Barnstable AIRPORT HYANNIS

IMMEDIATE RESPONSE ACTION PLAN
Status Report 7

Barnstable Municipal Airport
Hyannis, Massachusetts

RTN 4-26347

April 2020

Prepared for:
Barnstable Municipal Airport
480 Barnstable Road
Hyannis, MA 02840

Prepared by:
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BARNSTABLE MUNICIPAL AIRPORT
HYANNIS, MASSACHUSETTS
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1.0 INTRODUCTION

The Horsley Witten Group, Inc. (HW) has been retained by the Barnstable Municipal Airport (the "Airport") to develop this seventh Immediate Response Action (IRA) Plan Status Report for its property at 480 Barnstable Road, Hyannis, Massachusetts (Figure 1). HW has prepared this report in accordance with the Massachusetts Contingency Plan 310 CMR 40.0000 (MCP) on behalf of:

Ms. Katie Servis, Airport Manager
Barnstable Municipal Airport
Hyannis, Massachusetts 02601
(508) 775-2020

The report describes IRA related activities conducted between October 2019 and April 2020.

2.0 SUMMARY OF IRA PLAN AND IRA MODIFICATION

An IRA was initiated in response to a Notice of Responsibility (NOR) for Release Tracking Number (RTN) 4-26347 dated November 10, 2016, issued to the Airport by the Massachusetts Department of Environmental Protection (MassDEP). The NOR requested that the Airport conduct additional field investigations to evaluate:

- sources of two types of contaminants previously detected at the Airport and on adjacent properties; and
- to identify potential impacts to public water supply wells operated by the Hyannis Water District at the Mary Dunn and Maher wellfields.

The NOR specifically requests that the Airport investigate Per- and Poly-Fluoroalkyl Substances (PFAS) including perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) previously detected in groundwater at the Airport and several adjacent properties. MassDEP also requested further evaluation of 1,4-dioxane, previously detected in a monitoring well downgradient of the Airport on the Maher wellfield property.

A proposed IRA plan was submitted for approval in response to the NOR. Subsequently, a meeting was held by MassDEP at the Airport that included other stakeholders including the Barnstable Department of Public Works, the Hyannis Water District and Barnstable County representatives (representing the Fire Training Academy). At the meeting, IRA plans were coordinated between the Airport and Fire Training Academy including sampling locations, type of analysis, groundwater modeling, goals and next steps. The IRA plan served as the guide for the soil and groundwater testing conducted since November 2016 to follow up on the results of the previous analyses.

In June 2019, the MassDEP issued a Request for Modified Immediate Response Action Plan/Interim Deadline dated June 18, 2019 (the "Modified IRA Request") to the Airport. The Modified IRA Request asked that the Airport propose response actions to *"reduce infiltration of*

precipitation through PFAS-impacted soil, such as temporarily capping the source areas; excavating and properly disposing of the PFAS-impacted soil; or some equivalent approach". The Airports response is documented in the report titled *Final Immediate Response Action Plan Modification,* prepared by HW and dated December 2019 (the "IRA Modification"). The IRA Modification included details for the installation of a cap in two select areas to reduce precipitation infiltration. The two areas are identified as the Deployment Area and the Airport Rescue and Fire Fighting/Snow Removal Equipment (ARFF/SRE) building. The capped areas total approximately 94,100-square feet. Design details of the proposed caps are included in Appendix A.

2.1 Background

Prior to issuance of the NOR, the Airport had conducted investigations on both PFAS and 1,4-dioxane and provided results to MassDEP. In July 2015, HW sampled groundwater from seven wells for analysis of 1,4-dioxane. The contaminant was detected in well OW-9DD located in the Maher wellfield at a concentration of 0.926 ug/L, above the 0.30 ug/L groundwater standard for 1,4-dioxane. This well is screened from 77 to 87 feet below the ground surface. Samples taken from wells on Airport property did not contain 1,4-dioxane above laboratory reporting levels.

A potential source of 1,4-dioxane at the Airport is a historic release of 1,1,1-trichloroethane (1,1,1-TCA) from an oil/water separator associated with a floor drain in the former Provincetown Boston Airlines hangar (currently leased to Cape Air). Given the screen depth of monitoring well OW-9DD, the 1,4-dioxane may also be from an off-Airport source.

On August 4, 2016, MassDEP issued a Request for Information (RFI) to the Airport requiring investigation of PFAS. On July 1 and 5, 2016, HW collected samples from six monitoring wells and submitted samples for laboratory analysis for the presence of PFOS and PFOA. These compounds were detected in each of the wells tested. At monitoring wells HW-3 and HW-5, the sum of PFOS and PFOA concentrations were 0.0931 and 0.151 ug/L respectively, above the EPA health advisory limit and applicable MassDEP standard of 0.07 ug/L. PFOS and PFOA were also detected above the EPA health advisory limit and applicable MassDEP standard in monitoring well HW-1, located at the upgradient, western boundary of the Airport. The concentrations detected in all the other wells were below 0.07 ug/L.

2.2 Actions Under the IRA Plan

A summary of the IRA activities conducted between October 2019 and April 2020 include:

- Groundwater sampling for 1,4-dioxane;
- Spray water sampling from an Airport fire truck where aqueous film forming foam (AFFF) has historically been sprayed from for PFAS; and
- Completion of design specifications for two cap areas.

3.0 APPLICABLE MCP STANDARDS

In accordance with MCP Section 310 CMR 40.0900, the characterization of risk of harm to health, safety, public welfare, and the environment must be evaluated at each disposal site. This characterization includes the determination of site-specific soil and groundwater categories based on site location and use, and the comparison of laboratory results to these standards (310 CMR 40.0930).

Pursuant to 310 CMR 40.0933, the applicable soil category is selected based upon the frequency, intensity of use, and accessibility of the Airport by adults and children. Based on these criteria, soil at the Airport is category S-1/GW-1 and S-1/GW-3.

Groundwater located within a Current Drinking Water Source Area is considered category GW-1. The Airport is located within several zones of contribution (Zone II) for Barnstable Village, the Hyannis Water District and the Town of Yarmouth. Zone IIs are considered current drinking water sources as defined in 310 CMR 40.0006; thus, category GW-1 is applicable.

Groundwater located within 30 feet of an occupied building that has an average annual depth of less than 15 feet is categorized as GW-2. This is primarily a concern because of the possibility of vapor impacts to indoor air. The average annual depth to groundwater at the site is greater than 15 feet; therefore GW-2 Standards do not apply. Also, all disposal sites shall be considered a potential source of discharge to surface water, and therefore categorized as GW-3. Based on these criteria, categories GW-1 and GW-3 are applicable.

The soil and groundwater standards applicable to the Airport for PFAS and 1,4-dioxane as described in the document titled Final PFAS – Related Changes to the MCP – 2019-12-13 prepared by the MassDEP and promulgated December 27, 2019 as follows:

PFAS Standards				
Analyte	Soil Standard (ug/kg)		Groundwater Standard (ug/l)	
	S-1/GW-1	SW-1/GW-3	GW-1	GW-3
Pefluorodecanoic Acid (PFDA)	0.3	300	N/A	40,000
Perfluoroheptanoic Acid (PFHpA)	0.5	300	N/A	40,000
Perfluorohexanesulfonic Acid (PFHxS)	0.3	300	N/A	500
Perfluorononanoic Acid (PFNA)	0.32	300	N/A	40,000
Perfluorooctanesulfonic Acid (PFOS)	2	300	N/A	500
Perfluorooctanoic Acid (PFOA)	0.72	300	N/A	40,000
PFAS Sum of Six*	N/A	300	0.02	N/A

* PFAS Sum of Six is the sum of PFDA, PFHpA, PFHxS, PFNA, PFOS, and PFOA

1,4-dioxane			
Soil Standard (ug/kg)		Groundwater Standard (ug/l)	
S-1/GW-1	SW-1/GW-3	GW-1	GW-3
200 ug/kg	20,000 ug/kg	0.3	50,000

4.0 HISTORIC FIELD INVESTIGATIONS

Historic field investigations conducted since the November 2016 NOR and documented in prior status reports are summarized below:

- The installation of groundwater monitoring wells at six locations in April 2017: in the vicinity of potential sources of PFAS at the Air Rescue and Fire Fighting (ARFF) Building, at the firefighting training deployment area adjacent to the East Ramp, and at upgradient locations to evaluate potential off-site sources of PFAS and 1,4-dioxane.

- The first round of groundwater samples for PFAS and 1,4-dioxane were collected on April 5-7 and April 11, 2017. Additional groundwater samples and one surface water sample were collected for analysis of PFAS on June 20, 2017.

- An initial round of three soil samples were collected on December 6, 2016 as reported in the first status report. One sample was taken from each location where it was determined that AFFF had been used at the Airport, including the site of an airplane crash in 1981, the Deployment Area, and the 1991 Drill Location along the dirt road adjacent to the Deployment Area.

- A second round of soil samples were collected on June 20, 2017 adjacent to the ARFF building and within the Deployment Area to begin to determine the extent of PFAS within the surface soils. Based on the results of these analyses, a third round of samples from these two locations were collected on September 26, 2017. The third round of sampling was designed to further delineate the extent of PFAS in soils both horizontally and vertically, with samples taken at the ground surface and at two and four feet below ground surface (BGS).

- In October 2017, three composite soil samples were taken from piles of sediment and topsoil associated with the redevelopment of Runway 15/33. These piles were located on Airport property at the site of the former Mildred's Restaurant and were analyzed for PFAS compounds to evaluate if sediment removed from the Airport as part of this redevelopment contained PFAS.

- Two samples of AFFF concentrate were analyzed for PFAS compounds to evaluate the foam.

- Six PFAS soil samples were also analyzed for leaching potential using an SPLP test between September and October 2017. The chosen samples included four samples from within the boundaries of the PFAS sites at the Airport and two samples from runway reconstruction soils stockpiled at the Airport.

- On August 14, 2018, 24 PFAS surface soil samples were collected in proximity to the ARFF Building and the Deployment Area. PFAS compounds were previously detected in these areas and additional samples were collected to determine the vertical extent of PFAS impacts in soil and to refine the Disposal Site boundary at the Airport.

- In October 2018, three soil borings (DL11, DL14 and HW-F) were advanced in the Deployment Area. One soil boring (ARFF3) was advanced and one surface soil sample (HW-3) was collected near the ARFF Building in order to further delineate the extent of PFAS in soils both horizontally and vertically. All soil borings were advanced using direct push methods.

- In October 2018, six monitoring wells were installed at the Airport. A cluster of three wells (HW-G(s), HW-G(m), and HW-G(d)) was installed at an upgradient location to evaluate potential off-site sources of PFAS. Three additional wells (HW-H, HW-I, and HW-J) were installed southeast of the Deployment Area adjacent to the East Ramp.

- In November 2018, six groundwater samples were collected to evaluate PFAS concentrations in the Deployment Area. Four groundwater samples and one surface water sample from Mary Dunn Pond were also collected for analysis of oxygen and hydrogen isotopes to determine the contribution of pond water from Mary Dunn Pond to the four downgradient wells.

- In December 2018, two soil samples were collected from the 1991 Drill Location to determine if PFAS detected in the area are related to background conditions.

- In December 2018, 12 groundwater samples were collected for analysis of PFAS and 13 groundwater samples were collected for analysis of oxygen and hydrogen isotopes to determine the contribution of pond water from Mary Dunn Pond to the 13 downgradient wells. Groundwater samples were also collected from four monitoring wells in the Maher Wellfield for analysis of 1,4-dioxane.

- In February 2019, three additional surface soil samples were collected to further delineate the Disposal Site boundary around the ARFF building.

- In May and June 2019, HW installed nine groundwater monitoring wells to delineate the vertical and horizontal extent of PFAS and 1,4-dioxane at the Airport and on adjacent hydraulically upgradient properties.

- In June 2019, eight groundwater samples were collected from newly installed groundwater monitoring wells HW-L, HW-K, HW-I (m), HW-I (d), HW-M, HW-D(d), HW-D (dd), and HW-N for PFAS.

- In July 2019, one groundwater sample was collected from the newly installed groundwater monitoring wells HW-O for PFAS. One groundwater sample was collected from HW-L for 1,4-dioxane.

- In July 2019, two surface water samples were collected from Upper Gate and Lewis Ponds.

- In August 2019, four groundwater samples were collected from monitoring wells HW-N, HW-A(d), HW-O, and HW-1 to evaluate potential sources of 1,4-dioxane entering the Airport from unknown upgradient sources(s). One groundwater sample was also collected from groundwater monitoring well HW-E for PFAS.

- In August 2019, soil sample DL 11 (0-1) was collected from the Deployment Area.

- In August 2019, six spray water samples were collected from discharge locations on a fire truck at the Airport. The samples were collected to determine the concentration of residual PFAS (if any) that remained within the truck. The purpose of this sampling was to determine the appropriateness of spraying water from the equipment as recommended by the manufacturer in areas outside of the known disposal site boundary after these areas are capped in 2020. Foam has not been sprayed at the Airport since 2015. However, the fire trucks do store foam within them in the event they are needed to respond to an emergency. The equipment manufacturer recommends that water be sprayed from the trucks daily to verify that they work and are ready in the event of an emergency. The water sprayed from the trucks **should not contain any foam or foam residue.** The water exiting the tested truck contained PFAS at concentrations above the GW-1 standard. The Airport contacted the equipment manufacturer immediately to determine any potential sources of PFAS that could have skewed the results. The manufacturer recommended checking components within the valve mechanism for AFFF that may have become worn out and allowed a finite amount of the stored AFFF to be mixed with the water even though the mechanism was not engaged.

Soil, surface water and groundwater sampling locations are indicated on Figures 2 through 4. Tabulated soil, groundwater, and spray water data are included on Tables 1 through 5. Laboratory data packages and soil boring logs associated with historic field investigations have previously been submitted to MassDEP and are available in other IRA Status Reports.

5.0 FIELD INVESTIGATIONS CONDUCTED DURING THE CURRENT REPORTING PERIOD

Details concerning field investigations conducted between October 2019 and April 2020 are summarized below.

- On September 27, 2019, HW collected groundwater samples from six monitoring wells located on the Airport for 1,4-dioxane analysis. Results from the analysis were received on October 8, 2019 and were not included in the previous status report. Analytical results are included in Table 2 and the location of the monitoring wells are indicated on Figures 2 and 3. The laboratory report for the samples are included in Appendix B. To date, 1,4-dioxane has only been detected in one monitoring well (HW-L) located at the Airport. The source of the 1,4-dioxane is still being evaluated to determine if it is attributable to the Airport or from an unknown off-site source.

- In November 2019, the Airport replaced the valve mechanism in the fire truck to ensure that AFFF was no longer mixing with the water despite the mechanism not being engaged. In December 2019, HW resampled the six discharge locations from the fire truck at the Airport. PFAS was not detected above the GW-1 standard in any of the samples collected. Analytical results are included on Table 5 and the laboratory report for the samples is included in Appendix B.

6.0 IRA MODIFICATION ACTIVITIES CONDUCTED DURING THE CURRENT REPORTING PERIOD

Details concerning IRA Modification activities conducted between October 2019 and April 2020 are summarized below.

- In December 2019, the Airport submitted the IRA Modification to MassDEP. The IRA Modification was approved by the MassDEP in an email dated December 24, 2020.
- In March 2020, the Airport prepared the draft engineering design for the proposed caps described in the IRA Modification. The design of the caps is documented in the plan set titled “HYA Soil Capping & Drainage for Per- and Poly-Fluoroalkyl Substances (PFAS) Mitigation Bidding Set” (Appendix A). The Airport provided the design documents as an invitation to bid on the Town of Barnstable website on March 27, 2020.

7.0 GROUND WATER MODELING AND CONTAMINANT TRANSPORT ANALYSIS

MassDEP requested that the Airport evaluate if potential sources on the western portion of the Airport could be upgradient of the Mary Dunn Wellfield. To answer this question, HW is using and modifying an existing U.S. Geological Survey groundwater model to evaluate groundwater flow under current and recent historical pumping conditions. This work is ongoing and will be finalized in the Phase II Comprehensive Site Assessment due to MassDEP in November 2020. The model will be used to document what areas of the Airport are upgradient of the Mary Dunn Wellfield. It will also be used to evaluate groundwater flow and contaminant transport from

potential source areas on Airport property, as well as groundwater flow from the Fire Training Academy across the Airport to the southeast.

8.0 MANAGEMENT OF REMEDIAL WASTE

No remedial waste has been generated to date as a result of the work conducted under the IRA Plan.

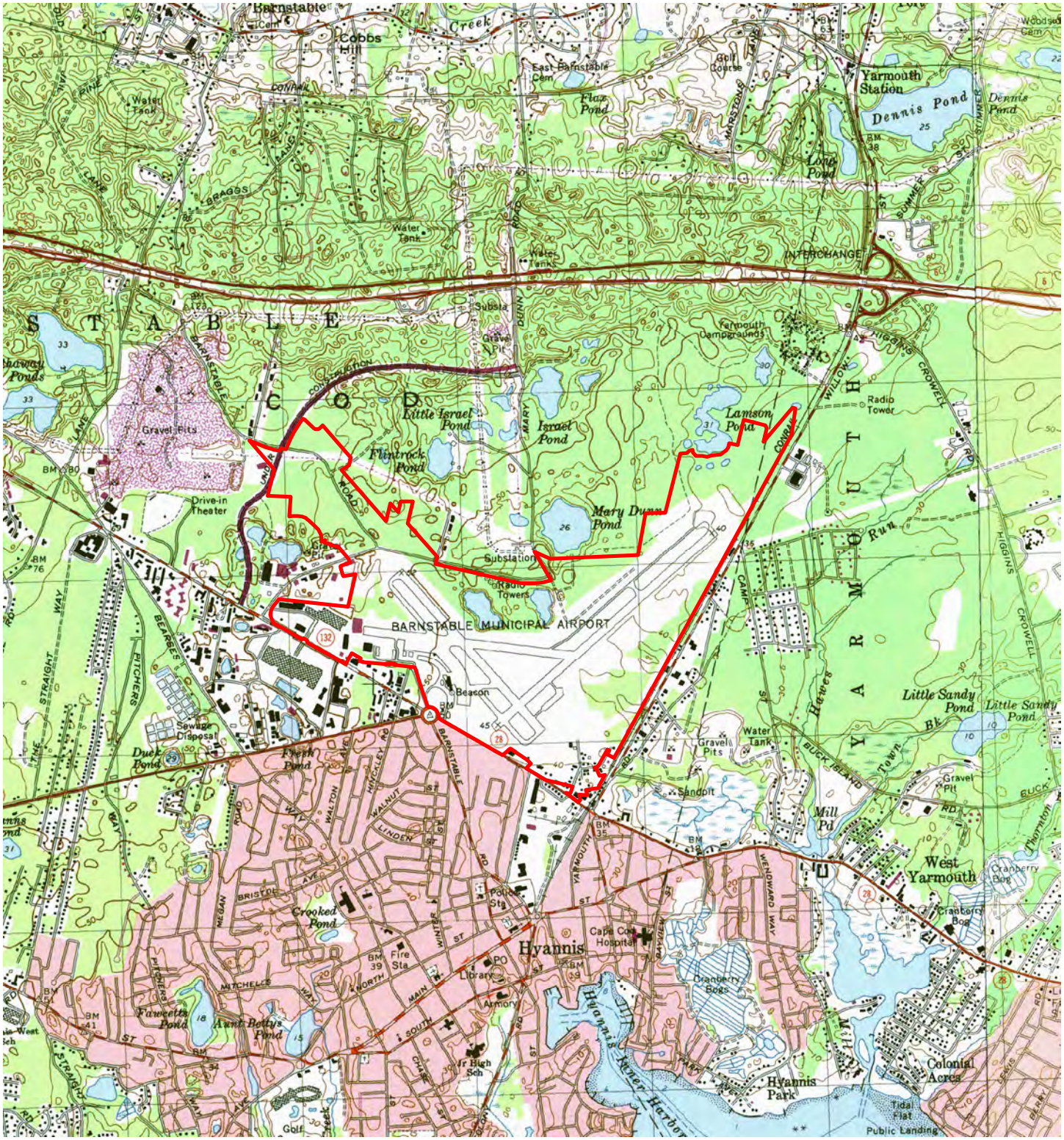
9.0 UPGRADES TO AFFF TESTING PROTOCOLS AT THE AIRPORT

The Airport has purchased two Ecologic Foam Test Systems to allow the Airport to test the AFFF delivery systems on its fire trucks without having to discharge the foam into the environment. These new systems meet the Federal Aviation Administration requirements for the regular testing of AFFF usage. Therefore, it is anticipated that no further foam will be deployed at the Airport except during an emergency situation when its use is required.

10.0 PLANS FOR NEXT REPORTING PERIOD

Further testing of soil and groundwater is planned to refine the disposal site boundaries in the Deployment Area and ARFF Building Area. Based on the IRA Modification that was submitted to the MassDEP, the Airport intents to begin cap construction in the Spring of 2020 with a planed completion date by June 2020 pending no significant setbacks from Covid-19.

FIGURES



Document Path: H:\Projects\HYA\11072 (697 Barnstable Airport)\GIS_Maps\Maps\USGS_Locus_20130815.mxd

Legend

Airport Property Line

**Hyannis Topographic Quadrangle*

N

Miles

0.5

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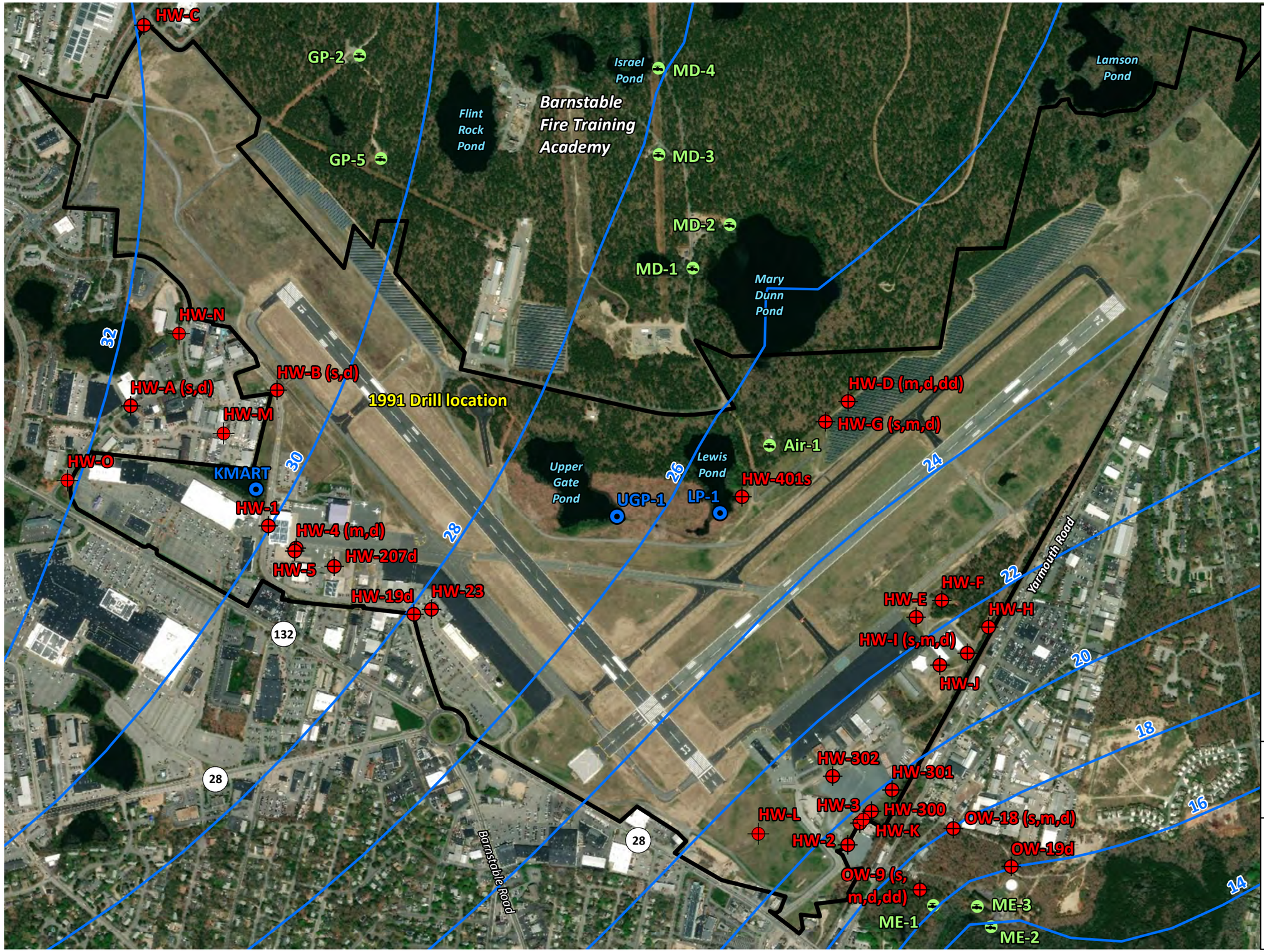
USGS Locus
Barnstable Municipal Airport
Hyannis, MA

Date: 4/17/2018

Figure 1



Legend

- PFAS Monitoring Wells
- Surface Water Samples Completed by Airport
- Drinking Water Wells
- Barnstable Municipal Airport Property Boundary
- Groundwater Contours*

N

0 750

1 in = 750 feet

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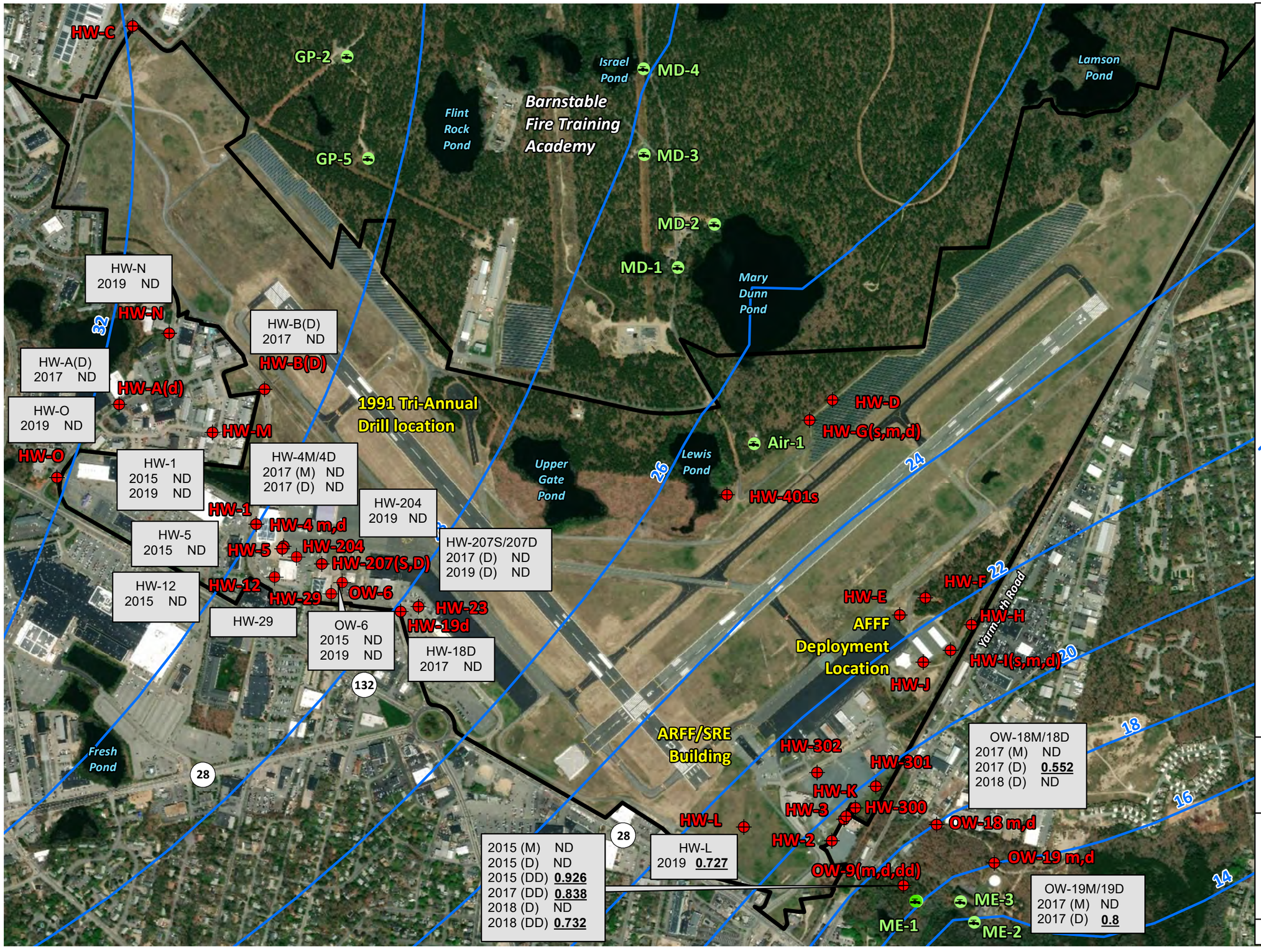
PFAS Groundwater Sampling Locations Barnstable Municipal Airport Hyannis, MA

