Supplemental Watershed Project Plan and Environmental Assessment Martins Creek Watershed

Meeting Agenda

- Introductions
- Project Background
- Outline of Planning Process
- Alternatives Considered
- Alternative Recommended
- Open Discussion

Meeting Logistics – Online Attendees

- Please put your name, agency, and email address in the chat box.
- Attendees Online Muted and Unable to Speak
  - Chat box is being monitored
- Meeting Handouts/Sign In Sheet
- Meeting will be Recorded

Supplemental Watershed Project Plan and Environmental Assessment

Martins Creek Watershed

Introductions

- **Chuck Litwin**, Mayor, Nicholson Borough
- **Jessica Bower**, Nicholson Borough Manager
- **Nicholson Borough Council Members**

- **Bernard Scalzo**, Wyoming County Conservation District Watershed Specialist
- **Nathan Harpster,** Susquehanna Conservation District Watershed Specialist

Introductions

- **Heather Smeltz, P.E.**, NRCS Assistant State Conservationist for Water Resources

- **Consultant Team: DDK Engineering**
  - **Michael Ward, P.E.,** Project Manager
  - **Chris Sargent, AICP,** Senior Environmental Planner
  - **Andy Hoak, P.E., P.G.**, Project Manager

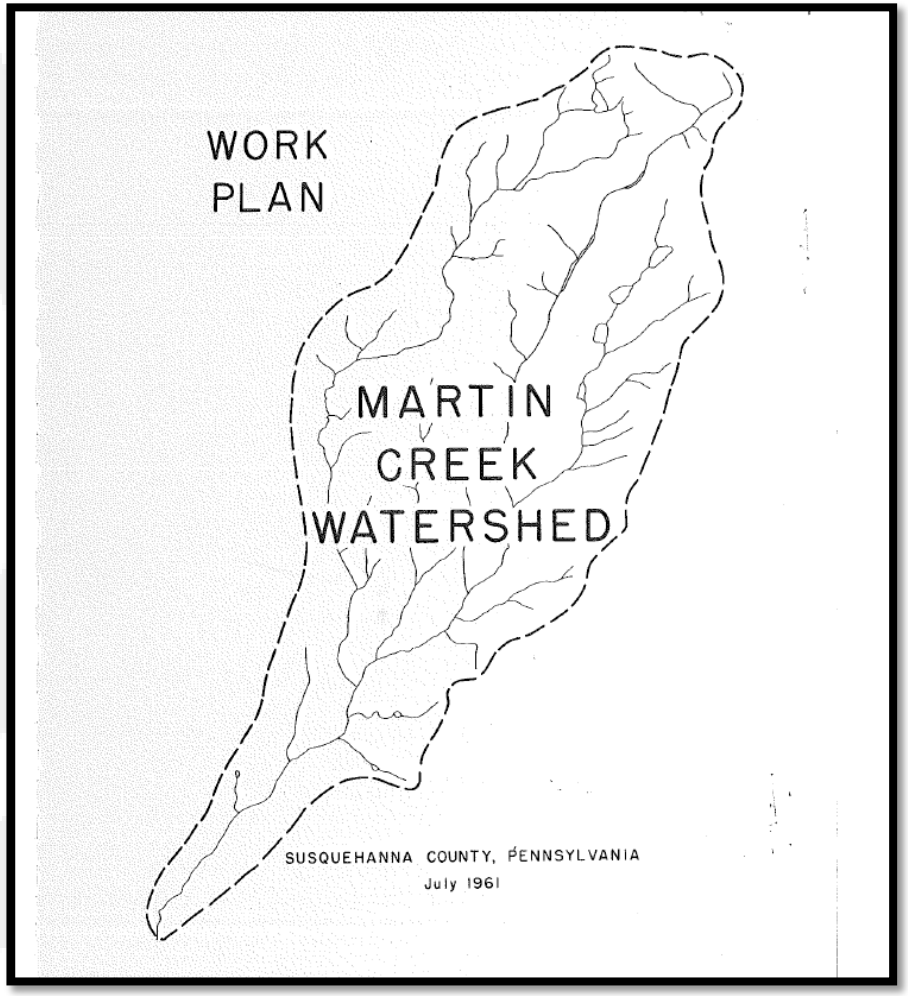
Why Are We Here?

- Second of two public meetings
  - first was January 2021
- Discuss progress and alternative development so far.
- Solicit public input to help the sponsors decide how to move forward.

Photo courtesy of DDK Engineering

Why Are We Here?

- PL83-566 Watershed and Flood Prevention Act
- Watershed Work Plan & Agreement signed in 1961
  - Flood Reduction
- Original Sponsors:
  - Susquehanna County Soil Conservation District
  - Susquehanna County Commissioners



The Martins Creek Watershed has historically been flooded…

PA-467 Kingsley Dam
Photo courtesy of NRCS

- 1926, 1946, 1954, 1958, 1960, 2004, 2006, 2018, and 2020. The 1958 flood led for a demand for flood control for Brooklyn and Kingsley.
- PA-467 Kinglsey and PA-468 Brooklyn Dams constructed
  - Flooding in Brooklyn and Kingsley was reduced

Why this Project?

- Flooding still occurs in Nicholson Borough.
  - Over $3,000,000 in reported damages in Nicholson since 2006
- Additional funding to the Watershed & Flood Prevention Operations Program in 2018.

Watershed Program Process

★ Planning

Design

Construction

★ We are in the planning phase

Watershed Planning Process

- Identify Problems and Opportunities
- Determine Objectives
- Inventory Resources
- Analyze Resource Data
- Formulate Alternatives
- Evaluate Alternatives
- **Make Decisions**
- Implement the Plan

We are here.

Martins Creek and State Street Bridge

Watershed Planning Process

- **Identify Problems and Opportunities**
- Determine Objectives
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Flooding along Martins Creek in Nicholson results in:

- Structure and property damage,
- Decreased water quality in Martins Creek,
- Site erosion,
- Stream bank instability,
- Accelerated sedimentation, and
- Loss of personal belongings and emotional stress to residents.

Watershed Planning Process

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Opportunities by reducing flooding:

- Reduction of risk to life,
- Prevention of further economic loss,
- Improvement of the water quality
- Stabilization of the creek channel
- Reduction in downstream sedimentation
- Reduction of the emotional stress of the residents
- Enhancement of aesthetics, and
- Improvement of community morale.

Watershed Planning Process

- Identify Problems and Opportunities
- **Determine Objectives**
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What does success look like?

- Reduce flood damages to homes, businesses, and infrastructure in Nicholson Borough.
- Eliminate the need for evacuations for storms with rainfall of 2 inches or less
- Maintain access to Martins Creek

Watershed Planning Process

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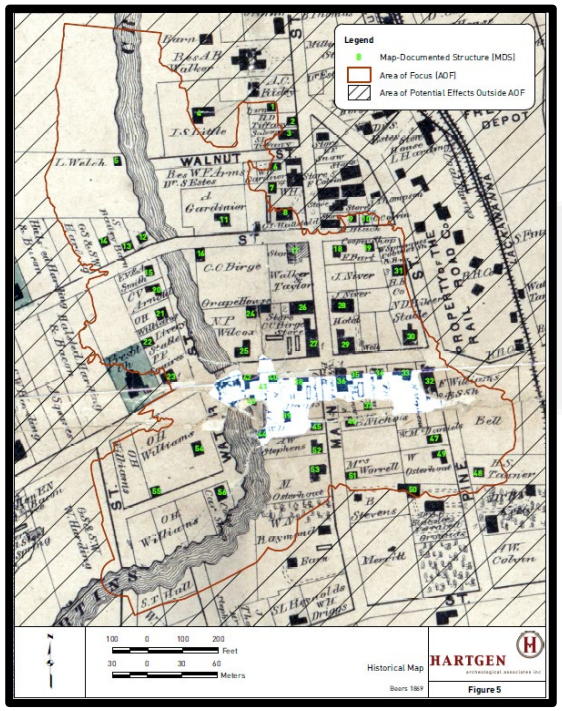
Studies that have been done:

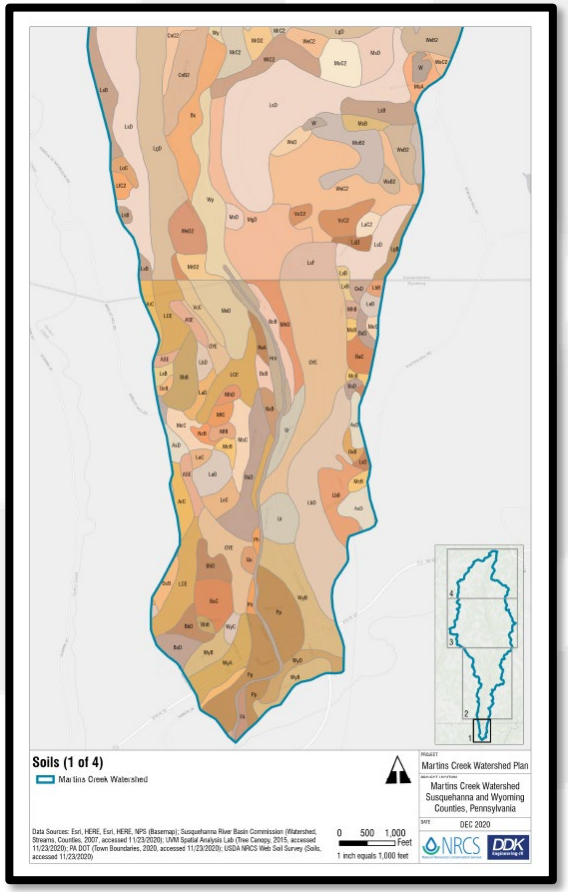
- Field Survey
- Topographic Mapping
- Stream/Wetland Surveys
- Archaeological and Historic Assessment
- Land Use Determination
- Climate Assessment
- Soils and Engineering Assessment
- Threatened and Endangered Species Identification
- Economic Assessments

