

**State of California**  
**Office of Statewide Health Planning and Development (OSHPD)**  
**Facilities Development Division (FDD)**

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Standard Structural Review Comments  
Based on the 2010 California Building Standards Code, (2010 CBSC)  
**Applicable to OSHPD 1 Projects received after January 1, 2011.**

(1) Marked Plans and Response

The structural comments are shown on this set of drawings in red. Each comment is identified by a number such as S-1, S-2, S-3, etc, and is enclosed in a cloud.

The text of standard structural comments can be found in the attached list. The standard structural comments are called out on the review set by "2010(1)" etc or circled here.

The comments are based on the California Building Code, 2010 (2010 CBC) and California Administrative Code, 2010 (2010 CAC).

In order to facilitate the back check, please respond in writing to each comment. Your response may be in the form of a letter or each response may be written on this final review set of drawings near the comment in a color other than red or green. If the responses are presented in a letter, identify the comment by drawing number and the comment number. In both cases, each response should specify how and where on the resubmitted drawings, specifications, or calculations the OSHPD comments have been resolved.

If you have any questions, please do not hesitate to call the Structural Reviewer:

\_\_\_\_\_  
(name)

\_\_\_\_\_  
(phone)

Reference: 2010 CBC Sections 105 and 107.

(2) Signature - Structural Engineer

All final structural drawings and specifications shall bear the structural engineer's stamp or seal, signature, and expiration date.

Reference: 2010 CAC Section 7-115.

(3) Intent of the Drawings

Due to the difficulty of anticipating every unsatisfactory condition that might exist in connection with the existing work where alteration or repair work is proposed, the following clause or one of similar meaning shall be included on the plans or in the specifications:

“The intent of the construction documents is to reconstruct the hospital building in accordance with the 2010 CBSC. Should any condition develop not covered by the approved construction documents, wherein the finished work will not comply with the 2010 CBSC, a change order detailing and specifying the required work shall be submitted to and approved by OSHPD before proceeding with the work.”

Reference: 2010 CBC Sections 107 and 116.

(4) Tests and Inspections

A Testing, Inspection, and Observation (TIO) program shall be developed, submitted, and approved during the plan review process. An acceptable TIO form can be down loaded from the OSHPD web site.

OSHPD must approve the TIO program including the individuals and/or firms who will perform the specified tests and/or inspections prior to issuance of a building permit.

Reference: 2010 CAC Section 7-141 and CBC 2010 Section 1701A.4.

(5) Documents for approval

Separate the substantiating documentation from construction documents to be stamped "Reviewed for Code Compliance" by OSHPD and bind them separately. OSHPD only approve construction documents, it does not approve substantiating documentation such as calculations, cost estimates, manufacturer cut sheets, etc. These substantiating documents should be submitted if they are required for approval of the construction documents, and should not be bound with the construction documents to be stamped "Reviewed for Code Compliance". For post approval construction documents, clearly identify the documents to be stamped "Reviewed for Code Compliance" by numbering all of the sheets that comprise changes to the existing OSHPD approved construction documents. Provide a cover sheet with a complete index of the documents to be stamped "Reviewed for Code Compliance". Changes to the existing OSHPD approved construction documents shall be identified by clouding them on the construction documents or identifying them by some other means.

Reference: 2010 CBC Section 107.

(6) Nonstructural components and equipment supports and anchorage

Provide details on the construction documents and substantiating calculations (when necessary) for the supports and anchorage of nonstructural components and equipment unless they are exempted from plan review by 2010 CBC Sections 1615A.1.12.

The supports and anchorage details shall be coordinated with the calculations and the manufacturer's literature. Sketches shown in the calculations for the purpose of illustrating the analytical method are not adequate. OSHPD does not approve calculations; therefore, they cannot appear on the construction documents that require approval.

Equipment installation and anchorage should not proceed without OSHPD approved special seismic certification and/or anchorage details on the jobsite. These details and calculations may not necessarily be the responsibility of the Structural Engineer of Record.

