SAGE
ENVIRONMENTAL

June 9, 2020

U.S. Environmental Protection Agency
RGP NOI Processing
5 Post Office Square, Suite 100
Mail Code OEP06-4
Boston, MA 02109-3912

RE: ***Notice of Intent (NOI) for Remediation General Permit Discharge***
Proposed Stormwater Management System Improvements
Logan International Airport
Boston, Massachusetts
SAGE Project No. M948

To Whom It May Concern:

On behalf of Bond Civil & Utility Construction, Inc. (BOND), SAGE Environmental, Inc. (SAGE) has prepared this Notice of Intent (NOI) for coverage under the National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP), Massachusetts General Permit (MAG910000), for the discharge of construction dewatering effluent to the Boston Main Channel of the Boston Inner Harbor through the Porter Street Outfall *via* Massport's Logan International Airport (Logan) storm drainage system. The temporary construction dewatering discharge will occur during stormwater management system improvements at Logan in Boston, Massachusetts (hereinafter referred to as the "Project Site"). The Project Site is located upon Logan off Prescott Street and is proximal to an existing fueling storage and distribution facility with associated paved driveway areas. The Project Site location is depicted on an United States Geological Survey (USGS) Quadrangle Project Site Location Map provided as **Figure 1**. A Project Site Plan, which depicts the excavation limits, is included as **Figure 2**.

Portions of the work will be within the limits of an existing Massachusetts Department of Environmental Protection (MassDEP) Disposal Site identified by Release Tracking Number (RTN) 3-13537. A Class A-2 Response Action Outcome (RAO) (i.e., Permanent Solution with No Conditions) was filed for the Disposal Site in 2003, following remedial actions which included excavation and off-site disposal of jet fuel impacted soils. Contaminants of concern (COCs) detected during source water groundwater sampling include inorganics and fuel parameters. Therefore, the project is eligible for discharge as an RGP Activity Category III-A/F and Water Quality Based Effluent Limitations (WQBELs) for Contamination Type A and F apply. The completed NOI form is included as **Attachment A.**

Owner and Applicant/Operator Information

The contact name, address, and telephone number for the current Project Site owner are listed below:

Massport
Ms. Rosanne M. Joyce
One Harborside Drive
East Boston, Massachusetts 02128
Office: (617) 568-3516
Email: RJoyce@massport.com

Please note, Massport is the owner of Logan, a portion of which the Project Site is located. However, Massport is not the Project Site Owner or Operator and is not a co-permittee.

The applicant/operator for this NOI RGP application is:

BOND Civil & Utility Construction, Inc.
Ms. Tara Canavan
10 Cabot Road, Suite 300
Medford, Massachusetts 02155
Office: (617)-394-6368
Email: tcanavan@bond-civilutility.com

Please note, BOND is a co-permittee as the applicant/operator.

The project owner for the Project Site is:

Delta Air Lines
Ms. Emily Smith
Chair – BOSFuel Corporation
Dept. 857
1030 Delta Boulevard
Atlanta, Georgia 30354
Office: (404) 773-4469
Email: Emily.L.Smith@delta.com

Please note, BOSFuel Corporation is a co-permittee as the project owner.

The general contractor/design-builder for the Project Site, who on behalf of BOSFuel Corporation (BOSFuel) has operational control over the construction plans and specifications is:

Burns & McDonnell
Mr. Kenneth M. Bilson, P.E.
3650 Mansell Road, Suite 300
Alpharetta, Georgia 30022
Office: (770) 510-4578
Email: kmbilson@burnsmcd.com

Proposed Scope of Construction Activities

This NOI has been prepared for discharge of dewatering effluent during stormwater management system improvements. The overall project consists of the following construction activities:

1. Construction of a pre-fabricated metal equipment enclosure;
2. Installation of a 10,000-gallon underground oil/water separator (OWS) measuring approximately 8 feet in diameter and 30 feet in length;
3. Placement of an underground transfer pump;
4. Installation of a 5,000-gallon underground OWS measuring approximately 6 feet in diameter and 15 feet in length; and
5. Installation of two (2) underground wastewater off-load vaults, each measuring approximately 10 feet by 15 feet and installed at a depth of 15 feet below ground surface (bgs).

The plan set for the project is provided as **Attachment B.**

Project Site History and Project Site Environmental Setting

Portions of the Project Site are within the limits of an existing MassDEP Disposal Site, concerning a release of jet fuel, identified by RTN 3-13537. In 2003, following remedial actions that included excavation and off-site disposal of petroleum impacted soil, a Class A-2 RAO was filed.

According to the MassDEP Bureau of Waste Site Cleanup (BWSC) Phase 1 Site Assessment Map, the Project Site and/or Porter Street Outfall are not located in an area defined as a Natural Heritage & Endangered Species Program (NHESP) Wetland Habitat, Area of Critical Environmental Concern, Approved Interim Wellhead Protection Area, Zone II Wellhead Protection Area, or within a Zone A of a Class A surface water body. In addition, no private wells are located within 500 feet of the Project Site and/or Porter Street Outfall. The Porter Street Outfall is located adjacent to a Federal Emergency Management Agency (FEMA) 100-year floodplain. A copy of the MassDEP BWSC Phase I Site Assessment Map for the Project Site and the Porter Street Outfall are included as **Figures 3A and 3B**, respectively.

Temporary Construction Dewatering

Based upon a review of previous environmental reports and recent gauging of several monitoring wells located at the Project Site, groundwater is present at an approximate depth of two (2) feet bgs. Due to the size of the Project Site (less than 5,000 square feet) and the surrounding surfaces being paved with asphalt and/or concrete, it is infeasible to dewater and reinfiltrate any groundwater or stormwater in the Project Site excavation. Therefore, a dewatering system will be implemented.

The Rain for Rent Engineering Department (RFRED) has proposed a wellpoint dewatering system around the perimeter of the excavation, which will be spaced four (4) feet center to center and jetted to a depth of 22 feet or refusal. The system will consist of approximately 70 well points with one (1) primary and one (1) backup BBA PT90 or PT150 dewatering pumps and 6-inch high density polyethylene (HDPE) SDR 17 wellpoint header pipe. The discharge from each pump to a nearby 21,000-gallon baffled fractionation tank (frac tank) will be 6-inches in diameter. Air/vacuum vents will be required at the pump station and at high points along the pipeline. If necessary, sumps and/or a French Drain may be utilized for nuisance

water and/or to aid in the dewatering process. If a French Drain is used, it will be filled with gravel to help reduce erosion and will be sloped to allow groundwater to travel to low points. Small submersible pumps will be placed in every low point to remove perched water. If higher than expected flows are encountered, an optional backup pump can be operated for the first few days to reduce draw-down time.

Based upon RFRED's calculations, it is estimated that approximately 38 to 179 gallons per minute (gpm) will continuously be pumped from the excavation. This estimation equates to a maximum total of 54,720 to 257,760 gallons per day (gpd). Please note, the dewatering system will be rated to pump a maximum of 200 gpm. RFRED's Engineered Solution and associated calculations are included as **Attachment C.** A plan depicting the catch basin location, stormwater drainage pathway, and the Porter Street Outfall is included as **Figure 4**.

Receiving Water Laboratory Analysis and Calculations

Based upon email correspondence with the United States Environmental Protection Agency (U.S. EPA) on May 5, 2020, the U.S. EPA stated that receiving water quality data reported for the West Outfall (located directly adjacent to the Porter Street Outfall) in a NPDES RGP NOI, dated August 12, 2019, and submitted to the U.S. EPA by GEI Consultants, Inc. (GEI), was acceptable for use as a receiving water sample in this NOI. A copy of the email correspondence is included as **Attachment D.**

On June 24, 2019, the receiving water quality data was collected by CDM Smith, Inc. (CDM) from the vault for the West Outfall. The sample was submitted to a Massachusetts-certified laboratory for analysis of total metals, hardness, and ammonia. The results of the surface water sample collected by CDM are summarized in **Table 1** and the laboratory analytical data report can be referenced in the aforementioned GEI NOI submittal at https://www3.epa.gov/region1/npdes/remediation/noi/2019/terminal-e-modernization-massport-suffolk-construction-east-boston-mag910871-mag910872.pdf.

Based upon email correspondence with the U.S. EPA on May 12, 2020, the U.S. EPA stated that for a saltwater receiving body, the dilution factor is 0. The receiving water is a saltwater body and therefore a dilution factor of zero (0) was utilized in calculating the effluent limits. The effluent limits were generated utilizing the NPDES RGP NOI Dilution Factor Calculation Spreadsheet (NOI Spreadsheet). A copy of the email correspondence is included as **Attachment D**. A copy of the *EnterData* and *Saltwater Results* tabs from the NOI Spreadsheet are included as **Attachment E**.

Source Water Laboratory Analysis and Calculations

On May 5, 2020, SAGE collected one (1) groundwater sample from a monitoring well located on the Project Site and representative of the proposed influent concentrations. The monitoring well was not identified on any plans related to RTN 3-13537 and therefore SAGE termed the monitoring well UNK-101. A plan depicting the groundwater monitoring well location is included as **Figure 2**.

Prior to collecting the groundwater sample, the monitoring well was gauged with an interface probe to determine the depth to groundwater and assess for the presence and/or absence of non-aqueous phase liquid (NAPL). No NAPL was detected nor observed. Measured depth to groundwater was 2.56 feet bgs below the top of the PVC casing (btoc). The monitoring well was purged of a minimum of three (3) static well volumes utilizing a low-flow peristaltic pump with dedicated tubing. In addition, a YSI 556

multiparameter water quality meter was utilized to collect field measurements of temperature and pH. pH was measured at 6.5 standard units (S.U.) and is within the 2017 RGP saltwater effluent limitation of 6.5 to 8.5 S.U.

Upon completion of purging, groundwater samples were collected from the monitoring well and submitted under chain-of-custody protocol to a Massachusetts-certified laboratory for analysis of the parameters required by the NPDES RGP. The analytical results reported the detection of methyl tert-butyl ether, iron, zinc, total hardness, ammonia, and chloride. The results of the groundwater sample and field measurements collected by SAGE are summarized in **Table 2** and the laboratory analytical report is included as **Attachment F**.

Based upon the calculations included as **Attachment E**, concentrations of analytes in the source water are less than the applicable technology-based effluent limitation (TBEL) and/or water quality-based effluent limitation (WQBEL) standards for each analyte.

Groundwater Treatment

Based on the results of the above-referenced groundwater analysis, dewatering can meet applicable effluent limitations established by the U.S. EPA *via* the use of existing stormwater infrastructure on the Project Site in combination with an engineered filtration system. Dewatering activities are expected to start in June 2020 and continue into August 2020. Anticipated treated effluent discharge rates are proposed to be 200 gpm or less.

The construction dewatering system design begins with the wellpoint dewatering system along the perimeter of the excavation area. The wellpoint dewatering system will discharge from each pump *via* six-inch diameter line to a nearby frac tank. Four 21,000-gallon baffled frac tanks equipped with high water detection/alarms will be utilized as settling tanks to remove gross fine soils prior to treatment. The frac tanks will be manifolded together *via* piping, and water will be transferred between each frac tank via sump pumps located on an upper shelf on the interior. Effluent from the final in-line frac tank will be pumped to a treatment system equipped with the following treatment train:

1. Two (2) 25-micron and two (2) 10-micron bag filters (in series) to remove fine sediment;
2. A totalizing flow meter;
3. Discharging to the Inner Boston Harbor at the Porter Street Outfall *via* the Massport Logan underground stormwater infrastructure.

Please note, additional frac tanks may be utilized, as necessary. Additional treatment may include two (2) 5,000-pound granular activated carbon (GAC) filtration units, an oil/water separator, iron removal (*via* flocculation/coagulation and clarifying), ion exchange resin, and pH adjustment, as necessary. As necessary, chemical additives treatment may include a metered sulfuric acid system and oxidizers. These chemical additives are not expected to exceed applicable effluent limits, water quality standards, or alter conditions of the receiving water and will not add any pollutants that would justify additional permit conditions. The proposed conceptual treatment system is provided as **Figure 5**. Example Safety Data Sheets (SDS) and product information are included as **Attachment G**.

Endangered Species Act Eligibility

A review of the information provided by the United States Fish and Wildlife Service (U.S. FWS) Information, Planning, and Conservation (IPAC) online database did not identify any threatened, endangered, or candidate species or critical habitats at the Project Site or the Porter Street Outfall. A copy of the database reports are included as **Attachment H.**

The proposed effluent discharge is to a nearshore marine water, and there has been no consultation with the National Marine Fisheries Services (NMFS) for this project. However, SAGE has reviewed the U.S. EPA determination made during consult with the NMFS and dated December 18, 2016. Pursuant to Appendix I: Endangered Species Act (ESA) Guidance and Eligibility Criteria in the NPDES RGP, the Atlantic Sturgeon, Shortnose Sturgeon, four species of sea turtles, and two species of whales are the only ESA-listed species under NMFS jurisdiction that may have a critical habitat in the Massachusetts Bay (inclusive of the Boston Harbor). The turtles and whales ae highly unlikely to be present in the vicinity of the effluent discharge at the Porter Street Outfall and sturgeon are expected to be present transiently. Based upon the lifecycles of the sturgeon, contaminants of concern/concentrations and the location of the outfall (which is offshore and not near coastal river mouths), the discharge is not expected to affect either population.

National Historic Preservation Requirements

A review of the online United States National Register of Historic Places (USNRHP) and the Massachusetts Cultural Resource Information System (MACRIS) did not identify the Project Site or the Porter Street Outfall as a National Historic Place. The MACRIS Report is included as **Attachment I**.

It should be noted, that due to the Project Site being a part of Logan and lacking a street address, Prescott Street was used to characterize any possible historical areas which may be impacted by construction activities.

NPDES RGP Eligibility

Based upon SAGE's evaluation of Project Site-specific information, it is SAGE's opinion that the proposed discharge is eligible for coverage under the NPDES RGP. On behalf of Bond, SAGE is requesting coverage for the discharge of treated construction dewatering effluent to the surface waters of the Boston Main Channel of the Boston Inner Harbor.

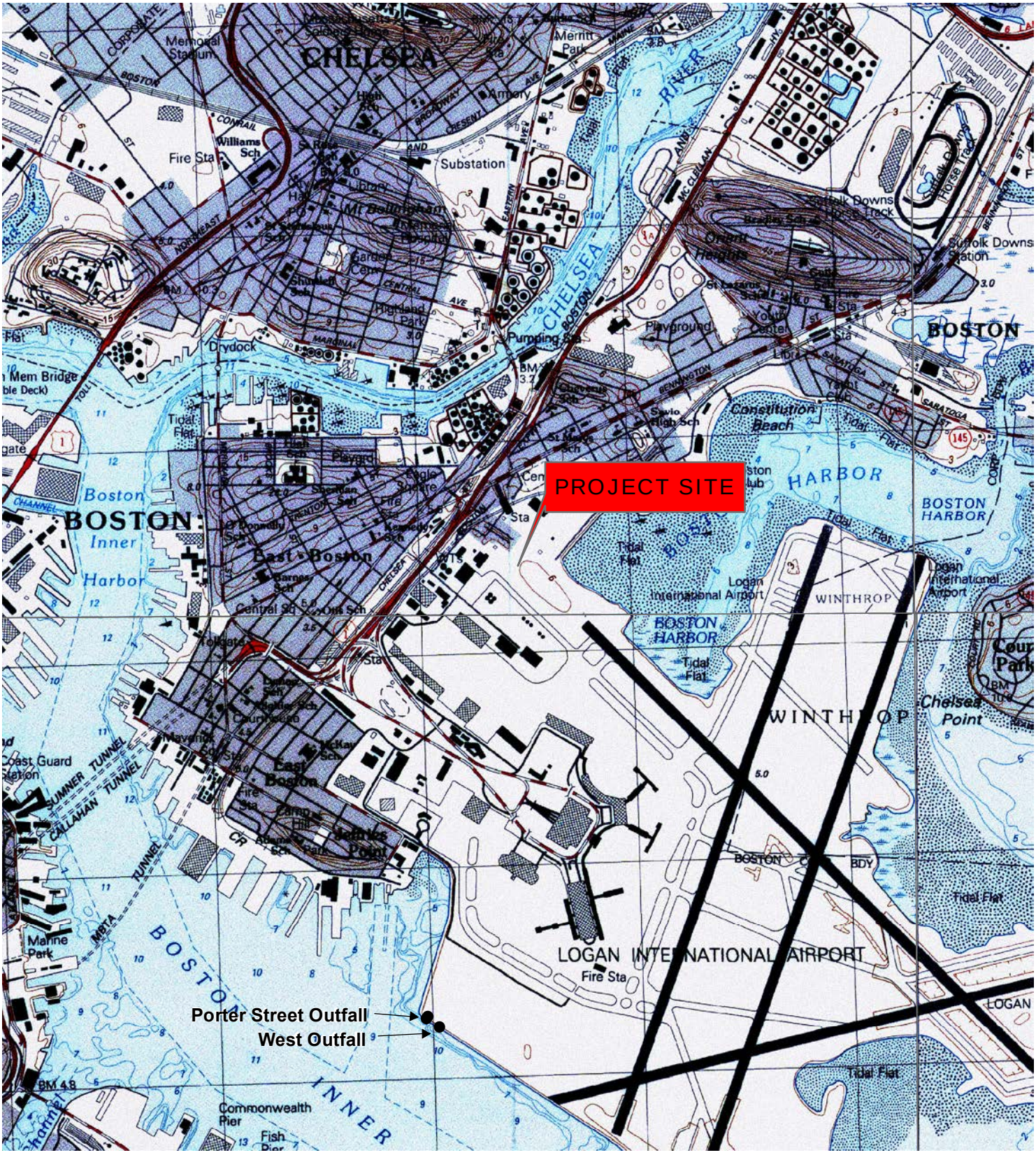
If you have any questions or concerns, please contact either of the undersigned at (401) 723-9900.

Sincerely,
SAGE Environmental, Inc.

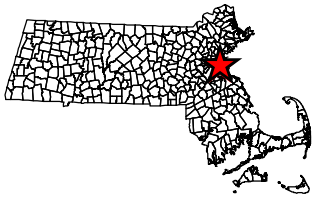
_____	_____
Anthony M. Rossato	Jacob H. Butterworth, MS, LSP
Project Manager	Vice President

AMR/JHB:alm

FIGURES



USGS QUADRANGLE
BOSTON NORTH, MASSACHUSETTS



★ Site Location

USGS Quadrangle Project Site Location Map

Logan International Airport
Boston, Massachusetts

Figure 1

DATE: 03/31/2020

JOB #: M948

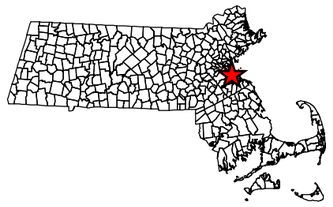
CREATED BY: ALM

N

0 550 1,100 2,200 Feet

Data Provided by MassGIS

SAGE ENVIRONMENTAL



Legend

Approximate Excavation Area Location

Approximate Monitoring Well Location

0 25 50 100 Feet

Data Provided by MassGIS

March 30, 2017
Orthoimagery provided by nearmap.com

N W E S

Project Site Plan

Boston Logan
International Airport
Boston, Massachusetts

Date: 05/13/2020

Job #: M948

Created By: ALM/jl

Figure 2

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MassDEP - Bureau of Waste Site Cleanup

Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:

PRESCOTT ST BOSTON, MA

NAD83 UTM Meters:
4693498mN , 333387mE (Zone: 19)
May 13, 2020

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection

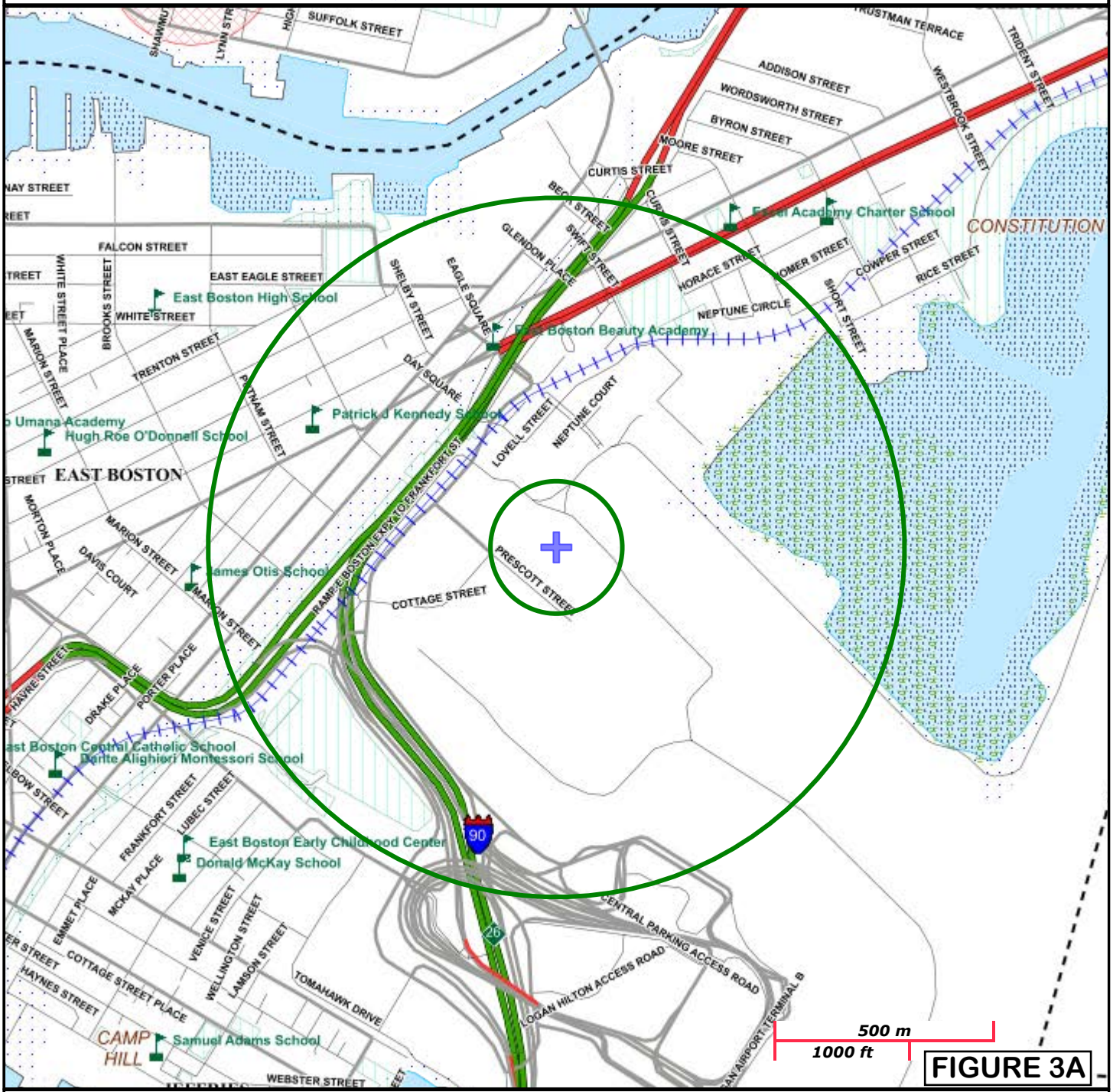


FIGURE 3A

Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential

Solid Waste Landfill; PWS: Com.GW,SW, Emerg., Non-Com.

MassDEP - Bureau of Waste Site Cleanup

Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:

PRESCOTT STREET BOSTON, MA

NAD83 UTM Meters:
4691505mN , 333010mE (Zone: 19)
May 13, 2020

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection

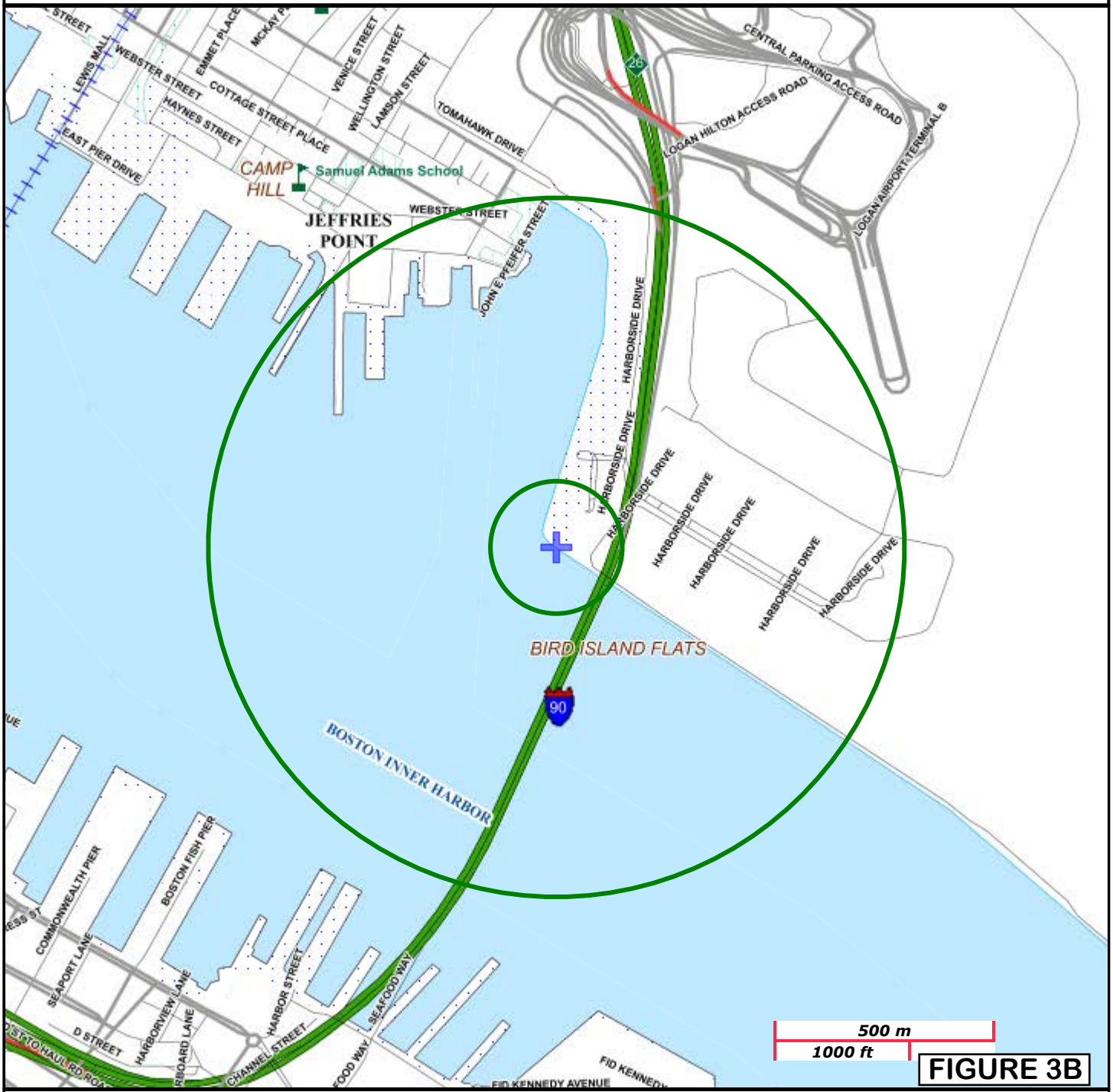


FIGURE 3B

Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

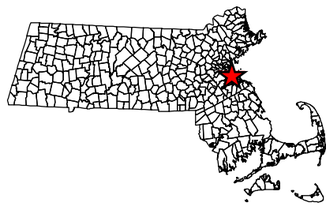
Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential

Solid Waste Landfill; PWS: Com.GW,SW, Emerg., Non-Com.



