Appendix E: Seismic Report

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Seismic Report (Probable Maximum Loss)

3175 Airway Avenue

3175 Airway Avenue
Costa Mesa, California

EBI Project No. 1319000059

February 25, 2019

Prepared for:

City of Costa Mesa
77 Fair Drive
Costa Mesa, CA 92628

Prepared by:

EBI Consulting
environmental | engineering | due diligence

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February 25, 2019

To Whom It May Concern
City of Costa Mesa
77 Fair Drive
Costa Mesa, CA 92628

Subject: Seismic Report (Probable Maximum Loss)
3175 Airway Avenue
3175 Airway Avenue**,** Costa Mesa, California
EBI Project No. 1319000059

To Whom It May Concern:

Attached please find our *Seismic (Probable Maximum Loss) Report* (the *Report*) for the above-mentioned asset (the Subject Property). During the property survey and research, our property surveyor met with agents representing the Subject Property, or agents of the owner, and reviewed the property and its history. The *Report* was completed in general conformance with ASTM Guide E2026-16a and ASTM Guide E2557-16a, and according to the terms and conditions authorized by you.

The exclusive purpose of this *Report* is to assist City of Costa Mesa in its Due Diligence effort in evaluating the Subject Property.

This *Report* is addressed to City of Costa Mesa and such other persons as may be designated by City of Costa Mesa and their respective successors and assigns.

EBI is an independent contractor, not an employee of either the issuer or the borrower, and its compensation was not based on the findings or recommendations made in the report or on the closing of any business transaction.

Thank you for the opportunity to be of service. Should you have questions or require additional information, please contact the undersigned.

Respectfully Submitted,
EBI CONSULTING

Kiki Okaly, PE
Author – Field Assessor / Structural Engineer

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EXECUTIVE SUMMARY

The Subject Property, known as 3175 Airway Avenue, is located in Costa Mesa, California at 3175 Airway Avenue, was reportedly constructed in 1972 and consists of a single-tenant, office/warehouse building totaling 29,816±[1] net rentable square feet on a 1.34-acre lot.

Kiki Okaly of EBI surveyed the property on February 22, 2019, and was accompanied by and interviewed Mr. Kyle Millen, the property owner. During the survey, representative areas of the site, amenities, tenant spaces, offices, mechanical spaces, mechanical equipment and building components were observed. No structural drawings or site-specific geotechnical information were available for our review.

The purpose of our review and *Report* is to assess the Probable Maximum Loss (PML) defined as a Scenario Expected Loss (SEL) for the property based on a seismic event with a return period consistent with current building code requirements.

Based upon our survey, and utilizing the St-Risk statistical software program, **the PML for the Subject Property is estimated as 15% of the replacement cost of the building (475-year return period, 10% chance of exceedance in a 50 year exposure period)**.

The Subject Property is not in an area subject to the Alquist-Priolo Earthquake Zoning Act or a seismic hazard zone as depicted on maps published by the California Department of Mines and Geology (CDMG).

No existing or prior significant structural or foundation damage from previous earthquakes was reported or observed.

Per ASTM Guide E2026-16a and ASTM Guide E2557-16a, potential building stability concerns were identified and are further discussed in Section 3.1.

1 Square footage obtained from Rent Roll.

1.0 INTRODUCTION & LIMITATIONS

The exclusive purpose of this Seismic Report (Probable Maximum Loss) (the *Report*) is to assist City of Costa Mesa in its due diligence evaluation of the Subject Property described in this *Report*. This *Report* has no other purpose and should not be relied upon by any other person or entity. Reliance upon this *Report* does not extend to property owners, or entities or individuals interested in purchasing the Subject Property. Amendments to EBI's limitations as stated herein that may occur after issuance of the *Report* are considered to be included in this *Report.* Payment for the *Report* is made by, and EBI's contract and *Report* extends to City of Costa Mesa only. By accepting draft and final Reports, City of Costa Mesa agrees to these terms and limitations.

This *Report* has been completed in general conformance with ASTM Guide E2026-16a Standard Guide for Seismic Risk Assessments of Buildings and ASTM Guide E2557-16a Standard Practice for Probable Maximum Loss (PML) Evaluations for Earthquake Due-Diligence Assessments. This Report is generally consistent with the definition of a "Level I investigation" as defined in ASTM Guide E2026.

The information reported was obtained through sources deemed reliable, a visual site survey of areas readily observable, easily accessible or made accessible by the property contact and interviews with owners, agents, occupants, or other appropriate persons involved with the Subject Property. Municipal information was obtained through file reviews of reasonably ascertainable standard government record sources, and interviews with the authorities having jurisdiction over the property. Findings, conclusions and recommendations included in the *Report* are based on our visual observations in the field, the municipal information reasonably obtained, information provided by the Client, and/or a review of readily available and supplied drawings and documents. No disassembly of systems or building components or physical or invasive testing was performed. EBI renders no opinion as to the property condition at un-surveyed and/or inaccessible portions of the Subject Property. EBI relies completely on the information, whether written, graphic or verbal, provided by the property contact, owner or agent, or municipal source, or as shown on any documents reviewed or received from the property contact, owner or agent, or municipal source, and assumes that information to be true and correct. The observations in this *Report* are valid on the date of the survey.

In accordance with ASTM Guides E2026 and E2557, the following limitations or exceptions to the Guides are identified below:

- The report certification is provided by supplying the professional license number and professional's signature. The seal has not been provided in this electronic copy.
- The Guide states that the User should arrange for or provide the Provider with timely access to all reports, plans, drawings, and specifications for the building(s), both for the original building and for any modifications, alterations or additions. No information of this type was provided to EBI.

The survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession, and in accordance with generally accepted practices of other consultants currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended. The *Report* speaks only as of its date, in the absence of a specific written update of the *Report*, signed and delivered by EBI.

The contents of the *Report* are not intended to represent an in-depth analysis of the Subject Property. The extent of the physical survey for the production of this *Report* has been limited, by contract and agreed upon Scope of Work, to a brief "walk through" of the property. Assumptions regarding the overall condition of the property have been developed based upon a survey of "representative" areas of the building. As such, no representation of *all* aspects of *all* areas or components is made.

