OSHPD Special Seismic Certification Preapproval (OSP)

Preapproval of Special Seismic Certification by OSHPD is a **voluntary** program for Equipment Manufacturers!

Office of
Statewide Health Planning and Development OSHPD

Facilities Development Division

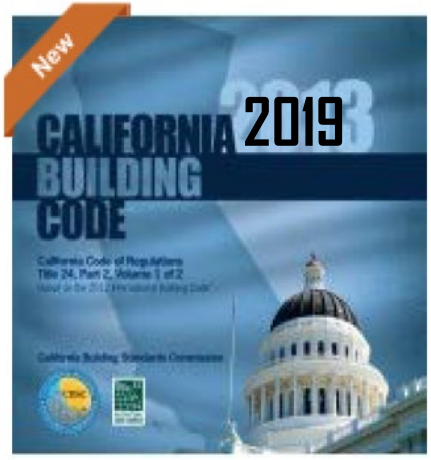
The Building Department for California's Hospitals

Scope of OSHPD Special Seismic Certification Preapproval (OSP)

- OSHPD Special Seismic Certification Preapproval (OSP) is limited to:
  - Components that require special seismic certification in accordance with the CBC 2019 Section 1705A.13.3.

OR

  - Components that require special seismic certification in accordance with the ASCE 7-16 Section 13.2.2.



What is Special Seismic Certification?

- Special Seismic Certification is a “Certificate of Compliance” provided by Manufacturers with assurance that after a Design Earthquake (DE) equipment shall maintain:

  1. Structural Integrity, and

  2. Functionality

Minimum Requirements for OSP

- For OSP of a product line with **similar structural configuration**, OSHPD requires:
  - Testing of at least two units (typically a small & largest/heaviest units) and
  - Verification of similarities for interpolated units

Test of two Units Required for Each Structural Configuration

- **<u>Test of two units</u>** shall be required for **<u>each anchorage or mounting configuration</u>**
  - Different mounting types, such as wall mounted vs. floor mounted will require two test for each configuration.

Testing Requirements for Virtually Identical Equipment with Two Different Materials

- If the **units are made of different materials** (e. g. Carbon Steel vs. Stainless Steel, etc.)
  - **Test of largest/heaviest unit of each material** can be used to satisfy the requirements for testing two representative equipment or component.

- If **sub-components are made by different manufacturer's:**
  - **Test of two units** shall be required for **each manufacturer**
  - **Special Seismic Certification** pre-approval is valid for components with design, construction, and quality control equivalent to units tested.

Simultaneous Testing of Multiple Units on Shake Table is Permitted

- Multiple units can be tested on a single shake table simultaneously:
  - Provided table is capable of achieving the Required Response Spectra (RRS) with total payload.

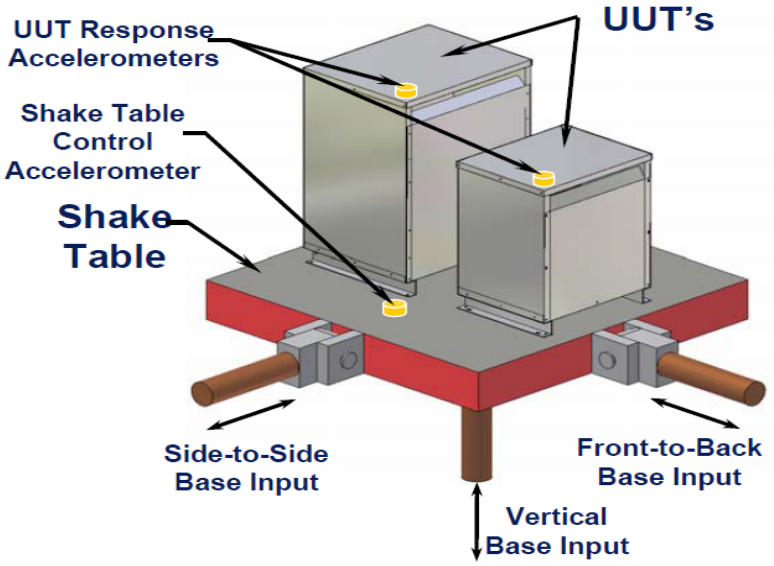


Illustration by Jeff Gatscher & Scott Littler

US Test Facility Requirements

- **Testing laboratory shall have ISO 17025 accreditation**,

or

- Testing shall be under the responsible charge of an independent California Licensed engineer.

