Outlook

Property Resilience Assessment - ASTM Standard for Commercial Real Estate

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Thank you for requesting input to your Natural Catastrophe Resiliency Study.

I serve as the volunteer secretary for the task group within ASTM International's Committee E06, Performance of Buildings, an organization whose standards are frequently referenced by federal, state, and local agencies as provided by the National Technology Transfer and Advance Act (NTTAA), which directs Federal agencies to adopt voluntary consensus standards wherever possible (avoiding development of unique government standards) and establishes reporting requirements.

We developed a due diligence standard for assessing and mitigating risks from natural hazards. A wide range of professionals in engineering, natural hazards, climate, insurance, finance, and real estate collaborated to develop the standard, which was published in late 2024 and may be found here: https://store.astm.org/e3429-24.html. This standard is already being adopted by property owners, investors, and lenders for commercial properties as part of a suite of environmental and engineering due diligence products that have been industry standard since the 1990s. We would like to make sure that you are aware of this standard and its use and adoption to manage risk in a very wide range of commercial property types.

You may contact the following committee and task group representatives for further information:

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Standard Guide for Property Resilience Assessments

Significance and Use

4.1 This guide is intended for use on a voluntary basis by parties such as real estate investors, owners, operators, lenders, and insurers (users) who wish to better understand the natural hazards, including those made more extreme by climate change, that may be affecting a property. A user may include a purchaser, tenant, owner, investor, lender, developer, designer, building professional, or property manager of the target property. This guide outlines procedures for conducting a PRA for specific users, considering the user's requirements.

4.2 Uses—This guide may be used for the purposes outlined above and by the users defined in 3.2.4 who may obtain a PRA during real estate investment, development, risk management and reporting, facilities management, capital planning, operations and maintenance, underwriting or financing activities. There is nothing in this guide that would prevent a user from requiring more than a baseline PRA to meet its needs as part of its scope of work or approval process.

4.3 Types of Investigations—This guide provides suggested approaches for the performance of the PRA. A user may contract for Stage 1 only in a Stage 1 PRA, or the entire process from Stage 1 through 3. A user may also contract for a PRA for a single building, multiple buildings, or a portfolio of properties (see 6.3). Although much of the PRA guide is directed to the PRA process for existing buildings, the PRA process can also be applied to planned development, new construction, and substantial renovation projects assuming sufficient design detail is provided. In addition, this guide may be used for a broad variety of structures and infrastructure, though some specialized facilities may require additional expertise.

4.4 Application and Temporal Relevance of Report—The user should only rely on the PRA for the specific purpose that it was intended and upon confirmation that the target property is in the condition it was at the time of assessment and that the considerations evaluated within the PRA have not materially changed. In addition, due to the evolving nature of climate conditions and ongoing operations and maintenance considerations, a PRA has a limited time of effectiveness. A PRA over 12 months old, or a PRA for a target property impacted by a significant hazard event or subject to significant updates to natural hazard resources (such as flood maps) since the PRA was issued, should no longer be considered reliable unless a PRA professional has determined that the above resulted in no material changes and the PRA remains valid. The

intent of this guidance is not that users would need to maintain a current PRA on file annually, but rather that if decisions are being made, a PRA older than 12 months may not be reliable.
4.5 Availability of Information—This guide recognizes that a provider's opinions and observations may be affected by or contingent on information that is readily available for the provider during the PRA process. For instance, a provider's observations may be affected by the number of people using the building or the availability of property management to provide information, such as detailed building construction information, elevation certificates, or construction documents.

4.6 Property-Specific—PRAs are property-specific in that they relate to a single property, multiple improvements at a single site, or a portfolio of properties. While the evaluation practices in this guide are generally property-specific, there is nothing in this guide that would prevent a PRA professional from conducting a hazard screening of a portfolio of properties in Stage 1. Properties selected for Stages 2 and 3 should then receive individual PRA reports, as further discussed in 4.7.3 and 6.3.

