



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

November 5, 2019

Alan Cathcart
Town of Concord
Water & Sewer Division
135 Keyes Road
Concord, MA 01742

RE: 401 WATER QUALITY CERTIFICATION
Application for: BRP WW 26
WATER QUALITY CERTIFICATION FOR DREDGING and FILL – MINOR PROJECT

AT: Nagog Pond, Acton
Concord (SuAsCo) Watershed

TRANSMITTAL #: X273001
MassDEP File #: 85-1188
Chapter 91 Permit #: 15081
MEPA Certificate #: 15446
ACoE Application #: NAE-2016-00162

Dear Mr. Cathcart:

The Department has reviewed your application for Water Quality Certification (WQC) referenced above. In accordance with the provisions of Section 401 of the Federal Clean Water Act as amended (33 U.S.C. §1251 et seq.), MGL c.21, §§ 26-53, and 314 CMR 9.00, the Department has determined there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law.

The waters of Nagog Pond, which is a Public Water Supply, and therefore, an Outstanding Resource Water ("ORW"), are designated in the Massachusetts Surface Water Quality Standards as Class A. Such waters are designated "as excellent habitat for fish, other aquatic life and wildlife and for primary and secondary contact recreation." Anti-degradation provisions of these Standards require that "existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." Furthermore, both dredging in, and discharge of dredged or fill material to, an ORW are not permitted, except as otherwise provided in 314 CMR 9.06(3) and 9.07(1)(k)1. through 5.

Project Description: The proposed project consists of improvements and upgrades to the Town of Concord's public water supply system infrastructure adjacent to Nagog Pond in Acton. The system has been utilized as a water supply since the early 1900s. The project mainly includes 1) replacement of the 1,290 square foot (SF) Ozone Disinfection Facility with a 7,165 sf two-story water treatment plant and 2) replacement of the existing 16 inch cast iron intake pipe with a new 16-inch inside diameter (ID) high density polyethylene (HDPE) intake pipe.¹ The existing intake pipe extends approximately 1,800 feet (FT) into Nagog Pond from the gatehouse at the dam (Figure 1). During physical inspections, the pipe has been found deteriorated which resulting decreased hydraulic carrying capacity and risk of failure. It is proposed that maximum 900 cubic yards (CY) of sediments will be dredged within the cove (Figure 1) which is proposed to be dewatered. To dewater the cove (Figure 1), temporary cofferdams will be installed and a dewatering pumping system will be used during the late stage of water drawdown/dewatering. The dredged material will be stockpiled along the trench and will be placed back in the trench once the existing intake pipe has been removed and the new intake pipe is in place. Dewatering of the material is not required other than what is proposed to allow construction equipment to travel on top of the exposed cove bottom. Although there is no time of year restrictions for this project,² the Town of Concord has proposed that the intake project would be best timed for the fall as during the summer the water supply is needed for production of drinking water. The reservoir level is typically at its lowest elevation in the fall (e.g. no overtopping of the dam, Figure 1) and the reservoir is typically refilling over the course of the winter.³

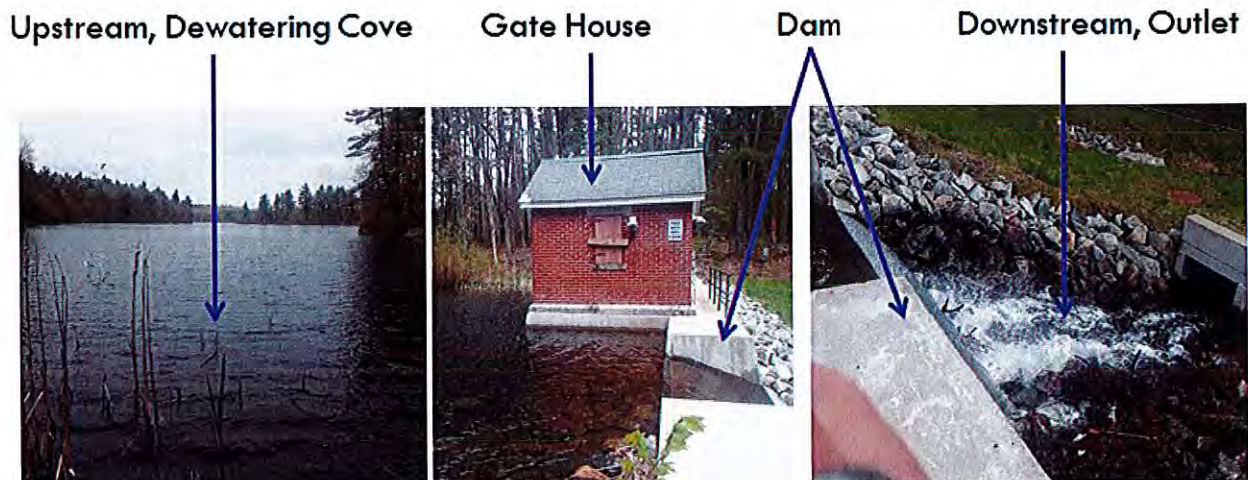


Figure 1. Nagog Pond cove to be dewatered (left), gate house and dam (center), dam and low-level outlet (right), Acton, MA (Photos by David Wong).

Fill will need to be placed in portions of the cove once it has been drained to ensure the intake pipe maintains a continuous positive slope from the intake structure to the gate house. The fill required to construct the intake pipe with a continuous positive slope will be placed within several pockets of low points along the pipe alignment within the cove. The total fill area is approximately 2,000 square feet (SF).⁴ The fill material will be a combination of

¹ Environmental Partners Group, Inc. Nagog Pond Intake Replacement Combined Application for Ch. 91 Waterways License & 401 Water Quality Certification, dated January 28, 2019.

² According to an email from Caleb Slater, Massachusetts Division of Fisheries and Wildlife, to Jeremy F. Butler, Environmental Partners Group, Inc., dated May 21, 2019.

³ According to an email from Eric A. Kelley, Environmental Partners Group, Inc., to David Wong, MassDEP, dated October 24, 2019.

⁴ IBID, Footnote #1.

excess dredged material, if available, and imported soil material that is physically similar to the existing cove sediment, concrete pipe collars on the pond bottom, and the precast concrete footing of the intake screen support structure.

Section 61 Findings: Pursuant to M.G.L. Chapter 30, Sections 61 to 62H (M.E.P.A.) this project was reviewed as EOEA No. 15446 and the Secretary's Certificate, issued on November 10, 2016 found the Final Environmental Impact Report (FEIR) complies with Massachusetts Environmental Policy Act (G.L.c.30, ss. 61-621) and its implementing regulations (310 CMR 11.00). Pursuant to M.G.L. Chapter 30, Section 61, the Department determines that the proposed project as conditioned will incorporate the appropriate feasible measures to avoid or minimize potential environmental impacts that may result from construction and operation of the project.

Therefore, based on information currently in the record, the Department grants a 401 Water Quality Certification for this project subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law. The Department further certifies in accordance with 314 CMR 9.00 that there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law. Finally, the Department has determined that upon satisfying the conditions and mitigation requirements of this approval, the project provides a level of water quality necessary to protect existing uses and accordingly finds that the project to be implemented satisfies the Surface Water Quality Standards at 314 CMR 4.00.

Conditions

1. The Contractor shall take all steps necessary to assure that the proposed activities will be conducted in a manner that will avoid violations of the anti-degradation provisions of the Massachusetts Surface Water Quality Standards that protect all waters, including wetlands.
2. Prior to the start of work or any portion of the work thereafter, the Department shall be notified of any change(s) in the proposed project or plans that may affect waters or wetlands. The Department will determine whether the change(s) require a revision to this Certification.
3. Dredging in accordance with this Certification may begin following the 21-day appeal period and once all other permits have been received.
4. All work shall be performed in accordance with the following documents and plans:
 - Application for Combined Permit, Transmittal Form # X273001, dated January 28, 2019.
 - Plan entitled "PROPOSED RAW WATER INTAKE PLAN, PLAN ACCOMPANYING PETITION OF: TOWN OF CONCORD, MASSACHUSETTS RAW WATER INTAKE, NAGOG POND, TOWN OF ACTON, MASSACHUSETTS," consisting of sixteen (16) sheets, various scales, dated January 25, 2019 with modified Intake Support Structure Detail dated March 25, 2019, signed and stamped by Ziad F. Elkary, PE, prepared by Environmental Partners Group. MassDEP shall be notified if there are modifications and/or deletions of work as specified in the plans. Depending on the nature and the scope of any change, approval by the Department may be required.

- Order of Condition and Extension Permit for Orders of Conditions issued pursuant to the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, § 40) by Acton Conservation Commission for MassDEP File Number 85-1188, dated January 8, 2016 and December 19, 2018, respectively.
5. MassDEP shall be notified, attention David Wong 617-292-5893, one week prior to the start of in-water work so that Department staff may inspect the work for compliance with the terms and conditions of this Certification.
 6. The applicant and its contractor shall allow agents of MassDEP to enter the project sites to verify compliance with the conditions of this Certification.
 7. The Certification remains in effect for the same duration as the federal permit that requires it or five years from the date of issuance of this Certification whichever comes first.
 8. Best Management Practices (BMPs) shall be deployed to minimize turbidity during drawdown/dewatering of the cove areas. At a minimum, silt curtain and appropriate energy dissipaters shall be used at the proposed discharge locations. A silt curtain or similar device shall be placed at the hosing outlet to trap sediment before the cove water is discharged. Water quality upstream of the main body of Nagog Pond or immediate downstream at the outlet of the dam⁵ should be monitored during drawdown/dewatering activities to ensure that water quality standards are met (See Conditions 9, 10, and 11).
 9. No later than 21-days prior to any activity commencing on the project site, the applicant shall conduct flow and turbidity monitoring at the proposed downstream discharge locations (the outlet below the dam).⁶ The applicant shall gather regular readings (no less than weekly) of flow rates and turbidity values immediately downstream of the low-level outlet (Downstream Outlet in Figure 1). The baseline data shall be utilized to determine acceptable flow rates and turbidity levels during the drawdown/dewatering of the cove to protect the downstream Nagog Brook, a Coldwater Fisheries Resource (CFR). The applicant shall submit a turbidity (NTU) and flow rate, monitoring plan to MassDEP for review and approval within eight weeks of the effective date of this Certification or four weeks prior to the commencement of the drawdown and dredging operation whichever comes first. The drawdown flow rate shall not exceed 4 cubic feet per second per square mile of drainage area (cfs/m).⁷ Turbidity measurements will be taken for real time monitoring for the duration of the dewatering operation. If the turbidity during operation is greater than the background, the project should be stopped and the applicant shall immediately control any silt problems that occur at the site. The applicant shall also immediately notify MassDEP's 401 WQC Program in the Boston Office (attention David Wong, 617-292-5893) of the proposed corrective action plan. If necessary, MassDEP require additional turbidity and/or damage prevention controls it may deem necessary. Turbidity curtain or sedimentation barriers shall serve as the limit of work

⁵ IBID, Footnote #1.

