



Consensus-Based Codes, Specifications and Standards for Public Assistance

(February 2020)

Disaster Recovery Reform Act Section 1235(b):

Section 1235(b) of the Disaster Recovery Reform Act of 2018 (DRRA) amended Section 406(e) of the Stafford Act to require FEMA to fund repair, restoration, reconstruction, or replacement in conformity with “the latest published editions of relevant consensus-based codes, specifications, and standards that incorporate the latest hazard-resistant design and establish minimum acceptable criteria for the design, construction, and maintenance of residential structures and facilities that may be eligible for assistance under this Act for the purposes of protecting the health, safety, and general welfare of a facility’s users against disasters.”

*Recovery Interim Policy FP-104-009-11, Consensus-Based Codes, Specifications and Standards for Public Assistance (Policy)*¹, defines the framework and requirements for the implementation of consensus-based design, construction and maintenance codes, specifications and standards for the Public Assistance (PA) program.

Purpose

1. What is the purpose of using consensus-based codes, specifications and standards and to which facilities does it apply?

The purpose is to promote resiliency and reduce future risk in the repair and replacement of disaster damaged facilities funded by FEMA’s PA program. The policy applies to: buildings, electric power, roads, bridges, and potable water and wastewater facilities.

Applicability

2. Is the Policy mandatory?

Yes, it is mandatory in all major disasters declared on or after the initial publication date of this Policy, November 6, 2019.

3. Who determines what codes, specifications and standards must be used in PA-funded projects?

Appendix A of the Policy identifies the required codes. The Applicant is responsible for identifying which of the consensus-based codes, specifications and standards are applicable for each PA project.

¹ Recovery Interim Policy FP-104-009-11, Consensus-Based Codes, Specifications and Standards for Public Assistance (Policy), was initially published on November 6, 2019. Version 2, was updated December 20, 2019, which increased the retroactive application to 180 days and incorporated several additional codes; minor reference corrections to specific codes were made in January 2020, which are reflected in Version 2.1.

4. What if an Applicant lacks the subject matter expertise to interpret and design to the code, specifications, and standards described in the Policy? Can FEMA assist them?

FEMA may approve PA funding as part of a project for technical assistance support, which may include architectural and engineering design (A&E), at the applicable cost-share of the project, to assist communities that lack the necessary subject matter expertise to implement the codes, specifications, and standards in this Policy.

5. What if an Applicant does not have the financial means to purchase the codes, specifications and standards included in the Policy's Appendix A?

An applicant may include the cost for purchasing a code, specification or standard on a specific project in the engineering and design expenses for the project. This is a one-time purchase per disaster where the Applicant can use the code, specification or standard for similar projects.

6. What is the process for determining code, specifications, and standards requirements?

For each damaged facility, element or component, Applicants must identify each applicable code, specification or standard required under the Policy. Applicants must upload in Grants Portal for the project or identify to the Program Delivery Manager (PDMG)/Regional staff, as applicable, the specific citation for the code, specification or standard that is applicable to the damaged facility, element or component being restored. Applicants should identify codes, specifications and standards and provide supporting information prior to the project being sent to a PA Consolidated Resource Center (CRC).

7. Who determines how the codes, specifications, and standards apply to an Applicant's facility?

Applicants identify the applicable codes, specifications and standards and should develop a description of the work required to comply with those standards. The description should:

- Identify specific elements or components affected and describe how each code, specification or standard applies (include Damage Inventory line item numbers)
- Describe the work related to the codes, specifications and standards and provide design drawings, component lists, or other similar documentation
- Include dimensions and quantities for all components
- Describe the direct relationship between disaster-related damage and any upgrades to undamaged elements

If the consensus-based codes, specifications and standards allow for discretion or for variances in the facility design to be appropriate for the facility's location, Applicants must identify the adjustments to the work and the section of the code, specification or standard that allows for the chosen design or construction variation.

8. Do communities need to adopt the codes, specifications and standards identified in the Policy's Appendix A?

No, while the Applicant is required to identify and use the applicable codes, specifications and standards in the Policy's Appendix A for repair and replacement of disaster-damaged facilities funded by FEMA PA, the policy does not require communities to adopt these codes, specifications and standards.

9. What happens if an Applicant does not restore facilities in compliance with these codes, specifications, and standards?

Failure to include the applicable codes, specifications and standards in the restoration of eligible PA projects will result in the denial or deobligation of project funding.

The Policy allows for flexibility for extenuating circumstances, specifically if the code requirement is not technically feasible, the costs of implementing the Policy are extraordinary, or the materials needed for construction are not available or would otherwise be inappropriate for the facility.

10. What if an Applicant completes work immediately after a disaster and does not incorporate the applicable codes, specification and standards?

Failure to incorporate the applicable codes, specifications and standards will result in denial or deobligation of some or all of the project funding (subject to Section B.3 of the Policy). Applicants that undertake work immediately after the disaster should ensure they are meeting PA requirements if they anticipate that they will be applying for PA funding.

11. Who determines what is extraordinary, infeasible or inappropriate?

Applicants are responsible to justify an applicable consensus-based code, specification or standard is technically infeasible, extraordinary or inappropriate, and would create an extraordinary burden. FEMA will review the justification and make a determination as to whether a waiver of the use of that code, specification or standard is warranted pursuant to Section B.3 of the Policy.

12. How do codes, specifications and standards apply to historic facilities?

Applicability of codes, specifications and standards to historic facilities may vary based on project specific circumstances. It is important for FEMA staff to coordinate early with environmental and historic preservation staff if a project involves work to a historic facility. Buildings are not the only facility types that can be historic. For example, bridges, can be listed or be eligible for listing under the National Historic Preservation Act.

13. A community was impacted by a flood. Why may they be required to integrate codes, standards, and specifications for other hazards into project designs?

