

# Bartlet Mall Restoration Project Conservation Commission Hearing – May 2, 2023



# AGENDA

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- 2 History and Current Conditions
- 3 Project Summary
- 4 Performance Standards and Variance Request
- 5 Investigation Summary
- 6 Alternative and Feasibility Analyses
- 7 Conceptual Project Sequence and Design Details
- 8 Questions and Comments



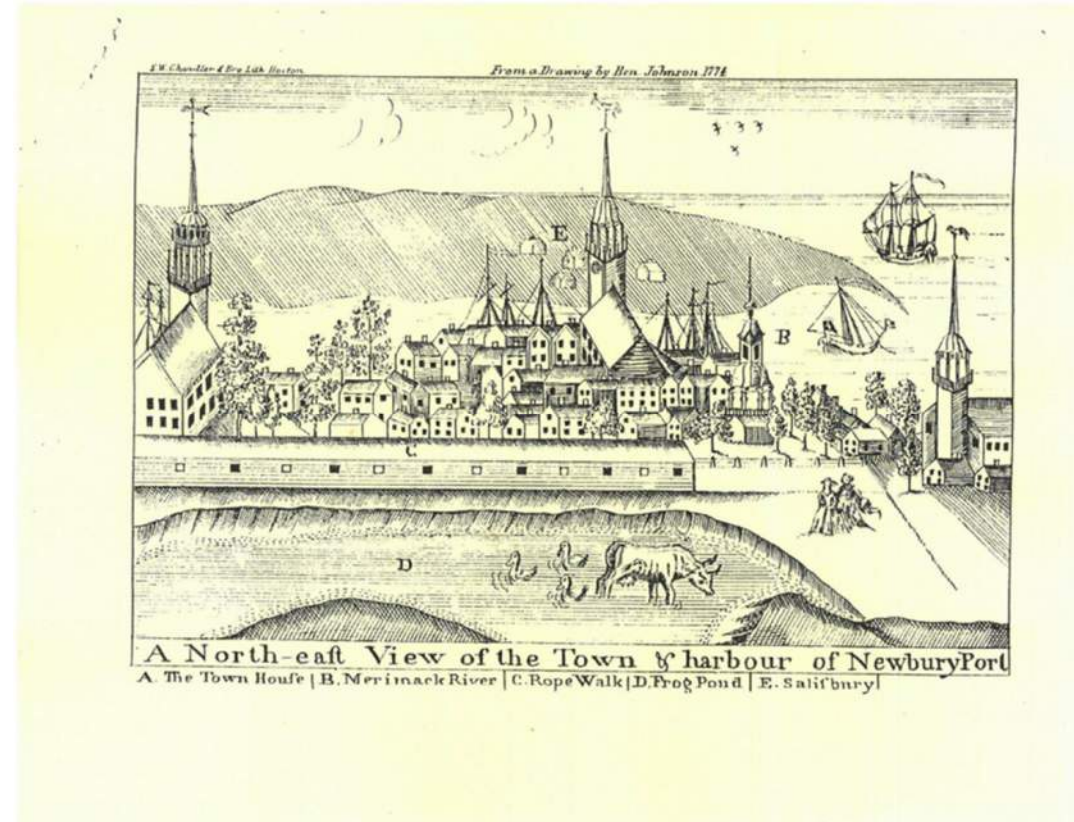


## Project Introduction: A Brief History

### Newburyport's Original Town Common

- 1600s-1700s: Livestock, rope making, training for Revolutionary War militia
- 1800: Transformed into a park
- 1805: Federal Courthouse built & water inlet cut off
- 1891: Fountain installed to attempt to clean the water
- 1987: Fountain restored but quickly deteriorated due to lack of clean water

Complaints of odors and water quality issues reported going back to the 1800s



## Project Introduction: A Brief History

### Charles Eliot's vision, early 1900s

- Protective granite edge
- Circulation of water (via fountain)
- Meticulously sloped lawn
- Water and high-branched trees frame the beauty of the space (no flowering plants)
- Complete the northwest corner slope

**What of Frog Pond?**  
The trouble is that in improving the Mall we have spoiled the pond. We have cut off the supply of fresh water, which ran in at either end with every shower, and have made a stagnant pool. Now there is only one of two remedies to adopt, supply fresh water from the water works—that is by a fountain and giving air outlet, or we must fill up the pond, which everybody would regret. The pond comes not from springs at the bottom, but by the drainage of the high lands near by. We have heard it said that the pond was first formed by an earthquake. Be that as it may, it is well known that a hundred years ago or so, it was a low patch of land full of tall grass and low bushes, with just enough water to invite the frogs, and from their abundance it took its name. From time to time it has been improved by scraping out the bottom, terracing its banks and decorating them with trees. It has been made an attractive spot—that pond on the ridge of land that gives the backbone of the town, running from the Merrimac to the Parker river, but nobody wants to die for that pond and the city will consider the cost of its water supply. When Mr Norman asked the privilege of laying pipes through our

tion, as far as it goes, should not be despised. For reasons such as are here hinted at, all must be glad to observe judicious improvements made to ornament the place where they live. This town, taking its means into the account, has not been backward in carrying on such improvements, and it is to be hoped never will be. The little that can be done, ought to be done; and the disposition to do it is a good sign.—Such a sign has, in fact, suggested these remarks. The selectmen are at work extending the Mall around the Pond—finishing what was so well begun a few years since. They could not well expend a portion of the Surplus Revenue better. Let the walk be finished the entire circuit of the pond, and ornamented with trees; and twenty years hence it will be a delightful promenade, and in much less time its advantages, its utility, will be apparent. Would not a wide gravelled path be an improvement?—  
Herald — 8/4/1843



