TALBOT MILLS DAM REMOVAL / CONCORD RIVER ECOLOGICAL RESTORATION PROJECT

HISTORIC DISTRICTS COMMISSION SUPPLEMENTAL INFORMATION TO APPLICATION

Town of Billerica, Middlesex County, MA

MAY 2025

Project Proponent:

CRT DEVELOPMENT REALTY, LLC

Prepared for:

TOWN OF BILLERICA
HISTORIC DISTRICTS COMMISSION

365 Boston Road, Room 105, Billerica, MA 01821

Prepared by:

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May 28, 2025

David Gagliardi, Chair
Historic Districts Commission
365 Boston Road, Room 105
Billerica, MA 01821
planning@town.billerica.ma.us

Re: Talbot Mills Dam Removal / Concord River Restoration Project
Application for Historic Districts Commission Review/Certificate, Supplemental Information

Dear Mr. Gagliardi:

Gomez and Sullivan Engineers, DPC hereby submits supplemental information for the previously submitted Application for Historic Districts Commission Review/Certificate for the Talbot Mills Dam Removal / Concord River Restoration Project in Billerica, Massachusetts on behalf of the dam owner, CRT Development Realty, LLC. The information provided herein further demonstrates that the removal of the Talbot Mills dam is consistent with the Commonwealth's biodiversity and climate resiliency goals, that the application of MGL Chapter 40C is inappropriate in this context, and that the Project will retain as many historical features of the site as feasible.

The Talbot Mills Dam is a former mill dam located on the Concord River just upstream of the Faulkner Street bridge. The dam no longer serves a current purpose and creates a barrier in the river, which blocks migratory fish from accessing important spawning habitat, and has resulted in other environmental and public safety impacts. The dam is considered to be in "fair" condition and it's hazard potential classification is "significant (Class II)" as defined by the Office of Dam Safety, which means that *"failure may cause loss of life and damage to home(s), industrial or commercial facilities, secondary highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities"* (302 CMR 10.06). The Division of Marine Fisheries is requiring the dam owner to provide fish passage for diadromous species. Dam removal is the only feasible and financially viable option for this dam to meet the Commonwealth's climate resiliency goals, dam safety requirements and fish passage requirements. Other options, such as dam repair and fish ladder construction have been explored, but would not be funded by grants, would cost over a million dollars and more than the proposed dam removal project, and would not remove the liability of the dam. Removal of this dam will:

- Reduce upstream flood hazards and increase climate resiliency
- Eliminate the potential for unexpected dam failure resulting in downstream property damage
- Restore passage and connectivity for migratory fish and resident aquatic species
- Support river and ocean ecosystems as migratory species are the base of the food chain in both ecosystems (e.g., striped bass, trout, cod, bluefish, tuna, seals, other larger marine mammals and fish, heron, eagles, and many more that forage upon diadromous fish in the Concord and Merrimack Rivers and throughout the Gulf of Maine) which in turn supports commercial and sport fisheries
- Restore natural riverine processes and ecological functions (e.g., sediment movement to the Merrimack River and estuary)
- Enhance aquatic habitat

- Improve water quality (increased flow velocity and dissolved oxygen, reduced water temperature and stagnation)
- Significantly reduce invasive water chestnut infestation in the impoundment that impedes recreational use of the river
- Improve public access to the river and new recreational activities (e.g., through-paddling, whitewater boating, fishing in fast-moving flow conditions, fishing for more species of fish, viewing of natural falls)

The purpose of MGL Chapter 40C, Historic Districts, is to

> *"promote the educational, cultural, economic and general welfare of the public through the preservation and protection of the distinctive characteristics of buildings and places significant in the history of the commonwealth and its cities and towns or their architecture, and through the maintenance and improvement of settings for such buildings and places and the encouragement of design compatible therewith."*

No where in Chapter 40C is the word "dam" used. The statute centers around the exteriors of buildings and "structures." The word structure is given the definition of *"a combination of materials other than a building, including a sign, fence, wall, terrace, walk or driveway."* In contrast, the word "dam" is defined in MGL Chapter 253 section 44 as *"any man-made artificial barrier, including appurtenant works, which impounds or diverts water."* Nothing like this definition exists in Chapter 40C. The word "dam" is mentioned in 145 sections in the Massachusetts General Laws throughout at least six chapters but not one of those mentions are in Chapter 40C. Dams are highly regulated by state agencies with expertise in dealing with the complex issues that arise with these man-made barriers. As admitted by a Billerica Historic District Commission (BHDC) member during the May meeting, the BHDC does not have experience in evaluating the issues that come along with the removal of a dam, and it is understandable that a Historic Districts Commission would not have this experience as dams were not meant to be regulated by Historic District Commissions. Therefore, the BHDC should recognize that a dam does not fit within its statutory authority.

Although the project team and legal counsel do not believe that the BHDC has authority to regulate this project under Chapter 40C, we do believe that the project would qualify for a hardship exemption under the BHDC's bylaws. The dam provides no value to the owner or the town. The cost to improve fish passage at the site through means other than removal, such as a fish ladder, would be prohibitively expensive and would involve decades of commitment by the owner to maintain, monitor and improve the fish ladder as necessary. The fish ladder alone would not address the necessary improvements to achieve the Commonwealth's standards for dam safety, which would require substantial additional upfront costs, as well as ongoing maintenance costs.

Despite the inappropriate assertion of authority over this project, the project does still intend to preserve and document as much as the historical elements of the dam as possible, in alignment with the BHDC's Review Standards. The removal of the dam will maintain the granite masonry abutment at the southwest end of the spillway and a portion of the granite block spillway to honor the history of the site and protect the Faulkner Street bridge. Additionally, the project will include archaeological recordation and removal of a former timber/rock fill dam thought to be submerged just upstream, as well as any other artifacts uncovered within the project area (if found). The federal Section 106 process being led by the National Oceanic and Atmospheric Administration (NOAA), as Lead Federal Agency, will result in a Memorandum of Agreement with the Massachusetts Historical Commission (MHC) and the dam owner that details these

historic preservation and other mitigation efforts such as interpretive signage that will be implemented as part of the project.

The dam removal and its potential impacts and benefits have been studied extensively. Electronic copies of previous studies and other permit application materials for the proposed project can be downloaded from: https://tinyurl.com/TalbotDamRemovalPublic. Additional resources can be found on the project websites (https://merrimack.org/talbotmills and https://oars3rivers.org/talbot-mills-dam-removal).

This project supports the goals of the Commonwealth for climate resiliency and for fish passage. Dams are highly regulated infrastructure that should not fall under the jurisdiction of the BHDC, however this project would qualify for a hardship exemption under the BHDC's bylaws and review standards.

Please do not hesitate to contact me directly with any questions or comments at jgriffiths@gomezandsullivan.com or (716) 402-6777.

Sincerely,

Jill Griffiths, PE
Water Resources Engineer

Encl.

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1. Consistency with Bylaws and Review Standards

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1.1 Purpose of Historic Districts

The purpose of MGL Part I, Title VII, Chapter 40C: Historic Districts (Massachusetts Bylaw) is defined in Section 2 to

> *"promote the educational, cultural, economic and general welfare of the public through the preservation and protection of the distinctive characteristics of buildings and places significant in the history of the commonwealth and its cities and towns or their architecture, and through the maintenance and improvement of settings for such buildings and places and the encouragement of design compatible therewith."*

The Billerica Historic District Commission's (BHDC) purpose is defined in Section 1 of the By-Law to establish Billerica Historic Districts Commission (BHDC Bylaw) as exactly the above, and in the Billerica Historic District Commissions Review Standards (Review Standards), the purpose is described as similar to above.

None of the purposes stated above indicate that the purpose of the bylaw is to preserve and protect infrastructure that impacts public safety and environmental habitat, such as a dam, whose maintenance, function and design are regulated by multiple state entities. The spirit of the law is tailored toward the exterior of buildings where adherence to the bylaw would not substantially change the function or safety of the building. Neither of the Bylaws nor the Review Standards mention the words "dam" or "infrastructure."

While it could be argued that the bylaws do discuss the preservation of "structures", this is defined in both the Massachusetts Bylaw and the BHDC Bylaw as a *"combination of materials other than a building, including but not limited to a sign, fence, wall, terrace, walk or driveway".* These are all structures on land, and none are infrastructure regulated by other public entities or whose structural integrity, design or function impact public safety. Additionally, dam statutes in MGL define dam without the use of the word "structure." In MGL Chapter 253 section 44, dam is defined as *"any man-made artificial barrier, including appurtenant works, which impounds or diverts water...."*

Dams are not meant to be regulated based on aesthetics like the exteriors of buildings. Dams are highly regulated in the Commonwealth having many statutes and agencies dedicated to rating their safety and condition and regulating their maintenance and removal. There are 145 sections in the MGL that mention the word dam, and not one of those is located within Chapter 40C. This is because the legislature did not intend for the Historic District Commissions to regulate dams. The statute that gives the Historic District Commission its authority does not support its regulation of dams which are infrastructure affecting public safety and already regulated by multiple state agencies.

Even if we try, as we have done, to fit the dam into the statute so that the BHDC could pass judgment on its removal, the Commission would still need to apply its own bylaws which bar the Commission from applying the law such that it prevents the meeting of standards required by public officials and public safety.

The BHDC Bylaw specifically states in Section 9 that *"Nothing in this By-Law shall be construed to prevent the ordinary maintenance, repair or replacement of any exterior architectural feature within an historic district which does not involve a change in design, material, color or the outward appearance thereof, subject to the application requirements of Section 12(c) of this By-Law, … nor to prevent the meeting of requirements certified by a duly authorized public officer to be necessary for public safety because of an*

unsafe or dangerous condition, nor construed to prevent any construction or alteration under a permit duly issued prior to the effective date of this By-Law."

The Talbot Mills Dam is a significant hazard dam considered to be in fair condition. It is regulated by the Massachusetts Department of Conservation and Recreation Office of Dam Safety (ODS) under 302 CMR 10 for compliance with dam safety standards. The dam does not currently meet all ODS standards and is not in full compliance. Further detail on the dam's condition is provided in **Section 1.2 Application of the Review Standards**, below. Removal of the dam is the most feasible, comprehensive and the only financially viable way to meet all ODS safety standards at this site. The federal and state grant funds and technical support provided for the project are for removal of the dam only, not for dam repair or rehabilitation. Even if financial viability were disregarded, the changes necessary to adhere to all ODS standards would include full or substantial removal of the existing dam and rebuilding a new and differently shaped dam, also requiring demolition within the historic district. A more detailed explanation of feasibility and financial viability are described in **Section 1.3 Demonstration of Hardship**.

Additionally, because migratory fish can access the river up to the dam but not beyond, it is regulated by the Massachusetts Division of Marine Fisheries (DMF) for fish passage. The dam owner is required to provide adequate fish passage during all upstream and downstream migration periods for migratory fish or be subject to pay DMF for alterations made to the site to allow for fish passage, per Massachusetts General Laws Part I, Title XIX, Chapter 130, Section 19. Removal of the dam is the most feasible, comprehensive and the only financially viable way to meet DMF fish passage requirements at this site. The Federal and State grant funds and technical support provided for the project are for removal of the dam only, not for other fish passage alternatives. A more detailed explanation of feasibility and financial viability are described in **Section 1.3 Demonstration of Hardship**, below.

Given this information, it is challenging to make the case that the bylaws and Review Standards do and should pertain to this project and the removal of the Talbot Mills Dam, as the purpose and spirit of the law does not align with the regulation of functional infrastructure such as a dam.

1.2 Application of the Review Standards

While the Bylaws fundamentally do not apply to this project as described above, further information is still provided regarding the application of the Review Standards to this project. Within the purpose of the Review Standards, in Section 1 it is stated that *"The goal is to minimize reliance on the individual tastes and preferences of those who happen to be awarding permits and instead set up clear rules that everyone will understand."* As such, the intent of this supplementary material is to demonstrate how the Talbot Mills Dam removal project does or does not align with the Review Standards, in order to minimize the influence of personal opinions in the review of the project.

It is challenging to find sections of the Review Standards that pertain to this project, as almost all the standards pertain to buildings and therefore do not apply to a dam. A building is defined in the BHDC Bylaws as *"A combination of materials forming a shelter for persons, animals, or property,"* And as we stated above, the definition of structure does not fit a dam either. However, there are a few standards that may be considered relevant within section 2.10 Demolition:

Demolition

There are seven standards within section 2.10 Demolition of the Review Standards:

- *"2.101 There shall be a presumption toward retaining all existing historic buildings.*

- *2.102 Demolition shall be allowed only when the new construction relates better to the Historic District than does the existing building, and when all the other requirements below are satisfied."*

  These two review standards do not apply as the dam is not a building.

- *"2.1021 A prerequisite for demolition shall be an application for Certificate of Hardship, which shall contain a financial report detailing the costs of rehabilitation and evidencing that the existing building is incapable of producing a reasonable economic return on the investment. The maximum rate of return which is theoretically possible on the land with new buildings shall not constitute such evidence if the existing buildings can generate a reasonable return."*

  As confirmed by the Billerica Planning and Community Development Department on May 6, 2025, there is no separate application for a Certificate of Hardship, and the previous application form submitted for this project is adequate to meet the prerequisite of *"an application for Certificate of Hardship"*. Nonetheless, the supplemental information demonstrating hardship is provided herein.

  The dam is not a building, and therefore *"evidencing that the existing building is incapable of producing a reasonable economic return on investment"* does not apply. Nonetheless, the property is incapable of producing any return on investment, and instead, continuing to own the dam incurs ongoing costs and liability to the dam owner. In 1997 the current dam owner sold the mill buildings and properties associated with the dam. It was intended that the sale included the dam as well. However, the company that purchased the property removed the dam from the sale. This left the dam owner owning only a dam, and no property. Since then, the dam owner has incurred $66,905 in direct costs related to dam ownership, as detailed in the table below. This does not account for the significant amount of personal time spent finding and hiring consultants and engineers and seeking ways to sell or remove the dam, or additional costs that would be incurred to ensure the dam meets all current regulatory requirements.

Table 1. Costs incurred due to dam ownership since 1997.

Description	Cost
26 years of Massachusetts state filings	$13,520
Phase I Dam Safety inspections	$24,000
Consulting services	$20,500
Legal fees	$8,885
Total	**$66,905**

While the dam once served a purpose that provided economic viability (powering adjacent mills), this is no longer feasible. The mills stopped using river water diverted off the Summit Pond as a power source in the mid to late 1800's when they switched to steam power. The canal that the Summit Pond once fed only exists in some places as a symbolic representation, but not as a functioning canal. There is no land associated with the dam where a new building could be built (as evidenced by the deed provided in **Section 3. Property Deed**). The dam sits in the river, and no other development on the footprint of the dam is feasible to build under current-day environmental regulations. Therefore, the property is not capable of producing any economic

return. More details regarding the economic costs of continued dam ownership and alterations necessary to meet current regulatory requirements are provided in **Section 1.3 Demonstration of Hardship**.

In addition to not being a source of *"reasonable economic return"* and costing the owner thousands of dollars a year, the dam remains a persistent liability. So long as a dam exists, the owner *"shall be responsible for liability for damage to property of others or injury to persons, including but not limited to loss of life, resulting from the operation, failure of or misoperation of a dam."* (MGL Ch. 253, S. 48B). Forcing the owner to keep the dam creates perpetual costs and an eternal liability.

- *"2.1022 If an applicant's request for permission to demolish a structure or part of a structure is based upon structural instability or advanced deterioration, a technical report prepared by an architect or professional engineer registered in Massachusetts and approved by the Commission shall be submitted, detailing the nature and extent of the specific problems, and providing reasonably accurate cost estimates for their correction."*

  The motivation to remove the dam is not entirely based upon structural instability or advanced deterioration. However, the condition of the dam and regulatory requirements to adhere to strict dam safety standards is relevant. The Talbot Mills Dam is classified as an Intermediate sized, Significant (Class II) Hazard potential structure by the ODS which means that *"failure [of the dam] may cause loss of life and damage to home(s), industrial or commercial facilities, secondary highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities"* (302 CMR 10.06). The hazard classification is determined separate from the condition of the dam, and based on the location of the dam relative to houses and other infrastructure.

  The most recent Phase I dam safety inspection which determines the dams condition, was conducted on April 30, 2021, by Geotechnical Consultants, Inc. (GCI) and is provided in **Section 2. Dam Safety Inspection.** According to the 2021 inspection, the Talbot Mills Dam was found to be in "fair" condition due to significant operational and maintenance deficiencies. The following deficiencies were noted:

  - Lack of an operation and maintenance plan
  - Lack of routine oversight of the dam, particularly during storm events
  - Lack of working controls
  - Lack of a functional low-level outlet
  - Leaks and inability to control water at sluiceway gate and weir
  - Trees located just downstream of the primary spillway and on the upstream face of the left embankment near the former intake gates to the Talbot Mills complex

  The following remedial measures were recommended in the inspection report:

  - Prepare an Emergency Action Plan (EAP).
  - Prepare and implement a comprehensive maintenance and routine inspection plan.
  - Remove trees on the upstream face of the roadway embankment near the non-functional intake gates to the Talbot Mills Complex.
  - Remove tree trunks and branches just upstream of the primary spillway.

- Repair/replace the sluiceway and stilling basin gates so that the gates are operational and can provide emergency bypass control.
- Inspect the interior of the Talbot Mills complex, particularly the downstream end of the former intake structures. The infilling of the intake tunnels on the left side of the dam rendered these intakes inoperable. Given the configuration of the dam, proximity of the mill complexes, and changing ownership of the downstream properties, the reconstruction of a low-level outlet in this area is impractical.
- Repair/replace the left spillway abutment to provide an operational low-level outlet and emergency bypass control.

Additionally, detailed hydraulic analyses conducted for this project found that the dam does not meet the dam safety requirement of being able to pass the spillway design flood—in this case the 100-year flood—without overtopping[1]. If the dam were to remain in place, an engineering assessment would need to be conducted to confirm this finding and investigate options to increase spillway capacity in order to meet dam safety standards. The alteration to the dam that would be necessary to meet these standards is explained in **Section 1.3 Demonstration of Hardship.**

- *"2.1023 Applications for permission to demolish existing structures shall be accompanied by complete plans for the new development proposed on the site, together with a timetable and a budget for the demolition and the reconstruction, as well as satisfactory evidence that adequate financing is available."*

  Complete plans for the restoration of the dam site and river were provided with the initial application and are provided again in **Section 4. Design Plans,** for reference. The plans do not include new development but instead restore the river to the closest possible historically accurate condition that existed prior to the dam construction, while protecting and maintaining existing infrastructure. Demolition and restoration are anticipated to begin once all permits are secured and last approximately three months.

  The project has received funding from the Nyanza Chemical Waste Dump Superfund Site Natural Resource Damages (NRD) settlement for feasibility studies, from the Massachusetts Division of Ecological Restoration (DER) for conceptual design, from the American Rescue Plan Act (ARPA) through DER for design, permitting, and construction phase services and from the US Fish and Wildlife Service (USFWS) for construction. The most recent Opinion of Probable Construction Cost is $1.2 million. The project team currently has $1.2 million in grant funding secured for the construction phase of dam removal. <u>This funding can only be used for dam removal. Dam repair or construction of a fish ladder are not eligible expenses for the available funding.</u>

- *"2.1024 A standard condition of approval for demolition shall be the documentation of the building's elevations, including details of specific notable architectural features (doors, cornices, etc.), through measured drawings and photographs. Such data shall be provided according to the procedures established by the Historic American Building Survey."*

[1] This finding contradicts that in the most recent dam safety inspection report (GCI, 2021) but is based on an updated analysis and more detailed hydraulic modeling.

The Public Archeology Lab (PAL) has already completed multiple studies of the area. In 2014–2016, PAL completed the reconnaissance survey for the project under a State Archaeologist's Permit issued by the Massachusetts Historic Commission. The reconnaissance survey identified previously recorded historic properties, archaeological sites, and archaeologically sensitive areas within a study area that was developed based on concept plans for the proposed project at the time. The 2016 survey identified 14 previously recorded historic and archaeological resources within the project area. More recently, PAL completed a Cultural Resources Assessment Update dated December 12, 2023 based on the 75% design plans.[2]

Some measures to minimize impacts to the Talbot Mills Dam have already been incorporated into the project design including retaining the river-left (southwest) granite masonry abutment (which contains the waste gate openings), as well as an adjacent section of the granite masonry spillway to support the remaining abutment. Additional potential mitigative measures could include the preparation of written and photographic documentation to form a permanent archival record of the affected properties and installation of interpretive signage, and archaeological monitoring and recordation during construction. These aspects of the project will be determined through the Federal Section 106 process and detailed in a Memorandum of Agreement between NOAA, MHC and the dam owner.

Certificates of Hardship

As stated in the Demolition section above, an application for a Certificate of Hardship is a prerequisite to demolition. According to Section 6.0 of the Review Standards:

- *"6.1 Where the Historic Districts Commission finds that extraordinary and unnecessary hardships may result from strict compliance with these standards, or where there are exceptional circumstances, it may vary these standards so that substantial justice may be done."*

  Compliance with disallowing demolition in this case would offend substantial justice. This dam is a financial drain and a source of liability for the owner. Should the dam fail, the owner would be strictly liable for damages. Because there is no source of reasonable economic return for the dam yet its ownership incurs ongoing expenses, a Certificate of Hardship is applicable and therefore, this supplemental information is provided to demonstrate hardship.

- *"In order to issue a Certificate of Hardship, the Commission shall make specific factual findings demonstrating that:*
  - *6.10 Owing to conditions specific to a particular building or structure, failure to approve an application will result in substantial hardship, whether financial or otherwise, to the applicant, and"*

  Failure to approve an application for a certificate of hardship would result in significant hardship for the dam property and the dam owner as well as upstream and downstream abutters, as the dam would continue to exist along with all the regulatory and financial requirements that accompany it. The responsibility of owning this dam amounts to a considerable financial loss every year for the dam owner, as discussed previously. As the dam deteriorates the owner's risk for liability for dam failure increases as well. The financial hardship of the dam is further demonstrated in **Section 1.3 Demonstration of Hardship**.

[2] All prior studies are available at: https://tinyurl.com/TalbotDamRemovalPublic

- *6.11 That granting the application will not involve substantial detriment to the public welfare or substantial derogation from the intent and purpose of the Historic Districts By-Law."*

As described in the initial application materials submitted, removal of the dam would provide significant benefits to the public welfare in the form of improved public safety, decreased flooding, improved climate resiliency, improved recreation, improved ecosystem health and the myriad of ecosystem services that accompany a healthy riverine and oceanic ecosystem. As such, granting the application will not involve substantial detriment to public welfare.

- *"6.2 In granting waivers, the Historic Districts Commission may require such conditions as will, in its judgment, secure substantially the objectives of the standards which have been waived. A Certificate of Hardship shall then be issued."*

  The federal Section 106 process being led by NOAA, as Lead Federal Agency, will result in a Memorandum of Agreement with the MHC and dam owner that details historic preservation and other mitigation efforts that will be implemented as part of the proposed project. The project team is also willing to work with the Historic District Commission regarding conditions to achieve the goals of historic preservation at the project location through this review process.

1.3 Demonstration of Hardship

According to the Appendix "Determination of Hardship" in the Review Standards:

- *"Application for a Certificate of Hardship shall be made on a form prepared by the Historic Districts Commission. The Commission shall schedule a public hearing concerning the application and any person may testify at the hearing concerning hardship."*

  As confirmed by the Billerica Planning and Community Development Department on May 6, 2025, there is no separate application or form for a Certificate of Hardship, and the previous application form submitted for this project is adequate.

- *The Commission may solicit expert testimony or require that the applicant for a Certificate of Hardship make submissions concerning any or all of the following information before it makes a determination on the application.*

  During the Billerica Historic Districts Commission hearing on May 7, 2025, representatives from Gomez and Sullivan Engineers and the Division of Ecological Restoration, on behalf of the applicant, asked the Commission what information the Commission requires to make a determination on the application. No specific information was requested, and commissioners admitted to being at a loss as to what information would be needed to assess the hardship of a dam. Nonetheless, this section documents how each item that the Commission may request, as listed in the Appendix of the Review Standards, is either provided or not applicable.

1. *A professional estimate of the cost of the proposed construction, alteration, demolition, or removal and an estimate of any additional cost that would be incurred to comply with the standards of the Commission for changes necessary for the issuance of a Historic Permit.*

   An Opinion of Probable Construction Cost for the dam removal project, prepared by a licensed engineer, is provided in **Section 5. Opinion of Probable Construction Cost** and is estimated to

cost nearly $1.2 million for construction. Additionally, the project already incorporates historic documentation so it is not anticipated that any additional costs would be incurred to comply with the standards of the Commission.

As discussed in **Section 1.1 Purpose of Historic Districts**, the Talbot Mills dam is regulated by ODS for dam safety and DMF for fish passage. There is no financially viable or feasible way to meet both regulatory agencies' standards aside from dam removal as dam removal is funded by state and federal grants and dam repairs and a fish ladder would not be, which is further explained below.

Costs to Meet Dam Safety Requirements

In order to meet the dam safety requirement of passing the 100-year flood, the existing spillway would need to be lengthened, lowered, or the shape would need to be changed. Due to the physical constraints at the site (i.e., the road, parking lot, and bridge bounding the current spillway), increasing spillway length is not feasible without replacing the spillway with an alternate design such as a labyrinth weir, which uses a zig-zag layout to fit more spillway length within a given overall width. This would significantly change the appearance of the dam and result in loss of the historic resource. It would therefore not protect the historic dam as it currently exists. Lowering the spillway height would also lead to significant change in the appearance of the dam and loss of the historic resource. Changing the spillway crest shape is generally costly for the limited results attained and would result in significant changes to the appearance of the dam and loss to the historic resource. Any of these potential spillway retrofit/replacement projects would involve destruction or significant modification of the historic resource, incurring all of the costs of dam removal as detailed in **Section 5. Opinion of Probable Construction Cost** in addition to the costs to rebuild the dam.

Costs to Meet Fish Passage Requirements

In order to meet the fish passage requirement, the dam would have to first meet all dam safety standards and incur the costs described in the previous paragraph. In addition to these costs, would be the costs of designing, permitting and building a fish ladder. Two examples of fish passage project costs are provided in **Section 6. Supplemental Cost Information.** The table below summarizes these costs, ranging from $599,000-$1.5M, which do not include any costs for dam repair/retrofit as would be required at the Talbot Mills Dam, and compares them against the cost for this dam removal project. The Forge Pond Dam Denil Fish Ladder is the most comparable project to a fish ladder that would be required at Talbot Mills Dam and the fish ladder alone costs significantly more than dam removal at $1.5M

Table 2. Comparison of two fish passage project costs with the Talbot Mills Dam removal costs.

Project	Fish passage construction cost ($2025)	Notes
Forge Pond Dam Denil Fish Ladder	$1,475,000	This is a very comparable fish ladder to the one that would need to be built at the Talbot Mills Dam. The dam is just upstream of the bridge, and due to the dam and site constraints, a Denil fish ladder is the best option for fish passage.
Centennial Island Dam Nature-Like Fishway	$599,000	This fishway is a nature-like rock-ramp fishway, which is significantly less expensive than building a fish ladder, which would be the necessary fishway type at the Talbot Mills Dam due to the site constraints and dam height.
Talbot Mills Dam Removal	$1,153,000	

Ongoing Maintenance and Repair Costs

In addition to the initial construction costs required to adhere to ODS and DMF requirements, they both require consistent ongoing maintenance. Fish ladders must be cleared daily during the migration period and adjusted and maintained in response to daily fluctuations in river flows. This requires an expert in the field of fish passage and fish ladder maintenance and is a nearly full-time job. Hydropower companies employ full-time and seasonal staff to manage fish passage operations at their dams. As the Talbot Mills dam generates no economic income, employing a fish passage technician at this dam location is not economically feasible. As the dam owner is retired, becoming a full-time fish passage technician, or starting a new business to employ a fish passage technician is not reasonable. Grants do not cover ongoing maintenance costs.

Additionally, fish ladders have a typical useful life of around 50 years, which means this is not a one-time cost. Ladders will have to be redesigned and built every 50 years, adding to the perpetual expense of the dam.

Adhering to dam safety standards also requires consistent and ongoing maintenance and compliance costs. The Talbot Mills Dam is a significant hazard dam which requires a Phase I safety inspection every five years. As shown in the Talbot Phase I Inspection proposal included in **Section 6. Supplemental Cost Information,** this can cost up to $14,755 for the Talbot Mills dam. According to ODS staff (See email exchange included in **Section 6. Supplemental Cost Information)**, on average, these range from $5,000 - $10,000. All the remedial measures recommended in the most recent dam safety inspection report incur costs separate from the costs to retrofit/remove the spillway to pass the design flood and are ongoing in perpetuity. In addition to the safety inspections, some of these include implementing a comprehensive maintenance and routine inspection plan which entails hiring professional engineers, regularly removing trees and branches from the dam, operating bypass controls during an emergency or high flood situation, among others. As noted above, the dam generates no economic income and maintenance is not funded by grants, so it is not economically feasible to achieve these requirements. Hydropower dams or dams owned by government entities such as a city or state agency provide alternative economic

viability in covering costs associated with dam ownership, where a privately owned dam providing no economic benefit or purpose does not.

In summary, retrofitting the dam to meet ODS standards would likely cost more than dam removal, $1.2M. Adding a fish ladder would like cost at least $1M and may be incurred every 50 years. Ongoing maintenance and repairs would cost at least what the dam owner has paid to date annually ($2,400) plus the cost of hiring staff to manage and maintain the fish ladder, both in perpetuity. None of these costs account for the potential costs related to liability if the dam were to fail. It is evident these costs are substantially more than the one-time cost of $1.2M to remove the dam, which adequately meets all Commonwealth regulatory requirements.

2. *A report from a licensed engineer or architect with experience in rehabilitation as to the structural soundness of any structures on the property and their suitability for rehabilitation.*

   See the explanation in **Section 1.2 Application of the Review Standards, Demolition**, standard 2.1022.

3. *Estimated market value of the property in its current condition; after completion of the proposed construction, alteration, demolition, or removal; and after changes required by the Commission.*

   There is no property associated with the dam, as demonstrated by the deed provided in **Section 3. Property Deed**. The dam owner only owns the dam, and no parcel associated with the dam. The dam owner has tried to sell and gift the dam by multiple means without success as described in item #9, below. As such, the dam has no market value however, as described previously, ownership of the dam incurs costs. Therefore, the current market value of the property could be considered less than $0.

4. *In the case of a proposed demolition, an estimate from an architect, developer, real estate consultant, appraiser, or other real estate professional experienced in rehabilitation as to the economic feasibility of rehabilitation or reuse of the existing Structure on the property.*

   The dam no longer serves the economic purpose it once did, and there is no economic need or viability for the dam to serve the purpose of powering the adjacent mill buildings as it once did. As such, the dam cannot be reused. See response to item #1 above for discussion regarding the economic feasibility of rehabilitation. This dam removal project is being funded by state and federal grants which is what makes it economically feasible. It is unlikely that dam repair and construction of a fish ladder would feasibly be funded by grants, as explained below.

   The Dam and Seawall grant program is largely the only state program that funds dam repair. It is unlikely that retrofit/rehabilitation of this dam would be funded as the dam currently serves no purpose. This is evidenced by the project eligibility and evaluation criteria outlined in the grant's request for responses[3]. In summary, dams that are municipally owned are prioritized for funding (this dam is not), and projects are scored based on the environmental and public safety benefits they provide. Rebuilding the Talbot Mills dam to meet ODS standards would not provide sufficient benefits to be competitive. Additionally, ongoing maintenance and operational costs are not eligible expenses for this grant program. Permitting the full replacement of the dam to meet modern standards would also prove to be extremely difficult, costly and time-consuming, if even allowed by the various federal and state regulators. The dam repair is also not eligible for

[3] Available for download at: https://www.commbuys.com/bso/external/bidDetail.sdo?docId=BD-25-1042-ENV-ENV01-113868&external=true&parentUrl=close

the Massachusetts Preservation Projects Fund which helps fund rehabilitation of historic sites, as private citizens are not eligible to apply. Additionally, the maximum award amount from this grant program is $100,000 and it is likely the cost of dam rehabilitation and construction of a fish ladder would cost over $2 million as explained previously.[4]

5. *Amount paid for the property, the date of purchase, and the party from whom purchased including a description of the relationship, if any, between the owner of record or applicant and person from whom the property was purchased, and any terms of financing between the seller and buyer.*

   The property was purchased from CRT Development Corp. for $1.00 on 7/9/1980 (Bk 2429, Pg 687), as shown in **Section 3. Property Deed**.

6. *If the property is income-producing, the annual gross income from the property for the previous two years; itemized operating and maintenance expenses for the previous two years; and depreciation deduction and annual cash flow before and after debt service, if any, for the previous two years;*

   The property does not produce income.

7. *Remaining balance on any mortgage or other financing secured by the property and annual debt service, if any, for the previous two years.*

   Not applicable.

8. *All appraisals obtained within the previous two years by the owner or applicant in connection with the purchase, financing, or ownership of the property.*

   Not applicable.

9. *Any listing of the property for sale or rent, price asked, and others received, if any, within the previous two years.*

   Soon after the initial property sale that left the dam owner owning the dam in 1997, the dam owner approached Leggett & Platt, Incorporated, the company that purchased the remaining property, about transferring dam ownership. Leggett & Platt, Incorporated was willing to accept the dam under certain conditions, including being able to gift the dam to another entity. Leggett & Platt, Incorporated offered the dam to the town and the Middlesex Canal Commission (MCC) and the town was unwilling to accept the dam and the MCC was only willing to accept it if they were also given $200,000 to cover ongoing maintenance and inspection costs, which was all discussed verbally. Leggett & Platt, Incorporated ultimately was unwilling to accept the dam. Later, the dam owner engaged in communications again with the town and the MCC regarding acceptance of the dam, as documented in an email exchange starting in 2017 included in **Section 6. Supplemental Cost Information.** By the time a response was received from the MCC five years later, the dam owner had already pursued other options and raised funds to advance removal. See email documentation in **Section 6. Supplemental Cost Information.**

10. *Assessed value of the property according to the two most recent assessments.*

    Not applicable.

[4] See grant information at https://www.sec.state.ma.us/divisions/mhc/grants/mppf.htm

11. *Real estate taxes for the previous two years.*

    Not applicable.

12. *Form of ownership or operation of the property, whether sole proprietorship, for-profit or not-for-profit corporation limited partnership, joint venture, or other.*

    Limited Liability Company (LLC)

1.4 Conclusion

The Talbot Mills Dam is a former mill dam located on the Concord River just upstream of the Faulkner Street bridge. The dam no longer serves a current purpose, generate no economic revenue, and is costly to own and creates a liability for the dam owner. The dam owner, with the support of various state and federal government entities and nonprofits it pursuing removal of the dam. Dam removal is the only feasible and financially viable option for this dam to meet the Commonwealth's dam safety and fish passage requirements and the removal of the dam provides a public safety benefit while supporting the Commonwealth's for climate resiliency goals.

Dams are highly regulated infrastructure that should not fall under the jurisdiction of Historic District Commissions. Although the project team and legal counsel do not believe that the BHDC has authority to regulate this project under Chapter 40C, we do believe that the project would qualify for a hardship exemption under the BHDC's bylaws, and evidence for this determination is provided within this supplemental material.

