

STRATEGIES FOR SUCCESSFUL NONSTRUCTURAL PLANNING

Danielle Tommaso, NAN
Rachel Williams, NWO

08 September 2022



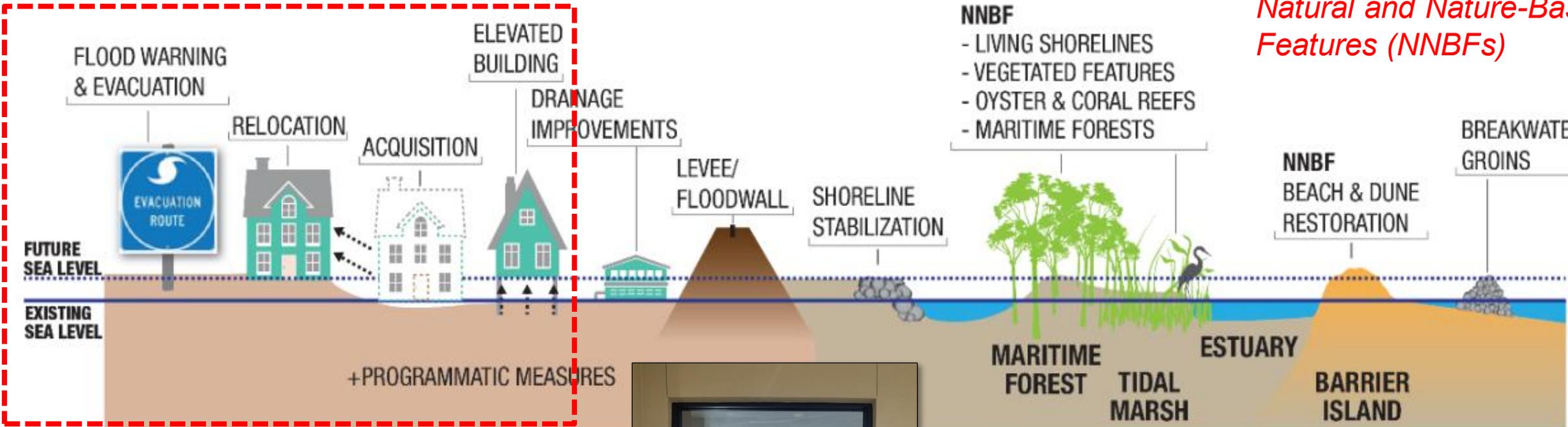
US Army Corps
of Engineers®





WHAT ARE NONSTRUCTURAL MEASURES?

*NOT nonstructural =
Natural and Nature-Based
Features (NNBFs)*







WORD CLOUD TIME!



What comes to mind when you think of nonstructural?

