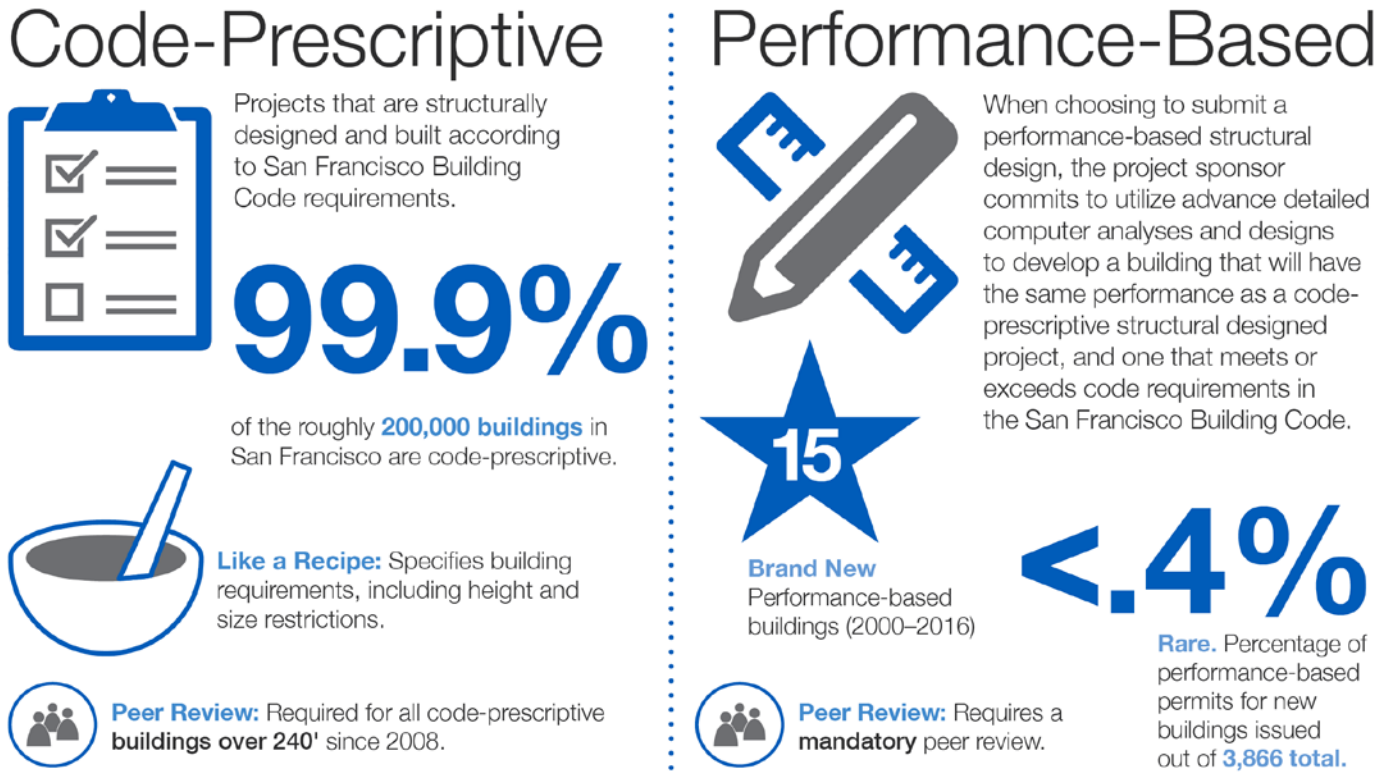
BIC Regular Meeting of March 15, 2017

Agenda Items 8 - Part 2

Performance Based vs. Code-Prescriptive Structural Design (Figure 3)



Design and Seismic Criteria of Buildings

All new buildings are designed and constructed to perform more safely during earthquakes and under strong wind conditions; and both the design and seismic criteria are set by the San Francisco Building Code.

All buildings vary in their anticipated "performance" during a seismic event (e.g. an earthquake). For example, "essential buildings" like hospitals and public safety buildings are designed and constructed to meet the highest, or maximum, standards for earthquake performance. Other buildings vary in how they are expected to perform.

While most tall buildings are not considered "essential buildings," and thus do not meet the highest standards for earthquake performance, San Francisco Building Code requires that they be built to avoid collapsing during a seismic event.

The building code also provides requirements for the structural detailing – the prescribed demands for material and its specific arrangement – based upon what engineers call "the seismic force-resisting system." The seismic force-resisting system is part of a

FOCUS ON SAFETY

It is the responsibility of the owner's engineer of record to ensure that the building plans and construction meet or exceed the safety standards set in the building code.

building's ability to resist the lateral loads caused by wind and earthquakes.

For code-prescriptive structural designs, requirements for the vertical and lateral loads of buildings are based on the expected occupancy and the size, height, and shape of the building. For performance-based structural designs, the peer review panel reviews the design criteria during the site permitting review process.

As part of DBI's ongoing review and strengthening of the peer review process, which includes updates to Administrative Bulletins 082 and 083, DBI's sole selection of peer review panel members, the addition of a second geotechnical engineer as part of the peer review panel for projects located in Soil Classification "F," or soils subject to liquefaction during a seismic event, and DBI's current efforts to establish through a Request for Qualifications' process a pool of experts to draw upon for future peer review panels.

While DBI enforces the City's building codes by regulating the design, construction, quality of materials, use and occupancy, it is the responsibility of the owner's engineer of record to ensure that the building plans and construction meet or exceed the safety standards set in the building code.

WHO IS INVOLVED IN PERFORMANCE-BASED STRUCTURAL DESIGN PROJECTS

It is the responsibility of the design professionals of a performance-based structural design to provide sufficient evidence demonstrating the building's ability to meet or exceed the minimum building code standards as a similar code-prescriptive design project following the San Francisco Building Code.