2. Dam Safety Inspection

TALBOT MILLS DAM

PHASE I

INSPECTION / EVALUATION REPORT

Dam Name:	***Talbot Mills Dam***
NID ID#:	***MA 00774***
Owner:	***CRT Development***
Town:	***North Billerica***
Consultant:	***Geotechnical Consultants, Inc.***
Date of Inspection:	***April 30, 2021***

EXECUTIVE SUMMARY

This Phase I Inspection/Evaluation Report details the inspection and evaluation of Talbot Mills Dam located in North Billerica, Massachusetts. The inspection was conducted on 30 April 2021 by Geotechnical Consultants, Inc. of Marlborough, Massachusetts.

Currently, the Talbot Mills Dam is classified as an Intermediate sized, Significant (Class II) Hazard potential structure. Based on our inspection, measurements and evaluation, it is our opinion the dam should remain as an Intermediate sized, Significant (Class II) Hazard potential structure.

In general, the Talbot Mills Dam was found to be in fair condition primarily due to the lack of any operation or maintenance plan. Structurally, we found non indications of instability of seepage which comprise the integrity of the dam and appurtenant structures. The spillway appears to be adequately sized for the Spillway Design Flood (SDF).

Some operational deficiencies exist and include:

- Minor seepage in the spillway particularly at the right side.
- Trees located on the upstream side of the right abutment near the spillway.
- Lack of an operable low-level outlet and emergency bypass in the event of flooding.

Geotechnical Consultants, Inc. recommends the following actions be taken to address the deficiencies found at the dam during this inspection and evaluation:

- Prepare and implement “routine” inspection and maintenance plans for the operation and maintenance of this dam.

- Inspect the interior of the Talbot Mills complex, particularly the downstream end of the former intake structures.

- Repair/replace the sluiceway and stilling basin gates so that the gates are operational and can provide emergency bypass control.

PREFACE

The assessment of the general condition of the dam reported herein was based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations were beyond the scope of this report unless reported otherwise.

In reviewing this report, it should be realized that the reported condition of the dam was based on observations of field conditions at the time of inspection, along with data available to the inspection team.

It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the reported condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Dan Kenneally, P.E.
Massachusetts License No.: 50527

Richard Pizzi, P.E.
Massachusetts License No.: 32644
GEOTECHNICAL CONSULTANTS, INC.

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APPENDICES

Dam Evaluation Summary Detail Sheet

1. NID ID:	**MA 00774**	**4. Inspection Date:**	**April 30, 2021**
2. Dam Name:	**Talbot Mills Dam**	**5. Last Insp. Date:**	**November 6, 2015**
3. Dam Location:	**Billerica, MA**	**6. Next Inspection:**	**April 30, 2026**
7. Inspector:	**Daniel Kenneally**		
8. Consultant:	**Geotechnical Consultants, Inc.**		
9. Hazard Code:	**Significant**	**9a. Is Hazard Code Change Requested?:**	**No**
10. Insp. Frequency:	**5 Years**	**11. Overall Physical Condition of Dam:**	**FAIR**
12. Spillway Capacity (% SDF)	**>100% SDF w/ no actions by Caretaker**		

E1. Design Methodology:	**1**	**E7. Low-Level Discharge Capacity:**	**1**
E2. Level of Maintenance:	**1**	**E8. Low-Level Outlet Physical Condition:**	**1**
E3. Emergency Action Plan:	**1**	**E9. Spillway Design Flood Capacity:**	**5**
E4. Embankment Seepage:	**5**	**E10. Overall Physical Condition of the Dam:**	**3**
E5. Embankment Condition:	**5**	**E11. Estimated Repair Cost:**	**$0**
E6. Concrete Condition:	**4**		

Evaluation Description

E1: DESIGN METHODOLOGY
1. Unknown Design – no design records available
2. No design or post-design analyses
3. No analyses, but dam features appear suitable
4. Design or post design analysis show dam meets most criteria
5. State of the art design – design records available & dam meets all criteria

E2: LEVEL OF MAINTENANCE
1. Dam in disrepair, no evidence of maintenance, no O&M manual
2. Dam in poor level of upkeep, very little maintenance, no O&M manual
3. Dam in fair level of upkeep, some maintenance and standard procedures
4. Adequate level of maintenance and standard procedures
5. Dam well maintained, detailed maintenance plan that is executed

E3: EMERGENCY ACTION PLAN
1. No plan or idea of what to do in the event of an emergency
2. Some idea but no written plan
3. No formal plan but well thought out
4. Available written plan that needs updating
5. Detailed, updated written plan available and filed with MADCR, annual training

E4: SEEPAGE (Embankments, Foundations, & Abutments)
1. Severe piping and/or seepage with no monitoring
2. Evidence of monitored piping and seepage
3. No piping but uncontrolled seepage
4. Minor seepage or high volumes of seepage with filtered collection
5. No seepage or minor seepage with filtered collection

E5: EMBANKMENT CONDITION (See Note 1)
1. Severe erosion and/or large trees
2. Significant erosion or significant woody vegetation
3. Brush and exposed embankment soils, or moderate erosion
4. Unmaintained grass, rodent activity and maintainable erosion
5. Well maintained healthy uniform grass cover

E6: CONCRETE CONDITION (See Note 2)
1. Major cracks, misalignment, discontinuities causing leaks, seepage or stability concerns
2. Cracks with misalignment inclusive of transverse cracks with no misalignment but with potential for significant structural degradation
3. Significant longitudinal cracking and minor transverse cracking
4. Spalling and minor surface cracking
5. No apparent deficiencies

E7: LOW-LEVEL OUTLET DISCHARGE CAPACITY
1. No low level outlet, no provisions (e.g. pumps, siphons) for emptying pond
2. No operable outlet, plans for emptying pond, but no equipment
3. Outlet with insufficient drawdown capacity, pumping equipment available
4. Operable gate with sufficient drawdown capacity
5. Operable gate with capacity greater than necessary

E8: LOW-LEVEL OUTLET PHYSICAL CONDITION
1. Outlet inoperative needs replacement, non-existent or inaccessible
2. Outlet inoperative needs repair
3. Outlet operable but needs repair
4. Outlet operable but needs maintenance
5. Outlet and operator operable and well maintained

E9: SPILLWAY DESIGN FLOOD CAPACITY
1. 0 - 50% of the SDF or unknown
2. 50-90% of the SDF
3. 90 - 100% of the SDF
4. >100% of the SDF with actions required by caretaker (e.g. open outlet)
5. >100% of the SDF with no actions required by caretaker

E10: OVERALL PHYSICAL CONDITION OF DAM
1. UNSAFE – Major structural, operational, and maintenance deficiencies exist under normal operating conditions
2. POOR - Significant structural, operation and maintenance deficiencies are clearly recognized under normal loading conditions
3. FAIR - Significant operational and maintenance deficiencies, no structural deficiencies. Potential deficiencies exist under unusual loading conditions that may realistically occur. Can be used when uncertainties exist as to critical parameters
4. SATISFACTORY - Minor operational and maintenance deficiencies. Infrequent hydrologic events would probably result In deficiencies.
5. GOOD - No existing or potential deficiencies recognized. Safe performance is expected under all loading including SDF

E11: ESTIMATED REPAIR COST

Estimation of the total cost to address all identified structural, operational, maintenance deficiencies. Cost shall be developed utilizing standard estimating guides and procedures

Changes/Deviations to Database Information since Last Inspection

SECTION 1

1.0 DESCRIPTION OF PROJECT

1.1 General

1.1.1 Authority

CRT Development Realty retained Geotechnical Consultants, Inc. to perform a visual inspection and develop a report of conditions for the dam at the Mill Pond Dam, also know as the Talbot Mills Dam along the Concord River in North Billerica, Middlesex County, Massachusetts. This inspection and report were performed in accordance with MGL Chapter 253, Sections 44-50 of the Massachusetts General Laws as amended by Chapter 330 of the Acts of 2002.

1.1.2 Purpose of Work

The purpose of this investigation was to inspect and evaluate the present condition of the dam and appurtenant structures in accordance with 302 CMR10.07 to provide information that will assist in both prioritizing dam repair needs and planning/conducting maintenance and operation.

The investigation was divided into four parts: 1) obtain and review available reports, investigations, and data previously submitted to the owner pertaining to the dam and appurtenant structures; 2) perform a visual inspection of the site; 3) evaluate the status of an emergency action plan for the site and; 4) prepare and submit a final report presenting the evaluation of the structure, including recommendations and remedial actions, and opinion of probable costs.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided in Appendix D. Many of these terms may be included in this report. The terms are presented under common categories associated with dams which include: 1) orientation; 2) dam components; 3) size classification; 4) hazard classification; and 5) miscellaneous. All elevations referred to in this report are given in feet and are referenced to the National Geodetic Vertical Datum (NGVD) of 1929.

1.2 Description of Project

1.2.1 Location

The Talbot Mills Dam is located in Middlesex County in the village of North Billerica, Massachusetts. North Billerica is an unincorporated village of the town of Billerica, Massachusetts; one of nine villages that make up the Town of Billerica.

The Concord River flows through North Billerica, and at the old Talbot and Faulkner Mills is the Mill Pond and Dam marking the area where the old Middlesex Canal crossed over the river. This run-of-the-river dam and the impoundment are shown on the Billerica USGS quadrangle map at the following approximate coordinates:

Latitude: 42.59173° North

Longitude: 71.28400° East

The best access for driving to the dam is via exit #29 off of US Route 3; then east on Billerica Road (State Route 129) for approximately 0.3 miles; turn north onto Brick Kiln Road for 0.4 miles; northeast onto Alpine Street for 0.4 miles; south onto Boston Road (State Route 3A) for approximately 400 feet; northeast onto Lowell Street for 0.5 miles; then northeast onto Old Elm Street 0.3 miles (Old Elm Street becomes Faulkner Street). The dam location and general vicinity are shown on the *Locus Plan* attached as Figure 1.

1.2.2 Owner/Caretaker

See Table 1.1 for current owner and caretaker data (names and contact information).

1.2.3 Purpose of the Dam

See Table 1.1 for the current purpose of the dam.

The area was originally meadow land and its hay and grass were used by the early English settlers as food for their farm animals. As it was subject to annual flood, attempts were made to curtail the problem. In 1659 William Sheldon received permission to construct a mill to grind corn, but it was not until 1708 that Christopher Osgood successfully erected an effective dam at the site. All subsequent owners of this spot trace their deed to Osgood and his dam. By the end of the 18th century there were five grist mills, three saw mills and one fulling mill at work here.

Faulkner Mills was at a crucial junction of waterways in the early 1800s. Not only were the mills on the Concord River, a source of water power, but they were also at the highest point of the Middlesex Canal. The canal was the longest early American canal, dug entirely by hand and explosives, reaching over 20 miles from Boston at the southeast end to Lowell and the Merrimack River in the north. This canal would prove to be an important link for commerce in the early 1800s, before the advent of the railroads. The canal was the transport mechanism for lumber from New Hampshire, textiles from Lowell, and passengers from Boston.

During the period of the Middlesex Canal's operations, its Proprietors were in charge of the area and continued to run the mills as well as a fishway. For them, Loammi Baldwin replaced Osgood's old worn dam with a new one near the current dam at the Faulkner Street bridge. In 1828 the Proprietors again built a new dam on this site. At the Canal's demise, the control of the area passed to two families: the Faulkners and the Talbots.[1]

1.2.4 Description of the Dam and Appurtenances

Talbot Mills Dam is located on the Concord River approximately 4.2 miles south of the confluence of the Concord and Merrimack Rivers. Overall, the dam, excluding the south training wall and sluiceway, is approximately 316 feet long with a maximum height of about 15 feet. It is an overflow or run-of-the-river type stone masonry, concrete and (presumably) earthen structure.

[1] http://www.middlesexcanal.org/gallery.htm

In 2015, Geotechnical Consultants, Inc. completed an evaluation study of the Talbot Mills Dam as part of its contract with the dam owner. This is the last known inspection report for the dam and the information contained in the report was used as the basis for the current DCR size and hazard classification.

The Geotechnical Consultants report entitled *Talbot Mills Dam Phase I Inspection/Evaluation Report* dated November 6, 2015 was reviewed as part of our services.

As part of the dam inspection done in 2009, a complete survey of the dam and appurtenant structures as well as limited soundings to determine the water depth of the pond were made to provide a completer and more accurate basis for determination of both DCR size and hazard classification. The survey was done by Eaglebrook Engineering & Survey, LLC in April 2009. A copy of the *Site Plan,* drawing EX-1 dated April 20, 2009 is attached as Figure 2. for reference.

There are three primary components to this dam:

- Main impoundment and intake structure to the Talbot Mills complex
- Main spillway and abutments
- Sluiceway and primary intake to the Faulkner Mills complex.

Main Impoundment

The primary dam structure is of unknown construction and makes up the left (south) portion of the dam. This area of the dam supports Old Elm Street/Faulkner Street and separates the Mill Pond from the Talbot Mills complex located on the left bank of the river just downstream from the dam. Elevations along Old Elm Street/Faulkner Street over this are of the dam range between 114.5 and 116.0 feet NGVD.

A vertical concrete wall was constructed at the southernmost end of the left side of the dam. The 60-foot-long concrete wall forms the upstream dam face of the dam and contains five intake gates which formerly provided water to the Talbot Mills. We understand the gates are no longer functional and the intake tunnels upstream of the Talbot Mills were filled with concrete at some time in the past. The top of the concrete wall is at approximately elevation 118.0 feet at the gates.

A masonry stone wall is located on the upstream side of the dam and is located between the north end of the concrete intake wall and the left abutment of the spillway. The stone wall is approximately 73 feet long. Elevations along the top of the stone all range between 115.3 feet at the south end and 114.2 feet at the north end adjacent to the spillway abutment.

Further to the south, a stone wall serves as a training wall. The top of the training wall ranges between elevation 112.2 and elevation 114.9 feet. Grades behind the wall slope slightly upward to the old Middlesex Canal Building. Remnants of the old Middlesex Canal alignment are located to the south of the building as shown in Photograph 13.

Spillway

Although the primary spillway was not visible at any time during our site visit due to the continued flow, both the left and right abutments were visible and appeared to be constructed of masonry granite blocks. During our site inspection on 30 April 2021, approximately 6-inches of water was flowing across the top of the spillway. It appears the spillway crest is square-cut with a near vertical face. A portion of the right abutment is constructed of cast-in-place concrete. Spot grades at the top of the abutments range between elevations 111.0± to 111.5±. The top elevation at the primary spillway was estimated in the field due to the high flow at elevation 109.7±. This elevation is consistent with the elevation provided in the FEMA study[2] of the Concord River. A complete copy of the FEMA study is provided in Appendix E.

Two small low-level outlets are located in the granite block left abutment. The outlets are blocked. Invert elevations at the downstream end of the outlets is approximately 100.6 feet. The outlets are shown in Photograph 12.

Numerous bedrock outcrops are visible at the toe of the spillway and form the downstream channel bed. Elevations of the downstream channel bed vary due to the jagged rock profile. However, the estimated grade at the top of rock/toe of spillway near the centerline of the channel is approximately elevation 99.5±.

The primary spillway is approximately 127 feet long with a height of approximately 10.2 feet. Both the left and right spillway abutments provide auxiliary spilling capacity. The left spillway abutment is approximately 17 feet long with a crest at elevation 111.2 feet. The right spillway abutment is approximately 20 feet long with the crest at elevation 111.6 feet.

Sluiceway

A sluiceway and intake structure provides water to the Faulkner Mills complex located on the right bank of the river just downstream from the dam. The sluiceway is approximately 13 feet wide and is located on the right side of the dam just east of the right spillway abutment. Walls of the sluiceway are constructed primarily of mortared masonry field stone but portions of the sluiceway are concrete lined. Water in the sluiceway passes under a small bridge supporting Faulkner Street and is discharged into a stilling basin located between Faulkner Street and the Faulkner Mill Complex. The outlet gate from the stilling basin is in an open locked position and directs flows through an intake tunnel to a turbine located within the mill complex. Reportedly, the turbine has not been in service since 1972.

A movable gate and concrete weir are located within the sluiceway just east of the Faulkner Street Bridge. The gate is in poor condition and water continuously bypasses the gate. It is unknown whether or not the gate is operational. There are no other controls for the dam.

A small park is located adjacent to the right abutment of the spillway. The park contains a sitting area and a historic marker dedicated to the employees of the Faulkner Mills. The marker is

[2] Federal Emergency Management Agency, *Flood Insurance Study*, town of Billerica, Massachusetts, Middlesex County; February 8, 1985.

shown in Photograph 11. Access to the park is available from a paved parking lot just east of the river and south of Faulkner Street by crossing a pedestrian bridge over the sluiceway.

Mill Pond

The dam impounds water to form the Mill Pond. Surface area of the irregularly shaped pond was estimated using scaled aerial photographs from several sources. The approximate pond shoreline and computation of surface area are shown on Figure 3. Attached as Appendix G are eight aerial photographs obtained from Environmental Data Resources, Inc. and are specifically prepared for this site. The eight photos contained in the EDR Aerial Photo Decade Packaged were taken between 1938 and 2006 and, in general, show the pond shoreline has remained relatively unchanged throughout this period.

During periods of "normal" flow, we estimated that the pond occupies an area of 8.6± acres and contains two branches which are shown on Figure 3. and the aerial photos of Appendix G. The west branch forms the main channel of the Concord River. Within the deeper west branch, the current is typically strong throughout the year. The east branch is much shallower, and during the summer months, has almost no flow as evidenced by an annual growth of algae on the pond surface. The delineation between the algae growth and channel flow are clearly visible in the 1980 and 2006 aerial photographs.

A complete profile for the Concord River is contained in the FEMA Flood Study of 1985. Stream bed elevations and water depths through the west branch of the Mill Pond, along the primary flow path of the river, are shown as elevation 98.5± and 16± feet, respectively. Soundings taken in the shallower east branch of the Mill pond showed the bed level to vary between elevations 108± near the periphery of the pond close to the north shore to elevations 103± at about the centerline of the east branch of the pond. No soundings were made at the south end of the east branch. Based on the general topography and evidence of aquatic plant growth at the south end of the east branch, we expect the water depths to be shallowest in this area. Using the information cited above along with the survey measurements and aerial photographs, we estimate the storage capacity of the Mill Pond at the 100-year flood level is 140 acre-feet.

Faulkner Street Bridge

Located immediately downstream from the primary dam spillway is the Faulkner Street Bridge. Having a width of approximately 32 feet, the bridge carries two lanes of vehicle traffic and a pedestrian sidewalk on the west (downstream) side only. The curved concrete arch bridge has an overall length of approximately 120 feet. Each individual span of the dual span concrete arch is approximately 42 feet long at the base. It appears the center pier and abutment footings are armored and founded directly on the bedrock. The bridge can be seen in Photograph 6.

1.2.5 Operations and Maintenance

The responsible party of the operations and maintenance of the Talbot Mills Dam is CRT Development Realty, LLC of Naples, Florida. The caretaker is Mr. Bruce Henriksen of 80 Washington Street in Norwell, Massachusetts.

There are no formal records kept on the operations and maintenance of this dam, nor are there any written operating procedures for this dam.

1.2.6 DCR Size Classification

Talbot Mills Dam has a height of dam of approximately 10.2 feet and a maximum storage capacity of 140 acre-feet. Refer to Appendix D for definitions of height of dam and storage. Therefore, in accordance with Department of Conservation and Recreation Office of Dam Safety classification, under Commonwealth of Massachusetts dam safety rules and regulations stated in 302 CMR 10.00 as amended by Chapter 330 of the Acts of 2002, Talbot Mills Dam is an intermediate size structure.

1.2.7 DCR Hazard Potential Classification

Talbot Mills Dam is located upstream of the Faulkner Street Bridge. It appears that a failure of the dam at maximum pool will not result in significant damage to the bridge or other downstream structures based on our review of the available flood records.

A review of the aerial photographs and topographic maps of the Concord River downstream of the Talbot Mills Dam indicated that the potential damage to habitable structures will be minor since no structures are in the direct path of the probable flood wave produced upon failure of the dam. In addition, both the Town of Billerica and City of Lowell have adopted zoning and conservation bylaws which are consistent with FEMA recommendations for construction within the floodway. As a result, not more than a 2.0-foot incremental rise of flood water above the lowest ground elevation adjacent to the outside foundation walls, nor more than a 2.0-foot incremental rise of flood water above the lowest habitable floor elevation of structures within the floodway is likely to occur in the event of dam breach at the Talbot Mills Dam during the design flood event.

Given the minimal rise in flood water downstream in the even of a dam failure, the risk of loss of life and damage to homes, industrial or commercial facilities, secondary highways or railroads is considered to be low. Additionally, flooding as a result of a dam breach to the Talbot Mills Dam is unlikely to cause interruption of use or service or relatively important facilities located downstream of the dam.

Therefore, in accordance with Department of Conservation and Recreation classification procedures, under Commonwealth of Massachusetts dam safety rules and regulations stated in 302 CMR 10.00 as amended by Chapter 330 of the Acts of 2002, Talbot Mills Dam should be classified as a Significant (Class II) hazard potential dam. The Hazard Potential Classification recommendation is consistent with the Hazard Potential Classification on record with the Office of Dam Safety for Talbot Mills Dam.

1.3 Pertinent Engineering Data

1.3.1 Drainage Area

The drainage area for Talbot Mills Dam is approximately 370 square miles and extends through the communities of Concord Carlisle, Bedford and Billerica. The Concord River is formed by the confluence of the Assabet and Sudbury Rivers, approximately one mile northwest of the center of Concord. The river system is often referred to as the Sudbury-Assabet-Concord (SuAsCo) river basin.

The Concord River flows sluggishly in a general northerly direction for approximately 16 miles before joining the Merrimack River in Lowell and falls 62 feet over its course. Approximately 50 feet of drop occurs at dam in the first mile of the river in Lowell; downstream from the Talbot Mills Dam. The 11.5-mile reach of the Concord River from its confluence with the Assabet an Sudbury Rivers in Concord to North Billerica is controlled by the Talbot Mills Dam

1.3.2 Reservoir

See Table 1.1 for data about normal, maximum, and spillway design flood (SDF) pools.

	Length[1] (feet)	Width[1] (feet)	Surface Area (acres)	Storage Volume (acre-feet)
Normal Pool	1300	720	8.6	110
Maximum Pool	1360	780	12.6	162
SDF Pool	--	--	10.7	140

1. Maximum dimension

1.3.3 Discharges at the Dam Site

Storm Event	Peak Discharges at Talbot Mills Dam (cfs)
10 Year	2,940
50 Year	4,660
100 Year	5,675
500 Year	8,395

1.3.4 General Elevations (feet – Referenced to NGVD of 1929)

A.	Top of Dam	114.6
B.	Spillway Design Flood Pool (100 Yr.)	114.2
C.	Normal Pool	110.5
D.	Spillway Crest	109.7
E.	Upstream Water at Time of Inspection	110.5
F.	Downstream Water at Time of Inspection	103.6
G.	Streambed at Toe of the Dam	99.5
H.	Low Point along Toe of the Dam	99.5

1.3.5 Main Spillway Data

A.	Type	Broad Crested
B.	Length	127 feet
C.	Invert Elevation	109.7 feet

D.	Upstream Channel	98.5 feet
E.	Downstream Channel	99.5 feet
F.	Downstream Water	103.6

1.3.6 Lower-Level Outlet

A.	Type	Sluiceway with Gate
B.	Number of bays:	2 (at left spillway abutment)
C.	Invert	105.7 feet
D.	Bay Size	13 feet open channel

1.3.7 Design and Construction Records and History

No construction records or design data were available for review during the inspection and preparation of this report.

1.3.8 Operating Records

There were no operating records or records of rainfall or pond height for this dam available at the time of inspection.

1.4 Summary Data Table

1.1 Summary Data Table

Required Phase I Report Data	Data Provided by the Inspecting Engineer
National ID #	MA 00774
Dam Name	Talbot Mills Dam
Dam Name (Alternate)	Old Elm Street/Old Elm Street Extension
River Name	Concord River
Impoundment Name	Mill Pond (a.k.a. Talbot Mills Pond or Faulkner Mills
Hazard Class	Significant
Size Class	Intermediate
Dam Type	Masonry/Earth (Spillway: Masonry Gravity)
Dam Purpose	Recreational and flood control purposes
Structural Height of Dam (feet)	16±
Hydraulic Height of Dam (feet)	10.2
Drainage Area (sq. mi.)	370
Reservoir Surface Area (acres)	10.7
Normal Impoundment Volume (acre-feet)	110±
Max Impoundment Volume ((top of dam) acre-feet)	162±
SDF Impoundment Volume* (acre-feet)	140
Spillway Type	Broad Crest Granite Masonry
Spillway Length (feet)	127
Freeboard at Normal Pool (feet)	5
Principal Spillway Capacity* (cfs)	6030
Auxiliary Spillway Capacity* (cfs)	620
Low-Level Outlet Capacity* (cfs)	Unknown - Gate is non-functional
Spillway Design Flood* (flow rate - cfs)	100 year / 5,675 cfs
Winter Drawdown (feet below normal pool)	0
Drawdown Impoundment Vol. (acre-feet)	110
Latitude	42.59173° North
Longitude	71.28400° East
City/Town	Billerica
County Name	Middlesex
Public Road on Crest	Faulkner Street
Public Bridge over Spillway	Faulkner Street Bridge
EAP Date (if applicable)	0
Owner Name	CRT Development Realty, LLC
Owner Address	242 5th Street South
Owner Town	Naples, FL 34102
Owner Phone	978-314-8080
Owner Emergency Phone	0
Owner Type	Private
Caretaker Name	Mr. Bruce Henriksen
Caretaker Address	80 Washington Street, Building S
Caretaker Town	Norwell, MA 02061
Caretaker Phone	781-878-9111
Caretaker Emergency Phone	0
Date of Field Inspection	4/30/2021
Consultant Firm Name	Geotechnical Consultants, Inc.
Inspecting Engineer	Daniel Kenneally
Engineer Phone Number	508-229-0900

*In the event a hydraulic and hydrologic analysis has not been completed for the dam, indicate "No H&H" in this table, recommendation section shall include specific recommendation to hire a qualified dam engineering consultant to conduct analysis to determine spillway adequacy in conformance with 302 CMR 10.00.

SECTION 2

2.0 INSPECTION

2.1 Visual Inspection

Talbot Mills Dam was inspected on 30 April 2021. At the time of the inspection, the weather was cloudy and in the 50's. On Thursday, 29 April 2021 approximately 1.3in of rainfall had occurred prior to our inspection. Photographs to document the current conditions of the dam were taken during the inspection and are included in Appendix A. The level of the impoundment was 110.5 on 30 April 2021. Underwater areas were not inspected. A copy of the inspection checklist is included in Appendix B.

2.1.1 General Findings

In general, Talbot Mills Dam was found to be in fair condition due to the lack of routine maintenance and operational procedures. The specific concerns are identified in more detail in the sections below:

2.1.2 Dam

Abutments
The left and right abutments appear sound with no evidence of erosion, significant seepage or cracking. Both abutments of the spillway appear to be founded on bedrock.

Embankments
The left embankment is of unknown construction but most likely consists of an earthen structure support Old Elm Street/Faulkner Street. Immediately downstream of the left embankment is the Talbot Mills Complex. No inspection was made of the interior space of the mill complex.

Upstream Face
The upstream face of the left embankment is constructed with a near vertical facing wall. Overall, the wall is approximately 133 long with a 60-foot-long concrete facing at the south end and 73-foot-long stone masonry face between the concrete wall and the primary abutment to the north. Intake gates for the Talbot Mills complex are located at the concrete wall. However, the gates are not operational and the intake tunnels have reportedly been infilled with concrete.

Crest
The crest of the embankment is nearly flat and level and supports the paved surface of Old Elm Street/Faulkner Street. This portion of the road leading to the Faulkner Street Bridge shows no indications of erosion or undue wear from traffic (either pedestrian or vehicular) and the area is well-maintained. Several trees are located at the upstream side of the crest; near the Talbot Mills intake gates

Downstream Face
The Talbot Mills complex is located at the downstream face of the embankment. No inspection was made of the interior space of the mill complex.

Right of the Spillway – This area is comprised of a portion of the Faulkner Street Embankment which is located between the right spillway abutment, the sluiceway and the stilling basin. This area is well maintained.

Drains
There were no drains in use or visible at this dam at the time or our inspection.

Instrumentation
There were no instruments at this dam at the time of our inspection.

Access Roads and Gates
Access to the dam is via Old Elm and Faulkner Streets. The intake gates at the left side of the dam which formerly provided water to the Talbot Mills are not operational and the intake tunnels have reportedly been infilled with concrete.

A movable gate and concrete weir are located within the sluiceway just east of the Faulkner Street Bridge. The gate is in poor condition and water continuously bypasses the gate. It is unknow whether or not the gate is operational.

2.1.3 Appurtenant Structures

- Primary Spillway

Although the primary spillway was not visible at any time during our site visit due to continued flow, both the left and right abutments were visible and appeared to be constructed of masonry granite blocks. Information contained in the previous inspection report characterize the spillway as a granite block structure forming a broad crested weir. During our site inspection on 30 April 2021, approximately 6-inches of water was flowing across the top of the spillway. It appears the spillway crest is square-cut with a near vertical face.

The primary spillway is approximately 127 feet long with a height of approximately 10.2 feet. Direct measurement of the top of spillway elevation was not possible due to the continuous flow during or site visit. The top elevation at the primary spillway is estimated to be at elevation 109.7±. This elevation is consistent with the data provided in the FEMA study[3] of the Concord River and the elevation shown on the river profile. A complete copy of the FEMA study is provided in Appendix E.

The primary spillway is flanked by small granite block abutments. A portion of the right abutment is constructed of cast-in-place concrete. At flood stages, the abutments serve as auxiliary spillways and provide additional discharge capacity. Spot grades at the top of the abutments range between elevation 111.2± to 111.6± with lengths of approximately 17 feet at the left abutment and 20 feet at the right abutment.

[3] Federal Emergency Management Agency, *Flood Insurance Study*, Town of Billerica, Massachusetts, Middlesex County; February 8, 1985.

Numerous bedrock outcrops are visible at the toe of the spillway and form the downstream channel bed. Elevations of the downstream channel bed vary due to the jagged rock profile which can be seen in Photographs 2, 4, 5, 6 and 7. However, the estimated grade at the top of rock/toe of spillway near the centerline of the channel is approximately elevation 99.5±.

A small tree which was once thriving amongst the jagged bedrock channel just downstream of the primary spillway is now just a stump. This tree was noted in the 1999 report prepared by Weston & Sampson and the 2009 and 2015 reports prepared by Geotechnical Consultants and is clearly visible in the photographs contained in those reports.

Based on the FEMA study, the flood elevation of the 100-year storm event at the Talbot Mills Dam crests at elevation 114.7 feet and the estimated river flow at the dam is 5,675 cfs. A check of the spillway capacity is provided in Appendix F. At the 100-year design level, we estimate the spillway capacity to be approximately 6,650 cfs. Our estimate compares favorably with the estimated capacity provided in the 1999 Weston & Sampson report and the 2009 and 2015 Geotechnical Consultants reports. Therefore, the spillway, in its current state is adequate to pass the design flood.

- Low-Level Outlets

There is no operational low-level outlet for the dam. A sluiceway and intake structure provides water to the Faulkner Mills complex located on the right bank of the river just downstream from the dam. The sluiceway is approximately 13 feet wide and is located on the right side of the dam just east of the right spillway abutment. Walls of the sluiceway are constructed primarily of mortared field stone but portions of the sluiceway are concrete lined. Water in the sluiceway passes under a small bridge supporting Faulkner Street and is deposited into a stilling basin located between Faulkner Street and the Faulkner Mill complex. From the stilling basin, the outlet gate is in a open locked position and directs flows to a turbine which reportedly has not been in service since 1972.

A movable gate and concrete weir are located within the sluiceway just east of the Faulkner Street Bridge. The gate is in poor condition and water continuously bypasses the gate. It is unknown whether or not the gate is operational. There are no other controls for the dam.

Two small low-level outlets are located in the granite block left abutment of the spillway. The outlets are blocked and the conditions of the upstream end of the outlets was not visible for inspection. Invert elevations at the downstream end of the outlets is approximately 110.6 feet. The outlets are shown in Photograph 12.

2.1.4 Downstream Area

Downstream of the dam are the Talbot Mills and Faulkner Mills complexes. Both of these complexes are founded on the exposed bedrock walls adjacent to the downstream channel. Beyond the mill complexes, is a series of floodplains and wetlands areas.

2.1.5 Reservoir Area

The Talbot Mill Dam impounds water to form the Mill Pond. Surface area of the irregularly shaped pond was estimated using scaled aerial photographs from several sources taken over many years. For all years reviewed, the pond shoreline was relatively unchanged.

Th pond is comprised of two branches. The west branch forms the main channel of the Concord River and is the deeper of the two while the east branch is much shallower. During the summer months, the east branch has almost no flow as evidenced by an annual growth of algae on the pond surface. The topography surrounding the pond is relatively flat and level with negligible risk of slides which potentially could affect the water level. A wetland area is located at the south end of the east branch which provides significant reserve capacity during periods of flooding.

2.2 Caretaker Interview

The caretaker is Mr. Bruce Henriksen of 80 Washington Street, Building S, in Norwell, Massachusetts. Mr. Henriksen was interview on 4 May 2021. He has taken over the caretaker position from William Martin since our inspection in 2009. At the time or our interview Mr. Henriksen did not know of a maintenance plan or any work that had taken place on the dam since he became involved.

According to Mr. Robert Martin, although originally part of the Talbot Mills and Faulkner Mills properties, when the mill complexes were sold in recent years, the dam site remained the possession of CRT Development Realty, LLC. Although the dam provided water power to the mill complexes, it is presently used exclusively for recreation, flood control and kept for its historical significance. Mr. Martin also stated that have been in serious discussions with state officials and are fairly far along in the process to breach the dam. He said studies to breach the dam have come back with favorable results.

Mr. Martin indicated that no formal operation or maintenance plan exist for the dam and due to the formerly disputed ownership, no maintenance has been performed at the dam for several years. He did state that some level of clearing debris has taken place since the last inspection.

2.3 Operation and Maintenance Procedures

At the time of the inspection there were no formal operation or maintenance plans available.

2.3.1 Operational Procedures

The dam spillway is uncontrolled, which means that the fixed elevation of the spillway crest controls the level of impoundment. No other operational procedures are in place, or are required, for this dam.

2.3.2 Maintenance of Dam and Operating Facilities

There are no maintenance plans available for this dam.

2.4 Emergency Warning System

There was no information found on an emergency warning system for this dam and it was not required at the time of the last inspection. However, since the last inspection the requirements have been amended and in 302 CMR 10.00: Dam Safety, Department of Conservation and Recreation, it is stated that all dams classified as high hazard potential and significant hazard potential shall submit an Emergency Action Plan (EAP) to the Department of Conservation and Recreation (DCR) and the Massachusetts Emergency Management Agency (MEMA). We understand this dam may be breached in the near future but if it is not, then a EAP should be submitted to the DCR and MEMA.

