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

12-3-2019

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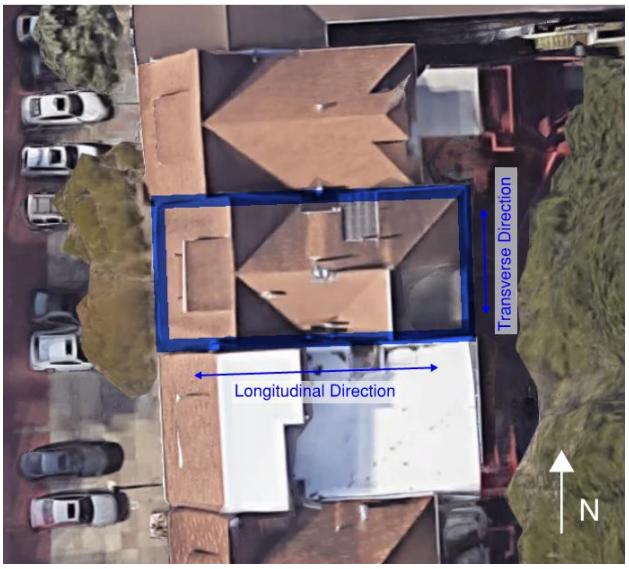
EXP. 6/30/20
STRUCTURAL
STATE OF CALIFORNIA

12/3/2019

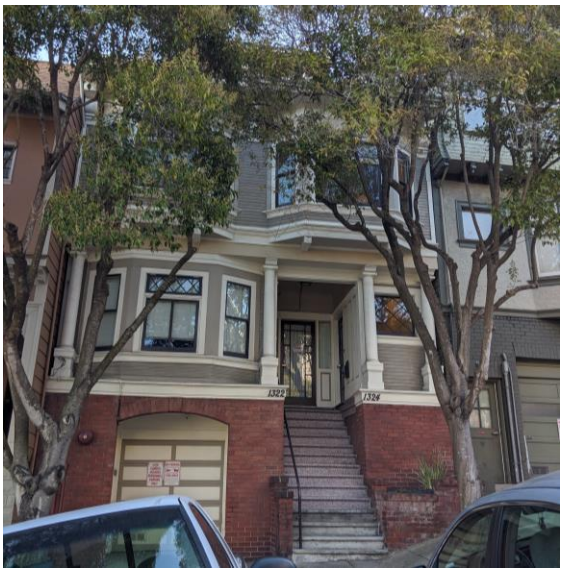
UCSF Building Seismic Ratings

1322-24 3RD AVENUE

CAAN #2003
1322-24 3rd 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 Floor Plans, "1322 3RD Avenue", dated 10 December 1981 (3 Sheets)
- Architectural Drawings by Scheinhotz Associates and VDK Architects, "UCSF Housing 1322/1324 3rd Ave. San Francisco, CA," dated 5 August 1998 (4 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 October 31, 2019 where the building exterior and garage space were observed. Access to the crawl space was not available.

Brief description of structure

The building functions as graduate student housing. It was built in 1911 as a duplex home. There are apartment units on the first and second floors over a garage basement with a crawl space. The garage space is used for storage for cleaning services and cleaning products. The main floor plate is approximately 50 ft north-south by 25 ft east-west.

Identification of Levels: Levels are identified on plan as Basement/Lower Garage Level, First Floor, and Second Floor. The site slopes downward toward the north. The garage (approximately 9'-0") is a partial level with a garage to the north and a crawl space to the south. The First and Second Floor (approximately 10'-9") each consist of a two-bedroom apartment with a kitchen, bathroom and living/dining room. The hip-shaped roof slopes to a maximum of 10' over the second floor. The basement/garage 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 October 31, 2019 continuous concrete stem wall footings were observed around the ground floor level. At the exterior east side of the building, there was a small section of brick over the concrete stem wall.

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 garage space, so it could not be determined if the sheathing in the first floor was straight or diagonal sheathing.

Building Code: The building was constructed in 1911, prior to a building code being enacted.