An independent, third-party peer review, also called a structural design review, must provide an evaluation of all performance-based designs to determine if the proposed building's structural system meets the minimum code safety standards and requirements outlined by the San Francisco Building Code.

TALL BUILDINGS IN SAN FRANCISCO

San Francisco has provided a codified definition for tall buildings since 2008. The San Francisco Building Code identifies a tall building as 240 feet and greater.

Tall buildings remain rare in San Francisco, representing less than 1 percent of the cityscape.

Prior to the early 2000s, the majority of tall buildings in San Francisco were steel framed and followed code-prescriptive structural designs. These code-prescriptive design requirements were revised and more tightly regulated following the 1994 Northridge Los Angeles earthquake.

In the early 2000s, DBI began receiving more proposals for tall buildings. These proposals correlated with advancements in construction that allowed for a greater adoption of concrete.

This section provides a brief background on the construction of tall buildings over the past 20 years and describes the roles and responsibilities of DBI, the project sponsor, and the chosen design team in the construction and inspection of new tall buildings.

KEY TERMS

- Tall Buildings
- High-Rise
- Proposition M

Defining Tall Buildings

DBI has had a codified definition for "tall buildings" for San Francisco since 2008, with the adoption of Administrative Bulletins (ABs) 082 and 083.

Under ABs 082 and 083, a structure that is 240 feet is considered a tall building for projects following a code-prescriptive design.

A height of 240 feet was selected as the minimum definition for tall buildings based upon a building's need for a dual lateral resisting system at that height. A building's lateral resisting system opposes such forces as wind and earthquake that are exerted on the structure.

Beginning in the early 2000s, DBI began receiving more proposals for tall buildings. Many developers sought locations in the City's downtown and South of Market (SoMa) neighborhoods, and developed plans for tall buildings intended for both residential and commercial use. The increase in tall building proposals correlated with advancements in construction that allowed for a greater adoption of concrete, as opposed to steel, as the construction material.

In recognition of the trend toward tall building proposals in the mid-2000s, DBI initiated development of ABs 082 and 083 to provide a codified definition for tall buildings and introduced regulations regarding their review and construction.

Tall Building vs. High-Rise

DBI's definition for tall buildings is separate and apart from the long-established definition for a high-rise used by the San Francisco Fire Department (SFFD). SFFD identifies a high-rise based on the department's ability to fight a fire in the building. A high-rise is determined by measuring the distance from the lowest access point, which can be downslope, against the length of the fire ladder, which is 75 feet.

Based upon SFFD's 2016 annual inspection of high-rise buildings, approximately 600 of the 200,000 buildings (0.003 percent) in San Francisco are high-rise buildings.

Construction of Tall Buildings: Concrete vs. Steel

Prior to the early 2000s, the majority of tall buildings in San Francisco were steel-framed buildings that followed code-prescriptive structural designs. These code-prescriptive design requirements were more tightly regulated following the 1989 Loma Prieta earthquake.

Prop M – Moratorium on Construction of Tall Buildings

Proposition M was passed by San Francisco voters in 1986 and established an annual limit of 475,000 square feet for high-rise development and a total annual office development limit of 875,000 square feet in San Francisco.

Although this proposition was focused on limiting square footage of high-rises in the City, it resulted in a decrease of tall building construction in SF from 1988 until the 2000s.

ENSURING TALL BUILDING SAFETY

Tall buildings are complex structures, and a team of design professionals is brought together by the project owner in their development and review to ensure their safety.

In the early 2000s, concrete became more common as a construction material. As a regional commodity, concrete is more readily available than steel, which is a world commodity and subject to worldwide market fluctuations.

Concrete also has different structural requirements under the San Francisco Building Code and requires less space between floors than steel. As a result, it is possible for a code-prescriptive concrete building to include more floors than a code-prescriptive steel building of the same height.

The choice of construction material is solely that of the developer or project sponsor. DBI does not have a role in selecting building materials used for construction, nor the method of structural design the project sponsor takes in constructing the building.

DBI's main role in plan review and permit issuance is to ensure that submitted projects meet the minimum building standard code requirements stipulated in the San Francisco Building Code.

Role of Owners/Developers in Tall Buildings

Tall buildings are complex structures, and a team of design professionals is brought together by the project owner in their development and review to ensure their safety. It is the responsibility of the project developer and/or owner to determine the scope of a project (e.g. architecture, building materials, weight, height, etc.) and thus, works with their hired design professionals to develop the design and building structure, decide on materials, and agree on important building elements to construct a safe and code-compliant building.

The project sponsor or developer selects the design team, generally consisting of the architect, structural engineer and geotechnical engineer. A project's architect provides the building's design, while the structural engineer is responsible for the structural and seismic system. In all aspects of the building, the design is required to meet the minimum standards set forth in the San Francisco Building Code. These design professionals are responsible for keeping records of documents, which are their instruments of service to securing a project's building permit. The structural and geotechnical engineers are also responsible for reviewing special inspection compliance documents.

The structural engineer of record works in concert with the property owner's chosen geotechnical engineer to determine the building's foundation. Generally, the geotechnical engineer compiles a soil report, which would include the foundation design and seismic ground motion requirements, and provides the related analysis of expected settlement. The structural engineer uses the soil report to design the building accordingly.

After the owner or developer receives a Certificate of Final Completion and

Occupancy from DBI, he or she is responsible for the continued maintenance and safety of the building.

Role of a Professional Engineer

The work, education, training, and experience required of a professional engineer in San Francisco are defined by California's Business and Professions Code under sections 6700-6799. This chapter also is referred to as the "Professional Engineers Act." The three major branches of engineering related to construction covered by this state code include civil, electrical, and mechanical engineering.

In addition to describing the licensing requirements, the Professional Engineers Act prescribes the permissible practices and scope of work for each field of engineering.

Section 6731.4 states that registered civil engineers who provide construction management services include in their responsibilities the following: construction project design review and evaluation, bid evaluation, project scheduling, and general management and administration of a construction project.

