Department of Health Care Access and Information

DESIGN GUIDE FOR WORKING ON PROJECTS UNDER OSHPD JURISDICTION



Tips from the Experts

Office of Statewide Hospital Planning and Development

April 15, 2024

Version 4.0

Department of Health Care Access and Information
Office of Statewide Hospital Planning and Development

Headquarters and Northern California
(916) 440-8300

Southern California
(213) 897-0166

https://hcai.ca.gov

PREAMBLE

In March 2006, the California Healthcare Foundation published the "*Best Practices for Project Management, Design, and Construction of Buildings Under OSHPD Jurisdiction*". The "Best Practices Manual" was developed in conjunction with the California Hospital Association (CHA), the California Society for Healthcare Engineers (CSHE), the Office of Statewide Hospital Planning and Development (OSHPD), and a task force comprised of stakeholders from the hospital design, inspection, and construction industries. It quickly became the "gold standard" for hospital design, inspection, and construction and served as a model for avoiding costly delays sometimes associated with large, complex projects.

The hospital industry in California is indebted to the California Healthcare Foundation for undertaking this monumental task. With the Foundation's consent, the Hospital Building Safety Board (HBSB), comprised of experts from all aspects of the hospital construction industry, in conjunction with the OSHPD, updated the "Best Practices Manual" and reissued it as the "*Design Guide for Working on Projects Under OSHPD Jurisdiction – Tips from the Experts",* hereinafter referred to as "Design Guide".

This Design Guide reflects many years of experience by all stakeholders involved in hospital construction, including owners, designers, inspectors, contractors, etc. and was vetted through several public meetings. It should be used as a general guide and is not intended to replace, supersede, or alter the requirements of the California Building Standards Code or any other enforceable regulations, codes, or standards for hospital construction.

This Design Guide reflects the enforceable building codes and regulations at the time of its publication, which is the 2022 California Building Standards Code (Title 24), and may not reflect requirements in subsequent editions. Therefore, it is intended that this Design Guide be a "living document" which is updated with each triennial building code cycle if substantial changes are made to the code that necessitates updating it. Substantive changes in hospital construction project delivery, plan review, and or construction methods may also justify an update of the Design Guide. Please feel free to offer any suggestions for improvement to this Design Guide to OSHPD's Building Standards Unit.

I wish to thank the HBSB, all OSHPD staff who participated, and the public who attended the meetings and provided valuable input during the many hours expended on the Design Guide's development.

Use of this Design Guide is discretionary; however, I think that you will find its use to be a good investment toward improving the quality of hospital construction projects and the working relationship between all parties involved in the process.

Chris Tokas, SE, F. SEAOC, CBO
Deputy Director

(This page is intentionally blank.)

TABLE OF CONTENTS

PREAMBLE ..... **i**

TABLE OF CONTENTS ..... **iii**

HOW TO USE THIS DESIGN GUIDE **1**

SECTION 1 Introduction to the Office of Statewide Hospital Planning and Development

1.0 Introduction 5
1.1 Authority of OSHPD 7
1.2 OSHPD Organization 8
1.3 Hospital Building Safety Board 10
1.4 Enforcement 11
1.5 OSHPD Plan Review and Permitting Processes 12
1.6 OSHPD Electronic Services Portal Client Access 13

SECTION 2 Geologic Hazards Investigation Guidelines

2.0 Introduction 15
2.1 Overview of the Process 15
2.2 Geologic Hazards Report 17
2.3 Approval of Seismic and Geologic Hazards Reports 17

SECTION 3 Plan Design and Review Guidelines

3.0 Introduction 19
3.1 Role of the Registered Design Professional 19
3.2 General Guidelines for the Project Drawings 22
3.3 Project Title Sheet 28
3.4 Fire and Life Safety Drawings 34
3.5 Accessibility Compliance Documentation 37
3.6 Door Schedule 39
3.7 Anchorage and Bracing of Equipment and Systems 41
3.8 Architectural Details 44
3.9 Title 24, Part 6 – Energy Code Compliance (CESC) 46
3.10 Seismic Compliance 48
3.11 Guidelines for Structural Drawings 49
3.12 Guidelines for Mechanical Drawings 52
3.13 Guidelines for Plumbing Drawings 55

3.14 Guidelines for Electrical Drawings 58
3.15 Building Information Modeling (BIM) 63
3.16 Project Closure 63
3.17 Plan Design and Review Guidelines 64

SECTION 4 Inspector of Record Guidelines

4.0 Introduction 67
4.1 Conduct Relative to Performance 68
4.2 Knowledge 68
4.3 Principal Duties 69
4.4 Documentation and Processing “Non-Material Alterations” 74
4.5 Inspections and Types of Inspections Provided by the IOR 74
4.6 Other Project Related Duties 76
4.7 Checklists 76
4.8 Coordination Concerns 77
4.9 Preconstruction Meetings 77
4.10 OSHPD Interaction 81
4.11 Project Closure 81
4.12 Concluding Remarks 82

SECTION 5 Testing, Inspection, and Observation Program Guidelines

5.0 Introduction 83
5.1 Purpose 83
5.2 Maintenance and Administration 83
5.3 Format 84
5.4 Instruments 84
5.5 Contract Drawings 84
5.6 Instructions 84
5.7 Responsible Personnel 87
5.8 Tests 89
5.9 Inspections 89
5.10 Milestones and Intervals 89
5.11 Samples 90
5.12 TIO Modifications 90
5.13 Review and Approval 90
5.14 Conclusion 90

SECTION 6 Guidelines for Contractors Working on OSHPD Projects

6.0 Introduction 91
6.1 Overview of the Process 92
6.2 Inspector of Record 92
6.3 Testing, Inspection, and Observation Program (TIO) 93
6.4 Preconstruction Meetings 94
6.5 Inspection Request Program (IRP) 95
6.6 Challenges and Recommendations 96

SECTION 7 Guidelines for Hospitals Working with OSHPD

7.0 Introduction 99
7.1 Basic OSHPD Process 100
7.2 Guidelines 101
7.3 Project Selection and Identification Phase 101
7.4 Project Planning Phase 103
7.5 Design Phase 111
7.6 Permit Phase 118
7.7 Construction Phase 125
7.8 Close-out Phase 126
7.9 Commissioning, Start-Up, and Occupancy/Use (Activation) 128

SECTION 8 Guidelines for Project Closure

8.0 Introduction 131
8.1 Different Types of Project Closure 131
8.2 Project Team Closure Responsibilities 132
8.3 Owner's Responsibilities 132
8.4 Why is Closure in Compliance Important? 133
8.5 Re-Opening Closed Projects 133

(This page is intentionally blank.)

HOW TO USE THIS DESIGN GUIDE

This Design Guide includes recommendations and tips for most stakeholders/concerned parties involved in the design and construction of hospital projects under the jurisdiction of the Office of Statewide Health Planning and Development (OSHPD). It is comprised of the following sections:

Section 1 includes an introduction to the OSHPD, background regarding its authority, an overview of its organization, the purpose, and functions of its advisory and appeals board, its provisions for enforcement, a summary of its plan review and permitting processes, and an introduction to its electronic services portal.

Section 2 provides guidelines relating to geologic hazards investigations. This is one of the early critical OSHPD processes for projects that include any new footprint, whether it be a new building or an addition to an existing building.

Section 3 defines the roles of the various design professional disciplines when working with OSHPD and provides construction document/project drawing guidelines for each discipline.

Section 4 provides guidelines for hospital construction Inspectors of Record (IORs). Hospitals are designated as essential facilities in the building code; therefore, continuous inspection is an especially important function of quality assurance on hospital construction projects. IORs following the guidelines provided herein will add value throughout the duration of the project.

Section 5 provides guidelines for the Testing, Inspection, and Observation Program (TIO), which identifies required tests, inspections, and observations to be performed during construction. The TIO also provides a similar function to the Building Card used to document required inspections by a local building department.

Section 6 provides guidelines for Contractors working on OSHPD construction projects. This Design Guide can assist the Contractor in having a more complete knowledge and better understanding of the OSHPD regulations, policies, and procedures.

Section 7 provides guidelines for hospital representatives, Project Managers, and others assigned by the facility to oversee and be responsible for a positive outcome of design and construction projects. It is also a good resource for hospital CEOs, COOs, and other executives who wish to better understand the OSHPD processes and how their continued involvement throughout the duration of a project is key to ensuring a successful design and construction project that fulfills the scope of the work as they envisioned it.

Acronyms and Definitions assist the user in recognizing and identifying various acronyms and terms generally used in the Design Guide.

Please refer to the Master Glossary of Acronyms and Definitions on the HCAI website at https://hcai.ca.gov/document/master-glossary-of-acronyms-and-definitions/ for a list that includes terms used in this Design Guide, as well as in other OSHPD published documents.

Other definitions may also be found in the Title 24, California Code of Regulations, California Building Standards Code. Access is provided to the codes promulgated by OSHPD through the California Building Standards Commission website (https://www.dgs.ca.gov/en/BSC/Codes) with active links to each publisher's website for read-only public access versions of the codes.

Part 1, California Administrative Code

Part 2, California Building Code, Volumes 1 and 2

Part 3, California Electrical Code
(Note: Accessed through the National Fire Protection Association (NFPA), however, requires the creation of a user account to view the Free Access - NFPA 70: 2022 California Electrical Code - NFPA 70 (2020 NEC®)

Part 4, California Mechanical Code

Part 5, California Plumbing Code

Part 6, California Energy Code

Part 9, California Fire Code

Your First Tip: *Government agencies use acronyms generously; therefore, it is important to become familiar with the ones used in this Design Guide.*

Because hospital construction is some of the most complex in California it is not possible to provide a comprehensive approach to the only way construction documents may be prepared or to limit construction processes to only those provided herein. However, it is the intent that this Design Guide provides some examples and tips of methods and approaches that have been used numerous times for projects that have been successful for all parties involved in the planning, design, and construction of hospital construction projects. Following the guidelines and tips will increase the likelihood of a successful project for all parties involved.

Many design firms have documentation standards that are the mainstay of their practice, developed over many years of successful projects and improved upon as codes and technology have evolved. The guidelines and tips offered in this Design Guide are not meant to suggest a better way of performing documentation/project drawings for construction. Instead, they are intended to offer suggestions, recommendations, and tips that may be used in conjunction with and/or incorporated into the firm's already established document standards to increase the efficiency of the plan review and permitting processes as these relate to working with OSHPD.

Renovation projects under $500,000 in construction cost comprise most project plans reviewed by OSHPD. Construction documents prepared for projects below this cost are sometimes prepared by architects and engineers who may have limited experience in healthcare design and in working with OSHPD. This Design Guide is intended to be a useful tool and resource for these firms to ensure that their projects are successful, regardless of the project size or complexity.

The legislature realized the importance of safe hospital buildings that are capable of not only serving patients in need of medical care, but to also provide for their safety during and after an emergency, whether human caused or a natural disaster. This is because many patients in hospital buildings are incapable of self-preservation. Therefore, hospital buildings in California must be built to a higher standard than other commercial buildings. To ensure that this happens the Hospital Facilities Seismic Safety Act (HSSA) requires continuous inspection during construction activities. This is mainly provided by Inspectors of Record (IORs). IORs are key to quality control in hospital construction. This Design Guide provides tools and tips to assist the IOR in carrying out their critical duties and to assist them in developing good working relationships with OSHPD's Field Staff.

Contractors have the important duty and responsibility of constructing quality hospital projects in strict accordance with the approved construction documents and applicable building codes in Title 24. Knowledge of OSHPD regulations, processes, and policies can ensure that the Contractor can accomplish this in the most efficient and cost-effective manner. This Design Guide provides information and tips for Contractors that will ensure that their involvement in every OSHPD project is successful.

Hospital construction would not occur without the vision and desire of the Owner/Healthcare Provider to provide state-of-the-art healthcare in a safe built environment that meets the needs of the staff who use the resources of the built environment to provide the often-critical healthcare needs of patients, the patients who receive their care in the facility, and the public who visit their facilities. This Design Guide provides information and tips for Owners to assist them in planning, preparing, and executing every construction project, regardless of size, complexity, or cost, to a successful conclusion that meets its intended purpose and goals.

Because this Design Guide is intended for a diverse group of stakeholders involved in the design and construction of hospital projects, some information found in one section and/or subsection may also be found in another section and/or subsection or information may be referred to in a different section when applicable. In this way each entity is furnished information deemed important for their role in the project or process in the applicable section or subsection.

Resources, such as Code Application Notices (CANs), Policy Intent Notices (PINs) Forms, Applications, Reminder/Check Lists, and Frequently Asked Questions are referenced throughout the document. Where deemed beneficial, hyperlinks are provided, shown in blue underlined text, so the user can go directly to the referenced resource while reviewing a topic that it is specifically related to.

OSHPD also produces companion documents, such as How-To-Guides for various maintenance and repair projects as well as the Field Review, Excluded from Plan Review, and Expedited Review (FREER) Manual. Additionally, OSHPD also offers several preapproval programs:

- OSHPD Preapproval of Manufacturers Certification (OPM) – PIN 62
- OSHPD Special Seismic Certification Preapproval (OSP) – PIN 55
- OSHPD Preapproved Details (OPD) - Are standard architectural and engineering details developed by OSHPD for use in California health facilities construction, at the discretion of Registered Design Professionals (RDP) – PIN 51

It is intended that significant changes made to this Design Guide will be reissued as a change to the document version and effective date, along with a summary of the changes incorporated in the revised version. Minor editorial or information that adds clarity to the Design Guide may not be identified.

SECTION 1
INTRODUCTION TO THE
OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT

1.0 Introduction

The Sylmar earthquake of 1971 caused the collapse of several hospital buildings, endangering the lives of patients in those hospitals at the time and rendering the hospitals incapable of providing emergency care to people injured in the earthquake. As a result, the California state legislature passed the Alfred E. Alquist Hospital Facilities Seismic Safety Act (hereinafter referred to as HSSA) and, since 1973, all hospital construction has been governed by the provisions of that legislation. The state preempted local building departments to ensure statewide uniformity in health facility construction standards. The standards are intended to ensure that vulnerable patients are safe in an earthquake and that the facilities remain functional after such a disaster, thereby being capable of providing care for injured persons in the community.

Why are higher standards required for performance of hospital buildings in California?

- Commercial buildings may not be repairable or functional following a catastrophe (fire, earthquake, etc.).
- Hospitals must function following an incident.

Health Philosophy:

- Ventilation systems must provide comfortable healing environment.
- Does not facilitate the spread of contagious diseases.
- Does not adversely affect immune suppressed patients.

Earthquake Philosophy:

- Hospitals must be reasonably capable of providing services to the public.
- Limited damage.
- Critical equipment and systems remain operational.
- Requires hospitals to be built 1-1/2 times stronger than most other buildings.

Fire Philosophy:

- Patients may be too ill to evacuate.
- “Defend in Place” by moving patients to adjacent “compartments”.

Sustained Operations Philosophy:

- Adequate Sanitation
- Adequate Lighting
- Emergency Power Systems
- Medical Gas Systems

Achieving this High Performance in Hospital Construction requires:

- Comprehensive building codes that are more complex.
- Thorough plan review requires more time than for other types of buildings.
- OSHPD has California licensed Architects, Structural Engineers, Mechanical Engineers, Electrical Engineers, and Fire Life Safety Officers who review hospital construction drawings.
- Continuous construction inspection and quality assurance which is more demanding on contractors and inspectors.

Pursuant to the HSSA, the Department of Health Care Access and Information (HCAI), formerly known as the Office of Statewide Health Planning and Development, is responsible for overseeing all aspects of the design and construction of general acute care hospital, psychiatric hospital, skilled nursing facility, and intermediate care facility construction in California. In 2021, the former Office of Statewide Health Planning and Development was legislatively changed to become the Department of Health Care Access and Information (HCAI). Under its previous organization the Office of Statewide Hospital Planning and Development (OSHPD) was known as the Facilities Development Division (FDD). Going forward, and as used in this Design Guide, OSHPD will refer to an Office of HCAI in a similar fashion as FDD had previously been a division of the former Office of Statewide Health Planning and Development.

HCAI advances health care access through more affordable services and safe hospitals staffed with a workforce that represents California. The healthcare data that HCAI compiles and disseminates empowers leaders to make informed policy decisions, HCAI's healthcare building teams ensure Californians can access care within resilient facilities, and HCAI's affordability programs aim to improve access to affordable health care by providing generic drugs at low prices and setting spending growth targets to help slow the rising costs of health care.

OSHPD is California's foremost authority in safeguarding public health by establishing and enforcing the building standards for hospitals and skilled nursing facilities. OSHPD's staff are the ambassadors who ensure that health facilities are resilient to the impacts of natural perils and can provide health services to all Californians.

OSHPD's responsibilities include establishing building standards that govern construction of the facilities under its jurisdiction; reviewing the plans and specifications for new construction, alteration, renovation, equipment replacement, or additions to health facilities; and observing construction in progress to ensure compliance with the

approved plans and specifications. In addition, OSHPD is responsible for establishing the building standards for freestanding licensed clinics, but plan review and construction observation functions are the responsibility of local building departments. For two types of clinics, dialysis and surgical clinics, local building departments may defer these functions to OSHPD, or the facility owner may request that OSHPD provide plan review and construction oversight services for them.

1.1 Authority of OSHPD

OSHPD oversees certain aspects of the integrity and safety of the built environment for:

- New building construction.
- Aspects of existing facility remodels, additions and/or modifications that affect architectural, electrical, mechanical, and structural systems and work that affects fire and life safety conditions, including replacement of equipment.
- Compliance with the conditions and deadlines established by the HSSA.

The basis for OSHPD's authority is established by statute, or law, in the HSSA. The regulations enforced by OSHPD are contained in the California Building Standards Code, Title 24, California Code of Regulations, hereinafter referred to as Title 24 whenever specific Parts, Articles, Sections, etc., are not being referred to. See CAN 1-0 – Enforceable Codes to determine the version of the code applicable to your project.

- Part 1 of Title 24 is the California Administrative Code (hereinafter referred to as CAC) defines the administrative procedures necessary for the design, construction, and inspection of facilities development, along with those for the seismic retrofit requirements of the HSSA.
- Part 2 of Title 24 is the California Building Code (hereinafter referred to as CBC), establishes all the technical requirements related primarily to Site, Architectural, Fire and Life Safety, Construction Materials and Methods, and Structural aspects of the built environment.
- Part 3 of Title 24 is the California Electrical Code (hereinafter referred to as CEC), establishes all the technical requirements related primarily to the electrical fixtures, equipment, and systems of the built environment.
- Part 4 of Title 24 is the California Mechanical Code (hereinafter referred to as CMC), establishes all the technical requirements related primarily to the HVAC and other mechanical, fixtures, equipment, and systems of the built environment.
- Part 5 of Title 24 is the California Plumbing Code (hereinafter referred to as CPC), establishes all the technical requirements related primarily to the plumbing fixtures, equipment, and systems of the built environment.
- Part 6 of Title 24 is the California Energy Code (hereinafter referred to as CESC - California Energy Standards Code), establishes the energy efficiency standards for occupied buildings to reduce overall energy use.

- Part 9 of Title 24 is the California Fire Code (hereinafter referred to as CFC), establishes all the technical requirements and standards for fire prevention, fire protection, and life safety aspects of the built environment.
- Part 10 of Title 24 is the California Existing Building Code (hereinafter referred to as CEBC), establishes the requirements for the alteration, addition, replacement, reuse, and repair of existing buildings.

The California Building Standards Commission is responsible for administering the code development process, adopting, and publishing Title 24. OSHPD is one of several state agencies that proposes amendments to Title 24.

The scope of authority for OSHPD extends to many types of healthcare buildings. It does not normally include medical office buildings or other non-hospital buildings on a campus unless they are essential for the functioning of the hospital. Other elements of the medical campus such as the right to site an acute care facility, grounds and landscaping, parking lot construction, and the general aesthetics of the site remain in the domain of the local government. Site development may also come under the requirements of the California Environmental Quality Act (CEQA). Local health departments govern issues related to operation of food preparation areas in healthcare buildings. Hospitals must recognize and account for local jurisdiction entitlements, design review, and site engineering approvals, which are completed outside of OSHPD jurisdiction but are required to be completed prior to issuance of an OSHPD permit, construction final, and/or occupancy, as applicable.

Unless notified in writing by a local jurisdiction of requirements which are more stringent than Title 24, OSHPD does not enforce regulations that are not adopted by the State of California. Hospital owners must ensure that the hospital's design team is responsible for compliance with the Americans with Disabilities Act (ADA) or Medicare Conditions of Participation (CMS) requirements when appropriate.

1.2 OSHPD Organization

OSHPD personnel are divided into three major sections: Office Support Section, Building Safety Section, and Structural Services Section, with multiple work Units within each Section.

A. Office Support Section

The Office Support Section (OSS) manages all major administrative and support functions for all OSHPD's other Sections and Units. The OSS is comprised of two subsections, the Administrative Services and Hospital Building Safety Board (AS/HBSB), and the Fiscal Services and eSP Support (FS/eSP). Each subsection is supervised by a Staff Services Manager II (SSM II). The AS/HBSB subsection consists of two units, the Business and Administrative Support Unit and the Records Management and Reporting Unit that are each supervised by a Staff Services Manager I (SSM I). In addition, the AS/HBSB subsection contains the Hospital Building Safety Board Support Unit that reports directly to the SSM II. The FS/eSP subsection consists

of two units, the Project and eSP Support Unit and the Los Angeles Program Support Unit that are each supervised by a SSM I. In addition, the FS/eSP subsection contains the Fiscal Services Support Unit that reports directly to the SSM II. The OSS is directed and managed by a Career Executive Assignment appointee (CEA).

B. Building Safety Section

The Building Safety Section manages technical considerations relative to the regulations, design, inspection, construction of new buildings, and/or modifications to existing buildings. Within the Building and Safety Section there are six regions, based on geographical assignments, and four specialized units. Each geographic region has both an Architectural and Engineering Unit and a Field Compliance Unit to provide plan review and field observation services.

1) **Architectural and Engineering Unit**
   The Architectural and Engineering Unit is responsible for ensuring that all plans for work within a hospital building are properly prepared by California licensed design professionals and that the plans conform to the requirements of Title 24. Each regional Architectural and Engineering Unit is managed by a Supervisor, HFR (Health Facilities Review) who oversees the work of a staff of plan reviewers comprised of licensed Architects and Electrical, Mechanical, and Structural Engineers, as well as Fire Life Safety Officers.

2) **Field Compliance Unit**
   The Field Compliance Unit oversees the construction inspections of facilities within the geographic boundary of their respective region. This oversight enhances the construction quality of hospital facilities and fosters better lines of communication between OSHPD, and the various architects, geologists, engineers, inspectors, and contractors involved in hospital construction. A Regional Compliance Officer, Health Facilities Construction (HFC) supervises a staff comprised of Compliance Officers, District Structural Engineers, and Fire Life Safety Officers.

3) **Building Standards Unit**
   The Building Standards Unit is responsible for the ongoing development of modifications to Title 24 that improve the safety and quality of the design, inspection, and construction processes in California and that keep pace with evolving healthcare and building design and construction technology. The group develops tools used for interpreting code called Code Application Notices (CANs) and for implementing OSHPD policies through Policy Intent Notices (PINs) that are used by designers, contractors, inspectors of record, hospital personnel, and others in the hospital construction industry to better understand the affected regulations. A Supervisor, HFR oversees this unit.

4) **Fire Prevention Unit**
The Fire Prevention Unit is responsible for the ongoing development, enforcement, and application of code provisions that improve conditions for fire prevention, fire protection, and life safety in both new and existing healthcare facilities. The Fire Prevention Unit also has a Fire Life Safety Academy for the recruitment and training of Fire Life Safety Officers. The Chief Fire Life Safety Officer supervises the staff of this unit.

5) **Inspection Services Unit**
The Inspection Services Unit is charged with the review of all matters relative to the quality assurance and quality control of building projects. Standards of care and practices by project inspection personnel and Approved Agencies are established and monitored by the unit. Practices associated with the onsite management of the Test, Inspection, and Observation (TIO) Programs are evaluated and modified as needed to improve the statewide application of hospital building construction. This unit also exams and certifies hospital construction inspectors and provides training for those seeking to be certified as well as those seeking to renew their certification. This unit is supervised by a Regional Compliance Officer, Health Facilities Construction (HFC).

C. Structural Services Section

The Structural Services Section is charged with distinct responsibilities associated with structural and seismic considerations of buildings and building system components. It is comprised of the Seismic Compliance Unit and the Structural Support Unit. A Principal Structural Engineer manages this Section.

1) **Seismic Compliance Unit**
The Seismic Compliance Unit is responsible for the management of ongoing compliance plans and progress associated with the Hospital Seismic Retrofit Program. This unit is supervised by a Supervisor, HFR.

2) **Structural Support Unit**
The Structural Support Unit is responsible for the Structural Regulations, Quality Assurance, Plan Review Contract management, review of Geotechnical/Geohazards Reports and the Preapproval programs for equipment special seismic certification, equipment anchorage and restraint, and standard details. This unit is supervised by a Supervisor, HFR.

1.3 Hospital Building Safety Board

The Hospital Building Safety Board (HBSB) is appointed by the Director of HCAI. The HBSB advises the Director on the implementation of the HSSA and acts as a board of appeals in all matters of the administration and enforcement of building standards relating to the design, construction, alteration, and seismic safety of hospital building projects submitted to the OSHPD in accordance with CAC, Chapter 7, Article 5 (see PIN 47 – Expedited Appeals). Appeals related to construction cost disputes, as they relate

to fees, and appeals related to Inspector of Record performance are heard by a Hearing Officer in accordance with CAC, Chapter 7, Article 5.5.

OSHPD's policy is to use the services of the Board for review of its proposed code and process changes. OSHPD is fortunate to have such a group of Industry experts to assist it in assuring that the codes and processes it adopts are practical, doable, adds improvement or value, and are cost effective. All stakeholders involved in the planning, design, and construction of hospitals and the public are invited and encouraged to participate in the Board meetings. The Board meetings are usually held in both in-person, in either of its two office locations, or virtual through Microsoft Teams. Meeting dates and times may be found at https://hcai.ca.gov/public-meetings/?committee=hbsb&subcommittee=&filter-by=upcoming.

Tip: *The OSHPD also has an informal appeals process known as Comment and Process Review (CPR – refer to CAC 7-161) which may be used to promptly resolve issues concerning plan review and construction observation comments or processes in an informal manner.* (*See the CPR Public User Guide at https://hcai.ca.gov/wp-content/uploads/2020/10/Section-12-Appeals-Using-Comment-and-Process-Review-1.pdf*)

1.4 Enforcement

OSHPD is responsible for determining whether a hospital complies with the requirements of Title 24. Operating compliant facilities is a basic requirement of Title 22 of the California Code of Regulations. Facility compliance is also a consideration for Centers for Medicare and Medicaid (CMS) certification and for accreditation by The Joint Commission.

If a hospital is found in violation of Title 24, OSHPD may take either formal or informal action. Informal action takes the form of instructions to correct the noncompliant condition. Formal actions are more severe and can have significant impacts on a hospital construction project. Refer to CAC 7-128 regarding unauthorized work.

Examples include:

- A Notice to Stop Work (refer to HSSA Section 129980).
- A Noncompliance Letter for work performed without a permit (commonly referred to as "bootlegged" work or unauthorized construction).

Even if the California Department of Public Health (CDPH) Licensing & Certification Program chooses not to act because of a noncompliance condition cited by OSHPD, there remains heightened risk to the hospital from action by the CMS that could materially affect the hospital's Medicare payment or The Joint Commission Accreditation. In addition, civil and other legal risks may incur in accordance with the provisions of the HSSA and other laws (refer to HSSA Section 129998). Noncompliance matters should be taken very seriously.

1.5 OSHPD Plan Review and Permitting Processes

OSHPD has several processes available for plan review, approval, and permitting. The type, size, and complexity of projects will often be the guiding factors used to determine which process is most suitable. The processes include, but may not be limited to: Preliminary Review, Standard Review, Managed Project Review, Incremental Review, Integrated Review, Expedited Review, Critical Path Expedited Review, Over-the-Counter Review, Field Review, and SB 1838 Exempt.

The design, construction, and quality assurance oversight process include the following: construction drawings and specifications are submitted to the OSHPD and reviewed for code compliance by its architects; structural, electrical, and mechanical engineers; and fire life safety personnel assigned to the specific regional group defined by the geographical location of the project. Upon approval of the project plans, specifications and Test, Inspection, and Observation (TIO) Plan, a building permit may be issued, after which construction may begin.

The facility owner hires one or more OSHPD certified Inspectors of Record (IOR), who work under the direction of the design professional of record (DPOR) throughout the construction phase and reports to OSHPD field personnel and the owners on the progress of the construction. The IOR notifies the DPOR of discrepancies between approved design documents and constructed conditions and requests direction by the registered design professional for proper resolution. Resolution that results in a material change to the project requires a submittal of amended construction documents by the DPOR. Otherwise, for changes that do not materially alter the scope of work the OSHPD field personnel confirm the acceptability of the resolution by review of a field log maintained by the IOR.

OSHPD field personnel make periodic visits to the construction site to ensure that the seismic, fire life safety, and other requirements of the building code are being met. Once construction is completed and required close-out documentation is submitted to OSHPD, and a certificate of occupancy or a construction final is issued by OSHPD, the project can be “Closed in Compliance”.

OSHPD serves as the building department for all aspects of health care facility construction. All architectural, geotechnical, structural, mechanical, electrical, and fire life safety considerations for inpatient healthcare facility physical plants are handled by OSHPD. The California Department of Public Health, Licensing and Certification Division, ensures that the organization and operation of health facilities meet specified standards, such as staffing ratios and qualifications, quality of care protocols, and emergency action plans.

The OSHPD team also provides an important function in the aftermath of an earthquake or other disaster, by being deployed to assess the extent of damage to health facilities in the affected communities. Based on these assessments, the facilities are cleared to continue providing care without interruption or, if the damage is severe enough, the facility, or a portion of the facility, may have restricted use or be closed. The results of these assessments are communicated to state and local emergency response

personnel so that they can route patients to safe facilities. OSHPD staff also review and approve on-site construction required for mitigation of earthquake or other damage caused by man-made or natural disasters to the facility.

1.6 OSHPD Electronic Services Portal Client Access

The Electronic Services Portal Client Access (eCA) is a comprehensive information management system based on the Accela Automation software system. eCA implements workflow controls which guide the user through the OSHPD business process, limiting the choices of the user to those that are compatible with the OSHPD policies.