4.7 Principles—The following principles are an integral part of this guide and should be referred to in resolving any ambiguity or exercising such discretion as is accorded to the user or the provider. The principles should also be used in judging whether a user or provider has conducted an appropriate PRA.

4.7.1 Uncertainty Not Eliminated—No assessment can fully quantify or wholly eliminate uncertainty regarding the hazards and potential risks to a property, especially with respect to estimates of future climate conditions. The successive stages of investigation described in this guide are intended to reduce, but not eliminate, uncertainty. This guide acknowledges the reasonable limits of time and cost related to a selected stage of assessment.

4.7.2 Not Exhaustive—There is a point at which the cost of gathering information outweighs the usefulness of the information and, in fact, may be detrimental to the orderly completion of transactions within the resources available to support the investigation. This guide acknowledges this and suggests that a balance be sought between the competing goals of limiting the costs and time demands versus limiting the resulting uncertainty by acquiring as much information as possible.

4.7.3 Assessment Scope—Not every property warrants the same extent of assessment. Consistent with good commercial or customary practice, choosing the appropriate scope of assessment is guided by the type and age of the target property subject to assessment, the resources and time available, the anticipated hazards and risks, the expertise and risk tolerance of the user, and the information developed during the PRA. Users may choose to work with a

PRA professional to conduct Stage 1 PRA screenings of a portfolio of properties, and then over time, complete Stage 2 and 3 of the PRA process only for those sites that are identified as a concern based on the user's purposes and risk thresholds. This guide provides flexibility to align with the user's goals and objectives and emphasizes transparency in the depth of assessment engaged and completed by the PRA professional. Additional information is provided in Appendix X4.

4.7.4 Subsequent Use of the PRA—This guide recognizes that assessments of buildings based on the approaches discussed herein may include information that subsequent users will want to use to avoid undertaking duplicative investigations. Consequently, usage of prior reports is based on the following principles that should be adhered to in addition to the specific procedures set forth in this guide.

4.7.4.1 Use of Prior Information—Information contained in prior reports may be helpful to assist in understanding the target property and planning the current PRA but should serve only as an aid to the provider and should be verified during completion of a current assessment. Prior PRAs should not be used without current investigation of conditions likely to affect the findings, as discussed in 4.4.

4.7.4.2 Use of Prior Assessments—Objectives, information, and evaluation methods may change over time. A prior PRA prepared for specific stages of assessment may be used in its entirety, without regard to specific procedures set forth in this guide, if, in the judgment of the PRA professional, the prior report was prepared meeting or exceeding the requirements of the current version of this guide and the PRA considerations are not likely to have changed materially since the prior report was prepared. In making this judgment, the PRA professional should consider the scope and limitations of the prior report, and any new information related to the hazards, building or target property, as well as current site conditions.

4.7.4.3 Actual Knowledge Exception—If the user or the PRA professional has actual knowledge that the information being used from a prior PRA is not accurate or suspected of being inaccurate, then such information from a prior report should not be used.

Scope

1.1 This guide covers a generalized, systematic approach for conducting a Property Resilience Assessment (PRA) consisting of three stages: Stage 1, identifying the natural hazards likely to affect a property; Stage 2, evaluating the risks posed by those hazards along with the capacity of the target property to prepare for, adapt to, withstand, and recover from those hazards; and Stage 3, identifying potential conceptual resilience measures to enhance property-level performance. The PRA includes, at minimum, a baseline assessment of occupant safety,

damage, functional recovery time, and a limited consideration of community resilience or other material dependencies.

1.2 Background—The intent of the guide is to increase the awareness of methods to assess property-level multi-hazard risks and property-specific resilience measures that can enhance performance and recovery of the target property, as well as to enhance awareness of the importance of community and infrastructure considerations as potential additional areas of inquiry (beyond the scope of this guide). This guide may be used for a broad variety of structures and infrastructure, though some specialized facilities may require additional expertise. Since the concept of resilience applies broadly beyond climate change considerations and since hazards interact at the property level, the PRA process includes evaluation of a broad range of hazards, including those related to, exacerbated by, and unrelated to climate change.

