Rating form completed by:

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Maryann Phipps, Alix Kottke

Text in green is to be part of UCSF building database and may be part of UCOP database 1212

12-3-2019

REGISTERED PROFESSIONAL ENGINEER
MARYANN T. PHIPPS
No. 2995
EXP. 6/30/20
STRUCTURAL
STATE OF CALIFORNIA

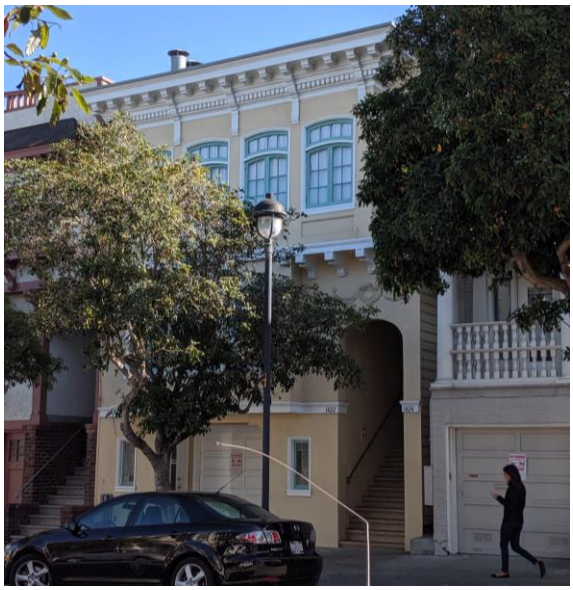
12/3/2019

UCSF Building Seismic Ratings

1422-24 5th AVENUE

CAAN #2062
1422-24 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	2019	
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 UCSF Facilities Management Architectural Design and Engineering Department and Structural Drawings by Butzbach Structural Engineering, "1422/24 Fifth Ave Building Renovation," dated 15 September 1997 (17 sheets).

Scope for completing this form

Architectural and structural drawings were reviewed, and an ASCE 41-17 Tier 1 evaluation was performed. A site visit was made on October 31, 2019 where the building exterior and ground floor were observed.

Brief description of structure

The building functions as faculty housing. It was built in 1915 as a duplex home. There is an apartment on the first and second floors over a garage basement with a mechanical space. The main floor plate is approximately 80 ft east-west by 25 ft north-south.

Identification of Levels: Levels are identified on plan as Basement/Ground Level, First Floor (1422 5th Avenue), and Second Floor (1424 5th Avenue). The site slopes gently (10°±) downward toward the west-northwest. The ground floor has a garage and mechanical space. The First and Second Floor each consist of a two-bedroom apartment with a kitchen, bathroom, living and dining room. The roof is flat. The Ground Level 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 and isolated footings below columns in the ground level. The two transverse shear walls added during the 1997 retrofit each received new foundation elements. The shear wall on Line 1 has a 24" square continuous footing over (2)-16" diameter x 12'-6" deep drilled piers. The shear wall on Line 2 has a continuous 16" square footing.

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 1x sheathing is supported by wood joists which span to load bearing wood framed walls and wood posts.

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 ceiling in the ground floor was concealed, so it was not possible to observe if the sheathing was straight or diagonal. The ground floor underwent a voluntary seismic retrofit in 1997. The retrofit consisted of adding three lines of shear resistance in the transverse direction – one shear wall towards the front of the building, one shear wall towards the middle and anchoring the existing framing into a concrete retaining wall at the rear of the building. In the longitudinal direction, shear walls were added along three lines of resistance – both exterior walls of the building and along the interior wall between the garage and corridor parallel to the garage and mechanical space.

Building Code: The building was constructed in 1915, prior to a building code being enacted. The 1995 CBC was the governing code at the time of the partial voluntary seismic retrofit in 1997; however, design criteria for the retrofit was not included on the drawings.

Building Condition: Good. The structure in the ground floor appeared to be reasonably well protected and well maintained. There was some damage observed to the gypsum board sheathing at the transverse plywood shear wall on Gridline 1.