## Project Introduction: A Critical Moment

Complex project with many pieces that must be carefully orchestrated

- Water quality problem demands a unique solution
- Funding for the project via CPA bond
- Political and public support for the project
- Water quality is at a critically dangerous ecological point (HAB, stagnant, toxic)





## Early Artistic Conceptual Variations of Parks Commission's Vision



- Mall and pond restoration included in this application to be discussed tonight
- Ellipse boardwalk, building modifications, master planting scheme, and shown water edge not included in this application

## Overview of Current Conditions

- The Bartlet Mall was modified into a park in 1800 and treated as a man-made feature since
- Pond is highly eutrophic and has been for ~200 years
- No apparent connection of the pond to groundwater
- Nutrient loads in sediment present to depths of up to 12 ft
- Urban contaminants present in shallow sediment
- Water not safe for human contact





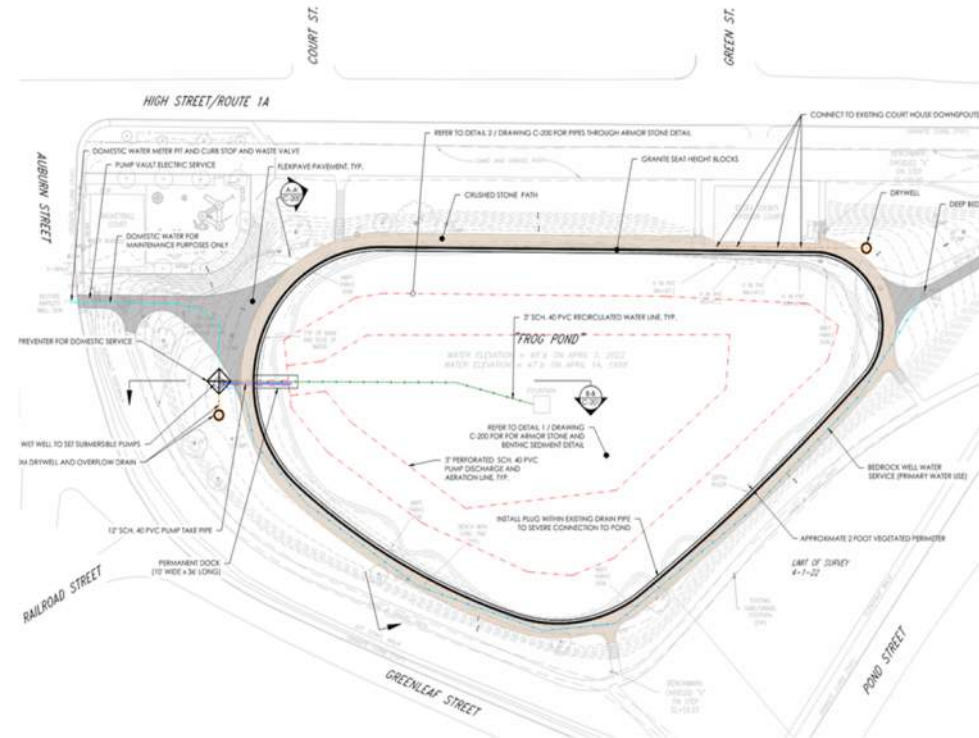
## Proposed Restoration Effort

### • Park Restoration:

- Upgrades to playground area
- Park access walkways
- Install granite seat-height blocks around pond perimeter above Bank

### • Pond Restoration:

- Dewater, treat, and discharge existing pond water under NPDES DRGP
- Install liner system: methane system, geogrid, HDPE, armor stone, benthic sediment, and vegetated perimeter
- Install water quality system: bedrock water supply, filtration, aeration, re-circulation
- Remove, rehabilitate, & reinstall fountain





## Wetlands Protection Act Performance Standards

- Proposed restoration impacts Resource Areas but meets Performance Standards
- Establish BMPs: minimize impacts to resource areas to the extent practical

### Bank:

- Restore grading/slope conditions to generally match existing conditions
- Increase Bank to ~ 1,314 LF from current 1,295 LF
- Install a new vegetated zone and clean benthic sediment to improve ecological health of the pond

### Land Under Waterbodies and Waterways:

- Restore grading/slope conditions to generally match existing conditions
- Increase Land under Water Bodies and Waterways to ~104,500 SF from current 93,871 SF

- Provide long-term improvement to water quality & ecological health of pond
  - Restored condition will bio-mimic a natural pond setting.
- Not Applicable Performance Standards:
  - Streams, boat channels, groundwater impacts, structures on the Bank, and NHESP habitats