Role of DBI in Tall Buildings

DBI works closely with a building's developer and/or owner's chosen engineer of record to ensure that submitted project plans and construction follow San Francisco Building Code. DBI also inspects life-safety systems in a building to ensure that they are code compliant and issues a Certificate of Final Completion and Occupancy (CFC), which allows occupancy.

PROFESSIONAL ENGINEERS ACT CHAPTER 7. PROFESSIONAL ENGINEERS
6731. Civil Engineering Defined

Civil engineering embraces the following studies or activities in connection with fixed works for irrigation, drainage, waterpower, water supply, flood control, inland waterways, harbors, municipal improvements, railroads, highways, tunnels, airports and airways, purification of water, sewerage, refuse disposal, foundations, grading, framed and homogeneous structures, buildings, or bridges:

(a) The economics of, the use and design of, materials of construction and the determination of their physical qualities.

(b) The supervision of the construction of engineering structures.

(c) The investigation of the laws, phenomena and forces of nature.

(d) Appraisals or valuations.

(e) The preparation or submission of designs, plans and specifications and engineering reports.

(f) Coordination of the work of professional, technical, or special consultants.

(g) Creation, preparation, or modification of electronic or computerized data in the performance of the activities described in subdivisions (a) through (f).

A CFC is not issued by DBI until approval from all other agencies having jurisdiction have been provided to DBI. Additionally, documentation of all required special inspection compliances must be submitted to and approved by the DBI Special Inspection services staff. This includes the final compliance reports from the architect or engineer of record and/or special inspection agency that inspected the work requiring special Inspection.

Agency Approvals

1. Planning Department
2. Public Works Bureau of Street Use & Mapping
3. Bureau of Urban Forestry
4. Fire Department
5. Mayor's Office on Disability
6. Municipal Transportation Agency
7. Public Utilities Commission
8. Office of Community Investment and Infrastructure

Compliance Reports from other Parties

1. Special Inspection Agencies
    a. Concrete
    b. Reinforcing steel and prestressing tendons
    c. Special moment resisting concrete frame
    d. Structural welding
    e. High-strength bolting
    f. Structural masonry
    g. Sprayed-on fireproofing
    h. Piling, drilled piers and caissons
    i. Special grading and excavation & filling
    j. Exterior facing
    k. Shear walls a& floor systems used as shear diaphragms
    l. Holdowns
    m. Smoke-control system
    n. Shoring
    o. Underpinning

2. Engineer of record Structural Observation
    a. Concrete
    b. Foundations
    c. Steel framing
    d. Wood framing
    e. Masonry construction

Once a CFC is issued, DBI will respond to any citizen complaints about the building, but the responsibility for continued maintenance and safety is that of the owner.

FOCUS ON: ENGINEERS OF RECORD AND SPECIAL INSPECTORS

Many of the roles and responsibilities of the different inspectors, engineers, construction professionals, and local jurisdiction officials are outlined and defined by the building codes. Chapter 17 of the California Building Code in particular specifies the duties and relationships between the project's engineer of record, the hired special inspectors, and the local jurisdiction. San Francisco Building Code adds to the provisions of Chapter 17 through Administrative Bulletin (AB) 046.

Under AB 046, the engineer of record is responsible for identifying the areas requiring special inspection, which is conducted by qualified, certified, third-party inspection specialists. Special inspectors review materials and workmanship or components critical to the integrity of the building and are hired by the project sponsor. Depending on their areas of expertise, special inspectors provide either periodic or continuous inspection.

Together, the special inspector and engineer of record are responsible for ensuring that construction conforms with the project's approved and code-compliant plans. Special inspectors are expected to bring any discrepancies in the materials or workmanship to the immediate attention of the engineer of record. The engineer of record is responsible for providing final, signed letters confirming the completion of special inspection for all required areas to DBI.

Roles & Responsibilities (Figure 4)

Developers/Owners

- Hire design professionals, special inspectors, contractors, and sub-contractors
- Design projects
- Draft project plans
- Submit plans that follow SFBC
- Choose Code-Prescriptive or Performance-Based design
- Comply with peer review requirements
- Address any inconsistencies DBI identifies
- Choose building materials
- Requires dewatering
- Work with other City agencies during construction
- Maintain safety of building during construction and after Certificate of Final Completion
- Disclose any safety concerns

Design Professionals

Licensed Architect:

- Design and draft project architectural plans that follow SFBC
- Submit building permit
- Retain project records

Design Professionals

Registered Engineer:

- Engineer of Record responsible for project
- Prepares structural calculations, designs, and plans for project
- Structural observation during parts of construction
- Provides final approval letter for project
- Retain project records

Roles & Responsibilities, Continued (Figure 4)

Design Professionals

Geotechnical Engineer:

- Investigate soil conditions at project site
- Provide geotechnical report
- Review structural, seismic, and foundation plans that follow SFBC
- Responsible for reviewing special inspection compliance documents
- Provide final letter stating they have reviewed and approved structural foundation plans
- Retain project records

Design Professionals

Certified Special Inspectors:

- Provide continuous onsite or periodic inspection as required by SFBC
- Monitor the materials and workmanship that are critical to the integrity of building structures and required for public safety
- Assure approved plans and specifications are being followed
- Provide timely reports
- Respond to field discrepancies
- Submit a final signed report

DBI

- Ensures submitted project plans and construction follow San Francisco Building Codes
- Inspects life safety systems in a building to ensure they are code-compliant
- Monitors all changes approved in the field by Engineer of Record
- Issues Certificate of Final Completion
- Responds to citizen complaints and enforce code

PERMIT REVIEW AND ISSUANCE PROCESS

New building proposals follow an extensive plan development and permit review process that generally begins two to three years prior to the first plans being submitted to DBI when the project sponsor selects and hires a design team.

DBI reviews plans to ensure that they meet or exceed the minimum standards prescribed by the San Francisco Building Code.