Building response in 1989 Loma Prieta Earthquake: Unknown

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

- The building relies interior and exterior walls for shear resistance in the upper two stories. These walls are insufficient to pass the Tier 1 Check. The ground floor, which has been retrofitted, has adequate wall for the Tier 1 Check.

- 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 built to the property line with virtually no separation between the neighboring buildings to the north and south. The floor levels of the building to the north and south align with the floor levels of the subject building.

In a large earthquake the walls are expected to be heavily damaged, particularly in the transverse directions in the first floor. Under excessive movement, there is a possibility of losing gravity support.

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	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 non-structural life-safety concerns, including at exit routes. [2]

The existing drawings show a fireplace at the first and second level. A sheet metal flue was observed extending above the roof from the street. The facilities maintenance technician assisting with our site observation stated that the fireplaces have been blocked off and are not used.

The water heaters in the ground floor 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 voluntary seismic retrofit of the ground floor addressed what is typically the most vulnerable space for a building with this configuration; however, the length of wall is below the amount required by the ASCE 41 Tier 1 procedures. The building is listed as Priority B because there is a relatively low risk to occupant life safety posed by conventional wood-framed construction.

[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.

Recommendations for further evaluation or retrofit

No further evaluation of this building is recommended. There is a relatively low risk to occupant life safety posed by this type of building. It is recommended that work to improve the seismic performance of the building in the upper floors 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 November 7, 2019 and are unanimous that the rating is IV.

Additional building data	Entry	Notes
Latitude	37.76190	
Longitude	-122.46107	
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)	4,993	
Risk Category per 2016 CBC 1604.5	II	
Building structural height, h_n	33 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	0.275 sec	Per ASCE 41-17 equation 4-4
Site data		
975 yr hazard parameters S_s, S_1	1.562, 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}	1.874,0.864	UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)
S_a at building period	1.874	
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	
Applicable code		
Applicable code or approx. date of original construction	Built: 1915	
Applicable code for partial retrofit	CBC 1995	Partial Retrofit of Ground Floor by Butzbach Structural Engineering; applicable code for retrofit assumed based on date of drawings.
Applicable code for full retrofit	None	
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 we performed ASCE 41 Tier 1 evaluation.
Previous ratings		
Most recent rating	V	2013 Report
Date of most recent rating	10/7/2013	Basis: Qualitative assessment based on drawing review
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

