ATTACHMENT B

SEISMIC EVALUATION REPORT

School: Report Date:
Building Name/ID: Previous Versions:
Building Address:

This is a template document intended to ensure complete and consistent reports to DBI. It is not meant to preclude separate correspondence or reporting between engineers and clients. Blue highlights are instructions to the engineer using this template. Remove all instructions and highlights before submittal. In most sections, the template text should be retained, but the engineer should modify or correct any misstatements and may supplement the text as needed. The format and outline of the report are required to be maintained, however, any specific wording may be modified where deemed appropriate by the design professional.

A single report may be used to cover multiple buildings or non-building structures subject to the same criteria. Alternatively, each building and non-building structure may have its own report. Clarity of presentation, subject to Department approval, is the priority.

This report complies with requirements of San Francisco Existing Building Code Section 329.

SE seal and signature

Report Outline *It is not necessary to provide page numbers*

1. Evaluation process and criteria
2. Site and building description
3. Deficiency list

Appendix A. Approved Scope Report
Appendix B. ASCE 41-13 Tier 1 Checklists
Appendix C. Structural calculations
Appendix D. Photographs and details

Date signed _____

FOR DBI USE ONLY

Report is incomplete or requires revision. See separate comment form. [ ]

Report appears complete as to form and is assumed correct based on the statement of the Structural Engineer whose seal and signature appear above. [ ]

DBI Reviewer: _____

Date: _____

SE Firm Name (Logo optional)
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SEISMIC EVALUATION REPORT

School: Report Date:
Building Name/ID: Previous Versions:
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1. Evaluation process and criteria

1.1 Purpose

The purpose of this report is to comply with San Francisco Existing Building Code Section (SFEBC) 329, as implemented by Department of Building Inspection Administrative Bulletin 109 (AB-109).

1.2 Scope

This report covers only the following buildings and non-building structures on the school campus. See Appendix A for a list of other buildings and non-building structures on the school campus that might be subject to SFEBC Section 329 but are not covered in this report.

Insert list; coordinate with site plan in Section 2.

1.3 Evaluation criteria: Modifications to ASCE 41-13

As provided in SFEBC Section 329.2 and AB-109, the evaluation applied the engineering standard known as ASCE 41-13[1] with the following evaluation objective:

	Performance Level	Hazard Level
Structural components	Life Safety	BSE-1E
Nonstructural components	Life Safety	BSE-1E

In accordance with SFEBC Section 329.2 and AB-109, the following modifications were applied to the standard ASCE 41-13 requirements:

Following is a list of variations allowed or required by AB-109. Retain the ones that apply to this evaluation. Delete the others. Add items as needed to reflect the work that was actually done:

- The Site Class was taken from the USGS map at http://earthquake.usgs.gov/regional/nca/soiltype/map/.
- The Site Class is possibly Site Class F, but no site-specific soils or geotechnical investigation was performed.
- Liquefaction and landslide potential were assumed from the Department of Conservation map at http://gmw.consrv.ca.gov/SHMP/download/pdf/ozn_sf.pdf.
- Despite a lack of original design and construction documentation, investigation of existing details was limited for budget and disruption purposes.
- Tier 3 Systematic Evaluation is required for this building by ASCE 41-13 Section 3.3 but for budget purposes was not done.

[1] *Seismic Evaluation and Retrofit of Existing Buildings* (ASCE/SEI 41-13), American Society of Civil Engineers, 2013.

SEISMIC EVALUATION REPORT

School: Report Date:
Building Name/ID: Previous Versions:
Building Address:

1.4 Document review

The following documents were used to complete the evaluation, in general compliance with ASCE 41-13 Section 3.2.2. The Set ID is used to identify the documents cited in Appendix B of this report.

Set ID	Date	Description
		For each document (set of plans, report, etc.), give the title and author, indicate the number of sheets or pages (especially if only part of the set was available), and state the context in which the document was produced (original construction, alteration, retrofit, repair, etc.)

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SEISMIC EVALUATION REPORT

School: Report Date:
Building Name/ID: Previous Versions:
Building Address:

1.5 Site visit

A site visit was made to verify certain information and to assist in completing the evaluation, in general compliance with ASCE 41-13 section 3.2.

