

Text in green is to be part of UCSF building database and may be part of UCOP database

4-8-2020

## UCSF Building Seismic Ratings

### 1442 5<sup>TH</sup> AVENUE

CAAN #2046

1442 5<sup>TH</sup> AVENUE, SAN FRANCISCO, CA 94122

UCSF Campus: Parnassus



4/8/2020



Plan



West Elevation

Rating summary	Entry	Notes
UC Seismic Performance Level (rating)	V	Findings based on drawing review and ASCE 41-17 Tier 1 evaluation <sup>1</sup>
Rating basis	Tier 1	ASCE 41-17
Date of rating	2020	
Recommended UCSF priority category for retrofit	Priority B	Priority A = Retrofit ASAP Priority B=Retrofit at next permit application for modification
Ballpark total project cost to retrofit to IV rating	High	See recommendations on further evaluation and retrofit.
Is 2018-2019 rating required by UCOP?	Yes	
Further evaluation recommended?	No	

<sup>1</sup> The evaluations at UCSF translate the Tier 1 evaluation to a Seismic Performance Level rating using professional judgment discussed among the Seismic Review Committee. Non-compliant items in the Tier 1 evaluation do not automatically put a building into a particular rating category, but such items are evaluated 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.

### **Building information used in this evaluation**

- Architectural Drawings by The Colyer Group Architects, “UCSF Grad. Student Residence 1442 5<sup>th</sup> Avenue,” dated 19 February 1988 (5 sheets)

### **Scope for completing this form**

Architectural drawings were reviewed and an ASCE 41-17 Tier 1 evaluation was performed. A site visit was made on December 10, 2019 where the building exterior and basement were observed. Access to the upper floors was not available.

### **Brief description of structure**

The building functions as graduate student housing. It was reportedly built in 1912 as a single-family home. There is an apartment on the first and second floors over a basement with garage and utility area. The main floor plate is approximately 25 ft north-south by 43 ft east-west. There is a two-story addition (first and second floors) off the rear that is open below, without a crawlspace. The addition on the back is approximately 12 feet north-south by 14 feet east-west. Drawings showing the construction of the addition were not available for review.

Identification of Levels: Levels are identified on plan as Basement, First Floor, Second Floor, and Roof. The site slopes downward toward the west. The basement (approximately 7’-6”) contains a garage to the north and a utility room to the south. The first floor (approximately 10’-0”) consists of a kitchen, living room, foyer, bedroom, and two bathrooms. The second floor (approximately 10’-0”) consists of four bedrooms and one and a half bathrooms. The roof is flat. The basement is at grade/street level and is used as the base of the building for this evaluation.

Foundation system: Existing foundation drawings are not available. It is presumed there are continuous footings below bearing walls. During the site visit on December 10, 2019 continuous concrete stem wall footings were observed around the ground floor level. The rear portion is supported on wood posts on isolated footings at the two eastern-most corners.

Structural system for vertical (gravity) load: Drawings showing the existing framing are not available. It is presumed based on the age of the building that wood joists span to load bearing wood framed walls.

Structural system for lateral forces: Drawings showing the existing framing are not available. It is presumed based on the age of the building that a sheathed diaphragm distributes load to the interior and exterior wood framed walls sheathed with gypsum board and/or plaster. There was a ceiling in the basement, so it could not be determined if the sheathing in the first floor was straight or diagonal sheathing. All exterior basement walls have gyp sheathing on the interior side, as specified in the 1988 drawings. No evidence of seismic upgrading was observed.

Building Code: The building was reportedly constructed in 1911, prior to a building code being enacted. However, no documentation was available to confirm the construction date.

Building Condition: What could be observed of the structure of the building appeared to be in fair condition; however, most of the structure was concealed behind finishes. The concrete stem walls in the utility space were poorly consolidated in many areas and some spalling was observed. The wood siding, trim, and rear wood exterior patio and stairs looked to be in good condition. The building underwent a renovation in 1988, which was mostly cosmetic in nature.

Building response in 1989 Loma Prieta Earthquake: The report titled “Performance of UCSF Buildings During the October 17, 1989 Loma Prieta Earthquake” by Impell Corporation stated the exterior and interior of the building was inspected after the earthquake and shifting of doors were observed in the janitor’s room.

### **Brief description of seismic deficiencies and expected seismic performance including structural behavior modes**

- The building relies on interior and exterior walls for shear resistance. There is not enough wall present to pass the Tier 1 quick check in the transverse or longitudinal direction in any story.
- Based on the age of construction, the walls between levels are not expected to be detailed to transfer shear and overturning forces between levels.

- The building is located on a sloped site. However, there is a significant length of wall on the downhill side of the building.
- The building is built to the property line with virtually no separation between the neighboring buildings to the north.
- The basement cripple walls were sheathed with gypsum board on the inside of all exterior walls. The interior wall is sheathed with straight sheathing. Based on the age of construction it is assumed the anchor bolts for the sill plate are not adequate.