Other city agencies to review new building plans include the Planning Department, Fire Department, Department of Public Work's Bureau of Street-use and Mapping, Department of Public Health, and the Public Utilities Commission.

After plans have been approved by DBI as conforming to the San Francisco Building Code, the department performs visual site inspections to verify that construction is code compliant and in accordance with the approved plans.

This section summarizes the different stages of the review process in issuing work permits.

KEY TERMS

- Site Permit
- Geotechnical Reports/Geotechnical Engineer
- Addenda

Launching a Project

Generally, the process for any new building in San Francisco begins two to three years prior to any filing by the permit owner for an application with city departments. The developer and/or sponsor initiates a new project by assembling its team of main experts, typically consisting of an architect, structural engineer, and geotechnical engineer. This team of design professionals develops the project plans—including drafting the architectural design, deciding on building materials, and determining the foundation and structural systems—in preparation to filing for a site permit.

After the design team has completed a conceptual design for a project, it files for a site permit with DBI, initiating the formal permitting process. The San Francisco Planning Department is the first to review a site permit application and is responsible for approving the entitlement necessary to start the project. After an entitlement is obtained, the application is referred back to DBI, which issues the site permit. The date of issuance triggers a 15-day clock for any public appeal of the issued permit. Issuance of a site permit does not allow for construction of any kind. Rather, it allows the developers to continue through the permitting process. Construction begins after addenda plans are reviewed and approved, with periodic inspections to verify construction per approved plans.

The majority of alteration projects follow an over-the-counter review process for their permit. An over-the-counter review generally results in issuance of a permit the same or following day. It is used for projects that can be properly assessed within an hour at each necessary review station – and accounts for 90 percent of all issued permits. More complex alteration projects requiring greater in-depth review follow DBI's intake process, undergoing the same review steps but allowing DBI more time for review.

SITE PERMIT PROCESS

The design team develops the project plans—including drafting the architectural design, deciding on building materials, and determining the foundation and structural systems—in preparation for filing for a site permit.

Site Permit Process

A site permit is the first step of the application process for new building permits filed through DBI's intake permitting process. Site permits consist of a set of conceptual design plans that includes the architectural design, exiting, and information on the construction type, which identifies construction materials to be used. Construction material is classified as combustible, meaning wood, or non-combustible, meaning concrete or steel.

Site permit plans are not construction drawings, and they do not include submission of structural, mechanical, electrical, plumbing, and other detailed information required for construction. Issuance of a site permit does not allow for construction of any kind; it is used as a basis to acknowledge the conceptual project has been reviewed and approved as a legal project.

New buildings and building expansion projects going through the intake permit process, regardless of scale or scope, will most typically use the site permit process. The site permit process allows the owner

and/or developer to test the validity of a conceptual design before undertaking the risk or expense of developing a complete set of construction documents.

The Planning Department reviews each site permit application to approve its design and occupancy use. Then DBI begins its review, which consists of an evaluation of the architectural and structural plans.

Other agencies to review a project's application for a site permit prior to issuance include the:

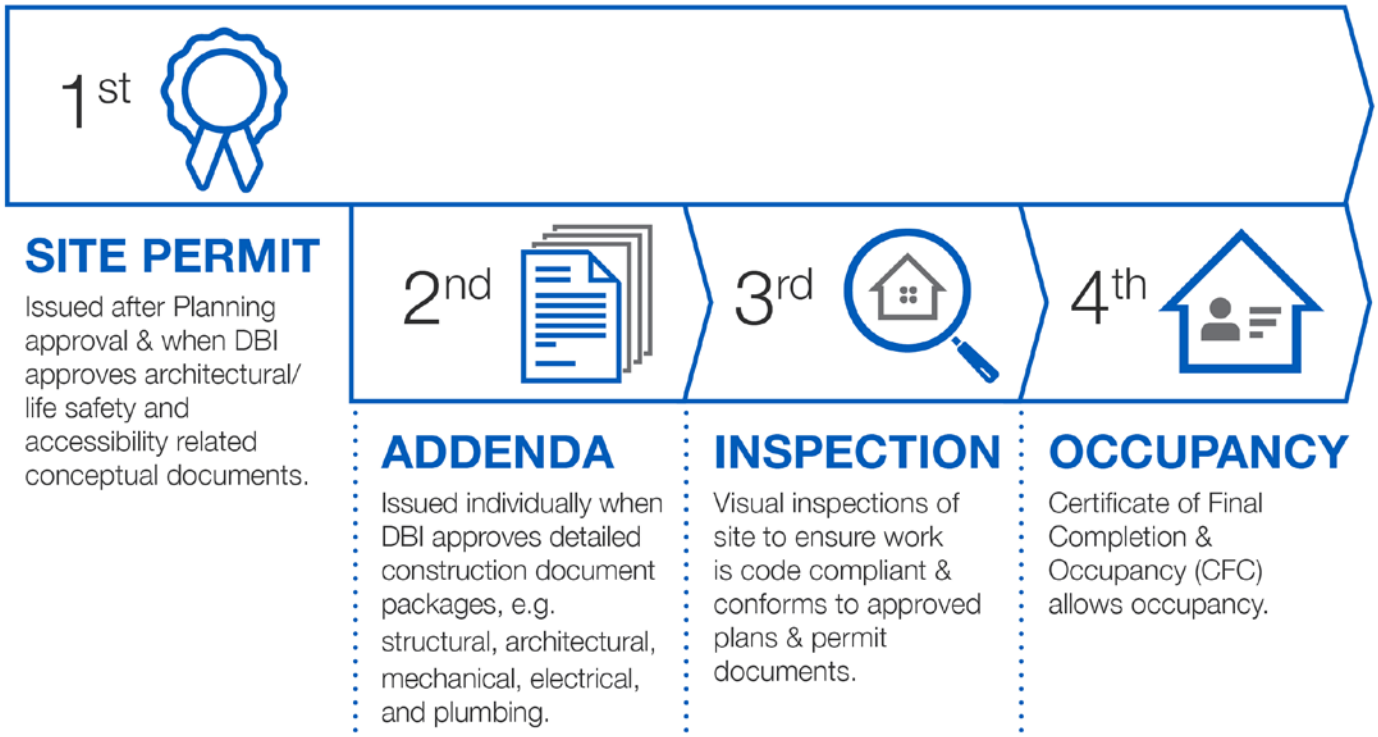
- Fire Department
- Public Works - Bureau of Street-Use and Mapping
- Public Utilities Commission

If required, a peer review panel would consider conceptual plans before a site permit is issued.