Date: 4/10/2020 Figure 2

* Cape Cod Commission (CCC) Groundwater Contours

Path: H:\Projects\HYA\17027 BMA PFOS 1-4 IRA\GIS\Maps\190711_ Well Locations.mxd



Legend

- Monitoring Wells
- ND — Not detected by the laboratory above the reporting limit
- 0.2 — 1,4 Dioxane Below MassDEP Limit (0.3 ug/L)
- **0.8** — 1,4 Dioxane Above MassDEP Limit (0.3 ug/L)
- Drinking Water Wells
- Barnstable Municipal Airport Property Boundary
- Groundwater Contours*

N

0 750

1 inch = 750 feet

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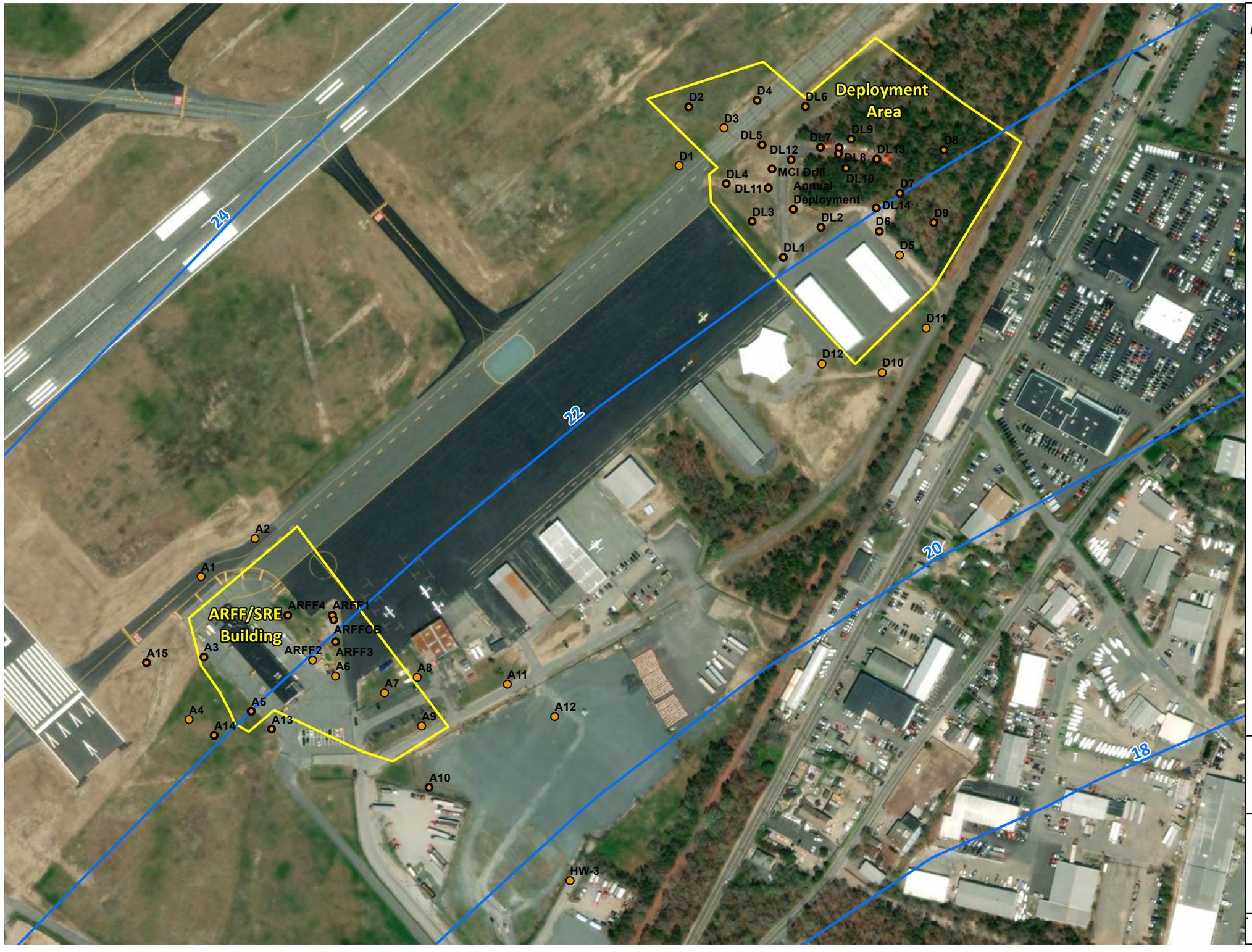
1,4 Dioxane Results In Groundwater Barnstable Municipal Airport Hyannis, MA

Date: 4/10/2020

Figure 3

* Cape Cod Commission (CCC) Groundwater Contours

Path: H:\Projects\HYA\17027 BMA PFOS 1-4 IRA\GIS\Maps\200408_DioxaneMap.mxd



Legend

- Groundwater Contours*
- Estimated Extent of Soil Impacts Related to AFFF Usage
- Soil Sample Location

N

0 225

1 in = 225 feet

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ARFF/SRE and Deployment Area
Soil Sample Locations
Barnstable Municipal Airport
Hyannis, MA

Date: 4/10/2020

** Cape Cod Commission (CCC) Groundwater Contours*

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TABLES

Table 1. PFAS Groundwater and Surface Water Results ug/L

	North Ramp											Lewis Pond Area	Airport Road Area								Surface Water			ARFF Building
Sample ID	HW-1	HW-1	HW-1	HW-4M	HW-5	HW-5	HW-5	HW-23	HW-23	HW-19D	HW-19D	HW-401S	HW-A(S)	HW-B(S)	HW-B(S)	HW-B(D)	HW-M	HW-N	HW-O	HW-C	Kmart	LP-1	UGP-1	HW-L
Sample Date	7/1/2016	6/20/2017	10/26/2018	4/5/2017	7/1/2016	4/7/2017	10/26/2018	6/20/2017	10/26/2018	6/20/2017	11/7/2018	4/7/2017	4/7/2017	4/7/2017	10/26/2018	10/26/2018	6/24/2019	6/24/2019	7/2/2019	4/7/2017	6/20/2017	7/11/19	7/11/19	6/19/2019
Perfluoroheptanoic acid (PFHpA)	0.01	0.0042 J	0.013 J	0.007 J	0.0041	0.0084 J	0.0074 U	0.0045J	0.0098 J	0.0052 J	0.0080 J	0.0043 J	0.0048 J	0.049	0.012 J	0.0074 U	0.007	0.0034	<0.002	0.0033 U	0.0033 U	<0.01	<0.02	0.0078
Perfluorohexanesulfonic acid (PFHxS)	0.018	0.065	0.018 J	0.02	0.011	0.018 J	0.0056 U	0.021	0.023	0.046	0.045	0.011 J	0.0079 J	0.044	0.047	0.0056 U	0.016	0.033	0.0043	0.0034 U	0.0034 U	<0.01	<0.02	0.033
Perfluorononanoic acid (PFNA)	<0.002	0.0057 J	0.0087 U	0.0046 U	<0.002	0.0046 U	0.0088 J	0.0038 U	0.0087 U	0.0065 J	0.0087 U	0.0046 U	0.0046 U	0.0046 U	0.0087 U	0.0087 U	<0.002	<0.002	<0.002	0.0046 U	0.0043 J	<0.01	<0.02	0.0033
Perfluorooctanoic acid (PFOA)	0.017	0.022	0.031	0.011 J	0.12	0.020 J	0.011 J	0.0046 U	0.011 J	0.017 J	0.014 J	0.0046 U	0.0026 U	0.0094 J	0.020 J	0.012 J	0.027	0.0088	0.0039	0.0026 U	0.0026 U	<0.01	<0.02	0.025
Perfluorooctane sulfonate (PFOS)	0.033	0.24	0.028	0.043	0.031	0.052	0.12	0.0079 J	0.015 J	0.061	0.069	0.012 J	0.0046 U	0.026	0.019 J	0.010 J	0.0074	0.004	0.017	0.0046 U	0.0046 U	<0.01	<0.02	0.049
Perfluorodecanoic Acid (PFDA)	NA	0.0040 U	0.0061 U	0.0040 U	NA	0.0040 U	0.0061 U	0.0040 U	0.0061 U	0.0040 U	0.0061 U	0.0040 U	0.0040 U	0.0040 U	0.0061 U	0.0061 U	<0.002	<0.002	0.0021	0.0040 U	0.0040 U	<0.01	<0.02	<0.002
Sum of Six (PFHpA,PFHxS,PFOA, PFOS, PFNA, and PFDA)	**0.078**	**0.3369**	**0.09**	**0.081**	**0.1661**	**0.0984**	**0.1398**	**0.0334**	**0.0588**	**0.1357**	**0.136**	**0.0273**	**0.0127**	**0.1284**	**0.098**	**0.022**	**0.0574**	**0.0492**	**0.0273**	<0.0046	**0.0043**	<0.01	<0.02	**0.1181**

	Solar Field						Steamship Parking Lot									Deployment Area								
Sample ID	HW-D	HW-D (d)	HW-D (dd)	HW-G(S)	HW-G(M)	HW-G(D)	HW-2	HW-3	HW-3	HW-3	HW-300	HW-301	HW-302	HW-302	HW-K	HW-I *	HW-I (m)	HW-I (d)	HW-J	HW-E	HW-E	HW-E	HW-F	HW-F	HW-H
Sample Date	4/7/2017	6/24/2019	6/24/2019	12/3/2018	12/3/2018	12/3/2018	7/1/2016	7/1/2016	4/5/2017	10/26/2018	7/1/2016	7/1/2016	7/1/2016	12/3/2018	6/19/2019	11/7/2018	6/24/2019	6/24/2019	11/7/2018	4/5/2017	11/7/2018	8/19/2019	4/5/2017	11/7/2018	11/7/2018
Perfluoroheptanoic acid (PFHpA)	0.0033 U	0.021	<0.002	0.0074 U	0.0074 U	0.0074 U	0.0071	0.016	0.1	0.10	0.0096	0.002	0.019	0.015 J	0.0051	0.2	0.0032	0.0053	0.025	0.15	0.0074 U	0.0053	0.34	0.0074 U	0.077
Perfluorohexanesulfonic acid (PFHxS)	0.0089 J	0.062	0.0092	0.0056 U	0.012 J	0.0056 U	0.0035	0.0043	0.020 J	0.012 J	0.012	0.038	0.0063	0.016 J	<0.002	0.18	0.019	0.057	0.0056 U	0.042	0.0056 U	0.0021	0.019J	0.0056 U	0.0056 U
Perfluorononanoic acid (PFNA)	0.0046 U	0.015	0.0041	0.0087 U	0.011 J	0.0087 U	<0.002	0.0063	0.027	0.023	<0.002	<0.002	0.054	0.0097 J	<0.002	0.16	<0.002	<0.002	0.028	0.0087 J	0.0087 U	<0.002	0.0046 U	0.0087 U	0.0087 U
Perfluorooctanoic acid (PFOA)	0.0046 U	0.0088	<0.002	0.0033 U	0.0033 U	0.0033 U	0.012	0.084	0.065	0.057	0.017	0.011	0.014	0.03	0.0041	0.26	0.0061	0.0047	0.026	0.053	0.0033 U	0.0047	0.075	0.0033 U	0.0050 J
Perfluorooctane sulfonate (PFOS)	0.022	0.095	0.013	0.0060 U	0.036	0.0060 U	0.0063	0.0091	0.15	0.053	0.0052	0.0037	0.033	0.031	<0.002	0.066	0.014	0.012	0.13	0.047	0.0060 U	<0.002	0.0026 U	0.0060 U	0.0060 U
Perfluorodecanoic Acid (PFDA)	0.0040 U	<0.002	<0.002	0.0061 U	0.0061 U	0.0061 U	NA	NA	0.0040 U	0.0061 U	NA	NA	NA	0.0061 U	<0.002	0.012 U	<0.002	<0.002	0.0061 U	0.0040 U	0.0061 U	<0.002	0.0040 U	0.0061 U	0.0061 U
Sum of Six (PFHpA,PFHxS,PFOA, PFOS, PFNA, and PFDA)	**0.0309**	**0.2018**	**0.0263**	<0.0087	**0.059**	<0.0087	**0.0289**	**0.1197**	**0.362**	**0.245**	**0.0438**	**0.0547**	**0.1263**	**0.1017**	0.0092	**0.866**	**0.0423**	**0.079**	**0.209**	**0.3007**	<0.0087	0.0121	**0.434**	<0.0087	**0.082**

	Maher Wells															
Sample ID	OW-9S	OW-9S	OW-9M	OW-9D	OW-9D	OW-9DD	OW-9DD	OW-18S	OW-18S	OW-18M	OW-18M	OW-18D	OW-18D	OW-18D Duplicate	OW-18D	OW-19D
Sample Date	7/5/2016	12/3/2018	12/3/2018	7/5/2016	12/3/2018	4/11/2017	12/3/2018	7/5/2016	12/7/2018	7/5/2016	12/7/2018	7/5/2016	4/11/2017	7/5/2016	12/7/2018	4/11/2017
Perfluoroheptanoic acid (PFHpA)	0.014	0.048	0.11	0.0028	0.033	0.034	0.015 J	0.0071	0.0074 U	0.0029	0.0074 U	0.0071	0.015J	0.0063	0.014 J	0.0051J
Perfluorohexanesulfonic acid (PFHxS)	<0.003	0.023	0.0056 U	0.012	0.12	0.12	0.042	0.0068	0.0056 U	0.016	0.073	0.01	0.13	0.011	0.13	0.029
Perfluorononanoic acid (PFNA)	0.0077	0.0087 U	0.044	0.0036	0.1	0.059	0.038	<0.002	0.0087 U	0.0076	0.0087 U	0.0065	0.0046 U	0.0058	0.0087 U	0.006J
Perfluorooctanoic acid (PFOA)	0.0074	0.032	0.052	0.041	0.057	0.055	0.020 J	0.0083	0.012 J	0.044	0.0060 J	0.018	0.025	0.019	0.019 J	0.0046 U
Perfluorooctane sulfonate (PFOS)	0.007	0.024	0.0081 J	0.0052	0.52	0.5	0.14	0.018	0.028	0.0058	0.24	0.0059	0.22	0.0059	0.32	0.029
Perfluorodecanoic Acid (PFDA)	NA	0.0061 U	0.0061 U	NA	0.0061 U	0.0040 U	0.0061 U	NA	0.0061 U	NA	0.0061 U	NA	0.0040 U	NA	0.0061 U	0.0040 U
Sum of Six (PFHpA,PFHxS,PFOA, PFOS, PFNA, and PFDA)	**0.0361**	**0.127**	**0.2141**	**0.0646**	**0.83**	**0.768**	**0.255**	**0.0402**	**0.04**	**0.0763**	**0.319**	**0.0475**	**0.39**	**0.048**	**0.483**	**0.0691**

< = Not detected by the laboratory above the reporting limit. Reporting limit shown.

J = Estimated concentration between the method detection limit and reporting limit.

Results in ug/L, micrograms per liter.

U= Not detected by the Laboratory above the method detection limit. Method detection limit shown.

Bold results above MassDEP GW-1 standard (0.02 ug/L)

Note: Totals include estimated values and do not include non-detects (U or <)

Table 2. 1,4 Dioxane Groundwater Results ug/L

	North Ramp															Airport Road					ARFF Building
Sample ID	HW-1	HW-1	HW-5	HW-12	OW-6	OW-6	HW-4M	HW-4D	HW-204	HW-29	HW-207S	HW-207D	HW-207D	HW-19D	HW-19D	HW-A(D)	HW-A(D)	HW-B(D)	HW-N	HW-O	HW-L
Sample Date	5/7/2015	8/5/2019	5/7/2015	5/7/2015	5/7/2015	9/27/2019	4/5/2017	4/5/2017	9/27/2019	9/27/2019	9/27/2019	4/5/2017	9/27/2019	4/5/2017	9/27/2019	4/5/2017	8/5/2019	4/5/2017	8/5/2019	8/5/2019	7/2/2019
1,4-Dioxane	<0.152	<0.25	<0.150	<0.150	<0.150	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**0.727**

					Maher Well Field							
Sample ID	OW-9M	OW-9D	OW-9D	OW-9DD	OW-9DD	OW-9DD	OW-18M	OW-18D	OW-18D	OW-19M	OW-19D	OW-19D
Sample Date	5/28/2015	5/28/2015	12/3/2018	5/28/2015	4/11/2017	12/3/2018	4/11/2017	4/11/2017	12/7/2018	4/11/2017	4/11/2017	12/7/2018
1,4-Dioxane	<0.141	<0.141	<0.25	**0.926**	**0.838**	**0.732**	<0.25	**0.552**	<0.25	<0.25	**0.800**	<0.25

Notes:

Results in ug/L, micrograms per liter

< = Not detected by the laboratory above the reporting limit. Reporting limit shown.

Bold results above MassDEP GW-1 standard (0.3 ug/L)

Table 3. PFAS Soil Results ug/kg

			ARFF Building																					
Sample ID	MCP Standard		ARFF1 (0-1')	ARFF1 (2')	ARFF1 (4')	ARFF2 (0-1')	ARFF3 (0-1')	ARFF4 (0-1')	ARFFCB (0-1)	A1 (0-1')	A2 (0-1')	A3 (0-1')	A4 (0-1')	A5 (0-1')	A6 (0-1')	A7 (0-1')	A8 (0-1')	A9 (0-1')	A10 (0-1')	A11 (0-1')	A12 (0-1')	ARFF3 (10-12')	A13 (0-1')	A14 (0-1')	A15 (0-1')
Sample Date	S-1/GW-1	S-1/GW-3	6/20/2017	9/26/2017	9/26/2017	6/20/2017	9/26/2017	9/26/2017	9/26/2017	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	10/9/2018	2/27/2019	2/27/2019	2/27/2019
Perfluoroheptanoic acid (PFHpA)	0.5	300	**0.82 J**	**1.8**	**0.66 J**	0.17 U	**0.60 J**	**0.75 J**	**0.60 J**	0.19 U	0.19 U	0.38 J	0.19 U	**1.1**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.32 J	**<2.0**	**<1.9**	**<2.0**
Perfluorohexanesulfonic acid (PFHxS)	0.3	300	0.23 U	0.23 U	0.23 U	0.23 U	**0.64 J**	0.23 U	0.23 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	**<2.0**	**<1.9**	**<2.0**
Perfluorooctanoic acid (PFOA)	0.72	300	**0.75 J**	**2.6**	**0.75 J**	0.26 U	**0.78 J**	**0.97 J**	**0.90 J**	0.25 U	0.25 U	0.37 J	0.30 J	**1.9**	0.25 U	0.25 U	0.25 U	0.34 J	0.25 U	0.25 U	0.25 U	**1.9**	**<2.0**	**<1.9**	**<2.0**
Perfluorononanoic acid (PFNA)	0.32	300	**2.5**	**5.7**	**1.4**	0.20 J	**0.91 J**	**2.9**	0.17 U	0.22 U	0.22 U	**0.51 J**	0.22 U	**0.87 J**	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	**3.1**	**<2.0**	**<1.9**	**<2.0**
Perfluorooctane sulfonate (PFOS)	2	300	**4.5**	**2.7**	1.1	0.29 J	**4.4**	1.0	1.1	0.26 U	0.26 U	0.29 J	0.26 U	0.26 U	0.26 U	0.38 J	0.26 U	0.85 J	0.26 U	0.26 U	0.26 U	1.1	<2.0	<1.9	<2.0
Perfluorodecanoic Acid (PFDA)	0.3	300	**4.4**	**1.2**	**0.62 J**	0.13 U	**1.6**	**0.85 J**	0.13 U	0.28 U	0.28 U	0.42 J	0.28 U	**1.4**	0.28 U	0.28 U	0.28 U	0.28 U	**0.33 J**	0.28 U	0.28 U	0.28 U	**<2.0**	**<1.9**	**<2.0**

			Deployment Area																					
Sample ID	MCP Standard		DL1(0-1')	DL2 (0-1')	DL2 2'	DL2 4'	DL3 (0-1')	DL3 2'	DL3 4'	DL4 (0-1')	DL4 2'	DL4 4'	DL5 (0-1')	DL5 2'	DL5 4'	DL6 (0-1')	DL7 (0-1')	DL8 (2')	DL8 (4')	DL9 (0-1')	DL10 (0-1')	DL 11 (0-1')	DL 11 (0-1')	DL12 (0-1')	DL13 (0-1')
Sample Date	S-1/GW-1	S-1/GW-3	6/20/2017	6/20/2017	9/26/2017	9/26/2017	6/20/2017	9/26/2017	9/26/2017	6/20/2017	9/26/2017	9/26/2017	6/20/2017	9/26/2017	9/26/2017	6/20/2017	6/20/2017	6/20/2017	9/26/2017	6/20/2017	6/20/2017	9/26/2017	8/20/2019	9/26/2017	9/26/2017
Perfluoroheptanoic acid (PFHpA)	0.5	300	0.30 J	**1.9**	**1.2**	0.48 J	**0.84 J**	0.17 U	0.17 U	0.31 J	0.17 U	0.17 U	**2.5**	0.40 J	**0.50 J**	**5.0**	**2.5 J**	**2.9 J**	**4.7 J**	**0.66 J**	**1.3**	**2.1**	**1.8**	**1.2**	**1.6**
Perfluorohexanesulfonic acid (PFHxS)	0.3	300	0.23 U	**1.8**	**1.3**	**0.59 J**	**0.34 J**	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	**0.49 J**	**0.49 J**	0.23 U	0.23 U	**2.3 U**	**2.3 U**	**2.3 U**	**0.35 J**	**0.94 J**	**0.82 J**	**<0.9**	0.23 U	0.23 U
Perfluorooctanoic acid (PFOA)	0.72	300	0.26 U	**1.6**	**4.1**	**0.74 J**	**0.80 J**	0.26 U	0.26 U	**0.83 J**	0.26 U	0.26 U	**3.7**	**1.6**	0.26 U	0.26 U	**4.2 J**	**25**	**22**	0.68 J	**1.7**	**4.7**	**5.2**	**4.6**	**2.4**
Perfluorononanoic acid (PFNA)	0.32	300	0.17 U	**0.81 J**	**2.5**	0.17 U	**0.55 J**	0.17 U	0.17 U	**2.7**	0.17 U	**3.7**	0.19 J	0.17 U	0.17 U	0.19 J	**9.6 J**	**46**	**1.7 U**	0.22 J	0.17 U	**16**	**2.4**	**7.3**	**1.5**
Perfluorooctane sulfonate (PFOS)	2	300	0.40 J	**12**	1.5	0.21 U	0.51 J	0.21 U	0.21 U	**2.0**	0.21 U	0.50 J	0.21 U	0.21 U	0.21 U	0.21 U	**3.9 J**	**14**	**2.1 U**	0.38 J	0.26 J	**29**	**1.5**	**23**	0.66 J
Perfluorodecanoic Acid (PFDA)	0.3	300	**0.63 J**	0.13 U	0.13 U	0.13 U	**1.4**	0.13 U	0.13 U	**1.3**	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	1.3 U	1.3 U	1.3 U	0.13 U	0.13 U	**1.8**	**8.7**	**0.66 J**	**7.4**

			Deployment Area																					
Sample ID	MCP Standard		DL14 (0-1')	D1 (0-1')	D2 (0-1')	D3 (0-1')	D4 (0-1')	D5 (0-1')	D6 (0-1')	D7 (0-1')	D8 (0-1')	D9 (0-1')	D10 (0-1')	D11 (0-1')	D12 (0-1')	DL11 (4-6')	DL11 (10-12')	DL11 (14-16')	DL14 (0-1')	DL14 (4-6')	DL14 (10-12')	DL14 (14-16')	HW-F (10-12')	HW-F (14-16')	HW-3 (0-1')
Sample Date	S-1/GW-1	S-1/GW-3	9/26/2017	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	8/14/2018	10/4/2018	10/4/2018	10/4/2018	9/26/2017	10/4/2018	10/4/2018	10/4/2018	10/4/2018	10/4/2018	10/9/2018
Perfluoroheptanoic acid (PFHpA)	0.5	300	**4.9**	0.19 U	0.21 J	0.19 U	**0.95 J**	0.22 J	0.25 J	**7.8**	**1.0**	**2.7**	0.19 U	0.19 U	0.19 U	**1.3**	0.31 J	0.23 J	**4.9**	0.36 J	0.19 U	**1.4**	0.32 J	**1.3**	0.19 U
Perfluorohexanesulfonic acid (PFHxS)	0.3	300	**0.71 J**	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	**0.31 J**	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	**0.71 J**	0.24 U	0.24 U	**0.74 J**	0.24 U	0.24 U	0.24 U
Perfluorooctanoic acid (PFOA)	0.72	300	**23**	0.25 U	0.33 J	0.25 U	**1.1**	0.25 U	0.28 J	**14**	**2.2**	**3**	0.25 U	0.25 U	0.25 U	**2.9**	**1.9**	0.50 J	**23**	0.58 J	0.32 J	**2.9**	0.25 U	**1.4**	0.25 U
Perfluorononanoic acid (PFNA)	0.32	300	**10**	0.22 U	**0.67 J**	0.22 U	**0.98 J**	0.22 U	0.22 U	**10**	**0.59 J**	**0.83 J**	0.22 U	0.22 U	**0.32 J**	**2.5**	0.22 U	0.22 U	**10**	0.22 U	0.22 U	**10**	0.22 U	0.22 U	0.22 U
Perfluorooctane sulfonate (PFOS)	2	300	**7.6**	0.26 U	0.66 J	0.38 J	**2.9**	0.26 U	0.26 U	**3.4**	**2.1**	0.67 J	0.54 J	0.91 J	0.44 J	0.26 U	0.26 U	0.26 U	**7.6**	0.26 U	0.26 U	**2.3**	0.26 U	0.26 U	0.26 U
Perfluorodecanoic Acid (PFDA)	0.3	300	**9.6**	0.28 U	0.28 U	0.28 U	**0.40 J**	0.28 U	**0.66 J**	**8.6**	**1.3**	**1.6**	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	**9.6**	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U

			1991 Drill Location					
Sample ID	MCP Standard		1991A (0-1')	1991B (0-1')	1991C (0-1')	1991D (0-1')	1991A-B (3-4')	1991C-D (2-3')
Sample Date	S-1/GW-1	S-1/GW-3	8/14/2018	8/14/2018	8/14/2018	8/14/2018	12/14/2018	12/14/2018
Perfluoroheptanoic acid (PFHpA)	0.5	300	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Perfluorohexanesulfonic acid (PFHxS)	0.3	300	0.24 U	**0.66 J**	0.24 U	0.24 U	0.24 U	0.24 U
Perfluorooctanoic acid (PFOA)	0.72	300	0.25 U	0.26 J	0.25 U	0.25 U	0.25 U	0.25 U
Perfluorononanoic acid (PFNA)	0.32	300	0.22 U	0.22 U	0.22 U	0.30 J	0.22 U	0.22 U
Perfluorooctane sulfonate (PFOS)	2	300	0.49 J	1.1	0.55 J	0.36 J	0.30 J	0.42 J
Perfluorodecanoic Acid (PFDA)	0.3	300	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U

