NABIH YOUSSEF ASSOCIATES
STRUCTURAL ENGINEERS

UC Seismic Evaluation – MacDonald Medical Research Laboratory

Date:	11/09/20
UC Campus:	UCLA – on campus
Building Name:	MacDonald Medical Research Laboratory
Building Address:	675 Charles E Young Dr S, Los Angeles, CA 90095
CAAN ID:	4348
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

Plan Image or Aerial Photo

Exterior Elevation Photo

Site location coordinates (decimal):
Latitude: 34.067433
Longitude: -118.444098

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]:
Longitudinal Direction: S1 – Steel Moment Frames (with Stiff Diaphragms)
Transverse Direction: S1 – Steel Moment Frames (with Stiff Diaphragms)

Number of stories:
Above grade: 5
Below grade: 1

[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.
[1] 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.
[1] 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: Uniform Building Code, 1985 Edition

Retrofit Building Design Code and Year: N/A

Cost Range to Retrofit (if applicable)[4]: Medium/High
"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 John A. Martin and Associates, "Medical Research Laboratory Building", dated December 19, 1988

Scope for completing this form:
Reviewed structural drawings for original construction and performed ASCE 41-17 Tier 1 evaluation.

Brief description of structure:

The 5-story building has an area of approximately 148,372 square feet and was built in 1991. The building is regular-shaped.

Foundation System: The typical foundation system consists of continuous concrete strip footing at perimeter basement wall and concrete spread footing at columns.

Structural System for Vertical (gravity) loads: The floor framing consists of metal deck with normal weight concrete fill supported by steel wide flange beams spanning to steel wide flange girders. The girders are supported by steel wide flange columns that are continuous to the foundations.

Structural System for Lateral (seismic/wind) loads: The metal deck with normal weight concrete fill acts as diaphragms to transfer seismic forces to steel moment frames at building perimeter in each direction.

BACKGROUND INFORMATION

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

Geologic Hazards (Y or N):

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

Site-specific Ground Motion Study? N

Site-modified Spectral Response (0.2s), Hazard Level BSE-1E, S_{XS}: 0.896

Site-modified Spectral Response (1.0s), Hazard Level BSE-1E, S_{X1}: 0.516

Estimated Fundamental Period (seconds):

- Longitudinal Direction: 1.54s
- Transverse Direction: 1.54s

[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., ADA, 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.

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 Mechanism: The existing moment frames utilize pre-Northridge welded connections, which have the potential for premature brittle failure.

Comments and Additional Deficiencies:
Column splice connections have partial penetration welds at flanges and webs. There are a few discontinuous columns in the moment frames and there are many moderate sized openings in the floor diaphragms.

Seismic Retrofit Concept Sketches/Description (only if above-listed rating is V or greater): Recommend Tier 3 evaluation of the building to assess effect of vertical and diaphragm irregularities. Minimum scope of retrofit includes repair/modification of existing welded moment connections and strengthening of existing column splice connections.

Appendices:

A. ASCE 41-17 Tier 1 Checklists
B. Quick Check Calculations