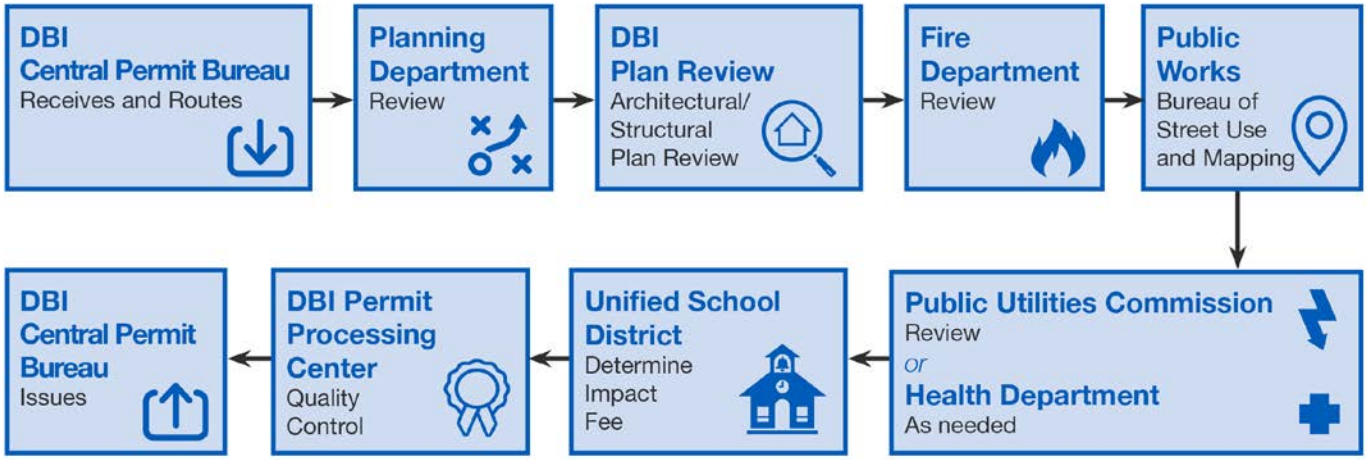
Addenda

"Addenda," for more than one submission, and "addendum," for one complete submission, provide all the information required for construction. These are submitted after a site permit is approved to continue the project in the permitting process.

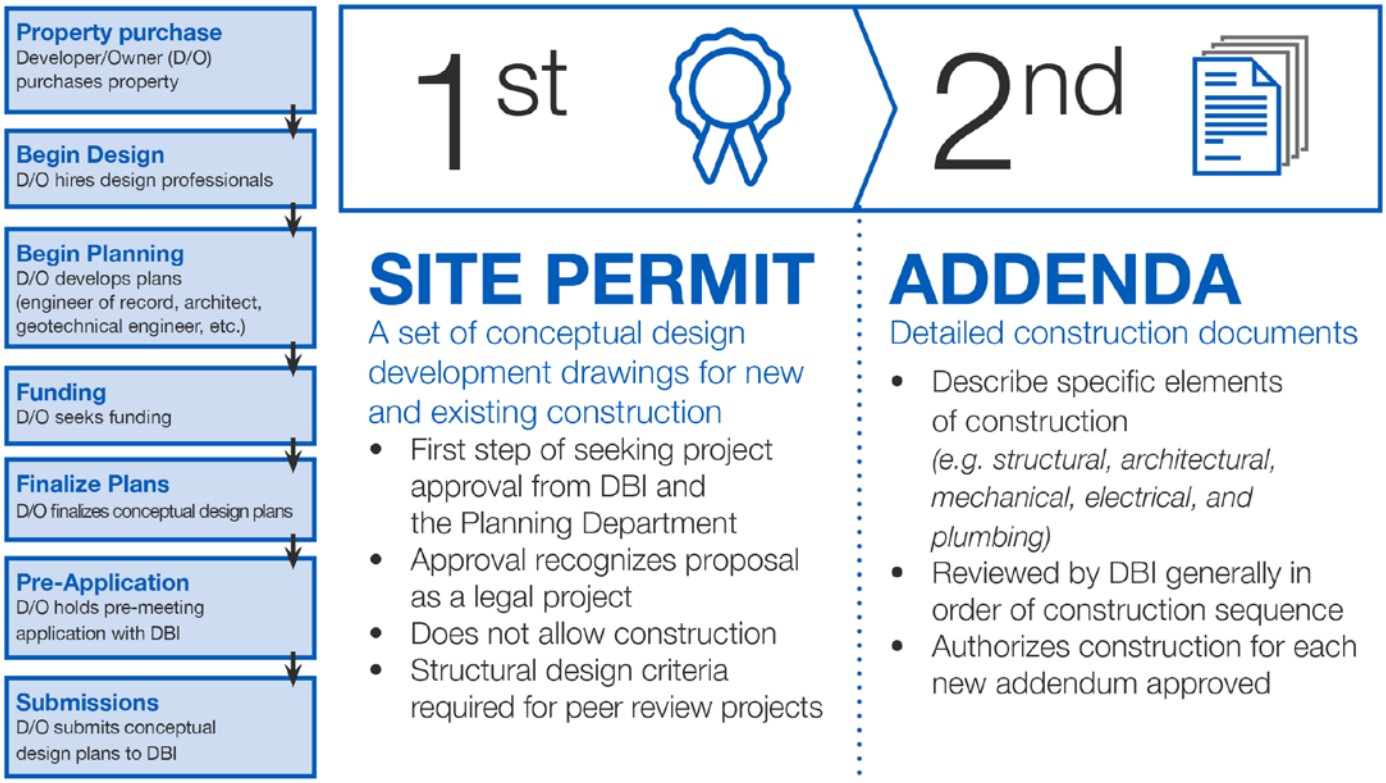
Building Permitting Process (Figure 5)



