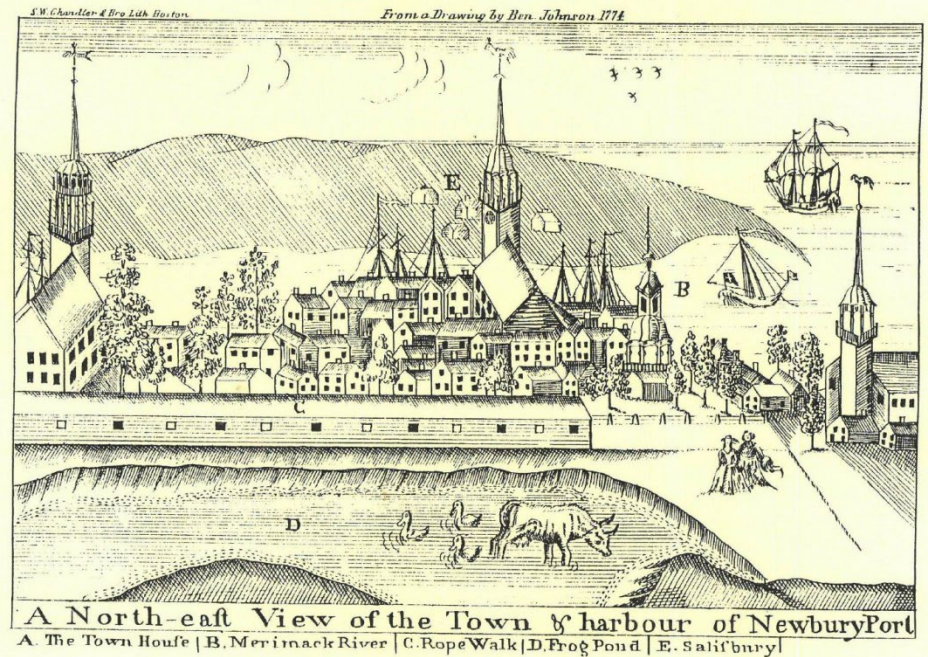




Breathing Life Back into the
Bartlet Mall Frog Pond

History of the Bartlet Mall

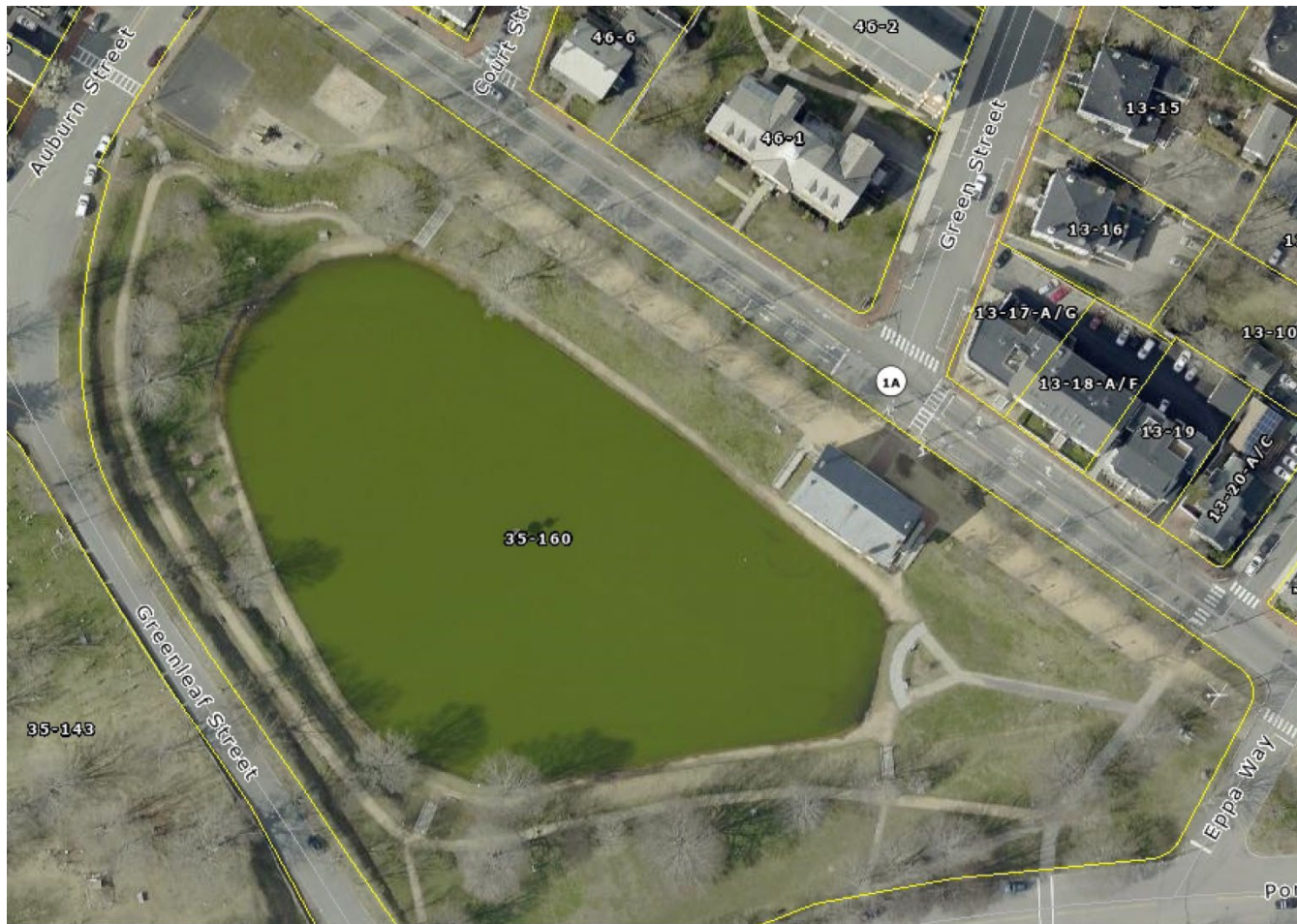
- Newburyport's first Common
- 1600-1700's: Livestock, rope making, training for Revolutionary War militia
- 1800: transformed into a park
- 1805: Federal Courthouse built, water inlet cut off
- 1891: fountain installed to attempt to clean the water
- 1987: fountain restored but quickly deteriorated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