The eCA is an online system that allows the facility representatives and licensed professionals to submit various applications for projects directly to OSHPD at any time and from any location. eCA enables public users to register for an online account, manage their accounts, create applications for projects and other records, submit project applications directly to OSHPD, pay application fees, and track the application status. eCA is accessible to all public users via the internet at https://esp.oshpd.ca.gov/. To perform the core functions, users must register for and obtain a public user account. Once a project application is submitted to OSHPD via eCA, the information is immediately available to OSHPD and can be viewed by the public users.

Tip: *Detailed information on the electronic submission process can be found in the following webpage: hcai.ca.gov/construction-finance/eservices-portal-information/*

(This page is intentionally blank.)

SECTION 2
GEOLOGIC HAZARDS INVESTIGATION GUIDELINES

2.0 Introduction

Identification of seismic and geologic hazards present on the site of a proposed hospital construction project occurs before the design of a building is begun. Seismic and geologic hazards affecting building construction and performance may include (but not be limited to) the following:

- Potential Earthquake Shaking
- Surface Fault Rupture
- Liquefaction
- Earthquake-Induced Landslides
- Slope Instability
- Weak and/or Sensitive Soils
- Shallow Groundwater
- Flooding
- Tsunami
- Volcanic Eruptions
- Hazardous Minerals

It is important to note these hazards may occur in combination.

2.1 Overview of the Process

Among the documents included in hospital construction permit applications is a geologic hazards report as required by CAC 7-117. CBC Chapters 16 and 16A (Structural Design) and 18 and 18A (Soils and Foundations) address the required elements of seismic and geologic hazards reports to be prepared and signed by the registered engineering geologist of record (GOR) and registered geotechnical engineer of record (GEOR).

Applications for new projects are submitted on a form provided by the OSHPD (https://hcai.ca.gov/wp-content/uploads/2023/07/2022-Project-Information-for-Geotechnical-Reports_CBC-2022-1.pdf) along with the required report component. OSHPD forwards the seismic and geologic hazards report component to the California Geological Survey (CGS) for review and comment when appropriate. CGS geologists and seismologists provide technical information and advice to OSHPD regarding geologic hazards with the potential to adversely affect hospitals. Using CGS Note 48, Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings, CGS staff prepare memoranda documenting their geologic reviews of hazard reports prepared by the

hospital's consultants. Of primary concern is compliance with the current building code. These review memoranda are submitted to OSHPD for incorporation into their project decision-making process.

Tip: *Retain experienced geotechnical and engineering geological consultant firms with duly registered California Geotechnical Engineers and Certified Engineering Geologists with hospital construction experience to perform the geologic hazard investigation.*

Tip: *The geotechnical and engineering geological consultants should be aware of any updates of CGS Note 48 issued by the California Geological Survey, which is used by CGS to review the geology, seismology, and geologic hazards evaluated in reports that are prepared under the CBC.*

A. Site Investigation

A site investigation is required to document the geologic conditions at the site. Projects involving new building construction, structural retrofit work, etc. often can't be approved without adequate and/or appropriate geologic data. Prior to collecting data, the GOR will conduct reconnaissance, such as review of historical air photos, geologic maps and data collected during previous work at the site, to understand what potential geologic issues may exist at the site and plan an appropriate exploration strategy.

Sites within Alquist-Priolo Earthquake Fault Zones (or local equivalents) should perform fault investigations well in advance of building design.

Exploration methods will vary depending upon the local geologic conditions and hazards being investigated, but at a minimum, will include drilling of subsurface borings. Chapter 18A of the CBC requires one boring per 5,000 square-feet of building (plan area) and a minimum of two borings per building to appropriate depths. Soil samples are collected from various soil layers encountered in the boring for laboratory testing to determine soil properties. Data and reports from previous geologic investigations at the site may be used to supplement site investigations of future projects so long as the data are in proximity and are relevant to the project to be constructed.

B. Unusual Projects

Sites within Alquist-Priolo Earthquake Fault Zones (or local equivalents) should perform fault investigations well in advance of building design. CGS should have the opportunity to review fault trenches in the field. Sites within regulatory earthquake hazard zones (or local equivalents), in addition to standard subsurface borings, and or cone penetration test soundings, may also require supplemental data collected using methods such as down-hole logging and assessment of seismic wave velocity.

C. Hazard Mitigation

Once the site investigation is completed and all geologic hazards are identified and characterized, as necessary and appropriate, the GEOR and GOR will provide mitigation recommendations. Geologic hazard mitigation typically includes removal of weak soils, ground improvement, foundation recommendations, or combinations thereof. Avoidance is the only acceptable mitigation for fault rupture hazard. Where active faults are known to cross a project site, a 50-foot minimum setback is required.

2.2 Geologic Hazards Report

After completion of site investigation activities and laboratory testing, the GOR and GEOR will compile a report documenting all site investigation activities and the results of laboratory testing, a summary of all important findings, and appropriate recommendations. A complete report may include (but not be limited to) the following:

- A summary of important findings.
- A site plan showing the location of site investigation activities with respect to the footprint of each building.
- Regional and site-specific geologic maps.
- Highest historical groundwater information.
- Subsurface exploration logs for earth materials encountered.
- Ground motion analysis.
- Copies of all laboratory test results.
- Copies of all calculations (including all input parameters).
- Mitigation recommendations.

2.3 Approval of Seismic and Geologic Hazards Reports

Upon receipt of reports transmitted from OSHPD, CGS reviewers will assess the document(s) for completeness with respect to CGS Note 48. After reviewing the documents, CGS will submit a letter to OSHPD either noting the geologic and seismic hazards are adequately addressed or summarizing inadequacies and requesting additional information. When additional information is requested, CGS will review the supplemental data and analysis and submit a letter to OSHPD stating whether all the geologic and seismic hazards are adequately addressed. In some cases, site ground improvement mitigation methods will result in a conditional approval of the project. Full approval of the project is granted after the GOR and GEOR complete the recommended ground improvement activities and provide a revised hazard report documenting the improved site conditions. For seismic upgrades or additions to existing structures, certain projects are exempt from geologic hazard review by the CBC. Upgrades and additions subject to geologic hazards review by CGS will be subject to all the requirements outlined in CGS Note 48.

Tip: *The Geologic Hazards Report should be submitted as early in the process as possible so that it does not become the critical path for project plan approval. Allow adequate time for CGS review and response to comments if needed.*

Tip: *If there are changes during the design that may affect the findings and/or the recommendations of the Geologic Hazards report, supplemental or addenda reports should be prepared and submitted to OSHPD as soon as possible to avoid project delays.*

SECTION 3
PLAN DESIGN AND REVIEW GUIDELINES

3.0 Introduction

Hospitals by their nature are large, complex buildings and hence so are the construction projects to build or renovate them. Before any construction can commence, the OSHPD must review and approve the various construction documents. Submitting consistently formatted construction documents, applying quality review checklists, and following practices that are proven to be effective, such as those outlined in this Design Guide, and other guidance published by national healthcare related organizations, such as Federal Guidelines Institute (FGI), Association for Professionals in Infection Control and Epidemiology, Inc., (APIC) Association for Operating Room Nurses (AORN), etc. all have the potential to improve and accelerate plan review and construction activities. Clearly prepared construction documents will also facilitate the contractor's ability to efficiently construct projects. The design team should meet with OSHPD staff as needed during predesign and design phases to review and confirm design issues.

These guidelines represent minimum guidelines for recommended practices; licensed design professionals and hospital representatives may want to go above and beyond the guidelines presented here.

Although OSHPD does not mandate the organization and style of construction documents, the guidelines outlined in this section should provide a consistent approach for preparation of construction documents that will facilitate the plan check review process. These guidelines represent minimum standards for recommended practices; licensed design professionals and hospital representatives may want to go above and beyond the guidelines presented here.

Keep in mind that the "Guidelines and Tips" outlined in this section are only general guidelines meant to serve as a reference tool. They are to be used in conjunction with the contract documents and do not, in any way, supersede or alter specific requirements of the project contract, drawings, specifications, and enforceable codes. In addition to other resources on the HCAI website, answers for many frequently asked questions (FAQs)that are administrative and/or discipline specific may be found at https://hcai.ca.gov/construction-finance/resources/#FAQs.

3.1 Role of the Registered Design Professional

The CAC states that "all construction documents or reports "shall be prepared under an architect or engineer in responsible charge." The California Architects' Practice Act requires architectural services to be provided under the "responsible control" of the licensed Architect exercising due "standard of care". However, for the preparation of documents for complex buildings like hospitals, the CAC requires a higher level of responsibility for the Design Professional in Responsible Charge (DPOR) over the

content and design in the construction documents. Refer to CAC 7-115 for requirements.

For large hospital projects, much of the actual work may in fact be delegated to other design professionals. Regardless of how the work is proportioned out, administration of the work remains the responsibility of the Registered Design Professional in Responsible Charge for the project. Although there may be some specific projects that are exclusive of architectural or structural work, which may be completed by other California registered engineers, it is important that the Architect understands when this applies under OSHPD regulations.

OSHPD submittals, including all drawings, specifications and other design and administration documents are required to be signed by the Registered Design Professional in Responsible Charge.

Except as provided for in CAC 7-115, OSHPD submittals, including all drawings, specifications, and other construction documents are required to be stamped and signed by a California Registered Design Professional. The CAC states that "all construction documents shall be signed and stamped prior to issuance of a building permit."

Tip: *Although all design professionals are required to stamp and sign the final construction documents prepared under their direction, the Registered Design Professional in Responsible Charge is required to sign all formal submittals to OSHPD to demonstrate she/he has exercised responsible charge as required.*

Tip: *The design team should meet with the appropriate OSHPD staff as needed during the predesign and design phases to reduce rework. See CAN 2-102.6 – Remodel for remodel projects.*

A. Working with the Authority Having Jurisdiction

The DPOR is responsible for ensuring that the project conforms to the local jurisdiction requirements, as well as those enforced by OSHPD. Many jurisdictions have requirements that are in addition to the requirements of Title 24, such as General Plans, Zoning and Planning Standards, etc., and in most of these cases the requirements have additional conditions and standards than covered by Title 24 and thus will significantly impact the design of the project. It is the DPOR's responsibility to be knowledgeable of the unique requirements of the local jurisdiction, to obtain approvals from the local jurisdiction regarding their requirements, and to incorporate and coordinate those requirements into the design of the project. OSHPD will not coordinate the requirements of the local jurisdiction for the project.

Much of the site work generally falls under the purview of the local jurisdiction, however, OSHPD will exercise its jurisdiction over building related site work, utilities, and systems which have a direct impact on code compliance for the hospital building, such as the site fire water line, as well as other jointly reviewed features. Other site accessibility requirements will be under the purview of the local jurisdiction. See CAN 2-0 – OSHPD Jurisdiction.

In addition to the local jurisdiction and OSHPD, other agencies approve or permit a hospital project. OSHPD is the building department for buildings under its jurisdiction and thus the permitting agency for the building. The California Department of Public Health (CDPH) licenses health care facilities and enforces Title 22 and other regulations that are in addition to OSHPD's. In addition, cafeterias require the local health department's approval; the use of a grease interceptor will require the review of the local water pollution agency; a storm water prevention plan might need to be filed; and an emergency generator or boiler might trigger an air quality review. This list is not comprehensive. The DPOR and/or the Owner ultimately takes full responsibility for working with the appropriate agencies. To avoid delays, the DPOR must ensure that all appropriate approvals are obtained prior to issuance of a building permit, a construction final, and/or occupancy, as applicable, being issued by OSHPD. Some of these entities are listed below:

- Local Jurisdiction Public Works Standard for Public Streets, Sidewalks and Curbs, Site Grading and Drainage, etc.
- Local Jurisdiction or Regional District for Sewer and Water Connections.
- Local Jurisdiction Fire Department or Fire District Requirements for Fire Hydrant and Connection Locations – See PIN 5 – Review of Underground Fire Main Submittals.
- Local Jurisdiction Planning Landscaping Requirements for Public Rights-of-Way and on-site landscaping and irrigation requirements.
- County Health Department for Food Service Facilities Operations – See PIN 40 – Dietary and Food Services within Health Facilities.
- County Health Department for Radiation Protection Requirements.
- California Air Quality Management Districts for Construction and Emergency Generator and Boiler Operations.
- Local Jurisdiction for parking, site accessibility, and other site improvements.
- Local school district for school fees – See PIN 48 – School District Fee Compliance.

Tip: *Although not reviewed by OSHPD, healthcare accrediting agencies requires completion of an infection control risk assessment (ICRA) for determining potential risks to the environment during construction in existing facilities where patient care is affected. The ICRA should occur during the design phase and prior to start of construction. The requirements of the ICRA should be incorporated into the construction documents for the benefit of the contractor.*

B. The California Environmental Quality Act

The local jurisdiction is typically the lead agency in the California Environmental Quality Act (CEQA) process. The DPOR and/or Owner is responsible for ensuring that the project conforms to the requirements of CEQA. Minor renovations normally do not trigger CEQA compliance, but an addition, major remodel, or a major change in function or use may. New buildings will require CEQA compliance, even if it is declared not to have an impact to the environment (a Negative Declaration). Specific requirements and regulations for CEQA can be found at http://opr.ca.gov/ceres/. For more information refer to Subsection 7.4.B. of this Design Guide.

Tip: *To avoid delays the DPOR must ensure that all appropriate approvals are obtained prior to issuance of a building permit, construction final, and/or occupancy being issued by OSHPD, as applicable.*

3.2 General Guidelines for the Project Drawings

A. Quality in Documentation

The "customers" for the architectural documents are many and varied clients, engineers and consultants, contractors, and vendors, as well as building officials. Although some are knowledgeable on how to read and use construction documents, there are still those who will be unfamiliar with specific graphic conventions, or common ways that are unique to an individual practice. The best method is to be sure the documents are as user friendly as possible.

Upon receipt, each submittal is logged in and reviewed by OSHPD Architects, Electrical, Mechanical, and Structural Engineers, and Fire and Life Safety Officers, to determine if the submittal is complete.

For every project, the goal is to prepare a set of coordinated documents that appears to have been prepared by a single entity. It is important that all disciplines (and their consultants) adhere to the same set of basic graphic standards that guide the preparation of the architectural documents. To assist in communication and coordination across the design and construction industry, organizations like the AIA, CSI, and National Institute of Building Sciences work jointly to create national standards for consistent documentation and data organization (see http://www.nationalcadstandard.org for more information).

Another approach to creating better, more complete documents includes the development and use of checklists. These can be created specifically for a project, or developed for project types, to help ensure consistency and completeness from project to project. OSHPD offers its own standard comments and reminder lists, developed by plan reviewers, for the design professionals to utilize when developing their documents, or as a quality-control review prior to submitting documents for review.

Tip: *Use the reminder lists and other resources on HCAI's website to assure project code compliance and thus reduce overall time to project approval.*

Tip: *Use the same basic graphic standards for all disciplines to ensure the documents are coordinated.*

After the documents for a project are deemed complete and coordinated by the DPOR, they are submitted to OSHPD along with an Application for New Project (https://hcai.ca.gov/wp-content/uploads/2023/05/HCAI-FD-121-Application-for-New-Project-REVISED.pdf). The office plan review process starts with triage, or a condition assessment of the submittal. Upon receipt, each submittal is logged in and reviewed by OSHPD Architects, Electrical, Mechanical, and Structural Engineers, and Fire Life Safety Officers, to determine if the submittal is complete and ready for review. If deemed a complete submittal, OSHPD will process the documents for most projects in one of three ways:

- Construction projects requiring detailed reviews are "Taken In" and scheduled for review by each discipline, as needed, with a specific target date set for return.
- Small projects with limited scope and dollar cost that can be reviewed within one to two hours by all disciplines may be reviewed as "Expedited". All disciplines requiring review must determine that the project complies with the criteria for Expedited review.
- Very small work scope projects that can be quickly reviewed within an hour, and two hours for structural, may be processed as "Over the Counter" reviews. All disciplines requiring review of the documents must determine that the project complies with the criteria for the project to be scheduled for an Over-The-Counter review.

Very large projects may be submitted and processed using the following plan review processes:

- Incremental Submittal and Review allows increments of a building or structure, such as the foundation, structural framing, architectural work, etc. to be submitted and permitted prior to construction documents for the entire building or structure being submitted, approved, and permitted. Refer to CAC 7-131 for requirements. This method is often referred to as "fast tracking".
- Integrated Review (IR) is a delivery process that engages OSHPD and key stakeholders early in the project design, continues through the development and submission of documents during all design phases, and through construction with

milestones established for specific, agreed upon points through the duration of the process. See PIN 50 – Integrated Review and refer to CAC 7-121(c) and 7-130 for requirements. This method is often used in conjunction with "lean construction" project delivery.

A Preliminary Review process (refer to CAC 7-123) is also available in which specific portions of work may be submitted prior to a submittal for the entire project. This process may be beneficial for ensuring that the floor plan layouts for department boundaries and requirements, circulation (both horizontal and vertical), fire life safety requirements, etc., are developing in a code compliant manner. The review performed will be limited to the contents of the documents as submitted.

Tip: *The designer may contact the Regional Supervisor prior to submittal of an application to OSHPD to assist them in determining the process which best fits their project's needs.*

It is important to note that if the submittal is deemed incomplete, the project will be returned unreviewed.

OSHPD recommends that projects with special concerns, conditions, or complexity, the DPOR arranges for a pre-submittal meeting with the Office to consult about the project's work scope and the design approach. This meeting is mandatory for projects with a construction cost of twenty million dollars ($20,000,000) or more, and of great benefit to the design team, as well as the owner, when the project or the existing conditions are difficult to make compliant because of the design program and parameters or because known code issues exist. Resolution of these kinds of issues during conceptual or preliminary design phases can eliminate rework of the design later in the process to achieve code compliance.

Tip: *As stated above, a Pre-submittal Meeting is required by CAC 7-121 for projects with a construction cost of $20 M or greater. The design team is encouraged to take maximum advantage of the benefits that this meeting can provide, such as determining the most expeditious processes and to save time and money in redesigning by helping to identify site and technical code issues to develop options to move the project forward.*

Tip: *The use of CAN 2-102.6 – Remodel is encouraged for remodel projects in existing facilities. If the flow charts do not lead to resolutions of project concerns or if questions regarding project issues are not addressed, it is advisable to conduct a pre-design meeting with OSHPD in accordance with provisions provided in the CAN. Doing so will expedite the plan review and approval process.*

Tip: *OSHPD is open to the use of innovation in the design and construction of hospital projects. Stakeholders are encouraged to reach out to discuss how proposed innovative approaches may be used in a manner that facilitates compliance with all required building codes and standards, with or without alternate methods of compliance, as well as OSHPD's policies and procedures.*

B. Time Limitations

OSHPD's Electronic Client Access (eCA) program will generate an Anticipated Plan Approval Date (APAD) (https://hcai.ca.gov/construction-finance/building-and-construction-projects/plan-review-processes-goals/#APAD) for Standard Review projects based on historical data and time limitations imposed in CAC 7-129 within which the applicant must resubmit plans for back check to keep the project from becoming void. The historical data includes the anticipated number of back checks based on the type and construction cost of the project. However, if the applicant has reason to believe that the project may not be able to comply with the required resubmittal time goals, the applicant may request that the project be converted to a Managed Project. In this event the applicant and OSHPD's plan review team will negotiate a plan review schedule that is mutually beneficial. Also, failure of the applicant to meet the resubmittal time goals in the APAD or the number of back checks exceed those used in the APAD will result in the time to approval extending beyond the APAD. Failure to meet required time frames may also result in cancellation of the project due to inactivity. If this occurs the project must be submitted as a new project for it to be active again.

C. General Organization of the Project Drawings

Although every project may require different organization of drawings based on size and complexity, it is commonly found that construction documents have a similar organization, as follows: (Refer to Sections in this Design Guide for each discipline for more detailed organization of drawings, where applicable.)

- **Cover Sheet**
- **Project Title Sheet and General Information**
- **Architectural Drawings**
  - Plans for Fire and Life Safety Information
  - Plans for Accessibility Compliance
  - Site Plans
  - Architectural Floor Plans
  - Architectural Ceiling Plans
  - Building Elevations and Sections
  - Elevator and Stair Drawings
  - Interior Elevations
  - Door and Window Schedules and Details
  - Interior Finish Schedule
  - Interior Partition and Ceiling Details
  - Radiation Shielding Plans

- **Structural Drawings**
  - Structural Design Criteria (General Notes) Drawings
  - Structural Foundations Plan
  - Primary Structural Framing Floor Plans
  - Structural Frame Elevations
  - Typical Structural Details
  - Special Structural Details
  - Medical Equipment Plans and Anchorage Details
  - Special Seismic Certification Equipment Schedule
- **Mechanical Drawings**
  - Mechanical Duct Piping Layout Plans
  - Equipment Schedules
  - Riser and Control Diagrams
  - Mechanical Details
- **Plumbing Drawings**
  - Plumbing Fixture and Piping Layout Plans
  - Fixture and Equipment Schedules
  - Riser Diagrams for Supply, Vent and Waste Lines
  - Plumbing Details
- **Electrical Drawings**
  - Electrical Power Distribution and Fixture Layout Plans
  - Fixture and Equipment Schedules
  - One-Line Diagrams
  - Electrical Details
- **Other Disciplines as Required for the Project**

D. Recommended Graphics and Symbols

Although each set of drawings is a composite of drawings prepared by differing architectural and/or engineering disciplines, all drawings must maintain a level of graphic standards that are commonly used for the project and that conveys a level of coordination to the OSHPD reviewer. Common practice follows an approach that includes:

- All disciplines should use the same base plans, orientation, and scale as the architectural plans.

- Numbering of drawing sheets should establish a common organization regardless of discipline.
- Where large projects require a separation of drawings into volumes, the organization of the set should be carefully arranged to allow reviewers to locate information easily. Indexes showing contents of each volume should be provided at the front of each volume of drawings.
- Where common elements are shown by different disciplines, or on enlarged or "typical" plans, care must be taken to avoid conflicting information and redundancies that create confusion. The discipline having the greatest responsibility should provide the detailed information on their plans and other drawings should reference those plans.

Some information is needed to be reflected on all plan drawings to assist reviewers to verify compliance. This is particularly true for fire-rated partitions and other life-safety components that establish the compliance needs for mechanical and electrical work. It is highly recommended that all plans use common graphic, symbolic line work that identify the following:

- One-hour fire partitions for corridors.
- Rated walls for one, two, three, and four-hour occupancy separations.
- Smoke barrier walls for smoke compartments.
- Two-hour rated horizontal exit walls.
- One and two-hour enclosures for stairs and shafts.

Examples of recommended graphics for fire life-safety plans and base floor plans used by all disciplines are provided in Subsection 3.17 Plan Design and Review Guidelines.

E. General Nomenclature

When developing the floor plans in the early stages of design, it may be appropriate to use terminology that comes from the hospital's staff, so all spaces required by the program may be accounted for in the schematic layouts. However, as the plans develop into construction documents, it is equally important that the room names and space designations reflect, as closely as possible, the code definitions provided in Title 24. The importance of this relates to conveying on the drawings both what the room functions are relative to the code and asking those reviewing the drawings to locate and account for required functions being included in the hospital plan.

Tip: *Use of room and space nomenclature as defined/used in Title 24 will facilitate a more expeditious plan review.*

Definitions are in Chapter 2 for each of the CBC, CMC, CPC, CFC, CESC, and Chapter 1, Article 100 of the CEC.

Some examples of common room names that can create confusion about occupancies include:

- Rooms that function as storage but may be labeled “utility” or “supply”.
- Rooms labeled as “Procedure,” but do not define intended operations or functions.
- Patient rooms labeled as “Step-down,” or “Flexible,” that do not fit code-defined uses.

Terminology related to egress and components of the means of egress are also subject to misunderstandings when not carefully coordinated with terms used in Chapter 10 of the CBC for Means of Egress. For example:

- Use of the terms “corridor,” “hallway,” or “hall,” and “exit passageway”.
- Proper descriptions for “exit,” “exit passageway,” and “exit discharge”.

When providing information on fire-rated construction and components defined in Chapter 7 of the CBC for fire and smoke protection features, utilizing code-compliant language when describing the performance levels for walls and doors is key to understanding how the plans provide for life safety provisions of the code. For example:

- Correct applications for “fire partition”, “fire wall”, and “fire barrier”.
- Similarly, the proper use of “smoke partitions” and “smoke barriers”.

3.3 Project Title Sheet

A. Purpose

The title sheet to a set of construction documents not only provides a general introduction to the project but also includes statements and descriptions for project-specific requirements, the basis of design for construction, and compliance with enforceable and applicable codes relevant to the project. Much of the information on the title sheet is general information for the contractors and presents the project scope and description, maps for location of the building, identification of the responsible design professionals and client, and general statements about the overall use of the documents. For small projects, or where room allows, it may also include an index to the drawings, site plans, and other overall drawings that help to describe the project scope and its setting, whether for a new building or for renovation of an existing building.

For reviewers of the drawings, the title sheet is also the preferred location for descriptions of building occupancy classifications, sizes, construction type, number of stories, and other general features of the design - all of which convey the designers’ intent and provide a basis of review for compliance. For projects involving buildings or portions of buildings that are not under OSHPD jurisdiction, there should be a clear delineation of what portions of the project are being submitted for review. An example would be a utility project in which the building that houses the utility is subject to

OSHPD review but the building to be serviced by the utility is subject to local government entity review.

B. Organization and Approach

The primary goal of the title sheet is to provide information in the clearest and most readable manner. The use of charts and outlines, simple descriptive phrases, and titled sections for each subject makes it easy for those who are not familiar with the project documents to find information relevant to their needs. The actual organization may vary depending on the size and type of project, the amount of information needed, and the graphic approach used by the architect, including the size of the drawing sheet and any graphic requirements of the owner. Existing renovations and applicable phasing must be clearly documented through appropriate existing and phasing documents.

C. Title Block or Strip

Provide the proper name and address of the project, the facility, and the DPOR. Also provide OSHPD with the number or letter of each sheet, date of preparation and, if relevant, the date of revision, the scale, and the north point of reference. OSHPD strongly recommends that its project number, assigned at the time of application, be prominently noted on all sheets. The signed stamp of the DPOR and the signature of the architect or engineer in general responsible charge must be clearly shown. A space should also be reserved for the OSHPD approval stamp, provided at the time of signing. When a submittal package is part of an approved incremental construction package, the title sheet should identify the increment represented by the package and list all increments that make up the complete project.

1) **Project Team**
   Provide the proper names of all firms responsible for the drawings and other design documents; include mailing addresses, phone numbers, and fax numbers for contact. Other contact information as shown on the application for plan review, such as names of individuals, e-mail addresses, and project websites, may be useful as determined by the DPOR in responsible charge. This information should match that provided in the Application for New Project.

2) **Project Scope Summary/Information**
   Provide a general description of the work, such as new, renovation, or addition, as applicable for the project. Use the latest edition of CAN 2-102.6 – Remodel for projects that include additions, alterations, or repairs. Include in table form and/or drawing format the following:

   - The occupancy classification of the building or portions of the building, related to new work as well as existing buildings, in accordance with CBC Chapter 3, and any specific use or occupancies in accordance with CBC Chapters 4 and 12.
   - The date of construction of the original building (for addition and renovation projects) and building code under which the building was originally designed.

- Whether the building is fully or partially sprinklered or unsprinklered. If partially sprinklered, show boundaries or parts that are sprinklered.
- The type of fire alarm system within the building, such as full or partial smoke detection, etc.
- The area of the building and number of stories and/or new construction, by occupancy and construction types, with a description of allowable increases, in accordance with CBC Chapter 5.
- The construction type classifications in accordance with CBC Chapter 6 and Table 601.
- The Seismic Design Category of the building in accordance with CBC Chapter 16A (or reference to structural information).
- Reference to OSHPD approved Alternate Methods of Compliance, Alternate Means of Protection, or Program Flexibility, in accordance with CBC 104.11 and 1224.2 Exception 3.

Tip: *The project scope summary/information defines all the elements of the project as well as assumptions, project requirements, including project boundaries, and may include proposed functions of rooms and spaces, such as how staff and the public will use the spaces or rooms, and acceptance criteria. The project scope statement will act as the primary tool for stakeholders to reference and use as a guideline to accurately measure project goals, objectives, and assumptions. A well thought out and detailed project scope summary may reduce the potential for "scope creep" or possibly for change orders, and will assist the reviewer in understanding the extent of the scope for the project.*

Tip: *A Functional Program as specified in CAC 7-119 is required for all projects that affect patient care directly or indirectly. Information provided in the Functional Program may be a good source for creating a Project Scope Summary to be shown on the Title Sheet.*

3) Applicable Codes and Regulation

List all codes and regulations that the project is required to meet in its construction, including the specific state and local regulations, National Fire Protection Association (NFPA) Codes and Standards, including applicable editions, pertinent to the project, etc. See CAN 1-0 – Enforceable Codes, for the current listing of enforceable codes and CBC Chapter 35 Reference Standards, for the current applicable editions of the NFPA Codes and Standards.

4) Deferred Submittals

While it is recommended that the submittal includes all parts of the work, it may be necessary to defer the submission of some aspects of the building design until after the approval of the main design documents. A deferred submittal item (DSI) refers to a portion of construction that cannot be fully detailed on the initial approved plans because of variations in product design and manufacture. Such

items include, but are not limited to, low-voltage electrical systems, elevators and other transportation systems, curtain wall systems, fire sprinklers, and oxygen and medical gas systems. OSHPD has the discretionary authority to allow the design of such systems to be reviewed as a deferred submittal. (refer to CAC 7-126).

OSHPD does not accept deferred submittals for primary gravity or lateral load resisting systems or stairways. All items being allowed by OSHPD to be submitted as a DSI should be listed on the project title sheet with numerical assignments for each system or construction component. An item that has all information available for design cannot be deferred. The engineering specialty specification should list the performance requirements that the contractor is required to meet in preparing the documents and define the requirements of the California-licensed engineer(s) who must be employed to prepare the documents for OSHPD review and approval. For design of structural work, a California-licensed structural engineer is required. The specification should describe in detail the process for submittal of documents to the design team for review prior to their being submitted to OSHPD for their review and approval. This specification section should also include a statement that the contractor shall not start any construction work on deferred items prior to OSHPD approval of the deferred design documents. A schedule showing when the deferred submittals, for those items approved to be deferred, is required to be submitted within thirty (30) calendar days after construction has started.

A deferred submittal refers to a portion of construction that cannot be fully detailed on the approved plan because of variations in product design and manufacture.

Stamping and signing of deferred approval documents must comply with the same requirements as for construction documents, as noted in CAC 7-115, and 7-126.

***Tip:** Deferred submittals should be minimized to the extent possible to avoid construction delays.*

D. Other Information

Provide other general compliance information as appropriate for the project including, but not limited to:

- Project construction phasing of other work sequences that affect the project operations or impact code compliance.
- Other work not included in the project and carried out under other permits if it affects the project.
- Local zoning conditions of approval related to the project.

