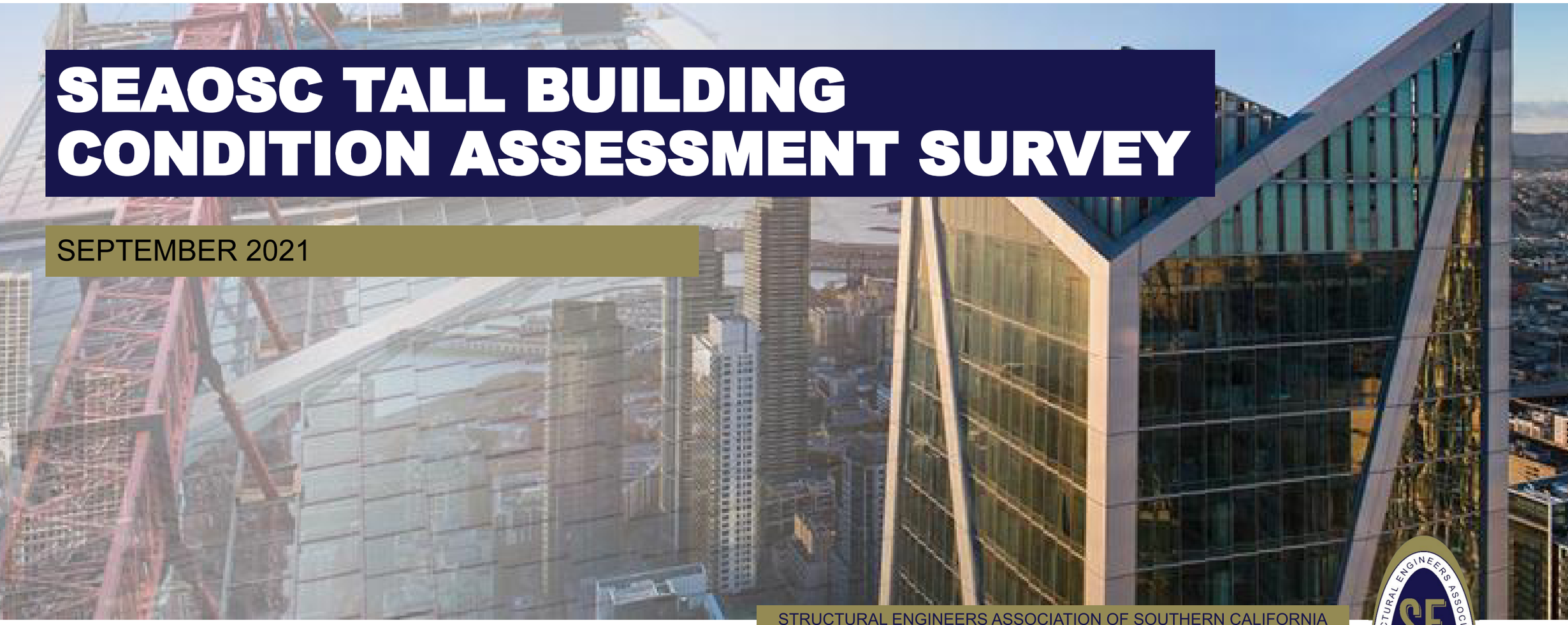


SEAOSC TALL BUILDING CONDITION ASSESSMENT SURVEY

SEPTEMBER 2021

STRUCTURAL ENGINEERS ASSOCIATION OF SOUTHERN CALIFORNIA

STRUCTURAL ENGINEERS ASSOCIATION OF SOUTHERN CALIFORNIA

2021 Tall Building Condition Assessment Survey

This survey was conducted at the request of Los Angeles County, Department of Public Works to understand the current process used by Structural Engineers to assess existing buildings.

Licensed PE and SE respondents were asked series of questions with respect to two scenarios: where no structural failure is observed in a building and also when failure occurs. They were asked to respond based on recent experiences of conducting condition assessments of existing buildings five or more stories in height.

This survey results provides a **point in time observation** as one set of data to inform future actions with regard to the issue of building condition assessments.

Ninety (90) SEAOSC/SEAOC Members responded. The majority of respondents practice in Southern California (78%).

