



# CHILDS ENGINEERING CORPORATION

34 WILLIAM WAY, BELLINGHAM, MA 02019 (508) 966-9092 FAX (508) 966-9096

May 18, 2018

Mr. William Clark  
Director of Planning and Community Development  
Town of Milton  
525 Canton Avenue  
Milton, Massachusetts 02186

RE: Results Summary Report for the Hydrographic Survey at Milton Landing and Proposed Site Improvements

Dear Mr. Clark,

As directed by your office, Childs Engineering Corporation performed a hydrographic survey of an area of the Neponset River at Milton Landing in support of the Town's proposed floating dock system and other site improvements at the landing. This letter report summarizes the hydro survey findings, and includes a preliminary discussion of the next steps required for the proposed floating dock system and land access structure, and other proposed Milton Landing improvements. The preliminary proposed landing improvements consist of the following:

- Construction of a new pile supported pier to create land access for the proposed floating dock system and to function as a storage area for crew club scull boats.
- Dredging of an area of the Neponset River to create the required water depths for the proposed floating dock system.
- Reconstruction of the deteriorated existing granite block seawall at the landing south end and backfilling the existing gravel boat ramp.
- Reconstruction of the existing concrete boat ramp/marine railway to function as a boat ramp at the north end of the landing.
- Resolving the permit status of the existing town floating dock system near the landing center.

## HYDROGRAPHIC SURVEY RESULTS

This section of the Neponset River has a maximum depth of roughly EL -5' MLLW over an approximately 25' wide channel at the center of the river. The river bottom slopes up to the east and to the west from this center channel. The MLLW contour is closest to the granite block seawall at the landing's south end. The existing Town floating dock is located almost entirely in a river section with a bottom elevation greater than EL 0' MLLW. The entrance to the boat ramp at the landing north end has a river bottom elevation of +4' MLLW. Launching and retrieving boats at the boat ramp will be limited to the highest half of the tide cycle without dredging. Please refer to the hydrographic survey drawing previously submitted to your office and included with this letter for more information.

## FLOATING DOCK

There are two permit design standards that will govern the location of the proposed floating dock; the two standards state that the dock structure may not extend more than 25% of the distance across a waterbody, and that the floating dock is installed in a location where there is an 18" clear height above the river bottom at low tide. It is recommended that the floating dock be located off the south end of the landing seawall to satisfy these permit design standards. See the enclosed sketch SK-01 for an illustration of the location for the proposed floating dock.

Based on information provided by RowAmerica, the floating dock will consist of six connected floats with a total footprint of 16' x 80'. It is recommended to anchor the floating docks with four mooring piles rather than using a bottom anchor system in order to minimize the float footprint in the constrained waterway. The floating dock shall be accessed from a 4' wide by 60' long aluminum gangway which is connected to a landside access pier. A minimum gangway length of 60' is recommended to make the gangway slope at MLW reasonable. A preliminary cost estimate for a contractor to install the floating dock, gangway, and four mooring piles is \$40,000. This estimate is based on the assumption that the mooring piles can be driven to design depth without encountering rock ledge, and the float material cost is donated by RowAmerica. This estimate does not include a contractor's mobe/demob cost. Typical mobilization costs for a marine contractor with a barge mounted crane is between \$25,000 and \$75,000.

It is recommended to locate the floating dock in water with a minimum depth of EL -3' MLLW. Based on the survey information, dredging to EL -3' with a one foot overdredge to EL -4' will be required to achieve the required water depth for the floating dock. Using the hydrosurvey plan, a rough hand calculation indicates approximately

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850 CY of sediment must be dredged to achieve an overdredge elevation of -4' MLLW around the floating dock. A preliminary cost estimate for a contractor to dredge, dewater, and dispose of the dredge sediment in a lined MA landfill is \$130,000. This estimate does not include a contractor's mobe/demob cost, and it is assumed that the dredge sediment contaminant levels are below the limits for disposal in a lined MA landfill. A dredging contractor will only be able to dredge around a high tide.

