM YIELD STRENGTH OF 50 KSI FOR HEAVIER GAGES.

5. METAL STUDS AND TRACKS SHALL BE OF SIZE, THICKNESS AND SECTION PROPERTIES SHOWN ON TABLES 1-1, 1-2 AND 1-3 OF THE AISI MANUAL, COLD-FORMED STEEL DESIGN, 2008 EDITION. THE RDP IN RESPONSIBLE CHARGE SHALL OBTAIN OSHPD APPROVAL FOR ANY SUBSTITUTIONS.

6. THESE RDP REFER TO FASTENER TYPE AND SIZE BUT DO NOT SPECIFY OR ENDORSE A SPECIFIC MANUFACTURER. THE RDP IN RESPONSIBLE CHARGE SHALL SELECT A MANUFACTURER AND SELECTED FASTENER CAPACITIES SHALL MATCH OR EXCEED THE STRENGTHS LISTED HEREIN. THE FOLLOWING REQUIREMENTS SHALL ALSO BE MET:

a. SHEET METAL SCREWS SHALL COMPLY WITH ASTM C 1513-10, ASME B18.6.4-98 (R2005) AND ICC-ES AC 118 AND ALLOWABLE STRENGTH SHALL BE BASED ON INFORMATION PROVIDED IN CL1.6 AND CL1.7. PENETRATION OF SCREWS THROUGH JOINED MATERIAL SHALL NOT BE LESS THAN THREE EXPOSED THREADS.

b. WELDING SHALL BE IN ACCORDANCE WITH AWS D1.3 USING E60XX SERIES ELECTRODES. FIELD WELDING SHALL HAVE SPECIAL INSPECTION IN ACCORDANCE WITH 2010 CBC SECTION 1704.3.

c. POST-INSTALLED ANCHORS (E.G. EXPANSION ANCHORS, SCREW ANCHORS AND POWER ACTUATED FASTENERS) SHALL HAVE SPECIAL INSPECTION AND TESTING IN ACCORDANCE WITH THE 2010 CBC SECTIONS 1704.4 & 1916.7. FOR QUALIFICATION, DESIGN AND USE OF POST-INSTALLED ANCHORS IN CONCRETE SEE THE 2010 CBC SECTIONS 1615A.1, 1616A.1.15 AND 1911A1.1. LISTING OF CURRENT ICC-ES EVALUATION REPORTS (OR REPORTS FROM OTHER TESTING AGENCIES ACCEPTABLE TO OSHPD) SHALL BE REQUIRED FOR FASTENER USED.

d. POWER-ACTUATED FASTENERS (PAF), POWDER DRIVEN FASTENERS (PDF), POWER DRIVEN PINS (PDP) AND SHOT PINS ALL REPRESENT THE SAME FASTENER AND WILL HEREAFTER BE REFERRED TO AS POWER ACTUATED FASTENERS (PAF). PAF'S SHALL SATISFY THE CURRENT AC70 ACCEPTANCE CRITERIA FOR FASTENERS POWER-DRIVEN INTO CONCRETE, STEEL AND MASONRY ELEMENTS AND THE 2010 CBC SECTIONS 1615A.1.15 AND 1911A1.1. LISTING OF CURRENT ICC-ES EVALUATION REPORTS (OR REPORTS FROM OTHER TESTING AGENCIES ACCEPTABLE TO OSHPD) SHALL BE REQUIRED FOR FASTENERS USED.

e. FOR PAF INSTALLED IN STEEL THE FASTENER PENETRATION SHALL HAVE THE ENTIRE POINTED END OF THE FASTENER DRIVEN THROUGH THE STEEL MEMBER. EXCEPT AS NOTED IN CURRENT REPORTS FROM TESTING AGENCIES ACCEPTABLE TO OSHPD.
7. DESIGN CRITERIA
   a. BUILDING CODE: 2010 CALIFORNIA BUILDING CODE (2010 CBC), ASCE 7-05, AISI S100-07/S2-10, ASTM E580-10a, C635-07, and C636-08. THE REQUIREMENTS IN THIS ODP APPLY TO CEILING SYSTEMS WHOSE TOTAL WEIGHT, INCLUDING CEILING MOUNTED AIR TERMINALS, SERVICES AND LIGHT FIXTURES, DOES NOT EXCEED FOUR (4) PSF. HEAVY SYSTEMS, AND THOSE SUPPORTING LATERAL LOADS FROM PARTITIONS, WILL REQUIRE PROJECT SPECIFIC DESIGN DETAILS. FOR LOAD COMBINATIONS, ALLOWABLE STRESS DESIGN SHALL BE IN ACCORDANCE WITH 2010 CBC SECTION 1605A.3.1.
   b. FASTENER CAPACITIES TABLES WERE DEVELOPED BASED ON ICC REPORTS BY SEVERAL MANUFACTURERS.
   c. THE DESIGN ASSUMES THAT BUILDING ELEMENTS AND SUPPORTS, TO WHICH THE COMPONENTS ADDRESSED IN THIS DOCUMENT ARE ANCHORED, HAVE SUFFICIENT CAPACITY TO CARRY THE LOADS IMPOSED BY THE COMPONENTS IN COMBINATION WITH ALL OTHER LOADS. EVALUATION OF THE CAPACITY OF THESE SUPPORTING BUILDING ELEMENTS IS BEYOND THE SCOPE OF THE ODP.

8. THE RDP IN RESPONSIBLE CHARGE SHALL VERIFY THE FIRE RESISTENCE AND ACOUSTICAL RATINGS FOR ALL CEILING ASSEMBLIES.

9. 'CEILING WIRE' SHALL CONFORM WITH GALVANIZED SOFT ANNEALED MILD STEEL WIRE AS DEFINED IN ASTM A641 (CLASS 1 COATING) WITH 70 KSI MINIMUM TENSILE STRENGTH:
   a. 4 TWISTS OF WIRE WITHIN 1.5" DEVELOPS THE ALLOWABLE LOAD FOR THE WIRE.
   b. 3 TWISTS WITHIN 3" MAY BE USED TO DEVELOP THE MAXIMUM 50% OF ALLOWABLE LOAD.

10. SUSPENSION SYSTEM COMPONENTS SHALL COMPLY WITH C635 AND E580 SECTION 5.1:
    a. THE CEILING GRID SYSTEM SHALL BE RATED HEAVY DUTY AS DEFINED BY ASTM C635.
    b. SUSPENSION WIRES SHALL BE #12 GAGE (0.106" DIAMETER), SOFT ANNEALED, AND GALVANIZED STEEL WIRES WITH CLASS 1 COATING. THEY MAY BE USED FOR UP TO AND INCLUDING 4'-0" X 4'-0" GRID SPACING ALONG AND ATTACHED TO MAIN RUNNERS. SPLICES ARE NOT PERMITTED IN ANY HANGER WIRE.
    c. MAIN RUNNERS, CROSS RUNNERS, SPLICES, EXPANSION DEVICES, INTERSECTION CONNECTORS SHALL BE DESIGNED TO CARRY A MEAN ULTIMATE TEST LOAD OF NOT LESS THAN 180 LBS. IN COMPRESSION & TENSION, IN ACCORDANCE WITH ASTM E580 SECTION 5.1.2.

11. SUSPENSION SYSTEM INSTALLATION, SHALL COMPLY WITH ASTM C636 AND E580 SECTION 5.2:
    b. CEILING GRID MEMBERS SHALL BE ATTACHED TO TWO (2) ADJACENT WALLS, IN ACCORDANCE WITH ASTM E580 SECTION 5.2.3. CEILING GRID MEMBERS SHALL BE AT LEAST 3/4" INCH CLEAR OF OTHER WALLS. IF WALLS RUN DIAGONAL TO THE CEILING GRID SYSTEM RUNNERS, ONE END OF MAIN AND CROSS RUNNERS SHOULD BE FREE, AND A MINIMUM OF 3/4" INCH CLEAR OF WALL.
    c. THE WIDTH OF THE PERIMETER SUPPORTING CLOSURE ANGLE SHALL BE NOT LESS THAN 2 INCHES. USE OF ANGLES WITH SMALLER WIDTHS IN CONJUNCTION WITH PERIMETER CLIPS SHALL REQUIRE AN ALTERNATE METHOD OF COMPLIANCE WITH ADEQUATE JUSTIFICATION.
    d. AT THE PERIMETER OF THE CEILING AREA WHERE MAIN OR CROSS RUNNERS ARE NOT CONNECTED TO THE ADJACENT WALL, PROVIDE INTERCONNECTION BETWEEN THE RUNNERS AT THE FREE END TO PREVENT LATERAL SPREADING. A METAL STRUT OR A #16 GAGE WIRE WITH A POSITIVE MECHANICAL CONNECTION TO RUNNER MAY BE USED. WHERE THE PERPENDICULAR DISTANCE FROM THE WALL TO THE FIRST PARALLEL RUNNER IS 8 INCHES OR LESS, THIS INTERLOCK IS NOT REQUIRED.

