

A photograph of a concrete-lined stream. In the background, a weir structure is visible with water cascading over it. In the foreground, a large log jam is partially submerged in the water, with many smaller branches and debris attached to it. The stream is bordered by concrete walls on both sides. The water is dark and reflects the surrounding trees and sky. The overall scene suggests a need for stream enhancement or maintenance.

Doan Brook Enhancement Project

Conceptual Design and Implementation Schedule

Project Location

The restoration work for the Doan Brook Enhancement Project will be limited to the area beginning just downstream of the culvert under the University Circle (UC) area, down to the upstream area of the Superior Avenue Culvert.

This area is approximately 5,200 linear feet of stream length. All of the enhancement work will be done within the Rockefeller Park area or those sections of stream owned and managed by the City of Cleveland.

For this conceptual plan, the enhancement area has been broken out into 5 reaches. Due to project budget limitations, all 5 sections will not be restored; however recommendations will be made on which sections to pursue based on the highest potential for ecological improvements as well as their benefits to park aesthetics and visibility.

On May 4, 2005, this section of Rockefeller Park was added to the National Registry of Historic Places. As such any work involving Federal funding in this area must adhere to the National Historic Preservation Action Section 106 process.

Project Goals

- Improve aquatic habitat in restored areas
- Provide for better control of stream flows
- Provide for some floodplain relief where possible
- Improve and enhance riparian vegetative cover
- Provide limited removal of invasive plant species
- Provide for some limited access to the brook

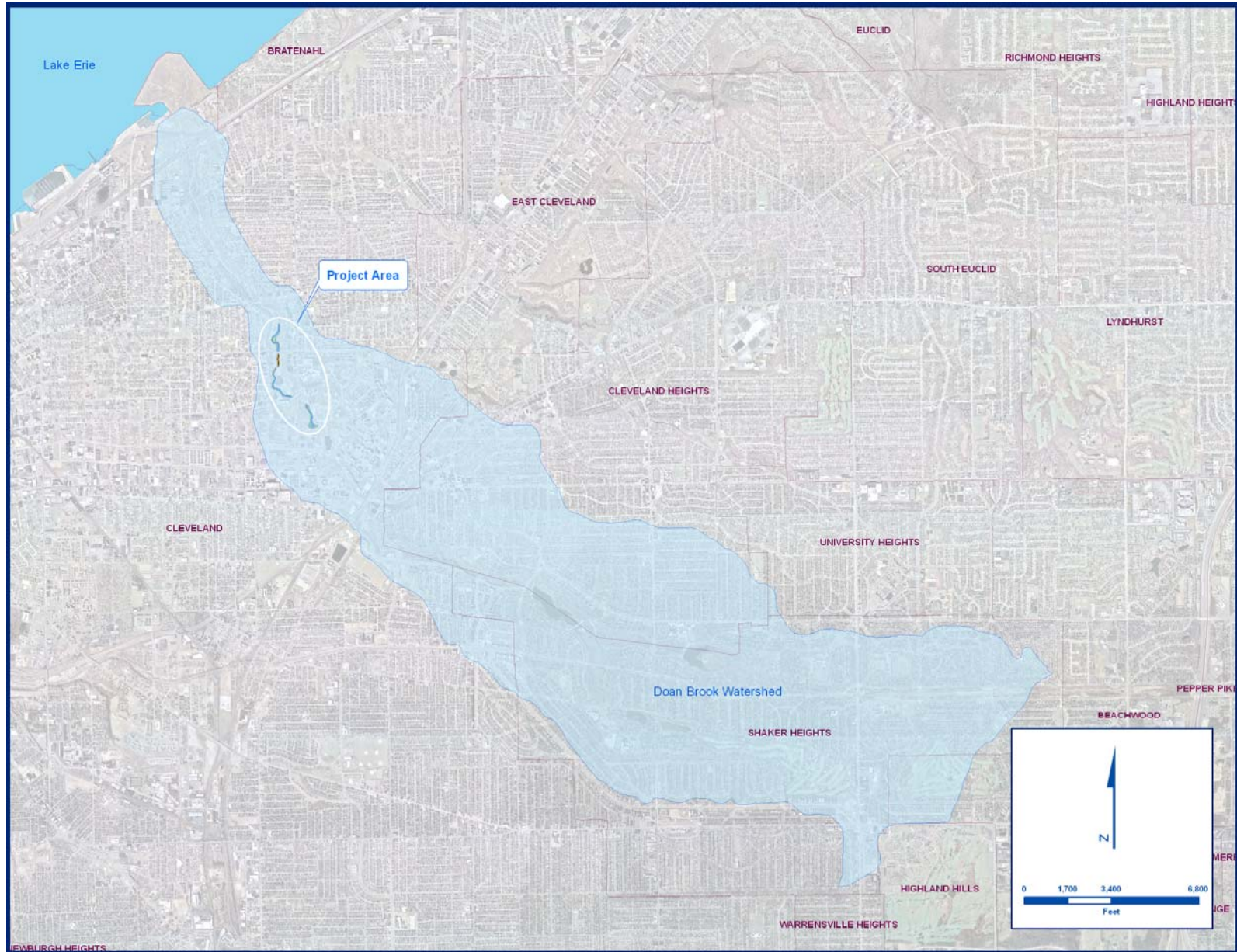
Project Responsibility

- NEORSR will manage all the tasks identified in the project schedule because of its experience with similar stormwater projects
- The City of Cleveland is still the responsible party for compliance with the Findings and Orders issued by the Ohio EPA
- The FAA will be the lead Federal Agency for the purposes of the Section 106 process

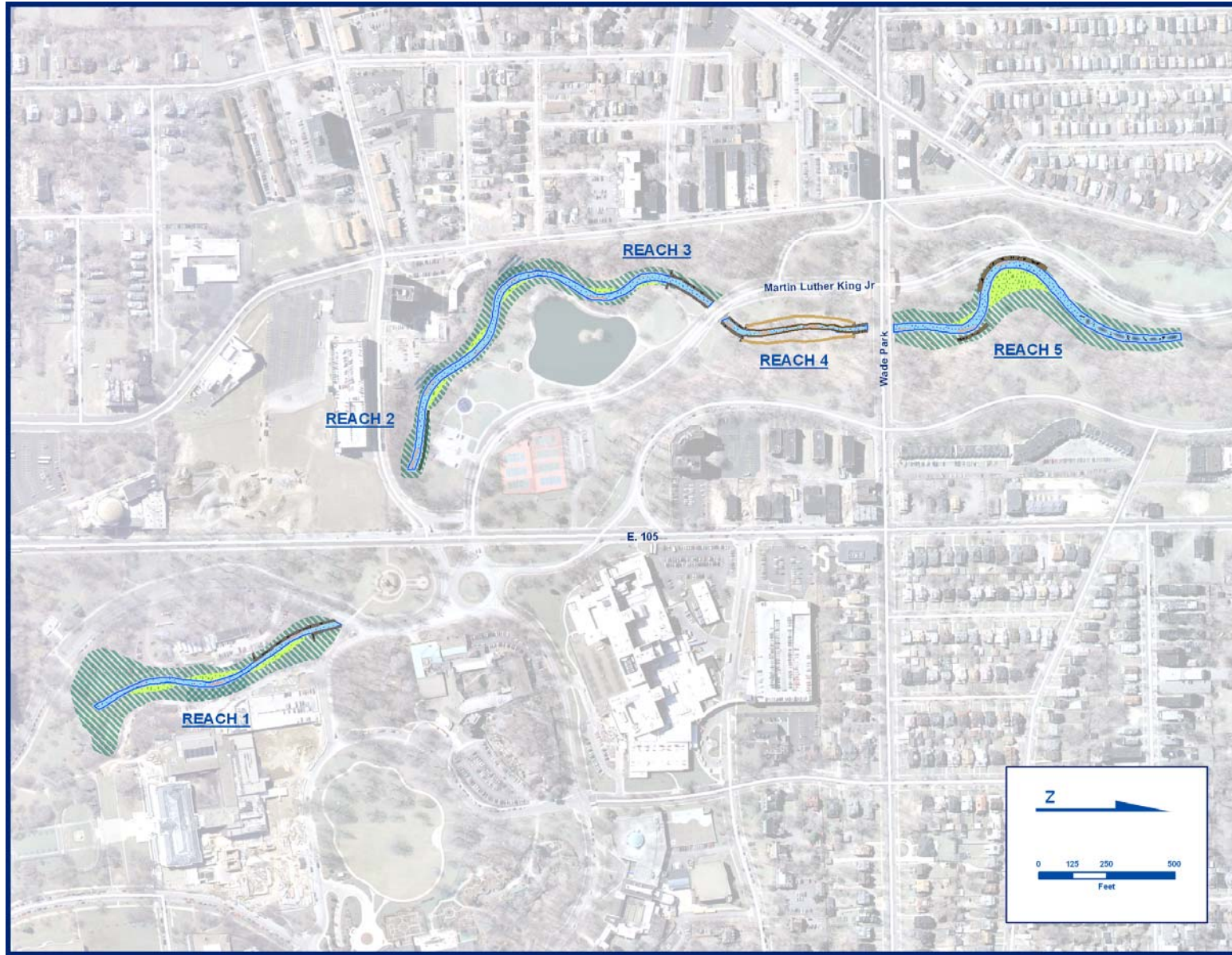
Project Schedule

- 4th Quarter 2009
 - Obtain Ohio EPA approval to proceed with enhancement plan
 - Re-engage the Section 106 Consulting Parties
- 1st Quarter 2010
 - Conduct 1st Section 106 stakeholder meeting
 - Develop RFP for design services
- 2nd Quarter 2010
 - Procure design services
- 3rd Quarter 2010
 - Conduct 2nd Section 106 stakeholder meeting
 - Begin design
- 3rd Quarter 2011
 - Complete design
 - Revise and execute new section 106 Memorandum of Understanding (MOU) between signatory parties
 - Procure construction services
- 4th Quarter 2011
 - Begin construction
- 4th Quarter 2012
 - Complete construction