Notes:
< = Not detected by the laboratory above the reporting limit. Reporting limit shown.
J = Estimated concentration between the method detection limit and reporting limit.
Results in ug/kg, micrograms per kilogram.
U= Not detected by the Laboratory above the method detection limit. Method detection limit shown.
Bold results above MassDEP S-1/GW-1 standard

Table 4: Ratio of Stable Isotopes Oxygen-18 and Hydrogen-2 Laboratory Results

Sample Date	Lab Sample ID	HW Sample ID	Stable Isotope Oxygen-18			Stable Isotope Hydrogen-2		
			δ18O (V-SMOW)	Atm %	Expected Values	δ18O (V-SMOW)	Atm %	Expected Values
11/7/2018	1811299-2	HW-I	-6.92	0.20	-	-40.41	0.01494	-
			-6.77	0.20	-	-40.17	0.01495	-
	1811299-4	HW-E	-6.79	0.20	-	-38.56	0.01497	-
			-6.85	0.20	-	-38.87	0.01497	-
	1811299-5	HW-F	-6.9	0.20	-	-38.28	0.01498	-
			-6.88	0.20	-	-38.15	0.01498	-
	1811299-7	SW-2	-2.67	0.20	-	-18.65	0.01528	-
			-2.61	0.20	-	-20.42	0.01526	-
						-23.04	0.01521	-
12/3/2018	1812198-1	HW-G(S)	-6.74	0.20	-	-38.19	0.01498	-
			-6.93	0.20	-	-37.87	0.01498	-
	1812198-2	HW-G(M)	-7.53	0.20	-	-44.34	0.01498	-
			-7.57	0.20	-	-44.39	0.01498	-
	1812198-3	HW-G(D)	-7.18	0.20	-	-44.15	0.01489	-
			-7.45	0.20	-	-44.56	0.01488	-
	1812198-4	OW-9S	-7.29	0.20	-	-41.86	0.01492	-
			-7.41	0.20	-	-42.94	0.0149	-
	1812198-5	OW-9D	-7.76	0.20	-	-47.91	0.01483	-
			-7.71	0.20	-	-46.82	0.01484	-
					-	-47.20	0.01484	-
	1812198-6	OW-9DD	-7.52	0.20	-	-45.58	0.01486	-
			-7.57	0.20	-	-45.48	0.01487	-
	1812198-7	OW-9M	-7.13	0.20	-	-41.44	0.01493	-
			-7.24	0.20	-	-43.40	0.0149	-
12/7/2018	1812232-1	OW-18S	-7.58	0.20	-	-49.29	0.01481	-
			-7.54	0.20	-	-49.66	0.0148	-
	1812232-2	OW-18M	-6.95	0.20	-	-42.64	0.01491	-
			-6.89	0.20	-	-42.57	0.01491	-
	1812232-3	OW-18D	-7.28	0.20	-	-44.76	0.01488	*
			-7.36	0.20	-	-41.61	0.01493	*
QA/QC	IAEA OH-14	-	-5.64	0.20	-5.6	-37.45	0.01499	-37.70
	IAEA OH-15	-	-9.59	0.20	-9.41	-77.89	0.01436	-78
	IAEA OH-16	-	-15.72	0.20	-15.41	-	-	-113.8
	Antarc IC	-	-29.83	0.19	-30	-	-	-239.69

Table 5. Fire Truck Spray Water Results for PFAS Compounds ug/L

	Fire Truck Spray Water Spray											
Sample ID	Hose		Roof		Bumper		Officer Side Handline		Driver side-Rear		Officer side-Rear	
Sample Date	8/22/2019	11/12/2019	8/22/2019	11/12/2019	8/22/2019	11/12/2019	8/22/2019	11/12/2019	8/22/2019	11/12/2019	8/22/2019	11/12/2019
Perfluoroheptanoic acid (PFHpA)	0.073	<0.002	0.0045	<0.002	0.0039	<0.002	0.027	<0.002	0.0055	<0.002	0.081	0.0021
Perfluorohexanesulfonic acid (PFHxS)	0.0059	<0.002	0.0033	<0.002	0.0039	<0.002	0.004	<0.002	0.0048	<0.002	0.0043	<0.002
Perfluorononanoic acid (PFNA)	0.011	<0.002	0.0026	<0.002	0.0031	<0.002	0.013	<0.002	0.003	<0.002	0.016	<0.002
Perfluorooctanoic acid (PFOA)	0.088	0.0062	0.0087	<0.002	0.01	<0.002	0.039	<0.002	0.011	<0.002	0.076	0.0041
Perfluorooctane sulfonate (PFOS)	0.009	0.0021	0.0068	<0.002	0.006	<0.002	0.0087	<0.002	0.0093	<0.002	0.0086	<0.002
Perfluorodecanoic Acid (PFDA)	0.014	<0.002	0.004	<0.002	0.0045	<0.002	0.032	<0.002	0.0049	<0.002	0.032	<0.002
Sum of Six (PFHpA,PFHxS,PFOA, PFOS, PFNA, and PFDA)	**0.2009**	0.0083	**0.0299**	<0.002	**0.0314**	<0.002	**0.1237**	<0.002	**0.0385**	<0.002	**0.2179**	0.0041

Notes:

< = Not detected by the laboratory above the reporting limit. Reporting limit shown.

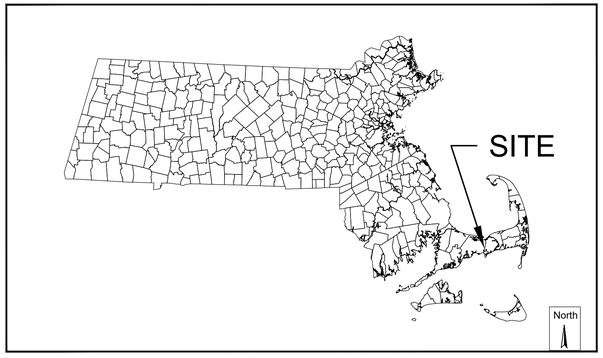
Results in ug/L, micrograms per liter.

Bold results above MassDEP GW-1 standard (0.02 ug/L)

APPENDIX A

Draft HYA Soil Capping & Drainage for Per- and Poly-fluoroalkyl Substances (PFAS) Mitigation Bidding Set

HYA SOIL CAPPING & DRAINAGE FOR PER- AND POLY-FLUOROALKYL SUBSTANCES (PFAS) MITIGATION
BIDDING SET
BARNSTABLE, MASSACHUSETTS
MARCH 2020

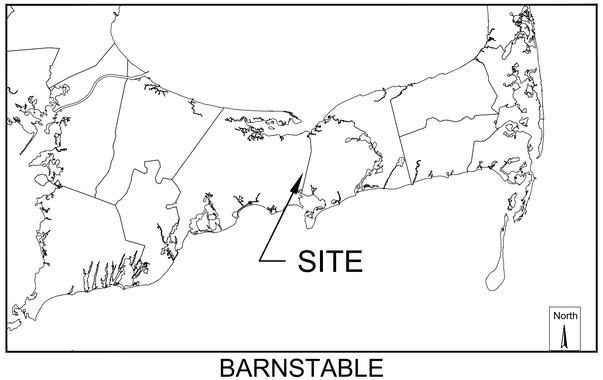


MASSACHUSETTS

Graphic Scale

0 150000

SCALE IN FEET
1:150000

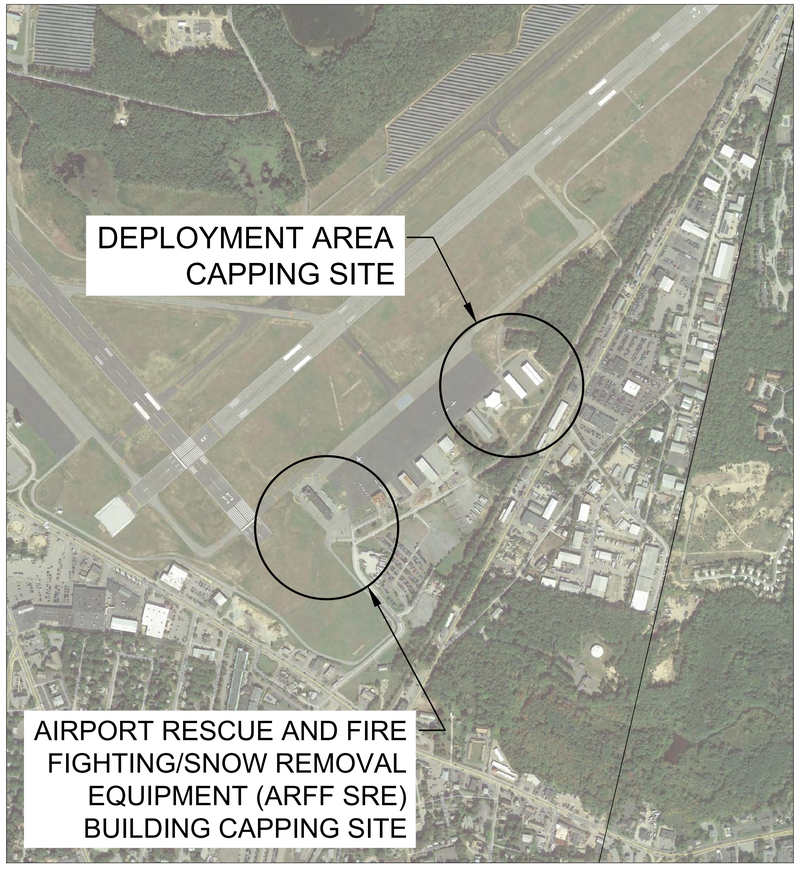


BARNSTABLE

Graphic Scale

0 12000

SCALE IN FEET
1:12000



CAPPING SITES

1 INCH = 500 FEET

0 500

SCALE IN FEET
1:500

Sheet List Table	
Sheet Number	Sheet Title
1	COVER & SHEET INDEX
2	CONSTRUCTION NOTES & DETAILS
3	EROSION & SEDIMENTATION CONTROL PLAN
4	SITE PLAN (ARFF SRE BUILDING)
5	SITE PLAN (DEPLOYMENT AREA)
6	CONSTRUCTION SAFETY AND PHASING PLAN - GENERAL NOTES
7	CONSTRUCTION SAFETY AND PHASING PLAN - DETAILS
8	CONSTRUCTION SAFETY AND PHASING PLAN - SITE PLAN
9	CONSTRUCTION SAFETY AND PHASING PLAN - WORK AREA I
10	CONSTRUCTION SAFETY AND PHASING PLAN - WORK AREA II

GENERAL NOTES:

1. THIS PLAN SET IS FOR BIDDING/PRICING AND NOT FOR CONSTRUCTION.

Plan Set:

HYA SOIL CAPPING & DRAINAGE FOR PER- AND POLY-FLUOROALKYL SUBSTANCES (PFAS) MITIGATION
BIDDING SET
BARNSTABLE, MASSACHUSETTS

Prepared For:

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Date Issued: MARCH 2020

Designed By: MCL

Drawn By: MCL

Checked By: BM

Registration: DRAFT NOT FOR CONSTRUCTION

Revisions

Rev.	Date	By	Appr.	Description
1				
2				
3				
4				
5				
6				
7				

Project Number: 17027A

Sheet Number: 1 of 5

Drawing Number: C - 1

last modified: 03/23/20 printed: 03/25/20 by ml H:\Projects\HYA\17027 BMA PFOS 1-4 IRA\Drawings\17027A CV.dwg

SURVEY NOTES:

1. THE EXISTING CONDITIONS DEPICTED IN THIS PLAN SET WERE TAKEN FROM THE SURVEY PLANS ENTITLED "EAST RAMP EXISTING CONDITIONS PLAN," PRODUCED BY DANIEL W. MACKENZIE, PLS OF THE HORSLEY WITTEN GROUP, INC. ON 2/7/20. THESE SURVEY PLANS WERE BASED ON A FIELD SURVEY CONDUCTED BY THE HORSLEY WITTEN GROUP ON NOVEMBER 19, AND NOVEMBER 22, 2019.
2. THIS PLAN DOES NOT SHOW ANY RECORDED OR UNWRITTEN EASEMENTS WHICH MAY EXIST. HOWEVER, THIS DOES NOT CONSTITUTE A GUARANTEE THAT NO SUCH EASEMENTS EXIST.
3. THE ELEVATIONS DEPICTED HEREON WERE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988.
4. ALL PROPERTY AND BOUNDARY LINES DEPICTED ARE APPROXIMATE ONLY.
5. EXISTING CONTOUR INTERVALS ARE EQUAL TO ONE FOOT.
6. THE ACCURACY OF MEASURED PIPE INVERTS AND PIPE SIZES IS SUBJECT TO FIELD CONDITIONS, THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS AND OTHER CONDITIONS

GENERAL CONSTRUCTION NOTES:

1. ALL SITE WORK TO COMPLETE THIS PROJECT AS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
2. IMMEDIATELY CONTACT AND COORDINATE WITH THE ENGINEER AND OWNER IF ANY DEVIATION OR ALTERATION OF THE WORK PROPOSED ON THESE DRAWINGS IS REQUIRED.
3. UTILIZE ALL PRECAUTIONS AND MEASURES TO ENSURE THE SAFETY OF THE PUBLIC, ALL PERSONNEL AND PROPERTY DURING CONSTRUCTION IN ACCORDANCE WITH OSHA STANDARDS, INCLUDING THE INSTALLATION OF TEMPORARY FENCING BARRICADES, SAFETY LIGHTING, CONES, POLICE DETAIL AND/OR FLAGMEN AS DETERMINED NECESSARY BY THE TOWN/CITY/LOCAL MUNICIPALITY. THE CONTRACTOR IS RESPONSIBLE FOR THE COST OF POLICE DETAIL AND FOR COORDINATING WITH THE LOCAL OR STATE POLICE DEPARTMENT FOR ALL REQUIRED POLICE DETAIL.
4. MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY CONSTRUCTION PERMITS, PAY ALL FEES INCLUDING POLICE DETAILS AND POST ALL BONDS, IF NECESSARY, ASSOCIATED WITH THE SAME, AND COORDINATE WITH THE OWNER AND THE ENGINEER.
5. ALL EXISTING CONDITIONS SHOWN ARE APPROXIMATE AND ARE BASED ON THE BEST INFORMATION AVAILABLE. PRIOR TO THE START OF CONSTRUCTION VERIFY THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, NOTIFY THE OWNER AND THE ENGINEER PRIOR TO INSTALLING ANY PORTION OF THE SITE WORK WHICH WOULD BE AFFECTED.
6. THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS INDICATED ON THE DRAWINGS ARE BASED ON RECORDS OF VARIOUS UTILITY COMPANIES, AND WHEREVER POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE. VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES IN THE FIELD PRIOR TO THE START OF CONSTRUCTION. CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY IN THE TOWN, AND "DIGSAFE" (1-888-344-7233) AT LEAST THREE BUSINESS DAYS PRIOR TO ANY EXCAVATION WORK IN PREVIOUSLY UNALTERED AREAS TO REQUEST EXACT FIELD LOCATION OF UTILITIES. THE CONTRACTOR MUST RESOLVE CONFLICTS BETWEEN THE PROPOSED UTILITIES AND FIELD-LOCATED UTILITIES AND REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED, INCOMPLETELY OR INACCURATELY SHOWN. THE CONTRACTOR MUST MAINTAIN ACCURATE RECORDS OF THE LOCATION AND ELEVATION OF ALL WORK INSTALLED AND EXISTING UTILITIES FOUND DURING CONSTRUCTION FOR THE PREPARATION OF THE AS-BUILT PLAN.
7. COORDINATE AND MAKE ALL CONNECTION ARRANGEMENTS WITH UTILITY COMPANIES, AS REQUIRED.
8. THE CONTRACTOR MUST MAINTAIN ALL EXISTING UTILITIES IN WORKING ORDER AND FREE FROM DAMAGE DURING THE ENTIRE DURATION OF THE PROJECT. REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR ALL COST RELATED TO THE REPAIR OF UTILITIES. EXCAVATION REQUIRED WITHIN THE PROXIMITY OF EXISTING UTILITY LINES MUST BE DONE BY HAND.
9. COORDINATE ALL TRENCHING WORK WITHIN ROADWAYS WITH THE PROPER LOCAL & STATE AGENCY. THE CONTRACTOR IS RESPONSIBLE FOR ALL TRENCH SAFETY INCLUDING ANY LOCAL AND/OR STATE PERMITS REQUIRED FOR THE TRENCH WORK. IF THIS WORK IS REQUIRED TO OCCUR OUTSIDE THE AGREED UPON HOURS OF OPERATION FOR THE FACILITY, THE CONTRACTOR MUST PLAN ACCORDINGLY.
10. SAWCUT ALL TRENCH WORK WITHIN EXISTING PAVEMENT AS INDICATED ON THE DRAWINGS. BACKFILL AND COMPACT TRENCH WORK AS INDICATED ON THE DRAWING AND IN THE SPECIFICATIONS. IF SETTLEMENT OCCURS DUE TO INADEQUATE COMPACTION, AS DETERMINED BY THE ENGINEER, WITHIN THE WARRANTY PERIOD, CONTRACTOR IS REQUIRED TO REMOVE, PATCH AND REPAVE AFTER ONE COMPLETE 12-MONTH CYCLE.
11. IMPORT ONLY CLEAN MATERIAL. MATERIAL FROM AN EXISTING OR FORMER 21E SITE AS DEFINED BY THE MASSACHUSETTS CONTINGENCY PLAN 310 CMR 40.0000 WILL NOT BE ACCEPTED . ANALYTICAL TESTING OF BACKFILL MATERIAL FOR PFAS IS REQUIRED TO BE SUBMITTED TO THE OWNER AND ENGINEER FOR APPROVAL PRIOR TO PLACEMENT.
12. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH AND MAINTAIN ALL CONTROL POINTS AND BENCHMARKS DURING CONSTRUCTION INCLUDING BENCHMARK LOCATIONS AND ELEVATIONS AT CRITICAL AREAS. COORDINATE WITH THE ENGINEER THE LOCATION OF ALL CONTROL POINTS AND BENCHMARKS.
13. SITE LAYOUT SURVEY REQUIRED FOR CONSTRUCTION MUST BE PROVIDED BY THE CONTRACTOR AND PERFORMED BY A MASSACHUSETTS' REGISTERED PROFESSIONAL LAND SURVEYOR. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE SURVEYOR FOR ALL SITE SURVEY WORK.
14. MAINTAIN ALL GRADE STAKES SET BY THE SURVEYOR. GRADE STAKES ARE TO REMAIN UNTIL A FINAL INSPECTION OF THE ITEM HAS BEEN COMPLETED BY THE ENGINEER. RE-STAKING OF PREVIOUSLY SURVEYED SITE FEATURES IS THE RESPONSIBILITY (INCLUDING COST) OF THE CONTRACTOR.
15. UNLESS OTHERWISE INDICATED ON THE DRAWINGS AND/OR IN THE SPECIFICATIONS, ALL SITE CONSTRUCTION MATERIALS AND METHODOLOGIES ARE TO CONFORM TO THE MOST RECENT VERSION OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS (THE COMMONWEALTH OF MASSACHUSETTS DEPARTEMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGES 2020 EDITION).
16. PROVIDE ALL CONSTRUCTION SERVICE IN ACCORDANCE WITH APPLICABLE LAWS AND REGULATIONS REGARDING NOISE, VIBRATION, DUST, SEDIMENTATION CONTAINMENT, AND TRENCH WORK.
17. COLLECT SOLID WASTES AND STORE IN A SECURED DUMPSTER. THE DUMPSTER MUST MEET ALL LOCAL AND STATE SOLID WASTE MANAGEMENT REGULATIONS.
18. RESTORE ALL SURFACES EQUAL TO THEIR ORIGINAL CONDITION AFTER CONSTRUCTION IS COMPLETE PER SPECIFICATIONS. LEAVE ALL AREAS NOT DISTURBED BY CONSTRUCTION IN THEIR NATURAL STATE. TAKE CARE TO PREVENT DAMAGE TO SHRUBS, TREES, OTHER LANDSCAPING AND/OR NATURAL FEATURES. WHEREAS THE PLANS DO NOT SHOW ALL LANDSCAPE FEATURES, EXISTING CONDITIONS MUST BE VERIFIED BY THE CONTRACTOR IN ADVANCE OF THE WORK.
19. REGULARLY INSPECT THE PERIMETER OF THE PROPERTY TO CLEAN UP AND REMOVE LOOSE CONSTRUCTION DEBRIS BEFORE IT LEAVES THE SITE. PROMPTLY REMOVE ALL DEMOLITION DEBRIS FROM THE SITE TO AN APPROVED DUMP SITE.
20. ALL TRUCKS LEAVING THE SITE MUST BE COVERED.
21. DO NOT WASH ANY CONCRETE OR MORTAR ONSITE. REMOVE BY HAND ANY CEMENT OR CONCRETE DEBRIS LEFT IN THE DISTURBED AREA.
22. BURIAL OF ANY STUMPS, SOLID DEBRIS, AND/OR STONES/BOULDERS ONSITE IS PROHIBITED.
23. AT THE END OF CONSTRUCTION, REMOVE ALL CONSTRUCTION DEBRIS AND SURPLUS MATERIALS FROM THE SITE. PERFORM A THOROUGH INSPECTION OF THE WORK PERIMETER. COLLECT AND REMOVE ALL MATERIALS AND BLOWN OR WATER CARRIED DEBRIS FROM THE SITE.
24. THE WORK AREA IS A DISPOSAL SITE AS DEFINED BY THE MASSACHUSETTS CONTINGENCY PLAN 310 CMR 40.0000. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DEVELOP A SITE SPECIFIC HEALTH AND SAFETY PLAN FOR INTRUSIVE SOIL ACTIVITIES IN AN AREA WITH KNOWN PFAS CONTAMINATION. THE OWNER WILL PROVIDE OVERSIGHT AND DUST MONITORING UNDER THE DIRECTION OF A LICENSED SITE PROFESSIONAL.
25. DETAILS REGARDING PFAS CONCENTRATIONS IN SOIL ARE SET FORTH IN THE REPORT TITLED, "*FINAL IMMEDIATE RESPONSE ACTION PLAN MODIFICATION;*" PREPARED BY HORSLEY WITTEN GROUP DATED DECEMBER 2019. THE MAXIMUM CONCENTRATION OF THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION SUM OF SIX PFAS IN SOIL IS 87.9 µg / kg. REFER TO THE ATTACHED REPORT FOR ADDITIONAL DETAILS.
26. THE CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL. AT NO TIME IS VISIBLE DUST GENERATION ACCEPTABLE. DUST SUPPRESSION INCLUDING THE USE OF WATER IS CONSIDERED INCIDENTAL TO THIS PROCESS.
27. SOIL REMOVED FROM ARFF SRE AREA IS TO BE USED IN GRADING AND SHAPING WITHIN THE DEPLOYMENT AREA. AT NO TIME IS ADDITIONAL SOIL FROM THE ARFF SRE OR DEPLOYMENT AREA TO BE DISTURBED OR REMOVED WITHOUT APPROVAL FROM OWNER OR ENGINEER.

GENERAL DEMOLITION NOTES:

1. THIS PLAN SET DOES NOT INCLUDE DETAILS & SPECIFICATIONS FOR ALL DEMOLITION WORK REQUIRED WITHIN THE PROPOSED CONSTRUCTION LIMITS. UNLESS OTHERWISE NOTED, THE CONTRACTOR IS RESPONSIBLE FOR THE RELOCATION, DEMOLITION, REMOVAL AND DISPOSAL, IN A LOCATION APPROVED BY ALL GOVERNING AUTHORITIES, OF ALL EXISTING SITE ELEMENTS AND STRUCTURES INCLUDING, BUT NOT LIMITED TO: ROADWAYS, PARKING AREAS, BITUMINOUS CONCRETE, CEMENT CEMENT CONCRETE, GRAVEL, BERMS, AND ALL OTHER STRUCTURES SHOWN AND NOT SHOWN WITHIN CONSTRUCTION LIMITS, AND WHERE NEEDED, TO ALLOW FOR NEW CONSTRUCTION. ALL FACILITIES TO BE REMOVED ARE TO BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE FILL MATERIAL, COMPACTED IF NECESSARY, PER SPECIFICATIONS.
2. OBTAIN ANY PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL.
3. REMOVE ALL DEBRIS FROM THE SITE AND DISPOSE OF THE DEBRIS IN A PROPER AND LEGAL MANNER.
4. PRIOR TO DEMOLITION OCCURRING, ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED.

BASIC CONSTRUCTION SEQUENCE:

THE FOLLOWING CONSTRUCTION SEQUENCE IS TO BE USED AS A GENERAL GUIDELINE. COORDINATE WITH THE OWNER AND ENGINEER AND SUBMIT A PROPOSED CONSTRUCTION SEQUENCE FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

1. SURVEY AND STAKE THE PROPOSED LIMIT OF DISTURBANCE, THE PROPOSED MATERIAL/EQUIPMENT STORAGE AREA, AND SEDIMENTATION BARRIER EXTENTS.
2. PLACE SEDIMENTATION BARRIERS AS INDICATED ON DRAWINGS AND STAKED OUT IN THE FIELD. UNDER NO CIRCUMSTANCES IS THE LIMIT OF WORK TO EXTEND BEYOND THE SEDIMENTATION BARRIERS/LIMIT OF DISTURBANCE AS INDICATED ON DRAWINGS.
3. INSTALL DRAINAGE MANHOLES, CATCH BASINS, DRAINAGE PIPES, AND UNDERGROUND DRAINAGE STRUCTURES. BEGIN WORK AT THE STORMWATER MANAGEMENT AREAS AND PROGRESS UP-GRADIENT. THE STORMWATER MANAGEMENT AREA(S) AND DRAINAGE NETWORK ARE TO BE PROTECTED FROM SEDIMENTATION UNTIL ALL UN-STABILIZED AREAS ARE STABILIZED. INSTALL SEDIMENT BARRIERS AT ALL POINTS OF ENTRY INTO THE DRAINAGE NETWORK. TAKE PARTICULAR CARE TO PROTECT THE UNDERGROUND STRUCTURES FROM SEDIMENT.
4. STRIP TOPSOIL FROM THE AREA OF THE PROPOSED CAPPING AND STOCKPILE IT IN APPROVED LOCATIONS. TOPSOIL STOCKPILES MUST BE PROTECTED BY A SEDIMENT BARRIER.
5. BEGIN ROUGH GRADING AREAS FOR CAPPING. BRING ROUGH GRADING TO PROPER ELEVATIONS AS SOON AS PRACTICABLE. COORDINATE WORK TO MINIMIZE TIME SOILS ARE UN-STABILIZED.
6. PERFORM CAPPING INSTALLATION AND TRENCHING.
7. FINISH PERMANENT VEGETATIVE STABILIZATION.
8. SWEEP THE ADJACENT PAVED WORK AREAS TO REMOVE ALL SEDIMENTS. REPAIR DRAINAGE OUTLETS AND BASINS AS REQUIRED. CLEAN AND FLUSH THE DRAINAGE STRUCTURES AND PIPES AT THE END OF CONSTRUCTION AND REMOVE ALL ACCUMULATED SEDIMENTS IN THE STORMWATER MANAGEMENT AREAS. CONTRACTOR MUST INSPECT THE DRAINAGE NETWORK AND REPAIR ANY DAMAGE IMMEDIATELY.
9. ENGINEER TO APPROVE THE REMOVAL OF ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES FOLLOWING VEGETATIVE ESTABLISHMENT OF ALL DISTURBED AREAS AND DETERMINE WHEN THE CONTRIBUTING AREA HAS REACHED A MINIMUM OF 80% STABILIZATION.

GENERAL GRADING AND DRAINAGE NOTES:

1. ALL CUT AND FILL SLOPES SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.
2. ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.
3. PROPOSED ELEVATIONS ARE SHOWN TO FINISH PAVEMENT OR GRADE UNLESS NOTED OTHERWISE.
4. ALL EARTHWORK AND SITE PREPARATION MUST BE DONE IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF ANY SUBSURFACE INVESTIGATION OR GEOTECHNICAL REPORTS PREPARED FOR THIS SITE.

STORMWATER FACILITY OPERATION & MAINTENANCE:

THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER INSPECTION AND MAINTENANCE OF ALL DRAINAGE/STORMWATER MANAGEMENT FACILITIES AS OUTLINED BELOW DURING CONSTRUCTION AND UNTIL SUCH TIME THAT THE PROJECT IS ACCEPTED BY THE OWNER AND THE ENGINEER.

