



### Key Topics:

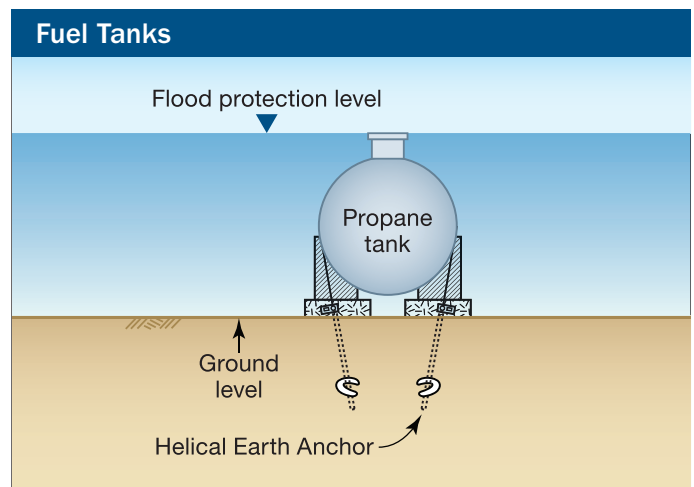
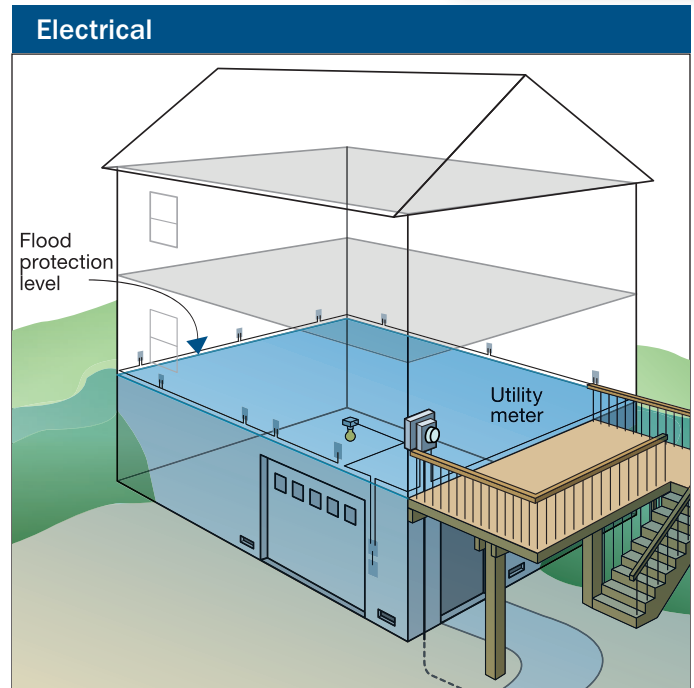
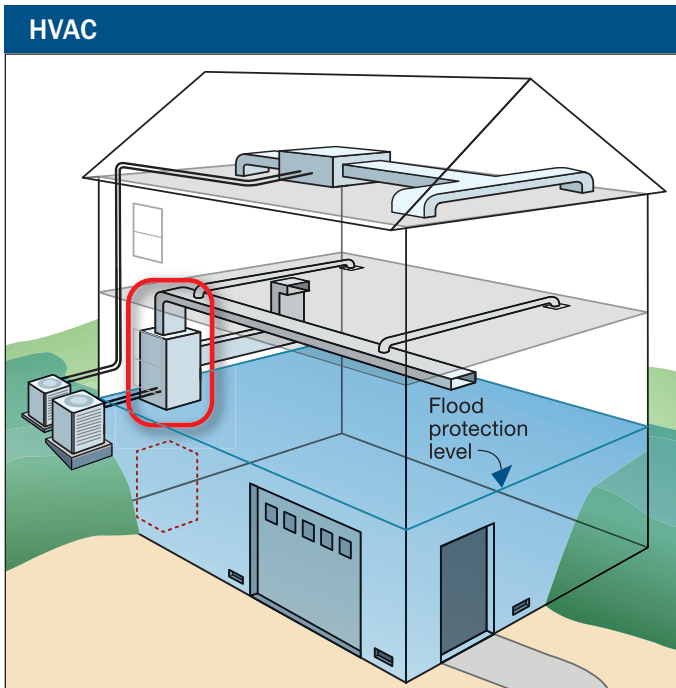
- Flood risks to, and mitigation for:
  - HVAC (heating, ventilation, and air conditioning) components (Sections 3.2, 4.1, and 5.1)
  - Electrical systems (including generators) (Sec. 4.2 and 5.2)
  - Plumbing systems (including backflow prevention) (Sec. 4.3 and 5.3)
  - Fuel systems (including anchoring) (Sec. 4.4 and 5.4)
- Raising utility systems (Sec. 3.1)
- Residential buildings (Chapter 4)
- Non-residential buildings (Ch. 5)
- NFIP requirements (Sec. 2.1–2.3)



