

Investing in commercial property requires comprehensive due diligence to be performed. This due diligence ensures that everyone involved in the lending process is aware of any property risks. During the due diligence process, one specialized assessment that might be required is a seismic risk assessment. This assessment is utilized in portions of the world with a history of earthquakes and or probability of future earthquakes.

For those considering the purchase of commercial real estate in an area affected by seismic activity, it is important to understand the role that a seismic risk assessment will have on the lending process. In this guide, investors can learn more about the purpose of this assessment, the difference between SEL and SUL, and how to mitigate seismic risks.

## What Is a Seismic Risk Assessment?

A seismic risk assessment evaluates how a property would fare during an earthquake. With this data, a probable maximum loss (PML) is calculated.

Seismic risk assessments utilize the ASTM E2026 Standard Guide for Seismic Risk Assessment of Buildings and the E2557

Standard Practice for Probable Maximum Loss (PML) Evaluations for Earthquake Due Diligence Assessments for standardizing results.

The ASTM E2026 outlines the broad scope of how seismic risk assessments should be conducted. This standardization can be used for any use case, not just real estate.

The ASTM E2557 takes a more specialized approach and specifically applies the information from the ASTM E2026 to real estate due diligence purposes.

According to seismic risk assessment standards outlined by Fannie Mae, when a property is located in an area that is considered high seismic risk, and there is a structural risk factor, a borrower must obtain a seismic risk assessment prior to a mortgage commitment date.

## What Is Considered a High Seismic Risk Area?

This refers to an area or a specific site that has a Peak Ground Acceleration (PGA) equal to or greater than 0.15g. This is determined by using the most recent United States Geological Survey (USGS) published data.

For lending purposes, a seismic risk assessment has to meet the ASTM seismic standards found in ASTM E2026 and ASTM E2557. This ensures that any consultant or professional working on the assessment is aligned to common terminology and ensures strict adherence to predefined levels of assessment.

Additionally, a seismic risk assessment must include estimates for the Scenario Expected Loss (SEL) and the Scenario Upper Loss (SUL) — more on that below.

Seismic assessments must be performed by professionals who meet the guidelines outlined in the ASTM standards. This has been recently updated to require that, in the case of a Level 1 or higher seismic risk assessment, the field survey and report production are completed by a licensed structural or civil engineer with a background in seismic design or evaluation. Additionally, reports are required to showcase the level of investigation, loss results, and a list of all personnel involved in creating the report.

Hazards addressed by a seismic risk assessment meeting the ASTM E2026-16a Standard Guide for Seismic Risk Assessment of Buildings include an analysis of the following variables as outlined by the ASTM:

- Earthquake ground shaking
- Earthquake-caused site instability, which includes fault rupture, landslides, soil liquefaction, lateral spreading, and settlement
- Earthquake-caused off-site response impacting the property, which includes flooding from dam or dike failure, tsunamis, and seiches

The ASTM standards allow a seismic risk assessment to be performed on an individual building or on a group of buildings.

There are five different types of seismic risk assessments included in the final report:

- Building stability
- Site stability
- Building damageability
- Contents damageability
- Business interruption

Along with assessing probable loss evaluations for building damageability, the ASTM standards recommend conducting an earthquake ground motion assessment.

## The Purpose of a Seismic Risk Assessment

A seismic risk assessment aims to help investors and lenders better understand the potential for commercial property losses due to an earthquake. In high seismic risk areas, this will be factored in with other property risks to determine the overall risk of a property investment.

For example, suppose an investor is interested in purchasing an apartment complex in a high seismic risk area. In that case, both the investor and their lender will want to understand what the potential is for this property to be damaged by an earthquake. An assessment will factor in the condition of the apartment complex, the exact location, any mitigating engineering put into place, and environmental factors, such as the soil. Not only that, but a seismic risk assessment report will help both parties understand what losses might occur due to an interruption in business.

Because there is no way to predict earthquakes with any certainty, the goal of a seismic assessment report is to create a probable loss estimate.

## Scenario Expected Loss (SEL) and Scenario Upper Loss (SUL): Replacing Probable Maximum Loss (PML)

In the past, when discussing the ASTM seismic assessment standards, the term Probable Maximum Loss (PML) was used to describe the potential damageability of a building in an earthquake. However, there was a lack of clarity around this term, which resulted in a number of inconsistencies in seismic risk reporting.

As such, the ASTM decided to create a better standard for loss probabilities. The two new terms that the association introduced are Scenario Expected Loss (SEL) and Scenario Upper Loss (SUL).

Both the SEL and SUL are based on a simulation of a seismic scenario. The same scenario is used when determining the SEL and the SUL. The only difference between these two assessments is the confidence in the estimate.

### Scenario Expected Loss (SEL)

The SEL provides a 50% confidence level on the loss estimate. Running the scenario, the SEL estimates that half of all similar buildings would undergo the same amount of damage or less.

### Scenario Upper Loss (SUL)

The SUL provides a 90% confidence level on the loss estimate. Running the same scenario as the SEL, the SUL estimates that 90 out of 100 buildings would undergo the same amount of damage or less. Hence, the SUL is typically higher than the SEL.

## Determining when a Seismic Risk Assessment is Necessary

Not all commercial properties require a seismic risk assessment during the due diligence process. To determine whether or not a seismic risk assessment is necessary, the following are two main screening criteria utilized in the U.S.

### Seismic Zones

If a property is located in seismic zones three or four, as defined by the Seismic Zone Map included as an appendix to the ASTM E2557 scope of work for Probable Maximum Loss assessments, a seismic risk assessment is most likely necessary. While this map published by the ASTM can still be used as a screening tool, it is an older method for screening, with most lenders transitioning to Peak Ground Acceleration (PGA).

### Peak Ground Acceleration

PGA is the most commonly used screening tool today, with key lenders such as Fannie Mae and Freddie Mac using this as their basis for seismic risk assessment requirements. In most cases, properties with a PGA equal to or greater than 0.15g require a seismic risk assessment.

## Seismic Risk Mitigation Options

If a property is deemed at high risk, it can create difficulties in securing lending. However, there are ways to mitigate the risks of seismic activity.

A property can be brought up to better standards, and work can be done to resolve stability issues. Sometimes, a simple seismic reinforcement may make a significant difference. In this case, an additional seismic risk assessment will need to be performed after the work has been completed.

Another option is to obtain earthquake insurance for the property. In most cases, lenders will require that the coverage amount is 100% of the property's insurable value. This solution is effective, but it is worth noting that earthquake insurance can be costly, particularly for properties in areas considered to be at high risk of seismic activity.

## Find Creative Commercial Lending Solutions

For investors interested in purchasing commercial real estate in areas affected by seismic activity, working with a lending partner who can think creatively about mortgage solutions is critical. At Slatt Capital, we provide personalized, high-touchpoint service that leaves our clients feeling heard. We continually strive to find the right lending solutions to meet unique needs.

If you are interested in investing in a property that might require a seismic risk assessment, we are here to help. While many banking institutions shy away from providing lending solutions for specialized situations, our team is passionate about matching our clients with the right capital solution. Our privately held commercial mortgage banking firm secures financing on all major commercial property, leveraging a robust network of correspondent relationships. If you'd like to learn more about how we can help, please reach out to our team today. We'll be happy to provide a one-on-one consultation outlining the steps you need to take to begin the process of seeking capital for your next commercial endeavor.