Inventory Resources

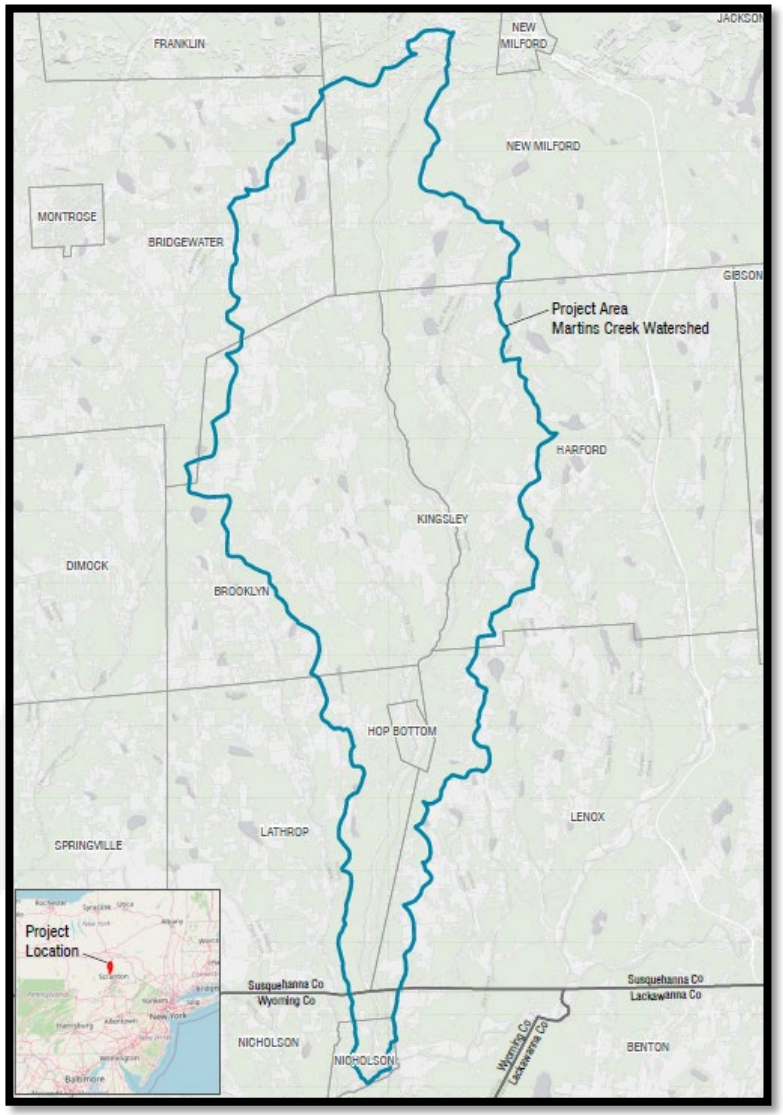
Historical Map



Soil Type Map



Watershed Map (51.7 Square Miles)



Watershed Planning Process

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- Hydrologic Analysis
  - Determination of volume and rate of runoff for different storm events.
- Hydraulic Analysis
  - Modeling the extents of different flooding events.

Watershed Planning Process

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- Primary Goals:
  - Reduce Flood Damages
  - Maintain Existing Land Uses and Stream Access
  - Preserve Environmental and Cultural Resources
  - Maintain or Enhance Aesthetics

Watershed Planning Process

- Identify Problems and Opportunities
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- Typical Flood Protection Strategies:
  - Flood Volume and Rate Reduction
  - Avoidance
  - Floodproofing
  - Barriers
  - Drainage Improvements

Alternatives Considered

1. Flood Volume and Rate Reduction
2. Avoidance
3. Floodproofing
4. Drainage Improvements
5. Barriers

Photo courtesy of David Brace

Alternatives Considered

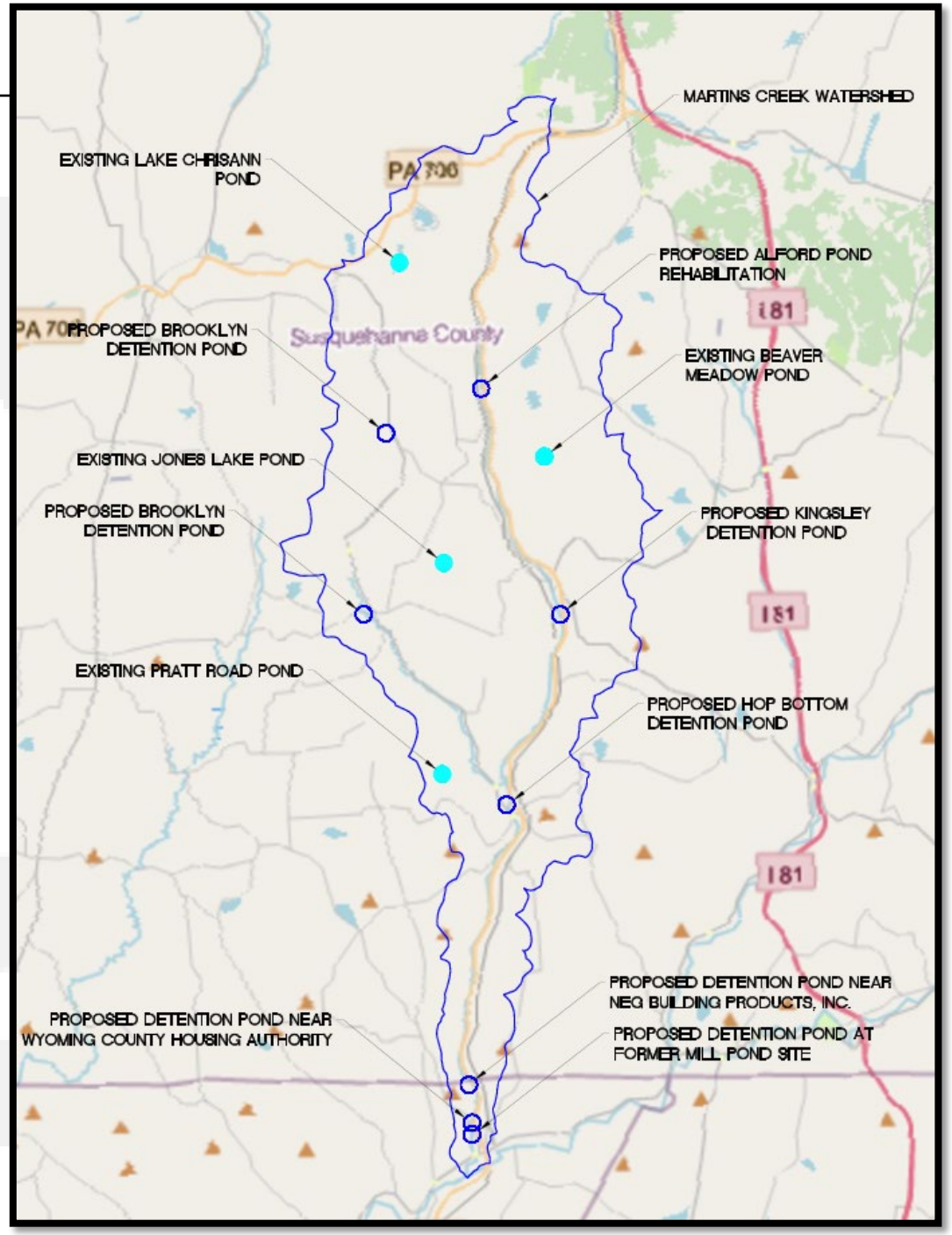
1. **Flood Volume and Rate Reduction**
2. Avoidance
3. Floodproofing
4. Drainage Improvements
5. Barriers

- Upstream Land Use Changes or Infiltration Structures
- New Upstream Detention Ponds
- Rehabilitate Alford Pond

1. Flood Volume and Rate Reduction

Considered Locations:

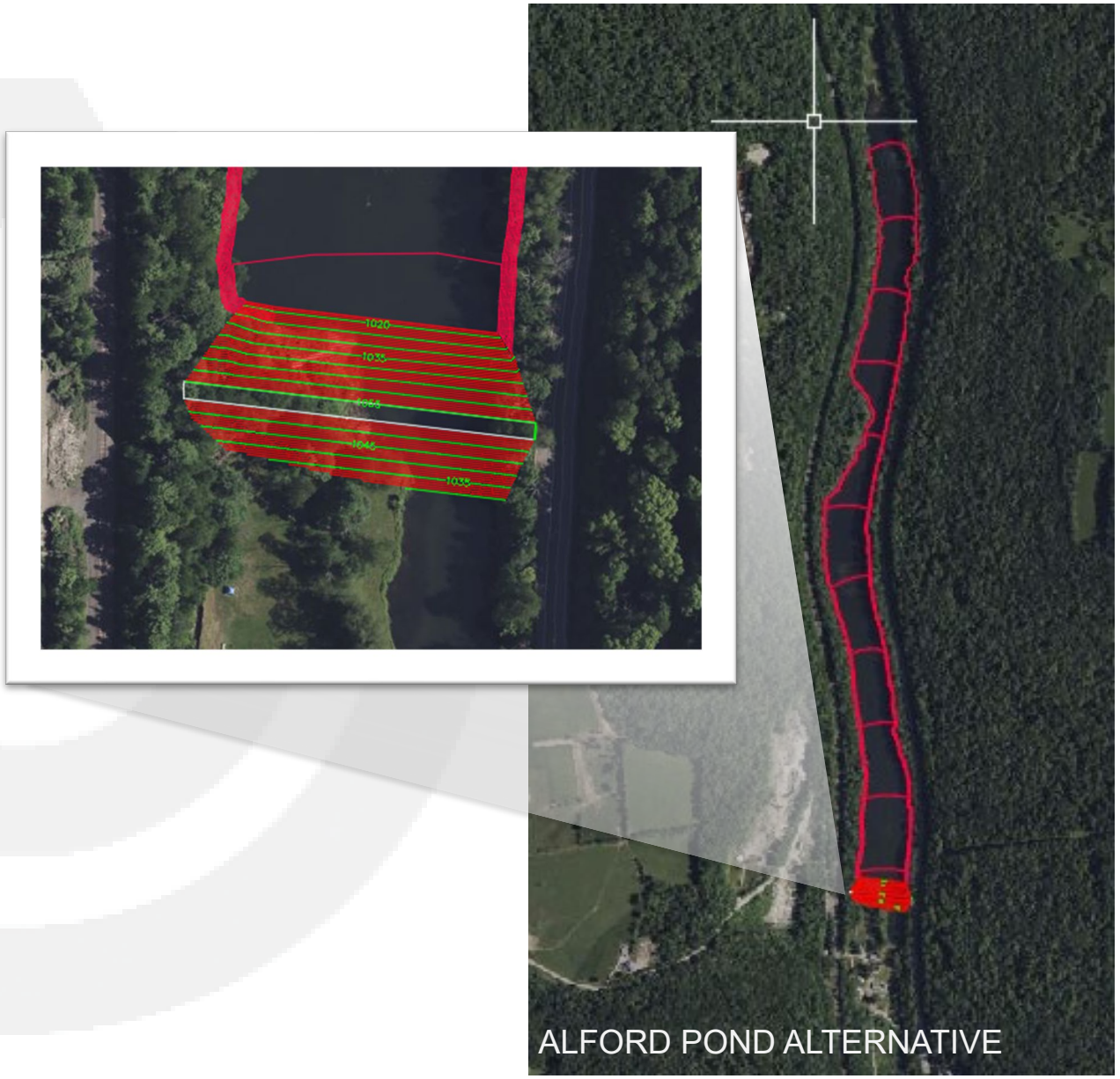
- Susquehanna County
  - Alford Pond
  - Brooklyn (2)
  - Kingsley
  - Hop Bottom
- Wyoming County
  - NEG Building Products
  - Former Mill Pond
  - Wyoming County Housing Authority



