Rating form completed by:

RUTHERFORD + CHEKENE
ruthchek.com
Evaluator: MTN/EB/WAL/BL
Date: 06/28/2019

Text in green is to be part of UC Santa Cruz building database and may be part of UCOP database

DATE: 2019-06-28

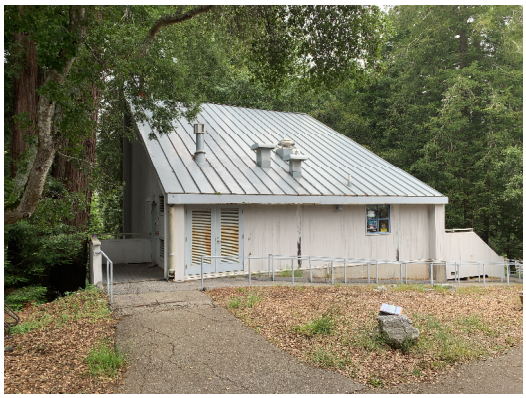
REGISTERED PROFESSIONAL ENGINEER
BRETT LIZUNDIA
No. S3950
Exp. 12-31-20
STRUCTURAL
STATE OF CALIFORNIA
06-28-19

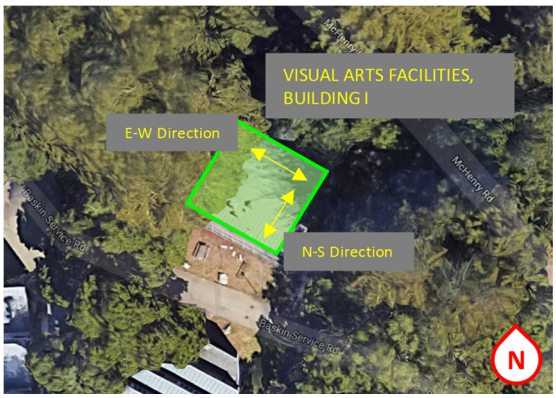
UC Santa Cruz building seismic ratings

Visual Arts Facilities-Building I

CAAN #7815
Elena Baskin Visual Arts, Santa Cruz, CA 95064
UCSC Campus: Main Campus

Reference South Elev. (Looking Northeast) Plan





Rating summary	Entry	Notes
UC Seismic Performance Level (rating)	IV (Fair)	
Rating basis	Tier 1	ASCE 41-17[1]
Date of rating	2019	
Recommended UC Santa Cruz priority category for retrofit	None	Priority A=Retrofit ASAP Priority B=Retrofit at next permit application
Ballpark total construction cost to retrofit to IV rating[2]	None	See recommendations on further evaluation and retrofit.
Is 2018-2019 rating required by UCOP?	Yes	Building was not previously rated.
Further evaluation recommended?	No	

[1] We translate this Tier 1 evaluation to a Seismic Performance Level rating using professional judgment. Non-compliant items in the Tier 1 evaluation do not automatically put a building into a particular rating category, but we evaluate such items along with the combination of building features and potential deficiencies, focused on the potential for collapse or serious damage to the gravity supporting structure that may threaten occupant safety. See Section III.B of the 19 May 2017 *UC Seismic Safety Policy* and Method B of Section 321 of the 2016 *California Building Code*.

[2] Per Section III.A.4.i of the 26 March 2019 *UC Seismic Program Guidebook, Version 1.3*, the cost includes all construction cost necessitated by the seismic retrofit, including restoration of finishes and any triggered work on utilities or accessibility. It does not include soft costs such as design fees or campus costs. The cost is in 2019 dollars.

Building information used in this evaluation

- Architectural and structural drawings by Herbert Kahn Architect, "Baskin Visual Arts Photo Studio, University of California, Santa Cruz," dated 22 July 1991.

Additional building information known to exist

None

Scope for completing this form

Reviewed structural drawings for original construction, made brief site visit on 23May 23 2019, and carried out ASCE 41-17 Tier 1 evaluation.

Brief description of structure

Baskin Building I (photo studio) was added to the visual art studio complex in 1992. The building was designed by Herbert Kahn Architect.

The building is a two-story rectangular wood-framed structure that contains approximately 2,260 square feet. The site slopes down to the northeast, and the rectangle is oriented nominally with the fall line of the slope. Reference plan orientation is used such that the reference north is towards the compass northeast. In the reference east-west direction, the building out-to-out dimension is 34'6"; in the reference north-south direction, the out-to-out dimension is 32'2-3/4". The upper floor aligns with grade on the reference south face; the lower floor aligns with grade on the reference north face. On the south, east, and west sides of the building, the soil is retained by an 8" reinforced concrete retaining wall. On the south side, the retaining wall extends from the foundation to underside of the upper floor. On the east and west sides, the retaining wall slopes down from south to north and does not extend to the underside of the upper floor. A wood bearing wall connects the footing to the upper floor level.

Identification of levels: The building has two stories: lower floor and upper floor. The lower floor aligns with grade on the reference north side; the upper floor aligns with grade on the reference south side. The height from the top of slab-on-grade at the lower floor to top of the upper floor is 10'0". The roof over the upper story slopes up to the north. On the reference south side, it is approximately 7'6" from the top of the main floor to the underside of the ceiling; on the reference north side, it is approximately 24'9".

Foundation system: The perimeter and interior walls are supported on strip footings.

Structural system for vertical (gravity) load: At the roof, sloped 12" TJI 35s support plywood diaphragm and a metal roof, and the TJIs span between the reference north and south walls. The tall reference north wall has a central clerestory window. The top of the wall is supported by 4x8 corner posts and 4 interior TS8x4x5/16 steel tubes. At the upper floor level, 14" TJI 35s span reference east-west between the exterior walls and an interior bearing wall. Walls are platform framed with 2x8 studs at 16" o.c. at the upper story and 2x6 studs at 16" at the lower story. The ground floor is a 4" concrete slab.

Structural system for lateral forces: At the upper story, the wall studs (and steel tubes) span out-of-plane between the upper floor and roof, the roof plywood diaphragm spans to the side walls and the plywood side walls carry loads down to the foundation. A similar approach is used for the lower story and the upper floor plywood diaphragm. The roof is a blocked 1/2" plywood diaphragm with 10d at 6" o.c. nailing. The upper floor is a ¾" plywood diaphragm with 10d at 6" o.c. nailing. The plywood shear walls are blocked with 10d at 4" o.c. nailing. They are connected with 5/8" diameter anchor bolts at 32" o.c. to the top of the concrete retaining walls and footings.