1. INSPECT AND RESTORE/CLEAN ALL NEWLY CONSTRUCTED OR ALTERED EXISTING FACILITIES (INLETS, MANHOLES, PIPES, AND UNDERGROUND INFILTRATION STRUCTURES) OF ACCUMULATED SEDIMENT AND DEBRIS PRIOR TO THE OWNER'S ACCEPTANCE.
2. REMOVE AND DISPOSE ALL SEDIMENT AND DEBRIS TO A PRE-APPROVED LOCATION.
3. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR ADDITIONAL INFORMATION PERTAINING TO STORMWATER FACILITY OPERATION AND MAINTENANCE REQUIREMENTS. MAINTAIN A WORKING COPY OF THE SWPPP ON SITE AT ALL TIMES.
4. AT A MINIMUM INSPECT MONTHLY AND AFTER STORM EVENTS GREATER THAN OR EQUAL TO 1" OF RAINFALL AS NECESSARY FOR THE ENTIRE DURATION OF THE CONSTRUCTION PROJECT AND THE FIRST 3 MONTHS AFTER CONSTRUCTION TO ENSURE PROPER OPERATION AND EFFECTIVE SITE STABILIZATION.
5. SPECIFIC MAINTENANCE REQUIRED DURING CONSTRUCTION:
   A. DRAINAGE STRUCTURES (INLETS, MANHOLES, CATCHBASINS, UNDERGROUND INFILTRATION STRUCTURES): MONITOR AND REGULARLY INSPECT ALL EXISTING AND PROPOSED DRAINAGE STRUCTURES. FOR PROPER OPERATION, COLLECTION OF LITTER OR TRASH, AND STRUCTURAL DETERIORATION. CLEAN AND REMOVE SEDIMENT FRO THE STRUCTURES (INCLUDING SUMPS) AS NECESSARY, AND REPAIR WHEN REQUIRED.
   B. ROUTINE MAINTENANCE: OTHER ROUTINE MAINTENANCE INCLUDES THE REMOVAL OF TRASH AND LITTER FROM PAVED AND PERIMETER AREAS, AND STREET AND PARKING LOT SWEEPING UPON COMPLETION OF CONSTRUCTION TO AVOID EXCESSIVE ACCUMULATION OF SEDIMENT IN THE DRAINAGE SYSTEM. INSPECT THE PIPES AND STRUCTURES FOR SEDIMENT ACCUMULATION AND PROPER FLOW.

LEGEND:

GENERAL

39

40

UTILITIES

G

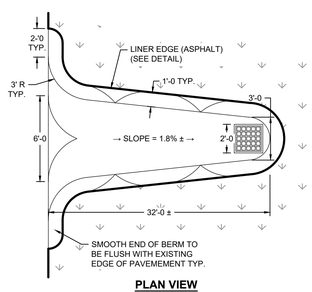
E/T/C

EROSION & SEDIMENT CONTROL

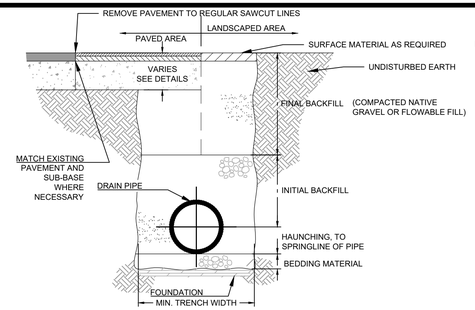
SF

SS

SYMBOLS	
CAPPING AREA	EL.98.45 EXISTING SPOT GRADE
MAJOR CONTOUR	EL.95.00 SPOT GRADE
MINOR CONTOUR	S SEWER MANHOLE
EDGE OF PAVEMENT	E ELECTRIC MANHOLE
LIMIT OF WORK	T TELEPHONE MANHOLE
PAVEMENT SAWCUT	MH MANHOLE
RECLAIMED ASPHALT MILLINGS	D DRAIN MANHOLE
STORMWATER AREA	CATCHBASIN
	INLET PROTECTION
DRAIN PIPE	WV WATER VALVE
GAS LINE	GV GAS VALVE
UNDERGROUND E/T/C	CO CLEAN OUT
	PIPE STUB
SILT FENCE	HYDRANT
SILT SOCK	MW MONITORING WELL



PLAN VIEW



NOTES:

1. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR TO EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH A SUITABLE COMPACTED GRAVEL MATERIAL OR AS AN ALTERNATIVE AND AT THE DISCRETION OF THE ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A WOVEN GEOTEXTILE FABRIC.
2. BEDDING, HAUNCHING AND INITIAL BACKFILL: SUITABLE MATERIAL TO CONSIST OF CLEAN, HARD, PARTICLES OF GRAVEL MEETING THE FOLLOWING:

SIEVE SIZE	PERCENT PASSING
3/8"	85-95
NO. 4	5-15
NO. 8	0-2

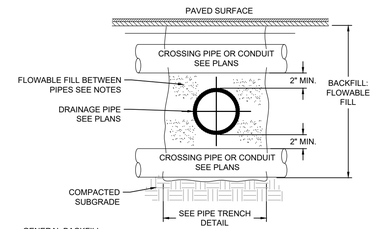
MATERIAL TO BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

MINIMUM BEDDING THICKNESS TO BE 4" (100mm) FOR 4"-24" PIPE (100-600mm).

3. MINIMUM TRENCH WIDTHS TO BE AS FOLLOWS:

NOMINAL Ø inches	MIN. RECOMMENDED TRENCH WIDTH inches
8	36
12	36

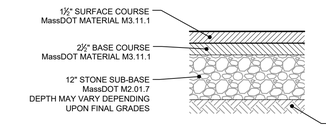
STORM DRAIN PIPE TRENCH
NOT TO SCALE



GENERAL BACKFILL:

1. WHERE TWO UTILITIES CROSS, USE FLOWABLE FILL FOR BACKFILL (INCLUDING DISTURBED AREAS SURROUNDING TRENCHES) AT THE AREA OF THE PIPE CROSSINGS.
2. THE FLOWBALE FILL MIX MUST BE FINE ENOUGH TO FILL THE VOID SPACE BETWEEN THE CROWN OF THE PIPE BELOW AND THE BOTTOM OF PIPE ABOVE.
3. THE FLOW ABLE FILL MUST ENCOMPASS THE ENTIRE SPACE BETWEEN THE PIPES AS WELL AS AROUND THE PIPES.

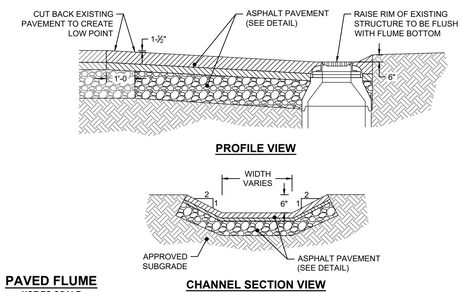
STORM DRAIN PIPE/UTILITY CROSSING
NOT TO SCALE



GENERAL NOTES:

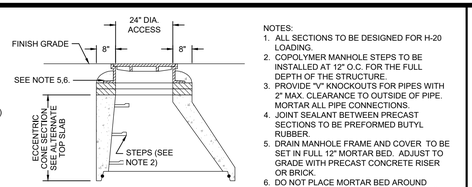
1. SUB-GRADE (EXISTING MATERIAL) SHALL CONSIST OF INERT MATERIAL THAT IS HARD, DURABLE STONE AND/OR COARSE SAND, FREE FROM LOAM AND CLAY TO A DEPTH NOT LESS THAN 4 FEET BELOW THE FINISH PAVEMENT SURFACE. EXCAVATE SANDY-LOAM AND/OR LOAMY-SAND TOPSOIL MATERIAL FROM ALL PAVED AREAS PRIOR TO SUB-BASE INSTALLATION.
2. PLACE SUB-BASE IN MAXIMUM 6" LIFTS (COMPACTED TO 95%).
3. COMPACT SUB-GRADE FILL TO 95% COMPACTION.
4. SEE SITE LAYOUT PLAN FOR PAVEMENT WIDTH AND LOCATION.
5. SEE GRADING PLANS FOR PAVEMENT SLOPE AND CROSS SLOPE.

TYPICAL BITUMINOUS PAVEMENT
NOT TO SCALE



PAVED FLUME
NOT TO SCALE

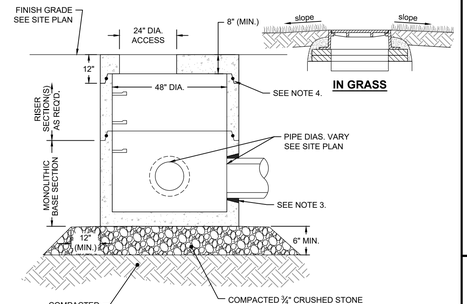
CHANNEL SECTION VIEW



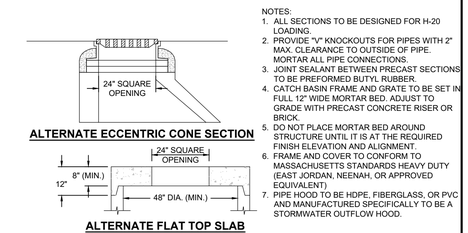
ALTERNATE TOP SLAB

NOTES:

1. ALL SECTIONS TO BE DESIGNED FOR H-20 LOADING.
2. COPOLYMER MANHOLE STEPS TO BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS TO BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME AND COVER TO BE SET IN FULL 12" MORTAR BED. ADJUST TO GRADE WITH PRECAST CONCRETE RISER OR BRICK.
6. DO NOT PLACE MORTAR BED AROUND STRUCTURE UNTIL IT IS AT THE REQUIRED FINISH ELEVATION AND ALIGNMENT.
7. FRAME AND COVER TO CONFORM TO MASSACHUSETTS STANDARDS HEAVY DUTY (EAST JORDAN, NEENAH, OR APPROVED EQUIVALENT).

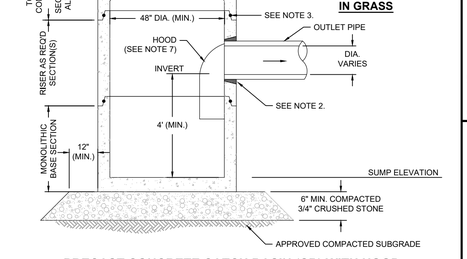


PRECAST DRAIN MANHOLE (DMH)
NOT TO SCALE

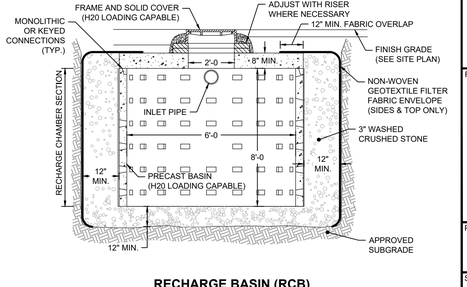


NOTES:

1. ALL SECTIONS TO BE DESIGNED FOR H-20 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS TO BE PREFORMED BUTYL RUBBER.
4. CATCH BASIN FRAME AND GRATE TO BE SET IN FULL 12" WIDE MORTAR BED. ADJUST TO GRADE WITH PRECAST CONCRETE RISER OR BRICK.
5. DO NOT PLACE MORTAR BED AROUND STRUCTURE UNTIL IT IS AT THE REQUIRED FINISH ELEVATION AND ALIGNMENT.
6. FRAME AND COVER TO CONFORM TO MASSACHUSETTS STANDARDS HEAVY DUTY (EAST JORDAN, NEENAH, OR APPROVED EQUIVALENT)
7. PIPE HOOD TO BE HDPE. FIBERGLASS, OR PVC AND MANUFACTURED SPECIFICALLY TO BE A STORMWATER OUTFLOW HOOD.



PRECAST CONCRETE CATCH BASIN (CB) WITH HOOD
NOT TO SCALE



RECHARGE BASIN (RCB)
NOT TO SCALE

Revisions

Rev.	Date	By	Appr.	Description

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508-833-6600 voice
508-833-3150 fax

Designed By: MDL | Drawn By: MCL | Checked By: BM | Date: MARCH 2020

Plan Set: HYA SOIL CAPPING & DRAINAGE FOR PER- AND POLY-FLUOROALKYL SUBSTANCES (PFAS) MITIGATION BIDDING SET BARNSTABLE, MASSACHUSETTS

Plan Title: CONSTRUCTION NOTES & DETAILS

Prepared For:
Barnstable Municipal Airport
480 Barnstable Road
Hyannis, MA 02601
Phone: (508) 775-2020
Fax: —

Survey Provided By:
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Sandwich, MA 02563
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Fax: —
Dated: January 2019

Registration:

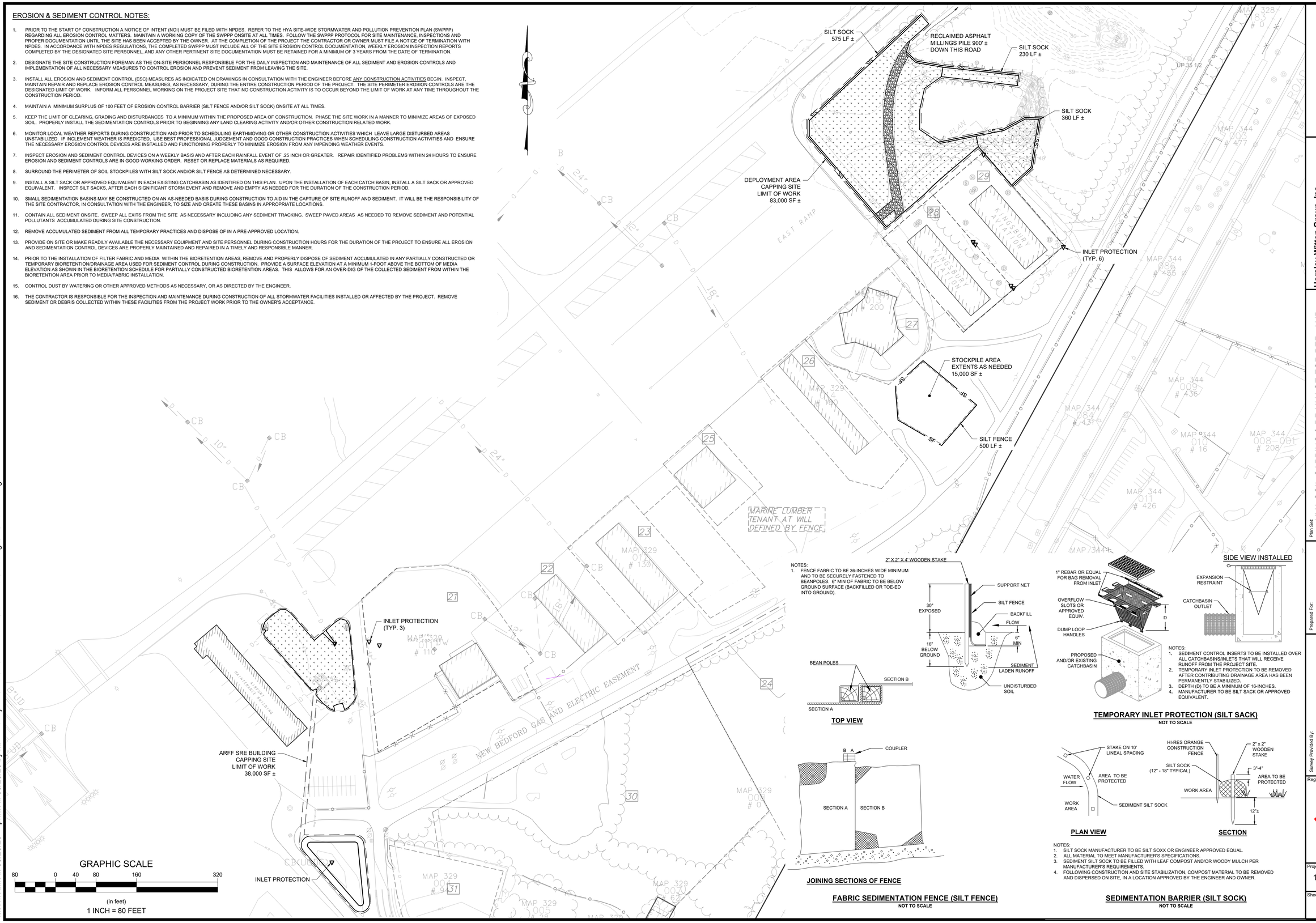
DRAFT NOT FOR CONSTRUCTION

Project Number: 17027A | Sheet: 2 of 5

Sheet Number: C - 2

EROSION & SEDIMENT CONTROL NOTES:

1. PRIOR TO THE START OF CONSTRUCTION A NOTICE OF INTENT (NOI) MUST BE FILED WITH NPDES. REFER TO THE HYA SITE-WIDE STORMWATER AND POLLUTION PREVENTION PLAN (SWPPP) REGARDING ALL EROSION CONTROL MATTERS. MAINTAIN A WORKING COPY OF THE SWPPP ONSITE AT ALL TIMES. FOLLOW THE SWPPP PROTOCOL FOR SITE MAINTENANCE, INSPECTIONS AND PROPER DOCUMENTATION UNTIL THE SITE HAS BEEN ACCEPTED BY THE OWNER. AT THE COMPLETION OF THE PROJECT THE CONTRACTOR OR OWNER MUST FILE A NOTICE OF TERMINATION WITH NPDES. IN ACCORDANCE WITH NPDES REGULATIONS, THE COMPLETED SWPPP MUST INCLUDE ALL OF THE SITE EROSION CONTROL DOCUMENTATION, WEEKLY EROSION INSPECTION REPORTS COMPLETED BY THE DESIGNATED SITE PERSONNEL, AND ANY OTHER PERTINENT SITE DOCUMENTATION MUST BE RETAINED FOR A MINIMUM OF 3 YEARS FROM THE DATE OF TERMINATION.
2. DESIGNATE THE SITE CONSTRUCTION FOREMAN AS THE ON-SITE PERSONNEL RESPONSIBLE FOR THE DAILY INSPECTION AND MAINTENANCE OF ALL SEDIMENT AND EROSION CONTROLS AND IMPLEMENTATION OF ALL NECESSARY MEASURES TO CONTROL EROSION AND PREVENT SEDIMENT FROM LEAVING THE SITE.
3. INSTALL ALL EROSION AND SEDIMENT CONTROL (ESC) MEASURES AS INDICATED ON DRAWINGS IN CONSULTATION WITH THE ENGINEER BEFORE ANY CONSTRUCTION ACTIVITIES BEGIN. INSPECT, MAINTAIN REPAIR AND REPLACE EROSION CONTROL MEASURES, AS NECESSARY, DURING THE ENTIRE CONSTRUCTION PERIOD OF THE PROJECT. THE SITE PERIMETER EROSION CONTROLS ARE THE DESIGNATED LIMIT OF WORK. INFORM ALL PERSONNEL WORKING ON THE PROJECT SITE THAT NO CONSTRUCTION ACTIVITY IS TO OCCUR BEYOND THE LIMIT OF WORK AT ANY TIME THROUGHOUT THE CONSTRUCTION PERIOD.
4. MAINTAIN A MINIMUM SURPLUS OF 100 FEET OF EROSION CONTROL BARRIER (SILT FENCE AND/OR SILT SOCK) ONSITE AT ALL TIMES.
5. KEEP THE LIMIT OF CLEARING, GRADING AND DISTURBANCES TO A MINIMUM WITHIN THE PROPOSED AREA OF CONSTRUCTION. PHASE THE SITE WORK IN A MANNER TO MINIMIZE AREAS OF EXPOSED SOIL. PROPERLY INSTALL THE SEDIMENTATION CONTROLS PRIOR TO BEGINNING ANY LAND CLEARING ACTIVITY AND/OR OTHER CONSTRUCTION RELATED WORK.
6. MONITOR LOCAL WEATHER REPORTS DURING CONSTRUCTION AND PRIOR TO SCHEDULING EARTHMOVING OR OTHER CONSTRUCTION ACTIVITIES WHICH LEAVE LARGE DISTURBED AREAS UNSTABILIZED. IF INCLEMENT WEATHER IS PREDICTED, USE BEST PROFESSIONAL JUDGEMENT AND GOOD CONSTRUCTION PRACTICES WHEN SCHEDULING CONSTRUCTION ACTIVITIES AND ENSURE THE NECESSARY EROSION CONTROL DEVICES ARE INSTALLED AND FUNCTIONING PROPERLY TO MINIMIZE EROSION FROM ANY IMPENDING WEATHER EVENTS.
7. INSPECT EROSION AND SEDIMENT CONTROL DEVICES ON A WEEKLY BASIS AND AFTER EACH RAINFALL EVENT OF .25 INCH OR GREATER. REPAIR IDENTIFIED PROBLEMS WITHIN 24 HOURS TO ENSURE EROSION AND SEDIMENT CONTROLS ARE IN GOOD WORKING ORDER. RESET OR REPLACE MATERIALS AS REQUIRED.
8. SURROUND THE PERIMETER OF SOIL STOCKPILES WITH SILT SOCK AND/OR SILT FENCE AS DETERMINED NECESSARY.
9. INSTALL A SILT SACK OR APPROVED EQUIVALENT IN EACH EXISTING CATCHBASIN AS IDENTIFIED ON THIS PLAN. UPON THE INSTALLATION OF EACH CATCH BASIN, INSTALL A SILT SACK OR APPROVED EQUIVALENT. INSPECT SILT SACKS, AFTER EACH SIGNIFICANT STORM EVENT AND REMOVE AND EMPTY AS NEEDED FOR THE DURATION OF THE CONSTRUCTION PERIOD.
10. SMALL SEDIMENTATION BASINS MAY BE CONSTRUCTED ON AN AS-NEEDED BASIS DURING CONSTRUCTION TO AID IN THE CAPTURE OF SITE RUNOFF AND SEDIMENT. IT WILL BE THE RESPONSIBILITY OF THE SITE CONTRACTOR, IN CONSULTATION WITH THE ENGINEER, TO SIZE AND CREATE THESE BASINS IN APPROPRIATE LOCATIONS.
11. CONTAIN ALL SEDIMENT ONSITE. SWEEP ALL EXITS FROM THE SITE AS NECESSARY INCLUDING ANY SEDIMENT TRACKING. SWEEP PAVED AREAS AS NEEDED TO REMOVE SEDIMENT AND POTENTIAL POLLUTANTS ACCUMULATED DURING SITE CONSTRUCTION.
12. REMOVE ACCUMULATED SEDIMENT FROM ALL TEMPORARY PRACTICES AND DISPOSE OF IN A PRE-APPROVED LOCATION.
13. PROVIDE ON SITE OR MAKE READILY AVAILABLE THE NECESSARY EQUIPMENT AND SITE PERSONNEL DURING CONSTRUCTION HOURS FOR THE DURATION OF THE PROJECT TO ENSURE ALL EROSION AND SEDIMENTATION CONTROL DEVICES ARE PROPERLY MAINTAINED AND REPAIRED IN A TIMELY AND RESPONSIBLE MANNER.
14. PRIOR TO THE INSTALLATION OF FILTER FABRIC AND MEDIA WITHIN THE BIORETENTION AREAS, REMOVE AND PROPERLY DISPOSE OF SEDIMENT ACCUMULATED IN ANY PARTIALLY CONSTRUCTED OR TEMPORARY BIORETENTION/DRAINAGE AREA USED FOR SEDIMENT CONTROL DURING CONSTRUCTION. PROVIDE A SURFACE ELEVATION AT A MINIMUM 1-FOOT ABOVE THE BOTTOM OF MEDIA ELEVATION AS SHOWN IN THE BIORETENTION SCHEDULE FOR PARTIALLY CONSTRUCTED BIORETENTION AREAS. THIS ALLOWS FOR AN OVER-DIG OF THE COLLECTED SEDIMENT FROM WITHIN THE BIORETENTION AREA PRIOR TO MEDIA/FABRIC INSTALLATION.
15. CONTROL DUST BY WATERING OR OTHER APPROVED METHODS AS NECESSARY, OR AS DIRECTED BY THE ENGINEER.
16. THE CONTRACTOR IS RESPONSIBLE FOR THE INSPECTION AND MAINTENANCE DURING CONSTRUCTION OF ALL STORMWATER FACILITIES INSTALLED OR AFFECTED BY THE PROJECT. REMOVE SEDIMENT OR DEBRIS COLLECTED WITHIN THESE FACILITIES FROM THE PROJECT WORK PRIOR TO THE OWNER'S ACCEPTANCE.



GRAPHIC SCALE

80 0 40 80 160 320

(in feet)

1 INCH = 80 FEET

NOTES:
1. FENCE FABRIC TO BE 36-INCHES WIDE MINIMUM AND TO BE SECURELY FASTENED TO BEANPOLES. 6" MIN OF FABRIC TO BE BELOW GROUND SURFACE (BACKFILLED OR TOE-ED INTO GROUND).

TOP VIEW

JOINING SECTIONS OF FENCE

FABRIC SEDIMENTATION FENCE (SILT FENCE)
NOT TO SCALE

NOTES:
1. SEDIMENT CONTROL INSERTS TO BE INSTALLED OVER ALL CATCHBASINS\INLETS THAT WILL RECEIVE RUNOFF FROM THE PROJECT SITE.
2. TEMPORARY INLET PROTECTION TO BE REMOVED AFTER CONTRIBUTING DRAINAGE AREA HAS BEEN PERMANENTLY STABILIZED.
3. DEPTH (D) TO BE A MINIMUM OF 16-INCHES.
4. MANUFACTURER TO BE SILT SACK OR APPROVED EQUIVALENT.

TEMPORARY INLET PROTECTION (SILT SACK)
NOT TO SCALE

PLAN VIEW **SECTION**

NOTES:
1. SILT SOCK MANUFACTURER TO BE SILT SOXX OR ENGINEER APPROVED EQUAL.
2. ALL MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.
3. SEDIMENT SILT SOCK TO BE FILLED WITH LEAF COMPOST AND/OR WOODY MULCH PER MANUFACTURER'S REQUIREMENTS.
4. FOLLOWING CONSTRUCTION AND SITE STABILIZATION, COMPOST MATERIAL TO BE REMOVED AND DISPERSED ON SITE, IN A LOCATION APPROVED BY THE ENGINEER AND OWNER.