★ Site Location

Legend

- Boston Innner Harbor
- Approximate Excavation Area Location
- Approximate Location of Stormwater Drainage Pathway

0 500 1,000 Feet

Data Provided by MassGIS

March 30, 2017
Orthoimagery provided by nearmap.com

N
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Effluent Discharge Plan

Boston Logan
International Airport
Boston, Massachusetts

Date: 05/21/2020

Job #: M948

Created By: ALM/jl

Figure 4

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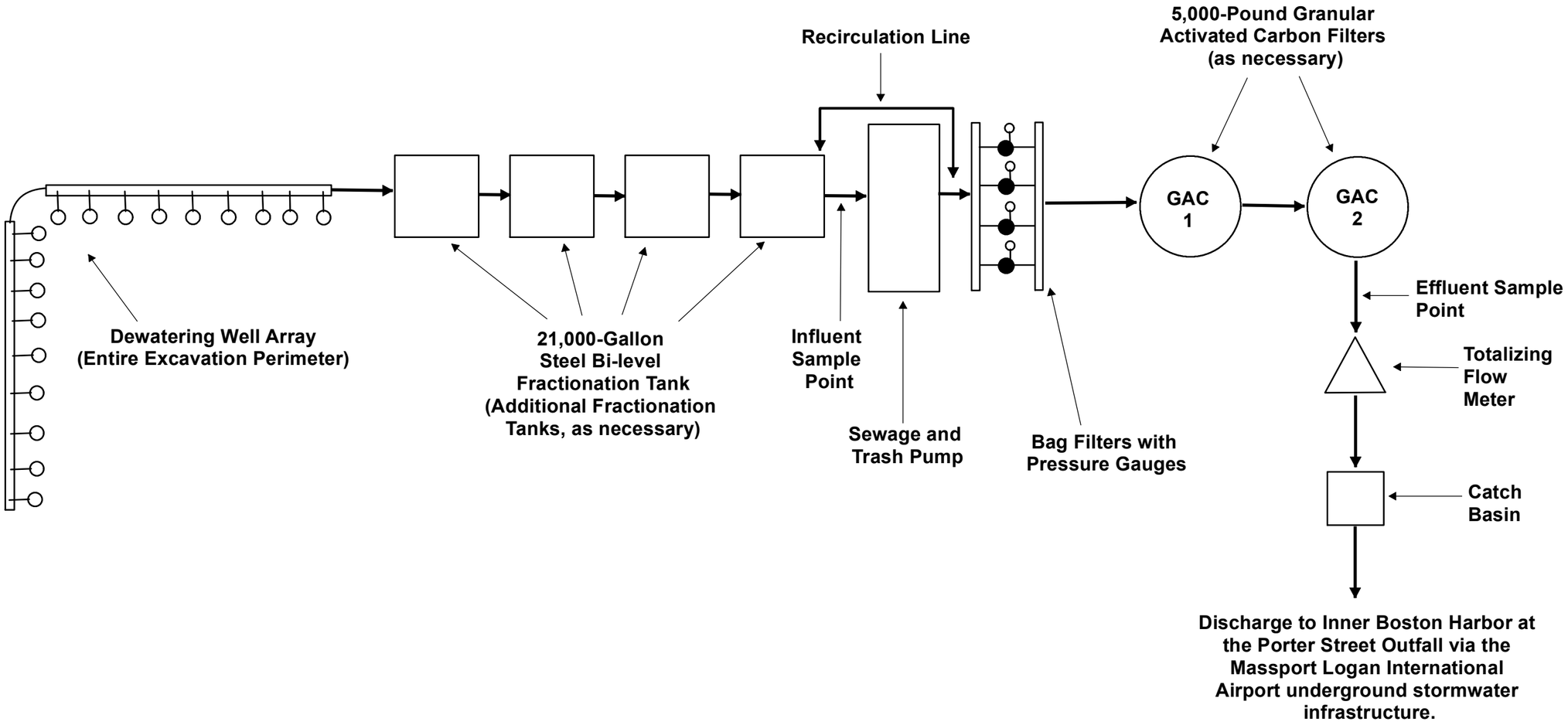

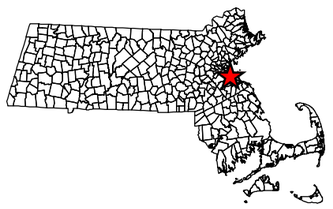

Legend

Process Flow Diagram

Boston Logan
International Airport
Boston, Massachusetts

Date: 05/21/2020

Job #: M948

Created By: ALM/jl

Figure 5

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TABLES

Table 1
Summary of Surface Water Sample Chemical Analysis Results
Receiving Water - Boston Inner Harbor

	Sample ID:	West RGP
	Date Sampled:	6/24/2019
Analyte	**Method in report**	**Sample Result**
Total Metals (µg/l)		
Antimony	200.8	<4
Arsenic	200.8	**3.03**
Cadmium	200.8	<0.2
Chromium, Trivalent	107	<10
Chromium, Hexavalent	7196A	<10
Chromium (Total)	200.8	<1
Copper	200.8	**5.22**
Iron	200.7	**2,780**
Lead	200.8	<1
Mercury	245.1	<0.2
Nickel	200.8	**2.18**
Selenium	200.8	<5
Silver	200.8	<0.4
Zinc	200.8	**41.9**
Other		
Hardness (µg/l)	200.7	**595,000**
Ammonia as Nitrogen (µg/l)	4500NH3-BH	**989**
Salinity (ppt)	Field	**5.72**
pH (S.U.)	Field	**6.72**

General Notes:

1. For a complete list of analytes, refer to the laboratory analytical data report.
2. "<" = Analyte not detected at a concentration above the laboratory reporting limit.
3. µg/l = micrograms per liter
4. ppt = parts per thousand
5. S.U. = standard units

Table 2
Summary of Groundwater Sample Chemical Analysis Results
Source Water - Logan Airport

			Sample ID:	UNK-101
			Date Sampled:	05/05/2020
Analyte	**Method**	**MCP RCGW-2**	**Site Specific Effluent Limits**	**Sample Result**
Volatile Organic Compounds (VOCs) (µg/l)				
Benzene	524.2	1,000	5	<0.5
1,4-Dioxane	8270D SIM	6,000	200	<0.25
Phenols	420.1	NE	1,080	<50
Total BTEX	524.2	NE	100	<0.5
Total Non-Halogenated VOCs[1]	Various	NE	NE	<0.25 - <0.5
Total Halogenated VOCs[2]	Various	NE	NE	<0.2 - <0.5
Semivolatile Organic Compounds (SVOCs) (µg/l)				
Total Phthalates	625.1 SIM	NE	190	<2.34
Total Group I PAHs[3]	625.1 SIM	NE	1	<0.05
Acenaphthene	625.1 SIM	6,000	NE	<0.19
Acenaphthylene	625.1 SIM	40	NE	<0.19
Fluorene	625.1 SIM	40	NE	<0.19
Naphthalene	625.1 SIM	700	20	<0.19
Phenanthrene	625.1 SIM	10,000	NE	<0.19
Total Group II PAHs[4]	625.1 SIM	NE	100	<0.19
Fuel Parameters (µg/l)				
Total Petroleum Hydrocarbons	1664A	5,000	5,000	<5,000
Ethanol	ASTM D3695	NE	Report	<10,000
Methyl-tert-Butyl Ether	524.2	5,000	70	**0.6**
Inorganic Compounds				
Ammonia as Nitrogen (mg/l)	350.1	NE	Report	**0.28**
Chloride (mg/l)	300.0	NE	Report	**61.3**
Total Residual Chlorine (ug/l)	4500ClD	NE	7,500	<20
Total Suspended Solids (mg/l)	2540D	NE	30	<5
Antimony (µg/l)	200.7	8,000	206	<10
Arsenic (µg/l)	3113B	900	104	<2.5
Cadmium (µg/l)	200.8	4	10.2	<0.5
Chromium, Total (µg/l)	200.7	300	10.2	<2
Chromium III (µg/l)	200.7	600	323	<10
Chromium VI (µg/l)	3500Cr B-2009	300	323	<10
Copper (µg/l)	200.7	100,000	242	<2
Iron (µg/l)	200.7	NE	5,000	**128**
Lead (µg/l)	200.7	10	160	<2
Mercury (µg/l)	245.1	20	0.739	<0.2
Nickel (µg/l)	200.7	200	1,450	<5
Selenium (µg/l)	3113B	100	235.8	<5
Silver (µg/l)	200.7	7	35.1	<1
Zinc (µg/l)	200.7	900	420	**5.8**
Total Cyanide (mg/l)	4500 CN CE	30	178	<0.005
Polychlorinated Biphenlyls (PCBs) (µg/l)				
Total PCBs	608.3	5	0.000064	<0.09
Other				
Hardness (µg/l)	CALC	NE	NE	**131,000**
Temperature (°C)	Field	NE	NE	15.52
pH (S.U.)	Field	NE	6.5 - 8.5	6.5

General Notes:

1. For a complete list of analytes, refer to the laboratory analytical data report.
2. "<" = Analyte not detected at a concentration above the laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective April 25, 2014.
4. RCGW-2 = Reportable Concentration for category GW-2 Groundwater
5. µg/l = micrograms per liter
6. mg/l = milligram per liter
7. °C = Degrees Celsius
8. S.U. = standard units
9. ND = Not detected. NE = No standard has been established for this analyte.
10. Dilution Factor of 0 used to establish effluent limits.
11. Effluent limits calculated using NPDES RGP NOI Dilution Factor Spreadsheet.
12. Total Non-Halogenated VOCs include benzene, ethylbenzene, toluene, and xylenes (BTEX), acetone, 1,4-dioxane, and phenols.
13. Total Halogenated VOCs include carbon tetrachloride, 1,2-dichlorobenzene, 1,3-dicholorobenzene, 1,4-dichlorobenzene, 1,1-dichloroethane, 1,2-dicholorethane, 1,2,-dichloroethene, ethylene dibromide, methylene chloride, 1,1,1-trichloroethane, 1,1,2- trichloroethane, trichloroethylene, tetrachloroethylene, cis-1,2 dichloroethylene, and vinyl chloride.
14. Group I PAHs include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and ideno(1,2,3-cd)pyrene.
15. Group II PAHs include: acenaphthene, acenaphthylene, anthracene, benzo(g,h,i)perylene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene.

ATTACHMENT A

II. Suggested Format for the Remediation General Permit Notice of Intent (NOI)

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
Stormwater Management System Improvements</td><td colspan="3">Site address: Logan International Airport
Street: Prescott Street</td></tr>
<tr><td>City: East Boston</td><td>State: MA</td><td>Zip: 02128</td></tr>
<tr><td rowspan="4">2. Site owner (Project Owner)
BOSFuel Corporation

Owner is (check one): ☐ Federal ☐ State/Tribal ■ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Emily Smith</td></tr>
<tr><td colspan="2">Telephone: (404) 773-4469</td><td>Email: Emily.L.Smith@delta.com</td></tr>
<tr><td colspan="3">Mailing address: Dept. 857
1030 Delta Boulevard
Street:</td></tr>
<tr><td>City: Atlanta</td><td>State: GA</td><td>Zip: 30354</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
BOND Civil & Utility Construction, Inc.</td><td colspan="3">Contact Person: Tara Canavan</td></tr>
<tr><td colspan="2">Telephone: (617) 394-6368</td><td>Email: tcanavan@bond-civilutility.com</td></tr>
<tr><td colspan="3">Mailing address:
10 Cabot Road, Suite 300
Street:</td></tr>
<tr><td>City: Medford</td><td>State: MA</td><td>Zip: 02155</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:

NPDES permit is (check all that apply: ■ RGP ☐ DGP ☐ CGP
☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:</td><td colspan="3">5. Other regulatory program(s) that apply to the site (check all that apply):
■ MA Chapter 21e; list RTN(s): RTN 3-13537
☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:
☐ CERCLA
☐ UIC Program
☐ POTW Pretreatment
☐ CWA Section 404</td></tr>
</table>

B. Receiving water information:

1. Name of receiving water(s):	Waterbody identification of receiving water(s):	Classification of receiving water(s):
Boston Inner Harbor	MA70-02	SB(CSO)

Receiving water is (check any that apply): ☐ Outstanding Resource Water ☐ Ocean Sanctuary ☐ territorial sea ☐ Wild and Scenic River

2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): ■ Yes ☐ No

Are sensitive receptors present near the site? (check one): ☐ Yes ■ No
If yes, specify:

3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP. Impaired Water Body - See attached Table 1.

4. Indicate the seven day-ten-year low flow (7Q10) of the receiving water determined in accordance with the instructions in Appendix V for sites located in Massachusetts and Appendix VI for sites located in New Hampshire.	NA (saltwater)
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	0 (saltwater)

6. Has the operator received confirmation from the appropriate State for the 7Q10and dilution factor indicated? (check one): ☐ Yes ■ No
If yes, indicate date confirmation received: NA (saltwater)

7. Has the operator attached a summary of receiving water sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ Yes ☐ No

C. Source water information:

1. Source water(s) is (check any that apply):

■ Contaminated groundwater Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ Yes ☐ No	☐ Contaminated surface water Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ☐ Yes ☐ No	☐ The receiving water ☐ A surface water other than the receiving water; if so, indicate waterbody:	☐ Potable water; if so, indicate municipality or origin: ☐ Other; if so, specify:

2. Source water contaminants: Methyl tert-butyl ether, iron, zinc, total hardness, ammonia, and chloride.	
a. For source waters that are contaminated groundwater or contaminated surface water, indicate are any contaminants present that are not included in the RGP? (check one): ☐ Yes ■ No If yes, indicate the contaminant(s) and the maximum concentration present in accordance with the instructions in Appendix VIII.	b. For a source water that is a surface water other than the receiving water, potable water or other, indicate any contaminants present at the maximum concentration in accordance with the instructions in Appendix VIII? (check one): ☐ Yes ☐ No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): ☐ Yes ■ No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): ☐ Existing discharge ■ New discharge ☐ New source	
Outfall(s): Porter Street Outfall	Outfall location(s): (Latitude, Longitude) 42°21'28" N -71°01'39" W
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: Indirectly discharged to the Boston Main Channel of the Boston Inner Harbor via Massport's storm drainage system ■ A private storm sewer system ☐ A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: Has notification been provided to the owner of this system? (check one): ■ Yes ☐ No Has the operator has received permission from the owner to use such system for discharges? (check one): ■ Yes ☐ No, if so, explain, with an estimated timeframe for obtaining permission: Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ■ No	
Provide the expected start and end dates of discharge(s) (month/year): June 2020 - August 2020 Indicate if the discharge is expected to occur over a duration of: ■ less than 12 months ☐ 12 months or more ☐ is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ■ Yes ☐ No	

<table>
<tr><td>2. Activity Category: (check all that apply)</td><td colspan="2">3. Contamination Type Category: (check all that apply)</td></tr>
<tr><td rowspan="5">☐ I – Petroleum-Related Site Remediation
☐ II – Non-Petroleum-Related Site Remediation
■ III – Contaminated Site Dewatering
☐ IV – Dewatering of Pipelines and Tanks
☐ V – Aquifer Pump Testing
☐ VI – Well Development/Rehabilitation
☐ VII – Collection Structure Dewatering/Remediation
☐ VIII – Dredge-Related Dewatering</td><td colspan="2">a. If Activity Category I or II: (check all that apply)

☐ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
☐ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ F. Fuels Parameters</td></tr>
<tr><td colspan="2">b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)</td></tr>
<tr><td>■ G. Sites with Known Contamination</td><td>☐ H. Sites with Unknown Contamination</td></tr>
<tr><td>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)

■ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
☐ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
■ F. Fuels Parameters</td><td>d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply</td></tr>
</table>

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✓	1	350.1	100	280	280	Report mg/L	---
Chloride		✓	1	300.0	5000	61300	61300	Report µg/l	---
Total Residual Chlorine	✓		1	4500 CL D	20	<20	0	0.2 mg/L	
Total Suspended Solids	✓		1	2540D	5000	<5	0	30 mg/L	---
Antimony	✓		1	200.7	10	<10	0	206 µg/L	
Arsenic	✓		1	3113B	2.5	<2.5	0	104 µg/L	
Cadmium	✓		1	200.8	0.5	<0.5	0	10.2 µg/L	
Chromium III	✓		1	200.7	10	<10	0	323 µg/L	
Chromium VI	✓		1	200.7	2	<2	0	323 µg/L	
Copper	✓		1	200.7	2	<2	0	242 µg/L	
Iron		✓	1	200.7	10	128	128	5,000 µg/L	
Lead	✓		1	200.7	2	<2	0	160 µg/L	
Mercury	✓		1	245.1	0.2	<0.2	0	0.739 µg/L	
Nickel	✓		1	200.7	5	<5	0	1,450 µg/L	
Selenium	✓		1	3113B	5	<5	0	235.8 µg/L	
Silver	✓		1	200.7	1	<1	0	35.1 µg/L	
Zinc		✓	1	200.7	5	5.8	5.8	420 µg/L	
Cyanide	✓		1	4500CNC	5	<5	0	178 mg/L	
B. Non-Halogenated VOCs									
Total BTEX	✓		1	524.2	0.5	<0.5	0	100 µg/L	---
Benzene	✓		1	524.2	0.5	<0.5	0	5.0 µg/L	---
1,4 Dioxane	✓		1	8270DSIM	0.25	<0.25	0	200 µg/L	---
Acetone	✓		1	524.2	5	<5	0	7.97 mg/L	---
Phenol	✓		1	420.1	50	<50	0	1,080 µg/L	

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
C. Halogenated VOCs									
Carbon Tetrachloride	✓		1	524.2	0.3	<0.3	0	4.4 µg/L	
1,2 Dichlorobenzene	✓		1	524.2	0.5	<0.5	0	600 µg/L	---
1,3 Dichlorobenzene	✓		1	524.2	0.5	<0.5	0	320 µg/L	---
1,4 Dichlorobenzene	✓		1	524.2	0.5	<0.5	0	5.0 µg/L	---
Total dichlorobenzene	✓		1	524.2	0.5	<0.5	0	763 µg/L in NH	---
1,1 Dichloroethane	✓		1	524.2	0.5	<0.5	0	70 µg/L	---
1,2 Dichloroethane	✓		1	524.2	0.5	<0.5	0	5.0 µg/L	---
1,1 Dichloroethylene	✓		1	524.2	0.5	<0.5	0	3.2 µg/L	---
Ethylene Dibromide	✓		1	504.1	0.015	<0.015	0	0.05 µg/L	---
Methylene Chloride	✓		1	524.2	0.5	<0.5	0	4.6 µg/L	---
1,1,1 Trichloroethane	✓		1	524.2	0.5	<0.5	0	200 µg/L	---
1,1,2 Trichloroethane	✓		1	524.2	0.5	<0.5	0	5.0 µg/L	---
Trichloroethylene	✓		1	524.2	0.5	<0.5	0	5.0 µg/L	---
Tetrachloroethylene	✓		1	524.2	0.5	<0.5	0	5.0 µg/L	
cis-1,2 Dichloroethylene	✓		1	524.2	0.5	<0.5	0	70 µg/L	---
Vinyl Chloride	✓		1	524.2	0.2	<0.2	0	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✓		1	625.1 SIM	2.34	<2.34	0	190 µg/L	
Diethylhexyl phthalate	✓		1	625.1 SIM	2.34	<2.34	0	101 µg/L	
Total Group I PAHs	✓		1	625.1 SIM	0.05	<0.05	0	1.0 µg/L	---
Benzo(a)anthracene	✓		1	625.1 SIM	0.05	<0.05	0	As Total PAHs	
Benzo(a)pyrene	✓		1	625.1 SIM	0.05	<0.05	0		
Benzo(b)fluoranthene	✓		1	625.1 SIM	0.05	<0.05	0		
Benzo(k)fluoranthene	✓		1	625.1 SIM	0.05	<0.05	0		
Chrysene	✓		1	625.1 SIM	0.05	<0.05	0		
Dibenzo(a,h)anthracene	✓		1	625.1 SIM	0.05	<0.05	0		
Indeno(1,2,3-cd)pyrene	✓		1	625.1 SIM	0.05	<0.05	0		

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
Total Group II PAHs	✓		1	625.1 SIM	0.19	<0.19	0	100 µg/L	---
Naphthalene	✓		1	625.1 SIM	0.19	<0.19	0	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✓		1	608.3	0.09	<0.09	0	0.000064 µg/L	---
Pentachlorophenol	✓		1	625.1 SIM	0.84	<0.84	0	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons	✓		1	1664A	5000	<5000	0	5.0 mg/L	---
Ethanol	✓		1	D3695	10000	<10000	0	Report mg/L	---
Methyl-tert-Butyl Ether		✓	1	524.2	0.5	0.6	0.6	70 µg/L	
tert-Butyl Alcohol	✓		1	524.2	25	<25	0	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✓		1	524.2	1	<1	0	90 µg/L in MA 140 µg/L in NH	---
Other (i.e., pH, temperature, hardness, salinity, LC_{50}, additional pollutants present); if so, specify:									
Hardness		✓	1	200.7	499	131000	131000		
Temperature		✓	1	Field	NA	15.52	15.52		
pH		✓	1	Field	NA	6.5	6.5		

E. Treatment system information

1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply)

☐ Adsorption/Absorption ☐ Advanced Oxidation Processes ☐ Air Stripping ■ Granulated Activated Carbon ("GAC")/Liquid Phase Carbon Adsorption

■ Ion Exchange ■ Precipitation/Coagulation/Flocculation ■ Separation/Filtration ■ Other; if so, specify:

Additional fractionation tanks, granular activated carbon filtration, oil/water separator, ion exchange resin, and other treatments, as necessary, to meet effluent limits.

2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.

Four 21,000-gallon baffled fractionation tanks equipped with high water detection/alarms will be utilized as settling tanks to remove gross fine soils prior to treatment. The fractionation tanks will be manifolded together via piping. Effluent from the final in-line fractionation tank will be pumped to a treatment system equipped with the following treatment train: two (2) 25-micron and two (2) 10-micron bag filters (in series) to remove fine sediment, a totalizing flow meter, followed by discharge to the Boston Inner Harbor at the Porter Street Outfall. Other treatments will be added, as necessary, to meet effluent limits.

Identify each major treatment component (check any that apply):

■ Fractionation tanks☐ Equalization tank ■ Oil/water separator ☐ Mechanical filter ☐ Media filter

☐ Chemical feed tank ☐ Air stripping unit ■ Bag filter ■ Other; if so, specify: Additional fractionation tanks, granular activated carbon filtration, oil/water separator, ion exchange resin, and other treatments, as necessary, to meet effluent limits.

Indicate if either of the following will occur (check any that apply):

☐ Chlorination ☐ De-chlorination

3. Provide the **design flow capacity** in gallons per minute (gpm) of the most limiting component. Indicate the most limiting component: Granular activated carbon filtration units Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	200
Provide the proposed maximum effluent flow in gpm.	200
Provide the average effluent flow in gpm.	200
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	NA

4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): ■ Yes ☐ No

F. Chemical and additive information

1. Indicate the type(s) of chemical or additive that will be applied to effluent prior to discharge or that may otherwise be present in the discharge(s): (check all that apply)

☐ Algaecides/biocides ☐ Antifoams ■ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ■ Flocculants ☐ Neutralizing agents ■ Oxidants ☐ Oxygen ☐ scavengers ■ pH conditioners ☐ Bioremedial agents, including microbes ☐ Chlorine or chemicals containing chlorine ☐ Other; if so, specify:
Chemical additives, as necessary, to meet effluent limits.

2. Provide the following information for each chemical/additive, using attachments, if necessary:

a. Product name, chemical formula, and manufacturer of the chemical/additive;
b. Purpose or use of the chemical/additive or remedial agent;
c. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each chemical/additive;
d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive;
e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks; and
f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)).

3. Has the operator attached an explanation which demonstrates that the addition of such chemicals/additives may be authorized under this general permit in accordance with the instructions in F, above? (check one): ■ Yes ☐ No; if no, has the operator attached data that demonstrates each of the 126 priority pollutants in CWA Section 307(a) and 40 CFR Part 423.15(j)(1) are non-detect in discharges with the addition of the proposed chemical/additive? (check one): ☐ Yes ■ No

G. Endangered Species Act eligibility determination

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

■ **FWS Criterion A**: No endangered or threatened species or critical habitat are in proximity to the discharges or related activities or come in contact with the "action area".

☐ **FWS Criterion B**: Formal or informal consultation with the FWS under section 7 of the ESA resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by FWS on a finding that the discharges and related activities are "not likely to adversely affect" listed species or critical habitat (informal consultation). Has the operator completed consultation with FWS? (check one): ☐ Yes ☐ No; if no, is consultation underway? (check one): ☐ Yes ☐ No

☐ **FWS Criterion C**: Using the best scientific and commercial data available, the effect of the discharges and related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the operator and affirmed by EPA, that the discharges and related activities will have "no effect" on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the FWS. This determination was made by: (check one) ☐ the operator ☐ EPA ☐ Other; if so, specify:

■ **NMFS Criterion**: A determination made by EPA is affirmed by the operator that the discharges and related activities will have "no effect" or are "not likely to adversely affect" any federally threatened or endangered listed species or critical habitat under the jurisdiction of NMFS and will not result in any take of listed species. Has the operator previously completed consultation with NMFS? (check one): ☐ Yes ■ No

2. Has the operator attached supporting documentation of ESA eligibility in accordance with the instructions in Appendix I, and G, above? (check one): ■ Yes ☐ No

Does the supporting documentation include any written concurrence or finding provided by the Services? (check one): ■ Yes ☐ No; if yes, attach.

H. National Historic Preservation Act eligibility determination

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

■ **Criterion A**: No historic properties are present. The discharges and discharge-related activities (e.g., BMPs) do not have the potential to cause effects on historic properties.

☐ **Criterion B**: Historic properties are present. Discharges and discharge related activities do not have the potential to cause effects on historic properties.

☐ **Criterion C**: Historic properties are present. The discharges and discharge-related activities have the potential to have an effect or will have an adverse effect on historic properties.

2. Has the operator attached supporting documentation of NHPA eligibility in accordance with the instructions in H, above? (check one): ■ Yes ☐ No

Does the supporting documentation include any written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (TPHO), or other tribal representative that outlines measures the operator will carry out to mitigate or prevent any adverse effects on historic properties? (check one): ☐ Yes ■ No

I. Supplemental information

Describe any supplemental information being provided with the NOI. Include attachments if required or otherwise necessary.
Letter Report prepared by SAGE Environmental, Inc.

Has the operator attached data, including any laboratory case narrative and chain of custody used to support the application? (check one): ■ Yes ☐ No

Has the operator attached the certification requirement for the Best Management Practices Plan (BMPP)? (check one): ■ Yes ☐ No

J. Certification requirement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A BMPP meeting the requirements of this general permit will be implemented prior to discharge.

BMPP certification statement:

Notification provided to the appropriate State, including a copy of this NOI, if required.	Check one: Yes ■ No ☐
Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐
Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐ NA ☐
Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.	Check one: Yes ■ No ☐ NA ☐
Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): ☐ RGP ☐ DGP ☐ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:	Check one: Yes ☐ No ☐ NA ■

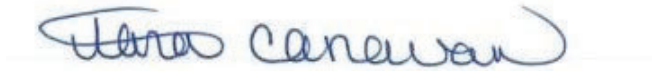
Signature: Emily Smith

Date: 6/18/2020

Print Name and Title: Emily Smith - Delta Air Lines, Chair - BOSFUEL Corporation

J. Certification requirement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

BMPP certification statement: A BMPP meeting the requirements of this general permit will be implemented prior to discharge.	
Notification provided to the appropriate State, including a copy of this NOI, if required.	Check one: Yes ▣ No ☐
Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested.	Check one: Yes ▣ No ☐
Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested.	Check one: Yes ▣ No ☐ NA ☐
Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.	Check one: Yes ▣ No ☐ NA ☐
Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): ☐ RGP ☐ DGP ☐ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:	Check one: Yes ☐ No ☐ NA ▣
Signature: 	Date: 6-15-2020
Print Name and Title: Tara Canavan, Project Manager	

MassDEP Online Map Viewer

Boston Inner Harbor

2014 Assessment Unit ID: MA70-02
Water Name: Boston Inner Harbor
Watershed: Boston Harbor (Proper) **Water Type:** ESTUARY **Water Code:** 70902
Size: 2.56 SQUARE MILES **Class:** SB(CSO) **Qualifier:** **Category:** 5 **TMDL Count:** 0
Description: From the Mystic and Chelsea rivers, Chelsea/Boston, to the line between Governors Island and Fort Independence, Boston (East Boston) (including Fort Point, Reserved and Little Mystic channels).

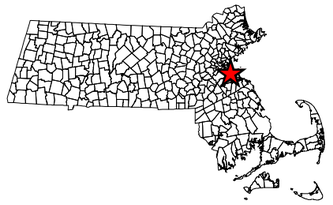
Use	Attainment	Cause	PoItnt_Flg	Source	TMDL DWM Id
Aesthetic	Not Assessed				
Fish Consumption	Not Supporting	PCB in Fish Tissue	Y	Contaminated Sediments	
Fish Consumption	Not Supporting	Other	Y	Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)	
Fish Consumption	Not Supporting	Other	Y	Contaminated Sediments	
Fish Consumption	Not Supporting	Other	Y	Upstream Source	

Overview | Map Layers | Legend | Map Help | Contact | Query Results

Site Location

Boston Inner Harbor

Porter Street Outfall



Legend

- Approximate Excavation Area Location
- Boston Innner Harbor

0 500 1,000 Feet

N W E S

Data Provided by MassGIS

March 30, 2017
Orthoimagery provided by nearmap.com

2014 Integrated List of Waters Map

Boston Logan International Airport
Boston, Massachusetts

Date: 05/13/2020

Job #: M948

Created By: ALM

Figure 1

SAGE ENVIRONMENTAL

Table 1: Water Quality Assessment Status for Reporting Year 2014
Boston Inner Harbor

Designated Use	Designated Use Group	Status
Aesthetic	Aesthetic Value	Impaired
Fish consumption	Aquatic Life Harvesting	Impaired
Fish, Other Aquatic Life and Wildlife	Fish, Shellfish, And Wildlife Protection and Propagation	Impaired
Primary Contact Recreation	Recreation	Impaired
Secondary Contract Recreation	Recreation	Impaired
Shellfish Harvesting	Aquatic Life Harvesting	Impaired

Causes of Impairment for Reporting Year 2014

Cause of Impairment	Cause of Impairment Group	Designated Use(s)	State TMDL Development Status
Dissolved Oxygen	Organic Enrichment/oxygen Depletion	Fish, Other Aquatic Life And Wildlife	TMDL needed
Enterococcus Bacteria	Pathogens	Primary Contact Recreation, Secondary Contact Recreation	TMDL completed
Fecal Coliform	Pathogens	Shellfish Harvesting	TMDL completed
Other Cause	Other Cause	Fish Consumption	TMDL needed
PCB(s) in Fish Tissue	Polychlorinated Biphenyls (PCBs)	Fish Consumption	TMDL needed

Sources:

1. EPA website: https://ofmpub.epa.gov/waters10/attains_index.home on July 8, 2019
2. Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds, October 2018. https://www.mass.gov/files/documents/2018/12/06/bharbor1.pdf

ATTACHMENT B

FOR CONTINUATION SEE E SERIES DRAWINGS
FOR CONTINUATION SEE SCHEDULE A PROJECT
Massachusetts Coordinate System
U.S. AIR HANGAR
TANK
TANK
MPA PUMP STA. BLDG. 6
JET-A STORAGE TANK #4 80' DIA. x 48' HT. 42,970 BBL
JET-A STORAGE TANK #3 80' DIA. x 48' HT. 42,970 BBL
JET-A STORAGE TANK #2 80' DIA. x 48' HT. 42,970 BBL
JET-A STORAGE TANK #1 80' DIA. x 48' HT. 42,970 BBL
JET-A TRUCK OFFLOAD STATION NO.2
JET-A TRUCK OFFLOAD STATION NO.1
PIPELINE RECEIVING STATION (NIC)
(1) 12,000 GAL. UNDERGROUND DIESEL STORAGE TANK
(2) 12,000 GAL. UNDERGROUND MOGAS STORAGE TANKS
UTILITY CORRIDOR (45' WIDE CLEAR ZONE)
OIL WATER SEPARATOR
FOR DUCTBANK SCHEDULE SEE DWGS. NO. E 2.01-E 2.02 (TYP. FOR ALL DUCTBANKS SHOWN ON THIS DWG.)
STEEL BEAM HIGHWAY GUARD TYPE SS (SEE DWG. NO. C 4.07)
FOR PAVEMENT MARKING DETAILS SEE DWG. NO. C 4.05
GUARD RAIL (TYP.)
RELOCATED WAITING SHELTER
PIPELINE INBOUND FILTRATION STATION
WASTE TANK
PRODUCT RECOVERY TANK
TRUCK OFFLOAD FILTER STATION SEE DWG. M9.01
REMOVE OR OTHERWISE OBSCURE EXIST. PARKING LINES AS REQUIRED FOR PROPOSED TRAVEL LANES (TYP.)
OPERATIONS CONTROL BUILDING (NOT IN CONTRACT)
HYDRANT SYSTEM PUMP STATION SEE DWG. M9.01
DIKE AREA SEE DWG. M 7.03
RELOCATED BUS SHELTER
SHUTTLE WAITING ROOM
GUARD HOUSE
12" WATER
FOR CONTINUATION SEE E SERIES DRAWINGS

FOR REFERENCE ONLY

GENERAL LEGEND

PROPOSED	EXISTING	ITEM	PROPOSED	EXISTING	ITEM
■ CB	□ C.B.	CATCH BASIN	—S—	—S—	SEWERAGE LINE
● SMH	○ SMH	SEWER MANHOLE	—D—	—D—	DRAINAGE LINE
● DMH	○ DMH	DRAIN MANHOLE	—W—	—W—	WATER LINE
● EMH	○ EMH	ELECTRIC MANHOLE	—G—	—G—	GAS LINE
□ EHH	□ EHH	ELECTRIC HANDHOLE	—F—	—F—	FUEL LINE
	○ WMH	WATER MANHOLE	—E—	—E—	DUCT BANK
● CMH	○ CMH	CONTROL MANHOLE	— — —	—DE—	DIRECT BURIED ELECTRICAL CONDUIT
	○ TMH	TELEPHONE MANHOLE	xxxxxxx		SECURITY GATE
o WG	o WG	WATER GATE		LP	LIGHT POLE
HYD	HYD	FIRE HYDRANT			BLAST WALL
GG	GG	GAS GATE	CB □		EXISTING CATCH BASIN TO BE MODIFIED
		CURB INLET	SMH ○		EXISTING SEWER MANHOLE TO BE MODIFIED
—x—x—	—x—x—	CHAIN LINK FENCE	DMH ○		EXISTING DRAIN MANHOLE TO BE MODIFIED

GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 inch = 30ft.

