NHERI GSC
October General Meeting

NHERI GSC

2025

NSF | NHERI GSC Graduate Student Council

Agenda

11:00-11:10	Welcome & Announcements
11:10-11:45	Bill Holmes & Kelly Cobeen
	NSF NHERI Technology Transfer Committee
11:45-11:55	Questions
11:58-12:00	Wrap up
12:00-12:30	Introductory RSR meetings in breakout rooms

NHERI GSC
Graduate Student Council

Welcome!

Bassam	Nasir	Citlalli	Ochoa
Olubunmi	Ogunleye	Shakirat	ALIYU
Osama	Altarawneh	Kamorudeen	Amuda
Sanidhya	Sharma	Jaril	Deschamps
Muhammad Sajjad	Rashid	Pramesh	Bhaila
Mahdieh	Givehki	Abdulmohsen	Aljohani
Manisha	Sapkota	Julius	Etuke
Sushant	Bist	Saurav	Bhattarai

Connect with us on LinkedIn

www.linkedin.com/in/ngsc/

Reach out to Diako Abbasi or Utkuhan Genc to learn how to get involved!

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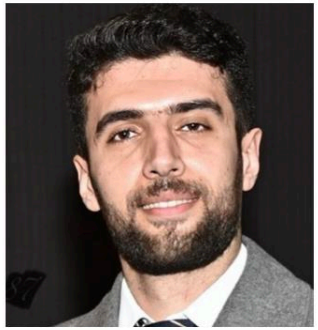
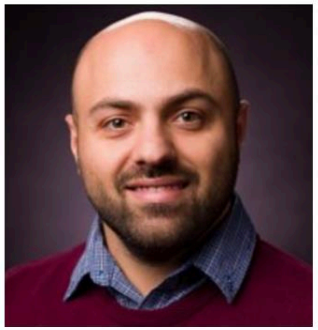
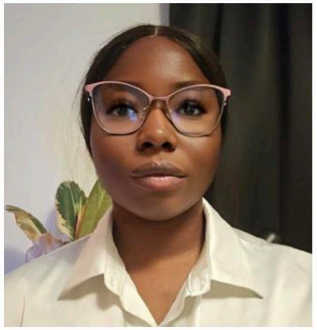


Chair of Membership
Diako Abassi

Co-Chair of Membership
Utkuhan Genc



Chair of Research
Pooria Mazaheri



Co-Chair of Research
Zul Kazeem

Chair of Workshops & Mentoring
Alireza Mirghafouri

Chair of Community Engagement
Rajee Tamrakar

Chair of Networking & Communtity Building
Matthew Van

Chair of Social Media & Outreach
Estovio Timothy

Congrats - NSF NHERI GSC Chairs

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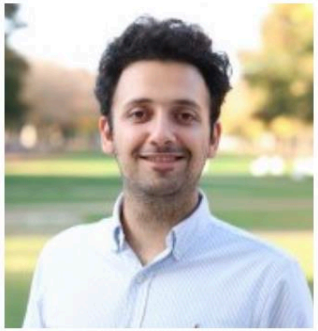


Coastal Engineering
Sadegh Nouri

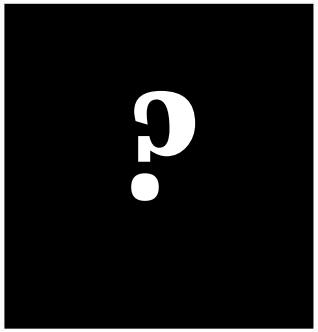
Simulation & Computational Methods
Mohammad Movahedi

Geotechnical Engineering
Mohamed Hassan

Wind Engineering
Arezoo Bakhshizadeh

Congrats - NSF NHERI GSC RSRs

Social Science
Najib Rashid



Earthquake Engineering
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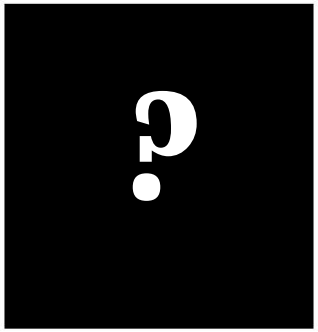

Reconnaissance
Unfilled

Interested in leading the Earthquake or Reconnaissance Research Subcommittee?
Contact Pooria Mazaheri (mazaheri@iastate.edu) or Zul Kazeem (azk15@case.edu).

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Conference Opportunities 1

Conference	Dates	Abstract
APPAM: Association for Public Policy Analysis & Management	November 13-15, 2025	Closed*
SRA: Society of RisK Analysis Conference	December 7-11, 2025	Not announced yet
YCSEC: Young Coastal Scientist and Engineers Conference	April 2026	December 19, 2025
Geotechnical Frontiers Conference	March 9-12, 2026	Closed*
AAG: 2025 American Association of Geographers	March 17-21, 2026	October 30, 2025
ANNSIM: Annual Modeling & Simulation Conference	May 4-7, 2026	January 11, 2026

*Conferences that are closed are open for registration, but abstract submission is closed.

