



PHASE IV REMEDY IMPLEMENTATION PLAN (RIP)

**FORMER HOLBROOK
CHEMICAL CORP. SITE**
3 PHILIPPS ROAD

HOLBROOK,
MASSACHUSETTS

MASSDEP RELEASE
TRACKING NUMBER
4-3024519

225604.03

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COMMITMENT & INTEGRITY DRIVE RESULTS

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1. INTRODUCTION

This Phase IV Remedy Implementation Plan (Phase IV RIP) was prepared by Woodard & Curran, Inc. (W&C) for the disposal site (the Site) as defined in the Massachusetts Contingency Plan (MCP; 310 CMR 40.000) located at the former Holbrook Chemical Corporation at 3 Philipps Road, Holbrook, Massachusetts (the Property). This plan was prepared in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) on behalf of TLA Holbrook, LLC (TLA Holbrook). The Site is listed under Massachusetts Department of Environmental Protection (MassDEP) Release Tracking Number (RTN) 4-3024519 and is currently Tier Classified as a Tier II Disposal Site. Refer to **Figure 1** for the Site Locus.

The Phase II Comprehensive Site Assessment (Phase II CSA) and Phase III Remedial Action Plan (Phase III RAP) reports were previously submitted to MassDEP in January 2013 as a combined document. The Phase II CSA identified bis(2-Ethylhexyl)phthalate (BEHP) and C11-C22 aromatic hydrocarbons in soil as the primary contaminants of concern at the Site, although various other trace constituents were also identified as chemicals of concern. Based on the conclusions of the Phase II CSA, the Phase III RAP report addressed these impacts and determined the most technologically and economically feasible means of remediation to achieve a condition of “No Significant Risk” at the Site (310 CMR 40.0850).

The purpose and objective of this Phase IV RIP is provided below.

1.1 PURPOSE

The purpose of this Phase IV RIP is to describe the design, construction and implementation of the Comprehensive Remedial Action alternative(s) identified in the January 2013 Phase III RAP. This Phase IV RIP will be used to guide implementation of selected remedial action alternatives under Phase IV of the MCP (310 CMR 40.0874). This Phase IV RIP is designed to meet the performance standards set forth in 310 CMR 40.0872. The performance standards are intended to ensure that:

1. The Phase IV RIP supports implementation of the comprehensive remedial actions;
2. Remedial actions meet design and performance specifications;
3. The performance standards of 310 CMR 40.0191 are met for design construction and implementation of the comprehensive remedial actions; and
4. The Phase IV RIP conforms to all applicable requirements of the MCP.

Accordingly, a copy of the Phase IV RIP transmittal form (BWSC-108) is provided in **Appendix A** and the public notification documentation is provided in **Appendix B**.

1.2 OBJECTIVE

The objective of this Phase IV RIP is to set forth a plan to reduce contaminant concentrations to a level that presents No Significant Risk, as defined by the MCP, and where feasible, to reduce the level of oil and hazardous materials in the environment to background levels. The ultimate goal of the implementation of the remedial action alternatives described in this document is to achieve a Permanent Solution for this Site consistent with the requirements of a Class A Response Action Outcome (RAO) Statement.

2. SITE BACKGROUND

2.1 SITE DESCRIPTION

The Site is located in the central portion of an 11-acre parcel located on the Property at 3 Philipps Road in Holbrook, Massachusetts. The coordinates of the Site are 42° 9' 7"N latitude, 71° 1' 39" longitude, and the Universal Transverse Mercator (UTM) coordinates are 4668632 Northing and 332475 Easting in Zone 19. **Figure 1** provides a Site Locus. **Figure 2** is a Site Plan.

2.2 SITE HISTORY, OPERATIONS, AND USE

Historical information regarding the history of the Property on which the Site is located is limited. Based on available information, the Property was initially owned and operated by the Portland Chemical Works in the years prior to 1960. In 1960, the Property was purchased by the Holbrook Chemical Corporation (Holbrook Chemical), which manufactured, stored, and sold various chemicals on-site until approximately 1998. Sometime prior to 1982, Philipp Brothers Chemicals, Inc. began operating Holbrook Chemical. Holbrook Chemical abandoned the Site in approximately 1998, and the land was taken by the Town of Holbrook through tax title in June 2005. TLA Holbrook is leasing the Property from the Town of Holbrook in order to construct and operate a municipal solid waste (MSW) transfer station at the Site.

Based on a review of available correspondence concerning the 1982 renewal of Holbrook Chemical's permit to store flammable fluids, Holbrook Chemical was permitted to store 157,800 gallons of flammable liquids on-site. These liquids were either stored in drums (62,000-gallon total capacity) or in ten bulk aboveground storage tanks ranging in size from 15,000 gallons to 25,000 gallons (177,000-gallon total capacity).

The bulk storage tanks are located within an earthen bermed area (Silo Containment Area) located south of the former so-called "Mixing Building" as shown in **Figure 2**. The raw chemicals were transported to the Property using a railroad spur located along the western side of the Property. The chemicals were off-loaded into the bulk storage tanks via a piping manifold system. The chemical manufacturing would take place in the Mixing Building, where the chemicals from the bulk storage tanks were piped and blended to produce the manufactured product. A so-called "chemical dry well", located between the Silo Containment Area and the Mixing Building was identified in the historical correspondence. The location of the former chemical dry well would appear to be the approximate location of the soil sample taken in 2004 by Nangle Consulting Associates, Inc. which resulted in the original DEP site notification.

Based on historical data obtained from the Holbrook Board of Health, during the period between 1982-1983, chemicals stored in the Silo Containment Area included:

- Tributoxy Ethyl Phosphate
- Acetone
- Dibutyl Phthalate
- Dioctyl Adipate
- Dioctyl Phthalate
- Glacial Acetic Acid
- Glycol Ethers
- Isopropyl Alcohol
- Methyl Ethyl Ketone

During the same time period, chemicals stored on-site in drums included:

- Acetone
- Ethyl Alcohol
- N. Butyl Acetate
- N. Butyl Alcohol
- Ethyl Acetate
- Toluene
- Xylene
- Tetrahydrofuran
- Propylene Oxide
- Isobutyl Acetate
- Isobutyl Alcohol
- Methanol
- Methyl Ethyl Ketone
- Methyl Isobutyl Ketone
- Triethylamine
- Glycol Ethers
- Cyclohexanone
- 2 Ethyl Hexanol
- Formic Acid
- Formalin
- Phenol Solution
- Ethylene Glycol
- Plasticizers (Epoxy)
- Plasticizers (Tallate)
- Glycerine
- Hexylene Glycol
- Triethanolamine
- Isophorone
- Plasticizers (Phosphate)
- Propylene Glycol
- Methyl Salicylate

2.3 CURRENT SITE OWNERSHIP

The Town of Holbrook took the Property on which the Site is located through tax title in June 2005. TLA Holbrook is leasing the Property from the Town of Holbrook in order to construct and operate a municipal solid waste transfer station. The Property is currently partially leased and occupied by Falvey Steel Castings, Inc.

3. PREVIOUS RESULTS AND REMEDIATION OBJECTIVES

As stated in Section 1, the primary objective of this Phase IV RIP is to implement a plan to reduce contaminant concentrations to a level that presents No Significant Risk. In order to accomplish this objective, the findings of the Phase II CSA and Phase III RAP for the Site were evaluated. A summary of the findings are described below.

3.1 PHASE II SUMMARY

Conclusions from the Phase II CSA are summarized below:

- Between December 2004 and June 2009, subsurface investigation activities were conducted at the Site.
- The Disposal Site, also referred to as the Site, is defined as an approximately one-acre portion of the Property in the historical area of the chemical storage as shown in **Figure 2**. Contaminants of potential concern (COPCs) in soil were detected from ground surface to approximately 8 feet bgs.
- Groundwater is present at depths less than 15 feet bgs and groundwater has been determined to flow east-southeast.
- Oil or Hazardous Materials (OHM) at low concentrations at the Site consist of heavy metals, pesticides (4,4-DDE and 4,4-DDT), EPH fractions, semi-volatile organic compounds (SVOCs) (chlorobenzene compounds, BEHP, and phenol), and volatile organic compounds (VOCs) (trichloroethene). Of all COPCs, BEHP and C₁₁-C₂₂ aromatic hydrocarbons are the primary contaminants that are present at elevated concentrations, notably in the location of soil boring S-10.
- Light non-aqueous phase liquid (LNAPL) has not been observed at the Site.
- Impacts to the subsurface primarily exist in surficial soil at depths of less than 4 feet. Residual impacts extend to approximately 8 feet bgs across the Site.
- The “hot spot” includes soil in the vicinity of soil boring S-10 (elevated concentrations of BEHP and C₁₁-C₂₂ aromatic hydrocarbons) that contribute to excess human health risks under current and future conditions.
- Based on the results of the Risk Characterization, further MCP response actions are required to address the “hot spot”.

3.2 PHASE III SUMMARY

The remedial action objective identified for the Site in the Phase III RAP was elimination of human exposures to impacted-soils such that a condition of No Significant Risk of harm to human health, public welfare, safety, and the environment as defined under the MCP can be achieved. Construction of an engineered barrier with institutional controls was selected as the remedial alternative to achieve this remedial action objective.

The site-specific remedial goals and engineering design for the Phase IV RIP are provided in Section 5 of this Report.

4. GENERAL SITE REQUIREMENTS

This Phase IV RIP addresses the impacts to soil at the Site. This Phase IV RIP has been prepared in accordance with the requirements of 310 CMR 40.0870 to describe the planned implementation of the construction of an engineered barrier over the impacted soils that pose a potential significant risk at the Site. The general requirements under the MCP are included below. The engineering and implementation details are provided in Section 5.

4.1 PROJECT CONTACTS

As required by Section 40.0874(3)(a) of the MCP, the following are the relevant site contacts:

Person Undertaking TLA Holbrook, LLC
Response Actions: 40 Shawmut Road
Canton, MA 02012
Phone: (781) 737-1700

LSP: Craig Blake, P.E., LSP#: 3760
Woodard & Curran
980 Washington Street
Suite 325
Dedham, MA 02026
Phone: (781) 251-0200

Entity Implementing To Be Determined
Response Actions: (Contractors currently being evaluated)

4.2 HEALTH AND SAFETY

In accordance with OSHA regulations and 40.0874(3)(e), Woodard & Curran developed a site-specific health and safety plan (HASP) for oversight of Phase IV RIP activities. The HASP, provided in **Appendix D**, outlines actions to be taken to prevent exposure to unsafe conditions during field oversight, construction management, and confirmatory and waste characterization sampling. In summary, modified Level D personal protection equipment (Tyvek TM, steel toe boots, protective gloves, safety glasses, etc.) has been assumed for all remedial implementation and sampling activities.

In addition to the HASP, contractor-specific HASP(s) will be prepared in accordance with OSHA and MCP requirements.

4.3 PERMITTING – REGULATED RESOURCE AREAS

The Property contains a number of protected wetland and resource areas under the jurisdiction of state and federal agencies, some of which fall within the Site boundaries. They include: Riverfront Area and associated Buffer Zones subject to the Wetlands Protection Act and the Town of Holbrook Wetland Bylaw. Final Construction Drawings illustrate the resource areas and associated buffer zones regulated at the Property. Therefore, in accordance with 310 CMR 40.0874(3)(f), the following permit is required for implementation of Phase IV activities:

Order of Conditions, Holbrook Conservation Commission – Required for excavation activities within the 200-foot Riverfront Area, which is identified as the top of the Cochato River bank and inland 200 feet.

The above permit has been obtained as part of the permitting for the proposed MSW transfer station. Additionally, as part of the on-going development plans for the Property, the project prepared and submitted an expanded Environmental Notification Form (expanded ENF) to the State MEPA Office under the Massachusetts Environmental Policy Act (as promulgated in 301 CMR 11.00). The expanded ENF is designed to provide state and federal agencies, local officials and interested public parties an overview of the project's environmental effects and lists the permits and approvals that the project is required to obtain. A Secretary's Certificate on the ENF was issued on January 25, 2013 stating that an Environmental Impact Report was not required.

4.4 PROPERTY / SITE ACCESS ISSUES

In accordance with 310 CMR 40.0874(3)(g), the Property and/or Site access issues which are relevant to the implementation of the Comprehensive Remedial Action have been summarized in the following table. Further details on the Property and/or Site access issues are included in Section 5.

Table 4-1: Property Access

Description of Property Access Issue and Proposed Resolution	Timetable
The Site will be cleared and grubbed as necessary to perform the remediation activities and the existing on-site access road will be available for use by heavy equipment and other field vehicles required to perform the remediation activities.	Clearing will be coordinated with the planned sequence of remediation activities.
The area to be remediated is within an earthen containment berm constructed around ten (10) aboveground chemical storage tanks (ASTs) ranging in size from 15,000 gallons to 25,000 gallons. The ASTs, concrete tank pads and connecting piping will be removed prior to remediation of the area.	Removal of the ASTs, concrete tank pads and piping will be completed as the initial phase of the remediation activities.

4.5 PUBLIC NOTIFICATION

In accordance with 310 CMR 40.1403(3)(a) and 310 CMR 40.1403(3)(e), the Chief Municipal Officer and Board of Health have been notified of the completion and submittal of this Phase IV RIP, the purpose, nature and expected duration of Phase IV field activities, and the level of protective clothing and equipment required during Phase IV field activities. Copies of the notification letters informing them of the Phase IV RIP submittal and detailing how copies of these submittals may be obtained are provided in **Appendix B**.

In accordance with the Public Involvement Plan (PIP), copies of this Report have been provided to the site repositories and notice of its availability has been mailed to the site mailing list.

5. ENGINEERING DESIGN

The site-specific remedial goals and engineering design associated with this Phase IV RIP are provided below in accordance with 310 CMR 40.0874(3)(b). Additional details on select portions of the remedial design are included in the Technical Specifications provided in **Appendix E**.

5.1 SUPPLEMENTAL SOIL SAMPLING

The Phase II identified the soil in the vicinity of boring S-10, located within the earthen bermed Silo Containment Area as shown on **Figure 2**, as a “hot spot” that potentially posed a significant risk to human health and the environment. On December 5, 2013, Woodard & Curran oversaw the advancement of three direct push soil probes in the vicinity of boring S-10. At each probe point, designated GP-1 through GP-3, soil samples were obtained at both the 0-4’ depth and the 4’-8’ depth and submitted to Alpha Analytical Labs for analyses for extractable petroleum hydrocarbons with target analytes by the MassEPH Method and semi-volatile organic compounds (SVOC) by EPA Method 8270. As shown in **Figure 2**, probe GP-3 was advanced in the same approximate location as boring S-10.

The analytical results are summarized in **Table 2** and document that previously identified bis(2-Ethylhexyl)phthalate) soil contamination was limited to the shallow (0-4 feet below ground surface) soil in the vicinity of the eastern edge of the concrete pad that supports the western five chemical storage tanks within the Silo Containment Area (see **Figure 2**) in the vicinity of borings GP-2 and GP-3. The laboratory analytical report is included as **Appendix F**.

5.2 SITE SPECIFIC DESIGN CONSIDERATIONS

The following site-specific factors were considered in the development of the remedial design:

- The Property contains the following state wetland resource areas: Riverfront Area and associated buffer zones and resource areas subject to the Wetlands Protection Act and the Town of Holbrook Wetland Bylaw.
- The Site access issues, as discussed in Section 4.4 above.
- The depth of impacted soil extends to approximately 4 feet below existing ground surface (bgs) in the vicinity of the ASTs and concrete tank pads. The existing ground elevation in the remediation area within the Silo Containment Area is approximately 135 feet NGVD 1929 Datum.
- The BEHP and C₁₁-C₂₂ aromatic hydrocarbons “hot spot” is limited to an approximately 45 foot by 22 foot area located at the eastern end of the western AST tank pad.
- The entire Silo Containment Area will be covered by the construction of an approximately 27,331-square foot split level municipal solid waste (MSW) transfer station building with proposed finish floor elevations of 132.12 feet and 136.12 feet, respectively.
- Previous groundwater sampling performed as part of the Phase II CSA confirmed that groundwater at the Site has not been significantly impacted by the release of hazardous materials to the soil.
- All site restoration work will be conducted in accordance with the requirements of the Technical Specifications (**Appendix E**), Final Construction Drawings (**Appendix C**), and all existing local and state permits (refer to Section 4.3).

5.3 REMEDIAL GOALS

Based on the site-specific conditions and the human health and ecological risk evaluations, the following remedial goals have been developed for implementation of Phase IV remedial response actions:

- Attainment of a Permanent Solution and achievement of a condition of No Significant Risk of harm to human health, public welfare, and the environment across the Site by eliminating exposure to soil impacted by elevated concentrations of BEHP and C₁₁-C₂₂ aromatic hydrocarbons.

5.4 REMEDIAL APPROACH

The remedial approach for the Site is to eliminate exposure to the impacted soils. This will be achieved by relocating the impacted soil to the area underneath the southern exterior wall of the proposed transfer station building. **Figure 3** shows the location of the boring S-10 and the impacted soil area in relationship to the proposed transfer station building. **Figures 4** and **5** show east-west and north-south cross-sections, respectively, of the area and the existing and proposed ground elevations in the impacted soil area.

Relocating the impacted soil to the area underneath the building as shown in **Figure 5** will allow the soil to be covered with the relocated concrete tank pads as a separation layer, a minimum of 24 inches of unimpacted fill, and 12 inches of reinforced concrete, thereby eliminating exposure to the impacted soil.

5.5 SITE PREPARATION

The following sections outline preparation activities necessary at the Property and the Site prior to commencing remedial activities.

5.5.1 Erosion Controls

Hay bales and a siltation fence will be installed downgradient of work areas to prevent migration of contaminated soils/sediments into adjacent resource areas as shown on the Final Construction Drawings in **Appendix C**. The fences will be inspected daily to ensure that they remain intact and that they continue to serve their purpose as a functional erosion control. Any debris found between the hay bale/siltation fence and the Cochato River will be removed by hand and transported back to the work area. For further details of erosion controls, refer to the Technical Specifications section 02 32 70 found in **Appendix E**.

5.5.2 Clearing and Grubbing

Areas of the Site that require soil excavation will be cleared of all vegetation. This includes the Silo Containment Area and associated distribution piping. The Final Construction Drawings found in **Appendix C** show the location of these areas.

Trees and brush located within the area designated for excavation will be removed immediately prior to groundwork in that area. Trees and vegetation that are removed will be chipped on-site and left at the surface prior to soil excavation activities.

All machinery and vehicles used for site clearing will be decontaminated prior to leaving the Site. For further details of the site clearing and grubbing plan, refer to the **Appendix E** - Technical Specifications section 02 20 00.

5.5.3 AST and Piping Removal

The Silo Containment Area includes nine (9) 12-foot diameter ASTs ranging in size from 15,000 gallons to 25,000 gallons and one (1) 15-foot diameter, 20,000-gallon AST. The Silo Containment Area is divided into two earthen bermed areas, each containing five (5) ASTs. Each group of five ASTs are supported by a concrete tank pad as shown in **Figure 2**.

The ASTs are interconnected via an insulated aboveground piping network that connects the ASTs to a manifold system previously used to unload the chemical tank rail cars that were historically used to deliver the raw chemicals to Holbrook Chemical. The insulated piping network also connects the ASTs to the former “Mixing Building” located north of the Silo Containment Area.

Preliminary inspection of the ASTs has shown that the ASTs are primarily empty with some residue potentially located in the bottom of the ASTs. Prior to excavation of impacted soil, the ASTs will be accessed and any encountered residuals will be removed by vacuum truck during AST cleaning activities. Piping will be isolated and cleaned. The cleaned ASTs and distribution piping will be dismantled and shipped off-site for recycling.

As part of the remediation activities and the transfer station pre-construction activities, the concrete tank pads will be removed, demolished and used as structural fill under the proposed transfer station building. For more information refer to **Appendix E** - Technical Specifications section 01 50 00.

5.5.4 Soil Relocation

Excavated impacted soils will be relocated to the area underneath the southeastern corner of the proposed transfer station building as shown in **Figure 3**. The approximately 150 cubic yards of impacted soil will be relocated to a 60 feet by 100 feet area located underneath the southeast corner of the proposed transfer station. The impacted soil will be placed in an 8-inch thick compacted lift and will be covered by the demolished concrete tank pads, which will serve as the separation layer. Approximately 24 inches of compacted structural fill will be placed on top of the impacted soil and concrete separation layer. The transfer station foundation, including a 12-inch reinforced floor slab, will be installed as the final layer of the barrier.

5.6 REMEDY IMPLEMENTATION

Upon relocation of the impacted soil and the construction of the barrier and transfer station, an Activity and Use Limitation (AUL) will be required to be implemented on the area to further restrict exposure to the impacted soil under the transfer station.

5.7 ENVIRONMENTAL MONITORING

During remediation work ambient air monitoring will be implemented in accordance with the HASP included in **Appendix D** of this Report. The HASP also includes contingencies for adjusting the personal protection levels and their implementation during the remedial construction activities. Selection and adjustment of the personal protective level will be based on the nature of the contaminants, including concentration and physical state, remedial construction being conducted, individual task assignments and environment conditions.

In addition, confirmatory soil sampling will be completed after the impacted soil has been excavated to confirm that the BEHP and C₁₁-C₂₂ aromatic hydrocarbons “hot spot” has been successfully relocated. Up to five (5) soil samples will be obtained from the soil remaining in place after excavation at a depth of 0-6 inches and submitted for analyses of SVOCs by EPA Method 8270 and extractable petroleum hydrocarbons (EPH) by MassEPH Method.

5.8 WASTE MANAGEMENT OF EXCAVATED MATERIALS

It is anticipated that all encountered impacted soil will be relocated under the transfer station building as detailed in Section 5.5.4. No remediation waste is anticipated to be relocated off-site.

5.9 SITE RESTORATION

All restoration activities will be completed in accordance with the Construction Drawings (see **Appendix C**) and Technical Specifications section 02 31 10, and 02 91 10 (refer to **Appendix E**). All work in this area will be completed in accordance with the Wetland Mitigation and Monitoring Plan (provided in **Appendix E**).

5.10 CONTROL OF SPILLS

Precautions will be taken to prevent spilling while cleaning and dismantling the ASTs and associated piping. If a spill should occur, it will be addressed immediately and all spilled material will be excavated and removed off-site. Confirmatory testing in the vicinity of the spill area will be performed if the spill is in an area where excavation activities have already been performed. Proper documentation of any spill, clean-up response, and confirmatory testing will be completed and submitted in the Phase IV Completion Report.

5.11 MEASURES TO PREVENT IMPACTS TO THE ENVIRONMENT

The sequence of work to be performed on-site was designed to limit impacts to the environment. The following measures will also be performed to prevent or limit impacts to the environment:

- Once excavation activities are complete, the Site will be restored in accordance with the Order of Conditions and the Final Construction Drawings in **Appendix C** and Technical Specification in **Appendix E**.
- Erosion controls will be set up downgradient of all work areas to ensure material is not transported into nearby resource areas (including the river).
- All personnel and equipment that enter the exclusion zone will be required to pass through the decontamination stations to prevent spreading of material into 'clean' zones.

5.12 ENGINEERING OVERSIGHT AND QUALITY CONTROL

The selected contractor for the Phase IV activities will be responsible for coordinating and facilitating the implementation of all Phase IV activities. In addition, they will:

- Ensure appropriate health and safety measures are taken by subcontractors; and
- Ensure that work is done in general accordance with this Phase IV RIP and the appropriate permits.

W&C, as the LSP for the Site, will monitor the Phase IV activities to ensure completion in general accordance with this plan. Specific roles to be performed include:

- Perform engineering and LSP review - monitor all phases of remedial work;
- Conduct confirmatory sampling;
- Perform quality assurance activities and coordinate with selected contractor to ensure activities meet performance standards;
- Perform data management and evaluation;

-
- Document that all work is done in general accordance with this Phase IV RIP and the appropriate permits; and
 - Preparation and submittal/recording of RAO and AUL.

6. CONSTRUCTION SUMMARY

6.1 CONSTRUCTION SUMMARY AND SEQUENCE OF ACTIVITIES

A summary of the anticipated construction activities is included on the following list; details for this phase of work are provided in the Sections above.

1. Mobilization and Site Preparation:
 - Notify public officials prior to commencing field activities, as required;
 - Establish temporary erosion controls consistent with Construction Drawings;
 - Clear and chip trees and all other vegetation;
 - Establish support area and work zones including: staging areas, decontamination facilities and other temporary facilities; and
 - Provide water to the Site for decontamination purposes.
2. Cleaning, Dismantling and Removal of Silo Containment Area ASTs and Distribution Piping:
 - Access ASTs as a permitted Confined Space Entry;
 - Remove encountered residual sludges;
 - Clean tank interiors;
 - Dismantle ASTs and remove from area as scrap metal;
 - Isolate and remove residual contents of distribution piping;
 - Dismantle piping and dispose of off-site at permitted facility.
3. Remove and stockpile Silo Containment Area Tank Pads (2).
4. Excavate and Relocate Impacted “Hot Spot” Soil under Transfer Station Cap:
 - Excavate and relocate impacted soil to the area underneath the southeastern corner of proposed MSW transfer station building in 8-inch compacted lift;
 - Collect confirmatory samples within excavation area;
 - If needed, complete additional excavation and confirmatory sampling;
 - Place stockpiled concrete tank pads over impacted soil as separation layer;
 - Construct compacted structural fill and transfer station floor slab over impacted soil relocation area; and
 - Complete transfer station construction and area restoration in accordance with the Final Construction Drawings and Appendix E – Technical Specifications.
5. MCP Reporting:
 - Prepare and file AUL for the Site;
 - Prepare and submit Phase IV Completion Statement; and
 - Prepare and submit RAO Statement.

6.2 ANTICIPATED SCHEDULE FOR IMPLEMENTATION

The following table illustrates the schedule for the Phase IV with estimated duration times and anticipated start dates.

Table 6-1: Implementation Schedule

Activity	Estimated Duration	Anticipated Dates of Activities
Site Preparation	2 weeks	June 2014
Silo Containment Area AST and Piping Removal	3 weeks	July 2014
Impacted Soil Excavation and Cap Construction	2 weeks	August 2014
Transfer Station Construction	4 to 5 months	August 2014 – December 2014
Site Demobilization	1 week	December 2014
Preparation and submittal of Phase IV Completion Statement and Final Inspection Report	3 weeks	September 2014
Submittal of AUL and Response Action Outcome Statement	4 weeks	October 2014

Note: The schedule detailed above is dependent on anticipated sequence of events and obtaining required permits to proceed with the site redevelopment. Selected contractor may propose alternative sequencing of work for review and approval with bid submission to more efficiently use resources in completing project.

6.3 CONTINGENCY PLAN

The HASP, provided in **Appendix D**, includes contingencies for adjusting the personal protection levels and their implementation during the remedial activities. Selection and adjustment of the personal protective level will be based on the nature of the contaminants, including: concentration, reactivity (if applicable) and physical state; remedial activities being conducted; individual task assignments; and environmental conditions.

Operational contingencies are intended to maximize the effectiveness of the remedial alternative to achieve cleanup levels for the Site. The following items will be considered as contingencies for issues that may arise during implementation of remedial activities:

- Additional soil removal may be required outside of the proposed limits of work if post-excavation sampling demonstrates the need to remove additional materials.
- For a site emergency during excavation activities, the following individual will serve as the emergency contact:

Craig Blake, LSP
Woodard & Curran
980 Washington Street, Suite 325
Dedham, MA 02026
Phone: (781) 251-0200

Should any of the contingencies noted above be required, all revisions will be documented in the Phase IV Completion Report.

6.4 OPERATION, MAINTENANCE AND MONITORING PLAN

The selected remedial action alternative for the Site does not require ongoing operation, maintenance and/or monitoring following implementation of the remedial activities.

6.5 OUTCOME OF COMPREHENSIVE RESPONSE ACTIONS

Upon completion of Phase IV activities, a Phase IV Completion Statement and Final Inspection Report will be prepared documenting the fulfillment of the Comprehensive Response Action. If the results of a post-Comprehensive Response Action analysis indicate that the Site remedial goals (refer to Section 5.3) have been met and an updated evaluation of site conditions through a MCP risk assessment indicates a condition of No Significant Risk, a Class A Response Action Outcome (RAO) will be prepared and submitted to MassDEP.

7. REFERENCES

Woodard & Curran (W&C), *Phase II Comprehensive Site Assessment Report and Phase III Remedial Action Plan – Former Holbrook Chemical Corp. Site*. January 2013.

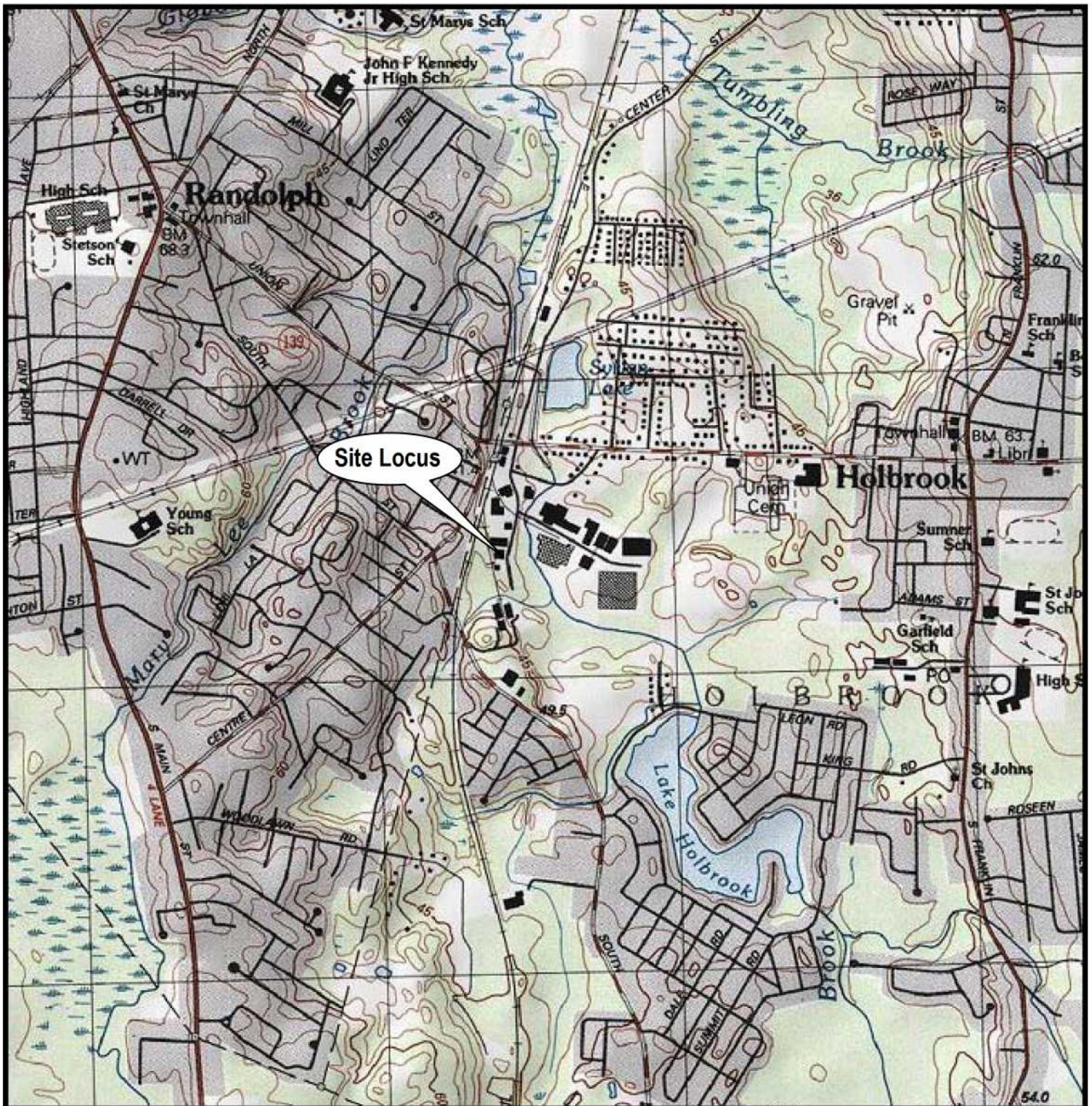
Figure 1: Site Locus Map

Figure 2: Site Plan – Existing Conditions

Figure 3: Site Plan – Proposed Conditions

Figure 4: Section A-A

Figure 5: Section B-B



MN ★ TN
15°

0 0.5 1 MILE
0 1000 FEET 0 500 1000 METERS

Printed from TOPO! ©2000 Wildflower Productions (www.topo.com)

Base Map Source:
TOPO!™ © 2000
Wildflower Productions

LAT: 42°09'07.36"
LONG: 71°01'39.66"

DES.BY: DR.BY: MES CK.BY: DC

3 Philipps Road
Holbrook, MA 02343

FIGURE 1 SITE LOCUS

SCALE: AS SHOWN JOB NO.: 225604.00

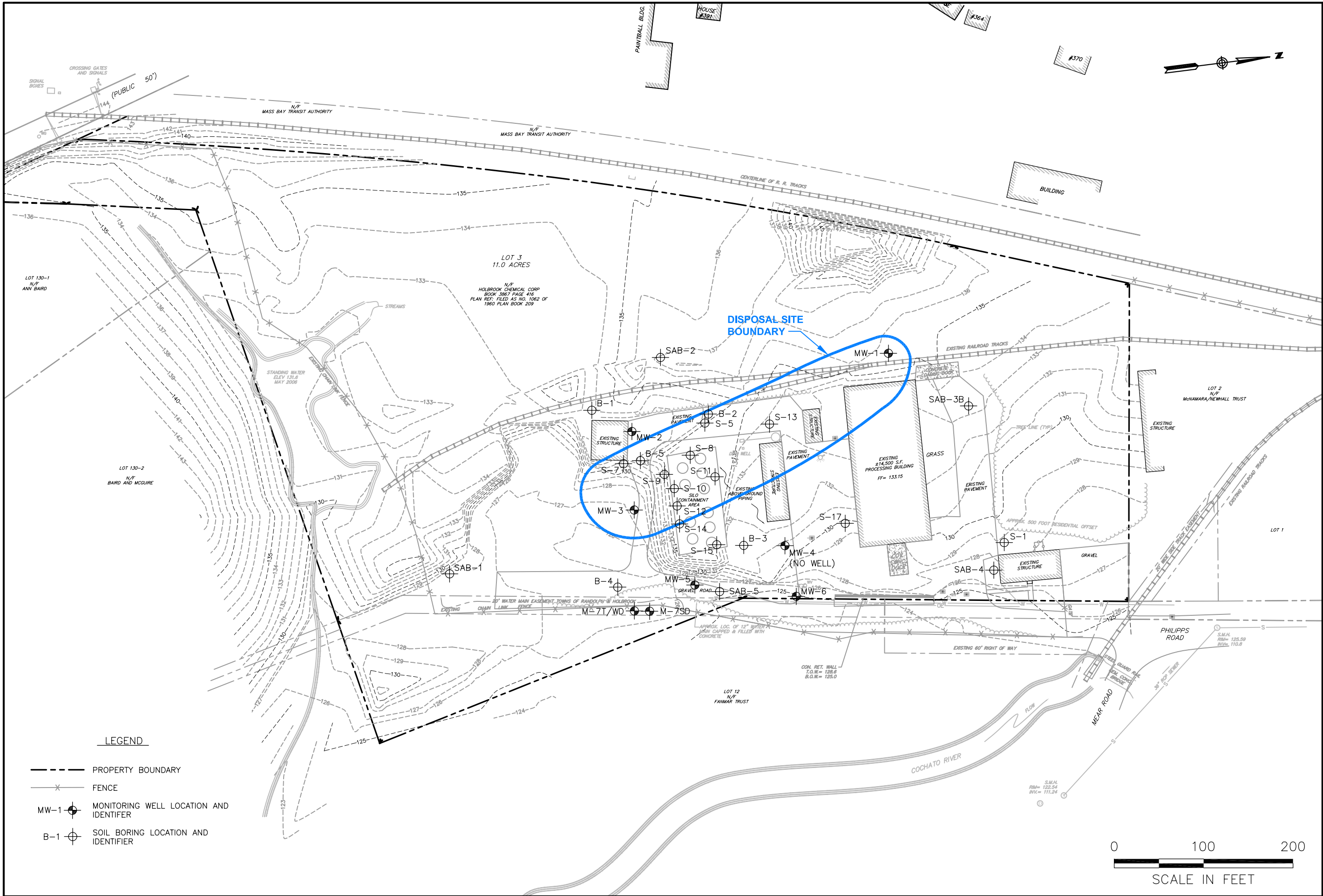
DATE: JAN 2013 FILE NAME:



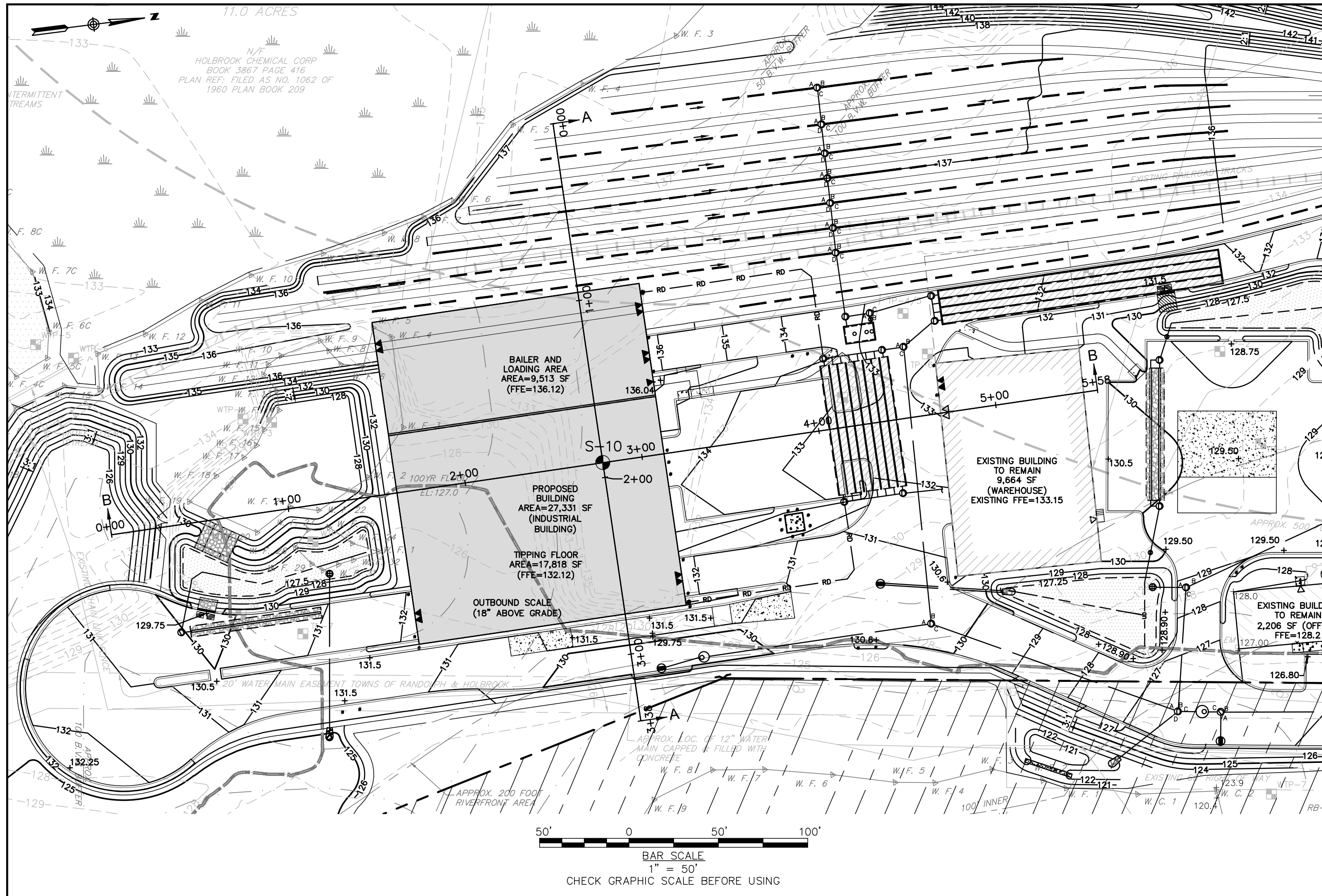
**COMMITMENT & INTEGRITY
DRIVE RESULTS**

980 Washington St, Suite 325
Dedham, MA 02026

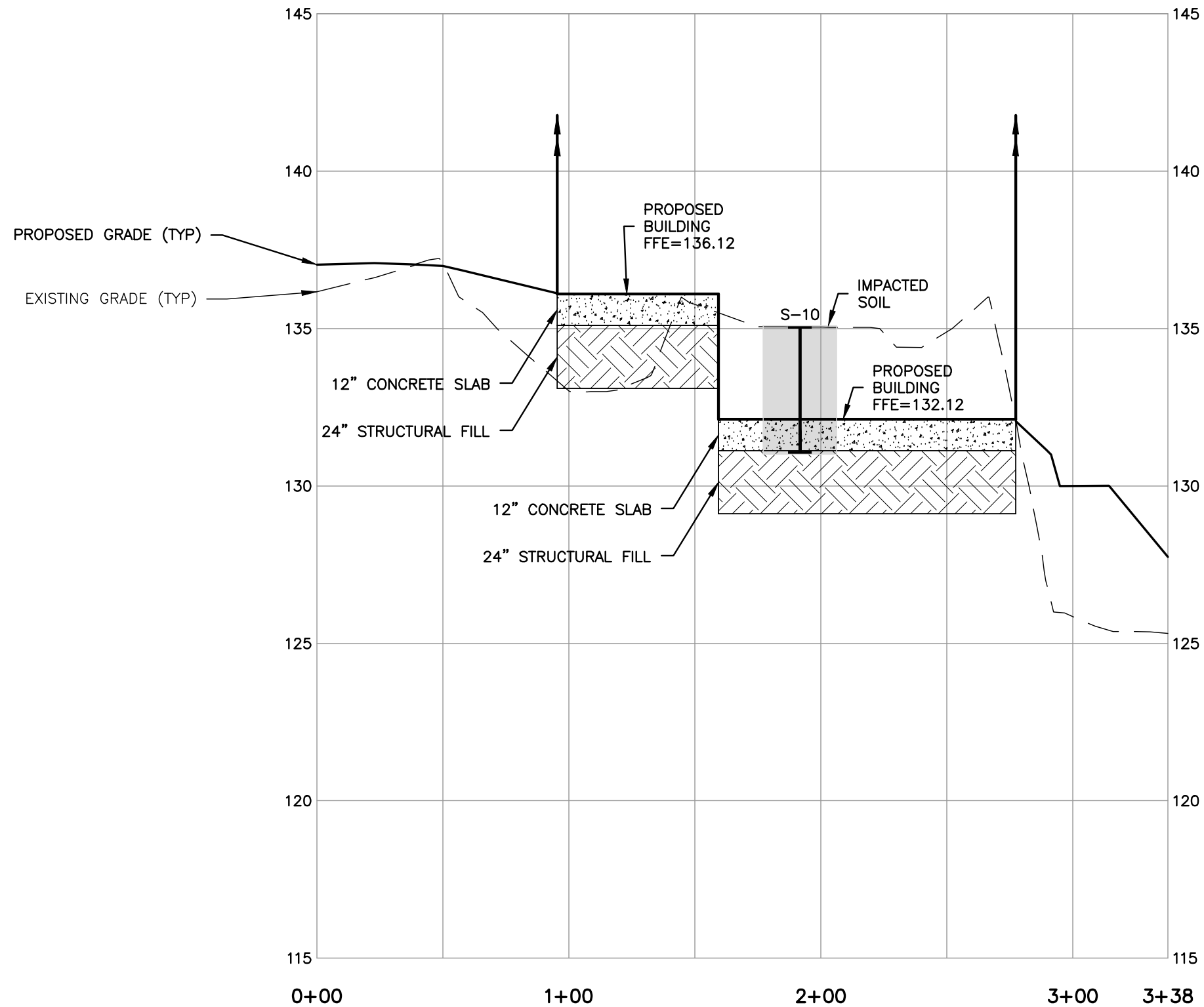
T: 800.446.5518



WOODARD & CURRAN 980 WASHINGTON STREET, SUITE 325 DEDHAM, MASSACHUSETTS 02026 800.446.5518 www.woodardcurran.com COMMITMENT & INTEGRITY DRIVE RESULTS	
SITE PLAN	
DESIGNED BY: DC	CHECKED BY: DC
DRAWN BY: EVR	Figure 2.dwg
TRANSLOAD AMERICA HOLBROOK SOLID WASTE TRANSFER STATION	
MAP 19 LOT 3 3 PHILIPPS ROAD HOLBROOK, MASSACHUSETTS	
JOB NO: 218390	
DATE: JUNE 2009	
SCALE: AS NOTED	
FIGURE 2	



WOODARD & CURRAN	
980 WASHINGTON STREET, SUITE 325 DEDHAM, MASSACHUSETTS 02026 800.446.5518 www.woodardcurran.com	
COMMITMENT & INTEGRITY DRIVE RESULTS	
SITE PLAN-PROPOSED CONDITIONS	
DESIGNED BY: CB	CHECKED BY: CB
DRAWN BY: GA	225604 Fig 3_5.dwg
TLA-HOLBROOK, LLC	
MAP 19 LOT 3 3 PHILLIPS ROAD HOLBROOK, MASSACHUSETTS	
JOB NO: 225604 DATE: DECEMBER 2013 SCALE: 1"=50'	
FIGURE 3	



SECTION A-A

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 4'

TLA-HOLBROOK, LLC

MAP 19 LOT 3
3 PHILIPPS ROAD
HOLBROOK, MASSACHUSETTS

SECTION A-A

DESIGNED BY: CB
DRAWN BY: GA

CHECKED BY: CB
225604 Fig 3_5.dwg

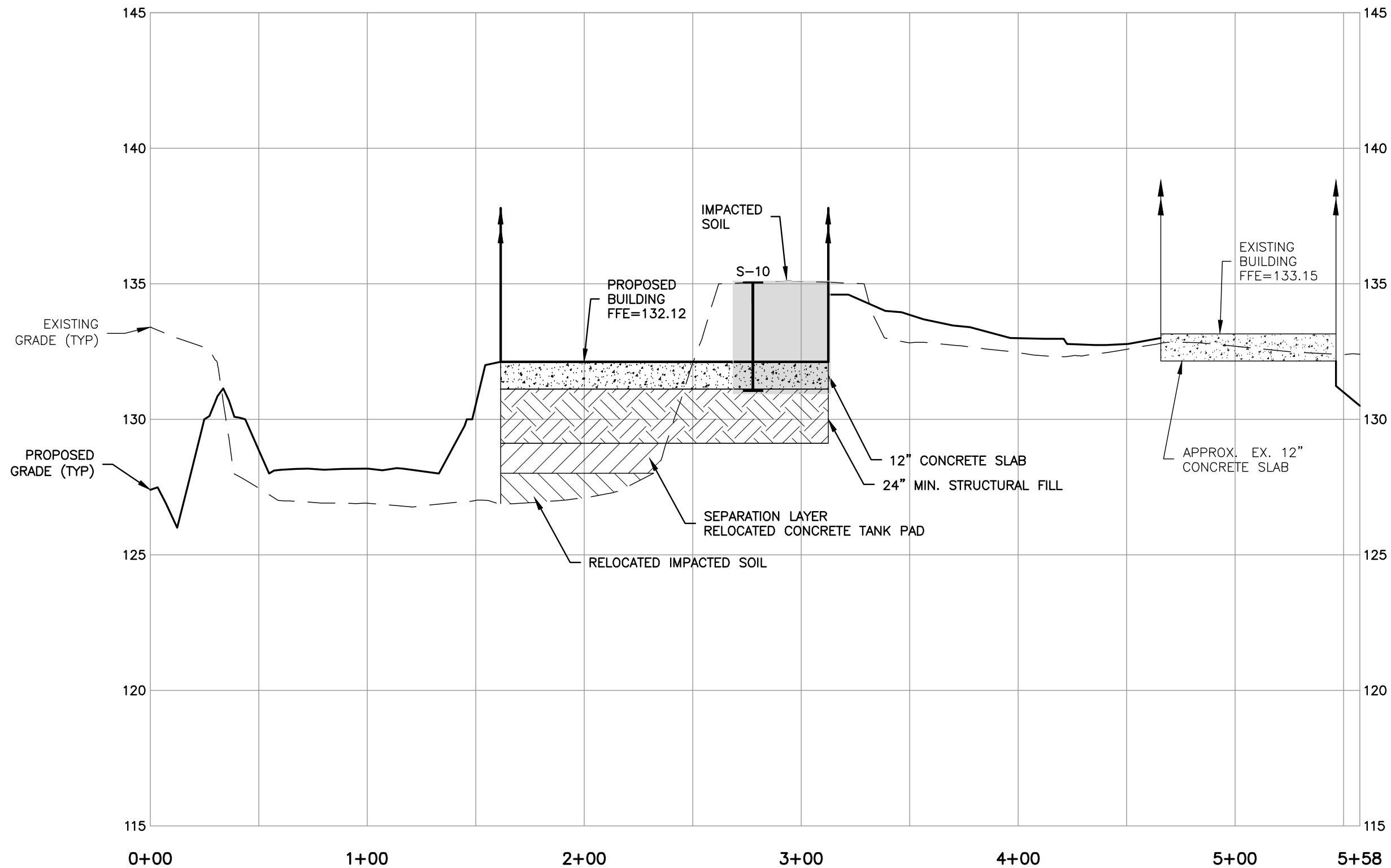
980 WASHINGTON STREET, SUITE 325
DEDHAM, MASSACHUSETTS 02026
800.446.5518 | www.woodardcurran.com



COMMITMENT & INTEGRITY DRIVE RESULTS

JOB NO: 225604
DATE: DECEMBER 2013
SCALE: AS SHOWN

FIGURE 4



SECTION B-B

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 4'

TLA-HOLBROOK, LLC

MAP 19 LOT 3
3 PHILIPPS ROAD
HOLBROOK, MASSACHUSETTS

JOB NO: 225604
DATE: DECEMBER 2013
SCALE: AS SHOWN

FIGURE 5

SECTION B-B

DESIGNED BY: CB
DRAWN BY: GA
CHECKED BY: CB
225604 Fig 3_5.dwg



980 WASHINGTON STREET, SUITE 325
DEDHAM, MASSACHUSETTS 02026
800.446.5518 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

Table 1: Summary of Soil Analytical Results

Table 1 - Summary of Soil Sampling Results

TLA Holbrook
3 Phillips Road
Holbrook, Massachusetts

LOCATION		SAMPLING DATE		S-1	S-5	S-7	S-8	S-8	S-9	S-9	S-10	S-11	S-11	S-12	S-12	S-13	S-14	S-15	S-17	MW-1	MW-2	MW-4	B-4	B-4	B-4	B-2	B-5	B-5	SAB-1	SAB-3B	B-1	SAB-2	GP-1	GP-1	GP-2	GP-2	GP-3	GP-3	
SAMPLING DATE		SAMPLING DATE		3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	3/8/06	6/8/09	6/8/09	6/8/09	6/8/09	6/8/09	6/8/09	6/8/09	6/8/09	6/8/09	6/8/09	12/5/13	12/5/13	12/5/13	12/5/13	12/5/13	12/5/13	
SAMPLE DEPTH (ft)		SAMPLE DEPTH (ft)		0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-1	0-4	0-4	0-7	5/7	5/7	0-6	6-10	6-10	6-10	0-6	6-10	0-4	0-6	0-6	0-4	0-4	0-4	0-4	0-4	0-4	0-4
				Method 1 Cleanup Std. (S-1/GW-1)		Method 1 Cleanup Std. (S-2/GW-1)		Method 3 UCL																															
Volatile Organic Compounds (mg/Kg)																																							
Chloroethane	NS	NS	NS	<0.032	<0.030	NA	<0.039	<0.034	<0.041	<0.047	<0.028	<0.048	<0.046	<0.027	<0.030	<0.031	<0.028	<0.045	NA	0.048	0.030	0.040	NA	NA	<0.0090	<0.0039	<0.0052	<0.300	NA	<0.0057	<0.0090	<0.0062	NA	NA	NA	NA	NA	NA	
Bromomethane	0.5	0.5	7000	<0.032	<0.030	NA	<0.039	<0.034	<0.041	<0.047	<0.028	<0.048	<0.046	<0.027	<0.030	<0.031	<0.028	<0.045	NA	0.100	0.080	0.087	NA	NA	<0.0036	<0.0016	<0.0021	<0.120	<0.0023	<0.0036	<0.0025	NA	NA	NA	NA	NA	NA		
Methylene Chloride	NS	NS	7000	<0.032	<0.030	NA	<0.039	<0.034	<0.041	<0.047	<0.028	<0.048	<0.046	<0.027	<0.030	<0.031	<0.028	<0.045	NA	0.100	0.080	0.087	NA	NA	<0.0036	<0.0016	<0.0021	<0.120	<0.0023	<0.0036	<0.0025	NA	NA	NA	NA	NA	NA		
Tetrachloroethane	1.0	1.0	5000	<0.032	<0.030	NA	<0.039	<0.034	<0.041	<0.047	<0.028	<0.048	<0.046	<0.027	<0.030	<0.031	<0.028	<0.045	NA	0.100	0.080	0.087	NA	NA	<0.0036	<0.0016	<0.0021	<0.120	<0.0023	<0.0036	<0.0025	NA	NA	NA	NA	NA	NA		
Trichloroethane	0.3	0.3	5000	<0.032	<0.030	NA	0.200	<0.034	<0.041	<0.047	<0.028	<0.048	<0.046	<0.027	<0.030	<0.031	<0.028	<0.045	NA	0.100	0.080	0.087	NA	NA	<0.0036	<0.0016	<0.0021	<0.120	<0.0023	<0.0036	<0.0025	NA	NA	NA	NA	NA	NA		
Benzene	2	2	2000	<0.032	<0.030	NA	<0.039	<0.034	<0.041	<0.047	<0.028	<0.048	<0.046	<0.027	<0.030	<0.031	<0.028	<0.045	NA	0.100	0.080	0.087	NA	NA	<0.0036	<0.0016	<0.0021	<0.120	<0.0023	<0.0036	<0.0025	NA	NA	NA	NA	NA	NA		
m,p-Xylene	400	400	2000	<0.032	<0.030	NA	<0.039	<0.034	<0.041	<0.047	<0.028	<0.048	<0.046	<0.027	<0.030	<0.031	<0.028	<0.045	NA	0.100	0.080	0.087	NA	NA	<0.0036	<0.0016	<0.0021	<0.120	<0.0023	<0.0036	<0.0025	NA	NA	NA	NA	NA	NA		
Toluene	30	30	10000	<0.032	<0.030	NA	<0.039	<0.034	<0.041	<0.047	<0.028	<0.048	<0.046	<0.027	<0.030	<0.031	<0.028	<0.045	NA	0.100	0.080	0.087	NA	NA	<0.0036	<0.0016	<0.0021	<0.120	<0.0023	<0.0036	<0.0025	NA	NA	NA	NA	NA	NA		
Chlorobenzene	1	1	10000	<0.032	<0.030	NA	<0.039	<0.034	<0.041	<0.047	<0.028	<0.048	<0.046	<0.027	<0.030	<0.031	<0.028	<0.045	NA	0.100	0.080	0.087	NA	NA	<0.0036	<0.0016	<0.0021	<0.120	<0.0023	<0.0036	<0.0025	NA	NA	NA	NA	NA	NA		
Volatile Petroleum Hydrocarbons (mg/Kg)																																							
Benzene	2	2	2000	<0.3	NA	NA	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Ethylbenzene	40	40	10000	<0.3	NA	NA	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Methyl-tert-butyl ether	0.1	0.1	5000	<0.3	NA	NA	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Naphthalene	4	4	10000	<1	NA	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Toluene	30	30	10000	<0.3	NA	NA	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Xylenes-mixed isomers	400	400	2000	<0.6	NA	NA	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
C9-C10 Aliphatic Hydrocarbons	100	500	500	<3.0	NA	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
C9-C12 Aliphatic Hydrocarbons	1000	3000	2000	<3.0	NA	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
C9-C10 Aromatic Hydrocarbons	100	300	5000	<3.0	NA	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Semi-volatile Organics (mg/Kg)																																							
1,2,4-Trichlorobenzene	2	2	10000	<0.051	<0.050	6.800	<0.054	<0.053	<0.051	<0.053	<0.057	<0.051	<0.057	<0.055	<0.055	<0.054	<0.052	<0.059	NA	0.060	0.050	0.054	<0.360	<0.380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1,4-Dichlorobenzene	0.7	0.7	2000	<0.051	<0.050	1.300	<0.054	<0.053	<0.051	<0.053	<0.057	<0.051	<0.057	<0.055	<0.055	<0.054	<0.052	<0.059	NA	0.060	0.050	0.054	<0.360	<0.380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
2,6-Dinitrobenzene	NS	NS	NS	<0.051	<0.050	<0.051	<0.054	<0.053	<0.051	<0.053	<0.057	<0.051	<0.057	<0.055	<0.055	<0.054	<0.052	<0.059	NA	0.060	0.050	0.054	<0.360	<0.380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
2-Methylnaphthalene	0.7	10000	<0.051	<0.050	0.073	<0.054	<0.053	<0.051	<0.053	<0.057	<0.051	<0.057	<0.055	<0.055	<0.054	<0.052	<0.059	NA	0.060	0.050	0.054	<0.360	<0.380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
4-Bromophenyl phenyl ether	NS	NS	NS	<0.051	<0.050	<0.055	<0.054	0.088	<0.051	<0.053	<0.057	<0.051	<0.057	<0.055	<0.055	<0.054	<0.052	<0.059	NA	0.060	0.050	0.054	<0.360	<0.380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
4-Methylphenol	NS	NS	NS	<0.051	<0.050	0.096	<0.054	<0.053	<0.051	<0.053	<0.057	<0.051	<0.057	<0.055	<0.055	<0.054	<0.052	<0.059	NA	0.060	0.050	0.054	<0.360	<0.380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzophenone	40	100	<0.051	<0.050	<0.054	<0.053	<0.051	<0.053	<0.051	<0.053	<0.057	<0.051	<0.057	<0.055	<0.055	<0.054	<0.052	<0.059	NA	0.060	0.050	0.054	<0.360	<0.380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzofluoranthene	7	40	100	<0.051	<0.050	<0.055	<0.054	<0.053	<0.051	<0.053	<0.057	<0.051	<0.057	<0.055	<0.055	<0.054	<0.052	<0.059	NA	0.060	0.050	0.054	<0.360	<0.380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(a)fluoranthene	NS	NS	NS	<0.770	<0.750	<0.820	<0.810	<0.800	0.084	<0.790	<0.850	<0.820	<0.800	<0.770	<0.880	<0.890	<0.750	<0.654	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzoic acid	NS	NS	NS	<0.770	<0.750	<0.820	<0.810	<0.800	0.084	<0.790	<0.850	<0.820	<0.800	<0.770	<0.880	<0.890	<0.750	<0.654	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NaC2-Ethylthiophthalate	200	700	1000	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230	NA	0.230	0.230	0.230	<0.720	<0.760	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Butyl benzyl phthalate	NS	NS	NS	<0.051	<0.050	<0.055	0.089	<0.053	0.2.																														

APPENDIX A: COPY OF BWSC-108 TRANSMITTAL FORM

This form is intentionally omitted from the electronic transmission of this report to eDEP as this Phase IV RIP is uploaded as an attachment to the form.

APPENDIX B: PUBLIC OFFICIALS NOTIFICATION



February 7, 2014

Mr. William J. Phelan
Town Administrator
50 Franklin Street
Holbrook, Massachusetts 02343

Subject: Notification of Phase IV Remedy Implementation Plan
Former Holbrook Chemical Co. Site, 3 Philipps Road, Holbrook, Massachusetts
MassDEP Release Tracking Number (RTN): 4-3024519

Dear Mr. Phelan:

This letter is being sent to you on behalf of TLA-Holbrook, LLC to fulfill the public notification requirements established by the Massachusetts Contingency Plan (MCP - 310 CMR 40.0000). In accordance with the public notification requirements described in 310 CMR 40.1403(3)(e), we are notifying you that a Phase IV Remedy Implementation Plan (RIP) has been prepared for the above-referenced Disposal Site.

The response action to be implemented includes the relocation of approximately 150 cubic yards of impacted soil that has been identified as a potential source of significant human health risk to beneath the proposed 27,000-square foot municipal solid waste transfer station to be constructed on the property at 3 Philipps Road. Relocating the impacted soil to underneath the building, along with the implementation of an Activity and Use Limitation that will restrict future construction in the area of the relocated soil, will eliminate any exposure to the soil contaminants and therefore eliminate any potential significant risk posed by the Site.

A complete copy of the report is available for your review at the Massachusetts Department of Environmental Protection (MassDEP) Southeast Region Office (20 Riverside Drive, Lakeville, Massachusetts, 02347, Main Phone: 508-946-2700 or online at http://public.dep.state.ma.us/wsc_viewer/main.aspx).

If you have any questions regarding this notification, please contact Craig Blake at the address or telephone number listed above.

Sincerely,

WOODARD & CURRAN

Craig Blake, PE, LSP
Vice President

Project No. 225604

cc: Mr. Paul M. Callinan, Chairman, Holbrook Board of Health
Massachusetts Department of Environmental Protection, Southeast Regional Office

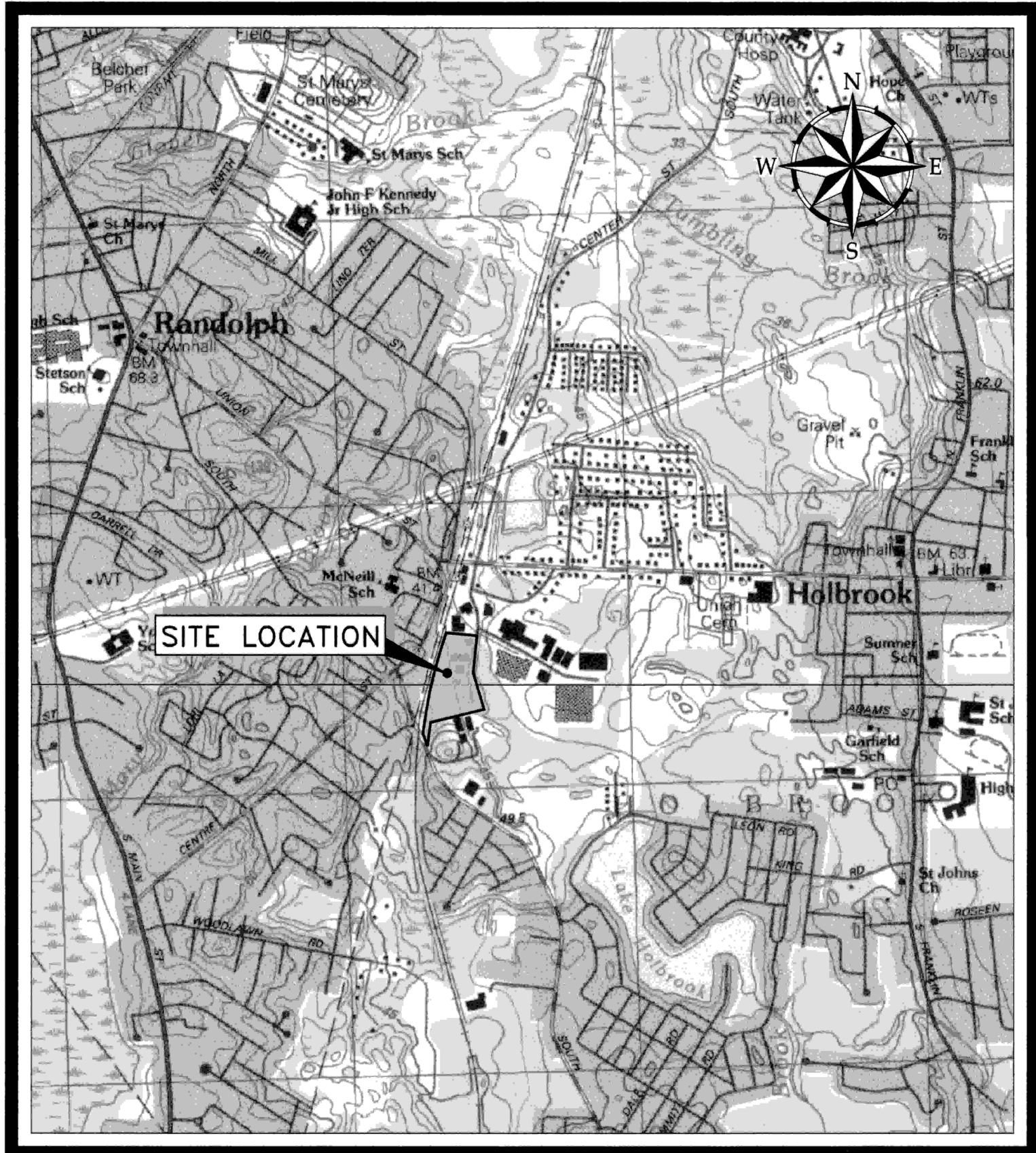
APPENDIX C: CONSTRUCTION DRAWINGS

TRANSLOAD AMERICA HOLBROOK SOLID WASTE TRANSFER STATION

PERMITTING PLANS

FOR

MAP 19 LOT 3
3 PHILIPPS ROAD
HOLBROOK, MASSACHUSETTS



SOURCE: USGS TOPOGRAPHIC MAP
SITE LOCATION MAP
Scale: 1 inch = 1 mile
Scale: 1 inch = 4000 feet



APPLICANT:
TLA HOLBROOK, LLC
40 SHAWMUT ROAD
CANTON, MA 02021

PLANS PREPARED BY:

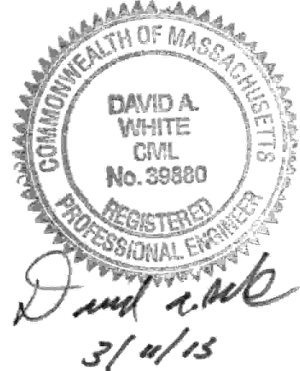
95 Cedar Street | Providence, Rhode Island 02903
800.985.7897 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

W&C PROJECT NO. 219630

SHEET INDEX

SHEET NO.	SHEET TITLE
G-100	GENERAL NOTES & LEGEND
C-100	EXISTING CONDITIONS PLAN
C-200	SITE LAYOUT PLAN
C-201	GRADING & DRAINAGE PLAN
C-202	UTILITY PLAN
C-203	SEDIMENTATION & EROSION CONTROL PLAN
C-204	PLANTING PLAN
C-300	DETAILS 1
C-301	DETAILS 2
C-302	DETAILS 3
C-303	DETAILS 4
C-304	DETAILS 5
A-300	BUILDING ELEVATIONS AND SECTIONS
L-100	LIGHTING PLAN (ISSUED AUGUST 20, 2012)



ISSUED: AUGUST 10, 2009
REVISED: MARCH 12, 2010
MARCH 11, 2013

LEGEND

EXISTING		PROPOSED
---	SETBACK	
---	PROPERTY LINE/RIGHT-OF-WAY	
---	122	122
---	CONTOUR	LW
---	LIMITS OF WORK	
---	GUARD RAIL	
---	FENCE	
---	VEGETATION	
---	RETAINING WALL	
---	CURB LINE	
---	STORMDRAIN LINE	SD
---	UNDER DRAIN LINE	UD
---	ROOF DRAIN LINE	RD
---	SANITARY SEWER	S
---	WATER	W
---	OVERHEAD ELECTRIC	OE
---	UNDERGROUND ELECTRIC	E
---	WETLAND FLAG LINE	
---	50' B.V.W. BUFFER	
---	100' B.V.W. BUFFER	
---	100' RIVERFRONT BUFFER	
---	200' RIVERFRONT BUFFER	
---	RAILROAD TRACKS	
---	CATCH BASIN	
---	DRAINAGE MANHOLE	
---	SEWER MANHOLE	
---	ELECTRIC MANHOLE	
---	FIRE HYDRANT	
---	WATER GATE VALVE	
---	UTILITY POLE	
---	SOIL BORING	
---	WETLAND	
---	EDGE OF PAVEMENT	
---	100 YEAR STORM ELEVATION	
---	10 YEAR STORM ELEVATION	
---	500' BUILDING OFFSET	
---	BUILDING ENTRANCE/EXIT - PEDESTRIAN	
---	BUILDING ENTRANCE/EXIT - VEHICULAR	
---	SIGN	
---	BOLLARD	
---	SPOT GRADE	+ 130.00

GENERAL NOTES

1. EXISTING CONDITIONS INFORMATION

A. BASE PLAN:

EXISTING PROPERTY LINE AND TOPOGRAPHICAL INFORMATION (INCLUDING EXISTING FEATURES) WERE OBTAINED FROM A DIGITAL PLAN PROVIDED BY HARDY ENGINEERING, 1287 WASHINGTON STREET, WEYMOUTH, MA DATED 4/26/06.

ADDITIONAL TOPOGRAPHICAL INFORMATION (INCLUDING EXISTING FEATURES) INFORMATION WERE OBTAINED FROM A DIGITAL PLAN PROVIDED BY G.A.F. ENGINEERING, 286 MAIN STREET, WAREHAM, MA 02571 DATED: 10-19-06

B. FLOOD ZONE:

A PORTION OF THE SUBJECT SITE LIES WITHIN ZONE AE, AN AREA DETERMINED TO BE WITHIN FLOOD ELEVATION, AS DEPICTED BY THE FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF HOLBROOK, MASSACHUSETTS, NORFOLK COUNTY, MAP NUMBER 2502102019E, MAP EFFECTIVE DATE: JULY 17, 2012.

C. UTILITIES:

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE ONLY AND HAVE NOT YET BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE CONTRACTOR IS TO CONTACT "DIG SAFE" AT 1-888-344-7233, SEVENTY-TWO (72) HOURS PRIOR TO ANY EXCAVATION PERFORMED ON SITE.

3. UTILITIES

A. LOCATION AND ELEVATIONS OF EXISTING UTILITIES

THE LOCATION AND ELEVATIONS OF ALL EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON THE INFORMATION AS REFERENCED IN THE EXISTING CONDITIONS INFORMATION PROVIDED ABOVE, AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

B. STORM DRAINAGE:

UNLESS OTHERWISE NOTED, STORM DRAIN PIPING SHALL BE ADS N-12 HIGH DENSITY POLYETHYLENE (HDPE). UNLESS OTHERWISE INDICATED, THE SIZES OF ALL PIPES ARE NOTED ON THE PLAN.

CATCH BASINS SHALL BE PRE CAST CONCRETE, AS SPECIFIED ON THE DETAIL SHEET. ALL CATCH BASINS SHALL BE FOUR (4) FEET IN DIAMETER, UNLESS OTHERWISE NOTED OR REQUIRED, HAVE A FOUR (4) FOOT MINIMUM SUMP, AND HAVE HODOS INSTALLED AT THEIR OUTLETS.

C. SEWER:

ALL BUILDING SEWER SERVICES SHALL BE CONSTRUCTED OF CORROSION RESISTANT MATERIAL AND EQUIPPED WITH WATERTIGHT JOINTS. POLYVINYL CHLORIDE PIPE UNLESS OTHERWISE INDICATED.

THE INSTALLATION OF ALL SEWER APPURTENANCES SHALL MEET THE STANDARDS OF THE TOWN OF HOLBROOK DEPARTMENT OF PUBLIC WORKS.

D. WATER:

ALL PROPOSED SEWER AND WATER UTILITIES SHALL BE CONSTRUCTED IN CONFORMITY WITH THE SPECIFICATIONS/REGULATIONS OF THE TOWN OF HOLBROOK SUPERINTENDENT OF PUBLIC WORKS.

WATER MAINS TO BE INSTALLED SHALL BE BELL AND SPIGOT, DUCTILE IRON PIPE CLASS 52

E. PROPOSED ELECTRIC

ALL PROPOSED ELECTRIC SERVICES TO BE COORDINATED DIRECTLY WITH APPLICABLE ELECTRIC COMPANY.