Date of site visit:
Visiting engineer(s) and staff:
School contact:
School on-site liaison:

The scope of the site visit was based on our judgment, accessibility of certain areas, and convenience of the school on-site liaison. The purpose of the following list is merely to record the work that was done. That some listed items are not checked does not indicate an incomplete evaluation. The site visit included:

[ ] Interview w/ on-site liaison
Engineer may add optional notes after each item to clarify the scope, make specific observations, reference photographs in Appendix, suggest need for destructive investigation, etc.
[ ] Grounds, for observation of soil, slopes, drainage, general condition
[ ] Exterior observation to verify basic massing, configuration, general condition
[ ] Interior observation to verify use, wall line configuration, general condition
[ ] Roof
[ ] Basement
[ ] Ceiling plenum
[ ] Unfinished spaces (mechanical rooms, closets, crawl spaces, etc.)
[ ] Details of structure-architecture interaction
[ ] Roof-to-wall connections
[ ] Gravity system framing
[ ] Seismic force resisting system elements or components
[ ] Adjacent buildings subject to pounding or falling hazard
[ ] Other:

Engineer to edit and/or complete the following paragraph as needed, using the table format for more detailed descriptions:

The site visit confirmed that the existing structure generally conforms to the available drawings listed in Section 1.4, with the following exceptions:

Set ID	Condition shown on plans	Condition observed at site visit

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SEISMIC EVALUATION REPORT

School: Report Date:
Building Name/ID: Previous Versions:
Building Address:

2. Site and building description

2.1 Site plan

If the school contains more than one structure, as listed in Appendix A, provide a site plan identifying each building, in coordination with the building names in Appendix A and Section 1.2.

2.2 Structure description

If this report addresses more than one building or non-building structure, provide all the information required by this section for each structure, using structure IDs in coordination with Section 1.2.

Year originally built:	
Number of stories above grade:	
Number of stories below grade:	
Total floor area [sq ft, approx]:	
Original design code	
History of significant structural alteration (non-seismic)	*For purposes of this report, "significant alteration" means work that could have affected the building's seismic demands by changing the weight or the distribution of story shear or overturning forces. It would generally not include replacement of finishes, upgrade of HVAC equipment (except possibly for heavy tanks or rooftop units), or architectural work that did not involve changes to structural elements. Describe the changes to structural elements.*
History of seismic retrofit	*If applicable, give the retrofit design code/criteria/performance objective, as well as dates and reference to Set ID(s) in Section 1.4.*

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SEISMIC EVALUATION REPORT

School: Report Date:
Building Name/ID: Previous Versions:
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Exterior elevation photograph, looking **_direction_**, taken **_date_**:

Provide one or two exterior elevation photographs sufficient to give a general sense of the building's massing.

- *Complete the caption above the photo box by adding a compass direction and the date of the photo.*
- *Additional annotations (north arrow, grid lines, etc. to match the plan sketch below) are useful but optional.*
- *If two photos are provided here, provide a similar caption above the second photo.*
- *Additional photographs, if needed, should be provided in Appendix D.*

Plan sketch:

Provide a rough sketch of a plan section showing:

- *Plan configuration, with approximate overall dimensions*
- *Substantially different parts of the building - original v. additions, different heights, different uses, etc.*
- *Grid lines or key notes, so that other sections of this report can reference certain areas or SFRS elements consistently*
- *Location and orientation of key SFRS walls and frame lines*
- *Project North arrow*

If the building plan varies over the height, show the first story and other stories as needed to convey significant information regarding basic SFRS configuration.

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2.3 BSE-1E Seismicity Parameters

Latitude:

Longitude:

Site Class:

Basis for Site Class: *See AB-109 re ASCE 41-13 Section 2.4.1.6.1. If unknown, list the USGS map. If known, cite the Set ID and page/detail from the list in Section 1.4.*

Period [sec]	Mapped BSE-1E values [g]	Site Coefficients	S_a spectral values [g]	Need not exceed values (optional) [g]
0.2	$S_{S,20/50}$ =	F_a =	$S_{XS,BSE\text{-}1E} = F_a S_{S,20/50}$ =	$S_{XS,BSE\text{-}1N}$ =
1.0	$S_{1,20/50}$ =	F_v =	$S_{X1,BSE\text{-}1E} = F_v S_{1,20/50}$ =	$S_{X1,BSE\text{-}1N}$ =

2.4 Gravity system

Roof diaphragm and framing — *For each item, briefly describe the structural material and structural elements.*

Typical floor diaphragm and framing

Ground floor framing

Vertical load-bearing elements

Basement walls

Foundation

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SEISMIC EVALUATION REPORT

School: Report Date:
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2.5 Seismic force resisting system