Reference: 2010 CBC Sections 107, 1707A.7, and 1707A.8.

(7) Temporary and movable equipment

Temporary and movable equipment may be exempt from anchorage and bracing requirements in accordance with the CBC 1615A.1.12. Where components are identified as “temporary”, the drawings should indicate the expected duration of use and intended permanent replacement component. Equipment may be considered “movable” if during normal use of the component, it is moved from one location to another. Components mounted on wheels to facilitate periodic maintenance or cleaning but which otherwise remain in the same location are not considered movable for the purposes of anchorage and bracing.

Reference: 2010 CBC Sections 108 and 1615A.1.12.

(8) Design specifications for equipment shall specify the design lateral forces and special seismic certification requirements. Alternatively, the specifications may require that equipment be able to resist the forces in accordance with 2010 CBC.

Reference: 2010 CBC Section 1615A and ASCE 7-05 Chapter 13.

(9) Equipment Anchorage Detailing

Show the following note prominently on the drawings:

Anchorage and supports of all equipment to be installed, as a part of this project shall be detailed on construction documents, except those exempt by 2010 CBC Section 1615A.1.12.

Equipment supports and anchorage shall be approved by the appropriate Design Professional of Record and OSHPD as a part of field reviews/observations. The Inspector of Record (IOR) shall assure that the above requirements are enforced.

Reference: 2010 CBC Sections 107 and 1615A.

(10) Pipes, Ducts, and Conduits Supports and Bracings

Provide calculations and details for the support and bracing of all pipes, ducts, and conduits. If a pre-approved system is specified (the OPA numbers for the acceptable alternatives must be specified on the drawings) for the bracing, calculations and details for the supporting structure are still required. See comment 2010(18).

Reference: 2010 CAC Sections 7-115, 7-126, and CBC 2010 Section 107.

(11) Building Separations

Pipes, ducts, and conduits which cross building separation spaces shall be designed and detailed to accommodate displacements calculated in accordance with 2010 CBC Section 1613A.6.7. Show the required details on the drawings and provide the substantiating calculations, including a longitudinal seismic brace on each side of the building separation.

Reference: 2010 CBC Sections 1613A and 1615A.

(12) Equipment Not In Contract (NIC)

For all new or relocated equipment to be installed under the scope of this application and designated as "by others" or "not in contract," it is the responsibility of the architect and/or the structural engineer in responsible charge of the project to sign and submit the necessary construction documents to OSHPD for review and approval. Alternatively, exclude the equipment from the construction documents and the scope of this application. All equipment thus excluded can be installed only after obtaining the approval of OSHPD under a separate application.

Reference: 2010 CAC Sections 7-115 and 7-126.

(13) Equipment anchorage and special seismic certification approval

Equipment support, anchorage, and special seismic certification must be approved by OSHPD, prior to fabrication and installation. If the equipment has been specified such that anchorage details can be determined, then the details must be shown on the construction documents. **No reference to "or equal" is allowed unless it is clearly specified that any "or equal" substitutions must be approved by OSHPD by means of a change order.**

Reference: 2010 CAC Sections 7-115, 7-126 and CBC 2010 Section 107.

(14) Deferred approval

Design of the Seismic Force Resisting System (SFRS), Primary Gravity Load Resisting System (PGLRS) and Stairs shall not be deferred.

Where the anchorage details cannot yet be determined, then their approval may be deferred if all of the following conditions are met:

- 1) The anchorage cannot be fully detailed on the approved construction documents because of variations in product design or manufacture; e.g., the manufacturer has not yet been chosen, or specified equipment is for performance criteria only.
- 2) All items requiring deferred approval are listed under a separate heading on the drawings, preferably on the title sheet, and on a letter size sheet that will be attached to the building permit. This list must include the maximum weight of the equipment for which the supporting structure was designed. **Clearly indicate that OSHPD approval of the deferred portion is required prior to fabrication and/or installation.**
- 3) The construction documents must fully describe the performance and loading criteria for such work. The design of the supporting building structure cannot be deferred; therefore, show the maximum allowable equipment weight on the drawings. When the equipment is chosen, comparing the actual equipment weight to the maximum allowable equipment weight shown on the drawings can substantiate the adequacy of the supporting structure.
- 4) The architect and/or engineer responsible for preparation of

construction documents for the main project, as listed on the applications, shall review and forward the construction documents for the deferred approval items to OSHPD with the appropriate application form.