1.3 Natural Hazards—Hazards addressed in this guide include the following:

1.3.1 Extreme Temperature, Snow, and Hail:

1.3.1.1 Extreme Temperature:

(1) Cold;

(2) Heat.

1.3.1.2 Extreme Snow and Hail:

(1) Heavy snow;

(2) Hail.

1.3.2 Geologic Phenomenon:

(1) Seismic;

(2) Landslide;

(3) Land Subsidence;

(4) Coastal erosion.

1.3.3 Water:

1.3.3.1 Precipitation:

(1) Heavy rainfall;

(2) Drought;

(3) Wind-driven rain;

(4) Freezing rain;

(5) Rain on snow;

(6) Freeze-thaw.

1.3.3.2 Flood:

(1) Storm surge;

(2) Coastal flood;

(3) Riverine flood (fluvial);

(4) Surface flood (pluvial).

1.3.4 Wildfire:

(1) Flame exposure;

(2) Blown embers;

(3) Smoke.

1.3.5 Wind:

(1) Tropical cyclone (hurricane);

(2) Winter storm;

(3) Severe thunderstorm and tornado;

(4) Local or regional wind.

1.4 Objectives—The objectives of this guide are to: (*1*) develop practical and reasonable steps for conducting and preparing PRAs; (*2*) assist in developing an industry baseline standard for appropriate research and observations; (*3*) facilitate high-quality standardized PRAs; and (*4*) establish guidelines by which a provider can communicate observations, opinions, and conclusions to a user in a manner that is meaningful and transparent.

1.5 Application—This guide may be used for the purposes outlined herein and by the users defined in 3.2.11 who may obtain a PRA during real estate investment due diligence, development, portfolio risk analysis, climate risk analysis and reporting, natural hazard identification and preparedness, facilities management, capital planning, operations and maintenance, underwriting or financing activities. The purpose, goals, and processes of evaluation outlined within this guide are not limited to any one area, region, or country. The applications for use may vary, including:

1.5.1 Climate-Related Risk Reporting—Many organizations and jurisdictions are developing recommendations, guidance, and standards to address climate change-related property physical risks and resilience. As these risks vary by region, it is critical to maintain consistent assessment methodology, terminology, and disclosure-related outputs. Organizations such as, but not limited to, the International Organization for Standardization (ISO), Task Force on Climate-Related Financial Disclosures (TCFD), and International Financial Reporting Standards (IFRS) Foundation have developed recommendations, guidance, and standards to assess, quantify, and mitigate climate-related risks.

1.5.2 Natural Hazard Risk, Disaster Recovery, and Resilience Assessments—Many organizations have developed or are developing natural hazard risk, disaster recovery, and resilience assessment guidance. Organizations such as, but not limited to, the Alliance for National and Community Resilience (ANCR), American Society of Civil Engineers (ASCE), Department of Homeland Security (DHS), International Code Council (ICC), Federal Emergency Management Agency (FEMA), National Institute of Building Sciences (NIBS), National Institute for Standards and Technology (NIST), United Nations Office for Disaster Risk Reduction (UNDRR), World Bank Building Regulation for Resilience (BRR), and others, have developed guidance on identifying hazards, evaluating risk, and enhancing resilience.

1.5.3 Complementary Application—This guide, to the extent feasible, is intended to complement existing and future climate and natural hazard-related risk and resilience assessment guidelines, frameworks, and standards to facilitate a consistent approach to evaluating property resilience, regardless of location. This guide is not intended to replace existing guidance or programs. The information generated in a PRA is intended to be supportive of and aligned with those programs, to the extent possible. There is nothing in this guide that would prevent users from requiring more than a baseline PRA to meet their needs as part of the scope of work. Although most of the context of this guide is focused on the United States, the use of this guide is not limited to any one area or country. It should be noted, however, that geographical variances are possible in other regions. This guide is also intended to complement existing property decision-making processes involving existing ASTM standards, including

Practice E1527, Guide E2018, and Guide E2026. Refer to 8.3.2.4*(1)* for additional information regarding seismic risk assessment and the PRA.