Test Report Requirements

- Test reports shall be **reviewed and accepted by an independent California Licensed Structural Engineer**, unless it is prepared by one.

Pre-Test Meeting with OSHPD is Recommended

- OSHPD strongly recommend that Manufacturer's representative and **California licensed structural engineer** in responsible charge of the OSP meet with OSHPD to review:
  - Test plan that will justify the scope of approval (OSHPD does not approve test plans).
  - Scope of pre-approval.
  - Test standard and reporting requirements.
  - Seismic Certification Label requirements.

What is the Acceptance Criteria after Shake Table Testing?

- Post-test acceptance criteria for shake-table testing shall be as required by ICC-ES AC 156:

1. **Structural Integrity** of components, supports, and attachments shall be maintained.

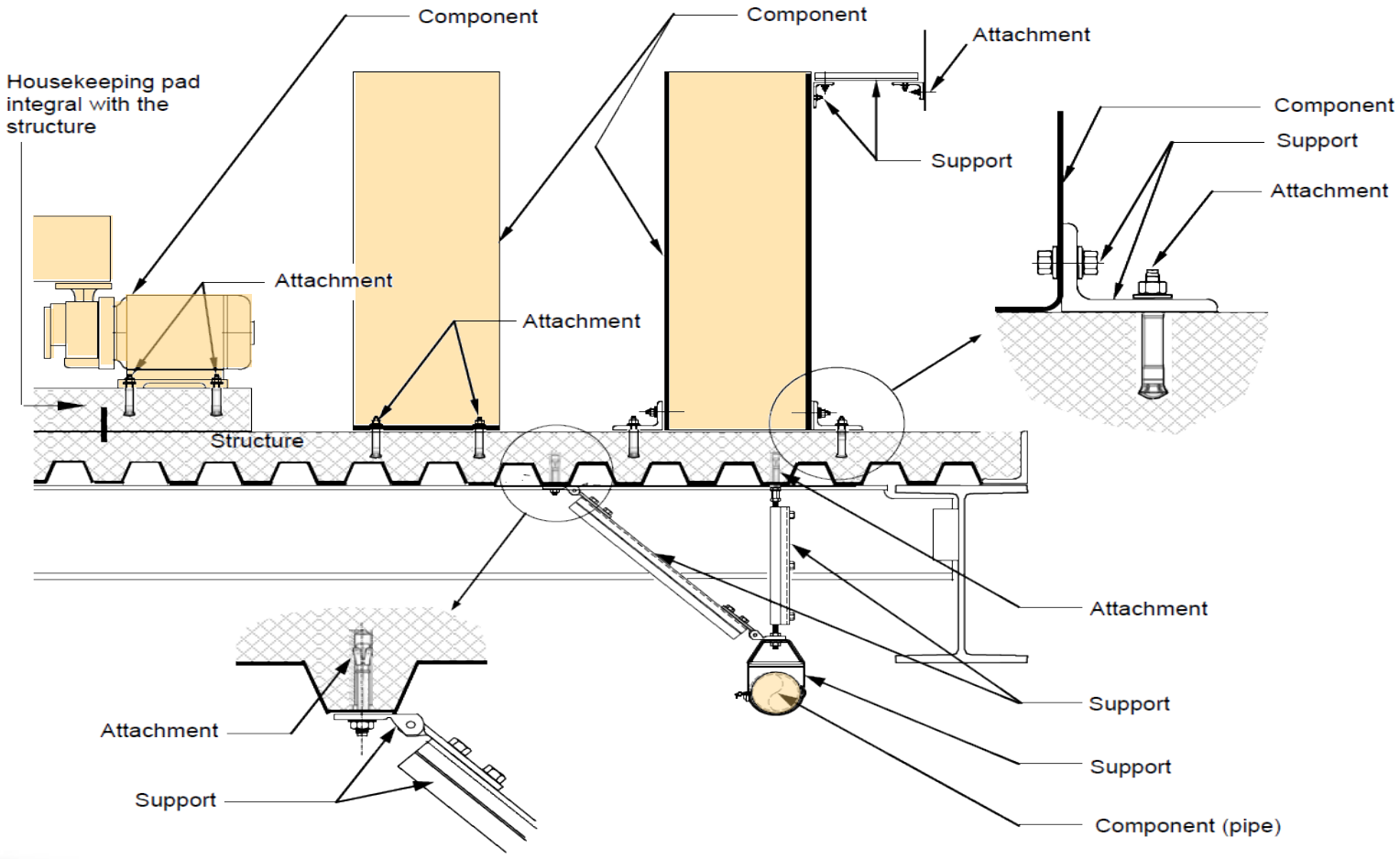
2. **Functionality** of components shall be maintained equivalent to pre-shake table test functionality test.

