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# McLaughlin Run Flood Control Project Bridgeville Borough



Lennon, Smith, Souleret  
Engineering, Inc.  
Civil Engineers and Surveyors



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# Background



US Army Corps  
of Engineers  
Pittsburgh District

January 2019

Summary Report for the Robinson Run Floodplain  
Management Services Study – Final Phase

Project No.: 456309

Allegheny and Washington Counties, PA

- As a result of recent flooding the United States Department of the Army Corp of Engineers (USACE) Met with Bridgeville Borough Representatives in 2018 and agreed to perform a study of McLaughlin Run.
- The Study was included in the USACE study dated January 2019.

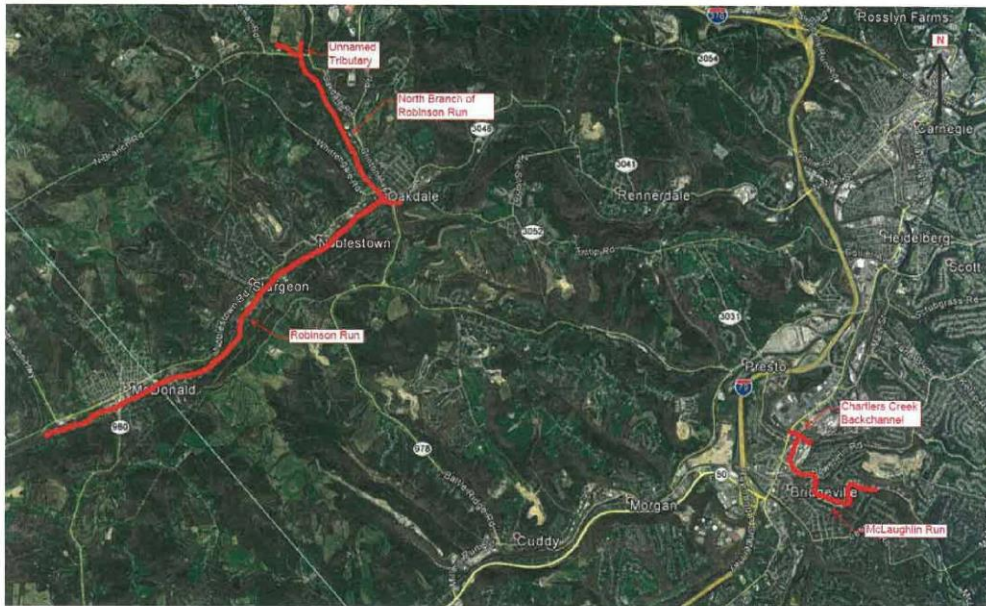


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# Background

## PROJECT BACKGROUND – STUDY AREAS

5



Study Area 2:  
McLaughlin Run



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# USACE Results

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- Structure Buyout – 16 Structures Not Flooded
- Dredging Channel – 24 Structures Not Flooded
- Detention Basin – 20 Structures Not Flooded
- Bower Hill Bridge Modification – 0 Structures Not Flooded
- Commercial Street Bridge Replacement -4 Structures Not Flooded



# LSSE Alternative Analysis

- LSSE reviewed the study prepared by USACE including a detailed review of the model prepared by USACE.
- Reviewed the stream corridor with Borough representatives.
- Identified critical restriction points within the stream channel.
- Developed options for consideration to address all structure flooding along the stream corridor:
  - Construction of Earthen Levees
  - Construction of Structural Levees
  - Bridge Removal & Replacements
  - Flood Control Tunnel
  - Detention Basin



# Primary Restrictions

## LSSE identified a number of restrictions to McLaughlin Run?

- Chartiers Creek Back Channel
- Commercial Street Culvert
- Bower Hill Road Bridge
- Baldwin Street Bridge
- Topographic Limitations



# Alternative Option Considerations

- Detention Basin
  - Adequate area is not available within the Borough to provide the storage necessary to eliminate flooding of structures.
  - Looked at properties in upstream community.
- Flood Control Tunnel
  - The property within the Borough that a tunnel would pass through is undermined
  - The flood elevation of the Chartiers Creek back channel would back up the pipe, eliminating available capacity.
- Bower Hill Road Bridge
  - Center column restricts flow captures debris
- Baldwin Street Bridge
  - Opening is restrictive
  - Bridge deck needs raised
- Commercial Street Culvert
  - Culvert has bend in it with center column
  - Sediment deposition
  - Train trestle limits hydraulic performance potential





# Option 1

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- Phase I – Confluence to Commercial Street
- Phase II – Bower Hill Road to Baldwin Street
- Phase III – Maple Street to McLaughlin Run Park Entrance



# Option 1

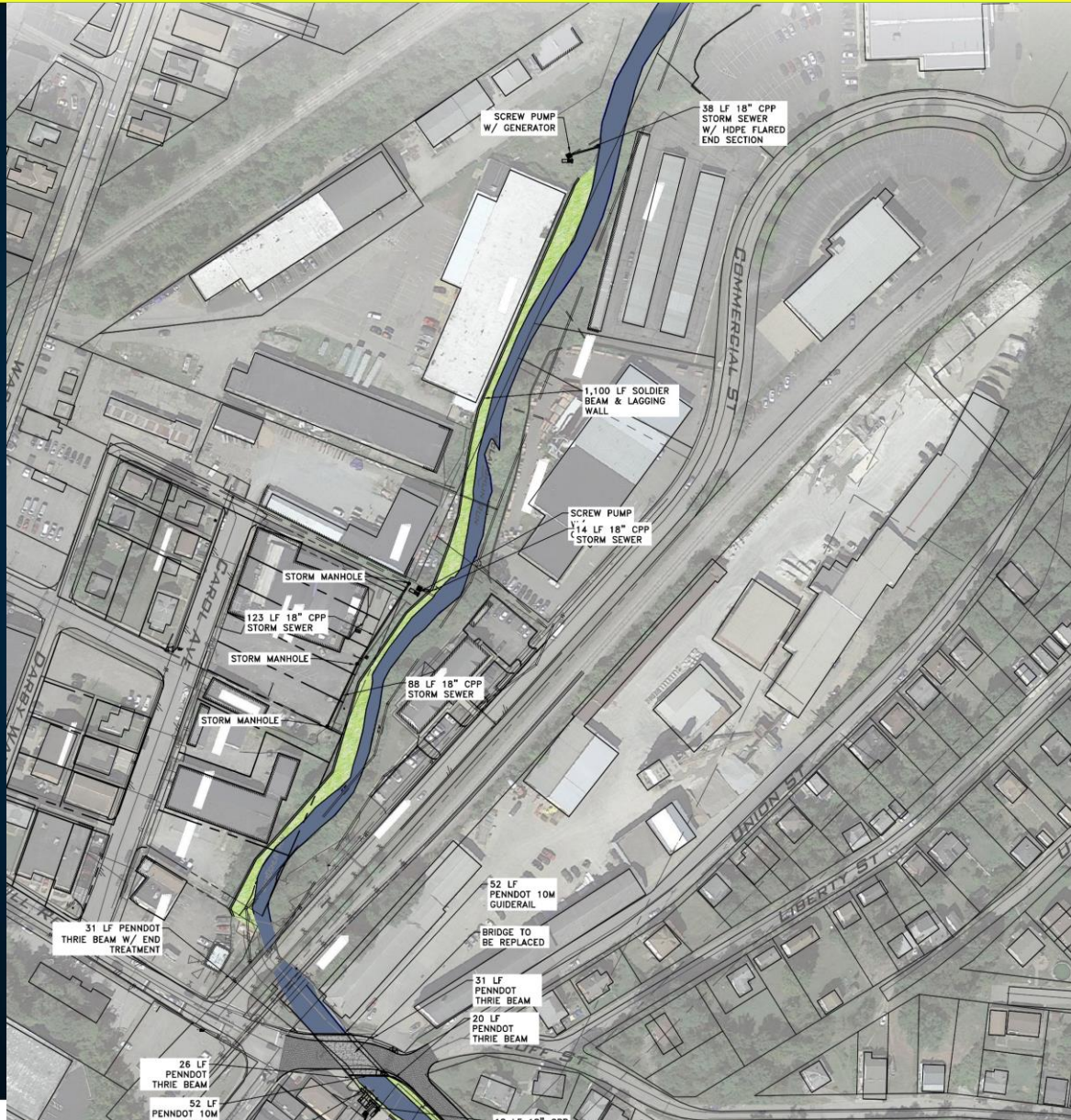
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- Phase 1

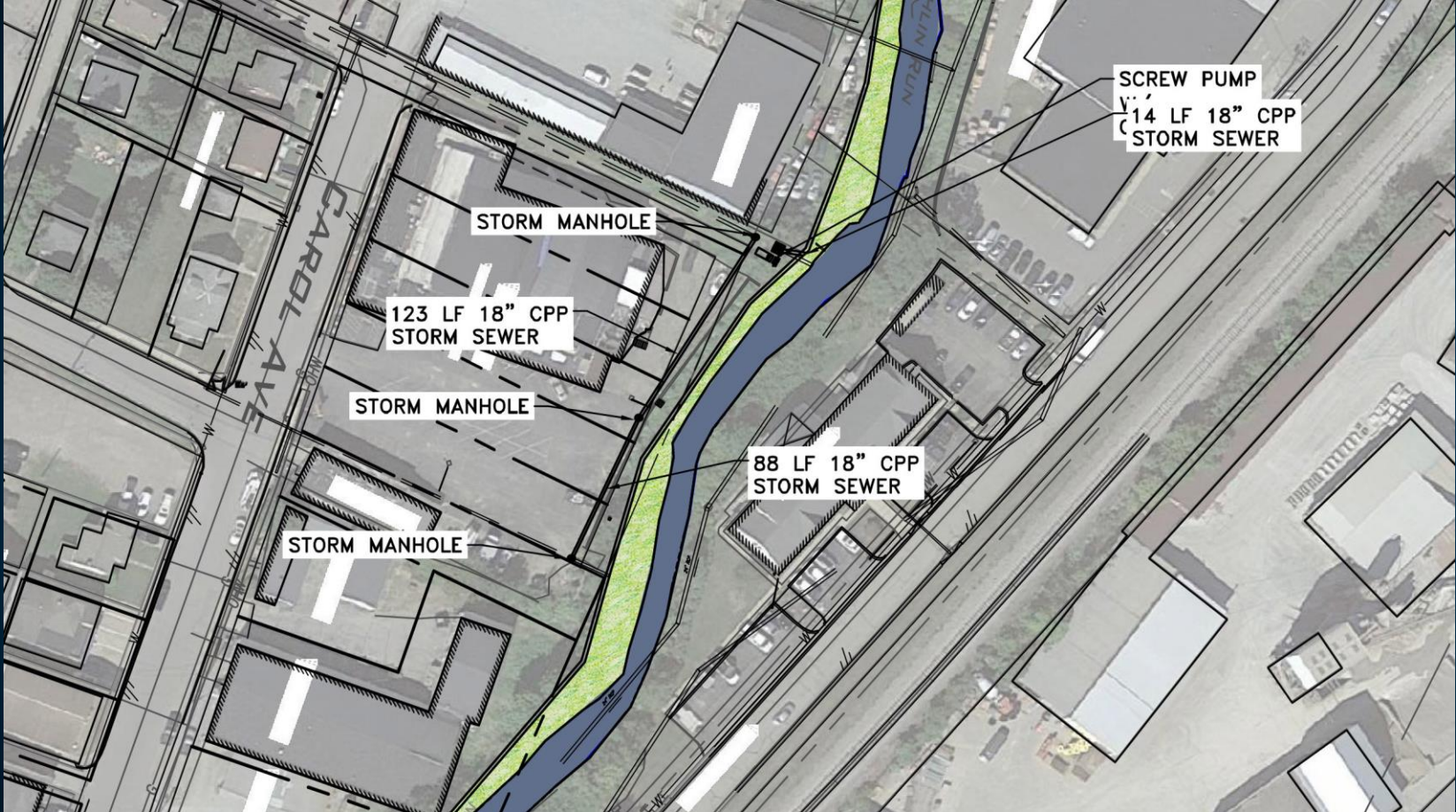
- Construct a soldier beam and lagging levee wall from north of the roller rink to Commercial Street 1,100 LF.
- Relocate a section of storm sewer along Carol Avenue
- Install two screw pumps at the storm sewer discharge points.
- Reduces risk of stream flooding along Carol Avenue
- Phase 1 cost \$3,930,625