GENERAL CONSTRUCTION REQUIREMENTS

- THE CONTRACTOR SHALL VERIFY THE PROPOSED LAYOUT WITH ITS RELATIONSHIP TO THE EXISTING SITE SURVEY. THE CONTRACTOR SHALL ALSO VERIFY ALL DIMENSIONS, SITE CONDITIONS, AND MATERIAL SPECIFICATIONS AND SHALL NOTIFY THE OWNER AND ENGINEER OF ANY ERRORS, OMISSIONS OR DISCREPANCIES BEFORE COMMENCING OR PROCEEDING WITH WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY CONSTRUCTION PERMITS, INSPECTIONS, BONDS, ETC. AND OTHER APPROVAL RELATED ITEMS WITH THE TOWN OF HOLBROOK. NO CONSTRUCTION SHALL COMMENCE UNTIL SUCH PERMITS HAVE BEEN SECURED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A PROTECTIVE BARRIER AROUND THE SITE PRIOR TO AND MAINTAINED DURING CONSTRUCTION.
- METHODS AND MATERIALS USED IN THE CONSTRUCTION OF IMPROVEMENTS FOR THIS PROJECT SHALL CONFORM TO THE CURRENT CONSTRUCTION STANDARDS AND SPECIFICATIONS OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, TOWN OF HOLBROOK, PROJECT PLANS AND SPECIFICATIONS.
- DEVIATIONS OR CHANGES FROM THESE PLANS WILL NOT BE ALLOWED UNLESS APPROVED BY THE ENGINEER AND OWNER.
- CONTRACTOR TO CONFIRM AND VERIFY THE VALIDITY, LOCATION, MATERIAL, AND AVAILABILITY TO USE EXISTING UTILITIES ON OR NEAR THE PROJECT SITE PROPERTY. CONTRACTOR TO LOCATE EXISTING UTILITIES AND CONFIRM SAID UTILITIES WITH ALL APPLICABLE MUNICIPALITIES AND UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION. ONCE UTILITIES HAVE BEEN CONFIRMED IN THE FIELD BY CONTRACTOR AND VERIFIED BY APPLICABLE MUNICIPALITY AND UTILITY COMPANY AND CONNECTION HAS BEEN APPROVED BY ENTITY, ONLY THEN SHALL CONTRACTOR CONSTRUCT AND UTILIZE THESE UTILITIES. CONTRACTOR TO IMMEDIATELY INFORM ENGINEER OF RECORD OF ANY DEVIATIONS TO PLANS.
- THE CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS AND LOCATE ANY EXISTING UTILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF NECESSARY. THE EXISTENCE AND/OR LOCATION OF UTILITIES SHOWN ON THESE PLANS MAY BE ONLY APPROXIMATELY CORRECT AND THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN HEREON AND ANY OTHER EXISTING UTILITIES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING, AT HIS EXPENSE, ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
- THE CONTRACTOR SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATION AT LEAST TWO WORKING DAYS, BUT NOT MORE THAN TEN WORKING DAYS, PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION.
- AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE.
- CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL AND ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM "THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER."
- THE CONTRACTOR IS RESPONSIBLE TO INSTALL AND MAINTAIN ALL EROSION AND SEDIMENTATION CONTROL DEVICES, IN ACCORDANCE WITH THE APPROVED STORMWATER POLLUTION PREVENTION PLAN, PERMIT APPROVALS, AND THESE PLANS.

EROSION CONTROL AND STORMWATER MAINTENANCE NOTES

- PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLAN, OR AS DICTATED BY THE TOWN OF HOLBROOK ENGINEER OR OWNER. ALL EROSION CONTROL DEVICES SHALL BE MAINTAINED IN EFFECTIVE CONDITION DURING CONSTRUCTION. ALL EROSION AND SEDIMENTATION CONTROL DEVICES TO BE USED FOR THIS PROJECT SHALL BE INSTALLED AND MAINTAINED AS SPECIFIED ON THESE PLANS AND IN VOLUME TWO OF THE STATE OF MASSACHUSETTS STORMWATER MANAGEMENT MANUAL.
- PROPER EROSION AND SEDIMENT CONTROL PRACTICES MUST BE IMPLEMENTED DURING ALL PHASES OF CONSTRUCTION AND UNTIL THE SITE IS SATISFACTORILY STABILIZED.
- THE CONTRACTOR IS RESPONSIBLE FOR THE TIMELY INSTALLATION, INSPECTION, MAINTENANCE, AND/OR REPLACEMENT OF ALL TEMPORARY AND PERMANENT EROSION CONTROL DEVICES TO ENSURE PROPER OPERATION THROUGHOUT THE LIFE OF THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF PERMANENT MEASURES UNTIL CONSTRUCTION OF THE PROJECT IS COMPLETED OR UNTIL IT IS ACCEPTED BY THE OWNER. THE OWNER IS RESPONSIBLE THEREAFTER.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CLEAN ROADS, CONTROL DUST, AND TAKE ALL NECESSARY MEASURES TO ENSURE THAT THE SITE AND ALL ROADS BE MAINTAINED IN A MUD AND DUST-FREE CONDITION AT ALL TIMES THROUGHOUT THE LIFE OF THE CONTRACT. DUST CONTROL SHALL INCLUDE, BUT IS NOT LIMITED TO, WATER, AND/OR CRUSHED STONE OR COARSE GRAVEL.
- ALL PROPOSED CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE SURROUNDING ROADWAYS. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO THE SURROUNDING ROADWAYS MUST BE REMOVED IMMEDIATELY.
- THE CONTRACTOR SHALL INSTALL ALL PERIMETER SEDIMENT CONTROL BARRIERS AS SHOWN ON THE SITE DEVELOPMENT PLANS. A SILT FENCE SHALL ALSO BE INSTALLED AROUND ANY SOIL STOCKPILE AREAS.
- THE CONTRACTOR SHALL RESTORE DISTURBED AREAS AS CLOSELY AS POSSIBLE. AREAS DAMAGED DURING CONSTRUCTION SHALL BE RESEDED, RESEDED, OR OTHERWISE RESTORED TO THEIR ORIGINAL STATE. TREES AND OTHER EXISTING VEGETATION SHALL BE RETAINED WHEREVER FEASIBLE.
- TEMPORARY VEGETATIVE COVER SHALL BE APPLIED TO ANY DISTURBED AREAS (INCLUDING SOIL STOCKPILE AREAS) THAT HAVE NOT YET REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN SEVENTY-TWO (72) HOURS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED, UNLESS THE ACTIVITY IS TO RESUME WITHIN TWENTY-ONE (21) DAYS. THE RECOMMENDED TEMPORARY SEEDING DATES ARE MARCH 1 TO JUNE 15 AND AUGUST 15 TO OCTOBER 1.
- PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO ALL DISTURBED AREAS THAT HAVE REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN SEVENTY-TWO (72) HOURS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS PERMANENTLY CEASED. THE RECOMMENDED PERMANENT SEEDING DATES ARE APRIL 1 TO JUNE 15 AND AUGUST 15 TO OCTOBER 1.
- AREAS WHICH HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED SHOULD BE MULCHED IMMEDIATELY FOLLOWING SEEDING IN ADDITION TO AREAS WHICH CANNOT BE SEEDED WITHIN THE RECOMMENDED SEEDING DATES AND ANY SOIL STOCKPILE AREAS. TEMPORARY MULCHING SHOULD BE PERFORMED AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED UNLESS THE ACTIVITY IS TO RESUME WITHIN TWENTY-ONE (21) DAYS.
- STRAW OR HAY MULCH, WOOD FIBER MULCH, AND HYDROMULCH ARE RECOMMENDED. THE MATERIALS USED IN MULCHING SHALL CONFORM TO THE REQUIREMENTS OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGES AND PROJECT SPECIFICATIONS.
- IF SEEDING CANNOT BE COMPLETED IMMEDIATELY OR WITHIN THE RECOMMENDED SEEDING DATES, USE THE TEMPORARY MULCHING MEASURE TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
- ANY EXISTING OR PROPOSED CATCH BASINS THAT MAY BE SUBJECT TO SEDIMENTATION PROCESSES SHALL HAVE SILT SACKS INSTALLED TO PREVENT SEDIMENT FROM ENTERING THE PROPOSED STORM DRAINAGE SYSTEM PRIOR TO PERMANENT STABILIZATION OF THE DISTURBED SITE. THE PROPER INLET PROTECTION DEVICES SHALL BE INSTALLED WHERE STORM DRAIN INLETS ARE TO BE MADE OPERATIONAL BEFORE PERMANENT STABILIZATION OF ANY DISTURBED DRAINAGE AREA.
- ALL MULCHES MUST BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS, TO CHECK FOR RILL EROSION. WHERE EROSION IS OBSERVED, ADDITIONAL MULCH MUST BE APPLIED. IF NETTING IS USED, THE NET SHOULD BE INSPECTED AFTER RAINSTORMS FOR DISLOCATION OR FAILURE. IF WASHOUTS OR BREAKAGE OCCUR, THE NET MUST BE REINSTALLED AS NECESSARY AFTER REPAIRING DAMAGE TO SLOPE. INSPECTIONS SHOULD TAKE PLACE UNTIL GRASSES ARE FIRMLY ESTABLISHED. GRASS IS CONSIDERED TO BE FIRMLY ESTABLISHED AT A MINIMUM HEIGHT OF THREE (3) INCHES.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTROL DUST AND TAKE ALL NECESSARY MEASURES TO ENSURE ALL ROADS ARE MAINTAINED IN A DUST FREE CONDITION AT ALL TIMES THROUGHOUT THE LIFE OF THE CONTRACT. REPETITIVE TREATMENTS SHOULD BE APPLIED AS NECESSARY.
- INSPECTION OF PERIMETER SEDIMENT BARRIERS (INCLUDING THOSE ENCOMPASSING SOIL STOCKPILE AREAS) SHOULD BE MADE AFTER EACH STORM EVENT AND REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED. CLEAN OUT OF ACCUMULATED SEDIMENT BEHIND THE SILT FENCE IS NECESSARY IF ONE-HALF OF THE ORIGINAL HEIGHT OF THE BALES BECOMES FILLED IN WITH SEDIMENT.
- SILT SACKS HAVE BEEN PROPOSED IN ALL ON-SITE AND DOWN GRADIENT CATCH BASINS IN ORDER TO PREVENT SEDIMENT FROM ENTERING THE EXISTING AND PROPOSED STORM DRAINAGE SYSTEM PRIOR TO PERMANENT STABILIZATION OF THE DISTURBED SITE. ALL SILT SACKS SHOULD BE INSPECTED AFTER EVERY RAIN STORM AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE DISPOSED OF IN A SUITABLE AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURAL OR VEGETATIVE MEANS. CATCH BASIN INLET PROTECTION SHOULD BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.
- REPAIRS OR REPLACEMENT OF DRAINAGE STRUCTURES, RIP RAP CHANNELS, OR OTHER ELEMENTS OF THE FACILITY SHOULD BE DONE WITHIN 30 DAYS OF DEFICIENCY REPORTS. IF AN EMERGENCY SITUATION IS IMMINENT THEN REPAIR/REPLACEMENT MUST BE DONE IMMEDIATELY TO AVERT FAILURE OR DANGER TO NEARBY RESIDENTS.
- WASTE DISPOSAL: MATERIALS WHICH COULD BE A POTENTIAL SOURCE OF STORMWATER POLLUTION SUCH AS GASOLINE, DIESEL FUEL, HYDRAULIC OIL, ETC., SHALL BE STORED AT THE END OF EACH DAY IN A STORAGE TRAILER OR COVERED LOCATION AND TAKEN OFF-SITE AND PROPERLY DISPOSED OF. ALL TYPES OF WASTE GENERATED AT THIS SITE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH STATE LAW AND/OR REGULATIONS.
- GOOD HOUSEKEEPING: THE PROJECT SITE SHALL PROVIDE FOR THE MINIMIZATION OF EXPOSURE OF CONSTRUCTION DEBRIS (INCLUDING, BUT NOT LIMITED TO, INSULATION, WIRING, PAINTS AND PAINT CANS, SOLVENTS, WALL BOARD, ETC.) TO PRECIPITATION BY MEANS OF DISPOSAL AND/OR PROPER SHELTER OR COVER.
- IN ADDITION, CONSTRUCTION WASTE MUST BE PROPERLY DISPOSED OF IN ORDER TO AVOID EXPOSURE TO PRECIPITATION AT THE END OF EACH WORKING DAY.
- IMMEDIATELY PRIOR TO THE END OF CONSTRUCTION OR ACCEPTANCE BY THE OWNER, THE CONTRACTOR SHALL INSPECT ALL ON-SITE CATCH BASINS, WATER QUALITY DEVICES, STORM DRAIN PIPES, SUBSURFACE INFILTRATION SYSTEM, AND BIO-RETENTION PONDS AND CLEAN AND FLUSH AS NECESSARY.

ABBREVIATIONS

GENERAL

ACR	ACCESSIBLE CURB RAMP
APPROX	APPROXIMATE
BIT.	BITUMINOUS PAVEMENT
BW	BOTTOM OF WALL
ELEV	ELEVATION
EXIST	EXISTING
LA	LANDSCAPE AREA
MAX	MAXIMUM
MIN	MINIMUM
NTS	NOT TO SCALE
PCC	PRE CAST CONCRETE
CURB	CURB
PROP	PROPOSED
REM	REMOVE

R&D

R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
TOS	TOP OF SLOPE
TW	TOP OF WALL
TYP	TYPICAL

UTILITY

CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED POLYETHYLENE PIPE
DCB	DOUBLE CATCH BASIN
DICL	DUCTILE IRON CEMENT LINE
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HYD	HYDRANT

INV

INV	INVERT ELEVATION
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
SMH	SEWER MANHOLE
DMH	DRAINAGE MANHOLE
TSV	TAPPING SLEEVE, VALVE AND BOX
UP	UTILITY POLE

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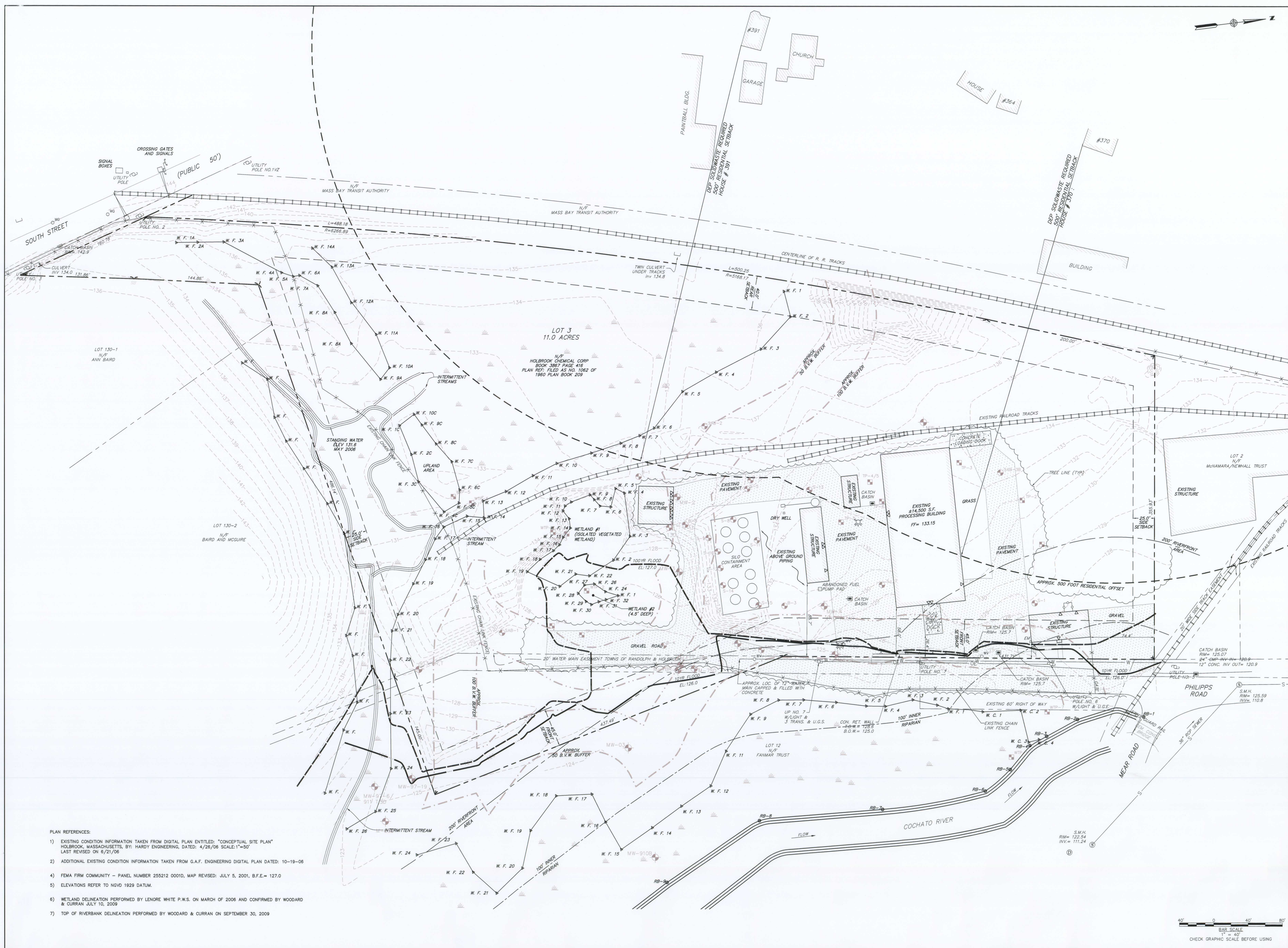
GENERAL NOTES AND LEGEND

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HOLBROOK, MASSACHUSETTSJOB NO.: 219630
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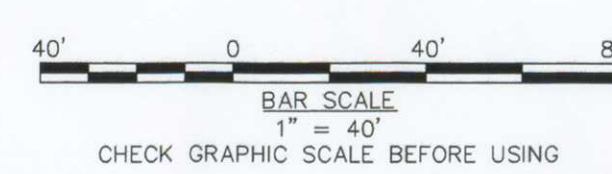
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95 Cedar Street | Suite 100
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- PLAN REFERENCES:
- 1) EXISTING CONDITION INFORMATION TAKEN FROM DIGITAL PLAN ENTITLED: "CONCEPTUAL SITE PLAN" HOLBROOK, MASSACHUSETTS, BY: HARDY ENGINEERING, DATED: 4/26/06 SCALE: 1"=50' LAST REVISED ON 6/21/06
 - 2) ADDITIONAL EXISTING CONDITION INFORMATION TAKEN FROM G.A.F. ENGINEERING DIGITAL PLAN DATED: 10-19-06
 - 3) FEMA FIRM COMMUNITY - PANEL NUMBER 255212 0001D, MAP REVISED: JULY 5, 2001, B.F.E.= 127.0
 - 4) ELEVATIONS REFER TO NGVD 1929 DATUM.
 - 5) WETLAND DELINEATION PERFORMED BY LENORE WHITE P.W.S. ON MARCH OF 2006 AND CONFIRMED BY WOODARD & CURRAN JULY 10, 2009
 - 6) TOP OF RIVERBANK DELINEATION PERFORMED BY WOODARD & CURRAN ON SEPTEMBER 30, 2009



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SEAL: PROFESSIONAL ENGINEER
STATE OF MASSACHUSETTS
No. 28850

REVISED PLANS PER PLANNING BOARD AND CONSERVATION COMMISSIONS FOR PLAN AMENDMENT	DATE
1	5/12/10
REV	DESCRIPTION
DESIGNED BY:	ICP/JCS
CHECKED BY:	JCS/DAM/BMD
DRAWN BY:	ICP

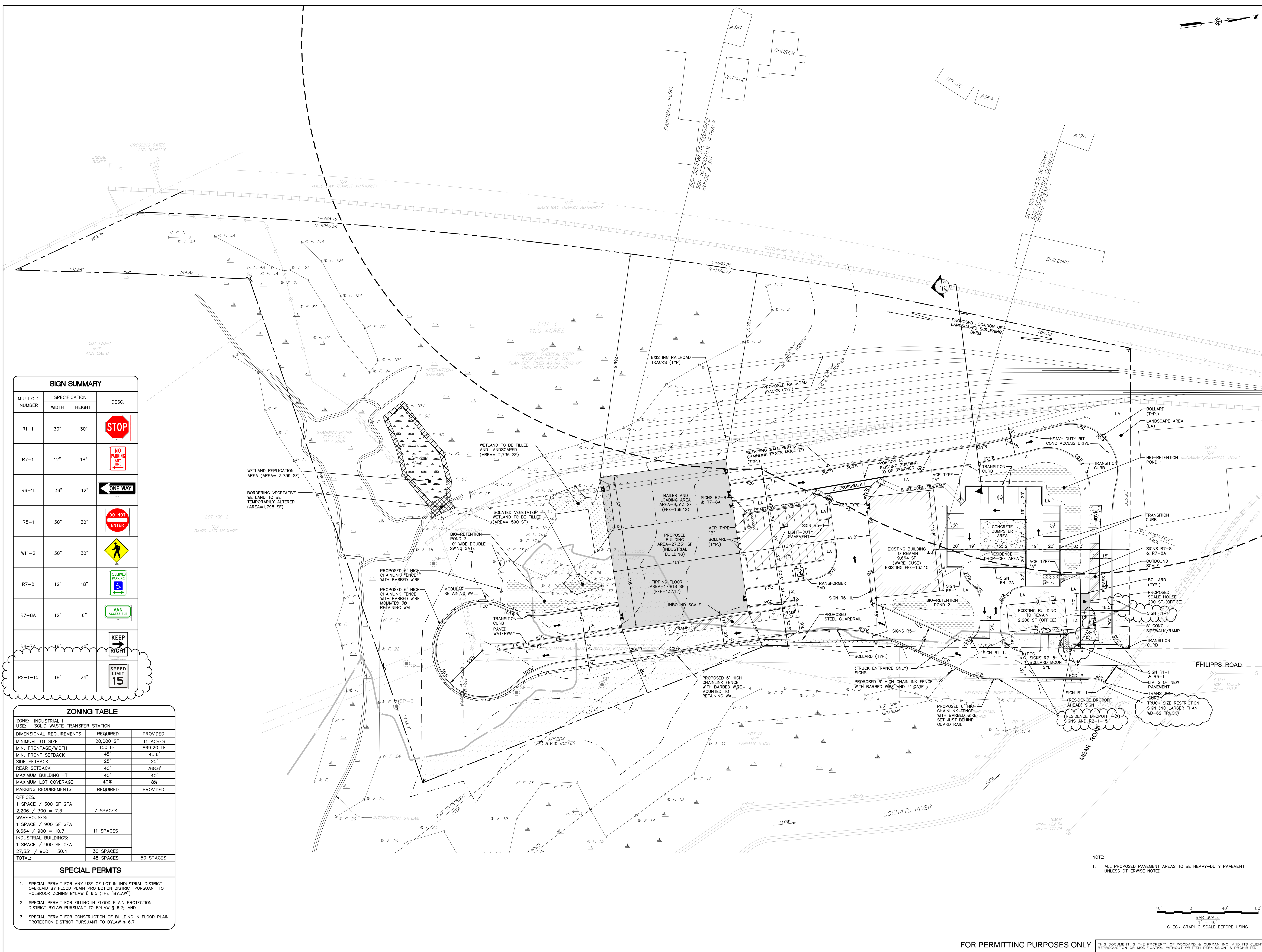
EXISTING CONDITIONS PLAN

TLA-HOLBROOK, LLC
SOLID WASTE TRANSFER STATION

MAP 18 LOT 3
3 PHILLIPS ROAD
HOLBROOK, MASSACHUSETTS

JOB NO.: 219630
DATE: AUGUST 10, 2009
SCALE: 1"=40'
SHEET: OF

C-100



SIGN SUMMARY			
M.U.T.C.D. NUMBER	SPECIFICATION	DESC.	
R1-1	30" x 30"	STOP	
R7-1	12" x 18"	NO PARKING ANY TIME	
R6-1L	36" x 12"	ONE WAY	
R5-1	30" x 30"	DO NOT ENTER	
W11-2	30" x 30"	PEDESTRIAN	
R7-8	12" x 18"	RESERVED PARKING	
R7-8A	12" x 6"	VAN ACCESSIBLE	
R4-7A	18" x 24"	KEEP RIGHT	
R2-1-15	18" x 24"	SPEED LIMIT 15	

ZONING TABLE		
ZONE: INDUSTRIAL I USE: SOLID WASTE TRANSFER STATION		
DIMENSIONAL REQUIREMENTS	REQUIRED	PROVIDED
MINIMUM LOT SIZE	20,000 SF	11 ACRES
MIN. FRONTAGE/WIDTH	150 LF	869.20 LF
MIN. FRONT SETBACK	45'	45.6'
SIDE SETBACK	25'	
REAR SETBACK	40'	268.6'
MAXIMUM BUILDING HT	40'	
MAXIMUM LOT COVERAGE	40%	8%
PARKING REQUIREMENTS	REQUIRED	PROVIDED
OFFICES: 1 SPACE / 300 SF GFA 2,206 / 300 = 7.3	7 SPACES	
WAREHOUSES: 1 SPACE / 900 SF GFA 9,664 / 900 = 10.7	11 SPACES	
INDUSTRIAL BUILDINGS: 1 SPACE / 900 SF GFA 27,331 / 900 = 30.4	30 SPACES	
TOTAL:	48 SPACES	50 SPACES
SPECIAL PERMITS		
1. SPECIAL PERMIT FOR ANY USE OF LOT IN INDUSTRIAL DISTRICT OVERLAP BY FLOOD PLAIN PROTECTION DISTRICT PURSUANT TO HOLBROOK ZONING BYLAW § 6.5 (THE "BYLAW")		
2. SPECIAL PERMIT FOR FILLING IN FLOOD PLAIN PROTECTION DISTRICT BYLAW PURSUANT TO BYLAW § 6.7. AND		
3. SPECIAL PERMIT FOR CONSTRUCTION OF BUILDING IN FLOOD PLAIN PROTECTION DISTRICT PURSUANT TO BYLAW § 6.7.		

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COMMITMENT & INTEGRITY DRIVE RESULTS

4	CURB LINE REVISIONS FOR TRUCK TURN	8/20/13	
3	REVISED PER PLANNING BOARD COMMENTS	8/05/13	
2	REVISED PER PLANNING BOARD COMMENTS	7/22/13	
1	CONSERVATION COMMISSION COMMENTS FOR	3/12/10	
REV	DESCRIPTION	DATE	

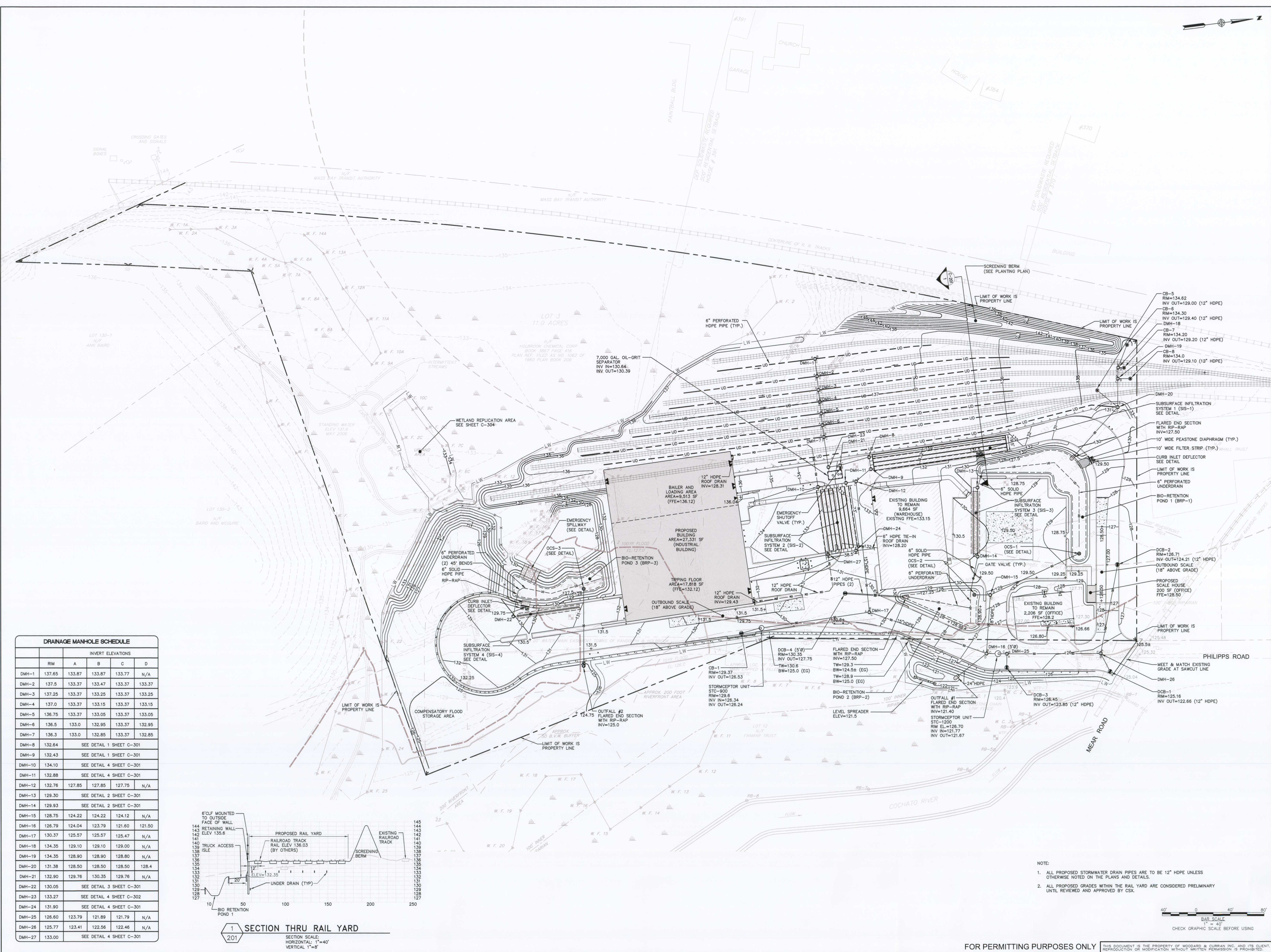
DESIGNED BY: M27/JCS
DRAWN BY: HCP
CHECKED BY: JCS/DAN/RMD

SITE LAYOUT PLAN

TLA-HOLBROOK, LLC
SOLID WASTE TRANSFER STATION
MAP 19 LOT 3
3 PHILLIPS ROAD
HOLBROOK, MASSACHUSETTS

JOB NO.: 219630
DATE: AUGUST 10, 2009
SCALE: 1"=40'
SHEET: OF

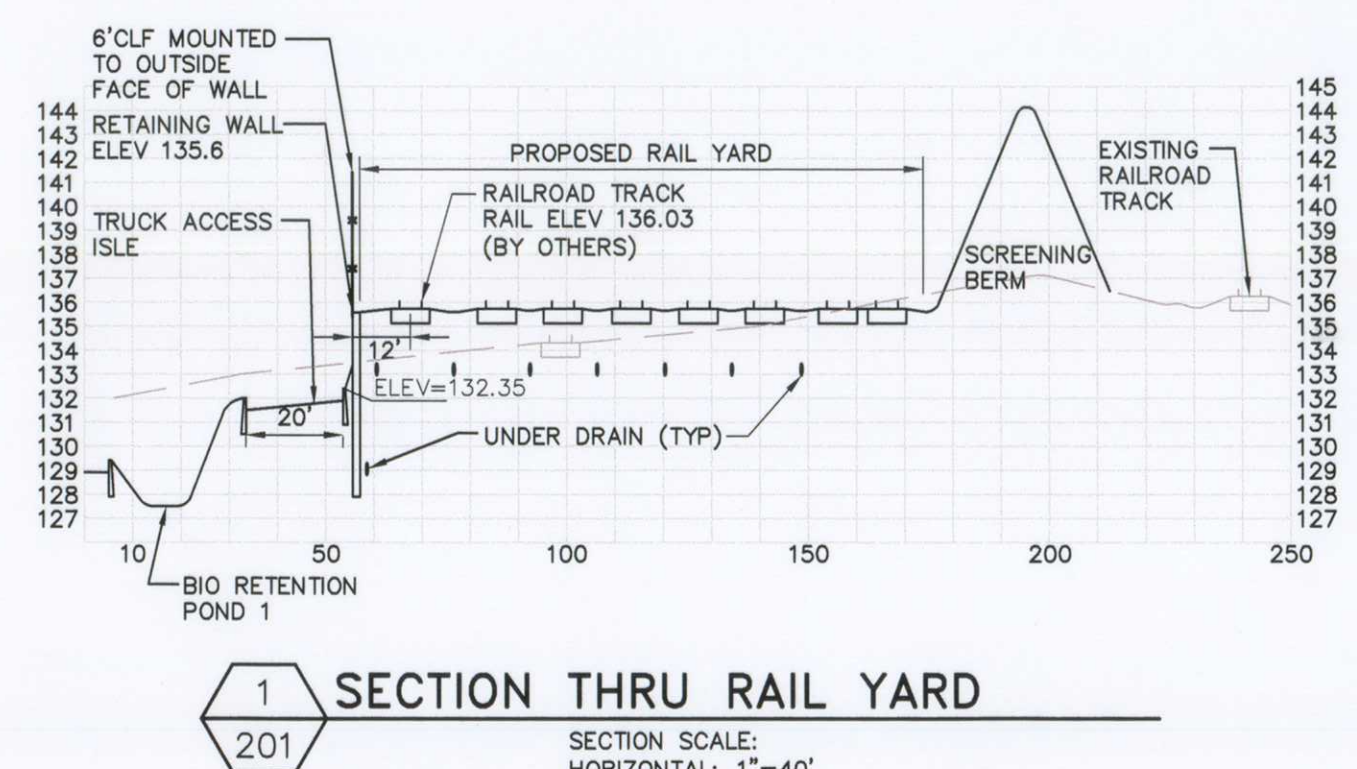
C-200



1
201

SECTION THRU RAIL YARD

DRAINAGE MANHOLE SCHEDULE				
	RIM	A	B	C
DMH-1	137.65	133.87	133.87	133.77
DMH-2	137.5	133.37	133.47	133.37
DMH-3	137.25	133.37	133.25	133.37
DMH-4	137.0	133.37	133.15	133.37
DMH-5	136.75	133.37	133.05	133.37
DMH-6	136.5	133.0	132.95	133.37
DMH-7	136.3	133.0	132.85	133.37
DMH-8	132.64	SEE DETAIL 1 SHEET C-301		
DMH-9	132.43	SEE DETAIL 1 SHEET C-301		
DMH-10	134.10	SEE DETAIL 4 SHEET C-301		
DMH-11	132.88	SEE DETAIL 4 SHEET C-301		
DMH-12	132.76	127.85	127.85	127.75
DMH-13	129.30	SEE DETAIL 2 SHEET C-301		
DMH-14	129.93	SEE DETAIL 2 SHEET C-301		
DMH-15	128.75	124.22	124.22	124.12
DMH-16	126.79	124.04	123.79	121.60
DMH-17	130.37	125.57	125.57	N/A
DMH-18	134.35	129.10	129.10	129.00
DMH-19	134.35	128.90	128.90	128.80
DMH-20	131.38	128.50	128.50	128.4
DMH-21	132.90	129.76	130.35	129.76
DMH-22	130.05	SEE DETAIL 3 SHEET C-301		
DMH-23	133.27	SEE DETAIL 4 SHEET C-302		
DMH-24	131.90	SEE DETAIL 4 SHEET C-301		
DMH-25	126.60	123.79	121.89	121.79
DMH-26	125.77	123.41	122.56	122.46
DMH-27	133.00	SEE DETAIL 4 SHEET C-301		



NOTE:

- ALL PROPOSED STORMWATER DRAIN PIPES ARE TO BE 12" HDPE UNLESS OTHERWISE NOTED ON THE PLANS AND DETAILS.
- ALL PROPOSED GRADES WITHIN THE RAIL YARD ARE CONSIDERED PRELIMINARY UNTIL REVIEWED AND APPROVED BY CSX.

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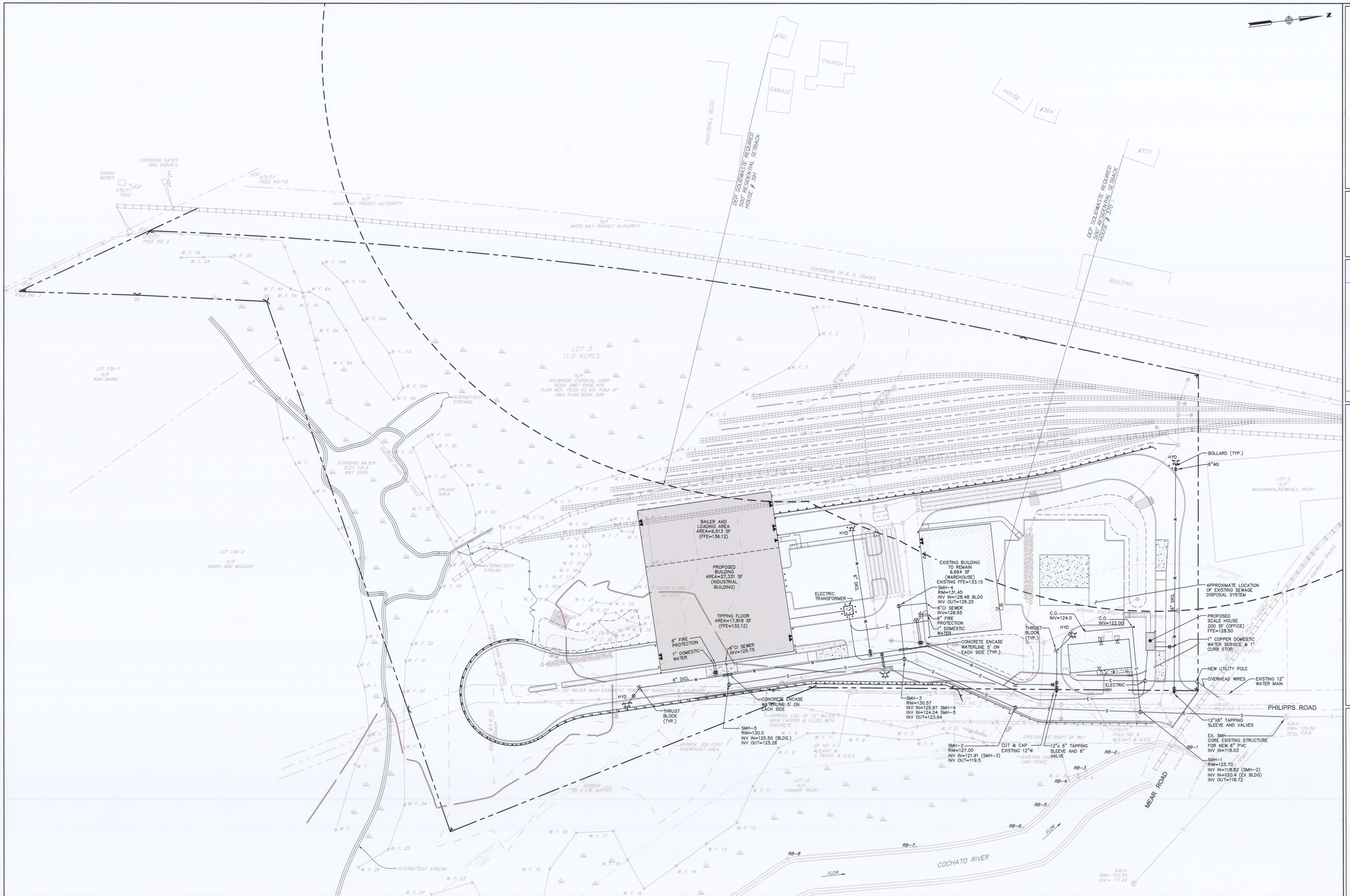
DATE: 3/12/10
REVISION: 1
DESCRIPTION: REVISIONS FOR PLAN AMENDMENT
DESIGNED BY: HCP/JCS
CHECKED BY: JCS/DAY/RMD
DRAWN BY: HCP

TLA-HOLBROOK, LLC
SOLID WASTE TRANSFER STATION
MAP 19, LOT 3
3 PHILLIPS ROAD
HOLBROOK, MASSACHUSETTS

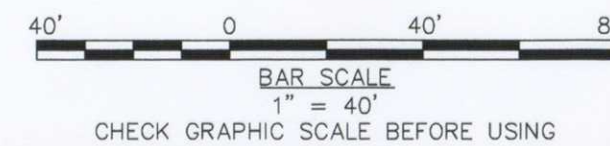
GRADING AND DRAINAGE PLAN

JOB NO.: 219630
DATE: AUGUST 10, 2009
SCALE: 1"=40'
SHEET: OF

C-201



- NOTE:
1. CONTRACTOR SHALL CONFIRM LOCATION AND TYPE OF WATER SERVICE TO EXISTING STRUCTURES. IF SERVICES ARE FOUND TO BE OTHER THAN COPPER TUBING, THEY SHALL BE REPLACED, FROM MAIN TO METER WITH 1" COPPER TUBING.
 2. ELECTRIC LAYOUT & DESIGN TO BE FINALIZED BY LOCAL UTILITY COMPANY.



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COMMITMENT & INTEGRITY DRIVE RESULTS

STATE OF MASSACHUSETTS
DAVID A. WHITE
No. 35890
Professional Engineer

REVIEWED PLANS FOR PLANNING BOARD AND
CONSERVATION COMMISSION COMMENTS FOR
PLAN AMENDMENT

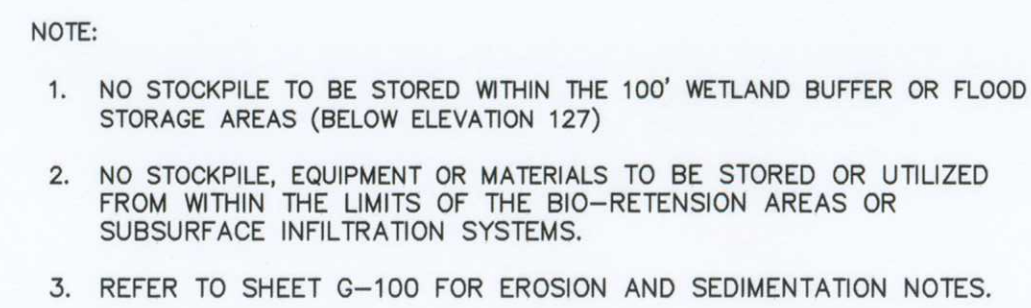
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DESIGNED BY: HOP/JCS
CHECKED BY: JCS/DAN/BMD
DRAWN BY: HOP

UTILITY PLAN

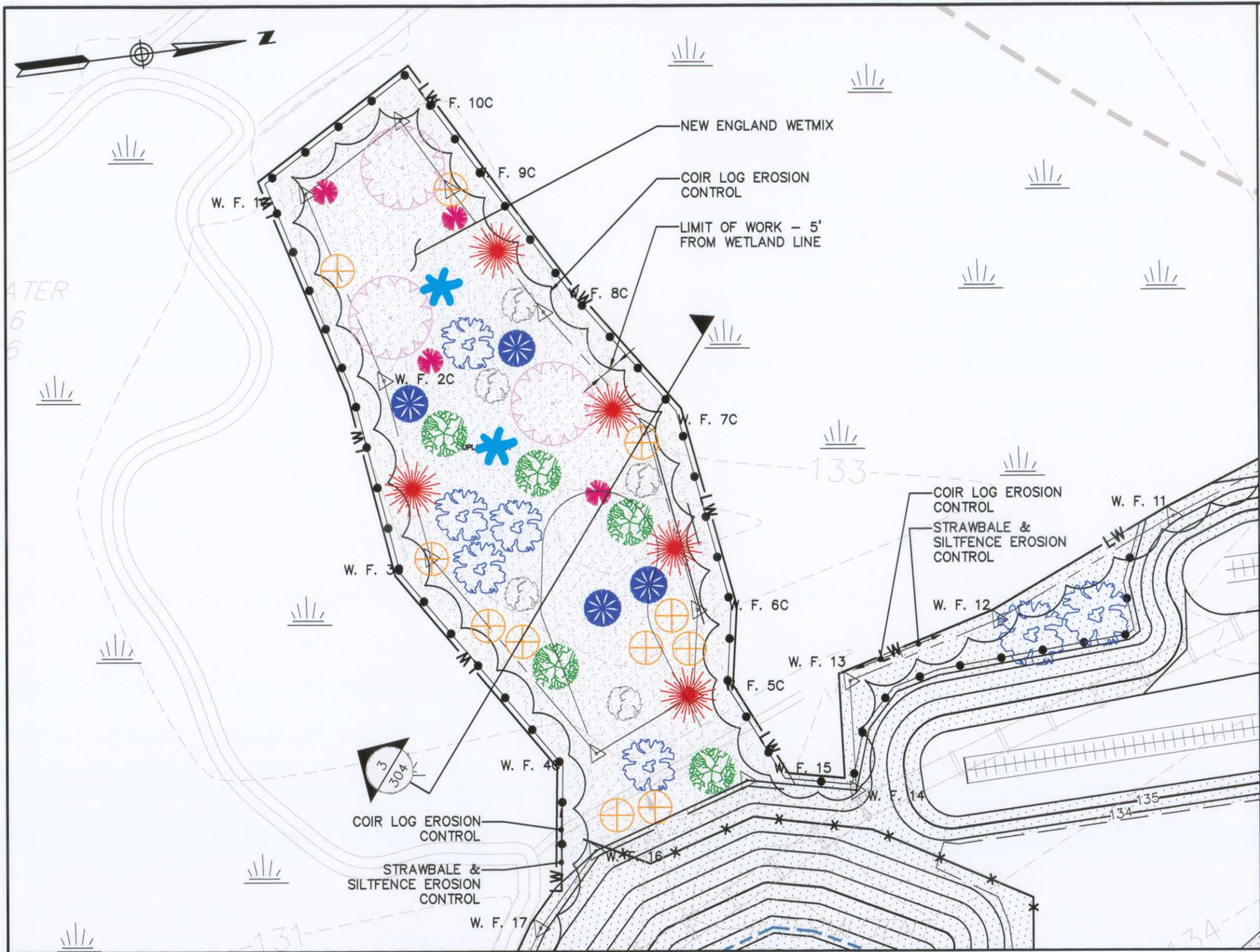
TLA-HOLBROOK, LLC
SOLID WASTE TRANSFER STATION
MAP 19 LOT 3
3 PHILIPPS ROAD
HOLBROOK, MASSACHUSETTS

JOB NO.: 219630
DATE: AUGUST 10, 2009
SCALE: 1"=40'
SHEET: OF

C-202



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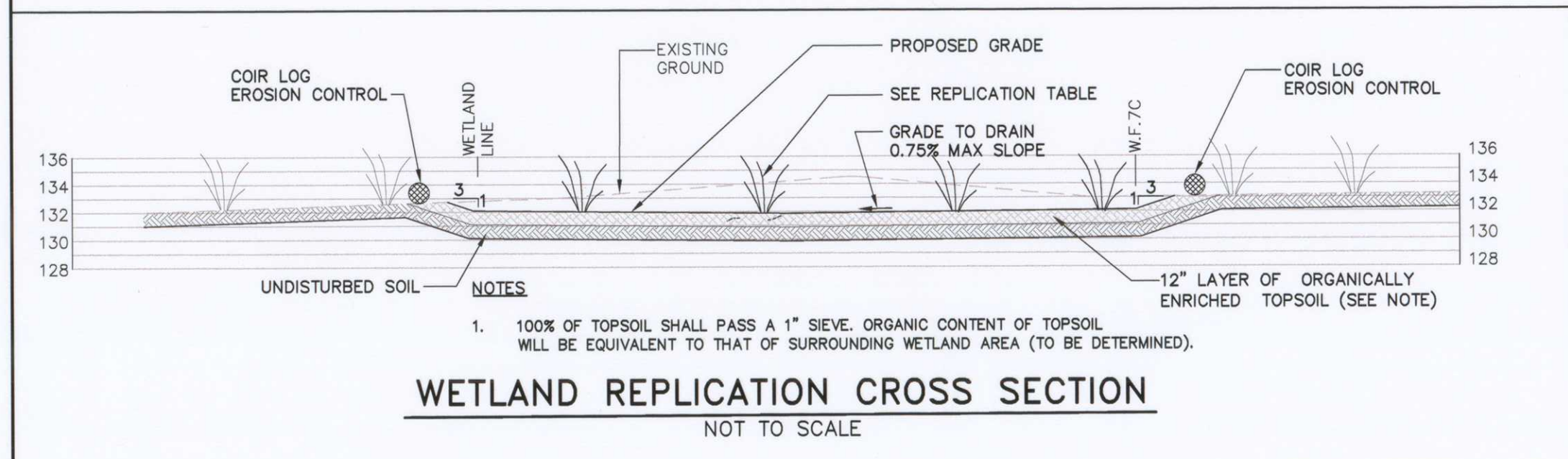
WETLAND REPLICATION AREA PLANTING PLAN
SCALE: 1"=20'

VEGETATION LAYER	COMMON NAME	SCIENTIFIC NAME	SIZE	STOCK	SPACING/ APPLICATION RATE (TYP)
TREES	RED MAPLE	ACER RUBRUM	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
	PIN OAK	QUERCUS PALUSTRIS	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
SHRUBS	WINTERBERRY	LILEX VERTICILLATA	2-3'	ROOTED CONTAINER	5-7' CENTER
	SWAMP ROSE	ROSA PALUSTRIS	2-3'	ROOTED CONTAINER	5-7' CENTER
	HIGHBUSH BLUEBERRY	VACCINIUM CORYMBOSUM	2-3'	ROOTED CONTAINER	5-7' CENTER
	SPICEBUSH	LINDERA BENZOIN	2-3'	ROOTED CONTAINER	5-7' CENTER
	PUSSYWILLOW	SALIX DISCOLOR	2-3'	ROOTED CONTAINER	5-7' CENTER
	SWAMP AZALEA	RHODODENDRON VISCIDUM	2-3'	ROOTED CONTAINER	5-7' CENTER
HERBACEOUS	CINNAMON FERN	OSUNDA CINNAMOMEA	1 GALLON	ROOTED CONTAINER	3-4' CENTER
	NEW ENGLAND WETMIX* (OR SIMILAR)			SEED	1 lb./2,500 sqft

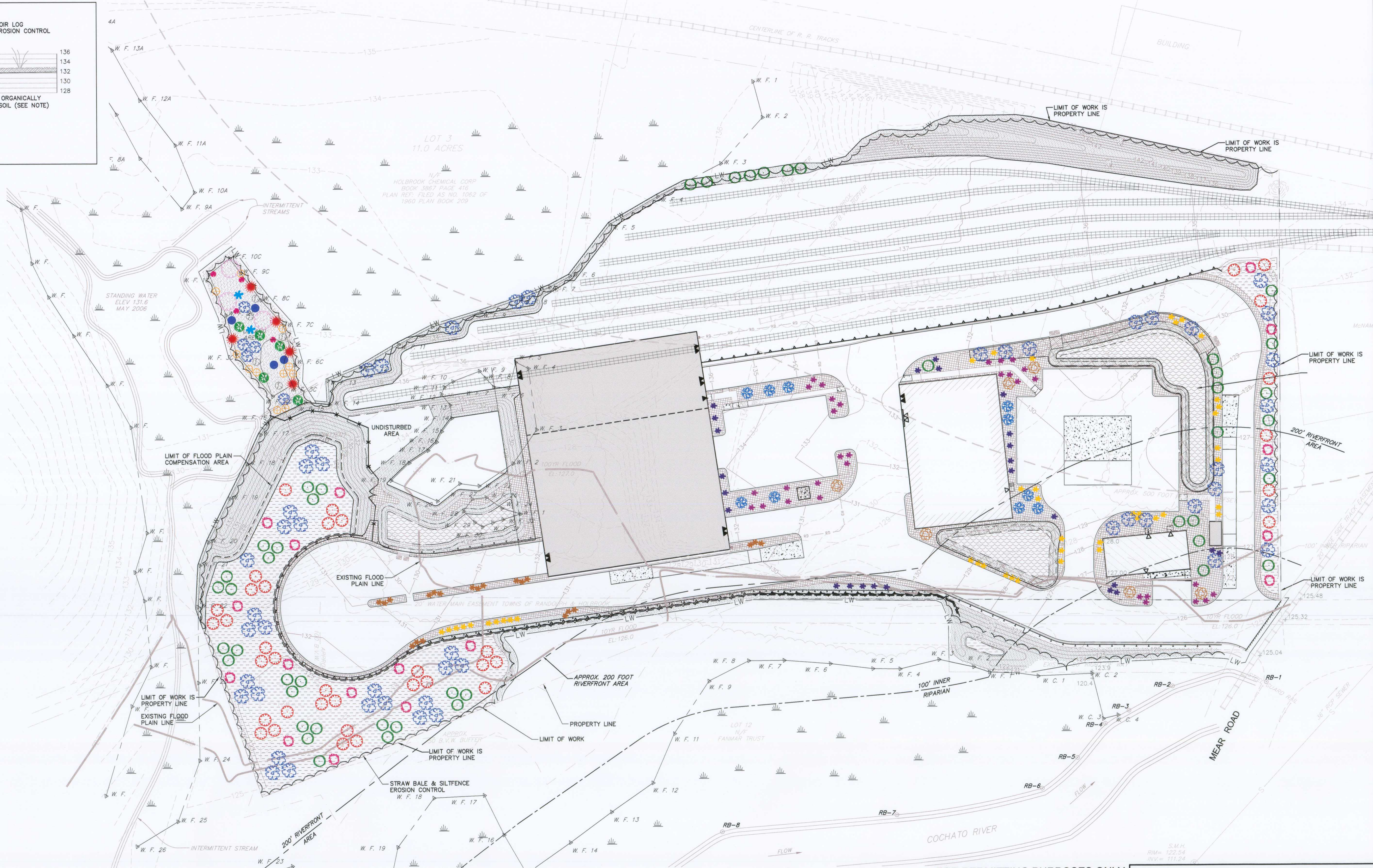
PLANT LEGEND

VEGETATION LAYER	COMMON NAME	SCIENTIFIC NAME	SIZE	STOCK	SPACING/ APPLICATION RATE (TYP)
TREES	RED MAPLE	ACER RUBRUM	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
	PIN OAK	QUERCUS PALUSTRIS	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
SHRUBS	WINTERBERRY	LILEX VERTICILLATA	2-3'	ROOTED CONTAINER	5-7' CENTER
	SWAMP ROSE	ROSA PALUSTRIS	2-3'	ROOTED CONTAINER	5-7' CENTER
	HIGHBUSH BLUEBERRY	VACCINIUM CORYMBOSUM	2-3'	ROOTED CONTAINER	5-7' CENTER
	SPICEBUSH	LINDERA BENZOIN	2-3'	ROOTED CONTAINER	5-7' CENTER
	PUSSYWILLOW	SALIX DISCOLOR	2-3'	ROOTED CONTAINER	5-7' CENTER
	SWAMP AZALEA	RHODODENDRON VISCIDUM	2-3'	ROOTED CONTAINER	5-7' CENTER
HERBACEOUS	CINNAMON FERN	OSUNDA CINNAMOMEA	1 GALLON	ROOTED CONTAINER	3-4' CENTER
	NEW ENGLAND WETMIX* (OR SIMILAR)			SEED	1 lb./2,500 sqft

- PLANT SIZES AND LOCATIONS ARE APPROXIMATE. FINAL PLANTING SCHEME MAY SLIGHTLY DIFFER FROM THAT SUMMARIZED ABOVE, SUBJECT TO RETAIL AVAILABILITY.
- NEW ENGLAND WETLAND PLANTS, INC. SPECIES INCLUDED IN WETMIX: FOX SEDGE (CAREX VULPINOIDEA), BEARDED SEDGE (CAREX COMOSA), LURID SEDGE (CAREX LURIDA), SOFT RUSH (JUNCUS EFFUSUS), GRASS-LEAVED GOLDENROD (EUTHAMIA GRAMINIFOLIA), BONESET (EUPATORIUM PERFOLIATUM), HOP SEDGE (CAREX LUPULINA), BLUE VERVAIN (VERBENA HASTATA), NODDING SEDGE (CAREX GYNANDRA), GREEN BULRUSH (SCIRPUS ATROVIRENS), SENSITIVE FERN (ONOCLEA SENSIBILIS), BLUE FLAG IRIS (IRIS VERSICOLOR), WOOLGRASS (SCIRPUS CYPERINUS), SPOTTED JOE PYE WEE (EUPATORIUM MACULATUM), SWAMP MILKWEED (ASCLEPIAS INCARNATA), MONKEY FLOWER (MIMULUS RINGENS), SOFT-STEM BULRUSH (SHOENOPLECTUS TABERNAMONTANI) (EX- S. VALIDUS), HARDSTEM BULRUSH (SHOENOPLECTUS ACUTUS) (EX-SCIRPUS ACUTUS), NODDING BUR MARIGOLD (BIDENS CERNUA), FLAT-TOP ASTER (ASTER UMBELLATUS).



WETLAND REPLICATION CROSS SECTION
NOT TO SCALE



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VEGETATION LAYER	COMMON NAME	SCIENTIFIC NAME	MINIMUM SIZE	STOCK	SPACING/ APPLICATION RATE (TYP)
TREES	RED MAPLE	ACER RUBRUM	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
	NORTHERN RED OAK	QUERCUS RUBRA	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
	WHITE PINE	PINUS STROBUS	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
	WHITE BIRCH	BETULA PAPIRUS	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
	EASTERN REDBUD	CERIS CANADENSIS	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
	SCARLET OAK	QUERCUS COCCINEA	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
SHRUBS	ARROWWOOD	VIBURNUM DENTATUM	2-3'	ROOTED CONTAINER	6' CENTER
	OAKLEAF HYDRANGEA	HYDRANGEA OEROPOLIA	2-3'	ROOTED CONTAINER	6' CENTER
	STAGHORN SUMAC, "TIGER EYES"	RHUS TYPHINA	2-3'	ROOTED CONTAINER	6' CENTER
	LANDSCAPING AZALEA	RHODODENDRON	2-3'	ROOTED CONTAINER	6' CENTER
HERBACEOUS	NEW ENGLAND CONSERVATION/MULCH MIX		---	SEED	25 LB./ACRE
	NEW ENGLAND DETENTION BASIN/ RESTORATION MIX		---	SEED	35 LB./ACRE
	ROADSIDE MATRIX, UPLAND SEED MIX		---	SEED	35 LB./ACRE

- PLANT SIZES AND LOCATIONS ARE APPROXIMATE. FINAL PLANTING SCHEME MAY SLIGHTLY DIFFER FROM THAT SUMMARIZED ABOVE, SUBJECT TO RETAIL AVAILABILITY.
- SEED MIXTURE FROM NEW ENGLAND WETLAND PLANTS, OR SIMILAR. SEED MIXTURE SPECIFICATIONS ARE PROVIDED IN APPENDIX C.

VEGETATION LAYER	COMMON NAME	SCIENTIFIC NAME	MINIMUM SIZE	STOCK	SPACING/ APPLICATION RATE (TYP)
TREES	RED MAPLE	ACER RUBRUM	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
	NORTHERN RED OAK	QUERCUS RUBRA	4-6'	ROOTED CONTAINER OR B&B	10' CENTER
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	NEW ENGLAND DETENTION BASIN/ RESTORATION MIX		---	SEED	35 LB./ACRE
	ROADSIDE MATRIX, UPLAND SEED MIX		---	SEED	35 LB./ACRE