- 5) Supports, anchorage, special seismic certification, and associated calculations must be submitted sufficiently in advance of the desired date of approval to provide time for the initial review by OSHPD and at least one cycle of response and back check review.

Reference: 2010 CAC Section 7-126.

(15) Anchorage pre-approval

Where contract drawings reference OSHPD anchorage Pre-Approval (OPA) numbers for specific pieces of equipment, the consultant shall verify that the pre-approval is appropriate and review the pre-approved documents to determine what work the pre-approval requires the consultant to perform. If the installation varies in any way from that shown in the OPA document, provide complete calculations for anchorage and bracing of the component and system or calculations that verify that the proposed anchorage and bracing details are code compliant.

A copy of the chosen bracing system(s) installation guide/manual shall be on the jobsite prior to starting the installation of the component, equipment, hangers and/or braces.

Reference: 2010 CAC Sections 7-115 and 7-126.

(16) Pre-approved Components and Systems with "OPA" numbers

Pre-approved nonstructural components installed under the 2010 CBC must have a valid OPA number. Only pre-approvals specifically approved for use with the 2010 CBC shall be used.

Reference: 2010 CAC Sections 7-115, 7-126, and CBC 2010 Section 107.

(17) Pre-approved components and system limitations

Some pre-approvals have limitations that require either a deferred submittal (see comment 2010(14) of layout drawings and component design or a pre-engineered design that is a part of the contract documents. All of the preapproved systems require that the seismic lateral force,  $F_p$ , including

consideration of  $a_p$  and  $R_p$ , be determined at each level of the building so that brace spacing and anchorage requirements can be determined. Provide all parameters required to compute  $F_p$  (e.g.  $a_p$ ,  $R_p$ ,  $S_{DS}$ ,  $I_p$ ,  $h$ , and  $z$  at each level) on construction drawings. The District Structural Engineer may approve the seismic lateral force computations.

Reference: 2010 CAC Sections 7-115 and 7-126 and CBC 2010 Section 107.

(18) Pre-approved Pipes, Ducts, and Conduits Bracing

A. Shop drawings of the supports and bracing systems in accordance with the pre-approval shall be submitted to the discipline in responsible charge of the project for review to verify that the details are in conformance with all code requirements. The shop drawings shall as a minimum satisfy the requirements of ASCE 7-05 Section 13.6 as modified by the CBC 2007 Section 1615A.

- a) The Structural Engineer Of Record (SEOR) shall verify that the supporting structure is adequate for the loads imposed on it by the supports and braces installed in accordance with the pre-approval in addition to all other loads.
- b) The SEOR will forward the anchorage and bracing drawings (including approved change orders for supplementary framing where required) to the discipline in responsible charge with a notation indicating that the drawings have been reviewed and are in general conformance with the pre-approval and the design of the project.
- c) A "shop drawing stamp" may be used to indicate compliance with this requirement.
- d) The Registered Design Professional (other than SEOR) may provide the shop drawing stamp for small projects at the discretion of the District Structural Engineer.

B. The SEOR shall design any supplementary framing that is needed to resist the loads, maintain stability and/or is required for installation of pre-approved system.

- The supplementary framing shall be submitted to OSHPD as a change order.

C. The shop drawings (with the shop drawing stamp) shall be submitted to the District Structural Engineer to review the  $F_p$  for pre-approved system.

D. The shop drawings (with the shop drawing stamp) shall be kept on the jobsite and can then be used for installation of the support and bracing.

- OSHPD field staff will review the installation.