    - ***Functionality test shall be similar to what manufacturer normally performs prior to delivery of the components for use.***

Can the Active Mechanical and Electrical Equipment get an OSP by analysis?

- **No!**
  - Active and energized equipment/components shall be certified **exclusively** on the basis of shake table testing.
  - ONLY connecting elements (such as pipes, interconnection between components, etc.), attachments, and supports can be justified by supporting analysis.

What are Components, Supports, and Attachments?



What is a Component?

- **COMPONENT:** A part of an architectural, electrical, or mechanical system (e. g. equipment, component, sub-component, sub-assembly, etc.).

- **Nonstructural Component:** A part of an architectural, mechanical, or electrical system within or without a building or nonbuilding structure.

What are Supports?

- **SUPPORTS:** Those members, assemblies of members, or manufactured elements, including braces, frames, legs, lugs, snubbers, hangers, saddles, or struts, and associated fasteners **that transmit loads between nonstructural components and their attachments to the structure.**

What are Attachments?

- **ATTACHMENTS:** Means by which components or supports of nonstructural components are secured or connected to the seismic force-resisting system of the structure. Such **attachments include anchor bolts, welded connections, and mechanical fasteners.**

What is a Sub-Component?

- **Sub-Component :** A portion of an equipment or component that is uniquely identified by a part number (also known as model number or identification number).

What is a Sub- Subassembly?

Subassemblies: A grouping or assemblage of sub-components and/or structural elements that require attachment to the component's primary force resisting system to achieve structural stability.

What is a System?

System: A group or combination of interrelated, interdependent, or interacting elements, equipment, or components forming a collective entity. Also, referred to as multi-component system.

What is Equivalence?

Equivalence: The material, method or work offered, is for the purpose intended, at least the equivalent of that prescribed in code in quality, strength, effectiveness, fire resistance, durability and safety.

OSP Submittal Requirements

1. *For all New and Renewal OSP applications and submittals, and for any existing application searches (see bottom of linked page), access eServices Portal by clicking on the link below:* ***https://eserv.oshpd.ca.gov/CitizenAccess/***

2. *Instruction guides organized by subject are available by clicking the "User Guides" tab at:* ***http://www.oshpd.ca.gov/FDD/eServices/index.html***

3. *Assistance is available Monday - Friday, 9:00 am - 4:00 pm PST, excluding California state holidays by calling 916-440-8400 or emailing* ***eserv@oshpd.ca.gov***

OSHPD Contact for Additional Information about OSP

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Does the Component Design need to Comply with the CBC 2019?

- **Yes!**
  - Demand and capacity shall be based on the CBC 2019.

Can the Analysis be Bookended Similar to Testing?

- **No!**

  •Analysis is only good for the unit analyzed (limited variations and/or grouping may be acceptable).

Can I get an OSP by Analysis or Experience data?

- **No!**
  - OSP is based on test ONLY.

What R_p value can be used for Special Seismic Certification?

- R_p/I_p = 1.0 for Special Seismic Certification by testing in accordance with ICC-ES AC 156.
- R_p = 1.0 & I_p = 1.5 shall be used for analysis part of Special Seismic Certification, since functionality can't be verified by analysis.
- ASCE 7-16 does not provide R_p and a_p values for special seismic certification.
- R_p and a_p values in ASCE 7-16 can be used for design of supports and attachments.