Project Location within Doan Brook Watershed



Project Breakdown by Reach



Reach 1

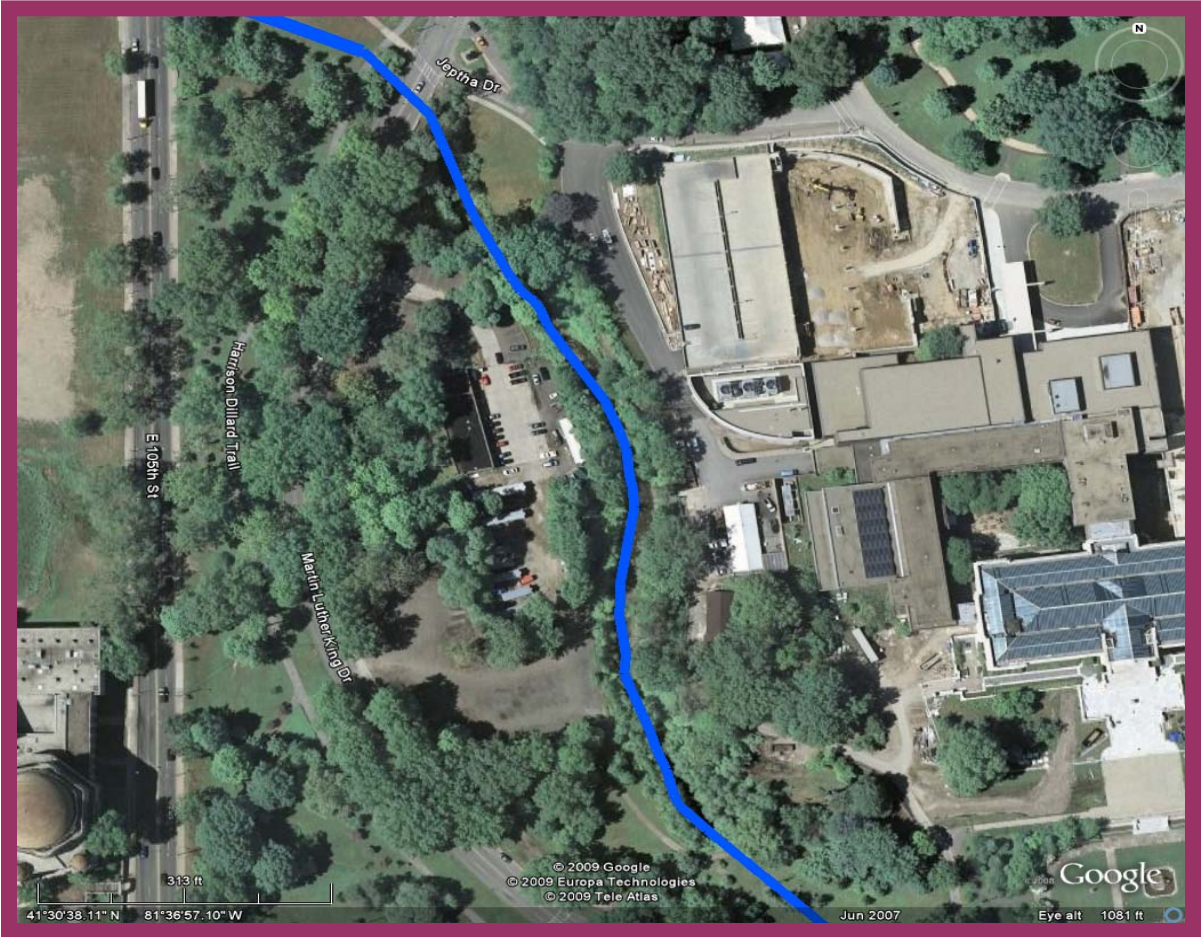
University Circle Culvert to East 105th Street Culvert

Current Reach 1 Conditions

Reach 1 begins at the downstream end of the culvert that carries Doan Brook under the University Circle area and ends at the upstream end of the culvert that carries Doan Brook under Jephtha Road. This reach is approximately 950' and is bounded by a steep slope to the east and the Art Museum service garage to the west.

A small section of the brook just downstream of the UC culvert has been restored and appears to be stable. Downstream, the channel has over widened and has very limited natural stream and habitat features, such as a stable pool and riffle complex. A steep bank along the east side is eroding. Sections of contributing walls remain that are in relatively good condition and the remaining banks are in fair condition.

Reach 1 Overview ▶



Previous Restoration Effort ▼



Previous Restoration Effort ▼



Existing Wall ▼



Reach 1 Constraints

The primary restoration constraint within this reach is the limited space in which restoration can take place. The steep slope to the east limits the lateral movement of the stream channel in this direction. To the west, it is uncertain at this time what the future of the Art Museum maintenance building will be. Any restoration work at this time will need to assume that this building will remain and continue to be a functioning piece of infrastructure for the Art Museum. This limits the amount of floodplain relief that can be built back into the stream.

Stream flows are controlled by the size of the culvert under University Circle delivering flows from upstream and the culvert under East 105th Street that delivers flows to the downstream sections of the brook.

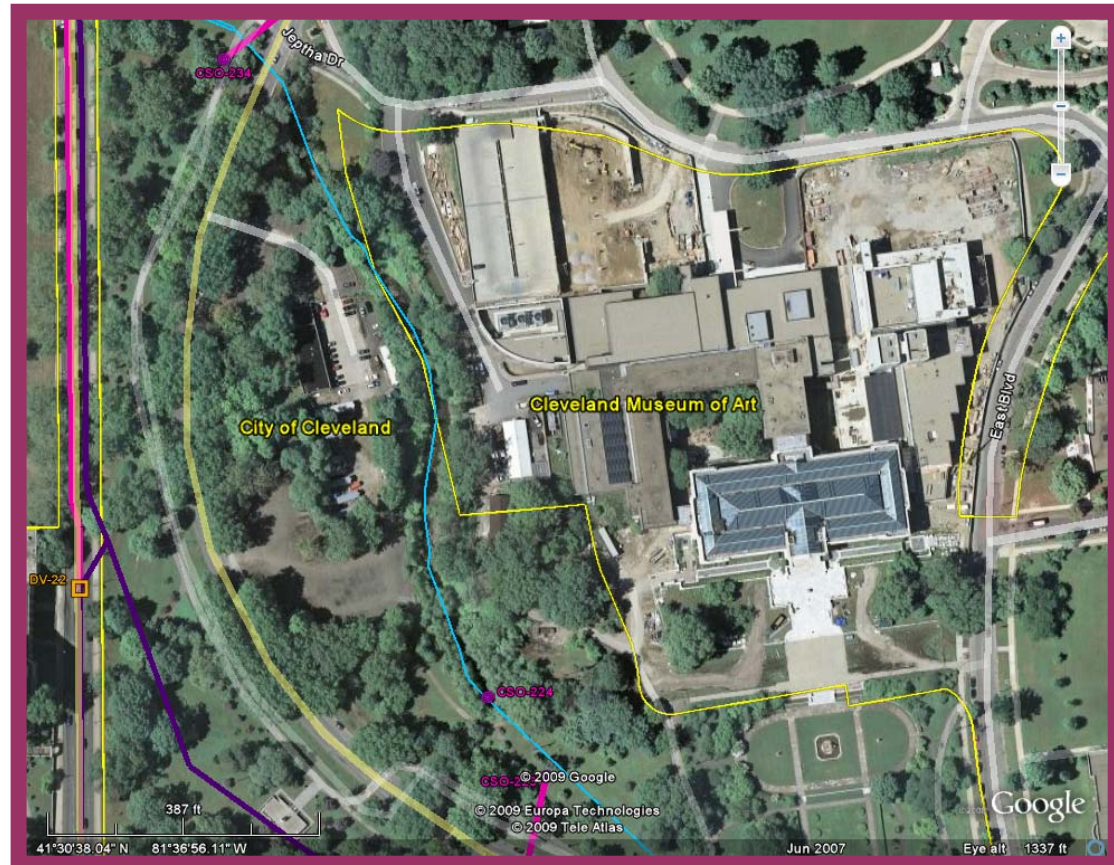
Reach 1 Property Ownership and Utilities

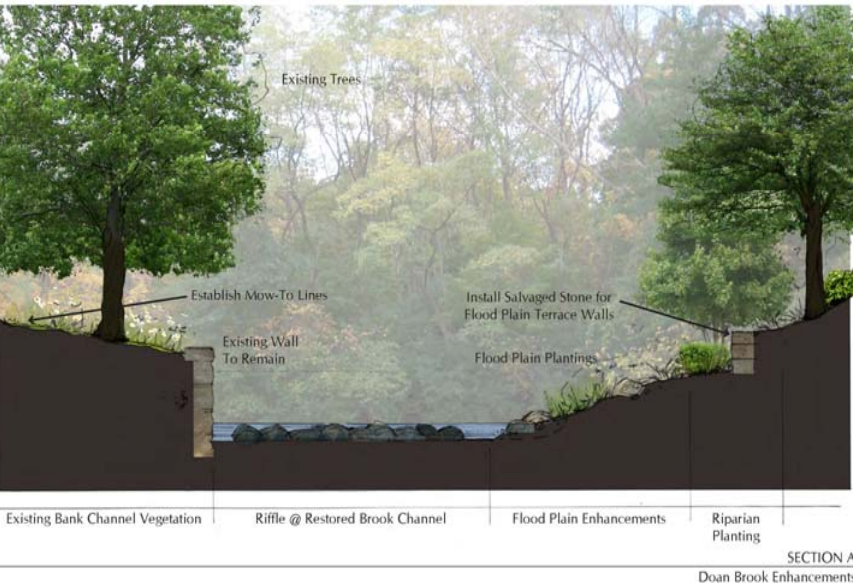
Property Ownership

Reach 1 is part of the Rockefeller Park system, which is owned and maintained by the City of Cleveland. However, the land immediately adjacent to the brook is owned by the Cleveland Museum of Art on both the east and west banks. The culverts that serve as the upstream and downstream constraints of this reach are under the responsibility of the Cuyahoga County Engineer.

