

File No. 160975 Committee Item No. 1  
Board Item No. \_\_\_\_\_

**COMMITTEE/BOARD OF SUPERVISORS**  
AGENDA PACKET CONTENTS LIST

Committee: Government Audit and Oversight Date October 28, 2016

Board of Supervisors Meeting Date \_\_\_\_\_

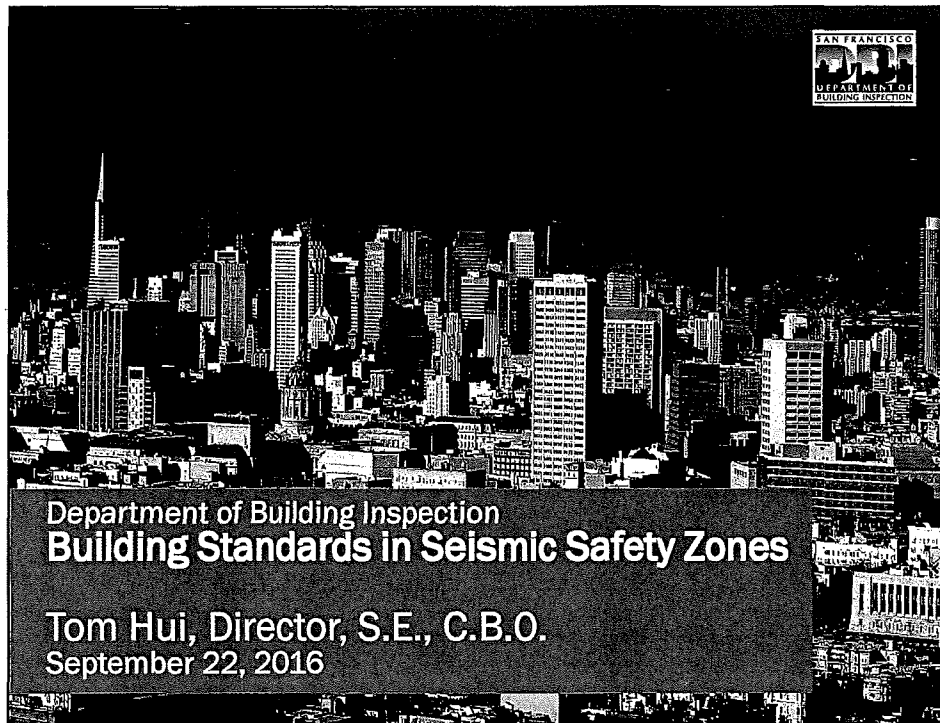
Cmte Board

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**OTHER** (Use back side if additional space is needed)

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| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>Referral FYI - 09/21/2016</u>                 |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>PPT DBI - 09/22/2016</u>                      |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>2013 Administrative Bulletin AB-082/AB083</u> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>Mayor Memo - 09/09/2016</u>                   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>Senator Feinstein Memo - 08/10/2016</u>       |
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Completed by: Erica Major Date October 24, 2016  
Completed by: \_\_\_\_\_ Date \_\_\_\_\_



**SAN FRANCISCO**  
**DEPARTMENT OF**  
**BUILDING INSPECTION**

**Department of Building Inspection**  
**Building Standards in Seismic Safety Zones**

**Tom Hui, Director, S.E., C.B.O.**  
**September 22, 2016**



## **Role of DBI in Construction Process**

- Review plans and designs developed by architects and engineers hired by project sponsor to verify compliance with code in force at time plans are submitted for review.
- Conduct site inspections to verify that construction is in accordance with approved plans.
- Address code compliance issues raised through complaints submitted by San Francisco residents.

## 301 Mission - General Project Information



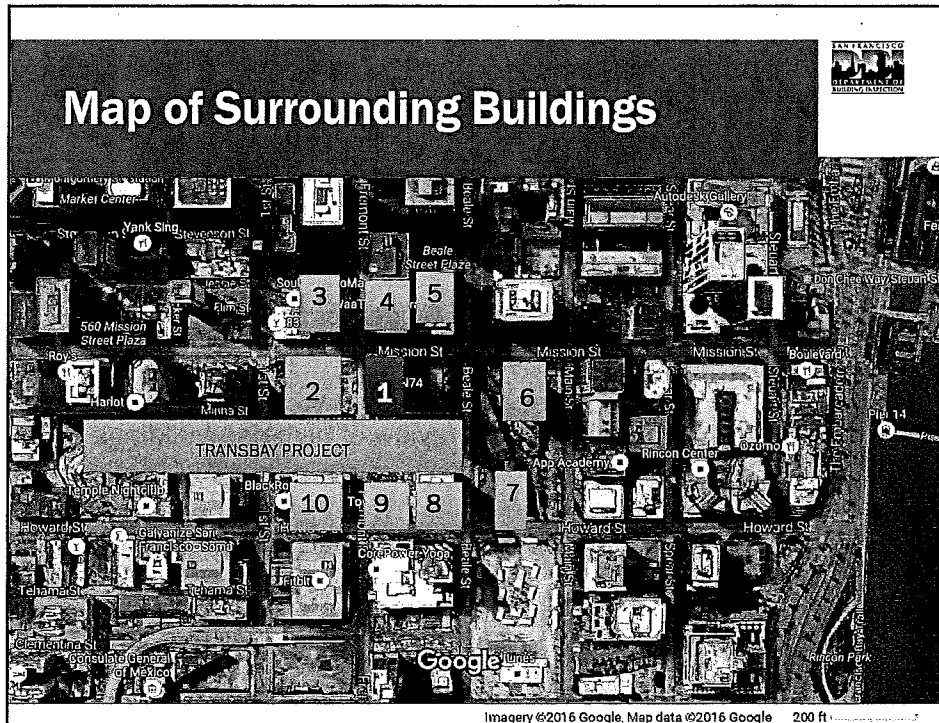
<b>Permit Application</b>	<b>200210239696</b>
<b>Project Description</b>	Erect 58-story 420 residential units
<b>Type of Construction</b>	Type I (Concrete)
<b>Project Valuation</b>	\$175M
<b>Foundation Type</b>	Mat slab with 900+ 14 inch square piles driven down 66-91 feet
<b>Building Code In Effect</b>	2001 CA Building Code

## 301 Mission Permit Issuance & CFC Timeline



<b>Permit Filed</b>	October 2002
<b>Permit Issued</b>	September 2005
<b>TCOs</b>	March 19/May 8, 2009
<b>CFC Issued</b>	August 2009

- DBI issues a TCO only after verifying that life safety components are installed in accordance with plans and are functional (plumbing, electrical, building, and fire).
- DBI inspected project site regularly from Jan 2006 – Aug 2009 and found no signs of settlement.



## Building Foundation Types

Number	Address	Stories	Sub	Foundation	Building Permit Issuance	Type of Construction
1	301 Mission Residential Tower	58	1	Tower: Mat w/ 14 insq piles 66ft-91ft		Concrete
	Retail	12	5	Retail: Mat w/o piles	2006	
2	415 Mission	61	3	Bedrock	2013	Concrete
3	50 Fremont	42	1	Piles: 49 feet long	1981	Steel
4	350 Mission	30	4	Mat w/ no piles	2012	Concrete
5	50 Beale	23	1	Piles: 55 feet long	1967	Steel
6	201 Mission	30	1	Piles: 95 feet piles	1979	Steel
7	250 Howard	45	2	4 to 6'0 pier into bedrock	Currently in review: foundation permit issued 2015	Concrete
8	199 Fremont	27	3	Matt no piles	2001	Steel
9	181 Fremont	56	5	5'0 pier into bedrock	2013	Steel
10	400 Howard	10	2	43 feet piles	2006	Concrete

## Current Policies for Tall Buildings



- Use of Administrative Bulletins (adopted in March 8, 2008) for Tall Buildings:
  1. **AB 082** – Guidelines and Procedures for Structural Design Review and
  2. **AB 083** – Requirements & Guidelines for the Seismic Design of New Tall Buildings Using Non-Prescriptive Seismic Design Procedures.
  
- Mandatory structural design review of high-rise buildings over 240 ft. in height
  
- Any performance based design building structure will require AB 082 review.
  
- These ABs have been used as a model by other jurisdictions

## Status



1. DBI is investigating reports of settlement at 301 Mission.
2. DBI has requested a final, signed copy of the 2014 Foundation Settlement Investigation report and a copy of the 2016 updated report by Simpson Gumpertz & Heger on behalf of project sponsor.
3. DBI has issued a request to the building owners and its engineering and technical teams to keep DBI informed specifically about any observed effects on the building's life safety systems that may be connected to the settlement, and to provide us with an updated engineering report by the end of September.

**ADMINISTRATIVE BULLETIN**

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**NO. AB-082** :  
**DATE** : March 25, 2008 (Updated 1/1/14 for code references)  
**SUBJECT** : Permit Processing and Issuance  
**TITLE** : **Guidelines and Procedures for Structural Design Review**

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**PURPOSE** : The purpose of this Administrative Bulletin is to present guidelines and procedures for Structural Design Review. Structural Design Review may be required by the San Francisco Building Code, by another Administrative Bulletin, or at the request of the Director of the Department of Building Inspection.