Structural deficiency	Affects rating?	Structural deficiency	Affects rating?
Lateral system stress check (wall shear, column shear or flexure, or brace axial as applicable)	Y	Openings at shear walls (concrete or masonry)	N
Load path	Y	Liquefaction	N
Adjacent buildings	Y	Slope failure	N
Weak story	Y	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	Y	Heavy partitions braced by ceilings	N
Wood sills (bolting)	Y	Appendages	N
Diaphragm continuity	N		

**Summary of review of non-structural life-safety concerns, including at exit routes. <sup>2</sup>**

It appeared the chimney had been replaced with a sheet metal flue. The facilities maintenance technician assisting with the site visit noted that the units have fireplaces, but they had been blocked off.

The water heater in the basement is strapped to the wall and had flex connections to the gas line. Bracing of the furnace was not observed.

UCOP non-structural checklist item	Life safety hazard?	UCOP non-structural 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	None Observed
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 Seismic Performance Level Rating**

The length of wall in the subject building is well below the amount required by the ASCE 41 Tier 1 procedures, and connections between walls between levels of the building and to the foundation are not adequate for resisting seismic loading. The building is listed as Priority B because there is a relatively low risk to occupant life-safety posed by conventional wood-framed construction.

<sup>2</sup> 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 non-structural hazards may occur.

**Recommendations for further evaluation or retrofit**

No further evaluation of this building is recommended. There is relatively low risk to occupant life-safety posed by this type of building based on historical performance of similar building types. It is recommended that work to improve the seismic performance of the building be included with any future renovation requiring a building permit.

**Peer review comments on rating**

The structural members of the UCSF Seismic Review Committee (SRC) reviewed the evaluation on January 8, 2020 and are unanimous that the rating is V.

<b>Additional building data</b>	<b>Entry</b>	<b>Notes</b>
Latitude	37.76156	
Longitude	-122.46168	
Are there other structures besides this one under the same CAAN#	No	
Number of stories above lowest perimeter grade	4	
Number of stories (basements) below lowest perimeter grade	0	
Building occupiable area (OGSF)	3,366	
Risk Category per 2016 CBC 1604.5	II	
Building structural height, $h_n$	28 ft	Structural height defined per ASCE 7-16 Section 11.2
Coefficient for period, $C_t$	0.02	Per ASCE 41-17 equation 4-4
Coefficient for period, $\beta$	0.75	Per ASCE 41-17 equation 4-4
Estimated fundamental period	0.243 sec	Per ASCE 41-17 equation 4-4
<b>Site data</b>		
975 yr hazard parameters $S_s, S_1$	1.563, 0.617	UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)
Site class	C	
Site class basis	Geotech Parameters	UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)
Site parameters $F_a, F_v$	1.200, 1.400	UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)
Ground motion parameters $S_{cs}, S_{c1}$	1.876, 0.864	UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)
$S_o$ at building period	1.876	
Site $V_{s30}$	390 m/s	
$V_{s30}$ basis	Geotech Parameters	UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)
Liquefaction potential/basis	No	UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)
Landslide potential/basis	No	UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)
Active fault-rupture hazard identified at site?	No	

Site-specific ground motion study?	No	
<b>Applicable code</b>		
Applicable code or approx. date of original construction	Built: 1911	Reported date, not confirmed
Applicable code for partial retrofit	None	No partial retrofit known
Applicable code for full retrofit	None	No full retrofit known
<b>Model building data</b>		
Model building type North-South	W1 : Wood Light Frames	
Model building type East-West	W1: Wood Light Frames	
FEMA P-154 score	N/A	Not included here because an ASCE 41 Tier 1 evaluation was performed.
<b>Previous ratings</b>		
Most recent rating	V	2013 Report
Date of most recent rating	10/7/2013	Basis: Qualitative assessment based on drawing reviewed
2 <sup>nd</sup> most recent rating	-	
Date of 2 <sup>nd</sup> most recent rating	-	
3 <sup>rd</sup> most recent rating	-	
Date of 3 <sup>rd</sup> most recent rating	-	
<b>Appendices</b>		
ASCE 41 Tier 1 checklist included here?	Yes	Refer to attached checklist file