- Parking counts, as needed for local acceptance and Title 24 accessibility.
- A chemical inventory on small projects, if other than new construction and remodel projects that alter the existing structural frame (may be referred to as "H" or "I" projects), to show compliance with number of control areas and maximum allowable quantities of hazardous materials as listed in CBC Tables 307.1(1) and 307.1(2) (see PIN 8 – Hazardous Materials Inventory Statement for required information and suggested format).

It is recommended that a tabulation or matrix be provided for projects resulting in a change in the number of patient bedrooms, isolation rooms, operating rooms, dietetic storage and refrigeration, general storage, and perinatal unit space. Such a tabulation or matrix should include the number of existing items, as well as the proposed items. Include a matrix of bed count and type.

E. Existing Special Conditions

Projects that include additions and/or renovations of existing spaces within OSHPD-approved buildings present additional challenges to providing required documentation for approval of the project. To assist the reviewer in understanding how the new work does not conflict with required levels of safety provided by the existing facility, in many cases the drawings will need to fully describe adjacent uses and occupancies, existing construction, and prior approvals and documentation. Buildings or structures outside the scope of work, but proximate to the scope of work, should be identified by size, area, height, and building and construction type.

Often this information is unavailable from old drawings but needs to be ascertained by field investigation and measurement. The title sheet can only outline the existing conditions, occupancies, and construction to inform the reviewer of information that is presented in more detail with the plans and other drawings. However, in the brief descriptions of existing facilities, use of the same code-matching terminology is particularly important, and, whenever possible, drawings from previous OSHPD-approved projects for the existing facility and related work should be listed and attached (and specifically called out as "reference only" drawings).

In addition to dealing with infection control issues that may occur during construction the designer must show how and where to provide alternative and/or temporary solutions for remodel projects in patient care areas where mechanical ventilation, medical gases, electrical, exiting, travel distances, etc. will be impacted during the remodel construction. See CAN 2-108 – Temporary Structures and Equipment and CAN 9-3301 – Fire-Resistance Rated Assemblies and Construction.

Continued Title 24 requirements for the health and safety of patients must always be maintained if the patient rooms, spaces, or services are to remain in operation during construction. These conditions should be shown on the construction documents for review and approval of OSHPD and may also require CDPH review and approval for any patient care concerns. The hospital and/or designer is responsible to obtain CDPH approval when applicable.

Tip: *Providing "reference only" documents of approved existing conditions can speed up the plan review process for renovations by reducing comments and the number of back checks.*

F. Additional Architectural Drawing Content

Depending on the scope of the project, the following additional drawing content should be incorporated into the Architectural drawings:

- The Architectural floor plans should clearly delineate the boundary of each unit. Show all rooms, support spaces, etc. required by the CBC for each unit, using the nomenclature of the code to facilitate plan review. Separate outpatient from inpatient and show how separate access is provided for each.
- Designate staff, patient, and visitor toilets for each unit or in proximity where required by the CBC.
- Clearly show the horizontal and vertical pathways, making sure that proper separations between kinds of units are maintained. Show patient/staff and separate visitor elevators with appropriate dimensions for multi-story buildings.
- Provide a finish schedule that clearly shows that all floor, wall, and ceiling finishes comply with the appliable code requirements for the room, space, or unit as applicable.
- Show partition types including details and sections as appropriate for sound attenuation, energy requirements, etc.
- Provide reflected ceiling plans and details showing finish materials, anchorage and bracing for suspended ceilings, HVAC, lighting locations, and other ceiling mounted equipment, systems, etc.
- Where applicable, show unrestricted areas, semi-restricted areas, and restricted areas based on the classifications of treatments, procedures, radiology services, and operating rooms.
- Show how infection control and interim life safety measures are incorporated into the construction documents when applicable. For additional information, refer to Subsections 7.6.B. and C. of this Design Guide.
- Where applicable, see CAN 2-407.2.2 – Nurses' Stations
- Where applicable, see Advisory Guide A2 – Sterile Compounding Pharmacies for Hospital Facilities.
- Where applicable, see Advisory Guide A3 – Dietetic Design and Review Checklist for Hospital and SNF Facilities.
- Where applicable, see Advisory Guide A4 - Acute Psychiatric Hospitals.

3.4 Fire and Life Safety Drawings

A. Purpose

The fire and life safety drawings are intended to depict the fire protection and life safety code requirements and assist the OSHPD reviewer by providing a graphic view of fire and life safety compliance and egress compliance for the project. For new projects this will include identifying all components of the exit path and building features that provide fire protection and separation of individual occupancies. For renovation projects, these drawings will also include a description of existing exit paths, types and ratings of walls, and separations, as well as indicate how the new work will maintain or modify the life safety requirements for compliance if applicable.

The drawings should include special graphic floor plans, coordinated with detailed information on the construction floor plans. For smaller projects, a combined drawing is acceptable.

Tip: *Showing fire-resistance--rated walls on all architectural, mechanical, electrical, and deferred approval drawings will facilitate the plan review process.*

B. Organization and Approach

Floor plans specific to the fire life safety design should be provided, except in very small or simple projects, where information may be combined. All floor levels must be shown for new construction, even if they do not have an occupancy classification, such as roofs. The scale of the floor plans will depend on the building size and should ensure that all information is legible. Smaller remodel projects need only show the affected floor(s).

Site plans are also recommended, even for small renovation projects, to assist in describing the context of the project and the compliance of the existing building to basic site requirements.

Building sections are usually needed when separations of occupancies are present between floors, when the floors of the building do not stack, or when the site slopes significantly. Another reason to include building sections is because the maximum allowed building heights in some occupancies may need to be shown. Building sections are required for new construction.

General notes are recommended to provide reference to other areas of the documents that provide additional fire life safety design and details needed for showing compliance. The following notes are recommended, as applicable, and must be coordinated with the project's actual scope and organization:

- The fire rating of the fire-resistance rated assemblies is shown diagrammatically.
- For construction of partitions, see floor plans and fire-resistance rated assemblies construction drawings.

- These plans do not attempt to show all fire-resistance rated ceilings and/ or horizontal partitions (such as bottom of shafts, for example) present in the building. See reflected ceiling plans and enlarged stairs and elevator drawings for conditions not shown here.
- For location and type of exit signs, see electrical drawings and specifications.
- For location and type of fire dampers, see mechanical drawings and specifications.
- For location and type of rated access panels in walls, see floor plans, plumbing drawings, and plumbing specifications.
- For location and type of fire-resistance rated ceiling assemblies, see reflected ceiling plans.
- For location of sprinkler system elements, see reflected ceiling plans and plumbing drawings.
- For location of smoke detectors and other fire alarm devices, see electrical drawings or fire alarm drawings.
- For security devices, see security drawings.
- Locations of and requirements for special hazards or hazardous materials that affect the occupancy classifications. (see PIN 8 – Hazardous Materials Inventory Statement)
- Unoccupied rooms must be designated for use by the design professionals, even if they are used for storage (e.g., clean utility, linen, medications, equipment, housekeeping, etc.); they may need to be constructed with a one-hour fire barriers. Similar one-hour fire barriers may be needed for mechanical, electrical and tele/data (IT) rooms per the code.
- Typical issues that must be considered in the design:
  - Head of wall details that provide 100% Class II movement.
  - Resolution of the “T” rating requirement for through horizontal assembly penetrations such as floor sinks, floor drains, piping not contained within walls, etc.
  - Resolution of the “L” rating requirement for joint systems in smoke barriers and perimeter fire containment systems.
  - Treatment of listed horizontal assemblies that use rebar in lieu of wire mesh.
  - Fire resistance rated details for edge of slab that match the listing.
  - Doors that must open 180° because they open into an 8-foot corridor.

C. Drawing Content

Depending on the size and complexity of the project, the information provided on the fire and life safety drawings should provide a clear description of how the project complies with the various provisions of the CBC. Some of the general information for the project may also appear on the drawing title sheet. Also, much of the specific information will be contained in the body of drawing details and schedules. It is not necessary to provide redundant information, but it is important to provide information that describes the basis of life safety design and to coordinate the drawings in a manner that is clear and complete. The following outlines the information that should be covered on the fire and life safety drawings by CBC chapters, when applicable. Because the drawing content information may not cover every condition, the Fire and Life Safety Quality Assurance checklist found on OSHPD's website at *FLS Quality Assurance 2022 CBSC (Rev 03.02.2023)* should be used in conjunction with the drawing contents information provided below.

- Provisions of CBC Chapter 3: Use and Occupancy Classification
- Provisions of CBC Chapter 4: Special Detailed Requirements Based on Use and Occupancy
- Provisions of CBC Chapter 5: General Building Heights and Areas
- Provisions of CBC Chapter 6: Types of Construction
- Provisions of CBC Chapter 7: Fire and Smoke Protection Features
- Provisions of CBC Chapter 8: Interior Finishes
- Provisions of CBC Chapter 9: Fire Protection Systems
- Provisions of CBC Chapter 10: Means of Egress
- Provisions of California Fire Code and NFPA Standards
- Provisions for interim life safety measures when applicable. For additional information, refer to Subsection 7.6.C. in this Design Guide.

D. Working with the Local Fire Authority

OSHPD reviews fire sprinkler and standpipe installations, for compliance with the minimum requirements of NFPA Standard No. 13, NFPA Standard No. 14, and NFPA Standard No. 24. OSHPD does not review projects for compliance with local fire flow, hydrant spacing, connection and control valve configuration, or location requirements. Review and approval by the local fire authority will be requested prior to final plan approval of the project. Local approval should be provided on forms available from OSHPD. See *Local Fire Authority Approval Checklist* and PIN 5 – Review of Underground Fire Main Submittals.

Tip: *Provide drawings that document the locations and details showing compliance to California Fire Code (CFC) and NFPA requirements.*

1) **Local Fire Authority Fire Sprinkler and Fire Hydrant Requirements**
   - The location of the Fire Department Connection (FDC) must be in accordance with NFPA Standard No. 24 and CFC 912.
   - The location and type of system control valve(s) must be in accordance with NFPA Standard No. 13.
   - Fire flow and hydrant spacing must be in accordance with the requirements of NFPA Standard No. 24 (for new construction only).

2) **Local Fire and Water Authority Requirements**
   The installation, location, and configuration of the cross-connection control device (detector check) must be in accordance with the requirements of the CFC and the CPC.

3) **Local Fire Authority Approval**
   The fire flow, hydrant spacing, FDC, and location and type of control valves must be in accordance with the requirements of the statutory fire authority.

   OSHPD reviews fire sprinkler installations for compliance with NFPA standards in accordance with CBC and CFC. In addition to the specific requirements of the NFPA standards, the location, configuration, and arrangement of fire mains, hydrants, FDCs, and control valves depend on site-specific conditions and the requirements of the local fire authority. The local fire jurisdiction should be contacted for requirements pertaining to fire flow and hydrant spacing. Requirements pertaining to fire flow, hydrant spacing, types of control valves, and the location of valves and connections vary from jurisdiction to jurisdiction and from facility to facility within each jurisdiction.

Tip: *Documentation of local fire authority approval must be submitted to OSHPD prior to OSHPD approval.*

E. Existing Special Conditions

The same information required for new project areas is also required for existing areas that are not part of the construction scope when those areas are adjacent and/or may be affected by the new work. The life safety drawings then provide a complete picture of the building, with the new work incorporated, that demonstrates compliance to all code requirements.

3.5 Accessibility Compliance Documentation

A. Purpose

OSHPD reviews design conformance with CBC Chapter 11B for accessibility requirements. There are differences between this code and the Americans with Disabilities Act Standards for Accessible Design (ADA Design Standards). The design professional is required to provide compliance to both the CBC and the ADA Design Standards. The owner is accountable for compliance to both the ADA and the CBC

accessibility requirements. Drawings describing accessibility requirements provide the OSHPD reviewer with information that shows compliance to the provisions of CBC Chapter 11B, as well as other related requirements applied to the project from federal and local agencies.

B. Organization and Approach

It is the responsibility of the architect to design a project that complies with Title 24. It is the responsibility of the contractor to build in accordance with the approved construction documents. The design professional should show the code-required clearances on the drawings. Additionally, the contract documents should show the actual project dimensions, not merely code-required minimum, or maximum dimensions. It should also be noted that normal construction tolerances may affect required dimensions for accessibility.

Tip: *Take construction tolerances into account when specifying absolute dimensions.*

When compliance with an applicable accessibility requirement is technically infeasible, the designer may submit for a finding of Unreasonable Hardship with OSHPD in accordance with CAN 2-11B – Accessibility in Health Facilities. Findings of equivalent facilitation by OSHPD for accessibility issues must be included in the drawings and must indicate where and how equivalent facilitation is provided.

C. Drawing Content

Accessibility compliance review does not require the architect to prepare drawings dedicated to the topic. Instead, information may be dispersed throughout the set of architectural drawings. However, it is recommended to add a general note explaining where in the set the reviewer can find the information.

1) **Site Plans**
   For new buildings, all entrances and exterior ground-floor exit doors are required to be made accessible to persons with disabilities. Accessible parking and other site accessibility requirements, such as accessible routes to public transportation stops, accessible routes between other buildings on the site, etc., are subject to OSHPD review as noted in CAN 2-0 – OSHPD Jurisdiction.

Tip: *CAN 2-11B – Accessibility in Health Facilities is an excellent tool to use when incorporating code required accessibility requirements and features into the design of a project.*

2) **Floor Plans**
   Include information on the accessible path of travel throughout the facility or remodel project. If an area is not accessible, explain why it is not accessible (for example: mechanical penthouse - accessibility not required by code):
   - Enlarged drawings to illustrate toilet accessibility are recommended but may not be necessary, especially if a typical mounting heights sheet is being used.

- Label toilets by user group as “Patient,” “Staff,” or “Public,” and indicate which serve the remodeled area on remodel projects as applicable. See PIN 65 – All-Gender Toilet Facilities for all-gender toilet facility requirements.
- On remodel projects show a small-scale plan of the entire facility with a clear designation of the remodeled area and show the accessible path of travel to it from the primary entrance into the building.
- On remodel projects show the location of all existing and new toilets, drinking fountains, and public telephones serving the remodeled area and indicate if they are accessible or not or whether they are to be made accessible for compliance.
- Signage required by Title 24 must be described and located on drawings and/or specifications; this includes, but is not limited to, signage for stairs, elevators, evacuation, toilets, maximum occupancy, assistive listening, hazards, and accessible entrances. Ensure that signage complies with the standards for accessibility when required.

3) **Enlarged Drawings**
Provide enlarged drawings for toilets and bathrooms, stairs, elevators, special public, and “stall” areas, such as reception desks, waiting rooms, lockers, etc., and patient bedrooms. At a minimum, enlarged drawings should be twice the size of general floor plans.

Tip: *Also include interior elevations of such spaces in addition to the enlarged plans to help explain how requirements for vertical dimensions are complied with.*

D. Existing Conditions

New additions and renovations to existing buildings may need additional information for accessibility that goes beyond the immediate scope of the project. This information may include the location of accessible toilets that serve the new addition or area of renovation and details of existing elevators, ramps, and stairways that provide access to the new addition or area of renovation.

3.6 Door Schedule

A. Purpose

The door schedule provides the essential information for the reviewers to determine compliance with required egress widths and rated assemblies, as well as detailed information for the contractors to coordinate the construction of walls, finishes, and hardware.

B. Organization and Approach

Traditionally, there are several ways to document door information. One way includes providing width and ratings information directly on the plans at each door location; another includes referencing the door to a schedule or spreadsheet that lists all the pertinent information for the door types and hardware. An example table is shown below.

OPENING NO.	RATING	OPENING SIZE	DOOR			FRAME			HDWRE GROUP NO.	NOTES
			TYPE	MAT.	GLASS	TYPE	MAT.	DTL.		
100A	20S	4-0"x7'-0"	A1	WD	-	F1	HM	12/A9.2	36	CARD READER
101A	60M	PR 4-0"x7'-0"	A3	WD	GL-1	F5	HM	23/A9.2	20	
101B	-	3-0"x7'0"	B1	HM	-	H2	HM	15/A9/2	17	

Tip: *Except in the smallest or simplest of projects, it is recommended that a schedule format be used.*

C. Drawing Content

The door schedule must provide at a minimum the rating of the door and frame assembly commensurate with the wall rating and the door's function. The function of the wall rating may be part of a one-hour corridor, a two-hour stair or exit passageway enclosure, a one-hour smoke compartment wall, or a rated occupancy separation wall. Rating requirements for openings in each of these wall conditions are provided in various sections of the CBC.

In addition to the door rating, such as 20, 45, 60, or 90 minutes, the schedule must indicate for the reviewer whether the door is required to be "tight-fitting smoke-and draft-control assemblies," typically with an "S" designation (for example: 20S, 60S, etc.). Some doors may also be required to have a specified temperature rating, using a "T" designation in the door schedule. Other door features that may be indicated in the door schedule for the reviewer's information include required door hardware such as panic devices, closers, view windows, etc.

The required width of the door is determined both by the occupant load assigned to pass through the door for exiting and by the specific requirements of its location within the hospital. Every means of egress door's minimum required opening width is identified in CBC 1010.1.1 as "sufficient for the occupant load thereof and shall provide a minimum clear width of 32 inches" and "the maximum width of a swinging door shall be 48 inches nominal." CBC 1005.3 provides multipliers for determining the egress capacities of doors based on occupant loads. Hardware features and gap clearances for The Joint Commission should be incorporated.

Required widths based on "I" occupancies indicated in CBC 1010.1.1 states, "In group I-2, doors serving as means of egress doors where used for the movement of beds and stretcher patients shall provide a minimum clear opening width of 44 inches." Given that the "clear" width at doors is measured inside the door stops, the 44-inch requirement is typically accommodated by four feet (48 inch) door leaf. Non-patient areas may use a standard three feet (36 inch) door leaf; however, it should be carefully noted whether the door is located within the overall exit path from the patient room or area, as it continues through the building and into the exit stair enclosure, to arrive at its safe, exterior termination. Doors along the exit path must maintain the required means of egress capacity width, which "shall not be diminished along the path of exit travel" (CBC 1003.6).

D. Existing or Special Conditions

Existing exit pathways, opening ratings, or other projects that include modifications to existing conditions should include information on both new and existing doors where such information is needed to describe the maintenance of door functions required by the design. The architect or engineer must verify with OSHPD that projects requiring construction of temporary walls and doors to separate construction from occupied spaces meet the same requirements as permanent construction when providing protection for exit corridors, occupancy separations, and other rated conditions.

3.7 Anchorage and Bracing of Equipment and Systems

A. Purpose

Equipment (fixed, mobile, moveable, interim, or temporary), building systems, and other manufactured items used in the operation of the building are required to be anchored or restrained, as applicable, to the floor, wall, or roof construction. The anchorage must be designed for gravity, seismic, wind, and other forces and displacements as required by the CBC based on the equipment classification and support locations. The primary considerations are position retention, structural integrity, and functionality of the equipment and components when subjected to design level earthquake forces. Equipment within the building must resist forces caused by a seismic event, which vary based on equipment location in the building. These forces must be delivered to elements of the building structure capable of resisting them (see PIN 68 – Support and Attachment Requirements for Fixed, Interim, Mobile, Movable, Other and Temporary Equipment for additional guidance regarding anchorage of equipment).

Although all permanent components, equipment, and elements of the structure must be anchored, the anchorage of some items need not be designed and detailed on the approved drawings. Chapter 16A of the CBC provides exemptions as follows:

- Furniture except storage cabinets as noted in Table 13.5-1.
- Equipment that is to be stored in an Equipment Storage Room when not in use.
- Temporary or mobile equipment (although restraints for heavy equipment and equipment with utility connections may be required).

- Architectural, mechanical, and electrical components in Seismic Design Categories D, E, or F where all the following apply:
  - The component is positively attached to the structure.
  - Flexible connections are provided between the component and associated ductwork, piping, and conduit; and either:
    - The component weighs 400 pounds or less and has a center of mass located 4 feet or less above the adjacent floor or roof level that directly support the component or,
    - The component weighs 20 pounds or less or, in the case of a distributed system, 5 pounds/foot or less.

In some instances, the information needed to provide details for specific products may be lacking for incorporation into the initial submittal of a project. With OSHPD acceptance, equipment anchorage may be submitted as a deferred submittal (refer to CAC 7-126). However, it is generally more desirable to submit all equipment with the initial submission documents than to separate the equipment details, to avoid delays in approval that may delay construction. This means that design decisions must be made in advance to allow the details to be completed, and as selections and procurement dictate changes, changes submitted to OSHPD as an Amended Construction Document must be issued for each final installation. Many equipment manufacturers have their equipment's supports and attachments preapproved by OSHPD through the Preapproval of Manufacturer's Certification (OPM) (PIN 62 – OSHPD Preapproval of Manufacturer's Certification). Use of OPMs in your project is recommended. In addition to seismic anchorage of equipment, the CBC also requires anchorage and bracing of mechanical, plumbing, electrical, and other systems.

CBC Chapter 17A requires Special Seismic Certification for certain mechanical and electrical equipment "that must remain operable following the design earthquake." Such equipment must be certified by the manufacturers as operable based on approved "shake table testing" or other methods provided for in the code. OSHPD has instituted Special Seismic Certification Preapproval (OSP) (PIN 55 – Special Seismic Certification Preapproval) program to facilitate the process.

B. Organization and Approach

On small projects the amount of equipment and anchorage details may be limited enough for direct reference of plan-noted equipment to the detail drawings. On larger or more complex projects, it is recommended that significant equipment be listed in a table or chart with detail references, equipment descriptions, and OSHPD preapproval numbers provided for each appropriate item. The sample equipment schedule shows the minimum amount of information needed for review. Additional information may include room locations, manufacturer's name and model numbers, responsibilities for supply and installation, and utility connection information.

Since anchorage details are specific to products, a numbering system, either provided by the owner or created for the project, is important for tracking equipment and changes throughout the construction. When any object needs to be bolted to the floor, the owner should be asking questions about cleaning, maintenance access, etc. If structural components must be added below the floor for support, the designer must confirm existing conditions and ensure access can be provided for the work.

EQUIPMENT SCHEDULE									
EQUIP NO.	DESCRIP-TION	MANUF.	ATTACHED TO	EQUIPMENT PROPERTIES				DETAIL NO.	OSHPD PRE-APPROVAL
				WT	W	D	H		

Figure 3.1 – Sample Equipment Schedule

C. Drawing Content

Equipment may include medical, mechanical, plumbing, electrical, food service, or accessory items such as shelving and appliances. Equipment may be installed by the contractor, the owner, or special vendors. Regardless of who performs the installation, for the purposes of construction, all items need information on the drawings to detail their installation. Anchorage of standard items, such as ceilings and casework, is best covered in the drawings by typical details. These may include typical backing-plate requirements for wall framing and clip attachments to walls, counters, and floors for miscellaneous items found throughout the project in toilets, kitchens, treatment, and exam rooms, etc. Drawings may also cover the anchorage of items exempt from plan review (discussed in the preceding section). However, such details are subject to field confirmation, and changes from the approved drawings may generate a post approval document review.

For those pieces of equipment that exceed the criteria for exemptions, specific details designed by the EOR or provided by the manufacturer's (California- registered) engineer are required on the drawings. Some manufacturers have engineered anchorage systems that have been submitted to OSHPD under its OPM Program (PIN 62 – OSHPD Preapproval of Manufacturer's Certification) for manufactured equipment. Preapproval

Some manufacturers have engineered anchorage systems that have been submitted to OSHPD under its OPM Program for manufactured equipment. Preapproval is for the adequacy of the supports and attachments only and does not include product approval.

is for the adequacy of the supports and attachments only and does not include product approval. This program allows the use of preapproved drawings for equipment anchorage, in most cases, to show just the preapproval number. However, in some cases, the actual details submitted by the manufacturer should be reproduced on the drawings for the reviewer to verify that the anchorage design is correctly applied to the project. The list of OSHPD preapproval of manufacturer's certification for equipment is maintained by OSHPD and provided on its website at OSHPD Preapproval of Manufacturer's Certification (OPM) for use by design professionals. If a preapproved product or system is specified, it is vital that the design team review the actual preapproval documents to confirm that they conform to the project requirements. The acceptability of proprietary fastening systems should be as specified in the CBC. When equipment cannot be specified at the time of submittal, the design team may request that the item be deferred as mentioned in Subsection A. above. Deferred items are to be listed in a schedule on the cover sheet of the drawings. However, assumptions should be made for equipment weights, location, and utility connections to allow the reviewers to check related items, such as the supporting structural framing, and to permit tracking of follow-up Amended Construction Documents (CAN 1-7-153 – Amended Construction Documents) for anchorage details. The drawings and specifications must fully describe the performance and loading criteria for the deferred item.

3.8 Architectural Details

A. Purpose

Details developed by the DPOR are intended to convey construction requirements to the contractors which, when properly constructed, complete the design intent, as well as meet the code requirements for structural integrity and life-safety. While it is not possible to provide details that reflect every possible condition of the construction, it is desirable to provide enough details, typical to the various conditions of the project, which establish the minimum construction standards.

Tip: *Follow current industry standards when developing these details.*

For interior partition construction and gypsum ceilings, such standards may include:

- CBC Table 720.1(2).
- Gypsum Association, Fire Resistive Design Manual.
- Leading manufacturers of Gypsum and Metal Stud Products.
- Metal Stud Manufacturers' Association (SSMA).
- Designs tested and published by an approved testing agency (UL, Intertek, Omega Point, etc.).

Tip: *To further assist in the correct application of interior details for partitions and ceiling construction, OSHPD has established a program of developing preapproved details which will provide the DPOR a library of details that, when properly used, meet the requirements of Title 24. (See PIN 51 – Use of HCAI Pre-Approved Details)*

Tip: *For small projects that may be categorized as "Field Review," "Exempt," or "Expedited Review", additional information is provided in the FREER Manual, which provides design criteria for various, minor non-structural work, which a hospital may undertake.*

B. Organization and Approach

Architectural interior details should be organized, as much as possible, based on subject matter, such as details for structural design, details for fire-resistive construction, and details for non-rated architectural finishes, etc. It is important to provide adequate references on the plans or in notes to assist in locating the proper details.

General application details may be un-referenced on the plans; however, it should be clear where these details apply. Where common standard details are provided for interior partitions, they may be organized in a schedule-type format to allow "tagging" of walls shown on the plans, which reference the various typical construction details. These details may cover required rated construction, acoustical requirements, and typical common construction of chase walls, shaft walls, and walls with radiation shielding. Where fire-resistive partition details are provided, the correct UL, or other testing agency number must be provided to show compliance to the intended rating.

C. Drawing Content

For details that provide information on structural connectors, proper sizing of connectors must be supported by engineering calculations and industry-assigned values, according to the loading on the connection and the seismic design category of the project. Component identification should also conform to industry nomenclature for structural shapes, sizes, and weights, such as the standard designation of studs provided by the SSMA.

OSHPD has created a Standard Details program (see PIN 51 – Use of HCAI Pre-Approved Details) which provides typical details which may be used by the design professional. OSHPD Preapproved Details (OPDs) are available from the website at OSHPD Preapproved Details (OPD) for use by the DPOR. The responsibility for the proper use and application of these details remains with the responsible design professional.

Details that provide information on tested rated assemblies should, similarly, adhere to the details provided by the test documentation, either by Underwriters Laboratories (UL), or other approved agencies.

Tip: *For fire-resistive construction provide the construction detail with the identifying Underwriters Laboratories (UL) or applicable listing number.*

Where project conditions require a variation to the tested details, an "engineering judgment" may need to be made by a qualified representative of the manufacturer, a registered professional engineer, fire protection engineer or an approved independent testing agency, and should be incorporated into the approved drawings. (See CAN 2-703.3 – Engineering Judgements)

3.9 Title 24, Part 6 – Energy Code Compliance (CESC)

Healthcare facilities are no longer exempt from compliance with the CESC. Healthcare facility projects that consist of a newly constructed building, an addition that increases floor area and/or conditioned volume, or replacement of equipment subject to energy ratings requires compliance with the CESC. The design team is responsible for ensuring that the project complies with the CESC. Compliance forms must be included as part of the drawing set. The California Energy Commission's website is a great resource.

The energy codes will affect multiple disciplines, such as energy ratings for the building envelope, glazing, etc., such as efficiencies of various mechanical equipment, standards for various plumbing fixtures, efficiency of electrical lighting, requirements for lighting control, and others. This work must be carefully coordinated and documented using the appropriate CESC forms, in the documents, and in the design of the work of construction to ensure full compliance with the energy requirements. Energy Compliance can be documented under the "prescriptive approach", the "performance approach", or a combination of the two. If under the prescriptive approach, the building envelope, mechanical systems, and indoor lighting each need their own Compliance Certification as NRCC-ENV-E, NRCC-MCH-E and NRCC-LTI-E. If a performance approach is taken, form NRCC-PRF-E is used. All information provided on required forms must match the information provided in the project drawings and details, specifications, and reports. In all cases, minimum mandatory requirements must be met.

The California Energy Commission sponsors a website energycodeace.com that provides helpful tools and information to assist in compliance of the energy code. A virtual compliance assistant is also available to complete forms and verify compliance and can be found at: https//energycodeace.com/content/project-tool. A fact sheet for healthcare facilities provided by Energy Code Ace can be found at: https://energycodeace.com/resources/?item_category_trait_file_type=17688

New facilities, additions, and tenant improvements of non-ventilated shell spaces are required to comply with the CESC. The following documentation is required to show compliance with the CESC on Healthcare Projects:

A. Architectural

Building Envelope efficiencies including:

- U-Values of Roof, Walls, and Floor Assemblies (including R-values for building insulation)
- Solar heat gain coefficient/ Visible Transmittance for exterior glazing
- U-Values for exterior doors (less than 50% glass)

The following required architectural NCRR forms shall be submitted with the contract documents:

- 2022-NRCC-CXR-E Commissioning/BOD (recommended)
- 2022-NRCC-ENV-E Envelope Component Approach (for prescriptive approach)
- 2022-NRCC-PRF-E Performance Modeling Approach (for performance approach)
- 2022-NRCC-SRA-E Solar-Ready Areas

B. Mechanical/Plumbing

Mechanical equipment efficiencies. The following required mechanical Nonresidential Certificate of Compliance (NRCC) forms shall be submitted with the contract documents:

- 2022-NRCC-MCH-E
- 2022-NRCC-PRC-E
- 2022-NRCC-PLB-E

C. Electrical

- Manual area lighting controls, automatic daylighting controls.
- All skylit daylit zones and primary sidelit daylit zones shall be shown on the plans.
- Outdoor lighting and controls.
- Lighting control acceptance installation and certification requirements.
- Maximum combined voltage drop on feeder and branch circuit conductors shall not exceed 5%.
- The following required electrical NCRR forms shall be submitted with the contract documents:
    - 2022-NRCC-ELC-E
    - 2022-NRCC-LTI-E
    - 2022-NRCC-LTO-E
    - 2022-NRCC-LTS-E

All items listed under “Declaration of Required Certificates of Installation” (NRCIs) and “Declaration of Required Certificate of Acceptance” (NRCAs) from the NRCC project forms above must be added to The Testing, Inspection and Observation program form (TIO). All items in the TIO must be completed satisfactorily prior to issuance of the building’s Certificate of Occupancy.