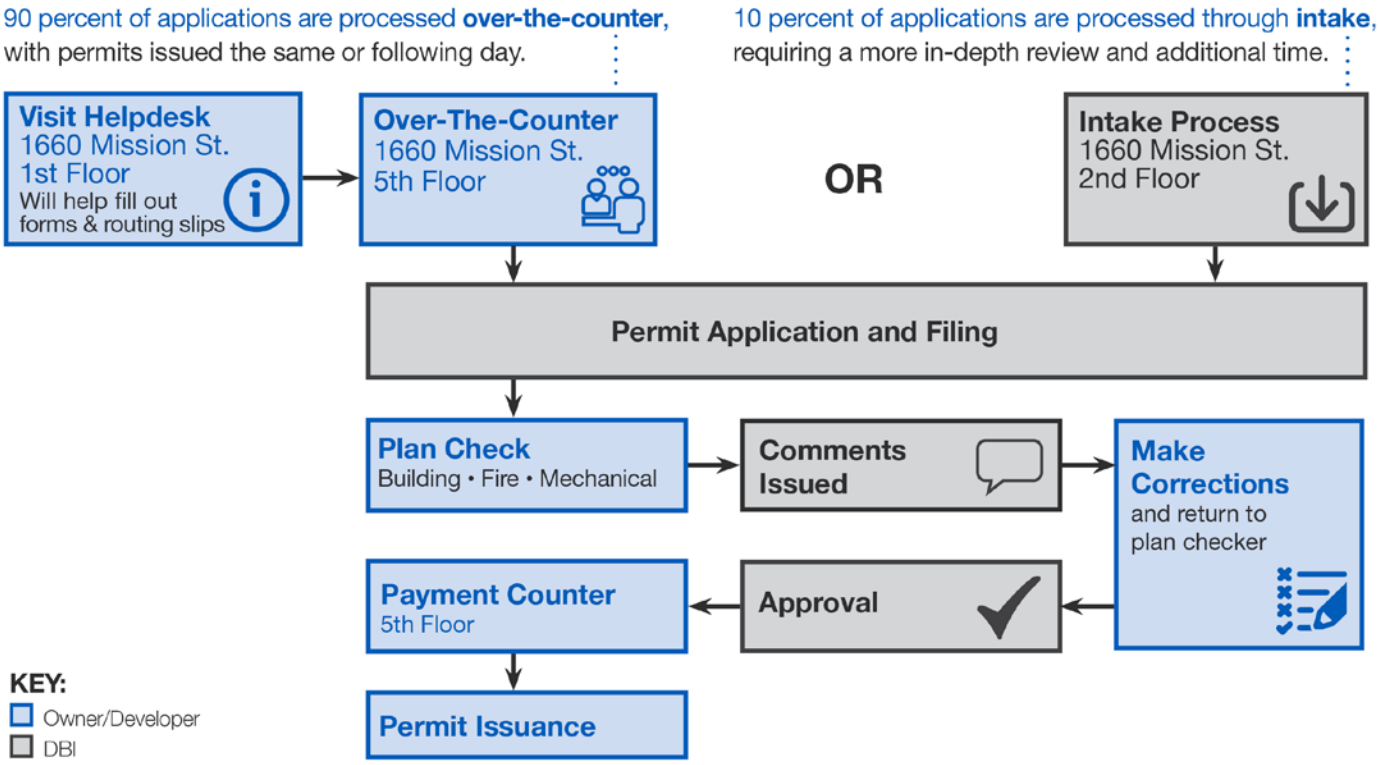
New or Existing Building Site Permit Routing Process (Figure 6)



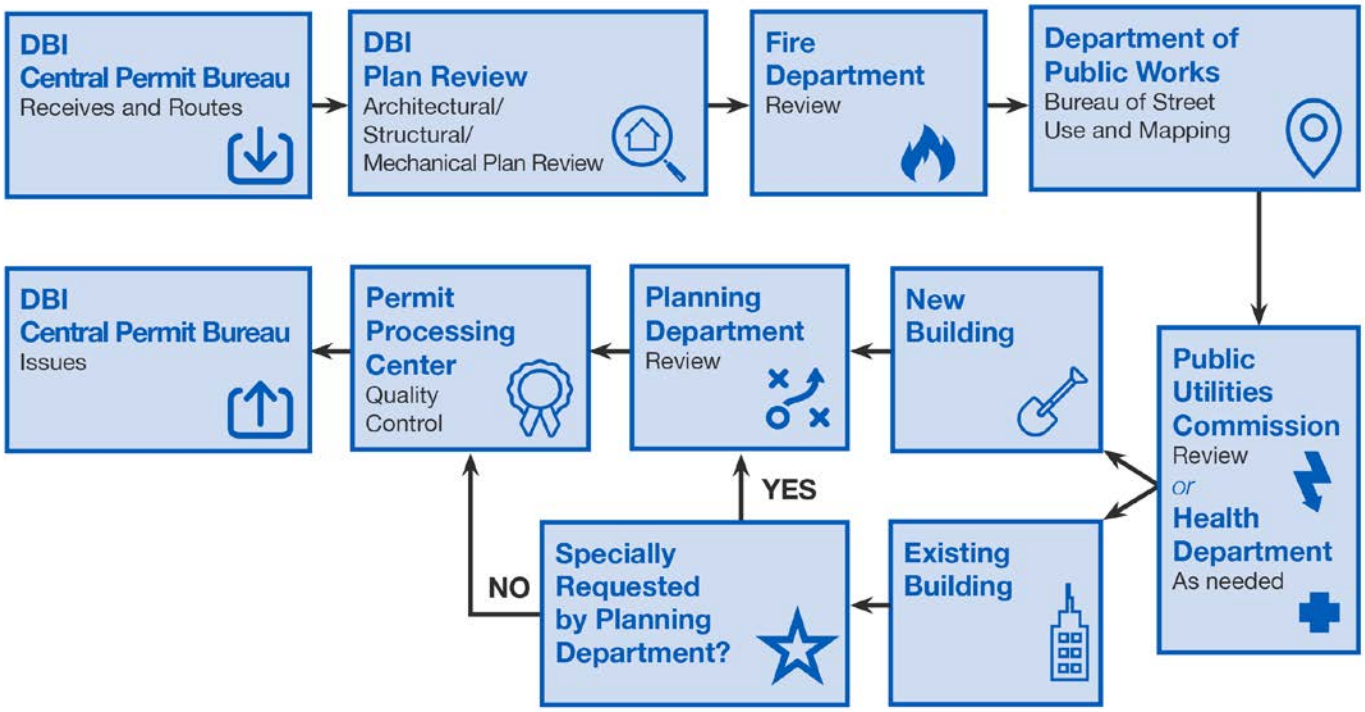
Construction Design Process (Figure 7)