## Newburyport Ordinance - Variance Request

- Alteration activities in:
  - Bank
  - Land under Waterbodies and Waterways
  - Newburyport 25-foot No-Disturbance Zone
  - 100-foot Buffer Zone
- Proposed restoration is in the overriding public interest:
  - Provides better recreational space for the public
  - Mitigates eutrophic conditions in the pond that are currently not safe for human contact
  - Increases Resource Areas: Bank and Land Under Waterbodies & Waterways
- Alternatives evaluation - No other reasonable alternatives exist that would have as much success without altering Resource Areas.
- Mitigating measures will be employed to protect Resource Areas to the extent possible







## Investigation Summary

- Reviewed previous investigations & data
- Performed additional investigations in 2021 to close data gaps:
  - Pond Investigations: sediment investigation, in situ shear vane testing, bathymetric survey, in-situ surface water quality assessment, and surface water sampling.
  - Upland Investigations: subsurface investigation, monitoring well installation and survey, in-situ groundwater quality assessment, and hydraulic conductivity testing.

### Findings

- Urban contaminants are present in shallow sediments
- Shallow sediment is not suitable for disposal at a Massachusetts lined landfill
- Phosphorus present up to 12 feet below bottom of pond
- No hydraulic connection to groundwater - groundwater is ~ 30 feet below the bottom of the pond
- Surface water in the pond is contained by low-permeability sediment

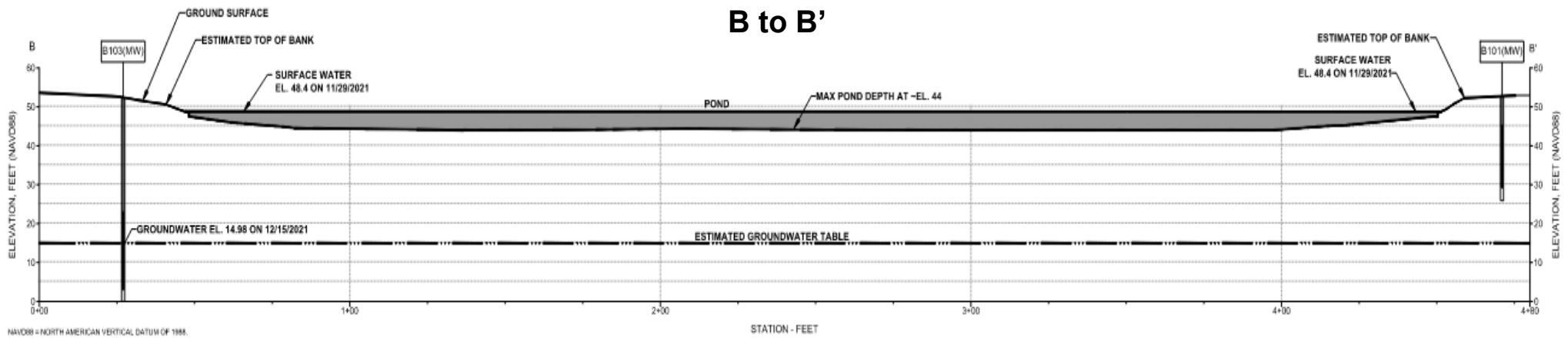
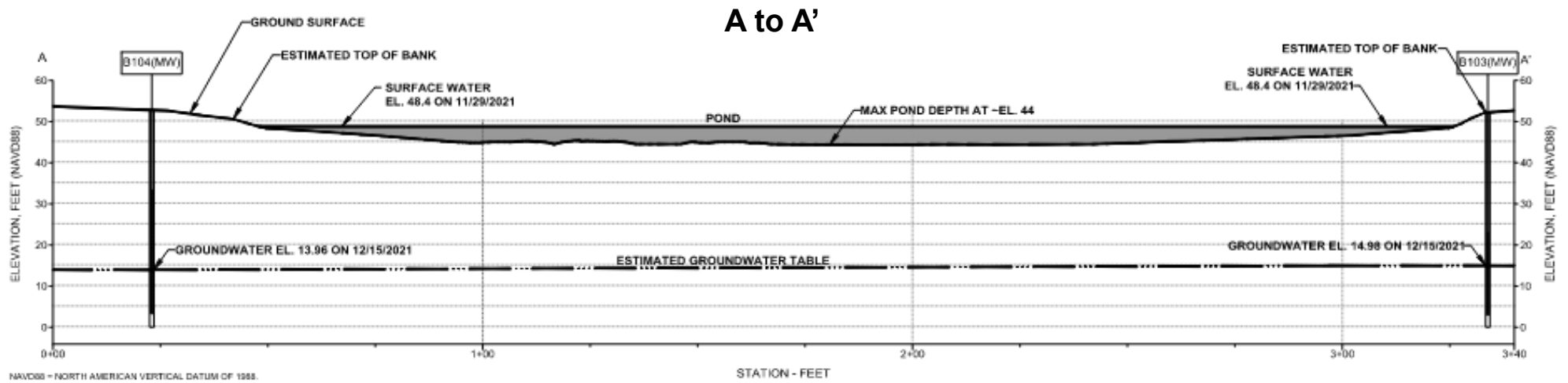