Any additional information that becomes available after our survey and draft submission concerning the Subject Property should be provided to EBI so that our conclusions may be revised and modified if necessary, at additional cost. This *Report* has been prepared in accordance with our Standard Conditions for Engagement, which is an integral part of this *Report.*

ABBREVIATIONS

EBI may use various abbreviations to describe various site, building or system components or legal descriptions. Not all abbreviations may be applicable to all *Reports.* The abbreviations most often utilized are defined below.

APA	American Plywood Association
CMU	Concrete Masonry Unit
EIFS	Exterior Insulating Finishing System
FRT	Fire retardant treated plywood
GWB	Gypsum Wall Board
MMI	Modified Mercalli Intensity
OSB	Oriented Strand Board
PL	Probable Loss
PML	Probable Maximum Loss
SEL	Scenario Expected Loss
SUL	Scenario Upper Loss
UBC	Uniform Building Code
DBE	Design Basis Earthquake

2.0 EVALUATION PROCEDURES

This report is based upon a site observation made on February 22, 2019. The Probable Maximum Loss (PML) has been estimated utilizing the St-Risk statistical software program. The PML value is not intended to be a guarantee of how the property will perform in a seismic occurrence. It is a statistical review that is intended to suggest how the property may be affected by a probable seismic event. The PML value is based on the building location, construction type, date of construction, and building configuration.

The PML values are provided as a mean recurrence interval or a probability of exceedance. The mean recurrence interval is the average period of time, in years, between the occurrence of earthquakes that produce effects of the same, or greater, severity. The probability of exceedance (e.g., 10% in 50 years) is a statistical representation of the chance that earthquake effects exceeding a given severity will be experienced at the site within a specified number of years.

The PML does not take into account the value of equipment, inventory or monetary loss from business interruption. EBI represents that the estimate of seismic performance for the building is based on a limited review of the property condition, and on a large measure of engineering judgment that is incorporated into the St-Risk program. Engineering judgment is a necessary component of this review since analytical methods do not exist that will encompass all parameters required to determine an exact cost of any damage caused by the scenario earthquake.

This report represents our professional experience and judgment, and a good faith effort to obtain all available information. Documents and information provided by the client, designated representatives of the client or other interested parties, and consulted in the preparation of this report, have been used herein, with the understanding that EBI assumes no responsibility or liability for their accuracy or for the withholding by any of the involved parties of any reports or other information that could affect the transaction.

3.0 PROPERTY DESCRIPTION

3.1 GENERAL INFORMATION

The Subject Property is improved with one concrete tilt-up construction, flat-roofed office/warehouse building. The building has office spaces at the south east and north west corners of the warehouse with mezzanine spaces. The table below lists the building and certain characteristics.

ADDRESS	YEAR BUILT	CONSTRUCTION TYPE	BUILDING FOOTPRINT SHAPE	NO. OF FLOORS	APPROX. DIMENSIONS	GROSS AREA (SF)
3175 Airway Avenue	1972	Concrete tilt-up bearing/shear wall	Relatively Rectangular	1 + mezzanines	130' x 225'	29,816

The superstructure consists of perimeter structural concrete tilt-up wall panels and interior wood columns supporting the roof. The roof is a wood framed roof with solid sawn wood sub-purlins and purlins, glue-laminated girders with plywood sheathing. The ground floor is a slab on grade. The foundation system could not be observed but likely consists of reinforced concrete continuous strip footings and pad footings supporting the walls and columns, respectively. The two mezzanines are wood framed with solid sawn wood joists and beams with plywood sheathing.

The lateral load resisting system for the building consists of the plywood sheathed roof acting as a deep beam, also referred to as a diaphragm, transmitting the wind and earthquake loads to the precast concrete tilt-up shear walls that transfer loads to the foundation.

The Subject Property appears to have been designed to the requirements of the 1970 Edition of the Uniform Building Code (UBC) or equivalent. Finishes within the roof structure prevented the verification of the wall/roof connection throughout the building.

Based on the above, the as-built framing system does appear to have some potential for a localized collapse. Consequently, the Subject Property improvements may be unable to maintain their vertical load-bearing capacity in whole or in part during considered earthquake ground motions due to the following observed conditions:

- EBI could not observe or verify any substantial positive wall tie anchorage connecting the wood framed roof to the exterior concrete walls; under these conditions, the heavy walls have the potential to separate from the roof and floors during a code level seismic event.

3.2 BUILDING AND SITE CHARACTERISTICS

For purposes of this analysis, buildings can be grouped into various classes. Buildings within the same class can be expected to perform similarly at different levels of earthquake shaking. To account for the differences between buildings within the same class, additional information is utilized.

BUILDING CHARACTERISTICS	
Construction Class:	Per section 3.1 table
Number of Stories:	Per section 3.1 table
Year Constructed:	Per section 3.1 table
Occupancy Type:	Office/Warehouse

SECONDARY STRUCTURAL CHARACTERISTICS:	
Shape Configuration:	Per section 3.1 table
Setbacks:	No setbacks observed
Overhangs:	No major overhangs observed
Redundancy:	Minor non-redundancy at loading dock doors and storefront systems
Torsion:	Minor due to loading dock doors and storefronts
Structural Irregularities:	None observed
Building Exterior:	Painted concrete tilt-up wall panels
Ornamentation:	Little
Wall-Roof Connection:	Seismic connection concealed or not observed but assumed to comply with code of record
Structural Upgrade:	None observed or reported
Engineered Foundation:	Assumed present
Mechanical/ Electrical Equipment:	Bracing of some equipment observed; one hot water heater observed with no seismic straps
Construction Quality:	Good
Hazardous Exposure:	None reported

SITE CHARACTERISTICS

The soil conditions at a site can influence the damageability of a structure in two general ways:

- Soft soils tend to amplify ground motion.
- Collateral hazards such as soil liquefaction, sliding or rupturing can potentially result in considerable damage to a structure.

No site-specific geotechnical information was provided.

Based on the location of the Subject Property, information regarding the site characteristics has been gathered from the soil data retrieved from the California Geologic Survey and the St-Risk database.

