



Improving the quality of life

DESIGNING WITH FLOODPLAIN MANAGEMENT IN MIND

OHIO COMMUNITY DEVELOPMENT CONFERENCE

JENNIFER MILLER NOVEMBER 20, 2014

FLOODPLAIN MANAGEMENT



- Executive Order 11988
- Implementing regulations are found at
 - 24 CFR Part 55**
 - > Establishes the 8-step decision-making process for evaluating floodplain impacts
 - > Exempts from evaluation a number of administrative actions and actions with minimal impacts; these are listed in Section 55.12 (b) and (c)



FLOODPLAIN MANAGEMENT

Definitions

- > Base floodplain: the 1% annual chance floodplain (also known as the 100-year floodplain) as identified by FEMA
- > 500-year floodplain: the 0.2% annual chance floodplain as identified by FEMA



SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD	
<small>The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.</small>	
ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
FLOODWAY AREAS IN ZONE AE	
<small>The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.</small>	
OTHER FLOOD AREAS	
ZONE X	<small>Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.</small>
OTHER AREAS	
ZONE X	<small>Areas determined to be outside the 0.2% annual chance floodplain.</small>
ZONE D	<small>Areas in which flood hazards are undetermined, but possible.</small>
COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS	
OTHERWISE PROTECTED AREAS (OPAs)	

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

FLOODPLAIN MANAGEMENT



- > Critical action: any activity for which even a slight chance of flooding would be too great, because such flooding might result in loss of life, injury to persons, or damage to property.
 - Facilities that produce, use or store highly volatile, flammable, explosive, toxic or water-reactive materials
 - Facilities providing essential and irreplaceable records or utility or emergency services that could become unavailable due to flooding
 - Facilities likely to contain persons who may not be mobile enough to avoid loss of life or injury during flood or storm events

FLOODPLAIN MANAGEMENT



- Critical action includes:
 - > Data storage centers
 - > Generating plants
 - > Police and fire stations
 - > Principal utility lines
 - > Roadways providing sole egress from flood-prone areas
 - > Hospitals
 - > Nursing homes
 - > Convalescent care centers
 - > Intermediate care facilities
 - > Board and care facilities
 - > Retirement service centers
 - > Facilities dedicated to serving those who live in nursing homes, etc.
- But not:
 - > Independent living for the elderly

FLOODPLAIN MANAGEMENT

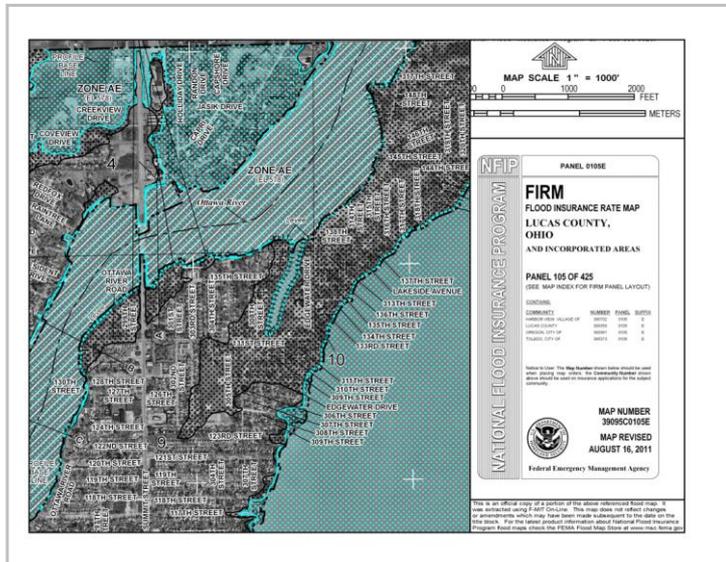


ACTION	FLOODWAYS	COASTAL HIGH HAZARD AREAS	100-YEAR FLOODPLAIN	500-YEAR FLOODPLAIN
Critical Action	Not allowed	Not allowed	Allowed if processed under Section 55.20	Allowed if processed under Section 55.20
Non-Critical Actions*	Allowed if functionally dependent use and processed under 55.20	Allowed with conditions and if processed under 55.20	Allowed if processed under 55.20	Allowed without conditions

SECTION 55.20 (8-STEP PROCESS)



- Step 1: Determine if the proposed project is in the base floodplain (or 500-year floodplain for critical actions)
 - > Floodplain borders are determined by FEMA, as shown on the current Flood Insurance Rate Map for the project site – see Map Service Center
 - > To be removed from the floodplain, a qualifying project could obtain a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR) from FEMA



SECTION 55.20 (8-STEP PROCESS)

- Step 2: Early public review
 - > Publish "Early Notice and Public Review" for the proposed activity
 - > Sample notice available on HUD website
 - > Minimum 15-day comment period
 - > Involve the interested public in the decision-making process and address any comments received

SECTION 55.20 (8-STEP PROCESS)