E. A copy of the chosen bracing system(s) installation guide/manual shall be on



the jobsite prior to starting the installation of hangers and/or braces.

- It is the contractor's responsibility to obtain copies of OSHPD pre-approvals and furnish the IOR with one copy of each.

F. Components of two or more pre-approved bracing systems shall not be mixed.

- Only one pre-approved bracing system may be used for a run of pipe, duct or conduit.
- Any substitution of component of a pre-approved bracing system shall require OSHPD review and approval.

Reference: 2010 CAC Sections 7-115, 7-126, 7-153, and CBC 2010 Section 107.

(19) Fire Sprinklers

Show a note on the construction documents requiring that the spacing and details of the support and bracing of fire sprinkler piping shall comply with the NFPA 13-10 as modified by 2010 CBC Sections 1613A/1615A and SFM Amendments.

Provide details and calculations for the sway bracing and their anchorage to the structure. Where applicable, details for the support and bracing may be referred to an OSHPD pre-approved anchorage system. All shop drawings of the sprinkler system shall be submitted to OSHPD for review and approval prior to installation.

Reference: 2010 CAC Sections 7-115, 7-126 and CBC 2010 Section 107.

(20) Vibration Isolators

For all vibration isolators and their anchorage, provide calculations, details, and/or test data to substantiate the isolator's capacity for vertical and lateral loads or use OSHPD pre-approved isolators. If the anchorage is not pre-approved, then calculations must also be submitted to substantiate the size, quantity, location and connection to the structure of the isolator. The drawings must be closely coordinated with the calculations and clearly specify the manufacturer, model type, model number, base plate size, quantity used and location at each piece of equipment, and how it is attached to the structure. Isolators, which support a component inside the prefabricated unit, will not be reviewed.

Reference: 2010 CAC Sections 7-115, 7-126 and CBC 2010 Section 107.

(21) Kitchen Equipment

Provide calculations and details for the support and anchorage of all kitchen equipment that is to be permanently fastened to the building or utilities.

Reference: 2010 CAC Sections 7-115 and 7-126

(22) Grab Bars

Show on the plans details of how grab bars and/or tub and shower seats, located in handicapped toilets and shower stalls, are connected to the supporting structure. See 2010 CBC Section 1607A.7, for required strength.

Reference: 2010 CBC Section 1607A.

(23) Television and Monitor Brackets

The design of wall or ceiling mounted television and monitor brackets shall comply with Chapter 13 of ASCE 7 as modified by 2010 CBC Sections 1613A and 1615A. The design shall include: 1) The connection of the bracket to the structure; 2) The supporting structure; 3) The bracket itself; and 4) The connection of the television and monitor to the bracket.

Reference: 2010 CBC Sections 1613A and 1615A.

(24) Anchorage to Concrete

Anchorage to concrete shall be designed in accordance with Sections 1615A and 1911A or 1912A subject to limitations there in.

Reference: 2010 CBC Sections 1615A, 1911A, and 1912A

(25) Post-Installed Anchors

For all post installed anchors show on the construction documents the manufacturer, type, diameter, minimum embedment, concrete type(s) and strength(s). Indicate edge distance and anchor spacing. Reduce anchor capacities due to edge distance and spacing as recommended in the anchor Evaluation Report. Show the actual magnitudes of the test loads on the contract documents. Testing is required in accordance with the 2010 CBC Section 1916A.7.

Reference: 2010 CBC Sections 1615A, 1911A, 1911A, and 1916A

(26) Installation of Post Installed Anchors

Show or reference the following note prominently on the plans (non-applicable portion may be excluded):

“When installing drilled-in anchors and/or powder driven pins in existing non-prestressed reinforced concrete, use care and caution to avoid cutting or damaging the existing reinforcing bars. When installing them into existing prestressed concrete (pre- or post-tensioned) locate the prestressed tendons by using a non-destructive method prior to installation. Exercise extreme care and caution to avoid cutting or damaging the tendons during installation. Maintain a minimum clearance of one inch between the reinforcement and the drilled-in anchor and/or pin.”