Building Permit Process (for Applicants with Plans) (Figure 8)



Addendum Routing Process (Figure 9)



PEER REVIEW PROCESS

Peer review, also referred to as structural design review, represents external reviewers with additional specialized, individual expertise to supplement DBI's own plan review.

Codified since March 2008 as a mandatory requirement for new tall buildings (at least 240 feet), peer review is performed by a two-to-three person panel. Per Abs 082 and 083, experts may not serve on the peer review if a conflict of interest exists, such as getting involved in the design of the project, with the proposed project.

This section provides on overview of the codification of peer review, outlines the peer review's role and responsibilities, and describes DBI's recent policy changes to improve regulation.

KEY TERMS

- Peer Review

Peer Review Process

Peer review consists of a two- to three-person expert panel, depending on the requirements of the proposed design, and may include a seismic expert, a structural engineer, and a geotechnical engineer.

Both the structural and geotechnical engineer selected to serve on the panel must be registered professional engineers in California. They must be current practitioners in their fields and are expected to provide approval of the proposed project addenda. The seismic expert is generally a respected academic from a locally recognized institution.

Additional areas of expertise expected to be provided by the peer review panel include:

- Structural engineering
- Earthquake engineering
- Performance-based earthquake engineering
- Nonlinear response history analysis
- Building design
- Earthquake ground motion
- Geotechnical engineering
- Other areas of knowledge and experience relevant to the project.

Although members of the peer review panel currently contract with and are compensated by the project sponsor, they are not considered part of the design team hired by the project sponsor or owner. The reviewers are under the purview of DBI. Peer review participants are required to provide DBI with written copies of their proposed scope of work under their contracts. This scope of work and services to be provided, and any subsequent changes, are reviewed and approved by the DBI Director or designee.

Experts may not serve on the peer review for a proposal if a conflict of interest exists with the project. It is the responsibility of each

person considered for peer review to disclose any potential conflict of interest. Registered engineers could be subject to disciplinary action by their state governing board if a conflict of interest were to be found of their appointment to the peer review.

Role of the Peer Review

The peer review's responsibility is to DBI, assisting the department to ensure that a project's proposed structural design complies with the San Francisco Building Code.

Peer review panels approve design criteria proposed by the project's design team and interpret code requirements as they pertain to performance-based design.

Assembly of a peer review panel is not intended to replace quality assurance measures ordinarily provided by the project's engineer of record in assessing the structural design of the building.

Structural peer review may include checking structural engineering concepts, constructability review, review of project assumptions and project approach, and review of structural design criteria and analysis/design methodology.

Mandatory Peer Review Requirements

Until 2007, peer review was not a requirement of the California Building Code. Cities and counties were therefore responsible for developing their own protocols regarding peer review practices. San Francisco began developing its peer review regulations prior to this state mandate. In 2005, DBI initiated drafting of Administrative Bulletins 082 (Guidelines and Procedures for Structural Design Review) and 083 (Requirements and Guidelines for the Seismic Design of New Tall Buildings Using Non-Prescriptive Design Procedures).

These Administrative Bulletins (ABs) were formally adopted and made part of the San Francisco Building Code in March 2008.

In October 2016, the DBI Director, in coordination with the Building Inspection Commission (BIC), added to the regulations

Peer Review Process Roles (Table 2)

DBI

- Activates Peer Review panel.
- Chooses Peer Review members as of October 2016.
- Approves scope of work and services to be provided, and any subsequent changes, are reviewed.

Peer Review Panel

- Consists of two to three individual experts.
- Reports all findings to DBI.
- Check structural engineering concepts
- Provide constructability review
- Review project assumptions and project approach
- Review structural design criteria and analysis/design methodology.

Project Sponsor/Owner

- Has contractual agreement with peer reviewers.
- Compensates peer review for professional services and fees.

for peer review panels, implementing a new selection policy. All peer review appointments are now made by DBI without input from the project sponsor. All peer review panelists continue to be compensated by the developer or project sponsor. DBI is working to develop a vetted pool of experts for DBI to work with on future peer review projects.

DBI's Peer Review Process Over Time (Figure 10)

Based on § AB-082 & 083: Permitting Processing & Issuance

Pre–2008

NO WRITTEN REQUIREMENTS

No written peer review process in place.

Mandatory peer review not required.

Mar. 2008–Oct. 2016

FORMAL REQUIREMENT

AB 082 and **083** formally require third-party peer reviews

for all tall buildings over 240 feet.

Oct. 2016–Present

IMPROVEMENTS UNDER DEVELOPMENT

AB 082 and **083** in place.

