NEW HAMPSHIRE DEPARTMENT OF Environmental Services

AQUATIC RESOURCE MITIGATION (ARM) PRE-PROPOSAL FORM

Water Division/Wetlands Bureau
Land Resources Management Program

RSA/ RULE: RSA 482-A/ Env-Wt 808.03

SECTION 1 - PROJECT TITLE		
Hadley Falls Dam Removal and River Restoration Project		
SECTION 2 - PROJECT LOCATION		
STREET ADDRESS: Factory Road	MUNICIPALITY: Goffstown	WATERSHED SERVICE AREA 5
SECTION 3 – APPLICANT INFORMATION		
APPLICANT NAME AND CONTACT INDIVIDUAL: NHDES Dam Bureau, Corey J. Clark, P.E.		
PHONE (OFFICE): 603-271-1961	PHONE (OTHER):	EMAIL: Corey.J.Clark@des.nh.gov
LANDOWNER (IF DIFFERENT FROM APPLICANT):		EMAIL:
SECTION 4 - OTHER ENTITIES INVOLVED AND THEIR ROLES (E.G., PARTNERS, CONTRIBUTORS)		
ENTITY: State of NH, Department of Environmental Services, Dam Bureau	ROLE: Owner and project lead	
ENTITY:	ROLE:	
ENTITY:	ROLE:	
ENTITY:	ROLE:	
SECTION 5 - GRANT AMOUNT REQUESTED		
TOTAL AMOUNT REQUESTED: $ 4,510,464		
MATCHING FUND SOURCE NAME: ARPA AMOUNT: $315,000	☒FUNDING IS SECURED ☐FUNDING IS PENDING ☐FUNDING IS PROPOSED	
MATCHING FUND SOURCE NAME: AMOUNT:	☐FUNDING IS SECURED ☐FUNDING IS PENDING ☐FUNDING IS PROPOSED	
MATCHING FUND SOURCE NAME: AMOUNT:	☐FUNDING IS SECURED ☐FUNDING IS PENDING ☐FUNDING IS PROPOSED	
TOTAL PROJECT COST: $ 4,825,464		
SECTION 6 - PROJECT TYPE – Select all that apply		

☒ WETLAND RESTORATION/ ENHANCEMENT	☒ STREAM RESTORATION/ ENHANCEMENT	☐ WETLAND ESTABLISHMENT (CREATION)	☐ PRESERVATION

SECTION 7 – PERMANENT LEGAL PROTECTION

☐ AQUATIC RESOURCES WILL BE PROTECTED IN PERPETUITY.	☐ AQUATIC RESOURCES WILL NOT BE PROTECTED IN PERPETUITY.	☒ UNKNOWN.

SECTION 8 – SIGNATURE

Signature of Submitter:	Print Name Legibly: Corey Clark	Date: 05/30/2025

PRE-PROPOSAL ATTACHMENTS

- Project Narrative (~1,000 words) including:
  - **Overview:** A summary of the project goals and objectives, how the project meets the background and mission of the ARM Fund Program, the tasks required to complete the project, a proposed timeline for completing the tasks, and the proposed results, **AND**
  - **For Wetland Restoration/Enhancement:** Summary of how the project meets the Eligible Projects & Minimum Criteria in the 2025 Guidance and Instructions. Describe the baseline condition of the aquatic resources and/or specific functions which will be improved by project activities. Describe how the project will result in a measurable lift in aquatic resource acreage and/or function at the landscape and watershed scale, **OR**
  - **For Stream Restoration/Enhancement:** Summary of how the project meets the Eligible Projects & Minimum Criteria in the 2025 Guidance and Instructions. Describe the baseline condition of the aquatic resources and/or the specific functions which will be improved by project activities. Describe how the project will result in a measurable lift in aquatic resource area and/or function at the landscape and watershed scale. For barrier projects, please include aquatic organism passage and geomorphic compatibility scores from the Aquatic Restoration Mapper, **OR**
  - **For Wetland Establishment (creation):** Summary of how project meets the Eligible Projects & Minimum Criteria in the 2025 Guidance and Instructions. Describe how the project will result in a measurable lift in aquatic resource acreage and function at the landscape and watershed scale, **OR**
  - **For Preservation:** Summary of how parcel meets the Eligible Projects & Minimum Criteria in the 2025 Guidance and Instructions. Describe baseline conditions of the property including aquatic resources and functions, presence of "Difficult-to-Replace" resources and habitat and whether there may be restoration/enhancement opportunities. Describe the threat and proposed protection mechanism. If restoration/enhancement opportunities exist, provide a summary of the conditions and proposed activities as outlined above.
- A preliminary budget with itemized expenditures, cost estimates, and pending or secured matching funds and their sources. Example/template budget.
- Acknowledgement of landowner's consent of the project.
- A landscape connectivity map showing the limits of the project area with any conservation and public lands within one mile of the project area.
- A wildlife action plan tiers map showing the limits of the project with critical habitats and populations of the state's species of conservation and management concern clearly delineated.
- For preservation: a letter indicating easement holder interest and a summary of the conservation goals.

The following attachments are RECOMMENDED information to include but are not required.

- A table of the aquatic resources included in the project.
- A GIS shapefile of the project parcel (or easement) boundary and aquatic resources.
- Letters of support for the project.
- A map of aquatic resources and classifications included in the project.
- Photos of project features.
- For restoration, enhancement or establishment: conceptual plans.

Hadley Falls Dam Removal and River Restoration Project

Overview:

The Hadley Falls Dam in Goffstown is listed by the NHDES Dam Bureau as a High Hazard Dam in poor condition (see attached data sheet and photographs of Hadley Falls Dam and associate project sites). The current dam was constructed in 1921 for mill power and retrofitted in the 1960s when NHDES took over ownership of the dam to generate hydroelectric power; however, the dam has not generated hydroelectric power since 2007. Because of the lack of hydropower generation at Hadley Falls Dam, the Federal Energy Regulatory Commission (FERC) issued a letter to NHDES in March of 2023 requiring NHDES to either restart hydropower generation at the site or surrender the FERC license. NHDES has chosen to proceed with surrendering the FERC license, however, due to a 2019 stability analysis performed on the dam, portions of the dam are currently unstable and will need to be addressed as part of the FERC license surrender. As a result of the need to address existing stability issues, NHDES contracted with Gannett and Fleming, Inc. (GF) to complete an alternative analysis to help determine the future of the dam (see attached Hadley Falls Dam Alternatives Analysis, dated September 2024 and GF's Technical Memorandum, dated May 29, 2025). This analysis looked at 5 Alternatives: 1. Removal of the Dam; 2. Removal of the Dam with River Restoration; 3. Removal of the Dam with River Restoration and Public Recreation Areas; 4. Removal and Replacement of the Hadley Falls Dam with Fish Passage; and 5. Removal and Replacement of the Hadley Falls Dam. After reviewing the completed report NHDES chose to pursue Alternative 2. This decision was due to the high cost of replacement of the dam with or without fish passage, environmental benefits associated with dam removal and restoration of the upstream river section and anticipated benefits to American eel (Anguilla rostrata) and other aquatic organism passage. Additionally, removal of the dam will benefit diadromous fish species (river herring), including American shad (Alosa sapidissima), blueback herring (Alosa aestivalis), and alewife (Alosa pseudoharengus), that are periodically stocked in the river system and that will be restored to the riverine system once the dam is removed and the planned fish ladder, trap and transport facility is constructed further downstream at the Kelley Falls Dam in Manchester (see attached, Kelley Falls Dam fish passage plan). It should be noted that removal of the Hadley Falls Dam is listed in the Merrimack River Watershed Comprehensive Plan for Diadromous Fishes (MRWCP 2021) as the preferred option to provide fish passage (please review the 2021 MRWCP for additional details Merrimack River Comprehensive Plan). Additional factors are that the dam no longer serves it's intended purpose, the potential private and public funding available for restoration of impacted river systems and the limited State funds available for NHDES to use towards the repair and reconstruction of 276 state-owned dams and to address maintenance and operational needs at 208 of those dams, including Hadley Falls Dam.

The project will consist of removing the concrete spillway to the natural stream bed and associated concrete structures and gates and restoration of approximately 2,800 linear feet of riverbed and banks (see attached draft plan sheets for Alternative/Concept 2). However, the two existing mill and hydropower buildings on the left and right abutments of the dam are not owned by NHDES and will remain in place after the dam is removed. Additionally, Alternative 2 is being pursued but if additional funds were available the public access areas noted in Alternative 3 could be added (see attached draft plan sheet for Alternative/Concept 3). The full description of the alternatives reviewed can be found in

the attached Hadley Falls Dam Alternatives Analysis, September 2024. Additionally, GF has prepared a revised design, Concept 2A, (see attached GF Technical Memorandum, dated May 29, 2025) that could be pursued if channel grading is not needed upstream up the noted "Sediment Removal Area". We would anticipate this design would still result in similar linear and square feet of restoration but would include passive restoration upstream of the "Rail Trail" right of way (former train trestle crossing) with active restoration being conducted closer to the dam. GF intends to further investigate and refine this concept, and restoration amounts if we are invited to submit a full proposal.

The goals of the project are removal of a dam that poses a potential threat to public safety, no longer serves its intended proposed, is in disrepair and has created negative impacts to the riverine and wetland system and species that historically inhabited them. Additionally, removal of the dam and associated river and wetland restoration will restore natural riverine processes, increase wetland and upland buffers, reduce flood flow elevation, improve resiliency, improve water quality and restore passage and connectivity for resident native fish species, stocked river herring and other aquatic organisms and improve passage for American eel (see attached maps, Wildlife Action Plan, NWIplus and Aquatic Mapper). Once the anticipated Kelley Falls Dam fish ladder, trap and transport facility located downstream in Manchester is completed river herring will have open access from Glen Lake (Gregg Falls Dam) through the site to nearly 250 miles of mainstem river and tributary habitats (see attached Stream Miles Map). We currently have a pending application with the National Oceanic and Atmospheric Administration (NOAA) for funding to complete the design and permitting for the fish ladder, trap and transport facility at Kelley Falls Dam. Additionally, $315,000 of American Rescues Plan Act of 2021 (ARPA) funds have been used on this project with $141,090 of that amount being used for GF to complete the design for the Hadley Falls Dam removal and river restoration (see attached Task Order 11, dated April 29, 2025). This application to ARM is for $4,510,646 of funding to complete any final design changes, collection of any remaining site information, permitting (and associated requirements), contractor bidding and selection, construction, construction oversight/monitoring, performance monitoring and adaptive management.

It is noted in the current ledger that the funds generated in this service area are from 3.3331 acres of permanent impact to wetlands and 166.1 linear feet of bank and channel impacts, along with numerous resources areas and functions and values that were impacted. The current proposal includes restoring approximately 2,800 linear feet (8,400 jurisdictional) of riverbed, banks and associated wetlands (within the current approximately 20-acre impoundment/area of influenced by the dam) that were historically impacted from construction of the dam and associated impoundment. Given the length and width of the river restoration area we expect at least 3 acres of wetlands will be restored along the constructed river channel and additional wetlands passively restored along exposed riverbed and banks upstream of the project. If selected for the full proposal GF will refine calculation for the area of wetlands that will be created as a result of the construction and lowered impoundment levels. In addition to the river and wetlands restoration it is expected the existing functions and values of the riverine and wetland system will be enhanced through restoration of a free flow riverine system and expected increased area of wetlands and upland buffers. As noted above, once the dam is removed the section of river below the dam and Glen Lake will be reconnected to nearly 250 miles mainstem river and tributary habitats.

Task required to complete: GF will finish field work, sediment evaluation, 90% removal design and project budget with existing ARPA funding. ARM funding will be used for permitting work (local, State and Federal) that would include wetlands and bank delineation, wetland functions and values assessments, baseline river assessment, Section 106 requirements, TE species review, 100% design work, land protection work, public meetings/outreach, finalize performance standards and monitoring plan, invasive species control plan, construction monitoring and 5 years of performance monitoring, adaptive management, contractor bidding and selection, construction and construction oversight. Additionally, as noted in GF's updated Technical Memorandum, dated May 29, 2025, funding may be needed for tasks associated with contaminated sediment disposal.

Timeline for completing tasks: If we are invited to submit a full proposal, GF will incorporate their ongoing work on Alternative 2 into the full proposal and address any comments or recommendations received from ARM. Remaining tasks will be completed starting upon final approval of the award through the winter of 2026-27, contractor bidding and selection in winter and spring of 2027, construction in summer and fall of 2027, performance monitoring through 2032.

Project Category 1: Wetland Restoration/Enhancement: Removal of the dam and associated river restoration will enhance or restore 5 of the 6 activities listed in this category.

Project Category 2: Stream Restoration/Enhancement: Removal of the dam and associated river restoration will enhance or restore all 7 activities listed in this category.

Acknowledgement of landowner's consent of the project:

The State of NH owns the dam and holds the associated flowage rights for the resulting impoundment. The NH Department of Environmental Services, Dam Bureau, is responsible for maintenance and operation of the dam. The Bureau is committed to the removal of the dam. Additionally, the Bureau is committed to working with the Town and abutting landowners to provide long-term protection of the restored site.

A landscape connectivity map showing the limits of the project area with any conservation and public lands within one mile of the project area:

See attached connectivity map.

A wildlife action plan tiers map showing the limits of the project with critical habitats and populations of the state's species of conservation and management concern clearly delineated:

See the attached Wildlife Action Plan Map.

See attached map generated with New Hampshire Stream Crossing Initiative Data Viewer (Formerly Aquatic Restoration Mapper).

See attached NWIplus Map.

