



Rating form completed by:

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Evaluator: BL

Date: 06/28/2019

Text in green is to be part of UC Santa Cruz building database and may be part of UCOP database

DATE: 2018-06-28

UC Santa Cruz building seismic ratings
Crown College Gatehouse

CAAN #7158

628 Crown Road, Santa Cruz, CA 95064

UCSC Campus: Main Campus



Plan



North facade and pergola (looking southeast)



Rating summary	Entry	Notes
UC Seismic Performance Level (rating)	IV (Fair)	
Rating basis	Level 1	FEMA P-154 ¹
Date of rating	2019	
Recommended UC Santa Cruz priority category for retrofit	None	Priority A=Retrofit ASAP Priority B=Retrofit at next permit application
Ballpark total construction cost to retrofit to IV rating ²	None	
Is 2018-2019 rating required by UCOP?	Yes	Building was not previously rated
Further evaluation recommended?	No	

¹ We translate this FEMA 154 evaluation to a Seismic Performance Level rating using professional judgment. Non-compliant items or a certain score in the FEMA 154 evaluation do not automatically put a building into a particular rating category, but we evaluate such items 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. See Section III.B of the 19 May 2017 *UC Seismic Safety Policy* and Method B of Section 321 of the 2016 *California Building Code*.

² Per Section III.A.4.i of the 26 March 2019 *UC Seismic Program Guidebook, Version 1.3*, the cost includes all construction cost necessitated by the seismic retrofit, including restoration of finishes and any triggered work on utilities or accessibility. It does not include soft costs such as design fees or campus costs. The cost is in 2019 dollars.

Building information used in this evaluation

- Architectural drawings by Ernest J. Kump Associates, "Residential College Number Three, University of California, Santa Cruz," as-built dated 18 March 1966, Sheet A16.
- Structural drawings by Ernest J. Kump Associates, "Residential College Number Three, University of California, Santa Cruz," as-built dated 24 February 1966, Sheets S1, S38, and S39.

Additional building information known to exist

- None

Scope for completing this form

The architectural and structural drawings were reviewed, a brief site observation was made on 3 June 2019, and a FEMA P-154 Level 1 evaluation was completed.

Brief description of structure

The Crown Gate House is a one-story wood framed building with a monoslope roof. It is located within the Crown College, to the north of the Crown Fireside Lodge and to the west of the Crown/Merrill Dining Hall, on the main UC Santa Cruz campus. It is rectangular in shape and measures 25'-0" in the east-west direction by 15'-8" in the north-south direction. A seismically separated pergola is located adjacent to the Crown Gatehouse on its west side. It is currently utilized as a mailroom, and the pergola serves as an entry gate feature for the Crown College.

The floor is framed with 2 x 12 wood joists spaced at 16" o.c. that span in the north-south direction over a crawl space to the exterior walls. The roof consists of clay tiles over sheathing supported by 2 x 10 framing members spaced at 16" o.c. that span in the north-south direction. The exterior walls are framed with 2 x 4 wood studs, except the west elevation which is framed with 2 x 6 studs. The building is clad with stucco, and the wall sheathing under the stucco is unknown.

The pergola contains two 11 x 17 7/8" glulam beams that are oriented in the east-west direction and span between 20" diameter circular wood posts. Wood joists oriented in the north-south direction span between the glulam beams and cantilever beyond the beams on both sides. The wood joists alternate in size between 6 x 10 and 4 x 6 joists.

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

Identified seismic deficiencies of the building include the following:

- The Crown Gatehouse is torsionally irregular. It contains solid exterior walls on the north, east, and south elevations; however, a large door opening is located on the west elevation which creates a "C"-shaped lateral force-resisting system. The wall length that remains on this elevation is considered to be sufficient and not a significant issue.