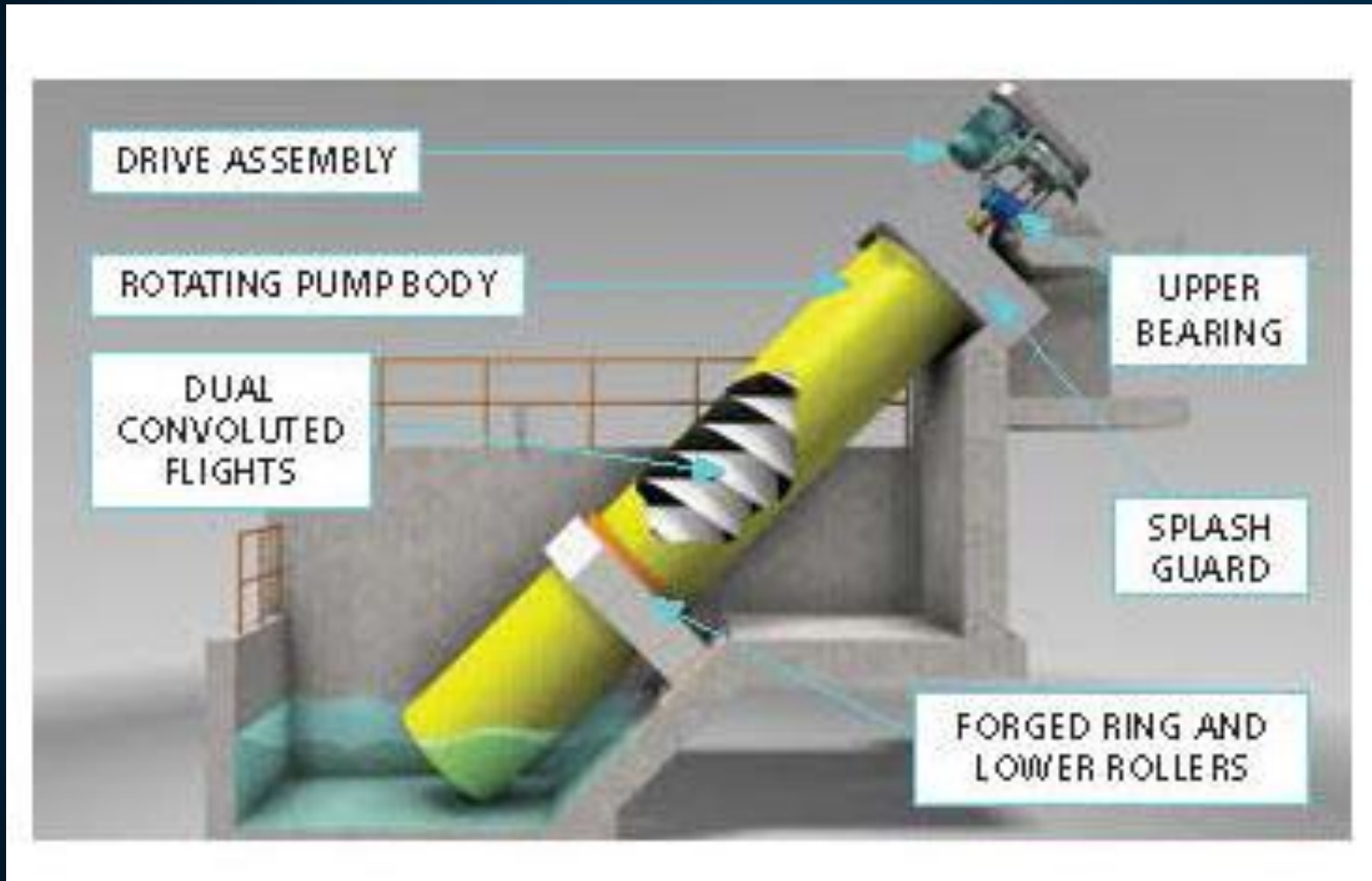
# Option 1 – Phase 1



# Option 1 – Phase 1



# Screw Pump



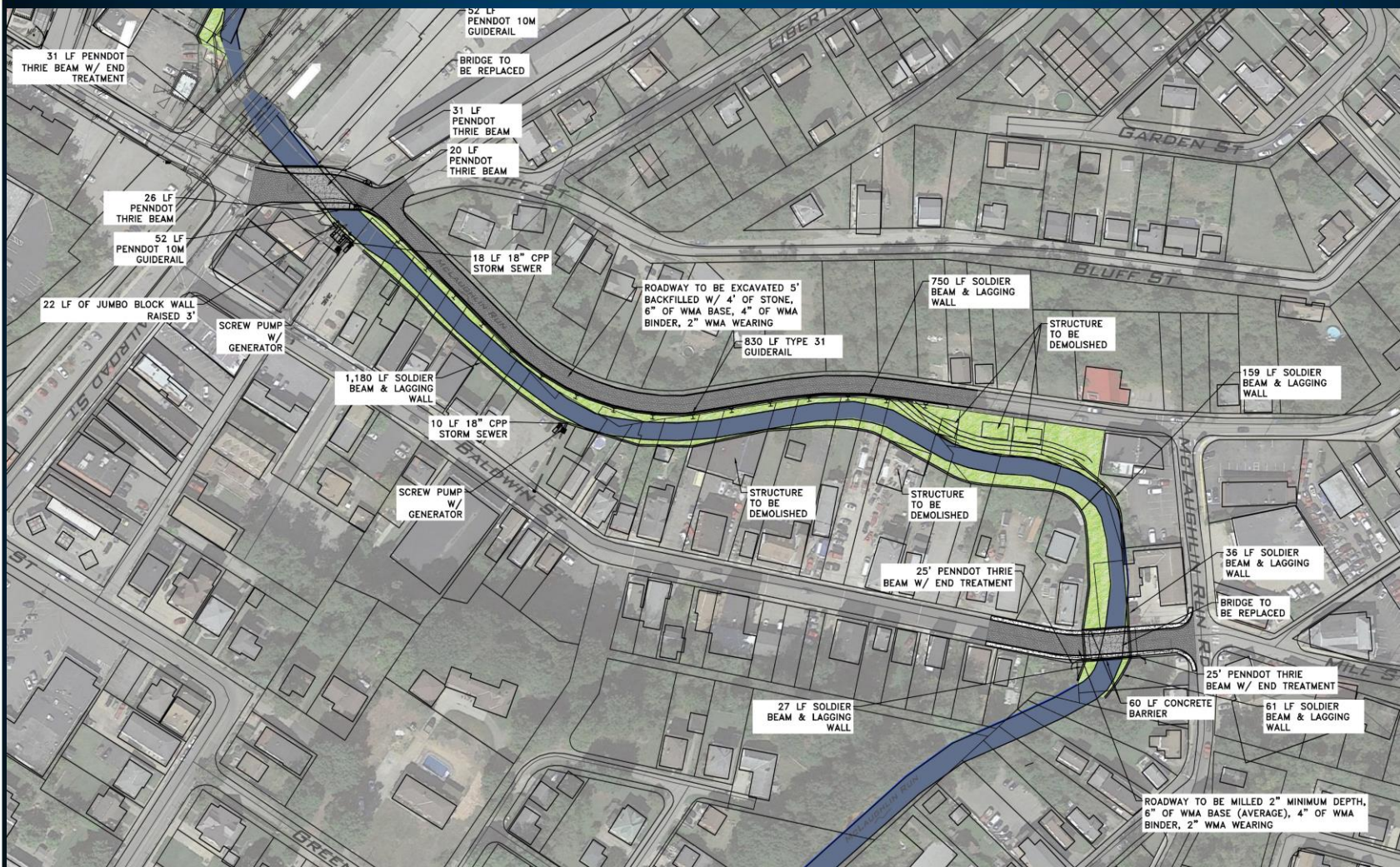
# Option 1

## ● Phase 2

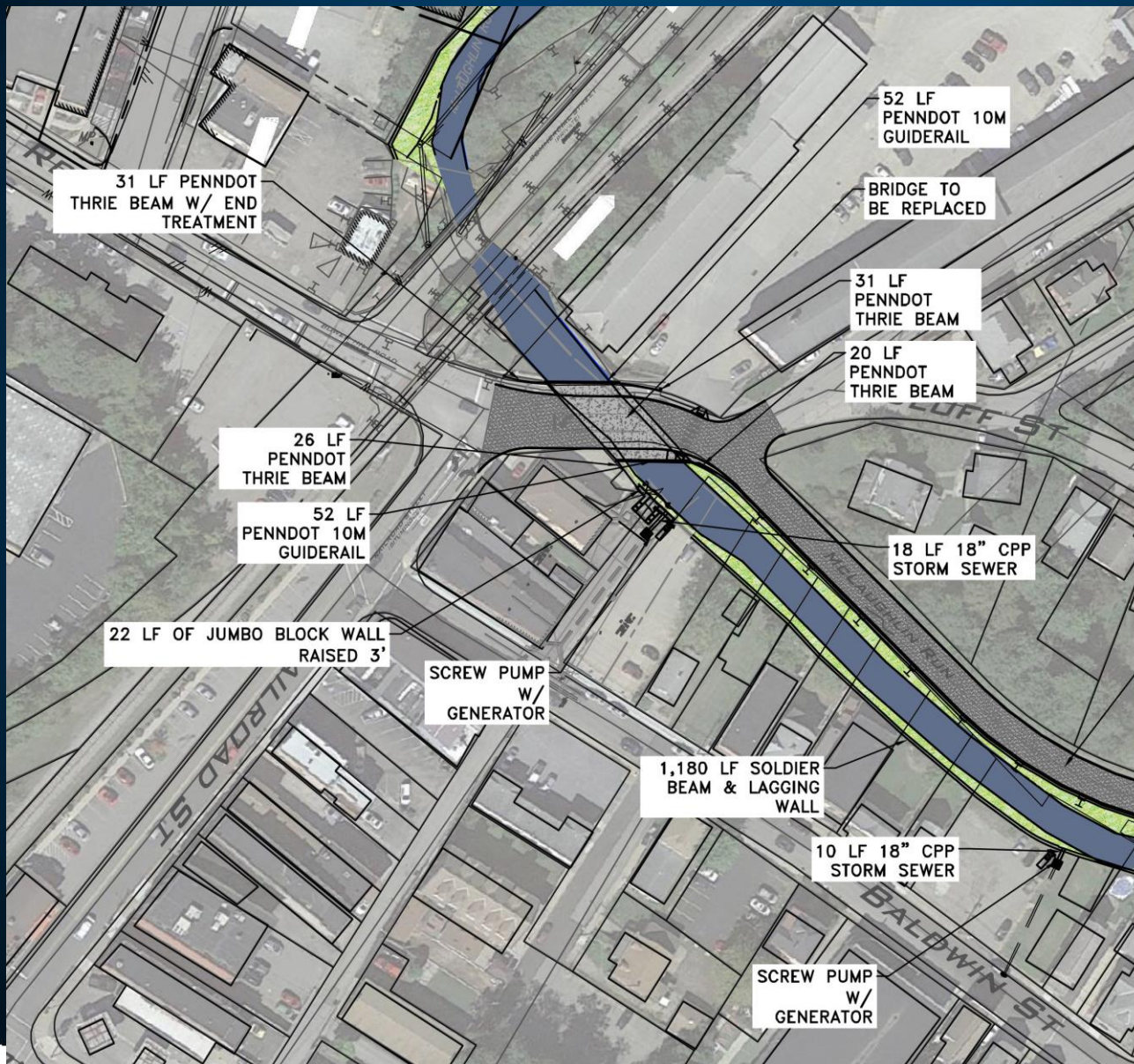
- Construct a soldier beam and lagging levee wall along left bank from Bower Hill Road Bridge to Baldwin Street 1,180 LF.
  - Remove the sidewalk along Bower Hill Road, construct a soldier beam and lagging levee wall along right bank from Bower Hill Road Bridge to existing residential structures, 830 LF.
  - Construct a soldier beam and lagging levee wall along right bank from residential structure to Baldwin Street 159 LF.
  - Replace Bower Hill Road
  - Replace Bower Hill Road bridge (eliminate center column)
  - Replace Baldwin Street Bridge
  - Install two screw pumps at the storm sewer discharge points.
  - Reduces risk of stream flooding along Baldwin Street/Jane Way
- Phase 2 cost \$15,023,219.
- Includes Condemning 4 properties.