Building code: The building code used for design is not listed on the architectural or structural drawings. The only date on the drawings is 22 July 1991. A history of building codes in California is provided in "Abridged History of San Francisco's Bureau of Building Inspection: 1944 to 1992," a 2016 document Lonnie Haughton of Richard Avelar & Associates and a similar "Abridged History of the Statewide 'California Building Code'," a 2018 document also by Haughton. They inform the following. In 1978, the State Building Standards Commission was given responsibility for state building codes. The 1985 State Building Code adopted the 1982 Uniform Building Code (UBC), with an effective date of 1 October 1985. In 1989, the first California Building Code (CBC) was developed; it adopted the 1988 UBC, with an effective date of 1 July 1989 for State projects. The 1991 CBC adopted the 1991 UBC, with an

effective date of 14 August 1992. Building I was permitted under the University of California, Santa Cruz jurisdiction, and it is assumed that the State Building Code/California Building Codes were used. It thus appears likely that the 1988 UBC was the building code used for Building I.

Benchmark note: Per Table 1 of the 26 March 2019 *UC Seismic Program Guidebook, Version 1.3*, W2 buildings built to a code later than 1976 UBC and that are not on hillside sites can be benchmarked. The definition of the hillside site is not clearly provided either in the Guidebook or in ASCE 41-17. One interpretation is that the definition is in the W2 Tier 1 checklist which requires both a grade change of over half a story and shear walls on the downslope with aspect ratios of higher than 1V:1H. Building I has a full story grade change, but the north wall is solid has an aspect ratio of 0.27V:1H. There are, however, narrow pier on both the west and east sides at the downslope end. This report was prepared before the hillside site issue was clarified.

Brief description of seismic deficiencies and expected seismic performance including mechanism of nonlinear response and structural behavior modes

There are no major deficiencies. Average loads per lineal foot in the north and south plywood shear walls from east-west loading are below the Quick Check threshold. If a tributary area approach is used, the loads at the north wall with its large clerestory window are relatively high, still below the Quick Check threshold with a D/C ratio of 0.92.

The flexible wood-framed diaphragms, comprised of truss joists with plywood sheathing, are properly anchored to the perimeter wood-framed walls and reinforced concrete walls on the perimeter of south, east, and west sides. This allows a safe load transfer over the height of the building to the foundation. The nonlinear behavior of the structure is expected to be limited to inelastic response of wood-framed walls in the perimeter of the structure. The calculated average shear stress in the walls is well below the ASCE41-17 limit, since the building has enough number of walls in both directions to withstand the seismic load. The weakest links are likely to be the piers adjacent to the clerestory window on the reference north elevation which are highly stressed from a tributary area analysis view. Loads will likely redistribute through the roof diaphragm to the strong south wall line.

Structural deficiency	Affects rating?	Structural deficiency	Affects rating?
Lateral system stress check (wall shear, column shear or flexure, or brace axial as applicable)	N	Openings at shear walls (concrete or masonry)	N
Load path	N	Liquefaction	N
Adjacent buildings	N	Slope failure	N
Weak story	N	Surface fault rupture	N
Soft story	N	Masonry or concrete wall anchorage at flexible diaphragm	N
Geometry (vertical irregularities)	N	URM wall height-to-thickness ratio	N
Torsion	N	URM parapets or cornices	N
Mass – vertical irregularity	N	URM chimney	N
Cripple walls	N	Heavy partitions braced by ceilings	N
Wood sills (bolting)	N	Appendages	N
Diaphragm continuity	N		

Summary of review of nonstructural life-safety concerns, including at exit routes.[3]

Tanks in the dark room are not properly anchored.

[3] For these Tier 1 evaluations, we do not visit all spaces of the building; we rely on campus staff to report to us their understanding of if and where nonstructural hazards may occur.

UCOP nonstructural checklist item	Life safety hazard?	UCOP nonstructural checklist item	Life safety hazard?
Heavy ceilings, feature or ornamentation above large lecture halls, auditoriums, lobbies or other areas where large numbers of people congregate	None observed	Unrestrained hazardous materials storage	Potential
Heavy masonry or stone veneer above exit ways and public access areas	None observed	Masonry chimneys	None observed
Unbraced masonry parapets, cornices or other ornamentation above exit ways and public access areas	None observed	Unrestrained natural gas-fueled equipment such as water heaters, boilers, emergency generators, etc.	None observed

Basis of rating

A Seismic Performance Level Rating of Level IV is assigned to this building. It is well tied together; loads in the diaphragms and shear walls are relatively low; and there are no major deficiencies.

Recommendations for further evaluation or retrofit

None.

Peer review of rating

This seismic evaluation was discussed in a peer review meeting on 24 June 2019. Reviewers present were Joe Maffei of Maffei Structural Engineering and Jay Yin of Degenkolb Engineers. Comments from the reviewers have been incorporated into this report. The reviewers agreed with the assigned rating.