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Conference Opportunities 2

Conference	Dates	Abstract
ACWE: 16th Americas Conference for Wind Engineering	Not announced yet	Closed*
EMI: ASCE Engineering Mechanics Institute	June 2-5, 2026	January 15, 2025
Natural Hazards Workshop & Researcher's Meeting	June 14-17, 2026	Not announced yet
IWSHM: International Workshop on Structural Health Monitoring	July 7-10, 2026	November 1, 2025
ASA: American Sociological Association	August 7-11, 2026	February 25, 2026

*Conferences that are closed are open for registration, but abstract submission is closed.

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NSF NHERI GSC 4th Mini-Conference
May 15, 2026

Innovation in Natural Hazards Research

- **Data Challenge**
- **Research Challenge**

Keynote Speaker:
Professor David Roueche

Register here:

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NSF NHERI GSC 4th Mini-Conference Data Challenge!

When Data Speaks:

Interpreting Hazards Beyond Numbers

Register by Nov. 13, 2025:

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NSF NHERI GSC 4th Mini-Conference Research Challenge!

Pioneering Innovative Solutions:

Understanding and Strengthening Infrastructure and Communities Under Multi-hazard Risk

Register by Nov. 13, 2025:

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Research Subcommittee Meetings

Group Breakout Rooms!

Breakout Rooms (*30 Minutes*):

1. Coastal Engineering RSR - Sadegh Nouri
2. Geotechnical Engineering RSR- Mohamed Hassan
3. Simulation & Computational Methods - Mohammad Movahedi
4. Social Science - Najiba Rashid
5. Wind Engineering - Arezoo Bakhshizadeh

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Speaker Introduction

Bill Holmes

Chair, NSF NHERI Technology Transfer Committee

Senior Consultant/Past Principal, Structural Engineer

Rutherford and Chekene

Member, National Academy of Engineering

wholmes@ruthchek.com

Kelly Cobeen

Member, NSF NHERI Technology Transfer Committee

Principal, Structural Engineer

Wiss Janey Elstner Associates

ASCE/SEI-7 Seismic Subcommittee

kcobeen@wje.com

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NHERI

Natural Hazards Engineering Research Infrastructure

Implementation of Research

NHERI Graduate Student Council
October 2025

NHERI Technology Transfer Committee

Bill Holmes, PE, SE, Chair, Rutherford and Chekene

Kelly Cobeen, PE, SE, Wiss Janney Elstner Associates

Presentation Outline

Section 1 – The NHERI Technology Transfer Committee

Section 2 – Methods of Research Implementation

Section 3 – The NHERI Research Database

NHERI NCO

Network Coordination Office

NHERI

Natural Hazards Engineering Research Infrastructure

Section 1
NHERI Technology Transfer Committee

Academic Research Landscape

Because of the fundamental research objectives of NSF, it is recognized that the results of all NSF funded research projects will not always be able to be implemented in the near term

Regardless, envisioning stakeholders, end-users and technology transfer mechanisms can have a positive impact on future implementation

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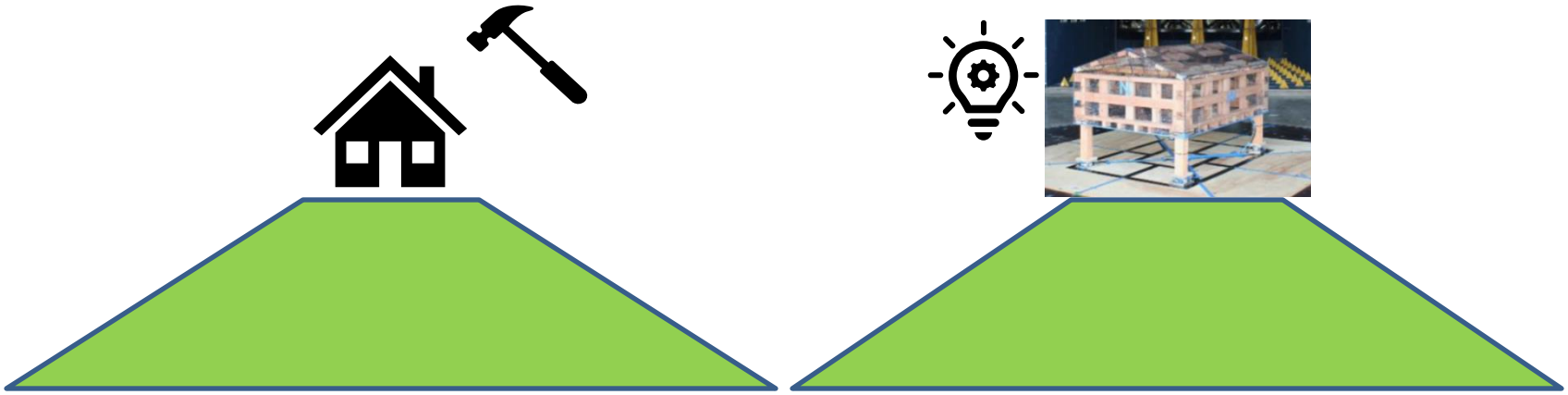
Academic Research Landscape