Third-party peer review panel appointments are made by DBI without project sponsor input, at the expense of project sponsor. Developing an RFQ of qualified, third party experts for future tall building review.

OTHER CITIES

DBI recently gathered information from Los Angeles, San Diego, San Jose, and Seattle regarding their peer review policies and procedures.

In comparison with other metropolitan West Coast cities (Los Angeles, San Diego, San Jose, and Seattle), San Francisco has a robust and proactive peer review process, reflective of the city's unique building design requirements and its world-class status.

San Francisco's Peer Review Process and Other Cities

In comparison with other metropolitan West Coast cities (Los Angeles, San Diego, San Jose, and Seattle), San Francisco has a robust and proactive peer review process, reflective of the city's unique building design requirements and its world-class status.

Data remains limited on how these four peer cities conduct their reviews—either as a peer review format similar to San Francisco's or as sort of a hybrid—specifically for performance-based structural designs. DBI has collected publicly available information from city websites to begin a comparison of practices. The department has also contacted the cities' building departments for additional information.

Los Angeles

The Los Angeles Department of Building and Safety (LADBS) has established a formal review for the seismic design of tall buildings using acceptable performance-based designs.

LADBS may call for a seismic peer review panel consisting of at least three individuals:

- A geotechnical engineer or engineering geologist with expertise in development of ground motions and geotechnical/geoseismic engineering;
- A practicing structural engineer with expertise in the structural system, performance-based design, and nonlinear response history; and
- An academic of structural engineering with research expertise in the proposed structural system.

LADBS approves appointment of the seismic peer review panel. Compensation of the panel is the responsibility of the owner and/or applicant, and the costs of assembling the panel is independent of other plan review and permitting fees required by LADBS.

Seattle

The Seattle Department of Planning and Development requires predesign conferences for high-rise structures and buildings with an atrium.

Structural plan reviewers review the structural calculations for both the building's gravity and lateral systems. If the building exceeds the limitations outlined in ASCE 7 (e.g. structural height exceeding 240 feet), the department has consultant peer reviewers perform the lateral (seismic and wind) review.

The Geotechnical Engineering Review group reviews the geotechnical report, looks at the structural calculations to see that appropriate geotechnical parameters were used in the design and appear on the plans, and it checks the plans for construction and testing notes and agreement with the geotechnical report and structural calculations for geotechnical parameters.

San Diego

San Diego requires an in-depth review, and the city's Building Official may refer the application directly to the Board of Building Appeals and Advisors for consideration or ratification of the approval being granted.

San Diego did not respond to specific questions about peer review or dewatering.

San Jose

San Jose has an enhanced high-rise design process, but did not respond to specific questions about peer review or dewatering.

Comparison of Peer Review Processes (Table 3)			
	San Francisco	Los Angeles	Seattle
Type of Review	Panel.	Formal review for the seismic design.	Predesign conferences.
Qualification	Reviewers must be a recognized expert in relevant fields.	At least three individuals: a geotechnical engineer, a practicing structural engineer, and an academic of structural engineering.	Peer reviewers perform the lateral (seismic and wind) review.
Selection of peer review	Formerly chosen by the project sponsor with DBI's approval; changed to DBI Director or staff designee.	Established by the Los Angeles Department of Building and Safety and the composition of the panel shall be subject to approval by the department.	Did not mention.
Compensation of peer review	The project sponsor.	The owner/applicant.	Did not mention.
Conflict of interest rules	Yes.	Does not mention.	Did not mention.
Record retention policy	Documents from the structural design reviewer will be retained as part of DBI's project files.	A comment log containing the seismic peer review panel's comments and Engineer of Record written responses shall be maintained.	Did not mention.
Document Referenced	Guidelines and Procedures for Structural Design Review and Requirements (AB 082) and Guidelines for the Seismic Design of New Tall Buildings using Non-Prescriptive Seismic-Design Procedures (AB 083)	Alternative Design Procedure for Seismic Analysis and Design of Tall Buildings and Buildings Utilizing Complex Structural Systems	Required Predesign Conferences for High-Rise Structures and Buildings With an Atrium

THE INSPECTION PROCESS

DBI's inspectors verify that buildings are built according to the approved plans and confirm that all life-safety systems are working properly before issuing a Certificate of Final Completion and Occupancy.

In addition to the visual site inspections conducted by DBI, it is the responsibility of the project's hired architect or engineer of record to perform regular structural observation, conducted at significant points in the construction stages during visual observations of the building's conformity to approved plans and specifications.

Separate special inspections are also conducted by certified, third-party specialists, which are required by San Francisco Building Code. These inspections monitor for material and workmanship critical to a building's integrity.

This section provides an overview of the various roles and responsibilities during inspection of new building construction.

KEY TERMS

- Special Inspection
- Dewatering

DBI's Inspection Process

After plans have been approved and a permit has been issued to the property owner, a building is inspected throughout construction by DBI as well as the project design team and certified special inspectors as needed.

DBI's inspectors verify that buildings are built according to the approved plans and confirm that all life-safety systems are working properly before occupancy can be granted. DBI's Inspection Services is comprised of three divisions—Building Inspection Division, Electrical Inspection Division, and Plumbing Inspection Division—which inspect for and verify code compliance of new building construction pertaining to tall buildings.

Inspection Services also responds to complaints received for residential and commercial buildings.

Building Inspection Division
The Building Inspection Division (BID) has the broadest range of responsibilities. BID inspects the construction of all new and existing buildings for conformity with their approved plans and permits. It also inspects for compliance with state and local building code requirements. BID responds to emergency situations and complaints of unsafe structures and work without a permit. It prepares Notices of Violation as necessary. Unaddressed Notices of Violation are referred to the Code Enforcement Section for Director's Hearings, and possible referral to City Attorney for litigation.

Electrical Inspection Division
The Electrical Inspection Division (EID) inspects electrical permits and life-safety and communications systems to ensure compliance with adopted codes and regulations, adding to personnel and structure safety.

Inspection Process (Figure 11)