FEMA P-154 Score

BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE, S_{L1}																		
FEMA BUILDING TYPE	Do Not Know	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score		2.1	1.9	1.8	1.5	1.4	1.6	1.4	1.2	1.0	1.2	0.9	1.1	1.0	1.1	1.1	0.9	1.1
Severe Vertical Irregularity, V_{L1}		-0.9	-0.9	-0.9	-0.8	-0.7	-0.8	-0.7	-0.7	-0.7	-0.8	-0.6	-0.7	-0.7	-0.7	-0.7	-0.6	NA
Moderate Vertical Irregularity, V_{L1}		-0.6	-0.5	-0.5	-0.4	-0.4	-0.5	-0.4	-0.3	-0.4	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.3	NA
Plan Irregularity, P_{L1}		-0.7	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.4	-0.4	-0.5	-0.3	-0.5	-0.4	-0.4	-0.4	-0.3	NA
Pre-Code		-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	0.0
Post-Benchmark		1.9	1.9	2.0	1.0	1.1	1.1	1.5	NA	1.4	1.7	NA	1.5	1.7	1.6	1.6	NA	0.5
Soil Type A or B		0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.1	0.3	0.2	0.3	0.3	0.1	0.1
Soil Type E (1-3 stories)		0.0	-0.2	-0.4	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	-0.1
Soil Type E (> 3 stories)		-0.4	-0.4	-0.4	-0.3	-0.3	NA	-0.3	-0.1	-0.1	-0.3	-0.1	NA	-0.1	-0.2	-0.2	0.0	NA
Minimum Score, S_{MIN}		0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	1.0
FINAL LEVEL 1 SCORE, $S_{L1} \geq S_{MIN}$: 1.4		UCOP SEISMIC PERFORMANCE LEVEL (OR "RATING") IV																

Summary of review of nonstructural life-safety concerns, including at exit routes.³

The are no falling hazards that pose a risk to the building occupants.

UCOP nonstructural checklist item	Life safety hazard?	UCOP nonstructural 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	Heavy partitions braced by ceilings	None observed
Heavy masonry or stone veneer above exit ways and public access areas	None observed	Appendages	None observed
Unbraced masonry parapets, cornices or other ornamentation above exit ways and public access areas	None observed	Unrestrained hazardous materials storage	None observed
Masonry chimneys	None observed	Unrestrained natural gas-fueled equipment such as water heaters, boilers, emergency generators, etc.	None observed

Discussion of rating

Although the building is likely torsionally irregular, it is assigned a Seismic Performance Level rating of IV as the building and loads in lateral force-resisting elements are relatively low, the roof diaphragm and remaining walls on three sides will help mitigate the rotation induce by torsion and provide additional resistance, and the wall piers that are adjacent to the door opening on the west elevation are deemed sufficient.

Recommendations for further evaluation or retrofit

No further analysis is required.

Peer review of rating

This seismic evaluation was discussed in a peer review meeting on 24 June 2019. Reviewers present were Jay Yin of Degenkolb Engineers and Joe Maffei of Maffei Structural Engineering. Comments from the reviewers have been incorporated into this report. The reviewers agreed with the assigned rating.

³ 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.

Additional building data	Entry	Notes
Latitude	37.000274	
Longitude	-122.05456	
Are there other structures besides this one under the same CAAN#	No	
Number of stories above lowest perimeter grade	1	
Number of stories (basements) below lowest perimeter grade	0	
Building occupiable area (OGSF)	683	
Risk Category per 2016 CBC Table 1604.5	II	Residential occupancy (dormitory).
Site data		
Site class	D	
Site class basis	Geotech ⁴	See footnote below
Liquefaction potential	Low	
Liquefaction assessment basis	County map	See footnote below
Landslide potential	Low	
Landslide assessment basis	County map	See footnote below
Active fault rupture identified at site?	No	
Fault rupture assessment basis	County map	See footnote below
Applicable code		
Applicable code or approx. date of original construction	Built: 1967 Code: 1964 UBC	Code inferred based on design year
Applicable code for partial retrofit	None	No partial retrofit
Applicable code for full retrofit	None	No full retrofit
Model building data		
Model building type North-South	W1 – Wood Frame	
Model building type East-West	W1 – Wood Frame	
FEMA P-154 score	1.4	