For the latest information on this survey by SEAOSC, contact seaosc@seaosc.org

Key Findings

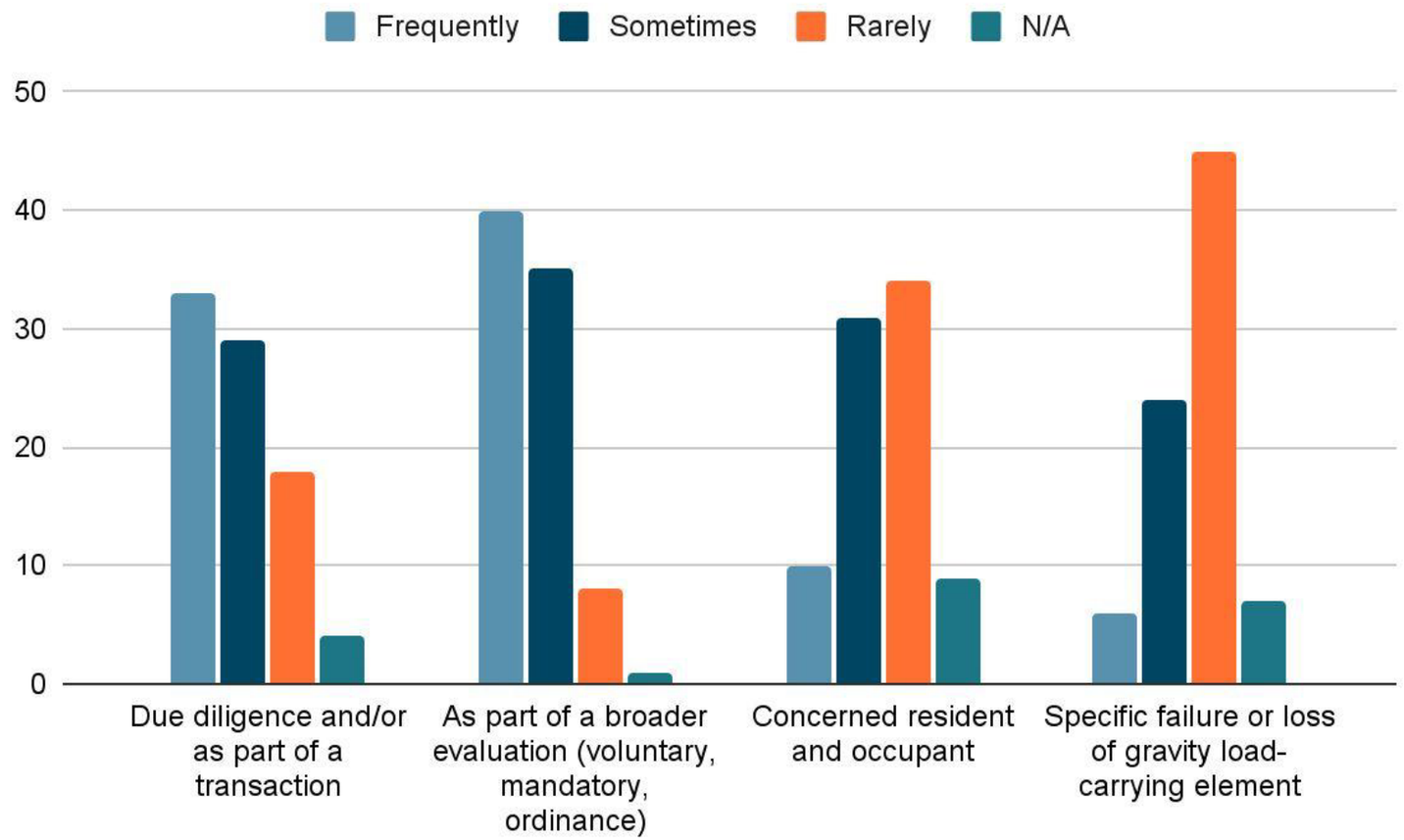
Respondents reported that the reason Condition Assessments are frequently performed is because it is part of due diligence for a transaction (real estate, insurance, etc) or as part of a broader evaluation due to a voluntary upgrade or mandatory ordinance-related upgrade (e.g. non-ductile concrete frame seismic retrofit).

Condition Assessments were rarely performed due to a specific failure or because of concerned occupant.

When deficiencies are observed, **life safety** is the primary priority of respondents.

What is the purpose of the assessment?

Ranked in order of frequency



Help us understand your process. *(Open responses)*

Participants were first asked a series of questions in the scenario where assessments are **NOT due to observed failure:**

- When performing condition assessments, the vast majority of respondents look for deterioration or damage (81%).