Check the chat for a link to PollEverywhere.com ---->



**THE NATIONAL NONSTRUCTURAL COMMITTEE'S
TOP 5 STRATEGIES FOR
SUCCESSFUL NONSTRUCTURAL
PLANNING**



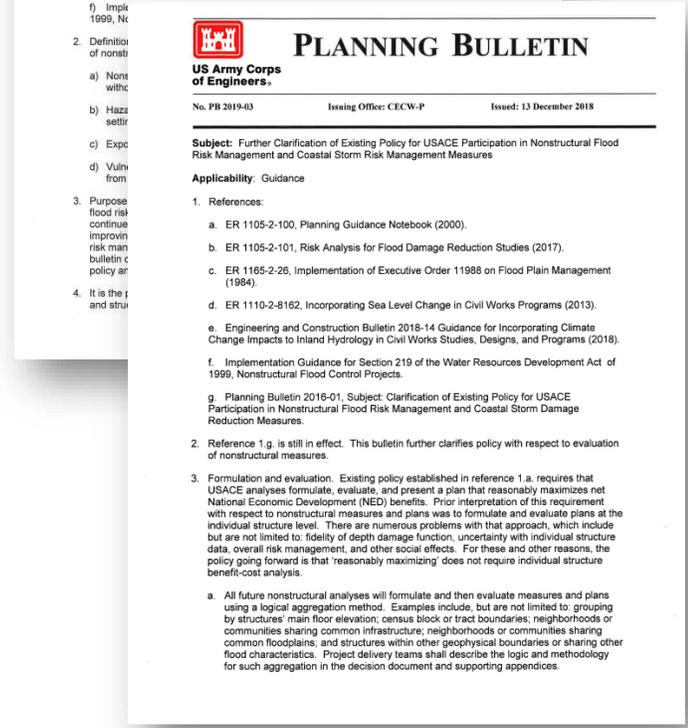
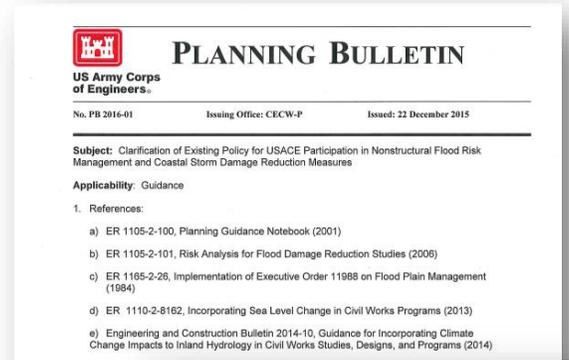
STRATEGY FOR SUCCESS #1



Know the guidance. There are specific requirements telling us how we should consider nonstructural measures and plans

Important Applicable Guidance

- 1983 Principles & Guidelines (P&G)
- Planning Guidance Notebook (ER 1105-2-100)
- Executive Order 11988: Floodplain Management
- ER 1165-2-26: Implementation of EO 11988
- Planning Bulletin 2016-01: Clarification of Existing Policy for USACE Participation in Nonstructural Flood Risk Management and Coastal Storm Damage Reduction Measures
- Planning Bulletin 2019-03: Further Clarification of Existing Policy for USACE Participation in Nonstructural Flood Risk Management and Coastal Storm Risk Management
- Director of Civil Works Memorandum "Comprehensive Documentation of Benefits in Decision Documents" (January 2021)





OTHER APPLICABLE GUIDANCE



All USACE policy and guidance is applicable to nonstructural = no difference with structural

- A lot of guidance is complementary

Consideration of P&G Accounts

- National Economic Development (NED)
- Environmental Quality (EQ)
- Regional Economic Development (RED)
- Other Social Effects (OSE)

ER 1105-2-101 “Risk Analysis for Flood Damage Reduction Studies”

- Procedures for risk analysis, including residual risk

ER 1110-2-8162 “Incorporating Sea Level Change in Civil Works Programs”

- Procedures for relative sea level change analysis, including sensitivity analysis
- Applicable to all CSRMs studies

Public Law 91-646, Uniform Relocation Assistance

- Property owners who willingly participate in structure elevations are not considered displaced persons (= no relocation assistance)
- Renters are considered displaced persons → eligible to receive relocation assistance
- Non-Federal sponsors must be willing to use eminent domain for mandatory measures



MAIN THEME OF THE GUIDANCE...



Nonstructural planning is not an afterthought!

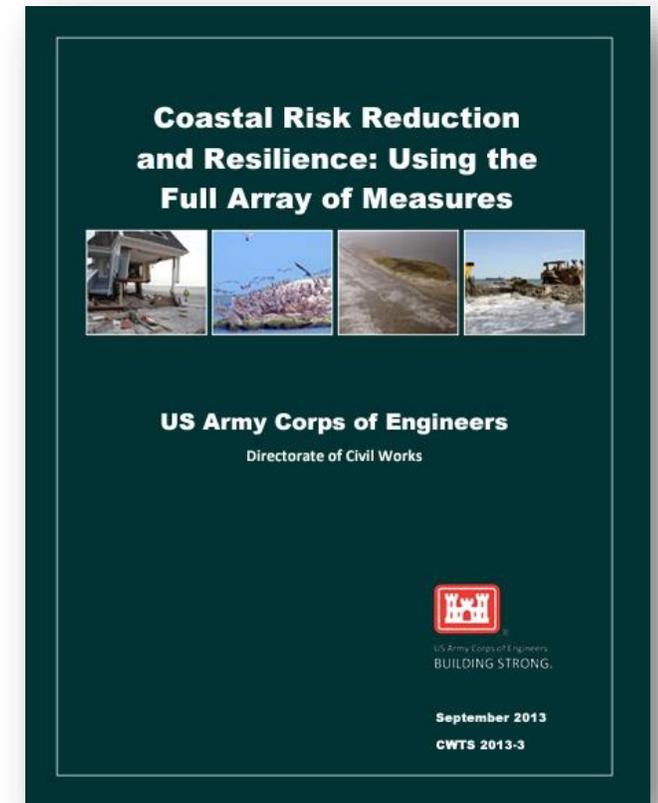
It should be considered from day one!