**REFERENCES** : 2013 San Francisco Building Code

- Section 101A.2, Purpose
- Section 104A.2, Powers and Duties of Building Official
- Section 104A.2.8, Alternate materials, design, and methods of construction
- Section 105A.6, Structural Advisory Committee
- Chapter 16, Structural Design

ASCE 7-10

- Section 16.2.5 Design Review, Seismic Response History Procedures
- Section 17.7 Design Review, Seismically Isolated Structures
- Section 18.8 Design Review, Structures with Damping Systems

**DISCUSSION** :

### **1. STRUCTURAL DESIGN REVIEWER**

The Director may request the assistance of a Structural Design Reviewer to provide additional and specialized expertise to supplement the Department of Building Inspection plan review. The Structural Design Reviewer is distinct from a Structural Advisory Committee, which is a formal, public body that the Director may convene regarding matters pertaining to special features or special design procedures. The Structural Design Reviewer meets with the Engineer of Record and with Department of Building Inspection staff as the need arises throughout the design process, providing the Director with a report of its findings after completion of their work.

Review by the Structural Design Reviewer is not intended to replace quality assurance measures ordinarily exercised by the Engineer of Record in the structural design of a building. Responsibility for the structural design remains solely with the Engineer of Record, and the burden to demonstrate conformance of the structural design to the letter and intent of San Francisco Building Code provisions resides solely with the Engineer of Record. The responsibility for conducting the structural review for the plan check resides with the Director and any plan review consultants.

The San Francisco Building Code (through reference to ASCE 7) requires design review by independent registered design professionals in several cases. These include use of seismic response history procedures, use of seismic isolation, and use of seismic dampers. The Structural Design Reviewer will provide this review where required by the San

Francisco Building Code. The Structural Design Reviewer will also provide review as required by other Department of Building Inspection Administrative Bulletins and when otherwise deemed necessary by the Director. Structural Design Review, as discussed herein, and design review, as discussed in ASCE 7, are equivalent.

### **Qualifications and Selection of Structural Design Reviewer**

The Structural Design Reviewer shall be a recognized expert in relevant fields such as structural engineering, earthquake engineering, performance-based earthquake engineering, nonlinear response history analysis, building design, earthquake ground motion, geotechnical engineering, geological engineering, and other areas of knowledge and experience relevant to the project.

The Structural Design Reviewer shall be selected by the Project Sponsor from a project specific list provided by the Director. The Project Sponsor may then engage a Structural Design Reviewer as a consultant for assistance as appropriate. The Structural Design Reviewer shall bear no conflict of interest with respect to the project and shall not be considered part of the design team for the project. The responsibility of the Structural Design Reviewer is to assist the Department of Building Inspection in ensuring compliance of the structural design with the San Francisco Building Code. While the Structural Design Reviewer will contract with the Project Sponsor, their responsibility is to the Department of Building Inspection.

The Structural Design Reviewer shall be registered as a Professional Engineer in California. The Structural Design Reviewer shall sign all written communication to the Director.

### **Administration of Structural Design Review**

The Project Sponsor is responsible for the payment of hourly fees and other expenses for the professional services of the Structural Design Reviewer. The Structural Design Reviewer shall provide to the Department of Building Inspection a written copy of a proposed scope of work of their contract with the Project Sponsor. The proposed scope of services in the contract and any changes proposed to be made thereto shall be approved by the Director.

## **2. PROJECTS REQUIRING STRUCTURAL DESIGN REVIEW**

The Director may require Structural Design Review for any project at his discretion. The following types of projects will generally require Structural Design Review:

1. Projects incorporating non-prescriptive or performance-based design.
2. Projects incorporating building heights that exceed 240 feet.
3. Projects incorporating seismic response-history analyses per Chapter 16 of ASCE 7.\*
4. Projects incorporating seismic isolation per Chapter 17 of ASCE 7.\*
5. Projects incorporating seismic damping per Chapter 18 of ASCE 7.\*
6. Projects with irregular and unusual configurations or systems.

Project Sponsors are strongly encouraged to contact the Department of Building Inspection early in the design to determine Structural Design Review requirements.

\*Note: To the extent design review is required under ASCE 7-10, Sections 16.2.5, 17.7 or 18.8, such review process shall be conducted in accordance with the specific requirements of the Building Code and all applicable law."

## **3. SCOPE OF STRUCTURAL DESIGN REVIEW SERVICES**

The scope of services for the Structural Design Reviewer shall be indicated by the Director to provide required expertise to supplement the Department of Building Inspection plan review. It may, therefore, be only for specific portions or structural elements of a project. This scope of services may include, but shall not be limited to, review of the following:

1. Earthquake hazard determination.
2. Site-specific ground motion characterization.
3. Seismic performance goals.
4. Basis of design, design methodology and acceptance criteria.
5. Mathematical modeling and simulation.

6. Interpretation of results of analysis.
7. Member selection and design.
8. Detail concepts and design.
9. Construction Documents, including drawings and specifications.
10. Isolator or damper testing requirements and quality control procedures.

11. At the discretion of the Director, the scope of services for the Structural Design Reviewer may include the review of other building aspects, including design for wind resistance, design of special foundation or earth retaining systems, or the design of critical non-structural elements.

#### 4. STRUCTURAL DESIGN REVIEW PROCESS

The Structural Design Reviewer should be engaged as early in the structural design phase as practicable. This affords the Structural Design Reviewer an opportunity to evaluate fundamental design decisions, which could disrupt design development if addressed later in the design phase. Early in the design process, the Engineer of Record and the Structural Design Reviewer should jointly establish the frequency and timing of Structural Design Reviewer review milestones, and the degree to which the Engineer of Record anticipates the design will be developed for each milestone.

The Structural Design Reviewer shall provide written comments to the Engineer of Record, and the Engineer of Record shall prepare written responses thereto. The Structural Design Reviewer shall maintain a log that summarizes Structural Design Reviewer comments, Engineer of Record responses to comments, and resolution of comments. The Structural Design Reviewer shall make the log available to the Engineer of Record as requested. The Structural Design Reviewer may also issue interim reports as appropriate relative to the scope and project requirements. At the conclusion of the review the Structural Design Reviewer shall submit to the Director a written report that references the scope of the review, includes the comment log and supporting documents, and indicates the professional opinions of the Structural Design Reviewer regarding the design's general conformance to the requirements and guidelines in this bulletin.

**Commentary::** None of the reports or documents from the Structural Design Reviewer are Construction Documents. Under no circumstances should letters or other documents from the Structural Design Reviewer be put into the Engineer of Record's drawings or reproduced in any other way that makes Structural Design Reviewer documents appear to be part of the Construction Contract Documents. The Engineer of Record is solely responsible for the Construction Contract Documents. Documents from the Structural Design Reviewer will be retained as part of the Department of Building Inspection's project files.

#### 5. DISPUTE RESOLUTION

The Engineer of Record and the Structural Design Reviewer shall work in a collegial manner, as independent and reasonable professionals. The Structural Design Reviewer shall prepare comments in a respectful manner and shall make reasonable requests of the Engineer of Record for additional analyses or backup information. The Engineer of Record shall address the Structural Design Reviewer comments cordially and respond directly and clearly.

The Engineer of Record and the Structural Design Reviewer shall attempt to develop a consensus on each issue raised by the Structural Design Reviewer. If the Engineer of Record and the Structural Design Reviewer are unable to resolve particular comments, the Structural Design Reviewer shall report the impasse to the Director.

The Director, as Building Official, shall make final decisions concerning all permits. The Director, should the need arise, may address differences of opinion between the Engineer of Record and the Structural Design Reviewer in whatever method he deems appropriate. The Director also may engage additional outside experts to assist in issue resolution.

Originally signed by:

Isam Hasenin, P.E., C.B.O., Director  
Department of Building Inspection

Approved by the Building Inspection Commission on March 19, 2008





**ADMINISTRATIVE BULLETIN**

- NO. AB-083** :
- DATE** : March 25, 2008 (Updated 01/01/14 for code references)
- SUBJECT** : Permit Processing and Issuance
- TITLE** : **Requirements and Guidelines for the Seismic Design of New Tall Buildings using Non-Prescriptive Seismic-Design Procedures**
- 
- PURPOSE** : The purpose of this Administrative Bulletin is to present requirements and guidelines for the seismic structural design and submittal documents for building permits for new tall buildings in San Francisco that use non-prescriptive seismic design procedures.
- REFERENCES** : 2013 San Francisco Building Code, Section 104A.2.8 Alternate materials, design and methods of construction  
 SEAONC, 2007, *Recommended Administrative Bulletin on the Seismic Design & Review of Tall Buildings Using Non-Prescriptive Procedures*, prepared by Structural Engineers Association of Northern California (SEAONC) AB-083 Tall Buildings Task Group  
 ASCE, 2011, *Minimum Design Loads for Buildings and Other Structures (ASCE/SEI 7-10)*, Prepared by the Structural Engineering Institute of the American Society of Civil Engineers  
 2003 NEHRP Recommended Provisions For New Buildings And Other Structures Part 1: Provisions and Part 2: Commentary (FEMA 450)  
 SEAONC, 1999, *Contractual Provisions to Address the Engineer's Liability when Using Performance-Based Seismic Design*, Structural Engineers Association of Northern California  
 SEAOC, 2001, "Seismology Committee Background and Position Regarding 1997 UBCEq. 30-7 and Drift," Structural Engineers Association of California  
 ([http://www.seaoc.org/seismpdfs/UBC/30\\_7.pdf](http://www.seaoc.org/seismpdfs/UBC/30_7.pdf))

**DISCUSSION** :

**1. SCOPE**

This bulletin presents requirements and guidelines for seismic structural design and submittal documents for building permit for new tall buildings in San Francisco that use non-prescriptive seismic design procedures.