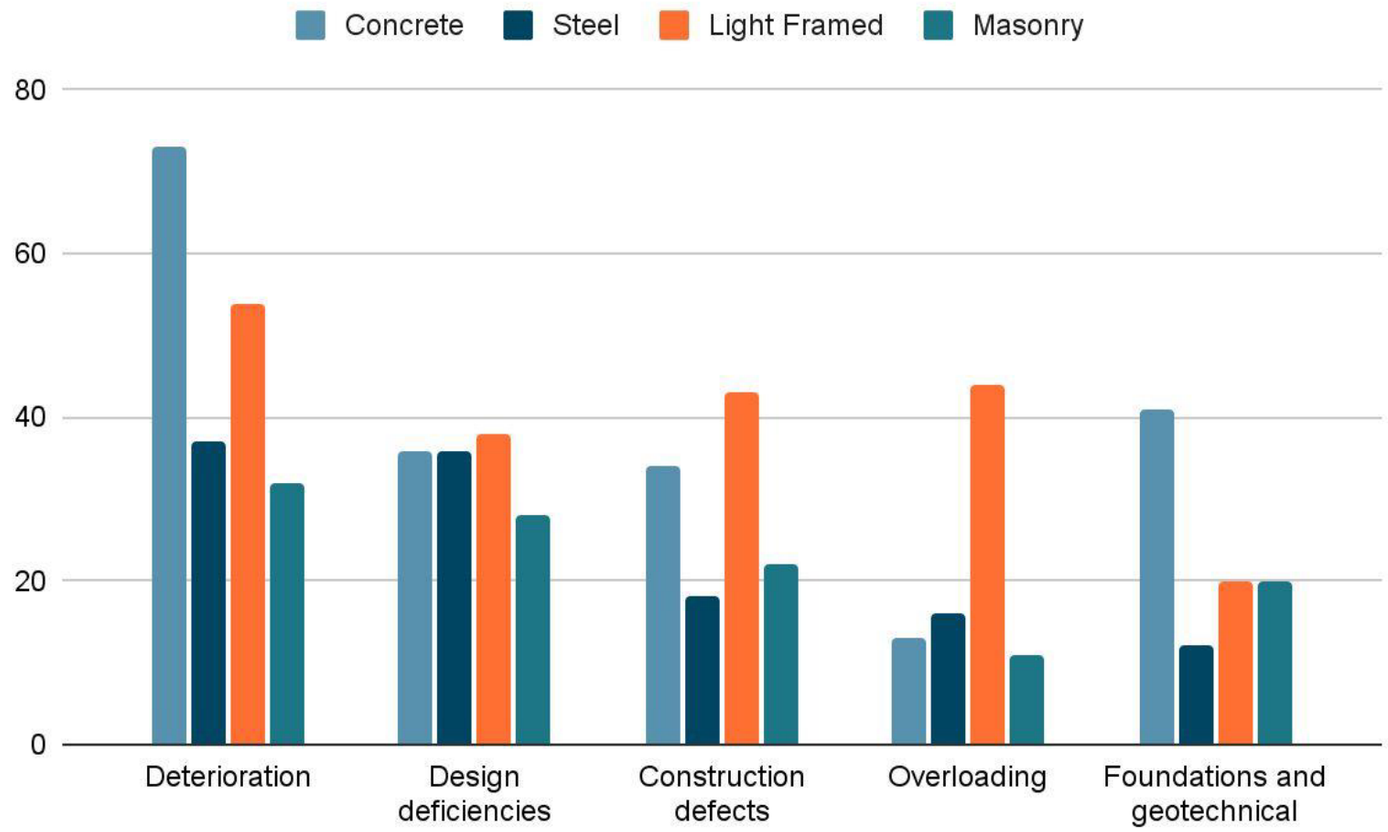
- Other common strategies reported included: checking for conformance with as-builts (31%), looking for typical problems (e.g water intrusion) (20%), observing modifications (15%), and performing independent calculations (13%) to assess the capacity of the structure.

Typical Deficiencies

Deficiencies from assessments ***NOT due to observed failure:***

- Concrete deterioration was the most common deficiency observed.
- In light framed construction, deterioration, overloading, construction defects, and design deficiencies were reported.
- Steel deterioration and design deficiencies were also reported.

For each type of construction material, what type of deficiency is typically observed?