## Appendix A

### Additional Images

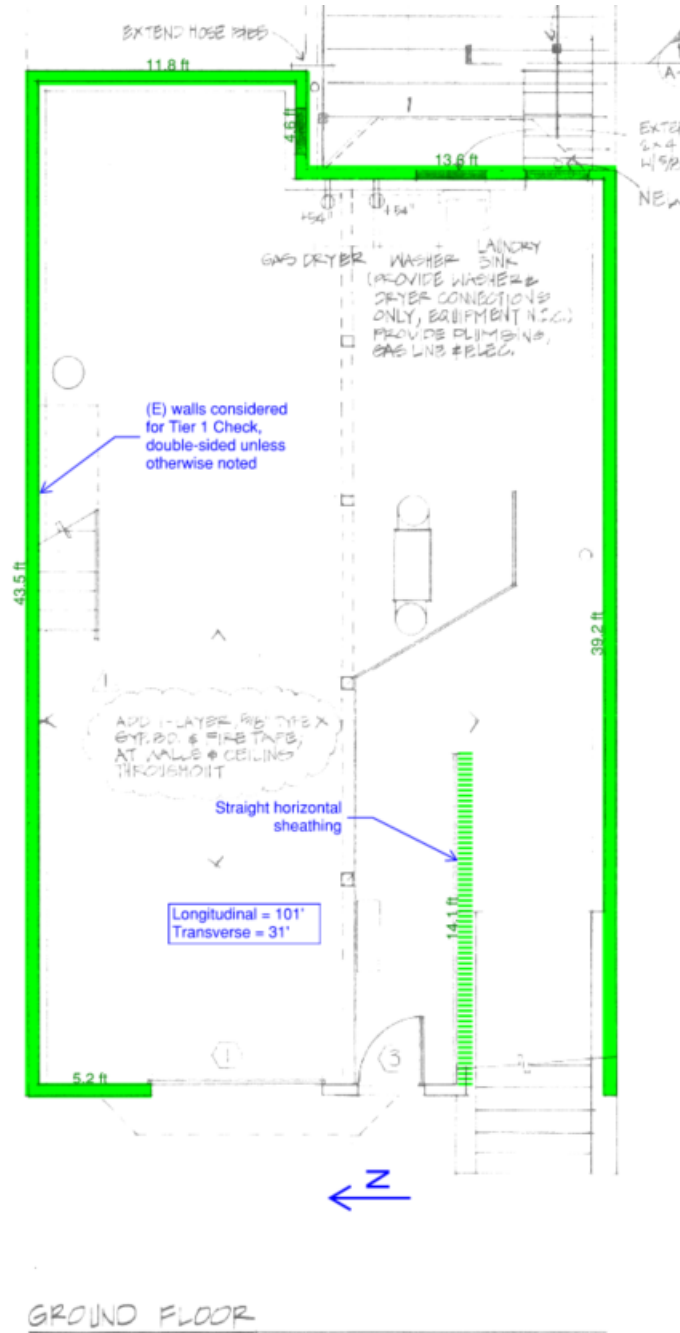


Figure 1 - Basement/Garage Floor Plan

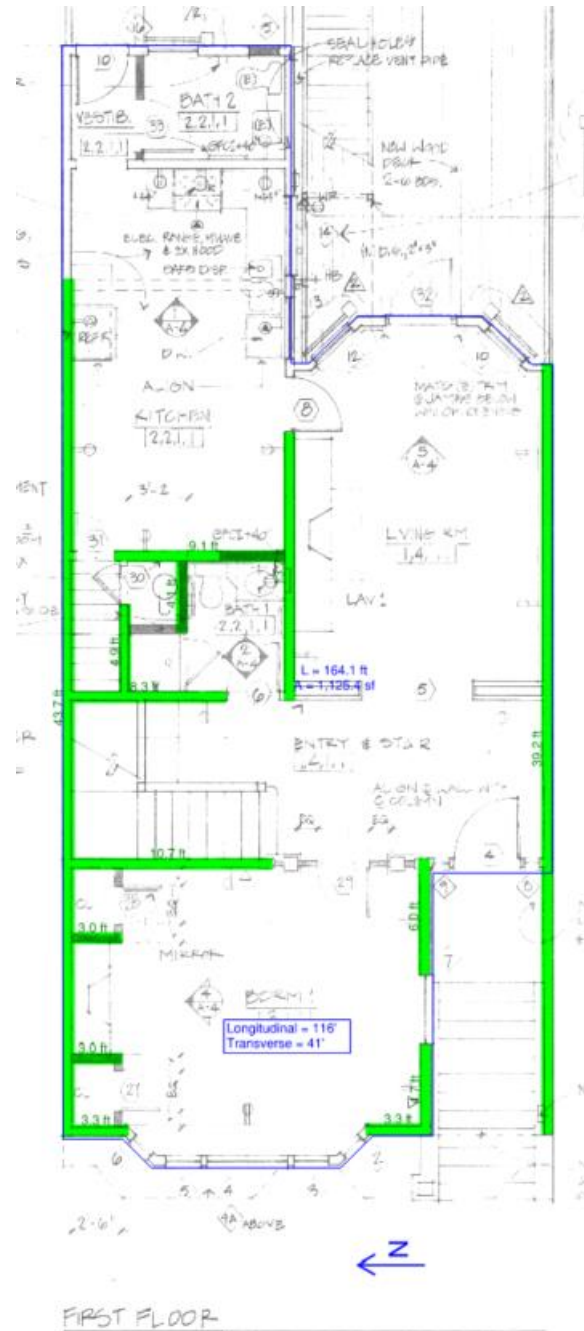


Figure 2 - First Floor Plan



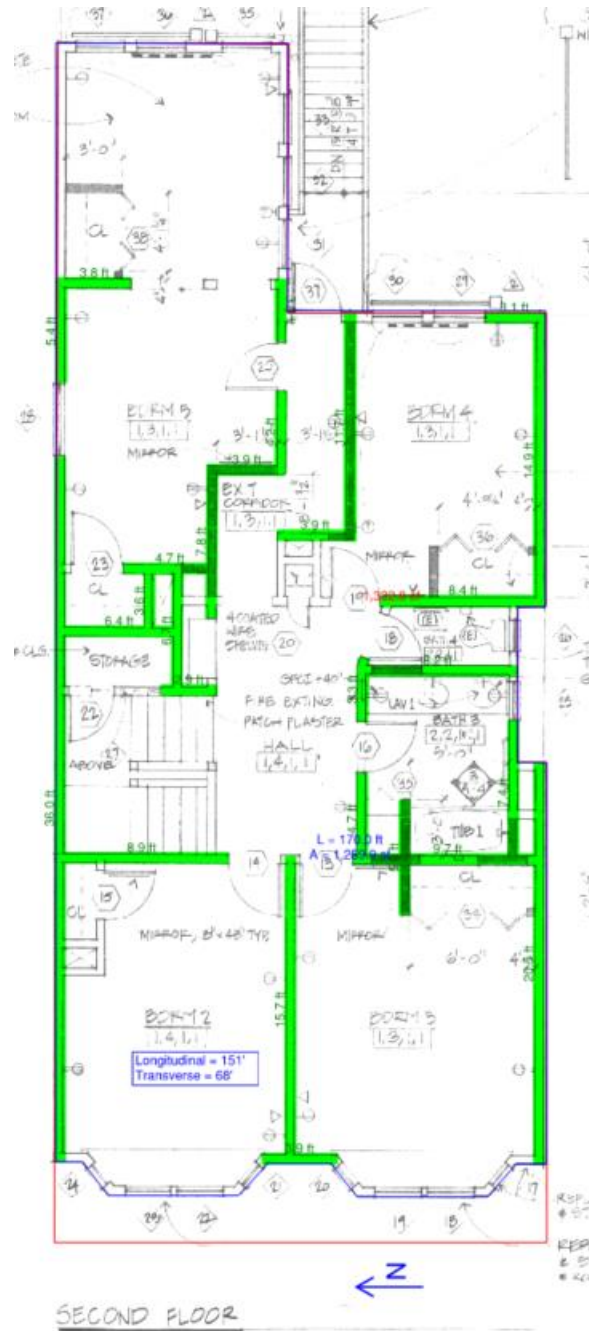
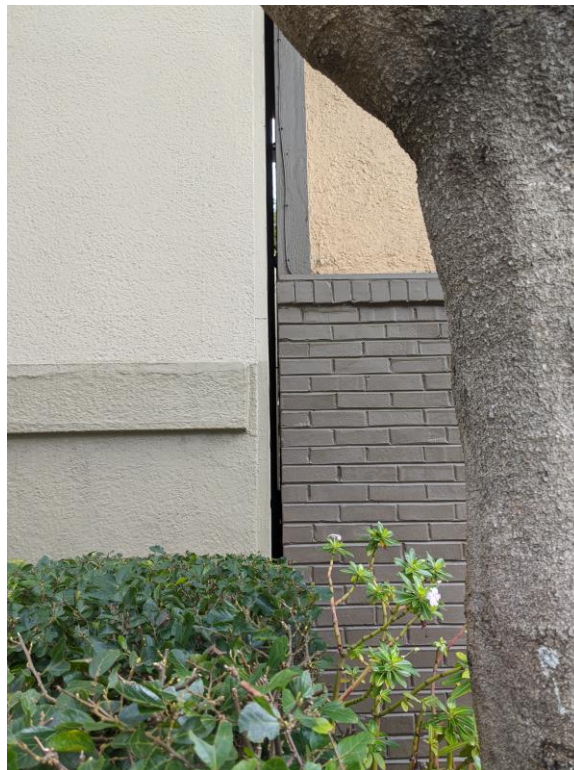


Figure 3 - Second Floor Plan



**Figure 4 - Exterior Elevation (West Elevation)**



**Figure 5 – Building Separation to the North**



**Figure 6 – South Exterior Wall and Rear**



**Figure 7 – Underside of First Floor Entrance Stairs and Backside of Interior Partition**



**Figure 8 – Anchored Water Heater, Concrete Stem Wall, & Gyp Wall Sheathing**



**Figure 9 – Top and Bottom of Interior Post**



**Figure 10 – Exterior Wood Stairs and Elevated Rear Addition on Posts**



**Figure 11 – Infill of Original Rear Basement Egress Door per 1988 Drawings**

Appendix B

ASCE 41- 17 Tier 1 Checklists (Structural)

UC Campus:	San Francisco			Date:	1/3/2020		
Building CAAN:	2046	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1442 5 <sup>th</sup> Avenue			Initials:	AJS	Checked:	MTP
Building Address:	1442 5 <sup>th</sup> Avenue, San Francisco, CA 94122			Page:	1	of	3

## ASCE 41-17 Collapse Prevention Basic Configuration Checklist

### LOW SEISMICITY

#### BUILDING SYSTEMS - GENERAL

	Description
<b>C NC N/A U</b> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	<p><b>LOAD PATH:</b> 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)</p> <p><b>Comments:</b> Based on the age of construction, it is presumed detailing does not provide transfer of forces between walls and between levels of the building.</p>
<b>C NC N/A U</b> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	<p><b>ADJACENT BUILDINGS:</b> 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)</p> <p><b>Comments:</b> The building to the south is built close to the property line, with minimal separation from the subject building.</p>
<b>C NC N/A U</b> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>	<p><b>MEZZANINES:</b> 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)</p> <p><b>Comments:</b></p>