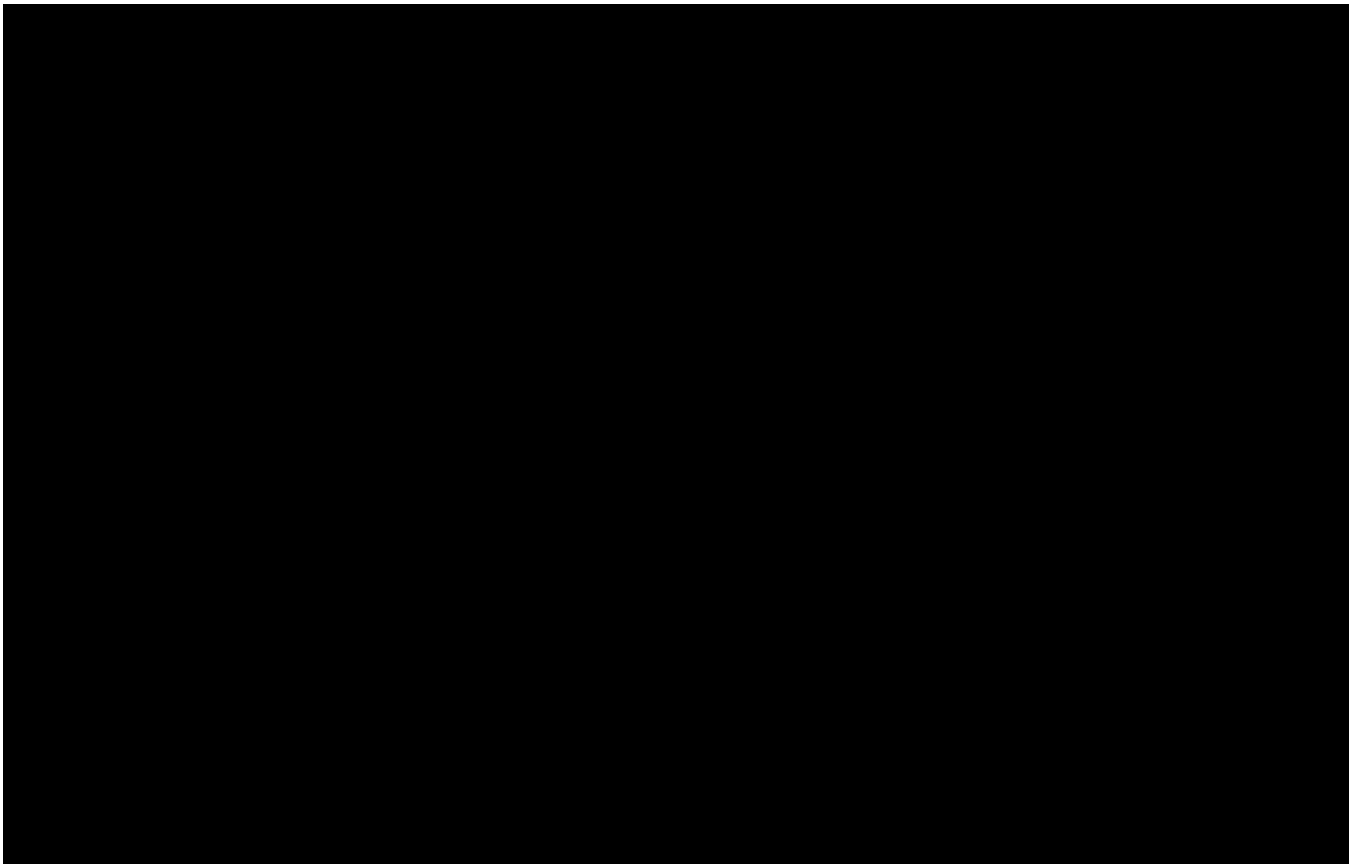
Additional building data	Entry	Notes
Latitude	36.994580	
Longitude	-122.060100	
Are there other structures besides this one under the same CAAN#	No	
Number of stories above lowest perimeter grade	2	
Number of stories (basements) below lowest perimeter grade	0	
Building occupiable area (OGSF)	2,261	From UCSC facilities database.
Risk Category per 2016 CBC Table 1604.5	II	
Building structural height, h_n	27 ft	Structural height defined per ASCE 7-16 Section 11.2
Coefficient for period, C_t	0.020	Estimated using ASCE 41-17 equation 4-4 and 7-18
Coefficient for period, β	0.75	Estimated using ASCE 41-17 equation 4-4 and 7-18
Estimated fundamental period	0.24 sec	Estimated using ASCE 41-17 equation 4-4 and 7-18
Site data		
975-year hazard parameters S_s, S_1	1.281, 0.485	From SEAOC/OSHPD website
Site class	D	
Site class basis	Geotech[4]	See footnote below

[4] Determination of site class and assessment of geotechnical hazards are based on correspondence with Pacific Crest Geotechnical Engineers and Nolan, Zinn, and Associates Geologists. [*Revised Geology and Geologic Hazards, Santa Cruz Campus, University of California*, Job # 04003-SC 13 May 2005]. Site class is taken as D throughout the main campus of UC Santa Cruz. The following links provide hazard maps for liquefaction, landslide, and fault rupture:

Site parameters F_a, F_v	1.0, 1.815	From SEAOC/OSHPD website
Ground motion parameters S_{cs}, S_{c1}	1.281, 0.880	From SEAOC/OSHPD website
S_a at building period	1.28	
Site V_{s30}	900 ft/s	
V_{s30} basis	Estimated	Estimated based on site classification of D.
Liquefaction potential	Low	
Liquefaction assessment basis	County map	See footnote below
Landslide potential	Low	
Landslide assessment basis	County map	See footnote below
Applicable code		
Applicable code or approx. date of original construction	Built: 1992 Code: 1988 UBC	
Applicable code for partial retrofit	None	No partial retrofit.
Applicable code for full retrofit	None	No full retrofit
FEMA P-154 data		
Model building type North-South	W2-Wood Frames	
Model building type East-West	W2-Wood Frames	
FEMA P-154 score	N/A	Not included here because we performed ASCE 41 Tier 1 evaluation.
Previous ratings		
Most recent rating	-	Not evaluated before.
Date of most recent rating	-	
2nd most recent rating	-	
Date of 2nd most recent rating	-	
3rd most recent rating	-	
Date of 3rd most recent rating	-	
Appendices		
ASCE 41 Tier 1 checklist included here?	Yes	Refer to attached checklist file.

https://gis.santacruzcounty.us/mapgallery/Emergency%20Management/Hazard%20Mitigation/LiquifactionMap2009.pdf
https://gis.santacruzcounty.us/mapgallery/Emergency%20Management/Hazard%20Mitigation/LandslideMap2009.pdf
https://gis.santacruzcounty.us/mapgallery/Emergency%20Management/Hazard%20Mitigation/FaultZoneMap2009.pdf