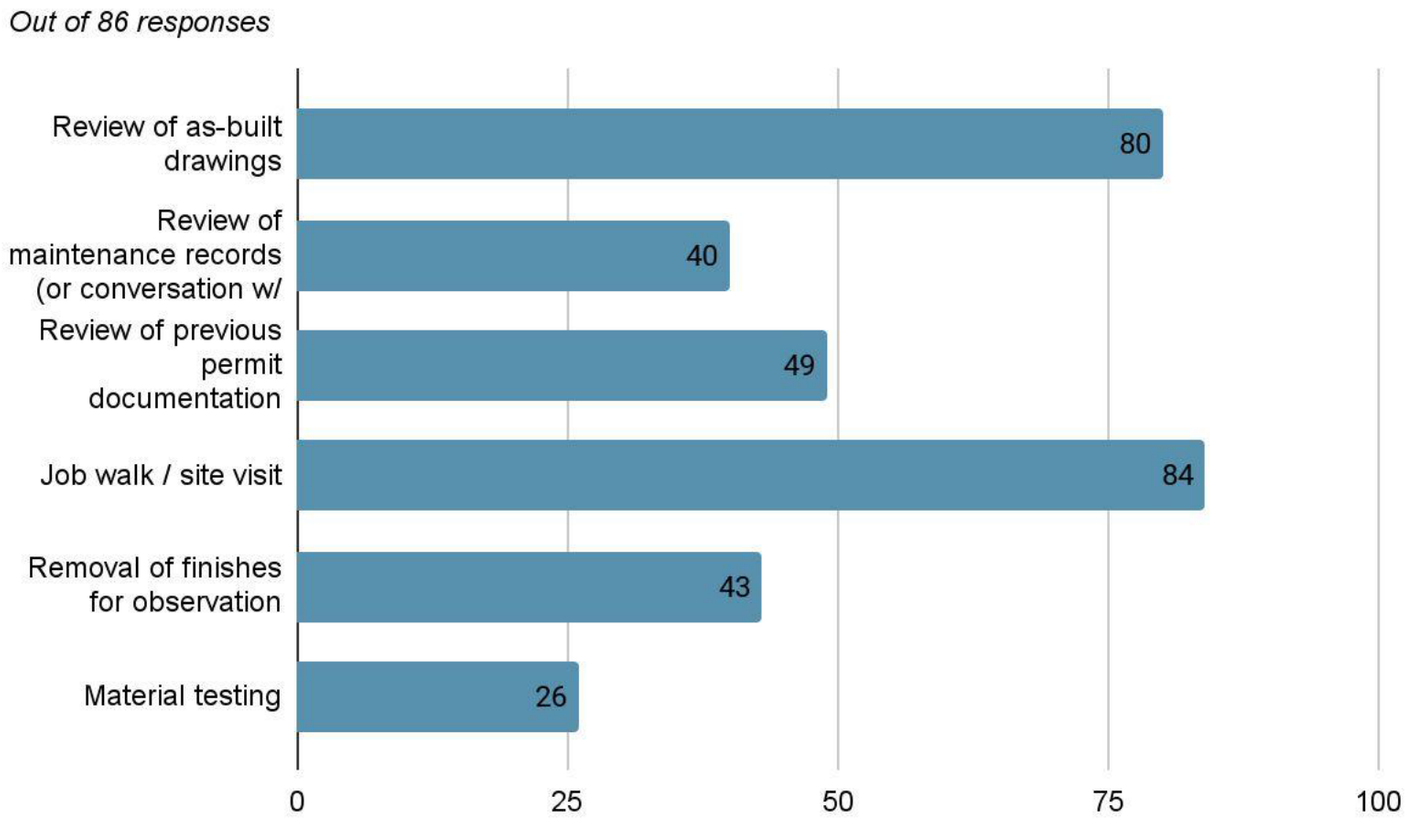


Scope of Assessment

*Methods of assessment when **NOT observing failure***

- Nearly all respondents reported performing a job walk (98%) and review of as-built documentation (93%) as part of the condition assessment scope.
- Other common strategies are review of previous permit documentation (57%), removal of finishes for observation (50%), and review of maintenance records (47%).

What is the typical scope of your assessment?

