Rating form completed by: Simpson Gumpertz & Heger
JFE, KDP, KSM
Peer reviewed by: **UCSF Seismic Review Committee**

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

Date: 2019-09-04

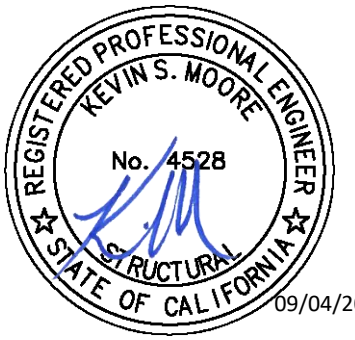
UCSF Building Seismic Ratings

Environmental Health & Safety Building

CAAN# 2414

50 Medical Center Way, San Francisco, CA 94133

UCSF Campus Site: *Parnassus*



09/04/2019

Rating summary	Entry	Notes
UC Seismic Performance Level (rating)	V	Findings based on a 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	B	Priority A=Retrofit ASAP Priority B=Retrofit at next permit application for modification
Ballpark total project cost to retrofit to IV rating	Medium ($50 - $200/sf)	See recommendations on further evaluation and retrofit
Is 2018-2019 rating required by UCOP?	Yes	Building does not have a fully documented quantifiable review
Further evaluation recommended?	None	

Building information used in this evaluation

- Structural Drawings – *Modular Building I*, Graham & Hayes Structural Engineers, Sheets S-1, S-2, and S-3, dated January 1971.
- Architectural Drawings – *Student Services Building Relocation*, Hugh O'Neil Company Structural Engineers and Architects, Sheets AA1, AA2, AA3, AA4, AA5, and AA6, dated 14 April 1987.

[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.

- Construction Drawings – *Incinerator Parking Area*, Sheets 1, 2, dated 16 May 1960.

Scope for completing this form

Reviewed structural construction drawings and performed an ASCE 41-17 Tier 1 evaluation. Made a visit to the building and verified that structural configuration generally matched the drawings. Observed no nonstructural life-safety hazards inside the building.

Brief Description of Structure

The Environmental Health & Safety (EH&S) building comprises approximately 6,100 sq ft in a two-story modular wood building. The building was relocated to its current foundation in 1987.

Identification of Levels: The building is sited on a hillside, within a hairpin turn of Medical Center Way. The building is founded on a flat site created by a tall concrete retaining wall along the north elevation. The highest occupiable level is termed "Street Floor" accessible via stairs, with the "First Floor" slightly below street level on the south side of the building. A crawl space is located below the First Floor. Exterior walls are supported on a 3-foot cripple wall, supported on concrete foundations.

Foundation System: The foundation comprises perimeter reinforced concrete grade beams and interior column footings. The grade beams bear directly on soil on the east, west, and south. The north side grade beam is supported on seven 18 ft deep, 18 in. diameter piers. Interior column footings, 44 in. square and 14 in. deep, run East to West in two lines.

Structural system for vertical (Gravity) Load: Wood trusses and joists are spaced at 4 ft on-center at the roof and 2 ft on-center at Street Floor and First Floor. Plywood floor sheathing spans between trusses or joists. The roof trusses are braced by 2x8 continuous bridging at midspan. Perimeter stud walls comprise 2x4 studs spaced at 16 in. on center and interior columns (4x6 for roof, 6x6 for Street and First levels) support horizontal floor framing. Non-load-bearing partition walls demarcate interior spaces and comprise 2x4 studs at 16 in. on center with 1/2 in. gypsum board.

Structural System for Lateral Forces: The lateral load-resisting system comprises exterior plywood shear walls in each direction. All perimeter walls are also sheathed with 1/2 in. gypsum on the interior and 5/8-in. plywood on the exterior. Walls are blocked with 10d edge nails at 4 in. on center and 12 in. in the field. The wall sills are anchored to the foundation with 3/4 in. anchor rods every 3 ft. Each level's diaphragm comprises 3/4 in. plywood with 10d nails at 6 in. on center at the supported edges and 12 in. on center in the field. The roof and floor diaphragms are blocked.

Brief description of seismic deficiencies and Expected Seismic Performance

Identified seismic deficiencies of the building include the following:

- Plywood walls at the First floor and cripple wall are inadequate in both N-S (DCRs = 1.3, 1.1) and E-W directions (DCRs = 1.3, 1.2).
- Aspect ratio of most shear walls is 3:1, greater than the 2:1 limit.
- Hold downs are not detailed at plywood shear wall ends.
- Exterior emergency egress stair details rely on nails and cross-grain bending in the ledgers.
- Roof chords are not continuous. Top plates are discontinuous between trusses without obvious splice detail.
- The diaphragm spans at the roof, Street and First levels are 51 ft (N-S and 60 ft (E-W), longer than the limit of 40 ft.

- The foundation is supported by soil retained by a lightly reinforced concrete retaining wall that was not originally designed for building loads or seismic increment soil loads (induced by ground shaking).

This building is expected to sustain damage during a seismic event, but collapse is not anticipated. Damage is likely attributable to the high aspect ratio of walls combined with DCRs greater than one. Emergency egress stair connections, foundation anchorage, retaining wall behavior/capacity and a history of wood deterioration repaired within the last 15 years all contribute to potentially undesirable performance. Further investigation, both physical and analytical, may support a higher rating.

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	N	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 nonstructural life-safety concerns, including at exit routes

An assessment of the nonstructural systems is based on visual observation of the building interior. No life safety hazards due to nonstructural systems was observed.

Building type does not contain conditions identified below.

