



## ADMINISTRATIVE BULLETIN

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**NO. AB-109**

**DATE** : **DRAFT for CAC Review March 4, 2014**  
**SUBJECT** : **Seismic Evaluation of Private School Facilities**  
**TITLE** : **Application of Engineering Criteria in SFBC Section 3428**

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**PURPOSE** : The purpose of this Bulletin is to establish acceptable evaluation criteria and reporting standards for complying with Section 3428 of the 2013 San Francisco Building Code, as amended by Ordinance No. XX-XX.

**REFERENCE** : Chapter 34, 2013 San Francisco Building Code  
ASCE 41-13, Seismic Evaluation and Retrofit of Existing Buildings

**ATTACHMENTS** : Template Scope Report, available at [sfdbi.org](http://sfdbi.org)  
Template Evaluation Report, available at [sfdbi.org](http://sfdbi.org)

**DISCUSSION** : SFBC Section 3428, created with Ordinance XX-XX, mandates the seismic evaluation of certain existing buildings and non-building structures used by elementary and secondary (K-12) schools that are not schools under the jurisdiction of the Division of the State Architect's Structural Safety section and are not used for homeschooling under the provisions of Section 33190 of the California Education Code.

**SCOPE** : Part A of this Bulletin provides regulations to implement the general requirements of SFBC Section 3428, as well as background commentary. Part B of this Bulletin provides interpretation and additional guidance regarding the application of technical provisions in ASCE 41-13, referenced by SFBC Section 3428.

## **Part A. Regulations and Commentary for SFBC Section 3428**

Part A of this Bulletin restates the provisions of Section 3428 and provides corresponding interpretations and background commentary. Commentary is shown in italic font. Section numbers refer to SFBC Section 3428.

### **Submittal schedule**

SFBC Sections 3428.3 and 3428.4 provide two submittal deadlines:

The Evaluation Scope document for each school is to be submitted within one year of the effective date of Section 3428.

The Evaluation Report (see template, attached) for each school building and non-building structure is to be submitted within three years of the effective date of Section 3428.

Report templates for each submittal are provided as attachments to this Bulletin.

### **3428.1 General.**

The intent of Section 3428.1 is to cover all the buildings and non-building structures on the school campus that are used primarily for school purposes, as further described in Section 3428.2. "Other facilities" include:

- Athletic facilities
- Parking structures
- Other buildings and non-building structures considered part of the school.

In addition to the explicit exceptions for small buildings and for homeschooling facilities, it is not the intent of this section to cover:

- Buildings off of the school's campus, even if used by students or faculty
- Buildings on the school's campus that are used primarily for non-school purposes, such as churches or convents, unless those buildings also contain spaces essential to school operations, such as classrooms or school offices.

Other buildings or non-building structures posing minimal risk might be exempted as well; see Section 3428.3.

### **3428.2 Scope and Criteria**

Subject to Department approval, lightweight fences, shelters, play structures, etc. need not be evaluated. The intent of Section 3428.2 is to include non-building structures that are relatively heavy (generally of concrete or masonry construction) or prone to earthquake damage.

Table 3428.2 shows that each building or non-building structure will be subject to one of two evaluation types: Safety Evaluation or Recovery Evaluation.

***Commentary:*** *The organization and content of ASCE 41-13 is such that the criteria for Recovery Evaluation include the criteria for Safety Evaluation. Thus, "buildings*

*subject to a Recovery Evaluation” will automatically receive a Safety Evaluation as well.*

**Table 3428.2. ASCE 41-13 Evaluation Objectives and Scopes<sup>1</sup>**

| <b>Evaluation type</b> | <b>Evaluation Objective/Scope</b>  |
|------------------------|--|
| Safety Evaluation      | Structural Life Safety with the BSE-1E hazard<br>Nonstructural Life Safety with the BSE-1E hazard                |
| Recovery Evaluation    | Structural Immediate Occupancy with the BSE-1E hazard<br>Nonstructural Position Retention with the BSE-1E hazard |

<sup>1</sup> As modified and interpreted by an Administrative Bulletin that shall be adopted by the Department.