Tip: *Visit Energy Code Ace – Get Forms - to find online fillable compliance forms at https://energycodeace.com/*

3.10 Seismic Compliance

The HSSA requires seismic compliance for hospital buildings containing acute care and related services. Each building in which acute care services are provided or that are necessary for the function of such buildings is given a Nonstructural Performance Category (NPC) designation and a Structural Performance Category (SPC) designation. It is important that the design team be aware of the designation of each building for which they are preparing design documents for. The NPC and SPC designations can have an impact on the services that are allowed to be provided in each building, which, if any, utilities may pass through or under certain buildings, which buildings may have exits through adjacent or adjoining buildings, etc. Staff in OSHPD’s plan review unit for the region in which the facility is located or in its Seismic Compliance Unit can assist the designer in finding out the categories for any given building and the services, utilities, exiting, etc. that may be impacted.

The seismic safety standards of each hospital building for Structural and Nonstructural performances are required to be conspicuously posted in a public location in each building as shown below:

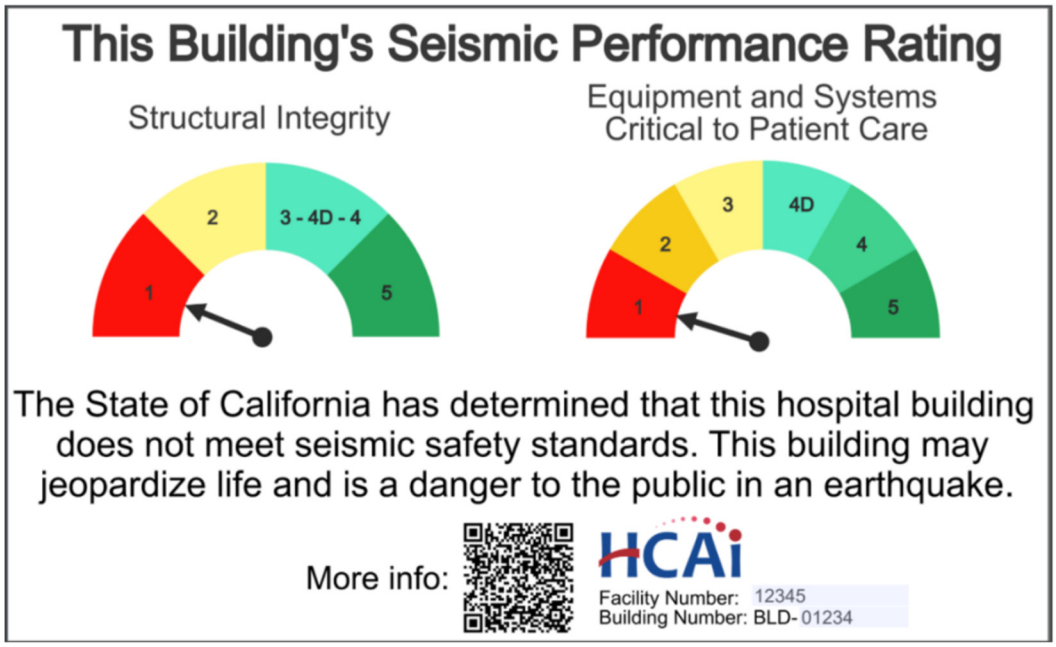


Figure 3.2 – Building Seismic Performance Rating Signage

In addition, this information can be found under Facility Detail on HCAI's website – see https://hcai.ca.gov/construction-finance/facility-detail/, and *Seismic Compliance Frequently Asked Questions* for additional information.

3.11 Guidelines for Structural Drawings

A. General Guidelines

The structural engineer, as a member of the design team has the primary role of developing the structural system necessary to meet the needs of the architectural design, as well as the code required performance of the gravity and lateral (seismic, wind, etc.) systems, dictated by seismic design category and the site-specific conditions. Most project designs start with the analysis of the site conditions (geotechnical issues, geologic hazard, flood, etc.) and the selection of the primary structural systems, which will determine the framework of the building, and support all architectural and MEP systems.

Although much of the structural engineer's work is determined by the site conditions and code design requirements for lateral (seismic, wind, thermal, flood, etc.) and gravity loads, the key to the success of the design process is a high degree of coordination with mechanical, HVAC, and piping, as well as the architectural systems of the exterior cladding and interior partitioning. It is essential that the structure engineer have early involvement in the planning process and contribute to the design team solutions to the building that respond to code and inform the architect and MEP engineers what considerations need to be made in developing their designs. Early activities may include:

- Compile site-specific conditions as early as possible (such as, existing buildings, survey of grades, geo-hazard, and geotechnical reports.
- Identify important project objectives (such as open spaces, long spans, floor plan flexibility).
- Develop structural schematic design alternatives based on early planning, site conditions, and project objectives.
- Select optimum design alternative and validate major structural systems using approximate analytical methods.
- Establish, quantify, and validate all sources of structural loading.
- Identify all conditions requiring alternate design procedures and/or special testing of structural elements.
- Coordination with ALL design disciplines for structural member penetrations, depths, support, bracing, anchorage, and other structural considerations. Refer to Subsection 3.7 for additional anchorage and bracing requirements.
- Establish all elements of the designated seismic system.

- Define structural engineering design requirements for building system components (non-structural).
- Ensure continuity of the load path.

B. Working with OSHPD Structural Engineers

Early in the design process, it is also essential to start communicating with OSHPD staff to identify any special issues and approaches necessary for the structural design to consider when developing the basis of design for lateral and gravity systems. For larger, new hospital projects, this might occur at a general kick-off meeting with OSHPD review staff to introduce the project and nature of the structural systems. For smaller projects, or renovations of existing hospitals, this might be a short meeting with structural engineer reviewers to review special aspects of the project which have structural issues.

- Identify all conditions requiring alternate design procedures and/or special testing of structural or nonstructural elements.
- Identify and validate design methodologies with OSHPD for structures with special design considerations.

As the building design progresses and structural documents are developed in coordination with the Architect and MEP Engineers, the Structural Engineer should be considering the following:

- Complete analysis and design of major structural systems, members, and connections.
- Complete analysis and design of nonstructural systems including exterior cladding, interior partitions and ceiling systems, distribution systems and equipment anchorage.
- Identify, map, and analytically validate all building load paths.
- Establish all member and connection capacities.
- Establish an appropriate analysis and design methodology.
- Identify structural requirements for the Test, Inspection, and Observation program.
- Regular internal peer review of structural systems throughout the design process.
- The additional gravity and lateral loads added to an existing building during a remodel project.

C. Organization and Approach

Overall quality of the design and the documents for the structural drawings will depend on having the right individuals with the right experience, as well as following established engineering processes for documentation and team coordination.

- Only assign design professionals to the project with California hospital design experience.
- Establish early involvement of structural engineering expertise.
- Maintain the same engineering resources throughout the project design, OSHPD plan review, and construction.
- Apply design drawing standards for quality assurance.
- Validate computer generated results by manual hand calculations at critical locations.
- Cross coordinate structural plans, sections, details, notes, and specifications.
- Coordinate with other project design professionals to confirm geometric compatibility of AMPE systems components.
- Maintain Structural Engineer of Record involvement throughout the project until construction is complete.
- Provide for regular site visits by the project structural engineering personnel.

D. Drawing Contents

The structural drawings should include coordinated framing, foundation, and details that use Industry standard graphics and symbols common to structural construction documents.

Tip: *Place general information on the structural basis of design and the design criteria for complex project on first sheets.*

Schematic design should include a presentation of the design criteria, demand on the building, and the primary structural system definition including foundations, framing systems, lateral force resisting systems, earth retention systems, etc. Detail design should include the necessary specification, analysis, and detailing that address the interconnections of primary structural elements that form complete load paths.

Working drawings that are submitted to OSHPD for review must be complete. They must provide thorough and high-resolution detailing that integrates both the interconnection of primary and secondary structural elements with complete load paths, as well as details that demonstrate the coordination of other disciplines. The complete specification of required materials and workmanship should be provided. Detailed drawings of anchorage and bracing of non-structural building components should be complete and be accompanied by references to seismic certifications, standard details, and preapprovals.

3.12 Guidelines for Mechanical Drawings

A. Purpose

The purpose of the mechanical drawings is to depict all mechanical systems and components necessary to provide code minimum heating, ventilating, and air-conditioning (HVAC) services within the hospital. Refer to Subsection 3.7 for anchorage and bracing requirements of mechanical equipment and systems. Refer to Subsection 3.9 for energy requirements.

B. Content

Based upon the complexity and scale of the project, the information provided on the mechanical drawings should show clear description of the work required for the project. In many cases, the project may involve the documentation of existing mechanical systems and should clearly identify new versus existing systems.

Some of the key components necessary on plans for all projects include:

- Identify any equipment that requires seismic certification and/or essential power.
- Identify equipment mounting detail locations.
- Provide humidification and temperature control for sensitive rooms as listed in CMC Chapter 3.
- Provide calculations that demonstrate that each room within the project is designed per CMC Table-4A. If the room is related to patient care and the Architectural room name is not listed in Table-4A, it is important to provide the requirements based on an equivalent room. Otherwise, the ventilation rate may be based on ASHRAE 62.1.
- Identify airflow pressure room relationships in either table format or on the plans via flow arrows.
- Indicate wall ratings and locations of fire/smoke dampers.
- Provide the appropriate flexible connections where ductwork, etc. crosses seismic and other expansion joints. Additionally at coil connections as indicated in CMC 1210.2.

Remodel projects within a hospital require precautions and measurements prior to start of construction to ensure that airflows in existing areas outside the project are not affected. Clearly identify on demolition drawings airflow measurements required prior the start of the demolition in the area surrounding the remodel.

It is recommended to obtain a pre-design air balance report for remodel projects to establish existing air flow quantities and outside air damper settings. If existing airflows are shown on plans add sheet note with the source and date of the data.

Identify the impact to the air-handling unit affected by the remodel if applicable, such as rebalancing the unit or duct system, additional outside air, etc. Airflows to areas outside of the project area are required to be maintained. An air precautions plan is needed to show air flow readings and balancing required to maintain compliant air flows due to modifications to the duct system. See CAN 2-102.6 – Remodel for additional guidance.

Tip: *Following CAN 2-102.6 – Remodel for remodel/renovation projects is critical to minimize OSHPD plan check comments.*

Tip: *Providing an air balance schedule that provides the information described below will expedite the plan review process as well as the air balancing of the systems during construction.*

Provide an Air Balance Schedule/Table showing the following minimum information:

AHU Number or System Description

Room Number

Room Name

Table 4-A Equivalent

Volume Cubic Foot

Relative Pressure

CMC Calculations to provide the following:

- Total AC/HR
- Total CFM
- OSA AC/HR
- OSA CFM

62.1 Outside Air Calculations for Non-Table 4-A Spaces

- A_z – Zone Floor Area
- P_z – Zone Population
- R_p – Outdoor Airflow Rate per Person
- R_a – Outdoor Airflow Rate required per Unit Area
- V_{ou} – Uncorrected Outside Air
- E_v – System Efficiency
- V_{ot} – Outside Airflow

Design Calculations to provide the following:

- SA CFM
- RA CFM
- EA CFM
- TA CFM
- OSA CFM

Some additional key components necessary for remodel plans include:

- Identify project boundary and be sure it matches architectural plans.
- Identify any temporary construction barriers.
- Provide a means to ensure that airflows outside the project boundary will be maintained.
- Phase construction: The mechanical design should document each of the phases (corresponding with architectural) as a separate demolition, construction, and balancing project.
- Provide system plans and identify all balance locations required to maintain existing airflows in all locations outside the project boundary. Provide explicit balancing design to maintain existing airflows per CAN 2-102.6 – Remodel. General notes to the contractor are not acceptable.
- Indicate wall ratings and provide fire stopping details for all penetrations as required.
- Incorporate any special infection control requirements into the plans. For additional information, refer to Section 7.6.B. of this Design Guide.
- Incorporate any interim fire life safety requirements into the plans. For additional information, refer to Section 7.6.C. of this Design Guide.

1) Information Plans

Various types of drawings are necessary to convey essential information such as schedules, piping diagrams, mounting details, and control diagrams.

The title page should clearly define the project location and vicinity by graphical means. The applicable building codes, including the year and supplements date, should be stated. A drawing index is recommended to clearly identify all the unique systems that may be involved. Identify the scope of work for the project.

2) Site Plans

If the project involves outside (exterior) mechanical work, then it should be clearly shown in the site plan documentation. See CAN 2-0 – OSHPD Jurisdiction to determine which components are under OSHPD jurisdiction, such as utilities serving the OSHPD building. Plans submitted to OSHPD should only include the scope for OSHPD jurisdiction or clearly define OSHPD and local jurisdiction scope.

3) Floor Plans

It is recommended to follow the architectural floor plan nomenclature for sheet order and sheet numbering to simplify the logical sequence of cross-coordination with all trades (disciplines). Traditionally, the floor plans provide the documentation of the architectural features as a shaded background and the mechanical devices are prominently shown on top of these locations. However, it is important to clearly identify room names and wall ratings for OSHPD review.

Plans should have a plan scale to provide plan clarity and to easily identify intended work to be performed.

4) **Enlarged Drawings**
The drawings that contain a significant amount of information require much more space to clearly communicate the scope of work. These drawings tend to be the 1/4 inch scale or larger, to show exact placements and or intent. In addition, these drawings may comprise several elevations to demonstrate the intent.

C. Organization and Approach

The mechanical drawings should reflect the clear scope of work and the application of separate systems on their own drawings will provide better definition of the intended work. Examples are in the following table:

Sheet Number	Sheet Description
M001	Mechanical Title Sheet, Drawing Index
M002	Schedules, Notes, Table 4-A Calculations
M100	Site Plan – Mechanical
M201	1st Floor Plan – Mechanical & Hydronic Plans
M202	2nd Floor Plan – Mechanical & Hydronic Plans
M301	Enlarged Floor Plans – Mechanical
M401	Piping Diagrams
M501	Details
M601	Controls
M701	Title 24 – Energy Code Compliance Forms

D. Local Requirements

The design team is responsible for ensuring that the project complies with local zoning standards, such as equipment screening, noise levels, etc. OSHPD does not enforce these requirements unless notified in writing by the local jurisdiction. CAN 2-0 – OSHPD Jurisdiction provides additional information regarding items under OSHPD jurisdiction and items under the local authority.

3.13 Guidelines for Plumbing Drawings

A. Purpose

The purpose of the plumbing drawings is to depict all plumbing systems and components necessary to provide code required plumbing systems within the hospital and as necessary to connect to municipal and other agency's systems, as applicable. Refer to Subsection 3.7 for anchorage and bracing requirements of mechanical equipment and systems. Refer to Subsection 3.9 for energy requirements.

B. Content

Based upon the complexity and scale of the project, the information provided on the plumbing drawings should show clear description of the work required for the project. In many cases, the project may involve the documentation of existing plumbing systems and should clearly identify new versus existing systems. Some of the key components necessary on plans for all projects include:

- Identify any equipment that requires seismic certification and/or essential power.
- Plumbing fixture counts for public, staff, and patients, in accordance with the California Plumbing Code requirements.
- Provide fixture schedule for all fixtures.
- Provide piping materials schedule for all affected plumbing system types.
- Specify insulation requirements for all affected plumbing system types.
- Demonstrate handwashing fixtures meet all CPC 210 requirements.
- Identify equipment mounting detail locations.
- Identify hot water temperatures and high limit alarm location that is continuously monitored.
- Provide information indicating domestic hot water distribution temperatures per CPC Chapter 6.
- Identify medical gas zone valve and alarm locations.
- Identify areas where special precautions need be taken for overhead piping per CAN 5-310.9 – Overhead Piping.
- Identify roof drainage calculations. - Verify rainfall rates with the local jurisdiction.
- Identify Domestic Water sizing criteria.
- Indicate wall ratings and provide fire stopping details for all penetrations.
- Provide validation that existing equipment and distribution services have the necessary capacity during remodel or expansion projects. Make note of non-recirculated and dead-end piping requirements in CPC 613.6.
- Provide the appropriate flexible connections where piping, etc. crosses seismic and other expansion joints.
- Provide NPC-5 compliant water and waste emergency storage systems.
- Submit NPC-5 water rationing plan.
- Provide a means to ensure that plumbing systems outside the project boundary will be maintained.

- Provide a means to ensure that plumbing systems, such as medical gases, etc., inside the project boundary will be maintained if it is to remain operational during construction. Modifications that affect patient care may need review and approval by CDPH.

Tip: *Consult Advisory Guide A5 – NPC-5 Water Rationing Plan for Hospital Facilities.*

1) Information Plans

Various types of drawings are necessary to convey essential information such as schedules, piping diagrams, mounting details, and control diagrams.

The title page should clearly define the project location and vicinity by graphical means. The applicable building codes, including the year and supplements date, should be stated. A drawing index is recommended to clearly identify all the unique systems that may be involved. Identify the scope of work for the project.

2) Site Plans

If the project involves outside (exterior) plumbing work outside the normal five feet from the building, then it should be clearly shown in the site plan documentation. CAN 2-0 – OSHPD Jurisdiction provides additional information regarding items under OSHPD jurisdiction and items under the local authority. Civil plans submitted for review should include a utility plan, but not include the stormwater, erosion and sediment control, or similar plans under the local authority. Private utilities serving the OSHPD building are included under OSHPD jurisdiction.

3) Floor Plans

It is recommended to follow the architectural floor plan nomenclature for sheet order and sheet numbering to simplify the logical sequence of cross-coordination with all disciplines. Traditionally, the floor plans provide the documentation of the architectural features as a shaded background and the plumbing devices are prominently shown on top of these locations. However, it is important to clearly identify room names and wall ratings for OSHPD review.

4) Enlarged Drawings

The drawings that contain a significant amount of information require much more space to clearly communicate the scope of work. These drawings tend to be the 1/4 inch scale or larger, to show exact placements and/or intent. In addition, these drawings may comprise several elevations to demonstrate the intent.

C. Organization and Approach

The plumbing drawings represent work that is closely coordinated with many other disciplines such as architectural, structural, electrical, and mechanical. The need to have very well coordinated drawings is equally important with all disciplines. Last minute changes, even room name changes, from one discipline can have an adverse impact on the other disciplines and on the construction documents.

The plumbing drawings should reflect the clear scope of work and the application of separate systems on their own drawings will provide better definition of the intended work. Examples are in the following table:

Sheet Number	Sheet Description
P001	Plumbing Title Sheet, Drawing Index
P002	Plumbing Schedules, Notes, Water Calculations
P100	Site Plan – Plumbing
P201	1st Floor Plan – Plumbing and Medical Gas Plans
P202	2nd Floor Plan –Plumbing and Medical Gas Plans
P301	Enlarged Floor Plans – Plumbing
P401	Piping Diagrams
P501	Details
P601	Controls

D. Local Requirements

The design team is responsible for ensuring that the project complies with local zoning standards, such as equipment screening, noise levels, etc. OSHPD does not enforce these requirements unless notified in writing by the local jurisdiction. CAN 2-0 – OSHPD Jurisdiction provides additional information regarding items under OSHPD jurisdiction and items under the local authority.

3.14 Guidelines for Electrical Drawings

A. Purpose

The purpose of the Electrical Drawings for a particular project is to provide documents that fully describe the scope of the project, can be reviewed for code conformance, can be used for contractors to build from and for inspectors to reference during their construction observation efforts. The drawings should include sufficient detail to allow others to understand the full scope of the project and be sufficient for the successful construction of the project. The drawings should be scaled, well organized, neat, and readable. In addition to the drawings, typically some forms of technical specifications are required to communicate acceptable product, installation requirements, testing and other information required to complete the contract document package. Refer to Subsection 3.7 for anchorage and bracing requirements of electrical equipment and systems. Refer to Subsection 3.9 for energy requirements.

Tip: *Visit Energy Code ACE to obtain Title 24 compliance forms. Design from the start to meet Title 24 Energy Code requirements. Healthcare facilities are no longer exempt from compliance with the Title 24 - Energy Code. The design team is responsible for ensuring that the project complies with the Energy Code and compliance must be demonstrated on the contract documents. Compliance forms are required as part of the contract drawing set. California Energy Commission's website is a great resource.*

B. Content

The drawing package should include a title page which clearly defines the project scope, location plans, and vicinity map. Applicable building codes should be listed on the title page along with a summary of the work and any deferred approval items. Symbol lists are important to help others decipher the drawings. A drawing index is recommended to clearly identify all the pages included in the set. Site plans are required if any work outside of the building is required. Floor plans with lighting and power designs should be included to graphically represent the new work. Low voltage drawings should be included to detail nurse call systems, fire alarm, and telecommunication wiring distribution and grounding requirements. Floor plans showing devices should also be included to identify and locate devices. Other drawings required for a complete set include equipment schedules, light fixture schedules, single line diagrams, panel schedules and load summaries.

Based upon the complexity and scale of the project drawings can be added or deleted as appropriate. The information provided on the electrical drawings should present a clear description of the new work required for the project, and in some cases existing work that may be impacted by or may affect the new work, for example existing panels, feeders, etc. from which the new work is deriving power.

The following is a checklist of key items that should be included with each submittal:

1. Electrical plans and specifications signed by the electrical engineer of record.
2. List of symbols and abbreviations used on plans and their meaning.
3. Correct electrical code edition cited.
4. Grid lines, room names, and numbers on all floor plan sheets.
5. Wall fire ratings and legend, and provide fire stopping details for all penetrations.
6. Single line diagram of the electrical system showing normal and emergency source with segregation of the essential electrical system. Clearly identify components as normal, critical, life safety, or equipment.
7. Site plan showing service entrance, distribution system, service transformer, and generator location.
8. Drawings showing switchboards, panels, and all distribution equipment.
9. Load calculations or other approved methods showing verification of load capacity for all equipment and conductors. Show effect on both normal and emergency systems.
10. Panel schedules with totalized, tabulated loads. Panel schedules shall indicate rating of panel, branch/system (critical, life safety, equipment), and a directory that indicates loads served by each circuit.
11. Clearly indicate, AIC ratings voltage and amperage ratings of all panelboards and distribution equipment.

12. Schedules with voltage, loads and connection requirements for mechanical, kitchen and medical equipment requiring electrical connections.
13. Feeders phase and ground conductors, conduit sizes, estimated lengths, voltage drop values and overcurrent protective devices.
14. Location and power source for all wiring devices, including receptacles, lights, switches, junction boxes, power outlets, and telephone outlets.
15. Fire alarm system. Provide specifications for equipment, show location of all devices, and show connection to life safety power source. Indicate if power limited.
16. Nurse call system. Provide specifications for equipment, show location of all devices, and show connection to critical power source. Indicate if power limited.
17. All equipment must be listed, labeled, or certified by a nationally recognized Approved Agency including x-ray and diagnostic equipment.
18. Coordination studies for all new devices associated with campus fire pumps, elevators, and essential equipment.
19. Review and update scope of work on lead sheet to be accurate and representative of the proposed work for each project submitted.
20. Verify that the symbol lists are provided, accurate and appropriate for the work shown on electrical drawings.
21. Provide a construction sequence with maximum outage and/or downtime of essential equipment if design/construction will result is power outages.
22. Verify that circuits shown on the plans match the circuit descriptions in the panel schedules.
23. Show circuiting with conduit sizing and conductor counts for all circuit runs (notes are okay).
24. Include load summaries to demonstrate sufficient capacity of new and existing electrical equipment for all added loads (see PIN 38 for guidance on how to present on drawings).
25. For large projects with multiple sheets full of panel schedules provide panel schedule “keys” (like building key plans) on the panel schedule sheets.
26. Follow requirements of PIN 70 to document coordination of Essential Electrical System Over Current Protection Devices.
27. Provide a means to ensure that electrical systems outside the project boundary will be maintained.
28. Provide a means to ensure that electrical systems, such as nurse call, etc., inside the project boundary will be maintained if it is to remain operational during construction. Modifications that affect patient care may need review and approval by CDPH.

29. Incorporate any interim fire life safety requirements into the plans. For additional information refer to Section 7.6.C. of this Design Guide.

Tip: *Use the "Electrical Equipment for Healthcare Facilities" guideline located on OSHPD website.*

1) Site Plans

If the project involves outside (exterior) electrical work, then it should be clearly shown on the site plan documents. Based upon the complexity of the project, the site plan can be developed into multiple documents such as:

- Site Plan – Electrical Power
- Site Plan – Lighting
- Site Plan – Low Voltage Systems

See CAN 2-0 – OSHPD Jurisdiction to determine which components are under OSHPD jurisdiction such as utilities serving the OSHPD building. Plans submitted to OSHPD should only include the scope for OSHPD jurisdiction or clearly define OSHPD and local jurisdiction scope.

2) Power Lighting and Low Voltage Plans

It is recommended to follow the architectural floor plan nomenclature for sheet order and sheet numbering to simplify the logical sequence of cross-coordination with all disciplines. Traditionally, the power, lighting and low voltage floor plans provide the documentation of the architectural features as a shaded background and the electrical devices are prominently shown (in bold print) on top of these backgrounds with circuiting and wiring requirements shown bold as well.

3) Enlarged Drawings

Enlarged plans for specific rooms such as IT and electric rooms can be provided to detail layouts for equipment and code mandated clearances. These drawings tend to be the 1/4 inch scale or larger, to show exact placements and or intent.

4) Single Line Diagrams and Panel Schedules

Single line diagrams that show normal and emergency sources along with feeders and Overcurrent Protection Devices (OCPD's). Panel schedules that match the single line diagrams and indicate branch circuiting. These drawings are schematic in nature and no scaling is required.

C. Organization and Approach

The electrical drawings should represent work that is closely coordinated with many other disciplines such as architectural, structural, medical equipment, kitchen mechanical, and plumbing. The need to have very well coordinated drawings is especially important with respect to mechanical and plumbing equipment. Reflected ceiling plans can be used for cross discipline coordination efforts. If multiple disciplines are not coordinated, single disciplines can be signed off as code compliant, but issues can be discovered in the field. Many of the costly change orders are a result of

inaccurate documentation of existing conditions and/or poor coordination between different trades/disciplines. It is the designers' and the builders' responsibility to survey existing conditions and to coordinate all systems during design to avoid rework in the field.

D. Drawing Content

The electrical drawings should reflect the clear scope of work and the separation of different systems on their own drawings. This will provide better definition of the intended work. Examples of typical sheets in an electrical set are as follows:

Electrical Title Sheet, Drawing Index

Schedules, Notes, Lighting Schedules

Title 24 Energy Code Compliance Forms

Site Plan – Electrical

Site Plan – Lighting

Site Plan – Low Voltage / Communication

Floor Plan – Electrical

Floor Plan – Lighting

Floor Plan – Low Voltage Systems (Voice/Data, Security, CA-TV)

Floor Plan – Fire Alarm

Floor Plan – Nurse Call

One Line Diagram
- Power
- Low Voltage Systems
- Grounding

Panel Schedules

Enlarged Floor Plans – Lighting, Power Low Voltage Systems

Details
- Wiring
- Installation
- Grounding

E. Existing Conditions

Projects that occur within existing spaces require an additional level of care and planning. The need for good site investigation and documentation requires a significant level of time and costs of the design team. In many cases, the initial scope of a project may be significantly altered once the existing infrastructure is evaluated. The emphasis should be placed on field investigations, followed by clear documentation of the existing facility restraints regarding the project.

The existing electrical and low voltage systems, in most cases, must stay operational and thus significant work-around planning must be developed. Showing much of the existing infrastructure helps to convey the true scope of work to the trades involved and minimizes future scope changes.

Tip: *Following CAN 2-102.6 for remodel/renovation projects is critical to minimize OSHPD plan check.*

F. Local Requirements

The design team is responsible for ensuring that the project complies with local zoning standards, such as equipment screening, noise levels, etc. OSHPD does not enforce these requirements unless notified in writing by the local jurisdiction.

3.15 Building Information Modeling (BIM)

Modeling building systems in a 3D format can be very beneficial in reducing conflicts between systems. Large, complex hospital projects may have a plethora of equipment, piping, ducting, and other systems contained in the space above corridors and in other congested areas. Modeling the equipment and systems in a three-dimensional model can pinpoint areas where they may intersect prior to the actual installation of the equipment or systems.

Some major projects have found thousands of potential issues that were resolved during design instead of during construction. Issues that arise during construction typically require submittal of Amended Construction Documents (ACDs). This can be cause for delays in construction as well as additional costs for redesign, plan review and approval, and rework of the affected systems.

Tip: *Experience has shown that the investment of time and resources to use the BIM process during the design of large, complex projects, such as those that utilize Lean Construction or the Integrated Review process, reap dividends during construction through less redesign, fewer ACDs, and reduced rework of installed equipment and/or systems.*

3.16 Project Closure

After construction is completed, the project is still incomplete until it is Closed in Compliance. The DPOR coordinates with the IOR to ensure that this occurs timely after construction is completed and the project is turned over to the owner for occupancy and/or use. The DPOR's responsibility to the project continues up through project closure. Lack of following through on project closure is an indication of a DPOR who is not fulfilling their duty to the owner. For additional information, see Section 8, Guidelines for Project Closure.

3.17 Plan Design and Review Guidelines

Recommended Graphics and Symbols for Rated Walls

A. General Rated Wall Graphics

The minimum designation of rated walls that should be provided on all plans, including architectural floor plans, mechanical, plumbing, and electrical distribution plans should be like the following:

One-Hour Rating 

Two-Hour Rating 

Three Hour Rating 

Four-Hour Rating 

Fire barrier walls for separation of spaces such as atriums, suites, or fire partitions required for tenant space separations may use a special graphic designation to distinguish its special use. Such graphics should be clearly identified in a graphic legend on the drawings.

One-Hour Separation Wall 

B. Special Rated Wall Designations

For fire barrier walls which have special functions that need to be identified in plans, the following may be used:

Horizontal Exit or Exit Passage
(Two-Hour) 

Smoke partitions which enclose elevator lobbies and smoke barrier walls which separate smoke compartments should use a unique graphic:

Non-Rated Smoke Partition 

One-Hour Smoke Barrier 

Fire walls (CBC 706) where separations create separate buildings and have limited, or no penetrations, and must be continuous from exterior wall to exterior wall should use the following graphic:

Two-Hour Fire Wall 

Three-Hour Fire Wall 

Four-Hour Fire Wall 

(This page is intentionally blank.)