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 extant	Unrestrained hazardous materials storage	None observed
Heavy masonry or stone veneer above exit ways and public access areas	None extant	Masonry chimneys	None observed
Unbraced masonry parapets, cornices or other ornamentation above exit ways and public access areas	Not applicable	Unrestrained natural gas-fueled equipment such as water heaters, boilers, emergency generators, etc.	None observed

Basis of seismic performance level rating

The building rating of V can be attributed to a lack of wall hold down hardware, walls with high aspect ratios, poor connection of emergency egress stairs, uncertain retaining wall behavior and foundation anchorage. Lack of hold downs notwithstanding, there is an adequate load path transferring diaphragm forces to shear walls to foundation anchorage, which may be of concern, but could be investigated further.

Recommendations for further evaluation or retrofit

We recommend that the University consider the rating in the context of the minimal quantification provided by a Tier 1 evaluation. We recommend that any retrofit would include added plywood nailing and hold down installation on shear wall panels.

Peer review comments on rating

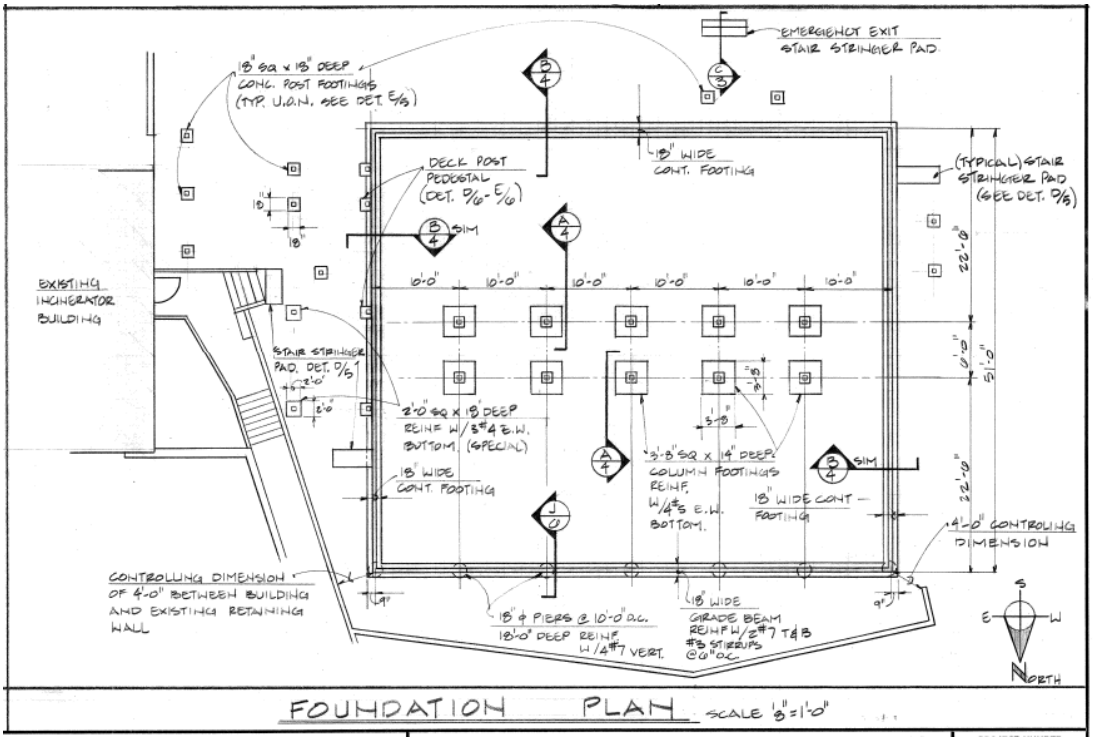
The structural members of the UCSF Seismic Review Committee (SRC) reviewed the evaluation on 4 September 2019 and agree that the rating is V. The SRC agrees that further study is not necessary for this building.

Additional building data	Entry	Notes
Latitude	37.7617°	
Longitude	-122.4591°	
Are there other structures besides this one under the same CAAN#	No	
Number of stories above lowest perimeter grade	2	
Number of stories (basements) below lowest perimeter grade	0	Crawlspace
Building occupiable area (OGSF)	6,120	From UCOP spreadsheet
Risk Category per 2016 CBC 1604.5	II	
Building structural height, h_n	24.5 ft	As defined per ASCE 7-16 Section 11.2
Coefficient for period, C_t	0.02	ASCE 41-17 equation 4-4 and 7-18
Coefficient for period, [?]	0.75	ASCE 41-17 equation 4-4 and 7-18
Estimated fundamental period	0.22 sec	ASCE 41-17 equation 4-4 and 7-18
Site data		
975 yr hazard parameters S_s, S_1	1.549, 0.626	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
Site class	C	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
Site class basis	Assumed	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
Site parameters F_a, F_v	1.2, 1.4	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
Ground motion parameters S_{cs}, S_{c1}	1.842, 0.847	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
S_a at building period	1.842	Calculated