#### BUILDING SYSTEMS - BUILDING CONFIGURATION

	Description
<b>C NC N/A U</b> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	<p><b>WEAK STORY:</b> 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. A.2.2.2. Tier 2: Sec. 5.4.2.1)</p> <p><b>Comments:</b> In the transverse direction (north-south), the sum of shear strength in the ground floor and first floor is 76% and 60% of the story above, respectively. In the longitudinal direction, the sum shear strength in the first floor is 77% of the story above.</p>
<b>C NC N/A U</b> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	<p><b>SOFT STORY:</b> 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)</p> <p><b>Comments:</b> In the transverse direction (north-south), the sum of shear strength in the ground floor and first floor is 76% and 60% of the story above, respectively. In the longitudinal direction, the sum shear strength in the first floor is 77% of the story above.</p>

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

UC Campus:	San Francisco			Date:	1/3/2020		
Building CAAN:	2046	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1442 5 <sup>th</sup> Avenue			Initials:	AJS	Checked:	MTP
Building Address:	1442 5 <sup>th</sup> Avenue, San Francisco, CA 94122			Page:	2	of	3

## ASCE 41-17 Collapse Prevention Basic Configuration Checklist

<b>C</b> <input type="radio"/> <b>NC</b> <input checked="" type="radio"/> <b>N/A</b> <input type="radio"/> <b>U</b> <input type="radio"/>	<b>VERTICAL IRREGULARITIES:</b> 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)  <b>Comments:</b>  Some walls are discontinuous between the ground and first story.
<b>C</b> <input checked="" type="radio"/> <b>NC</b> <input type="radio"/> <b>N/A</b> <input type="radio"/> <b>U</b> <input type="radio"/>	<b>GEOMETRY:</b> 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)  <b>Comments:</b>
<b>C</b> <input checked="" type="radio"/> <b>NC</b> <input type="radio"/> <b>N/A</b> <input type="radio"/> <b>U</b> <input type="radio"/>	<b>MASS:</b> 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)  <b>Comments:</b>
<b>C</b> <input checked="" type="radio"/> <b>NC</b> <input type="radio"/> <b>N/A</b> <input type="radio"/> <b>U</b> <input type="radio"/>	<b>TORSION:</b> 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)  <b>Comments:</b>

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

GEOLOGIC SITE HAZARD	
	Description
<b>C</b> <input checked="" type="radio"/> <b>NC</b> <input type="radio"/> <b>N/A</b> <input type="radio"/> <b>U</b> <input type="radio"/>	<b>LIQUEFACTION:</b> 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)  <b>Comments:</b>
<b>C</b> <input checked="" type="radio"/> <b>NC</b> <input type="radio"/> <b>N/A</b> <input type="radio"/> <b>U</b> <input type="radio"/>	<b>SLOPE FAILURE:</b> 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)  <b>Comments:</b>

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



UC Campus:	San Francisco			Date:	1/3/2020		
Building CAAN:	2046	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1442 5 <sup>th</sup> Avenue			Initials:	AJS	Checked:	MTP
Building Address:	1442 5 <sup>th</sup> Avenue, San Francisco, CA 94122			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

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<p>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)</p> <p><b>Comments:</b></p>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

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

#### FOUNDATION CONFIGURATION

				Description
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<p>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 <math>0.6S_a</math>. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)</p> <p><b>Comments:</b></p> <p style="margin-left: 20px;"><math>0.6 S_a = 0.6 * 1.876 = 1.125</math>            Base = 25 ft; height = 28 ft            Base/Height = <math>0.893 &lt; 1.125</math></p>
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<p>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)</p> <p><b>Comments:</b></p> <p style="margin-left: 20px;">Site class C.</p>
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	

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

UC Campus:	San Francisco			Date:	1/3/2020		
Building CAAN:	2046	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1442 5 <sup>th</sup> Avenue			Initials:	AJS	Checked:	MTP
Building Address:	1442 5 <sup>th</sup> Avenue, San Francisco, CA 94122			Page:	1	of	4

## ASCE 41-17 Collapse Prevention Structural Checklist For Building Type W1-W1A

LOW AND MODERATE SEISMICITY															
SEISMIC-FORCE-RESISTING SYSTEM															
				Description											
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<p>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)</p> <p><b>Comments:</b></p>											
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<p>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)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Structural panel sheathing</td> <td>1,000 lb/ft (14.6 kN/m)</td> </tr> <tr> <td>Diagonal sheathing</td> <td>700 lb/ft (10.2 kN/m)</td> </tr> <tr> <td>Straight sheathing</td> <td>100 lb/ft (1.5 kN/m)</td> </tr> <tr> <td>All other conditions</td> <td>100 lb/ft (1.5 kN/m)</td> </tr> </table> <p><b>Comments:</b></p> <p>No levels pass the quick check stress check. At the ground floor the wall stresses in the quick check are 600 plf in the east-west direction and 1,955 plf in the north-south direction compared with the allowable 186 plf and 200 plf, respectively. Note the ground floor capacity is based on the weighted average of walls per the attached calculations. Where sheathing occurs on both sides, capacities are doubled</p>				Structural panel sheathing	1,000 lb/ft (14.6 kN/m)	Diagonal sheathing	700 lb/ft (10.2 kN/m)	Straight sheathing	100 lb/ft (1.5 kN/m)	All other conditions	100 lb/ft (1.5 kN/m)
Structural panel sheathing	1,000 lb/ft (14.6 kN/m)														
Diagonal sheathing	700 lb/ft (10.2 kN/m)														
Straight sheathing	100 lb/ft (1.5 kN/m)														
All other conditions	100 lb/ft (1.5 kN/m)														
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>												
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<p>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)</p> <p><b>Comments:</b></p> <p>Only the upper levels of the west exterior wall are covered in stucco, which are less than 20% of the total walls at these levels.</p>											
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>												
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<p>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)</p> <p><b>Comments:</b></p> <p>Interior walls provide much of the shear resistance, particularly in the transverse (north-south) direction.</p>											
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>												
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<p>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)</p> <p><b>Comments:</b></p> <p>Some of the walls considered for the quick check have an aspect ratio greater than 2 to 1.</p>											
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>												