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12. EXPANSION JOINTS, SEISMIC SEPARATIONS, AND PENETRATIONS:

   a. EXPANSION JOINTS SHALL BE PROVIDED IN THE CEILING AT INTERSECTIONS OF CORRIDORS AND AT JUNCTIONS OF CORRIDORS WITH LOBBIES OR OTHER SIMILAR AREAS.

   b. FOR CEILING AREAS EXCEEDING 2500 SQUARE FEET, A SEISMIC SEPARATION JOINT SHALL BE PROVIDED TO DIVIDE THE CEILING INTO AREAS NOT EXCEEDING 2500 SQ. FT.

   c. PENETRATIONS THROUGH THE CEILING FOR SPRINKLER HEADS AND OTHER SIMILAR DEVICES THAT ARE NOT INTEGRLY TIED TO THE CEILING SYSTEM IN THE LATERAL DIRECTION SHALL HAVE A TWO (2) INCH OVERTSIZED RING, SLEEVE OR ADAPTOR THROUGH THE CEILING TILE TO ALLOW FREE MOVEMENT OF ONE (1) INCH IN ALL Horizontal DIRECTIONS. A FLEXIBLE SPRINKLER HOSE FITTING THAT CAN ACCOMMODATE 1 INCH OF CEILING MOVEMENT SHALL BE PERMITTED TO BE USED IN LIEU OF THE OVEERSIZED RING, SLEEVE OR ADAPTOR. SUCH FLEXIBLE SPRINKLER HOSE SHALL BE ADEQUATELY SUPPORTED FROM SOFFIT TO AS NOT TO EXCEED THE MAXIMUM TRIBUTARY WEIGHT OF THE CEILING.

13. LATERAL FORCE BRACING:

   LATERAL FORCE BRACING IS REQUIRED PER THIS SECTION FOR ALL CEILING AREAS.

   EXCEPTION: LATERAL FORCE BRACING MAY BE OMITTED FOR SUSPENDED ACOUSTICAL CEILING SYSTEMS WITH A CEILING AREA OF 144 SQ. FT. OR LESS, WHEN PERIMETER SUPPORT IN ACCORDANCE WITH ASTM E580 ARE PROVIDED AND PERIMETER WALLS ARE DESIGNED TO CARRY THE CEILING LATERAL FORCES.

   a. PROVIDE LATERAL-FORCE BRACING ASSEMBLIES CONSISTING OF A COMPRESSION STRUT AND FOUR (4) # 12 GAGE BRACING WIRES ORIENTED 90 DEGREES FROM EACH OTHER.

   b. LATERAL-FORCE BRACING ASSEMBLIES SHALL BE SPACED IN ACCORDANCE WITH CL2.2 AND CL2.3 FROM EACH WALL AND AT THE EDGES OF ANY CHANGE OF ELEVATION OF THE CEILING.

   c. THE SLOPE OF BRACING WIRES MAY BE FROM 0 TO 45 DEGREES BUT MAY NOT EXCEED 45 DEGREES FROM THE PLANE OF THE CEILING AND WIRES SHALL BE TAUT.

   d. COMPRESSION STRUTS SHALL BE ADEQUATE TO RESIST THE VERICAL COMPONENT INDUCED BY THE BRACING WIRES, AND SHALL NOT BE MORE THAN 1(HORIZONTAL) IN 6 (VERTICAL) OUT OF PLUMB.

14. ATTACHMENT OF HANGER AND BRACING WIRES:

   a. FASTEN #12 HANGER WIRES WITH NOT LESS THAN THREE (3) TIGHT TURN IN 3 INCHES. HANGER WIRE LOOPS SHALL BE TIGHTLY WRAPPED AND SHARPLY BENT TO PREVENT ANY VERTICAL MOVEMENT OR ROTATION OF THE MEMBER WITHIN THE LOOPS.

   b. FASTEN #12 BRACING WIRES WITH FOUR (4) TIGHT TURNS. MAKE ALL TIGHT TURNS WITHIN A DISTANCE OF 1 1/2" INCHES.

   c. HANGER OR BRACING WIRE ANCHORED TO THE STRUCTURE SHOULD BE INSTALLED IN SUCH A MANNER THAT THE DIRECTION OF THE ANCHOR ALIGNS AS CLOSELY AS POSSIBLE WITH THE DIRECTION OF THE WIRE.

   d. SEPARATE ALL CEILING HANGER AND BRACING WIRES AT LEAST SIX (6) INCHES FROM ALL UNBRACED DUCTS, PIPES, CONDUITS, ETC.

   e. HANGER WIRES SHALL NOT BE ATTACHED TO OR BEND AROUND INTERFERING MATERIAL OR EQUIPMENT. PROVIDE TRAPEZE OR OTHER SUPPLEMENTARY SUPPORT MEMBERS AT OBSTRUCTIONS TO TYPICAL HANGER SPACING. PROVIDE ADDITIONAL HANGERS, STRUTS OR BRACES AS REQUIRED AT ALL CEILING BREAKS, SOFFITS, OR DISCONTINUOUS AREAS.

   f. HANGER WIRES THAT ARE MORE THAN 1(HORIZONTAL) IN 6 (VERTICAL) OUT OF PLUMB SHALL HAVE COUNTER SLOPING WIRES. PERIMETER HANGER WIRES AT RUNNERS THAT ARE POSITIVELY ATTACHED TO THE PERIMETER CLOSURE ANGLE, COUNTER-SLOPING IS OPTIONAL.

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Approved by: [Signature]
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15. CEILING FIXTURES, TERMINALS, AND DEVICES:

a. CEILING PANELS SHALL NOT SUPPORT ANY LIGHT FIXTURES, AIR TERMINALS OR DEVICES.

b. ATTACH ALL LIGHT FIXTURES, CEILING MOUNTED AIR TERMINALS AND ALL OTHER DEVICES TO THE CEILING GRID RUNNERS TO RESIST A HORIZONTAL FORCE EQUAL TO THE WEIGHT OF THE FIXTURE. SCREWS OR APPROVED FASTENERS ARE REQUIRED. MINIMUM OF TWO ATTACHMENTS ARE REQUIRED AT EACH LIGHT FIXTURE.

c. RECESSED OR DROP-IN LIGHT FIXTURES, GRILLES, MECHANICAL TERMINALS, AND FLEXIBLE SPRINKLER HOSE FITTINGS OR OTHER SERVICES, LESS THAN 56 LBS. SHALL BE SUPPORTED DIRECTLY ON RUNNERS CLASSIFIED AS ASTM HEAVY DUTY, BUT THEY MUST ALSO HAVE A MINIMUM OF TWO (2) #12 GAGE SLACK SAFETY WIRES ATTACHED TO THE FIXTURE AT DIAGONAL CORNERS AND ANCHORED TO THE STRUCTURE ABOVE.

d. ALL FLUSH OR RECESSED LIGHT FIXTURES, MECHANICAL TERMINALS, AND FLEXIBLE SPRINKLER HOSE FITTINGS OR OTHER SERVICES WEIGHING 56 LBS. OR MORE SHALL BE INDEPENDENTLY SUPPORTED BY NOT LESS THAN FOUR (4) TAUT #12 GAGE WIRE ATTACHED TO THE HOUSING AND TO THE STRUCTURE ABOVE. THE FOUR (4) TAUT #12 GAGE WIRES, INCLUDING THEIR ATTACHMENT TO THE STRUCTURE ABOVE, SHALL BE CAPABLE OF SUPPORTING FOUR (4) TIMES THE WEIGHT OF THE UNIT.

e. ALL 4 ft. x 4 ft. LIGHT FIXTURES SHALL HAVE SLACK SAFETY WIRES AT EACH CORNER.

f. SURFACE-MOUNTED FIXTURES SHALL BE ATTACHED TO THE MAIN RUNNER WITH AT LEAST TWO POSITIVE CLAMPING DEVICES MADE OF MATERIAL WITH A MINIMUM #14 GAGE. ROTATIONAL SPRING CATCHES DO NOT COMPLY. A #12 GAGE SUSPENSION WIRE SHALL BE ATTACHED TO EACH CLAMPING DEVICE TO THE STRUCTURE ABOVE. PROVIDE ADDITIONAL SUPPORTS WHEN LIGHT FIXTURES ARE 8 ft. OR LONGER. MAXIMUM SPACING BETWEEN SUPPORTS SHALL NOT EXCEED 8 FEET.

g. SUPPORT PENDANT-MOUNTED LIGHT FIXTURES DIRECTLY FROM THE STRUCTURE ABOVE WITH THE HANGER WIRES OR CABLES PASSING THROUGH EACH PENDANT HANGER AND CAPABLE OF SUPPORTING TWO (2) TIMES THE WEIGHT OF THE FIXTURE. A BRACING ASSEMBLY IN ACCORDANCE WITH CL.2.1 IS REQUIRED IF THE PENDANT HANGER PENETRATES THE FIELD OF THE CEILING TILES. SPECIAL DETAILS ARE REQUIRED TO ATTACH THE PENDANT HANGER TO THE BRACING ASSEMBLY TO TRANSFER HORIZONAL FORCE. IF THE PENDANT MOUNTED LIGHT FIXTURE IS DIRECTLY AND INDEPENDENTLY BRACED BELOW THE CEILING (E.G., AIR CRAFT CABLE TO WALLS) THEN THE BRACING ASSEMBLY IS NOT REQUIRED ABOVE THE CEILING.

h. ALL LIGHTWEIGHT MISCELLANEOUS DEVICES, SUCH AS STROBE LIGHTS, SPEAKERS, EXIT SIGNS, ETC., SHALL BE ATTACHED TO THE CEILING GRID AS SPECIFIED ABOVE. IN ADDITION, DEVICES MORE THAN 10 LBS. SHALL HAVE A #12 SLACK SAFETY WIRE ANCHORED TO THE STRUCTURE ABOVE. DEVICES WEIGHING MORE THAN 20 LBS. SHALL BE SUPPORTED FROM THE STRUCTURE ABOVE PER NOTE 15.C IN CL.03.

