MORSES POND BEACH & BATHHOUSE FEASIBILITY STUDY

May 7, 2024

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Acknowledgements

We would like to thank every stakeholder, Town employee, public official, and resident who contributed their time and input during this feasibilty study. Your participation, knowledge, and dedication has been instrumental in guaranteeing that this feasibilty study reflects the needs and desires of the Town of Wellesley, MA. Your work on the Morses Pond Beach and Bathhouse Improvements project will ensure that future generations of town residents will enjoy this wonderful resource for many years to come.

Introduction

The Town of Wellesley Recreation Department engaged Weston & Sampson Engineers as the prime consultant for this feasibilty study for the renovation of the Morses Pond Beach property in Wellesley. Maryann Thompson Architects (architecture), TCi Consulting (cost opinion), and Brennan Consulting (topographical land survey) were included as sub consultants to assist with the study. The beach and surrounding property form a treasured and essential asset for the town and its residents, having been a leisure and recreation destination for generations.

Aerial image of Morses Pond

During 2019, and early 2020, Weston & Sampson developed a series of preliminary and final master plan designs, which were generated in response to the expressed needs and desires from a wide variety of town departments as well as residents from the surrounding neighborhood and greater town. Three community meetings were held and this created a venue for residents to express their opinions and preferences on a wide range of topics that included:

- The condition of the existing site and bathhouse
- Need and location options for new bathhouse
- Improved guest amenities
- Parking and pedestrian circulation system needs

- Town wellhead and water quality protection
- Traffic and safety issues
- Maintenance and operations concerns
- Security issues
- Other elements of community interest

After a brief hiatus to obtain approvals for CPC funds to perform this feasibilty study, the project started back up in January 2022. The Town formed its own working group to assist the design team in moving the project forward to reach concensus on the final preferred master plan for the site. Due to the pandemic all meetings were conducted remotely.

The design team met twice with the Town working group in early 2022. During these meetings, the site master plan was reviewed and revised slightly to accommodate emergency access as vehicles enter the main 12-foot-wide pedestrian path that runs parallel to the beach. During this time the site master plan also went through an opinion of probable costs exercise to determine the overall project budget current costs. Due to the pandemic, material and construction costs had increased significantly which had an impact on the master plan overall projected costs.

After further discussions with the Town regarding the increase in project costs it was decided that the removal of some scope items were required to get the costs back inline with the conceptual design budget. The items to be removed were agreed upon after discussions with Town staff. The items removed from the scope can be designed and constructed at a later date should more funds become available.

The final preferred site master plan, as shown in this document, represents the "consensus plan" as it matches the goals and aspirations of the majority of the individuals who participated in the planning process. It is understood that the plan will be implemented over a period of time and potentially include multiple phases of improvements.

It is important to note that "Site Master Plan" recommendations are typically general and therefore they should not be considered to be "cast in stone". It is expected that future improvements will generally follow the recommendations contained in this report, but that specific details will be adjusted or refined as needed to meet community preference and actual site conditions.

This report represents the culmination of the master planning process and feasibilty study. The document contains narrative and graphic depictions of the preferred site master plan with relevant sections dedicated to identifying the full extent of potential improvements. The overall goal is to improve the Morses Pond Beach and surrounding property with a series of context appropriate enhancements. It is required that the enhancements respect unique and inherent historical, environmental and landsape qualities in a way that will foster enhanced beach and pond usage, community interaction, park aesthetics, and environmental stewardship.

The Site Master Planning Process

The overall site master planning effort included three basic tasks. The tasks were performed by Weston & Sampson and Maryann Thompson Architects with support from town staff as follows:

Weston & Sampson was hired by the Town to develop the initial site master plans in 2019 and 2020. In 2021, the Town retained their services to prepare this feasibility study. Tasks also included design updates to the previously approved site master plans. Key aspects of these three basic work tasks are included below.

Task 1 | Project Kick-off Meeting

This initial meeting was held with Town staff, elected officials, and other key project stakeholders. The meeting confirmed the scope of work that was to be performed by the consultant team, with support from the Town and set forward all basic project goals and expectations. The Town also turned over for review all documents that contributed to the understanding of the Morses Pond Beach site and all of its natural and manmade features. Documents included topographic and property maps and other pertinent site and architectural plans.

Task 2A | Master Planning Public Meetings in 2019 and 2020

Three (3) advertised public meetings and multiple other project related meetings were held as summarized in the table below.

Date	Venue	Meeting Purpose
06.19.2019	Town Hall	Kick-off Meeting with Recreation Department to outline project goals, timelines, and review initial thoughts and desires for improvements to Morses Pond.
08.07.2019	Town Hall	Presentation of concepts to public to solicit comments and desires to be included in project.
10.16.2019	Warren Building	Meeting with Recreation Commission to review design progress and solicit feedback

Date	Venue	Meeting Purpose
12.16.2019	Warren Building	Public Forum to present design progress
01.21.2020	Wellesley DPW	Presentation to Public Works Commission to present concepts and solicit feedback.
02.12.2020	Police Department	Review of draft design plan to solicit comments and concerns from residents regarding design.
03.03.2020	Warren Building	Recreation Commission meeting to present final concepts and solicit final comments prior to preparation of the Master Plan report.

The community engagement meetings were very productive with a great deal of spirited discussion. Between 20 and 30 residents attended each meeting, with nearly every attendee contributing his or her thoughts on a variety of matters.

In essence, the intention was to achieve common ground on the level of renovation to the property while attempting to retain and enhance the rustic and natural character of the beach and overall property while also satisfying the varying neighborhood and town-wide recreational and municipal needs.

Task 2B | Feasibility Study Public Meetings in 2022 and 2023

The design team conducted a further ten (10) virtual meetings when the feasibility study began after CPC funding approvals and the pandemic related break. These meetings are summarized in the table below.

Date	Venue	Meeting Purpose
01.07.2022	Online	Kick-off Meeting with Recreation Department to discuss timelines, and review current approved Morses Pond master plan.
02.11.2022	Online	Working Group Meeting #1. Project recap. Discuss updates to site, architecture, MEP.
03.07.2022	Online	Public Meeting #1. Project recap. Discuss updates to the master plan and the schedule.

Date	Venue	Meeting Purpose
03.25.2022	Online	Working Group Meeting #2. What we heard at the public meeting. Emergency vehicle egress. Site and architecture updates.
05.02.2022	Online	Select Board Meeting. Discuss current site plan and accessibility, architecture, project costs, and schedule.
05.26.2022	Online	Cost Estimate Meeting. Discuss TCi estimate. Review town proposed value engineered items, and design team revised site plan.
10.11.2022	Online	NRC Meeting #1. Discuss TCi estimate. Review town proposed value engineered items, and design team revised site plan.
03.21.2023	Online	NRC Meeting #2. Discuss current master plan with value engineered revisions to the site and architecture.
05.16.2023	Online	Recreation Committee Meeting. Discuss current master plan with value engineered revisions to the site and architecture.
07.31.2023	Online	Public Meeting #2. Discuss full build master plan with costs. Value engineered cost savings and current site master plan, site accessibility, and schedule.

Task 3A | DRAFT and FINAL Master Plan

After completing the third community meeting and receiving considerable input from the National Resources Commission, Recreation Department, Recreation Board, Department of Public Works, Engineering Department related to final recommendations for improving the Morses Pond Beach, a draft master plan was prepared and submitted to the Recreation Department for review and for posting on the town website.

Task 3B | Feasibility Study

After CPC approvals to begin the feasibility study were given, unfortunately due to the pandemic, the project was put on hold for a period of time. During this period geotechnical borings were completed and a report of the findings from those borings was issued to the Town. These results can be found in the appendix at the end of this report.

In January 2022, the feasibility study phase began with a kick-off meeting between the design team and Town staff from the Facilities Department and Recreation Department. Topics discussed were the approved master plan, geotechnical report, and the new bathhouse building architecture.

An opinion of probable construction costs was developed for the 2021 site master plan. Due to the rise in construction materials and labor rates related to the pandemic, the project costs had seen a significant increase. The design team analyzed the current site master plan design to determine areas where design scope could be removed to help reduce overall costs.

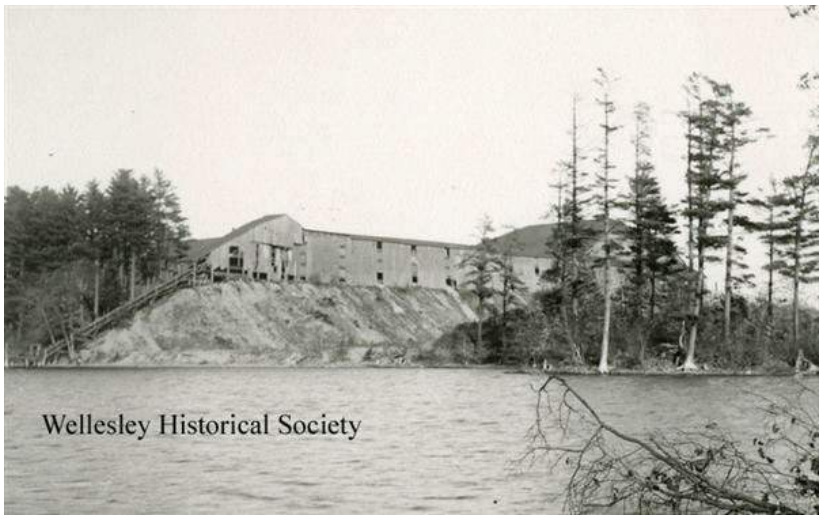
At a meeting on May 26, 2022 the design team presented these cost saving measures. Some of the recommended value engineering measures included removing the following scope items: kayak storage shed, parking lot, and the Ice House Pond boardwalk. The Town agreed to incorporate the design team recommendations into the preferred site master plan alternative.

Over the next 19-months the design team met multiple times with Town Agencies, stakeholders, and residents. From the feedback received at these meetings, the preferred alternative master plan for the buildings and site was developed and finalized.

History and Evolution of the Site

Morses Pond has a rich history dating back to 1738, when Edward Ward dammed his brook to create a small mill pond. The original Morses Pond was much smaller than the pond we enjoy today. During the following century, a string of owners from railroad companies to paint manufacturers built up the dam and used the impounded water as a source of hydropower.

Towards the end of the 1800's and into the early 1900's, the property was used as a location for ice harvesting in the winter.

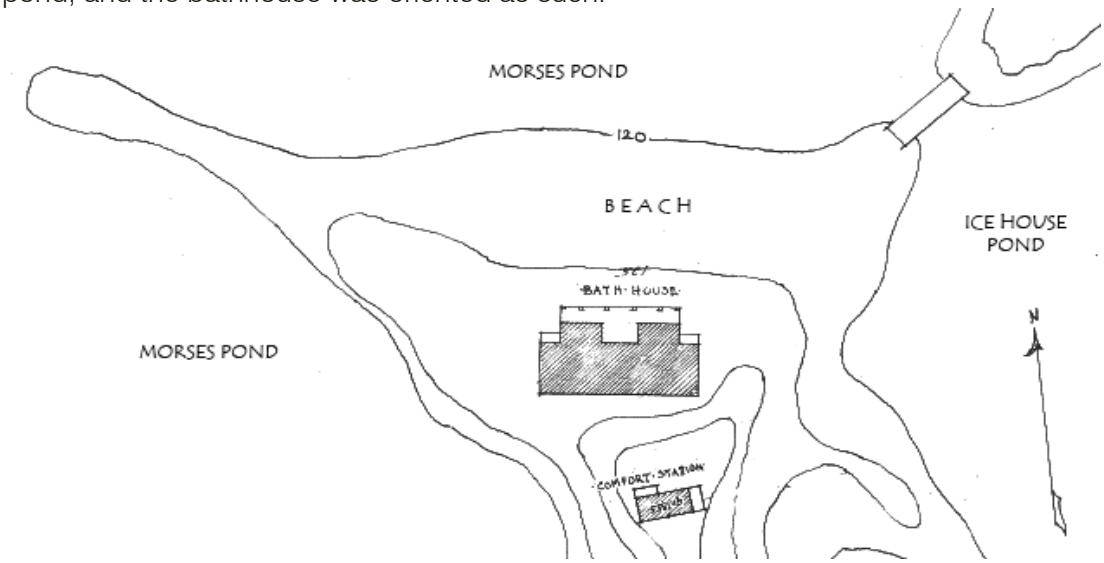


Ice making facility

Two different ice-making companies sequentially owned the pond, the Russell Ice Company in 1888 and the Boston Ice Company in 1902. Both companies built the pond up to the Morses Pond as it exists today. Icehouse workers carved blocks of ice out of the pond and loaded them onto a large conveyor belt which brought them to the warehouse atop the pond's bank, before being loaded onto rail cars as needed. The advent of refrigeration and the struggles of the Great Depression forced the Boston Ice Company to close. The property was then purchased by the Town in 1931 for $3,000 and opened as a public beach in 1935. It has been a community recreation resource since that time.

Existing Beach & Bathhouse Location

The 'old beach' as it is referred to now was on the north side of the peninsula that extends into the pond, and the bathhouse was oriented as such.



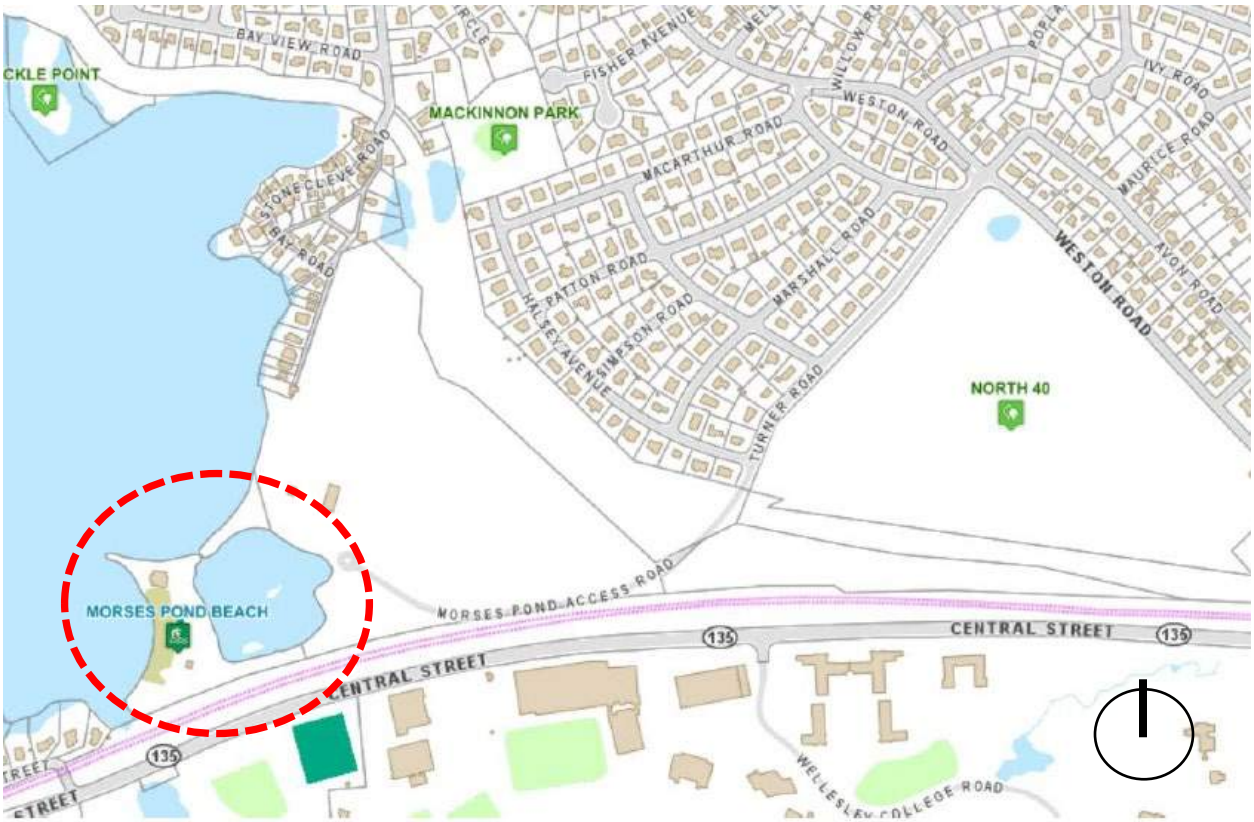
Plan of the original beach with bathhouse

Existing Site Conditions

Summary

Morses Pond covers about 100 acres of area between Central Street (Rt 135) and Worcester Street Rt 9) in the northwest corner of Wellesley. A large area of the pond is less than 10-feet deep; its average depth is about 8-feet, and its maximum depth is 23-feet. Water enters the north end of the pond from Bogle Brook, Boulder Brook, and Jennings Brook. Water exits the pond through the dam adjacent to Route 135 and continues south onto Paintshop Pond, Lake Waban, and eventually the Charles River. Water also exits via the groundwater wells that extract water for public consumption in both Natick and Wellesley.

The property is accessed off Weston Road via the Morse Pond Access Road which begins at the intersection of Turner Road and Halsey Avenue. The Wellesley College campus is located to the south of this property across the railroad tracks and Route 135.



Locus map of Morses Pond

Access & Circulation

Morses Pond entry sign

The site is accessed off Weston Road by Turner Road. At the corner of Turner Road and Halsey Avenue is the entry gate which is currently locked during the evenings and all but two weeks of the unprogrammed off season, marking the beginning of the Morses Pond Access Road. During the times when the gate is locked cars often park along Turner Road in order to access the site for trail and dog walking. We heard this is an issue for the abutters in this area.

The Morses Pond trails are popular and connect to the Crosstown Trail. Along with the North 40 property to the southwest of the site, there are many smaller walking trails through the woods. Within the project area is a portion of what is identified below as the Morses Pond Trail, a popular route for residents and guests both during and off-season.

Morses Pond Trail map

Vegetation & Wildlife Habitat

The site is comprised of a predominance of coarse to fine sand, which was mined over the years. This soil type also results in the vegetation of the site being primarily composed of white pine (Pinus strobus) and a combination of other deciduous trees including red oak, white oak, red maple, beech, birch, catalpa, and poplar. Certain invasive species have begun to populate the site, most notably oriental bittersweet and European buckthorn.

The site is populated by a wide variety of wildlife including birds, waterfowl (ducks, herons, swans, and Canada geese), squirrels, racoons, chipmunks, opossum, and the occasional fox and coyote and well as a wide variety of turtles, amphibians, and fish.

Local wildlife enjoying Morses Pond

Pond Ecology

Over the years as a result of residential development upstream and around Morses Pond, it has become eutrophic primarily from an excess of phosphorus, typically from lawn fertilizers.

Extra phosphorus reduces water clarity and supports the rampant growth of algae and other undesirable plants and weeds. While algae and undesirable plants and weeds thrive in a phosphorus-rich environment, they strangle fish and other aquatic animals by consuming the oxygen necessary for life.

Algal blooms kill fish and other animals, create unpleasant odors, and nurture vegetation that grows dense and thick enough to close large areas of the pond to swimmers and boaters for much of the summer.

Weed harvester in the pond

The Town has been managing this issue with the assistance of a weed harvester, which collects the weeds daily during the summer season and hauls the material off site to be composted. The Wellesley Department of Public Works manages and maintains a phosphorus inactivation system to help combat the weed growth in addition to the weed harvesting.

Shade Shelters

There are two shade shelters on the property with picnic tables, grills, and trash cans. These structures are fairly basic in their construction and the asphalt shingle roofs and in fair to poor shape.

Existing shelter with seating

One is ADA accessible, located directly of the main path that cuts along the back of the site, whereas the second is located in the lawn area, and therefore not ADA accessible. These are popular both for families and for day camps.

This smaller shade structure, with built in table and seats is located closer to the beach and is used by a variety of guests, lifeguards, and the park ranger.
There are no places directly at the beach to seek shelter from the elements. This makes it difficult for parents to supervise their children from the beach if they want to take a break from the sun.

Existing smaller shelter

The Recreation Department also uses a temporary seasonal canopy structure every summer at the south end of the beach, in the sand.

Retaining Wall

The site is divided between a lawn area and the sandy beach area by a pressure treated timber retaining wall which is starting to fail. Guests enjoy the ability to lay blankets on either the grass or the sand. The height of the wall varies from approximately 18” to 8” in height.

The walls make the transition from the lawn to the beach difficult for some users because of the step down. Small amounts of CCA can also leach into the surrounding areas over time which is not ideal for this natural resource environment utilized by people and wildlife.

Existing retaining wall looking toward the shelter

Storage

There exists an incongruous and haphazard collection of storage solutions on the site, that do not fully and adequately meet the current program requirements, such as lifeguard supplies, kayaks, paddles and life jackets, and miscellaneous maintenance equipment. This collection is both unsightly and inefficient.

Existing storge container

Existing dumpsters

Existing dumpsters

Play Equipment

There are two areas of 'dry play' play equipment. The first is a swing set located off the main path, while the second is a multi-feature slide and play area down on the sandy beach.

Although the play equipment location is convenient for parents who want to keep an eye on some kids who may be in the water and others on the play equipment, the current location and lack of walkways to the slide structure make this non-ADA accessible.

The wood chip surfacing in the playground area is not ideal for walking and it is not ADA accessible. The wood chips are also not the safest surface when dealing with trips and falls.

The playground also does not accommodate play for children with disabilities. The play structure is not accessible, and the swings do not have any seating that can be used by children with mobility difficulties.

Existing swings with wood chip surfacing

Existing play structure with wood chip surfacing

Aerial view of the beach area and playground

There is also a sand volleyball court located approximately in the middle of the beach front, within the grass area. This is used primarily by day campers, but only periodically.

Given its limited usage, and prime location roughly at the center of the beach, during the public engagement it was determined this area would be more useful as lawn area for sunbathers.

The sand volleyball court could be relocated to roughly the location of the existing play equipment which is typically a lesser populated portion of the beach.

Volleyball area adjacent to the beach

Ice House Pond

Ice House Pond is a wonderful natural resource within the Town of Wellesley. It is a place that is currently underutilized by town residents, but with some of the work listed below, this could become a year-round attraction. A place to be at one with nature.

In conjunction with dredging, invasive species removal, and other measures this small pond could have improved water clarity, and biodiversity, and create additional opportunities for recreation such as fishing, ice skating, and interacting with the wildlife that is drawn to this area.

Ice House Pond looking north

Boat Access

There is an ADA accessible kayak launch located at the north side of the beach was installed in the summer of 2014 and is recommended to remain. The grassed area to reach this boat launch is not ADA accessible and will be addressed. Kayaks and equipment are available for rental from the office in the bathhouse. Kayaks are stored in the green storage container and brought out by guards for rental.

The ADA accessible boat / kayak dock

Kayak storage facilities during the season

Shipping container used for storage

Access to this launch by residents bringing their own kayaks is difficult given the distance away from the parking lot.

A shipping container is utilized to store boating items.

Road to the boat launch

The existing boat launch is able to be accessed for public rooftop boats and kayaks, but it is fairly hidden from view and often busy with the operating weed harvesting equipment for the pond.

Signage to direct users to the boat launch is not easily recognizable for users of this amenity.

Turning movements for vehicles dropping boats off in this area are also restricted by the current road layout. The stone dust surfacing is also prone to damage from the effects of stormwater run-off, so maintenance is required.

Existing Parking

The existing parking area is located on the east side of Ice House Pond and the Water Department Building. The lot is approximately one and a half acres and has a compacted gravel surface. The western edge of the lot is adjacent to the Zone 1 wellhead protection area. There is no striping or

signage to help the organization of the lot, and this leads to inefficient parking congestion on busy days.

The existing entry drive to the main public parking lot

Other than the signage, the existing ADA parking adjacent to the beach areas is essentially non-conforming on multiple fronts.

Both the dirt parking and the slope from parking up to the main walkway, do not conform to the requirements set forth for accessible parking. As with the main public parking lot there are no delineated parking spaces.

Existing parking located closer to the beach area

Lawn Areas

One feature of the Morses Pond Beach area that is not seen at many other pond beaches is the lawn area that lies beyond the sandy beach. Current beach guests expressed a strong desire to maintain and enhance this feature, since it provides a softer and cooler place to lay out and enjoy the beach area without having to be directly on the sand. Additionally, maintaining and adding shade trees provides respite from the sun on the hottest days of summer.

View from the existing lawn area looking toward the pond

These lawn areas provide an opportunity for flexible gathering and the chance for visitors to run around and play in an open area but still within sight of the beach.

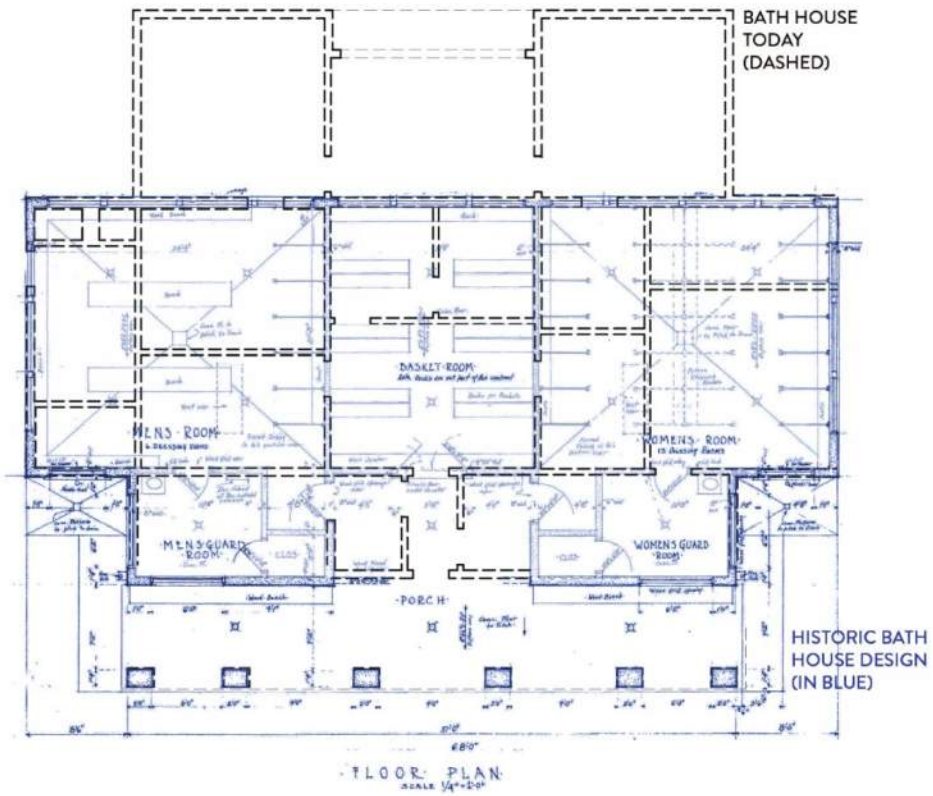
Existing Bathhouse Conditions

Summary

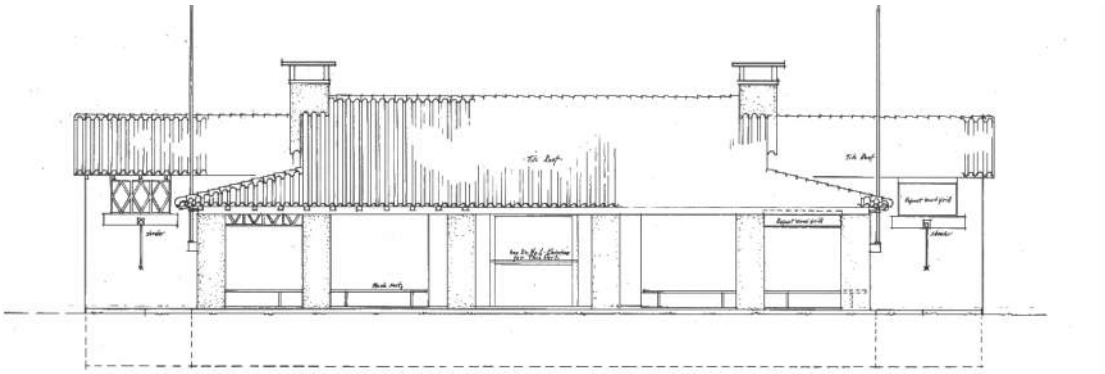
Maryann Thompson Architects along with the Weston & Sampson team and Wellesley Recreation Staff toured the existing bathhouse structure during the master plan phase and again in early 2022 to assess the current condition of the building. In general, the team agreed that the existing bathhouse structure contains dated systems beyond their useful life, is not currently configured to best meet the needs of visitors and staff and does not meet current accessibility standards. To meet the project goals, reuse of the existing structure was determined to not be feasible without major renovation and rebuilding and so the construction of a new bathhouse structure was determined to be the preferred approach to best meet the project goals.

Existing Bathhouse Description

The original bathhouse was a simple structure with a central 'basket room' where guests would leave their change of clothes after having put on bathing suits in either the men's or women's changing rooms. There were also a small room for each male and female lifeguards. The original design drawings for the structure show the building in the Mediterranean Revival architectural style with clay tile roof and a stucco finish, which was popular regionally during the time period that this was built, in the early 1930's.



Original Bathhouse with Current Floorplan Overlay illustrating additions and changes to the original floorplan



Original Bathhouse Elevation

Over the years this original structure underwent a series of renovations and additions which carved up the original spaces as the need for staff space, storage and bathroom facilities grew. The current building finishes also underwent changes as well with the primary materials being painted brick and an asphalt shingle roof. The roof is simple exposed wood framing with some small vents under the eaves which don't allow for adequate ventilation leading to issues with mold and mildew. As it stands now, the current facility configuration is poor and does not meet programmatic needs and code requirements, particularly as regards accessibility and storage.

Current bathhouse elevation

Single accessible bathroom

Small storage area

Roof structure

Bathroom ventilation

Storage area

Staff area

Community Needs Building Assessment

Existing Program Assessment

Through a collaborative process with town staff and community stakeholders the study team reviewed the existing bathhouse program and assessed the programmatic needs that weren't being met with the current facility. In general, the current bathhouse bathroom and changing facilities were seen as too small, dark, and not well ventilated. Staff areas were similarly seen as too small and not arranged to face the beach area. Storage areas are also spread around in several locations instead of a centralized space. The public also felt strongly that a portion of a redesigned bathhouse could be used in more seasons for visitors to the larger park area in the off-season.

Existing Bathhouse Program

Interior Spaces: 2,063gsf

Public Uses

- Women's Bathroom 426 nsf
  - Separate bathroom / changing areas
- Men's Bathroom 325 nsf
  - Separate bathroom / changing areas
- Accessible / Family Bathrooms 74 nsf
  - (1) provided
  - Accessed off corridor to staff area

Staff Uses

- Guardroom 206 nsf
  - Room for lockers / cubbies
  - Storage for equipment
  - Fridge / microwave for lunches
- Lifeguard changing rooms 242 nsf
  - (2): Women's/Men's
- First Aid 110 nsf
  - Room for first aid bed, supply cabinet and desk
  - Contains one hand sink
  - Not large enough for group training (approx. 10 ppl)
- Office/Gatekeeper 174 sf

Mechanical

- Mechanical spaces 62 nsf
  - Spread out in a few different areas plus overhead hot water tank in family bathroom

Storage

- General storage area 444 nsf
  - Spread out in three different building areas

Exterior Areas, Storage, and Elements: 868gsf

- Covered porch 180 sf
  - Vending Machine Location
  - Provides sheltered waiting area outside bathrooms
- Lifeguard break area 488 sf
  - Doesn't address beach area
- Water Fountain
  - Wall mounted model
  - Ability to drain down for winter
- Rinse station
- Storage container 200 sf

Proposed Program

Following the assessment of the existing bathhouse program the study team incorporated the comments received from town staff and the public to outline the program for the new facility. This program includes larger spaces for visitor use, adequately sized staff and storage areas. The new program also incorporates the ability to use the staff and family bathroom areas in the off-season. Below is the program developed through this process.

Proposed Bathhouse Program

Interior Spaces Total: 3,200 gsf

Unconditioned spaces: 1,837 gsf

Public Uses

- Women's Bathroom **465 nsf**
  - Separate bathroom / changing areas
- Men's Bathroom **465 nsf**
  - Separate bathroom / changing areas

Storage

- General storage area **740 nsf**
  - Consolidated in one space
  - Large enough for off-season storage

Grossing Factor (10%): 167 sf

Conditioned Spaces: 1,363 gsf

Public Uses

- Accessible / Family Bathrooms **140 nsf**
  - (2) provided
- Concession **130 nsf**
  - Walk up counter
  - Small kitchen

Staff Uses

- Gatekeeper office **165 nsf**
  - Adjacent to beach area entry
  - Visitor walk-up window
- Guardroom **265 nsf**
  - Room for lockers / cubbies
  - Storage for equipment
  - Fridge / microwave for lunches
  - Women's/Men's changing rooms
- First Aid **295 nsf**
  - Room for first aid bed, supply cabinet and desk
  - Contains one hand sink
  - Large enough for group training
- Town office **100 sf**
  - For full time staff use when on site

Mechanical / Storage

- General storage/mechanical areas **144 nsf**

Grossing Factor (10%): 124 sf

Exterior Elements: 3,450 gsf

- Covered porch **2,350 sf**
  - Picnic/BBQ area
  - Lifeguard break area
- Uncovered porch **1,100 sf**
  - Dogtrot area
  - Monitored entry to beach area
  - Views through from arrival to pond
  - Additional seating areas
- Rinse stations
  - Includes two to four sets of heads
  - Located on exterior wall of bathroom volume
- Water Fountain
  - Hi/low with bottle filler
  - Ability to drain down for winter

Building Code Review

Project Description

The Project involves the design and construction of a new bathhouse and administration building at Morses Pond. The building is proposed to have one level with an area of approximately 3,200 gsf split over two separate buildings.

