Rating form completed by:

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

4-8-2020

REGISTERED PROFESSIONAL ENGINEER
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EXP. 6/30/20
STRUCTURAL
STATE OF CALIFORNIA

4/8/2020

UCSF Building Seismic Ratings

1482 5TH AVENUE

CAAN #2030
1482 5th AVENUE, SAN FRANCISCO, CA 94122
UCSF Campus: Parnassus

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[1]
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	

[1] 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 Scheinhotz Associates and VDK Architects, "UCSF Housing 1482 5th Ave. San Francisco, CA," dated 30 November 1990 (6 sheets)
- Architectural Drawings, "1482 Fifth Avenue Cosmetic Upgrades," dated 15 June 2009 (2 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 12, 2019 where the building exterior, basement, and first floor were observed.

Brief description of structure

The building functions as graduate student housing. It was reportedly built in 1922 as a single-family home. There is an apartment on the first and second floors each over a basement/garage. The main floor plate is approximately 25 ft north-south by 41 ft east-west.

Identification of Levels: Levels are identified on plan as Basement, First Floor, Second Floor, and Roof. The site slopes downward toward the northwest. The basement (approximately 9'-9") consists of a garage, utility space, laundry, and building maintenance storage. The first floor (approximately 10'-0") consists of a dining room/kitchen, living room, foyer, a bedroom, a half bath, and a shower room. The second floor (approximately 10'-0) consists of three bedrooms, one and a half bathrooms, and a furnace closet. 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 12, 2019 continuous concrete stem wall footings were observed around the ground floor level. Posts bear on concrete pedestals that likely extend to isolated footings below the slab.

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. The basement ceiling was fully covered in gyp board, so the first floor sheathing could not be determined. Most of the basement walls were covered on each side by gyp board or straight sheathing. No evidence of seismic retrofit was observed.

Building Code: The building was reportedly constructed in 1922, 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, much of the structure was concealed behind finishes. The concrete stem walls in the basement were in good condition. No cracks in the exterior stucco were found. The wood siding (rear and sides) was in good condition.

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 no damage was observed.

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 either direction in any story, except for the longitudinal walls at the second floor.
- 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 and there in not 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 and south.
- The basement cripple walls were sheathed with a mixture of stucco, gyp board, and straight sheathing. Where wall sill plates were visible, no anchor bolts were observed.

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. [2]

The first level fireplace was blocked off. Like other buildings, it's likely the chimney was removed and replaced with a sheet metal flue.

The water heaters in the basement were anchored to the wall.

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 below the amount required by the ASCE 41 Tier 1 quick check in both directions of all stories, except for the longitudinal walls at the second floor. 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.

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.

[2] 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.

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.

Additional building data	Entry	Notes
Latitude	37.76087	
Longitude	-122.46166	
Are there other structures besides this one under the same CAAN#	No	
Number of stories above lowest perimeter grade	3	
Number of stories (basements) below lowest perimeter grade	0	
Building occupiable area (OGSF)	2,696	
Risk Category per 2016 CBC 1604.5	II	
Building structural height, h_n	30 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, β	0.75	Per ASCE 41-17 equation 4-4
Estimated fundamental period	0.256 sec	Per ASCE 41-17 equation 4-4
Site data		
975 yr hazard parameters S_s, S_1	1.565, 0.618	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}	1.878, 0.865	UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)
S_a at building period	1.878	
Site V_{s30}	440 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	
Applicable code		
Applicable code or approx. date of original construction	Built: 1922	Reported date, not confirmed

Applicable code for partial retrofit	None	No partial retrofit known
Applicable code for full retrofit	None	No full retrofit known
Model building data		
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.
Previous ratings		
Most recent rating	V	2013 Report
Date of most recent rating	10/7/2013	Basis: Qualitative assessment based on drawing reviewed
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