# Investigation Locations



# Findings - Existing Conditions





## Alternative & Feasibility Analyses

- Evaluated various alternatives to:
  - Address eutrophic conditions in the pond
  - Provide long-term water quality solution for the pond
- Evaluation considered:
  - Effectiveness
  - Estimated costs
  - Implementation feasibility
  - City's desired ultimate appearance and use of the pond
- **Recommendation: Pond dewatering, liner installation, and ongoing water quality treatment system**

### Alternatives Evaluated

1. Pond Dewatering, Mechanical Dredge of Pond, Offsite Disposal, and Placement of Fill Material
2. Hydraulic Dredge of the Pond, Partial Onsite Reuse of Sediments, Offsite Disposal of Excess Sediments, and Placement of Fill Material
3. Pond Dewatering, Removal of Six inches of Sediment, and Liner Installation.
4. Pond Dewatering, In-Situ Solidification/Stabilization of Sediments, and Placement of Sand Benthic Layer
5. Chemical Treatment of the Pond

### Water Quality Feasibility Evaluation

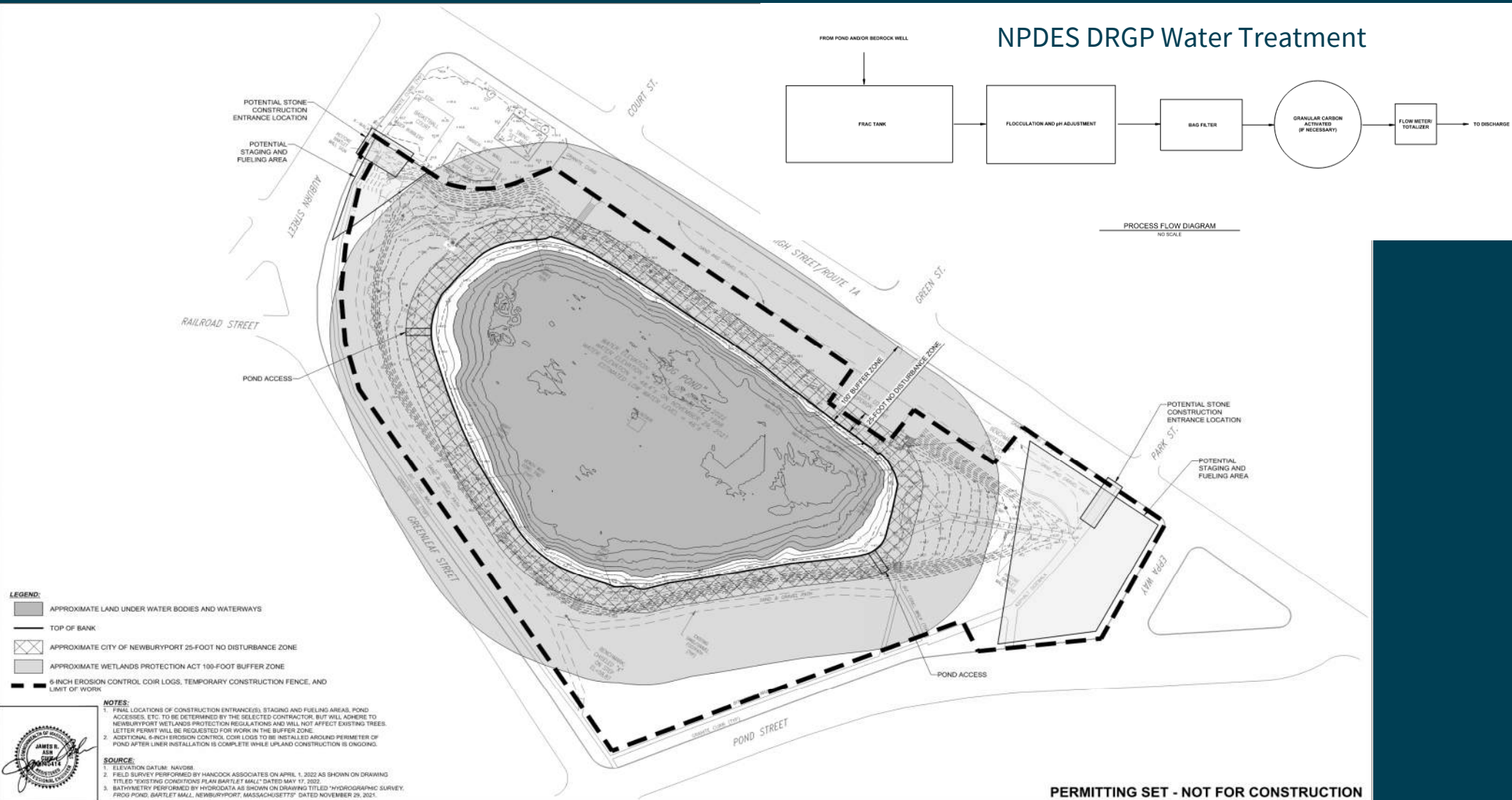
- Effects of oxygen, temperature, circulation, nutrient balance, and biodiversity on water quality.