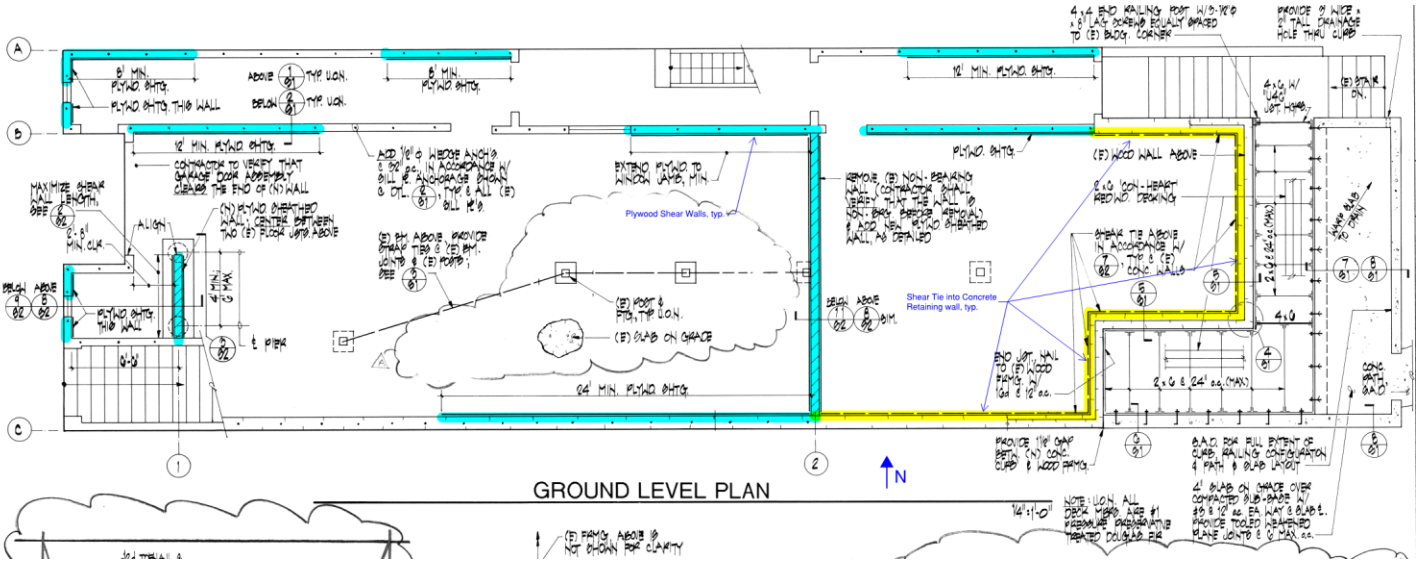


Figure 1 - Basement/Garage Floor Plan

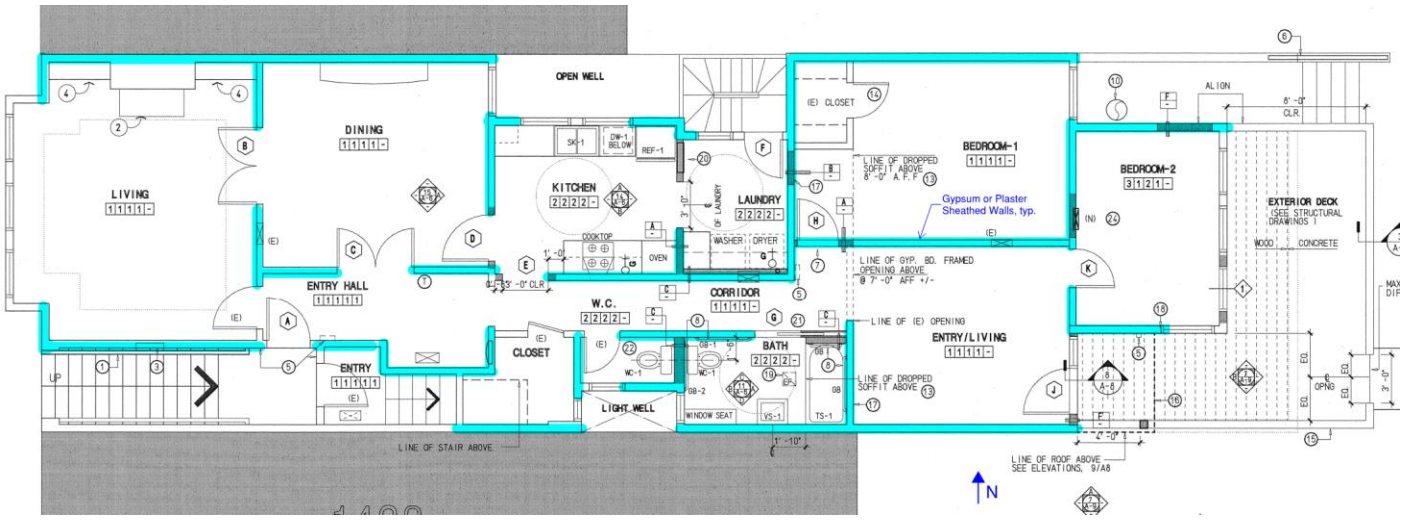


Figure 2 - First Floor Plan