See attached Budget Information. Please note the budget will be further refined as GF completes their design for the full proposal.

Attachment: Data sheet and Photographs of Hadley Falls Dam and Associated Project Sites

NHDAMS DATA SHEET

Dam# **D093002** Haz Cl: H Name HADLEY FALLS DAM
Status ACTIVE Town: GOFFSTOWN
Haz by Rule: River: PISCATAQUOG RIVER
Condition: POOR Other Name: BOBBIN SHOP DAM
NATDAM # NH00020 FERC #: 5379 FERC HZCL: S

Dam Owner: NH DES WATER DIVISION Class Own S
Represent: COREY CLARK Tel#: 603-271-3406
Street: PO BOX 95 29 HAZEN DRIVE Cell#: 603-419-0967
Mail Town: CONCORD State: NH Zip: 03302 0095
Email: COREY.J.CLARK@DES.NH.GOV

Emer Cont COREY CLARK EC Cell: 603-419-0967
EC Email: COREY.J.CLARK@DES.NH.GOV EC Tel: 603-271-3406
Alter Cont: COREY CLARK AC Tel: 603-271-1961

Last Field Insp: 5/24/2022 Insp By: FERC/JAH Next Insp YR: 2024

Comment: **FERC, COUNCIL, S TO H 11/20/2007**

Physical Loc: INTER OF RTE 13 & FACTORY RD

Height ft: 20
Length ft: 230
Impnd ac: 20
Free Board 6
Perm Stor: 150 acft
Max Stor: 250 acft
Drain Area: 125440 acres
Use: HYDRO

Design Event yr: 2.5 X 10
Year last HH:
Design Event inflow cfs:
Design Evnt rtd outflow cfs
Unop Disch w/1' frbrd cfs: 4300
Max Unop Disch cfs: 6620
Total Disch - full op cfs:
Primary Const: CONCRETE

Principal spill Type SHARP
Princpl spill dimen 176'
Stoplogbay dimen 5'
Gate dimensions 8' DIA
Flashboards Y or N Y
Outlet pipe type NA
Pond drain Y or N N
Auxilliary Spill dimen NA

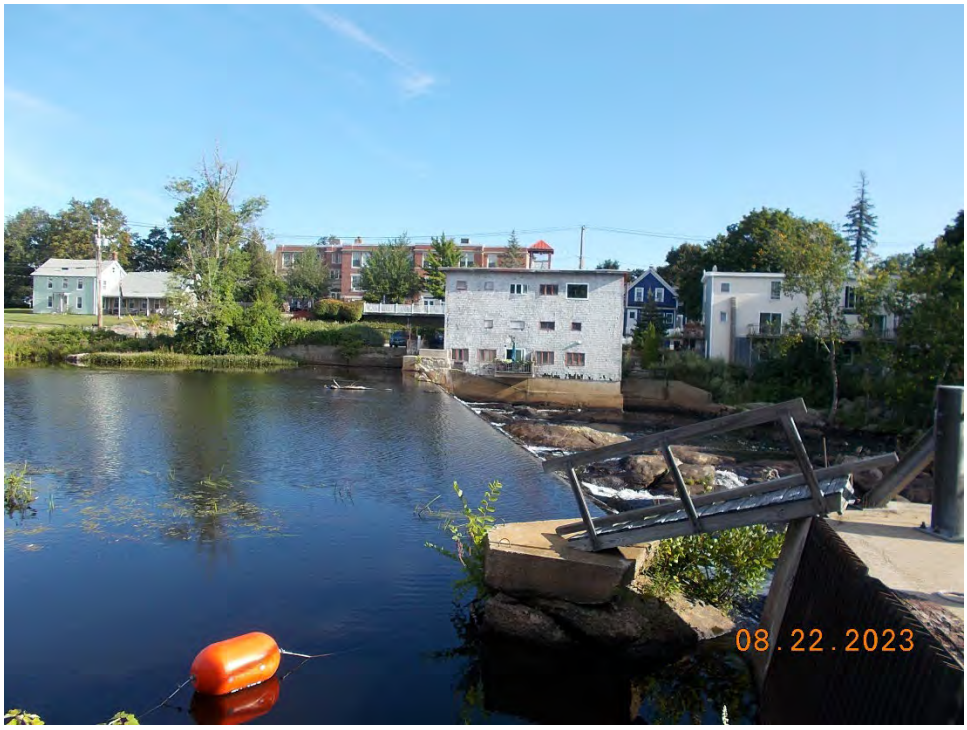
County: HILLSBOROUGH Tax ID:
Basin: MERR Deed BK/PG:
Lat/Lon: 43.0183 , -71.5977

Year orig Permit:
Year orig Const: 1921
Year last Reconst:

OMR Date 3/5/2012 Drawdown time: NA
Fall Drawdown N Drawdown dept NA
Drawdown comment: NA

5/20/2025

AN EMPTY FIELD MEANS DATA NOT YET ENTERED OR NOT YET AVAILABLE
ALL DATA SUBJECT TO CONTINUOUS CHANGE AND REVIEW



1. View of spillway/dam and impoundment from river right.

2. View of spillway and downstream side of spillway from river left.

3. Downstream view of spillway/dam from river left.

4. View of impoundment looking upstream from the river left side of the dam.

Hadley Falls

8/94

093.07

(SND)

downstream face from right

upstream & crest

upstream & crest

Hadley Falls
093:07
8/94
SND

Crest

Photo 1 (08-09-2023)

Hadley Falls Dam

View of Hadley Falls Dam from drone, facing downstream.

Photo 2 (09-13-2023)

Hadley Falls Dam

View of Hadley Falls Dam from left bank, facing downstream.

Photo 3 (08-09-2023)

Hadley Falls Dam

View of Hadley Falls Dam from drone, facing upstream.

Photo 4 (09-13-2023)

Hadley Falls Dam

View of Hadley Falls Dam from right bank, facing upstream.

Photo 5 (09-13-2023)

Gregg Falls Dam

View of Gregg Falls Dam hydroelectric facility from right bank, facing upstream.

Photo 6 (09-12-2023)

Kelley Falls Dam

View of Kelley Falls Dam spillway from left bank, facing upstream.

Photo 7 (08-09-2023)

Kelley Falls Dam

View of Kelley Falls Dam from right bank.

Photo 8 (08-09-2023)

Kelley Falls Dam

View of Kelley Falls Dam from left bank.

Photo 9 (08-09-2023)

Kelley Falls Dam

View of Kelley Falls Dam facing downstream, from drone.

Attachment: Hadley Falls Dam Alternatives Analysis, dated September 2024 and GF Technical Memorandum, dated May 29, 2025

HADLEY FALLS DAM ALTERNATIVES ANALYSIS

Hillsborough County, NH

National Inventory of Dams ID: NH00020
State/Federal Agency ID: 05379-01-01

Prepared for:
New Hampshire Department of Environmental Services
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Prepared by:
Gannett Fleming, Inc.
P.O. Box 67100
Harrisburg, PA 17106-7100

GF Project No. 073685.011

September 2024

Hadley Falls Fish Passage Alternatives Study

Background

Site Conditions

Hadley Falls Dam, located in Goffstown, New Hampshire, is a 20-foot-high, 176-foot-long concrete gravity dam that impounds the waters of the Piscataquog River. The dam was built in 1922 and was primarily used for hydroelectric power, fire protection, recreation, and as a small fishpond. In 2007, Goffstown Hydro Corporation ceased hydroelectric operations at the dam. In January of 2020, a stability analysis was performed and deemed Hadley Falls Dam unstable and in need of repairs. A hydroelectric intake is located at the dam's right abutment, and the outlet works through an old grist mill comprises the left abutment. The grist mill was subsequently converted into residential apartment buildings with the training wall between the main dam spillway and converted grist mill outlet works tunnel supporting the apartment building.

Purpose

The implementation of fish passage at Hadley Falls Dam will restore access for the following Managed diadromous species: American shad, blueback herring, alewife, American eel (Anguilla rostrata), and sea lamprey (Petromyzon marinus). Gannett Fleming has prepared five concepts which would allow fish passage upstream and downstream across Hadley Falls Dam. Due to the dam's poor condition, NHDES has requested that Gannett Fleming consider alternatives for removing or rebuilding the dam. The following factors have been considered in developing the alternatives: fish passage, permitting considerations, constructability concerns, meeting FEMA floodplain and dam safety regulations, public engagement, and approximate construction cost estimate.

Design Alternatives

According to Gannett Fleming's 2020 Stability Analysis Report for Hadley Falls Dam, the dam has deteriorated to the point that it is unlikely to pass FERC safety standards. It was determined that Hadley Falls Dam should be removed or replaced to reduce risk of failure.

Removing the dam would improve public safety and infrastructure resiliency, as Hadley Falls Dam is classified as a high-hazard dam. While public safety will be improved, the removal of Hadley Falls Dam will eliminate the recreational benefits that the dam currently provides. Providing new recreational benefits to compensate for the loss of the dam was considered during development of the dam removal alternatives.

A field survey was conducted by Gannett Fleming in August of 2023. Major features in the overbank areas were surveyed and bathymetric survey was conducted within the Piscataquog River. Sediment depths behind Hadley Falls Dam were also field-measured and were used in design development. Until samples of the sediment behind the Hadley Falls Dam are evaluated and compared to New Hampshire Freshwater and Marine Threshold Values, it is assumed that all sediment is uncontaminated. Within the watershed, potential sources of sediment contamination include 34 aboveground storage tank sites, 4 automobile salvage yards, 28 hazardous waste generators, 50 local potential contamination sources, 3 NPDES outfalls, 150 remediation sites, 7 solid waste facilities, and 139 underground storage tank sites. In consideration of the possibility that the sediment does not meet New Hampshire Freshwater and Marine Threshold

Values, the concepts contained in this report attempt to minimize disturbance and to vegetate these areas to minimize the potential transport downstream.

The five alternatives that were evaluated in the report are:

Alternative 1 - Removal. This alternative includes complete removal of Hadley Falls Dam from abutment to abutment, with both abutments remaining. See Concept Plan 1 in Appendix B.

Alternative 2 - Removal with River Restoration. Additionally, the two existing dry hydrants along Mill Street connected to the Piscataquog River are proposed to be replaced with new hydrants that will be connected to the Town of Goffstown's main water supply. See Concept Plan 2 in Appendix B.

Alternative 3 - Removal with River Restoration and Public Recreation Areas. Recreation areas were conceptualized in portions of the existing reservoir that would be located beyond the banks of the Piscataquog River following the dam removal. Additionally, the two existing dry hydrants along Mill Street connected to the Piscataquog River are proposed to be replaced with new hydrants that will be connected to the main water supply. See Concept Plan 3 in Appendix B.

Alternative 4 – Removal and Replacement of Hadley Falls Dam with Fish Passage. The proposed dam structure includes a vertical slot fishway. See Concept Plan 4 in Appendix B.

Alternative 5 - Removal and Replacement of Hadley Falls Dam. This alternative does not include a fish passage element. See Concept Plan 5 in Appendix B.

Overall Permitting Implications

Activities within waterways and wetlands in New Hampshire are regulated by the New Hampshire Department of Environmental Services (NHDES). Regardless of whether Alternative 1 or 2 is chosen, there are permitting requirements common to both.

The Corps will define their jurisdictional limits to all project activities below the ordinary high-water mark or adjacent wetlands of the Piscataquog River. Project activities within the US Army Corps of Engineers' (Corps) jurisdiction may require federal authorizations under the Clean Water Act, Section 404, and the Rivers and Harbors Act, Section 10. NHDES regulates the streambed and banks in its entirety along with wetlands. The level of project review by the Corps will depend on the proposed project impacts needed to implement the selected alternative.

Project activities that require Corps approval may also require coordination and demonstration of compliance with the following federal regulations before a federal permit may be granted:

- Section 408 of the Rivers and Harbors Act of 1899,
- Section 401 of the Clean Water Act,
- Section 402 of the Clean Water Act,
- Section 307(c) of the Coastal Zone Management Act of 1972,
- Section 106 of the National Historic Preservation Act of 1966,
- Section 7 of the Endangered Species Act,
- Fish and Wildlife Coordination Act of 1956,

- Magnuson-Stevens Fishery Conservation and Management Act,
- Section 302 of the Marine Protection, Research and Sanctuaries Act of 1972, and
- Section 7(a) of the Wild and Scenic Rivers Act.

To expedite the federal review and authorization process, the Corps has adopted General Permits (GPs) in New Hampshire for activities that meet the respective terms and eligibility criteria that satisfy the Corps and NHDES. The Corps will review activities according to the State of New Hampshire classification of Self-Verification (SV) (Minimum) and Pre-Construction Notification (PCN) (Minor/Major) per the State of New Hampshire Wetland Administrative Rules Env-Wt 100-1000. Table 1 presents the criteria used to evaluate the impact levels associated with a project.

Table 1
State and Federal Permit Criteria

Section 404 Thresholds for SV (Minimum) & PCN (Minor & Major)		
	NHDES	**USACE**
Non-tidal Wetlands		
SV (Minimum)	< 3,000 square feet (SF)	< 3,000 SF
PCN (Minor)	≥3,000 SF to <10,000 SF	≥3,000 SF to <3 acres
PCN (Major)	>10,000 SF	≥3,000 SF to <3 acres
Watercourses/Waterways		
SV (Minimum)	< 50 linear feet (LF)	< 100 LF
PCN (Minor)	≥50 LF to <200 LF	≥100 LF to <500 LF
PCN (Major)	≥200 LF	≥100 LF to <500 LF

For projects that exceed the criteria presented in Table 1, there are Individual Permits (IPs) that may be applied for and a more detailed scrutiny of the project will commence before an IP is granted. If an IP is needed, then GPs are no longer a valid approval mechanism and direct coordination with the Corps and NHDES to authorize an IP is needed. If the project is viewed as non-applicable to a GP, then every alternative may require an IP for federal and state authorization.

