DPD | Director's Rule 7-2009

Applicant: City of Seattle Department of Planning and Development	**Page** 1 of 4	**Supersedes:** 32-96
	Publication: 4/6/09	**Effective:** 4/24/09
Subject: Seismic Survey and Report Requirements for Buildings Undergoing Substantial Alterations or Repairs	**Code and Section Reference:** Seattle Building Code SMC 3404.9.2	
	Type of Rule: Code Interpretation	
	Ordinance Authority: SMC 3.06.040	
Index: Building Code/Technical Requirements	**Approved** **Date** (signature on file) 4/23/09 **Diane M. Sugimura, Director**	

BACKGROUND:

For existing buildings undergoing substantial alterations or repairs, as defined by Section 3404.9 of the Seattle Building Code (SBC), a seismic retrofit design proposal may be provided to the building official in lieu of providing a design in compliance with SBC Section 1613. The proposal shall be based on a comprehensive report, as described in SBC 3404.9.2 Exception 2. The purpose of this director's rule is to describe the requirements for a seismic survey and report which can be used for such a proposal.

For substantial alterations to existing buildings, the seismic safety objective of the Department of Planning and Development is to provide substantial life safety or immediate occupancy, as indicated in Table 1 of this rule. In an earthquake, a building which has been substantially altered is not expected to significantly jeopardize life due to structural collapse, falling hazards or blocked routes of entrance or egress. Buildings which meet this objective may still suffer significant damage in an earthquake.

SELECTED REFERENCES

Seattle Building Code Chapter 34. This chapter controls the alteration, repair, addition, maintenance and change of occupancy of existing structures, with Section 3404.9 specifically addressing substantial alterations or repairs and Section 3404.9.2 specifically addressing seismic regulations.

Client Assistance Memo (CAM) 314. This CAM is intended to clarify the definitions of substantial alteration and provide guidance in how the Department of Planning and Development applies SBC Chapter 34.

ASCE 31-03 Seismic Evaluation of Existing Buildings. This standard provides a three-tiered process for seismic evaluation of existing buildings in any level of seismicity.

ASCE 41-06 Seismic Rehabilitation of Existing Buildings. This standard specifies nationally applicable provisions for the seismic rehabilitation of buildings.

RULE

This rule addresses the report requirements, report contents, test requirements for unreinforced masonry buildings (URMs), special requirements for URMs, and requirements for parapets.

I. Report requirements

A seismic survey and report, where required by Section 3404.9.2, shall address the existence, nature and extent of structural deficiencies and shall include proposed solutions for mitigation of all structural deficiencies found. The proposed solutions are permitted to be conceptual only. Minimum design forces used for analysis shall be current SBC force levels or, if approved by the building official, both the force levels and evaluation procedure of an alternate approach are permitted to be used. Typical approved alternates to address seismic deficiencies are permitted to be one of the following standards:

ASCE 31-03 Seismic Evaluation of Existing Buildings, with minimum seismic performance criteria as noted in Table 1 below.

ASCE 41-06 Seismic Rehabilitation of Existing Buildings, with Supplement #1 and minimum seismic performance criteria as noted in Table 1 below.

Table 1: Seismic Performance Criteria

Occupancy Category (Based on SBC Table 1604.5)	Performance Level for use with ASCE 31	Performance Level for use with ASCE 41
I	Life Safety (LS)	Life Safety (LS)
II	Life Safety (LS)	Life Safety (LS)
III	Note a, Note b	Note b
IV	Immediate Occupancy (IO)	Immediate Occupancy (IO)

a. For Occupancy Category III, the ASCE 31 Screening Phase checklists shall be based on the Life Safety performance level.
b. Acceptance criteria for Occupancy Category III shall be taken as 80 percent of the acceptance criteria specified for Occupancy Category II performance levels, but need not be less than the acceptance criteria specified for Occupancy Category IV performance levels.

For ASCE 31 and ASCE 41, the design professional is permitted to use the BSE-1 spectral response acceleration parameters as defined in Section 1.6.1.2 of ASCE 41-06.

Other alternate methodologies are permitted to be submitted for review and approval, provided adequate documentation is included to justify approval.

II. Report contents

The seismic survey and report shall be prepared by a structural engineer licensed in the state of Washington. The report shall, as a minimum, contain the following information:

A. The street address of the building.

B. A description of the building including the number of stories and the approximate floor area of each floor.

C. The date the building was constructed and the dates of any significant additions, if known.

D. A list of all occupancy types, both existing and proposed.

E. Identification of all lateral force resisting systems with plans and elevations indicating locations, as appropriate.

F. Condition of structural systems, such as identification of dry rot, deteriorated brick or mortar, cracked or spalled concrete, etc.

G. Testing requirements needed to substantiate the conclusions of the structural report. Unless otherwise approved by the building official, test reports shall be submitted prior to permit issuance.

H. Seismic response parameters and site class.

I. Conclusions. The report shall include identification and prioritization of all significant deficiencies based on earthquake hazard. The report shall also include a conceptual remediation proposal for each deficiency. If the recommendations do not include full mitigation of identified deficiencies, then a request for a waiver or modification shall be submitted with justification of such waiver or modification. Justification may include cost benefit analysis, functional issues, total costs, testing, engineering judgment, redundancy, etc. The engineer shall also include a statement that indicates whether or not the intent of the recommendations is to meet the safety objective of this rule. If there are significant waivers or modifications such that the project will fail to meet the safety objective, then the engineer shall specify the level of risk reduction that is intended to be achieved. The level of risk reduction provided shall be included in the general notes on the structural drawings.

III. Test requirements for URMs

Where the shear stress check is non-compliant for an ASCE-31 Tier 1 Evaluation, unreinforced masonry walls used to carry vertical loads or resist lateral forces parallel and perpendicular to the wall plane shall be tested as specified in this subsection.

A. Mortar

1. The quality of mortar in all masonry walls shall be determined by performing in-place shear tests in accordance with UBC Standard 21-6. Alternative methods of testing are permitted to be used for masonry walls other than brick, subject to approval by the building official.

2. The shear tests shall be taken at locations representative of the mortar conditions throughout the entire building, taking into account variations in workmanship at different building height levels, variations in weathering of the exterior surfaces, and variations in the condition of the interior surfaces due to deterioration caused by leaks and condensation of water and/or by the deleterious effects of other substances contained within the building. The exact test location shall be determined at the building site by the engineer responsible for the structural design work. An accurate record of all such tests and their location in the building shall be recorded and these results shall be submitted by the structural engineer to the Department of Planning and Development for approval as part of the structural survey and report.

B. Wall Ties

Existing URM wall ties shall be tested in accordance with ASCE 31-03 or 2006 IEBC.

IV. Special requirements for URMs

Roof-to-wall ties and floor-to-wall ties shall be provided around the entire perimeter of unreinforced masonry buildings. Existing anchors must meet, or shall be upgraded to meet, the minimum requirements of ASCE 31-03 or Appendix A-1 of the 2006 IEBC.

V. Requirements for parapets

Parapets which exceed the H/T thresholds of the standard used for analysis shall be braced in accordance with ASCE 31-03 or 2006 IEBC.