# Conceptual Project Sequence

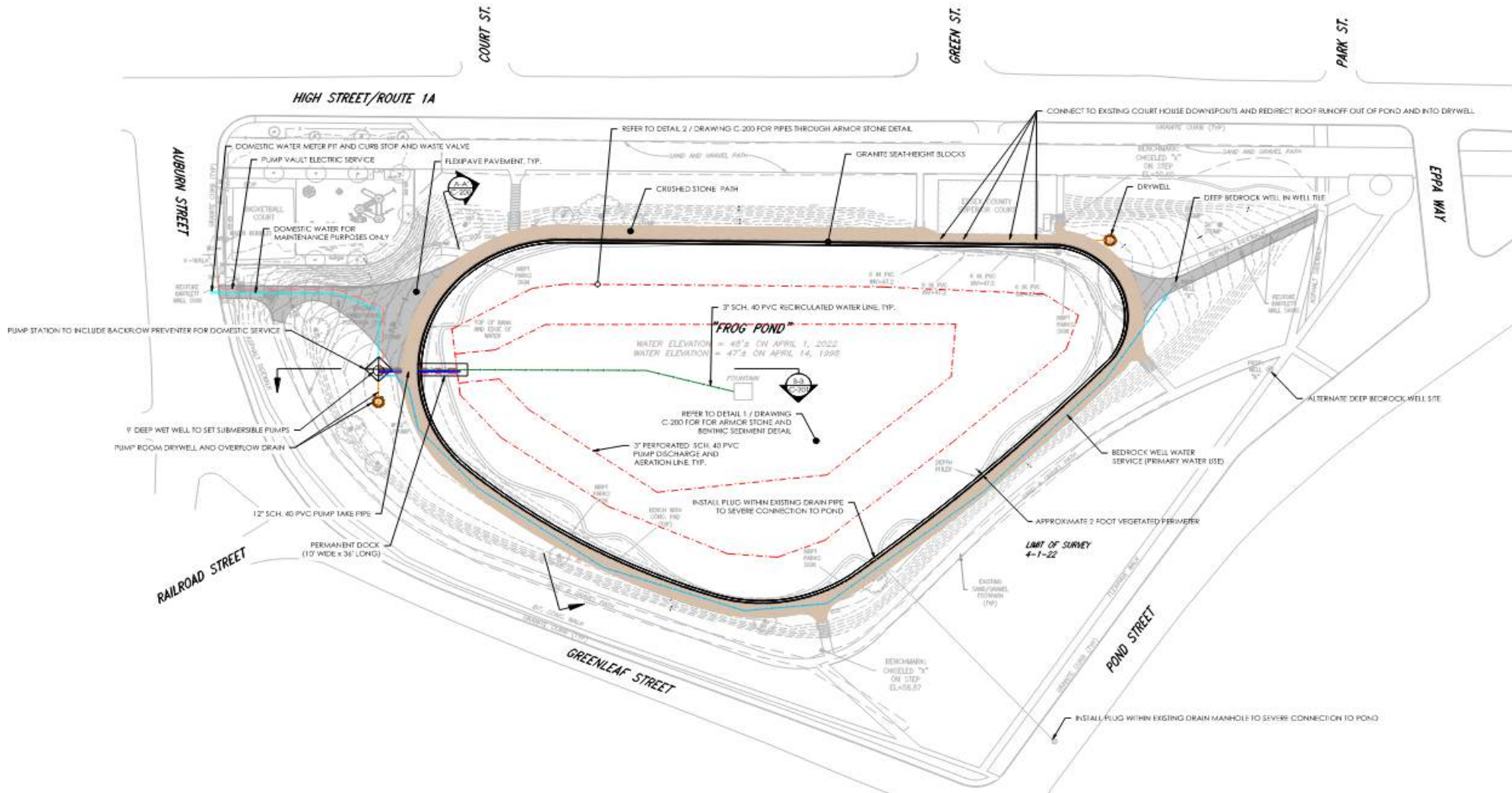
Stage	Description
1	Expand and upgrade playground
2	Mobilize for pond restoration: Install construction fence and erosion controls at perimeter of work area.
3	Remove Auburn Street stairs and asphalt in proposed Flexipave areas
4	Dewater pond and drill/test bedrock well
5	Remove fountain for restoration
6	Regrade pond basin and remove/regrade top of banks to prepare for liner system and continuous crushed stone path installation.
7	Install methane system and foundations elements for dock
8	Install geogrid and liner
9	Install water treatment system including conduits from water treatment system into the pond for the pump suction line, primary power, discharge and aeration lines, and connect to bedrock well
10	Place 3 inches of armor stone
11	Reinstall fountain with new recirculation line
13	Install 3 inches of benthic sand and plant vegetated perimeter
14	Begin refilling pond
15	Install erosion controls around the pond top of bank.
16	Begin restoration: Realign walkways. Install granite seat-height blocks and place crushed stone walkway. Install Flexipave walkways
17	Test water treatment system operations
18	Complete restoration