# Option 1 – Phase 2

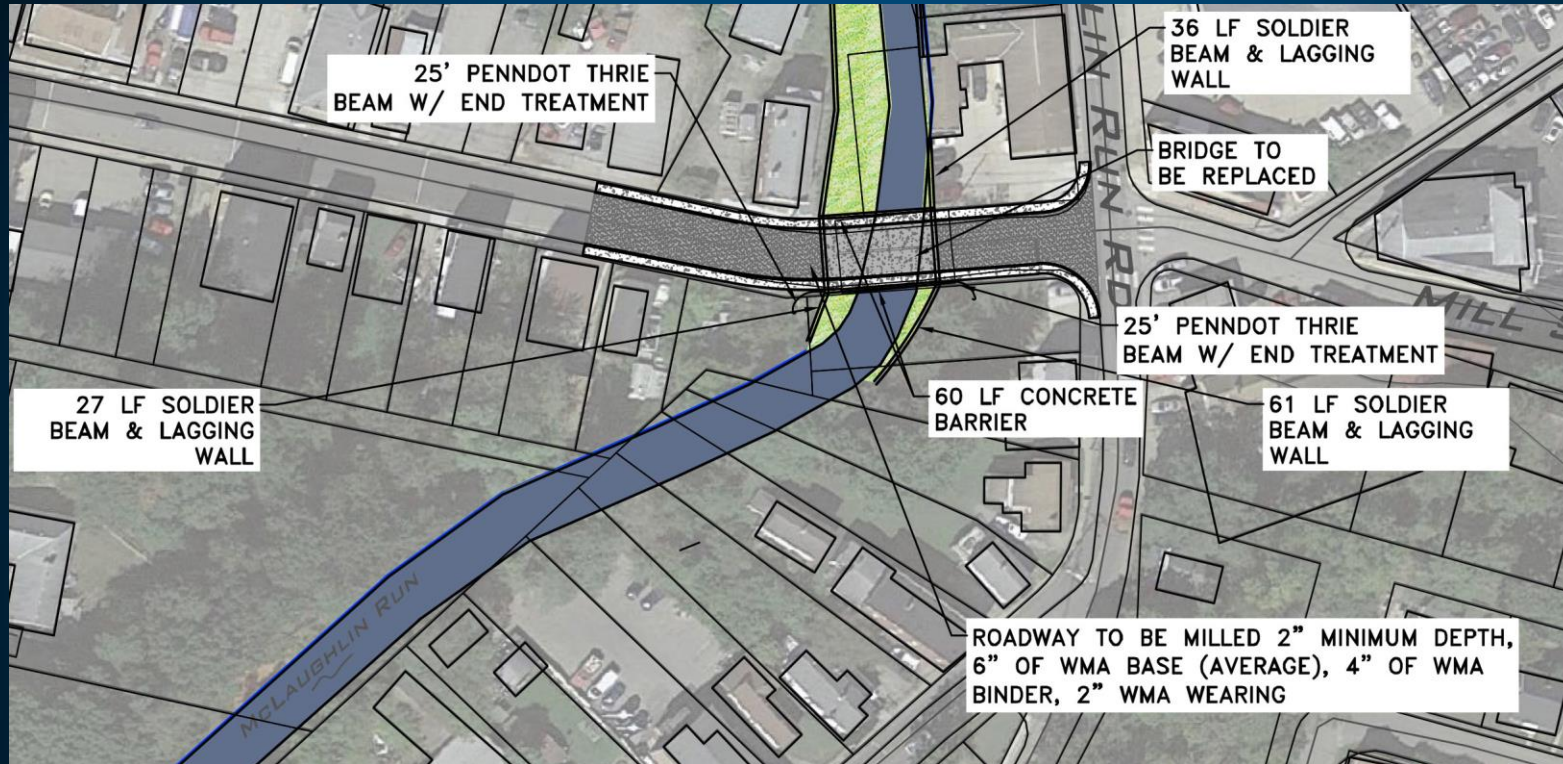


# Option 1 – Phase 2





# Option 1 – Phase 2



# Option 1

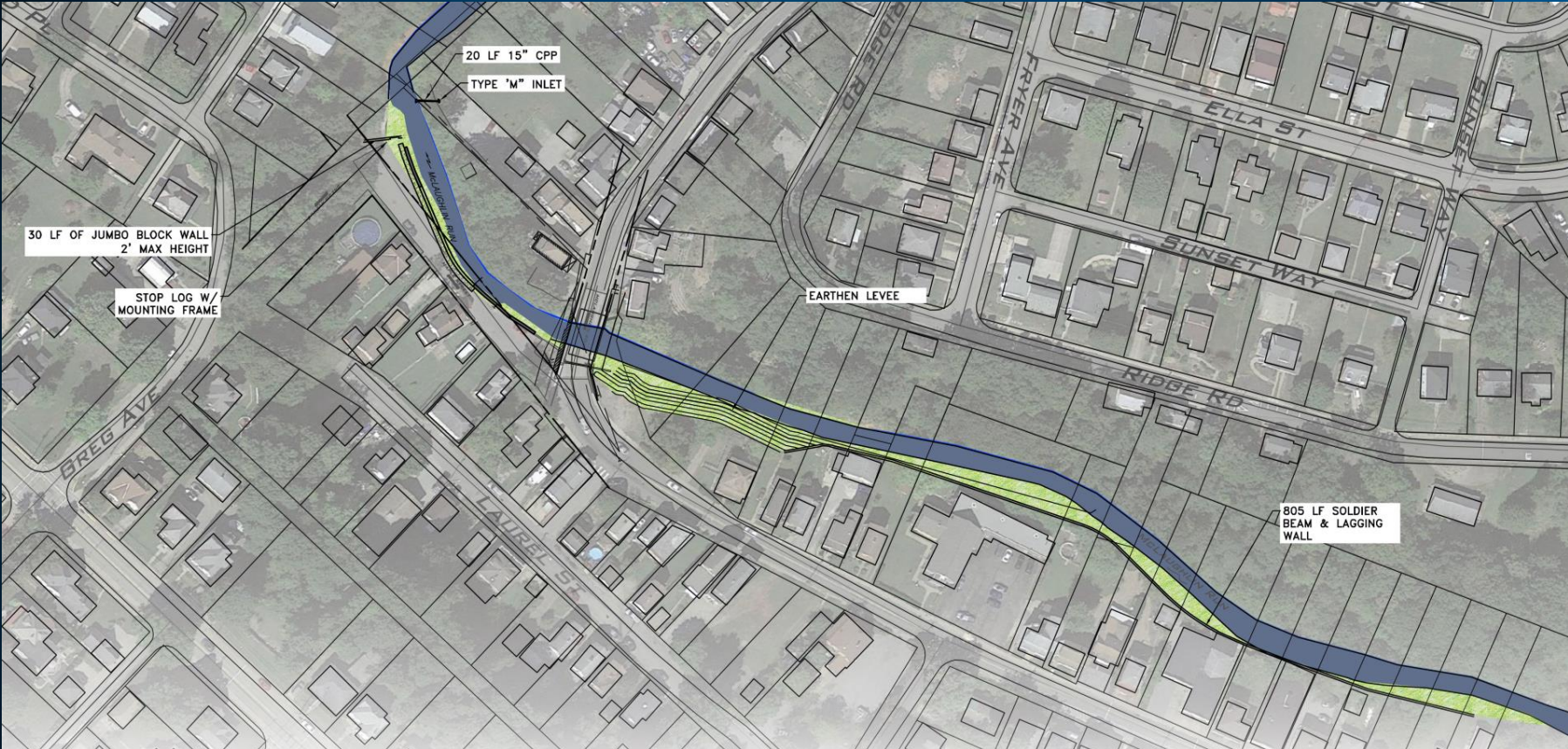
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- Phase 3

- Construct a soldier beam and lagging levee wall along left bank east of Maple Street 806 LF.
- Install jumbo block wall with Stop Log access to ramp at end of Maple Street
- Reduces risk of stream flooding along McLaughlin Run Road
- Phase 3 cost \$2,528,375.



# Option 1 – Phase 3





# Option 1A

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- Phase I – Confluence to Commercial Street
- Phase II – Bower Hill Road to Baldwin Street
- Phase III – Maple Street to McLaughlin Run Park Entrance



