NABIH YOUSSEF ASSOCIATES
STRUCTURAL ENGINEERS

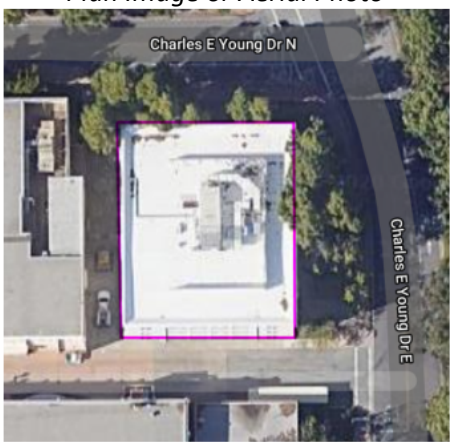
UC Seismic Evaluation – Melnitz East

Date:	10/30/2020
UC Campus:	UCLA – on campus
Building Name:	Melnitz East
Building Address:	235 Charles E Young Dr E, Los Angeles, CA 90024
CAAN ID:	4577B
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: VI

Plan Image or Aerial Photo



Exterior Elevation Photo

Site location coordinates (decimal):
Latitude: 34.076477
Longitude: -118.439378

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: S2a – Steel Braced Frames (with flexible diaphragms)
Transverse Direction: S2a – Steel Braced Frames (with flexible diaphragms)

Number of stories:
Above grade: 3
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.
[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: 1988 California Building Code
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 Stephen Perlof Consulting Structural Engineers, "East Melnitz Building", dated 05/20/1991

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

Brief description of structure:

The 3-story administration building has a total area of approximately 25,300 square feet and was built in 1991. The building is a roughly square rectangular-shaped building.

Foundation System: The foundation system consists of shallow continuous spread footings supporting perimeter exterior walls and isolated spread footings at interior columns. A 4" thick concrete slab forms the finished ground floor level.

Structural System for Vertical (gravity) loads: The typical floor and roof framing consists of steel W-shape beams at the building perimeter and at east-west gridlines that serve as girder lines for Wood I-Joists @ 16" on center with plywood sheathing deck.

Structural System for Lateral (seismic/wind) loads: The plywood roof and floor decks acts as the diaphragms to transfer seismic forces to perimeter steel frames that consist of concentric braced frames with rectangular steel tube braces in a chevron layout. At the ground floor, seismic forces are transferred from the base of the frames to grade beams with embedded threaded rods.

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

[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.

Site-specific Ground Motion Study? N

Site-modified Spectral Response (0.2s), Hazard Level BSE-1E, S_{XS}: 0.899

Site-modified Spectral Response (1.0s), Hazard Level BSE-1E, S_{X1}: 0.518

Estimated Fundamental Period (seconds):

- Longitudinal Direction: 0.318s
- Transverse Direction: 0.318s

Falling Hazards Assessment Summary: No egregious falling hazards are present at the exterior of the building. There is a braced parapet that is well detailed and does not support a heavy cladding type and because of this, the parapet should have a very low probability of experiencing failure.

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: Yielding of beams receiving midspan chevron brace connections, buckling of braced frame columns from overturning, and failure of brace to gusset welds in tension.

Comments and Additional Deficiencies: The worst performing element from the Tier 1 check are the beams receiving the chevron braces, but the brace connection could fail in tension prior to the beam failing. The column overstress from overturning is also a concern. NYA suggests a more in depth and detailed Tier 2 evaluation be performed to more accurately assess these non-compliant Tier 1 check issues.

Seismic Retrofit Concept Sketches/Description (only if above-listed rating is V or greater): Add zipper columns down the middle of the chevron frames from level 2 to the roof to assist the beam strength issue. Alternatively, the chevron configuration could be changed to an X configuration to alleviate the force unbalance on the beams due to the chevron configuration. Strengthen columns at braced frames for overturning stress (non-corner columns only) and add strengthening at brace end connections to develop the full tension yield capacities of the braces.

Appendices:

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