Common building type per ASCE 41-13 Section 3.2.1		North-South	East-West
Wood frame, Light	W1	[ ]	[ ]
Wood frame, multi-story, multi-unit residential	W1A	[ ]	[ ]
Wood frame, commercial / industrial	W2	[ ]	[ ]
Steel moment frame, rigid diaphragm	S1	[ ]	[ ]
Steel moment frame, flexible diaphragm	S1A	[ ]	[ ]
Steel braced frame, rigid diaphragm	S2	[ ]	[ ]
Steel braced frame, flexible diaphragm	S2A	[ ]	[ ]
Steel light frame	S3	[ ]	[ ]
Dual system w/ backup steel moment frame	S4	[ ]	[ ]
Steel frame w/ infill masonry shear wall, rigid diaphragm	S5	[ ]	[ ]
Steel frame w/ infill masonry shear wall, flexible diaphragm	S5A	[ ]	[ ]
Steel plate shear wall	S6	[ ]	[ ]
Concrete moment frame	C1	[ ]	[ ]
Concrete shear wall, rigid diaphragm	C2	[ ]	[ ]
Concrete shear wall, flexible diaphragm	C2A	[ ]	[ ]
Concrete frame w/ infill masonry shear wall, rigid diaphragm	C3	[ ]	[ ]
Concrete frame w/ infill masonry shear wall, flexible diaphragm	C3A	[ ]	[ ]
Precast/tilt-up concrete shear wall, flexible diaphragm	PC1	[ ]	[ ]
Precast/tilt-up concrete shear wall, rigid diaphragm	PC1A	[ ]	[ ]
Precast concrete frame w/ shear walls	PC2	[ ]	[ ]
Precast concrete frames w/o shear walls	PC2A	[ ]	[ ]
Reinforced masonry bearing wall, flexible diaphragm	RM1	[ ]	[ ]
Reinforced masonry bearing wall, rigid diaphragm	RM2	[ ]	[ ]
Unreinforced masonry bearing wall, flexible diaphragm	URM	[ ]	[ ]
Unreinforced masonry bearing wall, rigid diaphragm	URMA	[ ]	[ ]
Seismic Isolation or Passive Dissipation	SI/PD	[ ]	[ ]
Combination of type(s) checked above and the following other SFRS type(s): *List the other SFRS type(s) here.*		[ ]	[ ]
None of the above *List the present SFRS type(s) here.*		[ ]	[ ]

Benchmark year check:
In accordance with ASCE 41-13 Section 4.3 and Table 4-6, the structure qualifies **or *[select one, delete the other]*** does not qualify as a benchmark building. *If the building qualifies, state the building type and qualifying provisions.*
See ASCE 41-13 Section 4.3 and Table 4-6. State whether the combination(s) of common building type and design/retrofit/evaluation provisions qualify the building as a benchmark building. Note: Benchmark year exemptions apply only to structural elements.

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SEISMIC EVALUATION REPORT

School: Report Date:
Building Name/ID: Previous Versions:
Building Address:

For each item following, give a brief response or description.

Horizontal system combinations	*If more than one common building type is indicated in the table above, describe the horizontal combination, if any. Distinguish combinations in a single direction from combinations that involve a single system in each direction. In particular, address the Tier 1 & Tier 2 eligibility conditions for combined systems given in ASCE 41-13 Section 3.3.1.2.*
Vertical system combinations	*If more than one common building type is indicated in the table above, describe the vertical combination, if any. In particular, address the Tier 1 & Tier 2 eligibility conditions for combined systems given in ASCE 41-13 Section 3.3.1.2.*
SFRS foundation	
Gravity loading	*Describe the degree to which the SFRS elements also carry gravity load, distinguishing as appropriate between elements on different frame lines or in different directions.*
System details	*Give a brief description of the typical and critical SFRS elements in each direction to supplement the SFRS description by common building type. For example, describe column and girder sizes, infill thickness, spacing of roof-to-wall ties, etc.*
Structural materials	*List concrete, rebar, and masonry specified material properties, as well as the source of information, citing documents by Set ID and page/detail as listed in Section 1.4. See ASCE 41-13 section 4.2.3 for default values.*

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SEISMIC EVALUATION REPORT

School: Report Date:
Building Name/ID: Previous Versions:
Building Address:

3. Deficiency list

As further described in Appendix B, the following Deficiency List is based on:
[ ] Tier 1 evaluation only
[ ] Tier 1 evaluation, plus voluntary Tier 2 analysis for selected items
[ ] Tier 1, Tier 2, and Tier 3 evaluation due to requirements of ASCE 41-13 Section 3.3

The Deficiency List includes the following checklist items associated with full structural collapse:
After completing Appendix B and the summary list of NC and U items below, complete this table to highlight those items associated with structural collapse. The engineer may add items at the bottom of the list at his or her discretion.