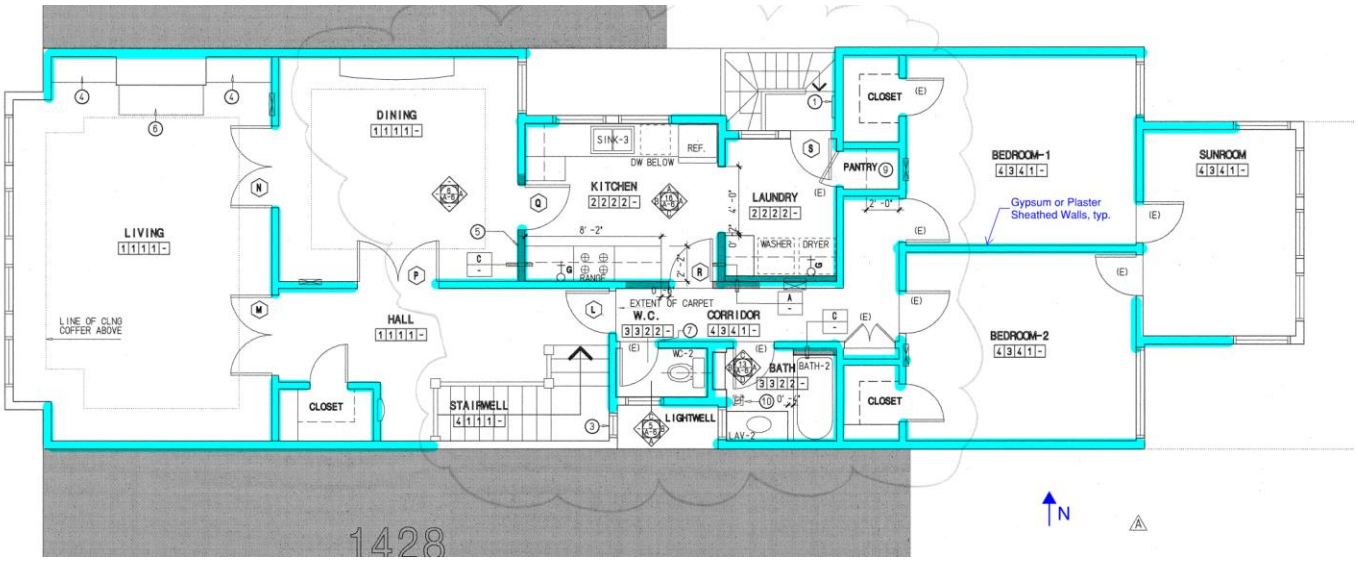


Figure 3 - Second Floor Plan

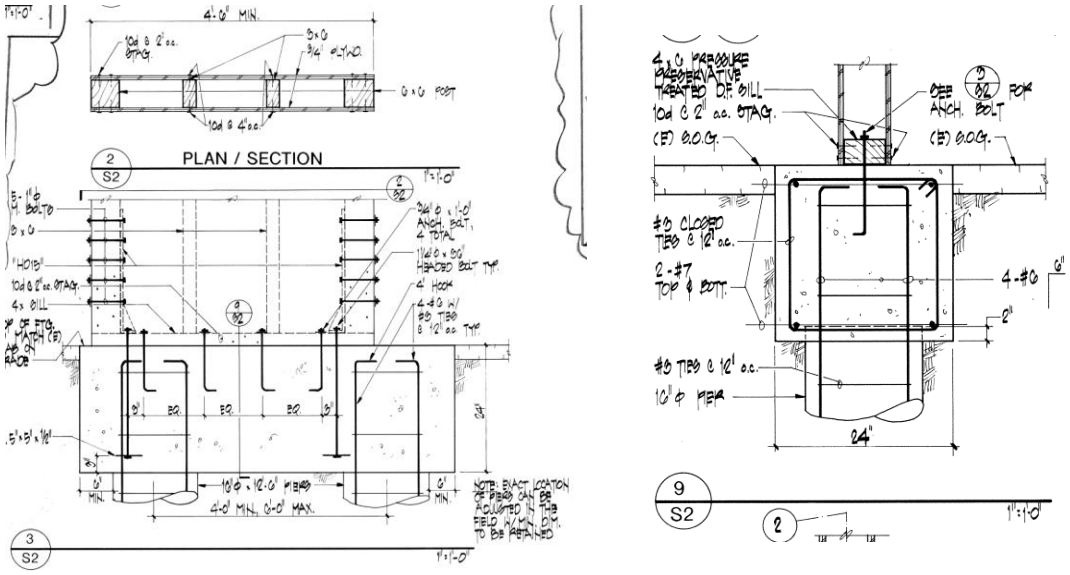


Figure 4 - Details for Shear Wall on Gridline 1