The purpose of incorporating consensus-based codes, specifications, and standards into project design is to reduce the risk and vulnerability of a community's infrastructure from all hazards that threaten that community. Therefore, design criteria to address all hazard types present at the site must be evaluated when conducting repairs or reconstruction, when applicable.

14. Will FEMA fund the increased costs associated with complying with this for a project at a higher federal cost share?

No, costs associated with meeting the requirements of this Policy are eligible for reimbursement based on the cost share for permanent work for the disaster.

15. Are there closeout requirements?

Yes, the Applicant is required to provide proof of compliance. Acceptable forms of proof include but are not limited to written certification by a registered engineer, design professional, or other qualified individual that the project was designed and constructed in compliance with the applicable consensus-based codes, specifications and standards identified.

Locally Adopted Codes & Standards

16. How does this Policy affect locally adopted codes, specifications and standards?

The Policy does not require communities to adopt the codes, specifications, and standards in Appendix A of the Policy. Instead, the Policy requires that as a condition of grant funding, the Applicant incorporate the codes, specifications, and standards in Appendix A of the Policy into the PA funded project's design and construction for applicable infrastructure types (i.e., buildings, electric power, roads, bridges, potable water and wastewater).

17. What if an Applicant has a local code that exceeds the minimum code, specification or standard in this Policy?

If an Applicant has a local code that meets or exceeds the specifications of those in the Policy, FEMA will provide funding to meet that code if it meets PA's five eligibility criteria for locally adopted codes, specifications and standards. These five eligibility requirements are:

- 1) Apply to the type of repair or restoration required;
- 2) Are appropriate to the pre-disaster use of the facility;
- 3) Are reasonable, in writing, and formally adopted and implemented by the state/tribe/local government on or before the disaster declaration date or are a legal Federal requirement applicable to the type of restoration;
- 4) Apply uniformly to all similar types of facilities within the state/tribal/local government's jurisdiction; and
- 5) For any code, specification or standard in effect at the time of the disaster, it must have been enforced during the time it was in effect.²

The Applicant must also provide information or documentation to substantiate that the locally adopted standard is equivalent to or more stringent than the consensus-based code, specification or standard. Applicants must upload to the project in Grants Portal or submit to the PDMG or Regional staff, as applicable, a copy of the locally-adopted code, specification or standard and identify the section that contains the equivalent or more

² Refer to 44 C.F.R. § 206.226(d) and the Public Assistance Program and Policy Guide for full list of eligibility criteria and conditions.

stringent requirement that is applicable to the damaged facility, element, or component being restored.

18. What about facilities that are not required to use this Policy?

Facilities not identified in the Policy must comply with the current applicable locally adopted codes, specifications and standards as set forth 44 C.F.R. § 206.226(d)(1)-(5). The codes, specifications and standards must:

- 1) Apply to the type of repair or restoration required;
- 2) Are appropriate to the pre-disaster use of the facility;
- 3) Are reasonable, in writing, and formally adopted and implemented by the state/tribe/local government on or before the disaster declaration date or are a legal Federal requirement applicable to the type of restoration;
- 4) Apply uniformly to all similar types of facilities within the state/tribal/local government's jurisdiction; and
- 5) For any code or standard in effect at the time of the disaster, it must have been enforced during the time it was in effect.

Retroactive Applicability

19. Is there a retroactive period for Applicants to opt in for disasters declared prior to November 6, 2019 (date of issuance of the Policy)?

Yes, DRRRA includes a provision for the retroactive implementation of this authority. To ensure Applicants have time to consider requesting application of the new Policy in previous incidents but also ensure that progress toward recovery is not delayed, Applicants must submit written notification to FEMA within 180 days from the date of the issuance of the Policy (until May 4, 2020) and identify the facilities for which they would like to opt-in.

20. Can Applicants that apply to retroactively participate in the Policy decide to withdraw?

Applicants that opt into the Policy for previous incidents must incorporate the codes, specifications and standards for the projects they have identified. The Applicant cannot withdraw once they have opted into this Policy. For projects that have an accepted fixed cost estimate (Section 428) that have not been obligated, the Applicant will have 90 days to work with FEMA to revise the scope of work and agree to a new cost estimate. If this timeline is not met, the project will convert back to the original accepted fixed cost estimate.

21. Can an obligated fixed cost estimate project retroactively opt into this Policy?

No, once an Applicant accepts a fixed cost offer (Section 428) and funding is obligated, the cost estimate is fixed and there will be no further adjustment.

22. What projects associated with incidents declared before August 1, 2017, but have not been obligated based on a finalized cost estimate as of the date of Policy publication, can be considered for retroactive implementation?

For incidents declared before August 1, 2017, retroactive implementation is available for PA projects that have not had an initial obligation or version 0. Additionally, retroactive implementation is available for projects that have received an obligated version 0 only for A&E costs.

23. What year codes, specifications and standards should an Applicant use if they are opting into this Policy?

Projects that opt into this Policy need to be restored based on the latest version of the applicable codes, specifications and standards listed in Appendix A for the date that the disaster was declared.

24. If an Applicant opts into this Policy can they choose which codes, specifications and standards they want to apply, or do they have to use all applicable codes, specifications and standards?

An Applicant that retroactively opts into this Policy must comply with the Policy and use all applicable codes, specifications and standards listed in Appendix A for the facilities identified.



Buildings

The following are recommended reference tables of applicable codes, specifications and standards for the construction or repair of non-residential buildings and certain residential buildings. It is important to note that each building is comprised of unique structural and non-structural components and these tables may not address every required code or standard.

- **Table 1** identifies codes, specifications and standards for major structural building components. This table may be used to determine the codes, specifications and standards applicable to a building based upon the types of material(s) used in the construction of various structural components.
- **Table 2** identifies codes, specifications and standards for several non-structural building components. This table does not identify specific codes, specifications and standards for non-structural building components because the I-Codes reference over 500 codes, specifications and standards within the individual chapters. These additional codes, specifications and standards not identified in the table may be required for compliance depending on the scope of work.
- **Table 3** identifies NFIP Technical Bulletins and lists how they apply to specific flooding conditions and building types.