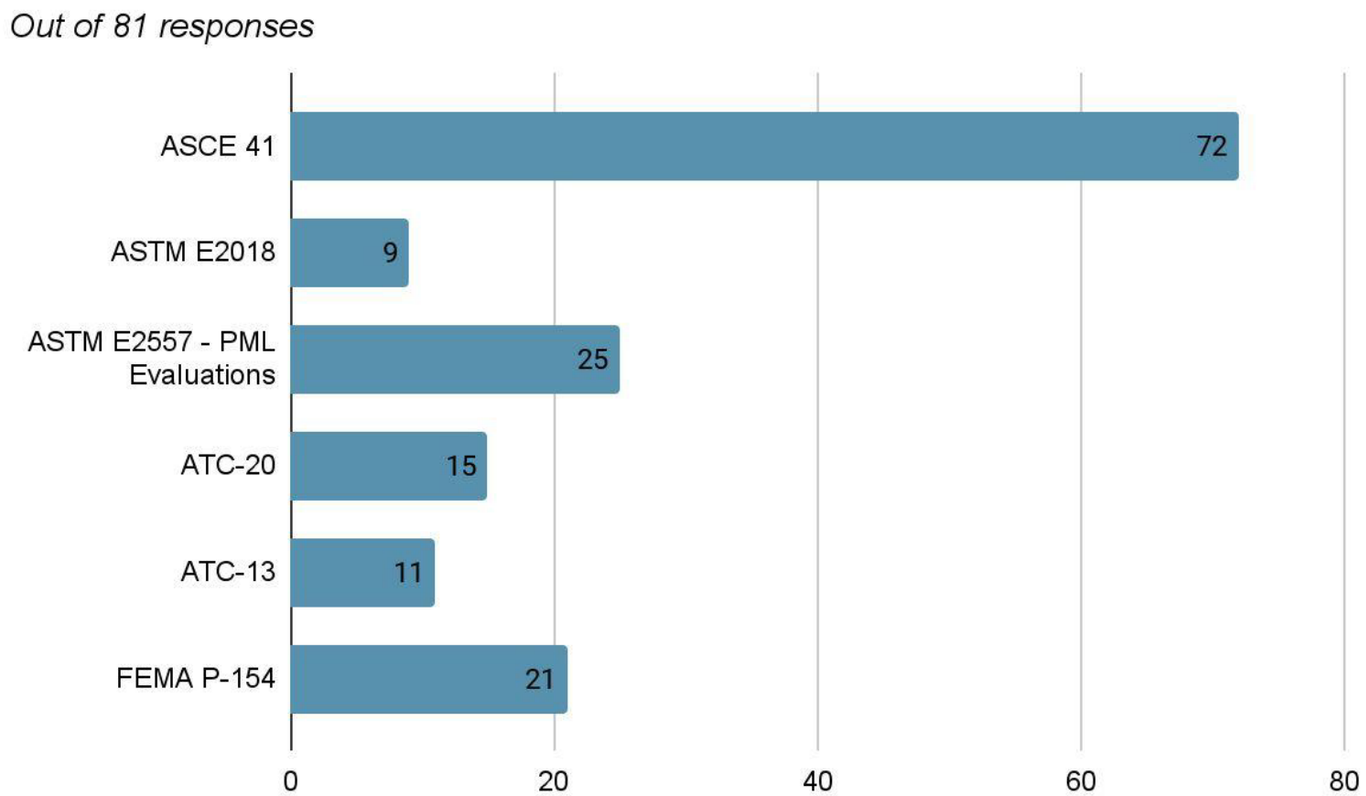


References

Reference Standards for assessment when ***NOT observing failure***

- The most common published standard used is ASCE 41 (89%)
- ASTM E2557 (31%) and FEMA P-154 (26%) are also often referenced

What standards do you use as a reference?



Prioritization

*Prioritizing assessment findings when **NOT observing failure***

- 92% of respondents reported prioritizing their findings.
- Life safety was overwhelmingly the top priority (75%)
- Next, most respondents prioritized cost-effectiveness and long term structural performance.

Help us understand your process. *(Open responses)*

Participants were then asked a series of questions in the scenario where assessments **ARE DUE to observed failure:**

- When performing condition assessments after a failure, the vast majority of respondents reported looking for the cause of damage (43%), as well as checking for conformance with as-built plans (38%), and looking for deterioration (33%).

- Other common themes included: investigating the extent of damage (17%), looking for modifications (13%) and hidden damage (13%) and performing independent calculations (15%).

- Reviewing load path, observing connections, and checking for overloading were mentioned frequently.