⁶ IBID, Footnote #1.

⁷ MassDEP's Guidance for Aquatic Plant Management in Lakes and Ponds As It Relates to the Wetlands Protection Act (Lealdon Langley, Lisa Rhodes, and Michael Stroman 2014) provides that, during drawdown, downstream flow rates should be equal to flow rates expected under normal conditions, since changes in stream flow can impact fish populations (different species habitats are dictated by depth, current velocity and area, and stability of flow).

unless another limit of work line has been approved by MassDEP pursuant to this Certification.

10. No later than 21-days prior to any activity commencing on the project site, the applicant shall conduct turbidity monitoring at the proposed upstream discharge locations (main body of Nagog Pond). The applicant shall gather regular readings (no less than weekly) of turbidity values at the main body of Nagog Pond. The baseline data shall be utilized to determine acceptable turbidity levels during the drawdown/dewatering of the cove. The applicant shall submit a turbidity (NTU) monitoring plan to MassDEP for review and approval within eight weeks of the effective date of this Certification or four weeks prior to the commencement of the drawdown and dredging operation whichever comes first. If the turbidity during operation is greater than the background, the project should be stopped and the applicant shall immediately control any silt problems that occur at the project site. The applicant shall also immediately notify MassDEP's 401 WQC Program in the Boston Office (attention David Wong, 617-292-5893) of the proposed corrective action plan. If necessary, MassDEP require additional turbidity and/or damage prevention controls it may deem necessary. Turbidity curtain or sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by MassDEP pursuant to this Certification.
11. Immediately downstream of the low-level outlet and upstream of the main body of Nagog Pond where the cove dewatering/drawdown water will be discharged, the applicant shall submit a turbidity, total suspended solids, and dissolved oxygen monitoring plan to MassDEP for review and approval within eight weeks of the effective date of this Certification or four weeks prior to the commencement of the dredging operation whichever comes first.
12. During cove drawdown/dewatering, a qualified Environmental Monitor (EM) shall be appointed to assist the operations such as identifying a site as a Fish/Wildlife Refuge Area to minimize any adverse impact to any observed fish and wildlife. Two weeks prior to construction, the pond shall be swept to collect fish and wildlife. All collected organisms, if any, shall be relocated to into the Fish/Wildlife Refuge Area. A final report of the monitoring/relocation efforts shall be submitted to MassDEP and copied to the Acton Conservation Commission. If there is any die-off event, written report shall be submitted to MassDEP and the Acton Conservation Commission.
13. Best Management Practices (BMPs) shall be deployed to minimize turbidity during temporary cofferdam construction. At a minimum, silt curtain shall be used to control turbidity at the surrounding areas. Water quality nearby the construction areas such as turbidity (NTU) should be monitored during before, during, and after cofferdam construction to ensure that water quality standards are met.
14. The dredged material shall not be transported to a facility without concurrence of MassDEP. The dredged material from Nagog pond shall be reused as described in the proposed plan and shall not be trucked to other areas without approval of the Department. If there is any change of the proposed disposal site, MassDEP shall be notified in writing of the name and location of the upland facility accepting the dredged material for disposal or reuse (See Conditions 15 and 16). If the licensed facility is located out of state, documentation shall be provided to the Department that the dredged material disposal/reuse has been approved and will be accepted by the receiving State in accordance with 314 CMR 9.07(13)(b).

15. A Dredged Material Tracking Form (DMTF) or Material Shipping Record (MSR) shall be used to track the dredged material to the licensed upland facility. A fully executed copy of the DMTF or MSR shall be provided to the Department within 30 days of final shipment to the reused location or facility.
16. If the receiving facility is a licensed upland facility, Best Management Practices (BMPs) shall be implemented during transportation of the dredged material. At a minimum, when transported upon public roadways, all dredged material shall have no free liquid as determined by the Paint Filter Test or other suitably analogous methodology acceptable to the Department, and a tarpaulin or other means shall be used to cover the dredged material during transport.
17. Within 10 days of the draining of Nagog Pond and within 30 days of the completion of the intake replacement project, the existing intake elevations shall be reported to MassDEP pursuant to 314 CMR 9.09(1). The future use of the Blind Flange at Elevation 200.7' (NAVD 1988) shall require a Water Management Act (WMA) permit unless an Emergency Declaration is approved by MassDEP. Note that WMA regulatory requirements (at 310 CMR 36.00) related to this condition apply beyond the expiration of the term of this 401 Certification.
18. Within 30 days of completion of the dredging and intake structure construction, the applicant shall provide a set of construction photographs depicting dredging and filling activity to the Wetlands and Waterways Program in the Boston Office, Attn: David Wong. The photographs shall be marked or labeled with the WQC transmittal number and wetlands file number of the project.
19. Any oily material, as evidenced by a visible sheen, released during construction and equipment operations shall be promptly collected, reused or disposed of at a licensed facility.
20. Upon completion of construction, remnants of construction debris such as timbers and concretes at the construction area shall be removed and disposed of appropriately at an offsite facility.
21. The Environmental Monitor (EM) shall report in writing to MassDEP and the conservation commission once every week while construction is underway within any wetland resource area to confirm that all activities are in compliance with the conditions of this Certification. The status report shall at a minimum include a description of any erosion control problems, progress on construction and grading, changes in construction schedule or sequence, actions taken to address problems and any other recommendations for site management.
22. No later than four weeks after issuance of this Water Quality Certification, the applicant shall submit a notification procedure outlining the reporting process to MassDEP for incidents relating to dredging activities that impact surrounding resource areas and habitats including, but not limited to, observed dead or distressed fish or other aquatic organisms, observed oily sheen on the surface of the water, a sediment spill, a turbidity plume beyond the deployed BMPs, and a barge or equipment accident/spill. If at any time during implementation of the project such an incident occurs, the applicant shall immediately notify MassDEP and all site related activities impacting the water shall cease until the source of the problem is identified and adequate mitigating measures are deployed to the satisfaction of MassDEP.

- d. if claiming to be a party aggrieved, the specific facts that demonstrate that the party satisfies the definition of “aggrieved person” found at 314 CMR 9.02;
- e. a clear and concise statement that an adjudicatory hearing is being requested;
- f. a clear and concise statement of (1) the facts which are grounds for the proceedings, (2) the objections to this Certificate, including specifically the manner in which it is alleged to be inconsistent with the Department's Water Quality Regulations, 314 CMR 9.00, and (3) the relief sought through the adjudicatory hearing, including specifically the changes desired in the final written Certification; and
- g. a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant, the owner (if different from the applicant), the conservation commission of the city or town where the activity will occur, the Department of Environmental Management (when the certificate concerns projects in Areas of Critical Environmental Concern), the public or private water supplier where the project is located (when the certificate concerns projects in Outstanding Resource Waters), and any other entity with responsibility for the resource where the project is located.

The hearing request along with a DEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100) must be mailed to:

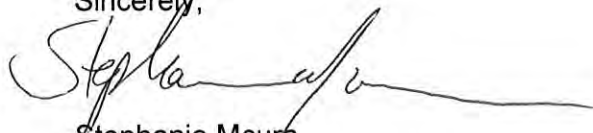
Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
P.O. Box 4062
Boston, MA 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority. The Department may waive the adjudicatory-hearing filing fee pursuant to 310 CMR 4.06(2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

Failure to comply with this certification is grounds for enforcement, including civil and criminal penalties, under MGL c.21 §42, 314 CMR 9.00, MGL c. 21A §16, 310 CMR 5.00, or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

If you have questions about this decision, please contact David Wong at 617-292-5893.

Sincerely,



Stephanie Moura
Director, Division of Wetlands and Waterways

enclosure: Communication For Non-English Speaking Parties - 310 CMR 1.03(5)(a)
Material Shipment Record (MSR)
Project Plan Set

This certification does not relieve the applicant of the obligation to comply with other applicable state or federal statutes or regulations. Any changes made to the project as described in the previously submitted Notice of Intent, 401 Water Quality Certification application, or supplemental documents will require further notification to the Department.

Certain persons shall have a right to request an adjudicatory hearing concerning certifications by the Department when an application is required:

- a. the applicant or property owner;
- b. any person aggrieved by the decision who has submitted written comments during the public comment period;
- c. any ten (10) persons of the Commonwealth pursuant to M.G.L. c.30A where a group member has submitted written comments during the public comment period; or
- d. any governmental body or private organization with a mandate to protect the environment, which has submitted written comments during the public comment period.

Any person aggrieved, any ten (10) persons of the Commonwealth, or a governmental body or private organization with a mandate to protect the environment may appeal without having submitted written comments during the public comment period only when the claim is based on new substantive issues arising from material changes to the scope or impact of the activity and not apparent at the time of public notice. To request an adjudicatory hearing pursuant to M.G.L. c.30A, § 10, a Notice of Claim must be made in writing, provided that the request is made by certified mail or hand delivery to the Department, with the appropriate filing fee specified within 310 CMR 4.10 along with a DEP Fee Transmittal Form within twenty-one (21) days from the date of issuance of this Certificate, and addressed to:

Case Administrator
Department of Environmental Protection
One Winter Street, 2nd Floor
Boston, MA 02108.