For purposes of Section 3428, previous versions of ASCE 41, specifically ASCE 31-03 and ASCE 41-06, are not acceptable as alternatives to ASCE 41-13. See Part B of this Bulletin for modifications and interpretations of ASCE 41-13 criteria.

**Commentary:** *The intent of the Safety Evaluation is to identify hazards known to be associated with earthquake-related severe injury or death. The evaluation objective is selected to match, approximately, the safety-related criteria for existing public school buildings implied by programs of the California Division of the State Architect and the San Francisco Unified School District.*

*The intent of the Recovery Evaluation (which includes a Safety Evaluation) is to collect information that the city, the schools, and others can use to plan emergency preparedness, response, and recovery. The evaluation objective involves a comprehensive review of conditions that can reasonably be expected to delay the reopening of a school following a damaging earthquake.*

*In addition to the tabulated scope, voluntary mitigation of contents hazards is encouraged. Such mitigation could include bracing, restraint, or removal of supplies, stored items, or furnishings prone to hazardous tipping or sliding. It might also include nonstructural mitigation that is not required by Section 3428. References regarding contents bracing have been developed by FEMA, the Division of the State Architect, and others. For example, see “Guide and Checklist for Nonstructural Earthquake Hazards in California Schools,” available at <http://www.documents.dgs.ca.gov/dsa/pubs/SB1122.pdf>.*

### **3428.2.2 Recovery Evaluation**

In general, if a school is subject to Recovery Evaluation, each building and non-building structure at that school should be evaluated with the Recovery Evaluation criteria. See Section 3428.3 for regarding building-specific exemptions.

**Commentary:** *The enrollment threshold of 225 students is not related to occupant load thresholds for individual buildings otherwise given in CBC/SFBC Table 1604.5. It is rather intended to focus on the largest schools, where delayed re-occupancy is expected to have a more significant effect on citywide recovery.*

### **3428.5 Voluntary Seismic Strengthening**

**Commentary:** *Section 3428 requires evaluation only. While voluntary mitigation is encouraged, Section 3428 does not require it and therefore does not provide objectives or criteria for retrofit design. In particular, Section 3428 does not provide criteria that, if applied through voluntary retrofit, would relieve an owner from future retrofit requirements. Nevertheless, voluntary retrofit following the criteria in 2013 California Building Code Sections 3417 through 3423 (intended for code-triggered retrofit of schools regulated by DSA) would be expected to satisfy most or all of the requirements of near-future San Francisco regulations for school facilities not expected to support post-earthquake recovery functions.*

*The criteria in CBC Sections 3417 through 3423 are different from the evaluation criteria in SFBC Section 3428. The difference between evaluation and retrofit criteria is common in earthquake engineering and has long-standing precedents in risk reduction policy. For example, the Safety Evaluation required by Section 3428 is intended to find only the most severe potential deficiencies in a cost-effective way; this avoids listing marginal deficiencies and non-conformance related to changes in building codes over the years. A safety-based retrofit, however, might want to use more conservative criteria to address a more comprehensive list of deficiencies in a cost-beneficial way. Similarly, the more thorough Recovery Evaluation required by Section 3428 for some schools is intended to address issues beyond safety in order to support recovery planning. A voluntary retrofit, especially one intended to address urgent safety issues, might reasonably choose to ignore some of the potential deficiencies this thorough evaluation might find.*

## **Part B. APPLICATION OF ASCE 41-13 TO EVALUATION**

Part B of this Bulletin makes modifications to and interpretations of ASCE 41-13 as they relate to compliance with SFBC Section 3428. The section numbers refer to section numbers in ASCE 41-13.

### **1.4 Seismic Evaluation Process**

With reference to Figure C1-1, Tier 3 Systematic evaluation is required for certain buildings, subject to Bulletin modifications to Section 3.3. Where Tier 3 Systematic evaluation is not required, Tier 1 Screening is required for all evaluations, and Tier 2 Deficiency-Based Evaluation is optional.

#### **1.4.1 Selection of Performance Objective**

Omit. The evaluation objective is given in SFBC Table 3428.2.

#### **1.4.2 Level of Seismicity**

Replace with the following:

The level of seismicity shall be taken as High for all schools subject to SFBC Section 3428.