Utilities

The NEORSD maintains CSO 224 through this reach, as well as CSO 234 just downstream of Reach 1. Overhead electrical wires service the maintenance facility along the west bank of the reach. Additional underground utilities might be located within the construction right-of-way, but those will be determined during the survey phase of design.





Restoration Narrative

The primary goals for Reach 1 will be to reconstruct a stable stream channel with the proper dimension, pattern, and profile that can handle the flows from the UC culvert.

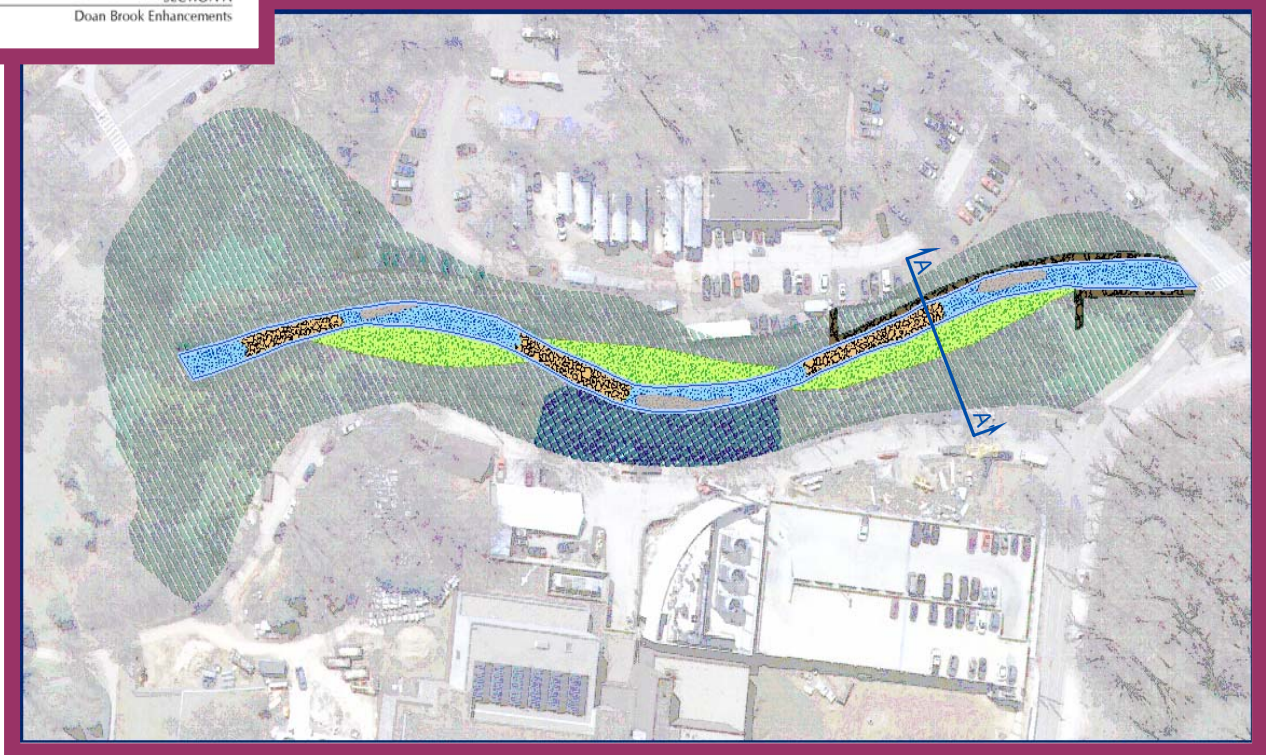
It appears that the previously restored section has identified a stable cross section they could potentially be carried downstream. The steep slope behind the Museum of Art will need to be stabilized and re-vegetated. It appears that the new channel and some floodplain relief can be confined within the contributing rock walls that are still intact downstream. Stable pools and riffles, as well as native vegetation along the riparian area should provide suitable habitat for an improved biotic community.

Proposed Section A

Proposed Site Plan

Restoration Benefits

- Improved aquatic habitat
- Improved riparian buffer
- Reintroduction of native vegetation
- Improved stream flows
- Aesthetic improvements



Reach 2

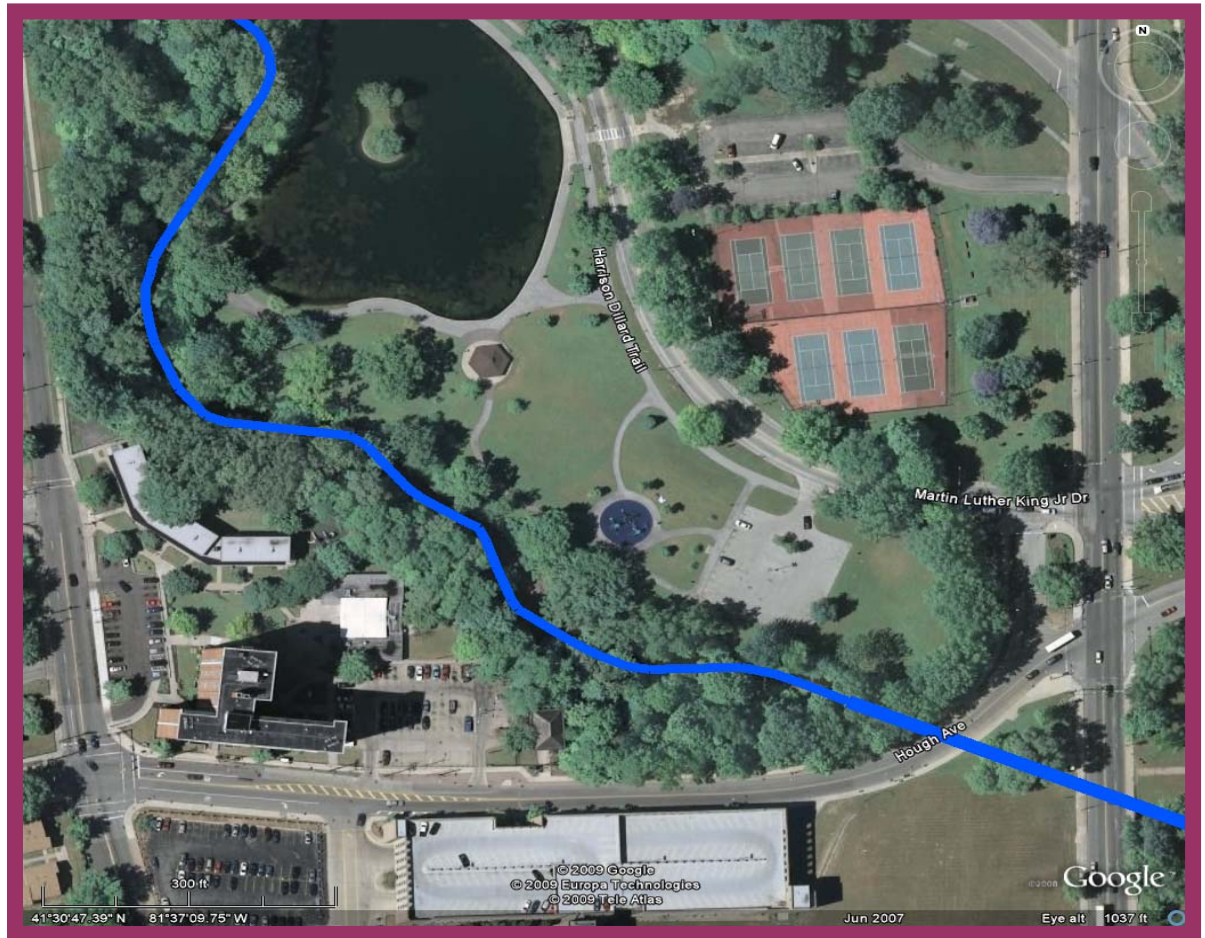
East 105th Street Culvert to Rockefeller Park Lagoon

Current Reach 2 Conditions

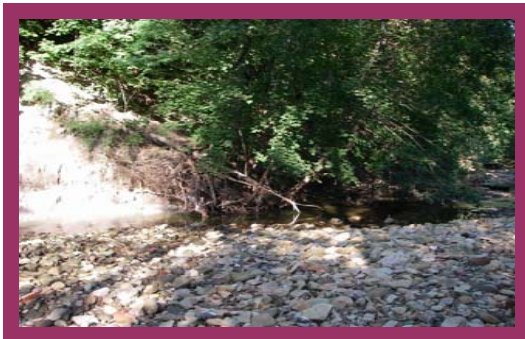
Reach 2 begins at the downstream end of the culvert that carries Doan Brook under East 105th Street and ends about the mid point of the Rockefeller Park Lagoon. This reach is approximately 1,000' and is bounded by a steep slope to the west and the playground / park area of Rockefeller Park to the east.

The section immediately downstream of the East 105th Street culvert is bound by a sheet pile wall that serves as the right bank for approximately 100'. Downstream, the channel has over-widened and has very limited natural stream and habitat features, such as a stable pool and riffle complex. A steep bank along the west is eroding. Most of the contributing walls through this reach are either completely missing, are severely degraded, or have been replaced with poured concrete.

Reach 2 Overview ►



Eroding Bank ▼



Failed Concrete Wall ▼



Missing Wall ▼



Reach 2 Constraints

The primary restoration constraint within this reach is the ability to restore the functionality of the stream without impacting the existing park setting. This is a highly used area of Rockefeller Park with one of only two active playgrounds.