2.5 Hydrologic/Hydraulic Data

Talbot Mills Dam is an intermediate size, Class II (Significant) hazard structure and in accordance with Massachusetts Law, the spillway design flood (SDF) for the site is ¼ PMF (100 year) storm event. A FEMA flood study was completed for the Town of Billerica in 1985. A copy of the study entitled *Flood Insurance Study*, Town of Billerica, Massachusetts, Middlesex County; February 8, 1985 is included as Appendix E. A summary of available information is provided below:

A. Spillway Design Flood (SDF) Return Period:	¼ PMF
B. Precipitation (inches) and methodology:	FEMA
C. SDF Inflow (cfs):	5,675
D. SDF Outflow (cfs):	--
E. Principal Spillway Capacity (cfs):	5,675
F. Auxiliary Spillway Capacity (cfs):	620
G. Low-level Outlet Capacity (cfs):	N/A
H. Percentage of the SDF that can be safely routed without overtopping:	100

Based on the FEMA study, the flood elevation of the 100-year storm event at the Talbot Mills Dam crests at elevation 114.7 feet and the estimated river flow at the dam is 5,675 cfs. A check of the spillway capacity is provided in Appendix F. At the 100-year design level, we estimate the spillway capacity to be approximately 6,650 cfs. Our estimate compares favorably with the estimated capacity provided in the 1999 Weston & Sampson report and the 2009 and 2015 Geotechnical Consultants reports. Therefore, the spillway, in its current state is adequate to pass the design flood.

2.6 Structural and Seepage Stability

2.6.1 Embankment Structural Stability

Based on our inspection and review, as well as historical evidence, the dam is stable. The spillway appears intact with a level crest. The impoundment side walls are vertical and level. The embankment supports Old Elm/Faulkner Street is paved and in good condition. There are no signs of vehicular ruts, foot trails, sloughing or animal burrows.

2.6.2 Structural Stability of Non-Embankment Structures

From our observations the Talbot Mills and Faulkner Mills complexes are founded on the exposed bedrock walls adjacent to the downstream channel. The Faulkner Street Bridge, as it appears, the center pier and abutment footings are armored and founded directly on the bedrock. We recommend that the necessary data should be collected to complete an analysis of the structural stability of non-embankment structures in accordance with 302 CMR 10.14.

2.6.3 Seepage Stability

There was no significant seepage observed during our site visit on 30 April 2021. No seepage instrumentation was available and it appears tat all field stone and concrete is founded on rock.

SECTION 3

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

In general, the overall condition of Talbot Mills Dam is Fair. The dam was found to have the following deficiencies:

1. Lack of operation and maintenance plan.
2. Lack of routine oversight of the dam, particularly during a storm event.
3. Lack of working controls.
4. Lack of functional low-level outlet.
5. Leaks and inability to control water at the sluiceway gate and weir.
6. Remove tree trunks and branches just upstream of the spillway.

Previously identified deficiencies from prior inspection reports are summarized in the table below. The table also presents the present condition or resolution of the deficiencies.

Previously Identified Deficiency	***Resolution or Current Condition***
Lack of operation and maintenance plan.	Unresolved, no apparent change since last inspection.
Lack of routine oversight of the dam, particularly during a storm event.	Unresolved, no apparent change since las inspection.
Lack of working controls.	Unresolved, and appears to be unchanged since last inspection.
Lack of functional low-level outlet	Unresolved, and appears to be unchanged since last inspection.
Leaks and inability to control water at sluiceway gate and weir.	Unresolved, no apparent change since last inspection.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the dam. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of environmental permits needs to be determined for activities that may occur within resource areas under the jurisdiction of local conservation commissions, MADEP, or other regulatory agencies.

3.2 Studies and Analyses

In 302 CMR 10.00: Dam Safety, Department of Conservation and Recreation, it is stated that all dams classified as high hazard potential and significant hazard potential shall submit an Emergency Action Plan (EAP) to the Department of Conservation and Recreation (DCR) and the Massachusetts Emergency Management Agency (MEMA). We understand this dam may be breached in the coming months but if it is not, then a EAP needs to be submitted to the DCR and MEMA. We also recommend that an Operations and Maintenance (O&M) manual should be implemented.

3.3 Recurrent Maintenance Recommendations

There are no routine maintenance procedures in place for this dam. A comprehensive maintenance and "routine" inspection plan should be implemented.

1. Regular maintenance activities should prevent growth of unwanted vegetation on the embankment, and pond periphery to reduce the potential for debris to impede flow over the spillway and downstream channel.

2. Clear debris from the spillway and downstream channel on a regular basis. Inspect the spillway for accumulation of debris particularly after storm events or other periods of high runoff.

3. Regularly inspect the dam for indications of seepage or erosion. Particular emphasis should be placed on:

    - the spillway walls
    - portions of the impoundment facing walls immediately adjacent to the spillway on the left side of the dam
    - the fieldstone wall immediately downstream of the spillway and north of the Faulkner Street Bridge
    - removal of debris and unwanted vegetation from the sluiceway and stilling basin on the right side of the primary spillway.

3.4 Minor Repair Recommendations

These recommendations may require construction by a contractor experienced in dam repair.

- Remove trees on the upstream face of the roadway embankment near the non-functional intake gates to the Talbot Mills Complex.

- Remove tree trunks and branches just upstream of the primary spillway.

- Repair/replace the sluiceway and stilling basin gates so that the gates are operational and can provide emergency bypass control.

- Inspect the interior of the Talbot Mills complex, particularly the downstream end of the former intake structures. The infilling of the intake tunnels on the left side of the dam rendered these intakes inoperable. Given the configuration of the dam, proximity of the mill complexes, and changing ownership of the downstream properties, the re-construction of a low-level outlet in this area is impractical.

3.5 Remedial Modifications Recommendations

Repair/replace the left spillway abutment to provide an operational low-level outlet.

3.6 Alternatives

At this time the owner is looking into the possibility of breaching this dam. At time of the inspection many fish were observed downstream at the toe of the dam. Breaching of the dam would allow the fish to travel further upstream.

3.7 Opinion of Probable Construction Costs

The following conceptual opinions of probable construction costs have been developed for the recommendations and remedial measures noted above. The costs herein are based on a limited investigation and are provided for general information only. This should not be considered an engineer's estimate, as actual construction costs may be somewhat less or considerably more than indicated

Talbot Mills Dam

• Remove trees	$5,000
• Repair/replace the sluiceway and stilling basin gates	$60,000
• Repair/replace the left spillway and install gates	$40,000

FIGURES

TALBOT MILLS DAM
Billerica, Massachusetts
NID ID# MA00774

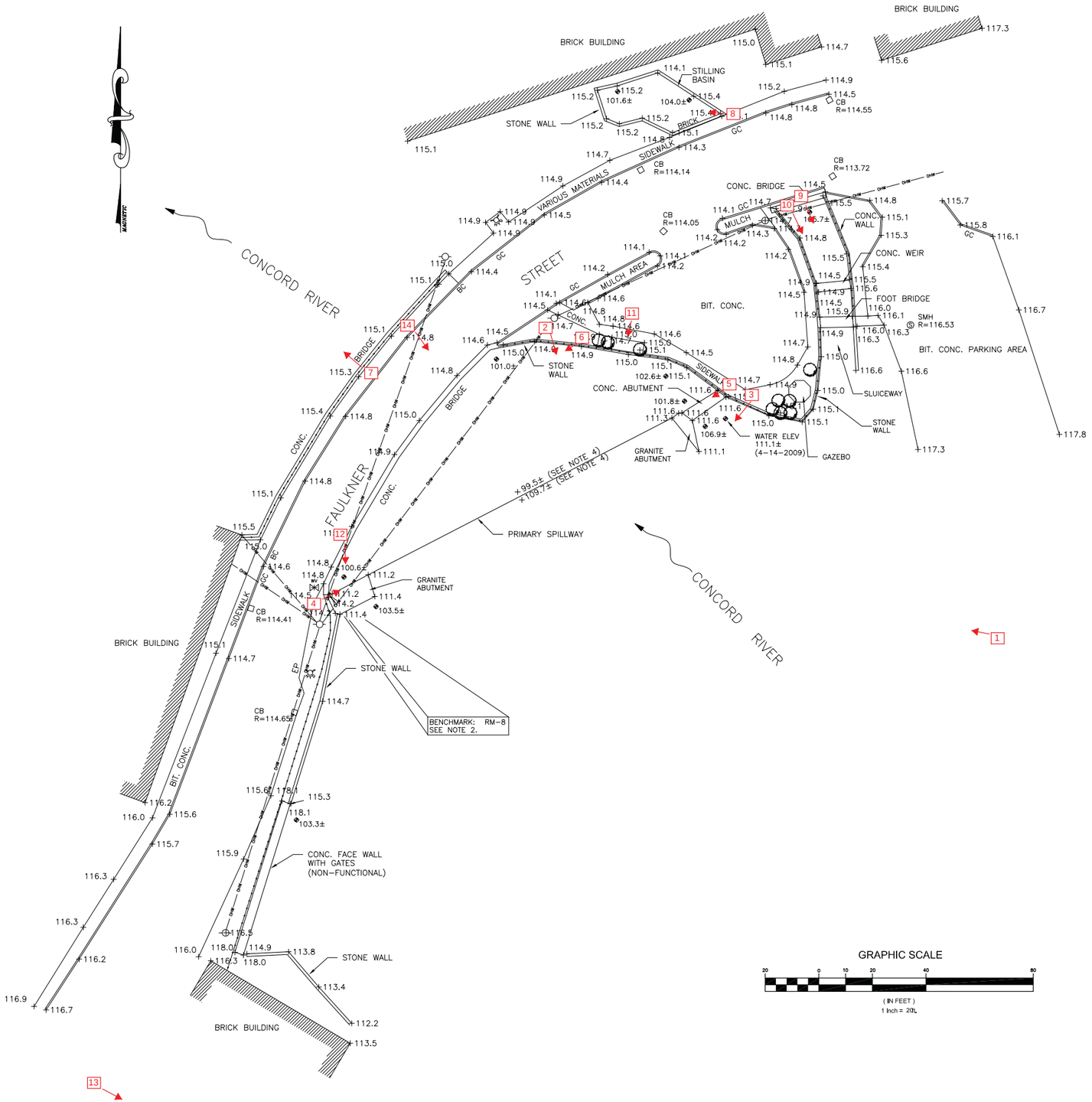
N

LOCUS PLAN
U.S.G.S. QUADRANGLE
Billerica
APPROX. SCALE 1:24 000

Geotechnical Consultants, Inc.
201 Boston Post Road West
Marlborough, MA 01752
(508)229-0900 FAX (508)229-2279

GCI Project # 2215032

Figure 1.



NOTES:

1. THE FIELD WORK WAS PERFORMED ON APRIL 14, 2009. A MAGNETIC NORTH READING WAS OBTAINED DURING THE FIELD WORK.
2. THE STARTING VERTICAL BENCHMARK IS THE NORTHEAST SIDE OF THE TOP OF GRANITE BLOCK, AT THE SOUTHWEST END OF THE TALBOT MILL DAM NEAR FAULKNER STREET, ON THE SOUTHWEST SIDE OF THE SPILLWAY AT GROUND LEVEL. A SQUARE CUT WAS NOT FOUND ON THE GRANITE BLOCK. ELEVATION IS 114.26 (RM-8) ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 AS DEPICTED ON THE FEMA FLOOD MAP 250183, PANEL 5 OF 10 DATED AUGUST 5, 1985. A BENCHMARK WAS CHECKED AS PROVIDED BY THE BILLERICA ENGINEERING DEPARTMENT SINCE THE SQUARE CUT WAS NOT VISIBLE. THE BENCHMEAK VERIFIED THE ACCURACY OF RM-8. IT IS DESCRIBED AS A HYDRANT SPINDLE AT THE SOUTHEAST CORNER OF LOWELL STREET AND TALBOT STREET (ELEV. 131.39)
3. THE SOLE PURPOSE OF THIS PLAN IS TO DEPICT PLANIMETRIC AND SPOT ELEVATIONS IN THE VICINITY OF THE TALBOT MILL DAM.
4. GRADES AT MID-POINT OF SPILLWAY WERE TAKEN FROM FEMA FLOOD INSURANCE STUDY DATED FEBRUARY 5, 1985.

LEGEND:

BIT. CONC.	BITUMINOUS CONCRETE
GC	GRANITE CURB
CONC.	CONCRETE
CB □	CATCHBASIN
R	RIM
SMH Ⓢ	SEWER MANHOLE
+110.0	SPOT ELEVATION
✥ 110.0±	GROUND ELEVATION (UNLESS NOTED OTHERWISE)
	TREE
EP	EDGE OF PAVEMENT
BC	BITUMINOUS CONCRETE CURB
-○-	UTILITY POLE
—OHW—	OVERHEAD WIRES

Talbot Mills Dam MA00774
North Billerica, Massachusetts
Dam Site Plan
Date of Inspection: April 30, 2021 Figure 2.

DWG No. 09-011 SITE PLAN

EAGLEBROOK
EAGLEBROOK ENGINEERING & SURVEY, LLC
199 NEWBURY STREET
DANVERS, MASS. 01923
TEL: (781) 771-7310

Geotechnical Consultants, Inc.
201 Boston Post Road West
Marlborough, MA 01752
Phone: (508)229-0900
FAX (508)229-2279
www.geotechnical.us

TALBOT MILL DAM
LOCATED IN
BILLERICA, MASSACHUSETTS
PREPARED FOR
GEOTECHNICAL CONSULTANTS, INC.
201 BOSTON POST ROAD WEST
MARLBOROUGH, MASSACHUSETTS

COMMONWEALTH OF MASSACHUSETTS
RICHARD PIZZI
32644
REGISTERED PROFESSIONAL ENGINEER

DATE:
APRIL 20, 2009

NO.:	DESCRIPTION:	DATE:
1	Spillway Grades	5-22-09

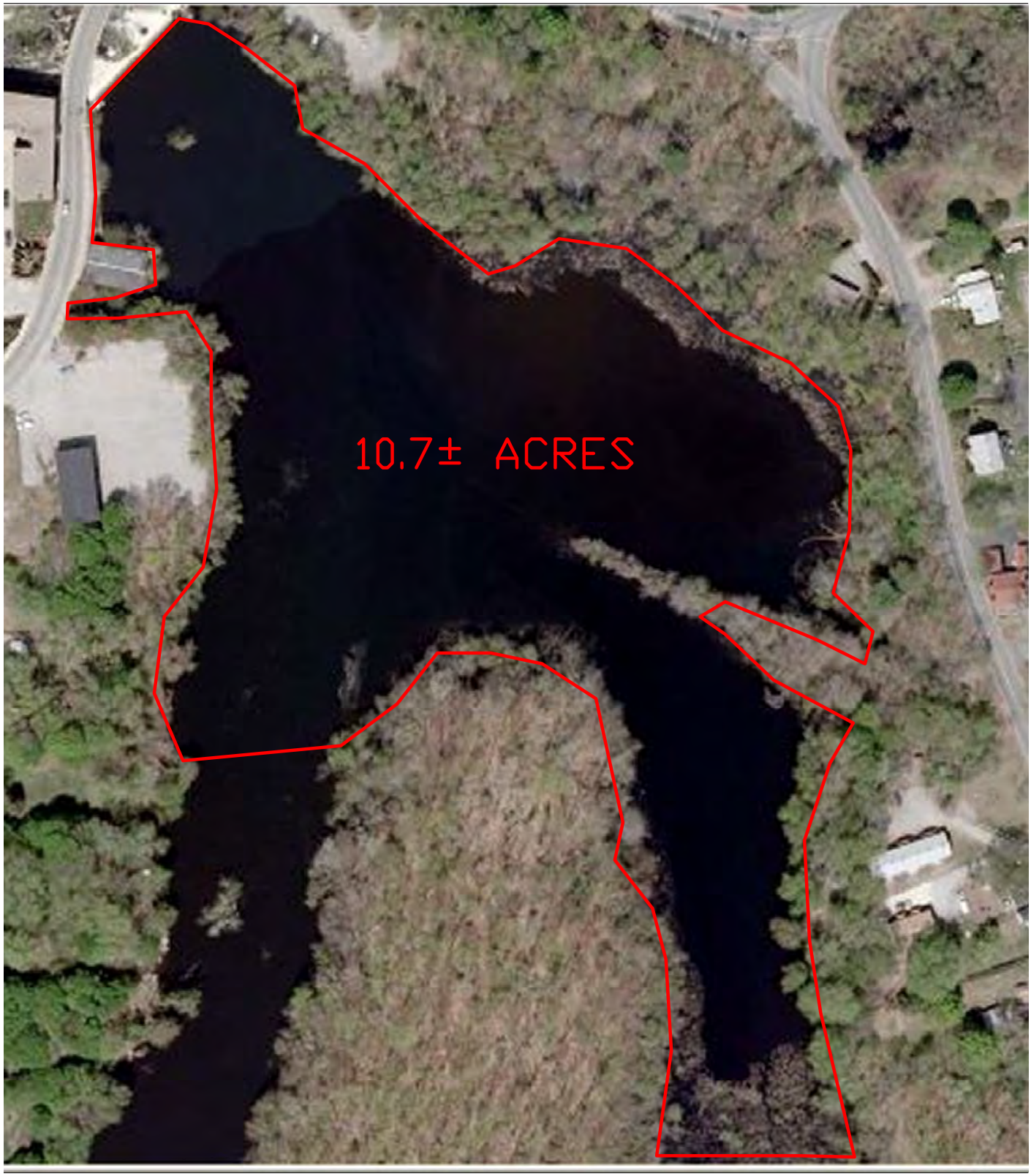
REVISIONS:

DRAWN BY: MJJ
CHECKED BY: MJJ/RP
SCALE: AS NOTED

PROJECT NO. 09-011

TITLE:
SITE PLAN
EX-1

SHEET No. 1 OF 1



0 150 300 600

1:150 FEET

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201 Boston Post Road West
Marlborough, MA 01752
(508)229-0900 FAX (508)229-2279

Rev.	Date
0	30 APRIL 2021

TALBOT MILLS DAM

FAULKNER STREET

Billerica, Massachusetts

FIG. 3

APPENDIX A
Photographs

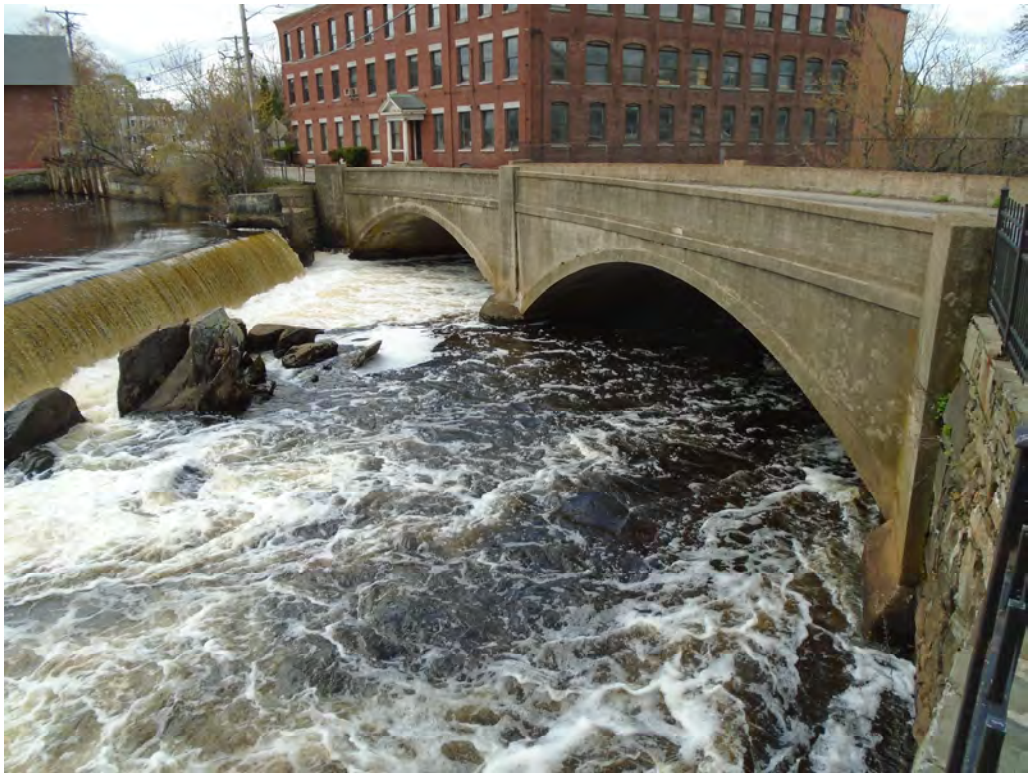
Photograph 1. Overview of Talbot Mills Dam Looking Downstream

Photograph 2. Overview of Talbot Mills Dam Looking Upstream

Photograph 3. Concrete Wall and Intake Gates Left of Spillway

Photograph 4. Downstream of Spillway Viewed from Left Abutment

Photograph 5. Downstream of Spillway Viewed from Right Abutment



Photograph 6. Falkner Street Bridge Viewed from Right Abutment

Photograph 7. Downstream Channel Viewed from Falkner Street Bridge

Photograph 8. Stilling Basin with Outlet Gate Locked in Open

Photograph 9. Sluiceway with Movable Gate and Concrete Weir

Photograph 10. Water Seepage Through the Sluiceway Gate

Photograph 11. Historic Marker Dedicated to the Employees of Faulkner Mills

Photograph 12. Lower Level Outlet at Left Spillway Abutment

Photograph 13. Alignment of Old Middlesex Canal

Photograph 14. Overview of Reservoir

APPENDIX B
Inspection Checklist

DAM SAFETY INSPECTION CHECKLIST

NAME OF DAM: Talbot Mills Dam

STATE ID #: 4-9-31-1

REGISTERED: ☑ YES ☐ NO

NID ID #: MA 00774

STATE SIZE CLASSIFICATION: Intermediate

STATE HAZARD CLASSIFICATION: Significant

CHANGE IN HAZARD CLASSIFICATION REQUESTED?: No

DAM LOCATION INFORMATION

CITY/TOWN: Billerica

COUNTY: Middlesex

DAM LOCATION: 67 Faulkner Street
(street address if known)

ALTERNATE DAM NAME: Old Elm Street/Old Elm Street Extension

USGS QUAD.: Billerica

LAT.: 42.59173° North

LONG.: 71.28400° East

DRAINAGE BASIN: Concord

RIVER: Concord River

IMPOUNDMENT NAME(S): Mill Pond (a.k.a. Talbot Mills Pond or Faulkner Mills Pond)

GENERAL DAM INFORMATION

TYPE OF DAM: Masonry/Earth (Spillway: Masonry Gravity)

OVERALL LENGTH (FT): 316

PURPOSE OF DAM: Recreational and flood control purposes

NORMAL POOL STORAGE (ACRE-FT): 110±

YEAR BUILT: circa 1828

MAXIMUM POOL STORAGE (ACRE-FT): 162±

STRUCTURAL HEIGHT (FT): 16±

EL. NORMAL POOL (FT): 110.5±

HYDRAULIC HEIGHT (FT): 10.2

EL. MAXIMUM POOL (FT): 114.8±

FOR INTERNAL MADCR USE ONLY

FOLLOW-UP INSPECTION REQUIRED: ☐ YES ☐ NO

CONDITIONAL LETTER: ☐ YES ☐ NO

NAME OF DAM: Talbot Mills Dam | STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 | NID ID #: MA 00774

INSPECTION SUMMARY

DATE OF INSPECTION: April 30, 2021 | DATE OF PREVIOUS INSPECTION: November 6, 2015

TEMPERATURE/WEATHER: 50's, Cloudy | ARMY CORPS PHASE I: ☐ YES ☑ NO If YES, date

CONSULTANT: Geotechnical Consultants, Inc. | PREVIOUS DCR PHASE I: ☑ YES ☐ NO If YES, date 11/6/2015

BENCHMARK/DATUM: NGVD 1929

OVERALL PHYSICAL CONDITION OF DAM: FAIR | DATE OF LAST REHABILITATION: Unknown

SPILLWAY CAPACITY: >100% SDF w/ no actions by Caretaker

EL. POOL DURING INSP.: 110.5± | EL. TAILWATER DURING INSP.: 103.6±

PERSONS PRESENT AT INSPECTION

NAME	TITLE/POSITION	REPRESENTING
Daniel Kenneally	Professional Engineer	Geotechnical Consultants, Inc.

EVALUATION INFORMATION

	Click on box to select E-code
E1) TYPE OF DESIGN	1
E2) LEVEL OF MAINTENANCE	1
E3) EMERGENCY ACTION PLAN	1
E4) EMBANKMENT SEEPAGE	5
E5) EMBANKMENT CONDITION	5
E6) CONCRETE CONDITION	4
E7) LOW-LEVEL OUTLET CAPACITY	1

	Click on box to select E-code
E8) LOW-LEVEL OUTLET CONDITION	1
E9) SPILLWAY DESIGN FLOOD CAPACITY	5
E10) OVERALL PHYSICAL CONDITION	3
E11) ESTIMATED REPAIR COST	
ROADWAY OVER CREST	YES
BRIDGE NEAR DAM	YES

NAME OF INSPECTING ENGINEER: Daniel Kenneally | SIGNATURE:

NAME OF DAM: Talbot Mills Dam | STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 | NID ID #: MA 00774

OWNER:		CARETAKER:	
ORGANIZATION	CRT Development Realty, LLC	ORGANIZATION	LMHS, PC
NAME/TITLE	Mr. Robert Martin	NAME/TITLE	Mr. Bruce Henriksen
STREET	242 5th Street South	STREET	80 Washington Street, Building S
TOWN, STATE, ZIP	Naples, FL 34102	TOWN, STATE, ZIP	Norwell, MA 02061
PHONE	978-314-8080	PHONE	781-878-9111
EMERGENCY PH. #		EMERGENCY PH. #	
FAX		FAX	
EMAIL	martinr181@gmail.com	EMAIL	bhenriksen@lmhspc.com
OWNER TYPE	Private		

PRIMARY SPILLWAY TYPE: Broad Crest Granite Masonry

SPILLWAY LENGTH (FT): 127 | SPILLWAY CAPACITY (CFS): 6,030

AUXILIARY SPILLWAY TYPE: Overflow - Both sides of Primary | AUX. SPILLWAY CAPACITY (CFS): 620

NUMBER OF OUTLETS: 1 | OUTLET(S) CAPACITY (CFS): Unknown - Gate is non-functional

TYPE OF OUTLETS: Sluiceway with Gate | TOTAL DISCHARGE CAPACITY (CFS): 6,650

DRAINAGE AREA (SQ MI): 370 | SPILLWAY DESIGN FLOOD (PERIOD/CFS): 100 year / 5,675 cfs

HAS DAM BEEN BREACHED OR OVERTOPPED ☐ YES ☑ NO | IF YES, PROVIDE DATE(S):

FISH LADDER (LIST TYPE IF PRESENT): none

DOES CREST SUPPORT PUBLIC ROAD? ☑ YES ☐ NO | IF YES, ROAD NAME: Old Elm Street/Faulkner Street

PUBLIC BRIDGE WITHIN 50' OF DAM? ☑ YES ☐ NO | IF YES, ROAD/BRIDGE NAME: Faulkner Street Bridge

MHD BRIDGE NO. (IF APPLICABLE):

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
CREST	1. SURFACE TYPE	Paved Roadway			
	2. SURFACE CRACKING	Minor cracking			
	3. SINKHOLES, ANIMAL BURROWS	None observed			
	4. VERTICAL ALIGNMENT (DEPRESSIONS	No depressions or sinkholes observed			
	5. HORIZONTAL ALIGNMENT	Straight			
	6. RUTS AND/OR PUDDLES	None observed			
	7. VEGETATION (PRESENCE/CONDITION)	Small trees adjacent to upstream face near concrete intake structure face wall			
	8. ABUTMENT CONTACT	Good; no indications of seepage			

ADDITIONAL COMMENTS:

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S SLOPE	1. WET AREAS (NO FLOW)	None observed			
	2. SEEPAGE	None observed			
	3. SLIDE, SLOUGH, SCARP	None			
	4. EMB.-ABUTMENT CONTACT	OK			
	5. SINKHOLE/ANIMAL BURROWS	None observed			
	6. EROSION	None observed			
	7. UNUSUAL MOVEMENT	None observed			
	8. VEGETATION (PRESENCE/CONDITION)	None			

ADDITIONAL COMMENTS: Note: The Talbot Mills Complex and Faulkner Mills complex from both the left and right downstream sides of the dam, respectively. These properties are not owned by the dam owners. Access to the inside of the mill complexes was not available at the time of this inspection.

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
U/S SLOPE	1. SLIDE, SLOUGH, SCARP	None observed. (see note 1)			
	2. SLOPE PROTECTION TYPE AND COND.	See note 1. Condition of walls; good.			
	3. SINKHOLE/ANIMAL BURROWS	None observed			
	4. EMB.-ABUTMENT CONTACT	OK. No observed indications of seepage.			
	5. EROSION	None observed			
	6. UNUSUAL MOVEMENT	None observed			
	7. VEGETATION (PRESENCE/CONDITION)	Small trees adjacent to upstream face near concrete intake structures face wall on top.			

ADDITIONAL COMMENTS: 1. Upstream faces of dam are constructed with either masonry stone walls or concrete wall.

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
INSTR.	1. PIEZOMETERS	N/A			
	2. OBSERVATION WELLS	N/A			
	3. STAFF GAGE AND RECORDER	N/A			
	4. WEIRS	N/A			
	5. INCLINOMETERS	N/A			
	6. SURVEY MONUMENTS	N/A			
	7. DRAINS	N/A			
	8. FREQUENCY OF READINGS	N/A			
	9. LOCATION OF READINGS	N/A			

ADDITIONAL COMMENTS: Ther is no known instrumentation at any part of the dam or appurtenant structures.

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

DOWNSTREAM MASONRY WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S WALLS	1. WALL TYPE	Masonry Walls; predominantly field stone. Some cut granite block. Concrete at Talbot M			
	2. WALL ALIGNMENT	Straight			
	3. WALL CONDITION	Good			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min: 6 | max: 16 | avg: 10			
	5. SEEPAGE OR LEAKAGE	None observed			
	6. ABUTMENT CONTACT	No observed seepage			
	7. EROSION/SINKHOLES BEHIND WALL	None observed			
	8. ANIMAL BURROWS	None observed			
	9. UNUSUAL MOVEMENT	None observed			
	10. WET AREAS AT TOE OF WALL	None observed. See note 1.			

ADDITIONAL COMMENTS: Note: The Talbot Mills Complex and the Faulkner Mills complex from both the left and right downstream sides of the dam, respectively. These properties are not owned by the dam owners. Access to the inside of the mill complexes was not available at the time of this inspection.

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

UPSTREAM MASONRY WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
U/S WALLS	1. WALL TYPE	Masonry Walls; predominantly field stone. Some cut granite block. Concrete at Talbot M			
	2. WALL ALIGNMENT	Straight			
	3. WALL CONDITION	Good			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min: 6 | max: 16 | avg: 10			
	5. ABUTMENT CONTACT	No observed seepage.			
	6. EROSION/SINKHOLES BEHIND WALL	None observed			
	7. ANIMAL BURROWS	None observed			
	8. UNUSUAL MOVEMENT	None observed			

ADDITIONAL COMMENTS:

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S AREA	1. ABUTMENT LEAKAGE	None observed			
	2. FOUNDATION SEEPAGE	None observed			
	3. SLIDE, SLOUGH, SCARP	None observed			
	4. WEIRS	N/A			
	5. DRAINAGE SYSTEM	N/A			
	6. INSTRUMENTATION	N/A			
	7. VEGETATION	Trees within the bedrock outcrops.			
	8. ACCESSIBILITY	Not Accessible			
	9. DOWNSTREAM HAZARD DESCRIPTION	The Faulkner Street Bridge is immediately downstream of the dam spillway. The Talbot and Faulkner Mills are on the left and right channel banks, respectively.			
	10. DATE OF LAST EAP UPDATE	0			

ADDITIONAL COMMENTS: Note: The Talbot Mills Complex and the Faulkner Mills complex from both the left and right downstream sides of the dam, respectively. These properties are not owned by the dam owners. Access to the inside of the mill complexes was not available at the time of this inspection.

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

MISCELLANEOUS

AREA INSPECTED	CONDITION	OBSERVATIONS
MISC.	1. RESERVOIR DEPTH (AVG)	6± feet
	2. RESERVOIR SHORELINE	Generally flat and level. Some trees and little underbrush.
	3. RESERVOIR SLOPES	No Significant slopes
	4. ACCESS ROADS	Old Elm Street/Faulkner Street
	5. SECURITY DEVICES	None
	6. VANDALISM OR TRESPASS	☐ YES ☑ NO WHAT:
	7. AVAILABILITY OF PLANS	☐ YES ☑ NO DATE:
	8. AVAILABILITY OF DESIGN CALCS	☐ YES ☑ NO DATE:
	9. AVAILABILITY OF EAP/LAST UPDATE	☐ YES ☑ NO DATE:
	10. AVAILABILITY OF O&M MANUAL	☐ YES ☑ NO DATE:
	11. CARETAKER/OWNER AVAILABLE	☑ YES ☐ NO DATE: xxxxxx
	12. CONFINED SPACE ENTRY REQUIRED	☐ YES ☑ NO PURPOSE:

ADDITIONAL COMMENTS:

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
SPILLWAY	SPILLWAY TYPE	Broad Crested Masonry - probably granite block construction (see note 1)			
	WEIR TYPE	N/A			
	SPILLWAY CONDITION	Presumed Good - No indication of instability			
	TRAINING WALLS	N/A - Small stone wall at left embankment			
	SPILLWAY CONTROLS AND CONDITION	None			
	UNUSUAL MOVEMENT	None observed			
	APPROACH AREA	Mostly clear and unobstructed. Some tree branches and logs need to be removed.			
	DISCHARGE AREA	Only the stump remains (see note 2)			
	DEBRIS	Some tree branches and logs ontop of the spillway and need to be removed.			
	WATER LEVEL AT TIME OF INSPECTION	Elevation 110.5 on 30 April 2021			

ADDITIONAL COMMENTS: 1. During the inspection date, only a small portion was visible due to the continuous flow.

2. Only the stump remains of the tree that was once growing among the rocks immediately downstrea of the spillway

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
SPILLWAY	SPILLWAY TYPE	Sluiceway at right of primary spillway; serves as intake for Faulkner Mills			
	WEIR TYPE	N/A			
	SPILLWAY CONDITION	Fair			
	TRAINING WALLS	Masonry stone and concrete			
	SPILLWAY CONTROLS AND CONDITION	Wood Gate - Non Functional			
	UNUSUAL MOVEMENT	None observed			
	APPROACH AREA	Clear, unobstructed			
	DISCHARGE AREA	Discharge through Faulkner Mills Complex; Not inspected			
	DEBRIS	Minor debris (wood, trash) in stilling basin and very minor vegetation growing within			
	WATER LEVEL AT TIME OF INSPECTION	N/A			

ADDITIONAL COMMENTS:

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
OUTLET WORKS	TYPE	Note 1.			
	INTAKE STRUCTURE	Intake tunner under Old Elm Street reportedly filled with concrete - no records.			
	TRASHRACK	N/A			
	PRIMARY CLOSURE	N/A			
	SECONDARY CLOSURE	N/A			
	CONDUIT	N/A			
	OUTLET STRUCTURE/HEADWALL	Outlet structure located within Talbot Mill complex - not inspected.			
	EROSION ALONG TOE OF DAM	None observed. Bedrock visible at channel bed			
	SEEPAGE/LEAKAGE	None observed.			
	DEBRIS/BLOCKAGE	Reportedly completely blocked by concrete infill - no records available.			
	UNUSUAL MOVEMENT	None observed.			
	DOWNSTREAM AREA	Not inspected.			
	MISCELLANEOUS				

ADDITIONAL COMMENTS: 1. Five (5) manually operated wooden gates left of the primary spillway - gates not operational. These gates formerly intake structure for the Talbot Mils complex. Also, a blocked low level outlet is located in the left spillway abutment. No gates visible at this outlet.