# Project Start –Up: Mobilization, Staging, Erosion Control, & Dewatering

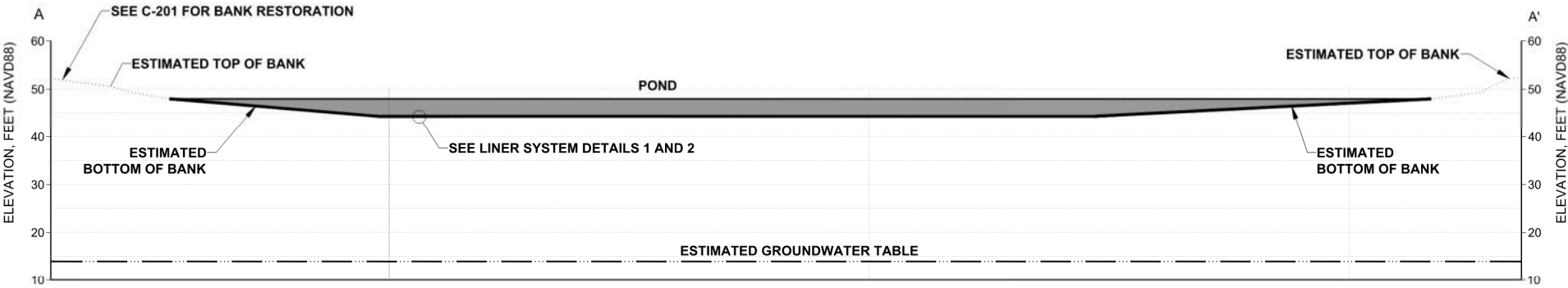




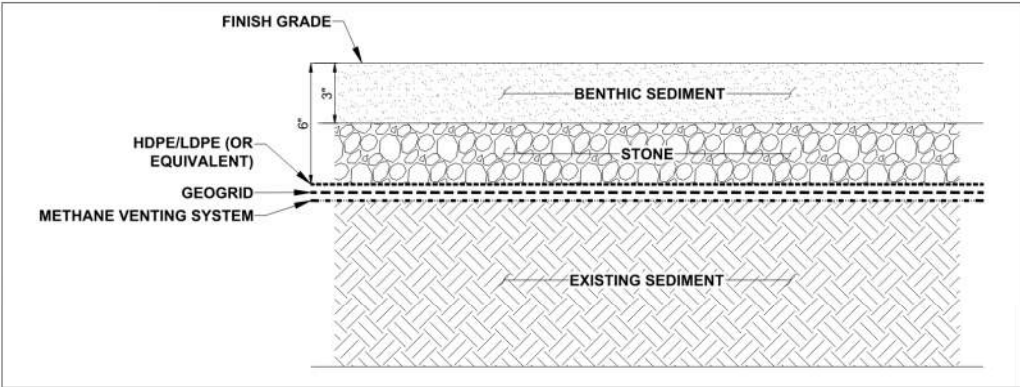
# Proposed Liner Installation & Water Quality System Overview



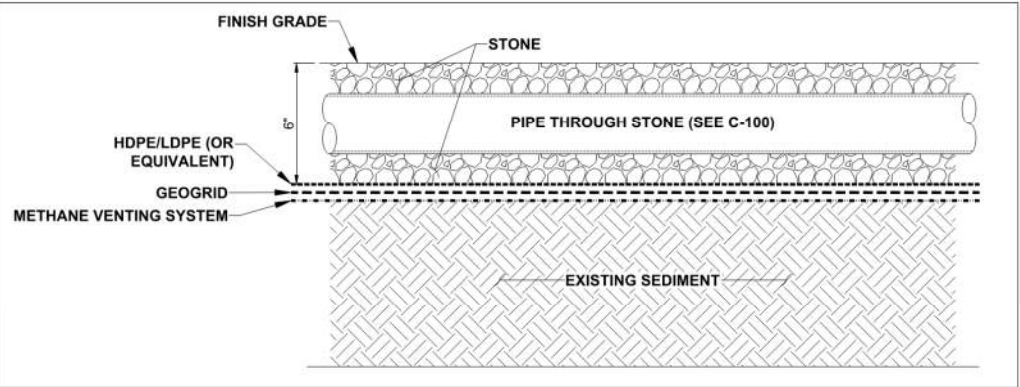
# Proposed Liner Installation



NAVD88 = NORTH AMERICAN VERTICAL DATUM OF 1988.