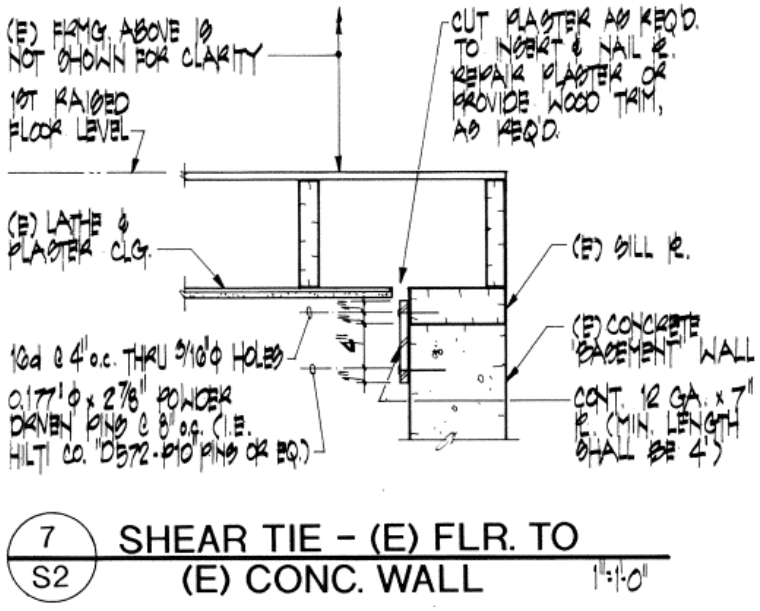


Figure 5 - Shear Tie at Concrete Walls

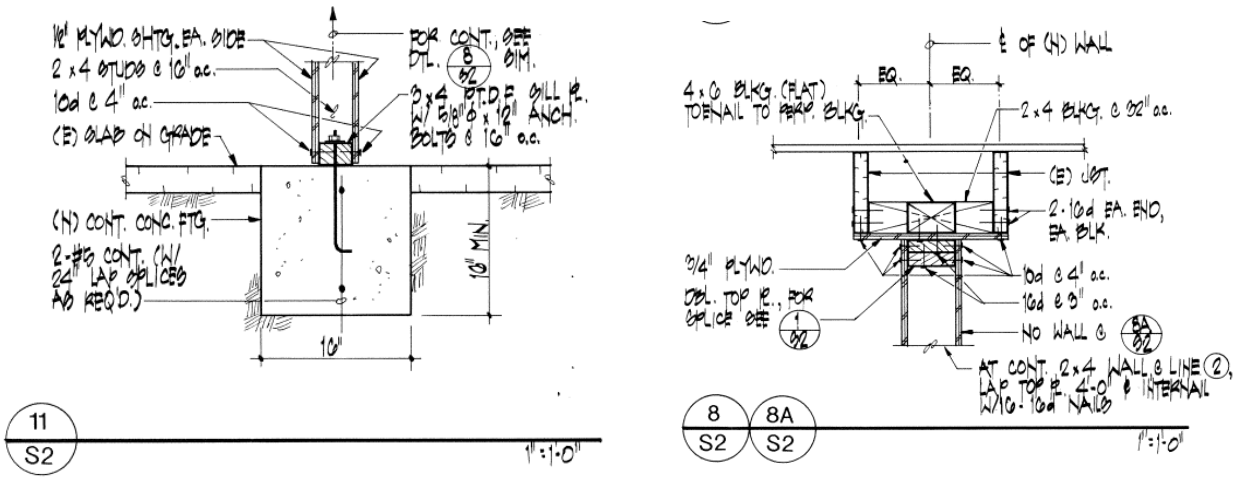


Figure 6 - Shear Wall on Gridline 2