Applicable Codes

The following primary codes are applicable to this project:

- Accessibility - Massachusetts Architectural Access Board, 521-CMR and the Americans with Disabilities Act Guidelines (ADAAG).
- Building - Massachusetts State Building Code (780 CMR) 9th Edition. 780 CMR is an amended version of the 2015 International Building Code.
- Electrical - Massachusetts Electrical Code, 527 CMR §12.00. The Massachusetts Electrical Code is an amended version of the 2017 National Electrical Code (NFPA 70).
- Fire Prevention - Massachusetts Fire Prevention Regulations, 527 CMR.
- Mechanical - International Mechanical Code, 2015, as adopted and amended by 780 CMR (IMC).
- Plumbing - Massachusetts Fuel Gas and Plumbing Codes, 248 CMR
- Building Energy – Massachusetts Specialized (Opt-in) Code, 225 CMR 23.00 including Appendix CC.

Assumptions

The code review and this report have been prepared based on the following specific assumptions:

1. The Building will not be equipped throughout with an automatic sprinkler system.
2. If any hazardous materials are to be located within the buildings now or in the future, the amounts will be limited to the exempt amounts permitted by 780 CMR §307.1.
3. There will be no Hydrogen Cutoff rooms, paint shops or similar incidental uses.

Use and Occupancy Classification

The following Uses are considered included in the Building:

1. Restroom Areas, breakroom and first aid room (Utility and Miscellaneous Group U per 780 CMR §312)
2. Moderate Hazard Storage (Storage Use S-1 per 780 CMR §311)

Mixed Use Approach

Because two or more occupancies are provided, compliance with Section 508.1 Mixed Use and Occupancy is required.

508.1 Mixed occupancies. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections.

Given the uses present and proposed total gsf, a non-separated mixed-use approach is recommended. The building is addressed as a non-separated mixed use with Utility and Miscellaneous Group (U) and Moderate Hazard Storage (S-1) areas present.

Construction Classification

Type V-B construction is proposed wherein the structural elements, exterior wall and interior walls can be of any material allowable by code. Occupancy classification U allows for a maximum one-story building with up to 5,500 gsf of area.

Means of Egress

At least one (1) accessible means of egress is provided from an accessible room or space. There are no spaces where more than one (1) means of egress or exit is required. Accessible means of egress must provide a continuous path of travel to a public way (780 CMR §1009.2).

Exits are located such that the maximum length of exit access travel, measured from the most remote point to an approved exit along the natural and unobstructed line of travel does not exceed 200-feet (780 CMR §1017.2).

Fire Protection Systems

- Sprinkler Systems - An NFPA 13 compliant sprinkler system is not required (780 CMR §903.2).
- Fire Extinguishers - Portable fire extinguishers are required in accordance with 780 CMR §906 and the 527 CMR. All fire extinguishers to be provided are to be in accordance with NFPA 10, Standard for the Installation of Portable Fire Extinguishers (780 CMR §906.0)
- Fire Alarm System - A fire alarm system is required to be provided per 780 CMR §907.2.

Fire Department Access

527 CMR addresses fire department access requirements and states that the head of the fire department shall require and designate public or private fire lanes as deemed necessary for the efficient and effective use of fire apparatus. The arrangement of fire department access to the project must be reviewed with the Wellesley Fire Department. Preliminary plans were reviewed with the Wellesley Fire Department and were found acceptable. Once the project reaches the Design Development phase an additional review will occur.

Plumbing Fixtures

Under the plumbing code (248 CMR), plumbing fixtures are required based on use and occupancy. Total fixtures supplied are to comply with Section 10.10 denoting minimum plumbing facilities as required by total occupant load. The proposed bathhouse design exceeds the minimum fixtures required and is based on maintaining the same quantities as the existing bathhouse.

Accessibility

The entire building must be designed to be accessible to, functional for and safe for use by persons with disabilities in accordance with 521 CMR and the Americans with Disabilities Act (ADA). This includes site access, entrances, bathrooms, and all public spaces within the building.

Preferred Site Master Plan Recommendations

The preferred site master plan was established in direct response to the ideas and preferences put forth by very engaged community members, Recreation Commission, and other key stakeholders. As previously noted, dialogue at the three public meetings was extremely spirited and thoughtful, with participants interested in striking just the right balance in the approach to refurbishing and enhancing this important property and recreational resource. To find that balance, project proponents kept returning to the central themes that community members continually gravitated toward, and these are summarized below:

- The site is very much loved as it is, so a master plan tenet should include preserving and enhancing all that is great.
- The bathhouse has outlived its practical and functional life and given the extent of repairs and upgrades required in order to bring the building into full code compliance and functionality, it is more cost effective and practical to demolish the existing building and create a new building.
- In order to improve universal access for all site amenities, walkways and paths must be graded in compliance with ADA guidelines.
- Designs should be simple and sustainable, and in keeping with the inherent historical, environmental, cultural, and social site character.
- Through the establishment of meadows and native landscape plantings, wildlife habitat can be improved.
- New enhancements should be attractive, low-intensity, and supportive of neighborhood and town-wide use both during and outside of the summer swimming season.

The site master plan was designed to strike the right balance as it introduces a relatively modest array of improvements that are in keeping with the preferences of master planning participants. This plan also considers the Town of Wellesley's capacity to maintain and operate the property in good order, while protecting the public drinking water supply wells and systems.

Aerial view of the site

Preliminary Building Location Studies

The design team developed a series of three (3) preliminary beach area designs looking at three main building configurations and where was the best location for them to be placed on the site was.

Master Plan Scheme 1

Master plan scheme one first looked at creating a new building in roughly the same location as the existing building. The location of the buildings are a not conducive to the new drop-off and parking area. This would require visitors to navigate across the site from the drop-off to pay their entry fee to use the beach facilities.

This scheme was not pursued because the building did not function well with trying to squeeze all of the programming into a single footprint, and its position in the relation to the primary swim area was not advantageous.

Master plan scheme 1

Master Plan Scheme 2

Master plan scheme two created a new pair of buildings closer to the existing bridge on the northern portion of the site. Advantages of this scheme included the creation of a formal and highly visible gateway between the buildings and to create the sense of arrival, while the building locations help to open up more space for guests around the perimeter of the beach.

The location of the playground would require some extensive regrading of the site to accommodate this amenity. The location of the buildings are a not conducive to the new drop-off and parking area. This would require visitors to navigate across the site from the drop-off to pay their entry fee to use the beach facilities. For these reasons, this scheme was not selected.

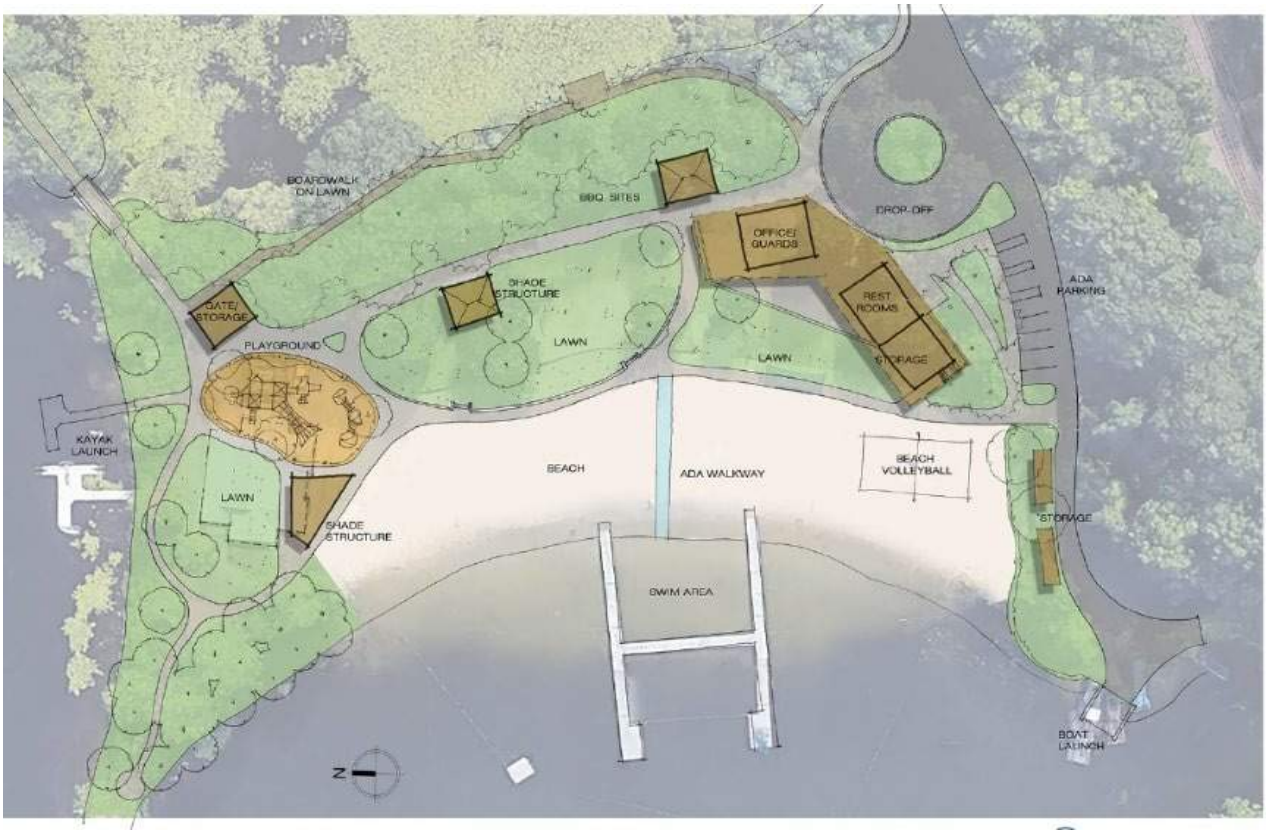
Master plan scheme 2

Master Plan Scheme 3

Master plan scheme three became the preferred scheme after receiving input from stakeholders. The building has been moved to the opposite side of the beach, closer to the drive on the southern edge of the site. This maintained the benefit of the second scheme in creating a gateway entrance while also opening up green space and view corridors by removing the existing structure from its current location.

With the buildings being located closer to the proposed drop-off and new parking area, it makes for a much simpler and quicker entry experience to the beach facilities. It also is advantageous for visitors who have mobility issues.

The location of the playground is also in an existing area that is relatively flat so extensive grading would not be required to make this a fully accessible and inclusive space.



Master plan scheme 3

Preferred Site Master Plan Design

This design reflects the full potential build out option that was derived from stakeholder feedback received after reviewing the first master plan developed in 2019 and 2020. The current proposed project scope within this study has components of this plan that are not included due to budget constraints.

Key Features of this Site Master Plan include:

Parking and Arrival

- Reconfigured and more efficient parking lot layout, with potential for future PV solar arrays.
- Reconfigured drop off.
- Open lawn area on east side of Ice House Pond.
- New wooden boardwalk along southern portion of Ice House Pond.
- New walkway along west edge of Ice House Pond, allowing guests without passes to have access to the new bathhouse building location.
- Walkway separated from Water Department driveway.

Bathhouse

- New bathhouse building's location closer to entrance drive/walkway.
- Bathhouse broken into two buildings, one which can be shut down during off-season.
- ADA parking brought into compliance.
- Increased and improved storage areas.

- One continuous roof connecting the two building footprints to create covered shaded outdoor space.

Open Space

- New children's playground along walkway.
- Volleyball relocated to beach area.
- Open lawn areas for flexible gathering opportunities.
- New kayak rental/storage which small check-in office.
- Adult outdoor exercise equipment areas.
- New tree plantings to frame the beach entry and important views of the pond.

Pedestrian Accessibility

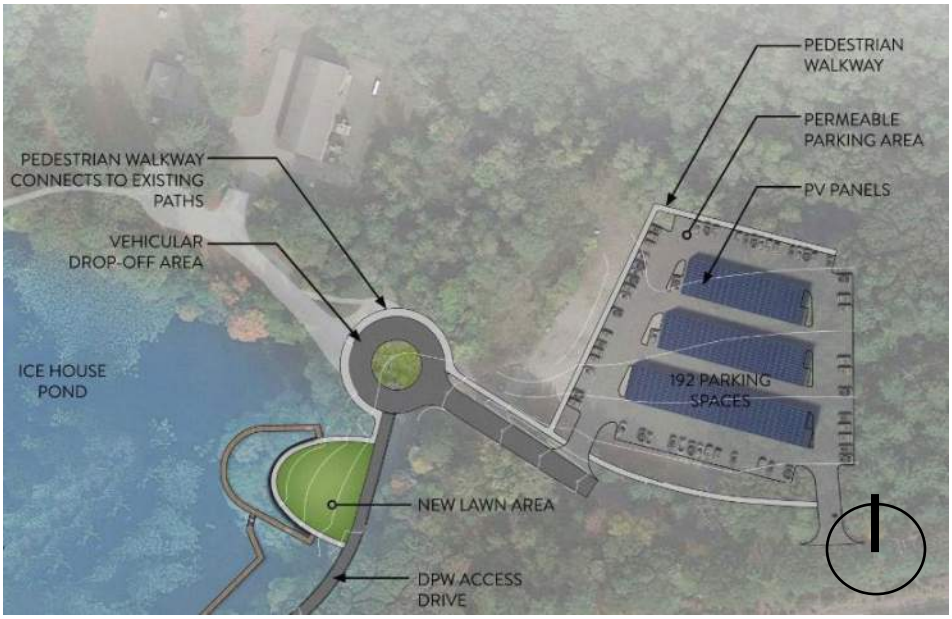
- New walkways at beach area including flush wooden walkway at beach.
- Site side ADA accessible walkways.
- ADA accessible mat across beach.
- Secondary path system through wooded area adjacent to Ice House Pond that allows visitors to use the site without entering the paid beach area.
- Peninsula walk with bench seating for pond views.

Ice House Pond

- Removal of invasive species.
- Dredging.
- Boardwalk with viewing and seating areas through Ice House Pond.

Parking Area /Drop-off Modifications

The current parking and drop off sequence is very unclear as to where exactly the entrance is, and how either vehicles or pedestrians are supposed to get to the beach area from their car.



Proposed entry drop-off and parking area

In order to clarify and remedy this issue the intent is to reconfigure the drop-off area, developing signage and visual clues to promote using what is currently the service and handicapped parking drive into the main pedestrian walkway. These changes will also create a more distinct vehicular access drive for the Water Department.

A total of 192 parking spaces have been created in this new more efficient layout, including six (6) ADA accessible stalls. A new sidewalk connection from the northern side of the parking lot will provide better pedestrian access to Morses Pond. The parking lot will be porous asphalt to help with stormwater run-off.

In an effort to help protect the town drinking wells, the parking lot, which currently abuts the Zone 1 wellhead protection area is proposed to be moved approximately 100' to the east in order to give a larger buffer to the wellheads.

Unless the lack of rebates and credits makes it cost prohibitive, there is the potential of adding solar array panels at the parking area. These solar array panels could possibly be purchased and installed under a separate contract when funds become available.

Image of canopy supported PV array

Pedestrian/ADA Parking Access at the Bathhouse

Reconfigured drive to boat launch and accessible parking stalls

In addition to expanding the width of the drive to allow for emergency vehicle access, the drive will have designated drive and walkway lanes in the infrequent event that both pedestrians and a vehicle are sharing the road.

Two (2) ADA accessible and seven (7) short-term/staff parking stalls are incorporated into the design. The roadway has also been slightly widened adjacent to the new boat launch dock to allow

for better maneuverability for vehicles in this area. A new sidewalk connects the parking area to bathhouse and main beach entrance.

The intent is that only the following vehicles would be allowed on roadway:

- Emergency vehicles.
- DPW vehicles in conjunction with the weed harvester.
- ADA/Accessible guest vehicles (with proper identification).
- Short-term/staff parking.
- Cartop boat vehicles utilizing boat launch.

Site-wide Pedestrian Access

Providing ADA access for the entire Morses Pond facility was an important goal of the design team when we began to think about existing and new pedestrian movements, and how they would navigate through the site.

The existing topography is challenging in certain areas with steep changes in grade. Through our design process and study of the existing topography we were able to make the whole site ADA accessible with all walkways graded with slopes less than 5%. The main building entry plaza is graded with cross slopes not to exceed 1.5% in any direction, again within the allowable limits for ADA accessibility. The accessible mat at the beach will allow for more people to access this area and the existing boat dock.

The plan includes two sets of stairs, one which leads from the lower Ice House Pond deck and a stair leading from the bathhouse gathering plaza to the beach front wooden deck pedestrian path. There are alternative accessible pedestrian routes, so these stairs are not the only means of egress in these areas. They can be used to gain a more direct route to connect these areas of the site.

A sidewalk is included on north and west perimeter side of the new parking lot. This will allow pedestrians to navigate through the parking lot in a much safer way and reduce the conflict with vehicles. The existing pedestrian route connection to Morses Pond from the parking lot along the northern side of Ice House Pond will remain in place.

The materials proposed for the site wide pedestrian sidewalks include bituminous concrete, concrete unit pavers, wood decking, and compacted stone dust. All of these surfaces are considered to be ADA compliant.

The diagram below indicates the accessible pedestrian routes from the parking lot to the bathhouse and other amenities throughout the site.

Site Master Plan Accessibility Diagram

LEGEND

- NEW PEDESTRIAN ACCESSIBLE ROUTE: SLOPE AT 5% OR LESS
- NEW PEDESTRIAN ROUTE WITH STAIR ACCESS
- SHARED ACCESS BETWEEN VEHICLES & PEDESTRIANS
- EXISTING PEDESTRIAN ACCESSIBLE ROUTE: SLOPE AT 5% OR LESS

Removal of Invasive Plant Species at Ice House Pond

There are several invasive species that affect the property, but oriental bittersweet (Celastrus orbiculatus) has had a particular impact on the aesthetics and openness of Ice House Pond. By eliminating this pervasive climbing vine, wide areas of currently inaccessible shoreline would be opened up and would prevent further damage to the surrounding landscape. Other invasive species to be controlled include buckthorn, multiflora rose, poison ivy, bush honeysuckle, autumn olive, and black locust.

Invasive species at Ice House Pond

Erosion Control Measures

At several locations throughout the site, measures should be taken to reduce soil erosion and siltation into the pond. A variety of solutions will likely be required including the use of riprap stabilization, groundcover plantings, and grading to redirect stormwater.

One location in particular need of attention is the woodland path on the north side of the 'Old Beach' near the Water Department property.

Erosion at Old Beach

Beach Area

Within the beach area itself there are minor modifications. The play structure will be moved in order to be in a more accessible location, while the volleyball area was moved from the hillside down onto the beach.

Additionally, an accessible mat system is proposed to allow guests with disabilities to get across the sand to the docks and water. These mats are easily to install and can be removed during the months when the beach area is closed to the public.

An accessible beach mat for wheelchair users

Lawn Areas

One feature of the Morses Pond Beach area that is not seen at many other pond beaches is the lawn area that lies beyond the sandy beach. Current beach guests expressed a strong desire to maintain and enhance this feature, since it provides a softer and cooler place to lay out and enjoy the beach area without having to be directly on the sand.

Programmed lawn activities

The new lawn areas are designed with flexibility in mind. Users can determine how they use these spaces. They can be used for programmed events like group yoga on the lawn, or something as simple as kicking the soccer ball with your child. Additionally, maintaining and adding shade trees that will provide respite from the sun on the hottest days of summer is an important inclusion to the master plan.

Maintenance of the lawn areas will be required, with weekly mowing and an organic pesticide program developed.

Playground

The existing play structure is located down on the sandy beach area which makes it inaccessible from an ADA point of view.

The new playground has been relocated to be accessible from the surrounding walkways. Its location is such that parents are still able to keep an eye on kids at both the beachfront and the play area simultaneously. It also makes accessing this facility much easier for users.

The playground has been graded to meet current ADA guidelines with cross slopes of less than 2%. Rubberized safety surfacing to help prevent serious injuries from trips and falls is proposed . A new main play equipment structure, swing set, and educational/sensory pieces are included in the design.

A fence surrounds the perimeter of the playground to help coral children in a safe environment while they play.

The proposed playground

Sensory play equipment

Exercise Equipment Areas

Three (3) locations for permanently installed adult exercise equipment have been incorporated into the plan. Health and fitness is becoming more important to people and part of their everyday lives.

Including these types of amenities within the overall design was well received during the stakeholder meetings. They offer visitors the opportunity to be active in a programmed way by using their own body weight.

These pieces of exercise equipment are designed to withstand regular daily uses by many people, potential vandalism, and the elements in this location. They will remain in-situ year-round so do not need any space for storage within the new buildings.

Outdoor exercise equipment

Site Furnishings

At the first public meeting the design team presented options for the proposed site furnishings. These included bike racks, trash and recycling receptacles, benches, and dining seating options.

The overall consensus was that furniture with color was preferred and that it should be able to withstand the elements, and also be made of sustainable materials.

Two (2) benches with arm rests would be placed on the lower secondary walk to provide a place of respite with views of Ice House Pond. Two (2) benches would also be placed on the main pedestrian path and one (1) adjacent to the playground.

The gathering plaza adjacent to the bathhouse will include furniture with options for communal gathering/dining. This furniture will be fixed in place so does not need any storage space within the new buildings.

Bike racks will be located directly adjacent to the bathhouse for convenience. Trash and recycling receptacles will be placed in key locations throughout Morses Pond.

Colorful dining furniture

Fixed communal dining furniture

Boardwalk at Ice House Pond

In order to provide greater access to and through Ice House Pond the design team has proposed a boardwalk that would cross along the southern edge of the pond. This would both allow access closer to the water but also provide a second walkway for pedestrians moving between the parking area and beach front in the event of vehicular traffic along the access drive.

An overlook area with seating would provide an area of respite for visitors using this connection, or a perfect place to fish.

Plan of the Ice House Pond boardwalk

Tropical hardwood decking and steel guardrails

Accessible fishing area

The material recommended for the decking and guardrails would either be Trex or a tropical hardwood. Trex is a sustainable product constucted of recyclable materials that requires no maintenance. Ipe or similar tropical hardwoods also require no maintenance and come from sustainable sources. Using these materials would prolong the lifespan of this amenity within Ice House Pond.

Conceptual Building Design

Overview

As described in the site master plan, the preferred bathhouse scheme was determined to be a two-building solution. One building footprint contains bathrooms with changing areas and a large storage space. This volume will be unconditioned and shut down after the summer beach season. The other volume contains staff spaces, first aid room, family bathrooms and concession spaces.

This volume will be conditioned and could be used year-round if desired. This approach would give the facility flexibility for use beyond the peak summer season. During the summer season, the two building volumes create a gateway to the beach area which visitors walk through and where a staffed walk-up window serves as a checkpoint where passes and entry fees are collected.

Both structures are proposed to have large overhang/canopies, to provide both shade from the sun and shelter from passing rain showers. Additionally, a larger roofed area adjacent to the concession space would allow for seating/dining in the shade during the summer and protection from snow and rain in the colder seasons.

Finish Materials / Design Character

During the course of the study, a series of images were presented to stakeholders as a way to discuss and select a preferred design character for the buildings. Through this process a general consensus was formed on the design character that the new buildings for the facility should exhibit. Below is a summary of the characteristics that were requested by both Town residents and Town staff members.

- Simple, modest appearance (not fancy or ornate).
- Natural material palette (i.e., wood) was preferred to man-made materials.
- Durable materials for ease of maintenance and longevity.
- Bathrooms and staff spaces opening toward the beach area.
- Lots of natural light for interior spaces.
- Blending of landscape and building through the use of building siting or layering of architecture and landscape elements.
- Roof with overhangs for covered gathering areas to provide areas of shade.

System and Material Narratives

Maryann Thompson Architects worked with project Mechanical, Electrical, Plumbing and Fire Protection engineers to develop a basis of design for building systems. A brief summary of these systems and the building structural system can be found below, for full design narratives refer to the appendix.

Structural Systems

Structural foundation systems will include concrete slab on grade foundation system with either concrete footing or helical piles. Geotechnical investigation would need to be performed early in the next phase to determine the best approach for the site. The wall structure will consist of typical wood framing. The roof structure is proposed to be timber beams supported by steel columns or wood framed bearing walls.

HVAC

The primary mechanical system of the proposed facility will be central exhaust fan ducted to all occupiable spaces. This system will be complemented with natural ventilation through louvers and operable windows. For the staff areas an air-source heat pump (VRF) system will be installed to provide heating and cooling. Supplemental electric heating will be installed in spaces desired to be used through colder seasons.

Electrical Systems

Electrical systems shall be designed to provide the lowest level of base energy use achievable. Lighting will be provided with all LED fixtures and controlled through daylight and occupancy sensors where practical. Any site lighting that will be provided that complies with dark-sky friendly products to minimize light pollution. A fire alarm system will be provided to meet all current codes and safety standards.

Plumbing Systems

Plumbing systems will be designed with water conserving low or no flow fixtures. Electric point of use water heaters will be used over a centralized water heating system to conserve energy.

Sustainability

As supported by town and stakeholder input, including the Climate Action Committee's Sustainability Guidelines for Municipal Buildings, the study team approached the design of the new bathhouse facility with sustainability as a key consideration. The bathhouse will feature a range of sustainability features and strategies such as:

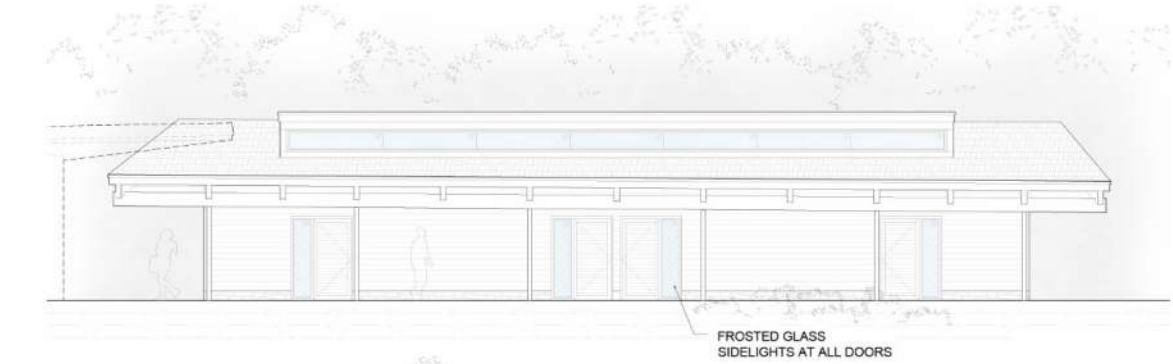
- Daylighting: Large windows allow interior spaces to be lit during the day by natural sunlight rather than electric light.
- Cross Ventilation: The building will be designed to be cooled down by natural breezes through the use of operable windows. This will reduce the use of AC systems in any conditioned spaces.
- Roof Overhangs: Large overhangs shade the exterior envelope to keep the building cooler in the summer but will allow low winter light in.
- Exterior envelope: Conditioned spaces to be super-insulated (approx. R-40 walls and R-60 roof). This will keep the building warmer in the winter and cooler in the summer. Windows for these spaces to be triple-paned.
- Materials: Specify wherever possible the use of locally available and environmentally friendly materials
- LED lighting: All lighting to be highly efficient LED lighting, lowering the energy consumption of the building.
- Electric Building Systems: HVAC and hot water systems to be all electric, eliminating the use of fossil fuels.
- PV system: a PV system located in the parking area or elsewhere could be installed to offset building energy use.

Administration and Bathhouse Buildings

The following images highlight the proposed plans and elevations for the new bathhouse and administration building. These plans and elevations include the feedback received from multiple sources during the public engagement and stakeholder's meetings.

