



Office of the City Manager

CONSENT CALENDAR
December 5, 2006

To: Honorable Mayor and
Members of the City Council

From: *PK* Phil Kamlarz, City Manager

Submitted by: Dan Marks, Director, Planning and Development Department

Subject: Amendment to BMC Chapter 19.39, Soft Story Ordinance

RECOMMENDATION

1) Adopt the first reading of an Ordinance amending Berkeley Municipal Code (BMC) Chapter 19.39, Soft Story Ordinance, to adopt the American Society of Civil Engineers Standard 31 (ASCE-31) - 'Seismic Evaluation of Existing Buildings', 2003 Edition, for the required seismic analysis of a non-wood frame ground story; and, 2) In compliance with state law on adopting such codes by reference, to hold a public hearing following the first reading and before the second reading, schedule a public hearing for December 12, 2006.

FISCAL IMPACTS OF RECOMMENDATION

A fee, currently set at \$554.40, deposited in the Permit Service Center Fund, will pay for the City's review of the required engineering reports. There is no fee for appealing the placement of a building on the Inventory of Potentially Hazardous Buildings because it would be unfair to charge owners to have a building removed from the Inventory that should not have been included. Buildings were originally selected based only on the apparent structure type and number of residential units from a sidewalk survey. The cost of staff time for review is absorbed as part of normal operations.

CURRENT SITUATION AND ITS EFFECTS

The Building Official has issued notice and orders to 334 building on the Inventory of Potentially Hazardous Soft Story Buildings that are believed to have wood frame ground stories. About another 155 buildings appear to have ground stories that are constructed of concrete or concrete block masonry wall or steel frame with a rigid platform that provides a "podium" above which the wood frame residential portion is constructed. While the 2003 International Existing Building Code Chapter A4 was adopted as the standard for the evaluation of the wood frame structures, the ordinance provided that the Building Official shall prepare an amendment to that standard for those buildings with a rigid podium.

The Building Official is proposing the attached ordinance, amending the Soft Story Ordinance to provide that the 2003 edition of the American Society of Civil Engineers Standard 31 (ASCE31) be adopted by reference to serve this purpose.

Under Berkeley practice, the Housing Advisory Commission (HAC) provides a recommendation to the Council on adoption of codes. On November 2, 2006, the HAC held a public hearing and unanimously recommended that the City Council adopt staff's recommendation.

State law requires adopting such codes by reference through a specific process where a public hearing is held after the first reading and before the vote on the second reading by the City Council. Therefore, staff placed the first reading adoption on the Consent Calendar. If Council would prefer to discuss tonight, staff will be available.

BACKGROUND

Following surveys and sidewalk assessments, nearly 400 buildings with 5 or more residential units were determined to appear to have soft or weak ground stories because of large openings for store fronts or parking and inadequate support and connections. This condition is commonly called a soft story. (Additional buildings were identified but not targeted for notice under this ordinance because they were also on the Unreinforced Masonry Building Inventory.) Most of the soft story buildings are wood framed, but about a quarter are of the rigid podium type with wood frame above. Soft story buildings have accounted for most deaths and building collapses that have occurred in recent California earthquakes. The General Plan recognizes the threat to the community and calls for the development of a mitigation program for these buildings. Although generally more earthquake resistant than wood frame ground stories, the assessment project found that buildings with a rigid podium needed engineering analysis, as well.

Because of lack of funding sources for financial incentives, staff developed a two-phase program to address the problem. Phase 1 is an individual soft story building assessment and identification program adopted last year. Phase 2 will be a retrofit program developed based on information learned in Phase 1.

The City Council adopted BMC 19.39, the Soft Story Ordinance, on October 25, 2005. The Ordinance provides that:

- The Building Official shall place the identified buildings on the Inventory of Potentially Hazardous Buildings and provide a notice to the owners;
- Following the six-month appeal period, the owner shall post the building and provide a warning to tenants;
- Within two years of the notice, the owner shall file an engineering report identifying the building's ground floor seismic weaknesses and a plan for correcting the identified weaknesses;
- Chapter A4 of the 2003 International Existing Building Code be used for the analysis of wood frame structures, or portions of structures;
- The Building Official shall provide an amendment to the standards to address those ground floors that are not of wood frame construction.

As identified in the assessment project, most of the buildings are totally wood-framed. However, 71 buildings with 2,017 housing units have 'rigid diaphragms' topping the ground story that provide a podium for construction of the wood-frame residential portion. Such podia are made of concrete, concrete masonry unit, or steel frame.