Previous (modern day) attempts to restore Frog Pond

- 2014 study showed depths of muck and identified contaminants (heavy metals) & total phosphorous (TP) in sediment, recommended dredging and disposing out of state—expensive and environmentally insensitive, wouldn't solve the problem
- 2017 reverse osmosis, not effective due to sheer volume of TP in the sediment
- The problem: TP is food source for cyanobacteria, causing HABs, will continue to proliferate if the sediment is not separated from the water

We have reached a critical point
(HAB=harmful to people, toxic to small animals)



2021 Engineering report (funded by CPA)

- Pond and upland investigations: sediment testing, shear vane testing, bathymetric survey, water quality testing, monitoring wells, hydrologic conductivity testing, etc.
- Groundwater is 30' beneath the bottom of the pond
- Pond is contained by low-permeability sediment which prevents it from draining
- No indication that groundwater is feeding the pond
- Phosphorous present throughout all layers of sediment (12' down)
- Eutrophic conditions appear to be the result of poor water circulation and accumulation of phosphorous and other nutrients from wildlife and runoff

2021 Engineering recommendation (funded by CPA)

- Dewater the pond: remove stagnant water that is impacted with phosphorous, cyanobacteria and other water quality issues (managed under NPDES permit)
- Remove 6" of sediment to accommodate the liner and stone/sand layer to keep depth of pond consistent OR raise perimeter walkways by 6", sculpt the bottom of the pond in the 'dry' to create deeper areas for aquatic life
- Install geogrid for structural stability and HDPE liner, 3" of armor stone and 3" of sand for benthic layer, as well as methane venting system
- Install pump, bedrock well (shallow well not possible) and outlet (tie into historic fire suppression system)
- Install aeration and water treatment/maintenance equipment for long-range maintenance support
- Shape pond and install plants or floating wetlands
- Stabilize the edge with granite