AS CONSTRUCTED PLANS*

I hereby certify that all construction required by this sheet has been accomplished as indicated hereon.

EDWARDS AND KELCEY, INC.

BY [signature] DATE 1/9/02

NOTES

1. WHEN INSTALLING ANY NEW UTILITIES THE CONTRACTOR DID TAKE WHATEVER MEASURES NECESSARY TO PROTECT ALL EXISTING UTILITIES TO REMAIN. THESE MEASURES INCLUDED SHEETING AND SHORING. ALL SUCH PROTECTIVE MEASURES ARE CONSIDERED INCIDENTAL TO THE VARIOUS WORK ITEMS AND NO SEPARATE PAYMENT WAS BE MADE FOR THESE MEASURES.
- *2. FOR GRADING PLAN SEE DWG. NO. C 2.03.
- *3. FOR DRAINAGE PLAN SEE DWG. NO. C 2.04.
- *4. FOR SANITARY SEWER PLAN SEE DWG. NO. C 2.05.
- *5. FOR NATURAL GAS AND WATER PLAN SEE DWG. NO. C 2.06.
- *6. FOR DEMOLITION PLAN SEE DWG. NO. C 2.07.
- *7. FOR ELECTRICAL INFORMATION SEE E SERIES DWGS.
- *8. FOR MECHANICAL INFORMATION SEE M SERIES DWGS.

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
1	12/01	AS-CONSTRUCTED	SNA	SEA	ESD

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
PROPOSED SITE CONDITIONS

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: TED	CHKD. BY: DMM	DWG. NO:
SCALE: 1"=30'	APPROVED: – DATE: 1/97	C 1.02

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 9 OF 200

AS BUILT

S:\VOL94\A94-3014.F\EK-ASBLT\1646C-B\CIVIL\C-102BLT.DWG 1-11-02 11:47:57 am EST

FOR REFERENCE ONLY

LEGEND

AS CONSTR	EXISTING	ITEM
		6" THICK BITUMINOUS CONCRETE PAVEMENT
		9.5" THICK P.C.C. PAVEMENT
		13" THICK P.C.C. PAVEMENT
		4" THICK P.C.C. SIDEWALK
		6" THICK TEMP. PAVEMENT
		SOIL TREATMENT (MULCH, SHRUBS, ETC.)
		6" THICK CRUSHED STONE

NOTES

1. FOR PAVEMENT DETAILS SEE DWG. NO. C 4.05.
2. FOR P.C.C. PAVEMENT JOINT LAYOUT AND DETAILS SEE DWG. NO. C 4.06.
3. FOR GENERAL LEGEND SEE DWG. NO. C 1.02.
4. FOR GENERAL PHASING NOTES SEE DWG. NO. PH 1.01.
5. FOR PAVEMENT ASSOCIATED WITH FUEL FACILITY STRUCTURES SEE M AND S SERIES DRAWINGS.

GRAPHIC SCALE
30 0 15 30 60
(IN FEET)
1 inch = 30 ft.

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated hereon.

EDWARDS AND KELCEY, INC.

BY [signature] DATE 1/9/02

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
1	12/01	AS CONSTRUCTED	SNA	SEA	ESD

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
SITE PAVEMENT PLAN

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: TED	CHKD. BY: DMM		DWG. NO:
SCALE: AS SHOWN	APPROVED:	DATE: 11/96	C 2.02

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 11 OF 200

AS BUILT

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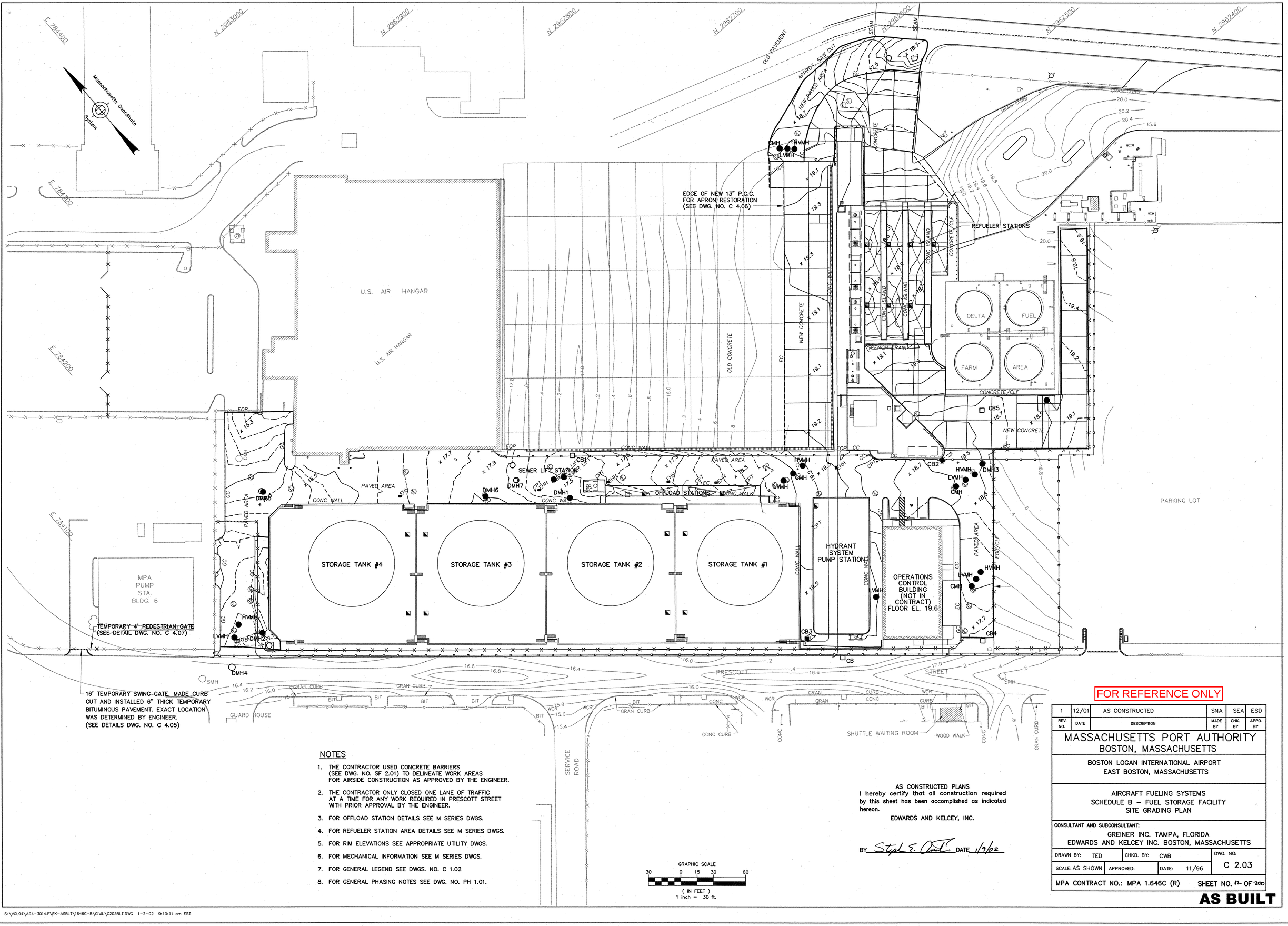

NOTES

1. THE CONTRACTOR USED CONCRETE BARRIERS (SEE DWG. NO. SF 2.01) TO DELINEATE WORK AREAS FOR AIRSIDE CONSTRUCTION AS APPROVED BY THE ENGINEER.
2. THE CONTRACTOR ONLY CLOSED ONE LANE OF TRAFFIC AT A TIME FOR ANY WORK REQUIRED IN PRESCOTT STREET WITH PRIOR APPROVAL BY THE ENGINEER.
3. FOR OFFLOAD STATION DETAILS SEE M SERIES DWGS.
4. FOR REFUELER STATION AREA DETAILS SEE M SERIES DWGS.
5. FOR RIM ELEVATIONS SEE APPROPRIATE UTILITY DWGS.
6. FOR MECHANICAL INFORMATION SEE M SERIES DWGS.
7. FOR GENERAL LEGEND SEE DWGS. NO. C 1.02
8. FOR GENERAL PHASING NOTES SEE DWG. NO. PH 1.01.

GRAPHIC SCALE
30 0 15 30 60
(IN FEET)
1 inch = 30 ft.

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated hereon.

EDWARDS AND KELCEY, INC.

BY Stephen E. Ouellette DATE 1/9/02

FOR REFERENCE ONLY

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
1	12/01	AS CONSTRUCTED	SNA	SEA	ESD

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
SITE GRADING PLAN

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: TED	CHKD. BY: CWB	DWG. NO: C 2.03
SCALE: AS SHOWN	APPROVED:	DATE: 11/96

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 12 OF 200

AS BUILT

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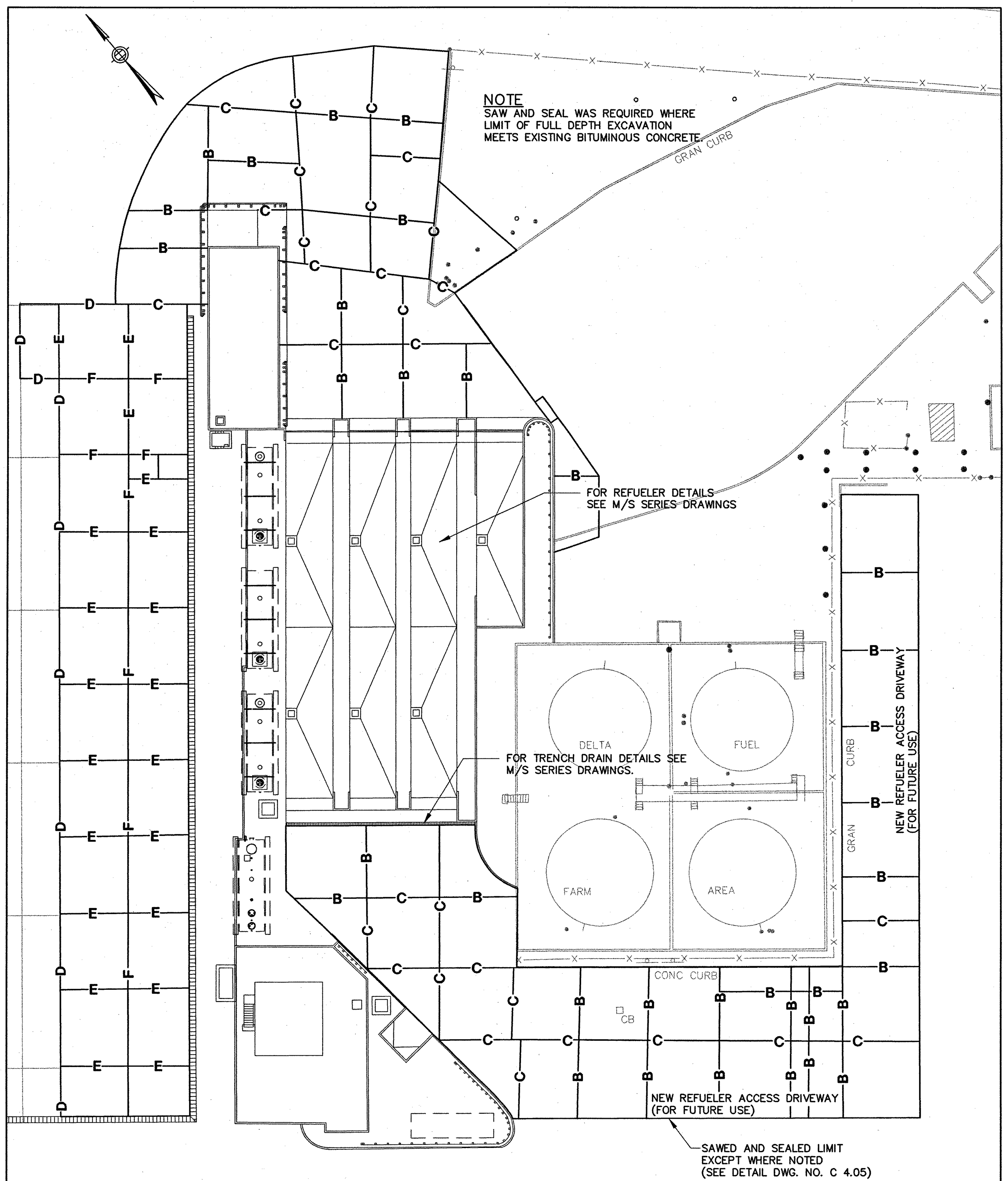
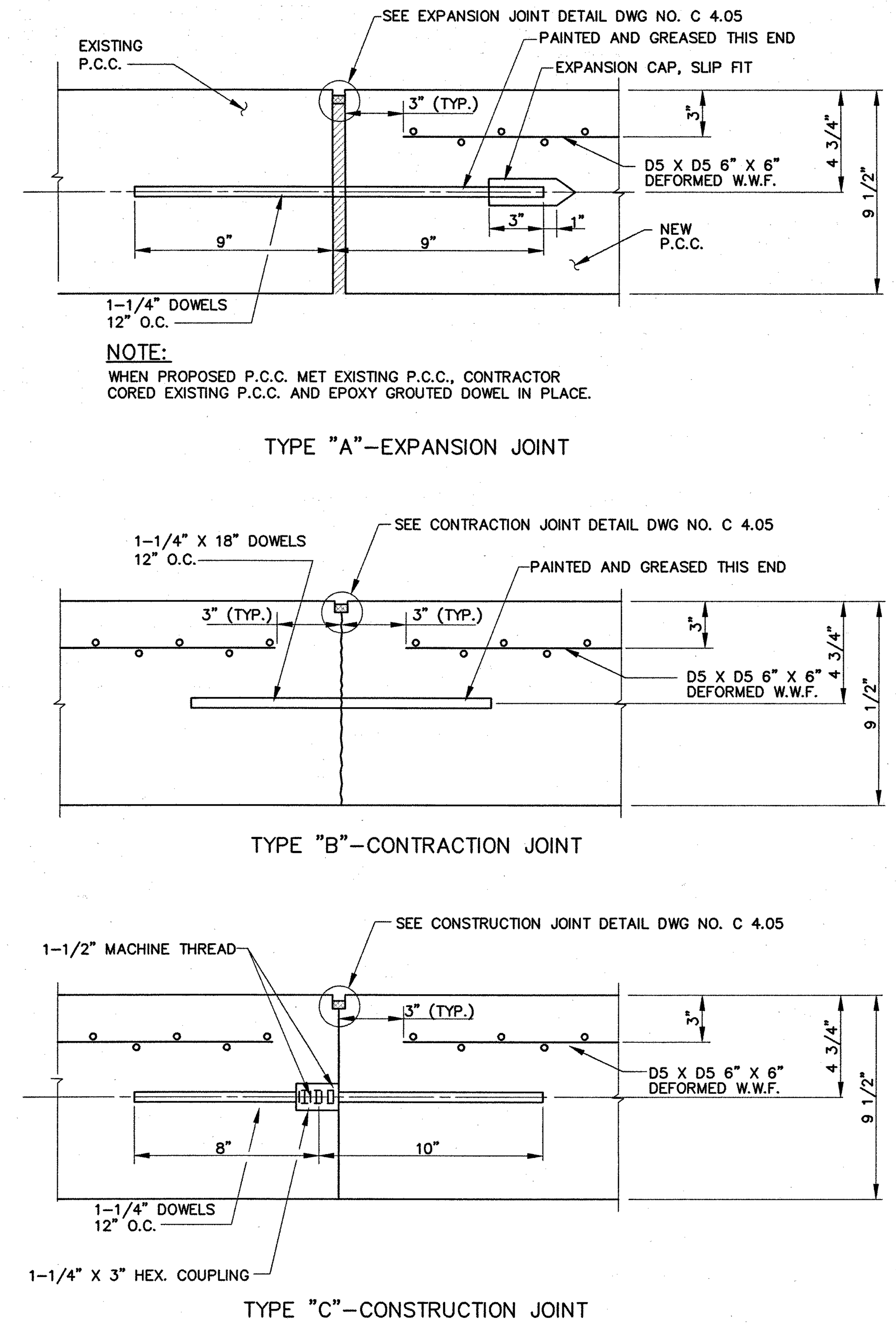
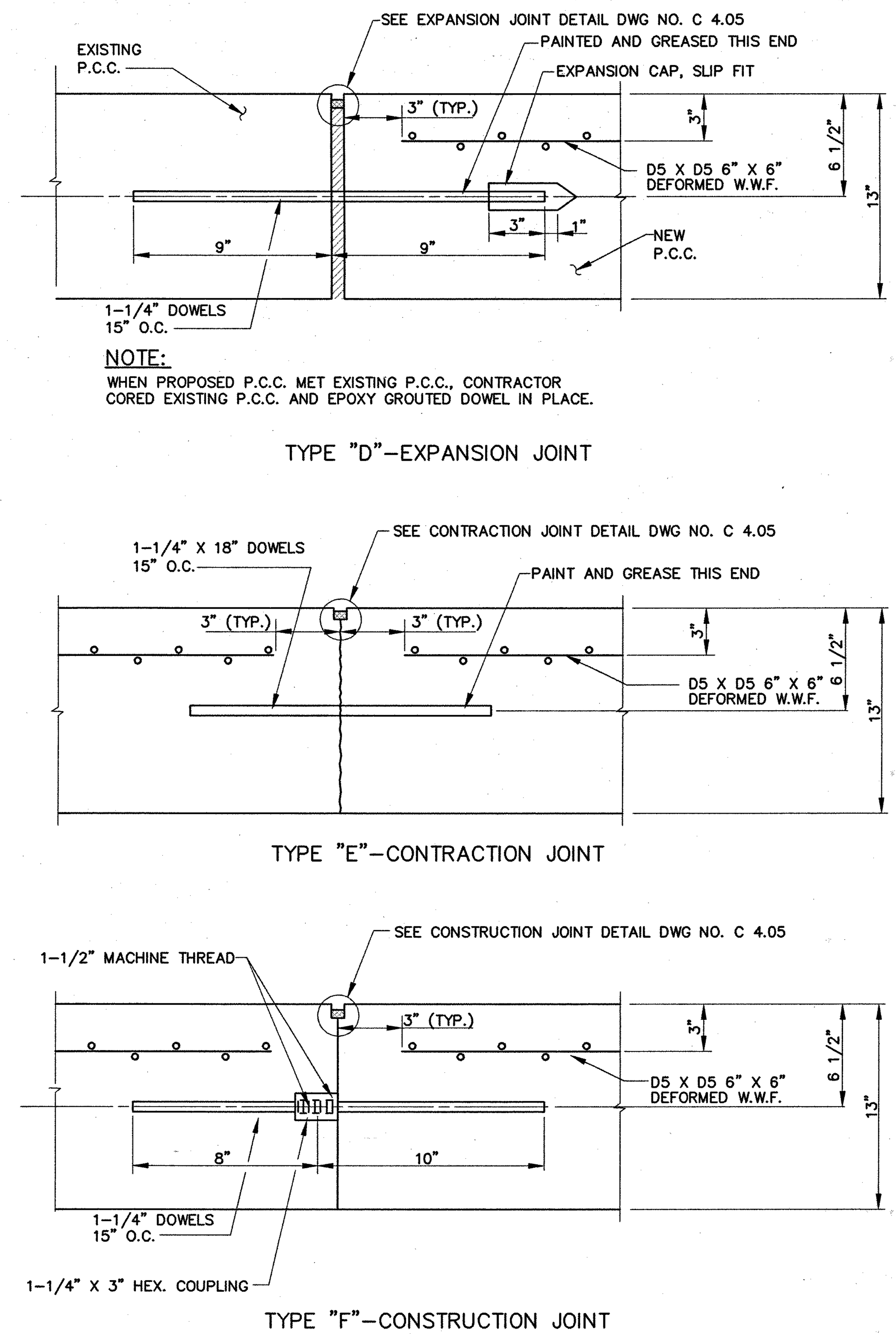


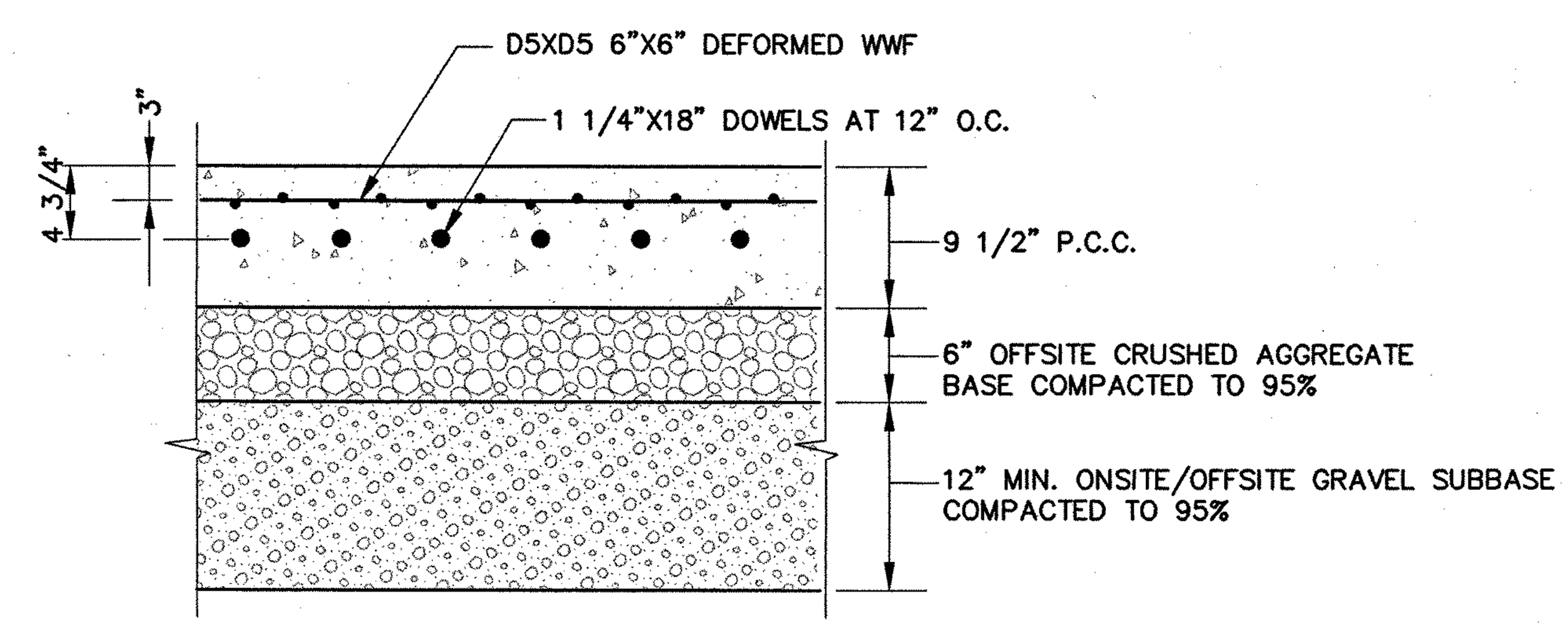
P.C.C. PAVEMENT JOINT LAYOUT
SCALE: 1"=20'



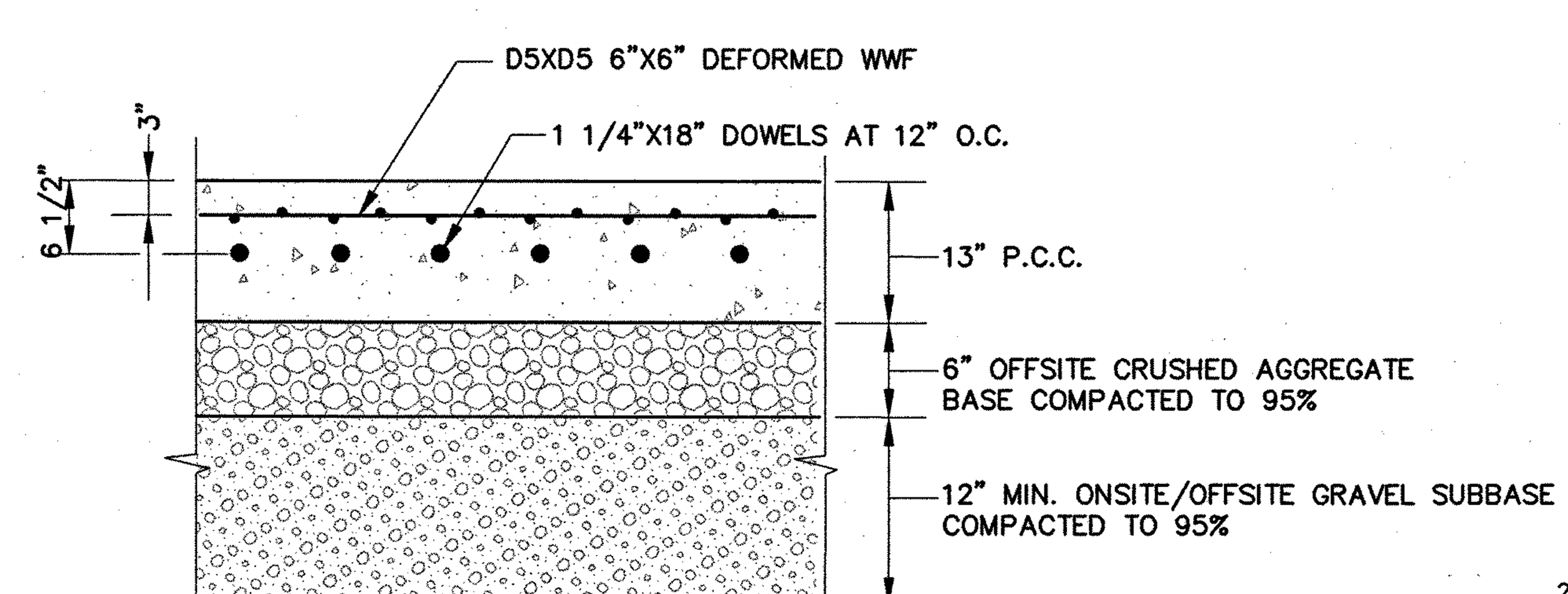
9.5" THICK REFUELER P.C.C. JOINT DETAILS
NOT TO SCALE



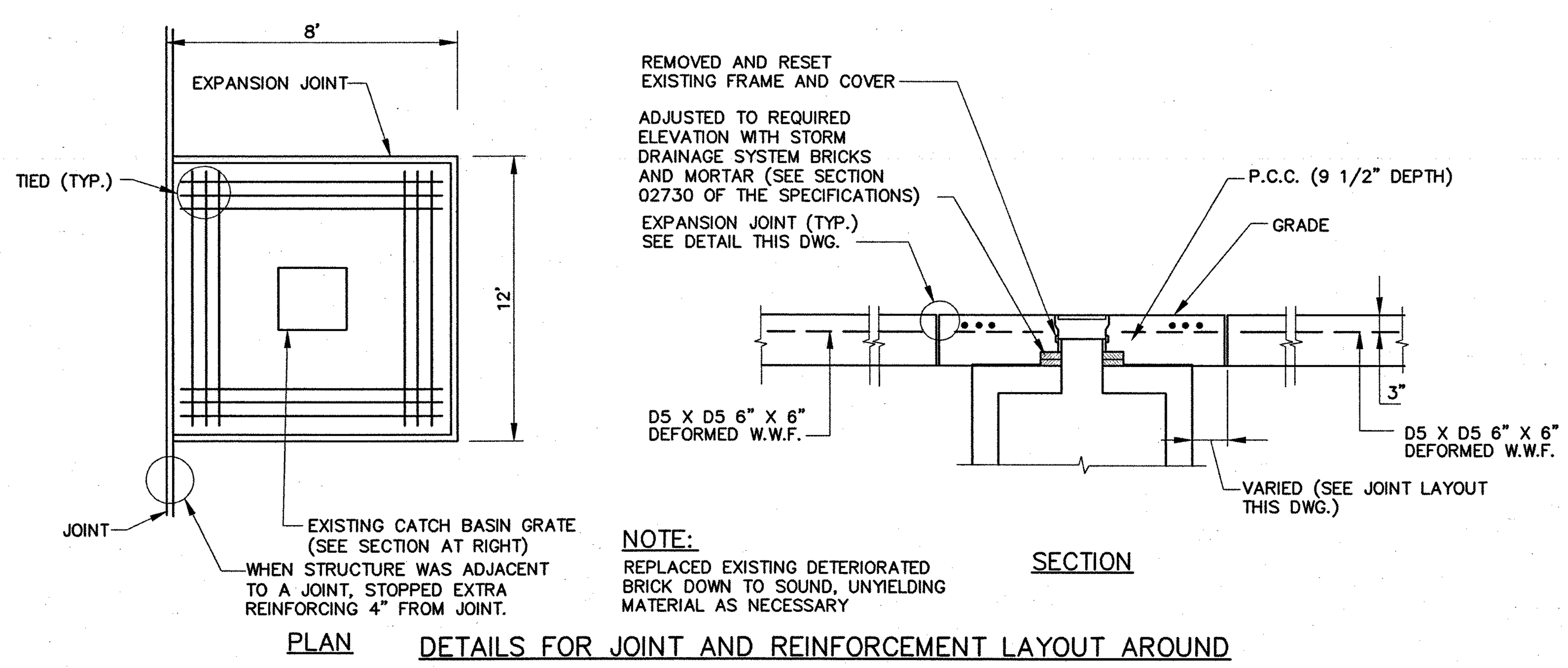
13" THICK APRON P.C.C. JOINT DETAILS
NOT TO SCALE



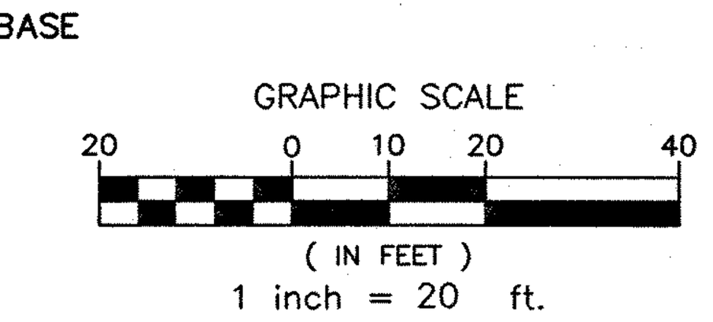
TYPICAL 9.5" REFUELER P.C.C. SECTION
NOT TO SCALE



TYPICAL 13" P.C.C. USAIR APRON SECTION
NOT TO SCALE



DETAILS FOR JOINT AND REINFORCEMENT LAYOUT AROUND EXISTING CATCH BASIN IN P.C.C. PAVEMENT
NOT TO SCALE



AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated hereon.
EDWARDS AND KELCEY, INC.