1. Flood Volume and Rate Reduction

Detention Structure Criteria:

- Drainage Area
- Storage Volume
- Location in Watershed
- Site Constraints



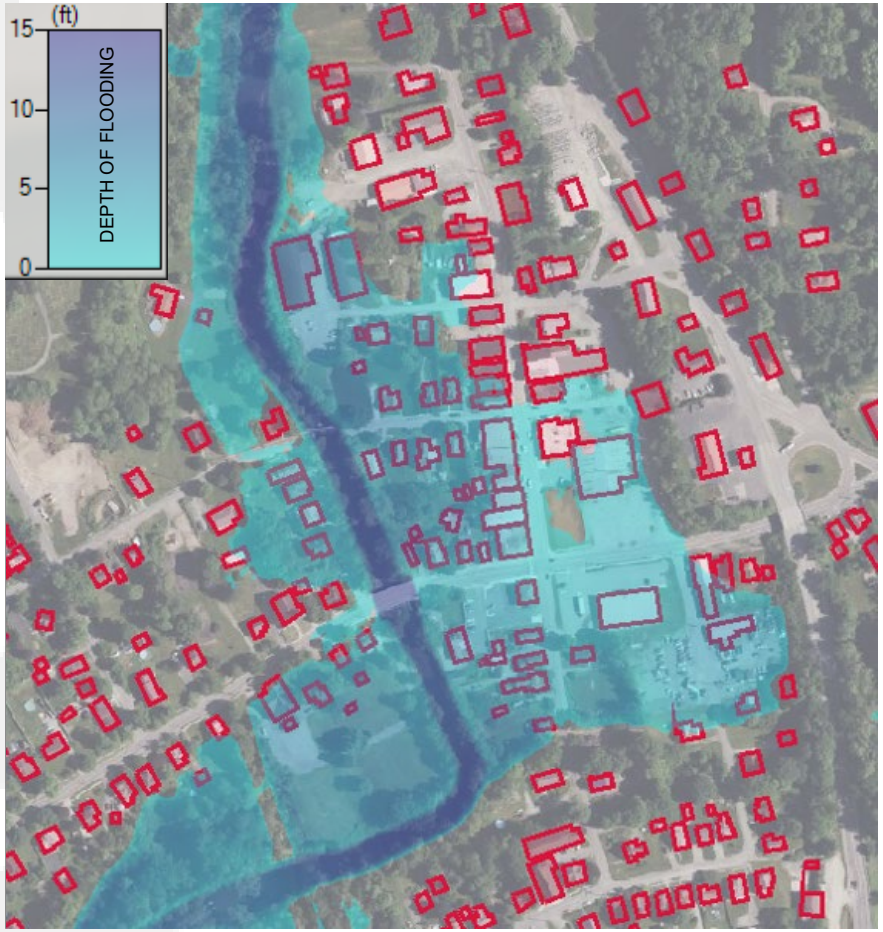
Alternatives Considered

1. Flood Volume and Rate Reduction
2. **Avoidance**
3. **Floodproofing**
4. Drainage Improvements
5. Barriers

- Buyout flood-prone properties
- Relocate flood-prone structures
- Raise flood-prone structures above expected flooding
- Add floodproofing