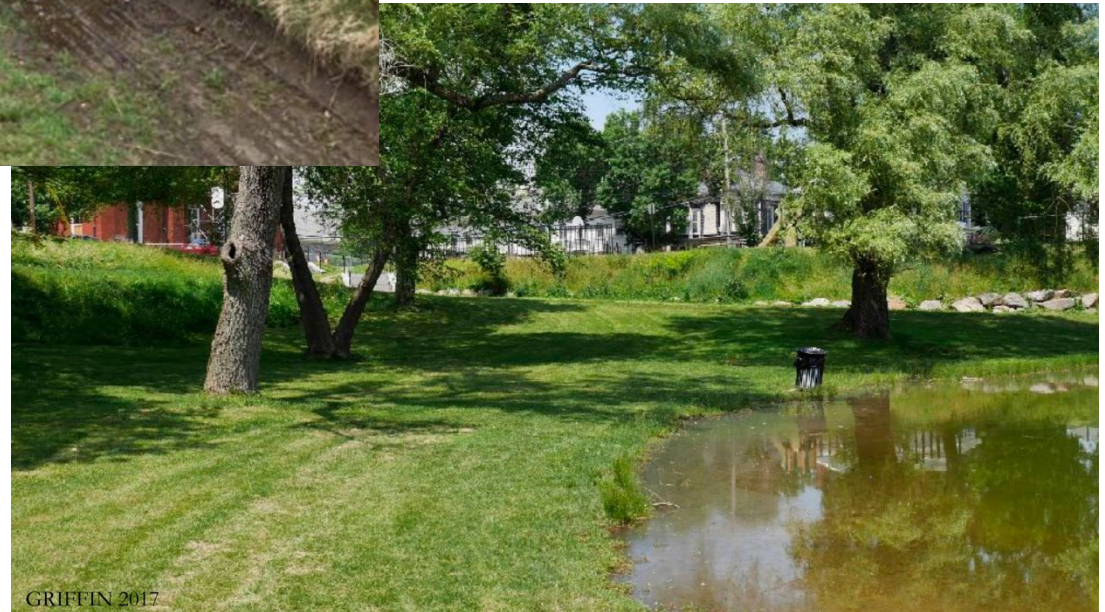
Original design intent



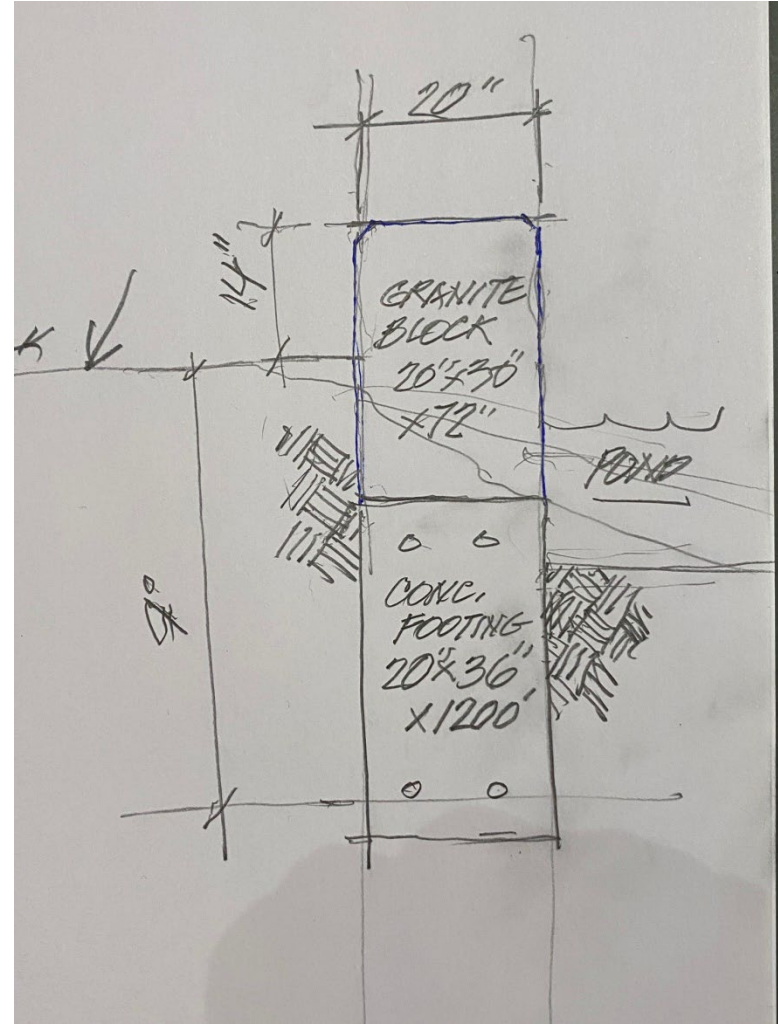
2022 CPC request

- Design, permitting and bid documents + 20% contingency: \$216,000
- Dewater, dredge 6", amend and off-site removal of material: \$530,748
- Liner and restoration of site: \$560,679
- Pump, well, & outlet: \$575,000
- Aeration, water treatment/maintenance equipment: \$325,000
- Pond shaping & plants: \$150,000
- 20% contingency: \$432,573
- Note: if raise walkways, eliminating need to dredge and remove material off site: -\$452,098 (including 20% contingency) can be used for granite edge (estimated \$500-800K)