	Non-compliant condition	Unknown condition
Load Path	[ ]	[ ]
Weak Story	[ ]	[ ]
Soft Story	[ ]	[ ]
Vertical Irregularities	[ ]	[ ]
Geometry	[ ]	[ ]
Mass	[ ]	[ ]
Torsion	[ ]	[ ]
***Additional system-specific items to be added	[ ]	[ ]
Slope Failure	[ ]	[ ]
Surface Fault Rupture	[ ]	[ ]
Other: ***for building-specific conditions. Provide reference to checklist item in summary table below***	[ ]	[ ]

The following table summarizes the potential deficiencies identified in Appendix B of this report.
Instructions for the tables below

- *Deficiencies correspond to discrete items in the Tier 1 checklists.*
- *Do NOT list an item here as a potential deficiency if Tier 2 or Tier 3 analysis has shown the corresponding condition to be acceptable, even if the corresponding condition is non-compliant by Tier 1.*
- *In the column labeled "Additional evaluation recommended," indicate whether additional work would likely result in the potential deficiency being removed from the list. There is no need to provide details or scope. Possible entries in this column are*
  - *None*
  - *Tier 2 evaluation*
  - *Tier 3 evaluation*
  - *Additional non-destructive investigation*
  - *Destructive investigation*
  - *Material testing*

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SEISMIC EVALUATION REPORT

School:
Building Name/ID:
Building Address:

Report Date:
Previous Versions:

Non-compliant condition	Discussion	Additional evaluation recommended
Restate in this column the titles of each checklist item marked NC.	*For each item, describe:* • *The extent of non-compliance: Isolated? Widespread? Only in certain directions, along certain lines, in certain stories?*	

Unknown condition	Discussion	Additional evaluation recommended
Restate in this column the titles of each checklist item marked U.	*For each item, describe:* • *The extent of non-compliance: Isolated? Widespread? Only in certain directions, along certain lines, in certain stories?*	

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Building Address:

Appendix A. Approved Scope Report

Provide a copy of the DBI-approved Scope Report.

Appendix B. ASCE 41-13 Tier 1 Checklists

Tier 1 and Tier 2 eligibility check:
See ASCE 41-13 Section 3.3.1 and Table 3-2. Provide a statement indicating whether the building is eligible for Tier 1 and Tier 2 procedures alone, or whether Tier 3 evaluation is necessary. Give building details as needed to address the various cases covered in Sections 3.3.1.1 and 3.3.1.2.

Applicable Tier 1 checklists: *Edit the following list as appropriate to the building type or types.*
- Life Safety Basic Configuration Checklist (ASCE 41-13 Section 16.1.2LS)
- Life Safety Structural Checklist for Building Type *** (ASCE 41-13 Section 16.***LS)
- Nonstructural Checklist (ASCE 41-13 Section 16.17)

Provide completed Tier 1 checklists, in ASCE 41-13 sequence. Instructions for formatting the checklists:
- *For each checklist item, indicate C, NC, N/A, or U. Recommended means of indicating C, NC, N/A, or U: Do not insert a circle or other graphic element that could get separated from the text. Instead select the response and use "Borders and Shading" to put a box/border around just the selected text.*
- *IMPORTANT: For each evaluation statement, provide a brief note citing the source of the information that justifies C, NC, etc. Refer to the Set ID and page/detail as listed in Section 1.4. Where applicable, provide additional discussion, Quick Check calculation, etc.*
- *Lengthy explanations, Tier 2 calculations, photos, etc. may be added here if convenient to do so. Otherwise, provide those in the Appendix C or D, and provide a reference there to the relevant Appendix B checklist item.*

Appendix C. Structural Calculations

Provide calculations or calc summary directly or insert graphics/screeenshots from spreadsheet, hand calcs, etc.

Alternatively, if appendix materials are provided in a separate file, use Appendix C to provide a table of contents or guide to that file indicating what's in it and how many pages it is. If a separate file is provided, each of its pages must include all of the identifying information shown in the header and footer to this report.

Provide the general calculations as needed to complete the evaluation of Appendix B. These will likely include weight take-offs, period calculation, base shear calculation and distribution, and general analysis results (such as story shear distributions by frame line).

Provide calculations and supporting information needed to complete the response to specific checklist items. Brief calculations or explanations should go in Appendix B directly. If this appendix section is used, organize it by the title of the checklist item. It is acceptable to omit checklist items from this appendix if no information is needed to supplement what's already provided in Appendix B.

SEISMIC EVALUATION REPORT

School: Report Date:
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Appendix D. Photographs and Details

Provide additional photographs or graphic information, with captions, in this optional appendix.