What Test Protocol should be used for Shake Table Testing?

ICC-ES AC 156

Acceptance Criteria for Seismic Certification By Shake-Table Testing of Nonstructural Components
(Editorially Revised May, 2015)

- *Where normal operating conditions of equipment involve variation of contents or configuration, each operating condition or configuration shall be simulated in the tests.*

- *If uniaxial or bi-axial tests are used for certification, a test at 45-degree to two horizontal orthogonal directions shall be required in addition to tests in two horizontal and vertical directions.*

Can test of a Component with Rigid and Isolated Supports Justify Installation with Intermediate Support Conditions?

- **Yes!**
  - *Provided mounting configurations (e.g. installation is wall mounted, etc.) are similar and only difference is in the attachments, and*
  - *Component is surface mounted.*

What is a Surface Mounted Component?

Surface Mounted Component: Means component directly attached to only one continuous flat surface of wall, floor or roof, without supports. Surface mounted components are directly attached to a surface by attachments (without any supports) and are not rigidly connected to anything else (e. g. distribution system, other components, etc.).

Are the tests in accordance with ICC-ES AC 156 by non-US Shake Table Test Facility Acceptable?

- **Yes! *Provided:***
  - ✓ *Test facility has ISO 17025 accreditation.*
  - ✓ *Test report is available in English.*
  - ✓ *Test report is prepared under the responsible charge of a California Licensed Structural Engineer.*

What Systems/Components Require Special Seismic Certification for OSHPD 1 Buildings?

- **Following Systems Require Certification in accordance with CBC 2019 Section 1705A.13.3.1:**
  1. *Emergency and standby power systems.*
  2. *Fluoroscopy and x-ray equipment required for radiological/diagnostic imaging service (for service requirements see CBC Section 1224.18.1) **and** any fluoroscopy and/or radiographic system provided in support of diagnostic assessment of trauma injuries.*
  3. *CT (Computed Tomography) systems used for diagnostic assessment of trauma injuries.*
  4. *Elevator equipment (excluding elevator cabs, machines, and governors).*
  5. *Power isolation and correction systems.*
  6. *Motorized surgical lighting systems.*
  7. *Motorized operating table systems.*
  8. *Medical gas and vacuum systems.*

What Systems/Components Require Special Seismic Certification for OSHPD 1 Buildings?

- **Following Equipment and Components Require Certification in accordance with the CBC 2019 Section 1705A.13.3.1:**

  9. Components with hazardous contents.

  10. Exhaust and smoke control fans

  11. Air conditioning units excluding Variable/Constant Air Volume (VAV/CAV) boxes up to 75 lbs.

  12. Air handling units.

  13. Chillers, including associated evaporators, and condensers.

  14. Cooling Towers.

What Systems/Components Require Special Seismic Certification for OSHPD 1 Buildings?

- **Following Equipment and Components Require Certification in accordance with the CBC 2019 Section 1705A.13.3.1:**

  15. Motor control centers.

  16. Switchgear and switchboards.

  17. Transformers.

  18. Electrical substations.

  19. UPS and batteries.

  20. Panelboards.

  21. Industrial Control panels.

What Systems/Components Require Special Seismic Certification for OSHPD 1 Buildings?

- **Following Equipment and Components Require Certification in accordance with the CBC 2019 Section 1705A.13.3.1:**

  22. Internal communication servers and routers.

  23. Electrical busways.

  24. Electrical control panels powered by the life safety branch in accordance with the California Electrical Code (CEC) Article 517.32 or critical branch in accordance with the California Electrical Code (CEC) Article 517.33.

What Components are Exempt from Special Seismic Certification for OSHPD 1 Buildings?