The following site characteristics were used in estimating the PML:

SITE SUMMARY	
Site Soil Type:	*Alluvium, S_D –Seismic Zone 4 (assumed soil profile)*
COLLATERAL HAZARDS	
Liquefaction Potential:	*Assumed low (Per State of California Seismic Hazard Zones for Tustin Quadrangle Official Map dated January 17, 2001, and St-Risk)*
Landslide Potential:	*Low*
Fault Rupture Potential:	*Low*

The estimated peak ground acceleration (PGA) is 0.4185g for the 475-year return period earthquake based upon 2014 data from the United States Geological Survey (USGS).

4.0 SEISMIC REVIEW

4.1 SITE SEISMICITY

The Richter Magnitude Scale gives an indication of the absolute energy released in an earthquake. However, generally speaking, the further a building is from the epicenter, the less shaking it will experience. As such, just considering the magnitude of an earthquake does not give an adequate picture of the building's risk, since the distances from potential earthquake sources to the subject site must also be considered.

The Modified Mercalli Intensity Scale considers the reduction, or attenuation, of ground motion as the distance between source and site increase; the scale is calibrated from I to XII. For example, in a large earthquake, a site next to the fault may experience intensity IX shaking, while a site many miles away may experience only intensity VI shaking.

St-Risk estimates the building damage ratio by calculating the local ground motion according to the MMI Scale. The table below describes the effect of the MMI Scale intensity levels:

SCALE	POTENTIAL DAMAGE
VI-	Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII-	Damage is negligible in buildings of good design and construction; slight to moderate in well-built ordinary buildings; considerable in poorly built or badly designed buildings. Fall of plaster and stucco is considerable. Numerous windows are broken and weak chimneys are cracked.
VIII-	Damage is slight in structures built especially to withstand earthquakes; considerable in ordinary substantial buildings with possible partial collapse; panel walls in the frame structures are thrown out. Chimneys, walls and monuments fall.
IX-	Damage is considerable in masonry structures built to withstand earthquakes; some wood frame houses built to withstand earthquakes will be thrown out-of-plumb. Damage is great in substantial buildings, some collapse in large part. Frame buildings are shifted off foundations, and frames crack.
X-	Damage is severe to well-built wooden structures; most masonry and frame structures are destroyed. Dangerous cracks develop in brick walls of excellent construction.
XI-	Few structures remain standing. Fissures appear in the ground. Pipes are broken by landslides.
XII-	Damage is total. Undulating waves from seismic forces are seen on ground surface. Objects are thrown in the air. Large rock masses are displaced.

CONCLUSION

The MMI for this site, located in seismic Zone 4, is VII-VIII for an event with a 475-year return period.

4.2 PROBABLE MAXIMUM LOSS

The PML is the amount of damage the property might suffer as a result of a seismic event with a return period consistent with current building code requirements. This PML has been estimated and formulated as a mean or Scenario Expected Loss (SEL); it represents the average damage expected for a given class of buildings. The PML is expressed as a damage ratio, which is defined as the approximate repair cost resulting from the site seismicity divided by the replacement cost of the building.

Replacement costs do not include the value of the land, nor do they refer to the market value of the property.

For the PML values please refer to Section 5 and the Seismic Analysis Summary appended to the *Report*.

5.0 CONCLUSIONS

Based upon our survey, utilizing the St-Risk statistical software program, **the SEL-475 for the Subject Property constructed in 1972 is estimated to be 15%, of the replacement cost of the building (475-year return period, 10% chance of exceedance in a 50 year exposure period)**.

The Subject Property is not in an area subject to the Alquist-Priolo Earthquake Zoning Act or a seismic hazard zone as depicted on maps published by the California Department of Mines and Geology (CDMG).

No existing or prior significant structural or foundation damage from previous earthquakes was reported or observed.

Our seismic evaluation of the building is based on our visual walk-through survey. No structural drawings or site-specific geotechnical information was provided for review.

We have performed a probable maximum loss (PML) evaluation for earthquake due diligence assessment in conformance with the scope and limitations of Guide E2026 and Practice E2557 for a Level I assessment of 3175 Airway Avenue, Costa Mesa, California, the property. Any exceptions to, or deletions from, this practice are described in Appendix D of this report. This probable maximum loss (PML) evaluation for earthquake due diligence assessment has determined the PML to be as stated above. The PML is defined as Scenario Expected Loss (SEL). The project does not meet the building stability requirements for the reasons discussed in Section 3.1 and meets the site stability requirements.

APPENDIX A
SEISMIC ANALYSIS SUMMARY

3175 AIRWAY AVENUE - Seismic Risk Analysis

Company Name:	EBI Consulting	**Date:**	February 25, 2019
Building Name:	3175 Airway Avenue	**Job Number:**	1319000059
Street Address:	3175 Airway Avenue Costa Mesa, CA, USA 92626	**Engineer:**	Kiki Okaly, PE
		PE Number/State:	C84457

INFORMATION SOURCES

SiteVisit: Kiki Okaly, PE
Interviewed: Kyle Millen, Owner
Date: February 22, 2019
Docs Reviewed: Only public permit search, no site specific documents provided for review

BUILDING DESCRIPTION

Building Classification: PC1(4C) - Precast/Tilt-up Concrete Shear Walls w/ Flexible Diaphragms
Occupancy: Manufacturing
Latitude/Longitude: 33.6802 -117.8707
Region: USA: California
Region Version: 3.10
Evaluation Lifetime (yrs): 30
Uniform Building Code Design Edition: 1970
Year Constructed: 1972
Year Retrofitted: 1970
Building Height (stories): 1
Fundamental Period (s):
Area (sf): 29,816
Replacement Cost ($):
Plan Dimensions: 130 x 225
Exterior North-South Walls: Painted concrete panel
Exterior East-West Walls: Painted concrete panel
Roof Deck/Framing: Wood framed roof
Intermediate Floors/Framing: Wood framed mezzanines
Ground Floors: Concrete slab on grade
Columns: Interior wood columns
Foundation: Assumed shallow reinforced concrete foundations
Basement Levels: NA
Parking Structure: NA