Prior to dredging, it is required by the permitting agencies to collect soil samples and have them physically and chemically tested at a MA state certified testing lab. Based on the assumed dredge sediment volume, it is estimated that two to three soil samples will be required. It is also recommended to perform two rock probes to locate the depth of rock ledge to determine whether the floating dock can be moored with driven piles without rock anchors. A preliminary cost estimate for a vibro coring contractor to obtain the sediment samples and perform rock probes is \$8,000. A preliminary cost estimate for a testing lab to analyze three sediment samples is a minimum of \$7,000. Additional sampling and testing may be required by local, state and federal permitting agencies which can total \$90,000 at the extreme high end to complete all necessary chemical testing.

## **TIMBER ACCESS PIER**

A timber pier is required to provide landside access to the floating dock and act as a connection point for the aluminum gangway to the dock. One option is to construct a 6' wide by 20' to 25' long timber access pier supported by timber piles at the seawall at the south end of the landing. Refer to the attached SK-01 for a visual representation of this option. A second option is to construct a 30' wide by 90' long timber access pier supported by timber piles at the seawall at the south end of the landing. The large timber pier will be the connection point for the gangway and also function as a storage area for the crew club rowing sculls. The timber pier dimensions shall be verified to meet the crew club needs. Refer to the attached SK-02 for a visual representation of this option.

The deteriorated existing granite block seawall at the landing south end will have to be rebuilt or replaced if it is to function as the landside access point for the timber access pier. An alternative to repairing the existing seawall is to construct the timber access pier to span over the seawall and create the landside access point inshore of the seawall. This option will require additional piles or other foundation to be installed on the land side of the seawall.

A preliminary cost estimate for a contractor to construct the smaller timber access pier is \$45,000. A preliminary cost estimate for a contractor to construct the

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larger timber access pier is \$250,000. These estimates do not include a contractor's mobe/demob cost, and these estimates are based on the assumption that the pier timber piles can be driven to design depth without encountering rock ledge.

## **SEAWALL REPAIR**

As stated above, the existing granite block seawall on the landing south end is in a deteriorated condition over approximately 90 LF and in need of repair or replacement. If the seawall is to be repaired or replaced, it is recommended to close off the existing gravel ramp and backfill the area. The reconstructed boat ramp at the landing north end will function as the boat ramp for the landing.

Constructing a new granite block seawall will be the most costly alternative for replacing the existing seawall due to the high material costs and labor costs associated with this type of work. Alternatives are to construct a steel sheet pile seawall or a steel soldier pile and concrete panel seawall. These alternative types of seawalls are functional and lower cost but are less aesthetically attractive than the granite block type design. A preliminary cost estimate for a contractor to construct 90 LF of steel sheet pile seawall is \$270,000. This estimate does not include a contractor's mobe/demob cost, and this estimate is based on the assumption that the piles can be driven to design depth without encountering rock ledge. A topographic site survey will be required for seawall repair work.

## **BOAT RAMP**

The existing boat ramp/railway is to be reconstructed to function as a standard boat ramp in order to launch and retrieve boats by truck and trailer. Based on a review of the limited site information available, it is likely the boat ramp can be reconstructed to function as a standard boat ramp by a combination of extending the inshore length of the ramp to meet the surrounding grade and by raising the existing grade of the boat ramp. Our office cannot provide a worthwhile preliminary construction cost estimate to perform this work since we do not have enough site and field information on the boat ramp to make a reasonable determination. It will be necessary to perform a site inspection and to perform a topographic survey of the boat ramp and the entire landing area in order to collect the field information required to design modifications to the existing boat ramp/railway.

Since the river bottom elevation is +4' MLLW at the boat ramp entrance, it is likely that launching and retrieving boats is limited to around high tide. To make the boat ramp functional throughout most of the tide cycle, an approach channel would have to be dredged from the center of the river where it is deepest to the boat ramp

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entrance. If the Town wishes to add this dredging work to the scope of improvements at Milton Landing, our office can provide the dredge design and permitting services for this additional work.

