ASTM WK 62996 UNDER E06.25 PERFORMANCE OF BUILDINGS

Property Resilience Assessment

Attributes of ASTM Standards

OPEN AND TRANSPARENT PROCESS

- Direct and equal participation to ASTM for all people and organizations
- Information on ASTM International standards are transparent and readily available online

IMPARTIAL, CONSENSUS-BASED MODEL OF ENGAGEMENT

- Balanced system where producer votes are equal to those of users
- Impartial, inclusive, and fair to all, with appeals and protections to avoid abuses

12,000+ ASTM standards globally

EFFECTIVE AND RELEVANT STANDARDS

- Constantly responding to market needs, keeping pace with industry and innovation
- Relevant to the global marketplace and performance-based in application

DRIVEN BY RESEARCH, DATA, AND SCIENCE-BASED DECISIONS

- Focus on science and technical quality, and specifically addressing risks and needs

COLLABORATION WITH OTHER STANDARDS BODIES TO AVOID DUPLICATIONS

- Collaborate with other standards organizations to avoid duplication and to pursue international standards work in a smart way

Existing ASTM Standards for CRE Space

- ASTM E 1527 – Standard Practice for Environmental Site Assessments - Phase I
- ASTM E 2018 – Standard Guide for Property Conditions Assessments
- ASTM E 2557 - Standard Practice for Probable Maximum Loss Evaluations for Earthquake Due Diligence Assessments
- ASTM E 1903 – Standard Guide for Environmental Site Assessments - Phase II Investigation
- ASTM E 2600 – Standard Practice for the Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions

Climate Risk Drivers

Investor Relations

Preserve & Protect Value

Risk Management

Exit Strategies

Insurance Coverage

Regulatory Pressures

Why develop a Property Resilience Assessment Standard

Investor Pressure to disclose and address climate risk. To enhance resilience, a review of all natural hazards along with climate-related risks is needed.

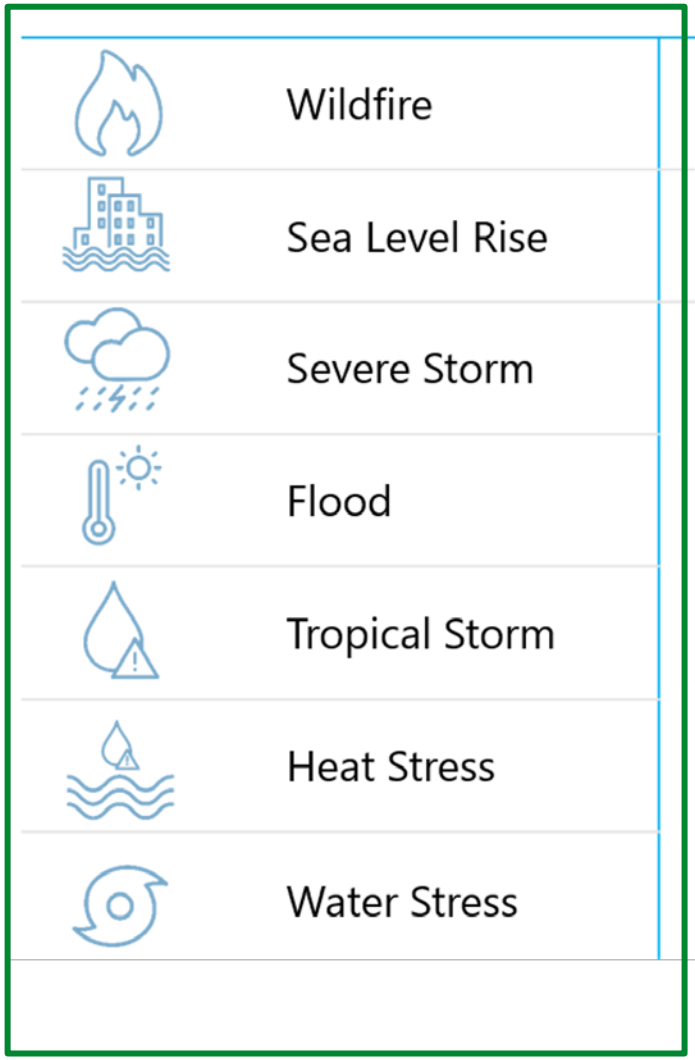
Understand physical climate risk for competitive advantage. For acquisition, disposition, risk management, underwriting, reporting, property management and capital planning.

Providers are generating climate risk assessments with wide variation in scope (climate risk data providers, engineers, consultants)

Transparency and Consistency is needed. Risk information is enhanced when provided alongside site observations and resilience recommendations.