A copy of the request shall at the same time be sent by certified mail or hand delivery to the issuing office of the Wetlands and Waterways Program at:

Department of Environmental Protection
One Winter Street, 5th Floor
Boston, MA 02108.

A Notice of Claim for Adjudicatory Hearing shall comply with the Department's Rules for Adjudicatory Proceedings, 310 CMR 1.01(6), and shall contain the following information pursuant to 314 CMR 9.10(3):

- a. the 401 Certification Transmittal Number and DEP Wetlands Protection Act File Number;
- b. the complete name of the applicant and address of the project;
- c. the complete name, address, and fax and telephone numbers of the party filing the request, and, if represented by counsel or other representative, the name, fax and telephone numbers, and address of the attorney;

401 WQC – Transmittal # X273001, Intake Replacement at Nagog Pond

ecc:

Eric Kelley, Environmental Partners Group, Inc., 18 Commerce Way, Suite 2000, Woburn, MA 01801

Carolyn Kiely, 11 Parkland Lane, Acton, MA 01720

Kim A. Kastens, 294 Pope Road, Acton, MA 01742

Robert Ferrara, Friends of Pine Hawk, 10 Wachusett Drive, Acton MA 01720

Miles Fidelman, 531 Old Stone Brook, Acton, MA 01718

Katherine Stock, Miyares and Harrington LLP, 40 Grove Street, Suite 190, Wellesley, MA 02482

Christine Jacek and Barbara Newman, Regulatory/Enforcement Division, U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742-2751

Edward Reiner, US EPA, 5 Post Office Square, Suite 100, Boston, MA 02109

Marielle Stone and Denise Childs, MassDEP CERO, 8 New Bond Street, Worcester, MA 01606

Rachel Freed and Sean Griffin, MassDEP NERO, 205B Lowell Street, Wilmington, MA 01887

Alice Doyle, Christine Hopps and Duane LeVangie, MassDEP Boston, 1 Winter Street, Boston, MA 02108

Caleb Slater, Massachusetts Division of Fisheries & Wildlife, 1 Rabbit Hill Road, Westborough, MA 01581

Amy Hoenig, Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, 1 Rabbit Hill Road, Westborough, MA 01581

Tom Tidman, Acton Conservation Commission, 472 Main Street, Acton, MA 01720



Massachusetts Department of Environmental Protection
One Winter Street, Boston MA 02108 • Phone: 617-292-5751

Communication For Non-English Speaking Parties -

310 CMR 1.03(5)(a)



1 English:

This document is important and should be translated immediately. If you need this document translated, please contact MassDEP's Diversity Director at the telephone numbers listed below.



2 Español (Spanish):

Este documento es importante y debe ser traducido inmediatamente. Si necesita este documento traducido, por favor póngase en contacto con el Director de Diversidad MassDEP a los números de teléfono que aparecen más abajo.



3 Português (Portuguese):

Este documento é importante e deve ser traduzida imediatamente. Se você precisa deste documento traduzido, por favor, entre em contato com Diretor de Diversidade da MassDEP para os números de telefone listados abaixo.



4(a) 中國（傳統） (Chinese (Traditional)):

本文件非常重要，應立即翻譯。如果您需要翻譯這份文件，請用下面列出的電話號碼與MassDEP的多樣性總監聯繫。



4(b) 中国（简体中文） (Chinese (Simplified)):

本文件非常重要，應立即翻譯。如果您需要翻譯這份文件，請用下面列出的電話號碼與MassDEP的多樣性總監聯繫。



5 Ayisyen (franse kreyòl) (Haitian) (French Creole):

Dokiman sa-a se yon bagay enpòtan epi yo ta dwe tradui imedyatman. Si ou bezwen dokiman sa a tradui, tanpri kontakte Divèsite Direktè MassDEP a nan nimewo telefòn ki nan lis pi ba a.



6 Việt (Vietnamese):

Tài liệu này là rất quan trọng và cần được dịch ngay lập tức. Nếu bạn cần dịch tài liệu này, xin vui lòng liên hệ với Giám đốc MassDEP đa dạng tại các số điện thoại được liệt kê dưới đây.



7 ប្រទេសកម្ពុជា (Kmer (Cambodian)):

ឯកសារនេះគឺមានសារៈសំខាន់និងគួរត្រូវបានបកប្រែភ្លាមៗ ប្រសិនបើអ្នកត្រូវបានបកប្រែឯកសារនេះសូមទំនាក់ទំនងឆ្នោតជានាយក MassDEP នៅលេខទូរស័ព្ទដែលបានរាយខាងក្រោម។

**8 Kriolu Kabuverdianu (Cape Verdean):**

Es documento é importante e deve ser traduzido imdiatamente. Se bo precisa des documento traduzido, por favor contacta Director de Diversidade na MassDEP's pa es numero indicode li d'boche.

**9 Русский язык (Russian):**

Этот документ является важным и должно быть переведено сразу. Если вам нужен этот документ переведенный, пожалуйста, свяжитесь с директором разнообразия MassDEP по адресу телефонных номеров, указанных ниже.

**10 العربية (Arabic):**

هذه الوثيقة الهامة وينبغي أن تترجم على الفور. إذا كنت بحاجة إلى هذه الوثيقة المترجمة، يرجى الاتصال مدير التنوع في PMassDE على أرقام الهواتف المدرجة أدناه.

**11 한국어 (Korean):**

이 문서는 중요하고 즉시 번역해야 합니다. 당신이 번역이 문서가 필요하다면 아래의 전화 번호로 MassDEP의 다양성 감독에 문의하시기 바랍니다

**12 հայերէն (Armenian):**

Այս փաստաթուղթը շատ կարևոր է եւ պէտք է թարգմանել անմիջապես. Եթե Ձեզ անհրաժեշտ է այս փաստաթուղթը թարգմանվել դիմել MassDEP բազմազանությունը տնօրեն է հեռախոսահամարների թվարկված են ստորև.

**13 فارسی (Farsi (Persian):**

این سند مهم است و باید فوراً ترجمه شده است. اگر شما نیاز به این سند ترجمه شده، لطفاً با ما تماس تنوع مدیر PMassDE در شماره تلفن های ذکر شده در زیر.

**14 Français (French):**

Ce document est important et devrait être traduit immédiatement. Si vous avez besoin de ce document traduit, s'il vous plaît communiquer avec le directeur de la diversité MassDEP aux numéros de téléphone indiqués ci-dessous.

**15 Deutsch (German):**

Dieses Dokument ist wichtig und sollte sofort übersetzt werden. Wenn Sie dieses Dokument übersetzt benötigen, wenden Sie sich bitte Diversity Director MassDEP die in den unten aufgeführten Telefonnummern.

**16 Ελληνική (Greek):**

Το έγγραφο αυτό είναι σημαντικό και θα πρέπει να μεταφραστούν αμέσως. Αν χρειάζεστε αυτό το έγγραφο μεταφράζεται, παρακαλούμε επικοινωνήστε Diversity Director MassDEP κατά τους αριθμούς τηλεφώνου που αναγράφεται πιο κάτω.

**17 Italiano (Italian):**

Questo documento è importante e dovrebbe essere tradotto immediatamente. Se avete bisogno di questo documento tradotto, si prega di contattare la diversità Direttore di MassDEP ai numeri di telefono elencati di seguito.

**18 Język Polski (Polish):**

Dokument ten jest ważny i powinien być natychmiast przetłumaczony. Jeśli potrzebujesz tego dokumentu tłumaczonego, prosimy o kontakt z Dyrektorem MassDEP w różnorodności na numery telefonów wymienionych poniżej.

**19 हिन्दी (Hindi):**

यह दस्तावेज महत्वपूर्ण है और तुरंत अनुवाद किया जाना चाहिए. आप अनुवाद इस दस्तावेज की जरूरत है, नीचे सूचीबद्ध फोन नंबरों पर MassDEP की विविधता निदेशक से संपर्क करें.



Massachusetts Department of Environmental Protection
Bureau of Air & Waste

Material Shipping Record & Log

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

Tracking Number _____

A. Location Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Provide the following information on the location where the waste was generated:

Release name (optional) _____

Street _____

Location aid _____

City/Town _____

State _____

Zip code _____

2. Date/Period of generation: _____

From _____

To _____

3. U.S. EPA ID number: _____

4. 21E release: _____

☐ Yes

☐ No

5. List additional tracking documents associated with this document:

B. Generator Information

1. Provide the following generator information:

Name of organization _____

Contact name _____

Title _____

Street address _____

City/Town _____

State _____

Zip code _____

Telephone number(including extension) _____

C. Owner and/or Operator Information

1. If the owner and/or operator is different from the generator as indicated in Section B, provide the following information:

Check applicable: ☐ owner ☐ operator

Name of organization _____

Contact name _____

Title _____

Street address _____

City/Town _____

State _____

Zip code _____

Telephone number _____

Ext. _____

Important:
 This form is not to be used for the shipment of remediation wastes subject to management under section 310 CMR 40.0035 of the Massachusetts Contingency Plan nor is it to be used in lieu of a hazardous waste manifest for hazardous waste or recyclable materials subject to the Massachusetts Hazardous Waste Regulations 310 CMR 30.000.