## **PERMITTING**

In order to conduct any dredging or other site improvements, it would be necessary to obtain local, state and federal permits. All activities would require an Order of Conditions from the Milton Conservation Commission, a Chapter 91 License from MADEP, and a General Permit from the U.S. Army Corps of Engineers. Dredging would require all these permits plus the addition of a combined Chapter 91 and 401 Water Quality permit through the MADEP. Our estimate for the length of time required to obtain the local, state, and federal permits, based on recent experience with similar jobs, is 4 months for the Order of Conditions, 9 to 12 months for the Chapter 91 license, and 6 months for the ACOE General Permit.

As we understand it, the original Chapter 91 license issued for the existing Town Floating dock at the center of the Landing was not recorded with the applicable Registry of Deeds. In accordance with 310 CMR 9.18, 9.26 and 9.27, the license will be considered void. Due to the status of the license, MADEP is within their right to require that the floating dock be removed. In order to correct this issue, the Town will have to request a hearing with the Chapter 91 program where they will determine if the structure is to be removed or what corrective measures are deemed appropriate to issue a new license. It is likely that they will not require the structure be removed but will ask that it be relicensed.

## **SUMMARY**

If the Town has interest in moving forward with any of the items discussed in this letter, additional information of the site will need to be collected prior. Geotechnical testing should be conducted at the south end of the landing to collect subsurface soil information needed for floating dock, pier and seawall design and to determine location of rock ledge. If rock ledge is encountered within 15 feet of the soil surface, rock borings should be obtained also.

Additional site information and a topographic survey of the Landing area would also be required to continue the design and permitting process for the site repair and development portions of this project. This would entail a one day site visit by two engineers. Childs Engineering is able to provide this service for a fee of \$5,150.

Prior to defining further engineering services that will be necessary for this project, it would be practical to further define the direction the Town of Milton would like

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to take based on the information we have provided in this report. Additional engineering services that would be required for this project include permitting services and design services; Childs Engineering is also able to provide contractor bidding and construction oversight. These services would vary in scale based on what options are decided on.