#### **1.4.4 Evaluation Procedures**

Replace with the following:

Tier 3 Systematic evaluation is required for certain buildings, subject to Bulletin modifications to Section 3.3. Where Tier 3 Systematic evaluation is not required, Tier 1 Screening is required for all evaluations, and Tier 2 Deficiency-Based Evaluation is optional.

#### **1.4.5 Evaluation Report**

Omit. Evaluation reports should use the attached Template Evaluation Report.

### **1.5 Seismic Retrofit Process**

Omit. Retrofit is beyond the scope of SFBC Section 3428.

### **2.1 Scope – 2.3 Target Building Performance Levels**

Omit. Evaluation objectives are given in SFBC Table 3428.2.

### **2.4 Seismic Hazard**

Per SFBC Table 3428.2, all evaluations are required to consider only the BSE-1E hazard.

For purposes of compliance with SFBC Section 3428, the Site-Specific Procedure of Section 2.4.2 need not be used.

#### **2.4.1 General Procedure for Hazard Due to Ground Shaking**

Per SFBC Table 3428.2, all evaluations are required to consider only the BSE-1E hazard.

Seismicity parameters for the BSE-1E hazard may be obtained using the USGS tool available at <http://geohazards.usgs.gov/designmaps/us/application.php>. From the Design

Code Reference Document menu, select “2013 ASCE 41.” From the Earthquake Hazard Level menu, select “BSE-1E”.

For purposes of calculating seismicity parameters with the USGS tool, Site Class F need not be assumed.

#### **2.4.1.6.1 Site Classes**

Where the Site Class is known from available documents, the known Site Class should be used. Where the Site Class is not known, for purposes of compliance with SFBC Section 3428, the Site Class may be estimated from the USGS map available at <http://earthquake.usgs.gov/regional/nca/soiltype/map/>.

Unless site-specific investigations indicate otherwise, Site Class F shall be assumed for any site located within a zone of required investigation for liquefaction on the 2000 Department of Conservation map available at [http://gmw.consrv.ca.gov/SHMP/download/pdf/ozn\\_sf.pdf](http://gmw.consrv.ca.gov/SHMP/download/pdf/ozn_sf.pdf).

Otherwise, Site Class F need not be assumed.

For purposes of compliance with SFBC Section 3428, site-specific investigation of potential Site Class F sites is not required as long as potential liquefaction is noted on the Deficiency List in the seismic evaluation report.

#### **2.5 Level of Seismicity**

Replace with the following:

The level of seismicity shall be taken as High for all schools subject to SFBC Section 3428.

#### **3.2.4 Site and Foundation Information**

For purposes of compliance with SFBC Section 3428, any requirement in ASCE41-13 for site-specific soils or geotechnical investigation is waived. Owners may perform and report the results of such investigations voluntarily.

#### **3.3.1 Limitations on the Use of the Tier 1 and 2 Evaluation and Retrofit Procedures**

For purposes of compliance with SFBC Section 3428, Tier 3 evaluation is not required. However, if ASCE 41-13 Section 3.3.1 would require Tier 3 evaluation, each Tier 1 checklist item subject to that requirement (which in some cases might be only those on Immediate Occupancy but not Life Safety checklists) shall be listed in the Deficiency List with a note indicating potential non-compliance subject to Tier 3 analysis.

#### **16.17 Nonstructural checklist**

The following Tier 1 nonstructural checklist items are normally required by ASCE 41-13 for Life Safety evaluation. For purposes of compliance with the Safety Evaluation criteria of SFBC Section 3428, the following items are not required. Where applicable, this variation from the ASCE 41-13 standard shall be noted in the Evaluation Report.

Ceilings

    Suspended Gypsum Board

Light Fixtures

Independent Support

Stairs

Stair Details

Contents and Furnishings

Industrial Storage Racks

Mechanical and Electrical Equipment

Fall-Prone Equipment

In-Line Equipment

Elevators

Retainer Guards

Retainer Plate

\_\_\_\_\_  
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\_\_\_\_\_  
Date

Approved by Building Inspection Commission on \_\_\_\_\_