PLANT LEGEND

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

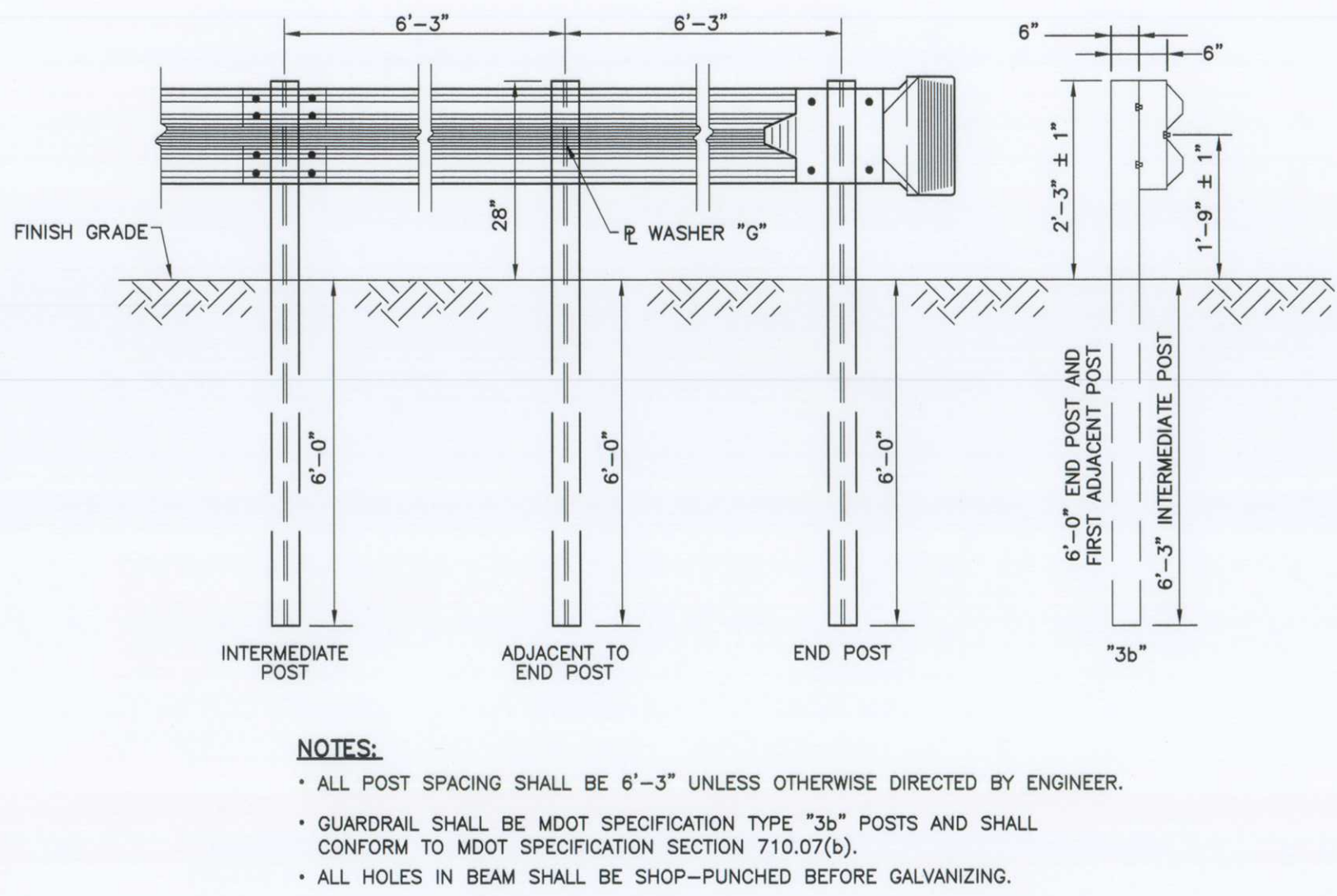
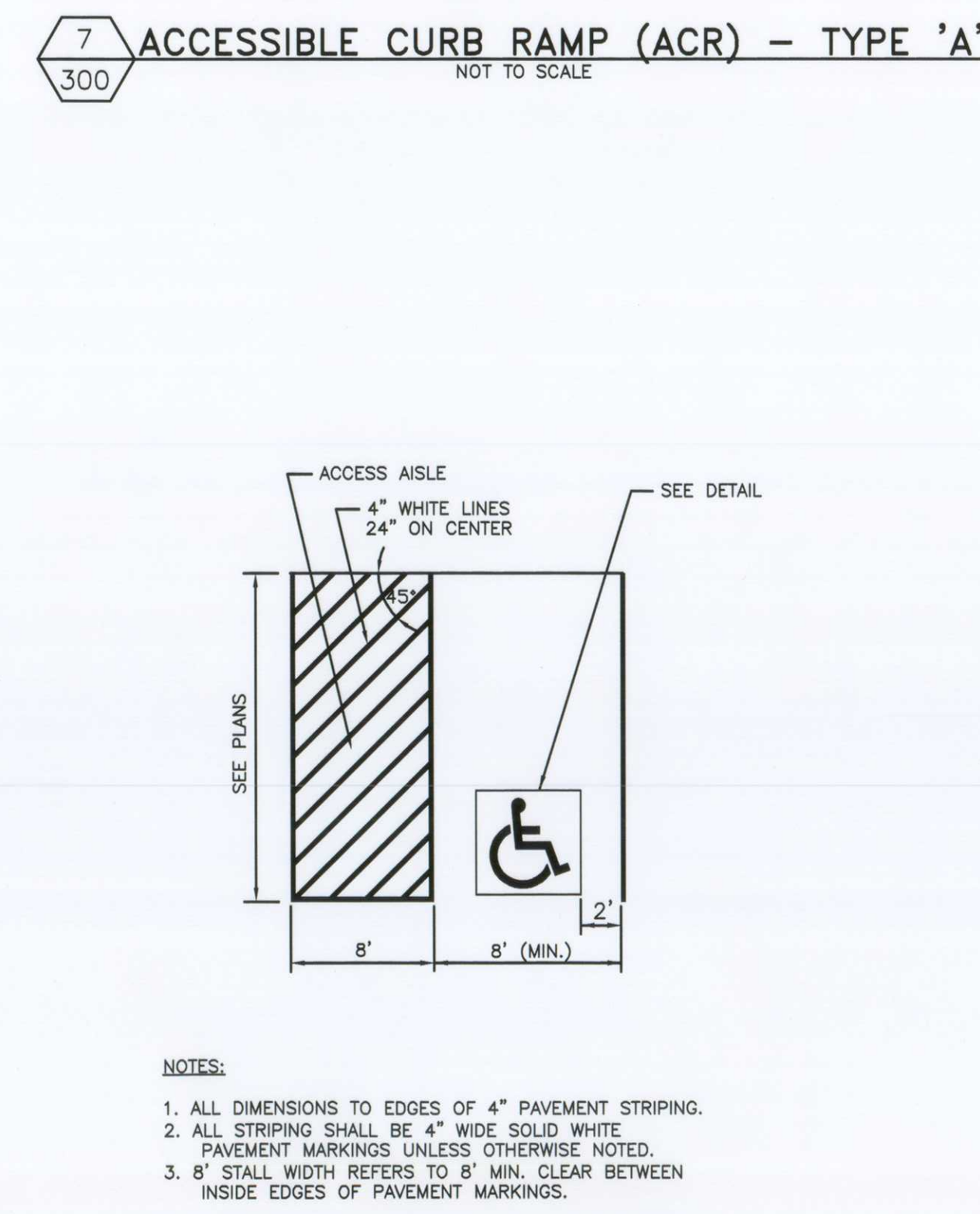
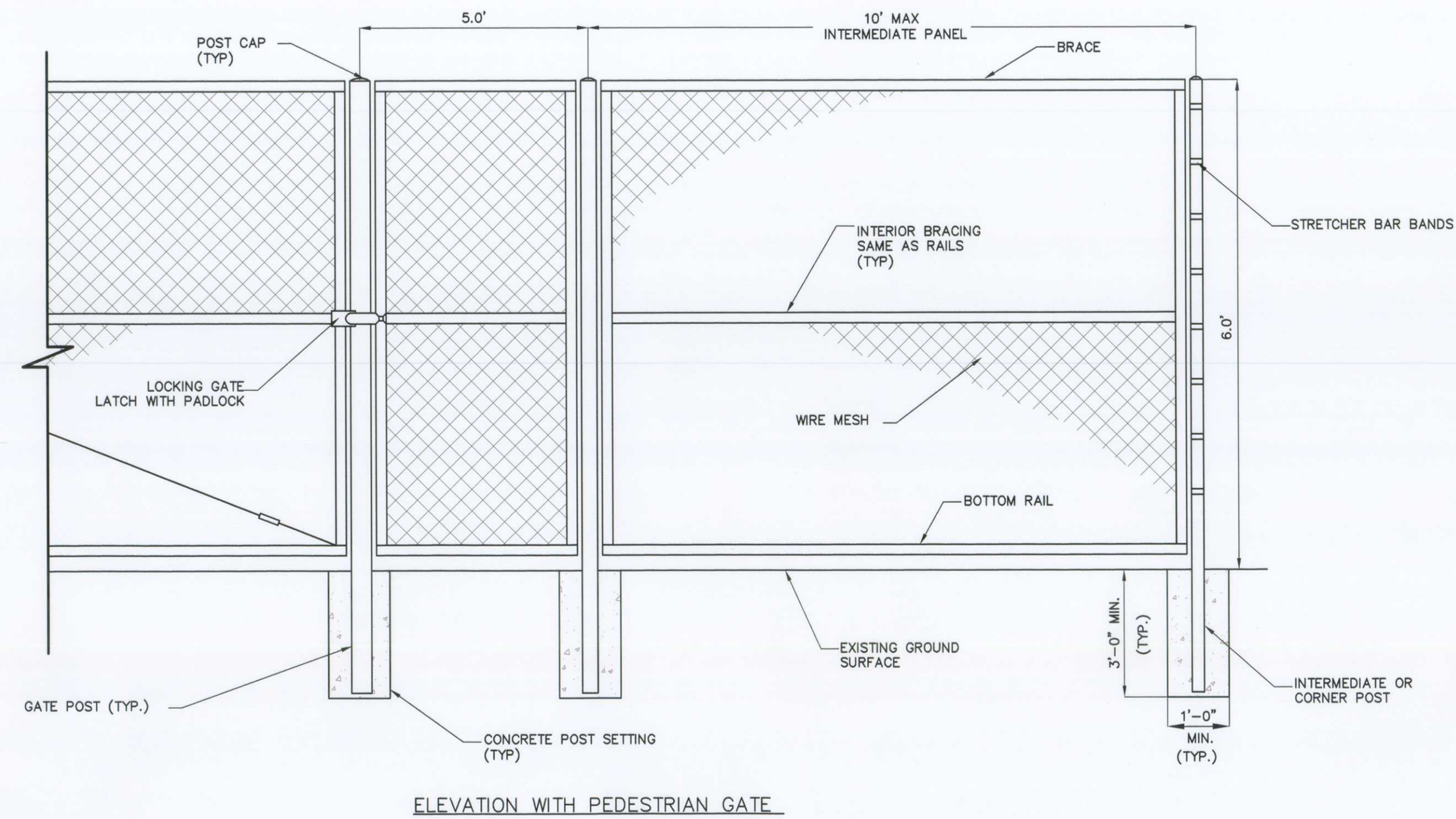
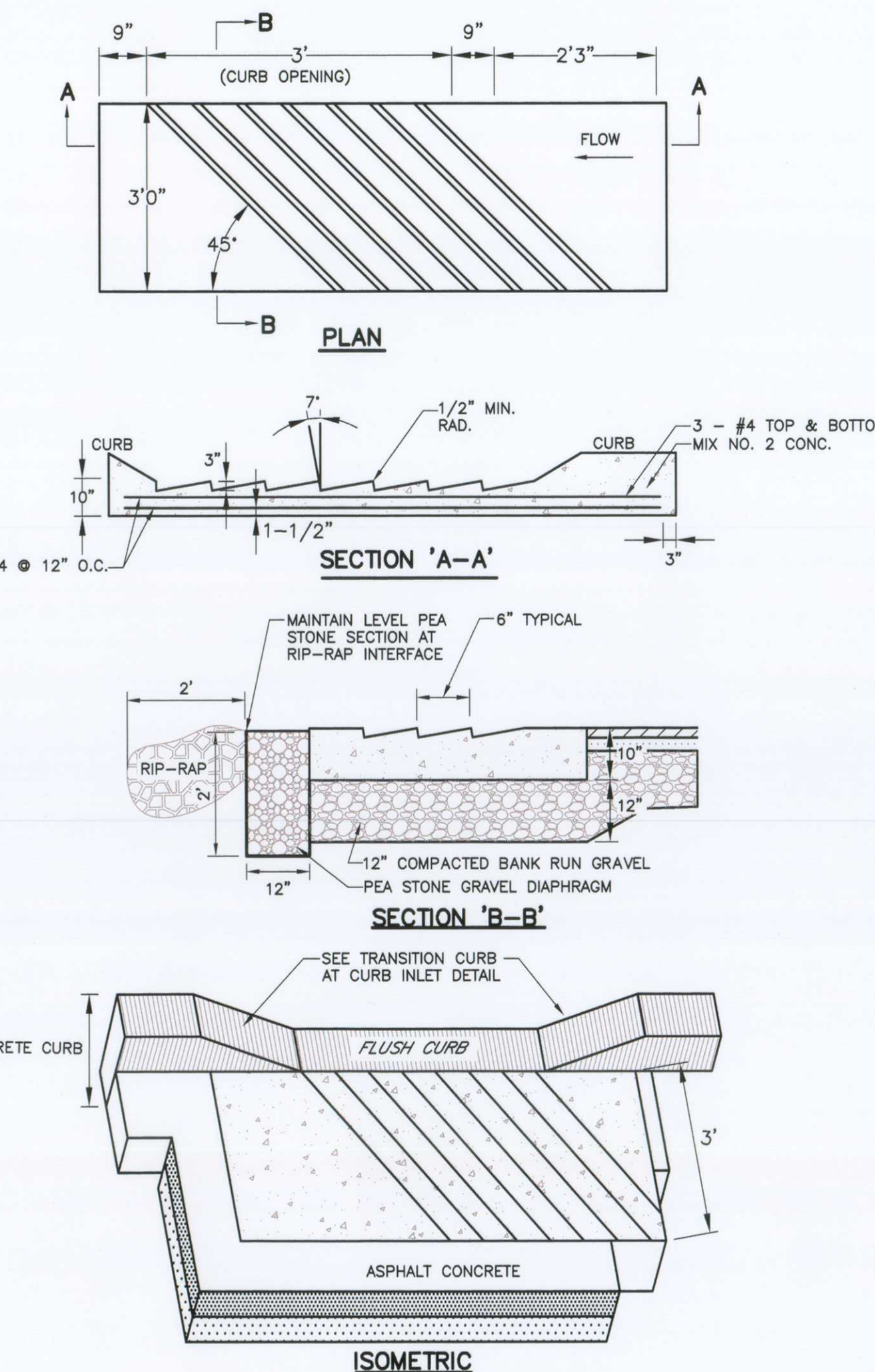
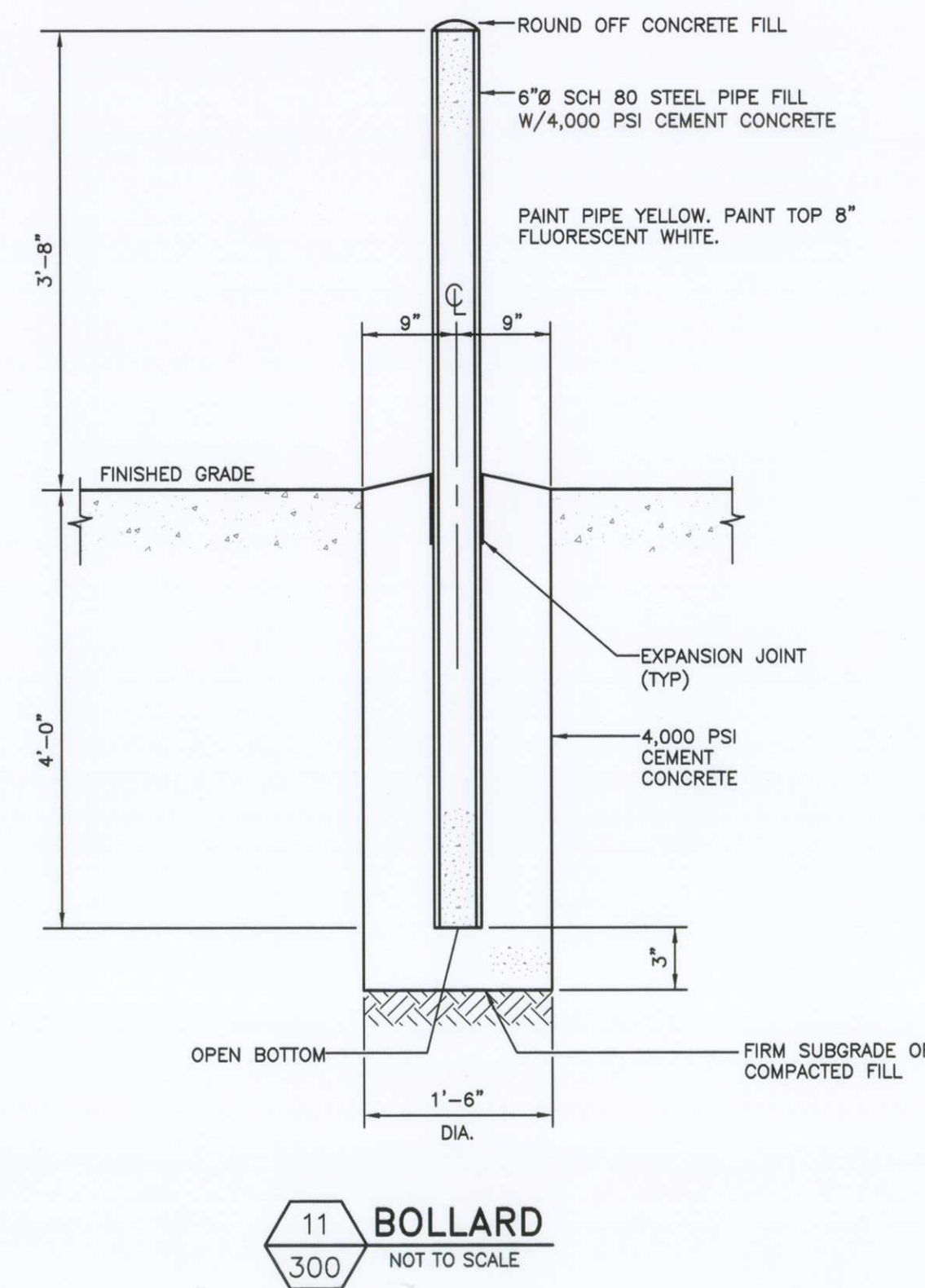
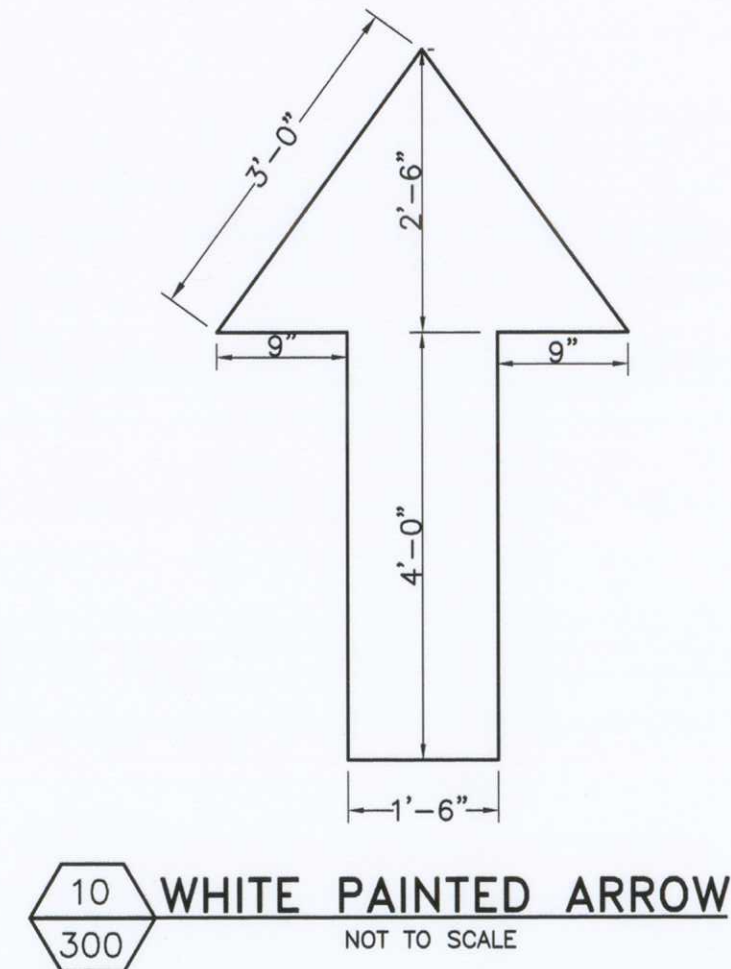
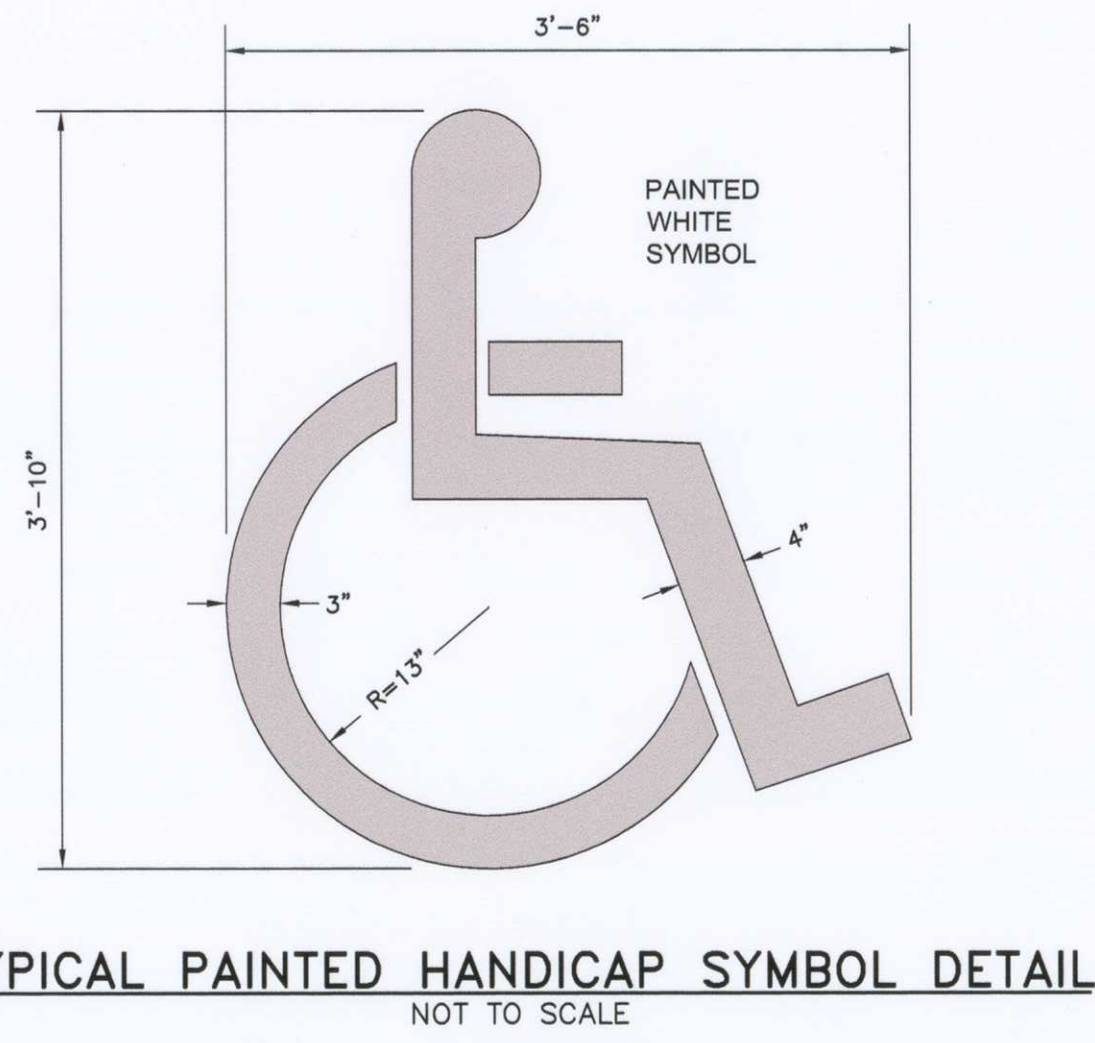
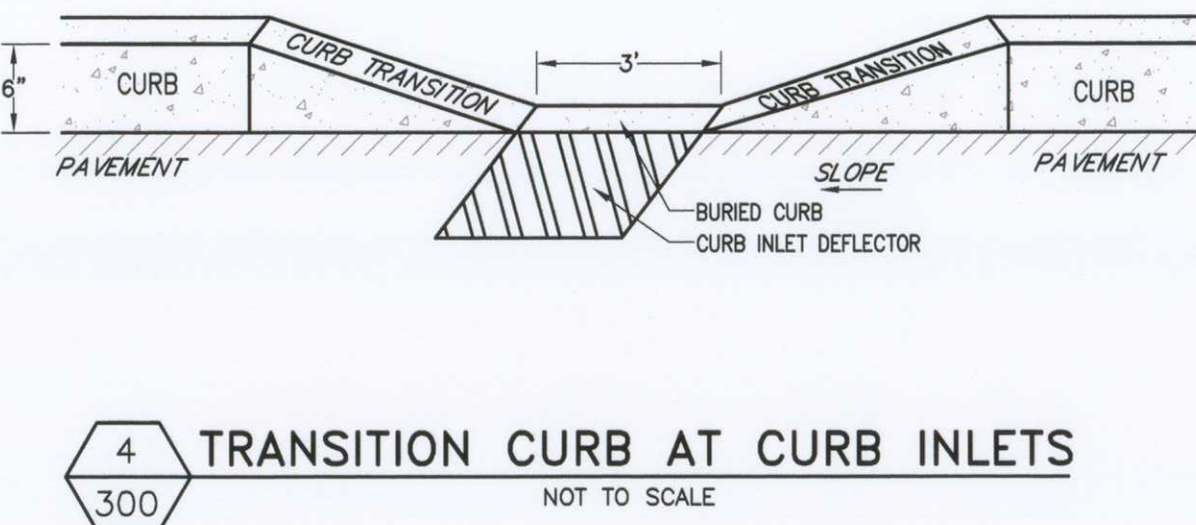
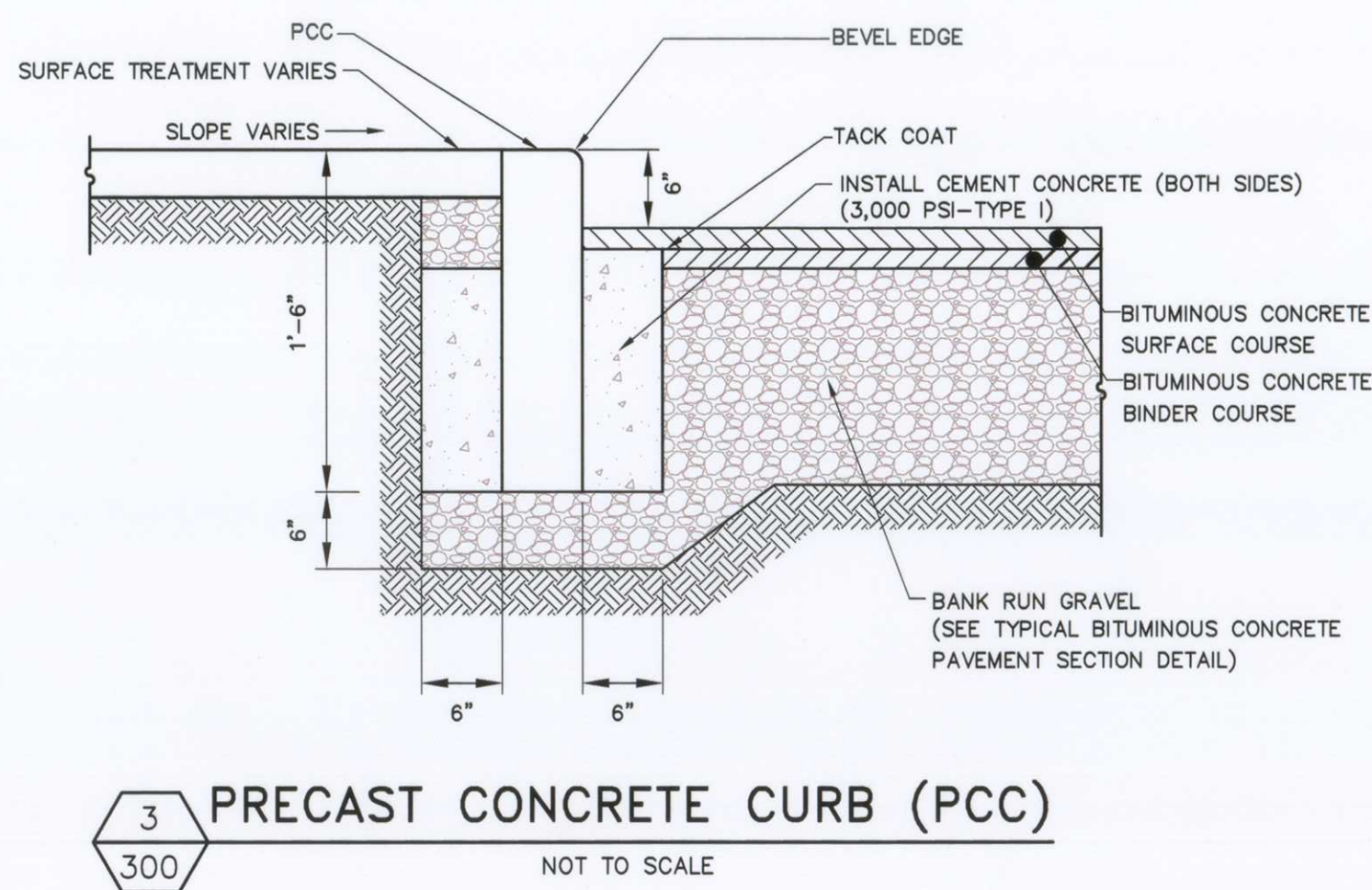
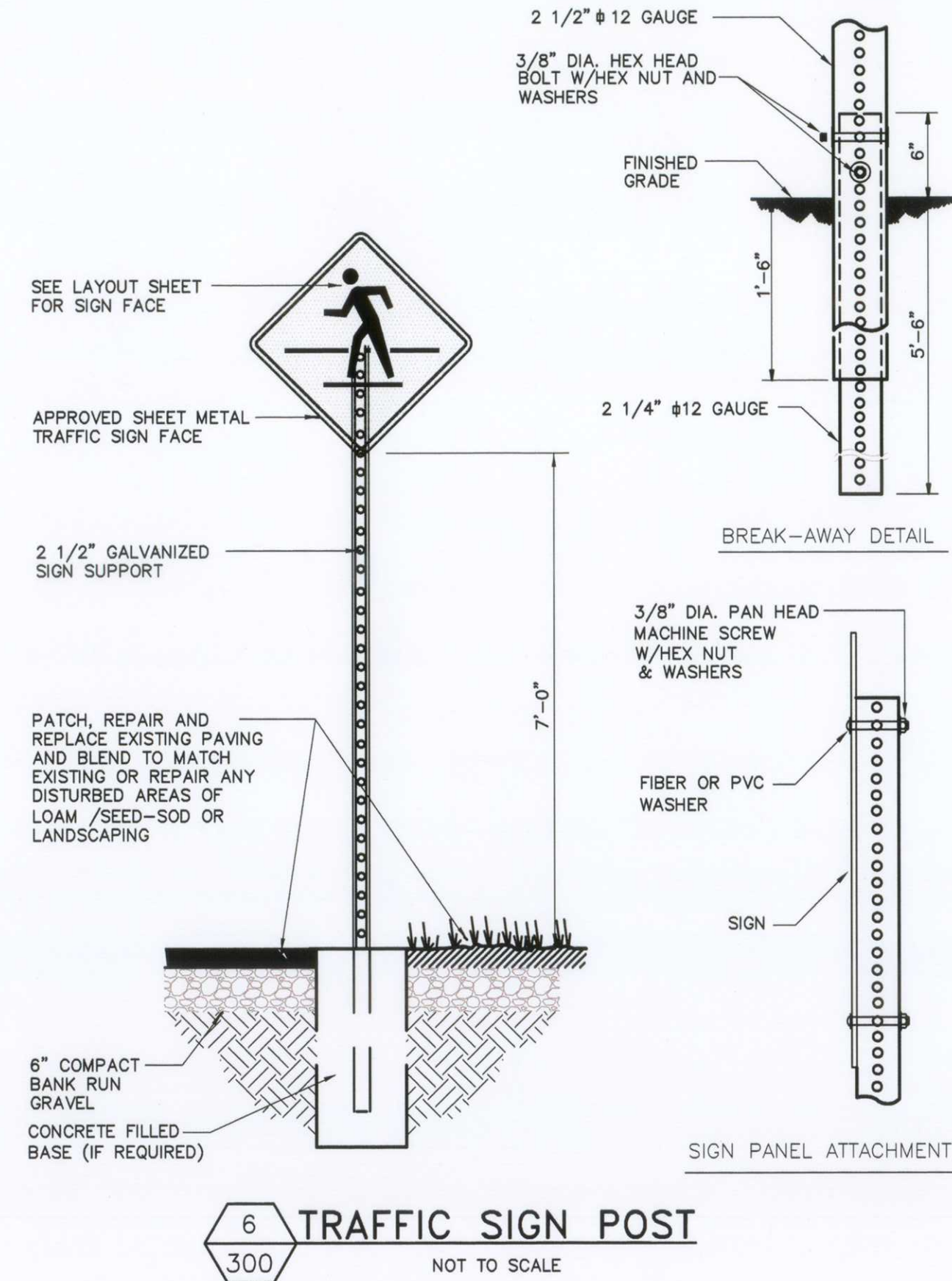
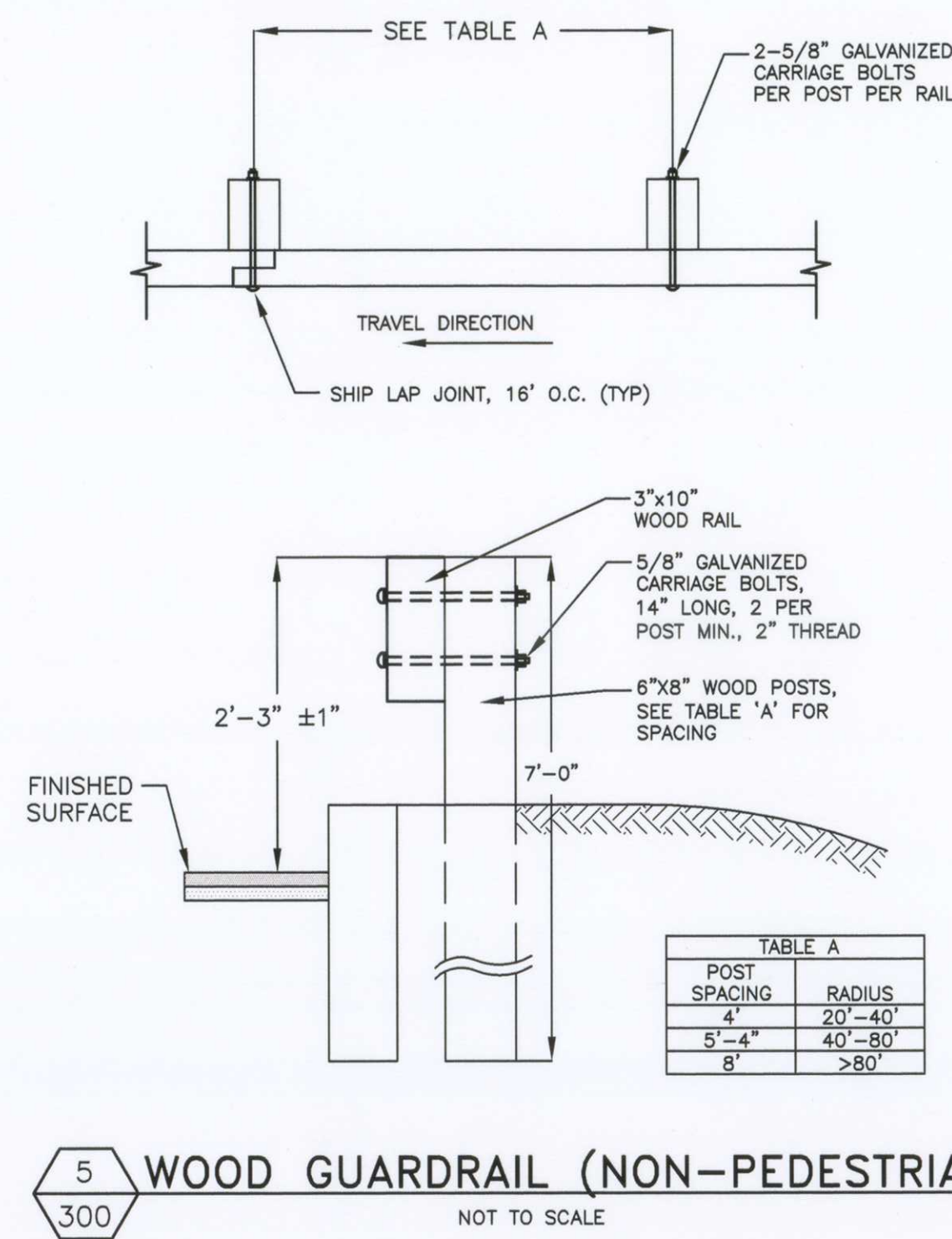
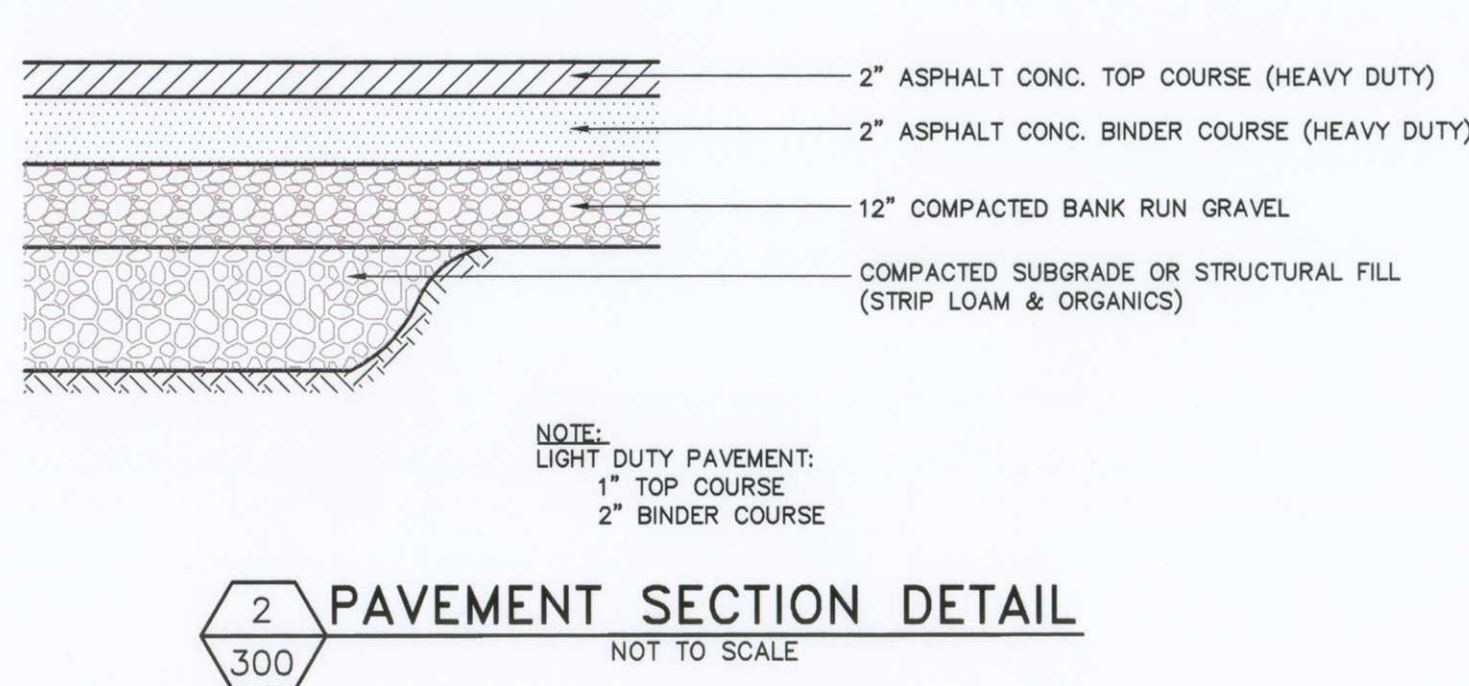
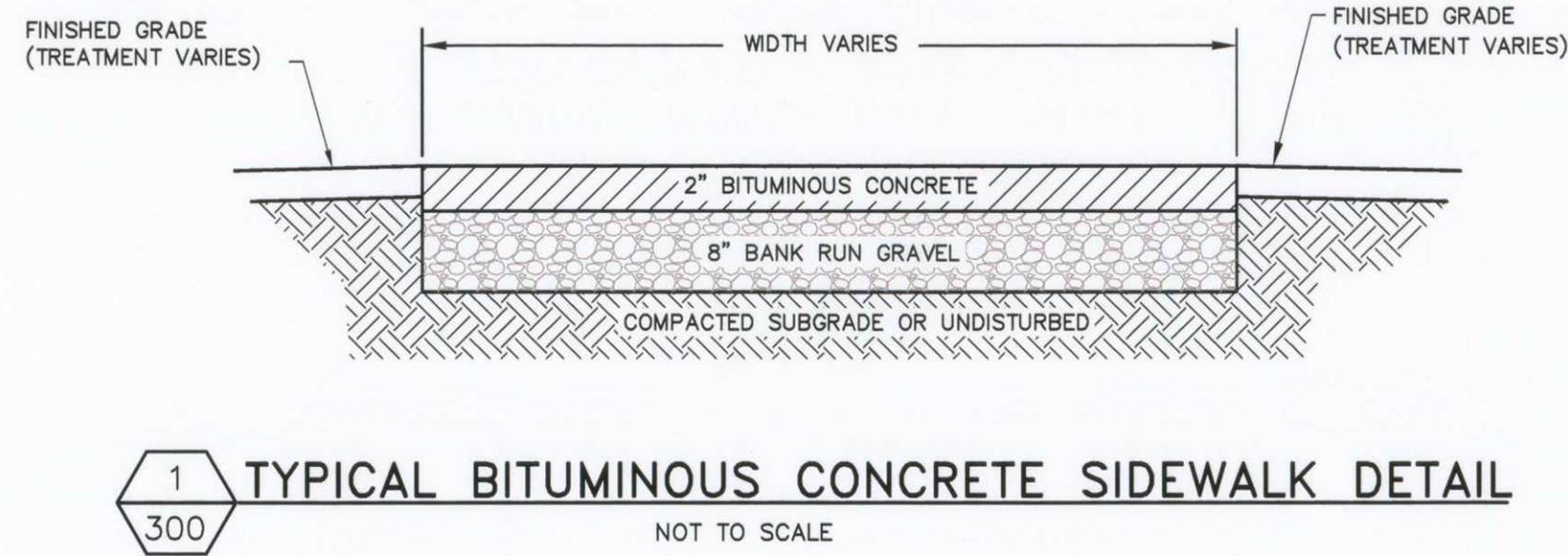
DAVID A. CURRAN
REGISTERED PROFESSIONAL ENGINEER
No. 38860
MASSACHUSETTS

DESIGNED BY: HCT/ACS/M
CHECKED BY: JCS/DWM/RMD
DATE: 3/12/10
DESCRIPTION: WETLAND REPLICATION AREA PLANTING PLAN
REVISION: 1

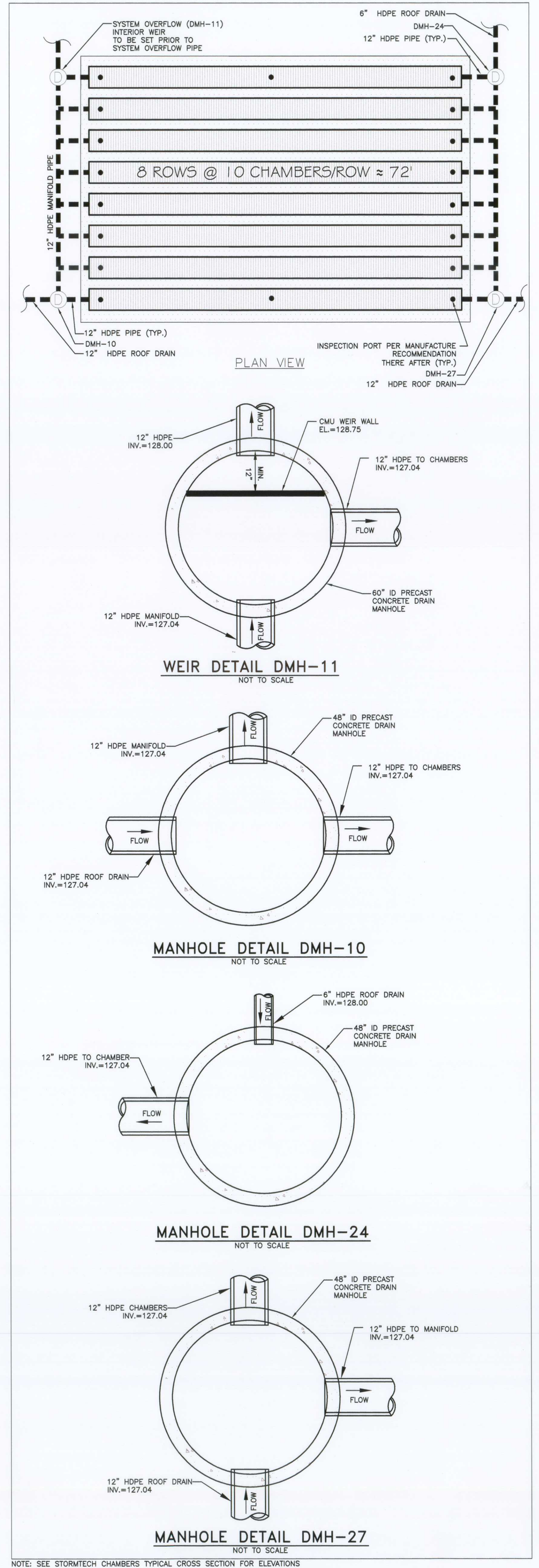
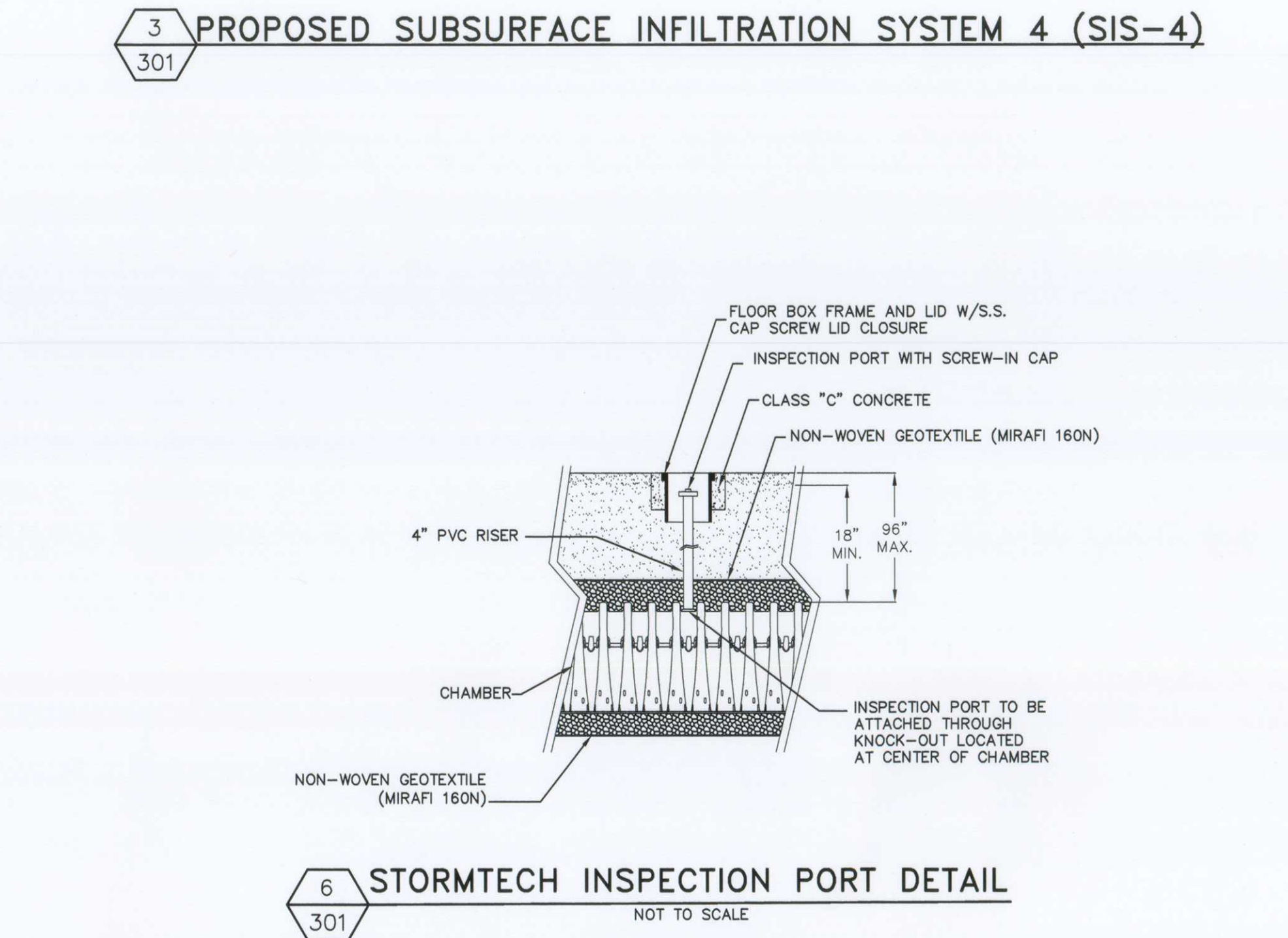
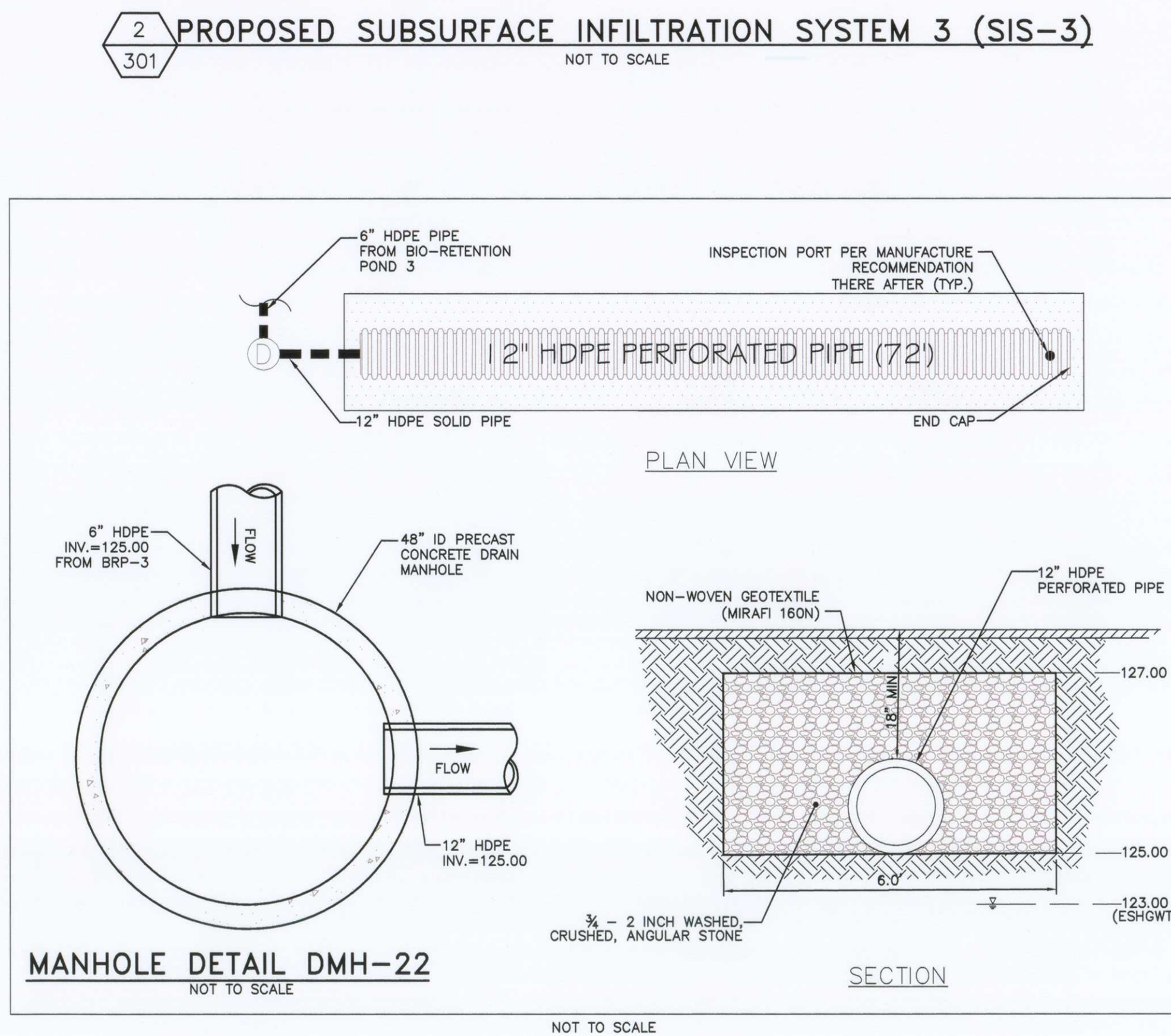
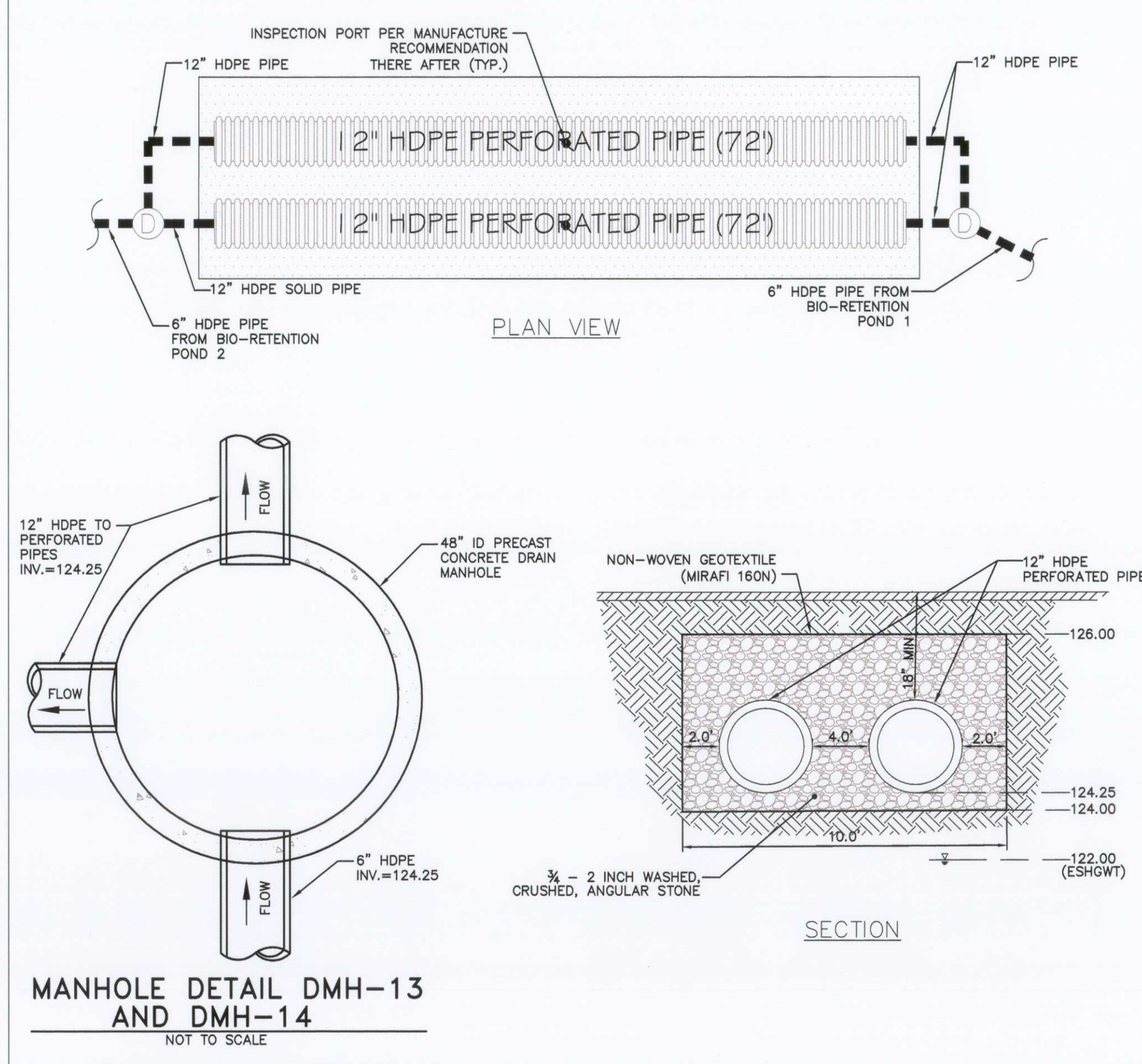
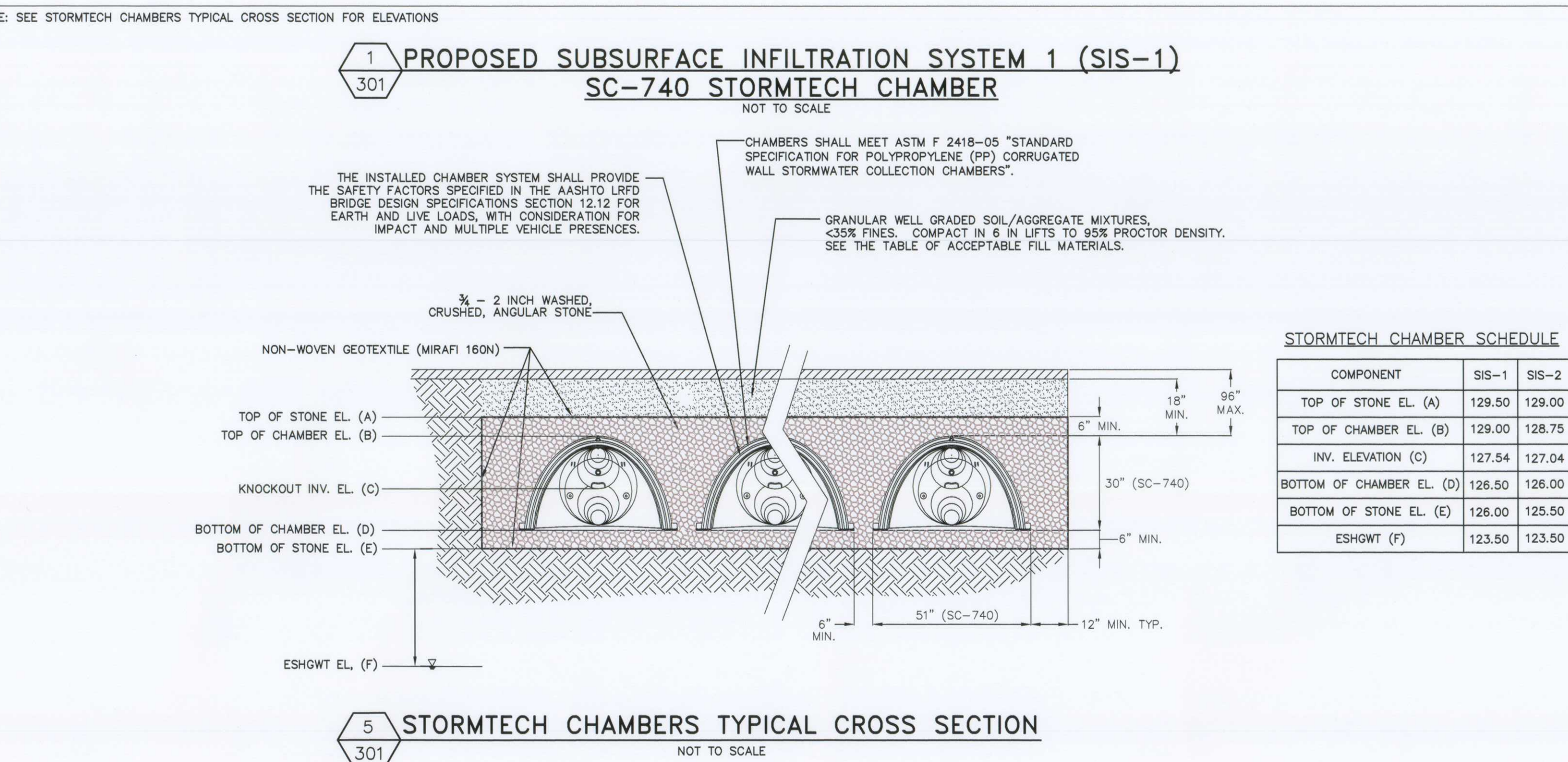
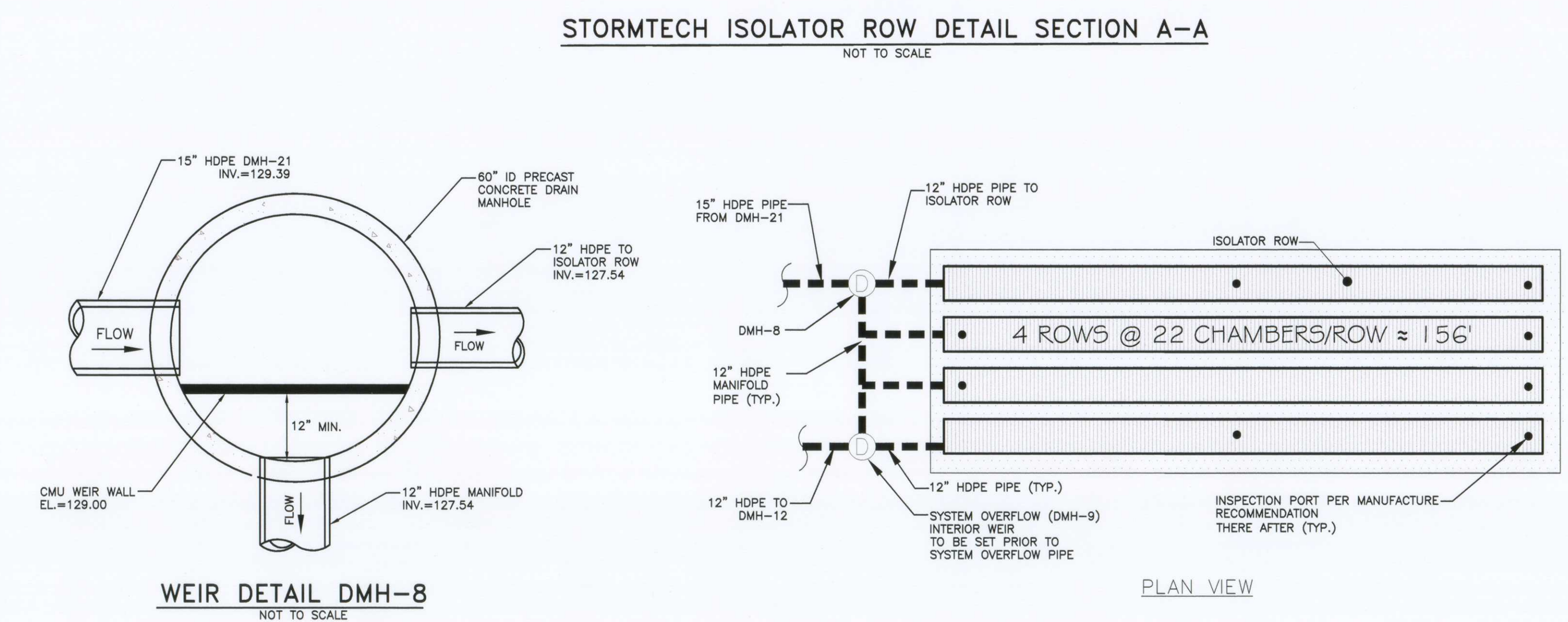
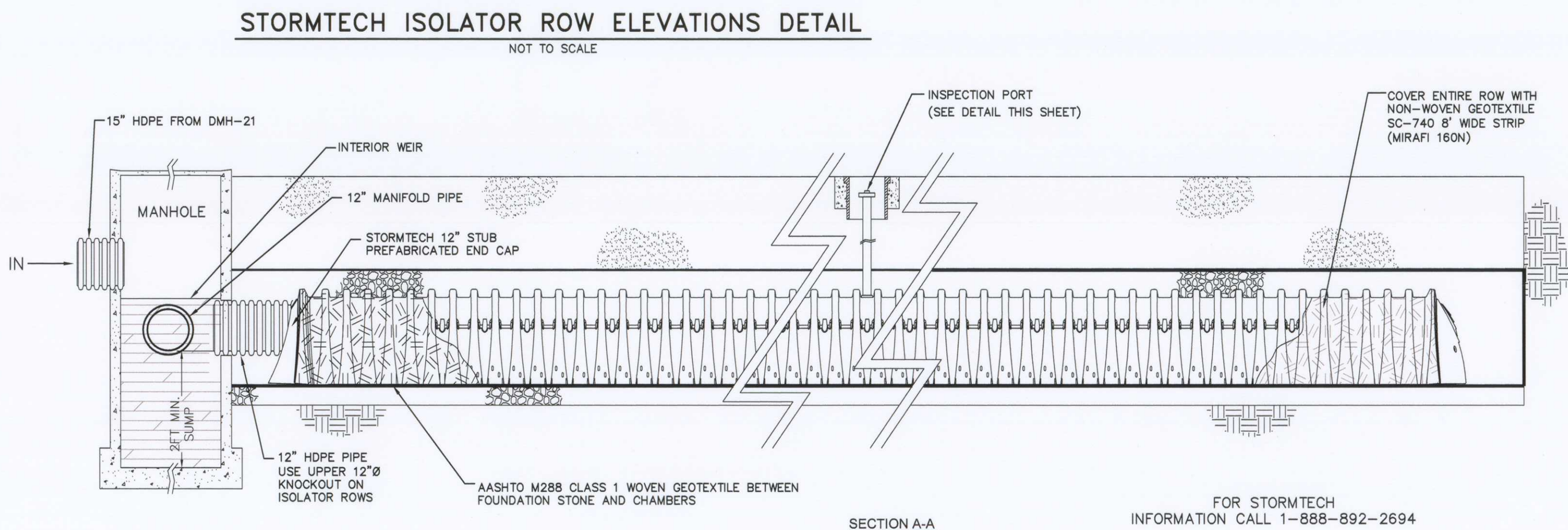
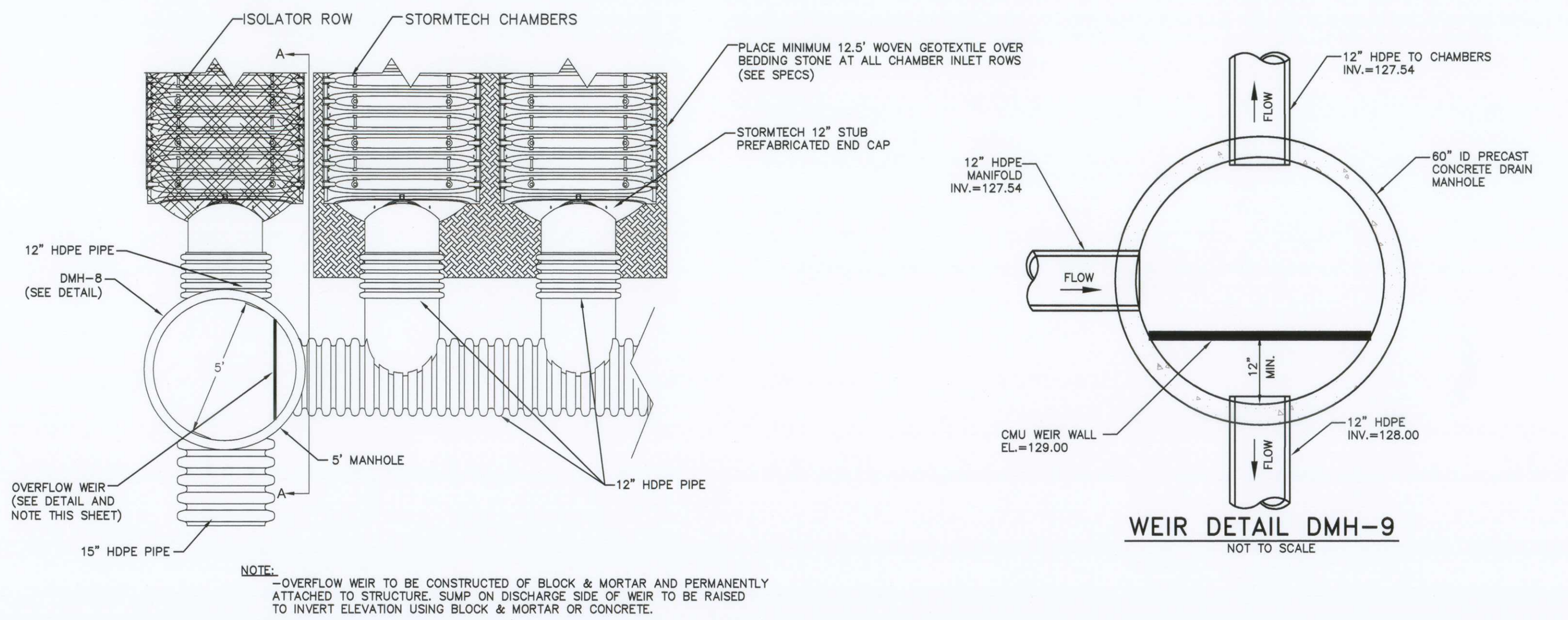
TLA-HOLBROOK, LLC
SOLID WASTE TRANSFER STATION
MAP 19 LOT 3
3 MILL HOLLOW RD
HOLBROOK, MASSACHUSETTS

JOB NO.: 219630
DATE: AUGUST 10, 2009
SCALE: 1"=40'
SHEET: OF

C-204



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WOODARD & CURRAN

COMMITMENT & INTEGRITY DRIVE RESULTS

STATE OF MASSACHUSETTS
DAVID A. WOODARD
CIVIL ENGINEER
No. 36860

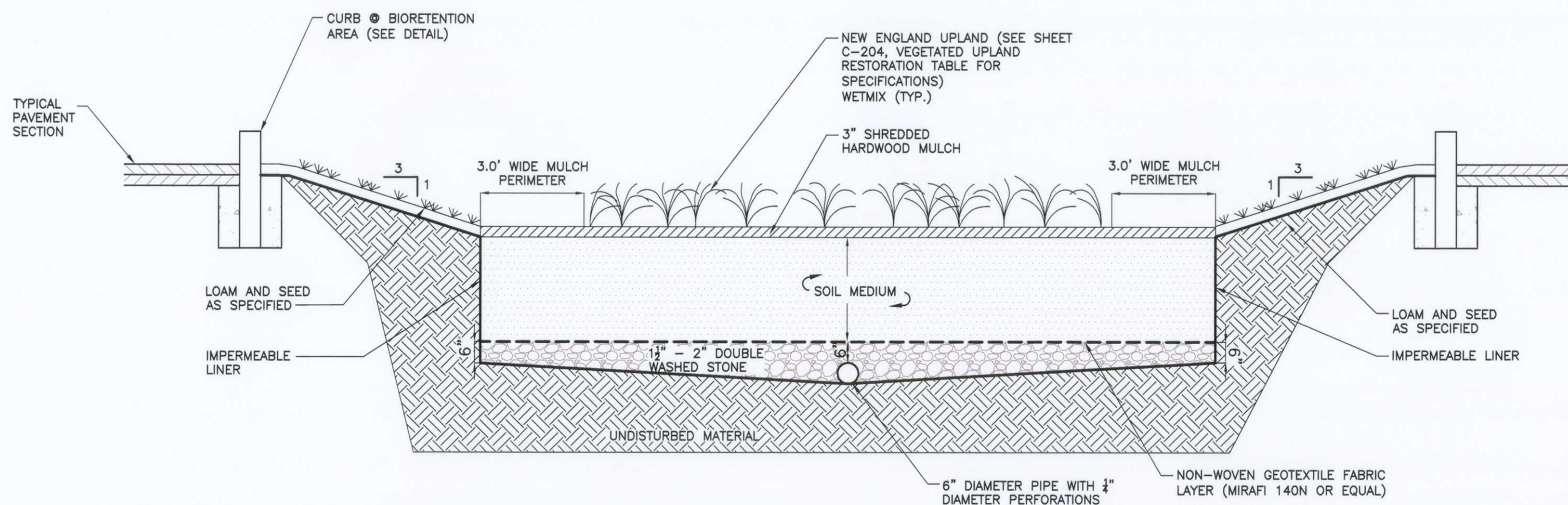
REUSED PLAN FOR PLANNING BOARD AND WASTE TRANSFER STATION
1
DESCRIPTION
3/12/10
DATE
DESIGNED BY: HCP/JCS
CHECKED BY: JCS/JAN/RMD
DRAWN BY: HCP

DETAILS 2

TLA-HOLBROOK, LLC
SOLID WASTE TRANSFER STATION
MAP 19 LOT 3
3 PHILLIPS ROAD
HOLBROOK, MASSACHUSETTS

JOB NO.: 219630
DATE: AUGUST 10, 2009
SCALE: N.T.S.
SHEET: OF

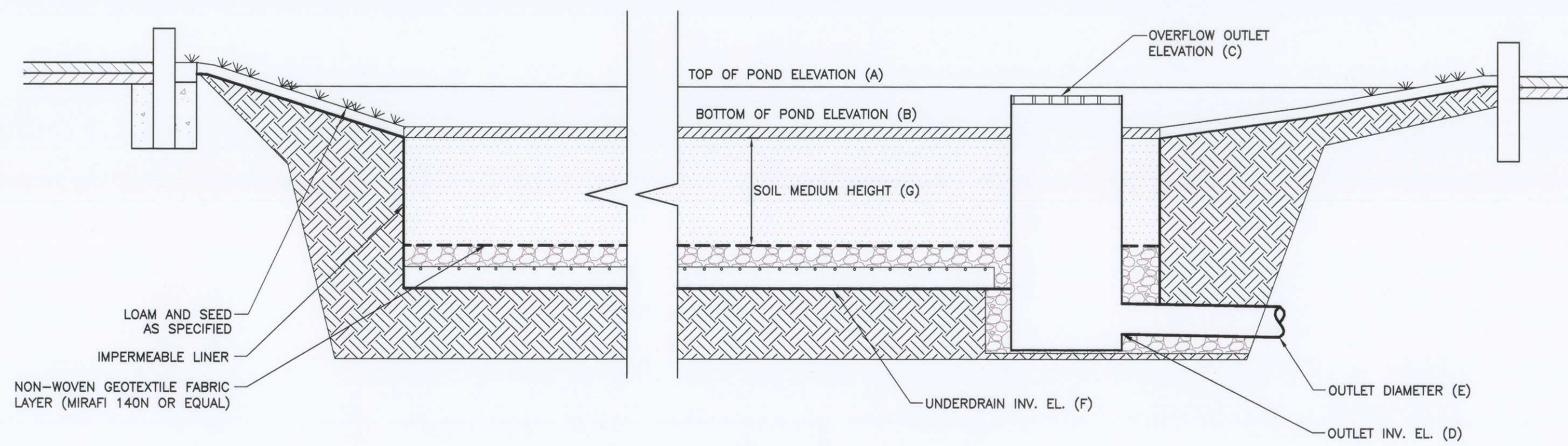
C-301



- NOTE:
- IF UNSUITABLE MATERIAL IS OBSERVED BELOW THE POND DEPTH, AT A MINIMUM IT SHALL BE REMOVED TO A DEPTH OF TWO FEET AND REPLACED WITH CLEAN SAND AND THE ENGINEER SHOULD BE NOTIFIED.
 - SOIL WITHIN BIORETENTION AREA TO BE PLACED, DO NOT COMPACT, LIFTS TO BE LIGHTLY WATERED TO ENCOURAGE NATURAL COMPACTION

BIO-RETENTION POND SCHEDULE

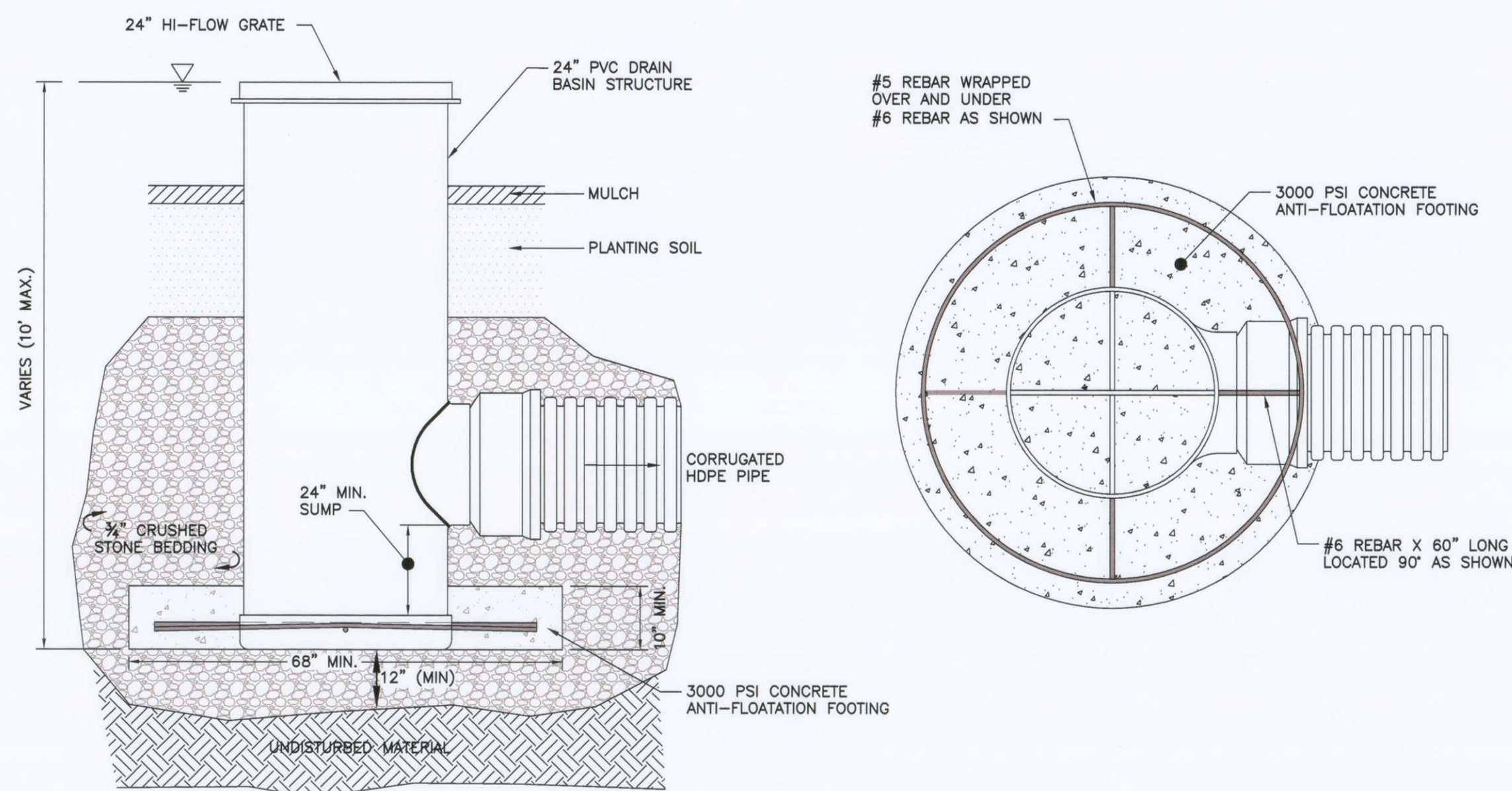
COMPONENT	BRP-1	BRP-2	BRP-3
TOP OF POND EL. (A)	128.50	128.90	129.00
BOTTOM OF POND EL. (B)	127.50	127.25	128.00
OVERFLOW OUTLET EL. (C)	128.10	128.50	128.70
OUTLET INVERT EL. (D)	126.00	124.40	125.84
OUTLET DIAMETER (E)	12"	12"	12"
UNDERDRAIN INVERT EL. (F)	124.50	124.25	125.00
SOIL MEDIUM HEIGHT (G)	2.0'	2.0'	2.0'



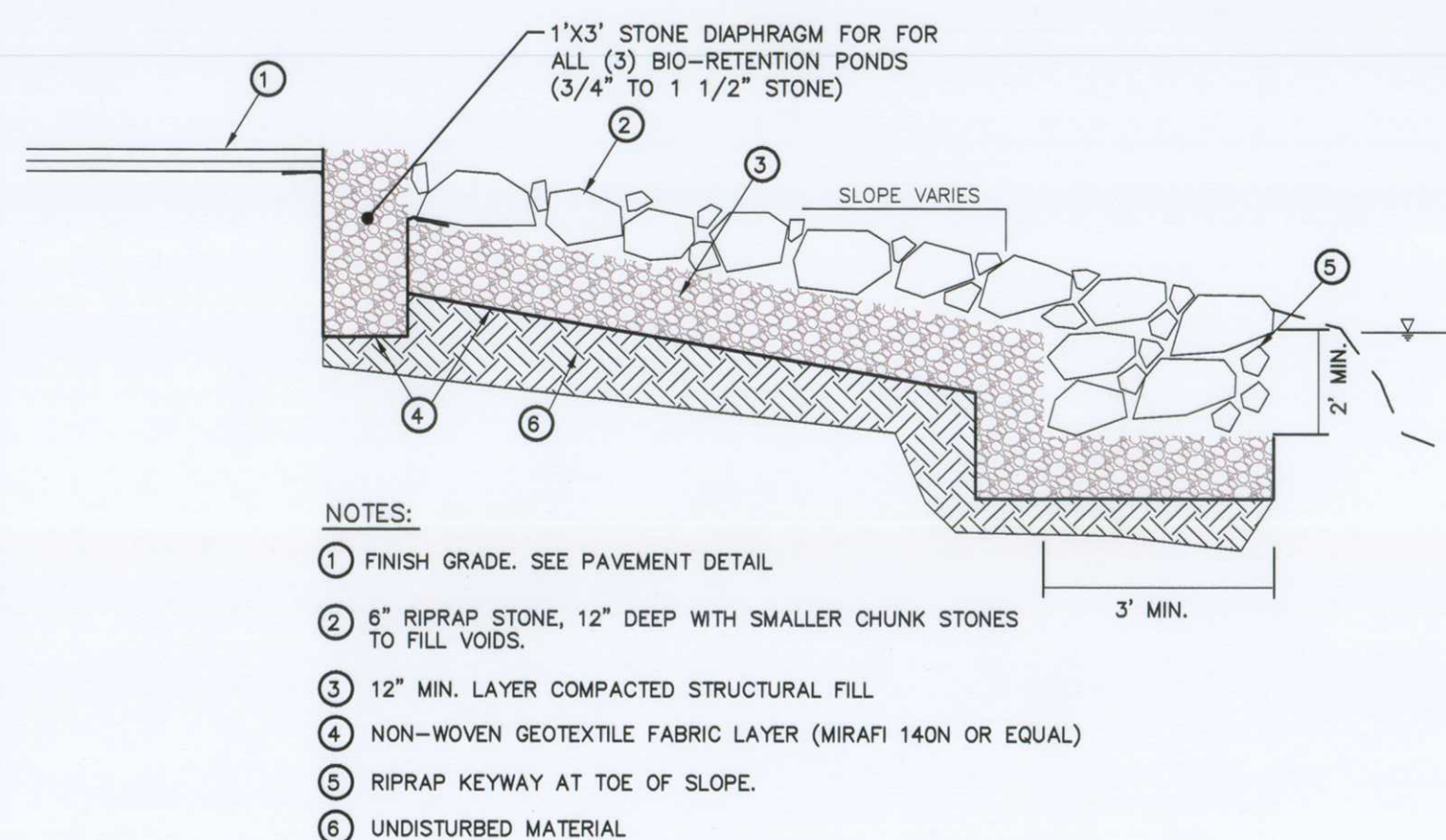
- NOTES:
- USE FLEXIBLE CONNECTION AT THE INLET AND OUTLET WHERE APPLICABLE.
 - THE COVER SHOULD BE POSITIONED OVER THE OUTLET DROP PIPE AND THE OIL PORT.
 - 55" MINIMUM FOR STC 900 (900 GAL.)
71" MINIMUM FOR STC 1200 (1,200 GAL.)