The I-Codes or the adopted code by the Authority Having Jurisdiction (AHJ) should be used to determine the appropriate codes needed for code compliance. If the AHJ has code requirements more restrictive than the current version of the I-Codes, then the more restrictive requirement applies.



Table 1. Table of the Application of Codes, Specifications and Standards to Structural Building Components

		Structural Building Components														
		Concrete				Masonry			Wood				Steel			
		Foundation	Load Bearing Components	Wall System	Roof Assembly	Foundation	Load Bearing Components	Wall System	Foundation	Load Bearing Components	Wall System	Roof Assembly	Foundation	Load Bearing Components	Wall System	Roof Assembly
Code	CFR Title 24: Housing and Urban Development	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	CFR Title 44: Emergency Management and Assistance	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	IBC—2018: International Building Code	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	IEBC—2018: International Existing Building Code	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	IRC—2018: International Residential Code	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	IPC—2018: International Plumbing Code	X			X	X			X			X	X		X	
	IMC—2018: International Mechanical Code															
	IFGC—2018: International Fuel Gas Code						I									
	IFC—2018: International Fire Code	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	FGI—2018: Guidelines for Design and Construction of Hospitals/Outpatient	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	FGI—2018: Guidelines for Design and Construction of Residential Health, Care, and Support	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	NFPA 5000—2018: Building Construction and Safety Code²	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	<i>State or City Codes²</i>	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	ADM1—2015: Aluminum Design Manual: Part 1—A Specification for Aluminum Structures			I				I			I				I	
ACI 318—19: Building Code Requirements for Structural Concrete	X	X	X	X												
ACI 543R—12: Guide to Design, Manufacture, and Installation of Concrete Piles	X															



ANSI/AISC 360—16: <i>Specification for Structural Steel Buildings</i>													X	X	X	X
AISI S100—16: <i>North American Specification for the Design of Cold-formed Steel Structural Members</i>													X	X	X	X
AMCA 540—13: <i>Test Method for Louvers Impacted by Wind Borne Debris</i>			I				I				I				I	
ASCE 7—16: <i>Minimum Design Loads and Associated Criteria for Buildings and Other Structures</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ASCE 8—17: <i>Standard Specification for the Design of Cold-formed Stainless-Steel Structural Members</i>													X	X	X	X
ASCE 24—14: <i>Flood Resistant Design and Construction</i>	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
ASCE 49—07: <i>Wind Tunnel Testing for Buildings and Other Structures</i>	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
ASME/A17.1—2016/CSA B44—16: <i>Safety Code for Elevators and Escalators⁴</i>																
ASTM E1886—13A: <i>Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials</i>			I				I				I				I	
ASTM E1996—14a: <i>Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes</i>			I				I				I				I	
ASTM D2487—11: <i>Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)</i>	X				X				X				X			
ANSI/AWC NDS—2018: <i>National Design Specification (NDS) for Wood Construction—with 2018 NDS Supplement</i>								X	X	X	X					
ANSI/DASMA 108—2017: <i>Standard Method for Testing Sectional Garage Doors, Rolling Doors and Flexible Doors: Determination of Structural Performance Under Uniform Static Air Pressure Difference</i>			I				I				I				I	



Table 2. Table of the Application of Codes, Specifications and Standards to Non-Structural Building Components

		Non-Structural Building Components											
		Other Building Elements							Utilities/Systems				
		Interior Non-Load Bearing Walls	Openings (Doors and Windows)	Glass and Glazing	Interior Finishes	Interior Environment	Egress	Accessibility	Fire/Smoke/Life Safety Protection	Electrical	Mechanical Systems	Plumbing Systems	Elevators/Conveying Systems
<i>See note below prior to using table</i>													
Code	CFR Title 24: Housing and Urban Development	I	I	I	I	I	I	I	I	I	I	I	I
	CFR Title 44: Emergency Management and Assistance	I	I	I	I	I	I	I	I	I	I	I	I
	IBC—2018: International Building Code	X	X	X	X	X	X	X	X	X	X	X	X
	IEBC—2018: International Existing Building Code	X	X	X	X	X	X	X	X	X	X	X	X
	IRC—2018: International Residential Code	X	X	X	X	X	X	X	I	X	X	X	I
	IPC—2018: International Plumbing Code					X			X			X	
	IMC—2018: International Mechanical Code					X	X		X	X	X		
	IFGC—2018: International Fuel Gas Code									I	I		
	IFC—2018: International Fire Code	X			X		X		X	X			I
	FGI—2018: Guidelines for Design and Construction of Hospitals/Outpatient	I	I	I	I	I	I	I	I	I	I	I	I
	FGI—2018: Guidelines for Design and Construction of Residential Health, Care, and Support	I	I	I	I	I	I	I	I	I	I	I	I
	NFPA 5000—2018: Building Construction and Safety Code¹	I	I	I	I	I	I	I	I	I	I	I	I
	International Wildland-Urban Interface Code	I	I	I	I	I	I	I	I	I	I	I	I
	NFPA 1141 - Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas	I	I	I	I	I	I	I	I	I	I	I	I
	NFPA 1143 - Standard for Wildland Fire Management	I	I	I	I	I	I	I	I	I	I	I	I
	NFPA 1144 - Standard for Reducing Structure Ignition Hazards from Wildland Fire	I	I	I	I	I	I	I	I	I	I	I	I
	<i>State or City Codes¹</i>	I	I	I	I	I	I	I	I	I	I	I	I

X = Applicable
 I = If Applicable – These standards may apply based on the location of the building in a hazard-prone area or the materials used in the design of the building.
 1 If the Authority Having Jurisdiction has adopted a code or standard more restrictive than the current version of the I-Codes then the more restrictive requirement applies.
Note: Users should note that I-Codes reference over 500 standards and specifications within the individual chapters. These additional standards and specifications may be required for code compliance depending on the scope of work. The I-Codes or the adopted code by the Authority Having Jurisdiction should be used to determine the appropriate codes needed for code compliance. If the Authority Having Jurisdiction has code requirements more restrictive than the current version of the I-Codes, then the more restrictive requirement applies.