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

CONCRETE/MASONRY DAMS

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
GENERAL	TYPE				
	AVAILABILITY OF PLANS	None available			
	AVAILABILITY OF DESIGN CALCS	None available			
	PIEZOMETERS	None available			
	OBSERVATION WELLS	None available			
	INCLINOMETERS	None available			
	SEEPAGE GALLERY	N/A			
	UNUSUAL MOVEMENT	None observed			

ADDITIONAL COMMENTS:

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

CONCRETE/MASONRY DAMS (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
CREST	TYPE				
	SURFACE CONDITIONS	Good condition. Concrete limited face wall at intake gate left of primary spillway.			
	CONDITIONS OF JOINTS	No observed craks or indications of seepage.			
	UNUSUAL MOVEMENT	None observed.			
	HORIZONTAL ALIGNMENT	Straight. No observed displacements.			
	VERTICAL ALIGNMENT	Straight. No observed displacements.			

ADDITIONAL COMMENTS:

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

CONCRETE/MASONRY DAMS (DOWNSTREAM FACE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S FACE	TYPE				
	SURFACE CONDITIONS	Surface appeared to be in good condition. See note 1.			
	CONDITIONS OF JOINTS	The joints looked to be in good condition. See note 1.			
	UNUSUAL MOVEMENT	None observed. See note 1.			
	ABUTMENT CONTACT	See note 1.			
	LEAKAGE	None observed. See note 1.			

ADDITIONAL COMMENTS: 1. During the inspection date, only a very small portion of the spillway was visible. Any observations listed above are based on the only small portion that was visible at the time of the inspection.

NAME OF DAM: Talbot Mills Dam STATE ID #: 4-9-31-1

INSPECTION DATE: April 30, 2021 NID ID #: MA 00774

CONCRETE/MASONRY DAMS (UPSTREAM FACE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
U/S FACE	TYPE				
	SURFACE CONDITIONS	Flat and level. No indications of seepage such as sinkholes or depressions.			
	CONDITIONS OF JOINTS	Ok; minor seepage at granite block abutment joints.			
	UNUSUAL MOVEMENT	None observed			
	ABUTMENT CONTACTS	Clean contact. No seepage observed.			

ADDITIONAL COMMENTS:

APPENDIX C
Previous Reports and References

PREVIOUS REPORTS AND REFERENCES

The following is a list of reports that were located during the file review, or were referenced in previous reports.

1. Department of Environmental Management, Office of Dam Safety, Talbot Mills Dam Phase 1 Inspection/Evaluation Report – Billerica, Massachusetts, Geotechnical Consultants, Inc.; November 06, 2015

2. Department of Environmental Management, Office of Dam Safety, Talbot Mills Dam Phase 1 Inspection/Evaluation Report – Billerica, Massachusetts, Geotechnical Consultants, Inc.; May 22, 2009

3. Department of Environmental Management, Office of Dam Safety, Owned Dam Inspection/Evaluation Report – Billerica, Massachusetts, Weston & Sampson Engineers, Inc.; May 20, 1999

4. Department of Environmental Management, Office of Dam Safety, Inspection/Evaluation Report – Billerica, Massachusetts, O'Brien & Gere Engineers, Inc..; November 17, 1987

The following references were utilized during the preparation of this report and the development of the recommendations presented herein.

5. *www.middlesexcanal.org*

6. Eaglebrook Engineering & Survey, Inc., Site Plan EX-1 "Talbot Mill Dam – Billerica, Massachusetts; April 20, 2009

7. Federal Emergency Management Agency, Flood Insurance Study, Town of Billerica, Massachusetts, Middlesex County, Feb 08 1985

8. Environmental Data Resources, Inc., Aerial Photo Decade Package, Talbot Mills Dam – Billerica, Massachusetts; April 13, 2009

APPENDIX D
Definitions

COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions refer to 302 CMR10.00 Dam Safety, or other reference published by FERC, Dept. of the Interior Bureau of Reclamation, or FEMA. Please note should discrepancies between definitions exist, those definitions included within 302 CMR 10.00 govern for dams located within the Commonwealth of Massachusetts.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.

Downstream – Shall mean the high side of the dam, the side opposite the upstream side.

Right – Shall mean the area to the right when looking in the downstream direction.

Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – Shall mean any artificial barrier, including appurtenant works, which impounds or diverts water.

Embankment – Shall mean the fill material, usually earth or rock, placed with sloping sides, such that it forms a permanent barrier that impounds water.

Crest – Shall mean the top of the dam, usually provides a road or path across the dam.

Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.

Appurtenant Works – Shall mean structures, either in dams or separate therefrom, including but not be limited to, spillways; reservoirs and their rims; low-level outlet works; and water conduits including tunnels, pipelines, or penstocks, either through the dams or their abutments.

Spillway – Shall mean a structure over or through which water flows are discharged. If the flow is controlled by gates or boards, it is a controlled spillway; if the fixed elevation of the spillway crest controls the level of the impoundment, it is an uncontrolled spillway.

Size Classification

(as listed in Commonwealth of Massachusetts, 302 CMR 10.00 *Dam Safety*)

Large – structure with a height greater than 40 feet or a storage capacity greater than 1,000 acre-feet.

Intermediate – structure with a height between 15 and 40 feet or a storage capacity of 50 to 1,000 acre-feet.

Small – structure with a height between 6 and 15 feet and a storage capacity of 15 to 50 acre-feet.

Non-Jurisdictional – structure less than 6 feet in height or having a storage capacity of less than 15 acre-feet.

Hazard Classification

(as listed in Commonwealth of Massachusetts, 302 CMR 10.00 *Dam Safety*)

High Hazard (Class I) – Shall mean dams located where failure will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s) or railroad(s).

Significant Hazard (Class II) – Shall mean dams located where failure may cause loss of life and damage to home(s), industrial or commercial facilities, secondary highway(s) or railroad(s), or cause the interruption of the use or service of relatively important facilities.

Low Hazard (Class III) – Dams located where failure may cause minimal property damage to others. Loss of life is not expected.

General

EAP – Emergency Action Plan – Shall mean a predetermined (and properly documented) plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam failure.

O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.

Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.

Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet.

Height of Dam (Structural Height) – Shall mean the vertical distance from the lowest portion of the natural ground, including any stream channel, along the downstream toe of the dam to the lowest point on the crest of the dam.

Hydraulic Height – means the height to which water rises behind a dam and the difference between the lowest point in the original streambed at the axis of the dam and the maximum controllable water surface.

Maximum Water Storage Elevation – means the maximum elevation of water surface which can be contained by the dam without overtopping the embankment section.

Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.

Maximum Storage Capacity – The volume of water contained in the impoundment at maximum water storage elevation.

Normal Storage Capacity – The volume of water contained in the impoundment at normal water storage elevation.

Condition Rating

Unsafe – Major structural*, operational, and maintenance deficiencies exist under normal operating conditions.

Poor – Significant structural*, operation and maintenance deficiencies are clearly recognized for normal loading conditions.

Fair – Significant operational and maintenance deficiencies, no structural deficiencies. Potential deficiencies exist under unusual loading conditions that may realistically occur. Can be used when uncertainties exist as to critical parameters.

Satisfactory – Minor operational and maintenance deficiencies. Infrequent hydrologic events would probably result in deficiencies.

Good – No existing or potential deficiencies recognized. Safe performance is expected under all loading including SDF.

* Structural deficiencies include but are not limited to the following:

- Excessive uncontrolled seepage (e.g., upwelling of water, evidence of fines movement, flowing water, erosion, etc.)
- Missing riprap with resulting erosion of slope
- Sinkholes, particularly behind retaining walls and above outlet pipes, possibly indicating loss of soil due to piping, rather than animal burrows
- Excessive vegetation and tree growth, particularly if it obscures features of the dam and the dam cannot be fully inspected
- Deterioration of concrete structures (e.g., exposed rebar, tilted walls, large cracks with or without seepage, excessive spalling, etc.)
- Inoperable outlets (gates and valves that have not been operated for many years or are broken)

APPENDIX E
FEMA Flood Insurance Study, 1985

APPENDIX F
(The Dam Spillway has remained unchanged since the previous inspection. Therefore, our attached Spillway Capacity Check from 2009 is sufficient)

Project TALBOT MILLS DAM - NORTH BILLERICA
Project No. 2092945 Sheet No. 1 OF 2.
Calculated By RP Date 5-4-2009.
Checked By Date
Subject Scale

Geotechnical Consultants, Inc.
201 Boston Post Road West
Marlborough, MA 01752
(508) 229-0900 FAX (508) 229-2279

SPILL WAY CAPACITY CHECK.

REFERENCES: 1. USACE EM-110-2-1603.
HYDRAULIC DESIGN OF SPILLWAYS

2. FEMA - FLOOD INSURANCE STUDY 1985
TOWN OF BILLERICA, MA

PERTINENT DATA

DESIGN FLOOD - 100YR EVENT.
REQUIRED DISCHARGE - 5675 cfs (per FEMA study).
SPILLWAY TYPE - BROAD CREST
SPILLWAY LENGTH - 127' (NOT INCL. AUX @ ABUTMENTS)
SPILLWAY CREST - EL 109.7 Ft.
CHANNEL - UPSTREAM: EL 98.5 Ft.
100YR FLOOD LEVEL - EL 114.7 Ft (per FEMA Study)

DESIGN HEAD; $114.7 - 109.7 \Rightarrow$ $H_d = 5.0$ Ft.

APPROACH CHANNEL X-SECT:

$(114.7 - 98.5) \times 127 = 2057$ SF

APPROACH CHANNEL VELOCITY

$$V_{ac} = \frac{5675 \text{ cfs}}{2057 \text{ SF}} = 2.75 \text{ Ft/sec.}$$

$$\frac{V_{ac}^2}{2g} = \frac{\left(2.75 \frac{\text{Ft.}}{\text{sec}}\right)^2}{(2)(32.2 \text{ Ft/sec}^2)} = 0.12 \text{ Ft.}$$ SMALL!

TOTAL ENERGY HEAD: $H_e = 5.0 + 0.12 = 5.12$ Ft

Project TALBOT MILLS DAM - NORTH BILLERICA
Project No. 2092945 Sheet No. 2 OF 2.
Calculated By (RP) Date 5-4-2009.
Checked By Date
Subject Scale

Geotechnical Consultants, Inc.
201 Boston Post Road West
Marlborough, MA 01752
(508) 229-0900 FAX (508) 229-2279

SPILLWAY CAPACITY CHECK (CONT.)

COMPUTE: $H_e/H_d = \frac{5.12\ ft}{5.00\ ft} = 1.02.$ OK.

COMPUTE: $P/H_d = \frac{109.7\ ft - 98.5\ ft}{5.0\ ft} = 2.24.$

DETERMINE DISCHARGE COEFFICIENT

REFER TO PLATE 3-4 $C = 4.1$

COMPUTE SPILLWAY DISCHARGE CAPACITY

SPILLWAY LENGTH = 127'

$$Q_s = C L_c H_e^{1.5} = (4.1)(127\ ft)(5.12)^{1.5}$$

$$= 6,032\ cfs$$

ESTIMATE CAPACITY AT SPILLWAY ABUTMENTS

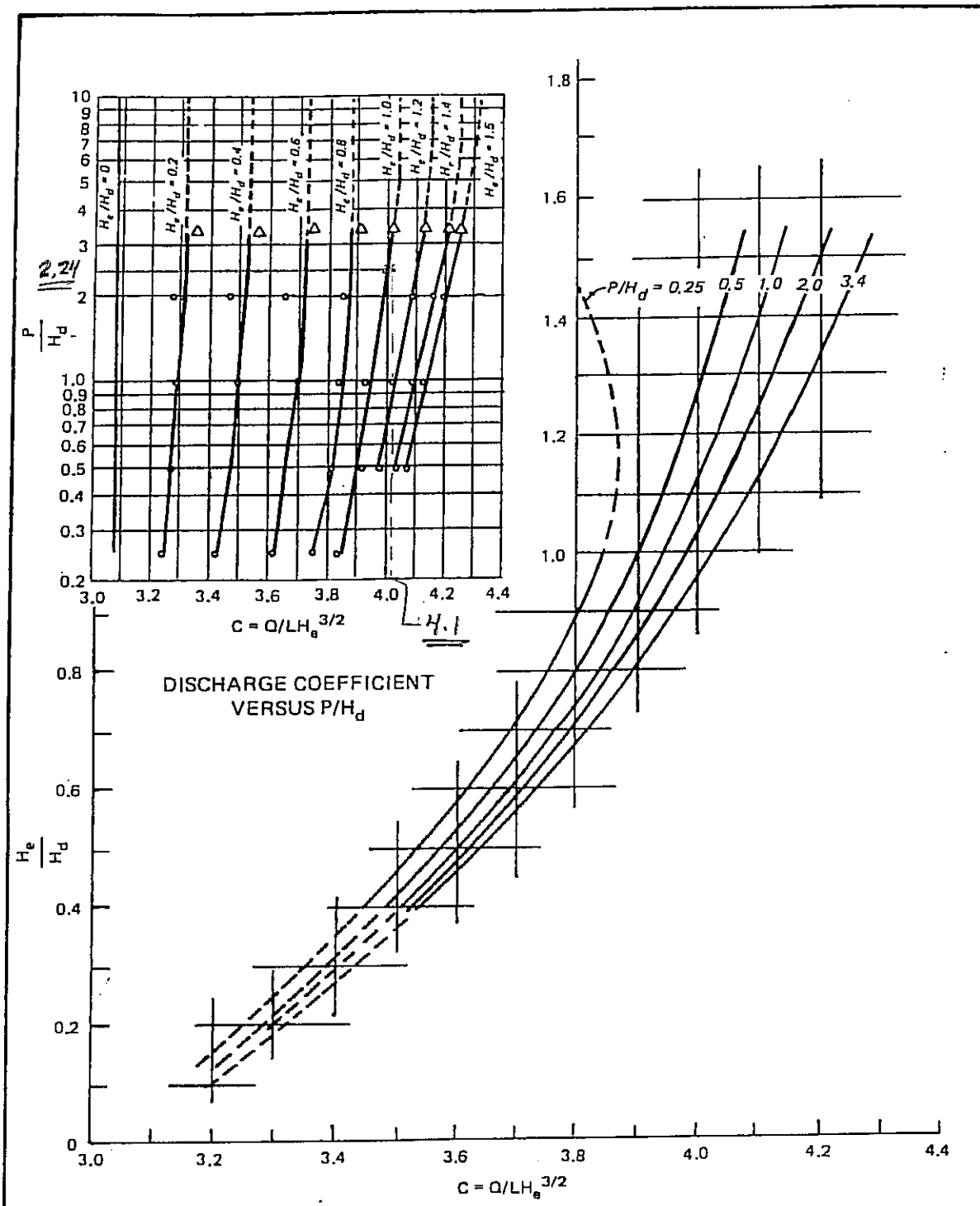
LENGTH: LEFT = 17' RIGHT = 20' TOT L = 27'

$H_{ea} \approx 114.7 - 111.5\ ft = 3.2\ ft$

$Q_a \approx (4.0)(27\ ft)(3.2\ ft)^{1.5} \approx 620\ cfs.$

$Q_{TOTAL} \approx 6,650\ cfs > 5675\ cfs$

OK.



SPILLWAY
DISCHARGE COEFFICIENTS
VERTICAL UPSTREAM FACE
FROM HDC 111-21

PLATE 3-4

APPENDIX G
EDR Aerial Photo Decade Package

3. Property Deed

M
2

2009 00000166
Bk: 22634 Pg: 104 Page: 1 of 2
Recorded: 01/02/2009 02:56 PM

dcr
Massachusetts

Commonwealth of Massachusetts
Department of Conservation and Recreation
Office of Dam Safety
DAM REGISTRATION CERTIFICATE
Issued in Accordance with MGL Chapter 253
Sections 44-50 and 302 CMR 10.05

CERTIFICATE NUMBER MA00774-R1

As required by MGL Chapter 253, and for the purpose of creating a public record of the subject dam, the Office of Dam Safety hereby issues this Dam Registration Certificate, to be recorded by the dam owner at the Registry of Deeds in the county where the dam lies.

Section 1: Dam Information

Dam Name	TALBOT MILLS DAM AKA FALKNER MILLS DAM
Name of Impoundment	CONCORD RIVER
Location (City/Town)	BILLERICA
Height	12.5'
Hazard Potential Rating	HIGH HAZARD
National Dam ID No.	MA00774
Latitude	42.592
Longitude	-71.284

Section II: Registry of Deeds Information for the Property of which the Dam Lies

Property/Dam Owner(s)	CRT DEVELOPMENT REALTY, LLC
Registry Location (County Name)	MIDDLESEX
Registry of Deeds Book No.	17958
Registry of Deeds Page No.	95

Section III: Town/City Accessor's Office Information for the Property on which the Dam Lies

Property/Dam Owner Name	CRT DEVELOPMENT REALTY, LLC
Mailing Address	6 NICHOLAS CIRCLE
Town/Zip	ANDOVER, MA 01810-4278
Map No	10
Lot No	

Locus: Falkner Street Dam, Billerica, MA

COMMONWEALTH OF MASSACHUSETTS · EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

Department of Conservation and Recreation
Office of Dam Safety
John Augustus Hall
180 Beaman Street
West Boylston, MA 01583
508-792-7716 508-792-7718 FAX
www.mass.gov/dcr

Deval L. Patrick, Governor
Timothy P. Murray, Lt. Governor
Ian A. Bowles, Secretary, Executive Office of Environmental Affairs
Richard K. Sullivan, Jr., Commissioner, Department of Conservation & Recreation

Please return to:
DAVAGIAN & ASSOCIATES
ATTORNEYS AT LAW
365 BOSTON POST ROAD, SUITE 200
SUDBURY, MA 01776-3023

CERTIFCATE NUMBER MA00774-R1

Section IV: Transfer of Ownership Notification Requirement

In accordance with M.G.L. c. 253, the dam owner shall notify the Commissioner by registered or certified mail, of the proposed transfer of legal title of such dam 30 days prior to any such transfer. Upon receipt of such notice, a new Certificate of Registration will be issued. Such Certificate shall contain any outstanding obligations of the registered owner under M.G.L. c. 253, §§ 44 through 50.

The Department of Conservation and Recreation

By: _____
William C. Salomaa, Director
Office of Dam Safety

Date Issued:
December 9 2008

Suffolk, *ss.* Commonwealth of Massachusetts

On this 9th day of December, 2008, before me, the undersigned notary public, personally appeared William C. Salomaa, proved to me through satisfactory evidence of identification, which was personally known to me, to be the person whose name is signed on the preceding document, and acknowledged to me that he signed it voluntarily, in his capacity as Director of the Office of Dam Safety with the Department of Conservation and Recreation, for its stated purpose.

_____
Ariana L. Johnson
Notary Public
My Commission Expires
August 13, 2015

2

QUITCLAIM DEED

CRT Development, a Massachusetts limited partnership with a principal place of business in Andover, Massachusetts for consideration paid of **One ($1.00) Dollar** hereby **grants** to **CRT Development Realty, LLC**, a Massachusetts limited liability company having a principal place of business of 6 Nicholas Circle, Andover, Massachusetts, with **quitclaim covenants** that certain parcel of land located in Billerica, Middlesex County, Massachusetts more particularly described on Exhibit A attached hereto and made a part hereof.

Executed as an instrument under seal this 21st day of Sept, 2004.

2004 00077164
Bk: 17958 Pg: 95 Page: 1 of 2
Recorded: 10/15/2004 02:41 PM

CRT DEVELOPMENT
a Massachusetts limited partnership

By: Robert S. Martin
Robert S. Martin, general partner

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

On this the 21 day of September, 2004, before me, the undersigned notary public, personally appeared Robert S. Martin, general partner of CRT Development, a Massachusetts limited partnership and proved to me through satisfactory evidence of identification, which was personal knowledge to be the person whose name is signed on this document, and acknowledged to me that he signed it voluntarily as general partner of CRT Development for its stated purpose.

Imogene H. Kandiel
Notary Public
My commission expires:

IMOGENE H. KANDIEL
Notary Public
Commonwealth of Massachusetts
My Commission Expires
May 22, 2009

Enc

EXHIBIT A

The land situated southeasterly of Faulkner Street and Westerly and Northerly of said Concord River and thus bounded and described Northwesterly by Faulkner Street 10 feet; Easterly and Southerly by said Concord River; Northerly by land now or formerly of North Billerica Company 60.72 feet; and Westerly by land now or formerly of North Billerica Company, and being Lot 25 on Plan recorded with Middlesex Northern District Registry of Deeds in Plan Book 62, Plan 64, a portion of which is recorded.

Together with the land and dam situated in and on the Concord River near and between the premises above described together with all concrete and granite walls adjacent thereto and the bed of the Concord River and all riparian rights and rights of flowage, all water rights (including all rights to draw water from the mill pond created by the existence of the above described dam and located over the bed of the Concord River hereinbefore described), mill powers, mill privileges, spillways, gates, rights of way and other rights and easements and appurtenant to the above described premises whether or not the same are specifically mentioned herein.

Being a greater portion of the premises conveyed to Fabricon, Inc., by Deed of Talbot Mills, Inc., dated October 28, 1965, recorded with said Registry in Book 1724, Page 23.

Conveying also all buildings and structures adjoining the above described premises located in and over the Concord River, together with the right to maintain, repair and replace the same.

Said premises are hereby conveyed subject to and with the benefit of all rights, easements, privileges, and appurtenances of record insofar as now in force and applicable, as set forth in deed of Fabricon, Inc., to Clifford R. Jennings, William S. Ricci, William Martin and Sherwood A. Quinlan dated April 2, 1968, recorded with Middlesex Northern District Registry of Deeds in Book 1838, Page 109, and deed from Sherwood A. Quinlan to Clifford R. Jennings, et als., dated January 7, 1972, recorded with said Deeds in Book 1994, Page 293.

Being a portion of the premises conveyed by Deed dated July 2, 1980 and recorded with said Deeds in Book 2429, Page 692.

END OF DOCUMENT

Richard P Howe Jr

MASSACHUSETTS QUITCLAIM DEED SHORT FORM (INDIVIDUAL) 881

Faulkner Realty, Inc., a corporation duly established under the laws of the Commonwealth of Massachusetts and having its usual place of business at Nine Central Street, Lowell, Middlesex County, Massachusetts

~~being unmarried~~, for consideration paid, and in full consideration of One Dollar ($1.00)

grants to Faulkner Mills Acquisition Corp.

of ~~55 High Street~~ North, Billerica, Massachusetts, ~~01866~~ P.O. Box 54 01862 with quitclaim covenants

[Description and encumbrances, if any]

the land in Billerica shown as Parcel II on Plan Book 202, Plan 21, which is more fully described in Exhibit "A" attached hereto.

The Grantor also conveys to the Grantee, its successors and assigns, all of the Grantor's rights as a riparian owner and its rights, if any, to the flow and use of water in the Concord River.

Property Address: 71 Faulkner Street
No. Billerica, Ma.
~~01821~~ 01862

07/31/2000 10:28:40 39250 26.50 6

In Witness Whereof, the said Faulkner Realty, Inc. has caused its corporate seal to be hereto affixed and these presents to be signed, acknowledged and delivered in its name and behalf by MARSHALL L. FIELD, Its President, and ROBERT A. MCKITTRICK, Its Treasurer, hereto duly authorized, this 13th day of July in the year Two Thousand.

Marshall L. Field, Its President

Robert A. McKittrick, Its Treasurer

The Commonwealth of Massachusetts

Middlesex, ss. July 13, 2000 ~~19~~

Then personally appeared the above named Marshall L. Field and Robert A. McKittrick

and acknowledged the foregoing instrument to be their free act and deed before me

Notary Public — Justice of the Peace
Barbara D. Goggin
My commission expires March 22, 2007

(*Individual — Joint Tenants — Tenants in Common.)

CHAPTER 183 SEC. 6 AS AMENDED BY CHAPTER 497 of 1969

Every deed presented for record shall contain or have endorsed upon it the full name, residence and post office address of the grantee and a recital of the amount of the full consideration thereof in dollars or the nature of the other consideration therefor, if not delivered for a specific monetary sum. The full consideration shall mean the total price for the conveyance without deduction for any liens or encumbrances assumed by the grantee or remaining thereon. All such endorsements and recitals shall be recorded as part of the deed. Failure to comply with this section shall not affect the validity of any deed. No register of deeds shall accept a deed for recording unless it is in compliance with the requirements of this section.

DESCRIPTION OF PARCEL TO BE PURCHASED BY

FAULKNER MILLS ACQUISITION CORP.

Being a portion of land and canal area located on the southerly side of Faulkner Street, Billerica, MA, and shown as Parcel II and Canal Area on a Plan by Robert M. Gill & Associates, Inc., dated August 25, 1999 (to be recorded herewith), bounded and described as follows:

Beginning at the southwesterly corner of the premises on the southerly side of Faulkner Street and the northerly side of the Concord River;

thence northerly and easterly at a curved line at a radius of 380.00 feet, a length of 106.93 feet, by Faulkner Street;

thence still by said Faulkner Street, N52°48'52"E, 25.71 feet to a point on the inlet canal;

thence in six courses by the easterly face of said canal wall, S47°13'38"E, 11.62 feet, S40°16'19"E, 13.39 feet, S25°59'47"E, 12.19 feet, S24°28'34"E, 23.64 feet, S15°39'17"E, 22.86 feet, S46°27'05"E, 6.58 feet;

thence across said canal by the edge of the Corcord River, S79°12'19"W, 19.95 feet;

thence in six courses by mostly a stone retaining wall and the Concord River, S52°37'39"W, 3.07 feet, S75°53'44"W, 7.47 feet, N84°27'36"W, 21.66 feet, N76°01'54"W, 20.18 feet, N88°58'21"W, 4.57 feet, S77°51'28"W, 65.24 feet, to the point of beginning.

Said Parcel II containing 4,979 square feet of land area. The area within the canal is 1,180 square feet, or a total of 6,159 square feet. Also included is a six (6) foot right of way easement, being six (6) feet easterly from and parallel to the easterly wall of said canal. This easement is for the purpose of passing and repassing, and to repair and maintain the easterly canal wall.

Refer to Book 7566 Page 275
Middlesex No. Co. Registry of Deeds

EXHIBIT A

END OF DOCUMENT

Richard P. Howe Jr.

4. Design Plans

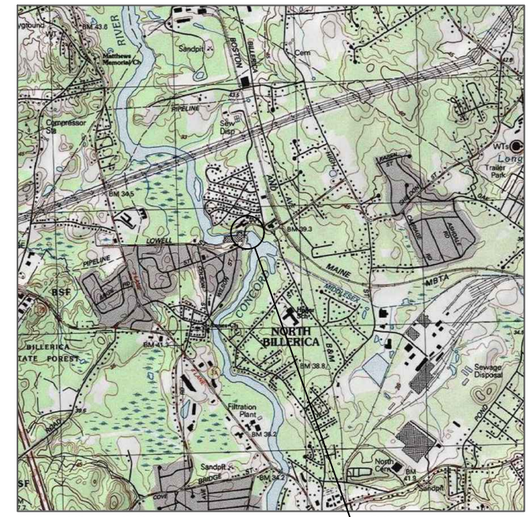
TALBOT MILLS DAM REMOVAL/
CONCORD RIVER RESTORATION PROJECT

BILLERICA, MA

CRT DEVELOPMENT REALTY, LLC (DAM OWNER)

90% (DRAFT FINAL) DESIGN PLANS

DRAWING NO.	TITLE
1	COVER
2	GENERAL NOTES
3	EXISTING AND PROPOSED RESOURCE AREAS
4	EXISTING WETLAND RESOURCES PLAN
5	EXISTING SITE PLAN
6	EXISTING DAM SECTION AND ELEVATION
7	PROPOSED STAGING AND INVASIVE SPECIES CONTROL PLAN
8	PROPOSED STAGING AND ACCESS PLAN
9	PROPOSED ACCESS, WATER CONTROL, & REMOVALS PLAN
10	PROPOSED DAM BREACH SECTION AND ELEVATION
11	PROPOSED SITE PLAN
12	PROPOSED WETLAND RESOURCES & RESTORATION PLAN
13	EROSION AND SEDIMENT CONTROL DETAILS (1 OF 2)
14	EROSION AND SEDIMENT CONTROL DETAILS (2 OF 2)



SOURCE: USGS *SCALE: 1" = 2000'*

PROJECT SITE

SOURCE: GOOGLE *SCALE: 1" = 1000'*

FUNDING PARTNERS:
MA DEPT. OF FISH & GAME, DIV. OF ECOLOGICAL RESTORATION
MA DEPT. OF FISH & GAME, DIV. OF MARINE FISHERIES
MA DEPT. OF ENVIRONMENTAL PROTECTION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION RESTORATION CENTER
US FISH AND WILDLIFE SERVICE

DATE	#	DESCRIPTIONS	BY	APP

DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

COVER

OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: AS NOTED DRAWING: 1

DATA SOURCES

1. HORIZONTAL DATUM IS NORTH AMERICAN DATUM (NAD) 1983, MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, MAINLAND ZONE. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM (NAVD) 1988 FEET.
2. BENCHMARK 'RM-8' SHOWN ON FEMA HISTORIC COMMUNITY PANEL 250183 0003 DATED AUGUST 5, 1985 IS DESCRIBED AS A CHISELED SQUARE ON THE NORTHEAST SIDE OF THE TOP OF A GRANITE BLOCK AT THE SOUTWEST END OF THE TALBOT MILLS DAM SPILLWAY AT GROUND LEVEL. THE PUBLISHED ELEVATION FOR 'RM-8' IS 114.26 NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29) OR 113.43 FT NAVD88 BASED ON A DATUM CONVERSION OF -0.827 FT FROM NGVD29 TO NAVD88 FOR THIS LOCATION.
3. CONTOUR INTERVAL SHOWN ON PLANS IS 1 FOOT UNLESS OTHERWISE NOTED.
4. TOPOGRAPHIC SURVEYS OF THE DAM AND DOWNSTREAM CHANNEL WERE CONDUCTED BY GOMEZ AND SULLIVAN ENGINEERS, DPC (GOMEZ AND SULLIVAN) ON OCTOBER 6, 2014 AND AUGUST 9, 2022. PLANS WERE SUPPLEMENTED BY SURVEY DATA COLLECTED BY EAGLEBROOK ENGINEERING & SURVEY, LLC ON APRIL 14, 2009 AND BY LANDPLEX, LLC IN OCTOBER 2017.
5. ALL OTHER TOPOGRAPHY OUTSIDE SURVEY AREAS DERIVED FROM LIDAR DATA WITH A VERTICAL ACCURACY OF 0.33 FEET COLLECTED IN 2021 AND OBTAINED FROM MASSGIS.
6. BATHYMETRIC SURVEY DATA WITHIN THE IMPOUNDMENT WAS COLLECTED BY GOMEZ AND SULLIVAN ON JULY 28, 2021 USING A SONTEK ACCOUSTIC DOPPLER CURRENT PROFILER (ADCP) AND SURVEY GRADE RTK GPS WITH AN ACCURACY OF 0.04 TO 0.14 FT. BATHYMETRY WAS SUPPLEMENTED FROM SEDIMENT PROBING DATA COLLECTED BY GOMEZ AND SULLIVAN ON OCTOBER 6, 2014 AND BY CR ENVIRONMENTAL, INC. ON MAY 24, 2022. BATHYMETRIC SURVEY DATA WAS ALSO COLLECTED IMMEDIATELY UPSTREAM AND DOWNSTREAM OF THE DAM DURING A LOW FLOW PERIOD BY GOMEZ AND SULLIVAN ON AUGUST 9, 2022 USING AN RTK GPS WITH AN ACCURACY OF 0.03 TO 0.1 FT.
7. WETLAND BOUNDARIES IN THE VICINITY OF THE DAM AND MILL POND WERE DELINEATED BY LEC ENVIRONMENTAL CONSULTANTS, INC ON JUNE 29, 2022 AND REFLAGGED ON OCTOBER 7, 2024. WETLAND BOUNDARIES UPSTREAM OF THE MILL POND AND DOWNSTREAM OF FAULKNER STREET WERE DERIVED FROM 2005 MASSACHUSETTS DEPT. OF ENVIRONMENTAL PROTECTION (MASSDEP) WETLANDS DATA, HYDRAULIC MODELING CONDUCTED BY GOMEZ AND SULLIVAN, AND/OR AERIAL IMAGERY.
8. PROPERTY BOUNDARIES FOR 2 OLD ELM ST (10-231-2) AND 6 OLD ELM ST (10-231-1) WERE OBTAINED FROM A NOVEMBER 2013 SURVEY BY CLAUDIO SALA, PLS (PLAN BOOK 237, PLAN 27). PROPERTY BOUNDARIES FOR PARCEL 10-39-4 WERE OBTAINED FROM AN AUGUST 25, 1999 PLAN OF LAND BY ROBERT M. GILL & ASSOCIATES, INC. (PLAN BOOK 202, PLAN 21). THE PROPERTY BOUNDARY FOR PARCEL 10-39-3 ALONG THE CONCORD RIVER WAS OBTAINED FROM A SEPTEMBER 20, 1995 PLAN OF LAND BY NOONAN & MCDOWELL, INC. (PLAN BOOK 189, PLAN 137). PROPERTY BOUNDARIES ADJACENT TO THE CONCORD RIVER FOLLOW THE MEAN ANNUAL HIGH WATER LINE, WHICH WAS SURVEYED FOR THIS PROJECT AS PART OF THE WETLAND DELINEATION CONDUCTED IN 2022 AND 2024 BY (SEE NOTE 8 ABOVE). ALL OTHER PROPERTY BOUNDARIES OUTSIDE OF THE IMMEDIATE DISTURBANCE AREA WERE OBTAINED FROM MASSGIS.
9. PORTIONS OF THE PROJECT AREA SHOWN HEREON ARE LOCATED WITHIN FLOOD HAZARD ZONE AE AS SHOWN ON FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) PANELS 25017C0258F AND 25017C0259F EFFECTIVE JULY 7, 2014, AND LETTER OF MAP REVISION 250183 EFFECTIVE FEBRUARY 9, 2018 (CASE NO. 17-01-1899P). THE BASE FLOOD ELEVATION AT THE UPSTREAM FACE OF THE DAM IS 113.9 FT NAVD88. PORTIONS OF THE PROJECT AREA ARE ALSO LOCATED WITHIN THE TOWN OF BILLERICA 'GREEN ENGINEERING' FLOODPLAIN, OBTAINED FROM THE BILLERICA GIS LAYER. PROPOSED BORDERING LAND SUBJECT TO FLOODING (BLSF) IS BASED ON 1% ANNUAL EXCEEDANCE PROBABILITY (AEP) (100-YR) FLOOD INUNDATION MAPPING DEVELOPED BY GOMEZ AND SULLIVAN FOR PROPOSED CONDITIONS.
10. UTILITIES OUTSIDE OF THE SURVEY AREA WERE OBTAINED FROM TOWN OF BILLERICIA GIS.