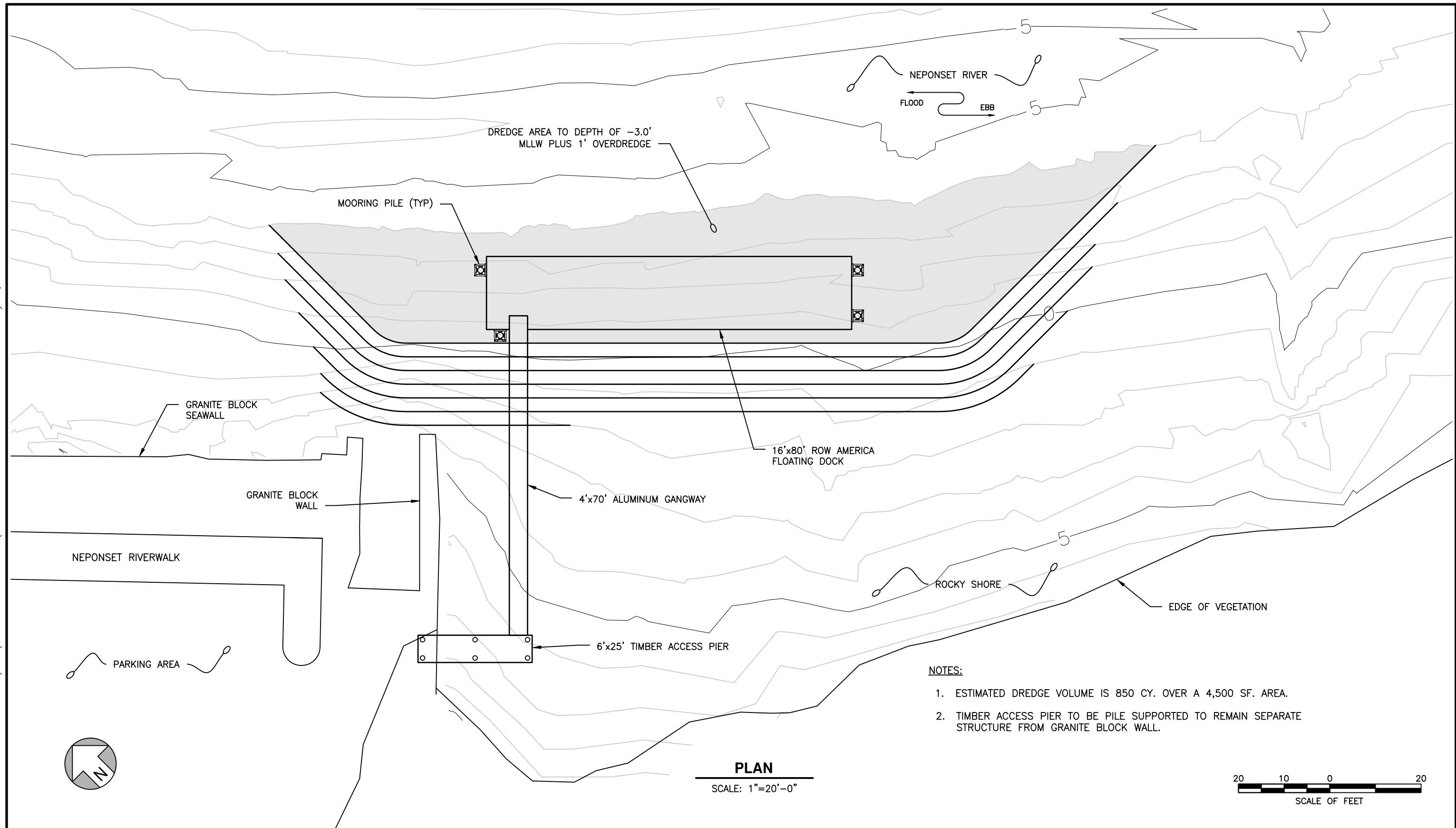
Childs Engineering is available to provide guidance on determining the best course of action for site development should you need it. If you decide to further develop this project, we are also able to deliver a proposal to provide further engineering services. If you have any questions or wish to discuss this summary report in further detail, please don't hesitate to contact me.