The steep slope to the west limits the lateral movement of the stream channel in this direction. The degrading rock walls have forced the stream in the opposite direction in several spots, which has accelerated the bank erosion. Although the stream is over-widened through this reach, the pond and park setting limit the amount of floodplain relief that can be built back into the system.

Stream flows are controlled by the size of the culvert under E. 105th Street delivering flows from upstream and the culvert under MLK Boulevard that delivers flows to the downstream sections of the brook.

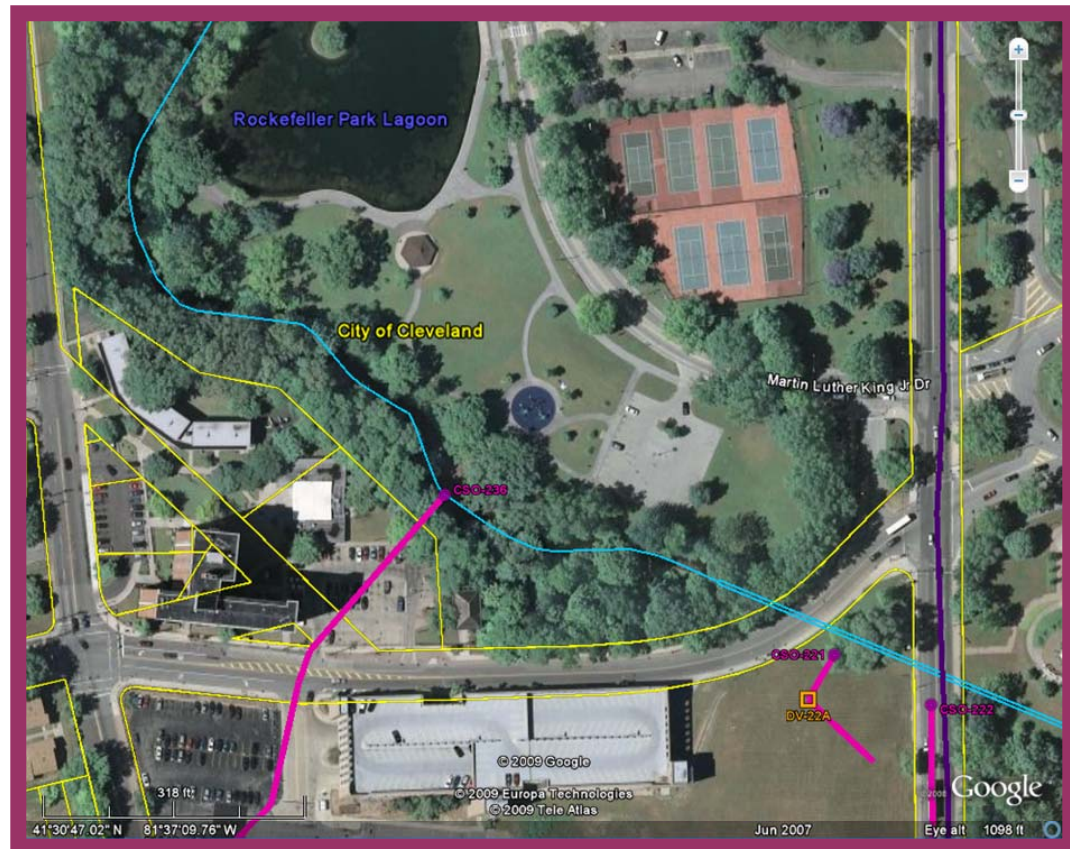
Property Ownership

Reach 2 is part of the Rockefeller Park system, which is owned and maintained by the City of Cleveland. All of the work within this reach should be limited to the area of the park.

Utilities

The NEORSD maintains CSO 236 through this reach, as well as CSO 221 just upstream in the E. 105th Street culvert. Additional underground utilities might be located within the construction right-of-way, which will be determined during the survey phase of design.

Reach 2 Property Ownership and Utilities

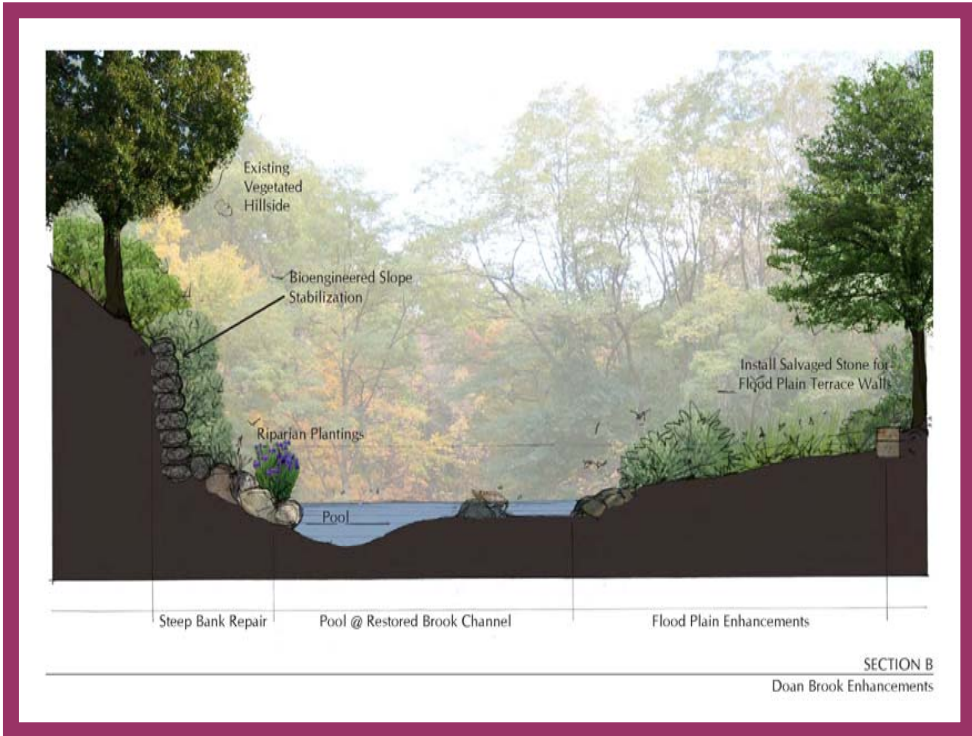


Restoration Narrative

The primary goals for Reach 2 will be to reconstruct a stable stream channel with the proper dimension, pattern, and profile that can handle the flows from upstream.

The sheet pile section just downstream of the E. 105th Street culvert is doing a good job holding the bank together and probably should be left in place. The steep slope just downstream will need to be stabilized and re-vegetated.

Once the meander pattern through this reach is redesigned, there should be some thought into allowing the stream flows to access some portions of Rockefeller Park, where flood flows might minimize disruption to park users. Stable pools and riffles, as well as native vegetation along the riparian area should provide suitable habitat for an improved biotic community. There is also a section through this reach where access down to the stream should be built into the design.

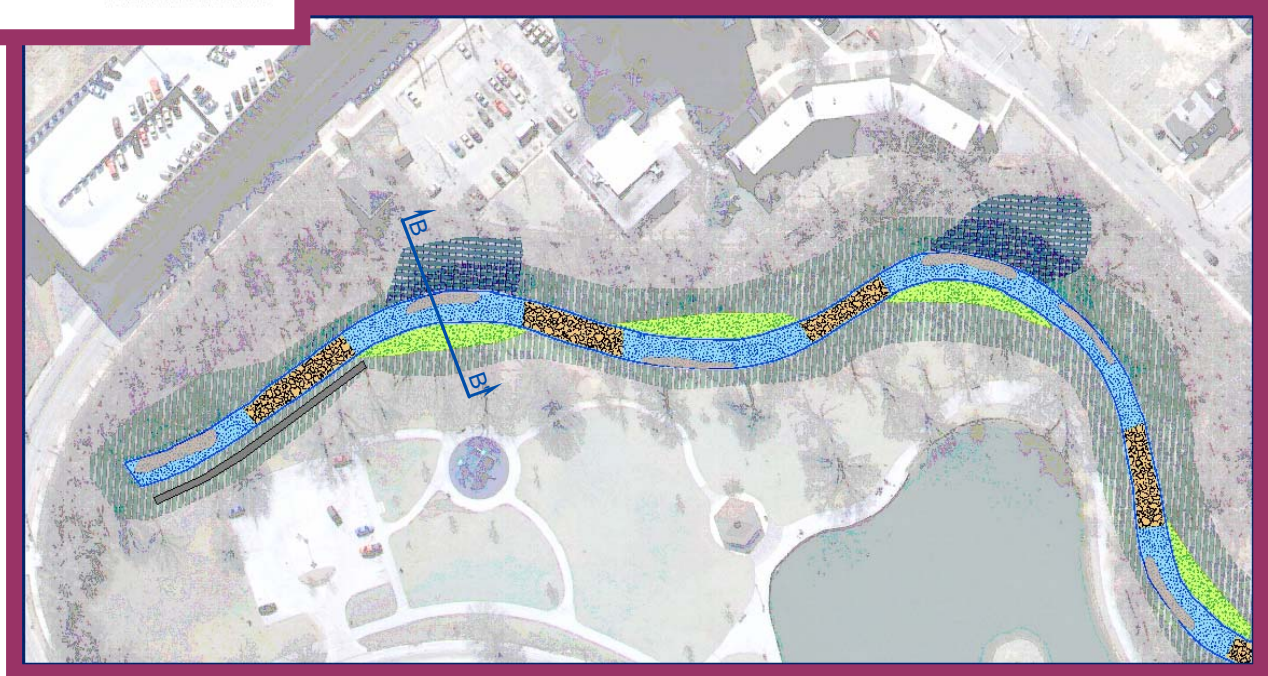


Proposed Section B

Proposed Site Plan

Restoration Benefits

- Improved aquatic habitat
- Improved riparian buffer
- Provide access down to the stream
- Improved stream flows
- Aesthetic improvements