16. ADDITIONAL REQUIREMENTS:

a. FIRE RATED CEILINGS: PROVIDE A DETAIL AND DESIGN NUMBER FOR RATED CEILING ASSEMBLIES FROM AN APPROVED TESTING AGENCY. THE COMPONENTS AND INSTALLATION DETAILS CONFORM IN EVERY RESPECT WITH THE LISTED DETAIL AND NUMBER. DETAILS SHALL CLEARLY DEPICT ALL COMPONENTS, INCLUDING INSULATION MATERIALS, FRAMING AND ATTACHMENT OF THE DESIGN SO THAT THE ASSEMBLY CAN BE CONSTRUCTED AND INSPECTED ACCORDINGLY. POP RIVETS, SCREWS, OR OTHER ATTACHMENTS ARE NOT ACCEPTABLE UNLESS SPECIFICALLY DETAILED ON THE DRAWINGS AND APPROVED BY APPROVED TESTING AGENCY.

b. METAL AND OTHER PANELS: METAL PANELS AND PANELS WEIGHING MORE THAN 1/2 PSF, OTHER THAN MINERAL FIBER ACOUSTICAL TILE, ARE TO BE POSITIVELY ATTACHED TO THE CEILING SUSPENSION RUNNERS.

c. BUILDING EXIT WAYS: CEILINGS IN EXIT WAYS SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 13.5.6.2.2(1) OF ASCE 7-05 AS AMENDED BY 2010 CBC SECTION 1611A.1.16. SPLICES OR INTERSECTION OF SUCH RUNNERS SHALL BE ATTACHED WITH THROUGH CONNECTORS SUCH AS POP RIVETS, SCREWS, PINS, PLATES WITH END TABS OR OTHER APPROVED CONNECTORS.

REVIEWS IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR

APPROVED

Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: GENERAL NOTES - PAGE 4 OF 4

Issue Date: 04/25/2013
Revision: Date: CL0.03
1. Power actuated fastener (PAF), powder driven fasteners (PDF), power driven pins (PDP), shot pins all represent the same fastener and will hereafter be referred to as power actuated fasteners (PAF).
2. Allowable strengths shall be compared to allowable stress design (ASD) level demand in accordance with the 2010 CBC Section 1605A.3.1.
3. Allowable strengths are for a single fastener which meet requirements per section below and tables on CL1.2. The allowable strengths are based upon the least of the allowable strengths listed in the ICC ESRS 2269 & 1799.
4. Minimum concrete strength f’c=2000 PSI for normal weight concrete and f’c=3000 PSI for all light weight concrete unless noted otherwise.
5. Power actuated fastener installed through low flutes of the metal deck shall meet the requirements of the installation criteria and section below.
6. Minimum edge distance of 1 1/8" from the edge of metal deck web and 4" from the edge of the deck.
7. Steel deck to be a minimum of 20GA.
8. Concrete fill depth above the top of metal deck must be a minimum of 3 1/4" at light weight concrete composite metal deck.
9. Power shall not be used to resist seismic shear forces except at interior non-load bearing, non-shear wall partition walls (as permitted by 2010 CBC Section 1911A.1.1) and components exempt from construction document review by 2010 CBC Section 1615A.1.12 (not permitted to take seismic shear by ICC-ES AC70 for any other conditions). PAF shall not be used to carry seismic tension loads (except for vertical seismic load produced by self weight of the components) or in cracked concrete unless approved for such loading by OSHPD.
10. PAF shall not be used in pre-stressed concrete unless non-destructive testing methods are used to locate strand and reinforcement prior to fastener installation.
11. PAF installation shall not nick or damage existing concrete reinforcement. Should this occur the RDP in responsible charge shall be notified immediately. PAF shall be installed 1" clear of existing reinforcement. This may require non-destructive testing.
12. PAF shall be installed per current ICC-ES Evaluation Reports (or reports from other testing agencies acceptable to OSHPD).
13. Testing of PAF shall be per 2010 CBC Section 1916A.7. Minimum concrete substrate thickness is three times the PAF penetration into the concrete substrate.
14. Testing is not required of PAF used to attached tracks of interior non-shear wall partitions for shear only where there are at least three fasteners.
15. Total allowable loads in tension, shear or tension shear combinations shall not exceed 90 lb as permitted by exception to the 2010 CBC Section 1615A.1.15.
16. Refer to Note 6d on CL0.00 for additional PAF requirements.

Section - Composite Deck

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED

Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: POWER ACTUATED FASTENER (PAF) IN CONCRETE FILLED METAL DECK OR CONCRETE SLAB - PAGE 1 OF 2

Issue Date: 04/25/2013
Revision: Date: CL1.1
### Table 1
**Power Actuated Fastener Installed in Sand-Lightweight Concrete Through Metal Deck (f'c min=3000 PSI)**

<table>
<thead>
<tr>
<th>Nominal Shank Diameter (in)</th>
<th>Min. Embed (in)</th>
<th>Min. Spacing (in)</th>
<th>Min. Edge Distance (in)</th>
<th>Tension (lb) (See Note 15)</th>
<th>Shear (lb) (See Note 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.145 Min</td>
<td>1 1/4</td>
<td>4</td>
<td>4</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>

### Table 2
**Power Actuated Fastener Installed Into Structural Sand-Lightweight Concrete (f'c min=3000 PSI)**

<table>
<thead>
<tr>
<th>Nominal Shank Diameter (in)</th>
<th>Min. Embed (in)</th>
<th>Min. Spacing (in)</th>
<th>Min. Edge Distance (in)</th>
<th>Tension (lb) (See Note 15)</th>
<th>Shear (lb) (See Note 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.145 Min</td>
<td>1 1/4</td>
<td>4</td>
<td>4</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>

### Table 3
**Power Actuated Fastener Installed Into Normal-Weight Concrete (f'c min=2000 PSI)**

<table>
<thead>
<tr>
<th>Nominal Shank Diameter (in)</th>
<th>Min. Embed (in)</th>
<th>Min. Spacing (in)</th>
<th>Min. Edge Distance (in)</th>
<th>Tension (lb) (See Note 15)</th>
<th>Shear (lb) (See Note 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.145 Min</td>
<td>1 1/4</td>
<td>5.1</td>
<td>4</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>
POWER ACTUATED FASTENER (PAF) GENERAL NOTES (INSTALLED IN STEEL)

1. MINIMUM STEEL TENSILE STRENGTH Fu=58 KSI.
2. MINIMUM SPACING 1 INCH.
3. MINIMUM EDGE DISTANCE 1/2 INCH.
4. USE KNURLED SHANK.
5. POWER ACTUATED FASTENERS (PAF) SHALL BE INSTALLED PER CURRENT ICC-ESS EVALUATION REPORTS OR REPORTS FROM OTHER TESTING AGENCIES ACCEPTABLE TO OSHPD.
6. SEE GENERAL NOTE 6d & 6e ON CL0.00 FOR PAF REQUIREMENTS & ATTACHMENT TO STEEL.
7. POWER ACTUATED FASTENER (PAF), POWDER DRIVEN FASTENERS (PDF), POWER DRIVEN PINS (PDP), SHOT PINS, ARE COMMON NOMINCLATURES THAT ALL REPRESENT THE SAME FASTENER DESCRIBED HERE IN.
8. ALLOWABLE STRENGTHS SHALL BE COMPARED TO ALLOWABLE STRESS DESIGN (ASD) LEVEL DEMAND IN ACCORDANCE WITH THE 2010 CBC SECTION 1605A.3.1.
10. TOTAL ALLOWABLE TENSION, SHEAR OR TENSION SHEAR COMBINATION SHALL NOT EXCEED 250 LBS. AS REQUIRED BY THE 2010 CBC.

POWER ACTUATED FASTENER (PAF) ALLOWABLE STRENGTHS (INSTALLED IN STEEL)

<table>
<thead>
<tr>
<th>NOMINAL SHANK DIAMETER (IN)</th>
<th>3/16</th>
<th>1/4</th>
<th>3/8</th>
<th>1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>TENSION (LB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHEAR (LB)</td>
<td>155</td>
<td>250</td>
<td>230</td>
<td>250</td>
</tr>
<tr>
<td>SHEAR (LB)</td>
<td>250</td>
<td>250</td>
<td>190</td>
<td>220</td>
</tr>
<tr>
<td>TENSION (LB)</td>
<td>250</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHEAR (LB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TENSION (LB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHEAR (LB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EXPANSION ANCHOR GENERAL NOTES