# Option 1A

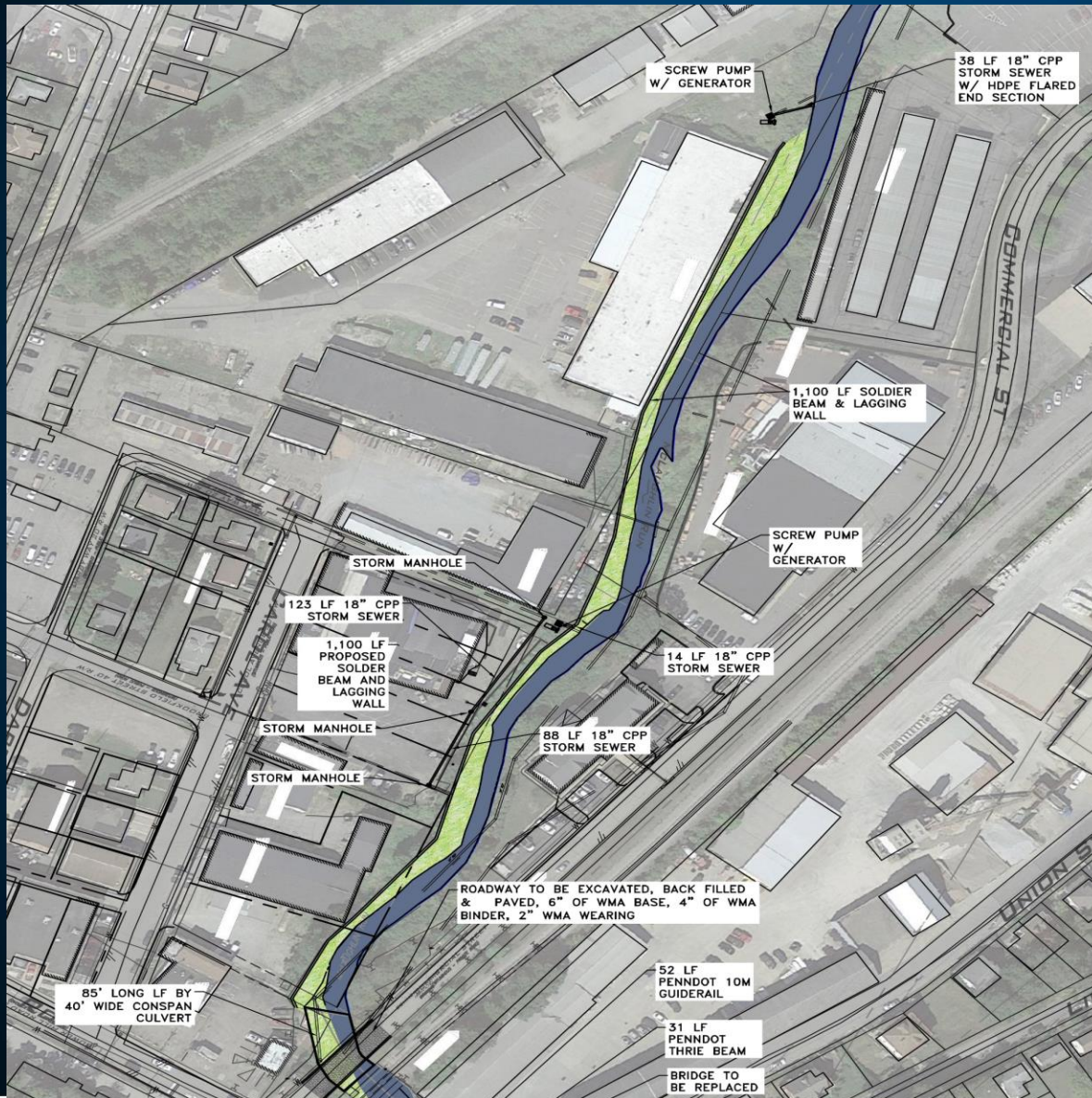
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- Phase 1

- Construct a soldier beam and lagging levee wall from north of the roller rink to Commercial Street 1,100 LF.
- Relocate a section of storm sewer along Carol Avenue
- Install two screw pumps at the storm sewer discharge points.
- Replace the Commercial Street Culvert
- Reduces risk of stream flooding along Carol Avenue
- Phase 1 cost \$5,604,344



# Option 1A – Phase 1



# Option 1A – Phase 1





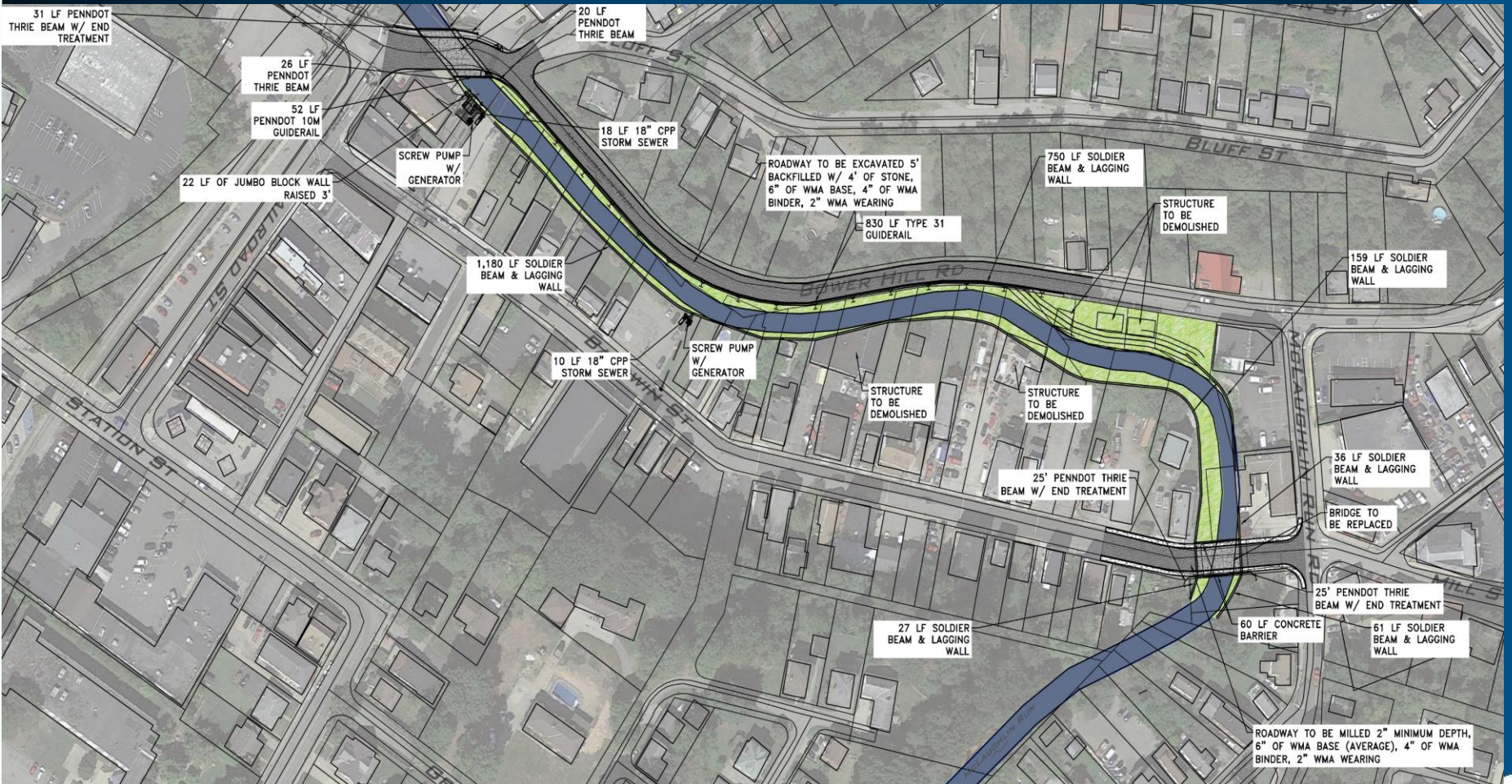
# Option 1A

## ● Phase 2

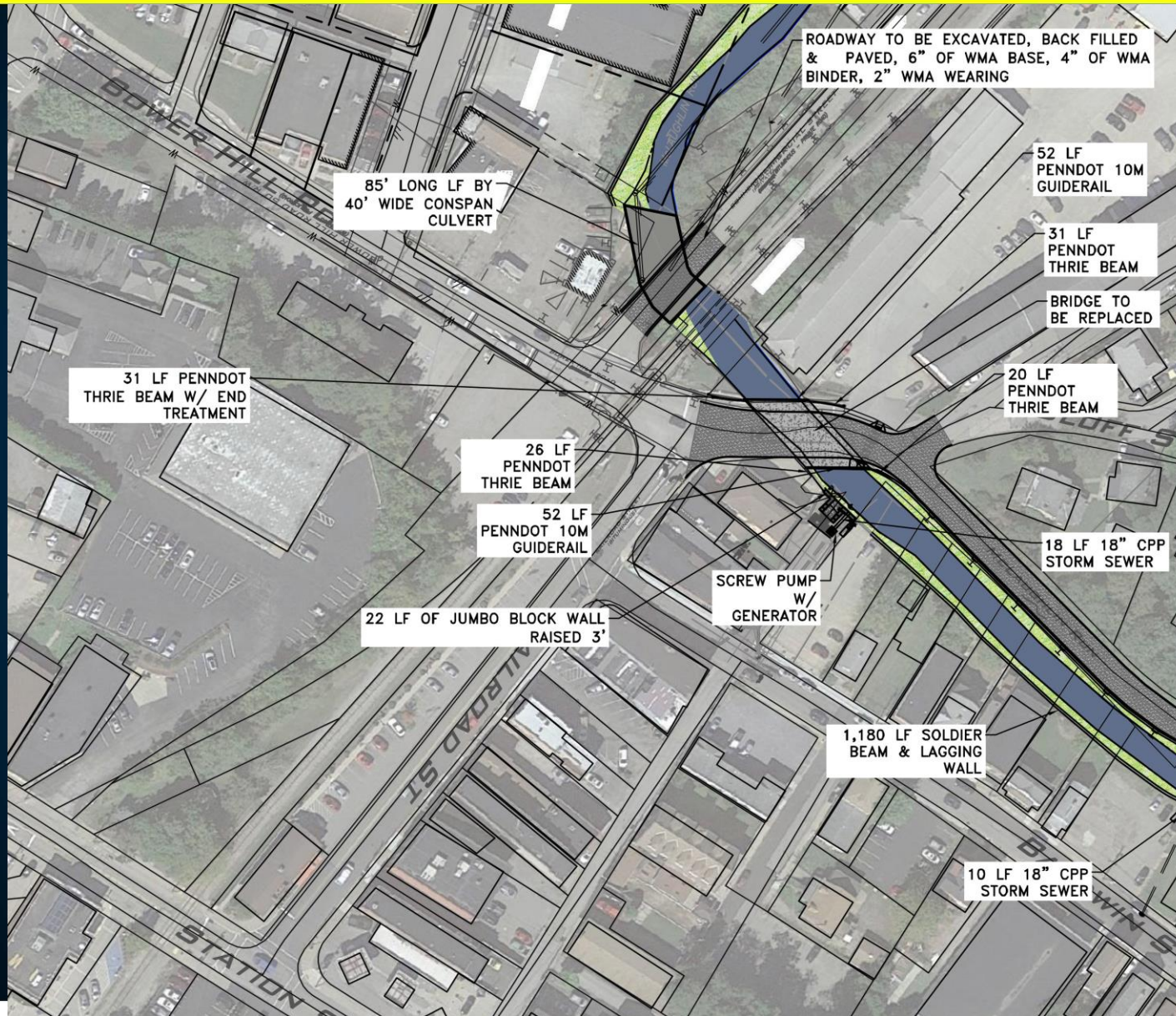
- Construct a soldier beam and lagging levee wall along left bank from Bower Hill Road Bridge to Baldwin Street 1,180 LF.
  - Remove the sidewalk along Bower Hill Road, construct a soldier beam and lagging levee wall along right bank from Bower Hill Road Bridge to existing residential structures, 830 LF.
  - Construct a soldier beam and lagging levee wall along right bank from residential structure to Baldwin Street 159 LF.
  - Replace Bower Hill Road
  - Replace Bower Hill Road bridge (eliminate center column)
  - Replace Baldwin Street Bridge
  - Install two screw pumps at the storm sewer discharge points.
  - Reduces risk of stream flooding along Baldwin Street/Jane Way
- Phase 2 cost \$15,023,219.
- Includes Condemning 4 properties.



