



**TOWN OF CONCORD**  
**COMMUNITY PRESERVATION COMMITTEE**  
141 KEYES ROAD, CONCORD, MA 01742  
TEL. (978) 318-3290 FAX (978) 318-3291

**Application for CPA Funding**  
**Due no later than 4:00pm on Friday, September 17, 2022**

Applicant: Town of Concord - Natural Resources Division

Co-Applicant (if applicable): \_\_\_\_\_

Project Name: Warner's Pond Restoration Project

Project Location/Address: Warner's Pond (2X Warner Street)

Purpose: (Select all that apply)

Open Space       Community Housing       Historic Preservation       Recreation

Project Budget:

Amount of CPA Funds Requested: \$ 550,000

Amount from Other Funding Sources: \$ 2.5 million

Total Project Budget: \$ 4.55 million

(If multi-year project, note current phase only)

Please check which of the following is included with this Application:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> One Paragraph Project Summary *         | <input checked="" type="checkbox"/> Timeline *   |
| <input checked="" type="checkbox"/> Map (if applicable)                     | <input checked="" type="checkbox"/> Architectural plans, site plans, photographs<br>(if appropriate)                     |
| <input checked="" type="checkbox"/> Narrative *                             | <input type="checkbox"/> Copy of Audit or most recent Financial<br>Information ( <u>Non Profit Organizations Only</u> )* |
| <input checked="" type="checkbox"/> Selection Criteria and Needs Assessment | <input type="checkbox"/> Letters of Support (if any)   |
| <input checked="" type="checkbox"/> Detailed Project Budget *               |  |
| <input checked="" type="checkbox"/> Feasibility Assessment                  |  |
| <input type="checkbox"/> Statement of Sustainability (if applicable)        |  |

\* Required Documentation

The Contact Person for this Project is: Delia Kaye, Natural Resources Director

All Correspondence should be mailed to: 141 Keyes Road, Concord MA 01742

The Contact Person can be reached by phone at: 978-318-3285 or by email at: dkaye@concordma.gov

Signature of Applicant: Delia Kaye

Signature of Property Owner (if different): [Signature]

**For Historic Preservation Projects Only** – please check the box below left and acknowledge:

- I/We have read the U.S. Secretary of the Interior's Standards for the Treatment of Historic Properties and understand that planning for and execution of this project must meet these standards.

### **Brief Project Summary:**

The Warner's Pond Restoration Project seeks to improve the ecological health and recreational opportunities at Warner's Pond through a limited dredging operation, and to improve the boat launch access to better serve public access to the pond. Warner's Pond once provided recreational opportunities including swimming, fishing, boating, and ice-skating, but these uses have diminished over time due to pond eutrophication, which has also decreased the ecological health of the pond. The Warner's Pond Watershed Management Plan identified limited dredging as the most economical strategy to sustainably improve the condition of Warner's Pond.

The 2015 Warner's Pond Dredging Feasibility Analysis developed preliminary cost estimates of \$1.8 million to \$2.2 million to dredge a limited portion of the pond. The 100% design costs prepared earlier this year estimated a project cost of \$2,955,000. The project was put out to bid last month, and one bid was received in the amount of \$9.5 million. The exorbitant cost is attributed to labor shortages, increased fuel costs, and inflation. This application seeks an additional \$550,000 to supplement previously awarded CPA funding and capital funding (totaling \$2.5 million). Funds will be used for the consultant to revise the project scope, amend permits, and conduct additional design (\$50,000) and towards the construction (\$500,000). The Division anticipates seeking \$1 million in capital funding, and 2024 CPA funding (\$500,000). Funding is requested from the Open Space and Recreation categories.

Previously completed studies on the pond can be viewed at:

- [www.concordma.gov/744/Warners-Pond-Watershed-Management-Plan](http://www.concordma.gov/744/Warners-Pond-Watershed-Management-Plan)
- [www.concordma.gov/DocumentCenter/View/18566/Warners-Pond-Dredging-Feasibility-Study](http://www.concordma.gov/DocumentCenter/View/18566/Warners-Pond-Dredging-Feasibility-Study)

### **Narrative:**

Warner's Pond is a 48-acre pond in West Concord formed by the damming of Nashoba Brook in the 1800s. Positioned at the base of an extensive 47-square mile, densely developed watershed which lies almost entirely outside of Concord's borders, Warner's Pond is subject to sedimentation caused by flows from Nashoba Brook slowing down and depositing sediments into the pond, which amass to allow excessive plant growth. These accumulating nutrient-rich sediments increase plant growth and decrease oxygen levels, resulting in eutrophication of the pond.

Eutrophication of the pond has been occurring since at least the 1980s; a consequence of the dammed condition and the large watershed to pond ratio, resulting in shallower water depths more susceptible to excessive weed growth. Nuisance aquatic plants, particularly highly invasive, non-native plant species such as variable watermilfoil (*Myriophyllum heterophyllum*), fanwort (*Cabomba caroliniana*), and water chestnut (*Trapa natans*), have degraded open water habitat and impaired recreational uses. The sediment accumulation, excess nutrients in the water column, and dense growth of non-native aquatic plants have led to seriously degraded conditions in the pond over time.

These degraded conditions have diminished the ecological value of the pond with regard to its ability to support fish and wildlife populations typical of healthier open water habitats. The poor

water quality and increased weed growth are also impairing the pond's ability to serve the community with regard to recreational opportunities. Sediment accumulation and excessive plant growth have increased to the point that many areas of the pond are impassable by kayakers and canoeists.

The Town commissioned a Watershed Management Plan in 2012, which identified dredging as the most economical strategy for sustainable and long-term improvements to Warner's Pond. The Watershed Management Plan recommended a range of options for improving the ecological and recreational value of the pond, including short-term options such as herbicides and biological controls, as well as long-term options including dredging. Dredging was recommended as the primary focus for management. While dredging is expensive, it addresses multiple in-pond problems and lasts for decades. As dredging the entire 48-acre pond is not economically feasible, the Plan recommended dredging a 6.1-acre portion of the pond, specifically the area between Scout Island, Pond Street, and the Commonwealth Avenue public access points, as a feasible alternative to dredging the entire pond. This dredge area targets primarily recreational areas while leaving more ecologically sensitive areas unaltered. With the recent acquisition of the Gerow Land, the Dredging Feasibility Study also evaluated a northern dredge area to enhance the ability of the Gerow land to be used for recreational activities. See Figure 1 showing proposed dredging areas.

This project proposes to dredge areas of the pond to reestablish open water habitat to improve wildlife habitat while also providing improved recreational opportunities for swimming, boating, and fishing. Along with these recreational improvements, the pond will also continue to afford a wide range of shallow water habitat including marsh, emergent wetland, and other vegetated areas that will maintain the pond's value for associated wildlife viewing. To minimize cost and maximize benefits for the Town, some dredge material will be repositioned along the northern shore of Scout Island and revegetated with wetland plants to create a wetland shelf, which will further improve wildlife habitat in Warner's Pond.

Dredging is a reliable approach for restoring ecological and aesthetic characteristics of Warner's Pond as it will remove the nutrient-rich sediments that are causing eutrophication of the pond. Part of the Dredging Feasibility Study included identifying grant opportunities to fund this work. The Study notes that not many sources of funding specifically dedicated to dredging or pond restoration projects are available, and that they are difficult to obtain. Town Meeting appropriated \$500,000 for Warner's Pond dredging in its Capital Improvement Plan for 2021, and \$1,250,000 in FY22. CPA has awarded \$750,000 towards the project, for a total of \$2.5 million currently available. With project scope modifications, it is anticipated that a total of \$4.5 million will be needed for the project. Fortunately, this dredge project is envisioned to last at least 100 years before additional dredging might be required.

### **CPC's Selection Criteria and Needs Assessment**

This application meets the following Selection Criteria as found in the 2020 Community Preservation Plan:

- a.) **Eligibility** – Under the CPA legislation, CPA funds can be used for “*the acquisition, creation, and preservation of open space*” and for “*recreational use*”. This proposal seeks to restore Town-owned open space, thereby preserving and improving the ecological health of the pond while enhancing the recreational experience of all users of Town land, a recreational opportunity once cherished by residents.
  
- b.) **Consistency with Town-wide Planning** – Goal 1 of the 2015 Open Space and Recreation Plan (OSRP) is to protect water resources and biodiversity. The restoration of Warner’s Pond, is a specifically listed goal under this section (Goal 1C3). This project also meets several goals identified in the 2018 Comprehensive Long Range Plan. Goal 4.6 1.1 recommends financial resources be allocated to maintain and protect current open space and conservation land. Goal 4.6 2.2 recommends that the Town restore Warner’s Pond as part of the Town’s effort to protect and improve the recreational accessibility of its water resources. The proposed project also meets Goal 4.6 7.2 which recommends increasing financial resources allocated to maintain and provide programming of current open space and recreational facilities. Goal 4.6 8.2 recommends ensuring the Concord’s open space and recreation facilities are physically and financially accessible to residents and improvements or new facility projects are fiscally sound. Goal 4.6 9.4 recommends increasing accessibility to open space and Goal 4.6 9.6 advocates for providing public amenities and improved access to recreation and natural areas. And, as stated previously, this project is consistent with the recommendations identified in the 2012 Warner’s Pond Watershed Management Plan. This project will result in improved recreational opportunities not presently at the pond. Being located directly adjacent to the newly constructed Bruce Freeman Rail Trail (BFRT), improved recreational use of Warner’s Pond will also enhance use of the BFRT, not only locally but also regionally.
  
- c.) **Support by Boards, Committees, Community & Town Meeting Actions** –With the recent construction of the Bruce Freeman Rail Trail and parking area, along with the planned recreational park at the Gerow Land, there is real movement to improve recreational opportunities in this area by the community. The project has received its environmental clearance under the Massachusetts Environmental Protection Act, an Order of Conditions from the Natural Resources Commission, a DEP Water Quality Certificate and Chapter 91 License, and Army Corps of Engineers approval.
  
- d.) **Enhancement of existing Town-owned open space, recreation, historic, and/or housing assets** –This proposal enhances and improves recreational uses within Warner’s Pond, restores degraded portions of open space, and protects the historic and cultural resource of Warner’s Pond, as well as its water quality.
  
- e.) **Service of Multiple or Underserved Populations** –Town lands are public and open to all members of the community. This project will provide and/or improve recreational opportunities not presently available in West Concord. Being linked to the BFRT, these opportunities are extended to regional populations as well.
  
- f.) **CPA Purposes** – This proposal meets two of the four CPA purposes: open space preservation and recreation.

- g.) **Administrative and Financial Management** - The Division of Natural Resources has overseen several restoration projects funded by the CPA and has completed all requirements for previously-funded projects.
- h.) **Successful Implementation of Similar Projects** – Though dredging projects are not undertaken frequently, the Division is familiar with all required permitting, regularly develops bid documents for various Division projects, and oversees restoration projects on a regular basis.
- i.) **Site Control** – Warner's Pond is owned by the Town of Concord under the care and custody of the Natural Resources Commission. Dewatering and disposal will occur at the MCI Concord facility. Approval has been obtained from MCI for activities that will occur on their land.
- j.) **Financial Need** – The Division of Natural Resources manages nearly 1,500 acres of conservation land and conducts regular maintenance and small improvements through careful application of limited funds within its operating budget, summer staff, trail stewards, and volunteers. A restoration project of this magnitude is beyond the funding provided by the operating budget. Grant funding for this type of project is extremely limited and difficult to secure. The project requires specialized equipment and personnel to successfully implement and is beyond the financial resources of the Town.
- k.) **Sources of Funding** – Due to the significant funds needed to undertake this work, the Town included \$1.75 million for Warner's Pond dredging in the Capital Improvement Plan. In-kind contributions of staff time will be provided for project administration.
- l.) **Project Plan Feasibility** – The 2012 Watershed Management Plan recommends dredging as the most cost-effective, long-lasting solution to improve recreational opportunities at Warner's Pond. Conceptual plans have been developed and permits will be secured over the next year; the next steps are to obtain construction funding to implement the project.
- m.) **Urgency of Project** – Besides improving wildlife habitat, which is in severe decline, with the recent construction of the BFRT and acquisition of the Gerow land, dredging is the first step to greatly improve recreational use of this underutilized resource in West Concord.
- n.) **Maintenance Provisions** – Benefits from this undertaking are projected to last 100 years before additional dredging might be required.
- o.) **Permanent Restriction** – No permanent restriction is needed as part of this project
- p.) **Reimbursement** – This proposal does not seek reimbursement of previously appropriated funds.