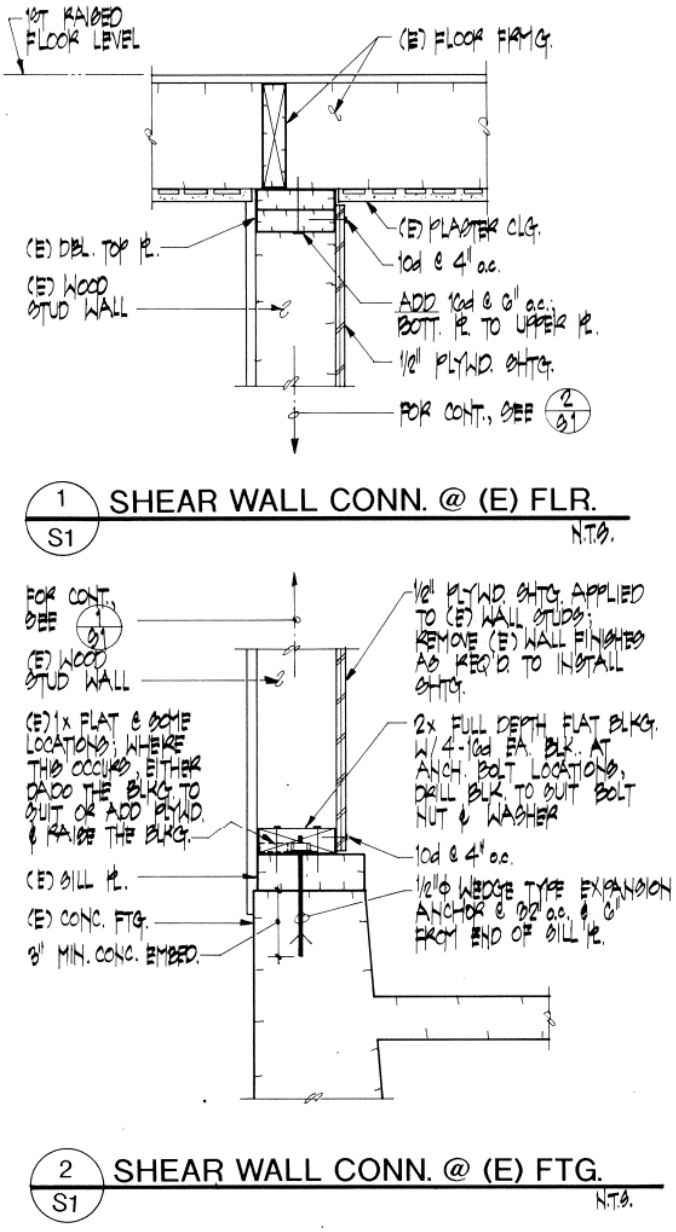


Figure 7 - Typical Shear Wall Detail

Figure 8 - Building Separation to the North (Left) and South (Right)