Respectfully submitted,

CHILDS ENGINEERING CORPORATION

*Andrew R. Nilson*

Andrew R. Nilson, P.E.  
Project Manager



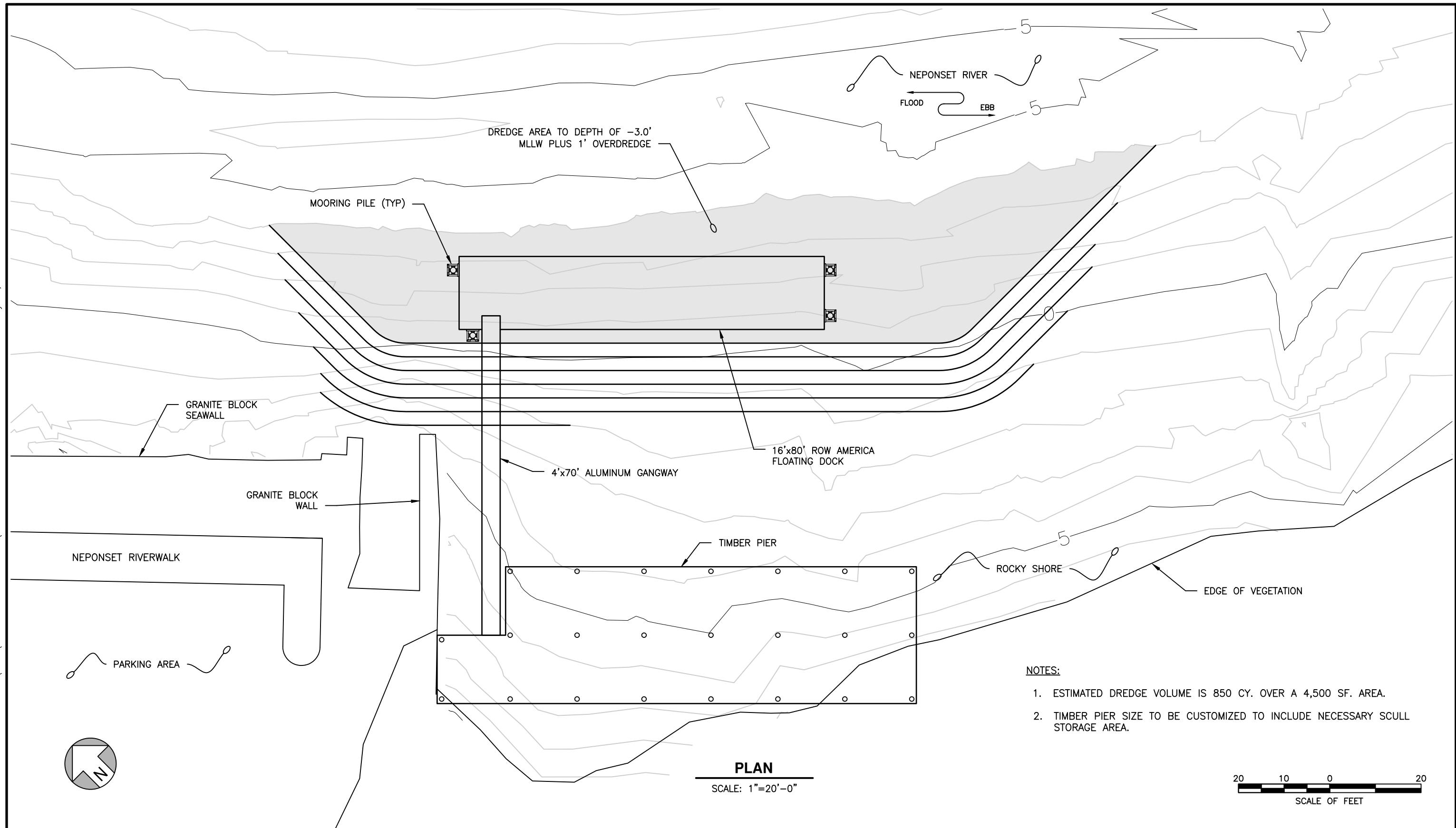
CHILDS ENGINEERING CORPORATION  
34 WILLIAM WAY, BELLINGHAM, MA 02019 U.S.A.  
Phone: (508) 966-9092 Fax: (508) 966-9096  
E-mail: mail@childsg.com

Mark	Description	Date	Appr.

Designed by:	ARN	Date:	05/17/18
Dwn by:	TEQ	Ckd by:	ARN
Reviewed by:	CMR	Design file no.	280518 SK-01
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MILTON LANDINGS  
TOWN OF MILTON  
MILTON, MA  
FLOATING DOCK  
OPTION 1