Massachusetts Department of Environmental Protection
Bureau of Air & Waste

Material Shipping Record & Log

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

Tracking Number _____

D. Transporter/Common Carrier Information

1. Provide the following information:

Transporter/Common carrier name _____

Hazardous waste license number (if applicable) _____

Licensing state (if applicable) _____

Contact person _____

Title _____

Street _____

City/Town _____

State _____

Zip code _____

Telephone number _____

Ext. _____

E. Receiving Facility Information

1. Provide the following information on the receiving facility:

Operator/Facility name _____

Contact person _____

Title _____

Street _____

City/Town _____

State _____

Zip code _____

Telephone number _____

Ext. _____

2. Type of facility:

- ☐ asphalt batch/cold mix
☐ asphalt batch/hot mix
☐ landfill/disposal
☐ landfill/ daily cover
☐ thermal processing
☐ landfill/structural fill
☐ other(specify): _____

3. Permit number: _____



Massachusetts Department of Environmental Protection
Bureau of Air & Waste

Material Shipping Record & Log

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

Tracking Number _____

F. Description of Material

Check all that apply:

1. a. ☐ soil ☐ dredge material ☐ fill

b. Description: _____

c. Classification: ☐ MIT ☐ USDA ☐ USAEC ☐ ASEE

2. ☐ Other(describe): _____

3. Type of contamination:

a. ☐ gasoline ☐ diesel fuel ☐ #2 oil ☐ #4 oil
☐ #6 oil ☐ waste oil ☐ kerosene ☐ jet fuel

b. ☐ Debris:

☐ demolition ☐ vegetative ☐ inorganic

c. ☐ Other(describe): _____

4. Constituents of concern (check all that apply):

☐ As	☐ HVOCs
☐ Cd	☐ PATH
☐ Cr	☐ VOCs
☐ Pb	☐ PAHs
☐ Hg	☐ BNAs
☐ Na	☐ TPH
☐ PCBs	☐ Other(describe): _____

5. Analyses performed (check all that apply):

☐ As	☐ PATH
☐ Cd	☐ VOCs
☐ Cr	☐ PAHs
☐ Pb	☐ BNAs
☐ Hg	☐ TPH
☐ Na	☐ TCLP (inorganic)
☐ PCBs	☐ TCLP (organic)
☐ HVOCs	☐ Other(describe): _____

6. Screening performed:

Type

Instrument used

Constituents



Massachusetts Department of Environmental Protection
Bureau of Air & Waste

Material Shipping Record & Log

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

Tracking Number _____

F. Description of Material (cont.)

7. Estimated volume of materials:

Cubic yards _____

Tons _____

Other(specify units) _____

8. Contaminant source (check one):

☐ transportation accident

☐ dust

☐ other(describe): _____

9. Indicate which waste characterization support documentation is attached:

☐ site history information

☐ sampling and analytical methods/procedure

☐ laboratory data

☐ field screening data

If supporting documentation is not appended, provide an attachment stating the date and in connection with what document such information was previously submitted to the facility.

G. Qualified Environmental Professional Opinion

"I have personally examined and am familiar with the information contained on and submitted with this form. Based on this information, it is my opinion that the testing and assessment actions undertaken were adequate to characterize the waste, and that the facility or location can accept wastes with the characteristics described in this submittal. I am aware that significant penalties including, but not limited to, possible fines and imprisonment may result if I willfully submit information which I know to be false, inaccurate, or materially incomplete."

 Name of Organization

 Name of Professional

 Title

 Telephone number

 Ext.

 Signature

 Date (MM/DD/YYYY)

 License Number¹

 Seal²:

¹A license number is required for all Qualified Environmental Professional completing this form. A Qualified Environmental Professional is licensed or certified in a discipline related to environmental assessment (i.e., engineering, geology, soil science, or environmental science) by a state or recognized professional organization.

²A seal is **not** required for a **Licensed Site Professional** as defined in M.G.L. 21A, s. 19, holding a valid license issued by the Board of Registration of Hazardous Waste Site Cleanup Professionals pursuant to M.G.L. c. 21A, § 19 through 19J. A seal is required for all other Qualified Environmental Professionals as defined in 1 above.



Massachusetts Department of Environmental Protection
Bureau of Air & Waste

Material Shipping Record & Log

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

Tracking Number _____

H. Certification of Generator

"I certify under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information contained herein is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information."

Signature _____

Date (MM/DD/YYYY) _____

Name (Print) _____

I. Acknowledgment of Receipt by Receiving Facility

Receiving Facility _____

Representative (Print) _____

Title _____

Signature _____

Date (MM/DD/YYYY) _____



Massachusetts Department of Environmental Protection
Bureau of Air & Waste

Material Shipping Record & Log

For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under section 310 CMR 40.0035 nor manifesting under 310 CMR 30.000

Tracking Number _____

J. Load Information

Note:
 Make additional
 copies of this page
 as necessary.

Load#: _____

Signature of transporter _____

Receiving facility _____

Date received _____

Time received _____

Date of shipment _____

Time of shipment _____

Truck/Tractor registration _____

Trailer registration _____

Load size (cubic yards/tons) _____

Load#: _____

Signature of transporter _____

Receiving facility _____

Date received _____

Time received _____

Date of shipment _____

Time of shipment _____

Truck/Tractor registration _____

Trailer registration _____

Load size (cubic yards/tons) _____

Load#: _____

Signature of transporter _____

Receiving facility _____

Date received _____

Time received _____

Date of shipment _____

Time of shipment _____

Truck/Tractor registration _____

Trailer registration _____

Load size (cubic yards/tons) _____

K. Log Sheet Volume Information

Total volume this page (cubic yards/tons) _____

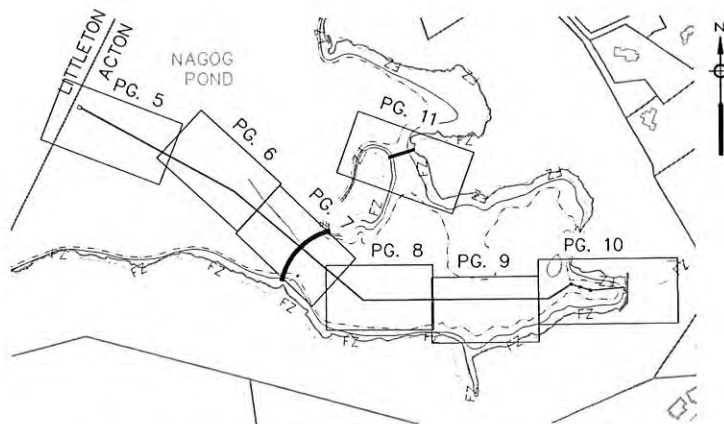
Total carried forward (cubic yards/tons) _____

Total carried forward and this page (cubic yards/tons) _____

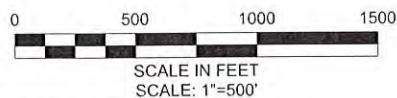
Page _____ of _____



LOCUS MAP

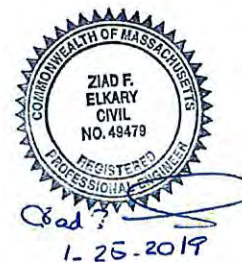


PROPOSED RAW WATER INTAKE PLAN



VERTICAL DATUM- NAVD 1988

PLAN ACCOMPANYING PETITION OF:
TOWN OF CONCORD, MASSACHUSETTS
RAW WATER INTAKE
NAGOG POND
TOWN OF ACTON, MASSACHUSETTS
PAGE 1 OF 16



GENERAL NOTES

1. USGS BATHYMETRY WAS OBTAINED FROM LEVIN, A.B., ARCHFIELD, S.A., AND MASSEY, A.J., 2011, REFINEMENT AND EVALUATION OF THE MASSACHUSETTS FIRM-YIELD ESTIMATOR MODEL VERSION 2.0: U.S. GEOLOGICAL SURVEY POINTS WERE OBTAINED FROM SARA LEVIN IN AN EMAIL CORRESPONDENCE. BATHYMETRY WAS CONFIRMED BY ENVIRONMENTAL PARTNERS GROUP.
2. ALL ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988.
3. HORIZONTAL DATUM IS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983.
4. PROPERTY LINE, STREET LINE, AND OWNER INFORMATION WAS COMPILED FROM RECORDS ON FILE AT THE MIDDLESEX NORTH REGISTRY OF DEEDS, THE TOWN OF ACTON ASSESSORS DEPARTMENT, AND THE TOWN OF LITTLETON ASSESSORS DEPARTMENT.
5. MEAN ANNUAL HIGH WATER MARK (MHW) FLAGS WERE DELINEATED BY PINEBROOK CONSULTING IN MAY 2015, AUGUST 2015, OCTOBER 2015, AND NOVEMBER 2015 AND WERE SURVEYED BY ENVIRONMENTAL PARTNERS GROUP AND MERRILL CORPORATION.
6. THE MEAN HIGH WATER MARK IS BASED ON THE 2015 AVERAGE POND SURFACE ELEVATION.
7. THE HISTORIC MEAN LOW WATER MARK IS BASED ON 1966-1967 AVERAGE POND SURFACE ELEVATION.
8. THE SUBJECT PROPERTY IS LOCATED IN ZONE X AND ZONE AE EL. 208 THROUGH 213 OF THE FLOOD INSURANCE RATE MAP, AS SHOWN ON COMMUNITY PANEL No. 250176 0234f, WHICH BEARS AN EFFECTIVE DATE OF JULY 7, 2014, AND IS PARTIALLY WITHIN A SPECIAL FLOOD HAZARD AREA.
9. NORTH DIRECTION SHOWN IS APPROXIMATE.
10. EXISTING PIPE ALIGNMENT IS BASED ON UNDERWATER INVESTIGATIONS PERFORMED BY ENVIRONMENTAL PARTNERS.
11. THE CONTRACTOR MAY INSTALL THE NEW HDPE ALONG A MORE DIRECT ROUTE BETWEEN THE INTAKE LOCATION AND THE GATEHOUSE, AS LONG AS THE HDPE PIPE REMAINS AT A CONSTANT UPWARD SLOPE TOWARD THE GATEHOUSE. THE CONTRACTOR MAY REMOVE LESS OF THE EXISTING CI PIPE THAN IS SHOWN IN THESE PLANS.
12. THE INTAKE BURST PIPING ALIGNMENT IS SUBJECT TO CHANGE, AS THE LOCATION OF THE AIR BURST SYSTEM HAS NOT BEEN FINALIZED AT THIS STAGE.