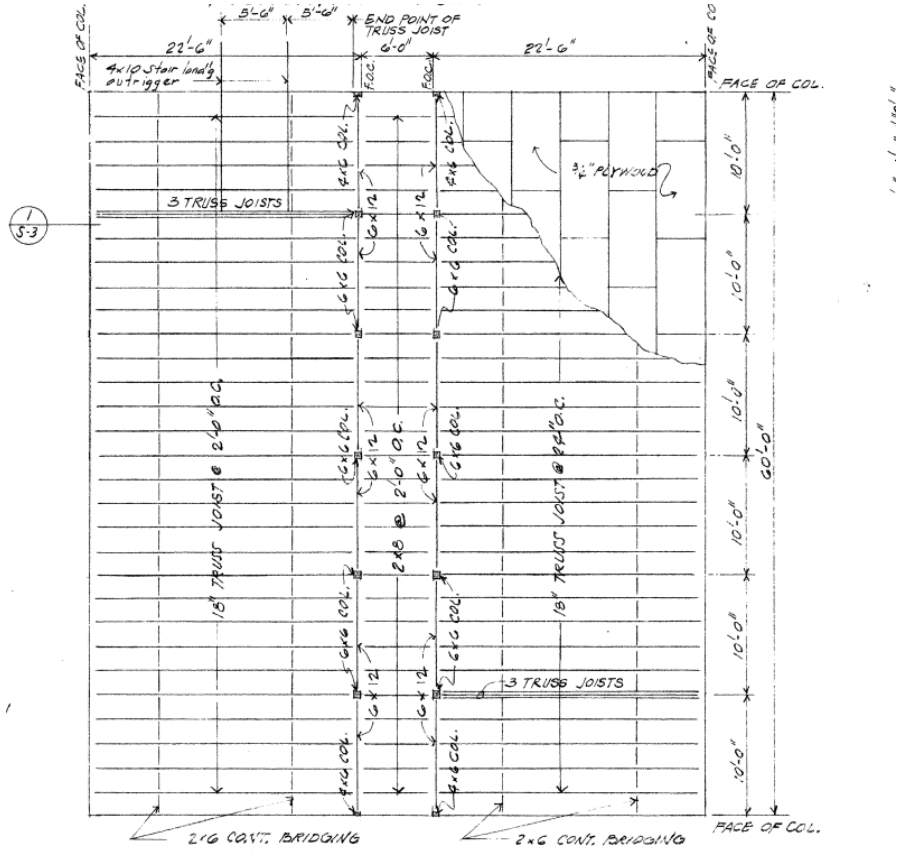
Additional building data	Entry	Notes
Site V_{s30}	730 m/s	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
V_{s30} basis	Estimated	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
Liquefaction potential	No	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
Liquefaction assessment basis	Estimated	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
Landslide potential	No	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
Landslide assessment basis	Sloped Site	Rutherford + Chekene Study, 2006
Active fault-rupture hazard identified at site?	No	UCSF Group 3 Buildings, Geotechnical Characteristic and Geohazards (2019)
Site-specific ground motion study?	No	
Applicable code		
Applicable code or approx. date of original construction	Drawings Dated: 1971, 1987 (for relocation)	
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 frame with shear walls
Model building type East-West	W1	Wood light frame with shear walls
FEMA P-154 score	N/A	Not included here because we performed ASCE 41 Tier 1 evaluation.
Previous ratings		
Most recent rating	None	
Date of most recent rating	-	
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

Drawing Images

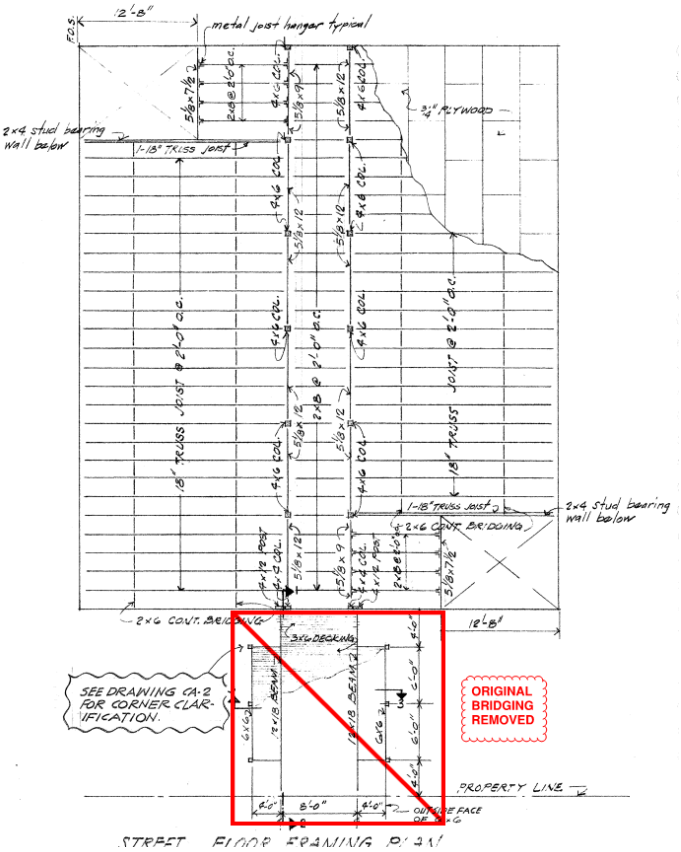


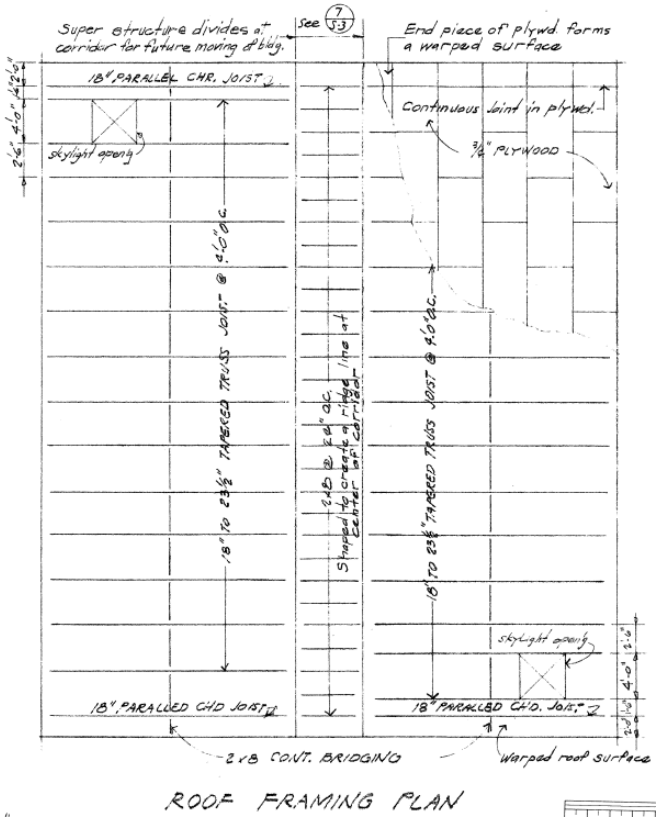
FOUNDATION PLAN SCALE 1/8"=1'-0"