1. ALLOWABLE STRENGTHS SHALL BE COMPAED TO ALLOWABLE STRESS DESIGN (ASD) LEVEL DEMAND IN ACCORDANCE WITH THE 2010 CBC SECTION 1605A.3.1.
2. ALLOWABLE STRENGTHS ARE FOR SINGLE ANCHORS WHICH MEET MIN. REQUIREMENTS PER TABLE & SECTION BELOW.
3. MINIMUM CONCRETE STRENGTH f'c = 3000 PSI.
4. EXPANSION ANCHORS INSTALLED THROUGH UPPER OR LOWER FLUTES OF METAL DECK SHALL MEET THE REQUIREMENTS OF THE INSTALLATION CRITERIA AND SECTION BELOW.
5. STEEL DECK TO BE MIN. 20 GA. W-DECK.
6. MINIMUM CONCRETE FILL DEPTH ABOVE THE TOP OF METAL DECK PER SECTION AND INSTALLATION CRITERIA BELOW.
7. EXPANSION ANCHORS SHALL NOT BE USED IN PRE-STRESSED CONCRETE UNLESS NON-DESTRUCTIVE TESTING METHODS ARE USED TO LOCATE STRAND & REINFORCING PRIOR TO ANCHOR INSTALLATION.
8. EXPANSION ANCHOR INSTALLATION SHALL NOT NICK OR DAMAGE EXISTING REINFORCEMENT. SHOULD THIS OCCUR THE RP/ IN RESPONSIBLE CHARGE SHALL BE NOTIFIED IMMEDIATELY. EXPANSION ANCHORS SHALL BE INSTALLED 1" CLEAR OF EXISTING REINFORCEMENT.
9. EXPANSION ANCHORS SHALL BE INSTALLED PER CURRENT ICC-ES EVALUATION REPORT OR REPORT FROM OTHER TESTING AGENCY ACCEPTABLE TO OSHPD.
11. EXPANSION ANCHORS SHALL BE INSTALLED TO COMPLY W/ THE MINIMUM SLAB THICKNESS REQUIREMENTS ESTABLISHED BY THE ICC-ESR FOR THE SPECIFIED ANCHOR.
12. REFER TO NOTE 6c ON CL0.00 FOR ADDITIONAL EXPANSION ANCHOR REQUIREMENTS.
13. ALL VALUES IN TABLES ARE FOR CRACKED CONCRETE & INCLUDE 0.75 REDUCTION BASED ON ACI 318-08 D3.3.3 REQUIREMENTS. THE ALLOWABLE STRENGTHS ARE BASED UPON THE LEAST OF THE ALLOWABLE STRENGTHS CALCULATED USING THE ICC ESRS 1917, 2427 & 3037 AND USING AN \( \alpha \) FACTOR OF 1.4.

<table>
<thead>
<tr>
<th>Expansion Anchors Installation Criteria</th>
<th>Nominal Anchor Diameter (In)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3/8</td>
</tr>
<tr>
<td>Effective Min. Embedment (In)</td>
<td>2</td>
</tr>
<tr>
<td>Min. Member Thickness W/C Slab or Beam</td>
<td>4.5</td>
</tr>
<tr>
<td>ONLY (In)</td>
<td></td>
</tr>
<tr>
<td>Min. Edge Distance (In)</td>
<td>6</td>
</tr>
</tbody>
</table>

Office of Statewide Health Planning & Development FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: EXPANSION ANCHOR GENERAL NOTES

Issue Date: 04/25/2013
Revision: Date: CL1.4a
# Expansion Anchor Allowable Strengths

## Table 1
Expansion Anchors Installed In To The Underside Of Structural Sand-Lightweight Concrete (f'c Min=3000 PSI) Over Metal Deck

<table>
<thead>
<tr>
<th>Anchor Dia. (In)</th>
<th>Embed (In)</th>
<th>Shear (LB)</th>
<th>Tension (LB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8</td>
<td>2</td>
<td>467</td>
<td>508</td>
</tr>
<tr>
<td>1/2</td>
<td>2 1/4</td>
<td>643</td>
<td>508</td>
</tr>
<tr>
<td>1/2</td>
<td>3 1/4</td>
<td>1108</td>
<td>912</td>
</tr>
<tr>
<td>5/8</td>
<td>3 1/8</td>
<td>845</td>
<td>696</td>
</tr>
<tr>
<td>5/8</td>
<td>4</td>
<td>1919</td>
<td>1617</td>
</tr>
</tbody>
</table>

## Table 2
Expansion Anchors Installed In To The Top Of Structural Sand-Lightweight Concrete (f'c Min=3000 PSI) Over Metal Deck

<table>
<thead>
<tr>
<th>Anchor Dia. (In)</th>
<th>Embed (In)</th>
<th>Shear (LB)</th>
<th>Tension (LB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8</td>
<td>2</td>
<td>593</td>
<td>520</td>
</tr>
<tr>
<td>1/2</td>
<td>2 1/4</td>
<td>593</td>
<td>550</td>
</tr>
</tbody>
</table>

## Table 3
Expansion Anchors Installed In Normal Weight Concrete (f'c Min=3000 PSI)

<table>
<thead>
<tr>
<th>Anchor Dia. (In)</th>
<th>Embed (In)</th>
<th>Shear (LB)</th>
<th>Tension (LB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8</td>
<td>2</td>
<td>638</td>
<td>866</td>
</tr>
<tr>
<td>1/2</td>
<td>2 1/4</td>
<td>987</td>
<td>917</td>
</tr>
<tr>
<td>1/2</td>
<td>3 1/4</td>
<td>2046</td>
<td>1875</td>
</tr>
<tr>
<td>5/8</td>
<td>3 1/8</td>
<td>1887</td>
<td>1719</td>
</tr>
<tr>
<td>5/8</td>
<td>4</td>
<td>2793</td>
<td>2561</td>
</tr>
</tbody>
</table>
SHEET METAL SCREW (SMS) GENERAL NOTES

1. THE ALLOWABLE STRENGTHS ARE BASED UPON THE ANSI S100-07/S2-10 AND ARE LIMITED BY ACTUAL TESTED STRENGTH OF THE SCREWS IN TENSION AND SHEAR.

2. THE ALLOWABLE STRENGTHS ARE BASED UPON THE LEAST OF THE AVERAGE TESTED TENSILE AND SHEAR STRENGTHS TABULATED FROM ICC ESRI'S 1976, 2196, 1730, 1408, AND THE STEEL STUD MANUFACTURER'S ASSOCIATION (SSMA). FASTENER TYPES AND SIZES APPLY TO NON-PROPRIETARY FASTENER TYPES AND SIZES, AND DOES NOT ENDORSE A SPECIFIC MANUFACTURER. WHERE PROPRIETARY FASTENERS ARE SPECIFIED, NO EXCEPTIONS ARE TAKEN TO THE USE OF MANUFACTURER SPECIFIC VALUES THAT ARE BASED UPON THE ANSI S100-07/S2-10, SECTION E4. ALL SCREW FASTENERS SHALL SATISFY ICC-ES AC118-ACCEPTANCE CRITERIA FOR SELF TAPPING SCREW FASTENERS.

3. TABLE 1 REPRESENTS ALLOWABLE TENSION AND SHEAR STRENGTHS FOR NON-PROPRIETARY SHEET METAL SCREWS FOR STEEL TO STEEL CONNECTIONS.

4. TABLE 2 AND 3 REPRESENT ALLOWABLE TENSION AND SHEAR STRENGTHS THAT INCORPORATE THE EFFECTS OF EITHER ONE OR TWO LAYERS OF 5/8" GYPSUM BOARD BETWEEN FASTENER HEAD AND CONNECTING STEEL MATERIAL.

5. IN ORDER TO USE THE VALUES IN TABLES 1, 2, AND 3, THE ATTACHMENTS SHALL BE DETAILED IN SUCH A WAY AS TO AVOID PRYING AND THE STUDS MUST BE STABILIZED WITH FULL-DEPTH BLOCKING WITH CONTINUOUS STRAPS ALONG THE FLANGES OR WITH BACKING BARS.

6. PENETRATION OF SCREWS THROUGH JOINED MATERIAL SHOULD NOT BE LESS THAN 3 EXPOSED THREADS.

7. STEEL THICKNESSES JOINED ARE ASSUMED TO BE THE SAME. IF DISSIMILAR THICKNESSES ARE BEING CONNECTED, THE VALUE FOR THE THINNER PART JOINED SHALL BE USED.

8. THE MINIMUM SPACING BETWEEN CENTERS OF FASTENERS SHALL NOT BE LESS THAN 3 X FASTENER DIAMETER. THE MINIMUM EDGE DISTANCE FROM THE CENTER OF A FASTENER TO THE EDGE OF ANY PART SHALL NOT BE LESS THAN 1.5 X FASTENER DIAMETER. WHERE THE END DISTANCE IS PARALLEL TO THE FORCE ON THE FASTENER, THE NOMINAL SHEAR STRENGTH SHALL BE LIMITED BY SECTION E4.3.2 OF THE ANSI S100-07/S2-10.

9. GALVANIZED METAL STUDS, TRACK AND SHEET STEEL SHALL CONFORM TO ASTM A653 MATERIAL (OR OTHER EQUIVALENT ASTM LISTED MATERIALS IN THE ANSI S100-07/S2-10, SECTION A2.1) WITH A MINIMUM YIELD STRENGTH OF 33 KSI FOR 43 MIL (18 GA) AND LIGHTER, AND MINIMUM YIELD STRENGTH OF 50 KSI FOR 54 MIL (16 GA) & HEAVIER.

10. WHERE VALUES ARE NOT GIVEN, SUCH COMBINATIONS OF SCREW SIZES & MATERIAL THICKNESS ARE NOT RECOMMENDED.

11. IF THE ATTACHMENT DETAILS RESULT IN PRYING WITH A MOMENT ARM NOT TO EXCEED 1 5/8", THE VALUES IN TABLE 4 MAY BE USED. IF THE ATTACHMENT DETAILS RESULT IN PRYING WITH A MOMENT ARM THAT EXCEEDS 1 5/8", THE REREGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE OF THE PROJECT SHALL DETERMINE THE ALLOWABLE VALUES AND SUBMIT SUBSTANTIATION FOR THEM TO OSHPD FOR REVIEW.