Floor plans of Bathhouse and Administration Building

Elevations – Bathroom and Changing Room Building



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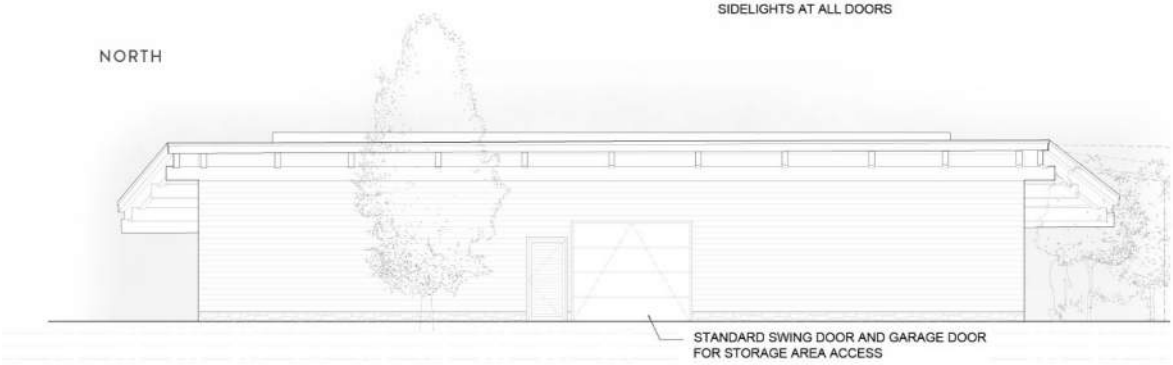

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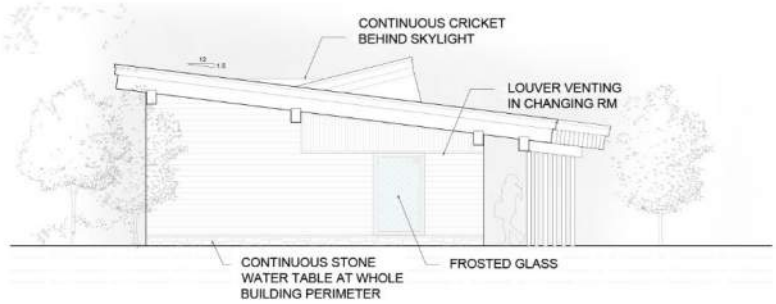

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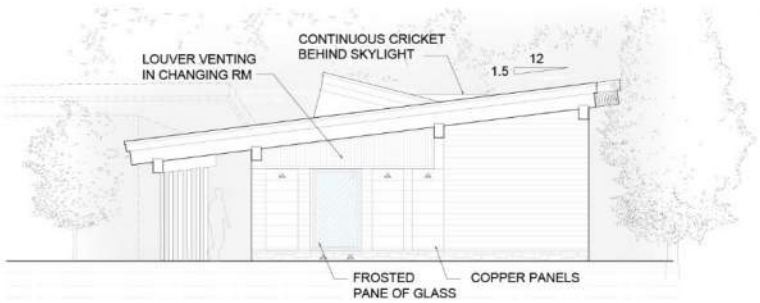
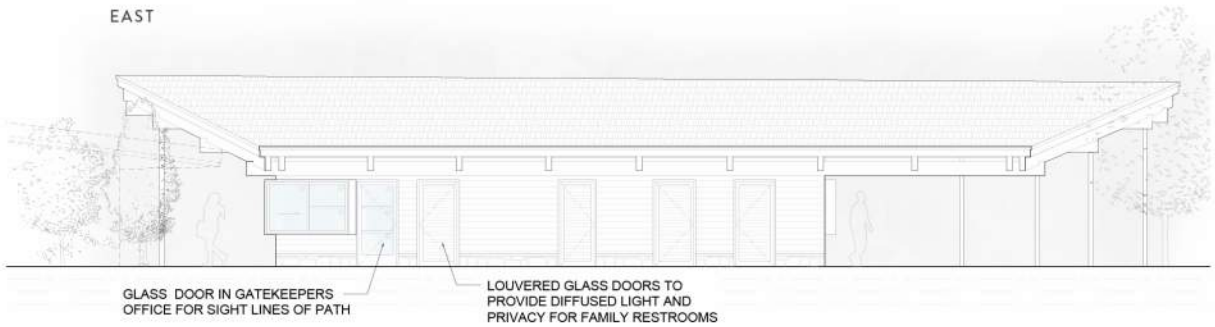


EAST

Elevations - Administration Building

EAST



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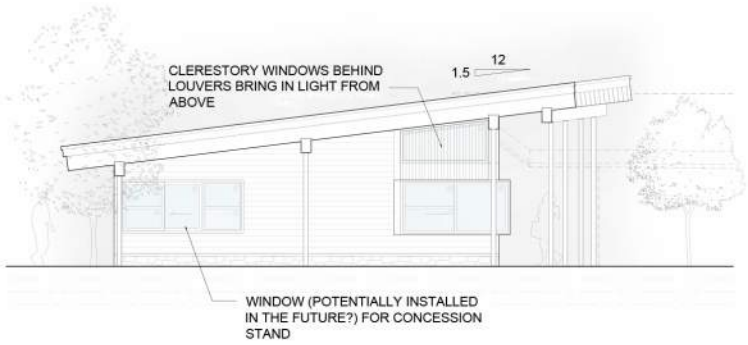

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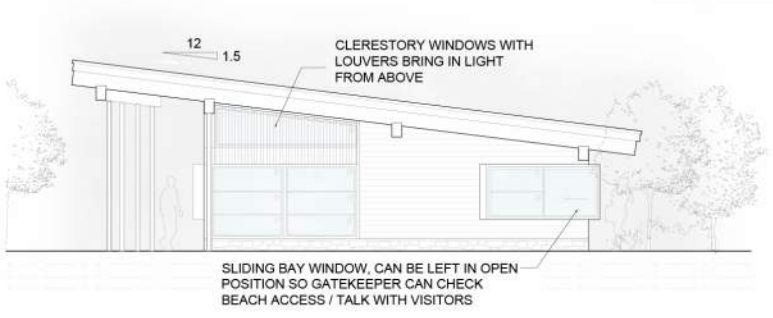
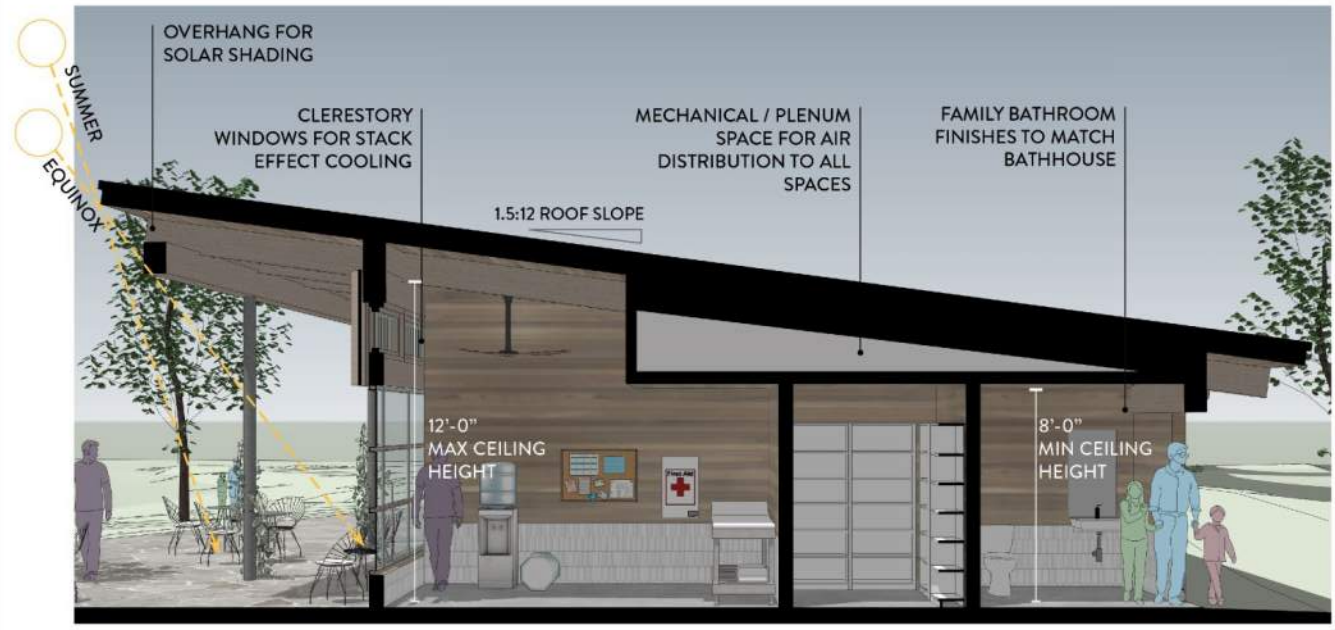
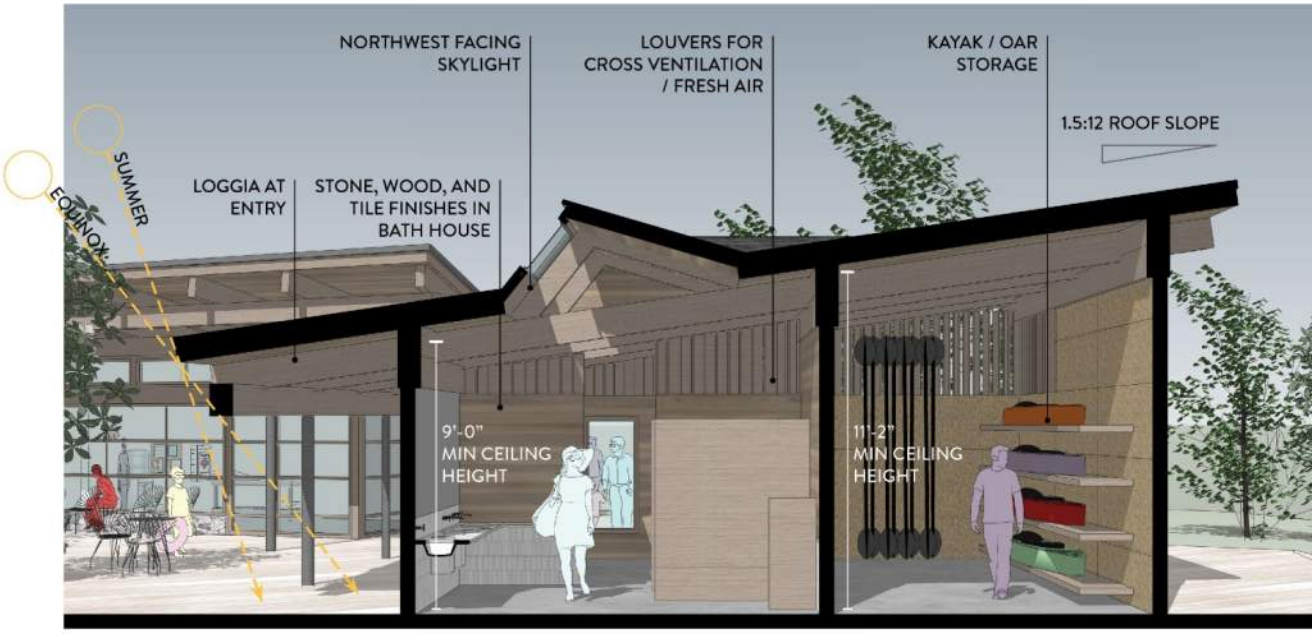


SOUTH

Proposed Interior Building Sections



Section through the Administration Building



Section through the Bathhouse Building

Proposed Site Renderings

Pedestrian entry approach from the accessible parking area

Framed view of the pond from the approach to the administration building

Proposed Site Renderings

First view of the pond as you enter the past the administration building

View of the pond from the dining plaza

Proposed Site Renderings

View of the pond from beneath the administration building canopy

View from the open lawn of the dining plaza with moveable furniture

Proposed Site Renderings

Aerial view of the two building volumes

Aerial view from above the pond looking east

Estimated Construction Cost for Preferred Option

The improvements can be accomplished by phasing one at a time or in groups or all at once, based on funding availability. The Friends of Morses Pond Beach group has also expressed a strong willingness to participate in the funding of capital improvements at the site and their continued support should be further encouraged and understood.

The estimated construction costs (or opoinion of probable construction costs) for the Full Build Site Master Plan identified above within this report is outlined below.

Improvement Area	Estimated Probable Cost
Building Improvements	$ 2,554,472
Site Improvements	$ 2,751,179
Sub Total	**$ 5,305,651**
General Conditions, Mobilization, Bonds, Overhead & Profit @ 18%	$ 955,017
Construction Contingency @ 10%	$ 530,565
Escalation/Market conditions to 2026 (7.5% per year) 22.5%	$ 1,193,769
Sub Total	**$ 2,679,351**
Grand Total	**$ 7,985,002**

Site Value Engineering Exercise

After reviewing the opinion of costs document for the overall site master plan, including buildings, with the Town on May 26, 2023, it was determined that some value engineering of scope items was required to bring the overall budget more into line with the Town's expectations.

The pandemic had a big impact on the cost of both materials and labor and this was reflected in the opinion of probable cost document.

The list below includes the cost reduction measures approved by the Town:

- Removal of all work associated with the new parking lot.
- Removal of lawn area overlook by the drop-off.
- Removal of Ice House Pond boardwalk.
- Removal of adult exercise equipment areas.
- Removal of secondary path at northwest peninsula.
- Removal of path and stair connection from Ice House Pond boardwalk.
- Removal of wooden boardwalk between the beach and lawn area.
- Reduce size of paved area at the gathering plaza.
- Reduce retaining walls.
- Relocate accessible dock to location of the existing boat launch.
- Remove the kayak storage building from the scope.

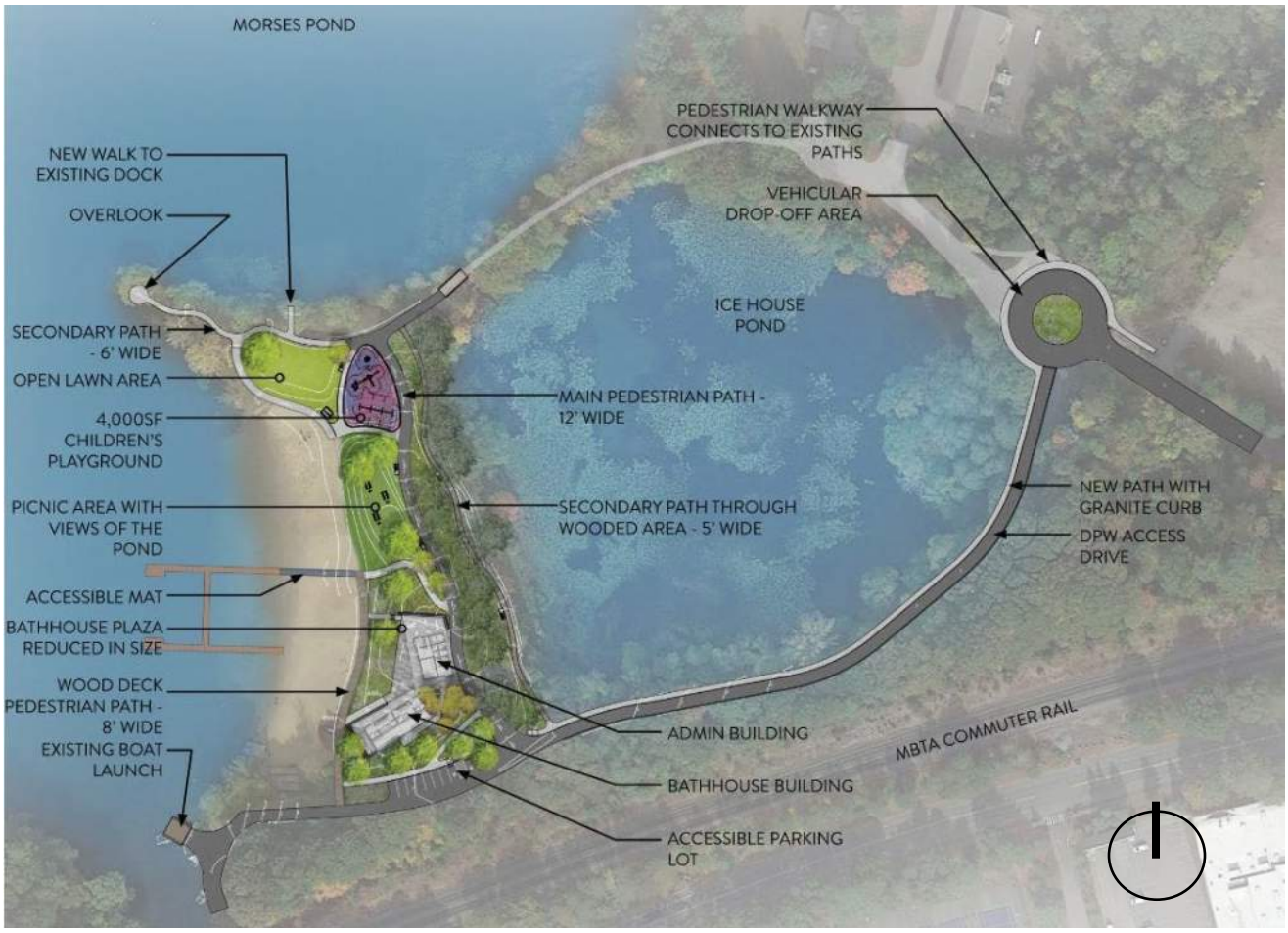
Estimated Construction Costs for Value Engineered Concept

As previously discussed, the design team, along with input from the town, developed the preferred alternative site master plan that included the agreed upon value engineered scope removal. Below is the summarized budget for construction improvements for the site, bathhouse, and administration building. The scope removal resulted in total construction cost savings of $ 1,925,970.

It should be understood that significant soft costs, including designer fees, contingencies, Owner's Project Manager services and other related project costs must be added to the construction cost for a total project cost, which would be the basis for funding request.

Improvement Area	Estimated Probable Cost
Building Improvements	$ 2,173,850
Site Improvements	$ 1,852,087
Subtotal	**$ 4,025,937**
General Conditions, Mobilization, Bonds, Overhead & Profit @ 18%	$ 724,668
Construction Contingency @ 10%	$ 402,593
Escalation/Market conditions to 2026 (7.5% per year) 22.5%	$ 905,834
Subtotal	**$ 2,033,096**
Grand Total	**$ 6,059,032**

Value Engineered Concept Site Master Plan



The beauty of this master plan design is that the scope items removed during the value engineering exercise can easily be designed, and built under separate contracts, even after the construction of this master plan has been completed. This value engineered master plan still delivers major improvements to Morses Pond for Wellesley residents to enjoy for years to come.

Permitting

Based on the current site and building design, we anticipate having to file and obtain the following permits. We will also complete a Wildlife Habitat Report.

- Notice of Intent – for work within and adjacent to wetlands resource areas
- Army Corps of Engineers Pre-Construction Notification – for new structure to provide access in waters of the US
- Wellesley Building Department

Estimated Designer Services Fee

As part of this report, the design team was requested to provide fees to produce a bid ready document package for the preferred alternative site plan, and to assist the town with construction administration services. These fees are a good indication of the budget required to turn this site plan into a set of bid ready documents, but with the understanding they are based on completing these tasks in 2025, with construction administration services extending into 2026. Expenses will be billed separately to the design fees at cost.

The fees related to construction administration have assumed an 18-month construction period. We are carrying the following services to deliver the production of these documents and to supervise the on-site construction:

- Landscape Architecture
- Architecture
- Civil Engineering
- Structural Engineering
- Mechanical Electrical and Plumbing (MEP)
- Permitting
- Opinion of Probable Construction Costs Estimate
- Environmental Support

Below is a table that indicates the estimated design fees by phase.

Task / Design Discipline	Fees
Task 1: Landscape Architecture	
Schematic Design	$ 27,000
Design Development	$ 48,000
Construction Documents	$ 69,000
Bidding	$ 4,000
Construction Administration	$ 62,000
10-month Warranty Review	$3,000
Sub Total	**$ 213,000**

Task / Design Discipline	Fees
Task 2: Architecture, Structural Engineering, MEP	
Schematic Design	$ 69,600
Design Development	$ 82,000
Construction Documents	$ 133,600
Bidding	$ 15,200
Construction Administration	$ 65,000
10-month Warranty Review	$ 6,600
Sub Total	**$ 372,000**
Task 3: Civil Engineering	
Schematic Design	$ 25,000
Design Development	$ 45,000
Construction Documents	$ 29,000
Bidding	$ 2,000
Construction Administration	$ 19,000
10-month Warranty Review	$2,000
Sub Total	**$ 122,000**
Task 4: Permitting	
Notice of Intent	$ 10,600
Design and Stormwater Report	$ 25,000
USEPA NPDES and SWPPP	$ 9,400
Wildlife Habitat Report	$ 5,000
Sub Total	**$ 50,000**

Task / Design Discipline	Fees
Task 5: Opinion of Probable Construction Costs Estimate	
Submissions at 100% SD, 100% DD, and 65% CD	$ 19,000
Sub Total	**$ 19,000**
Task 6: Environmental Support	
Phase 1 Environmental Review	$ 6,000
Design Phase Soil and Groundwater Management Evaluation	$ 22,000
Design Specifications, Soil and Groundwater Management	$ 5,500
Construction Administration	$ 15,000
Sub Total	**$ 48,500**
Grand Total	**$ 824,500**

Conclusion

In laying out the range of potential improvements to the Morses Pond Beach property, an attempt has been made to strike a balance between updating the functionality of the site amenities and maintaining the charming character that has existed at this property for years.

Given the age and condition of the existing bathhouse, it is necessary to develop a new bathhouse solution. This situation gives the Town of Wellesley the opportunity to not just repair or replace the building in its current location but to look at the property more holistically and develop a scheme that works better for both staff and patrons, while at the same time enhancing the overall natural and aesthetic qualities of the site.

Providing accommodations for residents to access the site during the shoulder seasons was a request we heard from the Recreation Department and through our public engagement. The new buildings will provide residents with the opportunity to do this. The architecture and placement of the two new buildings blend seamlessly into the existing fabric of the site, but at the same time help to create a new gateway to the beach area.

This new master plan also transforms a topographically challenged site into a fully ADA accessible inclusive amenity. It allows all Wellesley residents, regardless of mobility constraints, the opportunity to enjoy this wonderful natural resource. It includes a safe system of pathways at varying scales for site users to navigate in groups or alone. Strategically placed benches allow users moments of respite and stunning views of the pond throughout this enhanced site. A new children's playground and flexible lawn areas provide additional areas for gathering and play.

In summary, the production of this master plan is the result of many interested parties coming together in a collaborative way to help deliver a new and improved Morses Pond Beach and Bathhouse facility that will serve the Town of Wellesley for many future generations to come.

Appendices

Appendix A: Opinion of Probable Construction Costs

Appendix B: Site Survey

Appendix C: Geotechnical Report

Appendix D: Wetlands Delineation Report

Appendix E: Electrical System Narrative

Appendix F: HVAC System Narrative

Appendix G: Plumbing System Narrative

Appendix A: Opinion of Probable Construction Costs

Construction Cost Estimate

Morses Pond Beach & Bathhouse Improvements

Wellesley, Ma

Prepared by:

TCi Construction Cost Estimating

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Prepared for:
Weston & Sampson

April 21, 2022

Morses Pond Beach & Bathhouse Improvements
Wellesley, Ma

Construction Cost Estimate

April 21, 2022

MAIN CONSTRUCTION COST SUMMARY

	Building GSF	$/sf	Estimated Construction Cost
Sitework			$3,690,582
Admin Building	1,330	$1,343.28	$1,786,560
Bathhouse Building	1,840	$1,002.90	$1,845,341
Storage Shed/Kayak Rental Building	600	$1,050.96	$630,576
TOTAL ESTIMATED CONSTRUCTION COSTS	**3,770**	**$2,109.56**	**$7,953,059**

PV add costs

Allowance to add for PV panels and supports over parking	$800,000
Allowance to add for PV panels on buildings	$600,000

QUALIFICATIONS

This cost estimate was produced from study drawings and narratives prepared by Weston & Sampson and their design team received April 2022.

This estimate includes all direct construction costs, general contractor's overhead and profit and design contingency. Cost escalation assumes 2024 bidding and construction.

Bidding conditions are expected to be Chapter 149 public bidding to pre-qualified general contractors, and pre-qualified sub-contractors, open specifications for materials and manufactures.

The estimate is based on prevailing wage rates for construction in this market and represents a reasonable opinion of cost. It is not a prediction of the successful bid from a contractor as bids will vary due to fluctuating market conditions, errors and omissions, proprietary specifications, lack or surplus of bidders, perception of risk, etc. Consequently the estimate is expected to fall within the range of bids from a number of competitive contractors or subcontractors, however we do not warrant that bids or negotiated prices will not vary from the final construction cost estimate.

ITEMS NOT CONSIDERED IN THIS ESTIMATE

All professional fees and insurance
All Furnishings, Fixtures and Equipment not identified
Items identified in the design as Not In Contract (NIC)
Items identified in the design as by others
Special foundations (unless indicated by design engineers)
Utility company back charges, including work required off-site
Work to City streets and sidewalks, (except as noted in this estimate)
Construction or occupancy phasing or off hours' work, (except as noted in this estimate)
Construction contingency
All Furnishings, Fixtures and Equipment not identified in estimate
Design fees
Building Permit

Morses Pond Beach & Bathhouse Improvements
Wellesley, Ma

Construction Cost Estimate

April 21, 2022

CONSTRUCTION COST SUMMARY IN CSI FORMAT	Sitework	1,330 Admin Building	$/SF	1,840 Bathhouse Building	$/SF	600 Storage Shed/Kayak Rental Building	$/SF	3,770 Total	$/SF
033000 Cast-in-Place Concrete	$7,500	$73,731	*$55.44*	$85,500	*$46.47*	$45,385	*$75.64*	$212,116	*$56.26*
042000 Unit Masonry (part of 040001 FSB)		$7,800	*$5.86*	$9,000	*$4.89*	$11,000	*$18.33*	$27,800	*$7.37*
								$0	
								$0	
051200 Structural Steel Framing		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
053100 Steel Decking		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
055000 Metal Fabrications (part of 050001 FSB)	$15,950	$42,000	*$31.58*	$24,500	*$13.32*	$7,000	*$11.67*	$89,450	*$23.73*
061000 Rough Carpentry		$350,492	*$263.53*	$307,594	*$167.17*	$100,312	*$167.19*	$758,398	*$201.17*
064020 Interior Architectural Woodwork		$45,700	*$34.36*	$24,800	*$13.48*	$4,500	*$7.50*	$75,000	*$19.89*
072100 Thermal Insulation		$15,665	*$11.78*	$920	*$0.50*	$300	*$0.50*	$16,885	*$4.48*
072700 Air Barriers (part of 070001 FSB)		$5,540	*$4.17*	$0	*$0.00*	$46,240	*$77.07*	$51,780	*$13.73*
074600 Wood Siding and Trim		$18,390	*$13.83*	$55,550	*$30.19*	$47,190	*$78.65*	$121,130	*$32.13*
075400 Thermoplastic Membrane Roofing		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
075450 Roofing System		$118,440	*$89.05*	$114,000	*$61.96*	$0	*$0.00*	$232,440	*$61.66*
077200 Roof Accessories		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
078410 Penetration Firestopping		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
079200 Joint Sealants (part of 070001 FSB)		$4,200	*$3.16*	$3,000	*$1.63*	$6,600	*$11.00*	$13,800	*$3.66*
081110 Hollow Metal Doors and Frames		$17,900	*$13.46*	$25,500	*$13.86*	$25,000	*$41.67*	$68,400	*$18.14*
081400 Flush Wood Doors		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
083110 Access Doors and Frames		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
083310 Overhead Doors		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
084110 Wood Windows		$67,500	*$50.75*	$17,630	*$9.58*	$12,500	*$20.83*	$97,630	*$25.90*
084500 Aluminum-Framed Entrances and Storefronts		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
084650 Skylights		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
084660 Sunshades		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
087100 Door Hardware		$8,500	*$6.39*	$5,950	*$3.23*	$6,800	*$11.33*	$21,250	*$5.64*
088000 Glazing		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
089000 Louvers and Vents		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
092110 Gypsum Board Assemblies		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
093000 Tiling		$10,000	*$7.52*	$19,000	*$10.33*	$0	*$0.00*	$29,000	*$7.69*
095100 Acoustical Ceilings		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
096510 Resilient Flooring and Accessories		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
096550 Carpet		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
097300 Resinous flooring and base		$23,000	*$17.29*	$36,800	*$20.00*	$0	*$0.00*	$59,800	*$15.86*
099000 Painting and Coating (part of 090007 FSB)		$13,000	*$9.77*	$6,000	*$3.26*	$2,480	*$4.13*	$21,480	*$5.70*
101400 Signage		$1,500	*$1.13*	$2,000	*$1.09*	$1,200	*$2.00*	$4,700	*$1.25*
102800 Toilet Accessories		$1,860	*$1.40*	$4,635	*$2.52*	$2,247	*$3.75*	$8,742	*$2.32*
104400 Fire Protection Specialties		$600	*$0.45*	$600	*$0.33*	$600	*$1.00*	$1,800	*$0.48*
106500 Toilet Partitions		$0	*$0.00*	$24,900	*$13.53*	$0	*$0.00*	$24,900	*$6.60*
108500 Lockers		$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*

Morses Pond Beach & Bathhouse Improvements
Wellesley, Ma

Construction Cost Estimate

April 21, 2022

CONSTRUCTION COST SUMMARY IN CSI FORMAT		*Sitework*	*1,330* *Admin Building*	*$/SF*	*1,840* *Bathhouse Building*	*$/SF*	*600* *Storage Shed/Kayak Rental Building*	*$/SF*	*3,770* *Total*	*$/SF*
113100 Appliances			$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
118100 Concessions Equipment			$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
									$0	
122110 Horizontal Louver Blinds			$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
122510 Walk-Off Mats			$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
									$0	
210000 Fire Suppression			$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
220000 Plumbing - FSB			$63,345	*$47.63*	$223,401	*$121.41*	$0	*$0.00*	$286,746	*$76.06*
220000 HVAC - FSB			$110,390	*$83.00*	$32,031	*$17.41*	$0	*$0.00*	$142,421	*$37.78*
260000 Electrical - FSB		$150,000	$68,995	*$51.88*	$79,560	*$43.24*	$30,300	*$50.50*	$328,855	*$87.23*
311000 Site Clearing		$141,750	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$141,750	*$37.60*
312000 Earthwork		$355,032	$15,835	*$11.91*	$17,190	*$9.34*	$9,085	*$15.14*	$397,142	*$105.34*
312500 Erosion and Sedimentation Controls		$48,000	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$48,000	*$12.73*
315000 Ground Improvements		$0	$0	*$0.00*	$0	*$0.00*	$24,000	*$40.00*	$24,000	*$6.37*
321216 Asphalt Paving		$490,120	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$490,120	*$130.01*
321213 Portland Cement Concrete Paving		$0	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
321613 Curbs and Gutters		$0	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
323100 Site Improvements		$806,410	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$806,410	*$213.90*
329000 Landscaping		$150,000	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$150,000	*$39.79*
331000 Site Water Distribution		$30,800	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$30,800	*$8.17*
333000 Sanitary Sewerage Utilities		$44,500	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$44,500	*$11.80*
334000 Storm Drainage		$0	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
335000 Gas		$0	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*	$0	*$0.00*
		$2,240,062	***$1,084,383***	*$815.33*	***$1,120,061***	*$608.73*	***$382,739***	*$637.90*	***$4,827,245***	*$1,280.44*
GENERAL CONDITIONS & REQUIREMENTS	15%	$336,009	$162,657		$168,009		$57,411		$724,086	
GL INSURANCE	1.4%	$31,361	$15,181		$15,681		$5,358		$67,581	
BONDS	2%	$44,801	$21,688		$22,401		$7,655		$96,545	
OVERHEAD & PROFIT	6%	$159,134	$77,035		$79,569		$27,190		$342,928	
DESIGN AND PRICING CONTINGENCY	15%	$397,835	$192,586		$198,923		$67,974		$857,318	
ESCALATION/MARKET CONDITIONS to 2024	15%	$481,380	$233,030		$240,697		$82,249		$1,037,356	
TOTAL ESTIMATED CONSTRUCTION COSTS		**$3,690,582**	**$1,786,560**	***$1,343.28***	**$1,845,341**	***$1,002.90***	**$630,576**	***$1,050.96***	**$7,953,059**	***$2,109.56***

Sitework

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	A SITEWORK						
	Site Contractor general conditions						
312000	Mobilization	**2**	ea	6,500.00	13,000		
311000	Site fencing, protection, barricades	**1**	ls	15,000.00	15,000		
	Site prep and removals						
311000	Stabilized Construction Entrance	**2**	ea	6,500.00	13,000		
312500	Compost filer tubes	**4,000**	lf	12.00	48,000		
311000	Site removals	**125,000**	sf	0.75	93,750		
311000	Building removals	**1**	ls	20,000.00	20,000		
	Earthwork						
312000	Cut, fill, shape & compact subgrade for new grades and all utilities	**10,000**	cy	12.00	120,000		
312000	Import fill for new grades	**1,500**	cy	40.00	60,000		
	SUBTOTAL					382,750	
	Paving and walks prep						
312000	Bitum. Paving 12" Dense Grade	**4,264**	cy	38.00	162,032		
	Paving						
321216	Pedestrian Bitum conc	**14,712**	sf	3.85	56,641		
321216	Vehicular Bitum conc	**36,679**	sf	4.00	146,716		
321216	Permeable parking bitum conc	**63,725**	sf	4.50	286,763		
	SUBTOTAL					652,152	
	Electrical						
260000	Allowance for secondary services to buildings	**3**	ea	50,000.00	150,000		
	Storm						
334000	No storm systems included						
	Water						
331000	Water lines to bathhouse and admin	**300**	lf	80.00	24,000		
331000	Gates & valves	**4**	ea	950.00	3,800		
331000	Water CTE	**2**	ea	1,500.00	3,000		
	Sanitary						
333000	Sewer lines to bathhouse and admin	**300**	lf	95.00	28,500		
333000	SMH	**2**	ea	5,500.00	11,000		
333000	Connection to existing SMH	**2**	ea	2,500.00	5,000		
	SUBTOTAL					225,300	
	Site Improvements						
323100	On grade wood deck walkway - beach	**4,868**	sf	50.00	243,400		
323100	On grade wood deck walkway - Pond	**4,808**	sf	50.00	240,400		
323100	Accessible Mat	**723**	sf	10.00	7,230		
323100	Concrete pavers around buildings	**6,269**	sf	20.00	125,380		
323100	Stone faced CIP Retaining walls around buildings	**200**	lf	550.00	110,000		
03300	Site stairs	**1**	ea	7,500.00	7,500		
05500	Free standing railings at ramp and stairs	**50**	lf	175.00	8,750		
05500	Bollards	**12**	ea	600.00	7,200		
323100	Relocated docks	**1**	ls	10,000.00	10,000		
323100	Play ground equipment	**1**	ls	50,000.00	50,000		
323100	Benches, tables and misc site equipment	**1**	ls	20,000.00	20,000		
	SUBTOTAL					829,860	
	Landscaping						
329000	Allow for plantings and lawns	**1**	ls	150,000.00	150,000		
	SUBTOTAL					150,000	
	TOTAL - SITEWORK						***2,240,062***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
Admin Building							
	GROSS FLOOR AREA CALCULATION						
	First Floor			**1,330**			
	TOTAL GROSS FLOOR AREA				**1,330** ***GSF***		
	A10 FOUNDATIONS						
	A1010 STANDARD FOUNDATIONS						
	Strip footings						
03300	Formwork	**310**	sf	16.00	4,960		
03300	Re-bar	**1,080**	lbs	2.50	2,700		
03300	Concrete material	**18**	cy	160.00	2,880		
03300	Placing concrete	**18**	cy	40.00	720		
312000	Excavate and backfill	**207**	cy	30.00	6,210		
312000	Import structural fill	**46**	cy	45.00	2,070		
	Foundation walls						
03300	Formwork	**1,860**	sf	16.00	29,760		
03300	Re-bar	**2,340**	lbs	2.50	5,850		
03300	Concrete material	**36**	cy	160.00	5,760		
03300	Placing concrete	**36**	cy	40.00	1,440		
	Column footings/Piers						
03300	Formwork	**288**	sf	16.00	4,608		
03300	Re-bar	**630.0**	lbs	3.00	1,890		
03300	Concrete material	**8.4**	cy	160.00	1,344		
03300	Placing concrete	**8.4**	cy	45.00	378		
	SUBTOTAL					70,570	
	A1030 LOWEST FLOOR CONSTRUCTION						
	SOG						
07210	Vapor barrier	**1,330**	sf	0.50	665		
03300	Reinforcing	**1,530**	sf	1.50	2,295		
03300	Concrete - 5" thick	**23**	cy	160.00	3,680		
03300	Placing concrete	**23**	cy	35.00	805		
03300	Finishing and curing concrete	**1,330**	sf	1.50	1,995		
03300	Control joints - saw cut	**1,330**	sf	0.20	266		
	Miscellaneous						
312000	Excavate and backfill	**108**	cy	45.00	4,860		
07210	Rigid insulation	**1,240**	sf	5.00	6,200		
312000	Slab subbase	**49**	cy	55.00	2,695		
03300	Misc pads and curbs	**8**	cy	300.00	2,400		
	SUBTOTAL					25,861	
	TOTAL - FOUNDATIONS						***$96,431***
	B10 SUPERSTRUCTURE						
	B1020 ROOF CONSTRUCTION						
	Roof system (materials)						
06100	Roof framing: Doug-Fir 10x14 with 6x14 Doug-Fir purlins. All material to be FSC and kiln	**3,140**	sf	25.00	78,500		
06100	Roof sheathing: 2" T&G Doug-Fir structural decking	**3,140**	sf	10.00	31,400		
06100	Fasteners, hold down and tie hardware	**1**	ls	3,297.00	3,297		
06100	10% potential material increase allowance	**1**	ls	10,990.00	10,990		
05500	Steel Columns: 4" dia. (.25" wall) galvanized steel post	**12**	ea	3,500.00	42,000		
	Roof system (labor)						
06100	Boom crew, install and fasten	**8**	cd	2,560.00	20,480		
	SUBTOTAL					186,667	
	TOTAL - SUPERSTRUCTURE						***$186,667***