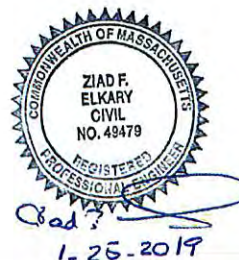


LEGEND

	PROPERTY LINE
	MHW
	HMLW
	TREELINE
	MAJOR CONTOUR
	MINOR CONTOUR
	FLOOD ZONE
	EXISTING GRADE
	PROPOSED INTAKE WITH CONCRETE COLLARS
	DREDGING LIMITS
	FILL LIMITS

ABBREVIATIONS

CI	CAST IRON
HDPE	HIGH-DENSITY POLYETHYLENE
MHW	MEAN HIGH WATER
HMLW	HISTORIC MEAN LOW WATER
TYP.	TYPICAL
SS	STAINLESS STEEL
ID	INSIDE DIAMETER
PG	PAGE

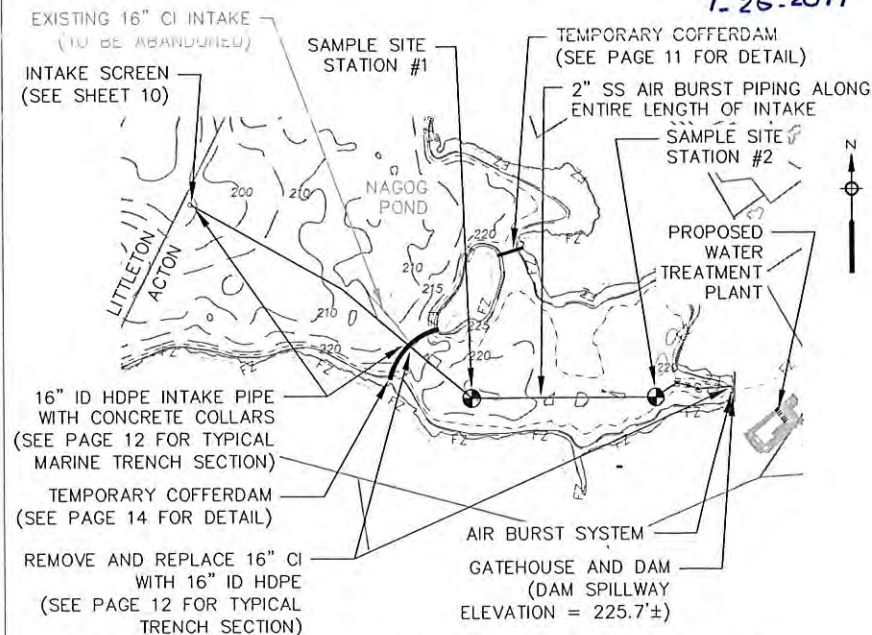


DREDGING DIMENSIONS

LENGTH = 1,210 ft
WIDTH = 4 ft
DEPTH = 5 ft
AREA = 4,840 sf
VOLUME = 900 cy

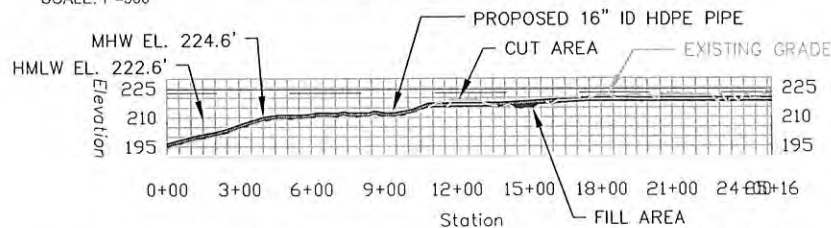
STRUCTURES FOOTPRINT

NUMBER OF COLLARS = 281
AREA PER COLLAR = 3 sf
TOTAL COLLAR AREA = 850 sf
INTAKE STRUCT. SUPPORT AREA = 225 sf
TOTAL STRUCT. FILL AREA = 1,075 sf



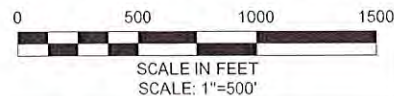
PROPOSED RAW WATER INTAKE - PLAN VIEW

SCALE: 1"=500'



PROPOSED RAW WATER INTAKE - PROFILE VIEW

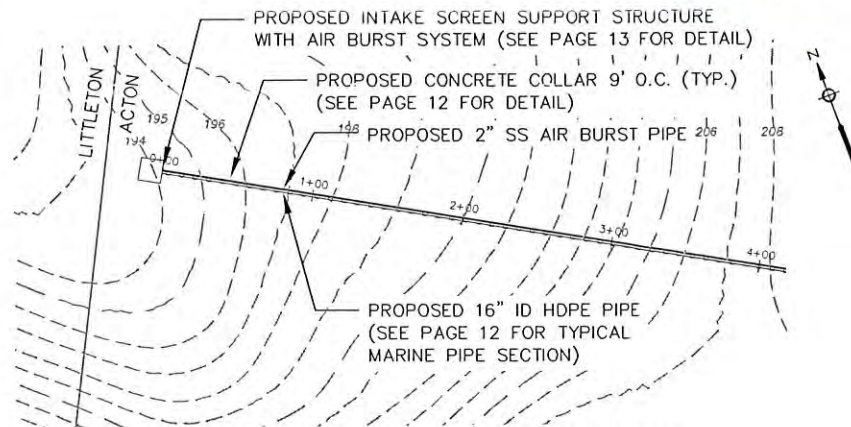
VERTICAL SCALE: 1"=62'-6"
HORIZONTAL SCALE: 1"=500'



DREDGING DIMENSIONS
NO DREDGING

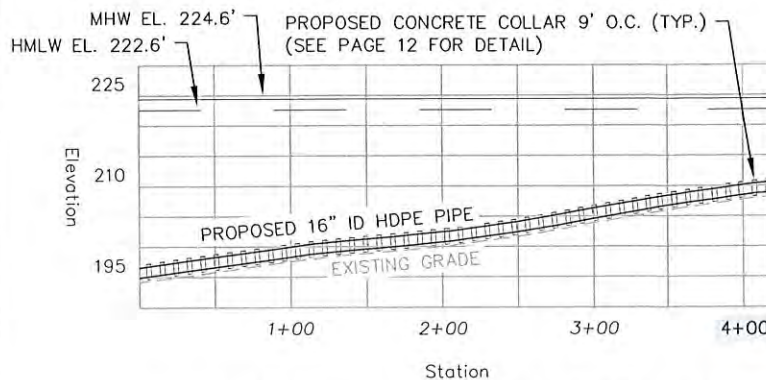
STRUCTURES FOOTPRINT

NUMBER OF COLLARS = 47
AREA PER COLLAR = 3 sf
TOTAL COLLAR AREA = 141 sf
INTAKE SCREEN SUPPORT STRUC. = 225 sf
TOTAL AREA = 366 sf



STRUCTURES AND FILL I - PLAN VIEW

SCALE: 1"=80'



STRUCTURES AND FILL I - PROFILE VIEW

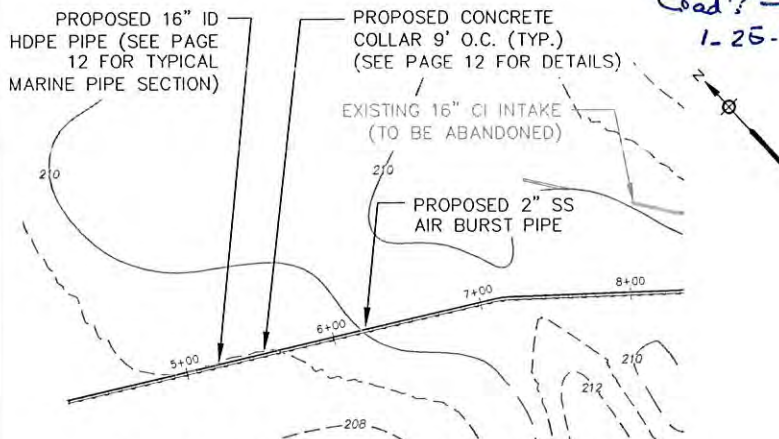
VERTICAL SCALE: 1"=20'
HORIZONTAL SCALE: 1"=80'



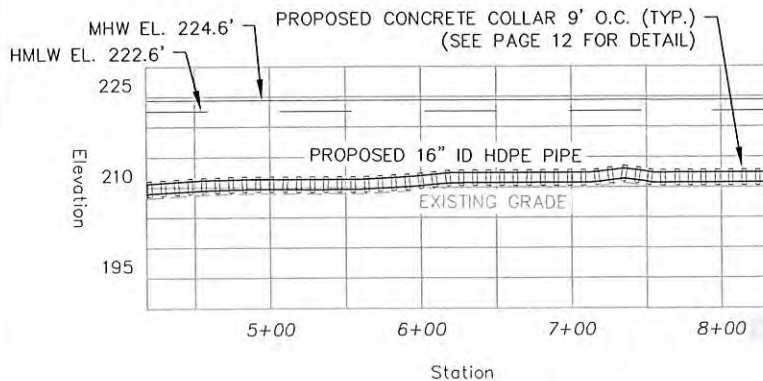
SCALE IN FEET
SCALE: 1"=80'

DREDGING DIMENSIONS
NO DREDGING

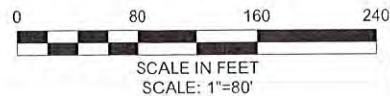
STRUCTURES FOOTPRINT
NUMBER OF COLLARS = 47
AREA PER COLLAR = 3 sf
TOTAL AREA = 141 sf



STRUCTURES AND FILL II - PLAN VIEW
SCALE: 1"=80'