- q.) **Incorporation of Sustainable Design Features** – This project proposes restoration of an environment impaired by past and present human activity. To conserve fuel required to transport dredge material from the site, we worked with MCI Concord who agreed to allow us to use their adjacent farm field temporarily to dewater dredge material. Following dewatering, MCI has agreed to accept the dredge material to amend their agricultural soils. This public-private partnership greatly reduces energy consumption to transport material, allows dewatering activities to occur within the same watershed, and reusing dredge material to enhance local agricultural soils. Reusing some of the dredged material to create wildlife shelves within Warner's Pond further reduces impacts on the environment and energy costs associated with undertaking this project.
- r.) **Four Sustainability Principles** – Proposed work entails reversing human impacts on Warner's Pond in an environmental sound manner.
- s.) **Local Qualified Vendors** – The Town will adhere to state bidding rules, and will award projects to local bidders where it is legal and feasible to do so.
- t.) **Normal CPC Schedule** - This proposal does not request the CPC to act outside their normal schedule.
- u.) **Land Acquisition Projects** – N/A.

**Attachments:**

- Figure 1: Warner's Pond Project Locus and Dredge Areas
- 100% Design Construction Cost Estimate
- Dredging Plans for Warner's Pond prepared by ESS Group, dated May 2018



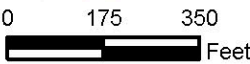
**Warner's Pond Dredging Feasibility Assessment**  
Concord, Massachusetts

**Warner's Pond Project Locus and Dredge Areas**

1 inch = 350 feet

Source: 1) MassGIS, Ortho Imagery, 2013

Dredge areas



**Figure 1**

Ref #	Description	Control		\$/Unit with Material, Labor, Equip, Overhead, & Profit	Time Factor (TF)	Item Total	Notes
		Quantity	Unit			\$ Total Cost	
<b>Site Preparation</b>							
1.01	Install construction entrances	18	BCY	\$19.41	1.00	\$343	4
1.02	Install temporary access roads	1298	SY	\$20.99	1.00	\$27,251	2
1.03	Install perimeter controls	3091	LF	\$6.10	1.00	\$18,851	4
1.04	Provide office trailer	1	EA	\$1,953.52	1.00	\$1,954	4
1.06	Dust control	30	day	\$1,180.05	1.00	\$35,401	2
<b>Commonwealth Avenue Access Improvements</b>							
2.01	Remove existing asphalt pavement	250	LF	\$1.57	1.00	\$393	4
2.02	Provide and install gravel	93	BCY	\$30.53	1.00	\$2,826	4
2.03	Excavate grassed channel	14	BCY	\$20.43	1.00	\$281	4
2.04	Seed grassed channel	83	SY	\$8.17	1.00	\$676	4
2.05	Install parking sign	1	EA	\$249.77	1.00	\$250	4
2.06	Install parking block	1	EA	\$153.23	1.02	\$157	1,4
2.07	Excavate 6 in. sand	7	BCY	\$20.43	1.00	\$137	4
2.08	Install cedar logs	68	VLF	\$43.45	1.00	\$2,954	2
2.09	Backfill 6 in. clean 3/4 in. gravel	7	BCY	\$80.00	1.00	\$538	4
2.10	Invasives species treatment and removal	877	SY	\$8.17	1.02	\$7,317	1,3
<b>Dewatering Area</b>							
3.01	Provide and install dewatering area perimeter controls	1,881	LF	\$11.24	1.02	\$21,593	1,4
3.02	Install jersey barriers	2,069	LF	\$166.35	1.02	\$351,620	1,4
3.03	Install sump	392	BCY	\$35.75	1.00	\$14,008	4
3.04	Install crushed stone in sump	392	BCY	\$30.53	1.00	\$11,963	4
3.05	Provide and install sediment filter bags	30	EA	\$102.16	1.04	\$3,198	1,4
3.06	Install perimeter dewatering drain	302	CF	\$35.75	1.00	\$10,806	4
3.07	Provide and install geomembrane and key into trench	225,087	SF	\$0.60	1.00	\$135,052	3
3.08	Provide and install geotextile tubes	5,493	LF	\$30.39	1.02	\$170,540	1,3
3.09	Provide and install inlet and outflow pipes	181	EA/Month	\$260.03	1.00	\$47,117	2
<b>Dredging and Wetland Shelf Creation</b>							
4.01	Pre-dredge surveys	1	LS	\$2,860.38	1.02	\$2,922	1,4
4.02	Install turbidity curtains	1,692	LF	\$30.07	1.02	\$51,984	1,4
4.03	Install wetland shelf perimeter controls	833	LF	\$6.10	1.00	\$5,080	4
4.04	Dredge north dredge area to final grades and pump to wetland/shelf/geotubes	4,970	BCY	\$22.72	1.00	\$112,916	2
4.05	Dredge south dredge area to final grades and pump to geotubes	30,800	BCY	\$22.72	1.00	\$699,763	2

Ref #	Description	Control		\$/Unit with Material, Labor, Equip, Overhead, & Profit	Time Factor (TF)	Item Total	Notes
		Quantity	Unit			\$ Total Cost	
4.06	Debris removal	10	Ton	\$112.45	1.02	\$1,149	1,3
4.07	Segregate potentially contaminated south dredge area sediment	646	LCY	\$15.32	1.04	\$10,330	1,4
4.08	Post-dredge surveys	1	LS	\$2,860.38	1.02	\$2,922	1,4
4.09	Sample and test potentially contaminated sediment	7	EA	\$1,225.88	1.02	\$8,766	1,4
4.10	Load & transport contaminated sediment	630	Ton	\$112.37	1.00	\$70,794	4
4.11	Dispose contaminated sediment	630	Ton	\$36.78	1.02	\$23,669	1,4
4.12	Load dewatered sediment	32,865	LCY	\$14.61	1.02	\$490,521	1,3
4.13	Transport dewatered sediment to Dredge Material Disposal Site	102,539	CY/mile	\$0.80	1.00	\$81,705	2
4.14	Place dewatered sediment at Dredge Material Disposal Site	32,865	LCY	\$1.90	1.00	\$62,447	2
4.15	Load C&D Waste	1,870	CY	\$27.06	1.00	\$50,606	2
4.16	Transport C&D Waste	7,480	CY/mile	\$0.80	1.00	\$5,960	2
4.17	Dispose C&D Waste	1,989	SY	\$10.22	1.00	\$20,315	4
<b>Restoration</b>							
5.01	Provide and install plants for wetland shelf	12,700	EA	\$2.19	1.00	\$27,764	5
5.02	Install herbivory protection	51,516	SF	\$0.25	1.00	\$12,705	2,3
5.03	Provide restoration seed mix	79	LB	\$18.39	1.00	\$1,461	5
5.04	Provide wildflower seed mix	4	LB	\$75.00	1.00	\$312	5
5.05	Seed areas of invasive management	877	SY	\$2.55	1.02	\$2,287	1,4
<b>Sub-Total</b>						<b>\$2,612,000</b>	
5.01	Mobilization/Demobilization	10%	-	-	-	\$261,000	-
5.02	Insurance	0.64%	-	-	-	\$16,700	-
5.03	Performance Bond	2.50%	-	-	-	\$65,000	-
<b>Construction Subtotal</b>						<b>\$2,955,000</b>	
<b>TOTAL</b>						<b>\$2,955,000</b>	
<b>10%</b>						<b>\$3,250,500</b>	
<b>Notes</b>							
1. Costs adjusted with time factor (TF) to 2022 to account for inflation using the RSMeans Historical Cost Index. The adjustment factor from 2020 to 2021 was used (1.02156334) assuming the adjustment rate will be similar. 2. Cost from RSMeans Site Work & Landscape Cost Data for Year 2022. Accessed online with adjustment for Lowell, Massachusetts. 3. Cost from EA prior project experience. 4. Cost from Rhode Island Department of Transportation Weighted Average Unit Prices 2022, 2021, and 2020. 5. Cost from New England Wetland Plants, Inc. website, accessed 2022.							



PROJECT INFORMATION

SITE LOCATION:
2X WARNER STREET
CONCORD, MA 01742
MAP 8D PARCEL 2017
PID 1392

CLIENT:
TOWN OF CONCORD
DIVISION OF NATURAL RESOURCES
141 KEYES ROAD
CONCORD, MASSACHUSETTS 01742

ENGINEER:
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC
301 METRO CENTER BLVD, SUITE 102
WARWICK, RHODE ISLAND 02886
401-736-3440

DATUM:
HORIZONTAL: MA-83F
VERTICAL: NAVD88

CONTRACTOR:
TBD

MAP NOTES AND REFERENCES

- 1. ALL ELEVATIONS REFERENCE NORTH AMERICAN VERTICAL DATUM (NAVD) 88 AND ARE IN US SURVEY FEET. BATHYMETRIC SURVEY WAS PERFORMED BY ESS GROUP USING WATER DEPTH MEASUREMENTS COLLECTED IN THE FIELD ON 10 AUGUST 2017 AND IN 2011 AND THEN GENERATING CONTOURS USING AUTOCAD CIVIL 3D. COORDINATES ARE IN US SURVEY FEET AND IN THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM 1983/2011 (NAD-83). BATHYMETRIC SURVEY CAN ONLY BE CONSIDERED TO REPRESENT CONDITIONS EXISTING AT THAT TIME. THE WATER SURFACE ELEVATION AT THE TIME OF FIELD MEASUREMENTS ON 10 AUGUST 2017 WAS 116.5 FEET.
2. ADDITIONAL EXISTING TOPOGRAPHY WAS PROVIDED BY ESS GROUP FROM MASSACHUSETTS LIDAR.
3. ADDITIONAL BATHYMETRIC POINTS WERE SURVEYED WITHIN THE AREA OF THE PROPOSED WETLAND SHELF BY EA ON 22 SEPTEMBER 2021 USING WATER DEPTH MEASUREMENTS COLLECTED IN THE FIELD. THE WATER SURFACE ELEVATION AT THE TIME OF FIELD MEASUREMENTS ON 22 SEPTEMBER 2021 WAS 116.6 FEET.
4. THE 100 YEAR AND 500-YEAR FLOODPLAIN BOUNDARIES ARE SOURCED FROM OLIVER: MASSGIS ONLINE MAPPING TOOL AND WERE ACCESSED 19 OCTOBER 2021. THE SITES FALLS IN ZONE AE AS DELINEATED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) IN MAP PANEL 25017C0359F EFFECTIVE 7 JULY 2014.
5. NATIONAL HERITAGE AREA ZONES, VERNAL POOLS, AND PROPERTY BOUNDARY LINES ARE APPROXIMATE ONLY AND WERE SOURCED FROM OLIVER: MASSGIS ONLINE MAPPING TOOL AND WERE ACCESSED 19 OCTOBER 2021. WETLAND RESOURCES WERE DELINEATED IN THE FIELD BY EA IN THE FIELD ON 22 SEPTEMBER 2021 AND 1 NOVEMBER 2021.