SEDIMENTATION BARRIER (SILT SOCK)
NOT TO SCALE

Revisions

Rev.	Date	By	Appr.	Description

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Checked By: BM
Drawn By: MCL
Designed By: KDL
Date: MARCH 2020

Plan Set: HYA SOIL CAPPING & DRAINAGE FOR PER- AND POLY-FLUOROALKYL SUBSTANCES (PFAS) MITIGATION BIDDING SET BARNSTABLE, MASSACHUSETTS

Plan Title: EROSION & SEDIMENTATION CONTROL PLAN

Prepared For:
Barnstable Municipal Airport
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Survey Provided By:
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Fax: —
Dated: January 2019

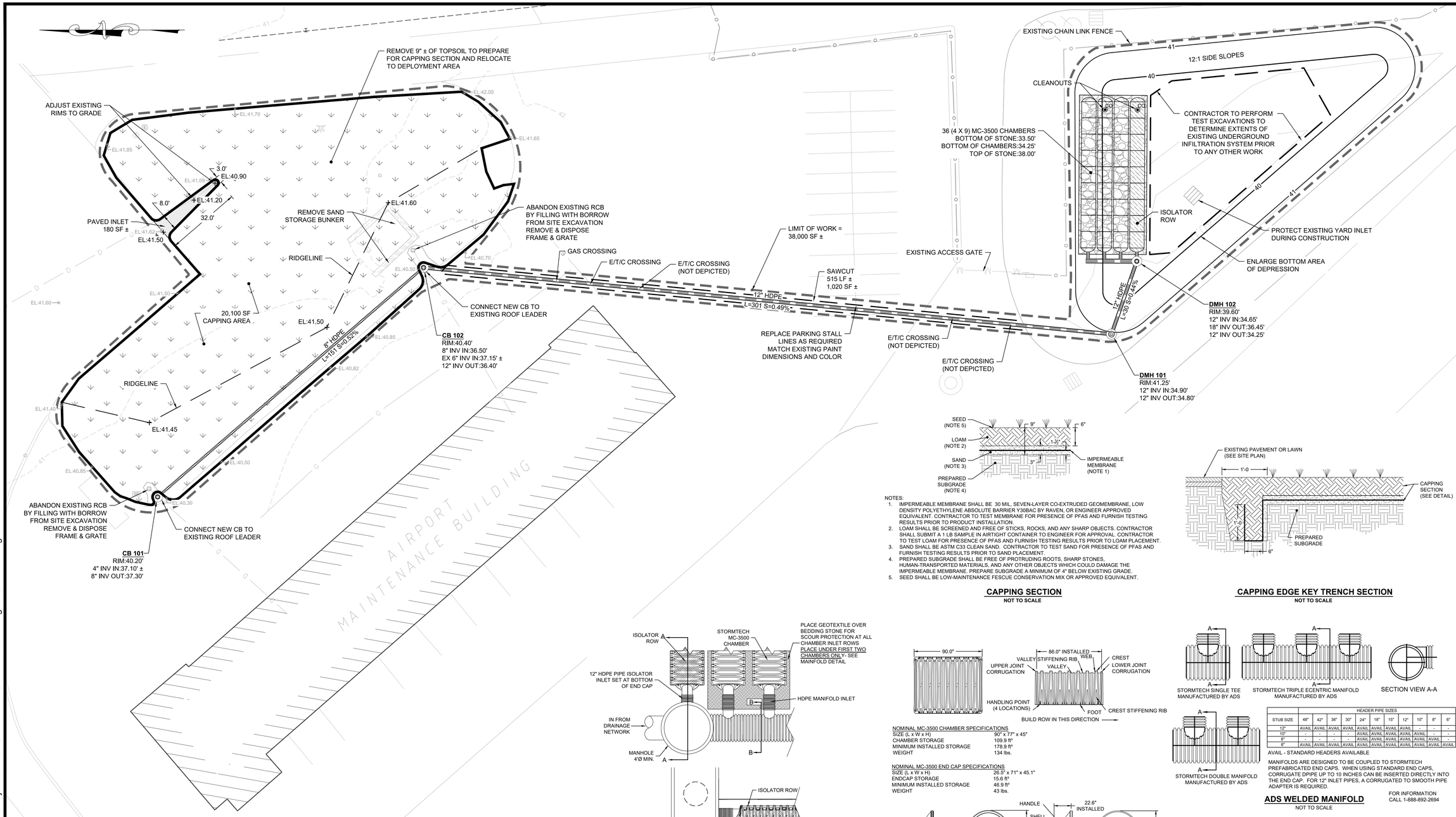
Registration:

DRAFT
NOT FOR CONSTRUCTION

Project Number: 17027A
Sheet : 3 of 5

Sheet Number: C - 3

last modified: 03/25/20 printed: 03/25/20 by mlt H:\Projects\HYA\17027 BMA PFOS 1-4 IRA\Drawings\17027A ST.dwg

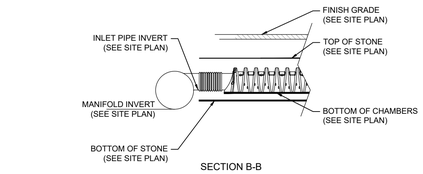


NOTES:
1. IMPERMEABLE MEMBRANE SHALL BE 30 MIL, SEVEN-LAYER CO-EXTRUDED GEOMEMBRANE, LOW DENSITY POLYETHYLENE ABSOLUTE BARRIER Y30BAC BY RAVEN, OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR TO TEST MEMBRANE FOR PRESENCE OF PFAS AND FURNISH TESTING RESULTS PRIOR TO PRODUCT INSTALLATION.
2. LOAM SHALL BE SCREENED AND FREE OF STICKS, ROCKS, AND ANY SHARP OBJECTS. CONTRACTOR SHALL SUBMIT A 1 LB SAMPLE IN AIRTIGHT CONTAINER TO ENGINEER FOR APPROVAL. CONTRACTOR TO TEST LOAM FOR PRESENCE OF PFAS AND FURNISH TESTING RESULTS PRIOR TO LOAM PLACEMENT.
3. SAND SHALL BE ASTM C33 CLEAN SAND. CONTRACTOR TO TEST SAND FOR PRESENCE OF PFAS AND FURNISH TESTING RESULTS PRIOR TO SAND PLACEMENT.
4. PREPARED SUBGRADE SHALL BE FREE OF PROTRUDING ROOTS, SHARP STONES, HUMAN-TRANSPORTED MATERIALS, AND ANY OTHER OBJECTS WHICH COULD DAMAGE THE IMPERMEABLE MEMBRANE. PREPARE SUBGRADE A MINIMUM OF 4" BELOW EXISTING GRADE.
5. SEED SHALL BE LOW-MAINTENANCE FESCUE CONSERVATION MIX OR APPROVED EQUIVALENT.

CAPPING SECTION
NOT TO SCALE

CAPPING EDGE KEY TRENCH SECTION
NOT TO SCALE

SECTION A-A



SECTION B-B

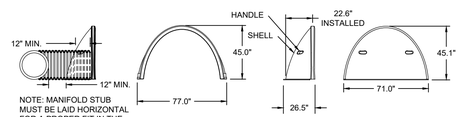
STORMTECH SYSTEM DETAIL
NOT TO SCALE

NOMINAL MC-3500 CHAMBER SPECIFICATIONS

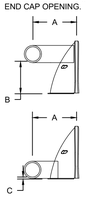
SIZE (L x W x H)	90" x 77" x 45"
CHAMBER STORAGE	109.9 ft³
MINIMUM INSTALLED STORAGE	178.9 ft³
WEIGHT	134 lbs.

NOMINAL MC-3500 END CAP SPECIFICATIONS

SIZE (L x W x H)	26.5" x 71" x 45.1"
ENDCAP STORAGE	15.6 ft³
MINIMUM INSTALLED STORAGE	46.9 ft³
WEIGHT	43 lbs.



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN THE END CAP OPENING.



PART NUMBERS ENDING WITH "B" ARE FOR STUBS AT BOTTOM OF END CAP.
PART NUMBERS ENDING WITH "T" ARE FOR STUBS AT TOP OF END CAP.

PART#	STUB	B	C
MC3500TEPE12T	12" [300 mm]	26.36" (670 mm)	N/A
MC3500TEPE12B	12" [300 mm]	N/A	1.35" [34 mm]
MC3500TEPE15T	15" [375 mm]	23.39" [594 mm]	N/A
MC3500TEPE15B	15" [375 mm]	N/A	1.50" [38 mm]
MC3500TEPE18T	18" [450 mm]	20.03" [509 mm]	N/A
MC3500TEPE18B	18" [450 mm]	N/A	1.77" [45 mm]
MC3500TEPE24T	24" [600 mm]	14.48" [368 mm]	N/A
MC3500TEPE24B	24" [600 mm]	N/A	2.06" [52 mm]

NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST.
INVENTORIED MANIFOLDS INCLUDE 12" - 24" SIZE ON SIZE AND 15" THROUGH 48" ECCENTRIC MANIFOLDS.

STORMTECH MC-3500 TECHNICAL DETAILS
NOT TO SCALE

	HEADER PIPE SIZES									
STUB SIZE	48"	42"	36"	30"	24"	18"	15"	12"	10"	8"	6"
12"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-
10"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-
8"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-
6"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL

AVAIL - STANDARD HEADERS AVAILABLE

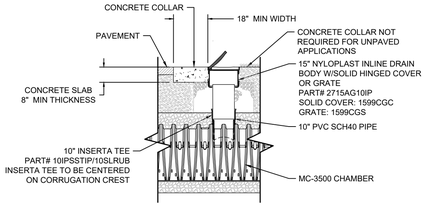
MANIFOLDS ARE DESIGNED TO BE COUPLED TO STORMTECH PREFABRICATED END CAPS. WHEN USING STANDARD END CAPS, CORRUGATE DIPPE UP TO 10 INCHES CAN BE INSERTED DIRECTLY INTO THE END CAP. FOR 12" INLET PIPES, A CORRUGATED TO SMOOTH PIPE ADAPTER IS REQUIRED.

ADS WELDED MANIFOLD
NOT TO SCALE

FOR INFORMATION CALL 1-888-892-2694

STORMTECH GENERAL NOTES

1. STORMTECH LLC ("STORMTECH") REQUIRES INSTALLING CONTRACTORS TO USE AND UNDERSTAND STORMTECH'S LATEST INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLATION.
2. OUR TECHNICAL SERVICES DEPARTMENT OFFERS INSTALLATION CONSULTATIONS TO INSTALLING CONTRACTORS. CONTACT OUR TECHNICAL SERVICES REPRESENTATIVE AT LEAST 30 DAYS PRIOR TO SYSTEM INSTALLATION TO ARRANGE A PRE-INSTALLATION CONSULTATION. OUR REPRESENTATIVES CAN THEN ANSWER QUESTIONS OR ADDRESS COMMENTS ON THE STORMTECH CHAMBER SYSTEM AND INFORM THE INSTALLING CONTRACTOR OF THE MINIMUM INSTALLATION REQUIREMENTS BEFORE BEGINNING THE SYSTEM'S CONSTRUCTION. CALL 1-888-892-2694 TO SPEAK TO A TECHNICAL SERVICE REPRESENTATIVE OR VISIT WWW.STORMTECH.COM TO RECEIVE A COPY OF OUR INSTALLATION INSTRUCTIONS.
3. STORMTECH'S REQUIREMENTS FOR SYSTEMS WITH PAVEMENT DESIGN (ASPHALT, CONCRETE PAVERS, ETC.): MINIMUM COVER IS 18 INCHES NOT INCLUDING PAVEMENT; MAXIMUM COVER IS 96 INCHES INCLUDING PAVEMENT. FOR INSTALLATIONS THAT DO NOT INCLUDE PAVEMENT, WHERE RUTTING FROM VEHICLES MAY OCCUR, MINIMUM REQUIRED COVER IS 24 INCHES, MAXIMUM COVER IS 96 INCHES.
4. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE DESIGN ENGINEER.
5. AASHTO M288 CLASS 2 NON-WOVEN GEOTEXTILE (FILTER FABRIC) MUST BE USED AS INDICATED IN THE PROJECT PLANS.
6. STONE PLACEMENT BETWEEN CHAMBERS ROWS AND AROUND PERIMETER MUST FOLLOW INSTRUCTIONS AS INDICATED IN THE MOST CURRENT VERSION OF STORMTECH'S INSTALLATION INSTRUCTIONS.
7. BACKFILLING OVER THE CHAMBERS MUST FOLLOW REQUIREMENTS AS INDICATED IN THE MOST CURRENT VERSION OF STORMTECH'S INSTALLATION INSTRUCTIONS.
8. THE CONTRACTOR MUST REFER TO STORMTECH'S INSTALLATION INSTRUCTIONS FOR A TABLE OF ACCEPTABLE VEHICLE LOADS AT VARIOUS DEPTHS OF COVER. THIS INFORMATION IS ALSO AVAILABLE AT STORMTECH'S WEBSITE: WWW.STORMTECH.COM. THE CONTRACTOR IS RESPONSIBLE FOR PREVENTING VEHICLES THAT EXCEED STORMTECH'S REQUIREMENTS FROM TRAVELING ACROSS OR PARKING OVER THE STORMWATER SYSTEM. TEMPORARY FENCING, WARNING TAPE AND APPROPRIATELY LOCATED SIGNS ARE COMMONLY USED TO PREVENT UNAUTHORIZED VEHICLES FROM ENTERING SENSITIVE CONSTRUCTION AREAS.
9. THE CONTRACTOR MUST APPLY EROSION AND SEDIMENT CONTROL MEASURES TO PROTECT THE STORMWATER SYSTEM DURING ALL PHASES OF SITE CONSTRUCTION PER LOCAL CODES AND DESIGN ENGINEER'S SPECIFICATIONS.
10. STORMTECH PRODUCT WARRANTY IS LIMITED. SEE CURRENT PRODUCT WARRANTY FOR DETAILS. TO ACQUIRE A COPY CALL STORMTECH AT 1-888-892-2694 OR VISIT WWW.STORMTECH.COM.



NOTES:
1. ALL SCHEDULE 40 FITTINGS TO BE SOLVENT CEMENTED.
2. INSPECTION PORTS TO BE INSTALLED IN THE MIDDLE CHAMBER OF EACH CHAMBER ROW
3. FOR STORMTECH INFORMATION CALL 1-888-892-2694

CLEANOUT
NOT TO SCALE

GRAPHIC SCALE
20 0 10 20 40 80
(in feet)
1 INCH = 20 FEET

Revisions

Rev.	Date	By	Appr.	Description

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Sustainable Environmental Solutions
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Checked By: BM
Drawn By: MDL
Designed By: MDL
Date: MARCH 2020

Plan Set: HYA SOIL CAPPING & DRAINAGE FOR PER- AND POLY-FLUOROALKYL SUBSTANCES (PFAS) MITIGATION
BIDDING SET
BARNSTABLE, MASSACHUSETTS

Plan Title: SITE PLAN (ARFF SRE BUILDING)

Prepared For:
Barnstable Municipal Airport
480 Barnstable Road
Hyannis, MA 02601
Phone: (508) 775-2020
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Survey Provided By:
Horsley Witten Group, Inc.
90 Route 6A
Sandwich, MA 02563
Phone: (508) 833-6600
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Registration:
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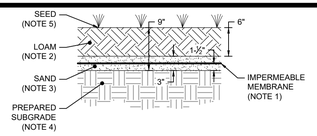
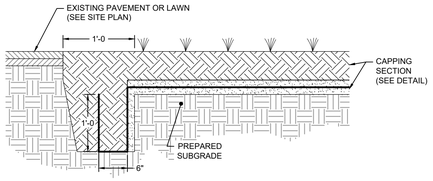
Project Number: 17027A
Sheet : 4 of 5
Sheet Number: C - 4

last modified: 03/25/20 printed: 03/25/20 by ml H:\Projects\HYA\17027 BMA PFOS 1-4 IRA\Drawings\17027A ST.dwg



NOTES:
1. IMPERMEABLE MEMBRANE SHALL BE 30 MIL, SEVEN-LAYER CO-EXTRUDED GEOMEMBRANE, LOW DENSITY POLYETHYLENE ABSOLUTE BARRIER Y30BAC BY RAVEN, OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR TO TEST MEMBRANE FOR PRESENCE OF PFAS AND FURNISH TESTING RESULTS PRIOR TO PRODUCT INSTALLATION.
2. LOAM SHALL BE SCREENED AND FREE OF STICKS, ROCKS, AND ANY SHARP OBJECTS. CONTRACTOR SHALL SUBMIT A 1 LB SAMPLE IN AIRTIGHT CONTAINER TO ENGINEER FOR APPROVAL. CONTRACTOR TO TEST LOAM FOR PRESENCE OF PFAS AND FURNISH TESTING RESULTS PRIOR TO LOAM PLACEMENT.
3. SAND SHALL BE ASTM C33 CLEAN SAND. CONTRACTOR TO TEST SAND FOR PRESENCE OF PFAS AND FURNISH TESTING RESULTS PRIOR TO SAND PLACEMENT.
4. PREPARED SUBGRADE SHALL BE FREE OF PROTRUDING ROOTS, SHARP STONES, HUMAN-TRANSPORTED MATERIALS, AND ANY OTHER OBJECTS WHICH COULD DAMAGE THE IMPERMEABLE MEMBRANE. PREPARE SUBGRADE A MINIMUM OF 4" BELOW EXISTING GRADE.
5. SEED SHALL BE LOW-MAINTENANCE FESCUE CONSERVATION MIX OR APPROVED EQUIVALENT.

CAPPING SECTION
NOT TO SCALE



CAPPING EDGE KEY TRENCH SECTION
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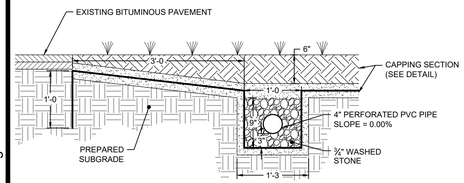
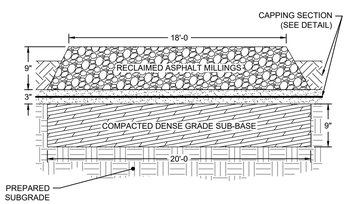
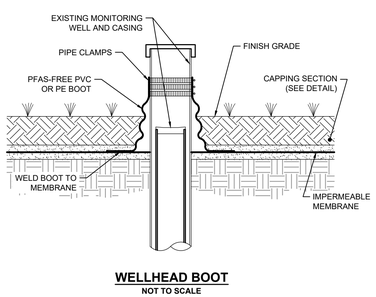


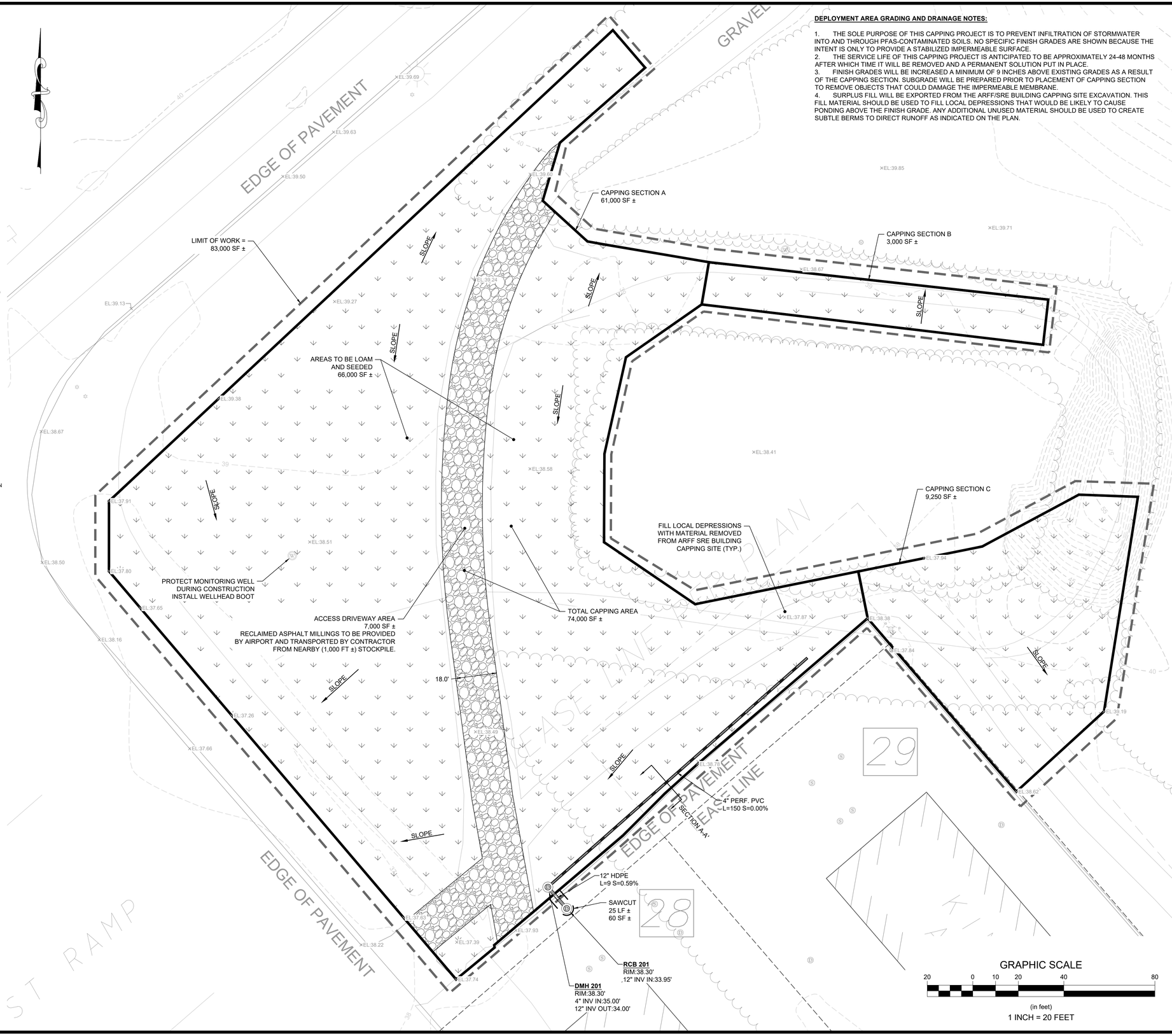
CAPPING WEEP TRENCH SECTION A-A'
NOT TO SCALE



ACCESS DRIVEWAY SECTION
NOT TO SCALE



WELLHEAD BOOT
NOT TO SCALE



DEPLOYMENT AREA GRADING AND DRAINAGE NOTES:

1. THE SOLE PURPOSE OF THIS CAPPING PROJECT IS TO PREVENT INFILTRATION OF STORMWATER INTO AND THROUGH PFAS-CONTAMINATED SOILS. NO SPECIFIC FINISH GRADES ARE SHOWN BECAUSE THE INTENT IS ONLY TO PROVIDE A STABILIZED IMPERMEABLE SURFACE.
2. THE SERVICE LIFE OF THIS CAPPING PROJECT IS ANTICIPATED TO BE APPROXIMATELY 24-48 MONTHS AFTER WHICH TIME IT WILL BE REMOVED AND A PERMANENT SOLUTION PUT IN PLACE.
3. FINISH GRADES WILL BE INCREASED A MINIMUM OF 9 INCHES ABOVE EXISTING GRADES AS A RESULT OF THE CAPPING SECTION. SUBGRADE WILL BE PREPARED PRIOR TO PLACEMENT OF CAPPING SECTION TO REMOVE OBJECTS THAT COULD DAMAGE THE IMPERMEABLE MEMBRANE.
4. SURPLUS FILL WILL BE EXPORTED FROM THE ARFF/SRE BUILDING CAPPING SITE EXCAVATION. THIS FILL MATERIAL SHOULD BE USED TO FILL LOCAL DEPRESSIONS THAT WOULD BE LIKELY TO CAUSE PONDING ABOVE THE FINISH GRADE. ANY ADDITIONAL UNUSED MATERIAL SHOULD BE USED TO CREATE SUBTLE BERMS TO DIRECT RUNOFF AS INDICATED ON THE PLAN.

Revisions

Rev.	Date	By	Appr.	Description

Horsley Witten Group, Inc.
Sustainable Environmental Solutions
www.horsleywitten.com
90 Route 6A
Sandwich, MA 02563
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Checked By: BM
Drawn By: MCL
Designed By: KDL
Date: MARCH 2020

Plan Set: HYA SOIL CAPPING & DRAINAGE FOR PER- AND POLY-FLUOROALKYL SUBSTANCES (PFAS) MITIGATION BIDDING SET
BARNSTABLE, MASSACHUSETTS

Plan Title: SITE PLAN (DEPLOYMENT AREA)

Prepared For:
Barnstable Municipal Airport
480 Barnstable Road
Hyannis, MA 02601
Phone: (508) 775-2020
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Survey Provided By:
Horsley Witten Group, Inc.
90 Route 6A
Sandwich, MA 02563
Phone: (508) 833-6600
Fax: —
Dated: January 2019

Registration:

DRAFT
NOT FOR CONSTRUCTION

Project Number: 17027A
Sheet: 5 of 5

Sheet Number: C - 5

GENERAL NOTES

AIRPORT MANAGER

1. THE AIRPORT MANAGER AND/OR HIS/HER DESIGNEE HAVE THE AUTHORITY TO OPEN AND CLOSE AIRPORT FACILITIES, ISSUE AND CANCEL NOTAM'S AND TO COORDINATE WITH AIRPORT USERS. THE AIRPORT MANAGER IS THE SOLE AUTHORITY WITH RESPECT TO AIRPORT OPERATIONS, SAFETY AND SECURITY.

AIRPORT SAFETY AND SECURITY

2. THE CONTRACTOR SHALL INSTALL AND MAINTAIN SAFETY AND SECURITY MEASURES THROUGHOUT THE PROJECT, INCLUDING BUT NOT LIMITED TO: WORKER SAFETY, PEDESTRIAN SITE ACCESS AND SAFETY, AIRFIELD AND OFF-AIRPORT TRAFFIC SAFETY DIRECTLY IMPACTED BY THE PROJECT, PEDESTRIAN ACCESS AND SAFETY MEASURES FOR ACCESSING AIRPORT FACILITIES THAT ARE IMPACTED BY THE PROJECT.

3. THE CONTRACTOR SHALL COMPLY WITH ALL AIRPORT SECURITY REQUIREMENTS AS DIRECTED BY THE AIRPORT MANAGER OR HIS/HER DESIGNEE. THE CONTRACTOR SHALL COMPLY WITH BADGING PER AIRPORT REQUIREMENTS.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING ACCESS TO THE WORK AREA AND ENSURING THAT SECURITY WITHIN THE CONTRACTOR'S LIMIT OF WORK IS MAINTAINED AT ALL TIMES. THE FAA CAN IMPOSE SIGNIFICANT FINES FOR SECURITY VIOLATIONS AND INCURSIONS INTO ACTIVE AIRCRAFT OPERATION AREAS (AOA). THE CONTRACTOR SHALL PAY ALL FINES ASSESSED AGAINST THE AIRPORT DUE TO VIOLATIONS CAUSED BY THE CONTRACTOR AND HIS/HER PERSONNEL, SUBCONTRACTORS AND VENDORS.

5. PARKING PERSONAL VEHICLES SHALL BE IN DESIGNATED LOCATIONS ONLY, BUT NOT WITHIN AN ACTIVE CONSTRUCTION AREA. THE CONTRACTOR, AS A SUBSIDIARY OBLIGATION, SHALL PROVIDE ADEQUATE AND SAFE TRANSPORTATION FOR HIS/HER EMPLOYEES, AND FOR ITS SUBCONTRACTORS AND VENDORS, BETWEEN THE WORK AREAS AND THE LOCATION OF THE PERSONAL VEHICLES. EMPLOYEES AND DRIVERS OF WORK VEHICLES SHALL BE INSTRUCTED AS TO PROPER ACCESS ROADS AND SHALL BE CAUTIONED THAT UNAUTHORIZED ACCESS AND USE OF AIRPORT PAVEMENTS OR OTHER AREAS OUTSIDE THE DESIGNATED WORK AREAS MAY LEAD TO THEIR ARREST AND SUBSEQUENT PAYMENT OF FINES. NO PERSONAL VEHICLES FOR EMPLOYEES OR REPRESENTATIVES OF THE CONTRACTOR OR ITS SUBCONTRACTORS OR VENDORS ARE ALLOWED WITHIN THE AIRCRAFT OPERATIONS AREA.

6. THE CONTRACTOR SHALL PROVIDE INSTRUCTION TO ALL OF ITS EMPLOYEES ENGAGED IN THE PROJECT AS WELL AS ALL SUBCONTRACTORS AND VENDORS INCLUDING MATERIAL SUPPLIERS REGARDING THE AIRPORT ACCESS PROCEDURES TO BE FOLLOWED BY THEIR DELIVERY DRIVERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ESCORTS OF NON-BADGED EMPLOYEES INCLUDING BUT NOT LIMITED TO MANAGEMENT STAFF, AS WELL AS VENDORS, SUBCONTRACTORS, VISITORS, DELIVERY DRIVERS, AND OTHERS UNDER THE AUTHORITY OF THE CONTRACTOR WHILE ON THE AIRPORT.

7. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER AND THE OWNER PRIOR TO THE START OF WORK, A WRITTEN CONSTRUCTION MANAGEMENT PLAN WHICH DETAILS AMONG OTHER THINGS, THE PRECAUTIONS HE/SHE PROPOSES FOR THE CONTROL OF ITS WORK INCLUDING VEHICLE TRAFFIC INCLUDING POLICE DETAILS, FLAG PERSONS, SIGNS, BARRICADES AND ANY OTHER MEASURES HE/SHE PROPOSES. THE OWNER AND ENGINEER WILL REVIEW AND APPROVE THE PROPOSED PLAN; THE CONTRACTOR SHALL COMPLY WITH THE APPROVED DOCUMENT. STOPPAGE OF WORK BY THE OWNER FOR NON-CONFORMANCE SHALL NOT CONSTITUTE A VALID REASON FOR EXTENDING CONTRACT TIME OR FOR ANY CLAIM OF ADDITIONAL COMPENSATION BY THE CONTRACTOR.