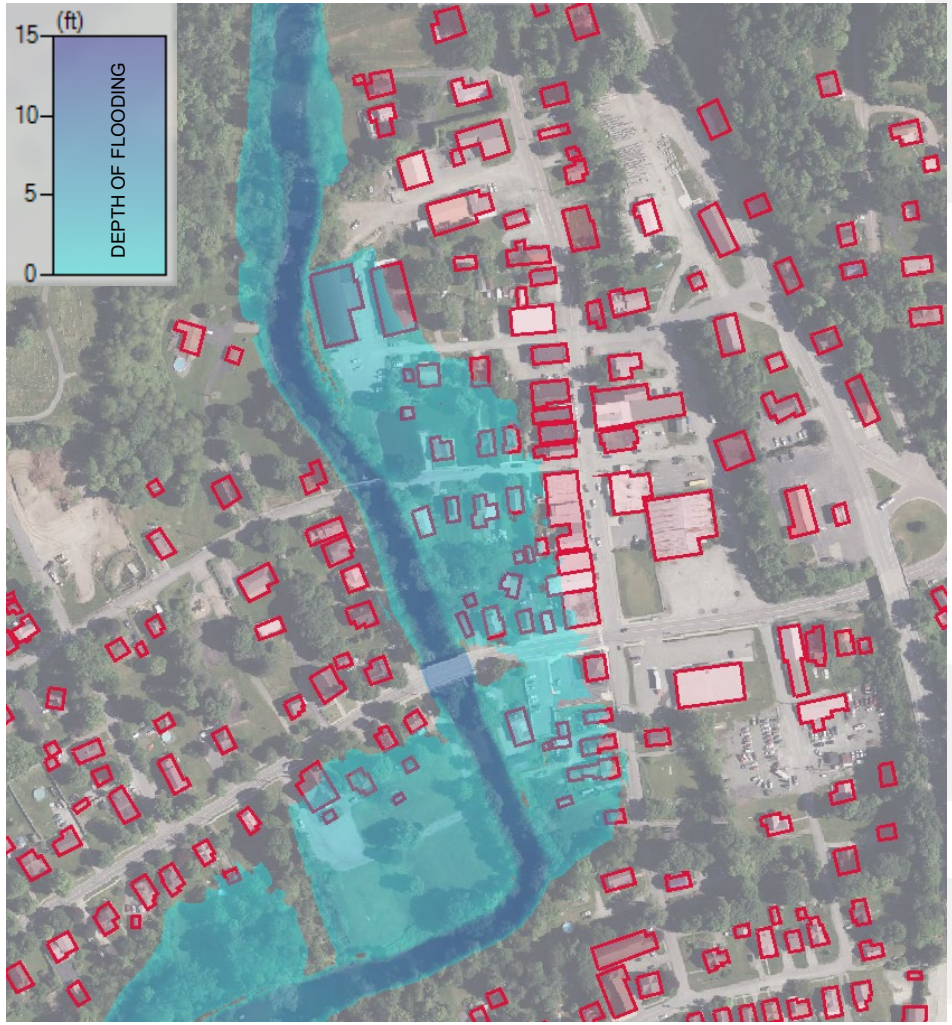
Alternatives Considered

1. Flood Volume and Rate Reduction
2. **Avoidance**
3. **Floodproofing**
4. Drainage Improvements
5. Barriers

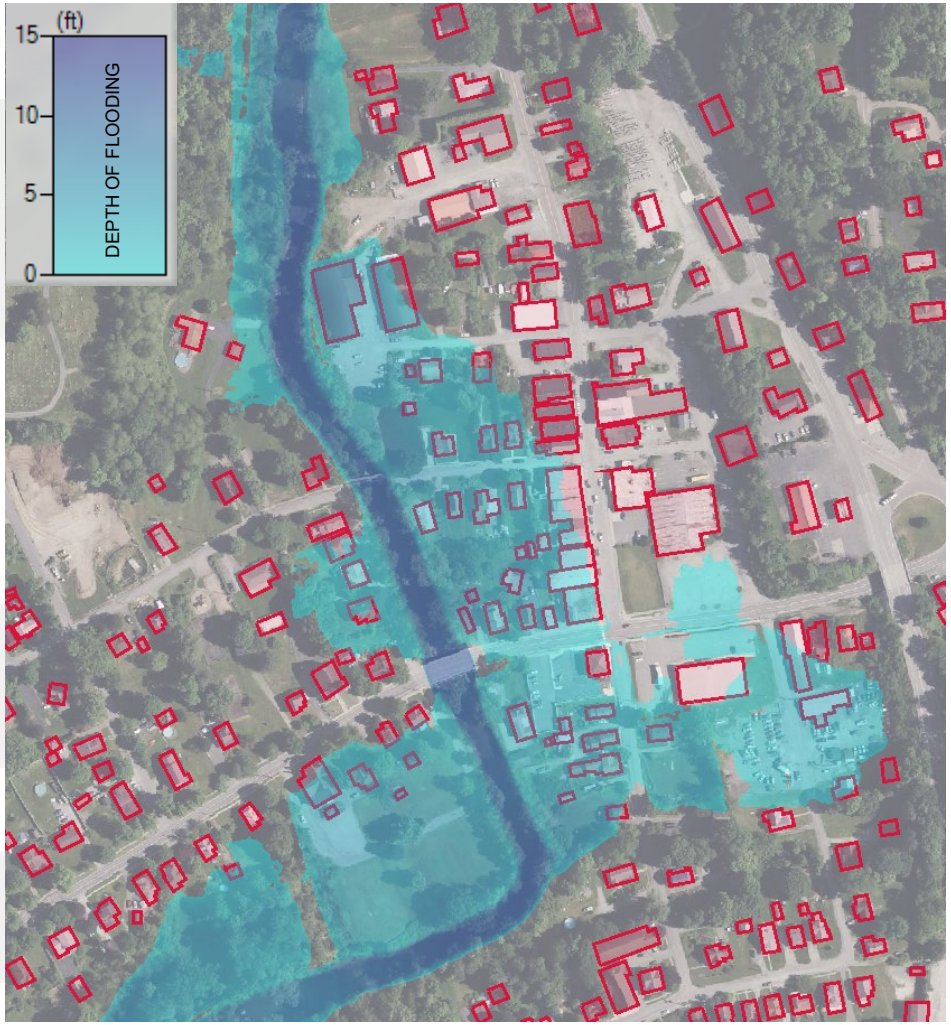


Structures Within 100-Yr Storm Inundation Area

Buyouts and Relocations



10-Yr Storm Inundation Area



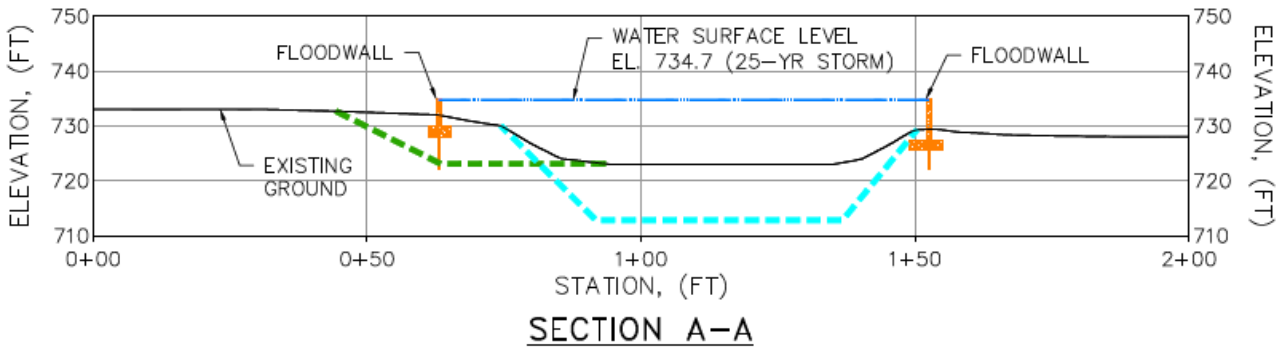
25-Yr Storm Inundation Area

Alternatives Considered

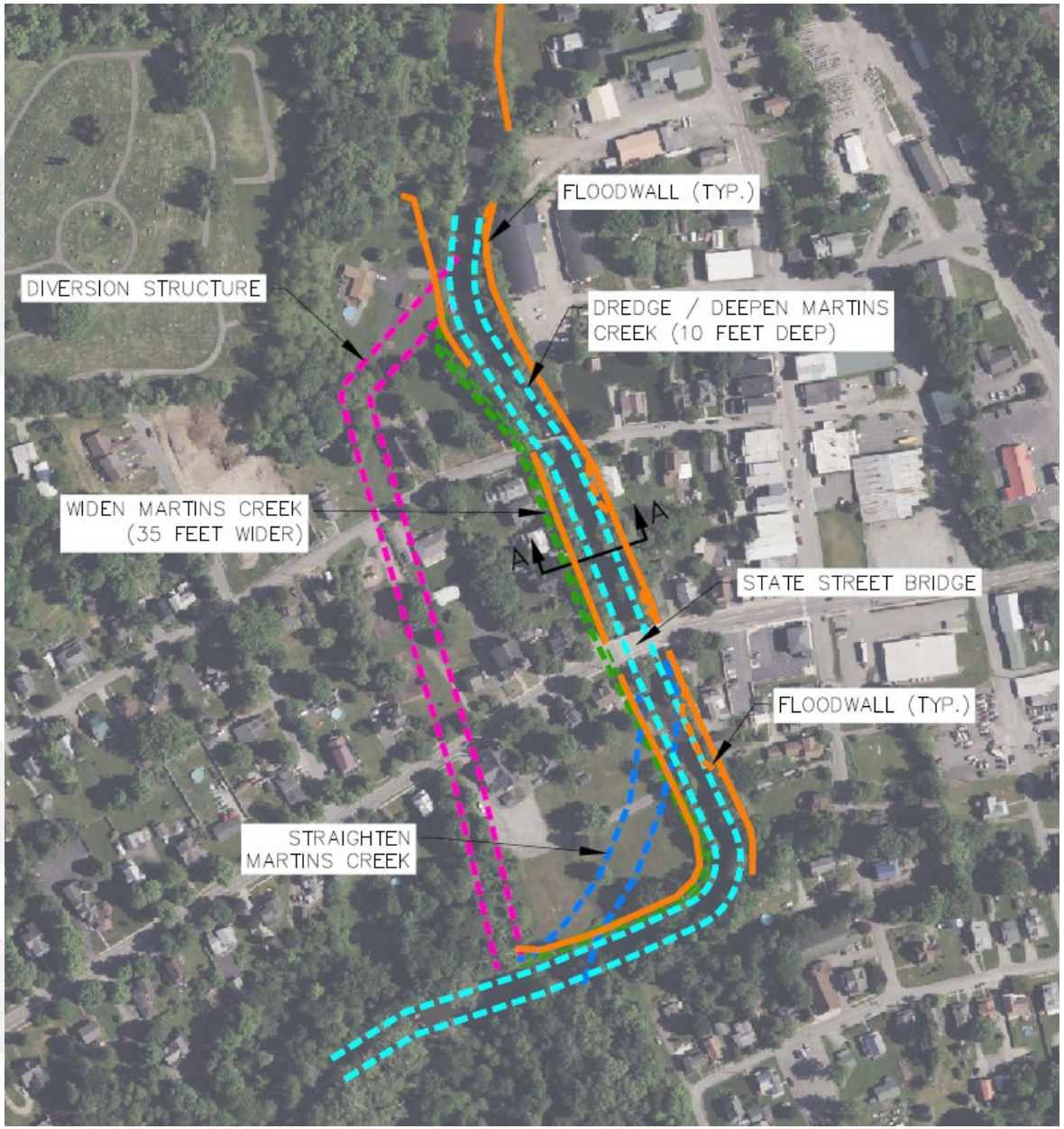
1. Flood Volume and Rate Reduction
2. Avoidance
3. Floodproofing
4. **Drainage Improvements**
5. Barriers

- Diversion culvert or channel through former trolley corridor
- Eliminate pier at State Street Bridge
- Widen Martins Creek
- Deepen/dredge Martins Creek
- Straighten Martins Creek at southern end of Nicholson (Water Street)

Barrier and Drainage Improvement Concepts



SECTION A–A



Alternatives Considered

1. Flood Volume and Rate Reduction
2. Avoidance
3. Floodproofing
4. Drainage Improvements
5. **Barriers**

- Floodwalls/Levees:
  - Concrete/masonry walls and earthen embankments
  - Mostly along the banks of Martins Creek
    - Some sections in creek to avoid removing existing structures

Alternatives Considered

1. Flood Volume and Rate Reduction
2. Avoidance
3. Floodproofing
4. Drainage Improvements
5. **Barriers**

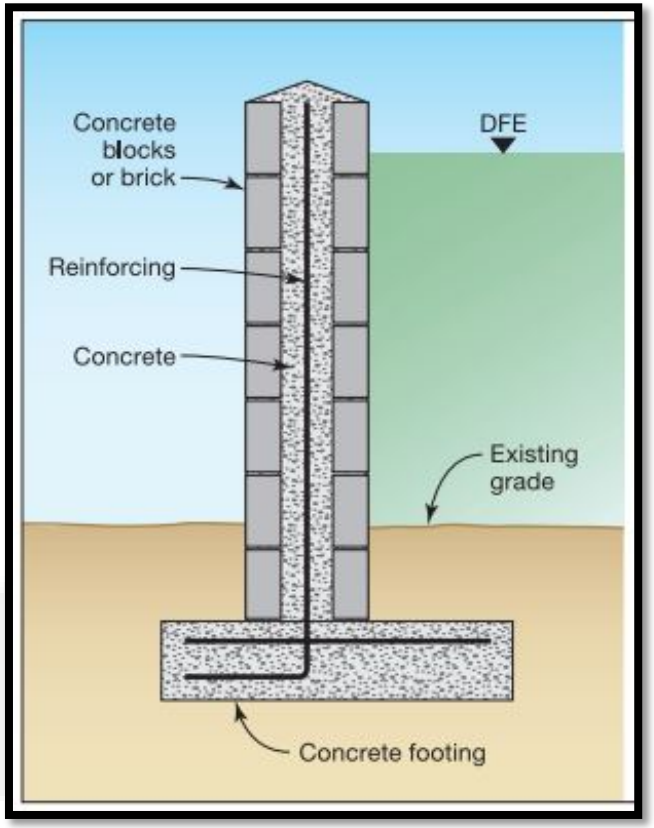
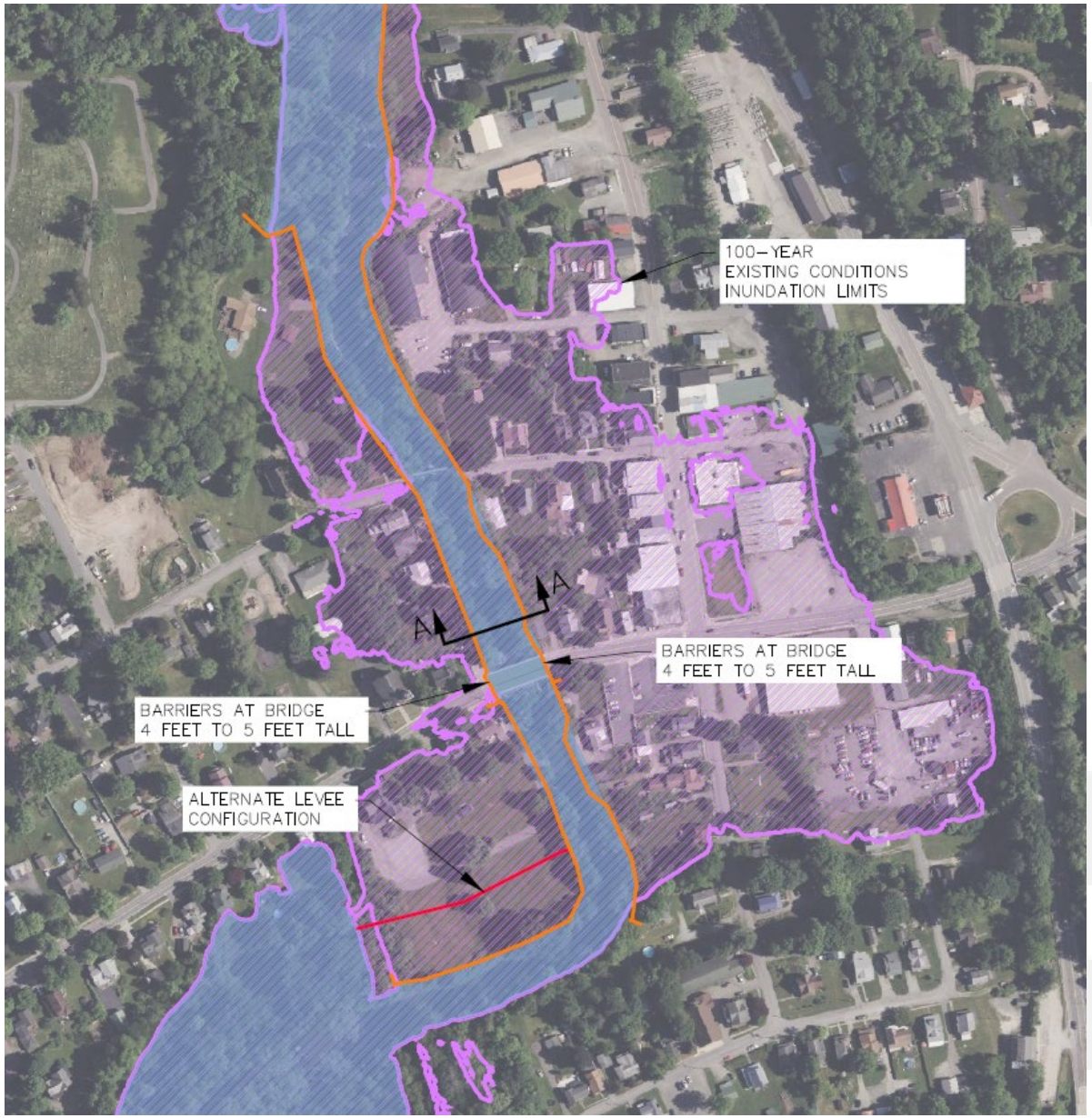