LATERAL FORCE RESISTING SYSTEM

Floors/Roof: Plywood sheathing on wood purlins with glue laminated girders at the roof. Wood framed mezzaniens at southeast and northwest corners.
Walls/Braces: Concrete tilt-up wall panels around building perimeter

BUSINESS INTERRUPTION

Max. Loss With No BI:
Min. Loss At Abandonment:
BI Months At Abandonment:
BI Revenue Loss Rate($/Month):

3175 AIRWAY AVENUE - Seismic Risk Analysis

Company Name:	EBI Consulting	**Date:**	February 25, 2019
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Street Address:	3175 Airway Avenue Costa Mesa, CA, USA 92626	**Engineer:**	Kiki Okaly, PE
		PE Number/State:	C84457

GEOTECHNICAL DESCRIPTION

Provider:
Date:
UBC Soil Class: CD
Liquefaction Resilience: Low
Liquefaction Susceptibility: Low
Depth to Water Table (ft): Unknown [Assuming - 30]
Landslide Susceptibility: Low

Topography:
Soil Conditions:

COMMENTS

Comments:

Company Name:	EBI Consulting	**Date:**	February 25, 2019
Building Name:	3175 Airway Avenue	**Job Number:**	1319000059
Street Address:	3175 Airway Avenue	**Engineer:**	Kiki Okaly, PE
	Costa Mesa, CA, USA 92626	**PE Number/State:**	C84457

MODIFIED FEMA-310 WORKSHEET

PC1(4C)Precast/Tilt-up Concrete Shear Walls w/ Flexible Diaphragms

Category	Range	Typical	Modifier
GENERAL BUILDING FEATURES			
Complete load path	T, F	F	?
No adjacent buildings	T, F	T	T
Interior mezzanines adequately braced	N/A, T, F	T	T
No strength irregularity	T, F	T	T
No soft story	T, F	T	T
No geometrical irregularities	T, F	T	T
No vertical discontinuities	T, F	T	T
No mass irregularity	T, F	T	T
Adequate tie reinforcement of girder/pilaster anchor bol	T, F	F	?
Adequate girder to column/wall connection	T, F	F	?
Adequate wall anchorage	T, F	F	?
Adequate out-of-plane panel anchors	T, F	F	?
Wood ledgers not in cross grain bending	N/A, T, F	F	T
One story	T, F	T	T
LATERAL FORCE RESISTING SYSTEM			
Redundancy	T, F, 0-10	5	T
Shear stress check of precast panels	T, F, 0-20	15	15
Reinforcing steel	T, F, 0-5	2	2
Reinforcing at corner openings	N/A, T, F, 0-5	2	2
Coupling beams properly reinforced	N/A, T, F, 0-15	15	15
Limited wall openings	N/A, T, F, 0-5	2	2
Panel to panel connections not inserts	T, F, 0-10	5	5
Adequate wall thickness	T, F, 0-5	2	2
Collectors	T, F, 0-5	2	2
CONNECTIONS			
Precast wall panels doweled into foundation	T, F, 0-10	0	0
Lateral load path at pile caps	N/A, T, F, 0-10	0	N/A
FLOOR DIAPHRAGMS			
Crossties	T, F, 0-5	2	0
Reinforcing at re-entrant corner	N/A, T, F, 0-10	0	N/A
Adequate reinforcing at openings	N/A, T, F, 0-5	0	N/A
Adequate straight sheathing aspect ratios	N/A, T, F, 0-5	2	N/A
Large spans adequately sheathed	N/A, T, F, 0-5	2	N/A
Unblocked diaphragms meet requirements	N/A, T, F, 0-5	2	N/A
Other diaphragms meet requirements	N/A, T, F, 0-5	2	N/A

Company Name:	EBI Consulting	**Date:**	February 25, 2019
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	Costa Mesa, CA, USA 92626	**PE Number/State:**	C84457

MODIFIED FEMA-310 WORKSHEET

Category	Range	Typical	Modifier
ROOF DIAPHRAGM (ONLY IF 5 STORIES OR LESS)			
Crossties	T, F, 0-5	2	2
Reinforcing at re-entrant corner	N/A, T, F, 0-10	0	N/A
Adequate reinforcing at openings	N/A, T, F, 0-5	0	0
Adequate straight sheathing aspect ratios	N/A, T, F, 0-5	2	N/A
Large spans adequately sheathed	N/A, T, F, 0-5	2	2
Unblocked diaphragms meet requirements	N/A, T, F, 0-5	2	2
Other diaphragms meet requirements	N/A, T, F, 0-5	2	2
UNUSUAL CONDITIONS			
Little deterioration of wood	T, F, 0-5	2	2
Little deterioration of precast concrete walls	T, F, 0-5	2	2
Little foundation damage	T, F, 0-5	2	2
Little foundation deterioration	T, F, 0-5	2	2
Adequate overturning resistance	T, F, 0-5	2	2
Ties between foundation elements	N/A, T, F, 0-5	2	2
Lateral force on deep foundations	N/A, T, F, 0-5	2	N/A
Pole buildings	N/A, T, F, 0-5	0	N/A
Insignificant sloping at site	N/A, T, F, 0-5	0	0
SITE DEPENDENT HAZARDS - ACTIVE FAULTS			
Surface fault rupture	N/A, 0-50	0	0
NONSTRUCTURAL EXTERIOR 'WALLS'			
Cladding, glazing, veneer	N/A, T, F, 0-10	5	1
Chimneys	N/A, T, F, 0-5	5	N/A
NONSTRUCTURAL INTERIOR 'WALLS'			
Partitions (HC tile)	N/A, T, F, 0-10	0	N/A
Partitions (pre-cast panels, plaster, other)	N/A, T, F, 0-10	5	N/A
EXTERIOR ORNAMENTATION			
Parapets, cornices, and appendages	N/A, T, F, 0-10	0	0
INTERIOR ORNAMENTATION			
Building contents and furnishings	T, F, 0-10	5	2
Ceiling systems	T, F, 0-5	5	0
Light fixtures	T, F, 0-5	5	1

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	Costa Mesa, CA, USA 92626	**PE Number/State:**	C84457