CONSTRUCTION NOTES

- 1. THE PROJECT SITE IS ADJACENT TO A NATURAL HERITAGE AREA AS SHOWN IN THE "DREDGE MANAGEMENT PLAN." NO PROJECT WORK IS PROPOSED WITHIN THE NATURAL HERITAGE AREA.
2. THE CONTRACTOR SHALL CHECK AND VERIFY THE LOCATIONS OF ALL UTILITIES, BOTH OVERHEAD AND UNDERGROUND, AND "DIG-SAFE" MUST BE NOTIFIED PRIOR TO COMMENCING ANY CONSTRUCTION OPERATIONS. RESTORATION AND REPAIR OF DAMAGE TO EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR WITH NO ADDITIONAL COST TO THE OWNER. NO EXCAVATION SHALL COMMENCE UNTIL ALL INVOLVED UTILITY COMPANIES AND/OR TOWN WHOSE FACILITIES MIGHT BE AFFECTED BY ANY WORK TO BE PERFORMED BY THE CONTRACTOR ARE NOTIFIED AT LEAST 72 HOURS IN ADVANCE.
3. PROJECT OBJECTIVE IS TO DREDGE 35,770 CY OF ACCUMULATED SOFT SEDIMENT WITHIN PROJECT LIMITS AND CREATE A WETLAND SHELF ON THE NORTH SIDE OF SCOUT ISLAND. CONTOURS SHOWN ARE APPROXIMATE AND ARE DRAWN TO PROVIDE IN A DREDGE VOLUME OF APPROXIMATELY 35,770 CY WITH A FILL VOLUME OF APPROXIMATELY 4,470 CY.
4. CONTRACTOR IS REQUIRED TO PERFORM A NEW BATHYMETRIC SURVEY PRIOR TO DREDGING THAT WILL ESTABLISH PRECONSTRUCTION CONDITIONS AND BE USED TO CALCULATE DREDGE QUANTITIES FOR PAYMENT.
5. SEDIMENT DEWATERING IS PROPOSED TO OCCUR IN THE LOCATION SHOWN ON SHEET C-106, OUTSIDE OF THE 200-FOOT RIVERFRONT AREA AND THE 100-YEAR FLOODPLAIN.
6. THE PROJECT LIMITS OF DISTURBANCE IDENTIFIED ON THE DRAWINGS MAY BE MODIFIED TO MEET FIELD CONDITIONS. THE ENGINEER, AND APPLICABLE REGULATORY AUTHORITIES SHALL REVIEW AND APPROVE ANY REQUESTED CHANGES TO THE LOD PRIOR TO THE CONTRACTOR UNDERTAKING ANY WORK OUTSIDE THE LOD.
7. THE CONTRACTOR, UNDER THE DIRECTION OF THE ENGINEER, SHALL ESTABLISH CONSTRUCTION LIMITS ON THE SITE USING ACCEPTABLE VISUAL MARKERS. ALL WORK AND EQUIPMENT SHALL BE CONFINED TO WITHIN THESE LIMITS UNLESS OTHERWISE SPECIFICALLY AUTHORIZED.
8. NO CHANGES ARE TO BE MADE UNLESS AUTHORIZED BY THE ENGINEER AND/OR APPLICANT/OWNER.
9. THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO PROTECT ALL WALKS, STREETS, PAVEMENTS, HIGHWAY GUARDS, CURBING, EDGING, TREES AND PLANTINGS, ETC. ON AND OFF THE PREMISES, AND SHALL REPAIR AND REPLACE OR OTHERWISE MAKE GOOD AT HIS/HER OWN EXPENSE AS REQUIRED BY THE ENGINEER ANY ITEMS DAMAGED AS A RESULT OF THE CONTRACTOR'S WORK.
10. THE CONTRACTOR SHALL DISPOSE OF ALL RUBBISH AND DEBRIS IN ACCORDANCE WITH THE SPECIFICATIONS AND ALL APPLICABLE CODES AND REGULATIONS. THE CONTRACTOR SHALL LEAVE THE PROJECT SITE IN A SAFE AND CLEAN CONDITION AT THE COMPLETION OF SITE WORK.
11. CONSTRUCTION SEQUENCE SHALL BE COORDINATED TO MINIMIZE DISTURBANCE OF EXISTING CONDITIONS AND OPERATIONS.
12. ALL NECESSARY FEES AND CONSTRUCTION PERMITS SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR.
13. TYPICAL SIDE SLOPES FOR SAND IN STILL WATER RANGES FROM 15 TO 20 DEGREES. SEDIMENT WITHIN THE POND IS CHARACTERIZED AS MEDIUM FINE SAND AND IS PROPOSED TO BE DREDGED OR PLACED WITH SIDE SLOPES OF 3H:1V OR 18 DEGREES. SOME SLOUGHING OF SEDIMENT IS EXPECTED TO OCCUR.

SEDIMENTATION AND EROSION CONTROL NOTES

- 1. DISTURBANCE OF SOIL SURFACES IS REGULATED BY STATE LAW AND LOCAL ORDINANCE. ALL WORK SHALL COMPLY WITH THE FOLLOWING CRITERIA AND ISSUED PERMIT CONDITIONS TO PREVENT OR MINIMIZE SOIL EROSION.
2. THE INSTALLATION AND MAINTENANCE OF EROSION CONTROL DEVICES IS THE RESPONSIBILITY OF THE CONTRACTOR. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES THE CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLAN. ALL EROSION CONTROL DEVICES SHALL BE MAINTAINED IN EFFECTIVE CONDITION DURING CONSTRUCTION.
3. EXISTING VEGETATION SHALL BE PROTECTED. ALL DISTURBED AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AND CONTOUR, UNLESS OTHERWISE INDICATED ON THE PLANS. THE CONTRACTOR SHALL TAKE SPECIAL CARE WITH THEIR CONSTRUCTION METHODS AND SHALL COMPLY WITH THE FOLLOWING GUIDELINES.
4. SEDIMENTATION CONTROL - ALL AREAS SHALL BE PROTECTED FROM SEDIMENTATION DURING AND AFTER CONSTRUCTION, PARTICULARLY THE STORAGE OF EXCAVATED OR STOCKPILED MATERIAL. WHERE TEMPORARY GRADING IS PROPOSED AT THE SEDIMENT DEWATERING AREA, TOPSOIL WILL BE STRIPPED AND STOCKPILED SEPARATELY FROM SUBSOIL. EACH STOCKPILE MUST BE ADEQUATELY RINGED WITH SEDIMENT CONTROL MATERIAL (I.E. HAY BALES AND/OR FILTER FABRIC ROLL).
5. DEBRIS AND OTHER WASTE RESULTING FROM EQUIPMENT MAINTENANCE AND CONSTRUCTION SHALL BE DISPOSED OFFSITE AT A PERMITTED FACILITY.
6. MINIMIZE SOIL EXPOSURE DURING CONSTRUCTION. AFTER CONSTRUCTION, GRADE, RESPREAD TOPSOIL, AND STABILIZE SOIL BY SEEDING AND MULCHING TO PREVENT EROSION.
7. SOILS TO BE STOCKPILED FOR A PERIOD OF MORE THAN 30 DAYS SHALL BE SURROUNDED BY EROSION CONTROLS AND TEMPORARILY SEEDED AND MULCHED.
8. PERMANENT SEEDING SHALL OCCUR BETWEEN 1 MARCH AND 15 JUNE OR BETWEEN 15 AUGUST AND 15 OCTOBER.
9. TEMPORARY STORAGE OF MATERIALS ON-SITE SHALL BE LOCATED GREATER THAN 100 FEET FROM WETLAND AREAS.
10. THE SITE SHALL BE LEFT IN A STABLE CONDITION AT THE COMPLETION OF EACH WORK DAY.
11. ALL SEDIMENTATION AND EROSION CONTROL DEVICES SHALL BE INSPECTED DURING CONSTRUCTION ON A DAILY BASIS AND FOLLOWING ALL STORMS BY THE CONTRACTOR. THE CONTRACTOR SHALL MAINTAIN AND MAKE REPAIRS AND REMOVE SEDIMENT AS REQUESTED BY THE CONTRACTOR. THIS WORK SHALL BE PERFORMED WITHIN 24 HOURS OF REQUEST.
12. THE CONTRACTOR SHALL CLEAN OUT SEDIMENT AND DEBRIS FROM ALL DRAINAGE STRUCTURES AT THE COMPLETION OF CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ALL ERODED AREAS AND ENSURE GOOD STAND OF TURF IS ESTABLISHED THROUGHOUT. THE CONTRACTOR SHALL REPAIR ALL ERODED OR DISPLACED RIPRAP AND CLEAN SEDIMENT COVERED STONES.

MAINTENANCE NOTES

- 1. GRASSED CHANNEL
a. INSPECT SEMI-ANNUALLY THE FIRST YEAR. INSPECT THE GRASS FOR GROWTH AND THE SIDE SLOPES FOR SIGNS OF EROSION AND FORMATION OF RILLS AND GULLIES. PLANT AN ALTERNATIVE GRASS SPECIES IF THE ORIGINAL GRASS COVER IS NOT SUCCESSFULLY ESTABLISHED. IF GRASS GROWTH IS IMPAIRED BY WINTER ROAD SALT OR OTHER DEICER USE, RE-ESTABLISH THE GRASS IN THE SPRING.
b. REMOVE ACCUMULATED TRASH AND DEBRIS PRIOR TO MOWING. SET THE MOWER BLADES NO LOWER THAN 3 TO 4 INCHES ABOVE THE GROUND. DO NOT MOW BENEATH THE DEPTH OF THE DESIGN FLOW DURING THE STORM ASSOCIATED WITH THE WATER QUALITY EVENT. MOW ON AN AS-NEEDED BASIS DURING THE GROWING SEASON SO THAT THE GRASS HEIGHT DOES NOT EXCEED 6 INCHES.
c. CHECK ON A YEARLY BASIS AND CLEAN AS NEEDED. USE HAND METHODS (I.E. A PERSON WITH A SHOVEL) WHEN CLEANING TO MINIMIZE DISTURBANCE TO VEGETATION AND UNDERLYING SOILS. SEDIMENT BUILD-UP IN THE GRASS CHANNEL REDUCES ITS CAPACITY TO TREAT AND CONVEY THE WATER QUALITY EVENT, 2-YEAR AND 10-YEAR 24-HOUR STORM.
2. HAY BALES
a. HAY BALES SHOULD BE KEPT CLEAN AND FREE OF DEBRIS TO FACILITATE FLOW.
b. EACH BALE SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR REBARS DRIVEN THROUGH THE BALE. THE FIRST STAKE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
c. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

ABBREVIATIONS

Table with 2 columns: Abbreviation and Description. Includes terms like ACRES, APPROXIMATELY, AMERICAN SOCIETY FOR TESTING AND MATERIALS, BOTTOM OF CURB, BUILDING, BOTTOM OF WALL, CABLE TELEVISION, CENTER LINE, CORRUGATED METAL PIPE, COMMUNICATIONS, CONCRETE, CUBIC YARDS, DRAINAGE AREA, DIAMETER, DEPARTMENT OF TRANSPORTATION, ELEVATION, ENVIRONMENTAL CONCEPT PLAN, U.S. ENVIRONMENTAL PROTECTION AGENCY, SOIL EROSION AND SEDIMENT CONTROL, ENVIRONMENTAL SITE DESIGN, EXISTING, FEDERAL EMERGENCY MANAGEMENT AGENCY, FENCE LINE, FEET, FEET BELOW GROUND SURFACE, GLOBAL POSITIONING SERVICE, INVERT, MEAN HIGH WATER, MEAN LOW WATER, MEAN SEA LEVEL, NOT APPLICABLE, NORTH AMERICAN DATUM OF 1983, NORTH AMERICAN VERTICAL DATUM OF 1988, NATIONAL GEODETIC SURVEY, NUMBER, NATIONAL RESOURCE CONSERVATION SERVICE, OVERHEAD, PROPOSED, REINFORCED CONCRETE PIPE, REAL-TIME KINEMATIC, SCHEDULE, STORM DRAIN, SANITARY SEWER, SQUARE FEET, STORMWATER MANAGEMENT, STORMWATER POLLUTION PREVENTION PLAN, TOP OF CURB, TOP OF WALL, TYPICAL, UNDERGROUND, UNITED STATES, U.S. ARMY CORPS OF ENGINEERS, U.S. DEPARTMENT OF AGRICULTURE, U.S. GEOLOGICAL SURVEY, WITH, WATER SURFACE ELEVATION.