There can be significant gaps between the results of research and implementation

- Designers not aware of research
- Researchers not aware of implementation potential and process



NHERI NCO
Network Coordination Office

NHERI National Coordination Office

- Recognizing this landscape, the NHERI NCO proposed to form a Technology Transfer Committee (TTC) in its initial solicitation in 2016 to act as a resource for interested researchers.
- Bill Holmes was on the initial NCO team, primarily as a seismic subject matter expert, but having years of experience in technology transfer, became the chair of the TTC.
- Kelly Cobeen has been on the committee from the beginning, also having years of experience in technology transfer, and has contributed much to the NHERI community at the annual Summer Institute for early career faculty.

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NHERP Technology Transfer Committee Purpose and Composition

- Purpose: To encourage and assist implementation of NHERI research, particularly for early career researchers or others not familiar with implementation paths.
- The committee is composed of 15-20 volunteers, mostly practicing engineers, specializing in seismic, wind, hurricane, and tsunami hazards, as well as geotechnical issues.
- Committee members are aware of and involved in technology transfer, not only in codes and standards , but also directly to improve practice or develop policy.

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What the TTC does

- Engage with researchers when they contact us
- Help them make connections that benefit their research and facilitate technology transfer

What the TTC does not do

- Direct or run technology transfer activities

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Natural Hazards Engineering Research Infrastructure

Section 2 – Methods of Research Implementation

Preplanning to Enhance Implementation
Other Sources of Research Needs

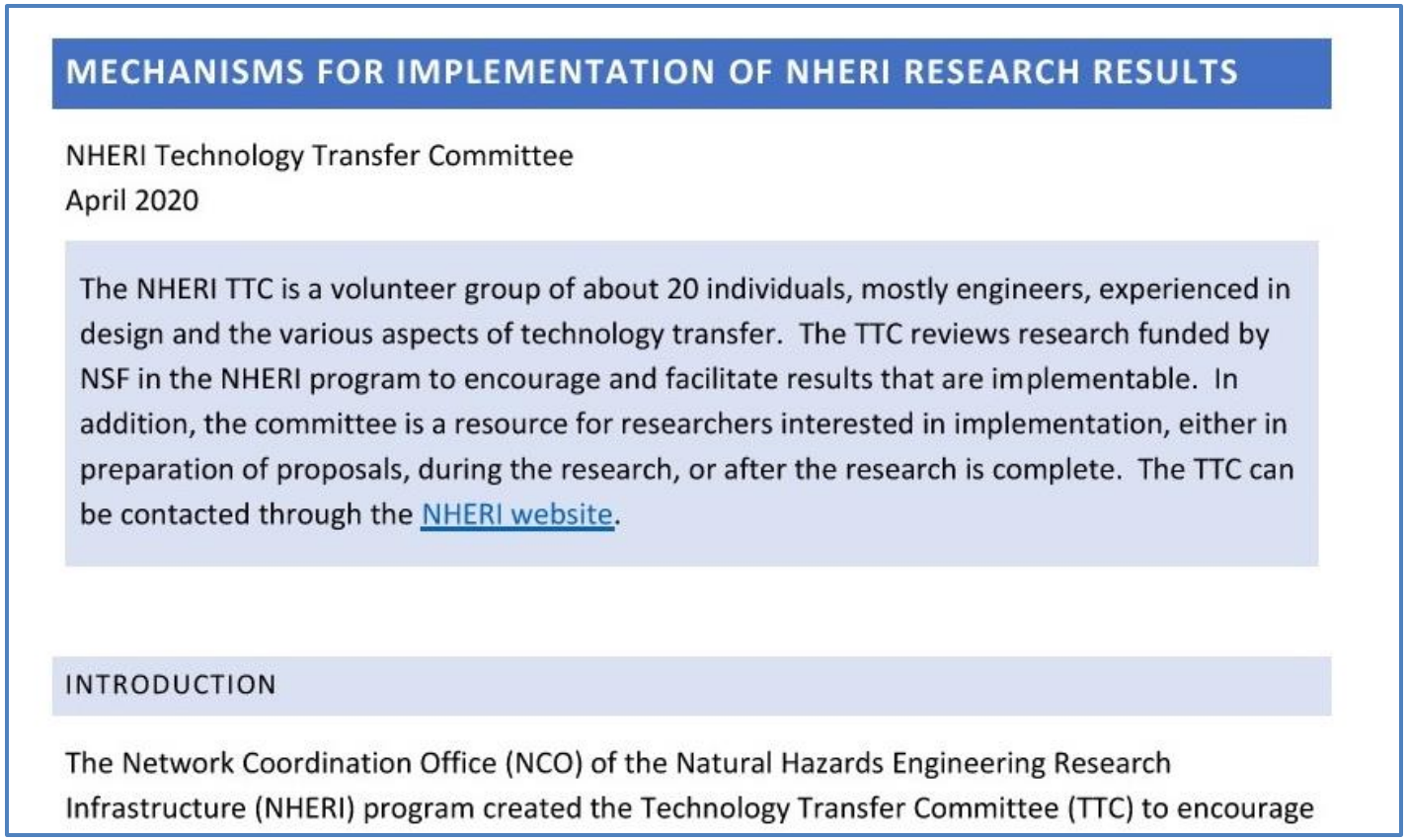
Wind:
From the *National Windstorm Impact Reduction Program (NWIRP)*
NWIRP Strategic Plan
https://www.nist.gov/system/files/documents/2018/09/24/nwirp_strategic_plan.pdf