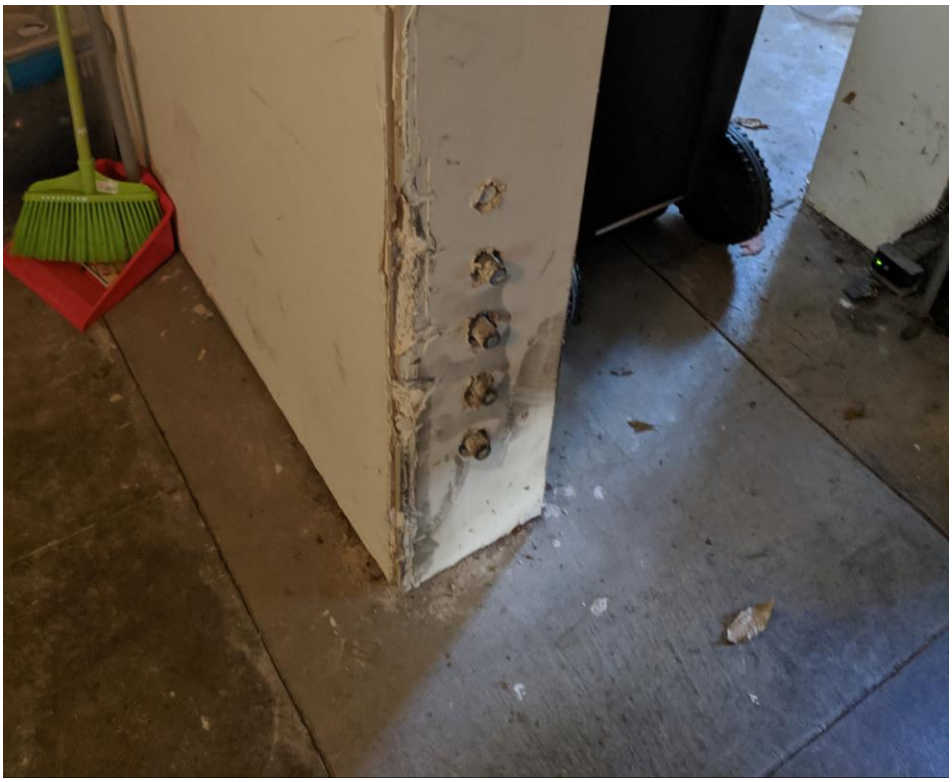


Figure 9 - Hold-down Bolts to Vertical stud and Extent of Foundation Element below Wall on Gridline 1

Figure 10 - Water Heaters

Figure 11 - Garage

Figure 12 - East Exterior Elevation

Appendix B

ASCE 41- 17 Tier 1 Checklists (Structural)

UC Campus:	San Francisco			Date:	12/3/2019		
Building CAAN:	2062	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1422-24 5th Avenue, San Francisco			Initials:	*ARK*	Checked:	*MTP*
Building Address:	1422-24 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:** Buildings to the north and south are built to the property line and without 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:**
◉	○	○	○	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:**
◉	○	○	○	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:**

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

ASCE 41-17
Collapse Prevention Basic Configuration Checklist

C	NC	N/A	U	
◉	○	○	○	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:**

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:**
◉	○	○	○	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:**

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

UC Campus:	San Francisco			Date:	12/3/2019		
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Building Address:	1422-24 5th Avenue, San Francisco, CA 94122			Page:	3	of	3

ASCE 41-17
Collapse Prevention Basic Configuration Checklist

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:** 0.6 Sa = 0.6 * 1.85 = 1.11 Base = 25 ft; height = 33 ft Base/Height = 0.76 < 1.11
◉	○	○	○	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

UC Campus:	UC San Francisco			Date:	12/3/2019		
Building CAAN:	2062	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1422-24 5th Avenue			Initials:	*ARK*	Checked:	*MTP*
Building Address:	1422-24 5th 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
C ● NC ○ N/A ○ U ○	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:**
C ○ NC ● N/A ○ U ○	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:** Walls in the ground floor longitudinal direction pass the shear stress quick check. Walls in the ground floor transverse direction and upper stories do not pass the shear stress quick check using the allowable capacity of 200 plf.
C ○ NC ● N/A ○ U ○	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:** Exterior walls were observed to be stucco.
C ○ NC ● N/A ○ U ○	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.
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:** Some of the interior and exterior walls considered for the quick check have an aspect ratio greater than 2 to 1.
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:** Drawings showing wall details are not provided, but it is presumed there are not ties between floors to transfer load between floors.

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

C	NC	N/A	U	
○	◉	○	○	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 site slopes dramatically to the south. Walls in the longitudinal direction have aspect ratios greater than 1:1; however, transverse walls have aspect ratios less than 1:1.
◉	○	○	○	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:** Voluntary seismic retrofit provided sheathing for ground floor walls and braced the walls to the foundation.
◉	○	○	○	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:**

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:** Existing details are not available, and the connections were concealed by gypsum board sheathing in our site visit.
◉	○	○	○	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 shown bolted in the voluntary seismic retrofit.
○	○	○	◉	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:** Existing details are not available, and the connections were concealed by gypsum board sheathing in our site visit.

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:** Wood sill bolts were added as part of the voluntary seismic retrofit.

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:** Drawings showing these 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:** Maximum Aspect Ratio = 40 ft : 25 ft.
○	◉	○	○	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:** Drawings showing roof sheathing are not available. It is presumed the diaphragm has straight sheathing based on the age of construction, and there are spans greater than 24 feet.
○	◉	○	○	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:** The diaphragm span over the crawl space is greater than 40 feet at the first floor.