SECTION 4
INSPECTOR OF RECORD GUIDELINES

4.0 Introduction

The Inspector of Record (IOR) is an individual who is appropriately certified by OSHPD in one of three classifications of inspection. The level of classification required for each project is based on the scope, size, and complexity of the work. Only an OSHPD Certified Hospital Inspector (CHI) can be approved for hospital construction projects as an Inspector of Record (IOR). OSHPD approves three classes of IORs as follows:

CLASS A

Hospital Inspector may inspect all phases of construction, including architectural, mechanical, electrical, fire and life safety, and structural elements.

NOTE: *This class includes major structural construction.*

CLASS B

Hospital Inspector may inspect only the following phases of construction: architectural, mechanical, electrical, fire and life safety, and anchorage of non-structural elements.

CLASS C

Hospital Inspector may inspect one or more areas of construction specifically but may not inspect the complete scope of construction authorized for Class “A” or Class “B” inspectors.

The duties and responsibilities of the IOR on a project are based on the requirements found in Chapter 7 of the CAC. The IOR is interviewed and approved for each project by the design professional of record (DPOR) as appropriate and works under the direction of the Architect of Record (AOR) and/or the Engineer of Record (EOR) (Refer to CAC 7-144 and 7-145); is employed by the hospital governing board or authority; and is then approved for the project and monitored by OSHPD to perform competently and adequately to ensure compliance (Refer to CAC 7-213).

When questions arise on the assigned project, the IOR should consult the Design Professional of Record (DPOR), the appropriate OSHPD personnel associated with the project, including the Compliance Officer (CO), Fire Life Safety Officer (FLSO), District Structural Engineer (DSE), and if necessary, the Regional Compliance Officer (RCO).

It takes much more than simply having an OSHPD certification to be an OSHPD inspector. A complex hospital construction project requires a knowledge-based inspector with the proper background and experience for the project to be constructed. Inspectors help make a project successful by performing their duties (refer to CAC 7-145) properly and effectively without ever compromising their position. This section gives a general description of the duties and responsibilities, with insight to the best

practices for the IOR, along with an overview of the necessary working relationships required for a successful project.

4.1 Conduct Relative to Performance

The Inspection Services Unit (ISU) at OSHPD administers the Hospital Inspector Certification Program, assists the RCOs with approval of IORs as part of the project approval process, and is authorized to examine, certify, recertify, and monitor hospital inspectors within OSHPD's jurisdiction. OSHPD promotes a high standard of professionalism in the hospital inspection industry. Integrity, honesty, and objectivity are the fundamental principles and obligations of ethical conduct for the IOR.

Tip: *Hospital IORs must be familiar with and follow all requirements, perform all responsibilities, and maintain high ethical standards as found in the CAC 7-144 and 7-215*

IOR services may sometimes be contracted through a company or firm that provides IOR services. It should be noted that OSHPD only approves CHIs as individuals and not a company or firm for which they work, if applicable. However, whether contracted through a firm or as an IOR whose services are directly contracted for by the facility owner, in addition to other services or actions prohibited by the CAC, the IOR should **not** do the following (refer to CAC 7- 7-144 and 7-215 for conduct relative to IOR performance):

- Engage in Project Management.
- Include an IOR on a project record without inspection responsibilities.
- Provide general contractor quality control (QC).
- Act as a facility representative.
- Have contractual affiliations with approved agencies and/or special inspection companies or individuals.

4.2 Knowledge

The IOR should be thoroughly familiar with the following as applicable to the project for which the IOR has been approved:

- California Administrative Code, Part I, Chapter 7.
- Policy Intent Notices (PINs) appropriate for the project.
- Applicable Code Application Notices (CANs) appropriate for the project.
- Contract Document requirements.
- Project Schedules.
- Applicable Codes and Standards.
- Approved Contract Document (Drawings and Specifications).

- All instructions or clarifications issued by the DPOR.
- Requirements for testing and inspections based on the approved Testing, Inspection, and Observation (TIO) Program.
- Hospital procedures for notifications and special requirements.
- Temporary barriers and egress requirements as appropriate for the project. Refer to Section 7.6.C. of this Design Guide for more information.
- Infection control policies and work practices to reduce risk of exposure to infectious organisms during demolition, remodel, and construction. Refer to Section 7.6.B. of this Design Guide for more information.
- The various parties involved with the project.
- Emergency procedures.
- Safety requirements for construction and the facility.
- All the Authorities Having Jurisdiction (AHJs) associated with the project that require involvement through the project start- up, duration, close-out, and finalization.
- All associated design professionals as appropriate for the project.
- The geotechnical services and special testing lab for the project and how to notify and schedule required inspections and other testing as appropriate for the project.
- The inspection request processes for the project.
- The General Contractor's/Builder's Quality Control Program.
- Approved program flexes.
- Radiology physicist report.
- Medical equipment.
- Engineering judgments.
- Methods of Procedures for shutting down, switching over, modifying, energizing, etc. any active system in the facility.

4.3 Principal Duties

A. Scope

The following are the duties outlined in CAC Chapter 7 and are the minimum requirements for the performance of principal duties.

B. Continuous Inspection of the Work

The general duties of the inspector are as follows:

1) The IOR must have personal knowledge of the work of construction by a regular on-site presence and may only partially rely on information provided by others for specific construction work, such as special inspections, however, the IOR must use due diligence and oversight to ensure that the work is performed, tested, and inspected in strict accordance with the approved construction documents.

2) The IOR must provide continuous inspection of the work. This requires the actual presence of the IOR during some parts of the work, such as placing concrete, erecting masonry, and similar work that must be inspected as it is performed. Some work, such as framing, that can be inspected after the work is done but prior to it being concealed, may not require the IOR's constant presence. The purpose of continuous inspection is to ensure that all portions of the work are inspected.

Where work is performed away from the site, the IOR may obtain personal knowledge from the reporting of others, such as Special Inspectors; however, reasonable diligence must be exercised in obtaining the facts. This will include reviewing the Special Inspector's qualifications, periodic visits to the location where the off-site work is being performed to ensure that the appropriate qualified staff are present, and that they are performing their work in a competent, code-compliant manner.

3) The IOR must never take on other duties and responsibilities, whether on-site or off-site, that would preclude or prevent continuous inspection of the work or that could be a conflict of interest in performing the IOR's duties.

4) The IOR works under the guidance and direction of the DPOR. The IOR should never take on the roles of the design professional regarding interpreting the construction documents or providing resolutions and instructions to the contractor. However, should the IOR find possible errors and/or inconsistencies in the approved construction documents, it is the IOR's responsibility to bring them to the DPOR to resolve in conformance with the approved construction documents and Title 24.

To perform their job, the IOR must maintain sets of the approved construction documents, including the approved TIO, all test and inspection reports, and all applicable building codes, regulations, and standards that are applicable to the work of construction on the jobsite when they are present. With changes in technology, these documents are often electronic and not paper. Any unapproved documents must be returned to the DPOR for proper action. In addition, the IOR should maintain the following documents, resources, etc.:

- All documents relating to changes are: Amended Construction Document (ACD), Deferred Submittal Item (DSI), Non-Material Alterations (NMA), and the Log of all changes.

- The related building codes and standards as indicated by CAN 1-0 – Enforceable Codes
- and as shown on the approved documents.

C. Files, Records, and Reports

The IOR must maintain files for the project as outlined in Section 7-145 of the CAC and the following:

- Start of Construction Notice.
- Contractor's Schedule.
- Deferred Submittals.
- All inspections performed (on site and off site).
- Inspection requests.
- Special inspection reports.
- Certifications of all special inspectors used for the project.
- All project-related meetings.
- Daily reports from the inspection team.
- Test results from materials and certification of materials.
- Approved concrete mix designs.
- Welding procedures and Welders' Qualifications.
- All reports and documentation given by AHJs.
- All noncompliance notices issued and related notifications and communications that have had an impact on the documents' progress.
- Digital image or photos taken of the project.
- All OSHPD field staff reports.
- IOR shall compile and maintain the verified compliance reports (VCRs) submitted by the special inspector(s) for the work performed.
- Approved Plans and Building Permit
- The IOR must notify OSHPD, in writing, when the work is started or resumed on the project, at least 48 hours in advance of the time when foundation trenches will be complete, ready for footing forms, at least 48 hours in advance of the first placing of concrete, and when work has been suspended for a period of more than two weeks.

1) The IOR must maintain field records on-site regarding the progress of construction for each day or any portion of a day that they are present at the project site location. At a minimum the field record must show the information specified in CAC 7- 145. In addition, this record should contain the following as applicable:

a. The log of changes to the work prepared by the DPOR required by CAC 7-153(e) such that the record set shall be a true representation of the work in place. Deferred submittals require additional monitoring by the IOR for approval from OSHPD and incorporation into the approved documents.

b. Project specifications are maintained and must be updated with the changes that occur to the same extent that the drawings are updated through clarifications, ACDs and NMAs.

c. The record set should reflect areas that do not materially alter the work that have been added to or modified in the drawing.

d. The record set should reflect the areas where Preapproved Details have been incorporated.

e. A record of all inspections performed, including special inspections, geotechnical inspections, those done by system certifiers, verifications, observations by design professionals, project walkthroughs, and all project-related inspections; violations noted and how notifications were presented.

f. All requests and notifications for the following:

- Clarifications
- Interpretations
- Amended Construction Documents
- Deferred Approval Documents
- Inspection Requests
- Noncomplying Work
- Notifications given to the contractor. When notifying the contractor of noncomplying work use reasonable judgment and verbal notification when appropriate; when the contractor does not take immediate and appropriate action the IOR must provide a written notice in accordance with CAC 7-145(b). Always document when and how notifications have been given (even when initial verbal notification has been given).
- Discussions and agreements made, comments made by AHJs and/or needed corrections, memos of concerns, and inquiries to the DPOR for document interpretations.
- Incidents affecting the hospital systems or accidents related to the project.
- Schedule impacts.
- Workforce.

- Weather.
- Any deficiencies in materials and installations.
- Any direction given by the DPOR.
- All photos taken for progress identification and problem documentation.

g. Log and record areas that do not materially alter and have been added to or modified the drawings and/or specifications for OSHPD review upon its visits. The log may be maintained and available by electronic transmission and on the project site as part of the inspector's field records. Refer to CAC 7-153 (e).

h. Log and record the areas where Preapproved Details have been incorporated for OSHPD review upon visits – See PIN 51 – Use of HCAI Pre-Approved Details.

i. Provide courtesy notices to the contractor and appropriate design professionals of deficiencies observed prior to a request for inspection.

j. The IOR may serve as a special inspector when approved in the TIO Program. For additional information on special inspections, see Section 5, Testing, Inspection, and Observation Guidelines.

k. The IOR is responsible for assuring that all areas requiring special inspections are inspected and accepted by special inspectors. The IOR shall maintain on the job a file containing daily field reports for all special inspections.

2) Field records may be kept electronically and may be retained off-site if they are available to OSHPD staff, the DPOR, and the owner when requested. However, they must always be on-site when the IOR is present. After completion of the project construction the original field records must be submitted to the hospital owner for their records – refer to CAC 7-145(a)6.

3) The IOR is responsible to notify the contractor, in writing, of any noncompliance with Title 24, which have not been immediately corrected by the contractor. Should this occur, copies of these notices are to be forwarded immediately to the DPOR, the owner, and to the OSHPD.

D. Code Required Verified Compliance Reports (VCRs)

Verified Compliance Reports (VCRs) (refer to CAC 7-151) (Form OSH-FD-123) must be submitted to OSHPD at the intervals, work progress, milestones, etc. as stated in the approved TIO Program. A VCR must always be submitted at the completion of the work. The IOR and the DPOR should monitor the status of all post approval items, deferred submittals, etc. and confirm compliance of approved construction changes and deferred submittals in the field. OSHPD approved construction documents are to be the basis of all inspection work. Shop drawings are generally used by the builder for fabrication and/or installation of specific items and components that are to be installed during the construction process and are not part of the OSHPD approved construction

documents. Therefore, they will not be used as a basis for inspection unless they have been submitted to and approved by OSHPD as part of the construction documents.

4.4 Documentation and Processing "Non-Material Alterations"

CAC 7-153. Changes to the approved work, defines "Materially Alter" (as applied to construction projects or approved construction documents) as any change, alteration, or modification, as determined by OSHPD, that alters the scope of a project, causes the project to be in noncompliance with Title 24, or causes an unreasonable risk to the health and safety of patients, staff, or the public. Only changes that materially alter the work must be submitted to OSHPD as an ACD for review and approval.

CAN 1- 7-153(b) – Non-Material Alterations (NMA) defines the types of changes to the approved construction documents that do not materially alter the work during construction and therefore are not subject to formal submittal and review by OSHPD. The IOR's record set of approved documents is utilized to monitor, record, and provide for OSHPD observation of items that qualify as "does not materially alter" the work. The DPOR shall determine what qualifies and what does not. No amended construction document required.

If the DPOR determines that changes to the approved construction documents are necessary and do not materially alter the work, all such changes shall be stamped and signed by the appropriate design professional(s) pursuant to CAC 7-115. All changes in the work are subject to concurrence of the OSHPD field staff as to whether the change materially alters the work.

The DPOR shall maintain a log of all changes to the work of construction. The log shall indicate whether OSHPD has decided as to whether each change materially alters the work, the date such determination was made, and the name of the OSHPD staff who made the determination. The log must be maintained as part of the inspector's field records. The log must show all items approved by the DPOR as materially altering as opposed to amending the construction documents (ACD). The log will include sequential numbering, item description, and a block with the initials and date of the OSHPD staff who concurred with the design professional's determination that the change did not materially alter the work. The record set should indicate areas that are modified with a cloud and delta. Provide the number corresponding to the delta in the title block. In addition, all changes must be stamped and signed by the appropriate design professional.

4.5 Inspections and Types of Inspections Provided by the IOR

There are three types of inspections provided by the IOR:

1. Continuous inspections as outlined earlier in principal duties.
2. Inspections completed using inspection requests.

3. Required inspections listed with the TIO Program as outlined Section 7-141 of the CAC. Refer to Section 5, Testing, Inspection, and Observation Guidelines.

OSHPD only allows the IOR to inspect the project consistent with what is provided in the permit documents. Construction and inspections should be limited to what has been permitted. If the project has a permit, then this indicates that there is adequate information contained in the documents to inspect. It is not the IOR's responsibility to interpret code, but to verify installations meet code requirements that are part of the approved documents. The IOR should inspect what is installed and either confirm that it meets the requirements indicated in the permit documents or note the deficiencies and deviations not in compliance with Title 24 in a daily report, inspection request, and/or courtesy notice provided to the DPOR, owner, and contractor in writing. In this regard the IOR should:

- Communicate with the contractor to ensure understanding of the contract documents.
- Request manufacturer's literature or printed instructions if referenced and in doubt.
- Observe that the testing Approved Agency performs all tests and inspections required.
- Review test results and notify the contractor and DPOR of observed deficiencies.
- Refer suggestions or recommendations made by the contractor to the DPOR.
- Accompany the DPOR's consultants when observing or inspecting the work.
- Record and report conditions that may cause a delay in completion of the work.

The IOR should never authorize deviations from the contract documents nor should an IOR interfere with the work being performed by the contractor nor assume any responsibility for the performance of the contractor's work. It is not the role of the IOR to advise or issue directions relative to any aspect of construction means, methods, techniques, sequences, or procedures.

The inspection request is one of the few important tools an IOR has for documenting, tracking, organizing, verifying, and maintaining accountability and provability of inspections conducted on a OSHPD project. CAC 7-145(a)1 requires the IOR to have personal knowledge of all parts of the work.

The IOR should begin information of the inspection request program at the first preconstruction meeting. In addition, having a one-on-one meeting with the project contractor to let her/him know what is needed and expected to perform your required inspection duties will facilitate a better and more detailed understanding of the program and how adherence to the program will improve the outcome of the project for all parties.

The IOR must be consistent with inspections by insisting that all work requires an inspection by the IOR and/or special inspector, if applicable, prior to covering the work. In addition, the contractor should maintain strict compliance with its Quality Control Program.

Tip: *The contractor will properly present inspection requests to the IOR provided the IOR is consistent in implementing the system as established.*

4.6 Other Project Related Duties

Other Project Related duties of the IOR include the following:

- Attend preconstruction meetings.
- Attend various project related meetings as required.
- Effectively communicate with contractor, OSHPD, the Structural Engineer of Record (SEOR), the AOR, and owners.
- Keep in contact with the AHJs and notify them about all phases of the work and meetings that may require their presence at the site. Keep ahead of the work being performed to anticipate required inspections that might tend to interfere with the progress of the construction.
- Do not assume responsibility for any safety procedures. Should hazards be observed, report conditions to the contractor.
- The IOR is not a safety engineer or a safety inspector. Job-site safety measures and procedures are the sole responsibility of the contractor and are normally so specified in the contract documents. Many safety aspects of a project under construction involve the adequacy of shoring in trenches or scaffolding or false work, which cannot be easily determined without an engineering analysis of size and placement of support members. The IOR should find out who the contractor has designated as its site safety engineer or representative-in-charge of site safety. Also, the IOR should determine who is second in charge in case the contractor's safety representative is absent. These individuals are responsible for maintaining safe conditions at the job site for the workers, authorized visitors, and others who have a right to be on site, including the design professionals, consultants, AHJs, and the IOR. The IOR must follow all safety directions from the Contractor's Safety Engineer.

4.7 Checklists

Many books written about project inspections and administration of inspections include checklists. One such book is the Construction Inspection Manual. As discussed in Section 5, Testing, Inspection, and Observation Program Guidelines of this Design Guide, the TIO Program is a basic project specific checklist of tests, inspections, and observation requirements. It is described in CAC 7-141. The most complete checklist of what needs to be verified and inspected is the approved documents and the information contained in them. The building codes and standards are also applicable.

OSHPD has a standard fire and life safety checklist and other checklists on its website. Comprehensive checklists can be purchased from a variety of sources. Specific checklists are not provided here because of the numerous items needed to make them comprehensive and because any checklist would vary from project to project.

4.8 Coordination Concerns

Coordinating the work is the responsibility of the contractor. However, successful coordination requires all parties to communicate with each other so that construction can proceed in an orderly manner. Although verbal communication is used extensively, scheduling, and legal procedures required during construction are best served by written correspondence, with proper distribution of copies to all concerned parties including the owner's representative.

In addition to work coordination, various notifications and compliance with hospital facility in-house requirements must be met. These notices and compliances should be approved by the owner's representative. Because lives are at stake in the hospital, procedures for notifications, barriers, infection control, and life and safety issues concerning the hospital need to be communicated to all parties of the construction group, AHJs, AOR, EOR, etc. The best times to initially review these issues are during preconstruction meetings. These should be held prior to every phase of construction or when a new group begins construction.

The IOR needs to have personal knowledge of the construction progress and schedule. When applicable, the IOR should be aware of how the work affects the operations of the hospital. Though the IOR may not be directly responsible for the execution of notifications and infection control practices, the IOR should be aware when procedures are not followed or overlooked and notify the appropriate personnel.

4.9 Preconstruction Meetings

A preconstruction meeting can be a powerful tool and help prevent much of the conflict that could develop in the field. The following individuals should attend the preconstruction meeting:

- Contractor (who exerts minimum, direct control and coordination of the subcontractors).
- Project manager, when applicable (who understands the contractual obligations of his or her subcontractors).
- Project engineer, when applicable (who understands the need and status of all submittals).
- Project secretary or someone designated to record meeting attendees and provides meeting minutes.
- Major Subcontractors (at least the foreman, project manager, or other representative).

- Manufacturers' representatives, when applicable (who can provide information and guidelines).
- Architect and engineer in responsible charge (as appropriate) and other design professionals associated with the project as applicable.
- Hospital staff of affected areas (when appropriate).
- OSHPD personnel (who can advise on OSHPD's policies, procedures, and expectations).
- Project IOR (or all IORs if there are multiple IORs).
- Special inspector and/or Approved Agency representative (if needed or required).
- Consultants (when needed).
- Facilities maintenance representatives when applicable (who normally will be invited to the preconstruction walk-through if there are areas of the hospital that may be affected).
- Infection control and safety officers.

The advantage of having the preconstruction meeting is that all the key parties will be in attendance and thus everyone will be apprised of their individual accountability. The IOR can provide advice on potential problems, OSHPD required procedures, and the minimum requirements to satisfy code, approved documents, hospital procedural considerations, infection control enforcement, life and safety issues, and inspection procedures. Chapter 7 of the CAC is very clear about the need for approved documents prior to commencing work. Some projects will refer to a preconstruction meeting as a pre-installation meeting. Some project specifications may lack direction in defining when meetings are required, who will attend, and how it will be conducted.

Tip: *The Preconstruction meeting should be used by all parties to ensure that the project starts off in a good way. This can be accomplished by everyone knowing what their roles and responsibilities on the project are. The meeting should also be used to establish good working relationships and effective lines of communication.*

A. Preparation for the Preconstruction Meeting

Above all else, the IOR should be prepared. The IOR should have all information received from the owner and DPOR available. The IOR needs to review this prior to the meeting. This information should include:

- Approved drawings.
- Project specifications.
- Project schedule.
- A copy of an inspection request.

- GC's Quality Control Program.
- Approved TIO Program.

The IOR should be familiar with the project schedule and the actual work taking place. If advanced notice of the preconstruction meeting is given at the owners meeting, it then becomes part of the meeting minutes and will be carried forward until the preconstruction meeting takes place.

B. During the Meeting

Meetings are usually run by the DPOR, or the contractor. Participation by other contractors and subcontractors will vary based on their level of preparation and experience. During the pre-construction meeting, the contractor should be able to give assurances regarding personnel and materials to complete the work.

The OSHPD Field Staff may do the following:

- Request the DPOR establish and define lines of communication among subcontractors, contractors, design professionals, the IOR, and OSHPD field staff.
- Identify and review the requirements of the Hospital Seismic Safety Act of 1983 and Chapter 7 of the CAC.
- Summarize the overall duties, observation, and coordination functions of the AOR or SEOR as required by Chapter 7 of the CAC, including preparation of ACDs, and VCRs, site visits to verify work, and certification and submittals to OSHPD.
- Summarize the overall duties of the IOR, reporting relationships, and the IOR's responsibility to verify compliance with the plans, specifications, and applicable codes.
- Discuss required coordinated review of the project by OSHPD representatives (CO, FLSO, and DSE).
- Identify specific and/or unusual code and project requirements, such as air balance requirements, systems to remain functional or to be modified during construction, infection control measures, interim life safety measures, temporary equipment and systems, hours of work, noise-related issues, etc.
- Explain the procedures and requirements for approving ACDs. Review the approved TIO Program.
- Discuss the schedule for submittal of DSI to avoid delays in construction.
- Review scheduling requests from owners and contact information for the hospital representative.

- Review the project closure requirements to ensure that everyone is aware of their duties and responsibilities for closure of the project in compliance so that timely occupancy and/or use of the project can be obtained from OSHPD.
- Describe AHJ's involvement, requirements and procedures with contractors and subcontractors for the permitted documents.

The IOR should do the following:

- Ask how the contractors intend to accomplish the work and allow them to walk you through the construction process.
- Review the specifications. The subcontractor may not be aware of the unique requirements of the project and may not have reviewed the specifications.
- Give a copy of the inspection request to all parties and reasons for the correction by providing the applicable code, standard, specification section, and the appropriate reference to the approved drawing. Provide a copy of how the IOR will notify the contractor and go over the notification requirements. It is important to stipulate the quality standards expected so that all responsible parties will adhere to the approved documents.
- Review the TIO Program requirements.
- Review the noncompliance procedures.
- Review what the IOR needs to see and at what stage the IOR must perform inspections.
- Discuss material inspection upon arrival at the project.
- Ensure that contractors and subcontractors understand what is to be coordinated through the IOR and the project manager.
- Make it clear to the contractor that the IOR is not responsible for reviewing the adequacy of the contractor's safety program.
- If OSHPD field representatives are not present, describe AHJ's involvement, requirements and procedures with contractors and subcontractors for the permitted documents and specifically the TIO Program.

The preconstruction meeting is an opportune time to bring up fire stopping of penetrations and to inform the contractor that all penetrations will have to be completed per a listed testing agency, such as Underwriters Laboratories (UL). Engineering judgments should only be used in rare cases as the process of obtaining one may delay the construction. Bringing such issues to the contractor's attention early should mitigate potential problems.

Note if and what specifications were reviewed, who attended, and, in general, what was covered. For example, the contractor and/or subcontractor needs to be aware of any special requirements, inspection requirements, OSHPD notifications, testing requirements, infection control requirements, notification requirements, shutdown

procedures, submittal requirements, material samples, special requirements for phased construction, etc.

4.10 OSHPD Interaction

The IOR acts under the direction of the DPOR. The IOR serves as the eyes and ears for various parties including the architect, structural engineer, other design professionals associated with the project, AHJs, owners, and owners' representatives.

It is important that the IOR prepare documentation representing the various inspections conducted on an OSHPD project to give evidence of compliance and that inspections are conducted continuously. This allows the CO, DSE, FLSO, and RCO to observe the inspection process and to ensure that adequate and competent inspection is provided and documented. It is not the responsibility of OSHPD to provide the inspections.

The IOR should be able to show an OSHPD representative the approved documents and the maintained record documents that show approved changes and a true representation of the project. The IOR should be able to show how inspections have been organized, discuss project progress, and describe any problems being faced in the field.

Normally, the IOR will perform a walk-through of the project with the OSHPD representative. If the OSHPD representative has any concerns at that time, the inspector shall note it and ensure that the appropriate parties are notified via a copy of the OSHPD field staff report.

OSHPD representatives can be valuable resources for the IOR since they have a wealth of first-hand information regarding hospital construction practices and should be consulted as needed. OSHPD representatives encounter many problems as they visit various projects and thus can assist in preventing mistakes and advise the IOR of potential issues, often before they arise. The IOR should use OSHPD's visits to take advantage of the advice provided by its representatives.

Tip: *The IOR shall contact the various OSHPD representatives for special reviews of work and needed visits.*

4.11 Project Closure

After construction is completed, the project is still incomplete until it is Closed in Compliance. The IOR coordinates with the DPOR to ensure that this occurs timely after construction is completed and the project is turned over to the owner for occupancy and/or use. The IOR's responsibility to the project continues up through project closure. Lack of following through on project closure is an indication of an IOR who is not fulfilling their duty to the owner. For additional information, see Section 8, Guidelines for Project Closure.

4.12 Concluding Remarks

An IOR needs to have good communication skills to minimize misunderstandings. By being consistent and providing organized documentations, an IOR can assist in keeping a project on schedule. There are no skills, however, that can replace a well-produced set of approved documents and a contractor willing to comply with them. But with foresight and a thorough understanding of the process, an IOR can pace the project, complete timely inspections, and provide notifications and documentation that will keep a project moving. The IOR can help to ensure that the project complies with the approved documents, making for a smoother close-out process.

SECTION 5
TESTING, INSPECTION, AND OBSERVATION PROGRAM GUIDELINES

5.0 Introduction

A Testing, Inspection, and Observation (TIO) Program is required by Title 24 for all hospital building projects in California. The purpose of the TIO is to identify all tests, inspections, and observations required for a particular hospital construction project, and the individual or entities to provide the required testing, inspections, and observations. In this way it performs a similar function of a "Job Card" on a non-OSHPD construction project under a local jurisdiction. Title 24 requires specific information be provided in the TIO but does not stipulate a certain format in which it must be presented to OSHPD for approval. Therefore, the use and application of this recommended Guide is voluntary. It is intended to be a guideline used by design and construction professionals involved in new and remodel hospital building projects in California and is based on the provisions in CAC 7-141.

5.1 Purpose

The purpose of these guidelines are:

- To increase collaboration, accountability, and cooperation among those design and construction personnel responsible for new and remodel construction in California hospitals.
- To help with the efficient development and implementation of the TIO Program required by Title 24.
- To clarify the roles and responsibilities of the parties involved with the design, inspections, testing, construction, and approval of hospital building projects in California.
- To better define the TIO requirements and the sequential milestones associated with projects through the course of the project development.

5.2 Maintenance and Administration

A TIO Program must be submitted with every plan review application, and an essential element of its successful implementation is the ongoing effort by the project team through the construction process. It is particularly important for the Design Professional of Record (DPOR) to keep all aspects of the OSHPD approved program current with evolving project conditions. Although these conditions will generally include tests, inspections, and milestones, they will almost certainly include information on responsible personnel as the project team members become known or as they change over the course of the project. The TIO is not a rarely referenced static program; rather, it constitutes a dynamic document that the entire project team must regularly reference as a benchmark for ongoing quality assurance.

5.3 Format

OSHPD has developed and published spreadsheet based TIO forms and is currently developing an online TIO application. These TIO options were developed to assist design professionals working on projects under OSHPD's jurisdiction with the creation and administration of the TIO program. The OSHPD developed TIO has commonly used tests and special inspections, however a design professional, depending on their project scope, may need to add additional tests and special inspections not listed. There is no code section requiring a design professional to use the OSHPD developed TIO form. The design professional may design and implement their own TIO form and program. Regardless of the preferred format, all TIO Programs should be created by design professionals who are thinking critically about the work scope and how to best preserve design intent and maintain construction quality.

5.4 Instruments

Traditionally the DPOR creates and maintains TIO Programs using the standard OSHPD Forms. Although this is acceptable, it may not reflect the best approach to the State's requirements because of the concentrated involvement that is required for the ongoing TIO Program implementation over the course of the project. Depending on the size and nature of the construction projects, alternate means for developing and maintaining the integrity of the construction quality may offer better solutions for achieving the objectives of the TIO Program requirements. The IOR should maintain current documents and report activities in their daily records related to the TIO Program. The management needed for ensuring the currency of the TIO Program in the field is the responsibility of the DPOR.

5.5 Contract Drawings

Although including the TIO Program within the sheets of the OSHPD approved and large-format construction drawings is possible, this approach may be cumbersome to maintain. Personnel, firms, tests, inspections, and milestones are dynamic because of the nature of the project. Rather, a stand-alone letter or legal-size document that is approved separately from the rest of the project and that can easily be transmitted to others on the team may offer a more manageable approach. Revisions to the approved TIO Program that do not change the intent of the original approved plans, specifications and/or code required tests, or inspections and that do not constitute a material alteration as defined in the CAC 7-111 are not required to be submitted to OSHPD for review and approval as noted in CAC 7-153 but do require concurrence and acceptance of the appropriate OSHPD field staff.