GENERAL NOTES

1. CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF EXCAVATION. CONTRACTOR SHALL NOTIFY DIG SAFE MASSACHUSETTS AT 811 OR 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION. SATURDAYS, SUNDAYS, AND LEGAL HOLIDAYS ARE NOT TO BE INCLUDED IN THE REQUIRED 72 HOUR NOTICE.
2. CONTRACTOR SHALL MAINTAIN CONTROL POINTS DURING CONSTRUCTION, INCLUDING BENCHMARKS AND ELEVATIONS AT CRITICAL AREAS. SITE LAYOUT SURVEY REQUIRED FOR CONSTRUCTION SHALL BE PROVIDED BY THE CONTRACTOR AND PERFORMED BY A MASSACHUSETTS' REGISTERED PROFESSIONAL LAND SURVEYOR. ALL GRADE STAKES SET BY SURVEYOR SHALL BE MAINTAINED BY CONTRACTOR UNTIL FINAL INSPECTION OF THE ITEM HAS BEEN COMPLETED BY ENGINEER.
3. CONTRACTOR SHALL PREPARE AND IMPLEMENT TRAFFIC CONTROL PLAN. TRAFFIC MANAGEMENT PLAN PREPARED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND MASSDOT TRAFFIC CONTROL STANDARDS.
4. EXCESSIVE IDLING DURING THE CONSTRUCTION PERIOD IS PROHIBITED. SIGNS SHALL BE POSTED AT THE SITE LIMITING IDLING TO 5 MINUTES OR LESS. PERIODIC INSPECTIONS SHALL BE CONDUCTED BY SITE SUPERVISORS TO ENSURE COMPLIANCE. STAGING AREAS SHALL BE LOCATED TO MINIMIZE EMISSION IMPACTS TO ABUTTING PROPERTIES.
5. ANY WOOD OR OTHER DEBRIS CAUGHT ON THE DAM OR IN THE SLUICEWAY SHALL BE REMOVED AND DISPOSED OF BY CONTRACTOR PRIOR TO CONSTRUCTION.

CONSTRUCTION WASTE MANAGEMENT

1. SITE SHALL BE KEPT WELL ORGANIZED, SIGNED, AND FREE OF WASTE MATERIALS, DEBRIS, AND RUBBISH AT ALL TIMES. GOOD HOUSEKEEPING PRACTICES SHALL BE MAINTAINED ON A CONTINUOUS BASIS FROM WORK SITE TO WORK SITE. DISPOSAL OF ANY WASTE MATERIALS ON THE CONSTRUCTION SITE IS PROHIBITED.
2. SANITARY, WASTE DISPOSAL, AND EMPLOYEE FACILITIES SHALL BE PROVIDED BY CONTRACTOR.
3. ALL WATER RESOURCES (E.G., GROUND AND SURFACE WATERS), INCLUDING ALL DRAINS AND CATCH BASINS, SHALL BE PROTECTED FROM LEACHING AND/OR RUN-OFF OF CHEMICAL POLLUTANTS, SOLID WASTES, AND CONSTRUCTION SITE DEBRIS. ALL CATCH BASINS SHALL BE MAINTAINED FREE FLOWING.
4. ALL COMBUSTIBLE WASTE MATERIALS SHALL BE PLACED IN COVERED METAL CONTAINERS AND PROMPTLY DISPOSED OF IN AN APPROVED MANNER AT AN APPROVED WASTE DISPOSAL FACILITY.
5. STORAGE AND/OR USE OF CHEMICALS, FUELS, OILS, GREASES, BITUMINOUS MATERIALS, SOLIDS, WASTE WASHINGS, AND CEMENT SHALL BE HANDLED APPROPRIATELY AS TO PREVENT LEACHING OR SURFACE RUNOFF INTO PUBLIC WATERS OR DRAINS. ALL APPROVED STORAGE AREAS FOR THESE MATERIALS MUST BE DIKED.
6. ALL ROADWAYS SHALL BE MAINTAINED FREE OF DEBRIS. STABILIZED CONSTRUCTION ENTRANCES SHALL BE CONSTRUCTED TO CAPTURE DEBRIS FROM WHEELS OF CONSTRUCTION VEHICLES. VEHICLES SHALL BE INSPECTED AT ENTRANCES BEFORE TURNING ONTO THE ROADWAY AND EXCESS DEBRIS SHALL BE REMOVED.
7. ALL EXCESS DREDGED MATERIALS SHALL BE REMOVED FROM THE SITE AS SOON AS POSSIBLE AND IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS FOR REUSE AND DISPOSAL.

CARE AND DIVERSION OF WATER

1. REFER TO DETAILED WATER CONTROL NOTES ON SHEET 9.

TEMPORARY ACCESS ROUTE STABILIZATION

1. DEFINITION: THE STABILIZATION OF TEMPORARY CONSTRUCTION ACCESS ROUTES, ON-SITE VEHICLE TRANSPORTATION ROUTES, AND CONSTRUCTION PARKING AREAS.
2. PURPOSE: TO CONTROL EROSION ON TEMPORARY CONSTRUCTION ROUTES AND PARKING AREAS.
3. CONDITION WHERE PRACTICE APPLIES: ALL TRAFFIC ROUTES AND PARKING AREAS FOR TEMPORARY USE BY CONSTRUCTION TRAFFIC.
4. DESIGN CRITERIA: CONSTRUCTION ROADS SHOULD BE LOCATED TO REDUCE EROSION POTENTIAL, MINIMIZE IMPACT ON EXISTING SITE RESOURCES, AND MAINTAIN OPERATIONS IN A SAFE MANNER. HIGHLY EROSIVE SOILS, WET OR ROCKY AREAS, AND STEEP SLOPES SHOULD BE AVOIDED. ROADS SHOULD BE ROUTED WHERE SEASONAL WATER TABLES ARE DEEPER THAN 18 INCHES. SURFACE RUNOFF AND CONTROL SHOULD BE IN ACCORDANCE WITH MASSDEP EROSION AND SEDIMENT CONTROL GUIDELINES.
5. TEMPORARY ACCESS ROAD/RAMP GRADE: A MAXIMUM GRADE OF 12% IS RECOMMENDED, ALTHOUGH GRADES UP TO 20% ARE ACCEPTABLE FOR SHORT DISTANCES.
6. TEMPORARY ACCESS ROAD/RAMP WIDTH: 14 FT (9 FT MINIMUM) FOR ONE-WAY TRAFFIC, OR 24 FT MINIMUM FOR TWO-WAY TRAFFIC.
7. SIDE SLOPE OF ROAD EMBANKMENT: 2:1 OR FLATTER.
8. COMPOSITION: MINIMUM 8-INCH OF MASSDOT 'GRAVEL BORROW' ITEM NO. M1.03.0(b), PLACED ON WOVEN GEOTEXTILE FABRIC MASSDOT ITEM NO. M9.50.0.
9. MAINTENANCE: ACCESS ROUTES AND PARKING AREAS SHALL BE INSPECTED PERIODICALLY FOR CONDITION OF SURFACE AND TOPDRESSED WITH NEW GRAVEL AS NEEDED.
10. RESTORATION: UPON COMPLETION OF THE WORK, ALL TEMPORARY MATERIALS SHALL BE REMOVED AND THE SITE SHALL BE RESTORED TO PRE-PROJECT CONDITIONS.

CONSTRUCTION SEQUENCE

1. CONTRACTOR SHALL PREPARE A CONSTRUCTION SEQUENCE PLAN TO BE APPROVED BY OWNER AND ENGINEER. THE FOLLOWING GENERAL SEQUENCE SHALL BE ADAPTED FOR THE SITE-SPECIFIC REQUIREMENTS. ALL TASKS LISTED WITH "AT CONTRACTOR'S DISCRETION" SHALL BE ADDRESSED IN THE CONTRACTOR'S REQUIRED SUBMITTALS.
2. INSTALL TURBIDITY CURTAIN PRIOR TO DEWATERING.
3. REMOVE STLOPLOGS FROM SLUICE GATE TO LOWER IMPOUNDMENT.
4. INSTALL TEMPORARY FENCING AND SWING GATES AT ENTRANCE(S) TO STAGING AREA(S).
5. INSTALL EROSION AND SEDIMENTATION CONTROLS.
6. INSTALL OIL BOOM ACROSS CHANNEL DOWNSTREAM OF DAM.
7. ANCHOR 1/2" STEEL PLATE TO INFRASTRUCTURE ADJACENT TO LEFT AND/OR RIGHT DAM ABUTMENTS TO PROTECT FROM FLOW AS REQUIRED BY WATER CONTROL PLAN.
8. AT CONTRACTOR'S DISCRETION, DREDGE SEDIMENT AND REMOVE ANY BLOCKAGES FOUND UPSTREAM OF WEST ABUTMENT TO ALLOW FLOW THROUGH TWO EXISTING APPROX. 4'H X 3'W LOW-LEVEL OUTLETS TO FURTHER DRAW DOWN IMPOUNDMENT PRIOR TO CONSTRUCTION.
9. INSTALL TEMPORARY ACCESS ROAD FROM STAGING AREA AT 6 OLD ELM STREET TO WEST (LEFT) DAM ABUTMENT AND ALONG SPILLWAY AS SHOWN.
10. REMOVE EAST (RIGHT) ABUTMENT AND BREACH A 30-FOOT-WIDE SECTION OF GRANITE SPILLWAY AND FORMER TIMBER/ROCK DAM (IF FOUND) TO FACILITATE FLOW.
11. AT CONTRACTOR'S DISCRETION, INSTALL COFFERDAM UPSTREAM OF SPILLWAY AS NECESSARY.
12. COMMENCE ARCHAEOLOGICAL RECORDATION AND REMOVAL OF FORMER DAM REMAINS (IF FOUND) FOLLOWED BY EXISTING GRANITE SPILLWAY. RETAIN STEPPED GRANITE BLOCKS ADJACENT TO LEFT ABUTMENT TO SUPPORT ABUTMENT (SEE ELEVATION SHEET 10). SALVAGE GRANITE BLOCKS AS REASONABLY PRACTICABLE FOR STOCKPILING AS DIRECTED BY OWNER. GRADE ANY SEDIMENT UPSTREAM OF DAM AT 3:1 SLOPE OR FLATTER.
13. REMOVE ANY TEMPORARY ACCESS RAMPS, ROADS, AND/OR COFFERDAMS WITHIN THE CHANNEL.
14. RESTORE ACCESS AND STAGING AREAS TO FORMER CONDITIONS.
15. REMOVE TEMPORARY FENCING AND SWING GATES
16. REMOVE EROSION AND POLLUTION CONTROL MEASURES ONLY AFTER ALL AREAS ARE STABILIZED TO THE SATISFACTION OF ENGINEER.

SOIL EROSION AND SEDIMENT CONTROL

1. ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH MASSDEP EROSION AND SEDIMENT CONTROL GUIDELINES, APPLICABLE NPDES STANDARDS, LOCAL CONSERVATION COMMISSION, AND BOARD OF HEALTH REGULATIONS.
2. ALL APPLICABLE SOIL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE INSTALLED PRIOR TO ANY SOIL OR STREAM DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT STABILIZATION IS ESTABLISHED.
3. ALL DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN FOURTEEN (14) DAYS, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, SHALL IMMEDIATELY RECEIVE A TEMPORARY SEEDING WITH A NATIVE SEED MIXTURE. MULCH, WATER AND ANCHOR AS NECESSARY TO ESTABLISH GRASS AND PREVENT LOSS TO WIND OR EROSION. IF THE SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY COVER, THE DISTURBED AREAS SHALL BE MULCHED WITH SMALL GRAIN STRAW AT A RATE OF TWO (2) TONS PER ACRE IN ACCORDANCE WITH STATE STANDARDS.
4. PERMANENT VEGETATION SHALL BE SEEDED WITH A NATIVE SEED MIXTURE ON ALL EXPOSED AREAS IMMEDIATELY AFTER FINAL GRADING. MULCH SHALL BE USED AS NECESSARY FOR PROTECTION UNTIL SEEDING IS ESTABLISHED.
5. ALL CRITICAL AREAS SUBJECT TO EROSION SHALL RECEIVE A TEMPORARY SEEDING WITH AN APPROVED NATIVE SEED MIXTURE IN COMBINATION WITH STRAW MULCH, AT A RATE OF TWO (2) TONS PER ACRE IN ACCORDANCE WITH STATE STANDARDS.
6. SHOULD THE CONTROL OF DUST AT THE SITE BE NECESSARY, THE SITE SHALL BE SPRINKLED WITH WATER UNTIL THE SURFACE IS WET, TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED, OR MULCH SHALL BE APPLIED IN ACCORDANCE WITH STATE STANDARDS FOR EROSION CONTROL.
7. ALL SOIL WASHED, DROPPED, SPILLED, OR TRACKED OUTSIDE THE LIMIT OF DISTURBANCE OR ONTO PUBLIC RIGHTS-OF-WAY SHALL BE REMOVED IMMEDIATELY.
8. STOCKPILE AND STAGING LOCATIONS DETERMINED IN THE FIELD SHALL BE PLACED WITHIN THE LIMIT OF DISTURBANCE. ALL SOIL STOCKPILES SHALL BE TEMPORARILY STABILIZED IN ACCORDANCE WITH NOTE #3 AND PROTECTED BY COMPOST FILTER SOCKS ON DOWNHILL SIDES.
9. THE CONTRACTOR SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE, AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION AND THAT HAVE NOT BEEN FINALLY STABILIZED, STABILIZATION PRACTICES, STRUCTURAL PRACTICES, AND OTHER CONTROLS AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS AFTER THE END OF ANY STORM THAT PRODUCES AT LEAST 0.5 INCHES OF RAINFALL AT THE SITE. WHERE SITES HAVE BEEN FINALLY STABILIZED, SUCH INSPECTION SHALL BE CONDUCTED AT LEAST ONCE EVERY MONTH UNTIL FINAL COMPLETION. CRITICAL AREAS AND AREAS WHERE VEHICLES EXIT THE SITE SHALL BE INSPECTED DAILY.

PROPOSED DREDGE/FILL VOLUMES

TYPE	VOLUME (CY)	DESCRIPTION
DREDGE	440	GRANITE MASONRY SPILLWAY + ABUTMENT
	30	CONCRETE ABUTMENT
	350	WOOD/ROCK FILL FORMER DAM
	600	ROCK FILL BETWEEN DAMS
	220	ACTIVE SEDIMENT GRADING UPSTREAM OF DAMS
	1,640	**TOTAL DREDGE**
FILL	**0**	**TOTAL FILL**

PROPOSED DREDGING DIMENSIONS

LENGTH (FT)	150	SPILLWAY + ABUTMENT
WIDTH (FT)	30	BOTH DAMS + ACTIVE SEDIMENT GRADING
DEPTH (FT)	< 13	MAX HEIGHT OF SPILLWAY
AREA (SF)*	10,000	

**NOTE THAT THE VOLUME CALCULATED BY THESE DIMENSIONS IS LARGER THAN THE PROPOSED DREDGING VOLUME IN THE TABLE ABOVE BECAUSE IT IS CONSERVATIVE IN ALL DIMENSIONS.*

DATE	#	DESCRIPTIONS	BY	APP

DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

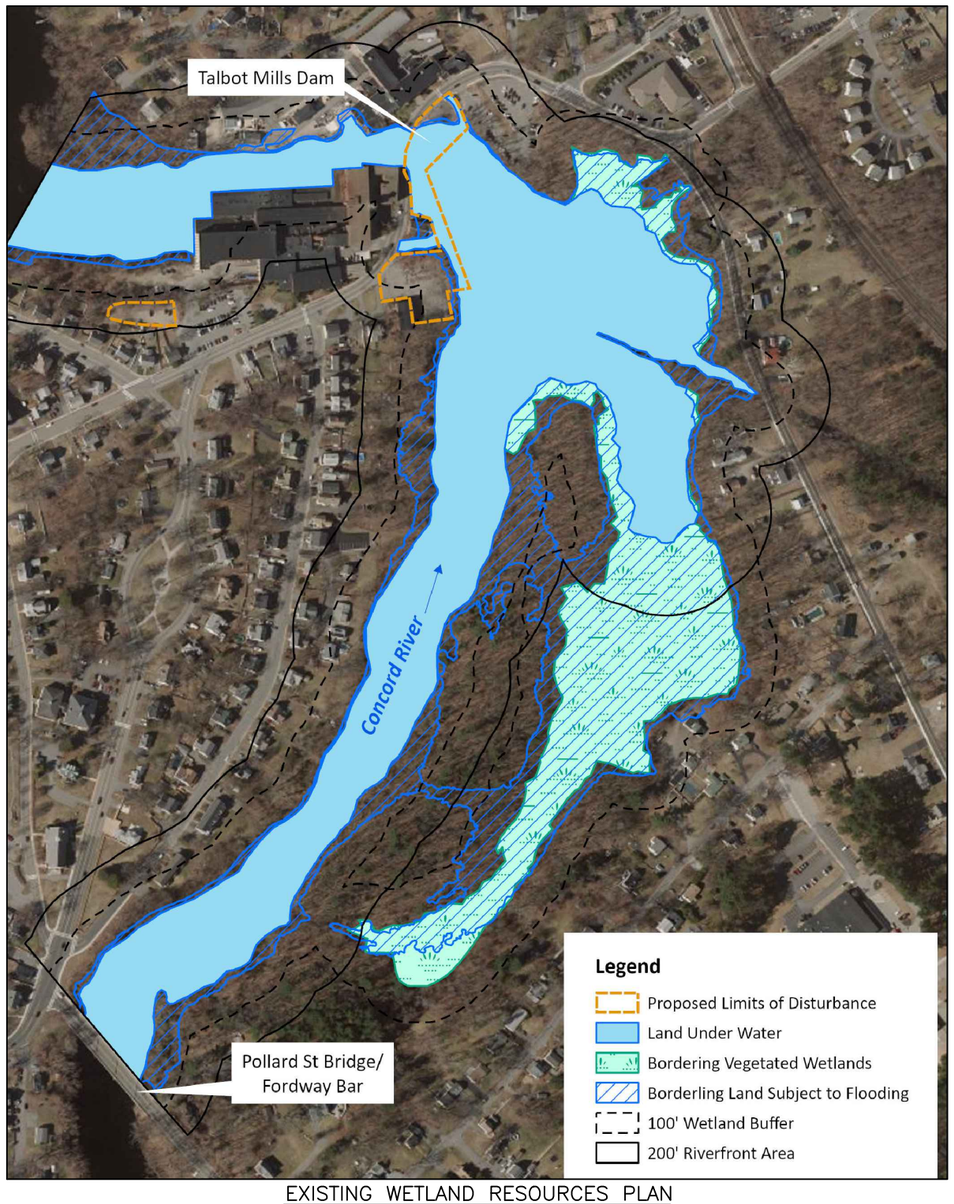
TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

GENERAL NOTES

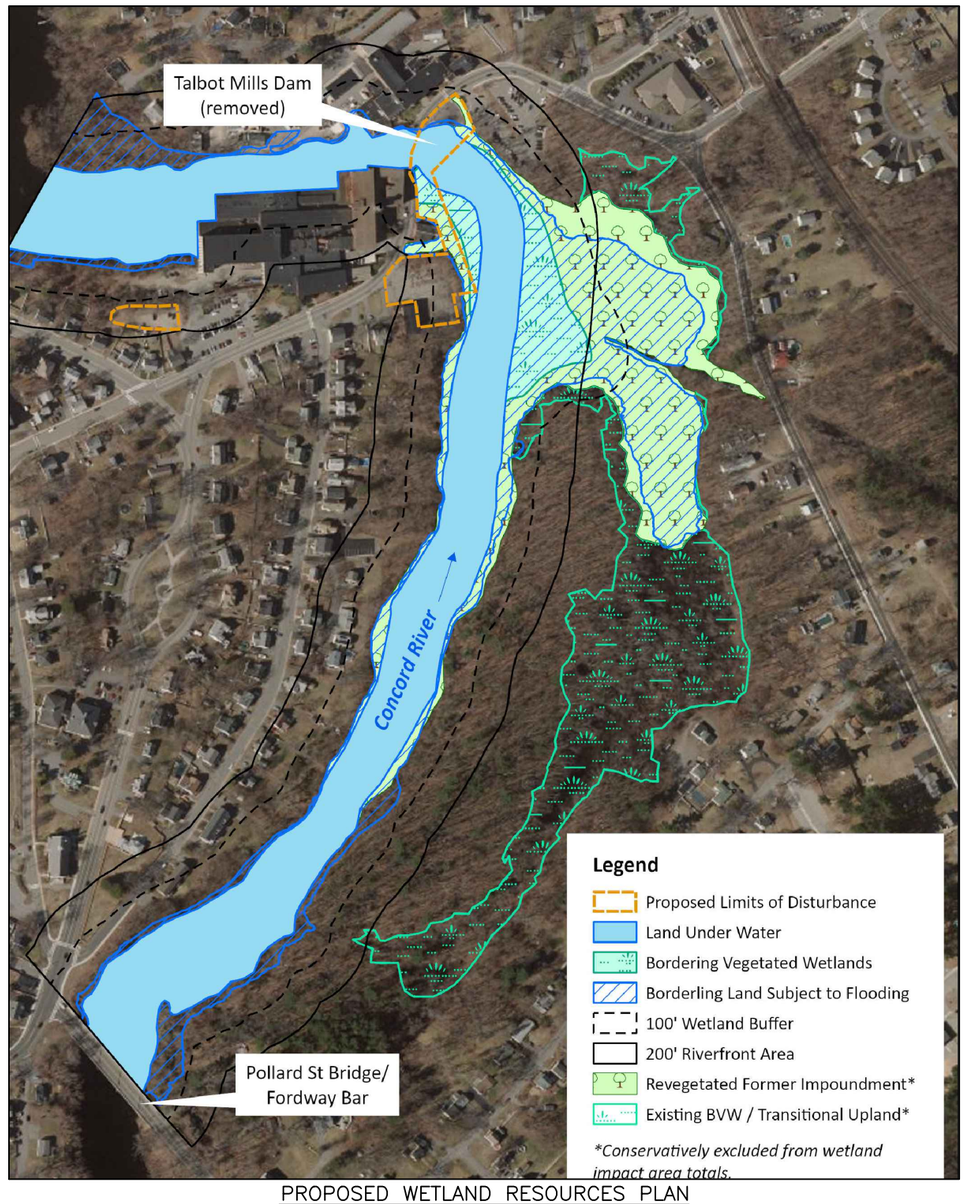
OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: NONE
DRAWING: 2



EXISTING WETLAND RESOURCES PLAN
SCALE: 1" = 400'



PROPOSED WETLAND RESOURCES PLAN
SCALE: 1" = 400'

WETLAND RESOURCE AREA IMPACTS

WETLAND RESOURCE	AREA (SF)	
	TEMP. DISTURBANCE	PERMANENT CHANGE
BANK (LINEAR FEET)	1,300	-3,100
LAND UNDER WATER (LUW)	30,000	-430,000
BORDERING VEGETATED WETLANDS (BVW)	0	-327,000
BORDERING LAND SUBJECT TO FLOODING (BLSF)	3,800	-317,000
25' NO ALTERATION ZONE	10,200	-173,000
100' BANK/BVW BUFFER ZONE	31,600	-599,000
100' RIVERFRONT AREA (RFA)	31,600	-232,000
200' RIVERFRONT AREA (RFA)	47,900	-388,000

400' 0 400' 800'
SCALE:1"=400'

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

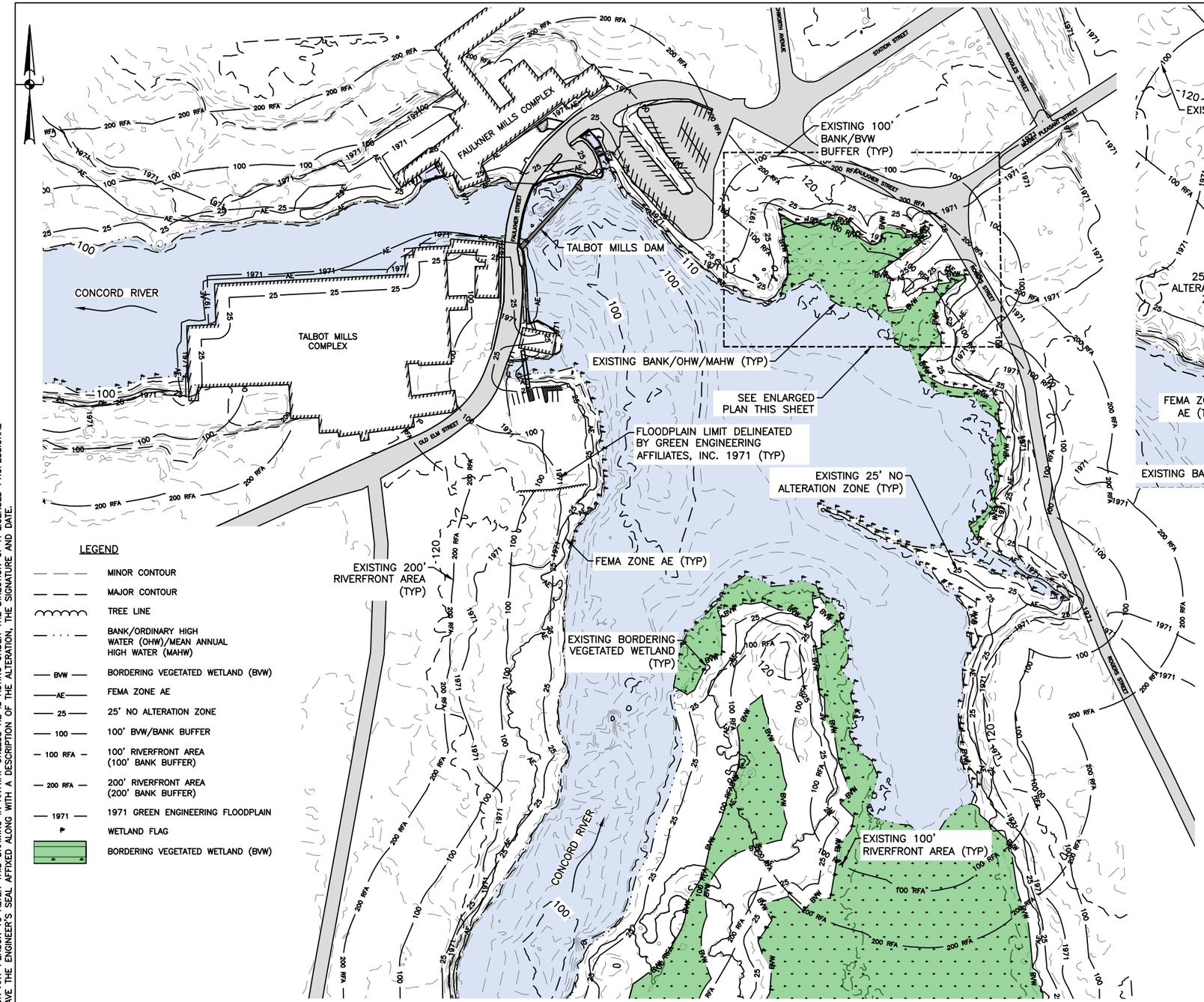
EXISTING AND PROPOSED RESOURCE AREAS

DATE	#	DESCRIPTIONS	BY	APP

DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025
SCALE: 1" = 400'
DRAWING: 3

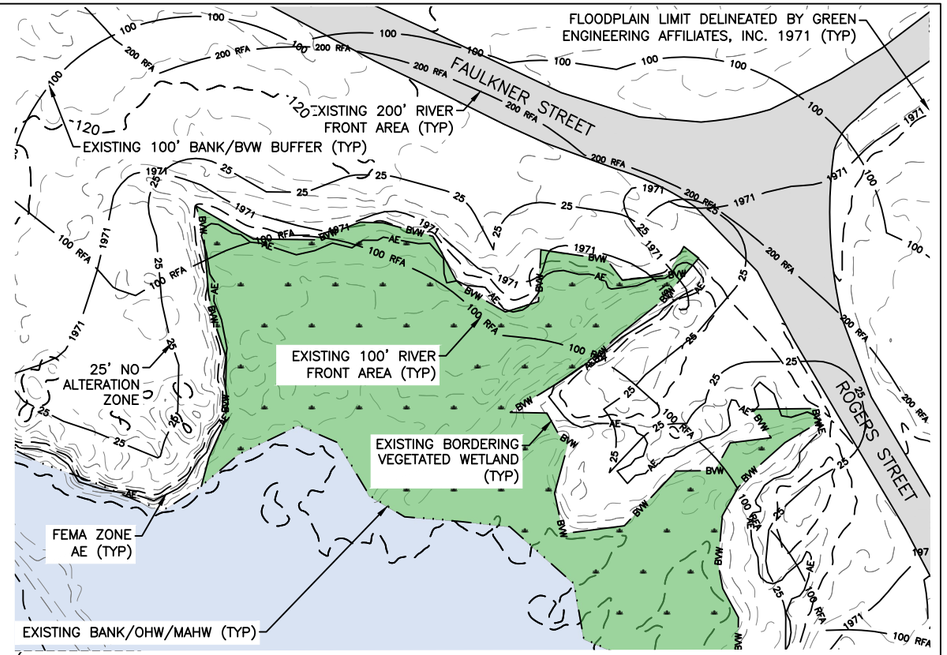
OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242



EXISTING PLAN
SCALE: 1" = 80'

NOTES:
1. WHERE THE 100' BVW/BANK BUFFER AND THE 100' RFA ARE COINCIDENT ONLY THE 100' BANK/BVW BUFFER IS SHOWN.
2. CONTOUR INTERVAL SHOWN ON PLAN IS 2 FEET.



ENLARGED PLAN
SCALE: 1" = 80'

NOTES:
1. CONTOUR INTERVAL SHOWN ON PLAN IS 2 FEET.

LEGEND

- MINOR CONTOUR
- MAJOR CONTOUR
- TREE LINE
- BANK/ORDINARY HIGH WATER (OHW)/MEAN ANNUAL HIGH WATER (MAHW)
- BVW — BORDERING VEGETATED WETLAND (BVW)
- AE — FEMA ZONE AE
- 25 — 25' NO ALTERATION ZONE
- 100 — 100' BVW/BANK BUFFER
- 100 RFA — 100' RIVERFRONT AREA (100' BANK BUFFER)
- 200 RFA — 200' RIVERFRONT AREA (200' BANK BUFFER)
- 1971 — 1971 GREEN ENGINEERING FLOODPLAIN
- WETLAND FLAG
- BORDERING VEGETATED WETLAND (BVW)

80' 0 80' 160'
SCALE:1"=80'

200' 0 200' 400'
SCALE:1"=200'

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

EXISTING WETLAND RESOURCES PLAN

DATE	#	DESCRIPTIONS	BY	APP

DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: AS NOTED
DRAWING: 4

FAULKNER MIILLS COMPLEX

PARCEL 9-93-1
71 FAULKNER ST
N/F FAULKNER MILLS AQUISITION CORP.

STILLING BASIN

2'W X 3'H SLUICE GATE
OUTLET TO SLUICEWAY
UNDER BUILDING

STONE WALL

RIM 113.7
INV 109.5

RIM 112.9
INV 107.4

SLUICEWAY

CONC. WEIR
WITH SLUICE
GATE

FOOTBRIDGE

RIM 115.5
INV 102.15

RIM 113.3
INV 111.1

RIM 113.2
INV 110.4

PARCEL 10-39-4
0 FAULKNER ST.
N/F FAULKNER MILLS
ACQUISITION CORP.

LOT LINE FOLLOWS FACE OF STONE WALLS/MAHW
LINE (PER PLAN BOOK 189, PLAN 137)

CONC. SIDEWALK

GRANITE
MEMORIAL

STONE
RETAINING
WALL

GAZEBO

RIM 126.6
INV 113.6

RIM 123.0
INV 111.5

12" ø STORM DRAIN OUTFALL
INV 106.3

CONCRETE ABUTMENT

30" ø SANITARY
SEWER OUTFALL
INV 101.1

FORMER FISHWAY
LOCATION

GRANITE ABUTMENT

GRANITE MASONRY SPILLWAY
APPROX. CREST EL. 108.2 FT

TALBOT MILLS DAM, ADJACENT WALLS,
SPILLWAYS, GATES, AND FLOWAGE RIGHTS
OWNED BY CRT DEVELOPMENT CORP.
(DEED BK. 2429, PG. 687)

BEDROCK OUTCROPS DOWNSTREAM OF
DAM (ELEVATIONS VARY/UNKNOWN)

PARKING LOT

CONCORD RIVER

PARCEL 10-39-3
0 FAULKNER ST
N/F L. DOHERTY TR.

ASSUMED SUBMERGED 1798 WOOD
FRAME/ROCK FILL DAM (APPROX.)

1
6

FAULKNER STREET

6" ø STORM DRAIN OUTFALL

ASSUMED SUBMERGED ROCK
FILL BETWEEN DAMS

2
6

TALBOT
MIILLS
COMPLEX

GRANITE ABUTMENT

BM RM-8 ELEV. 113.48
(SEE SHEET 2)

APPROX. LOCATION OF IRON BOLT
BENCHMARK EL. 108.81 FT NAVD 88

RIM 113.6
INV 110.0

12" ø STORM DRAIN OUTFALL
INV 110.0

RIM 113.8
INV 110.0

ROCK OUTCROP

LOT LINE FOLLOWS MAHW LINE
(PER PLAN BOOK 189, PLAN 137)

OLD ELM STREET

FORMER INTAKE STRUCTURE

SILT SACK IN CATCH BASIN AT TIME OF SURVEY

PARCEL 9-94-0
1 OLD ELM ST
N/F L&P ALUMINUM
HOLDINGS LLC

PARCEL 10-231-2
2 OLD ELM ST
N/F MIDDLESEX CANAL ASSOC. INC.