### Protecting Building Utility Systems From Flood Damage

Principles and Practices for the Design and Construction of Flood Resistant Building Utility Systems

FEMA P-348, Edition 2 / February 2017



## Description

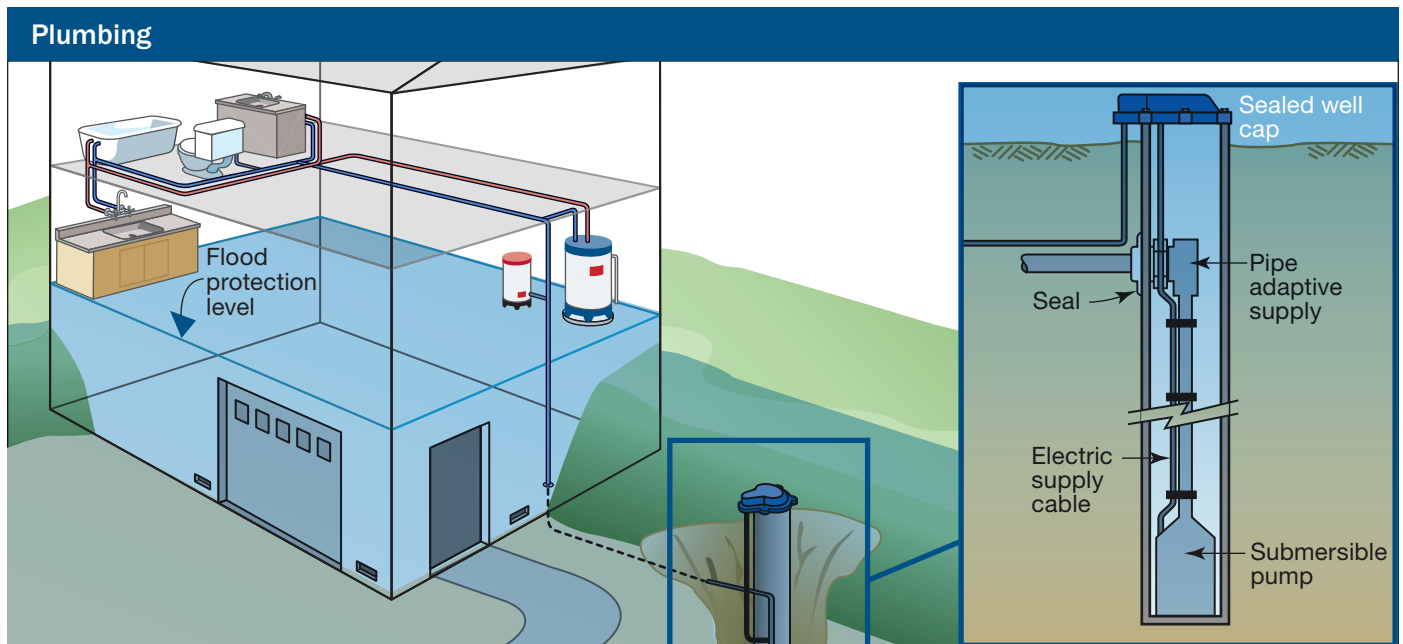
This publication illustrates the design and construction of utility systems that comply with the National Flood Insurance Program (NFIP) requirements for construction of new residential and non-residential structures in flood-prone areas. It is also useful when evaluating structures that will undergo Substantial Improvement, guiding users to meet floodplain management regulations and building code requirements. Even if compliance is not required, many building owners may find that applying mitigation measures described in this publication will not only reduce future flood damage, but also facilitate recovery after flooding.

## Target Audience

Developers, property managers, designers (architects and engineers), building contractors, building owners, maintainers and operators of residential, non-residential and multi-family buildings, local officials responsible for enforcing floodplain management regulations and building codes.

## General Publication Content

- Building Systems and Flood Hazards
  - Flood Hazard Characteristics and Flood Loads
  - Risk Assessment and Risk Reduction
- Regulatory Framework
  - National Flood Insurance Program Regulations
  - Building Codes and Standards
- National Flood Insurance Program Compliance and Mitigation Measures
  - Elevation, Relocation, and Component Protection
  - Partial Protection Measures when Compliance is not required
- Mitigation for Residential Buildings and Non-Residential Buildings
  - Heating, Ventilation and Air Conditioning (HVAC)
  - Electrical Systems
  - Plumbing Systems
  - Fuel Systems and Tanks
  - Conveyances – Elevators and Lifts



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