⁴ Determination of site class and assessment of geotechnical hazards are based on correspondence with Pacific Crest Geotechnical Engineers and Nolan, Zinn, and Associates Geologists. [*Revised Geology and Geologic Hazards, Santa Cruz Campus, University of California*, Job # 04003-SC 13 May 2005]. Site class is taken as D throughout the main campus of UC Santa Cruz. The following links provide hazard maps for liquefaction, landslide, and fault rupture:

<https://gis.santacruzcounty.us/mapgallery/Emergency%20Management/Hazard%20Mitigation/LiquifactionMap2009.pdf>
<https://gis.santacruzcounty.us/mapgallery/Emergency%20Management/Hazard%20Mitigation/LandslideMap2009.pdf>
<https://gis.santacruzcounty.us/mapgallery/Emergency%20Management/Hazard%20Mitigation/FaultZoneMap2009.pdf>

Previous ratings	
Most recent rating	None
Date of most recent rating	
2 nd most recent rating	-
Date of 2 nd most recent rating	-
3 rd most recent rating	-
Date of 3 rd most recent rating	-
Report attachments	
P-154 Level 1 Form	



APPENDIX A

FEMA P-154 Form and Additional Photos

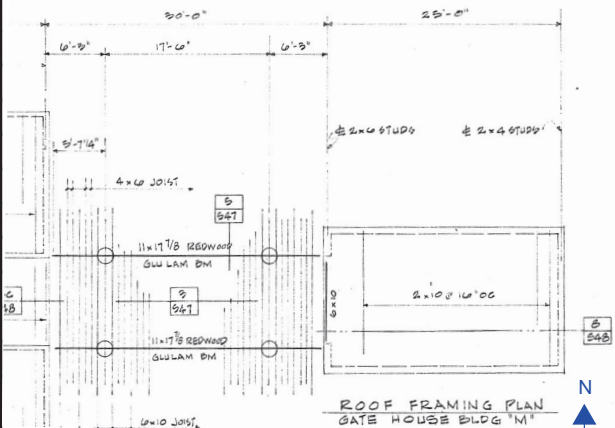


Rapid Visual Screening of Buildings for Potential Seismic Hazards
FEMA P-154 Data Collection Form

Level 1
VERY HIGH Seismicity



North facade and pergola (looking southeast)



Roof framing plan from Sheet S39

Address: 628 Crown Road
Santa Cruz, CA Zip: 95064

Other Identifiers: Crown College Gatehouse

Building Name: _____

Use: Mail room and entrance structure for the college

Latitude: 37.000274 Longitude: -122.05456

S_s: 1.476g (MCE_R Site Class B) S_i: 0.504g (MCE_R, Site Class B)

Screener(s): Bret Lizundia/Cynthia Perry Date/Time: 6/3/19 / 11:00 AM

No. Stories: Above Grade: 1 Below Grade: 0 Year Built: 1967 EST

Total Floor Area (sq. ft.): 683 Code Year: 1961/1964

Additions: None Yes, Year(s) Built: _____

Occupancy: Assembly Commercial Emer. Services Historic Shelter
 Industrial Office School Government
 Other Warehouse Residential, # Units: _____

Soil Type: A B C D E F DNK
Hard Avg Dense Stiff Soft Poor
Rock Rock Soil Soil Soil Soil
If DNK, assume Type D.

Geologic Hazards: Liquefaction: Yes No DNK Landslide: Yes No DNK Surf. Rupt.: Yes No DNK

Adjacency: Pounding Falling Hazards from Taller Adjacent Building

Irregularities: Vertical (type/severity)
 Plan (type) Torsional Irregularity (see note below)

Exterior Falling Hazards: Unbraced Chimneys Heavy Cladding or Heavy Veneer
 Parapets Appendages
 Other: _____

COMMENTS:

- 1966 architectural/structural drawings. 1961/1964 UBC listed on Sheet A1.
- Clay tile roof over sheathing over 2x joists spanning to north-south stud walls down to perimeter concrete strip footing.
- Stucco over unknown sheathing over 2x6 stud walls.
- Wall length is less at west entrance, but has sufficient length by judgment and size is sufficient that torsion is not considered to be a significant issue.
- Pergola is seismically separated from the gatehouse.
- Note that FEMA P-154 uses the MCE_R Site Class B site parameters to determine the Seismicity Region. The Very High Seismicity Region applies here since S_s = 1.5 >= 1.5.