NHDES coordination and approvals are needed for Water Quality Certification (WQC) and the Coastal Zone Management Act (CZMA) Federal Consistency Concurrence approvals are required before work can occur in the Corps' jurisdiction. Other state approvals may apply, and early project coordination and pre-application meetings are valuable in identifying all required authorizations. Project coordination is needed with the NHDES Wetlands Bureau, NHDES Dam State Historic Preservation Office (SHPO), and NHDES Dam Bureau.

At the state level, the dam removal may be authorized by NHDES Dam Bureau and NHDES Wetlands Bureau under RSA 482 and Administrative Rules Env-Wr 100-700. The applicant will submit the permit application *Attachment to the Standard Wetlands Permit Application for Dam Removal Projects*, Version 1.2 or most recent available.

Each project alternative will require the same baseline information to determine the potential project impacts associated with the respective alternative. Disturbances and impacts will determine the level of

permit authorization required and complexity of coordination and mitigation requirements, if any. Prior to the preparation of permit application packages, agencies recommend that pre-application meetings be held to allow the applicant and reviewing federal and state agencies the opportunity to discuss and comment on a pending submission.

Alternative 1 - Removal

Design Parameters

This alternative includes removing the dam from abutment to abutment. No additional fish passage design is included in this alternative; however, since Hadley Falls Dam was built on top of a bedrock structure that created the original Hadley Falls, it is anticipated that fish historically were able to make it over this natural waterfall and will be able to do so once the concrete is removed. No modification of the bedrock is proposed.

Permitting Implications

It is anticipated that the Dam Removal Attachment, which discusses site impact evaluations, will need to be completed. This will be sent to the New Hampshire Dam Bureau to ensure compliance.

The site will need to be evaluated by the New Hampshire Division of Historical Resources. If historical properties are identified, the State Historic Preservation Officer (SHPO) will be coordinated with to prevent or reduce any negative impacts. It is unlikely that the portion of the dam being removed in this alternative will be affected by this requirement.

Additionally, a Wetlands Permit Application will need to be completed for this alternative, specifically Env-WT 526 Standard Dredge and Fill Wetlands Permit for Dam Projects in Non-Tidal Areas Within RSA 482-A Jurisdiction. A Standard Dredge and Fill Wetlands Permit Application and New Hampshire General Permits may also be required. Appendix B – Corps Secondary Impacts Checklist is an attachment to the NHDES Wetlands Bureau permit application that will also need to be completed.

A Shorelands Permit from the Water Division/ Shoreland Program: Land Resources Management and Coastal Zone Consistency Determination from New Hampshire Coastal Program may be required. Since Hadley Falls is in a non-tidal zone, the New Hampshire Department of Environmental Services, Wetlands Bureau and Dams Bureau and the Coastal Zone Management will be coordinated with to ensure compliance.

Lastly, a standard NPDES permit will likely be required. It is expected that all dam work could and would occur outside of fish passage season and will be coordinated accordingly. Due to the relatively short duration of demolition, this is likely achievable.

This alternative represents the least onerous permitting effort out of all the presented alternatives in this report.

Fish Passage Design

Historical records indicate that migratory fish have been present above Hadley Falls since before the installation of the dam. This means that fish were able to migrate across the falls. In this alternative, no additional grading is needed following the rationale that fish will be able to navigate the falls following dam demolition as they did prior to the dam's construction.

Constructability

Constructability concerns include difficult site access, complicated and costly diversion of water, potential impounded sediment contamination, and the questionable structural integrity of remaining structures on the left and right abutments.

Access to the site for dam removal will need to be coordinated. It is anticipated that site access for dam removal will need to be via the SMC Residences Hadley Falls LP property off of Factory Street.

Hadley Falls Dam is a run-of-the-river dam which makes diversion of water difficult during removal. However, of the alternatives involving removal of the dam, diversion of water is the least difficult for this alternative.

As stated above, there are significant sediment deposits behind Hadley Falls Dam. A soil testing program will need to be conducted prior to removal of the dam. If sediments behind Hadley Falls Dam are identified as contaminated, the sediments will be minimally disturbed and vegetated in an effort to keep them from remobilizing.

Portions of the dam may be removed close to the abutments while the pool is still full. Once the area behind the dam has been dewatered, the dam will be demolished using heavy equipment such as a backhoe with a hydraulic hammer attachment and the concrete will be hauled away. There is a former mill building, which is currently an apartment building, attached to the left abutment and a hydropower intake and power generation structure, which is currently a maintenance building, at the right abutment. It is expected that vibration monitoring will be required so as not to damage the structural integrity of the mill structure or the former powerhouse structure on either side of the dam during its removal. Additionally, noise monitoring or time of day work restrictions may be required due to the large number of residents likely to occupy the new apartment complex at the former factory buildings on the right bank.

Relative to all of the other alternatives, this alternative represents the least complicated construction alternative.

FEMA Floodplain Analysis

Hadley Falls Dam is in FEMA Zone AE with a detailed floodway. Increases in flood risk to residents downstream are not anticipated upon dam removal as the dam provides little-to-no attenuative benefit. At the conclusion of the removal of Hadley Falls dam, it is anticipated that the Base Flood Elevation (BFE) will be reduced. Hydraulic modeling may be required to prove that no increase in the BFE has occurred. This will need to be submitted to FEMA via the local floodplain

administrator and must adhere to the Town of Goffstown Zoning Ordinance provisions. It is known that, although FEMA conducted a detailed study of the Piscataquog River in this reach, FEMA is unable to locate those models. This will necessitate additional effort and likely invite additional scrutiny into the hydraulic modeling effort. As this option represents only a removal of items within the floodway, and no placement of fill within the floodway, this alternative represents the least risk for scrutiny by the floodplain administrator.

Cost Estimate

The estimated construction cost for this option is $1,868,290, excluding contaminated sediment removal. If regulations necessitate soil contamination removal, it would result in significant additional cost. These extra costs are consistent across all options and thus are not a differentiating factor in the comparison provided in this report. Refer to Appendix A for a comprehensive cost estimate.

Comparative Positives & Negatives

The removal of the Hadley Falls high-hazard dam will significantly reduce the risk of loss of life and property damage to downstream property owners that would result from the dam's failure. Removal of Hadley Falls Dam will eliminate significant maintenance and repair costs. The removal of the dam will improve resilience to climate hazards as barrier removal is expected to reduce upstream flooding by reducing the flood elevations for portions of Goffstown.

Another benefit of this alternative is the restoration of fish passage at Hadley Falls, creating an additional 229 river miles of upstream access in the Piscataquog River system. However, fish passage is contingent upon downstream fish passage measures being installed on Kelley Falls Dam and Greggs Falls Dam.

The removal of Hadley Falls Dam has the ability to aid in restoring access for the following Managed diadromous species: American shad, blueback herring, alewife, American eel (Anguilla rostrata) and sea lamprey (Petromyzon marinus). Increased populations of diadromous forage fish in the Merrimack River system will improve fishing throughout the system for key recreational and commercial species such as smallmouth bass, Atlantic striped bass, and bluefish. River herring and shad are also caught and used as bait in commercial and recreational fishing.

Being able to source bait locally avoids importation costs and reduces the potential spread of invasive species. Expansion of target species' habitat through the restoration of fish passage and dam removal will aid in the recovery of their populations. The MRWCP noted that areas with an increase in diadromous fish have an increased presence of wildlife.

A drawback of this alternative is that the recreation provided by the former dam is lost and this alternative does not provide amenities to replace them.

Alternative 2 - Removal with River Restoration

Design Parameters

This alternative includes the removal of the dam from abutment to abutment and full river restoration. Since, Hadley Falls Dam was built on top of a bedrock structure that created the original Hadley Falls, it is anticipated that fish historically were able to make it over this natural waterfall and will be able to do so once the concrete is removed. No modification of the bedrock if proposed. The natural stream channel design will be implemented once dam removal is completed.

Permitting Implications

It is anticipated that the Dam Removal Attachment, also titled the Dam Removal Project Attachment for the Wetlands Permit Application, which discusses site impact evaluations will need to be completed. This will be sent to the New Hampshire Dam Bureau to ensure compliance. The site will need to be evaluated by the New Hampshire Division of Historical Resources. If historical properties are identified, the SHPO will be coordinated with to prevent or reduce any negative impacts. Additionally, a Wetlands Permit Application will need to be completed, specifically Env-WT 526 Standard Dredge and Fill Wetlands Permit for Dam Projects in Non-Tidal Areas Within RSA 482-A Jurisdiction. A Standard Dredge and Fill Wetlands Permit Application and New Hampshire General Permits may also be required. Appendix B – Corps Secondary Impacts Checklist is an attachment to the NHDES Wetlands Bureau permit application that will also need to be completed. A Shorelands Permit from the Water Division/ Shoreland Program: Land Resources Management and Coastal Zone Consistency Determination from New Hampshire Coastal Program may be required. Since Hadley Falls is in a non-tidal zone, the New Hampshire Department of Environmental Services, Wetlands Bureau and Dams Bureau and the Coastal Zone Management will be coordinated with to ensure compliance. A standard NPDES permit will likely be required. It is expected that all dam and stream restoration work will occur outside of fish passage season and will be coordinated accordingly.

Fish Passage Design

Historical records indicate that migratory fish have been present above Hadley Falls prior to the installation of the dam. This means that fish were able to migrate across the falls. In this alternative, no additional grading is needed following the rationale that fish will be able to navigate the falls following dam demolition as they did prior to the dam's construction. This alternative also expands the fish passage design to grade in a more-defined channel. This supposes that silt and other material has deposited behind the dam during its lifespan and would be manually removed to create an incised channel and overbanks.

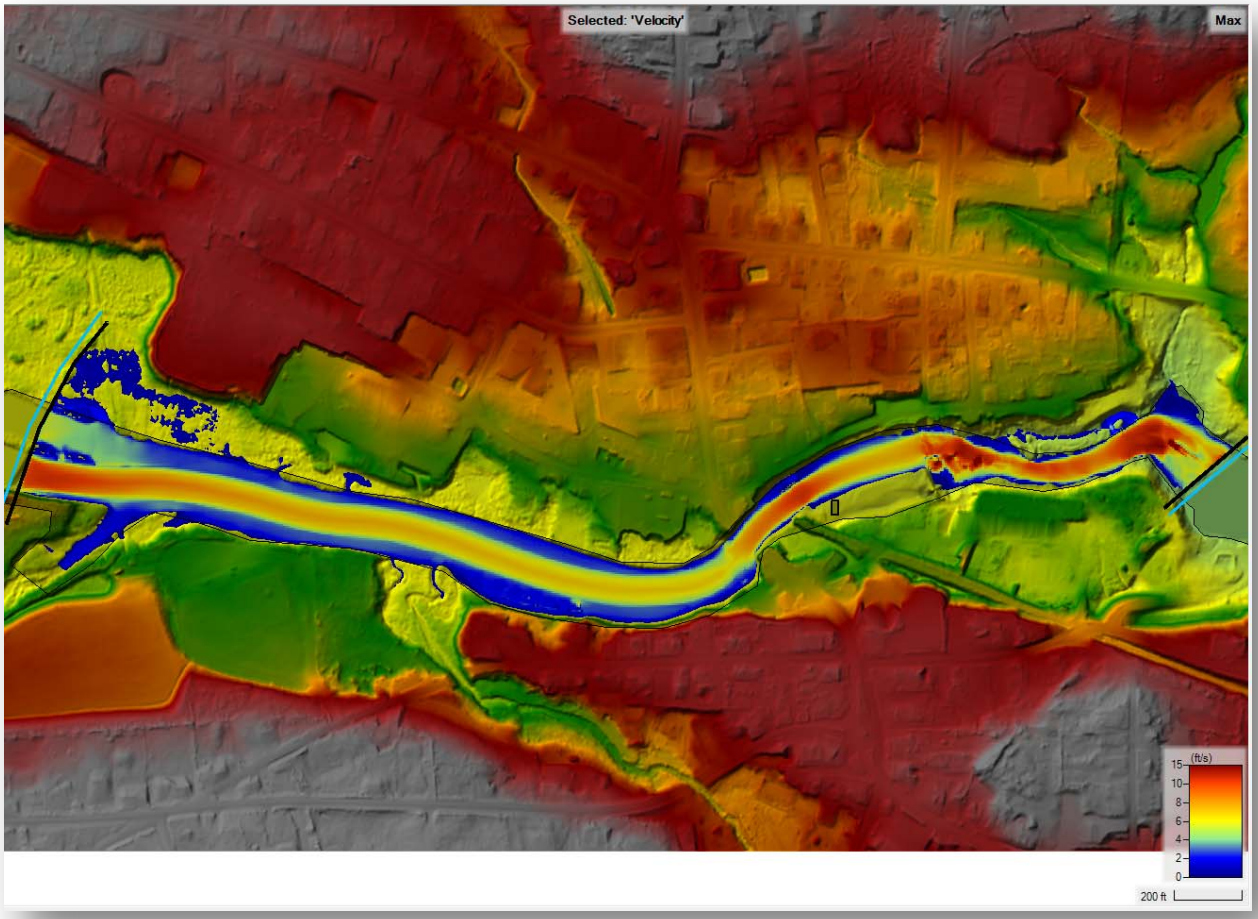


Figure 1 – River Restoration 2-Dimensional HEC-RAS Velocities during a 2-year Storm Event

Constructability

Constructability concerns include site access, diversion of water, sediment contamination, and structural integrity of remaining structures on left and right abutments.

