



BUILDING REPORT REQUIREMENTS
ASCE 41-17 TIER 1 SEISMIC EVALUATIONS

BUILDING REPORT

- 1) UC Campus: Los Angeles
2) Building Name: Engineering IV
3) Building CAAN ID: 4256A
4) Auxiliary Building ID:
5) Date of Evaluation: 9/15/2020
6) Evaluation by: Englekirk, TAS/TN
7) Seismic Performance Rating and Basis of Rating: V, ASCE 41-17 Tier 1



8) Plan Image or Aerial Photo



9) Exterior Elevation Photo

- 10) Site Location
(a) Latitude Decimal Coordinates: 34.0687997
(b) Longitude Decimal Coordinates: -118.4440275
11) ASCE 41-17 Model Building Type and Description
(a) Longitudinal Direction: S2 and S2a: Steel eccentrically braced frame
(b) Transverse Direction: S2 and S2a: Steel eccentrically braced frame
12) Number of Stories
(a) Above grade: 6
(b) Below grade: 0
13) Original Building Design Code & Year: UBC-1979
14) Retrofit Building Design Code & Year (if applicable):
15) Cost Range to Retrofit (if applicable): (Low, Medium, High or Very High): High



Comments: The building consists of EBF frames as the lateral force resisting system in the transverse and longitudinal directions. The closest standard checklist that we can use is the S2/S2A form but it is inadequate in providing a Tier 1 evaluation of the components of an EBF frame. The following is a list of issues that we suggest need to be investigated further: 1) The links, 2) the beam outside the link, 3) For Frame System 3, the brace configuration has the potential to generate an unbalanced point load where



the two braces intersect on a beam, 4) Frame System 6 does not have a bracing system at the bottom floor (hence the non-compliance for "Vertical Irregularities"). The assumption is Frame System 6 unloads its seismic force into the Plaza diaphragm and transfers load to Frame System 5, 5) The adequacy of drag lines and the steel deck and concrete fill to transfer loads to the frames. A quick check was performed to compare the shear capacity of the EBF link to the axial capacity of the braces. The ratios are low indicating the potential for framing outside the link to have sufficient capacity perform in an expected manner. The building did not satisfy the 1.5% separation criteria for a building in a high seismic area (16" provided vs. 18" required for the quick check) but given the stiffness of an EBF frame, it is likely that additional analysis will show compliance with this criterion. The check for overturning of the frames was not satisfied. One frame along grid 8 has openings on both sides and therefore does not satisfy the check "Openings at Frames" but there is a defined drag line to the frame to transfer seismic loads. The W12x65 brace did not satisfy the criteria for a moderately ductile member so a further study is recommended.

BACKGROUND INFORMATION

Site Information

16) Site Class (A – F) and Basis of Assessment

- (a) Site Class: **D**
- (b) Site Class Basis: **Unknown (Default)**
- (c) Site Class Company: **None**
- (d) Site Class Report Date: **None**
- (e) Site Class Ref Page No.: **None**

17) Geologic Hazards

- (a) Fault Rupture (Yes, No or Unknown) and Basis of Assessment: **No, CGS Maps**
- (b) Liquefaction (Yes, No or Unknown) and Basis of Assessment: **No, CGS Maps**
- (c) Landslide (Yes, No or Unknown) and Basis of Assessment: **No, CGS Maps**

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

Seismic design acceleration parameters of interest:	
For BSE-1N	1.629 and 0.826
For BSE-1E	0.897 and 0.516

19) Estimated Fundamental Period (seconds)

- (a) Longitudinal: **0.96**
- (b) Transverse: **0.96**

20) Falling Hazards Assessment Summary: **No deficiency noted**

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

- (a) Lateral System Stress Check (wall shear, column shear or flexure, or brace axial as applicable):
No deficiency noted
- (b) Load Path: **No deficiency noted**



- (c) Adjacent Buildings: Yes, deficiency noted
- (d) Weak Story: No deficiency noted
- (e) Soft Story: No deficiency noted
- (f) Geometry (vertical irregularities): Yes, vertical irregularity noted
- (g) Torsion: No deficiency noted
- (h) Mass – Vertical Irregularity: No deficiency noted
- (i) Cripple Walls: Not Applicable
- (j) Wood Sills (bolting): Not Applicable
- (k) Diaphragm Continuity: No deficiency noted
- (l) Openings at Shear Walls (concrete or masonry): Not Applicable
- (m) Liquefaction: No
- (n) Slope Failure: No
- (o) Surface Fault Rupture: No
- (p) Masonry or Concrete Wall Anchorage at Flexible Diaphragm: Not Applicable
- (q) URM wall height to thickness ratio: Not Applicable
- (r) URM Parapets or Cornices: Not Applicable
- (s) URM Chimney: Not Applicable
- (t) Heavy Partitions Braced by Ceilings: Not Applicable
- (u) Appendages: Not Applicable

22) Brief Description of Anticipated Failure Mechanism

Failure of EBF links. For Frame System 3, potential yielding of the steel beam at the bottom of the bracing. The unloading of seismic forces at the Plaza Level from Frame System 6 on grid 1.5 to Frame System 5 on grid 2. Premature buckling of W12x65 braces.

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

Diaphragm strengthening at the Plaza Level to transfer seismic loads from Frame System 6 on grid 1.5 to Frame System 5 on grid 2. Strengthening of EBF links. As an alternate, the addition of supplemental damping systems may be a more cost effective approach to reconcile deficiencies the EBF frame system.

Building Report Appendices

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

B) Quick Check Calculations