8. THE CONTRACTOR'S PERSONNEL AND CONTRACTOR'S VEHICLES SHALL BE RESTRICTED TO AND SHALL REMAIN WITHIN THE WORK AREAS, HAUL AND ACCESS ROUTES, AND THE STAGING AREAS AS SHOWN ON THE CONTRACT PLANS.

9. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SECURITY WHEN USING AIRPORT GATES TO ACCESS THE CONSTRUCTION SITE. GATES SHALL BE CLOSED AND LOCKED WHEN NOT IN USE. WHEN GATE(S) ARE IN USE IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE A DEDICATED GATE GUARD TO MONITOR THE CONSTRUCTION TRAFFIC, AS WELL AS VEHICULAR AND PEDESTRIAN ACCESS WHICH MAY CONFLICT WITH THE CONTRACTOR'S OPERATION. LIQUIDATED DAMAGES MAY BE APPLICABLE FOR A VIOLATION OF THIS REQUIREMENT - SEE SPECIFICATIONS.

AIRCRAFT OPERATIONS AREA (AOA)

10. IN GENERAL, THE WORK ASSOCIATED WITH THIS PROJECT WILL REQUIRE THE CONTRACTOR TO BE NEAR OR WITHIN THE AIRCRAFT OPERATIONS AREA (AOA). THE AOA IS ANY AREA OF AN AIRPORT USED OR INTENDED TO BE USED FOR LANDING, TAKEOFF, OR SURFACE MANEUVERING OF AIRCRAFT. AN AOA INCLUDES SUCH PAVED OR TURF AREAS THAT ARE USED OR INTENDED TO BE USED FOR THE UNOBSTRUCTED MOVEMENT OF AIRCRAFT IN ADDITION TO ITS ASSOCIATED RUNWAY, TAXIWAY, OR APRON.

11. FOR THIS PROJECT, THE CONTRACTOR SHALL KEEP HIS/HER PERSONNEL AND EQUIPMENT OUTSIDE OF THE TAXIWAY / RUNWAY SAFETY AREAS PER THE CONSTRUCTION SAFETY AND PHASING PLAN (CSPP).

12. THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN, AND RELOCATE SAFETY BARRICADES. THE CONTRACTOR SHALL MAINTAIN THE BARRICADES ON A REGULAR BASIS AND IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED CONSTRUCTION MANAGEMENT PLAN.

13. PRIOR TO THE RE-OPENING OF THE WORK AREA(S), THE CONTRACTOR SHALL RELOCATE ALL MATERIALS AND EQUIPMENT OUT OF THE AOA TO THE STAGING AREA, REMOVE STOCKPILES, BACKFILL AND COMPACT TRENCHES AND EXCAVATIONS, AND RESTORE GRADES PER THE CONTRACT DOCUMENTS, AND MECHANICALLY SWEEP ALL PAVED AREAS TO REMOVE ALL DEBRIS, MAKING SURE THAT CLEANUP AND SWEEPING OPERATIONS ARE COMPLETED WITH NO ADVERSE IMPACT TO AIRPORT OPERATIONS. STREET SWEEPING AND OTHER SOIL INTRUSIVE ACTIVITES SHALL BE CONDUCTED IN A MANNER THAT DOES NOT GENERATE FUGITIVE DUST EMISSIONS. SITE SOILS CONTAIN PFAS. APPROPRIATE DUST SUPPRESSION TECHNIQUES ARE CONSIDERED INCIDENTAL TO THE PROJECT. THE OWNER WILL PROVIDE DUST MONITORING AT THE SITE UNDER THE DIRECTION OF A LICENSED SITE PROFESSIONAL.

14. THE CONTRACTOR SHALL KEEP ACTIVE PAVED SURFACES CLEAN AND CLEAR OF CONSTRUCTION MATERIAL, FOREIGN OBJECTS, DIRT, GRAVEL, AND DEBRIS, AND SHALL REMOVE SUCH MATERIALS FROM ACTIVE PAVED SURFACES WITHIN 15 MINUTES OF VERBAL NOTICE FROM THE AIRPORT MANAGER OR HIS/HER DESIGNEE OR THE ENGINEER. THE CONTRACTOR SHALL PROVIDE A MANNED VAC SWEEPER DURING ALL TIMES WHEN ACTIVE AOA PAVEMENTS ARE CROSSED AT NO ADDITIONAL COST TO THE OWNER.

15. THE CONTRACTOR MUST STAY WITHIN THE LIMITS OF THE WORK AREA, DESIGNATED HAUL ROADS, AND STAGING AREAS AT ALL TIMES WHILE OPERATING AT THE AIRPORT. THE CONTRACTOR SHALL PAY CAREFUL ATTENTION TO WORK AREA REQUIREMENTS AND ENSURE THAT ITS OWN PERSONNEL AS WELL AS SUBCONTRACTORS AND VENDORS UNDERSTAND WHICH AREAS ARE ACTIVE (TO AIRCRAFT MOVEMENT) AND WHICH AREAS ARE CLOSED DURING CONSTRUCTION ACTIVITIES.

16. ALL OF THE CONTRACTOR'S EQUIPMENT AND VEHICLES, INCLUDING ESCORT VEHICLES, SHALL BE EQUIPPED WITH A 3' X 3' CHECKERED ORANGE AND WHITE FLAG WITH COMPANY IDENTIFICATION PLAINLY VISIBLE ON BOTH SIDES OF THE VEHICLE, AS WELL AS AMBER FLASHING ROTATING BEACONS.

OPEN TRENCHES OR EXCAVATIONS

17. THE CONTRACTOR WILL NOT BE PERMITTED TO LEAVE TRENCHES OR OTHER EXCAVATIONS OPEN AT NIGHT, ON WEEKENDS, OR AT OTHER TIMES WHEN THE CONTRACTOR IS NOT ON THE WORK SITE, UNLESS APPROVAL IS RECEIVED BY THE AIRPORT MANAGER AND THE CONTRACTOR PROTECTS THE EXCAVATION AS MAY BE APPROPRIATE TO MAINTAIN SAFETY AND SECURITY, INCLUDING BUT NOT LIMITED TO THE USE OF STEEL PLATES, BARRICADES, AND LIGHTING, AS APPROVED BY THE ENGINEER.

    IN ADDITION, NO EXCAVATION EXCEEDING 3 INCHES IN DEPTH SHALL BE LEFT OPEN WITHIN THE AOA, AS DESCRIBED ABOVE, WHILE THE WORK AREA(S) ARE IN USE UNLESS THE EXCAVATIONS ARE COVERED WITH APPROVED STEEL PLATES AND/OR OTHER MEASURES AS MAY BE REQUIRED TO MAINTAIN SAFETY AND SECURITY. STEEL PLATES SHALL BE CAPABLE OF BEARING THE HEAVIEST AIRCRAFT/VEHICLE USING THE AIRPORT OVER THE SPAN OF TIME IN WHICH THEY ARE TO BE USED.

18. ALL EXCAVATIONS SHALL BE BACK FILLED, COMPACTED AND THE PAVEMENT REPAIRED AND PROPERLY CURED PRIOR TO THE AREA BEING REOPENED TO TRAFFIC. ALL EXCAVATION REQUIRED SHALL BE CONSTRUCTED PER THE CONTRACT DOCUMENTS, INCLUDING DEPTH OF EXCAVATION, SIDEWALL STABILIZATION, BACKFILL, COMPACTION, ETC.

DEBRIS AND DUST CONTROL

19. THE CONTRACTOR SHALL STRICTLY CONTROL DEBRIS AND LITTER AT ITS WORK SITE(S) FOR THE PROJECT. MUD, STONES OR OTHER DEBRIS RESULTING FROM CONSTRUCTION OPERATIONS SHALL BE PROMPTLY AND COMPLETELY REMOVED FROM ALL PAVEMENTS TO FACILITATE DAILY AIRCRAFT OPERATIONS AND A CLEAN ENVIRONMENT. DUST CONTROL MEASURES SHALL BE TAKEN AS NECESSARY BY THE CONTRACTOR TO ENSURE THAT NO DUST PRODUCED BY CONSTRUCTION ACTIVITY IS ALLOWED TO DRIFT INTO THE AOA, INTO LOCATIONS WHERE AIRCRAFT ARE PARKED AT ANY TIME, OR SURROUNDING RESIDENCES OR BUSINESSES. THE CONTRACTOR SHALL ENSURE THAT ALL PUBLIC ROADS ARE CONTINUOUSLY MAINTAINED FREE OF MUD AND DEBRIS THAT MAY RESULT FROM ITS OPERATIONS INCLUDING OPERATIONS ASSOCIATED WITH ITS SUBCONTRACTOR AND VENDORS. DEBRIS AND DUST CONTROL MEASURES SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT. THE CONTRACTOR SHALL PROVIDE A MANNED VAC SWEEPER DURING ALL TIMES WHEN ACTIVE AOA PAVEMENTS ARE CROSSED AT NO ADDITIONAL COST TO THE OWNER.

CONTRACTOR'S STAGING AREAS

20. THE CONTRACTOR SHALL USE THE AREAS SHOWN ON THE PLANS FOR HIS/HER STAGING AREA(S). NO OTHER AREAS ARE APPROVED WITHOUT THE EXPLICIT CONSENT OF THE AIRPORT MANAGER AND THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL IMPROVEMENT AND RESTORATION OF THE DESIGNATED STAGING AREAS SUCH AS GRUBBING, GRADING, AND CONSTRUCTION OF STABILIZED ACCESS ROADS, THAT IS NECESSARY FOR THE UTILIZATION OF THE AREA. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR ANY TEMPORARY ACCESS PERMITS AND ASSOCIATED FEES FOR ACCESS TO THE ADJACENT ROAD NETWORK. THERE WILL BE NO SEPARATE PAYMENT FOR THIS WORK. THE COST FOR ALL WORK NECESSARY TO ESTABLISH, USE AND RESTORE THE STAGING AREA(S) SHALL BE DEEMED INCIDENTAL TO THE OVERALL PROJECT.

21. THE CONTRACTOR SHALL MAINTAIN THE STAGING AREA(S), AND THE PROJECT SITE, IN A NEAT MANNER AND PREVENT TRASH, DUST, AND DEBRIS FROM BLOWING INTO ABUTTING AREAS.

GENERAL NOTES

22. IF THE OWNER REQUIRES WEEKLY JOB MEETINGS, THE TIME AND DATE WILL BE DETERMINED BY MUTUAL AGREEMENT OF THE OWNER, CONTRACTOR AND ENGINEER. ENGINEER WILL CONDUCT THE MEETING. AT A MINIMUM THE CONTRACTOR SHALL PROVIDE IT'S PROJECT MANAGER, SITE SUPERINTENDENT(S) AND OTHER KEY PERSONNEL THAT THE CONTRACTOR FEELS IS NECESSARY TO ATTEND THE MEETING. THE MEETING SHALL ALSO BE ATTENDED BY A REPRESENTATIVE OF EACH SUBCONTRACTOR THAT IS PERFORMING WORK AT THE TIME OF THE MEETING, OR BY A SUBCONTRACTOR THAT MAY PLAY A CRITICAL ROLE IN ANY PARTICULAR MEETING. THE MEETING MAY ALSO BE ATTENDED BY THE AIRPORT MANAGER OR HIS/HER DESIGNEE, AND OTHER INVITED PARTIES.

23. THE CONTRACTOR SHALL PROVIDE A WRITTEN UPDATE TO THE PROJECT SCHEDULE AT EACH WEEKLY JOB MEETING; AN ELECTRONIC COPY OF THE SCHEDULE SHALL ALSO BE PROVIDED TO THE OWNER AND ENGINEER VIA EMAIL ON THE DATE OF EACH WEEKLY JOB MEETING. AT A MINIMUM, THE PROJECT SCHEDULE SHALL INCLUDE THE STATUS OF EACH PAY ITEM BY NOTING THE PERCENT COMPLETE TO DATE AND THE CORRESPONDING ANTICIPATED COMPLETION DATE. THE CONTRACTOR SHALL ALSO INDICATE THE STATUS OF THE OVERALL PROJECT INDICATING WHETHER THE PROJECT IS ON SCHEDULE, AHEAD OF SCHEDULE, OR BEHIND SCHEDULE.

24. THE CONTRACTOR SHALL SUBMIT A CONSTRUCTION MANAGEMENT PLAN FOR REVIEW AND APPROVAL BY ENGINEER. AT A MINIMUM, THIS PLAN SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING ELEMENTS:
    a. PROJECT SCHEDULE - UPDATED WEEKLY
    b. 24-HOUR CONTACT INFORMATION FOR KEY PERSONNEL, INCLUDING: PROJECT MANAGER, SITE SUPERINTENDENT(S), AND 24-HOUR CONTACT INFORMATION FOR ALL SUBCONTRACTORS.
    c. SITE SECURITY PLAN
    d. DUST CONTROL
    e. CONSTRUCTION SAFETY MEASURES PURSUANT TO THE CONSTRUCTION SAFETY AND PHASING PLAN

CLOSEOUT DELIVERABLES AND FINAL PAYMENT

25. THE CONTRACTOR SHALL COMPLETE AND PROVIDE THE FOLLOWING DOCUMENTS AND DELIVERABLES BEFORE FINAL PAYMENT:
    a. AS-BUILT PLANS, STAMPED BY PLS SUBCONTRACTOR
    b. AUTOCAD DRAWING OF AS-BUILT PLANS
    c. PROJECT PHOTOGRAPHS
    d. CONTRACTOR WARRANTY
    e. LIEN WAIVERS
    f. FINAL CERTIFIED PAYROLL
    g. EQUIPMENT / O&M MANUALS, AS REQUIRED

26. THE CONTRACTOR IS RESPONSIBLE FOR THE PREPARATION OF ITS OWN HEALTH AND SAFETY PLAN CONSISTENT WITH OSHA. PFAS IS LOCATED WITHIN SITE SOILS. REFER TO DOCUMENT TITLED " FINAL IMMEDIATE RESPONSE ACTION PLAN MODIFICATION", PREPARED BY THE HORSELY WITTEN GROUP, INC. AND DATED DECEMBER 2019

NO.	DATE	DESCRIPTION	BY

PROJECT: PFAS MITIGATION

OWNER: BARNSTABLE MUNICIPAL AIRPORT
480 Barnstable Road • Hyannis, MA 02601
(508) 775-2020

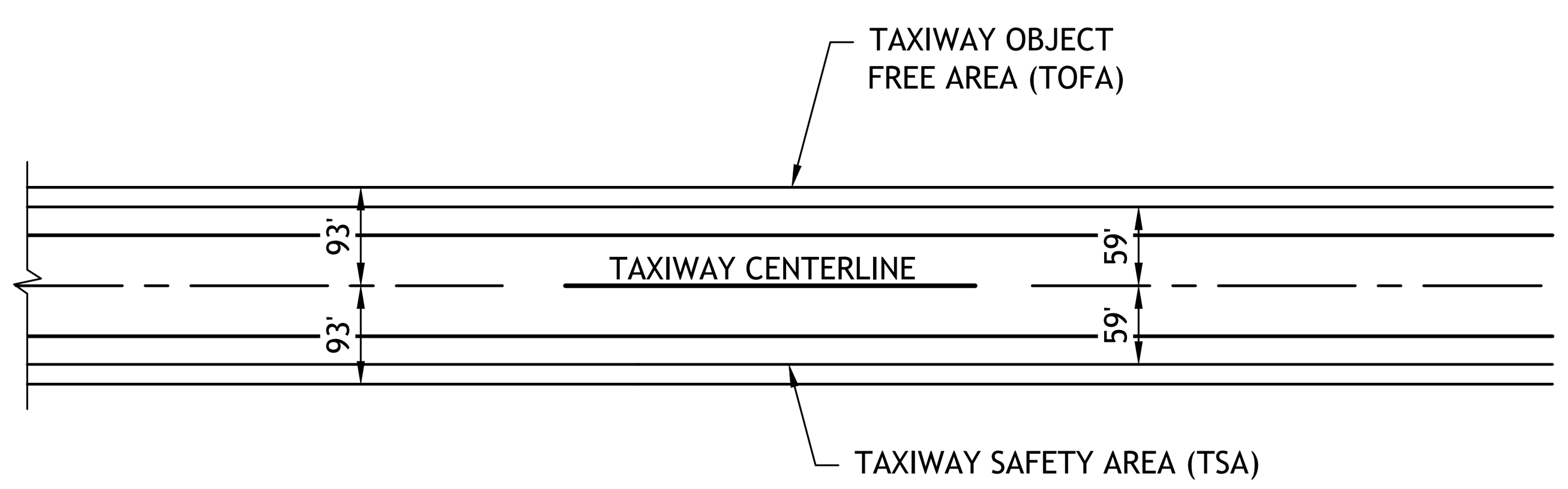
PROJECT NO.	17027A
DESIGNED BY	PEJ
DRAWN BY	PEJ
CHECKED BY	CAS
DATE	MARCH 2020
DRAWING SCALE	N.T.S

SHEET TITLE: CONSTRUCTION SAFETY AND PHASING PLAN - GENERAL NOTES

GRAPHIC SCALE: N.T.S.

DRAWING NO.

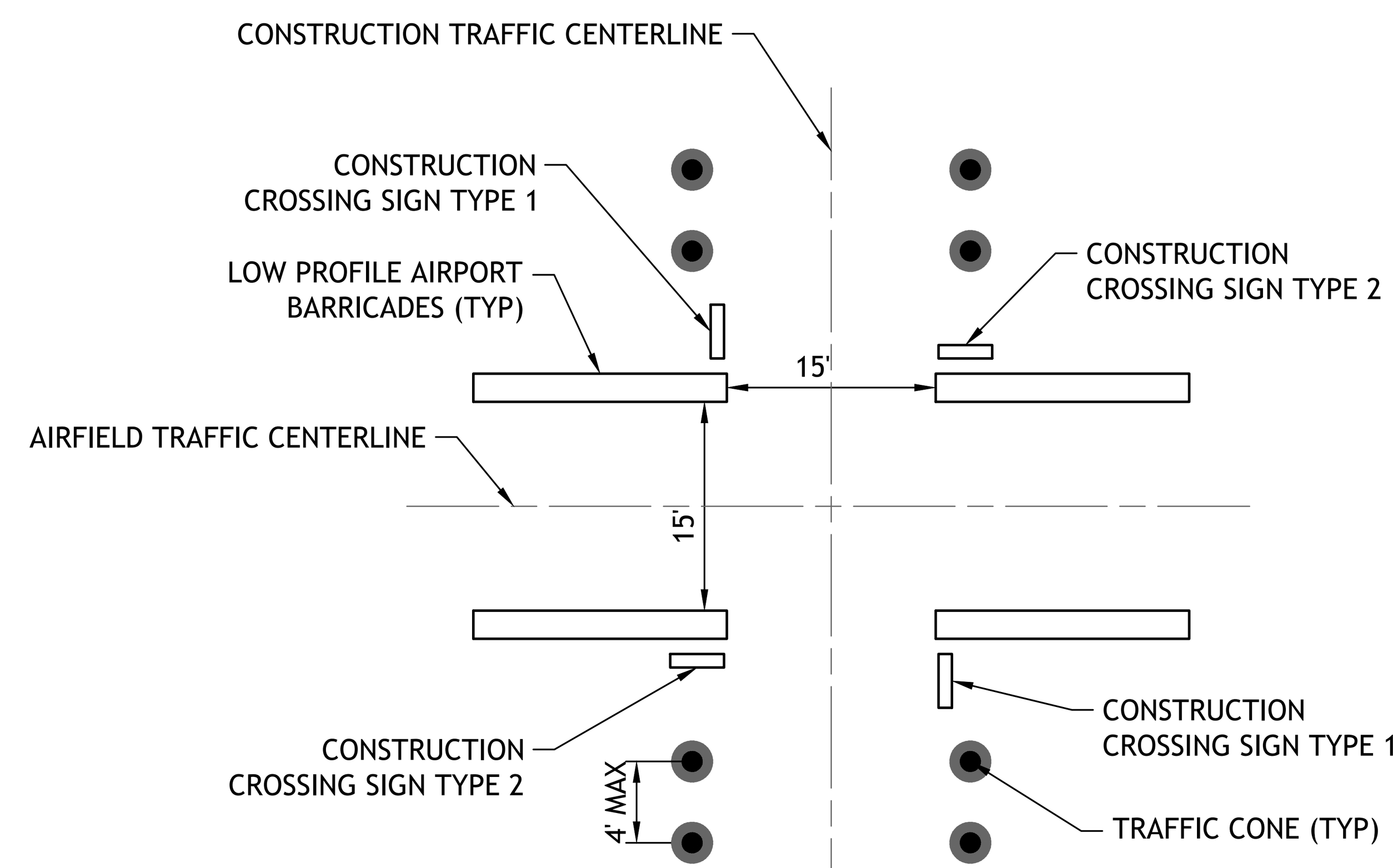
S1.1



NOTE: NO WORK MAY OCCUR WITHIN THE TSA WITHOUT CLOSING DOWN THE TAXIWAY.

TAXIWAYS B RESTRICTED CONSTRUCTION AREAS

SCALE: N.T.S.



NOTE: CONSTRUCTION SITE CROSSING TO BE IMPLEMENTED DURING WORK AREA IB.

CONSTRUCTION SITE CROSSING

SCALE: N.T.S.

CONSTRUCTION CROSSING SIGN TYPE 1

SCALE: N.T.S.

CONSTRUCTION CROSSING SIGN TYPE 2

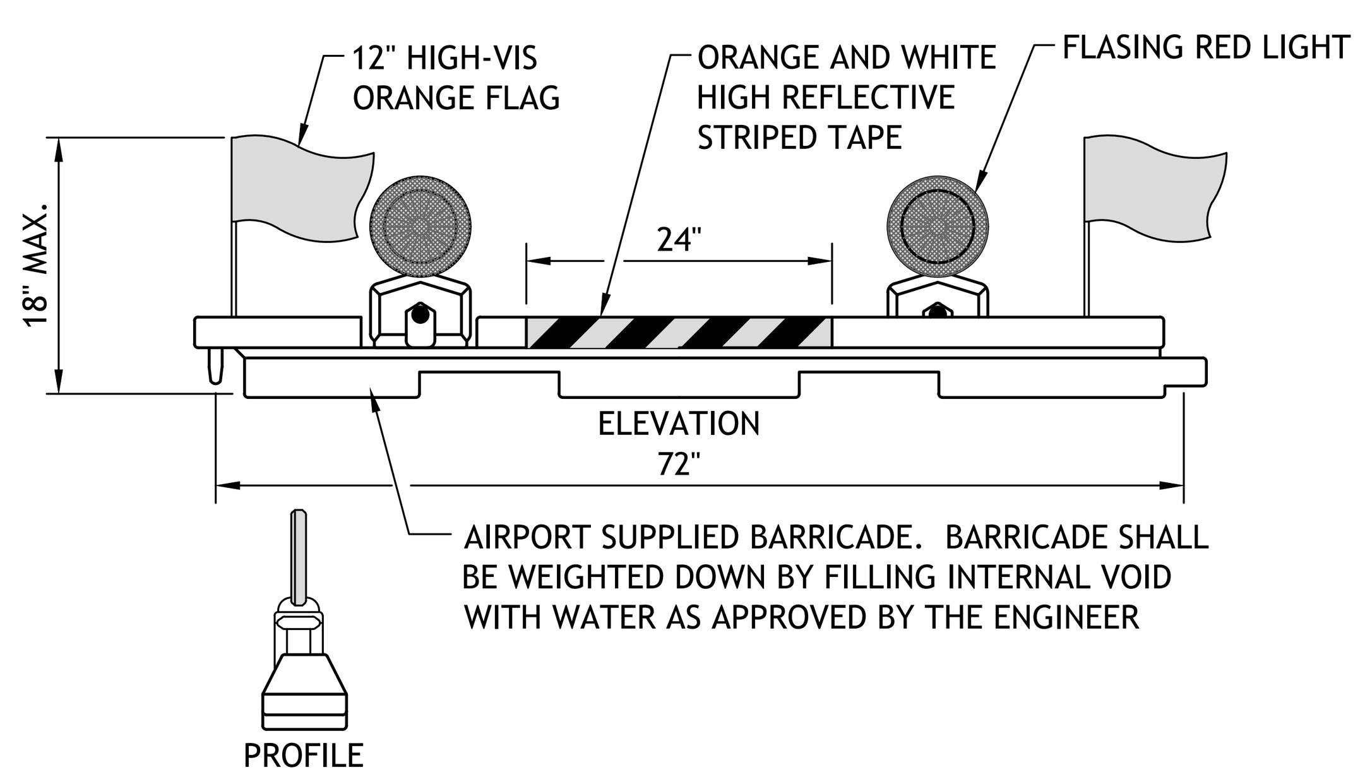
SCALE: N.T.S.

NOTES:

1. "WATCH FOR CROSSING TRAFFIC" SIGNS SHALL BE DESIGNED PER W20-1 SIGN IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), 2009 EDITION.
2. "DO NOT TURN" SIGNS SHALL BE DESIGNED PER R3-3 SIGN IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), 2009 EDITION.
3. SIGNS SHALL CONFORM TO THE DIMENSIONS AND MATERIAL REQUIRED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), 2009 EDITION.
4. SIGN MOUNTING TO BE APPROVED BY ENGINEER.
5. SIGNS SHALL BE OF RETROREFLECTIVE MATERIAL AND MEET THE MINIMUM REQUIREMENTS LISTED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), 2009 EDITION.
6. SIGNS SHALL BE PLACED AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER OR AIRPORT.

TEMPORARY CONSTRUCTION SIGNS

SCALE: N.T.S.

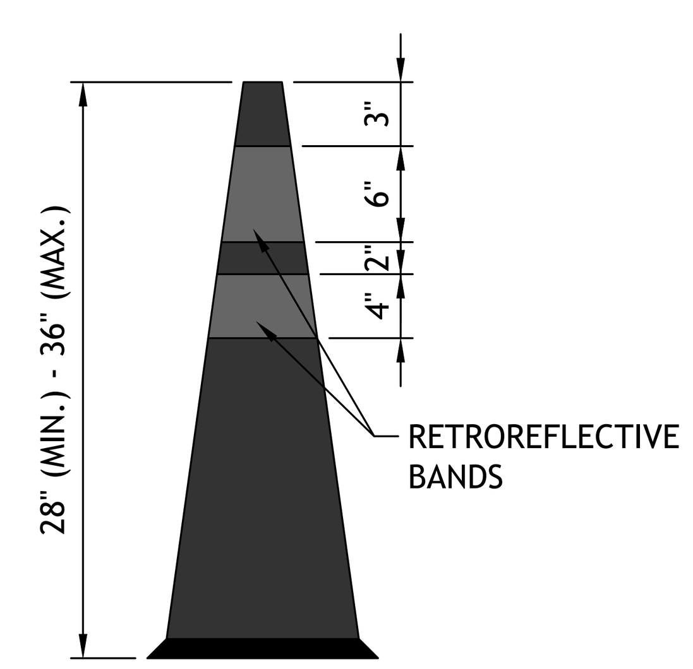


NOTES

1. THE AIRPORT WILL SUPPLY 210 BARRICADES. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT THE BARRICADES MEET FAA REQUIREMENTS FOR VISIBILITY, PER ADVISORY CIRCULAR 150/5370-2G, OR LATEST EDITION, SUCH AS PROVIDING NEW LIGHTS, REPLACEMENT OF BATTERIES, PROVIDING NEW FLAGS, ETC.
2. IT IS THE CONTRACTORS RESPONSIBILITY TO TRANSPORT AND PLACE THE BARRICADES FROM THEIR CURRENT LOCATION ON THE AIRPORT TO THE WORK AREA. IT IS ALSO THE RESPONSIBILITY OF THE CONTRACTOR TO RETURN THE BARRICADES BACK TO THEIR ORIGINAL AIRPORT STORAGE AREA UPON COMPLETION OF THE PROJECT.
3. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT THE BARRICADES ARE RETURNED IN A LIKE OR BETTER CONDITION. ANY BARRICADES DAMAGED BY THE CONTRACTOR SHALL BE REPLACED IN KIND BY THE CONTRACTOR AT THEIR COST.
4. BARRICADE LIGHTS SHALL HAVE RED LENSES AND LED LAMPS AND ORANGE FLAGS.
5. DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE THE NECESSARY SAFETY BARRICADES TO ENSURE THE SAFETY OF AIRCRAFT, AIRCRAFT PASSENGERS, AIRFIELD EMPLOYEES, THE PUBLIC, AND THE CONTRACTOR'S EMPLOYEES.
6. BARRICADES SHALL BE IN PLACE EACH DAY TO DELINEATE THE WORK AREA AND TO RESTRICT ANY AIRCRAFT FROM TAXIING INTO THE ACTIVE WORK AREA. PLACEMENT AND LOCATION OF BARRICADES SHALL BE APPROVED BY THE ENGINEER ON A DAILY BASIS AND COORDINATED WITH THE AIRPORT MANAGER.
7. BARRICADES SHALL BE WEIGHTED WITH WATER TO RESIST WIND, PROP WASH, AND JET BLAST.
8. MAXIMUM ALLOWABLE HEIGHT IS 18 INCHES. STANDARD TYPE HIGHWAY BARRICADES, BARRELS, AND CONES ARE NOT ACCEPTABLE FOR AIRPORT BARRICADES.
9. THE BARRICADES SHOWN ON THE PLAN DO NOT REPRESENT THE QUANTITY OF BARRICADES BUT REPRESENTS THE LOCATION.