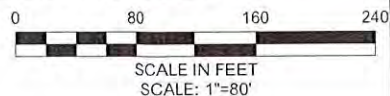
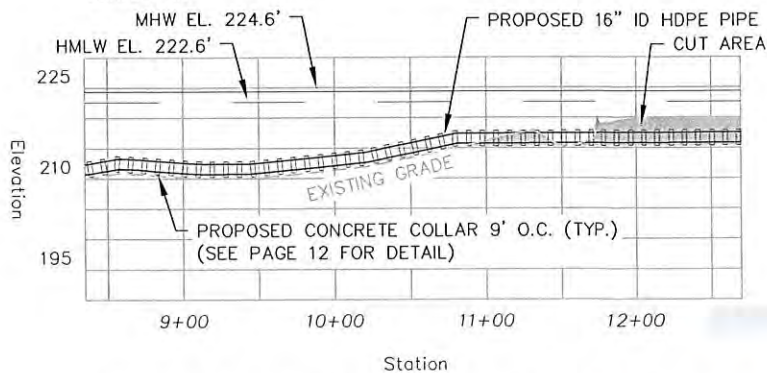
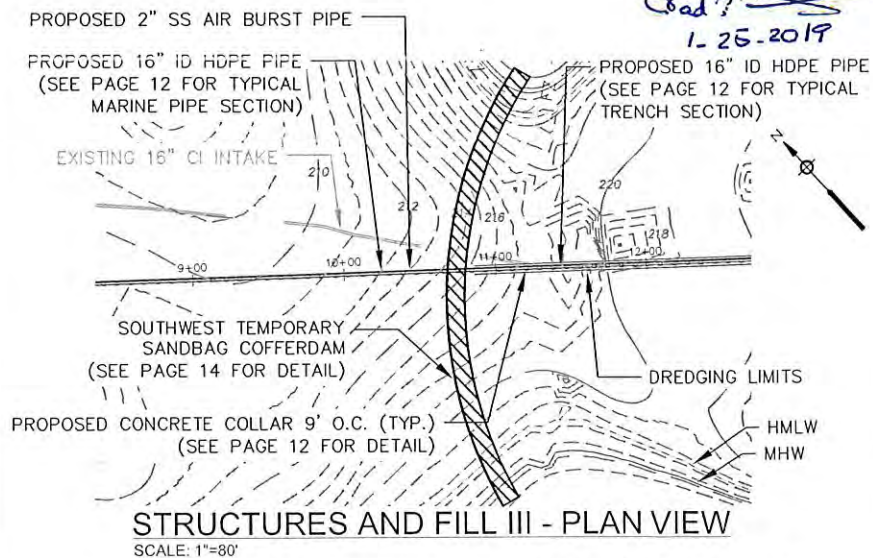


STRUCTURES AND FILL II - PROFILE VIEW
VERTICAL SCALE: 1"=20'
HORIZONTAL SCALE: 1"=80'



DREDGING DIMENSIONS
LENGTH = 185 ft
WIDTH = 4 ft
DEPTH = 5 ft
AREA = 740 sf
VOLUME = 137 cy

STRUCTURES FOOTPRINT
NUMBER OF COLLARS = 49
AREA PER COLLAR = 3 sf
TOTAL AREA = 147 sf



DREDGING DIMENSIONS

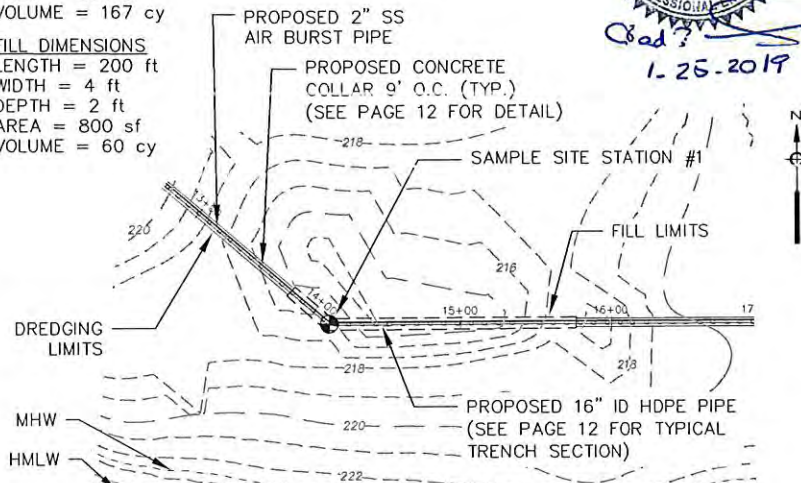
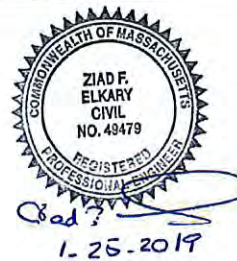
LENGTH = 226 ft
WIDTH = 4 ft
DEPTH = 5 ft
AREA = 904 sf
VOLUME = 167 cy

STRUCTURES FOOTPRINT

NUMBER OF COLLARS = 47
AREA PER COLLAR = 3 sf
TOTAL AREA = 141 sf

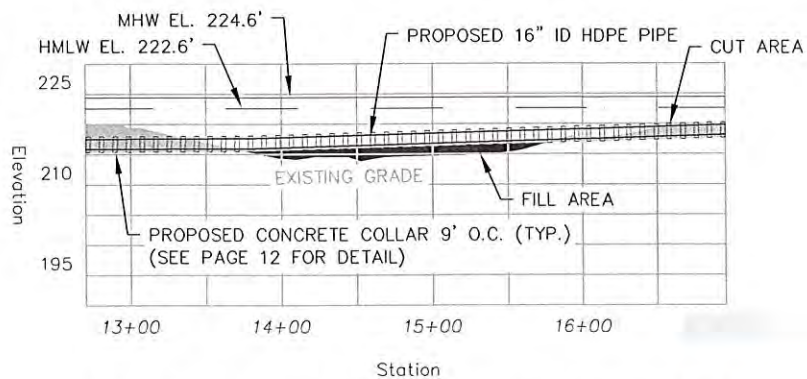
FILL DIMENSIONS

LENGTH = 200 ft
WIDTH = 4 ft
DEPTH = 2 ft
AREA = 800 sf
VOLUME = 60 cy



STRUCTURES AND FILL IV - PLAN VIEW

SCALE: 1"=80'



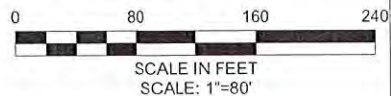
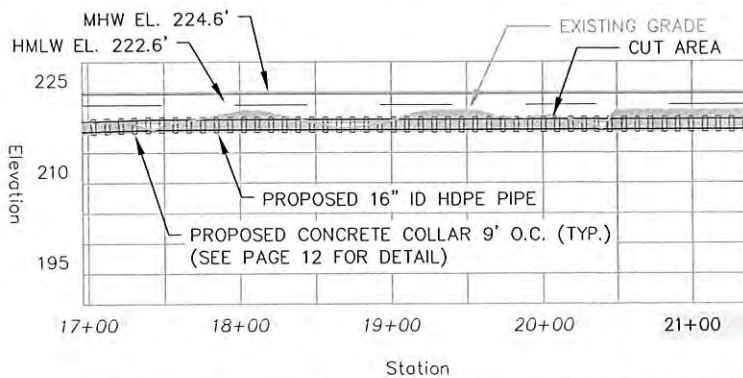
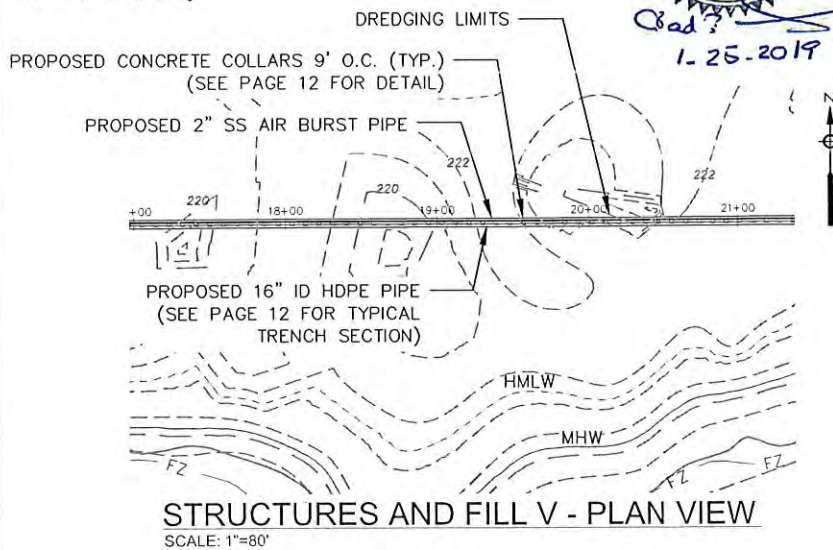
STRUCTURES AND FILL IV - PROFILE VIEW

VERTICAL SCALE: 1"=20'
HORIZONTAL SCALE: 1"=80'



DREDGING DIMENSIONS
LENGTH = 441 ft
WIDTH = 4 ft
DEPTH = 5 ft
AREA = 1,764 sf
VOLUME = 327 cy

STRUCTURES FOOTPRINT
NUMBER OF COLLARS = 49
AREA PER COLLAR = 3 sf
TOTAL AREA = 147 sf



DREDGING DIMENSIONS

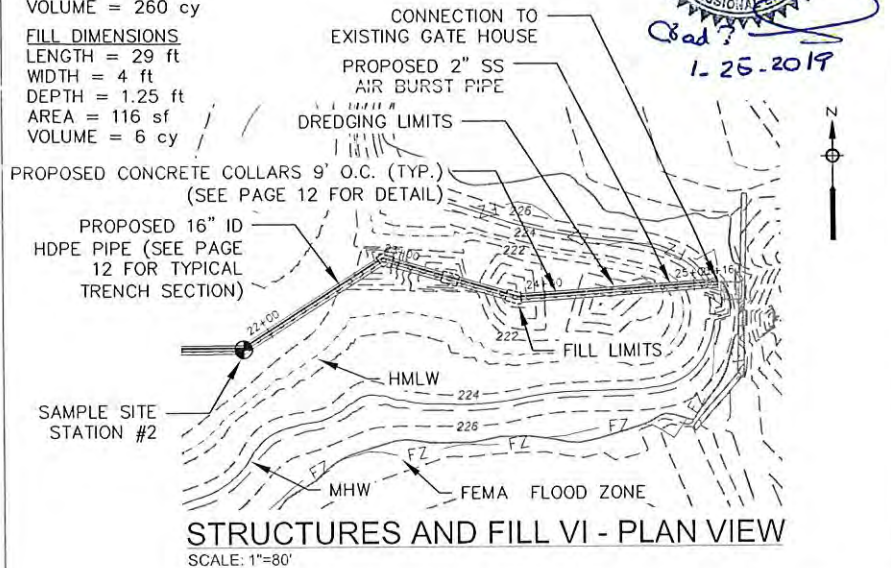
LENGTH = 351 ft
WIDTH = 4 ft
DEPTH = 5 ft
AREA = 1,404 sf
VOLUME = 260 cy