CSI CODE		DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	B20	***EXTERIOR CLOSURE***						
	B2010	**EXTERIOR WALLS**						
		Wall Framing (materials)						
06100		Building framing: 2x6 SPF infill walls with PSL posts for roof support where concealed in walls. ½" Plywood sheathing	**2,200**	sf	18.00	39,600		
06100		10% potential material increase allowance	**1**	ls	3,960.00	3,960		
06100		Fasteners, hold down and tie hardware	**1**	ls	1,306.80	1,307		
		Framing (labor)						
06100		Install exterior walls and misc framing	**3**	cd	2,640.00	7,920		
		SUBTOTAL					52,787	
		Insulation & AB						
07210		R-21 batt insulation	**2,200**	sf	4.00	8,800		
07270		Tyvek or similar air barrier - wrap up to roof edge	**2,200**	sf	1.50	3,300		
		SUBTOTAL					12,100	
		Finish						
07460		Exterior siding and trim - Maple	**613**	sf	30.00	18,390		
04200		Stone water table	**156**	sf	50.00	7,800		
06100		Wood louver system - Maple	**262**	sf	45.00	11,790		
		SUBTOTAL					37,980	
	B2020	**WINDOWS**						
84110		Clerestory windws	**140**	sf	125.00	17,500		
84110		Sliding and awning windows	**400**	sf	125.00	50,000		
		SUBTOTAL					67,500	
	B2030	**EXTERIOR DOORS**						
		Doors						
08111		Ext 3x7 glass doors	**3**	ea	1,800.00	5,400		
08111		Ext 3x7 louvered glass doors	**4**	ea	2,000.00	8,000		
08710		Hardware	**7**	lvs	850.00	5,950		
		Misc						
07920		Backer rod & double sealant	**280**	lf	15.00	4,200		
		SUBTOTAL					23,550	
		TOTAL - EXTERIOR CLOSURE						***$193,917***
	B30	***ROOFING***						
	B3010	**ROOF COVERINGS**						
07545		Ice and water shield	**3,140**	sf	5.00	15,700		
07545		Underlayment	**3,140**	sf	3.00	9,420		
07545		Insulation	**3,140**	sf	8.00	25,120		
07545		Cedar shake roof and metal trims	**31**	sq	2,200.00	68,200		
		SUBTOTAL					118,440	
	B3020	**ROOF OPENINGS**						
07720		N/A						
		SUBTOTAL					-	
		TOTAL - ROOFING						**$118,440**

CSI CODE		DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	C10	***INTERIOR CONSTRUCTION***						
	C1010	**PARTITIONS**						
		Interior Wall Framing (materials)						
06100		2x framing	**2,240**	sf	8.00	17,920		
06100		Plywood each side	**4,480**	sf	5.00	22,400		
06100		Maple finish each side	**4,480**	sf	15.00	67,200		
06100		20% potential material increase allowance	**1**	ls	10,752.00	10,752		
06100		Fasteners & hardware	**1**	ls	5,376.00	5,376		
		Interior Wall Framing (labor)						
06100		Install exterior walls and misc framing	**10**	cd	1,760.00	17,600		
		SUBTOTAL					141,248	
		Insulation & AB						
07270		Acoustical batt	**2,240**	sf	1.00	2,240		
		SUBTOTAL					2,240	
	C1020	**INTERIOR DOORS**						
		Doors						
08111		Int 3x7 doors	**3**	ea	1,500.00	4,500		
08710		Hardware	**3**	lvs	850.00	2,550		
		SUBTOTAL					7,050	
	C1030	**SPECIALTIES / MILLWORK**						
10440		Fire extinguisher cabinets	**2**	ea	300.00	600		
10140		Interior and exterior code signage	**1**	ls	1,500.00	1,500		
06402		Storage closet shelving	**26**	lf	100.00	2,600		
06402		Office counters/shelving	**16**	lf	400.00	6,400		
06402		Gatekeeper counters/shelving	**14**	lf	400.00	5,600		
06402		Dressing benches	**13**	lf	350.00	4,550		
06402		First aid millwork	**13**	lf	600.00	7,800		
06402		Guard area millwork	**5**	lf	600.00	3,000		
06402		Concessions/storage counters/shelving	**35**	lf	450.00	15,750		
10280		TP dispenser	**2**	ea	85.00	170		
10280		Soap disp	**2**	ea	45.00	90		
10280		HC Mirror	**2**	ea	265.00	530		
10280		GB	**4**	ea	125.00	500		
10280		Changing station	**2**	ea	285.00	570		
		SUBTOTAL					49,660	
		TOTAL - INTERIOR CONSTRUCTION						***$200,198***
	C30	***INTERIOR FINISHES***						
	C3010	**WALL FINISHES**						
09900		Finish interior wood	**4,480**	sf	1.50	6,720		
09300		Tile to wet walls	**400**	sf	25.00	10,000		
		SUBTOTAL					16,720	
	C3020	**FLOOR FINISHES**						
09730		Epoxy floor/base	**1,150**	sf	20.00	23,000		
		SUBTOTAL					23,000	
	C3030	**CEILING FINISHES**						
09900		Finish exposed exposed framing and T&G	**3,140**	sf	2.00	6,280		
		SUBTOTAL					6,280	
		TOTAL - INTERIOR FINISHES						***$46,000***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	D20 PLUMBING						
	D20 PLUMBING, GENERALLY						
	Equipment						
220000	Instantaneous Electric Water Heater	**1**	ea	1,250.00	1,250		
220000	Back flow	**1**	ls	800.00	800		
	Fixtures						
220000	Water Closets	**2**	ea	1,285.00	2,570		
220000	Lavatory	**2**	ea	1,175.00	2,350		
220000	Concession	**2**	ea	1,175.00	2,350		
220000	Non Freeze Wall Hydrants	**2**	ea	385.00	770		
220000	Hose Bibb	**1**	ea	235.00	235		
220000	Floor Drain	**2**	ea	565.00	1,130		
220000	Clean Out	**2**	ea	250.00	500		
220000	Fixture Connections	**6**	ea	350.00	2,100		
	Piping						
220000	Water	**480**	lf	32.00	15,360		
220000	Waste	**240**	lf	68.00	16,320		
220000	Vent	**260**	lf	44.00	11,440		
220000	Insulation	**480**	lf	9.00	4,320		
	Trade Requirements						
220000	Rigging	**1**	ls	500.00	500		
220000	Coordination	**10**	hrs	135.00	1,350		
	SUBTOTAL					63,345	
	TOTAL - PLUMBING						***$63,345***
	D30 HVAC						
	D30 HVAC						
230000	Central inline energy recovery ventilator would be ducted to outdoor air intake and exhaust louvers to provide fresh air to the building and remove code required exhaust air. A duct-mounted DX coil in series with a duct-mounted electric resistance heating coil would provide tempered and de-humidified air to the building occupiable areas.	**1,330**	sf	15.00	19,950		
230000	Variable Refrigerant Flow (VRF) heat pump system shall provide heating and cooling to the regularly occupied areas of the building; a combination of wall and ceiling mounted indoor fan coil units would be installed within the spaces to be served and connected to an outdoor-mounted heat pump condenser unit	**1,330**	sf	60.00	79,800		
230000	Electric radiant ceiling/wall panels shall be provided to heat the non-occupied building spaces (storage/ toilet/ concessions) that are not provided with VRF indoor units	**1,330**	sf	8.00	10,640		
	SUBTOTAL					110,390	
	TOTAL - HVAC						***$110,390***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	D40 FIRE PROTECTION						
	D40 FIRE PROTECTION						
210000	N/A						
	SUBTOTAL					-	
	TOTAL - FIRE PROTECTION						***$0***
	D50 ELECTRICAL						
	D50 ELECTRICAL						
	Light Fixtures						
260000	Interior lighting	**1,330**	sf	10.00	13,300		
260000	Exterior lighting	**1,810**	sf	10.00	18,100		
	Branch Circuitry						
260000	Branch Circuitry	**1,330**	sf	2.50	3,325		
	Power Circuitry						
260000	Power Circuitry	**1,330**	sf	3.00	3,990		
	Power Equipment						
260000	Power Equipment	**1,330**	sf	6.00	7,980		
	Fire Alarm						
260000	Fire Alarm	**1,330**	sf	5.00	6,650		
	Security						
260000	Security	**1,330**	sf	5.00	6,650		
	Lightning Protection						
260000	Lightning Protection	**1**	ls	6,500.00	6,500		
	Misc						
260000	Temp Power and Lighting	**1**	ls	2,500.00	2,500		
	SUBTOTAL					68,995	
	TOTAL - ELECTRICAL						***$68,995***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
Bathhouse Building							
	GROSS FLOOR AREA CALCULATION						
	First Floor			**1,840**			
	TOTAL GROSS FLOOR AREA				**1,840**	***GSF***	
	A10 FOUNDATIONS						
	A1010 STANDARD FOUNDATIONS						
	Strip footings						
03300	Formwork	**376**	sf	16.00	6,016		
03300	Re-bar	**1,320**	lbs	2.50	3,300		
03300	Concrete material	**22**	cy	160.00	3,520		
03300	Placing concrete	**22**	cy	40.00	880		
312000	Excavate and backfill	**251**	cy	30.00	7,530		
312000	Import structural fill	**56**	cy	45.00	2,520		
	Foundation walls						
03300	Formwork	**2,256**	sf	16.00	36,096		
03300	Re-bar	**2,860**	lbs	2.50	7,150		
03300	Concrete material	**44**	cy	160.00	7,040		
03300	Placing concrete	**44**	cy	40.00	1,760		
	Column footings/Piers						
03300	Formwork	**168**	sf	16.00	2,688		
03300	Re-bar	**367.5**	lbs	3.00	1,103		
03300	Concrete material	**4.9**	cy	160.00	784		
03300	Placing concrete	**4.9**	cy	45.00	221		
	SUBTOTAL					80,608	
	A1030 LOWEST FLOOR CONSTRUCTION						
	SOG						
07210	Vapor barrier	**1,840**	sf	0.50	920		
03300	Reinforcing	**2,116**	sf	1.50	3,174		
03300	Concrete - 5" thick	**32**	cy	160.00	5,120		
03300	Placing concrete	**32**	cy	35.00	1,120		
03300	Finishing and curing concrete	**1,840**	sf	1.50	2,760		
03300	Control joints - saw cut	**1,840**	sf	0.20	368		
	Miscellaneous						
312000	Excavate and backfill	**136**	cy	30.00	4,080		
312000	Slab subbase	**68**	cy	45.00	3,060		
03300	Misc pads and curbs	**8**	cy	300.00	2,400		
	SUBTOTAL					23,002	
	TOTAL - FOUNDATIONS						***$103,610***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
Bathhouse Building							
	B10 SUPERSTRUCTURE						
	B1020 ROOF CONSTRUCTION						
	Roof system (materials)						
06100	Roof framing: Doug-Fir 10x14 with 6x14 Doug-Fir purlins. All material to be FSC and kiln	**3,000**	sf	25.00	75,000		
06100	Roof sheathing: 2" T&G Doug-Fir structural decking	**3,000**	sf	10.00	30,000		
06100	Fasteners, hold down and tie hardware	**1**	ls	3,150.00	3,150		
06100	10% potential material increase allowance	**1**	ls	10,500.00	10,500		
05500	Steel Columns: 4" dia. (.25" wall) galvanized steel post	**7**	ea	3,500.00	24,500		
	Roof system (labor)						
06100	Boom crew, install and fasten	**8**	cd	2,560.00	20,480		
	SUBTOTAL					163,630	
	TOTAL - SUPERSTRUCTURE						***$163,630***
	B20 EXTERIOR CLOSURE						
	B2010 EXTERIOR WALLS						
	Wall Framing (materials)						
06100	Building framing: 2x6 SPF infill walls with PSL posts for roof support where concealed in walls. ½" Plywood sheathing	**2,604**	sf	18.00	46,872		
06100	10% potential material increase allowance	**1**	ls	4,687.20	4,687		
06100	Fasteners, hold down and tie hardware	**1**	ls	1,546.77	1,547		
	Framing (labor)						
06100	Install exterior walls and misc framing	**3**	cd	2,640.00	7,920		
	SUBTOTAL					61,026	
	Finish						
07460	Exterior siding and trim - Maple	**1,565**	sf	30.00	46,950		
04200	Stone water table	**180**	sf	50.00	9,000		
07460	Wood louver system - Maple	**80**	sf	45.00	3,600		
07460	Copper panels at showers	**50**	sf	100.00	5,000		
	SUBTOTAL					64,550	
	B2020 WINDOWS						
84110	Skylight windows	**88**	sf	125.00	11,000		
84110	Frosted glass windows	**51**	sf	130.00	6,630		
	SUBTOTAL					17,630	
	B2030 EXTERIOR DOORS						
	Doors						
08111	Swing door 10x8	**1**	ea	6,500.00	6,500		
08111	Ext 3x7 door with frosted glass sidelight	**4**	ea	3,500.00	14,000		
08111	Ext 3x7 door and frame	**1**	ea	2,000.00	2,000		
08710	Hardware	**5**	lvs	850.00	4,250		
	Misc						
07920	Backer rod & double sealant	**200**	lf	15.00	3,000		
	SUBTOTAL					29,750	
	TOTAL - EXTERIOR CLOSURE						***$172,956***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
Bathhouse Building							
	B30 ROOFING						
	B3010 ROOF COVERINGS						
07545	Ice and water shield	**3,000**	sf	5.00	15,000		
07545	Underlayment	**3,000**	sf	3.00	9,000		
07545	Insulation	**3,000**	sf	8.00	24,000		
07545	Cedar shake roof and metal trims	**30**	sq	2,200.00	66,000		
	SUBTOTAL					114,000	
	B3020 ROOF OPENINGS						
07720	N/A						
	SUBTOTAL					-	
	TOTAL - ROOFING						**$114,000**
	C10 INTERIOR CONSTRUCTION						
	C1010 PARTITIONS						
	Interior Wall Framing (materials)						
06100	2x framing	**1,176**	sf	8.00	9,408		
06100	2x framing - 2 rows	**602**	sf	16.00	9,632		
06100	Plywood each side	**2,954**	sf	5.00	14,770		
06100	Maple finish each side	**2,954**	sf	15.00	44,310		
06100	20% potential material increase allowance	**1**	ls	7,812.00	7,812		
06100	Fasteners & hardware	**1**	ls	3,906.00	3,906		
	Interior Wall Framing (labor)						
06100	Install exterior walls and misc framing	**10**	cd	1,760.00	17,600		
	SUBTOTAL					107,438	
	C1020 INTERIOR DOORS						
	Doors						
08111	Int 3x7 doors	**2**	ea	1,500.00	3,000		
08710	Hardware	**2**	lvs	850.00	1,700		
	SUBTOTAL					4,700	
	C1030 SPECIALTIES / MILLWORK						
10440	Fire extinguisher cabinets	**2**	ea	300.00	600		
10140	Interior and exterior code signage	**1**	ls	2,000.00	2,000		
06402	Vanity counter	**22**	lf	400.00	8,800		
10650	Toilet partitions - HC	**4**	ea	1,800.00	7,200		
10650	Toilet partitions - reg	**11**	ea	1,500.00	16,500		
10650	Toilet partitions - screens	**2**	ea	600.00	1,200		
06402	Large storage shelving	**2**	ea	2,000.00	4,000		
06402	Kayak storage	**2**	ea	3,500.00	7,000		
06402	Chaning room benches	**2**	ea	2,500.00	5,000		
10280	TP dispenser	**9**	ea	85.00	765		
10280	Soap disp	**8**	ea	45.00	360		
10280	Mirror	**8**	ea	265.00	2,120		
10280	GB	**4**	ea	125.00	500		
10280	Jan closet MB	**2**	ea	160.00	320		
10280	Changing station	**2**	ea	285.00	570		
	SUBTOTAL					56,935	
	TOTAL - INTERIOR CONSTRUCTION						***$169,073***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
Bathhouse Building							
	C30 INTERIOR FINISHES						
	C3010 WALL FINISHES						
230000	Finish interior wood	**2,954**	sf	1.50	4,431		
09300	Tile to wet walls	**760**	sf	25.00	19,000		
	SUBTOTAL					23,431	
	C3020 FLOOR FINISHES						
09730	Epoxy floor/base	**1,840**	sf	20.00	36,800		
	SUBTOTAL					36,800	
	C3030 CEILING FINISHES						
09900	Finish exposed exposed framing and T&G	**3,000**	sf	2.00	6,000		
	SUBTOTAL					6,000	
	TOTAL - INTERIOR FINISHES						***$66,231***
	D20 PLUMBING						
	D20 PLUMBING, GENERALLY						
	Equipment						
220000	Water Meter	**1**	ea	1,200.00	1,200		
220000	Back flow	**1**	ls	800.00	800		
220000	Instantaneous Electric Water Heater	**2**	ea	1,250.00	2,500		
220000	Plumbing Specialties	**1**	ls	1,500.00	1,500		
	Fixtures						
220000	Water Closets	**9**	ea	1,285.00	11,565		
220000	Lavatory	**8**	ea	1,175.00	9,400		
220000	Urinals	**3**	ea	1,150.00	3,450		
220000	Showers - Outdoor	**3**	ea	1,062.50	3,188		
220000	Mop Sink	**2**	ea	1,185.00	2,370		
220000	Electric Water Cooler	**1**	ea	2,437.50	2,438		
220000	Non Freeze Wall Hydrants	**4**	ea	385.00	1,540		
220000	Hose Bibbs	**2**	ea	235.00	470		
220000	Floor Drains	**6**	ea	565.00	3,390		
220000	Clean Outs	**6**	ea	250.00	1,500		
220000	Fixture Connections	**25**	ea	350.00	8,750		
	Piping						
220000	Water	**2,000**	lf	32.00	64,000		
220000	Waste	**1,000**	lf	68.00	68,000		
220000	Vent	**260**	lf	44.00	11,440		
220000	Insulation	**2,000**	lf	9.00	18,000		
	Trade Requirements						
220000	Rigging	**1**	ls	2,500.00	2,500		
220000	Coordination	**40**	hrs	135.00	5,400		
	SUBTOTAL					223,401	
	TOTAL - PLUMBING						***$223,401***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
Bathhouse Building							
	D30 HVAC						
	D30 HVAC						
230000	HVAC system - central inline exhaust fan shall be ducted to all regularly occupiable spaces to provide code-required ventilation. Make-up air for the exhaust system shall be provided through the use of operable windows and/or louvered intakes	**1,840**	sf	15.00	27,600		
	SUBTOTAL					27,600	
	TOTAL - HVAC						***$27,600***
	D40 FIRE PROTECTION						
	D40 FIRE PROTECTION						
210000	N/A						
	SUBTOTAL					-	
	TOTAL - FIRE PROTECTION						***$0***
	D50 ELECTRICAL						
	D50 ELECTRICAL						
	Light Fixtures						
260000	Interior lighting	**1,840**	sf	10.00	18,400		
260000	Exterior lighting	**1,160**	sf	10.00	11,600		
	Branch Circuitry						
260000	Branch Circuitry	**1,840**	sf	2.50	4,600		
	Power Circuitry						
260000	Power Circuitry	**1,840**	sf	3.00	5,520		
	Power Equipment						
260000	Power Equipment	**1,840**	sf	6.00	11,040		
	Fire Alarm						
260000	Fire Alarm	**1,840**	sf	5.00	9,200		
	Security						
260000	Security	**1,840**	sf	5.00	9,200		
	Lightning Protection						
260000	Lightning Protection	**1**	ls	7,500.00	7,500		
	Misc						
260000	Temp Power and Lighting	**1**	ls	2,500.00	2,500		
	SUBTOTAL					79,560	
	TOTAL - ELECTRICAL						***$79,560***

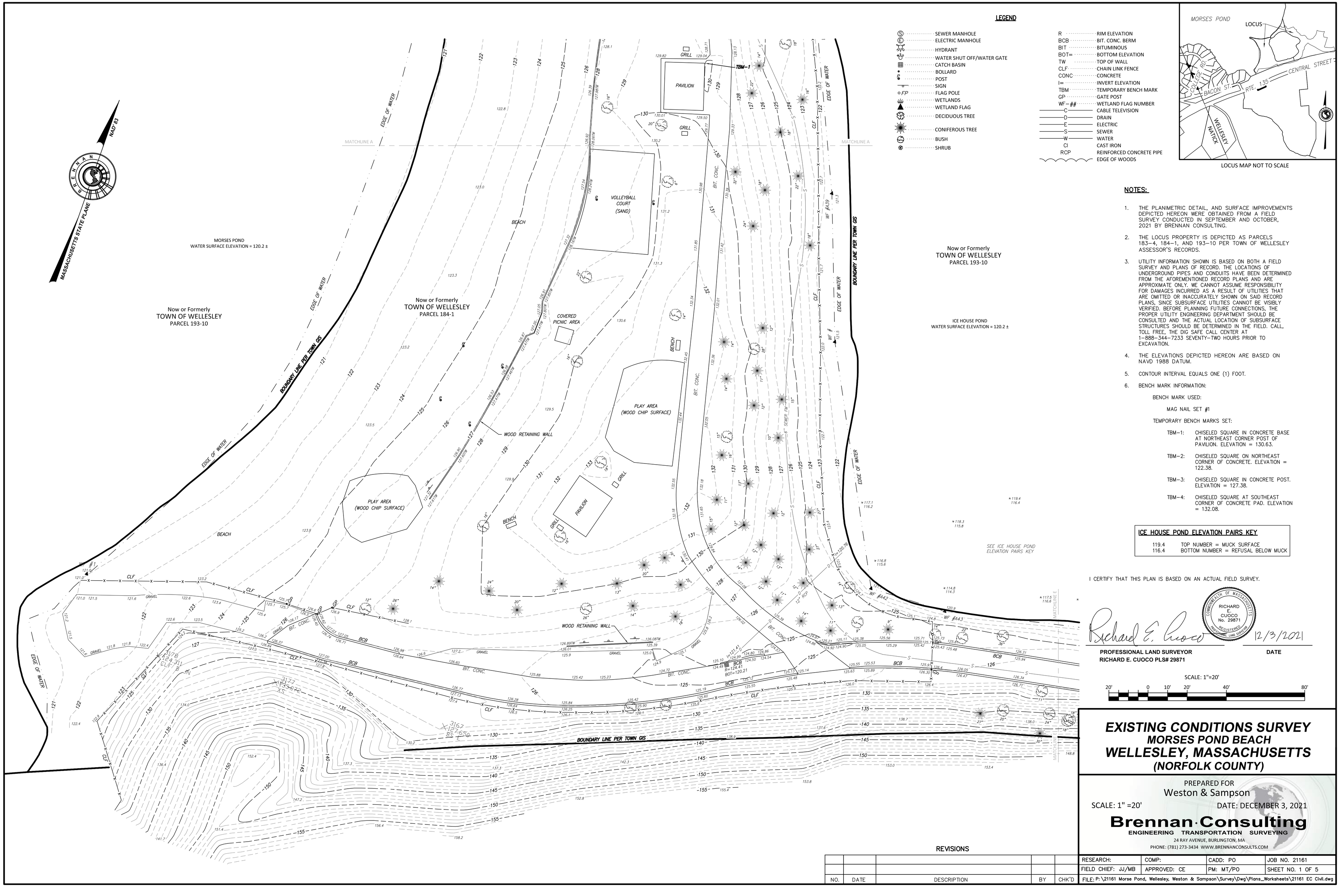
CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
Storage Shed/Kayak Rental Building							
	GROSS FLOOR AREA CALCULATION						
	First Floor			**600**			
	TOTAL GROSS FLOOR AREA				**600**	***GSF***	
	A10 FOUNDATIONS						
	A1010 STANDARD FOUNDATIONS						
	Strip footings						
03300	Formwork	**220**	sf	16.00	3,520		
03300	Re-bar	**780**	lbs	2.50	1,950		
03300	Concrete material	**13**	cy	160.00	2,080		
03300	Placing concrete	**13**	cy	40.00	520		
312000	Excavate and backfill	**147**	cy	30.00	4,410		
312000	Import structural fill	**33**	cy	45.00	1,485		
	Foundation walls						
03300	Formwork	**1,320**	sf	16.00	21,120		
03300	Re-bar	**1,690**	lbs	2.50	4,225		
03300	Concrete material	**26**	cy	160.00	4,160		
03300	Placing concrete	**26**	cy	40.00	1,040		
	Column footings/Piers						
03300	Formwork	**48**	sf	16.00	768		
03300	Re-bar	**105.0**	lbs	3.00	315		
03300	Concrete material	**1.4**	cy	160.00	224		
03300	Placing concrete	**1.4**	cy	45.00	63		
	SUBTOTAL					45,880	
	A1030 LOWEST FLOOR CONSTRUCTION						
	SOG						
07210	Vapor barrier	**600**	sf	0.50	300		
03300	Reinforcing	**690**	sf	1.50	1,035		
03300	Concrete - 5" thick	**11**	cy	160.00	1,760		
03300	Placing concrete	**11**	cy	35.00	385		
03300	Finishing and curing concrete	**600**	sf	1.50	900		
03300	Control joints - saw cut	**600**	sf	0.20	120		
	Miscellaneous						
315000	Helical Piers	**20**	ea	1,200.00	24,000		
312000	Excavate and backfill	**44**	cy	50.00	2,200		
312000	Slab subbase	**22**	cy	45.00	990		
03300	Misc pads and curbs	**4**	cy	300.00	1,200		
	SUBTOTAL					32,890	
	TOTAL - FOUNDATIONS						***$78,770***
	B10 SUPERSTRUCTURE						
	B1020 ROOF CONSTRUCTION						
	Roof system (materials)						
06100	Roof framing: Doug-Fir 10x14 with 6x14 Doug-Fir purlins. All material to be FSC and kiln	**1,240**	sf	25.00	31,000		
06100	Roof sheathing: 2" T&G Doug-Fir structural decking	**1,240**	sf	10.00	12,400		
06100	Fasteners, hold down and tie hardware	**1**	ls	1,302.00	1,302		
06100	10% potential material increase allowance	**1**	ls	4,340.00	4,340		
05500	Steel Columns: 4" dia. (.25" wall) galvanized steel post	**2**	ea	3,500.00	7,000		
	Roof system (labor)						
06100	Boom crew, install and fasten	**5**	cd	2,560.00	12,800		
	SUBTOTAL					68,842	
	TOTAL - SUPERSTRUCTURE						***$68,842***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	Storage Shed/Kayak Rental Building						
	B20 EXTERIOR CLOSURE						
	B2010 EXTERIOR WALLS						
	Wall Framing (materials)						
06100	Building framing: 2x6 SPF infill walls with PSL posts for roof support where concealed in walls. ½" Plywood sheathing	**1,498**	sf	18.00	26,964		
06100	10% potential material increase allowance	**1**	ls	2,696.40	2,696		
06100	Fasteners, hold down and tie hardware	**1**	ls	889.80	890		
	Framing (labor)						
06100	Install exterior walls and misc framing	**3**	cd	2,640.00	7,920		
	SUBTOTAL					38,470	
	Finish						
07460	Exterior siding and trim - Maple	**1,498**	sf	30.00	44,940		
04200	Stone water table	**220**	sf	50.00	11,000		
07460	Wood louver system - Maple	**50**	sf	45.00	2,250		
	SUBTOTAL					58,190	
	B2020 WINDOWS						
84110	Wood windows	**100**	sf	125.00	12,500		
	SUBTOTAL					12,500	
	B2030 EXTERIOR DOORS						
	Doors						
08111	Ext 6x7 door with frame	**6**	ea	3,500.00	21,000		
08111	Ext 3x7 door and frame	**2**	ea	2,000.00	4,000		
08710	Hardware	**8**	lvs	850.00	6,800		
	Misc						
07920	Backer rod & double sealant	**320**	lf	15.00	4,800		
	SUBTOTAL					36,600	
	TOTAL - EXTERIOR CLOSURE						***$145,760***
	B30 ROOFING						
	B3010 ROOF COVERINGS						
07270	Ice and water shield	**1,240**	sf	5.00	6,200		
07270	Underlayment	**1,240**	sf	3.00	3,720		
07270	Insulation	**1,240**	sf	8.00	9,920		
07270	Cedar shake roof and metal trims	**12**	sq	2,200.00	26,400		
	SUBTOTAL					46,240	
	B3020 ROOF OPENINGS						
07720	N/A						
	SUBTOTAL					-	
	TOTAL - ROOFING						**$46,240**

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
Storage Shed/Kayak Rental Building							
	C10 INTERIOR CONSTRUCTION						
	C1010 PARTITIONS						
	N/A						
	SUBTOTAL					-	
	C1020 INTERIOR DOORS						
	N/A						
	SUBTOTAL					-	
	C1030 SPECIALTIES / MILLWORK						
10440	Fire extinguisher cabinets	**2**	ea	300.00	600		
10140	Interior and exterior code signage	**1**	ls	1,200.00	1,200		
06402	Gatekeeper counters/shelving	**15**	lf	300.00	4,500		
	SUBTOTAL					6,300	
	TOTAL - INTERIOR CONSTRUCTION						***$6,300***
	C30 INTERIOR FINISHES						
	C3010 WALL FINISHES						
10280	Finish interior wood	**1,498**	sf	1.50	2,247		
	SUBTOTAL					2,247	
	C3020 FLOOR FINISHES						
07920	Sealed concrete	**600**	sf	3.00	1,800		
	SUBTOTAL					1,800	
	C3030 CEILING FINISHES						
09900	Finish exposed exposed framing and T&G	**1,240**	sf	2.00	2,480		
	SUBTOTAL					2,480	
	TOTAL - INTERIOR FINISHES						***$6,527***
	D20 PLUMBING						
	D20 PLUMBING, GENERALLY						
	N/A						
	SUBTOTAL					-	
	TOTAL - PLUMBING						***$0***
	D30 HVAC						
	D30 HVAC						
	N/A						
	SUBTOTAL					-	
	TOTAL - HVAC						***$0***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
Storage Shed/Kayak Rental Building							
	D40 FIRE PROTECTION						
	D40 FIRE PROTECTION						
210000	N/A						
	SUBTOTAL					-	
	TOTAL - FIRE PROTECTION						***$0***
	D50 ELECTRICAL						
	D50 ELECTRICAL						
	Light Fixtures						
260000	Interior lighting	**600**	sf	10.00	6,000		
260000	Exterior lighting	**640**	sf	10.00	6,400		
	Branch Circuitry						
260000	Branch Circuitry	**600**	sf	2.50	1,500		
	Power Circuitry						
260000	Power Circuitry	**600**	sf	3.00	1,800		
	Power Equipment						
260000	Power Equipment	**600**	sf	6.00	3,600		
	Fire Alarm						
260000	Fire Alarm	**600**	sf	5.00	3,000		
	Security						
260000	Security	**600**	sf	5.00	3,000		
	Lightning Protection						
260000	Lightning Protection	**1**	ls	3,500.00	3,500		
	Misc						
260000	Temp Power and Lighting	**1**	ls	1,500.00	1,500		
	SUBTOTAL					30,300	
	TOTAL - ELECTRICAL						***$30,300***

Appendix B: Site Survey



LEGEND

- SEWER MANHOLE
- ELECTRIC MANHOLE
- HYDRANT
- WATER SHUT OFF/WATER GATE
- CATCH BASIN
- BOLLARD
- POST
- SIGN
- FP FLAG POLE
- WETLANDS
- WETLAND FLAG
- DECIDUOUS TREE
- CONIFEROUS TREE
- BUSH
- SHRUB

R	RIM ELEVATION
BCB	BIT. CONC. BERM
BIT	BITUMINOUS
BOT=	BOTTOM ELEVATION
TW	TOP OF WALL
CLF	CHAIN LINK FENCE
CONC	CONCRETE
I=	INVERT ELEVATION
TBM	TEMPORARY BENCH MARK
GP	GATE POST
WF-##	WETLAND FLAG NUMBER
C	CABLE TELEVISION
D	DRAIN
E	ELECTRIC
S	SEWER
W	WATER
CI	CAST IRON
RCP	REINFORCED CONCRETE PIPE
	EDGE OF WOODS

LOCUS MAP NOT TO SCALE

NOTES:

1. THE PLANIMETRIC DETAIL, AND SURFACE IMPROVEMENTS DEPICTED HEREON WERE OBTAINED FROM A FIELD SURVEY CONDUCTED IN SEPTEMBER AND OCTOBER, 2021 BY BRENNAN CONSULTING.
2. THE LOCUS PROPERTY IS DEPICTED AS PARCELS 183-4, 184-1, AND 193-10 PER TOWN OF WELLESLEY ASSESSOR'S RECORDS.
3. UTILITY INFORMATION SHOWN IS BASED ON BOTH A FIELD SURVEY AND PLANS OF RECORD. THE LOCATIONS OF UNDERGROUND PIPES AND CONDUITS HAVE BEEN DETERMINED FROM THE AFOREMENTIONED RECORD PLANS AND ARE APPROXIMATE ONLY. WE CANNOT ASSUME RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES THAT ARE OMITTED OR INACCURATELY SHOWN ON SAID RECORD PLANS, SINCE SUBSURFACE UTILITIES CANNOT BE VISIBLY VERIFIED. BEFORE PLANNING FUTURE CONNECTIONS, THE PROPER UTILITY ENGINEERING DEPARTMENT SHOULD BE CONSULTED AND THE ACTUAL LOCATION OF SUBSURFACE STRUCTURES SHOULD BE DETERMINED IN THE FIELD. CALL, TOLL FREE, THE DIG SAFE CALL CENTER AT 1-888-344-7233 SEVENTY-TWO HOURS PRIOR TO EXCAVATION.
4. THE ELEVATIONS DEPICTED HEREON ARE BASED ON NAVD 1988 DATUM.
5. CONTOUR INTERVAL EQUALS ONE (1) FOOT.
6. BENCH MARK INFORMATION:

BENCH MARK USED:

MAG NAIL SET #1

TEMPORARY BENCH MARKS SET:

TBM-1: CHISELED SQUARE IN CONCRETE BASE AT NORTHEAST CORNER POST OF PAVILION. ELEVATION = 130.63.

