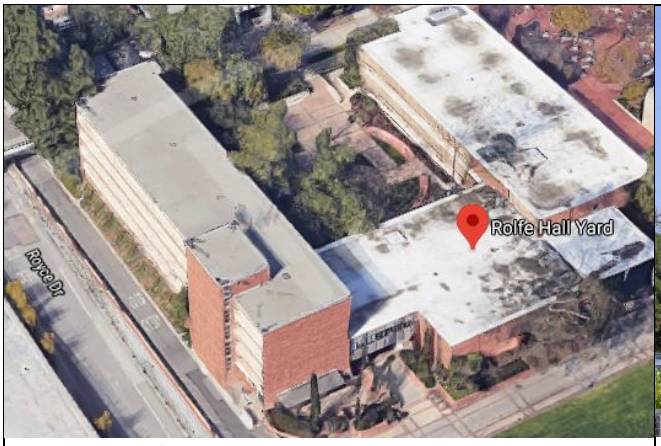
UNIVERSITY OF CALIFORNIA

BUILDING REPORT

1) UC Campus: UCLA
2) Building Name: Rolfe Hall-Office Wing
3) Building CAAN ID: 4216
4) Auxiliary Building ID[1]: 4216.1
5) Date of Evaluation: October 30, 2020
6) Evaluation by (Firm, Evaluator Name, Signature, Stamp): John A. Martin & Associates, Inc. JJ, JL
7) Seismic Performance Rating[2] and Basis of Rating: V, University of California Seismic Safety Policy and ASCE 41-17 Tier 1 evaluation. A segment of the south elevation shear wall discontinues at the first floor level, and some shear wall segments exceed the shear stress limits per the Tier 1 requirements for concrete and reinforced masonry walls. The short 8" thick gunite wall piers lack confined boundary elements which may lead to buckling of the vertical wall reinforcement. A rating level V is given based on the anticipated overall structural performance of the building. A Tier 2 analysis is recommended to confirm this seismic performance rating.

REGISTERED PROFESSIONAL ENGINEER
KALMAN VAN BENUSKA
No. 3504
STRUCTURAL
STATE OF CALIFORNIA
10/30/2020



8) Plan Image or Aerial Photo

9) Exterior Elevation Photo

10) Site Location
    (a) Latitude Decimal Coordinates: 34.07
    (b) Longitude Decimal Coordinates: -118.44

11) ASCE 41-17 Model Building Type and Description[3]
    (a) Longitudinal Direction: Building Type C2 (Concrete Shear Walls with Stiff Diaphragms) and RM2 (Reinforced Masonry Shear Walls with Stiff Diaphragms)

[1] Applicable only for individual buildings that are structurally separate units within a building complex. Each auxiliary building shall be designated with the main building CAAN ID with a decimal number suffix (i.e. main building CAAN ID 5534; auxiliary building CAAN ID 5534.1). Auxiliary building ID is null for a single building or the main building in a building complex.
[2] The designated Seismic Performance Rating shall be a Roman numeral associated with the most applicable performance description from Table 1 of the UC Facilities Manual, UC Seismic Program Guidelines.
[3] If a building has multiple building types in one story, the model building type should be designated based on engineering judgement as the lateral system that would have the most predominantly negative effect on the seismic behavior of the building in that respective direction.

(b) Transverse Direction: Building Type C2 (Concrete Shear Walls with Stiff Diaphragms) and RM2 (Reinforced Masonry Shear Walls with Stiff Diaphragms)

Rolfe Hall is comprised of three seismically separated structures – the Office Wing, the Classroom Wing, and the Center Portion. The Office Wing is separated from the Center Portion with a 3" seismic joint. The gravity structural system consists of 9½-inch flat slabs at typical floors and 9-inch flat slabs at the roof level, supported by rectangular HSS steel columns spaced at 20 feet on center along the north-south direction and 26 feet on center along the east-west direction of the building. The lateral load resisting system consists of the 9-inch reinforced brick masonry and 8-inch gunite concrete walls in both orthogonal directions of the building up to the third floor. At the levels above, 9-inch brick masonry walls form the lateral load resisting system in both orthogonal directions of the building. Continuous wall footings support the brick masonry walls while the gunite concrete walls in the north-south direction are supported on grade beams and bell caissons.

12) Number of Stories
   (a) Above grade: 5
   (b) Below grade: 0

13) Original Building Design Code & Year: Uniform Building Code 1952

14) Retrofit Building Design Code & Year (if applicable): Not Applicable

15) Cost Range to Retrofit (if applicable)[4] (Low, Medium, High, or Very High): Low

Please assume a "Low" cost-range corresponds to a complete retrofit cost less than $50 per square foot (sf), a "Medium" cost-range corresponds to a complete retrofit cost greater than $50 per sf and less than $200 per sf, a "High" cost-range corresponds to a complete retrofit cost greater than $200 per sf and less than $400 per sf, and a "Very High" cost-range corresponds to a complete retrofit cost greater than $400 per sf.

