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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No. 2995
EXP. 6/30/20
STRUCTURAL
STATE OF CALIFORNIA

4/8/2020

**UCSF Building Seismic Ratings**

# 1472-74 5TH AVENUE

CAAN #2029
1472-74 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<br>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 by Edward L. Muffeny & Associates, "1474/80 5th Avenue San Francisco, CA," dated 16 January 1987 (3 sheets)
- Architectural Drawings by Mathau / Roche Design Group, "1472-74 5th Avenue Alterations," dated 28 February 1992 (13 sheets)
- Structural Drawings by Thad Povey, "1472-74 5th Avenue Alterations," dated 28 February 1992 (2 sheets) (Note to our knowledge, this work was not completed)
- Structural Drawings by Butzbach Structural Engineering, "Internal Modifications & General Repairs to 1472, 1474, 1478, & 1480 5th Avenue," dated 13 May 1994 (2 sheets)
- Architectural Drawing by UCSF Facilities, "1474 Fifth Avenue Campus Housing Remodel," dated 21 June 2010 (1 sheet)

**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 and basement were observed.

**Brief description of structure**

The building functions as graduate student housing and facilities storage. It was reportedly built in 1922 as a duplex home. There are two apartments over a basement with garage. The main floor plate is approximately 29 ft north-south by 60 ft east-west. A voluntary seismic retrofit of the ground floor was completed based on the 1994 design according to a conversation with Tom Butzbach on December 13, 2019.

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 11'-0") consists of a garage, utility space, laundry, and UCSF facilities storage. The first floor (approximately 10'-0") consists of a four-bedroom, two-bath apartment with a kitchen and living room. The second floor (approximately 10'-0") consists of a three-bedroom, two-bath apartment with a kitchen and living room. 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 basement level. Posts beared 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 first floor sheathing was not visible. The basement walls are all sheathed on both sides. It our understanding the 1994 retrofit design was completed and the 1992 design was not. Structural work was only done at the basement. Work consisted of installing new plywood sheathing, anchor bolts, and sill blocking to much of the basement walls. Gyp board was installed over all plywood sheathing, so plywood sheathing could not be observed or confirmed. The structural drawings call for 15/32" CDX with 10d nails at 4" on center edge nailing and 10d nails at 12" on center at intermediate supports.

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. The 1994 retrofit was per the 1991 Uniform Building Code with 1992 California Building Code Amendments.

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 slab in the basement was in good condition. No cracks in the exterior stucco were found.

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. The following was observed: cracks in vertical riser of steps, plaster cracks in east wall of east bedroom of 1474, and interior wall cracks at expansion joint between 1472 and 1474

**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 at the first floor in either direction or the second floor in the transverse direction.
- 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 only approximately 2-1/2" to the south.
- Because the basement has been retrofitted, it is expected to have good seismic performance.

| 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]

There is an approximately 2-foot tall roof parapet. Along the front wall it is covered in stucco. It may not be braced or detailed to preclude falling.

The basement storage includes multiple flammable storage cabinets that may not be restrained. A container of Noxon Metal Polish, which is a flammable liquid, was observed on an open shelf, outside of the storage cabinet. Several cleaning products were also stored on open shelves.

There are fireplaces on the first and second floor, but it is assumed they have been closed off, like other buildings. No chimney could be seen.

Access to the utility space was unavailable. It is unknown if the water heaters are braced or not.

[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 | Observed In Basement |
| 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. | Unknown |

**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 at the first floor in both directions and the second floor in the transverse direction. 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 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 January 8, 2020 and are unanimous that the rating is V.

| Additional building data | Entry | Notes |
|---|---|---|
| Latitude | 37.76103 | |
| Longitude | -122.46167 | |
| 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) | 4,138 | |
| Risk Category per 2016 CBC 1604.5 | II | |
| Building structural height, $h_n$ | 31 ft | Structural height defined per ASCE 7-16 Section 11.2 |
| Coefficient for period, $C_t$ | 0.02 | Per ASCE 41-17 equation 4-4 |
| Coefficient for period, $\beta$ | 0.75 | Per ASCE 41-17 equation 4-4 |
| Estimated fundamental period | 0.263 sec | Per ASCE 41-17 equation 4-4 |
| **Site data** | | |
| 975 yr hazard parameters $S_s$, $S_1$ | 1.564, 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 $S_{cs}$, $S_{c1}$ | 1.877, 0.865 | UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019) |
| $S_a$ at building period | 1.877 | |
| 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 | 1988 UBC | Partial Retrofit |
| 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