TBM-2: CHISELED SQUARE ON NORTHEAST CORNER OF CONCRETE. ELEVATION = 122.38.

TBM-3: CHISELED SQUARE IN CONCRETE POST. ELEVATION = 127.38.

TBM-4: CHISELED SQUARE AT SOUTHEAST CORNER OF CONCRETE PAD. ELEVATION = 132.08.

ICE HOUSE POND ELEVATION PAIRS KEY

119.4	TOP NUMBER = MUCK SURFACE
116.4	BOTTOM NUMBER = REFUSAL BELOW MUCK

I CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY.

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. CUOCO No. 29871 REGISTERED PROFESSIONAL LAND SURVEYOR

Richard E. Cuoco 12/3/2021

PROFESSIONAL LAND SURVEYOR **DATE**
RICHARD E. CUOCO PLS# 29871

SCALE: 1"=20'

20' 0 10' 20' 40' 80'

EXISTING CONDITIONS SURVEY
MORSES POND BEACH
WELLESLEY, MASSACHUSETTS
(NORFOLK COUNTY)

PREPARED FOR
Weston & Sampson

SCALE: 1" =20' DATE: DECEMBER 3, 2021

Brennan·Consulting
ENGINEERING TRANSPORTATION SURVEYING
24 RAY AVENUE, BURLINGTON, MA
PHONE: (781) 273-3434 WWW.BRENNANCONSULTS.COM

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D

RESEARCH:	COMP:	CADD: PO	JOB NO. 21161
FIELD CHIEF: JJ/MB	APPROVED: CE	PM: MT/PO	SHEET NO. 1 OF 5
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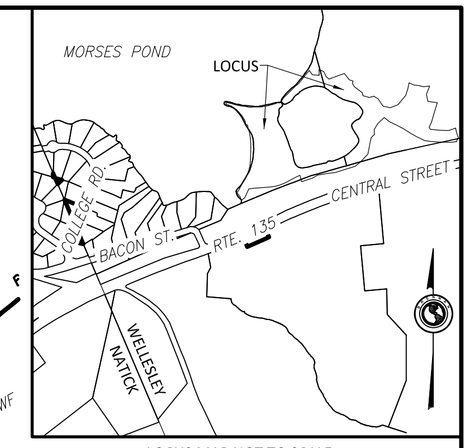

LOCUS MAP NOT TO SCALE

NAD 83

MASSACHUSETTS STATE PLANE

BRENNAN

Now or Formerly
TOWN OF WELLESLEY
PARCEL 193-10

Now or Formerly
TOWN OF WELLESLEY
PARCEL 184-1

MORSES POND
WATER SURFACE ELEVATION = 120.2 ±

CANOE/KAYAK LAUNCH
COMPOSITE LLDPE DOCK
113.3 = ELEV. OF MUCK SURFACE
113.1 = ELEV. OF REFUSAL BELOW MUCK

BOUNDARY LINE PER TOWN GIS

EDGE OF WATER

WF #13 WF #14 WF #15 WF #16 WF #17 WF #18 WF #19 WF #20 WF #21 WF #22 WF #23 WF #24 WF #25 WF #26 WF #27 WF #29 WF #30 WF #31 WF #33 WF #34 WF #35 WF #36 WF #37 WF #38 WF #39 WF #40 WF #41 WF #42 WF #43 WF #44 WF #45 WF #46 WF #47 WF #48 WF #49 WF #50 WF #51 WF #52 WF #53 WF #54 WF #55 WF #56 WF #57 WF #58 WF #59 WF #60 WF #61 WF #62 WF #63 WF #64 WF #65 WF #66 WF #67 WF #68 WF #69 WF #70 WF #71 WF #72 WF #73 WF #74 WF #75 WF #76 WF #77 WF #78 WF #79 WF #80 WF #81

EXISTING BATH HOUSE
POST WITH LOUD SPEAKER
BRICK COLUMN
BRICK BACK
BENCH
WOOD RETAINING WALL
PAVILION
VOLLEYBALL
BEACH
GRILL
HANDRAIL
12" HDPE INV=119.68
6" SEWER FM
SMH
1 a=131.44 6" CI
1 b=123.41 2" STEEL
1 c=117.64 6" CI
1 d=117.49 6" CI
TBM-1
TBM-2
BIT. CONC.
CONC.
CLF
2" WATER
MATCHLINE A
MATCHLINE B

MORSES POND
WATER SURFACE ELEVATION = 120.2 ±

Now or Formerly
TOWN OF WELLESLEY
PARCEL 193-10

ICE HOUSE POND
WATER SURFACE ELEVATION = 120.2 ±

Now or Formerly
TOWN OF WELLESLEY
PARCEL 193-10

Now or Formerly
TOWN OF WELLESLEY
PARCEL 184-1

SCALE: 1"=20'

20' 0 10' 20' 40' 80'

EXISTING CONDITIONS SURVEY
MORSES POND BEACH
WELLESLEY, MASSACHUSETTS
(NORFOLK COUNTY)

PREPARED FOR
Weston & Sampson

SCALE: 1" =20'

DATE: DECEMBER 3, 2021

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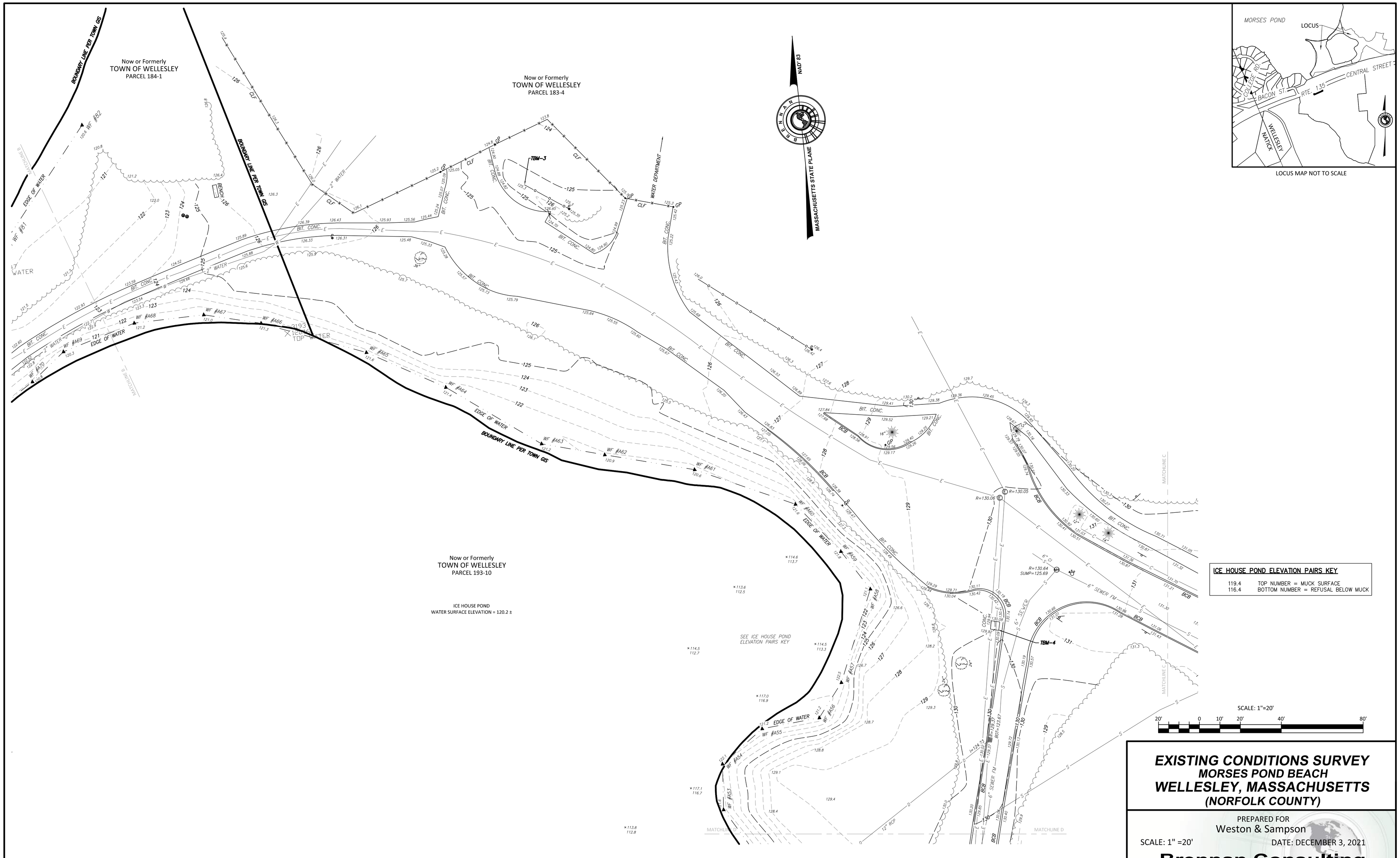

ICE HOUSE POND ELEVATION PAIRS KEY

119.4 TOP NUMBER = MUCK SURFACE
116.4 BOTTOM NUMBER = REFUSAL BELOW MUCK

SCALE: 1"=20'

20' 0 10' 20' 40' 80'

EXISTING CONDITIONS SURVEY
MORSES POND BEACH
WELLESLEY, MASSACHUSETTS
(NORFOLK COUNTY)

PREPARED FOR
Weston & Sampson

SCALE: 1" =20'

DATE: DECEMBER 3, 2021

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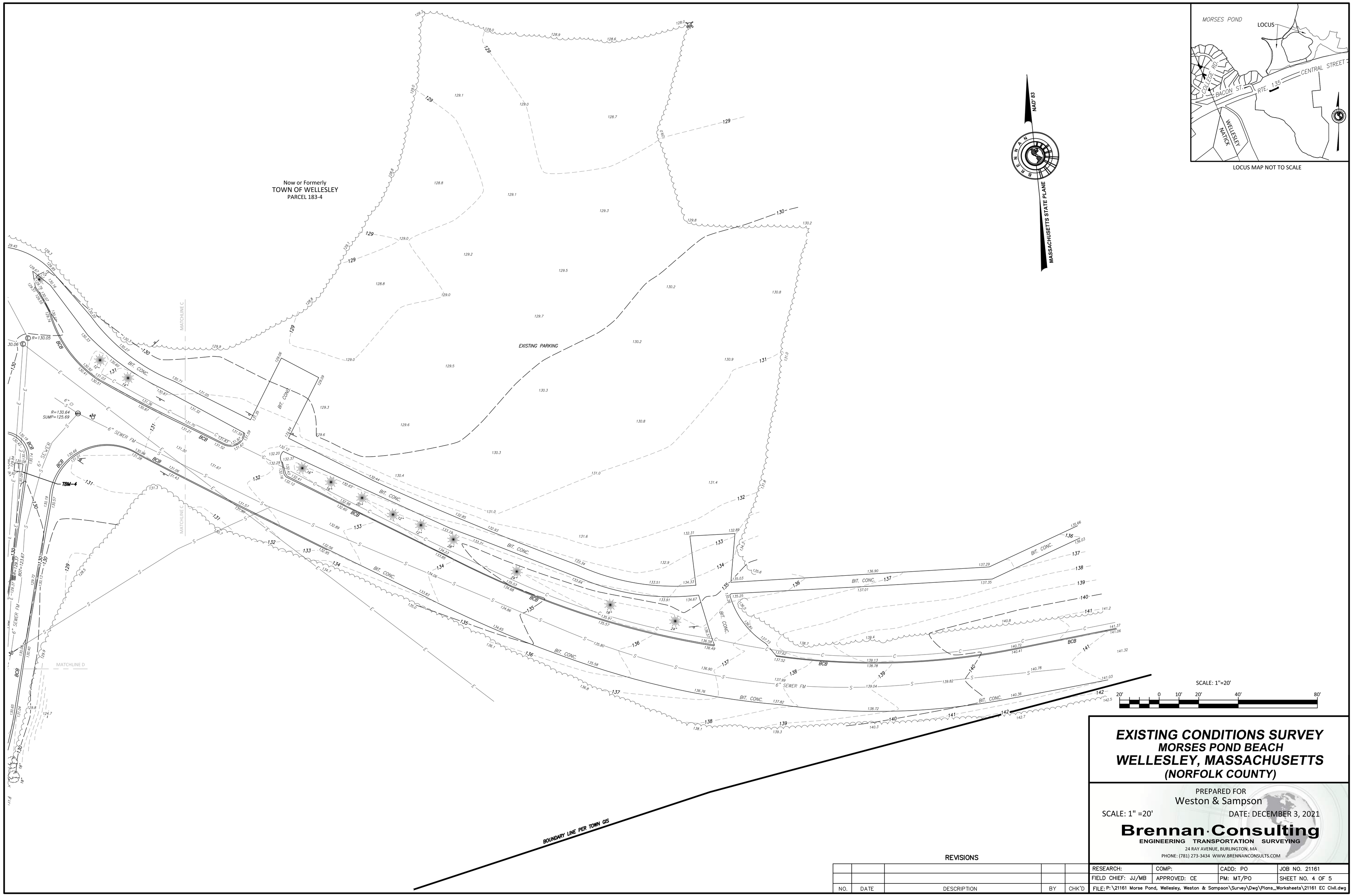

EXISTING CONDITIONS SURVEY
MORSES POND BEACH
WELLESLEY, MASSACHUSETTS
(NORFOLK COUNTY)

PREPARED FOR
Weston & Sampson

SCALE: 1" =20'

DATE: DECEMBER 3, 2021

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REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D

RESEARCH:	COMP:	CADD: PO	JOB NO. 21161
FIELD CHIEF: JJ/MB	APPROVED: CE	PM: MT/PO	SHEET NO. 4 OF 5
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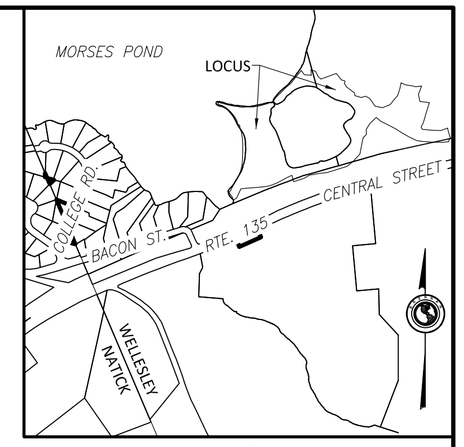
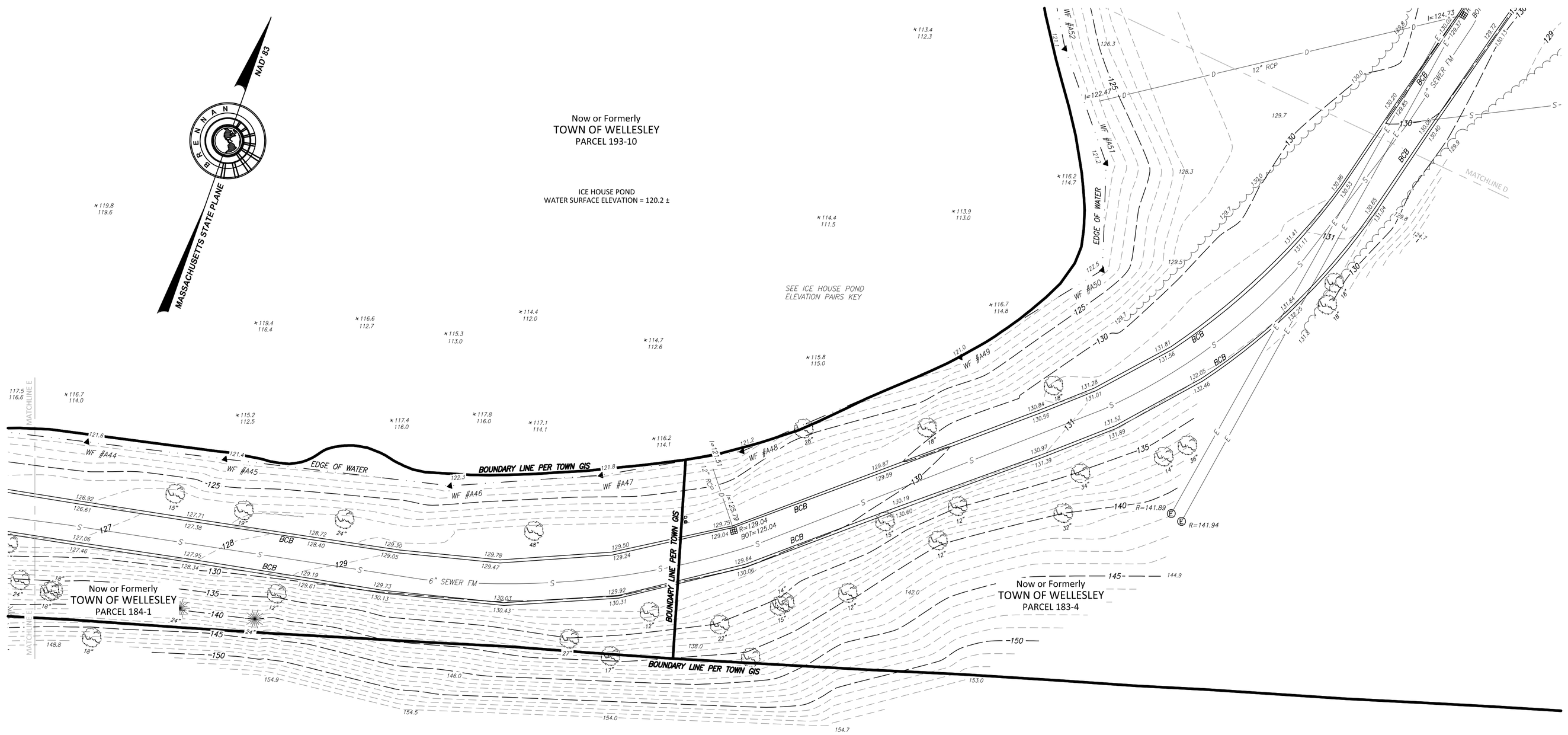


LOCUS MAP NOT TO SCALE



ICE HOUSE POND ELEVATION PAIRS KEY

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SCALE: 1"=20'

20' 0 10' 20' 40' 80'

EXISTING CONDITIONS SURVEY
MORSES POND BEACH
WELLESLEY, MASSACHUSETTS
(NORFOLK COUNTY)

PREPARED FOR
Weston & Sampson

SCALE: 1" =20'

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REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D

RESEARCH:	COMP:	CADD: PO	JOB NO. 21161
FIELD CHIEF: JJ/MB	APPROVED: CE	PM: MT/PO	SHEET NO. 5 OF 5
FILE: P:\21161 Morse Pond, Wellesley, Weston & Sampson\Survey\Dwg\Plans_Worksheets\21161 EC Civil.dwg			

Appendix C: Geotechnical Report

55 Walkers Brook Drive, Suite 100, Reading, MA 01867
Tel: 978.532.1900

November 23, 2021

Town of Wellesley
c/o Johnathan Law, RLA
Weston & Sampson
85 Devonshire Street, 3rd Floor
Boston, MA 02109

RE: Preliminary Geotechnical Report
Proposed Morses Pond Improvements
Wellesley, Massachusetts

INTRODUCTION

Weston & Sampson Engineers, Inc. (Weston & Sampson) is pleased to present this letter report summarizing our geotechnical evaluation and feasibility-level study for the proposed improvements at the Morses Pond Beach Area located along Morses Pond Access Road in Wellesley, Massachusetts. The purpose of our feasibility study was to identify preliminary geotechnical considerations for the proposed project. Our understanding of the proposed project is based on our correspondence with the project team and an August 2021 conceptual plan titled "Morses Pond Beach Area Improvements" prepared by Weston & Sampson and Maryann Thompson Architects.

EXISTING CONDITIONS

The Morses Pond Beach Area (the "site") is an approximately 11-acre parcel bound by Morses Pond to the north and west, Morses Pond Access Road to the east, and the Massachusetts Bay Transportation Authority (MBTA) Framingham/Worcester Line commuter rail right-of-way to the south, as shown on *Figure 1 – Project Locus* and *Figures 2A and 2B – Site Plan – West* and *Site Plan - East*. The site has served as a Wellesley Town Beach since approximately 1935 and includes the approximately 4.5-acre Ice House Pond on the eastern part of the site, the main beach area on the west side of Ice House Pond extending westward to Morses Pond, and an approximately 25 to 50 ft. wide strip of land supporting an asphalt-paved walking path between the north side of Ice House Pond and Morses Pond. A portion of this path is supported by a pedestrian bridge where Ice House Pond and Morses Pond are connected by a small waterway. Handicapped and maintenance vehicle access is via an asphalt-paved access drive along the south side of Ice House Pond. The Town of Wellesley Morses Pond Pump Station and Water Treatment Facility is present to the northeast of the site and is encompassed by a drinking water protection area.

The main beach area contains an approximately 70 ft. by 60 ft. single-story brick bathhouse building to the north, a swimming area along the western border with Morses Pond, a playground structure and boat ramp south of the swimming area, two approximately 27 ft. by 23 ft. canopy shade structures east of the swimming area and several benches and asphalt-paved walking paths. A swim dock is present within the swimming area and a similar boat dock is present to the north of the existing bathhouse building.

Known utilities at the site include water and electric below the walking path and strip of land to the north of Ice House Pond and force-main sewer below the access drive and beach area to the south and west of Ice House Pond. The three known utilities connect to the existing bathhouse.

Our understanding of existing grades at the site is based on our site visits and an October 2021 Existing Conditions Survey Plan prepared by Brennan Consulting. Water surface elevations in Morses and Ice House Ponds are generally between about El. 120 to El. 121. The ground surface between these two ponds rises to approximately El. 133 near the south shade structure and grass-covered area. The site is generally gently sloping downwards towards Morses Pond to the west with slopes up to about 9H:1V along the swimming area. To the east side of the beach area, the site generally slopes down to Ice House Pond at about 5H:1V. Grades increase steeply along the southern edge of Ice House Pond (generally up to 1.8H:1V) and between the access drive and MBTA ROW (generally up to about 1.4H:1V). Elevations described herein are in feet (ft.) and reference the North American Vertical Datum of 1988 (NAVD88).

PROPOSED PROJECT

Based on the conceptual plan included as *Figure 3*, we understand the proposed project includes improvements to the main beach area including new bathhouse (30 ft. by 65 ft.) and administration (40 ft. by 30 ft.) buildings connected by an overhead canopy and ADA parking areas at the southern end; a new playground area and kayak storage shed at the north end; a flush wood walkway along the existing beach area, and new landscaped areas and walking paths. The project also includes a new boardwalk crossing the southern area of Ice House Pond. The existing single-story brick bathhouse and shade canopies will be demolished.

The new administration and bathhouse buildings are proposed at the apparent high point of the site based on the existing site grades depicted in *Figures 2A* and *2B*.

Based on our experience with similar projects, we assume the proposed boardwalk will be supported on helical piers or driven timber piles and will be designed for typical pedestrian traffic loads.

Proposed grading was not made available to us at the time of this report however we assume that grade changes will generally be limited to within approximately 2 ft. of existing grades. Structural loading information was not made available to us at the time of this report.

SUBSURFACE CONDITIONS

Geologic Setting

Based on the United States Geological Survey (USGS) 2018 “Surficial Materials Map of the Natick Quadrangle, Massachusetts” compiled by Janet R. Stone and Byron D. Stone, surficial soils are anticipated to consist of coarse sand and gravel deposits. According to the Massachusetts Office of Geographic Information (MassGIS) OLIVER system, bedrock at the site is mapped as Granite at depths between approximately 50 ft. and 100 ft. The nearest bedrock outcrops to the site are mapped

approximately ½-mile to the northeast. No outcrops were observed at the site during our site reconnaissance.

Subsurface Explorations

Subsurface conditions at the site were explored on September 1, 2021, by advancing five borings (B-1 through B-5) to depths ranging from 6 to 21 ft. Approximate boring locations are shown in *Figure 2*. Weston & Sampson geotechnical engineering staff monitored explorations in the field and prepared logs for each exploration.

The borings were completed by Technical Drilling Services of Sterling, MA. Standard penetration tests (SPTs) were conducted in each boring at two- to five-foot intervals by driving a split spoon sampler with an automatic hammer in general accordance with ASTM D1586. Additional details are provided on the Guide to Subsurface Exploration Logs included in *Attachment A*. Each of the borings were backfilled with cuttings upon completion.

Subsurface conditions encountered in the explorations are described in the following section and included in *Attachment A – Boring Logs*.

Subsurface Conditions

Subsurface conditions encountered in the borings below surficial topsoil generally consisted of native sand, silty sand or undocumented fill over variable sand and gravel. The subsurface conditions encountered in the borings were generally consistent with mapped surficial geology.

Subsurface soil and groundwater conditions described below have been interpreted based on a limited number of explorations that were observed by Weston & Sampson. Variations may occur and should be expected between locations. The strata boundaries shown in our boring logs are based on our interpretations and the actual transitions may be gradual. Refer to the boring logs included in *Attachment A* for detailed descriptions of the soil samples collected. The general Unified Soil Classification System (USCS) designation(s) for each stratum is included in the descriptions below in parentheses. Depths provided below are relative to the existing ground surface at the time of drilling.

Topsoil – Approximately 3 to 6 inches of topsoil was encountered at the ground surface in each of the borings.

Undocumented Fill – Undocumented Fill was encountered below the topsoil in B-2 and B-5 and extended to depths of approximately 4 ft. and 10 ft., respectively. The undocumented fill encountered in B-2 generally consisted of medium dense fine to coarse sand with some fine gravel and little silt (SM). The undocumented fill encountered in B-5 generally consisted of soft to very stiff, dark brown, organic silt with some sand and trace gravel (OL) with trace debris including wood chips, glass, and plastic.

Review of existing information including historic imagery and maps of the site indicate previous land areas within the current bounds of Ice House Pond that no longer appear to be present. Additionally, Morses Pond dredging efforts were completed in 2012 and the Morse Pond Beach was used as a staging and dewatering area. Based on the observed organics and debris, it is possible that the thick organic fill deposit encountered in B-5 may be redistributed and graded dredge spoils sourced either from Ice House Pond or Morses Pond.

Buried Topsoil – Medium stiff, organic, buried topsoil was encountered below the fill in B-2 and extended to a depth of approximately 7.5 ft. The buried topsoil was approximately 3.5 ft. thick and generally consisted of dark brown, organic silt with some sand and little gravel (OL). An organic odor and occasional plant fibers were noted within the buried topsoil.

Native Sand and Gravel – Medium dense to very dense interbedded native sand and gravel was encountered below the surficial topsoil in B-1, B-3, and B-4; below the buried topsoil in B-2, and below the undocumented fill in B-5. The gravel layers generally consisted of mostly gravel with few to some sand and few to little silt. (GM, GP-GM, GW-GM). The sand layers generally consisted of mostly fine to coarse sand with few to some silt and trace to some fine gravel (SM, SP-SM, SW-SM). The native sand was generally siltier at shallower depths. Each of the borings were terminated in this stratum at depths between approximately 4 and 21 feet.

Groundwater – Depth to water was measured in each boring at the end of drilling and ranged from approximately 4 to 12.5 ft. below ground surface which corresponds to approximately El. 118.5 to El. 119.5. Groundwater was not encountered in B-4 (terminated at 6 ft.). We anticipate that groundwater levels at the site will fluctuate with water levels of Morses Pond and Ice House Pond and with season, variations in precipitation, construction in the area, and other factors. Perched groundwater conditions could exist close to the ground surface, especially during and after extended periods of wet weather.

Geotechnical Laboratory Testing

Select samples were submitted for geotechnical laboratory testing to confirm field descriptions and determine engineering properties of the encountered soils. Geotechnical laboratory testing was completed on two samples from the borings to confirm field descriptions and determine engineering properties of the soil. One grain size analysis (ASTM D6913) was performed on the silty sand from B-1. One moisture, ash, and organic content test (ASTM D2974) was performed on the undocumented fill from B-5. The laboratory test results are presented on the boring logs and in *Attachment B – Geotechnical Laboratory Test Results.*

PRELIMINARY GEOTECHNICAL DESIGN RECOMMENDATIONS

General

As indicated above, our project understanding and recommendations are based upon the April 2018 conceptual level plans. We understand some of the proposed design features described above are subject to change and may be modified or removed in final design. Our recommendations included herein are based on our current understanding of the project as described above and depicted in *Figure 3*. Design of proposed improvements should be in accordance with the International Building Code (IBC) as adapted by the Massachusetts State Building Code (MSBC) including supplemental Massachusetts requirements.

The proposed improvements include three buildings: administration, bathhouse, and storage shed. The administration and bathhouse buildings can be supported on shallow spread footings bearing on the natural sand encountered below the surficial topsoil. Boring B-2 completed in the vicinity of the proposed storage shed encountered undocumented granular fill overlying buried topsoil extending to about 7.5 feet below existing grade; these materials are not suitable (or allowed by the MSBC) for support of foundations, slabs, or other rigid structural site improvements that could be adversely affected by differential settlement. Therefore, we recommend

supporting storage shed on shallow spread footings following removal and replacement of these materials, or on deep foundations.

The proposed improvements also include a new boardwalk across the southern side of Ice House Pond. Boring B-5 completed in the vicinity of the proposed west boardwalk landing encountered soft to very stiff, organic, undocumented fill extending to about 10 feet below existing grade. We anticipate thick organic deposits on the bottom of Ice House Pond. We recommend supporting the boardwalk on deep foundations bearing in the natural sand below the fill and organic deposits.

These geotechnical considerations are further discussed in the following sections. Additional geotechnical explorations, analyses, and laboratory testing may be required to provide design level geotechnical recommendations once site grading has been determined and building locations and structural loadings have been finalized.

Shallow Foundations

Based on the encountered subsurface conditions and our analysis, the proposed administration and bathhouse buildings, and storage shed can be supported by shallow foundations bearing on undisturbed, medium dense (or denser) native sand or gravel or on properly constructed Structural Fill overlying such soils.

Existing undocumented fill and buried topsoil should be completely removed from within the zone-of-influence (ZOI) beneath proposed foundations and other structural elements. The ZOI is defined by planes extending horizontally away from the bottom outside edges of footings and other structural site improvements a distance of 2 ft. in all directions, then down and away at 1H:1V (horizontal: vertical) slopes to the intersection with undisturbed, native soils. Excavation to remove the fill and buried topsoil below the proposed storage shed are anticipated to extend several feet below the water level.

Footings bearing on these materials can be designed using an allowable bearing pressure of 4,000 psf. The allowable bearing pressure can be increased to 6,000 psf to resist temporary wind and seismic loads provided load eccentricities are within the middle third of the footing. Resistance to lateral loads can be obtained by a passive equivalent fluid unit weight of 250 pcf, ignoring the top 12 inches of embedment, and by a footing base friction coefficient of 0.45.

Footings should be embedded at least 4 ft. below the nearest proposed adjacent ground surface exposed to freezing. Interior footings not exposed to freezing should be embedded at least 18 inches below the lowest overlying floor slab elevation. These footings may require special frost protection measures if constructed during freezing conditions. Shallow foundations constructed as recommended herein are anticipated to undergo total and differential settlements of less than 1 inch and ½ inch, respectively.