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 architectural finishes. The wood around the door frame to the garage has degraded. The exterior patio and stair on the south side of the house appeared to be in need of maintenance. Metal brackets for the elevated wood walkway and stair were rusting in some places. The concrete stairs exiting the ground floor at the back of the house appeared to have moved over time under lateral soil pressure from the hillside behind the property. There is a water pipe exiting the back of the building and passing under the elevated wood walkway. The braces of the pipe were corroded and one was unattached to the structure. The vertical hanger for the pipe was also corroded, and unattached to the structure above.

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 of the building was inspected following the earthquake and no damage was observed. Based on the inspection, the house was determined safe or occupancy.

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 and south. The floor levels do not align with the adjacent buildings due to the steeply sloped site.
- The garage cripple walls were primarily sheathed with plaster and gypsum board, but they appeared to have straight sheathing where some of the plaster was missing. Based on the age of construction, it is assumed the anchor bolts for the sill plate are not adequate.

In a large earthquake, walls may be heavily damaged to the extent that the building leans on the adjacent building for stability. Since neighboring buildings do not possess reliable lateral force-resisting systems, there is some risk to gravity load 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	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 existing drawings exterior elevation (Figure 4) show a chimney, as does satellite imagery. During the site visit, 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 facilities maintenance technician also noted the water heaters were in the units and located within a closed off closet. Two gas-fueled furnaces were located in the basement garage space. Positive attachment could not be identified from the furnace to the structure; however, the units also appeared squat enough that overturning did not appear to be a concern. The furnaces had flexible connections with the gas line.

The garage partially functions as storage for cleaning products. None of the products appeared to pose a life safety concern if dislodged from the shelving unit.

[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.

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. 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 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 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 V.

Additional building data	Entry	Notes
Latitude	37.76396	
Longitude	-122.45970	
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)	3,089	
Risk Category per 2016 CBC 1604.5	II	
Building structural height, h_n	35 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	0.288 sec	Per ASCE 41-17 equation 4-4
Site data		
975 yr hazard parameters S_s, S_1	1.557,0.610	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}	1.847,0.854	UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)
S_a at building period	1.847	
Site V_{s30}	490 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: 1911	
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 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