2 PRECAST CONCRETE SUBMERGED STORMCEPTOR DETAIL
NOT TO SCALE

1 BIO-RETENTION POND SECTIONS
NOT TO SCALE

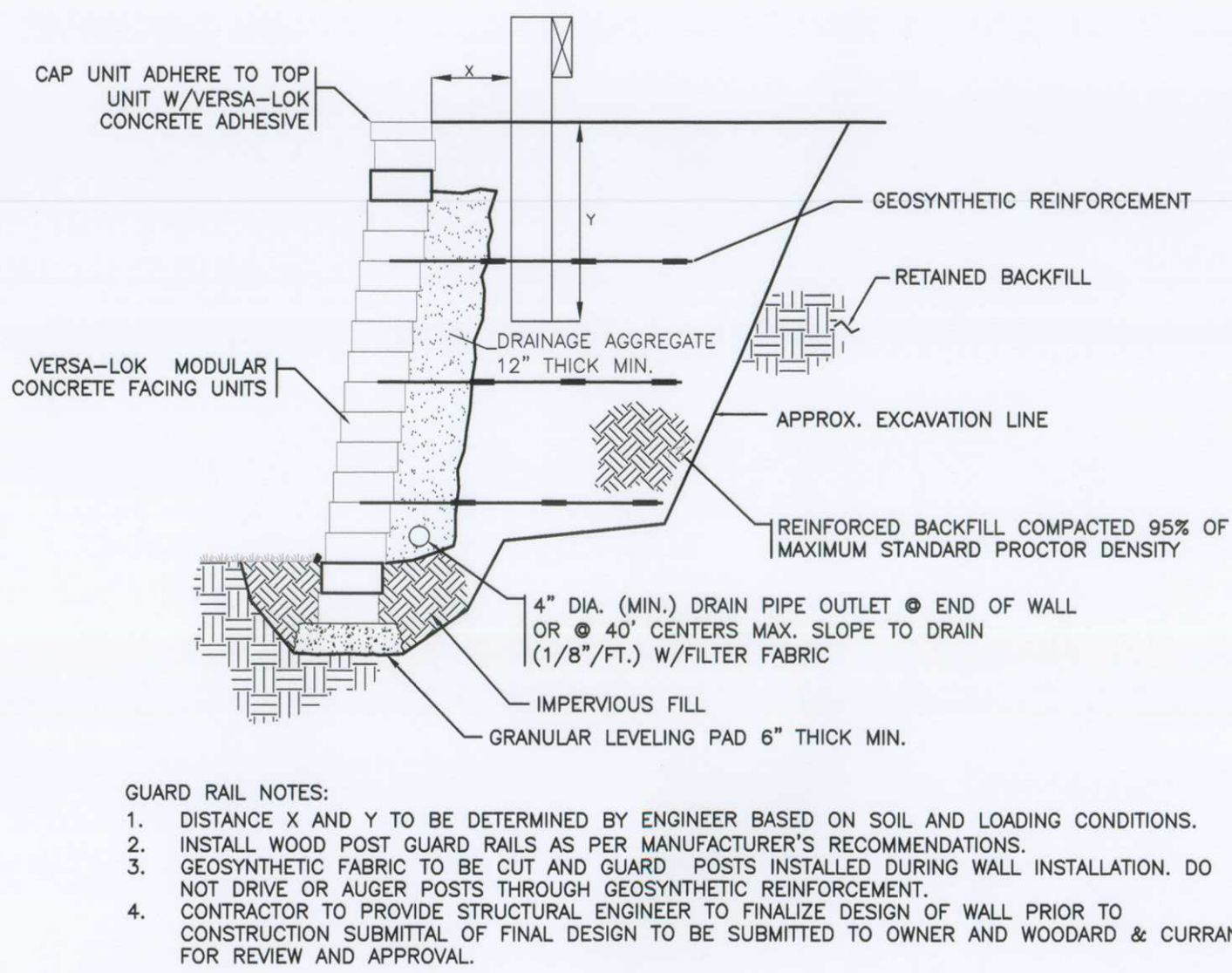


3 OUTLET CONTROL STRUCTURE
NOT TO SCALE



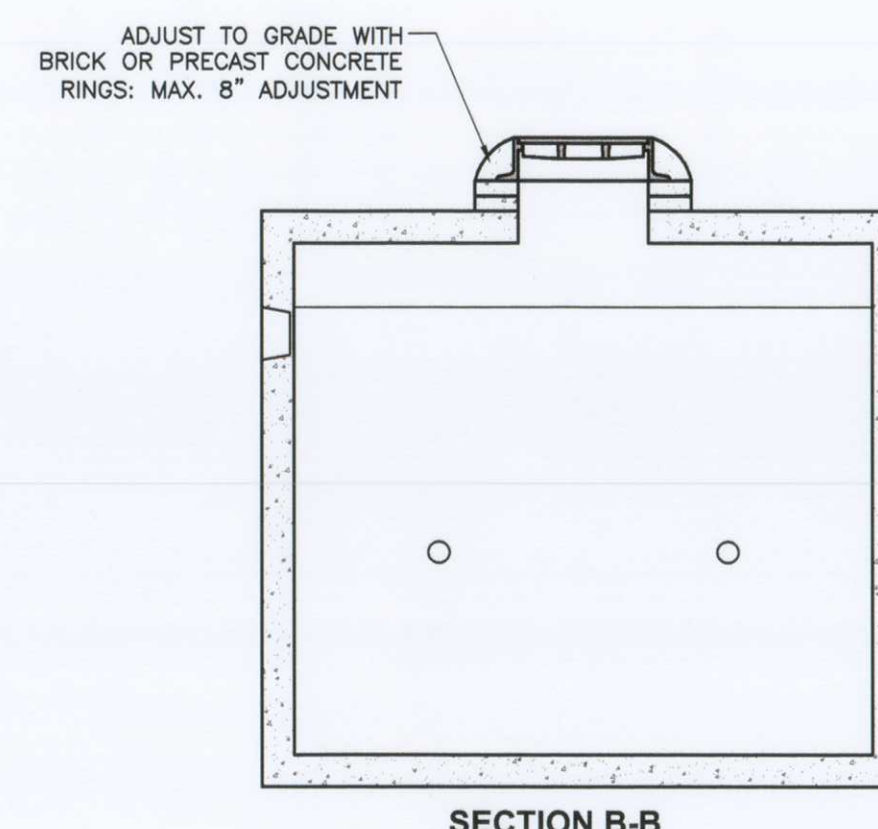
- NOTES:
- FINISH GRADE. SEE PAVEMENT DETAIL
 - 6" RIPRAP STONE, 12" DEEP WITH SMALLER CHUNK STONES TO FILL VOIDS.
 - 12" MIN. LAYER COMPACTED STRUCTURAL FILL
 - NON-WOVEN GEOTEXTILE FABRIC LAYER (MIRAF 140N OR EQUAL)
 - RIPRAP KEYWAY AT TOE OF SLOPE.
 - UNDISTURBED MATERIAL

5 TYPICAL RIPRAP SLOPE SECTION
NOT TO SCALE



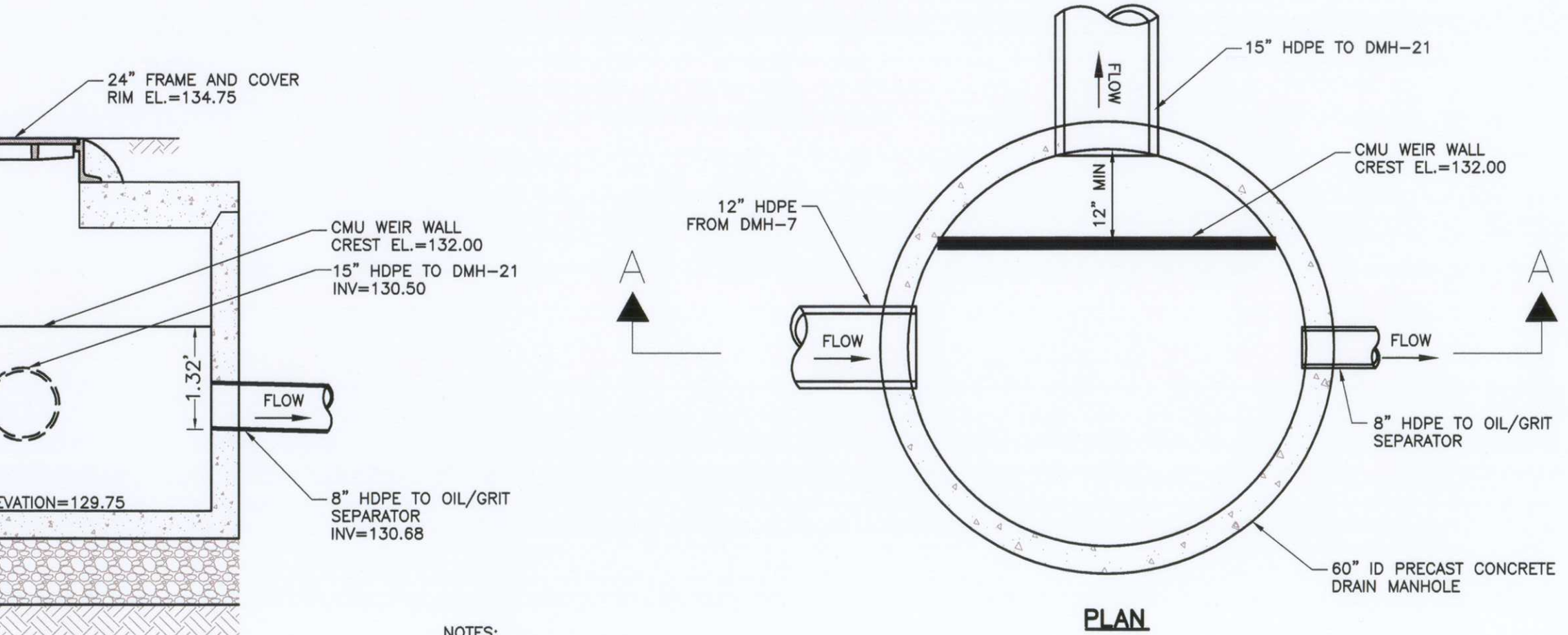
- GUARD RAIL NOTES:
- DISTANCE X AND Y TO BE DETERMINED BY ENGINEER BASED ON SOIL AND LOADING CONDITIONS.
 - INSTALL WOOD POST GUARD RAILS AS PER MANUFACTURER'S RECOMMENDATIONS.
 - GEOSYNTHETIC FABRIC TO BE CUT AND GUARD POSTS INSTALLED DURING WALL INSTALLATION. DO NOT DRIVE OR AUGER POSTS THROUGH GEOSYNTHETIC REINFORCEMENT.
 - CONTRACTOR TO PROVIDE STRUCTURAL ENGINEER TO FINALIZE DESIGN OF WALL PRIOR TO CONSTRUCTION SUBMITTAL OF FINAL DESIGN TO BE SUBMITTED TO OWNER AND WOODARD & CURRAN FOR REVIEW AND APPROVAL.

6 MODULAR BLOCK RETAINING WALL SYSTEM
NOT TO SCALE



- NOTES:
- CONCRETE : 5,000 P.S.I. MINIMUM STRENGTH @ 28 DAYS
 - STEEL REINFORCING- ASTM A-615, GRADE 60.
 - COVER TO STEEL-1" MINIMUM
 - TANKS ARE DESIGNED TO MEET ASTM C886 AND ACI 318 WITH AASHTO HS-20 LOADING
 - EARTH COVER -0 TO 5 FEET MAX.
 - CONSTRUCTION JOINT-SEALED WITH 1" DIA BUTYL RUBBER OR EQUIVALENT
 - USE OLDCASTLE PRECAST WATER TIGHT TANK OR EQUAL

7 7,000 GAL. OIL-GRIT SEPARATOR
NOT TO SCALE



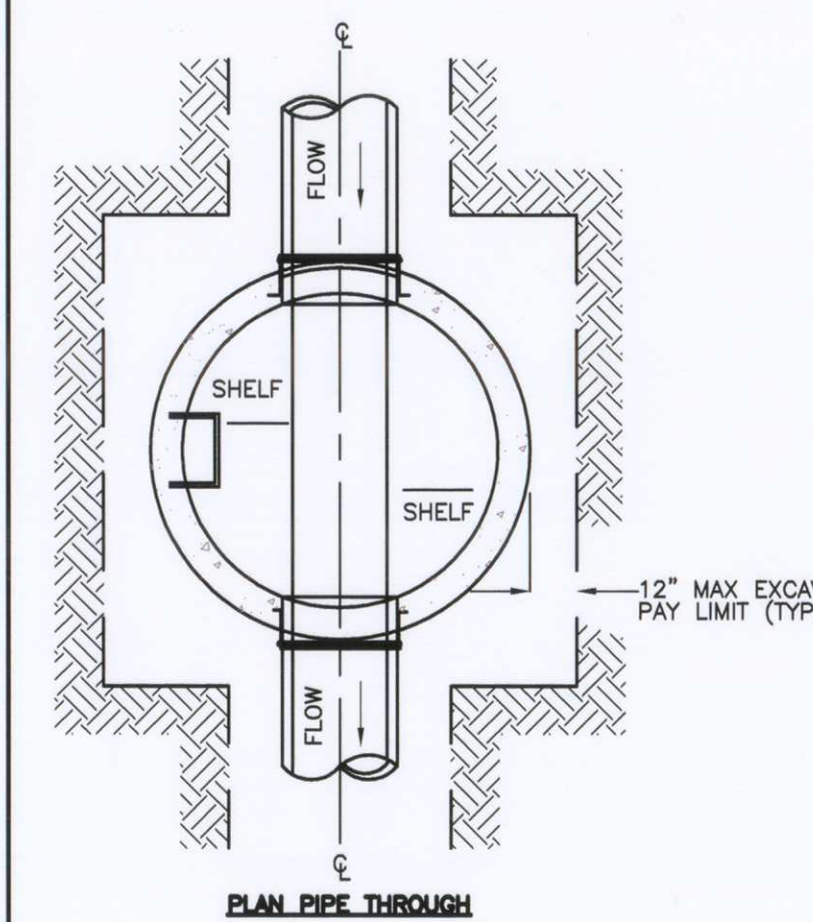
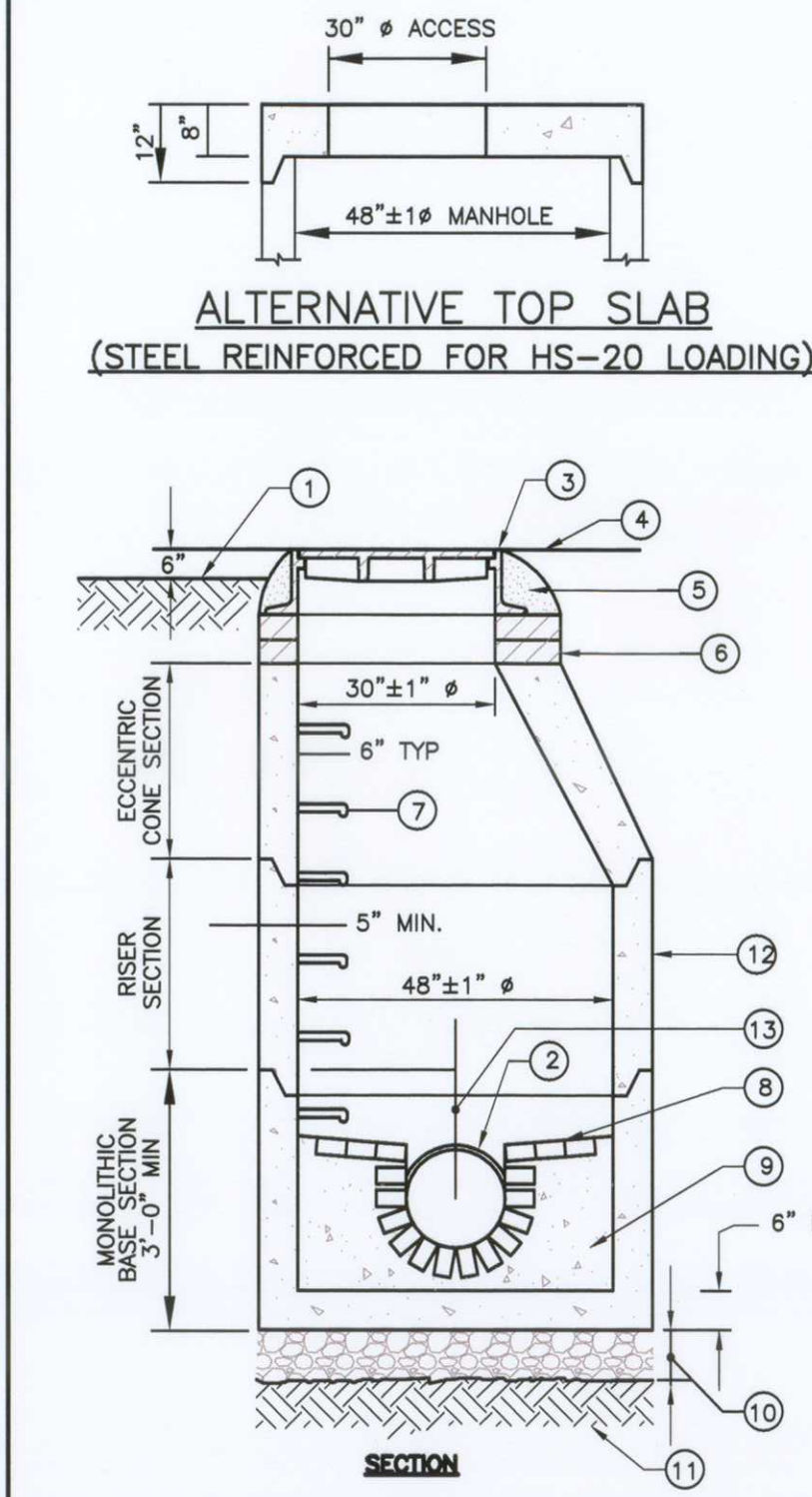
- NOTES:
- PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL BE SUITABLE FOR HS20 LOADINGS.
 - PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM-C-478.
 - SLAB TOP SHALL BE USED FOR ALL DIVERSION STRUCTURES.

4 DIVERSION STRUCTURE (DMH-23)
NOT TO SCALE

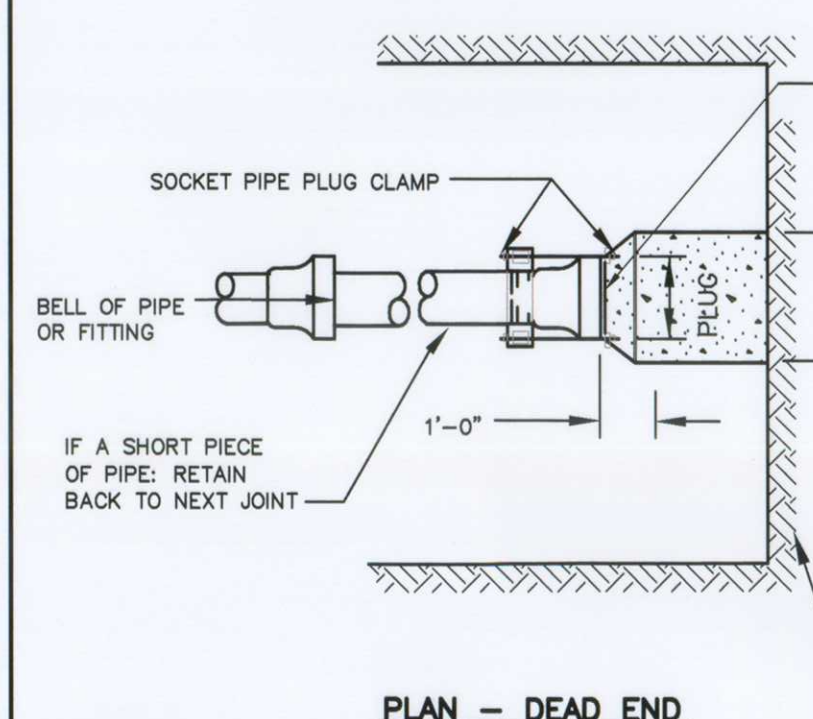
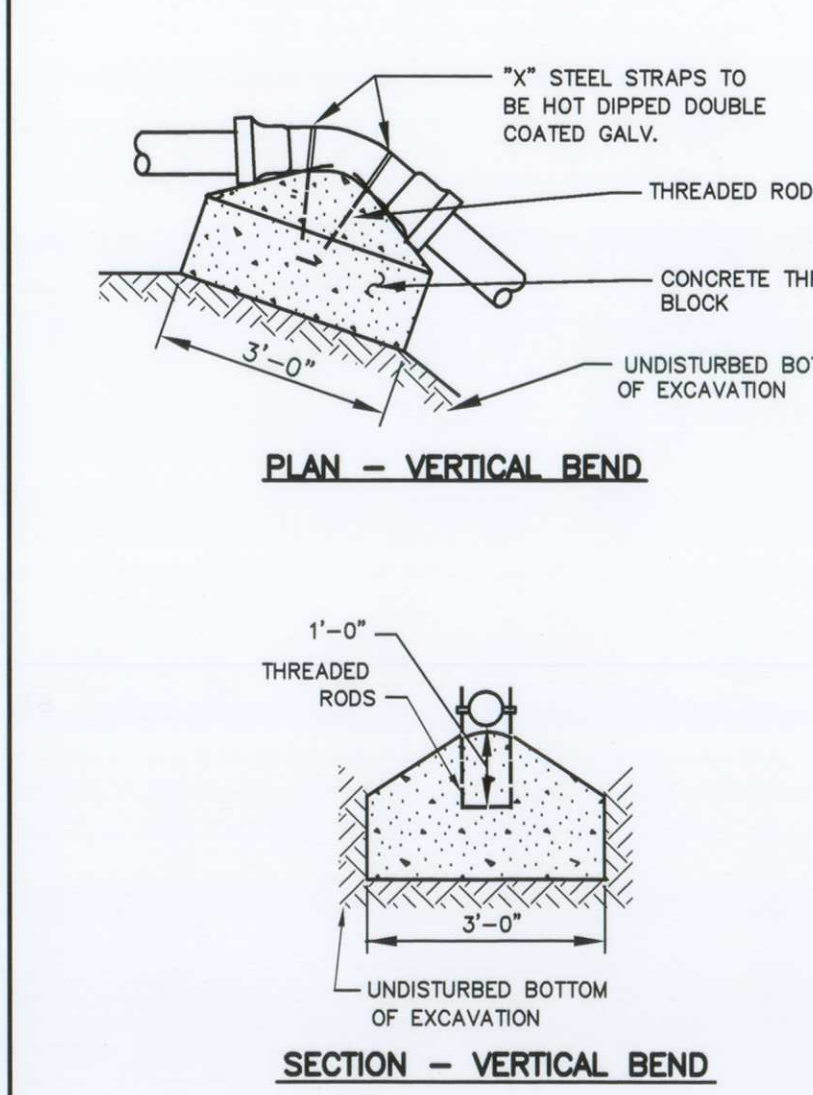
SECTION B-B

SECTION A-A

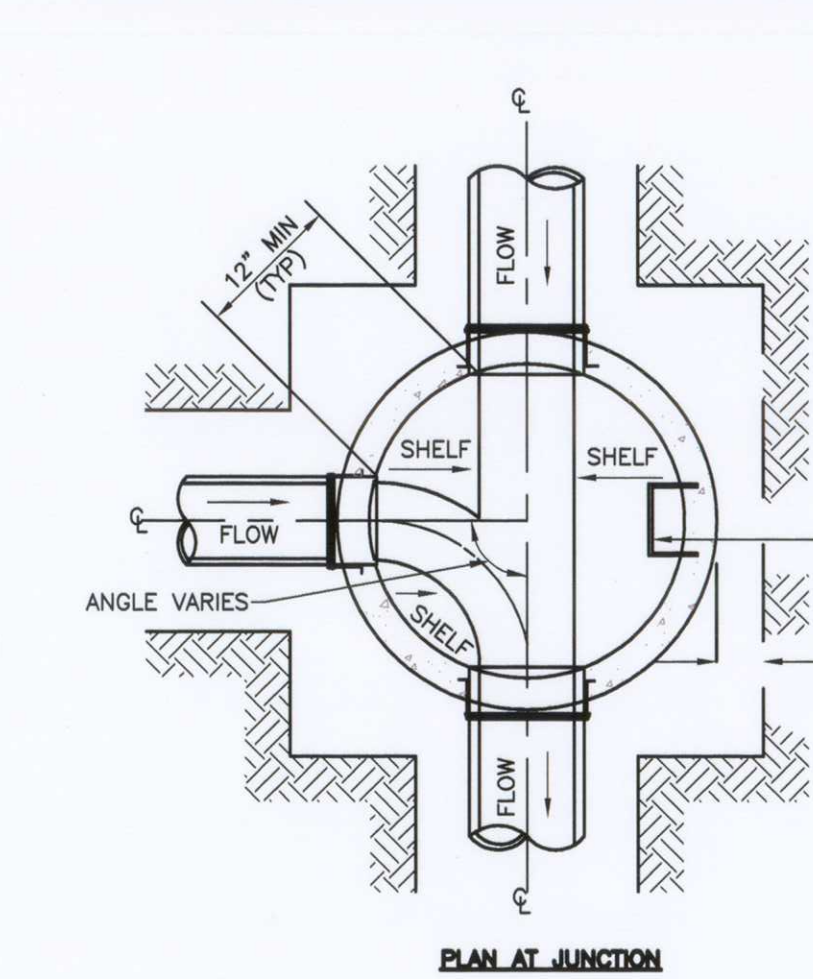
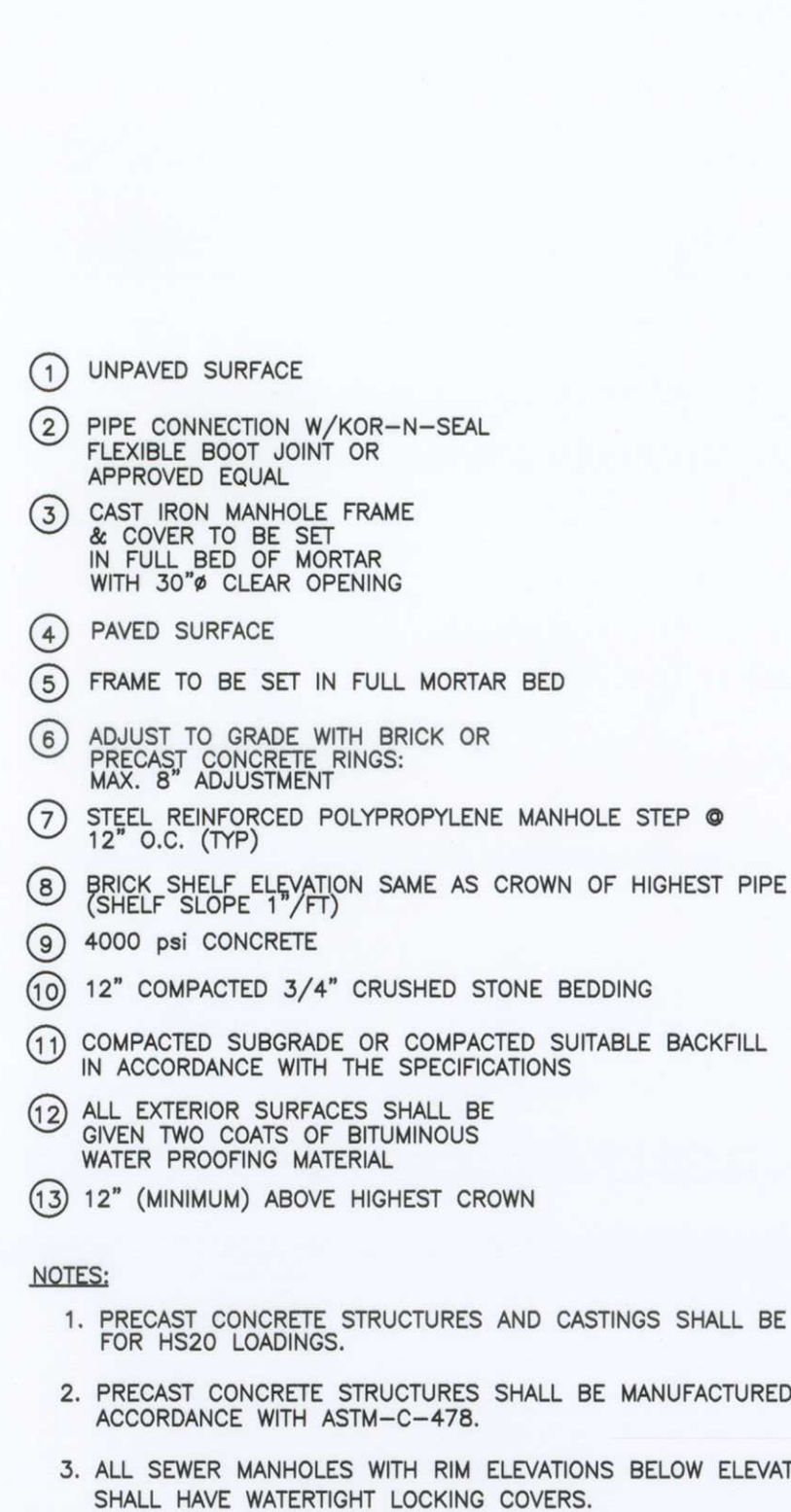
PLAN VIEW



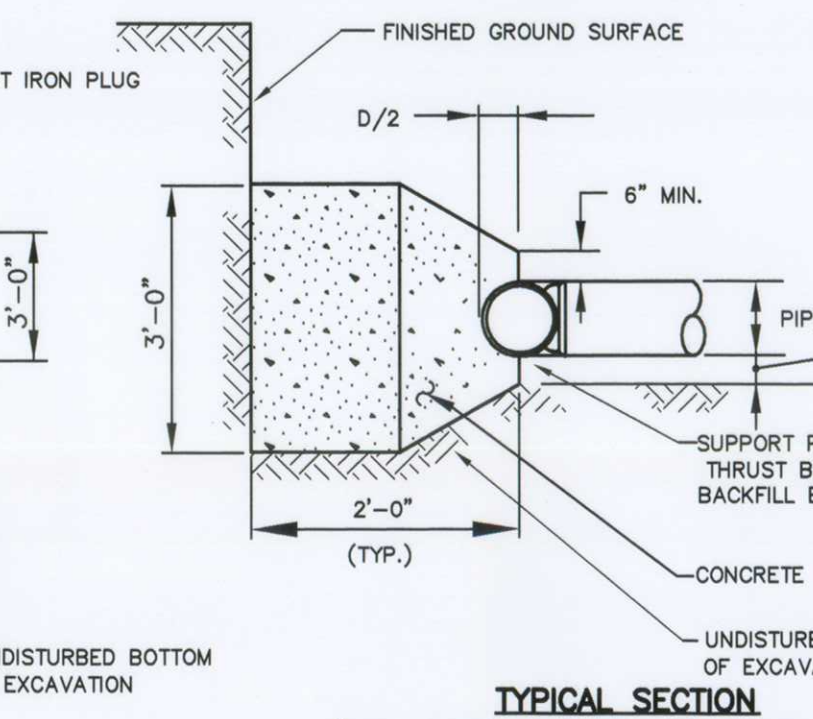
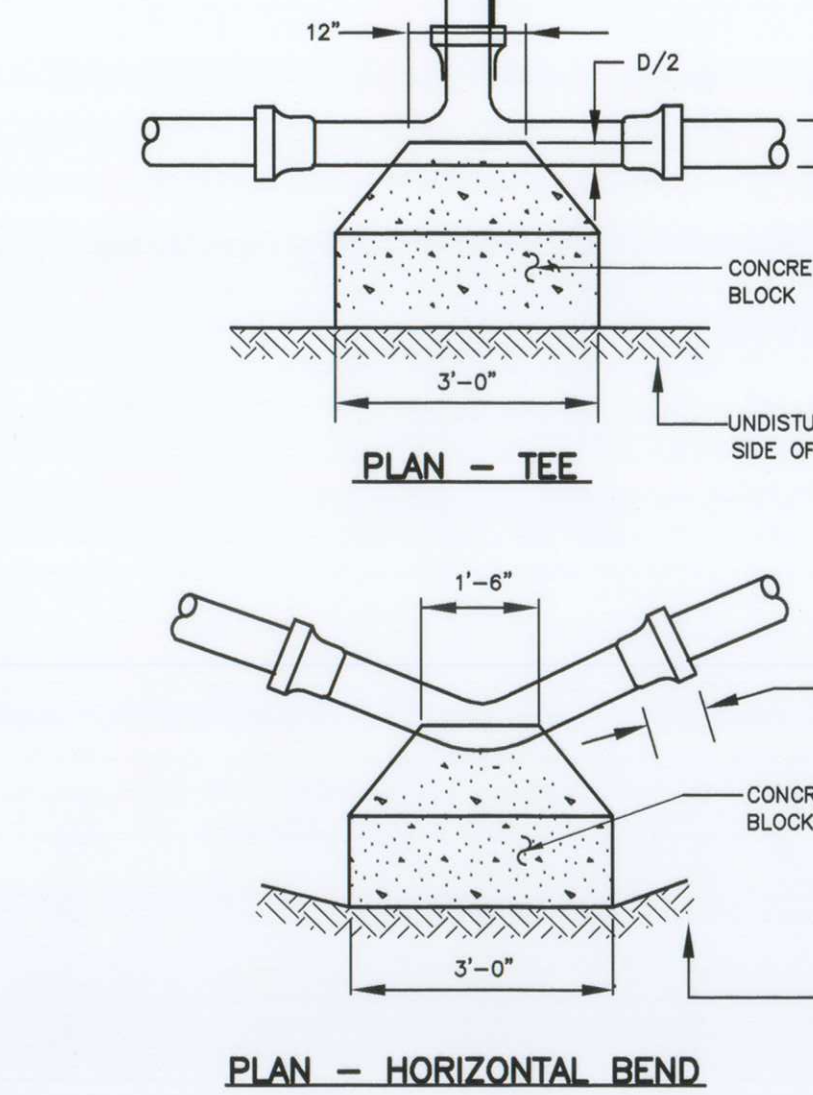
1 TYPICAL PRECAST SEWER MANHOLE
NOT TO SCALE



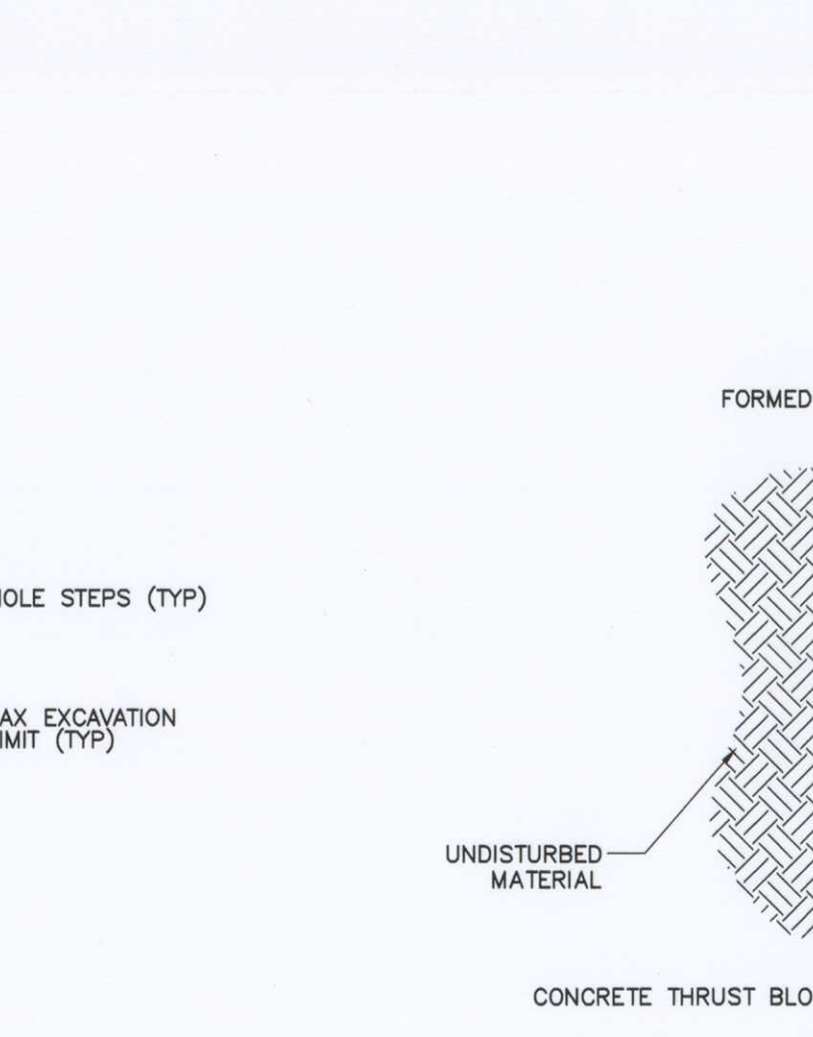
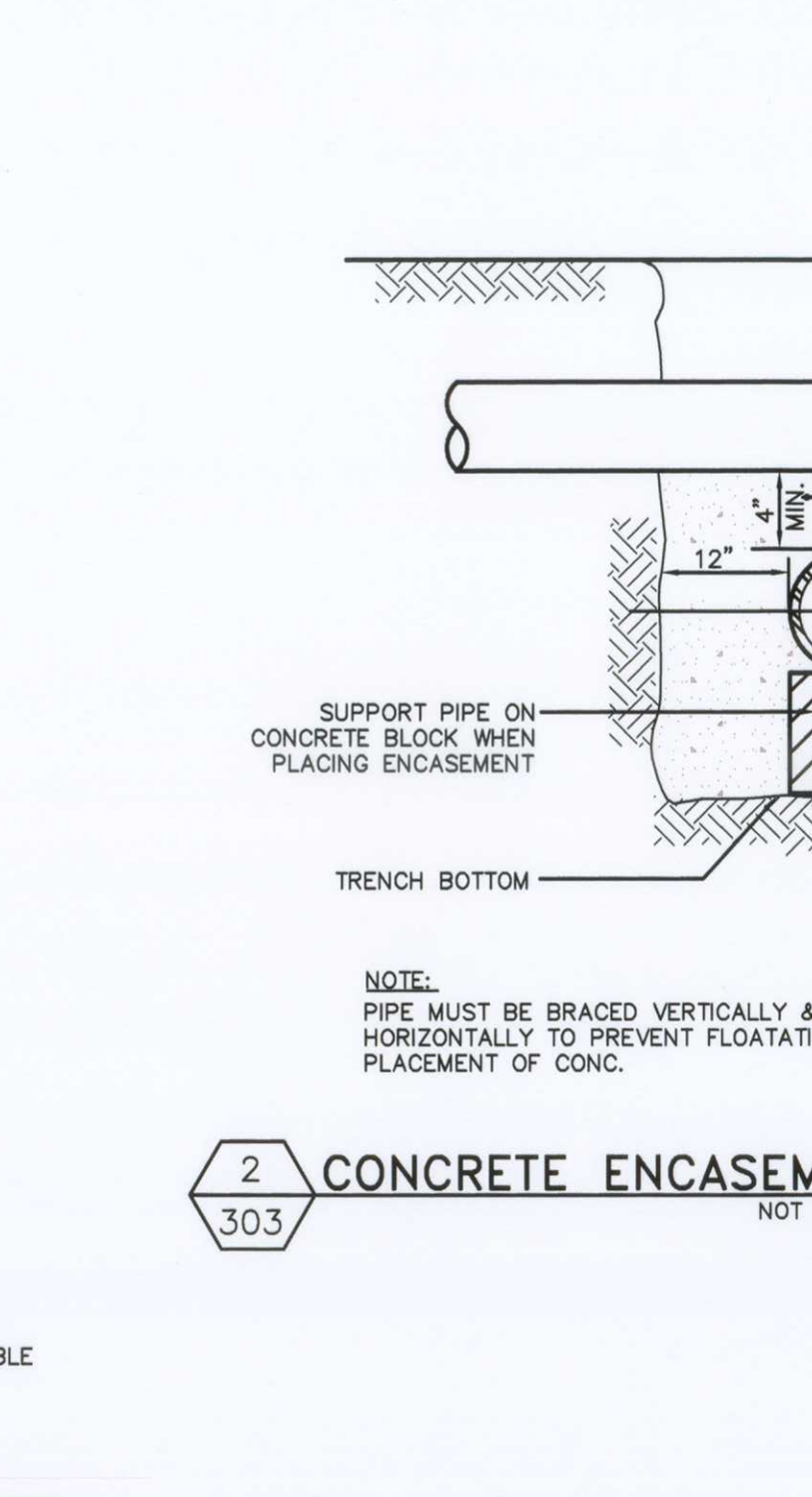
3 FIRE HYDRANT CONNECTION
NOT TO SCALE



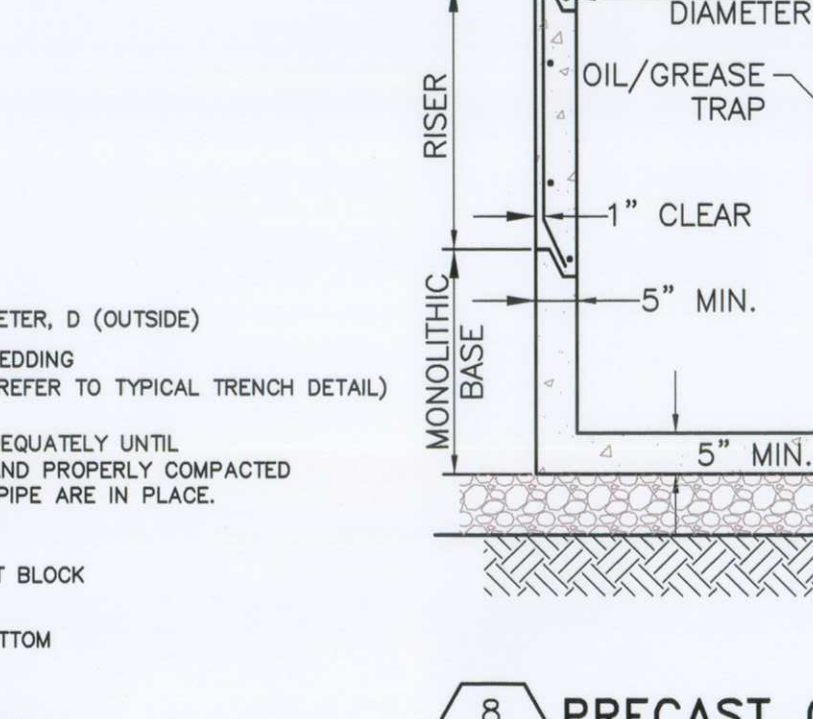
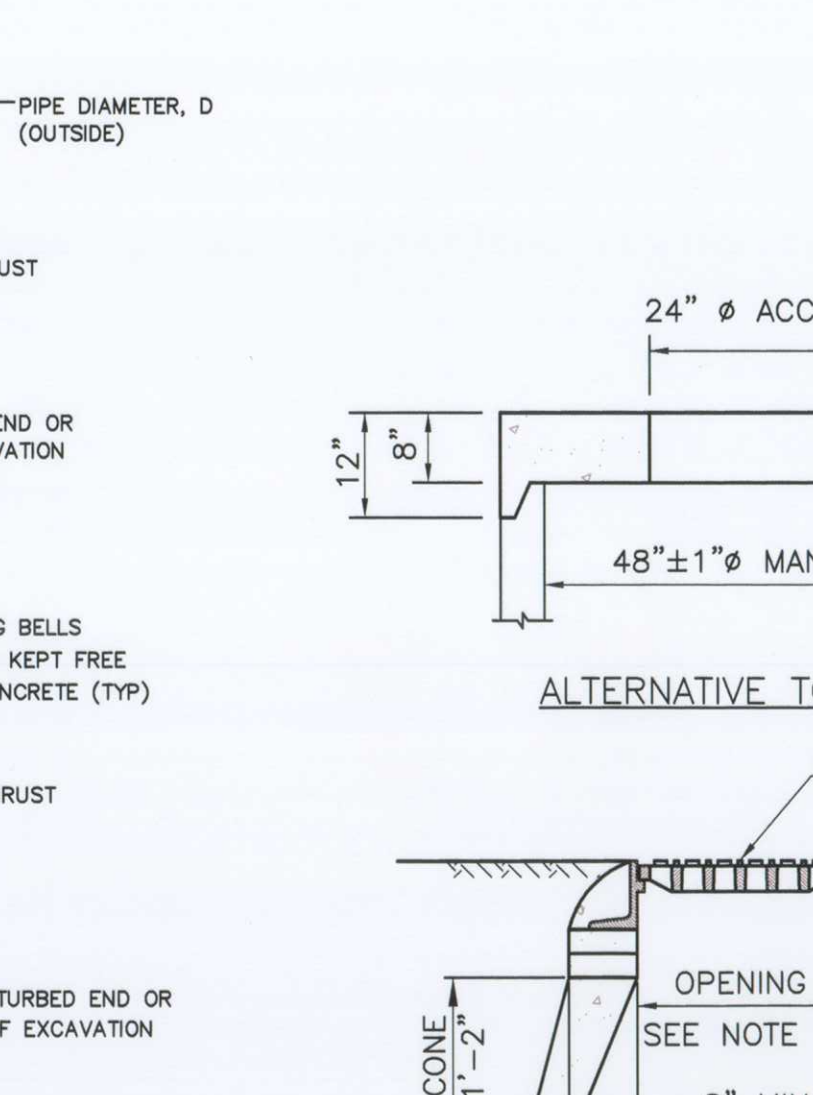
6 EMERGENCY SPILLWAY DETAIL
NOT TO SCALE



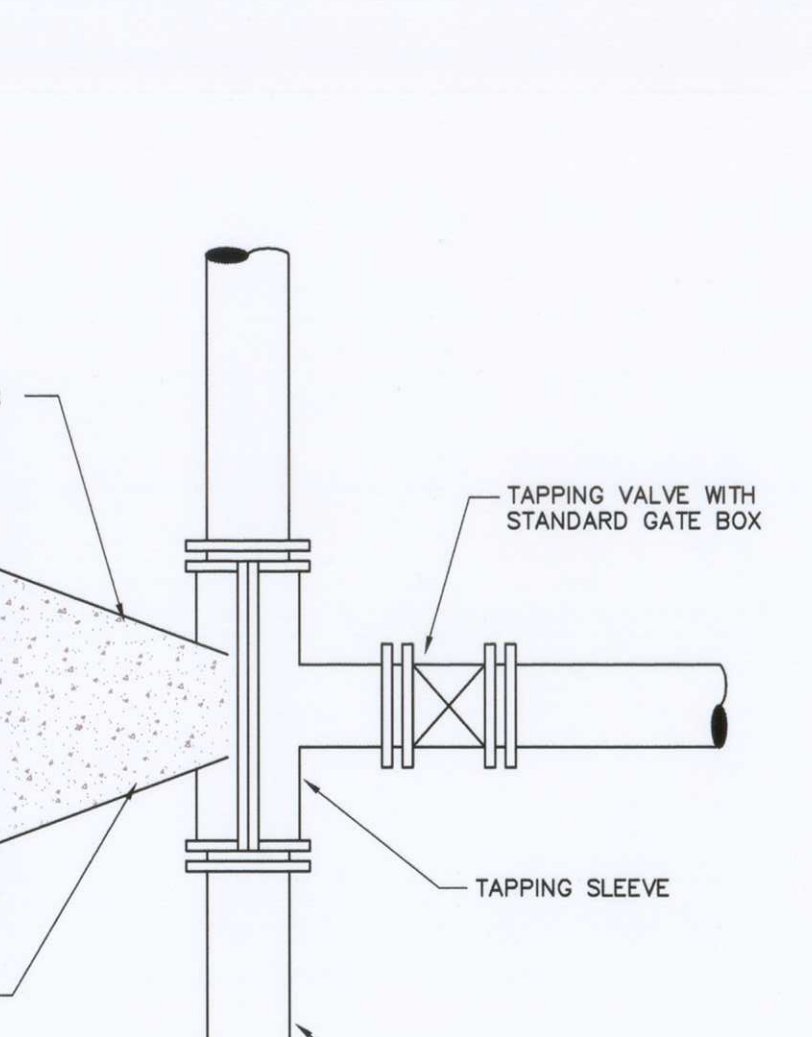
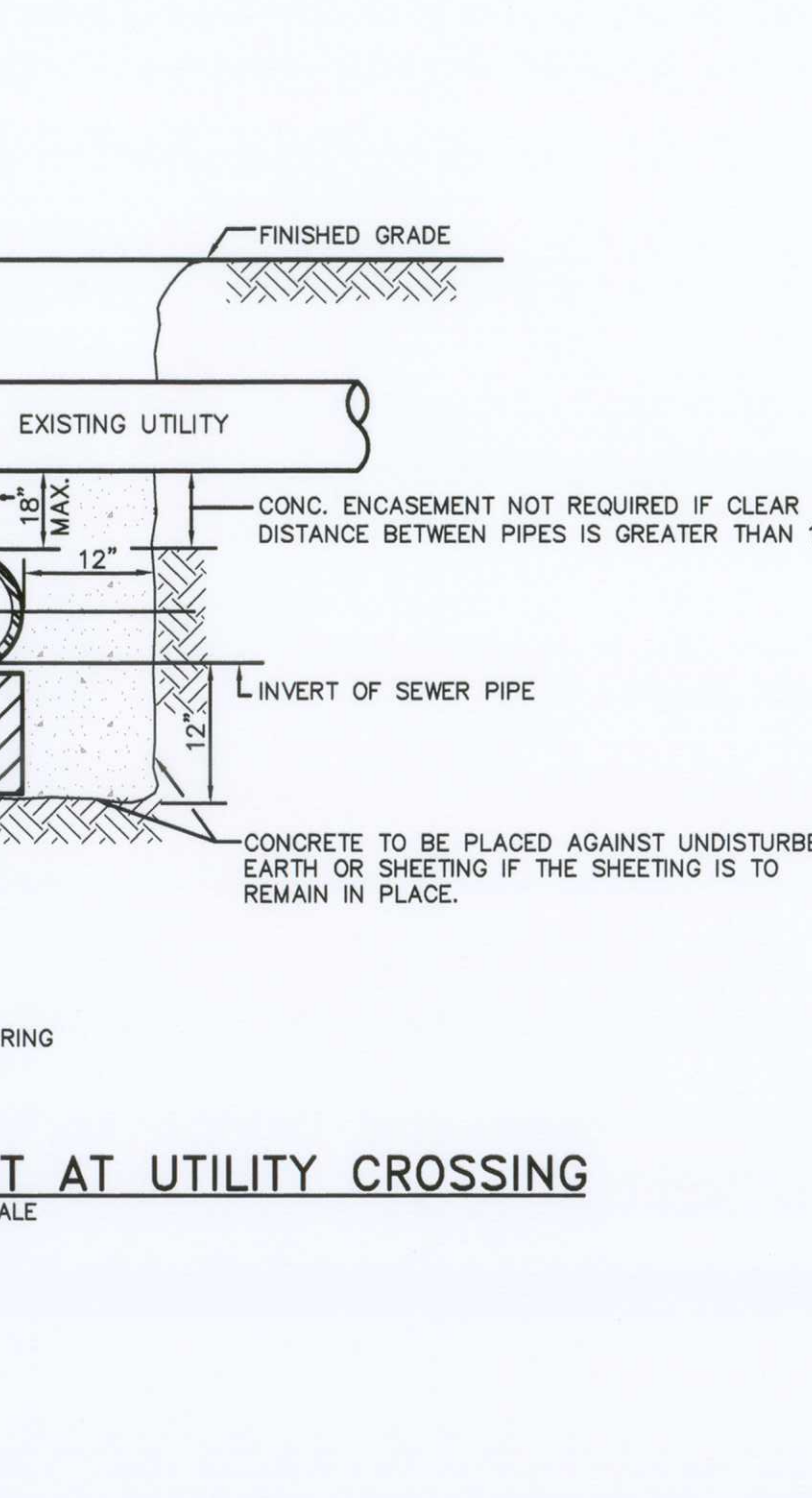
7 DOUBLE CATCH BASIN GRATE
NOT TO SCALE



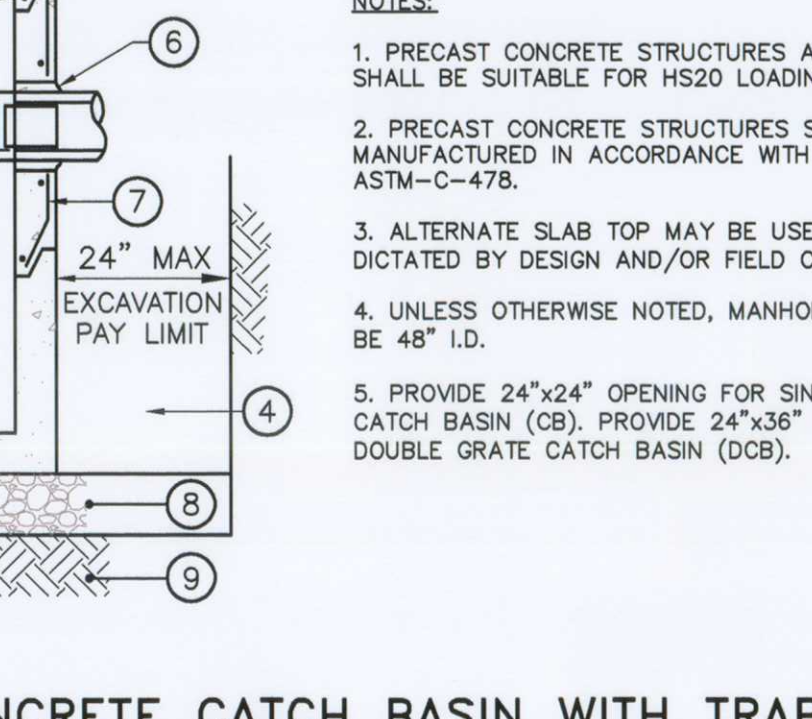
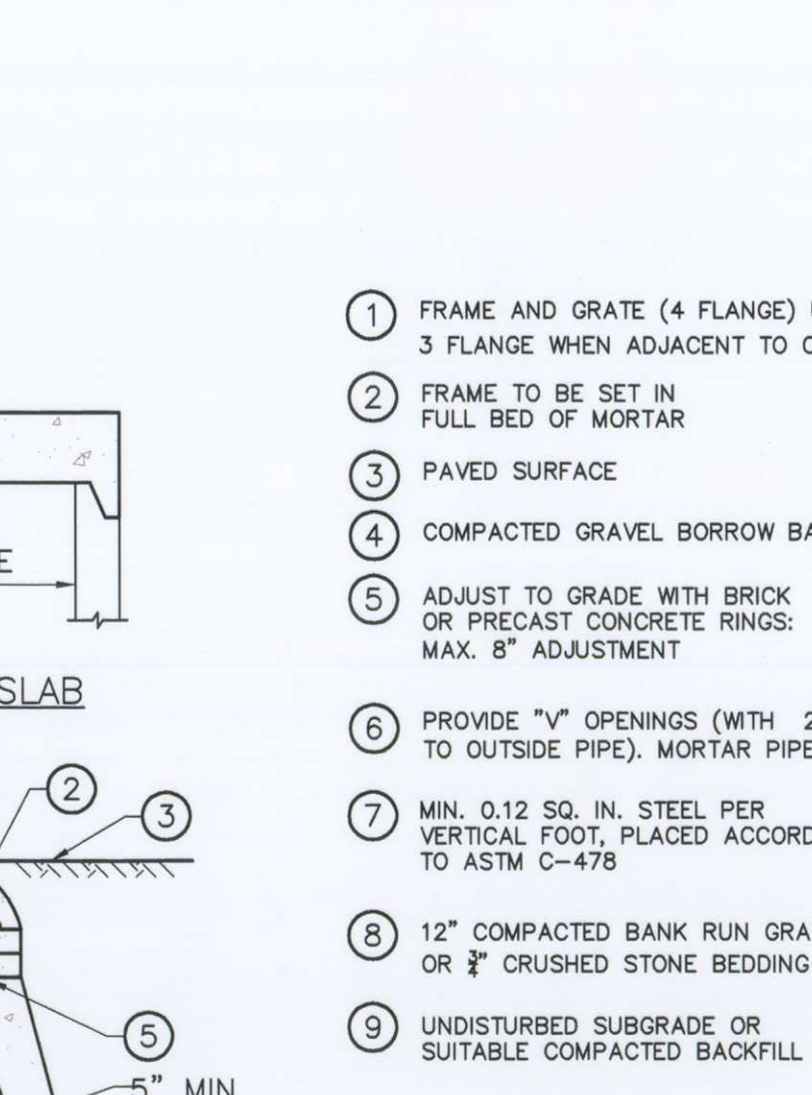
11 DOUBLE CATCH BASIN GRATE
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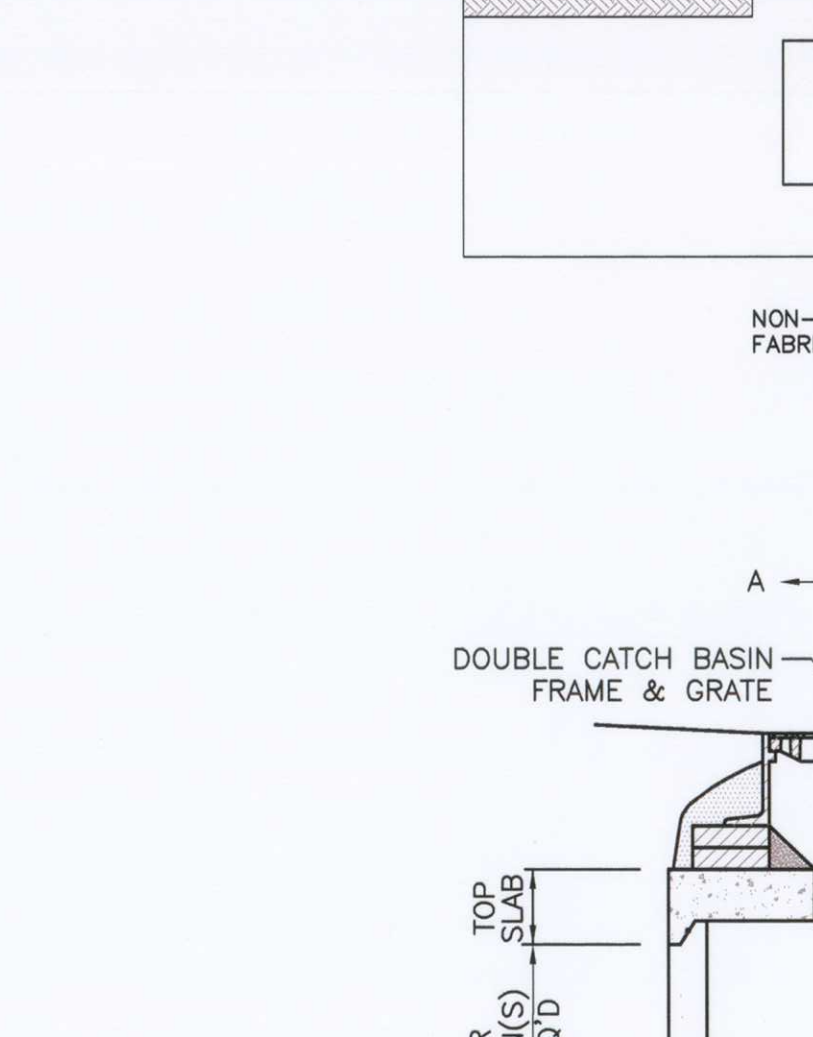
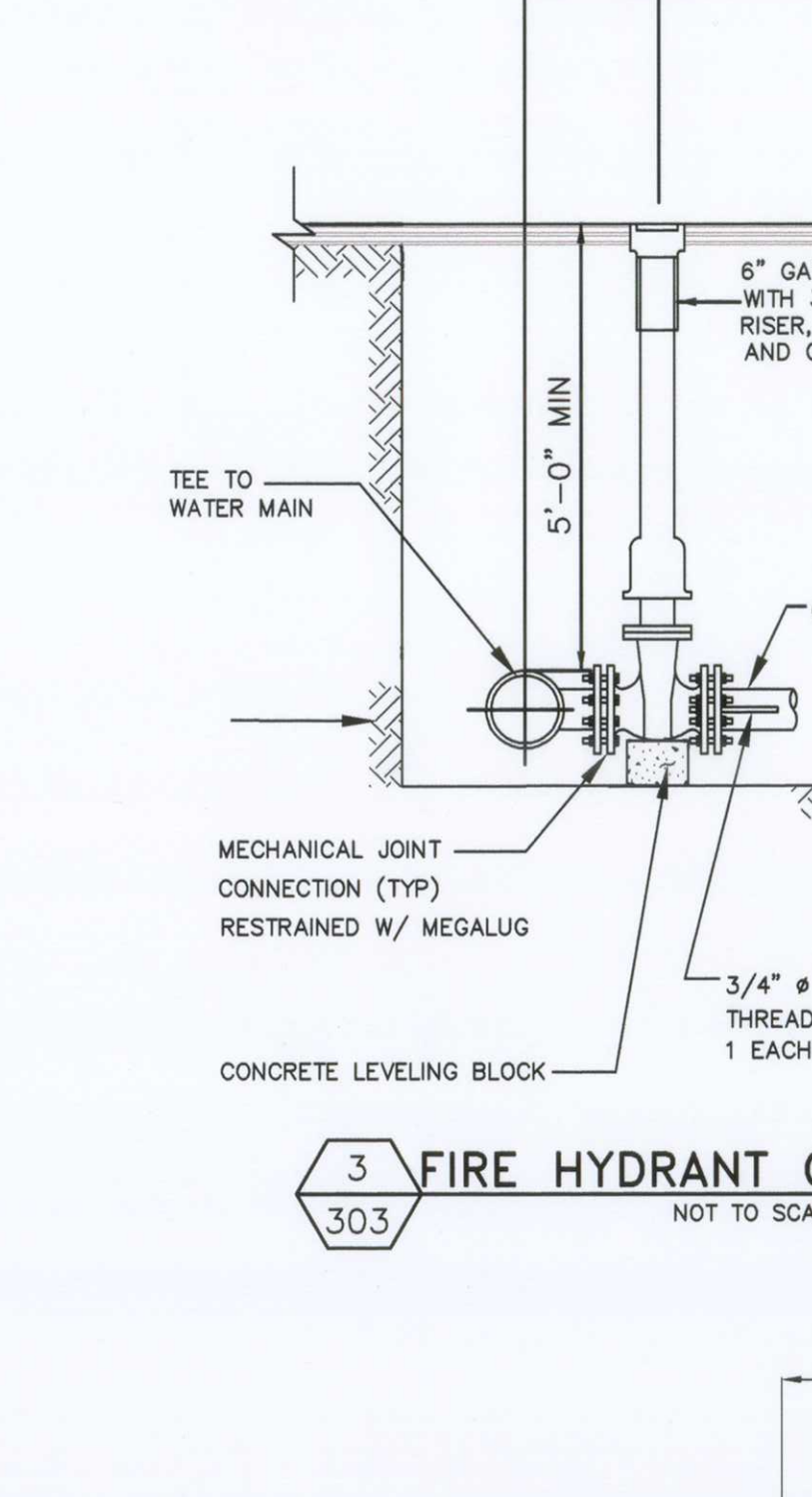
12 TYPICAL TRENCH DETAIL
NOT TO SCALE