Photo courtesy of FEMA P-259: Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures



Floodwalls/Levees

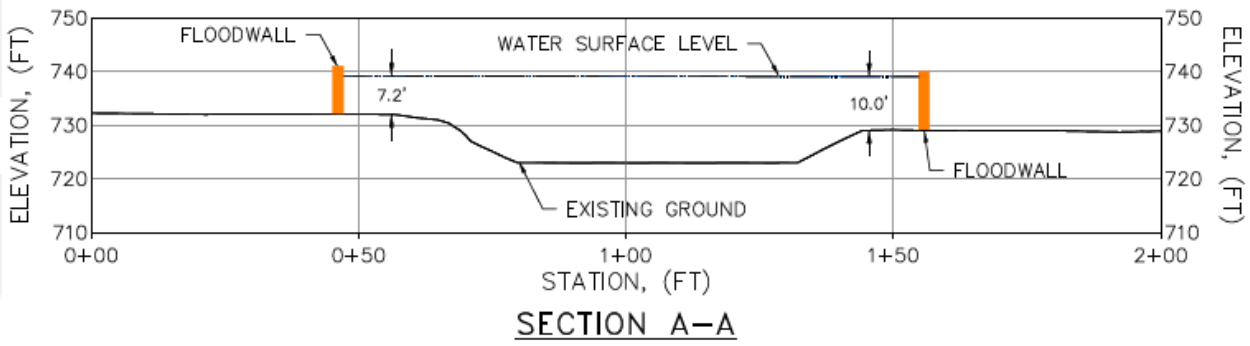
100-Year Storm

100-year Storm

- 5.8 inches of Rainfall

Floodwall Heights

- 2 ft to 12 ft
- Intersect State Street Bridge



SECTION A–A

Floodwalls/Levees

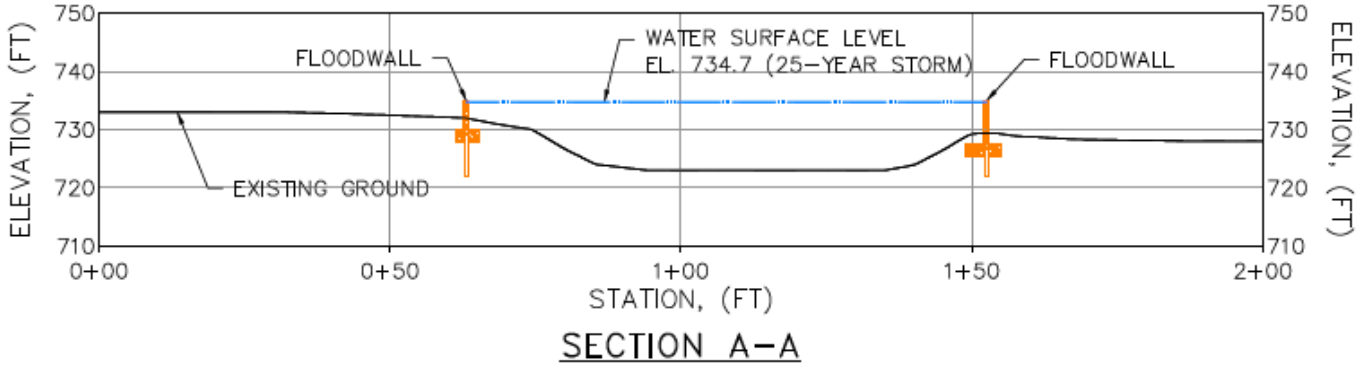
25-Year Storm

25-year Storm

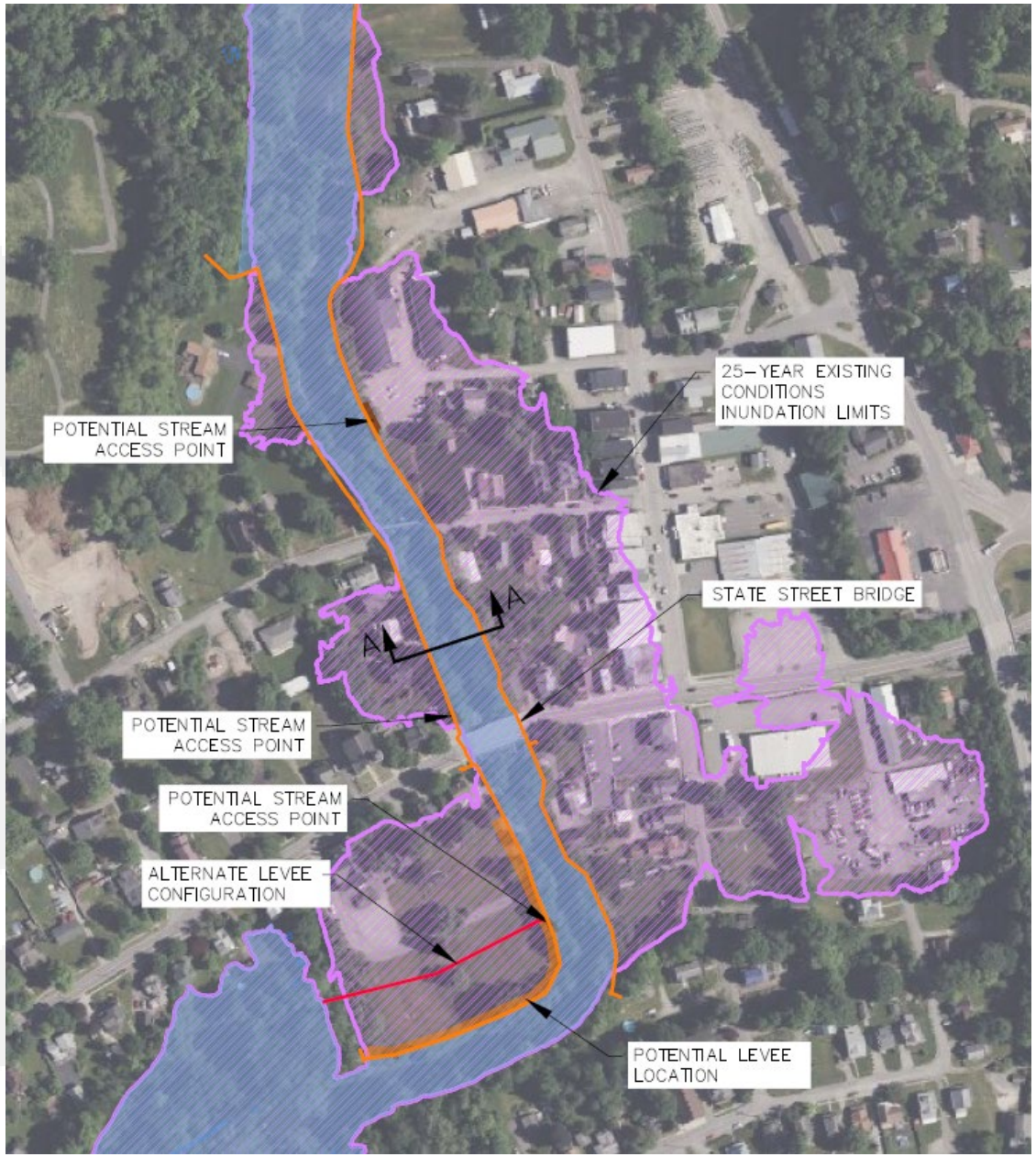
- 4.4 inches of Rainfall

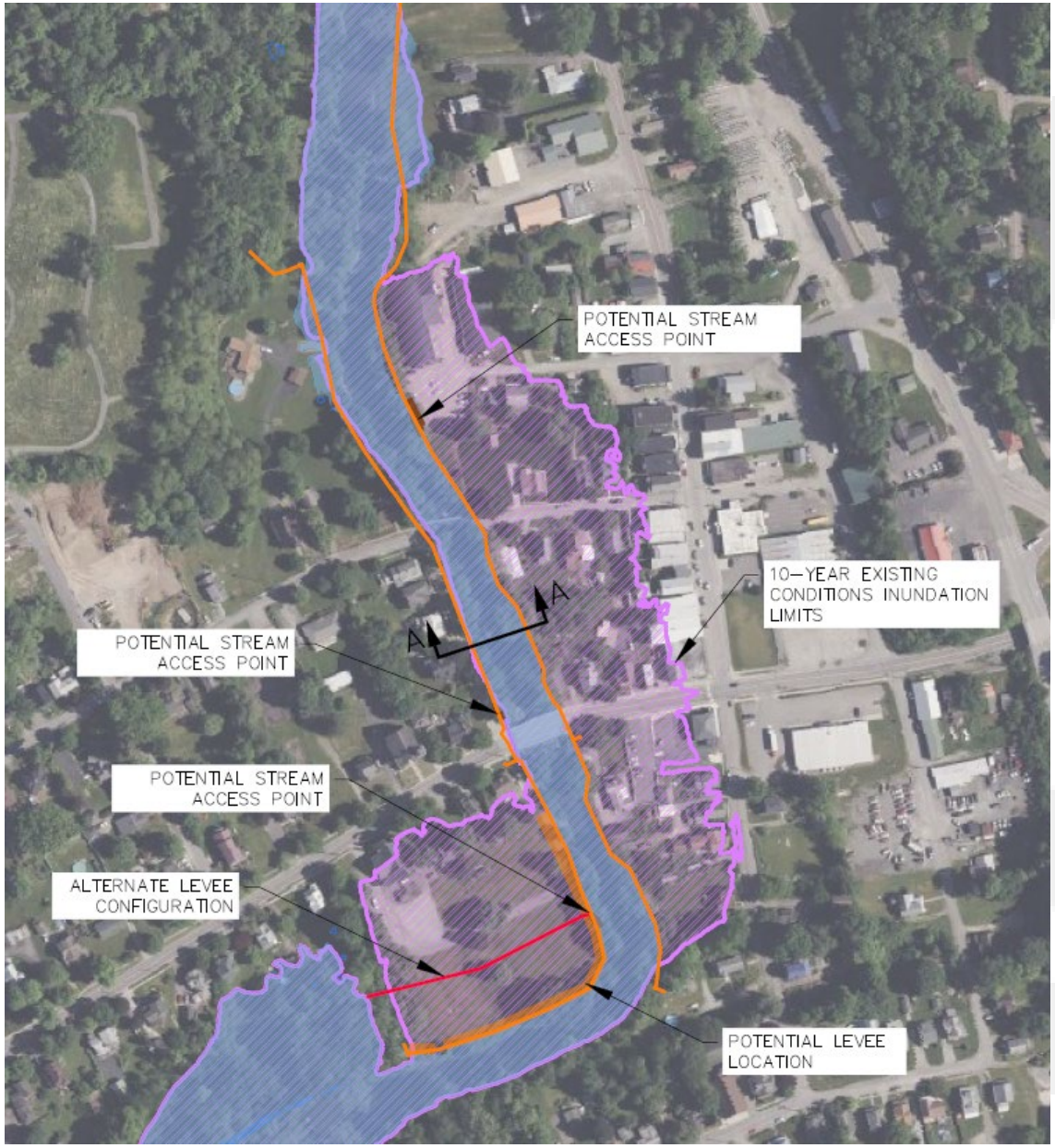
Floodwall Heights

- 1 ft to 7 ft
- 8 ft in isolated area



SECTION A–A





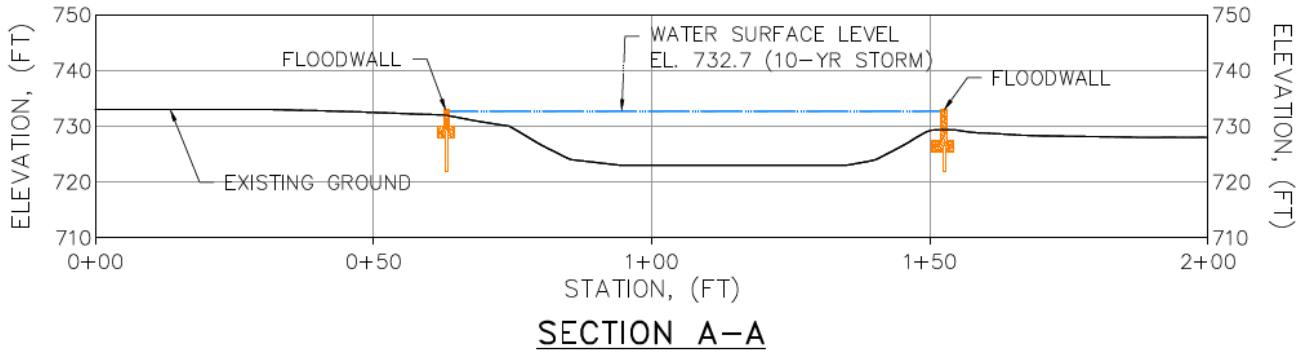
Floodwalls/Levees
10-Year Storm

10-year Storm

- 3.7 inches of Rainfall

Floodwall Heights

- 1 ft to 5 ft
- 7 ft in isolated area



SECTION A-A

Watershed Planning Process

- Identify Problems and Opportunities
- Determine Objectives
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- **Evaluate Alternatives**
- Make Decisions
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- Hydrologic and Hydraulic Analysis
  - Flood Reduction
- Economics
  - Benefit are greater than Cost
- Social
  - Public Safety
  - Tax Base
  - Cultural Resources
  - Community Impacts
- Environmental
  - Pollutants
  - Land Use Changes
  - Threatened & Endangered Species

Alternative Selection Table