STRUCTURES FOOTPRINT

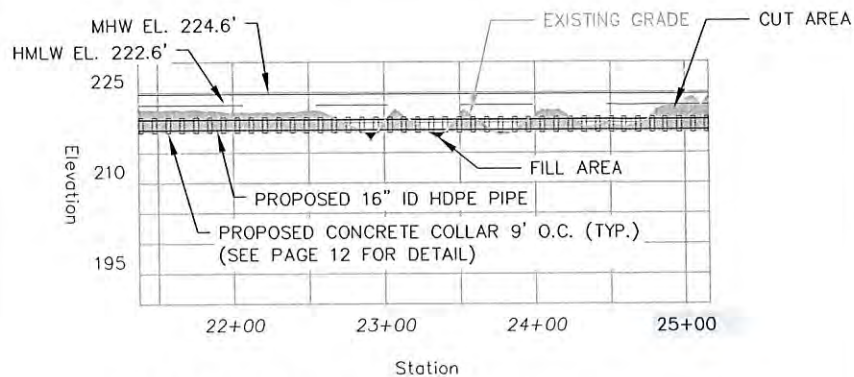
NUMBER OF COLLARS = 42
AREA PER COLLAR = 3 sf
TOTAL AREA = 126 sf

FILL DIMENSIONS

LENGTH = 29 ft
WIDTH = 4 ft
DEPTH = 1.25 ft
AREA = 116 sf
VOLUME = 6 cy



STRUCTURES AND FILL VI - PLAN VIEW
SCALE: 1"=80'



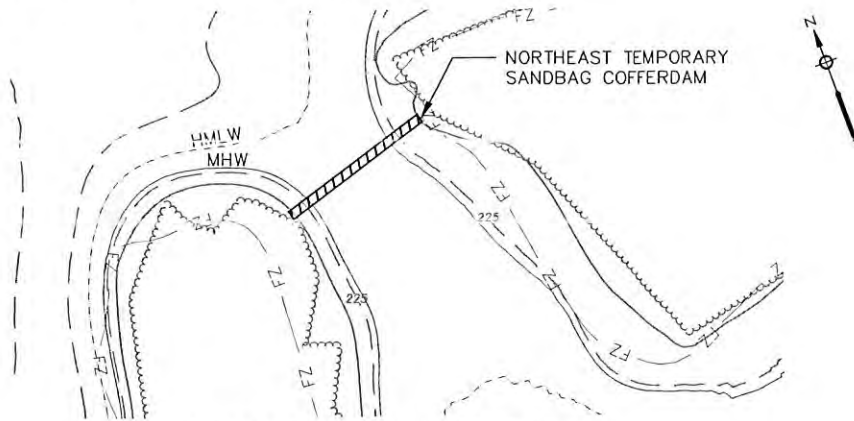
STRUCTURES AND FILL VI - PROFILE VIEW

VERTICAL SCALE: 1"=20'
HORIZONTAL SCALE: 1"=80'



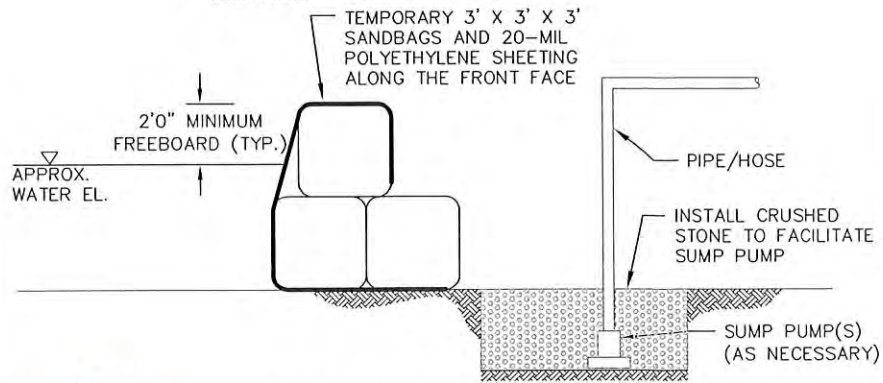
DREDGING DIMENSIONS
NO DREDGING

STRUCTURES FOOTPRINT
NO STRUCTURES



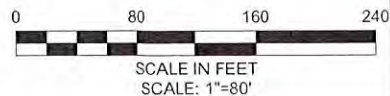
STRUCTURES AND FILL VII

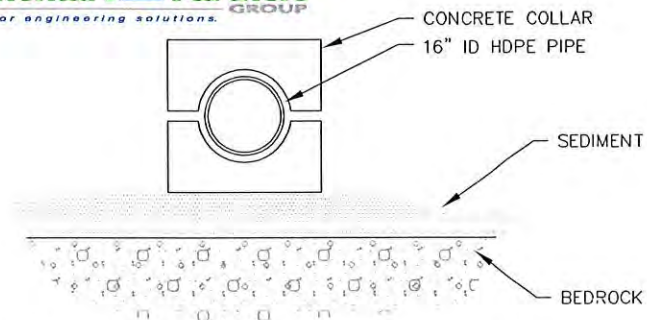
SCALE: 1"=80'



NORTHEAST TEMPORARY SANDBAG COFFERDAM DETAIL

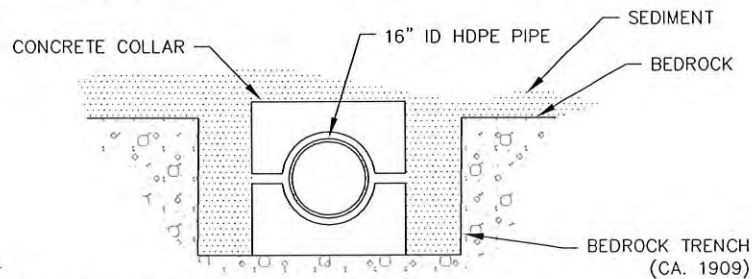
SCALE: N.T.S.





TYPICAL MARINE PIPE SECTION

SCALE: N.T.S.

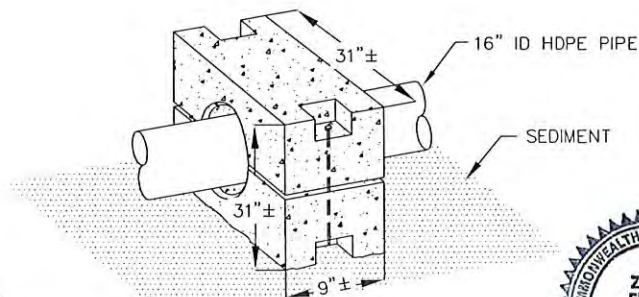


NOTE:

1. TRENCH DIMENSIONS VARY.

TYPICAL TRENCH SECTION

SCALE: N.T.S.



NOTE:

1. COLLAR DIMENSIONS ARE APPROXIMATE.

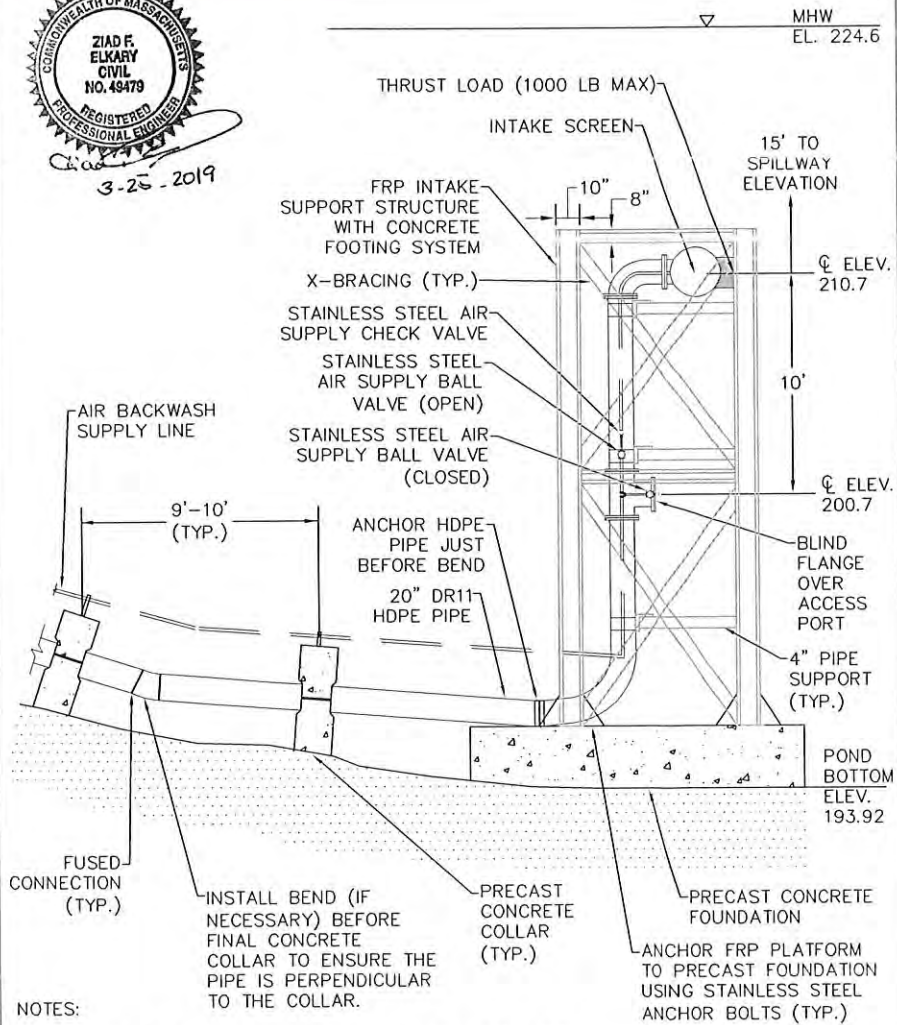
CONCRETE COLLAR DETAIL

SCALE: N.T.S.