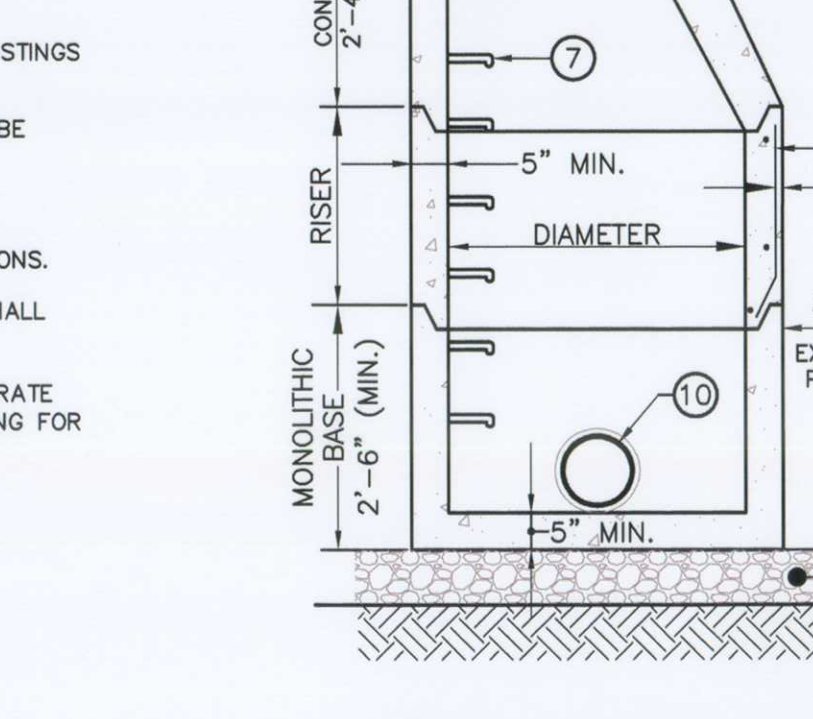
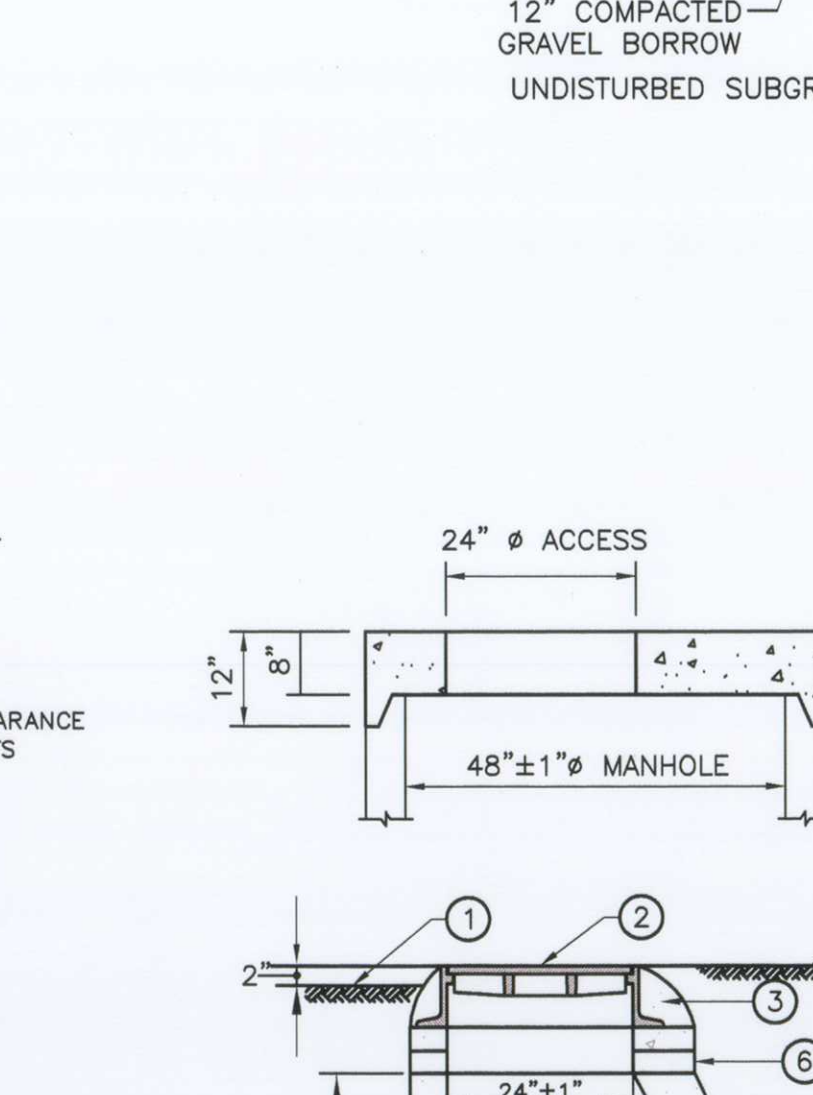
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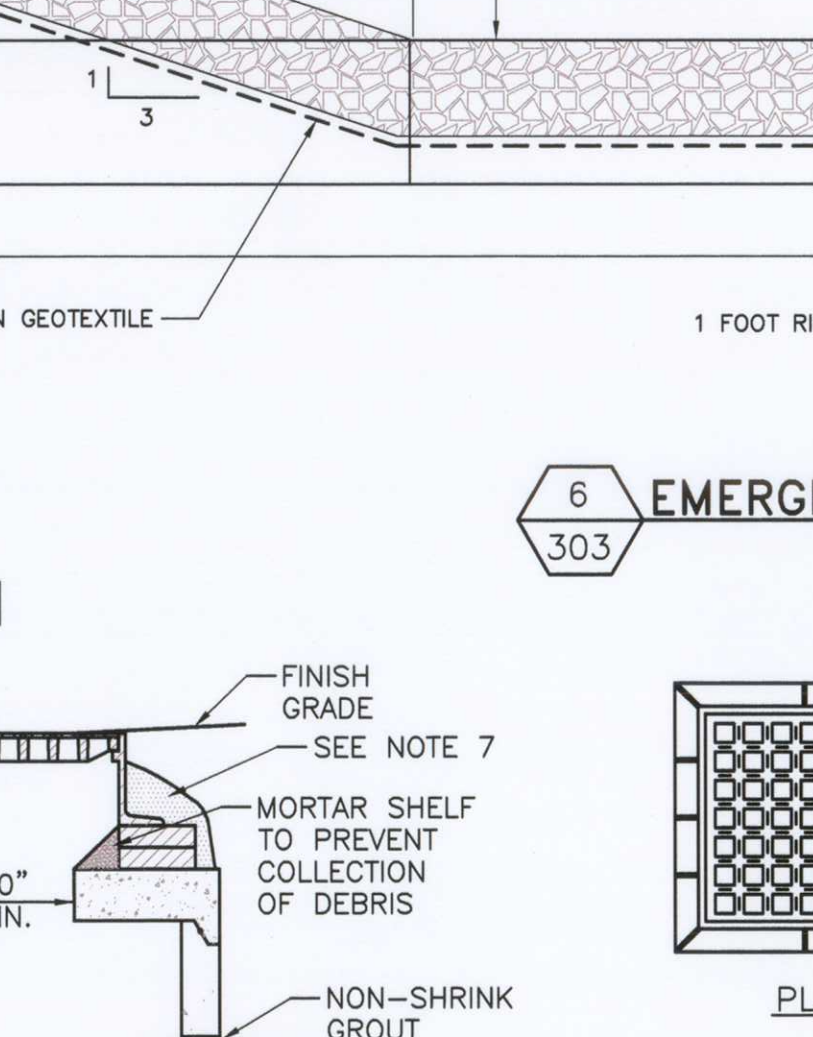
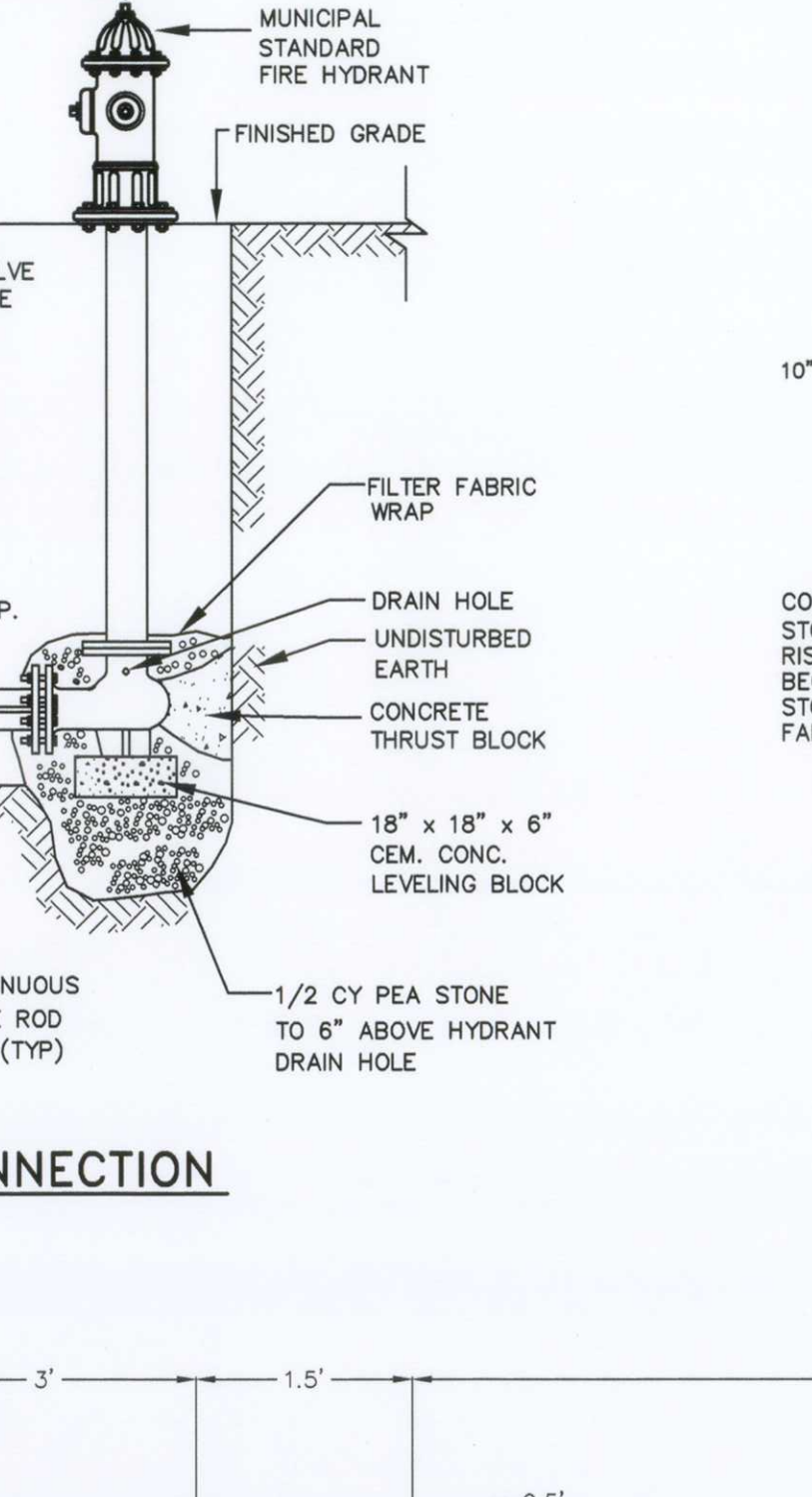
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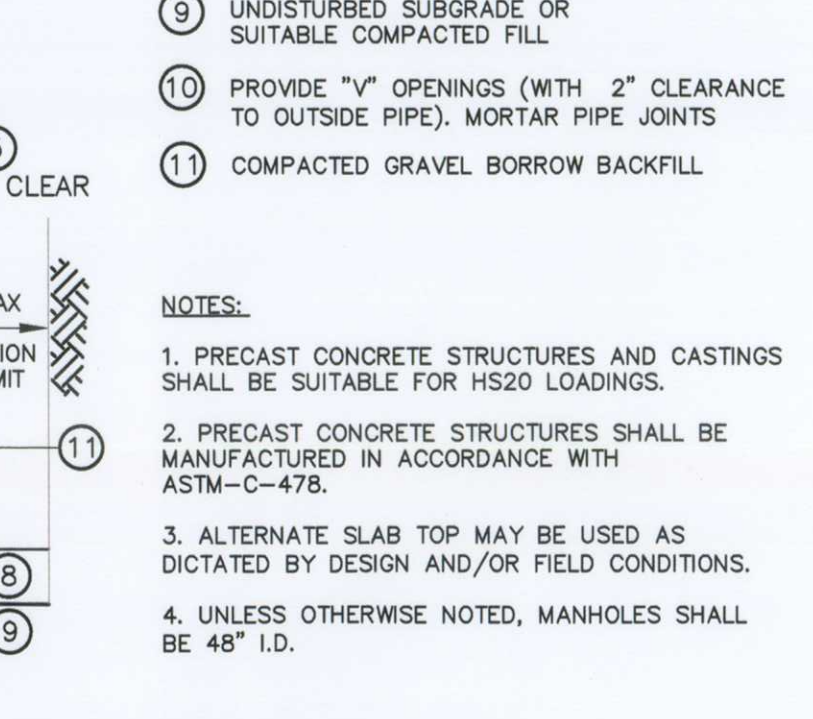
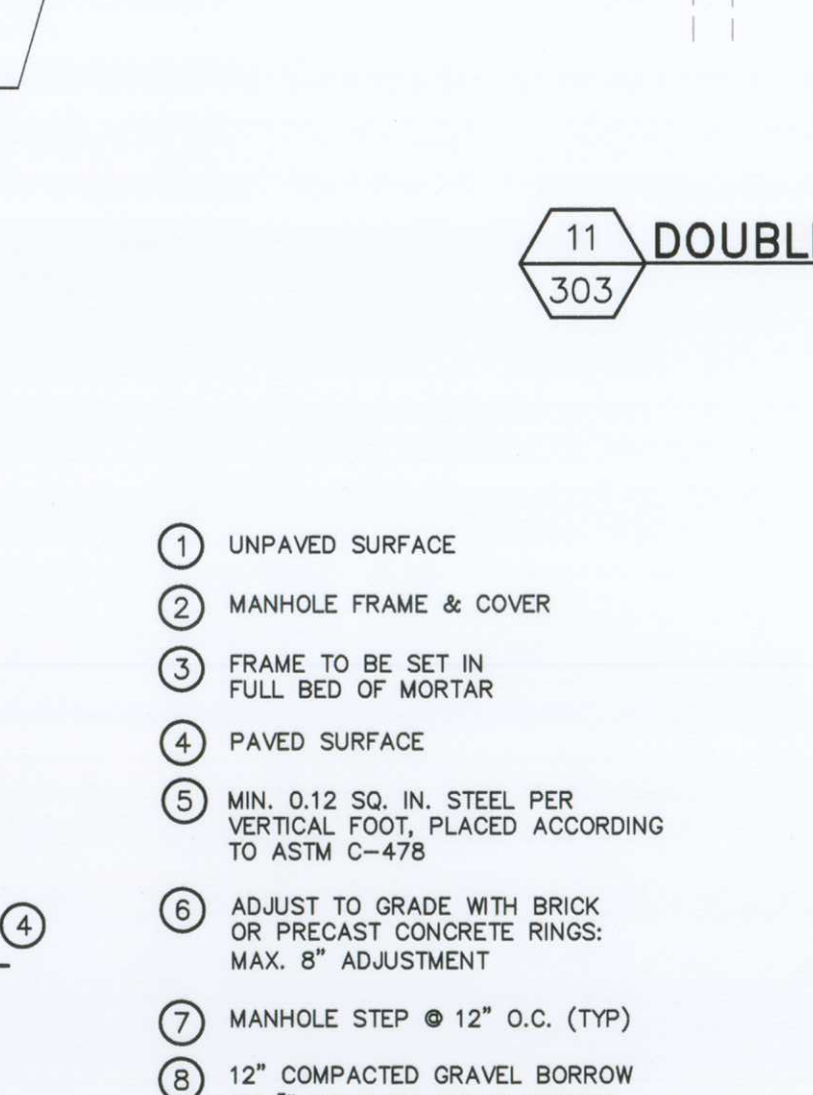
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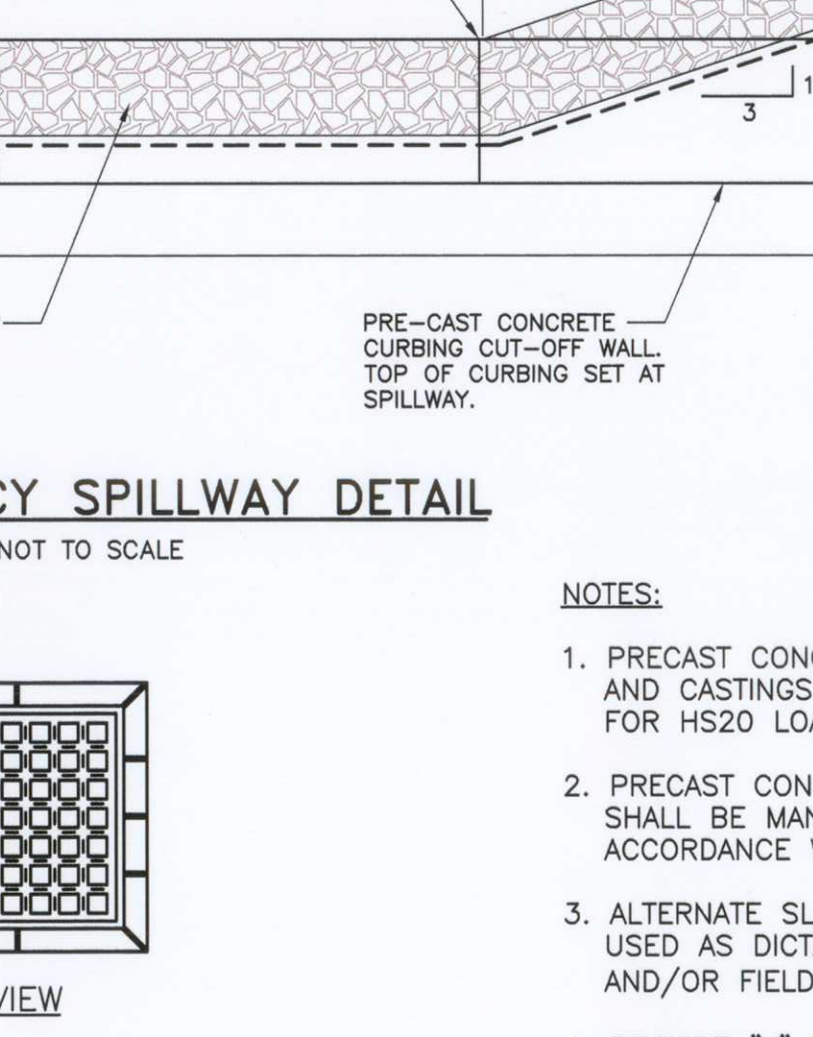
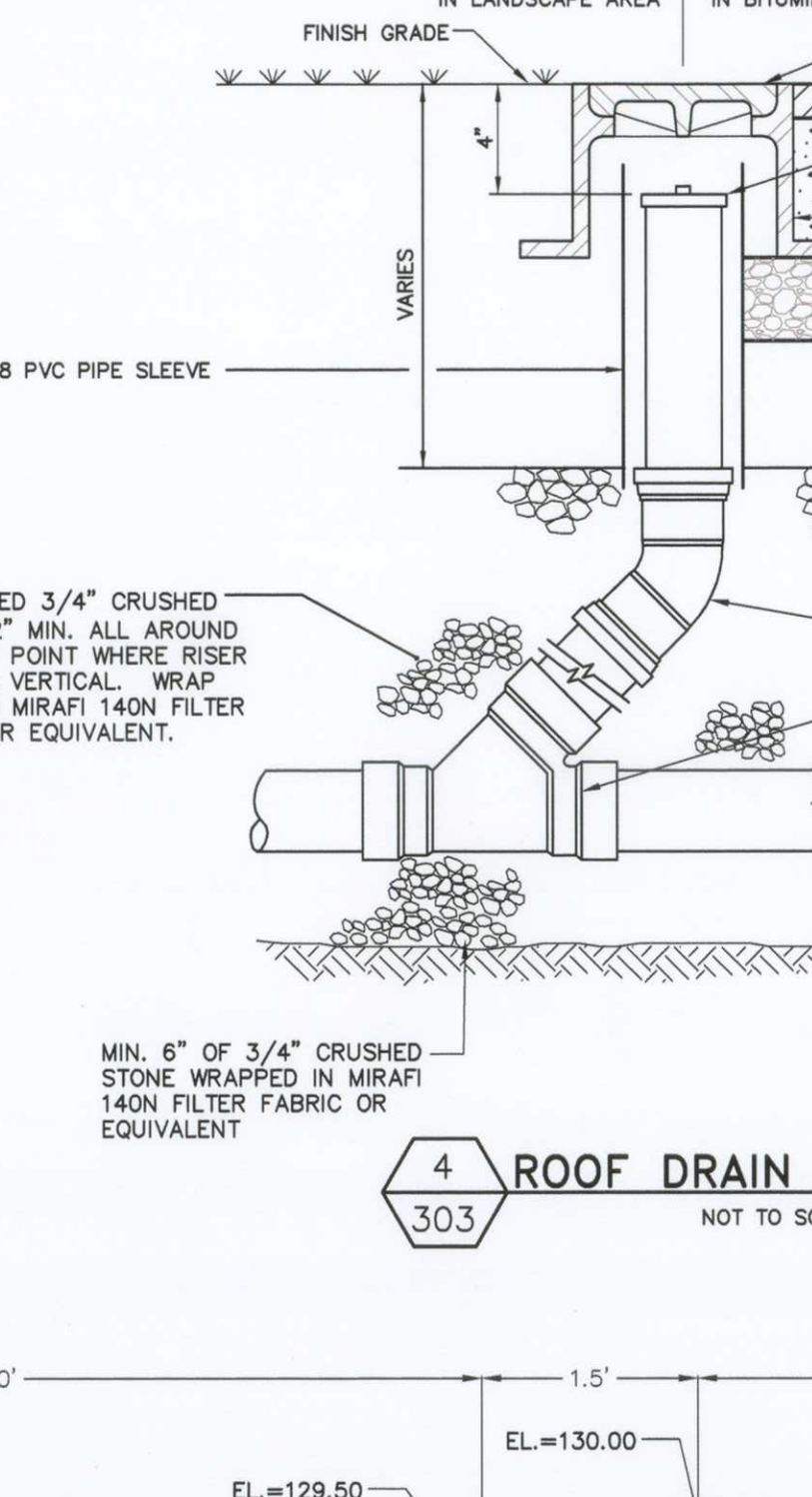
16 TYPICAL TRENCH DETAIL
NOT TO SCALE



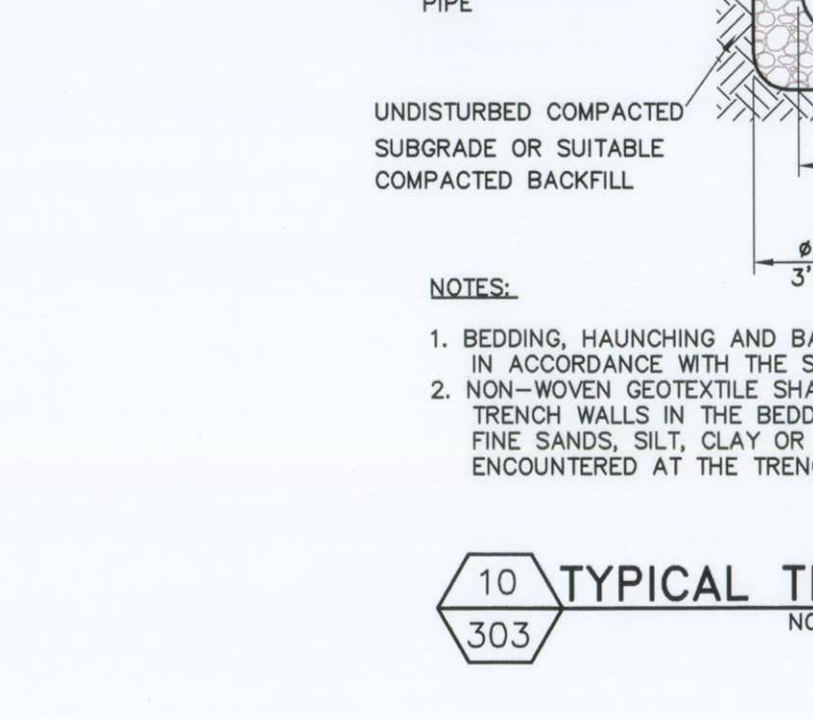
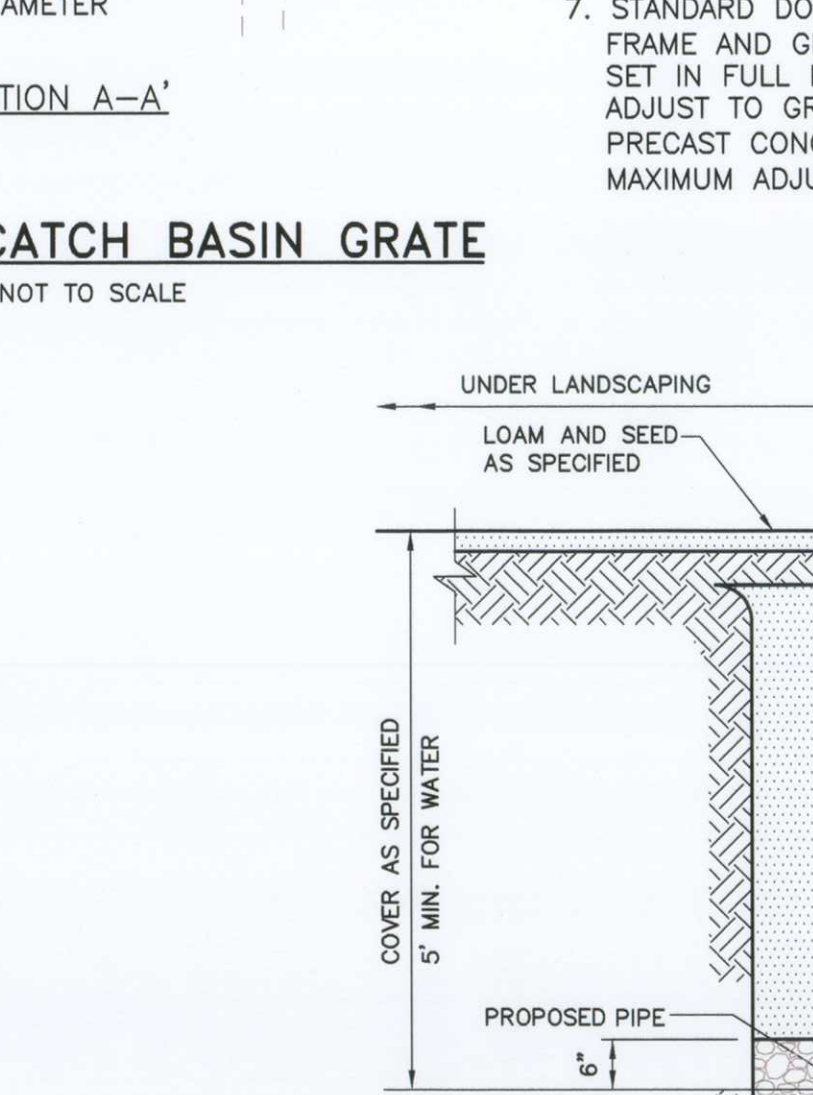
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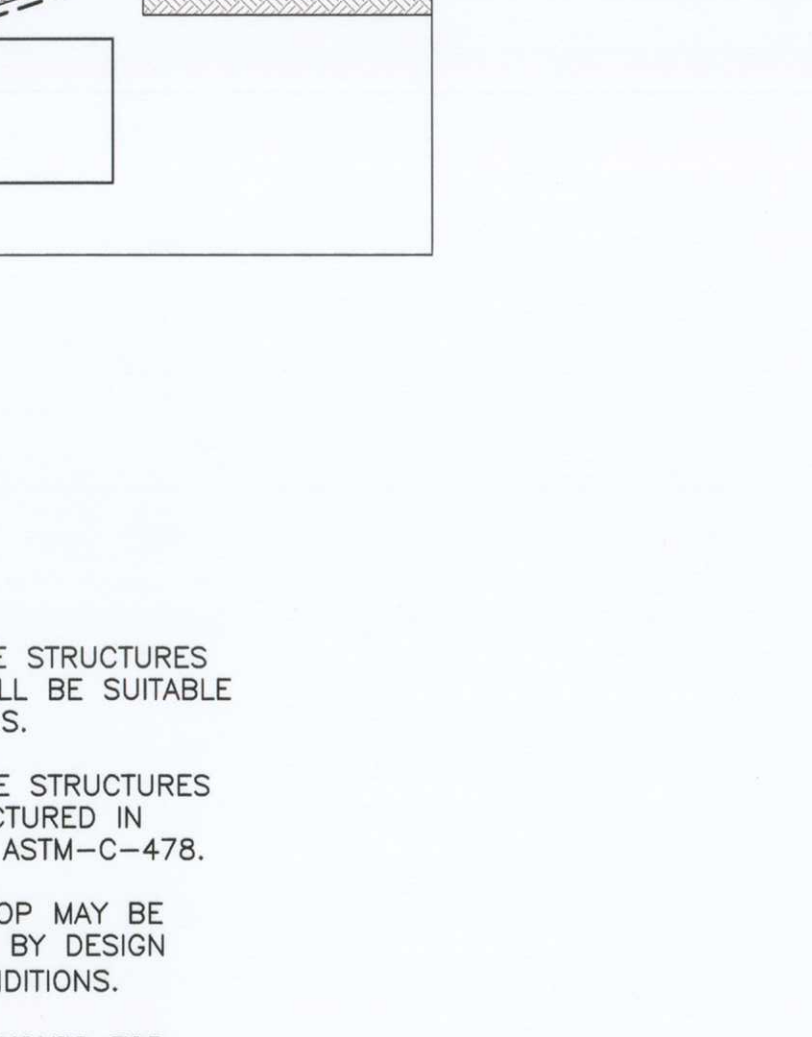
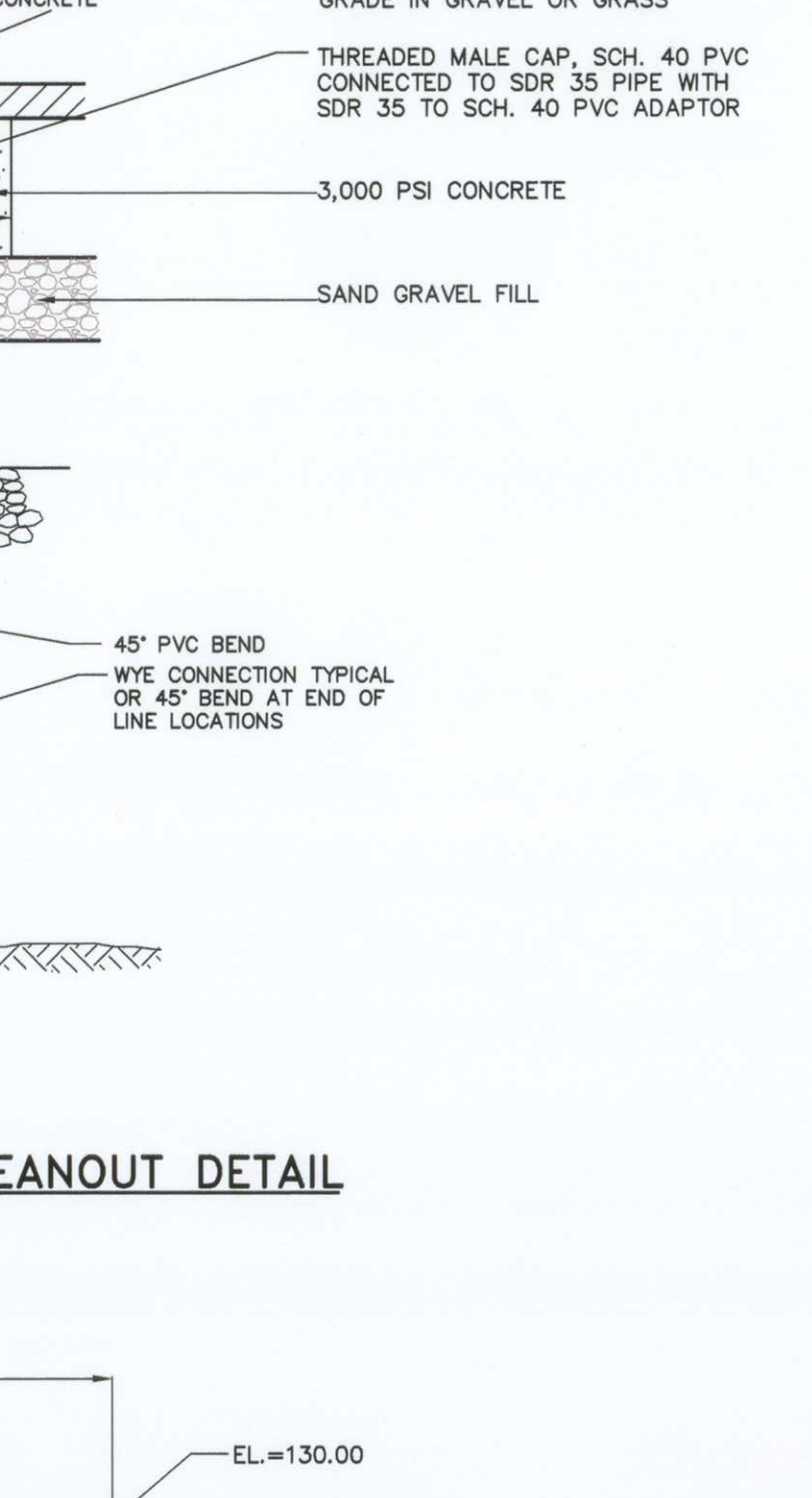
18 TYPICAL TRENCH DETAIL
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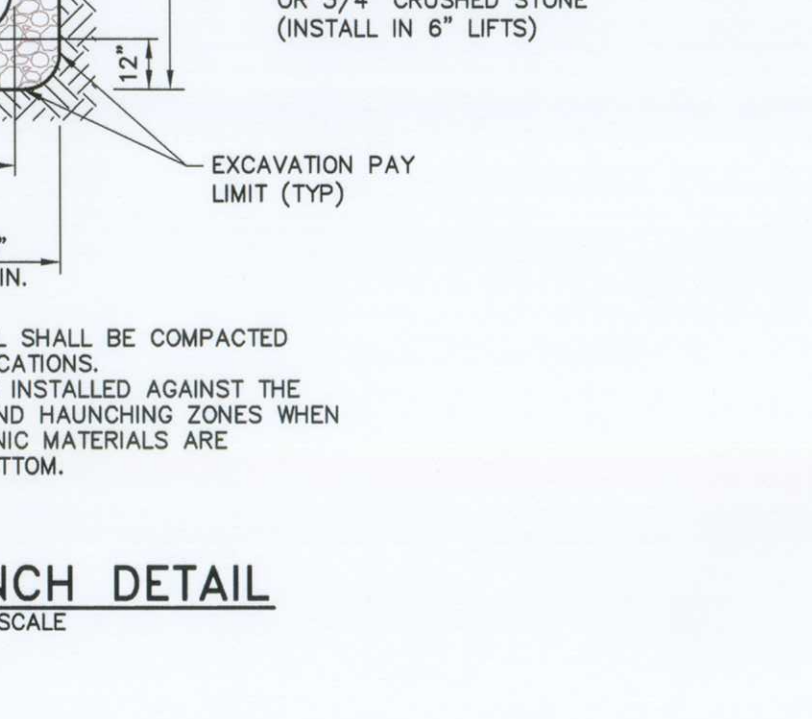
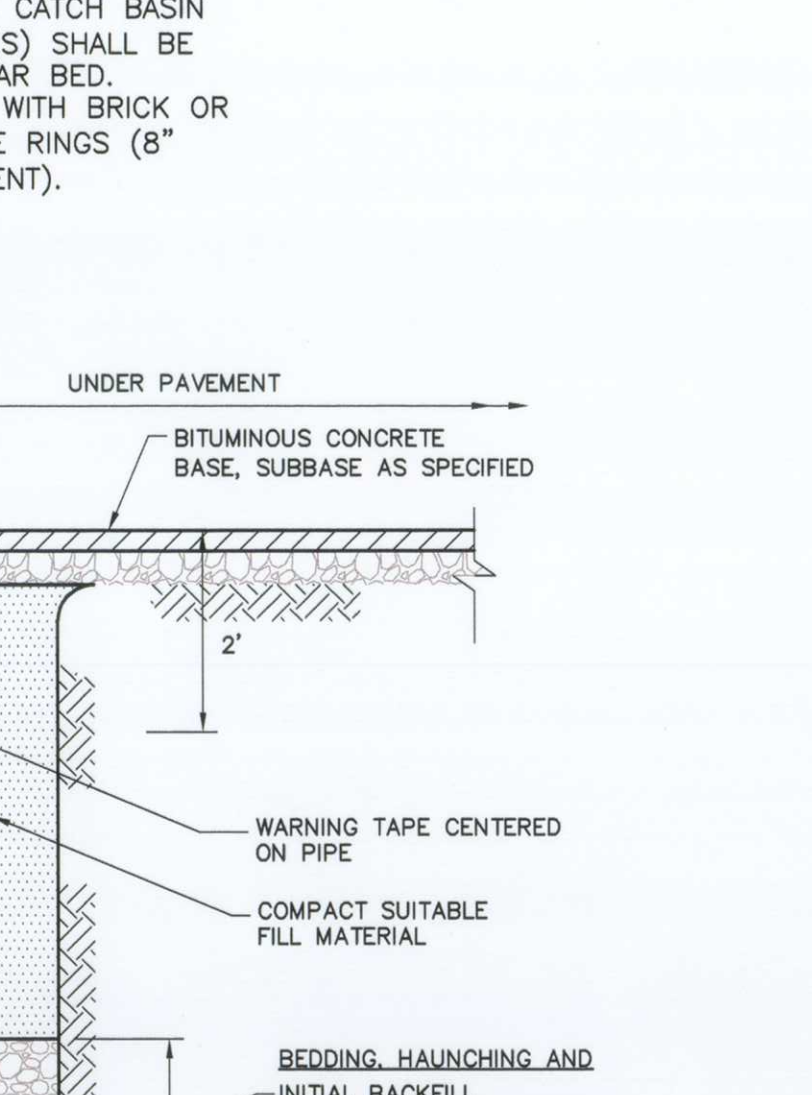
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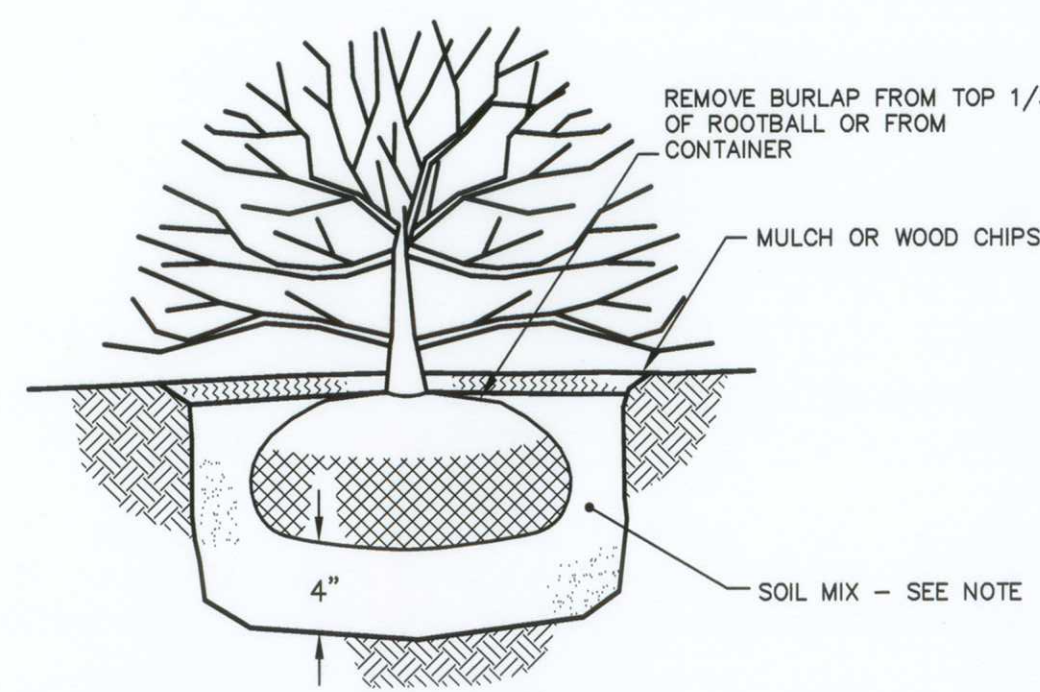
20 TYPICAL TRENCH DETAIL
NOT TO SCALE



21 TYPICAL TRENCH DETAIL
NOT TO SCALE

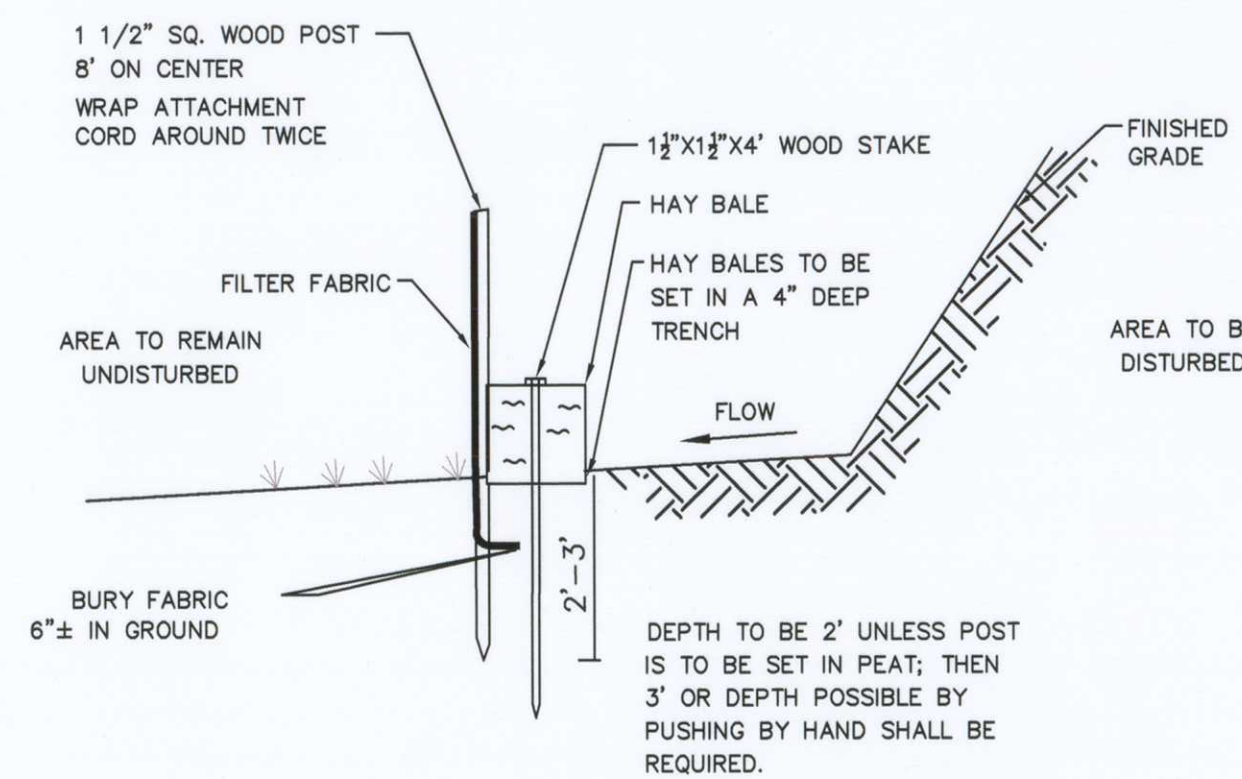
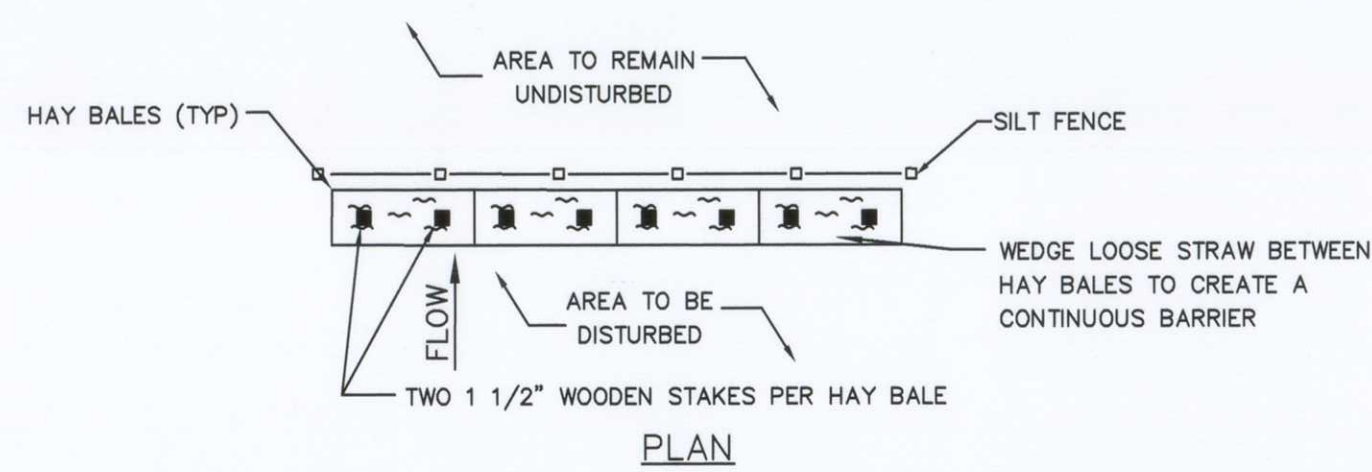


22 TYPICAL TRENCH DETAIL
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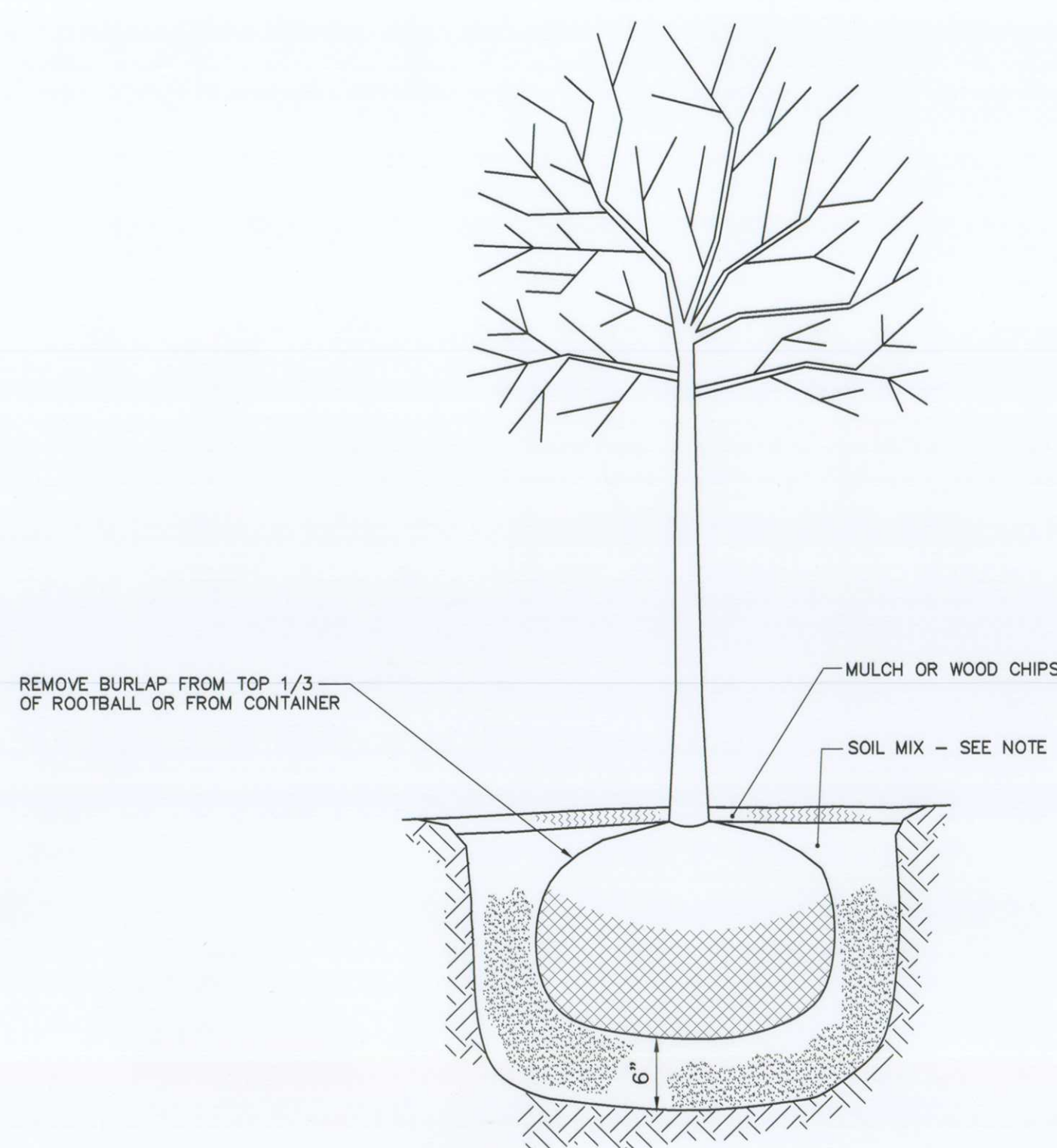
NOTE:
FOR DECIDUOUS SHRUBS, USE A MIXTURE OF
4 PARTS TOPSOIL TO 1 PART ROTTED MANURE.
FOR EVERGREEN SHRUBS, USE A MIXTURE OF
4 PARTS TOPSOIL TO 1 PART PEAT HUMUS.

1 SHRUB DETAIL
304 NOT TO SCALE



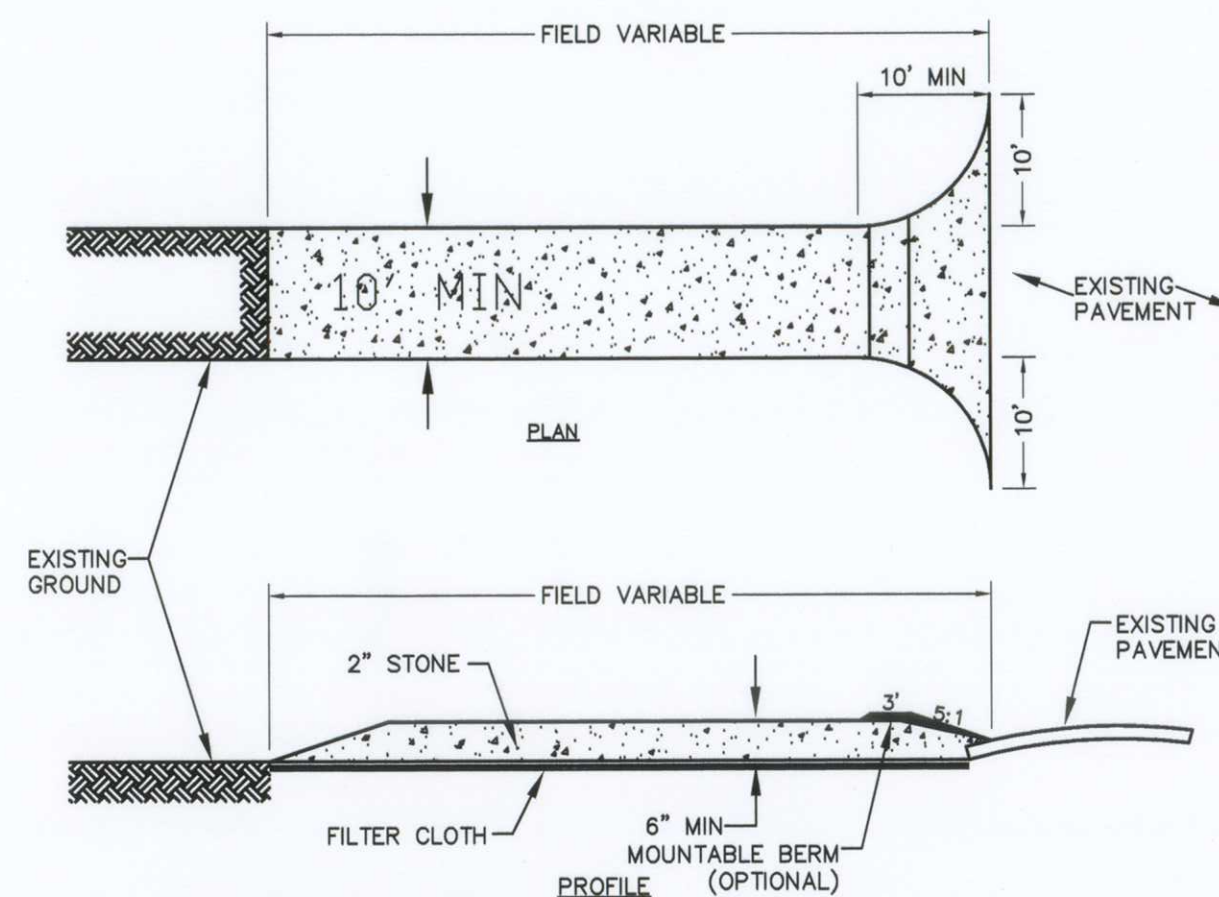
SECTION

2 HAYBALE AND SILT FENCE DETAIL
304 NOT TO SCALE



NOTE:
FOR DECIDUOUS TREES, USE A MIXTURE OF
4 PARTS TOPSOIL TO 1 PART ROTTED MANURE.
FOR EVERGREEN TREES, USE A MIXTURE OF
4 PARTS TOPSOIL TO 1 PART PEAT HUMUS.

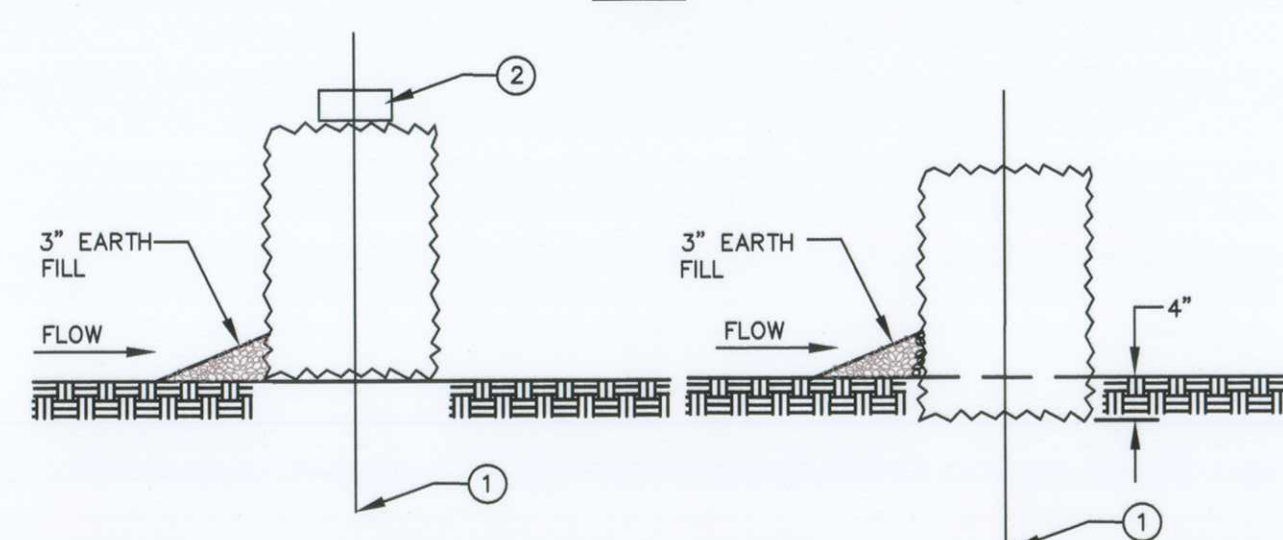
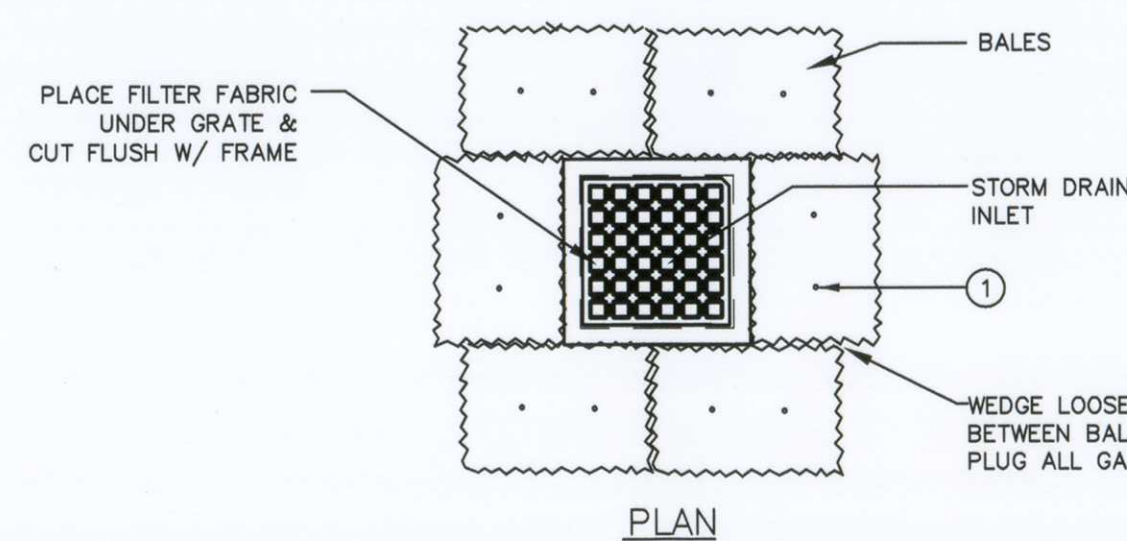
3 TREE DETAIL
304 NOT TO SCALE



CONSTRUCTION SPECIFICATIONS:

1. USE 2" DIAMETER STONE OR RECLAIMED/RECYCLED CONCRETE EQUIVALENT.
2. RECOMMENDED LENGTH GREATER THAN 50 FEET WHERE PRACTICAL.
3. THICKNESS NOT LESS THAN 6 INCHES.
4. 10 FOOT MINIMUM WIDTH, BUT NOT LESS THAN FULL WIDTH AT POINTS WHERE INGRESS AND EGRESS OCCUR.
5. FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WILL BE PERMITTED.
7. ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED BY THE CONTRACTOR.
9. REMOVE STABILIZED CONSTRUCTION ENTRANCE PRIOR TO PLACEMENT OF BITUMINOUS CONCRETE PAVEMENT.

4 STABILIZED CONSTRUCTION ENTRANCE
304 NOT TO SCALE



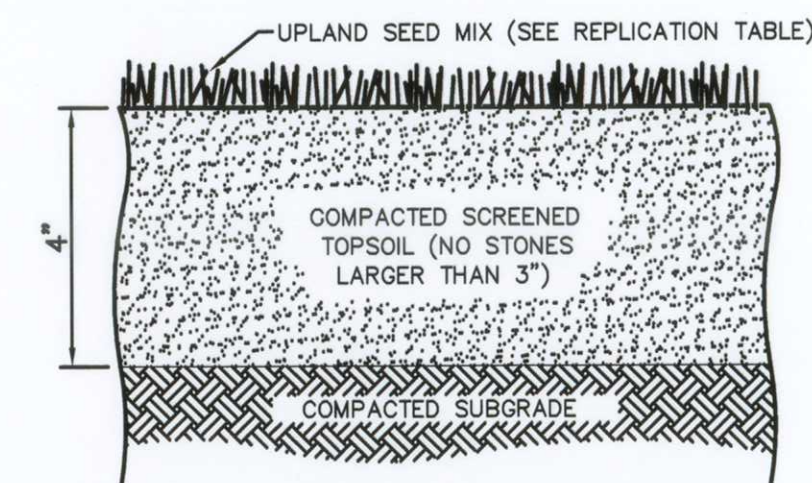
SECTION - OPTION 1 (PAVED) SECTION - OPTION 2 (UNPAVED)

NOTES:

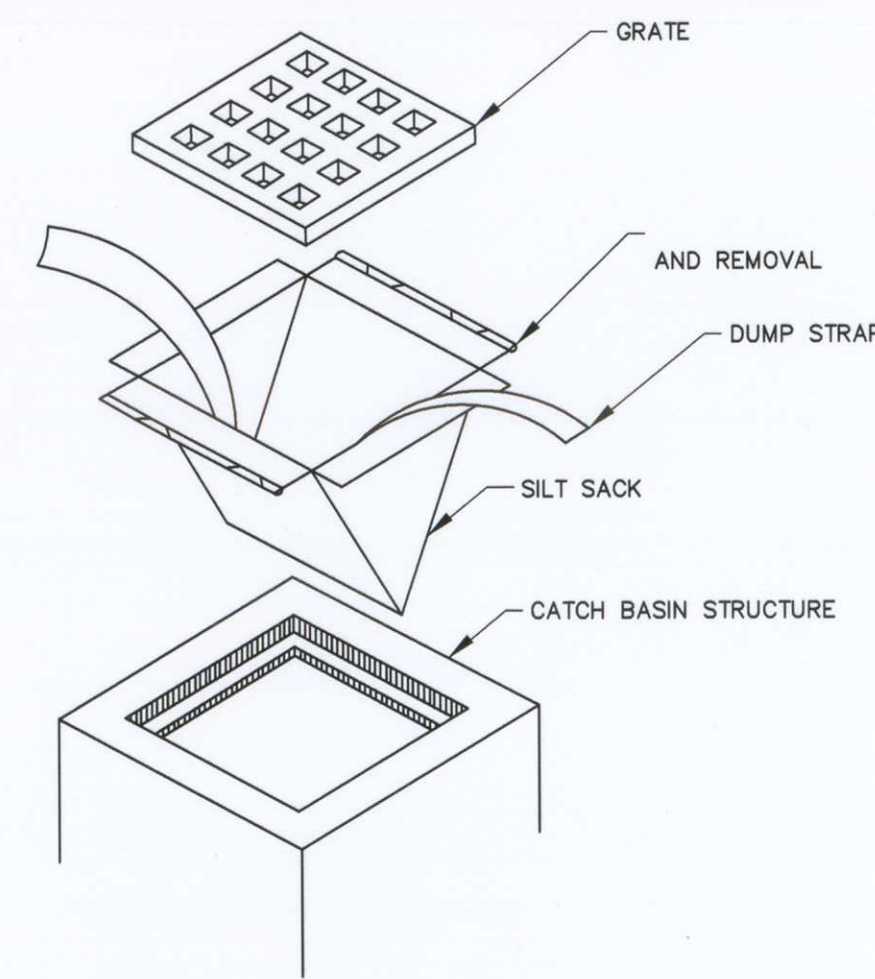
1. TWO 1 1/2" X 1 1/2" WOOD STAKES OR REINFORCING BARS IN EACH BALE AND EMBEDDED IN THE GROUND 10" MINIMUM.
2. PLACE DEAD WEIGHT AS NECESSARY TO HOLD HAYBALE IN PLACE.

5 HAYBALE EROSION CONTROL AT DRAIN INLETS
304 NOT TO SCALE

NOTES:
1. TOP OF LOAM (VEGETATIVE SOIL) IS FINISHED GRADE.
2. TOPSOIL SHALL BE FERTILE, PRIABLE SOIL, TYPICAL OF PRODUCT SOILS IN THE SURROUNDING AREA AND SHALL CONTAIN BETWEEN 5% AND 12% ORGANIC MATTER. SHALL HAVE A MAXIMUM STONE OR ROOT SIZE OF 3" AND 85% SHALL PASS THE 1" SIEVE.
3. UPLAND SEEDING IS WITH NEW ENGLAND CONSERVATION/WILDLIFE MIX AS DESCRIBED ON SHEET C04



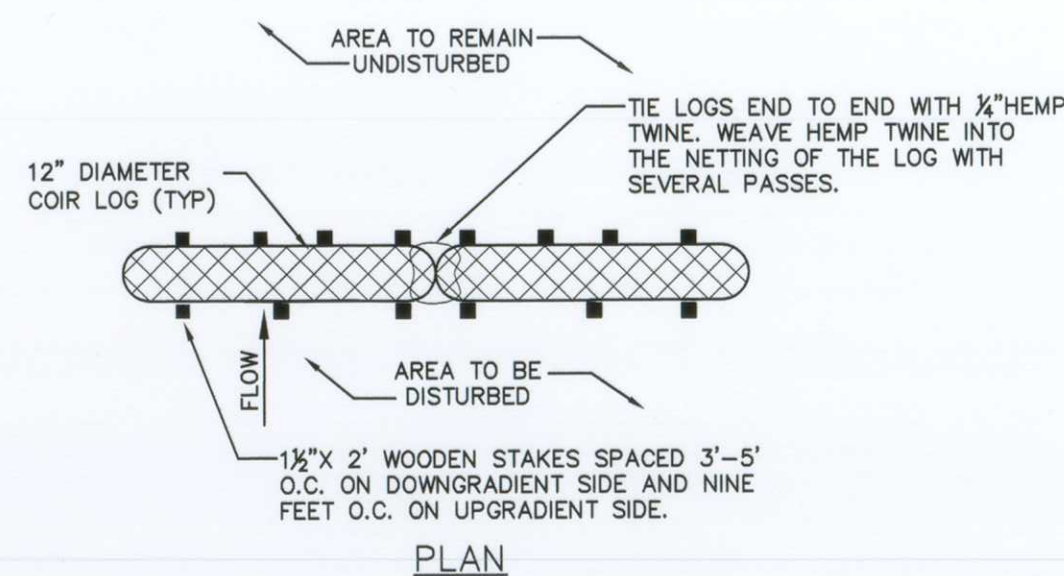
6 UPLAND BACKFILL DETAIL
304 NOT TO SCALE



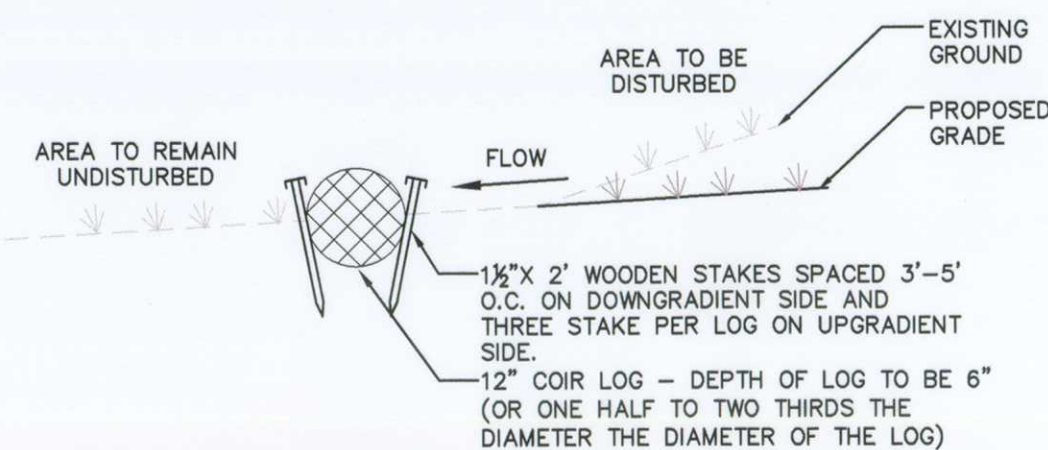
NOTE:

1. INSTALL SILTSACK PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. EMPTY OR REMOVE SEDIMENT FROM SILTSACK WHEN RESTRAINT CORD IS NO LONGER VISIBLE. CLEAN, RINSE, AND REPLACE AS NEEDED.
2. SILT SACKS TO BE INSTALLED DURING CONSTRUCTION OPERATIONS WHEN THE POTENTIAL FOR SEDIMENT TO ENTER EXISTING & PROPOSED BASINS EXISTS.

7 SILTSACK INLET DETAIL
304 NOT TO SCALE



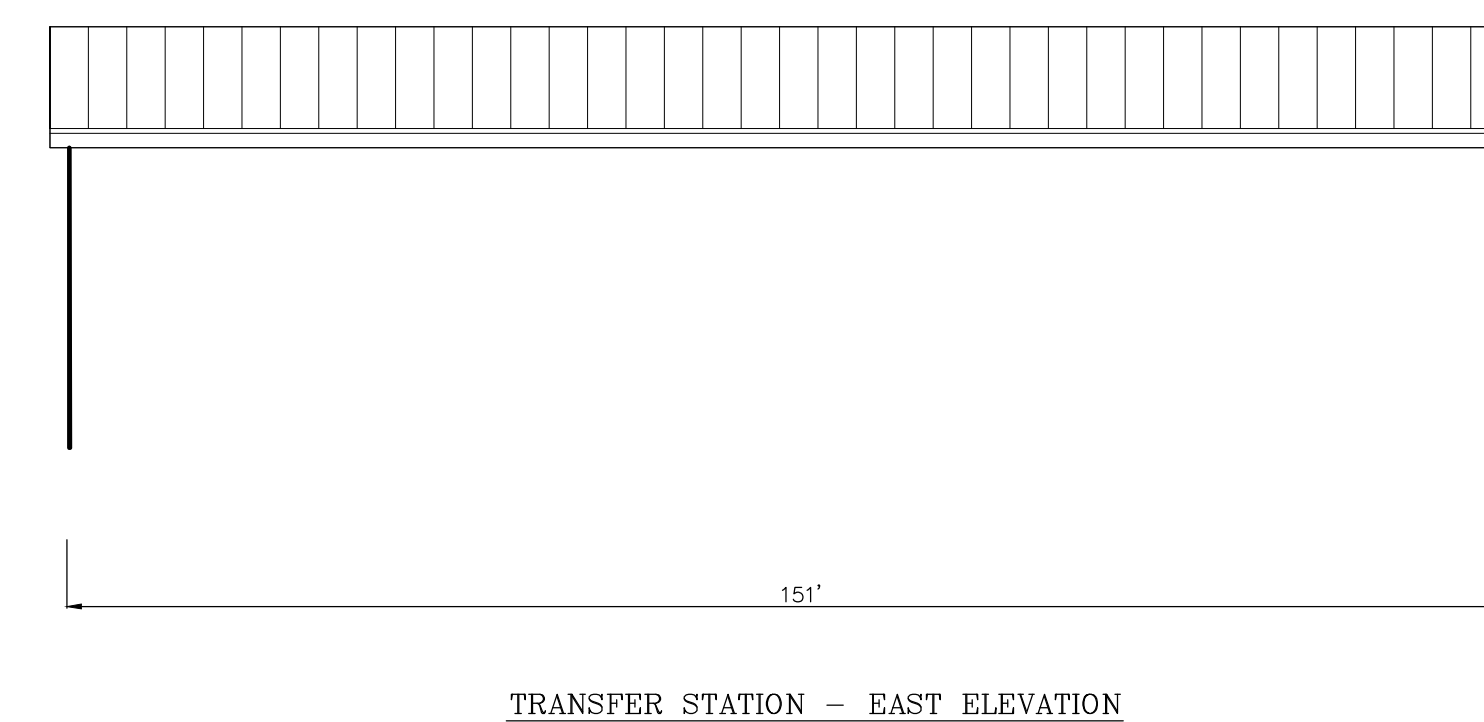
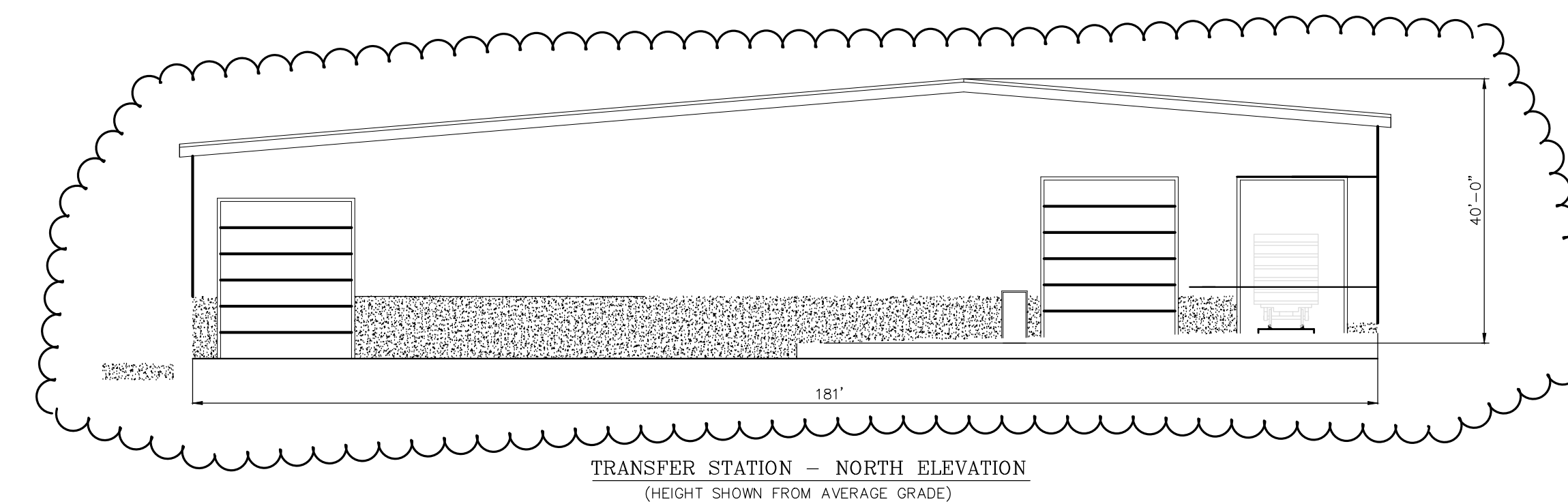
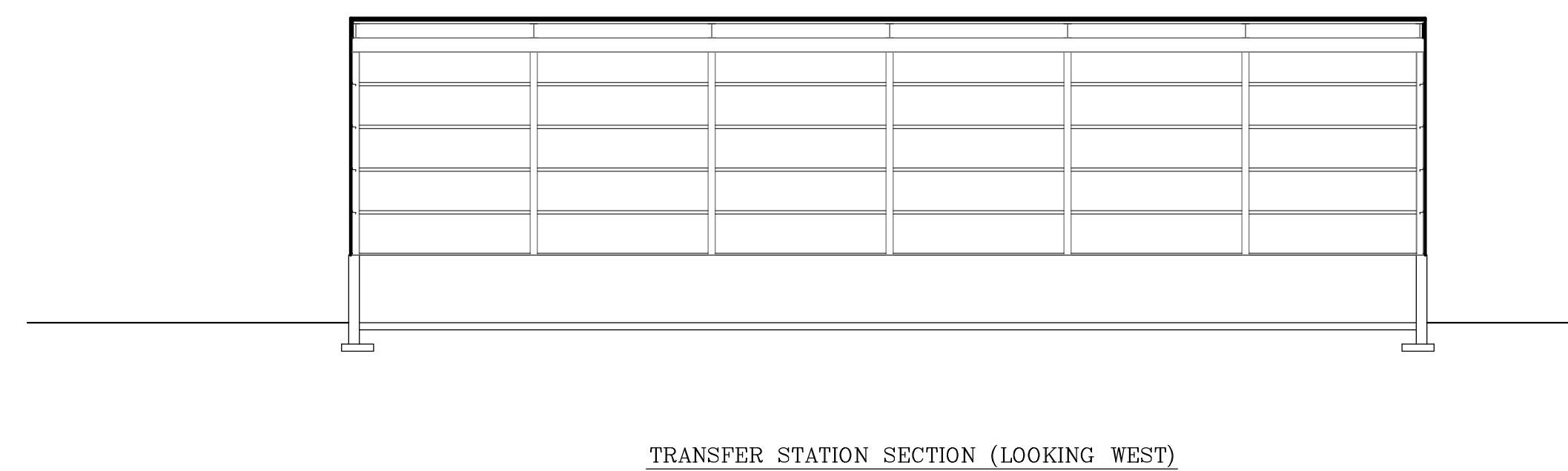
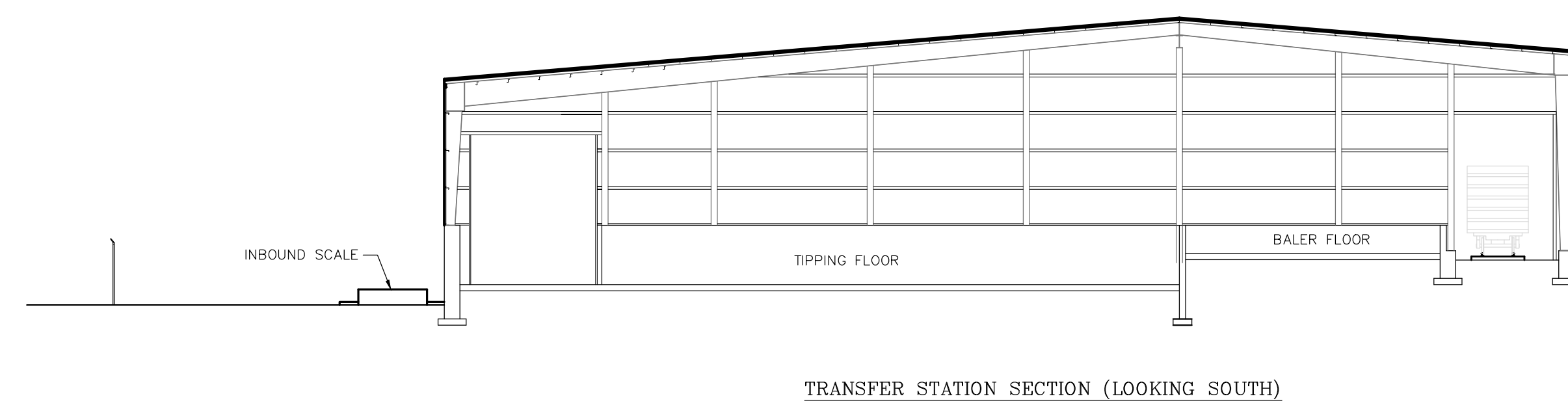
PLAN



SECTION

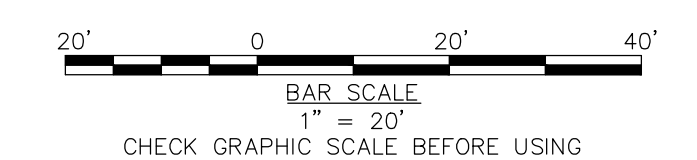
8 COIR LOG EROSION CONTROL DETAIL
304 NOT TO SCALE

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NOTE:

1) BUILDING ELEVATIONS AND SECTIONS DIGITAL INFORMATION PROVIDED BY ET ENVIRONMENTAL



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[illegible]

BUILDING ELEVATIONS AND SECTIONS

TLA-HOLBROOK, LLC
SOLID WASTE TRANSFER STATION

TLA-HOLBROOK, LLC
SOLID WASTE TRANSFER STATION

MAP 19 LOT 3
3 PHILLIPS ROAD
HOLBROOK, MASSACHUSETTS

MAP 19 LOT 3
3 PHILIPPS ROAD
LOBBROOK, MASSACHUSETTS

3 PHILIPPS ROAD
HOLBROOK, MASSACHUSETTS

JOB NO.: 219630
DATE: AUGUST 10, 2009
SCALE: 1"=40'
SHEET: OF

DATE: AUGUST 10, 2009

SCALE: 1"=40'

SHEET: OF

SHEET: _____ OF _____

A-300



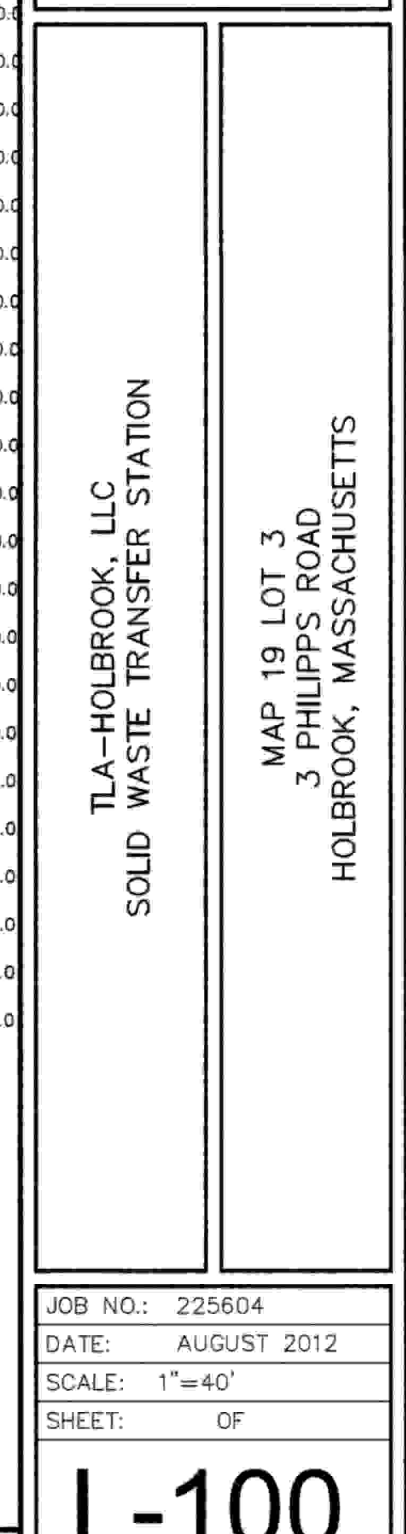
95 Cedar Street | Suite 100
Providence, Rhode Island 02903
800.9857897 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

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COMMITMENT & INTEGRITY DRIVE RESULTS



Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Parking lot	Illuminance	Fc	2.20	11.0	0.2	11.00	55.00
Roadway	Illuminance	Fc	1.29	7.6	0.2	6.45	38.00
Other area	Illuminance	Fc	0.63	6.9	0.0	N.A.	N.A.
Spill	Illuminance	Fc	0.03	2.9	0.0	N.A.	N.A.