BY [signature] DATE 1/9/02

FOR REFERENCE ONLY

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
1	12/01	AS CONSTRUCTED	SNA	SEA	ESD

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
P.C.C. PAVEMENT JOINT LAYOUT AND DETAILS

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: TED | CHKD. BY: DMM | DWG. NO: C 4.06
SCALE: AS SHOWN | APPROVED: – | DATE: 11/96

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 22 OF 200

AS BUILT

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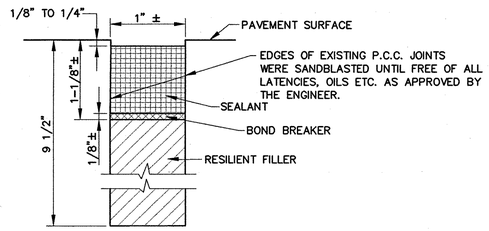
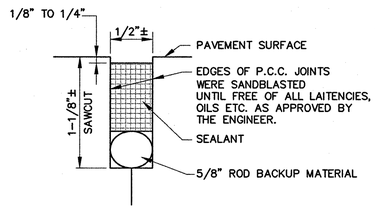


EXPANSION JOINT DETAIL
NOT TO SCALE



CONSTRUCTION JOINT DETAIL
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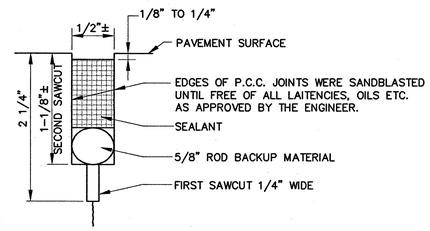
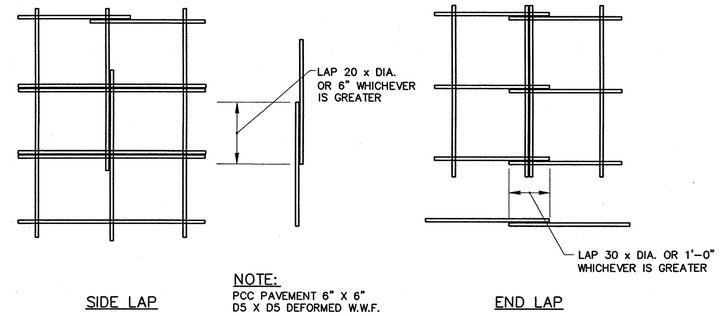
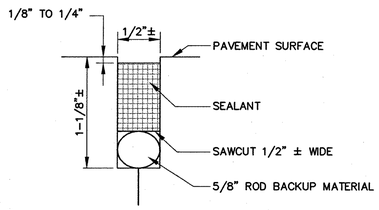


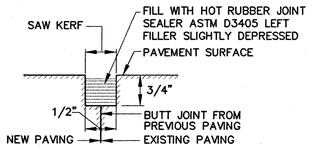
CONTRACTION JOINT DETAIL
NOT TO SCALE



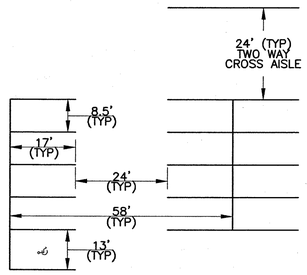
WELDED WIRE FABRIC LAYOUT
NOT TO SCALE



SIDEWALK CONSTRUCTION JOINT DETAIL
NOT TO SCALE

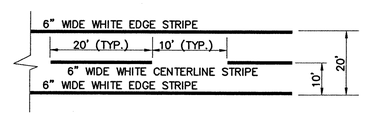


SAW AND SEAL DETAIL
NOT TO SCALE



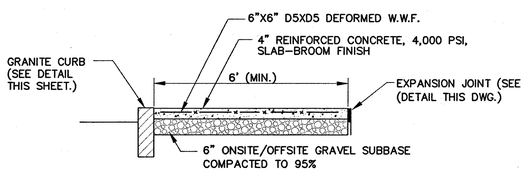
NOTES:
1. FOR ACTUAL LAYOUT IN SATELLITE PARKING SEE SHEET C 1.02 – PROPOSED SITE CONDITIONS.
2. STALLS FOR INDIVIDUALS WITH DISABILITIES ARE 13' x 17'.
3. IF A SECTION IS DESIGNATED FOR SUBCOMPACT VEHICLES, THESE STALLS CAN BE 8' x 15'.

TYPICAL PARKING LAYOUT DETAIL
NOT TO SCALE

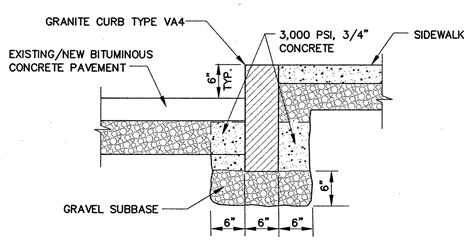


NOTES
1. FOR TEMPORARY VSR USE 6 INCH WIDE TEMPORARY PAVEMENT MARKING (WHITE).
2. FOR PERMANENT VSR USE THERMOPLASTIC PAVEMENT MARKING (WHITE).

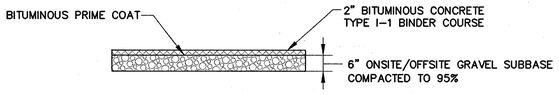
VEHICLE SERVICE ROAD (VSR) MARKING DETAIL
NOT TO SCALE



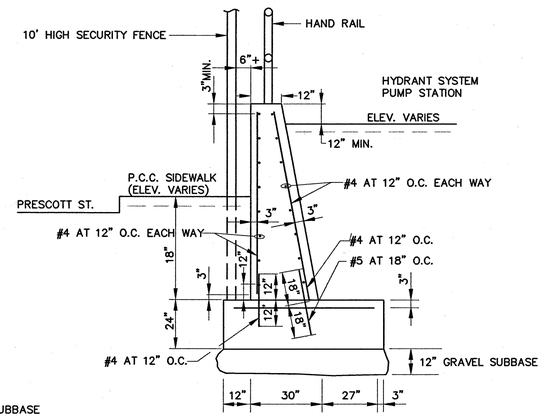
P.C.C. SIDEWALK DETAIL
NOT TO SCALE



GRANITE CURB DETAIL
NOT TO SCALE

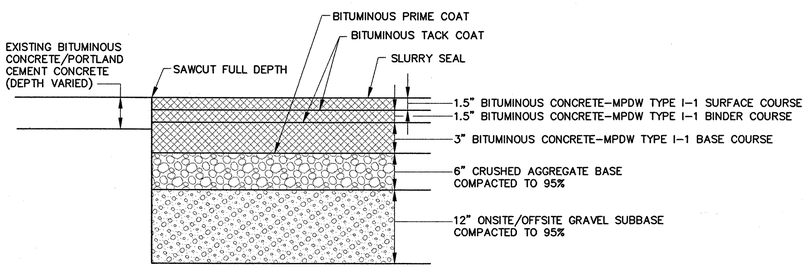


BITUMINOUS CONCRETE COVERING DETAIL
NOT TO SCALE



NOTES
1. CONCRETE REINFORCEMENT MET REQUIREMENTS OF SPEC SECTION 02550–STRUCTURAL PORTLAND CEMENT CONCRETE FOR 3500 PSI STRENGTH.
2. FENCE WAS SITED AT BACK OF SIDEWALK.

RETAINING WALL SECTION
NOT TO SCALE



6" THICK BITUMINOUS CONCRETE TYPICAL SECTION
NOT TO SCALE

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated hereon.

EDWARDS AND KELCEY, INC.

BY Stephen E. Quinn DATE 1/9/02

FOR REFERENCE ONLY

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
1	12/01	AS CONSTRUCTED	SNA	SEA	ESD

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
PAVEMENT DETAILS

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: TED	CHKD. BY: DMM	DWG. NO: C 4.05
SCALE: NONE	APPROVED:	DATE: 11/96

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 21 OF 200

AS BUILT

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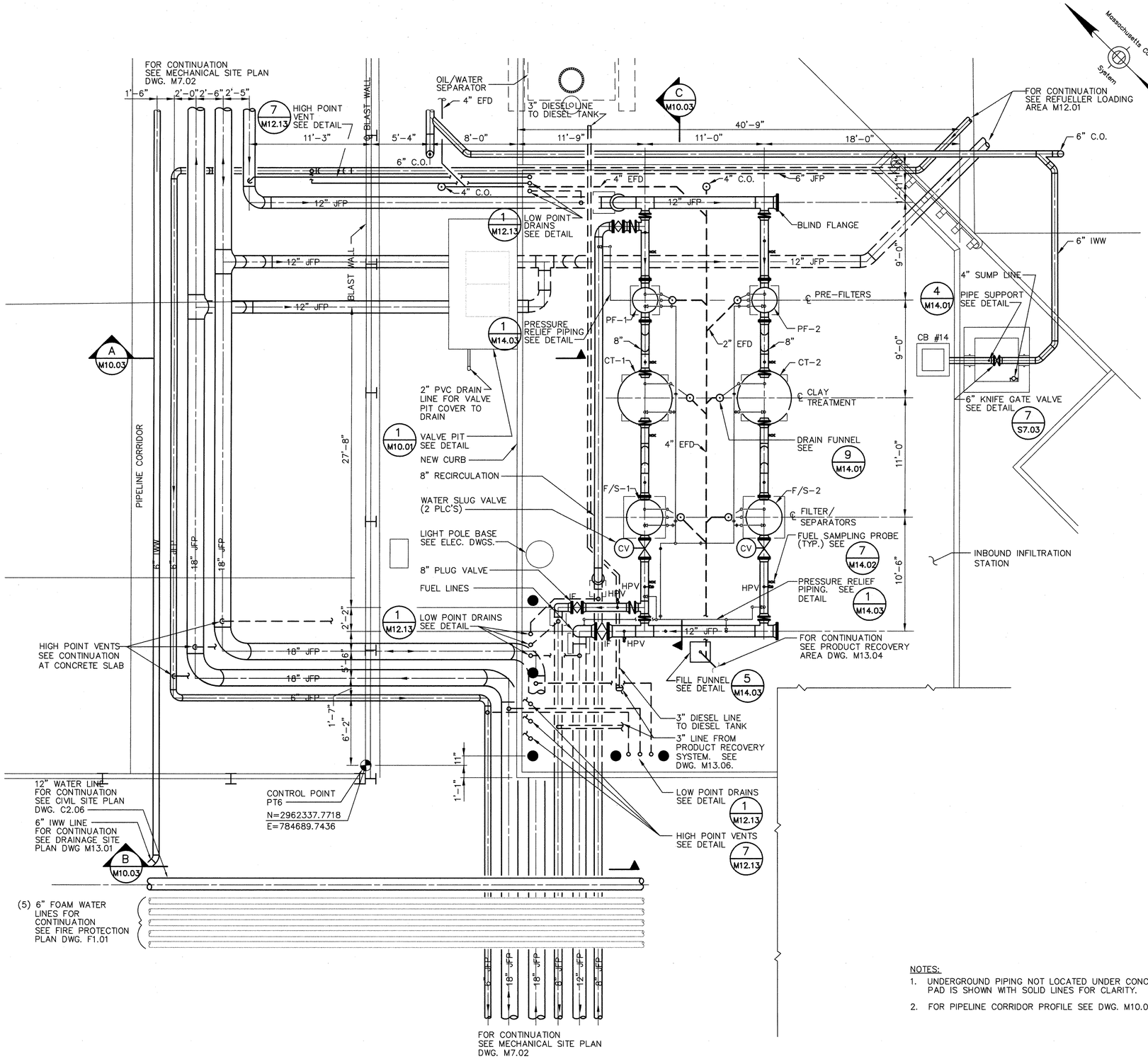
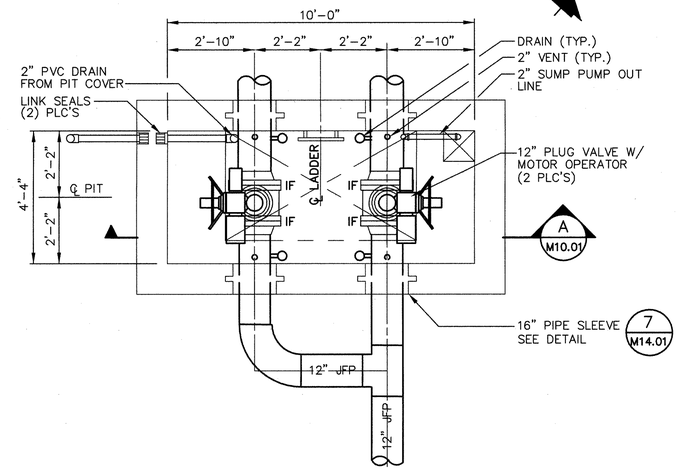
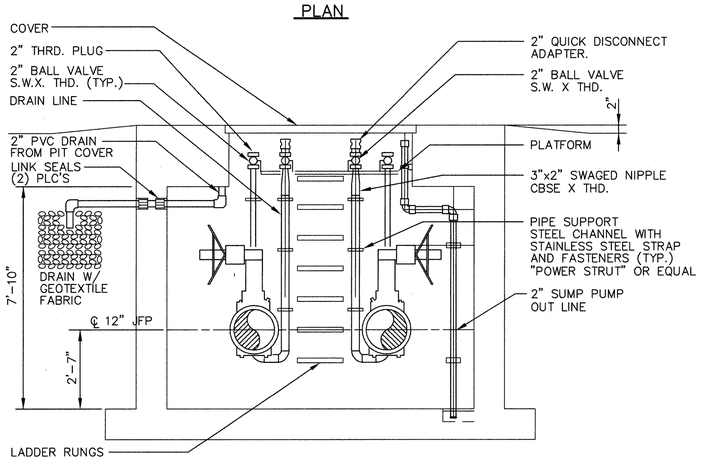


PARTIAL PLAN
SCALE: 1/4" = 1'-0"



PLAN



SECTION A M10.01

VALVE PIT DETAIL 1 M10.01
SCALE: 1/2"=1'-0"

NOTES:

1. UNDERGROUND PIPING NOT LOCATED UNDER CONCRETE PAD IS SHOWN WITH SOLID LINES FOR CLARITY.
2. FOR PIPELINE CORRIDOR PROFILE SEE DWG. M10.03.

GRAPHIC SCALE

2' 0 1' 2'
1/2"=1'-0"

4' 0 2' 4'
1/4"=1'-0"

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

Mike Greiner Woodward Clyde, Inc.
BY _____ DATE 11/9/02

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
INBOUND FILTRATION/PIPELINE CORRIDOR – PARTIAL PLAN

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: DM	CHKD. BY: AEP	DWG. NO:
SCALE: AS SHOWN	APPROVED: RAH	DATE: 2/97	M10.01

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 42 OF 79

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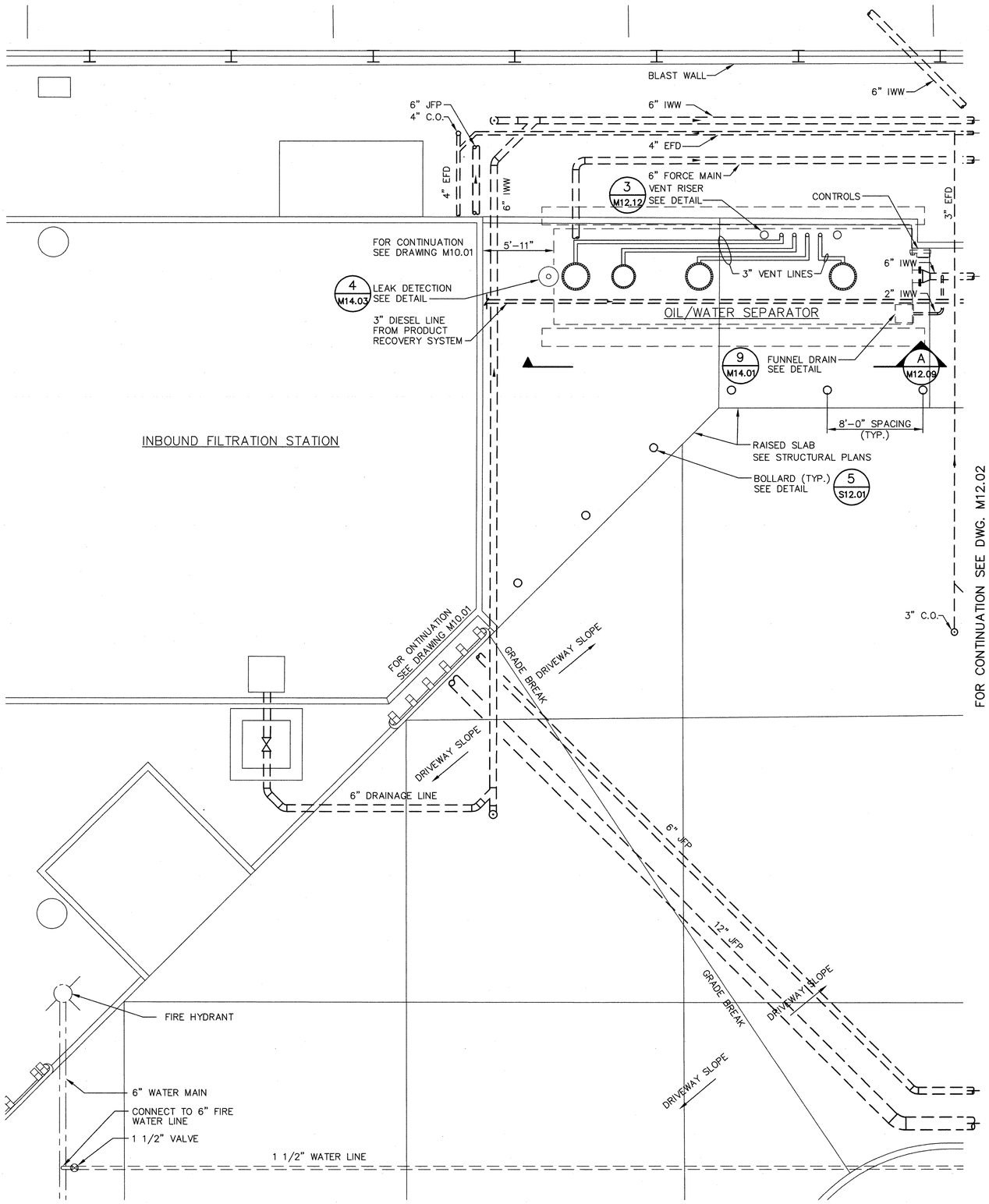
AS BUILT



REFUELER LOADING STATION PARTIAL AREA PLAN
SCALE: 1/4"=1'-0"

Massachusetts Coordinate System

GRAPHIC SCALE
4' 0 2' 4'
1/4" = 1'-0"

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY _____ DATE 11/96 2

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
REFUELER LOADING STATION – PARTIAL SITE PLAN

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY:	CGH	CHKD. BY:	RAH	DWG. NO:
SCALE: 1/4"=1'-0"	APPROVED: RAH	DATE:	2/97	M12.01

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 142 OF 209

AS BUILT

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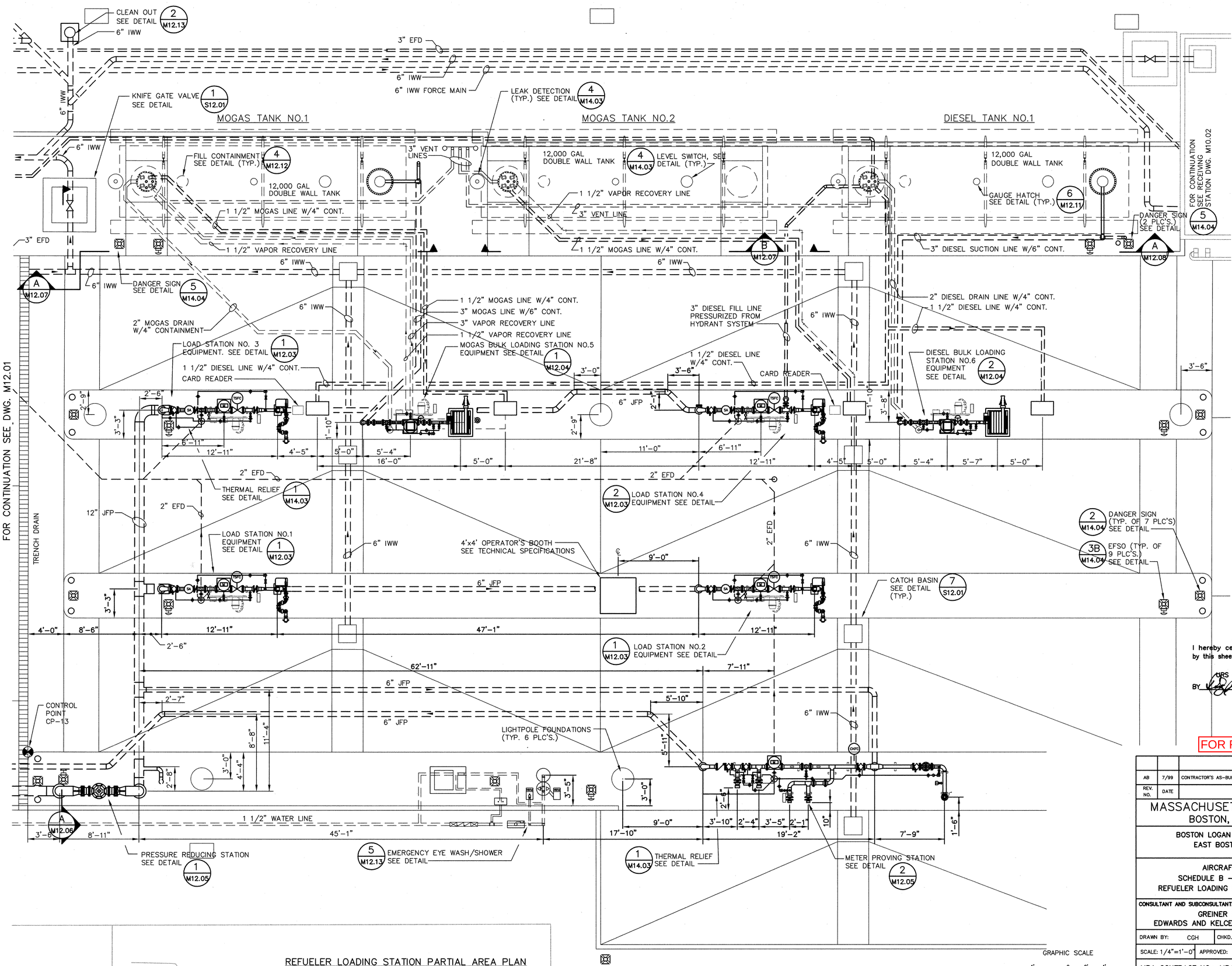

REFUELER LOADING STATION PARTIAL AREA PLAN
SCALE: 1/4"=1'-0"

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

GRS Greiner Woodward Clyde, Inc.
BY _____ DATE 1/96

FOR REFERENCE ONLY

REV. NO.	DATE		MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
REFUELER LOADING STATION – PARTIAL SITE PLAN

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: CGH	CHKD. BY: RAH		DWG. NO:
SCALE: 1/4"=1'-0"	APPROVED: RAH	DATE: 2/97	M12.02

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 48 OF 240

AS BUILT

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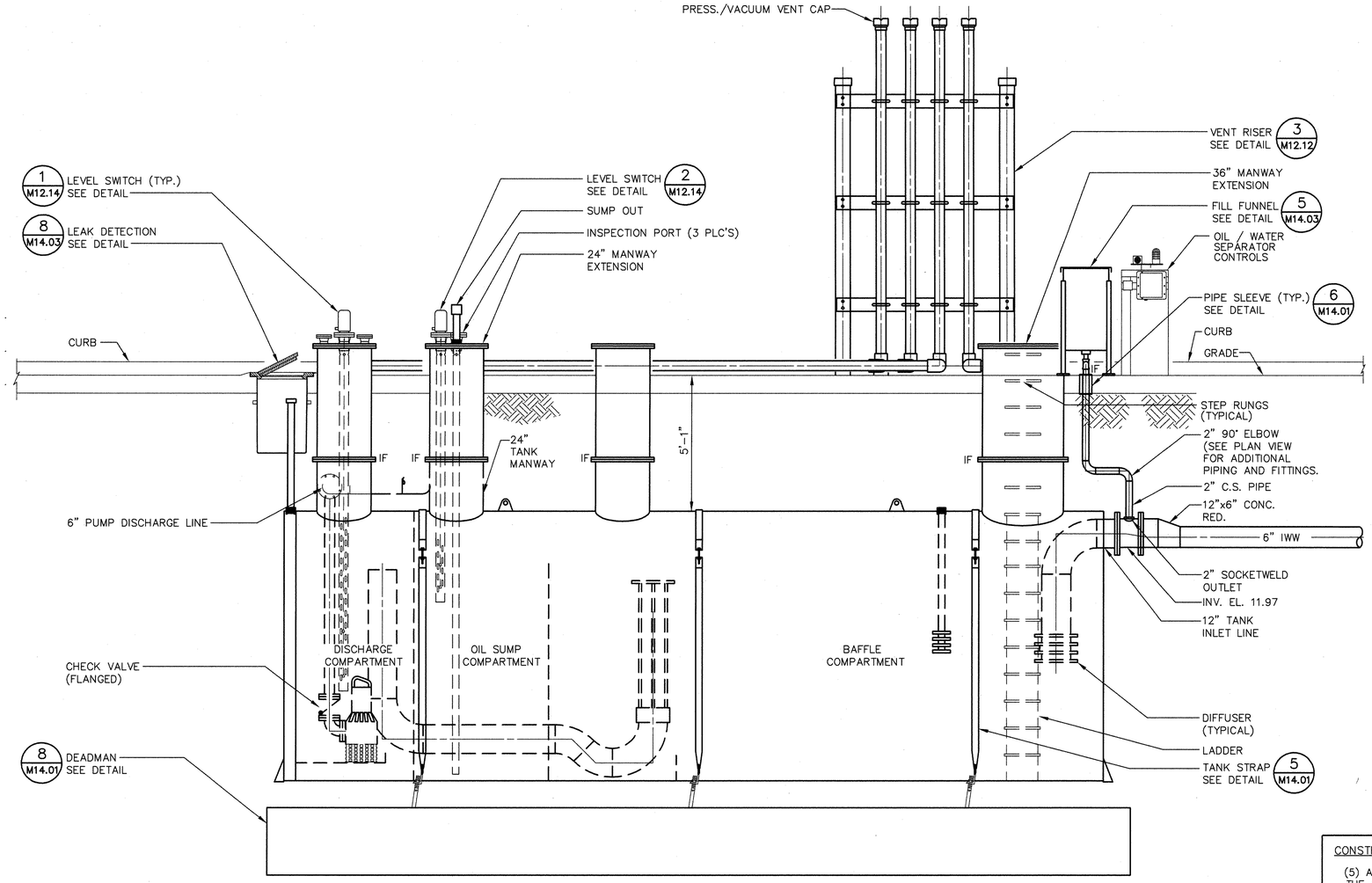

NOTE:
FOR ADDITIONAL INTERNAL COMPONENTS FOR OIL / WATER SEPARATOR NOT SHOWN ON THIS DRAWING REFER TO THE TECHNICAL SPECIFICATIONS FOR THIS PROJECT

OIL/WATER SEPARATOR SECTION A M12.01
SCALE: 1/2"=1'-0"

CONSTRUCTION NOTE:

(5) ADDITIONAL ANODES WERE INSTALLED 10' WEST OF THE OIL/WATER SEPARATOR. THE ANODES ARE 5' IN LENGTH, APPROX. 6" IN HEIGHT, INSTALLED HORIZONTALLY WITH A 5' SEPARATION BETWEEN EACH ANODE.

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY _____ DATE 1/6/02

GRAPHIC SCALE
2' 0 1' 2'
1/2" = 1'-0"

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
OIL/WATER SEPARATOR SECTION

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: CGH	CHKD. BY: RAH		DWG. NO:
SCALE: 1/2"=1'-0"	APPROVED: RAH	DATE: 2/97	M12.09
MPA CONTRACT NO.: MPA 1.646C (R)			SHEET NO. 52 OF 249

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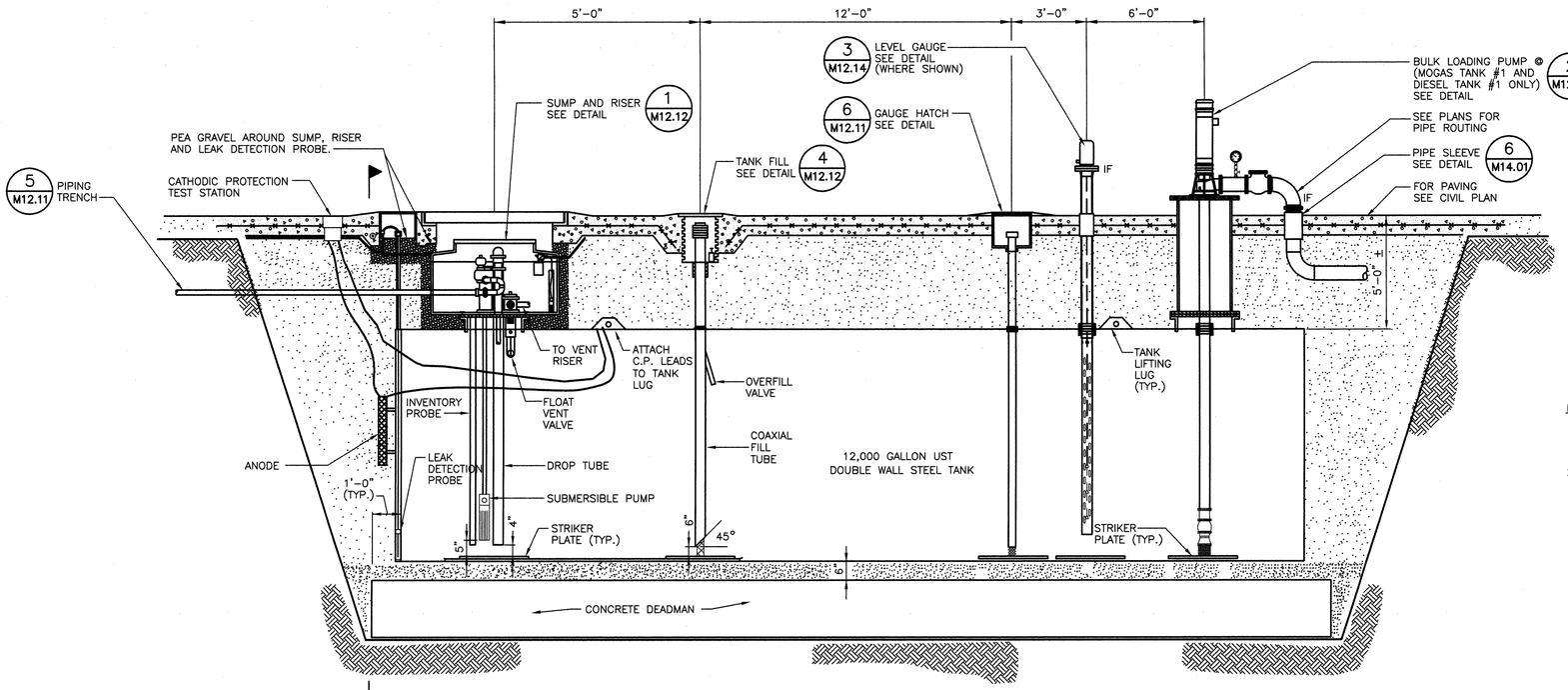
AS BUILT



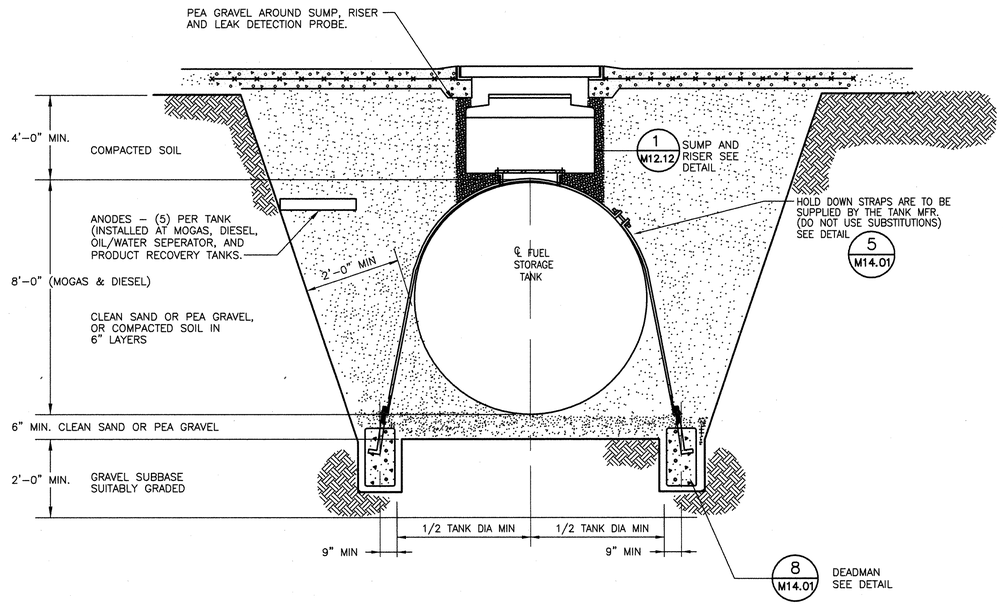
GENERAL UNDERGROUND MOGAS AND DIESEL TANK ELEVATION 1

N.T.S.