Alternative	Flood Reduction	Benefit > Cost	Social and/or Environmental Effects
New Upstream Detention Pond(s)	No	No	Yes
Modify Other Existing Pond	No	No	Yes
Alford Pond Rehabilitation	Yes	Yes	Yes
Floodproofing (10- or 100-year storm)	**No**	**Yes**	**No**
Eliminate Pier at State Street Bridge	**No**	**No**	**No**
Widen Martins Creek	**No**	**No**	**Yes**
Straighten Martins Creek	**No**	**No**	**Yes**
Diversion Channel/Culvert	**Yes**	**No**	**Yes**
Deepen Martins Creek	**Yes**	**No**	**Yes**
Buy-Outs (10-, 25-year, or 100-year storm**)**	**Yes**	**Yes**/No	**Yes**
Floodwalls (10-, 25-year, or 100-year storm**)**	**Yes**	**Yes**	**Yes**

Bolded fonts indicate preliminary local sponsor support.

Alternative Selection Table

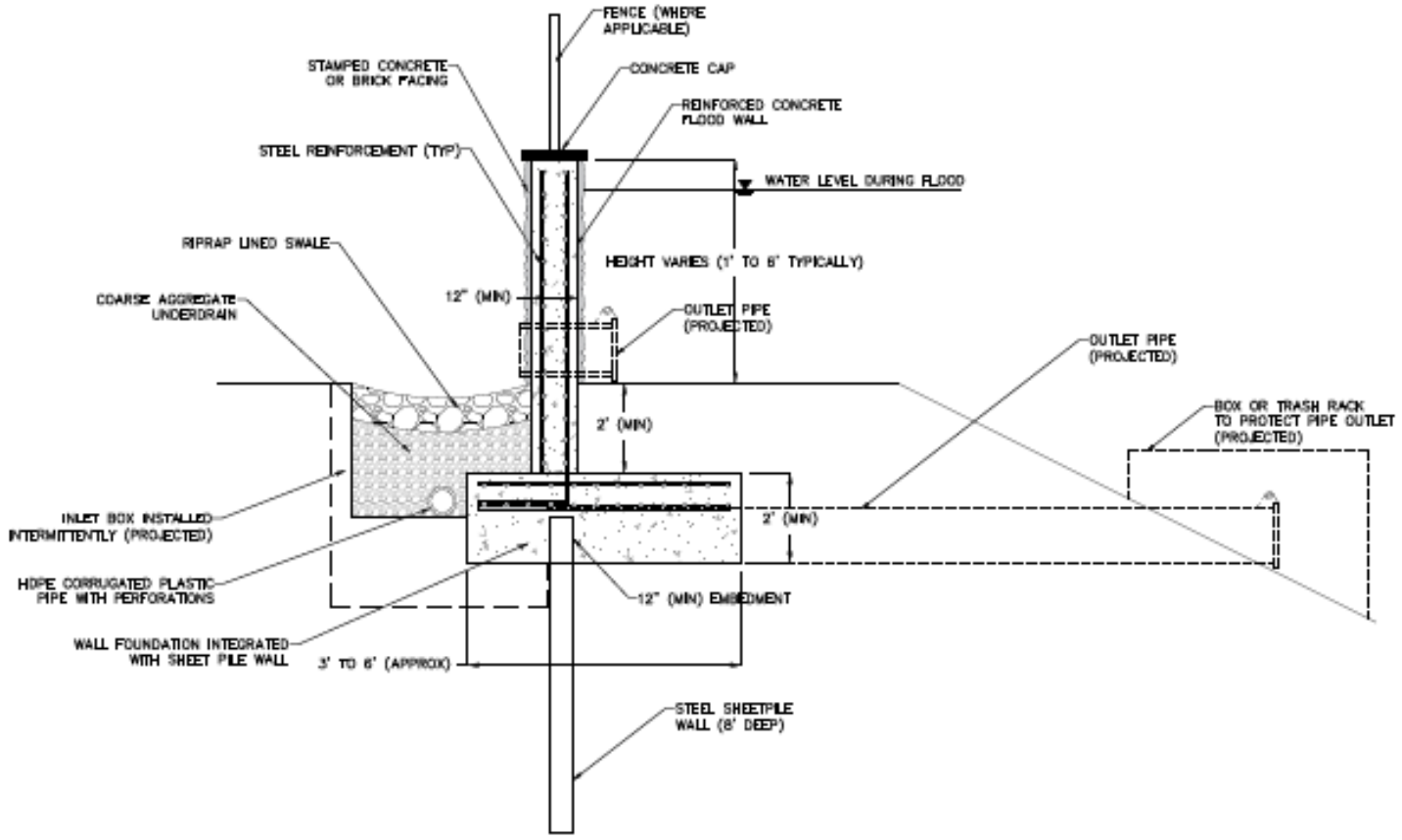
Alternative	Flood Reduction	Benefit > Cost	Sponsor Support
Alford Pond Rehabilitation	Yes	Yes	No
Buy-Outs (10-, 25-year storm)	Yes	Yes	No
Floodwalls (10-, 25-year storm)	**Yes**	**Yes**	**Yes**

Floodwalls/Levee Summary

Storm Event (24-hour)	Rainfall Depth	Average Height	Maximum Height *	Notes
10-Year	3.7'	1'-5'	7'	• Permanent Stream Impacts
25-Year	4.4"	1'-7'	8'	• Permanent Stream Impacts • May affect State Street Bridge Operation
100-Year	5.8"	2' - 12'	12'	• Permanent Stream Impacts • Affects State Street Bridge Operation

* Maximum height of walls on top of streambank.