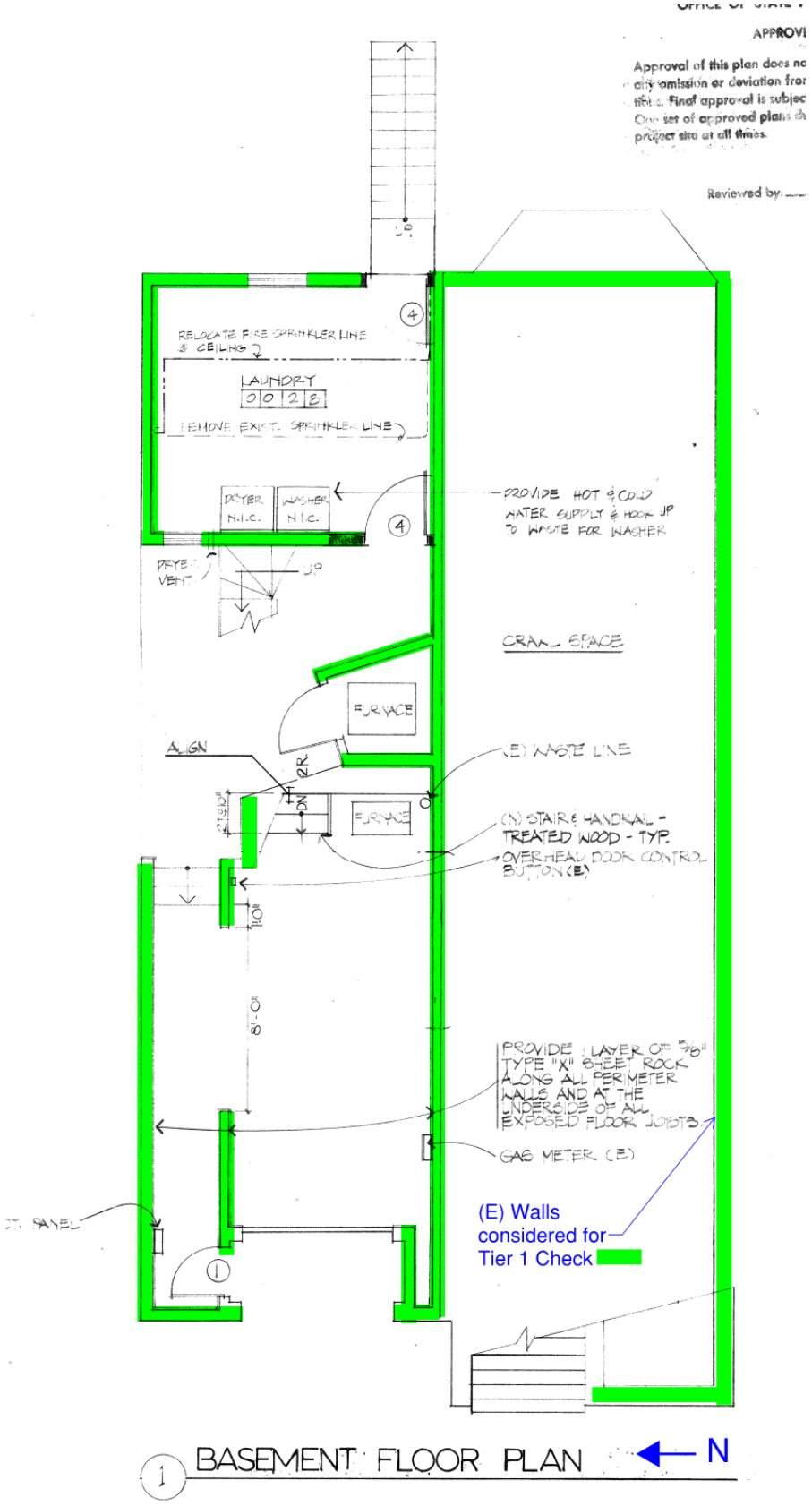


Figure 1 - Basement/Garage Floor Plan

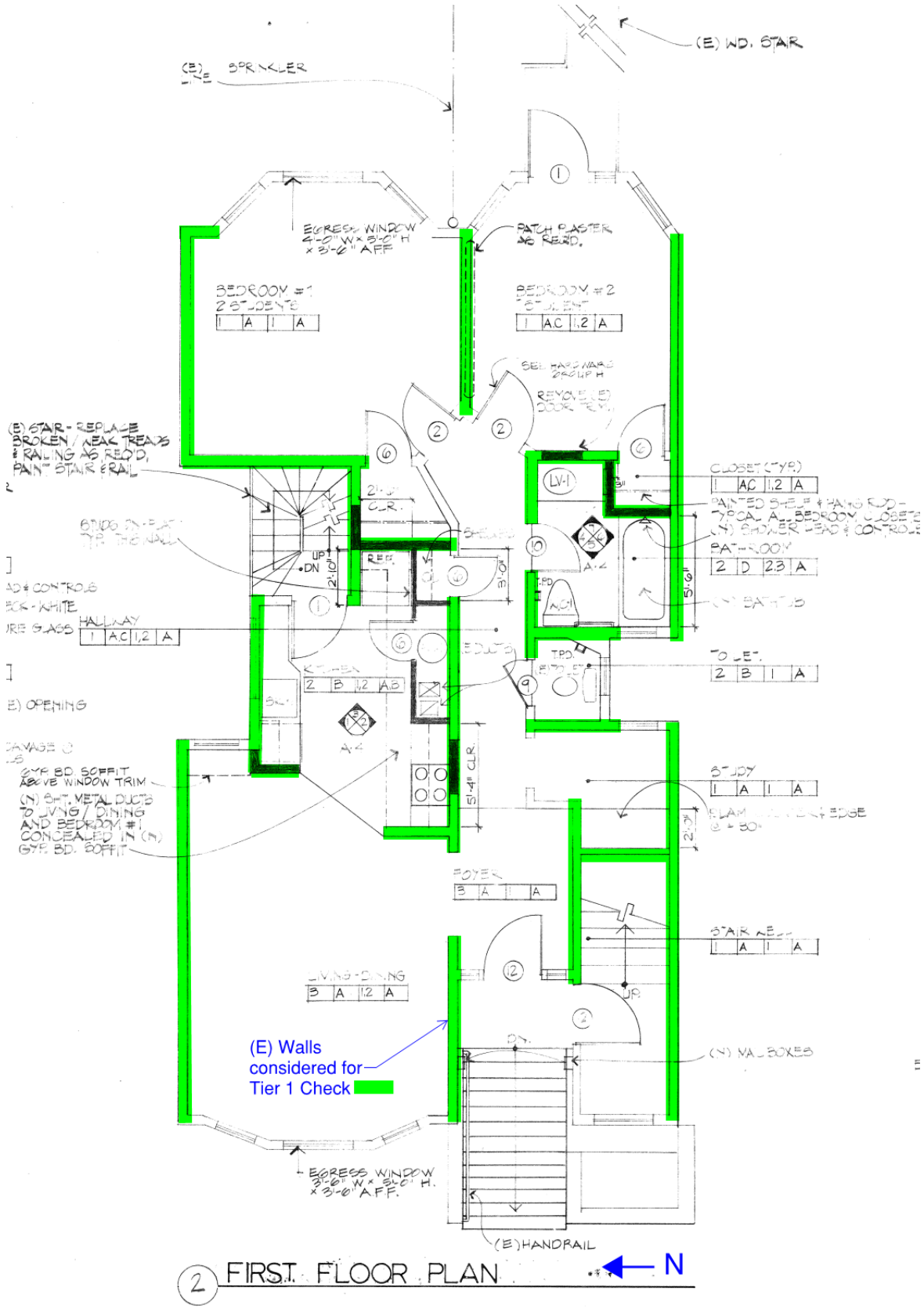


Figure 2 - First Floor Plan

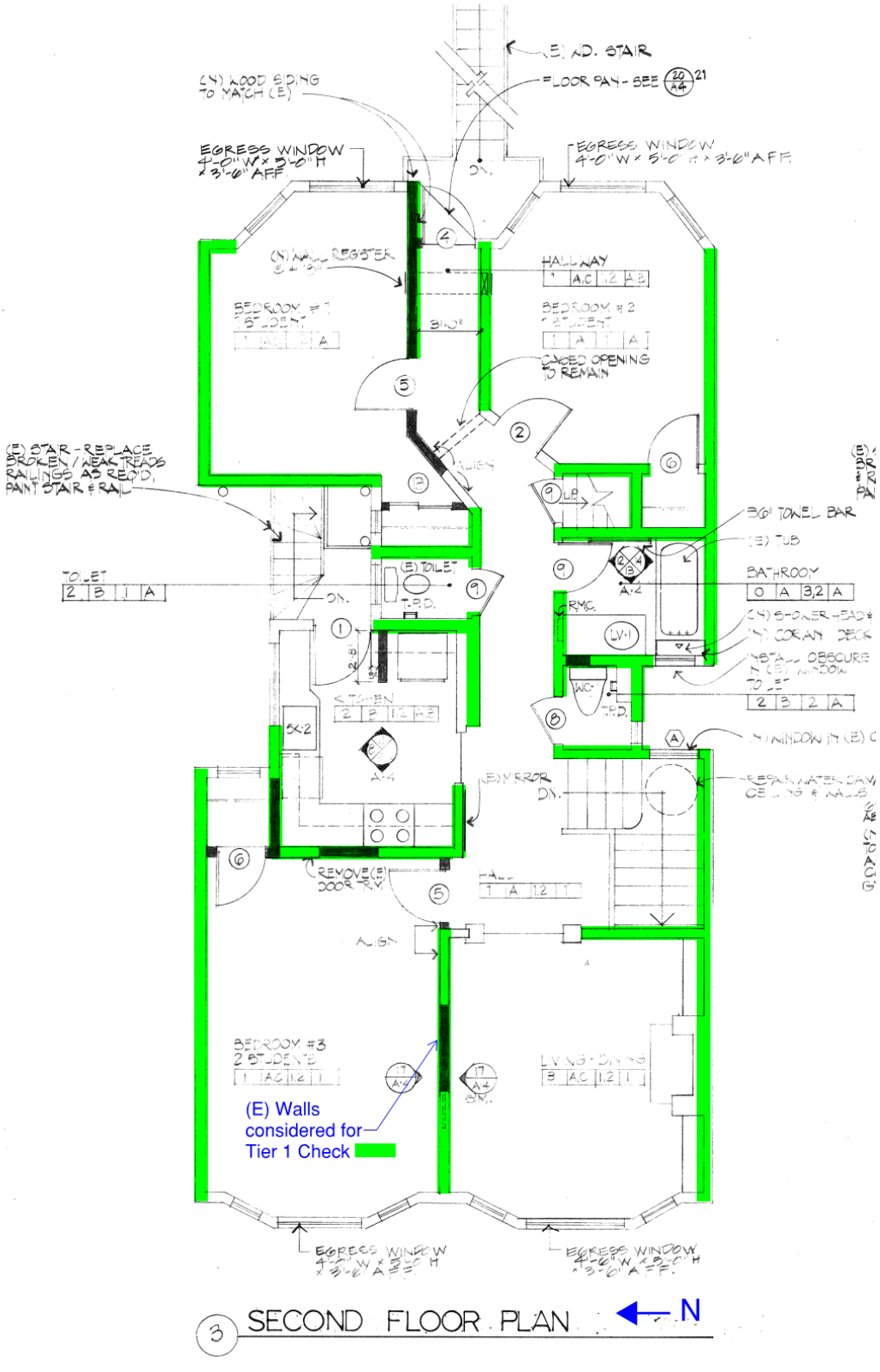


Figure 3 - Second Floor Plan

Figure 4 - Exterior Elevation (West Elevation)

Figure 5 - Wood Deterioration at Garage Door

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

Figure 7 - Cleaning Product Storage in Garage

Figure 8 - Gas Furnace in Garage

Figure 9 - Area of Brick Wall Over Concrete Stem Wall in Basement

Figure 10 - Unattached, Corroded Water Pipe Brace and Hanger

Figure 11 - Corrosion Observed at Elevated Wood Walkway

Figure 12 - Concrete Stem Wall on North Side of Building

Appendix B

ASCE 41- 17 Tier 1 Checklists (Structural)

UC Campus:	San Francisco			Date:	12/3/2019		
Building CAAN:	2003	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1322-24 3rd Avenue, San Francisco			Initials:	*ARK*	Checked:	*MTP*
Building Address:	1322-24 3rd 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 , with only a small 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 length of wall in the ground and first floors is 75% of the length of wall in the second story.
◉	○	○	○	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2) **Comments:**

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

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:**

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:**

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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

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 = 35 ft Base/Height = 0.71 < 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

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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:** Walls in the transverse and longitudinal direction do no pass the quick check stress check. At the ground floor the wall stresses in the quick check are 233 plf in the east-west direction and 739 plf in the north-south direction compared with the allowable 100 plf.
◉	○	○	○	STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1) **Comments:** No exterior walls are sheathed with stucco.
○	◉	○	○	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.
○	◉	○	○	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.

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:** While the street in which the structure is located slopes, it does not appear the change in elevation across the transverse direction of the building is greater than one-half story.
○	◉	○	○	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:** The ground floor front wall has significant openings for the garage door. There are no wood structural panels present.