Color Coded Floor Plan

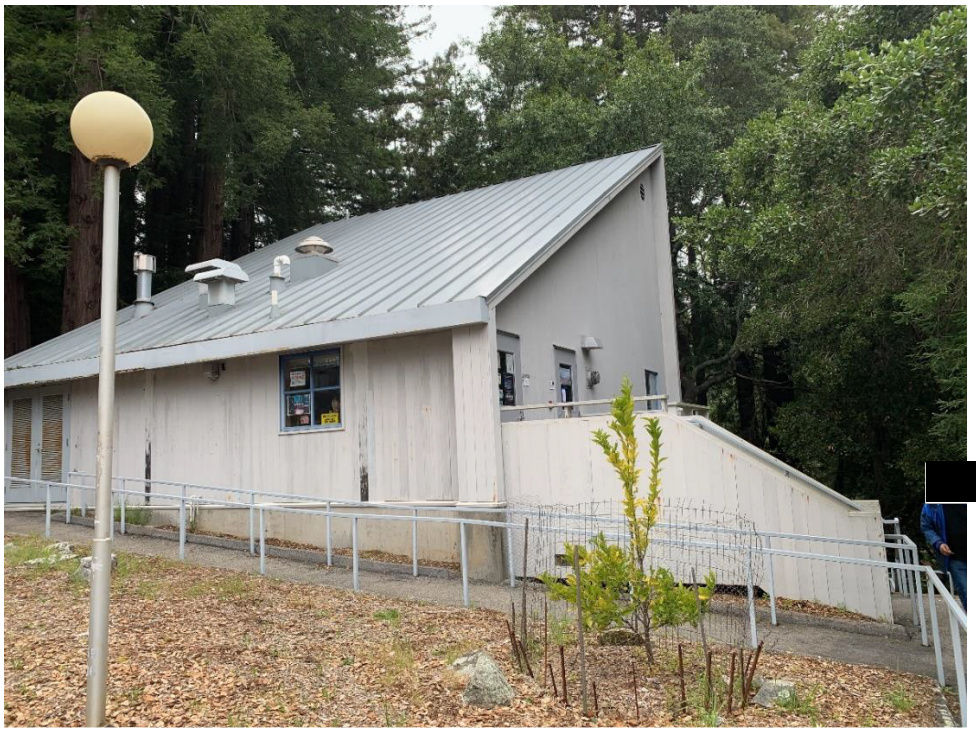


Upper Floor

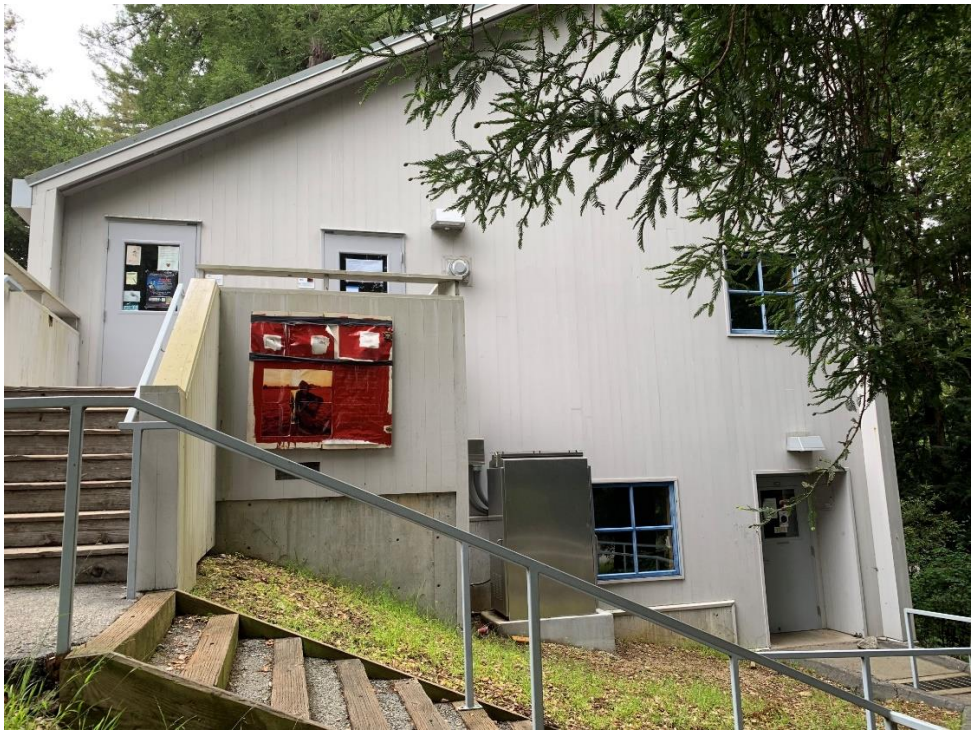
Location of plywood shear walls

APPENDIX A

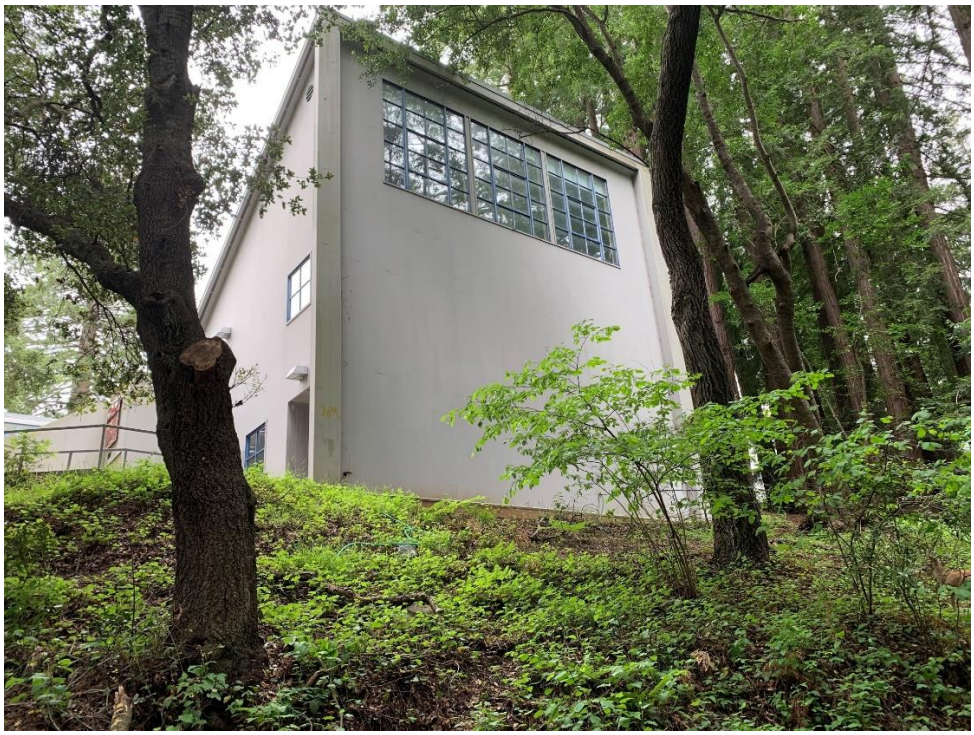
Additional Photos



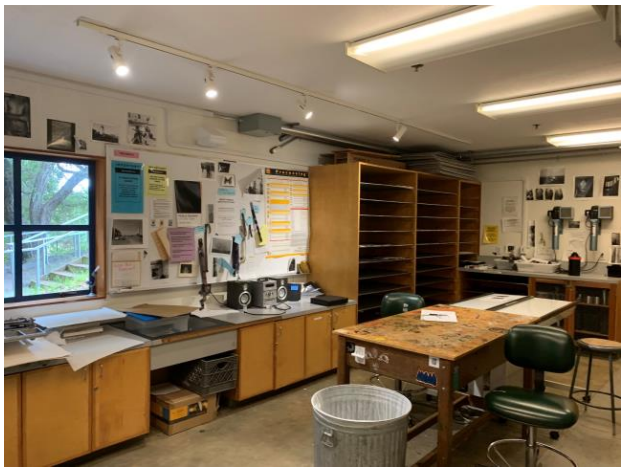
Reference southeast corner (looking northwest)

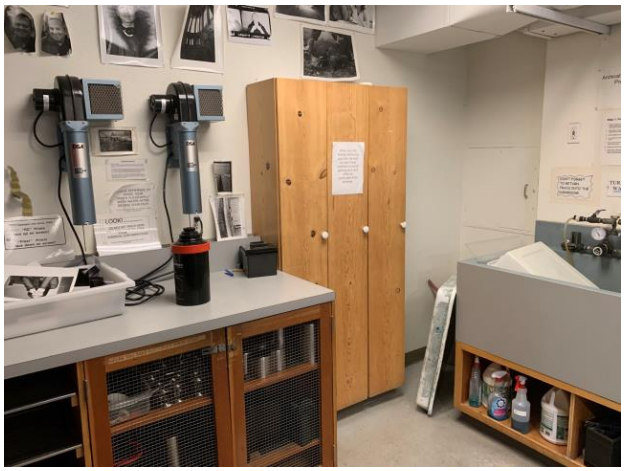


Reference east elevation

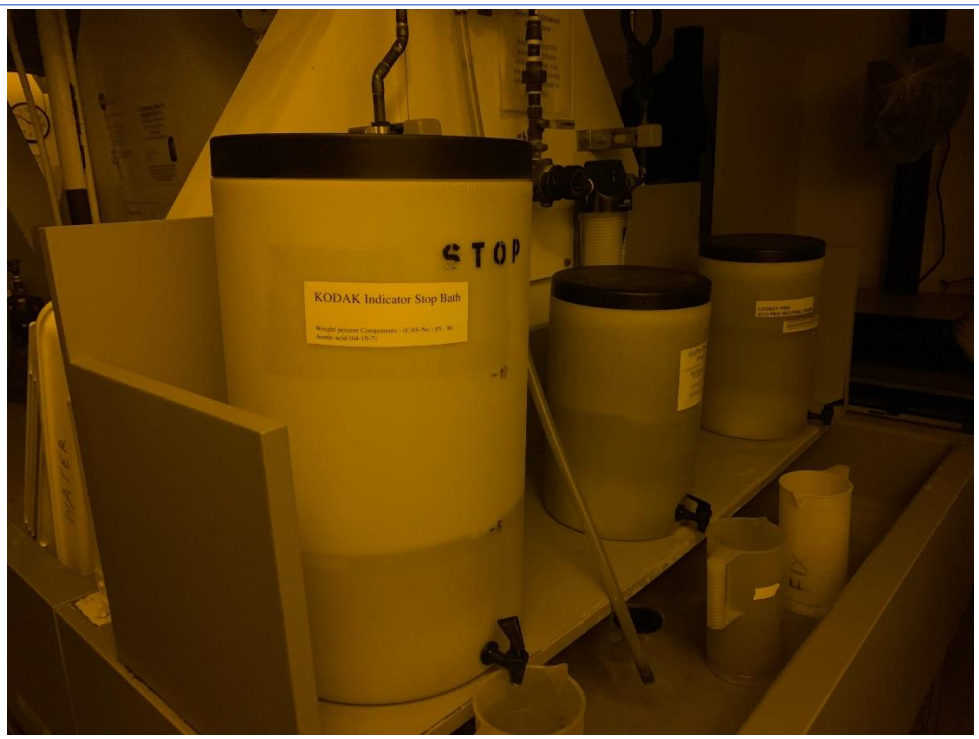


Reference north wall with large window





Shelves and cabinets in the office



Unbraced chemical tanks in dark room

APPENDIX B

ASCE 41-17 Tier 1 Checklists (Structural)

UC Campus:	Santa Cruz			Date:	06/28/2019		
Building CAAN:	7815	Auxiliary CAAN:		By Firm:	Rutherford + Chekene		
Building Name:	Elena Baskin Visual Arts Building I			Initials:	EB/MTN	Checked:	WAL/BL
Building Address:	Santa Cruz, CA 95064			Page:	1	of	3

ASCE 41-17
Collapse Prevention Basic Configuration Checklist

LOW SEISMICITY

BUILDING SYSTEMS - *GENERAL*

C	NC	N/A	U	Description
●	○	○	○	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1) **Comments:** In the E-W direction (transverse), a metal roof on 1/2" plywood sheathing deck delivers the lateral loads to the wood shear walls (Details 1/3 and 4/3 on Sheet 3/12 and Details 5/3 on Sheet 3/12 and Details8/5, 10/5, and 15/5 on Sheet 5/12) and from them to the soil through a reinforced concrete strip foundation. A reinforced concrete retaining wall received the loads in the south wall of the building and delivered it to the foundation. In the N-S direction (longitudinal), the 3/4" plywood roof and floor diaphragms transfers the load to wood shear walls which are built atop reinforced concrete footings. Well detailed connections are identified in both directions.
●	○	○	○	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.25% of the height of the shorter building in low seismicity, 0.5% in moderate seismicity, and 1.5% in high seismicity. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2) **Comments:** There is more than 1.5% of the height of the building to the closest structure.
●	○	○	○	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3) **Comments:** There are no mezzanines.