Tsunami:
National Tsunami Research Plan: Report of a Workshop Sponsored by NSF/NOAA
https://www.pmel.noaa.gov/pubs/PDF/bern3043/bern3043.pdf

Seismic:
BSSC NEHRP Provisions "FUTURE ISSUES AND RESEARCH NEEDS"
Available on BSSC website; Recommended Future Issues and Research Needs Identified During the Development of the 2020 NEHRP Recommended Seismic Provisions

Coastal Resilience:
This is a workshop report, based on the workshop held in May 2024 held at Princeton University and sponsored by NSF, ATC, and Princeton University.
Available on NHERI website; https://www.designsafe-ci.org/data/browser/public/designsafe.storage.published/PRJ-6017

Mechanisms For Implementation of NHERI Research Results



MECHANISMS FOR IMPLEMENTATION OF NHERI RESEARCH RESULTS

NHERI Technology Transfer Committee
April 2020

The NHERI TTC is a volunteer group of about 20 individuals, mostly engineers, experienced in design and the various aspects of technology transfer. The TTC reviews research funded by NSF in the NHERI program to encourage and facilitate results that are implementable. In addition, the committee is a resource for researchers interested in implementation, either in preparation of proposals, during the research, or after the research is complete. The TTC can be contacted through the NHERI website.

INTRODUCTION

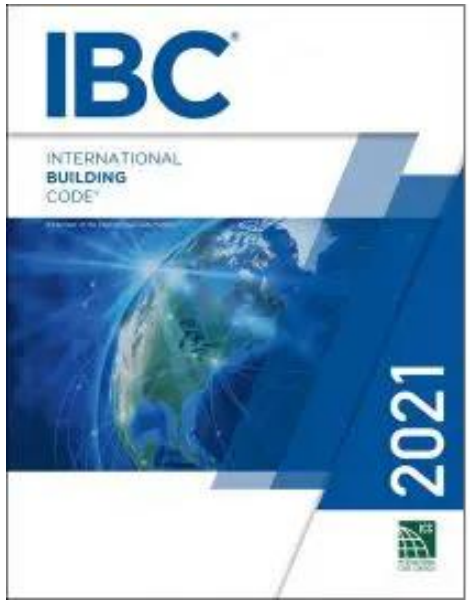
The Network Coordination Office (NCO) of the Natural Hazards Engineering Research Infrastructure (NHERI) program created the Technology Transfer Committee (TTC) to encourage

https://www.designsafe-ci.org/media/filer_public/85/0c/850c36d4-4f89-4ca4-8a50-0bc13c61db4d/mechanisms_for_implementation_of_nheri_research_results_0419_finalr1.pdf

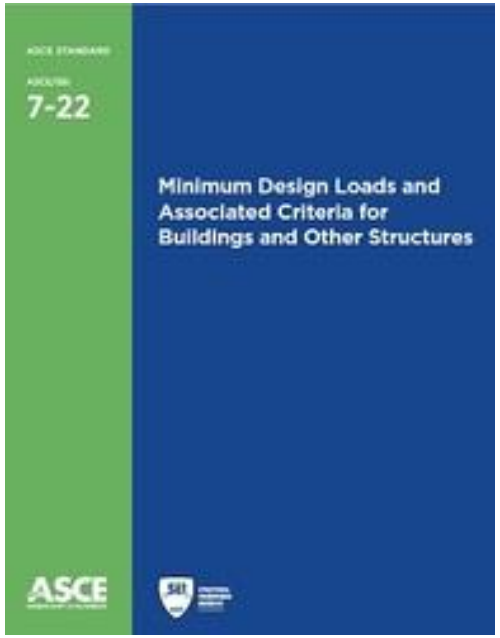
Mechanisms For Implementation of NHERI Research Results: Contents