**Commentary:** It is intended that buildings designed to the requirements and guidelines of this bulletin will have seismic performance at least equivalent to that intended of code-prescriptive seismic designs, consistent with the San Francisco Building Code sections indicated below. To demonstrate that a building design is capable of providing code equivalent seismic performance, a three-step procedure shall be performed as specified in Section 4 of this Administrative Bulletin. Intended code seismic performance can be found in the commentary of FEMA 450.

This bulletin intentionally contains both requirements, which are stated in mandatory language (e.g., "shall") and guidelines, which use non-mandatory language.

This bulletin is not written to cover essential facilities.

For the purposes of this Administrative Bulletin, a non-prescriptive seismic design is one that takes exception to one or more of the prescriptive requirements of the San Francisco Building Code and Chapter 12 of ASCE/SEI 7-05 and the standards referenced therein, by invoking San Francisco Building Code, Section 104A.2.8, which allows alternative materials and methods of construction as approved by the Building Official.

For the purposes of this bulletin, tall buildings are defined as those with  $h_n$  greater than 160 feet above average adjacent ground surface.

The height,  $h_n$  is defined in the San Francisco Building Code as the height of Level  $n$  above the average level of the ground surface adjacent to the structure. Level  $n$  is permitted to be taken as the roof of the structure, excluding mechanical penthouses and other projections above the roof whose mass is small compared with the mass of the roof.

Procedures other than those presented herein may be acceptable pursuant to the approval of the Director of the Department of Building Inspection.

**Commentary:** ASCE/SEI 7-10 Sections that discuss non-prescriptive or "alternative" seismic design procedures are reproduced below:

**11.1.4 Alternate Materials and Methods of Construction.** Alternate materials and methods of construction to those prescribed in the seismic requirements of this standard shall not be used unless approved by the authority having jurisdiction. Substantiating evidence shall be submitted demonstrating that the proposed alternate, for the purpose intended, will be at least equal in strength, durability, and seismic resistance.

**12.1.1 Basic Requirements.** ...An approved alternative procedure shall not be used to establish the seismic forces and their distribution unless the corresponding internal forces and deformations in the members are determined using a model consistent with the procedure adopted.

San Francisco Building Code sections that discuss non-prescriptive or "alternative" seismic design procedures are reproduced below:

**104A.2.8 Alternate materials, design and methods of construction.** The provisions of this code are not intended to prevent the use of any material, alternate design or method of construction not specifically prescribed by this code, provided any alternate has been approved and its use authorized by the building official.

The building official may approve any such alternate, provided the building official finds that the proposed design is satisfactory and complies with the provisions of this code and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in suitability, strength, effectiveness, fire resistance, durability, safety and sanitation.

The building official shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding its use. The details of any action granting approval of an alternate shall be recorded and entered in the files of the code enforcement agency.

**1604.4 Analysis.** Any system or method of construction to be used shall be based on a rational analysis in accordance with well-established principles of mechanics. Such analysis shall result in a system that provides a complete load path capable of transferring all loads and forces from their point of origin to the load-resisting elements.

## 2. STRUCTURAL DESIGN REVIEW

Structural Design Review shall be in accordance with AB-082. At the conclusion of the review, the Structural Design Reviewer shall provide a written statement that, in their professional opinion, the building elements under their review are equivalent in strength, durability, and seismic resistance of the building to those of a building designed according to the prescriptive provisions of the San Francisco Building Code.

### 3. SUBMITTAL REQUIREMENTS

Project submittal documents shall be in accordance with the San Francisco Building Code and Department of Building Inspection interpretations, Administrative Bulletins, and policies. In addition, documents relevant to the Structural Design Review shall be submitted by the Engineer of Record to the Director and to the Structural Design Reviewer.

As early as practicable, the Engineer of Record shall submit to the Director an initial Seismic Design Criteria along with a description and initial drawings of the structure. The Seismic Design Criteria shall be consistent with the requirements of this bulletin, and shall be updated to incorporate issues resolved during the Structural Design Review process.

The Seismic Design Criteria shall describe the proposed building and structural system, proposed analysis methodology, and acceptance criteria. The Seismic Design Criteria shall include any proposed exceptions to the prescriptive provisions of the San Francisco Building Code, modeling parameters, material properties, drift limits, element force capacities and deformation capacities. The Seismic Design Criteria shall identify all exceptions to the San Francisco Building Code prescriptive requirements that the Engineer of Record proposes. The Seismic Design Criteria shall be subject to review by the Structural Design Reviewer and approval by the Director. A summary of the Engineer of Record's final Seismic Design Criteria shall be included in the general notes of the structural drawings.

### 4. SEISMIC DESIGN REQUIREMENTS

The Engineer of Record shall evaluate the structure at the levels of earthquake ground motion as indicated in the subsections below.

If nonlinear response is anticipated under any of the Maximum Considered Earthquake (MCE) ground motions specified in Section 4.3, the Engineer of Record shall apply capacity design principles and design the structure to have a suitable ductile yielding mechanism, or mechanisms, under nonlinear lateral deformation. The code-level analysis shall be used to determine the required strength of the yielding actions. The Engineer of Record shall include in the Seismic Design Criteria all assumptions and factors used in the application of capacity design principles.

**Commentary:** The purpose of each level of seismic evaluation is as follows:

The code-level evaluation of Section 4.1 is used to identify the exceptions being taken to the prescriptive requirements of the San Francisco Building Code and to define the minimum required strength and stiffness for earthquake resistance. Minimum strength is defined according to San Francisco Building Code minimum base shear equations, with a response modification coefficient  $R$ , proposed by the Engineer of Record, reviewed by the Structural Design Reviewer, and approved by the Director. Minimum stiffness is defined by requiring the design to meet San Francisco Building Code-specified drift limits, using traditional assumptions for effective stiffness. Providing a non-prescriptive seismic design with minimum strength and stiffness comparable to code-prescriptive designs helps produce seismic performance at least equivalent to the code. Minimizing the number of exceptions to prescriptive requirements also helps achieve this aim.

As indicated in Section 4.2, a service-level evaluation is required by this bulletin to demonstrate acceptable seismic performance for moderate earthquakes.

The MCE-level evaluation of Section 4.3 is intended to verify that the structure has an acceptably low probability of collapse under severe earthquake ground motions. The evaluation uses nonlinear response-history analysis to demonstrate an acceptable mechanism of nonlinear lateral deformation and to determine the maximum forces to be considered for structural elements and actions designed to remain elastic.

#### 4.1 Code-Level Evaluation

The seismic structural design shall be performed in accordance with the prescriptive provisions of the San Francisco Building Code, except for those provisions specifically identified by the Engineer of Record in the Seismic Design Criteria as Code Exceptions.

**Commentary:** Code exceptions that have typically been taken for non-prescriptive designs of tall buildings in high seismic design categories include exceeding the height limitations of ASCE/SEI 7-10 Table 12.2.1. Other exceptions, including provisions related to  $R$ ,  $O$ , limitations on  $T$ , and various detailing requirements, may be considered at the discretion of the Director. The Engineer of Record is required to justify all exceptions to prescriptive code provisions. The scope of structural design review shall include all proposed code exceptions.

The lower limit of ASCE/SEI 7-10 Eq. 12.8-5 and 12.8-6 for the calculation of the Seismic Response Coefficient applies to the scaling process of ASCE/SEI 7-05 Section 12.9. The value of  $R$  used shall be indicated in the Seismic Design Criteria, and shall not be greater than 8.5.

The Engineer of Record shall demonstrate that the structure meets the story drift ratio limitations of the San Francisco Building Code using a code-level response-spectrum analysis and the following requirements:

- a) The design lateral forces used to determine the calculated drift need not include the minimum base shear limitation of ASCE/SEI 7-10 eq. 12.8-5 and 12.8-6.
- b) Stiffness properties of non-prestressed concrete elements shall not exceed 0.5 times gross-section properties.
- c) Foundation flexibility shall be considered, using recommendations provided by the Geotechnical Engineer of Record that are defined in the Seismic Design Criteria.
- d) The analysis shall account for P-delta effects.