M12.02
M12.07
M12.08

NOTES:

1. THIIS DRAWING REPRESENTS A TYPICAL INSTALLATION FOR BELOW GROUND FUEL TANKS. REFER TO SPECIFIC TANK SECTIONS FOR IDENTIFICATION OF COMPONENTS.
2. CONTRACTOR SHALL PROVIDE SHEETING FOR TANK EXCAVATION OR SLOPED WALLS IN ACCORDANCE WITH APPLICABLE SAFETY REGULATIONS.



SECTION A M12.10

N.T.S.

CONSTRUCTION NOTES:

1. (5) ADDITIONAL ANODES WERE INSTALLED 10' WEST OF THE FOLLOWING UST'S: MOGAS TANKS 1 & 2, DIESEL TANK, AND OIL/WATER SEPARATOR.
2. (5) ADDITIONAL ANODES WERE INSTALLED 10' NORTH OF THE PRODUCT RECOVERY TANK.
3. THE ANODES ARE 5' IN LENGTH, APPROX. 6" IN HEIGHT, INSTALLED HORIZONTALLY WITH A 5' SEPARATION BETWEEN EACH ANODE.

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

ORS Greiner Woodward Clyde, Inc.
BY _____ DATE 1/2002

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
GENERAL UNDERGROUND TANK INSTALLATION DETAIL

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY:	CGH	CHKD. BY:	RAH	DWG. NO:
SCALE:	NONE	APPROVED: RAH	DATE: 2/97	M12.10

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 51 OF 80

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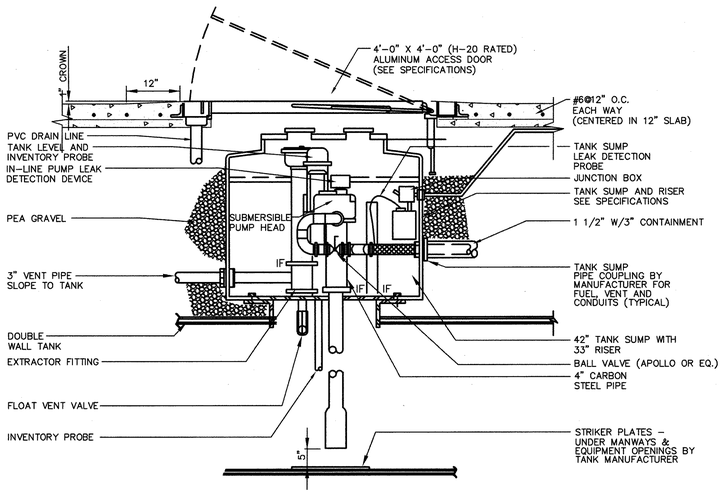
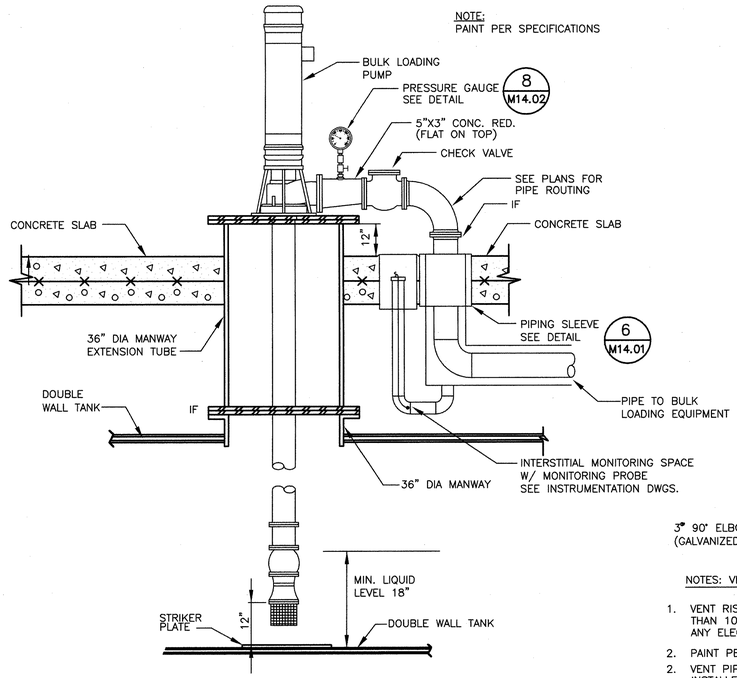
AS BUILT

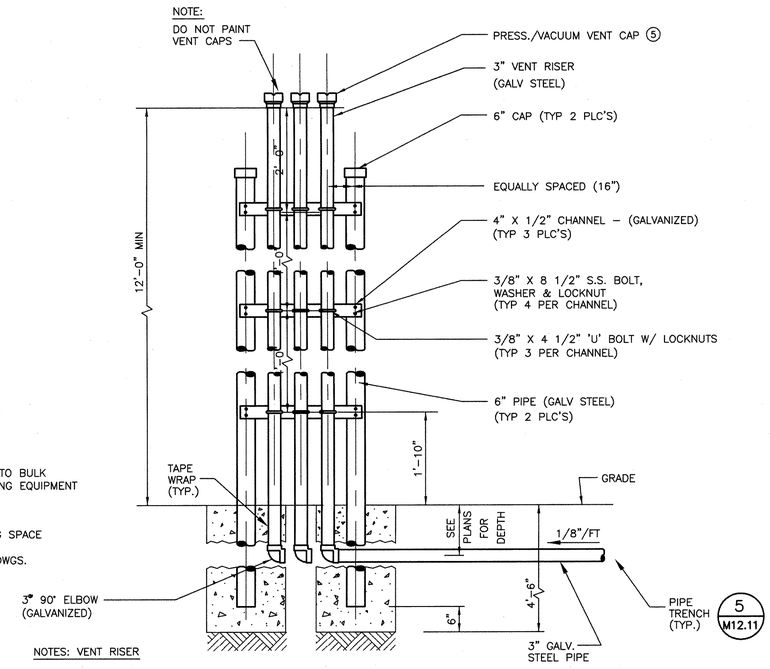


NOTE:
MOGAS AND DIESEL SIMILAR. DIESEL DOES NOT REQUIRE VAPOR RECOVERY SYSTEM.
SEE M12.02 FOR ADDITIONAL PIPING NOT SHOWN IN THIS DETAIL.

TANK SUMP AND RISER DETAIL (1 TYP.)
N.T.S.



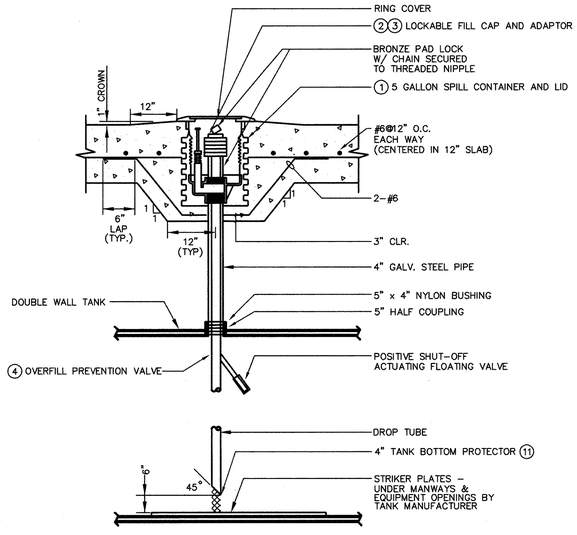
BULK PUMP DETAIL (2 TYP.)
N.T.S.



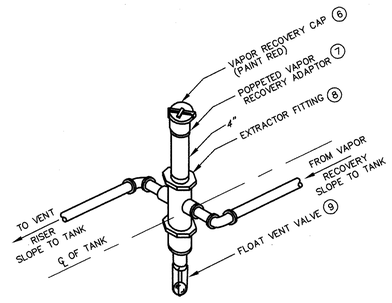
NOTES: VENT RISER

1. VENT RISERS SHALL TERMINATE NOT LESS THAN 10'-0" MEASURED HORIZONTALLY FROM ANY ELECTRICAL CONNECTION.
2. PAINT PER SPECIFICATIONS.
2. VENT PIPING FOR OIL/WATER SEPARATOR INSTALLED ABOVEGROUND.

VENT RISER DETAIL (3)
N.T.S.
M12.01
M12.09



TANK FILL DETAIL (4 TYP.)
N.T.S.



VENT AND VAPOR PIPING DETAIL (5 M12.12)
N.T.S.

EQUIPMENT LIST

	DESCRIPTION	PART NUMBER
(1)	SPILL CONTAINER AND LID	OPW-1
(2)	4" FILL CAP (PADLOCKED)	OPW-634-TT-7085
(3)	TOP SEAL ADAPTOR	OPW-633-T
(4)	OVERFILL PREVENTION VALVE	OPW-61-50
(5)	2" PRESSURE/VACUUM VAPOR VENT	OPW-523
(6)	4" VAPOR RECOVERY CAP	OPW-1711-T
(7)	4" VAPOR RECOVERY ADAPTOR	OPW-1611-AV
(8)	4" X 2" EXTRACTOR FITTING	OPW-233-V
(9)	SERIES FLOAT VENT	OPW-53-V
(10)	4" DROP TUBE	OPW-61-T-7368
(11)	4" TANK BOTTOM PROTECTOR	OPW-61-TP
(12)	9" ROUND MANHOLE WITH LOCKABLE OPW 126-B CAP AND OPW MANHOLE WRENCH	OPW-126-007
(13)	18" DIAMETER MANHOLE	OPW-104-MW-001B
(14)	SERIES EMERGENCY SHUT-OFF VALVE WITH OPW-10-S STABILIZER	OPW-10-R

NOTE:
CONTRACTOR SHALL PROVIDE EQUIPMENT LISTED ABOVE OR APPROVED EQUAL.

FOR REFERENCE ONLY
AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated
BY ORS Greiner Woodward Clyde, Inc. DATE 1/96

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B - FUEL STORAGE FACILITY
REFUELER LOADING STATIONS - DETAILS

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY:	CGH	CHKD. BY:	RAH	DWG. NO:
SCALE:	NONE	APPROVED: RAH	DATE: 2/97	M12.12

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 52 OF 250

AS BUILT

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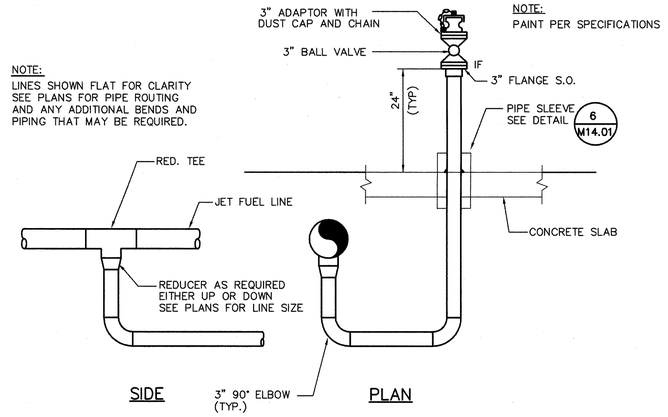
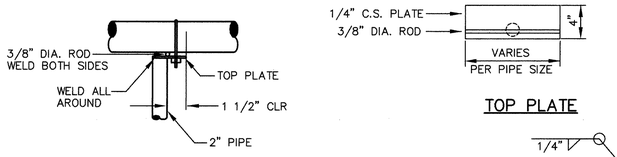


NOTE:
LINES SHOWN FLAT FOR CLARITY SEE PLANS FOR PIPE ROUTING AND ANY ADDITIONAL BENDS AND PIPING THAT MAY BE REQUIRED.

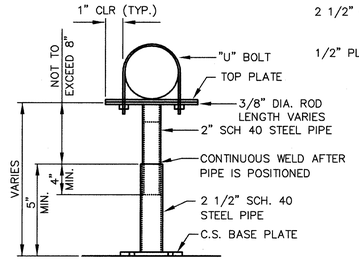
NOTE:
PAINT PER SPECIFICATIONS

LINE SUMP DETAIL 1
N.T.S.

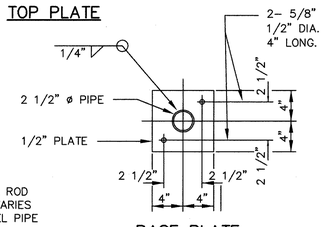
M10.01
M12.05
M12.06



BAR PLATE

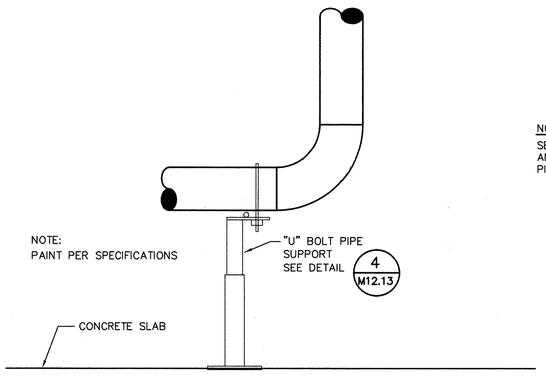


"U" BOLT PIPE SUPPORT DETAIL 4
N.T.S.
M12.13

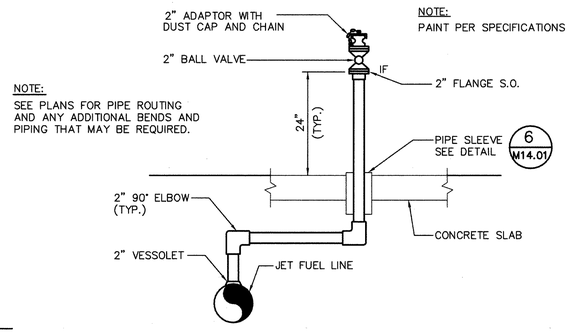


BASE PLATE

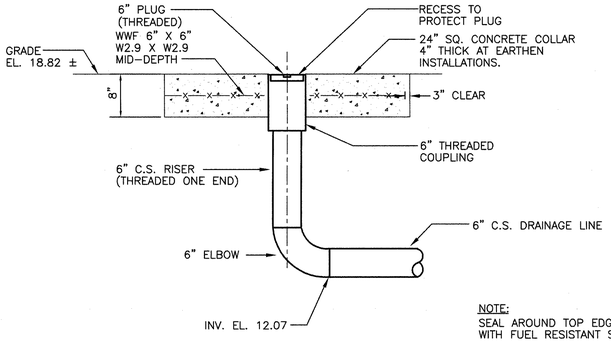
NOTE:
PAINT PER SPECIFICATIONS



LOADING ARM BASE DETAIL 6
N.T.S.
TYP.

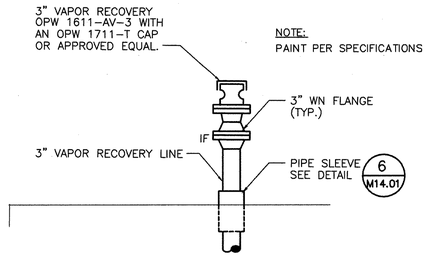


HIGH POINT VENT DETAIL 7
N.T.S.
M10.01



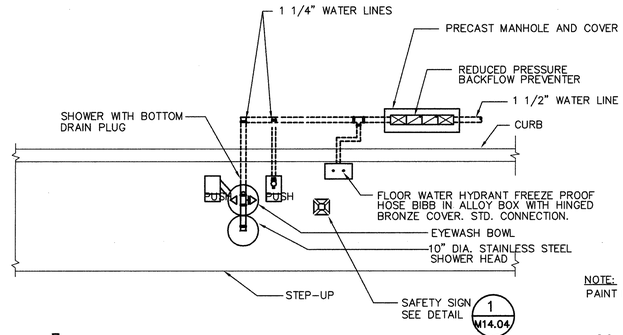
NOTE:
SEAL AROUND TOP EDGE OF COUPLING WITH FUEL RESISTANT SEALANT.

CLEAN OUT DETAIL 2
N.T.S.
TYP.

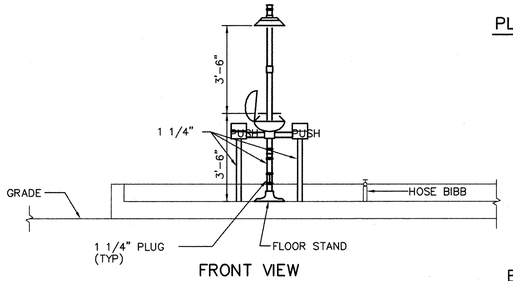


NOTE:
PAINT PER SPECIFICATIONS

BULK VAPOR RECOVERY DETAIL 3
N.T.S.
M12.04

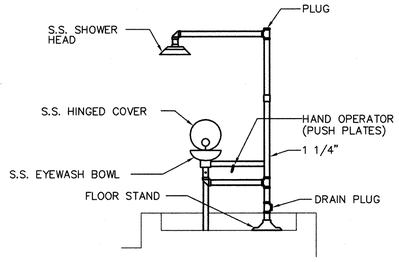


NOTE:
PAINT PER SPECIFICATIONS



PLAN

FRONT VIEW



SIDE VIEW

EMERGENCY EYEWASH/ SHOWER DETAIL (FREEZE PROOF) 5
N.T.S.
M12.02

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY _____ DATE 1/9/02

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
REFUELER LOADING STATIONS – DETAILS

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY:	CHKD. BY:	DWG. NO:
CGH	RAH	M12.13
SCALE: NONE	APPROVED: RAH	DATE: 2/97

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 62 OF 209

AS BUILT

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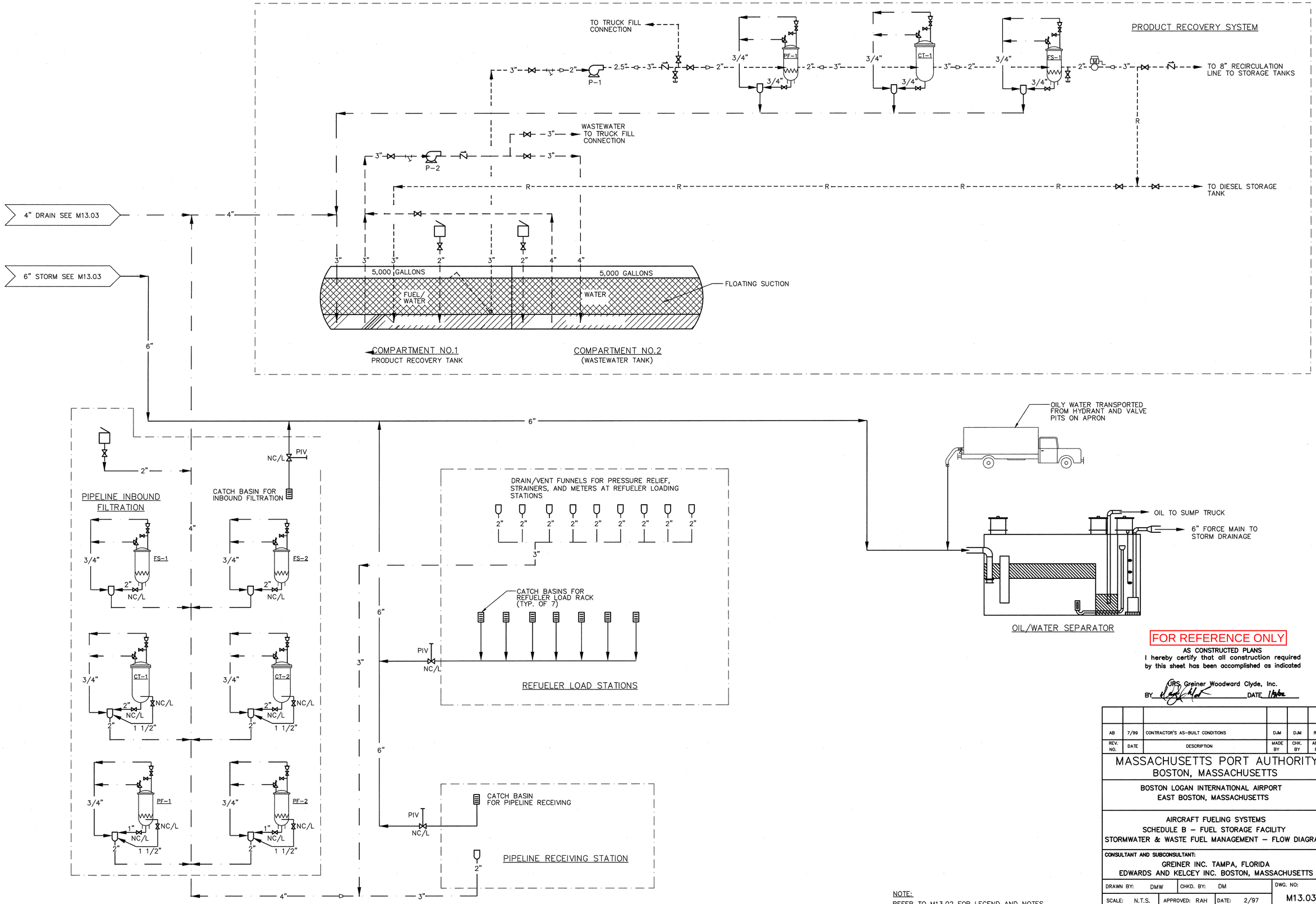

NOTE:
REFER TO M13.02 FOR LEGEND AND NOTES.

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY _____ DATE 1/26/00

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
STORMWATER & WASTE FUEL MANAGEMENT – FLOW DIAGRAM

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: DMW	CHKD. BY: DM		DWG. NO:
SCALE: N.T.S.	APPROVED: RAH	DATE: 2/97	M13.03

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 64 OF 240

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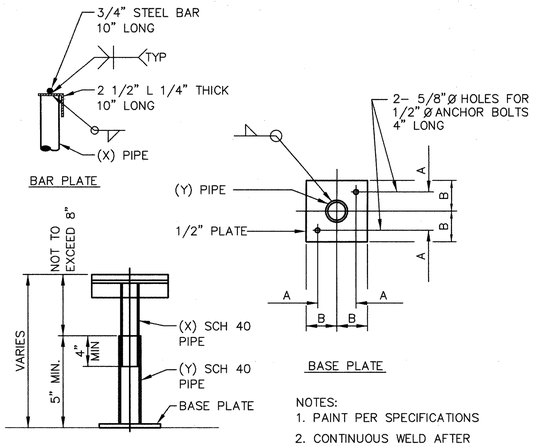
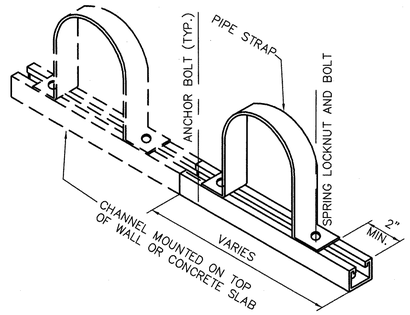
AS BUILT



NOTES:
1. PAINT PER SPECIFICATIONS
2. CONTINUOUS WELD AFTER PIPE IS POSITIONED

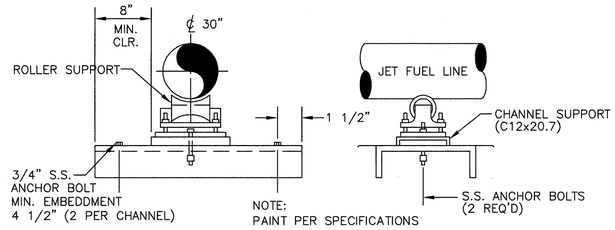
PIPE ø	A DIM.	B DIM.	X PIPE ø	Y PIPE ø
3"	2 1/2"	4"	1 1/2"	2 1/2"
4"	2 1/2"	4"	2 1/2"	3"
6"	2 1/2"	4"	2 1/2"	3"
8"	2 1/2"	4"	2 1/2"	3"
18"	4 1/2"	6"	4"	6"

PEDESTAL PIPE SUPPORT DETAIL 1 TYP.
N.T.S.



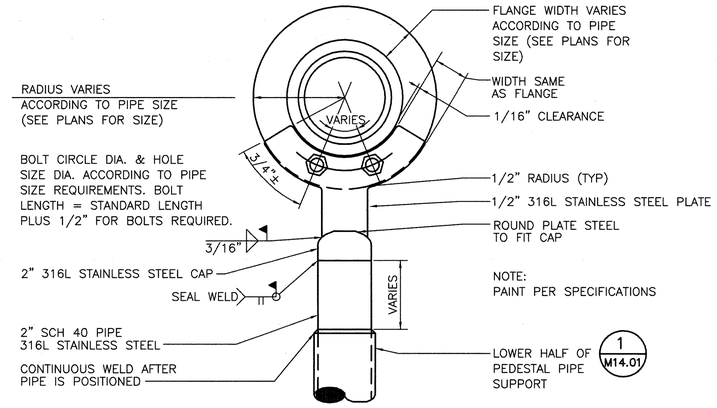
NOTE:
PAINT PER SPECIFICATIONS

CHANNEL PIPE SUPPORT DETAIL 2 M12.05
N.T.S.

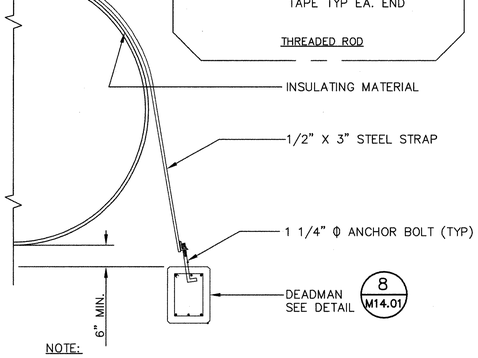


NOTE:
PAINT PER SPECIFICATIONS

ROLLER PIPE SUPPORT DETAIL 3 M9.03
N.T.S.



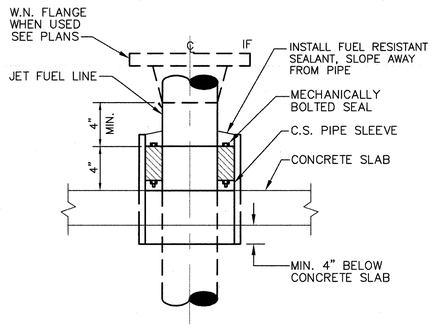
FLANGE PIPE SUPPORT DETAIL 4 TYP.
N.T.S.



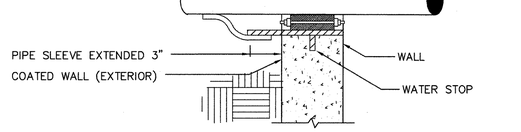
NOTE:
NUMBER AND LOCATION OF TANK STRAPS PER MANUFACTURE'S SPECIFICATIONS

TANK STRAP DETAIL 5 TYP.
N.T.S.

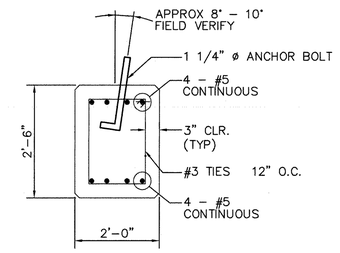
NOTE:
PAINT PER SPECIFICATIONS



CONCRETE SLAB PIPE SLEEVE DETAIL 6 TYP.
N.T.S.

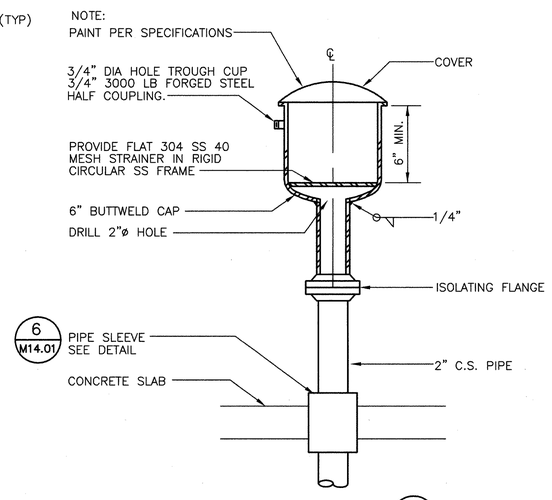


MECHANICALLY BOLTED SEAL DETAIL 7 TYP.
N.T.S.