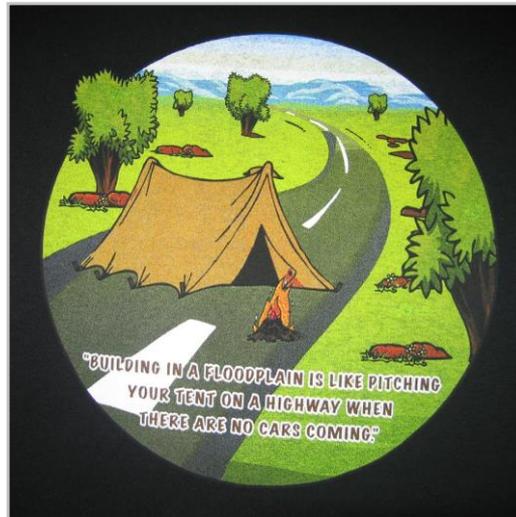


- Step 3: Identify and evaluate practicable alternatives
 - > Evaluation should always include the “no action” alternative
 - > Evaluation should always include locating outside the floodplain
 - > Discuss program requirements and objectives as part of the evaluation
 - > HUD wishes to avoid floodplain development if possible, so be certain to document solid reasons for eliminating any alternative that does not cause or promote floodplain development

SECTION 55.20 (8-STEP PROCESS)



- Step 4: Identify potential direct and indirect impacts associated with floodplain development
 - > Be thorough – even if some or all impacts will be mitigated, they must be evaluated and discussed here
 - > Projects not located within the floodplain but which could have impacts in the floodplain or promote development (of other projects) in the floodplain must also go through this evaluation



- Direct impact...

SECTION 55.20 (8-STEP PROCESS)



- Indirect impacts - utilities:
 - > Locating new utilities in or adjacent to the floodplain can encourage more, or more intense, floodplain development
 - Roads
 - Water/wastewater
 - Power/natural gas

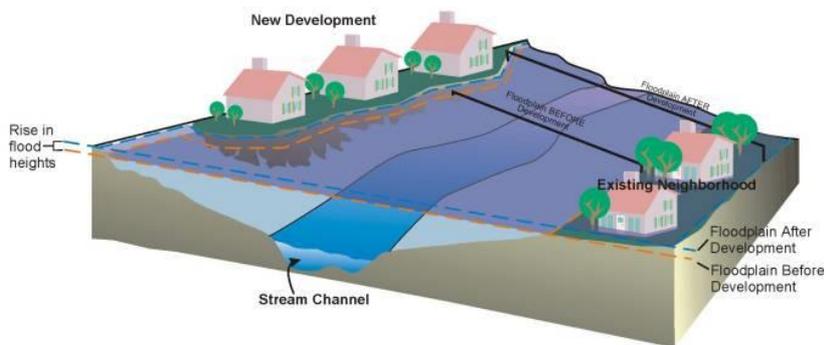
SECTION 55.20 (8-STEP PROCESS)



- Indirect impacts – public buildings:
 - > Plan new facilities so that they will remain open during flooding and will not be cut off from parts of the community by flooded roads
 - Fire and police stations
 - Emergency centers
 - Water and wastewater treatment plants
 - Municipal maintenance centers



Development Causing A Rise



- One property's floodplain mitigation is another's indirect impact

SECTION 55.20 (8-STEP PROCESS)



- Step 5: Minimize harm and restore and preserve natural and beneficial values
 - > Mitigations!
 - > Based on the impacts identified previously, what can be done to minimize the negative effects of the project and promote the continued proper function of the existing floodplain system?

SECTION 55.20 (8-STEP PROCESS)



- Critical actions have specific requirements:
 - > New construction built at or above 100-year floodplain elevation
 - > Preparation of and participation in early warning system
 - > Emergency evacuation and relocation plan
 - > Identification of evacuation routes out of the 500-year floodplain
 - > Identification marks of past or estimated flood levels on all structures

SECTION 55.20 (8-STEP PROCESS)



- Step 6: Reevaluate the proposed action:
 - > Is it still practicable in light of exposure to flood hazards, aggravation of current hazards to other floodplains and/or potential to disrupt floodplain values?
 - > Are alternatives rejected in Step 3 practicable in light of evaluation done during Steps 4 and 5?
 - > If decide to limit the action to make it more practicable, return to Steps 3-5 and evaluate the revised proposal

SECTION 55.20 (8-STEP PROCESS)



- Step 7: If the reevaluation determines that there are no practicable alternatives to the proposed action in the floodplain, publish the Final Notice and Explanation, including discussion of:
 - > Why the proposed action must be located in the floodplain
 - > Alternatives considered
 - > Mitigation measures to be taken
- Minimum 7-day public comment period

SECTION 55.20 (8-STEP PROCESS)



- Step 8: Implement the proposed action
 - > Responsible entity has continuing obligation to ensure that mitigating measures are implemented



- Questions?