Access to the site for dam removal will need to be coordinated. It is anticipated that site access for dam removal will need to be via the SMC Residences Hadley Falls LP property off of Factory Street.

If sediments behind Hadley Falls Dam are identified as contaminated, the sediments will be minimally disturbed and vegetated where applicable.

Once the area behind the dam has been dewatered, the dam will be demolished using heavy equipment such as a backhoe with a hydraulic hammer attachment and the concrete hauled away. There is a former mill building, which is currently an apartment building, attached to the concrete dam abutment on the left bank and a hydropower intake and power generation structure, which is currently a maintenance building, on the right bank. It is expected that

vibration monitoring will be required so as not to damage the structural integrity of the mill structure or the former powerhouse structure on either side of the dam during its removal. Additionally, noise monitoring or time of day work restrictions may be required due to the large number of residents likely to occupy the new apartment complex at the former factory buildings on the right bank.

FEMA Floodplain Analysis

A FEMA one-dimensional analysis is needed to assess the impacts of this alternative on flood risk in the area. Hadley Falls Dam is in FEMA Zone AE with a detailed floodway. It is a run-of-the-river dam that has no attenuation and does not impact any downstream dams. Upon inspection, increases in flood risk to residents downstream are not anticipated upon dam removal. Flooding regimes both upstream and downstream of Hadley Falls will improve as flow will no longer be restricted and will be allowed to drain into a larger floodplain which may decrease the flood severity.

Cost Estimate

The estimated construction cost for this alternative is $2,951,820, not including contaminated sediment removal. See Appendix A for a detailed cost estimate.

Comparative Positives & Negatives

Removal of the Hadley Falls high-hazard dam will significantly reduce the risk of loss of life and property damage to downstream property owners that would result from the dam's failure. This alternative also includes the restoration of the stream channel upstream of the dam using natural channel design principles, which will result in further flood retention and a stream system that is more resilient to flow variability as a result of climate change. Furthermore, vegetation on the newly constructed floodplain will sequester carbon, filter pollutants, and absorb nutrients from storm flows. Floodplain creation will promote sediment deposition to improve water quality. The removal of Hadley Falls Dam will improve public safety and resilience to climate hazards as barrier removal is expected to reduce upstream flooding by reducing the flood elevations through Goffstown. The removal of Hadley Falls Dam will foster improved ecosystem health and increased biodiversity that is more resilient to changing climate.

Public safety will also be improved by replacing two existing dry hydrants along Mill Street at Hadley Falls with new hydrants that are connected to the main water supply. This is a more resilient solution than relying on the variable water depth, changing river flows, and freezing.

Removing the dam will eliminate significant maintenance and repair costs for Hadley Falls Dam that would be paid for by tax-payer dollars.

The proposed channel restoration at Hadley Falls will also stabilize riverbanks and sediment within the former reservoir, reducing sediment deposition in Glen Lake. Reducing the risk of sedimentation in Glen Lake is a significant public concern due to its recreational value. Sediment behind Hadley Falls Dam will be evaluated to determine if contamination exceeds New Hampshire

Freshwater and Marine Threshold Values. If contaminated sediments are identified, any excavated sediment will be minimally disturbed and vegetated where applicable.

Increased populations of diadromous forage fish in the Merrimack River system will improve fishing throughout the system for key recreational and commercial species such as smallmouth bass, Atlantic striped bass, and bluefish. River herring and shad are also caught and used as bait in commercial and recreational fishing. Being able to source bait locally avoids importation costs and reduces the potential spread of invasive species. Expansion of target species' habitat through the restoration of fish passage and dam removal will aid in the recovery of their populations,

The MRWCP noted that areas with an increase in diadromous fish have an increased presence of wildlife.

A drawback of this alternative is that although access to the newly restored floodplain within the former reservoir will be created, the recreational benefits of the former dam most likely outweigh this proposed public benefit.

Alternative 3 - Removal with River Restoration and Public Recreation Areas

Design Parameters

This alternative includes the removal of the dam from abutment to abutment, full river restoration, and the implementation of recreational amenities. Since, Hadley Falls Dam was built on top of a bedrock structure that created the original Hadley Falls, it is anticipated that fish historically were able to make it over this natural waterfall and will be able to do so once the concrete is removed. No modification of the bedrock is proposed. The natural stream channel design and recreation amenities will be implemented once dam removal is completed.

Permitting Implications

It is anticipated that the Dam Removal Attachment, also titled the Dam Removal Project Attachment for the Wetlands Permit Application, which discusses site impact evaluations will need to be completed. This will be sent to the New Hampshire Dam Bureau to ensure compliance. The site will need to be evaluated by the New Hampshire Division of Historical Resources. If historical properties are identified, the SHPO will be coordinated with to prevent or reduce any negative impacts. Additionally, a Wetlands Permit Application will need to be completed, specifically Env-WT 526 Standard Dredge and Fill Wetlands Permit for Dam Projects in Non-Tidal Areas Within RSA 482-A jurisdiction. A Standards Dredge and Fill Wetlands Permit Application and New Hampshire General Permits may also be required. Appendix B – Corps Secondary Impacts Checklist is an attachment to the NHDES Wetlands Bureau permit application that will also need to be completed. A Shorelands Permit from the Water Division/ Shoreland Program: Land Resources Management and Costal Zone Consistency Determination from New Hampshire Coastal Program may be required. Since Hadley Falls is in a non-tidal zone, the New Hampshire Department of Environmental Services, Wetlands Bureau and Dams Bureau and the Coastal Zone Management will be coordinated with to ensure compliance. A standard NPDES permit will likely

be required. It is expected that all dam and stream restoration work will occur outside of fish passage season and will be coordinated accordingly.

Fish Passage Design

Historical records indicate that migratory fish have been present above Hadley Falls prior to the installation of the dam. This means that fish were able to migrate across the falls. In this alternative, no additional grading is needed following the rationale that fish will be able to navigate the falls following dam demolition as they did prior to the dam's construction. This alternative also expands the fish passage design to grade in a more-defined channel. This supposes that silt and other material has deposited behind the dam during its lifespan and would be manually removed to create an incised channel and overbanks.

Constructability

Constructability concerns include site access, diversion of water, sediment contamination, and structural integrity of remaining structures on left and right abutments.

Access to the site for dam removal will need to be coordinated. It is anticipated that site access for dam removal will need to be via the SMC Residences Hadley Falls LP property off of Factory Street.

If sediments behind Hadley Falls Dam are identified as contaminated, the sediments will be minimally disturbed and vegetated where applicable.

Once the area behind the dam has been dewatered, the dam will be demolished using heavy equipment such as a backhoe with a hydraulic hammer attachment and the concrete will be hauled away. There is a former mill building, which is currently an apartment building, attached to the concrete dam abutment on the left bank and a hydropower intake and power generation structure, which is currently a maintenance building, on the right bank. It is expected that vibration monitoring will be required so as not to damage the structural integrity of the mill structure or the former powerhouse structure on either side of the dam during its removal. Additionally, noise monitoring or time of day work restrictions may be required due to the large number of residents likely to occupy the new apartment complex at the former factory buildings on the right bank.

Certain parcels adjacent to the water have deeds that are written such that public access areas may require permanent easements to be located in their proposed locations. The public access areas could also be redesigned to avoid crossing of adjacent parcels.

FEMA Floodplain Analysis

A FEMA one-dimensional analysis is needed to assess the impacts of this alternative on flood risk in the area. Hadley Falls Dam is in FEMA Zone AE with a detailed floodway. It is a run-of-the-river dam that has no attenuation and does not impact any downstream dams. Upon inspection, increases in flood risk to residents downstream are not anticipated upon dam removal. Flooding regimes both upstream and downstream of Hadley Falls will improve as flow will no longer be

restricted and will be allowed to drain into a larger floodplain which may decrease the flood severity.

Cost Estimate

The estimated construction cost for this alternative is $5,489,811, without contaminated sediment removal. See Appendix A for a detailed cost estimate.

Comparative Positives & Negatives

Removal of the Hadley Falls high-hazard dam will significantly reduce the risk of loss of life and property damage to downstream property owners that would result from the dam's failure. This alternative also includes the restoration of the stream channel upstream of the dam using natural channel design principles, which will result in further flood retention and a stream system that is more resilient to flow variability as a result of climate change. Removal of Hadley Falls Dam will restore the stream through the former reservoir to pre-dam conditions and provide access to a vegetated floodplain within the former reservoir width. Furthermore, vegetation on the newly constructed floodplain will sequester carbon, filter pollutants, and absorb nutrients from storm flows. Floodplain creation will promote sediment deposition to improve water quality.

The removal of Hadley Falls Dam will foster and increased biodiversity that is more resilient to changing climate. Public safety will also be improved by replacing two existing dry hydrants along Mill Street at Hadley Falls with new hydrants that are connected to the main water supply. This is a more resilient solution than relying on the variable water depth, changing river flows, and freezing.

The proposed channel restoration at Hadley Falls will also stabilize riverbanks and sediment within the former reservoir, reducing sediment deposition in Glen Lake. Reducing the risk of sedimentation in Glen Lake is a significant public concern due to its recreational value. Sediment behind Hadley Falls Dam will be evaluated to determine if contamination exceeds New Hampshire Freshwater and Marine Threshold Values. If contaminated sediments are identified, any excavated sediment will be minimally disturbed and vegetated where applicable.

Removing the dam will eliminate significant maintenance and repair costs for Hadley Falls Dam that would be paid for by tax-payer dollars. Instead, this alternative will improve recreational amenities and create or improve river access points near Goffstown benefiting the surrounding community. These improvements include two pavilions with benches overlooking the river, additional parking spaces along Mill Street, a raised platform walking and viewing area overlooking the river along Mill Street, and two walkways that lead to large riverside steps with fishing platforms on either side of the river. Pending the acquisition of any necessary easements, the fishing platform and access along the river right side will be ADA accessible. The pavilion areas will be connected to the former railroad bridge abutments at the Goffstown Rail Trail. Improved access amenities are also proposed at Lions Park, upstream of downtown Goffstown pending easement acquisition. There is also potential for a trail to connect the access points in Goffstown to the access point at Lions Park pending several easement acquisitions. This will improve connectedness and recreation opportunities on the Piscataquog River. NHDES plans to provide

public access and informational signage about fish passage as part of the fish passage implementation. This site may also be used as a field trip and educational opportunity for local schools and other organizations during the migration season.

This alternative will also bolster angling opportunities along project area streams and lakes. Increased populations of diadromous forage fish in the Merrimack River system will improve fishing throughout the system for key recreational and commercial species such as smallmouth bass, Atlantic striped bass, and bluefish. River herring and shad are also caught and used as bait in commercial and recreational fishing. Being able to source bait locally avoids importation costs and reduces the potential spread of invasive species. Expansion of target species' habitat through the restoration of fish passage and dam removal will aid in the recovery of their populations,
The MRWCP noted that areas with an increase in diadromous fish have an increased presence of wildlife.

A potential drawback to this alternative is the high estimated cost.

Alternative 4 – Removal and Replacement of Hadley Falls Dam with Fish Passage

Design Parameters

This alternative includes the removal and replacement of Hadley Falls Dam with a new Roller Compacted Concrete dam, with low level outlet. The proposed dam structure will also include a vertical slot fishway for fish passage.

Permitting Implications

It is anticipated that the Dam Removal Attachment, also titled the Dam Removal Project Attachment for the Wetlands Permit Application, which discusses site impact evaluations will need to be completed. This will be sent to the New Hampshire Dam Bureau to ensure compliance. The site will need to be evaluated by the New Hampshire Division of Historical Resources. If historical properties are identified, the SHPO will be coordinated with to prevent or reduce any negative impacts. Additionally, a Wetlands Permit Application will need to be completed, specifically Env-WT 526 Standard Dredge and Fill Wetlands Permit for Dam Projects in Non-Tidal Areas Within RSA 482-A Jurisdiction. A Standard Dredge and Fill Wetlands Permit Application and New Hampshire General Permits may also be required. Appendix B – Corps Secondary Impacts Checklist is an attachment to the NHDES Wetlands Bureau permit application that will also need to be completed. A Shorelands Permit from the Water Division/Shoreland Program: Land Resources Management and Coastal Zone Consistency Determination from New Hampshire Coastal Program may be required. Since Hadley Falls is in a non-tidal zone, the New Hampshire Department of Environmental Services, Wetlands Bureau and Dams Bureau and the Coastal Zone Management will be coordinated with to ensure compliance. A standard NPDES permit will likely be required. It is expected that all dam work will occur outside of fish passage season and will be coordinated accordingly.

Fish Passage Design

Federal fishway design criteria from NOAA and USFWS and input from New Hampshire Fish & Game (NHFG) were utilized for concept design development for fish passage at Hadley Falls. The concept design conveys flow from the water surface elevation of the impounded lake to the Piscataquog River in a manner that maintains appropriate slope and velocities for target species. The current design incorporates a log weir or similar structure at the upstream end of the fishway that will allow for the management of flow under seasonal changes in water level. Entrance velocities will be designed to maintain a range of 4 to 6 feet per second, which is the recommended range for fishways serving shad and river herring. The entrance channel will be designed to be approximately 5 feet below normal tailwater elevation to allow for sufficient depth for fish passage under variable flow conditions. Depth of the exit will be approximately three feet below spillway elevation to provide sufficient depth for target species passage throughout the entire length of the fishway. Turning points within the fishway will be designed to minimize turbulent flow; bends greater than 90 degrees will utilize a weir to guide fish up the fishway. Velocities in the designed fishway will be designed commensurate with the swimming abilities of target species.

