



**BUILDING REPORT**



11/6/2020

- 1) UC Campus: **UCLA**
- 2) Building Name: **Royce Hall - Rehearsal Hall**
- 3) Building CAAN ID: **4375**
- 4) Auxiliary Building ID<sup>1</sup>: **4375.1**
- 5) Date of Evaluation: **11/06/20**
- 6) Evaluation by (Firm, Evaluator Name, Signature, Stamp) **John A. Martin & Associates, Inc., EH, JL**
- 7) Seismic Performance Rating<sup>2</sup> and Basis of Rating: **IV, UC Seismic Safety Policy and ASCE 41-17 Tier 1 evaluation. A rating level IV is given based on the anticipated overall seismic performance of the building. Tier 2 analysis is recommended to evaluate the noted deficiencies.**



10) Site Location

- (a) Latitude Decimal Coordinates: **34.0728249**
- (b) Longitude Decimal Coordinates: **-118.4421591**

11) ASCE 41-17 Model Building Type and Description<sup>3</sup>

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

The 1982 Rehearsal Hall addition is a one-story structure with an intermediate mezzanine level and two small penthouse structures on the roof. The Rehearsal Hall is located directly west of the original Royce Hall structure and is separated by a 2½” seismic joint. The elevated slabs consist of 1½” deep metal deck topped with 4½” light-weight concrete. Slabs are supported with steel beams that are supported on concrete and CMU bearing walls. The beams at the south end of the building interfacing with the original Royce Hall structure are supported on bearing connections that allow for sliding to accommodate differential movement between the two structures. The lateral system is

<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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.



comprised primarily of bearing reinforced masonry walls with a few reinforced concrete walls. The bearing shear walls are supported on strip footings.

12) Number of Stories

- (a) Above grade: 1
- (b) Below grade: 0

13) Original Building Design Code & Year: 1982 UBC

14) Retrofit Building Design Code & Year (if applicable): N/A

15) Cost Range to Retrofit (if applicable)<sup>4</sup> (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.

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<sup>4</sup> 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 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 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 <sub>XS</sub> : <a href="#">1.861</a> S <sub>X1</sub> : <a href="#">0.948</a>
For BSE-1E	S <sub>XS</sub> : <a href="#">0.898</a> S <sub>X1</sub> : <a href="#">0.517</a>

19) Estimated Fundamental Period (seconds)

- (a) Longitudinal: [0.30s](#)
- (b) Transverse: [0.30s](#)

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 construction documents, the parapet is constructed of reinforced double-wythe brick masonry columns at 18’-6” on center, which are doweled into the perimeter walls with #4 bars at each corner of the column. Concrete balustrades span between the brick masonry columns. The attachment of the concrete balustrades to the primary structure is not shown on the drawings 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 separation between Royce Hall was determined to be inadequate based on a Tier 1 analysis. A Tier 2 evaluation is recommended to verify if the existing seismic joint is sufficient to accommodate the relative displacement of the adjacent structures.](#)
- (b) Geometry (vertical irregularities): [A shear wall vertical irregularity occurs at the west exterior wall between gridlines 2 and 3 above the double wide door opening.](#)



(c) Torsion: Penthouse structures above Level 1 have a torsional response and require further evaluation.

22) Brief Description of Anticipated Failure Mechanism:

The masonry lintel supporting the discontinuous shear wall pier lacks transverse reinforcing which may lead to shear failure. The lateral system of the penthouse structures above Level 1 (above patio level) consists of brick masonry cantilevered columns with transverse reinforcing of #3 bars at 16" spacing. Torsional behavior may also contribute to overstressed columns. Pounding may occur between the Rehearsal Hall and the main Royce Hall structure.

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

**Building Report Appendices**

- A) ASCE 41-17 Tier 1 Checklists (Structural only)
- B) Quick Check Calculations