Table 3. Table of NFIP Technical Bulletins and Areas of Applicability

		Areas of Applicability					
		Zone V	Zone A	Nonresidential	Residential	Coastal	Riverine
NFIP Technical Bulletins	1. Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings in Special Flood Hazard Areas (2008)		X	X	X	X	X
	2. Flood Damage-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas (2008)	X	X	X	X	X	X
	3. Non-Residential Floodproofing – Requirements and Certification for Buildings Located in Special Flood Hazard Areas (1993)		X	X		X	X
	4. Elevator Installation for Buildings Located in Special Flood Hazard Areas (2019)	I	I	I	I	X	X
	5. Free-of-Obstruction Requirements for Buildings Located in Coastal High Hazard Areas (2008)	X		X	X	X	
	6. Below-Grade Parking Requirements for Buildings Located in Special Flood Hazard Areas (1993)		I	I		X	X
	7. Wet Floodproofing Requirements for Structures Located in Special Flood Hazard Areas (1993)		I	I			X
	8. Corrosion Protection for Metal Connectors and Fasteners in Coastal Areas (2019)	X	X	X	X	X	
	9. Design and Construction Guidance for Breakaway Walls Below Elevated Buildings Located in Coastal High Hazard Areas (2008)	I		I	I	X	
	10. Ensuring That Structures Built on Fill in or Near Special Flood Hazard Areas Are Reasonably Safe from Flooding (2001)		I	I	I	X	X
	11. Crawlspace Construction for Buildings Located in Special Flood Hazard Areas (2001)		I	I	I	X	X

X = Applicable

I = If Applicable - These Technical Bulletins only apply if the building incorporates the listed design element.



POTABLE WATER

Source	1. Design Parameters	GLUMRB - Recommended Standards for Water Works, 2012
	2. Wells	a. AWWA - Standards for Potable Water Source, Storage, Treatment, and Distribution b. ASCE MOP 127 - Hydraulics of Wells: Design, Construction, Testing, and Maintenance of Water Well Systems, 2014
	3. Plastic Well Casing Pipe	ASTM-F-480-17 - Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR)
	4. Resilience	ASCE MOP 140 - Climate-Resilient Infrastructure: Adaptive Design and Risk Management, 2018
Treatment	1. Design Parameters	GLUMRB - Recommended Standards for Water Works, 2012
	2. Chemicals	AWWA - Standards for Potable Water Source, Storage, Treatment, and Distribution
	3. Automation, Instrumentation and Control	a. GLUMRB - Recommended Standards for Water Works, 2012 b. AWWA M2 - Instrumentation & Control, Third Edition c. WEF MOP 26 – GIS Implementation for Water and Wastewater Treatment Facilities
	4. Electrical	NFPA (National Electric Code)
	5. Energy Conservation	WEF MOP 32 – Energy Conservation in Water and Wastewater Facilities
	6. Flood Resistance	ASCE/SEI 24-14 – Flood Resistant Design and Construction
	7. Materials	NSF/ANSI Standard 61 – Drinking Water System Components – Health Effects
	8. Rehabilitation	WEF MOP 28 – Upgrading and Retrofitting Water and Wastewater Treatment Plants
	9. Structures	a. ICC – International Building Code (IBC) b. ICC – International Existing Building Code (IEBC) c. ICC – International Energy Conservation Code (IECC) d. ICC – International Wildland-Urban Interface Code (IWUIC) e. ASCE/SEI 7-16 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures



	10. Resilience:	<ul style="list-style-type: none"> a. ASCE MOP 140 - Climate-Resilient Infrastructure: Adaptive Design and Risk Management, 2018 b. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas c. NFPA 1142, Standard on Water Supplies for Suburban and Rural Firefighting d. NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire
Finished Water Storage	1. Design Parameters	GLUMRB - Recommended Standards for Water Works 2012
	2. Automation, Instrumentation and Control	<ul style="list-style-type: none"> a. GLUMRB - Recommended Standards for Water Works, 2012 b. AWWA M2 - Instrumentation & Control, Third Edition c. WEF MOP 26 – GIS Implementation for Water and Wastewater Treatment Facilities
	3. Materials	<p>Steel Structures:</p> <ul style="list-style-type: none"> a. AWWA - Standards for Potable Water Source, Storage, Treatment, and Distribution b. AWWA M42 - Steel Water-Storage Tanks, Revised Edition <p>Covers:</p> <ul style="list-style-type: none"> c. AWWA M25 - Flexible Membrane Covers and Linings for Potable-Water Reservoirs
	4. Flood Resistance	ASCE/SEI 24-14 – Flood Resistant Design and Construction
	5. Structures	<ul style="list-style-type: none"> a. ICC – International Building Code (IBC) b. ICC – International Existing Building Code (IEBC) c. ASCE/SEI 7-16 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures
	6. Resilience	<ul style="list-style-type: none"> a. ASCE MOP 140 - Climate-Resilient Infrastructure: Adaptive Design and Risk Management, 2018 b. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas c. NFPA 1142, Standard on Water Supplies for Suburban and Rural Firefighting d. NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire
	1. Design Parameters	GLUMRB - Recommended Standards for Water Works, 2012
	2. Automation, Instrumentation and Control	<ul style="list-style-type: none"> a. GLUMRB - Recommended Standards for Water Works, 2012 b. AWWA M2 - Instrumentation & Control, Third Edition c. WEF MOP 26 – GIS Implementation for Water and Wastewater Treatment Facilities