Reference: 2010 CBC Section 1603A.1.10.

(27) Incomplete Submittals

The following comments are based on a preliminary or incomplete submittal. A more thorough review will be made upon resubmittal and additional comments will follow.

Reference: 2010 CAC Section 7-121.

(28) Underground Tanks

Underground Tanks shall be located so that loads from existing foundations and supports are not transmitted to the tank.

Underground tank designed to comply with ASCE 7-05 Section 13.6.9 and not within the influence area of foundations nor subject to the influence of vehicle traffic (unless specifically shown to be designed for those loads by the manufacturer), do not require structural calculations for OSHPD review.

Review for structural compliance of underground storage tanks, in general, will be limited to evaluating anchorage and will not involve a structural analysis of the tank. The only exception is when the tank is under a driveway or parking lot. In that situation, the Office will verify that the tank has been listed and approved by a recognized testing agency, for the specific loading condition. For tanks not approved for the specific loading condition, structural calculations will be required.

Reference: 2010 CBC Section 107 and PIN 2.

(29) Pneumatic Tube Systems

Details for the bracing and anchorage of piping associated with the installation of Pneumatic Tube Systems need not be provided to the Office for review, unless hospital desires the Pneumatic Tube System to be designed as a designated seismic system (essential system), for continued operation following a seismic event.

Piping associated with these systems is generally light (4.5 plf or less) and has no weight inside the pipe except when the "slug" is moving from station to station. Details and calculations shall be required for the stations, diverters and blowers in accordance with Chapter 13 of ASCE 7-05 as modified by Sections 1613A and 1615A of the 2010 CBC.

Separation of 6" between the pneumatic tube system piping and suspended ceiling lateral force bracing systems shall be provided in accordance with ASTM E580-08. Fire protection issues are addressed in Chapter 7 of the 2010 CBC.

Reference: 2010 CBC Section 107 and PIN 20.

(30) Earthquake Design Data

Provide seismic parameters used in the design of the project on the construction documents as required by 2010 CBC 2010 Sections 1603A.1.5 and 1613A.1.9.

Reference: 2010 CBC 2010 Sections 1603A.1.5 and 1603A.1.9.

(31) Site Data

Project cannot be approved prior to approval of the Engineering Geologic Report (Section 1803A.6 of 2010 California Building Code), the Geotechnical and Supplemental Ground-response Report (Section 1803A.7 and 1803A.6.2 of 2010 CBC) in accordance with Section 7-117 of 2010 CAC.

The current review has assumed that the values used for the seismic and geotechnical parameters are correct. If revisions are made to these parameters in the course of the separate review of the Geotechnical/Geohazard Report, further comments will be forthcoming and subsequent revisions may be required.

Geotechnical information shall be shown on the construction documents in accordance with Section 1603A.1.6 of 2010 CBC.

Reference: 2010 CBC Sections 1603A.1.6 and 1803A.6.

(32) Missing, Incomplete, or Incorrect Information or references, Details not clear

Add missing information, correct information or references, provide additional details to clarify work proposed where indicated on the construction documents.

Reference: 2010 CBC Sections 107.1 and 107.2.1.

(33) Missing Dimensions, or Missing size/section of structural member, or Missing weight of nonstructural equipment

Provide missing dimension, add missing size/section of structural member, provide missing weight of nonstructural equipment where indicated on the construction documents.

Reference: 2010 CBC Section 1603A.1.

(34) Inadequate member or connection design

Provide calculations to prove that the member or connection indicated on the construction documents is adequate.

Reference: 2010 CBC Section 1604A.4 and ASCE 7-05 Section 12.1.

(35) Inadequate wind or seismic load path

Provide calculations or revised details to prove that there exists an adequate load path as indicated on the construction documents.

Reference: ASCE 7-05 Sections 1.3.5 and 12.1.3.

(36) Missing Anchorage information

Provide missing anchorage information as indicated on the construction documents.

Reference: ASCE 7-05 Section 13.4