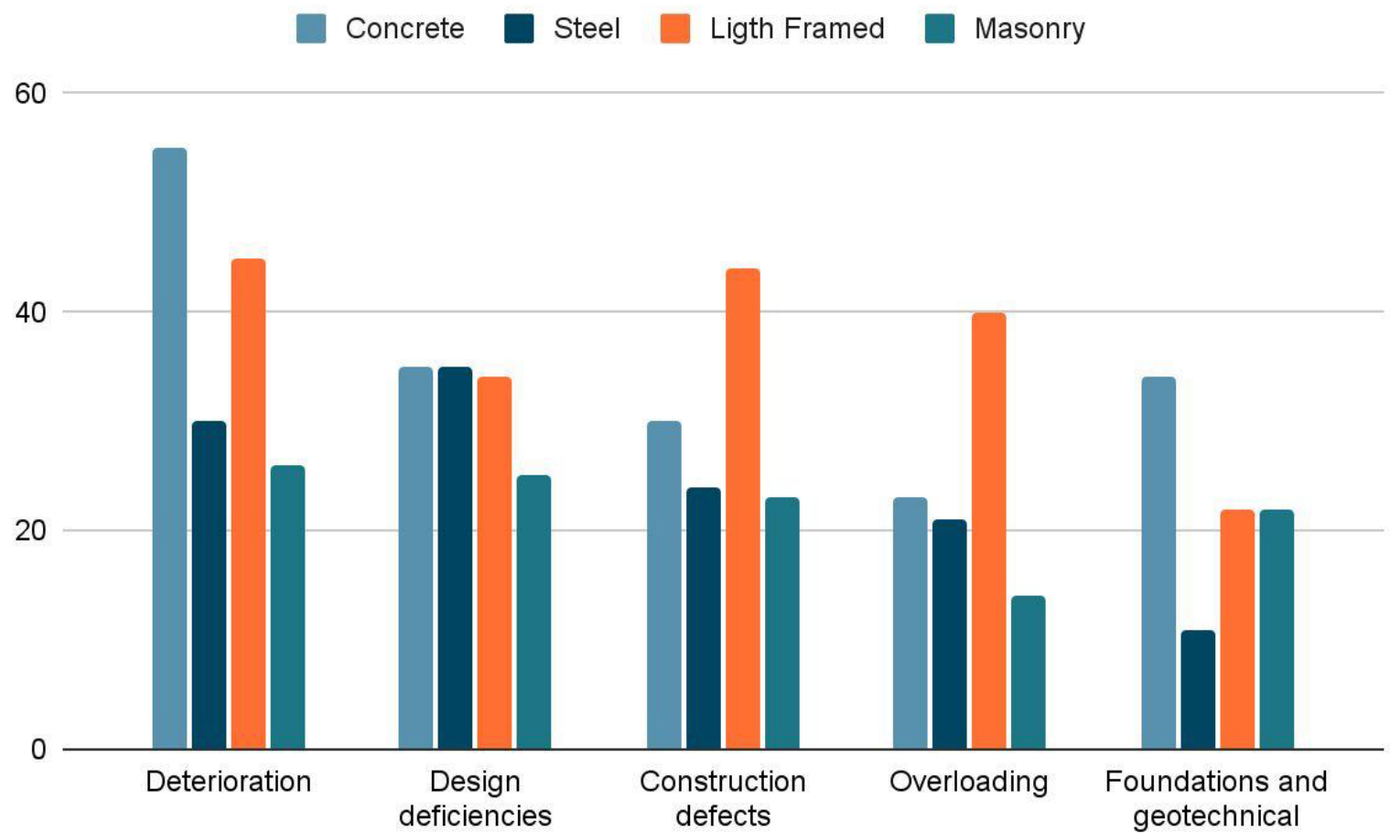
Typical Deficiencies

Deficiencies from assessments **DUE to observed failure:**

Typical deficiencies reported were quite similar to the scenario where no failure was observed.

- Concrete deterioration was the most common deficiency observed.
- In light framed construction, deterioration, overloading, construction defects, and design deficiencies were reported.
- Steel deterioration and design deficiencies were reported.
- In addition, failure of foundations is reported more frequently in this scenario.

For each type of construction material, what type of deficiency is typically observed?