Floodwalls/Levees

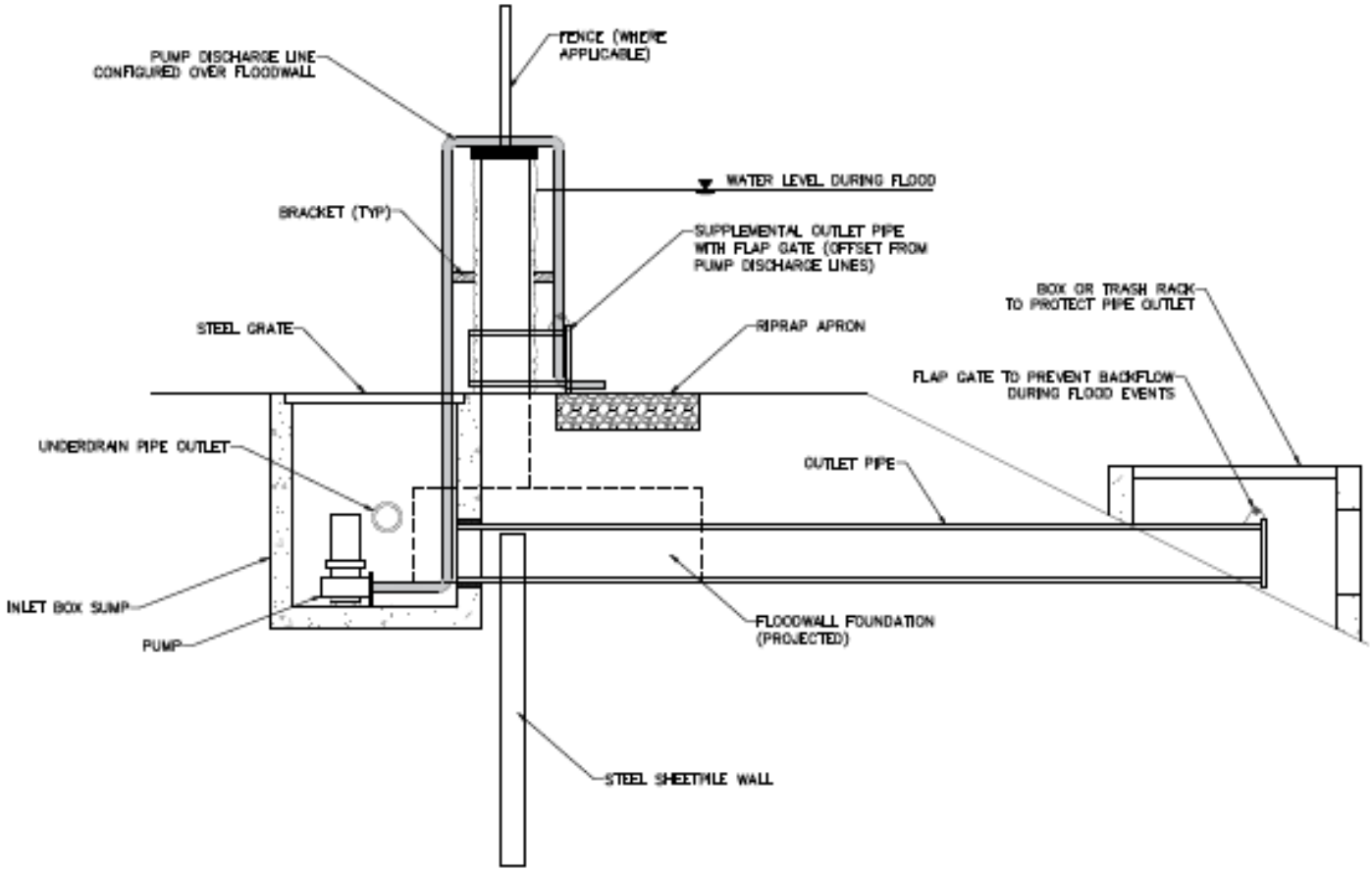


FLOODWALL DETAIL – TYPICAL SECTION

NTS

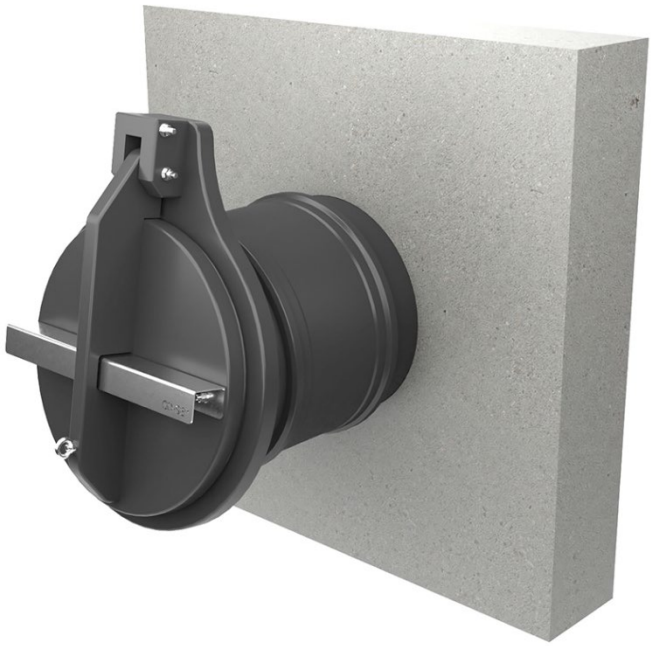
https://magnumstone.com/how-concrete-retaining-walls-offer-flood-and-erosion-protection/

Floodwalls/Levees



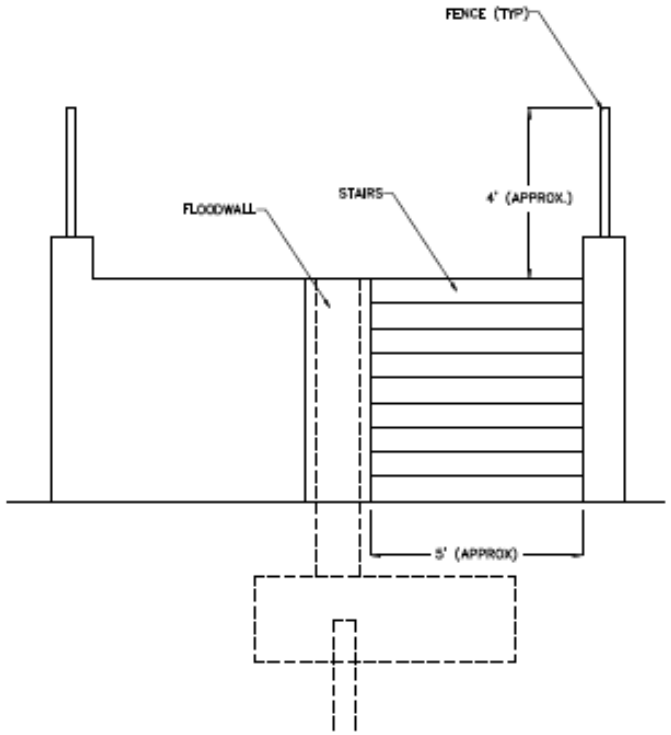
FLOODWALL DETAIL – DRAINAGE SUMP

NTS

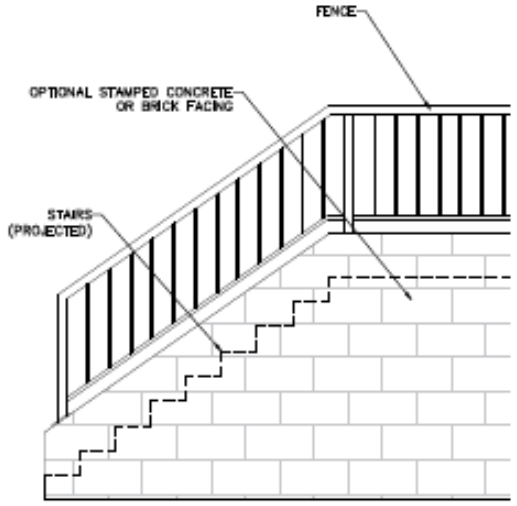


https://go-sep.com/product/flap-valve-gfv-p/

Floodwalls/Levees



FLOODWALL CROSSING – ELEVATION VIEW
NTS



FLOODWALL CROSSING – PROFILE VIEW
NTS

https://sheaconcrete.com/homeowners/

Floodwalls/Levees

TYPICAL LEVEE CONFIGURATION:

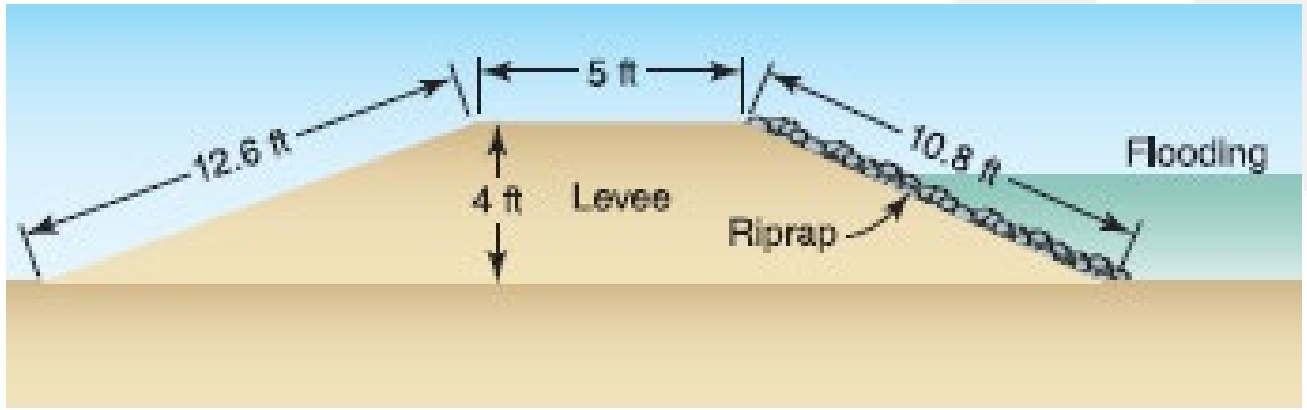


Photo courtesy of FEMA P-312: Homeowner's Guide to Retrofitting

https://www.nws.usace.army.mil/About/Offices/Engineering/Levee-Safety/

Floodwall/Levee Alternative Summary

Floodwall/Levee System	10-Year Storm (3.7” Rain)	25-Year Storm (4.4” Rain)
Total Construction Cost	**$7,136,362**	$10,259,475
Annual Project Benefit	**$308,500**	$482,615
Annual Project Cost	**$335,701**	$388,100
Benefit Cost Ratio	**0.92**	0.80
Project Life	**50 Years**	50 Years

Engineer's Preferred Alternative - Floodwall/Levee System (10-Year storm)

Project Timeline

- Planning Phase (9 Months)
  - Incorporate Public Input, Draft Documentation, NRCS Review
- Design Phase (2 to 3 Years)
  - Survey, Subsurface Exploration, Permitting, Engineering Design
- Construction Phase (2 Years)
  - Bidding and Selection, Mobilization, Heavy Construction, Site Stabilization

Floodwall/Levee Construction

General Sequence:

- Locate and Mark Utilities/Site Features
- Erosion and Sediment Controls
- Clear Trees and Strip Topsoil
- Foundation/Install Sheetpile
- Concrete Structures
- Backfill Subsurface Structures
- Install Drainage Features
- Vegetate the Site

https://www.louisianacat.com/new/equipment/excavators/

Floodwall/Levee Construction

General Sequence:

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https://filtrexx.com/en

PADEP Erosion and Sediment Pollution Control Program Manual

Floodwall/Levee Construction

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https://everlastseawalls.com/floodwall-chaing-mai-thailand/

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https://www.nan.usace.army.mil/Media/News-Stories/Story-Article-View/Article/1259913/army-corps-builds-foundation-for-resiliency/