**Commentary:** ASCE/SEI 7-10 requires the consideration of the minimum base shear of Eq. 12.8-5 and 12.8-6 for checking design story drifts relative to allowable story drifts. However, the consensus of SEAONC's AB-083 Task Group for this Administrative Bulletin, approved by the SEAONC Board, is that UBC Formula 30-7 (equivalent to ASCE/SEI 7-10 Eq. 12.8-6) need not be applied to the check of drift limits for tall buildings designed according to this bulletin, because the MCE-level Evaluation of Section 4.3 includes a check of drift for site-specific ground motions. Such ground motions are required to take account of near-fault and directivity effects. The consensus of the task group is that this is an appropriate and more explicit way of addressing the intended purpose of applying Formula 30-7 to the check of drift limits.

Actual concrete stiffness properties may vary significantly from the value of 0.5 times gross-section properties referenced for the code-level check of story drift limits. This assumption is specified to provide a consistent requirement for minimum building stiffness. This requirement is intended to lead to earthquake serviceability performance related to story drift that is at least comparable to that expected of prescriptively-designed tall buildings designed to the San Francisco Building Code.

For the deformation compatibility evaluation of critical non-structural elements, such as exterior curtain wall and cladding systems and egress stairways, the drift ratio demand shall be calculated using the minimum base shear limitations of ASCE/SEI 7-10 Eq. 12.8-5 and 12.8-6. In lieu of this requirement, these critical non-structural elements may be designed for drift ratios at the MCE-level.

#### 4.2 Service-Level Evaluation

A service-level evaluation of the primary structural system is required to demonstrate acceptable, essentially elastic seismic performance at the service-level ground motion.

**Commentary:** To ensure code-equivalent seismic performance, the Director is requiring a service-level evaluation for new tall buildings utilizing non-prescriptive design procedures.

There are circumstances where there is a reason to believe that the serviceability performance of the design would be worse than that anticipated for a code-prescriptive design. Some of these circumstances have been identified as follows:

- a) Where the Engineer of Record has taken any exception to code-prescriptive requirements for non-structural elements (ASCE/SEI 7-10, Chapter 13)

- b) Where the stiffness representation of any structural element in the code-level evaluation is significantly less than the effective linear-elastic stiffness described in applicable research
- c) For a structure that exhibits disproportionably large drift or accelerations for ground motions less than the San Francisco Building Code Design Basis Ground Motion (not reduced by  $R$ ).

While this bulletin does not require checking all non-structural elements at the service-level evaluation, it is expected that the building cladding will remain undamaged and that egress from the building will not be impeded when the building is subjected to the service-level ground motion.

For the purposes of this bulletin, the service-level ground motion shall be that having a 43-year mean return period (50% probability of exceedance in 30 years).

Structural models used in the service-level evaluation shall incorporate realistic estimates of stiffness and damping considering the anticipated levels of excitation and damage. The evaluation shall demonstrate that the elements being evaluated exhibit serviceable behavior.

**Commentary:** While essentially elastic performance is required in the service-level ground motion, it is not the intent of this bulletin to require that a structure remain fully linear and elastic. It is permissible for the analysis to indicate minor yielding of ductile elements of the primary structural system, provided such results do not suggest appreciable permanent deformation in the elements, strength degradation, or significant damage to the elements requiring more than minor repair. It is permissible for the analysis to indicate minor and repairable cracking of concrete elements.

Where numerical analysis is used to demonstrate serviceability, the analysis model should represent element behavior that is reasonably consistent with the expected performance of the elements. In typical cases it may be suitable to use a linear response spectrum analysis, with appropriate stiffness and damping, and with the earthquake demands represented by a linear response spectrum corresponding to the service-level ground motion. Where response history analysis is used, the selection and scaling of ground motion time series should comply with the requirements of ASCE/SEI 7-10, Section 16.1.3, with the service-level response spectrum used instead of the design basis earthquake response spectrum, and with the design demand represented by the mean of calculated responses for not less than seven appropriately selected and scaled time series.

As expressed by SEAONC [1999], it should be understood “that the current state of knowledge and available technology is such that the design profession’s ability to accurately predict the earthquake performance of a specific building is limited and subject to a number of uncertainties.” Actual performance may differ from intended performance.

#### 4.3 Maximum Considered Earthquake-Level Evaluation

*Ground Motion:* The ground motion representation for this evaluation shall be the Maximum Considered Earthquake(MCE) as defined in ASCE/SEI 7-10, Chapter 21.

A suite of not less than seven pairs of appropriate horizontal ground motion time series shall be used in the analyses. The selection and scaling of these ground motion time series shall comply with the requirements of ASCE/SEI 7-10, Chapter 16, with the following modifications:

- a) The MCE response spectrum shall be the basis for ground motion time series scaling instead of the design response spectrum.
- b) Either amplitude-scaling procedures or spectrum-matching procedures may be used.
- c) Where applicable, an appropriate number of the ground motion time series shall include near fault and directivity effects such as velocity pulses producing relatively large spectral ordinates at relatively long periods.

**Commentary:** The procedures for selecting and scaling ground motion records, as presented here, represent the current state of practice. The procedures are written to retain some flexibility so that engineering judgment can be used to identify the best approach considering the unique characteristics of the site and the building.

Selection and scaling of earthquake ground motion records for design purposes is a subject of much current research. The Engineer of Record may wish to consider alternative approaches recently proposed; however, some of the proposed approaches have not been adequately tested on tall buildings so their adoption should only be considered with caution. Aspects of particular concern include the long vibration period of many tall buildings and the contributions of multiple vibration “modes” to key response quantities.

At near-fault sites, the average fault-normal response spectrum usually is larger than the average fault-parallel response spectrum due to the presence of a rupture directivity pulse in the fault-normal component of the ground motion. It is important to include in the suite of ground motions an appropriate number of motions that include near-fault and directivity effects so that design drift demands are appropriately determined, especially considering that Section 4.1 permits the design to be exempt from applying Equations 12.8-5 and 12.8-6 to drift calculations. If spectral matching is used, individual ground motion components should account for the distinction between fault-normal and fault-parallel hazard.

*Mathematical Model:* The three-dimensional mathematical analysis model of the structure shall conform to ASCE/SEI 7-10 Section 12.7.3.

The analyses shall consider the interaction of all structural and non-structural elements that materially affect the linear and nonlinear response of the structure to earthquake motions, including elements not designated as part of the lateral-force-resisting system in the code-level analysis (Section 4.1).

**Commentary:** This requires explicit modeling of those parts of the structural and non-structural systems that affect the dynamic response of the building. In addition, the effect of building response on all materially affected parts of the building must be evaluated.

The stiffness properties of reinforced concrete shall consider the effects of cracking and other phenomena on initial stiffness.

**Commentary:** In addition to cracking, effective stiffness can be affected by other phenomena. These include bond slip, yield penetration, tension-shift associated with shear cracking, panel zone deformations, and other effects.

The effective initial stiffness of steel elements embedded in concrete shall include the effect of the embedded zone. For steel moment frame systems, the contribution of panel zone (beam-column joint) deformations shall be included.

The Engineer of Record shall identify any structural elements for which demands for any of the response-history runs are within a range for which significant strength degradation could occur, and shall demonstrate that these effects are appropriately considered in the dynamic analysis.

**Commentary:** For typical situations, element strength degradation of more than 20% of peak strength should be considered significant.

P- effects that include all the building dead load shall be included explicitly in the nonlinear response history analyses.

Documentation submitted for Structural Design Reviewer review shall clearly identify which elements are modeled linearly and which elements are modeled nonlinearly. For elements that are modeled as nonlinear elements, submitted documentation shall include suitable laboratory test results or analyses that justify the hysteretic properties represented in the model.

The properties of elements in the analysis model shall be determined considering earthquake plus expected gravity loads. In the absence of alternative information, gravity load shall be based on the load combination  $1.0D + L_{exp}$ , where  $D$  is the service dead load and  $L_{exp}$  is the expected service live load.

**Commentary:** In typical cases it will be sufficient to take  $L_{exp} = 0.2L$ , where  $L$  is the code-prescribed live load without live load reduction.

The foundation strength and stiffness contribution to the building seismic response shall be represented in the model. The foundation strength and stiffness characterization shall be consistent with the strength and stiffness properties of the soils at the site, considering both strain rate effects and soil deformation magnitude.

*Analysis Procedure:* Three-dimensional nonlinear response history (NLRH) analyses of the structure shall be performed. Inclusion of accidental torsion is not required. When the ground motion components represent site-specific fault-normal ground motions and fault-parallel ground motions, the components shall be applied to the three-dimensional mathematical analysis model according to the orientation of the fault with respect to the building. When the ground motion components represent random orientations, the components shall be applied to the model at orientation angles that are selected randomly; individual ground motion pairs need not be applied in multiple orientations.