IDENTIFYING AND SCREENING NONSTRUCTURAL MEASURES



- 1. ALL CSR and FRM studies are required to consider nonstructural measures and plans**
 - Required by: P&G, ER 1105-2-100, and also WRDA 1974, 1996, WRDA 1999, 2007, and 2016
- 2. You should consider the full suite of nonstructural measures - even those outside USACE's purview**
 - Required by: EO 11988, ER 1165-2-26, PB 2016-01
 - Note: "care and consideration should be taken when considering whether nonstructural measures are appropriate for USACE participation"
- 3. Ringwalls, berms, and floodwalls = structural measures**
 - Pursuant to: PB 2016-01
- 4. Acquisition, relocation, and permanent evacuation = mandatory participation**
 - Pursuant to: PB 2016-01
 - Sponsor must retain use of eminent domain
 - All other measures = voluntary participation
- 5. Local flood ordinances and NFIP regulations alone are not sufficient criteria for screening nonstructural measures**
 - Pursuant to: PB 2016-01
 - These design constraints and criteria must be acknowledged and should be considered as part of an LPP





FORMULATING NONSTRUCTURAL PLANS



1. A minimum one nonstructural plan should be considered, when the Recommended Plan does not have significant nonstructural features

- Required by: ER 1105-2-100 Exhibit G-1, WRDA 1986 Section 905

2. FRM studies MUST include one standalone nonstructural only plan in the final array of alternatives

- Required by: Director of Civil Works Memorandum “Comprehensive Documentation of Benefits in Decision Documents”
- Not a requirement of CSRMs studies

3. You are required to use logical aggregation (grouping) method

- Required by: PB 2019-03

4. Consider the P&G accounts, life safety, residual risk, and study-specific planning objectives when formulating, evaluating, and selecting nonstructural measures

- Required by: PB 2019-03



EVALUATING NONSTRUCTURAL PLANS



1. Evaluate and document residual risk to life safety and economic damages

- Required by: PB 2016-01, ER 1105-2-101
- Departures from the NED plan are permissible to reduce residual risk (ER 1105-2-100, ER 1105-2-101, DCW Memo)

2. OSE benefits and costs could be unique

- Pursuant to: PB 2016-01
- Include the effects of permanent relocation to community cohesion, the ability of remaining properties to support necessary infrastructure, impacts to vulnerable populations (PB 2016-01)

3. Consider benefits associated with alternative use of land

- Required by: PB 2016-01, ER 1105-2-100
- Allows for inclusion of environmental restoration and recreation benefits when justifying permanent relocation and evacuation
- Benefits may account for more than 50% of project justification (unlike justification for structural alternatives)

4. Consider different participation rates that are appropriate for a community, and utilize a sensitivity analyses of different participation rates

- Required by: PB 2019-03

5. Calculate Interest During Construction (benefit stream reflects construction duration for specific measures)

- Required by: PB 2019-03



STRATEGY FOR SUCCESS #2



Scale of your nonstructural analysis to your study

- CAP vs. GI study? Large-scale vs. small-scale study?
- Consider your problems, needs, opportunities, constraints, and considerations
- Currently no detailed implementation guidance
- Document your logic and analysis in your decision documents and during Vertical Team coordination
- Nonstructural planning
- Four accounts (NED, RED, EQ, OSE)



Manhattan, New York City

VS.