Appendix A

Additional Images

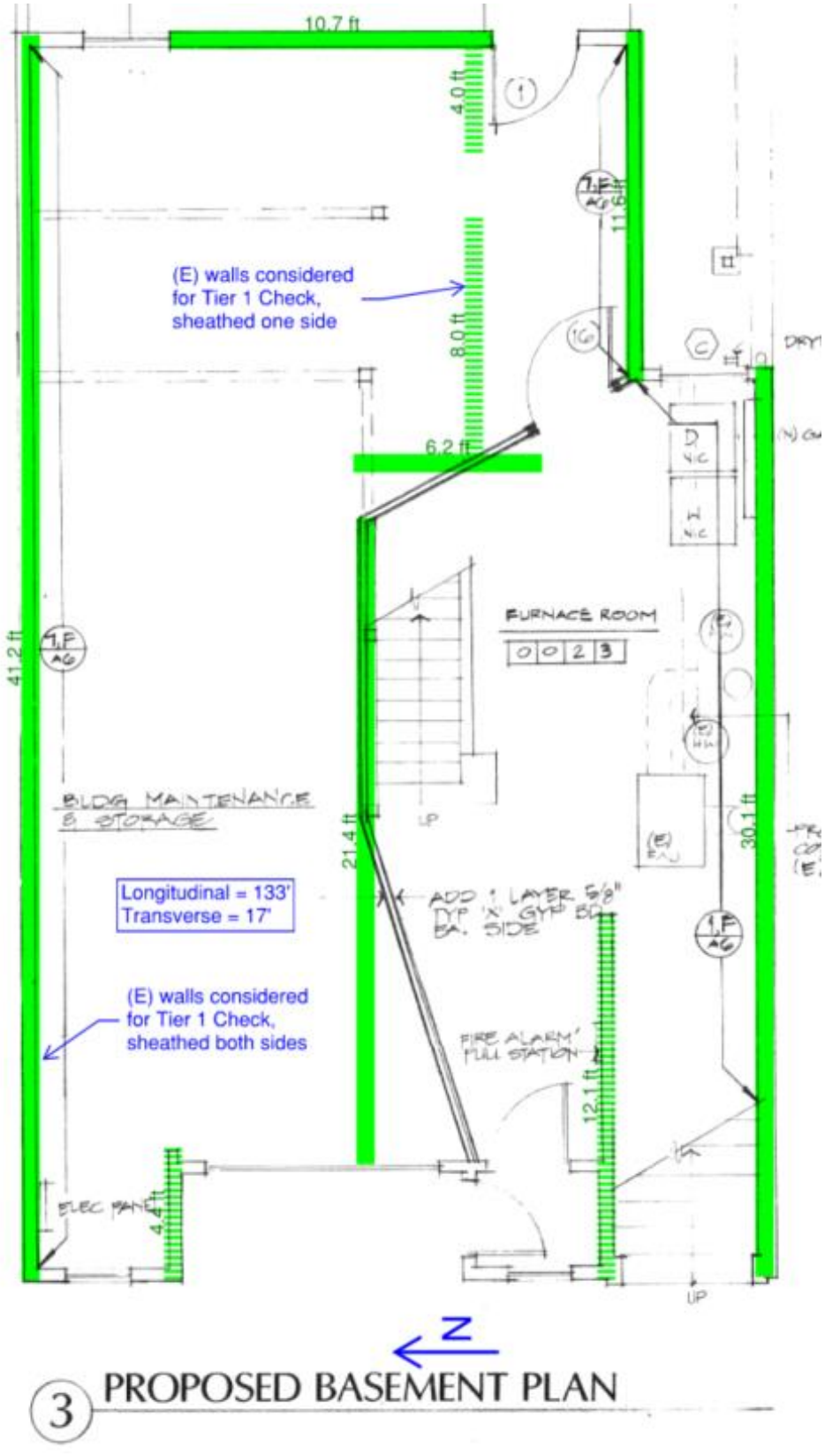

Figure 1 - Basement/Garage Floor Plan

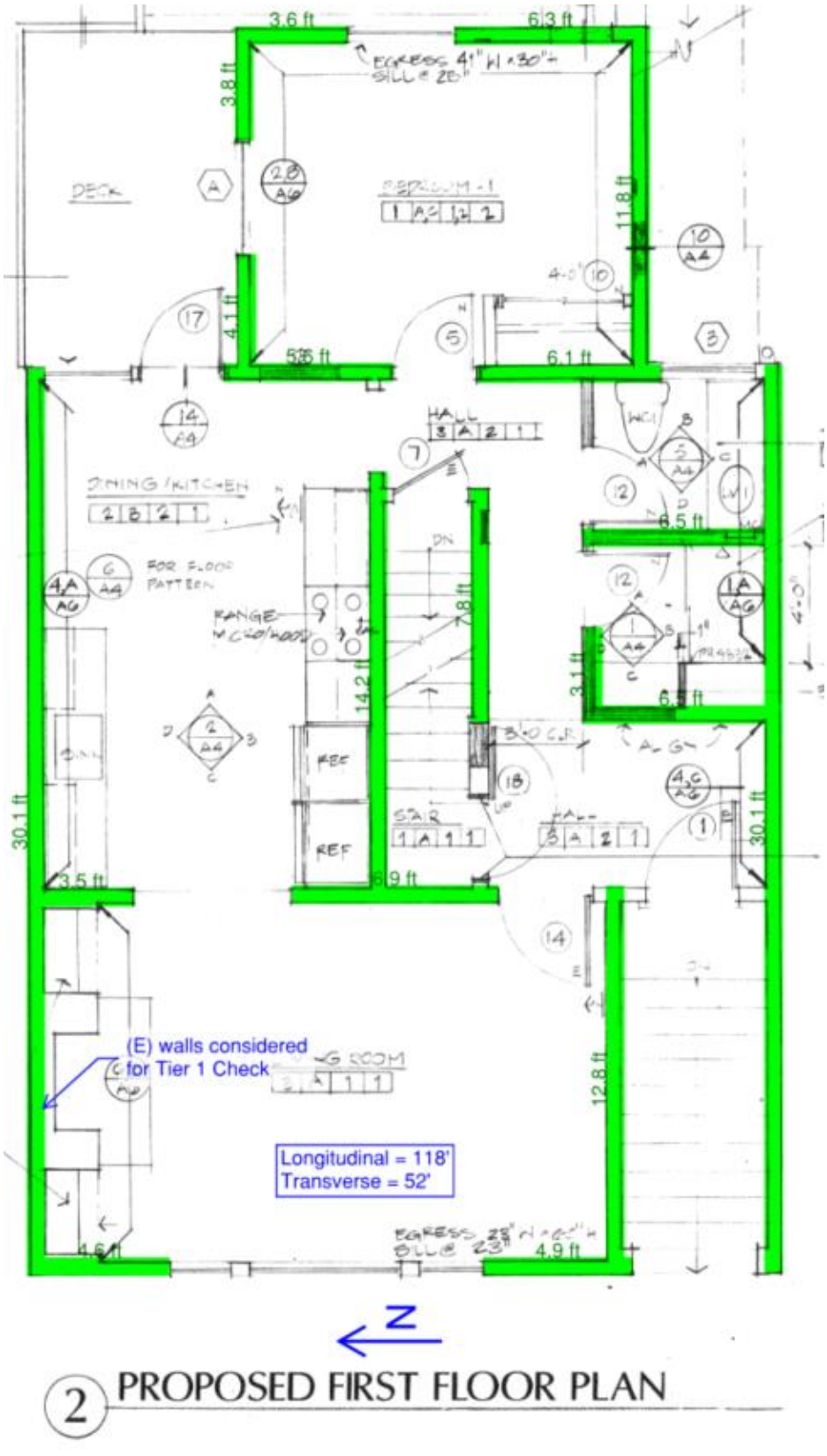

Figure 2 - First Floor Plan