Reach 3

Rockefeller Park Lagoon to Martin Luther King, Jr. Boulevard Culvert

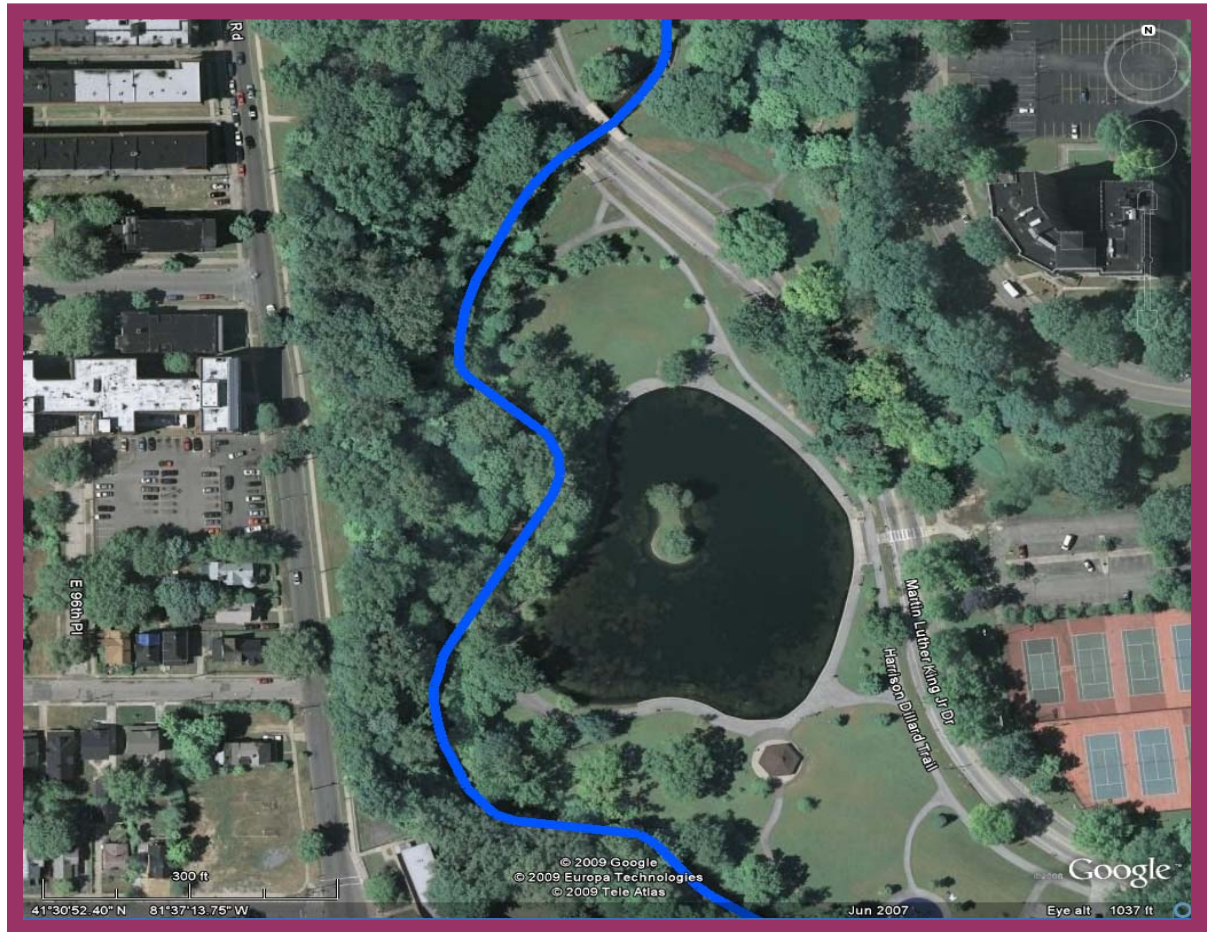
Current Reach 3 Conditions

Reach 3 begins at the mid point of the Rockefeller Park Lagoon and ends at the upstream end of the MLK Boulevard culvert. This reach is approximately 700' and is bounded by a steep slope to the west and the park area and pond of Rockefeller Park to the east.

There are remnants of a failed restoration project through this reach.

The channel has over-widened and has very limited natural stream and habitat features, such as a stable pool and riffle complex.

Most of the contributing walls through this reach are either completely missing, are severely degraded, or have been replaced with poured concrete.



Reach 3 Overview ▶

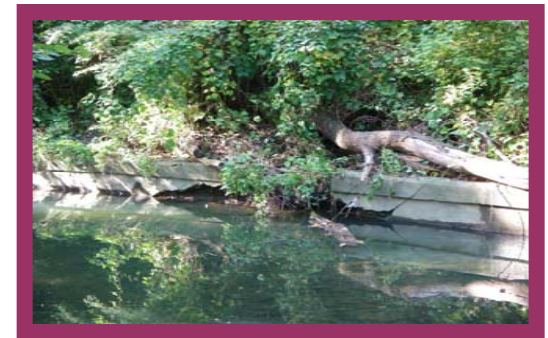


Leaning Wall with Undermined Base ◀

Missing Wall on Left Bank ▼



Failed Concrete Wall ▼



Reach 3 Constraints

The primary restoration constraint within Reach 3 is the ability to restore the functionality of the stream without impacting the existing park setting. This is a highly used area of Rockefeller Park with one of only two active playgrounds.

The steep slope to the west limits the lateral movement of the stream channel in this direction.

The contributing walls through this section are degraded, but there are several areas where the walls are still functioning and are in much better shape than upstream.

Although the stream is over-widened through this reach, the pond and park setting limit the amount of floodplain relief that can be built back into the system.

Stream flows are controlled by the size of the culvert under E. 105th Street delivering flows from upstream and the culvert under MLK Boulevard that delivers flows to the downstream sections of the brook.

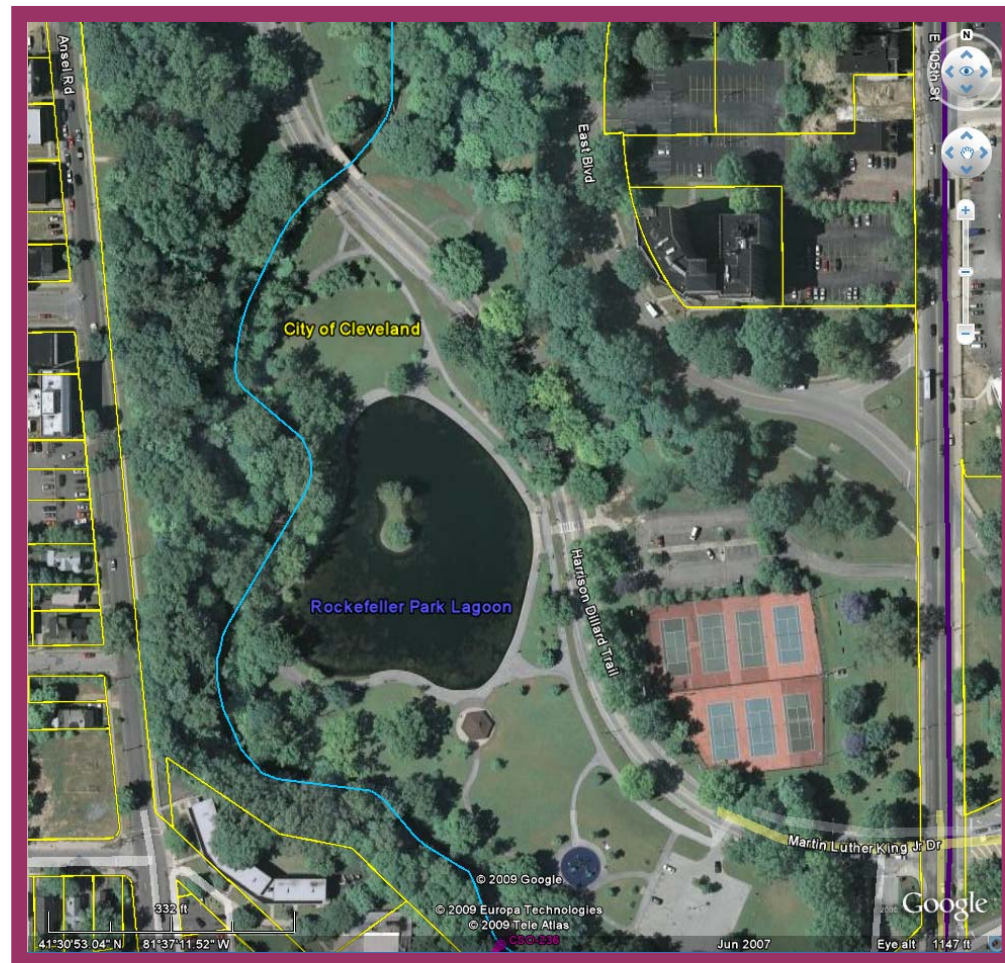
Property Ownership

Reach 3 is part of the Rockefeller Park system, which is owned and maintained by the City of Cleveland. All of the work within this reach should be limited to the area of the park.

Utilities

It is unknown at this time what additional underground utilities might be within the construction right-of-way within this reach, but those will be determined during the survey phase of design.