BUILDING SYSTEMS - *BUILDING CONFIGURATION*

C	NC	N/A	U	Description
●	○	○	○	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1) **Comments:** The length of plywood and concrete retaining walls at the lower story equals or exceeds that of the plywood walls at the upper story.
●	○	○	○	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2) **Comments:** The length of plywood and concrete retaining walls at the lower story equals or exceeds that of the plywood walls at the upper story and the lower story is typically shorter than the upper story.

UC Campus:	Santa Cruz			Date:	06/28/2019		
Building CAAN:	7815	Auxiliary CAAN:		By Firm:	Rutherford + Chekene		
Building Name:	Elena Baskin Visual Arts Building I			Initials:	EB/MTN	Checked:	WAL/BL
Building Address:	Santa Cruz, CA 95064			Page:	2	of	3

ASCE 41-17
Collapse Prevention Basic Configuration Checklist

C	NC	N/A	U	
●	○	○	○	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3) **Comments:** All lateral force-resisting system elements are continuous to the foundation with properly detailed connections.
●	○	○	○	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4) **Comments:** Both stories have the same horizontal dimension.
●	○	○	○	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5) **Comments:** There is no significant change in the effective mass over the height of the building.
●	○	○	○	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6) **Comments:** The center of rigidity might shift toward the south due to the presence of the concrete walls, but the wood frame diaphragms can be considered flexible.

MODERATE SEISMICITY (COMPLETE THE FOLLOWING ITEMS IN ADDITION TO THE ITEMS FOR LOW SEISMICITY)

GEOLOGIC SITE HAZARD

C	NC	N/A	U	Description
●	○	○	○	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2m) under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1) **Comments:** There is no mapped liquefaction on https://gis.santacruzcounty.us/mapgallery/Emergency%20Management/Hazard%20Mitigation/LiquifactionMap2009.pdf.
●	○	○	○	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1) **Comments:** There are no mapped landslides on https://gis.santacruzcounty.us/mapgallery/Emergency%20Management/Hazard%20Mitigation/LandslideMap2009.pdf.

Note: **C =** Compliant **NC =** Noncompliant **N/A =** Not Applicable **U =** Unknown

UC Campus:	Santa Cruz			Date:	06/28/2019		
Building CAAN:	7815	Auxiliary CAAN:		By Firm:	Rutherford + Chekene		
Building Name:	Elena Baskin Visual Arts Building I			Initials:	EB/MTN	Checked:	WAL/BL
Building Address:	Santa Cruz, CA 95064			Page:	3	of	3

ASCE 41-17
Collapse Prevention Basic Configuration Checklist

MODERATE SEISMICITY (COMPLETE THE FOLLOWING ITEMS IN ADDITION TO THE ITEMS FOR LOW SEISMICITY)

GEOLOGIC SITE HAZARD

C	NC	N/A	U	
◉	○	○	○	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1) **Comments:** There are no faults at the project site per https://gis.santacruzcounty.us/mapgallery/Emergency%20Management/Hazard%20Mitigation/FaultZoneMap2009.pdf.

HIGH SEISMICITY (COMPLETE THE FOLLOWING ITEMS IN ADDITION TO THE ITEMS FOR MODERATE SEISMICITY)

FOUNDATION CONFIGURATION

C	NC	N/A	U	Description
◉	○	○	○	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3) **Comments:** Building width B = 32'-5", Building Height is H = 26', B/H = 1.25 Sa = 1.281g per ATC at BSE-2E 0.6 x Sa = 0.77 B/H > 0.8 Sa
○	○	○	◉	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4) **Comments:** Site Class D assumed. Reinforced slab-on-grade ties the footings together per Details 11/5, 14/5, and 15/ 5 on Sheet 5.

Note: **C =** Compliant **NC =** Noncompliant **N/A =** Not Applicable **U =** Unknown

UC Campus:	Santa Cruz			Date:	06/28/2019		
Building CAAN:	7815	Auxiliary CAAN:		By Firm:	Rutherford + Chekene		
Building Name:	EBASK BLDG L			Initials:	EB/MN	Checked:	WAL/BL
Building Address:	Santa Cruz, CA 95064			Page:	1	of	4

ASCE 41-17
Collapse Prevention Structural Checklist For Building Type W2

LOW AND MODERATE SEISMICITY

SEISMIC-FORCE-RESISTING SYSTEM

C	NC	N/A	U	Description
◉	○	○	○	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1) **Comments:** Two lines of shear walls are used in each direction.
◉	○	○	○	SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the following values: (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1) Structural panel sheathing: 1,000 lb/ft Diagonal sheathing: 700 lb/ft Straight sheathing: 100 lb/ft All other conditions: 100 lb/ft **Comments:** • First Story: - Average shear stress in N-S direction: 365 plf < 1000 plf → OK - Average shear stress in E-W direction (North wall): 342 plf < 1000 plf → OK • Second Story: - Average shear stress in N-S direction: 251 plf < 1000 plf → OK - Average shear stress in E-W direction (North and South wall): 489 plf < 1000 plf → OK - Average shear stress in E-W direction in narrow piers in the North wall with large window: 919 plf < 1000 plf → OK
◉	○	○	○	STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1) **Comments:** No exterior stucco walls are used.
◉	○	○	○	GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used for shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1) **Comments:** External 1/2" plywood and internal 5/8" gypsum board sheathing are used per details on Sheet 5/12.