Scope of Assessment

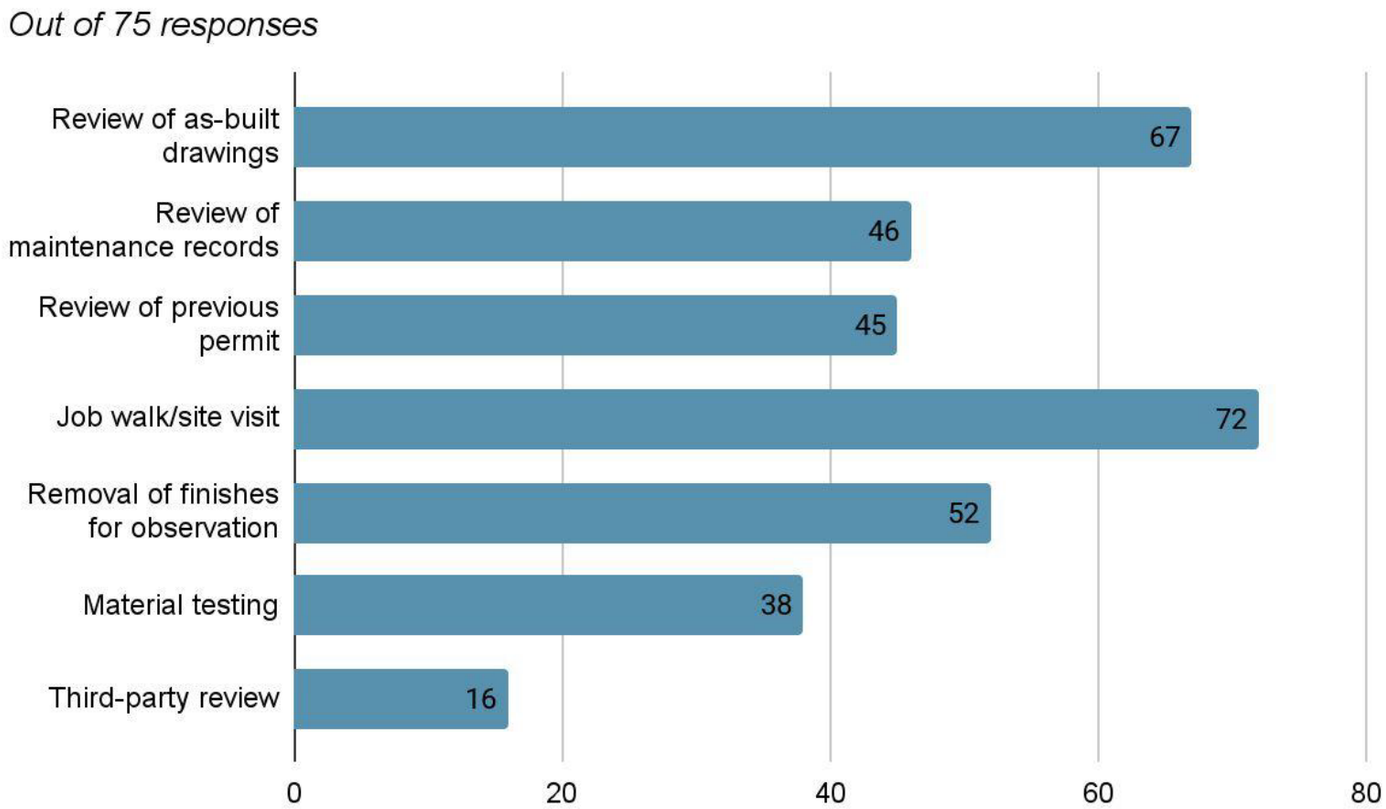
Methods of assessment ***when*** **observing failure**

As with the previous scenario, nearly all respondents reported performing a job walk (96%) and review of as-built documentation (89%) as part of the condition assessment scope.

Removal of finishes for observation is more common in this scenario (69%), as well as review of maintenance records (61%) and review of previous permit documentation (60%).

In this scenario, material testing (51%) is also common.

What is the typical scope of your assessment?

