SAMPLE SEISMIC RISK ASSESSMENT

FULL DETAILED REPORT

162 Folsom Street

San Francisco, CA

Prepared for: Hunter Real Estate

Prepared by: FB&C Engineers Consulting Group

June 22, 2015

Report Generated by the:

Seismic Performance Prediction Program by Haselton Baker Risk Group

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I. PROJECT OVERVIEW

A. Overview

Project Name: 8-Story RC SMF – Example for Sample Report

Client Name: Hunter Real Estate

Project Engineer: Curt Haselton

B. Site Information

Address: 162 Folsom Street, San Francisco, CA 94105

Latitude: 37.7898

Longitude:-122.3918

Site Class: C

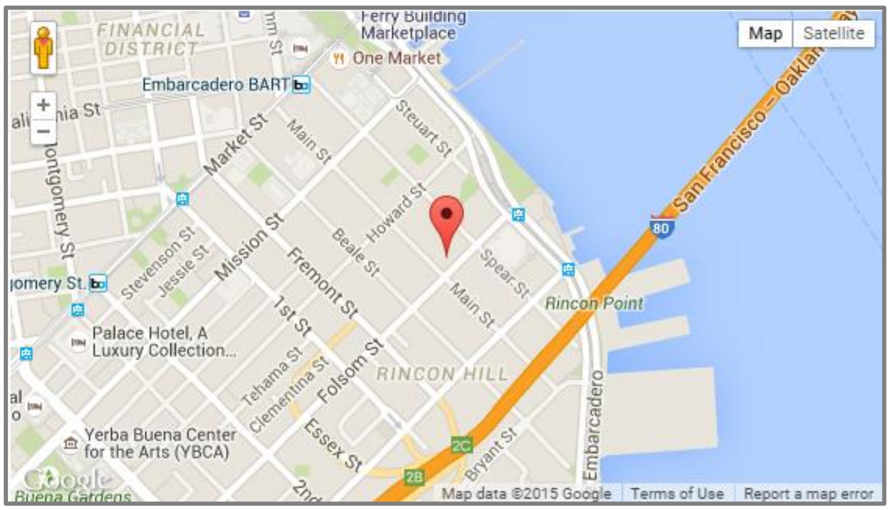

Figure 1. Site Location

C. Building Information

Material Type: Reinforced Concrete

Building Type: Moment Frame Perimeter

Design Year: 2015

Number of Stories: 8

Total Building Square Footage: 172,800

Occupancy Type: Commercial Office

Total Building Value: $34,560,000

D. Summary of Analysis Complete

FEMA P-58 Analyses:

- Intensity-based analysis: Yes
- Time-based analysis: Yes

U.S. Resiliency Council Building Rating:

- FEMA P-58 rating: Yes
- Comparative ASCE 31/41 rating: No

REDi Recovery Times:

- Repair times: Yes
- Full recovery times with impeding factors: Yes

II. U.S. RESILIENCY COUNCIL SEISMIC RATING

The following is a summary of the building seismic rating based on the FEMA P-58 rating approach developed by the U.S. Resiliency Council (USRC) (www.usrc.org). Note that this is not an official USRC rating unless submitted to the USRC for review and archival.

Safety: 4 Stars

★★★★

Expected performance results in conditions that are unlikely to cause serious injuries.

Damage: 3 Stars

★★★

The repair cost in a 475-year earthquake is less than 20% of building value

(13.4% for analysis of this building).

Recovery: 3 Stars

★★★

The REDi Functional Recovery Time in a 475-year earthquake is less than 6 months

(5.6 months for analysis of this building).

III. REPAIR COSTS – INTENSITY BASED

A. EXPECTED LOSS FOR ALL INTENSITY LEVELS

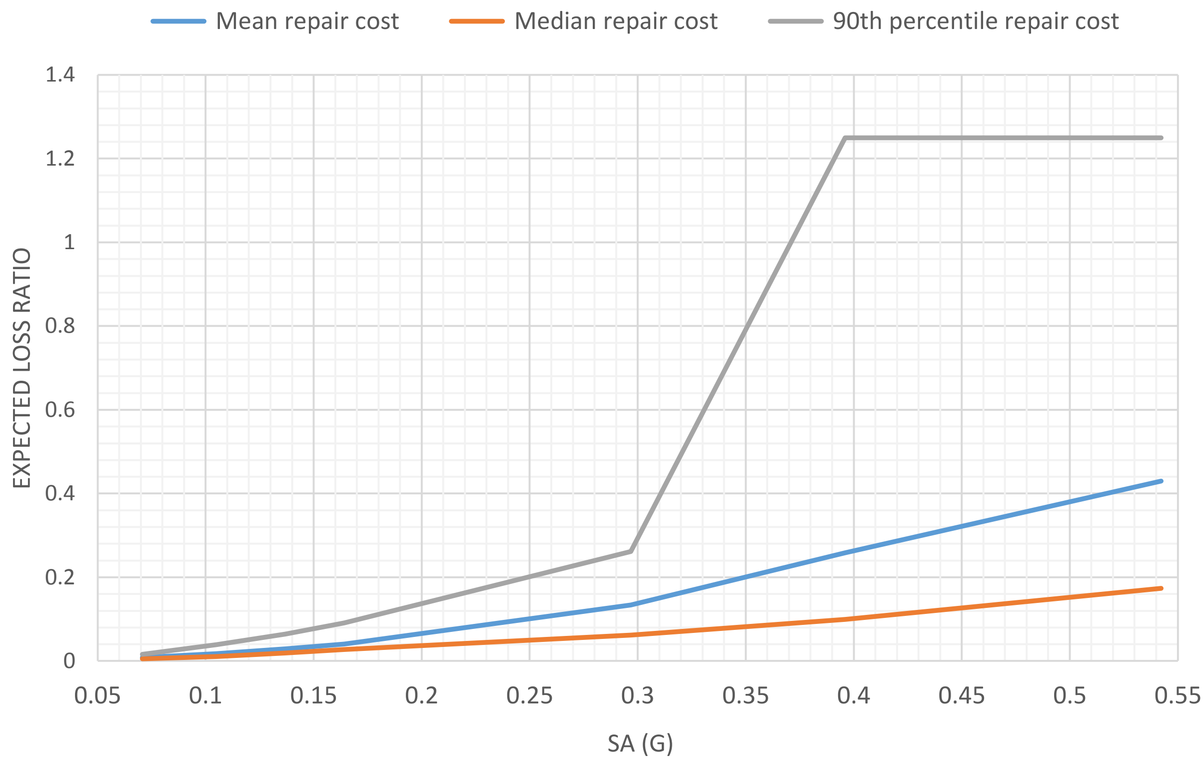

Figure 2. Expected loss over all intensities.

Table 1. Expected Loss. Vales displayed as ratio of building value.

IM Level	*Sa(1.7s) (g)*	*Mean repair cost*	*Median repair cost*	*90th percentile repair cost*
50% In 30 Years	0.07	0.01	0.01	0.02
50% In 50 Years	0.10	0.02	0.01	0.04
50% In 75 Years	0.14	0.03	0.02	0.06
50% In 100 Years	0.16	0.04	0.03	0.09
10% In 50 Years	0.30	0.13	0.06	0.26
5% In 50 Years	0.40	0.26	0.10	1.25
2% In 50 Years	0.54	0.43	0.17	1.25

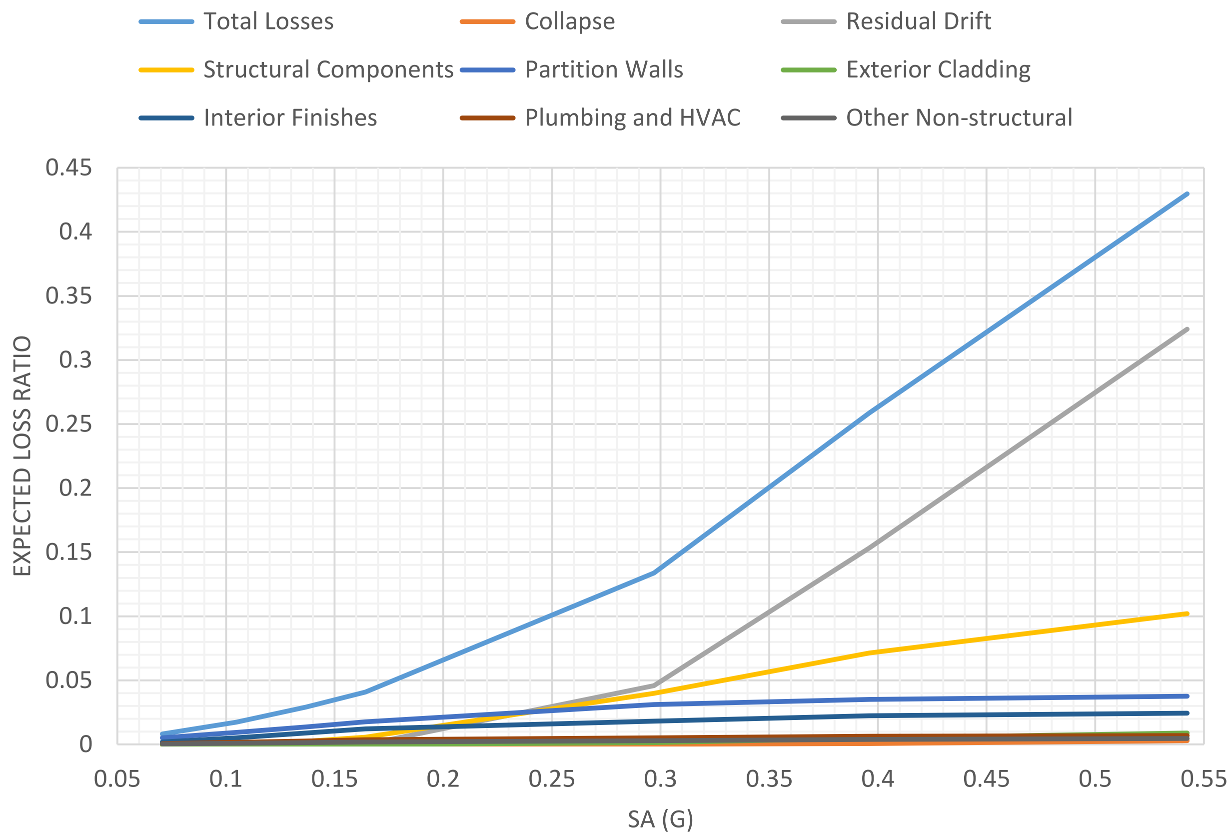

Figure 3. Average loss per component over all intensities.

Table 2. Average loss per component. Values are displayed as ratio of building value.