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:** Wood post observed had positive connection to the foundation.
○	○	○	◉	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3) **Comments:** All 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.
◉	○	○	○	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:** Girders observed were positively connected to columns.

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:** All 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.

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:** Maximum Aspect Ratio = 50 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:** Existing 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.

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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:**

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:	12/3/2019		
Building CAAN:	2003	Auxiliary CAAN:		By Firm:	Estructure		
Building Name:	1322-24 3rd Avenue			Initials:	*ARK*	Checked:	*MTP*
Building Address:	1322-24 3rd 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:** The garage partially functions as storage for cleaning products. None of the products appeared to pose a life safety concern if dislodged from the shelving unit.
P ☐ N/A ☒	**Masonry chimneys** **Comments:** The existing drawings show a chimney in the building elevation, as does satellite imagery. During the site visit, 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 ☐ N/A ☒	**Unrestrained natural gas-fueled equipment such as water heaters, boilers, emergency generators, etc.** **Comments:** The facilities maintenance technician assisting with the site visit noted the water heaters were in the units and located within a closed off closet. Two gas fueled furnaces were located in the basement garage space. Positive attachment could not be identified from the furnace to the structure; however, the units also appeared squat enough that overturning did not appear to be a concern. The furnaces had flexible connections with the gas line.
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		4	*psf*	
MEP		0.5	*psf*	
Misc		0.5	*psf*	
Interior Walls		8	*psf*	*20 psf (2x4 studs w/ plaster ea side)*4.5ft*100ft/1150 ft²*
Exterior Walls		*8*	*psf*	*15 psf (2x4 studs w/ plaster + sheathing)*4.5ft*142ft/1150 ft²*
Total	$\sum$	**33**	**psf**	
Area	A_{roof}	1150	ft^2	
Seismic Weight	W_{R4}	**38**	**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		16	*psf*	*20 psf (2x4 studs w/ plaster ea side)*9ft*100ft/1150 ft²*
Exterior Walls		*17*	*psf*	*15 psf (2x4 studs w/ plaster + sheathing)*9ft*142ft/1150 ft²*
Total	$\sum$	**47**	**psf**	
Area	A_2	1150	*ft²*	
Seismic Weight	W_{typ}	**54**	**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		16	*psf*	*20 psf (2x4 studs w/ plaster ea side)*8ft*80ft/1150 ft²*
Exterior Walls		13	*psf*	*15 psf (2x4 studs w/ plaster + sheathing/brick veneer)*9ft*110ft/1150 ft²*
Subtotal	$\sum$	**43**	**psf**	
Area	A_1	1150	*ft²*	
Seismic Weight	W_{typ}	**49**	**kips**	

Earthquake	Site Parameters - UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019)		
BSE-C	S_s = 1.557	F_a = 1.2	S_{Cs} = 1.847
	S_1 = 0.61	F_v = 1.4	S_{C1} = 0.854

Building Period			
Empirical factor	C_t	0.02	*ASCE 41-17 Sec. 4.4.2.4*
Roof level height	h	35 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*		0.288 sec	

Calculate Base Shear				
Spectral Acceleration	$S_a = S_{X1} / T$ =	2.97		*ASCE 41-17, 4.4.2.3*
	$S_{a,max} = S_{XS}$ =	1.847	*governs*	*ASCE 41-17, 4.4.2.3*
Modification Factor	C =	1.00		*ASCE 41-17, Table 4-7*
Pseudo Seismic Force	$V = S_a \times C \times W$ =	1.85 W		*ASCE 41-17, Eqn. 4-1*
	V =	**260 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	38	35	1335	0.47	123	123
2nd	54	19.75	1058	0.37	97	220
1st	49	9	443	0.16	41	260
		0	0	0.00	0	260
∑	*141*	∑	*2836*	*1.00*	*260*	

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	123	134	4.5	203	200	N
1	220	139	4.5	351	200	N
Ground	260	143	4.5	405	200	N

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	123	60	4.5	454	200	N
1	220	45	4.5	1085	200	N
Ground	260	45	4.5	1285	200	N