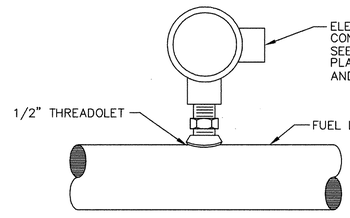


NOTE:
2'–6" X 2'–0" CONCRETE PILE DEADMAN (2 PER TANK) MIN. LENGTH = OVERALL TANK PLUS 1'–0". DEADMAN SHALL BE LAID PARALLEL TO TANK AXIS.

CONCRETE DEADMAN DETAIL 8 TYP.
N.T.S.



DRAIN FUNNEL DETAIL 9 TYP.
N.T.S.



NOTE:
PAINT PER SPECIFICATIONS

THERMAL FLOW SWITCH DETAIL 10 TYP.
N.T.S.

FOR REFERENCE ONLY
AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated
URS Greiner Woodward Clyde, Inc.
BY _____ DATE 11/96

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS–BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
DETAILS

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: CGH	CHKD. BY: RAH		DWG. NO:
SCALE: NONE	APPROVED: RAH	DATE: 2/97	M14.01

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 62 OF 240

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AS BUILT

FILTER VESSEL SCHEDULE

DRAWING IDENTIFICATION	SERVICE	GPM	DESCRIPTION	ASME PRESSURE RATING (PSI)	CONNECTIONS (IN.)	NOTES
F/S-1	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-2	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-3	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-4	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-5	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-6	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-7	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-8	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-9	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-10	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-11	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-12	HYDRANT SYSTEM	1200	FILTER SEPARATOR	275	8"	–
F/S-13	–	–	–	–	–	1
F/S-14	–	–	–	–	–	1
F/S-1	TRUCK OFFLOADING STATION	475	FILTER SEPARATOR	275	6"	–
F/S-2	TRUCK OFFLOADING STATION	475	FILTER SEPARATOR	275	6"	–
F/S-1	INBOUND FILTRATION	1200	FILTER SEPARATOR	275	8"	–
F/S-2	INBOUND FILTRATION	1200	FILTER SEPARATOR	275	8"	–
F/S-1	PRODUCT RECOVERY SYSTEM	100	FILTER SEPARATOR	250	2"	–
PF-1	INBOUND FILTRATION	1200	PREFILTER	275	8"	–
PF-2	INBOUND FILTRATION	1200	PREFILTER	275	8"	–
PF-1	PRODUCT RECOVERY SYSTEM	100	PREFILTER	250	2"	–
CT-1	INBOUND FILTRATION	1200	CLAY TREATMENT VESSEL	275	8"	–
CT-2	INBOUND FILTRATION	1200	CLAY TREATMENT VESSEL	275	8"	–
CT-1	PRODUCT RECOVERY SYSTEM	100	CLAY TREATMENT VESSEL	150	2"	–

NOTES:
1. FILTER SEPARATORS WILL BE INSTALLED IN THE FUTURE. (N.I.C.)

PUMP SCHEDULE

UNIT NO. (MARK)	GPM	HEAD FT.	RPM	HP	BHP	MIN. % EFF.	ELECTRICAL DATA (V/PH/HZ)	MIN. NPSH	SIZE	MODEL	TYPE	SERVICE	NOTES
P-1	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-2	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-3	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-4	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-5	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-6	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-7	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-8	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-9	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-10	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-11	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BYRON JACKSON	HYDRANT PUMPING	–
P-12	1000	600	3550	200	183	73	460/3/60	13.4	4X6X14	HHS	BRYON JACKSON	HYDRANT PUMPING	–
P-13	–	–	–	–		–	–	–	–	–	–	–	1
P-14	–	–	–	–		–	–	–	–	–	–	–	1
P-1	400	126	3450	30	23	53	460/3/60	4	4X3	RD3A-B	GORMAN-RUPP	TRUCK OFFLOADING STATION	–
P-2	400	126	3450	30	23	53	460/3/60	4	4X3	RD3A-B	GORMAN-RUPP	TRUCK OFFLOADING STATION	–
P-1	75	30	1750	3	–	63	460/3/60	5	2X1.5X7L	–	CORKEN	PRODUCT RECOVERY SYSTEM	–
P-2	75	133	1750	5	3	N/A	460/3/60	N/A	2 1/2 A	–	CORKEN	PRODUCT RECOVERY SYSTEM	–
P-1	300	115	1770	15	10	78	460/3/60	8	4X12	VTP 10L-30	INGERSOLL-DRESSER OR EQUAL	DIESEL PUMP - BULK	–
P-2	300	95	1770	10	7	83	460/3/60	8	4X12	VTP 10L-30	INGERSOLL-DRESSER OR EQUAL	MO-GAS PUMP - BULK	–
P-3	30	45	N/A	1/3	N/A	N/A	208/1/60	N/A	4"	CP75S1	RED JACKET	DIESEL PUMP	–
P-4	60	60	N/A	3/4	N/A	N/A	208/1/60	N/A	4"	CP75S1	RED JACKET	MO-GAS PUMP	–
P-5	60	60	N/A	3/4	N/A	N/A	208/1/60	N/A	4"	CP75S1	RED JACKET	MO-GAS PUMP	–
P-1	400	30	1750	5	N/A	N/A	460/3/60	N/A	8"	CP-3127	FLYGT	O/W SEPARATOR - WATER	–
P-2	30	16	N/A	3/4	N/A	N/A	208/1/60	N/A	2"	CP75S1	RED JACKET	O/W SEPARATOR - OIL	–

NOTES:
1. HYDRANT PUMPS WILL BE INSTALLED IN THE FUTURE (N.I.C.)

UNDERGROUND STORAGE TANKS

DRAWING IDENTIFICATION	SERVICE	TOTAL CAPACITY (GAL.)	DIMENSIONS	DESCRIPTION	NOTES
DT-1	DIESEL TANK	12,000	8' DIA. x 32'	DBL. WALL STEEL	–
MT-1	MO-GAS TANK	12,000	8' DIA. x 32'	DBL. WALL STEEL	–
MT-2	MO-GAS TANK	12,000	8' DIA. x 32'	DBL. WALL STEEL	–
PRT-1	PRODUCT RECOVERY TANK	10,000	8' DIA. x 26'-8"	DBL. WALL STEEL	–
WT-1	WASTE TANK	5,000	8' DIA. x 13'-4"	DBL. WALL STEEL	–
GT-1	GENERATOR FUEL STORAGE TANK	1,000	4' DIA. x 10'-8"	DBL. WALL STEEL	–

ABOVE GROUND TANK SCHEDULE

DRAWING IDENTIFICATION	SERVICE	CAPACITY	DIMENSIONS	CONSTRUCTION	REMARKS
TANK 1	JET-A STORAGE	42,970 BBL	80' DIA. x 48' HT.	API 650	–
TANK 2	JET-A STORAGE	42,970 BBL	80' DIA. x 48' HT.	API 650	–
TANK 3	JET-A STORAGE	42,970 BBL	80' DIA. x 48' HT.	API 650	–
TANK 4	JET-A STORAGE	42,970 BBL	80' DIA. x 48' HT.	API 650	–

OIL/WATER SEPARATOR SCHEDULE

DRAWING IDENTIFICATION	WATER FLOW RATE (GPM)	INLET/OUTLET CONNECTIONS (IN.)	TOTAL CAPACITY (GAL.)	OIL STORAGE CAPACITY (GAL.)	DIMENSIONS	CONSTRUCTION	NOTES
O/W-1	400	8"	10,000	8,000	8' DIA. x 27'	DOUBLE WALL STEEL	–

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY _____ DATE 11/96

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
EQUIPMENT SCHEDULES

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: DM	CHKD. BY: RAH	DWG. NO: M14.06
SCALE: NONE	APPROVED: RAH	DATE: 2/97

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 74 OF 240

AS BUILT

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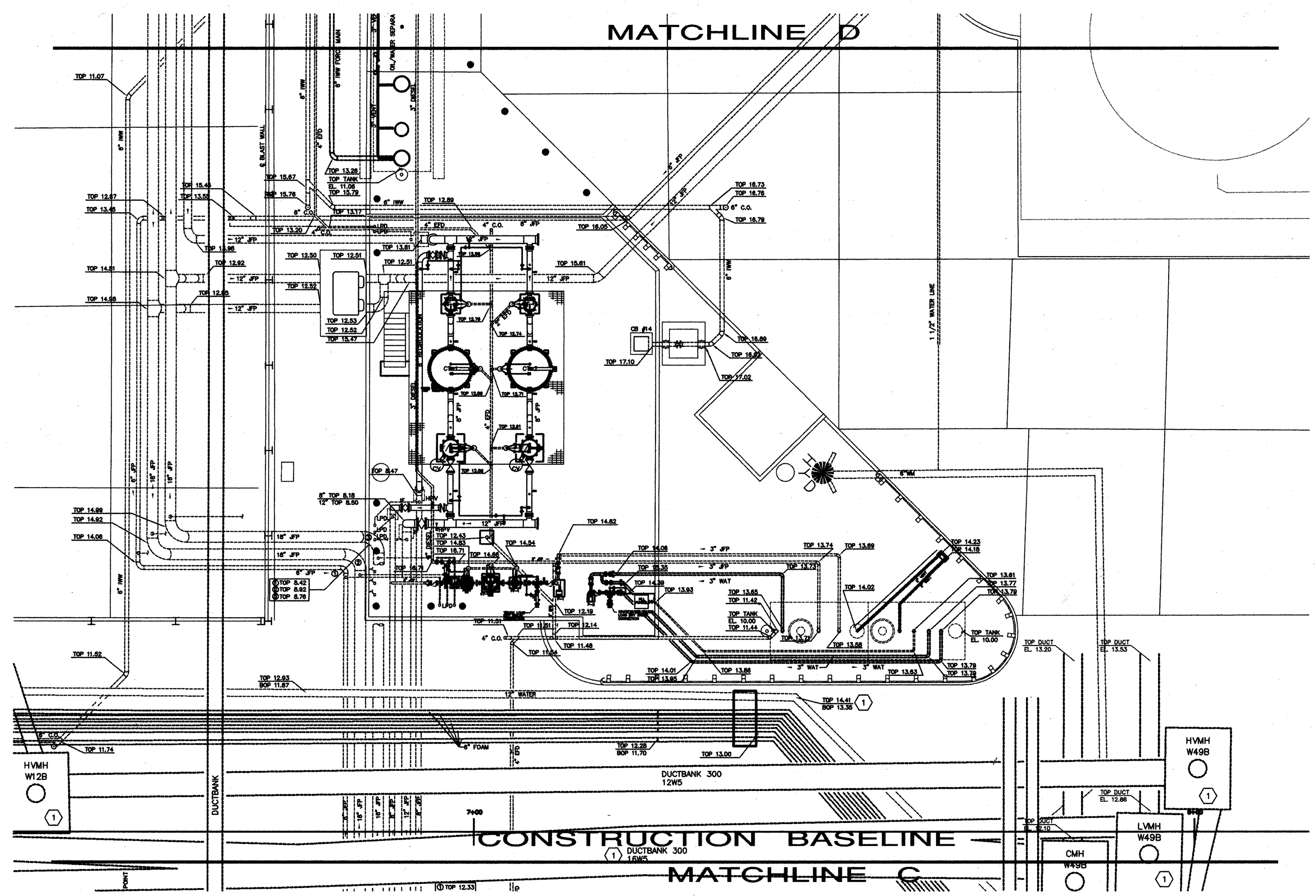
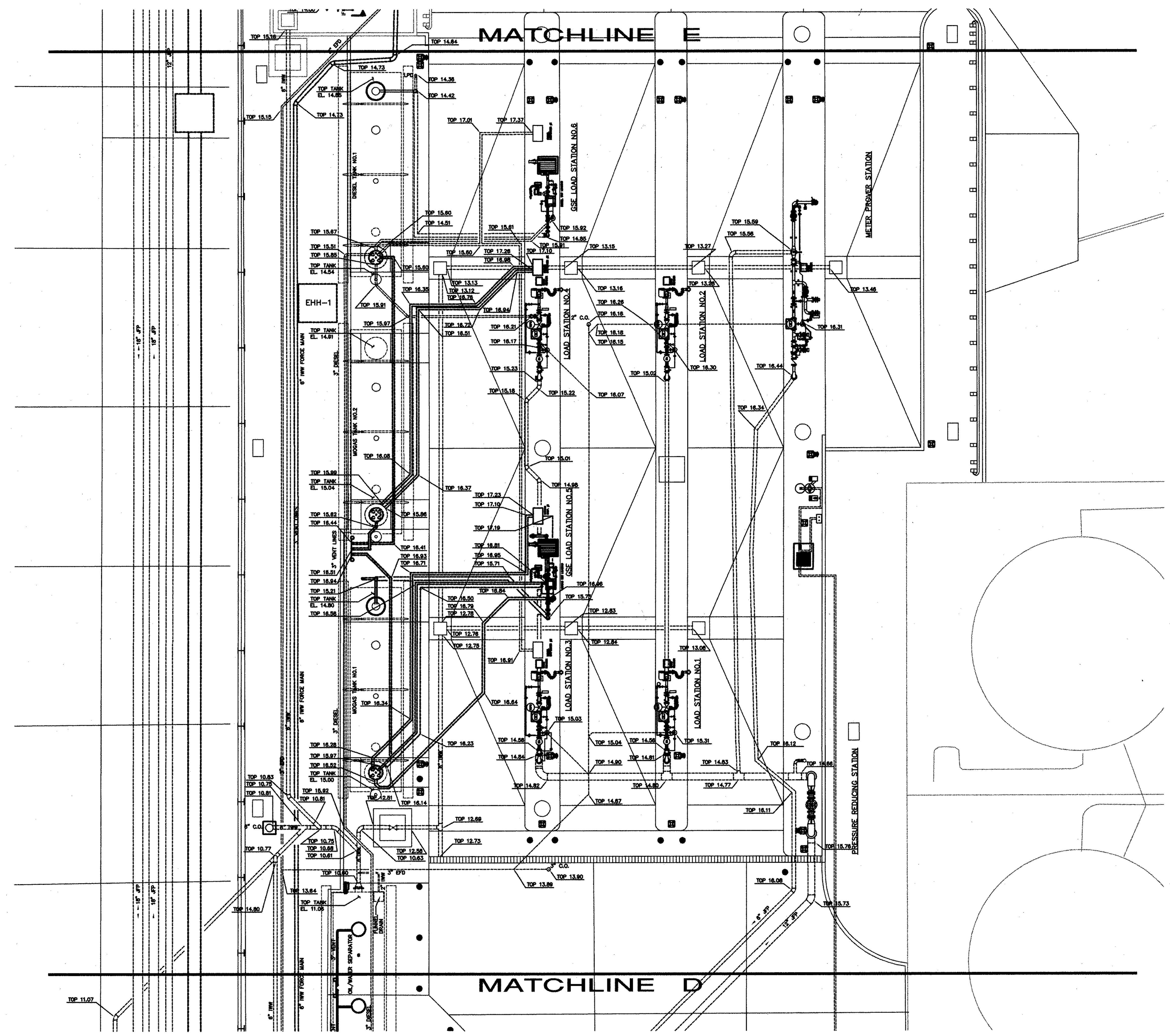




GENERAL NOTES:

1. UTILITY COORDINATION DRAWINGS U1.01 THRU U1.04 HAVE BEEN DEVELOPED TO AID CONSTRUCTION AND ARE SUPPLIED TO THE CONTRACTOR AS A CONVENIENCE. DRAWINGS WERE COMPILED BY COMBINING VARIOUS UTILITY DRAWINGS FROM MPA 1.646C (R)–SCHEDULE B, M. DeMATTEO CONSTRUCTION CO. AS–BUILT DRAWINGS DATED 1/23/98 AND ACTUAL FIELD VERIFICATION OF EXISTING UTILITIES BY MASSPORT AND M. DeMATTEO SURVEY UNITS.

2. DRAWINGS U1.01 THRU U1.05 ARE PROVIDED AS A CONVIENCE TO THE CONTRACTOR AND SHALL BE USED IN CONJUNCTION WITH MPA 1.646C (R) SCHEDULE B CONTRACT DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL REPORT ANY APPARENT DISCREPENCY, ERROR OR OMMISSIONS IN THESE DRAWINGS TO THE ENGINEER PRIOR TO COMMENCING THE ASSOCIATED WORK FOR A WRITTEN INTERPRETATION.

3. MODIFICATIONS TO UTILITY LOCATIONS AS A RESULT OF AS–BUILT CONDITIONS AND EXISTING UTILITY VERIFICATIONS ARE INDICATED BY REVISION NO. ⚠x. REFER TO REVISION NOTES FOR ADDITIONAL INFORMATION.

4. UTILITY DRAWINGS WERE USED TO ILLUSTRATE UNDERGROUND UTILITY LOCATIONS AND ELEVATIONS ONLY. REFER TO CIVIL, ELECTRICAL, MECHANICAL, INSTRUMENTATION DRAWINGS, ETC. FOR ACTUAL DETAILS OF PIPING AND EQUIPMENT USED.

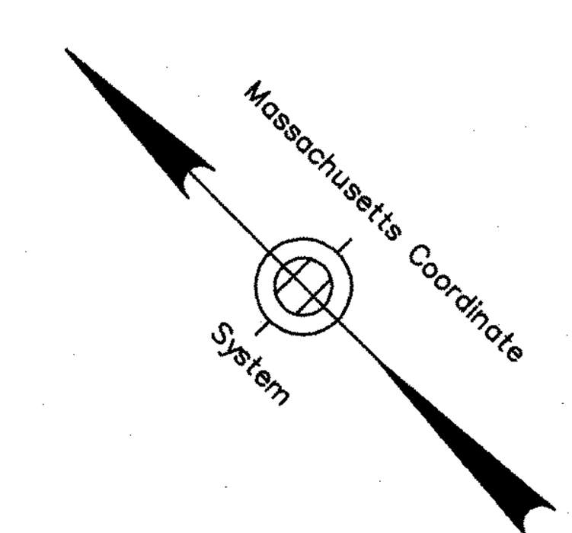
KEY NOTES

(1) HORIZONTAL AND VERTICAL LOCATIONS OF UTILITIES AS INDICATED BY M. DeMATTEO CONSTRUCTION CO., AS–BUILT DRAWINGS DATED 1/23/98.

(2) LOCATION OF FOAM LINES INSTALLED BY M. DeMATTEO PER AS–BUILT DRAWINGS DATED 1/23/98. CONTRACTOR TO MAKE NECESSARY CORRECTIONS TO CONNECT TO AS–DESIGNED LOCATION.

CONSTRUCTION NOTES:

1. DRAWINGS U1.01 TO U1.05 WERE PREPARED TO COORDINATE THE EXISTING AND NEW UTILITIES DURING CONSTRUCTION OF THE FUEL STORAGE FACILITY. THESE DRAWINGS INCLUDE A GENERAL LAYOUT OF THESE UTILITIES WITH ELEVATIONS. REFER TO OTHER DISCIPLINES FOR ADDITIONAL DETAIL.



GRAPHIC SCALE

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY [signature] DATE 1/9/02

AB	7/99	CONTRACTOR'S AS–BUILT CONDITIONS	DJM	DJM	RAH
REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
FUEL FARM – UTILITY COORDINATION PLANS

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: CGH	CHKD. BY: CGH/RAH	DWG. NO: U1.04
SCALE: AS SHOWN	APPROVED: RAH	DATE: 3/98

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 199 OF 200

AS BUILT

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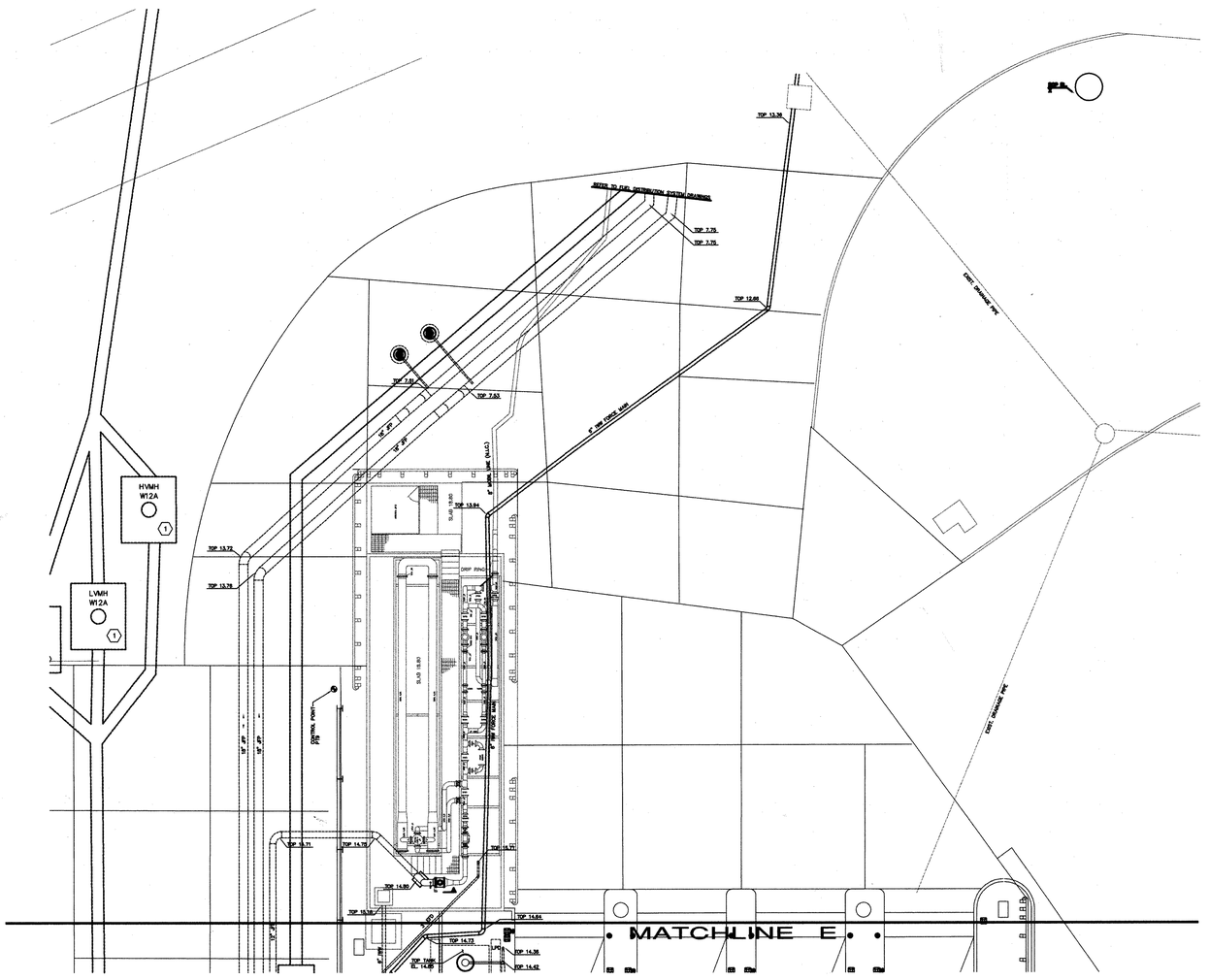

GENERAL NOTES:

1. UTILITY COORDINATION DRAWINGS U1.01 THRU U1.05 HAVE BEEN DEVELOPED TO AID CONSTRUCTION AND ARE SUPPLIED TO THE CONTRACTOR AS A CONVENIECE. DRAWINGS WERE COMPILED BY COMBINING VARIOUS UTILITY DRAWINGS FROM MPA 1.646C (R)–SCHEDULE B, M. DeMATTEO CONSTRUCTION CO. AS–BUILT DRAWINGS DATED 1/23/98 AND ACTUAL FIELD VERIFICATION OF EXISTING UTILITIES BY MASSPORT AND M. DeMATTEO SURVEY UNITS.
2. DRAWINGS U1.01 THRU U1.05 ARE PROVIDED AS A CONVIENCE TO THE CONTRACTOR AND SHALL BE USED IN CONJUNCTION WITH MPA 1.646C (R) SCHEDULE B CONTRACT DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL REPORT ANY APPARENT DISCREPENCY, ERROR OR OMMISSIONS IN THESE DRAWINGS TO THE ENGINEER PRIOR TO COMMENCING THE ASSOCIATED WORK FOR A WRITTEN INTERPRETATION.
3. MODIFICATIONS TO UTILITY LOCATIONS AS A RESULT OF AS–BUILT CONDITIONS AND EXISTING UTILITY VERIFICATIONS ARE INDICATED BY REVISION NO. (A). REFER TO REVISION NOTES FOR ADDITIONAL INFORMATION.
4. UTILITY DRAWINGS WERE USED TO ILLUSTRATE UNDERGROUND UTILITY LOCATIONS AND ELEVATIONS ONLY. REFER TO CIVIL, ELECTRICAL, MECHANICAL, INSTRUMENTATION DRAWINGS, ETC. FOR ACTUAL DETAILS OF PIPING AND EQUIPMENT USED.
5. MOBIL PIPELINE & RECEIVING STATION WERE NOT INCLUDED IN THIS CONTRACT. MOBIL PIPELINE & RECEIVING STATION IS SHOWN FOR REFERENCE ONLY, CONTACT MOBIL FOR AS–BUILT DRAWINGS.

KEY NOTES

(1) HORIZONTIAL AND VERTICAL LOCATIONS OF UTILITIES AS INDICATED BY M. DeMATTEO CONSTRUCTION CO., AS–BUILT DRAWINGS DATED 1/23/98.

CONSTRUCTION NOTES:

1. DRAWINGS U1.01 TO U1.05 WERE PREPARED TO COORDINATE THE EXISTING AND NEW UTILITIES DURING CONSTRUCTION OF THE FUEL STORAGE FACILITY. THESE DRAWINGS INCLUDE A GENERAL LAYOUT OF THESE UTILITIES WITH ELEVATIONS. REFER TO OTHER DISCIPLINES FOR ADDITIONAL DETAIL.

Massachusetts Coordinate System

GRAPHIC SCALE

10' 0 5' 10'

1" = 10'-0"

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

BY URS Greiner Woodward Clyde, Inc. DATE 1/98

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS–BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
FUEL FARM – UTILITY COORDINATION PLANS

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: CGH	CHKD. BY: CGH/RAH		DWG. NO:
SCALE: AS SHOWN	APPROVED: RAH	DATE: 3/98	U1.05

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 200 OF 202

AS BUILT

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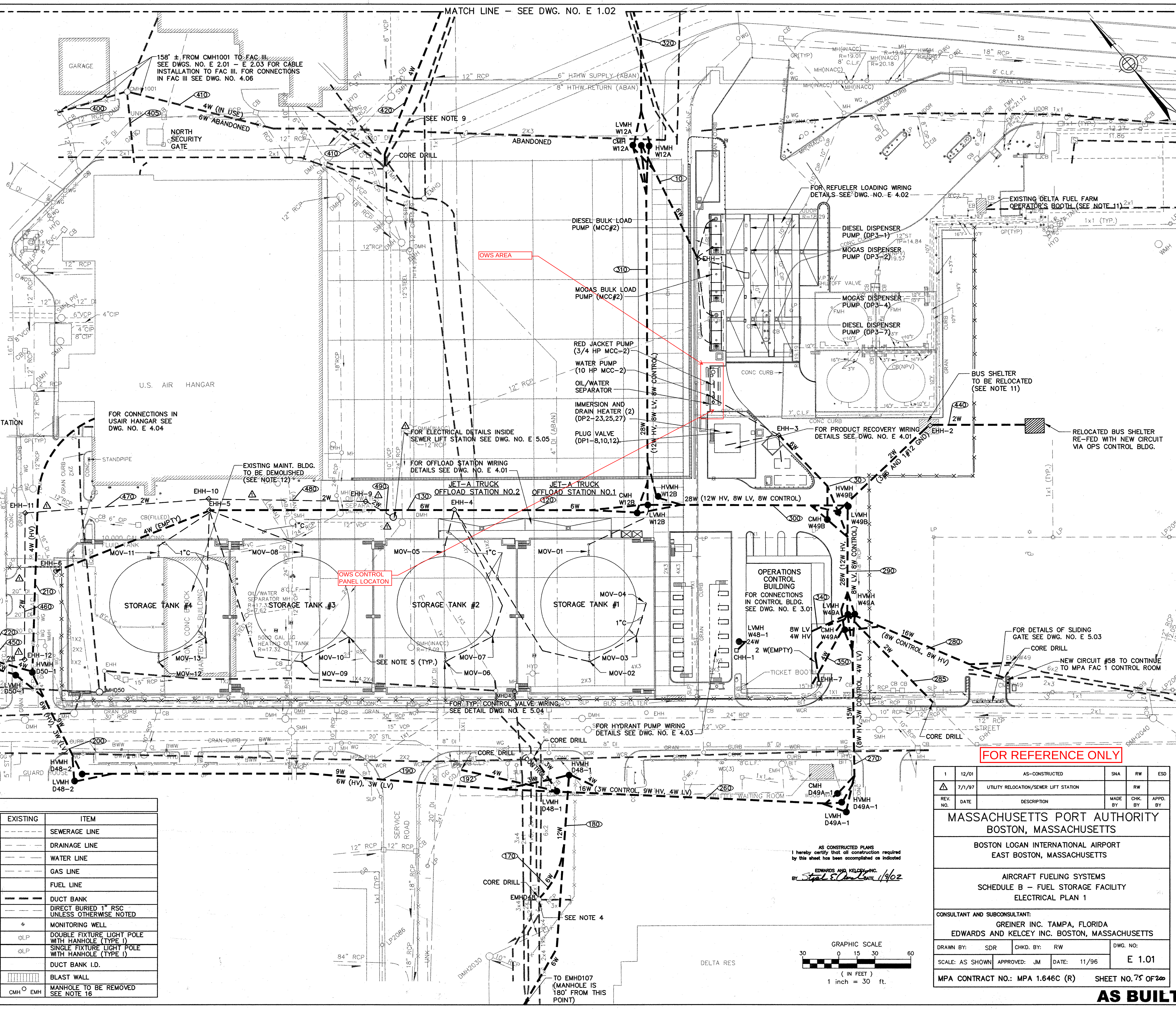