LOW PROFILE AIRPORT BARRICADE

SCALE: N.T.S.



NOTES:

1. TRAFFIC CONES MUST MEET THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
2. DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE THE NECESSARY TRAFFIC CONES TO ENSURE THE SAFETY OF AIRCRAFT, AIRCRAFT PASSENGERS, AIRFIELD EMPLOYEES, THE PUBLIC, AND THE CONTRACTOR'S EMPLOYEES.
3. CONES SHALL BE IN PLACE EACH DAY TO DELINEATE THE WORK AREA AND TO RESTRICT ANY AIRCRAFT FROM TAXIING INTO THE ACTIVE WORK AREA. PLACEMENT AND LOCATION OF CONES SHALL BE APPROVED BY THE ENGINEER ON A DAILY BASIS AND COORDINATED WITH THE AIRPORT MANAGER.
4. CONES SHALL BE WEIGHTED TO RESIST WIND, PROP WASH, AND JET BLAST.
5. MAXIMUM ALLOWABLE SPACING OF CONES IS TEN (10) FEET. SEE DRAWINGS.

TRAFFIC CONE

SCALE: N.T.S.

NO.	DATE	DESCRIPTION	BY

PROJECT: PFAS MITIGATION

OWNER: BARNSTABLE MUNICIPAL AIRPORT, 480 Barnstable Road • Hyannis, MA 02601, (508) 775-2020

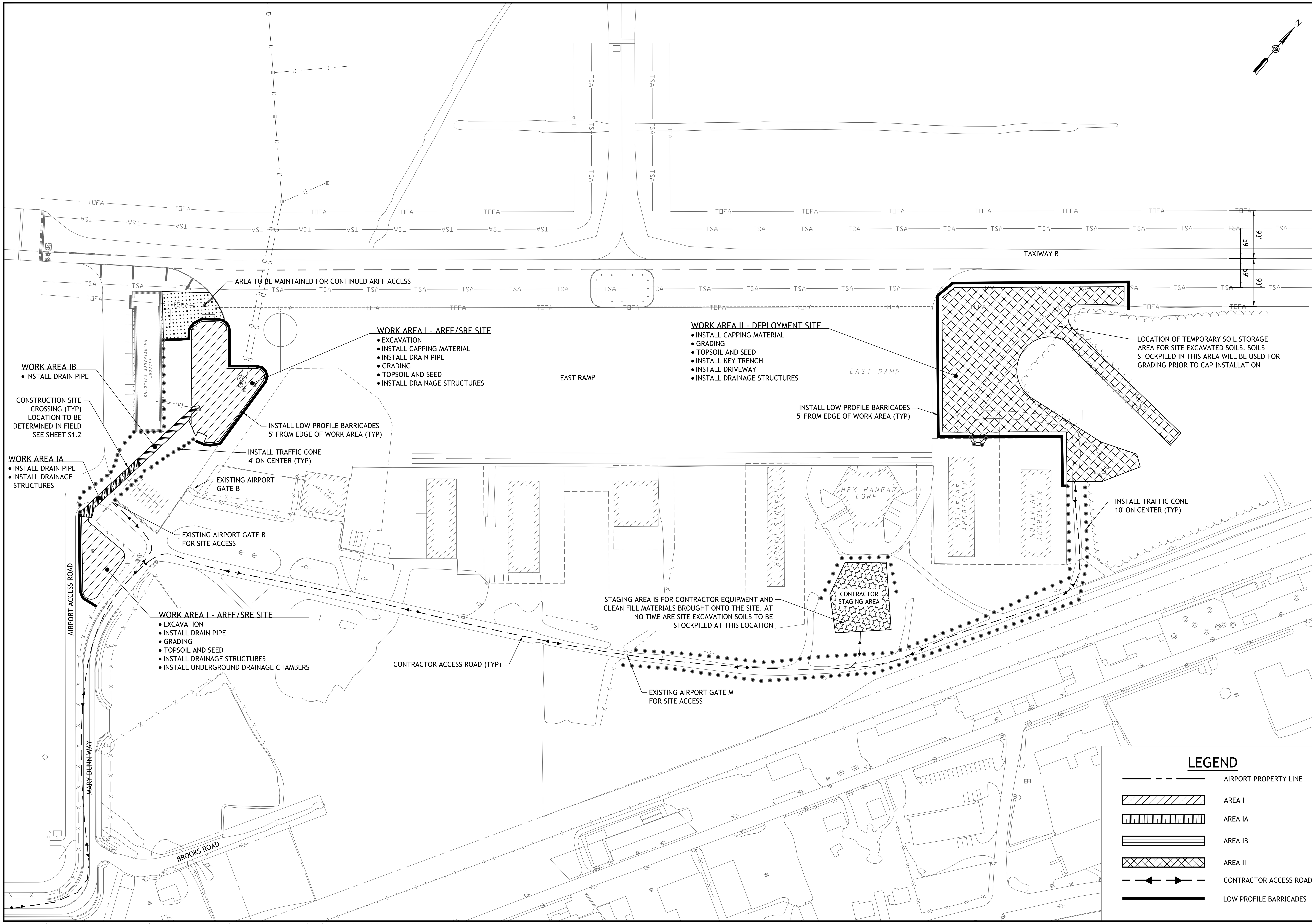
PROJECT NO.	17027A
DESIGNED BY	PEJ
DRAWN BY	PEJ
CHECKED BY	CAS
DATE	MARCH 2020
DRAWING SCALE	N.T.S

SHEET TITLE: CONSTRUCTION SAFETY AND PHASING PLAN - DETAILS

GRAPHIC SCALE: N.T.S.

DRAWING NO.

S1.2


TAXIWAY B
AREA TO BE MAINTAINED FOR CONTINUED ARFF ACCESS
WORK AREA I - ARFF/SRE SITE
• EXCAVATION
• INSTALL CAPPING MATERIAL
• INSTALL DRAIN PIPE
• GRADING
• TOPSOIL AND SEED
• INSTALL DRAINAGE STRUCTURES
WORK AREA II - DEPLOYMENT SITE
• INSTALL CAPPING MATERIAL
• GRADING
• TOPSOIL AND SEED
• INSTALL KEY TRENCH
• INSTALL DRIVEWAY
• INSTALL DRAINAGE STRUCTURES
LOCATION OF TEMPORARY SOIL STORAGE AREA FOR SITE EXCAVATED SOILS. SOILS STOCKPILED IN THIS AREA WILL BE USED FOR GRADING PRIOR TO CAP INSTALLATION
WORK AREA IB
• INSTALL DRAIN PIPE
CONSTRUCTION SITE CROSSING (TYP) LOCATION TO BE DETERMINED IN FIELD SEE SHEET S1.2
EAST RAMP
INSTALL LOW PROFILE BARRICADES 5' FROM EDGE OF WORK AREA (TYP)
INSTALL TRAFFIC CONE 4' ON CENTER (TYP)
WORK AREA IA
• INSTALL DRAIN PIPE
• INSTALL DRAINAGE STRUCTURES
EXISTING AIRPORT GATE B
EXISTING AIRPORT GATE B FOR SITE ACCESS
INSTALL TRAFFIC CONE 10' ON CENTER (TYP)
HEX HANGAR CORP.
HYANNIS HANGAR
KINGSBURY AVIATION
CAPE AIR
AIRPORT MAINTENANCE BUILDING
CONTRACTOR STAGING AREA
STAGING AREA IS FOR CONTRACTOR EQUIPMENT AND CLEAN FILL MATERIALS BROUGHT ONTO THE SITE. AT NO TIME ARE SITE EXCAVATION SOILS TO BE STOCKPILED AT THIS LOCATION
AIRPORT ACCESS ROAD
WORK AREA I - ARFF/SRE SITE
• EXCAVATION
• INSTALL DRAIN PIPE
• GRADING
• TOPSOIL AND SEED
• INSTALL DRAINAGE STRUCTURES
• INSTALL UNDERGROUND DRAINAGE CHAMBERS
CONTRACTOR ACCESS ROAD (TYP)
EXISTING AIRPORT GATE M FOR SITE ACCESS
MARY DUNN WAY
BROOKS ROAD
LEGEND
AIRPORT PROPERTY LINE
AREA I
AREA IA
AREA IB
AREA II
CONTRACTOR ACCESS ROAD
LOW PROFILE BARRICADES

PROJECT
PFAS MITIGATION

OWNER
BARNSTABLE MUNICIPAL AIRPORT
480 Barnstable Road • Hyannis, MA 02601
(508) 775-2020

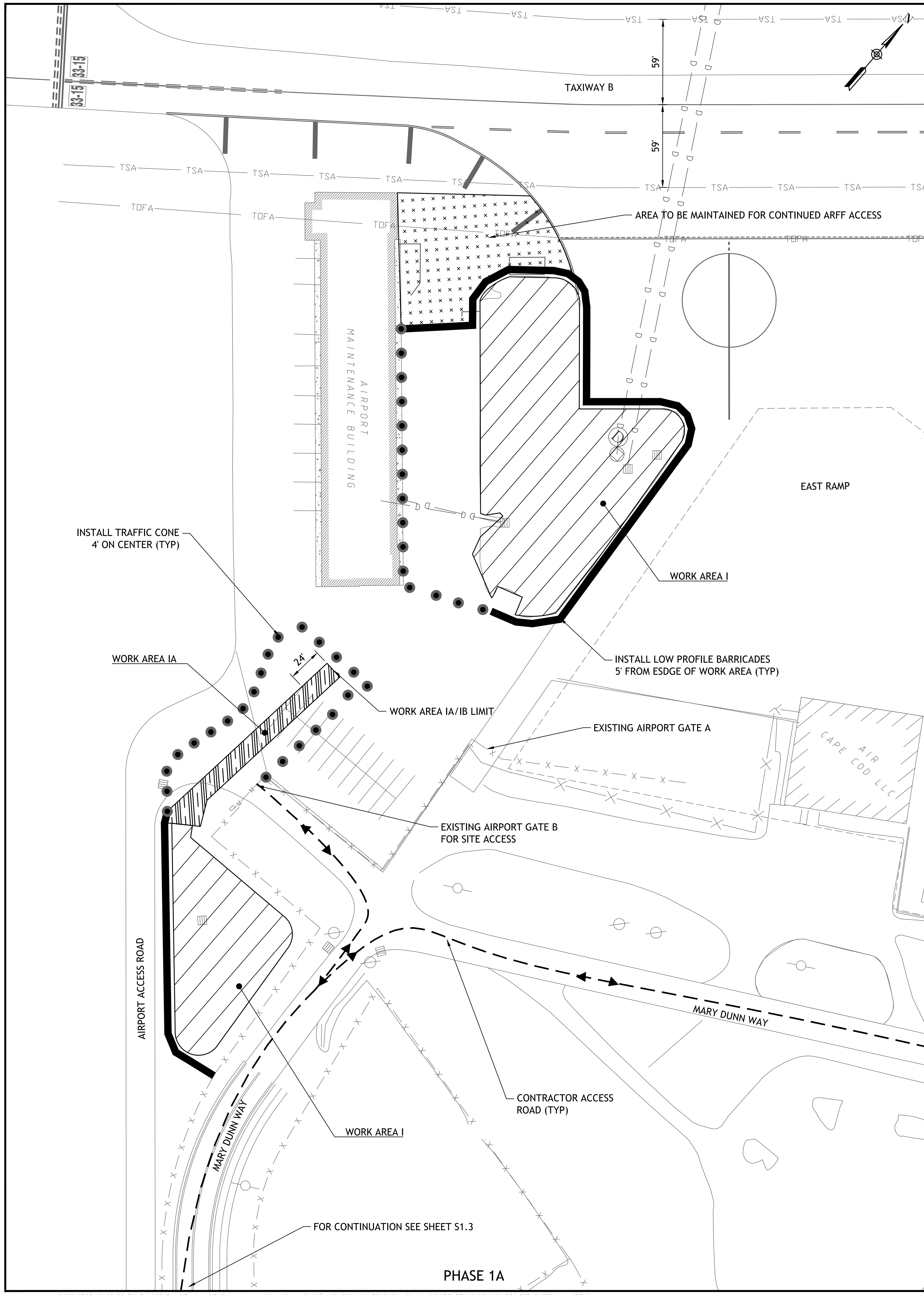
PROJECT NO.	17027A
DESIGNED BY	PEJ
DRAWN BY	PEJ
CHECKED BY	CAS
DATE	MARCH 2020
DRAWING SCALE	1" = 80'

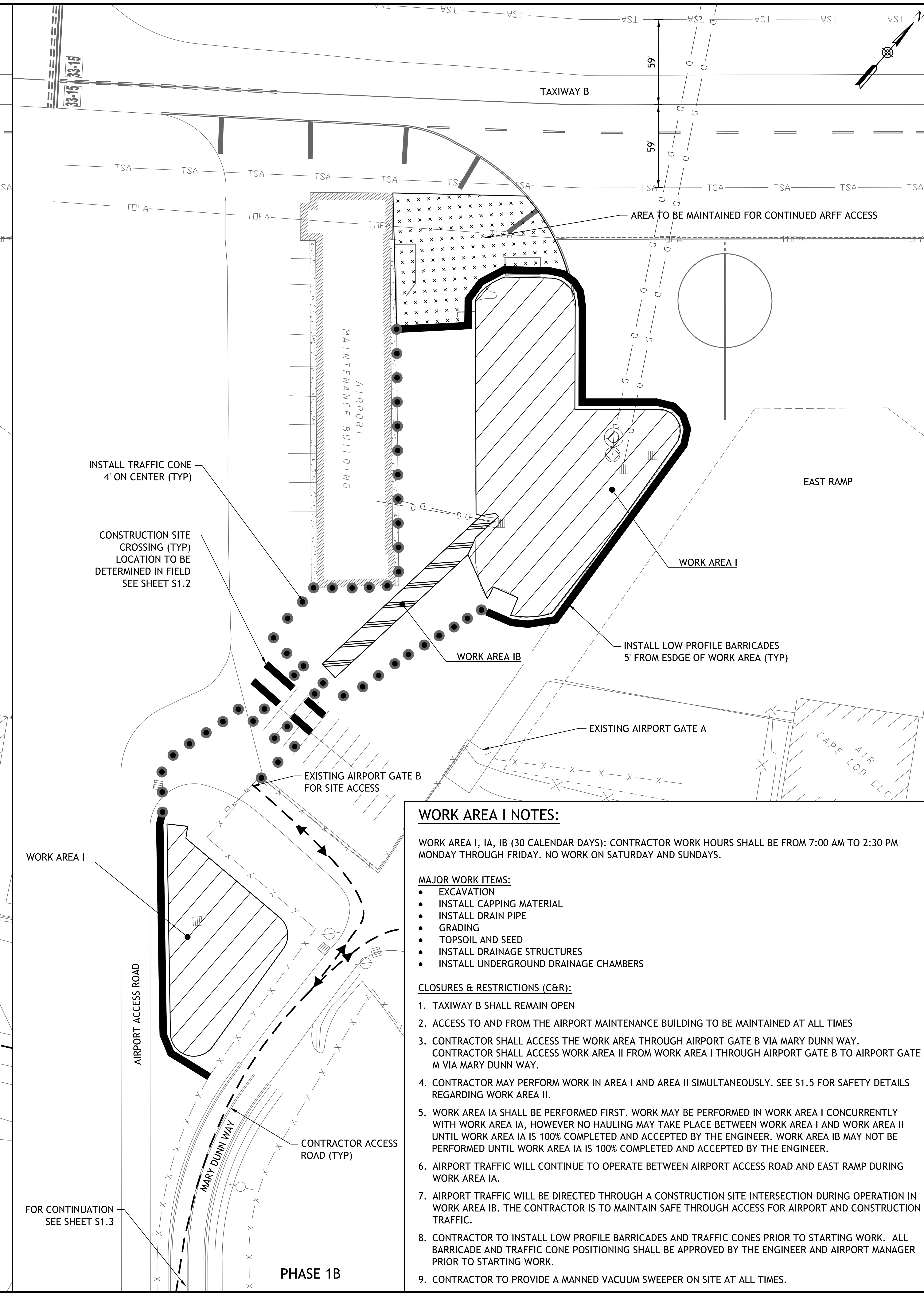
NO.	DATE	DESCRIPTION	BY

SHEET TITLE
CONSTRUCTION SAFETY AND PHASING PLAN - SITE PLAN

GRAPHIC SCALE 0 40' 80' 160'

DRAWING NO.
S1.3





WORK AREA I NOTES:

WORK AREA I, IA, IB (30 CALENDAR DAYS): CONTRACTOR WORK HOURS SHALL BE FROM 7:00 AM TO 2:30 PM MONDAY THROUGH FRIDAY. NO WORK ON SATURDAY AND SUNDAYS.

MAJOR WORK ITEMS:

- EXCAVATION
- INSTALL CAPPING MATERIAL
- INSTALL DRAIN PIPE
- GRADING
- TOPSOIL AND SEED
- INSTALL DRAINAGE STRUCTURES
- INSTALL UNDERGROUND DRAINAGE CHAMBERS

CLOSURES & RESTRICTIONS (C&R):

1. TAXIWAY B SHALL REMAIN OPEN
2. ACCESS TO AND FROM THE AIRPORT MAINTENANCE BUILDING TO BE MAINTAINED AT ALL TIMES
3. CONTRACTOR SHALL ACCESS THE WORK AREA THROUGH AIRPORT GATE B VIA MARY DUNN WAY. CONTRACTOR SHALL ACCESS WORK AREA II FROM WORK AREA I THROUGH AIRPORT GATE B TO AIRPORT GATE M VIA MARY DUNN WAY.
4. CONTRACTOR MAY PERFORM WORK IN AREA I AND AREA II SIMULTANEOUSLY. SEE S1.5 FOR SAFETY DETAILS REGARDING WORK AREA II.
5. WORK AREA IA SHALL BE PERFORMED FIRST. WORK MAY BE PERFORMED IN WORK AREA I CONCURRENTLY WITH WORK AREA IA, HOWEVER NO HAULING MAY TAKE PLACE BETWEEN WORK AREA I AND WORK AREA II UNTIL WORK AREA IA IS 100% COMPLETED AND ACCEPTED BY THE ENGINEER. WORK AREA IB MAY NOT BE PERFORMED UNTIL WORK AREA IA IS 100% COMPLETED AND ACCEPTED BY THE ENGINEER.
6. AIRPORT TRAFFIC WILL CONTINUE TO OPERATE BETWEEN AIRPORT ACCESS ROAD AND EAST RAMP DURING WORK AREA IA.
7. AIRPORT TRAFFIC WILL BE DIRECTED THROUGH A CONSTRUCTION SITE INTERSECTION DURING OPERATION IN WORK AREA IB. THE CONTRACTOR IS TO MAINTAIN SAFE THROUGH ACCESS FOR AIRPORT AND CONSTRUCTION TRAFFIC.
8. CONTRACTOR TO INSTALL LOW PROFILE BARRICADES AND TRAFFIC CONES PRIOR TO STARTING WORK. ALL BARRICADE AND TRAFFIC CONE POSITIONING SHALL BE APPROVED BY THE ENGINEER AND AIRPORT MANAGER PRIOR TO STARTING WORK.
9. CONTRACTOR TO PROVIDE A MANNED VACUUM SWEEPER ON SITE AT ALL TIMES.

ASG AIRPORT SOLUTIONS GROUP, LLC
Innovation By Design
AIRPORT CONSULTANT • BURLINGTON, MASSACHUSETTS
PHONE (781) 491-0083 FAX (781) 491-0360

NO.	DATE	DESCRIPTION	BY

PROJECT: PFAS MITIGATION

OWNER: BARNSTABLE MUNICIPAL AIRPORT
480 Barnstable Road • Hyannis, MA 02601
(508) 775-2020

PROJECT NO.	17027A
DESIGNED BY	PEJ
DRAWN BY	PEJ
CHECKED BY	CAS
DATE	MARCH 2020
DRAWING SCALE	1" = 40'

SHEET TITLE: CONSTRUCTION SAFETY AND PHASING PLAN - WORK AREA I

GRAPHIC SCALE: 0 20' 40' 80'

DRAWING NO.

S1.4

WORK AREA II NOTES:

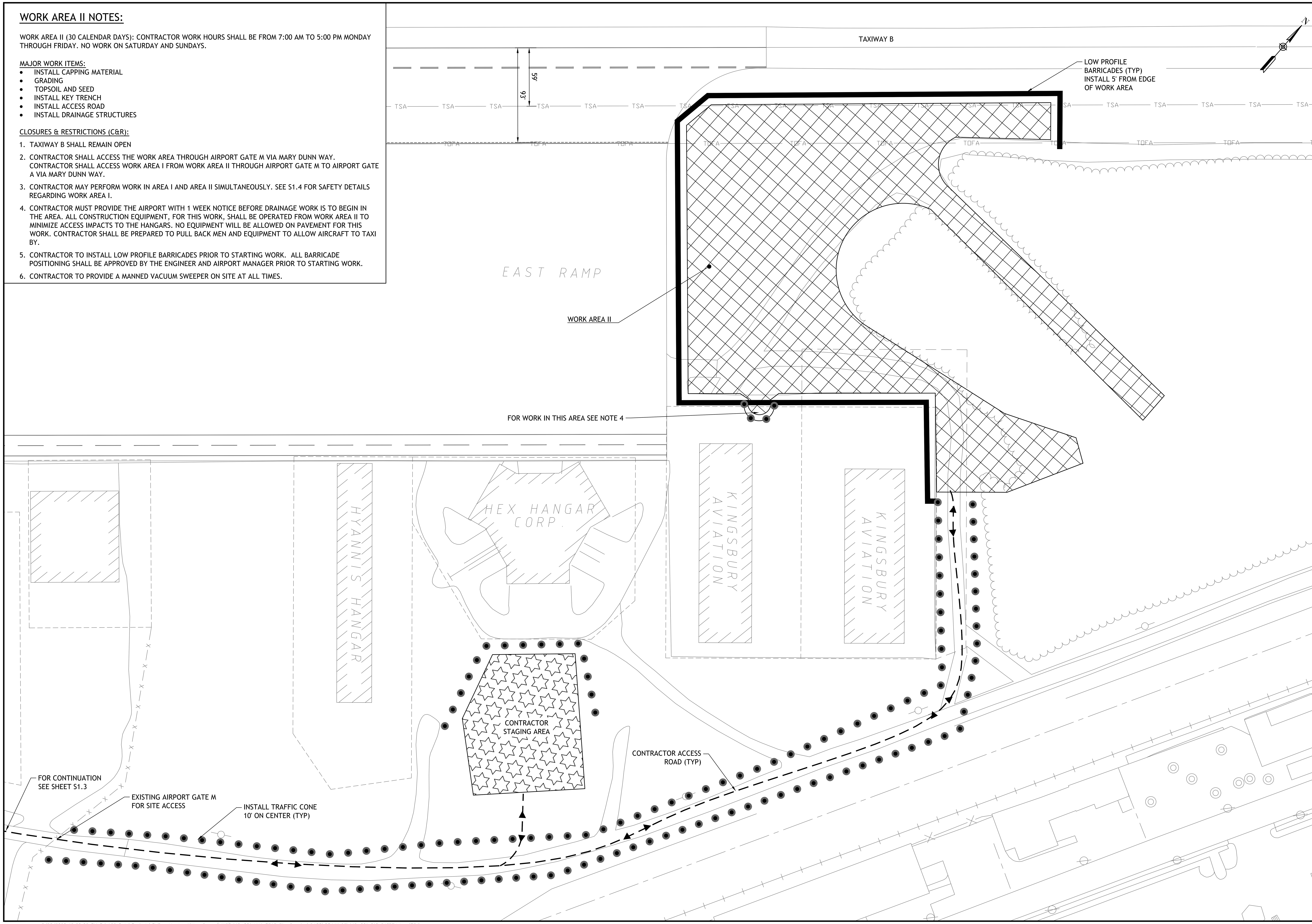
WORK AREA II (30 CALENDAR DAYS): CONTRACTOR WORK HOURS SHALL BE FROM 7:00 AM TO 5:00 PM MONDAY THROUGH FRIDAY. NO WORK ON SATURDAY AND SUNDAYS.

MAJOR WORK ITEMS:

- INSTALL CAPPING MATERIAL
- GRADING
- TOPSOIL AND SEED
- INSTALL KEY TRENCH
- INSTALL ACCESS ROAD
- INSTALL DRAINAGE STRUCTURES

CLOSURES & RESTRICTIONS (C&R):

1. TAXIWAY B SHALL REMAIN OPEN
2. CONTRACTOR SHALL ACCESS THE WORK AREA THROUGH AIRPORT GATE M VIA MARY DUNN WAY. CONTRACTOR SHALL ACCESS WORK AREA I FROM WORK AREA II THROUGH AIRPORT GATE M TO AIRPORT GATE A VIA MARY DUNN WAY.
3. CONTRACTOR MAY PERFORM WORK IN AREA I AND AREA II SIMULTANEOUSLY. SEE S1.4 FOR SAFETY DETAILS REGARDING WORK AREA I.
4. CONTRACTOR MUST PROVIDE THE AIRPORT WITH 1 WEEK NOTICE BEFORE DRAINAGE WORK IS TO BEGIN IN THE AREA. ALL CONSTRUCTION EQUIPMENT, FOR THIS WORK, SHALL BE OPERATED FROM WORK AREA II TO MINIMIZE ACCESS IMPACTS TO THE HANGARS. NO EQUIPMENT WILL BE ALLOWED ON PAVEMENT FOR THIS WORK. CONTRACTOR SHALL BE PREPARED TO PULL BACK MEN AND EQUIPMENT TO ALLOW AIRCRAFT TO TAXI BY.
5. CONTRACTOR TO INSTALL LOW PROFILE BARRICADES PRIOR TO STARTING WORK. ALL BARRICADE POSITIONING SHALL BE APPROVED BY THE ENGINEER AND AIRPORT MANAGER PRIOR TO STARTING WORK.
6. CONTRACTOR TO PROVIDE A MANNED VACUUM SWEEPER ON SITE AT ALL TIMES.