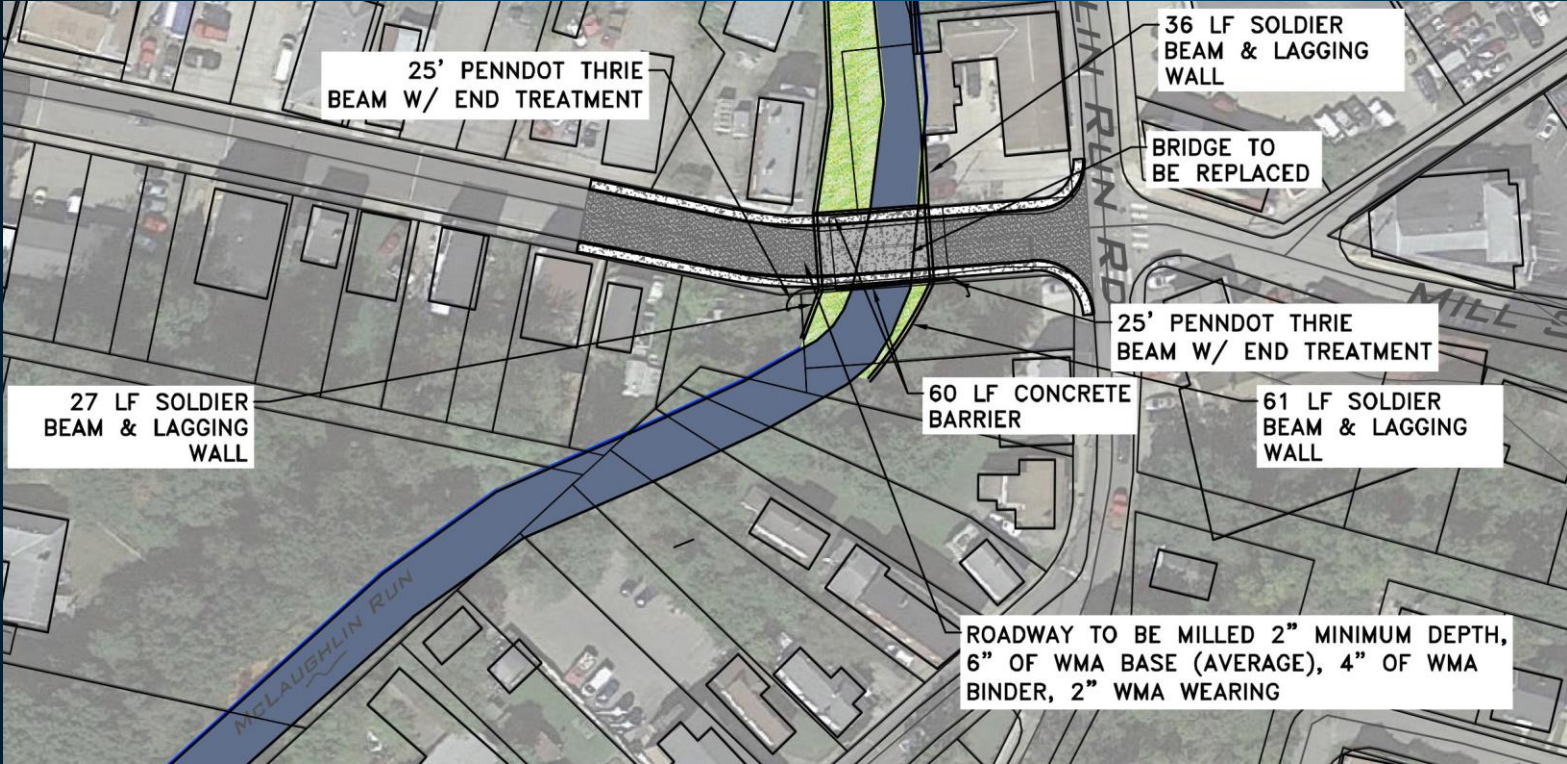
# Option 1A – Phase 2



# Option 1A – Phase 2



# Option 1A – Phase 2



# Option 1A

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- Phase 3

- Construct a soldier beam and lagging levee wall along left bank east of Maple Street 806 LF.
- Install jumbo block wall with Stop Log access to ramp at end of Maple Street
- Reduces risk of stream flooding along McLaughlin Run Road
- Phase 3 cost \$2,528,375.



# Option 1A – Phase 3





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# Option 2

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- Phase I – Confluence to Commercial Street
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# Option 2

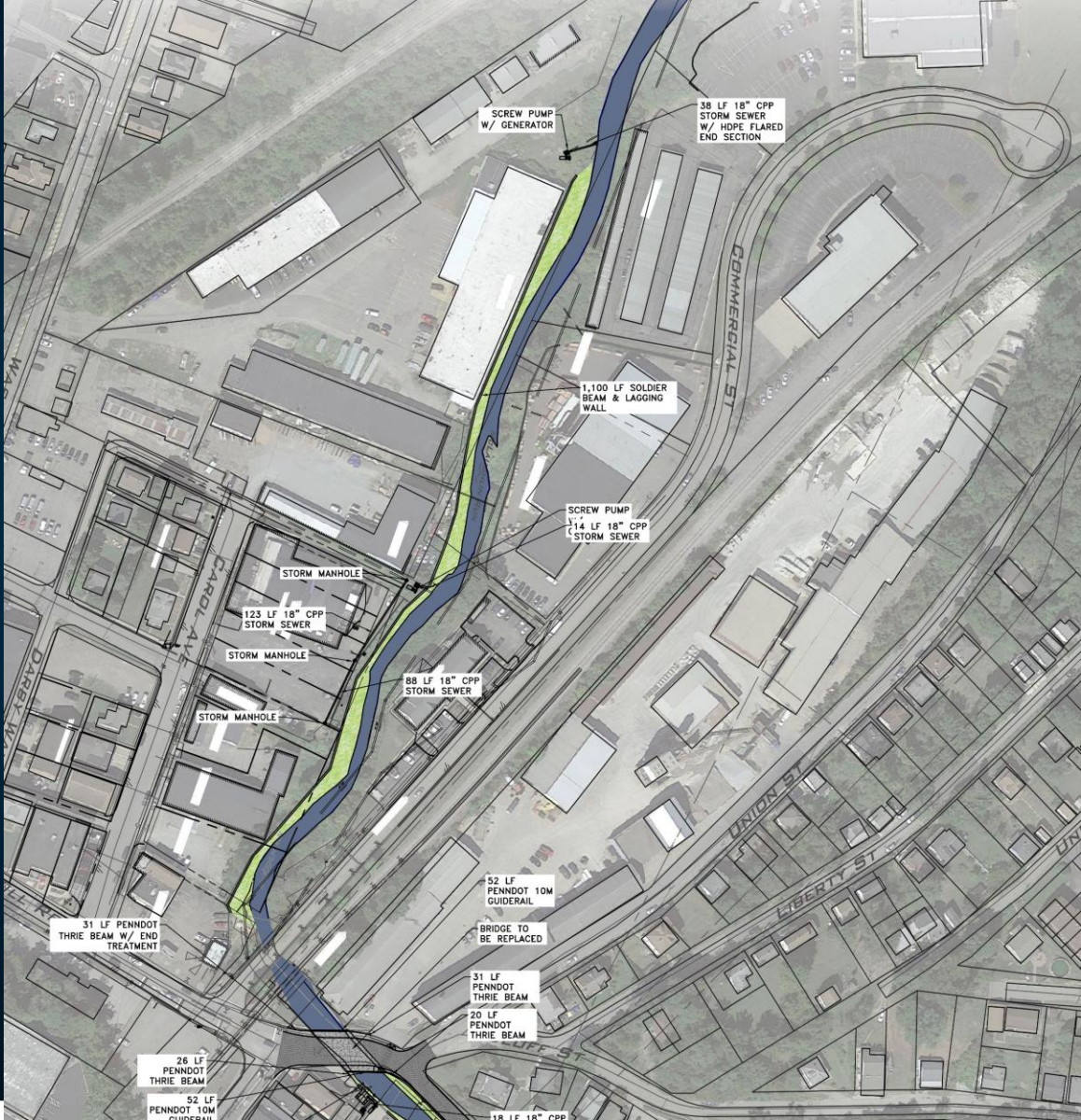
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- Phase 1

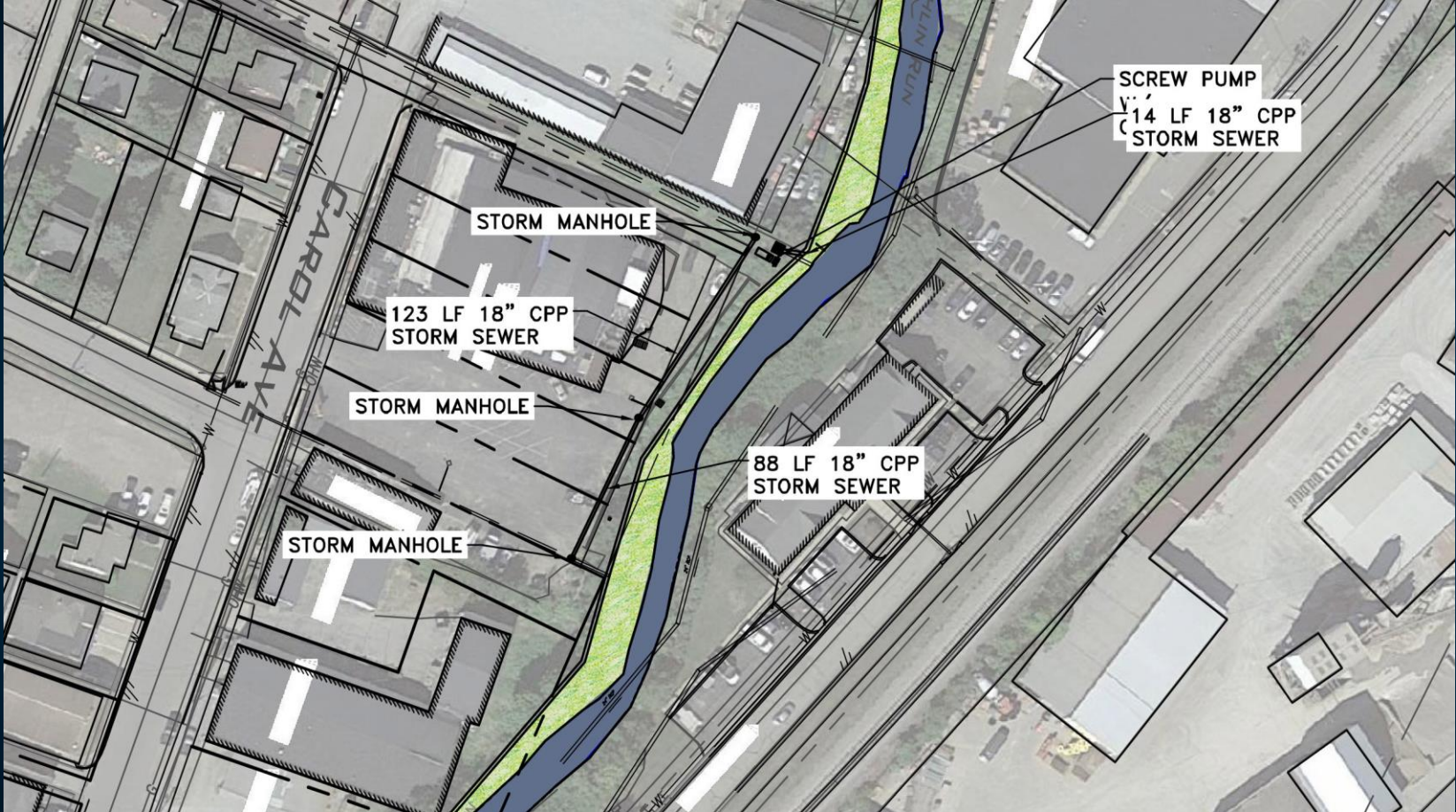
- Construct a soldier beam and lagging levee wall from north of the roller rink to Commercial Street 1,100 LF.
- Relocate a section of storm sewer along Carol Avenue
- Install two screw pumps at the storm sewer discharge points.
- Reduces risk of stream flooding along Carol Avenue
- Phase 1 cost \$3,930,625