MANAGEMENT CONCEPTS

- No Adverse Impact (NAI) Floodplain Management: the actions of one property owner are not allowed to adversely affect the rights of other property owners
- Low Impact Development (LID): design a hydrologically functional site that mimics predevelopment conditions
- Wet Weather Green Infrastructure: specific strategies used for controlling storm hydrology



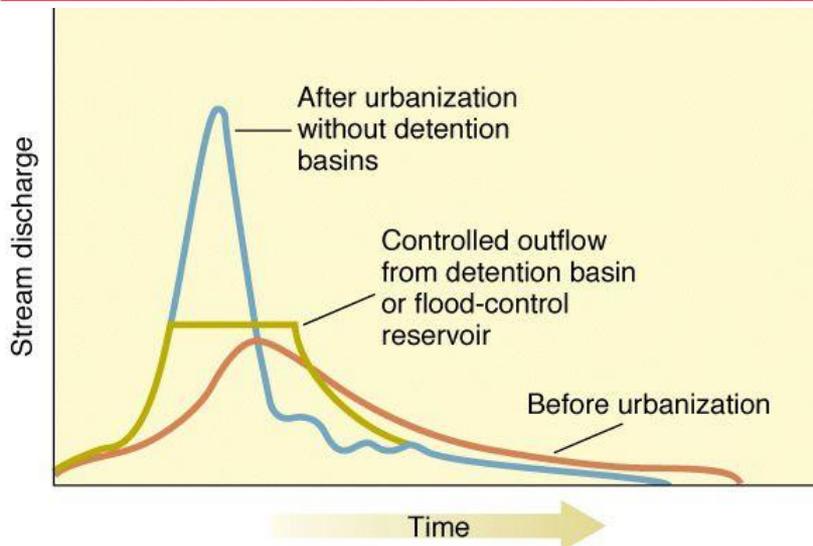
MANAGEMENT CONCEPTS

- NAI floodplain management is implemented via a locally developed management plan that defines a community's priorities: what negative effects are to be controlled?
 - > Can be narrowly defined to include only flood damage, or can encompass related issues such as water quality protection, groundwater recharge, stormwater management, or wetland and riparian corridor management

MANAGEMENT CONCEPTS



- Community activities that can incorporate NAI:
 - > Hazard identification
 - > Education and outreach
 - > Planning
 - > Regulations and standards
 - > Mitigation actions
 - > Infrastructure
 - > Emergency services



- LID attempts to maintain streamflow hydrograph at "before" condition

MANAGEMENT CONCEPTS

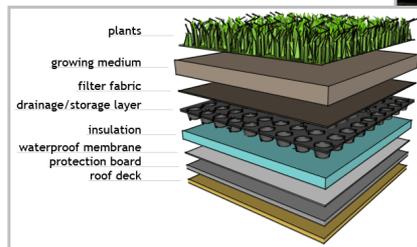


- LID/wet weather green infrastructure strategies:
 - > Green roofs
 - > Rain gardens
 - > Planter boxes
 - > Bioswales
 - > Rainwater harvesting
 - > Permeable pavement
 - > Downspout disconnection
 - > Urban tree canopy
 - > Green streets and alleys
 - > Green parking
 - > Land conservation

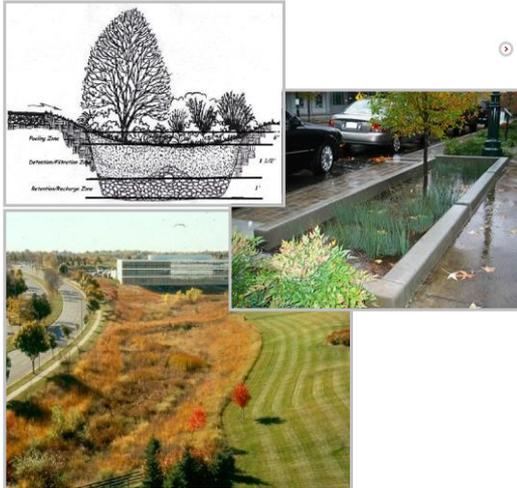
MANAGEMENT CONCEPTS



- Green roofs
 - > Reduce runoff
 - > Also tend to reduce urban heat island effect



MANAGEMENT CONCEPTS



- Rain gardens, planter boxes and bioswales
 - > Vegetated areas engineered to store stormwater, remove excess nutrients and suspended solids and increase infiltration when compared to a paved surface and storm sewer

MANAGEMENT CONCEPTS



- Permeable pavement: multiple options that increase resilience of surface while allowing stormwater to infiltrate the subsurface



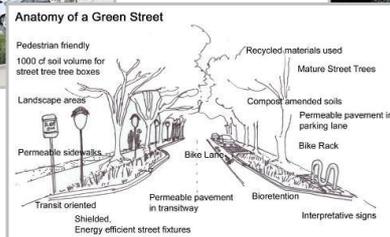
MANAGEMENT CONCEPTS



- Rainwater harvesting: Store rainwater onsite for future use
 - > Currently most popular in arid regions
 - > Detention basins/buried detention tanks have similar effects on runoff, but do not reuse water at the site



MANAGEMENT CONCEPTS



- Downspout disconnection, green streets, green alleys, green parking: combine strategies into management system

MANAGEMENT CONCEPTS



- Land conservation
 - > Mitigate water quality and flooding impacts
 - > Provide recreational opportunities for residents
 - > Some areas are of particular interest:
 - Riparian areas (along waterways)
 - Wetlands
 - Steep slopes



- Questions?