- Common methods for implementing research results.
- Steps to make research readily implementable in the updating of building codes and standards.
- Overview of existing building codes and standards such as the IBC, IRC and the ASCE/SEI 7 and ASCE/SEI 41 standards for seismic design.
- Overview of research implementation and tech transfer programs of major federal organizations such as FEMA, NIST, ATC and BSSC.
- Information on privately funded entities and tech transfer activities conducted by early adopters.
- Methods of implementation when proprietary materials, design methods, or construction methods are involved.
- Presentations at professional associations, cross-disciplinary meetings and webinars with a question-and-answer session.

Mechanisms for Implementation: Codes and Standards



Design Codes (Family of Codes from ICC), AASHTO



Design Criteria Standards (ASCE 7, ASCE 41)

Material Design Standards (AISC, ACI, AWC, ASTM)

…and other state and local agency provisions

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Mechanisms for Implementation: Codes and Standards

I-CODES AND SIMILAR BUILDING CODES

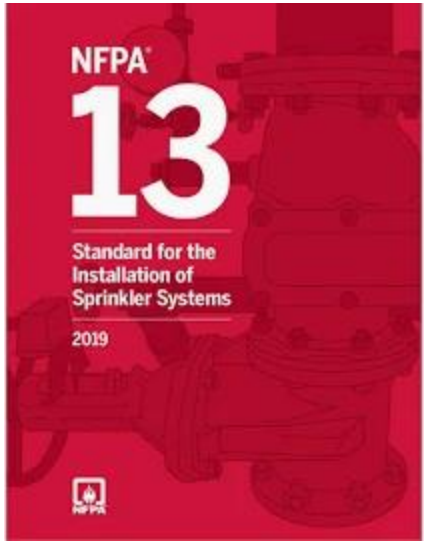
The predominant code for buildings in the U.S. consists of the I-Code family developed by the International Code Council (ICC). These model codes are not law, but they are commonly amended for local conditions and adopted by states and local jurisdictions as binding regulations. The primary model codes of interest are the International Building Code, which controls most new buildings, the International Residential Code, which controls most single and two-family dwellings, and the International Existing Building Code, which controls remodels, renovation, and additions to existing buildings. The ICC also develops many other published specialty codes that may be promoted for adoption, such as the following:

- International Energy Conservation Code
- International Fire Code
- International Fuel Gas Code
- International Green Construction Code
- International Mechanical Code
- ICC Performance Code
- International Plumbing Code
- International Private Sewage Disposal Code
- International Property Maintenance Code
- International Swimming Pool and Spa Code
- International Wildland Urban Interface Code
- International Zoning Code

Mechanisms for Implementation: Codes and Standards

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

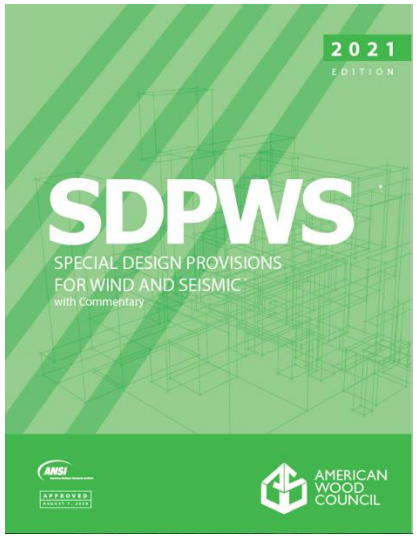
NFPA's code and standards development process is described on its website. NFPA lists over 700 Codes and Standards on their website mostly concerning fire protection and associated hazards. Examples include NFPA 70, the "National Electrical Code," NFPA 1, the "Fire Code," and NFPA 101, the "Life Safety Code." Similar to the I-Codes, NFPA codes adopt many standards developed by others.



CODE REFERENCE STANDARDS

Both the I-Codes and the NFPA codes adopt many standards developed by others. These referenced standards become part of the building code to the extent specifically cited in sections of the code. Some of these are developed by industry and trade groups such as the American Concrete Institute (ACI), the American Institute for Steel Construction (AISC), the American Iron and Steel Institute (AISI), the American Wood Council (AWC), APA – Engineered Wood Association, and The Masonry Society (TMS).