12. INTERACTION OF SHEAR AND TENSION SHALL BE BASED ON T/TALL + V/VALL ≤ 1.0.

13. REFER TO NOTE 6a ON CLG.00 FOR ADDITIONAL SHEET METAL SCREW REQUIREMENTS.
**Sheet Metal Screw (SMS) Allowable Strengths**

**Table 1**

Sheet Metal Screw Allowable Strengths for Steel to Steel Connections.

<table>
<thead>
<tr>
<th>$F_y$ (KSI)</th>
<th>No. 14</th>
<th>No. 12</th>
<th>No. 10</th>
<th>No. 8</th>
<th>No. 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.250 IN</td>
<td>0.216 IN</td>
<td>0.190 IN</td>
<td>0.164 IN</td>
<td>0.138 IN</td>
</tr>
<tr>
<td><strong>MIL (Steel GA)</strong></td>
<td><strong>Shear (LB)</strong></td>
<td><strong>Tension (LB)</strong></td>
<td><strong>Shear (LB)</strong></td>
<td><strong>Tension (LB)</strong></td>
<td><strong>Shear (LB)</strong></td>
</tr>
<tr>
<td>50</td>
<td>97 (12)</td>
<td>704</td>
<td>275</td>
<td>525</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td>68 (14)</td>
<td>704</td>
<td>275</td>
<td>525</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td>54 (16)</td>
<td>613</td>
<td>261</td>
<td>525</td>
<td>205</td>
</tr>
<tr>
<td>33</td>
<td>43 (18)</td>
<td>302</td>
<td>144</td>
<td>280</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>33 (20)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. See general notes on CL1.5 for additional information.
2. Where one or two layers of gyp board occur between steel surfaces, the allowable values of Table 2 & 3 shall be used.
3. Allowable strength values do not account for effects from prying. The RDP in responsible charge of the project shall provide adequate blocking/restraint to prevent prying action. Where prying occurs, the values of Table 4 shall be used.

**Table 2—Non-Prying Condition**

Sheet Metal Screw Allowable Strengths for Steel to Steel Connections with One Layer of 5/8" Gyp Board between Steel Surfaces.

<table>
<thead>
<tr>
<th>$F_y$ (KSI)</th>
<th><strong>MIL (Steel GA)</strong></th>
<th>No. 14</th>
<th>No. 12</th>
<th>No. 10</th>
<th>No. 8</th>
<th>No. 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.250 IN</td>
<td>0.216 IN</td>
<td>0.190 IN</td>
<td>0.164 IN</td>
<td>0.138 IN</td>
<td></td>
</tr>
<tr>
<td><strong>Fy (KSI)</strong></td>
<td><strong>Shear (LB)</strong></td>
<td><strong>Tension (LB)</strong></td>
<td><strong>Shear (LB)</strong></td>
<td><strong>Tension (LB)</strong></td>
<td><strong>Shear (LB)</strong></td>
<td><strong>Tension (LB)</strong></td>
</tr>
<tr>
<td>50</td>
<td>97 (12)</td>
<td>226</td>
<td>275</td>
<td>180</td>
<td>205</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68 (14)</td>
<td>226</td>
<td>275</td>
<td>180</td>
<td>205</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>54 (16)</td>
<td>226</td>
<td>261</td>
<td>180</td>
<td>205</td>
<td>140</td>
</tr>
<tr>
<td>33</td>
<td>43 (18)</td>
<td>226</td>
<td>144</td>
<td>180</td>
<td>124</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>33 (20)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

**Notes:**
1. See general notes on CL1.5 for additional information.
2. Allowable strength values do not account for effects from prying. The RDP in responsible charge of the project shall provide adequate blocking/restraint to prevent prying action. Where prying occurs, the values and constraints of Table 4 shall be used.

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR

APPROVED

Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC  Issue Date: 04/25/2013  OPD No.
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS  Revision:  Date: 
Sheet Title: SHEET METAL SCREW ALLOWABLE STRENGTHS - PAGES 1 OF 2  CL1.6
TABLE 3 - NON-PRYING CONDITION
SHEET METAL SCREW ALLOWABLE STRENGTHS FOR STEEL TO STEEL CONNECTIONS WITH TWO LAYERS OF 5/8" GYP BOARD BETWEEN STEEL SURFACES.

<table>
<thead>
<tr>
<th>$F_y$ (ksi)</th>
<th>No. 14</th>
<th>No. 12</th>
<th>No. 10</th>
<th>No. 8</th>
<th>No. 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>(steel ga)</td>
<td>0.250 in</td>
<td>0.216 in</td>
<td>0.190 in</td>
<td>0.164 in</td>
<td>0.138 in</td>
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<tr>
<td>SHEAR (lb)</td>
<td>TENSION (lb)</td>
<td>SHEAR (lb)</td>
<td>TENSION (lb)</td>
<td>SHEAR (lb)</td>
<td>TENSION (lb)</td>
</tr>
<tr>
<td>50</td>
<td>97 (12)</td>
<td>166</td>
<td>275</td>
<td>130</td>
<td>205</td>
</tr>
<tr>
<td>68 (14)</td>
<td>166</td>
<td>275</td>
<td>130</td>
<td>205</td>
<td>100</td>
</tr>
<tr>
<td>54 (16)</td>
<td>166</td>
<td>261</td>
<td>130</td>
<td>205</td>
<td>100</td>
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<tr>
<td>33</td>
<td>43 (16)</td>
<td>166</td>
<td>144</td>
<td>130</td>
<td>124</td>
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<tr>
<td>33 (20)</td>
<td>43</td>
<td>144</td>
<td>130</td>
<td>124</td>
<td>100</td>
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</tbody>
</table>

NOTES:
1. See general notes on CL 1.5 for additional information.
2. Allowable strength values do not account for effects from prying. RDP is responsible charge to provide adequate blocking/restraint to prevent prying action. Where prying occurs, the values and constraints of Table 4 shall be used.

TABLE 4 - PRYING CONDITION (SEE DETAILS BELOW - STRUT CAN BE HORIZONTAL OR VERTICAL)
SHEET METAL SCREW ALLOWABLE STRENGTHS FOR STEEL TO STEEL CONNECTIONS WITH ONE OR TWO LAYERS OF 5/8" GYP BOARD BETWEEN STEEL SURFACES AND MAXIMUM PRYING MOMENT ARM OF 1 5/8".

<table>
<thead>
<tr>
<th>$F_y$ (ksi)</th>
<th>(steel ga)</th>
<th>No. 14</th>
<th>No. 12</th>
<th>No. 10</th>
<th>No. 8</th>
<th>No. 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>(lb)</td>
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<tr>
<td>50</td>
<td>97 (12)</td>
<td>40</td>
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<tr>
<td>68 (14)</td>
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<td>275</td>
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<td>205</td>
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<td>54 (16)</td>
<td>40</td>
<td>261</td>
<td>30</td>
<td>205</td>
<td>25</td>
<td>159</td>
</tr>
<tr>
<td>33</td>
<td>43 (16)</td>
<td>40</td>
<td>144</td>
<td>30</td>
<td>124</td>
<td>25</td>
</tr>
<tr>
<td>33 (20)</td>
<td>43</td>
<td>144</td>
<td>30</td>
<td>124</td>
<td>25</td>
<td>109</td>
</tr>
</tbody>
</table>

NOTES:
1. See general notes on CL 1.5 for additional information.
2. The allowable strength values listed in Table 4 are based upon a limited test assembly where the origin and direction of the load results in prying upon the fastener. The magnitude of this prying effect shall be limited to a moment arm of 1 5/8" from the fastener.
1 1/2", 1-3/8" OR 1 5/8"
2 1/2", 3 1/2", 3 5/8 OR 3 3/4"
3 7/8"

1-3/8" OR 1-5/8"
6"

1-3/8" OR 1-5/8"
3/8"

STRUCTURAL STUD (S-SECTIONS)

<table>
<thead>
<tr>
<th>DESIGNATION THICKNESS (MILS)</th>
<th>REFERENCE ONLY GAUGE NO.</th>
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<tbody>
<tr>
<td>18</td>
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<td>27</td>
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<td>14</td>
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<tr>
<td>97</td>
<td>12</td>
</tr>
<tr>
<td>118</td>
<td>10</td>
</tr>
</tbody>
</table>

NOTE:
1. Fy = 50ksi for 54 mil (16GA) & thicker sections, and Fy = 33ksi for sections up to & including 43 mil (19GA)
2. Size and thickness are considered minimums.
3. Structural studs shall not be punched unless noted otherwise.

REVIEWSD IN ACCORDANCE WITH
THE REQUIREMENTS OF T24, CCR
APPROVED

OFFICE OF STATEWIDE HEALTH
PLANNING & DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: METAL STUD PROFILES
12 GA VERTICAL HANGERS AT 4'-0" O.C. EACH WAY (AT MAIN RUNNER WITH MINIMUM 3-TIGHT TURNS IN 3" AT BOTH ENDS, SEE Cl4.1

12 GA. BRACING WIRE W/ MIN. 4-TIGHT TURNS IN 1 1/2" BOTH ENDS OF WIRE CONNECTED TO MAIN RUNNERS 90° APART, 4-TOTAL AT EACH COMPRESSION STRUT (U.O.N.) SEE Cl4.1

RIGID VERT. COMPRESSION STRUT, SEE DET. OR Cl3.1 Cl3.2

45° MAX.