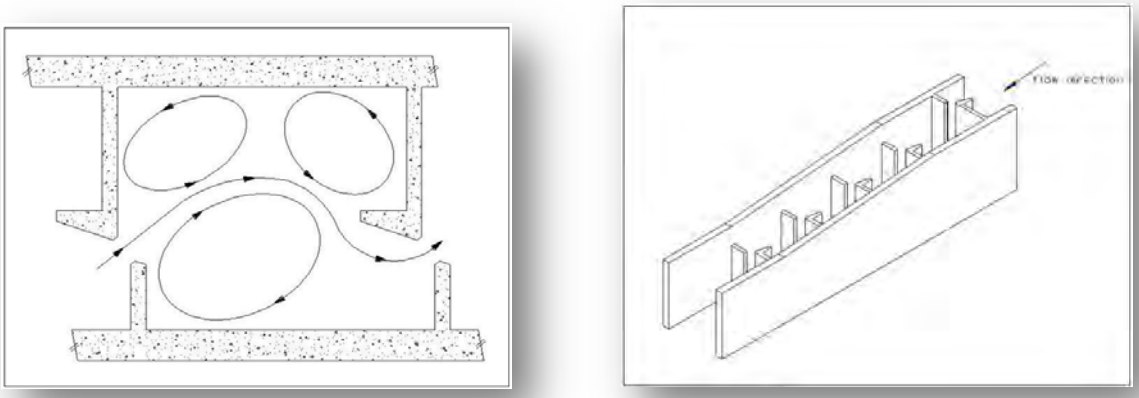


Figure 2 - Plan (left) and Isometric (right) Views of Vertical Slot Fish Ladder (taken from Anadromous Salmonid Passage Facility Design, National Marine Fisheries Service Northwest Region, NOAA July 2011)

The USFWS publishes guidance on vertical slot fish passage design. The design low flow for fish passage is prescribed to be the mean daily average streamflow that is exceeded 95 percent of the time when migrating fish are normally present at the site. This design was done at a very conceptual level to inform a cost estimate, therefore all the values in this report should be re-investigated at the time of the actual design. Flows for the downstream dam, Kelley Falls, were used in sizing of the fish ladder. This is an appropriate conservative approximation of the flows to be expected at Hadley Falls. The design low flow for the fish ladder was found to be approximately 1,460 cfs. The design high flows for fish passage is defined as the mean daily average streamflow that is exceeded 5 percent of the time during periods when migrating fish are normally present at the site. The design high flow was found to be approximately 9,390 cfs.

Another important criterion is the design of attractant flow, which the guidelines dictate to be between 5 and 10 percent of the fish passage design high flow for streams with a mean annual streamflow exceeding 1,000 cfs. For smaller streams, larger percentages (up to 100 percent of the mean annual streamflow) can be used. In general, a preference for maximizing the attractant flow is emphasized. For this concept, an attraction flow of 5 percent was used for sizing the parallel attractant flow channel. This parallel channel will also be designed to function as a downstream fish passage channel.

This design is suitable for a concept-level fish ladder design but refinements should be made at the time of design including a Computational Fluid Dynamics (CFD) model of the fish ladder to verify the flow patterns and velocities predicted by the empirical equations.

Constructability

Constructability concerns include site access, diversion of water, and sediment contamination.

Access to the site for dam removal will need to be coordinated. It is anticipated that site access for dam removal will need to be via the SMC Residences Hadley Falls LP property off of Factory Street.

Diversion of water for reconstruction of the dam will be difficult and costly, as it is a run-of-the-river dam, with substantial base flows. Ideally the new dam would be built downstream of the old, but the current dam sits just upstream of a natural waterfall making this not a feasible option.

If sediments behind Hadley Falls Dam are identified as contaminated, the sediments will be minimally disturbed and vegetated where applicable.

Once the area behind the dam has been dewatered, the dam will be demolished using heavy equipment such as a backhoe with a hydraulic hammer attachment and the concrete will be hauled away. There is a former mill building, which is currently an apartment building, attached to the concrete dam abutment on the left bank and a hydropower intake and power generation structure, which is currently a maintenance building, on the right bank. It is expected that vibration monitoring will be required so as not to damage the structural integrity of the mill structure or the former powerhouse structure on either side of the dam during its removal. Additionally, noise monitoring or time of day work restrictions may be required due to the large number of residents likely to occupy the new apartment complex at the former factory buildings on the right bank.

FEMA Floodplain Analysis

Kelley Falls Dam is in a FEMA Zone AE with delineated floodway. As portions of this proposed alternative are within the floodway, FEMA requires a one-dimensional hydraulic analysis to assess if the project would cause an increase to the BFE. FEMA was contacted in an attempt to obtain the effective flood insurance study models, however, FEMA was unable to locate these models. Rather than recreate the models from scratch, a qualitative assessment is provided in this report.

This project has a marginal potential for increasing the FEMA BFE due to the potential for exposed sections of the fishway sticking out above grade.

Prior to commencing with this project, a quantitative analysis (with HEC-RAS) will be required to demonstrate to FEMA that there will be no increases to the BFE. It should also be noted that it is atypical for FEMA to not be able to provide their effective models establishing the BFE. This will create additional work with FEMA and the local floodplain administrator as the modeler will have to re-create the FEMA effective model. Should the project show increases to the BFE, and those increases affect insurable structures, FEMA regulations would require NHDES to buy out any affected properties in addition to submitting a Conditional Letter of Map Revision (CLOMR) and subsequent Letter of Map Revision (LOMR). Should the project show increases to the BFE, and those increases do not affect any insurable structures, NHDES would still need to submit a CLOMR and LOMR. This process is laborious and costly. To avoid this, an iterative design process could be undertaken to revise the fishway design until no increases to the BFE were shown.

Cost Estimate

The estimated construction cost for this alternative is $10,032,363. See Appendix A for a detailed cost estimate.

Comparative Positives & Negatives

Replacement of the Hadley Falls high-hazard dam will significantly reduce the risk of loss of life and property damage to downstream property owners that would result from the existing dam's failure. This alternative also preserves the recreational benefits of the existing dam

The proposed vertical slot fish ladder will lead to increased populations of diadromous forage fish. Increased populations of diadromous forage fish in the Merrimack River system will improve fishing throughout the system for key recreational and commercial species such as smallmouth bass, Atlantic striped bass, and bluefish. River herring and shad are also caught and used as bait in commercial and recreational fishing. Being able to source bait locally avoids importation costs and reduces the potential spread of invasive species.

The MRWCP noted that areas with an increase in diadromous fish have an increased presence of wildlife.

A potential drawback to this alternative is the high cost of building a new dam and a concrete fish ladder. Fish ladders can also require significant maintenance to keep operational, adding to the overall cost.

Alternative 5 - Removal and Replacement of Hadley Falls Dam

Design Parameters

This alternative includes the removal and replacement of Hadley Falls Dam with a new Roller Compacted Concrete dam, with low level outlet, without providing any fish passage measures.

Permitting Implications

It is anticipated that the Dam Removal Attachment, also titled the Dam Removal Project Attachment for the Wetlands Permit Application, which discusses site impact evaluations will need to be completed. This will be sent to the New Hampshire Dam Bureau to ensure compliance. The site will need to be evaluated by the New Hampshire Division of Historical Resources. If historical properties are identified, the SHPO will be coordinated with to prevent or reduce any negative impacts. Additionally, a Wetlands Permit Application will need to be completed, specifically Env-WT 526 Standard Dredge and Fill Wetlands Permit for Dam Projects in Non-Tidal Areas Within RSA 482-A Jurisdiction. A Standard Dredge and Fill Wetlands Permit Application and New Hampshire General Permits may also be required. Appendix B – Corps Secondary Impacts Checklist is an attachment to the NHDES Wetlands Bureau permit application that will also need to be completed. A Shorelands Permit from the Water Division/Shoreland Program: Land Resources Management and Coastal Zone Consistency Determination from New Hampshire Coastal Program may be required. Since Hadley Falls is in a non-tidal zone, the New Hampshire Department of Environmental Services, Wetlands Bureau and Dams Bureau and the Coastal Zone Management will be coordinated with to ensure compliance. A standard NPDES permit will likely be required. It is expected that all dam work will occur outside of fish passage season and will be coordinated accordingly.

Fish Passage Design

This is the only concept in this report that does not provide fish passage across Hadley Dam. It is possible that fish passage could occur if non-volitional fish passage (trap and truck) is implemented at Kelley Falls Dam.

Constructability

Constructability concerns include site access, diversion of water, and sediment contamination.

Access to the site for dam removal will need to be coordinated. It is anticipated that site access for dam removal will need to be via the SMC Residences Hadley Falls LP property off of Factory Street.

Diversion of water for reconstruction of the dam will be difficult and costly, as it is a run-of-the-river dam, with substantial base flows. Ideally the new dam would be built downstream of the old, but the current dam sits just upstream of a natural waterfall making this not a feasible option.

If sediments behind Hadley Falls Dam are identified as contaminated, the sediments will be minimally disturbed and vegetated where applicable.

Once the area behind the dam has been dewatered, the dam will be demolished using heavy equipment such as a backhoe with a hydraulic hammer attachment and the concrete will be hauled away. There is a former mill building, which is currently an apartment building, attached to the concrete dam abutment on the left bank and a hydropower intake and power generation structure, which is currently a maintenance building, on the right bank. It is expected that vibration monitoring will be required so as not to damage the structural integrity of the mill

structure or the former powerhouse structure on either side of the dam during its removal. Additionally, noise monitoring or time of day work restrictions may be required due to the large number of residents likely to occupy the new apartment complex at the former factory buildings on the right bank.

FEMA Floodplain Analysis

A FEMA one-dimensional analysis is needed to assess the impacts of this alternative on flood risk in the area. Hadley Falls Dam is in FEMA Zone AE with a detailed floodway. It is a run-of-the-river dam that has no attenuation and does not impact any downstream dams. Upon inspection, increases in flood risk to residents downstream are not anticipated upon dam replacement.

Cost Estimate

The estimated construction cost for this alternative is $6,418,563. See Appendix A for a detailed cost estimate.

Benefits & Drawbacks

Replacement of the Hadley Falls high-hazard dam will significantly reduce the risk of loss of life and property damage to downstream property owners that would result from the existing dam's failure. This alternative also preserves the recreational benefits of the existing dam.

A drawback of this alternative is that fish passage is not restored at Hadley Falls.

GANNETT FLEMING

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Mechanicsburg, PA 17050

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TECHNICAL MEMORANDUM	
Date:	May 29, 2025
To:	New Hampshire Department of Environmental Services
RE:	Hadley Falls Dam Removal Itemized Budget Update

INTRODUCTION

Hadley Falls Dam, located in Goffstown, New Hampshire, is a 20-foot-high, 176-foot-long concrete gravity dam that impounds the waters of the Piscataquog River. The dam was built in 1922 and was primarily used for hydroelectric power, fire protection, recreation, and as a small fishpond. In 2007, Goffstown Hydro Corporation ceased hydroelectric operations at the dam. In January of 2020, a stability analysis was performed and deemed Hadley Falls Dam unstable and in need of repairs. A hydroelectric intake is located at the dam's right abutment, and the outlet works through an old grist mill comprises the left abutment. The grist mill was subsequently converted into residential apartment buildings with the training wall between the main dam spillway and converted grist mill outlet works tunnel supporting the apartment building.

Several diadromous fish species are managed in the Merrimack River Watershed, of which the Piscataquog River is a part. The existing Hadley Falls Dam does not allow for fish passage within the reach. The New Hampshire Department of Environmental Services (NHDES) is evaluating means of addressing the dam safety and fish passage concerns.

In September 2024, Gannett Fleming issued a report titled, "Hadley Falls Dam Alternatives Analysis" outlining five general concepts which would allow fish passage upstream and downstream of Hadley Falls Dam. Alternative 1 included complete removal of Hadley Falls Dam from abutment to abutment. In addition to the complete removal of the dam as proposed in Alternative 1 (Concept 1), Alternative 2 (Concept 2) included additional work to address fish passage through deposited sediments upstream of the dam and to replace two hydrants owned by the Town of Goffstown. This alternative has been selected as the preferred alternative by NHDES. The estimated construction costs within the report assumes no special handling and/or disposal requirements associated with contaminated sediment.

Since the 2024 Alternatives Analysis, NHDES has contracted with Gannett Fleming to characterize the sediment upstream of Hadley Falls Dam. The characterization is anticipated to be completed in 2025, however, initial tasks to plan for this work have been initiated.

An updated itemized budget is needed by NHDES to pursue potential funding opportunities. This memorandum documents the updated itemized budget including refinements to the alternative to incorporate additional information and enhance constructability. The refined alternative will be designated as Concept 2A.

CONCEPT 2A

According to NHDES, Hadley Falls reservoir was drawn down in 1994 by diverting the Piscataquog River through the "Waste Gate" at the left abutment. While the current condition of the waste gate is unknown, it is assumed that the waste gate could be repaired such that it could be used to facilitate diversion for the Hadley Falls Dam removal.

Photographs from the 1994 drawdown were provided by NHDES. These photographs reveal the presence of remnants of a timber structure upstream from the concrete gravity structure. Between the timber structure remnants and the concrete gravity structure, large, varying size rock is present. The photographs do not depict large sediment deposits in this area. Key photographs are provided in Appendix A. Based on review of the photographs in conjunction with review of the sediment probe data completed previously, it was concluded that the sediment deposits identified during the sediment probing effort could be classified as two separate types. The large, deep sediment deposit near the dam is due to the presence of the dam

and should be addressed as part of the dam removal project. The shallow, narrow, linear sediment deposits identified upstream of the Main Street Bridge are likely transient and part of the normal sediment bed load of the Piscataquog River. Because these deposits do not extend across the entire river bottom they do not appear to create a barrier to the passage of fish in this area. Based on the successful drawdown of the reservoir in 1994, it is assumed that additional work to stabilize or establish a channel upstream of the Main Street Bridge is not needed.