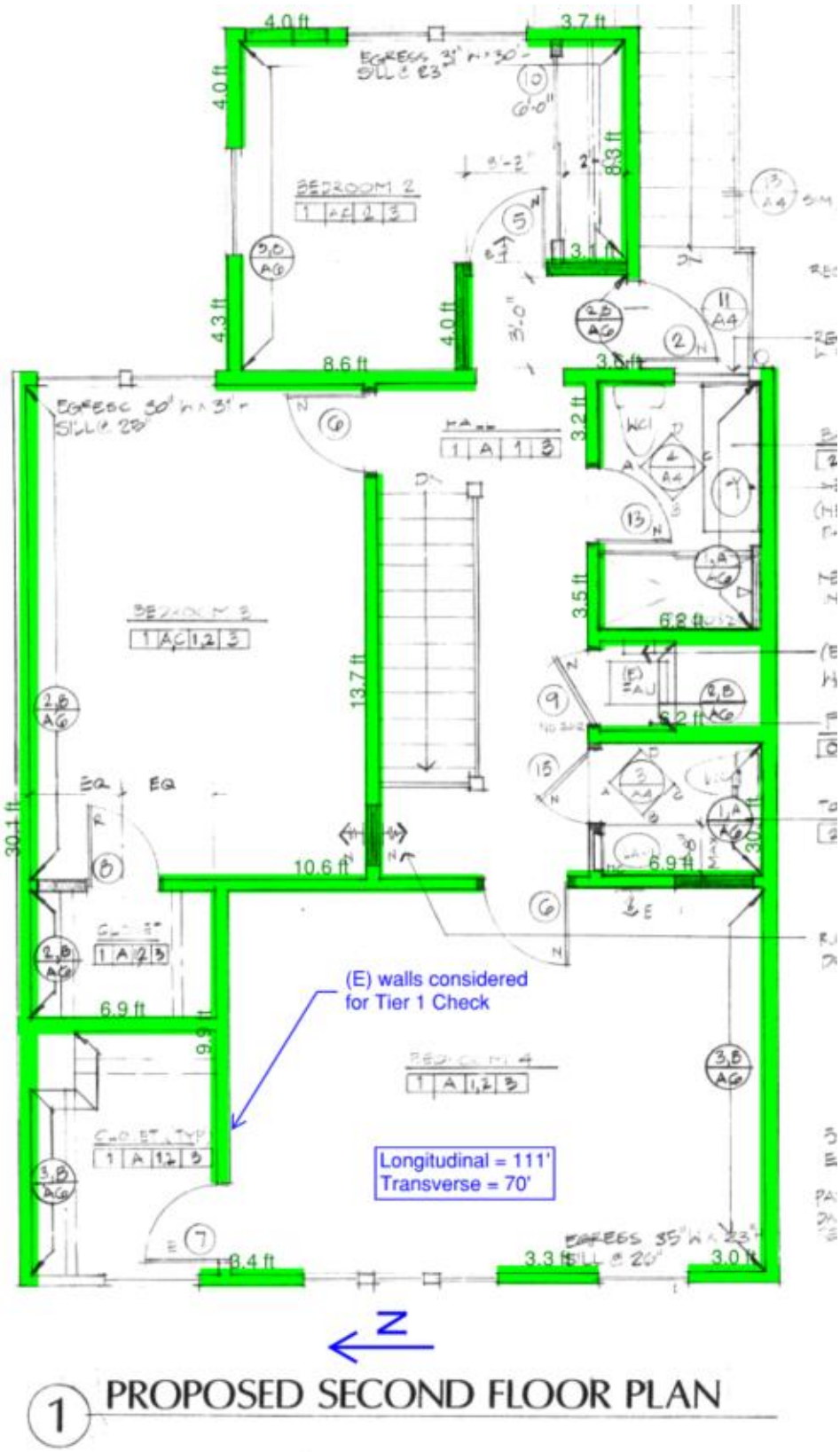

Figure 3 - Second Floor Plan

Figure 4 - Exterior Elevation (West Elevation)

Figure 5 - Exterior Elevation (West Elevation)

Figure 6 - Building Separation to the North (Left) and South (Right)

Figure 7 – Building Maintenance Storage in Basement. Left: Looking West. Right: Looking East.