FOR PERMITTING PURPOSES ONLY

APPENDIX D: HEALTH AND SAFETY PLAN



SITE-SPECIFIC HEALTH & SAFETY PLAN

**Former Holbrook Chemical
Corp. Site**

**3 Philipps Road
Holbrook, Massachusetts**

MassDEP RTN: 4-3024519

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HEALTH AND SAFETY PLAN SUMMARY

PROJECT EMERGENCY CONTACTS		
Woodard & Curran Field Office Telephone	<i>TBD</i>	
Woodard & Curran Site Health and Safety Officer:	Dan Clinton	Cell: 781-929-6976
Woodard & Curran Project Manager:	Craig Blake	Cell: 781-929-1474
Woodard & Curran Health and Safety Manager:	Jeremy Wherren	Cell: 207-228-5831
Contractor's Site Health and Safety Officer:	<i>TBD</i>	
Contractor's Project Manager:	<i>TBD</i>	
Other Contractor's Personnel:	<i>TBD</i>	
Client's Project Manager:	Heather Sites	Office: 781-737-1737
LOCAL EMERGENCY CONTACTS		
General Emergency: <u> 911</u> Fire Department: <u> 911</u> Police Department: <u> 911</u> Ambulance: <u> 911</u> Poison Control Center: <u> 1-800-222-1222</u> State Police: <u> 911</u> Brockton Hospital: <u> 508-941-7000</u> State Emergency Management Agency: <u>1-617-727-3200 (MEMA)</u> DigSafe: <u>Dial 811 or (1-888-DIGSAFE)</u>		

SITE SPECIFIC HAZARDS AND TRAINING

Site Specific Hazards are described in **Section 7**. Hazard control information is described in **Section 13**.

EMERGENCY PROCEDURES

Project emergency contacts are provided in this HASP summary for immediate reference above and **Section 1.0**.

The nearest hospital is **Brockton Hospital** – *see above for telephone #*. A map showing the route and hospital location is included in **Section 1.1**.

The designated signal for an onsite emergency is three sustained blasts from air horn or very loud whistle. In the event of an onsite emergency, the evacuation assembly point for the work Site is **The Falvey Office Building**. All personnel must be accounted for before leaving the assembly area unless it is too dangerous to remain in the assembly area.

Injuries, illnesses and close calls shall be immediately reported to the Site Safety Officer (SSO) and Project Manager.

GENERAL HEALTH AND SAFETY REQUIREMENTS

Pre-work Briefing: Prior to the start of work, the contractor will attend a Site specific safety orientation given by the W&C SSO. The SSO will be responsible for providing Site-specific and HASP awareness training to all personnel that work at the Site. This training shall be documented by an attendance sheet or Site logbook entry.

Routine Safety Briefing: During the course of this project the SSO shall conduct toolbox/tailgate safety sessions at least on a daily basis. Personnel must sign training talk attendance sheets or be listed in the Site log book to verify attendance.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Level D protection will be worn for initial entry onsite and for all activities except as noted in **Table 8-1**. Workers conducting oversight activities only, including atmospheric monitoring at the work area boundary, will use Level D PPE.

Level D protection will consist of:

- Standard work clothes.
- Natural fiber trousers and long sleeve shirts.
- Steel-toe safety boots.
- Hard hat.
- Safety glasses with side shields (i.e. handling wet sediment, wetting soils during mixing).
- Safety goggles if a splash hazard is present.
- Reflective safety/traffic vest if conducting material handling or other work activities onsite.

- Leather work gloves during material transfer activities such as soil excavation and removal operations, shoveling, and other similar manual labor tasks.
- Disposable PVC or nitrile gloves must be worn during direct handling of contaminated soil, water, and sampling activities; and fresh gloves will be donned before the collection of each new sample.
- Hearing protection devices, as needed.

Air Monitoring

A summary of the action levels and restrictions for excavation of soil is provided below. A more detailed listing of action levels and monitoring of work activities is presented in **Section 7**.

Instrument	Frequency	Action Level	PPE Level/Action
Photoionization Detector (PID) with 10.6 eV lamp	Continuously	PID Reading < 5 ppm* PID Reading \geq 5 ppm* PID Reading \geq 20 ppm*	Level D Ventilate and back off from excavation Stop Work and Evacuate Area

*Continuous reading on PID for at least 5 minutes.

WOODARD & CURRAN'S HEALTH AND SAFETY POLICIES AND PROCEDURES

Woodard & Curran's (W&C's) Health and Safety Policies and Procedures are incorporated into this Site Specific Health and Safety Plan (HASP) as applicable and appropriate. Woodard & Curran's Health and Safety Policies and Procedures include the following:

<u>Section</u>	<u>Health and Safety Policy or Procedure</u>
1	Use of the Health and Safety Manual
2	Hazard Recognition, Assessment and Control
3	Ergonomics Program
4	Vehicle Safety Program
5	Accident Reporting and Investigation Procedure
6	Hazard Communication Program
7	Emergency Preparedness
8	Medical Surveillance Program
9	Personal Protective Equipment (PPE) Program
10	Respiratory Protection Program (RPP)
11	Hearing Conservation Program (HCP)
12	Permit-Required Confined Space (PRCS) Program
13	Control of Hazardous Energy (Lockout/Tagout [LOTO])
14	Bloodborne Pathogens (BBPs) Exposure Control Plan (ECP)
15	First Aid (FA) and Cardiopulmonary Resuscitation (CPR)
16	Work Zone Traffic Control
17	PITS Aerial Devices
18	Trenching and Excavation
19	Electrical Safety

All Woodard & Curran Health and Safety Policies and Procedures are contained in the Woodard & Curran Corporate Health and Safety Policies and Procedures Manual which is available on the Woodard & Curran Intranet Page and in hard copy at each Woodard & Curran office.

1. EMERGENCY CONTACT INFORMATION

1.1 MEDICAL CARE

Emergency Medical Care:

Emergency medical care will be provided by the: Ambulance (911), Fire Dept. (911), Police Dept. (911).

Non-Emergency Medical Care:

First Aid Kits: A basic first aid kit is located in the Woodard & Curran project vehicle and/or field office on the job Site. A full service hospital with emergency room has also been identified below should the facility's medical services be required. The site safety officer will be trained in basic first aid and CPR.

1.2 SITE MAP WITH DIRECTIONS TO HOSPITAL

HOSPITAL: Signature Healthcare Brockton Hospital, 680 Centre Street, Brockton, MA.

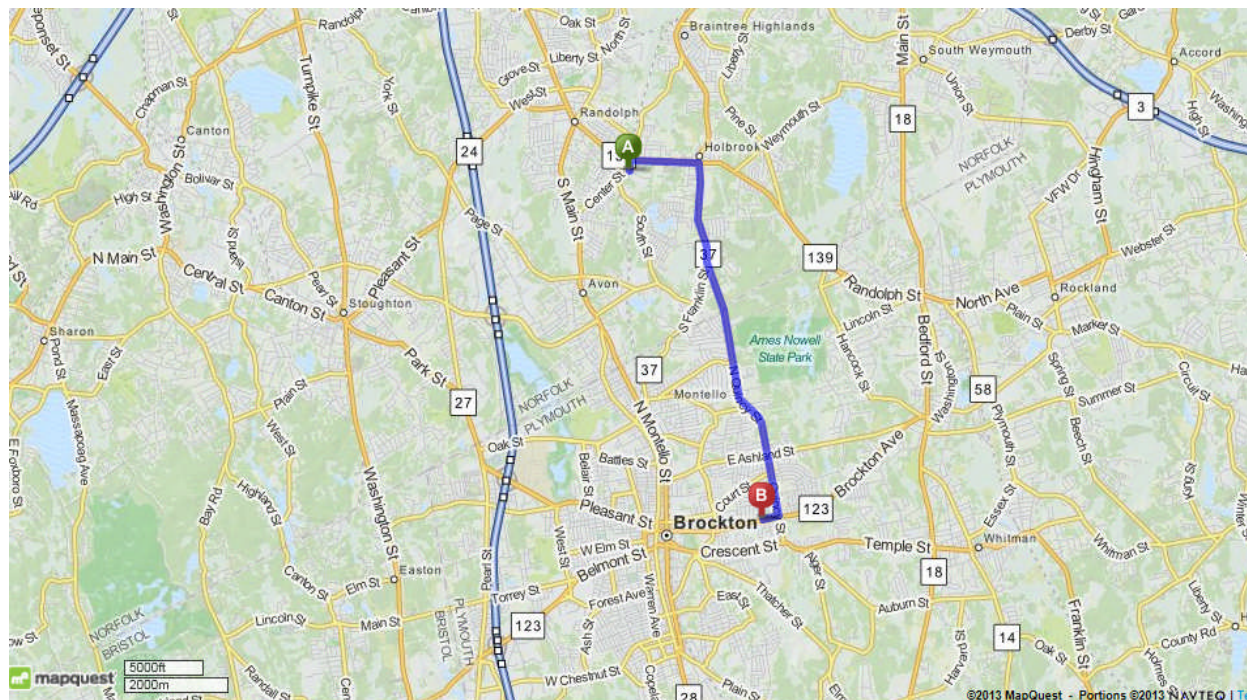
Directions to Hospital:

Start: 3 Philipps Road, Holbrook, MA

1. Head north on Philipps Road to Rt. 139 Union St. (0.2 mi)
2. Turn RIGHT onto Rt. 139 Union St. (1.0 mi)
3. Turn RIGHT at Rt. 37 S. Franklin St. (1.3 mi)
4. Turn Slight LEFT onto Quincy Street (3.6 mi)
5. Turn RIGHT at Rt. 123 Centre Street (0.2 mi)

End: Arrive at 680 Centre St., Brockton, MA

Total Distance: 6.27 miles (15 minutes)



2. SITE COMMUNICATION AND ORGANIZATIONAL STRUCTURE

2.1 SIGNAL FOR EMERGENCIES

Three sustained blasts from air horn or very loud whistle.

(Note: Emergency signal can NOT be the same as other signals on the Site, e.g., blasting warning).

Rally Point for Emergencies: Site/field office or in event of entire site evacuation Falvey Office Building.

All Site personnel must exit to the support zone and therefore upwind of operations upon hearing or seeing the evacuation signal. Further instructions will be given at that point.

2.2 ROUTINE SITE COMMUNICATION

Telephone number to reach onsite personnel: see list of phone numbers on Page WC-1

In case of an emergency the following onsite communication system may be used:

- Verbal communication;
- Radios/Walkie-Talkies, (verify onsite);
- Cellular telephones (verify onsite reception) may be used to call out from the Site; and/or
- Hand signals as follows:

<u>Signal</u>	<u>Definition</u>
Hands clutching the throat	Out of air/cannot breathe
Thumbs up	OK/I am all right/I understand
Thumbs down	No/Negative/I do not understand
Arms waving upright	Send backup support/need assistance
Grip buddy's wrist	Exit area immediately

2.3 ORGANIZATIONAL STRUCTURE

1. W&C's organizational structure and lines of communication for projects are as follows:

Craig Blake (Project Manager) ↔ Dan Clinton (Field/Task Manager) ↔ Brent Aigler (Field Oversight / SHSO)

2. Subcontractors (TBD) organizational structure and lines of communication to be determined following contractor selection.

For this scope of work, the selected remedial contractor will be contracted directly to TLA Holbrook, LLC. All communications between W&C and contractor will be communicated to TLA Holbrook, LLC.

3. SITE DESCRIPTION AND SCOPE

3.1 SITE BACKGROUND

The Property is located at 3 Philipps Road in Holbrook, Massachusetts. The Property is an 11-acre parcel of land. The Site is an approximately one acre area located in the central portion of the Property.

Prior to 1960, the Property was owned by the Portland Chemical Works. From 1960 to approximately 1998, the Property was owned by the Holbrook Chemical Corporation and operated as a chemical storage, processing, and sales company. The Holbrook Chemical Corporation abandoned the Property in the late 1990s and the Town took the land through tax title in June 2005. TLA Holbrook is leasing the property from the Town of Holbrook to construct and operate a municipal solid waste transfer station at the Property, with the Town retaining ownership. The Property is now partially occupied by Falvey Steel Castings, Inc.

Between December 2004 and June 2009, subsurface investigation activities were conducted across the Property as more fully described herein. Results from these studies indicate that concentrations of metals, VOCs, pesticides, and extractable petroleum hydrocarbons detected are present in soil within the Site above applicable MCP S-1 soil standards but potential significant health risk is limited to an identified “hot spot” of bis(2-Ethylhexyl)phthalate and C11-C22 aromatic hydrocarbon impacted shallow soil (0-4 Feet below ground surface) in the vicinity of boring S-10 as shown in **Figure 2** (see **Appendix A**).

3.2 OWNER / OPERATOR AND OPERATIONS HISTORY

Based on a review of available correspondence concerning the 1982 renewal of the Holbrook Chemical Corporation’s permit to store flammable fluids, the Holbrook Chemical Corporation was permitted to store 157,800 gallons of flammable liquids on-site. These liquids were either stored in drums (62,000-gallon total capacity) or in ten bulk aboveground storage tanks ranging in size from 15,000 gallons to 25,000 gallons (177,000–gallon total capacity).

The bulk storage tanks are located within an earthen bermed area (Silo Containment Area) located south of the former “Mixing Building”. The raw chemicals were transported to the Property using a railroad spur located along the western side of the Property. The chemicals were off-loaded into the bulk storage tanks via a piping manifold system. The chemical manufacturing would take place in the so called “Mixing Building”, where the chemicals from the bulk storage tanks would be piped to, and blended within, to produce the manufactured product. A “chemical dry well”, located between the Silo Containment Area and the “Mixing Building” as shown in **Figure 2** was identified in the historical correspondence.

3.3 OBJECTIVES OF PHASE IV FIELD ACTIVITIES

Based on the site-specific conditions and the human health and ecological risk evaluations, the following remedial goals have been developed for implementation of Phase IV remedial response actions:

- Attainment of a Permanent Solution and achievement of a condition of NSR of harm to human health, public welfare, and the environment across the Site through the elimination of exposure to soil impacted by elevated concentrations of bis(2-Ethylhexyl)phthalate and C11-C22 aromatic hydrocarbons.

4. PERSONNEL AND REVIEW REQUIREMENTS

4.1 HEALTH AND SAFETY

Health and safety is affected by the actions of all personnel on the project Site. Any health and safety concerns should be referred to the Site Health and Safety Officer or Project Manager (PM). The Site Health and Safety Officer will make any necessary modifications to the HASP should any health and safety site conditions change. Amendments to the HASP are to be recorded in **Appendix B**.

W&C and its employees shall follow health and safety precautions that meet federal, state and local regulations. If asked to conduct any activities which do not conform to said regulations, or which W&C determines in its sole discretion to be unsafe or unhealthy, W&C shall have the option to stop work immediately and inform the client of unacceptable health and safety conditions, and both parties shall enter into good-faith negotiations to remedy the unacceptable conditions. If no remedy can be agreed upon, W&C and the client have the option of terminating the agreement with respect to Scope of Services in accordance with the terms in the contract.

W&C will not implement or be responsible for health or safety procedures other than for its own employees. W&C shall not share any responsibility for the acts or omissions of other parties on the project site or have control or charge of, or be responsible for safety precautions and programs of the client or other contractors. Unless otherwise agreed in the Scope of Services, W&C's observation and testing of portions of the work of other parties on a project site shall not relieve such other parties from their responsibilities for performing their work in accordance with applicable plans, specifications and health and safety requirements.

4.2 CONTRACTORS AND SUBCONTRACTORS

W&C requires that all project onsite subcontractors work under their own site-specific health and safety plan(s). W&C is not responsible for the health and safety of site subcontractor(s) unless that subcontractor endangers the health or safety of a W&C employee (see stop work option in **Section 4.1** above).

Subcontractors shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with their work on the project. Subcontractors shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to all persons on the project site or who may be affected by their work whether they are directly working for the subcontractor or other onsite contractors.

With respect to their work on the project, the Subcontractor shall comply with all applicable laws and regulations relating to the health and safety of persons or property, or to the protection of persons or property from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Subcontractors shall designate a qualified and experienced safety representative at the project site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

4.3 MEDICAL SURVEILLANCE

Medical Surveillance is in adherence with both W&C's Medical Surveillance Program (Section 8 of W&C's Health and Safety Policies and Procedures) and OSHA's medical surveillance regulation 29 CFR 1910.1020 – *Access to Employee Exposure and Medical Records*. All employees working in contaminated or potentially contaminated areas have had medical surveillance examinations. Medical

surveillance clearance records are kept at the W&C corporate office in Portland and are available upon request and authorization of the employee. All personnel are required to have had a physical examination within the last 12 or 24 months depending on field assignment and exposure potential.

4.4 TRAINING REQUIREMENTS AND DOCUMENTATION

Training required of all employees working in the exclusion and contamination reduction zones:

- 40-hour OSHA training.
- Three days of supervised field experience after initial 40-hour training.
- Annual OSHA refresher training.

Other health and safety related training includes the following:

- HAZWOPER 8-hour Supervisor (for SHSOs, PMs, or anyone with supervisory or management responsibility related to health and safety).
- Safety awareness training for lead and it's hazards per 29 CFR 1926.62.
- Personal protective equipment (PPE).
- Hazard communication.
- Respiratory protection.
- First aid and cardiopulmonary resuscitation (CPR).
- Blood borne Pathogens (BBPs).
- Excavations and trenching.
- Fire extinguishers.
- Use of site monitoring equipment.

Documentation of training and medical surveillance clearance for hazardous waste site work will be maintained at the project site and is also kept in the W&C corporate health and safety files at the Portland office. Specialized exceptions can be made for certain types of subcontractors which work onsite which do not perform intrusive activity or will not be onsite during active remedial operations (i.e. surveyor, fence contractor, trucking company personnel). These exceptions will be communicated, reviewed, and implemented by the Site Safety Officer, W&C Project Manager, Subcontractor Project Manager, and TLA Holbrook, LLC as applicable.

4.5 REASSESSMENT OF HASP

When a significant change occurs, the hazards will be reassessed. Some indicators of the need for reassessment include:

- The commencement of a new work phase not previously identified in this HASP.
- Chemical compounds discovered other than those previously identified.
- A change in the scope of work that affects the degree of contact with the chemical.

-
- Review contacts and emergency information at least annually if scope of work involving this HASP extends beyond one year and none of the listed above triggers reassessment.

5. SITE SAFETY BRIEFING

5.1 PRE-WORK BRIEFING

The Site Health and Safety Officer will provide a safety briefing to W&C employees prior to beginning work on the property. The SHSO will be responsible for providing site-specific and HASP awareness training to all personnel that work at the Site. This training should include the following topics as applicable:

- Names of personnel responsible for site safety and health.
- Safety, health, and other hazards at the Site.
- PPE to be used at the Site.
- Necessary training as applicable to tasks.
- Work practices to be used at the Site to reduce risks from identified hazards.
- Emergency procedures (e.g. evacuation, incident reporting, spill response).
- Decontamination procedures.

5.2 ROUTINE DAILY BRIEFINGS

Daily safety meetings will be conducted by the Site Health and Safety Officer, or other designated individual, each morning prior to beginning work. Safety meetings by W&C will be coordinated with other contractors and sub-contractors onsite and information regarding site hazards will be shared by all.

The safety meetings are provided to encourage safe work practices as well as safe working conditions, and do not imply that W&C will direct the selected remedial contractor's health and safety practices or that of his subcontractors. These meetings will be documented in a site log book. However, any onsite health and safety related activity which requires modification to the HASP will be communicated to all personnel working at the Site.

A list of example Tail Gate Safety Meeting Topics and Tips is included in **Appendix C**. Personnel must sign training talk attendance sheet (Example form provided in **Appendix C**) or be listed in the site log book to verify attendance.

6. SITE CONTROL

6.1 SITE PLAN AND WORK ZONES

For Site Plan showing Site boundary, see **Appendix A**.

Site work zones will be established prior to the beginning of the project. Decontamination lines (if necessary) for heavy equipment, small equipment and personnel will be established based on the potential to spread contamination. Please see **Section 10** for further decontamination details.

Exclusion Zone: The exclusion zone (sometimes also referred to as the “hot zone” or “dirty zone”) at the Site will be designated by the Site Health and Safety Officer and will generally consist of an area within 15 feet of the active excavation areas (but may vary widely depending on wind, weather, topography, chemicals, contamination, etc.). The exclusion zone will be demarcated by high visibility construction fencing. **Please note:** Only authorized personnel who meet the training and medical surveillance requirements may enter this zone.

Contamination Reduction Zone (CRZ): The CRZ (sometimes also referred to as the “warm zone” or “decontamination” or “decon” zone) will be identified by the Site Health and Safety Officer. The CRZ will be determined daily and between the exclusion and support zones. The access or “contamination reduction corridor” or CRC (often also referred to as the “decon area”) for the exclusion zone will be marked with traffic cones or other means. The CRC will be located upwind of the exclusion zone. Employees must enter and leave the exclusion zone using this corridor. Workers will sign in and out of the work area if the work area does not allow workers to be readily observable from outside the exclusion zone. Log books will be kept at the support zone/CRZ boundary for signing in and out (see **Appendix D** for example Site Sign-In/Sign-Out Log Sheet.) **Please note:** **Section 9** of this HASP contains information about decontamination supplies and procedures.

Support Zone: The support zone (sometimes also referred to as the “cold zone” or “clean zone”) functions as the clean area and is the outermost zone beyond the Contamination Reduction Zone. This is where support and administrative employees remain. The support zone is also where the project vehicle, phone, meeting area, and command post are located. Normal work uniforms (street clothes) are appropriate clothing for this zone. The support zone will be located upwind of the high hazard areas (the exclusion zone) as appropriate.

6.2 USE OF BUDDY SYSTEM

The buddy-system ensures that no employee works alone at Level C or higher in the Exclusion Zone or in other high hazard conditions. Examples of “High hazard conditions” could include temperature extremes, higher chemical concentrations, dangerous wildlife, dangerous topography or walking conditions, working in, on or around water, severe weather, and in locations where getting lost is a possibility. When working in a “buddy-system required” area, employees are paired and must always be in close proximity of each other. If one employee has to leave the zone for any reason, both employees must leave.

6.3 GENERAL SITE SECURITY

General security for the Site is a necessity and varies from site to site. Some factors that affect site security include neighbors, proximity to abutters, zoning, topography, existing barriers, site operations, etc.

For this Site, the work area is completely fenced with chain link fence with a locking gate. The gate allowing egress to and from the Site will be locked during non-working hours. Only the selected remedial contractor, W&C, and the client will have keys for the gate.

7. HEALTH AND SAFETY HAZARD ANALYSIS

This section of the HASP identifies and evaluates the potential chemical hazards which may be encountered during the investigation/remediation activities at the Former Holbrook Chemical Corp. Site. The primary contaminants of concern at the Site are bis(2-Ethylhexyl)phthalate (BEHP) and C11-C22 aromatic hydrocarbons. Although other select heavy metals, volatile organic compounds, semi-volatile organic compounds and pesticides have been detected at the Site, these constituents were not identified as contributing risk (in accordance with the MCP), and therefore are not chemicals of concern.

7.1 CHEMICAL HAZARD ANALYSIS

In order to eliminate the potential for health risks associated with exposure the substances of concern present at the Site, action levels have been established and a monitoring plan has been developed. **Table 7-1** below provides a list of chemicals of concern for the project along with appropriate action levels. The appropriate monitoring and personal protection levels to be applied for the site chemical hazards are described in **Section 8**.

Table 7-1: Chemical Contaminants of Concern

Contaminant	Exposure Limits (TWA unless noted)	IDLH	Symptoms of Exposure	Ionization Potential	Contaminant Specific Recommended Action Level	Contaminant Specific Recommended Action
C11-C22 Aromatic Hydrocarbons ¹	500 ppm for an 8-hour workday, 40-hour workweek		Headaches, dizziness	≤10.6 eV	PID Reading < 5 ppm* PID Reading ≥ 5 ppm* PID Reading ≥ 20 ppm*	Level D Ventilate and back off from excavation Stop Work and Evacuate Area
Bis(2-Ethylhexyl) phthalate (BEHP)	TWA 5 mg/m ³ OSHA PEL 5 mg/m ³	5,000 mg/m ³	Harmful by ingestion, inhalation or skin absorption. Potential carcinogen. Exposure may cause liver damage. May cause reproductive effects.	N/A	Do not taste or swallow. Do not come into contact with exposed skin.	Immediately wash exposed surface. If ingested wash out mouth with water. Have conscious person drink several glasses of water to dilute. Induce vomiting.

Notes:

¹Referenced to Total Petroleum Hydrocarbons (TPH)

TWA = Time-Weighted Average; FID = Flame Ionization Detector; PID = Photoionization detector. STEL = Short-term exposure limit.

*PEL = Permissible Exposure Limit. Defined in 29 CFR 1910.120 as the exposure limits established in 29 CFR 1910.1000 Subpart Z. If not listed, values published in specified documents from sources in the following hierarchy: NIOSH Pocket Guide to Chemical Hazards, Recommended Exposure Limits (RELs); ACGIH ® Threshold Limit Values ® (TLVs ®); or other. Often expressed as Time-Weighted Averages (TWAs) or Ceiling Limits (C) or STELs.

**IDLH = Immediately Dangerous to Life and Health. Any atmospheric condition that poses an immediate threat to life.

--- or N/A = not applicable.

7.2 PHYSICAL HAZARD ANALYSIS

Precautions will be taken to abate physical hazards identified for this project as well as chemical hazards as described in **Section 7.1** above. The following physical hazards have been identified for this project and will be minimized through a task hazard assessment described herein. Additional hazard control information describing applicable precautions and controls to be taken are described in **Section 13**.

Table 7-2: Physical Hazard Analysis for Work Tasks

Task	Hazard	Standard Operating Procedure
Site Visit	Slips, trips, falls	Safe lifting techniques, PPE as required per Electric Boat Contractor Safety Plan to include in designated areas: <ul style="list-style-type: none"> • hard hats • safety glasses • steel toed shoes
General Construction	Power tool and hand tool use, Exposure to site contaminants in soils, noise	Appropriate PPE (as per Table 8-1), frequent changing of gloves, hearing protection as required.
Heavy Equipment Operations	Motion of machinery (struck by hazards), noise, exposure to site contaminants in soils, underground utilities.	Appropriate PPE (as per Table 8-1) frequent changing of gloves, hearing protection as required, utility mark out.
Soil Sampling	Motion of machinery, hand tool use, exposure to site contaminants in soils, noise.	Level D PPE, frequent changing of gloves.

7.3 TASK HAZARD ASSESSMENT

In order to eliminate hazards identified above in **Sections 7-1** and **7-2** with the work to be completed at the Site, W&C has completed a Job Safety Analysis (JSA) for each of the tasks to be completed on this project. Copies of the full JSAs are included in **Appendix E**. The JSAs identify potential hazards associated with completing the identified project work tasks.

The SSO will be responsible for creating new JSAs or amending existing JSAs if tasks or exposures change. Any changes to project JSAs will be reviewed with all work site employees and the project manager.

8. PERSONAL PROTECTIVE EQUIPMENT

While PPE can be vitally important and useful, it should ***not*** be the first form of hazard control implemented. Engineering and administrative controls should be implemented first. OSHA has several regulations on PPE (29 CFR 1910.132-139) and W&C has a formal PPE Program detailed in Section 9 of its Corporate Health and Safety Policies and Procedures Manual. Both OSHA's regulations as well as W&C's PPE policies apply and will be followed using this HASP. This section also doubles as W&C's OSHA-required written certification. See the approval page for required date and name of certifier.

The levels of PPE to be used for this Site are summarized in **Table 8-1**. The information in this table is based on the hazard analysis completed for the Site and summarized in **Section 7**.

Table 8-1: PPE Levels and Corresponding Work Activities

PPE Level	
PPE Required	Applicable Work Activities
Level D Work Uniform:	
<ul style="list-style-type: none"> Sleeved shirts and long pants Safety glasses with side shields Composite or steel toe work boots Reflective safety/traffic vest 	All site work activities
Level D Modifications:	
<ul style="list-style-type: none"> Hard Hat 	Working around drilling and excavation equipment
<ul style="list-style-type: none"> Leather work gloves 	During material transfer activities such as soil removal operations, shoveling, and other similar manual labor tasks.
<ul style="list-style-type: none"> Disposable nitrile gloves and chemical resistant clothing such as Tyvek or Saranek or equivalent. 	Handling of contaminated soil, water, and sampling activities, where liquids are present.
<ul style="list-style-type: none"> Hearing protection devices 	Conducting drilling, and any other work near vicinity of excavation or other heavy equipment. Mixing and Stabilization operations, soil transport and handling. MSDS should be made available for the mixing reagent and any H&S adjustment will need to be made if necessary

8.1 IDLH CONDITIONS

Base site characterization data and past work experience, IDLH conditions are not expected during site activities. If IDLH conditions arise at any point based on monitoring, work will cease, further engineering and administrative controls will be implemented, and personal protective equipment will be upgraded as appropriate pending project manager review of proceeding work and related hazards.

9. DECONTAMINATION PLAN

A decontamination line for personnel and equipment may need to be set up if the work to be completed at the Site has the potential for contaminating equipment or clothing. If this occurs, please follow the procedures outlined below. Typically this will involve plastic sheeting, disposal bags, and washing supplies.

9.1 DISPOSABLE PPE

Employees wearing disposable PPE (outer cover boots, gloves, etc.) and disposable clothing will leave the PPE at the hot line before leaving the contamination reduction zone. Disposable PPE should be disposed of in accordance with applicable state or federal regulations.

9.2 DECONTAMINATION OF NONDISPOSABLE PPE

To decontaminate, wash all visibly or suspect contaminated areas of the PPE with a detergent (TSP, Alconox, or Liquinox) and water solution. Used or contaminated decontamination fluids shall be disposed of in accordance with applicable state or federal regulations.

9.3 DECONTAMINATION OF EQUIPMENT

Excavating or Heavy Equipment:

Heavy equipment that has entered either the exclusion zone or CRZ will be appropriately decontaminated (e.g., steam-cleaned and washed with a water spray) prior to leaving the contamination reduction zone (most likely by the contractor operating the equipment). Tracks and wheels of all equipment will be washed (e.g., with a steam cleaner) prior to entering or crossing a public road. All waste water must be collected and disposed of according to local, state, and EPA regulations for hazardous waste disposal.

10. EMERGENCY PROCEDURES

In the event of an exposure, accident, injury, or fire, the following general accident and emergency response procedures are to be followed by all employees working under this HASP.

10.1 EVACUATION AND EMERGENCY RESPONSE

In the event of an emergency, immediately notify the Site Health and Safety Officer.

The signal to evacuate is ***three (3) sustained blasts on the air horn or very loud whistle***. Note that the emergency signal can ***not*** be the same as other site signals, e.g., blasting warning.

All personnel will evacuate to a location established by the Site Safety Officer. These locations will be designated daily and situated upwind of the exclusion zone. All locations will be a safe distance from where the emergency occurred.

Evacuation Location: ***The W&C field office, or the Falvey Office Building as determined in the field by the SSO.***

If you are in the exclusion zone, proceed to the access corridor of the CRZ for further instructions.

Following evacuation, the Site Safety Officer will perform a head count, using the log book, to account for all personnel who entered the Site.

Rally points for the evacuation will be set ***at each work location*** unless otherwise specified by the Site Safety Officer.

10.2 FIRE OR EXPLOSION

In the event of fire or explosion, the Fire Department (911) will be notified immediately, along with the Site Health and Safety Officer. ***Fire extinguishers may then be used for small incipient stage fires by trained employees only.*** Otherwise, evacuate!

10.3 CHEMICAL SPILLS AND LEAKS

Employees must report any chemical spills or leaks to the Site Health and Safety Officer. Should a spill or leak (e.g., gases, vapors, dusts, liquids, solids, radioactive materials, or any other hazardous materials) occur which is a threat to the environment or human health, the person observing the spill will:

- Evacuate or request evacuation of all people at risk or shelter-in-place (SIP); and
- Inform the Site Health and Safety Officer.

The decision as to whether to evacuate or SIP is an important one. Factors affecting the decision include the following (refer to the DOT's Emergency Response Guidebook [ERG] for more detailed information):

- Hazardous material(s) released (degree of hazard, amount, containment/control, and rate of vapor movement);
- Population Threatened (location, number of persons, available time, ability to control the process, building types and availability, and special institutions/populations [day cares, schools, hospitals, nursing homes, prisons, etc.]); and
- Weather conditions (effects on vapor and cloud movement, potential for change, and effect on the process).

The Site Health and Safety Officer will contact the appropriate Federal, State, or Local agencies in the event of a chemical emergency. These typically include the following:

- Holbrook and Randolph Police and Fire Departments;.
- State Police;
- Massachusetts DEP;.
- Holbrook and Randolph Health Departments;
- National Response Center (NRC) (if reportable above the RQ); and/or
- Others as applicable.

10.4 INCIDENT REPORTING

All employees on this Site must immediately report injuries and illnesses to the SHSO, PM, and Team Leader (TL). If the injury or illness is a result of, or could result in, a chemical exposure, the SHSO will report it and will then take appropriate action to prevent further exposure.

Following an incident, a Supervisor's Report of Incident (SRI) (found in **Appendix G**) will be completed by the TL in accordance with the procedures outlined in Section 5 of the Corporate Health and Safety Manual. The W&C Corporate Health & Safety Manager must be notified of the accident and supplied with a copy of the SRI report within 24 hours of the incident.

Near misses (close calls) will also be reported similarly to injuries and illnesses as described above.

In the event of a hazardous material spill or chemical release above the reportable quantity, the appropriate federal and state agencies will be notified by the Site Health and Safety Officer or designee.

11. SPILL CONTAINMENT PROGRAM

Although W&C's typical activities do not warrant spill containment measures, it is never-the-less feasible (though remote) that W&C may have "spillable" quantities of chemicals. Possibilities include acids for preserving metals samples, gasoline for generators, solvents for decontamination, etc.

Specific details on chemicals and measures that will be taken to contain any potential spills are as follows:

For gasoline and oil spills:

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by dicing, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. Prevent contact with ignition sources or areas/equipment that requires protection. Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Ensure contaminated spill materials are properly disposed of per state and federal requirements.

In the event of a spill, W&C personnel will immediately contact SSO.

12. CONFINED SPACE ENTRY

Confined Space Entry (CSE) is **NOT applicable** to this project.

Confined Space Entry (CSE) can be very hazardous work and it is W&C's policy that CSE work will be avoided whenever possible. Improper CSEs across the country have resulted in numerous deaths of both entrants and would be rescuers. W&C's CSE Program complies with the U.S. Occupational Safety and Health Administration (OSHA) standard, 29 CFR Part 1910.146, Permit-Required Confined Spaces (PRCSs). Confined space work presents unique hazards to workers who enter such spaces, as well as to those on the outside. Proper preparation and attention to detail during entry operations is required to avoid the occurrence of serious or fatal accidents. W&C's CSE Program applies to any entry of a PRCS, whether it is for the purposes of on-going operations, maintenance, construction related activities, and/or is made by an outside contractor.

A confined space is defined as a space that:

1. Is large enough to bodily enter, and
2. Has limited or restricted means of entry or exit, and
3. Is not designed for continuous employee occupancy

A permit-required confined space (PRCS) is defined as a confined space that has:

4. The potential for a hazardous atmosphere, or
5. The potential for an engulfment hazard, or
6. A tapered floor or inwardly converging walls, or
7. Any other serious health or safety hazard.

The Federal OSHA standard 29 CFR Part 1910.146 is typically applicable to general industry and is more comprehensive than the construction standard 29 CFR 1926.21 (b) (6) (i) for confined space entry. In the event of an OSHA inspection the regulatory agency can and has cited employers utilizing the general duty clause. W&C's CSE Program applies to any entry of a PRCS, whether it is for the purposes of on-going operations, maintenance, construction related activities, and/or is made by an outside contractor.

CSE at this Site is as follows: **No Confined Space Entry is to be conducted in association with the remedial activities covered by this HASP.**

W&C employees are trained to recognize and identify a permit-required confined space (PRCS) but shall **not** enter or work in a PRCS without additional proper training, back ups, and requisite supplies and equipment.

13. HAZARD CONTROL INFORMATION

13.1 COLD AND HEAT STRESS INFORMATION

When chemical resistant clothing is worn, body ventilation and evaporation are greatly reduced. Additional breaks will be scheduled for personnel wearing coveralls in hot weather.

Employees should be aware of the effects of heat stress, provided with adequate liquids, and instructed to observe each other for signs of heat stress during hot weather.

Signs of **heat stress** are summarized as follows:

Heat Exhaustion: clammy skin, confusion, dizziness, light headed, fatigue, heat rash, fainting, nausea, profuse sweating, slurred speech, weak pulse.

Heat Stroke: confusion, convulsion, hot dry skin, high temperature (may feel chilled), incoherent speech, staggered gait, cessation of sweating, unconsciousness.

These signs can be distinguished from those associated with chemical hazards as chemical hazards usually do not cause changes in skin temperature and/ or color, or the ability to sweat.

Treatment: A victim of heat stress should be moved to a cool but not cold environment and allowed to rest by lying down. Fluids should be taken slowly but steadily by mouth until the urine volume indicates that the body's fluid level is in balance.

Workers may be required to use the "buddy system" to monitor for signs of chemical exposure, weather-related stress, and other health and safety hazards. Employees will work in pairs and will maintain constant line of sight with each other. If a "buddied" employee has to leave the work area, then his or her buddy must accompany them. First aid equipment and trained personnel will be available onsite.

ACGIH ® TLVs ® for Heat Exposure – Wet Bulb Globe Temperature (WBGT) Readings in °C *

<u>Work Demands</u>	<u>Acclimatized Workers</u>				<u>Unacclimatized Workers</u>			
	<u>Light</u>	<u>Mod.</u>	<u>Heavy</u>	<u>Very Heavy</u>	<u>Light</u>	<u>Mod.</u>	<u>Heavy</u>	<u>Very Heavy</u>
100% work	29.5	27.5	26	N/A	27.5	25	22.5	N/A
75% work/25% rest	30.5	28.5	27.5	N/A	29	26.5	24.5	N/A
50% work/50% rest	31.5	29.5	28.5	27.5	30	28	26.5	25
25% work/75% rest	32.5	31	30	29.5	31	29	28	26.5

* Consult the ACGIH TLVs and BEIs current edition for additional notes and instructions on implementing WBGTs. Only applicable for Level D PPE ensemble – **NOT** for CPC that restricts evaporation of sweat.

Wet Bulb Globe Temperature (WBGT) from Temperature and Relative Humidity																																																	
	Temperature (°C)																																																
	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50																		
Relative Humidity (%)	0	15	16	16	17	18	18	19	19	20	20	21	22	22	23	23	24	24	25	25	26	27	27	28	28	29	29	30	31	31	32	32																	
	5	16	16	17	18	18	19	19	20	21	21	22	22	23	24	24	25	26	26	27	27	28	29	29	30	31	31	32	33	33	34	35																	
	10	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28	29	30	30	31	32	32	33	34	35	36	36	37																	
	15	17	17	18	19	19	20	21	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	33	33	34	35	36	37	38	39																		
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	60	21	22	23	24	25	26	27	28	29	30	31	32	33	35	36	37	38																															
	65	21	22	23	24	25	26	27	28	29	31	32	33	34	36	37	38																																
	70	22	23	24	25	26	27	28	29	30	31	33	34	35	36	38	39																																
75	22	23	24	25	26	27	29	30	31	32	33	35	36	37	39																																		
80	23	24	25	26	27	28	29	30	32	33	34	36	37	38																																			
85	23	24	25	26	28	29	30	31	32	34	35	37	38	39																																			
90	24	25	26	27	28	29	31	32	33	35	36	37	39																																				
95	24	25	26	27	29	30	31	33	34	35	37	38																																					
100	24	26	27	28	29	31	32	33	35	36	38	39																																					

Note: This table is compiled from an approximate formula which only depends on temperature and humidity. The formula is valid for full sunshine and a light wind

Weather-related problems anticipated during operations include cold and heat stress. Cold stress will most likely occur during colder temperatures in the spring or early fall (however, hypothermia has been known to occur in the summer), if personnel or clothing gets wet, and/or with wind chill conditions. Heat stress will be most likely to occur when wearing protective clothing that decreases natural body ventilation. Workers should be aware of signs of cold or heat stress in themselves and in other workers as described below. Cold-related symptoms range from a “chill” and “trench foot” to more serious conditions such as frostbite or hypothermia. Heat-related symptoms range from heat rash and heat cramps to more serious conditions such as heat exhaustion and heat stroke.

Types of Cold Stress:

- A “chill” caused by exposure to cold temperatures and often characterized by shivers.
- “Trench foot” caused by prolonged contact with cold, wet water. Trench foot can occur at any temperature.
- Frostbite caused by extreme cold temperatures and affecting predominantly the outermost parts of the extremities (fingers and toes) and areas with exposure and poor circulation (nose and ears).
- Hypothermia caused by prolonged exposure to intense cold conditions (temperature and/or wind chill) and characterized by a lowering of body core temperature. Hypothermia is a life-threatening condition. Medical attention must be sought immediately.

Should signs of cold stress be detected, appropriate first aid measures will be taken to protect workers. Appropriate first aid measures are summarized below.

Cold Stress Treatment

1. Get the victim out of the cold.
2. Loosen tight clothing.
3. Remove perspiration soaked or wet clothing.
4. Apply warm blankets to the skin.
5. If conscious, give the victim cool water to drink.
6. Seek medical attention and call 911.

New wind chill chart

Frostbite occurs in 15 minutes or less

		Temperature (°F)											
Wind (MPH)		30	25	20	15	10	5	0	-5	-10	-15	-10	-25
	5	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40
	10	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47
	15	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51
	20	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55
	25	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58
	30	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60
	35	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62
	40	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64
	45	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65
	50	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67
	55	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68
	60	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69

Source: USA Today

13.2 NOISE EXPOSURE/HEARING CONSERVATION

Hazardous noise levels are ubiquitous on construction sites. Noise sources typically include the engines and/or motors of the equipment, the operating parts of the equipment, compressed air, and others. All employees on the Site will be enrolled in their respective company's hearing conservation program (HCP). Employers will comply with 29 CFR Part 1910.95, 1926.52, and 1926.101. Noise-induced hearing loss (NIHL) is insidious and often occurs before one notices it. Hearing protection devices (HPDs) including ear plugs and/or muffs as appropriate will be provided to employees and will be used in areas with noise levels at or above 85 decibels on the A-weighting scale (dBA).

OSHA PEL for Noise

Noise limit	Time (hrs.)
90 dBA	8 hours
95	4
100	2
105	1
110	½
115	¼

ACGIH ® TLV ® and NIOSH REL for Noise

Noise limit	Time (hrs.)
85 dBA	8 hours
88	4
91	2
94	1
97	½
100	¼

Some examples of typical approximate sound levels include the following (also refer to **Appendix H – “Noise Thermometer”**):

<u>Sound Pressure Level</u>	<u>Activity/ies or Settings (varies depending on distance)</u>
180 decibels (dB)	Rocket launch from pad
170 dB	Shotgun blast
150 dB	Jet engine taking off, firecracker, artillery at 500 feet
140 dB	Pain threshold and jet engine at 25 meters distance
130 dB	Jackhammer, power drill, air raid, car race, symphony percussion
125 dB	Jet taking off at 100 meters distance, car stereo, chain saw
120 dB	Chain saw, hammering, siren, jet plane at ramp
110 dB	Pop/rock group/band, power saw, leafblower
100 dB	Pneumatic chipper, factory machinery
90 dB	Heavy truck, tractor, blender, mixer
85 dB	Average street traffic, handsaw, noisy restaurant

Sources: Bruel & Kjar Instruments, Inc. and League for the Hard of Hearing.

W&C has completed extensive noise monitoring for tasks typically completed as part of our work and the majority of the work completed does not exceed the 8-hour time weighted average of 85 dBA and therefore a Hearing Conservation Program is not warranted for these tasks. However, any tasks being completed where even short term noise levels exceed 85 dBA, then hearing protection should be utilized.

13.3 EXCAVATIONS AND TRENCHING

Excavations and trenches present potentially dangerous hazards. OSHA has a nation-wide Special Emphasis Program (SEP) that requires a Compliance Safety and Health Officer (CSHO) to inspect any and all excavations that the CSHO observes. This is because an accident in an excavation is 17 times more likely to result in death than another accident in construction and 170 times more likely to result in death than another accident in general industry.

No digging or excavation will occur prior to confirming the absence of buried utility lines or other buried debris. Personnel will not enter an excavation or trench without the required special training and adequate protective measures. W&C personnel are prohibited from entering any trench or excavation greater than 3 feet deep unless they have completed OSHA Competent Person Training. Excavations 4 feet deep or greater will be tested for hazardous atmospheres prior to entry using a multi-gas meter and PID. Sampling will be performed from above ground using hose extensions whenever possible to reduce unnecessary exposure and to avoid congestion of personnel in confined areas.

W&C and other employers will comply with OSHA regulations 29 CFR Part 1926, Subpart P – Excavations 1926.650 – 1926.652 including having an OSHA Competent Person for excavations on site. The following are required at a minimum:

- Excavated materials will not be placed within 2 feet of an excavation edge.
- Trenches 4 feet deep or greater will have ladders installed for ease of egress at least every 50 feet of trench length (such that employees need not travel more than 25 feet to exit via a ladder per OSHA).

- Excavations 5 feet deep or greater require protective systems prior to entry into the excavation to complete work.
- No water accumulation is allowed in the excavation or trench.
- Walkways 4 feet high or greater above trench bases require full OSHA guardrails.
- Excavations 20 feet deep or greater must be designed by a PE.
- Excavations will be inspected at least daily by a competent person for safety and structural integrity.

13.4 HEAVY EQUIPMENT

Some project sites will have heavy and other types of equipment onsite presenting significant hazards to workers. Two areas of an OSHA “focused inspection” for construction include “struck by” and “caught in or between” hazards, accidents or injuries. [Note: The remaining two areas of an OSHA “focused inspection” for construction are electrical and fall hazards]. Most accidents involving heavy equipment are due to a lack of awareness of the victim by the operator and/or of the impending motion by the victim.

Communication, eye contact, hand signals, and awareness of personnel locations and movements and equipment motions are critical to avoid accidents and injuries. Personnel will not “take breaks” under or behind heavy equipment (on average, 20 workers per year die when they are backed over while doing this). All heavy equipment will have back-up alarms. Personnel on the ground will not approach equipment (such as excavators or backhoes) from the operator’s “blind side” (the side with the arm and bucket).

W&C and other employers will comply with OSHA regulations 29 CFR Part 1926, Subpart O – Motor Vehicles, Mechanized Equipment, and Marine Operations 1926.600 – 1926.606. Personnel will not repair, fix, service, or maintain heavy equipment without first locking out and tagging out all hazardous energy sources that the worker(s) may be exposed to during the repair. This includes “blocking” sources of gravitational energy (e.g., a falling bucket).

13.5 ELECTRICAL HAZARDS

The electrical safety program for W&C is detailed in Section 19 of the Company Health and Safety Manual. Electrical hazards are one of four aspects of an OSHA “focused inspection” for construction and present obviously life-threatening hazards. Equipment capable of reaching the overhead power lines shall always maintain a safe clearance of at least 10 feet. Lines rated above 50 kilovolts (kV) will have safe clearance of 10 feet plus at least 0.4 inches per additional 1 kV. W&C will request that lines are de-energized prior to work in the area or adequately insulate the lines, if and as necessary.

W&C and other employers will comply with OSHA regulations 29 CFR Part 1926, Subpart K – Electrical 1926.400 – 1926.449. Ground fault circuit interrupter (GFCI) protection will be used for power equipment, etc. Only heavy-duty, 3-prong, outdoor-type extension cords approved for the work and load will be used as necessary.

The following activities may ONLY be completed by a qualified person using appropriate arc flash protection and safe work practice:

- Testing work on electrical circuits or equipment.
- Working on energized circuit parts or equipment.
- Defeating an electrical safety interlock.

Wherever feasible, the equipment or system must be totally de-energized before beginning work using control of hazardous energy procedure. Deenergization must be verified prior to commencement of work.

A decision to work on live electrical conductors instead of deenergizing must be made by a qualified person and is only acceptable when either:

- Deenergization introduces additional hazards (e.g., deactivation of emergency alarm systems, removal of illumination for an area, etc.).
- The equipment/system must be energized to facilitate the troubleshooting process.

13.6 HAZARD COMMUNICATION

All employers on site must comply with 29 CFR Part 1926.59 – Hazard Communication. Employers will maintain copies of material safety data sheets (MSDSs) onsite for all chemicals onsite. Employees will have appropriate hazard communication training and each employer will have a written Hazard Communication Program for any chemicals that will be brought to and/or stored on the project site.

13.7 HAND AND POWER TOOLS

W&C and other employers will comply with OSHA regulations 29 CFR Part 1926, Subpart I – Tools – Hand and Power 1926.300 – 1926.307. All tools shall be maintained in a safe condition. Tools shall be used only for their intended purpose. Employers are responsible for tools their employees use even if the tool is the property of the employee. Power tools will be appropriately guarded and guards will not be removed. Chain saws will be operated using appropriate PPE including safety glasses, face shield, hardhat, HPDs, work gloves, hard toe boots, safety orange vest, and protective leggings (chaps).

13.8 SLIPS, TRIPS, AND FALLS

Slips, trips, and falls are responsible for most workplace accidents and injuries and hazards from falls are one part of an OSHA “focused inspection” for construction. There are likely to be many slip and trip hazards onsite due to topography and construction activities. These include steep slopes, vegetation, rocks, rough terrain, air and water hoses, power cords, equipment and supplies, tools and materials, and potentially wet polyethylene sheeting for decontamination and/or erosion control. Site workers will exercise due care in traversing the Site. Footwear must be of adequate traction. Workers will not carry hazardous equipment or other materials that could contribute to an accident or fall while ascending or descending steep slopes or other dangerous terrain.

13.9 WEATHER-RELATED HAZARDS

In addition to heat and cold temperatures, weather-related hazards should be anticipated and appropriate protective measures taken. Given the multi-season work schedule and unpredictable New England

weather, multiple seasons' adverse weather should be anticipated. ***Always check the weather forecast for the Site locale before heading out!*** The following are some possible weather-related hazards and protective measures:

- **Lightning:** Do not work during electrical storms. Stay off of high areas (e.g., top of the landfill) and hazardous areas (e.g., on water) that attract lightning.
- **Snow squalls, whiteouts, blizzards, and nor'eaters:** Do not schedule work when weather reports indicate potential snowstorm watches or warnings. Send personnel home early in advance of an approaching storm.
- **Freezing rain, sleet, or ice:** Do not schedule work when weather reports indicate potential storm watches or warnings. Send personnel home early in advance of an approaching storm. Alternatively, shelter workers if conditions are too hazardous to risk travel.
- **Hurricane or tornado:** Take appropriate shelter. Do not schedule work when weather reports indicate potential hurricane or tornado watches or warnings. Send personnel home early in advance of an approaching storm.
- **Hail:** Take appropriate shelter. Do not schedule work when weather reports indicate potential hail watches or warnings.
- **Flash flooding:** Take appropriate shelter. Do not schedule work when weather reports indicate potential flash flooding watches or warnings. Have workers vacate low-lying areas and seek high ground. Do not attempt to navigate across flooded areas or waterways.

13.10 ASBESTOS-CONTAINING MATERIALS

Asbestos-containing materials (ACM) may be present but is not anticipated. However if encountered in some building materials of various structures on Site the work will be conducted in accordance with the appropriate regulations. As required by both Federal USEPA regulation and by Massachusetts DEP regulations, if present friable ACM will be properly "abated" prior to demolition by a DEP-licensed asbestos abatement contractor.

13.11 FAUNA AND FLORA HAZARDS

During the course of field work employees are at risk of being exposed to poisonous plants, insects, spiders and snakes. Of these the most prevalent biological hazards include poison ivy, mosquitoes, ticks, and bees or wasps.

13.11.1 Poison Ivy

Poison ivy is a common cause of a skin irritation called contact dermatitis that may result in a red, itchy rash consisting of small bumps, blisters or swelling. This native perennial grows throughout Northeast, in woods, fields, and sometimes in the garden. It grows in sun or shade, and in wet or dry places. Its growth habit depends on where it is growing, resulting in a trailing ground cover, free-standing shrub, or a vine supported by trees, shrubbery and fences. All parts of the poison ivy plant contain, urushiol, which causes the allergic reaction. Most poisoning occur during the growing season when the presence of lush foliage increases the chance of contact, but the dormant stems and roots of the vine can cause winter poisoning as well.

The best way to protect yourself against poison ivy is to avoid poison ivy. The best defense against contracting poison ivy is to recognize the plants. “Leaves of three, let it be” refers to the groupings of three leaflets connected to a common stem that characterize most of these plants. However, if you cannot avoid poison ivy (and poison oak or poison sumac), follow these precautions to help prevent contact:

- Wear protective clothing such as long-sleeved shirts, long trousers, boots or sturdy shoes with socks and gloves;
- Use a pre contact skin protectant such as CoreTex IvyX™ Pre-Contact towelettes or barrier cream;
- If heat stress will not be a problem the use of a Tyvek™ coveralls and nitrile gloves is recommended for areas with heavy poison ivy infestation.

If contact with poison ivy has been made or is suspected, follow these guidelines:

- As soon as possible (within 5–10 minutes of contact), wash all exposed skin with strong soap (i.e. Dawn) and water to remove the oil. If this is not possible, rinse thoroughly with water;
- Use a post-contact skin cleanser such as Tecnu® skin cleanser or CoreTex IvyX™ cleanser towelettes;
- Put on gloves to remove clothes and shoes, and wash clothing in hot water and detergent to remove any plant oil that may be on them;
- Notify your supervisor if contact or suspected contact is made with poison ivy; and.
- If a severe allergic reaction develops seek medical attention.

13.11.2 Ticks

Ticks transmit bacteria that cause illnesses such as Lyme disease or Rocky Mountain spotted fever. Ticks wait for host from the tips of grasses and shrubs (not from trees). When brushed by a moving person, they quickly let go of the vegetation and climb onto the host. Ticks can only crawl; they cannot fly or jump. Tick season typically lasts from April through October; peak season is May through July; seasons can vary depending on climate. Ticks can be active on winter days when the ground temperatures are about 45° Fahrenheit.

The best way to protect against tick borne illness is to avoid tick bites. This includes avoiding known tick-infested areas. However, if you visit wooded areas or areas with tall grass and weeds, follow these precautions to help prevent tick bites and decrease the risk of disease:

- Wear protective clothing such as long-sleeved shirts, long trousers, boots or sturdy shoes and a head covering. (Ticks are easier to detect on light-colored clothing.)
- Tuck trouser cuffs in socks. Tape the area where pants and socks meet so ticks cannot crawl under clothing.
- Apply insect repellent containing 10 percent to 30 percent *N,N*-Diethyl-*meta*-toluamide (DEET) or 5 percent to 10 percent picaridin primarily to clothes. Apply sparingly to exposed skin. Do not spray directly to the face; spray the repellent onto hands and then apply to face. Avoid sensitive areas like the eyes, mouth and nasal membranes. Be sure to wash treated skin after coming indoors.
- Use repellents containing permethrin to treat clothes (especially pants, socks and shoes) but not skin. Always follow label directions; do not misuse or overuse repellents.
- Personnel should carefully inspect themselves each day for the presence of ticks or any rashes. This is important since prompt removal of the tick can prevent disease transmission. Removal of

the tick is important in that the tick should not be crushed and care must be taken so that the head is also removed.

- Report tick exposure and bites to your supervisor.

13.11.3 Mosquitoes

Mosquitoes, carriers of the West Nile Virus, Yellow Fever and other diseases, are indigenous to the area. As mentioned above, DEET is an effective mosquito repellent and is recommended. Although concentrated DEET formulations protect longer than those that are more dilute, little improvement is offered by concentrations of the active ingredient higher than 50 percent. Adverse effects, though documented, are infrequent and are generally associated with gross overuse of the product. Users should avoid the temptation to apply the most concentrated product available. The transient protection offered by more dilute preparations can be extended by reapplication. When using DEET care should be taken to reapply the repellent when its effectiveness wears off.

13.11.4 Wasps and Bees

Wasps (hornets and yellow-jackets) and bees (honeybees and bumblebees) are common insects that may pose a potential hazard to the field team if work is performed during spring, summer or fall. Bees normally build their nests in the soil. However, they use other natural holes such as abandoned rodent nests or tree hollows. Wasps make a football-shaped, paper-like nest either below or above the ground. Yellow-jackets tend to build their nests in the ground but hornets tend to build their nests in trees and shrubbery. Bees are generally more mild-mannered than wasps and are less likely to sting. Bees can only sting once while wasps sting multiple times because their stinger is barbed. Wasps sting when they feel threatened. By remaining calm and not annoying wasps by swatting, you lessen the chance of being stung. Wasps and bees inject a venomous fluid under the skin when they sting. The venom causes a painful swelling that may last for several days. If the stinger is still present, carefully remove it with tweezers or scraping a credit card or other blunt object against the sting site in the opposite direction in which the stinger is embedded.

Some people may develop an allergic reaction, i.e. anaphylaxis, to a wasp or bee sting. If such a reaction develops, **seek medical attention at once**. Persons who are allergic to bee and wasp stings should carry an epinephrine pen, e.g. epi-pen, with them that is prescribed by a doctor and used to help abate swelling that occurs due to their allergy. Even if an employee utilizes their epi-pen, they still need to seek medical attention for follow-up care and observation.

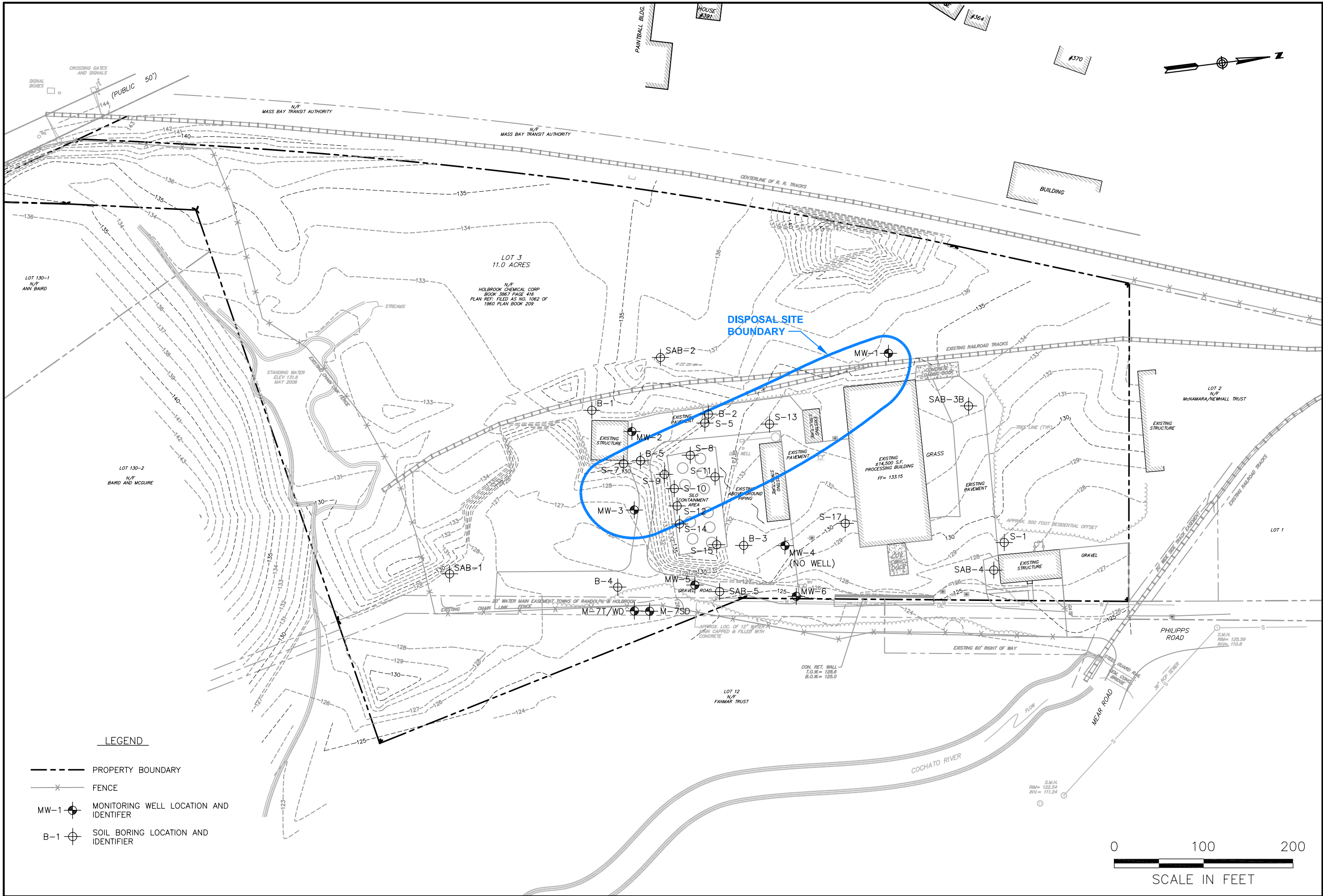
13.12 OFT-FORGOTTEN HAZARDS

There are many not so obvious hazards that are often forgotten or overlooked. Here is a partial list that should be considered and controlled as applicable to the scope of work.

- Allergies or medical conditions.
- Lack of food and drink.
- Repetitive motion (musculoskeletal disorders, ergonomics, lifting).
- Sun blindness (sunset, water or building reflection, snow blindness, etc.).
- Thin ice conditions.

- Ultraviolet radiation (UV) – eyes and sunburns.
- Other vehicles (snowmobiles, ATVs, trucks, boats, etc.).
- Dangerous neighborhoods.
- Lack of needed supplies - change of clothes, flashlights and batteries.
- Driving (routine driving – on/off-site, 4WD limitations, moving water, locking keys in vehicle).

APPENDIX A: WORK ZONE AND SITE PLAN



WOODARD & CURRAN 980 WASHINGTON STREET, SUITE 325 DEDHAM, MASSACHUSETTS 02026 800.446.5518 www.woodardcurran.com COMMITMENT & INTEGRITY DRIVE RESULTS	
SITE PLAN	
DESIGNED BY: DC	CHECKED BY: DC
DRAWN BY: EVR	Figure 2.dwg
TRANSLOAD AMERICA HOLBROOK SOLID WASTE TRANSFER STATION	
MAP 19 LOT 3 3 PHILIPPS ROAD HOLBROOK, MASSACHUSETTS	
JOB NO: 218390	
DATE: JUNE 2009	
SCALE: AS NOTED	
FIGURE 2	

APPENDIX B: AMENDMENTS TO SITE SAFETY PLAN

[illegible]

APPENDIX C: TAIL GATE TOPICS & DAILY ATTENDANCE SHEET

TAIL-GATE SAFETY MEETING – CHECKLIST AND TIPS

Checklist for Tail-Gate Safety Meetings:

- ✓ Emergency numbers – review list and where posted
- ✓ Hospital(s) and route(s)
- ✓ Communications – routine and emergency
- ✓ Activities and tasks – hazards
- ✓ Medical issues – first aid, allergies, and conditions
- ✓ Hazards – obvious and oft-overlooked ones
- ✓ PPE – Level, availability, de-con
- ✓ Action levels – responses
- ✓ Zones – How marked and determined
- ✓ Security issues
- ✓ Buddy system
- ✓ Confined space entry – applicability (or not)
- ✓ De-contamination – personal and equipment
- ✓ Spill containment – types and supplies
- ✓ Other?

Top 12 Ways to Keep “Tail-Gate” or Daily/Weekly Safety Meetings Effective

1. **Keep it “on-time”!** Everyone’s time is important. If the meeting doesn’t start and end on-time, people won’t want to attend or will be late!
2. **Keep it “short”!** The longer the meeting lasts, the less effective it becomes. People have short attention spans!
3. **Keep it “focused”!** Don’t ramble! Stay “on message”!
4. **Keep it “topical”!** Make sure that the topics are directly applicable to the daily/weekly operation/tasks! Make sure that the meeting relates to the job and what’s going on!
5. **Keep it “timely”!** Make sure that you’re covering only things that are happening (or are about to or just did happen). Adults don’t want training if does not matter.
6. **Keep it “fresh”!** Don’t do the same stuff repeatedly. Cover new items or in new ways!
7. **Keep it “organized”!** Be prepared! Don’t leave it to the last minute or people will pick up on that and it will lose its perceived value!
8. **Keep it “open”!** Be “open” to attendees input prior to and during the meeting. Adults like to contribute when/where it matters!
9. **Keep it “flexible”!** Be flexible enough to allow for attendees to ask questions!
10. **Keep it “diverse”!** People will get tired of the regularity. Change something about the meeting so people will look forward to it!
11. **Keep it “safe and healthy”!** Don’t engage in any unsafe or unhealthy behaviors during the meeting. You’ll at best be sending a mixed message, more likely will lose any respect for the training, and could get hurt or ill!
12. **Keep it “well fed”!** People love to be fed. Consider bringing or providing some refreshments!

[illegible]

APPENDIX D: SITE SIGN-IN/SIGN-OUT FORM

[illegible]

APPENDIX E: JOB SAFETY ANALYSES (JSA)

Appendix E: Site-Specific Job Hazard Analysis			
Operational Phase	Task/Operation	Location Where Task/Operation Performed	
Site Visit	Site survey, site reconnaissance, utility mark-out, habitat assessment	Site-wide Remedial Areas	
Date this JHA Conducted 8/20/2010	Employee Certifying this JHA		
	Print Name George Franklin	Signature	
Physical Hazards			
Name of Physical Hazard	Source	Exposure Level/Potential	Exposure Limit
Heat/cold stress	Working outdoors	Very Likely	N/A
Heavy lifting	Lifting/carrying tools/equipment	Likely	N/A
Slips, trips, falls	Wooded environment, uneven ground	Likely	N/A
Exposure to lead and other OHM	Impacted soil, sediment and debris	Likely	See Tables 7-1 and 8-1 of HASP
Working near water (Forest River, the beach)	Sampling on the beach	Likely	N/A
Biological Hazards			
Name of Biological Hazard	Source	Exposure Potential	
Insect bites and stings, ticks	Wooded environment	Very Likely	
Poisonous plants (Ivy, Oak, and/or Sumac)	Wooded environment	Likely	
Control Measures Used			
Engineering Controls: Remove all trip hazards by keeping materials/objects organized and out of rights-of-way Work Practices: Personnel working with lead impacted soils shall wear proper PPE (see below). Use proper bending/lifting techniques by lifting with arms and legs and not with back. Use mechanical assistance to move heavy objects if possible. Use the buddy system when working near water Personnel shall use adequate protection from the elements, e.g. sunscreen and glasses for heat, rain gear in rain, etc., take necessary breaks, and eat/hydrate as necessary outside of the active work zone. Personnel can use bug repellent containing DEET to repel insects and ticks.			
Level of PPE: D	Task Specific Modifications:	Disposable over booties (in impacted area), steel-toed boots, nitrile gloves and/or work gloves; hard hat, hearing protection, safety glasses and high visibility clothing if within the vicinity of heavy machinery.	
PPE Upgrade: No			

Appendix E: Site-Specific Job Hazard Analysis			
Operational Phase	Task/Operation	Location Where Task/Operation Performed	
Site Preparation and Restoration	Placing erosion barriers, clearing and grubbing, and creating onsite access roads (at start of work); regrading, site restoration and planting (following work)	Site-wide Remedial Areas	
Date this JHA Conducted 8/20/2010	Employee Certifying this JHA		
	Print Name George Franklin	Signature	
Physical Hazards			
Name of Physical Hazard	Source	Exposure Level/Potential	Exposure Limit
Heavy Equipment Operations (during creation of access roads and regrading)	Heavy equipment operations	Likely	N/A
Noise	Heavy equipment operations, clearing and grubbing (power tools)	>85 dBA	85 dBA TWA NIOSH
Heavy lifting	Lifting/carrying tools/equipment; grubbing/clearing	Likely	N/A
Slips, trips, falls	Wooded environment, uneven ground	Likely	N/A
Chainsaw	Use of chainsaw for clearing	Possible	N/A
Exposure to lead and other OHM	Impacted soil, sediment, and debris.	Likely	See Tables 7-1 and 8-1 of HASP
Heat/cold stress	Working out doors	Very Likely	N/A
Working near water (Forest River, the beach)	Restoration	Likely	N/A
Biological Hazards			
Name of Biological Hazard	Source	Exposure Potential	
Insect bites and stings, ticks	Wooded environment	Very Likely	
Poisonous plants (Ivy, Oak, and/or Sumac)	Wooded environment	Likely	
Control Measures Used			
<p>Engineering Controls: Stop work if there is any continuous uncontrolled visible dust. Excavation activities along the riverbank and beach will be performed during low water levels. Apply water to excavated material to suppress dust during handling. Remove all trip hazards by keeping materials/objects organized and out of rights-of-way.</p> <p>Work Practices: Dust monitoring as per HASP. Heavy equipment shall maintain a distance of 20 feet from overhead utilities. Personnel working with lead impacted soils shall wear proper PPE (see below) Personnel must make eye contact with the heavy equipment operator before approaching the equipment. Personnel shall use adequate protection from the elements, e.g. sunscreen and glasses for heat, rain gear in rain, etc., take necessary breaks, and eat/hydrate as necessary outside of the active work zone. Use the buddy system when working near water. Personnel can use bug repellent containing DEET to repel insects and ticks.</p>			
Level of PPE: D	Task Specific Modifications: Disposable over booties (in impacted area), steel-toed boots, nitrile gloves and/or work gloves; hard hat, hearing protection, safety glasses and high-visibility clothing if within the vicinity of heavy machinery.		
PPE Upgrade: No			

Appendix E: Site-Specific Job Hazard Analysis			
Operational Phase	Task/Operation	Location Where Task/Operation Performed	
Excavation and offsite disposal of impacted soils	Excavation of soils and loading of soils into trucks for offsite disposal	Site-wide Remedial Areas	
Date this JHA Conducted 8/20/2010	Employee Certifying this JHA		
	Print Name George Franklin	Signature	
Physical Hazards			
Name of Physical Hazard	Source	Exposure Level/Potential	Exposure Limit
Heavy Equipment Operations (during excavation, blending/homogenization, and loading into trucks for offsite disposal)	Heavy Machinery	Likely	N/A
Noise	Heavy equipment operations, power tools	>85 dBA	85 dBA TWA NIOSH
Power tool use	Power equipment	Likely	
Hand tool use	Equipment	Likely	
Heavy lifting	Lifting/carrying tools/equipment; excavation of soils with hand tools	Likely	N/A
Slips, trips, falls	Wooded environment, uneven terrain, excavations	Possible	N/A
Motion of machinery (struck by hazards, rotating equipment hazards)	Machinery operations	Likely	N/A
Exposure to lead and other OHM	Impacted soil, sediment, and debris	Possible	See Tables 7-1 and 8-1 of HASP
Heat/cold stress	Working outdoors	Very Likely	N/A
Working near water (Forest River, the beach)	Excavation of sediment or beach soils	Likely	N/A
Biological Hazards			
Name of Biological Hazard	Source	Exposure Potential	
Insect bites and stings, ticks	Wooded environment	Very Likely	
Poisonous plants (Ivy, Oak, and/or Sumac)	Wooded environment	Likely	
Control Measures Used			
<p>Engineering Controls:</p> <p>Apply water to excavated material to suppress dust while handling.</p> <p>Stop work if there is any continuous uncontrollable visible dust.</p> <p>Excavation activities along the riverbank and beach will be performed during low water levels.</p> <p>Shoring/shielding/trench boxes will be installed as the designing engineer deems necessary.</p> <p>Work Practices:</p> <p>Dust monitoring as per HASP.</p> <p>No one will enter any excavation 3 feet or deeper.</p> <p>Personnel working with lead impacted soils shall wear proper PPE (see below)</p> <p>Heavy equipment shall maintain a distance of 20 feet from overhead utilities.</p> <p>Personnel must make eye contact with the heavy equipment operator before approaching the equipment.</p> <p>Personnel shall use adequate protection from the elements, e.g. sunscreen and glasses for heat, rain gear in rain, etc., take necessary breaks, and eat/hydrate as necessary outside of the active work zone.</p> <p>Personnel can use bug repellent containing DEET to repel insects and ticks.</p> <p>Use the buddy system when working near water.</p> <p>Personnel and equipment that enters the exclusion zone shall pass through the decon station to prevent spreading of material into 'clean' zones.</p>			
Level of PPE: D	<p>Task Specific Modifications:</p> <p>Disposable over booties (in impacted area), steel-toed boots, nitrile gloves and/or work gloves; hard hat, safety glasses, hearing protection, and high-visibility clothing when in the vicinity of heavy machinery.</p>		
PPE Upgrade: No			

Appendix E: Site-Specific Job Hazard Analysis			
Operational Phase	Task/Operation	Location Where Task/Operation Performed	
Environmental Sampling	Sampling of soil and sediment, post excavation confirmatory sampling	Site-wide Remedial Areas	
Date this JHA Conducted 8/20/2010	Employee Certifying this JHA		
	Print Name George Franklin	Signature	
Physical Hazards			
Name of Physical Hazard	Source	Exposure Level/Potential	Exposure Limit
Equipment Operations	Sampling equipment	Very Likely	N/A
Heat/Cold Stress	Working outdoors	Very Likely	N/A
Heavy lifting	Lifting/carrying tools/equipment	Possible	N/A
Slips, trips, falls	Wooded environment, uneven ground	Possible	N/A
Exposure to lead and other OHM	Impacted soil, sediment, and debris	Possible	See Tables 7-1 and 8-1 of HASP
Working near water (Forest River, the beach)	Sampling on the beach	Likely	N/A
Biological Hazards			
Name of Biological Hazard	Source	Exposure Potential	
Insect bites and stings, ticks	Wooded environment	Very Likely	
Poison Plants (Ivy, Oak, and/or Sumac)	Wooded environment	Likely	
Control Measures Used			
<p>Engineering Controls:</p> <p>No one will enter any excavation 3 feet or deeper.</p> <p>Utilize large equipment (backhoe arm) to collect confirmatory soil samples from excavation.</p> <p>Remove all trip hazards by keeping materials/objects organized and out of rights-of-way</p> <p>Cut rope and/or tubing with appropriate non-bladed tool (e.g. wire cutters, snips); keep any blades retracted when not in use.</p> <p>Stop work if there is any continuous uncontrolled visible dust.</p> <p>Work Practices:</p> <p>Personnel working with lead impacted soils shall wear proper PPE (see below)</p> <p>Use proper bending/lifting techniques by lifting with arms and legs and not with back. Use mechanical assistance to move heavy objects if possible.</p> <p>Use the buddy system when working near water.</p> <p>Personnel shall use adequate protection from the elements, e.g. sunscreen and glasses for heat, rain gear in rain, etc., take necessary breaks, and eat/hydrate as necessary outside of the active work zone.</p> <p>No one will enter any excavation 3 feet or deeper.</p> <p>Personnel can use bug repellant containing DEET to repel insects and ticks.</p>			
Level of PPE: D	Task Specific Modifications:	Disposable over booties (in impacted area), safety glasses, steel-toed boots, nitrile gloves and/or work gloves; hard hat, hearing protection, and high-visibility clothing when sampling within the vicinity of heavy machinery.	
PPE Upgrade: No			

APPENDIX F: TOXIC SUBSTANCE FACT SHEETS

This fact sheet answers the most frequently asked health questions (FAQs) about di(2-ethylhexyl) phthalate (DEHP). For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Di(2-ethylhexyl) phthalate (DEHP) is found in many plastics. Exposure to DEHP is generally very low. Increased exposures may come from intravenous fluids delivered through plastic tubing, and from ingesting contaminated foods or water. DEHP is not toxic at the low levels usually present in the environment. In animals, high levels of DEHP damaged the liver and kidney and affected the ability to reproduce. DEHP has been found in at least 733 of the 1,613 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is di(2-ethylhexyl) phthalate?