MATCH LINE – SEE DWG. NO. E 1.02
U.S. AIR HANGAR
STORAGE TANK #4
STORAGE TANK #3
STORAGE TANK #2
STORAGE TANK #1
OPERATIONS CONTROL BUILDING
FOR CONNECTIONS IN CONTROL BLDG. SEE DWG. NO. E 3.01
OWS AREA
OWS CONTROL PANEL LOCATON
JET-A TRUCK OFFLOAD STATION NO.2
JET-A TRUCK OFFLOAD STATION NO.1
FOR CONNECTIONS IN PUMP STATION SEE DWG. NO. E 4.05
MPA PUMP STA. BLDG. 6
FOR CONNECTIONS IN USAIR HANGAR SEE DWG. NO. E 4.04
NORTH SECURITY GATE
GARAGE
FOR REFUELER LOADING WIRING DETAILS SEE DWG. NO. E 4.02
EXISTING DELTA FUEL FARM OPERATOR'S BOOTH (SEE NOTE 11)
BUS SHELTER TO BE RELOCATED (SEE NOTE 11)
RELOCATED BUS SHELTER RE-FED WITH NEW CIRCUIT VIA OPS CONTROL BLDG.
FOR PRODUCT RECOVERY WIRING DETAILS SEE DWG. NO. E 4.01
FOR OFFLOAD STATION WIRING DETAILS SEE DWG. NO. E 4.01
FOR ELECTRICAL DETAILS INSIDE SEWER LIFT STATION SEE DWG. NO. E 5.05
EXISTING MAINT. BLDG. TO BE DEMOLISHED (SEE NOTE 12)
FOR TYP. CONTROL VALVE WIRING, SEE DETAIL DWG. NO. E 5.04
FOR HYDRANT PUMP WIRING DETAILS SEE DWG. NO. E 4.03
FOR DETAILS OF SLIDING GATE SEE DWG. NO. E 5.03
NEW CIRCUIT #58 TO CONTINUE TO MPA FAC 1 CONTROL ROOM
158' ± FROM CMH1001 TO FAC III. SEE DWGS. NO. E 2.01 – E 2.03 FOR CABLE INSTALLATION TO FAC III. FOR CONNECTIONS IN FAC III SEE DWG. NO. 4.06
TO EMHD107 (MANHOLE IS 180' FROM THIS POINT)
FOR REFERENCE ONLY

NOTES

1. FOR AREA LIGHTING SEE DWG. NO. E 5.01.
2. FOR DUCT BANK SECTIONS AND CABLE DETAILS SEE DWGS. NO. E 2.01 – E 2.03.
3. FOR DEMOLITION PLAN SEE DWG. NO. C 2.06.
4. FOR SPLICING DETAILS SEE DWG. NO. E 2.04.
5. FOR MOV WIRING DIAGRAM SEE DWG. NO. E 5.05.
6. FOR ADDITIONAL CONTROL WIRING IN NEW DUCT BANKS SEE DWGS. NO. E 2.01 – E 2.03.
7. FOR PUMP CONTROL WIRING SEE DWG. NO. E 3.07.
8. CONTRACTOR VERIFIED ALL EXISTING CIRCUITS BEFORE DIGGING. ALL UTILITY LINES WERE DETECTED AND MARKED. ANY DAMAGED UTILITY LINE OR UTILITY, SERVICE INTERRUPTION (DUE TO CONSTRUCTION) RESULTED IN LIQUIDATED DAMAGES FOR THE CONTRACTOR.
9. DURING INSTALLATION OF NEW DUCK BANK, VEHICULAR TRAFFIC HAD ACCESS TO THE NORTH GATE AT ALL TIMES. CONTRACTOR COORDINATED THIS WORK AT WEEKLY OPERATIONS MEETINGS AND SUBMITTED TRAFFIC/CONSTRUCTION OPERATIONS PLAN FOR APPROVAL.
10. CONTRACTOR PULLED EXISTING POWER CABLES BACK TOWARD SOURCE, INSTALLED NEW HANDHOLE WHERE EXISTING CONDUITS TERMINATED AND PULLED EXISTING CABLES TO HANDHOLE. SPLICED NEW CABLES TO EXISTING CABLES.
11. EXISTING FEED FOR RELOCATED BUS SHELTER ORIGINATED IN THIS BUILDING.
12. ELECTRICAL SERVICE FOR MAINTENANCE BUILDING ORIGINATES IN USAIR HANGAR. CONTRACTOR DISCONNECTED SERVICE BEFORE ANY DEMOLITION BEGAN. FOR DETAIL SEE DWG. NO. E 4.04.
13. FOR CABLE REMOVAL SEE DWGS. NO. E 6.01 AND E 6.02.
14. CONTRACTOR INSTALLED 8 CCTV CAMERAS AT LOCATIONS TO BE DETERMINED DURING CONSTRUCTION. FOR A DESCRIPTION OF CAMERA SEE CONTRACT SPECIFICATIONS. EACH CAMERA RECEIVED SEPERATE POWER AND CONROL FEEDS. WIRING DETAILS FOR CCTV CAMERAS ARE AS FOLLOWS:
   - POWER FEED – 3#12 AWG (USE INSULATION 600V)
   - CONTROL FEED – 1 PAIR (TWISTED SHIELDED INSTRUMENTATION CABLE) 18 AWG (USE INSULATION 600V)
   - CAC6 CABLE
   - RG59 COILCORD
15. CONTRACTOR LEFT 20' OF SLACK FIBER OPTIC CABLE IN EACH MANHOLE.
16. EXISTING MANHOLE WAS REMOVED. FOR DETAILS OF DEMOLITION SEE DWG. NO. C 2.07. FOR CABLE REMOVAL FROM THESE MANHOLES SEE DWGS. NO. E 6.01 AND E 6.02.

LEGEND

PROPOSED	EXISTING	ITEM	PROPOSED	EXISTING	ITEM
■ CB	□ C.B.	CATCH BASIN	— — — —		SEWERAGE LINE
● SMH	○ SMH	SEWER MANHOLE	— · — · —		DRAINAGE LINE
● DMH	○ DMH	DRAIN MANHOLE	— — —		WATER LINE
● EMH	○ EMH	ELECTRIC MANHOLE	— — —		GAS LINE
□ EHH	□ EHH	ELECTRIC HANDHOLE (TYPE II)	— — —		FUEL LINE
	○ WMH	WATER MANHOLE	— — —		DUCT BANK
● CMH	○ CMH	CONTROL MANHOLE	— — —		DIRECT BURIED 1" RSC UNLESS OTHERWISE NOTED
	○ TMH	TELEPHONE MANHOLE			MONITORING WELL
○ WG	○ WG	WATER GATE		○LP	DOUBLE FIXTURE LIGHT POLE WITH HANHOLE (TYPE I)
-○- HYD	-○- HYD	FIRE HYDRANT		○LP	SINGLE FIXTURE LIGHT POLE WITH HANHOLE (TYPE I)
▷◁ GG	▷◁ GG	GAS GATE	(360)		DUCT BANK I.D.
		CURB INLET			BLAST WALL
—x—x—	—x—x—	CHAIN LINK FENCE		CMH ○ EMH	MANHOLE TO BE REMOVED SEE NOTE 16

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated
EDWARDS AND KELCEY INC.
BY [signature] DATE 1/9/02

GRAPHIC SCALE
30 0 15 30 60
(IN FEET)
1 inch = 30 ft.

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
1	12/01	AS-CONSTRUCTED	SNA	RW	ESD
△	7/1/97	UTILITY RELOCATION/SEWER LIFT STATION		RW	

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
ELECTRICAL PLAN 1

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: SDR	CHKD. BY: RW	DWG. NO:
SCALE: AS SHOWN	APPROVED: JM	DATE: 11/96	E 1.01

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 75 OF 200

AS BUILT

S:\VOL94\A94-3014.F\EK-ASBLT\RW\E-101BLT.DWG 1-7-02 9:21:51 am EST

* CONDUIT AND CABLE FEEDER SIZES

- (A) 3#500MCM AND 1#1 GND.–4"C
- (B) 3#10 AND 1#10 GND.–1"C
- (C) 3#6 AND 1#10 GND.–1"C
- (D) 3#12 AND 1#12 GND.–1"C
- (E) 3#4/0 AND 1#6 GND.–2"C
- (F) 2(3#350 MCM AND 1#2 GND.–4"C)SETS
- (G) 3#1/0 AND 1#6 GND.–2"C
- (H) 4#1 AND 1#8 GND.–1 1/2"C
- (J) 3#6 AND 1#10 GND.–1"C
- (I) 3#350MCM AND 1#1 GND.–4"C

* LEGEND

SYMBOL	FUNCTION
ATC	AUTOMATIC TRANSFER CONTROL
(K)	KIRK KEY INTERLOCK
I Q A	IQ ANALIZER
27/47	UNDER/OVER VOLTAGE RELAY
(M)	METER (KW)
MFS	MAIN FEED SWITCH (15KV)

EXISTING WOOD ISLAND SUBSTATION

FEEDER No. 15W2–16 (13.8KV)
MAIN C.B. MONITOR
IQ ANALYZER
DIGITRIP MV
CT (3) 200:5A
FUSE
PT (3) 14.4KV/120V

FEEDER No. 15W1–20 (13.8KV)
DIGITRIP MV
CT (3) 200:5A
FUSE
PT (3) 14.4KV/120V
IQ ANALYZER

MFS#1
SEE DWG. E 3.05 FOR IMPACC SYSTEM
WESTINGHOUSE 15KV LOAD FUSED INTERRUPTER SWITCH
150 E
TRANSFORMER 2500 KVA 13.8KV/480/277 VOLTS
CPT
VT TAP FUSED
MAIN 480V CB #1 4000AT 4000AF OPEN
27/47
ATC
4000A BUS
4000AT TIE CB 4000AF

MFS#2
WESTINGHOUSE 15KV LOAD FUSED INTERRUPTER SWITCH
150E
SEE DWG. E 3.05 FOR IMPACC SYSTEM
TRANSFORMER 2500 KVA 13.8KV/480/277 VOLTS
CPT
TO METER
VT TAP FUSED
27/47
MAIN 480V CB #2 4000AT 4000AF
4000A BUS

2000AT 2000AF
500AT 800AF
FUTURE LOADS
2000AT 2000AF

SEE NOTE 3
1500KW GENERATOR
ATS#1 CB 2500AT 3200AF
ATS#2 CB 400AT 800AF
ATS 2500A AUTOMATIC TRANSFER SWITCH
SEE NOTE 2
2500AT 3200AF
500AT 800AF
FUTURE LOADS

MCC #2
2000A BUS

3A	500A	500A	500A	500A	80A	80A	70A	40A	30A	3A	30A	15A	3A	3A		
SPARES	SUCTION PUMP P–7	SUCTION PUMP P–8	FUTURE HYDRANT SYSTEM PUMPS		TRUCK OFF LOAD PUMPS P–15	TRUCK OFF LOAD PUMPS P–16	MOGAS BULK LOAD PUMP	DIESEL BULK LOAD PUMP	OIL/WATER SEPARATOR	HOSE REEL 1	PRODUCT RECOVERY PUMP 1	PRODUCT RECOVERY PUMP 2	HOSE REEL 2	SPARE SIZE 0		
					(C) 30 HP	(C) 30 HP	(B) 10 HP	(B) 15 HP	(D) 5 HP	(D) 3/4 HP	(D) 3 HP	(D) 5 HP	(D) 3/4 HP			
	(I) 200 HP	(I) 200 HP	200 HP 200 HP													

2500A BUS
MCC #3

500A	500A	500A	500A	500A	500A	
(I) 200 HP	(I) 200 HP	(I) 200 HP	(I) 200 HP	(I) 200 HP	(I) 200 HP	MOTOR (TYP.)
SUCTION PUMP P–1	SUCTION PUMP P–2	SUCTION PUMP P–3	SUCTION PUMP P–4	SUCTION PUMP P–5	SUCTION PUMP P–6	

2500A BUS
MCC #1

100A	600A	500A	500A	500A	500A	100A	100A	100A	400A
100A 480/277 NDP1 3Ø,3W		(I) 200 HP	(I) 200 HP	(I) 200 HP	(I) 200 HP				ATS #2 (A)
	SPARE	SUCTION PUMP P–9	SUCTION PUMP P–10	SUCTION PUMP P–11	SUCTION PUMP P–12	SPARE	SPARE	SPARE	SEE NOTE 1

100A 3P CONTACTOR (H)
DISTRIBUTION PANEL 480/277V (C) LP1
150KVA TRANSFORMER 480–208/120V (E)(F)
DP1 DISTRIBUTION PANEL 480/277V (H)
DP2 DISTRIBUTION PANEL 480/277V–100A
CEQ (H)
DP3 DISTRIBUTION PANEL 208/120V
OPERATORS BOOTH (H)
RL (G)
UPS (J)
C
DISTRIBUTION PANEL 208/120V (BY OTHERS)
DISTRIBUTION PANEL 208/120V
15KVA TRANSFORMER 208/120–208/120V

FUEL FARM – ELECTRICAL ONE LINE DIAGRAM

NOT TO SCALE

NOTE

1. 400A AUTOMATIC TRANSFER SWITCH LOCATED IN GENERATOR ROOM SWITCHBOARD
2. 2500A AUTOMATIC TRANSFER SWITCH LOCATED IN GENERATOR ROOM SWITCHBOARD
3. GENERATOR ROOM SWITCHBOARD

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated hereon.
EDWARDS AND KELCEY, INC.
BY _____ DATE 1/9/02

FOR REFERENCE ONLY

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
1	12/01	AS–CONSTRUCTED	SNA	RW	ESD

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

FUEL OPERATIONS AND CONTROLS BUILDING
ELECTRICAL ONE LINE DIAGRAM – WITH GENERATOR CONNECTION

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: JJ	CHKD. BY: RW	DWG. NO:
SCALE: NONE	APPROVED: PRH / DATE: 7/97	E 3.03

MPA CONTRACT NO.: MPA 1.646C(R) SHEET NO. 87 OF 200

AS BUILT

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MCC SCHEDULE

MCC No.	SECTION	BUS	DESCRIPTION	STARTER SIZE/TYPE	CIRCUIT BREAKER RATING (IN AMPS)	FEEDER	REMARKS
1	INCOMING	2500A					12 X IC 500 MCM 600V INSC 2 X IC – (4/0) G
	PUMP P–9		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	PUMP P–10		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	PUMP P–11		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	PUMP P–12		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	ATS #2		400A–NORMAL SIDE FEED	–	400	4"C–4#500 MCM AND 1#2 GROUND	IC RATING 65,000A
			SPACE	–	–		
			SPACE	–	–		
	CIRCUIT BREAKER		SPARE	–	600		IC RATING 65,000A
			SPACE	–	–		IC RATING 65,000A
			SPACE	–	–		IC RATING 65,000A
			SPACE	–	–		IC RATING 65,000A
	CIRCUIT BREAKER		SPACE	–	100		IC RATING 65,000A
	PANEL/NDPI		12 CKT PANEL	480 VOLT	100A MCB	W (2) 3P 50A SPACE FOR 2 ADDITIONAL	IC RATING 65,000A
2	INCOMING	2000A	–	–	–	12 X IC 500 MCM 600V INSC 2 X IC – (4/0) G	IC RATING 65,000A
	PUMP P–7		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	PUMP P–8		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	(FUTURE PUMP)		–	SIZE 5 AUTO–TRANS	500	–	IC RATING 65,000A
	(FUTURE PUMP)		–	SIZE 5 AUTO–TRANS	500	–	IC RATING 65,000A
	TRUCK–OFF LOAD PUMP		30 HP	SIZE 3	80	1"C–3#6 AND 1#10 GROUND	IC RATING 65,000A
	TRUCK–OFF LOAD PUMP		30 HP	SIZE 3	80	1"C–3#6 AND 1#10 GROUND	IC RATING 65,000A
	MOGAS BULK LOAD PUMP		10 HP	SIZE 1	30	1"C–3#10 AND 1#10 GROUND	IC RATING 65,000A
	DIESEL BULK LOAD PUMP		15 HP	SIZE 2	40	1"C–3#10 AND 1#10 GROUND	IC RATING 65,000A
	OIL/WATER SEPARATOR		5 HP	SIZE 1	30	1"C–3#12 AND 1#12 GROUND	IC RATING 65,000
	PRODUCT REC–PUMP 1		3 HP	SIZE 1	30	1"C–3#12	IC RATING 65,000A
	PRODUCT REC–PUMP 2		5 HP	SIZE 1	15	1"C–3#12	IC RATING 65,000A
	HOSE REEL #1		3/4 HP	SIZE 1	3	1"C–3#12	IC RATING 65,000A
	HOSE REEL #2		3/4 HP	SIZE 1	3	1"C–3#12	IC RATING 65,000A
	SPACE						
	SPACE						
	SPACE						
	SPACE						
3	INCOMING	2500A	–	–	–	6 x 3C– (500MCM) 600V, 600V, MC JACKET	IC RATING 65,000A
	SPARE		–	–	–		IC RATING 65,000A
	SPARE		–	–	–		IC RATING 65,000A
	SPARE		–	SIZE 1	15		IC RATING 65,000A
	PUMP P–1		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	PUMP P–2		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	PUMP P–3		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	PUMP P–4		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	PUMP P–5		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A
	PUMP P–6		200 HP	SIZE 5 AUTO–TRANS	500	4"C–3#350MCM AND 1#1 GROUND	IC RATING 65,000A

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated hereon.

EDWARDS AND KELCEY, INC.
BY Stephen E. Austin DATE 1/9/02

FOR REFERENCE ONLY

NOTE
FOR LOCATION OF MCC'S, SEE DWG. NO E 3.02.

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
1	12/01	AS–CONSTRUCTED	SNA	RW	ESD

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
MCC SCHEDULE

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY:	TED	CHKD. BY:	RW	DWG. NO:
SCALE:	NONE	APPROVED: JM	DATE: 11/96	E 3.09

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 93 OF 200

AS BUILT

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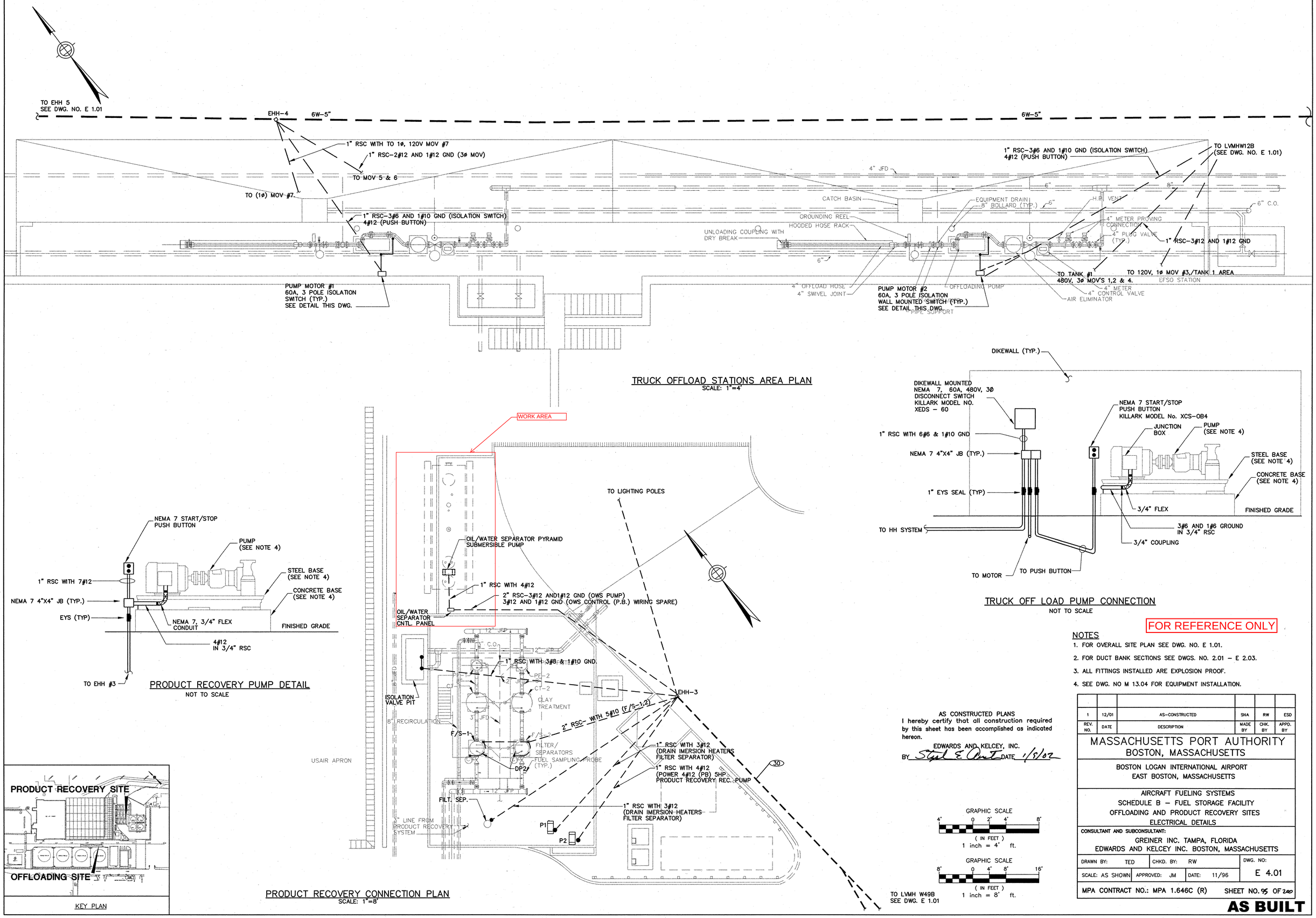

TRUCK OFFLOAD STATIONS AREA PLAN
SCALE: 1"=4'

PRODUCT RECOVERY PUMP DETAIL
NOT TO SCALE

TRUCK OFF LOAD PUMP CONNECTION
NOT TO SCALE

FOR REFERENCE ONLY

NOTES
1. FOR OVERALL SITE PLAN SEE DWG. NO. E 1.01.
2. FOR DUCT BANK SECTIONS SEE DWGS. NO. 2.01 – E 2.03.
3. ALL FITTINGS INSTALLED ARE EXPLOSION PROOF.
4. SEE DWG. NO M 13.04 FOR EQUIPMENT INSTALLATION.

KEY PLAN

PRODUCT RECOVERY CONNECTION PLAN
SCALE: 1"=8'

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated hereon.
EDWARDS AND KELCEY, INC.
BY Steve E. Hunt DATE 1/8/02

GRAPHIC SCALE
4' 0 2' 4' 8'
(IN FEET)
1 inch = 4' ft.

GRAPHIC SCALE
8' 0 4' 8' 16'
(IN FEET)
1 inch = 8' ft.

TO LVMH W49B
SEE DWG. E 1.01

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
1	12/01	AS-CONSTRUCTED	SNA	RW	ESD

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
OFFLOADING AND PRODUCT RECOVERY SITES
ELECTRICAL DETAILS

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY:	TED	CHKD. BY:	RW	DWG. NO:
SCALE: AS SHOWN		APPROVED: JM	DATE: 11/96	E 4.01

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 95 OF 200

AS BUILT

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LEGEND

PROPOSED	EXISTING	ITEM
■ CB	□ C.B.	CATCH BASIN
● SMH	○ SMH	SEWER MANHOLE
● DMH	○ DMH	DRAIN MANHOLE
● EMH	○ EMH	ELECTRIC MANHOLE
□ EHH	□ EHH	ELECTRIC HANDHOLE TYPE II
	○ WMH	WATER MANHOLE
● CMH	○ CMH	CONTROL MANHOLE
	○ TMH	TELEPHONE MANHOLE
○ WG	○ WG	WATER GATE
HYD	HYD	FIRE HYDRANT
⋈ GG	⋈ GG	GAS GATE
	▣	CURB INLET
—×—	—×—×—	CHAIN LINK FENCE

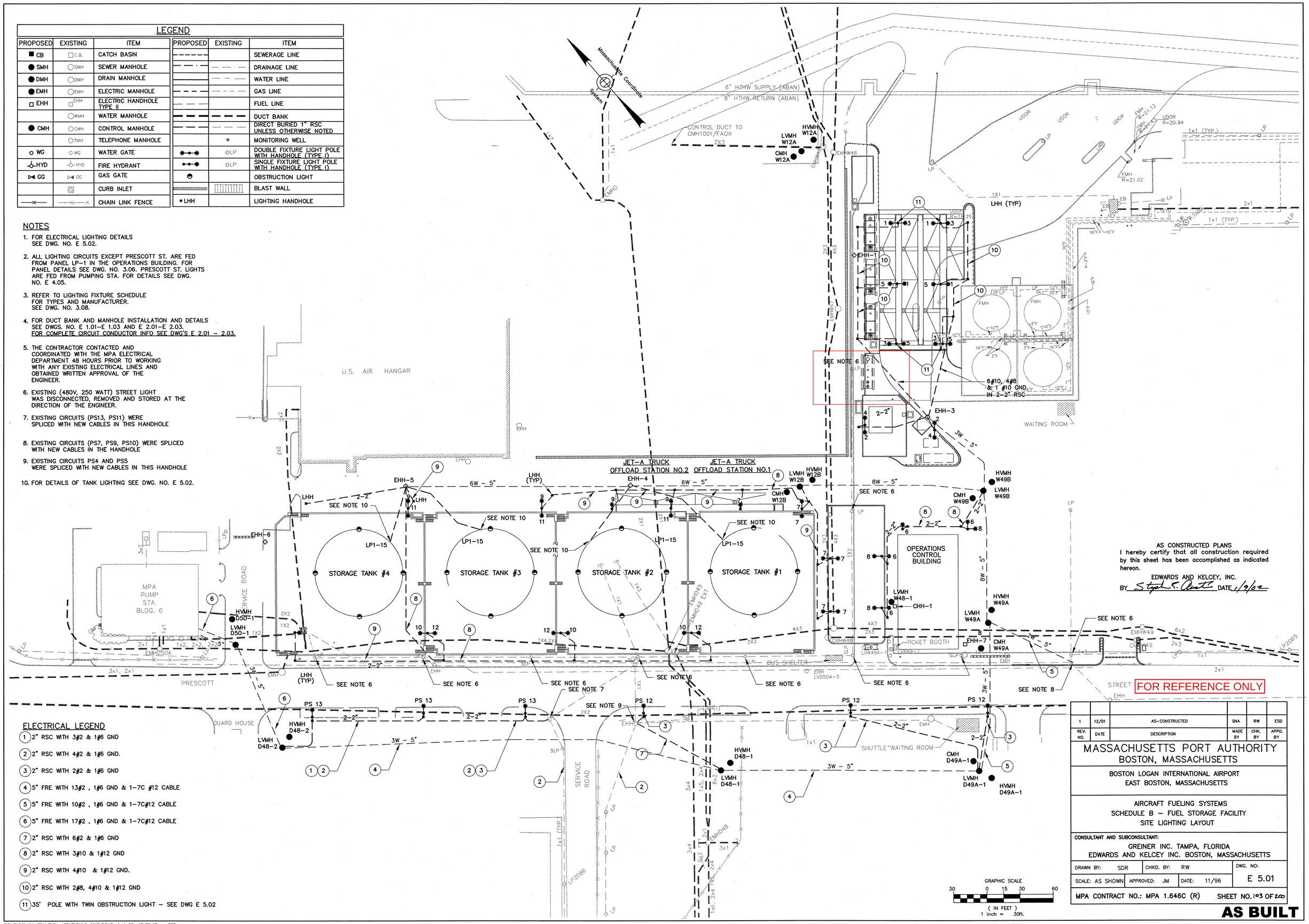
PROPOSED	EXISTING	ITEM
		SEWERAGE LINE
		DRAINAGE LINE
		WATER LINE
		GAS LINE
		FUEL LINE
		DUCT BANK
		DIRECT BURIED 1" RSC UNLESS OTHERWISE NOTED
	⊕	MONITORING WELL
✱—✱	☼LP	DOUBLE FIXTURE LIGHT POLE WITH HANDHOLE (TYPE I)
✱—	☼LP	SINGLE FIXTURE LIGHT POLE WITH HANDHOLE (TYPE I)
◓		OBSTRUCTION LIGHT
		BLAST WALL
▪ LHH		LIGHTING HANDHOLE

NOTES

1. FOR ELECTRICAL LIGHTING DETAILS SEE DWG. NO. E 5.02.
2. ALL LIGHTING CIRCUITS EXCEPT PRESCOTT ST. ARE FED FROM PANEL LP-1 IN THE OPERATIONS BUILDING. FOR PANEL DETAILS SEE DWG. NO. 3.06. PRESCOTT ST. LIGHTS ARE FED FROM PUMPING STA. FOR DETAILS SEE DWG. NO. E 4.05.
3. REFER TO LIGHTING FIXTURE SCHEDULE FOR TYPES AND MANUFACTURER. SEE DWG. NO. 3.08.
4. FOR DUCT BANK AND MANHOLE INSTALLATION AND DETAILS SEE DWGS. NO. E 1.01–E 1.03 AND E 2.01–E 2.03. FOR COMPLETE CIRCUIT CONDUCTOR INFO SEE DWG'S E 2.01 – 2.03.
5. THE CONTRACTOR CONTACTED AND COORDINATED WITH THE MPA ELECTRICAL DEPARTMENT 48 HOURS PRIOR TO WORKING WITH ANY EXISTING ELECTRICAL LINES AND OBTAINED WRITTEN APPROVAL OF THE ENGINEER.
6. EXISTING (480V, 250 WATT) STREET LIGHT WAS DISCONNECTED, REMOVED AND STORED AT THE DIRECTION OF THE ENGINEER.
7. EXISTING CIRCUITS (PS13, PS11) WERE SPLICED WITH NEW CABLES IN THIS HANDHOLE
8. EXISTING CIRCUITS (PS7, PS9, PS10) WERE SPLICED WITH NEW CABLES IN THE HANDHOLE
9. EXISTING CIRCUITS PS4 AND PS5 WERE SPLICED WITH NEW CABLES IN THIS HANDHOLE
10. FOR DETAILS OF TANK LIGHTING SEE DWG. NO. E 5.02.