2" MAX FROM BRACING WIRES TO COMPRESSION STRUT AND 1 1/2" MAX. FROM CROSS RUNNER

CROSS RUNNER

MAIN RUNNER

NOTES:
1. SEE SUSPENDED CEILING NOTES ON Cl0.02

2. COMPRESSION STRUTS SHALL NOT REPLACE HANGER WIRES. ATTACH COMPRESSION STRUTS TO MAIN RUNNERS WITHIN 1 1/2" OF CROSS RUNNER

3. FOR CONDITIONS AT CORRIDOR SEE DRAWING NO. Cl2.3

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24 CCC
APPROVED

Office of Statewide Health Planning & Development

FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: SUSPENDED CEILING BRACING ASSEMBLY

Issue Date: 04/25/2013
OpD No.
Revision: Date:

CL2.1
NOTE:
BRACING WIRES AND COMP. STRUT SHALL OCCUR AT EVERY 64 SQ. FT. MAX. IN ROOMS OVER 64 SQ. FT.

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
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Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC  Issue Date: 04/25/2013
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Revision:  Date:
Sheet Title: TYPICAL CEILING PLAN FOR $S_{ds} > 1.73$
           AND $z/h <= 1.0$

CL2.2a
NOTE:
BRACING WIRES AND COMP. STRUT SHALL OCCUR AT EVERY 96 SQ. FT. MAX. IN ROOMS OVER 96 SQ. FT.

Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: TYPICAL CEILING PLAN FOR $1.15 < S_{os} \leq 1.73$ AND $z/h \leq 1.0$

Issue Date: 04/25/2013
Revision: Date:

CL2.2b
NOTE:
BRACING WIRES AND COMP. STRUT SHALL OCCUR
AT EVERY 144 SQ. FT. MAX. IN ROOMS OVER 144 SQ. FT.
LOCATION OF EXPANSION/SLIP JOINTS IN CORRIDORS
RUNNER SPLICE  

EXPANSION JOINT

EXPANSION JOINT AT INTERSECTION OF CORRIDORS, JUNCITONS OF CORRIDORS AND LOBBIES, SIMILAR AREAS AND CEILING OVER 2500 SFT

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED

Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: SUSPENDED ACOUSTICAL CEILING - EXPANSION JOINT AT INTERSECTIONS

Issue Date: 04/25/2013
Revision: Date:

OPD No: CL2.4
NOTES:
1. PERIMETER WALLS SHALL BE DESIGNED TO CARRY TRIBUTARY LATERAL FORCES PARALLEL TO THE WALL AND THE ENTIRE LATERAL FORCES PERPENDICULAR TO THE WALL, RDP TO VERIFY. SEISMIC BRACING WIRES AND COMPRESSION STRUTS IN ACCORDANCE WITH PAGES CL2.2X SHALL BE PREMITTED IN LIEU OF DESIGNING PERIMETER WALLS FOR SEISMIC FORCES AND BRACING SYSTEM SHOWN ON PAGE CL2.3 AND THIS PAGE.

2. 2" STANDARD LEDGER ANGLE AT PERIMETER, RDP TO SPECIFY THICKNESS, CONNECTOR TYPE & SIZE (CONNECTION SHALL BE TO STRUCTURE OR THROUGH FINISH TO STRUCTURE WHERE FINISH IS APPLIED AND NOT TO FINISH)

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CDR
APPROVED

Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC  Issue Date: 04/25/2013  OPD No: CL2.5
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS  Revision: Date:
Sheet Title: TYPICAL CEILING SECTION AT EXITWAYS
**FIXED JOINT**

1. PROVIDE #12 GAGE HANGER WIRES AT THE ENDS OF ALL MAIN AND CROSS RUNNERS WITHIN EIGHT (8) INCHES OF THE SUPPORT OR WITHIN ONE-FOURTH (1/4) OF THE LENGTH OF THE END TEE, WHICHEVER IS LEAST, FOR THE PERIMETER OF THE CEILING AREA. PERIMETER WIRES ARE NOT REQUIRED WHEN THE LENGTH OF THE END TEE IS EIGHT (8) INCHES OR LESS.

2. NAILS AT ENDS OF HORIZONTAL STRUTS ARE TO BE PLACED WITH NAIL HEAD TOWARD CENTER LINE OF SPAN OF STRUT.

3. SPACERS MAY BE SLOTTED APPROVED ANGLES OR CHANNELS WITH "DIAMOND POINTS" OF SPRING STEEL WHICH SNAP TIGHT TO PREVENT MOVEMENT OF STRUT.

**EXPANSION JOINT**

- **APPROVED SPACER**

---

**Code:** 2010 CBC

**Section Title:** OSHPD STANDARD SUSPENDED CEILING DETAILS

**Sheet Title:** CEILING PERIMETER NOT AT EXITWAYS

**Issue Date:** 04/25/2013

**Revision:** Date:

**OPD No:** CL2.6
LOCATE HANGER WIRE AT EACH TRACK CONNECTIONS

SPICE @ CROSS RUNNERS

T-BAR

ADD ADDITIONAL HANGER WIRE WHERE DISTANCE TO CROSS RUNNER EXCEEDS 6"

ACOUSTICAL CEILING PANEL

2-#8 S.M.S. PARALLEL AND CENTERED ON TRACK @ 48" O.C. AND 12" MAX. FROM EACH END OF TRACK ATTACHED TO CEILING GRID MEMBERS ONLY

CUBICLE CURTAIN OR I.V. TRACK, 15 LBS/FT MAX., RDP TO VERIFY

24" MAX.
NOTES:
1. SEE GENERAL NOTE #15 ON CL0.03 AND CL0.04

(2) 12 GA. SLACK WIRE HANGERS FOR DEVICES THAT WEIGH LESS THAN 56 LBS (HEAVY DUTY GRID SYSTEM REQUIRED), PLACE ON DIAGONAL CORNERS.

EXCEPTION: 4'X4' FIXTURES SHALL HAVE (4) TAUT HANGERS AT CORNERS

AIR TERMINAL OR LIGHT FIXTURE (56# MAX.)

2#8 S.M.S. EA. SIDE

HEAVY DUTY SYSTEM
ELECTRICAL CONDUIT TUBE SCHEDULE

<table>
<thead>
<tr>
<th>L</th>
<th>DIA.</th>
<th>&quot;t&quot;</th>
</tr>
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<tbody>
<tr>
<td>4'-0&quot;</td>
<td>3/4&quot;</td>
<td>0.046&quot;</td>
</tr>
<tr>
<td>5'-6&quot;</td>
<td>1&quot;</td>
<td>0.054&quot;</td>
</tr>
<tr>
<td>7'-0&quot;</td>
<td>1-1/4&quot;</td>
<td>0.061&quot;</td>
</tr>
</tbody>
</table>

FOR CONNECTION TO STRUCTURE SEE CL5.1

HANGER WIRE WITHIN

"L"

(2) #10 S.M.S. @ 2" O.C.

3/4"  2"

12" MAX.

TIGHT TO RUNNER

LOWER SECTION ONE SIZE LARGER THAN MAIN SECTION

ELECTRICAL CONDUIT TUBE PER SCHEDULE (SELECT "L" FOR SMALLER DIAMETER USED)

HANGER WIRE

(2) #10 S.M.S. @ 2" O.C.

6" MIN. OVERALL

1 1/2" MAX.

BRACE WIRES SEE CL4.1

FLATTEN END

1/4" DIA. MACHINE BOLT

SLOT END

DOUBLE NUTS

OPTION 1

OPTION 3

OPTION 2

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED

Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: SUSPENDED ACOUSTICAL CEILING - TUBE TYPE COMPRESSION STRUT

Issue Date: 04/25/2013
Revision: Date:

OPD No.: CL3.2
HANGER WIRE

1/2" MAX. U.O.N.
FOR CONNECTION TO STRUCTURE SEE CONNECTION MATRIX ON
CL4.2

12GA x 3/4" WIDE, U.O.N.

3" MAX.

3 TURNS @ HANGER WIRE TYPICAL @ EACH END

BRACING WIRE

1 1/2" MAX.

FOR CONNECTION TO STRUCTURE SEE CONNECTION MATRIX ON
CL4.2

12GA x 1" WIDE, U.O.N.

45° MAX.

4 TURNS @ BRACE WIRES TYP. @ EACH END
<table>
<thead>
<tr>
<th>STRUCTURAL CONDITION OF FLOOR/ ROOF ABOVE SUSPENDED CEILING</th>
<th>APPLICABLE DETAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCRETE FILLED METAL DECK</td>
<td>CL4.3</td>
</tr>
<tr>
<td>CONCRETE FILLED METAL DECK AND STRUCTURE CONCRETE</td>
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</tr>
<tr>
<td>CONCRETE SLAB, BEAM, OR JOIST</td>
<td>CL4.5</td>
</tr>
<tr>
<td>STRUCTURAL STEEL</td>
<td>CL4.6</td>
</tr>
<tr>
<td>SAWN TIMBER</td>
<td>CL4.7</td>
</tr>
<tr>
<td>METAL STUD WALL</td>
<td>CL4.8</td>
</tr>
</tbody>
</table>
HANGER WIRE

MIN. 3/8" DIA. EXPANSION ANCHOR @ BRACING TYP.