Florida Keys



STRATEGY FOR SUCCESS #3



Don't be afraid to go big. Many studies are recommending nonstructural solutions - and the plans seem to keep getting bigger!

Why?

- Recognition that nonstructural measures provide cost-effective CSRM – not just a “check the box” exercise or written off during initial plan formulation
- Study area boundaries: regional/large vs. small study area
- Low vs. high density development
- Constraints that may drive up the cost of structural solutions (e.g., real estate)
- Difficulty in implementation (e.g., impacts to views/water usage, very high OMRR&R costs)

Large-scale nonstructural plans in recent and ongoing CSRM studies

- New Jersey Back Bays, NJ CSRM study – 18,800 structures
- Nassau County Back Bays, NY CSRM study – 16,850 structures
- Florida Keys, FL CSRM study – 11,200 structures
- St. Tammany, LA FRM study – 8,500 structures
- Miami-Dade Back Bays, FL CSRM study – 6,150 structures
- Fire Island Inlet to Montauk Point, NY CSRM project – 4,400 structures
- South Central Coast, LA CSRM study – 3,450 structures



Home relocation on Fire Island, NY



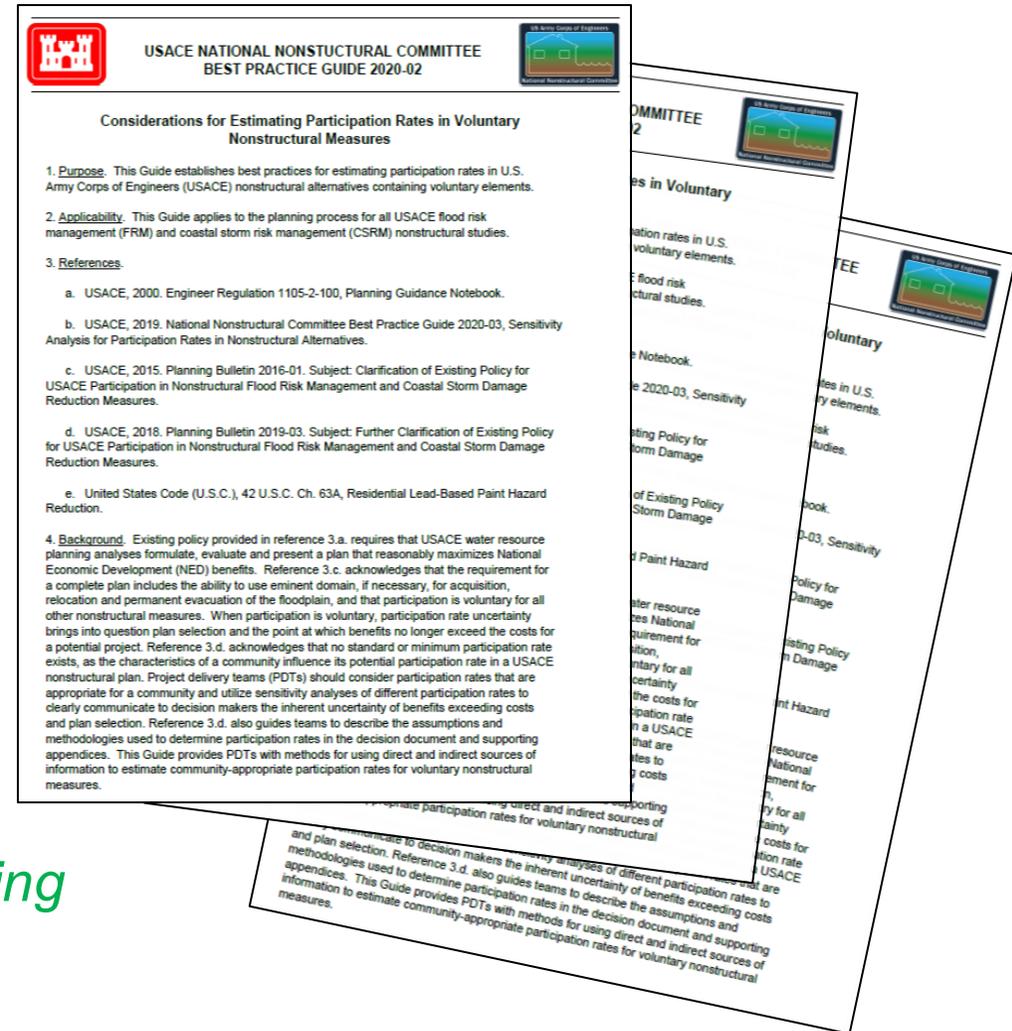
STRATEGY FOR SUCCESS #4



Recognize there are challenges and unknowns about nonstructural plan formulation and implementation

- Structure aggregation during plan formulation
- Estimating participation rates for nonstructural plans
- Determining target heights for elevated structures
- Acquisition (contracting) implementation
- Real estate, including URA benefits (relocation and temporary housing)
- Cost estimating

... and the National Nonstructural Committee is coordinating throughout the enterprise to find answers for you!



Best Practice Guides from the NWG SharePoint



BEST PRACTICE GUIDES



BPGs are written to be brief, easily understood, reference appropriate guidance, and provide useful recommendations



Team Collaboration

- Libraries
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- Nonstructural Methods
- SharePoint Admin
- Examples
- Nonstructural Costs
- Q&A Forum
- Site Contents

Institute for Water Resources Risk Management Center (RMC) Water Supply Business

BestPracticeGuides

All Documents

Name	Modified
Archived	...
BPG 2020-01_Rev2 Calculating Interest During Construction	March 3
BPG 2020-02 Considerations for Estimating Participation Rates in Volunta...	February 1
BPG 2020-03 Sensitivity Analysis for Participation Rates in Nonstructura...	February 1
BPG 2020-04 Uniform Relocation Assistance and and Real Property Acquisit...	February 1
BPG 2020-05 Policy Considerations for Nonstructural Measures	March 3
BPG 2020-06 Structure Aggregation Methods	March 3
BPG 2020-07 Compliance with the ADA and ABA	March 3
Field Guide for NS Assessments - May 2019	March 3
NS FRM Matrix - May 2019	March 3