AIRPORT SOLUTIONS GROUP, LLC
Innovation By Design
AIRPORT CONSULTANT • BURLINGTON, MASSACHUSETTS
PHONE (781) 491-0083 FAX (781) 491-0360

NO.	DATE	DESCRIPTION	BY

PROJECT: PFAS MITIGATION

OWNER: ***BARNSTABLE MUNICIPAL AIRPORT***
480 Barnstable Road • Hyannis, MA 02601
(508) 775-2020

PROJECT NO.	17027A
DESIGNED BY	PEJ
DRAWN BY	PEJ
CHECKED BY	CAS
DATE	MARCH 2020
DRAWING SCALE	1" = 40'

SHEET TITLE: CONSTRUCTION SAFETY AND PHASING PLAN - WORK AREA II

GRAPHIC SCALE: 0 20' 40' 80'

DRAWING NO. S1.5

APPENDIX B

Laboratory Analysis Reports

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

December 3, 2019

Bryan Massa
Horsley Witten Group
90 Route 6A Unit #1
Sandwich, MA 02563

Project Location: Hyannis, MA
Client Job Number:
Project Number: 17027
Laboratory Work Order Number: 19K0691

Enclosed are results of analyses for samples received by the laboratory on November 12, 2019. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Raymond J. McCarthy
Project Manager

Table of Contents

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Horsley Witten Group
90 Route 6A Unit #1
Sandwich, MA 02563
ATTN: Bryan Massa

REPORT DATE: 12/3/2019

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 17027

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19K0691

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

PROJECT LOCATION: Hyannis, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
Hose	19K0691-01	Water		SOP 434-PFAAS	
Driver Side Rear	19K0691-02	Water		SOP 434-PFAAS	
Officer Side	19K0691-03	Water		SOP 434-PFAAS	
Officer Side Rear	19K0691-04	Water		SOP 434-PFAAS	
Roof	19K0691-05	Water		SOP 434-PFAAS	
Bumper	19K0691-06	Water		SOP 434-PFAAS	

con-test® ANALYTICAL LABORATORY

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

CASE NARRATIVE SUMMARY

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

SOP 434-PFAAS

Qualifications:

PF-03

Internal standard area >150% of associated calibration standard internal standard area. Re-analysis yielded similar internal standard non-conformance. Original results reported.

Analyte & Samples(s) Qualified:

13C-PFOA
19K0691-01[Hose], 19K0691-04[Officer Side Rear]

PF-05

Opening calibration verification was within control criteria. Closing calibration verification was outside of criteria and biased on the low side. Re-analysis yielded similar non-conformance.

Analyte & Samples(s) Qualified:

13C-PFDA
S043184-CCV3

13C-PFHxA
S043184-CCV3

S-01

The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Analyte & Samples(s) Qualified:

13C-PFDA
19K0691-01RE1[Hose], 19K0691-04RE1[Officer Side Rear]

13C-PFHxA
19K0691-01RE1[Hose], 19K0691-04RE1[Officer Side Rear]

d5-NEtFOSAA
19K0691-01RE1[Hose], 19K0691-04RE1[Officer Side Rear]

S-17

Surrogate recovery is outside of control limits. Data validation is not affected since all associated results are less than the reporting limit and bias is on the high side.

Analyte & Samples(s) Qualified:

13C-PFOA
B246429-BLK1

V-06

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side for this compound.

Analyte & Samples(s) Qualified:

Perfluoropentanoic acid (PFPeA)
19K0691-01[Hose], 19K0691-02[Driver Side Rear], 19K0691-03[Officer Side], S043184-CCV1

Z-01

Sample required a 10x dilution for 6:2 FTS A only. The entire 10x analysis is reported to show Internal Standard non-conformance in the undiluted analysis is matrix related.

Analyte & Samples(s) Qualified:

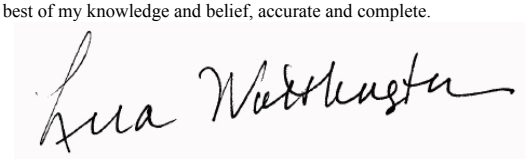
19K0691-01RE1[Hose], 19K0691-04RE1[Officer Side Rear]

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

EPA 537

If more than the compound list from method EPA 537 has been reported, prep and analysis has been conducted by method SOP 434-PFAAS.

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.



Lisa A. Worthington
Technical Representative

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Hyannis, MA | Sample Description: | Work Order: 19K0691

Date Received: 11/12/2019

Field Sample #: Hose | Sampled: 11/8/2019 10:40

Sample ID: 19K0691-01

Sample Matrix: Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorobutanoic acid (PFBA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluoropentanoic acid (PFPeA)	7.8	2.0	ng/L	1	V-06	SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluoropentanoic acid (PFPeA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorohexanoic acid (PFHxA)	25	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorohexanoic acid (PFHxA)	27	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorohexanesulfonic acid (PFHxS)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluoroheptanoic acid (PFHpA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorooctanoic acid (PFOA)	6.2	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorooctanoic acid (PFOA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorooctanesulfonic acid (PFOS)	2.1	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorooctanesulfonic acid (PFOS)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorooctanesulfonamide (FOSA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
6:2 Fluorotelomersulfonate (6:2 FTS A)	250	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorononanoic acid (PFNA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorodecanoic acid (PFDA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
N-EtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
N-EtFOSAA	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
8:2 Fluorotelomersulfonate (8:2 FTS A)	48	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
8:2 Fluorotelomersulfonate (8:2 FTS A)	37	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluoroundecanoic acid (PFUnA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
N-MeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
N-MeFOSAA	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorododecanoic acid (PFDoA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 6:53	BLM
Perfluorotetradecanoic acid (PFTA)	ND	20	ng/L	10		SOP 434-PFAAS	11/19/19	11/27/19 7:06	ZZZ

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
13C-PFHxA	82.3	70-130		11/27/19 6:53
13C-PFHxA	*	70-130	S-01	11/27/19 7:06

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

Project Location: Hyannis, MA | Sample Description: | Work Order: 19K0691

Date Received: 11/12/2019

Field Sample #: Hose | Sampled: 11/8/2019 10:40

Sample ID: 19K0691-01

Sample Matrix: Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
13C-PFDA		78.7	70-130					11/27/19 6:53	
13C-PFDA		*	70-130		S-01			11/27/19 7:06	
d5-NEtFOSAA		95.1	70-130					11/27/19 6:53	
d5-NEtFOSAA		*	70-130		S-01			11/27/19 7:06	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Hyannis, MA | Sample Description: | Work Order: 19K0691

Date Received: 11/12/2019

Field Sample #: Driver Side Rear | Sampled: 11/8/2019 10:45

Sample ID: 19K0691-02

Sample Matrix: Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluoropentanoic acid (PFPeA)	5.3	2.0	ng/L	1	V-06	SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorohexanoic acid (PFHxA)	3.4	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
6:2 Fluorotelomersulfonate (6:2 FTS A)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
N-EtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
8:2 Fluorotelomersulfonate (8:2 FTS A)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
N-MeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:19	BLM

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
13C-PFHxA	86.1	70-130		11/27/19	7:19
13C-PFDA	77.0	70-130		11/27/19	7:19
d5-NEtFOSAA	81.5	70-130		11/27/19	7:19

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Hyannis, MA | Sample Description: | Work Order: 19K0691

Date Received: 11/12/2019

Field Sample #: Officer Side | Sampled: 11/8/2019 10:50

Sample ID: 19K0691-03

Sample Matrix: Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluoropentanoic acid (PFPeA)	7.5	2.0	ng/L	1	V-06	SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorohexanoic acid (PFHxA)	6.3	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
6:2 Fluorotelomersulfonate (6:2 FTS A)	28	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
N-EtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
8:2 Fluorotelomersulfonate (8:2 FTS A)	6.3	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
N-MeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:31	BLM

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
13C-PFHxA	93.1	70-130		11/27/19 7:31	
13C-PFDA	95.1	70-130		11/27/19 7:31	
d5-NEtFOSAA	107	70-130		11/27/19 7:31	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Hyannis, MA | Sample Description: | Work Order: 19K0691

Date Received: 11/12/2019

Field Sample #: Officer Side Rear | Sampled: 11/8/2019 10:55

Sample ID: 19K0691-04

Sample Matrix: Water

Sample Flags: Z-01

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluoropentanoic acid (PFPeA)	8.8	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorohexanoic acid (PFHxA)	21	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluoroheptanoic acid (PFHpA)	2.1	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorooctanoic acid (PFOA)	4.1	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
6:2 Fluorotelomersulfonate (6:2 FTS A)	24	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
N-EtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
N-EtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
8:2 Fluorotelomersulfonate (8:2 FTS A)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
8:2 Fluorotelomersulfonate (8:2 FTS A)	26	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
N-MeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
N-MeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:09	ZZZ
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 7:56	BLM

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
13C-PFHxA	*	70-130	S-01	11/27/19 8:09
13C-PFHxA	76.9	70-130		11/27/19 7:56

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

Project Location: Hyannis, MA | Sample Description: | Work Order: 19K0691

Date Received: 11/12/2019

Field Sample #: Officer Side Rear | Sampled: 11/8/2019 10:55

Sample ID: 19K0691-04

Sample Matrix: Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
13C-PFDA		81.3	70-130					11/27/19 7:56	
13C-PFDA		*	70-130		S-01			11/27/19 8:09	
d5-NEtFOSAA		*	70-130		S-01			11/27/19 8:09	
d5-NEtFOSAA		88.8	70-130					11/27/19 7:56	

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

Project Location: Hyannis, MA | Sample Description: | Work Order: 19K0691

Date Received: 11/12/2019

Field Sample #: Roof | Sampled: 11/8/2019 11:00

Sample ID: 19K0691-05

Sample Matrix: Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluoropentanoic acid (PFPeA)	6.4	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorohexanoic acid (PFHxA)	4.3	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
6:2 Fluorotelomersulfonate (6:2 FTS A)	9.8	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
N-EtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
8:2 Fluorotelomersulfonate (8:2 FTS A)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
N-MeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:22	BLM

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
13C-PFHxA	94.1	70-130		11/27/19 8:22
13C-PFDA	99.5	70-130		11/27/19 8:22
d5-NEtFOSAA	85.1	70-130		11/27/19 8:22

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Hyannis, MA | Sample Description: | Work Order: 19K0691

Date Received: 11/12/2019

Field Sample #: Bumper | Sampled: 11/8/2019 11:05

Sample ID: 19K0691-06

Sample Matrix: Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluoropentanoic acid (PFPeA)	5.7	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorohexanoic acid (PFHxA)	3.9	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
6:2 Fluorotelomersulfonate (6:2 FTS A)	7.1	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
N-EtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
8:2 Fluorotelomersulfonate (8:2 FTS A)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
N-MeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	11/19/19	11/27/19 8:34	BLM

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
13C-PFHxA	80.7	70-130		11/27/19 8:34
13C-PFDA	85.0	70-130		11/27/19 8:34
d5-NEtFOSAA	79.3	70-130		11/27/19 8:34

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

Sample Extraction Data

Prep Method: SOP 434-PFAAS-SOP 434-PFAAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19K0691-01 [Hose]	B246429	250	1.00	11/19/19
19K0691-01RE1 [Hose]	B246429	250	1.00	11/19/19
19K0691-02 [Driver Side Rear]	B246429	250	1.00	11/19/19
19K0691-03 [Officer Side]	B246429	250	1.00	11/19/19
19K0691-04 [Officer Side Rear]	B246429	250	1.00	11/19/19
19K0691-04RE1 [Officer Side Rear]	B246429	250	1.00	11/19/19
19K0691-05 [Roof]	B246429	250	1.00	11/19/19
19K0691-06 [Bumper]	B246429	250	1.00	11/19/19

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246429 - SOP 434-PFAAS										
Blank (B246429-BLK1)				Prepared: 11/19/19 Analyzed: 11/27/19						
Perfluorobutanoic acid (PFBA)	ND	2.0	ng/L							
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L							
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L							
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L							
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L							
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L							
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L							
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L							
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L							
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L							
6:2 Fluorotelomersulfonate (6:2 FTS A)	ND	2.0	ng/L							
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L							
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L							
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L							
N-EtFOSAA	ND	2.0	ng/L							
8:2 Fluorotelomersulfonate (8:2 FTS A)	ND	2.0	ng/L							
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L							
N-MeFOSAA	ND	2.0	ng/L							
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L							
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L							
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L							
Surrogate: 13C-PFHxA	*33.2*		ng/L	40.0		83.0	70-130			
Surrogate: 13C-PFDA	*32.9*		ng/L	40.0		82.1	70-130			
Surrogate: d5-NEtFOSAA	*154*		ng/L	160		96.5	70-130			
LCS (B246429-BS1)				Prepared: 11/19/19 Analyzed: 11/29/19						
Perfluorobutanoic acid (PFBA)	2.18	2.0	ng/L	2.00		109	50-150			
Perfluorobutanesulfonic acid (PFBS)	2.02	2.0	ng/L	1.77		114	50-150			
Perfluoropentanoic acid (PFPeA)	2.21	2.0	ng/L	2.00		110	50-150			
Perfluorohexanoic acid (PFHxA)	1.96	2.0	ng/L	2.00		97.9	50-150			
Perfluorohexanesulfonic acid (PFHxS)	1.21	2.0	ng/L	1.82		66.3	50-150			
Perfluoroheptanoic acid (PFHpA)	1.27	2.0	ng/L	2.00		63.6	50-150			
Perfluoroheptanesulfonic acid (PFHpS)	1.44	2.0	ng/L	1.90		75.9	50-150			
Perfluorooctanoic acid (PFOA)	2.06	2.0	ng/L	2.00		103	50-150			
Perfluorooctanesulfonic acid (PFOS)	1.51	2.0	ng/L	1.85		81.4	50-150			
Perfluorooctanesulfonamide (FOSA)	1.86	2.0	ng/L	2.00		93.1	50-150			
6:2 Fluorotelomersulfonate (6:2 FTS A)	1.47	2.0	ng/L	1.90		77.6	50-150			
Perfluorononanoic acid (PFNA)	1.47	2.0	ng/L	2.00		73.7	50-150			
Perfluorodecanoic acid (PFDA)	1.88	2.0	ng/L	2.00		93.8	50-150			
Perfluorodecanesulfonic acid (PFDS)	2.39	2.0	ng/L	1.93		124	50-150			
N-EtFOSAA	2.19	2.0	ng/L	2.00		109	50-150			
8:2 Fluorotelomersulfonate (8:2 FTS A)	1.97	2.0	ng/L	1.92		103	50-150			
Perfluoroundecanoic acid (PFUnA)	1.74	2.0	ng/L	2.00		86.8	50-150			
N-MeFOSAA	2.20	2.0	ng/L	2.00		110	50-150			
Perfluorododecanoic acid (PFDoA)	1.51	2.0	ng/L	2.00		75.3	50-150			
Perfluorotridecanoic acid (PFTrDA)	1.47	2.0	ng/L	2.00		73.7	50-150			
Perfluorotetradecanoic acid (PFTA)	1.36	2.0	ng/L	2.00		68.2	50-150			
Surrogate: 13C-PFHxA	*29.8*		ng/L	40.0		74.6	70-130			
Surrogate: 13C-PFDA	*37.6*		ng/L	40.0		94.0	70-130			
Surrogate: d5-NEtFOSAA	*184*		ng/L	160		115	70-130			

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

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
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant 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.
PF-03	Internal standard area >150% of associated calibration standard internal standard area. Re-analysis yielded similar internal standard non-conformance. Original results reported.
PF-05	Opening calibration verification was within control criteria. Closing calibration verification was outside of criteria and biased on the low side. Re-analysis yielded similar non-conformance.
S-01	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
S-17	Surrogate recovery is outside of control limits. Data validation is not affected since all associated results are less than the reporting limit and bias is on the high side.
V-06	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side for this compound.
Z-01	Sample required a 10x dilution for 6:2 FTS A only. The entire 10x analysis is reported to show Internal Standard non-conformance in the undiluted analysis is matrix related.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
EPA 537 in Drinking Water	
Perfluorobutanoic acid (PFBA)	NH
Perfluorobutanesulfonic acid (PFBS)	NH,ME,RI,NJ,CT,PA
Perfluorohexanoic acid (PFHxA)	NH,ME,RI,NJ,CT,PA
Perfluorohexanesulfonic acid (PFHxS)	NH,ME,RI,NJ,CT,PA
Perfluoroheptanoic acid (PFHpA)	NH,ME,RI,NJ,CT,PA
Perfluorooctanoic acid (PFOA)	NH,NY,ME,RI,NJ,CT,PA
Perfluorooctanesulfonic acid (PFOS)	NH,NY,ME,RI,NJ,CT,PA
Perfluorononanoic acid (PFNA)	NH,ME,RI,NJ,CT,PA
Perfluorodecanoic acid (PFDA)	NH,ME,RI,NJ,CT,PA
N-EtFOSAA	NH,RI,NJ,CT,PA
Perfluoroundecanoic acid (PFUnA)	NH,ME,RI,NJ,CT,PA
N-MeFOSAA	NH,RI,NJ,CT,PA
Perfluorododecanoic acid (PFDoA)	NH,ME,RI,NJ,CT,PA
Perfluorotridecanoic acid (PFTrDA)	NH,ME,RI,NJ,CT,PA
Perfluorotetradecanoic acid (PFTA)	ME,RI,NJ,CT,PA
SOP 434-PFAAS in Water	
Perfluorobutanoic acid (PFBA)	NH-P
Perfluorobutanesulfonic acid (PFBS)	NH-P
Perfluoropentanoic acid (PFPeA)	NH-P
Perfluorohexanoic acid (PFHxA)	NH-P
Perfluorohexanesulfonic acid (PFHxS)	NH-P
Perfluoroheptanoic acid (PFHpA)	NH-P
Perfluorooctanoic acid (PFOA)	NH-P
Perfluorooctanesulfonic acid (PFOS)	NH-P
6:2 Fluorotelomersulfonate (6:2 FTS A)	NH-P
Perfluorononanoic acid (PFNA)	NH-P
Perfluorodecanoic acid (PFDA)	NH-P
N-EtFOSAA	NH-P
8:2 Fluorotelomersulfonate (8:2 FTS A)	NH-P
Perfluoroundecanoic acid (PFUnA)	NH-P
N-MeFOSAA	NH-P
Perfluorododecanoic acid (PFDoA)	NH-P
Perfluorotridecanoic acid (PFTrDA)	NH-P
Perfluorotetradecanoic acid (PFTA)	NH-P

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

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2020
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2020
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2020
RI	Rhode Island Department of Health	LAO00112	12/30/2019
NC	North Carolina Div. of Water Quality	652	12/31/2019
NJ	New Jersey DEP	MA007 NELAP	06/30/2020
FL	Florida Department of Health	E871027 NELAP	06/30/2020
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2020
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2019
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2020
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2020
NC-DW	North Carolina Department of Health	25703	07/31/2020
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2020

KJM 19K0691

con-test ANALYTICAL LABORATORY

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Email: info@contestlabs.com

http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Doc # 381 Rev 2_06262019

Page 1 of 1

Company Name: Horsley Witten Group, Inc.
Address: 90 Route 6A, Unit 1
Phone: 508-833-6600
Project Name: BMA
Project Location: Hyannis, MA
Project Number: 17027
Project Manager: Bryan Mussa
Con-Test Quote Name/Number:
Invoice Recipient: Bryan Mussa
Sampled By: Bryan Mussa

Requested Turnaround Time
7-Day ☐ 10-Day ☐
PFAS 10-Day (std) ☒ Due Date:

Rush Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Disposition of Field Samples
○ Field Filtered
○ Lab to Filter

Chromatograms Required
○ Field Filtered
○ Lab to Filter

Data Delivery
Format: PDF ☑ EXCEL ☑
Other:
CLP Like Data Pkg Required: ☐
Email To:
Fax To #:

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	[1] Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE	PFAS
1	Hose	11/8/19	10:40 AM	Grab	O	U			2			0
2	Driver side Rear		10:45 AM									
3	Officer side handline		10:50 AM									
4	officer side Rear		10:55 AM									
5	Roof		11:00 AM									
6	Bumper		11:05 AM									

[2] Preservation Code

Courier Use Only
Total Number Of:
VIALS
GLASS
PLASTIC
BACTERIA
ENCORE

Glassware in the fridge? Y / N
Glassware in freezer? Y / N
Prepackaged Cooler? Y / N
*Contest is not responsible for missing samples from prepacked coolers

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)
~~Trizma~~ Chlorinated Water

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)
Trizma

Relinquished by: (signature)	Date/Time:
Bryan M	11/8/19 1300
Received by: (signature)	Date/Time:
Sample Refrigerator	11/8/19 1300
Relinquished by: (signature)	Date/Time:
	11/12/19 1825
Received by: (signature)	Date/Time:
	11/12/19 1825
Relinquished by: (signature)	Date/Time:
	11/12/19 2115
Received by: (signature)	Date/Time:
4.4 11/12	2115
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Client Comments:

Detection Limit Requirements
MA: GW-1
RCP:
Other:

Special Requirements
☒ MA MCP Required
☐ MCP Certification Form Required
☐ CT RCP Required
☐ RCP Certification Form Required
☐ MA State DW Required
PWSID #

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

NELAC and AIHA-LAP, LLC Accredited

Project Entity
Government ☐ Municipality ☐ MWRA ☐ WRTA ☐
Federal ☐ 21 J ☐ School ☐
City ☐ Brownfield ☐ MBTA ☐

Other
☐ Chromatogram
☐ AIHA-LAP,LLC

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

Comments:

Disclaimer: Con-Test Labs is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine wha analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Con Test values your partnership on each project and will try to assist with missing information, but will not b held accountable.

Table of Contents

I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples_____

con-test® ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client Horsley W.

Received By SA Date 11/2 Time 1115

How were the samples received? In Cooler T No Cooler ____ On Ice T No Ice ____ Direct from Sampling ____ Ambient ____ Melted Ice ____

Were samples within Temperature? 2-6°C T By Gun # 5 Actual Temp - 4.1°

By Blank # ____ Actual Temp - ____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished ? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? ____

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Analysis T Sampler Name T

Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F

Are there Rushes? F Who was notified? ____

Are there Short Holds? F Who was notified? ____

Is there enough Volume? T Who was notified? ____

Is there Headspace where applicable? NA MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? F

Do all samples have the proper pH? Acid NA Base NA

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic	12	4oz Amb/Clear	
Bisulfate-		Flashpoint		Col./Bacteria		2oz Amb/Clear	
DI-		Other Glass		Other Plastic		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

CERTIFICATE OF ANALYSIS

Josphine Ibanez
Horsley & Witten
90 Route 6A
Sandwich, MA 02563

RE: Barn On-Call No. 4 (17027)
ESS Laboratory Work Order Number: 19J0034

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:01 pm, Oct 08, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4

ESS Laboratory Work Order: 19J0034

SAMPLE RECEIPT

The following samples were received on October 01, 2019 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Question I: All samples for SVOA were analyzed for a subset of the required MCP list per the client's request.

Lab Number	Sample Name	Matrix	Analysis
19J0034-01	OW-6	Ground Water	8270D SIM
19J0034-02	HW-207S	Ground Water	8270D SIM
19J0034-03	HW-207D	Ground Water	8270D SIM
19J0034-04	HW-204	Ground Water	8270D SIM
19J0034-05	HW-29	Ground Water	8270D SIM
19J0034-06	HW-19D	Ground Water	8270D SIM

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4 ESS Laboratory Work Order: 19J0034

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4

ESS Laboratory Work Order: 19J0034

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4

ESS Laboratory Work Order: 19J0034

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **19J0034-01 through 19J0034-06**

Matrices: (X) Ground Water/Surface Water ( ) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

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

Affirmative responses to questions A through F are 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?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
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?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes ( ) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
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)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for "'Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (X) No ( )*
	***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?	Yes (X) No ( )*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

****All negative responses must be addressed in an attached laboratory 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: Laurel Stoddard Date: October 08, 2019

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4
Client Sample ID: OW-6
Date Sampled: 09/27/19 10:23
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 19J0034
ESS Laboratory Sample ID: 19J0034-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 10/2/19 17:10

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	10/04/19 5:42	C9J0087	CJ90246

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*55 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4
Client Sample ID: HW-207S
Date Sampled: 09/27/19 11:31
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 19J0034
ESS Laboratory Sample ID: 19J0034-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 10/2/19 17:10

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	10/04/19 6:15	C9J0087	CJ90246

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*47 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4
Client Sample ID: HW-207D
Date Sampled: 09/27/19 12:06
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 19J0034
ESS Laboratory Sample ID: 19J0034-03
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 10/2/19 17:10

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	10/04/19 6:47	C9J0087	CJ90246

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*49 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4
Client Sample ID: HW-204
Date Sampled: 09/27/19 13:15
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 19J0034
ESS Laboratory Sample ID: 19J0034-04
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 10/2/19 17:10

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	10/04/19 7:20	C9J0087	CJ90246

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*37 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4
Client Sample ID: HW-29
Date Sampled: 09/27/19 15:10
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 19J0034
ESS Laboratory Sample ID: 19J0034-05
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 10/2/19 17:10

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	10/04/19 7:52	C9J0087	CJ90246

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	44 %		15-115

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4
Client Sample ID: HW-19D
Date Sampled: 09/27/19 16:23
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 19J0034
ESS Laboratory Sample ID: 19J0034-06
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 10/2/19 17:10

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	10/04/19 8:25	C9J0087	CJ90246

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	46 %		15-115

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4

ESS Laboratory Work Order: 19J0034

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch CJ90246 - 3535A										
Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	*ND*		ug/L	*5.000*		*36*	*15-115*			
LCS										
1,4-Dioxane	12.9	0.250	ug/L	10.00		129	40-140			
Surrogate: 1,4-Dioxane-d8	*2.49*		ug/L	*5.000*		*50*	*15-115*			
LCS Dup										
1,4-Dioxane	11.8	0.250	ug/L	10.00		118	40-140	9	20	
Surrogate: 1,4-Dioxane-d8	*2.72*		ug/L	*5.000*		*54*	*15-115*			

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4 ESS Laboratory Work Order: 19J0034

Notes and Definitions

U	Analyte included in the analysis, but not detected
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Horsley & Witten
Client Project ID: Barn On-Call No. 4

ESS Laboratory Work Order: 19J0034

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Horsley Witten Group - KPB/HDM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 19J0034
Date Received: 10/1/2019
Project Due Date: 10/8/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.2 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	393875	Yes	NA	Yes	500 mL Amber - Unpres	NP	
01	393876	Yes	NA	Yes	500 mL Amber - Unpres	NP	
02	393873	Yes	NA	Yes	500 mL Amber - Unpres	NP	
02	393874	Yes	NA	Yes	500 mL Amber - Unpres	NP	
03	393871	Yes	NA	Yes	500 mL Amber - Unpres	NP	
03	393872	Yes	NA	Yes	500 mL Amber - Unpres	NP	
04	393869	Yes	NA	Yes	500 mL Amber - Unpres	NP	
04	393870	Yes	NA	Yes	500 mL Amber - Unpres	NP	
05	393867	Yes	NA	Yes	500 mL Amber - Unpres	NP	
05	393868	Yes	NA	Yes	500 mL Amber - Unpres	NP	
06	393865	Yes	NA	Yes	500 mL Amber - Unpres	NP	
06	393866	Yes	NA	Yes	500 mL Amber - Unpres	NP	

2nd Review

Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Horsley Witten Group - KPB/HDM

ESS Project ID: 19J0034

Date Received: 10/1/2019

Completed By: [signature] Date & Time: 10/1/19 16:58

Reviewed By: [signature] Date & Time: 10/1/19 1806

Delivered By: [signature] 10/1/19 1806

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 190034
Turn Time Standard Rush
Reporting Limits GW-1
Regulatory State MA
Is this project for any of the following?: ○CT RCP ☒MA MCP ○RGP
Electonic Deliverables ☒Limit Checker ☐Standard Excel ☒Other (Please Specify →) PDF

Company Name	Project #	Project Name
HORSLEY WITTEN GROUP	17027	BARN. ON CALL #4
Contact Person	**Address**	
JOSEPHINE IBANEZ	90 ROUTE 6A, UNIT 1	
City	**State**	**Zip Code** / **PO #**
SANDWICH	MA	02563
Telephone Number	**FAX Number**	**Email Address**
508-833-6600	508-833-3150	jibanez@horsleywitten.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis: 1,4-dioxane *																	
1	9/27/19	1023	GRAB	GW	OW-6	*																	
2		1131			HW-207S																		
3		1206			HW-207D																		
4		1315			HW-204																		
5		1510			HW-29																		
6		1623			HW-19D																		

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G-Glass O-Other P-Poly S-Sterile V-Vial — Ah
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* — 5
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Ascorbic Acid 12-Other* — 1
Number of Containers per Sample: 2

Laboratory Use Only
Cooler Present: ✓
Seals Intact: NA
Cooler Temperature: °C ice temp 2.2

Sampled by : HW

Comments: Please specify "Other" preservative and containers types in this space
*8270 SIM (LOW level)

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
9/27/19 1749	HW FRIDGE 9/27/19 1749	HW FRIDGE	10/1/19 14:40
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
10/1/19 16:47	10/1/19 16:50		