Di(2-ethylhexyl) phthalate (DEHP) is a manufactured chemical that is commonly added to plastics to make them flexible. DEHP is a colorless liquid with almost no odor.

DEHP is present in plastic products such as wall coverings, tablecloths, floor tiles, furniture upholstery, shower curtains, garden hoses, swimming pool liners, rainwear, baby pants, dolls, some toys, shoes, automobile upholstery and tops, packaging film and sheets, sheathing for wire and cable, medical tubing, and blood storage bags.

What happens to DEHP when it enters the environment?

- ☐ DEHP is everywhere in the environment because of its use in plastics, but it does not evaporate easily or dissolve in water easily.
- ☐ DEHP can be released in small amounts to indoor air from plastic materials, coatings, and flooring.
- ☐ It dissolves faster in water if gas, oil, or paint removers are present.
- ☐ It attaches strongly to soil particles.
- ☐ DEHP in soil or water can be broken down by microorganisms into harmless compounds.

☐ DEHP does not break down easily when it is deep in the soil or at the bottom of lakes or rivers.

☐ It is in plants, fish, and other animals, but animals high on the food chain are able to break down DEHP, so tissue levels are usually low.

How might I be exposed to DEHP?

DEHP is usually present at very low levels in:

- ☐ Medical products packaged in plastic such as blood products.
- ☐ Some foods packaged in plastics, especially fatty foods like milk products, fish or seafood, and oils.
- ☐ Well water near waste sites.
- ☐ Workplace air or indoor air where DEHP is released, but usually not at levels of concern.
- ☐ Fluids from plastic intravenous tubing if used extensively as for kidney dialysis.

How can DEHP affect my health?

At the levels found in the environment, DEHP is not expected to cause harmful health effects in humans. Most of what we know about the health effects of DEHP comes from studies of rats and mice given high amounts of DEHP.

ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>

Harmful effects in animals generally occurred only with high amounts of DEHP or with prolonged exposures. Moreover, absorption and breakdown of DEHP in humans is different than in rats or mice, so the effects seen in rats and mice may not occur in humans.

Rats that breathed DEHP in the air showed no serious harmful effects. Their lifespan and ability to reproduce were not affected.

Brief oral exposure to very high levels of DEHP damaged sperm in mice. Although the effect reversed when exposure ceased, sexual maturity was delayed in the animals.

High amounts of DEHP damaged the liver of rats and mice. Whether or not DEHP contributes to human kidney damage is unclear.

Skin contact with products containing DEHP will probably cause no harmful effects because it cannot be taken up easily through the skin.

How likely is DEHP to cause cancer?

The Department of Health and Human Services (DHHS) has determined that DEHP may reasonably be anticipated to be a human carcinogen. The EPA has determined that DEHP is a probable human carcinogen. These determinations were based entirely on liver cancer in rats and mice. The International Agency for Research on Cancer (IARC) has stated that DEHP cannot be classified as to its carcinogenicity to humans.

How can DEHP affect children?

Children can be exposed to DEHP in the same manner as adults. In addition, small children can be exposed by sucking on or skin contact with plastic toys and pacifiers that contain DEHP, but there is no conclusive evidence of adverse health effects after such exposures. Nonetheless, because of concern for children's health, many toy

manufacturers have discontinued use of DEHP in their products. In pregnant rats and mice exposed to high amounts of DEHP, researchers observed birth defects and fetal deaths.

How can families reduce the risk of exposure to DEHP?

- ☐ It is almost impossible to completely avoid contact with some DEHP because it is commonly found in plastics.
- ☐ Prevent babies and small children from chewing on plastic objects not designed for that purpose.

Is there a medical test to show whether I've been exposed to DEHP?

There is a test available that measures a breakdown product of DEHP called mono(2-ethylhexyl) phthalate (MEHP) in your urine or blood. This test can only detect recent exposure because DEHP is rapidly broken down and eliminated from your body. This test is not routinely available at the doctor's office because it requires special equipment.

Has the federal government made recommendations to protect human health?

The EPA limits the amount of DEHP that may be present in drinking water to 6 parts of DEHP per billion parts of water (6 ppb).

The Occupational Safety and Health Administration (OSHA) sets a maximum average of 5 milligrams of DEHP per cubic meter of air (5 mg/m³) in the workplace during an 8-hour shift. The short-term (15-minute) exposure limit is 10 mg/m³.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological Profile for Di(2-ethylhexyl) phthalate (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



This fact sheet answers the most frequently asked health questions (FAQs) about total petroleum hydrocarbons (TPH). For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: TPH is a mixture of many different compounds. Everyone is exposed to TPH from many sources, including gasoline pumps, spilled oil on pavement, and chemicals used at home or work. Some TPH compounds can affect your nervous system, causing headaches and dizziness. TPH has been found in at least 23 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are total petroleum hydrocarbons?

(Pronounced tōt'l pə-trō'lē-əm hī'drə-kär'bənz)

Total petroleum hydrocarbons (TPH) is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil. Crude oil is used to make petroleum products, which can contaminate the environment. Because there are so many different chemicals in crude oil and in other petroleum products, it is not practical to measure each one separately. However, it is useful to measure the total amount of TPH at a site.

TPH is a mixture of chemicals, but they are all made mainly from hydrogen and carbon, called hydrocarbons. Scientists divide TPH into groups of petroleum hydrocarbons that act alike in soil or water. These groups are called petroleum hydrocarbon fractions. Each fraction contains many individual chemicals.

Some chemicals that may be found in TPH are hexane, jet fuels, mineral oils, benzene, toluene, xylenes, naphthalene, and fluorene, as well as other petroleum products and gasoline components. However, it is likely that samples of TPH will contain only some, or a mixture, of these chemicals.

What happens to TPH when it enters the environment?

- ☐ TPH may enter the environment through accidents, from industrial releases, or as byproducts from commercial or private uses.
- ☐ TPH may be released directly into water through spills or leaks.
- ☐ Some TPH fractions will float on the water and form surface films.
- ☐ Other TPH fractions will sink to the bottom sediments.
- ☐ Bacteria and microorganisms in the water may break down some of the TPH fractions.
- ☐ Some TPH fractions will move into the soil where they may stay for a long time.

How might I be exposed to TPH?

- ☐ Everyone is exposed to TPH from many sources.
- ☐ Breathing air at gasoline stations, using chemicals at home or work, or using certain pesticides.
- ☐ Drinking water contaminated with TPH.
- ☐ Working in occupations that use petroleum products.
- ☐ Living in an area near a spill or leak of petroleum products.
- ☐ Touching soil contaminated with TPH.

ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>

How can TPH affect my health?

Some of the TPH compounds can affect your central nervous system. One compound can cause headaches and dizziness at high levels in the air. Another compound can cause a nerve disorder called "peripheral neuropathy," consisting of numbness in the feet and legs. Other TPH compounds can cause effects on the blood, immune system, lungs, skin, and eyes.

Animal studies have shown effects on the lungs, central nervous system, liver, and kidney from exposure to TPH compounds. Some TPH compounds have also been shown to affect reproduction and the developing fetus in animals.

How likely is TPH to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that one TPH compound (benzene) is carcinogenic to humans. IARC has determined that other TPH compounds (benzo[a]pyrene and gasoline) are probably and possibly carcinogenic to humans. Most of the other TPH compounds are considered not to be classifiable by IARC.

Is there a medical test to show whether I've been exposed to TPH?

There is no medical test that shows if you have been exposed to TPH. However, there are methods to determine if you have been exposed to some TPH compounds. Exposure to kerosene can be determined by its smell on the breath or clothing. Benzene can be measured in exhaled air and a breakdown product of benzene can be measured in urine. Other TPH compounds can be measured in blood, urine, breath, and some body tissues.

Has the federal government made recommendations to protect human health?

There are no regulations or advisories specific to TPH. The following are recommendations for some of the TPH fractions and compounds:

The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration has set an exposure limit of 500 parts of petroleum distillates per million parts of air (500 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Immune system: Body organs and cells that fight disease.

Pesticides: Chemicals used to kill pests.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for total petroleum hydrocarbons (TPH). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



APPENDIX G: WOODARD & CURRAN INCIDENT REPORTING FORM



Woodard & Curran
SUPERVISOR'S REPORT OF INCIDENT

A. INCIDENT DATA

1. INCIDENT DATE:		2. FACILITY:	
3. DAY OF THE WEEK:	3a. SHIFT START TIME:	4. TIME INCIDENT OCCURRED:	5. DATE/TIME REPORTED:
6. Employee Name:		7. TITLE:	8. AGE:
9. START DATE:		10. Job Service:	11. Incident Reported to:
12. BODY PART:		14. NATURE OF INJURY:	15. MEDICAL ATTENTION:
<input type="checkbox"/> HANDS	<input type="checkbox"/> HEAD	<input type="checkbox"/> AMPUTATION	<input type="checkbox"/> FOREIGN BODY/EYE
<input type="checkbox"/> EYES	<input type="checkbox"/> LEGS	<input type="checkbox"/> BURN	<input type="checkbox"/> FRACTURE/DISLOCATION
<input type="checkbox"/> TRUNK	<input type="checkbox"/> FEET	<input type="checkbox"/> CONCUSSION	<input type="checkbox"/> CONTUSION/BRUISE
<input type="checkbox"/> INTERNAL	<input type="checkbox"/> ARMS	<input type="checkbox"/> HERNIA	<input type="checkbox"/> INFECTION OF WOUND
<input type="checkbox"/> BACK	<input type="checkbox"/> OTHER:	<input type="checkbox"/> CUT/PUNCTURE	<input type="checkbox"/> INHALATION/INGESTION
13. CHECK ONE		<input type="checkbox"/> SPRAIN/STRAIN	<input type="checkbox"/> OTHER
<input type="checkbox"/> LEFT	<input type="checkbox"/> RIGHT	<input type="checkbox"/> CUMULATIVE TRAUMA DISORDER	
			16. DRUG/ALCOHOL TEST
			<input type="checkbox"/> YES <input type="checkbox"/> NO
		LOCATION OF CLINIC:	
17. DOCTOR/HOSPITAL (If applicable, list name, address and phone number.):			
18. WHERE DID IT HAPPEN?			
19. EYEWITNESSES:		20. JOB ASSIGNMENT AT TIME OF INCIDENT:	

B. DESCRIPTION OF INCIDENT

1. GIVE FULL DETAILS. DESCRIBE CONDITIONS PRECEDING THE INCIDENT, WORK IN PROGRESS; ACTIONS OF INJURED AND FELLOW WORKERS, ETC., SO THAT A CLEAR PICTURE OF THE INCIDENT IS GIVEN. USE ANOTHER SHEET OF PAPER IF NECESSARY. PICTURES OR DIAGRAMS ARE DESIRABLE
2. WAS EMPLOYEE WEARING PPE? If yes, please list:
3. DESCRIBE ANY MEDICAL TREATMENT OR FIRST AID RECEIVED:
4. WERE ANY MEDICATIONS PRESCRIBED BY A PHYSICIAN? If yes, please list:

C. INCIDENT TYPE

1. FALL FROM ELEVATION: <input type="checkbox"/> Manway Opening <input type="checkbox"/> Ladder or Scaffold <input type="checkbox"/> Machine or Stationary Equipment <input type="checkbox"/> Piled Materials <input type="checkbox"/> Stairs <input type="checkbox"/> Heavy Equipment <input type="checkbox"/> Other	3. STRUCK BY: <input type="checkbox"/> Falling Object <input type="checkbox"/> Flying Object <input type="checkbox"/> Swinging Object <input type="checkbox"/> Motor Vehicle <input type="checkbox"/> Altercation <input type="checkbox"/> Tipping, Sliding, or Rolling Object <input type="checkbox"/> All Other Moving Objects	5. CAUGHT IN, UNDER, OR BETWEEN: <input type="checkbox"/> Running or Mashing Objects <input type="checkbox"/> Point of Operation (machine or equipment) <input type="checkbox"/> Other than Point of Operation <input type="checkbox"/> Moving and Stationary Objects <input type="checkbox"/> Two Moving Objects <input type="checkbox"/> All Other Moving Parts	7. EXPOSURE TO: <input type="checkbox"/> Chemicals <input type="checkbox"/> Noise <input type="checkbox"/> Dust <input type="checkbox"/> Heat <input type="checkbox"/> Cold <input type="checkbox"/> Radiation <input type="checkbox"/> Electric Current
2. FALL FROM SAME LEVEL: <input type="checkbox"/> Slip <input type="checkbox"/> Trip	4. STRUCK AGAINST: <input type="checkbox"/> Moving Object <input type="checkbox"/> Stationary Object <input type="checkbox"/> Sharp Object	6. STRAIN OR OVER EXERTION: <input type="checkbox"/> Lifting (back) <input type="checkbox"/> Lifting (other than back) <input type="checkbox"/> Pulling or Pushing <input type="checkbox"/> Reaching, Twisting, Overextending <input type="checkbox"/> Cumulative Trauma <input type="checkbox"/> Repetitive Motion	8. MISCELLANEOUS <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input type="checkbox"/> Absorption <input type="checkbox"/> Insect/Animal Bites <input type="checkbox"/> Near Miss <input type="checkbox"/> Other

D. CAUSES

Find and deal with the real cause of the problem (hidden cause) rather than simply dealing with the symptoms (immediate cause). Tip: to help determine the hidden cause, ask "WHY" did the immediate cause take place in the first place? Refer to Appendix C for guidance.

1. IMMEDIATE:

2. HIDDEN:

E. CORRECTIVE AND PREVENTATIVE ACTIONS

What are you doing to prevent similar occurrences? List all that apply.

1. ACTION ITEM a. b. c. d.	2. RESPONSIBLE PARTY a. b. c. d.	3. DATE COMPLETED a. b. c. d.
4. TEAM LEADER/SUPERVISOR NAME:	SIGNATURE:	DATE:

F. REVIEW COMMENTS – COMPLETED BY HEALTH & SAFETY MANAGER

1. INCIDENT CLASSIFICATION <input type="checkbox"/> NEAR MISS <input type="checkbox"/> FIRST AID <input type="checkbox"/> RECORDABLE (No lost days) <input type="checkbox"/> RESTRICTED ACTIVITY <input type="checkbox"/> LOST WORKDAY CASE <input type="checkbox"/> FATALITY	2. HAS A SIMILAR INCIDENT OCCURRED AT THIS FACILITY BEFORE? <input type="checkbox"/> YES <input type="checkbox"/> NO WHEN:
3. DAYS AWAY FROM WORK:	4. DAYS RESTRICTED ACTIVITY:
5. REMARKS:	
6. NAME:	SIGNATURE:
DATE:	

APPENDIX H: NOISE THERMOMETER

NOISE THERMOMETER



140 DECIBELS

Immediate danger to hearing
Gunshot, Jet engine at take-off

120 DECIBELS

Risk of hearing damage in 7.5 minutes
Rock concert, Sandblasting



110 DECIBELS

Risk of hearing damage in 30 minutes
Snowmobile from driver's seat



100 DECIBELS

Risk of hearing damage in 2 hours
Chainsaw, Stereo headphones

90 DECIBELS

Risk of hearing damage in 8 hours
Lawn mower, Truck traffic



125 DECIBELS

Pain threshold
Air raid siren, Firecracker



115 DECIBELS

Risk of hearing damage in 15 minutes
Baby's cry, Stadium football game



105 DECIBELS

Risk of hearing damage in 1 hour
Jackhammer, Helicopter



95 DECIBELS

Risk of hearing damage in 4 hours
Motorcycle, Power Saw



85 DECIBELS

Beginning of OSHA regulations

30 DECIBELS

Faint sound
Whisper



APPENDIX E: PHASE IV TECHNICAL SPECIFICATIONS

LIST OF SPECIFICATIONS

DIVISION 01 - General Requirements

01 45 00	Quality Control
01 50 00	Temporary Facilities
01 65 00	Health and Safety

DIVISION 02 - Existing Conditions

02 13 00	Decontamination
02 20 00	Site Preparation
02 31 10	Rough Grading
02 31 15	Excavation and Fill
02 32 70	Erosion and Sedimentation Control

SECTION 01 45 00 - QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. Minimum requirements for quality control, procedures, and performance work of a general nature include but are not necessarily limited to the following:
- Supervisory personnel.
 - Tradespersons and workmanship standards.
 - Utilities.
 - Inspections, tests and reports.
 - General installation provisions.
 - Cutting and patching.
 - Cleaning and protection.
 - Environmental Controls (water pollution and dust control)

1.02 SUPERVISORY PERSONNEL:

- A. Submittal of Staff Names, Duties: Within ten (10) days of Contract date, submit a listing of CONTRACTOR'S principal staff assignments, naming persons and listing their addresses and telephone numbers. Specifically indicate persons to contact in the event of emergency or problems at the site who are available 24 hours a day, 7 days a week.

1.03 TRADESPERSONS AND WORKMANSHIP STANDARDS:

- A. General: Persons performing work at site shall be skilled and knowledgeable in methods and craftsmanship needed to produce required quality-levels for workmanship in completed Work. Remove and replace work which does not comply with workmanship standards as specified and as recognized in the construction industry for applications indicated. Remove and replace other work damaged or deteriorated by faulty workmanship. Remove and replace workers responsible for non-complying work and/or poor workmanship. CONTRACTOR shall remove from the Project any worker who is incompetent, unfaithful, disorderly or otherwise unsatisfactory in the written opinion of the ENGINEER.

1.04 UTILITIES:

- A. General: Cooperate with utility companies involved. Follow their recommendations and requirements for protection and repair of utilities, if encountered. Maintain protection of utilities for the duration of the Work. Prior to starting Work become familiar with all utilities and pipelines which may be affected by performance of the Work and have them

located in the field as work progresses. All costs associated with field locations by utilities shall be borne by the CONTRACTOR.

- B. Damage to Utilities: Repair damage to any utilities resulting from CONTRACTOR'S operations to the satisfaction of the ENGINEER and the utility company involved. Repairs shall be at the CONTRACTOR'S expense.
- C. Utility Contact Persons:

Holbrook Fire Department (781) 767-2234
Dig-Safe (888) 344-7233 (1-888-DIG-SAFE)
- D. Underground Utilities: Alignment and elevations of known underground utilities are indicated on the Drawings where possible. Completeness and accuracy of this information is not guaranteed. Utilities not shown on the Drawings, but can be readily located by contacting the appropriate utility, will be considered as utilities shown on the plans and will not be considered for extra payment requests unless a direct on-grade conflict occurs.
- E. Adjustments in grade and alignment of the Work or utilities may be made by the ENGINEER to avoid interference. Where utilities must be relocated, and the utility has not been made part of the Drawings or Specifications, payment will be negotiated as extra work. The ENGINEER must be notified in advance and additional costs shall be estimated prior to re-location.

1.05 INSPECTIONS, TESTS AND REPORTS:

- A. General: The CONTRACTOR shall provide for all testing services, unless otherwise noted in the Contract Documents. The CONTRACTOR shall cooperate and give timely notice to ENGINEER so that scheduling with testing laboratory personnel can be arranged. The ENGINEER shall provide for inspection services.

Where no testing is specifically required but the OWNER or ENGINEER decides that testing is required, the OWNER may direct that such testing be performed under current standards for testing. Payment will be made as described in this Section.

- B. Reports: Submit test/inspection reports, including agency's analysis of results and recommendations where applicable, in duplicate to ENGINEER except as otherwise indicated, and submit copies directly to governing authorities where required or requested.
- C. Payment for Testing:
 - 1. General: Testing which is the responsibility of the CONTRACTOR will be designated in technical sections.
 - 2. Initial Testing: CONTRACTOR will pay for initial tests.
 - 3. Retesting: Costs of retesting due to non-compliance will be paid by the CONTRACTOR.
 - 4. CONTRACTOR'S Convenience Testing: Inspections and tests performed exclusively for the CONTRACTOR'S convenience will be paid for by the CONTRACTOR.

5. Testing of Potentially Defective Work: Costs of testing Work performed that is considered potentially defective due to non-compliance with the Specifications contained herein shall be the responsibility of the CONTRACTOR.
- D. Qualifications of Testing Laboratory: Acceptable to ENGINEER, OWNER, and CONTRACTOR; shall meet ASTM requirements for type of testing to be performed. Allow adequate time for ENGINEER to schedule tests with testing laboratory.
- E. Coordination of Testing: Notify ENGINEER when work will be ready for testing a minimum of 48 hours in advance. Allow adequate time for ENGINEER to schedule tests with testing laboratory.

If scheduled tests or sampling cannot be performed due to lack of coordination by CONTRACTOR or incomplete work, testing costs due to the delay will be paid by the CONTRACTOR.

PART 2 - PRODUCTS (not applicable)

PART 3 - EXECUTION

3.01 CLEANING AND PROTECTION:

- A. General: Clean and protect site work in progress and adjoining work on a continuous basis. At reasonable intervals completely remove debris and waste materials from site. The ENGINEER may specify clean-up intervals at no extra cost to the OWNER, if necessary. Protect installed work to prevent damage or deterioration. Perform maintenance on newly installed work as necessary through construction period. Adjust and lubricate operable components to ensure operability without damage.
- B. Limiting Exposures of Work: Protect work whether completed or in progress, from harmful, dangerous, damaging, or otherwise deleterious exposures during construction period.

3.02 ENVIRONMENTAL CONTROLS:

- A. Water Pollution Control: Take all precautions necessary to prevent contaminating, polluting, or silting of water courses or water storage areas.
- B. Dust Control: Provide all measures necessary to control dust caused by construction operations, whether on or off-site. Provide treatment of roads and excavated materials with water as required by ENGINEER.
- C. Toxic/Hazardous Waste Material: Potential always exists for excavation of toxic and hazardous materials. Report any suspicious materials, immediately to ENGINEER for instructions for further deposition.

*** END OF SECTION ***

SECTION 01 50 00 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Provide temporary facilities including:

- Temporary stormwater controls
- Temporary erosion controls
- Decontamination facilities

1.02 QUALITY ASSURANCE:

- A. General: Comply with OSHA regulations, and any other applicable federal, state, or local regulations.
- B. Conditions of Use: Install, operate, maintain and protect temporary facilities in a manner and at locations which will be safe, non-hazardous, sanitary and protective of persons and property.

PART 2 - PRODUCTS

2.01 TEMPORARY STORMWATER CONTROLS: Provide temporary stormwater controls as described in Section 02 32 70 – Erosion and Sedimentation Controls.

2.02 TEMPORARY DEWATERING CONTROLS: Provide temporary construction dewatering so as to prevent stormwater runoff damage to the construction area or other off-site areas as described in paragraph 3.03 of Section 02 31 15 – Excavation and Fill.

2.03 DECONTAMINATION FACILITIES:

- A. Provide necessary materials and construct a vehicle and equipment decontamination (“decon”) pad as described in Section 02 13 00. The decon pad shall be dismantled only when all vehicles, equipment and debris have been decontaminated and the Work has progressed to the point where re-contamination will not occur.
- B. The decon pad and personnel decon pad will be used by all personnel working with lead-containing materials in any capacity, within the exclusion zone.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS:

- A. Provide temporary facilities at the time first required for proper performance of the Work.
- B. Remove temporary facilities at earliest reasonable time when no longer required for performance of the Work.

- C. Reimbursements for temporary work stoppages and/or demobilization or remobilization charges not specifically requested by Owner and/or Engineer will not be allowed.
- D. Location of Facilities: Location to be approved by ENGINEER.

*** END OF SECTION ***

SECTION 01 65 00 - HEALTH AND SAFETY

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The purpose of this Section is to establish minimum health and safety requirements for the CONTRACTOR. These requirements shall be used by the CONTRACTOR'S Health and Safety Officer (SHSO) to assist in preparation of the CONTRACTOR'S Construction Health and Safety Plan (HASP). These requirements shall not relieve any party from compliance with any applicable Federal, State, local, or other health and/or safety requirements and safe construction practices.
- B. Existing site characterization data includes the presence of bis(2-Ethylhexyl)phthalate and C11-C22 aromatic hydrocarbons in soil above regulatory levels established under the Massachusetts Contingency Plan (MCP; 310 CMR 40.000). Additional compounds have also been historically detected in site media; although the presence of these COCs do not present a significant risk of harm to utility/construction workers, recreational users or trespassers that may frequent the Site.
- C. The CONTRACTOR shall provide all labor, equipment, supervision, quality control, machinery, materials, as required to ensure that the health and safety of workers in work areas and the public in adjacent areas for the duration of the project. Health and safety controls may include, but are not limited to, training, medical surveillance, work area safety monitoring, personal protective equipment and monitoring, engineering controls, or any other means, methods, or construction procedures, required to ensure health and safety in accordance with these Specifications and all applicable, Federal, State, and local regulations. Perimeter air monitoring will be conducted by the ENGINEER, or by a secondary Subcontractor selected by the ENGINEER. All results will be made available to the CONTRACTOR upon request.
- D. The CONTRACTOR shall perform operations in a prudent, safe, and professional manner. At a minimum, the CONTRACTOR'S personnel and equipment shall comply with applicable Federal, State, local and installation laws, safety regulations, and procedures. The CONTRACTOR, shall ensure that its employees perform all Work in a safe manner. PPE shall be provided by the CONTRACTOR when necessary and shall be appropriate to ensure safe handling of the waste in accordance with 29 CRFR 1910.120 and the Site HASP.

1.02 GENERAL HEALTH AND SAFETY REQUIREMENTS

- A. The CONTRACTOR shall prepare and implement a HASP that conforms to all applicable, Federal, State, and local regulations, but not limited to OSHA Title 29 CFR 1926, Safety and Health for Construction, and OSHA Title 29 CFR 1910, Occupational Safety and Health Standards.
- B. The HASP shall be prepared by a Certified Industrial Hygienist, Certified Safety Professional, or both, with experience in establishing and implementing Health and Safety Plans and Programs for similar site operations. The HASP shall accommodate the requirements set forth by Federal, State, and local regulations, but not limited to OSHA Title

29 CFR 1926, Safety and Health for Construction, and OSHA Title 29 CFR 1910, Occupational Safety and Health Standards.

- C. The HASP shall address, at a minimum, the following:
1. Site hazards;
 2. Description of work;
 3. Key personnel and organizational chart,;
 4. Hazard evaluation;
 5. Engineering and work practice controls;
 6. Training;
 7. Personal protective equipment and levels of protection;
 8. Medical surveillance program;
 9. Standard operating procedures;
 10. Site control; and
 11. Contingency measures and emergency response.
- D. All CONTRACTOR employee at the project site shall have completed OSHA 1910.120 40-hour Health and Safety Training requirements, be actively participating in a medical surveillance program, including annual medical examinations, and have current 8-hour Refresher Training.
- E. The CONTRACTOR'S designated Site Safety Officer (SSO) shall be responsible for ensuring compliance with the HASP and will work to achieve adequate dust, vapor, and odor control in accordance with Federal, State, and local regulations. These responsibilities are promulgated to ensure general protection of all workers, the ENGINEER, and general public.
- F. The HASP shall incorporate the requirements contained herein and shall describe all actions to be taken to perform work and air monitoring, decontamination, and to protect the general public and worker safety and health. All tasks undertaken by the CONTRACTOR shall be identified along with all health and safety procedures, support drawings maps and plans in the HASP. The CONTRACTOR'S HASP and any modifications once implemented shall be submitted to the ENGINEER for review. Review of the CONTRACTOR'S HASP by the ENGINEER does not relieve the CONTRACTOR of any obligation or liability.
- G. At a minimum, the CONTRACTOR shall erect an orange plastic mesh safety fence around any open excavation at the end of each working day.
- H. The HASP must be supplied to the ENGINEER not less than two (2) weeks prior to the commencement of the Work. Review of the HASP will be made with respect to general conformance with OSHA Regulations; however, this review will not constitute an approval of the HASP will not relieve the CONTRACTOR of full responsibility for health and safety at the Site.

- I. All parties engaged in on-site activities must read and understand the HASP. Compliance with this requirement shall be documented and maintained on Site. Written compliance with 29 CFR 1910.120 shall be maintained on-site by the CONTRACTOR.
- J. The OWNER maintains the right to stop Work if they believe the CONTRACTOR is operating under un-safe or under-protected working conditions. Such right does not preclude nor relieve the CONTRACTOR from its duty to protect its Workers, the OWNER, the ENGINEER, or the public. The CONTRACTOR shall not have the right for extra claims resulting from work stoppage by the OWNER for health and safety reasons.

1.03 PROHIBITIONS

- A. Open fires are prohibited on the Site.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

*** END OF SECTION ***

SECTION 02 13 00 - DECONTAMINATION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The Work covered by this Section includes all labor, equipment, supervision, materials, and quality control necessary to:
 - 1. Construct, operate, and maintain decontamination facilities for personnel and vehicles including sump and appurtenances necessary to support collection, containment, and off-site disposal of decontamination fluids.
 - 2. Decontaminate truck tires, dump bodies/trailers, equipment, tools, and personnel such that potentially contaminated materials are not transported beyond the contamination reduction zone, as established by the CONTRACTOR'S Health and Safety Plan.
- B. Materials (lead-residuals, impacted soils, debris, etc.) transported beyond exterior of the site gate shall be limited to those materials located wholly within the approved transport (dump body or trailer).
- C. Decontamination fluids are to be containerized and tested to determine proper disposal.
- D. Decontamination procedures shall comply with the site-specific Health and Safety Plan (HASP), as accepted by the OWNER, unless otherwise directed by the ENGINEER.
- E. All personnel, vehicles and equipment used in exclusion zones (i.e. impacted areas) shall be decontaminated in the designated Contaminant Reduction Zone (CRZ).

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Refer to the Drawings and the site-specific HASP.

PART 3 - EXECUTION

3.01 PERFORMANCE OBJECTIVES

- A. Protect public and off-site receptors from excavated material.
- B. Minimize risk to on-site workers and the general public.

3.02 PREPARATION OF DECONTAMINATION PAD

- A. A truck/equipment decontamination pad with the minimum dimensions of 20-feet by 30-feet by 12-inches.
- B. The equipment decon pad area shall be stripped of organic soils and roots, graded and compacted to allow the flow of wash water into a sump for the collection of decon water.

- C. Ordinary borrow shall be used as needed to backfill and properly grade the area.
- D. A non-woven geotextile shall be placed over the subgrade and perimeter timbers shall be installed. The 60-mil HDPE liner shall be positioned and secured in the timber “box” to create a containment area.
- E. Timber mats shall then be installed along the length of the decon pad as travel strips. These mats shall be placed on plywood and a layer of non-woven geotextile to protect the underlying HDPE liner.
- F. A high-visibility orange snow fencing shall be erected on either side of the decon pad to direct the trucks and other equipment onto the timber mats.
- G. A pressure washer shall be used at the truck/equipment decon pad to decontaminate trucks and heavy equipment as needed. A sump pump shall be used to collect decon water for storage in a polyethylene storage tank. The wash water shall be used to wet materials for transport, if needed. Finally, pending analytical results, the stored decon water will then either be allowed to percolate into the surrounding ground surface or managed and disposed of in accordance with applicable regulations. The CONTRACTOR shall be responsible for the construction and maintenance of the decon pad, as well as the collection, analytical testing, and proper reuse or disposal of the wash water.
- H. Decon Pad shall also be utilized to decontaminate debris and other materials prior to shipment off-site. Care should be taken by the CONTRACTOR to keep the decon pad and in particular the sump area clear of soil and debris.

*** END OF SECTION ***

SECTION 02 20 00 - SITE PREPARATION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The Work covered by this Section includes all labor, equipment and materials, to perform all operations in connection with the clearing, grubbing, and the preparation of the site within the limits of construction as shown on the Drawings. The work also includes the on-site dispersal of materials resulting from clearing and grubbing and site preparation operations, and all appurtenant work.
- B. All work shall be performed in accordance with, the Town of Order of Conditions, the site-specific Health and Safety Plan (HASP) and the details provided below.

1.02 QUALITY ASSURANCE

- A. Confine clearing and grubbing operations to within the Limits of Work as shown on Construction Drawings.

PART 2 - MATERIALS

Not Used.

PART 3 - EXECUTION

3.01 GENERAL

- A. Verify that all limiting boundaries such as permanent and temporary easements, property lines, rights-of-way and grading limits have been accurately located and clearly marked.
- B. Verify that pipeline routings and other items of work have been accurately located and clearly marked.

3.02 DEFINITIONS

- A. Clearing shall consist of the felling, trimming, and cutting of trees and brush (i.e., all above ground vegetation) into sections which can be sent through a chipper grinding machine and other vegetation designated for chipping and grinding, including down timber, snags, and brush, occurring in the areas to be cleared.
- B. Grubbing shall consist of the removal of stumps and roots from the designated grubbing areas. Care shall be taken by the CONTRACTOR when filling depressions resulting from grubbing.

3.03 CLEARING AND GRUBBING

A. Remediation Areas

1. Clearing and grubbing in Silo Containment Area shall be performed using tree shears, or equivalent means approved by Engineer, to cut trees as close to ground surface as possible, followed by in place cutting of the stump and roots, followed by excavation and disposal of the root ball and roots with the contaminated soil.
2. Workers performing clearing operations on Site shall have 40-hour OSHA training, three days of supervised field experience, annual OSHA refresher training, medical monitoring, and a site-specific health and safety orientation as required by OSHA.
3. Vegetation in these areas shall be cleared using tree clearing equipment and procedures. Brush above grade may be cut, dropped, dragged and chipped with no special regard to their location, or to the disposition of the wood chips.
4. All timber, stumps, roots, brush, and other debris from clearing and grubbing operations shall be chipped and disperses on-site at the discretion of the ENGINEER.

3.04 DISPOSAL OF MATERIALS

- A. All timber, stumps, roots, brush, and other debris from clearing and grubbing operations shall be removed during the excavation and disposal of lead-impacted soils/sediments. Cleared material will not be stockpiled on-site but immediately dispersed during clearing and grubbing operations. No stumps, trees, limbs or brush shall be buried in any fills or embankments. Burning at the Site is not permitted under any conditions.

*** END OF SECTION ***

SECTION 02 31 10 - ROUGH GRADING

PART 1 - GENERAL

1.01 PROVISIONS INCLUDED

- A. The Conditions of the Contract and Division 1, General Requirements, apply to the work under this section.
- B. Attention of the CONTRACTOR and his Subcontractor is drawn to provisions of the Contract Documents regarding the responsibility of all bidders to visit and inspect the site, and to base all bids on conclusions drawn from such inspections.

1.02 SCOPE OF WORK

- A. The work of this Section includes:
 - 1. Cutting, shaping, trimming, filling, compacting and finishing of the surface of the subgrade; grading and finishing of all unpaved areas as shown on the drawings or as directed by OWNER.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Principle classes of work related to the work of this Section are listed below, and are specified to be performed under the indicated Sections of the Specifications. Refer to the indicated Sections for description of the extent and nature of the indicated work, and for coordination with related trades. This listing may not include all related work items, and it is the responsibility of the CONTRACTOR to fully coordinate the work of this Section with that of all other trades. Related sections included:
 - 1. Excavation and Fill: Section 02 31 15

1.04 REFERENCES

- A. American Association of State Highway Transportation Officials
 - 1. –AASHTO T180 *Moisture Density Relations of Soils Using a 10 lb. Rammer and an 18 inch Drop.*
- B. American National Standards Institute (ANSI) Publications
 - 1. –ANSI/ ASTM D698 *Test Methods for Moisture Density Relations of Soils and Soil Aggregate Mixtures, Using 5.5 lb. Rammer and 12 Inch Drop.*
 - 2. –ANSI/ ASTM D1556 *Test Method for Density of Soil in Place by the Sand Cone, Method*
 - 3. –ANSI/ ASTM D1557 *Test Methods for Moisture Density Relations of Soils and Soil Aggregate Mixtures Using 10lb. Rammer and 18 inch Drop.*

C. American Society for Testing and Materials Standards

1. –ASTM D2167 *Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.*
2. –ASTM D2922 *Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).*
3. –ASTM D3017 *Test Methods for Moisture Content of Soil and Soil Aggregate Mixtures.*

1.05 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section Contract Closeout.
- B. Accurately record actual elevations of the remediation areas and slope gradients.

1.06 COORDINATION AND SCHEDULING

- A. See section on coordination and scheduling.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store all products in unopened original manufacturer's packaging. Store all materials in strict accordance with manufacture's instructions and recommendations. Protect materials from all damage.

1.08 WARRANTY

- A. In addition to the guarantee/ warranty requirements of the Contract and General Conditions, the CONTRACTOR shall obtain in the name of the OWNER the standard manufacturer's guarantee of all materials furnished under this Section where such guarantees are offered in the manufacturer's published product data. These guarantees are in addition to, and not in lieu of, other liabilities which the CONTRACTOR may have by law or other provisions of the CONTRACTOR Documents.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Common Borrow: as specified in Section 02 31 15 – Excavation and Fill.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Inspect all parts of the structure to which “ROUGH GRADING” are to be installed and the conditions under which the work must be performed. Report in writing to the CONTRACTOR, with copy to the ENGINEER, any conditions which might adversely affect the installation. Do not proceed with the installation until defects have been corrected and conditions are satisfactory.
- B. Verify site conditions under provisions of Division 1 Section Summary of Work.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect utilities that remain, from damage.
- D. Protect above and below grade utilities that remain.
- E. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.03 FILLING

- A. Fill areas to contours and elevations with unfrozen materials as specified in Section Soil Materials.
- B. Place fill materials in continuous layers and compact in accordance with specified compaction levels in Section 02 31 15.
- C. Maintain optimum moisture content of fill materials to attain required compaction density.
- D. Reuse surplus fill material from site as permitted by the OWNER.

*** END OF SECTION ***

SECTION 02 31 15 – EXCAVATION AND FILL

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

- A. Work included: All excavating, filling, backfilling, and removal of materials.

1.02 PROTECTION:

- A. Maintain excavations with approved barricades, lights, and signs to protect life and property until excavation is filled and graded to a condition acceptable to the ENGINEER.
- B. Protect structures, utilities, sidewalks, pavements, property monuments, monitoring wells, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations. The CONTRACTOR shall be responsible for actual cost of repair or replacement of any items damaged as a result of construction activities. This cost shall include any professional services required for inspection of repairs or replacement.

1.03 QUALITY ASSURANCE:

- A. Standards: 29 CFR 1926/1910 - OSHA Safety and Health Standards; Standard Specification for Highways and Bridges, Massachusetts Highway Department, current revision; Technical Guidance Document Quality Assurance and Quality Control for Waste Containment Facilities (EPA/600/R-93/182)
- B. Testing and Inspection: See Quality Control Specification Section 01 45 00 for general requirements. The CONTRACTOR shall be responsible for all testing, unless otherwise noted. The CONTRACTOR shall be responsible for coordinating with ENGINEER to allow for testing to be performed at the frequencies specified. A minimum of 48-hours notice for in-place testing shall be given to allow proper scheduling by ENGINEER.
- C. Inspection of Material Sources: The ENGINEER may inspect off-site sources of materials and order tests of these materials to verify compliance with these Specifications.
- D. Construction Quality Assurance: The CONTRACTOR shall agree to participate in and conform to all items contained in the Quality Control Specification 01 45 00.

1.04 TESTING STANDARDS:

- A. Laboratory Testing: Procedures for testing earthwork shall be performed in accordance with the following standards:

Sieve Analysis.....	ASTM D422
Moisture Content.....	ASTM D2216
Moisture/Density (Standard Proctor)	ASTM D698
Atterburg Limits.....	ASTM D4318
Hydraulic Conductivity	ASTM D2434
Direct Shear.....	ASTM D3080

Costs for source testing shall be paid by the CONTRACTOR. If test results are unacceptable, additional tests may be performed, with costs paid by CONTRACTOR. In the event it becomes necessary to utilize material from a new source, costs for testing a new source shall be borne by the CONTRACTOR.

Any re-tests due to failing results shall be paid by CONTRACTOR.

- B. Testing for confirmatory post excavation samples shall be conducted by the ENGINEER. Testing for soil stabilization and disposal characteristics for the remediation waste shall be conducted by the CONTRACTOR.

1.05 SUBMITTALS:

- A. Material Test Reports: Submit reports on material gradations (sieve analysis) to the ENGINEER prior to receiving material on-site.

1.06 SITE CONDITIONS:

- A. Existing Utilities: Locate existing underground utilities within limits of Work and provide adequate means of support and protection during earthwork operations, if utilities are indicated to remain in place. Coordinate with utility companies for actual locations and shutoff services, if lines are active. Demolish and completely remove from site existing underground utilities indicated to be removed.

PART 2 - MATERIALS

2.01 MATERIALS:

- A. General: All materials utilized for this project shall be obtained from a source that has been licensed or permitted for such use by local and state authorities as applicable. The CONTRACTOR shall be required to submit evidence of such, if so requested by ENGINEER. Testing responsibility shall be as outlined in Section 01 45 00.
 - 1. Suitable Materials: Materials complying with ASTM D2487 soil classification groups GW, SM, SW, and SP found from on-site excavation or as specified.
 - 2. Unsuitable Materials: Material containing excessive amounts of water, blue or plastic clay, vegetation, organic matter, debris, pavement, stones or boulders greater than 12-inches in any dimension, frozen material, and material which, in the opinion of the ENGINEER, will not provide a suitable foundation or subgrade. Debris from the excavation areas shall be decontaminated prior to shipment off-site. The 'cleaned debris surface' when viewed without magnification will be free of all visible contaminated soil and hazardous waste except that residual staining from soil. At a minimum simple physical or mechanical means shall be used to provide such cleaning and separation of non-debris material to ensure the surface of the debris has no caked soil or waste material.

3. On-Site Material: Any suitable material from on-site excavation.
 4. Material for embankments and general fills may contain pieces of excavated ledge having a greatest dimension of up to 12-inches, if approved by the ENGINEER.
- B. Gravel: Hard, durable stone with coarse to fine sand containing materials no larger than 4- inches in any dimension. Sieve analysis by weight:

<u>Sieve Size</u>	<u>Max. % Passing by Weight</u>
3"	100
1/4"	25 - 70
No. 40	0 - 30
No. 200	0 - 5

- C. 2" Crushed Stone: Durable, clean angular rock fragments obtained by breaking and crushing rock material. Sieve analysis by weight:

<u>Sieve Size</u>	<u>Max. % Passing by Weight</u>
2"	100
3/8"	30 - 65
No. 4	25 - 55
No. 10	15 - 40
No. 40	8 - 20
No. 200	2 - 10

- D. 1" Crushed Stone: Durable, clean angular rock fragments obtained by breaking and crushing rock material. Sieve analysis by weight:

<u>Sieve Size</u>	<u>Max. % Passing by Weight</u>
1-1/2"	100
1"	80 - 100
3/4"	80 - 90
1/2"	35 - 70
3/8"	0 - 25
No. 200	0 - 2

- E. Structural Fill: Bank-run gravel. Sieve analysis by weight:

<u>Sieve Size</u>	<u>Max. % Passing by Weight</u>
2"	100
1/2"	50 - 85
3/8"	45 - 80
No. 4	40 - 75
No. 40	0 - 45
No. 200	0 - 10

- F. Common Borrow: Earth suitable for refilling excavations below normal grade, rock excavation or refilling excavated unsuitable material, embankment or general fill construction, free from frozen material, plastic clay, vegetation, perishable rubble, peat and other unsuitable materials. The material must be 100 percent passing the 12-inch sieve with moisture content sufficient to provide required compaction and stable embankment. In no case shall the moisture content exceed 4% above optimum as

determined by ASTM D698.

PART 3 - EXECUTION

3.01 EXCAVATION:

- A. The CONTRACTOR shall not excavate below the proposed depths in the remediation areas unless soil screening by the ENGINEER identifies elevated soils requiring further removal. The CONTRACTOR shall follow a construction procedure, which permits visual identification and confirmation that the proposed depth has been accomplished and removal of soil is complete in that cell.
- B. All excavations shall be approximately level and clear of loose material. Any debris or vegetable matter encountered in the excavation shall be removed. All excavations shall be carried to depth required by design.
- C. Frost is a concern when grading and backfilling operations are conducted. CONTRACTOR shall monitor the backing filling over frozen soil and attempt when possible to avoid using frozen material when backfilling.
- D. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- E. Notify ENGINEER of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- F. Correct areas over-excavated in accordance with Section 3.03.
- G. Unauthorized excavation: Removal of materials beyond indicated subgrade elevations or dimensions without specific direction of ENGINEER. Unauthorized excavation, refilling shall be at the CONTRACTOR'S expense.
- H. Refilling Unauthorized Excavation:
 - 1. Trenches: Use 1" crushed stone as directed by ENGINEER.
 - 2. Elsewhere: Backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by ENGINEER.
- I. Excavation of Unsuitable Materials: When excavation has reached required subgrade elevations, notify ENGINEER to allow for an inspection of conditions. If unsuitable bearing materials are encountered, carry excavations deeper as directed by ENGINEER and replace excavated material with 1" crushed stone or common borrow as directed by the ENGINEER.

3.02 STABILITY OF EXCAVATIONS:

- A. Slope sides of excavations to comply with OSHA Regulations and local codes. Shore and brace where sloping is not possible due to space restrictions or stability of material excavated. Maintain sides and slopes of excavation in safe condition until completion of backfilling.

3.03 BACKFILL AND FILL:

- A. General: Place acceptable soil material in layers in accordance with the range of allowable tolerances as shown on the Drawings. Fill, backfill, and compact to produce minimum subsequent settlement of the material and provide adequate support for the surface treatment or structure to be placed on the material. Place material in approximate horizontal layers, beginning at lowest

area to be filled. Do not impair drainage.

- B. After all excavation has been completed, structural fill shall be deposited in layers conducive for compaction over the areas to be filled. Each layer shall be leveled off by the use of blade graders or bulldozers with adequate power for the work involved. After the layer is leveled the operator shall at a minimum traverse over the filled area in two passes, each pass perpendicular (90 degrees) to each other. A visual inspection of the track pattern by the ENGINEER shall be verified prior to placement of the subsequent layer.
- C. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills.
- D. Placement: Place backfill and fill materials in layers not more than twelve (12) inches in loose depth for material compacted by heavy compaction equipment, and not more than six (6) inches in loose depth for material compacted by hand-operated tampers, unless otherwise indicated. Do not place backfill or fill material on surfaces that are wet, frozen, or contain frost or ice.

3.04 COMPACTION:

- A. Compaction of all fill within building areas shall be to a minimum of 95 percent of the maximum dry density as determined by ASTM D-1557, the modified Proctor density test. Contractor shall adjust lift thickness to meet required compaction.

3.05 GRADING:

- A. Grading: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Finish surfaces free from irregular surface changes and shall be finished to elevations consistent with existing grades and within the range of tolerances depicted on the Construction Drawings.
- C. After grading, compact surfaces using a minimum of three (3) equipment passes.

3.06 MAINTENANCE:

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

*** END OF SECTION ***

SECTION 02 32 70 - EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

- A. Provide and maintain devices to control erosion, siltation, sedimentation and dust that occurs during construction operations. Undertake every reasonable precaution and do whatever is necessary to avoid erosion of soil and to prevent silting of drainage ditches, storm sewers, rivers, streams, and lakes.
- B. Provide measures to control dust caused whether on or off the project site.
- C. Deficiencies in erosion control measures indicated by failures or erosion will be immediately corrected by providing additional measures or different techniques to correct the situation and prevent subsequent erosion.
- D. Exposure of soils on embankments, excavations, and graded areas shall be kept as short as possible. Initiate mulching, seeding and other temporary erosion control practices as specified.
- E. Install erosion control measures in any ditch, swale or channel before water is allowed to flow in the waterway.
- F. Mechanized equipment will not be permitted in watercourses.

1.02 QUALITY ASSURANCE:

- A. Conform to all requirements of applicable federal, state and local requirements.
- B. Meet with the ENGINEER to discuss erosion control requirements prior to the start of construction.
- C. Standards: "Massachusetts Stormwater Handbook", by the Massachusetts Department of Environmental Protection, February 2008, hereinafter referred to as BMPs.

1.03 SCHEDULE OF IMPLEMENTATION:

- A. All pollution prevention measures and erosion and sedimentation control measures are to be employed before, during, and after soils are exposed. Prior to soil disturbance or soil storage, the CONTRACTOR shall implement all erosion and sedimentation control measures to the greatest extent practicable to ensure that such measures are in-place before the activity occurs. Additional measures shall be employed as the Work progresses. Implementation and maintenance shall occur as necessary until the site is permanently stabilized.
- B. All disturbed areas shall be stabilized with temporary and permanent erosion control practices as soon as practicable, but no more than 14 days after construction activity on a particular portion of the site has temporarily or permanently ceased. Two exceptions to this requirement apply to the project: (1) where construction activities will resume on the

particular portion of the site within 21 days; and (2) where snow cover precludes initiation of stabilization measures.

- C. Disturbed soil areas, material storage areas exposed to precipitation, and in-place erosion control measures will be inspected by the CONTRACTOR and the ENGINEER a minimum of once every 7 days and also within 24 hours after any storm event greater than 0.5 inches of rainfall. Deficiencies in the erosion control measures identified by the inspections shall be corrected by the CONTRACTOR within 7 calendar days.

1.04 REGULATORY COMPLIANCE AND TIMELY COMPLETION

- A. The CONTRACTOR is responsible for coordinating review and approval of the installed erosion controls with the Town of Holbrook Conservation Commission in accordance with the Order of Condition. In addition the CONTRACTOR is responsible to construct the project in accordance with all provisions of the Order of Conditions. Erosion controls must be inspected and approved by a representative from the Town of Holbrook Conservation Commission prior to commencement of construction activities.
- B. The CONTRACTOR is responsible for obtaining the approval of the Conservation Commissions in a timely manner and within the schedule for completion of the work.

PART 2 - PRODUCTS

2.01 MATERIALS: Use the following materials to implement and construct erosion control measures. Other materials require approval of the ENGINEER.

- A. Siltation Fence: Mirafi Environfence, Amoco 1380 Silt Stop, or approved equal.
- B. Mulch: Type and use as specified by the BMP's.
 - 1. Long fibered hay, or straw, in dry condition relatively free of weeds and foreign matter detrimental to plant life.
 - 2. Mulch binder: An asphalt emulsion mulch binder of type acceptable to the ENGINEER.
 - 3. Mulch netting: Plastic or nylon mesh netting with approximate openings of 1/4 inch to 1 inch; or other netting approved by the ENGINEER.
- C. Temporary Erosion Control Matting: Type and use as specified by the BMPs.
 - 1. Rolled matting blanket consisting of curled wood excelsior, coconut fiber, straw or paper bound with a weave of twisted craft paper, cotton cord or plastic mesh.
 - 2. Provide staples for fastening matting to the ground. Staples shall be fabricated in a "U" shape from 11 gage or heavier stiff steel wire, 6 to 12 inches in length and 1 to 2 inches across.

D. Hay Bales:

1. Consist of rectangular shaped bales of hay or straw weighting at least 40 pounds per bale.
2. Free from noxious weed seeds and rough or woody materials.

PART 3 - EXECUTION

3.01 STABILIZATION PRACTICES:

A. Siltation Fence:

1. Construct as shown on Drawings. Install parallel to contours where possible, prior to site clearing and grading activities.
2. Bury lower edge of fabric at least 6 inches below ground surface to prevent underflow.
3. Curve ends of fence uphill to prevent flow around ends.
4. Inspect frequently; repair or replace any damaged sections.
5. Remove fence only when adequate grass catch has been established.

B. Temporary Erosion Control Matting:

1. Surface Preparation:
 - a. Conform to grades and cross sections for slopes and ditches shown on the Drawings.
 - b. Finish to a smooth and even condition with all debris, roots, stones, and lumps raked out and removed.
 - c. Loosen soil surface to permit bedding of the matting.
 - d. Unless otherwise directed, apply seed prior to placement.
2. Installation:
 - a. Place strips lengthwise in the direction of the flow of water.
 - b. Where strips are laid parallel or meet as in a tee, overlap at least 4 inches.
 - c. Overlap ends at least 6 inches in a shingle fashion.
 - d. The up-slope end of each strip of the matting shall be turned down and buried to a depth of not less than 6 inches with the soil firmly tamped against it.
 - e. The ENGINEER may require that any other edge exposed to more than normal flow of water be buried in a similar manner.
 - f. Build check slots at right angles to the direction of the flow of water. Space so that one check slot or one end occurs within each 50 feet of slope length. Construct by placing a tight fold of the matting at least 6 inches vertically into the ground, and tamp the same as up-slope ends.
 - g. Bury edges of matting around the edges of catch basins and other structures.
 - h. When ordered, additional seed shall be spread over matting, particularly at those

locations disturbed by building the slots. Matting shall then be pressed onto the ground with a light lawn roller or by other satisfactory means.

- i. Drive staples vertically into the ground flush with the surface.
- j. On slopes flatter than 4:1, space staples not more than 3 feet and one row, alternately spaced, down the center.
- k. On grades 4:1 or steeper, place staples in the same three rows, but spaced 2 feet apart.
- l. On all overlapping or butting edges, double the number of staples, with the spacing halved; all ends of the matting and all required check slots shall likewise have staples spaced every foot.

E. Hay Bales:

1. Place as ordered to provide for temporary control of erosion, and in ditches at 100 foot minimum intervals.
2. Install as shown on Drawings, and stake with required stakes.

F. Dust Control: Utilize the application of sprinkled water to prevent the emission of airborne soil particulates from the Project site. Project work will be immediately halted if any visible dust emissions are observed; soils will be wetted, and work may resume upon elimination of visible dust.

G. Other Temporary Measures:

1. Utilize other temporary erosion control measures as directed by the ENGINEER.
2. Type and use shall be as specified in the BMPs.

3.02 MAINTENANCE:

- A. Inspect erosion controls immediately after each rainfall and at least daily during prolonged rainfall or snowmelt for damage. Make appropriate repairs or replacement at no additional cost to the OWNER, until project acceptance.
- B. Remove silt from siltation fence when it has reached one-half the fence height, or prior to expected heavy runoff or siltation.
- C. Repair matting if any staples become loosened or raised, or if any matting becomes loose, torn, or undermined. Make satisfactory repairs immediately.
- D. Maintain areas mulched or matted, at no additional cost to the OWNER, until project acceptance.

3.03 REMOVAL OF TEMPORARY EROSION CONTROL:

- A. Remove temporary materials and measures when permanent soil stabilization has been achieved. Re-use materials in good condition if approved by the ENGINEER.
- B. Level and grade to the extent required to present a slightly appearance and to prevent any obstruction of the flow of water or any other interference with the operation of or access to

the permanent works.

- C. Remove unsuitable materials from site and dispose of in a lawful manner.

*** END OF SECTION ***

APPENDIX F: ANALYTICAL LAB REPORTS

December 16, 2013

Craig Blake
Woodard & Curran, Inc. - Dedham MA
980 Washington Street, Suite 325
Dedham, MA 02026

Project Location: Holbrook, MA
Client Job Number:
Project Number: 225604
Laboratory Work Order Number: 13L0311

Enclosed are results of analyses for samples received by the laboratory on December 6, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley
Project Manager

Woodard & Curran, Inc. - Dedham MA
980 Washington Street, Suite 325
Dedham, MA 02026
ATTN: Craig Blake

REPORT DATE: 12/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 225604

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13L0311

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Holbrook, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
GP-1 (0-4)	13L0311-01	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 8270D	
GP-1 (4-8)	13L0311-02	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 8270D	
GP-2 (0-4)	13L0311-03	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 8270D	
GP- 2 (4-8)	13L0311-04	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 8270D	
GP-3 (0-4)	13L0311-05	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 8270D	
GP-3 (4-8)	13L0311-06	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 8270D	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

MADEP-EPH-04-1.1**Qualifications:**

Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.

Analyte & Samples(s) Qualified:**Benzo(a)pyrene**

B086746-MS1

Potential false positive result due to a non-petroleum hydrocarbon peak or peaks within the aliphatic/aromatic range.

Analyte & Samples(s) Qualified:**C11-C22 Aromatics, Unadjusted C11-C22 Aromatics**

13L0311-01[GP-1 (0-4)], 13L0311-03[GP-2 (0-4)], 13L0311-04[GP- 2 (4-8)], 13L0311-05[GP-3 (0-4)]

SW-846 8270D**Qualifications:**

Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:**4-Chloroaniline, Bis(2-Ethylhexyl)phthalate**

13L0311-06[GP-3 (4-8)], B086827-MS1, B086827-MSD1

Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is outside of the method specified criteria. Reduced precision anticipated for any reported result for this compound.

Analyte & Samples(s) Qualified:**Di-n-octylphthalate**

B086827-MSD1

Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this compound in this sample.

Analyte & Samples(s) Qualified:**Di-n-octylphthalate**

13L0311-06[GP-3 (4-8)], B086827-MS1

Elevated reporting limit due to high concentration of target compounds. MA CAM reporting limit not met.

Analyte & Samples(s) Qualified:

13L0311-01RE1[GP-1 (0-4)], 13L0311-03[GP-2 (0-4)], 13L0311-03RE1[GP-2 (0-4)], 13L0311-04[GP- 2 (4-8)], 13L0311-05[GP-3 (0-4)]

Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.

Analyte & Samples(s) Qualified:**Benzo(g,h,i)perylene, Pyrene**

13L0311-05[GP-3 (0-4)]

Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side.

Analyte & Samples(s) Qualified:**4-Nitrophenol**

B086827-MS1, B086827-MSD1

Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:**4-Nitrophenol**

13L0311-01[GP-1 (0-4)], 13L0311-02[GP-1 (4-8)], 13L0311-06[GP-3 (4-8)]

MADEP-EPH-04-1.1

SPE cartridge contamination with non-petroleum compounds, if present, is verified by GC/MS in each method blank per extraction batch and excluded from C11-C22 aromatic range fraction in all samples in the batch. No significant modifications were made to the method.

SW-846 8270D

Laboratory control sample recoveries for required MCP Data Enhancement 8270 compounds were all within control limits specified by the method, 40-140% for base/neutrals and 30-130% for acids except for "difficult analytes" listed below and/or otherwise listed in this narrative. Difficult analytes limits are 15 and 140%: 2,4-dinitrophenol, 4-chloroaniline, 4-nitrophenol, and phenol.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-1 (0-4)

Sampled: 12/5/2013 09:49

Sample ID: 13L0311-01

Sample Matrix: Soil

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Acenaphthylene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Acetophenone	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Aniline	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Anthracene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Benzo(a)anthracene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Benzo(a)pyrene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Benzo(b)fluoranthene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Benzo(g,h,i)perylene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Benzo(k)fluoranthene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Bis(2-chloroethoxy)methane	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Bis(2-chloroethyl)ether	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Bis(2-chloroisopropyl)ether	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Bis(2-Ethylhexyl)phthalate	61	7.7	mg/Kg dry	20		SW-846 8270D	12/10/13	12/13/13 17:55	CMR
4-Bromophenylphenylether	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Butylbenzylphthalate	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
4-Chloroaniline	ND	0.74	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2-Chloronaphthalene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2-Chlorophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Chrysene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Dibenz(a,h)anthracene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Dibenzofuran	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Di-n-butylphthalate	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
1,2-Dichlorobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
1,3-Dichlorobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
1,4-Dichlorobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
3,3-Dichlorobenzidine	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2,4-Dichlorophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Diethylphthalate	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2,4-Dimethylphenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Dimethylphthalate	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2,4-Dinitrophenol	ND	0.74	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2,4-Dinitrotoluene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2,6-Dinitrotoluene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Di-n-octylphthalate	ND	0.75	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
1,2-Diphenylhydrazine (as Azobenzene)	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Fluoranthene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Fluorene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Hexachlorobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Hexachlorobutadiene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Hexachloroethane	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Indeno(1,2,3-cd)pyrene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Isophorone	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2-Methylnaphthalene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-1 (0-4)

Sampled: 12/5/2013 09:49

Sample ID: 13L0311-01

Sample Matrix: Soil

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2-Methylphenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
3/4-Methylphenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Naphthalene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Nitrobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2-Nitrophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
4-Nitrophenol	ND	0.74	mg/Kg dry	1	V-20	SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Pentachlorophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Phenanthrene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Phenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Pyrene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
1,2,4-Trichlorobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2,4,5-Trichlorophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
2,4,6-Trichlorophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 21:55	CMR
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
2-Fluorophenol	60.1	30-130						12/12/13 21:55	
Phenol-d6	71.6	30-130						12/12/13 21:55	
Nitrobenzene-d5	64.6	30-130						12/12/13 21:55	
2-Fluorobiphenyl	67.5	30-130						12/12/13 21:55	
2,4,6-Tribromophenol	54.7	30-130						12/12/13 21:55	
p-Terphenyl-d14	51.3	30-130						12/12/13 21:55	

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-1 (0-4)

Sampled: 12/5/2013 09:49

Sample ID: 13L0311-01

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Unadjusted C11-C22 Aromatics	150	11	mg/Kg dry	1	Q-01	MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
C11-C22 Aromatics	150	11	mg/Kg dry	1	Q-01	MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 21:57	SCS
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	63.7	40-140						12/11/13 21:57	
o-Terphenyl (OTP)	81.6	40-140						12/11/13 21:57	
2-Bromonaphthalene	103	40-140						12/11/13 21:57	
2-Fluorobiphenyl	112	40-140						12/11/13 21:57	

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Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Sampled: 12/5/2013 09:49

Field Sample #: GP-1 (0-4)

Sample ID: 13L0311-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.7		% Wt	1		SM 2540G	12/12/13	12/13/13 9:55	WAL

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-1 (4-8)

Sampled: 12/5/2013 09:55

Sample ID: 13L0311-02

Sample Matrix: Soil

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Acenaphthylene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Acetophenone	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Aniline	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Anthracene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Benzo(a)anthracene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Benzo(a)pyrene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Benzo(b)fluoranthene	0.35	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Benzo(g,h,i)perylene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Benzo(k)fluoranthene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Bis(2-chloroethoxy)methane	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Bis(2-chloroethyl)ether	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Bis(2-chloroisopropyl)ether	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Bis(2-Ethylhexyl)phthalate	0.77	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
4-Bromophenylphenylether	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Butylbenzylphthalate	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
4-Chloroaniline	ND	0.73	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2-Chloronaphthalene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2-Chlorophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Chrysene	0.30	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Dibenz(a,h)anthracene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Dibenzofuran	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Di-n-butylphthalate	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
1,2-Dichlorobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
1,3-Dichlorobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
1,4-Dichlorobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
3,3-Dichlorobenzidine	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2,4-Dichlorophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Diethylphthalate	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2,4-Dimethylphenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Dimethylphthalate	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2,4-Dinitrophenol	ND	0.73	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2,4-Dinitrotoluene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2,6-Dinitrotoluene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Di-n-octylphthalate	ND	0.74	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
1,2-Diphenylhydrazine (as Azobenzene)	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Fluoranthene	0.51	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Fluorene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Hexachlorobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Hexachlorobutadiene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Hexachloroethane	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Indeno(1,2,3-cd)pyrene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Isophorone	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2-Methylnaphthalene	0.22	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-1 (4-8)

Sampled: 12/5/2013 09:55

Sample ID: 13L0311-02

Sample Matrix: Soil

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2-Methylphenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
3/4-Methylphenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Naphthalene	ND	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Nitrobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2-Nitrophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
4-Nitrophenol	ND	0.73	mg/Kg dry	1	V-20	SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Pentachlorophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Phenanthrene	0.43	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Phenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Pyrene	0.20	0.19	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
1,2,4-Trichlorobenzene	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2,4,5-Trichlorophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
2,4,6-Trichlorophenol	ND	0.38	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 22:23	CMR
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
2-Fluorophenol	59.2	30-130						12/12/13 22:23	
Phenol-d6	80.0	30-130						12/12/13 22:23	
Nitrobenzene-d5	63.7	30-130						12/12/13 22:23	
2-Fluorobiphenyl	72.8	30-130						12/12/13 22:23	
2,4,6-Tribromophenol	64.0	30-130						12/12/13 22:23	
p-Terphenyl-d14	54.3	30-130						12/12/13 22:23	

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-1 (4-8)

Sampled: 12/5/2013 09:55

Sample ID: 13L0311-02

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Unadjusted C11-C22 Aromatics	35	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
C11-C22 Aromatics	32	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Benzo(a)anthracene	0.12	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Benzo(a)pyrene	0.14	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Benzo(b)fluoranthene	0.42	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Benzo(g,h,i)perylene	0.13	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Benzo(k)fluoranthene	0.11	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Chrysene	0.32	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Fluoranthene	0.43	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Fluorene	0.16	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Indeno(1,2,3-cd)pyrene	0.18	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
2-Methylnaphthalene	0.21	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Naphthalene	0.22	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Phenanthrene	0.36	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS
Pyrene	0.38	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:18	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	57.0	40-140	
o-Terphenyl (OTP)	69.4	40-140	
2-Bromonaphthalene	101	40-140	
2-Fluorobiphenyl	111	40-140	

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Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-1 (4-8)

Sampled: 12/5/2013 09:55

Sample ID: 13L0311-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.4		% Wt	1		SM 2540G	12/12/13	12/13/13 9:55	WAL

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-2 (0-4)

Sampled: 12/5/2013 10:40

Sample ID: 13L0311-03

Sample Matrix: Soil

Sample Flags: RL-05

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Acenaphthylene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Acetophenone	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Aniline	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Anthracene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Benzo(a)anthracene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Benzo(a)pyrene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Benzo(b)fluoranthene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Benzo(g,h,i)perylene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Benzo(k)fluoranthene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Bis(2-chloroethoxy)methane	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Bis(2-chloroethyl)ether	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Bis(2-chloroisopropyl)ether	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Bis(2-Ethylhexyl)phthalate	5500	750	mg/Kg dry	2000		SW-846 8270D	12/10/13	12/16/13 12:17	CMR
4-Bromophenylphenylether	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Butylbenzylphthalate	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
4-Chloroaniline	ND	7.3	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2-Chloronaphthalene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2-Chlorophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Chrysene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Dibenz(a,h)anthracene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Dibenzofuran	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Di-n-butylphthalate	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
1,2-Dichlorobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
1,3-Dichlorobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
1,4-Dichlorobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
3,3-Dichlorobenzidine	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2,4-Dichlorophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Diethylphthalate	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2,4-Dimethylphenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Dimethylphthalate	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2,4-Dinitrophenol	ND	7.3	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2,4-Dinitrotoluene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2,6-Dinitrotoluene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Di-n-octylphthalate	ND	7.4	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
1,2-Diphenylhydrazine (as Azobenzene)	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Fluoranthene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Fluorene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Hexachlorobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Hexachlorobutadiene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Hexachloroethane	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Indeno(1,2,3-cd)pyrene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Isophorone	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2-Methylnaphthalene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-2 (0-4)

Sampled: 12/5/2013 10:40

Sample ID: 13L0311-03

Sample Matrix: Soil

Sample Flags: RL-05

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2-Methylphenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
3/4-Methylphenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Naphthalene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Nitrobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2-Nitrophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
4-Nitrophenol	ND	7.3	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Pentachlorophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Phenanthrene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Phenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Pyrene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
1,2,4-Trichlorobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2,4,5-Trichlorophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
2,4,6-Trichlorophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 10:32	CMR
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
2-Fluorophenol	67.8	30-130						12/16/13 10:32	
Phenol-d6	79.2	30-130						12/16/13 10:32	
Nitrobenzene-d5	69.5	30-130						12/16/13 10:32	
2-Fluorobiphenyl	73.2	30-130						12/16/13 10:32	
2,4,6-Tribromophenol	69.6	30-130						12/16/13 10:32	
p-Terphenyl-d14	74.6	30-130						12/16/13 10:32	

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-2 (0-4)

Sampled: 12/5/2013 10:40

Sample ID: 13L0311-03

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Unadjusted C11-C22 Aromatics	5200	550	mg/Kg dry	50	Q-01	MADEP-EPH-04-1.1	12/10/13	12/12/13 10:34	SCS
C11-C22 Aromatics	5100	550	mg/Kg dry	50	Q-01	MADEP-EPH-04-1.1	12/10/13	12/12/13 10:34	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:38	SCS
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	51.3	40-140							
o-Terphenyl (OTP)	57.0	40-140							
2-Bromonaphthalene	80.4	40-140							
2-Fluorobiphenyl	99.7	40-140							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Sampled: 12/5/2013 10:40

Field Sample #: GP-2 (0-4)

Sample ID: 13L0311-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.5		% Wt	1		SM 2540G	12/12/13	12/13/13 9:55	WAL

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP- 2 (4-8)

Sampled: 12/5/2013 10:45

Sample ID: 13L0311-04

Sample Matrix: Soil

Sample Flags: RL-05

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Acenaphthylene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Acetophenone	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Aniline	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Anthracene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Benzo(a)anthracene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Benzo(a)pyrene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Benzo(b)fluoranthene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Benzo(g,h,i)perylene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Benzo(k)fluoranthene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Bis(2-chloroethoxy)methane	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Bis(2-chloroethyl)ether	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Bis(2-chloroisopropyl)ether	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Bis(2-Ethylhexyl)phthalate	1200	190	mg/Kg dry	500		SW-846 8270D	12/10/13	12/15/13 14:19	CMR
4-Bromophenylphenylether	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Butylbenzylphthalate	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
4-Chloroaniline	ND	7.2	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2-Chloronaphthalene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2-Chlorophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Chrysene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Dibenz(a,h)anthracene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Dibenzofuran	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Di-n-butylphthalate	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
1,2-Dichlorobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
1,3-Dichlorobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
1,4-Dichlorobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
3,3-Dichlorobenzidine	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2,4-Dichlorophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Diethylphthalate	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2,4-Dimethylphenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Dimethylphthalate	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2,4-Dinitrophenol	ND	7.2	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2,4-Dinitrotoluene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2,6-Dinitrotoluene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Di-n-octylphthalate	ND	7.3	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
1,2-Diphenylhydrazine (as Azobenzene)	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Fluoranthene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Fluorene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Hexachlorobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Hexachlorobutadiene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Hexachloroethane	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Indeno(1,2,3-cd)pyrene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Isophorone	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2-Methylnaphthalene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP- 2 (4-8)