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:	12/3/2019		
Building CAAN:	2062	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1422-24 5th Avenue			Initials:	*ARK*	Checked:	*MTP*
Building Address:	1422-24 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:** The existing drawings show a fireplace at the first and second level. A sheet metal flue was observed extending above the roof from the street. The facilities maintenance technician assisting with our site observation stated that the fireplaces have been blocked off and are not used.
P ☐ N/A ☒	**Unrestrained natural gas-fueled equipment such as water heaters, boilers, emergency generators, etc.** **Comments:**
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 Level				
Roofing		3	*psf*	*Estimate, Assume Asphalt Shingles*
Sheathing		3	*psf*	*Estimate, Assumed 1x Sheathing*
Roof Joists		6	*psf*	*Estimate, Assumed 2x10 @16*
Ceiling		2.25	*psf*	*Estimate, 5/8" Gyp Board*
MEP		0.5	*psf*	
Misc		0.5	*psf*	
Interior Walls		5	*psf*	*20 psf (2x4 studs w/ plaster ea side)*4.5ft*100ft/1800 ft²*
Exterior Walls		*10*	*psf*	*20 psf (2x4 studs w/ plaster + stucco)*4.5ft* 200ft/1800 ft²*
Total	$\sum$	**30**	**psf**	
Area	A_{roof}	1800	ft^2	
Seismic Weight	W_{R4}	**54**	**kips**	

Second Floor Level				
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*	
Interior Walls		9	*psf*	*20 psf (2x4 studs w/ plaster ea side)*9ft*100ft/2000 ft²*
Exterior Walls		*19*	*psf*	*20 psf (2x4 studs w/ plaster + stucco)*9ft* 210ft/2000 ft²*
Total	$\sum$	**42**	**psf**	
Area	A_3	2000	ft^2	
Seismic Weight	W_{typ}	**84**	**kips**	

First Floor Level				
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, Assume 5/8" Gyp Board*
MEP		0.5	*psf*	
Misc		0.5	*psf*	
Interior Walls		*8*	*psf*	*20 psf (2x4 studs w/ plaster ea side)*9ft*90ft/2000 ft²*
Exteiror Walls		*11*	*psf*	*20 psf (2x4 studs w/ plaster + stucco)*9ft* 125ft/2000 ft²*
Subtotal	$\sum$	**34**	**psf**	
Area	A_2	2000	ft^2	
Seismic Weight	W_{typ}	**67**	**kips**	

Earthquake	Site Parameters - UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)		
BSE-C	S_s = 1.562	F_a = 1.2	S_{Cs} = 1.874
	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	33 ft	
Empirical factor	β	0.75	*ASCE 41-17 Sec. 4.4.2.4*
Fundamental period, $T= C_t h_n^{\beta}$ = *ASCE 41-17 Sec. 4.4.2.4 eqn. 4-4*		0.275 sec	

Calculate Base Shear				
Spectral Acceleration	$S_a = S_{X1} / T$ =	3.14		*ASCE 41-17, 4.4.2.3*
	$S_{a,max} = S_{XS}$ =	1.874	*governs*	*ASCE 41-17, 4.4.2.3*
Modification Factor	C =	1.00		*ASCE 41-17, Table 4-7*
Pseudo Seismic Force	$V = S_a \times C \times W$ =	1.87 W		*ASCE 41-17, Eqn. 4-1*
	V =	**386 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
Roof	54	35	1906	0.46	176	176
2nd	84	19.75	1665	0.40	154	330
1st	67	9	605	0.14	56	386
		0	0	0.00	0	386
∑	*206*	∑	*4175*	*1.00*	*386*	

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 (plf)	Pass? (Y/N)
2	176	175	4.5	224	200	N
1	330	160	4.5	458	200	N
Ground	386	125	4.5	686	1000	Y

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 (plf)	Pass? (Y/N)
2	176	86	4.5	455	200	N
1	330	73	4.5	1005	200	N
Ground	386	64	4.5	1340	1000	N