Additionally, other buildings identified in the soft story building survey were also originally on the Inventory of Potentially Hazardous Unreinforced Masonry (URM) Buildings on the URM Inventory

were not originally categorized as being subject to the Soft Story ordinance. Buildings were removed from the URM inventory for two reasons: either they were retrofitted as required; or they were not actually URM, primarily because of adequate existing reinforcement in the masonry unit walls. URM buildings required to be retrofitted also had to correct any ground story soft story condition, but those removed for not being URM did not. Staff has identified 85 such buildings that were removed from the URM inventory without retrofit that should be subject to the Soft Story Ordinance. Thus, the total number of buildings subject to receiving the soft story notice and order will be about 478.

The Building Official retained a consultant structural engineer, Tom Castle of Ficcadenti, Waggoner, & Castle Consulting Structural Engineers, to prepare a standard for analyzing rigid podia buildings and test the application of the standard to a number of subject buildings. The proposal and tests were reviewed by a peer review panel consisting of David Mar, S.E., Janiele Maffei, S.E., and Kelly Cobeen, S.E. led by Charles Thiel, Ph.D. and Principal of Telesis Engineers. On October 20, 2006, Dr. Thiel transmitted the attached letter indicating that the consensus of the panel is to recommend the use of the 2003 American Society of Civil Engineers Standard 31(ASCE-31). ASCE-31 was developed in cooperation with the Federal Emergency Management Agency for the seismic analysis of existing buildings. Similar to the adopted wood-frame standard, ASCE-31 is set at a level less than the California Building Code but still provides adequate life safety and uses structural checklists to guide the analysis. A copy of ASCE-31 is available for review through the contact persons below.

Notice and orders for the buildings will be sent after the new year. The Building Official will also revise the 'Engineering Evaluation Report Framework', a document prepared to guide engineers, to reflect the amended standards.

RATIONALE FOR RECOMMENDATION

As provided for in the Soft Story Ordinance, a special standard is needed for the engineering analysis of subject buildings that have a rigid podium. Adoption of ASCE 31 to provide the standards for analysis supplies a nationally recognized standard that is designed to identify this type of vulnerability and afford protection from catastrophic collapse, but at a lower cost than meeting the current building code. Action is needed to mitigate the potentially catastrophic threat to the community presented by seismically vulnerable, soft story type construction.

ALTERNATIVE ACTIONS CONSIDERED

A custom designed standard was considered but was rejected in favor of a national standard that is familiar and acceptable to the engineering community and the Federal Emergency Management Agency.

CONTACT PERSON

Daniel Lambert, Project Manager, Planning and Development Department, 510 981-7406
Joan MacQuarrie, Building Official, Planning and Development Department, 510 981-7441

Attachments:

1. Ordinance
2. Peer Review Panel Approval Letter

ORDINANCE NO. -N.S.

AMENDING BERKELEY MUNICIPAL CODE (BMC) SECTION 19.39.030 OF BMC CHAPTER 19.39 (SOFT STORY ORDINANCE) TO PROVIDE THE AMERICAN SOCIETY OF CIVIL ENGINEERS STANDARD 31, SECTION 3.0, AS THE TECHNICAL STANDARD FOR THE ANALYSIS OF SUBJECT BUILDINGS WITH A CONCRETE OR STRUCTURAL STEEL PODIUM GROUND STORY

BE IT ORDAINED by the Council of the City of Berkeley as follows:

Section 1. That Berkeley Municipal Code Section 19.39.030 is to read as follows:

19.39.030 Adoption and modifications of Chapter A4 of the 2003 IEBC.

A. Chapter A4 of the 2003 International Existing Building Code ("IEBC"), as published by the International Code Council is hereby adopted and made a part of this chapter as though fully set forth herein, subject to modifications set forth in this chapter. For purposes of this chapter, the standards in the IEBC shall be used for the analysis of seismic weakness and to formulate the elements of work required to remedy any identified weaknesses; but the submittal of an application for a building permit or the actual retrofit of a building is not required. For the purposes of this chapter, the non-wood frame ground floor of a designated building shall also be analyzed.