APPROVED CLIP ASSEMBLY

MIN. 4 TIGHT TURNS IN 1 1/2" EA. END

MIN. # 12 GA. ASTM A641 CLASS 1 WIRE

BRACING WIRE

NOTES:
1. LOAD TEST IN ACCORDANCE WITH GENERAL NOTE 14(g), PAGE
   CL0.03 SHALL BE REQUIRED
2. REFER TO CL4.1 FOR ADDITIONAL DETAILS

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: HANGER AND BRACING WIRE CONNECTION TO CONCRETE FILLED METAL DECK

Issue Date: 04/25/2013
OPD No:
Revision: Date:

Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

APPROVED

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24 CCR
HANGER WIRE

NOTES:
1. LOAD TEST IN ACCORDANCE WITH GENERAL NOTE 14 (g), PAGE CL0.03 SHALL BE REQUIRED

2. FOR HANGER WIRE OPTION 3: PRIOR TO INSTALLATION, REINFORCING/PRESTRESSING BAR LOCATIONS SHALL BE DETERMINED BY NON-DESTRUCTIVE TESTING

3. REFER TO CL4.1 FOR ADDITIONAL DETAILS

Code: 2010 CBC  Issue Date: 04/25/2013  OPD No: 
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS  Revision:  Date: 
Sheet Title: HANGER WIRE CONNECTION TO CONCRETE FILLED METAL DECK AND STRUCTURAL CONCRETE  CL4.4
LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE SLAB. DO NOT CONNECT SPLAY WIRE TO JOIST OR BEAM.

3/8" DIA. EXPANSION ANCHOR @ BRACING WIRE TYP.

1 1/2" X 1 1/2" 12 GA X 2" CEILING CLIP

1/2" (MAX)

CL4.1

APPROVED EYEBOLT ASSEMBLY

OPTION 1

BRACE WIRE

4" MIN. EDGE DISTANCE

FACE OF BEAM OR JOIST WHERE OCCUR

3/8" DIA. EXPANSION ANCHOR

LIGHTWEIGHT OR NORMAL WEIGHT CONC.

12 GA X 1" WIDE CEILING CLIP

CL4.1

1/2" MAX.

SLAB, BEAM OR JOIST SOFFIT (MIN. 8" WIDE)

APPROVED EYEBOLT ASSEMBLY

OPTION 1

HANGER WIRE

OPTION 2

APPROVED POWDER-ACTUATED CEILING CLIP ASSEMBLY

MIN. #12 GA, ASTM A641 CLASS 1 WIRE

OPTION 3

NOTES:
1. LOAD TEST IN ACCORDANCE WITH GENERAL NOTE 14 (g), PAGE CL0.03 SHALL BE REQUIRED

2. FOR HANGER WIRE OPTION 3: PRIOR TO INSTALLATION, REINFORCING/PRESTRESSING BAR LOCATIONS SHALL BE DETERMINED BY NON-DESTRUCTIVE TESTING

3. REFER TO CL4.1 FOR ADDITIONAL DETAILS

Reviewed in accordance with the requirements of T24, ccr

APPROVED

Office of statewide health planning & development
facilities development division

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: HANGER & BRACING WIRE CONNECTION TO CONCRETE SLAB, BEAM, JOIST

Issue Date: 04/25/2013
Revision: Date:

CL4.5
HANGER WIRE

BRACING WIRE

NOTES:
1. BEAM FLANGE THICKNESS SHALL NOT BE LESS THAN 3/16" OR MORE THAN 3/8"

2. FRAMING MEMBERS SHALL BE DESIGNED TO CARRY THE CEILING LOADS, RDP TO VERIFY

3. RDP IN RESPONSIBLE CHARGE, I.O.R. AND CONTRACTOR SHALL VERIFY THAT NO PAF IS INSTALLED IN THE PROTECTED ZONE OF ANY STEEL MEMBER, SEE ANSI/AISC 341-05 SECTION 7.4

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: HANGER & BRACING WIRE CONNECTION TO STRUCTURAL STEEL

Issue Date: 04/25/2013
Revision: Date: CL4.6
GYP. BOARD WHERE OCCURS

1/4" DIA. CLOSED EYE SCREW

2X BLOCKING FASTEN TO JOIST W/ 1/2"x1 1/2"x18GA CLIP AND (4) 8D x 1 1/2" NAILS EACH SIDE AND EACH END.

HANGER WIRE

APPROVED 1/2" DIA. EYE SCREW W/ 2" MIN. PENETRATION AT ANGLE OF WIRE.

GYP. BOARD WHERE OCCURS

45° MAX.

BRACING WIRE

NOTES:
1. FRAMING MEMBERS SHALL BE DESIGNED TO CARRY THE CEILING LOADS, RDP TO VERIFY
2. RDP SHALL VERIFY THAT SCREWS AT THE BOTTOM FLANGE OF TRUSS IS ACCEPTABLE
362S137-33 MIN., RDP TO VERIFY

1 LAYER OF GYP. BD.
2-#10 S.M.S. @ 2" O.C.
12 GA.x 2" WIDE CLIP ANGLE
3 TIGHT TURNS IN 3"

BACK TO BACK 1 1/2' x 3' x 12
GA ANGLE (LLV) SPAN 2
WALL STUDS MIN. FASTEN
ANGLE TO WALL STUDS
USING 2x #10 S.M.S. PER
ANGLE AT EACH STUD.

4 TIGHT TURNS IN 1 1/2"
45° MAX.

NOTE:
FRAMED WALLS SHALL BE DESIGNED TO CARRY THE
CEILING LOADS, RDP TO VERIFY.

BRACING WIRE

HANGER WIRE

REVIEWED IN ACCORDANCE WITH
THE REQUIREMENTS OF T24. CCR
APPROVED

Office of Statewide Health
Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: HANGER AND BRACING WIRE CONNECTION TO METAL STUD WALL FRAMING

Issue Date: 04/25/2013
Revision: Date: OPD No.

CL4.8
A. "DIRECT" (FOR NOTES SEE "THRU GYP")

B. "THRU GYP"

6 MAX. SLOPE FROM VERTICAL

362S137-33 MIN., RDP TO VERIFY

GYP. BD.

(2) #10 SCREW TO FRAMING

1-3/4" x 3/4" 12 GA CLIP

CEILING HANGER WIRE AS REQUIRED

NOTES:
1. THIS IS APPLIED FOR PERIMETER WIRE ATTACHMENT OR WHERE OBSTRUCTION PREVENTS ATTACHMENT TO STRUCTURE ABOVE
2. RDP SHALL DESIGN FRAMING WALL TO CARRY THE CEILING LOAD

HANGER WIRE

REVIEWED IN ACCORDANCE WITH
THE REQUIREMENTS OF 724, CCR
APPROVED

Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC

Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS

Sheet Title: HANGER WIRE CONNECTION TO METAL STUD WALL FRAMING

Issue Date: 04/25/2013

OPD No:

Revision: Date:

CL4.9
302S137-33 MIN. BACKING STUD. SPAN 2 WALL STUDS MINIMUM. FASTEN BACKING TO WALL STUDS USING (2) #10X1-1/4" SMS AT EACH STUD.

12 GA. X 1" WIDE SEISMIC BRACKET. FASTEN TO BACKING STUD USING #10 X 1-1/4" SHEET METAL SCREW.

6 MAX. SLOPE FROM VERTICAL

12 GA. PERIMETER WIRE WITH 3 TIGHT TURNS IN 3" BOTH ENDS OF WIRE TYPICAL.

NOTES:
1. THIS IS APPLIED FOR PERIMETER WIRE ATTACHEMENT OR WHERE OBSTRUCTION PREVENTS ATTACHMENT TO STRUCTURE ABOVE, AND IS BETWEEN WALL STUDS
2. RDP SHALL DESIGN FRAMING WALL TO CARRY THE CEILING LOADS

HANGER WIRE

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24. CCR
APPROVED

Office of Statewide Health Planning & Development FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC  Issue Date: 04/25/2013  OPD No:
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS  Revision: Date:
Sheet Title: HANGER WIRE CONNECTION TO METAL STUD WALL FRAMING  CL4.10
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<td>NOT USED</td>
<td>CL5.3</td>
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<tr>
<td>CONCRETE SLAB, BEAM, OR JOIST</td>
<td>CL5.4</td>
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<tr>
<td>STRUCTURAL STEEL</td>
<td>CL5.5</td>
</tr>
<tr>
<td>SAWN TIMBER WITH GYPSUM BOARD</td>
<td>CL5.6</td>
</tr>
<tr>
<td>SAWN TIMBER WITHOUT GYPSUM BOARD</td>
<td>CL5.7</td>
</tr>
</tbody>
</table>
CHANNEL STRUT

OPTIONS

1. STRUCTURAL STEEL MEMBER SHALL HAVE A MINIMUM FLANGE THICKNESS OF 3/16" AND MAXIMUM OF 3/8"

2. FRAMING MEMBERS MUST BE DESIGNED TO CARRY THE CEILING LOADS, RDP TO VERIFY

3. RDP IN RESPONSIBLE CHARGE, I.O.R. AND CONTRACTOR SHALL VERIFY THAT NO PAF IS INSTALLED IN THE PROTECTED ZONE OF ANY STEEL MEMBER, SEE ANSI/AISC 341-05 SECTION 7.4

4. SEE PAGES CL5.2 AND CL5.4 FOR ADDITIONAL INFORMATION

Code: 2010 CBC  Issue Date: 04/25/2013  OPD No:
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS  Revision:  Date:
Sheet Title: COMPRESSION STRUT CONNECTION TO STRUCTURAL STEEL

CL5.5
**OPTION 1**

CHANNEL STRUT

- Cut flanges and bend
- Fasten compression strut to 2x4 in lieu of rafter/joist

**OPTION 2**

CHANNEL STRUT

- Optional orientation
- (2) #10 x 2" S.M.S. thru both walls of EMT
- L-1-1/2"x1-1/2" x 12 GA. x 0"-2" clip
- Place tight to clip or structure

**OPTION 3**

CHANNEL STRUT

- L-1-1/2" x 1-1/2" 12 GA. bearing plate min.
- 1/4" dia. closed eye screw
- Wire within

**TUBE STRUT**

- 1" dia. lag screw
- L-1-1/2" x 1-1/2" 12 GA. x 0"-2" clip
- Place tight to clip or structure

**NOTES:**
1. Framing members must be designed to carry the ceiling loads. RDP to verify.
2. RDP shall verify that screws at the bottom flange of truss is acceptable.
3. See pages CL5.2 and CL5.4 for additional information.