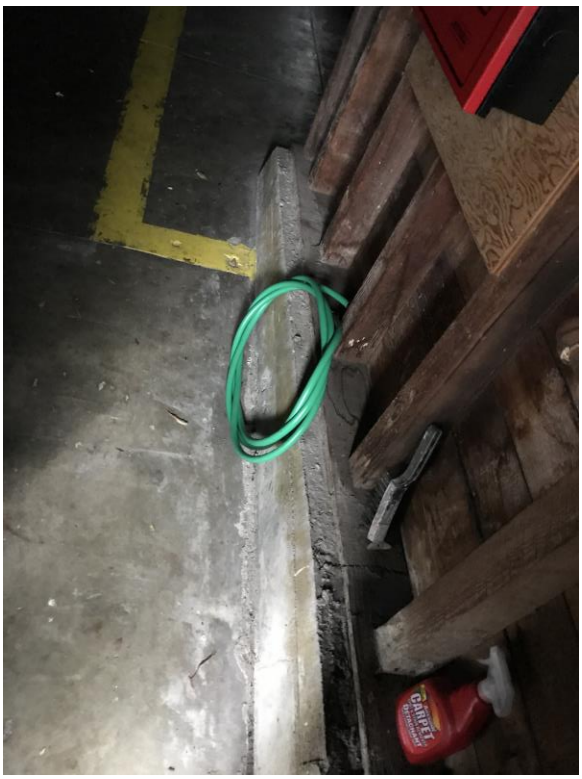

Figure 8 – Sill Plate South Garage Entrance

Figure 9 – Furnace / Laundry Room

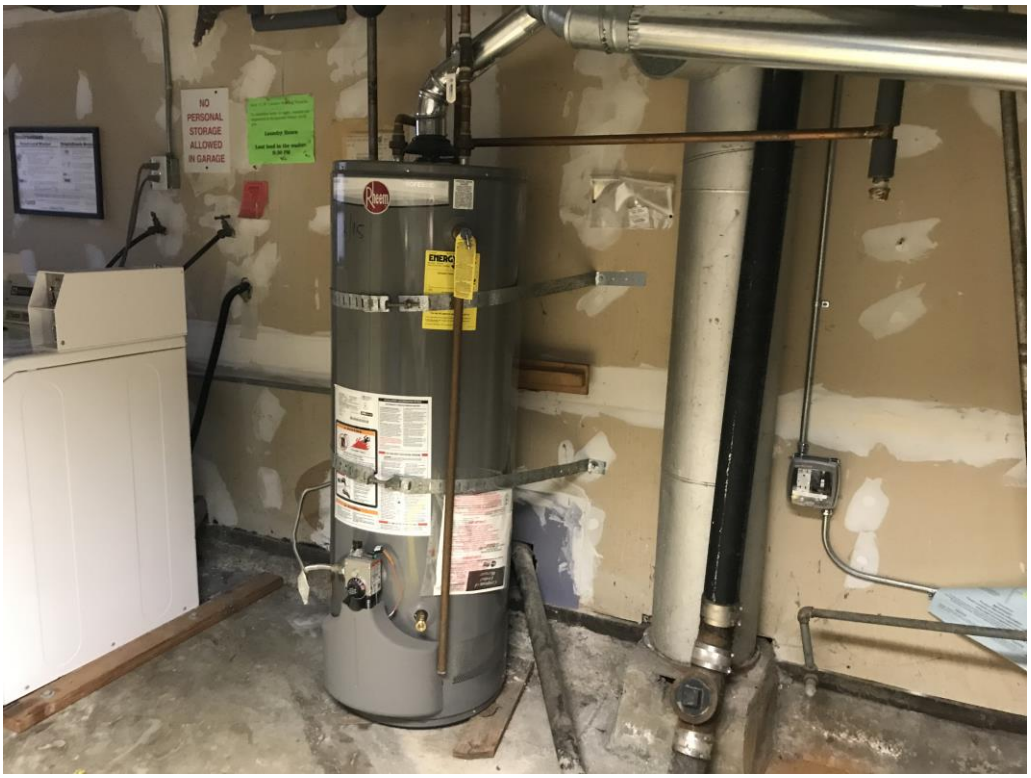

Figure 10 – Anchored Water Heater

Figure 11 – Rear Hallway. Left: Looking East. Right: Looking West

Figure 12 – Top of Basement Post

Appendix B

ASCE 41- 17 Tier 1 Checklists (Structural)

UC Campus:	San Francisco			Date:	4/8/2020		
Building CAAN:	2030	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1482 5th Avenue			Initials:	*AJS*	Checked:	*MTP*
Building Address:	1482 5th Avenue, San Francisco, CA 94122			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:** Based on the age of construction, it is presumed detailing does not provide transfer of forces between walls and between levels of the building.
○	◉	○	○	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:** The buildings to the north and south are built nearly to the property line, with minimal separation from the subject building.
○	○	◉	○	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:**

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:** In the transverse direction (north-south), the sum of shear strength in the ground floor and first floor is 33% and 74% of the story above, respectively.
○	◉	○	○	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:** In the transverse direction (north-south), the sum of shear strength in the ground floor and first floor is 33% and 74% of the story above, respectively.

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:** Some walls are discontinuous between the ground and first story.
●	○	○	○	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:**
●	○	○	○	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:**
○	●	○	○	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 ground floor only has transverse walls at the back half of the building.