NS FRM Matrix User Guide - May 2019	March 3



USACE NATIONAL NONSTRUCTURAL COMMITTEE
BEST PRACTICE GUIDE 2020-02

Considerations for Estimating Participation Rates in Voluntary Nonstructural Measures

1. **Purpose.** This Guide establishes best practices for estimating participation rates in U.S. Army Corps of Engineers (USACE) nonstructural alternatives containing voluntary elements.
2. **Applicability.** This Guide applies to the planning process for all USACE flood risk management (FRM) and coastal storm risk management (CSR) nonstructural studies.
3. **References.**
 - a. USACE, 2000. Engineer Regulation 1105-2-100, Planning Guidance Notebook.
 - b. USACE, 2019. National Nonstructural Committee Best Practice Guide 2020-03, Sensitivity Analysis for Participation Rates in Nonstructural Alternatives.
 - c. USACE, 2015. Planning Bulletin 2016-01. Subject: Clarification of Existing Policy for USACE Participation in Nonstructural Flood Risk Management and Coastal Storm Damage Reduction Measures.
 - d. USACE, 2018. Planning Bulletin 2019-03. Subject: Further Clarification of Existing Policy for USACE Participation in Nonstructural Flood Risk Management and Coastal Storm Damage Reduction Measures.
 - e. United States Code (U.S.C.), 42 U.S.C. Ch. 63A, Residential Lead-Based Paint Hazard Reduction.
4. **Background.** Existing policy provided in reference 3.a. requires that USACE water resource planning analyses formulate, evaluate and present a plan that reasonably maximizes National Economic Development (NED) benefits. Reference 3.c. acknowledges that the requirement for a complete plan includes the ability to use eminent domain, if necessary, for acquisition, relocation and permanent evacuation of the floodplain, and that participation is voluntary for all other nonstructural measures. When participation is voluntary, participation rate uncertainty brings into question plan selection and the point at which benefits no longer exceed the costs for a potential project. Reference 3.d. acknowledges that no standard or minimum participation rate exists, as the characteristics of a community influence its potential participation rate in a USACE nonstructural plan. Project delivery teams (PDTs) should consider participation rates that are appropriate for a community and utilize sensitivity analyses of different participation rates to clearly communicate to decision makers the inherent uncertainty of benefits exceeding costs and plan selection. Reference 3.d. also guides teams to describe the assumptions and methodologies used to determine participation rates in the decision document and supporting appendices. This Guide provides PDTs with methods for using direct and indirect sources of information to estimate community-appropriate participation rates for voluntary nonstructural measures.