5.6 Instructions

Within the first pages of the TIO Program there should be "Instructions" to the project personnel for the proper implementation of the program. Along with clarifying the expectations for its use, the "Instructions" should clearly define the responsibilities of the project participants as they relate to the TIO Program. Instructions are optional but may

be beneficial depending on the size and scope of the project and the level of OSHPD experience for all parties involved in the project. The forms HCAI-FD-303A and HCAI-FD-303B that are posted to the HCAI website are acceptable instruments to use for the TIO Program development and include some basic instructions. However, the DPOR may find that more detailed instructions like the two examples below may be more helpful.

Example 1:

TESTING, INSPECTION, AND OBSERVATION PROGRAM (TIO)

INSTRUCTIONS:

- The TIO Program is a part of the OSHPD approved construction documents.
- The DPOR is responsible for the development and administration of a project specific TIO program.
- The DPOR shall coordinate with all design professionals assigned to the project to establish the scope of the testing and inspections.
- The DPOR shall be responsible for the distribution and gathering of all required Verified Compliance Reports (VCRs) and Test and Inspection Forms.
- A copy of the approved TIO form will be distributed upon issuance of the OSHPD Building Permit.
- A copy of the approved TIO form should be kept with the approved plans at the job site throughout construction.
- A copy of the TIO program shall be maintained at the project site by the Inspector of Record (IOR) and serve as a job card throughout the course of construction.
- Certifications of all special inspectors, owner provided third party certifiers, and manufacturer required certified technicians are required to be approved by the DPOR and collected by the IOR.
- All design professionals, the general contractor, approved agency, and the project inspector of record must submit VCRs, when required, at the progress milestones and observation intervals identified in this TIO program.
- When the field conditions disclose the need for additional tests, special inspections, and/or observations, the TIO program may be amended by the DPOR.
- The new amended TIO must be submitted to the Office if there are Material Alterations to the approved plans, specifications, and/or code required tests or inspections.
- When an Amended Construction Document revises the scope of a project and additional tests are required, a revised TIO program will be submitted to OSHPD for review and approval.
- After the tests and inspections identified on the Approved TIO form are completed, verified, and accepted, it shall be submitted to the DPOR and will become part of the required project closure documentation.

Example 2:

TESTING, INSPECTION, AND OBSERVATION PROGRAM (TIO)

INSTRUCTIONS:

- The TIO Program is a part of the OSHPD approved construction documents. The DPOR is responsible for the development and administration of a project specific TIO program. This includes the identification of individuals and companies performing the required tests, inspections, and observations. The DPOR shall coordinate with all design professionals assigned to the project to establish the scope of the testing and inspections. They shall coordinate with the owner, OSHPD field staff, and the entire design team to identify the critical milestones of progress and observation intervals to verify construction compliance. The DPOR shall be responsible for the distribution and gathering of all required Verified Compliance Reports and Test and Inspection Forms.
- A copy of the approved TIO form will be distributed when the building permit and IOR application have been approved by OSHPD. A copy should be kept with the approved plans at the job site throughout construction. The original approved document will be maintained in the OSHPD files. The OSHPD staff will initial the "Construction Acceptance" box in the approved TIO program as the work is completed and accepted. A copy of the TIO program shall be maintained at the project site by the IOR and serves as a job card throughout the course of construction.
- Certifications of all DPOR acceptable special inspectors, owner provided third party certifiers, and manufacturer required certified technicians are required to be collected by the IOR. Once they have been collected, they become part of the project file.
- All design professionals, the general contractor and the project inspector of record must submit Verified Compliance Reports (VCRs) at the progress milestones and observation intervals identified in this TIO program. Furthermore, each Special Inspector or (when acceptable to the office) an officer of the firm milestones and observation intervals identified in this TIO program. Furthermore, each Special Inspector or (when acceptable to the office) an officer of the firm employing the Special Inspector(s) must submit Test and Special Inspection documents to the IOR and the DPOR.
- The firms and individuals assigned to perform the tests and special inspections may not be fully identified in the program. In cases where not all names have been included in the TIO program, the building permit and TIO program can be approved by OSHPD with comments. Once the firms and individuals performing the tests and special inspections are identified, a revised TIO form must be submitted for field review and approval by the appropriate OSHPD field staff. OSHPD field staff will issue a Field Visit Report indicating the approval of the TIO program.
- When the field conditions disclose the need for additional tests, special inspections, and/or inspections, the TIO program may be amended by the DPOR. When an Amended Construction Document revises the scope of a project and additional tests are required, a revised TIO program will be submitted to OSHPD for review and approval.
- After the fully executed and completed Approved TIO form is initialed by the IOR and OSHPD staff, it shall be submitted to the DPOR and will become part of the required project closure documentation.

Tip: *The TIO is a critical document used for quality control that validates the completed construction project meets the design intent, the owner's expectations, and complies with Title 24. This ensures a safe built environment for patients, staff, and visitors to hospital facilities.*

5.7 Responsible Personnel

Successful projects include a full complement of required personnel who are fully engaged in the process and communicate often and deliberately regarding the various TIO issues. Included within this group are owners, design professionals, inspectors, OSHPD staff, and contractors. Each of these participants and their contact information should be clearly presented in a directory on the TIO Program. Relative to the TIO Program, each must be responsible for certain aspects of the quality assurance and controls as follows:

Example:

St Elsewhere Memorial
Sample Project

HS-999999

DIRECTORY **Section A**

Role	Name			Registration	Company
POR Professional of Record Porview Rd	**POR Sample** Porterville	Ca	33333	55555 ph 222-333-4444	**PORs R US** fax 555-666-7777 por@tio.com
OB Owner Builder 111 Elsewhere Ave	**Hospital Sample** Elsinor	Ca	11111	 ph 111-222-3333	**St Elsewhere Memorial Hospital** fax 333-444-5555 hos@tio.com
CO OSHPD Compliance Officer 400 R Street, Ste 200	**OSHPD CO** Sacramento	Ca	95811	55555 ph 916-440-8300	**OSHPD - SAC** fax 916-324-9188
DSE OSHPD District Structural 400 R Street, Ste 200	**OSHPD DSE** Sacramento	Ca	95811	55555 ph 916-440-8300	**OSHPD - SAC** fax 916-324-9188
FLS OSHPD Fire and Life Safety 400 R Street, Ste 200	**OSHPD FLSO** Sacramento	Ca	95811	55555 ph 916-440-8300	**OSHPD - SAC** fax 916-324-9188
IOR Inspector of Record 999 Inspection Rd	**Joe Ior** Quality City	Ca	91001	A-9999 ph 999-999-9999	**IORs R US** fax 999-888-8888 ior@tio.com
SI Special Inspector Laboratory Lane	**Joe Lab** Testing City	Ca	91101	1234 ph 999-777-1111	**LABS R US** fax 222-333-5555 labrie@tioteamline.com

Figure 5.1 – TIO Program Directory

A. Owner

The owner is responsible for funding a quality assurance program, including the TIO Program. The owner is responsible for the general oversight of the project progress and performance of all others associated with the development and implementation of the TIO Program. If the project does not require the service of a DPOR, the program should be prepared and submitted by the applicant.

B. OSHPD Staff

The OSHPD staff is responsible for the review and approval of the TIO Program. During construction they are responsible for the acceptance of the performance of the inspection personnel. Furthermore, they are responsible for the acceptability of tests and inspections as verified by the IOR and the DPOR and reported in VCRs.

C. Design Professional of Record

The DPOR is responsible for the development and ongoing administration of the project specific TIO program. This includes the identification and acceptance of individuals and companies performing the required tests, inspections, and observations. They will coordinate with all other design professionals assigned to the project and the IOR to establish the scope of the tests and inspections and determine which, if any, of the tests, inspections, and milestones must be observed by the OSHPD field staff. The DPOR should coordinate with the owner, OSHPD staff, IOR, and the entire design team to identify the critical milestones of progress and observation intervals to verify construction compliance. Furthermore, they are responsible for the distribution and gathering of all required VCRs and Test and Special Inspection Forms.

D. Inspector of Record

The DPOR, in coordination with the IOR, is responsible for the overall quality assurance of the project. The IOR is responsible for coordinating, reporting, and validating the work done by the approved agency, owner provided third party testing, and special inspectors, and for gathering, maintaining, and validating related test and inspection documentation. Such documentation should include credentials of special inspectors, collection of OSHPD Test and Special Inspection forms, and distribution of OSHPD staff field reports to the owner, contractor, and the DPOR. The IOR is responsible for validating and reporting on the installed work performed by the contractor. The contractor is responsible to submit VCRs to the DPOR at predefined progress Milestones as prescribed on the OSHPD approved TIO and they are responsible for keeping records relative to the status of sign-off by those responsible to perform, verify, and accept the prescribed tests and inspections during construction. As outlined in the OSHPD approved TIO, the IOR will perform all the inspections which identify the IOR as the responsible party for the designated inspections.

E. Contractor

The contractor is responsible for control of construction means, methods, techniques, sequences, and procedures, for providing a safe place to work, for constructing the project in accordance with the OSHPD approved construction documents; and for controlling the quality of construction. The contractor is also responsible for providing safe access to those elements that require tests and inspections by inspectors, OSHPD staff, design professionals, and the owner. They are further responsible for submitting VCRs to the DPOR at the predefined progress milestones or observation intervals as prescribed on the OSHPD-approved TIO Program.

F. Special Inspectors

The special inspectors are generally employed by the Approved Agency and must be paid by the owner. They have qualifications and certifications that demonstrate experience with the types of construction in which they are certified to inspect. They must be explicitly accepted by the DPOR, identified in the TIO Program, and are responsible for special inspections and related documentation as prescribed in the OSHPD approved TIO Program.

G. Design Professional

The design professionals are responsible to identify and coordinate with the DPOR in general responsible charge for all the necessary tests and inspections within their respective design discipline. They are further responsible for conducting field visits to observe and report on conditions relative to their design specifications. Each design professional is responsible for submitting a VCR to the DPOR at the predefined progress milestones and observation intervals as prescribed in the OSHPD approved TIO Program.

5.8 Tests

The TIO Program should clearly identify the required building elements and systems to be tested for the entire project scope in accordance with CAC 7-141(e). Each test should be properly identified and referenced to the pertinent code and/or guideline. It should present a brief description of the test requirements and the discipline of construction to which it applies. The TIO should identify the progress status and persons responsible to perform the tests, verification that the tests were conducted in conformance with building code standards, and the acceptability of the test results.

5.9 Inspections

The TIO Program should clearly identify the required building construction processes that require special inspection in accordance with CAC 7-141(g). Each inspection should be properly named and referenced to the pertinent code and/or guideline. It should present a brief description of the inspection requirements and the discipline of construction to which it applies. The TIO should identify inspection progress status and persons responsible to perform the inspections, verify that the inspections are conducted in conformance with building code standards, and the acceptability of the special inspection process.

5.10 Milestones and Intervals

The TIO Program should clearly identify all required progress Milestones and Intervals for observation throughout the duration of the construction. Each should be properly identified and sequentially numbered. Each should include a brief description of the relevant elements of construction that are to be completed within it. Although the TIO must identify the progress status and participants responsible to submit VCRs at each of these progress steps, it is left to the discretion of the DPOR whether assigning

expected dates for reaching such Milestones is beneficial. In addition, OSHPD staff may require a VCR be submitted at any additional milestone or interval deemed necessary.

***Tip:** Determining the appropriate milestones and intervals for observations on a project is important to its ultimate success by ensuring that the project is on track to comply with the construction documents and Title 24. Verifying compliance of completed work as it progresses will reduce the possibility of rework or delays in construction.*

5.11 Samples

TIO Programs that include samples of tests, inspections, observation reports, certifications, and other related documents can often further clarify the expectations for compliance with the requirements for TIO Programs. Tests and inspections performed by Approved Agencies that are approved and in good standing with the OPAA Pre-Approval Program need not submit sample reports.

5.12 TIO Modifications

It should be clearly identifiable if or when the design professional has modified the document. This could be accomplished by a summary letter describing the changes and the reason by the appropriate design professional/DPOR along with a dated revision of the TIO and the delta number. This is then initialed by the appropriate OSHPD Field Staff (CO, FLSO, or DSE as applicable) as having been field approved for the modification. Any modifications are usually reviewed with OSHPD field staff during their field visit. Typically, no further documents will be required by OSHPD for the process of changing the TIO.

5.13 Review and Approval

The TIO Program should include a “TIO Reviewed” page with OSHPD plan review staff signature and a “Field Staff Approval Page” that clearly documents the certification by the DPOR and the approval by OSHPD field staff. It should identify all applicable codes and any notes that will clarify its application.

5.14 Conclusion

Regardless of the specific approach used to develop and maintain TIO Programs, strong leadership of the team throughout the process is of paramount importance. Leadership by the DPOR must include open communication and persistent monitoring of the TIO progress. Project quality can best be assured by teams of design, construction, and inspection professionals committed to excellence through critical thinking that is properly applied to specific conditions of the project.

SECTION 6
GUIDELINES FOR CONTRACTORS WORKING ON OSHPD PROJECTS

6.0 Introduction

After the plans and specifications for a hospital project have been approved and the building permit and approval of the Inspector of Record (IOR) has been issued, OSHPD's responsibility passes to its field staff. The field observation group comprises a Regional Compliance Officer (RCO), Compliance Officers (COs), District Structural Engineers (DSEs), and the Fire Life Safety Officers (FLSOs). This section presents a brief description of their duties and offers suggestions on how to develop an efficient and professional working relationship that will maximize the effectiveness of the construction process from a regulatory perspective. The regulatory requirements and authority are specified in Chapter 7, Safety Standards for Health Facilities in the California Administrative Code (CAC).

The contractor is responsible for control of construction means, methods, techniques, sequences, and procedures, for providing a safe place to work, for constructing the project in accordance with the OSHPD approved construction documents; and for controlling the quality of construction. The contractor is also responsible for providing safe access to those elements that require tests and inspections by inspectors, OSHPD staff, design professionals, and the owner. They are further responsible for submitting Verified Compliance Reports (VCRs) to the Design Professional of Record (DPOR) at the predefined progress milestones or observation intervals as prescribed on the OSHPD-approved Testing, Inspection, and Observation (TIO) Program.

OSHPD field staff is responsible for ensuring that hospital buildings are constructed per the approved plans and specifications. OSHPD will make such observations that in its judgment are necessary or proper for the enforcement of the regulations and all applicable parts of Title 24.

The construction of hospitals in California is a complex and demanding process that requires effective management and cooperation of the various stakeholders involved. The needs and requirements of each stakeholder must be taken into consideration:

- Contractors may want to make changes to material specifications or change the design to improve construction efficiencies, or they may find details that cannot be constructed.
- The design team wants the project constructed in compliance with the approved documents. Designers may leave many details to the discretion of the contractor as "means and methods", however, any such deviations may be changes that require OSHPD approval (see CAN 2-107.4 – Amended Construction Documents).
- The owner would like a quality project constructed on time and within budget.
- California law requires that OSHPD approval be obtained before any construction is performed.

6.1 Overview of the Process

The contractor begins construction per the approved plans and specifications. The Inspector of Record (IOR), who is the primary liaison with OSHPD during construction, continuously inspects the construction work as it is proceeding and maintains records of the activities, as described in Section 4, Inspector of Record Guidelines, of this Design Guide. The OSHPD field staff makes scheduled and unscheduled visits to the project to observe the execution of the construction by conducting a construction site review and audit of the TIO Program (see Section 5, Testing, Inspection, and Observation Guidelines) and project construction documentation with the IOR. The DPOR also makes periodic visits to observe the construction to ensure work is compliant with the design.

The field staff triage requested changes and either approves the changes in the approved construction documents or directs that the design professional forward the documents to the OSHPD Plan Review group for review and approval. For detailed guidelines for plan review, see Section 3, Plan Design and Review Guidelines.

In an ideal project, the plans and specifications would be followed exactly such that the contractor builds the structure in strict compliance with the plans, the IOR performs continuous inspection competently and adequately, and the OSHPD field staff visit the project as frequently as needed. Critical elements must be managed carefully to ensure that:

- Changes are only made when they are absolutely needed or required.
- All construction is approved by OSHPD.

Comprehensive control of all documents, including amended construction documents (ACDs), inspection records, and reports, is key to the success of a project.

6.2 Inspector of Record

The Inspector of Record (IOR) is an individual who is certified by OSHPD to perform “continuous inspection” on hospital projects as required by statute and Title 24. Only OSHPD Certified Hospital Inspectors can be approved for hospital construction projects. The duties and responsibilities of the IOR on a project are based on the requirements found in Chapter 7 of the CAC. The IOR is interviewed and approved for each project by the DPOR as appropriate and works under the direction of the Architect of Record (AOR) and/or the Engineer of Record (EOR) (Refer to CAC 7-144 and 7-145); is employed by the hospital governing board or authority; and is then approved for the project and monitored by OSHPD for competently and adequately ensuring compliance (Refer to CAC 7-213). Smaller projects may be inspected by one IOR whereas most larger projects will have multiple IORs.

The IOR must provide continuous inspection of the work that is obtained through personal knowledge. This requires the actual presence of the IOR during some parts of the work, such as placing concrete, erecting masonry, and similar work that must be

inspected as it is performed. Some work, such as framing, that can be inspected after the work is done but prior to it being concealed, may not require the IOR's constant presence. The purpose of continuous inspection is to ensure that all portions of the work are inspected.

Where work is performed away from the site, the IOR may obtain personal knowledge from the reporting of others, such as Special Inspectors; however, reasonable diligence must be exercised by the IOR in obtaining the facts. This will typically include reviewing the Special Inspector's qualifications, periodic visits to the location where the off-site work is being performed to ensure that the appropriate qualified staff are present, and that they are performing their work in a competent, code-compliant manner.

The contractor should assist in providing the IOR access to all off-site construction/fabrication as needed to comply with the TIO (see the section below), the approved construction documents, and the CAC requirements.

6.3 Testing, Inspection, and Observation Program (TIO)

The TIO Program is a part of the OSHPD approved construction documents. The primary function of the TIO Program is to identify all tests, inspections, and observations required for a particular hospital construction project, and the individual or entities to provide the required testing, inspections, and observations. In this way it performs a similar function of a "Job Card" on a non-OSHPD construction project under a local jurisdiction.

The DPOR is responsible for the development and administration of a project specific TIO program. This includes the identification of individuals and companies performing the required tests, inspections, and observations. The DPOR coordinates with all design professionals assigned to the project to establish the scope of the testing and inspections. They also coordinate with the owner, OSHPD field staff, and the entire design team to identify the critical milestones of progress and observation intervals to verify construction compliance. The DPOR is responsible for the distribution and gathering of all required Verified Compliance Reports (VCRs) and Test and Inspection Forms.

A copy of the approved TIO will be distributed when the building permit and IOR application have been approved by OSHPD. The staff initial the "Construction Acceptance" box in the approved TIO as the work is completed, tested, inspected, observed, and accepted as applicable.

All design professionals, the contractor, and the IOR must submit VCRs at the progress milestones and observation intervals identified in the TIO. Each Test and Special Inspection document must be submitted to the IOR, the DPOR, and made available to OSHPD field staff. If the field conditions disclose the need for additional tests, special inspections, and/or other inspections, the TIO may be amended by the DPOR. When an Amended Construction Document (ACD) revises the scope of a project and additional tests are required, a revised TIO will be submitted to OSHPD for review and

approval. Amendments may alter at what times and milestones the contractor must submit a VCR, or when additional tests, inspections, or special inspections are required before work may commence or be concealed. Therefore, it is important that the contractor be aware of any changes made to the TIO.

Refer to Section 5, Testing, Inspection and Observation Program Guidelines, for additional information regarding the TIO.

6.4 Preconstruction Meetings

A preconstruction meeting can be a powerful tool and help prevent much of the conflict that could develop in the field. Projects with a construction cost of five million dollars ($5,000,000) or more often benefit from a preconstruction meeting. However, the cost of the project is not always the determining factor; project size, complexity, phasing, fast-tracking, etc. may be more important considerations than the cost. The contractor, major subcontractors, major suppliers, manufacturer's representatives, etc. as applicable, should attend the meeting. The advantage of having the preconstruction meeting is that all the key parties will be in attendance and thus everyone will be apprised of their individual responsibilities.

Meetings are usually run by the DPOR or the contractor. Participation by other contractors and subcontractors will vary based on their level of involvement in the project. During the preconstruction meeting, the contractor should be able to provide assurances regarding personnel and materials to complete the work and furnish a construction schedule.

Lines of communication between the contractor, subcontractors, contractors, professionals, the IOR, the DPOR, and OSHPD field staff should be established including, but not limited to the following:

- Required coordinated review of the project by OSHPD representatives (CO, FLSO, and DSE) should be discussed.
- The design team should make the Contractor aware of any specific and/or unusual code and project requirements. Review any infection control or interim life safety measures that must be complied with. For more information refer to Sections 7.6.B. and C. of this Design Guide.
- Review the approved TIO Program.
- Discuss the schedule for submittal of deferred approval items to avoid delays in construction. A schedule for submittal of deferred items must be submitted to OSHPD within thirty days of construction start.
- Review the Inspection Request Program (IRP) requirements and expectations.
- Review the notification and procedures to be followed in case of noncompliance.
- Discuss material inspection by the IOR and acceptance upon arrival at the project.

- Ensure that contractors and subcontractors understand what is to be coordinated through the IOR and the project manager, if applicable.
- Make it clear that the contractor is solely responsible for safety on the construction site.

The preconstruction meeting is an opportune time to bring up fire stopping of penetrations and to inform the contractor that all penetrations will have to be completed per a listed testing agency. Engineering judgments should only be used in rare cases. Bringing such issues to each subcontractor's attention early should mitigate potential problems. A mock-up of fire penetration assemblies by the appropriate subcontractors is a very useful tool for ensuring that the assemblies will be approved as the work progresses.

In summary the contractor and/or subcontractors need to be aware of any special requirements, inspection requirements, OSHPD notifications, testing requirements, infection control requirements, notification requirements, shutdown procedures, submittal requirements, material samples, special requirements for phased construction, etc.

Tip: *The Preconstruction meeting should be used by all parties to ensure that the project starts off in a good way. This can be accomplished by everyone knowing what their roles and responsibilities on the project are. The meeting should also be used to establish good working relationships and effective lines of communication.*

6.5 Inspection Request Program (IRP)

The development of the IRP often begins at the first preconstruction meeting. The contractor and the IOR should discuss the details of the program and have a clear understanding what is needed and expected from each other, such as:

- How the inspection request is initiated and what is required to initiate it.
- How and when the inspection requests are to be turned in.
- Agree that all work requires an inspection by the IOR and/or special inspector prior to covering the work.

Inspection requests can be rejected when appropriate. The IOR should not consider an inspection request when the work is not complete or has not been started. The contractor should never request an inspection for work that is incomplete or that does not comply with the approved construction documents, including any approved ACDs or changes that do not materially alter the scope of the work (NMAs). If the work is not ready for inspection the IOR should reject that inspection request. If only a portion of the work is ready for inspection the IOR should not give a partial approval. If the inspection request is rejected for cause the contractor should submit a new request when the completed work is ready for inspection.

The inspection request form should require signatures by the contractor and the subcontractor requesting the inspection. By signing the form, the individuals have indicated that they have verified that the work is complete and in compliance with the approved plans, specifications, and Title 24 requirements and is ready for inspection.

6.6 Challenges and Recommendations

Several potential challenges and issues may be encountered on a project. Contractors may want to make changes to improve their efficiencies or to request material substitutions. Sometimes changes are made in the field when the construction details on the plans cannot be constructed as shown because of onsite conditions, insufficient clearances, or other constructability issues. Any changes to plans and specifications that materially alter the work require OSHPD approval prior to the execution of the work. (Refer to CAC 7-153; Addenda, Change Orders, and Instruction Bulletins). If unapproved changes are found during construction by the IOR or OSHPD field staff, then work will be halted until appropriate approvals have been obtained, and if necessary, the unapproved work is brought into compliance with the approved construction documents and/or Title 24.

Tip: *On larger projects it may be beneficial to have the contractor's superintendent or other project representative(s) accompany the IOR and OSHPD field staff during their scheduled walk-throughs of the construction when appropriate. This allows the contractor to see how the process works and therefore better accommodate OSHPD requirements.*

A. Avoid Changes When Possible

It is difficult to prepare construction plans that are perfect for buildings as complex as hospitals, therefore, changes will most likely be necessary. Unforeseen conditions, bid alternates, product substitutions, owner changes, defective plans and specifications, and errors or deficiencies in the construction that must be brought into code compliance will all require that the plans and specifications be changed. Changes to these documents must be approved by OSHPD staff and are documented using the OSHPD Application for ACD – Amended Construction Document.

OSHPD ACDs are changes to the construction documents that materially alter the work and are prepared by the DPOR. The approval process for ACDs can range from one day for field approval to several months for Plan Review team review and approval depending on size and scope. ACDs must include the change to the contract amount unless alternate methods have been approved by OSHPD for confirming construction cost changes. Construction cannot proceed until OSHPD approves the ACD.

If unapproved changes are found during construction by the IOR or OSHPD field staff, then work will be halted until appropriate approvals have been obtained.

The following practices are recommended to avoid delays and additional costs:

- *Changes should not be made only for convenience*. The project manager should communicate this with the contractor(s) during the preconstruction meeting. Contractor recommended changes often do not save money for the project because of the resulting delay for the modification of the approved plans and the approval of OSHPD. In 2023 twenty-seven percent (27%) of ACDs were generated because of contractor requested changes.
- *Avoid making changes to the approved documents.* ACDs can number into the hundreds depending on the quality of the construction documents and contractor requested changes that are approved by the owner representative. Although the case is often made that a change will improve the schedule and reduce cost, such is seldom the case when delays, work coordination issues, and obtaining the required approvals are factored in.
- *Maintain a management file or logs for ACDs and NMAs that tracks the status of each.* Ensure that the log is consistent with that of the DPORs, IOR, and OSHPD staff so that work does not proceed without required approvals.
- *Maintain a management file for deferred submittals submitted to OSHPD that tracks the status of each and assigns responsibility for required completion.* Failure to ensure that deferred submittals are done timely will result in construction delays as work is halted awaiting approval of the deferred items.

B. Owner Requested Changes

Owner requested changes accounted for twenty percent (20%) of ACDs in 2023. Owner participation varies depending on project size and scope. Some owners employ Project Managers, while others have staff dedicated to projects, and others rely primarily on their DPOR. Owner requested changes can be a major factor associated with project delays and associated problems, therefore, once the project permit is issued owners should resist wanting to make changes. The contractor should ensure that the owner is aware of the impacts to schedule and cost that any proposed change will have on the project.

Other owner-related issues are discussed in more detail in Section 7, Guidelines for Hospitals Working with OSHPD.

C. Summary

The major challenges associated with construction project delays are the following:

- Work not executed in conformance with the approved construction documents.
- Post approval changes.
- Delays in processing deferred approval submittals and ACDs.
- Changes may be required for a project but the key to success is to minimize changes to the extent possible. Unrealistic expectations can cause difficulties

and delays. OSHPD field staff can only perform their duties within the code requirements as stipulated in Title 24. It is incumbent upon owners and owner representatives, contractors, and designers to become knowledgeable with OSHPD procedures and processes and to manage the construction project process to maximize the effectiveness of OSHPD's policies and procedures.

SECTION 7
GUIDELINES FOR HOSPITALS WORKING WITH OSHPD

7.0 Introduction

The purpose of this section is to provide hospital chief executive officers and other hospital personnel responsible for hospital construction and renovation projects with a basic understanding of the role of the Department of Health Care Access and Information's (HCAI) Office of Statewide Hospital Planning and Development (OSHPD) as the building department for health care facilities and to present guidelines that can assist in ensuring that hospital projects in California are designed, reviewed, and constructed in as expeditious manner as possible.

California hospital buildings are considered by many architects and engineers as some of the most complex buildings in the world to construct. Very few buildings with complicated mechanical, plumbing, and electrical systems as hospitals are expected to continue operation following a seismic event or other disaster. Unlike other buildings and occupancies, hospitals are not immediately evacuated when a fire occurs in the building, and because of this challenge, California hospitals are also required to meet additional fire and life safety and access compliance requirements beyond those required by other less challenging occupancies.

By their nature, and because of state law requirements, California hospital buildings take longer to design, obtain building permits, and construct and therefore are more expensive to build than non-hospital buildings or hospital buildings in other states of equivalent size. This section describes OSHPD's role in the planning, design and construction process and provides important tips and strategies that can minimize delays, reduce project costs, and ensure safe buildings are constructed.

Working on a hospital construction project can be either a frustrating experience or a collaborative one and the better the construction process is understood, the simpler it is to have a successful experience. To make it a positive experience, follow these basic guidelines:

Determine if the project will benefit from Integrated Review project delivery.

- Determine if a pre-design meeting with OSHPD and the California Department of Licensing and Certification (CDPH) staff is necessary. A pre-design meeting is required by Code for projects with a construction value of twenty million dollars ($20,000,000) or more.
- Require your project team to communicate with OSHPD.
- When required, submit a geotechnical report to OSHPD at least six months prior to submitting the project.
- Ensure that your design team produces quality documents. Do not let the design team submit incomplete construction documents just to maintain the delivery schedule because ultimately this will result in delaying the project.

- Monitor the progress of the project using the various processes and available technologies. Do not allow your design team to blame OSHPD for its own shortcomings or delays.
- Resolve conflicts by using existing appeals processes, informal and formal, when necessary and as early as possible if a conflict occurs.
- Ensure that your contractor adheres to the approved plans. Amended Construction Documents (ACDs) requested by the contractor can often be reduced by involving the contractor in a value-engineering process early in the design phase when possible.
- Avoid owner-driven changes resulting in ACDs (formerly referred to as Change Orders). Owner requested changes were the second highest cause of ACDs. The owner should obtain buy-in from all hospital stakeholders affected by the project during the development of the project program to avoid potential changes later.

The reasons for ACD submittals in 2023 are as follows:

- Contractor Requested = 27%
- Owner Requested = 20%
- Discovered Conditions = 14%
- Design Professional Requested = 11%
- As-built Conditions = 10%
- Document Clarification = 9%
- Required for Code Compliance = 7%
- Other (non-specified) = 2%

Proper use of the guidelines outlined in this Design Guide should decrease the likelihood of ACDs caused by the reasons above. It will also improve the probability that a project is designed and constructed in such a way as to allow it to navigate efficiently through the OSHPD process from beginning to end.

7.1 Basic OSHPD Process

The basic business processes of OSHPD are focused on its central mission: to assure that hospital buildings are safe. The main aspects of the process are as follows:

- Plans developed by licensed architects and engineers are submitted to OSHPD for review and approval.
- Approved plans become eligible for a building permit.
- Construction is performed by a California-licensed contractor or an owner/builder.

- All construction activities are conducted under the continuous inspection of an OSHPD-certified Hospital Inspector of Record (IOR) and is observed by OSHPD field staff.
- OSHPD field staff accepts the work as complete and certifies it is code-compliant, allowing CDPH to license the construction for healthcare, patient care, and operations.