Slabs On-Grade

Slabs for the proposed administration, bathhouse buildings, and storage buildings can be designed and constructed as slabs-on-grade supported by the undisturbed, medium dense (or denser) native sand or gravel or on properly constructed Structural Fill overlying such soils. The building slabs on-grade should be designed and constructed in accordance with recommendations contained in the latest editions of ACI Committee Reports 360R

and 302.1R. Based on subgrade preparation procedures recommended herein and the existing soil conditions, a subgrade modulus (k) of 200 pounds per cubic inch (pci) is recommended for slab-on-grade design.

Concrete slabs on-grade should be supported on a minimum of 6 inches of clean, well graded, angular crushed stone with no more than 10 percent passing a #200 sieve placed between the prepared subgrade and concrete. If the underslab stone is saturated or trapping water, the water should be removed prior to slab placement.

Some flooring manufacturers require specific slab moisture levels and/or vapor barriers to validate the warranties on their products. A properly installed and protected vapor flow retardant can reduce slab moistures. If a vapor flow retardant is used, care should be taken not to trap moisture within the overlying crushed stone and floor slab concrete.

Building slabs on-grade supporting loads up to 250 psf and bearing on the materials discussed above are expected to induce less than one inch of total settlement.

Helical Pier Foundations

As discussed above, the proposed storage shed and boardwalk can be supported on helical piers as currently sited. Up to approximately 7.5 feet of fill and buried topsoil was encountered below the proposed storage shed and up to approximately 10 ft. of existing organic fill was encountered in B-5, located at the west end of the proposed boardwalk. No borings were completed within the limits of Ice House Pond however, soft, organic pond-bottom sediment should be expected. Helical piers supporting the storage shed or boardwalk sections should extend through fill and loose, soft, or organic soils and derive support in the underlying medium dense or denser native sand or native gravel. Due to the variable nature of the site soils, actual pier lengths should be expected to vary.

We expect a helical pier design to support the storage shed and boardwalk structures will consist of vertical helical piers to resist axial loads and cross bracing or battered (angled) piers to resist lateral loads. Where sections of the boardwalk are not within Ice House Pond, buried foundation elements such as pier caps and grade beams may be viable options for resistance to lateral loads.

We can provide additional recommendations for helical piers, including minimum embedment depths and torque requirements, recommended pile design, and corresponding allowable axial capacities during final design. Ultimately, the helical pier installation contractor should provide a helical pier design for capacities required by the structural engineer. The helical pier design should be stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts and include calculations that demonstrate adequate geotechnical and structural capacities including resistance to buckling.

Seismic Site Class

Seismic site class is determined in accordance with the IBC as adapted by the MSBC using a weighted average of SPT blow counts in the upper 100 ft. of soil at a site. Based on the results of explorations and analyses and depths of proposed structures, we recommend that the subject project be evaluated using parameters associated with Site Class D.

Liquefaction can occur in loose, saturated, granular soils. Strong shaking, such as that experienced during earthquakes, can cause a sudden loss of shear strength, densification, and subsequent settlement of these soils. We evaluated the potential for liquefaction in accordance with the latest provisions of the MSBC using the soil types and consistencies encountered in our explorations and interpretation of the existing subsurface information referenced above. Based on our evaluation, the risk of structurally damaging ground deformations due to liquefaction is low.

CONSTRUCTION RECOMMENDATIONS

Site Preparation

The Site should be prepared by removing all vegetation, topsoil, and existing unsuitable (e.g. soft, disturbed, or organic) soils from the ZOI beneath shallow foundations, slabs-on-grade, pavement, and fill areas as described above. Deeper stripping depths and removal of loose surficial organic soil should be anticipated in areas of trees and brush.

Root balls from trees and brush may extend several feet and grubbing operations can cause considerable subgrade disturbance. In general, roots greater than one inch in diameter should be removed as well as areas of concentrated smaller roots. All disturbed material should be removed to undisturbed subgrades.

Excavations required for site preparation and grubbing should be brought back to grade with Structural Fill as recommended below. In general, the sides of these excavations should be sloped back flatter than 1.5H:1V to allow proper compaction of the interface between existing soil and new fill.

Excavation Considerations

Excavation will be required for site preparation, foundation construction, utility construction, site grading, etc. Groundwater and surface water should be controlled during construction and prevented from eroding slopes and disturbing excavation and subgrade materials. Groundwater was observed in some of the borings at depths ranging from about 4 to 12.5 feet below existing grades. Some excavations may encounter groundwater and moderate to severe caving and possible flowing conditions should be expected where seepage is present.

Surface water should be controlled during construction and prevented from eroding temporary slopes and disturbing excavation and subgrade materials. If excavations encounter groundwater, moderate to severe caving should be expected where seepage is present. Flowing conditions are likely where granular soils and groundwater seepage are present.

Depending on excavation depths and amount of groundwater seepage, dewatering may be necessary. Flow rates for dewatering are likely to vary depending on location, soil type, and the season during which the excavation occurs. The dewatering system should be capable of lowering the groundwater table at least 2 ft. below the anticipated excavation depths and be kept operational until fill placement and compaction and concrete installation have been completed to at least 2 ft. above the groundwater table elevation. The dewatering system should be capable of handling variable flow rates and should be the responsibility of the Contractor.

All excavations should be made in accordance with applicable OSHA safety regulations. Temporary excavation support may be required depending on depths of excavations and if excavations need to approach the ZOI

beneath existing structures or other site features. Excavation support systems, if necessary, should be the responsibility of the Contractor and designed by a Professional Engineer licensed in the Commonwealth of Massachusetts. Foundations and utilities should be designed and constructed so that excavations into ZOIs below and adjacent to footings are not required.

Subgrade Preparation and Protection

Following site preparation and excavation to the required subgrade elevations, the native sand or native gravel subgrades should be proof compacted with at least four (4) complete passes of a 10-ton vibratory roller, or equivalent effort. Footing subgrades and other areas with limited access should be proof compacted with at least four (4) complete passes of a 700-pound vibratory plate compactor, or equivalent effort. Weston & Sampson should be contacted to evaluate the exposed subgrades prior to placement of foundation forms, rebar, or overlying materials.

Soft and/or disturbed areas will require re-compaction or over-excavation and backfilling with compacted angular crushed stone or compacted Structural Fill. A geosynthetic separation layer between the excavation subgrade and crushed stone backfill may also be required. We recommend that a geosynthetic used for stabilization consist of a woven geosynthetic with an AOS of #70 to #100 sieve, and a minimum puncture resistance of at least 120 pounds (such as Mirafi FW700 or equivalent).

Soils containing more than trace amounts of silt are highly susceptible to softening and disturbance by construction activity during wet or freezing weather. Subgrade protection should be the responsibility of the Contractor and special precautions and protective measures appropriate for the weather and traffic conditions during construction should be used during earthwork and foundation construction to preserve the integrity of subgrades. Construction traffic should not operate directly on prepared subgrades.

A few inches of crushed stone can be placed and compacted at the base of footing excavations to protect subgrades from disturbance during construction, particularly if footing construction occurs during wet weather conditions. If footing construction occurs during freezing conditions, insulating blankets, heaters, or other suitable measures should be employed to prevent foundation subgrades from freezing until the foundations are backfilled sufficiently to prevent frost from reaching the footing subgrade.

Fill

Imported well-graded sand and gravel with less than approximately 10 percent passing the No. 200 sieve and a maximum particle size of 3-inches (such as MassDOT M1.03.0 Gravel Borrow, type b or M2.01.7 Dense Graded Crushed Stone for Subbase) is recommended for use as Structural Fill within the ZOI beneath new foundations and slabs. Structural Fill should be placed in maximum 10-inch-thick lifts (uncompacted thickness), with each lift compacted to at least 95 percent of the materials maximum dry density as determined by ASTM D1557.

Crushed Stone may also be acceptable for use as Structural Fill with prior approval of the geotechnical engineer. Crushed stone should be compacted until dense and well-keyed with several passes of a vibratory plate compactor.

On-site granular soil meeting the grain size requirements of Structural Fill can be used as such provided they are free of organics, contamination (including metals, VOCs, SVOCs, etc.), and other deleterious materials. On-site

granular soils with less than approximately 20 percent passing the No. 200 sieve may be re-used in landscaped areas (Common Fill). Common Fill should be placed in maximum 10-inch-thick lifts (uncompacted thickness), with each lift compacted to at least 92 percent of the materials maximum dry density as determined by ASTM D1557.

Trenches

Open utility trench excavations should be completed as recommended above. Pipe bedding should be installed in accordance with the pipe manufacturers' recommendations. If groundwater seepage or standing water is present in the base of utility trench excavations, we recommend over-excavating the trench by 12 to 18 inches and placing trench stabilization material in the base. Trench stabilization material should consist of well-graded, angular crushed stone with a maximum particle size of 4 inches and free of deleterious materials. The percent passing the No. 200 Sieve should be less than 5 percent by weight when testing in accordance with ASTM C117.

Trench backfill above the pipe zone should consist of imported granular sand and gravel with less than approximately 10 percent fines such as Structural Fill or granular soils from on-site excavations meeting the above requirements. Trench backfill should be placed in 6-inch maximum loose lifts with each lift compacted to 92 percent of ASTM D1557 and to 95 percent of ASTM D1557 within 2 ft. of finished grades. Construction of overlying hard surfaces, such as pavement, should not occur before at least one week after backfilling.

Additional Explorations and Analyses

Our explorations were completed at widely spaced locations and located based on conceptual-level design layouts. Design plans are still being evaluated and the locations of structures and other site features have not been finalized. Additional explorations and geotechnical analyses may be required to develop final design recommendations for foundation support and earthwork design. We should be contacted prior to final design to review design plans and revise and/or supplement our recommendations as necessary.

LIMITATIONS

Observation of Construction

Satisfactory earthwork and foundation performance depends to a large degree on the quality of construction. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to evaluate whether actual subsurface conditions differ from those anticipated. In addition, full-time construction observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications.

The recommendations in this report are preliminary as actual subsurface conditions may differ from those interpreted based on our subsurface explorations. In order for our recommendations to be considered final, we must be retained to observe the actual subsurface conditions encountered during construction. Our observations will allow us to interpret the actual conditions present during construction and adapt our recommendations if needed.

Variations of Subsurface Conditions and Use of Report

We have prepared this report for use by the owner, members of the design and construction team for the subject project and site, only. The data and report can be used for estimating purposes, but our report, conclusions, and interpretations should not be construed as a warranty of the subsurface conditions and are not applicable to other sites.

Explorations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect subsurface conditions that may exist outside or between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, reevaluation will be necessary and we should be consulted.

Site development plans and design details were considered preliminary at the time this report was prepared. If changes are made in site grades, configuration, design loads, or type of construction for the structure, the conclusions and recommendations may not be applicable. We should be consulted to review final design drawings and specifications to see that our recommendations are suitably followed. If design changes are made, we should be retained to review our conclusions and recommendations and provide a written evaluation or modification. Additional geotechnical engineering analyses and explorations may be necessary.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, expressed or implied, is given. For additional information on the use of this report, please refer to the document titled “Important Information about This Geotechnical-Engineering Report” included in *Attachment C*.

It has been a pleasure assisting you with this project and we look forward to our continued involvement. Please call if you have any questions.

Sincerely,

WESTON & SAMPSON ENGINEERS, INC.

Matthew J. Zanchi, PE
Project Engineer

Jennifer MacGregor, PE
Technical Leader

Attachments:
Figure 1 – Project Locus
Figure 2A – Site Plan - West

Figure 2B – Site Plan - East
Figure 3 – Site Concept Plan
Attachment A – Boring Logs
Attachment B – Geotechnical Laboratory Test Results
Attachment C – Important Information about This Geotechnical-Engineering Report

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FIGURES

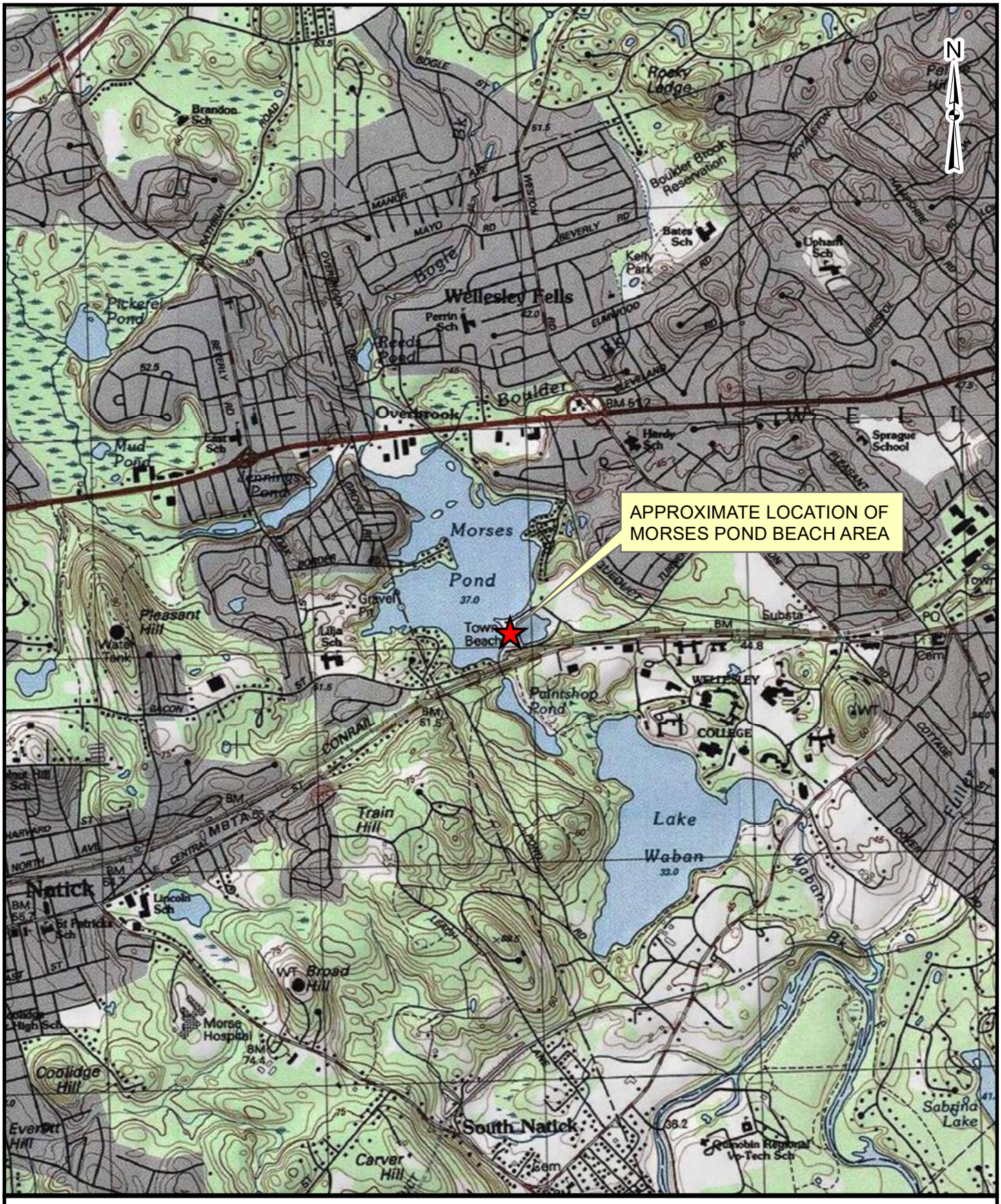


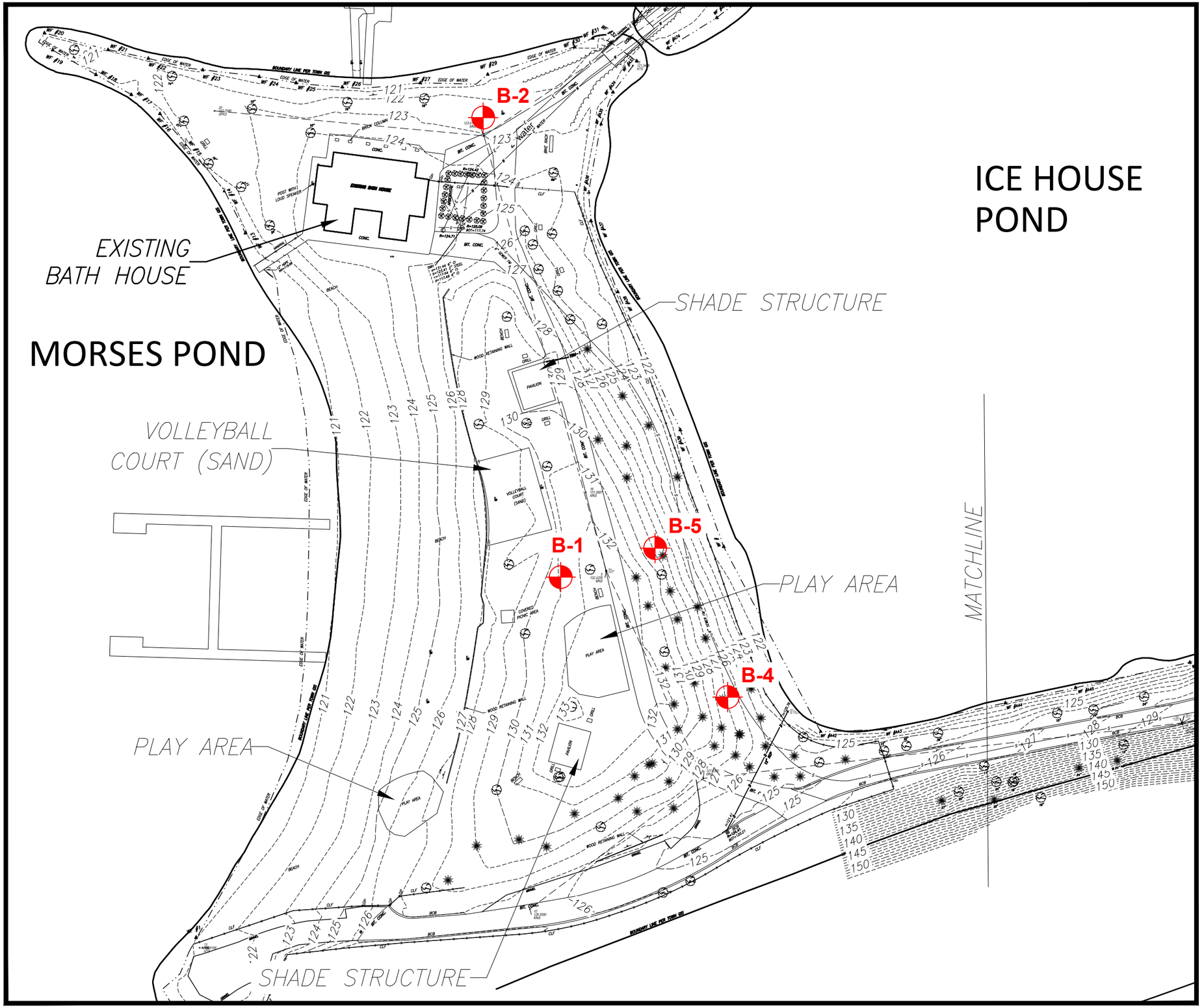
FIGURE 1
PROJECT LOCUS

MORSES POND BEACH AREA FEASIBILITY STUDY
WELLESLEY, MASSACHUSETTS

2,000 0 2,000

Scale In Feet

Weston & Sampson



Weston & Sampson℠

Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
978.532.1900 800.SAMPSON
www.westonandsampson.com

NOTES

1. THIS PLAN IS BASED ON AN EXISTING CONDITIONS SURVEY OF MORSES POND BEACH PREPARED BY BRENNAN CONSULTING DATED OCTOBER 2021.
2. BORINGS WERE COMPLETED BY TECHNICAL DRILLING SERVICES, INC. OF STERLING, MA ON SEPTEMBER 1, 2021.
3. ALL EXPLORATIONS WERE OBSERVED BY A WESTON & SAMPSON ENGINEER.
4. BORING LOCATIONS SHOWN ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS RELATIVE TO EXISTING SITE FEATURES.
5. ELEVATIONS REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

LEGEND

B-1 DESIGNATION AND APPROXIMATE LOCATION OF BORING

GRAPHIC SCALE

60 30 0 60 120

SCALE: 1"=60'

ORIENTATION	TITLE
	SITE PLAN – WEST
	PROJECT: MORSES POND BEACH AND BATH HOUSE, WELLESLEY, MA 02482

DATE	11/2021
DRWN BY	AJC
CHKD BY	WZ
PRJ. NO.	ENG21-0701
REV. NO.	-

FIGURE

FIGURE 2A

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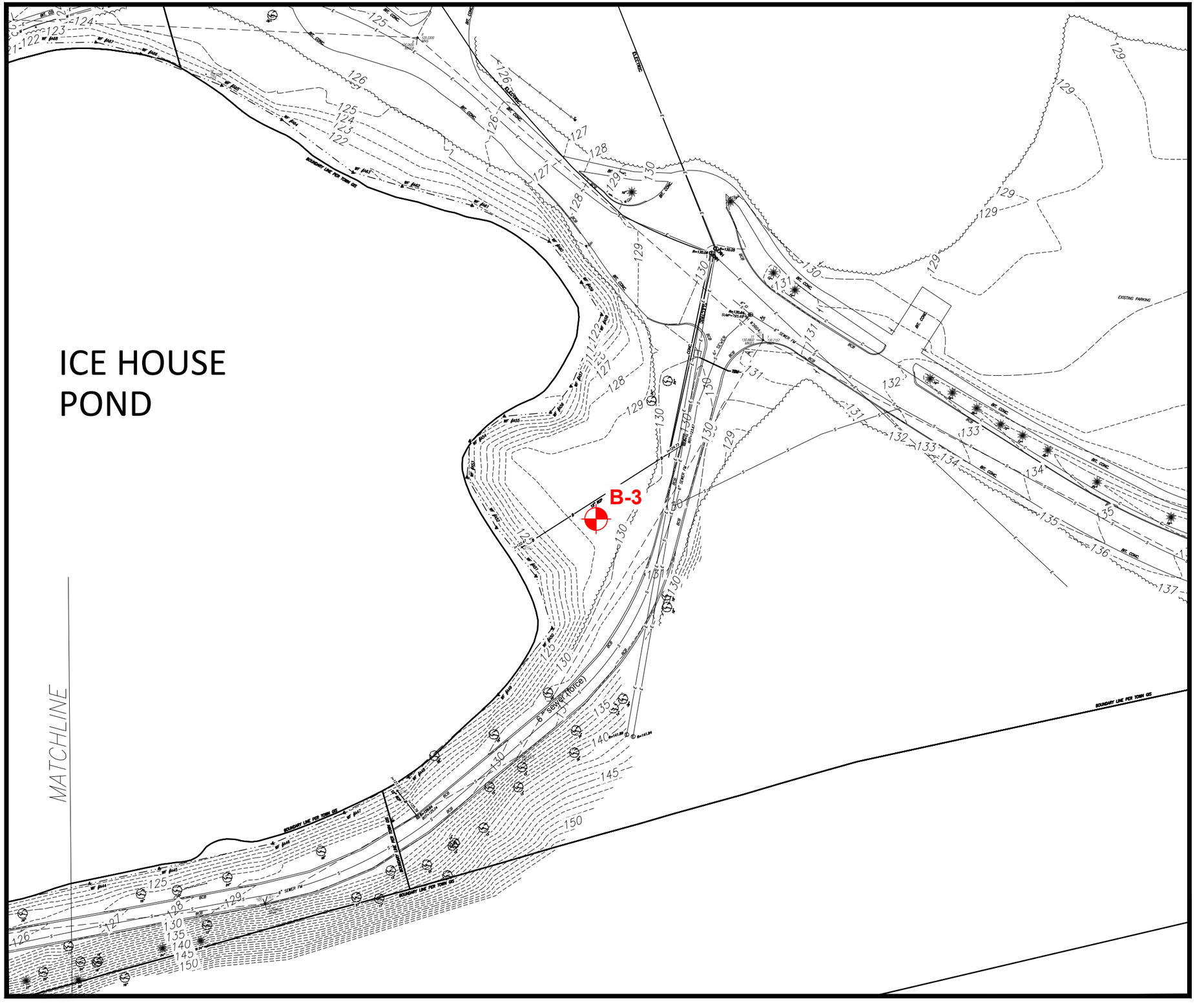

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3. ALL EXPLORATIONS WERE OBSERVED BY A WESTON & SAMPSON ENGINEER.
4. BORING LOCATIONS SHOWN ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS RELATIVE TO EXISTING SITE FEATURES.
5. ELEVATIONS REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

LEGEND

B-3 — DESIGNATION AND APPROXIMATE LOCATION OF BORING

GRAPHIC SCALE

60 30 0 60 120

SCALE: 1"=60'

ORIENTATION	TITLE
	SITE PLAN – EAST
	PROJECT
	MORSES POND BEACH AND BATH HOUSE
	WELLESLEY, MA 02482

DATE	11/2021
DRWN BY	AJC
CHKD BY	MZ
PRJ. NO.	ENG21-0701
REV. NO.	-

FIGURE

FIGURE 2B

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NOTES:

1. THIS FIGURE IS BASED ON A SITE CONCEPT PLAN PREPARED BY WESTON AND SAMPSON ENGINEERS, INC. DATED MARCH 2020.
2. FIGURE IS NOT DRAWN TO SCALE.

NOT TO SCALE

FIGURE 3
CONCEPTUAL SITE PLAN

MORSES POND BEACH AND BATHHOUSE
WELLESLEY, MASSACHUSETTS

DESIGNED BY: MJZ	CHECKED BY: JACM	DATE: NOVEMBER 2021

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Attachment A
Boring Logs

Weston & Sampson

WSE Project: ENG21-0701

Morses Pond Beach and Bath House
Morses Pond Access Road, Wellesley, MA

BORING ID: B-1

CONTRACTOR:	Technical Drilling Services, Inc.	BORING LOCATION:	See Attached Figure	DATE START:	September 1, 2021
FOREMAN:	Donny Watson	ADVANCE METHOD:	Hollow-Stem Auger Drilling	DATE FINISH:	September 1, 2021
LOGGED BY:	Aaron Chabot, E.I.T.	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	Not Available
CHECKED BY:	TJ Blair, P.E.	SUPPORT CASING:	N/A	FINAL DEPTH:	21.0 ft.
EQUIPMENT:	Deidrich D-50, ATV Mounted	CORING METHOD:	N/A	GRID COORDS:	N/A
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings	GRID SYSTEM:	N/A

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	REMARKS, OTHER TESTS, AND INSTALLATIONS
			● N-Value, Raw (bpf) ☒ Organic Content (%) 10 20 30 40 ⊕ Moisture Content (%) ▶ Plastic Limit, PL (%) ◀ Liquid Limit, LL (%) 25 50 75 100		Surface: Grass area.	Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
	S-1 12/24	9 17 16 17	33		Topsoil- 4 inches thick. Well graded gravel with silt and sand (GW-GM) - Medium dense to dense; light brown; moist; mostly fine to coarse GRAVEL, some fine to coarse sand, few non plastic fines.	
	S-2 6/24	8 10 9 8	19			[2.0 - 21.0] Intermittent auger grinding.
5	S-3 10/24	11 6 6 11	12		Silty sand (SM) - Medium dense; brown; moist; mostly fine to coarse SAND, little non plastic fines, few fine gravel. 2-inch seam of fine sand	[4.0] GC: 9%, SC: 74%, FC: 17%
					Silty sand with gravel (SM) - Dense; brown; moist; mostly fine to coarse SAND, some fine gravel, little non plastic fines.	
10	S-4 6/24	21 23 20 16	43			
					Poorly graded gravel with silt (GP-GM) - Very dense; brown; wet; mostly coarse GRAVEL, few fine to coarse sand, few non plastic fines.	[12.5] Estimated water level at time of drilling based on changes in sample moisture.
15	S-5 6/24	20 24 32 46	>> 56		Sample is primarily gravel-sized rock fragments	
	S-6 12/12				Silty sand (SM) - Brown; wet; mostly fine to medium SAND, some non plastic fines, few fine gravel.	[16.0] Split spoon advanced 12 inches to obtain sample but blow counts not recorded.
20	S-7 9/24	19 17 19 33	36		Silty gravel with sand (GM) - Dense; brown; wet; mostly fine to coarse GRAVEL, some medium to coarse sand, little non plastic fines.	
						Exploration ended at 21.0 ft.