B. The Building Official shall provide guidelines delineating the standards for the use of Chapter A4, including amendments for buildings with concrete podia and non-wood-frame ground floors, and for filing the report required by this ordinance. The guidelines shall provide details for items required in the report, procedures to be followed, and a framework for both the assembly of the required information by the professional and for the evaluation of the report by the City.

C. To provide standards for the analysis of a non-wood frame ground floor, the American Society of Civil Engineers (ASCE) Standard 31 - 'Seismic Evaluation of Existing Buildings', 2003 Edition, is hereby adopted by reference.

D. Chapter A4 of the 2003 International Existing Building Code is amended as follows

1. Section.A403.2 Scope of Analysis is amended to add the following: If the wood structure is constructed over a concrete or concrete block masonry wall or frame podium, the adequacy of the lateral system of the podium shall be verified per section A403.12.

2. Section A403 is amended to add a new section as follows: A403.12: Verify Adequacy of the Lateral System of the Podium Base. Provide an evaluation of the podium level of the structure following the requirements of ASCE Standard 31 - 'Seismic Evaluation of Existing Buildings', 2003 Edition. The podium structure is to be evaluated with the ASCE 31 Screening Phase (Tier 1) per ASCE 31 Section 3.0. For each Non-Compliant (NC) item on the ASCE 31 Screening Phase (Tier 1) Structural Checklist provide an analysis following the requirements of the Tier 2 of ASCE 31 Section 4. Establish a strengthening plan to mitigate the remaining Non-Compliant (NC) items from the Tier 2 analysis.

CE. Terms in capital case used in this chapter are as defined in Chapter A4 of the IEBC and ~~FEMA-356~~, in ASCE Standard 31, unless otherwise defined in this chapter.

Section 2. Copies of this Ordinance shall be posted for two days prior to adoption in the display case located near the walkway in front of Old City Hall, 2134 Martin Luther King Jr. Way. Within 15 days of adoption, copies of this Ordinance shall be filed at each branch of the Berkeley Public Library and the title shall be published in a newspaper of general circulation.

Attachment 2

Telesis Engineers

480 Arlington Avenue, Berkeley, California 94707
Telephone (510) 528-8262, Facsimile (510) 528-8293

Charles C. Thiel Jr., Ph.D.
Gary S. Varum, S.E.

Friday, October 20, 2006

Ms. Joan Macquarrie
Building Official
City of Berkeley
2120 Milvia Street,
Berkeley, California 94704

Re: Proposed modifications of Chapter A4 of the 2003 IEBC

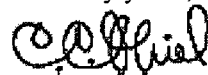
Dear Ms. Macquarrie:

Over the past several months a panel of experienced structural engineers was convened to review the proposed concrete podium ordinances. The group included David Mar, S.E., Janiele Maffei, S.E., and Kelly Cobeen, S.E., with me acting as chair. We had the assistance of the department's consultant Tom Castle who assisted the department in drafting materials..

The issue posed to us was to review and advise the Building Official on technical issues to review the performance of residential, wood-framed buildings constructed on concrete podia. The Panel unanimously recommended that the basis for such analysis by ASCE-31. This was the conclusion of a test of its application to a number of buildings at interest and the observation by the panel that the conclusions reached based on ASCE-31 appeared to be technically reliable.

I have reviewed the text for the proposed amendments of Sections A403.2 and A403.12 (copy attached) and it to be technically consistent with the findings and reconditions of the Panel as determined in its meetings. On behalf of the Panel we endorse the technical content of the amendments.

Sincerely yours,



Charles C. Thiel Jr., Ph.D.
Principal

City of Berkeley Amendments to Chapter A4 of the 2003 IEBC

Amend section A403.2 Scope of Analysis to add:

If the wood structure is constructed over a concrete or concrete block masonry wall or frame podium, the adequacy of the lateral system of the podium shall be verified per section A403.12.

Amend Section A403 to add:

A403.12 Verify Adequacy of the Lateral System of the Podium Base. Provide an evaluation of the podium level of the structure following the requirements of ASCE Standard 31 - "Seismic Evaluation of Existing Buildings", 2003 Edition. The podium structure is to be evaluated with the ASCE 31 Screening Phase (Tier 1) per ASCE 31 Section 3.0. For each Non-Compliant (NC) item on the ASCE 31 Screening Phase (Tier 1) Structural Checklist provide an analysis following the requirements of the Tier 2 of ASCE 31 Section 4. Establish a strengthening plan to mitigate the remaining Non-Compliant (NC) items from the Tier 2 analysis.