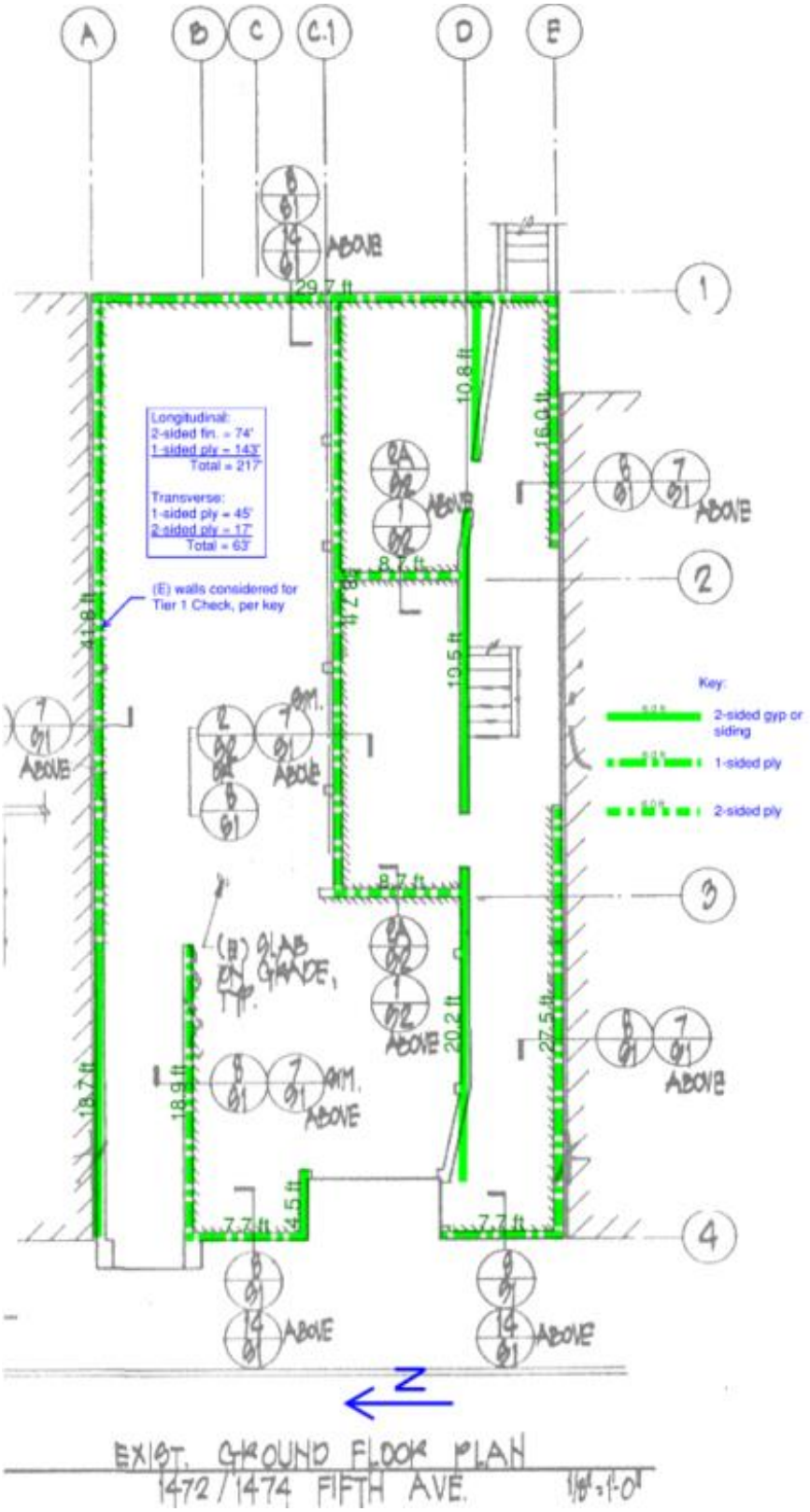


**Figure 1 - Basement/Garage Floor Plan**

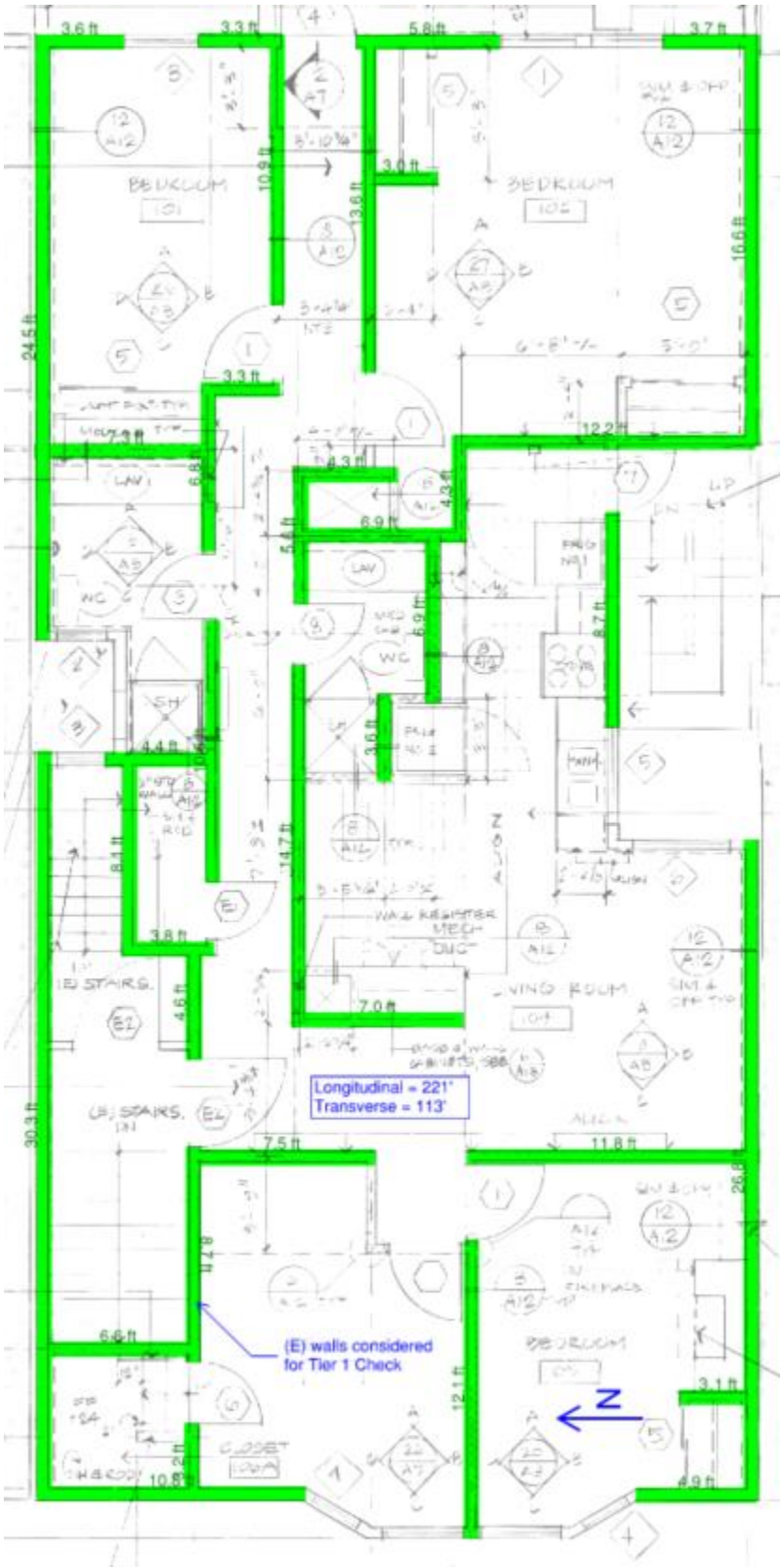


**Figure 2 - First Floor Plan**

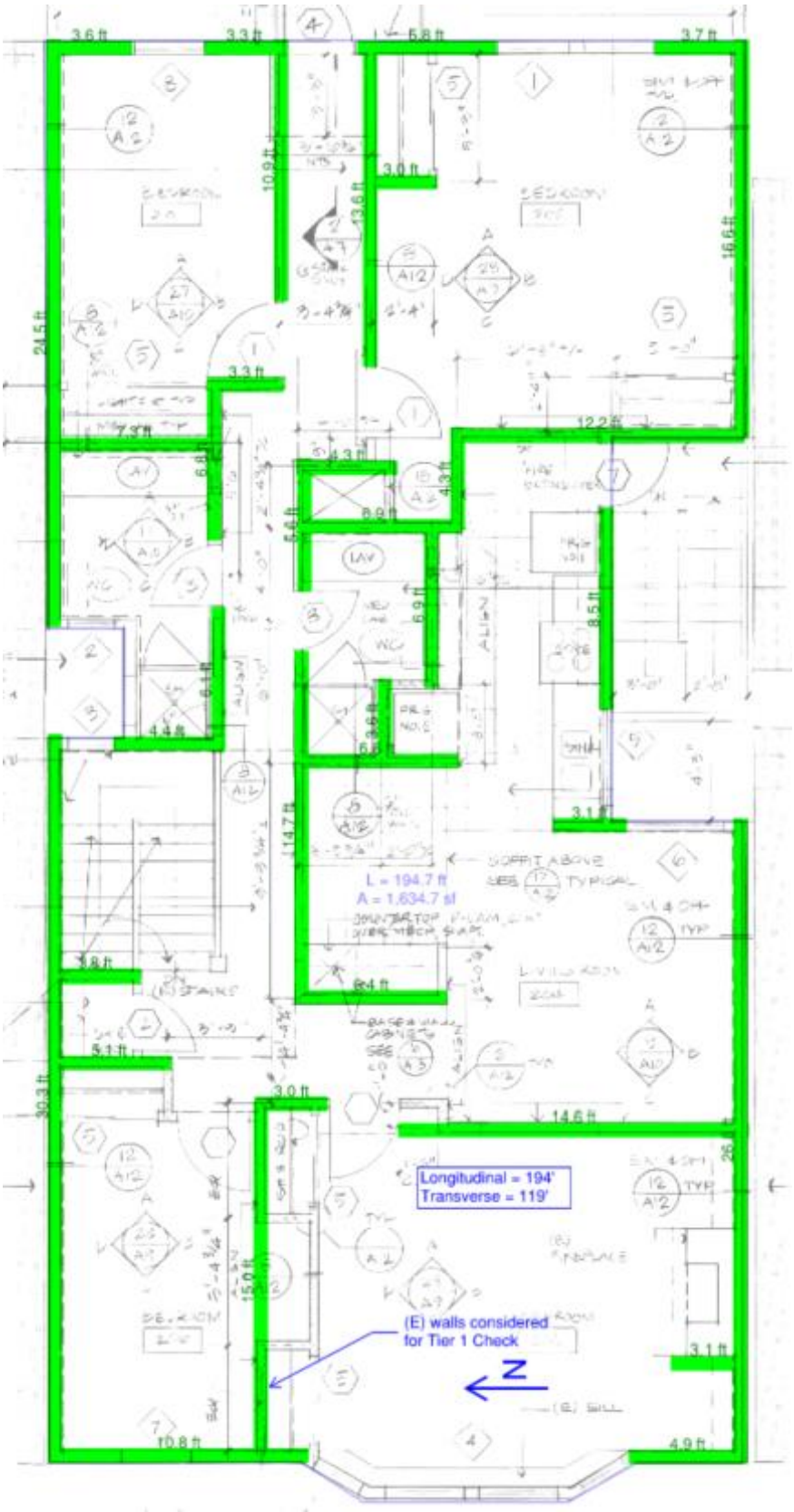


**Figure 3 - Second Floor Plan**

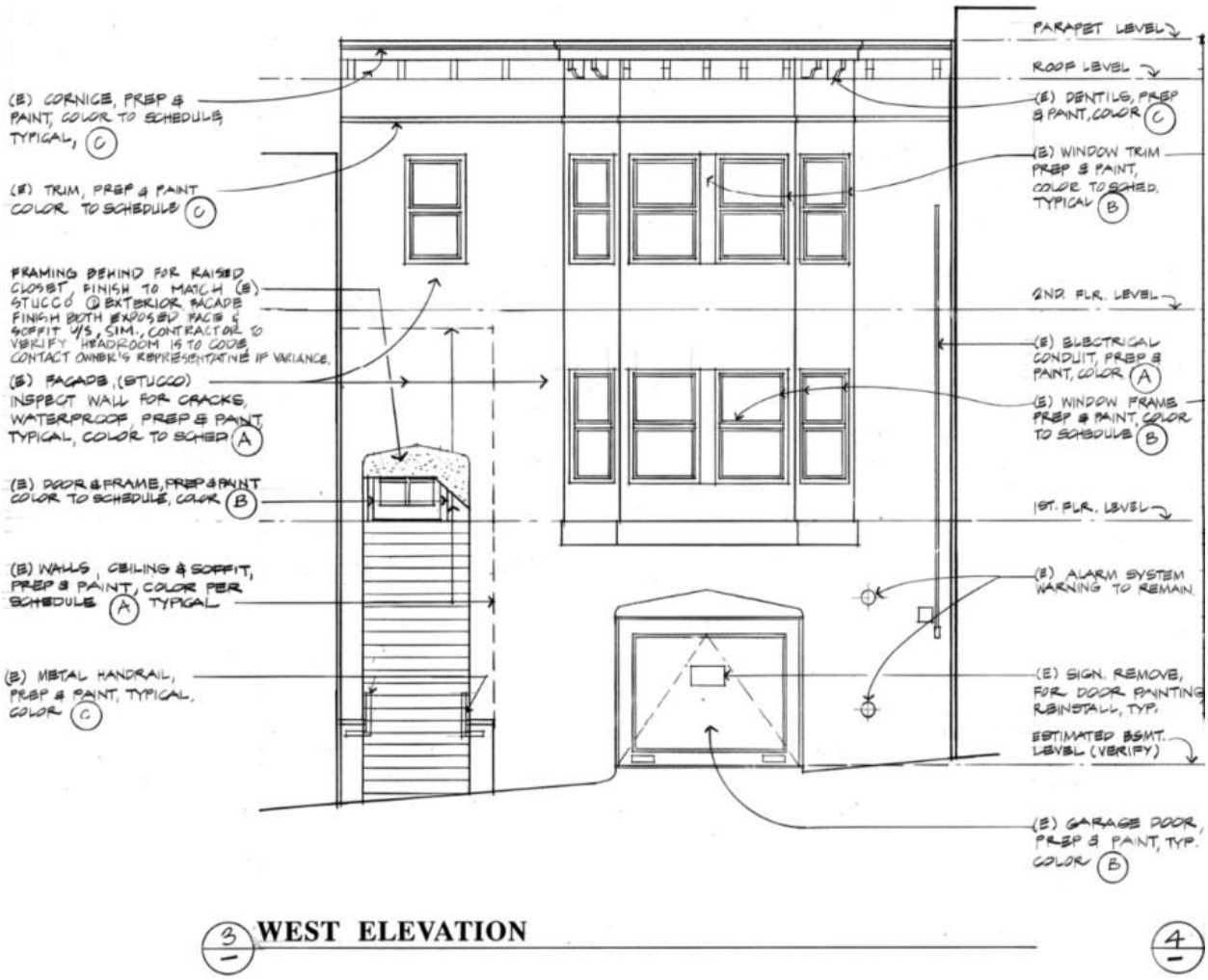


**Figure 4 - Exterior Elevation (West Elevation)**

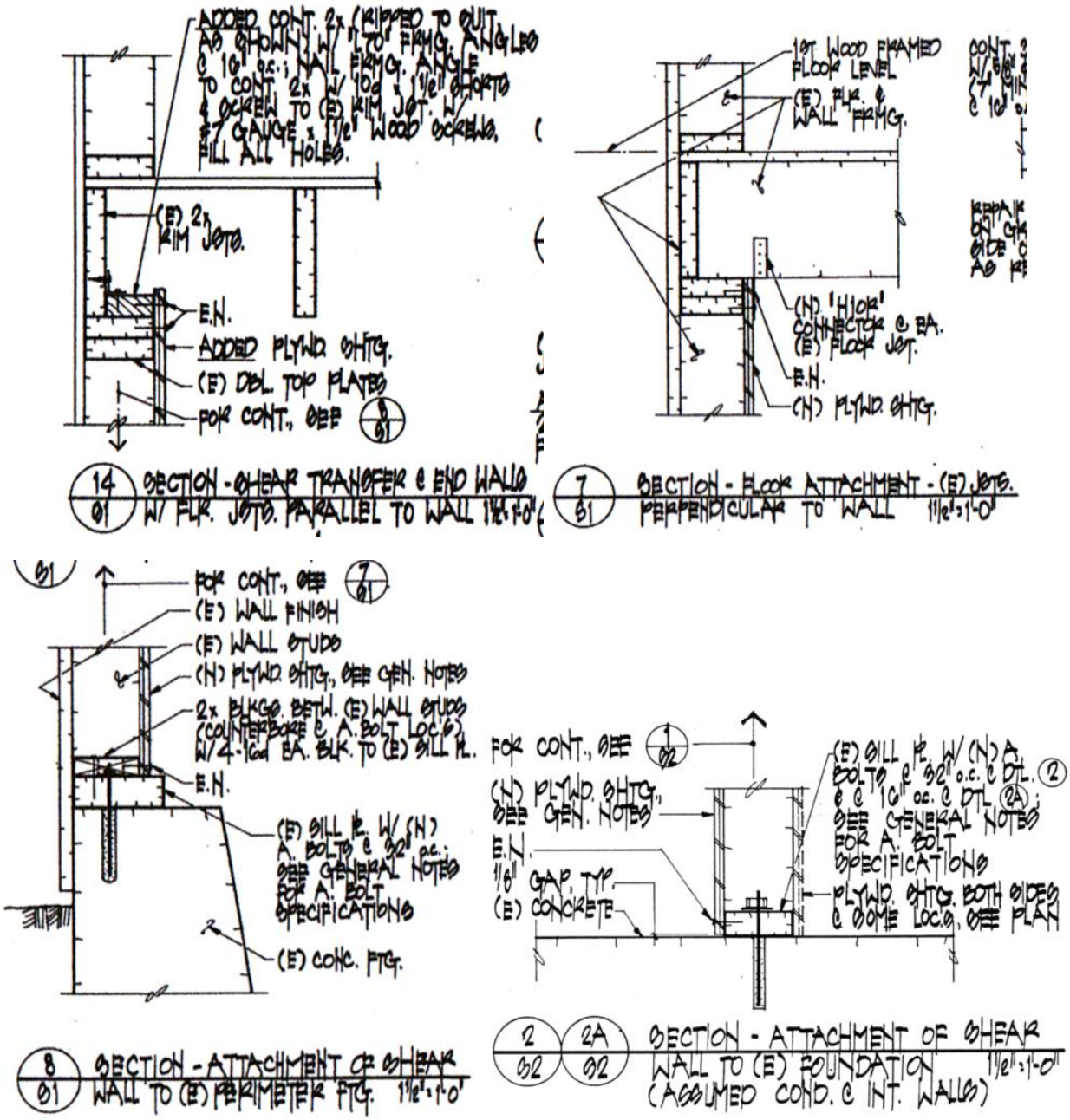


**Figure 5 – Selected Structural Retrofit Details (1994 drawings)**

**Figure 6 – Basement Laundry Room**


**Figure 7 - Flammable Material Storage in Garage**


**Figure 8 – Cleaning Supplies Storage in Garage**

**Figure 9 – Underside of Main Entry Stairs**

**Figure 10 – Base of Concealed Post**

# Appendix B

## ASCE 41- 17 Tier 1 Checklists (Structural)

| UC Campus: | San Francisco | | | Date: | 1/5/2020 | | |
|---|---|---|---|---|---|---|---|
| Building CAAN: | 2029 | Auxiliary CAAN: | | By Firm: | Estructure | | |
| Building Name: | 1472-74 5th Avenue | | | Initials: | *AJS* | Checked: | *MTP* |
| Building Address: | 1472-74 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)<br>**Comments:**<br>Based on the age of construction, it is presumed detailing does not provide transfer of forces between walls and 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)<br>**Comments:**<br>Building to the south is built close 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)<br>**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)<br>**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)<br>**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)<br>**Comments:**<br>Some walls are discontinuous between the ground and first story. |

**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)<br>**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)<br>**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)<br>**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)<br>**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)<br>**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)<br>**Comments:** |

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

| UC Campus: | San Francisco | | | Date: | 1/5/2020 | | |
|---|---|---|---|---|---|---|---|
| Building CAAN: | 2029 | Auxiliary CAAN: | | By Firm: | Estructure | | |
| Building Name: | 1472-74 5th Avenue | | | Initials: | *AJS* | Checked: | *MTP* |
| Building Address: | 1472-74 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)<br>**Comments:**<br>0.6 Sa = 0.6 * 1.877 = 1.126<br>Base = 29 ft; height = 31 ft<br>Base/Height = 0.935 < 1.126 |
| ○ | ○ | ◉ | ○ | 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)<br>**Comments:**<br>Site class C. |

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

| UC Campus: | San Francisco | | | Date: | 1/5/2020 | | |
|---|---|---|---|---|---|---|---|
| Building CAAN: | 2029 | Auxiliary CAAN: | | By Firm: | Estructure | | |
| Building Name: | 1472-74 5th Avenue | | | Initials: | *AJS* | Checked: | *MTP* |
| Building Address: | 1472-74 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