Sheet reference number:  
**SK-01**  
Sheet 1 of 1



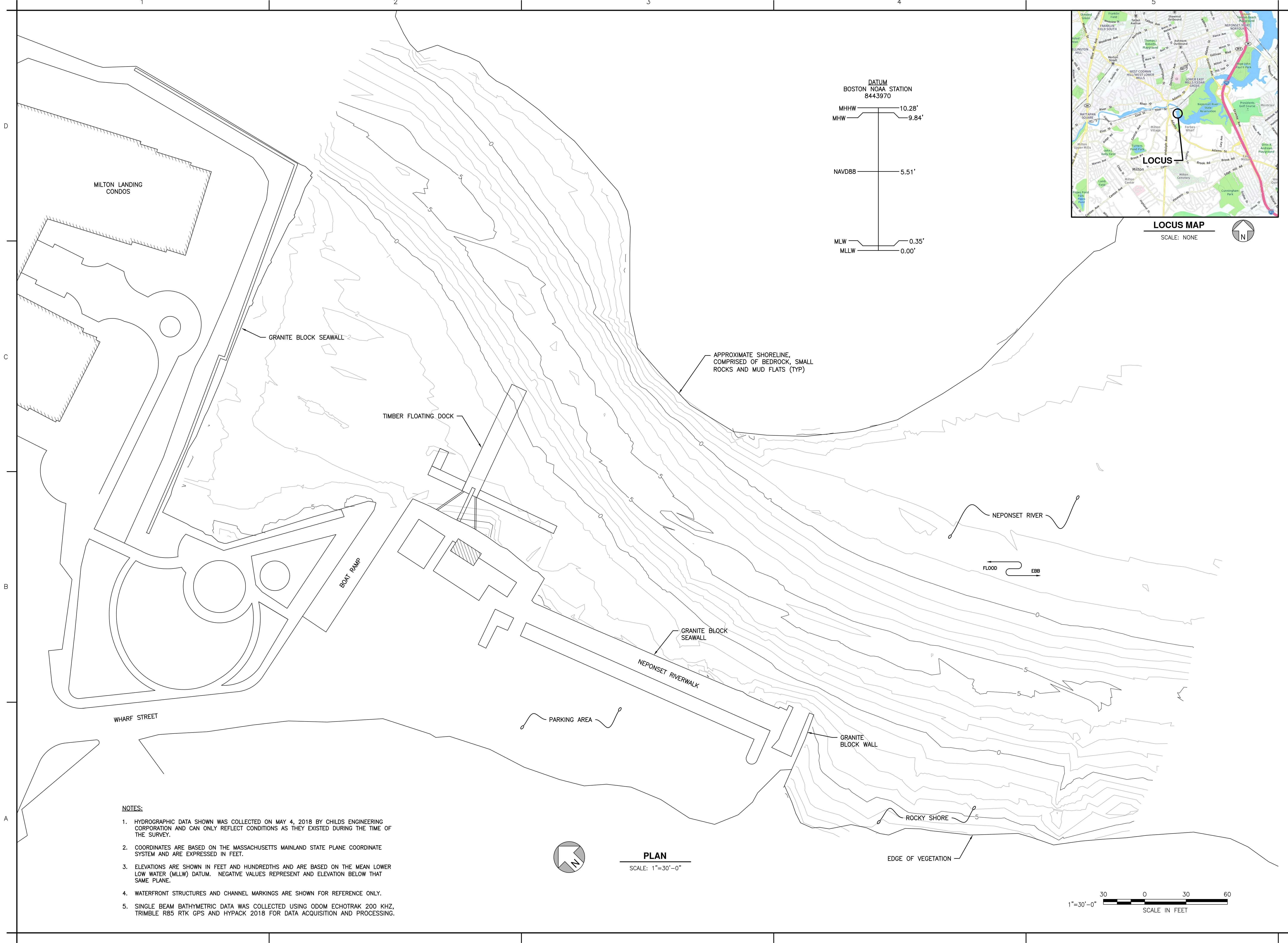
CHILDS ENGINEERING CORPORATION  
34 WILLIAM WAY, BELLINGHAM, MA 02019 U.S.A.  
Phone: (508) 966-9092 Fax: (508) 966-9096  
E-mail: [mail@childsen.com](mailto:mail@childsen.com)