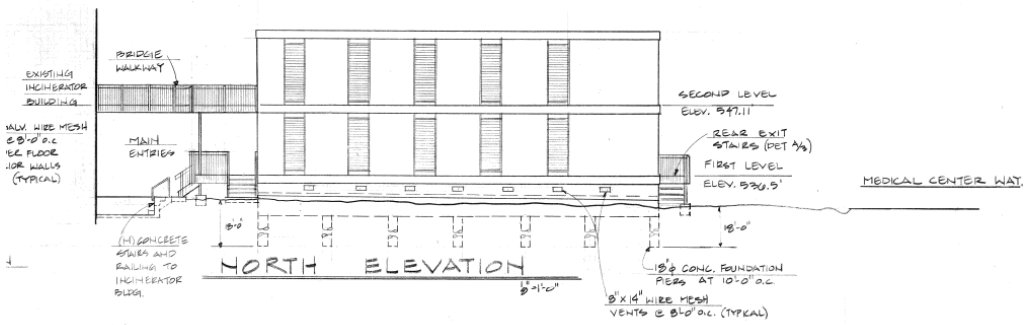


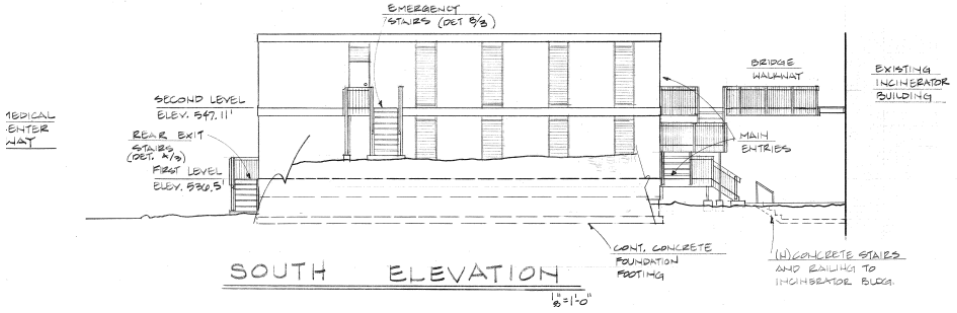
FIRST FLOOR FRAMING PLAN

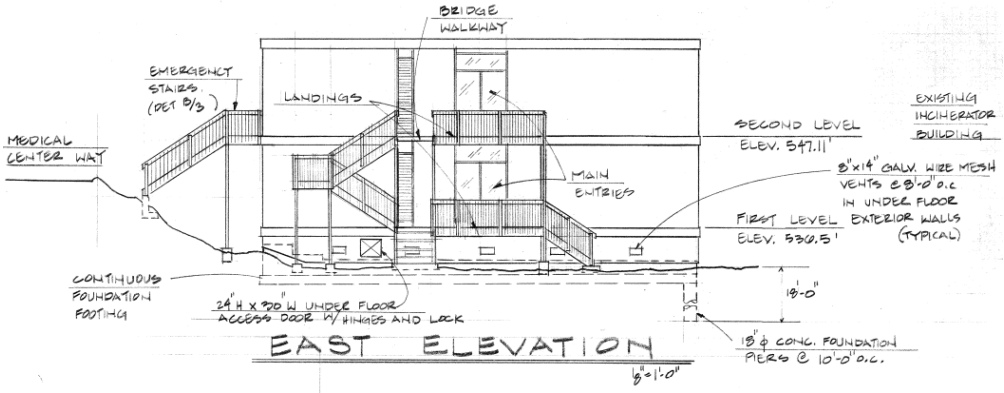
Scale: 1/8"=1'-0"

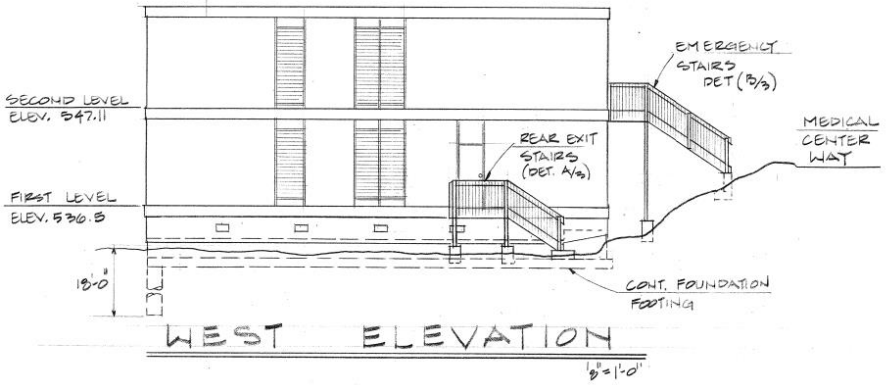

12'-8"
metal joist hanger typical
2x4 stud bearing wall below
1-18" TRUSS JOIST
2x6 CONT. BRIDGING
3/4" PLYWOOD
18" TRUSS JOIST @ 2'-0" o.c.
2x4 stud bearing wall below
1-18" TRUSS JOIST
2x6 CONT. BRIDGING
18'-8"
3x6 DECKING
SEE DRAWING CA-2 FOR CORNER CLARIFICATION.
ORIGINAL BRIDGING REMOVED
PROPERTY LINE
4'-0"
8'-0"
4'-0"
OUTSIDE FACE OF CURB
STREET FLOOR FRAMING PLAN