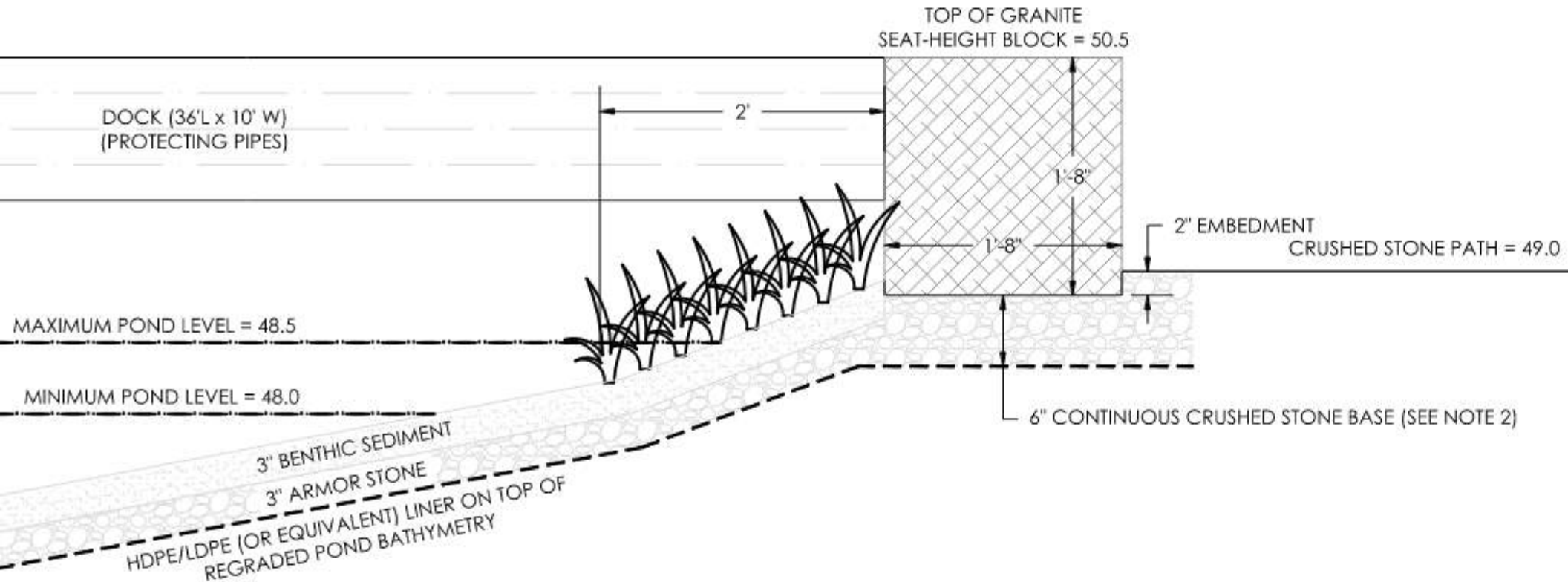


1 TYPICAL DETAIL  
C-04 LINER SYSTEM DETAIL NO SCALE



2 TYPICAL DETAIL  
C-04 LINER SYSTEM DETAIL AROUND WATER QUALITY PIPES NO SCALE

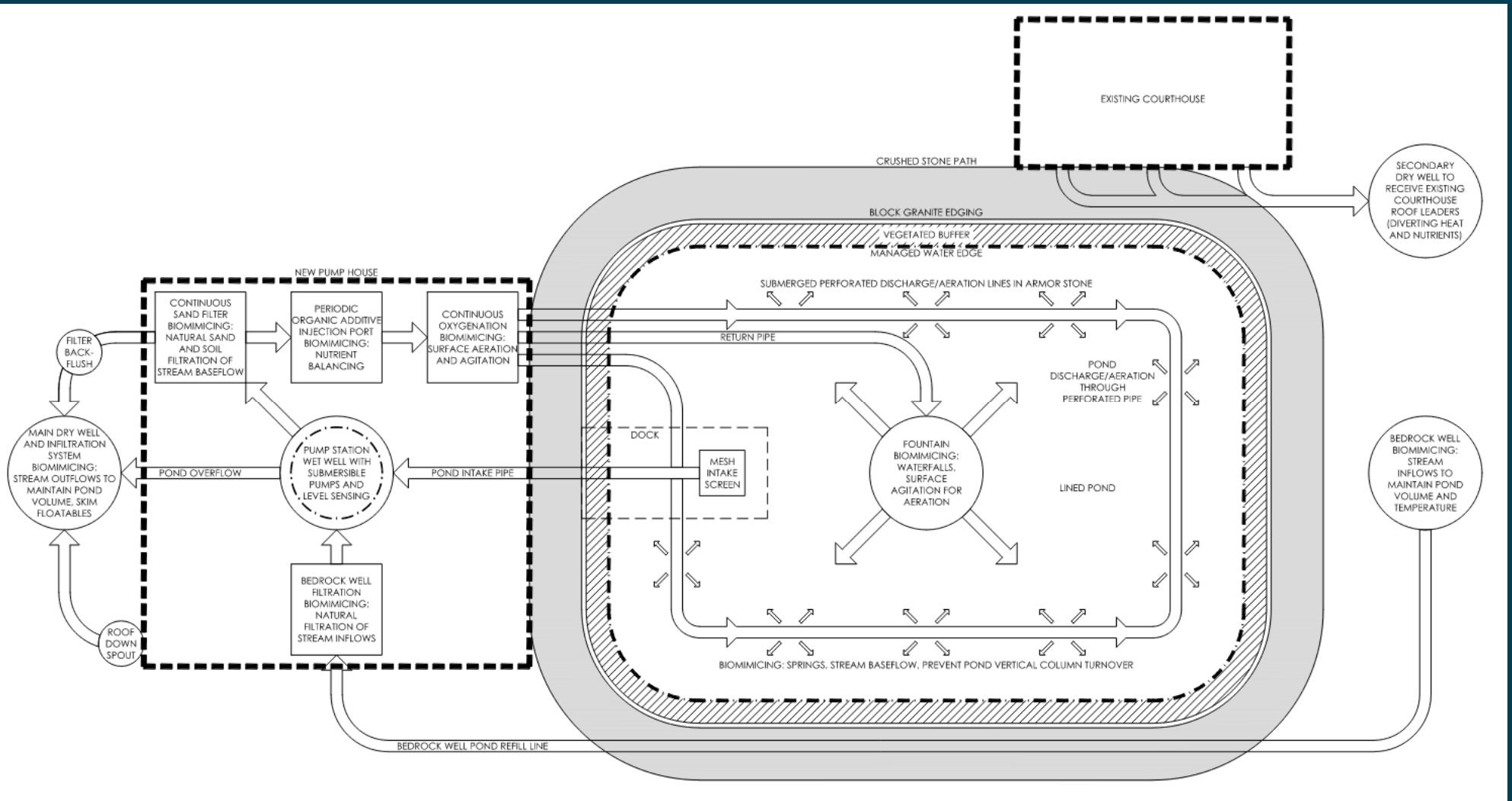
# Conceptual Liner Installation – Bank Detail