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

UC Campus:	San Francisco			Date:	1/3/2020		
Building CAAN:	2046	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1442 5 <sup>th</sup> Avenue			Initials:	AJS	Checked:	MTP
Building Address:	1442 5 <sup>th</sup> Avenue, San Francisco, CA 94122			Page:	2	of	4

## ASCE 41-17 Collapse Prevention Structural Checklist For Building Type W1-W1A

<b>C</b> <input type="radio"/>	<b>NC</b> <input checked="" type="radio"/>	<b>N/A</b> <input type="radio"/>	<b>U</b> <input type="radio"/>	<p>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)</p> <p><b>Comments:</b> Existing drawings showing wall details are not provided but it is presumed there are no ties between floors to transfer load between floors.</p>
<b>C</b> <input checked="" type="radio"/>	<b>NC</b> <input type="radio"/>	<b>N/A</b> <input type="radio"/>	<b>U</b> <input type="radio"/>	<p>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)</p> <p><b>Comments:</b> While the site slope down to the west, it does not appear the change in elevation across the transverse direction of the building is greater than one-half story</p>
<b>C</b> <input type="radio"/>	<b>NC</b> <input checked="" type="radio"/>	<b>N/A</b> <input type="radio"/>	<b>U</b> <input type="radio"/>	<p>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)</p> <p><b>Comments:</b> No plywood sheathing could be observed on cripple walls in the basement. It is presumed, based on the age of construction and available existing drawings, that the cripple walls are not sheathed with wood structural panels.</p>
<b>C</b> <input checked="" type="radio"/>	<b>NC</b> <input type="radio"/>	<b>N/A</b> <input type="radio"/>	<b>U</b> <input type="radio"/>	<p>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)</p> <p><b>Comments:</b> The ground floor front wall has significant openings for the garage door (13.1 ft), but the openings are less than 80% of the wall length (18.3 ft). There are no wood structural panels present.</p>

### CONNECTIONS

				Description
<b>C</b> <input type="radio"/>	<b>NC</b> <input checked="" type="radio"/>	<b>N/A</b> <input type="radio"/>	<b>U</b> <input type="radio"/>	<p>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)</p> <p><b>Comments:</b> Wood posts did not have positive connections to the foundation.</p>
<b>C</b> <input type="radio"/>	<b>NC</b> <input type="radio"/>	<b>N/A</b> <input type="radio"/>	<b>U</b> <input checked="" type="radio"/>	<p>WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)</p> <p><b>Comments:</b> All exterior wood sills in the basement space were concealed by plaster. However, based on the age of the building it is anticipated the wood sill bolting is not adequate.</p>
<b>C</b> <input type="radio"/>	<b>NC</b> <input checked="" type="radio"/>	<b>N/A</b> <input type="radio"/>	<b>U</b> <input type="radio"/>	<p>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)</p> <p><b>Comments:</b> Wood posts did not have positive connections to girders.</p>

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

UC Campus:	San Francisco		Date:	1/3/2020		
Building CAAN:	2046	Auxiliary CAAN:	By Firm:	Estructure		
Building Name:	1442 5 <sup>th</sup> Avenue		Initials:	AJS	Checked:	MTP
Building Address:	1442 5 <sup>th</sup> Avenue, San Francisco, CA 94122		Page:	3	of	4

**ASCE 41-17**  
**Collapse Prevention Structural Checklist For Building Type W1-W1A**

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

**CONNECTIONS**

	Description
<b>C</b> <b>NC</b> <b>N/A</b> <b>U</b> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>	<p>WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less with acceptable edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)</p> <p><b>Comments:</b>  All exterior wood sills in the basement space were concealed by plaster. However, based on the age of the building it is anticipated the wood sill bolting is not adequate.</p>

**DIAPHRAGMS**

	Description
<b>C</b> <b>NC</b> <b>N/A</b> <b>U</b> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<p>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)</p> <p><b>Comments</b>  No split levels or expansion joints.</p>
<b>C</b> <b>NC</b> <b>N/A</b> <b>U</b> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>	<p>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)</p> <p><b>Comments:</b>  Chords are at one elevation. However, existing drawings showing splice details are not available.</p>
<b>C</b> <b>NC</b> <b>N/A</b> <b>U</b> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<p>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)</p> <p><b>Comments:</b>  Maximum Aspect Ratio = 39 ft : 25 ft.</p>
<b>C</b> <b>NC</b> <b>N/A</b> <b>U</b> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	<p>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)</p> <p><b>Comments:</b>  Existing drawings showing roof sheathing are not available and all areas had ceiling finishes. It is presumed the diaphragm has straight sheathing based on the age of construction. The first floor diaphragm span is greater than 24 ft.</p>