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:**
●	○	○	○	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:**

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

UC Campus:	San Francisco			Date:	4/8/2020		
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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:**

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

FOUNDATION CONFIGURATION

				Description
C	NC	N/A	U	
○	◉	○	○	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:** 0.6 Sa = 0.6 * 1.878 = 1.127 Base = 25 ft; height = 30 ft Base/Height = 0.833 < 1.127
C	NC	N/A	U	
○	○	◉	○	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 C.

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

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

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:**
○	●	○	○	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 (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) **Comments:** Only the second story longitudinal walls pass the quick check. At the ground floor, the wall stresses in the quick check are 336 plf in the east-west direction and 2,632 plf in the north-south direction, compared to their capacities of 179 plf and 200 plf, respectively. Note the ground floor capacity is based on the weighted average of wall capacities per the attached calculations. Where sheathing occurs on both sides, capacities are doubled
○	●	○	○	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:** Only the street-facing exterior wall has stucco, but it is considered in the stress check.
○	●	○	○	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:** Interior walls provide much of the shear resistance, particularly in the transverse (north-south) direction.
○	●	○	○	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:** Some of the walls considered for the quick check have an aspect ratio greater than 2 to 1.

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

C	NC	N/A	U	
○	◉	○	○	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:** Existing drawings showing wall details are not provided but it is presumed there are no ties between floors to transfer load between floors.
○	◉	○	○	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 front of the building is approximately 7 feet taller than the back. The wall piers at the downhill side have aspect ratios of approximately 6-to-1.
○	◉	○	○	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:** 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.
◉	○	○	○	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:** Less than 80% of the front wall is open, although the wall piers have aspect ratios of approximately 6-to-1.

CONNECTIONS

C	NC	N/A	U	Description
○	◉	○	○	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:** Positive connections of wood posts to foundations was not observed.
○	◉	○	○	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3) **Comments:** Most of the walls were sheathed on both sides. On the walls that were not, there were no anchor bolts or the spacing was greater than 6 feet on center.
○	◉	○	○	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:** Positive connections of wood posts to girder was not observed.

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

C	NC	N/A	U	Description
○	◉	○	○	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) **Comments:** Most of the walls were sheathed on both sides. On the walls that were not, there were no anchor bolts or the spacing was greater than 6 feet on center.

DIAPHRAGMS

C	NC	N/A	U	Description
◉	○	○	○	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** No split levels or expansion joints.
○	○	○	◉	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:** Chords are at one elevation. However, existing drawings showing splice details are not available.
○	◉	○	○	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:** The first floor diaphragm has an aspect ratio greater than 2-to-1 over the building maintenance storage space.
◉	○	○	○	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:** No diaphragm spans are greater 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 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:** All diaphragms span less than 40 ft.

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

C	NC	N/A	U	
○	○	◉	○	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:**

Appendix C

UCOP Seismic Safety policy Falling Hazards Assessment Summary

UC Campus:	San Francisco			Date:	1/4/2020		
Building CAAN:	2030	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1482 5th Avenue			Initials:	*AJS*	Checked:	*MTP*
Building Address:	1482 5th Avenue, San Francisco, CA 94122			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:**
P ☐ N/A ☒	**Heavy masonry or stone veneer above exit ways or public access areas** **Comments:**
P ☐ N/A ☒	**Unbraced masonry parapets, cornices, or other ornamentation above exit ways or public access areas** **Comments:**
P ☐ N/A ☒	**Unrestrained hazardous material storage** **Comments:**
P ☐ N/A ☒	**Masonry chimneys** **Comments:** It appeared the chimney had been replaced with a sheet metal flue. One blocked off fireplace was observed at the first level.
P ☐ N/A ☒	**Unrestrained natural gas-fueled equipment such as water heaters, boilers, emergency generators, etc.** **Comments:** The water heaters are restrained.
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; Falling Hazards Risk: Low, Moderate, or High

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*	
Total	∑	**27**	**psf**	*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*	
Total	∑	**24**	**psf**	
Deck Assembly				
Decking		5	*psf*	*2x*
Framing		6	*psf*	*Estimate, Assumed 2x10 @16*
Guardrails and Misc		2	*psf*	
Total	∑	**13**	**psf**	
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*	
Total	∑	**10**	**psf**	
Exterior Wall Finish - Stucco				
Finish		10	*psf*	*Estimate, Stucco, less wood siding*
		-2	*psf*	*Less wood siding*
Total	∑	**8**	**psf**	Add to typical ext. wall assembly, where occurs