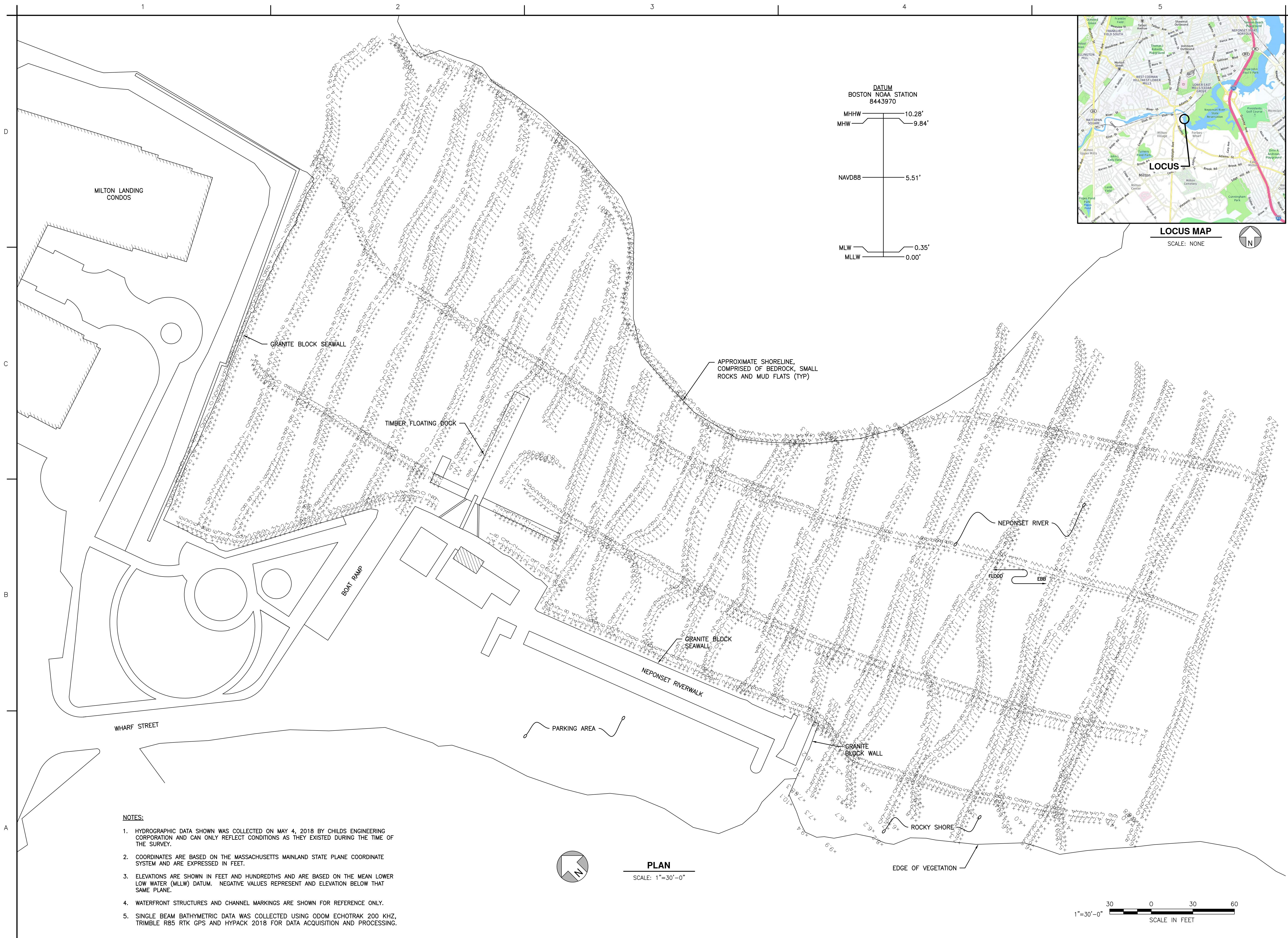
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MILTON LANDINGS  
TOWN OF MILTON  
MILTON, MA

FLOATING DOCK  
OPTION 2

Sheet  
reference  
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**SK-02**





CHILDS ENGINEERING CORPORATION  
34 WILLIAM WAY, BELINGHAM, MA 02019 U.S.A.  
Phone: (508) 966-9002  
E-mail: mail@childserg.com



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MILTON LANDINGS HYDRO	
TOWN OF MILTON, MA	
HYDROGRAPHIC SURVEY	
POINTS PLAN	

Sheet reference number:	
X-102	
Sheet 2 of 2	