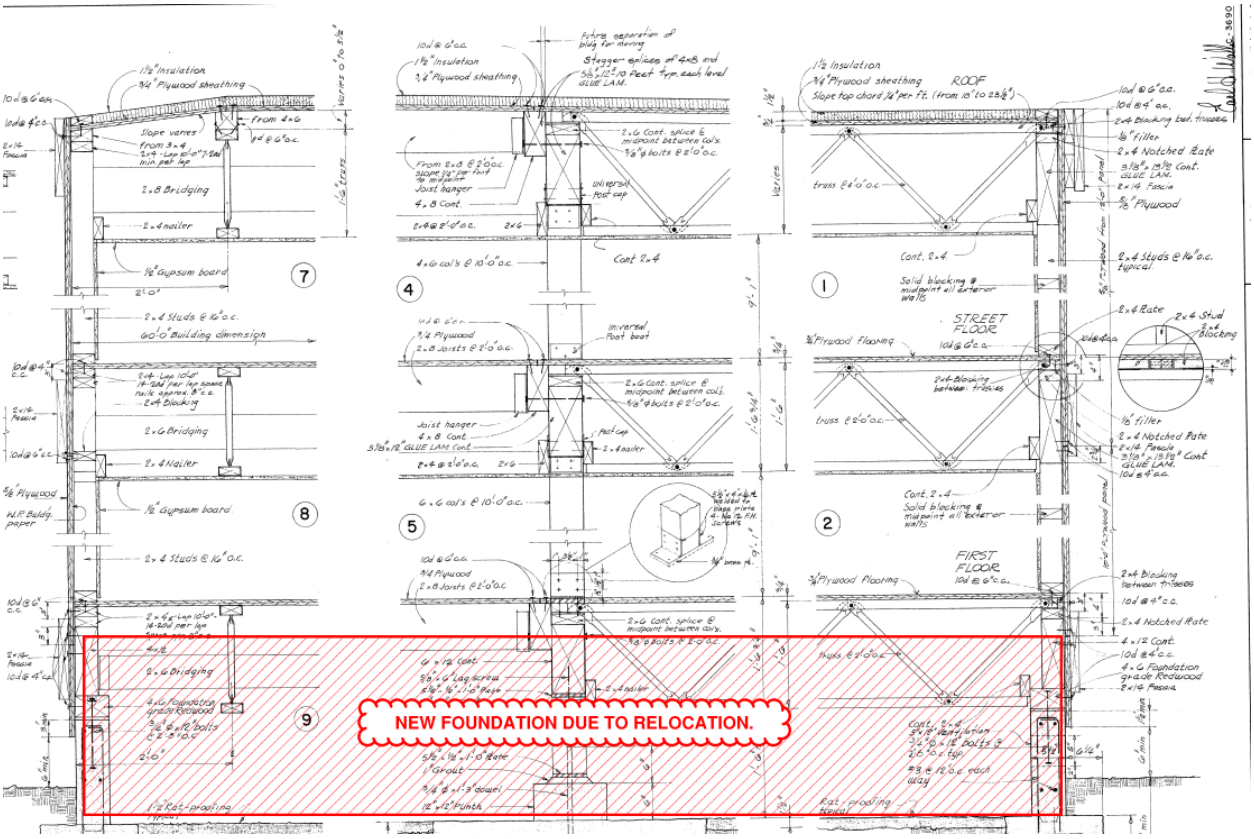

Super structure divides at corridor for future moving of bldg.
See 7/S3
End piece of plywd forms a warped surface
18" PARALLEL CHR. JOIST
Continuous joint in plywd.
3/4" PLYWOOD
skylight opening
18" TO 23 1/2" TAPERED TRUSS JOIST @ 4'-0" o.c.
Stagger to create a rigid line at center of corridor
18" TO 23 1/2" TAPERED TRUSS JOIST @ 4'-0" o.c.
skylight opening
18" PARALLED CHD JOIST
2x8 CONT. BRIDGING
18" PARALLED CHD. JOIST
Warped roof surface
ROOF FRAMING PLAN