Research on the performance of various structural components and systems are often implemented in these material industry standards, rather than the building code itself. ASTM International, formerly known as the American Society for Testing and Materials (ASTM), promulgates standards for materials, products, specialized components and testing methods used for determining their acceptability. The International Code Council itself has developed some of the reference standards, such as those for storm shelters and residential construction in high-wind regions. When these standards are adopted by reference in the building code, they govern certain detailed aspects of design and construction of specific structural components and systems.



Mechanisms for Implementation: Codes and Standards

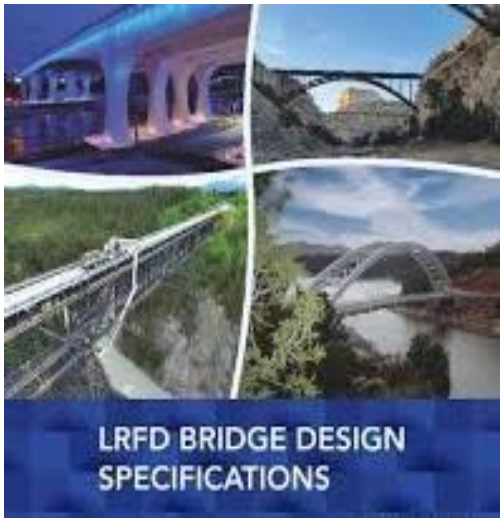
AASHTO STANDARDS AND SPECIFICATIONS

"Building Codes" discussed above are just that, covering buildings and building-like structures. Many other structures are designed using similar standards developed by others. For example, the American Association of State Highway and Transportation Officials (AASHTO) develops many standards covering design of transportation systems, such as highways and rail. Much-used examples are the AASHTO LRFD Bridge Design Specifications and the Bridge Construction Specifications. Many states also have developed their own design and construction criteria for bridges. AASHTO has hundreds of other publications dealing with transportation systems. In

general, research regarding transportation systems and components such as bridges and tunnels is done under the auspices of the United States Department of Transportation rather than under the National Earthquake Hazards Reduction Program (NHERP), although NHERP experimental facilities can be used for research funded by others.

OTHER STANDARDS

Similarly, several groups have developed design standards for dams, levees, and canals. The Bureau of Reclamation, the Army, and many states have their own design and construction criteria for these structures. Other specialty structures such as power plants, petroleum storage and manufacturing facilities, and pipelines and transmission lines also are covered by various codes and standards developed by interested parties.



Codes and Standards
American Society of Civil Engineers

The scope of ASCE/SEI 7 can be gleaned from its Table of Contents:

1. General
2. Combinations of Loads
3. Dead Loads, Soil Loads, and Hydrostatic Pressure
4. Live Loads
5. Flood Loads
6. Tsunami Loads and Effects
7. Snow Loads
8. Rain Loads
9. Reserved for Future Provisions
10. Ice Loads—Atmospheric Icing
11. Seismic Design Criteria
12. Seismic Design Requirements for Building Structures
13. Seismic Design Requirements for Nonstructural Components
14. Material-Specific Seismic Design and Detailing Requirements
15. Seismic Design Requirements for Nonbuilding Structures
16. Nonlinear Response History Analysis
17. Seismic Design Requirements for Seismically Isolated Structures
18. Seismic Design Requirements for Structures with Damping Systems
19. Soil-Structure Interaction for Seismic Design
20. Site Classification Procedures for Seismic Design
21. Site-Specific Ground Motion Procedures for Seismic Design
22. Seismic Ground Motion, Long-Period Transition, and Risk Coefficient Maps
23. Seismic Design Reference Documents
24. Reserved for Future Provisions
25. Reserved for Future Provisions
26. Wind Loads: General Requirements
27. Wind Loads on Buildings: Main Wind Force Resisting System (Directional Procedure)
28. Wind Loads on Buildings: Main Wind Force Resisting System (Envelope Procedure)
29. Wind Loads on Building Appurtenances and other Structures: Main Wind Force Resisting System (Directional Procedure)
30. Wind Loads: Components and Cladding
31. Wind Tunnel Procedure

<u>Institutes</u>

Architectural Engineering

Coasts, Oceans, Ports, and Rivers

Construction

Engineering Mechanics

Environmental & Water Resources

Geotechnical Engineering

Structural Engineering

Transportation & Development

Utility Engineering and Surveying

<u>Technical Groups</u>

Aerospace

Changing Climate

Codes & Standards

Cold Regions Engineering

Computing

Energy

Forensic Engineering

Infrastructure Resilience

Wind Engineering

Local Laws, Policies, Programs

- Through local governments to address local hazards
  - Public projects
  - Voluntary/ mandatory retrofits
  - Voluntary/ mandatory rules for new development