Additional sketches or comments on separate page

BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE, S_{L1}

FEMA BUILDING TYPE	Do Not Know	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score		<u>2.1</u>	1.9	1.8	1.5	1.4	1.6	1.4	1.2	1.0	1.2	0.9	1.1	1.0	1.1	1.1	0.9	1.1
Severe Vertical Irregularity, V _{L1}		-0.9	-0.9	-0.9	-0.8	-0.7	-0.8	-0.7	-0.7	-0.7	-0.8	-0.6	-0.7	-0.7	-0.7	-0.7	-0.6	NA
Moderate Vertical Irregularity, V _{L1}		-0.6	-0.5	-0.5	-0.4	-0.4	-0.5	-0.4	-0.3	-0.4	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.3	NA
Plan Irregularity, P _{L1}		<u>-0.7</u>	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.4	-0.4	-0.5	-0.3	-0.5	-0.4	-0.4	-0.4	-0.3	NA
Pre-Code		-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	0.0
Post-Benchmark		1.9	1.9	2.0	1.0	1.1	1.1	1.5	NA	1.4	1.7	NA	1.5	1.7	1.6	1.6	NA	0.5
Soil Type A or B		0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.1	0.3	0.2	0.3	0.3	0.1	0.1
Soil Type E (1-3 stories)		0.0	-0.2	-0.4	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	-0.1
Soil Type E (> 3 stories)		-0.4	-0.4	-0.4	-0.3	-0.3	NA	-0.3	-0.1	-0.1	-0.3	-0.1	NA	-0.1	-0.2	-0.2	0.0	NA
Minimum Score, S _{MIN}		0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	1.0

FINAL LEVEL 1 SCORE, S_{L1} ≥ S_{MIN}: 1.4

UCOP SEISMIC PERFORMANCE LEVEL (OR "RATING") IV

EXTENT OF REVIEW

Exterior: Partial All Sides Aerial
Interior: None Visible Entered
Drawings Reviewed: Yes No
Soil Type Source: Default campus site class
Geologic Hazards Source: County maps
Contact Person: _____

OTHER HAZARDS

Are There Hazards That Trigger A Detailed Structural Evaluation?

Pounding potential (unless S₂ > cut-off, if known)
 Falling hazards from taller adjacent building
 Geologic hazards or Soil Type F
 Significant damage/deterioration to the structural system

ACTION REQUIRED

Detailed Structural Evaluation Required?

Yes, unknown FEMA building type or other building
 Yes, score less than cut-off
 Yes, other hazards present
 No

Detailed Nonstructural Evaluation Recommended? (check one)

Yes, nonstructural hazards identified that should be evaluated
 No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary
 No, no nonstructural hazards identified DNK

LEVEL 2 SCREENING PERFORMED?

Yes, Final Level 2 Score, S_{L2} _____ No
Nonstructural hazards? Yes No

Where information cannot be verified, screener shall note the following: EST = Estimated or unreliable data OR DNK = Do Not Know

Legend: MRF = Moment-resisting frame RC = Reinforced concrete URM INF = Unreinforced masonry infill MH = Manufactured Housing FD = Flexible diaphragm
BR = Braced frame SW = Shear wall TU = Tilt up LM = Light metal RD = Rigid diaphragm



Northwest Corner of Gatehouse (Looking Southeast)



South Elevation (Looking North)



East Elevation Gatehouse at Far Right (Looking South)



Crown College Entry Pergola, Gatehouse at Left (Looking South)



Interior View Mail Room at Gatehouse



Interior View Mail Room (Looking East)