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

UC Campus:	San Francisco		Date:	1/3/2020		
Building CAAN:	2046	Auxiliary CAAN:	By Firm:	Estructure		
Building Name:	1442 5 <sup>th</sup> Avenue		Initials:	AJS	Checked:	MTP
Building Address:	1442 5 <sup>th</sup> Avenue, San Francisco, CA 94122		Page:	4	of	4

**ASCE 41-17**  
**Collapse Prevention Structural Checklist For Building Type W1-W1A**

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<p>DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12 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)</p> <p><b>Comments:</b> All diaphragms span less than 40 ft. Maximum span is 39 ft.</p>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<p>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)</p> <p><b>Comments:</b></p>
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	

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

## Appendix C

### UCOP Seismic Safety policy Falling Hazards Assessment Summary

UC Campus:	San Francisco		Date:	1/3/2020		
Building CAAN:	2046	Auxiliary CAAN:	By Firm:	Estructure		
Building Name:	1442 5 <sup>th</sup> Avenue		Initials:	AJS	Checked:	MTP
Building Address:	1442 5 <sup>th</sup> Avenue, San Francisco, CA 94122		Page:	1	of	1

## UCOP SEISMIC SAFETY POLICY Falling Hazard Assessment Summary

		Description
P <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	<p>Heavy ceilings, features or ornamentation above large lecture halls, auditoriums, lobbies, or other areas where large numbers of people congregate (50 ppl or more)</p> <p><b>Comments:</b></p>
P <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	<p>Heavy masonry or stone veneer above exit ways or public access areas</p> <p><b>Comments:</b></p>
P <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	<p>Unbraced masonry parapets, cornices, or other ornamentation above exit ways or public access areas</p> <p><b>Comments:</b></p>
P <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	<p>Unrestrained hazardous material storage</p> <p><b>Comments:</b></p>
P <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	<p>Masonry chimneys</p> <p><b>Comments:</b> It appeared the chimney had been replaced with a sheet metal flue. The facilities maintenance technician assisting with the site visit noted that the units have fireplaces, but they had been blocked off.</p>
P <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	<p>Unrestrained natural gas-fueled equipment such as water heaters, boilers, emergency generators, etc.</p> <p><b>Comments:</b> The water heater was anchored to the wall.</p>
P <input type="checkbox"/>	N/A <input type="checkbox"/>	<p>Other:</p> <p><b>Comments:</b></p>
P <input type="checkbox"/>	N/A <input type="checkbox"/>	<p>Other:</p> <p><b>Comments:</b></p>
P <input type="checkbox"/>	N/A <input type="checkbox"/>	<p>Other:</p> <p><b>Comments:</b></p>

Falling Hazards Risk: *Low*

## Appendix D

### Quick Check Calculations



Dead loads & Seismic Weight Calculation			
Roof Assembly			
Roofing	3 psf	Estimate, Assume Asphalt Shingles	
Sheathing	3 psf	Estimate, Assumed 1x Sheathing	
Roof Joists	6 psf	Estimate, Assumed 2x10 @16	
Ceiling	9 psf		
MEP	0.5 psf		
Misc	0.5 psf		
Walls	5 psf		
<b>Total</b>	$\Sigma$	<b>27 psf</b>	Flat roof

Floor Assembly			
Flooring	2 psf	Estimate, Assume Carpet	
Sheathing	3 psf	Estimate, Assumed 1x Sheathing	
Wood Framing	6 psf	Estimate, Assumed 2x10 @16	
Ceilings	2.25 psf	Estimate, 5/8" Gyp Board	
MEP	0.5 psf		
Misc	0.5 psf		
Partitions	10 psf		
<b>Total</b>	$\Sigma$	<b>24 psf</b>	

Exterior Wall Assembly - Wood Siding			
Finish	2 psf	Estimate, Wood Siding	
Sheathing	3 psf	Estimate, Assumed 1x Sheathing	
Wood Framing	1.5 psf	Estimate, Assumed 2x6 @16	
Insulation	0.5 psf		
Interior Finish	2.25 psf	Estimate, 5/8" Gyp Board	
MEP	0.5 psf		
Misc	0.5 psf		
<b>Total</b>	$\Sigma$	<b>10 psf</b>	

Exterior Wall Finish - Stucco			
Finish	10 psf	Estimate, Stucco, less wood siding	
	-2 psf	Less wood siding	
<b>Total</b>	$\Sigma$	<b>8 psf</b>	Add to typical ext. wall assembly, where occurs

Exterior Wall Finish - Brick Veneer			
Finish	39 psf	Estimate, Brick Veneer	
	-2 psf	Less wood siding	
<b>Total</b>	$\Sigma$	<b>37 psf</b>	Add to typical ext. wall assembly, where occurs