Reach 3 Property Ownership and Utilities



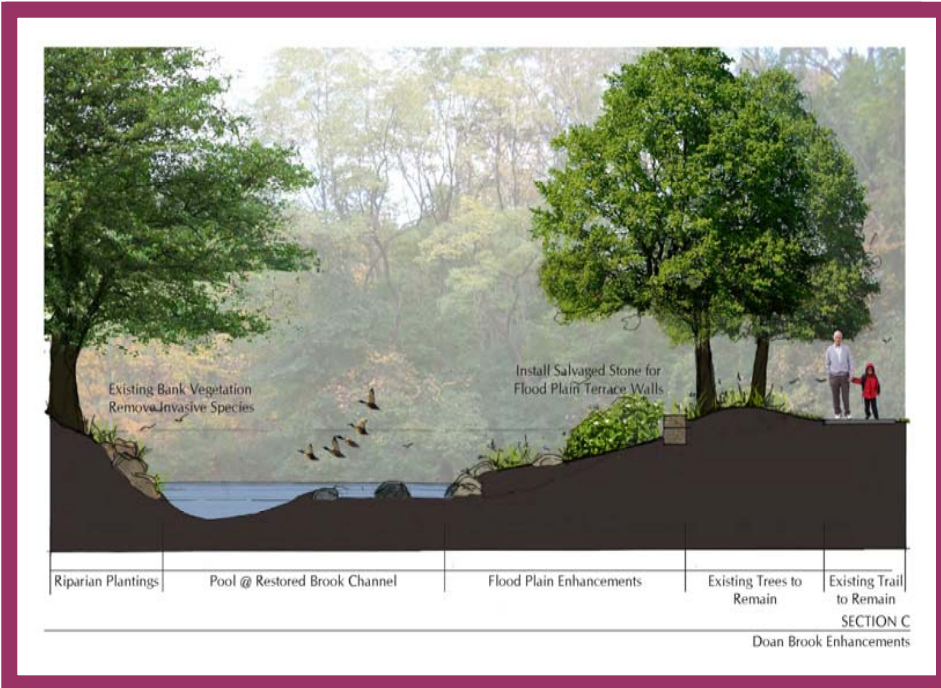
Restoration Narrative

The primary goals for Reach 3 will be to reconstruct a stable stream channel with the proper dimension, pattern, and profile that can handle the flows from the E. 105th Street culvert. The steep slope along the west bank will need to be stabilized and re-vegetated.

Once the meander pattern through this reach is redesigned, there should be some thought into allowing the stream flows to access some portions of Rockefeller Park, where flood flows might minimize disruption to park users.

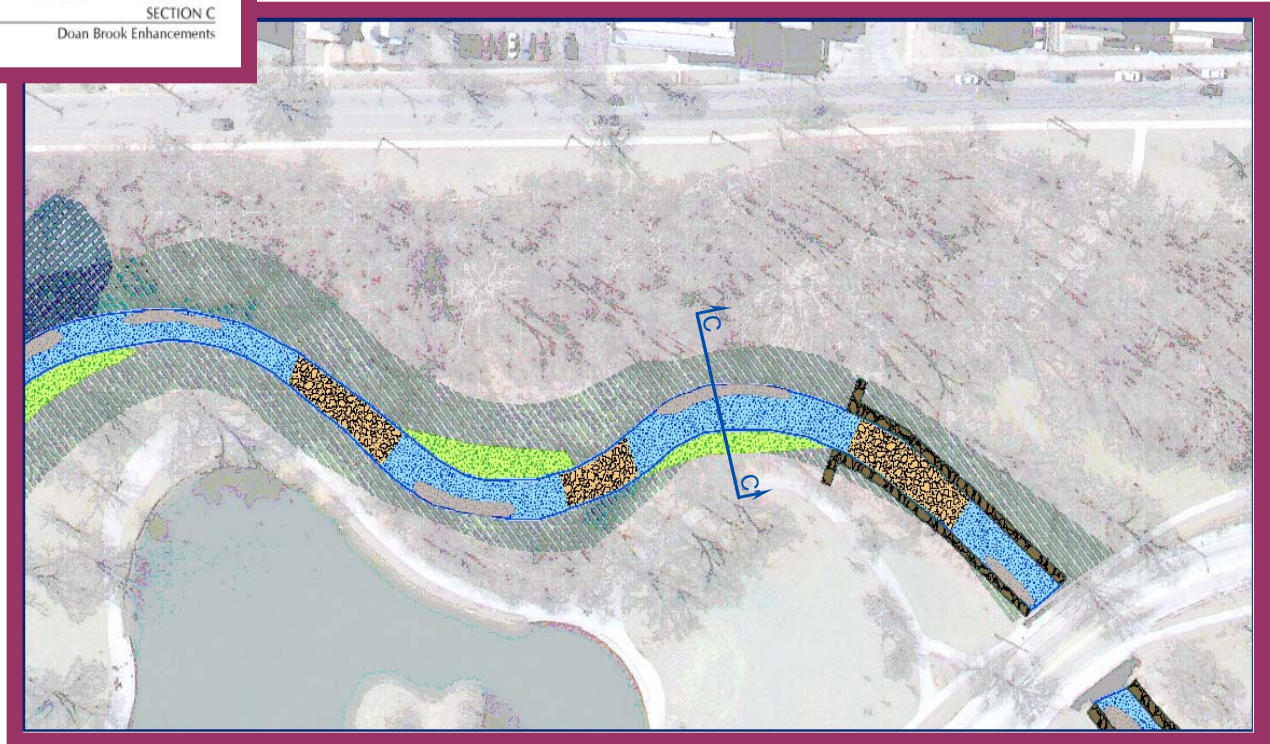
Stable pools and riffles, as well as native vegetation along the riparian area should provide suitable habitat for an improved biotic community.

Sections of contributing walls that are still in good shape could potentially be left in place on outside meanders to provide bank stability.



Proposed Section C

Proposed Site Plan



Restoration Benefits

- Improved aquatic habitat
- Improved riparian buffer
- Reintroduction of native vegetation
- Improved stream flows
- Aesthetic improvements

Reach 4

Martin Luther King, Jr. Boulevard Culvert to Wade Park Boulevard Culvert

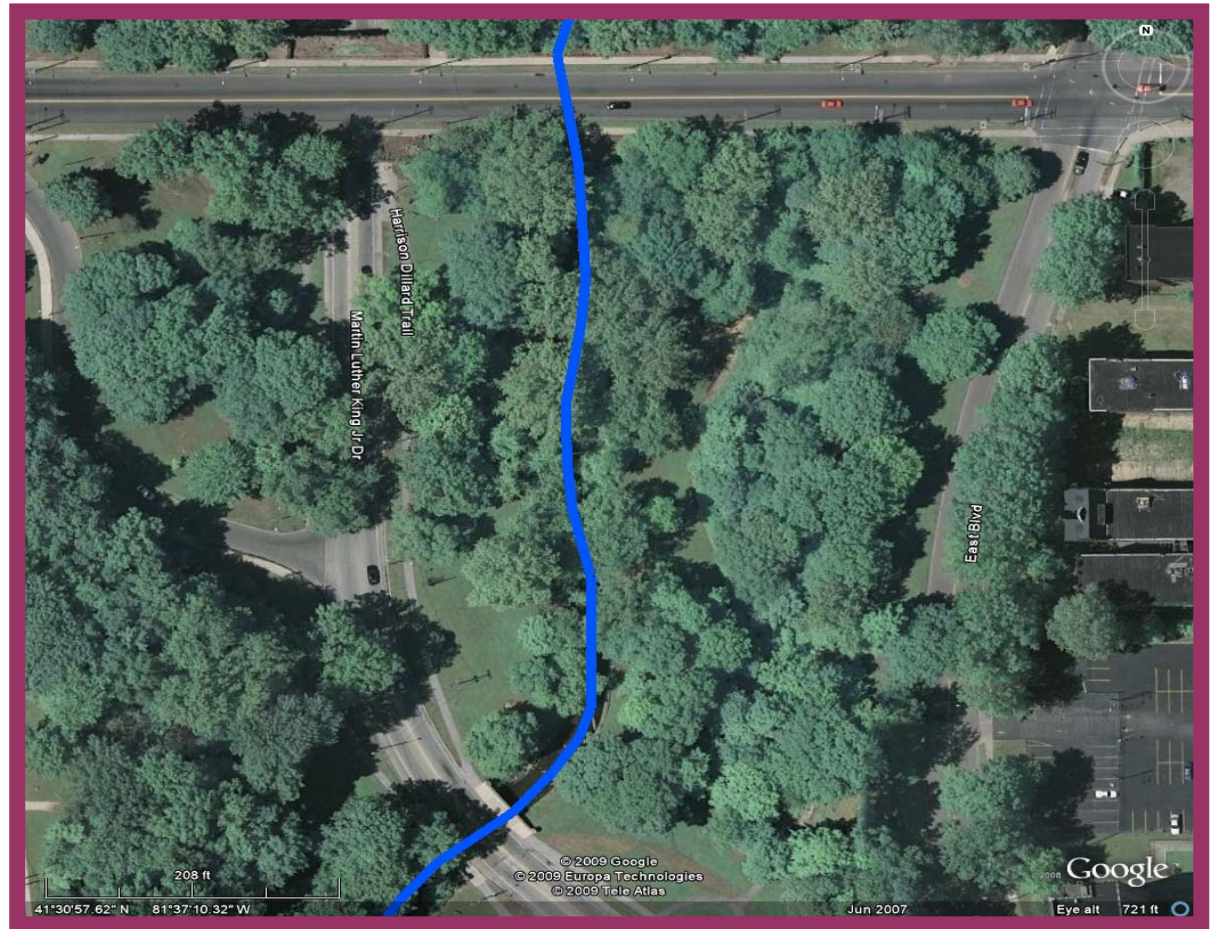
Current Reach 4 Conditions

Reach 4 begins at the downstream end of the MLK Boulevard culvert and ends at the upstream end of the Wade park Boulevard culvert. This reach is approximately 550' and is the first reach within the project area where most of the contributing walls are in good condition.

This reach cuts through a section of Rockefeller Park that is mostly wooded on both sides of the stream.

There is a small section of wall that is missing just downstream of the MLK Boulevard culvert.

The channel bottom is very flat through this reach and provides very little variability in aquatic habitat.



Reach 4 Overview ►

Eroding Bank ▼



Failed Wall ▼



Existing Wall ▼



Reach 4 Constraints

The primary restoration constraint within this reach is the existing walls. Stream flows are controlled by the size of the culvert under Martin Luther King Boulevard delivering flows from upstream and the culvert under Wade Park Boulevard that delivers flows to the downstream sections of the brook.