Edges are compromised

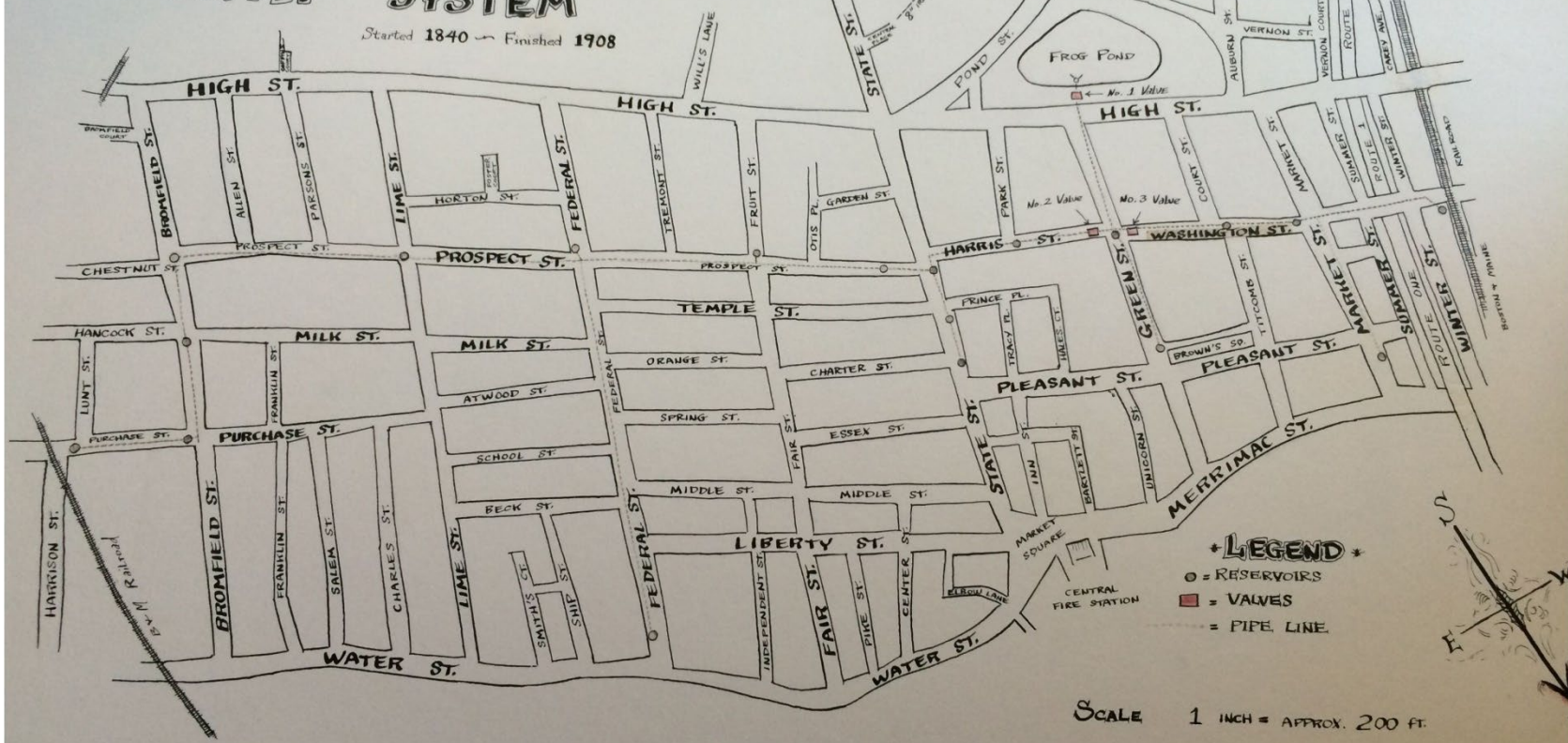
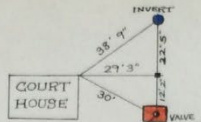


Water level is not consistent



FROG POND AUXILIARY WATER SUPPLY SYSTEM

Started 1840 - Finished 1908



- * LEGEND ***
- = RESERVOIRS
 - = VALVES
 - = PIPE LINE

SCALE 1 INCH = APPROX. 200 FT.

Next steps (if funded):



- Review new information from Engineering team with Parks Commission (May 19)
- Begin permitting processes
- Bid documents
- Send to bid
- Construction summer-fall 2023