MODIFIED FEMA-310 WORKSHEET

Category	Range	Typical	Modifier
MECHANICAL AND ELECTRICAL SYSTEMS			
Mechanical and electrical equipment	T, F, 0-10	5	5
Piping and sprinklers	T, F, 0-5	2	2
Ducts	T, F, 0-5	2	2
Elevators	N/A, T, F, 0-5	2	N/A
HAZARDOUS EXPOSURES - MATERIALS			
No hazardous materials	N/A, T, F, 0-10	0	0
OCCUPANCY (TYPE: MANUFACTURING)			
Interior Construction	-15-0	0	-12
SITE DEPENDENT CHARACTERISTICS			
UBC Soil Class	A - E	CD	CD
Liquefaction Resilience	Low - High	Low	Low
Liquefaction Susceptibility	V. Low-V. High	Very Low	Low
Depth to Water Table (ft)	0-1000+	30	Unknown
Landslide Susceptibility	V. Low-V. High	Very Low	Low

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VULNERABILITY SUMMARY

Component Modifier Summary

Base Class 90% Fractile Loss at MMI=IX (% of Value): 56

Modifiers to Base Class Loss

Item	Group Modifier (% of Loss)	Sigma (% of Loss)
1. Occupancy type:	-12	1.5
2. Connections:	0	1.1
3. Walls:		
A. Exterior	-2	2.6
B. Interior	0	0.0
4. Diaphragms:		
A. Floor(s)	-1	0.4
B. Roof	0	1.9
5. Ornamentation:		
A. Exterior	0	2.1
B. Interior	-4	1.8
6. Mechanical/electrical systems:	0	4.0
7. Unusual conditions:	0	3.7
8. Hazardous exposures:		
A. Tank and overhanging walls	0	2.1
B. Pounding and adjacent buildings	0	0.0
9. Site dependent hazards:		
A. Proximity of active fault	0	10.6
Total	-19	13.0

Modified Base Class 90% Fractile Loss at MMI=IX (% of Value): 45

Loss vs MMI

MMI	Loss to Facilities (% of Value)	
	90% Frac. Loss	Mean
V	0	0
VI	3	2
VII	17	10
VIII	31	18
IX	45	26
X	52	30
XI	59	34
XII	66	38

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RISK SUMMARY

Expected Loss Table

Probability of Exceedence	MMI	Loss to Facilities (% of Value)			BI (months)
		PL	SUL	SEL	
50.0% in 30 years 43 year return period	VI-VII	2	7	4	N/A
10.0% in 30 years 285 year return period	VII-VIII	12	22	13	N/A
2.0% in 30 years 1485 year return period	VIII	23	35	20	N/A
10.0% in 50 years 475 year return period	VII-VIII	15	26	15	N/A
2.0% in 50 years 2475 year return period	VIII-IX	29	39	23	N/A

Event and Fault Table

Close and Significant Seismic Sources	Maximum Magnitude	Closest Distance (km)	Max. MMI	Max. SUL *	Max. SEL *	Maximum Business Interuption (months)	Percent Contribution **
San Joaquin Hills***	7.1	2.3	IX	45	26	N/A	16
California Gridded	7.0	5.0	VIII-IX	39	22	N/A	16
Imp Extensional Gridded, GR, Strike Slip	7.0	5.0	VIII-IX	37	21	N/A	<1
Imp Extensional Gridded, GR, Normal	7.0	5.0	VIII	34	19	N/A	<1
Imp Extensional Gridded, Char, Strike Slip	7.0	5.1	VIII-IX	36	21	N/A	<1
Imp Extensional Gridded, Char, Normal	7.0	5.1	VIII	33	19	N/A	<1
Newport-Inglewood, alt 2	7.2	9.1	VIII	30	17	N/A	3
Newport Inglewood Connected alt 2	7.5	9.1	VIII	32	19	N/A	2
Newport-Inglewood, alt 1	7.2	9.2	VIII	30	17	N/A	3
Newport Inglewood Connected alt 1	7.5	9.3	VIII	32	19	N/A	2
Newport Inglewood Connected al	7.5	9.3	VIII	32	18	N/A	3
Newport-Inglewood (Offshore)	7.0	10.7	VII-VIII	26	15	N/A	7
Puente Hills (Coyote Hills)	6.9	21.9	VII	18	11	N/A	1
Elsinore;W	7.0	25.7	VII	15	9	N/A	3
Palos Verdes	7.3	27.4	VII	18	10	N/A	4
Palos Verdes Connected	7.7	27.4	VII-VIII	22	13	N/A	4

* Losses to individual events are from shaking only.
** Percent contributions are for the probabilistic 475 year return period risk.
*** Event causing highest loss (from shaking only)

Average Annual Loss (% of Repl. Cost): 0.228034
Business Interruption Average Annual Loss ($): 0
Return Period of Major Liquefaction/Landslide: 8038 Years

Company Name:	EBI Consulting	**Date:**	February 25, 2019
Building Name:	3175 Airway Avenue	**Job Number:**	1319000059
Street Address:	3175 Airway Avenue Costa Mesa, CA, USA 92626	**Engineer:** **PE Number/State:**	Kiki Okaly, PE C84457

DISCLAIMERS and OTHER INFORMATION

RESULTS DISCLAIMER

This report, and the analyses, estimates and conclusions are based on scientific data, mathematical and empirical models, and experience of engineers, geologist and geotechnical specialist, using the input specified by the software licensee. Actual losses experienced during any earthquake may differ substantially from these estimates. Neither Risk Engineering, Inc., Degenkolb Engineers, nor any third party supplier of information to this software can be held liable for any inaccuracies in the results obtained by ST-RISK.

SPRINKLER DAMAGE

Substantial building facilities loss has occurred in recent large earthquakes due to fire sprinkler damage. The figures presented herein may not adequately account for these potential losses. If the modifier for sprinklers in the Mechanical and Electrical Systems section of the Modified FEMA-310 Worksheet was 3 or higher, or '?', a more detailed evaluation of potential sprinkler damage should be made and additional loss anticipated.

THIRD PARTY DATA

Much of the data in this report is derived from data provided by the California Geological Survey (CGS), the US Geological Survey (USGS), the Geological Survey of Canada (GSC), as well as other parties. Most of the original data received was modified to make compatible with ST-RISK. None of these parties can be held liable for any inaccuracies inherent in the data or inherent in the modifications.