Exceptions:

1. *Equipment and components weighing not more than 50lbs., surface mounted on building structures or components not requiring special seismic certification.*
2. *Mobile equipment /components.*
3. *Pipes, ducts, conduits, and cable trays, excluding in-line equipment and components.*
4. *Underground tanks.*
5. *Electric motors, base-mounted horizontal pumps, and compressors.*
6. *Based-mounted vertical pumps up to 20 hp.*
7. *Certified subcomponents up to operating weight of 10 lbs.*
8. *Components where importance factor, Ip, is permitted to be 1.0 by this code.*
9. *Emergency generators up to 25 kilowatts.*
10. *Equipment and Components used for clinical trials only.*
11. *Elevator machines and governors.*

Requirements for Components/Subcomponents Exempt from Special Seismic Certification

For Exceptions 5, 6, and 7:
Exempt subcomponents, which are an integral part of equipment that require special seismic certification, shall be tested attached to the equipment. Exempt subcomponents shall be permitted to be substituted without testing, provided that the substituted subcomponent relative to the certified subcomponent has:

1. *Similar configuration with equivalent function.*
2. *Supports and attachments of similar configuration with equivalent strength and stiffness.*
3. *Same attachment location.*
4. *Changes in dimensions, center of gravity, and mass, of not more than 10 percent of the certified subcomponent and still meets Exception 5, 6, or 7.*
5. *Manufacturing process with ISO 9001 certification.*

What is Covered by X-Ray Equipment?

- **Medical radiography system used to generate** and record an x-ray pattern for the purpose of providing the user with a **static image(s)** after termination of exposure.

- Following radiography system require special seismic certification **ONLY when used for diagnostic assessment of trauma injuries:**
  - CT (Computed Tomography)
  - Mammography or
  - Angiography

Do the Components Mounted on/or Supporting Equipment NOT Listed in the CBC 2019 Section 1705A.13.3.1 Require Special Seismic Certification?

- ***Yes!*** *All components listed in the CBC 2019 Section 1705A.13.3.1 require special seismic certification for OSHPD 1 buildings irrespective of their function or location.*

- *Components not listed in the CBC 2019 Section 1705A.13.3.1 may be rugged but not the components listed, hence will require special seismic certification.*

- *Certain components that are not rugged and are required for functionality of hospitals are not listed in the CBC 2019 Section 1705A.13.3.1, since requirements may not be enforceable at this time considering readiness of the industry.*

- ***NO!***
  - *Special Seismic Certification is required for components when the maximum allowable quantity of Hazardous Materials per control area as specified in the CFC 2019 Tables 5003.1.1(1) through 5003.1.1(4) are exceeded.*

Do the Redundant or Optional Equipment Require Special Seismic Certification?

- ***Yes!***

  - *All equipment listed in the CBC 2019 Section 1705A.13.3.1 require special seismic certification for OSHPD 1 buildings even if they are considered redundant or optional.*

  - *Redundancy and options are provided only because they are considered necessary/required.*

  - *Consequential damage due to failure of redundant or optional components may cause failure of essential components.*

Do the Equipment in Support Spaces in OSHPD 1 Buildings Require Special Seismic Certification?

- ***Yes!***

  - *All equipment listed in the CBC 2019 Section 1705A.13.3.1 require special seismic certification for OSHPD 1 buildings even when they are not directly required for patient beds.*

  - *All support spaces in an OSHPD 1 building are considered essential for the operation of the hospital building.*

Can the Supports and Attachments for Equipment with an OSP be Substituted?

- ***Yes!*** **Provided substituted supports and attachments have:**
  - *Similar installation configurations (e. g. Support, Mounting, Attachment, Orientation, etc.), and*
  - Equivalent Strength and Stiffness to those tested and approved.

What does a Special Inspector Need to Verify in the Field for Special Seismic Certification?

Special Inspector shall verify:

1. ***Label*** *for conformance with the certificate of compliance.*

2. **Anchorage or mounting** for *conformance with the certificate of compliance and construction documents.*

- **Yes!**
  - "Certificate of Compliance" by the **Manufacturers** for each component that requires special seismic certification shall be submitted to OSHPD for review after review and acceptance by the Registered Design Professional (RDP).

Who provides Certificate of Compliance for Components?

- Manufacturer shall provide “Certificate of Compliance” for components **with** Special Seismic Certification in accordance with ASCE 7-16 Section 13.2.2.

- For components **where Special Seismic Certification is NOT required by Code**, “Certificate of Compliance” can be provided by manufacturers, designers or suppliers (H&SC #129895).

