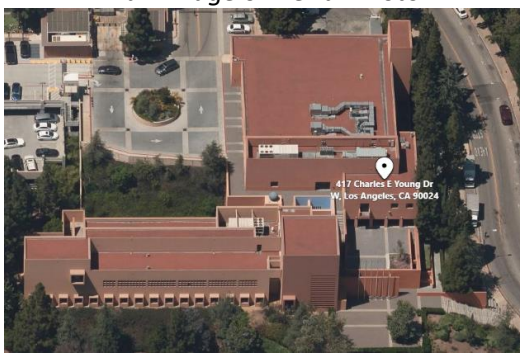
UC Seismic Evaluation – Bradley Hall

Date:	10/30/20
UC Campus:	UCLA – on campus
Building Name:	Bradley Hall
Building Address:	417 Charles E. Young Drive, Los Angeles, CA 90024
CAAN ID:	4271
Auxiliary Building ID[1]:	N/A

Summary of information provided by Evaluator:
Nabih Youssef Associates Structural Engineers
UCOP Seismic Performance Level[2] (or "Rating") based on ASCE 41-17 Tier 1 evaluation findings: V*
*A Tier 3 evaluation and 3D analysis is recommended for this building due to the hillside site and multiple structural systems.

Plan Image or Aerial Photo



Exterior Elevation Photo

Site location coordinates (decimal):
Latitude: 34.069611
Longitude: -118.449124

Is this a "Partial" Building (i.e., a single structure in a complex building? (Y or N): N

ASCE 41-17 Model Building Type[3]: Noting that building is on a hillside site and is not considered a benchmark building, the building is most similar to a combination of the S1 - Steel Moment Frame and S2 - Steel Braced frame building types with stiff diaphragms at the typical floors and a flexible metal deck diaphragm at the roof levels.

Number of stories:
Above grade: 4
Below grade: 0

[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 Level shall be a Roman numeral associated with the most applicable performance description from Table A.1 in Appendix A of the UC Seismic Safety Policy.
[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.

Original Building Design Code and Year: 1991 UBC with 1992 CA updates
Retrofit Building Design Code and Year: N/A
Cost Range to Retrofit (if applicable)[4]: Medium
"Low" cost-range corresponds to a complete retrofit cost less than $50 per square foot (sf), "Medium" cost-range corresponds to a complete retrofit cost greater than $50 per sf and less than $200 per sf, "High" cost-range corresponds to a complete retrofit cost greater than $200 per sf and less than $400 per sf, and "Very High" cost-range corresponds to a complete retrofit cost greater than $400 per sf.

Building information used in this evaluation:
Structural drawings by LPA, "Tom Bradley International Center / Rita and Stanley Dashew International Center", dated March 14, 1996

Scope for completing this form:
Reviewed structural drawings for original construction and performed ASCE 41-17 Tier 1 evaluation based on similar building types not located on a hillside site.

Brief description of structure:

The 4-story building has an area of approximately 56,066 square feet and was built in 1997. The building is irregular-shaped in-plan with re-entrant corners and located on a hillside site.

Foundation System: The foundation system consists of shallow spread footings at varying elevations along the sloping grade and supporting columns and strip footings supporting walls and frames. A 5-in-thick concrete slab-on-grade forms the basement level at varying elevations.

Structural System for Vertical (gravity) loads: The roof and typical office floors consist of metal deck with concrete fill spanning to rolled steel beams and girders. The steel floor framing is supported by steel wide flange and tube steel columns.

Structural System for Lateral (seismic/wind) loads: The metal deck and concrete fill roof and floors act as diaphragms to transfer seismic forces to distributed bolted flange plate steel moment frames and chevron and concentric braced frames. Vertical distribution of braced and moment frames is irregular and not all frames and columns are continuous to the foundation. A combination of concrete and CMU walls are utilized below grade and along the hillside.

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BACKGROUND INFORMATION

Site Information:
Site Class (A-F): D; Default

Geologic Hazards (Y or N):

- Fault Rupture: N; EZRIM Beverly Hills
- Liquefaction: N; USGS
- Landslide: N; EZRIM Beverly Hills

Site-specific Ground Motion Study? N

Site-modified Spectral Response:
Hazard Level BSE-2E, (0.2s), SXS: 1.848
Hazard Level BSE-2E, (1.0s), SX1: 0.944
Hazard Level BSE-1E, (0.2s), SXS: 0.896
Hazard Level BSE-1E, (1.0s), SX1: 0.516
Estimated Fundamental Period (seconds): 0.55s*
*A Tier 3 evaluation is recommended for this building due to the hillside site and multiple structural systems.

Falling Hazards Assessment Summary: None observed.

Summary of Tier 1 Seismic Evaluation Structural Non-compliances/Findings Significantly Affecting Rating Determination:

Significant Structural Deficiencies, Potentially Affecting *Seismic Performance Level* Designation:

- ☒ Lateral System Stress Check (wall shear, column shear or flexure, or brace axial as applicable)
- ☐ Load Path
- ☐ Adjacent Buildings
- ☐ Weak Story
- ☐ Soft Story
- ☒ Geometry (vertical irregularities)
- ☒ Torsion
- ☐ Mass – Vertical Irregularity
- ☐ Cripple Walls
- ☐ Wood Sills (bolting)
- ☐ Diaphragm Continuity
- ☐ Openings at Shear Walls (concrete or masonry)
- ☐ Liquefaction
- ☐ Slope Failure
- ☐ Surface Fault Rupture
- ☐ Masonry or Concrete Wall Anchorage at Flexible Diaphragm
- ☐ URM wall height to thickness ratio
- ☐ URM Parapets or Cornices
- ☐ URM Chimney
- ☐ Heavy Partitions Braced by Ceilings

☐ Appendages

Brief Description of Anticipated Failure Mechanisms: Additional review and 3D analysis is recommended. Possible failure mechanisms include excessive settlement and lateral movement at isolated shallow foundations, yielding of beams at chevron brace configurations, flexural hinging of moment frame columns, buckling of braced frame braces, and braced frame brace connection failure in tension.

Comments and Additional Deficiencies:

The building is "L" shaped and located on a hillside site. Foundations consists of shallow spread footings at varying elevations. Geotechnical evaluation of expected slope stability and settlement performance is recommended.

Seismic Retrofit Concept Sketches/Description (only if above-listed rating is V or greater): Additional review and 3D analysis is recommended. A seismic retrofit may consist of the addition of braced frames or walls to stiffen the building along the hillside slope, strengthening of moment frame columns to mitigate possible column flexural hinging, strengthening of beams or reconfiguration of braces at chevron braces, strengthening of braced frame brace connection to develop the tension capacity of the braces, and soil improvement in accordance with geotechnical recommendations for possible slope instability and excessive settlement mitigation.

Appendices:

A. ASCE 41-17 Tier 1 Checklists - S1-S1A & S2-S2A
B. Quick Check Calculations