LIST OF APPLICABLE PERMITS

- 1. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL SAFETY CODES, REGULATIONS, LEGAL REQUIREMENTS, PERMIT CONDITIONS, ETC.
2. ORDER OF CONDITIONS UNDER THE MASSACHUSETTS WETLANDS PROTECTION ACT AND CONCORD WETLANDS BYLAW; 137-1585
3. CHAPTER 91 LICENSE AND PERMIT UNDER THE MASSACHUSETTS PUBLIC WATERFRONT ACT; 21-WW01-0007-APP
4. 401 WATER QUALITY CERTIFICATION UNDER THE MASSACHUSETTS CLEAN WATERS ACT; 21-WW10-0015, 21-WW08-0007
5. MASSACHUSETTS GENERAL PERMIT AUTHORIZATION UNDER SECTION 404 OF THE FEDERAL CLEAN WATER ACT; NAE-2019-00744
6. CONSTRUCTION GENERAL PERMIT AUTHORIZATION UNDER SECTION 402 OF THE FEDERAL CLEAN WATER ACT (NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM).
7. CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS ON THE ENVIRONMENTAL NOTIFICATION FORM UNDER THE MASSACHUSETTS ENVIRONMENTAL POLICY ACT; 15997

LEGEND

Table with 3 columns: Description, Existing, Proposed. Includes symbols for PROPERTY BOUNDARY, SITE CONTOUR, SITE EDGE OF WATER, SITE STREAM CHANNEL, NAT. HERITAGE PRIORITY HABITAT, SITE FEMA FLOODWAY, SITE FEMA 100-YEAR FLOODPLAIN, SITE FEMA 500-YEAR FLOODPLAIN, 200 FOOT RIVERFRONT AREA, WETLANDS LINE AND FLAG, 25 FOOT NO DISTURB ZONE, 50 FOOT NO BUILD ZONE, 100 FOOT WETLAND BUFFER, HAY BALES, HAY BALES/SILT FENCE, HIGH WATER MARK, BORDERING VEGETATED WETLAND, ESC LIMIT OF DISTURBANCE, ESC COIR LOG, ESC SILT FENCE, ESC TURBIDITY CURTAIN, TEMP. CONSTRUCTION ENTRANCE.

LEGEND

Table with 3 columns: Description, Existing, Proposed. Includes symbols for PLAN NORTH ARROW, PLAN NUMBER CALLOUT, PLAN KEYNOTE CALLOUT, PLAN REVISION CALLOUT, PLAN STRUCTURE NAME/NUMBER, PLAN SECTION CUT VIEW BEGIN, PLAN SECTION CUT VIEW END.

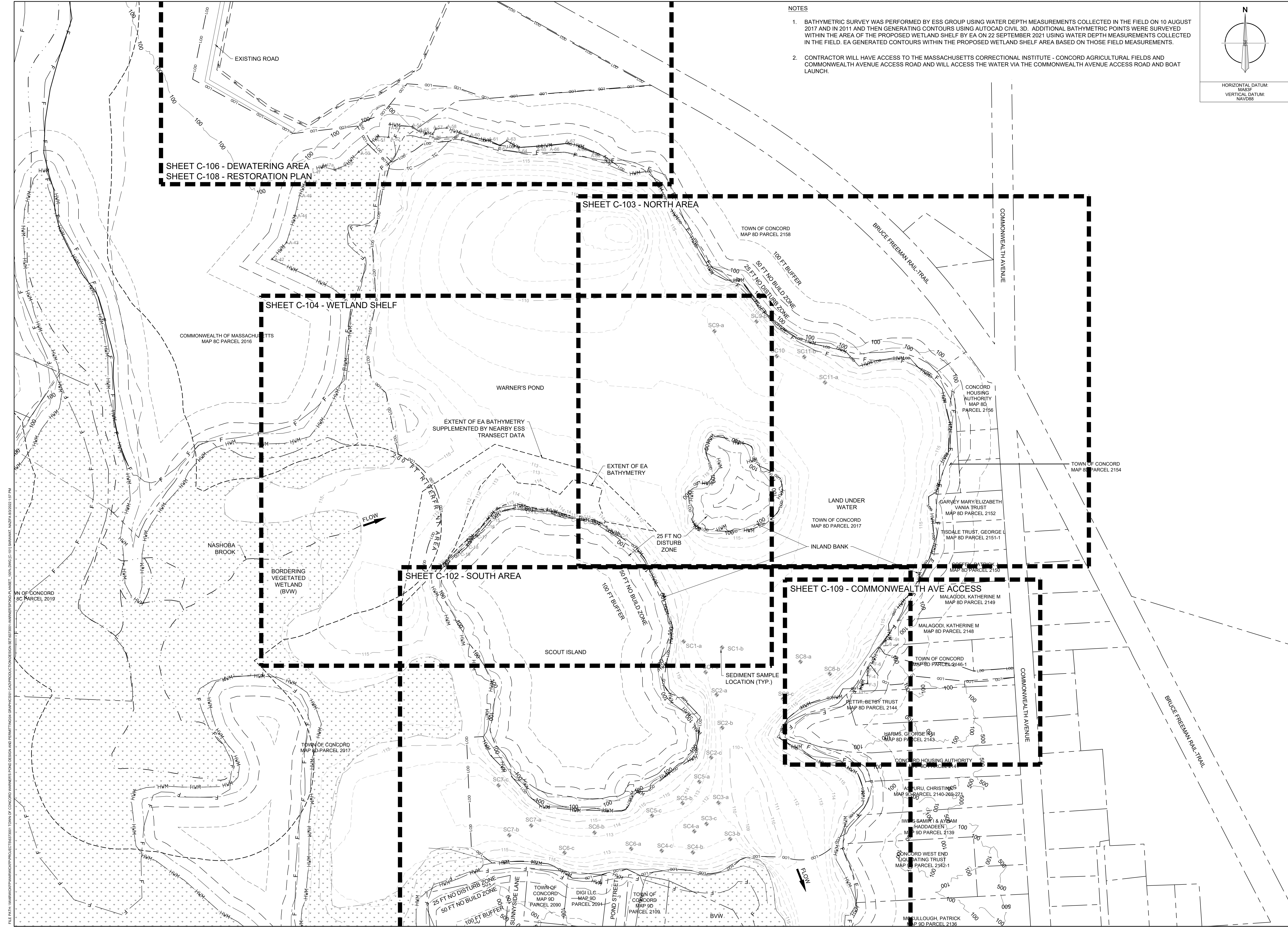
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REVISIONS table with columns: NO., DATE, BY, DESCRIPTION. Includes a circular seal of the Commonwealth of Massachusetts and a signature.

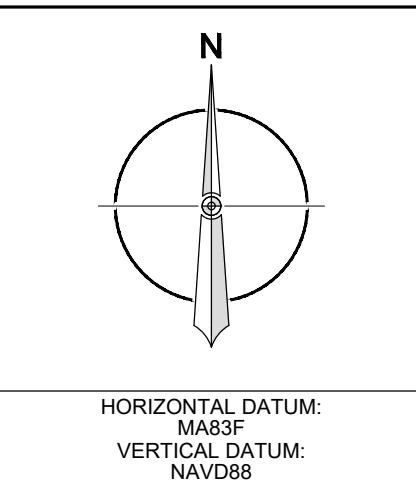
TOWN OF CONCORD
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CONCORD, MASSACHUSETTS
GENERAL NOTES AND LEGEND

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G-002
SHEET: 2 OF 13

100% PLANS - FOR CONSTRUCTION



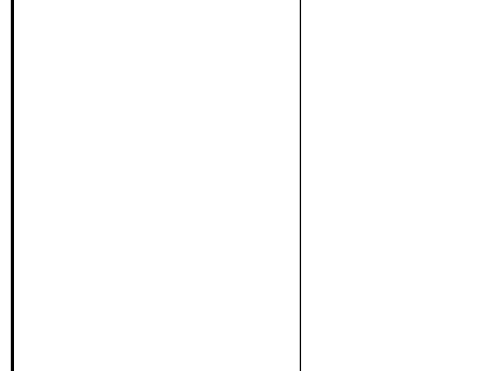
- NOTES
- BATHYMETRIC SURVEY WAS PERFORMED BY ESS GROUP USING WATER DEPTH MEASUREMENTS COLLECTED IN THE FIELD ON 10 AUGUST 2017 AND IN 2011 AND THEN GENERATING CONTOURS USING AUTOCAD CIVIL 3D. ADDITIONAL BATHYMETRIC POINTS WERE SURVEYED WITHIN THE AREA OF THE PROPOSED WETLAND SHELF BY EA ON 22 SEPTEMBER 2021 USING WATER DEPTH MEASUREMENTS COLLECTED IN THE FIELD. EA GENERATED CONTOURS WITHIN THE PROPOSED WETLAND SHELF AREA BASED ON THOSE FIELD MEASUREMENTS.
  - CONTRACTOR WILL HAVE ACCESS TO THE MASSACHUSETTS CORRECTIONAL INSTITUTE - CONCORD AGRICULTURAL FIELDS AND COMMONWEALTH AVENUE ACCESS ROAD AND WILL ACCESS THE WATER VIA THE COMMONWEALTH AVENUE ACCESS ROAD AND BOAT LAUNCH.



REVISIONS		DESCRIPTION	
NO.	DATE	BY	

DESIGNED BY:	AP
DRAWN BY:	DPA
CHECKED BY:	AEH
PROJECT MANAGER:	AP



**TOWN OF CONCORD**  
**WARNER'S POND RESTORATION PROJECT**  
 CONCORD, MASSACHUSETTS  
**EXISTING CONDITIONS PLAN**

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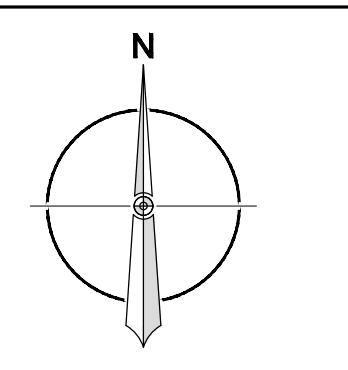
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 SHEET: 3 OF 13

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- NOTES**
- TOTAL SURFACE AREA TO BE DREDGED FROM SOUTH DREDGE AREA IS 226,710 SF. TOTAL VOLUME TO BE DREDGED FROM SOUTH DREDGE AREA IS 30,800 CY OF DREDGE MATERIAL.
  - TURBIDITY BARRIER TO BE USED AROUND ALL ACTIVE DREDGING
  - AN ELEVATED CONCENTRATION OF ARSENIC HAS BEEN DETECTED WITHIN THE POTENTIALLY CONTAMINATED SEDIMENT DREDGING AREA SHOWN (17,500 SF). TOTAL VOLUME TO BE DREDGED FROM POTENTIALLY CONTAMINATED SEDIMENT DREDGING AREA IS 646 CY. MATERIAL DREDGED FROM WITHIN THE POTENTIALLY CONTAMINATED SEDIMENT DREDGING AREA SHALL BE SEGREGATED FROM ALL OTHER SEDIMENT AND DEWATERED IN A MANNER THAT PREVENTS CONTAMINATION FROM SPREADING.