In recent years, a new high-end apartment complex was constructed at the right abutment of Hadley Falls Dam, "The Residences at Hadley Falls." The presence of the apartment complex limits site access options. Aerial imagery and Google Earth Street View imagery of Factory Street and the Goffstown Rail Trail provide insight into potential site access options. It appears that site access is possible from a cleared area off of the Goffstown Rail Trail.

With the additional information described above, two drawings were prepared to depict Concept 2A (Appendix B). The drawings show two phases of construction. During the first phase of construction, flow will be diverted through the waste gate at the left abutment and a temporary cofferdam will be constructed. The cofferdam will facilitate the removal of the sediement, the demolition of the remnants of the timber structure, and the majority of Hadley Falls Dam. The cofferdam will also allow for the construction of the proposed concrete wall to seal shut the existing abandoned hydroelectric facilities.

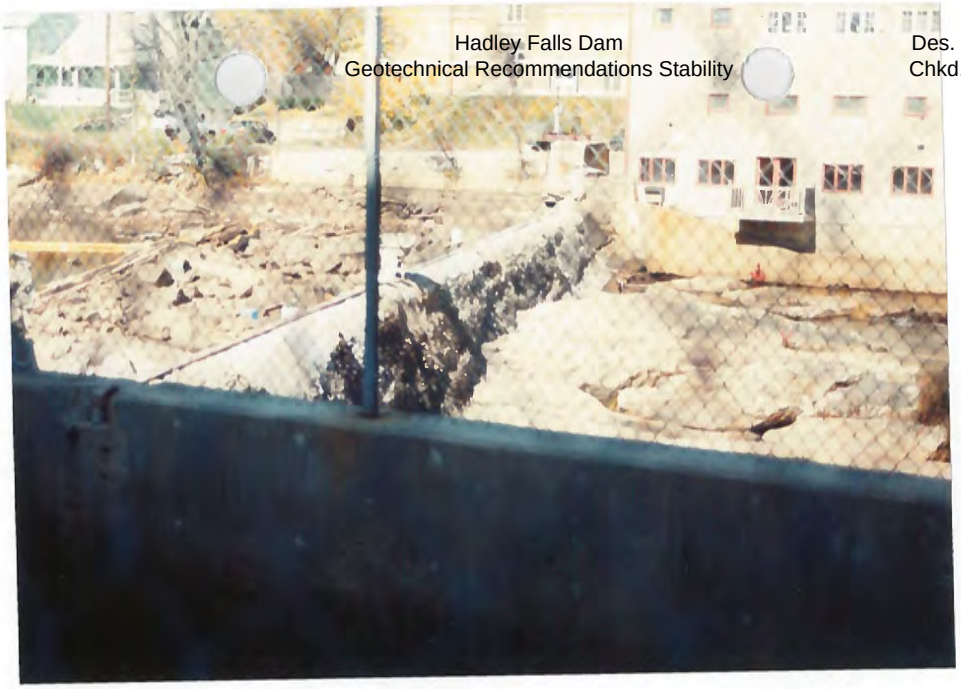
During phase 2 of construction, the cofferdam will be modified to include several conduits and flow will be diverted through the conduits. The cofferdam will be extended to isolate the training wall at the left abutment and the existing concrete wall will be reinforced. Future design efforts should explore the need for this item.

The engineer's opinion of probable construction cost for Concept 2A is $2,750,000. The itemized estimate is provided in Appendix C. It includes cost to remove and haul the sediment located between the concrete gravity dam and Main Street assuming that the sediment is uncontaminated. If the sediment is found to be contaminated but meets non-hazardous material requirements, the construction cost would increase by $100,000 to $400,000 for a total of $2,850,000 to $3,050,000. It is assumed that if the sediment was found to be hazardous that it would be indicative of all of the sediment in the area and that efforts would be made to stabilize the material in-place rather than remove the sediment. It should be noted that the sediment characterization task currently underway will further inform these estimates.

GANNETT FLEMING

APPENDIX A
PHOTOGRAPHS FROM 1994 DRAWDOWN

Hadley Falls
8/94
093.02
(SND)



downstream face from right

upstream & crest

upstream & crest

Hadley Falls
3.02
8/94
SND

crest

FORM E2

NEW HAMPSHIRE
WATER RESOURCES
BOARD
CONCORD, N. H.

PROJECT HADLEY'S FALLS — Hadley Falls Dam — Des. By: RTS Date: 10/19 — FILE 93.02

SUBJECT Geotechnical Recommendations Stability — Chkd. By: EJB Date: 10/19 — ACC

Ordered inspection

COMPUTER SND CHECKER CONT. FROM ACC CONT. ON ACC SUMMARY ON ACC DATE 9/14/97

1

2

3

4

5

GANNETT FLEMING

APPENDIX B
CONCEPT 2A DRAWINGS

NOTES:

1. EXISTING CONTOURS BASED ON NEW HAMPSHIRE GRANIT LiDAR (MAY 2019) AND SUPPLEMENTED WITH BATHYMETRY SURVEY COMPLETED BY GANNETT FLEMING IN SEPTEMBER 2023.
2. HADLEY FALLS DAM TO BE REMOVED IN ITS ENTIRETY. REMOVAL TO INCLUDE THE CONCRETE DAM, THE REMNANTS OF THE UPSTREAM TIMBER CRIB STRUCTURE, AND THE FILL/BOULDERS LOCATED BETWEEN THE CONCRETE DAM AND THE TIMBER CRIB STRUCTURE. EXCAVATION WITHIN THE DAM REMOVAL AREA SHALL EXTEND DOWNWARD UNTIL BEDROCK IS ENCOUNTERED OR AS DIRECTED BY THE OWNER/ENGINEER.
3. BOULDERS LOCATED BETWEEN THE CONCRETE DAM AND TIMBER CRIB STRUCTURE SHALL BE SALVAGED AND REUSED IN THE PERMANENT WORKS AS DIRECTED BY THE OWNER/ENGINEER TO ENHANCE AQUATIC MOVEMENT AND/OR HABITAT WITHIN THE BED AND BANKS OF THE PISCATAQUOG RIVER.
4. EXISTING DRY HYDRANTS (2) ALONG MILL STREET TO BE ABANDONED. ABOVE GROUND PORTIONS OF THE HYDRANT ARE TO BE REMOVED TO A DEPTH OF AT LEAST ONE FOOT BELOW EXISTING GROUND AND THE REMAINING PIPING TO BE BACKFILLED WITH FLOWABLE CONCRETE. DRY HYDRANTS ARE TO BE REPLACED WITH TWO NEW FIRE HYDRANTS CONNECTED TO AN EXISTING WATER MAIN LOCATED ALONG THE NORTH SIDE OF MILL STREET.

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
MGS	MGS	AS SHOWN
DRAWN	CHECKED	APPROVED
MGS	DRAFT	DRAFT

GANNETT FLEMING

NH DEPARTMENT OF ENVIRONMENTAL SERVICES
29 HAZEN DR, CONCORD, NH 03301

HADLEY FALLS
GOFFSTOWN, HILLSBOROUGH COUNTY, NH

CONCEPT 2A
DAM DECOMMISSIONING
SITE PLAN (PHASE 1)

JOB NO.	SHEET NO.
073685.024	OF 1
DATE	DRAWING NO.
MARCH 2023	2A-1

C:\Users\eneast\DC\ACCDocs\GANNETT FLEMING INC\073685_NHDES_2022\Project Files\Design\Eng\GDH\NOAA_Fish_Passage\DWG\Design_Set\New Dam Concept\073685_Hadley_Dam Removal_Concept 1A.dwg
Plot Date: 5/29/2025 2:32 PM, Plotted By: Neast, Eric C.

NOTES:
1. EXISTING CONTOURS BASED ON NEW HAMPSHIRE GRANIT LiDAR (MAY 2019) AND SUPPLEMENTED WITH BATHYMETRY SURVEY COMPLETED BY GANNETT FLEMING IN SEPTEMBER 2023.
2. ACCESS TO THE LEFT ABUTMENT AS NEEDED TO CONSTRUCT THE CONCRETE RETAINING WALL SHALL BE PROVIDED BY EXTENDING THE TEMPORARY ACCESS ROAD AND FURNISHING AN ADEQUATE NUMBER OF CULVERTS TO PASS BASE FLOWS. THE REMAINDER OF THE TEMPORARY ACCESS ROAD SHALL BE CONFIGURED TO ALLOW OVERTOPPING WITHOUT LOSS OF ROADWAY MATERIAL.
3. TEMPORARY ACCESS ROADS, INCLUDING CULVERTS, SHALL BE REMOVED IN THEIR ENTIRETY AT THE COMPLETION OF THE PROJECT.

NO.	DESCRIPTION	DATE	BY

REVISIONS

DESIGNED	CADD	SCALE
MGS	MGS	AS SHOWN
DRAWN	CHECKED	APPROVED
MGS	DRAFT	DRAFT

GANNETT FLEMING

NH DEPARTMENT OF ENVIRONMENTAL SERVICES
29 HAZEN DR, CONCORD, NH 03301

HADLEY FALLS
GOFFSTOWN, HILLSBOROUGH COUNTY, NH

CONCEPT 2A
DAM DECOMMISSIONING
SITE PLAN (PHASE 2)

JOB NO.	SHEET NO.
073685.024	OF 1
DATE	DRAWING NO.
MARCH 2023	2A-2

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APPENDIX C
CONCEPT 2A ITEMIZED COST ESTIMATE

Engineer's Opinion of Probable Construction Cost

2025 Price Level

Hadley Falls Dam Removal - Concept 2A

By: MKB Date: 10-24-2023

Updated: ECN Date: 05-29-2025

Item No.	Item Description	Quantities	Unit	2025 Unit Price	2025 Cost
1	Mobilization, Demobilization (Assume 8%)	Job	LS	-	$160,000
2	Bonds and Insurances (Assume 2%)	Job	LS	-	$40,000
3	Care and Diversion of Water	Job	LS	-	$250,000
4	Dewatering	Job	LS	-	$20,000
	a. Dewater Reservoir (Gate Operation & Management)	Job	LS	-	$20,000
5	Erosion & Sediment Control (Assume 3%)	Job	LS	-	$60,000
	a. Temporary Site Access From Right River Bank	Job	LS	-	$175,000
6	Select Demolition and Removal	Job	LS	-	$450,000
7	Reinforced Concrete Walls at Left/Right Abutments				
	a. Concrete Support Walls/Footers	315	CY	$ 4,000.00	$1,260,000
	b. Anchor Bars / Dowels to Secure New Wall to Existing	Job	LS	-	$200,000
	c. Foundation Preparation	200	SY	$ 30.00	$6,000
8	Seeding & Mulching	1.0	Acre	$ 8,000.00	$8,000
9	Fire Hydrants	2.0	EA	$ 12,500.00	$25,000
10	Soil Stabilization Matting	2420	SY	$ 10.00	$24,200
11	Tree / Shrub Plantings	Job	LS	-	$20,000
				Total:	$2,718,200
				Rounded Total:	**$2,750,000**

Note: Item 6 includes the cost to remove and haul uncontaminated sediment.

Attachment: Draft Plan Sheets for Alternative/Concept 2

NO.	DESCRIPTION	DATE	BY

REVISIONS

DESIGNED	CADD	SCALE
MKB	MKB	AS SHOWN
DRAWN	CHECKED	APPROVED
MKB		

GANNETT FLEMING

NH DEPARTMENT OF ENVIRONMENTAL SERVICES
29 HAZEN DR, CONCORD, NH 03301

HADLEY FALLS
GOFFSTOWN, HILLSBOROUGH COUNTY, NH

DAM REMOVAL GRADING CONCEPT PLAN 2

JOB NO.	SHEET NO.
073685	CP-2
DATE	DRAWING NO.
NOV. 2023	1 OF 1

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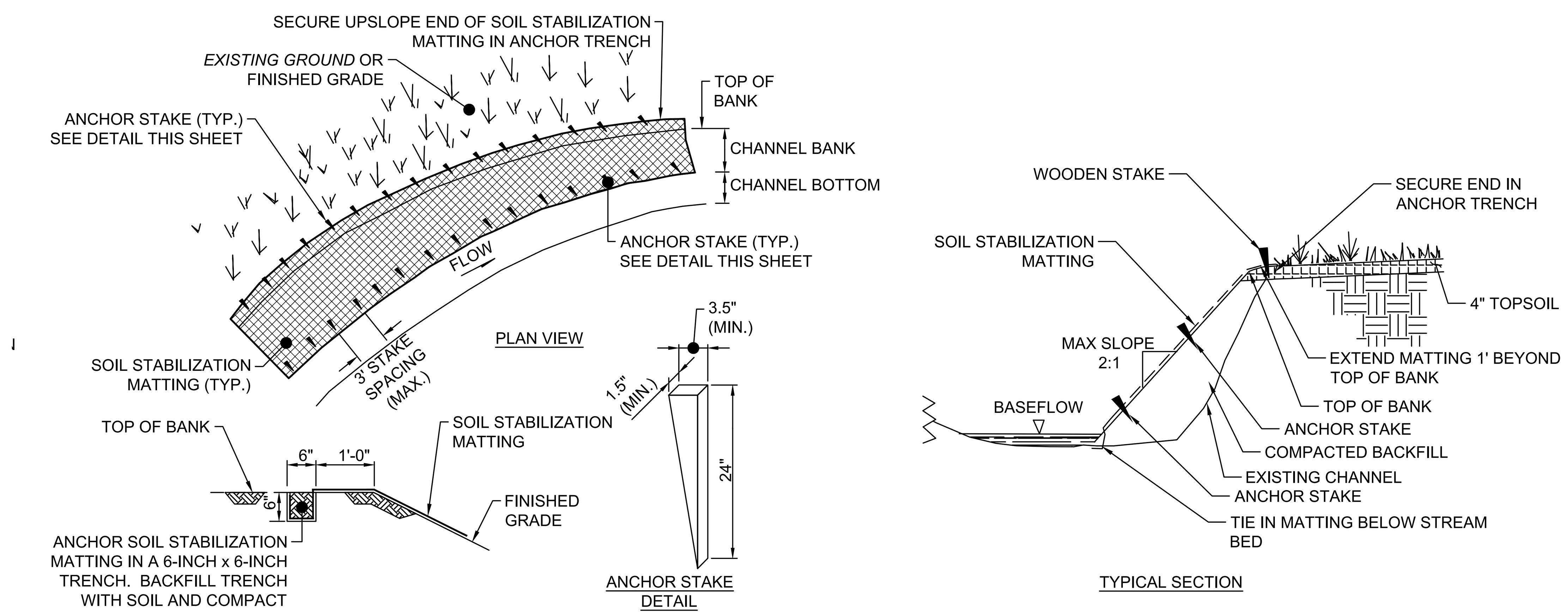


NOTES:

1. FOR USE IN ALL AREAS WITH A 3:1 SLOPE OR GREATER. SEE PLAN VIEW FOR LOCATIONS

ANCHOR STAKE NOTES:

1. ANCHOR STAKES SHALL BE TAPERED TWO FOOT LONG WOODEN STAKES CONSISTING OF STANDARD 2" X 4" WOODEN BOARDS CUT DIAGONALLY.