\* Concept Only - Granite Seat-Height Block to be installed above the Top of Bank\*

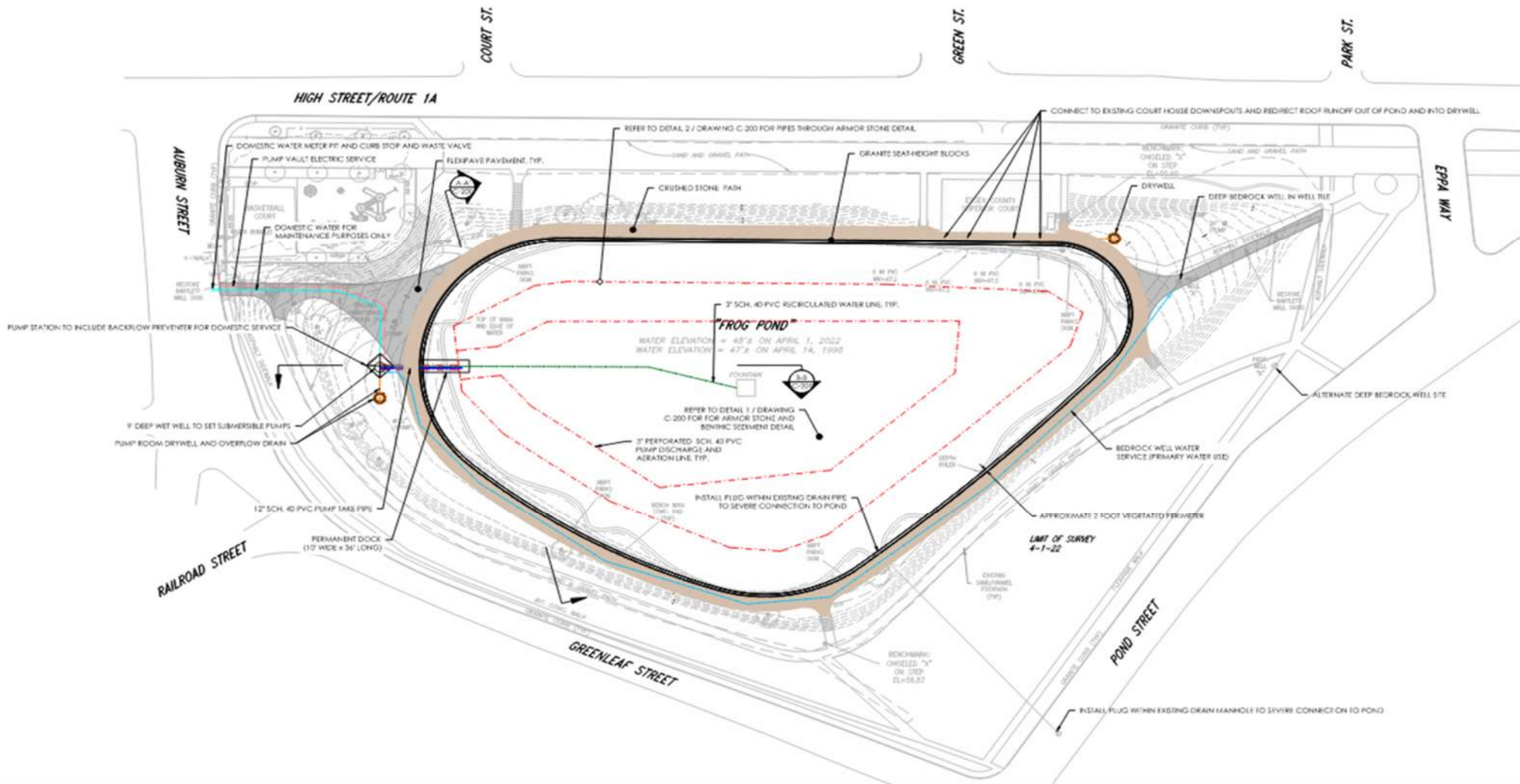


# Proposed Water Quality System - Flow Diagram





# Proposed Restoration Final Conditions





# Discussion/Questions