**Commentary:** Three-dimensional analyses are required to represent the inherent torsional response of the building to earthquake ground shaking. This is done by including in the NLRH model the actual locations and distribution of the building mass, stiffness, and strength. Accidental torsion is not required to be included in the NLRH analyses. (Accidental torsion is required for the code-level analysis of Section 4.1.)

The Engineer of Record shall report how damping effects are included in the NLRH analyses. The equivalent viscous damping level shall not exceed 5%, unless adequately substantiated by the Engineer of Record.

**Commentary:** The effects of damping in an analysis depend on the type of damping model implemented. Some models may over-damp higher modes or have other undesirable effects.

For each horizontal ground motion pair, the structure shall be evaluated for the following load combination:

$$1.0D + L_{exp} + 1.0E$$

Alternative load combinations, if used, shall be adequately substantiated by the Engineer of Record.

Demands for ductile actions shall be taken not less than the mean value obtained from the NLRH. Demands for low-ductility actions (e.g., axial and shear response of columns and shear response of walls) shall consider the dispersion of the values obtained from the NLRH.

**Commentary:** In typical cases the demand for low-ductility actions can be defined as the mean plus one standard deviation of the values obtained from the NLRH. Procedures for selecting and scaling ground motions, and for defining the demands for low-ductility actions, should be defined and agreed to early in the review process.

*Acceptance Criteria:* Calculated force and deformation demands on all elements required to resist lateral and gravity loads shall be checked to ensure they do not exceed element force and deformation capacities. This requirement applies to those elements designated as part of the lateral-force-resisting system in the code-level analysis (Section 4.1), as well as those elements not designated as part of the lateral-force-resisting system in the code-level analysis but deemed to be materially affected.

**Commentary:** Elements not designated as part of the lateral-force-resisting system in the code-level analysis (gravity systems) may be subjected to substantial deformations and forces, including axial forces accumulated over many stories, as they interact with the primary lateral-force-resisting system. Non-structural elements such as cladding are evaluated according to code requirements. This bulletin does not require checking non-structural elements at the MCE level.

The Engineer of Record shall identify the structural elements or actions that are designed for nonlinear seismic response. All other elements and actions shall be demonstrated by analysis to remain essentially elastic.

**Commentary:** Essentially elastic response may be assumed for elements when force demands are less than design strengths. Design strengths for non-ductile behaviors (e.g., shear and compression) of these essentially elastic elements are defined as nominal strengths, based on specified material properties, multiplied by strength reduction factors as prescribed in the SFBC. Design strengths for ductile behaviors of these essentially elastic elements are defined as nominal strengths, based on expected material properties, multiplied by  $\phi=1.0$ . Alternative approaches to demonstrating essentially elastic response may be acceptable where appropriately substantiated by the Engineer of Record.



For structural elements or actions that are designed for nonlinear seismic response, the Engineer of Record shall evaluate the adequacy of individual elements and their connections to withstand the deformation demands. Force and deformation capacities shall be based on applicable documents or representative test results, or shall be substantiated by analyses using expected material properties.

The average result, over the NLRH analyses, of peak story drift ratio shall not exceed 0.03 for any story.

All procedures and values shall be included in the Seismic Design Criteria and are subject to review by the Structural Design Reviewer and approval by the Director.

Originally signed by:

Isam Hasenin, P.E., C.B.O.,  
Director  
Department of Building Inspection

Approved by the Building Inspection Commission on March 19, 2008

**Millennium Litigation Group**

930 Montgomery Street, Suite 600

San Francisco, CA 94133

Tel: (415) 433-3475

Fax: (415) 781-8030

[www.millenniumlitigation.com](http://www.millenniumlitigation.com)

**Re:** Item 160975, Special Meeting September 22, Government Audit and Oversight Committee

We represent the homeowners of the Millennium Tower in a Class Action - Superior Court Of The State of California City and County Of San Francisco, case number: Ct CGC -16-553574. For more information you may see [www.Millenniumlitigation.com](http://www.Millenniumlitigation.com)

We thank the Government Audit and Oversight Committee, and particularly Supervisor Peskin, for the good work they are doing to probe the background of 301 Mission, and better understand the challenges of erecting high-rise, and skyscraper structures on precarious soil conditions in San Francisco. Their concerns to establish whether there was political pressure, or corruption involved in the approvals is commendable. While it is very important to understand and learn from the history of this building, and what may have gone wrong along the way, it is far, far more important to fully understand what public safety issues are posed by its present condition, and how it may further be detrimentally impacted by future causes.

As the various stakeholders position their interests to pursue litigation, they have each retained experts to opine on what the causes of the sinking and tilting may be. Each party and their experts, will for obvious reasons, spin, and nuance the opinions to advance their ultimate agenda, laying blame at the feet of others. Additionally, the various experts' opinions will not be made known until years from now when depositions will be taken before trial. During the course of litigation, the investigation results and conclusions, which are considered attorney work product, will be shielded from public scrutiny, and even from the homeowners by their own HOA experts. The various stakeholders have financial interests in assuaging the homeowners and the city, with opinions that the building is currently safe. However, such opinions must be viewed with suspicion. There currently is no independent, unbiased review of the life safety condition of Millennium Tower, and it is unlikely with pending complex litigation that there will be any such reliable independent, unbiased opinion in the near future.

It is without dispute that the Millennium Tower skyscraper currently stands in a compromised state, as it continues to sink and lean. There is very serious life safety concern by all, for the homeowners, the other buildings in the vicinity (including the Transbay Terminal), and the citizens of San Francisco. The failure of the Millennium Tower could potentially cause catastrophic damage to property, and life, unlike anything this city has previously experienced.

There are allegations that the foundation was improperly designed, and/or has been adversely impacted by changes in the water table brought about by construction activities. There has been no independent investigation to date, to determine how much of a life safety hazard this massive skyscraper is currently posing, or may cause in the future. Many factors may have the potential to turn this magnificent structure, the crown jewel of the Transbay Terminal, into an instrument of mass destruction. Earthquakes, changes in the water table, either man made or through natural causes such as the rising sea level, or a prolonged drought in California, are just a few obvious factors to investigate and consider. This building may be totally safe for a long time in the future, or may be a ticking time bomb, resulting in a catastrophe of epic proportions. It is critical that the City and County of San Francisco act immediately to protect the homeowners, and the public. A complete independent investigation into the current and future public safety condition of the building must be implemented immediately.

The appropriate agencies of the San Francisco government, who have the power to do so, should immediately implement a full investigation by well qualified, unbiased experts, under their public supervision, who owe no loyalty to any of the stakeholders in this conflict. Such work product and findings should be transparent and made public to avoid any bias and maintain integrity.

We hope and trust that the Honorable Mayor, Board of Supervisors, Senator Diane Feinstein who has expressed interest, and appropriate city officials, will agree that such an investigation is urgently needed, and will take immediate steps to bring it about.

Sincerely,



Millennium Litigation Group

[www.millinniumlitigation.com](http://www.millinniumlitigation.com)

Mark M. Garay, Esq.

Law Offices Of Mark M. Garay

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**From:** Otellini, Patrick (ADM)  
**Sent:** Wednesday, September 21, 2016 11:16 AM  
**To:** Peskin, Aaron (BOS); Angulo, Sunny (BOS)  
**Cc:** Major, Erica (BOS); Calvillo, Angela (BOS); Elliott, Jason (MYR); Elliott, Nicole (MYR); Kelly, Naomi (ADM)  
**Subject:** RE: Letter of Inquiry in advance of Thursday's hearing  
**Attachments:** 160909 MEL Feinstein Letter.pdf; 2016.2017 ESIC Tasks.pdf

Good morning Supervisor Peskin,

In reference to your letter and in anticipation of tomorrow's hearing I am happy to provide this response to your request regarding the building located at 301 Mission Street. Our office has not issued any official responses in the form of letters, emails, memorandums or bulletins in reference to this project. We provided guidance to the Mayor's office in responding to Senator Feinstein's letter by advising on the following items from the City's 30 Year Earthquake Safety Implementation Program that could be accelerated and added to our current policy agenda for the coming year:

- Reviewing ground failure mitigation measures for buildings in geologically hazardous areas (ESIP Task B.6.c)  
– *This task is already underway by the Department of Building Inspection and they will be directing their Structural Subcommittee of the Code Advisory Committee to review this issue and make recommendations to the Building Inspection Commission per the Mayor's letter to Senator Feinstein (Mayor's letter attached).*
- Mandatory earthquake evaluations at the time of sale (ESIP Tasks A.2.a and B.2.c)
- Mandatory evaluation and retrofit of buildings with more than 300 occupants (ESIP Task C.2.c)
- Mandatory evaluation and retrofit of other low performing buildings (ESIP Task C.2.e)  
– *These three existing tasks from the City's 30 Year ESIP plan have been included in this year's legislative work plan. The second attached file shows the existing identified policy initiatives from the larger 30 year timeline that we are actively working on now through the Earthquake Safety Implementation Committee.*

Your letter also mentioned the work I do as the City's Chief Resilience Officer. In addition to overseeing the City's 30 year ESIP plan, our office also recently released Resilient San Francisco – Stogner Today, Stronger Tomorrow which is a strategy on building greater resilience in San Francisco and includes much of our work on earthquake safety but also brings the issues of climate change and sea level rise and other hazards that an uncertain future will most certainly bring to our City. I look forward to the opportunity to brief you and your staff on this strategy as well as review the status and development of our current programs such as the Mandatory Soft Story Retrofit Program, the Private School Earthquake Evaluation Program and our new Façade Maintenance Program.