As simple as it sounds, there are many opportunities for missteps along the path that can significantly escalate costs, delay occupancy, and require changes in project scope.

7.2 Guidelines

To avoid the pitfalls inherent in any complex construction process, hospital owners should adopt practices in their project planning and construction delivery methods that anticipate the causes of budget, schedule, and scope impacts and prepare to resolve them proactively.

These strategies are most effective when applied during the appropriate phase of the overall project program. The phases used herein are as follows:

- Project Selection and Identification Phase
- Project Planning Phase
- Design Phase
- Permit Phase
- Construction Phase
- Closeout Phase

7.3 Project Selection and Identification Phase

Whether the project is as simple as replacing a piece of equipment or as complicated as constructing an entire acute care campus, all strategies for working with OSHPD stem from how clearly and unambiguously you understand and communicate what you want to accomplish.

A. Develop a Master Facilities Plan and Program

Some hospitals are incurring additional expense in meeting the seismic compliance mandates because, over the years, construction and renovation projects took place without a Master Facilities Plan (MFP). To meet the seismic compliance mandates, some seismic-compliant buildings and systems may need to be modified or replaced while conducting seismic retrofits of noncompliant buildings. A Master Facilities Plan can assist in identifying proposed projects that may require upgrades of mechanical, electrical, plumbing, and structural systems, as well as assist in determining where additional sources of power are required.

Seismic compliance can be incorporated into these projects as they are developed to have less impact on the overall cost of seismic compliance. This strategy is most effective when applied during the appropriate phase of the upgrades of the systems. The owner should ensure that the designer is noting all work that qualifies as seismic compliance in project applications as applicable. In this way seismic compliance can be achieved incrementally as retrofit, remodel, and equipment replacement projects are constructed, resulting in anchorage, and bracing of systems that did not previously meet earthquake standards.

Tip: *The MFP should include all types of services provided by the facility, including outpatient as well as clinical services. The MFP should also consider plans for future growth or for additional service types as these may be impacted by seismic considerations of existing buildings and structures.*

Some local jurisdictions, clinic owners, and design professionals have experienced confusion regarding which clinics and outpatient facilities are subject to the OSHPD 3 clinic requirements found in Title 24. This results in a lack of consistency in application of the appropriate code provisions and uncertainty regarding the roles of the local building department and OSHPD in the plan review, certification, and construction inspection processes. To assist hospitals in interpreting clinic building code requirements, OSHPD developed a Code Application Notice, CAN 1-7-2100 – Clinics. This CAN will assist hospitals in determining which building authority has responsibility for reviewing and permitting a clinic construction project and to determine the applicable code provisions the project will need to comply with.

B. Long-Term Building Planning

The hospital seismic compliance laws provide for compliance options for nonconforming buildings. Such buildings can be (a) retrofitted; (b) closed, demolished, or replaced; or (c) have their acute care services removed and be converted to non-acute-care use. When it is desirable to convert from general acute care to other uses, CAN 1-6-1.4.5.1 – Removal from Acute Care Services, provides the specific steps and processes necessary for code compliance.

C. Be Prepared to Invest the Necessary Time and Resources

Contractor requested changes was the major driver of ACDs in 2023. To reduce the factors leading to these changes the owner should determine if an Integrated Review (IR) team is needed for the project. The IR method has been proven beneficial for large, complex projects. IR may result in higher up-front costs but can better define and stabilize overall project costs.

IR may not be the right solution for every project; however, value engineering may eliminate many contractor-requested changes by obtaining the contractor's input regarding constructability, product selections, etc. if it is applied early in the project. This can usually be accomplished during the design development phase prior to submittal of the final construction documents to OSHPD for plan review.

Discovered conditions during construction was the third major cause of ACDs in 2023. To prevent this, owners should invest ample time and resources for inspection, discovery, and documentation of existing conditions at the beginning of project design. This can result in substantial savings of time and costs during construction of the project.

Project cost estimates must consider building and equipment needs, inflation, project design fees, plan review schedule, and construction time. Being realistic will minimize delays that are attributed to the OSHPD review process. Develop and validate current project concept budgets, with contingencies, that align with defined scope.

Tip: *Be realistic about the preliminary budget and length of time needed to achieve your goal.*

7.4 Project Planning Phase

A. Organization and Approach

If a hospital owner is unsure whether a construction permit is needed, a hospital representative should check with the OSHPD Compliance Officer (CO) or Regional Supervisor of the plan review region in which the facility is located. If construction proceeds without a permit when a permit is otherwise required, it is considered unauthorized construction (sometimes referred to as a "bootlegged project"). Unauthorized construction is a misdemeanor violation of State law and can have serious consequences, such as noncompliance with licensing requirements, validation survey citations, and noncompliance with Medicare Conditions of Participation and standards of accrediting organizations. Following a natural disaster, a damaged hospital that has unauthorized construction may not be eligible for Federal Emergency Management Agency (FEMA) assistance and reimbursement. Many problems that arise with construction projects can be traced back to unauthorized construction. OSHPD will require correction of all unauthorized construction and require that the new work be performed under a building permit and designed to code. A penalty fee will be assessed, and review and construction oversight activities will be assessed on a Time and Material basis.

Tip: *Contact an OSHPD Compliance Officer or Regional Supervisor of the plan review region in which the facility is located to determine when a permit is needed for a remodeling project. See the excluded project list in the FREER Manual for guidance which projects do not require a permit.*

The development of a comprehensive functional program communicates the project intent and purpose to the various regulating agencies and shows that the project meets the applicable regulatory requirements for design and construction; it also confirms the project will meet the CDPH patient care and supervision standards found in Title 22. The functional program outlines the purpose of the project, provides detailed information regarding the environment of the building, operational requirements, environmental requirements, accommodations and flow, design intents, and planning and technology

considerations. Refer to CAC 7-119 for further details on the requirements of the functional program.

Obtaining desired outcomes require effective project management by qualified individuals who have the requisite bandwidth in their workload. Personnel assignments can be scalable; for instance, the installation of equipment may be managed by a single staff member however, a hospital replacement project may require a team of qualified project managers. Keep in mind, the design team, equipment vendors and contractors do not typically have the same level of interests in the success and well-being of a hospital as that of its management team. Effective project management is essential to identify issues early and to minimize problems as the work proceeds through the construction process.

Consider assigning a project manager to each project submitted to OSHPD. Make sure the project manager is responsible for the overall coordination required to ensure a successful project and that everyone involved know their roles. OSHPD experiences have identified the following potential problems related to project management:

Some hospitals do not use project managers and expect all project participants (architect, engineers, IOR, contractor, etc.) to communicate and coordinate among themselves and with OSHPD. This coordination and communication may not occur without a project manager.

Some hospitals think the IOR serves as the project manager. The IOR has a statutorily defined role which precludes project management activities.

On occasion, a hospital will subcontract with the architect, engineer, or contractor on a project to also serve as the project manager. These individuals may have a conflict of interest in serving as a project manager, focusing primarily on their own tasks and responsibilities, and may not be focusing on the owner's priorities and interests and overall needs of the project.

In some cases, a hospital employee who has full-time responsibilities is asked to pick up project manager responsibilities under "other duties as assigned". Because of the time required to perform quality project management, this scenario does not usually work, and this employee may not have sufficient training and experience in complex project management techniques nor the sufficient time to devote to the project as needed.

Tip: *Assign project management duties to qualified people who can handle the expected workload.*

Nothing hampers the OSHPD process more than architects and engineers who do not understand the demanding requirements of California hospital design and how California hospital requirements are different from other hospitals and types of buildings in the United States. Architects and engineers who will be assigned to your project should be interviewed to ensure that they have previous experience and a

demonstrated knowledge of California hospital design and can work constructively in the OSHPD environment. They must be licensed in California and should have had prior success with similar OSHPD projects. For large projects where it is desirable to use an out-of-state designer, owners have required that the design firm enter into a joint venture agreement with a local firm in a "Design Architect/Executive Architect" arrangement to ensure all California code requirements will be adequately addressed.

This best practice is also pertinent to selection of equipment vendors and technology systems providers.

***Tip:** Choose planning and design consultants who have a demonstrated knowledge and understanding of California Building Code regulations and of the type of project you need delivered.*

The design team must be knowledgeable about the unique OSHPD procedures and processes and have a firm understanding of Title 24 as it pertains to health facilities construction.

Check references for architects and engineers.

- References are needed for both the architecture and engineering firms and for the individuals who will perform the work. Interview the specific design team individuals proposed for your project.
- Review recent similar projects that the firms have submitted to OSHPD to determine the quality of their work and the firm's ability to design to code (for example: look at type of OSHPD comments and number of backchecks) are appropriate for complex building design.
- Require the design professionals to perform written code reviews by qualified internal staff or a qualified outside code consultant, particularly fire and life safety provisions.
- On large complex projects, the hospital should obtain an independent peer review of the architectural and/or engineering plans prior to submitting them to OSHPD.

Although this entails additional up-fronts costs, it can ultimately save both time and money. It will enhance quality design, facilitate a quicker plan review, and help to identify the cause of any delays that may occur during the plan review process. This is a natural component of the IR process.

- Select a design team based on factors other than just a presentation by a firm's marketing representative.
- If any team members working on your project leave the design team during your project, stipulate in your contract that the replacement will have similar design and OSHPD experience and that the hospital owner has final sign-off on replacement personnel being assigned to your project.

T*ip:* *Require that the architect and/or engineer contract contain a provision of the basic services and code-compliant drawings to ensure there are no extra charges for backchecks; and ensure that the hospital will receive timely copies of OSHPD's plan review comments. Ensure that the contract covers OSHPD project closure so that the hospital is not left with a project that it cannot occupy or use.*

OSHPD has jurisdiction over all construction in healthcare buildings as well as certain aspects outside of it, however OSHPD is usually not the only public agency involved given the nature of your project. All construction that adds floor area to your hospital will require some level of review by your local planning department for possibly a California Environmental Quality Act (CEQA), a Conditional Use Permit, and/or land use review, and it is possible that multiple jurisdictions may be involved. All projects should be completed with the goal of achieving licensure by CDPH.

Determine the entire breadth of regulatory oversight with your design and legal consultants before undertaking your project. Incorporate the time required for all reviews, approvals and permits when planning the project schedule and the associated costs when developing your budget.

B. Land Use Approvals and CEQA

Land in California is typically not zoned for hospital use. New hospitals and additions to existing facilities must undergo a local jurisdiction review and approval process intended to create an entitlement to build a new hospital building. The local planning department will review your application to determine what local approvals might be required. The entitlement process often takes longer than the OSHPD plan review and permitting process, and as such, may become the critical path toward commencement of construction. Because of the complexity and potential costs of entitlement issues, many hospitals will retain a qualified land use attorney with experience working with the jurisdiction in question.

Tip: *Develop a full understanding of the local regulatory environment that affects your project.*

At a minimum, the local planning department will review your land use application to determine consistency with adopted general or specific development plans that include the property in question to determine what modifications to those documents might be necessary to support the proposed project. The planning department is also responsible for environmental review under CEQA. A preliminary review will be conducted to determine the potential effects to the environment. The initial review may result in a declaration that there are no significant impacts ("Negative Declaration"); that impacts can be substantially reduced by requiring the project to undertake prescribed mitigations ("Mitigated Negative Declaration"); or that the project may have significant impacts that require a full or partial Environmental Impact Report (EIR) that could result in major mitigation measures.

Development, review, and approval of an EIR is a public process under the control of the local planning department and is intended to give the public opportunity to raise concerns about the project and its potential impact. A draft EIR (DEIR) is prepared and published with a comment period deemed long enough by the local jurisdiction to ensure all concerned persons and organizations have a chance to comment. Comments and their responses are published in a final EIR (FEIR), the findings of which must be approved by the local jurisdiction along with any modifications to urban plans and a development agreement (if required). Because this is a discretionary land use issue, there is no guarantee that a proposed project will be approved to proceed to construction. Once approved, the local jurisdiction issues a Notice of Determination (NOD) which serves as the proof of entitlement to be provided to OSHPD and other permitting entities. The NOD is required by the local building department to release local permits as well.

Major changes to functions or uses in an existing hospital could require a review by the local Planning Department. For example, the parking requirements for general acute beds may be less than those for long term stay beds or for outpatient services.

C. Other Permitting Entities

Many locations in California have multiple layers of government which may have permitting authority. Some locales have special school tax fees that must be paid prior to the issuance of a building permit. There may also be local air quality management districts that issue asbestos abatement and emergency generator permits. The local planning department or your legal counsel should assist you in determining which additional government bodies have influence over your project.

D. California Department of Public Health (CDPH)

Prior to commencement of healthcare operations of a new building, an addition, remodeled facility, new or replaced equipment, new or expanded services, etc., CDPH will survey the facility to evaluate the operational practices and readiness of the facility and staff following field acceptance by OSHPD. While this is fundamentally a step undertaken at project closeout, it is essential that the hospital have a plan in place during the project planning phase, the design phase, and the construction phase to ensure that the survey will be successful. Any service that the hospital intends to offer in a new or innovative way should be reviewed with the local CDPH office prior to design to reduce the likelihood of rejection following completion of construction.

Tip: *The CDPH licensing application process cannot start until a Certificate of Substantial Compliance, a Construction Final report, or Certificate of Occupancy has been issued by the OSHPD Compliance Officer and included in the application package. Be sure to plan sufficient time in the construction schedule for transition planning, activation, and licensing.*

Tip: *For projects under review by CDPH, a Construction Final report should be postponed until after licensing is completed. If CDPH finds any deficiencies, the issue can be resolved via ACD rather than having to submit a new project through OSHPD.*

Use your staff and consultants to fully define all the project's standard and unique characteristics. Understand the type of approval required, and the documentation needed for CDPH evaluation. Adding, deleting, or changing services will invariably add cost and time.

Tip: *Determine your project scope and phasing at the beginning of the project.*

Owners should maintain awareness and control of the construction process throughout the length of the project. The way the work is contracted should reflect the nature of the work and business approach of the owner. There are three fundamental contracting and project delivery models with ample variation between them. Select the one that's right for you and your project.

E. Design-Bid-Build

Considered the traditional model of construction contracting, the design-bid-build model relies on design professionals who develop plans that are intended to guide the work of the contractor. The "design-intent" documents are less complete than other methods, leaving many design decisions up to the bidding contractor to give them as much flexibility to determine means and methods and ultimately the bid price. Long thought to be the method that assures lowest cost, many owners have discovered that bids only cover what is shown on the bid set, opening the door for multiple ACDs that are really completion of the initial design at a cost higher than the bid.

Public entities are usually required to use the design-bid-build method but the risk of cost overruns using this method is causing some owners to rethink its use. OSHPD only reviews construction documents for code compliance, not constructability or good design. The design-bid-build method poses challenges for the OSHPD project due to its requirement that every element going into the construction of an OSHPD building that "materially alters" the work must be reviewed and approved prior to installation; this requirement is the primary barrier to continuous construction where the contractor is building from "design-intent" drawings that the contractor is completing design of in the field as the work progresses.

F. Design-Build

In this model, a contractor is hired to construct from plans that the contractor has taken responsibility for developing. The owner sets forth the requirements and the conditions of satisfaction, but the contractor has the ultimate authority to determine how they are to be fulfilled. The design-build method produces a much higher level of certainty for adherence to budget but may not produce as satisfactory a result due to the extent the owner gives up control of design. Although design-build has many useful applications, it

works to particular benefit for an OSHPD project focused on specific types of engineering systems. This approach requires a sophisticated, engaged owner. The owner must clearly define the project scope, specifications, and design intent up front.

G. Integrated Project Delivery

An Integrated Project Delivery Team (IPD) project is one in which all major design disciplines, the contractor, and trade partners are selected at the beginning of the project to work as a team. This model often relies on Lean Construction principles. In a typical IPD contract, all major parties work from an open book and put their profit at risk, thereby ensuring that the success of the individual team member relies on the success of the entire team. The IPD team simultaneously designs the building and how it is going to be built, thereby minimizing ACDs, and substantially improving adherence to budget. The need for deferred submittals should also be substantially reduced, if not eliminated, using this model. The time to initial permit may be longer than a traditional design-bid-build project but can be reviewed by OSHPD with a greater certainty of constructability.

While IPDs are becoming a more popular approach to major construction, it represents a different way to develop facilities than the historical Design-Bid-Build approach. The IPD approach works best where the owner is committed to a specific scope for the project that is not expected to vary. Some contractors are moving aggressively in the direction of heightened collaboration while others are not comfortable with it. The owner who is seeking the control of the design and function of the built space along with the greater reliability of adherence to budget may still find it difficult to adopt IPD due to the large upfront investment in having the full project team engaged from the very beginning. However, more owners have embraced IPD in recent years because of the substantially greater likelihood of having the project come in on time and budget without sacrifice to program from unanticipated budget adjustments that result in “value engineering”, a process resulting in major redesign of architecture and engineering systems late in the design phase used to bring projects back into budget and/or schedule.

H. Different Approaches for Review and Permitting Projects

In many cases, except for project types that fall within only a single approach, the applicant has several choices for project submittal and processing. Project applications that do not specify a particular approach will be reviewed as a standard project which includes permits for new construction and remodel projects that alter the existing structural frame (also known as “H” projects) and permits for new construction that do not alter the existing structural frame (also known as “S” projects). OSHPD maintains standard turnaround goals for these types of projects. OSHPD offers a “preliminary” review process for these projects to look at major code issues prior to completion of construction documents. OSHPD also offers a program where limits of work for remodel and renovation projects can be agreed upon prior to submittal. See CAN 2-102.6 – Remodel.

Additional automatic and optional plan review programs include:

- **Annual Permit** – covers up to $50,000 in very small work on an annual basis for single-story Skilled Nursing Facilities.
- **AB 2632 Project** – for certain types of maintenance and repair work for single story buildings.
- **SB 1838 Project** – for projects under $50,000. An owner can select the SB 1838 application for work under $50,000 excluding the cost of fixed equipment. Projects using SB 1838 are not plan reviewed; they are triaged to ensure eligibility for the program followed by issuance of a permit. The SB 1838 permit is intended to expedite commencement of construction for very small projects; the risk in using this method is the potential to construct something to a non-code conforming condition which may require correction and rework at additional cost and time.
- **Incremental Projects** – for new construction and remodel projects that alter the existing structural frame (also known as "H" projects) may be separated into two or more permit sets by applying for it to be an Incremental (also known as "I") project instead of a standard review project.

  Each increment of these types of projects must represent one or more complete building systems. The incremental project method is typically chosen for large projects to allow for some portion of work to commence while other portions continue through the plan review process. This approach has also been known as "fast-tracking". The applicant must request use of the incremental project process and OSHPD will determine whether the proposal meets the requirements of code and is separated into appropriate incremental packages. This process can result in rework if changes to already completed work must be made because of subsequent incremental approvals.
- **Integrated Review (IR)** - OSHPD implemented its Phased Plan Review (PPR) process in 2007. Due to the Industry's growing demand for utilizing LEAN principles and Integrated Project Delivery methods, in 2013 the Office implemented an optional plan review process known as Collaborative Review and Construction (CRC). Several iterations of these integrated review processes have been used successfully on many projects reducing the time to first approval by up to six months and minimizing the number of back checks and post approval documents during construction. With new developments in Electronic Plan Review, many of the benefits for CRC have been incorporated and are available for a wider assortment of projects. CRC and PPR are being combined and is now known as Integrated Review (IR). See PIN 50 – Integrated Review.

OSHPD is not obligated to accept any project for IR. IR functions as a method to resolve all code issues prior to development of construction documents, thus improving their completeness and quality. IR works well with new construction and remodel projects that alter the existing structural frame (also known as "H" or "I" projects); project teams using Integrated Project Delivery (IPD) methods will see IR as a way of ensuring

conforming design at the earliest possible opportunity during design phase to eliminate waste or rework.

Tip: *Select the project approach and organization that is appropriate for the nature of the project and the hospital's preferred construction contracting method*

I. Determine Limitations to Achieving the Intended Outcome

Use your management staff and consultants to determine whether what you want to do can be accomplished. The following sub strategies are needed to ensure feasibility.

There are limits to the built environment that can make a project infeasible. Physical feasibility may also be affected by existing conditions of the project's physical location or by adjacent conditions. In applying regulations, OSHPD can require changes that either increase cost or result in project abandonment if physical feasibility is not properly evaluated. Accurate as-built drawings and physical evaluation of existing conditions are essential in determining feasibility for remodel or addition projects. Drawings should include all disciplines as applicable, including but not limited to architectural, structural, electrical, mechanical, and plumbing.

Whether you start with a target budget or target outcome, make certain that the total project budget and the scope of the project match. Careful planning at this stage of the process is the most important determinant of project success. Inaccurate or unrealistic budgets are a common driver of change throughout the project duration. Any corresponding changes in the scope of the project must be addressed in the project's budget. Distinguish between the budget and construction costs. Make sure adequate contingencies are defined to accommodate unforeseen hospital impacts.

Tip: *Determine whether your project is feasible.*

7.5 Design Phase

A. Make Sure the Design Team is Meeting Current Codes and Standards

Experience has shown that there are common problems arising from design that seriously impact the satisfactory completion of the OSHPD process. These include:

- Designing to a code other than the appropriate provisions of Title 24.
- Designing to out-of-date codes.
- Using room designations or other nomenclature on plans that are not consistent with Title 24.
- Failure to make best use of PINs, CANs, FAQs (Frequently Asked Questions, and Reminder Lists) published by OSHPD.
- Failure to follow the CAN 2-102.6 – Remodel, which provides flow diagrams for use in planning the scope and boundaries of remodel projects.

- Failure to accurately identify and implement into plan development, the existing facility building as-built conditions.
- Failure to incorporate the manufacturer installation requirements into your permitted plan.
- Failure of the design team to meet with the appropriate OSHPD staff if there are codes and standards uncertainties related to the project.

OSHPD expects the licensed design professional to know and follow the code in the preparation of design. The code itself can be somewhat flexible and open to interpretation. When designers have questions or require clarity as to the meaning of specific code issues, or need validation of their interpretation, they are encouraged to seek clarifications through the various opportunities OSHPD provides.

- The designer may contact the Building Standards Unit for clarification of specific aspects of the code to determine their applicability.
- Design teams may present concepts to a regional plan review staff on an appointment basis in pre-application conferences to validate specific design issues or to clarify project scope.
- Design teams should clarify which aspects of their design may not adhere to the specifics of the code. These issues include:
    - Alternate means of compliance for architectural, electrical, mechanical, and structural conditions.
    - Alternate methods of protection for fire and life safety issues.
    - Program flexibility, which affects the relationship between architecture codes and the specific needs of different care delivery models.
- The resources of the Seismic Compliance Unit can be used to ensure that the designer understands his or her obligations under the Seismic Safety Act and is including the scope needed in the project to further compliance needs.
- Plans can be submitted for a preliminary review by OSHPD.

The purpose of the preliminary review is to obtain written comments that validate or correct the basis of the architectural and fire and life safety elements of design. A preliminary review can mitigate potentially costly errors in the documents submitted for permitting. To get the most out of the process, plans should be submitted at about the 50 percent Design Development (DD) stage. Architects and engineers should sequence for the intended results. OSHPD preliminary review comments should be included by the architect or engineer at the end of the DD phase and the comments can then be incorporated into the construction documents. The preliminary review submittal date will also establish the date of applicable codes to which the project will be designed.

Tip: *Ensure OSHPD is contacted for interpretation or clarification of all code issues that are not clear.*

B. Make Sure Flexibility is Provided in the Design

A foundational design goal of any hospital project should be to provide flexibility for change. With the length of time necessary to implement hospital projects in California and the quick evolution of technology, potential changes/reactions from healthcare reform, changes in future workloads (increased or decreased) and evolution of models of care, building designs need to build in flexibility in as many ways as possible to help address necessary modifications to the building as planned.

A few of the best methods to accomplish this important goal is the inclusion of shell or unassigned space, the use of a "universal" structural grid, the planning in of soft functions around critical departments for future expansion, utilization of standard size rooms, and consideration of adaptable rooms. These should not be afterthoughts in the project or only part of a value engineering effort but carefully integrated as part of the planning process.

There are varying degrees of shelling (cold shell, warm shell, built out but not equipped, etc.) as well as different opinions on what is soft space vs critical, but the point is clear – plan into the project ways to adapt and adjust to the unknown changes in the future. If considering standardizing or multi use rooms, ensure that the size is inclusive of all the potential uses – exam rooms that can be easily converted to minor procedure rooms, or medical/surgical patient rooms that can be easily modified to ICU. Ensure that the infrastructure to support future build outs of shell or conversion of soft space or adapting rooms to higher functionality is built into the project (air changes, filtrations, code requirements, etc.).

Another creative variation is to fully design and permit the project knowing that you may shell some of the building or phase the build out over time. Develop a shelling or phasing strategy, which could be implemented either as an alternate approved design or as an ACD. Design of systems should be planned to accommodate this plan.

As a peripheral perspective, sustainable design and disaster planning need to be considered in designing flexibility into a hospital. Facilities currently in design in California need to meet the 2030 Energy Challenge mandate. Health facilities will continue to be challenged by constantly changing industry environmental standards. Planning for various threats (human-caused or acts of nature) requires careful infrastructure design considerations. Facilities must consider these threats as part of their overall infrastructure strategy. These events may be unique with unusual risk factors such as major earthquake, wildfires, chemical, radiation, and biological attacks, or unique to healthcare such as pandemic flu. In any case, facility infrastructure should be designed with consideration to these risk factors. Design interventions range from providing ED/inpatient bed surge capacity, mechanically isolating areas of the building, creating major outdoor triage/decontamination spaces, accommodating additional staff, etc.

OSHPD also has a *Design Guide for Planning and Preparing for a Disasters*. This Design Guide offers suggestions and recommendations on how hospitals may design flexibility into their projects during planning so they can be better prepared for a disaster.

Tip: *Build in flexibility for change.*

C. Geologic Hazards Investigation

Some projects require geotechnical reports except as noted in CAC 7-117 and CBC 1603A. Approval for a geotechnical report takes time. Owners should plan for this and submit the report at least six months ahead of the preliminary submittal.

OSHPD believes the key to receiving approved geotechnical and engineering geologic reports in a timely manner is to use experienced firms and to submit the reports early in the process. Consequently, the geotechnical report for the selected project site should be submitted prior to the preliminary review if possible. The approved report will establish the foundation and structural design criteria necessary for the structural engineer to design preliminary submittal data. For additional information, see Section 2, Geologic Hazards Investigation Guidelines.

Tip: *Submit a geotechnical report, when needed, in a timely manner.*

D. Incremental Projects (Fast Tracking)

OSHPD allows larger new construction projects to have complete phases of construction broken out into incremental submittals for permitting. Typical incremental submittals might be foundations and structure in one package and the building skin and interior build-out in a second package. Incremental project permits can sometimes allow for an earlier start to new construction than would occur if a permit for the entire building had to be obtained first. The decision for incremental submittals should be included in preliminary submittals. However, although incremental submittals may reduce time frames, they may also add cost and complexity. Errors found in plans for subsequent work may require that work already in place be changed or corrected, resulting in more time and costs.

Tip: *Determine during the design process whether you want to have early permits for portions of the work.*

E. Obtain Signoffs as the Design Develops/Progresses to Avoid Changes

Once construction documents are completed, adding, deleting, or changing programs and services will add cost and result in delays because OSHPD will need to review the project again. A hospital gains the maximum benefit of OSHPD services prior to completion of construction documents. Obtain all design development signoffs before producing the construction documents. Upon completion of documents, an independent

plan reviewer should be retained for larger, more complex projects to ensure the design meets code and to minimize the number of OSHPD backchecks.

Tip: *Begin production of the construction documents only upon receipt of design development signoffs.*

F. Deferred Submittals

Designers in California sometimes ask OSHPD to allow the submittal of designs for various building systems to be delayed until after the project has been approved and permitted. Deferred submittals are requested by the design team, and it is up to OSHPD to determine whether they will be granted. At one time, it was seen as a courtesy to the design team to allow deferred submittals; however, this practice has led to designs that are poorly coordinated. Review of deferred approval applications can take as long as the review for the initial application and can cause delays if not managed properly. Modern design management supports early coordination of all building elements to be designed together. Insist on there being no deferred submittals that cannot be otherwise avoided.

Deferred submittals may be used by hospitals for large or technologically-sensitive pieces of clinical equipment when there will be long periods of time between design and installation. Because in a new hospital five years or more may elapse between preparation of construction documents and the completion of construction, use of the deferred approval method will allow the hospital owner to select the most current technology for installation without having to change a prior design. A hospital owner must recognize that some deferred submittals are common unless a subcontractor or manufacturer has been selected early enough to incorporate the necessary details and calculations into the OSHPD submittal documents.

Tip: *Avoid Deferred Submittals to the extent possible.*

- Deferred Submittals - Clinical Equipment: Clinical Equipment (CTs, MRI, PETs, etc.) presents a unique challenge to owners and designers. Medical staff wants the latest technology when procuring large expensive clinical equipment, so it is in their interest to delay the selection and procurement of the equipment as long as possible. Designers need the specifications of the equipment and the design assistance from the manufacturer to design the room to support the physical requirements (electrical, mechanical, plumbing, space needs, etc.) of the equipment. Clinical equipment manufacturers work with the project designers to provide a floor plan for approval by the owner, this floor plan is the basis of design for the equipment installation and operation.

  Large hospital projects may be designed in increments. Increment 1 would be foundation and steel, Increment 2 would be the build out of the floors, Increment 3 clinical equipment, etc. Increment 1 and Increment 2 plans would include designed shelled space for the clinical equipment. This space should be labeled on the plans for the intended future use. Increment submittals should be

submitted up front. This will assist OSHPD plan reviewers and improve plan review turnaround time.

Determining the schedule for the selection and delivery/installation of the equipment is a collaborative effort by the owner, the design team, and the contractor/installer. One effective method is to use the project schedule to determine the date of beneficial occupancy and then work backwards. The manufacturer has installation and testing schedule requirements, the design team can provide the schedule requirements for design, OSHPD, and construction. With this information, a procurement schedule can be developed.

Designers should design the "shell space" large enough to accommodate any manufacturers' clinical equipment of the type needed. The mechanical, electrical, and plumbing (MEP) systems should be sized accordingly to meet equipment needs. Some owners require the designers to increase MEP system's capacity by 10% to 20% to ensure future changes to technology can be accommodated.

- Deferred Submittals - Low Voltage (Information Technologies/Information Services) Design: As with the clinical equipment issues addressed in clinical equipment above, low voltage design requires special attention. These systems are complex, unique, and rapidly changing and require a designer with the necessary specialized knowledge and experience. The owner should require that the architectural and engineering team include a low voltage design engineer, or the owner can assign a low voltage design professional that knows the facility and can make decisions for the owner.