SOIL STABILIZATION MATTING

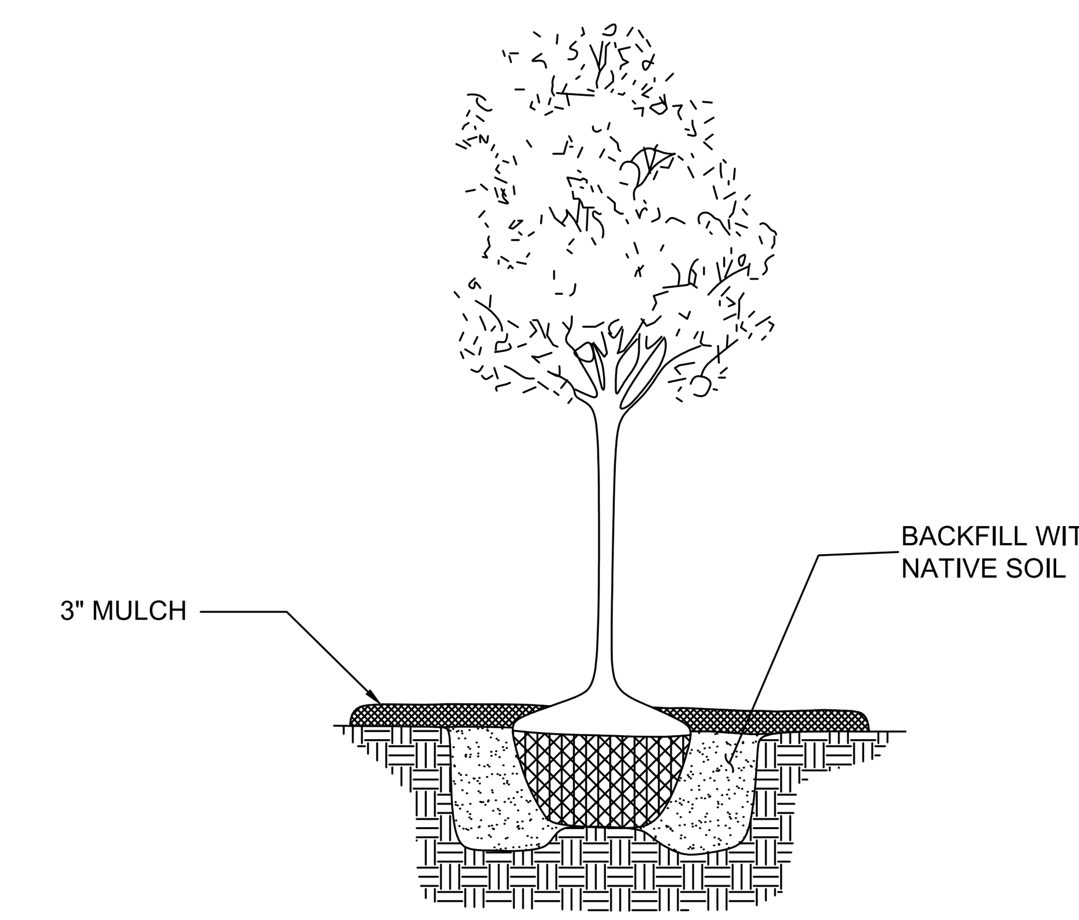
NOT TO SCALE

INSTALLATION INSTRUCTIONS:

1. PLANT TREE ACCORDING TO STANDARD SPECIFICATIONS.
2. PLACE THE SHELTER AROUND THE TREE.
3. DRIVE LONGER STAKES INTO THE GROUND.
4. TIE-OFF ROPE ENDS AROUND TREE.

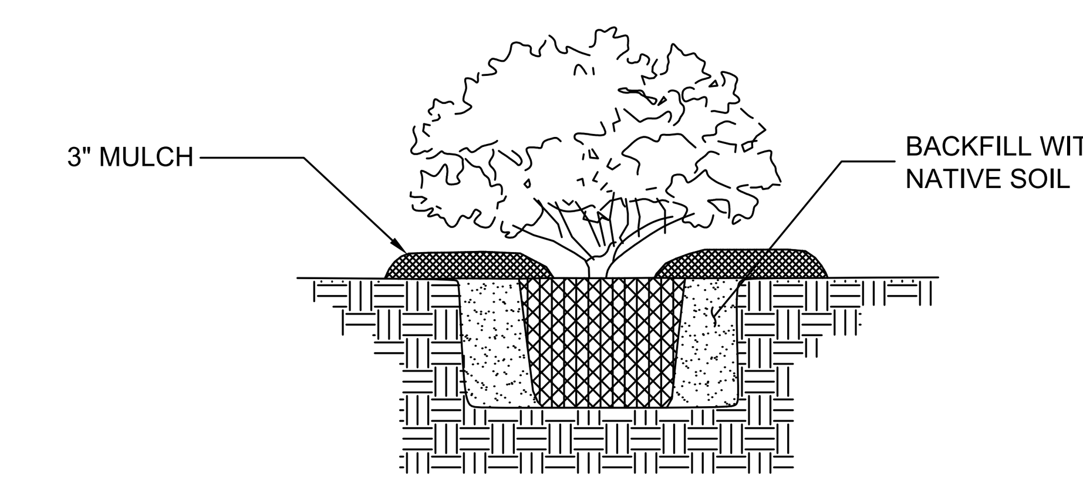
PRODUCT NOTES:

1. TREE SHELTER MUST BE MADE OF 100% BIODEGRADABLE MATERIALS.
2. TREE SHELTER SHOULD BE MADE OF HARDWOOD SLATES WOVEN TOGETHER WITH NATURAL ROPING.
3. TREE SHELTER MUST HAVE LONGER, HARDY STAKES FOR INSERTION INTO GROUND TO PROVIDE SUPPORT.



CONTAINER TREE PLANTING CROSS SECTION

NOT TO SCALE



CONTAINER SHRUB PLANTING CROSS SECTION

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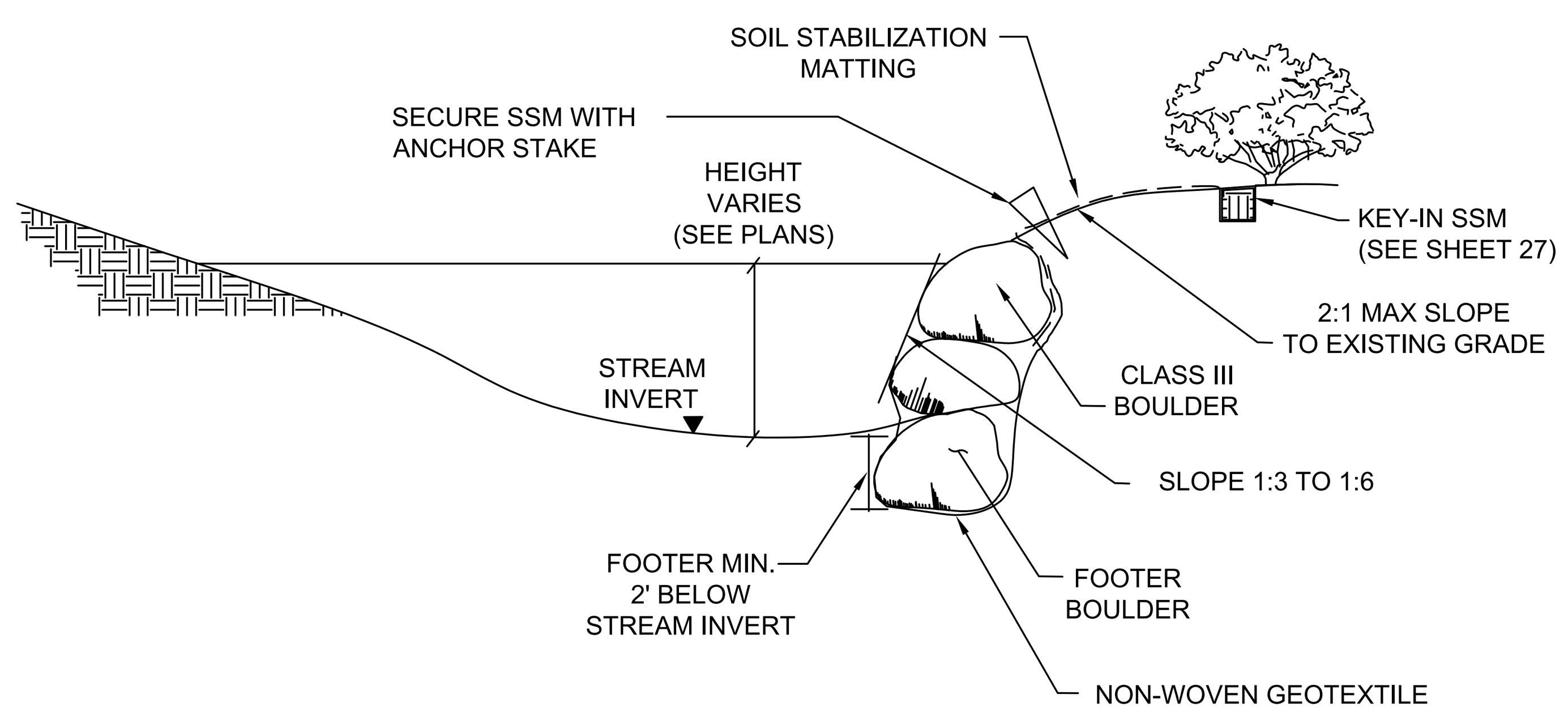
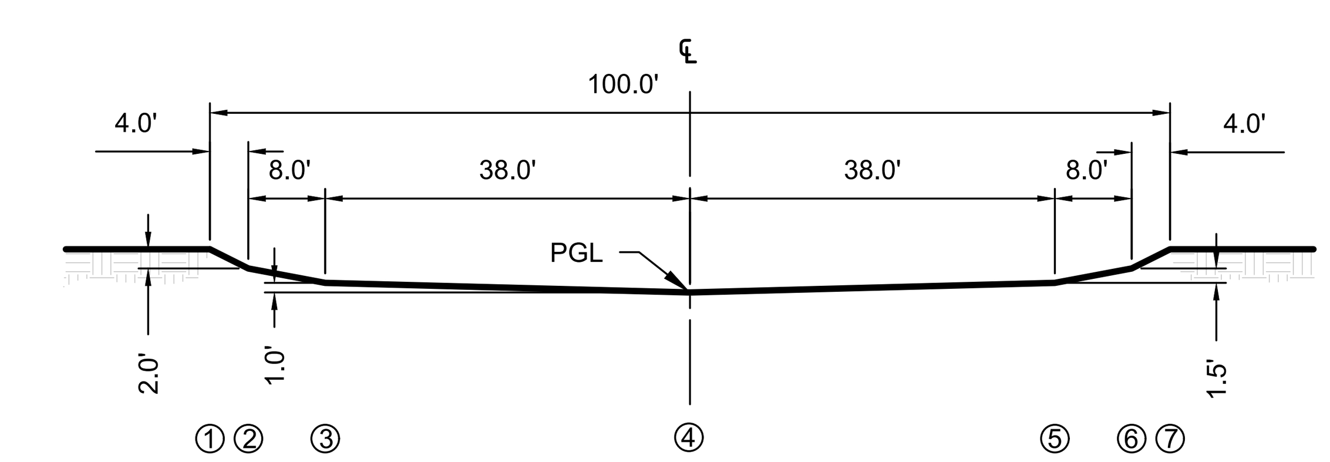


NOTES:

1. ELIMINATE CLASS III BOULDER FOOTER WHERE BOULDER REVETMENT CAN BE FOUNDED ON BEDROCK.
2. REFER TO SPECIFICATION FOR TIE IN INSTRUCTIONS.