REVISIONS		DESCRIPTION
NO.	DATE	BY

DESIGNED BY:	AP
DRAWN BY:	DPA
CHECKED BY:	AEH
PROJECT MANAGER:	AP

**TOWN OF CONCORD**  
**WARNER'S POND RESTORATION PROJECT**  
CONCORD, MASSACHUSETTS  
**PROPOSED DREDGING PLAN - SOUTH AREA**



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FULL SIZE PLOT: 24" x 36"  
DATE: AUGUST 2022  
PROJECT NUMBER: 6373001  
**C-102**  
SHEET: 4 OF 13

100% PLANS - FOR CONSTRUCTION

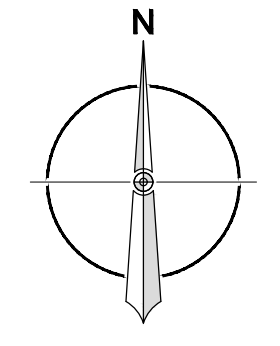
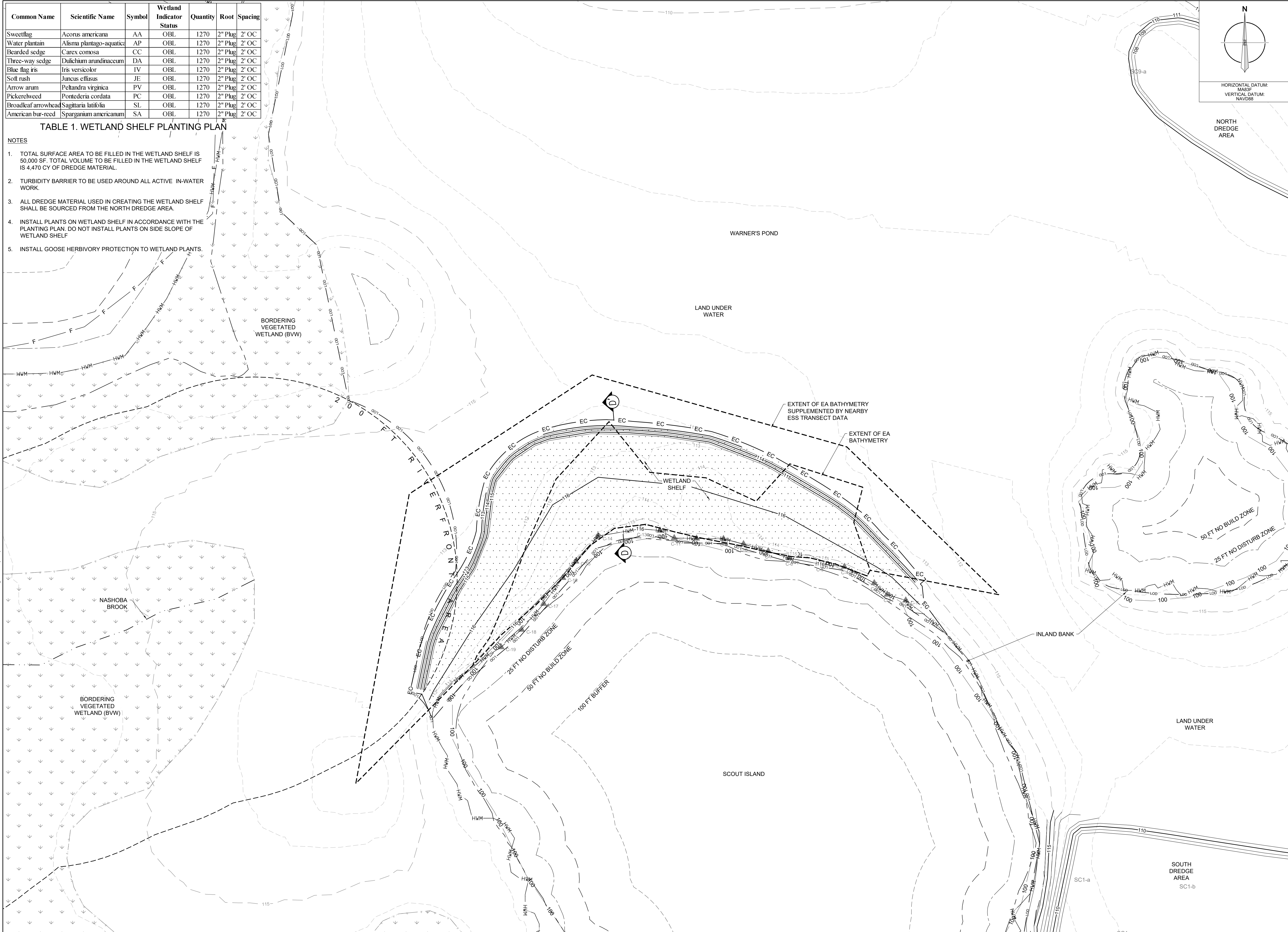


Common Name	Scientific Name	Symbol	Wetland Indicator Status	Quantity	Root	Spacing
Sweetflag	<i>Acorus americana</i>	AA	OBL	1270	2" Plug	2' OC
Water plantain	<i>Alisma plantago-aquatica</i>	AP	OBL	1270	2" Plug	2' OC
Bearded sedge	<i>Carex comosa</i>	CC	OBL	1270	2" Plug	2' OC
Three-way sedge	<i>Dulichium arundinaceum</i>	DA	OBL	1270	2" Plug	2' OC
Blue flag iris	<i>Iris versicolor</i>	IV	OBL	1270	2" Plug	2' OC
Soft rush	<i>Juncus effusus</i>	JE	OBL	1270	2" Plug	2' OC
Arrow arum	<i>Peltandra virginica</i>	PV	OBL	1270	2" Plug	2' OC
Pickerehweed	<i>Pontederia cordata</i>	PC	OBL	1270	2" Plug	2' OC
Broadleaf arrowhead	<i>Sagittaria latifolia</i>	SL	OBL	1270	2" Plug	2' OC
American bur-reed	<i>Sparganium americanum</i>	SA	OBL	1270	2" Plug	2' OC

TABLE 1. WETLAND SHELF PLANTING PLAN

NOTES

- TOTAL SURFACE AREA TO BE FILLED IN THE WETLAND SHELF IS 50,000 SF. TOTAL VOLUME TO BE FILLED IN THE WETLAND SHELF IS 4,470 CY OF DREDGE MATERIAL.
- TURBIDITY BARRIER TO BE USED AROUND ALL ACTIVE IN-WATER WORK.
- ALL DREDGE MATERIAL USED IN CREATING THE WETLAND SHELF SHALL BE SOURCED FROM THE NORTH DREDGE AREA.
- INSTALL PLANTS ON WETLAND SHELF IN ACCORDANCE WITH THE PLANTING PLAN. DO NOT INSTALL PLANTS ON SIDE SLOPE OF WETLAND SHELF.
- INSTALL GOOSE HERBIVORY PROTECTION TO WETLAND PLANTS.



HORIZONTAL DATUM: MAB83  
VERTICAL DATUM: NAVD88

NORTH DREDGE AREA

NO.	DATE	BY	DESCRIPTION

DESIGNED BY:	AP
DRAWN BY:	DPA
CHECKED BY:	AEH
PROJECT MANAGER:	AP



**TOWN OF CONCORD**  
**WARNER'S POND RESTORATION PROJECT**  
 CONCORD, MASSACHUSETTS  
**PROPOSED WETLAND SHELF**



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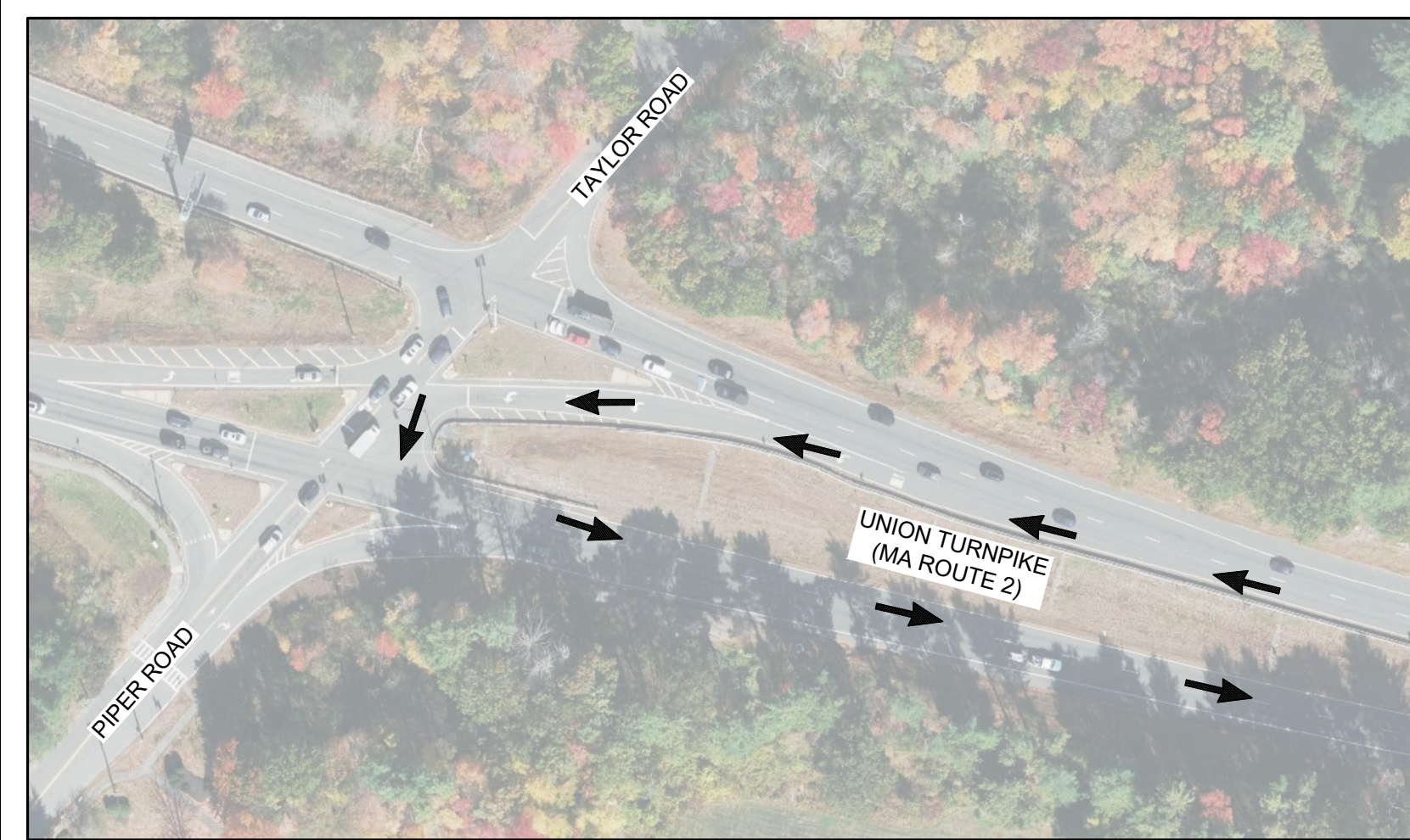
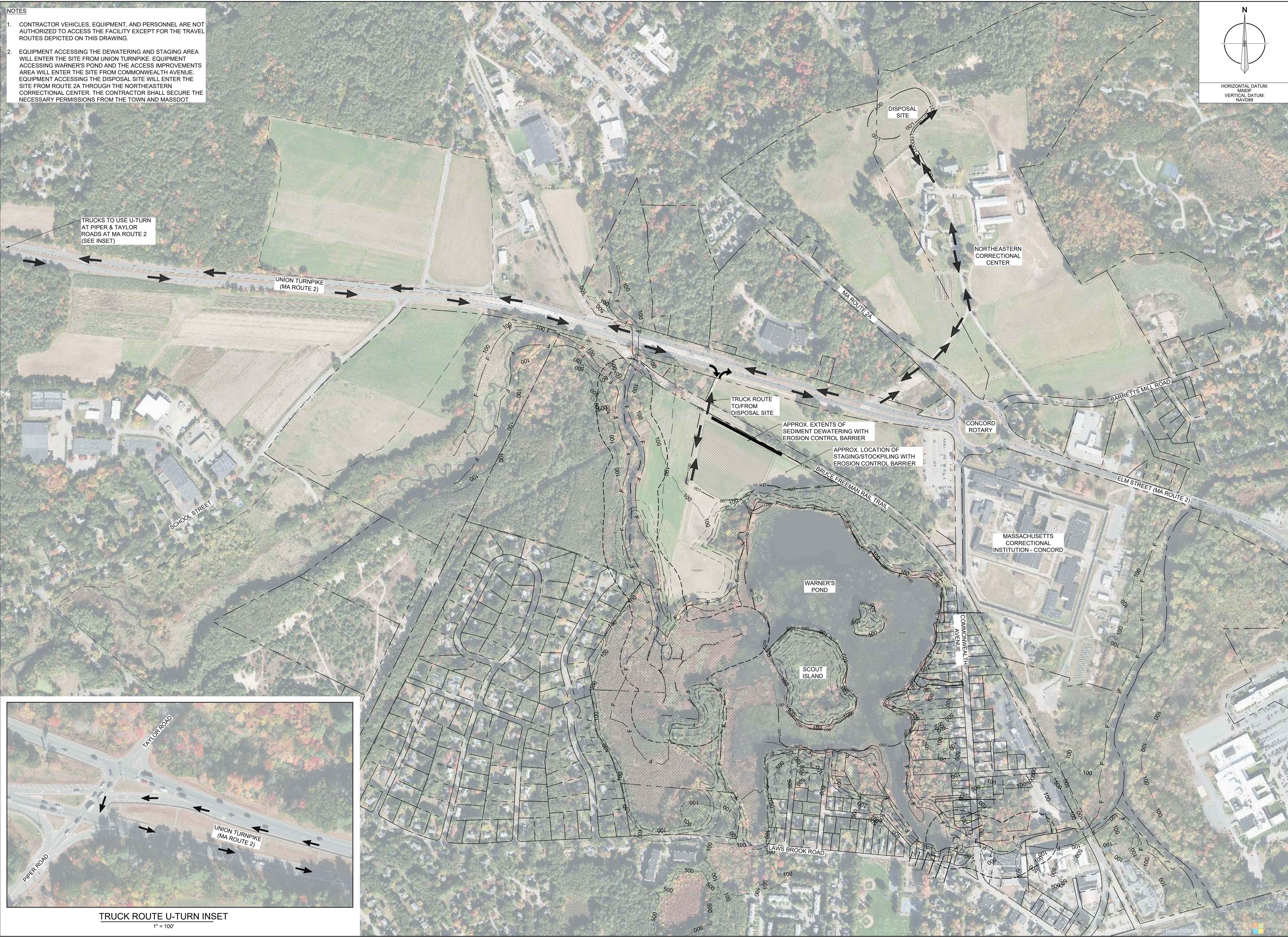
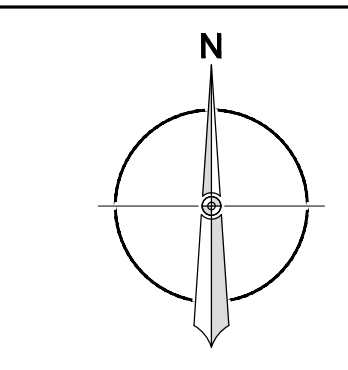
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DATE: AUGUST 2022  
PROJECT NUMBER: 6373001