**Record Information:**

<table>
<thead>
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<th>Code</th>
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<tr>
<td>Section Title</td>
<td>OSHPD STANDARD SUSPENDED CEILING DETAILS</td>
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<tr>
<td>Sheet Title</td>
<td>COMPRESSION STRUT CONNECTION TO SAWN TIMBER WITH GYPSUM BOARD</td>
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<td>CL5.6</td>
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</table>
OPTION 1

CHANNEL STRUT

OPTION 2

CHANNEL STRUT

OPTION 1

TUBE STRUT

OPTION 2

NOTE:
1. FRAMING MEMBERS MUST BE DESIGNED TO CARRY THE CEILING LOADS, RDP TO VERIFY.

2. RDP SHALL VERIFY THAT SCREWS AT THE BOTTOM FLANGE OF TRUSS IS ACCEPTABLE

3. SEE PAGES CL5.2 CL5.4 AND CL5.6 FOR ADDITIONAL INFORMATION

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: COMPRESSION STRUT CONNECTION TO SAWN TIMBER WITHOUT GYPSUM BOARD
Issue Date: 04/25/2013
CEILING OBSTRUCTION WHERE OCCURS

FOR CONNECTION TO STRUCTURE SEE

CL4.1

12 GA WIRE WITH MIN. OF 3 TIGHT TURNS WITHIN 3" TOP & BOTTOM

LOCATE CHANNEL AS REQUIRED TO MAINTAIN HANGER SPACING CHANNEL PER

CL6.2

ACoustical or LAY-IN PANEL CEILINGS AS OCCURS

CEILING OBSTRUCTION WHERE OCCURS

FOR CONNECTION TO STRUCTURE SEE

CL4.1

12 GA WIRE WITH MIN. OF 4 TIGHT TURNS WITHIN 1-1/2" TOP & BOTTOM

note:

SINGLE HANGER WIRES OK UP TO 1/6 OUT OF PLUMB. COUNTER SLOPING WIRES REQUIRED WHEN GREATER THAN 1/6 OUT OF PLUMB.

ACoustical or LAY-IN PANEL CEILINGS AS OCCURS

TRAPEZE SUPPORT

COUNTER SLOPING WIRES
### SPAN x SECTION

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<tr>
<td>12'-0&quot;</td>
<td>2 - 400S200-54</td>
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</table>

### DBL. SECTION

- #8 S.M.S.
  - @18" O.C.
  - STAGGERED
  - @ EA. END

### WALL WHERE OCCURS

- PROVIDE COMPR. STRUT & BRACING WIRE WHERE CLG. STRUT OCCURS
- PROVIDE COMPRESSION STRUT WHERE OCCURS
- ACOUSTICAL OR LAY-IN PANEL CEILINGS AS OCCURS
- #10 S.M.S. TOP & BOTT.
- PROVIDE COMPR. STRUT & BRACING WIRE WHERE CLG. STRUT OCCURS

### RDP SHALL DESIGN FRAMING WALL TO CARRY THE CEILING LOADS (20 GA MIN.)

- DOUBLE HANGER WIRES MAX. 1/6 OUT OF PLUMB. CONNECT TO STRUCTURE PER CL4.1
- #10 S.M.S. TOP & BOTT. TO PREVENT HGR. FROM SLIPPING OFF.
- SADDLE TIE HANGERS TO CHANNEL

### OBSTRUCTIONS

- 16 GA TRACK BRIDGE BETWEEN ADJACENT STUDS (3 STUDS MIN.)
- CHANNEL PER SCHEDULE

---

**CODE:** 2010 CBC  
**SECTION TITLE:** OSHPD STANDARD SUSPENDED CEILING DETAILS  
**SHEET TITLE:** OBSTRUCTION-BRIDGE AT LARGE OFFSET CONDITION  
**ISSUE DATE:** 04/25/2013  
**OPD NO.:** CL6.2
OPPOSING COMPRESSION POSTS
SEE CL3.X. BOTH POSTS TO BE SAME
ANGLE: MAX ANGLE FROM HORIZONTAL
OF 70, MIN ANGLE FROM HORIZONTAL
OF 30. SEE COMPRESSION STRUT
CONNECTION TO STRUCT. FOR MORE
DETAIL.

HANGER WIRE AT EACH
COMPRESSION POST 3 TIGHT
TURNS.

(2) #10 S.M.S.

(2) 12 GA BRACE WIRES, 45° MAX, TYP
ORTHOGONAL TO OPPOSING POSTS
ATTACHED TO STRUCTURE. SEE HANGER
& BRACING WIRE CONNECTION TO
STRUCTURE FOR MORE DETAIL.

NOTE: ONE WIRE PER 4-WAY INTERSECTION
MAY BE FIXED TO STUD EDGE 2" MAX
ABOVE MAIN RUNNER (AT OBSTRUCTION)

OPPOSING COMPRESSION POST FOR
ACOUSTICAL CEILING
362S137-33 MIN., RDP TO VERIFY
400T125-54 MIN. BACKING SPANNING 3 STUDS MIN.
GYP. BD.
(3) #10 SCREW TO FRAMING, TOP & BOTTOM
10 GA. LLH 5"x6"x0'-6" LONG
MEP OBSTRUCTION
CEILING HANGER WIRE AS REQUIRED THROUGH HOLES IN PLATE

NOTE:
AT LOCATIONS WHERE IN-WALL BACKING IS NOT PROVIDED, INSTALL 600T125-54 SPANNING 3 STUDS MIN. ON THE OUTSIDE OF GYP. BD, FASTEN TO WALL STUD USING (3) #10 S.M.S. AT EACH STUD.

EXTENDED CLIP AT OBSTRUCTIONS
WHEN OBSTRUCTIONS OCCURRED BOTH AT THE WALL AND ABOVE THE GRID AT THE PERIMETER HANGER WIRE.

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24 CCR
APPROVED

Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

Code: 2010 CBC  Issue Date: 04/25/2013  OPD No:
Section Title: SPECIAL DETAILS  Revision:  Date: 
Sheet Title: OBSTRUCTION-PERIMETER CONDITION  CL6.4
LOCATIONS WITHOUT CROSS JOISTS

18 GA ANGLE SCREWED TO (2) STUDS WITH (2) #10 S.M.S. TO EACH STUD

ANGLE 1.5" x 1.5" x 18 GA WITH (2) #10 S.M.S.

LIGHT FIXTURE SUPPORT BRACKET

STRAIGHTBACK 250S162-43, SPAN TO COMPRESSION POST EA SIDE, 4'-0" MAX EACH DIRECTION

18 GA CLIP ANGLE WITH (2) #10 S.M.S EA LEG

DO NOT ATTACH CLG TO LIGHT FIXTURE

45° MAX.

LOCATIONS WITHOUT CROSS JOISTS

250T162-43 MIN SCREWED TO (2) STUDS WITH (2) #10 S.M.S TO EACH STUD AND CROSS JOIST

250S162-43 MIN CROSS JOIST, RDP TO VERIFY

SEE CL3.X WITH (2) #10 S.M.S EACH END

3'-0" MAX.

DO NOT ATTACH CLG TO LIGHT FIXTURE

45° MAX.

STRONGBACK FROM COMPRESSION POST EA SIDE 4'-0" MAXIMUM EA DIRECTION

NOTES:
1. RDP SHALL DESIGN CROSS JOIST, STRONGBACK, COMPRESSION POST AND SUPPORTING WALL

2. DETAILS IN THIS PAGE ARE ONLY PERMITTED AT THE FIXED END OF THE CEILING AND ARE NOT PERMITTED AT THE EXPANSION JOINT

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: OBSTRUCTION-RECESSED LIGHT AT PERIMETER

Issue Date: 04/25/2013
Revision: Date: CL6.5
T-BAR CEILING - WIRE OBSTRUCTION DETAIL W/STUD BRACE, LESS BRACING WIRES, TO DECK.

Code: 2010 CBC
Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS
Sheet Title: OBSTRUCTION-STUD BRACE TO OVERHEAD
1. Kicker bracing is an alternate to bracing wires. This method may be used in lieu of opposing wires at fixed joint only. Not permitted at expansion joint.

2. RDP shall design framed walls to carry the ceiling loads.

Kicker Schedule

<table>
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<tr>
<th>Span</th>
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<td>18 GA</td>
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<td>18 GA</td>
<td>400S162-43</td>
</tr>
<tr>
<td>14'-0&quot;</td>
<td>16 GA</td>
<td>400S162-54</td>
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T-Bar Ceiling - Wire Obstruction Detail W/Stud Brace, Less Bracing Wires, To Wall