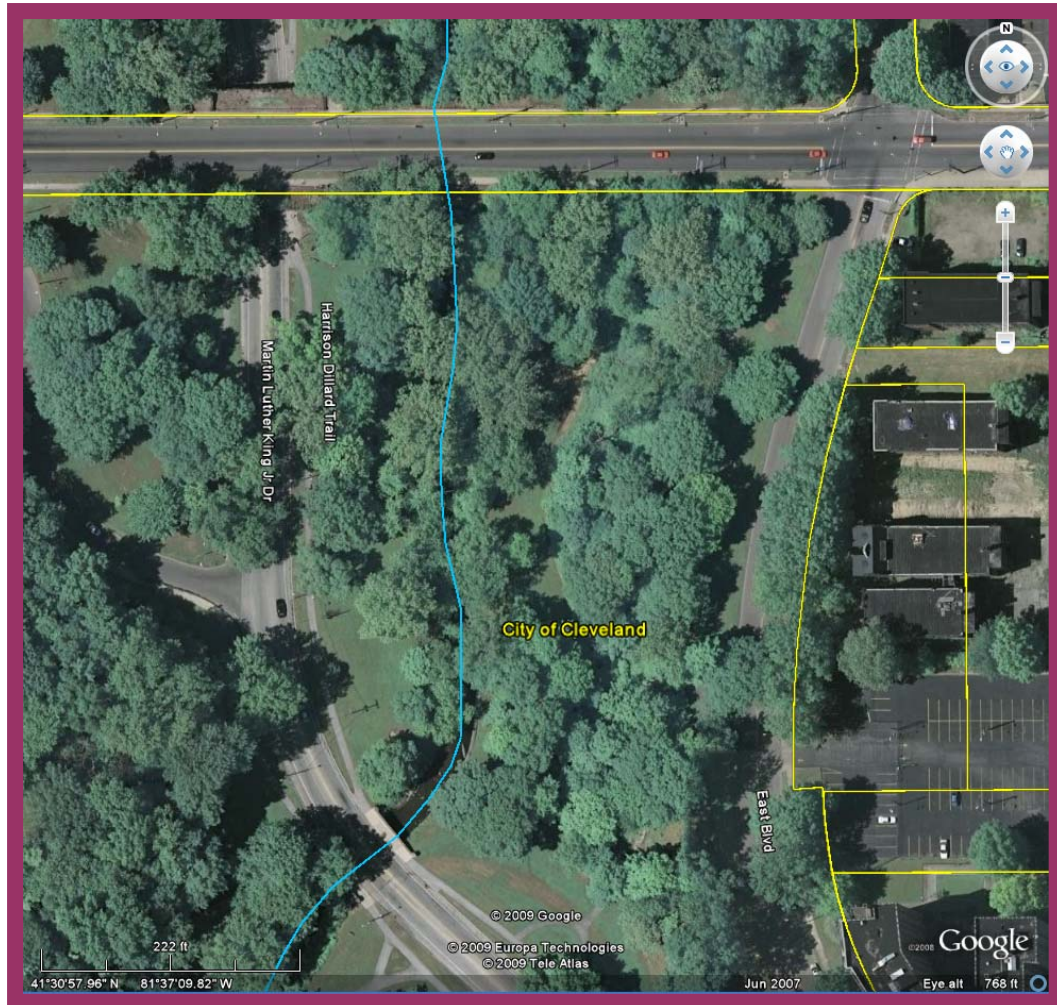
Property Ownership

Reach 4 is part of the Rockefeller Park system, which is owned and maintained by the City of Cleveland. All of the work within this reach should be limited to the area of the park.

Utilities

It is unknown at this time what underground utilities might be within the construction right-of-way within this reach, but those will be determined during the survey phase of design.

Reach 4 Property Ownership and Utilities

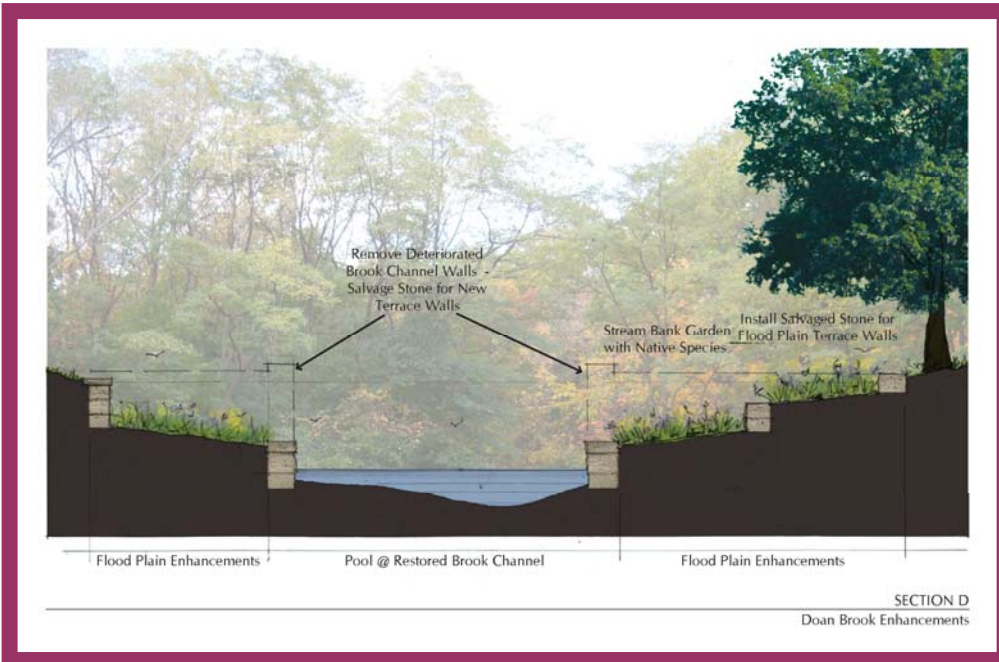


Restoration Narrative

The primary goals for Reach 4 will be to reconstruct a stable stream channel with the proper dimension, pattern, and profile that can handle the flows from the MLK Boulevard culvert.

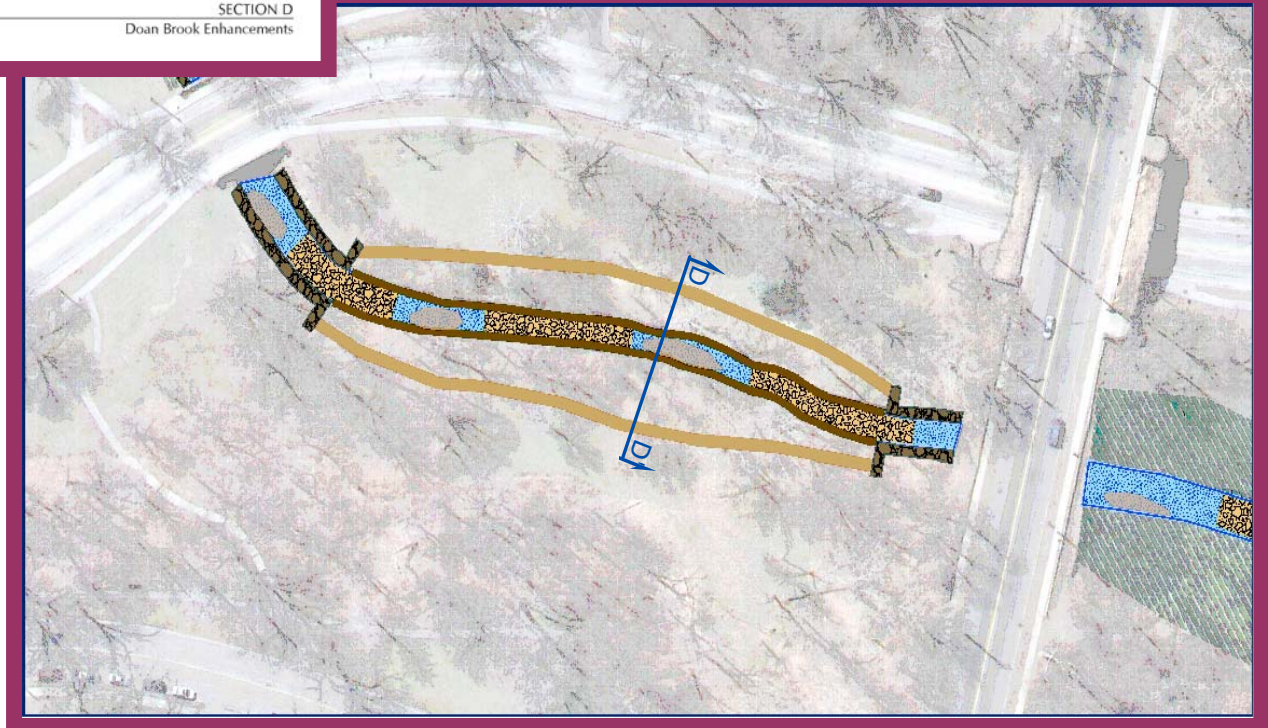
During the assessment phase of this restoration project, the idea of building habitat between the contributing stone walls was discussed for portions of Doan Brook. This section would be a good site for keeping the contributing walls in place, up to bankfull elevation, and reconstructing the walls further back on the banks to create a wider floodplain bench.

Stable pools and riffles, as well as native vegetation along the riparian area should provide suitable habitat for an improved biotic community.



Proposed Section D

Proposed Site Plan



Restoration Benefits

- Improved aquatic habitat
- Floodplain relief within the rock walls
- Reintroduction of native vegetation
- Improved stream flows
- Aesthetic improvements

Reach 5

Wade Park Boulevard Culvert to Old Bridge Abutment

Current Reach 5 Conditions

Reach 5 begins at the downstream end of the Wade Park Boulevard Culvert and ends at an old concrete bridge abutment, just downstream of the last check dam. This reach is approximately 1,200' and is bounded by MLK Boulevard to the west, nearly the entire length of the reach.