[4] Assume a complete retrofit conforming to the current UC Seismic Safety Policy. Note this range includes all construction costs, including code upgrades (e.g., accessibility, fire and life safety, mechanical, electrical, plumbing) triggered by the seismic retrofit. No specific estimate is required to be supplied at this time (i.e., provide an approximate cost to retrofit using Low, Medium, High or Very High cost-range categories). It is acknowledged that such a cost range is assumed to be based only on the engineer's rough estimate and is not intended to require input from a professional cost estimator. For estimation purposes, CSEs may judgmentally determine an approximate cost range for seismic retrofits based on recent relevant experience, and then apply a multiplier to approximate total construction costs.

BACKGROUND INFORMATION

Site Information

16) Site Class (A – F) and Basis of Assessment: Site Class D (default site class per code; no geotechnical reports available)

17) Geologic Hazards
   (a) Fault Rupture (Yes, No or Unknown) and Basis of Assessment: No, based on "Fault Activity Map of California" from California Geological Survey.
   (b) Liquefaction (Yes, No or Unknown) and Basis of Assessment: No, based on "Earthquake Zones of Required Investigation Beverly Hills Quadrangle" map published by the California Geological Survey, dated January 11, 2018.
   (c) Landslide (Yes, No or Unknown) and Basis of Assessment: No, based on "Earthquake Zones of Required Investigation Beverly Hills Quadrangle" map published by the California Geological Survey, dated January 11, 2018.

18) Site-specific Ground Motion Study? (Yes or No): No

Seismic design acceleration parameters of interest:	
For BSE-2E	S_{XS}: 1.861g S_{X1}: 0.948g
For BSE-1E	S_{XS}: 0.898g S_{X1}: 0.517g

19) Estimated Fundamental Period (seconds)
   (a) Longitudinal
   Office Wing: 0.37sec
   (b) Transverse
   Office Wing: 0.37sec

20) Falling Hazards Assessment Summary: A structural observation could not be conducted as the campus is currently closed due to the Covid-19 pandemic. Based on the record architectural drawings, the precast roof coping overhanging around the perimeter of the roof is reinforced with light mesh and anchored to the roof slab with ½" diameter expansion bolts at 3'-0" on center spacing. The minimal reinforcing and anchorage may result in localized spalling and may present a falling hazard.

21) Structural Non-Compliances/Findings Significantly Affecting Rating Determination Summary
Significant Structural Deficiencies, Potentially Affecting *Seismic Performance Rating* Designation:

   (a) Adjacent Buildings
   The clear distance between the office wing and center portion of Rolfe Hall is 3 inches per the structural drawings (reference sheet S-3), which is less than the required clear distance per the Tier 1 checklist.

   (b) Geometry (vertical irregularities)

Office Wing: An in-plane shear wall vertical irregularity occurs at the brick masonry shear wall along the south elevation from the ground to first floor level.

(c) Torsion

Office Wing: The estimated distance between the center of mass and center of rigidity along the east-west direction of the building is greater than the permissible distance per the Tier 1 checklist.

(d) Overturning

The ratio of the least horizontal dimension of the seismic-force-resisting system (taken to be same as the width of the building) is greater than the permissible ratio from the Tier 1 checklist. A 3D analysis model and Tier 2 evaluation may show that the building is not susceptible to overturning.

(e) Shear Wall Stress Checks

The average shear stress in some of the brick masonry and concrete shear walls in both orthogonal directions of the building exceed the shear stress limit per the Tier 1 checklist. A Tier 2 evaluation may eliminate some of these deficiencies and show that the noncompliant walls meet the required acceptance criteria.

(f) Openings at Shear Walls (concrete or masonry)

Diaphragm openings near Stair 3 and Stair 4 are more than 25% of the length of shear wall adjacent to the opening and is identified as a deficiency per the Tier 1 checklist. The shear wall near Stair 4 is an exterior masonry shear wall and the diaphragm opening is greater than the permissible limit of 8 feet.

22) Brief Description of Anticipated Failure Mechanism

Select concrete and masonry walls may experience in-plane shear failure during a seismic event. Insufficient confinement ties at the ends of the gunite wall piers may cause buckling of the shear wall boundary elements.

23) Seismic Retrofit Concept Sketches/Description (only required for buildings rated V or worse)

Strengthen the deficient shear walls using fiber reinforced polymer (FRP) wrap or shotcrete. Wall boundary elements can be strengthened by jacketing the wall ends with concrete and providing column ties around the vertical reinforcement or by wrapping the ends of the shear walls with FRP.

Building Report Appendices

A) ASCE 41-17 Tier 1 Checklists (Structural only)

B) Quick Check Calculations