FUTURE MCA MUSEUM

LOT LINE FOLLOWS FACE OF STONE WALL/MAHW
LINE (PER PLAN BOOK 237 PLAN 27)

IMPOUNDMENT
(MILL POND)

40' 0 40' 80'
SCALE:1"=40'

LEGEND

- MINOR CONTOUR
- MAJOR CONTOUR
- PROPERTY BOUNDARY
- OHE — OVERHEAD ELECTRIC LINE
- S — SANITARY SEWER
- SD — STORMWATER DRAIN
- W — WATER MAIN
- TREE LINE
- BANK/ORDINARY HIGH WATER(OHW)/MEAN ANNUAL HIGH WATER (MAHW)
- BVW — BORDERING VEGETATED WETLAND (BVW)
- AE — FEMA FLOOD ZONE AE
- 25 — 25' NO ALTERATION ZONE
- 100 — 100' BANK/BVW BUFFER
- 100 RFA — 100' RIVERFRONT AREA (100' BANK BUFFER)
- 200 RFA — 200' RIVERFRONT AREA (200' BANK BUFFER)
- 1971 — 1971 FLOODPLAIN LIMIT
- CATCH BASIN
- HYDRANT
- WATER VALVE
- SEWER MANHOLE
- OUTFALL
- WETLAND FLAG

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

EXISTING SITE PLAN

DATE	#	DESCRIPTIONS	BY	APP

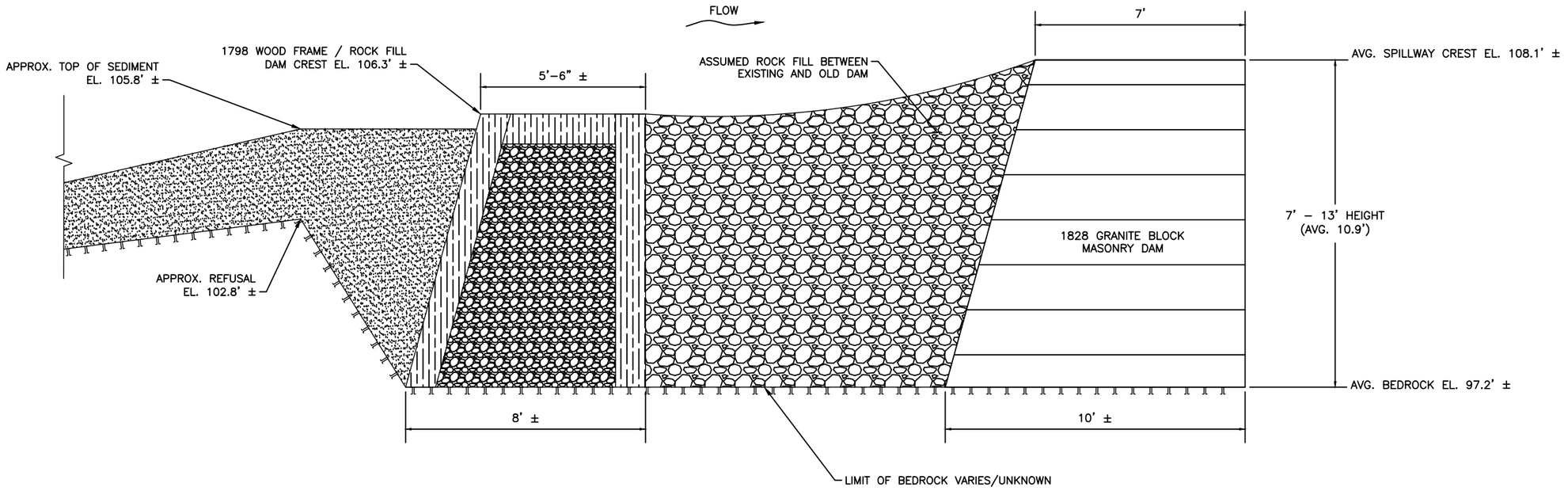
DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

OARS, INC.
23 Bradford Street
Concord, MA 01742

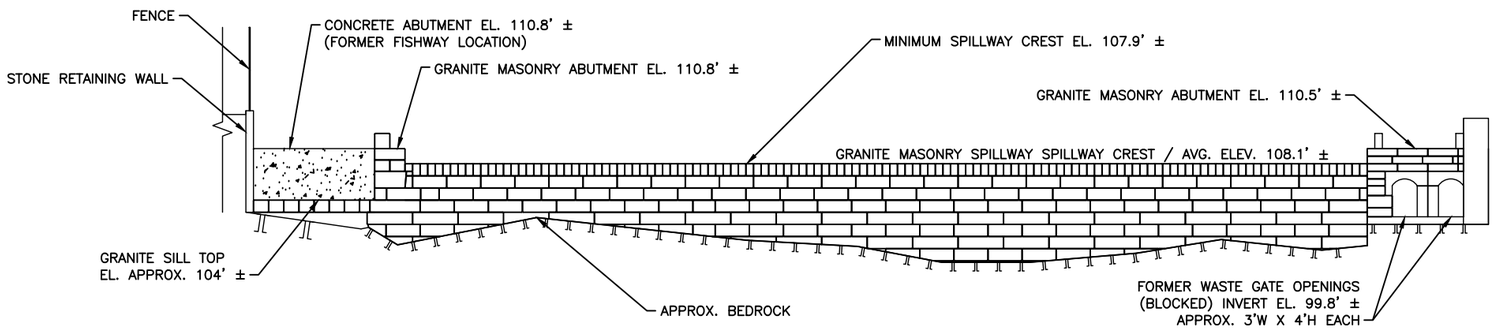
Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: 1" = 40'

DRAWING: 5



1/6 EXISTING AND 1798 DAM SECTION
SCALE: 1"=4'



2/6 EXISTING DAM ELEVATION (LOOKING UPSTREAM)
SCALE: 1" = 20'

4' 0 4' 8'
SCALE:1"=4'

20' 0 20' 40'
SCALE:1"=20'

DATE	#	DESCRIPTIONS	BY	APP

DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

EXISTING DAM SECTION AND ELEVATION

OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: AS NOTED

DRAWING: 6

FAULKNER MILLS COMPLEX

PROPOSED SILT SACK IN CATCH BASIN (SEE DETAIL SHEET 13)

CONC. WEIR WITH SLUICE GATE

FOOTBRIDGE

TALBOT MILLS DAM

PROPOSED COMPOST FILTER SOCK ON PAVEMENT OR APPROVED EQUAL (TYP) (SEE SHEET 13 FOR DETAIL)

PROPOSED OIL BOOM ACROSS CHANNEL DOWNSTREAM OF DAM (SEE DETAIL SHEET 13)

CONCORD RIVER

FAULKNER STREET

ASSUMED SUBMERGED 1798 WOOD FRAME/ROCK FILL DAM (APPROX.)

ASSUMED SUBMERGED ROCK FILL BETWEEN DAMS

PROPOSED SILT SACK IN CATCH BASIN (SEE DETAIL SHEET 13)

TALBOT MILLS COMPLEX

WATER CHESTNUT GROWTH AREA (TYP)

OLD ELM STREET

FUTURE MCA MUSEUM

FOOTBRIDGE

FORMER MIDDLESEX CANAL

IRON MOORING RINGS FOR HISTORIC FLOATING TOW PATH

PROPOSED SILT SACK IN CATCH BASIN (SEE DETAIL SHEET 13)

POTENTIAL STAGING/ SEDIMENT DEWATERING/ CONSTRUCTION PARKING AREA

PARCEL 10-231-1
6 OLD ELM ST
N/F CRT DEVELOPMENT REALTY, LLC

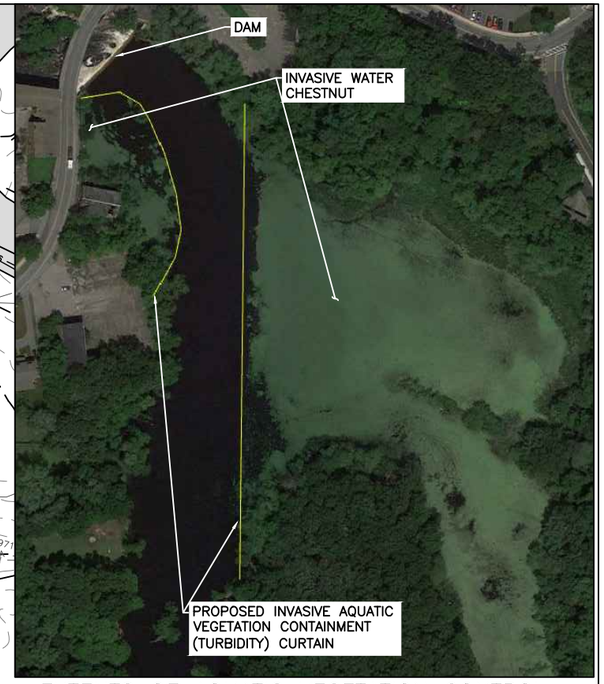
LOT LINE FOLLOWS MAHW LINE (PER PLAN BOOK 237, PLAN 27)

PROPOSED COMPOST FILTER SOCK OR APPROVED EQUAL (TYP) (SEE SHEET 13 FOR DETAIL)

APPROX. LOCATION OF PROPOSED INVASIVE AQUATIC VEGETATION AND SEDIMENT CONTAINMENT (TURBIDITY) CURTAIN TO BE INSTALLED AT EDGE OF EXISTING WATER CHESTNUT BASED ON FIELD CONDITIONS AT THE TIME OF INSTALLATION (SEE NOTE 1 AND SHEET 13 FOR DETAIL)

WATER CHESTNUT GROWTH AREA (TYP)

60' 0 60' 120'
SCALE:1"=60'



EXTENTS OF AQUATIC VEGETATION CONTROL

SCALE: NOT TO SCALE

LEGEND

- MINOR CONTOUR
- MAJOR CONTOUR
- PROPERTY BOUNDARY
- OHE — OVERHEAD ELECTRIC LINE
- S — SANITARY SEWER
- SD — STORMWATER DRAIN
- W — WATER MAIN
- TREE LINE
- BANK/ORDINARY HIGH WATER (OHW) /MEAN ANNUAL HIGH WATER (MAHW)
- BVW — BORDERING VEGETATED WETLAND (BVW)
- AE — FEMA FLOOD ZONE AE
- 25 — 25' NO ALTERATION ZONE
- 100 — 100' BANK/BVW BUFFER
- 100 RFA — 100' RIVERFRONT AREA (100' BANK BUFFER)
- 200 RFA — 200' RIVERFRONT AREA (200' BANK BUFFER)
- 1971 — 1971 FLOODPLAIN LIMIT
- AQUATIC VEGETATION CONTAINMENT CURTAIN
- FS — COMPOST FILTER SOCK
- CATCH BASIN
- HYDRANT
- WATER VALVE
- SEWER MANHOLE
- OUTFALL
- WETLAND FLAG

NOTES:

1. PROPOSED AQUATIC VEGETATION CONTAINMENT CURTAIN TO BE INSTALLED ALONG EDGES OF EXISTING INVASIVE WATER CHESTNUT GROWTH AREAS TO PRIOR TO LOWERING OF THE IMPOUNDMENT TO MINIMIZE DOWNSTREAM TRANSPORT OF SEDIMENT CONTAINING NUTS. SEE SHEET 13 FOR DETAIL.
2. CATCH BASIN INVERT ELEVATIONS MAY BE AFFECTED BY SEDIMENT BUILDUP AND/OR BLOCKED BY TEMPORARY SILT SACKS AT TIME OF SURVEY.

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

PROPOSED STAGING AND INVASIVE SPECIES CONTROL PLAN

DATE	#	DESCRIPTIONS	BY	APP

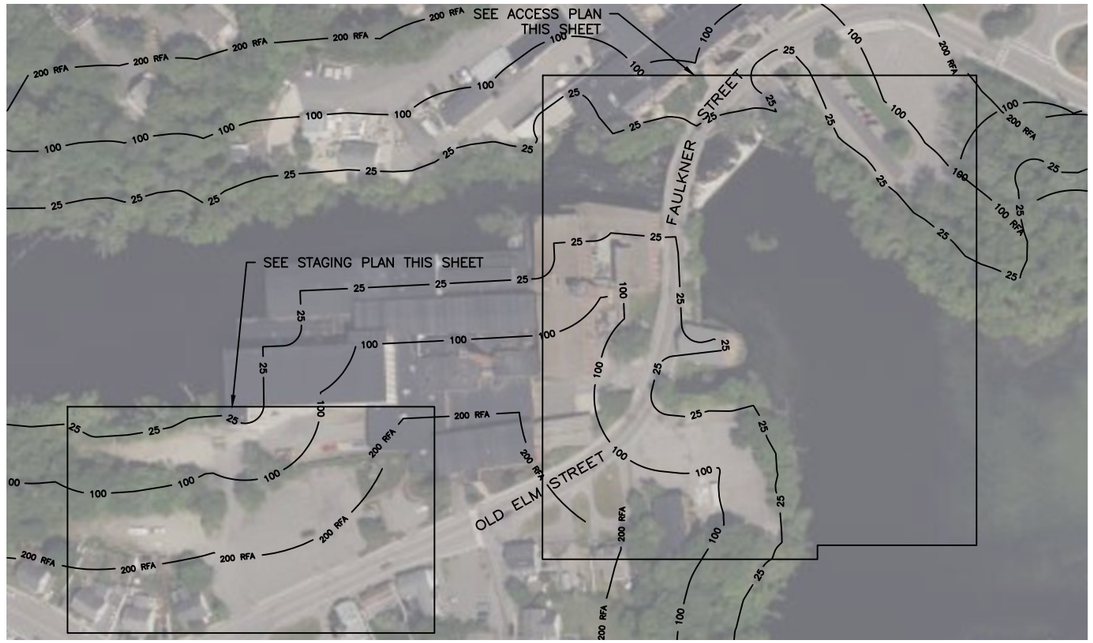
DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

OARS, INC.
23 Bradford Street
Concord, MA 01742

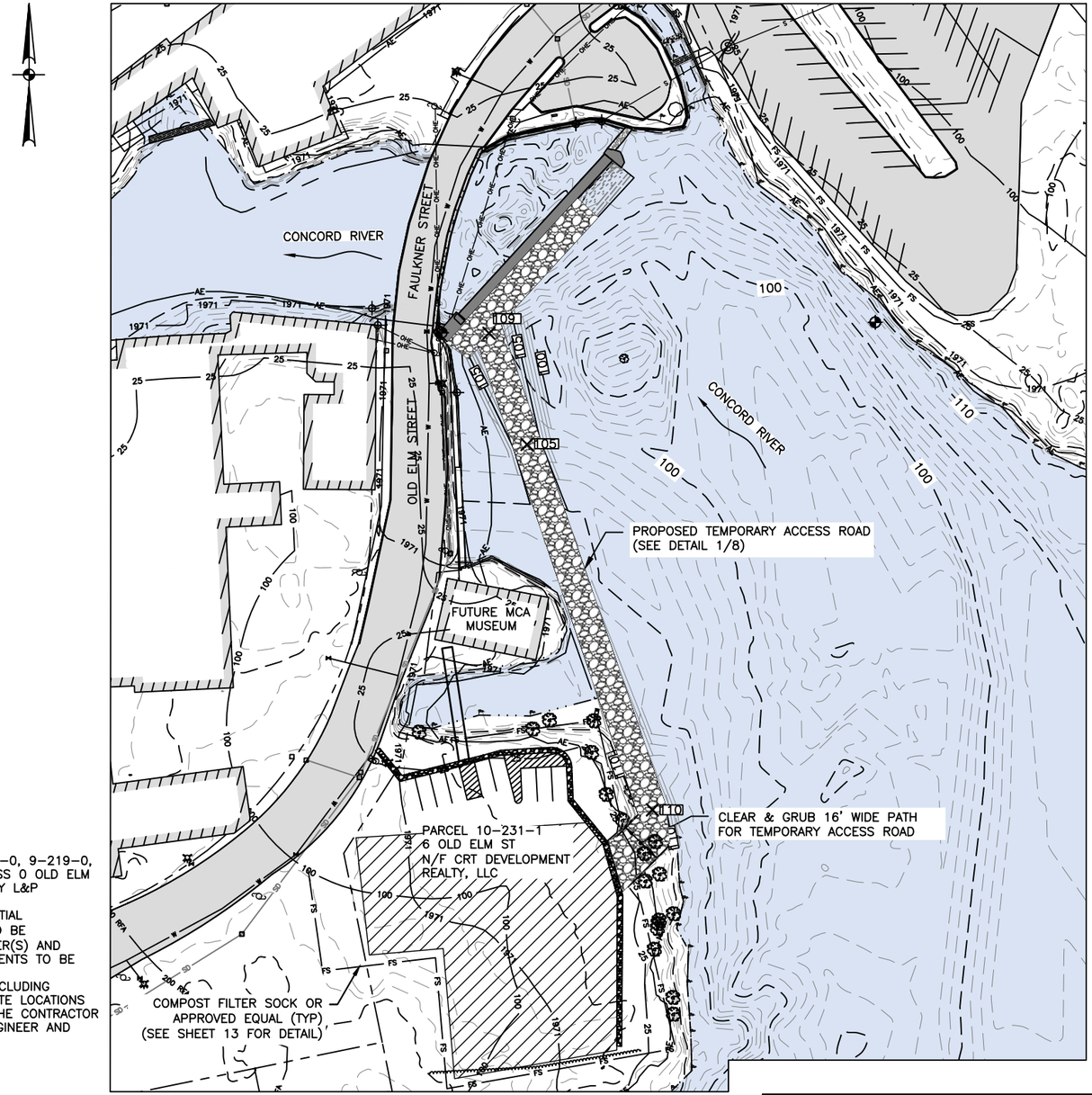
Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

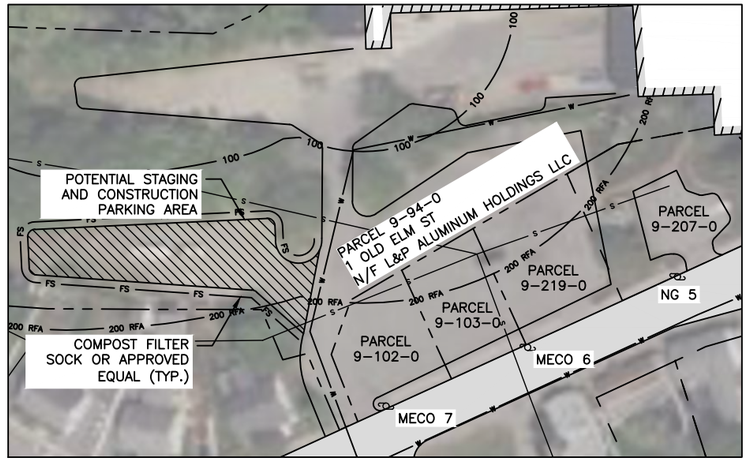
SCALE:1" = 60'

DRAWING: 7



SITE PLAN
SCALE: 1" = 200'

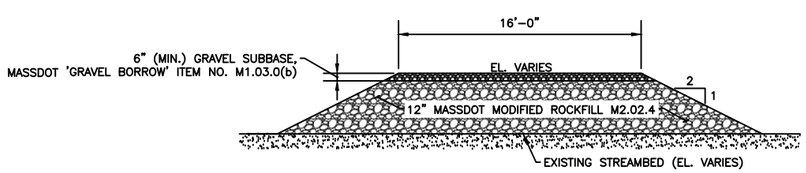




NOTES:

1. PARCELS 9-102-0, 9-103-0, 9-219-0, AND 9-207-0 ARE ADDRESS 0 OLD ELM STREET AND ARE OWNED BY L&P ALUMINUM HOLDINGS LLC.
2. PERMISSION TO USE POTENTIAL STAGING/LOADING AREAS TO BE CONFIRMED WITH LANDOWNER(S) AND TEMPORARY ACCESS EASEMENTS TO BE ESTABLISHED AS NEEDED.
3. TRAFFIC CONTROL PLAN, INCLUDING TEMPORARY FENCE AND GATE LOCATIONS SHALL BE SUBMITTED BY THE CONTRACTOR FOR APPROVAL BY THE ENGINEER AND OWNER.

STAGING PLAN
SCALE: 1" = 100'



1/8 TEMPORARY ACCESS ROAD DETAIL
SCALE: 1" = 10'

200' 0 200' 400'
SCALE:1"=200'

100' 0 100' 200'
SCALE:1"=100'

80' 0 80' 160'
SCALE:1"=80'

10' 0 10' 20'
SCALE:1"=10'

ACCESS PLAN
SCALE: 1" = 80'

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

PROPOSED STAGING AND ACCESS PLAN

DATE	#	DESCRIPTIONS	BY	APP

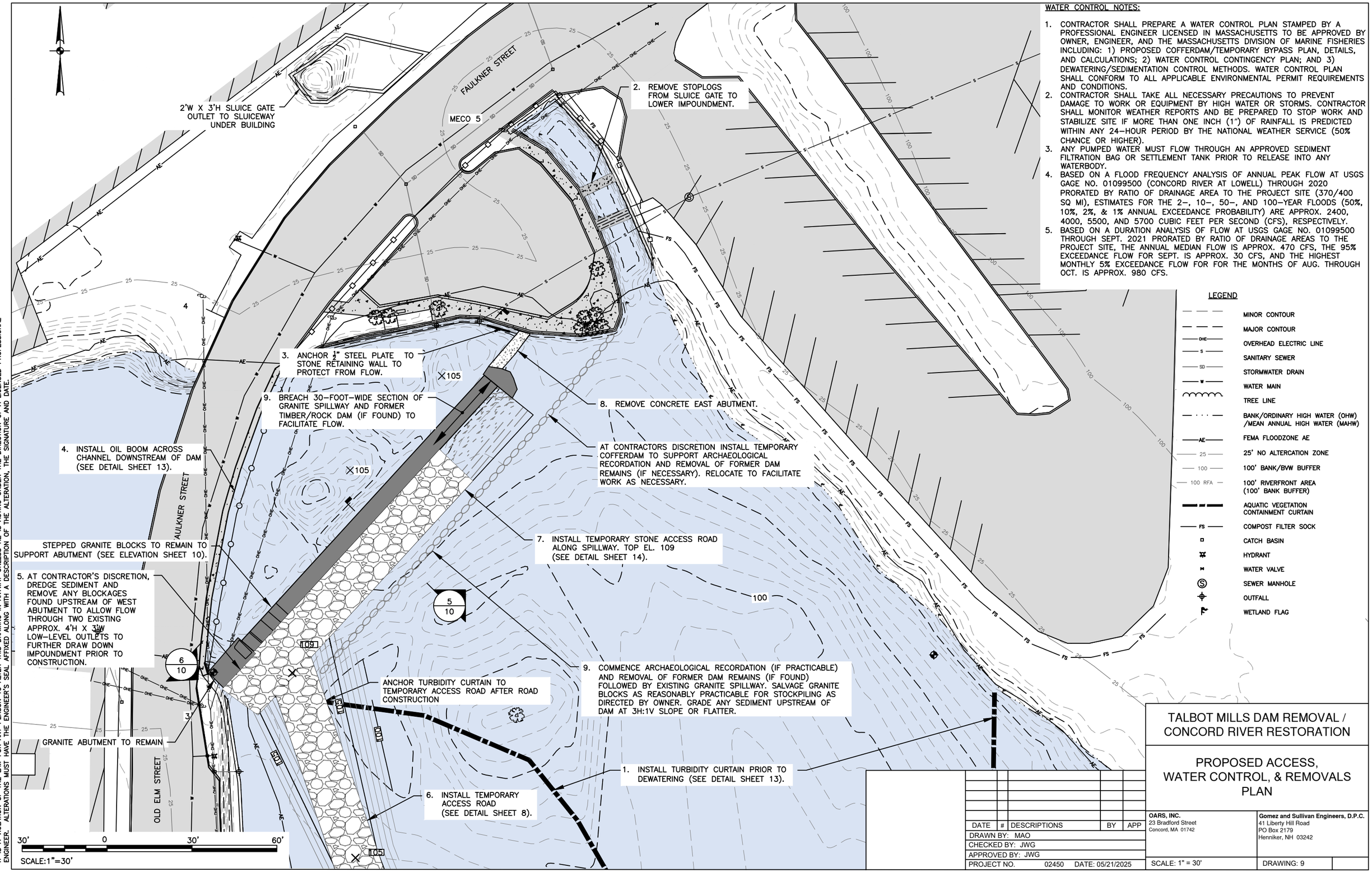
DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: AS NOTED

DRAWING: 8



WATER CONTROL NOTES:

1. CONTRACTOR SHALL PREPARE A WATER CONTROL PLAN STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN MASSACHUSETTS TO BE APPROVED BY OWNER, ENGINEER, AND THE MASSACHUSETTS DIVISION OF MARINE FISHERIES INCLUDING: 1) PROPOSED COFFERDAM/TEMPORARY BYPASS PLAN, DETAILS, AND CALCULATIONS; 2) WATER CONTROL CONTINGENCY PLAN; AND 3) DEWATERING/SEDIMENTATION CONTROL METHODS. WATER CONTROL PLAN SHALL CONFORM TO ALL APPLICABLE ENVIRONMENTAL PERMIT REQUIREMENTS AND CONDITIONS.
2. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO WORK OR EQUIPMENT BY HIGH WATER OR STORMS. CONTRACTOR SHALL MONITOR WEATHER REPORTS AND BE PREPARED TO STOP WORK AND STABILIZE SITE IF MORE THAN ONE INCH (1") OF RAINFALL IS PREDICTED WITHIN ANY 24-HOUR PERIOD BY THE NATIONAL WEATHER SERVICE (50% CHANCE OR HIGHER).
3. ANY PUMPED WATER MUST FLOW THROUGH AN APPROVED SEDIMENT FILTRATION BAG OR SETTLEMENT TANK PRIOR TO RELEASE INTO ANY WATERBODY.
4. BASED ON A FLOOD FREQUENCY ANALYSIS OF ANNUAL PEAK FLOW AT USGS GAGE NO. 01099500 (CONCORD RIVER AT LOWELL) THROUGH 2020 PRORATED BY RATIO OF DRAINAGE AREA TO THE PROJECT SITE (370/400 SQ MI), ESTIMATES FOR THE 2-, 10-, 50-, AND 100-YEAR FLOODS (50%, 10%, 2%, & 1% ANNUAL EXCEEDANCE PROBABILITY) ARE APPROX. 2400, 4000, 5500, AND 5700 CUBIC FEET PER SECOND (CFS), RESPECTIVELY.
5. BASED ON A DURATION ANALYSIS OF FLOW AT USGS GAGE NO. 01099500 THROUGH SEPT. 2021 PRORATED BY RATIO OF DRAINAGE AREAS TO THE PROJECT SITE, THE ANNUAL MEDIAN FLOW IS APPROX. 470 CFS, THE 95% EXCEEDANCE FLOW FOR SEPT. IS APPROX. 30 CFS, AND THE HIGHEST MONTHLY 5% EXCEEDANCE FLOW FOR FOR THE MONTHS OF AUG. THROUGH OCT. IS APPROX. 980 CFS.

LEGEND

- MINOR CONTOUR
- MAJOR CONTOUR
- OHE — OVERHEAD ELECTRIC LINE
- S — SANITARY SEWER
- SD — STORMWATER DRAIN
- W — WATER MAIN
- TREE LINE
- BANK/ORDINARY HIGH WATER (OHW) /MEAN ANNUAL HIGH WATER (MAHW)
- AE — FEMA FLOODZONE AE
- 25 — 25' NO ALTERCATION ZONE
- 100 — 100' BANK/BVW BUFFER
- 100 RFA — 100' RIVERFRONT AREA (100' BANK BUFFER)
- AQUATIC VEGETATION CONTAINMENT CURTAIN
- FS — COMPOST FILTER SOCK
- CATCH BASIN
- HYDRANT
- WATER VALVE
- SEWER MANHOLE
- OUTFALL
- WETLAND FLAG

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

PROPOSED ACCESS, WATER CONTROL, & REMOVALS PLAN

DATE	#	DESCRIPTIONS	BY	APP

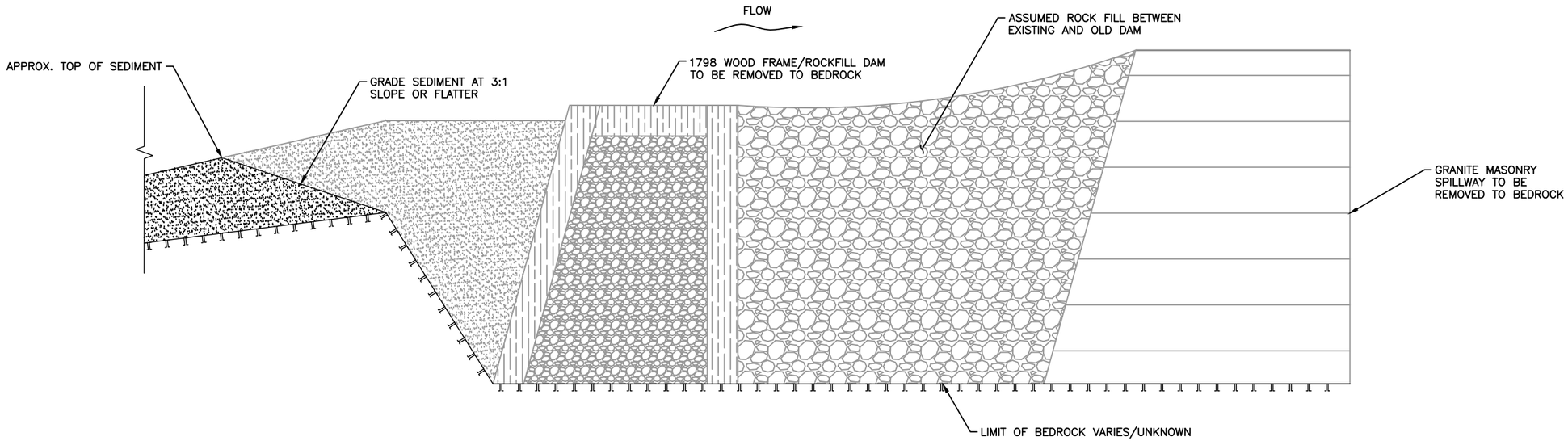
DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

OARS, INC.
23 Bradford Street
Concord, MA 01742

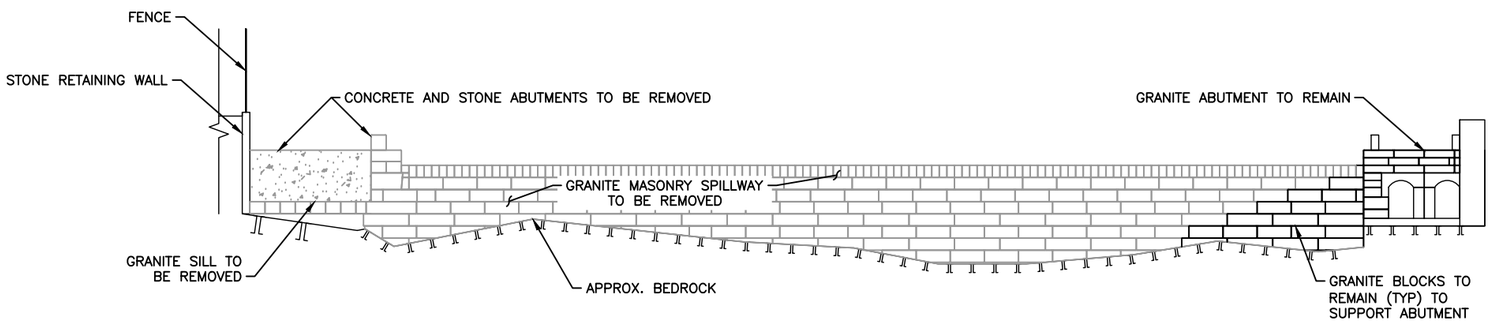
Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: 1" = 30'

DRAWING: 9



5/10 PROPOSED DAM REMOVAL SECTION
SCALE: 1"=4'



6/10 PROPOSED DAM REMOVAL ELEVATION (LOOKING UPSTREAM)
SCALE: 1" = 20'

4' 0 4' 8'
SCALE:1"=4'

20' 0 20' 40'
SCALE:1"=20'

DATE	#	DESCRIPTIONS	BY	APP

DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

PROPOSED DAM BREACH SECTION AND ELEVATION

OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: AS NOTED
DRAWING: 10

SLUICEWAY TO BE RESTORED TO PRE-CONSTRUCTION CONDITIONS. SLUICEWAY WILL REMAIN DRY UNDER NORMAL FLOW CONDITIONS AND WILL TEMPORARILY FILL WITH WATER DURING HIGH FLOWS.

GRANITE SPILLWAY AND ADJACENT NORTHEAST ABUTMENTS REMOVED

PROPOSED GRADES ARE APPROXIMATE AND WILL FOLLOW BEDROCK UNDERLYING DAM STRUCTURES (VARIES/EXTENTS UNKNOWN)

STEPPED GRANITE BLOCKS TO REMAIN

GRANITE ABUTMENT TO REMAIN

PROPOSED STORMWATER OUFALL RIPRAP APRON (SEE DETAILS SHEET 14)

LIVE STAKES IN 1 ROW (SEE TABLE AND DETAIL A SHEET 12)

CONCORD RIVER

FAULKNER STREET

TALBOT MIILLS COMPLEX

30' 0 30' 60'

SCALE:1"=30'

LEGEND

- MINOR CONTOUR
- MAJOR CONTOUR
- PROPOSED CONTOUR
- OHE — OVERHEAD ELECTRIC LINE
- S — SANITARY SEWER
- SD — STORMWATER DRAIN
- W — WATER MAIN
- TREE LINE
- EXISTING BANK/ORDINARY HIGH WATER(OHW)/MEAN ANNUAL HIGH WATER (MAHW)
- BVW — EXISTING BORDERING VEGETATED WETLAND (BVW)
- 25 — EXISTING 25' NO ALTERATION ZONE
- 100 — EXISTING 100' BANK/BVW BUFFER
- 100 RFA — EXISTING 100' RIVERFRONT AREA (100' BANK BUFFER)
- 200 RFA — EXISTING 200' RIVERFRONT AREA (200' BANK BUFFER)
- PROPOSED BANK/ORDINARY HIGH WATER (OHW)/MEAN ANNUAL HIGH WATER (MAHW)
- BVW — PROPOSED BORDERING VEGETATED WETLAND (BVW)
- 100 — PROPOSED 100' BVW/BANK BUFFER
- 100 RFA — PROPOSED 100' RIVERFRONT AREA (100' BANK BUFFER)
- 200 RFA — PROPOSED 200' PROPOSED RIVERFRONT AREA (200' BANK BUFFER)
- BLSF — BORDERING LAND SUBJECT TO FLOODING (BLSF) (MODELED)
- CATCH BASIN
- HYDRANT
- WATER VALVE
- SEWER MANHOLE
- OUTFALL

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

PROPOSED SITE PLAN

DATE	#	DESCRIPTIONS	BY	APP

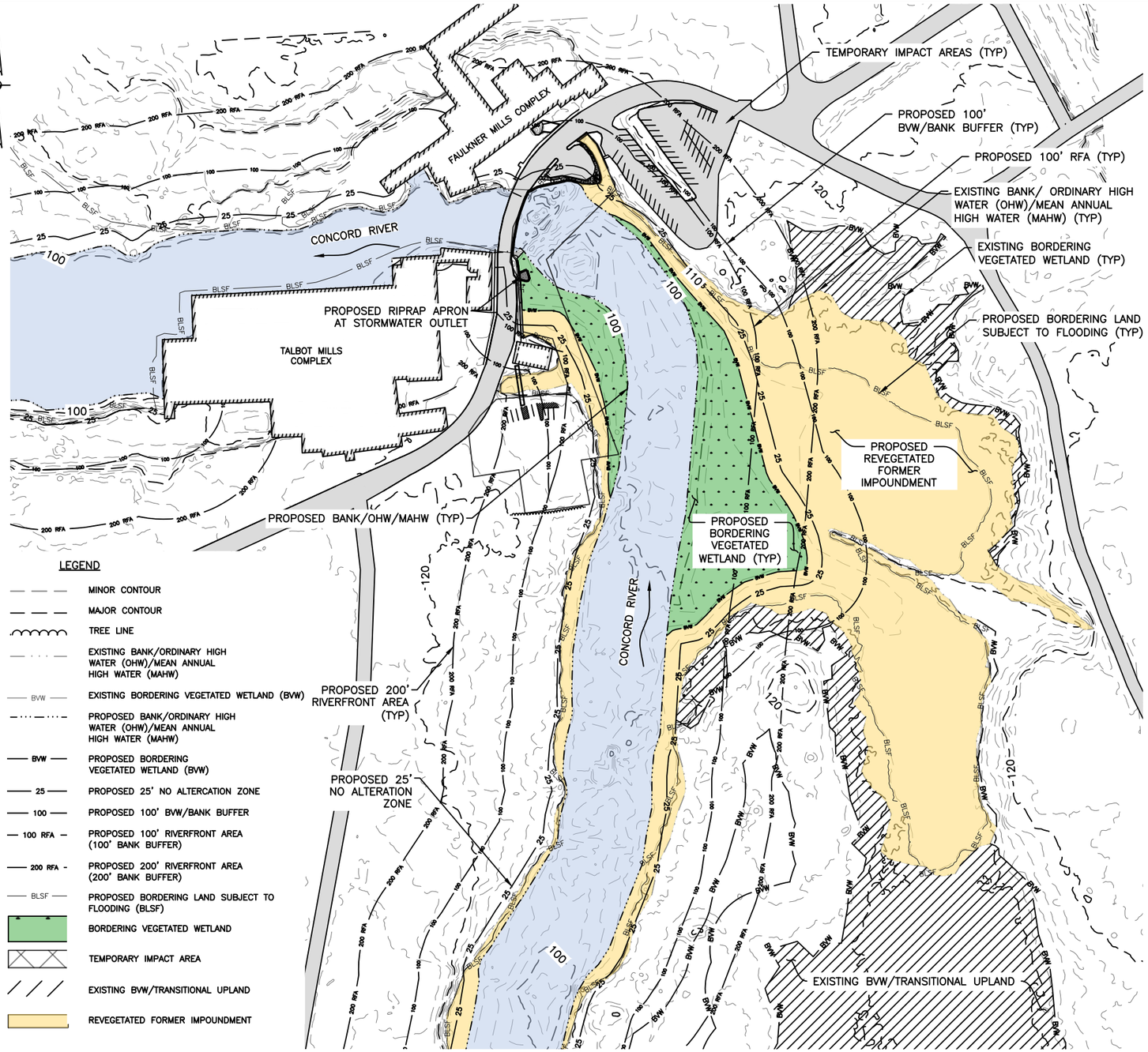
DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

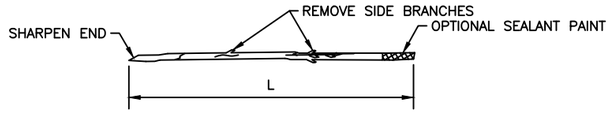
SCALE: 1" = 30'

DRAWING: 11



PROPOSED PLAN
SCALE: 1" = 200'

NOTES:
1. WHERE THE 100' BVW/BANK BUFFER AND THE 100' RFA ARE COINCIDENT ONLY THE 100' BANK/BVW BUFFER IS SHOWN.
2. CONTOUR INTERVAL SHOWN ON PLAN IS 2 FEET.