There are nine concrete check dams through this reach that most likely were installed as some form of grade control. The check dams have created pockets of stagnant water and areas of heavy bed load accumulation.

Some of the contributing walls through this reach are severely degraded, but there are still sections that are in good condition.

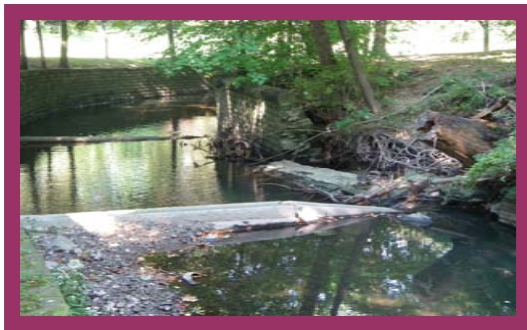
The large meander bend at the start of the project area is very close to the all purpose path running along MLK Boulevard.

The channel at the end of the reach narrows considerably as it approaches the old bridge abutment.



Reach 5 Overview ▶

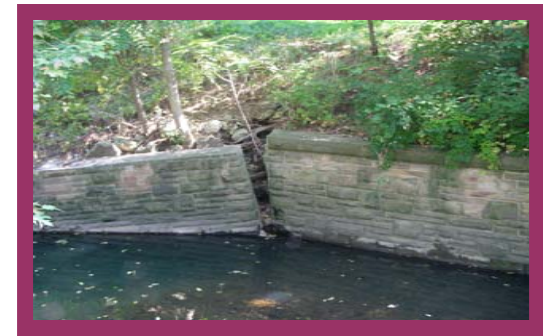
Eroding Bank ▼



Concrete Check Dams ▼



Failed Wall ▼



Reach 5 Constraints

The primary restoration constraint within this reach is the limited space in which restoration can take place. A slope to the east limits the lateral movement of the stream channel in this direction. To the west, MLK Boulevard and the all purpose path provide limited room for stream movement. This limits the amount of floodplain relief that can be built back into the stream.

Stream flows are controlled by the size of the culvert under Wade Park Boulevard, but the check dams are also providing some relief to stream velocity. Construction staging for work in this reach will probably need to be coordinated off East Boulevard.


Property Ownership

Reach 5 is part of the Rockefeller Park system, which is owned and maintained by the City of Cleveland. All of the work within this reach should be limited to the area of the park.

Utilities

The NEORS D maintains CSO 220 just at the downstream limits of this reach. It is unknown at this time what additional underground utilities might be within the construction right-of-way within this reach, but those will be determined during the survey phase of design.



Reach 5 Property Ownership and Utilities 

Restoration Narrative

The primary goals for Reach 5 will be to remove the nine check dams and reconstruct a stable stream channel with the proper dimension, pattern, and profile that makes up for the loss of the check dams.

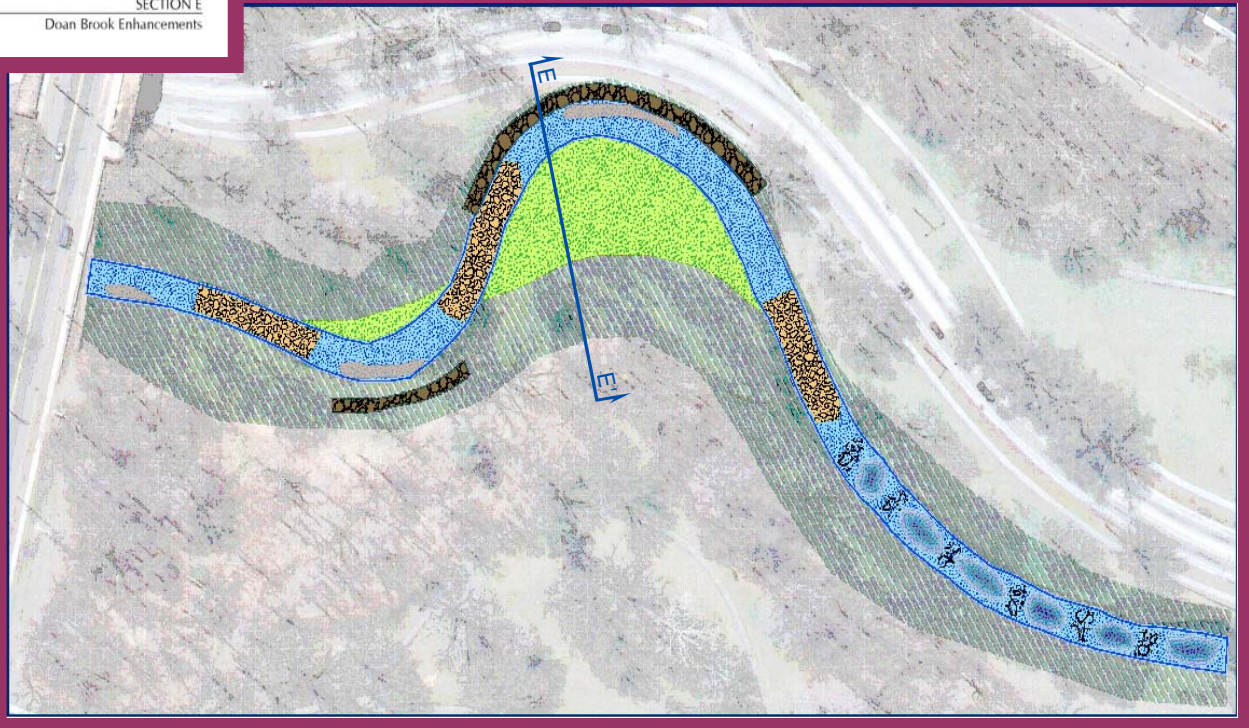
There is room along the large meander bend to pull back the stream to the east and create a vegetated point bar. There is a small section of contributing wall through this meander that will need to be repaired, but the wall might be able to be left in place to provide bank stability and protection to MLK Boulevard. A pool / riffle system or "B" Type channel might be suitable for this reach, which might be a more natural replacement for the check dams.

Stable pools and riffles, as well as native vegetation along the riparian area should provide suitable habitat for an improved biotic community.



Proposed Section E

Proposed Site Plan



Restoration Benefits

- Improved aquatic habitat
- Improved riparian buffer
- Removal of fish migration barriers
- Improved stream flows
- Aesthetic improvements

Doan Brook Enhancement Project

Proposed Implementation Schedule

Implementation Schedule

The implementation of the Doan Brook Enhancement project will be broken down into 3 phases; Planning, Design, and Construction.

The Planning Phase is nearly complete and consists of the development of this conceptual document as well as approvals from Ohio EPA and the start of stakeholder meetings.

We anticipate the Design Phase to take approximately 18 months, which should begin in the first quarter of 2010. This phase will also include stakeholder input. The design work will be competitively bid under NEORSD's consultant procurement system.

The Construction Phase will also be competitively bid and we anticipate a construction period, including procurement, of approximately 16-months. This period accounts for possible contractor downtime during the winter months.

There are two tasks within this project that we are highlighting here. These include the Historic Preservation 106 Consultation process and the construction sequencing task, which includes the development of a SWPPP and flow control procedures during construction.

Section 106 Consultation

The Section 106 Consultation involves a detailed process of engaging project stakeholders to determine project impacts on historic features within or adjacent to the project site. The process is typically led by a Federal Agency. In the case of Doan Brook this agency will most likely be the FAA.

There was a Section 106 process done for the last restoration design effort, which resulted in a MOU that was agreed upon and signed by all of the consulting parties. Since the design of this project will be changed from the previous design effort, the Ohio Historical Preservation office has asked that the Section 106 process to be re-engaged and any changes to the original MOU will need to be modified.

We have scheduled the first consulting parties meeting to begin this process in the 4th quarter of 2009. We anticipate being fully engaged in the 106 Consultation by the 1st quarter of 2010. The final consultation / stakeholder involvement will coincide with any design changes and the final design package. Therefore, it is difficult to determine at this time how long this process might take. We have scheduled completion of the 106 process to coincide with the Design Phase, but it should be noted that this process could delay certain schedule components.

Construction Sequencing

Another project component that could potentially change the schedule sequence is the development and approval of a Stormwater Pollution Prevention Plan (SWPPP) and the management of flows during construction. It should be noted that these 2 construction components were very costly line items during the bid phase of the original project that was designed.

By reducing the overall size of the project, as well as focusing on areas of Doan Brook that might have better access to the stream and available staging area, we hope to avoid many of the major issues that were a part of the original SWPPP.

We have also broken the enhancement project down into smaller reaches, each one beginning and ending at a transportation crossing culvert. We anticipate that this will provide us with better control over managing stream flows during construction.

As with the Section 106 process, we have specifically spelled out these components of the project to make note that they could place additional time constraints on the project, but we have made an effort to work these into the following proposed schedule.

Doan Brook Enhancement Project - Proposed Implementation Schedule

Task	Start	Duration	2009	2010				2011				2012			
			4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q
Obtain Ohio EPA Approval to proceed with enhancement plan	Dec '09	1 month	█												
Re-engage the Section 106 Consulting Parties	Dec '09	1 month	█												
Conduct 1st Section 106 Stakeholder Meeting	Jan '10	1 month		█											
Develop RFP for design services	Feb '10	2 months		█											
Procure Design Services	Apr '10	2 months			█										
Conduct 2nd Section 106 Stakeholder Meeting	Jun '10	1 month				█									
Design	Jun '10	14 months				█	█	█	█	█					
Revise and Execute new Section 106 MOU between signatory parties	Aug '11	1 month									█				
Procure Construction Services	Sep '11	2 months									█	█			
Construction	Nov '12	14 months										█	█	█	█