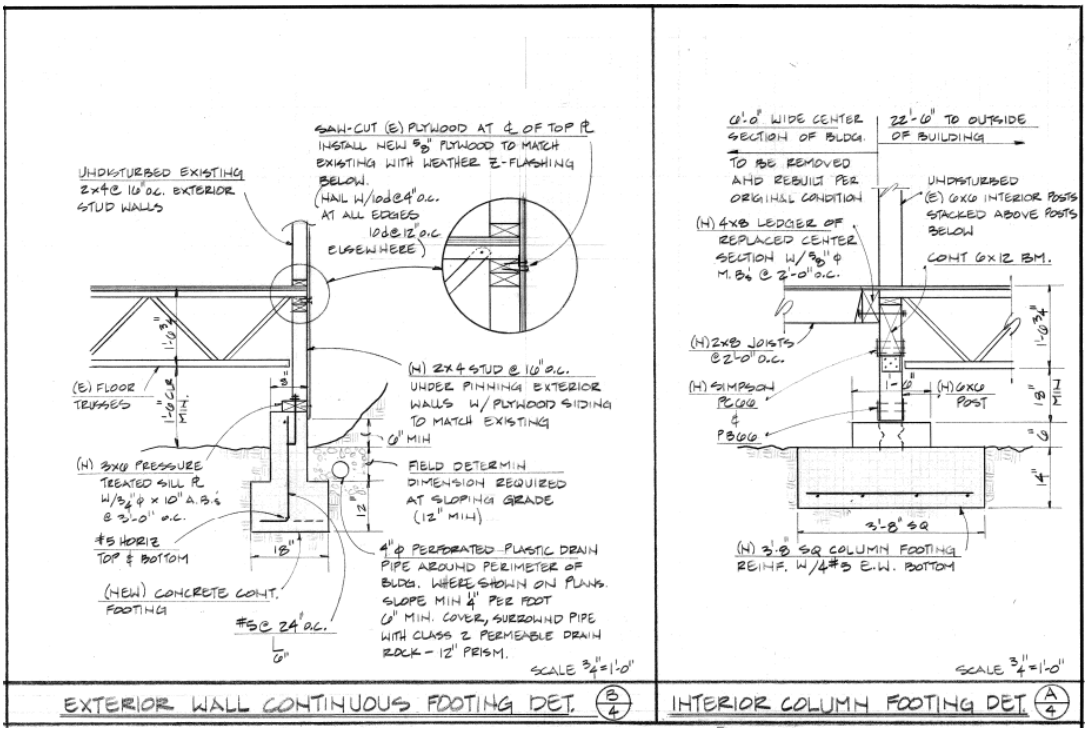

EXISTING INCINERATOR BUILDING
BRIDGE WALKWAY
MAIN ENTRIES
(N) CONCRETE STAIRS AND RAILING TO INCINERATOR BLDG.
SECOND LEVEL ELEV. 547.11'
REAR EXIT STAIRS (DET A/3)
FIRST LEVEL ELEV. 530.5'
MEDICAL CENTER WAY
18" ϕ CONC. FOUNDATION PIERS AT 10'-0" O.C.
8"x14" WIRE MESH VENTS @ 8'-0" O.C. (TYPICAL)
NORTH ELEVATION
3/8"=1'-0"


EMERGENCY STAIRS (DET B/3)
BRIDGE WALKWAY
EXISTING INCINERATOR BUILDING
SECOND LEVEL ELEV. 547.11'
REAR EXIT STAIRS (DET. A/3)
FIRST LEVEL ELEV. 530.5'
MAIN ENTRIES
CONT. CONCRETE FOUNDATION FOOTING
(N) CONCRETE STAIRS AND RAILING TO INCINERATOR BLDG.
SOUTH ELEVATION
3/8"=1'-0"


BRIDGE WALKWAY
EMERGENCY STAIRS (DET B/3)
LANDINGS
EXISTING INCINERATOR BUILDING
MEDICAL CENTER WAY
SECOND LEVEL ELEV. 547.11'
MAIN ENTRIES
8"x14" GALV. WIRE MESH VENTS @ 8'-0" O.C IN UNDER FLOOR
FIRST LEVEL ELEV. 530.5'
EXTERIOR WALLS (TYPICAL)
CONTINUOUS FOUNDATION FOOTING
24" H x 30" W UNDER FLOOR ACCESS DOOR W/ HINGES AND LOCK
18'-0"
18" ϕ CONC. FOUNDATION PIERS @ 10'-0" O.C.
EAST ELEVATION
3/8"=1'-0"


EMERGENCY STAIRS DET (B/3)
SECOND LEVEL ELEV. 547.11
REAR EXIT STAIRS (DET. A/3)
MEDICAL CENTER WAY
FIRST LEVEL ELEV. 530.5
18'-0"
CONT. FOUNDATION FOOTING
WEST ELEVATION
3/8"=1'-0"


NEW FOUNDATION DUE TO RELOCATION.
STREET FLOOR
FIRST FLOOR
ROOF


SAW-CUT (E) PLYWOOD AT ℄ OF TOP ℞ INSTALL NEW ⅝" PLYWOOD TO MATCH EXISTING WITH WEATHER Z-FLASHING BELOW. NAIL W/10d@4" O.C. AT ALL EDGES 10d@12" O.C. ELSEWHERE)
UNDISTURBED EXISTING 2x4@ 16" O.C. EXTERIOR STUD WALLS
(N) 2X4 STUD @ 16" O.C. UNDER PINNING EXTERIOR WALLS W/ PLYWOOD SIDING TO MATCH EXISTING
(E) FLOOR TRUSSES
(N) 3X10 PRESSURE TREATED SILL ℞ W/ ⅝" ℄ x 10" A.B.'s @ 3'-0" O.C.
#5 HORIZ TOP & BOTTOM
(NEW) CONCRETE CONT. FOOTING
#5 @ 24" O.C.
FIELD DETERMIN DIMENSION REQUIRED AT SLOPING GRADE (12" MIN)
4" ℄ PERFORATED PLASTIC DRAIN PIPE AROUND PERIMETER OF BLDG. WHERE SHOWN ON PLANS. SLOPE MIN ¼" PER FOOT 6" MIN. COVER, SURROUND PIPE WITH CLASS 2 PERMEABLE DRAIN ROCK - 12" PRISM.
SCALE ¾"=1'-0"
EXTERIOR WALL CONTINUOUS FOOTING DET. 6/4
6'-0" WIDE CENTER SECTION OF BLDG. TO BE REMOVED AND REBUILT PER ORIGINAL CONDITION
22'-6" TO OUTSIDE OF BUILDING
UNDISTURBED (E) 6X6 INTERIOR POSTS STACKED ABOVE POSTS BELOW
CONT 6x12 BM.
(N) 4X8 LEDGER OF REPLACED CENTER SECTION W/ ⅝" ℄ M. B.'s @ 2'-0" O.C.
(N) 2X8 JOISTS @ 2'-0" O.C.
(N) SIMPSON PCG66 & PB66
(N) 6X6 POST
(N) 3'-8" SQ COLUMN FOOTING REINF. W/ 4 #5 E.W. BOTTOM
SCALE ¾"=1'-0"
INTERIOR COLUMN FOOTING DET. A/4