  The design team should work in collaboration with the hospital's Information Technology/Information Services (IT/IS) staff to develop the basis of design (systems, capacities, technology, HVAC requirements, future growth, etc.) and to review the construction drawings as they progress. One of the first issues that should be resolved is the project's responsibilities verses IT/IS's responsibilities. Many IT/IS departments have a select number of low voltage contractors that they have confidence in and with which they work on a regular basis. This may work satisfactorily for small IT/IS projects but could be a significant issue for larger projects.

  Other team members to include are the Clinical Informatics Nurse to ensure that the clinical needs of the systems are being addressed, as well as the Clinical Engineering Department (Bio-Med) to ensure that all cabling and power needs are being addressed for the clinical equipment and systems that must be linked to the network. It must be noted that many building systems run on the Owner's network. Systems such as pneumatic tube, building management systems, lighting controls, etc. require capacity from the overall system and reside on the permanent systems.

Due to the overall coordination and installation responsibilities of multiple trades, experience has proven that the best approach is to have the project construction team responsible for installing everything including the finished wall, ceiling, floor, and equipment racks and mounting involved. IT/IS would then be responsible for the installation of IT/IS equipment and operational testing. IT/IS installation and testing should be included in the owner's project schedule as it will impact beneficial occupancy.

It is becoming more apparent to the healthcare industry that IT systems are complex. Because of the multi-disciplines that are needed to design the IT infrastructure, it is highly recommended that facilities construction manager be the hospital lead for such projects due to their experience with central plant infrastructure systems for both hospital buildings and the campus.

G. Application of project to OSHPD

Design professionals are customarily responsible for preparing the OSHPD plan review application. However, mistakes may be made. Therefore, the hospital representative should review the application to ensure that:

- The right forms and all applicable forms are used and are completed correctly and thoroughly as well as signed by the appropriate parties (for example: projects with incremental submittals and permits will require a special form).
- An appropriate hospital official with adequate OSHPD knowledge is named as the facility representative (who will receive copies of OSHPD correspondence that would otherwise go only to the designers).
- The boxes on the form describe how this work furthers fulfillment of your SB 1953 Compliance Plan (although almost all work does, most goes uncredited).
- The hospital owner will pay 1.64% of construction costs (excluding designer's fees and other "soft" costs) to OSHPD as their fee for service. If Integrated Review is chosen, the fee is 1.95%. Refer to CAC 7-133 for fee assessments of various OSHPD processes.
- OSHPD has deemed the plan complete owing to no defects or omissions.

An applicant is expected to be as accurate as possible in estimating construction costs and there will be adjustments made at the end of the project. Please see CAN 1-7-133(k) – Review of Design and Construction by Seismic Examination for more comprehensive information about fees.

Tip: *Ensure that the application for plan review is complete.*

7.6 Permit Phase

A. Plan Approval

Plan review follows a predictable course through the OSHPD process depending on the plan review process utilized. Documents submitted are triaged by OSHPD plan review staff for completeness and are accepted or sent back. Once a review is completed, the documents are returned as approved documents or with comments that must be addressed before they can be approved. Revised documents are submitted for additional review called a backcheck. The backcheck cycle repeats until the plans can be approved. OSHPD sets target durations for each phase of review. Hospital leadership should closely monitor the progress of the plan review process:

Tip: *Receive an explanation from the design team if drawings are returned by OSHPD during triage.*

Tip: *The hospital project manager should track OSHPD performance during review cycles to maintain an understanding of the status of the plan review.*

All OSHPD plan reviews can be observed in real time using the OSHPD website. Concerns over missed target dates should be raised with your design team and ask them to seek clarification from OSHPD plan review managers.

Tip: *Monitor the passage of time between the date that OSHPD releases drawings with comments to be corrected and the date that your design team resubmits.*

Do not blame OSHPD for a slow "turnaround" by the designers. Projects that take longer than ninety (90) days in turnaround waste the hospital's resources and could result in being treated by OSHPD as abandoned projects.

Tip: *Keep track of the number of review cycles.*

Depending on the size and scope of the project three cycles are not unusual: first review and two backchecks. Continued comments by OSHPD plan review staff after the second backcheck may be an indication of a problem with design or inappropriate response to OSHPD comments by the design team. Hold your design team accountable for the satisfactory outcome of the OSHPD process.

Tip: *Request the design team to provide complete schedules with committed response times and a list of critical issues requiring hospital input, as well as dates required for hospital data to be provided so that the data can be completely integrated into the documents.*

OSHPD has developed a project review time calculator which can be used to establish reasonable time frames for the initial review and any backchecks. OSHPD will want to schedule a meeting of interested parties if there are still plan review comments after two backchecks. More than two backchecks indicates that there are problems with the

project and hospital owners should want to schedule such a meeting as quickly as possible.

All documents sent to OSHPD are triaged. Any document that can be handled in less than a half hour is acted upon immediately. OSHPD uses over-the-counter review for projects that do not require more than two hours for structural review and no more than one hour of review for other disciplines.

OSHPD lists the status of each project on its website. A hospital owner or representative can reach the website using the hospital's facility number or the project number. This tracking system can be used by the hospital leadership to track the status of a project.

OSHPD reports that the chief reasons for project delays are the following:

- Defects or omissions in plans.
- Failure to promptly reply or to provide complete responses to OSHPD plan review comments.
- Project changes during the review process
- Project changes during construction.

Although a project is complete and a building permit is issued, an ACD can result in a delay of a project during construction. On several occasions, OSHPD has observed a contractor informing a hospital representative that considerable money can be saved during construction using an alternate means. What the owner is not told is that many times the alternate means can hold up construction while it is plan reviewed and the delay costs may be more than the savings from using the alternate means. It is essential that hospital representatives understand that code is minimal. On some occasions, designers may attempt to use an alternate means to achieve less than code. Any alternate means must be equivalent or greater than code. Submittal of an Alternate Means of Construction will result in additional review time and costs - refer to CAC 7-133 (p).

Tip: *Keep track of the plan review process through OSHPD.*

Tip: *OSHPD Forms can change over time. Obtain all needed OSHPD forms from the OSHPD website to ensure they are current.*

The owner is responsible to ensure that OSHPD is notified when construction begins. This notification must include the name and address of the contractor, the contract price, the date on which the contract was awarded, and the date of construction start. Construction must start within one year of plan approval. Failure to do so will cause the permit to expire and with it the approval of the plans. Prior to a building permit lapsing, an extension can be requested. Once a permit is allowed to lapse, proceeding with the project involves starting the OSHPD process from the beginning. If the building codes have been revised in the meanwhile, the design process must be based on the new

code. The owner is also responsible to notify OSHPD if construction is suspended for more than two weeks.

Tip: *Never let your permit lapse.*

B. Infection Control Risk Assessment (ICRA)

Prior to initiating construction in an operational healthcare setting, an ICRA should be completed to determine the environmental risks and mitigation efforts to keep the environment safe due to construction activity. ICRA parameters are designed into the construction documents by the design professionals of record (DPOR) and built/maintained by the construction crew throughout the duration of the project. The ICRA is used to help reduce the infection risk during construction and can help identify potential risk to the healthcare environment.

The ICRA process is a proactive and integrated process for planning, design, construction, and commissioning activities. A team of experts from the facility develop, analyze, and approve the ICRA. This team is a collaborative team of various departments within the hospital from Infection Prevention, Clinical, Quality, and frontline caregivers along with Facilities management. As a team, the ICRA is developed by using the health risk assessment tools within the Facilities Guidelines Institute (FGI). The outcome of the ICRA risk assessment can then be passed down to the contractor through the OSHPD approved construction documents and monitored via the ICRA team for strict adherence to the level of containment needed depending on the risk level within the environment the project is in.

ICRA During Design: During design, the DPOR addresses standards as required for airborne isolation/protective equipment rooms, airborne isolation rooms, special HVAC needs, water and plumbing systems, and materials for surface and furnishings.

ICRA During Construction: Consider the risks associated with construction in the healthcare environment. Debris compromising the environment, particulates and airborne microbes being introduced into the hospital ventilation systems. Also, water stagnation and contamination and transporting of waste and construction debris.

Pre-Construction Risk Assessment (PCRA): Before any construction starts, a PCRA must be completed to help identify the overall risks associated with the activity and identify the measures the contractor will need to follow. As a rule, the PCRA focuses on both the systems within the hospital and how the construction-related activity may affect patient safety. As with the ICRA, the PCRA should be developed by representatives from hospital safety staff, DPOR, contractor, maintenance, Infection Control, and Facility Operations.

The team develops the assessment-based walk through of the proposed project area and evaluating the surrounding areas on the same floor, as well as below and above. The assessment should be based on key criteria as identified during the walk.

- Noise Generated from the Project
- Vibration
- Emergency Procedures
- Nurse Call and Staff Alerting Systems
- Fire Alarm and Security Systems
- Utility Disruption
- Medical Gas Systems
- Shutdown Notifications
- Hazardous Material Remediation
- Impact on Fire Alarm and Fire Suppression Systems
- Firewalls or Door Assemblies Compromised
- Impacts to Adjacent Areas
- Impact on Circulation
- Hot Work Impacts (welding, grinding, etc.)

With the assessment complete and approved by the facility, the ICRA, PCRA, and Interim Life Safety Measures (ISLM) should be posted at the job site and saved as part of the project documents. Throughout the course of the project the construction activity can be monitored and inspected to ensure compliance is kept to the standards set forth by the parameters identified. Contractor and staff training are also required as part of the ICRA, PCRA, and ILSM. This training educates not only the contactors on the specifics of the ICRA, PCRA, and ILSM but also ensures that staff are kept aware of the environment ensuring occupant's safety.

C. Interim Life Safety Measures (ILSM)

ILSM's have been identified by accrediting agencies and the National Fire Protection Association to compensate for hazards caused by Life Safety Code deficiencies or construction activity. Healthcare facilities in general apply ISLMs to ensure the safety of all staff, patients, and visitors. These measures include clear pathways to egress points, fire protection systems, exit signage, and smoke barriers. As with the ICRA and PCRA, the ILSM should be developed by representatives from hospital safety staff, DPOR, contractor, maintenance, Infection Control, and Facility Operations.

With construction projects, general renovation or extensive maintenance potentially impacting the environment, new ILSM measures need to be implemented to ensure operation safety for patients, staff, and visitors. ILSM assessments must be performed

on any system or element that could create a life safety code deficiency. Among the questions that should be asked as part of this process are:

- Will any egress pathways or exits be altered or obstructed?
- Will access to emergency services and for emergency responders be impaired, restricted, or rerouted?
- Will any fire detection or alarm systems be impaired?
- Will any part of the fire suppression or sprinkler system be impaired?
- Will any smoke/firewalls, doors, or assemblies be compromised?
- Will the fire safety of personnel in adjacent areas be affected?
- Will it be necessary to install temporary construction partitions?
- Will the project result in the accumulation of debris and/or materials and increase the combustible load in the work area?
- Will the project activity include significant ignition sources (e.g., cutting, welding, soldering, or other activities involving an open flame)?
- Will the project activity present any other safety-related hazards?

Tip: *During the project review phase, establish the criteria for ICRA, PCRA, and ILSM to be used during construction.*

D. Other Practices Recommended for the Owner

There are some general overall recommendations that have been found to increase the likelihood of a successful project. These include, but are not necessarily limited to the following:

- *Examine requests for changes by owner stakeholders carefully.* Changes create project delay and increase costs. Evaluate whether any change is really needed or simply reflects a preference. Often new staff or new technology can stimulate the "need" for change by owners, but these may not be sufficient motivation giving time and cost impacts. Determine whether the changes can be made later, after the project is complete. Often the cost of making changes during construction will be significantly greater than if the changes are made as a separate follow-on project.
- *Consider administrative support for the IOR program.* The IOR, the primary interface with OSHPD field staff and the project during construction, conducts inspections, acts as the on-site representative for OSHPD, and keeps the owner informed about progress and problems. Consequently, allocating IOR resources is one of the critical elements of success for any project. The IOR's inspection duties and documentation will consume most of their time. Providing the IOR with administrative support for filing, record keeping, etc. will allow the IOR to perform their inspection duties and responsibilities as designated in the OSHPD

approved Testing, Inspection, and Observation Program. Any weakness in the IOR program will lead to project delays, contractor claims, and other disruptions.

- *Include the IOR inspection program as part of the project planning and budget.* Inspections by the IOR are required by the regulations and must be performed. Establishing the inspection program early and managing it daily will facilitate coordination with OSHPD and optimize the time spent on the project by OSHPD field staff. Ensure that adequate numbers of IORs are provided on larger projects such that inspection does not become the critical path for the work. The inability to obtain inspections when and where needed will result in additional time and costs. Ensure that the IOR's contract includes project closure requirements and activities. Failure to ensure closure of a project in compliance can have negative impacts for the owner, such as not obtaining use or occupancy of the project after construction is completed. Refer to Section 8, Guidelines for Hospitals Working with OSHPD, regarding Project Closure.
- *Schedule OSHPD field staff time efficiently.* OSHPD's available time at the project site is limited. The owner, through the IORs, should ensure that priorities are established and that all parties are ready when COs, DSEs, or FLSOs are on site so that their time is efficiently utilized.
- *Ensure the DPOR's contract includes their responsibilities and duties as prescribed in Title 24.* This will include, but is not limited to reviewing and approving IORs for the project, overseeing the work of the IORs, ensuring compliance with all TIO requirements, ensuring that all project closure steps, and documentation is completed prior to occupancy or construction final of the project, etc.

E. Comment and Process Review

The decision of OSHPD plan review and field staff as it relates to interpretation of Title 24 may be appealed by a hospital or its design team or contractors if it is felt that the interpretation is in error. There are both informal and formal processes for appeals, each with its own timing and mechanisms. The Comment and Process Review (CPR) program is established by OSHPD as a method for a hospital owner or its consultants to have persons of increasing authority review code interpretations made by first-line plan reviewers and field personnel. This informal process is as follows:

Step 1: Review with the Comment Originator
The plan review staff and field staff are responsible for rendering judgments regarding applicability of the building code. If the hospital or design team object to an interpretation of the code as expressed through the comments made by OSHPD staff, the first step of the process is to discuss the difference of opinion with the staff person who originated the interpretation. This allows for disputes to be resolved at the lowest level.

Step 2: Appeal to the Supervisor
If the matter is not resolved satisfactorily with the staff member, the issue may be appealed to the Regional Supervisor or the Regional Compliance Officer who supervises the originator of the code interpretation. The supervisor may uphold, overturn, or modify the interpretation as is determined to be appropriate. The supervisor's ruling then becomes effective.

Step 3: Appeal to the Division Chief
If the matter is not resolved satisfactorily with the supervisor, the issue may be appealed to the Division Chief over the region involved in the dispute. The Division Chief may uphold, overturn, or modify the interpretation and may seek guidance from other supervisory personnel who serve as subject-matter experts over the disciplines in question or from other OSHPD staff as appropriate. The decision of the Division Chief marks the end of the informal appeal process.

F. Hospital Building Safety Board

After the informal CPR process has been exhausted, the issue may enter the formal appeal process by being submitted for judgment to the Hospital Building Safety Board (HBSB). The HBSB, a statutory body appointed by the HCAI Director, serves two purposes:

- To advise the Director of HCAI on the administration of the Hospital Facilities Seismic Safety Act.
- To act as a board of appeals regarding any actions taken by OSHPD related to hospital facilities and any other action taken by OSHPD, including SB 90 appeals.

The hearing process is a formal action of the State of California, and the outcome is binding. If the appellant has been adversely affected by the decision of the HBSB, the appellant may further appeal the issue for resolution by the California Building Standards Commission (Health and Safety Code Section 18945).

G. Considerations for Appeals

Applicants have an undisputed right to appeal without retaliation. Before engaging in appeals, the hospital owner should consider the following points:

- *Ensure that your professional design consultant or contractor has a winning position.* Codes can be open to interpretation and OSHPD's orientation of interpretation is toward the greatest degree of safety. Be ready to show that the code unambiguously allows the design being proposed and that the application of code does not reduce safety.
- *Ensure that your project can endure the time it takes to appeal a comment.* The informal CPR process, which has specified time limits for each step, is intended to take less time than the formal process through the HBSB, that can take up to a year for resolution. Projects in the plan review stage can often pursue the CPR

process but may be set back substantially by an HBSB appeal. However, PIN 47 – Expedited Appeals provides for an expedited HBSB appeals process.

Tip: *Use established channels in resolving disputes with OSHPD.*

7.7 Construction Phase

The CAC requires that all hospital construction be observed continuously by an OSHPD-certified IOR. The IOR is selected and hired by the hospital owner. An OSHPD-certified IOR is required to perform inspection of all alterations, modifications, and additions to existing hospital buildings and new hospital facility construction. OSHPD certifies inspectors for three levels of inspection defined as follows:

- Class A IORs may inspect all phases of construction, including architectural, mechanical, electrical, fire and life safety, and structural elements. Note that this class includes major structural construction.
- Class B IORs may inspect only the following phases of construction: architectural, mechanical, electrical, fire and life safety, and anchorage of nonstructural elements.
- Class C IORs may inspect only specific disciplines of construction defined in regulations.

See Section 4, Inspector of Record Guidelines, for a comprehensive review of IOR roles and responsibilities. Depending on the size and complexity of a project, more than one IOR may be necessary to avoid construction delays. The owner should ensure that the inspection process does not become the critical path during construction, by providing competent adequate inspection including the number of inspectors needed to perform timely inspections.

Prior to retaining an IOR, references should be checked with hospitals and architects who worked on projects with the IOR. The prospective IOR should also have experience with similar projects.

Tip: *Hire an IOR appropriate for the project.*

Large projects sometimes require that occupancy is requested for portions of the construction before all the work is finished. Discuss your early occupancy needs with OSHPD field staff before construction begins. Use of an integrated project delivery model will address this issue up front.

Tip: *Discuss your phased occupancy plans with OSHPD field staff before construction begins.*

ACDs are one of the primary reasons for project delays and cost overruns. ACDs are sometimes generated to meet the needs of medical staff after a project receives a building permit or originate from a contractor who has an alternative means of constructing the project (not approved by OSHPD) to potentially save the hospital

money. A building permit is issued for a specific plan reviewed project. All ACDs that materially alter the work of construction need to be reviewed by OSHPD and this will cost time and money. Hospital owners should determine all the actual cost implications of an ACD prior to requesting it or approving it to proceed.

Tip: *Avoid deviations from approved plans to minimize ACDs.*

Ensure that your contract for services with the contractor requires the contractor to adhere to the requirements of the approved plans without deviation. Any work not performed to exact specifications can be ordered removed by OSHPD field staff at any time. If that happens, hold the contractor responsible for costs and lost time resulting from such deviations. Hold the contractor responsible for understanding, complying, and building per the OSHPD-approved documents. The contractor should be involved with the project early, depending on the delivery method chosen by the owner, and should work with designers and the hospital to resolve construction issues prior to construction starting. Owner-driven ACDs are common in the rapidly changing healthcare industry since needs and services often change. As experienced professionals, the hospital owner, designer, and contractor team must assume responsibility for managing and anticipating some of these changes and incorporate flexibility into the design and construction schedules to mitigate ACDs.

Tip: *Require that the contractor obtain both the hospital's and OSHPD's approval before deviating from the approved plans.*

Each OSHPD field staff member has a large geographic territory to cover with numerous hospitals to visit. Scheduling field staff visits well in advance of the need for an on-site visit is the norm; however, the trip will be of little or no value, and the construction will face costly delays if the contractor and design team are not properly prepared for the visit. Ensure that your project team understands its responsibility and the consequences of not being prepared. Typically, the IOR schedules OSHPD staff visits. A hospital representative, who understands the project and can keep the hospital leadership up to date on the project, should be a participant in these meetings.

Tip: *Ensure that your architects and contractors are ready for OSHPD field staff visits.*

7.8 Close-Out Phase

OSHPD field staff must approve the work before issuing a certificate of occupancy or construction final for the construction. Ensure that the observation will be successful by making certain that the work is ready for the review and that all required verified reports, testing and inspection reports, and ACDs have been approved before the final inspection. For additional project closure requirements, see Section 8, Guidelines for Project Closure.

Tip: *Be prepared for the final OSHPD review. Ensure that the project is "Closed in Compliance" by holding the DPOR, Contractor, and IOR responsible to achieve this outcome.*

The hospital is unauthorized to use the finished work until OSHPD has issued the certificate of occupancy or construction final, as applicable. Normally use for patient care is restricted until CDPH has licensed the construction, equipment, or service for use following the receipt of the certificate of occupancy.

Tip: *Do not attempt to use any building or equipment or provide any service until the building is approved by OSHPD with a certification of occupancy or construction final as applicable.*

Approval by OSHPD is often assumed to be the end of the journey. Before OSHPD will log a project as being Closed with Compliance (CLSD) the following needs to occur:

- OSHPD shall schedule a final state agency inspection of the work after the receipt of the responsible architect or engineer's statement that the contract is performed or substantially performed.
- The final approval of the construction shall be issued by OSHPD when:
  - All work has been completed in accordance with the approved plans and specifications.
  - The required verified compliance reports and test and inspection reports have been filed with OSHPD.
  - All remaining fees have been paid to OSHPD.

Final approval shall be confirmed by a letter sent to CDPH with a copy to the applicant. The letter shall state that the work has been constructed in accordance with Title 24. Upon completion of the project, all originals of field records of construction procedure as required by CAC Section 7-145(a)6 shall be submitted to the Hospital Governing Board or authority.

Final verified reports by the AOR, various EORs (e.g., Electrical, Mechanical, and Structural), the IOR, and the contractor, as well as written notice from the hospital asking that the project be closed, and certification of the final construction cost and cost of radiology equipment installed must be submitted to OSHPD. Projects are classified as Closed Without Compliance (CLWC) typically for two reasons:

- Work was abandoned after it began.
- The closing paperwork was not properly filed.

Projects that are logged into the OSHPD database as CLWC do not disappear with the passage of time. They require resolution of the conditions that resulted in the assigned status. Future work may be severely impacted by the existence of CLWC projects when the new projects must rely on conditions that were created under the CLWC project. The CLWC status can sometimes be cleared retroactively but often with great effort.

If outstanding non-code complying issues remain, the project will be closed without Title 24 compliance (CLWCC). Licensing and Certification will be notified for appropriate action if the non-code compliance issue results in an unsafe condition.

***Tip:** Ensure the project is closed with compliance.*

7.9 Commissioning, Start-Up, and Occupancy/Use (Activation)

Although not part of OSHPD's jurisdiction, it is important that project teams are aware of the remaining activities of the project after construction for a facility to become operational. Opening a healthcare facility is a complex process. During Activation, the team strategically works with all stakeholders to bring this phase of the planning process to completion. Activation is the process of preparing people, staff, and facilities for moving and start-up. The key to a successful activation is the plan and workflow. A successful plan starts well before Activation Day One. Throughout the project, the team should be noting clinical impacts, ordinary use of the facility, department, etc. so that all elements of use by patients, staff, and visitors are addressed. Some of the tasks in this phase may include:

- Develop department and hospital-wide logistical and operational plans that include support services and workflows.
- Develop a logistical and operational plan that includes biomedical equipment, furniture, IT, security, cleaning, maintenance, and supply distribution.
- Ensure readiness for Day One Activation inclusive of materials, supplies, and miscellaneous items required for functional operation.
- Development of recommended staffing matrix.
- Coordination of training with ancillary and support services for activation.

In addition to the Activation process, most larger projects and projects involving new equipment will go through commissioning or the commissioning process. This is a coordinated and methodical process to ensure, through documented verification, that all building systems perform interactively according to the design intent. The commissioning process establishes and documents the owner's project requirements criteria for system function, performance expectations, maintainability, etc. Verification and documentation of compliance with these criteria should be continuous throughout all phases of the project (design, installation, construction, startup, testing, and operations). Commissioning procedures require a team effort and should begin during the pre-design or planning phase of the project, continue through the design and construction phases, initial occupancy phase, training of operations and maintenance staff, and into occupancy for warranty and future re-commissioning.

Energy Code Commissioning for new buildings is not a requirement currently, however, it is a highly recommended quality assurance process for new buildings or additions to ensure desired energy efficiency of building systems through design, installation, operation, and maintenance. Commissioning activities start during the design phase of a project and continues through Permitting, Construction, and Occupancy. Tasks include:

- Design
  - Owner's Project Requirements (OPR) Development
  - Basis of Design (BOD) Development
  - Design Review of Construction Documents
- Permitting
  - Submittal of Certificate of Compliance (NRCC-CXR-E)
  - Commissioning Plan Development (Cx)
- Construction
  - Buildings with less than 10,000 sf conditioned area: Acceptance and Verification Testing per NRCC form
  - Buildings of 10,000 sf or greater: Acceptance and Verification Testing per NRCC form, Functional testing per Cx Plan, Operations and Maintenance (O&M), and Cx Report
- Occupancy
  - Certificate of Occupancy

(This page is intentionally blank.)

SECTION 8
GUIDELINES FOR PROJECT CLOSURE

8.0 Introduction

No construction project under OSHPD jurisdiction is complete until the project closure process (PCP) is complete. The California Administrative Code of Title 24 (CAC) 7-155 requires OSHPD to grant a final approval of the work only after the PCP is complete. The PCP should be considered at the beginning of the project and should be a continuing effort throughout the life of the project.

8.1 Different Types of Project Closure

Project closure types include the following:

- Project Closure in Code Compliance: It is the goal of OSHPD and should be the goal of the owner as well, to close every construction project in compliance, unless the owner has chosen to cancel the project.
- Project Cancellation: Projects may be cancelled by the facility at any point during the plan review or construction process.
- Project Closure due to Inactivity: The CAC specifies time limitations for completion of construction document reviews, for the start of construction after obtaining the permit, and for continuous construction efforts without undue delay. Failure to comply with these time limitations may result in the project being closed due to inactivity.
- Project Closure – Administrative: This process is used when a project needs to be closed for reasons outside the parameters of the other closure processes. This may include, but is not limited to executive decisions, legislative mandates, business decisions, etc.
- Project Closure in Non-California Administrative Code Compliance: Projects for which Title 24 documentation, such as Verified Compliance Reports (VCRs), final construction costs, etc. have not been submitted to OSHPD within CAC timeframes after being notified by OSHPD of the need to submit the documentation.
- Project Closure in Non-California Building Standards Code Compliance: Projects that typically fall into this category are those that have been abandoned after construction commenced, that involve unauthorized construction, or defective non-compliant construction that has not been brought into compliance with the OSHPD approved construction documents and/or Title 24. Hazardous conditions related to structural safety, fire and life safety, and public health may exist because of the suspension or abandonment of the project or because of unauthorized or unapproved construction. In this case, CDPH may not approve the project for occupancy or use until it is brought into compliance.

8.2 Project Team Closure Responsibilities

Many of the entities involved in the construction project have a responsibility for project closure. This is because Verified Compliance Reports (VCRs) must be submitted to OSHPD in accordance with the approved Testing, Inspection, and Observation (TIO) program as part of the PCP. However, the Design Professional of Record (DPOR) in responsible charge has the primary responsibility to ensure that all required VCRs are submitted. The DPOR will typically coordinate with the Inspector of Record (IOR) in obtaining the VCRs.

Failure of any entity to provide any required VCRs can result in a project being closed in non-compliance. Therefore, it is incumbent upon the owner to make sure provisions are included in the contracts for everyone required to submit a VCR does so and within the timeframes required by the TIO, the CAC, as well as OSHPD's policies and procedures. The final VCR for each entity will be designated with the letter "F" in the box provided on the VCR form.

All field approved plans must be received by the Office. Failure to submit field approved plans to the Office may result in the loss of the use of field plan approval on future projects. Completion of all tests, inspections, and observation reports will be verified by OSHPD field staff. These documents will then be turned over to the hospital for its records.

Tip: *Begin the project closure process at the preconstruction meeting so that everyone involved in the project is aware of their duties and responsibilities related to closing the project in compliance.*

8.3 Owner's Responsibilities

The owner must provide a final construction cost to OSHPD as part of the closure process. The person providing the final certified costs must be an authorized representative of the owner as designated by a Letter of Authorization. Final costs for construction, fixed equipment, and imaging must be provided. These costs may be provided on the OSHPD form created for submittal of final costs or by a letter on the facility's letterhead. The Regional Compliance Officer (RCO) reviews the final costs and reconciles them with the balances in OSHPD's records. The RCO may request documents to substantiate the difference, such as executed construction contracts, paid invoices, approved ACDs, cancelled checks, etc. If final costs are not submitted, the Office may perform a final construction cost estimate and bill the owner for any fees determined to be owed (refer to CAC 7-133). If outstanding fees are owed, HCAI's accounting office will issue an invoice to the facility. After all outstanding fees are paid, if applicable, the construction cost portion of the PCP is complete.

Tip: *Closing projects in compliance is critical for the hospital, therefore, the owner should include provisions for this in contracts for all entities involved in the project.*

8.4 Why is Closure in Compliance Important?

Construction is finished and the building or space is ready to occupy and/or the equipment or service is ready for use. Some may question why it is important to spend any more time and money on the PCP. Here are a few of the reasons:

- Occupancy or use of the project may be delayed until the project is closed in compliance. OSHPD is not required to provide occupancy or use until a project is closed in compliance.
- Failure to close a project in compliance may stop future construction projects. OSHPD is not required to review plans and/or issue a construction permit for a facility that has projects that have not been closed in compliance or for projects that may be impacted by previous projects that were not closed in compliance.
- Projects closed in noncompliance may not be used to substantiate seismic compliance with the Hospital Facilities Seismic Safety Act, or to change the Structural Performance or Nonstructural Performance Category of a building.
- The occupancy of a building or space, or use of equipment, or implementation of a new or expanded service may be delayed by Licensing and Certification until the project is closed in compliance.
- A facility may lose the right to receive MediCal or other state reimbursement for services for projects not closed in compliance.
- If a hospital wishes to remove acute care services from a building and change the jurisdiction of that building to the local Authority Having Jurisdiction as part of its seismic compliance, having outstanding projects not closed in compliance may delay or prevent the change in jurisdiction.
- As part of due diligence, a prospective buyer will check the status of the facility's OSHPD projects. Projects not closed in compliance will usually hold up any such sale until the projects are reopened and then reclosed in compliance.
- A facility may not receive reimbursement from FEMA after a disaster for work that was not closed in compliance.

8.5 Re-Opening Closed Projects

If a project was closed in noncompliance, the owner may want to reopen the project and reclose it in compliance for the reasons stated herein above, or for other reasons. PIN 56 – Request for Reopening a Closed Project provides instruction on how to accomplish this. OSHPD will evaluate the steps on a case-by-case basis depending on the type of noncompliance closure. There are additional time and material costs associated with this work.

(This page is intentionally blank.)