**C-104**  
SHEET: 6 OF 13

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100% PLANS - FOR CONSTRUCTION

- NOTES**
1. CONTRACTOR VEHICLES, EQUIPMENT, AND PERSONNEL ARE NOT AUTHORIZED TO ACCESS THE FACILITY EXCEPT FOR THE TRAVEL ROUTES DEPICTED ON THIS DRAWING.
  2. EQUIPMENT ACCESSING THE DEWATERING AND STAGING AREA WILL ENTER THE SITE FROM UNION TURNPIKE. EQUIPMENT ACCESSING WARNER'S POND AND THE ACCESS IMPROVEMENTS AREA WILL ENTER THE SITE FROM COMMONWEALTH AVENUE. EQUIPMENT ACCESSING THE DISPOSAL SITE WILL ENTER THE SITE FROM ROUTE 2A THROUGH THE NORTHEASTERN CORRECTIONAL CENTER. THE CONTRACTOR SHALL SECURE THE NECESSARY PERMISSIONS FROM THE TOWN AND MASSDOT.



**TRUCK ROUTE U-TURN INSET**  
1" = 100'

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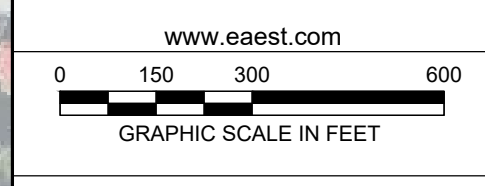
  

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DRAWN BY:	DPA
CHECKED BY:	AEH
PROJECT MANAGER:	AP



**TOWN OF CONCORD**  
**WARNER'S POND RESTORATION PROJECT**  
 CONCORD, MASSACHUSETTS  
**DREDGE MATERIAL MANAGEMENT PLAN**

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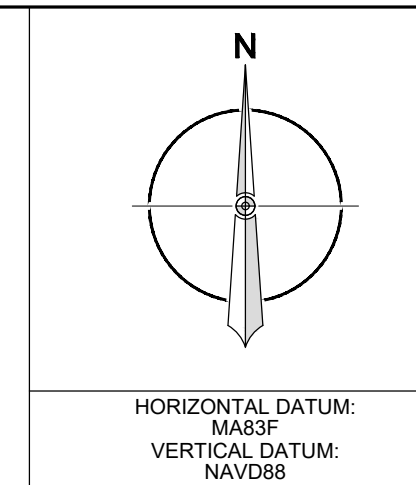
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 DATE: AUGUST 2022  
 PROJECT NUMBER: 6373001

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100% PLANS - FOR CONSTRUCTION



UNION TURNPIKE  
(MA ROUTE 2)



- NOTES:
1. INSTALL PERIMETER DEWATERING DRAIN ALONG LOWEST GRADES IN DEWATERING AREA TO COLLECT WATER FROM DEWATERING DREDGE MATERIAL. GRADE PERIMETER DEWATERING DRAIN TO THE OUTFLOW POINT INDICATED. ENSURE SIZE OF DRAIN IS SUFFICIENT TO CONVEY WATER FROM DEWATERING DREDGE MATERIAL AND ENSURE WATER DOES NOT BACK UP AS A RESULT OF HIGH INFLOW RATES.
  2. INSTALL GEOTUBES AND SUMP WITHIN DEWATERING AREA. ENSURE ALL WATER IS CAPTURED IN THE SUMP AND THAT THE SUMP IS LOCATED ON THE LOWEST POINT IN THE GRADING.
  3. INSTALL GEOTUBES WITHIN DEWATERING AREA UPGRADIENT OF THE PERIMETER DEWATERING DRAIN. ENSURE ALL WATER IS CAPTURED IN THE DRAIN.
  4. ANY TEMPORARY COVER USED ON SITE SHALL BE 40% ANNUAL RYEGRASS AND 60% PERENNIAL RYEGRASS APPLIED AT A RATE OF 18 LBS/ACRE.

REVISIONS		DESCRIPTION	
NO.	DATE	BY	

DESIGN INFORMATION			
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CHECKED BY:	AEH	PROJECT MANAGER:	AP

SEAL

TOWN OF CONCORD  
WARNER'S POND RESTORATION PROJECT  
CONCORD, MASSACHUSETTS  
DEWATERING PLAN

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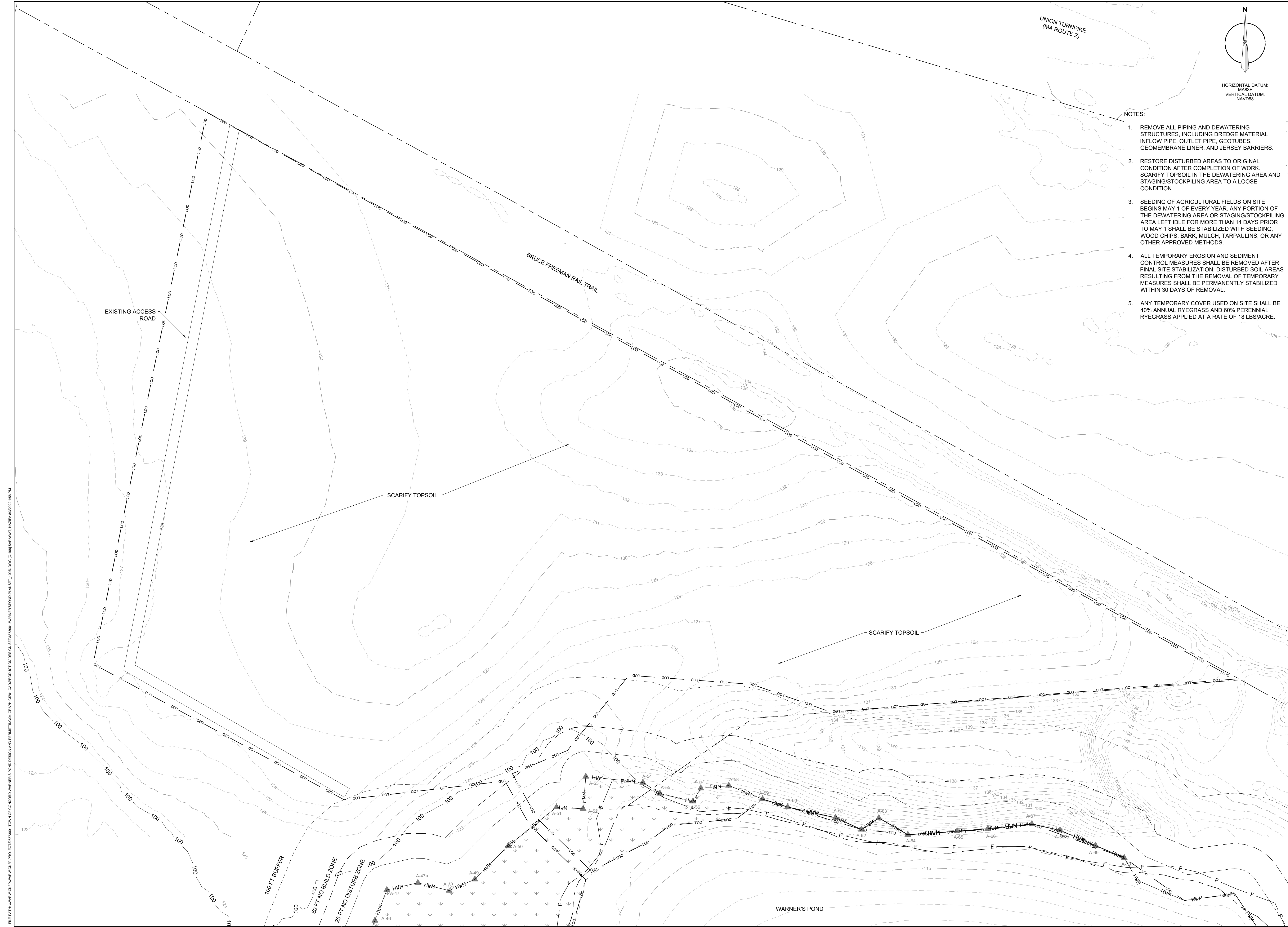
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FULL SIZE PLOT: 24" x 36"  
DATE: AUGUST 2022  
PROJECT NUMBER: 6373001  
**C-106**  
SHEET: 8 OF 13

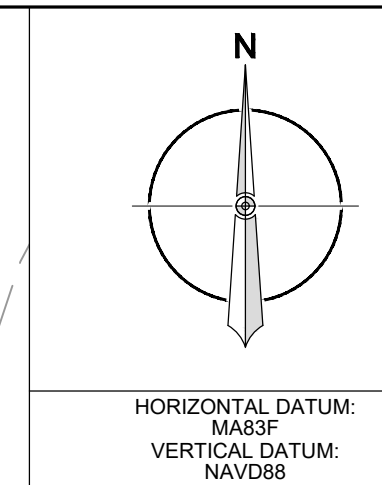
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100% PLANS - FOR CONSTRUCTION





UNION TURNPIKE  
(MA ROUTE 2)



HORIZONTAL DATUM:  
MA83  
VERTICAL DATUM:  
NAVD88

**NOTES:**

1. REMOVE ALL PIPING AND DEWATERING STRUCTURES, INCLUDING DREDGE MATERIAL INFLOW PIPE, OUTLET PIPE, GEOTUBES, GEOMEMBRANE LINER, AND JERSEY BARRIERS.
2. RESTORE DISTURBED AREAS TO ORIGINAL CONDITION AFTER COMPLETION OF WORK. SCARIFY TOPSOIL IN THE DEWATERING AREA AND STAGING/STOCKPILING AREA TO A LOOSE CONDITION.
3. SEEDING OF AGRICULTURAL FIELDS ON SITE BEGINS MAY 1 OF EVERY YEAR. ANY PORTION OF THE DEWATERING AREA OR STAGING/STOCKPILING AREA LEFT IDLE FOR MORE THAN 14 DAYS PRIOR TO MAY 1 SHALL BE STABILIZED WITH SEEDING, WOOD CHIPS, BARK, MULCH, TARPULINS, OR ANY OTHER APPROVED METHODS.
4. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS OF REMOVAL.
5. ANY TEMPORARY COVER USED ON SITE SHALL BE 40% ANNUAL RYEGRASS AND 60% PERENNIAL RYEGRASS APPLIED AT A RATE OF 18 LBS/ACRE.