Sampled: 12/5/2013 10:45

Sample ID: 13L0311-04

Sample Matrix: Soil

Sample Flags: RL-05

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2-Methylphenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
3/4-Methylphenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Naphthalene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Nitrobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2-Nitrophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
4-Nitrophenol	ND	7.2	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Pentachlorophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Phenanthrene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Phenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
Pyrene	ND	1.9	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
1,2,4-Trichlorobenzene	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2,4,5-Trichlorophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR
2,4,6-Trichlorophenol	ND	3.7	mg/Kg dry	10		SW-846 8270D	12/10/13	12/16/13 11:05	CMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual
2-Fluorophenol	69.0	30-130	12/16/13 11:05
Phenol-d6	69.5	30-130	12/16/13 11:05
Nitrobenzene-d5	74.0	30-130	12/16/13 11:05
2-Fluorobiphenyl	69.5	30-130	12/16/13 11:05
2,4,6-Tribromophenol	83.7	30-130	12/16/13 11:05
p-Terphenyl-d14	71.8	30-130	12/16/13 11:05

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP- 2 (4-8)

Sampled: 12/5/2013 10:45

Sample ID: 13L0311-04

Sample Matrix: Soil

Petroroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Unadjusted C11-C22 Aromatics	1800	220	mg/Kg dry	20	Q-01	MADEP-EPH-04-1.1	12/10/13	12/12/13 10:13	SCS
C11-C22 Aromatics	1800	220	mg/Kg dry	20	Q-01	MADEP-EPH-04-1.1	12/10/13	12/12/13 10:13	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 22:59	SCS
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	57.3	40-140							
o-Terphenyl (OTP)	65.9	40-140							
2-Bromonaphthalene	90.9	40-140							
2-Fluorobiphenyl	99.4	40-140							

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Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Sampled: 12/5/2013 10:45

Field Sample #: GP- 2 (4-8)

Sample ID: 13L0311-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.6		% Wt	1		SM 2540G	12/12/13	12/13/13 9:55	WAL

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-3 (0-4)

Sampled: 12/5/2013 10:15

Sample ID: 13L0311-05

Sample Matrix: Soil

Sample Flags: RL-05

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Acenaphthylene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Acetophenone	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Aniline	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Anthracene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Benzo(a)anthracene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Benzo(a)pyrene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Benzo(b)fluoranthene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Benzo(g,h,i)perylene	ND	0.92	mg/Kg dry	5	V-05	SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Benzo(k)fluoranthene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Bis(2-chloroethoxy)methane	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Bis(2-chloroethyl)ether	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Bis(2-chloroisopropyl)ether	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Bis(2-Ethylhexyl)phthalate	15	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
4-Bromophenylphenylether	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Butylbenzylphthalate	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
4-Chloroaniline	ND	3.6	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2-Chloronaphthalene	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2-Chlorophenol	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Chrysene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Dibenz(a,h)anthracene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Dibenzofuran	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Di-n-butylphthalate	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
1,2-Dichlorobenzene	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
1,3-Dichlorobenzene	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
1,4-Dichlorobenzene	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
3,3-Dichlorobenzidine	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2,4-Dichlorophenol	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Diethylphthalate	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2,4-Dimethylphenol	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Dimethylphthalate	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2,4-Dinitrophenol	ND	3.6	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2,4-Dinitrotoluene	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2,6-Dinitrotoluene	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Di-n-octylphthalate	ND	3.6	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
1,2-Diphenylhydrazine (as Azobenzene)	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Fluoranthene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Fluorene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Hexachlorobenzene	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Hexachlorobutadiene	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Hexachloroethane	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Indeno(1,2,3-cd)pyrene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Isophorone	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2-Methylnaphthalene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-3 (0-4)

Sampled: 12/5/2013 10:15

Sample ID: 13L0311-05

Sample Matrix: Soil

Sample Flags: RL-05

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2-Methylphenol	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
3/4-Methylphenol	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Naphthalene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Nitrobenzene	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2-Nitrophenol	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
4-Nitrophenol	ND	3.6	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Pentachlorophenol	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Phenanthrene	ND	0.92	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Phenol	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Pyrene	ND	0.92	mg/Kg dry	5	V-05	SW-846 8270D	12/10/13	12/13/13 19:24	CMR
1,2,4-Trichlorobenzene	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2,4,5-Trichlorophenol	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
2,4,6-Trichlorophenol	ND	1.8	mg/Kg dry	5		SW-846 8270D	12/10/13	12/13/13 19:24	CMR
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
2-Fluorophenol	84.6	30-130						12/13/13 19:24	
Phenol-d6	91.6	30-130						12/13/13 19:24	
Nitrobenzene-d5	86.3	30-130						12/13/13 19:24	
2-Fluorobiphenyl	85.4	30-130						12/13/13 19:24	
2,4,6-Tribromophenol	96.6	30-130						12/13/13 19:24	
p-Terphenyl-d14	68.9	30-130						12/13/13 19:24	

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-3 (0-4)

Sampled: 12/5/2013 10:15

Sample ID: 13L0311-05

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Unadjusted C11-C22 Aromatics	420	54	mg/Kg dry	5	Q-01	MADEP-EPH-04-1.1	12/10/13	12/12/13 11:29	SCS
C11-C22 Aromatics	420	54	mg/Kg dry	5	Q-01	MADEP-EPH-04-1.1	12/10/13	12/12/13 11:29	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:19	SCS
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	46.0	40-140							
o-Terphenyl (OTP)	53.8	40-140							
2-Bromonaphthalene	93.3	40-140							
2-Fluorobiphenyl	100	40-140							

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Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Sampled: 12/5/2013 10:15

Field Sample #: GP-3 (0-4)

Sample ID: 13L0311-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.6		% Wt	1		SM 2540G	12/12/13	12/13/13 9:55	WAL

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Sampled: 12/5/2013 10:19

Field Sample #: GP-3 (4-8)

Sample ID: 13L0311-06

Sample Matrix: Soil

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Acenaphthylene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Acetophenone	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Aniline	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Anthracene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Benzo(a)anthracene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Benzo(a)pyrene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Benzo(b)fluoranthene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Benzo(g,h,i)perylene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Benzo(k)fluoranthene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Bis(2-chloroethoxy)methane	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Bis(2-chloroethyl)ether	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Bis(2-chloroisopropyl)ether	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Bis(2-Ethylhexyl)phthalate	2.3	0.37	mg/Kg dry	1	MS-09	SW-846 8270D	12/10/13	12/12/13 20:27	CMR
4-Bromophenylphenylether	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Butylbenzylphthalate	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
4-Chloroaniline	ND	0.71	mg/Kg dry	1	MS-09	SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2-Chloronaphthalene	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2-Chlorophenol	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Chrysene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Dibenz(a,h)anthracene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Dibenzofuran	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Di-n-butylphthalate	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
1,2-Dichlorobenzene	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
1,3-Dichlorobenzene	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
1,4-Dichlorobenzene	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
3,3-Dichlorobenzidine	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2,4-Dichlorophenol	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Diethylphthalate	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2,4-Dimethylphenol	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Dimethylphthalate	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2,4-Dinitrophenol	ND	0.71	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2,4-Dinitrotoluene	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2,6-Dinitrotoluene	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Di-n-octylphthalate	ND	0.73	mg/Kg dry	1	R-06	SW-846 8270D	12/10/13	12/12/13 20:27	CMR
1,2-Diphenylhydrazine (as Azobenzene)	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Fluoranthene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Fluorene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Hexachlorobenzene	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Hexachlorobutadiene	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Hexachloroethane	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Indeno(1,2,3-cd)pyrene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Isophorone	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2-Methylnaphthalene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-3 (4-8)

Sampled: 12/5/2013 10:19

Sample ID: 13L0311-06

Sample Matrix: Soil

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2-Methylphenol	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
3/4-Methylphenol	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Naphthalene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Nitrobenzene	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2-Nitrophenol	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
4-Nitrophenol	ND	0.71	mg/Kg dry	1	V-20	SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Pentachlorophenol	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Phenanthrene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Phenol	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Pyrene	ND	0.18	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
1,2,4-Trichlorobenzene	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2,4,5-Trichlorophenol	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
2,4,6-Trichlorophenol	ND	0.37	mg/Kg dry	1		SW-846 8270D	12/10/13	12/12/13 20:27	CMR
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
2-Fluorophenol	66.9	30-130						12/12/13 20:27	
Phenol-d6	78.3	30-130						12/12/13 20:27	
Nitrobenzene-d5	73.2	30-130						12/12/13 20:27	
2-Fluorobiphenyl	72.4	30-130						12/12/13 20:27	
2,4,6-Tribromophenol	81.5	30-130						12/12/13 20:27	
p-Terphenyl-d14	66.6	30-130						12/12/13 20:27	

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Field Sample #: GP-3 (4-8)

Sampled: 12/5/2013 10:19

Sample ID: 13L0311-06

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Unadjusted C11-C22 Aromatics	31	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
C11-C22 Aromatics	31	11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	12/10/13	12/11/13 23:40	SCS
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	50.9	40-140						12/11/13 23:40	
o-Terphenyl (OTP)	67.3	40-140						12/11/13 23:40	
2-Bromonaphthalene	97.0	40-140						12/11/13 23:40	
2-Fluorobiphenyl	103	40-140						12/11/13 23:40	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Holbrook, MA

Sample Description:

Work Order: 13L0311

Date Received: 12/6/2013

Sampled: 12/5/2013 10:19

Field Sample #: GP-3 (4-8)

Sample ID: 13L0311-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.1		% Wt	1		SM 2540G	12/12/13	12/13/13 9:55	WAL

Sample Extraction Data**Prep Method: SW-846 3546-MADEP-EPH-04-1.1**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13L0311-01 [GP-1 (0-4)]	B086746	20.0	2.00	12/10/13
13L0311-02 [GP-1 (4-8)]	B086746	20.0	2.00	12/10/13
13L0311-03 [GP-2 (0-4)]	B086746	20.0	2.00	12/10/13
13L0311-04 [GP- 2 (4-8)]	B086746	20.0	2.00	12/10/13
13L0311-05 [GP-3 (0-4)]	B086746	20.0	2.00	12/10/13
13L0311-06 [GP-3 (4-8)]	B086746	20.0	2.00	12/10/13

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13L0311-01 [GP-1 (0-4)]	B086961	12/12/13
13L0311-02 [GP-1 (4-8)]	B086961	12/12/13
13L0311-03 [GP-2 (0-4)]	B086961	12/12/13
13L0311-04 [GP- 2 (4-8)]	B086961	12/12/13
13L0311-05 [GP-3 (0-4)]	B086961	12/12/13
13L0311-06 [GP-3 (4-8)]	B086961	12/12/13

Prep Method: SW-846 3546-SW-846 8270D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13L0311-01 [GP-1 (0-4)]	B086827	30.1	1.00	12/10/13
13L0311-01RE1 [GP-1 (0-4)]	B086827	30.1	1.00	12/10/13
13L0311-02 [GP-1 (4-8)]	B086827	30.1	1.00	12/10/13
13L0311-03 [GP-2 (0-4)]	B086827	30.1	1.00	12/10/13
13L0311-03RE1 [GP-2 (0-4)]	B086827	30.1	1.00	12/10/13
13L0311-04 [GP- 2 (4-8)]	B086827	30.0	1.00	12/10/13
13L0311-04RE1 [GP- 2 (4-8)]	B086827	30.0	1.00	12/10/13
13L0311-05 [GP-3 (0-4)]	B086827	30.1	1.00	12/10/13
13L0311-06 [GP-3 (4-8)]	B086827	30.1	1.00	12/10/13

QUALITY CONTROL
Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B086827 - SW-846 3546
Blank (B086827-BLK1)

Prepared: 12/10/13 Analyzed: 12/12/13

Acenaphthene	ND	0.17	mg/Kg wet
Acenaphthylene	ND	0.17	mg/Kg wet
Acetophenone	ND	0.34	mg/Kg wet
Aniline	ND	0.34	mg/Kg wet
Anthracene	ND	0.17	mg/Kg wet
Benzo(a)anthracene	ND	0.17	mg/Kg wet
Benzo(a)pyrene	ND	0.17	mg/Kg wet
Benzo(b)fluoranthene	ND	0.17	mg/Kg wet
Benzo(g,h,i)perylene	ND	0.17	mg/Kg wet
Benzo(k)fluoranthene	ND	0.17	mg/Kg wet
Bis(2-chloroethoxy)methane	ND	0.34	mg/Kg wet
Bis(2-chloroethyl)ether	ND	0.34	mg/Kg wet
Bis(2-chloroisopropyl)ether	ND	0.34	mg/Kg wet
Bis(2-Ethylhexyl)phthalate	ND	0.34	mg/Kg wet
4-Bromophenylphenylether	ND	0.34	mg/Kg wet
Butylbenzylphthalate	ND	0.34	mg/Kg wet
4-Chloroaniline	ND	0.66	mg/Kg wet
2-Chloronaphthalene	ND	0.34	mg/Kg wet
2-Chlorophenol	ND	0.34	mg/Kg wet
Chrysene	ND	0.17	mg/Kg wet
Dibenz(a,h)anthracene	ND	0.17	mg/Kg wet
Dibenzofuran	ND	0.34	mg/Kg wet
Di-n-butylphthalate	ND	0.34	mg/Kg wet
1,2-Dichlorobenzene	ND	0.34	mg/Kg wet
1,3-Dichlorobenzene	ND	0.34	mg/Kg wet
1,4-Dichlorobenzene	ND	0.34	mg/Kg wet
3,3-Dichlorobenzidine	ND	0.17	mg/Kg wet
2,4-Dichlorophenol	ND	0.34	mg/Kg wet
Diethylphthalate	ND	0.34	mg/Kg wet
2,4-Dimethylphenol	ND	0.34	mg/Kg wet
Dimethylphthalate	ND	0.34	mg/Kg wet
2,4-Dinitrophenol	ND	0.66	mg/Kg wet
2,4-Dinitrotoluene	ND	0.34	mg/Kg wet
2,6-Dinitrotoluene	ND	0.34	mg/Kg wet
Di-n-octylphthalate	ND	0.67	mg/Kg wet
1,2-Diphenylhydrazine (as Azobenzene)	ND	0.34	mg/Kg wet
Fluoranthene	ND	0.17	mg/Kg wet
Fluorene	ND	0.17	mg/Kg wet
Hexachlorobenzene	ND	0.34	mg/Kg wet
Hexachlorobutadiene	ND	0.34	mg/Kg wet
Hexachloroethane	ND	0.34	mg/Kg wet
Indeno(1,2,3-cd)pyrene	ND	0.17	mg/Kg wet
Isophorone	ND	0.34	mg/Kg wet
2-Methylnaphthalene	ND	0.17	mg/Kg wet
2-Methylphenol	ND	0.34	mg/Kg wet
3/4-Methylphenol	ND	0.34	mg/Kg wet
Naphthalene	ND	0.17	mg/Kg wet
Nitrobenzene	ND	0.34	mg/Kg wet
2-Nitrophenol	ND	0.34	mg/Kg wet
4-Nitrophenol	ND	0.66	mg/Kg wet
Pentachlorophenol	ND	0.34	mg/Kg wet
Phenanthrene	ND	0.17	mg/Kg wet

QUALITY CONTROL
Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B086827 - SW-846 3546										
Blank (B086827-BLK1)				Prepared: 12/10/13 Analyzed: 12/12/13						
Phenol	ND	0.34	mg/Kg wet							
Pyrene	ND	0.17	mg/Kg wet							
1,2,4-Trichlorobenzene	ND	0.34	mg/Kg wet							
2,4,5-Trichlorophenol	ND	0.34	mg/Kg wet							
2,4,6-Trichlorophenol	ND	0.34	mg/Kg wet							
Surrogate: 2-Fluorophenol	5.79		mg/Kg wet	6.67		86.9	30-130			
Surrogate: Phenol-d6	5.62		mg/Kg wet	6.67		84.3	30-130			
Surrogate: Nitrobenzene-d5	2.66		mg/Kg wet	3.33		79.7	30-130			
Surrogate: 2-Fluorobiphenyl	2.70		mg/Kg wet	3.33		81.0	30-130			
Surrogate: 2,4,6-Tribromophenol	5.09		mg/Kg wet	6.67		76.4	30-130			
Surrogate: p-Terphenyl-d14	3.01		mg/Kg wet	3.33		90.3	30-130			
LCS (B086827-BS1)				Prepared: 12/10/13 Analyzed: 12/12/13						
Acenaphthene	1.59	0.17	mg/Kg wet	1.67		95.4	40-140			
Acenaphthylene	1.60	0.17	mg/Kg wet	1.67		95.9	40-140			
Acetophenone	1.37	0.34	mg/Kg wet	1.67		82.4	40-140			
Aniline	1.11	0.34	mg/Kg wet	1.67		66.8	40-140			
Anthracene	1.80	0.17	mg/Kg wet	1.67		108	40-140			
Benzo(a)anthracene	1.65	0.17	mg/Kg wet	1.67		98.9	40-140			
Benzo(a)pyrene	1.69	0.17	mg/Kg wet	1.67		101	40-140			
Benzo(b)fluoranthene	1.45	0.17	mg/Kg wet	1.67		87.0	40-140			
Benzo(g,h,i)perylene	1.42	0.17	mg/Kg wet	1.67		85.5	40-140			
Benzo(k)fluoranthene	1.71	0.17	mg/Kg wet	1.67		102	40-140			
Bis(2-chloroethoxy)methane	1.65	0.34	mg/Kg wet	1.67		99.1	40-140			
Bis(2-chloroethyl)ether	1.62	0.34	mg/Kg wet	1.67		97.3	40-140			
Bis(2-chloroisopropyl)ether	1.70	0.34	mg/Kg wet	1.67		102	40-140			
Bis(2-Ethylhexyl)phthalate	1.78	0.34	mg/Kg wet	1.67		107	40-140			
4-Bromophenylphenylether	1.68	0.34	mg/Kg wet	1.67		101	40-140			
Butylbenzylphthalate	1.80	0.34	mg/Kg wet	1.67		108	40-140			
4-Chloroaniline	0.550	0.66	mg/Kg wet	1.67		33.0	15-140			†
2-Chloronaphthalene	1.33	0.34	mg/Kg wet	1.67		80.0	40-140			
2-Chlorophenol	1.49	0.34	mg/Kg wet	1.67		89.7	30-130			
Chrysene	1.52	0.17	mg/Kg wet	1.67		91.2	40-140			
Dibenz(a,h)anthracene	1.54	0.17	mg/Kg wet	1.67		92.3	40-140			
Dibenzofuran	1.53	0.34	mg/Kg wet	1.67		91.8	40-140			
Di-n-butylphthalate	1.93	0.34	mg/Kg wet	1.67		116	40-140			
1,2-Dichlorobenzene	1.27	0.34	mg/Kg wet	1.67		76.3	40-140			
1,3-Dichlorobenzene	1.27	0.34	mg/Kg wet	1.67		76.4	40-140			
1,4-Dichlorobenzene	1.25	0.34	mg/Kg wet	1.67		75.3	40-140			
3,3-Dichlorobenzidine	0.926	0.17	mg/Kg wet	1.67		55.6	40-140			
2,4-Dichlorophenol	1.51	0.34	mg/Kg wet	1.67		90.6	30-130			
Diethylphthalate	1.61	0.34	mg/Kg wet	1.67		96.6	40-140			
2,4-Dimethylphenol	1.84	0.34	mg/Kg wet	1.67		110	30-130			
Dimethylphthalate	1.69	0.34	mg/Kg wet	1.67		101	40-140			
2,4-Dinitrophenol	0.427	0.66	mg/Kg wet	1.67		25.6	15-140			†
2,4-Dinitrotoluene	1.51	0.34	mg/Kg wet	1.67		90.6	40-140			
2,6-Dinitrotoluene	1.65	0.34	mg/Kg wet	1.67		99.2	40-140			
Di-n-octylphthalate	1.97	0.67	mg/Kg wet	1.67		118	40-140			
1,2-Diphenylhydrazine (as Azobenzene)	1.91	0.34	mg/Kg wet	1.67		114	40-140			
Fluoranthene	1.77	0.17	mg/Kg wet	1.67		106	40-140			
Fluorene	1.42	0.17	mg/Kg wet	1.67		85.3	40-140			
Hexachlorobenzene	1.79	0.34	mg/Kg wet	1.67		107	40-140			

QUALITY CONTROL
Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B086827 - SW-846 3546										
LCS (B086827-BS1)				Prepared: 12/10/13 Analyzed: 12/12/13						
Hexachlorobutadiene	1.36	0.34	mg/Kg wet	1.67		81.8	40-140			
Hexachloroethane	1.29	0.34	mg/Kg wet	1.67		77.3	40-140			
Indeno(1,2,3-cd)pyrene	1.53	0.17	mg/Kg wet	1.67		92.0	40-140			
Isophorone	1.65	0.34	mg/Kg wet	1.67		99.0	40-140			
2-Methylnaphthalene	1.52	0.17	mg/Kg wet	1.67		90.9	40-140			
2-Methylphenol	1.52	0.34	mg/Kg wet	1.67		91.1	30-130			
3/4-Methylphenol	1.55	0.34	mg/Kg wet	1.67		92.8	30-130			
Naphthalene	1.42	0.17	mg/Kg wet	1.67		85.3	40-140			
Nitrobenzene	1.52	0.34	mg/Kg wet	1.67		91.4	40-140			
2-Nitrophenol	1.54	0.34	mg/Kg wet	1.67		92.4	30-130			
4-Nitrophenol	1.36	0.66	mg/Kg wet	1.67		81.7	15-140			†
Pentachlorophenol	1.21	0.34	mg/Kg wet	1.67		72.9	30-130			
Phenanthrene	1.56	0.17	mg/Kg wet	1.67		93.8	40-140			
Phenol	1.34	0.34	mg/Kg wet	1.67		80.7	15-140			†
Pyrene	1.75	0.17	mg/Kg wet	1.67		105	40-140			
1,2,4-Trichlorobenzene	1.43	0.34	mg/Kg wet	1.67		85.6	40-140			
2,4,5-Trichlorophenol	1.46	0.34	mg/Kg wet	1.67		87.7	30-130			
2,4,6-Trichlorophenol	1.39	0.34	mg/Kg wet	1.67		83.2	30-130			
Surrogate: 2-Fluorophenol	6.16		mg/Kg wet	6.67		92.4	30-130			
Surrogate: Phenol-d6	6.08		mg/Kg wet	6.67		91.2	30-130			
Surrogate: Nitrobenzene-d5	2.85		mg/Kg wet	3.33		85.6	30-130			
Surrogate: 2-Fluorobiphenyl	2.72		mg/Kg wet	3.33		81.6	30-130			
Surrogate: 2,4,6-Tribromophenol	6.22		mg/Kg wet	6.67		93.3	30-130			
Surrogate: p-Terphenyl-d14	3.23		mg/Kg wet	3.33		97.0	30-130			
LCS Dup (B086827-BS1)				Prepared: 12/10/13 Analyzed: 12/12/13						
Acenaphthene	1.53	0.17	mg/Kg wet	1.67		91.6	40-140	4.04	30	
Acenaphthylene	1.51	0.17	mg/Kg wet	1.67		90.6	40-140	5.66	30	
Acetophenone	1.32	0.34	mg/Kg wet	1.67		79.0	40-140	4.29	30	
Aniline	0.961	0.34	mg/Kg wet	1.67		57.6	40-140	14.7	30	
Anthracene	1.68	0.17	mg/Kg wet	1.67		101	40-140	6.89	30	
Benzo(a)anthracene	1.59	0.17	mg/Kg wet	1.67		95.3	40-140	3.67	30	
Benzo(a)pyrene	1.60	0.17	mg/Kg wet	1.67		96.0	40-140	5.49	30	
Benzo(b)fluoranthene	1.35	0.17	mg/Kg wet	1.67		80.7	40-140	7.49	30	
Benzo(g,h,i)perylene	1.50	0.17	mg/Kg wet	1.67		90.2	40-140	5.37	30	
Benzo(k)fluoranthene	1.55	0.17	mg/Kg wet	1.67		93.0	40-140	9.64	30	
Bis(2-chloroethoxy)methane	1.59	0.34	mg/Kg wet	1.67		95.6	40-140	3.57	30	
Bis(2-chloroethyl)ether	1.62	0.34	mg/Kg wet	1.67		97.2	40-140	0.185	30	
Bis(2-chloroisopropyl)ether	1.68	0.34	mg/Kg wet	1.67		101	40-140	0.968	30	
Bis(2-Ethylhexyl)phthalate	1.70	0.34	mg/Kg wet	1.67		102	40-140	4.23	30	
4-Bromophenylphenylether	1.57	0.34	mg/Kg wet	1.67		94.4	40-140	6.69	30	
Butylbenzylphthalate	1.65	0.34	mg/Kg wet	1.67		99.3	40-140	8.41	30	
4-Chloroaniline	0.604	0.66	mg/Kg wet	1.67		36.3	15-140	9.35	30	†
2-Chloronaphthalene	1.18	0.34	mg/Kg wet	1.67		70.8	40-140	12.3	30	
2-Chlorophenol	1.46	0.34	mg/Kg wet	1.67		87.6	30-130	2.39	30	
Chrysene	1.45	0.17	mg/Kg wet	1.67		87.2	40-140	4.51	30	
Dibenz(a,h)anthracene	1.58	0.17	mg/Kg wet	1.67		94.5	40-140	2.40	30	
Dibenzofuran	1.46	0.34	mg/Kg wet	1.67		87.6	40-140	4.71	30	
Di-n-butylphthalate	1.84	0.34	mg/Kg wet	1.67		110	40-140	5.07	30	
1,2-Dichlorobenzene	1.34	0.34	mg/Kg wet	1.67		80.7	40-140	5.53	30	
1,3-Dichlorobenzene	1.27	0.34	mg/Kg wet	1.67		76.0	40-140	0.578	30	
1,4-Dichlorobenzene	1.26	0.34	mg/Kg wet	1.67		75.6	40-140	0.371	30	

QUALITY CONTROL
Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B086827 - SW-846 3546
LCS Dup (B086827-BSD1)

Prepared: 12/10/13 Analyzed: 12/12/13

3,3-Dichlorobenzidine	0.980	0.17	mg/Kg wet	1.67		58.8	40-140	5.63	30	
2,4-Dichlorophenol	1.41	0.34	mg/Kg wet	1.67		84.6	30-130	6.87	30	
Diethylphthalate	1.56	0.34	mg/Kg wet	1.67		93.6	40-140	3.18	30	
2,4-Dimethylphenol	1.73	0.34	mg/Kg wet	1.67		104	30-130	6.11	30	
Dimethylphthalate	1.60	0.34	mg/Kg wet	1.67		95.9	40-140	5.42	30	
2,4-Dinitrophenol	0.391	0.66	mg/Kg wet	1.67		23.5	15-140	8.88	30	†
2,4-Dinitrotoluene	1.37	0.34	mg/Kg wet	1.67		82.0	40-140	9.96	30	
2,6-Dinitrotoluene	1.56	0.34	mg/Kg wet	1.67		93.7	40-140	5.70	30	
Di-n-octylphthalate	1.67	0.67	mg/Kg wet	1.67		100	40-140	16.5	30	
1,2-Diphenylhydrazine (as Azobenzene)	1.77	0.34	mg/Kg wet	1.67		106	40-140	7.36	30	
Fluoranthene	1.73	0.17	mg/Kg wet	1.67		104	40-140	2.34	30	
Fluorene	1.38	0.17	mg/Kg wet	1.67		83.1	40-140	2.61	30	
Hexachlorobenzene	1.71	0.34	mg/Kg wet	1.67		102	40-140	4.71	30	
Hexachlorobutadiene	1.37	0.34	mg/Kg wet	1.67		82.1	40-140	0.317	30	
Hexachloroethane	1.31	0.34	mg/Kg wet	1.67		78.7	40-140	1.74	30	
Indeno(1,2,3-cd)pyrene	1.60	0.17	mg/Kg wet	1.67		96.3	40-140	4.57	30	
Isophorone	1.60	0.34	mg/Kg wet	1.67		95.9	40-140	3.14	30	
2-Methylnaphthalene	1.47	0.17	mg/Kg wet	1.67		88.1	40-140	3.17	30	
2-Methylphenol	1.56	0.34	mg/Kg wet	1.67		93.8	30-130	2.96	30	
3/4-Methylphenol	1.46	0.34	mg/Kg wet	1.67		87.6	30-130	5.81	30	
Naphthalene	1.39	0.17	mg/Kg wet	1.67		83.6	40-140	1.99	30	
Nitrobenzene	1.49	0.34	mg/Kg wet	1.67		89.2	40-140	2.39	30	
2-Nitrophenol	1.49	0.34	mg/Kg wet	1.67		89.1	30-130	3.66	30	
4-Nitrophenol	1.24	0.66	mg/Kg wet	1.67		74.5	15-140	9.24	30	†
Pentachlorophenol	1.13	0.34	mg/Kg wet	1.67		67.5	30-130	7.58	30	
Phenanthrene	1.52	0.17	mg/Kg wet	1.67		91.4	40-140	2.55	30	
Phenol	1.30	0.34	mg/Kg wet	1.67		78.1	15-140	3.30	30	†
Pyrene	1.57	0.17	mg/Kg wet	1.67		94.2	40-140	10.7	30	
1,2,4-Trichlorobenzene	1.39	0.34	mg/Kg wet	1.67		83.5	40-140	2.48	30	
2,4,5-Trichlorophenol	1.44	0.34	mg/Kg wet	1.67		86.5	30-130	1.38	30	
2,4,6-Trichlorophenol	1.31	0.34	mg/Kg wet	1.67		78.8	30-130	5.43	30	
Surrogate: 2-Fluorophenol	6.05		mg/Kg wet	6.67		90.7	30-130			
Surrogate: Phenol-d6	5.41		mg/Kg wet	6.67		81.2	30-130			
Surrogate: Nitrobenzene-d5	2.75		mg/Kg wet	3.33		82.4	30-130			
Surrogate: 2-Fluorobiphenyl	2.64		mg/Kg wet	3.33		79.1	30-130			
Surrogate: 2,4,6-Tribromophenol	5.99		mg/Kg wet	6.67		89.9	30-130			
Surrogate: p-Terphenyl-d14	2.87		mg/Kg wet	3.33		86.0	30-130			

Matrix Spike (B086827-MS1)

Source: 13L0311-06

Prepared: 12/10/13 Analyzed: 12/12/13

Acenaphthene	1.60	0.18	mg/Kg dry	1.81	ND	88.5	40-140			
Acenaphthylene	1.56	0.18	mg/Kg dry	1.81	ND	86.4	40-140			
Acetophenone	1.70	0.37	mg/Kg dry	1.81	ND	94.1	40-140			
Aniline	1.00	0.37	mg/Kg dry	1.81	ND	55.3	40-140			
Anthracene	1.65	0.18	mg/Kg dry	1.81	ND	91.2	40-140			
Benzo(a)anthracene	1.64	0.18	mg/Kg dry	1.81	ND	90.6	40-140			
Benzo(a)pyrene	1.68	0.18	mg/Kg dry	1.81	ND	92.8	40-140			
Benzo(b)fluoranthene	1.76	0.18	mg/Kg dry	1.81	ND	97.3	40-140			
Benzo(g,h,i)perylene	0.965	0.18	mg/Kg dry	1.81	ND	53.3	40-140			
Benzo(k)fluoranthene	1.80	0.18	mg/Kg dry	1.81	ND	99.7	40-140			
Bis(2-chloroethoxy)methane	1.61	0.37	mg/Kg dry	1.81	ND	88.7	40-140			
Bis(2-chloroethyl)ether	1.53	0.37	mg/Kg dry	1.81	ND	84.5	40-140			
Bis(2-chloroisopropyl)ether	1.28	0.37	mg/Kg dry	1.81	ND	70.5	40-140			

QUALITY CONTROL
Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B086827 - SW-846 3546										
Matrix Spike (B086827-MS1)	Source: 13L0311-06			Prepared: 12/10/13 Analyzed: 12/12/13						
Bis(2-Ethylhexyl)phthalate	1.92	0.37	mg/Kg dry	1.81	2.26	-18.9	*	40-140		MS-09
4-Bromophenylphenylether	1.73	0.37	mg/Kg dry	1.81	ND	95.7		40-140		
Butylbenzylphthalate	1.41	0.37	mg/Kg dry	1.81	ND	77.8		40-140		
4-Chloroaniline	0.557	0.72	mg/Kg dry	1.81	ND	30.8	*	40-140		MS-09
2-Chloronaphthalene	1.40	0.37	mg/Kg dry	1.81	ND	77.1		40-140		
2-Chlorophenol	1.58	0.37	mg/Kg dry	1.81	ND	87.4		30-130		
Chrysene	1.58	0.18	mg/Kg dry	1.81	ND	87.5		40-140		
Dibenz(a,h)anthracene	1.14	0.18	mg/Kg dry	1.81	ND	63.0		40-140		
Dibenzofuran	1.59	0.37	mg/Kg dry	1.81	ND	87.9		40-140		
Di-n-butylphthalate	1.60	0.37	mg/Kg dry	1.81	ND	88.7		40-140		
1,2-Dichlorobenzene	1.49	0.37	mg/Kg dry	1.81	ND	82.1		40-140		
1,3-Dichlorobenzene	1.36	0.37	mg/Kg dry	1.81	ND	75.3		40-140		
1,4-Dichlorobenzene	1.41	0.37	mg/Kg dry	1.81	ND	77.9		40-140		
3,3-Dichlorobenzidine	1.03	0.18	mg/Kg dry	1.81	ND	57.0		40-140		
2,4-Dichlorophenol	1.71	0.37	mg/Kg dry	1.81	ND	94.2		30-130		
Diethylphthalate	1.53	0.37	mg/Kg dry	1.81	ND	84.6		40-140		
2,4-Dimethylphenol	1.71	0.37	mg/Kg dry	1.81	ND	94.5		30-130		
Dimethylphthalate	1.65	0.37	mg/Kg dry	1.81	ND	91.0		40-140		
2,4-Dinitrophenol	1.48	0.72	mg/Kg dry	1.81	ND	81.9		30-130		
2,4-Dinitrotoluene	1.56	0.37	mg/Kg dry	1.81	ND	86.1		40-140		
2,6-Dinitrotoluene	1.69	0.37	mg/Kg dry	1.81	ND	93.1		40-140		
Di-n-octylphthalate	2.18	0.73	mg/Kg dry	1.81	ND	120		40-140		R-06
1,2-Diphenylhydrazine (as Azobenzene)	1.70	0.37	mg/Kg dry	1.81	ND	94.0		40-140		
Fluoranthene	1.63	0.18	mg/Kg dry	1.81	ND	89.9		40-140		
Fluorene	1.52	0.18	mg/Kg dry	1.81	ND	83.7		40-140		
Hexachlorobenzene	1.77	0.37	mg/Kg dry	1.81	ND	97.6		40-140		
Hexachlorobutadiene	1.45	0.37	mg/Kg dry	1.81	ND	80.0		40-140		
Hexachloroethane	1.41	0.37	mg/Kg dry	1.81	ND	78.1		40-140		
Indeno(1,2,3-cd)pyrene	1.06	0.18	mg/Kg dry	1.81	ND	58.4		40-140		
Isophorone	1.63	0.37	mg/Kg dry	1.81	ND	90.1		40-140		
2-Methylnaphthalene	1.76	0.18	mg/Kg dry	1.81	ND	97.5		40-140		
2-Methylphenol	2.01	0.37	mg/Kg dry	1.81	ND	111		30-130		
3/4-Methylphenol	2.00	0.37	mg/Kg dry	1.81	ND	110		30-130		
Naphthalene	1.59	0.18	mg/Kg dry	1.81	ND	88.1		40-140		
Nitrobenzene	1.44	0.37	mg/Kg dry	1.81	ND	79.4		40-140		
2-Nitrophenol	1.53	0.37	mg/Kg dry	1.81	ND	84.3		30-130		
4-Nitrophenol	1.40	0.72	mg/Kg dry	1.81	ND	77.4		30-130		V-06
Pentachlorophenol	1.67	0.37	mg/Kg dry	1.81	ND	92.0		30-130		
Phenanthrene	1.65	0.18	mg/Kg dry	1.81	ND	91.4		40-140		
Phenol	1.47	0.37	mg/Kg dry	1.81	ND	81.1		30-130		
Pyrene	1.03	0.18	mg/Kg dry	1.81	ND	57.2		40-140		
1,2,4-Trichlorobenzene	1.50	0.37	mg/Kg dry	1.81	ND	83.0		40-140		
2,4,5-Trichlorophenol	1.58	0.37	mg/Kg dry	1.81	ND	87.5		30-130		
2,4,6-Trichlorophenol	1.51	0.37	mg/Kg dry	1.81	ND	83.7		30-130		
Surrogate: 2-Fluorophenol	5.12		mg/Kg dry	7.24		70.8		30-130		
Surrogate: Phenol-d6	5.98		mg/Kg dry	7.24		82.7		30-130		
Surrogate: Nitrobenzene-d5	2.71		mg/Kg dry	3.62		75.0		30-130		
Surrogate: 2-Fluorobiphenyl	2.82		mg/Kg dry	3.62		77.9		30-130		
Surrogate: 2,4,6-Tribromophenol	5.74		mg/Kg dry	7.24		79.3		30-130		
Surrogate: p-Terphenyl-d14	2.30		mg/Kg dry	3.62		63.5		30-130		

QUALITY CONTROL

Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B086827 - SW-846 3546										
Matrix Spike Dup (B086827-MSD1)	Source: 13L0311-06			Prepared: 12/10/13 Analyzed: 12/12/13						
Acenaphthene	1.68	0.18	mg/Kg dry	1.81	ND	93.0	40-140	5.05	30	
Acenaphthylene	1.64	0.18	mg/Kg dry	1.81	ND	90.6	40-140	4.79	30	
Acetophenone	1.88	0.37	mg/Kg dry	1.81	ND	104	40-140	10.1	30	
Aniline	1.01	0.37	mg/Kg dry	1.81	ND	56.0	40-140	1.26	30	
Anthracene	1.75	0.18	mg/Kg dry	1.81	ND	96.5	40-140	5.69	30	
Benzo(a)anthracene	1.76	0.18	mg/Kg dry	1.81	ND	97.4	40-140	7.23	30	
Benzo(a)pyrene	1.81	0.18	mg/Kg dry	1.81	ND	100	40-140	7.75	30	
Benzo(b)fluoranthene	2.08	0.18	mg/Kg dry	1.81	ND	115	40-140	16.6	30	
Benzo(g,h,i)perylene	0.869	0.18	mg/Kg dry	1.81	ND	48.0	40-140	10.5	30	
Benzo(k)fluoranthene	2.06	0.18	mg/Kg dry	1.81	ND	114	40-140	13.5	30	
Bis(2-chloroethoxy)methane	1.69	0.37	mg/Kg dry	1.81	ND	93.6	40-140	5.42	30	
Bis(2-chloroethyl)ether	1.71	0.37	mg/Kg dry	1.81	ND	94.5	40-140	11.2	30	
Bis(2-chloroisopropyl)ether	1.37	0.37	mg/Kg dry	1.81	ND	75.8	40-140	7.14	30	
Bis(2-Ethylhexyl)phthalate	2.27	0.37	mg/Kg dry	1.81	2.26	0.733 *	40-140	16.9	30	MS-09
4-Bromophenylphenylether	1.99	0.37	mg/Kg dry	1.81	ND	110	40-140	13.7	30	
Butylbenzylphthalate	1.48	0.37	mg/Kg dry	1.81	ND	81.8	40-140	5.04	30	
4-Chloroaniline	0.498	0.72	mg/Kg dry	1.81	ND	27.5 *	40-140	11.2	30	MS-09
2-Chloronaphthalene	1.64	0.37	mg/Kg dry	1.81	ND	90.5	40-140	16.0	30	
2-Chlorophenol	1.78	0.37	mg/Kg dry	1.81	ND	98.2	30-130	11.7	30	
Chrysene	1.71	0.18	mg/Kg dry	1.81	ND	94.2	40-140	7.40	30	
Dibenz(a,h)anthracene	1.04	0.18	mg/Kg dry	1.81	ND	57.3	40-140	9.44	30	
Dibenzofuran	1.59	0.37	mg/Kg dry	1.81	ND	88.0	40-140	0.0682	30	
Di-n-butylphthalate	1.64	0.37	mg/Kg dry	1.81	ND	90.6	40-140	2.21	30	
1,2-Dichlorobenzene	1.55	0.37	mg/Kg dry	1.81	ND	85.6	40-140	4.15	30	
1,3-Dichlorobenzene	1.44	0.37	mg/Kg dry	1.81	ND	79.6	40-140	5.50	30	
1,4-Dichlorobenzene	1.46	0.37	mg/Kg dry	1.81	ND	80.8	40-140	3.65	30	
3,3-Dichlorobenzidine	1.04	0.18	mg/Kg dry	1.81	ND	57.6	40-140	1.08	30	
2,4-Dichlorophenol	1.71	0.37	mg/Kg dry	1.81	ND	94.4	30-130	0.191	30	
Diethylphthalate	1.43	0.37	mg/Kg dry	1.81	ND	78.8	40-140	7.02	30	
2,4-Dimethylphenol	1.89	0.37	mg/Kg dry	1.81	ND	105	30-130	10.2	30	
Dimethylphthalate	1.65	0.37	mg/Kg dry	1.81	ND	91.2	40-140	0.285	30	
2,4-Dinitrophenol	1.35	0.72	mg/Kg dry	1.81	ND	74.4	30-130	9.55	30	
2,4-Dinitrotoluene	1.37	0.37	mg/Kg dry	1.81	ND	75.5	40-140	13.0	30	
2,6-Dinitrotoluene	1.65	0.37	mg/Kg dry	1.81	ND	91.1	40-140	2.26	30	
Di-n-octylphthalate	3.00	0.73	mg/Kg dry	1.81	ND	166 *	40-140	31.8 *	30	MS-23
1,2-Diphenylhydrazine (as Azobenzene)	2.04	0.37	mg/Kg dry	1.81	ND	113	40-140	18.2	30	
Fluoranthene	1.73	0.18	mg/Kg dry	1.81	ND	95.6	40-140	6.21	30	
Fluorene	1.44	0.18	mg/Kg dry	1.81	ND	79.5	40-140	5.25	30	
Hexachlorobenzene	1.97	0.37	mg/Kg dry	1.81	ND	109	40-140	11.1	30	
Hexachlorobutadiene	1.53	0.37	mg/Kg dry	1.81	ND	84.5	40-140	5.50	30	
Hexachloroethane	1.47	0.37	mg/Kg dry	1.81	ND	81.2	40-140	3.94	30	
Indeno(1,2,3-cd)pyrene	0.956	0.18	mg/Kg dry	1.81	ND	52.8	40-140	10.1	30	
Isophorone	1.70	0.37	mg/Kg dry	1.81	ND	94.1	40-140	4.30	30	
2-Methylnaphthalene	1.71	0.18	mg/Kg dry	1.81	ND	94.6	40-140	2.98	30	
2-Methylphenol	2.17	0.37	mg/Kg dry	1.81	ND	120	30-130	7.36	30	
3/4-Methylphenol	1.92	0.37	mg/Kg dry	1.81	ND	106	30-130	3.96	30	
Naphthalene	1.62	0.18	mg/Kg dry	1.81	ND	89.6	40-140	1.73	30	
Nitrobenzene	1.52	0.37	mg/Kg dry	1.81	ND	84.3	40-140	5.96	30	
2-Nitrophenol	1.63	0.37	mg/Kg dry	1.81	ND	89.8	30-130	6.27	30	
4-Nitrophenol	1.18	0.72	mg/Kg dry	1.81	ND	64.9	30-130	17.5	30	V-06
Pentachlorophenol	1.70	0.37	mg/Kg dry	1.81	ND	93.7	30-130	1.79	30	
Phenanthrene	1.81	0.18	mg/Kg dry	1.81	ND	100	40-140	9.16	30	

QUALITY CONTROL
Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B086827 - SW-846 3546
Matrix Spike Dup (B086827-MSD1)
Source: 13L0311-06

Prepared: 12/10/13 Analyzed: 12/12/13

Phenol	1.59	0.37	mg/Kg dry	1.81	ND	87.9	30-130	8.02	30	
Pyrene	0.989	0.18	mg/Kg dry	1.81	ND	54.6	40-140	4.51	30	
1,2,4-Trichlorobenzene	1.60	0.37	mg/Kg dry	1.81	ND	88.5	40-140	6.44	30	
2,4,5-Trichlorophenol	1.51	0.37	mg/Kg dry	1.81	ND	83.4	30-130	4.73	30	
2,4,6-Trichlorophenol	1.64	0.37	mg/Kg dry	1.81	ND	90.8	30-130	8.19	30	
Surrogate: 2-Fluorophenol	5.50		mg/Kg dry	7.24		76.0	30-130			
Surrogate: Phenol-d6	6.11		mg/Kg dry	7.24		84.4	30-130			
Surrogate: Nitrobenzene-d5	2.90		mg/Kg dry	3.62		80.1	30-130			
Surrogate: 2-Fluorobiphenyl	3.25		mg/Kg dry	3.62		89.8	30-130			
Surrogate: 2,4,6-Tribromophenol	4.92		mg/Kg dry	7.24		68.0	30-130			
Surrogate: p-Terphenyl-d14	2.16		mg/Kg dry	3.62		59.6	30-130			

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B086746 - SW-846 3546
Blank (B086746-BLK1)

Prepared & Analyzed: 12/10/13

C9-C18 Aliphatics	ND	10	mg/Kg wet							
C19-C36 Aliphatics	ND	10	mg/Kg wet							
Unadjusted C11-C22 Aromatics	ND	10	mg/Kg wet							
C11-C22 Aromatics	ND	10	mg/Kg wet							
Acenaphthene	ND	0.10	mg/Kg wet							
Acenaphthylene	ND	0.10	mg/Kg wet							
Anthracene	ND	0.10	mg/Kg wet							
Benzo(a)anthracene	ND	0.10	mg/Kg wet							
Benzo(a)pyrene	ND	0.10	mg/Kg wet							
Benzo(b)fluoranthene	ND	0.10	mg/Kg wet							
Benzo(g,h,i)perylene	ND	0.10	mg/Kg wet							
Benzo(k)fluoranthene	ND	0.10	mg/Kg wet							
Chrysene	ND	0.10	mg/Kg wet							
Dibenz(a,h)anthracene	ND	0.10	mg/Kg wet							
Fluoranthene	ND	0.10	mg/Kg wet							
Fluorene	ND	0.10	mg/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	0.10	mg/Kg wet							
2-Methylnaphthalene	ND	0.10	mg/Kg wet							
Naphthalene	ND	0.10	mg/Kg wet							
Phenanthrene	ND	0.10	mg/Kg wet							
Pyrene	ND	0.10	mg/Kg wet							
n-Decane	ND	0.10	mg/Kg wet							
n-Docosane	ND	0.10	mg/Kg wet							
n-Dodecane	ND	0.10	mg/Kg wet							
n-Eicosane	ND	0.10	mg/Kg wet							
n-Hexacosane	ND	0.10	mg/Kg wet							
n-Hexadecane	ND	0.10	mg/Kg wet							
n-Hexatriacontane	ND	0.10	mg/Kg wet							
n-Nonadecane	ND	0.10	mg/Kg wet							
n-Nonane	ND	0.10	mg/Kg wet							
n-Octacosane	ND	0.10	mg/Kg wet							
n-Octadecane	ND	0.10	mg/Kg wet							
n-Tetracosane	ND	0.10	mg/Kg wet							
n-Tetradecane	ND	0.10	mg/Kg wet							
n-Triacontane	ND	0.10	mg/Kg wet							
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
Surrogate: Chlorooctadecane (COD)	3.45		mg/Kg wet	4.99		69.2	40-140			
Surrogate: o-Terphenyl (OTP)	3.80		mg/Kg wet	5.00		76.0	40-140			
Surrogate: 2-Bromonaphthalene	4.12		mg/Kg wet	5.00		82.4	40-140			
Surrogate: 2-Fluorobiphenyl	4.85		mg/Kg wet	5.00		97.0	40-140			

LCS (B086746-BS1)

Prepared & Analyzed: 12/10/13

Acenaphthene	4.02	0.10	mg/Kg wet	5.00		80.3	40-140			
Acenaphthylene	3.98	0.10	mg/Kg wet	5.00		79.5	40-140			
Anthracene	4.38	0.10	mg/Kg wet	5.00		87.6	40-140			
Benzo(a)anthracene	4.48	0.10	mg/Kg wet	5.00		89.6	40-140			
Benzo(a)pyrene	4.44	0.10	mg/Kg wet	5.00		88.9	40-140			
Benzo(b)fluoranthene	4.59	0.10	mg/Kg wet	5.00		91.8	40-140			
Benzo(g,h,i)perylene	5.24	0.10	mg/Kg wet	5.00		105	40-140			
Benzo(k)fluoranthene	4.43	0.10	mg/Kg wet	5.00		88.6	40-140			
Chrysene	4.14	0.10	mg/Kg wet	5.00		82.9	40-140			

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B086746 - SW-846 3546
LCS (B086746-BS1)

Prepared & Analyzed: 12/10/13

Dibenz(a,h)anthracene	4.97	0.10	mg/Kg wet	5.00		99.5	40-140			
Fluoranthene	4.40	0.10	mg/Kg wet	5.00		88.1	40-140			
Fluorene	4.22	0.10	mg/Kg wet	5.00		84.5	40-140			
Indeno(1,2,3-cd)pyrene	5.24	0.10	mg/Kg wet	5.00		105	40-140			
2-Methylnaphthalene	3.73	0.10	mg/Kg wet	5.00		74.5	40-140			
Naphthalene	3.38	0.10	mg/Kg wet	5.00		67.6	40-140			
Phenanthrene	4.35	0.10	mg/Kg wet	5.00		86.9	40-140			
Pyrene	4.32	0.10	mg/Kg wet	5.00		86.3	40-140			
n-Decane	2.52	0.10	mg/Kg wet	5.00		50.4	40-140			
n-Docosane	4.24	0.10	mg/Kg wet	5.00		84.7	40-140			
n-Dodecane	3.21	0.10	mg/Kg wet	5.00		64.2	40-140			
n-Eicosane	4.16	0.10	mg/Kg wet	5.00		83.2	40-140			
n-Hexacosane	4.22	0.10	mg/Kg wet	5.00		84.5	40-140			
n-Hexadecane	4.07	0.10	mg/Kg wet	5.00		81.5	40-140			
n-Hexatriacontane	4.49	0.10	mg/Kg wet	5.00		89.9	40-140			
n-Nonadecane	4.16	0.10	mg/Kg wet	5.00		83.2	40-140			
n-Nonane	1.70	0.10	mg/Kg wet	5.00		34.0	30-140			
n-Octacosane	4.14	0.10	mg/Kg wet	5.00		82.9	40-140			
n-Octadecane	4.20	0.10	mg/Kg wet	5.00		83.9	40-140			
n-Tetracosane	4.17	0.10	mg/Kg wet	5.00		83.3	40-140			
n-Tetradecane	3.70	0.10	mg/Kg wet	5.00		73.9	40-140			
n-Triacontane	4.32	0.10	mg/Kg wet	5.00		86.4	40-140			
Naphthalene-aliphatic fraction	0.220	0.10	mg/Kg wet	5.00		4.40	0-5			
2-Methylnaphthalene-aliphatic fraction	0.146	0.10	mg/Kg wet	5.00		2.92	0-5			
Surrogate: Chlorooctadecane (COD)	3.79		mg/Kg wet	4.99		76.0	40-140			
Surrogate: o-Terphenyl (OTP)	4.12		mg/Kg wet	5.00		82.3	40-140			
Surrogate: 2-Bromonaphthalene	4.27		mg/Kg wet	5.00		85.3	40-140			
Surrogate: 2-Fluorobiphenyl	4.99		mg/Kg wet	5.00		99.9	40-140			

LCS Dup (B086746-BS1)

Prepared & Analyzed: 12/10/13

Acenaphthene	4.07	0.10	mg/Kg wet	5.00		81.3	40-140	1.23	25	
Acenaphthylene	4.02	0.10	mg/Kg wet	5.00		80.5	40-140	1.21	25	
Anthracene	4.43	0.10	mg/Kg wet	5.00		88.6	40-140	1.10	25	
Benzo(a)anthracene	4.55	0.10	mg/Kg wet	5.00		90.9	40-140	1.50	25	
Benzo(a)pyrene	4.52	0.10	mg/Kg wet	5.00		90.4	40-140	1.70	25	
Benzo(b)fluoranthene	4.66	0.10	mg/Kg wet	5.00		93.2	40-140	1.56	25	
Benzo(g,h,i)perylene	5.34	0.10	mg/Kg wet	5.00		107	40-140	1.85	25	
Benzo(k)fluoranthene	4.51	0.10	mg/Kg wet	5.00		90.2	40-140	1.83	25	
Chrysene	4.21	0.10	mg/Kg wet	5.00		84.1	40-140	1.50	25	
Dibenz(a,h)anthracene	5.08	0.10	mg/Kg wet	5.00		102	40-140	2.03	25	
Fluoranthene	4.46	0.10	mg/Kg wet	5.00		89.1	40-140	1.16	25	
Fluorene	4.27	0.10	mg/Kg wet	5.00		85.4	40-140	1.07	25	
Indeno(1,2,3-cd)pyrene	5.34	0.10	mg/Kg wet	5.00		107	40-140	1.91	25	
2-Methylnaphthalene	3.78	0.10	mg/Kg wet	5.00		75.6	40-140	1.38	25	
Naphthalene	3.42	0.10	mg/Kg wet	5.00		68.4	40-140	1.31	25	
Phenanthrene	4.39	0.10	mg/Kg wet	5.00		87.9	40-140	1.10	25	
Pyrene	4.37	0.10	mg/Kg wet	5.00		87.3	40-140	1.14	25	
n-Decane	2.47	0.10	mg/Kg wet	5.00		49.4	40-140	1.95	25	
n-Docosane	4.12	0.10	mg/Kg wet	5.00		82.3	40-140	2.92	25	
n-Dodecane	3.15	0.10	mg/Kg wet	5.00		63.0	40-140	1.99	25	
n-Eicosane	4.06	0.10	mg/Kg wet	5.00		81.1	40-140	2.49	25	
n-Hexacosane	4.10	0.10	mg/Kg wet	5.00		82.1	40-140	2.87	25	

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B086746 - SW-846 3546										
LCS Dup (B086746-BSD1)				Prepared & Analyzed: 12/10/13						
n-Hexadecane	3.97	0.10	mg/Kg wet	5.00		79.4	40-140	2.63	25	
n-Hexatriacontane	4.37	0.10	mg/Kg wet	5.00		87.4	40-140	2.82	25	
n-Nonadecane	4.05	0.10	mg/Kg wet	5.00		81.0	40-140	2.73	25	
n-Nonane	1.67	0.10	mg/Kg wet	5.00		33.4	30-140	1.84	25	
n-Octacosane	4.02	0.10	mg/Kg wet	5.00		80.4	40-140	3.08	25	
n-Octadecane	4.09	0.10	mg/Kg wet	5.00		81.7	40-140	2.69	25	
n-Tetracosane	4.06	0.10	mg/Kg wet	5.00		81.1	40-140	2.65	25	
n-Tetradecane	3.62	0.10	mg/Kg wet	5.00		72.4	40-140	2.01	25	
n-Triacontane	4.18	0.10	mg/Kg wet	5.00		83.6	40-140	3.31	25	
Naphthalene-aliphatic fraction	0.208	0.10	mg/Kg wet	5.00		4.16	0-5			
2-Methylnaphthalene-aliphatic fraction	0.142	0.10	mg/Kg wet	5.00		2.84	0-5			
Surrogate: Chlorooctadecane (COD)	3.68		mg/Kg wet	4.99		73.8	40-140			
Surrogate: o-Terphenyl (OTP)	4.16		mg/Kg wet	5.00		83.2	40-140			
Surrogate: 2-Bromonaphthalene	4.32		mg/Kg wet	5.00		86.4	40-140			
Surrogate: 2-Fluorobiphenyl	5.06		mg/Kg wet	5.00		101	40-140			
Matrix Spike (B086746-MS1)				Source: 13L0311-01	Prepared: 12/10/13	Analyzed: 12/12/13				
C9-C18 Aliphatics	33.5	11	mg/Kg dry	33.8	9.69	70.3	40-140			
C19-C36 Aliphatics	50.2	11	mg/Kg dry	45.1	10.9	87.2	40-140			
Unadjusted C11-C22 Aromatics	279	11	mg/Kg dry	95.8	146	140	40-140			
Acenaphthene	5.52	0.11	mg/Kg dry	5.64	0.00	97.8	40-140			
Acenaphthylene	5.48	0.11	mg/Kg dry	5.64	0.00	97.2	40-140			
Anthracene	5.55	0.11	mg/Kg dry	5.64	0.00	98.5	40-140			
Benzo(a)anthracene	5.59	0.11	mg/Kg dry	5.64	0.00	99.1	40-140			
Benzo(a)pyrene	9.54	0.11	mg/Kg dry	5.64	0.00	169 *	40-140			MS-22
Benzo(b)fluoranthene	6.28	0.11	mg/Kg dry	5.64	0.00	111	40-140			
Benzo(g,h,i)perylene	6.25	0.11	mg/Kg dry	5.64	0.00	111	40-140			
Benzo(k)fluoranthene	5.88	0.11	mg/Kg dry	5.64	0.00	104	40-140			
Chrysene	5.27	0.11	mg/Kg dry	5.64	0.00	93.5	40-140			
Dibenz(a,h)anthracene	6.08	0.11	mg/Kg dry	5.64	0.00	108	40-140			
Fluoranthene	5.57	0.11	mg/Kg dry	5.64	0.0592	97.8	40-140			
Fluorene	5.61	0.11	mg/Kg dry	5.64	0.0612	98.3	40-140			
Indeno(1,2,3-cd)pyrene	6.26	0.11	mg/Kg dry	5.64	0.00	111	40-140			
2-Methylnaphthalene	5.33	0.11	mg/Kg dry	5.64	0.00	94.5	40-140			
Naphthalene	4.70	0.11	mg/Kg dry	5.64	0.0570	82.4	40-140			
Phenanthrene	5.64	0.11	mg/Kg dry	5.64	0.0775	98.6	40-140			
Pyrene	5.45	0.11	mg/Kg dry	5.64	0.00	96.6	40-140			
n-Nonane	1.92	0.11	mg/Kg dry	5.64	0.00	34.0	30-140			
Surrogate: Chlorooctadecane (COD)	3.97		mg/Kg dry	5.63		70.7	40-140			
Surrogate: o-Terphenyl (OTP)	5.18		mg/Kg dry	5.64		92.0	40-140			
Surrogate: 2-Bromonaphthalene	6.00		mg/Kg dry	5.64		106	40-140			
Surrogate: 2-Fluorobiphenyl	6.58		mg/Kg dry	5.64		117	40-140			

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B086746 - SW-846 3546										
Matrix Spike Dup (B086746-MSD1)	Source: 13L0311-01			Prepared: 12/10/13 Analyzed: 12/12/13						
C9-C18 Aliphatics	32.6	11	mg/Kg dry	33.8	9.69	67.6	40-140	2.74	50	
C19-C36 Aliphatics	47.8	11	mg/Kg dry	45.1	10.9	81.9	40-140	4.91	50	
Unadjusted C11-C22 Aromatics	224	11	mg/Kg dry	95.8	146	81.4	40-140	22.2	50	
Acenaphthene	4.72	0.11	mg/Kg dry	5.64	0.00	83.7	40-140	15.6	50	
Acenaphthylene	4.67	0.11	mg/Kg dry	5.64	0.00	82.8	40-140	15.9	50	
Anthracene	4.72	0.11	mg/Kg dry	5.64	0.00	83.8	40-140	16.1	50	
Benzo(a)anthracene	4.76	0.11	mg/Kg dry	5.64	0.00	84.5	40-140	15.9	50	
Benzo(a)pyrene	7.82	0.11	mg/Kg dry	5.64	0.00	139	40-140	19.9	50	
Benzo(b)fluoranthene	5.28	0.11	mg/Kg dry	5.64	0.00	93.7	40-140	17.3	50	
Benzo(g,h,i)perylene	5.36	0.11	mg/Kg dry	5.64	0.00	95.1	40-140	15.4	50	
Benzo(k)fluoranthene	4.94	0.11	mg/Kg dry	5.64	0.00	87.7	40-140	17.3	50	
Chrysene	4.49	0.11	mg/Kg dry	5.64	0.00	79.7	40-140	15.9	50	
Dibenz(a,h)anthracene	5.16	0.11	mg/Kg dry	5.64	0.00	91.6	40-140	16.2	50	
Fluoranthene	4.75	0.11	mg/Kg dry	5.64	0.0592	83.2	40-140	15.9	50	
Fluorene	4.76	0.11	mg/Kg dry	5.64	0.0612	83.4	40-140	16.3	50	
Indeno(1,2,3-cd)pyrene	5.37	0.11	mg/Kg dry	5.64	0.00	95.3	40-140	15.3	50	
2-Methylnaphthalene	4.58	0.11	mg/Kg dry	5.64	0.00	81.2	40-140	15.1	50	
Naphthalene	4.11	0.11	mg/Kg dry	5.64	0.0570	72.0	40-140	13.3	50	
Phenanthrene	4.79	0.11	mg/Kg dry	5.64	0.0775	83.6	40-140	16.2	50	
Pyrene	4.66	0.11	mg/Kg dry	5.64	0.00	82.6	40-140	15.7	50	
n-Nonane	1.93	0.11	mg/Kg dry	5.64	0.00	34.2	30-140	0.697	50	
Surrogate: Chlorooctadecane (COD)	3.90		mg/Kg dry	5.63		69.4	40-140			
Surrogate: o-Terphenyl (OTP)	4.42		mg/Kg dry	5.64		78.4	40-140			
Surrogate: 2-Bromonaphthalene	5.36		mg/Kg dry	5.64		95.1	40-140			
Surrogate: 2-Fluorobiphenyl	5.86		mg/Kg dry	5.64		104	40-140			

QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B086961 - % Solids

Duplicate (B086961-DUP1)

Source: 13L0311-01

Prepared: 12/12/13 Analyzed: 12/13/13

% Solids	90.4		% Wt		88.7			1.90	20	
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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
MS-09	Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-22	Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is within method specified criteria.
MS-23	Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is outside of the method specified criteria. Reduced precision anticipated for any reported result for this compound.
Q-01	Potential false positive result due to a non-petroleum hydrocarbon peak or peaks within the aliphatic/aromatic range.
R-06	Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this compound in this sample.
RL-05	Elevated reporting limit due to high concentration of target compounds. MA CAM reporting limit not met.
V-05	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.
V-06	Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side.
V-20	Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
MADEP-EPH-04-1.1 in Soil	
C9-C18 Aliphatics	CT,NC,WA,ME,ME,NH-P
C19-C36 Aliphatics	CT,NC,WA,ME,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,WA,ME,ME,NH-P
C11-C22 Aromatics	CT,NC,WA,ME,ME,NH-P
Acenaphthene	CT,NC,WA,ME,ME,NH-P
Acenaphthylene	CT,NC,WA,ME,ME,NH-P
Anthracene	CT,NC,WA,ME,ME,NH-P
Benzo(a)anthracene	CT,NC,WA,ME,ME,NH-P
Benzo(a)pyrene	CT,NC,WA,ME,ME,NH-P
Benzo(b)fluoranthene	CT,NC,WA,ME,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,WA,ME,ME,NH-P
Benzo(k)fluoranthene	CT,NC,WA,ME,ME,NH-P
Chrysene	CT,NC,WA,ME,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,WA,ME,ME,NH-P
Fluoranthene	CT,NC,WA,ME,ME,NH-P
Fluorene	CT,NC,WA,ME,ME
Indeno(1,2,3-cd)pyrene	CT,NC,WA,ME,ME,NH-P
2-Methylnaphthalene	CT,NC,WA,ME,ME
Naphthalene	CT,NC,WA,ME,ME,NH-P
Phenanthrene	CT,NC,WA,ME,ME,NH-P
Pyrene	CT,NC,WA,ME,ME,NH-P
SW-846 8270D in Soil	
Acenaphthene	CT,NY,NH
Acenaphthylene	CT,NY,NH
Acetophenone	NY,NH
Aniline	NY,NH
Anthracene	CT,NY,NH
Benzo(a)anthracene	CT,NY,NH
Benzo(a)pyrene	CT,NY,NH
Benzo(b)fluoranthene	CT,NY,NH
Benzo(g,h,i)perylene	CT,NY,NH
Benzo(k)fluoranthene	CT,NY,NH
Bis(2-chloroethoxy)methane	CT,NY,NH
Bis(2-chloroethyl)ether	CT,NY,NH
Bis(2-chloroisopropyl)ether	CT,NY,NH
Bis(2-Ethylhexyl)phthalate	CT,NY,NH
4-Bromophenylphenylether	CT,NY,NH
Butylbenzylphthalate	CT,NY,NH
4-Chloroaniline	CT,NY,NH
2-Chloronaphthalene	CT,NY,NH
2-Chlorophenol	CT,NY,NH
Chrysene	CT,NY,NH
Dibenz(a,h)anthracene	CT,NY,NH
Dibenzofuran	CT,NY,NH
Di-n-butylphthalate	CT,NY,NH
1,2-Dichlorobenzene	NY,NH

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8270D in Soil</i>	
1,3-Dichlorobenzene	NY,NH
1,4-Dichlorobenzene	NY,NH
3,3-Dichlorobenzidine	CT,NY,NH
2,4-Dichlorophenol	CT,NY,NH
Diethylphthalate	CT,NY,NH
2,4-Dimethylphenol	CT,NY,NH
Dimethylphthalate	CT,NY,NH
2,4-Dinitrophenol	CT,NY,NH
2,4-Dinitrotoluene	CT,NY,NH
2,6-Dinitrotoluene	CT,NY,NH
Di-n-octylphthalate	CT,NY,NH
1,2-Diphenylhydrazine (as Azobenzene)	NY,NH
Fluoranthene	CT,NY,NH
Fluorene	NY,NH
Hexachlorobenzene	CT,NY,NH
Hexachlorobutadiene	CT,NY,NH
Hexachloroethane	CT,NY,NH
Indeno(1,2,3-cd)pyrene	CT,NY,NH
Isophorone	CT,NY,NH
2-Methylnaphthalene	CT,NY,NH
2-Methylphenol	CT,NY,NH
3/4-Methylphenol	CT,NY,NH
Naphthalene	CT,NY,NH
Nitrobenzene	CT,NY,NH
2-Nitrophenol	CT,NY,NH
4-Nitrophenol	CT,NY,NH
Pentachlorophenol	CT,NY,NH
Phenanthrene	CT,NY,NH
Phenol	CT,NY,NH
Pyrene	CT,NY,NH
1,2,4-Trichlorobenzene	CT,NY,NH
2,4,5-Trichlorophenol	CT,NY,NH
2,4,6-Trichlorophenol	CT,NY,NH

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2014
CT	Connecticut Department of Public Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2014
FL	Florida Department of Health	E871027 NELAP	06/30/2014
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2014
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2014
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2014



con-test
ANALYTICAL LABORATORY

Phone: 413-525-2332
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www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Page 1 of 1

Company Name: Woodard + Curran

Telephone: 781-251-0200

Address: 980 Washington Street

Project # 225604

Dedham, MA 02026

Attention: Craig Blake

Client PO#

Project Location: Holbrook, MA

DATA DELIVERY (check all that apply)
☐ FAX ☒ EMAIL ☒ WEBSITE

Sampled By: BVA

Fax #
Email: cblake@woodardcurran.com

Project Proposal Provided? (for billing purposes)
☐ yes ☐ no

Format: ☒ PDF ☒ EXCEL ☐ OGIS
☐ OTHER

Con-Test Lab ID

Client Sample ID / Description

Beginning Date/Time

01 GRP-1 (0-4)

12/5/13 0949

Composite Grab

02 GRP-1 (4-8)

0955

*Matrix

03 GRP-2 (0-4)

1040

Sample Code

04 GRP-2 (4-8)

1045

Sample Code

05 GRP-3 (0-4)

1015

Sample Code

06 GRP-3 (4-8)

1019

Sample Code

Comments: EPH + SVOC collected in same container

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High, M - Medium, L - Low, C - Clean, U - Unknown

Relinquished by (signature)

Date/Time: 12/6/13

Turnaround ☐ 7-Day ☒ 10-Day ☐ Other

Detection Limit Requirements

MA MCP S-1

Received by (signature)

Date/Time: 12/6/13

Massachusetts: MA MCP S-1

Is your project MCP or RCP?

MA State DW Form Required PWSID #

Relinquished by (signature)

Date/Time: 12/6/13

Connecticut:

MA State DW Form Required PWSID #

NEIAC & AIHA-LAP, LLC

Received by (signature)

Date/Time: 12/6/13

Other:

MA State DW Form Required PWSID #

NEIAC & AIHA-LAP, LLC

Received by (signature)

Date/Time: 12/6/13

Other:

MA State DW Form Required PWSID #

NEIAC & AIHA-LAP, LLC

Received by (signature)

Date/Time: 12/6/13

Other:

MA State DW Form Required PWSID #

NEIAC & AIHA-LAP, LLC

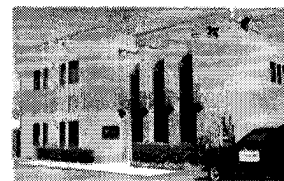
TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR AS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com



Page 1 of 2



Sample Receipt Checklist

CLIENT NAME: Woodard - Curran RECEIVED BY: JMM DATE: 12/6/13

1) Was the chain(s) of custody relinquished and signed? Yes No No CoC Included

2) Does the chain agree with the samples?

Yes No

If not, explain:

3) Are all the samples in good condition?

Yes No

If not, explain:

4) How were the samples received:

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 3.4°C

5) Are there Dissolved samples for the lab to filter?

Yes No

Who was notified _____ Date _____ Time _____

6) Are there any RUSH or SHORT HOLDING TIME samples?

Yes No

Who was notified _____ Date _____ Time _____

7) Location where samples are stored:

19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) Do all samples have the proper Acid pH: Yes No N/A

9) Do all samples have the proper Base pH: Yes No N/A

10) Was the PC notified of any discrepancies with the CoC vs the samples: Yes No N/A

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz <u>amber</u> /clear jar	<u>6</u>
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____

Doc# 277 # Bisulfate _____ # DI Water _____

Rev. 4 August 2013 # Thiosulfate _____ Unpreserved _____

Time and Date Frozen:

Login Sample Receipt Checklist**(Rejection Criteria Listing - Using Sample Acceptance Policy)****Any False statement will be brought to the attention of Client**

<u>Question</u>	<u>Answer (True/False)</u>		<u>Comment</u>
	T/F/NA		
1) The cooler's custody seal, if present, is intact.	NA		
2) The cooler or samples do not appear to have been compromised or tampered with.	T		
3) Samples were received on ice.	T		
4) Cooler Temperature is acceptable.	T		
5) Cooler Temperature is recorded.	T		
6) COC is filled out in ink and legible.	T		
7) COC is filled out with all pertinent information.	T		
8) Field Sampler's name present on COC.	T		
9) There are no discrepancies between the sample IDs on the container and the COC.	T		
10) Samples are received within Holding Time.	T		
11) Sample containers have legible labels.	T		
12) Containers are not broken or leaking.	T		
13) Air Cassettes are not broken/open.	NA		
14) Sample collection date/times are provided.	T		
15) Appropriate sample containers are used.	T		
16) Proper collection media used.	T		
17) No headspace sample bottles are completely filled.	NA		
18) There is sufficient volume for all requested analyses, including any requested MS/MSDs.	T		
19) Trip blanks provided if applicable.	NA		
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA		
21) Samples do not require splitting or compositing.	T		

Doc #277 Rev. 4 August 2013

Who notified of False statements?**Log-In Technician Initials:** JMH**Date/Time:****Date/Time:** 12/6/13 1500

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory

Project #: 13L0311

Project Location: Holbrook, MA

RTN:

This Form provides certifications for the following data set: [list Laboratory Sample ID Number(s)]
13L0311-01 thru 13L0311-06

Matrices: Soil

CAM Protocol (check all that below)

8260 VOC CAM II A ()	7470/7471 Hg CAM IIIB ()	MassDEP VPH CAM IV A ()	8081 Pesticides CAM V B ()	7196 Hex Cr CAM VI B ()	MassDEP APH CAM IX A ()
8270 SVOC CAM II B (X)	7010 Metals CAM III C ()	MassDEP EPH CAM IV A (X)	8151 Herbicides CAM V C ()	8330 Explosives CAM VIII A ()	TO-15 VOC CAM IX B ()
6010 Metals CAM III A ()	6020 Metals CAM III D ()	8082 PCB CAM V A ()	9014 Total Cyanide/PAC CAM VI A ()	6860 Perchlorate CAM VIII B ()	

Affirmative response to Questions A through F is required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ¹
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ¹
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ¹
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ¹
E a	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ¹
E b	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	<input type="checkbox"/> Yes <input type="checkbox"/> No ¹
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all No responses to Questions A through E)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ¹

A response to questions G, H and I below is required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No ¹
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Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were all QC performance standards specified in the CAM protocol(s) achieved?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: 

Position: Laboratory Manager

Printed Name: Daren J. Damboragian

Date: 12/16/13