Level 3 (Roof)				
Roof Assembly	p	27	*psf*	
	A	907	*ft²*	
	Wt	**24.49**	***kips***	
Exterior Wall - Wood	p	10	*psf*	
	h_{trib}	5	*ft*	*Half approximate floor height*
	L	133	*ft*	
	Wt	**6.82**	***kips***	
Exterior Wall - Stucco	p	8	*psf*	
	h_{trib}	5	*ft*	*Half approximate floor height + 2 foot parapet*
	L	25	*ft*	*Along front wall only*
	Wt	**1.00**	***kips***	
Seismic Weight	ΣW_{typ}	**32**	**kips**	

Level 2				
Floor Assembly	p	24	*psf*	
	A	907	*ft²*	
	Wt	**21.99**	***kips***	
Exterior Wall - Wood	p	10	*psf*	
	h_{trib}	10	*ft*	*Approximate floor height*
	L	133	*ft*	
	Wt	**13.64**	***kips***	
Exterior Wall - Stucco	p	8	*psf*	
	h_{trib}	10	*ft*	*Approximate floor height*
	L	25	*ft*	*Along front wall only*
	Wt	**2.00**	***kips***	
Seismic Weight	ΣW_{typ}	**38**	**kips**	

Level 1				
Floor Assembly	p	24	*psf*	
	A	933	*ft²*	
	Wt	**22.63**	***kips***	
Exterior Wall - Wood	p	10	*psf*	
	h_{trib}	10	*ft*	*Approximate floor height*
	L	133	*ft*	
	Wt	**13.64**	***kips***	
Exterior Wall - Stucco	p	8	*psf*	
	h_{trib}	5	*ft*	*Half approximate floor height*
	L	25	*ft*	*Along front wall only*
	Wt	**1.00**	***kips***	
Seismic Weight	ΣW_{typ}	**37**	**kips**	

Earthquake	Site Parameters - UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)		
BSE-C	S_s = 1.565	F_a = 1.2	S_{Cs} = 1.878
	S_1 = 0.618	F_v = 1.4	S_{C1} = 0.865

Building Period				
Empirical factor	C_t	0.02		*ASCE 41-17 Sec. 4.4.2.4*
Roof level height	h	30	ft	*ASCE 7-18, 11.2*
Empirical factor	β	0.75		*ASCE 41-17 Sec. 4.4.2.4*
Fundamental period, $T= C_t h_n^{\beta}$ =		0.256	sec	*ASCE 41-17 Sec. 4.4.2.4 eqn. 4-4*

Calculate Base Shear				
Spectral Acceleration	$S_a = S_{X1} / T$ =	3.37		*ASCE 41-17, 4.4.2.3*
	$S_{a,max} = S_{XS}$ =	1.878	*governs*	*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	x W	*ASCE 41-17, Eqn. 4-1*
	V =	**201**	**kips**	

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	32	30.00	969	0.47	94	94
2nd	38	19.75	743	0.36	72	166
1st	37	9.75	363	0.18	35	201
∑	*107*	∑	*2076*	*1.00*	*201*	

Longitudinal Direction (East-West)							
Story	Story Shear (kips)	Length of Wall (ft)	M_s Factor (ASCE 41-17, Table 4-8)	Average Story Shear Stress (plf)	Quick Check Shear Capacity[1] (plf)	Pass? (Y/N)	Lvl N Strength / Lvl N+1 Strength
2	94	111	4.5	188	200	Y	--
1	166	118	4.5	313	200	N	106%
Ground	201	133	4.5	336	179 [2]	N	101%

Transverse Direction (North-South)							
Story	Story Shear (kips)	Length of Wall (ft)	M_s Factor (ASCE 41-17, Table 4-8)	Average Story Shear Stress (plf)	Quick Check Shear Capacity[1] (plf)	Pass? (Y/N)	Lvl N Strength / Lvl N+1 Strength
2	94	70	4.5	298	200	N	--
1	166	52	4.5	710	200	N	74%
Ground	201	17	4.5	2,632	200	N	33%

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

2. Weighted Ground Floor Capacity, longitudinal

Assembly	Capacity (plf)	Length (ft)	Capacity (lbs)
1-sided	100	28.5	2,850
2-sided	200	104.5	20,900
	Σ	133	23,750
		ΣCapacity / ΣLength =	179 plf