Pumping (Transmission and Distribution)	3. Electrical	NFPA -National Electric Code
	4. Flood Resistance	ASCE/SEI 24-14 – Flood Resistant Design and Construction
	5. Energy Conservation	WEF MOP 32 – Energy Conservation in Water and Wastewater Facilities
	6. Structures	a. ICC – International Building Code (IBC) b. ICC – International Existing Building Code (IEBC) c. ASCE/SEI 7-16 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures
	7. Resilience	a. ASCE MOP 140 - Climate-Resilient Infrastructure: Adaptive Design and Risk Management, 2018 b. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas c. NFPA 1142, Standard on Water Supplies for Suburban and Rural Firefighting d. NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire
Piping and Appurtenances (Transmission and Distribution)	1. Design Parameters	a. GLUMRB - Recommended Standards for Water Works, 2012 b. AWWA M22 - Sizing Water Service Lines and Meters, Third Edition c. AWWA M11 - Steel Pipe: A Guide for Design and Installation, Fifth Edition d. AWWA M23 - PVC Pipe Design and Installation, Second Edition e. AWWA M31 - Distribution System Requirements for Fire Protection, Fourth Edition f. AWWA M55 - PE Pipe Design and Installation g. AWWA M45 - Fiberglass Pipe Design, Third Edition h. AWWA M68 – Water Quality in Distribution Systems
	2. Rehabilitation	a. AWWA M28 - Rehabilitation of Water Mains, Third Edition b. AWWA M77 - Condition Assessment of Water Mains
	3. Materials	a. GLUMRB - Recommended Standards for Water Works, 2012 b. AWWA - Standards for Potable Water Source, Storage, Treatment, and Distribution c. AWWA M33 - Flowmeters in Water Supply, Third Edition d. AWWA M41 - Ductile-Iron Pipe and Fittings, Third Edition e. AWWA M44 - Distribution Valves: Selection, Installation, Field Testing & Maintenance f. AWWA M6 - Water Meters: Selection, Installation, Testing & Maintenance, Fifth Edition g. NSF/ANSI: Standard 14 – Plastic Pipe System Components and Related Materials



QUICK REFERENCE

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		h. NSF/ANSI Standard 61 – Drinking Water System Components – Health Effects
	4. Installation	a. GLUMRB - Recommended Standards for Water Works, 2012 b. AWWA - Standards for Potable Water Source, Storage, Treatment, and Distribution c. ASCE MOP 132 – Renewal of Potable Water Pipes; d. ASCE MOP 108 – Pipeline Design for Installation by Horizontal Directional Drilling, Second Edition e. ASCE MOP 106 Horizontal Auger Boring Projects, Second Edition
	5. Automation, Instrumentation and Control	a. GLUMRB - Recommended Standards for Water Works, 2012 b. AWWA M2 - Instrumentation & Control, Third Edition c. WEF MOP 26 – GIS Implementation for Water and Wastewater Treatment Facilities
	6. Electrical	NFPA - National Electric Code
	7. Resilience	a. ASCE MOP 140 - Climate-Resilient Infrastructure: Adaptive Design and Risk Management, 2018 b. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas c. NFPA 1142, Standard on Water Supplies for Suburban and Rural Firefighting d. NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire



WASTEWATER

Gravity Sewers	1. Design Parameters	<ul style="list-style-type: none"> a. GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014 b. ASCE MOP 60 - Gravity Sanitary Sewer Design and Construction Second Edition, 2007 c. WEF MOP FD-12 – Alternative Sewer Systems, 2nd Edition d. WEF MOP FD-17 - Prevention and Control of Sewer System Overflows, 3rd Edition
	2. Materials	GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014
	3. Installation	<ul style="list-style-type: none"> a. ASTM D-2321-18 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Installations b. ASTM F-1417-11a (2015) - Standard Practice for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air c. ASTM C-12-17 - Standard Practice for Installing Vitrified Clay Pipe Lines d. ASTM C-828-11 - Standard Test Method for Low Pressure Air Test of Vitrified Clay Pipe Lines e. ASCE MOP 108 - Pipeline Design for Installation by Horizontal Directional Drilling, Second Edition f. ASCE MOP 106 - Horizontal Auger Boring Projects, Second Edition g. ASCE MOP 60 - Gravity Sanitary Sewer Design and Construction Second Edition, 2007
	4. Resilience	ASCE MOP 140 - Climate-Resilient Infrastructure: Adaptive Design and Risk Management, 2018
Manholes	1. Design Parameters	GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014
	2. Materials	<ul style="list-style-type: none"> a. GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014 b. ASTM C-478-18 - Standard Specification for Circular Precast Reinforced Manhole Sections
	3. Installation	<ul style="list-style-type: none"> a. GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014 b. ASTM C-1244 - Standard Test Method for Concrete Sewer Manholes Negative Air Pressure (Vacuum) Test Prior to Backfill
	4. Flood Resistance	ASCE/SEI 24-14 – Flood Resistant Design and Construction
	5. Resilience	ASCE MOP 140 - Climate-Resilient Infrastructure: Adaptive Design and Risk Management, 2018