# Option 2 – Phase 1



# Option 2 – Phase 1

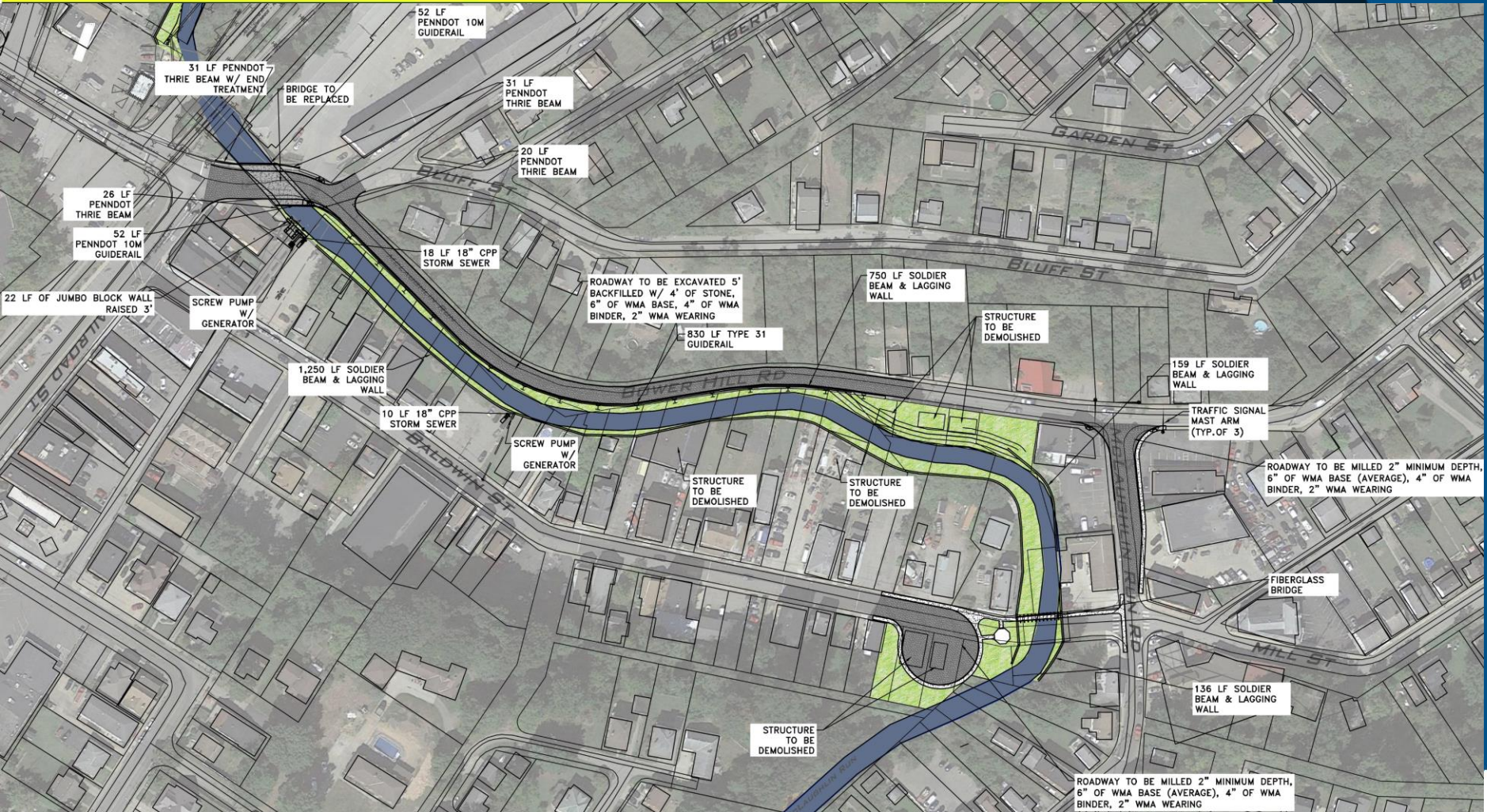


# Option 2

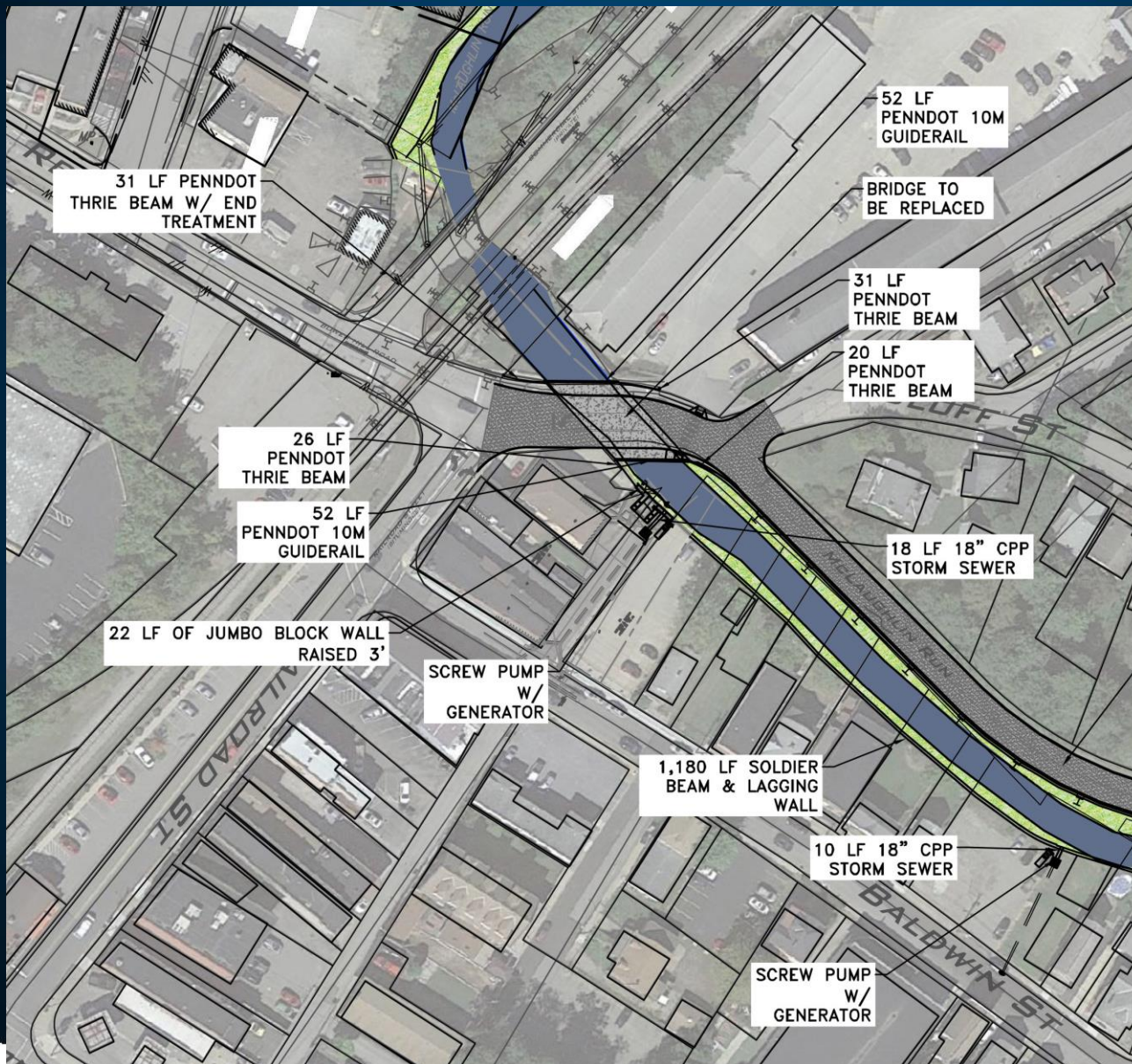
- Phase 2
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    - Remove the sidewalk along Bower Hill Road, construct a soldier beam and lagging levee wall along right bank from Bower Hill Road Bridge to existing residential structures, 830 LF.
    - Construct a soldier beam and lagging levee wall along right bank from residential structure to Baldwin Street 159 LF.
    - Replace Bower Hill Road
    - Replace Bower Hill Road bridge (eliminate center column)
    - Remove Baldwin Street Bridge & install a fiberglass pedestrian bridge.
    - Install Cul-De-Sac on Baldwin Street.
    - Construct turning lanes on McLaughlin Run Road.
    - Install two screw pumps at the storm sewer discharge points.
    - Reduces risk of stream flooding along Baldwin Street/Jane Way
- Phase 2 cost \$13,223,912.
- Includes condemning 6 properties.



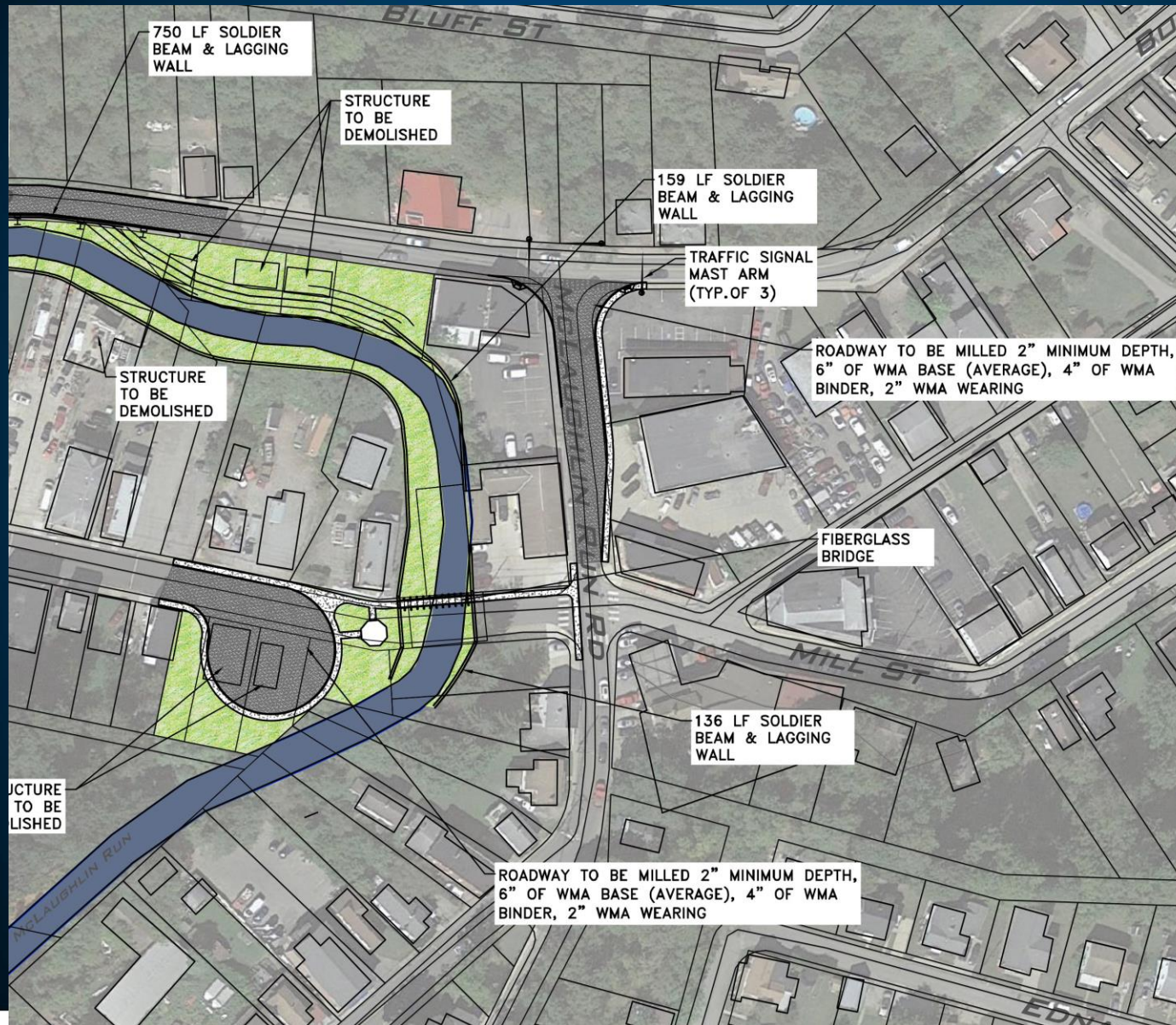
# Option 2 – Phase 2



# Option 2 – Phase 2



# Option 2 – Phase 2



# Option 2

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- Phase 3

- Construct a soldier beam and lagging levee wall along left bank east of Maple Street 806 LF.
- Install jumbo block wall with Stop Log access to ramp at end of Maple Street
- Reduces Risk stream flooding along McLaughlin Run Road
- Phase 3 cost \$2,528,375.