STRATEGY FOR SUCCESS #5



There are *many* nonstructural resources for planners

1. National Nonstructural Committee

2. Nonstructural Working Group

- NWG SharePoint

3. Best Practices & Training Resources

- Best Practice Guides
- NWG SharePoint
- Virtual and in-person workshops (recorded and live)

4. Lean on your Vertical Team and SMEs

- CSR and FRM PCXs
- VT, review teams, etc.



THE NNC IS HERE TO HELP!



Reach out to the National Nonstructural Committee for study support or with questions

- Any type of planning study: GI, CAP, FPMS, PAS, and SJ
- Plan formulation, economics, public engagement, policy, engineering, real estate...
- NNC Members

- Lea Adams – Chair (HEC)
- Andrew (Andy) MacInnes (MVN)
- Drew Minert (NWO)
- Danielle Tommaso (NAN)
- Rachel Williams (NWO)
- Christina (Chris) Rasmussen (NAN) – *retiring soon*
- **New member – maybe you?**
 - Applications due 9/16/22 - email Stephanie Bray + see Susan Layton's 8/4/22 email for info



NWG September 2022 Webinar

Tuesday 20 September @ 2 pm ET
Topic: *The Nonstructural Matrix Comes Alive! Using a Python Script for Decision Making*
Presented by: *Fire Island Inlet to Montauk Point NAN PDT (Chris Rasmussen, Marko Nedzbala)*

Join the Nonstructural Working Group

- Email Rachel Williams to join listserv (rachel.c.williams@usace.army.mil)
- Webinar series
- NWG SharePoint: <https://team.usace.army.mil/sites/IWR/PDT/nonstrucworkgrp>
 - Best Practice Guides, nonstructural guidance, tools, Q&A Forum, and other resources





NONSTRUCTURAL WORKING GROUP SHAREPOINT



- Libraries
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 - 2022 Workshop
 - PED
 - Nonstructural Schematics/Photos
 - NS Project Catalog
 - 2021 Virtual Training Materials
- Q&A Forum
- Site Contents

Welcome to the Nonstructural Working Group Sharepoint!

The USACE Nonstructural Working Group facilitates communication and learning within the USACE community, to support the study and use of nonstructural measures.

Nonstructural Measures, Webinars	Guidance & Resources	Tools	Reports, D&I Examples
NWG Webinars	Planning Bulletins	Nonstructural Costs	Implementation Plans
Q & A	Best Practice Guides	Historic Structures	NS Project Catalog
Nonstructural Methods	USACE Guidance	Photos / Schematics	PED Example Docs
2021 Virtual Training Materials	FEMA References		
2022 Workshop Training Materials			

Events:

Upcoming NWG webinar: September 2022!



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Site Content Managers

- Adams, Lea G CIV USARMY CEIWR (USA)
- Tommaso, Danielle M CIV USARMY CENAN (USA)
- Williams, Rachel C CIV USARMY CENWO (USA)

<https://team.usace.army.mil/sites/IWR/PDT/nonstrucworkgrp>



POLL TIME!



Where do your teams struggle? Where are the gaps?

*Check the chat for a link to PollEverywhere.com ---->
(Same link used for Word Cloud)*



PERTINENT LAWS, DIRECTIVES & GUIDANCE?