Thank you and please don't hesitate to contact myself or my staff with any additional questions.

Best,

**Patrick Otellini**

Chief Resilience Officer  
Director, Office of Resilience and Recovery  
City and County of San Francisco  
Office of the City Administrator

1 Dr. Carlton B. Goodlett Place  
City Hall, Room 362  
San Francisco, CA 94102  
Direct: (415) 554-5404 | E-Mail: [Patrick.otellini@sfgov.org](mailto:Patrick.otellini@sfgov.org)  
[www.sfgov.org/orr](http://www.sfgov.org/orr)

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**From:** Peskin, Aaron (BOS)  
**Sent:** Tuesday, September 20, 2016 7:09 PM  
**To:** Otellini, Patrick (ADM) <patrick.otellini@sfgov.org>; Elliott, Nicole (MYR) <nicole.elliott@sfgov.org>  
**Cc:** Calvillo, Angela (BOS) <angela.calvillo@sfgov.org>; Major, Erica (BOS) <erica.major@sfgov.org>; Angulo, Sunny (BOS) <sunny.angulo@sfgov.org>  
**Subject:** Letter of Inquiry in advance of Thursday's hearing

Mr. Otellini and Ms. Elliott:

Attached, please find a letter of inquiry in the furtherance of this Thursday's hearing objectives. Please transmit responses to me and my staff, Sunny Angulo, before Thursday. I look forward to your response.

Best,

Aaron

\*\*\*\*\*

Aaron Peskin  
*District 3 Supervisor*  
415.554.7450 – VOICE  
[Aaron.Peskin@sfgov.org](mailto:Aaron.Peskin@sfgov.org)

OFFICE OF THE MAYOR  
SAN FRANCISCO



EDWIN M. LEE  
MAYOR

September 9, 2016

The Honorable Dianne Feinstein  
United States Senate  
331 Hart Senate Office Building  
Washington, D.C. 20510

Dear Senator Feinstein:

Thank you for your letter regarding seismic safety of high-rise buildings in San Francisco. As you know, earthquake resilience has been a key priority of mine stretching back to my days as DPW Director and City Administrator.

You asked for more information about the Millennium Tower at 301 Mission Street. Specifically, the building permit approval process for this building commenced in 2002 under the 2001 California Building Code, and the Department of Building Inspection initiated a peer review process from a panel of experts, as they typically do for high-rise construction that employs a design-based approach. 301 Mission Street went through that process and was designed and constructed to the approved plans, building codes and standards in place at the time. That said, the Department of Building Inspection has suggested the Homeowners' Association make corrective actions to improve the joints, plumbing, and other operational parts of the building.

More broadly, you also expressed concern about the potential number of buildings in San Francisco that are not anchored to bedrock. Modern high rises typically employ a performance-based design to ensure that the building meets the structural requirements of the current code. To this end, the Department of Building Inspection has already enhanced and clarified their process for having skyscrapers peer-reviewed by a panel of experts prior to approval to begin construction.

As all Mayors of San Francisco know so deeply, earthquake preparedness is always a first priority, and we must strive for continual improvement. In my time as City Administrator and Mayor, I led and initiated my 30-year Earthquake Safety Implementation Plan (ESIP), a multi-point program to evaluate and retrofit seismically vulnerable buildings and to pass new laws to make our City more resilient. I'm proud of the progress my Administration has made thus far which includes the retrofit of more than 5,000 dangerous soft story buildings by 2020, evaluating all of the City's private schools for earthquake risks by 2017 and tougher regulations requiring façade inspections of every building in San Francisco more than five stories in height. We have also successfully passed \$812 million in Earthquake Safety & Emergency Response general obligation bonds.

To address the specific issue in your letter about high-rise resiliency, I am requesting the Department of Building Inspection's Code Advisory Structural Subcommittee immediately

review ground failure mitigation measures for buildings in geologically hazardous areas and make recommendations to the Building Inspection Commission.

As a further result of your writing, I have directed the Department of Building Inspection and the Office of Resilience & Recovery to amend our 30-year ESIP plan to expedite the safety of new and existing high-rise buildings. Specifically, I have ordered immediate inclusion into this year's work plan of:

- Reviewing ground failure mitigation measures for buildings in geologically hazardous areas (ESIP Task B.6.c)
- Mandatory earthquake evaluations at the time of sale (ESIP Tasks A.2.a and B.2.c)
- Mandatory evaluation and retrofit of buildings with more than 300 occupants (ESIP Task C.2.c)
- Mandatory evaluation and retrofit of other low performing buildings (ESIP Task C.2.e)

Previously, several of these tasks were spread over the next 25 years. As a result of your letter, and my direction to staff, we're starting this work right away.

I appreciate your attention to this issue, and I always welcome your continued guidance on protecting San Francisco.

Sincerely,



Edwin M. Lee  
Mayor, City & County of San Francisco





---

**From:** Elliott, Nicole (MYR)  
**Sent:** Wednesday, September 21, 2016 11:20 AM  
**To:** Peskin, Aaron (BOS); Otellini, Patrick (ADM)  
**Cc:** Calvillo, Angela (BOS); Major, Erica (BOS); Angulo, Sunny (BOS)  
**Subject:** RE: Letter of Inquiry in advance of Thursday's hearing  
**Attachments:** 8.10.16 Feinstein.pdf; 9.9.16 Lee.pdf; 9.14.16 Feinstein.pdf

Good afternoon Supervisor Peskin,

Please find the following letters attached:

- 1) August 10<sup>th</sup> letter from Senator Feinstein to Mayor Lee
- 2) September 9<sup>th</sup> letter from Mayor Lee to Senator Feinstein
- 3) September 14<sup>th</sup> letter from Senator Feinstein to Mayor Lee

Please feel free to be in touch if you have questions related to these letters.

Best,  
Nicole

Nicole A. Elliott  
Director, Legislative & Government Affairs  
Office of Mayor Edwin M. Lee  
(415) 554-7940

---

**From:** Peskin, Aaron (BOS)  
**Sent:** Tuesday, September 20, 2016 7:09 PM  
**To:** Otellini, Patrick (ADM) <patrick.otellini@sfgov.org>; Elliott, Nicole (MYR) <nicole.elliott@sfgov.org>  
**Cc:** Calvillo, Angela (BOS) <angela.calvillo@sfgov.org>; Major, Erica (BOS) <erica.major@sfgov.org>; Angulo, Sunny (BOS) <sunny.angulo@sfgov.org>  
**Subject:** Letter of Inquiry in advance of Thursday's hearing

Mr. Otellini and Ms. Elliott:

Attached, please find a letter of inquiry in the furtherance of this Thursday's hearing objectives. Please transmit responses to me and my staff, Sunny Angulo, before Thursday. I look forward to your response.

Best,

Aaron

\*\*\*\*\*

Aaron Peskin  
*District 3 Supervisor*  
415.554.7450 – VOICE  
[Aaron.Peskin@sfgov.org](mailto:Aaron.Peskin@sfgov.org)

DIANNE FEINSTEIN  
CALIFORNIA



SELECT COMMITTEE ON INTELLIGENCE - VICE CHAIRMAN  
COMMITTEE ON APPROPRIATIONS  
COMMITTEE ON THE JUDICIARY  
COMMITTEE ON RULES AND ADMINISTRATION

## United States Senate

WASHINGTON, DC 20510-0504

<http://feinstein.senate.gov>

August 10, 2016

The Honorable Edwin Lee  
Mayor  
City Hall  
1 Dr. Carlton B. Goodlett Place  
San Francisco, CA, 94102

Dear Mayor Lee:

I have been reading with increasing alarm the recent stories about the Millennium Tower and its reported sinking and tilting. As you know, I have had great concern, generally, with the recent residential and commercial density increase in San Francisco, as well as concern about the City's preparedness for a large scale seismic event. Now, to add to that mix of concern, I am left wondering if the City's building code played any role in allowing this sinking and tilting to happen, and whether or not other approved buildings are suffering the same fate.

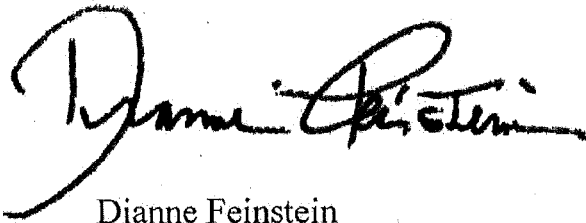
The fact most alarming to me is that the Millennium's engineers constructed the building only over a thick concrete slab, supported by piles roughly 80 feet into dense sand **as opposed to drilling piles into the bedrock 200 feet down.** While I was always under the impression that buildings needed to be anchored to bedrock, I have learned that there are numerous buildings throughout San Francisco (e.g. the Embarcadero buildings, AT&T Park, Moscone Center) that have used a similar type of foundation.