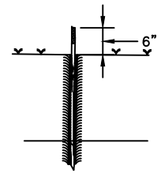


STEP 1

NOTES:
1. OBTAIN WILLOW OR WILLOW TYPE ADVENTITIOUSLY ROOTABLE STOCK.
2. MATERIAL SHOULD BE FROM AN AREA WITH SIMILAR SOIL, CLIMATE, AND LOCATION RELATIVE TO THE RIVER.
3. THE MATERIAL SHALL BE AT LEAST TWO YEARS OLD AND FREE OF DISEASE, ROT, OR INSECT INFESTATION.
4. MATERIAL SHALL BE HARVESTED WHILE DORMANT AND SOAKED (1 TO 14 DAYS) BEFORE INSTALLATION.

STEP 2

NOTES:
1. CREATE A PILOT HOLE THAT IS PERPENDICULAR TO THE GROUND SURFACE AND DEEP ENOUGH TO REACH THE LOWEST WATER TABLE OF THE YEAR.
2. THE HOLE SHALL BE ⅔ TO ¾ THE LENGTH OF THE LIVE STAKE.
3. A WATERJET (HYDRODRILL) MAY BE USED TO CREATE THE PILOT HOLE IN SILT, LOAM, AND SOME CLAY SOILS. IT DOES NOT WORK WELL IN LARGE GRAVELS AND COBBLES.



STEP 3

NOTES:
1. TAMP LIVE POLES INTO HOLE.
2. TOP OF CUTTING SHALL BE ABOVE COMPETING VEGETATION.
3. BACK FILL HOLE WITH WATER AND SOIL MIX TO ACHIEVE GOOD SOIL TO STEM CONTACT.
4. SPACE STAKES IN A 1 TO 3 FOOT RANDOM PATTERN.
5. IF PILOT HOLE IS MADE WITH A WATER JET (HYDRO DRILL), BACKFILLING WITH WATER SOIL SLURRY MAY NOT BE NECESSARY.

A LIVE STAKES
SCALE: NOT TO SCALE (NTS)

LIVE STAKES		
Common Name	*Scientific Name*	*Specification*
Pussy Willow	Salix discolor	1-3" diameter/18-36" long/2' o.c.
Silky Willow	Salix sericea	1-3" diameter/18-36" long/2' o.c.

IT IS A VIOLATION OF THE LAW FOR ANY PERSON TO ALTER THIS DRAWING IN ANYWAY UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER. ALTERATIONS MUST HAVE THE ENGINEER'S SEAL AFFIXED ALONG WITH A DESCRIPTION OF THE ALTERATION, THE SIGNATURE AND DATE.

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

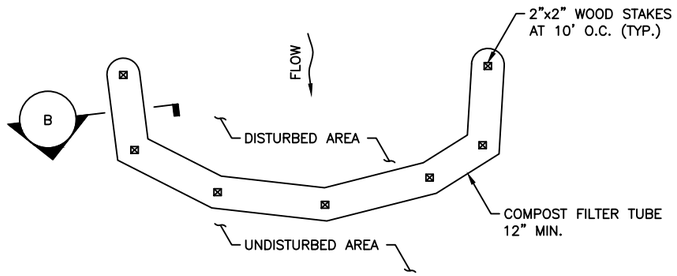
PROPOSED WETLAND RESOURCES & RESTORATION PLAN

DATE	#	DESCRIPTIONS	BY	APP

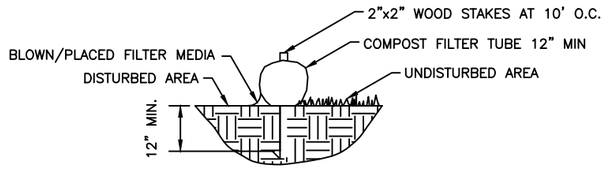
DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025
SCALE: 1" = 100'
DRAWING: 12

OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242



A COMPOST FILTER SOCK PLAN
SCALE: NOT TO SCALE (NTS)



B COMPOST FILTER SOCK SECTION
SCALE: NOT TO SCALE (NTS)

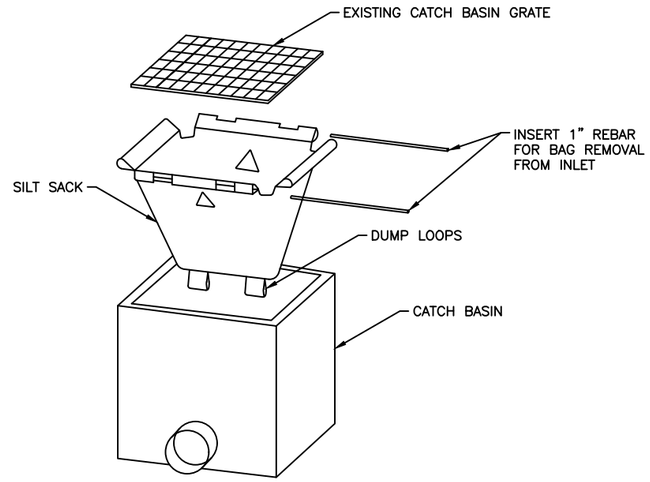
NOTES:

1. THIS SOCK FABRIC SHALL MEET MADEP STANDARDS.
2. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.
3. TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
4. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
5. COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
6. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.
7. IF THERE ARE SEAMS WHERE ONE SOCK ABUTS ANOTHER, THERE MUST BE OVERLAP AND STAKING PER MANUFACTURERS SPECIFICATIONS.

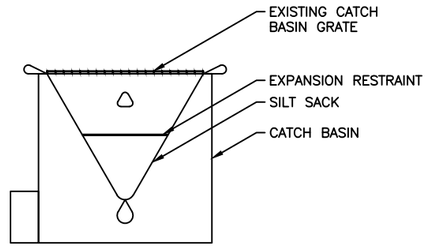
C DEWATERING BAG
SCALE: NOT TO SCALE (NTS)

NOTES:

1. BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY.
2. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.



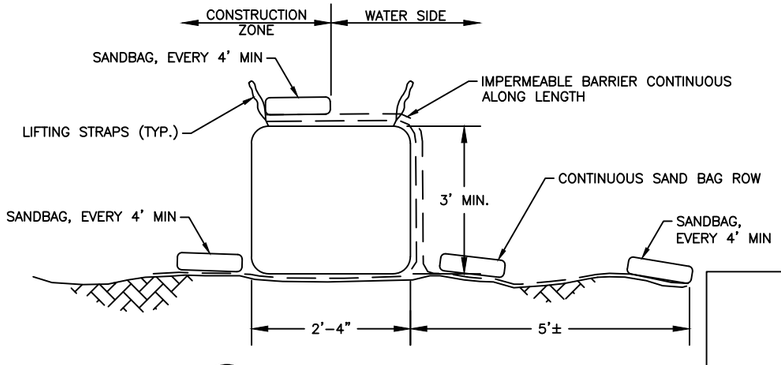
E SILT SACK COMPONENTS (NOT INSTALLED)
SCALE: NOT TO SCALE (NTS)



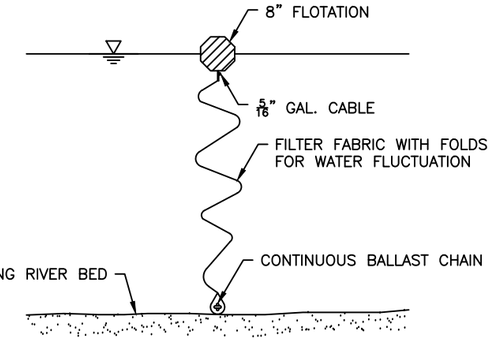
F SILT SACK SECTION (INSTALLED)
SCALE: NOT TO SCALE (NTS)

NOTES:

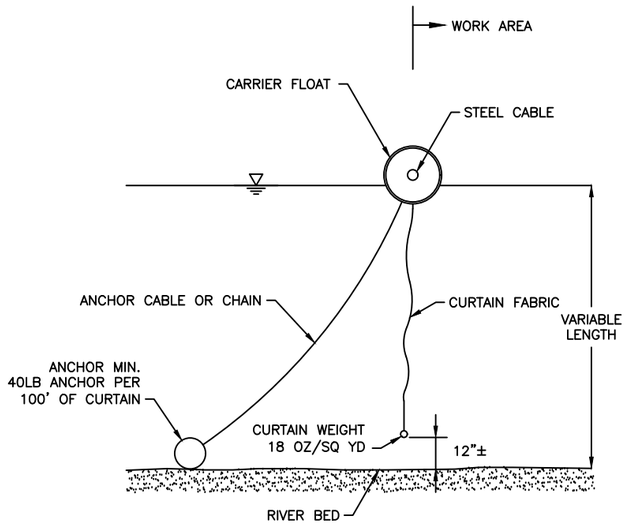
1. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR MORE INFORMATION.



G SUPER SACK
SCALE: NOT TO SCALE (NTS)



H OIL BOOM
SCALE: NOT TO SCALE (NTS)



I TURBIDITY CURTAIN
SCALE: NOT TO SCALE (NTS)

IT IS A VIOLATION OF THE LAW FOR ANY PERSON TO ALTER THIS DRAWING IN ANYWAY UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER. ALTERATIONS MUST HAVE THE ENGINEER'S SEAL AFFIXED ALONG WITH A DESCRIPTION OF THE ALTERATION, THE SIGNATURE AND DATE.

DATE	#	DESCRIPTIONS	BY	APP

DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

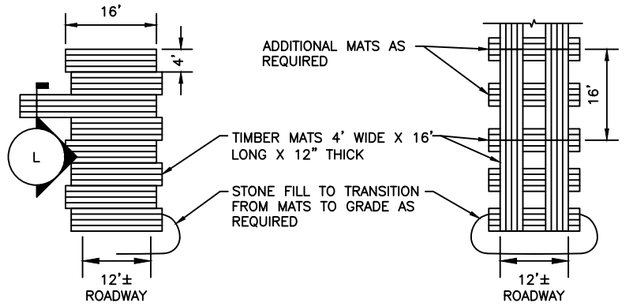
EROSION AND SEDIMENT CONTROL DETAILS (1 OF 2)

OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

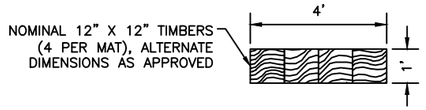
SCALE: NONE

DRAWING: 13



J SINGLE LAYER SWAMP MAT
SCALE: NOT TO SCALE (NTS)

K DOUBLE LAYER SWAMP MAT
SCALE: NOT TO SCALE (NTS)



L SECTION
SCALE: NOT TO SCALE (NTS)

NOTES:

INSTALLATION

1. MATS SHALL BE IN GOOD CONDITION TO ENSURE PROPER INSTALLATION, USE AND REMOVAL.
2. OPERATING HEAVY EQUIPMENT IN WETLANDS SHALL BE MINIMIZED, AND SUCH EQUIPMENT OTHER THAN FIXED EQUIPMENT (DRILL RIGS, FIXED CRANES, ETC.) SHALL NOT BE STORED, MAINTAINED, FUELED OR REPAIRED IN WETLANDS UNLESS THE EQUIPMENT IS BROKEN DOWN AND CANNOT BE EASILY REMOVED.
3. AN ADEQUATE SUPPLY OF SPILL CONTAINMENT EQUIPMENT SHALL BE MAINTAINED ON SITE.
4. MINIMIZE IMPACTS TO WETLAND AREAS DURING INSTALLATION, USE, AND REMOVAL.
5. INSTALL ADEQUATE EROSION AND SEDIMENT CONTROLS AT APPROACHES TO MATS TO PROMOTE A SMOOTH TRANSITION TO, AND MINIMIZE SEDIMENT TRACKING ONTO, SWAMP MATS.
6. IN MOST CASES, CONSTRUCTION MATS SHOULD BE PLACED ALONG THE TRAVEL AREA SO THAT THE INDIVIDUAL BOARDS ARE RESTING PERPENDICULAR TO THE DIRECTION OF TRAFFIC. NO GAPS SHOULD EXIST BETWEEN MATS. PLACE MATS FAR ENOUGH ON EITHER SIDE OF THE RESOURCE AREA TO REST ON FIRM GROUND.

MAINTENANCE

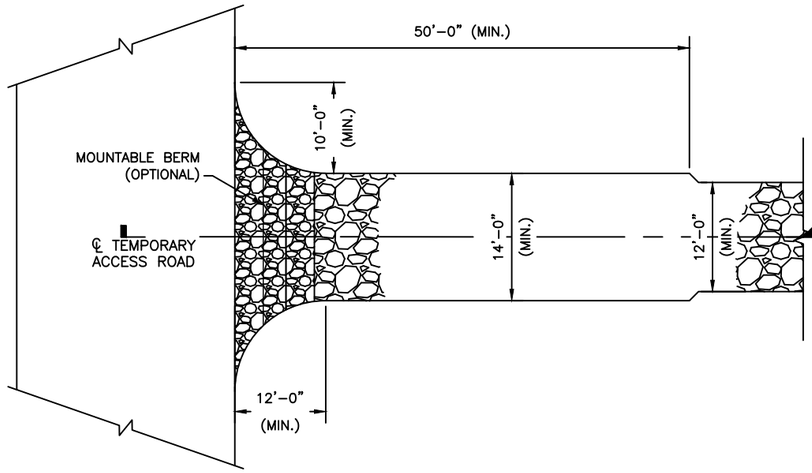
1. MAT INSTALLATIONS SHOULD BE MONITORED TO ASSURE CORRECT FUNCTIONING OF THE MATS. INSPECT MATS AFTER USE. LOOK FOR ANY DEFECTS OR STRUCTURAL PROBLEMS. MATS WHICH BECOME COVERED WITH SOILS OR CONSTRUCTION DEBRIS SHOULD BE CLEANED AND THE MATERIALS REMOVED AND DISPOSED OF IN AN UPLAND LOCATION. THE MATERIAL SHOULD NOT BE SCRAPED AND SHOVELED INTO THE RESOURCE AREA. MATS WHICH BECOME IMBEDDED MUST BE RESET OR LAYERED TO PREVENT MUD FROM COVERING THEM OR WATER PASSING OVER THEM.

REMOVAL

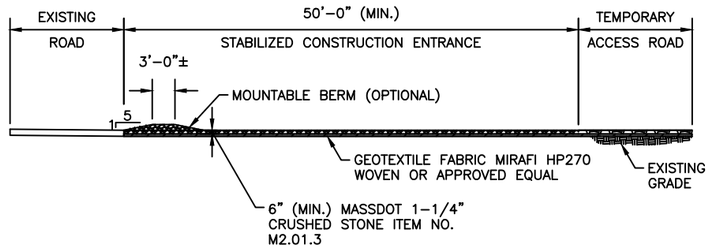
1. MATTING SHOULD BE REMOVED BY "BACKING" OUT OF THE SITE, REMOVING MATS ONE AT A TIME. ANY RUTTING OR SIGNIFICANT INDENTATIONS IDENTIFIED DURING MAT REMOVAL SHOULD BE REGRADED IMMEDIATELY, TAKING CARE NOT TO COMPACT SOILS.
2. MATS SHOULD BE CLEANED BEFORE TRANSPORT TO ANOTHER WETLAND/STREAM LOCATION TO REMOVE SOIL AND ANY INVASIVE PLANT SPECIES SEED STOCK OR PLANT MATERIAL.
3. MATS SHALL BE CLEANED OF SOIL AND ANY INVASIVE PLANT SPECIES SEED STOCK OR PLANT MATERIAL FROM BEFORE INSTALLATION.
4. CLEANING METHODS MAY INCLUDE BUT ARE NOT LIMITED TO SHAKING OR DROPPING MATS IN A CONTROLLED MANNER WITH A PIECE OF MACHINERY TO KNOCK OFF ATTACHED SOIL AND DEBRIS, SPRAYING WITH WATER OR AIR, AND SWEEPING.

RESTORATION

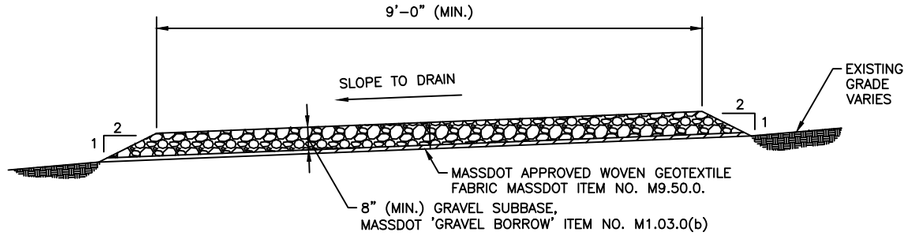
1. SPECIAL PRECAUTIONS SHOULD BE TAKEN TO PROMPTLY STABILIZE AREAS OF DISTURBED SOIL LOCATED NEAR WETLANDS AND STREAMS. MATTED AREAS WITHIN WETLANDS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AND ELEVATION. THIS MAY INVOLVE NATURAL REVEGETATION FROM EXISTING ROOT AND SEED STOCK OF NATIVE PLANT SPECIES. CONDITIONS MAY WARRANT PLANTING AND THE BROADCAST OF A WETLAND SEED MIX OVER THE MATTED AREA TO SUPPLEMENT THE EXISTING SEED AND ROOTSTOCK. SEED MIXES AND VEGETATION SHALL CONTAIN ONLY PLANT SPECIES NATIVE TO NEW ENGLAND. THE USE OF MULCH IN WETLANDS SHALL CONSIST OF WEED-FREE MULCH TO MITIGATE THE RISK OF THE SPREAD OF INVASIVE PLANT SPECIES



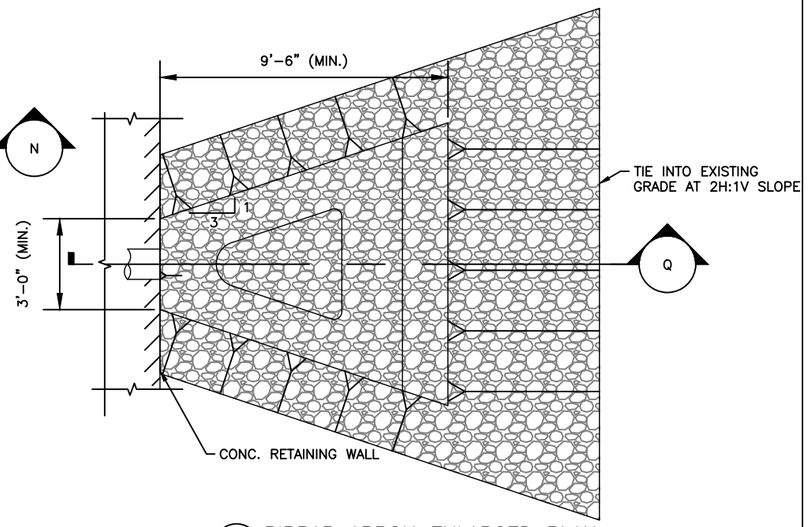
M STABILIZED CONSTRUCTION ENTRANCE PLAN
SCALE: NOT TO SCALE (NTS)



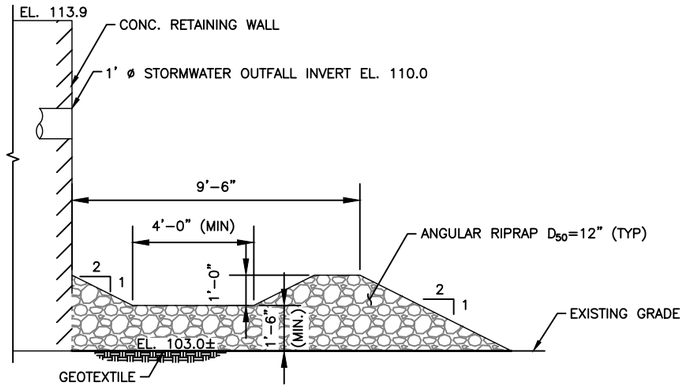
N STABILIZED CONSTRUCTION ENTRANCE SECTION
SCALE: NOT TO SCALE (NTS)



O TEMPORARY ACCESS ROAD
SCALE: NOT TO SCALE (NTS)



P RIPRAP APRON ENLARGED PLAN
1"=5'



Q RIPRAP APRON SECTION
1"=5'

TALBOT MILLS DAM REMOVAL / CONCORD RIVER RESTORATION

EROSION AND SEDIMENT CONTROL DETAILS (2 OF 2)

DATE	#	DESCRIPTIONS	BY	APP

DRAWN BY: MAO
CHECKED BY: JWG
APPROVED BY: JWG
PROJECT NO. 02450 DATE: 05/21/2025

OARS, INC.
23 Bradford Street
Concord, MA 01742

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: NONE

DRAWING: 14

5. Opinion of Probable Construction Cost

Date:	4/22/2025
Revision No.:	4

Opinion of Probable Construction Cost for Talbot Mills Dam Removal Project - Permitting Phase

Bid Item No.	Category	Item	MassDOT Item No.	Descriptions	Unit	Qty	Unit Cost	Ext. Cost *(2024 $)*
1	Mobilization/ Demobilization	Mobilization/demobilization	748		LS	10%	$893,100	$89,310
							SUBTOTAL	**$89,310**
2	Site Controls	Temporary fence	657	Temporary security fence	LF	200	$82	$16,400
		Fence removed & reset	666	Black metal fencing around gazebo area	FT	100	$120	$12,000
		Compost filter socks	697	Around access/staging areas	LF	650	$15	$9,750
		Turbidity curtain	697.2	Type 2, for invasive species/sediment containment	LF	1200	$58	$69,600
		Turbidity curtain anchors	-	For floating silt fence (50' spacing)	EA	24	$840	$20,160
		Oil containment boom	-	Across channel downstream of dam	LF	100	$40	$4,000
		Steel plates	-	For protection of stone walls adjacent to abutments	SF	140	$10	$1,400
		Straw bales	767.8	For sediment dewatering	LF	200	$14	$2,800
		Police detail			HR	480	$80	$38,400
		Roadway flagger	850.41	Two flaggers for 6 weeks	HR	480	$85	$40,800
							SUBTOTAL	**$215,310**
3	Access Alt 1 (Pace)	Modified rockfill	986.2	For temporary access road through impoundment	CY	500	$150	$75,000
		Rockfill removal		Removal of temporary access road (50% of material cost)	CY	500	$80	$40,000
		Gravel subbase	402	For 6" layer on top of temp. access road & across spillway	CY	50	$90	$4,500
							SUBTOTAL	**$119,500**
4	Optional Water Control & Access Measures	Cofferdams	-	SuperSacks or similar to facilitate archeological recordation	LS	1	$86,000	$86,000
		Swamp mats		For access in dewatered impoundment	LS	1	$38,000	$38,000
		Crane		To lift equipment into/out of channel	MO	3	$5,030	$15,090
		Gravel subbase		For optional ramp to downstream channel	CY	310	$90	$27,900
							SUBTOTAL	**$166,990**
5	Dam & Sediment Removal	Granite block excavation	-	Spillway & right stone abutment; assume 50% salvage	CY	440	$130	$57,200
		Concrete excavation	127	Right concrete abutment	CY	30	$560	$16,800
		Loading & hauling	-	Stone & concrete materials; assume 50% stays onsite	CU	250	$80	$20,000
		Earth excavation & disposal	120	Former timber crib dam & rock fill between dams	CY	950	$110	$104,500
		Sediment excavation & disposal	123	Sediment immediately upstream of dam graded 3:1	CY	220	$350	$77,000
							SUBTOTAL	**$275,500**
6	Site Restoration & Mitigation	Pavement surface course	450.22	Restoration of pavement in access/staging areas	TON	580	$190	$110,200
		Interpretive signage		24" x 36" x 0.5" thick frameless HPL angle-mount with pedestal	EA	2	$2,800	$5,600
							SUBTOTAL	**$115,800**
CONSTRUCTION							**SUBTOTAL Direct Construction Cost**	**$982,410**
							Contingency Allowance: 15%	*$147,362*
							TOTAL DIRECT CONSTRUCTION COST *(2024 $)*	**$1,129,772**
							Escalation (2%/year x 1 years)	*$22,595*
							TOTAL DIRECT CONSTRUCTION COST *(2025 $, rounded to nearest $1,000)*	**$1,153,000**
CONSULTING SERVICES							Design & Permitting	*$400,000*
							Construction Phase Services	*$235,000*
							TOTAL OPINION OF PROBABLE CONSTRUCTION COST *(2025 $ rounded up to the nearest $1000)*	**$1,788,000**

6. Supplemental Cost Information

Please note that these costs are solely for fish passage work as described herein and to not include any improvements or repairs to the embankment beyond those specifically described.

6.1 ENGINEERING AND PERMITTING

Table 8 below summarizes a cost estimate of future engineering, permitting, and construction services costs to assist the DMF in advancing the project.

Table 8: Final Engineering and Construction Services Cost Estimate

Category	Cost ($)
Spillway stability analysis:	$ 15,000
Permit Application Process (including public meetings)	$ 50,000
Final Design (including structural) Drawings	$ 25,000
Tech Specs and Project Manual	$ 20,000
Bidding Support	$ 10,000
Construction Observation (part time)	$ 30,000
Completion Services	$ 10,000
Total	**$ 160,000**

Note: DMF staff contributions may reduce costs for the Permit Application Process and Construction Observations

6.2 CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COSTS

GZA has developed the following opinion of probable construction cost estimate (**Table 9**) of probable construction costs for the fishway design, downstream passage system, and recommended spillway modifications.

Table 9: Opinion of Probable Construction Cost

Category	Cost ($)
Mobilization / Demobilization	$ 50,000
Temporary Facilities	$ 30,000
Traffic Control	$ 25,000
Water / Sediment Control	$ 250,000
Demolition	$ 25,000
Dredging	$ 50,000
Earthwork / Rock Excavation	$ 125,000
Concrete	$ 530,000
Channel Modifications / Rock Weirs	$ 50,000
Misc. Wood and Metal Fabrications	$ 125,000
Site Restoration	$ 15,000
Subtotal	**$ 1,275,000**
Engineering and Permitting Subtotal	**$ 160,000**
Contingency (~25%)	**$ 360,000**
Total	**$ 1,635,000**

Note: The dam owner contributions per the Fishway MOU are expected to lower some of these cost categories

Centennial Island Fishway Budgetary Opinion of Probable Construction Costs

DESIGN STAGE: Conceptual

Date:	2/5/2025
Revision No.:	5

Category	Item	MassDOT Item No.	Description	Unit	Qty	Unit Cost	Ext. Cost	Rounded Cost
Mobilization/ Demobilization	Contractor's general requirements	748	10% of remaining costs	LS	10%	$416,732	$41,673	$42,000
						SUBTOTAL	**$41,673**	**$42,000**
Access & Erosion Control	Sediment control barriers	767.121	Compost filter socks	LF	500	$12	$6,000	$6,000
	Oil containment boom	-	Across channel downstream of work area	LF	100	$60	$6,000	$6,000
	Temporary fence	657	Perimeter of project area	LF	160	$46	$7,360	$8,000
	Roadway flagger	850.41		HR	80	$75	$6,000	$6,000
	Crushed stone	156	Construction entrance (1-1/4", M2.01.3)	TON	200	$60	$12,000	$12,000
	Dense graded crushed stone for subbase	402	Access ramp	CY	100	$95	$9,500	$10,000
	Geotextile fabric for separation	698.3	Under temporary access road, temporary access, ramp, and staging areas	SY	500	$7	$3,500	$4,000
	Excavation	120	Removal of temporary stone/gravel	CY	300	$50	$15,000	$15,000
						SUBTOTAL	**$65,360**	**$66,000**
Water Control	Water control	-	Cofferdam to divert water from work area (110' L Super Sacks)	LS	1	$60,000	$60,000	$60,000
						SUBTOTAL	**$60,000**	**$60,000**
Site Work	Sawcutting concrete	482.4	Removal of concrete at proposed fishway location	DAY	2	$3,000	$6,000	$6,000
	Reinforced concrete	904	Training wall to spillway and Weir 1	CY	8	$2,000	$16,000	$16,000
	Dense graded crushed stone for subbase	402	Fishway subbase/filter stone (8" bottom layer)	CY	30	$95	$2,850	$3,000
	Modified rockfill	986	For fishway bed material (12' W x 4' H x 70' L)	TON	90	$100	$9,000	$9,000
	Gravel borrow	151	Channel substrate (6" top layer)	CY	16	$82	$1,312	$2,000
	Boulders	-	Fishway weirs (5 x 12' L)	EA	40	$800	$32,000	$32,000
	Stone masonry wall, dry	685.1	Training walls (3' H x 70' L)	CY	22	$2,250	$49,500	$50,000
	Construction of instream structures	-	Hydraulic excavator, operator, 2 laborers	DAY	10	$4,000	$40,000	$40,000
						SUBTOTAL	**$156,662**	**$157,000**
Public Access Enhancements	Park bench	707.1		EA	2	$4,000	$8,000	$8,000
	Trash receptacle	707.2		EA	1	$2,500	$2,500	$3,000
	Bicycle rack	707.9		EA	1	$2,500	$2,500	$3,000
	Interpretive signage	-	24" x 36" x 0.5" thick frameless HPL angle-mount with pedestal	EA	1	$3,000	$3,000	$3,000
	Fence	655	Cedar rail fence	LF	100	$85	$8,500	$9,000
	Stone dust	704.1	100' L x 8' W x 2" thick for side trail improvements along viewing area	TON	7	$225	$1,575	$2,000
	Dense graded crushed stone for subbase	402	100' L x 8' W x 6" thick for side trail improvements along viewing area	CY	15	$95	$1,425	$2,000
	Deciduous trees	775-783	2-2.25" caliper	EA	6	$900	$5,400	$6,000
	Deciduous shrubs	788-795		EA	24	$120	$2,880	$3,000
	Mulch	767.6	Aged pine bark mulch	CY	10	$105	$1,050	$2,000
						SUBTOTAL	**$36,830**	**$37,000**
Viewing Platform	Structural steel			LB	3000	$8	$24,000	$24,000
	Reinforced concrete		Platform deck	CY	3	$1,500	$4,500	$5,000
	Reinforced concrete		Concrete foundation	CY	16	$2,000	$32,000	$32,000
	Railing			LS	1	$5,000	$5,000	$5,000
	Contingency		Additional 20% contingency due to pre-design stage of platform	%	0.2	$65,500	$13,100	$14,000
						SUBTOTAL	**$78,600**	**$79,000**
Restoration	Hot mix asphalt	450.22	Restoration of paved access trail (1.5" overlay on 500' L section of trail)	TON	47	$240	$11,280	$12,000
	Paving crew	-	Roller, operator, 2 laborers	LS	1	$4,000	$4,000	$4,000
	Seeding	765	For disturbed areas along access trail/viewing area	SY	800	$5	$4,000	$4,000
						SUBTOTAL	**$19,280**	**$20,000**
						SUBTOTAL Direct Construction Cost	**$458,405**	**$461,000**
						Contingency Allowance (30%)	*$137,522*	*$138,000*
						TOTAL DIRECT CONSTRUCTION COST *(2025 $)*	**$595,927**	**$599,000**
						Escalation (2.1% x 2 years)	*$25,292*	*$26,000*
						PROJECTED CONSTRUCTION COST *(2027 $)*	**$621,218**	**$625,000**
						Final Design and Permitting	$170,000	$170,000
						Construction Phase Services	$75,000	$75,000
						TOTAL OPINION OF PROBABLE CONSTRUCTION COST	**$866,218**	**$870,000**

1. Engineers' OPCC is based on generally available databases (e.g., MassDOT, R.S. Means) and in-house pricing information for the local market. Competitive bidding environments, unknown field conditions , and other local market factors may contribute to variances in costs.

2. A contingency of 30% has been added in accordance with American Association of Cost Engineering (AACE) Class 3 estimates for conceptual design.

3 Escalation to anticipated construction year based on historical construction cost indices and average projected annual inflation rates.

GOMEZ AND SULLIVAN ENGINEERS

41 Liberty Hill Road • PO Box 2179 • Henniker, NH 03242 • Phone 603-428-4960

April 12, 2021

Robert Martin
CRT Development Realty, LLC
242 5th Street
South Naples, FL 34102

Re: Proposal to Perform Phase I Inspection and Report of Talbot Mills Dam

Dear Bob,

Gomez and Sullivan Engineers, D.P.C. is pleased to submit our proposal to perform a Phase I Inspection and Report of the Talbot Mills Dam, as required by the Massachusetts Department of Conservation and Recreation, Office of Dam Safety. This proposal includes our understanding of the project and proposed scope of services and cost to complete the requested tasks.