| 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)<br>**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)<br>Structural panel sheathing: 1,000 lb/ft (14.6 kN/m)<br>Diagonal sheathing: 700 lb/ft (10.2 kN/m)<br>Straight sheathing: 100 lb/ft (1.5 kN/m)<br>All other conditions: 100 lb/ft (1.5 kN/m)<br>**Comments:**<br>Walls at the first floor do not pass the quick check in either direction. Transverse walls at the second floor also do not pass the quick check. At the first floor, the wall stresses in the quick check are 279 plf in the east-west direction and 545 plf in the north-south direction compared with the allowable 200 plf. 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)<br>**Comments:**<br>The front wall is stucco and was considered in the quick check calculation. |
| ○ | ● | ○ | ○ | 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)<br>**Comments:**<br>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)<br>**Comments:**<br>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)<br>**Comments:**<br>Existing drawings showing wall details are not provided but it is presumed there are no ties between floors to transfer load between floors at the upper 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)<br>**Comments:**<br>While the site slopes down to the northwest, 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)<br>**Comments:**<br>Although not visible, it is our understanding that the basement cripple walls were sheathed with wood structural panels based on the 1994 drawings and confirmed by the engineer of record, Tom Butzback. |
| ● | ○ | ○ | ○ | 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)<br>**Comments:**<br>Wood structural panel shear walls with aspect ratios of 1.4-to-1 (11 ft-to-7.7 ft) are present each side of the garage door. Additionally, garage door opening is approximately 8 feet wide, or 28% of the 29-foot long wall. |

## 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)<br>**Comments:**<br>All posts were concealed by finishes. |
| ● | ○ | ○ | ○ | WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)<br>**Comments:**<br>All wood sills in the basement space were concealed. However, anchor bolts were to be added per the 1994 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)<br>**Comments:**<br>All posts were concealed by finishes. |

# 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)<br>**Comments:**<br>All wood sills in the basement space were concealed. However, anchor bolts were to be added per the 1994 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)<br>**Comments**<br>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)<br>**Comments:**<br>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)<br>**Comments:**<br>First floor sheathing type is unknown, although walls are distributed throughout such that diaphragms have aspect ratios below 2-to-1. |
| ● | ○ | ○ | ○ | 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)<br>**Comments:**<br>First floor sheathing type is unknown, but no 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)<br>**Comments:**<br>All diaphragms span less than 40 ft. |

| UC Campus: | San Francisco | | | Date: | 1/5/2020 | | |
|---|---|---|---|---|---|---|---|
| Building CAAN: | 2029 | Auxiliary CAAN: | | By Firm: | Estructure | | |
| Building Name: | 1472-74 5th Avenue | | | Initials: | *AJS* | Checked: | *MTP* |
| Building Address: | 1472-74 5th Avenue, San Francisco, CA 94122 | | | Page: | 4 | of | 4 |

# 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)<br><br>**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: | 1/5/2020 | | |
|---|---|---|---|---|---|---|---|
| Building CAAN: | 2029 | Auxiliary CAAN: | | By Firm: | Estructure | | |
| Building Name: | 1472-74 5th Avenue | | | Initials: | *AJS* | Checked: | *MTP* |
| Building Address: | 1472-74 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)**<br>**Comments:** |
| P ☐ N/A ☒ | **Heavy masonry or stone veneer above exit ways or public access areas**<br>**Comments:** |
| P ☐ N/A ☒ | **Unbraced masonry parapets, cornices, or other ornamentation above exit ways or public access areas**<br>**Comments:** |
| P ☒ N/A ☐ | **Unrestrained hazardous material storage**<br>**Comments:** The basement storage includes multiple flammable storage cabinets that may not be restrained. A container of Noxon Metal Polish, which is a flammable liquid, was observed on an open shelf, outside of the storage cabinet. Several cleaning products were also stored on open shelves. |
| P ☐ N/A ☒ | **Masonry chimneys**<br>**Comments:** No chimney could be seen. |
| P ☐ N/A ☒ | **Unrestrained natural gas-fueled equipment such as water heaters, boilers, emergency generators, etc.**<br>**Comments:** Access to the utility space was unavailable. It is unknown if the water heaters are braced or not. |
| P ☐ N/A ☐ | **Other:**<br>**Comments:** |
| P ☐ N/A ☐ | **Other:**<br>**Comments:** |
| P ☐ N/A ☐ | **Other:**<br>**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 | 1,635 | *ft²* | |
| | Wt | **44.15** | ***kips*** | |
| *Exterior Wall - Wood* | p | 10 | *psf* | |
| | $h_{trib}$ | 5 | *ft* | *Half approximate floor height* |
| | L | 195 | *ft* | |
| | Wt | **10.00** | ***kips*** | |
| *Exterior Wall - Stucco* | p | 8 | *psf* | |
| | $h_{trib}$ | 7 | *ft* | *Half approximate floor height + 2 foot parapet* |
| | L | 29 | *ft* | *Along front wall only* |
| | Wt | **1.62** | ***kips*** | |
| **Seismic Weight** | $\Sigma W_{typ}$ | **56** | **kips** | |