Appendix B

Checklists

UC Campus:	San Francisco – Parnassus			Date:	4 September 2019		
Building CAAN:	2414	Auxiliary CAAN:		By Firm:	Simpson Gumpertz & Heger		
Building Name:	Environmental Health & Safety (EH&S)			Initials:	*KDP*	Checked:	*KSM*
Building Address:	50 Medical Center Way			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: Holdowns not provided at plywood shearwall ends.**
●	○	○	○	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: No building within 0.37 ft, note connection to EH&S annex by walkway bridge**
○	○	●	○	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: No mezzanine**

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: Shearwall configuration and strengths between floors similar**
●	○	○	○	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: Shearwall configuration and stiffness between floors similar**
●	○	○	○	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: Shearwalls align between floors**

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: Shearwall configurations similar between floors**
◉	○	○	○	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: Mass of each floor similar**
◉	○	○	○	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: Outdoor stairways/bridging have negligible influence on C.R.**

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: Liquefaction potential is negligible**
◉	○	○	○	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: Slope failure unlikely**
◉	○	○	○	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: Faults are adequately distant and do not pose a risk at this site**

UC Campus:	San Francisco – Parnassus			Date:	4 September 2019		
Building CAAN:	2414	Auxiliary CAAN:		By Firm:	Simpson Gumpertz & Heger		
Building Name:	Environmental Health & Safety (EH&S)			Initials:	*KDP*	Checked:	*KSM*
Building Address:	50 Medical Center Way			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

	Description
C ● **NC** ○ **N/A** ○ **U** ○	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3) **Comments: The building has a base/height ratio that is greater than 0.6Sa**
C ● **NC** ○ **N/A** ○ **U** ○	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4) **Comments: Site Class C**

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

UC Campus:	San Francisco – Parnassus			Date:	4 September 2019		
Building CAAN:	2414	Auxiliary CAAN:		By Firm:	Simpson Gumpertz & Heger		
Building Name:	Environmental Health & Safety (EH&S)			Initials:	*KDP*	Checked:	*KSM*
Building Address:	50 Medical Center Way			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: Two shear wall lines each direction**
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: DCRs by level (NS, EW) ---- Street Floor (0.68, 0.70), 1st Floor (1.3, 1.3), Cripple wall (1.1, 1.2)**
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 are plywood sheathed**
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 are partition walls**
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: Aspect ratio of most shear walls is 3:1**
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: No holdowns are shown on the drawings. Shear can be transferred through plywood at the floors, plywood sheathing splices occur away from floor and plywood is nailed to top and bottom plates.**

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: Site slopes from south to north but the north side soil is retained by a wall and the north side footings comprise piers extending down to bottom of retaining wall**
◉	○	○	○	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: Sheathing same as shear walls and anchored to foundation wall**
○	○	◉	○	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: No openings that large**

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: Posts are connected to concrete foundation with a ¾" diameter dowel embedded 6 inches into the post and 9 inches into the concrete**
◉	○	○	○	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3) **Comments: Sill anchor bolted (3/4" diameter) to concrete footing every 3 ft**
◉	○	○	○	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: Glulam girders are supported on a steel post cap that is nailed to the posts and girders**

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

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

CONNECTIONS

	Description
C ◉ NC ○ N/A ○ U ○	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: Sill bolts spaced at 3ft**

DIAPHRAGMS

	Description
C ◉ NC ○ N/A ○ U ○	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: Diaphragms are continuous**
C ○ NC ◉ N/A ○ U ○	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: Top plates are discontinuous between trusses without obvious splice detail**
C ○ NC ○ N/A ◉ U ○	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: Diaphragms composed of plywood sheathing**
C ◉ NC ○ N/A ○ U ○	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: Diaphragms composed of plywood sheathing**
C ○ NC ◉ N/A ○ U ○	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: Diaphragms spans 51 ft North-South, 60 ft East-West**

UC Campus:	San Francisco – Parnassus			Date:	4 September 2019		
Building CAAN:	2414	Auxiliary CAAN:		By Firm:	Simpson Gumpertz & Heger		
Building Name:	Environmental Health & Safety (EH&S)			Initials:	*KDP*	Checked:	*KSM*
Building Address:	50 Medical Center Way			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) **Comments: All diaphragms composed of plywood sheathing**

Appendix C

UCOP Seismic Safety Policy Falling Hazards Assessment Summary

UC Campus:	**UCSF – Parnassus**			Date:	**4 September 2019**		
Building CAAN:	**2234**	Auxiliary CAAN:		By Firm:	**Simpson Gumpertz & Heger**		
Building Name:	**Environmental Health & Safety (EH&S)**			Initials:	***KDP***	Checked:	***KSM***
Building Address:	**50 Medical Center Way**			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:** No areas of congregation of over 50 people are located within the building.
P ☐ **N/A** ☒	**Heavy masonry or stone veneer above exit ways or public access areas** **Comments:** No masonry or stone veneer is located near exit ways or public access areas.
P ☐ **N/A** ☒	**Unbraced masonry parapets, cornices, or other ornamentation above exit ways or public access areas** **Comments:** There are no masonry parapets, cornices, or other ornamentation.
P ☐ **N/A** ☒	**Unrestrained hazardous material storage** **Comments:** No hazardous materials stored in the building.
P ☐ **N/A** ☒	**Masonry chimneys** **Comments:** No masonry chimneys are in the building.
P ☒ **N/A** ☐	**Unrestrained natural gas-fueled equipment such as water heaters, boilers, emergency generators, etc.** **Comments:** Water heater and boiler do not appear to be anchored adequately.
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

Tier 1 Calculations

EH&S IS A MODULAR BUILDING W/ WOOD SHEARWALLS, GROUND FLOOR RAISED UP ABOVE FOUNDATION FOR GROUND SEPARATION.