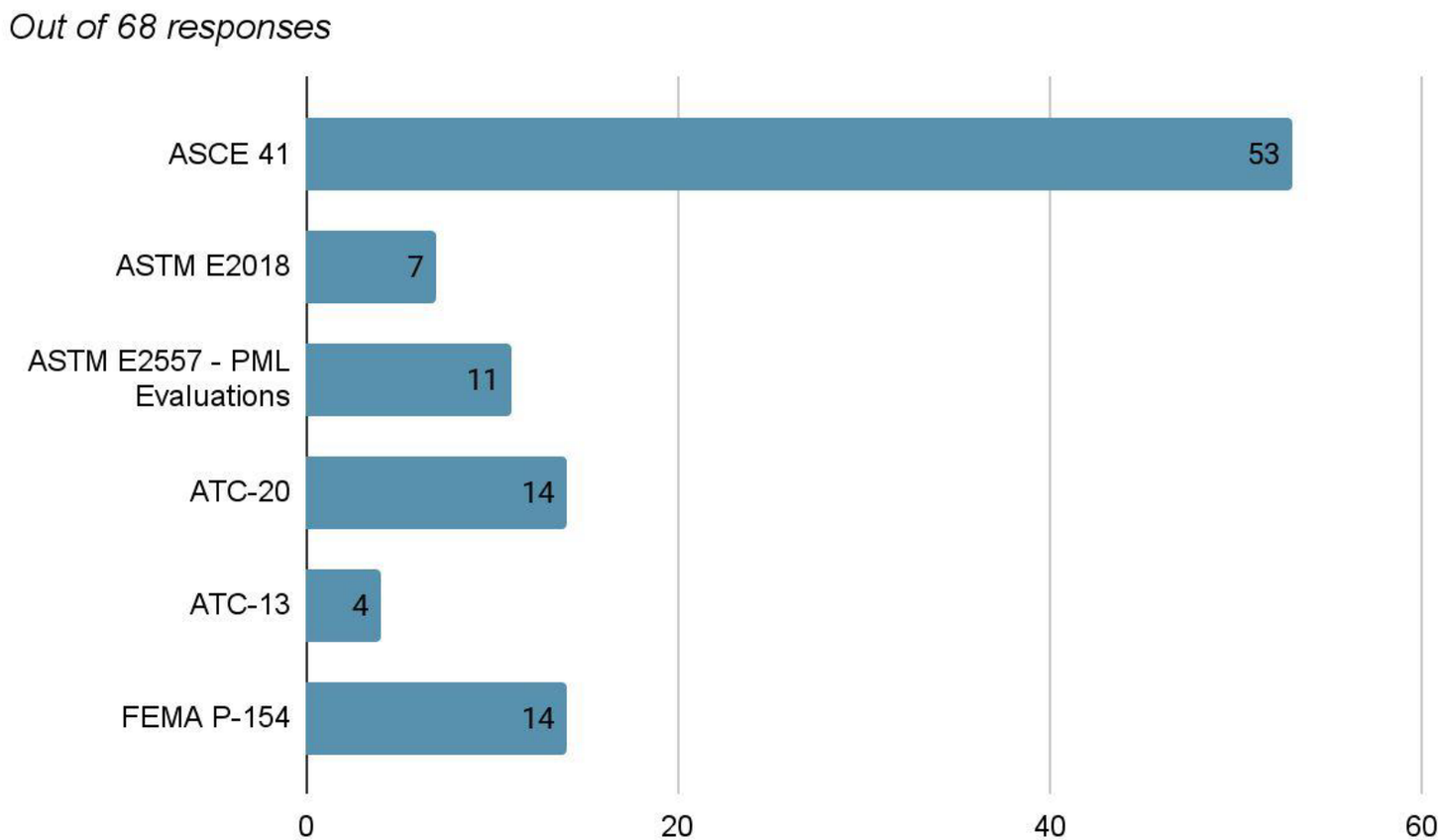


References

Reference Standards for assessment ***when observing failure***

- By far, the most common standard used when a failure occurs is ASCE 41 (78%).
- ACT-20 (21%) and FEMA P-154 (21%) are also referenced.

What standards do you use as a reference?



Prioritization

Prioritizing *assessment findings* ***when observing failure***

- The majority of respondents reported prioritizing their findings.
- Life safety was overwhelmingly the top priority (77%)
- Next, most respondents prioritized long-term structural performance.

Is the jurisdiction notified?

Notification of findings ***when observing failure***

- 44% of respondents did not typically notify the jurisdiction.
- 34% reported notification only if was required.
- 22% of respondents did notify the jurisdiction, usually through the permit process.

Many respondents reported that they will notify the jurisdiction if there are life safety issues or if the owner is not timely in addressing deficiencies.

Higher rates of deterioration in certain areas?

Marine and coastal environments showed up in 67% of the responses. Water in general was a common theme, and also included humidity, pools, planters, and central plants.

Hillside sites and areas with poor soils were also mentioned.