| Level 2 | | | | |
|---|---|---|---|---|
| *Floor Assembly* | p | 24 | *psf* | |
| | A | 1,635 | *ft²* | |
| | Wt | **39.65** | ***kips*** | |
| *Deck Assembly* | p | 13 | *psf* | |
| | A | 122 | *ft* | *Approximate floor height* |
| | Wt | **1.54** | ***kips*** | |
| *Exterior Wall - Wood* | p | 10 | *psf* | |
| | $h_{trib}$ | 10 | *ft* | *Approximate floor height* |
| | L | 195 | *ft* | |
| | Wt | **20.00** | ***kips*** | |
| *Exterior Wall - Stucco* | p | 8 | *psf* | |
| | $h_{trib}$ | 10 | *ft* | *Approximate floor height* |
| | L | 29 | *ft* | *Along front wall only* |
| | Wt | **2.32** | ***kips*** | |
| **Seismic Weight** | $\Sigma W_{typ}$ | **63** | **kips** | |

| Level 1 | | | | |
|---|---|---|---|---|
| *Floor Assembly* | p | 24 | *psf* | |
| | A | 1,635 | $ft^2$ | |
| | Wt | **39.65** | ***kips*** | |
| *Exterior Wall - Wood* | p | 10 | *psf* | |
| | $h_{trib}$ | 10 | *ft* | *Approximate floor height* |
| | L | 195 | *ft* | |
| | Wt | **20.00** | ***kips*** | |
| *Exterior Wall - Stucco* | p | 8 | *psf* | |
| | $h_{trib}$ | 5 | *ft* | *Half approximate floor height* |
| | L | 29 | *ft* | *Along front wall only* |
| | Wt | **1.16** | ***kips*** | |
| **Seismic Weight** | $\Sigma W_{typ}$ | **61** | **kips** | |

| Earthquake | Site Parameters - UCSF Group 3 Buildings – Tier 1 Geotechnical Assessment, Egan (2019) | | |
|---|---|---|---|
| BSE-C | $S_s$ = 1.564 | $F_a$ = 1.2 | $S_{Cs}$ = 1.877 |
| | $S_1$ = 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 | 31 | ft | *ASCE 7-18, 11.2* |
| Empirical factor | β | 0.75 | | *ASCE 41-17 Sec. 4.4.2.4* |
| Fundamental period, $T= C_t h_n^{\beta}$ = | | 0.263 | sec | *ASCE 41-17 Sec. 4.4.2.4 eqn. 4-4* |

| Calculate Base Shear | | | | |
|---|---|---|---|---|
| Spectral Acceleration | $S_a = S_{X1} / T$ = | 3.29 | | *ASCE 41-17, 4.4.2.3* |
| | $S_{a,max} = S_{XS}$ = | 1.8768 | *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 =** | **338** | **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 | 56 | 31.00 | 1729 | 0.46 | 157 | 157 |
| 2nd | 63 | 21.00 | 1333 | 0.36 | 121 | 277 |
| 1st | 61 | 11.00 | 669 | 0.18 | 61 | 338 |
| ∑ | *180* | ∑ | *3731* | *1.00* | *338* | |

| 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 | 157 | 194 | 4.5 | 179 | 200 | Y | -- |
| 1 | 277 | 221 | 4.5 | 279 | 200 | N | 114% |
| Ground | 338 | 217 | 4.5 | 346 | 727 [2] | Y | 357% |

| 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 | 157 | 119 | 4.5 | 292 | 200 | N | -- |
| 1 | 277 | 113 | 4.5 | 545 | 200 | N | 95% |
| Ground | 338 | 62 | 4.5 | 1,211 | 1,274 [2] | Y | 350% |

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) |
|---|---|---|---|---|
| 2-sided fin. | 200 | | 74 | 14,800 |
| 1-sided ply | 1,000 | | 143 | 143,000 |
| | | Σ | 217 | 157,800 |
| | | | ΣCapacity / ΣLength = | 727 plf |

Weighted Ground Floor Capacity, Transverse

| Assembly | Capacity (plf) | | Length (ft) | Capacity (lbs) |
|---|---|---|---|---|
| 1-sided ply | 1,000 | | 45 | 45,000 |
| 2-sided ply | 2,000 | | 17 | 34,000 |
| | | Σ | 62 | 79,000 |
| | | | ΣCapacity / ΣLength = | 1,274 plf |