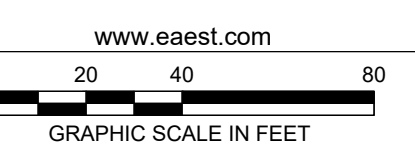
REVISIONS		DESCRIPTION	
NO.	DATE	BY	

DESIGN INFORMATION			
DESIGNED BY:	AP	DRAWN BY:	DPA
CHECKED BY:	AEH	PROJECT MANAGER:	AP



**TOWN OF CONCORD**  
**WARNER'S POND RESTORATION PROJECT**  
CONCORD, MASSACHUSETTS  
**RESTORATION PLAN**



FULL SIZE PLOT: 24" x 36"  
DATE: AUGUST 2022  
PROJECT NUMBER: 6373001

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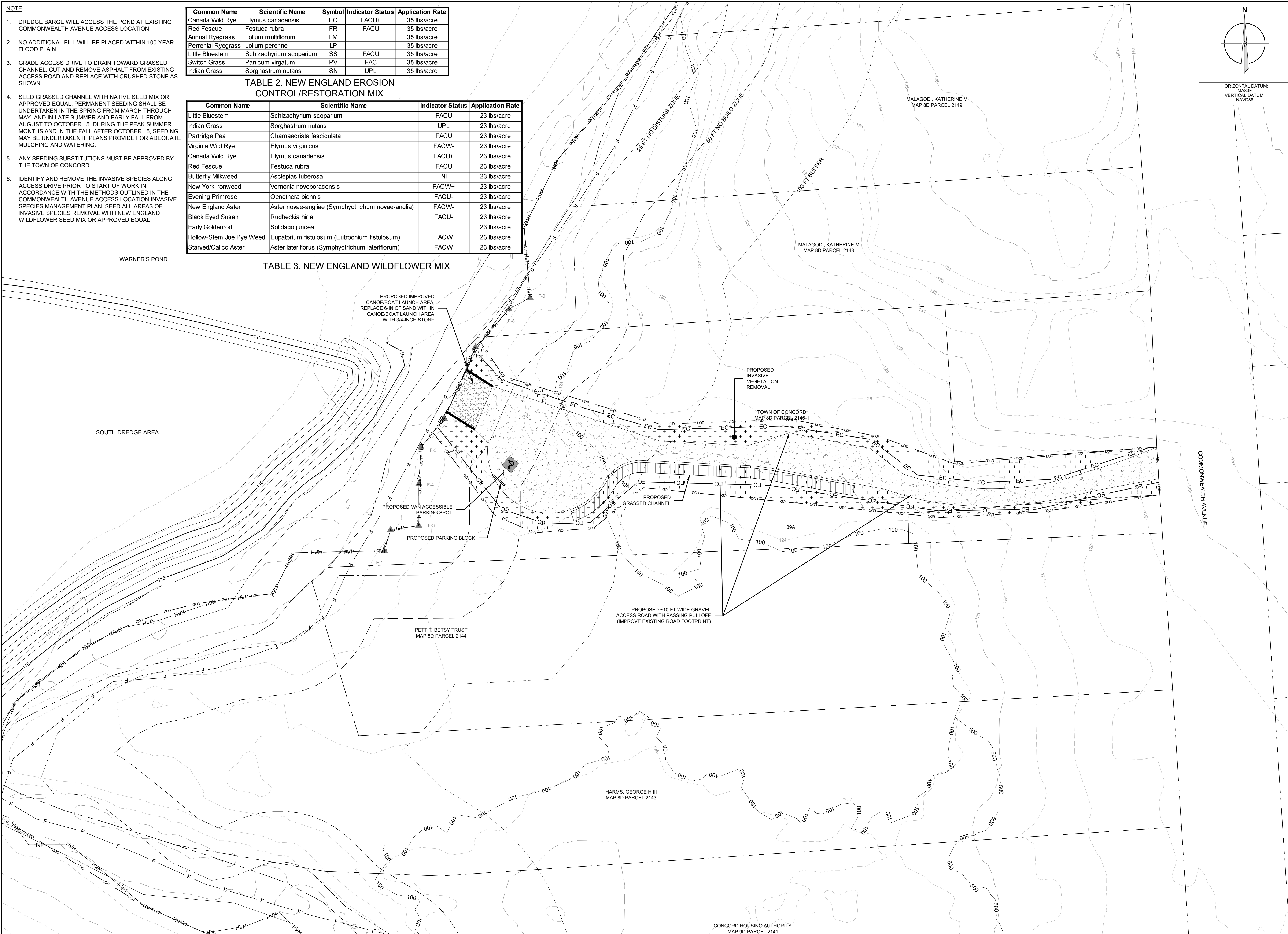
- DREDGE BARGE WILL ACCESS THE POND AT EXISTING COMMONWEALTH AVENUE ACCESS LOCATION.
- NO ADDITIONAL FILL WILL BE PLACED WITHIN 100-YEAR FLOOD PLAIN.
- GRADE ACCESS DRIVE TO DRAIN TOWARD GRASSED CHANNEL. CUT AND REMOVE ASPHALT FROM EXISTING ACCESS ROAD AND REPLACE WITH CRUSHED STONE AS SHOWN.
- SEED GRASSED CHANNEL WITH NATIVE SEED MIX OR APPROVED EQUAL. PERMANENT SEEDING SHALL BE UNDERTAKEN IN THE SPRING FROM MARCH THROUGH MAY, AND IN LATE SUMMER AND EARLY FALL FROM AUGUST TO OCTOBER 15, DURING THE PEAK SUMMER MONTHS AND IN THE FALL AFTER OCTOBER 15. SEEDING MAY BE UNDERTAKEN IF PLANS PROVIDE FOR ADEQUATE MULCHING AND WATERING.
- ANY SEEDING SUBSTITUTIONS MUST BE APPROVED BY THE TOWN OF CONCORD.
- IDENTIFY AND REMOVE THE INVASIVE SPECIES ALONG ACCESS DRIVE PRIOR TO START OF WORK IN ACCORDANCE WITH THE METHODS OUTLINED IN THE COMMONWEALTH AVENUE ACCESS LOCATION INVASIVE SPECIES MANAGEMENT PLAN. SEED ALL AREAS OF INVASIVE SPECIES REMOVAL WITH NEW ENGLAND WILDFLOWER SEED MIX OR APPROVED EQUAL

Common Name	Scientific Name	Symbol	Indicator Status	Application Rate
Canada Wild Rye	Elymus canadensis	EC	FACU+	35 lbs/acre
Red Fescue	Festuca rubra	FR	FACU	35 lbs/acre
Annual Ryegrass	Lolium multiflorum	LM		35 lbs/acre
Perennial Ryegrass	Lolium perenne	LP		35 lbs/acre
Little Bluestem	Schizachyrium scoparium	SS	FACU	35 lbs/acre
Switch Grass	Panicum virgatum	PV	FAC	35 lbs/acre
Indian Grass	Sorghastrum nutans	SN	UPL	35 lbs/acre

TABLE 2. NEW ENGLAND EROSION CONTROL/RESTORATION MIX

Common Name	Scientific Name	Indicator Status	Application Rate
Little Bluestem	Schizachyrium scoparium	FACU	23 lbs/acre
Indian Grass	Sorghastrum nutans	UPL	23 lbs/acre
Partridge Pea	Chamaecrista fasciculata	FACU	23 lbs/acre
Virginia Wild Rye	Elymus virginicus	FACW-	23 lbs/acre
Canada Wild Rye	Elymus canadensis	FACU+	23 lbs/acre
Red Fescue	Festuca rubra	FACU	23 lbs/acre
Butterfly Milkweed	Asclepias tuberosa	NI	23 lbs/acre
New York Ironweed	Vernonia noveboracensis	FACW+	23 lbs/acre
Evening Primrose	Oenothera biennis	FACU-	23 lbs/acre
New England Aster	Aster novae-angliae (Symphyotrichum novae-angliae)	FACW-	23 lbs/acre
Black Eyed Susan	Rudbeckia hirta	FACU-	23 lbs/acre
Early Goldenrod	Solidago juncea		23 lbs/acre
Hollow-Stem Joe Pye Weed	Eupatorium fistulosum (Eutrochium fistulosum)	FACW	23 lbs/acre
Starved/Calico Aster	Aster lateriflorus (Symphyotrichum lateriflorum)	FACW	23 lbs/acre

TABLE 3. NEW ENGLAND WILDFLOWER MIX



FILE PATH: I:\WARNER\WARNER'S POND RESTORATION PROJECT\3D\3D\CONCORD\WARNER'S POND DESIGN AND RESTORATION\WARNER'S POND DESIGN\WARNER'S POND PLANSET.dwg

DESIGN INFORMATION

DESIGNED BY:	AP
DRAWN BY:	DPA
CHECKED BY:	AEH
PROJECT MANAGER:	AP

REVISIONS

NO.	DATE	BY	DESCRIPTION

SEAL

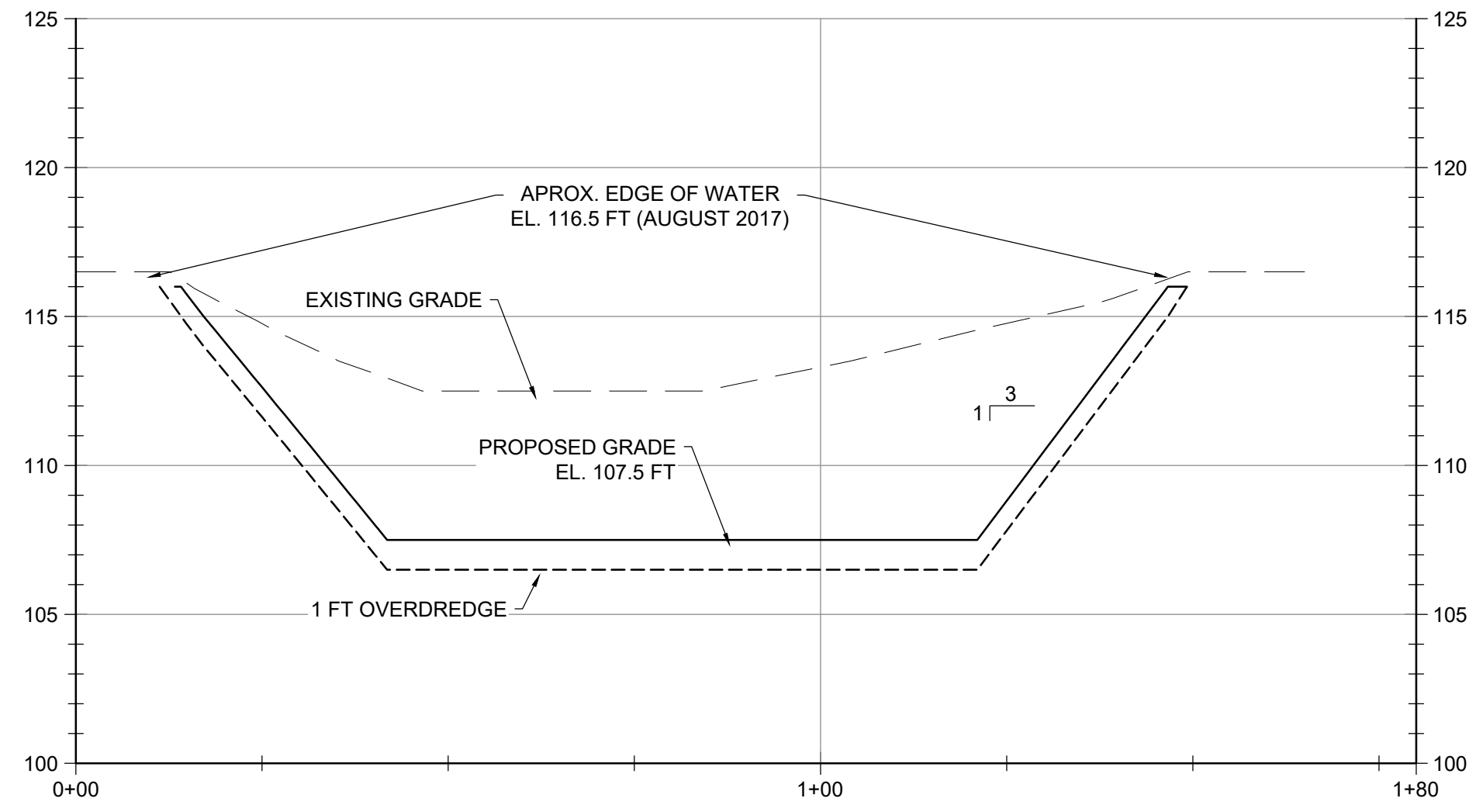
TOWN OF CONCORD  
**WARNER'S POND RESTORATION PROJECT**  
 CONCORD, MASSACHUSETTS  
 COMMONWEALTH AVE ACCESS IMPROVEMENTS