UC Campus:	Santa Cruz			Date:	06/28/2019		
Building CAAN:	7815	Auxiliary CAAN:		By Firm:	Rutherford + Chekene		
Building Name:	EBASK BLDG L			Initials:	EB/MN	Checked:	WAL/BL
Building Address:	Santa Cruz, CA 95064			Page:	2	of	4

ASCE 41-17
Collapse Prevention Structural Checklist For Building Type W2

C	NC	N/A	U	
●	○	○	○	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1) **Comments:** **The north wall on the second story has a pier with an aspect ratio of 2.35 on each side of the window (Detail 16/5 on Sheet 5/12). However, the member next to the window is a 4x8x5/16 structural tube which provides more shear capacity to the piers.**
●	○	○	○	WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2) **Comments:** **Upper story walls are connected to the diaphragm to transfer the loads to the bottom walls. (Detail 5/3 on Sheet 3/12 and Details 4/5, 7/5, 8/5, 10/5, and 17/5 on Sheet 5/12)**
●	○	○	○	HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3) **Comments:** **The wall on the downhill slope at the north side of the building is solid and has an aspect ratio of 0.27, between the lower and upper floor.**
●	○	○	○	CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4) **Comments**: **Plywood sheathing continues down the wood walls from the upper floor to the lower floor.**
●	○	○	○	OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5) **Comments:** **The north wall on the second floor (34'-6" in length by 24'-9" in height) has a 24'-8" by 9'-9 1/2" window, which is approximately equal to the 72% of the wall length.**

CONNECTIONS

	Description
C NC N/A U	WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3) **Comments:** **The posts are connected to the sill using Simpson L50 angle per Detail 12/5 on Sheet 5/12.**
C NC N/A U	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3) **Comments:** **Wood sills are connected to the foundation using one 5/8"ϕx10" bolt spaced 2'-8" o.c. per Details 8/5, 10/5, and 15/5 on Sheet 5/12.**

Note: **C** = Compliant **NC** = Noncompliant **N/A** = Not Applicable **U** = Unknown

UC Campus:	Santa Cruz			Date:	06/28/2019		
Building CAAN:	7815	Auxiliary CAAN:		By Firm:	Rutherford + Chekene		
Building Name:	EBASK BLDG L			Initials:	EB/MN	Checked:	WAL/BL
Building Address:	Santa Cruz, CA 95064			Page:	3	of	4

ASCE 41-17
Collapse Prevention Structural Checklist For Building Type W2

C	NC	N/A	U	
◉	○	○	○	GIRDER/COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1) **Comments:** No girder-column connections are used.

HIGH SEISMICITY (COMPLETE THE FOLLOWING ITEMS IN ADDITION TO THE ITEMS FOR LOW AND MODERATE SEISMICITY)

CONNECTIONS

				Description
C	NC	N/A	U	
◉	○	○	○	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft (1.8 m) or less with acceptable edge and end distance provided for wood and concrete. (Commentary: A.5.3.7. Tier 2: Sec. 5.7.3.3) **Comments:** Wood sills are connected to the foundation using one 5/8"ϕx10" bolt spaced 2'-8" o.c. per Details 8/5, 10/5, and 15/5 on Sheet 5/12.

DIAPHRAGMS

				Description
C	NC	N/A	U	
◉	○	○	○	DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1) **Comments:** Continuous wood diaphragms are used.
C	NC	N/A	U	
◉	○	○	○	ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1) **Comments:** At the roof, the plywood diaphragm is connected through nailed blocking to a continuous double top plate which serves as the diaphragm chord. At the upper floor, similarly, the plywood diaphragm is connected through blocking to the double top plate of the wood walls of the lower story which serves as the diaphragm chord.
C	NC	N/A	U	
○	○	◉	○	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5) **Comments:** There are no large diaphragm openings.

UC Campus:	Santa Cruz			Date:	06/28/2019		
Building CAAN:	7815	Auxiliary CAAN:		By Firm:	Rutherford + Chekene		
Building Name:	EBASK BLDG L			Initials:	EB/MN	Checked:	WAL/BL
Building Address:	Santa Cruz, CA 95064			Page:	4	of	4

ASCE 41-17
Collapse Prevention Structural Checklist For Building Type W2

C	NC	N/A	U	
○	○	◉	○	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2) **Comments:** There are no straight-sheathed diaphragms; 1/2" and 3/4" plywood per floor and roof framing details are used per Sheet 5/12.
◉	○	○	○	SPANS: All wood diaphragms with spans greater than 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2) **Comments:** Diaphragm spans smaller than 24 ft.
○	○	◉	○	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and have aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2) **Comments:** No diagonally sheathed or unblocked structural panels are used.
◉	○	○	○	OTHER DIAPHRAGMS: The diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5) **Comments:** The roof and floor diaphragms have plywood.

APPENDIX C

UCOP Seismic Safety Policy Falling Hazards Assessment Summary

UC Campus:	Santa Cruz			Date:	06/28/2019		
Building CAAN:	7815	Auxiliary CAAN:		By Firm:	Rutherford + Chekene		
Building Name:	EBASK BLDG I			Initials:	EB	Checked:	WAL/BL
Building Address:	Santa Cruz, CA 95064			Page:	1	of	1

UCOP SEISMIC SAFETY POLICY
Falling Hazard Assessment Summary

	Description
P ☐ N/A ☒	**Heavy ceilings, features or ornamentation above large lecture halls, auditoriums, lobbies, or other areas where large numbers of people congregate (50 ppl or more)** **Comments:** There are no heavy ceilings, features or ornamentation in the studio space.
P ☐ N/A ☒	**Heavy masonry or stone veneer above exit ways or public access areas** **Comments:** There is no masonry or stone veneer.
P ☐ N/A ☒	**Unbraced masonry parapets, cornices, or other ornamentation above exit ways or public access areas** **Comments:** There are no masonry parapets or other ornamentation.
P ☒ N/A ☐	**Unrestrained hazardous material storage** **Comments:** Tanks in the dark room are not anchored.
P ☐ N/A ☒	**Masonry chimneys** **Comments:**
P ☐ N/A ☒	**Unrestrained natural gas-fueled equipment such as water heaters, boilers, emergency generators, etc.** **Comments:** No natural gas-fueled equipment was observed.
P ☐ N/A ☒	**Other:** **Comments:**
P ☐ N/A ☒	**Other:** **Comments:**
P ☐ N/A ☒	**Other:** **Comments:**

Falling Hazards Risk: Low

Note: P= Present, N/A = Not Applicable

APPENDIX D

Quick Check Calculations

Rating form completed by:

RUTHERFORD + CHEKENE
ruthchek.com

Evaluator: EB/EFA//WAL/BL

Date: 06/28/2019

Unit Weights:

Roof	Seismic Weight psf	Dead Load psf	Remarks
Roofing	3	3	Metal roof per arch. Dwg.; Product specification not available
Sheathing Board	1.4	1.4	1/2" plywood
Joists	2.5	2.5	14" TJI 35@16"
Ceiling	2	2	typ. gypboard ceiling panels
Lighting and misc.	5	5	
MEP	3	3	
Columns	0.163	0.163	
Partition+Plywood shear walls	7.5	7.5	Half of 15 psf
Total	25	25	

Upper Floor	Seismic Weight psf	Dead Load psf	Remarks
Finishing	1.4	1.4	Vinyl Composite Tile
Sheathing Board	2.1	2.1	3/4" plywood
Joists	2.3	2.3	12" TJI 35@16"
Ceiling	2	2	typ. gypboard ceiling panels
Columns	0.301	0.301	
Lighting and misc.	5	5	
MEP	3	3	
Partition+Plywood shear walls	15	15.0	
Total	31	31	

Rating form completed by:

RUTHERFORD + CHEKENE
ruthchek.com

Evaluator: EB/EFA//WAL/BL

Date: 06/28/2019

Story Weights

Floor Levels	Floor Area (ft2)	Floor Weight (psf)	Additional Weight (kips)	Total Seismic Weight (kips)
Roof	1,403	25	0	34
Upper floor	1,072	31	0	33
			Total Weight (kips) =	**68**

Period

C_t=	0.02
h_n (ft) =	27.00
B=	0.75

T=	0.24	sec

Notes:

1- The period calculated per ASCE 41-17 Equation 4-4.

$$T = C_t \cdot h_n^{\,B}$$

2- Ct and B are for "all other framing system" per ASCE 41-17 Section 4.4.2.4.

3- The building height is taken from the base to the average height of the roof.

Rating form completed by:

RUTHERFORD + CHEKENE
ruthchek.com

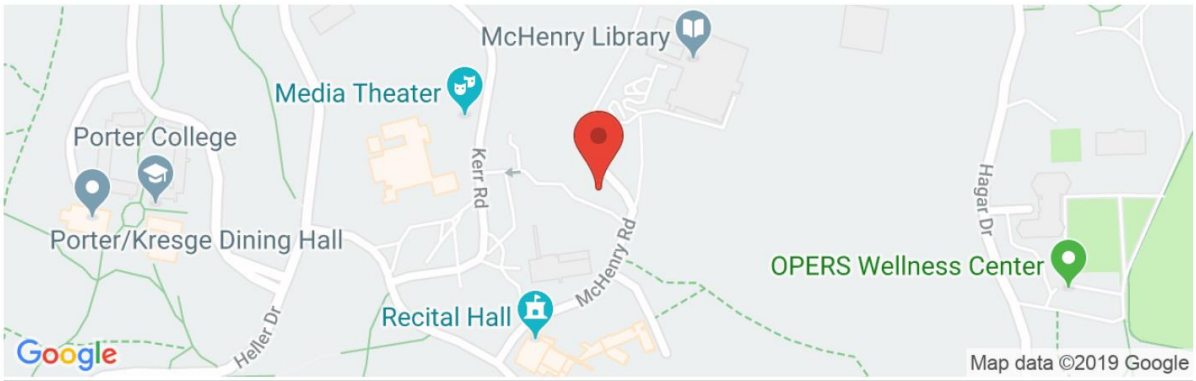
Evaluator: EB/EFA//WAL/BL

Date: 06/28/2019

BSE-2E Response Spectrum

7815

Latitude, Longitude: 36.994580, -122.060100



Date	5/31/2019, 8:52:25 AM
Design Code Reference Document	ASCE41-17
Custom Probability	
Site Class	D - Stiff Soil

Type	Description	Value
Hazard Level		BSE-2E
S_S	spectral response (0.2 s)	1.281
S_1	spectral response (1.0 s)	0.485
S_{XS}	site-modified spectral response (0.2 s)	1.281
S_{X1}	site-modified spectral response (1.0 s)	0.881
f_a	site amplification factor (0.2 s)	1
f_v	site amplification factor (1.0 s)	1.815

Rating form completed by:

RUTHERFORD + CHEKENE
ruthchek.com

Evaluator: EB/EFA//WAL/BL

Date: 06/28/2019

Story Shears

Sa=	1.281	
W=	68	kips
C=	1.1	ASCE 41-17 Table 4-7

1 - Modification Factor, C, per ASCE 41-17, Table 4-7 for two story W2 shear wall building type is used.

V=	95	kips

k=	1.00	

Floor Levels	Story Height	Total Height, H	Weight, W	W x H^k	coeff	Fx	Story Shear, V
	(ft)	(ft)	(kips)			(kips)	(kips)
Roof	17.00	27.00	34	930	0.74	70	70
Upper floor	10.00	10.00	33	333	0.26	25	95

Notes:

1- The base of building is assumed to be at top of the slab-on-grade.

Rating form completed by:
RUTHERFORD + CHEKENE
ruthchek.com
Evaluator: EB/EFA//WAL/BL
Date: 06/28/2019

Average Stress in Wood-framed Wall

Average Stresses

Ms =	4.5

First Story						
Direction	**Story Shear**	**Wall Length**	**Opening Reduction Factor**	**Average Shear Stress**	**Tier 1 Shear Stress Limit**	**Wall OK?**
	(kips)	(ft)		(plf)	(plf)	
E-W direction: North wall	48	34.5	0.90	342	1000	OK
N-S direction	95	64.5	0.90	365	1000	OK

Second Story						
Direction	**Story Shear**	**Wall Length**	**Opening Reduction Factor**	**Average Shear Stress**	**Tier 1 Shear Stress Limit**	**Wall OK?**
	(kips)	(ft)		(plf)	(plf)	
E-W direction: South and North wall	70	35.50	0.90	489	1000	OK
E-W direction: Short piers in the North wall with large window	35	8.5	1.00	919	1000	OK
N-S direction	70	69	0.90	251	1000	OK