- SEISMIC WEIGHT - $A_{FLOOR} = 51ft \times 60ft \rightarrow A = 3060 ft^2$

- ROOF:

3/4" PLYWOOD	3psf
INSULATION	1psf
GYP, CEILING	2.5psf
TRUSS	3.5psf
ROLLED ROOFING	1psf
MISC	+ 2psf
	13psf

@ 4'0" O.C. CONSERVATIVE ACCOUNTS FOR JOISTS ASWELL

- WALLS - 5.3ft TO ROOF, 12psf PLYWOOD WALLS ~200 ft INT, 222 ft EXT. — PLYWOOD BOTH INT & EXT

$W_{ROOF} = (13psf \times 3060) + (12psf \times 5.3ft \times (200 + 222ft))$

$W_{ROOF} = 66614.2\ lb \rightarrow W_{ROOF} = 67\ kip$

- STREET FLOOR:

3/4" PLYWOOD	3psf
GYP, CEILING	2.5psf
TRUSS	7psf
MISC	+ 2psf
	14.5psf

@ 2'0" O.C.

- WALLS - 5.3 FROM ABOVE, 5.3 BELOW, 12psf PLYWOOD WALLS ~200 ft INT ABOVE, ~250 BELOW, 222 EXTERIOR WALLS — PLYWOOD BOTH INT & EXT

$W_{ST} = (14.5psf \times 3060) + (12psf \times (10.6 \times 222 + 5.3(200+250)))$

$W_{ST} = 101226 \rightarrow W_{ST} = 101\ kip$

- SEISMIC WEIGHT (cont'd) - FIRST FLOOR: 3/4" PLYWOOD 3psf
TRUSS 7psf @2'0" o.c.
MISC +2psf
12psf

- WALLS - 5.3 INT, 7.3 EXT 12psf PLYWOOD WALLS
~250FT INT 222ft EXT

$$w_{1ST} = (12psf \times 3060ft) + (12psf(7.3 \times 222 + 5.3 \times 250))$$

$$w_{1ST} = 72067.216 \rightarrow w_{1ST} = 72 kips$$

- PERIOD: $C_t = 0.02$, $\beta = 0.75$ OTHER FRAMING ELEMENTS

$h_n = 24.5ft \longrightarrow T = 0.02 \times 24.5^{0.75} \rightarrow T = 0.22sec$

- S_1: $S_{xs} = 1.842$, $S_{x1} = 0.847$ SITE CLASS C

$0.847/1.842 = 0.46 > 0.22 \therefore S_a = S_{xs} = 1.842g$

- C: $C = 1.1$ 2 STORY W1-1a TABLE 9-7

BASE SHEAR: $V = 1.1 \times 1.842 \times (67 + (101 + 72)) \rightarrow V = 483 kips$

- STORY SHEAR

	w_x	h_x	F_x	V_j
ROOF	67	24.5	244	244
ST LVL	101	13.75	207	451
1ST LVL	72	3	32	483

$$\sum_{i=x}^{n} w_i h_i = (67 \times 24.5 + 101 \times 13.75 + 72 \times 3) = 3246.25$$

- ADJACENT BUILDING DISTANCE — COMPLIANT - A.2.1.2

$h_n = 24.5$ ft → $0.015 \times 24.5 = 0.37$ ft

EH&S ANNEX IS 25 FT AWAY, NOTE CONNECTED BY WALKWAY BRIDGE

25 ft > 0.37 ft

- WEAK STORY - SHEAR WALLS - 10d NAILS @ 4" O.C., 5/8" PLYWOOD. — COMPLIANT - A.2.2.2

∴ V_s = 1020 lb/ft, G = 16 k/in — SDPWS-2015

@ ST. LVL - 80 ft OF WALL N-S — 51' SIDE
- 78 ft OF WALL E-W — 60' SIDE

@ 1ST LVL - 80 ft OF WALL N-S
- 78 ft OF WALL E-W

@ SUBLVL - WALLS WRAP BLDG.
∴ 102 ft N-S, 120 ft E-W

b/c SAME SYSTEM EACH FLOOR $V_{n_{ST}} = V_{n_{1ST}} < V_{n_{SUB}}$

∴ NO FLOOR WEAKER THAN FLOOR ABOVE

- SOFT STORY - CONSIDERING IDENTICAL FLOOR HEIGHT @ ST & 1ST LVLS AND IDENTICAL SHEARWALL CONFIG, NO STIFFNESS CHANGE — COMPLIANT A.2.2.3
- CONSIDERING SUBLVL CRIPPLE WALL HEIGHT IS MUCH LESS THAN STORY HEIGHT, INFERRING GREATER STIFFNESS THAN STORIES ABOVE

- MASS CHANGE - LIGHT ROOF NOT CONSIDERED — COMPLIANT A.2.2.6

ST. LVL → 1ST. LVL
101 kip → 72 kip $\frac{|72-101|}{101} = 28\%$ CHANGE
< 50%

- OVERTURNING - LEAST HORIZ. DIM. @ CRIPPLE WALL LVL: 51'-11" OF WALL

$h_n = 24.5$ ft

$51/24.5 = 2.08 > 0.6 \times 1.842 = 1.11$

COMPLIANT A.6.2.1

W1-1a CHECKS

- SHEAR WALL STRESS (4.4.3.3) → $DCR = v_{j\,avg}/1000$

NON COMPLIANT A.3.2.7.1

$M_s = 4.5$

	V_j	DCR - A_w(NS)	DCR - A_w(EW)	NS v_{avg}	NS DCR	EW v_{avg}	EW DCR
2ND LVL	244 k	80	78	678 plf	0.68	695 plf	0.70
1ST LVL	451 k	80	78	1,253 plf	1.3	1,285 plf	1.3
CRIPPLE WALL	483 k	102	120	1,052 plf	1.1	1,237	1.2

CP BPOE

EQ 4-8