**EA**  
 Engineering, Science, and Technology, Inc., PBC  
 301 Metro Center Blvd, Suite 102  
 Warwick, Rhode Island 02886  
 (401) 736-3440  
 www.eaest.com

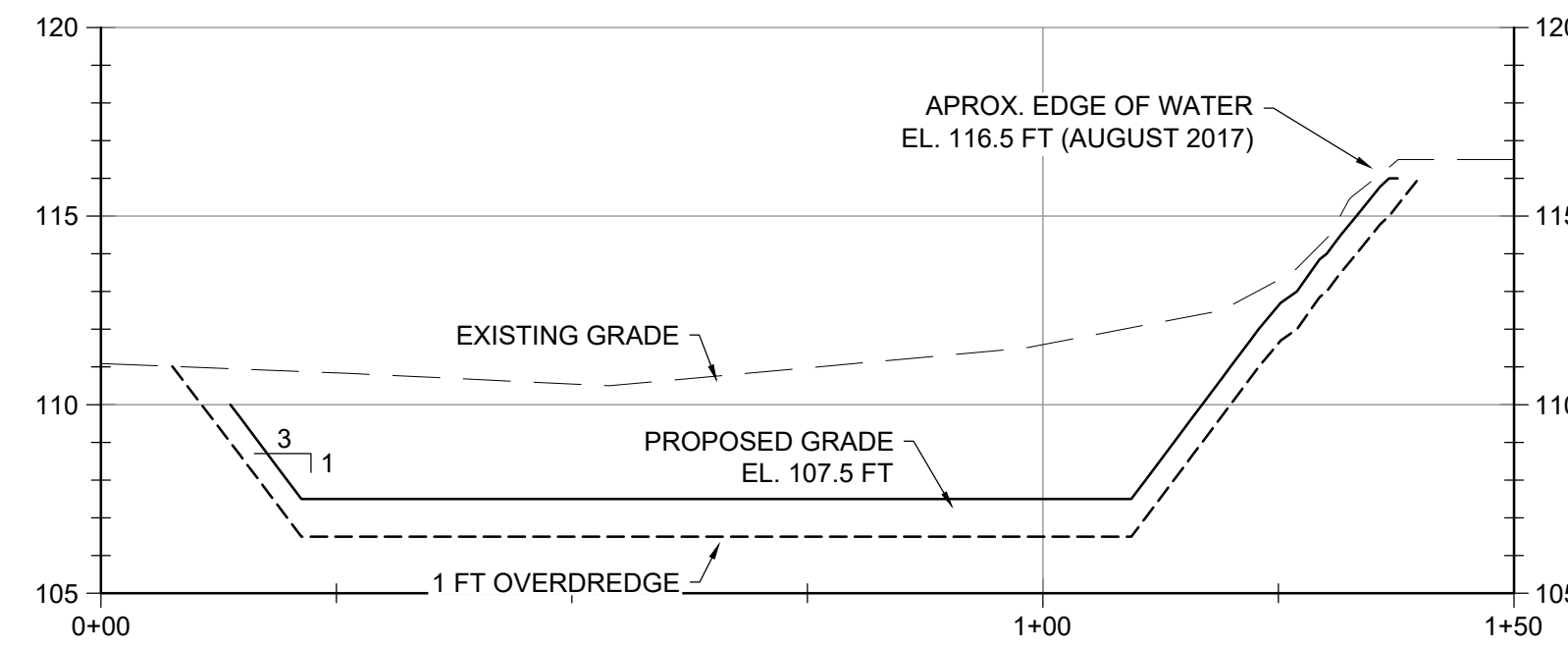
0 10 20 40  
 GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"  
 DATE: AUGUST 2022  
 PROJECT NUMBER: 6373001  
**C-109**  
 SHEET: 11 OF 13

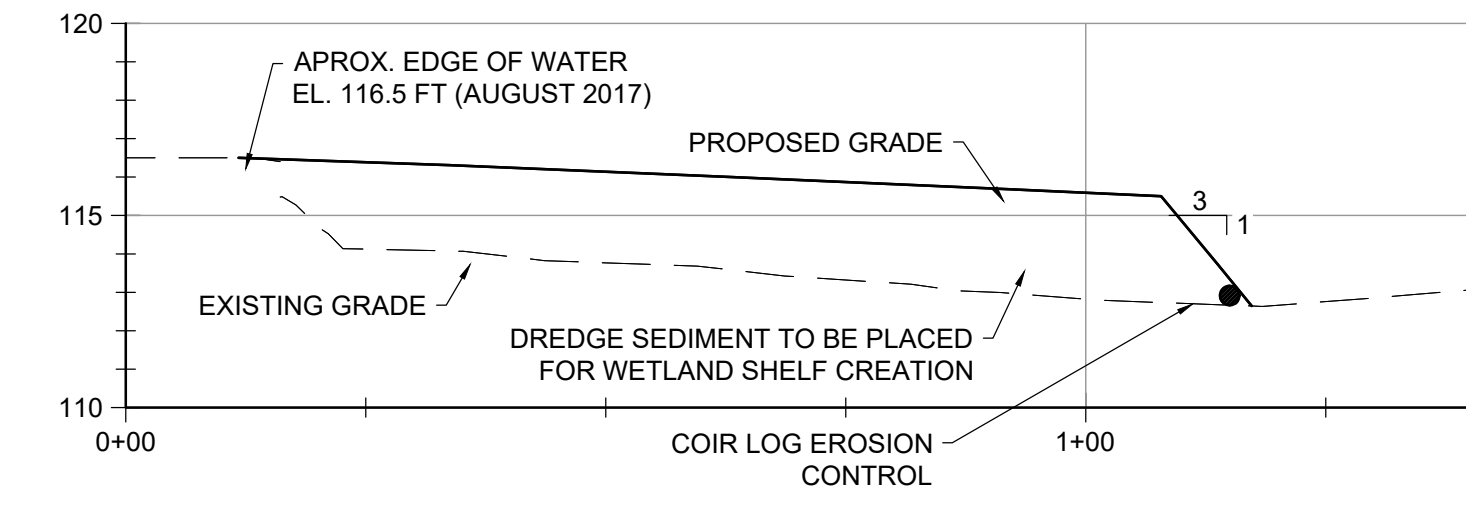
100% PLANS - FOR CONSTRUCTION



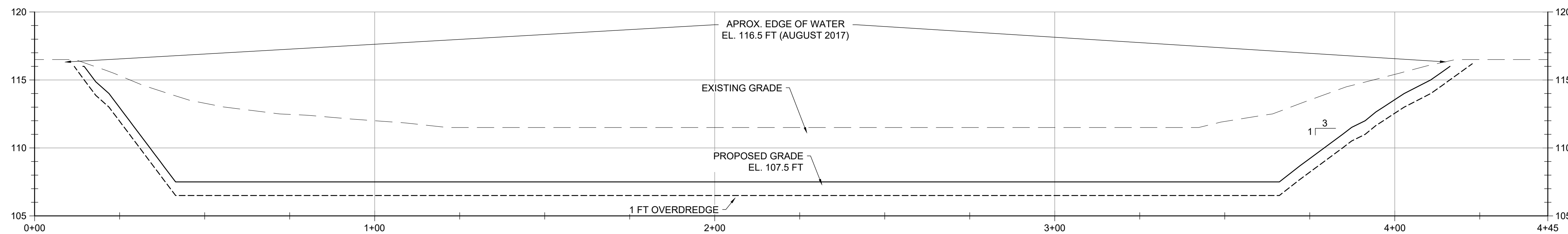
**SECTION A-A'**  
H: 1" = 20'  
V: 1" = 5'



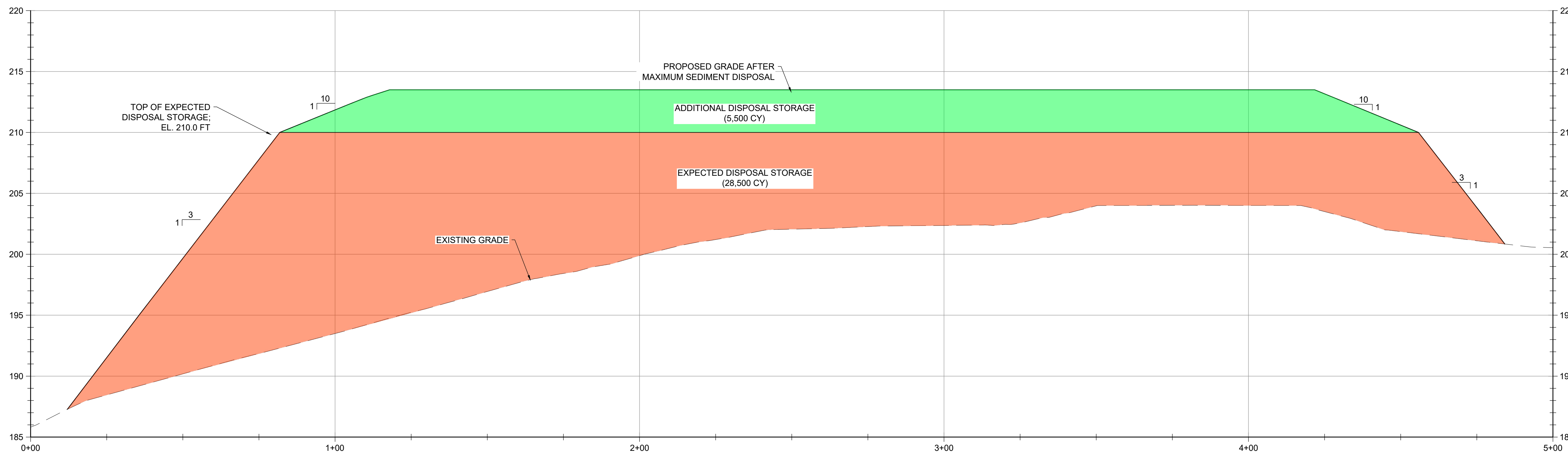
**SECTION C-C'**  
H: 1" = 20'  
V: 1" = 5'



**SECTION D-D'**  
H: 1" = 20'  
V: 1" = 5'



**SECTION B-B'**  
H: 1" = 20'  
V: 1" = 5'

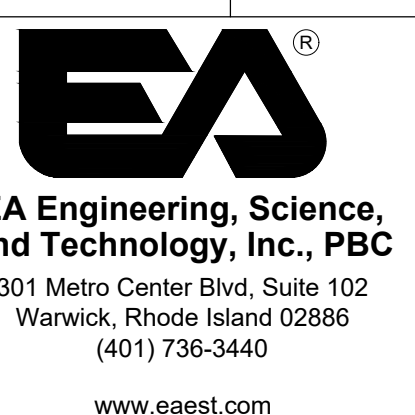


**SECTION E-E'**  
H: 1" = 20'  
V: 1" = 5'

DESIGN INFORMATION		REVISIONS		DESCRIPTION	
DESIGNED BY:	AP	NO.	DATE	BY	
DRAWN BY:	DPA				
CHECKED BY:	AEH				
PROJECT MANAGER:	AP				



**TOWN OF CONCORD**  
**WARNER'S POND RESTORATION PROJECT**  
CONCORD, MASSACHUSETTS  
**CROSS SECTIONS**



SCALE AS SHOWN  
FULL SIZE PLOT: 24" x 36"  
DATE: AUGUST 2022  
PROJECT NUMBER: 6373001

**C-301**  
SHEET: 12 OF 13

FILE PATH: I:\PROJECTS\WARNER'S POND RESTORATION\PROJECT\301\TOWN OF CONCORD\WARNER'S POND RESTORATION\DESIGN\SECTION\SECTION E-E' CROSS SECTION\SECTION E-E' CROSS SECTION.dwg (3/1/2022 1:18 PM)

100% PLANS - FOR CONSTRUCTION