- The owner or owner’s authorized agent shall submit certificate of compliance to OSHPD in accordance with the CBC 2019 Section 1704A.5.

Certificate of Compliance for Components where Special Seismic Certification is NOT required

- Certificate of Compliance for Seismic Certification of Components, **where Special Seismic Certification is NOT required:**
  1. Components commonly designed by calculations (e.g. those listed in ASCE 7-19 Table 13.5-1), such as storage racks, shall be justified by calculations;

  2. Mechanical and Electrical components (e.g. those listed in ASCE 7-19 Table 13.6-1) can be justified by reference to ANSI approved seismic design standards.

➢ **Certificate of Compliance shall specify validity range for S_{DS} & z/h, and I_p.**

Can a Single Product with Absolutely No Variation be Certified by One Test Only?

- ***Yes!*** *Provided:*

1. Manufacturing process is ISO 9001 certified.

2. A single product (and not a product line with more than one product with variations) is certified.

3. Variations, if any, are limited to software and color/branding.

What Systems/Components Require Special Seismic Certification for OSHPD 2 Buildings?

- *Special seismic certification shall be required for life-safety components, such as emergency and standby power systems, mechanical smoke removal systems, and fire sprinkler/fire protection systems.*
- *Equipment and components supporting sub-acute bed(s) shall have same special seismic certification requirements as OSHPD 1 buildings.*

How much change can be made before OSP becomes invalid?

OSP will be nullified when:

- *Design, construction, or quality control/quality assurance method are **materially altered** as defined in the California Administrative Code, 2019 Section 7-111.*

OR

- *Strength, Stiffness, Size, Weight, Materials, Support, Orientation, or Manufacturer are changed/altered so that they are no longer equivalent to what was approved in the OSP.*

Can we Submit Multiple Products through a Single OSP Application?

- Yes!
  - How the product will be grouped for approval is completely up to the Manufacturer.

Will OSHPD Distribute Approved OSP's?

- **Yes!**
- **All approved OSP's will be posted at OSHPD website.**
- OSHPD website shows all currently approved OSP at:

http://oshpd.ca.gov/FDD/Pre-Approval/SpecSeisCert-lrgeScrn-wModelCol.html

- OSP list by category is available at:

http://oshpd.ca.gov/FDD/Pre-Approval/OSP-List-by-Category.pdf

Are Third Party Seismic Certification Subject to OSHPD Review?

- **Yes!**
  - Required by Health and Safety Code Sections 129680 and 129770.
  - Required by the CBC 2019 Section 1601A.2.

Sample Special Seismic Certification Label for Components with OSPs to Satisfy the CBC 2019!

Special Seismic Certification Label
California Building Code

OSHPD Special Seismic Certification Preapproval: OSP-0XXX
Product Name: XXXX
Product Type: XXX
Supports and Attachments: XXXXX
Seismic Performance Characteristics: $S_{DS}(g)$ =x.xx, z/h ≤ 1.0, I_p = 1.5
Manufacturer's Identification Number: XXXXXXXXXXXXX
For Seismic Enhancements: See OSP

Company Logo

Label Tracking Number (If any)

Certificate of Compliance
Manufacturer's Certification of Components
California Building Code

OSHPD Special Seismic Certification Preapproval: OSP-0XXX
Product Name: XXXX
Product Type: XXX
Supports and Attachments: XXXXX
Seismic Performance Characteristics: $S_{DS}(g)$ =x.xx, z/h ≤ 1.0, I_p = 1.5
Manufacturer's Identification Number: XXXXXXXXXXXXX

Company Logo

Signature: _____
Print Name: _____
Title: _____
Date: _____

Certificate of Compliance
Manufacturer's Certification of Components
California Building Code

Component Designed in accordance with ASCE 7-16
Product Name: XXXX
Product Type: XXX
Supports and Attachments: OPM-0XXX-13
Seismic Performance Characteristics: $S_{DS}(g)$ =x.xx, z/h ≤ 1.0, I_p = 1.5
Manufacturer's Identification Number: XXXXXXXXXXXXX

Company Logo

Signature: _____
Print Name: _____
Title: _____
Date: _____