Types of Climate Risk

PHYSICAL VS. TRANSITIONAL CLIMATE RISK



Building Efficiency Regulation

Carbon Emissions Regulation

Focus of the PRA

Focus of this ASTM Guide – Physical Risk & Resilience

Graphic Courtesy of AEI Consultants

Our Mission for Task Group WK62996:

Develop an umbrella Guide outlining the process for multi-hazard evaluations of resilience

Create a foundation from which hazard-specific Practices can be created

Align with existing standards and frameworks

Task Group Participation

- Adaptation International
- BREEAM US
- Insurance Institute for Business & Home Safety (*advisory)
- National Center for Atmospheric Research
- US Resiliency Council
- Building Technology Inc
- Climate Advisory
- Fannie Mae
- Freddie Mac
- Virginia PACE
- Institute for Sustainable Communities
- American Society of Civil Engineers (ASCE)
- Enterprise Communities
- ULI Resilience Program
- GAF
- Turner Construction
- MIT
- Jumpstart Insurance
- Willis Towers Watson
- 40/86 Mortgage Capital
- Chase
- GreenRock
- JP Morgan Asset Management
- Prologis
- Heitman
- Panattoni
- Citizens Bank
- PGIM Real Estate
- CIT
- CBRE
- Revantage / Blackstone
- LBA Realty
- US Bank
- Principal Financial
- LaSalle
- TA Realty
- Amazon Web Services
- Equity Residential
- Regions Bank
- McCarter & English LLP
- PCCP
- Waterfront Alliance
- RETech Advisors
- Marriott
- AEI
- Apex Companies
- Arup
- BBG
- Cannon Design
- Simpson Gumpertz
- Marx/Okubo
- Climate Advisory
- TRI
- Dewberry
- Bureau Veritas
- EM Partners
- EBI
- EFI Global
- Partner Energy
- EPM
- Nova
- Intertek
- TRC
- Haselton Baker Risk Group
- Ramboll
- Kinetica Risk
- Verisk
- JLL Due Diligence
- Moody's ESG
- Lightbox
- RMS
- Measurbl
- Risk Footprint
- Climate Check
- EPIC Insurance
- ResCentric
- SPA Risk
- MSCI
- MunichRe
- Envirosite
- True Flood Risk
- SPA Risk
- ImageCat
- LivCor
- JAE Law Group PLLC
- Verdani
- EY
- Resilience Youth Network
- Terracon
- Pond Robinson
- Haley Aldrich
- Resilience Insurance Analytics
- Umpqua Bank

ASTM E3429 Property Resilience Assessment Process

HAZARD SCREENING

Stage 1: Screening and identifying hazards* - review model and mapping outputs

- Review regional hazard data from public and/or commercial risk modeling/ mapping sources

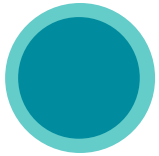
Stage 1a: Hazard verification

- Site specific desktop review of local or regional natural hazard risk plans/maps, if available

RISK AND RESILIENCE ASSESSMENT

Stage 2: Risk & Resilience Assessment

- Site Inspection and review of building characteristics (age, occupancy, construction) to assess the vulnerability to the hazards identified in Stage 1
- Assess safety, damage, and functional recovery time, along with material impacts related to community resilience/lifelines.



RESILIENCE MEASURES

Stage 3: Resilience measures

- Identify specific resilience measures and provide cost estimates, if possible.
  For example, flood barrier installation, relocating critical equipment, energy efficiency and power supply redundancy, hurricane rated glass & roofing, etc.
- Recommend full community resilience study or advanced engineering / design consulting if needed.

***Hazards include natural hazards including those made more extreme by climate change.**

Depending on their purposes and needs, Users may stop at Level 1, Level 2, or utilize an iterative process based on the results of each level.

ASTM E3429-24 Property Resilience Assessment (PRA)

Natural Hazards (including Climate Change Hazards)

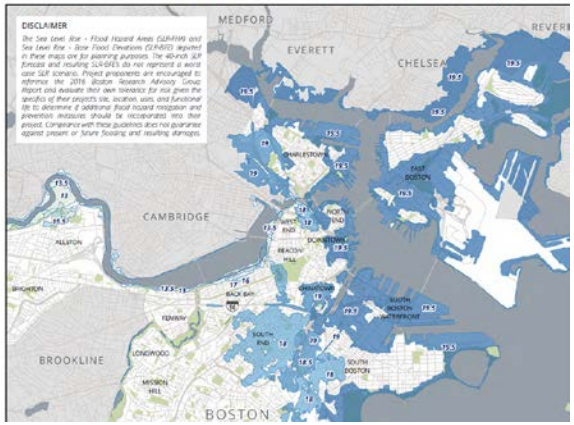
- FLOOD
- WILDFIRE
- WIND
- GEOLOGIC PHENOMENON
- WATER/DROUGHT
- EXTREME WEATHER