# Option 2 – Phase 3





# Option 3

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- Phase I – Confluence to Commercial Street
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# Option 3

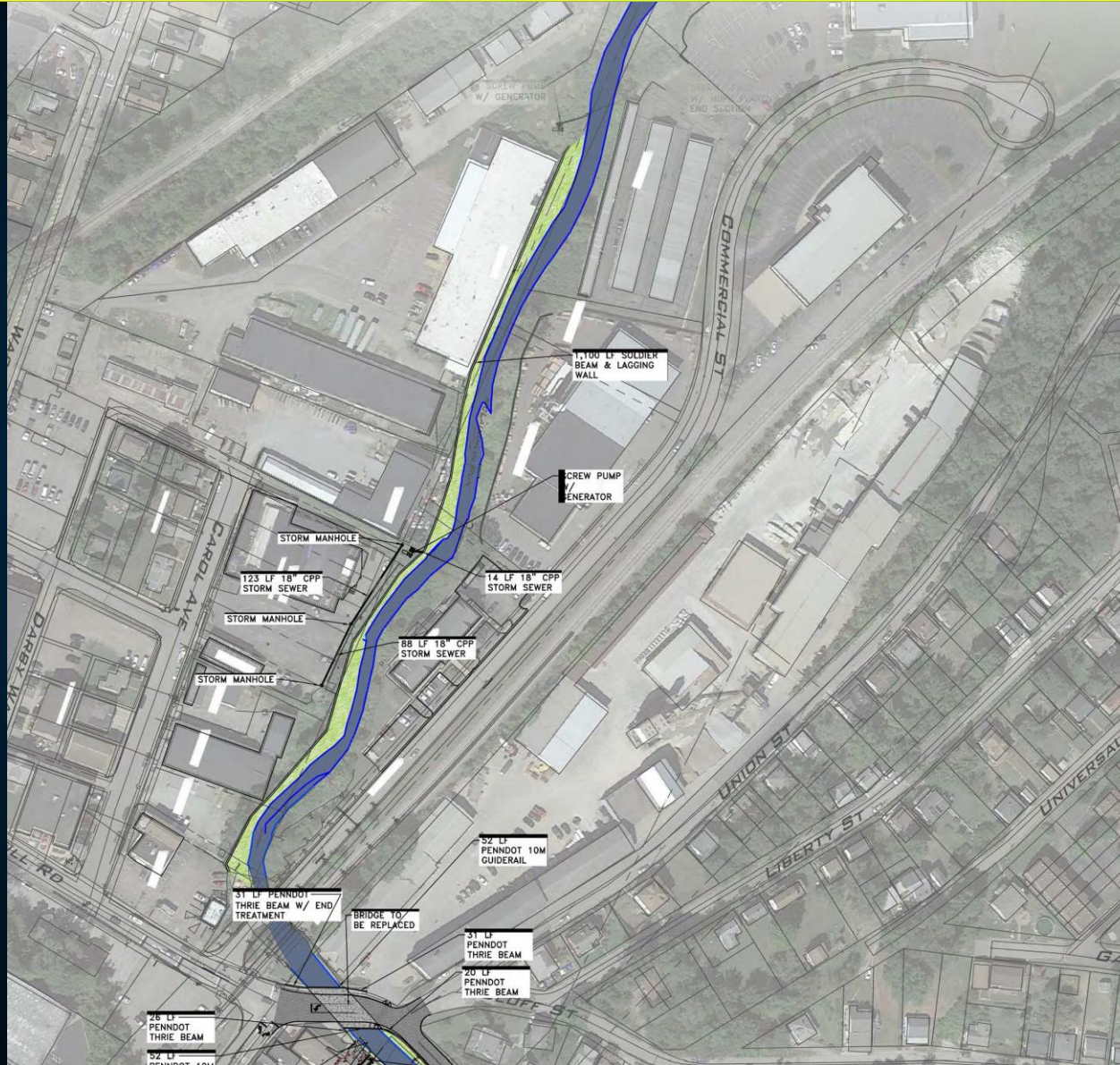
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- Phase 1

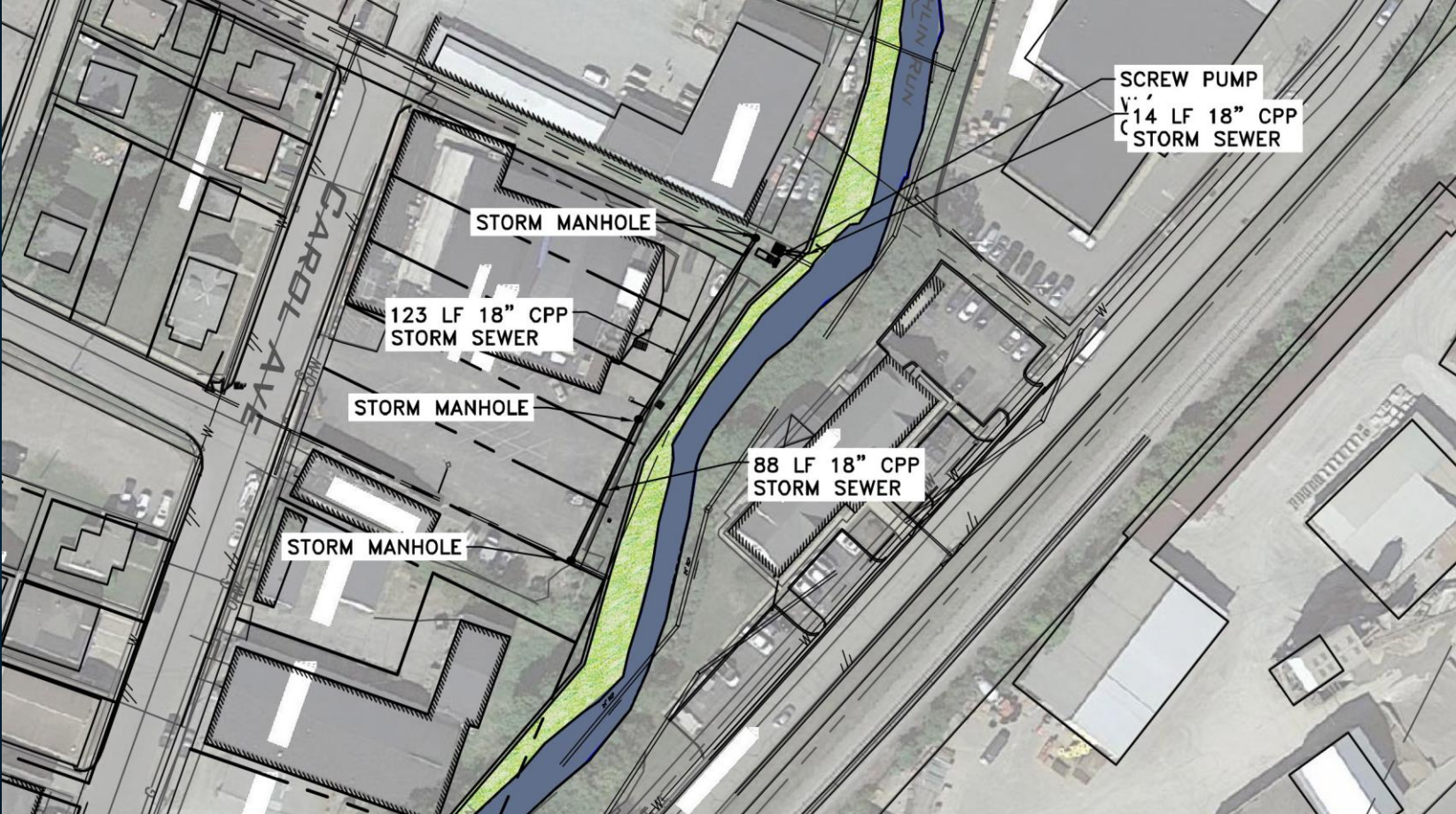
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- Relocate a section of storm sewer along Carol Avenue
- Install two screw pumps at the storm sewer discharge points.
- Reduces Risk of stream flooding along Carol Avenue
- Phase 1 cost \$3,930,625