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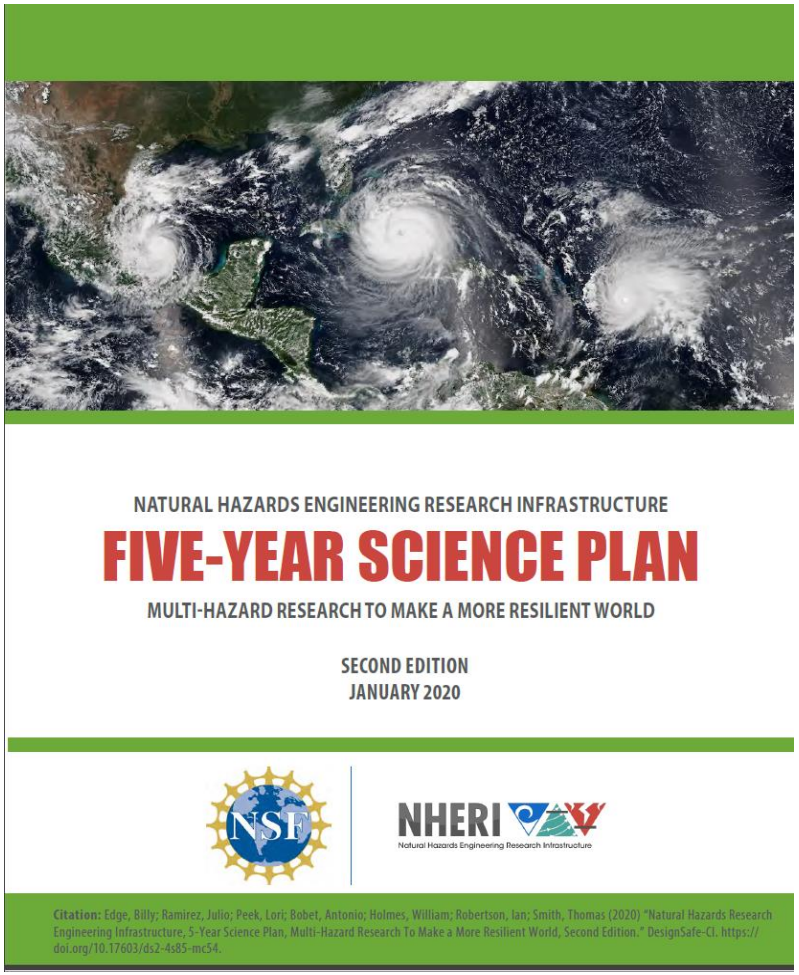
Preplanning to Enhance Implementation

Research that is related to issues already noted by industry or standards groups is likely to be implemented:

NHERI Science Plan
Is intended to be comprehensive regarding mitigation of risks or improving resilience related to covered natural hazards.



Additional Technology Transfer Mechanisms

- Mechanisms for geotechnical research results
- Mechanisms for software research results
- More…

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Additional Technology Transfer Mechanisms

METHODS OF IMPLEMENTATION WHEN PROPRIETARY MATERIALS, DESIGN METHODS, OR CONSTRUCTION METHODS ARE INVOLVED

The technology transfer methods discussed up to this point have focused on research results that can be incorporated into building codes and reference standards. As discussed in the introduction, if research incorporates proprietary materials, methods of design, or methods of construction, the resulting recommendations often fall outside the purview of the building code. In part, this is because complete descriptions in the building code transform the developer's proprietary knowledge into common knowledge.

Other avenues involve full development of the proprietary product by the manufacturer and often involve the manufacturer's use of product evaluation reports. The reports are developed through an accredited product certification body (such as the International Code Council Evaluation Service) to recognize product-use as meeting one or more requirements of the building code. Examples of product research developments that fall in this category include new uses of fiber-reinforced polymer (FRP) materials, innovative steel moment frame connections, and others. Those conducting research that involve development of new innovative products or use of existing proprietary products in new applications should consider partnering with a product manufacturer.

Additional Technology Transfer Mechanisms

EDUCATION AND OUTREACH

As previously discussed, research results can be implemented by many avenues. Often, some uses of research results may be unknown to the researcher, so it is important for the results of research to be widely disseminated. Commonly researchers describe their work at technical conferences and in peer-reviewed technical journals. Although these venues are important to academic progress and disseminate information among peers, potential implementers such as engineers and policy makers may not be exposed to the results. Therefore, presentations at cross disciplinary meetings, webinars with a question-and-answer forum, and local technical groups (e.g. ASCE chapters, local structural engineering associations, and meetings such as the Natural Hazards Workshop in Colorado) are more likely to expose the data and the researcher's findings to potential implementers.