Level 3 (Roof)			
Roof Assembly	p	27 psf	
	A	1330 ft <sup>2</sup>	
	Wt	<b>35.91 kips</b>	
Exterior Wall - Wood	p	10 psf	
	h <sub>trib</sub>	5 ft	Half approximate floor height
	L	170 ft	
	Wt	<b>8.72 kips</b>	
Exterior Wall - Stucco	p	8 psf	Along front wall only
	h <sub>trib</sub>	7 ft	Half approximate floor height + 2 foot parapet
	L	25 ft	
	Wt	<b>1.40 kips</b>	
<b>Seismic Weight</b>	$\Sigma W_{typ}$	<b>46 kips</b>	

Level 2			
Floor Assembly	p	24 psf	
	A	1260 ft <sup>2</sup>	
	Wt	<b>30.56 kips</b>	
Exterior Wall - Wood	p	10 psf	
	h <sub>trib</sub>	10 ft	Approximate floor height
	L	167 ft	
	Wt	<b>17.12 kips</b>	
Exterior Wall - Stucco	p	8 psf	Along front wall only
	h <sub>trib</sub>	10 ft	Approximate floor height
	L	25 ft	
	Wt	<b>2.00 kips</b>	
<b>Seismic Weight</b>	$\Sigma W_{typ}$	<b>50 kips</b>	

Level 1			
<i>Floor Assembly</i>	p	24 psf	
	A	1125 ft <sup>2</sup>	
	Wt	<b>27.28 kips</b>	
<i>Exterior Wall - Wood</i>	p	10 psf	
	h <sub>trib</sub>	10 ft	<i>Approximate floor height</i>
	L	164 ft	
	Wt	<b>16.82 kips</b>	
<i>Exterior Wall - Stucco</i>	p	8 psf	<i>Along front wall only</i>
	h <sub>trib</sub>	5 ft	<i>Half approximate floor height</i>
	L	25 ft	
	Wt	<b>1.00 kips</b>	
<i>Exterior Wall - Brick</i>	p	37 psf	<i>Along front wall only</i>
	h <sub>trib</sub>	5 ft	<i>Half approximate floor height</i>
	L	25 ft	
	Wt	<b>4.63 kips</b>	
<b>Seismic Weight</b>	$\Sigma W_{typ}$	<b>50 kips</b>	

Earthquake		Site Parameters - UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)		
BSE-C	$S_s = 1.563$	$F_a = 1.2$	$S_{CS} = 1.876$	
	$S_1 = 0.617$	$F_v = 1.4$	$S_{C1} = 0.864$	

Building Period			
Empirical factor	$C_t$	0.02	ASCE 41-17 Sec. 4.4.2.4
Roof level height	$h$	28 ft	ASCE 7-18, 11.2
Empirical factor	$\beta$	0.75	ASCE 41-17 Sec. 4.4.2.4
Fundamental period, $T = C_t h_n^\beta =$		0.243 sec	ASCE 41-17 Sec. 4.4.2.4 eqn. 4-4

Calculate Base Shear			
Spectral Acceleration	$S_a = S_{X1} / T = 3.55$		ASCE 41-17, 4.4.2.3
	$S_{a,max} = S_{XS} = 1.8756$	<i>governs</i>	ASCE 41-17, 4.4.2.3
Modification Factor	$C = 1.00$		ASCE 41-17, Table 4-7
Pseudo Seismic Force	$V = S_a \times C \times W =$	$1.88 \times W$	ASCE 41-17, Eqn. 4-1
	<b>V =</b>	<b>273 kips</b>	

Seismic Force Vertical Distribution						
Level	Weight (kips)	Height (ft)	$w_x h_x$ (kip_ft)	$C_{vx} = w_x h_x / \sum w_x h_x$	$F_x = C_{vx} V$	Story Shear, V
3rd	46	27.5	1266	0.50	138	138
2nd	50	17.5	869	0.35	95	232
1st	50	7.5	373	0.15	41	273
$\Sigma$	145	$\Sigma$	2508	1.00	273	

Longitudinal Direction (East-West)							
Story	Story Shear (kips)	Length of Wall (ft)	M <sub>s</sub> Factor (ASCE 41-17, Table 4-8)	Average Story Shear Stress (plf)	Quick Check Shear Capacity <sup>(1)</sup> (plf)	Pass? (Y/N)	Lvl N Strength / Lvl N+1 Strength
2	138	151	4.5	203	200	N	--
1	232	116	4.5	445	200	N	77%
Ground	273	101	4.5	600	186 <sup>(2)</sup>	N	81%

Transverse Direction (North-South)							
Story	Story Shear (kips)	Length of Wall (ft)	M <sub>s</sub> Factor (ASCE 41-17, Table 4-8)	Average Story Shear Stress (plf)	Quick Check Shear Capacity <sup>(1)</sup> (plf)	Pass? (Y/N)	Lvl N Strength / Lvl N+1 Strength
2	138	68	4.5	450	200	N	--
1	232	41	4.5	1259	200	N	60%
Ground	273	31	4.5	1,955	200	N	76%

1. Shear capacity is doubled where walls are covered on both sides.

2. Weighted Ground Floor Capacity

Assembly	Capacity (plf)	Length (ft)	Capacity (lbs)
1-sided	100	14.1	1,410
2-sided	200	86.9	17,380
	Σ	101	18,790
	ΣCapacity / ΣLength =		186 plf