# Option 3 – Phase 1



# Option 3 – Phase 1

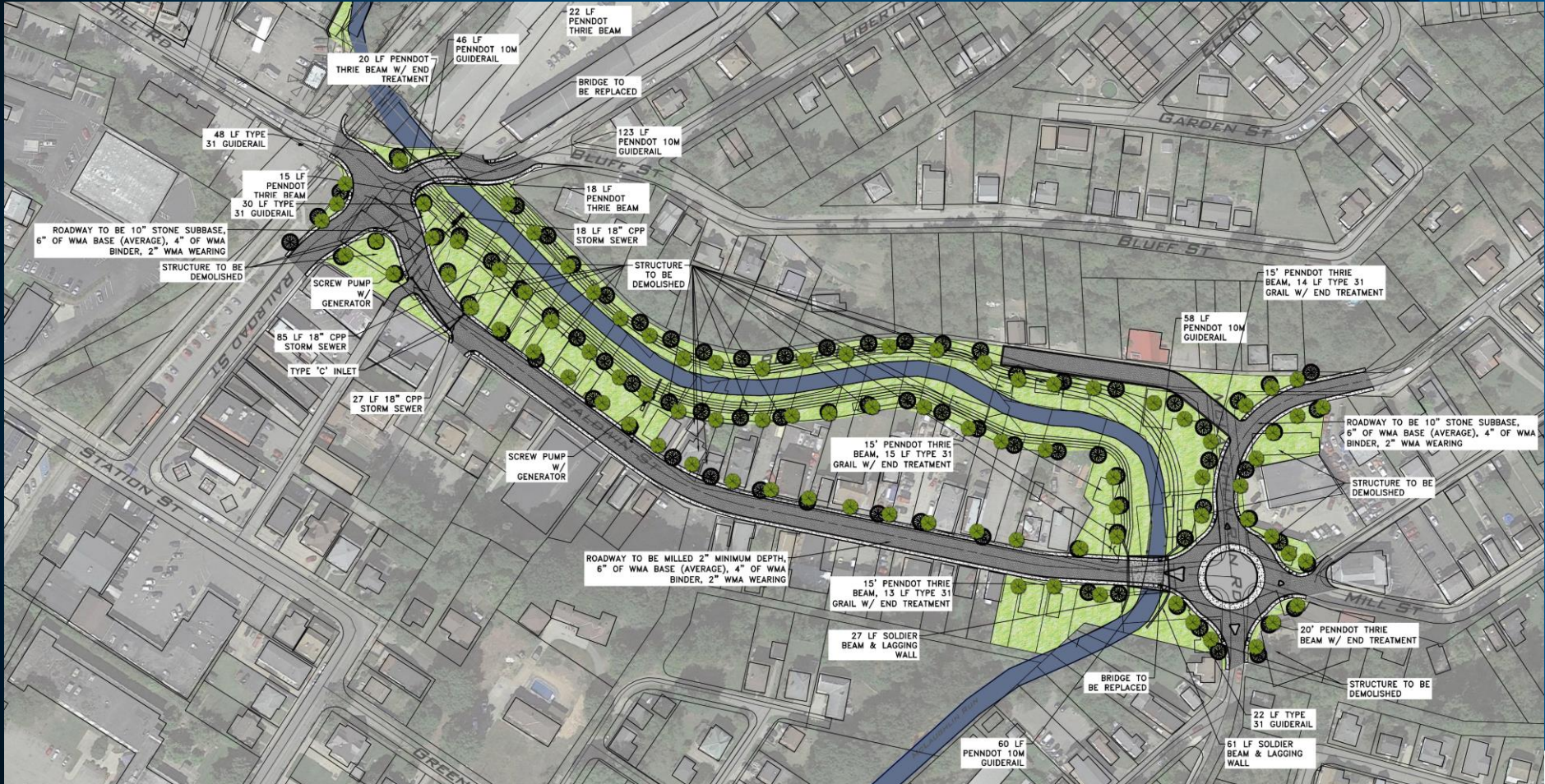


# Option 3

- Phase 2
    - Remove Bower Hill Road from Railroad Street to McLaughlin Run Road.
    - Reconfigure the intersection of Baldwin Street, Bower Hill Road and Railroad Street to create a plus intersection.
    - Replace and reduce the size of Bower Hill Road bridge (eliminate center column)
    - Replace Baldwin Street Bridge
    - Reconfigure the intersection of Baldwin Street and McLaughlin Run Road including replacing the traffic signal with a round about.
    - Construct an earthen levee on the left bank of McLaughlin Run from Baldwin Street to Railroad Street.
    - Create a vegetated riparian buffer along McLaughlin Run
    - Install two screw pumps at the storm sewer discharge points.
    - Reduces risk of stream flooding along Baldwin Street/Jane Way
- Phase 2 cost \$16,900,431.
- Includes Condemning 37 properties.



# Option 3 – Phase 2

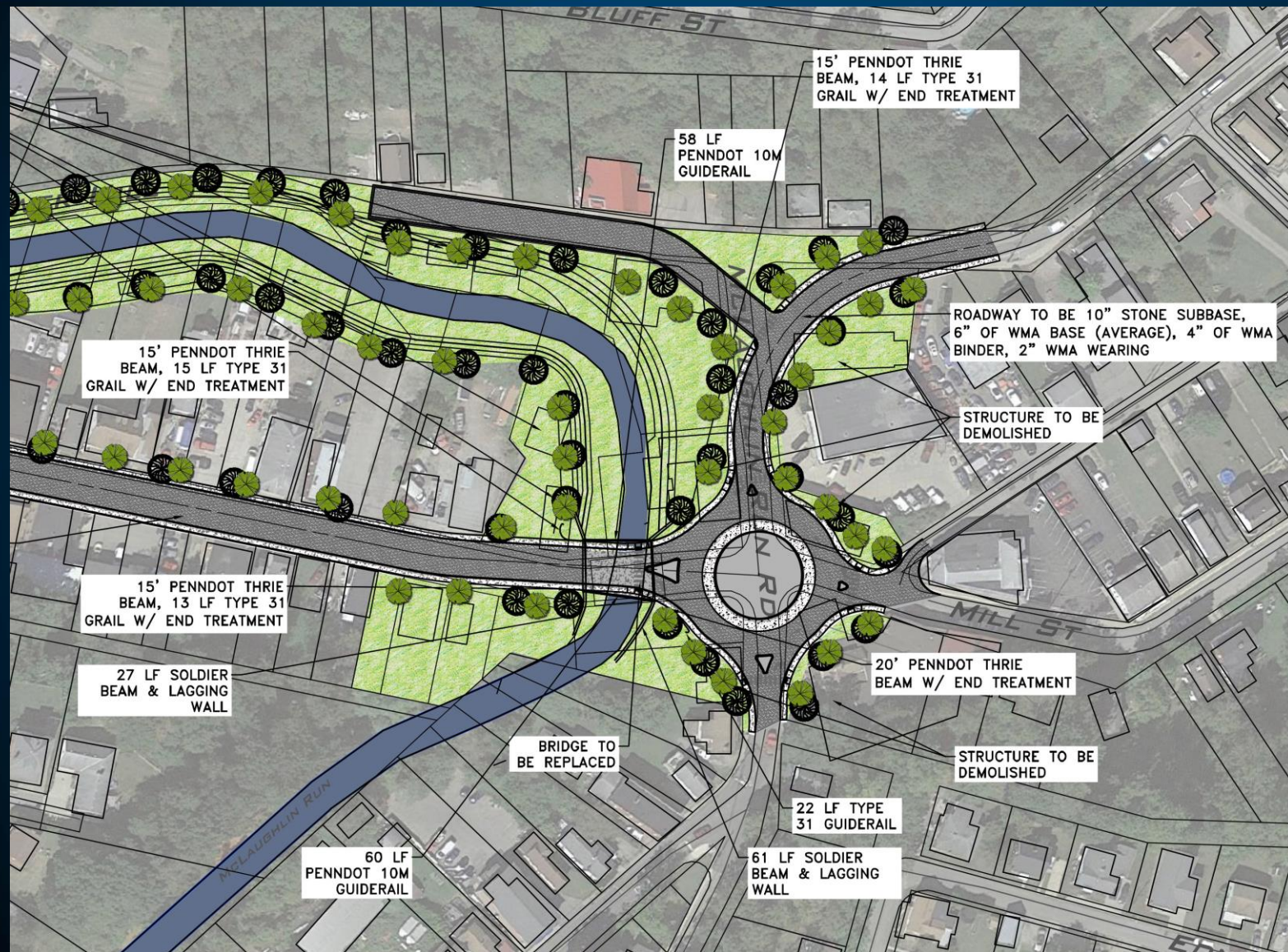




# Option 3 – Phase 2



# Option 3 – Phase 2



# Option 3

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- Phase 3

- Construct a soldier beam and lagging levee wall along left bank east of Maple Street 806 LF.
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- Phase 3 cost \$2,528,375.



# Option 3 – Phase 3





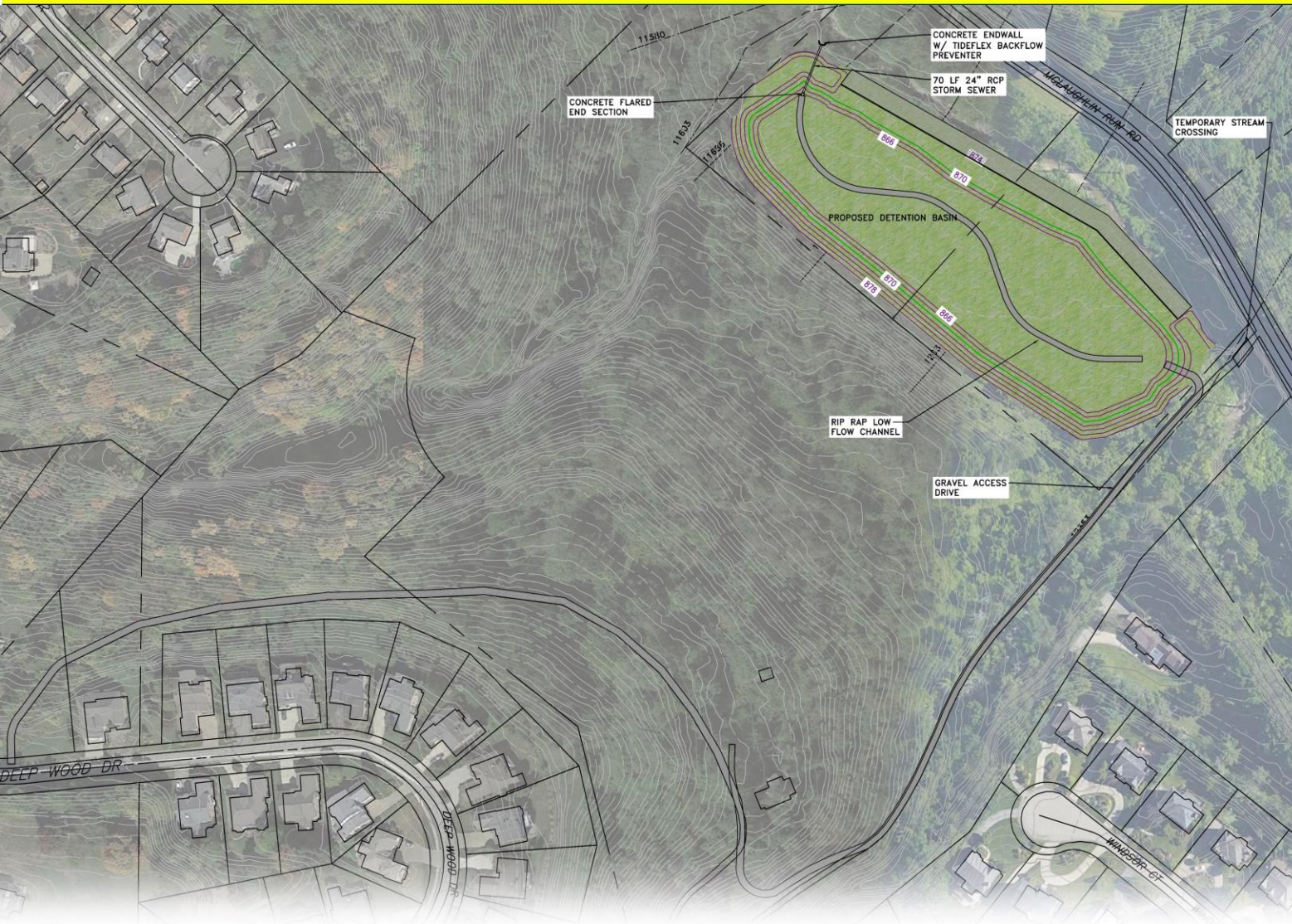
# Option 4

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- Construction of a 9.5 Acre-FT offline detention facility in Upper St. Clair.



# Option 4







# Option Comparison

- Option 1 - \$21,482,219; 4 Properties Condemned; 6 structures demolished; Reduce the risk of flooding 171 Structures.
- Option 1A - \$23,155,938; 4 Properties Condemned; 6 structures demolished; Reduce the risk of flooding 171 Structures.
- Option 2 - \$19,682,913; 6 Properties Condemned; 6 structures demolished; Reduce the risk of flooding 169 Structures.
- Option 3 - \$23,359,431; 37 Properties Condemned; 27 structures demolished; Reduce the risk of flooding 147 Structures.
- Option 4 - \$3,870,375; 2 Properties Condemned; Reduce the risk of flooding 79 Structures.



# Potential Funding

- USACOE – Section 219 Environmental Infrastructure Grant (Currently Not Open)
- USACOE – Section 7001 Grant (Currently Not Open)
- FEMA – Mitigation Assistance (Currently Not Open)
- CFA Act 13 – Flood Mitigation Program (Currently Not Open)
- CFA - PA Small Water and Sewer Program (Currently Not Open)
- CFA - H2O PA (Currently Not Open)
- DCED – PA Infrastructure Bank (Loan for Bridges)
- Allegheny County GEDF (Currently Not Open)