HAZARD		RISK & RESILIENCE ASSESSMENT	RESILIENCE MEASURES	
STAGE 1 Screening Hazards	**STAGE 1A** Hazard Confirmation	**STAGE 2** Site Specific Risk and Resilience Assessment	**STAGE 3** Customized Resilience Measures	**LEVEL 4** Advanced Resiliency Engineering
Screening of hazards from public sources and/or commercial risk mapping and modeling sources	Site Specific Desktop Review of local municipal resilience plans/maps or site-specific plans	Site Specific Vulnerability Evaluation Site inspection to evaluate: • Site Characteristics. • Safety • Damage • Functional Recovery Time • Material Dependencies	Identify resilience measures for the identified hazards and vulnerabilities and estimated costs. Examples: Flood Barrier Installation, Relocating critical equipment	Advanced Adaptation and Building Design (Not Included)

This Guide will likely result in creation of additional hazard-specific guides or practices such as Wildfire, Windstorm, Flood, Etc.

Stage 1
Hazard Screening/ Identification

BPDA Sea Level Rise-Flood Hazard Area Map



Source:
Resiliency Toolkit Boston

	low	high	hazard rating
Earthquake			No or Very Low Exposure
Volcanoes			No or Very Low Exposure
Tsunami			No or Very Low Exposure
Tropical Cyclone			Medium Exposure
Extratropical Storm			Medium Exposure
Hail			Medium Exposure
Tornado			High Exposure
Lightning			No or Very Low Exposure
River Flood			No or Very Low Exposure
Flash Flood			Medium Exposure
Storm Surge			No or Very Low Exposure
Wildfire			No or Very Low Exposure

Source:
MunichRe

Stage 1A
Hazard
Confirmation

Local Hazard Resources

- Flood Maps/Models
- Sea Level Rise Maps/Models
- Storm Surge Maps/Models
- Topographic Maps
- Government Tools and Databases
  - NOAA and NWS
  - USGS
  - FEMA
  - EPA
  - NIST
  - UNESCO
  - State Level Resources
- ASCE 7-22 Hazard Tool
- Wildfire Maps (NFDRS and NIFC)
- Wind Hazard Maps
- Slope Stability/Landslide Maps
- Community Resilience Information

Stage 2
Property-Level Risk and Resilience Evaluation

Inspect

Site Inspection and review of documents and plans to determine vulnerability and exposure to the hazards identified in Stage 1

Evaluate

Nature of construction, type of occupancy, age of the building, existing resilience measures, hazard preparedness, etc.

Assess

- Safety
- Damage
- Functional Recovery
- Material Dependencies

Stage 3
Resilience Measures

PROTECTION – STRATEGIES TO REDUCE A BUILDING'S VULNERABILITY TO EXTREME WEATHER.

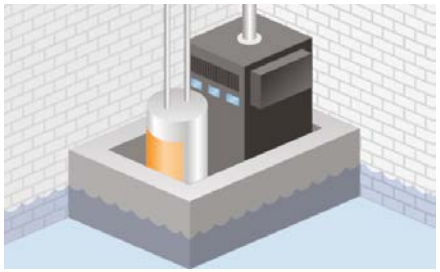
- Wet, dry and site perimeter floodproofing
- Resilient Elevators
- Backwater valves and sump pumps

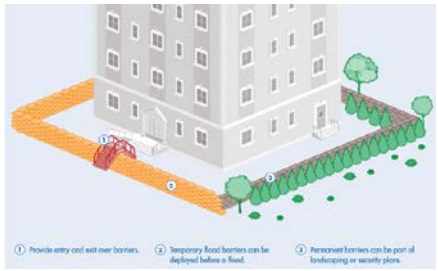
ADAPTATION – STRATEGIES THAT IMPROVE A FACILITY'S ABILITY TO ADAPT TO CHANGING CLIMATE CONDITIONS.

- Envelope Efficiency
- Elevated equipment and living space
- Surface stormwater management
- Window shading and distributed heating / cooling

BACK-UP – STRATEGIES THAT PROVIDE CRITICAL NEEDS FOR WHEN A FACILITY LOSES POWER OR OTHER SERVICES.

- Backup power to critical systems
- Emergency Lighting
- Access to potable water





Source: Enterprise Communities

Resilience works….