Pumping	1. Design Parameters	a. GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014 b. WEF MOP FD-4 - Design of Wastewater and Stormwater Pumping Stations
	2. Electrical	NFPA - National Electrical Code
	3. Materials	GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014
	4. Installation	GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014
	5. Energy Conservation	WEF MOP 32 - Energy Conservation in Water and Wastewater Facilities
	6. Flood Resistance	ASCE/SEI 24-14 - Flood Resistant Design and Construction
	7. Resilience	a. ASCE MOP 140 - Climate-Resilient Infrastructure: Adaptive Design and Risk Management, 2018 b. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas c. NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire
	8. Automation, Instrumentation, and Controls	a. GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014 b. WEF MOP 21 - Automation of Water Resource Recovery Facilities, 4th Edition c. WEF MOP 26 - GIS Implementation for Water and Wastewater Treatment Facilities d. WEF FS - Sanitary Sewer Systems: Lift Stations and Data Management Fact Sheet, 2019
	9. Rehabilitation	WEF MOP FD-6 - Existing Sewer Evaluation and Rehabilitation
	10. Structures	a. ICC - International Building Code (IBC) b. ICC - International Existing Building Code (IEBC) c. ASCE/SEI 7-16 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures
Force Mains	1. Design Parameters	GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014
	2. Materials	GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014
	3. Installation	GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014
	4. Resilience	ASCE MOP 140 - Climate-Resilient Infrastructure: Adaptive Design and Risk Management, 2018



Treatment	1. Design Parameters	<ul style="list-style-type: none"> a. GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014 b. WEF MOP 8 - Design of Water Resource Recovery Facilities c. WEF MOP 25 - Control of Odors and Emissions from Wastewater Treatment Plants d. WEF MOP FD-19 – Natural Systems for Wastewater Treatment, 3rd Edition e. WEF MOP 28 – Upgrading and Retrofitting Water and Wastewater Treatment Plants
	2. Electrical	NFPA - National Electric Code
	3. Materials	GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014
	4. Installation	GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014
	5. Energy Conservation	<ul style="list-style-type: none"> a. WEF MOP 32 – Energy Conservation in Water and Wastewater Facilities b. WEF MOP 38 – Sustainability and Energy Management for Water Resource Recovery Facilities
	6. Structures	<ul style="list-style-type: none"> a. ICC – International Building Code (IBC) b. ICC – International Existing Building Code (IEBC) c. ICC – International Energy Conservation Code (IECC) d. ICC – International Wildland-Urban Interface Code (IWUIC) e. ASCE/SEI 7-16 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures
	7. Resilience	<ul style="list-style-type: none"> a. ASCE MOP 140 - Climate Resilient Infrastructure Adaptive Design and Risk Management, 2018 b. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas c. NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire
	8. Flood Resistance	ASCE/SEI 24-14 – Flood Resistant Design and Construction
	9. Automation, Instrumentation, and Controls	<ul style="list-style-type: none"> a. GLUMRB - Recommended Standards for Wastewater Facilities (Ten States Standards), 2014 b. WEF MOP 21 – Automation of Water Resource Recovery Facilities, 4th Edition c. WEF MOP 26 – GIS Implementation for Water and Wastewater Treatment Facilities d. WEF FS – Sanitary Sewer Systems: Lift Stations and Data Management Fact Sheet, 2019



ROADS AND BRIDGES

<p>Geotechnical</p>	<p>1. FHWA Geotechnical Engineering Circulars</p>	<p>No. 4 - Ground Anchors and Anchored Systems (June 1999) No. 5 - Geotechnical Site Characterization (November 2016) No. 6 - Shallow Foundations (September 2002) No. 7 - Soil Nail Walls (March 2015) No. 8 - Design and Construction of Continuous Flight Auger Piles (April 2007) No. 9 - Design and Analysis of Laterally Loaded Deep Foundations (April 2018) No. 10 - Drilled Shafts: Construction and Design Methods (September 2018) No. 11 - Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Vol I, Vol II, (November 2009) No. 12 - Design and Construction of Driven Pile Foundations (September 2016) No. 13 - Ground Modifications Reference Manual Vol I, Vol II (April 2017) No. 14 - Assuring Quality in Geotechnical Reporting Documents (August 2106) No. 15 - Geotechnical Differing Site Conditions (05/02/1998) No. 16 - Determination of Unknown Subsurface Bridge Foundations (08/27/1998) HIF-17-024 - Evaluation and Guidance Document for Post-Grouted Drilled Shafts for Highways (March 2017)</p>
<p>Roads</p>	<p>1. Design Parameters</p>	<p>a. FHWA - Federal Lands Highway Project Development and Design Manual (PDDM) (2018) b. FHWA - 23 CFR Part 625 - Design Standards for Highways c. AASHTO - A Policy on Geometric Design of Highways and Streets d. AASHTO Pavement Design, Construction, and Management: A Digital Handbook, 1st Edition e. AASHTO Guidelines for Geometric Design of Low-Volume Local Roads, 2019 Edition</p>
	<p>2. Materials</p>	<p>a. FHWA - Federal Lands Highway Project Development and Design Manual (PDDM) (2018) b. FHWA - 23 CFR Part 625 - Design Standards for Highways</p>
	<p>3. Installation</p>	<p>a. FHWA - Federal Lands Highway Project Development and Design Manual (PDDM) (2018) b. FHWA - 23 CFR Part 625 - Design Standards for Highways</p>
	<p>4. Resilience</p>	<p>a. ASCE MOP 140 - Climate Resilient Infrastructure Adaptive Design and Risk Management, 2018</p>