IMBRICATED BOULDER WALL

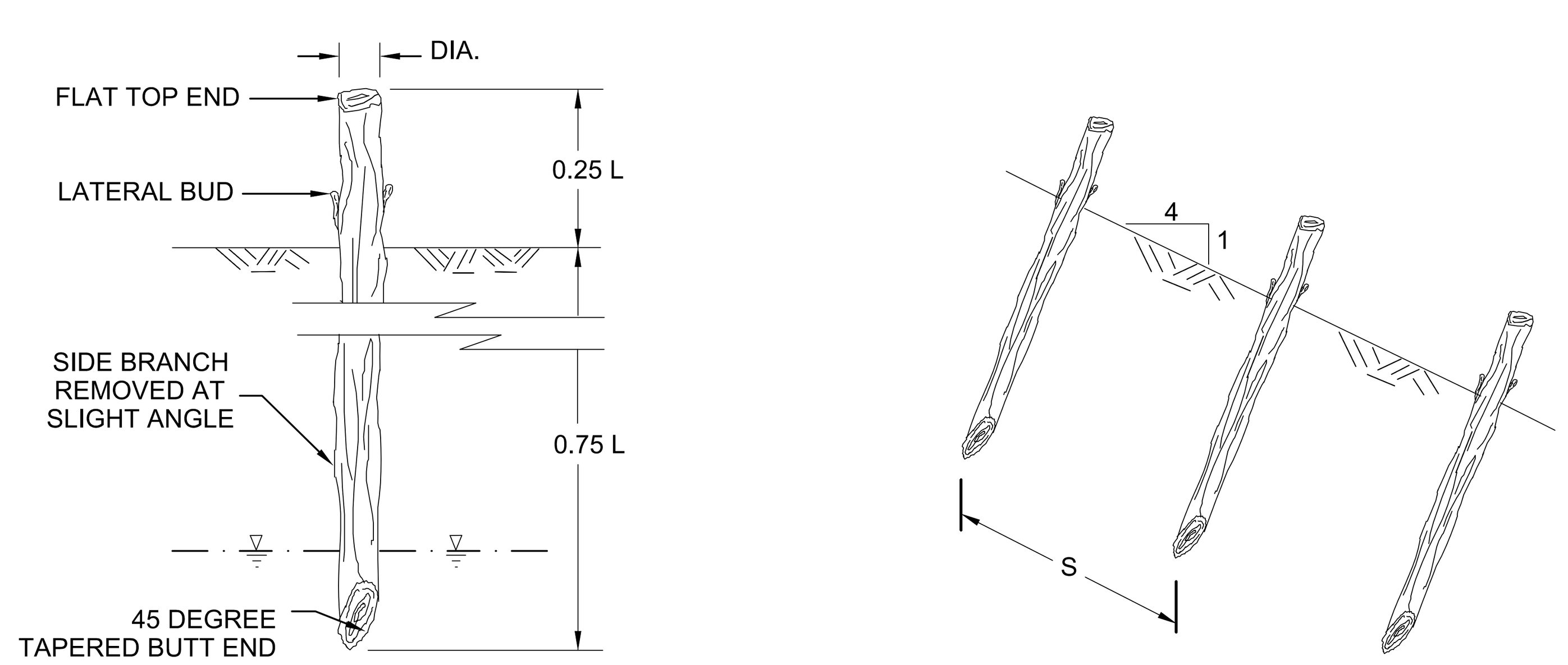
NOT TO SCALE



PROPOSED SECTION STATION RANGE:
1+00 - 21+00
24+50 - 28+00

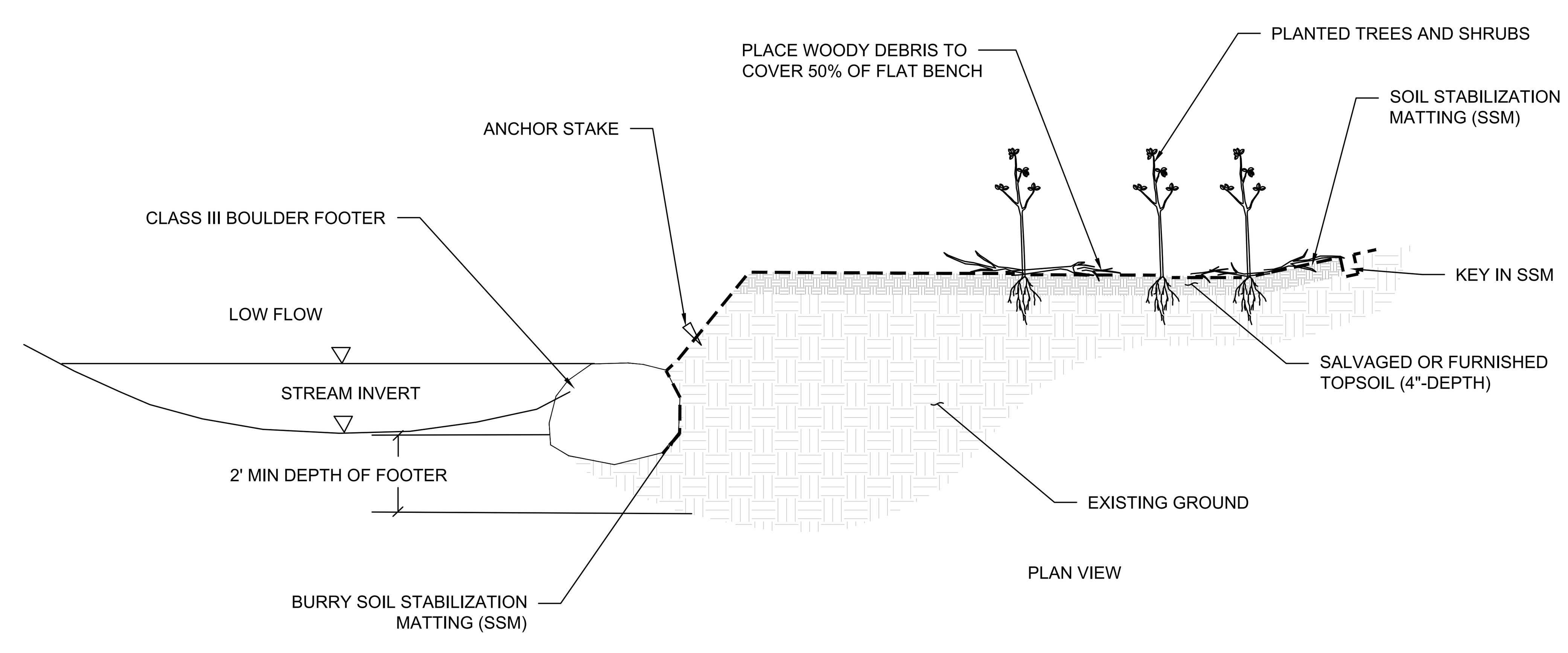
PROPOSED SECTION 1

NOT TO SCALE



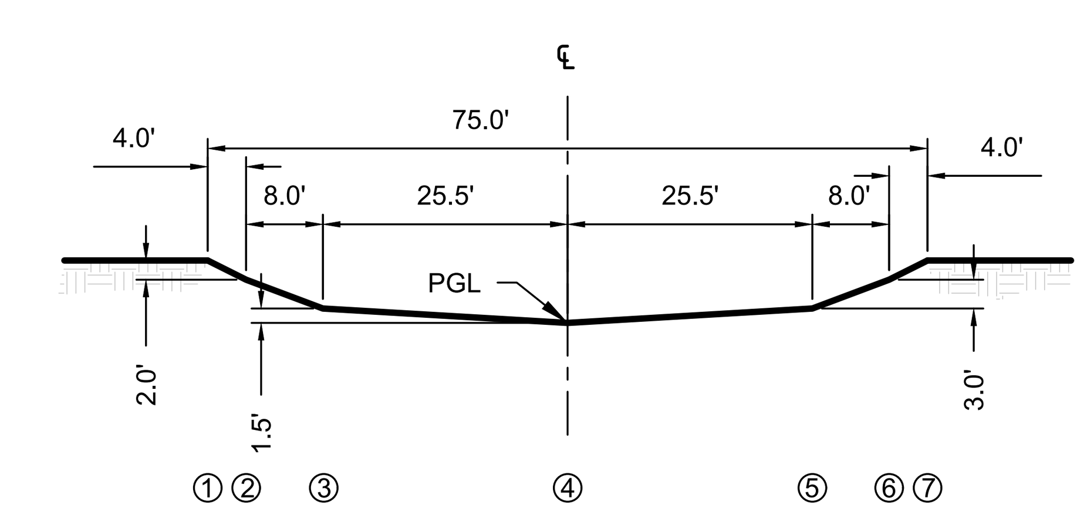
LIVE STAKES

NOT TO SCALE



FLAT BENCH

NOT TO SCALE



PROPOSED SECTION STATION RANGE:
21+50 - 24+00

PROPOSED SECTION 2

NOT TO SCALE

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NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
RWS	MKB	AS SHOWN
DRAWN	CHECKED	APPROVED
MKB	NCC	NCC

GANNETT FLEMING

NH DEPARTMENT OF ENVIRONMENTAL SERVICES
29 HAZEN DR, CONCORD, NH 03301

HADLEY FALLS
GOFFSTOWN, HILLSBOROUGH COUNTY, NH

STREAM RESTORATION DETAILS

Figure 5

JOB NO.	SHEET NO.
073685	CP-3
DATE	DRAWING NO.
OCT. 2023	3 OF 4

Attachment: Draft Plan Sheet for Alternative/Concept 3

100 -0- 100 200

SCALE IN FEET

SCALE: 1"=20' 1H : 2V

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NO.	DESCRIPTION	DATE	BY

REVISIONS

DESIGNED	CADD	SCALE
#######	MKB	AS SHOWN
DRAWN	CHECKED	APPROVED
MKB	##	###

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NH DEPARTMENT OF ENVIRONMENTAL SERVICES
29 HAZEN DR, CONCORD, NH 03301

HADLEY FALLS
GOFFSTOWN, HILLSBOROUGH COUNTY, NH

DAM REMOVAL GRADING CONCEPT PLAN 3

JOB NO.	SHEET NO.
073685	CP-1
DATE	DRAWING NO.
OCT. 2023	1 OF 4

Attachment: Stream Miles Map

Goffstown
Bedford
Manchester
Amherst
Merrimack
Brookline
1
2
3
4
5
6
7
8

Dam Key:
1- Hadley Falls Dam
2- Gregg Falls Dam
3- Kelley Falls Dam
4- Black Brook Dam
5- Kimball Pond Dam
6- Pine Island Pond Dam
7- Stowell Pond Dam
8- Potanipo Pond Dam

River Miles Gained:
Hadley and Kelley Falls Dam 257 Miles
Black Brook and Kimball Pond Dam 30 Miles
Pine Island Pond Dam 37 Miles
Potanipo Pond Dam 47 Miles
Stowell Pond Dam 40 Miles

0 3 6 9 12 Miles

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Excellence Delivered As Promised

Figure 2.
Map of Stream Miles Made Accessible.

Located in
Hillsborough County, New Hampshire

Legend

Major Cities
Major Cities
Towns
Dam

Black Brook and Kimball Pond Dam
Stowell Pond Dam
Potanipo Pond Dam

Pine Island Pond Dam
Kelley Falls Dam
Hadley Falls Dam

N
W E
S

AQUATIC RESOURCES MITIGATION (ARM) FUND
2025 GRANT PROJECT BUDGET TEMPLATE

Budget Category	ARM Funds Requested	Total Cost	Notes/Matching Funds/Sources
Engineering Design and Permitting	$578,400	$893,400	2023 NOAA grant cost plus ongoing ARPA work
Section 106 Consultation and Environmental Review	$80,000	$80,000	2023 NOAA Grant Cost
Wetland Delineation and Functional Assessment / Stream Survey	$50,000	$50,000	2023 NOAA Grant Cost
Materials	$0	$0	Unknown at this time
Construction Contract Services	$2,750,000	$2,750,000	Assumed sediment is not contaminated
Construction Oversight and Monitoring by Restoration Professional	$50,000	$50,000	2023 NOAA Grant Cost
Record Drawings and As-built Reporting	$277,064	$277,064	Reduced 2023 costs due to removal of public improvem
Project/Grant Management	$10,000	$10,000	2023 NOAA Grant Cost
Performance Monitoring (five-year minimum)	$5,000	$5,000	2023 NOAA Grant Cost
Financial Assurance for Maintenance	$0	$0	Unknown at this time
Adaptive Management (*recommend at least 20% of total project cost*)	$550,000	$550,000	Used 20% of construction cost estimate
Land or Easement Purchase	$0	$0	Unknown at this time
Appraisal	$0	$0	Unknown at this time
Property Survey	$0	$0	Surveys have already been completed
Title Research, Opinion, Insurance	$0	$0	Research has already been completed
Legal Services and Closing	$0	$0	Unknown at this time
Real Estate Transfer Tax	$0	$0	Unknown at this time
Baseline Documentation Report	$0	$0	Unknown at this time
Environmental Assessment/Phase One - Hazardous Waste	$80,000	$80,000	2023 NOAA Grant Cost
Project Management /Land Agent Cost	$0	$0	Unknown at this time
Stewardship and Long-term Monitoring	$0	$0	Unknown at this time
Other (*add in items and describe*)	$80,000	$80,000	FEMA CLOMR - 2023 NOAA Grant Cost
TOTAL PROJECT EXPENSES:	$4,510,464	$4,825,464	

arm@des.nh.gov or (603) 271-2147
29 Hazen Drive, PO Box 95, Concord, NH 03302-0095
des.nh.gov