VERTICAL DATUM- NAVD 1988

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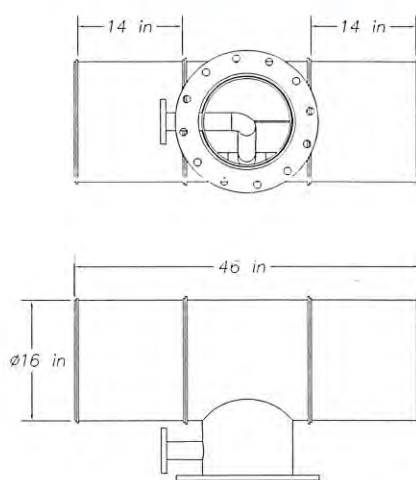


INTAKE SUPPORT STRUCTURE DETAIL

SCALE: N.T.S.

VERTICAL DATUM- NAVD 1988

PAGE 13 OF 16

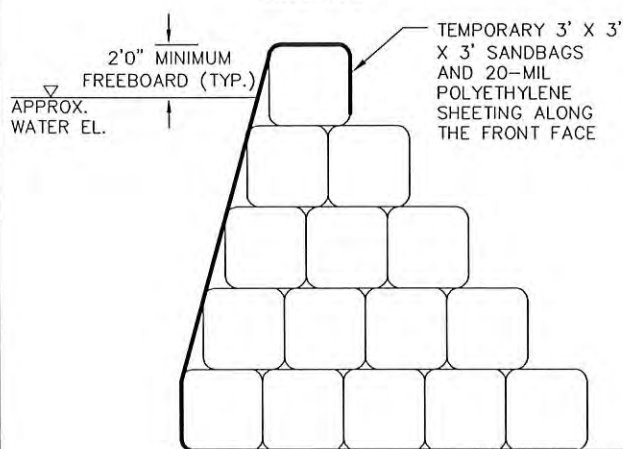


NOTES:

1. MATERIAL = 304 SS
2. UNIT CAPACITY = 1.5 MGD
3. MAX SLOT VELOCITY = 0.50 FPS
5. OUTLET SIZE 12 IN
6. AIRBURST SIZE = 12 IN
7. SLOT WIDTH = 0.125 IN

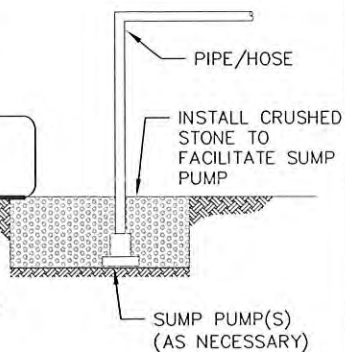
INTAKE SCREEN DETAIL

SCALE: N.T.S.

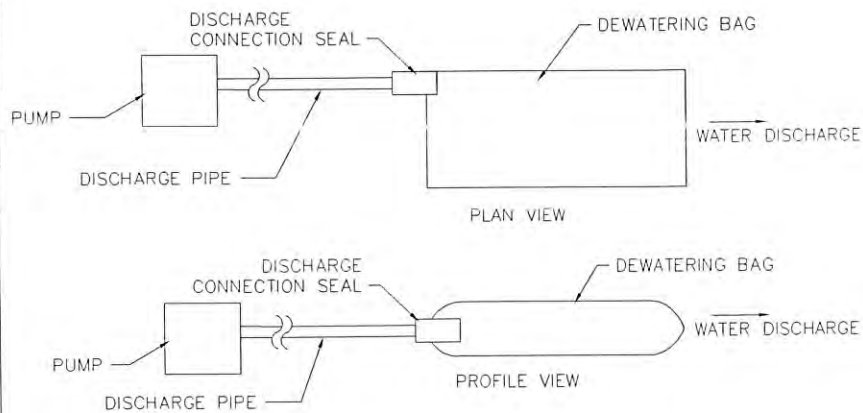


**SOUTHWEST TEMPORARY
SANDBAG COFFERDAM DETAIL**

SCALE: N.T.S.



VERTICAL DATUM- NAVD 1988



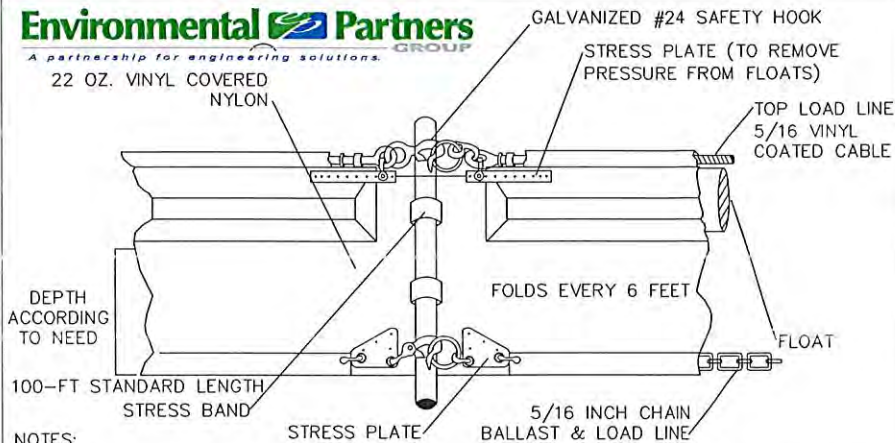
NOTES:

1. CONTRACTOR SHALL USE STONE AROUND THE SUCTION END TO MINIMIZE DISCHARGE OF TRENCH MATERIALS. THE DISCHARGE WATER SHALL PASS THROUGH FILTER FABRIC.
2. DEWATERING BAG SIZE AND QUANTITY SHALL BE AS NEEDED TO ADEQUATELY FILTER ALL PUMP EFFLUENT FROM DEWATERING ACTIVITIES. CONTRACTOR SHALL PROVIDE A REDUNDANT BAG ON SITE AT ALL TIMES.
3. EACH BAG SHALL HANDLE A 2", 3", OR 4" DISCHARGE HOSE.
4. DISCHARGE HOSES CAN BE PLACED ALONG ANY EDGE BY MAKING A SMALL INCISION INTO THE FABRIC, INSERTING THE HOSE, AND THEN CLAMPING THE FABRIC TO THE HOSE VIA WIRE, TIES, CLAMP, ROPE OR SIMILAR TO CREATE A GOOD SEAL.
5. CONTRACTOR SHALL AVOID DISCHARGING MULTIPLE PIPES INTO ONE BAG.

DEWATERING BAG DETAIL

SCALE: N.T.S.





NOTES:

1. THE TURBIDITY CURTAIN AND ANCHOR SYSTEM SHALL BE ADEQUATE FOR A MINIMUM FLOW VELOCITY OF 2 FEET PER SECOND.
2. THE TURBIDITY CURTAIN SHALL EXTEND THE ENTIRE DEPTH OF THE WATER COURSE.
3. TURBIDITY CURTAIN EXTERNAL ANCHORING SHALL BE ACCOMPLISHED WITH THE USE OF BOTTOM ANCHORS. BOTTOM ANCHORS MUST BE SUFFICIENT TO HOLD THE CURTAIN IN THE SAME POSITION RELATIVE TO THE BOTTOM OF THE WATERCOURSE WITHOUT INTERFERING WITH THE ACTION OF THE CURTAIN.
4. THE MINIMUM PHYSICAL PROPERTY REQUIREMENTS FOR THE CURTAIN FABRIC SHALL BE AS FOLLOWS:
 THICKNESS = 45 MILS
 WEIGHT = 22 OZ./SQ.YD.
 GRAB TENSILE STRENGTH = 300 LBS.
 UV INHIBITOR IS REQUIRED
5. THE CONTRACTOR SHALL ATTEMPT TO MINIMIZE THE NUMBER OF JOINTS IN THE SILT CURTAIN. A MINIMUM CONTINUOUS SPAN OF 50-FT BETWEEN JOINTS SHALL BE MAINTAINED.
6. THE ENDS OF THE CURTAIN, BOTH FLOATING AND WEIGHTED LOWER, SHOULD EXTEND WELL UP INTO THE EDGE OF WATER, ESPECIALLY IF HIGH WATER CONDITIONS ARE EXPECTED. THE ENDS SHOULD BE SECURED FIRMLY TO THE EDGE OF WATER TO FULLY ENCLOSE THE AREA WHERE SEDIMENT MAY ENTER THE WATER.
7. ALL BARRIER HARDWARE AND FITTINGS SHALL BE GALVANIZED UNLESS OTHERWISE NOTED.
8. THE TURBIDITY CURTAIN SHALL BE MAINTAINED IN PLACE AFTER CONSTRUCTION IS COMPLETED, UNTIL ENGINEER PROVIDES DIRECTION TO REMOVE THE CURTAIN.
9. THE TURBIDITY CURTAIN SHALL COMPLETELY ENCLOSE ANY CONSTRUCTION ACTIVITY WITHIN THE POND AS SPECIFIED.

TURBIDITY CURTAIN DETAIL

SCALE: N.T.S.

VERTICAL DATUM- NAVD 1988
 SHEET 16 OF 16