Post-Research Studies
Development of Design Pre-Standards

POST-RESEARCH STUDIES AND REPORTS AND THE DEVELOPMENT OF DESIGN PRE-STANDARDS

Especially when promising new technology or design methodologies are suggested by an accumulation of collaborative research, a transitional study may be prepared by any number of entities, such as the Federal Emergency Management Agency (FEMA), the National Institute of Standards and Technology (NIST), the Applied Technology Council (ATC), or code-development committees of the American Society of Civil Engineers (ASCE), the Building Seismic Safety Council (BSSC), industry and building material associations or professional organizations. See further descriptions of the activities of these organizations below.

A particular format for some such reports is the "pre-standard." In general, these pre-standards constitute nonmandatory guidelines that attempt to provide a recommended procedure, in which some of the provisions may not be fully vetted, although they are often in standards format. They do not constitute consensus-based provisions since they are often compiled by a smaller interest group or a team of hired technical consultants. A pre-standard may be considered a "test-bed" of provisions for engineers to consider, subject to each professional's judgement, that may undergo later substantial technical revisions based on feedback and experience.

Organizations Involved in Technology Transfer

Organizations Involved in Technology Transfer

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

FEMA is one of the four federal agencies that make up the National Earthquake Hazards Reduction Program (NEHRP). The other agencies are the National Science Foundation (NSF), the

NATIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY

NIST supports the development and advancement of model building codes and nationally applicable design and construction standards. To support this mission, NIST researchers work to

BUILDING SEISMIC SAFETY COUNCIL

Established as a Council of the National Institute of Building Sciences in 1979, the Building Seismic Safety Council (BSSC) deals with the complex technical, regulatory, social and economic

APPLIED TECHNOLOGY COUNCIL

The Applied Technology Council (ATC) is a nonprofit, tax-exempt corporation established in 1973 through the efforts of the Structural Engineers Association of California (SEAOC). ATC's

NATIONAL COUNCIL OF STRUCTURAL ENGINEERING ASSOCIATIONS (NCSEA)

NCSEA is made up of 44-member structural engineering associations, each representing a state. Most state organizations have active committees that focus on structural engineering issues in

NATIONAL ASSOCIATION OF HOME BUILDERS (NAHB)

A federation of more than 700 state and local associations, NAHB represents more than 140,000 members. About one-third are home builders and remodelers. The rest work in closely

INSURANCE INSTITUTE FOR BUSINESS AND HOME SAFETY (IBHS)

IBHS is an independent, nonprofit, scientific research and communications organization supported solely by property insurers and reinsurers. IBHS develops numerous guidance

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Natural Hazards Engineering Research Infrastructure

Part 3 –The NHERI Research Database

NHERI Database

- To make NHERI research results more accessible, the TTC has developed a searchable database.
  - Contains over 400 NSF awards in the NHERI Program
    - Next year, all Extreme Event Reconnaissance (GEER, STEER, etc) reports will be added.
  - Includes Title, PI, Institution, and Abstract, and two assigned descriptive key words.
  - Word/subject search in abstract will be improved in next year.

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NHERI Database Key Words

The first is **type of study:**

- **Testing** (mostly typical laboratory testing in EFs but also some testing in the field (eg Texas Stomper)
- **Modeling** (developing or improving computer modeling of hazard or responses)
- **Reconnaissance** (mainly intended for EERs, but convenient tag for awards that are mostly field work)
- **Facility** (establishing or improving a NHERI facility—mostly EFs but also includes regional "hubs" that have been established)

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NHERI Database Key Words

The second is **hazard:**

- **Seismic**—primarily shaking and ground motions
- **Tsunami**
- **Storm Surge** (could be combined with tsunami, but we didn't)
- **Wind**
- **Coastal** (combinations of wind, flood, and wave action)
- **All Hazards** (often improvements in modeling)
- **Wildfire**
- **Geotechnical** (not a hazard, but geotechnical is often not associated with the hazards above and it seemed to work well In the first category

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Potential Uses of Database

- Enable potential implementers to find research of interest
- Student and early career faculty
  - Understand breadth of NHERI Research, particularly state of knowledge in areas of interest.
  - Find institutions where research of interest is being done
  - Find PIs who are doing research of interest

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Natural Hazards Engineering Research Infrastructure

QUESTIONS ?

Research Subcommittee Meetings

Group Breakout Rooms!

Breakout Rooms (*30 Minutes*):

1. Coastal Engineering RSR - Sadegh Nouri
2. Geotechnical Engineering RSR- Mohamed Hassan
3. Simulation & Computational Methods - Mohammad Movahedi
4. Social Science - Najiba Rashid
5. Wind Engineering - Arezoo Bakhshizadeh

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Future General Meeting Date

3rd Friday of every month at 11:00am CST

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