1.6 Flexibility and Transparency—Depending on the intended application of the PRA by the user, as well as the level of confidence required, the depth of assessment may vary. For example, site selection screening or risk awareness within a portfolio of properties may require less rigor than financial disclosures, risk quantification, and development of site-specific retrofit and resilience strategies. The guide provides flexibility to align with the user's goals and objectives and emphasizes transparency in the depth of assessment engaged and completed by the PRA professional.

1.7 Considerations Beyond Scope—The use of this guide is strictly limited to the scope set forth herein. This guide does not address the following:

1.7.1 Hazards and the effects of hazards not listed in 1.3.

1.7.2 Federal or state, local, tribal, or territorial (SLTT) laws and regulations of building construction or maintenance. Users are cautioned that current federal or SLTT laws and regulations may differ from those in effect at the time of the original construction of the building(s).

1.7.3 Advanced (or performance-based) design for resilience and climate adaptation.

1.7.4 Socio-economic factors.

1.7.5 Transportation and utility infrastructure, except as noted in 6.17.

1.7.6 Direct human-caused impacts such as terrorism and vandalism.

1.7.7 The causes of natural hazards or climate change.

1.7.8 Secondary hazards such as pollution and pests which may be present on a local, regional, or national basis.

1.7.9 Transitional risks, cultural impacts, environmental justice, or impacts to society in general.

1.7.10 Broad sustainability considerations or climate change mitigation-related reporting requirements such as greenhouse gas emission reporting, except as noted in 9.11.8 (refer to Guide E2725) and financial disclosures (refer to Guide E2718).

1.7.11 The PRA is only intended to provide concept-level resilience measures and rough order of magnitude costs. In some cases, additional study or analysis by a qualified professional may be required following the completion of the PRA to determine the appropriate resilience

measures to implement at the target property. Detailed engineering and design drawings and detailed cost estimates are not included within the PRA scope.

1.7.12 This list is not comprehensive, and additional considerations beyond scope are noted in 8.7.

1.8 Organization of This Guide—This guide consists of several sections and appendices. The appendices are included for informational purposes only to assist with implementing this guide.

1.8.1 Section 1 describes the scope.

1.8.2 Section 2 identifies referenced standards.

1.8.3 Section 3 provides terminology both unique and not unique to this guide.

1.8.4 Section 4 sets out significance and use of this guide.

1.8.5 Section 5 describes qualifications of those conducting a PRA.

1.8.6 Section 6 contains a summary of the PRA Assessment Methodology and Approach.

1.8.7 Sections 7 through 9 provide in-depth discussion of the three stages of the PRA.

1.8.8 Appendix X1 provides a list of hazard-specific and other resilience-related resources.

1.8.9 Appendix X2 provides building considerations related to each of the hazards.

1.8.10 Appendix X3 provides qualifications of the hazard specialist, if utilized, as noted in 5.2.

1.8.11 Appendix X4 provides greater detail on user engagement.

1.8.12 Appendix X5 provides recommended content of a detailed PRA report.

1.8.13 Appendix X6 provides hazard-specific mapping and modeling discussion.

1.8.14 Appendix X7 provides further detail on climate and natural hazard maps and models.

1.8.15 Appendix X8 provides a discussion of cascading and compounding hazards.

1.8.16 Appendix X9 provides example risk and benefit-cost analysis methodologies.

1.8.17 Appendix X10 outlines example resilience and adaptation measures for each of the hazards.

1.8.18 Appendix X11 provides more information regarding consideration of community resilience.

1.8.19 References and citations are provided at the end of the document.
1.9 Units—The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.10 *This guide is a compendium of information. ASTM guides are intended to increase the awareness of information, approaches, and existing standards in a given subject area. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this guide may be applicable in all circumstances. This ASTM standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word "Standard" in the title means only that the document has been approved through the ASTM consensus process.*

1.11 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.12 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

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