		<ul style="list-style-type: none"> b. FHWA HEC 17 - Highways in the River Environment- Floodplains, Extreme Events, Risk, and Resilience, 2nd Edition c. FHWA HEC 25 - Highways in the Coastal Environment: Assessing Extreme Events, Volume 2 d. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas
	5. Flood Resistance	<ul style="list-style-type: none"> a. ASCE/SEI 24-14 - Flood Resistant Design and Construction b. FHWA HEC 17 - Highways in the River Environment- Floodplains, Extreme Events, Risk, and Resilience, 2nd Edition c. FHWA HEC 25 - Highways in the Coastal Environment: Assessing Extreme Events, Volume 2
Culverts and Drainage	1. Design Parameters	<ul style="list-style-type: none"> a. FHWA - Federal Lands Highway Project Development and Design Manual (PDDM) (2018) b. FHWA - 23 CFR Part 625 - Design Standards for Highways c. AASHTO Drainage Manual, CD-ROM d. AASHTO Highway Drainage Guidelines, 4th Edition. FHWA HEC 24 – Highway Stormwater Pump Station Design, 2001 f. FHWA HEC 14 – Hydraulic Design of Energy Dissipators for Culverts and Channels, 3rd Edition g. FHWA HDS 2 - Highway Hydrology, 2nd Edition h. FHWA HDS 4 - Introduction to Highway Hydraulics i. FHWA HDS 5 – Hydraulic Design of Highway Culverts j. FHWA HDS 6 – River Engineering for Highway Encroachments k. FHWA HEC 9 – Debris Control Structures Evaluation and Countermeasures, 3rd Edition l. FHWA HEC 15 – Design of Roadside Channels with Flexible Linings, 3rd Edition m. FHWA HEC 20 – Stream Stability at Highway Structures, 4th Edition n. FHWA HEC 22 – Urban Drainage Design Manual, 3rd Edition o. FHWA HEC 26 - Culvert Design for Aquatic Organism Passage, 2010
	2. Materials	<ul style="list-style-type: none"> a. FHWA - Federal Lands Highway Project Development and Design Manual (PDDM) (2018) b. FHWA - 23 CFR Part 625 - Design Standards for Highways
	3. Installation	<ul style="list-style-type: none"> a. FHWA - Federal Lands Highway Project Development and Design Manual (PDDM) (2018) b. FHWA - 23 CFR Part 625 - Design Standards for Highways
	4. Resilience	<ul style="list-style-type: none"> a. ASCE MOP 140 - Climate Resilient Infrastructure Adaptive Design and Risk Management, 2018 b. FHWA HEC 17 - Highways in the River Environment- Floodplains, Extreme Events, Risk, and Resilience, 2nd Edition



		<p>c. FHWA HEC 25 - Highways in the Coastal Environment: Assessing Extreme Events, Volume 2</p> <p>d. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas</p>
<p>Bridges</p>	<p>1. Design Parameters</p>	<p>a. FHWA - Federal Lands Highway Project Development and Design Manual (PDDM) (2018)</p> <p>b. FHWA - 23 CFR Part 625 - Design Standards for Highways</p> <p>c. AASHTO - LRFD Bridge Design Specifications</p> <p>d. AASHTO - LRFD Movable Highway Bridge Design Specifications;</p> <p>e. FHWA HIF-18-041 - Report on Techniques for Bridge Strengthening, 2019</p> <p>f. FHWA HIF-18-046 - Manual for Refined Analysis in Bridge Design and Evaluation, 2019</p> <p>g. FHWA HDS 7 - Hydraulic Design Safe Bridges; 2012</p> <p>h. FHWA HEC 21 - Design of Bridge Deck Drainage</p> <p>i. FHWA HEC 22 - Urban Drainage Design Manual, 3rd Edition</p> <p>j. FHWA HEC 23 - Bridge Scour and Stream Instability Countermeasures: Experience, Selection, and Design Guidance, 3rd Edition, Volume 2</p> <p>k. AASHTO LRFD Guide Specifications for Accelerated Bridge Construction, 1st Edition</p> <p>l. AASHTO Guide Specifications for LFRD Seismic Bridge Design, 2nd Edition</p> <p>m. AASHTO Guide Specifications for Design of Bonded FRP Systems for Repair or Strengthening of Concrete Bridge Elements, 1st Edition</p> <p>n. AASHTO Guide Specifications for Bridges Vulnerable to Coastal Storms, 1st Edition</p> <p>o. AASHTO Guide Specifications for Design and Construction of Segmental Concrete Bridges, 2nd Edition</p> <p>p. AASHTO Guide Specifications for Wind Loads on Bridges During Construction, 1st Edition</p> <p>q. FHWA HEC 18 - Evaluating Scour at Bridges, 2012</p>
	<p>2. Materials</p>	<p>a. ACI 301-16 - Specifications for Structural Concrete,</p> <p>b. ACI-341.2R-14 - Analysis and Design of Seismic-Resistant Concrete Bridge Systems</p> <p>c. ACI-341.3R-07 - Seismic Evaluation and Retrofit Techniques for Concrete Bridges</p> <p>d. ACI-341.4R-16 - Report on the Seismic Design of Bridge Columns Based on Drift</p> <p>e. ACI-342R-16 - Report on Flexural Live Load Distribution Methods for Evaluating Existing Bridges</p> <p>f. ACI-343R-95 - Analysis & Design of Reinforced Concrete Bridge Structures (Reapproved 2004)</p>



QUICK REFERENCE

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		<ul style="list-style-type: none"> g. ACI-345.1R-16 - Guide to Maintenance of Concrete Bridge Members h. ACI-345.2R-13 - Guide for Widening Highway Bridges ACI-345R-11 - Guide for Concrete Highway Bridge Deck Construction i. ACI-548.10-10 - Specification for Type MMS (Methyl Methacrylate Slurry) Polymer Overlays for Bridge and Parking Garage Decks j. ACI-548.8-07 - Specification for Type EM (Epoxy Multi-Layer) Polymer Overlay for Bridge and Parking Garage Decks k. ACI-548.9-08 - Specification for Type ES (Epoxy Slurry) Polymer Overlays for Bridge and Parking Garage Decks l. ANSI/AISC 303 - Code of Standard Practice for Steel Buildings and Bridges
	3. Installation	<ul style="list-style-type: none"> a. AASHTO - Standard Specifications for Highway Bridges b. AASHTO - LRFD Bridge Construction Specifications c. AASHTO/AWS D1.5M/D1.5 - Bridge Welding Code d. AWS D1.4/D1.4M - 2011 Structural Welding Code, Reinforcing Steel
	4. Resilience	<ul style="list-style-type: none"> a. ASCE MOP 140 - Climate Resilient Infrastructure Adaptive Design and Risk Management, 2018 b. FHWA HEC 17 - Highways in the River Environment- Floodplains, Extreme Events, Risk, and Resilience, 2nd Edition c. FHWA HEC 25 - Highways in the Coastal Environment: Assessing Extreme Events, Volume 2 d. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas



ELECTRIC POWER

<p>Generation: There are several types of plants and equipment that can generate electric energy. Below is a listing of the most common</p>	<p>1. Coal, Lignite, or Biomass Fired Steam Plant</p>	<p>a. Power - NESC b. Existing Buildings – IEBC & IWUIC c. New or Replacement Buildings - IBC, IRC, ASCE/SEI 7-16, IWUIC & IECC</p>
	<p>2. Nuclear Steam Plant</p>	<p>a. Power – NESC b. Existing Buildings – IEBC & IWUIC c. New or Replacement Buildings - IBC, IRC, ASCE/SEI 7-16, IWUIC & IECC</p>
	<p>3. Natural Gas or Oil-fired Steam Plant</p>	<p>a. Power – NESC b. Existing Buildings – IEBC & IWUIC c. New or Replacement Buildings - IBC, IRC, ASCE/SEI 7-16, IWUIC & IECC</p>
	<p>4. Hydro Plant</p>	<p>a. Power - NESC b. Existing Buildings - IEBC & IWUIC c. New or Replacement Buildings - IBC, IRC, ASCE/SEI 7-16, IWUIC & IECC</p>
	<p>5. Combustion Turbine</p>	<p>a. Power - NESC b. Existing Buildings – IEBC & IWUIC c. New or Replacement Buildings - IBC, IRC, ASCE/SEI 7-16, IWUIC & IECC</p>
	<p>6. Solar Panels or Other Solar Powered Devices</p>	<p>a. Power - NESC for portion b. Existing Buildings – IEBC & IWUIC c. New or Replacement Buildings - IBC, IRC, ASCE/SEI 7-16, IWUIC & IECC</p>
	<p>7. Wind Turbines</p>	<p>a. Power - NESC b. Existing Buildings – IEBC & IWUIC c. New or Replacement Buildings - IBC, IRC, ASCE/SEI 7-16, IWUIC & IECC</p>
<p>Transmission: RUS Bulletin 1730B-2 applies to all transmission and distribution</p>	<p>1. Overhead Transmission</p>	<p>a. Conductor – RUS Bulletin 1724D-106, RUS Bulletin 1728F-811, and RUS Bulletin 1724E-203 b. Transmission Substations – NESC & ASCE MOP74 for substations; NESC for power portion, IEBC for existing buildings if any buildings, and IBC, IRC, ASCE/SEI 7-16, & IECC for new or replacement buildings c. Wood poles –RUS Bulletin 1724E-200 RUS Bulletin 1728H-701, RUS Bulletin 1728F-811, & RUS Bulletin 1728F-810 d. Steel single pole and H Frame Structures – RUS Bulletin 1724E-204, RUS Bulletin 1724E-214, RUS Bulletin 1724E-203, RUS Bulletin 1724E-205, RUS Bulletin 1728F-811, & RUS Bulletin 1724E-224 e. Pre-stressed concrete poles and concrete pole structures – RUS Bulletin 1724E-206, RUS Bulletin 1724E-216, RUS</p>



		<p>Bulletin 1724E-203, RUS Bulletin 1724E-205, RUS Bulletin 1724E-226, and RUS Bulletin 1728F-811</p> <p>f. International Wildland-Urban Interface Code (IWUIC)</p> <p>g. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas;</p> <p>h. NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire</p>
	<p>2. Underground Transmission</p>	<p>a. Insulated conductor replacement or repair – NESC</p> <p>b. Conduit repair or replacement – NESC</p> <p>c. Risers – NESC</p>
<p>Electric Distribution RUS Bulletin 1730B-2 applies to all transmission and distribution</p>	<p>1. Overhead Distribution</p>	<p>a. Distribution pole</p> <p>i. Wood poles designs for 12kV voltage - RUS Bulletin 1724E-150, RUS Bulletin 1724E-151, RUS Bulletin 1724E-153, RUS Bulletin 1724E-154, RUS Bulletin 1728F-700, Bulletin 1728F-804, and RUS Bulletin 1730-B121</p> <p>ii. Wood poles designs for 25kV voltage –RUS Bulletin 1724E-150, RUS Bulletin 1724E-151, RUS Bulletin 1724E-153, RUS Bulletin 1724E-154, RUS Bulletin 1728F-700, RUS Bulletin 1728F-803, and RUS Bulletin 1730-B121</p> <p>iii. Wood poles designs for 35kV voltage – RUS Bulletin 50-4, RUS Bulletin 1724E-150, RUS Bulletin 1724E-151, RUS Bulletin 1724E-153, RUS Bulletin 1724E-154, RUS Bulletin 1728F-700, and RUS Bulletin 1730-B121</p> <p>b. Conductor – RUS Bulletin 50-4, RUS Bulletin 1724D-106, and RUS Bulletin 1724E-152</p> <p>c. Substation – RUS Bulletin 50-4 and RUS Bulletin 1724E-300</p> <p>d. International Wildland-Urban Interface Code (IWUIC)</p> <p>e. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas</p> <p>f. NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire</p>
	<p>2. Underground Distribution</p>	<p>a. Insulated conductor replacement or repair – NESC, RUS Bulletin 1728F-806</p> <p>b. Conduit repair or replacement – NESC, RUS Bulletin 1728F-806</p> <p>c. Risers -- NESC, RUS Bulletin 1728F-806</p>
<p>Emergency Operations Center ICC 500 Standards & ASCE SEI 7, 24, & 41</p>	<p>Building</p>	<p>a. International Wildland-Urban Interface Code (IWUIC)</p> <p>b. NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas</p> <p>c. NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire</p>