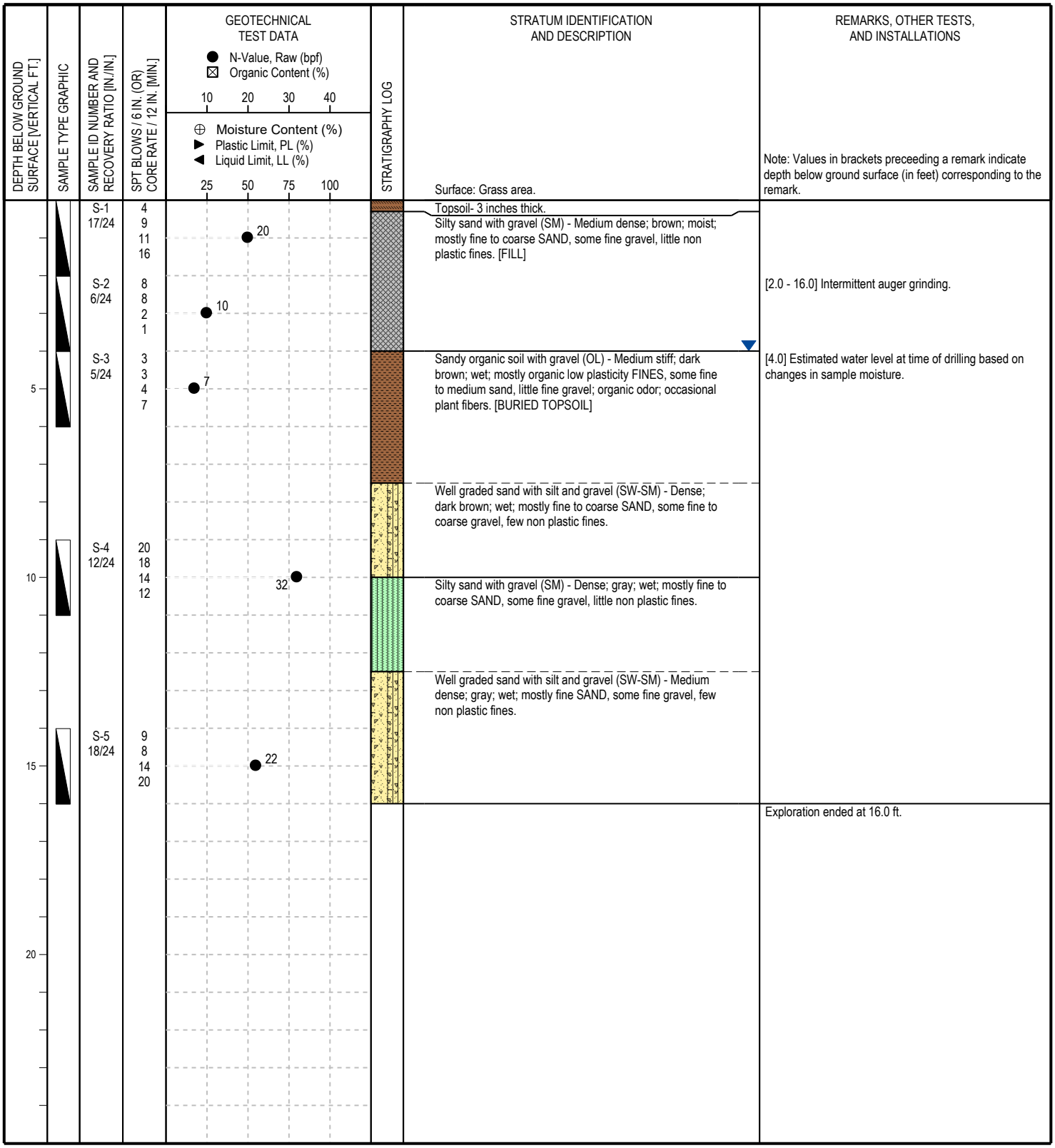
Weston & Sampson

WSE Project: ENG21-0701

Morses Pond Beach and Bath House
Morses Pond Access Road, Wellesley, MA

BORING ID: B-2

CONTRACTOR:	Technical Drilling Services, Inc.	BORING LOCATION:	See Attached Figure	DATE START:	September 1, 2021
FOREMAN:	Donny Watson	ADVANCE METHOD:	Hollow-Stem Auger Drilling	DATE FINISH:	September 1, 2021
LOGGED BY:	Aaron Chabot, E.I.T.	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	Not Available
CHECKED BY:	TJ Blair, P.E.	SUPPORT CASING:	N/A	FINAL DEPTH:	16.0 ft.
EQUIPMENT:	Deidrich D-50, ATV Mounted	CORING METHOD:	N/A	GRID COORDS:	N/A
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings	GRID SYSTEM:	N/A



Weston & Sampson

WSE Project: ENG21-0701

Morses Pond Beach and Bath House
Morses Pond Access Road, Wellesley, MA

BORING ID: B-3

CONTRACTOR:	Technical Drilling Services, Inc.	BORING LOCATION:	See Attached Figure	DATE START:	September 1, 2021
FOREMAN:	Donny Watson	ADVANCE METHOD:	Hollow-Stem Auger Drilling	DATE FINISH:	September 1, 2021
LOGGED BY:	Aaron Chabot, E.I.T.	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	Not Available
CHECKED BY:	TJ Blair, P.E.	SUPPORT CASING:	N/A	FINAL DEPTH:	16.0 ft.
EQUIPMENT:	Deidrich D-50, ATV Mounted	CORING METHOD:	N/A	GRID COORDS:	N/A
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings	GRID SYSTEM:	N/A

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	REMARKS, OTHER TESTS, AND INSTALLATIONS
				N-Value, Raw (bpf); Organic Content (%); 10 20 30 40; Moisture Content (%); Plastic Limit, PL (%); Liquid Limit, LL (%); 25 50 75 100		Surface: Forest debris.	Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
		S-1 8/24	3 9 6 6	15		Topsoil- 5 inches thick.	
						Silty sand with gravel (SM) - Loose to medium dense; brown; moist; mostly fine SAND, some fine to coarse gravel, little non plastic fines.	
		S-2 10/24	5 4 5 5	9			[2.0 - 16.0] Intermittent auger grinding.
5		S-3 9/24	8 10 14 12	24		Well graded sand with silt and gravel (SW-SM) - Medium dense; light brown; moist to wet; mostly fine to coarse SAND, some fine to coarse gravel, few non plastic fines.	
10		S-4 8/24	14 14 12 9	26		▼	[10.0] Estimated water level at time of drilling based on changes in sample moisture.
15		S-5 15/24	8 8 11 22	19			
							Exploration ended at 16.0 ft.
20							

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

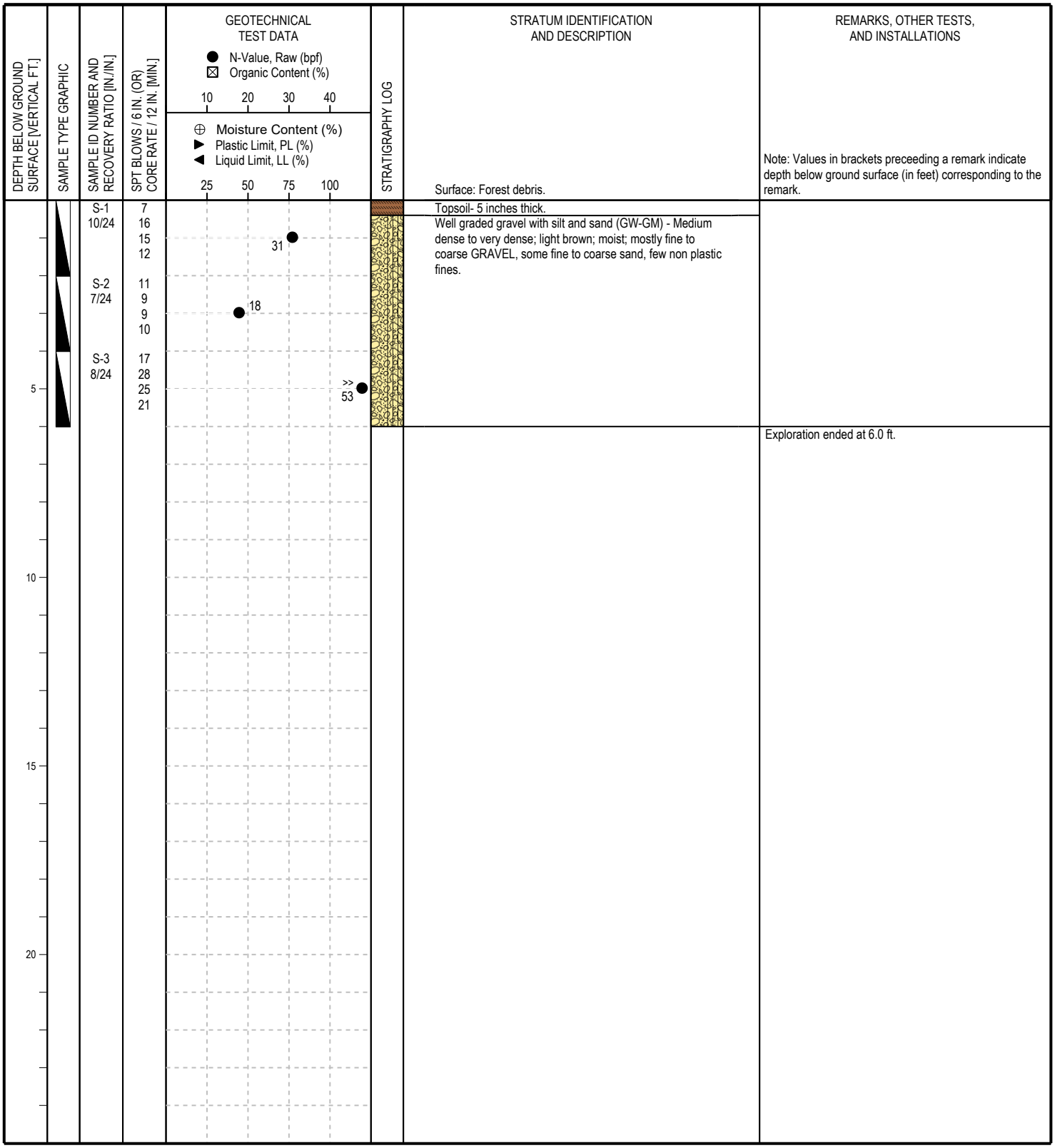
Weston & Sampson

WSE Project: ENG21-0701

Morses Pond Beach and Bath House
Morses Pond Access Road, Wellesley, MA

BORING ID: B-4

CONTRACTOR:	Technical Drilling Services, Inc.	BORING LOCATION:	See Attached Figure	DATE START:	September 1, 2021
FOREMAN:	Donny Watson	ADVANCE METHOD:	Hollow-Stem Auger Drilling	DATE FINISH:	September 1, 2021
LOGGED BY:	Aaron Chabot, E.I.T.	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	Not Available
CHECKED BY:	TJ Blair, P.E.	SUPPORT CASING:	N/A	FINAL DEPTH:	6.0 ft.
EQUIPMENT:	Deidrich D-50, ATV Mounted	CORING METHOD:	N/A	GRID COORDS:	N/A
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings	GRID SYSTEM:	N/A



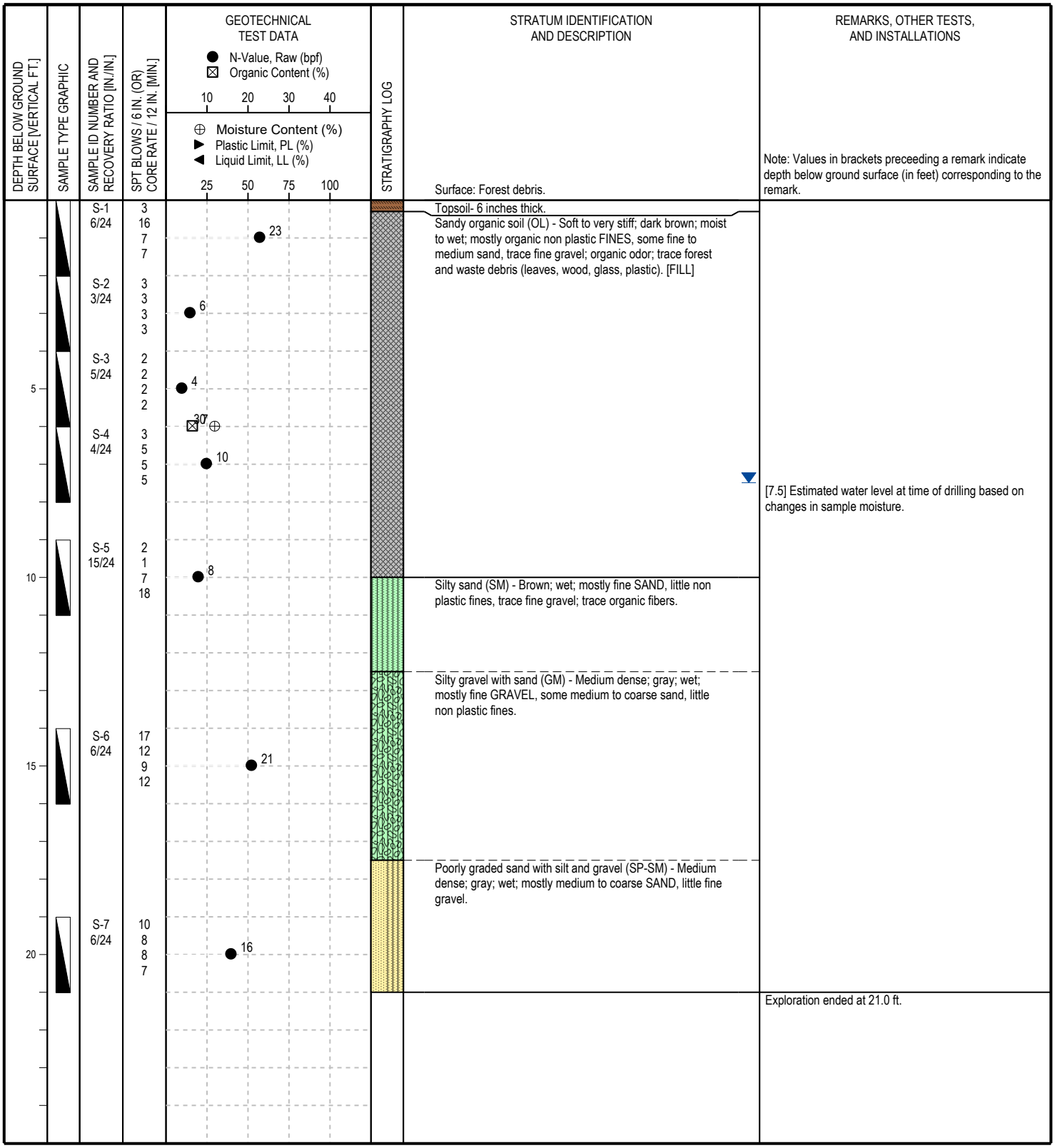
Weston & Sampson

WSE Project: ENG21-0701

Morses Pond Beach and Bath House
Morses Pond Access Road, Wellesley, MA

BORING ID: B-5

CONTRACTOR:	Technical Drilling Services, Inc.	BORING LOCATION:	See Attached Figure	DATE START:	September 1, 2021
FOREMAN:	Donny Watson	ADVANCE METHOD:	Hollow-Stem Auger Drilling	DATE FINISH:	September 1, 2021
LOGGED BY:	Aaron Chabot, E.I.T.	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	Not Available
CHECKED BY:	TJ Blair, P.E.	SUPPORT CASING:	N/A	FINAL DEPTH:	21.0 ft.
EQUIPMENT:	Deidrich D-50, ATV Mounted	CORING METHOD:	N/A	GRID COORDS:	N/A
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings	GRID SYSTEM:	N/A



GUIDE TO SUBSURFACE EXPLORATION LOGS

Weston & Sampson℠

INDEX SHEET 1 GENERAL INFORMATION

GENERAL NOTES AND USE OF LOGS

1.) Explorations were made by ordinary and conventional methods and with care adequate for Weston & Sampson's study and/or design purposes. The exploration logs are part of a specific report prepared by Weston & Sampson for the referenced project and client, and are an integral part of that report. Information and interpretations are subject to the explanations and limitations stated in the report. Weston & Sampson is not responsible for any interpretations, assumptions, projections, or interpolations made by others.

2.) Exploration logs represent general conditions observed at the point of exploration on the date(s) stated. Boundary lines separating soil and rock layers (strata) represent approximate boundaries only and are shown as solid lines where observed and dashed lines where inferred based on drilling action. Actual transitions may be gradual and changes may occur over time.

3.) Soil and rock descriptions are based on visual-manual examination of recovered samples, direct observation in test pits (when permissible), and laboratory testing (when conducted).

4.) Water level observations were made at the times and under the conditions stated. Fluctuations should be be expected to vary with seasons and other factors. Use of fluids during drilling may affect water level observations. The absence of water level observations does not necessarily mean the exploration was dry or that subsurface water will not be encountered during construction.

5.) Standard split spoon samplers may not recover particles with any dimension larger than 1-3/8 inches. Reported gravel conditions or poor sample recovery may not reflect actual in-situ conditions.

6.) Sections of this guide provide a general overview of Weston & Sampson's practices and procedures for *identifying* and *describing* soil and rock. These procedures are predominantly based on ASTM D2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)*, the International Society of Rock Mechanics (ISRM) standards, and the *Engineering Geology Field Manual* published by the Bureau of Reclamation. Not all aspects of this guide relating to description and identification procedures of soil and rock may be applicable in all circumstances.

SAMPLER GRAPHICS

- Split Spoon (Standard) 2" OD, 1-3/8" ID
- Split Spoon (Oversize) 3" OD, 2-3/8" ID
- Shelby or Piston Tube 3" OD, 2-7/8" ID
- Double-Tube Rock Core Barrel 2" Core Diameter
- Direct Push with Acetate Liner Various Liner Sizes
- A — Auger Sample *(from cuttings or hand auger)*
- G — Grab Sample *(manual, from discrete point)*
- C — Composite Sample *(multiple grab samples)*

WELL GRAPHICS

- Cement concrete seal around casing or riser pipe
- Bentonite seal around casing or riser pipe
- Cement grout seal around casing or riser pipe
- Soil backfill around riser pipe or beneath screen
- Gravel backfill around screen or riser pipe
- Sand backfill around screen or riser pipe (filter sand)
- Solid-wall riser; Sch. 40 PVC, 1" ID unless noted otherwise
- Slotted screen; Sch. 40 PVC, 1" ID with machined slots

CAVING / SEEPAGE TERMS

The following caving and/or seepage terms may appear on a test pit log.

Caving Term	Criteria
Minor	less than 1 cubic ft.
Moderate	1 to 3 cubic ft.
Severe	greater than 3 cubic ft.

Seepage Term	Criteria
Slow	less than 1 gpm
Moderate	1 to 3 gpm
Fast	greater than 3 gpm

KEY TO WATER LEVELS

- Observed in exploration during advancement.
- Measured in exploration at completion, prior to backfilling or well installation.
- Measured in exploration after the stated stabilization period, prior to backfilling, or in well installation if noted.

DEFINITIONS OF COMMON TERMS

Sample Recovery Ratio - The length of material recovered in a drive or push type sampler over the length of sampler penetration, in inches (e.g. 18/24).

Standard Penetration Test (*SPT*) - An in-situ test where a standard split-spoon sampler is driven a distance of 12 or 18 inches (after an initial 6-inch seating interval) using a 140-lb. hammer falling 30 inches for each blow.

SPT Blows - The number of hammer blows required to drive a split-spoon sampler each consecutive 6-inch interval during a *Standard Penetration Test*. If no discernable advancement of a split spoon sampler is made after 50 consecutive hammer blows, 50/X indicates *sampler refusal* and is the number of blows required to drive the sampler X inches.

SPT N-Value (*N*) - The uncorrected blow count representation of a soil's penetration resistance over a 12-inch interval after an initial 6-in. seating interval, reported in blows per foot (bpf). The N-value is correlated to soil engineering properties.

Auger Refusal - No discernable advancement of the auger over a period of 5 minutes with full rig down pressure applied.

Casing Refusal (Driven) - Casing penetration of less than 6 inches after a minimum 50 blows of a drop hammer weighing 300 lbs. or a minimum 100 blows of a drop hammer weighing 140 lbs.

PID Measurement - A measurement (electronic reading) taken in the field using a photoionization detector (PID) to detect the presence of volatile organic compounds in a soil sample. Values are reported as benzene equivalent units in parts per million (ppm) unless noted otherwise.

Rock Quality Designation (RQD) - A qualitative index measure of the degree of jointing and fracture of a rock core taken from a borehole. The RQD is defined as the sum length of solid core pieces 4 inches or longer divided by the run (cored) length, expressed as a percentage. Higher RQD values may indicate fewer joints and fractures in the rock mass.

Fill (Made Ground) - A deposit of soil and/or artificial waste materials that has been placed or altered by human processes.

LABORATORY TESTS AND FIELD MEASUREMENTS

MC	Moisture Content	IC	1D Incremental Consolidation
OC	Organic Content	VS	Laboratory Vane Shear
PL	Plastic Limit	US	Unconfined Compression
LL	Liquid Limit	TC	Triaxial Compression
GC	Gravel Content	PP	Pocket (Hand) Penetrometer
SC	Sand Content	TV	Torvane (Hand Vane)
FC	Fines Content	PID	Photoionization Detector
DS	Direct Shear	FID	Flame Ionization Detector

BORING ADVANCEMENT METHODS

Hollow-Stem Auger Drilling - Utilizes continuous flight auger sections with hollow stems to advance the borehole. Drill rods and a plug are inserted into the auger stem to prevent the entrance of soil cuttings into the augers.

Rotary Wash Drilling - Utilizes downward pressure and rotary action applied to a non-coring bit while washing the cuttings to the surface using a circulating fluid injected down the drill rods. The borehole is supported with either steel casing or the drilling fluid. Where a casing is used, the borehole is advanced sequentially by driving the casing to the desired depth and then cleaning out the casing. The process of driving and cleaning the casing is commonly referred to as the 'drive-and-wash' technique.

Continuous Sampling - Includes a variety of methods and procedures during which the borehole is advanced via continuous recovery of soil samples. *Direct Push* sampling is a common method that uses static downward pressure combined with percussive energy to drive a steel mandrel into the ground at continuous intervals while recovering soil samples in disposable acetate liners.

Rock Coring - Utilizes downward pressure and rotary action applied to a core barrel equipped with a diamond-set or tungsten carbide coring bit. During conventional coring, the entire barrel is retrieved from the hole upon completion of a core run. Wireline coring allows for removal of the inner barrel assembly containing the actual core while the the drill rods and outer barrel remain in the hole. Various types and sizes of core barrels and bits are used.

GUIDE TO SUBSURFACE EXPLORATION LOGS

Weston & Sampson℠

INDEX SHEET 2
SOIL DESCRIPTION

SOIL CONSTITUENTS

Naturally occurring soils consist of one or more of the following matrix constituents defined in terms of particle size.

Constituent		U.S. Sieve Size			Observed Size (in.)		
Gravel	(Coarse)	3/4 in.	-	3 in.	3/4	-	3
Gravel	(Fine)	No. 4	-	3/4 in.	1/5	-	3/4
Sand	(Coarse)	No. 10	-	No. 40	1/16	-	1/5
Sand	(Medium)	No. 40	-	No. 10	1/64	-	1/16
Sand	(Fine)	No. 200	-	No. 40	1/300	-	1/64
Fines	(Silt or Clay)	Smaller than		No. 200	Less than		1/300

SOIL IDENTIFICATION

Soil identification refers to the grouping of soils with similar physical characteristics into a category defined by a **group name** and corresponding **group symbol** based on estimation of the matrix soil constituents to the nearest 5% and simple manual tests. Proportions of cobbles, boulders, and other non-matrix soil materials are not considered during this procedure but are included in the overall soil description if observed or thought to be present. Refer to the following descriptions and tables adapted from ASTM D2488.

Coarse-Grained Soil - Coarse-grained soils contain fewer than 50% fines and are identified based on the following table.

Primary Constituent	Fines Percent	Type of Fines and Gradation		Group Symbol	Group Name [1]
GRAVEL *% gravel > % sand*	≤ 5%	well graded		GW	Well graded gravel
		poorly graded		GP	Poorly graded gravel
	10%	clayey fines	well graded	GW-GC	Well graded gravel with clay
			poorly graded	GP-GC	Poorly graded gravel with clay
		silty fines	well graded	GW-GM	Well graded gravel wth silt
			poorly graded	GP-GM	Poorly graded gravel with silt
	15% to 45%	clay fines		GC	Clayey gravel
		silt fines		GM	Silty gravel
SAND *% sand ≥ % gravel*	≤ 5%	well graded		SW	Well graded sand
		poorly graded		SP	Poorly graded sand
	10%	clayey fines	well graded	SW-SC	Well graded sand with clay
			poorly graded	SP-SC	Poorly graded sand with clay
		silty fines	well graded	SW-SM	Well graded sand with silt
			poorly graded	SP-SM	Poorly graded sand with silt
	15% to 45%	clay fines		SC	Clayey sand
		silt fines		SM	Silty sand

[1] If soil is a gravel and contains 15% or more sand, add "with sand" to the group name. If soil is a sand and contains 15% of more gravel, add "with gravel" to the group name.

Inorganic Fine-Grained Soil - Fine-grained soils contain 50% or more fines and are identified based on the following table.

Plasticity Criteria	Dry Strength	Coarse Fraction S = Sand, G = Gravel		Group Symbol	Group Name [1]
Medium	Medium to high	< 15% S + G		CL	Lean clay
		≥ 30%	% S ≥ % G	CL	Sandy lean clay
		S + G	% S < % G	CL	Gravelly lean clay
Non-plastic	None to low	< 15% S + G		ML	Silt
		≥ 30%	% S ≥ % G	ML	Sandy silt
		S + G	% S < % G	ML	Gravelly silt
High	High to very high	< 15% S + G		CH	Fat clay
		≥ 30%	% S ≥ % G	CH	Sandy fat clay
		S + G	% S < % G	CH	Gravelly fat clay
Low to Medium	Low to medium	< 15% S + G		MH	Elastic silt
		≥ 30%	% S ≥ % G	MH	Sandy elastic silt
		S + G	% S < % G	MH	Gravelly elastic silt

[1] If soil contains 15% to 25% sand or gravel, add "with sand" or "with gravel" to the group name.

Organic Fine-Grained Soil - Fine-grained soils that contain enough organic particles to influence the soil properties are identified as Organic Soil and assigned the group symbol **OL** or **OH**.

Highly Organic Soil (Peat) - Soils composed primarily of plant remains in various stages of decomposition are identified as Peat and given the group symbol **PT**. Peat usually has an organic odor, a dark brown to black color, and a texture ranging from fibrous (original plant structure intact or mostly intact) to amorphous (plant structure decomposed to fine particles).

SOIL DESCRIPTION

Soils are *described* in the following general sequence. Deviations may occur in some instances.

Identification Components

(1) Group Name and Group Symbol

Description Components

(2) Consistency (Fine-Grained) or Apparent Density (Coarse-Grained)
(3) Color (*note, the term "to" may be used to indicate a gradational change*)
(4) Soil Moisture
(5) Matrix Soil Constituents (Gravel, Sand, Fines)
  └► Proportion (*by weight*), particle size, plasticity of fines, angularity, etc.
(6) Non-Matrix Soil Materials and Proportions (*by volume*)
(7) Other Descriptive Information (Unusual Odor, Structure, Texture, etc.)
(8) [Geologic Formation Name or Soil Survey Unit]

SPT N-VALUE CORRELATIONS

Consistency	SPT N-Value	Apparent Density	SPT N-Value
Very soft	0 - 2	Very loose	0 - 5
Soft	2 - 4	Loose	5 - 10
Medium stiff	4 - 8	Medium dense	10 - 30
Stiff	8 - 15	Dense	30 - 50
Very stiff	15 - 30	Very dense	> 50
Hard	> 30		

SOIL MOISTURE

Dry..... Apparent absence of moisture; dry to the touch.
Moist..... Damp but no visible water.
Wet..... Visible free water; saturated.

PROPORTIONS / PERCENTAGES

Proportions of gravel, sand, and fines (excluding cobbles, boulders, and other constituents) are stated in the following terms indicating a range of percentages by weight (to nearest 5%) of the minus 3-in. soil fraction and add up to 100%.

Mostly ..... 50% - 100%
Some ..... 30% - 45%
Little ..... 15% - 25%
Few ..... 5% - 10%
Trace..... Less than 5%

Proportions of cobbles, boulders, and other non-matrix soil materials including artificial debris, roots, plant fibers, etc. are stated in the following terms indicating a range of percentages by volume (to the nearest 5%) of the total soil.

Numerous ..... 40% - 50%
Common ..... 25% - 35%
Occasional ..... 10% - 20%
Trace..... Less than 5%

PLASTICITY (FINES ONLY)

Non-plastic.....Dry specimen ball falls apart easily. Cannot be rolled into thread at any moisture content.
Low.....Dry specimen ball easily crushed with fingers. Can be rolled into 1/8-in. thread with some difficulty.
Medium.....Difficult to crush dry specimen ball with fingers. Easily rolled into 1/8-in. thread.
High.....Cannot crush dry specimen ball with fingers. Easily rolled and re-rolled into 1/8-in. thread.

COBBLES AND BOULDERS

Cobbles - Particles of rock that will pass a 12-in. square opening and be retained on a 3-in. sieve.

Boulders - Particles of rock that will not pass a 12-in. square opening.

Note: Where the percentage (by volume) of cobbles and/or boulders cannot be accurately or reliably estimated, the terms "with cobbles", "with boulders", or "with cobbles and boulders" may be used to indicate observed or inferred presence.

GUIDE TO SUBSURFACE EXPLORATION LOGS

Weston & Sampson℠

INDEX SHEET 3
ROCK DESCRIPTION

ROCK DEFINITION

Where reported on an exploration log, *rock* is defined as any naturally formed aggregate of mineral matter occurring in larges masses or fragments. This definition of rock should not be taken as a replacement for any definitions relating to rock and/or rock excavation defined in construction documents. Intensely weathered or decomposed rock that is friable and can be reduced to gravel size particles or smaller by normal hand pressure is identified and described as soil. Poorly indurated formational materials which display both rock-like and soil-like properties are identified and described as rock followed by the soil description. In such cases, the term "poorly indurated" or "weakly cemented" is added to the rock name (e.g. weakly cemented sandstone).

ROCK IDENTIFICATION

Rock is identified by a combination of *rock type* (igneous, metamorphic, or sedimentary) followed by the the *rock name* (e.g. granite, schist, sandstone).

ROCK DESCRIPTION

Rock descriptions are presented in the following general sequence. The detail of description is dictated by the complexity and objectives of the project.

Identification Components

(1) Rock Type and Name

Description Components

(2) Rock Grain Size (*for clastic sedimentary rock*)
(3) Crystal Size (*for igneous and metamorphic rock*)
(4) Bedding Spacing (*for sedimentary rock*)
(5) Color
(6) Hardness and Weathering Descriptors
(7) Fracture Density
(8) [Geologic Formation Name]

ROCK QUALITY DESIGNATION

$$\text{RQD (\%)} = \frac{\Sigma \text{ Length of intact core pieces} \geq 4 \text{ inches}}{\text{Total length of core run (inches)}} \times 100$$

The RQD should correlate with the fracture density in most cases. Higher RDQ values generally indicate fewer joints and fractures.

GRAIN / CRYSTAL SIZE

Grain Size for Clastic Sedimentary Rock

The names of clastic sedimentary rocks are generally based on their predominant clast or grain size (e.g. fine sandstone, medium sandstone, coarse gravel conglomerate, cobble conglomerate, siltstone, claystone).

Crystal Size for Igneous and Metamorphic Rock

Grain Size Description	Average Crystal Size (in.)
Very coarse grained (pegmatitic)	Greater than or equal to 3/8
Coarse-grained	Between 3/16 and 3/8
Medium-grained	Between 1/32 and 3/16
Fine-grained	Between 1/250 and 1/32
Aphanitic	Less than or equal to 1/250

BEDDING SPACING

Bedding Description	Thickness / Spacing
Massive	Less than 10 ft.
Very thickly bedded	3 ft. to 10 ft.
Thickly bedded	1 ft. to 3 ft.
Moderately bedded	4 in. to 1 ft.
Thinly bedded	1 in. to 4 in.
Very thinly bedded	1/4 in. to 1 in.
Laminated	Less than 1/4 in.

Note: Bedding is generally only applicable to sedimentary or bedded volcanic rocks.

HARDNESS

Hardness	Criteria
Extremely hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very hard	Cannot be scratched with a pocketknife or sharp pick with difficulty. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with with a pocketknife or sharp pick with difficulty. Breaks with heavy hammer blows.
Moderately hard	Can be scratched with a pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily with a pocketknife or sharp pick. Breaks with light to moderate manual pressure.
Very soft	Can be readily indented, grooved, or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

WEATHERING (INTACT ROCK)

Weathering Description	Discoloration and/or Oxidation	General Characteristics
Fresh	Body of rock and fracture surfaces are not discolored or oxidized.	Rock texture unchanged. Hammer rings when crystalline rocks are struck.
Slightly weathered	Discoloration or oxidation limited to surface of, or short distance from, fractures. Most surfaces exhibit minor to complete discoloration.	Rock texture preserved. Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately weathered	Discoloration or oxidation extends usually throughout. Fe-Mg minerals appear rusty. All fracture surfaces are discolored or oxidized.	Rock texture generally preserved. Hammer does not ring when rock is struck. Body of rock slightly weakened.
Intensely weathered	Discoloration or oxidation throughout. Feldspar and Fe-Mg minerals altered to clay to some extent. All fracture surfaces are discolored or oxidized and friable.	Rock texture altered by chemical disintegration. Can usually be broken with moderate to heavy manual pressure or by light hammer blow . Body of rock is significantly weakened.
Decomposed	Discoloration or oxidation throughout but resistant minerals such as quartz may be unaltered. All feldspar and Fe-Mg minerals are completely altered to clay.	Resembles a soil; partial or complete remnant rock structure may be preserved. Can be granulated by hand. Resistant minerals may present as stringers or dikes.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures
Very slightly fractured	Core lengths greater than 3 ft.
Slightly fractured	Core lengths mostly from 1 ft. to 3 ft.
Moderately fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely fractured	Core lengths mostly from 1 in. to 4 in.
Very intensely fractured	Mostly chips and fragments

Note: Fracture density is based on the fracture spacing in recovered core, measured along the core axis (excluding mechanical breaks).

Attachment B
Geotechnical Laboratory Test Results

THIELSCH ENGINEERING

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thielsch.com
Let's Build a Solid Foundation

Client Information:
Weston & Sampson
Foxborough, MA
PM: Matthew Zanchi
Assigned By: Matthew Zanchi
Collected By: Client

Project Information:
Morses Pond Beach and Bath House
Morses Pond Access Road, Wellesley, MA 02482
W&S Project Number: ENG21-0701
Summary Page: 1 of 1
Report Date: 10.18.2021

LABORATORY TESTING DATA SHEET, Report No.: 7421-K-B009

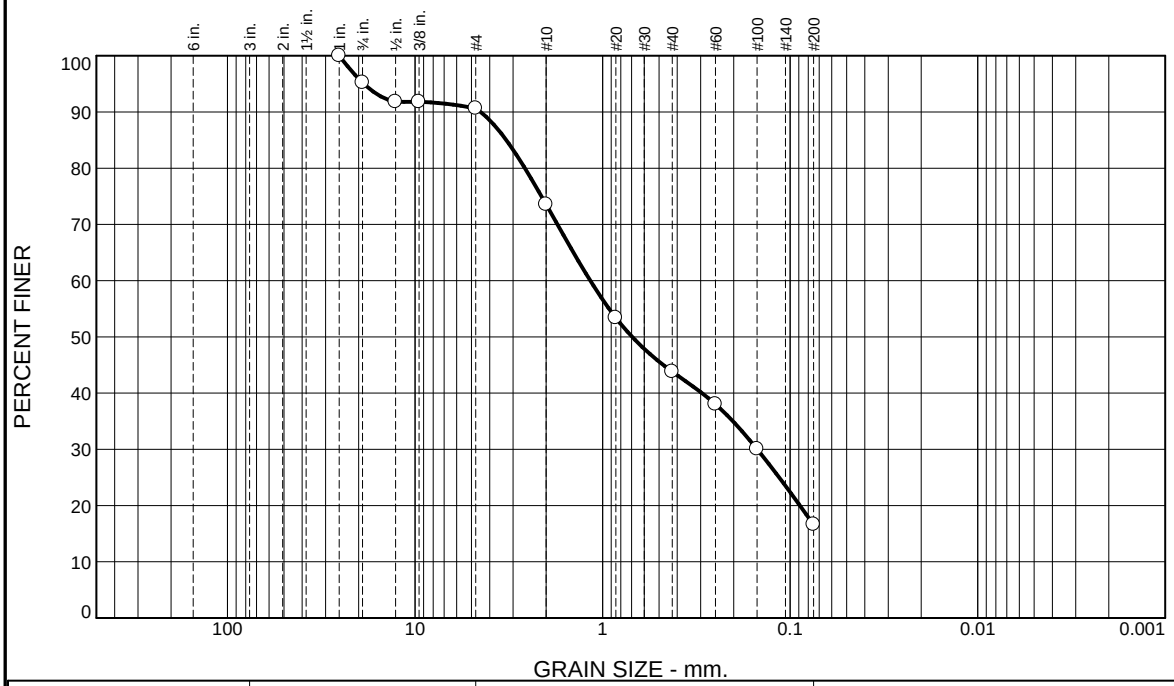
Boring No.	Sample No.	Depth (ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Moisture Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Test Moisture Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318		D6913/D422			D2974	D854			D1557						
B-1	S-3	4-6	21-S-B280				9.4	74.0	16.6											Light Brown silty sand
B-5	S-4	6-8	21-S-B281	29.9						6.6										Organic Content Only

Date Received: 10.08.2021

Reviewed By: Ronald L. Thielsch

Date Reviewed: 10.18.2021

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.8	4.6	17.0	29.8	27.2	16.6	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	95.2		
1/2"	91.8		
3/8"	91.8		
#4	90.6		
#10	73.6		
#20	53.4		
#40	43.8		
#60	38.0		
#100	30.0		
#200	16.6		

* (no specification provided)

Material Description

Light Brown silty sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 4.4663 D_{85}= 3.2627 D_{60}= 1.1624
D_{50}= 0.6960 D_{30}= 0.1497 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 10.08.2021 **Date Tested:** 10.13.2021

Tested By: RL / DN

Checked By: Ronelle LeBlanc, E.I.T.