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Q&A FORUM?



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- Williams, Rachel C CIV USARMY CENWO (USA)

Questions received by the NNC – and HQ-vetted answers! Ask your questions in the Q&A Forum!

<https://team.usace.army.mil/sites/IWR/PDT/nonstrucworkgrp>



BROWSE ITEMS LIST



Team Collaboration

[Institute for Water Resources](#)

[ALLIWR Information](#)

[Risk Management Center \(RMC\)](#)

[Water Supply Business Line](#)

Q&A Forum ⓘ

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Schematics/Photos

NS Project Catalog

2021 Virtual Training
Materials

Structure Inventory
Examples

Q&A Forum

Site Contents

[+ new discussion](#)

[Recent](#) [My discussions](#) [Unanswered questions](#) [...](#)

What about Flood Warning Systems?

Question 1: If a Flood Warning and Emergency Evacuation Plan is included in the recommended plan r...

By Tommaso, Danielle M CIV USARMY CENAN (USA) | May 25

Who pays the 35% Non-Federal share of the implementation cost for a nonstructural proj...

Q1: Who pays the 35% Non-Federal share of the implementation cost for a nonstructural project?A1: T...

By Williams, Rachel C CIV USARMY CENWO (USA) | May 12

Are there any nonstructural actions that can reduce flood risk to storage tanks?

Yes. Commonly used measures include building a flood resistant vault; using concrete slabs and anchor...

By Tommaso, Danielle M CIV USARMY CENAN (USA) | May 10

Is there (or could there be) a repository of images of nonstrutural methods that teams co...

By Kniep, Michelle R CIV USARMY CEMVP (USA) | Latest reply by
Williams, Rachel C CIV USARMY CENWO (USA) | April 18

Are there any Items of Local Cooperation that are unique to nonstructural projects?

Yes, as shown here: <https://www.usace.army.mil/Missions/Civil-Works/Project-Partnership-Agreements/...>

By Tommaso, Danielle M CIV USARMY CENAN (USA) | March 22

Is the cost share requirement different for nonstructural and structural components?

NONSTRUCTURAL: For projects authorized after 10/12/96, the non-Federal sponsor must provide all LE...

By Williams, Rachel C CIV USARMY CENWO (USA) | July 6, 2021

How should PDTs consider and quantify life safety risk for nonstructural measures?

PDTs should use the same methods for quantifying life safety risk for nonstructural measures as for stru...

By Tommaso, Danielle M CIV USARMY CENAN (USA) | May 11, 2021

Should the Real Estate Plan disclose the addresses of properties included in a nonstructur



POLL TIME!



How can the National Nonstructural Committee help you?

*Check the chat for a link to [PollEverywhere.com](https://www.PollEverywhere.com) ---->
(Same link used for last poll)*



ONGOING AND UPCOMING



Recently Completed

- Real estate questions just posted to the NWG SharePoint Q&A Forum
- South Central Coast Lessons Learned NWG Webinar posted to NWG SharePoint

Ongoing and Upcoming

- Two upcoming webinars
 - 9/20 NWG webinar
 - 9/22 PCoP webinar
- Cost estimating tools
- Target elevation BPG
- Aggregation updates
- Dry floodproofing higher than 3 feet
- Q&A Forum – post your questions!



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Tuesday 20 September @ 2 pm ET
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Presented by: *Fire Island Inlet to Montauk Point NAN PDT (Chris Rasmussen, Marko Nedzbala)*



PCoP 22 September 2022 Webinar

Tuesday 22 September @ 2 pm ET
Topic: *Nonstructural Aggregation*
Presented by: *Eric Thaut (FRM PCX)*

THANK YOU! REACH OUT TO US!

NNC MEMBERS

LEA ADAMS – CHAIR (HEC)
ANDREW (ANDY) MACINNES (MVN)
DREW MINERT (NWO)

DANIELLE TOMMASO (NAN)
RACHEL WILLIAMS (NWO)
CHRISTINA (CHRIS) RASMUSSEN (NAN)
– *RETIRING SOON*

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