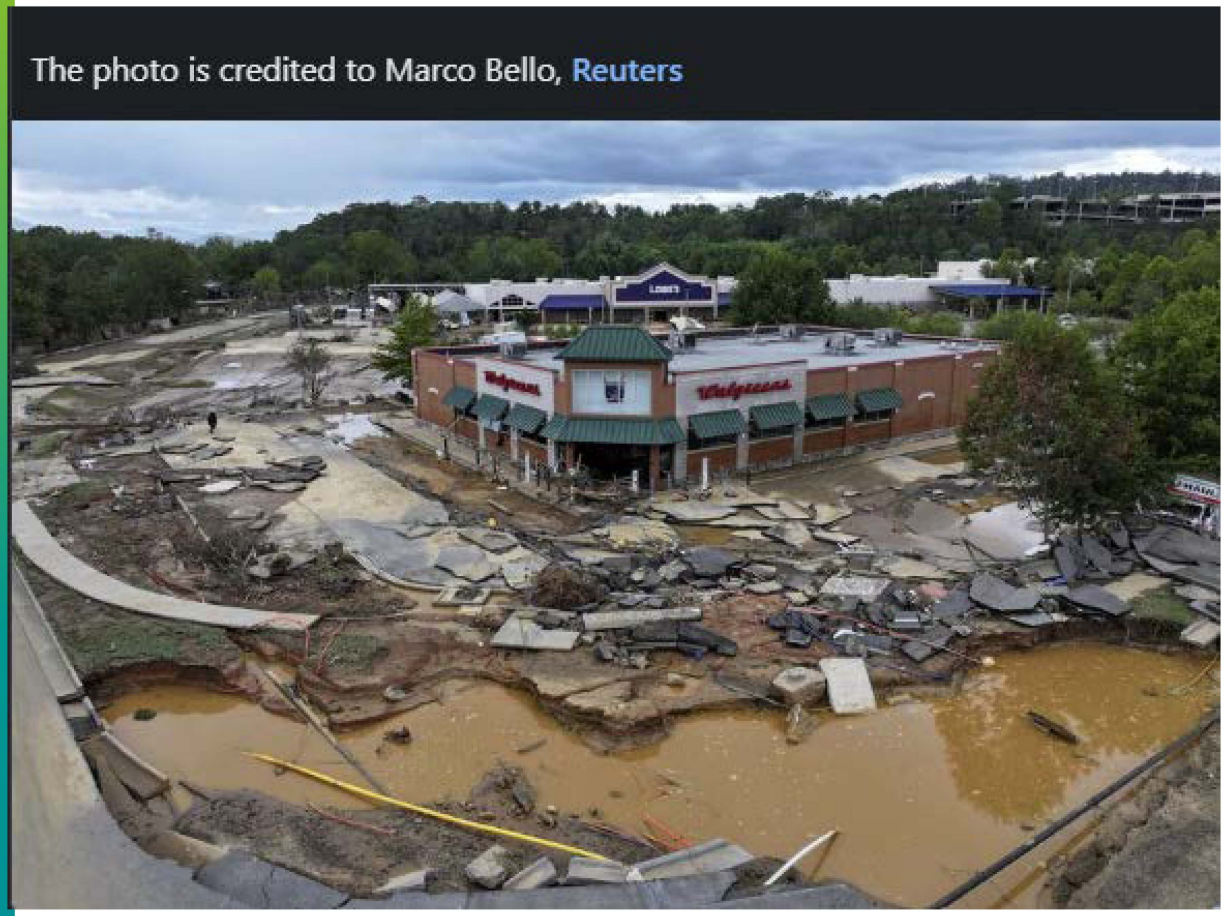
One Florida community built to weather hurricanes endured Ian with barely a scratch

As parts of Florida went dark from Helene and Milton, the lights stayed on in this net-zero, storm-proof community

A drone image shows Hunters Point homes in Cortez, Florida, in April 2024. Billed as the first "net-zero" single-family home development in the US, Hunters Point boasts some of the most sustainable, energy-efficient and hurricane-proof homes in the country. Julian Quinones/CNN/File

abcock Ranch, in Florida, runs on solar power and was built to weather the worst storms. After Hurricane Ian, the community didn't lose power or water, and it experienced minimal damage.
arlos Osorio for NPR

Community Considerations



Use Cases and Next Steps

PRAs are currently being performed for:

- Acquisition and disposition due diligence
- Underwriting potential future damage and/or insurance costs
- Positioning assets for insurance coverage
- Sustainability benchmark or regulatory compliance reporting related to physical climate risks
- Communicating resilience measures to prospective tenants and other stakeholders

- The PRA Task Group is collecting information via survey for future improvements to the Guide.
- The PRA Task Group is always open to new members.

For more information contact:

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