I met recently with Patrick Otellini, your Chief Resiliency Officer, who spoke at great length about the work you are leading to keep the City safe in the event of a large seismic event. Thank you for that work. However, I believe answering the

question of the seismic stability of these new high buildings, other such buildings currently in the construction or review phase, and whether or not they can sufficiently survive a large scale earthquake without being anchored into bedrock should become a top priority for you.

I suggest reaching out to leaders in the world of academia to solicit their guidance and input, as opposed to current geotechnical engineers currently practicing in the field in order to avoid any appearance of conflict of interest. Consider forming a "Mayoral Seismic Safety Advisory Committee," or other panel of independent experts who can advise you and the Department of Building Inspection thoroughly and independently. If I can be of any help to you in this endeavor, please know I am at your service.

Sincerely,

A handwritten signature in black ink, appearing to read "Dianne Feinstein". The signature is fluid and cursive, with a large initial "D" and a long, sweeping underline.

Dianne Feinstein  
United States Senator

OFFICE OF THE MAYOR  
SAN FRANCISCO



EDWIN M. LEE  
MAYOR

September 9, 2016

The Honorable Dianne Feinstein  
United States Senate  
331 Hart Senate Office Building  
Washington, D.C. 20510

Dear Senator Feinstein:

Thank you for your letter regarding seismic safety of high-rise buildings in San Francisco. As you know, earthquake resilience has been a key priority of mine stretching back to my days as DPW Director and City Administrator.

You asked for more information about the Millennium Tower at 301 Mission Street. Specifically, the building permit approval process for this building commenced in 2002 under the 2001 California Building Code, and the Department of Building Inspection initiated a peer review process from a panel of experts, as they typically do for high-rise construction that employs a design-based approach. 301 Mission Street went through that process and was designed and constructed to the approved plans, building codes and standards in place at the time. That said, the Department of Building Inspection has suggested the Homeowners' Association make corrective actions to improve the joints, plumbing, and other operational parts of the building.

More broadly, you also expressed concern about the potential number of buildings in San Francisco that are not anchored to bedrock. Modern high rises typically employ a performance-based design to ensure that the building meets the structural requirements of the current code. To this end, the Department of Building Inspection has already enhanced and clarified their process for having skyscrapers peer-reviewed by a panel of experts prior to approval to begin construction.

As all Mayors of San Francisco know so deeply, earthquake preparedness is always a first priority, and we must strive for continual improvement. In my time as City Administrator and Mayor, I led and initiated my 30-year Earthquake Safety Implementation Plan (ESIP), a multi-point program to evaluate and retrofit seismically vulnerable buildings and to pass new laws to make our City more resilient. I'm proud of the progress my Administration has made thus far which includes the retrofit of more than 5,000 dangerous soft story buildings by 2020, evaluating all of the City's private schools for earthquake risks by 2017 and tougher regulations requiring façade inspections of every building in San Francisco more than five stories in height. We have also successfully passed \$812 million in Earthquake Safety & Emergency Response general obligation bonds.

To address the specific issue in your letter about high-rise resiliency, I am requesting the Department of Building Inspection's Code Advisory Structural Subcommittee immediately

1 DR. CARLTON B. GOODLETT PLACE, ROOM 200  
SAN FRANCISCO, CALIFORNIA 94102-4681  
TELEPHONE: (415) 554-6141

review ground failure mitigation measures for buildings in geologically hazardous areas and make recommendations to the Building Inspection Commission.

As a further result of your writing, I have directed the Department of Building Inspection and the Office of Resilience & Recovery to amend our 30-year ESIP plan to expedite the safety of new and existing high-rise buildings. Specifically, I have ordered immediate inclusion into this year's work plan of:

- Reviewing ground failure mitigation measures for buildings in geologically hazardous areas (ESIP Task B.6.c)
- Mandatory earthquake evaluations at the time of sale (ESIP Tasks A.2.a and B.2.c)
- Mandatory evaluation and retrofit of buildings with more than 300 occupants (ESIP Task C.2.c)
- Mandatory evaluation and retrofit of other low performing buildings (ESIP Task C.2.e)

Previously, several of these tasks were spread over the next 25 years. As a result of your letter, and my direction to staff, we're starting this work right away.

I appreciate your attention to this issue, and I always welcome your continued guidance on protecting San Francisco.

Sincerely,



Edwin M. Lee  
Mayor, City & County of San Francisco

DIANNE FEINSTEIN  
CALIFORNIA



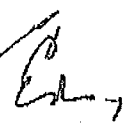
SELECT COMMITTEE ON INTELLIGENCE - VICE CHAIRMAN  
COMMITTEE ON APPROPRIATIONS  
COMMITTEE ON THE JUDICIARY  
COMMITTEE ON RULES AND ADMINISTRATION

## United States Senate

WASHINGTON, DC 20510-0504

<http://feinstein.senate.gov>

September 14, 2016

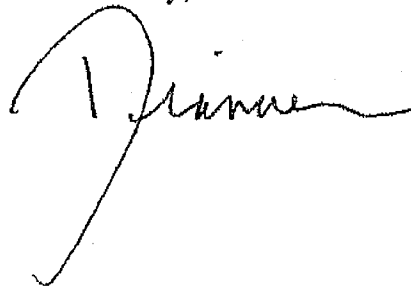
Dear Mayor Lee: 

Thank you for your September 9, 2016 response to my August 10, 2016 letter to you raising concerns about the reported "sinking and tilting" of the Millennium Tower. I am very encouraged by your response detailing your commitment to moving forward action items within the City's Earthquake Safety Implementation Plan for high rise buildings. Your letter makes clear you remain steadfast, as you have throughout your public service career, to ensuring the seismic safety of San Francisco – thank you!

Specifically to the Millennium Tower, I also appreciate your response summarizing the building permit approval process prior to the construction of the Tower. Moving forward, what role will the City play in addressing the continued "sinking and tilting" of the building? What role can you play as Mayor to ensure that all impacted City Departments stand at the ready to assist the developer, the homeowner's association, and other impacted parties, as they formulate a plan to fix the problem? Most importantly, what can you do to ensure the residents of San Francisco that its City government is on top of the issue?

As always, I am more than pleased to offer any assistance I can to the City of San Francisco.

Sincerely,

A large, stylized handwritten signature in black ink, appearing to read "Dianne".

The Honorable Edwin Lee  
Mayor  
City Hall  
1 Dr. Carlton B. Goodlett Place  
San Francisco, CA, 94102

Member, Board of Supervisors  
District 3



City and County of San Francisco

AARON PESKIN

September 20, 2016

Patrick Otellini, Chief Resilience Officer  
Office of the City Administrator, Room 362

Nicole Elliott, Director of Legislative & Government Affairs  
Office of Mayor Edwin M. Lee, Room 200

Mr. Otellini and Ms. Elliott:

Thank you for making yourself available to participate in the hearing this Thursday, September 22, 2016 at 10:00am at the Government Audit and Oversight Committee (GAO).

I understand that you are the world's first Chief Resilience Officer, and I am eager to know more about your office and the specific work you have undertaken to address resiliency and recovery efforts here in San Francisco. I also understand that you have considerable experience after spending a decade in the private sector dealing with building code compliance issues, so I appreciate the guidance you have been giving the City on these issues since assuming your post.

The GAO committee members will be using the recent revelations around 301 Mission Street as a case study in the first of a series of hearings on buildings standards in seismic zones, and I am requesting your assistance in providing any and all letters, emails, memorandums or bulletins that you have submitted to city staff or drafted for the Mayor or any of his staff in your role as the City's resident expert as to the condition and seismic safety and sustainability of the 301 Mission Street project.

Ms. Elliott, the September 13, 2016 *SF Magazine* article "Millennium Tower Goes on Trial" includes a letter from Mayor Lee to Senator Dianne Feinstein dated September 9, 2016. Please provide any correspondence that triggered Mayor Lee's official response on behalf of the City.

Thank you both in advance for your help in facilitating this hearing by transmitting these documents in advance of this Thursday. Please feel free to contact my staff, Sunny Angulo, with further questions.

Best,

A handwritten signature in black ink, appearing to read "Aaron Peskin".