IM Level	*Total Losses*	*Collapse*	*Residual Drift*	*Structural Components*	*Partition Walls*	*Exterior Cladding*	*Interior Finishes*	*Plumbing and HVAC*	*Other*
50% In 30 Years	0.008	0.000	0.000	0.000	0.005	0.000	0.002	0.001	0.000
50% In 50 Years	0.017	0.000	0.000	0.000	0.009	0.000	0.005	0.002	0.001
50% In 75 Years	0.029	0.000	0.000	0.002	0.014	0.000	0.009	0.003	0.001
50% In 100 Years	0.041	0.000	0.000	0.006	0.018	0.000	0.012	0.004	0.002
10% In 50 Years	0.134	0.000	0.046	0.040	0.031	0.001	0.018	0.005	0.003
5% In 50 Years	0.259	0.001	0.153	0.071	0.035	0.005	0.022	0.006	0.004
2% In 50 Years	0.430	0.003	0.324	0.102	0.038	0.009	0.024	0.007	0.005

B. Breakdown of Loss at Critical Seismic Events

50% in 30 Year Ground Motion (43 Year Return Period)

Mean Loss: 0.8%

Median Loss: 0.5%

90th Percentile Loss: 1.6%

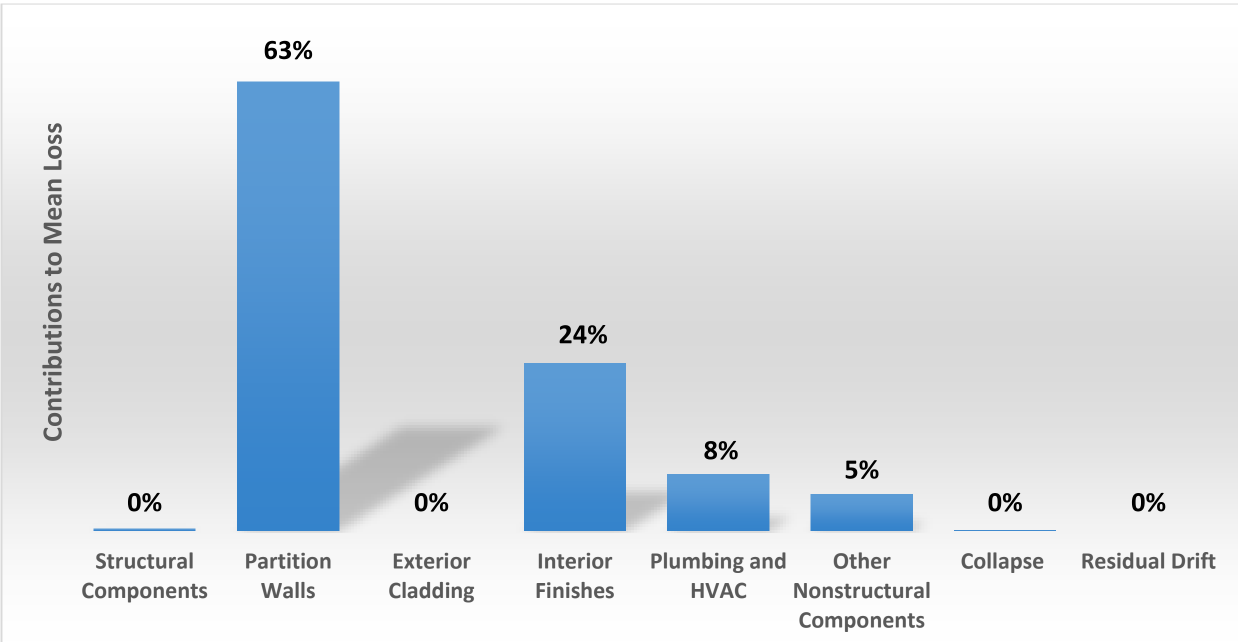

Figure 4. Contributions of Various Component Types of Mean Loss for 50% in 30 year Ground Motion

10% in 50 Year Ground Motion (475 Year Return Period)

Mean Loss: 13.4%

Median Loss: 6.2%

90th Percentile Loss: 26.2%

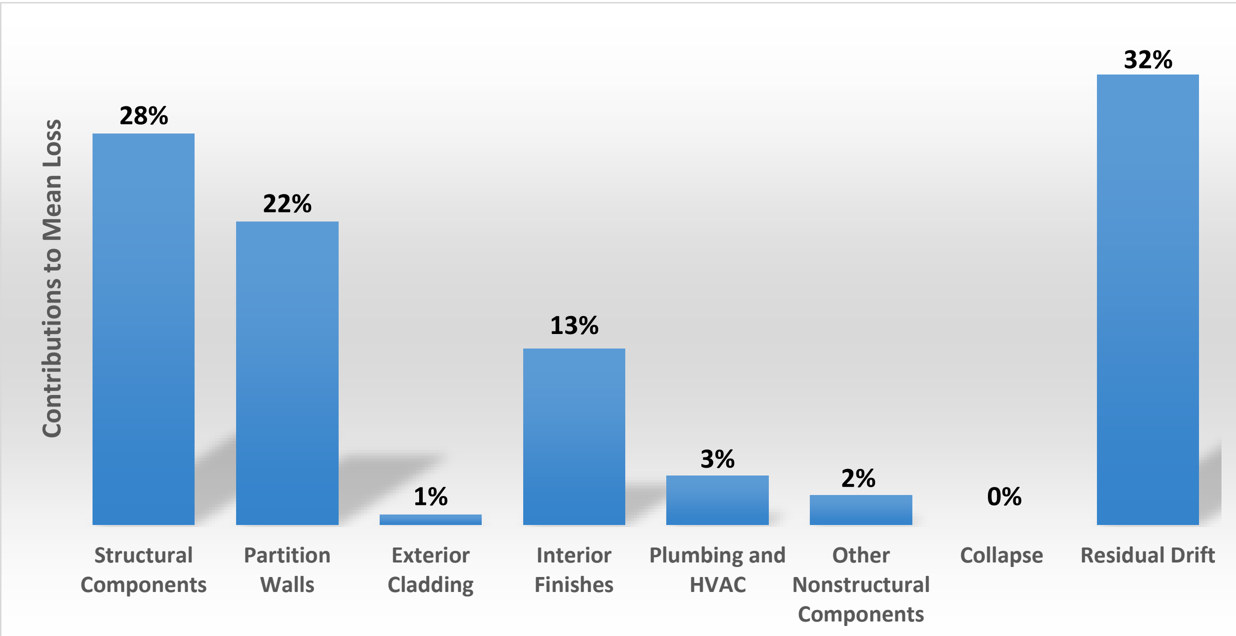

Figure 5. Contributions of Various Component Types of Mean Loss for 10% in 50 year Ground Motion

2% in 50 Year Ground Motion (2475 Year Return Period)

Mean Loss: 43.0%

Median Loss: 17.3%

90^{th} Percentile Loss: 125%

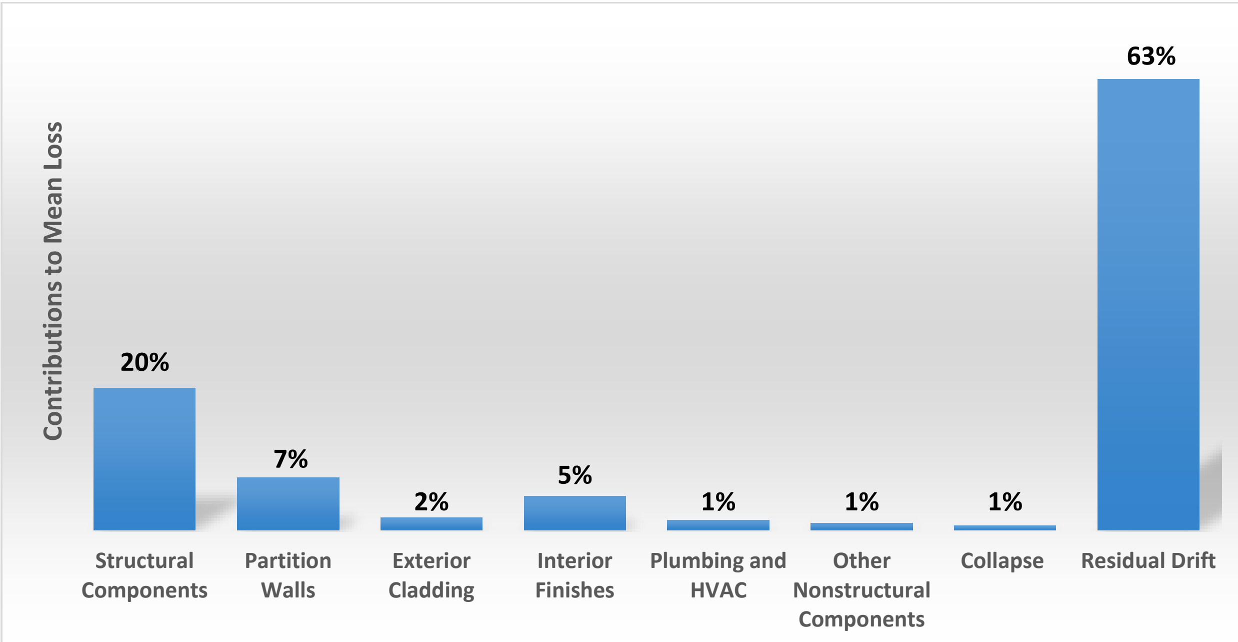

Figure 6. Contributions of Various Component Types of Mean Loss for 2% in 50 year Ground Motion

C. Most Damaged Components for a 10% in 50 Year Ground Motion

Structural Components:

Component: Post Tensioned Concrete Flat Slab Columns

Expected Damage State: Damage State 1 - Yield strain of the slab flexural reinforcement has been exceed, spalling of concrete may or may not occur, and slab exhibits large enough crack widths to allow epoxy injection.

Average Loss from Component: $590k

Figure 7. Yielding of slab reinforcement for a post tensioned concrete flat slab column.

Non-Structural Components:

Component: Wall Partitions - Full Height with Fixed Connections

Expected Damage State: Damage State 3 - Significant Cracking and/or crushing of gypsum wallboards, buckling of studs and tearing of tracks.

Average Loss from Component: $390k

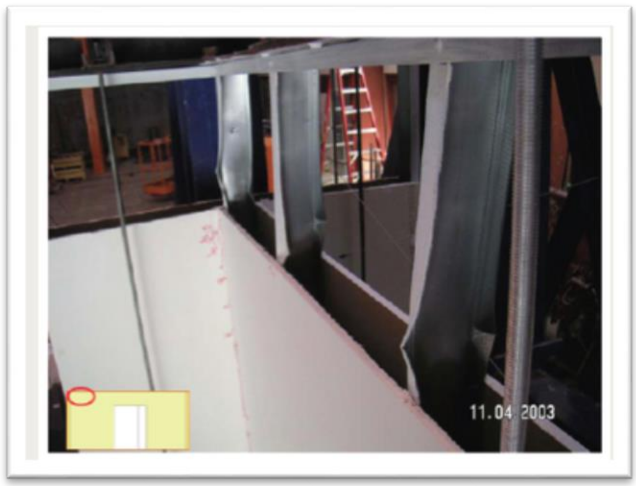

Figure 8. Buckling of studs for a fixed connection partition wall.

IV. REPAIR COSTS – ANNUALIZED

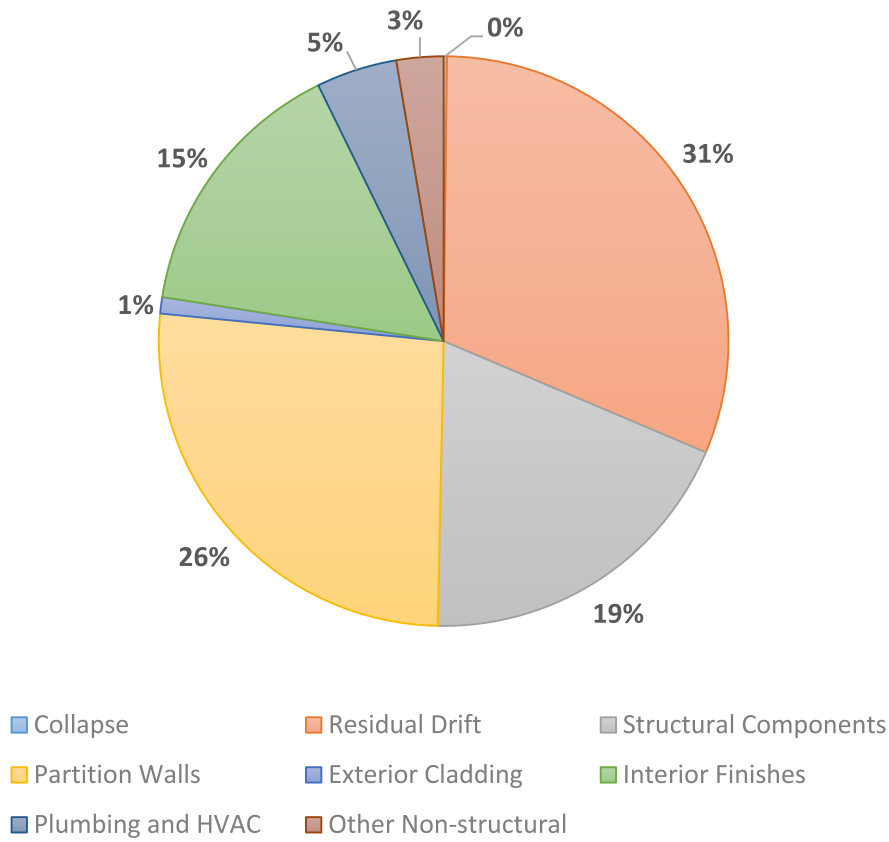

Figure 9. Percent contribution of components to annualized loss.

Table 3. Annualized loss per building component. Values are shown as a ratio of the building value.

Total Expected Annual Loss	**0.102%**
Collapse	0.000%
Residual Drift	0.035%
Structural Components	0.021%
Partition Walls	0.029%
Exterior Cladding	0.001%
Interior Finishes	0.017%
Plumbing and HVAC	0.005%
Other Non-structural	0.003%

V. REPAIR AND RECOVERY TIME

A. Recovery Time for All Intensity Levels

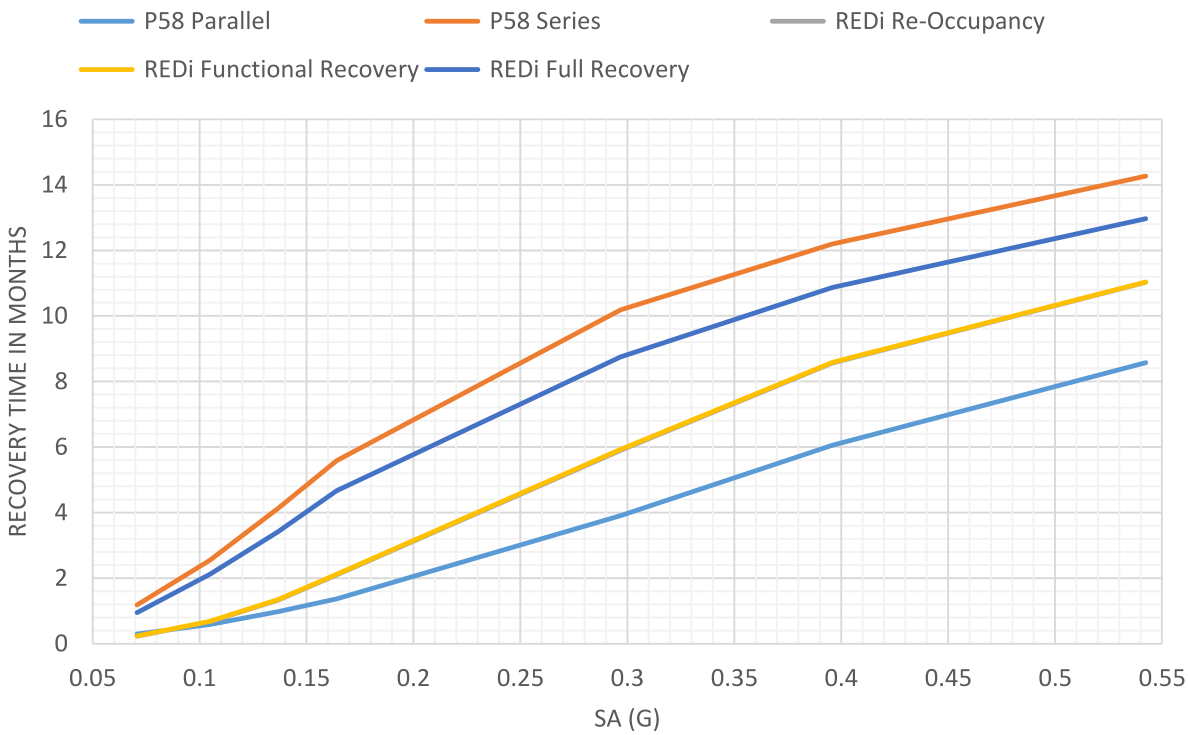

Figure 10. Average recovery time over all intensities (in months).

Table 4. Average recovery time over all intensities (in months).

IM Level	*Sa(1.7s) (g)*	*P58 Parallel*	*P58 Series*	*REDi Re-Occupancy*	*REDi Functional Recovery*	*REDi Full Recovery*
50% In 30 Years	0.07	0.3	1.2	0.2	0.2	0.9
50% In 50 Years	0.10	0.6	2.5	0.7	0.7	2.1
50% In 75 Years	0.14	1.0	4.1	1.3	1.3	3.4
50% In 100 Years	0.16	1.4	5.6	2.1	2.1	4.7
10% In 50 Years	0.30	3.9	10.2	5.9	5.9	8.8
5% In 50 Years	0.40	6.1	12.2	8.6	8.6	10.9
2% In 50 Years	0.54	8.6	14.3	11.0	11.0	13.0

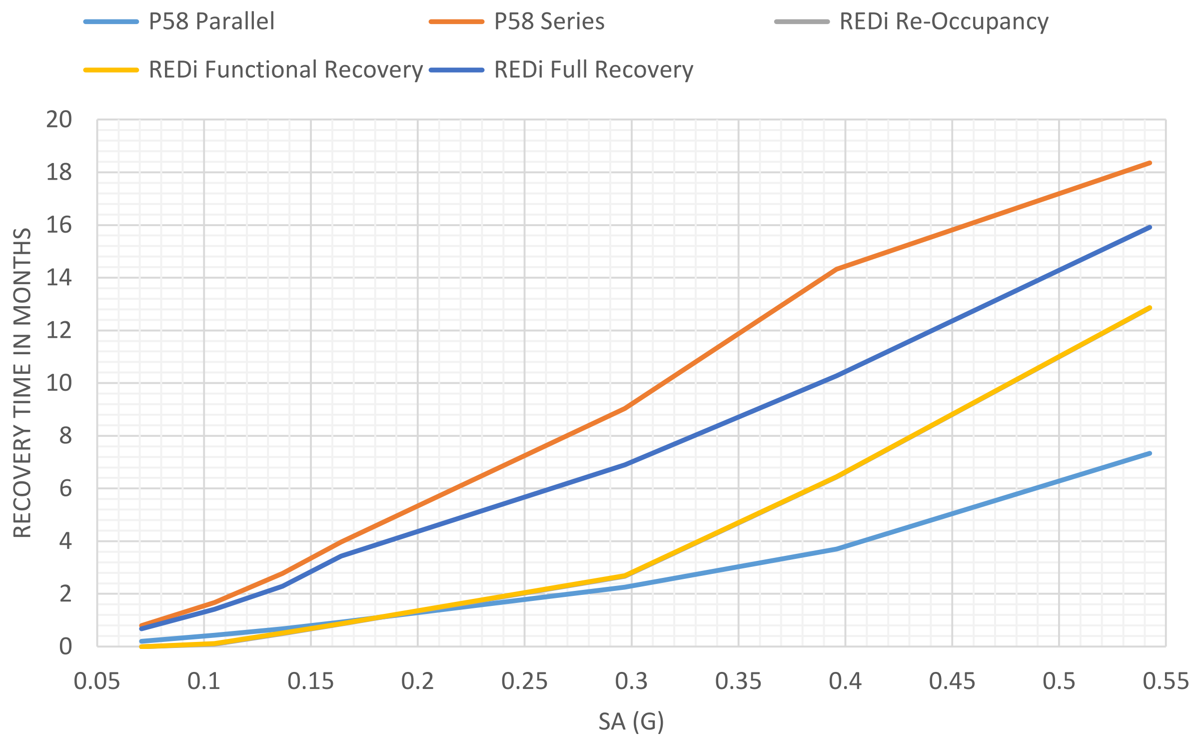

Figure 11. Median recovery time over all intensities.

Table 5. Median recovery time in months.

IM Level	*Sa(1.7s) (g)*	*P58 Parallel*	*P58 Series*	*REDi Re-Occupancy*	*REDi Functional Recovery*	*REDi Full Recovery*
50% In 30 Years	0.07	0.2	0.8	0.0	0.0	0.7
50% In 50 Years	0.10	0.4	1.7	0.1	0.1	1.4
50% In 75 Years	0.14	0.7	2.8	0.5	0.5	2.3
50% In 100 Years	0.16	0.9	4.0	0.9	0.9	3.4
10% In 50 Years	0.30	2.3	9.0	2.7	2.7	6.9
5% In 50 Years	0.40	3.7	14.3	6.4	6.4	10.3
2% In 50 Years	0.54	7.3	18.4	12.9	12.9	15.9

B. Breakdown of Expected Recovery Time for Critical seismic Events

50% in 30 Year Ground Motion (43 Year Return Period)

Average REDi repair times without impeding factors:

- 7 days to Reoccupancy
- 7 days to Functional Recovery
- 29 days to Full Recovery

Average P-58 Repair Times

- 9 days to Parallel Recovery
- 39 days to Series Recovery

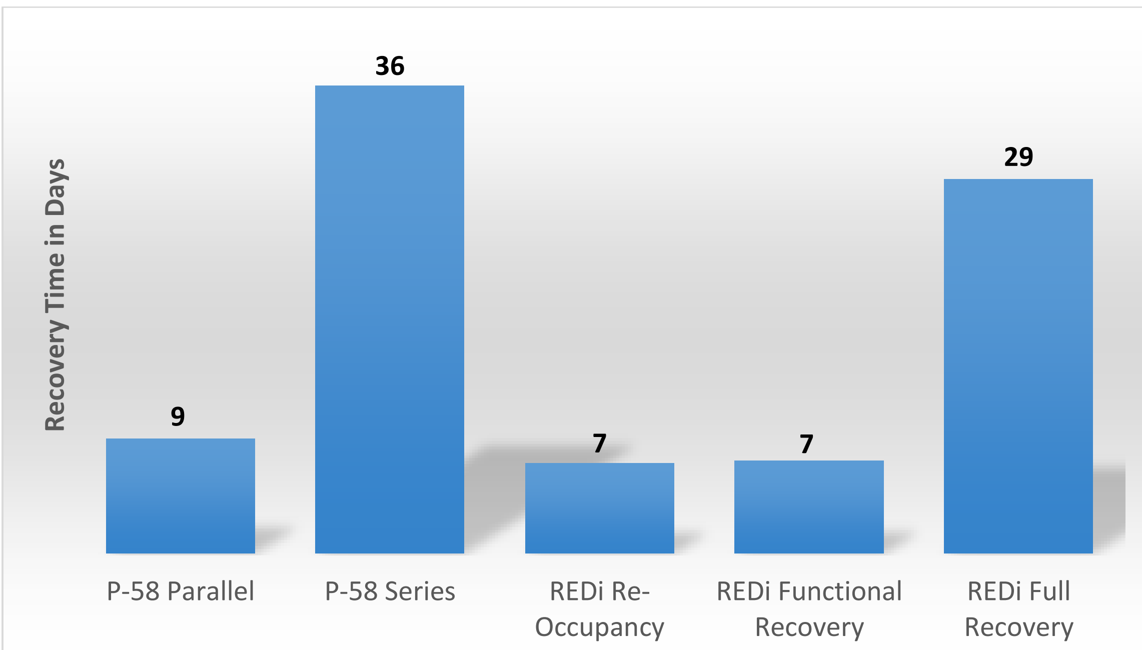

Figure 12. Comparison of average Recovery Time for a 50% in 30 year ground motion. Results shown in days.

10% in 50 Year Ground Motion (475 Year Return Period)

Average REDi repair times without impeding factors:

- 5.6 months to Reoccupancy
- 5.6 months to Functional Recovery
- 8.8 months to Full Recovery

Average REDi recovery times including impeding factors:

- 12.8 months to Functional Recovery

Average P-58 Repair Times

- 3.9 months to Parallel Recovery
- 10.2 months to Series Recovery

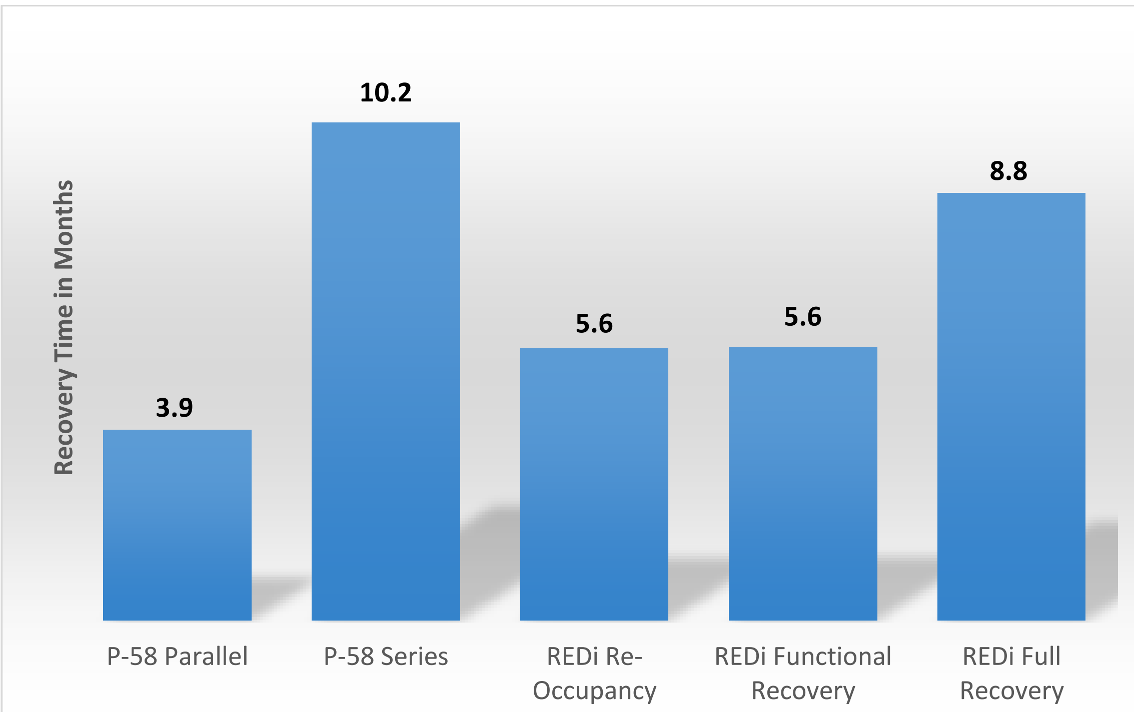

Figure 13. Comparison of average Recovery Time for a 10% in 50 year ground motion. Results shown in months.

2% in 50 Year Ground Motion (2475 Year Return Period)

Average REDi repair times without impeding factors:

- 11 months to Reoccupancy
- 11 months to Functional Recovery
- 13 months to Full Recovery

Average P-58 Repair Times

- 8.6 months to Parallel Recovery
- 14.3 months to Series Recovery

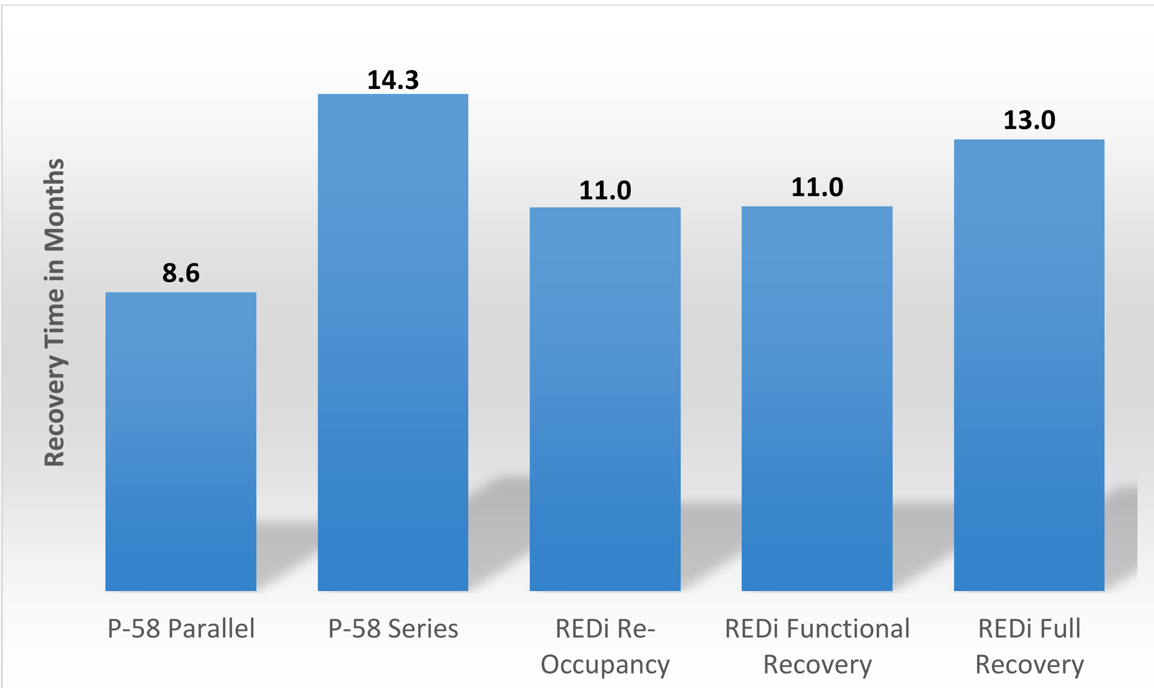

Figure 14. Comparison of average Recovery Time for a 2% in 50 year ground motion. Results shown in months.

VI. SUMMARY OF THE LEVEL OF ANALYSIS COMPLETED

A. Site Hazard

Site Class: User-input value

Hazard: USGS Hazard Curve

B. Structural Analysis

Method: FEMA P-58 Simplified Method

Building Period: User-input value

Base Shear Strength: Default values used

Yield Drifts: Default values used

Mode Shape: Default values used

C. Building Capacity

Collapse:

- Included in the analysis
- FEMA 154 checklist method used to estimate collapse capacity

Residual Drifts:

- Included in the analysis
- Default capacities used

D. Building Components

Non-Structural Components:

- FEMA P-58 normative quantities used - Yes
- Automated ASCE7 Chapter 13 capacity calculations used - Yes
- User modified quantity values (see next section for details) – Done for 2 components
- User added a user-defined fragility curve (see next section for details) – Done for 1 component

Structural Components:

- SP3 normative quantities used (from user-inputs structural layout and component types) - Yes
- No user modifications were made.

Contents:

- No contents were included in the SP3 analysis model.

VII.SUMMARY OF USER-MODIFICATIONS TO DEFAULT VALUES

E. Site Hazards

Site Class

User Input: Site Class C

Default Value: Site Class D

Ground Motion Hazard: No exception was taken to defaults.

User Explanation of Modified Inputs

"Based on a site-specific geotechnical evaluation, this site has been shown to be Site Class C."

F. Structural Responses

Building Period

User Input: 1.6 sec. for Direction 1, 1.8 sec. for Direction 2, and hazard analysis done at 1.7 sec.

Suggested Values: HAZUS – 1.2 sec., Building – 1.2 sec., Bare Frame – 2.2 sec.

Building Strength and Yield Drift: No exception was taken to defaults.

Mode Shape: No exception was taken to defaults.

User Explanation of Modified Inputs

"To be reasonable for a 10% in 50 year ground motion level, an average building period of 1.7 seconds was used, which is the central point between a bare frame period and a HAZUS building period. Additionally, the building configuration shows that Direction 1 is slightly stiffer than Direction 2."

G. REDi Recovery Time Calculation Inputs

User Input: 60 maximum workers on site; Default Value: 46 maximum workers on site

User-Explanation of Modified Inputs: "Based on the feedback of my contractor, this site and building should be able to accommodate up to 60 workers."

H. Building Components

Table 8. Documentation of user-modified building component types and quantities.

Component Description	Location	Default Quantity	User Quantity
C3032.003d: Suspended Ceiling, SDC D,E (Ip=1.0), Area (A): A > 2500, Vert & Lat support	All Floors	1.94	0
User Defined 1: Suspended Ceiling for SDC D/E Designed with Better Bracing and Double Capacity, Area (A): A > 2500	All Floors	0	1.94
C3033.002: Recessed lighting in suspended ceiling - with independent support wires	All Floors	324	30
C31011.001a: Wall Partition, Type: Gypsum with metal studs, Full Height, Fixed Below, Fixed Above	Story 1	8	6

User Explanation of Modified Inputs

"For large ceiling areas, additional ceiling bracing was provided to increase the ceiling capacity by a factor of two. This factor of two is supported by testing done by Doe et al. (2013)."

"The lighting falling hazards were causing too many injuries to achieve the 4-star safety rating. To remedy this, nearly all of the recessed lighting in the building were provided additional anchoring to prevent falling (with the anchoring schemed shown to prevent falling at very high acceleration levels by Doe et al 2011). This additional anchoring was used for all by 30 fixtures per floor, so the 30 were left in the building model. The new anchored fixtures are anticipated to be robust and were not included in the model (which may slightly under-estimate repair costs, but the results show that lighting is mostly a safety issue and not a repair cost issue)."

"The quantity of wall partitions on the first floor was reduced by 30% to account for the open floor plan in the building lobby"

VIII. DOCUMENTATION OF ALL INPUT PARAMETERS

A. Overview

Model Overview

Model: 8-Story RC SMF

Client Name: Hunter Real Estate

Reference Number: ABC-123

Project Engineer: Curt Haselton

PE License Number: 1234

Site Information

Project Name: Trail Concrete Building

Address: 162 Folsom Street, San Francisco, CA 94105

Latitude: 37.7898

Longitude: -122.3918

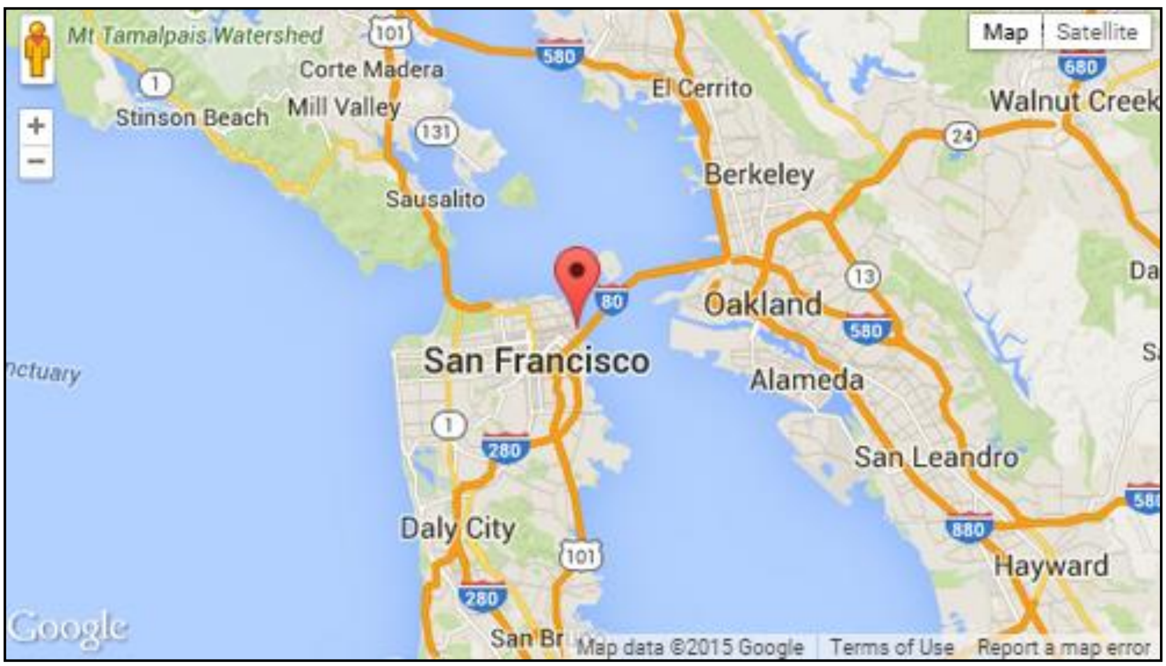

Figure 15. Site Location

Building Information

Material Type:

- Direction 1 – Reinforced Concrete
- Direction 2 – Reinforced Concrete

Building Type:

- Direction 1 – Moment Frame (Perimeter)
- Direction 2 – Moment Frame (Perimeter)

Design Year: 2015

Number of Stories: 8

Total Building Square Footage: 172,800 sq. ft.

Story Height: 13 feet

Occupancy: Commercial Office

Risk Category: Risk Category I/II

Total Cost per sq. ft.: $200

Advanced Options

Building Dimension:

- Direction 1 – 150 feet
- Direction 2 – 150 feet

Replacement Time Per Floor: 70 days

Maximum Workers per sq. ft.: 0.001

Regional Cost Multiplier: 1

Date Cost Multiplier: 1.127

Total Replacement Cost (with demolition): $43,200,000

Total Loss Threshold: 1

B. Analysis Options

FEMA P-58 Analysis

Intensity-Based Assessment: On

Time-Based Assessment: On

Scenario Based Assessment: Off

USRC Analysis

Safety: On

Repair Cost: On

Functional Recovery: On

ASCE 31/41 Rating: Off

Other Analysis

REDi Repair Time: On

REDi Down Time: On

Realization

Number of Realizations: 10000

Save Detailed Per-Realization Results: No

C. REDi Method Input Values

Impeding Factors:

- Inspection: Yes
- Financing: Yes
- Permitting: Yes
- Engineering Mobilization and Review/Re-Design: Yes
- Contractor Mobilizations: Yes
- Utilities: Yes
- Is the building an Essential Facility: No
- Is an engineer on retainer to begin review of damage and re-design (if necessary) quickly: No
- Have arrangements been made with a qualified professional for expedient post-earthquake: No
- How will funds to repair seismic damage be obtained: Private Loans
- Is a general contractor on retainer to begin repairs quickly following an earthquake: No

Workers per Repair Sequence:

- Structure – 0.002 workers per sq. ft.
- Interior: 0.001 workers per sq. ft.
- Exterior – 0.001 workers per sq. ft.
- Mechanical – 3 workers per damaged component
- Electrical – 3 workers per damaged component
- Elevator – 2 workers per damaged component
- Stairs – 2 workers per damaged component

Maximum Workers:

- Structure – 46 workers
- Interior: 30 workers
- Exterior – 30 workers.
- Mechanical – 18 workers
- Electrical – 18 workers
- Elevator – 12 workers
- Stairs – 12 workers
- Max Workers on Site – 60 workers

D. Site Hazard

Hazard Method: USGS Defined Hazard Curve

Period: 1.7 sec

Site Class: Site Class C

VS30 Range: 360 to 760 meters per second

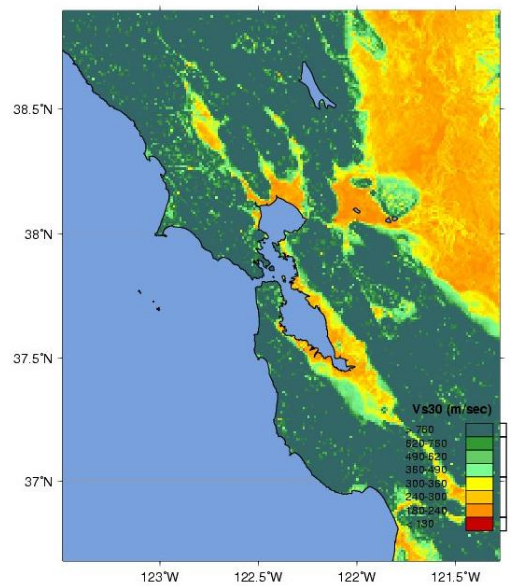

Figure 16. USGS Soil Map.

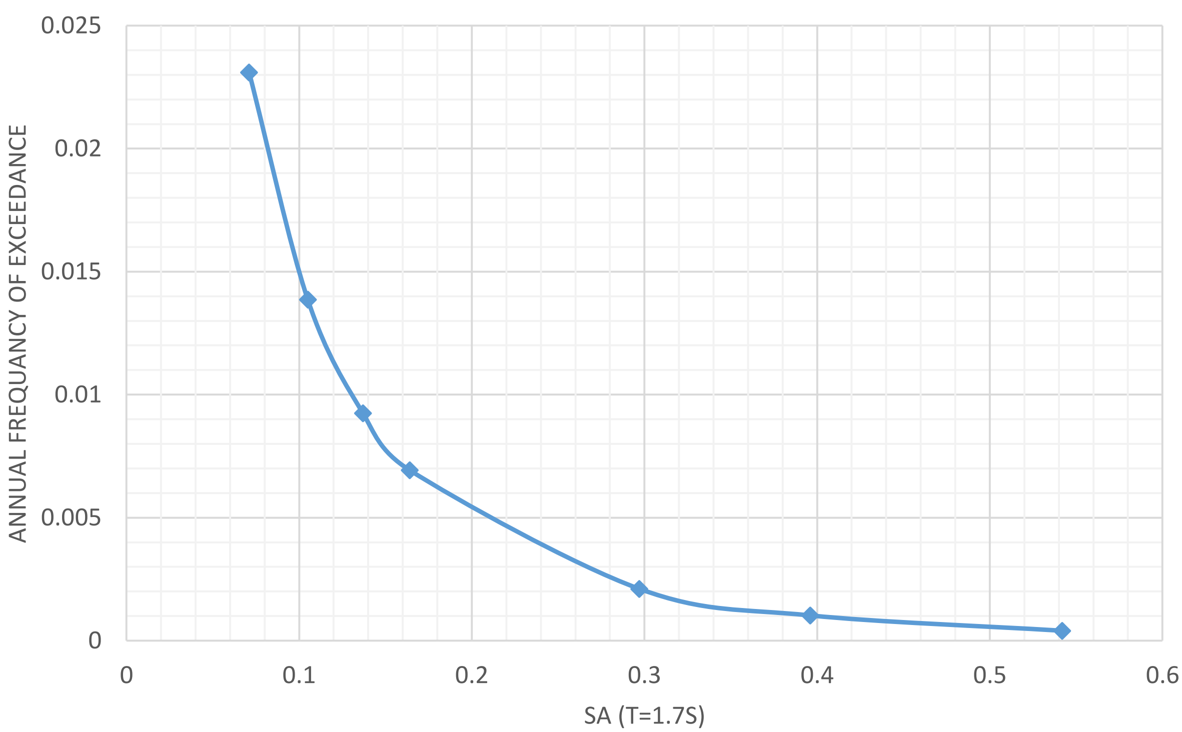

Figure 17. Hazard Curve

Table 6. Hazard Curve Details.

Probability of Exceedance	*Annual Frequency of Exceedance*	*Sa (T=1.7s) (g)*	*PGA (g)*	*Return Period (Years)*
50% in 30 years	0.023105	0.071	0.149	43
50% in 50 years	0.013863	0.105	0.209	72
50% in 75 years	0.009242	0.137	0.261	108
50% in 100 years	0.006931	0.164	0.299	144
10% in 50 years	0.002107	0.297	0.478	475
5% in 50 years	0.001026	0.396	0.598	975
2% in 50 years	0.000404	0.542	0.766	2475

Comparative ASCE/SEI 7 Design Standard Information

Code Reference: ASCE 7-10

Seismic Design Category: D

S_{MS}: 1.5 g

S_{M1}: 0.78 g

S_{DS}: 1.0 g

S_{D1}: 0.52 g

MCE_{MAX} (1.7s): 0.46 g

$MCE_{GEOMEAN}$ (1.7s): 0.35 g

DBE_{MAX} (1.7s): 0.31 g

$DBE_{GEOMEAN}$ (1.7s): 0.24 g

Faults and Scenarios

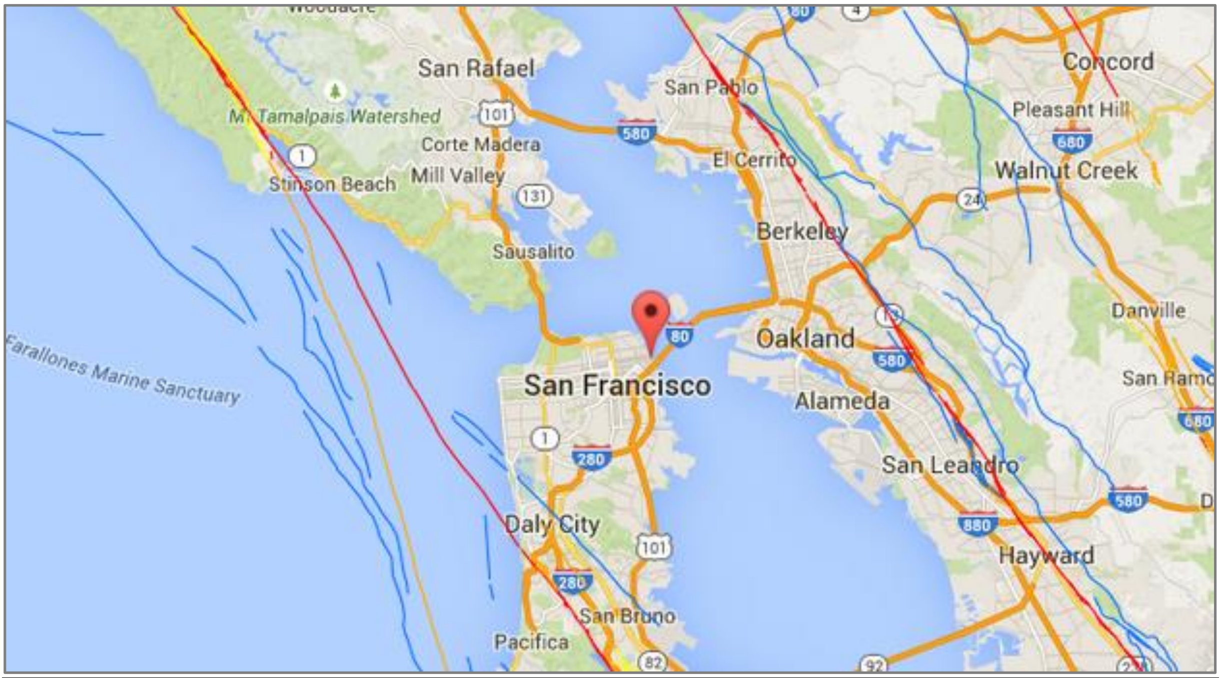

Figure 18. Local faults contributing to site hazard.

Deaggregation

Table 7. Individual faults contributing to site hazard.

Fault	*Contribution*	*Distance to Fault (km)*	*Magnitude*	*Epsilon*	*Site-to-Source (Azimuth)*
N. San Andreas;SAO+SAN MoBal	13.4%	16	7.79	0.66	-91.8
N. San Andreas;SAP+SAS MoBal	11.1%	13.6	7.48	0.81	-123.7
N. San Andreas Unsegmented A-flt	6.7%	14.3	7.65	0.69	-121.4
N. S.Andr.;SAO+SAN APriori	5.3%	16	7.79	0.66	-91.8
San Gregorio Connected Char	5.0%	19.4	7.47	1.14	-110.3
N. San Andreas;SAO+SAN+SAP+SAS M	4.5%	13.6	7.98	0.35	-123.7
N. S.Andr.;SAP+SAS aPriori	4.3%	13.6	7.48	0.81	-123.7
Hayward-Rodgers Crk;HN+HS aPrior	3.2%	15.6	6.95	1.48	56.1
Hayward-Rodgers Creek;HN+HS MoBa	2.7%	15.6	6.9	1.54	56.1
Hayward-Rodgers Crk;Unsegmented	2.4%	15.7	7.01	1.41	53.9
Hayward-Rodgers Creek;HS aPriori	2.2%	16.4	6.74	1.79	75.3

Table 8. Source categories contributing to site hazard.

Source Category	*Contribution*	*Distance to Fault (km)*	*Magnitude*	*Epsilon*
California B-faults Char	5.49	22.4	7.42	1.26
California A-faults	90.36	15.1	7.58	0.81

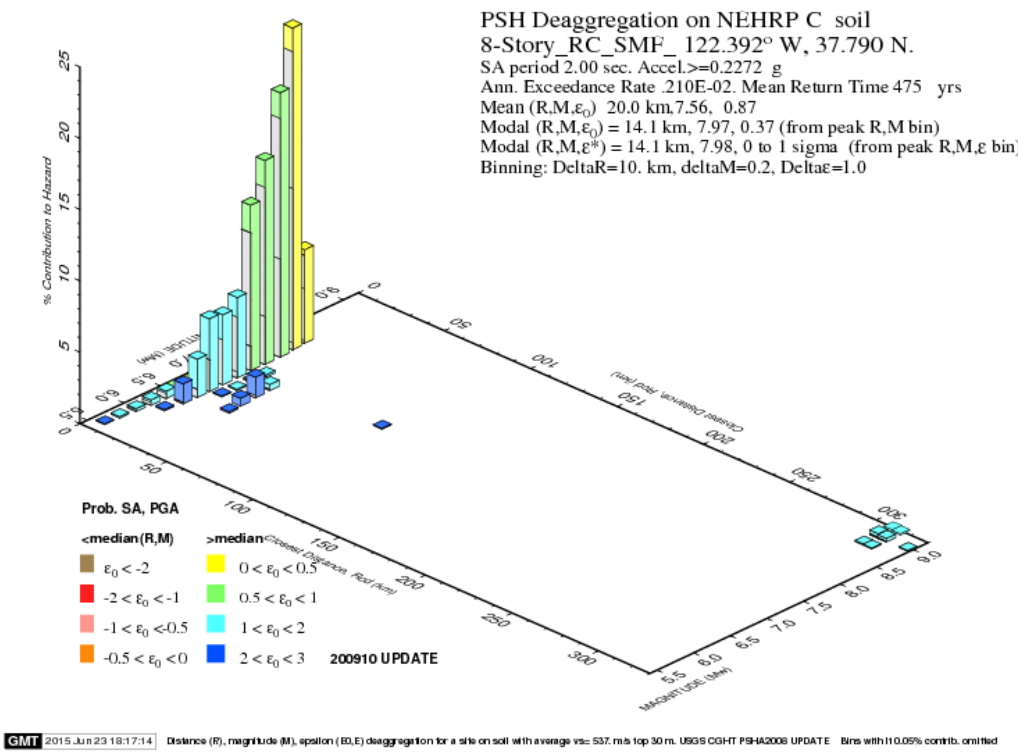

Figure 19. USGS deaggregation plot.

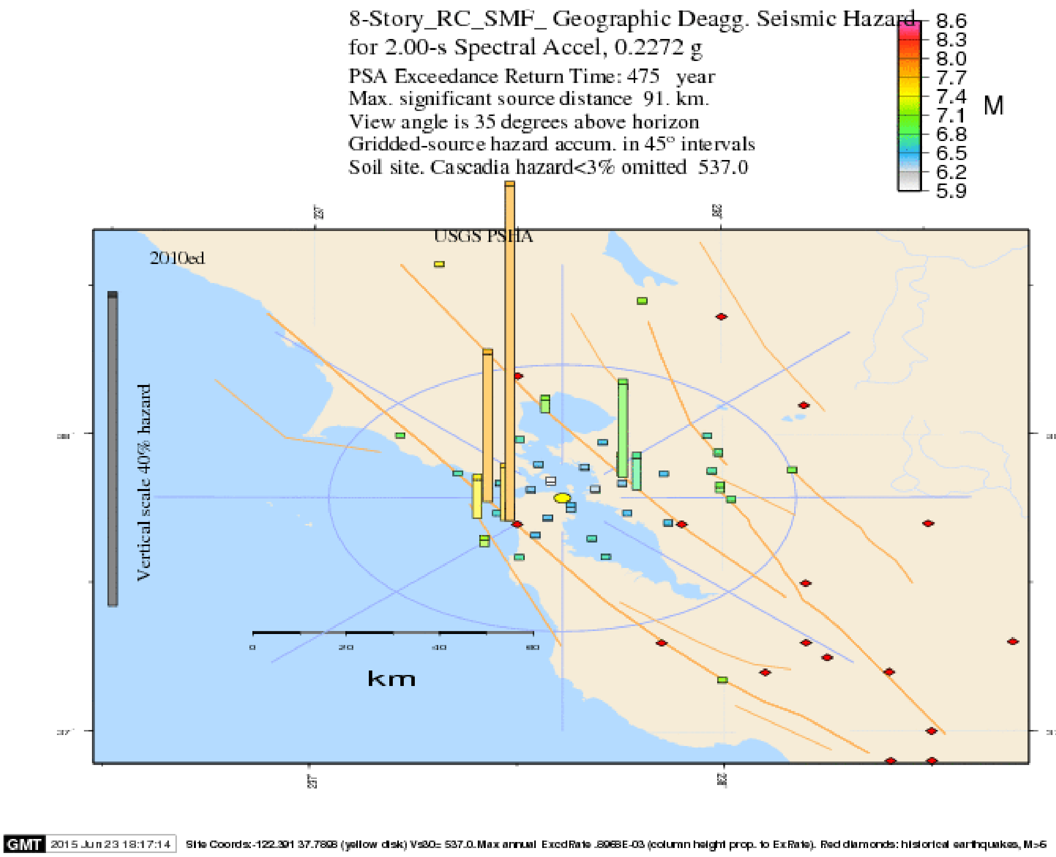

Figure 20. USGS geographic deaggregation diagram.

Other Geologic Hazards

Note that non-shaking hazards are reported here but are not currently included in the loss and repair time results.

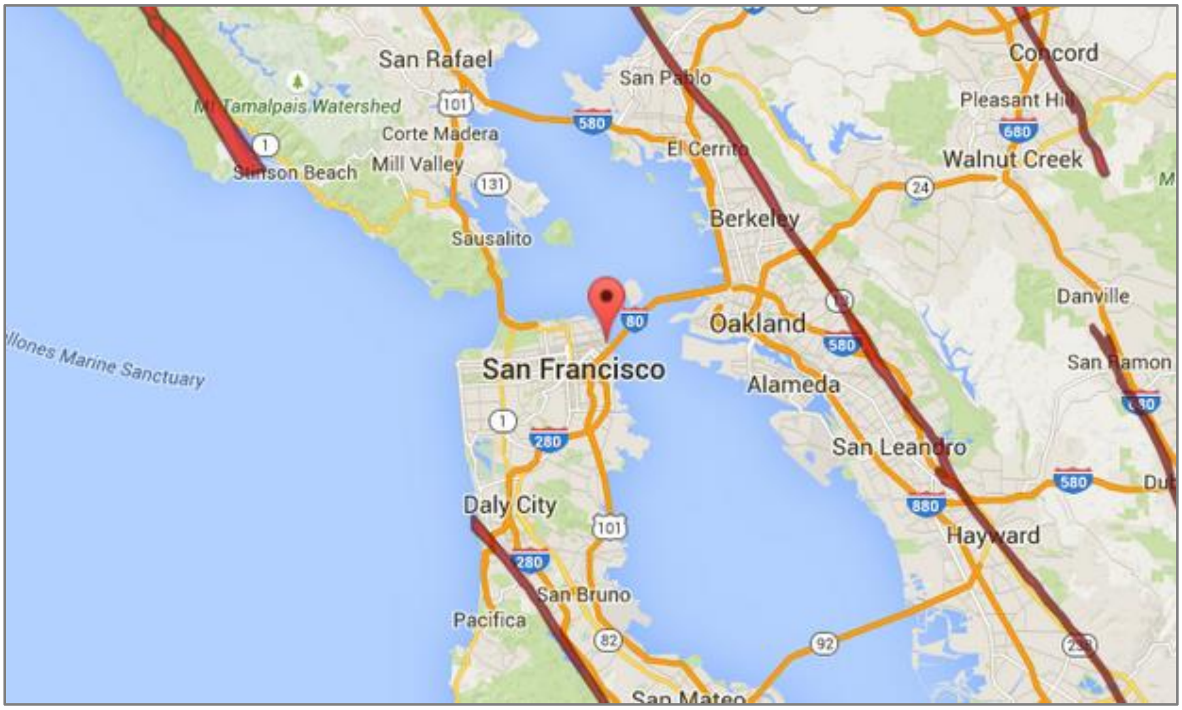

Figure 21. Alquist Priolo Zones

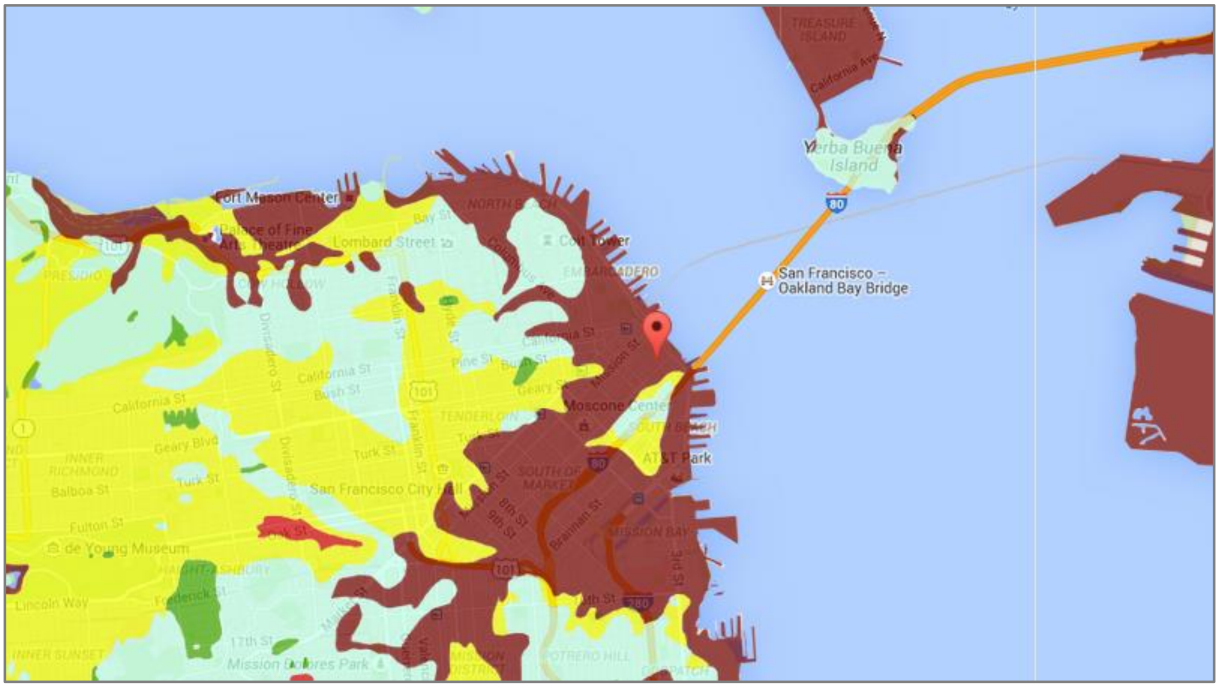

Figure 22. Liquefaction Susceptibility (still needs the legend).

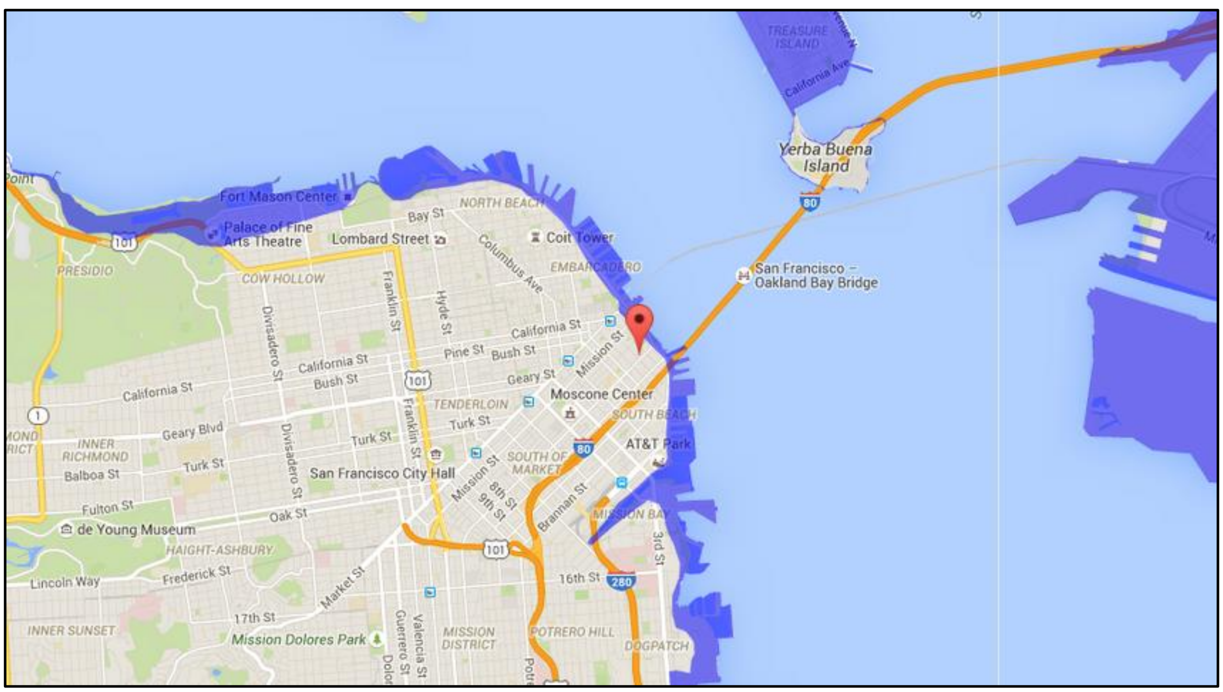

Figure 23. Tsunami Inundation Zones.

E. Structural Responses

Structural Analysis Method: FEMA P-58 Simplified Method

Period:

- Direction 1 – 1.6 sec
- Direction 2 – 1.8 sec

Vy (yield base shear coefficient):

- Direction 1 – 0.067 g
- Direction 2 – 0.067 g

DeltaY (yield story drift ratio):

- Direction 1 – 0.0085
- Direction 2 – 0.0085

Modal Mass Ratio, Cm (first mode):

- Direction 1 – 1.0
- Direction 2 – 1.0

Mode Shape

α (alpha):

- Direction 1 – 30
- Direction 2 – 30

a (loading distribution):

- Direction 1 – 0.01
- Direction 2 – 0.01

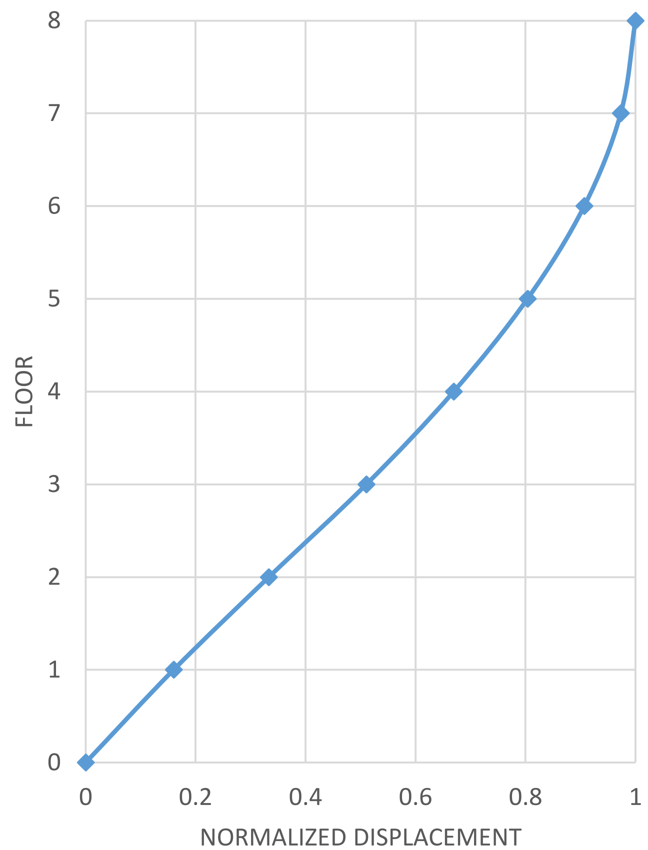

Figure 24. Mode Shape.

Table 9. Normalized mode shape in both directions.

Floor	*Direction 1*	*Direction 2*
0	0	0
1	0.16	0.16
2	0.33323	0.33323
3	0.51061	0.51061
4	0.66948	0.66948
5	0.80366	0.80366
6	0.90698	0.90698
7	0.97338	0.97338
8	1	1

Median Story Drift Ratio

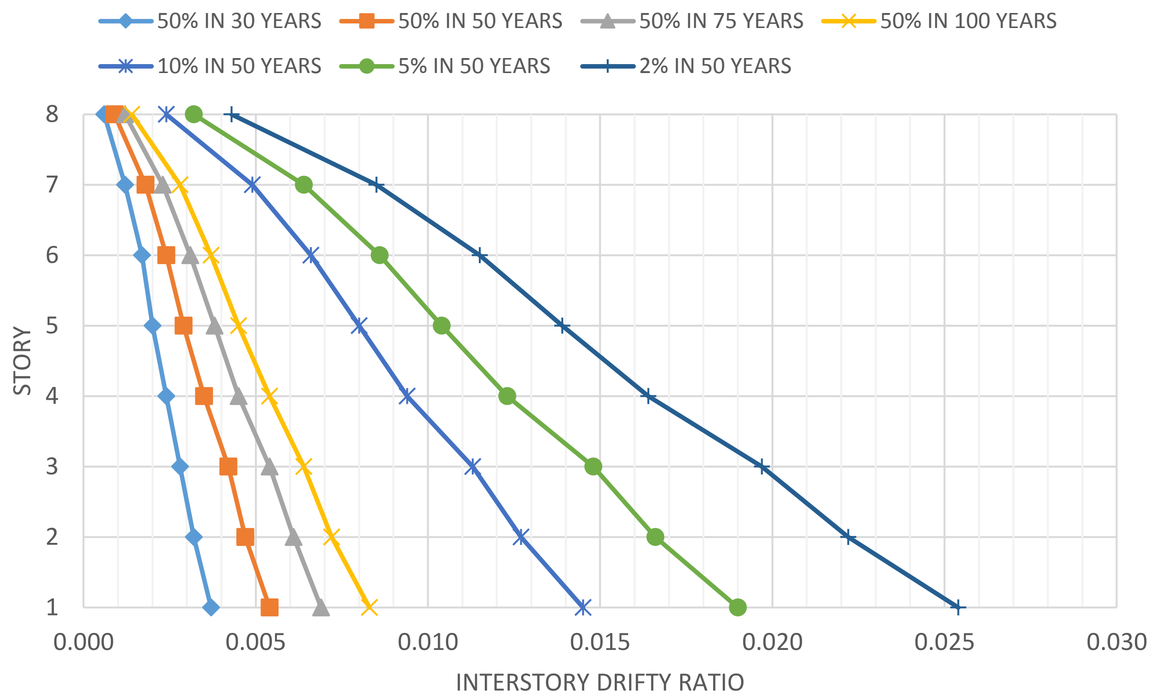

Figure 25. Story drift from the simplified method.

Table 10. Median interstory drift ratio demand.

STORY	*50% IN 30 YEARS*	*50% IN 50 YEARS*	*50% IN 75 YEARS*	*50% IN 100 YEARS*	*10% IN 50 YEARS*	*5% IN 50 YEARS*	*2% IN 50 YEARS*
1	0.004	0.005	0.007	0.008	0.015	0.019	0.025
2	0.003	0.005	0.006	0.007	0.013	0.017	0.022
3	0.003	0.004	0.005	0.006	0.011	0.015	0.020
4	0.002	0.004	0.005	0.005	0.009	0.012	0.016
5	0.002	0.003	0.004	0.005	0.008	0.010	0.014
6	0.002	0.002	0.003	0.004	0.007	0.009	0.012
7	0.001	0.002	0.002	0.003	0.005	0.006	0.009
8	0.001	0.001	0.001	0.001	0.002	0.003	0.004

Median Peak Floor Acceleration

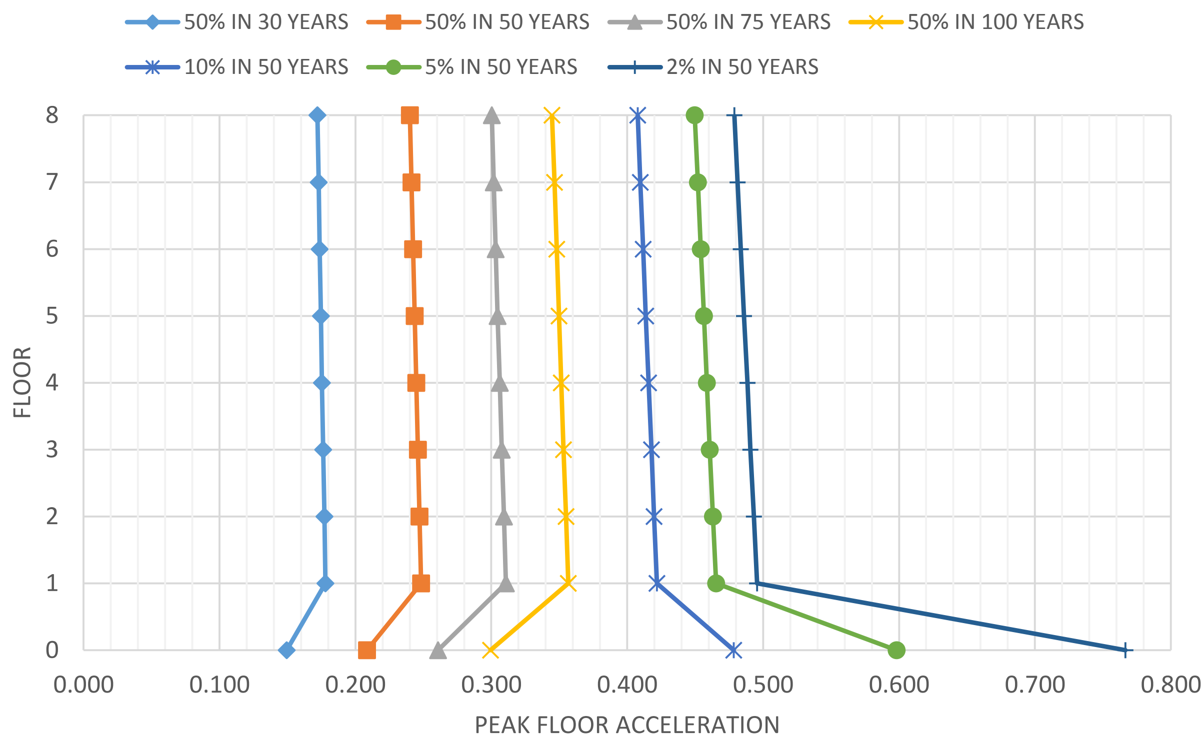

Figure 26. Peak floor acceleration form the simplified method.

Table 11. Median Peak floor acceleration demand.

FLOOR	*50% IN 30 YEARS*	*50% IN 50 YEARS*	*50% IN 75 YEARS*	*50% IN 100 YEARS*	*10% IN 50 YEARS*	*5% IN 50 YEARS*	*2% IN 50 YEARS*
0	0.149	0.209	0.261	0.299	0.478	0.598	0.767
1	0.178	0.248	0.311	0.357	0.422	0.465	0.496
2	0.177	0.247	0.309	0.355	0.420	0.463	0.493
3	0.176	0.246	0.308	0.353	0.418	0.461	0.491
4	0.175	0.245	0.306	0.352	0.416	0.459	0.488
5	0.175	0.244	0.305	0.350	0.414	0.456	0.486
6	0.174	0.243	0.303	0.348	0.412	0.454	0.484
7	0.173	0.241	0.302	0.346	0.410	0.452	0.481
8	0.172	0.240	0.300	0.345	0.408	0.450	0.479

Median Residual Drift Demand

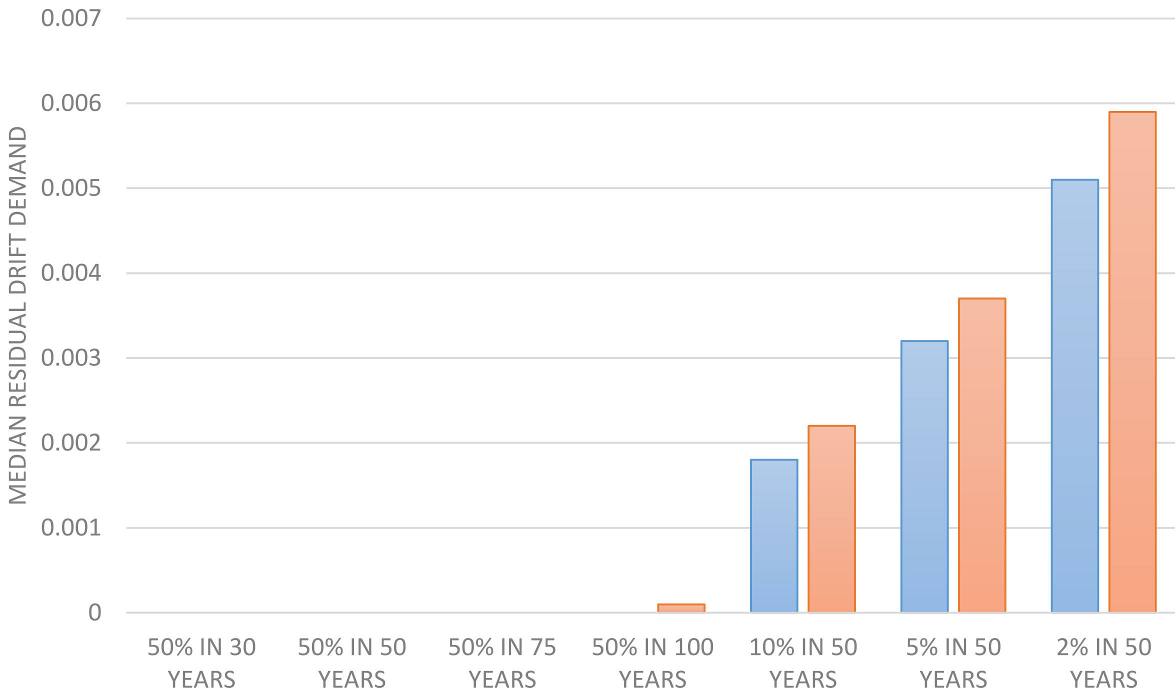

Figure 27. Residual drift form the simplified method.

Table 12. Median residual drift demand.

DIRECTION	*50% IN 30 YEARS*	*50% IN 50 YEARS*	*50% IN 75 YEARS*	*50% IN 100 YEARS*	*10% IN 50 YEARS*	*5% IN 50 YEARS*	*2% IN 50 YEARS*
Direction 1	0	0	0	0	0.0018	0.0032	0.0051
Direction 2	0	0	0	0.0001	0.0022	0.0037	0.0059

F. Building Capacities

Collapse Capacity

Type of Collapse Capacity: FEMA 154 Checklist

Probability of Collapse at MCE: 0.02%

Beta Value (Dispersion): 0.7

Median Collapse Capacity Sa(1.7s): 3.90 g

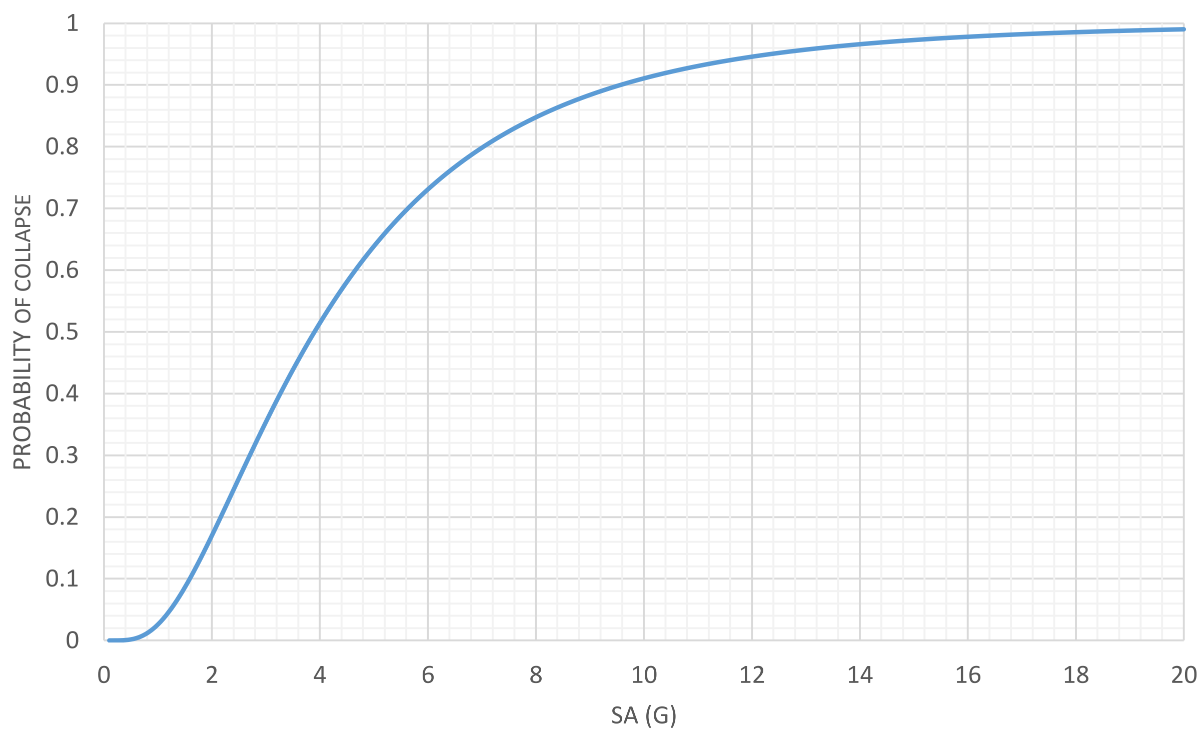

Figure 28. Distribution of collapse capacity.

Residual Drift Capacity

Include Residual Drift: Yes

Median Residual Drift Capacity: 0.01 g

Beta Value (Dispersion): 0.3

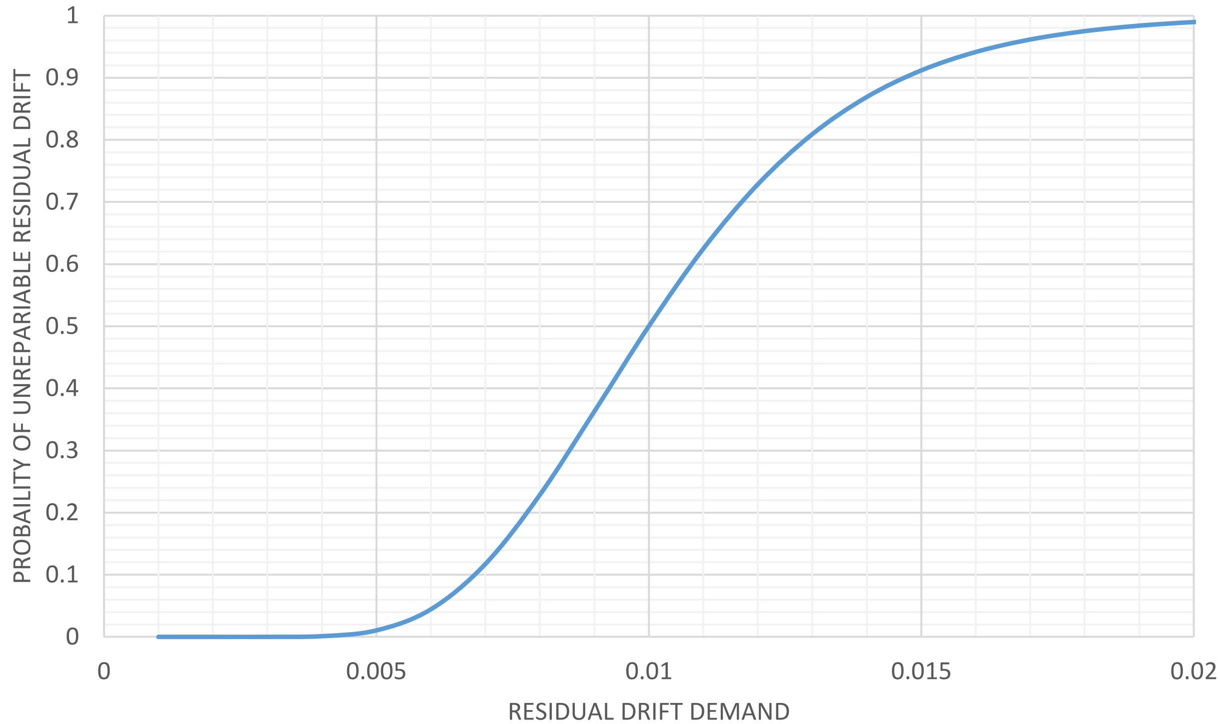

Figure 29. Distribution of residual drift capacity

G. FEMA 154 Checklist

Screening Level: 1 and 2

Level of Seismicity: High

Basic Score: 1.5

Vertical Irregularities: None

Plan Irregularities: None

Pounding: No

Other Modifiers:

- Redundancy

Design Year:

- Post Benchmark

Final Score: 3.7

Collapsed Portion Ratio: 1.0

Collapse Fragility Beta Factor: 0.7

Probability of Collapse at MCE: 0.02%

H. Building Contents

Content Algorithms Used:

- Auto-Populate Contents
- User Defined Nonstructural Capacities per ASCE 7-10 Chapter 13

Table 13. Structural components.

ID	*Name*	*Quantity*	*Location*	*Direction*
B1041.002a	SMF , Conc Col & Bm	4	All stories	Direction 1
B1041.002b	SMF , Conc Col & Bm	10	All stories	Direction 1
B1041.003a	SMF , Conc Col & Bm	4	All stories	Direction 2
B1041.003b	SMF , Conc Col & Bm	10	All stories	Direction 2
B1049.031	RC Slab Column Connection	25	All stories	Non-direction

Table 14. Nonstructural components with ASCE 7 Chapter 13 computed capacities.

ID	*Name*	*Quantity*	*Location*	*Direction*
C2011.011a	Concrete stairs with seismic joints	2	All stories	Direction 1
C2011.011a	Concrete stairs with seismic joints	2	All stories	Direction 2
D3031.013i	Chiller	1	Roof only	Non-direction
D3031.023i	Cooling Tower	1	Roof only	Non-direction
D3052.013l	Air Handling Unit	5	Roof only	Non-direction
D5012.013b	Motor Control Center	7	Roof only	Non-direction
D5012.023j	Low Voltage Switchgear	1	All Floors	Non-direction

Table 15. Nonstructural components with default database capacities.

ID	*Name*	*Quantity*	*Location*	*Direction*
C1011.001b	Wall Partition, Metal Stud, Partial Height	6	All stories	Direction 1
C1011.001b	Wall Partition, Metal Stud, Partial Height	8	All stories	Direction 2
B2022.001	Curtain Walls	104	All stories	Direction 1
B2022.001	Curtain Walls	156	All stories	Direction 2
C3011.001b	Wall Partition Finishes	1	All stories	Direction 1
B3011.011	Concrete tile roof	58.32	Roof only	Non-direction
C3011.001b	Wall Partition Finishes	1.5	All stories	Direction 2
C3027.002	Raised Access Floor, seismically rated.	16.2	8 floors selected	Non-direction
C3032.003a	Suspended Ceiling	19.44	8 floors selected	Non-direction
C3032.003b	Suspended Ceiling	8.1	8 floors selected	Non-direction
C3032.003c	Suspended Ceiling	2.7	8 floors selected	Non-direction
C3032.003d	Suspended Ceiling	1.944	8 floors selected	Non-direction
C3033.002	Recessed lighting in suspended ceiling	324	8 floors selected	Non-direction
C3034.002	Independent Pendant Lighting	32.4	8 floors selected	Non-direction
D1014.011	Traction Elevator	5	Ground only	Non-direction
D2021.013a	Cold Water Piping	0.324	8 floors selected	Non-direction
D2021.013b	Cold Water Piping	0.324	8 floors selected	Non-direction
D2022.013a	Hot Water Piping	1.184	8 floors selected	Non-direction
D2022.013b	Hot Water Piping	1.184	8 floors selected	Non-direction
D2022.023a	Hot Water Piping	0.648	8 floors selected	Non-direction
D2022.023b	Hot Water Piping	0.648	8 floors selected	Non-direction
D2031.023a	Sanitary Waste Piping	1.231	8 floors selected	Non-direction
D2031.023b	Sanitary Waste Piping	1.231	8 floors selected	Non-direction
D3041.011c	HVAC Ducting	1.62	8 floors selected	Non-direction
D3041.012c	HVAC Ducting	0.432	8 floors selected	Non-direction
D4011.023a	Fire Sprinkler Water Piping	4.32	8 floors selected	Non-direction
C1011.001a	Wall Partition, Metal Stud	6	All stories	Direction 1
D4011.053a	Fire Sprinkler Drop	1.944	8 floors selected	Non-direction
C1011.001a	Wall Partition, Metal Stud	8	All stories	Direction 2