Company Name:	EBI Consulting	**Date:**	February 25, 2019
Building Name:	3175 Airway Avenue	**Job Number:**	1319000059
Street Address:	3175 Airway Avenue Costa Mesa, CA, USA 92626	**Engineer:**	Kiki Okaly, PE
		PE Number/State:	C84457

GLOSSARY

MMI	Modified Mercalli Intensity - A measure of ground motion intensity based on human perception of motion and observed structural damage.
PML	Probable Maximum Loss - The percentage monetary loss (damage/replacement cost x 100) that has a 10 percent chance of being exceeded for a 475-year ground motion.
PL	Probable Loss - For a given time interval, or return period, this is the amount of loss that a property is expected to meet or exceed on an average basis. This combines the probability distribution of hazard with the full damage distribution, representing the best overall assessment of risk.
SUL	Scenario Upper Loss - The percentage monetary loss (damage/replacement cost x 100) that has a 10 percent chance of being exceeded given any defined ground shaking intensity. Equal to PML for 475-year ground shaking.
SEL	Scenario Expected Loss - The expected, or mean, percentage monetary loss (damage/replacement cost x 100) that is predicted given any defined ground shaking intensity.
Mean Loss	The expected, or average, percentage monetary loss (damage/replacement cost x 100) that is predicted for a given ground shaking level.
Sigma	The range of building assessment variation covered by one standard deviation. This represents the uncertainty of characterizing the building properly. This does not include uncertainty in the expected ground motion intensities nor range of expected damage. It is implied that the distribution of uncertainty is truncated at 100% and 0% of building value.
BI	Business Interruption / Loss-of-Use - The number of months that the facility is out of operation.
Base Class Loss	The percentage monetary loss for 90% fractile (damage/replacement cost x 100) assigned to a building class that accounts for type of construction and important construction deficiencies.
Modified Base Class Loss	The percentage monetary loss for 90% fractile assigned to a building class that accounts for the Base Class Loss and location and minor construction deficiencies.
Probability of Exceedence	The probability that the ground shaking level or damage level will be exceeded.
Event Causing Highest Loss	The highest level of intensity due only to shaking that is experienced when considering all earthquakes given a median predicted shaking level.
Maximum Considered Earthquake (MCE)	Loss associated with a 2% in 50 year probability of exceedence.
Uniform Building Code (UBC)	Loss associated with a 10% in 50 year probability of exceedence as defined by new building design provisions found in the Uniform Building Code.
% Contribribution	Percent contribution of fault or fault segment to the 475-year return period risk.

U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Input

Edition

Dynamic: Conterminous U.S. 2014 (v4.1

Spectral Period

Peak ground acceleration

Latitude

Decimal degrees

33.6802

Time Horizon

Return period in years

475

Longitude

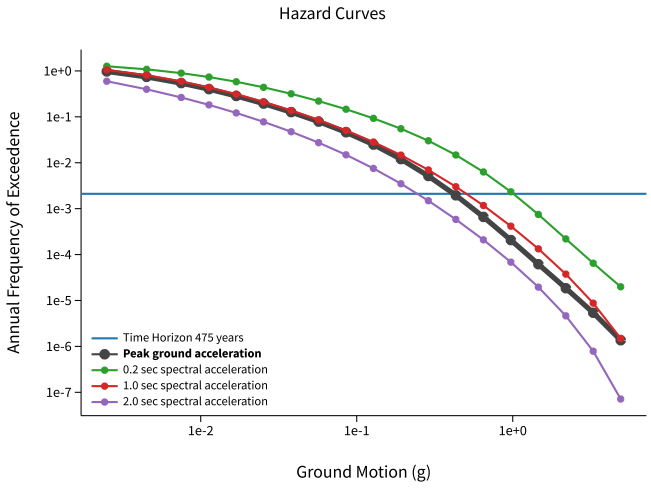
Decimal degrees, negative values for western longitudes

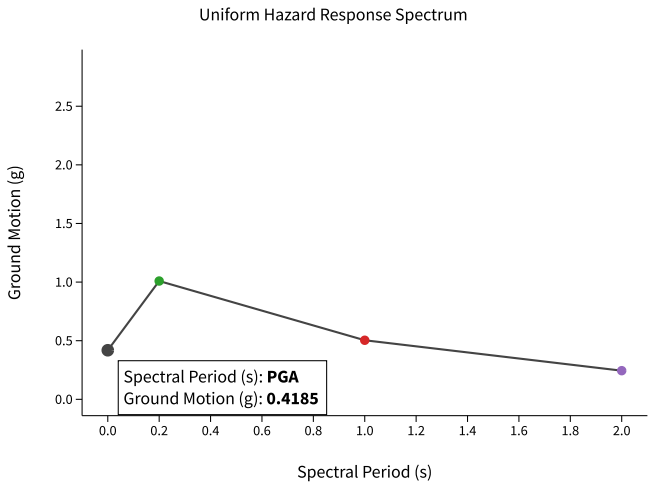
-117.8707

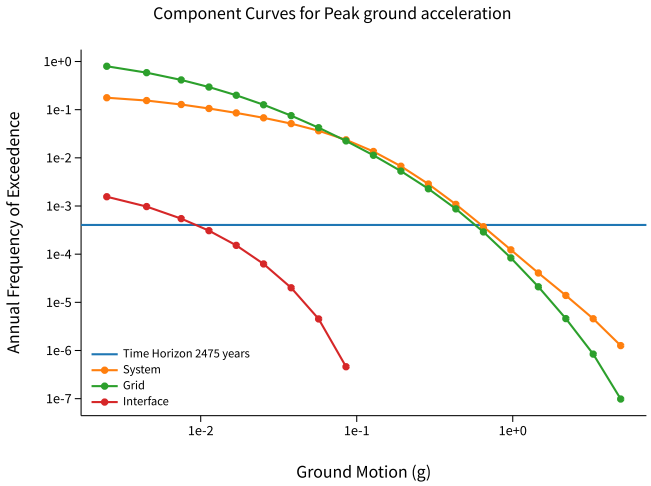
Site Class

259 m/s (Site class D)

Hazard Curve





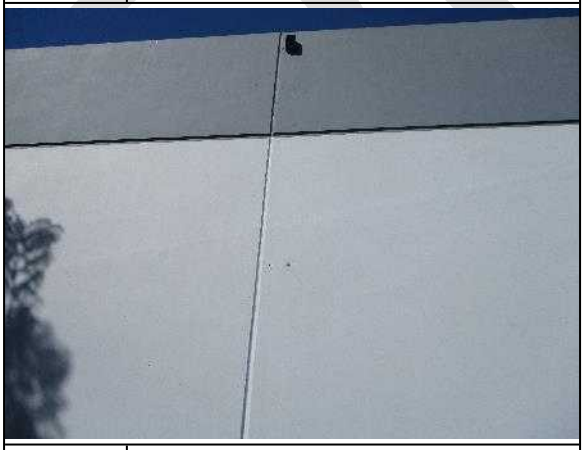


View Raw Data

APPENDIX B
PHOTOGRAPHS

1.	View of Subject Property from street. Note storefront system at south east corner.

2.	Representative façade with some loading dock doors.



3.	Exterior concrete tilt-up wall panels.

4.	Interior of warehouse space.

5.	Underside of roof framing. Note diagonal bracing of HVAC unit.

6.	Wood purlins and glue-laminated girder.

7.	Glue-laminated girder on concrete pilaster at exterior wall.

8.	Glue-laminated girder on concrete pilaster at exterior wall.

9.	Base of interior wood column to concrete floor slab.

10.	Wood framed stairs to office mezzanine.

11.	Hot water heater in south east office portion with seismic straps.

12.	Hot water heater in north west office portion. Note no seismic straps.

APPENDIX C
PROFESSIONAL QUALIFICATIONS

EBI Consulting
environmental | engineering | due diligence

KIKI OKALY, P.E.
Structural Engineer
Los Angeles, CA, 90034
Mobile: 323-539-4226

Summary of Experience

Ms. Okaly has over 6 years of experience in the structural engineering field. Ms. Okaly has worked doing new building design, seismic retrofits, tenant improvement design, and property assessments. The assessments have included on-site inspections and written reports for general building condition evaluations, seismic damage assessments, and ASCE Tier I seismic performance evaluations for a large range of property types including commercial, residential, multi-family, and school buildings. Ms. Okaly is a licensed PE in the state of California and is a Cal OES Safety Assessment Program evaluator.

Relevant Project Experience

Seismic Performance Evaluations:

University Portfolio – Worked with building owners to analyze current structural capacity of campus buildings. Performed site inspections of over 20 university buildings in Southern California; including education spaces, offices, and dormitories. Wrote ASCE Tier I seismic performance evaluations for all sites.

Structural Design:

Worked with building owners, architects, mechanical teams, and contractors on new and renovation design projects throughout Southern California. Projects included site visits before construction to assess the space, as well as during construction to ensure all is being building per plans and up to code. Was responsible for designing all building components for varied construction types including steel, concrete, masonry, and wood.

Damage Assessments:

Worked with insurance companies and building owners to analyze damage and property claims arising from natural perils. Wrote damage assessment reports for all buildings and developed basic repair and seismic retrofit plans when required. Majority of work was as result of the Canterbury earthquake sequence of 2011.

- University Portfolio – Performed site inspections of over 30 university buildings; including education spaces, offices, and dormitories.
- Church Portfolio – Performed site inspections of over 75 church owned buildings; including churches, offices, and daycare facilities.
- General Commercial & Residential sites – Performed site inspections of various industrial, commercial, and multi-residential properties.

Education

Master of Engineering, Structural Engineering, Lehigh University 2011
Bachelor of Science, Civil Engineering, Lehigh University, 2010

Professional Registrations

Professional Engineer (PE), CA #84457 – April 2015

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KIKI OKALY, P.E.
Structural Engineer
Los Angeles, CA, 90034
Mobile: 323-539-4226

Cal OES SAP Evaluator #80393 – May 2016

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Manuel Chan P.E. S.E.
Senior Structural Engineer
Placentia, CA 92870
Mobile: 626.376.1706

Summary of Experience

Mr. Chan is a registered professional engineer has over 15 years of experience in the structural engineering, seismic design and construction field. His expertise includes the design and analysis of commercial, residential and institutional projects. Mr. Chan also has 5 years of experience in the structural evaluation of existing properties, including the preparation of over 1000 seismic reports for real estate due diligence studies.

At EBI Consulting, Mr. Chan specializes in structural risk evaluation and structural condition assessments.

Relevant Project Experience

Seismic Evaluations for Over 1000 Commercial, Residential and Hospitality Buildings to Determine Probable Maximum Loss Estimates: Collected data, evaluated, and completed over 1000 reports providing an estimate of financial losses due to earthquakes. The work has included HUD scope evaluations.

Long Beach Catalina Landing Seismic Evaluation: Lead engineer in the seismic evaluation of a three story concrete special moment frame building based on the guidelines of ASCE 31-03; seismic evaluation of existing buildings

Fullerton community college: Lead project engineer in the structural design of a steel special moment frame, two story building. Dynamic analysis and preparation of calculations, CAD drawings and details.

Boulevard 6200 Hollywood, CA: Lead project engineer in the structural design of a $450 million mixed used project in Hollywood Blvd. One million square feet of residential comprised of wood framed towers over concrete podium retail and underground parking. Preparation of calculations, drawings and specifications by directing CAD and engineering staff.

Education

B.S. Civil Engineering Universidad Santa Maria La Antigua, Panama City, Panama
M.S. Structural Engineering University of Southern California

Professional Affiliations

Structural Engineer's Association of Southern California
American Society of Civil Engineers

Professional Registrations

Professional Engineer – California CE 71512
Structural Engineer – California SE 5682

APPENDIX D
ASTM SUMMARY FINDINGS FORM

Property Name: *3175 Airway Avenue*

Property Address: *3175 Airway Avenue, Costa Mesa, California*

Report Title and Date: Seismic Report dated February 25, 2019

Site Visit Performed By / Date: Kiki Okaly, PE, EBI Consulting, License #C84457 / February 22, 2019

Evaluation Performed By: Kiki Okaly, PE, EBI Consulting, License #C84457

Specific Design Documents Reviewed: None available

Methods to Determine Site Ground Motions and Site Stability: St-Risk

PML Defined As: Scenario Expected Loss (SEL)

Analysis Methods/Procedures Used to Determine PML: St-Risk

Analysis Methods/Procedures Used to Determine Building Stability: St-Risk

ASTM E2026 and E2557 Level of Review: with scope as defined by BS[1], G[1], SS[1], BD[1]

The Report Includes the Following Exceptions to ASTM Requirements: EBI has provided license numbers for the individuals involved in the report preparation in lieu of providing a seal. The number of hours expended on the evaluation is not provided on the basis of confidentiality. The PML does not take into account the value of equipment, inventory or monetary loss from business interruption. EBI represents that the estimate of seismic performance for the building is based on a limited review of the property condition, and on a large measure of engineering judgment that is incorporated into the St-Risk program. Engineering judgment is a necessary component of this review since analytical methods do not exist that will encompass all parameters required to determine an exact cost of any damage caused by the scenario earthquake. Additionally, please refer to section 1.0.

EBI Consulting has performed a probable maximum loss (PML) evaluation for earthquake due diligence assessment in conformance with the scope and limitations of ASTM Guide E2026 and Practice E2557 for a Level I assessment of *3175 Airway Avenue, Costa Mesa, California*. Any exceptions to, or deletions from, ASTM requirements are listed above. This PML evaluation for earthquake due diligence assessment has determined the PML to be *15%*, where PML is defined as Scenario Expected Loss (SEL). The project does not meet the building stability requirements as determined by St-Risk and meets the site stability requirements.

The undersigned hereby acknowledges that the above referenced report is considered an engineering work product, and as such, confirms that he/she is qualified by licensing and experience to conduct such review. Furthermore, the report was prepared by or under the direct supervision of the undersigned as specified by state laws or codes including, but not limited to, the site visit, determination of building stability, and estimation of probable maximum loss. The information and opinions in the report are subject to the limitations and qualifications contained therein.

Name: Manuel Chan
Company: EBI Consulting
License No. SE5682 State: CA
Registration Title: Registered Professional Engineer

APPENDIX E
IMPORTANT INFORMATION ABOUT
YOUR SEISMIC RISK ASSESSMENT REPORT

Seismic Reports are Performed for Specific Purposes, Clients, and Projects

Seismic risk assessment reports are intended to meet the specific needs of their clients. A seismic report prepared for a particular client may not fulfill the needs of a different client such as a lender, an insurance company, or the owner. Because each seismic report is unique, no one should rely on your seismic report without first conferring with the engineer who prepared it. No one, not even the intended client, should apply the report for any purpose or project except the one for which it was originally prepared.

ASTM Standards
Seismic risk assessment reports should be based on the following ASTM Standards:
• ASTM E2026 Standard Guide for Seismic Risk Assessments of Buildings
• ASTM E2557 Standard Practice for Probable Maximum Loss (PML) Evaluations for Earthquake Due-Diligence Assessments

Reference of the standards in a report does not constitute an adequate report. The report should follow the scope and requirements for qualifications of the preparer.

Basic Report Requirements

As a minimum, each report should contain the following:
• Property information and description of buildings,
• Review of seismic hazards at the site,
• A list of documents reviewed, such as design drawings,
• Level of Review provided by the report,
• Estimation of building loss, the definition of the loss, and the analysis and methods used to determine loss,
• Determination of building stability (collapse potential) and methods used to reach opinion, and
• Qualifications of the reviewer and those conducting the site visit (if different).

Know the Level of Investigation

The ASTM Standards provide for four levels of investigation, each with decreasing uncertainty:
• Level 0 is often referred to as a screening level or desktop review and is based on general information about the building type, characteristics and site information. It is considered to have a high uncertainty level. It is generally provided by in-house PCA or Environmental firms, insurance brokers, or through data entry in seismic risk programs.
• Level 1 is generally considered an engineering cursory review, including a review of construction documents and site visit by a practicing structural engineer. It is considered to have a moderate uncertainty level.
• Level 2 is considered a detailed evaluation with a moderately low uncertainty level. It is generally conducted by a practicing professional engineer with specific knowledge of the particular building systems.
• Level 3 is considered an exhaustive engineering review with minimum uncertainty. It is performed by engineering firms with demonstrated, substantial understanding and experience in the specific technical issues for the specific type of structure.

Qualifications of the Reviewer Can Vary

Each Level of ASTM review allows for different qualifications of the reviewer and those conducting site visits. Simply having professional license does not qualify an individual, as those individuals may be experienced or licensed in an unrelated field such as mechanical, electrical or environmental engineering. For Levels 1 and higher, both the person preparing the report (Senior Assessor) AND the person performing the site visit (Field Assessor) should be a registered Professional Engineer (PE) with primary experience in the design and analysis of building structural systems, and preferably a registered Structural Engineer (SE) in a State with that designation.

Read the Entire Report

Serious problems have occurred because those relying on a seismic report did not read the entire report. Do not rely on an executive summary. Do not read selected elements only. In many cases, clients look for an acceptable "PML" value without reading the definition of the loss, or understanding that there may be building or site stability issues which may result in high risk to life-safety.

Conditions Can Change

A seismic report is based on the conditions of the property and knowledge of seismic hazards at the time the report was prepared. Do not rely on a seismic report whose adequacy may have been affected by: the passage of time wherein damage such as settlement or the deterioration of the structural systems may have occurred; natural disasters such as earthquakes, wind or floods; or man-made changes such as the modification to the building or lateral force resisting systems. Always contact the engineer before relying on the report.

Most Findings are Professional Opinions

Professional Engineers review drawings, conduct site observations, perform analyses of buildings, then apply their professional judgment to render an opinion regarding the potential seismic loss and building stability. Hiring a qualified professional with a complete scope of services will result in seismic risk assessment reports that are comprehensive, reliable, and have lower uncertainty.

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