Aaron Peskin

Member, Board of Supervisors  
District 3



City and County of San Francisco

AARON PESKIN

September 20, 2016

Tom C. Hui  
Department of Building Inspection, Director  
1660 Mission Street, Sixth Floor  
San Francisco, CA 94103

Dear Director Hui:

Thank you for working to prepare for this Thursday's Government Audit and Oversight hearing. In addition to the questions we transmitted on September 12, 2016, please be advised of the following questions, as well:

- What other projects have been built on friction piles in the city? Out of those projects, which friction piles go into clay and which go into sand? Please provide a list for the hearing and indicate whether the buildings are constructed out of steel or concrete.
- Please provide an overview of the dewatering and drilling preparation work that happened at 301 Mission Street prior to 2010.
- How many permit expeditors were involved with the 301 Mission project over the course of its vetting and approval process?
- How many inspectors does the Department of Building Inspection (DBI) employ and how many are necessary to evaluate projects over 120 feet? How many inspectors were assigned to evaluate the seismic safety and structural soundness of 301 Mission Street?
- What is the relationship of Consolidation Engineering Laboratories (CEL) to the 301 Mission Street project and any other projects since? What about Construction Testing Service (CTS) Inspection Company?
- Who signs off on Requests for Information from engineers within DBI typically? Who signed off on any Requests for Information on the 301 Mission Street project, as well as any inspection punch lists?
- Has the successful performance of tower buildings on pads in a seismic zone (particularly on poor quality soil deposits) been proven?

Thank you for your attention to these inquiries, and I look forward to the September 22 hearing.

  
Aaron Peskin



Member, Board of Supervisors  
District 3



City and County of San Francisco

AARON PESKIN

September 12, 2016

Tom C. Hui  
Department of Building Inspection, Director  
1660 Mission Street, Sixth Floor  
San Francisco, CA 94103  
CC: Angela Calvillo; William Strawn; Lily Madjus

Dear Director Hui:

Thank you for copying me on the public records request regarding 301 Mission Street. After review of the documents, I have asked the Clerk of the Board to transmit this letter of inquiry in order to obtain further information and to give the Department of Building Inspection official notice that I am convening a special meeting of the Government Audit and Oversight Committee to hear File #160975 on Thursday, September 22, 2016 at 10:00am.

I request the following individuals to be present: William Strawn, Daniel Lowrey, Gary Ho and former staff and Acting Director Amy Lee.

The documents responsive to the NBC Investigative Unit's disclosure request seem woefully incomplete. Please identify what documents were not turned over and why.

Additional questions in advance of the September 22<sup>nd</sup> hearing:

- In 2005, geotechnical engineers, Treadwell & Rollo wrote that the project's structural engineer would determine the depth of the piles, yet there are no documents identifying this review or approval process. Please provide this written determination.
- The 2006 correspondence between the Department of Building Inspection and the lead at DeSimone Consulting Engineers focuses primarily on DBI concerns with the proposed BauGrid® reinforcement system installed at 301 Mission. All but one of these 22 pages of documents deal with these prefabricated joints, which received review and approval by the structural review panel consisting of Mr. Hardip Pannu and Professor Jack Moehle. Oddly, the subject of the structural foundation was *not* covered in the correspondence, leading me to inquire whether or not there was peer review of this critical aspect of the project.
- What is the Department of Building Inspection's current policy on performance-based peer review of structural foundations for projects over 120 ft? Has this policy always been in place, or did it come about at a certain time? Why was it changed or created?
- Why does the Department of Building Inspection have an inquiry in 2009 regarding the larger than expected settlements of the high-rise and mid-rise buildings at 301 Mission, but no response included in its disclosure? Please provide the response from DeSimone Consulting Engineers.
- The DeSimone Consulting Engineers letter from February 2009 states that they *do not* expect differential settlement to occur. What was the Department's response to this.

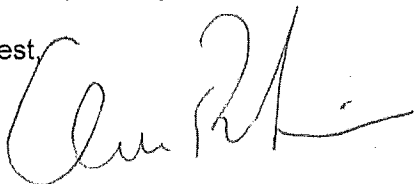
assertion and was this the understanding when the Certificates of Occupancy were issued, that no differentiated settlement had been noticed to any oversight agency?

- In 2008 negotiations appear to have been ongoing to expedite life safety inspections in order to obtain a temporary occupancy for the 60 story residential high rise at 301 Mission. On what basis did the city feel it should expedite the issuance of temporary occupancy permits? Who was the permit expeditor for the 301 Mission project?
- Why does the City have an unsigned report put together by an independent structural engineer, with no responses or follow-up from Department officials? The Draft Foundation Settlement investigation by Ronald Hamburger identifies a number of issues, including aggressive dewatering during construction (even *before* additional dewatering as a result of the Transbay project), as well as projected sinkage over the anticipated norm.
- As stated prior, the DeSimone Consulting Engineers 2009 report stipulated to no differential settlement but that marginal shift can be expected. Yet the Hamburger report later identified foundational cracking as a serious concern. Please explain this information and assessment gap. Whose responsibility is it to notify the City when new verifiable concerns are flagged or found to be substantive? Did the Hamburger report cause the City concern and are there any additional geotechnical structural reviews that have additional information warranting analysis that we have not been made aware of?
- According to the Hamburger report, the pile drives were built into mud clay *not* dense sand. Does this sediment create enough "friction" for friction piles to maintain their depth and stability and not sink? Was this evaluated before approval?
- Please also submit a complete list in advance of the hearing of projects within the waterfront, Transbay and Rincon Hill neighborhood plan areas that have opted to drill down to bedrock and those that have not, along with their height and whether they utilized performance-based design with peer review.
- Please provide a comparison of the structural analysis and approval standards required in Section 1701 of the San Francisco Building Code, the California Uniform Building Code and the federal requirements, including whether peer review of project foundations is required or encouraged as a best practice.
- What are the implications of the existing aggravated lean at 301 Mission Street on the seismic sustainability of the adjacent Transbay project and what steps is the City undertaking to ensure we protect our investment in this public project, given the new information?
- How many Certificates of Occupancy has the Department of Building Inspection issued since 301 Mission Street in the Transbay and Rincon neighborhoods?
- What steps is the Department undertaking to remediate the issues that have been uncovered at 301 Mission and the potential projects in the surrounding neighborhood? What recommendations can you offer that we must pursue immediately?

Please work with my staff to transmit this information in advance of the September 22 hearing and be prepared to discuss it as a part of our collective efforts to ensure the appropriate standards for our city-approved projects moving forward.

Thank you for your cooperation.

Best,



Aaron Peskin

BOARD of SUPERVISORS



City Hall  
1 Dr. Carlton B. Goodlett Place, Room 244  
San Francisco 94102-4689  
Tel. No. 554-5184  
Fax No. 554-5163  
TDD/TTY No. 554-5227

## MEMORANDUM

TO: Tom Hui, Director, Department of Building Inspection

FROM: Erica Major, Assistant Clerk, Government Audit and Oversight Committee,  
Board of Supervisors

DATE: September 12, 2016

SUBJECT: HEARING MATTER INTRODUCED

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The Board of Supervisors' Government Audit and Oversight Committee has received the following hearing request, introduced by Supervisor Peskin on September 6, 2016:

**File No. 160975**

**Hearing on existing building standards in seismic safety zones, including infill and waterfront neighborhoods; and requesting the Department of Building Inspection to report.**

If you have any comments or reports to be included with the file, please forward them to me at the Board of Supervisors, City Hall, Room 244, 1 Dr. Carlton B. Goodlett Place, San Francisco, CA 94102.

cc:

William Strawn, Department of Building Inspection  
Carolyn Jayin, Department of Building Inspection

# Introduction Form

By a Member of the Board of Supervisors or the Mayor

RECEIVED  
BOARD OF SUPERVISORS  
SAN FRANCISCO

2016 SEP -6 PM 1:53  
Time stamp  
or meeting date

I hereby submit the following item for introduction (select only one):

BY \_\_\_\_\_

- 1. For reference to Committee. (An Ordinance, Resolution, Motion, or Charter Amendment)
- 2. Request for next printed agenda Without Reference to Committee.
- 3. Request for hearing on a subject matter at Committee.
- 4. Request for letter beginning "Supervisor [ ] inquires"
- 5. City Attorney request.
- 6. Call File No. [ ] from Committee.
- 7. Budget Analyst request (attach written motion).
- 8. Substitute Legislation File No. [ ]
- 9. Reactivate File No. [ ]
- 10. Question(s) submitted for Mayoral Appearance before the BOS on [ ]

Please check the appropriate boxes. The proposed legislation should be forwarded to the following:

- Small Business Commission       Youth Commission       Ethics Commission
- Planning Commission       Building Inspection Commission

**Note: For the Imperative Agenda (a resolution not on the printed agenda), use a Imperative Form.**

**Sponsor(s):**

Aaron Peskin

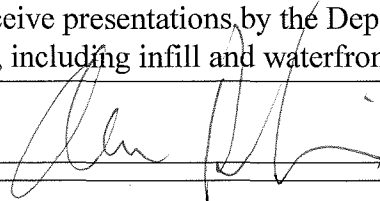
**Subject:**

Hearing on Building Standards in Seismic Safety Zones

**The text is listed below or attached:**

Hearing at the Government Audit and Oversight Committee to receive presentations by the Department of Building Inspections on existing building standards in seismic safety zones, including infill and waterfront neighborhoods.

Signature of Sponsoring Supervisor: \_\_\_\_\_



For Clerk's Use Only: