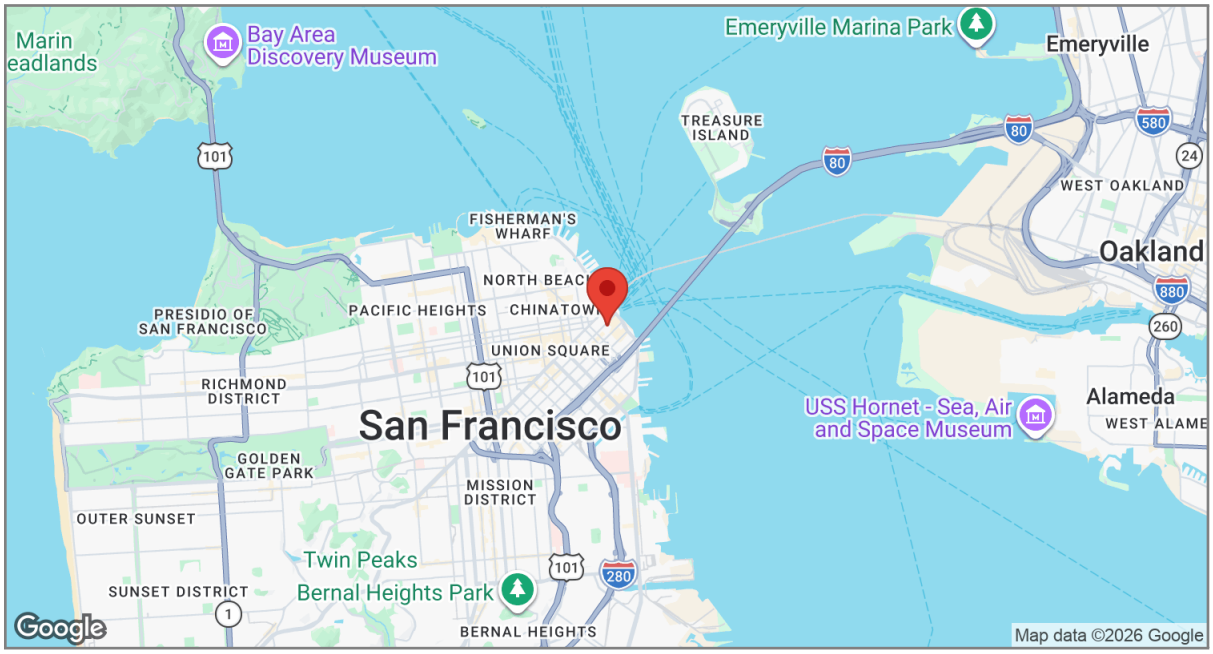
SEISMIC RISK ASSESSMENT REPORT

Created with the SP3-RiskModel *Advanced + Recovery*

U.S. Resiliency Council Rating Summary



Report Generated for:

123 Main Street, San Francisco, CA

Latitude: 37.79166°

Longitude: -122.39442°

Report Generated by:

v14.7.1 of the SP3-RiskModel

May 22, 2026

Seismic Performance Prediction Platform

SP3 | Where Research Meets Practice

1 SUMMARY OF INPUTS AND RISK RESULTS

Risk Model Inputs

Primary	
Project Name:	Website
Model Name:	123 Main Street
Building Type:	Steel: BRBF CoreBrace with Back-up Frame
Design Code Year:	2010
Number of Stories:	8
Address:	
	123 Main Street
	San Francisco, CA
Latitude:	37.79166°
Longitude:	-122.39442°
Occupancy:	Commercial Office

Analysis Options	
Include Collapse in Analysis:	Yes
Consider Residual Drift:	Yes
Simulation Options	
Number of EQ Simulations:	2,500
Collapse Distribution Truncation?	Yes
Truncation Level:	–
Component Distribution Truncation?	No
Truncation Level:	–
Cost Multipliers	
Region Cost Multiplier:	–
Date Cost Multiplier:	–
Occupancy Cost Multiplier:	–
Component Soft Cost Modifier:	–

Building Layout Information	
Cost per Square Foot:	–
Scale component repair costs with building value?	Yes
Total Square Feet:	–
Aspect Ratio:	–
First Story Height (ft):	–
Upper Story Heights (ft):	–

Ground Motion and Soil Information	
Site Class:	–
Site Hazard:	U.S. Geological Survey
Edition:	–

Building Design Info	
Level of Detailing (Dir. 1, 2):	Special, Special
Drift Limit (Dir. 1, 2):	1%, 1%
Risk Category:	(Cat. III)
Seismic Importance Factor, I_e:	–
Component Importance Factor, I_p:	–
Design Spectral Acceleration	
Mapped Short Period, S_s	–
Mapped 1 Second, S_1	–
Design Short Period, S_{Ds}	–
Design 1 Second, S_{D1}	–

Structural Properties		
Mode Shapes Specified?	No	
Directional Properties	*Dir. 1*	*Dir. 2*
Base Shear Strength (g):	–	–
Yield Drift (%):	–	–
Design Model Period (T_1) (s):	–	–
1^{st} Mode Period (T_1) (s):	–	–
2^{nd} Mode Period (T_2) (s):	–	–
3^{rd} Mode Period (T_3) (s):	–	–

Component Information	
Selection Method	Automatic

Building Stability	
Collapse Definition Method:	FEMA P-154
Score Calc Method:	Rapid Visual Screening Checklist
FEMA P-154 Score:	–
Beta (Dispersion):	–

Recovery Time Options	
Recovery Time Method	ATC-138 (Beta)
Building Replacement Time	–
Statistical Damage Correlation Model: Original FEMA P-58 Correlation Model (2012/2018)	
Factors Delaying Start of Repairs	
Inspection	Yes
Financing	Yes
Permitting	Yes
Engineering Mobilization	Yes
Contractor Mobilization	Yes
Long Lead Time	No
Mitigation Factors	
Inspector on Retainer	Yes
Engineer on Retainer	Yes
Contractor Relationship	Retainer
Funding Source	–
Cash on Hand	15.0%

Responses

Response	EDP	Method	Use as Default for Comps?	Derived From
Peak Story Drift Ratio	IDR	SP3 SRPE	Yes	–
Peak Floor Acceleration	PFA	SP3 SRPE	Yes	–
Residual Story Drift Ratio	RIDR	SP3 SRPE	Yes	Peak Story Drift Ratio
Direction 1				
Residual Drift Model:		–		
Record-to-Record Dispersion:		–		
Direction 2				
Residual Drift Model:		–		
Record-to-Record Dispersion:		–		

Structural Response Dispersion Options	
Record-to-Record Dispersion Model:	FEMA P-58
Modeling dispersion:	–
Residual Drift Simulation Method:	–

Recovery Time Options Specific to ATC-138 (Beta)

HVAC			
Need Ventilation for Reoccupancy?	–	Need Ventilation for Function?	Yes
Need Heating for Reoccupancy?	–	Need Heating for Function?	Yes
Need Cooling for Reoccupancy?	–	Need Cooling for Function?	Yes
Need Exhaust for Reoccupancy?	–	Need Exhaust for Function?	Yes
Elevator			
Need Elevator for Function?	Yes	Max. Walkable Story	3
Use updated elevator components?	No		
Surge			
Include Surge Demand?	No		
Temporary Repair			
Allow Temporary Repairs?	Yes	Allow Temporary Shoring?	–
Fire			
Allow Fire Watch for Occupancy?	No		
Plumbing			
Is Potable Water Required for Occupancy?	–	Is Potable Water Required for Function?	–
Is Sanitary Piping Required for Occupancy?	–	Is Sanitary Piping Required for Function?	–
Electrical			
Is Electricity Required for Function?	–		
Egress			
Percentage of the Exits Required for Occupancy?	–	Minimum Number of Exits Required for Occupancy?	–
Door racking affects egress?	–		
Flooding			
Include flooding consequences?	Yes		
"Smart" Components			
Use "smart" piping components?	No		
Use "smart" equipment components?	No		

Component Checklist

Exterior

- Percent of Building Surface Glazed
  > *80.0%*
- Does the building have glazing?
  > *Yes*
  - What type of glazing does the building have?
    > *Insulating Glass Unit (Untested)*
- Does the building have cladding?
  > *Yes*
  - What kind of cladding does the building have?
    > *Precast Concrete Panels*

Interior Finishes

- Are there partition walls in the building?
  > *Yes*
  - What kind of partition walls does the building have?
    > *Metal Studs*

Continued on next page

Component Checklist (*Continued*))

- What finish do the partition walls have?
  > *Gypsum + Wallpaper*
  - How are the partitions constructed?
    > *Full Height: Slip Tracks with Returns*
- Does the building have raised access floors?
  > *No*
- Does the building have suspended ceilings?
  > *Yes*
  - Are the ceilings laterally supported?
    > *Yes (SDC D/E/F or equivalent)*
    - What is the Ip factor used to design the ceilings?
      > *1.5*
- Does the building contain pendant (non-recessed) lighting?
  > *No*

Stairs and Elevators

- Does the building have stairs?
  > *Yes*
  - What type of stairs are in the building?
    > *Prefabricated steel*
    - Do the stairs have seismic joints?
      > *Yes*
- Are there elevators in the building?
  > *Yes*
  - What type of elevators are in the building?
    > *Traction*
    - From which era are the building's elevators?
      > *Post-2000 Seismic Zone 3*

Fire Supression

- Does the building contain a fire sprinkler system?
  > *Yes*
  - Does the fire sprinkler system have braced horizontal mains?
    > *Yes*
    - Are the horizontal mains OSHPD certified (or equivalent)?
      > *Yes*
  - Are the fire sprinkler drops OSHPD certified (or equivalent)?
    > *Yes*
    - What type of ceiling do the fire drops enter into?
      > *Soft Braced*

Piping

- Does the building contain potable water piping?
  > *Yes*
  - Is the building's water piping OSHPD certified or equivalent?
    > *Yes*
- Does the building contain sanitary piping?
  > *Yes*
  - Is the building's sanitary piping OSHPD certified or equivalent?
    > *Yes*
    - What type of couplings do the pipes have?
      > *Flexible*

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Component Checklist (*Continued*))

HVAC

- Does the building have an HVAC system?
  > *Yes*
  - Is the HVAC cooling/heating equipment seismically anchored?
    > *Yes*
    - How is the cooling/heating system configured?
      > *Roof Top Units*
      - Are the RTUs used for medical purposes (or equivalent)?
        > *No*
        - Are the RTUs small or large?
          > *Large*
      - Does the building have a control panel?
        > *Yes*
  - Is there an HVAC exhaust system in the building?
    > *Yes*
    - Is the HVAC exhaust system seismically anchored?
      > *Yes*
  - Does the HVAC distribution system meet OSHPD standards (or similar)?
    > *Yes*
    - Is there any large diameter ducting (6 SqFt+) in the HVAC system?
      > *Yes*

Electrical

- Does the building have a backup battery/generator system?
  > *Yes*
  - Is the battery backup system equipment seismically anchored?
    > *Yes*
- Which best describes the building's electrical system?
  > *Full Commercial-grade Electrical System*
  - Is the electrical equipment seismically anchored?
    > *Yes*
  - What best describes the buildings motor control centers?
    > *Anchored*

Building Modifiers Checklist

Vertical Irregularities	
Soft Story	
Soft or Weak Story Vertical Irregularity?	–
Sloping Site	
Full story grade change? (FEMA Type non-W1 buildings)	–
Setback	
Outboard vertical elements of the lateral system at an upper story?	–
Inboard vertical elements of the lateral system at upper stories?	–
In-plane offset of the lateral elements greater their length?	–
Split Level	
Split level at one of the floor levels or at the roof?	–
Other	
Other observable vertical irregularity?	–
Plan Irregularities	
Torsion Irregularity?	–
Non-parallel system?	–
Re-entrant corner projection 25% of plan dimension?	–
Diaphragm opening over 50% of the total diaphragm width?	–
Other observable plan irregularity?	–
Redundancy	
At least two bays of lateral elements?	–
Pounding	
Floors Unaligned?	–
Different building heights?	–
End of block?	–
Steel Braced Frames (S1)	
K bracing geometry is visible?	–
Construction Quality	
Structural Construction Quality	–
Non-structural Construction Quality	–
Structural Material Deterioration	–

Notes

No notes were provided.

Expected Loss

Expected loss in percent of total building value

Shaking Intensity	Return Period	SEL (%)	SUL (%)
90% in 50 years	22 Years	0.0	0.1
50% in 30 years	43 Years	0.1	0.2
50% in 50 years	72 Years	0.3	0.6
50% in 75 years	108 Years	0.5	1.2
50% in 100 years	144 Years	0.8	1.7
20% in 50 years	224 Years	1.6	3.0
10% in 50 years	475 Years	4.4	6.6
DE	920 Years	21	40
5% in 50 years	975 Years	23	43
2% in 50 years	2475 Years	56	90
MCE_R	2880 Years	60	96

Recovery Time

Reported recovery times are the time required for the entire building to reach a recovery state (re-occupancy, functional recovery, or full recovery).

Median recovery time summary

Intensity	ATC-138 Functional Recovery (Beta)†			FEMA P-58‡	
	Re-Occupancy	Functional	Full	Full (Parallel)	Full (Series)
90% in 50 years	0 days	0 days	6 days	0.19 days	0.58 days
50% in 30 years	0 days	0 days	8 days	0.27 days	1.2 days
50% in 50 years	0 days	3 days	10 days	0.55 days	2.4 days
50% in 75 years	2 days	4 days	13 days	1.2 days	4.2 days
50% in 100 years	3 days	5 days	2.3 weeks	2.1 days	6.8 days
20% in 50 years	4 days	6 days	4.9 weeks	5 days	12 days
10% in 50 years	7 days	5.6 weeks	2.7 months	11 days	3.8 weeks
DE	2.3 months	3.4 months	4.1 months	3.1 weeks	7.7 weeks
5% in 50 years	2.6 months	3.6 months	4.3 months	3.2 weeks	1.9 months
2% in 50 years	38 months	38 months	38 months	38 months	38 months
MCE_R	38 months	38 months	38 months	38 months	38 months

† Does include factors delaying start of repairs

‡ Does ***not*** include factors delaying start of repairs

2 U.S. RESILIENCE COUNCIL SEISMIC RATING

2.1 Summary

The following is a summary of the building seismic rating based on the in-progress FEMA P-58 rating approach developed by the U.S. Resiliency Council (Applied Technology Council, 2018). For more information, the U.S. Resiliency Council's (USRC) website can be found here. These results are based on the current version of the rating method.

The rating was performed at the design earthquake (DE) intensity per USRC guidelines.

Note that this is not an official USRC rating unless submitted to the USRC for review and archival.

Safety: 4 Stars

Serious injuries unlikely

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

How to improve this rating:
To obtain a 5 star rating, the likelihood of a building occupant being fatally injured (including collapse and non-collapse hazards) must be decreased from 0.000045 to 0.000030.

This USRC safety rating is based on the FEMA P-58 approach, which is sometimes overly sensitive to falling hazards and irregularities. An ASCE 41 checklist-based safety rating method is also available here[1] and that safety rating can be used in place of the rating shown in this table.

Damage: 2 Stars

Substantial damage

Repair cost likely less than 40% of building replacement cost.

How to improve this rating:
Mean loss must be decreased from 21.4% to 20% to obtain a 3 star damage rating.

Recovery: 3 Stars

Within weeks to months

The expected performance may result in delay of minimum operational use for weeks to months, excluding external factors.

How to improve this rating:
Median downtime must be decreased from 14.6 weeks to 4 weeks to obtain a 4 star recovery rating.

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[1] https://form.jotform.com/93174849551164

2.2 Safety Rating

The safety rating is used to assess the the building in terms of the potential for people in the building to get out after an earthquake event and the bodily injuries or loss of life during the event. Table 2.1 shows the values that were used to obtain the safety rating of 4 stars. The probability of egress impedance indicates the likelihood of a component of the specified type impeding a building occupant's ability to exit the building. Residual drift is reported here because excessive residual drifts may cause doors to jam, thus impeding egress from the building. The probability of injury and fatality include collapse.

Table 2.1. Safety parameters used to determine rating (all values in %).

P[Injury]	0.588
P[Fatality]	0.004
P[Egress Impedance] for Stairs:	1.28
P[Egress Impedance] for Parapets:	0
P[Egress Impedance] for Ceilings:	0.160
P[Egress Impedance] for Piping:	0
P[Egress Impedance] for HVAC:	0.040
Residual Drift, Dir. 1:	0.306
Residual Drift, Dir. 2:	0.306

2.3 Damage Rating

The damage rating is entirely dependent on mean loss ratio. The mean loss ratio for this building was computed to be 21.4%.

2.4 Recovery Rating

The recovery rating is based on the median ATC-138 Functional Recovery (Beta) Methodology downtime of 3.4 months which includes the impedance factors specified by the user.

3 DISCLAIMER

REFERENCES

Applied Technology Council. 2018. *FEMA P-58: Seismic Perfromance Assessment of Buildings*.