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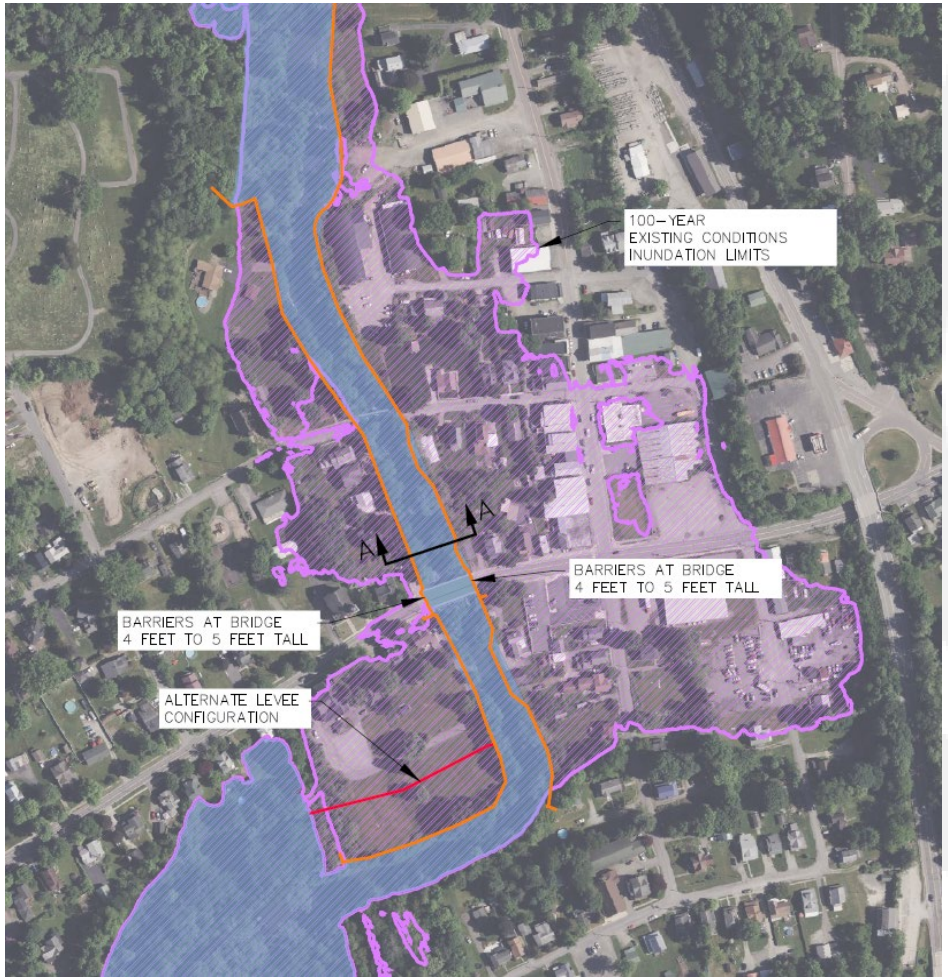
- **Vegetate the Site**

https://magnumstone.com/how-concrete-retaining-walls-offer-flood-and-erosion-protection/

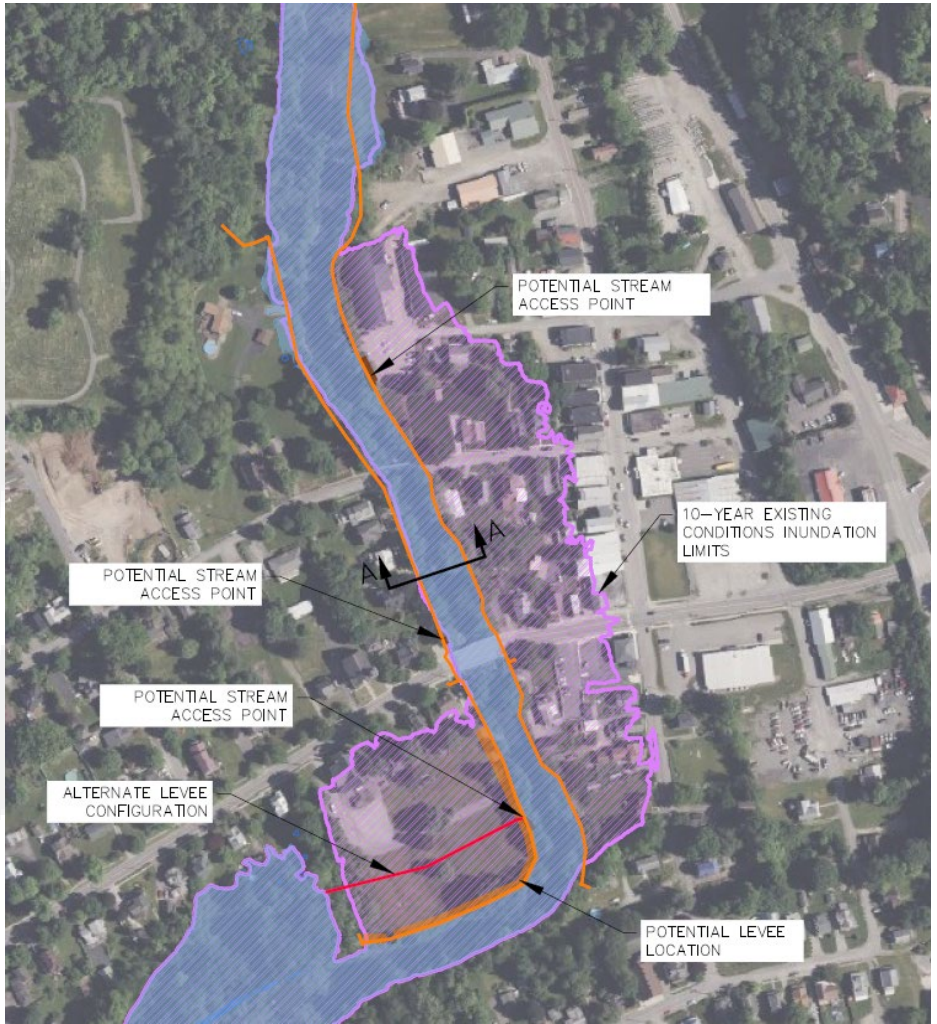
Engineer's Preferred Alternative - Floodwall/Levee System (10-Year storm)



- General Comments
  - Flooding during storms larger than the 10-year storm will still occur (> 3.7" in 24-hours)
    - Only controls nuisance storms
  - Will not affect flood insurance requirements or rates
  - Will not control groundwater (seepage into basements)

Engineer's Preferred Alternative - Floodwall/Levee System (10-Year storm)

- Pros
  - Controls surface runoff for up to 10-year, 24-hour storm
    - Reduces flood damages by $308,500 per year
    - Reduces potential for evacuations during smaller rainfall events
  - No homes, buildings, or bridge impacts.
  - Martins Creek will still be accessible and visible.
    - May work with Borough's walking trail plans
  - Relatively little environmental impacts



Engineer's Preferred Alternative - Floodwall/Levee System (10-Year storm)

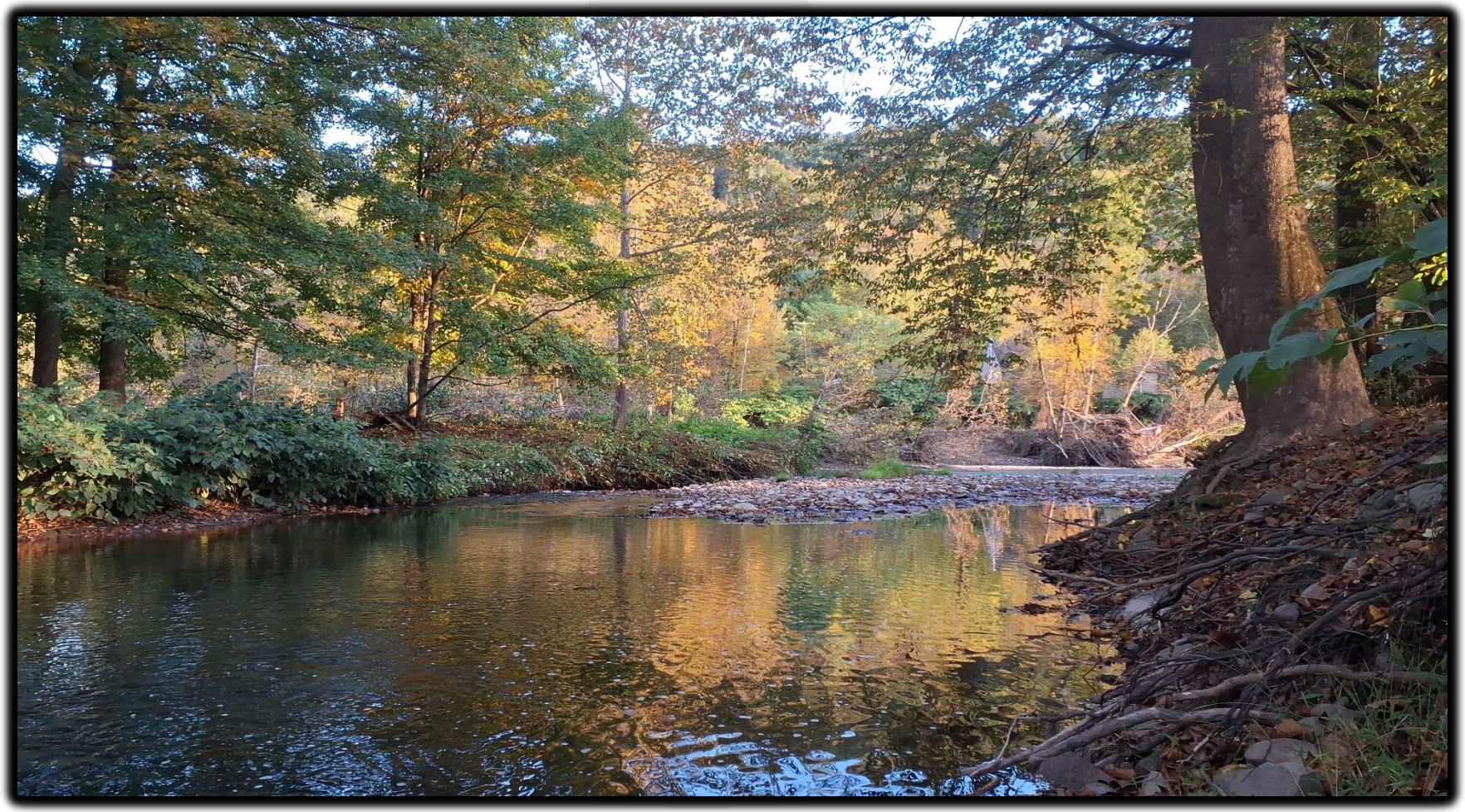
- Cons
  - Pedestrian bridge will need to be removed and/or replaced
  - Some large trees along Martins Creek will need to be removed
  - Construction in Martins Creek to establish floodwalls
  - Easements, with use restrictions, will be needed from landowners
    - Limited landscaping/plantings in floodwall/levee corridor
    - Temporary construction impacts

Watershed Planning Process

- Identify Problems and Opportunities
- Determine Objectives
- Inventory Resources
- Analyze Resource Data
- Formulate Alternatives
- Evaluate Alternatives
- **Make Decisions**
- Implement the Plan

- Make Decisions/Prepare Draft Plan EA
  - Public Comment
  - Sponsor Preferred Alternative
  - Finalize Alternatives
  - Prepare Draft Plan EA
- Response to Comments/Finalize EA
- Authorization of Design/Construction Funding

Open Discussion / Input / Questions?



Contacts

If you have any questions, please contact:

Heather L. Smeltz, PE
ASTC – Water Resources
Natural Resources Conservation Service
O - (717) 237-2214 |
C – (717) 678-1048
heather.smeltz@usda.gov

Mike Ward, PE
Principal Engineer
D'Appolonia Engineering
O – (412) 856-9440
mdward@dappolonia.com

Andy Hoak, PE, PG
Project Engineer
Dubois & King, Inc.
O – (716) 926-9195
ahoak@dubois-king.com