I. Background and Understanding

The Talbot Mills Dam (NID ID MA00774) is located on the Concord River in the town of Billerica, Middlesex County, MA. The structure is a former mill dam, now privately owned by CRT Development Realty, LLC (CRT). It is approximately 316 feet long with a maximum height of about 15 feet, and is comprised of stone masonry, concrete, and (presumably) earthen materials. The three major components of the dam are:

- Primary spillway and abutments
- Non-overflow section and intake structure to the Talbot Mills complex (river left side)
- Sluiceway and intake structure to the Faulkner Mills complex (river right side)

The primary spillway is a broad-crested stone masonry structure of mortared square-cut granite block construction with a near-vertical downstream face. It is approximately 127 feet long with a height of about 10.2 feet and a crest elevation of approximately 108.2 feet (elevations herein reference NAVD 88 datum unless otherwise indicated). The spillway is trapezoidal in cross-section with an 8-foot wide base and 7-foot wide crest. It has a curving footprint and a narrow capstone across the downstream lip of the crest. The spillway crest reportedly dips slightly lower toward the middle of the structure, as shown in historical dam plans and evidenced by photographs taken during low flow events.

The spillway is flanked by small granite block masonry abutments that tie into retaining/training walls for the river and impoundment. Both abutments are topped with a large granite capstone adjacent to the spillway. At flood stages, the abutments serve as auxiliary spillways to provide additional discharge capacity. The left and right abutments have lengths of approximately 17 and 20 feet and average crest elevations of 110.5 and 110.8 feet[1], respectively. The left abutment contains two small low level outlets

[1] Average elevations exclude the additional 2- to 3-foot height of the right and left abutment granite capstones, respectively.

with downstream inverts at approximately 99.8 feet. The outlets are blocked, although discharge has been observed at their downstream end. There is no operational low level outlet for the dam.

The embankment or non-overflow section of the dam extends from the left spillway abutment approximately to an 1880s brick former cloth warehouse for the Talbot Mill, supporting Faulkner Street and separating the impoundment from the Talbot Mills complex located on the left bank of the river just downstream from the dam. A 60-foot-long vertical concrete wall at the southernmost end of the embankment section of the dam contains five intake gates which formerly provided water to the Talbot Mills complex. The gates are no longer functional and the intake tunnels upstream of the Talbot Mills complex have been filled with concrete. An approximately 12-foot-wide, mortared stone masonry and concrete sluiceway just east of the right spillway abutment, historically known as the Faulkner Canal, diverts water to the Faulkner Mill complex located on the right bank of the river just downstream from the dam. The sluiceway contains a concrete weir with a movable sluice gate. Water in the sluiceway passes under a small bridge supporting Faulkner Street and into a stilling basin (likely the former turbine pit) located between the road and the Faulkner Mill complex. From the stilling basin, water flows through an outlet gate locked in the open position to a turbine under the mill, which reportedly has not been in service since 1972, and is then discharged back to the river approximately 150 feet downstream of the Faulkner Street bridge.

It is our understanding that the Talbot Mills Dam is classified as an Intermediate sized, Significant (Class II) hazard dam. Per Massachusetts Department of Conservation and Recreation, Office of Dam Safety (MADCR ODS) requirements, significant hazard potential dams must have a Phase I Formal Dam Safety Inspection and Report performed every five years. The most recent Phase I dam safety inspection was conducted on October 28, 2015 and November 6, 2015 by Geotechnical Consultants, Inc. Previous inspections on file with the MADCR ODS were conducted in 2009 by Geotechnical Consultants, Inc. and in 1999 by Weston & Sampson Engineers, Inc. According to the 2015 inspection, the Talbot Mills Dam was found to be in "fair" condition. Recommendations presented in the 2015 report included but were not limited to:

- An Operations and Maintenance (O&M) Manual should be implemented.
- Inspect the interior of the Talbot Mills complex, particularly the downstream end of the former intake structures.
- Repair/replace the sluiceway and stilling basin gates so that the gates are operational and can provide emergency bypass control.
- Repair/replace the left spillway abutment to provide an operational low level outlet and provide emergency bypass control.
- Necessary data should be collected to complete an analysis of the structural stability of non-embankment structures in accordance with 302 CMR 10.14.

It is our understanding that these recommendations have not been implemented. At the time of the 2015 Phase I report, an Emergency Action Plan (EAP) was not required for Significant hazard dams. However, MADCR revised their requirements in 2017, and EAPs are now a requirement for Significant hazard dams. It is our understanding an EAP has not been developed for the Talbot Mills Dam. It is also assumed no structural or seepage stability analyses have been performed for the embankment sections of the project.

It is also understood that the current Phase I Formal Inspection Report is due to MADCR ODS by May 18, 2021. This is a fairly aggressive timeframe. While we will proceed with the intent of meeting this deadline, we recommend that CRT submit a letter to MADCR ODS that indicates they are contracting with an

engineering firm to perform the Phase I Inspection and request an extension of time of one month (i.e. until June 18, 2021).

302 CMR 10.00 of MA Department of Conservation and Recreation Regulations requires inspecting engineers to be Commonwealth of Massachusetts Registered Professional Engineers with a Civil Engineering license with experience in dam safety inspections and engineering. Furthermore, the dam inspection must be conducted and the report prepared and stamped by a Massachusetts registered professional engineer experienced in dam inspection, engineering, and design.

In order to complete the Phase I Inspection and Report, Gomez and Sullivan will perform a records review of existing information for the dam, as well as perform a dam safety inspection of the site to determine the condition of the dam relative to current NYSDEC dam safety criteria. Any deficiencies identified during the records review and inspection will be noted and Gomez and Sullivan will recommend, as appropriate, operational restrictions, monitoring, and/or modifications. It is our understanding that CRT, MA Division of Marine Fisheries, and NOAA (the Project Partners) have plans to remove the dam within the next few years, therefore recommendations for remedial repairs, future analyses and/or studies will be considered in the context of immediate dam safety concerns and removal of the dam within the next three years.

II.Scope of Services

This section presents our proposed approach for completing the requested services for the project. The scope tasks address items required by MADCR ODS Guidelines and are based on our discussions with project partner personnel (NOAA and MA Division of Marine Fisheries), and our resulting assessment of the work required.

Task 100 – Data Collection and Existing Analyses Review

Under this task we will perform a review of available information for the Talbot Mills Dam. The purpose of this review is to prepare for the site visit (Task 200), understand what engineering evaluations were previously completed for the dam, and formulate a basis of information for developing the Phase I Report. It is anticipated that the following documents will be provided, if available:

- Original design report and/or construction drawings
- Operation and Maintenance (O&M) Procedures
- Emergency Warning System and/or current Emergency Action Plan (EAP)
- Previous analyses regarding hydrology and hydraulics, geology, and/or stability
- Past inspection reports
- Summary of maintenance work completed since the last Phase I Inspection, and a summary and schedule of planned upcoming work

Documents currently available to us include:

- Talbot Mills Dam Phase I Inspection Report – Geotechnical Consultants, Inc. (November 6, 2015)
- Talbot Mills Dam Phase I Inspection Report – Geotechnical Consultants, Inc. (May 22, 2009)
- Visual Inspection Report - Department of Environmental Management, ODS (May 15, 2002)
- Application to Change Hazard Classification - Geotechnical Consultants, Inc. (June 2, 2009)
- Dam Hazard Potential Reclassification – MA DCR (July 7, 2009)

Gomez and Sullivan will review existing procedures and engineering evaluations (i.e. hydrology, hydraulics, and hazard classification; as indicated above, it is assumed O&M procedures, an EAP, and stability analyses have not been developed for the project) in accordance with current MADCR ODS Guidelines. Our scope assumes no additional analyses will be required in conjunction with the Phase I Report. As required by MADCR ODS Guidelines, a discussion of the current procedures and engineering evaluations will be provided in the Phase I Inspection Report. The applicability of these items with respect to the project will be discussed, and if an item is deemed not applicable Gomez and Sullivan will provide a summary of the issues with the current analyses and/or analysis documentation and recommendations will be included in the Phase I Report, as appropriate.

Task 200 – Field Inspection

The inspection and report will be performed in accordance with MGL Chapter 253, Sections 44-50 of the Massachusetts General Laws as amended by Chapter 330 of the Acts of 2002. The purpose of the investigation is to inspect and evaluate the present condition of the dam and appurtenant structures in accordance with 302 CMR10.07 to provide information that will assist in both prioritizing dam repair needs and planning/conducting maintenance and operation. The inspection will be performed by a registered professional engineer, who will evaluate the safety and integrity of the dam and appurtenant structures to determine if the structure appears to meet current design criteria. The inspection will include field observations to detect any signs of deterioration in material, seepage, developing weaknesses or unsafe hydraulic and/or structural conditions.

Gomez and Sullivan anticipates that the inspection will be scheduled to take place no later than April 30, 2021. Gomez and Sullivan has assumed that CRT will cooperate in scheduling the inspection such that it will be conducted under favorable low-flow conditions (to the degree practical), whereby maximum portions of the structures of interest will be viewable. For the purpose of the site inspection we anticipate inspecting the following structures (as applicable), as described below:

- Dams, Spillways, Gates, Intake and Project Structures. The field inspection of the principal project structures will focus on the detection and assessment of the following possible safety-related items: settlement, structural movement, leakage, cracking, deterioration, erosion, seepage, sloughing, functioning of any foundation drains and relief wells, condition of existing instrumentation and/or monitoring equipment, site geological conditions, effects of overtopping of non-overflow structures, and hazard potential which would result from failure of the project works. Concrete conditions will be observed and documented, noting occurrences of cracking, spalling, concrete deterioration, and the condition of joints. At embankment areas, the condition of vegetative cover and wave protection will be assessed, and signs of burrowing animals or insects will be noted. Certain basic statistical data (e.g. structural height, hydraulic height, etc.) will be verified by the use of a measuring tape.

- Water Conveyance Systems. Inspect visible portions of penstocks, tunnels, or canals (as applicable) to assess overall condition of structures and equipment. The overall condition will be determined based on joint conditions, foundation stability, leakage, and general condition. An internal (or underwater) inspection of the water conveyance structures is not included in our scope of services.

- Powerhouse and Gate Structures (as applicable). Check condition and operability of gates and operators, drainage pumps, auxiliary power systems, and miscellaneous electrical and mechanical equipment as they pertain to public safety.

- Reservoir, Tailrace, and Channel Banks. As applicable, the condition of the reservoir, tailrace, and channel banks associated with the dam will be observed. Major embankments adjacent to the reservoir will be examined for settlement, sliding and riprap movements to assess stability.

Inspection checklists provided by MADCR ODS and required as part of the Phase I Inspection Report will be completed for each project structure during the field inspection. These checklists will document current conditions and will be included as an appendix to the Phase I Inspection Report.

In conjunction with the site inspection, we will also perform a "Caretaker Interview" as required for Phase I Inspections. As of the previous (2015) Phase I Inspection Report, the caretaker was Mr. Bruce Henriksen of 80 Washington Street, Building S, in Norwell, Massachusetts. If the caretaker is not available to be onsite during the inspection, it is anticipated the interview will be conducted via a pre-inspection conference calls. If, during the inspection, conditions are observed that differ from information presented during the pre-inspection call, we will follow-up with the Caretaker to assess the nature of the conditions observed. Topics to be discussed may include but not be limited to: project history, operating procedures, low-level outlet operation and maintenance history, emergency response procedures, current and historic concerns, documentation and records, recent developments, overtopping and flood of record events.

We will discuss safety protocols with CRT prior to the inspection, but have assumed based on our previous experience that we will be required to wear hard hats, high-visibility vests, and safety boots. We have also assumed that a brief safety meeting will be conducted the day of the inspections to review site-specific safety procedures based on the planned activities for the day.

Task 300 – Develop Phase I Inspection Report

For this task, Gomez and Sullivan will develop a draft version of the Phase I Inspection Report for the Talbot Mills Dam for CRT's review. The draft report will be developed in accordance with 302 CMR 10.00 of MA Department of Conservation and Recreation Regulations and the most recent version of *Phase I Formal Dam Inspection Report Format and Submission Requirements* (MADCR, current version October 2015). We envision that the Phase I Inspection Report will address the following topics, as briefly discussed below:

- Executive Summary and Preface – The Executive Summary will include a brief narrative overview of the inspection report, and will also include a completed Dam Evaluation Summary Detail Sheet. The Preface will include the signature and PE stamp of the licensed professional engineer responsible for the Phase I Inspection Report.
- General Description of the Project – This section will include a general description of the overall project, including a description of each of the project structures, the purpose of the dam, the DCR size and hazard classification, and a summary of pertinent engineering data (based on available information). Available project drawings will be used to supplement this section.
- Dam Safety Inspection Discussion – A summary of the site inspection will be provided and will include documentation of the conditions observed for each of the project structures during the inspection. Photographs from the site inspection that show the conditions observed will be included in the report and will be coordinated with the inspection write up. A discussion of the caretaker interview will be summarized as well.
- Operation and Maintenance Procedures – This section will discuss formal operations and maintenance (O&M) procedures. Frequency of tasks, record keeping and training will be summarized. Any low-level outlet exercising (if applicable) will be indicated. It is our understanding an O&M Manual has not been developed for the Talbot Mills Dam.

- Emergency Warning System – This section will describe response procedures, availability of an Emergency Action Plan (EAP), contents of the EAP, and other emergency warning features or devices. This section will also indicate the applicability of the plan, when it was last updated, and when and how training for an emergency has been conducted. It is our understanding an EAP has not been developed for the Talbot Mills Dam.
- Hydraulic/Hydrologic Data – A summary of available Hydrologic/Hydraulic (H&H) analyses and results will be provided in this section. The applicability of the previous results based upon any changes within the drainage area or at the dam since the completion of the H&H analyses will be discussed. If insufficient data exist for a thorough review or significant changes have occurred since the last analyses, completion of a new H&H analyses will be recommended in Section 3.2. Analyses to be discussed may include but not be limited to: Probable Maximum Precipitation (PMP) and methodology; Spillway Design Flood (SDF) return period, inflow, outflow, and percentage that can be safety passed at the dam; and discharge capacities of spillways and outlets. The likelihood and potential impacts of overtopping (if applicable) will also be discussed based upon the results of available H&H Evaluations. Our scope assumes no additional analyses will need to be performed in conjunction with the Phase I Report.
- Structural and Seepage Stability – This section will include a summary of the stability of the project structures based upon visual observation/inspection, an evaluation of previous structural stability analyses, and a reference to previous analyses performed. The evaluation will include available static and dynamic stability based upon the usual, unusual, and extreme loading scenarios included in 302 CMR10.14(9). Physical evidence of any instabilities will be highlighted. An evaluation of the potential for seepage instability of the water retaining structures due to internal erosion or piping will be summarized. Known data about seepage including observations of seepage, seepage instrumentation, filters or zoning of embankments, and foundation soils will be provided. If insufficient data is available for a review of the structural and seepage stability, recommendations will be made to collect necessary data and complete analyses in accordance with 302 CMR 10.14. It is our understanding structural and seepage stability analyses have not been developed for the Talbot Mills Dam.
- Assessments and Recommendations – This section will indicate if the dam is in good, satisfactory, fair, poor, or unsafe condition based upon all aspects of the dam including structural integrity, operational procedures, maintenance, and compliance with design standards. Any deficiencies identified during preparation of the Phase I report will be listed. A comparison to conditions documented in the previous Phase I report will be described, as well as the status of any major recommendations from the previous report. Additional studies and analyses, maintenance and operation procedures, repairs, modifications, and/or alternatives identified for the project through preparation of the Phase I report will be summarized as well. An Opinion of Probable Construction Cost (OPCC) for implementing the recommendations and alternatives will be provided based upon published estimating guides, current market pricing, and manufacturer information where applicable. Where possible, an indication of engineering and permitting effort will be incorporated.
- Appendices – Will include photographs taken during the site inspection, completed inspection checklists, previous reports and references, and definitions per MADCR ODS Guidelines. Additional appendices may be incorporated as appropriate.

We will provide CRT with an electronic version (in Adobe or Microsoft Word format) of the draft Phase I Inspection Report for review. Following submittal and CRT's review of the draft document, Gomez and Sullivan will be available to discuss the report with CRT. Gomez and Sullivan's scope/fee assumes that this will be accomplished via a conference call. It is assumed that CRT will provide one consolidated set of written review comments for the draft report.

Following the conference call, we will incorporate all appropriate comments into the report and provide CRT with the final Phase I Inspection Report. The final Phase I Inspection Report will be stamped and signed by a Massachusetts-licensed PE. The following deliverables will be provided to CRT following finalization of the report:

- One (1) bound hard copy of the final Phase I Inspection Report suitable for filing with MADCR ODS. The final report document will include color photos and figures, where applicable. Per ODS Guidelines, the report will be double sided without plastic or laminated covers, and bound only by staples on the left edge of the report.
- Two (2) CD-ROMs, each with electronic copies of: A) the Phase I Inspection Report in searchable, Adobe (*.pdf) format, and B) the completed Excel inspection checklist worksheet file using the latest DCR prescribed format. One CD-ROM will be for filing with MADCR ODS; the second CD-ROM will be for CRT's files.

Additional hard copies and/or CD-ROMs of the report can be provided upon request for an additional fee.

Task 400 – Project Management and Communications

Coordination with CRT will occur on a regular basis. We have budgeted time within this task to discuss project progress with CRT as needed, and other administrative costs include reviewing invoices and managing the budget, scope, and schedule.

III. Schedule

The tentative schedule a Phase I Inspection and Report of the Talbot Mills Dam is presented below. The inspection date noted below is tentative and will be coordinated with CRT. This schedule is based on the assumption that a Notice to Proceed will be issued by April 16, 2021.

As indicated previously, it is understood that the current Phase I Formal Inspection Report is due to MADCR ODS by May 18, 2021. This is a fairly aggressive timeframe. While we will proceed with the intent of meeting this deadline, we recommend that CRT submit a letter to MADCR ODS that indicates they are contracting with an engineering firm to perform the Phase I Inspection and request an extension of time of one month (i.e. until June 18, 2021).

Table 1: Schedule to Complete Talbot Mills Dam Phase I Inspection and Report

Project Milestones	Targeted Completion Date
Contract Award	By April 16, 2021
Receipt of Information/Documents for Review	April 21, 2021
Field Inspection	By April 30, 2021
Draft Phase I Inspection Report to CRT	By May 5, 2021
Review Comments on Draft Report Received from CRT Within 1 week (No later than May 12, 2021)	
Final Phase I Inspection Report and CD-ROMs to CRT	By May 14, 2021

IV. Compensation

Gomez and Sullivan Engineers, D.P.C. proposes to undertake the proposed services on the basis of hourly billing rates plus direct costs for tasks authorized by CRT Development Realty, LLC (CRT). Our cost estimate is shown in **Table 2** on the following page.

Hourly billing rates include actual direct salary payments to all personnel for the time directly engaged on the project, plus payroll charges including vacation, sick leave, and holiday pay; unemployment and payroll taxes; social security contributions; workman's compensation insurance; retirement benefits, medical insurance; group insurance benefits; general overhead; and profit.

Hourly billing rates for Gomez and Sullivan staff are shown in **Table 3**. These billing rates will remain in effect through December 31, 2021, at which time they may be adjusted to reflect changing business conditions.

Direct costs include costs which are directly applicable to the work, such as transportation and subsistence expense during travel in the interest of the work, long distance telephone calls, reproductions, topographic maps, special insurance, outside electronic computer rental costs, usage of computer programs, model and laboratory testing, aerial and ground surveying, subsurface exploration, and subcontractors billed through Gomez and Sullivan.

Telecommunications (phone, fax, e-mail, and conference calls) will be billed at the rate of three percent (3%) of labor based fee. All other direct costs (except telecommunications) will be assessed a 10% service charge when handled by Gomez and Sullivan.

Invoices will be submitted to CRT monthly. Payment will be due from CRT within thirty days of the invoice date. Payments not received within thirty days will be subject to an interest charge of 1.5 percent per month.

The scope of services contained herein will commence after a fully executed contract, signed by Gomez and Sullivan Engineers, D.P.C. and CRT Development Realty, LLC, is complete.

We look forward to your favorable review of our proposal. In the meantime, should you have any questions or require additional information, please do not hesitate to contact me at (518) 703-7728 or via email at wfriers@gomezandsullivan.com.

Very Truly Yours,

William J. Friers, P.E.
Senior Civil/Structural Engineer

Table 2: Cost Estimate to Complete a Phase I Inspection and Report for Talbot Mills Dam

		JAG, TJS	MJW, MES, DAG, WJF	DMG	JWG, KMM, KJC, HNC	AKK, ARC, RFT, EAP	BAS, JND, RLK, JSC	CMD, AGL	PMG, BAM, MOP, CCC				
Task No.	**Task Description**	**HOURS**									**COST**		
		Principal	Sr. Engr. (V)	Engr. (IVB)	Engr. (IIIB)	Proj. Engr. (II)	Proj. Engr. (IIB)	Jr. Engr. (I)*	Project Assistant	**TOTAL HOURS**	Labor	Direct Expenses*	**TOTAL**
100	Data Collection and Existing Analyses Review			8	2	4				14	$2,168	$65	$2,233
200	Field Inspection				8		8			16	$2,152	$335	$2,487
300	Develop Phase I Inspection Report		6		10	34		12		62	$8,556	$347	$8,903
400	Project Management	2	2						2	6	$1,100	$33	$1,133
	TOTAL	**2**	**8**	**8**	**20**	**38**	**8**	**12**	**2**	**98**	**$13,976**	**$779**	**$14,755**
												Say	**$14,800**

**Direct expenses reflect a 10% service charge. Telecommunications (phone, fax, e-mail, and conference calls) will be billed at the rate of three percent (3%) of labor based fee.*

Bresney, Susie (FWE)

From: Caruso, Emily (DCR)
Sent: Wednesday, May 21, 2025 2:09 PM
To: Bresney, Susie (FWE); Bulens, Nicholas (EEA)
Subject: Re: average Phase I inspection cost

Hi Susie.

The vendors that have state contracts are currently getting paid about $5,500 to $6,000 (depending on if a previous inspection has been completed or not, respectively) per Phase I inspection and about $2,500 for Follow-Up (abbreviated) inspections, but I have been informed that this price is due to the high volume of inspections performed under state contracts.

I have been informed by some dam owners seeking quotes for individual inspections that these same inspections can average about $10,000 and upwards.

Hope this helps. Let me know if you have any other questions or if there is anything we might be able to assist with.

Thanks for your time.

Emily

Emily Caruso
Dam Safety Engineer
Office of Dam Safety
MA Dept. of Conservation & Recreation
180 Beaman Street
West Boylston, MA 01583
Cell phone: 617-620-8583
Hours: Monday - Friday, 7 AM - 3 PM

From: Bresney, Susie (FWE) <Susie.Bresney@mass.gov>
Sent: Wednesday, May 21, 2025 2:03 PM
To: Bulens, Nicholas (EEA) <Nicholas.Bulens2@mass.gov>; Caruso, Emily (DCR) <emily.caruso@mass.gov>
Subject: average Phase I inspection cost

Hi Nick and Emily,

I am looking for an average cost for a dam safety phase I inspection and I thought you both would be well-versed in recent examples. Do you have that on-hand?

Thank you very much!

Susie

Susie Bresney (she/her)
Restoration Specialist, Dam Removal Program
Div. of Ecological Restoration
MA Dept. of Fish & Game
100 Cambridge Street, 6th Floor
Boston, MA 02114
Cell: 857-274-4857
Email: susie.bresney@mass.gov

Web: http://www.mass.gov/der
Instagram: instagram.com/MassEcoRestore

Bresney, Susie (FWE)

From:	Eric Hutchins - NOAA Federal <eric.hutchins@noaa.gov>
Sent:	Monday, June 27, 2022 8:18 PM
To:	Jill Griffiths
Subject:	EXTERNAL EMAIL -Fwd: Fw: Middlesex Canal
Attachments:	deed bk17958 p95 Sep 21, 2004 partnership to LLC.jpg

---------- Forwarded message ---------
From: **Robert Martin** <martinr181@gmail.com>
Date: Mon, Jun 27, 2022 at 6:14 PM
Subject: Fwd: Fw: Middlesex Canal
To: Eric Hutchins - NOAA Federal <eric.hutchins@noaa.gov>
Cc: Bill Martin <martinw@rcn.com>

Eric as we discussed. pls send a copy of Gov letter and we will see you Wed around 2;30-3;00pm at Town Hall if we don't have a Wed am zoom.

Bob
---------- Forwarded message ---------
From: **J. Jeremiah Breen** <jj@middlesexcanal.org>
Date: Mon, Jun 27, 2022 at 5:05 PM
Subject: Fw: Middlesex Canal
To: Bob Martin <martinr181@gmail.com>
Cc: MCA Directors <towpath@googlegroups.com>, Thomas Lincoln <tlinc02155@aol.com>

Dear Mr. Martin:

Five years after Tom Raphael's death,
the state's Middlesex Canal Commission
has stated its willingness to accept the dam.

For reference,
attached is a copy of the deed transferring
the dam from the partnership to the LLC.

Serge's paintings in the lobby of the
Cambridge Division were removed when
Pace Industries put new corporate insignia
on the lobby's walls. Marc Turcotte does

not know what happened to the paintings.
Pace headquarters did the work overnight.

----- Forwarded Message -----
From: Martin Robert <martinr181@gmail.com>
To: J. Jeremiah Breen <jj@middlesexcanal.org>
Cc: Bill Martin <martinw@rcn.com>; MCA Directors <towpath@googlegroups.com>
Sent: Monday, October 16, 2017 at 08:53:15 AM EDT
Subject: Re: Middlesex Canal

Dear Mr Breen,
Unfortunately, the Middlesex Canal Commission and the community lost a great Stewart. As the President of the canal commission, I would recommend that you engage your directors to determine if there is interest in negotiating acceptance of the dam. Until you have concluded a position any further emails and or discussions are non productive. Neither Bill nor myself are associated with the Pace group. I'm sure Bill will follow up with his comment on the painting he referred to in the email below.
Bob Martin

Sent from my iPhone

On Oct 16, 2017, at 1:32 AM, J. Jeremiah Breen <jj@middlesexcanal.org> wrote:

> Dear Mr. Martin:
>
> If the state's Divison of Marine Fisheries is insisting on a fishway and the Office of Dam Safety is insisting on repairs, the state's Middlesex Canal Commission would likely accept the dam as a gift as is. I can't say for certain that the commisson would accept the dam as Tom Raphael died August 27.
>
> The paintings in the Pace lobby are not easily removed from the wall. With only Serge? for identification, he is still unknown for identification when the painting is displayed. The paintings in the lobby are in bright acrylic, great for publication. The Middlesex Canal Association would be glad of a photo of your Lexington painting with permission to publish.
>
> J. Breen, president
> Middlesex Canal Association
>
> Tom, US Navy, meteorologist, WWII
> <image.png>

From: Bill
Sent: Monday, June 20, 2016 11:15 AM
To: Martin Robert
Cc: Thomas Raphael ; Bill Martin
Subject: Re: Pace Lobby Paintings

Tom & Bob
I have a painting at my home in Lexington (I am on the Cape for now) it was painted by a boyfriend of a gal that used to work for us, if I remember his name was Serge. It shows part of the dam and the storage building next to the dam. If I remember I payed around $175.00, at the time he wanted much more.

Bill
PS. Tom, did you know that John moved out of Lexington, he moved to somewhere in Penn. to be close by some family. His wife was not doing well and needed someone around most of the time.

Sent from my iPad

On Jun 20, 2016, at 10:11 AM, Martin Robert wrote:

Tom good morning,
Our deceased partner Bill Ricci had that painted. Sorry we can't be of any further help.
Maybe the name will be behind the picture if you want to contact Bill Donovan to double Ck at the plant.
Regards,
Bob Martin

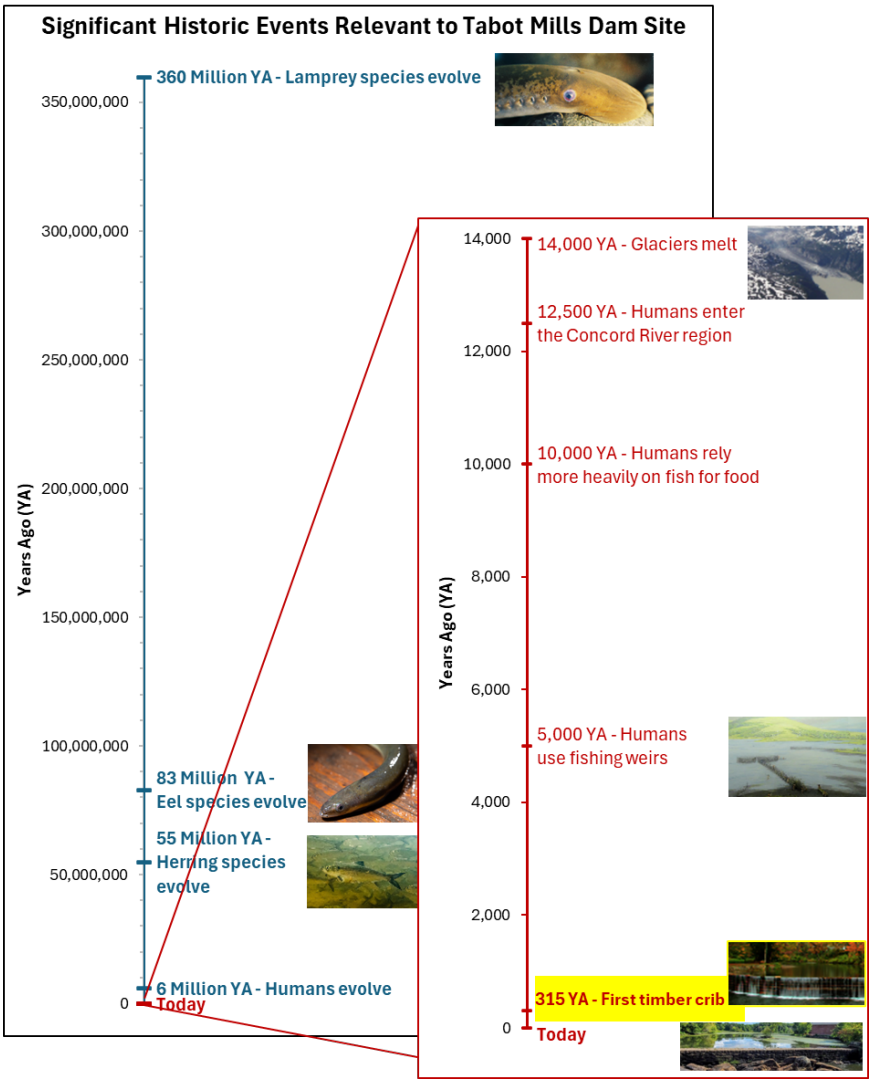
<image.png>

--
Eric Hutchins
Fisheries Biologist
NOAA Restoration Center
55 Great Republic Drive
Gloucester, MA 01930

Phased Retirement Working Hours:
Monday: 8 am - 4:30 pm
Tuesday: 8 am - 4:30 pm
Wednesday: 8 am - noon
P: 978-281-9313

7. Extended History of the Talbot Mills Dam Site

The Concord River and the site of the Talbot Mills Dam is unarguably a place "significant in the history of the Commonwealth". However, the lifetime of the current dam and the Commonwealth as a state represents only a small sliver of time in the long and significant history that has occurred at this site (see timeline below). The migratory fish species that dam removal will restore filled the Concord River during migration periods since the end of the last ice age, 14,000-12,500 years ago. Moreso, these species have existed on earth for much longer than that, with lamprey species first appearing in the fossil record 360 million years ago and eels, river herring and shad all evolving between then and 55 million years ago. These species inhabited earth long before humans evolved, just 6 million years ago. These species were integral in shaping our planet and yet today, they are in danger. Sea lamprey populations in the Merrimack River watershed are considered vulnerable[1], as well as blueback herring[2] and American eels are listed as endangered[3]. Population loss of these resilient species that have existed for millions of years is largely due to habitat fragmentation due to the development of dams over the last few hundred years.



After the last ice age, for five to ten thousand years, the rivers, fish and people evolved together in the Concord River basin. The watershed contains a large inventory of known pre-contact Native American sites demonstrating that people lived near falls such as that underneath the Talbot Mills dam where fishing was easier. A map of Billerica circa 1700 documents the existence of a series of falls in the Concord River between the present-day Pollard Street and Faulkner Street bridges. A large Native American village is reported to have been located along the Concord River in proximity to the Talbot Mills Dam and natural falls, which would have afforded an abundance of diadromous fish resources and wildlife. While both migratory fish and Native Americans maintained long-standing populations in the area, both were devastated by colonization. Today, we are lucky to have the opportunity to learn from the culture, traditions and perspectives of the elders and members of the Greater Lowell Indian Cultural Association, who have shared their support for dam removal and restoration of diadromous fish to the Concord River. The project, which will include signage and interpretation at the site, provides an opportunity to communicate the whole history, not just that of the dam.

It was only a few hundred years ago that the fraught history of the Talbot Mills dam began, documented by several exhaustive studies of the river system and upstream impacts associated with the "Flowage Controversy" of 1858-1862. One famed author, Henry David Thoreau, dedicated years to studying and advocating for the removal of the Talbot Mills dam[4]. The first dam was erected at the location of the current Talbot Mills Dam in 1710-11 and since then, five dams in total existed, one dam was destroyed by court order, another destroyed by a group of vigilante farmers, a third was ordered lowered, but saved by injunction, four different commissions studied the dam and its effect on upriver flooding, at least six petitions requested the dam be removed or altered to reduce flooding, improve drainage, or restore fish passage and at least eight lawsuits were filed covering the same issue, with many countersuits and appeals. The current dam was built in 1828 just downstream of a previous dam at the site, built in 1798. It is believed this dam is still submerged in the impoundment just upstream of the current dam. As such, removal of the current dam provides a unique opportunity to uncover one of the even more historic dams currently under water as well as various other artifacts that may be uncovered during removal. This provides a unique opportunity to document and preserve more historic artifacts, consistent with the goals of historic preservation.

Removal of the only 197-year-old current Talbot Mills dam is an opportunity to renew the 10,000-year-old story of diadromous fish and humans in the Concord River watershed, and to honor the long interrelationship between these species and our own. This provides a unique opportunity to uncover, restore and honor tens of thousands of years of history that was lost; document and acknowledge a fraught history including dam removal at the dam location; and restore migratory fish species that have shaped the planet since long before humans existed. A river without the dam is the most historically accurate representation of the distinctive characteristic of this place that is largely the reason for ten thousand years of human civilization here, including the last three hundred since the first dam was built.

The goals of this project are in alignment with the goals of historic preservation, as it restores a more historically accurate version of the river and its ecosystem, which existed for thousands of years in comparison to the dam's existence of only 197. Additionally, the project includes signage, interpretation

and documentation of the long history at the site, both before the dam was built and since which can tell the full story of the site, as opposed to the limited short-term history of the dam that is visible today. Undoubtedly the dam removal, and the historic documentation and interpretation opportunities it provides *"promote[s] the educational, cultural, economic and general welfare of the public through the preservation and protection of the distinctive characteristics of … places significant in the history of the commonwealth and its cities and towns".* It is unquestionable that a free-flowing Concord River is a distinctive characteristic of this place and the very fundamental reason civilization has existed for thousands of years on its banks.