Title: Laboratory Coordinator

Source of Sample: B-1 **Depth:** 4-6
Sample Number: S-3 **Date Sampled:**

Thielsch Engineering Inc.

Cranston, RI

Client: Weston & Sampson

Project: Morses Pond Beach and Bath House
Morses Pond Access Rd, Wellesley, MA 02482

Project No: ENG21-0701 **Figure** 21-S-B280

Attachment C
Important Information about this
Geotechnical-Engineering Report

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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e-mail: info@geoprofessional.org www.geoprofessional.org

Appendix D: Wetlands Delineation Report

Weston & Sampson

westonandsampson.com

55 Walkers Brook Drive, Suite 100
Reading, MA 01867
tel: 978.532.1900

Wetland Delineation Report

August 2021

Wellesley, Massachusetts
Project # ENG21-0701

Morses Pond Beach
Wellesley, MA

Wetland Delineation Conducted By:
Devin Batchelder, CWS on 8/27/2021

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1.0 SITE DESCRIPTION

On August 27th, 2021, the presence of wetland resources was investigated near Morses Pond in Wellesley, MA. This investigation area is located off Morses Pond Access Road with undeveloped woodlands and recreational walking paths. Please see Figure 1 (Wetlands Field Map) and Figure 2 (USGS Topographic Map) of this report for the investigation area.

Wetland resource areas including, an isolated vegetated wetland and lake banks, were identified and flagged in the field using pink flagging by a Weston & Sampson employee who is trained in the wetland delineation process using the Massachusetts Department of Environmental Protection (MassDEP) and the US Army Corps of Engineers methodology. A further description of these wetland resource areas is presented in the following sections.

2.0 DELINEATION OF WETLAND RESOURCES

2.1 Site Observations

The Weston & Sampson wetland scientist, trained in the ACOE Wetland Delineation Manual and Massachusetts Department of Environmental Protection (MassDEP) Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetland Protection Act guidance document, observed the following protected wetland resources at the site:

- Isolated Vegetated Wetland (IW)
- Banks – Lake

Field data were recorded on US Army Corps of Engineers (ACOE) Wetland Determination Data Forms. See Appendix A for completed data forms and Appendix B for site photographs.

2.2 Wetland Delineation Methodology

A wetland delineation assessment was conducted in accordance with the Massachusetts Wetland Protection Act Regulations (310 CMR 10.55(2)(c)), Massachusetts Department of Environmental Protection (MassDEP) Delineating Bordering Vegetated Wetlands Under the Massachusetts Protection Act (March 1995), and ACOE Wetland Manual (Technical Report Y-87-1).

The bordering vegetated wetlands (BVW) delineation methodology included the characterization of vegetation, soil any hydrologic conditions in both wetland and upland areas to identify the transitional area, which was used as the wetland limit. Pink flags with distinct flag numbers are left in the field to show wetland resource area limits.

Vegetation, hydrology and soils are assessed in both wetland and upland areas to accurately place the wetland limits at each site. The percentage of vegetative species was estimated by creating sample plots. Sample plot radius for trees, saplings, shrubs, groundcover and woody vine strata was 30', 15', 15', 5' and 30', respectively. After creating the sample plot areas, the percent basal area coverage of each species within the monitoring plot was recorded. Using these field observations, the percent dominance of each species within its stratum was calculated. The 50/20 Rule was then used to determine dominance. Dominant species were considered the most abundant plant species (when

ranked in descending order of abundance and cumulatively totaled) that immediately exceeds 50% of the total dominance measure (basal area) for the stratum, plus any additional species comprising 20% or more of the total dominance measure for the stratum. Once the dominant species were determined, they were treated equally to determine the presence of hydrophytic vegetation. If the number of dominant species with a Wetland Indicator Status of FAC (excluding FAC-), FACW or OBL is greater than, or equal to, the number of remaining dominant species, the area was considered a jurisdictional wetland resource area based on vegetation.

A soil sample from each wetland sample plot is also taken. Each soil sample goes to a depth of at least 12-24 inches. The soil is characterized to determine if the soil sample is considered a hydric (wetland) soil. Soil samples, including mottles, are characterized based on color using Munsell Soil-Color charts as a color reference.

The general area is then assessed for hydrologic conditions, including, but not limited to, site inundation, depth to free water, depth of soil saturation, water marks, drift lines, sediment deposits, water-stained leaves.

2.3 Isolated Vegetated Wetland (IW)

A single Isolated Vegetated Wetland (IW) series was delineated at the site. The limit of the IW resource area was determined by locating the transitional area between wetland and upland vegetation, soils and hydrologic conditions consistent with the BVW delineation methodology. Wetland flags left in the field included:

- Wet A1 through Wet A9 (Wet “A” Series)

Dominant vegetation within the IW included red maple (*Acer rubrum*), coastal pepperbush (*Clethra alnifolia*), and poison ivy (*Toxicodendron radicans*), these species commonly thrives in hydric conditions. The soils were composed of fine sandy loam with 5% redoximorphic features appearing 8 inches below the soil surface. Wetland hydrology was evident having a high-water table, surface water, saturation present, and water-stained leaves.

The adjacent upland vegetation was dominated by American hop-hornbeam (*Ostrya virginiana*), red oak (*Quercus rubra*), and wild sarsaparilla (*Aralia nudicaulis*). Soils were composed of fine sandy loam. No indicators of wetland hydrology were observed.

The Massachusetts Wetland Protection Act does not protect isolated vegetated wetlands however, certain individual communities have chosen to extend protections to these isolated wetlands within their local bylaws. The town of Wellesley places protection on isolated wetlands per the Town of Wellesley Wetlands Protection Bylaw: Article 44 of Town Bylaw section 2 states isolated wetlands are considered jurisdictional as long as they cover 2,500 square feet of surface area. This isolated wetland on site is approximately 5,360 square feet in size, therefore is considered to be jurisdictional.

Under the Town of Wellesley Wetland bylaws isolated wetlands are subject to a 100-foot buffer.

2.4 Bank

Water bodies, including perennial streams, intermittent streams, ponds and lakes, have banks which are protected by the Massachusetts Wetland Protection Act. Bank is a wetland resource area defined by 310 CMR 10.54(2)(a) as "the portion of land surface which normally abuts and confines a water body. It occurs between a waterbody and a vegetated bordering wetland and adjacent floodplain, or, in absence of these, it occurs between a waterbody and an upland." Vegetated banks provide valuable functions such as flood control, stormwater prevention, fisheries protection, and water quality protection. The limit of this resource area is identified by Top of Bank (TOB) which is located at the first observable break in slope or the Mean Annual Flood Level (MAFL), whichever is lower. TOB is easily identified in the field so that indicator was utilized for this wetland delineation.

Lake Bank

Morses Pond and adjacent un-named adjacent extension of the pond are located in Wellesley, MA. Both ponds are connected to form a joined water body. The waterbody is 100 acres in size, based on the Towns of Wellesley history page on this pond. Due to its size, Morses Pond and un-named pond are classified as a lake. According to the Massachusetts Wetland Protection Act a lake is defined as "any open body of fresh water with a surface area of ten acres or more and shall include great ponds." (310 CMR 10.04). Great Ponds are defined in 310 CMR 9.02 as "any pond which contained more than ten acres in its natural state … prior to any alteration by damming or other human activity". Although Morses

Pond is greater than ten acres in size, it is not listed on the Massachusetts List of Great Ponds. Both banks of the lake were flagged. Wetland flags left in the field included:

- TOB-A1 through TOB-A84 Stop (Lake Bank "A" Series)

The Lake Bank A Series begins near the Morses Pond boat ramp. Flags were not left within the beach area due to public safety and usage however the locations were identified using GPS. The flag line continues to include the un-named lake extension due to a hydrologic connection being present running under a walking bridge. Fewer flags were hung on the western side of the unnamed lake extension due to the presence of a fence. The flag line otherwise continues to wrap around the entire lake system.

Banks are subject to a 100-foot buffer under the Massachusetts Wetland Protection Act per 310 CMR 10.02(2)(b).

2.5 Other Protected Areas

Weston & Sampson created environmental resources maps (see Figure 4) of the site to determine the presence of other protected areas. The data source of these map layers was the Massachusetts Geographic Information System (MassGIS). These areas included:

- NHESP Priority Habitats of Rare Species
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Certified and Potential Vernal Pools
- Areas of Critical Environmental Concern (ACEC)
- Outstanding Resource Waters (ORW)
- Cold Water Fisheries

Wetland resources identified in the field were also added to these maps. These maps showed no other environmental resource areas are located on this site other than the wetland resource areas previously identified in this report.

FEMA Flood Insurance Rate Maps (FIRM) were created online from the FEMA website to determine if there is a 100-year flood zone at the site. See Figure 3 for FIRM map. Based on the information provided

by the FIRM map a portion of the investigation area located within a Zone AE. FEMA defines a Zone AE as “areas subject to inundation by the 1-percent-annual-chance flood event”. The 1-percent-annual-chance flood event is the same as the 100-year event. As a result, portions of the investigation area are located within the 100-year flood zone.

3.0 SUMMARY

On August 27th, 2021, the presence of wetland resources was investigated near Morses Pond in Wellesley, MA. A single isolated vegetated wetland and lake banks were identified and flagged at the site.

Additional environmental mapping was conducted using MassGIS data layers and FEMA FIRM mapping. This additional mapping indicates that the site location is found in the 100-year flood zone.

4.0 REFERENCES

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Path: \\wse03.local\WSE\Projects\MA\Wellesley MA\Morses Pond Beach Feasibility Study (2)\Permitting\Wetland Delineation Wellsley\GIS\Maps\Wetland Flags.mxd **User:** Page.Hailey **Saved:** 9/2/2021 1:46:59 PM **Opened:** 9/2/2021 1:47:10 PM

N
W E
S

100 50 0 100
Feet

Data Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

Legend

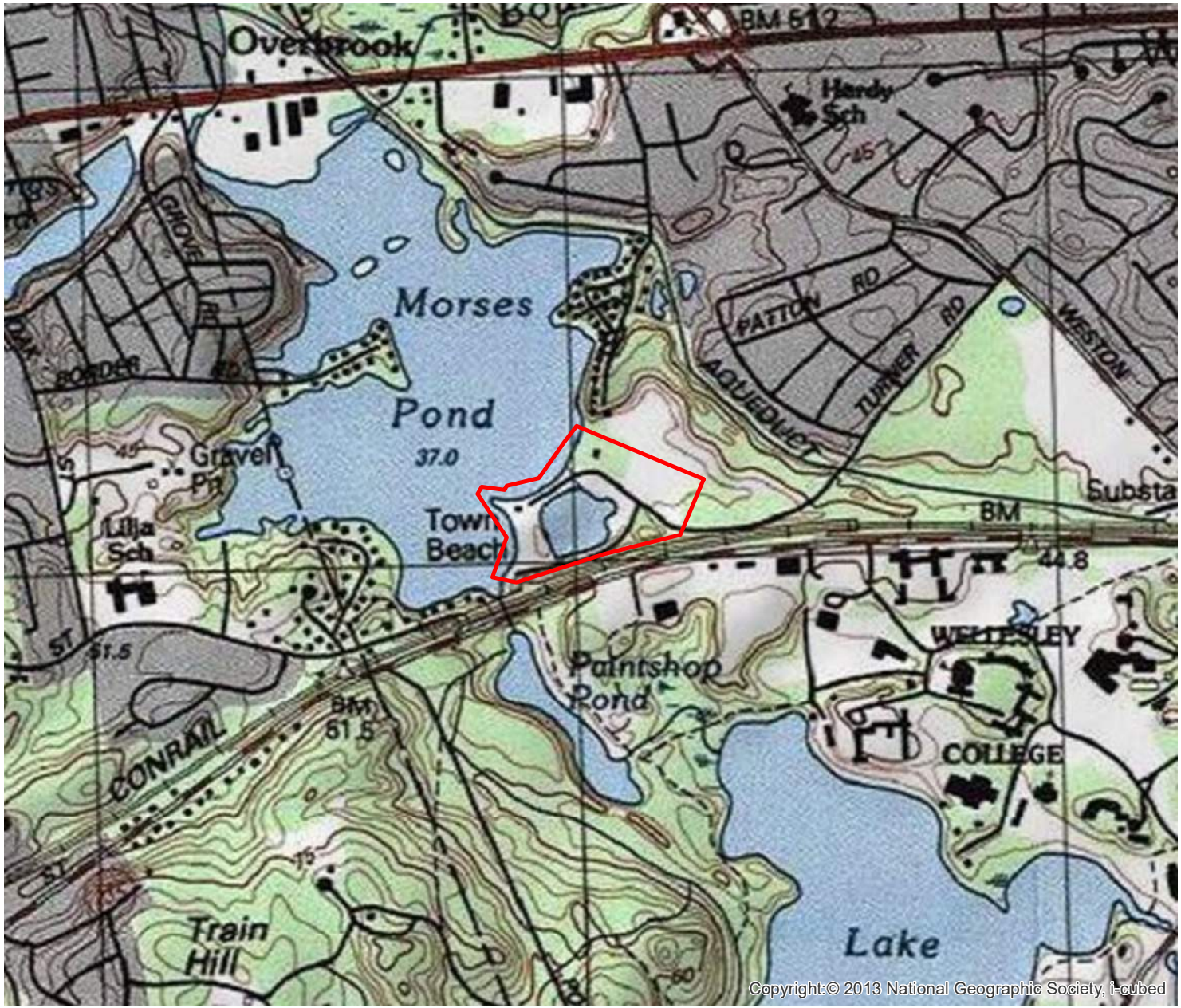
- Area of Interest
- Isolated Wetland
- Bank- Lake

FIGURE 1

Morses Pond Beach
Wellesley, MA

Wetland Field Map

Weston & Sampson



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1,000 500 0 1,000
Feet

Data Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

Legend

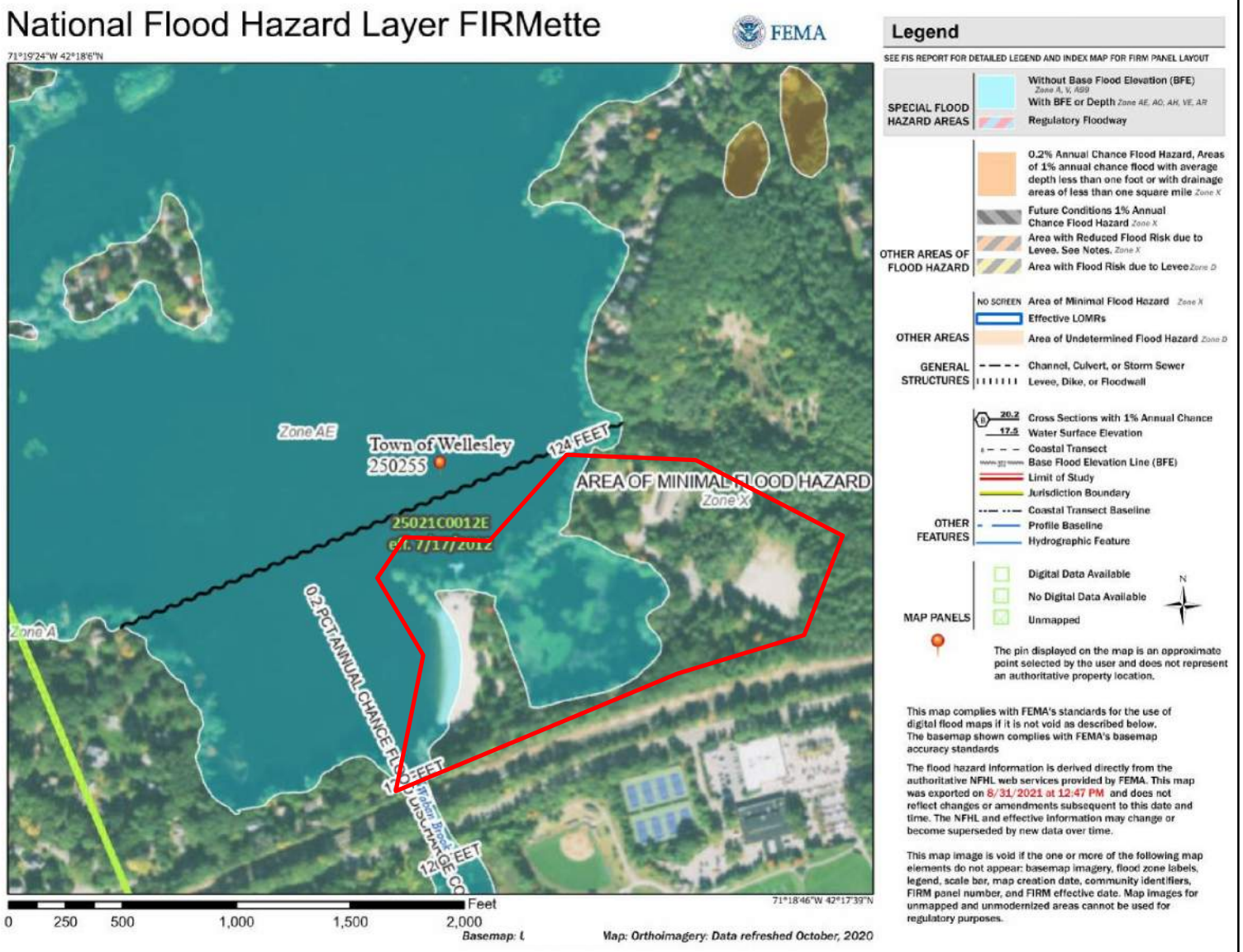
Area of Interest

FIGURE 2

Morses Pond Beach
Wellesley,MA

USGS Topographic Map

Weston & Sampson



Legend

Area of Interest

FIGURE 3

Morses Pond Beach
Wellesley,MA

FEMA Map

Weston & Sampson

N
W E
S

200 100 0 200
Feet

Data Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

Legend

- Isolated Wetland
- Bank- Lake
- Area of Interest
- Perennial Stream
- Intermittent Stream
- Marsh/Bog
- Wooded marsh
- Cranberry Bog
- Salt Marsh
- Open Water
- Reservoir (with PWSID)
- Tidal Flats
- Beach/Dune
- Public Way
- Marsh Boundary - landward
- Landlocked Tidelands
- Jurisdiction
- Historic High Water
- Marsh Boundary - seaward
- Contemporary High Water
- Inferred Contemporary High Water
- Inferred Historic High Water
- <all other values>

HABITAT

- American Oyster
- Blue Mussel
- Bay Scallop
- European Oyster
- Ocean Quahog
- Quahog
- Razor Clam
- Surf Clam
- Sea Scallop
- Soft-Shelled Clam

ACECs

- ACECs
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Priority Habitats of Rare Species
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Cold Water Fisheries

Outstanding Resource Waters

- Public Water Supply Contributor
- ORW for ACEC
- ORW for both Water Supply and Other

FIGURE 4

Morses Pond Beach
Wellesley,MA

Environmental Resources Map

Weston & Sampson

APPENDIX A

ACOE Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Morses Pond City/County: Wellesley Sampling Date: 8/27/2021

Applicant/Owner: _____ State: MA Sampling Point: Wet-A UP

Investigator(s): Devin Batchelder Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____

Slope (%): 0-8% Lat: 42°17'46.81"N Long: 71°18'53.48"W Datum: _____

Soil Map Unit Name: Hinckley loamy sand NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: Wet-A UP

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. American Hop-hornbeam(*Ostrya virginiana*)	25	Yes	FACU
2. Red Oak (*Quercus rubra*)	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	35	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. American Hop-hornbeam(*Ostrya virginiana*)	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Wild Sarsaparilla(*Aralia nudicaulis*)	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	50 (A)		200 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wet-A UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR2/1	100					FSL	
10-20	10YR3/5	100					FSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Morses Pond City/County: Wellesley Sampling Date: 8/27/2021

Applicant/Owner: Borrego Solar State: MA Sampling Point: Wet-A WET

Investigator(s): Devin Batchelder Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____

Slope (%): 0-8% Lat: 42°17'46.81"N Long: 71°18'53.48"W Datum: _____

Soil Map Unit Name: Hinckley loamy sand NWI classification: PSS1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes X	No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No _____	Depth (inches): 0"
Water Table Present?	Yes X	No _____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: BVW-A8 WET

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Maple (*Acer Rubrum*)	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Coastal Pepperbush(*Clethra alnifolia*)	25	Yes	FAC
2. White Ash(*Fraxinus americana*)	5	No	FACU
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Poison ivy (*Toxicodendron radicans*)	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Virginia Creeper(*Parthenocissus quinquefolia*)	1	No	FACU
2.			
3.			
4.			
	1 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ Rapid Test for Hydrophytic Vegetation

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: BVW-A8 WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR2/1	100					FSL	
8-20	2.5Y5/2	95	10YR4/6	5			FSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

APPENDIX B

Site Photographs

Photo 1: Morses Pond

Photo 2: Connecting Bridge of Un-named adjacent extension to Morses Pond

Photo 3: Un-named extension adjacent Pond to Morses

Photo 4: Isolated Wetland

Appendix E: Electrical System Narrative

Morses Pond Bathhouse & Administration Building
Wellesley, MA
J#791 010 00.00
L#79933/Page 1/April 1, 2022

ELECTRICAL SYSTEMS

NARRATIVE REPORT

The following is the Electrical Systems narrative, which defines the scope of work and capacities of the Power and Lighting system, as well as the Basis of Design.

1. CODES

All work installed under Section 260000 shall comply with the Massachusetts State Building Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the electrical work and all items incidental thereto, including commissioning and testing.

A. Power Distribution:

1. Electrical power will be brought into the site via underground secondary cables. Service entrance equipment will be located in the utility room, along with lighting and power panels. The service capacity will be sized for 200 amperes at 120/208V, 3Ø, 4 wire.

2. The emergency lighting system will consist of battery backup integral to the LED light fixtures.

B. Interior Lighting System:

1. General offices lighting fixtures will consist of recessed 2'x2' LED luminaries with dimming drivers. The fixtures will be wired for automatic dimming where natural day light is available and also for multi-level switching.

2. Toilet Rooms will consist of LED wall mounted valance fixtures and wet location LED recessed downlights.

3. Storage, mechanical, etc. will be provided with LED industrial wraparound fixtures with acrylic lens.

4. Exit signs will be of the energy efficient, long life LED type with battery back-up.

5. Each area will be locally switched and designed for multi-level controls. Each office space and toilet room will have an occupancy sensor to turn lights off when unoccupied. In general, lighting power density will be 30-40% less than IECC 2018.

C. Site Lighting System:

1. Building perimeter fixtures will be wall mounted LED luminaries over exterior doors.

2. Covered canopy lighting will consist of marine grade LED cylinders with dimming drivers.

3. All fixtures will be of the dark sky compliant, cut-off type.

D. Wiring Devices:

1. Offices will generally have one (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided.

2. Exterior weatherproof receptacles will be installed at exterior doors.

3. Receptacles in Toilet Rooms will be GFI type mounted at 48 inches above floor.

E. Fire Alarm System:

1. A fire alarm and detection system will be provided with battery back-up. The system will be of the addressable type where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms.

2. Heat detectors will be provided in all spaces.

3. The alarm transmission method will be via an AES radio box with antenna via the multi-tap cabinet.

F. Security System:

1. An addressable security intrusion system will be provided.

2. Position switches will be provided at all exterior doors.

G. Lightning Protection System:

1. A system of lightning protection will be provided. The system will be installed in compliance with the provisions of the latest “Code for Protection Against Lightning” for buildings as adopted by the National Fire Protection Association and the Underwriters’ Laboratories, Inc. for UL Master Label System.

2. The lightning protection equipment will include air terminals, conductors, conduits, fasteners, connectors, ground rods, etc.

3. The lightning protection system will be installed for the new facility.

3. TESTING REQUIREMENTS

A. The Electrical Contractor shall provide testing of the following systems with the Owner and Owner's Representative present:

1. Lighting and power panels for correct phase balance.
2. Emergency Lighting
3. Lighting control system
4. Fire alarm system.
5. Security systems.
6. Lightning Protection System

B. Testing reports shall be submitted to the Engineer for review and approval before providing to the Owner.

4. OPERATION MANUALS AND MAINTENANCE MANUALS:

A. When the project is completed, the Electrical Contractor shall provide operation and maintenance manuals to the Owner.

5. RECORD DRAWINGS AND CONTROL DOCUMENTS:

A. When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items will be provided to the Owner.

Appendix F: HVAC System Narrative

Morses Pond Bathhouse & Administration Building
Wellesley, MA
J#791 010 00.00
L#79932/Page 1/April 1, 2022

HVAC SYSTEMS

NARRATIVE REPORT

The following is the HVAC system narrative, which defines the scope of work and capacities of the HVAC system as well as the Basis of Design.

1. CODES

   All work installed under Section 23 00 00 shall comply with the Massachusetts State Building Code and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   The work of Section 23 00 00 shall be new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Heating, Ventilating and Air Conditioning work and all items incidental thereto, including commissioning and testing.

   Capacities of systems and equipment are as specified:

   1. Electric radiant heaters: (6) 375 watt electric radiant heaters
   2. One (1) inline exhaust fan; 1,335 CFM
   3. Electric duct re-heat coil: (1) 3.8 kW electric duct heater
   4. One (1) 3-ton VRF air-cooled heat pump condenser serving 5 VRF indoor heat pump fan coil units
   5. One (1) 1.6-ton duct-mounted heat pump DX coil & associated outdoor-mounted heat pump condenser
   6. One (1) indoor-mounted energy recovery unit with an air handling capacity of approximately 400 cfm
   7. Grilles, registers and diffusers.
   8. Copper refrigerant piping and elastomeric cellular piping insulation
   9. Copper condensate drain piping
   10. Galvanized ductwork
   11. 2” & 3” thick duct insulation wrap
   12. Vibration isolation and seismic restraints.
   13. Testing and balancing of systems.

14. Four (4) exhaust/ intake louvers with gravity damper.

3. BASIS OF DESIGN: (MASS CODE)

Weather values are listed herein based on the local weather values as determined from ASHRAE Weather data tables.

Outside: 5°F winer, Summer 88°F DB 74°F WB

Inside: 70° F +/- 2 deg F. for heating. Unoccupied temperature setback will be provided.

Generally outside air is provided at the rate of 20 cfm/person in all office and restroom spaces. In all cases ASHRAE guide 62-2013 and IMC 2015 Mechanical Code will be met as a minimum. All occupied areas will be designed to maintain 1,000 PPM carbon dioxide maximum.

4. SYSTEM DESCRIPTION

A. Bath House – HVAC System:

1. A central inline exhaust fan shall be ducted to all regularly occupiable spaces to provide code-required ventilation. Make-up air for the exhaust system shall be provided through the use of operable windows and/or louvered intakes.

B. Office Building – HVAC System:

1. A central inline energy recovery ventilator would be ducted to outdoor air intake and exhaust louvers to provide fresh air to the building and remove code required exhaust air. A duct-mounted DX coil in series with a duct-mounted electric resistance heating coil would provide tempered and de-humidified air to the building occupiable areas.

2. A Variable Refrigerant Flow (VRF) heat pump system shall provide heating and cooling to the regularly occupied areas of the building; a combination of wall and ceiling mounted indoor fan coil units would be installed within the spaces to be served and connected to an outdoor-mounted heat pump condenser unit.

3. Electric radiant ceiling/wall panels shall be provided to heat the non-occupied building spaces (storage/ toilet/ concessions) that are not provided with VRF indoor units.

4. All condensate would be piped to drain to a mop sink or to a splash block outdoors.

5. Supply and exhaust air shall be conveyed to and from the spaces served by ceiling or wall-mounted return air registers and supply diffusers.

Appendix G: Plumbing System Narrative

Morses Pond Bathhouse & Administration Building
Wellesley, MA
J#791 010 00.00
L#79931/Page 1/April 1, 2022

PLUMBING SYSTEMS

NARRATIVE REPORT

The following is the Plumbing system narrative, which defines the scope of work and capacities of the Plumbing system as well as the Basis of Design.

1. CODES

   A. All work installed under Section 220000 shall comply with the MA Building Code, MA Plumbing Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Plumbing work and all items incidental thereto, including commissioning and testing.

3. GENERAL

   A. The Plumbing Systems that will serve the project are cold water, hot water and sanitary waste and vent system.

   B. The Building will be serviced by Municipal water and Municipal sewer system.

   C. All Plumbing in the building will conform to Accessibility Codes and to Water Conserving sections of the Plumbing Code.

4. DRAINAGE SYSTEM

   A. Soil, Waste, and Vent piping system is provided to connect to all fixtures and equipment. System runs from 10 feet outside building and terminates with stack vents through the roof.

   B. Drainage system piping will be service weight cast iron piping; hub and spigot with gaskets for below grade; no hub with gaskets, bands and clamps for above grade 2 in. and larger. Waste and vent piping 1-1/2 in. and smaller will be type ‘L’ copper.

5. WATER SYSTEM

   A. New 2-inch domestic water service from the municipal water system will be provided. A meter and backflow preventer, if required, will be provided.

   B. Cold water distribution main is provided. Non-freeze wall hydrants with integral back flow preventers are provided along the exterior of the building.

   C. Domestic hot water heating for bathroom lavatories and sinks shall be provided with instantaneous electric point of use water heaters.

   D. Water piping will be type ‘L’ copper with wrot copper sweat fittings, silver solder or press-fit system. All piping will be insulated with 1 in. thick high density fiberglass.

6. FIXTURES

A. Furnish and install all fixtures, including supports, connections, fittings, and any incidentals to make a complete installation.

B. Fixtures shall bear the manufacturer's guaranteed label trademark indicating first quality. All acid resisting enameled ware shall bear the manufacturer's symbol signifying acid resisting material.

C. Vitreous china and acid resisting enameled fixtures, including stops, supplies and traps shall be of one manufacturer by Kohler, American Standard, or Eljer, or equal. Supports shall be Zurn, Smith, Josam, or equal. All fixtures shall be white. Faucets shall be Speakman, Chicago, or equal.

D. Fixtures shall be as scheduled on drawings.

1. Water Closet: High efficiency toilet, 1.28 gallon per flush, wall hung, vitreous china, siphon jet. Manually operated 1.28 gallon per flush-flush valve.

2. Urinal: High efficiency 0.13 gallon per flush urinal, wall hung, vitreous china. Manually operated 0.13 gallon per flush-flush valve.

3. Lavatory: Wall hung/countertop ADA lavatory with 0.35 GPM metering mixing faucet.

4. Sink: MAAB/ADA stainless steel countertop sink with gooseneck faucet and 0.5 GPM aerator.

5. Drinking Fountain: Barrier free hi-low wall mounted electric water cooler, stainless steel basin with bottle filling stations.

6. Janitor Sink: 24 x 24 x 10 Terrazo mop receptor Stern-Williams or equal.

7. DRAINS

A. Drains are cast iron, caulked outlets, nickaloy strainers, and in waterproofed areas and roofs shall have galvanized iron clamping rings with 6 lb. lead flashings to bond 9 in. in all directions. Drains shall be Smith, Zurn, Josam, or equal.

8. VALVES

A. Locate all valves so as to isolate all parts of the system. Shutoff valves 3 in. and smaller shall be ball valves, solder end or screwed, Apollo, or equal.

9. INSULATION

A. All water piping shall be insulated with snap-on fiberglass insulation Type ASJ-SSL, equal to Johns Manville Micro-Lok HP.

10. CLEANOUTS

A. Cleanouts shall be full size up to 4 in. threaded bronze plugs located as indicated on the drawings and/or where required in soil and waste pipes.

11. ACCESS DOORS

A. Furnish access doors for access to all concealed parts of the plumbing system that require accessibility. Coordinate types and locations with the Architect.