ELECTRICAL LEGEND

(1) 2" RSC WITH 3#2 & 1#6 GND
(2) 2" RSC WITH 4#2 & 1#6 GND.
(3) 2" RSC WITH 2#2 & 1#6 GND
(4) 5" FRE WITH 13#2 , 1#6 GND & 1–7C #12 CABLE
(5) 5" FRE WITH 10#2 , 1#6 GND & 1–7C#12 CABLE
(6) 5" FRE WITH 17#2 , 1#6 GND & 1–7C#12 CABLE
(7) 2" RSC WITH 6#2 & 1#6 GND
(8) 2" RSC WITH 3#10 & 1#12 GND
(9) 2" RSC WITH 4#10 & 1#12 GND.
(10) 2" RSC WITH 2#8, 4#10 & 1#12 GND
(11) 35' POLE WITH TWIN OBSTRUCTION LIGHT – SEE DWG E 5.02



AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated hereon.
EDWARDS AND KELCEY, INC.
BY Stephen E. Austin DATE 1/9/02

FOR REFERENCE ONLY

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
1	12/01	AS-CONSTRUCTED	SNA	RW	ESD

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
SITE LIGHTING LAYOUT

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: SDR	CHKD. BY: RW		DWG. NO:
SCALE: AS SHOWN	APPROVED: JM	DATE: 11/96	E 5.01

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 103 OF 200

AS BUILT

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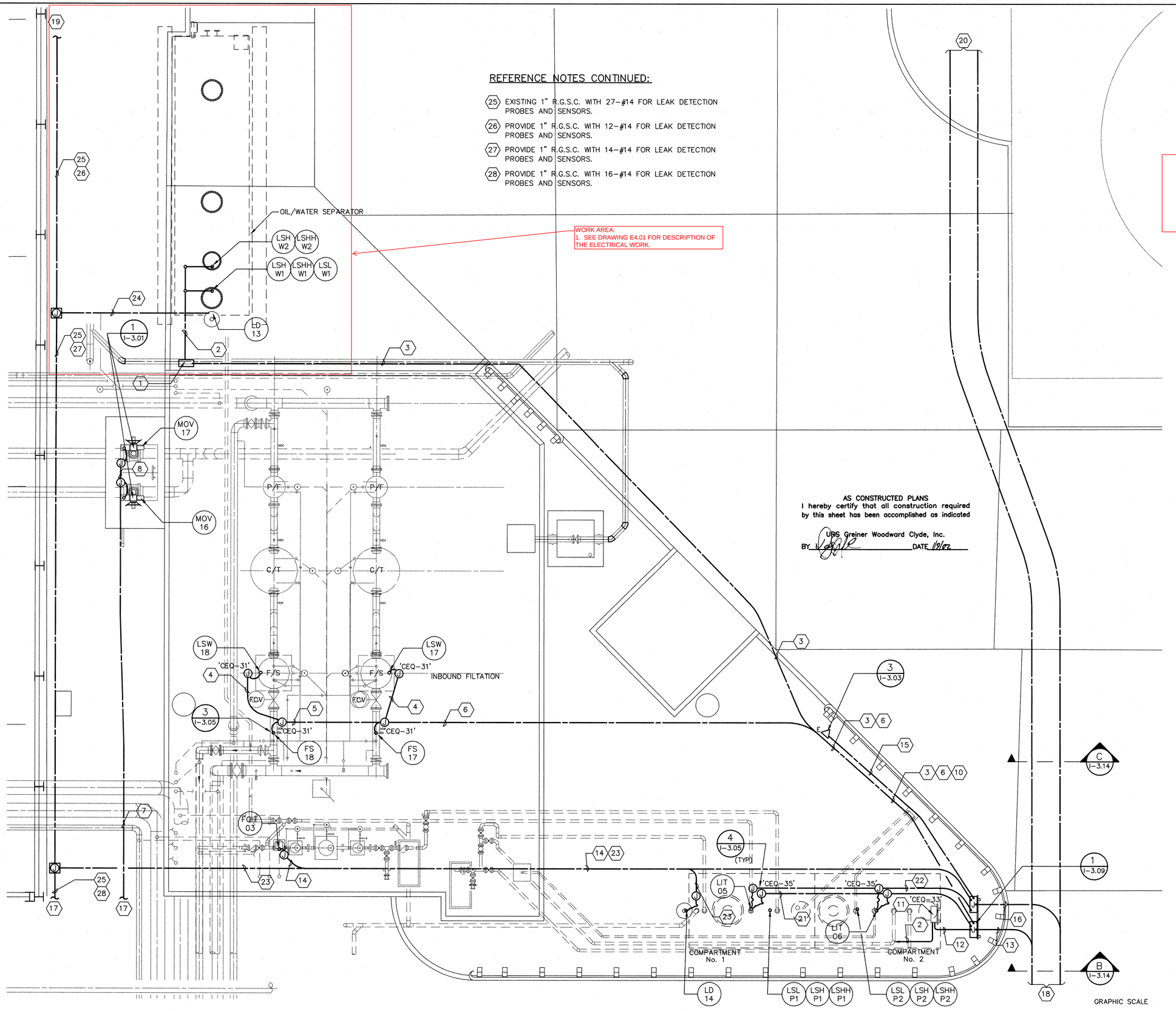

PRODUCT RECOVERY AREA INSTRUMENTATION PLAN
SCALE: 1/4"=1'-0"

REFERENCE NOTES CONTINUED:

25. EXISTING 1" R.G.S.C. WITH 27-#14 FOR LEAK DETECTION PROBES AND SENSORS.
26. PROVIDE 1" R.G.S.C. WITH 12-#14 FOR LEAK DETECTION PROBES AND SENSORS.
27. PROVIDE 1" R.G.S.C. WITH 14-#14 FOR LEAK DETECTION PROBES AND SENSORS.
28. PROVIDE 1" R.G.S.C. WITH 16-#14 FOR LEAK DETECTION PROBES AND SENSORS.

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY _____ DATE 10/02

GENERAL NOTES:

1. REFER TO GENERAL NOTES ON SHEET I-1.01.

REFERENCE NOTES:

1. EXISTING OIL/WATER SEPARATOR TANK CONTROL PANEL
2. EXISTING CONDUIT & WIRES PER MANUFACTURER'S REQUIREMENTS FOR LEVEL SWITCHES AND LEAK DETECTION PROBES.
3. PROVIDE 1" R.G.S.C. WITH 3-#12 POWER, 10-#12 SIGNALS (LSH-W1, LSHH-W1, LSL-W1, LSH-W2 & LSHH-W2) FROM 'FORM C' RELAY CONTACTS IN O/W SEPARATOR CONTROL PANEL.
4. PROVIDE 1" R.G.S.C. WITH 3-#12 POWER AND 1-#12 FOR F/S WATER PROBE SIGNAL.
5. PROVIDE 1" R.G.S.C. WITH 3-#12 POWER AND 2-#12 SIGNALS (FS-17 & LSW-17).
6. PROVIDE 1" R.G.S.C. WITH 3-#12 POWER AND 4-#12 SIGNALS (FS-17, FS-18, LSW-17 & LSW-18).
7. PROVIDE 1" R.G.S.C. WITH (2) #8760 BELDEN CABLES ONE FROM MASTER STATION TO MOV-16 AND VIA JB AT MOV-17 AND ONE FROM MOV-4 TO MOV-17 VIA JB AT MOV-15.
8. PROVIDE 1" R.G.S.C. WITH (2) #8760 BELDEN CABLES ONE FROM MOV-17 TO MOV-16 AND ONE FROM MOV-17 TO MOV-4 VIA JB AT MOV-15.
9. WASTE WATER TANK CONTROL PANEL PROVIDED BY TANK MANUFACTURER.
10. PROVIDE 1" R.G.S.C. WITH 3-#12 POWER, 6-#12 SIGNALS (LSH-WW, LSHH-WW & LSL-WW) FROM FORM 'C' RELAY CONTACTS IN WASTE WATER TANK PANEL.
11. PRODUCT RECOVERY TANK CONTROL PANEL PROVIDED BY TANK MANUFACTURER.
12. PROVIDE 1" R.G.S.C. WITH 3-#12 POWER, 12-#12 SIGNALS (LSH-P1, LSH-P2, LSHH-P1, LSHH-P2, LSL-P1 & LSL-P2) FROM FORM 'C' RELAY CONTACTS IN PRODUCT RECOVERY TANK PANEL.
13. PROVIDE 2" R.G.S.C. WITH 39-#12 FOR POWER & SIGNALS, AND ONE 2" R.G.S.C. WITH PULL-CORD (SPARE).
14. PROVIDE 1" R.G.S.C. WITH ONE SHIELDED 6-#18 CABLE FOR PD METER POWER & COMMUNICATIONS.
15. PROVIDE 1" R.G.S.C. WITH ONE 4-WIRE TWISTED PAIR CABLE FOR FIRE RESCUE EMERGENCY PHONE.
16. PROVIDE (1) 2" R.G.S.C. WITH ONE SHIELDED 6-CONDUCTOR CABLE FOR PD METER AND ONE 4-WIRE TWISTED PAIR CABLE FOR FIRE RESCUE EMERGENCY PHONE, ONE BELDEN CABLE No. 8719 AND (1) 2" R.G.S.C. WITH PULL-CORD (SPARE).
17. FOR CONTINUATION SEE SHEET I-2.03.
18. FOR CONTINUATION SEE SHEET I-2.04.
19. FOR CONTINUATION SEE SHEET I-2.06.
20. FOR CONTINUATION SEE SHEET I-2.07.
21. PROVIDE 1" R.G.S.C. WITH 3-#12 FOR TANK GAUGE POWER.
22. PROVIDE 1" R.G.S.C. WITH ONE BELDEN No. 8719 CABLE FOR TANK GAUGE COMMUNICATIONS.
23. PROVIDE 3/4" R.G.S.C. WITH 2-#14 TO PRODUCT RECOVERY TANK INTERSTITIAL LEAK DETECTOR PROBE.
24. PROVIDE 3/4" R.G.S.C. WITH 2-#14 TO O/W SEPARATOR TANK INTERSTITIAL LEAK DETECTOR PROBE.

FOR REFERENCE ONLY

GRAPHIC SCALE
4' 0 2' 4'
1/4" = 1'-0"

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	JTV/CGH	JV	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B - FUEL STORAGE FACILITY
PRODUCT RECOVERY AREA INSTRUMENTATION PLAN

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: SJD	CHKD. BY: CJL/DEV		DWG. NO:
SCALE: AS SHOWN	APPROVED: TDT	DATE: 2/97	I-2.05

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 159 OF 282

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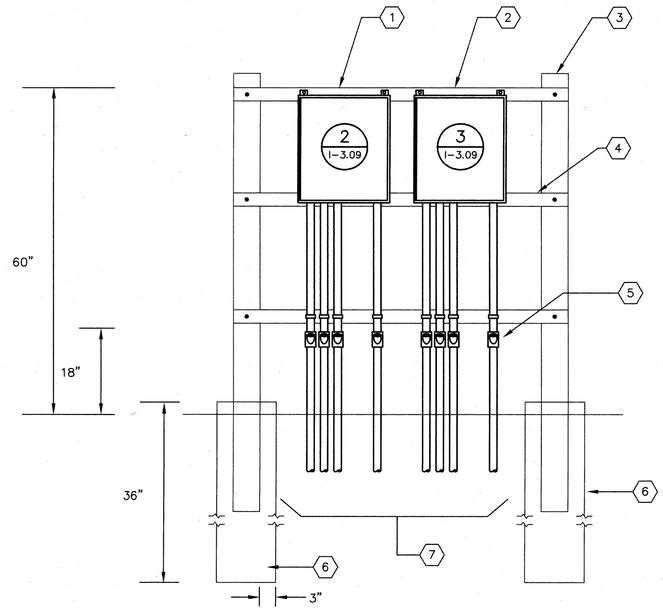
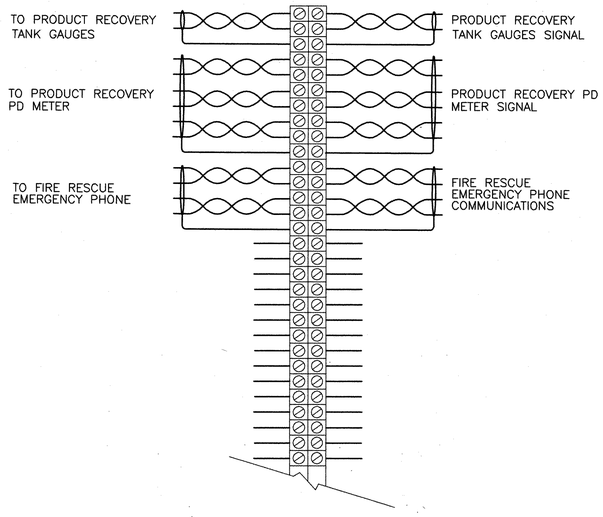
AS BUILT



PRODUCT RECOVERY TERMINAL CABINETS RACK DETAIL (1 / I-2.05)
N.T.S.

NOTES:

1. PRODUCT RECOVERY COMMUNICATIONS TERMINAL CABINET. PROVIDED 20"X 20"X 6" STAINLESS STEEL CONTINUOUS HINGE TYPE 4X CABINET WITH INTERIOR STEEL PANEL, FOR MOUNTING OF TERMINAL BLOCKS. PROVIDED ONE (1) 50 POINT TERMINAL BLOCK. PROVIDED PLASTIC LAMINATED LABEL BLACK BACKGROUND WITH ETCHED WHITE LETTERS, 3/8" HIGH TO READ "PRODUCT RECOVERY COMMUNICATIONS TERMINAL CABINET". REFER TO TERMINAL BLOCK #10 DIAGRAM.
2. PRODUCT RECOVERY 120V POWER & SIGNALS TERMINAL CABINET. PROVIDED 20"X 20"X 6" STAINLESS STEEL CONTINUOUS HINGE TYPE 4X CABINET WITH INTERIOR STEEL PANEL, FOR MOUNTING OF TERMINAL BLOCKS. PROVIDE TWO (2) 50 POINT TERMINAL BLOCKS. PROVIDED PLASTIC LAMINATED LABEL BLACK BACKGROUND WITH ETCHED WHITE LETTERS, 3/8" HIGH TO READ "PRODUCT RECOVERY 120V POWER & SIGNALS TERMINAL CABINET". REFER TO TERMINAL BLOCK #11 DIAGRAM.
3. CA X 5.4 GALVANIZED STEEL CHANNEL (TYPICAL).
4. 1 1/2" X 1 1/2" UNISTRUT GALVANIZED STEEL CHANNEL (TYPICAL).
5. PROVIDED EYS FITTING TOP 18" AFF (TYPICAL).
6. PROVIDED CONCRETE FOUNDATION, 3000 PSI.
7. REFER TO DRAWING I-2.05 FOR CONDUIT/CONDUCTOR REQUIREMENTS.



TERMINAL BLOCK #10 DIAGRAM (2 / I-3.09)
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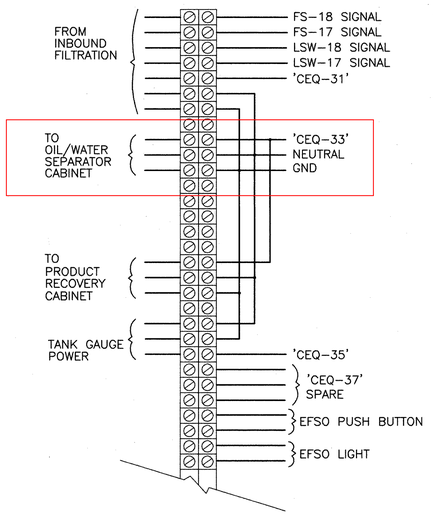

TERMINAL BLOCK #11 DIAGRAM (3 / I-3.09)
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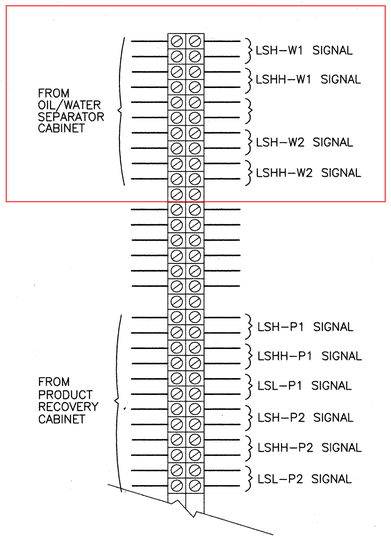


FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

BY _____ DATE 1/9/02
URS Greiner Woodward Clyde, Inc.

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	JV	JV	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
PRODUCT RECOVERY TERMINAL CABINETS DETAILS

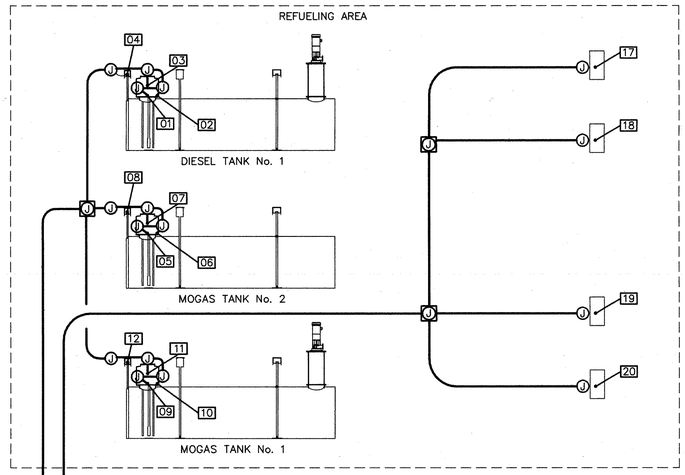
CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

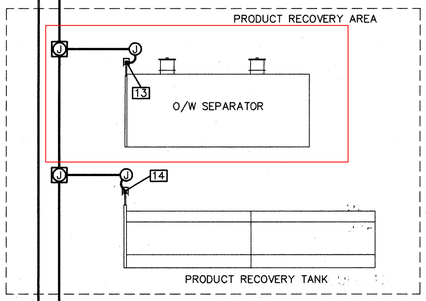
DRAWN BY: SJD	CHKD. BY: CJL/DEV		DWG. NO:
SCALE: NONE	APPROVED: TDT	DATE: 2/97	I-3.09

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO: 171 OF 280

T:\BOSTON AB\BOSFUEL\FUELSTOR\INST-AB\I-309ABC.DWG 10/09/01 09:39

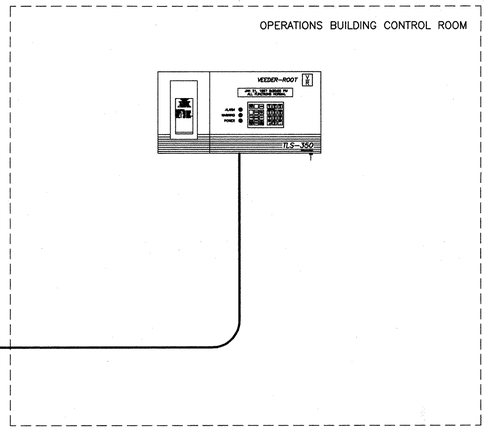
AS BUILT



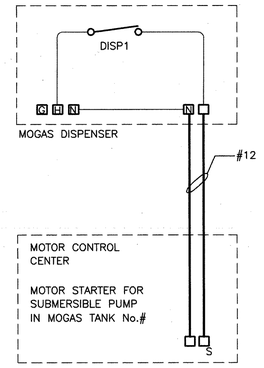


MONITORING POINTS:

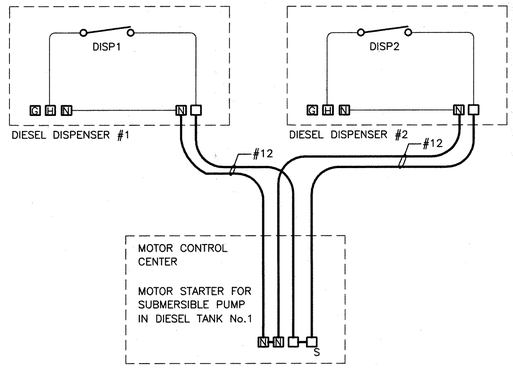
01	(LD-01) TANK INVENTORY & LEVEL PROBE
02	(LD-02) CONTAINMENT SUMP LEAK SENSOR
03	(LD-03) PRESSURIZED LINE LEAK PROBE
04	(LD-04) INTERSTITIAL SPACE LEAK PROBE
05	(LD-05) TANK INVENTORY & LEVEL PROBE
06	(LD-06) CONTAINMENT SUMP LEAK SENSOR
07	(LD-07) PRESSURIZED LINE LEAK PROBE
08	(LD-08) INTERSTITIAL SPACE LEAK PROBE
09	(LD-09) TANK INVENTORY & LEVEL PROBE
10	(LD-10) CONTAINMENT SUMP LEAK SENSOR
11	(LD-11) PRESSURIZED LINE LEAK PROBE
12	(LD-12) INTERSTITIAL SPACE LEAK PROBE
13	(LD-13) INTERSTITIAL SPACE LEAK PROBE
14	(LD-14) INTERSTITIAL SPACE LEAK PROBE
15	(LD-15) INTERSTITIAL SPACE LEAK PROBE
16	(LD-16) INTERSTITIAL SPACE LEAK PROBE
17	(LD-17) DISPENSER PAN LEAK SENSOR
18	(LD-18) DISPENSER PAN LEAK SENSOR
19	(LD-19) DISPENSER PAN LEAK SENSOR
20	(LD-20) DISPENSER PAN LEAK SENSOR



LEAK DETECTION SYSTEM COMMUNICATIONS WIRING DIAGRAM
N.T.S.



MOGAS SUBMERSIBLE PUMP START WIRING DIAGRAM
N.T.S.



DIESEL SUBMERSIBLE PUMP START WIRING DIAGRAM
N.T.S.

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY _____ DATE 1/26/02

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	JV	JV	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
INSTRUMENTATION WIRING DIAGRAM

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: SJD	CHKD. BY: CJL/DEV		DWG. NO: I-4.04
SCALE: NONE	APPROVED: TDT	DATE: 2/97	

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 181 OF 200

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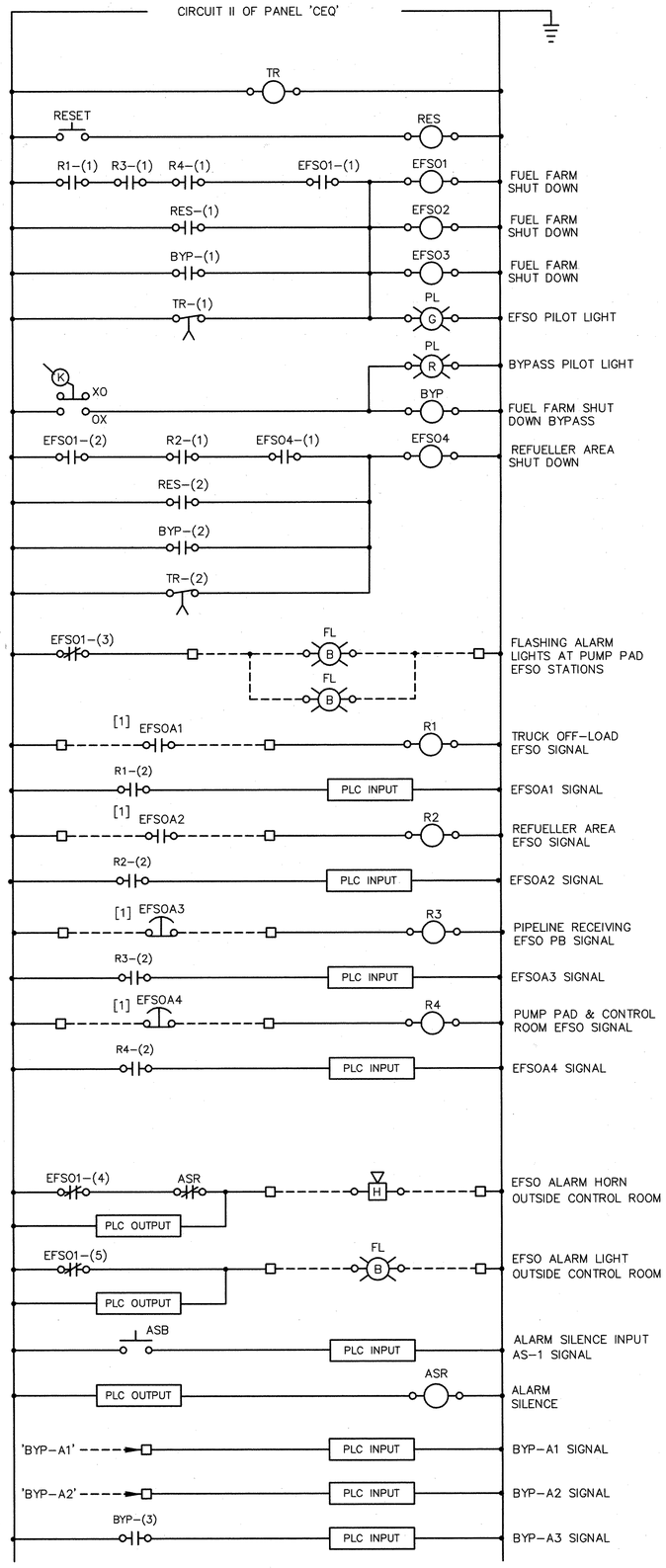
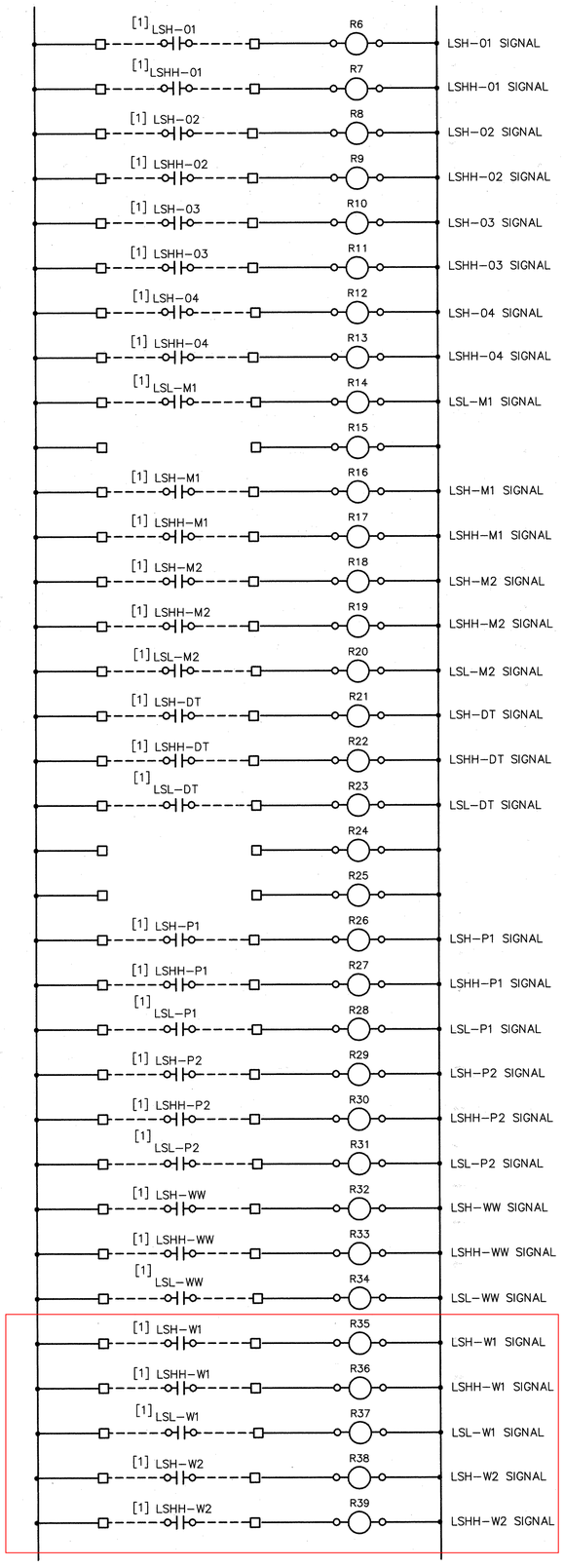
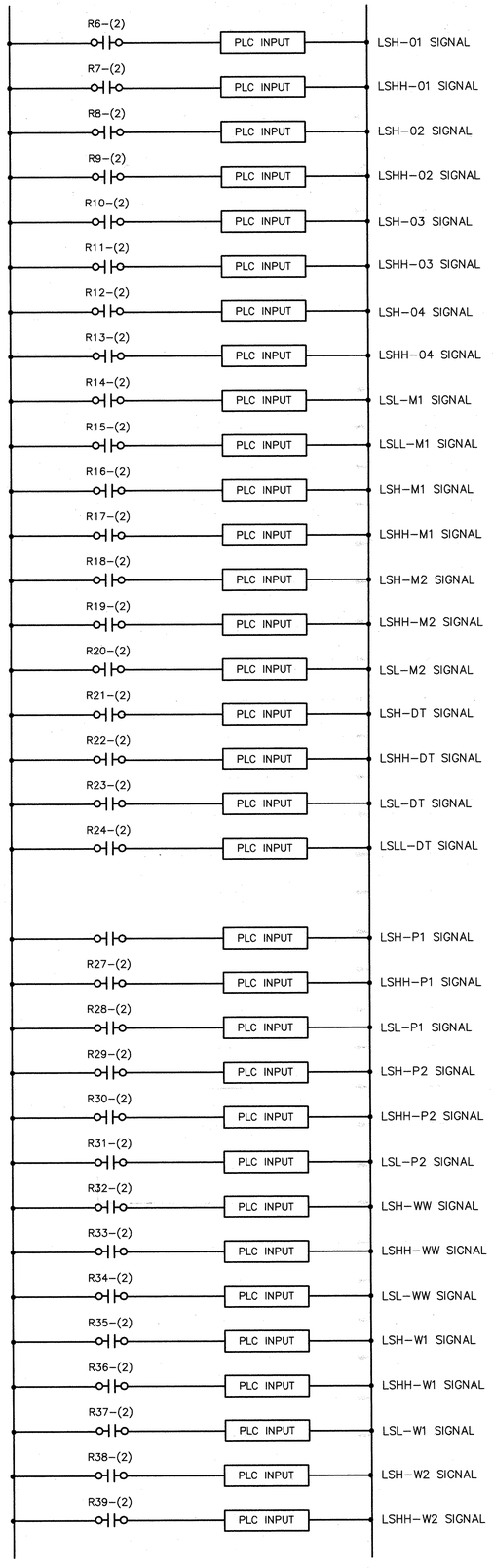
AS BUILT







CONTROL CABINET WIRING DIAGRAM

NOT TO SCALE

GENERAL NOTES:

1. REFER TO LEGEND ON SHEET I–6.03.

DIAGRAM NOTES:

[1] SEE REMOTE CONTACT SCHEDULE FOR LOCATION ON SHEET I–6.04.

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY _____ DATE 1/9/02

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS–BUILT CONDITIONS	JV	JV	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
CONTROL CABINET WIRING DIAGRAM

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: SAD	CHKD. BY: CJL/DEV		DWG. NO:
SCALE: NONE	APPROVED: TDT	DATE: 2/97	I–6.02

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 186 OF 200

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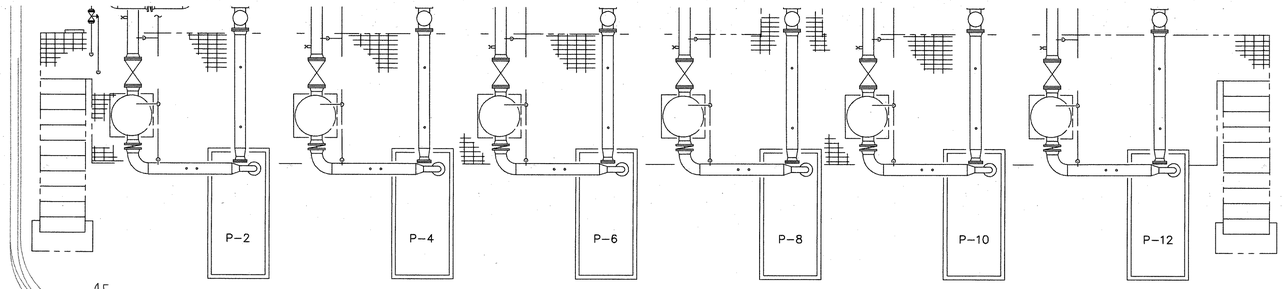
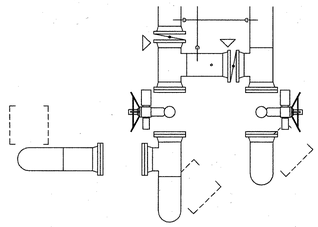
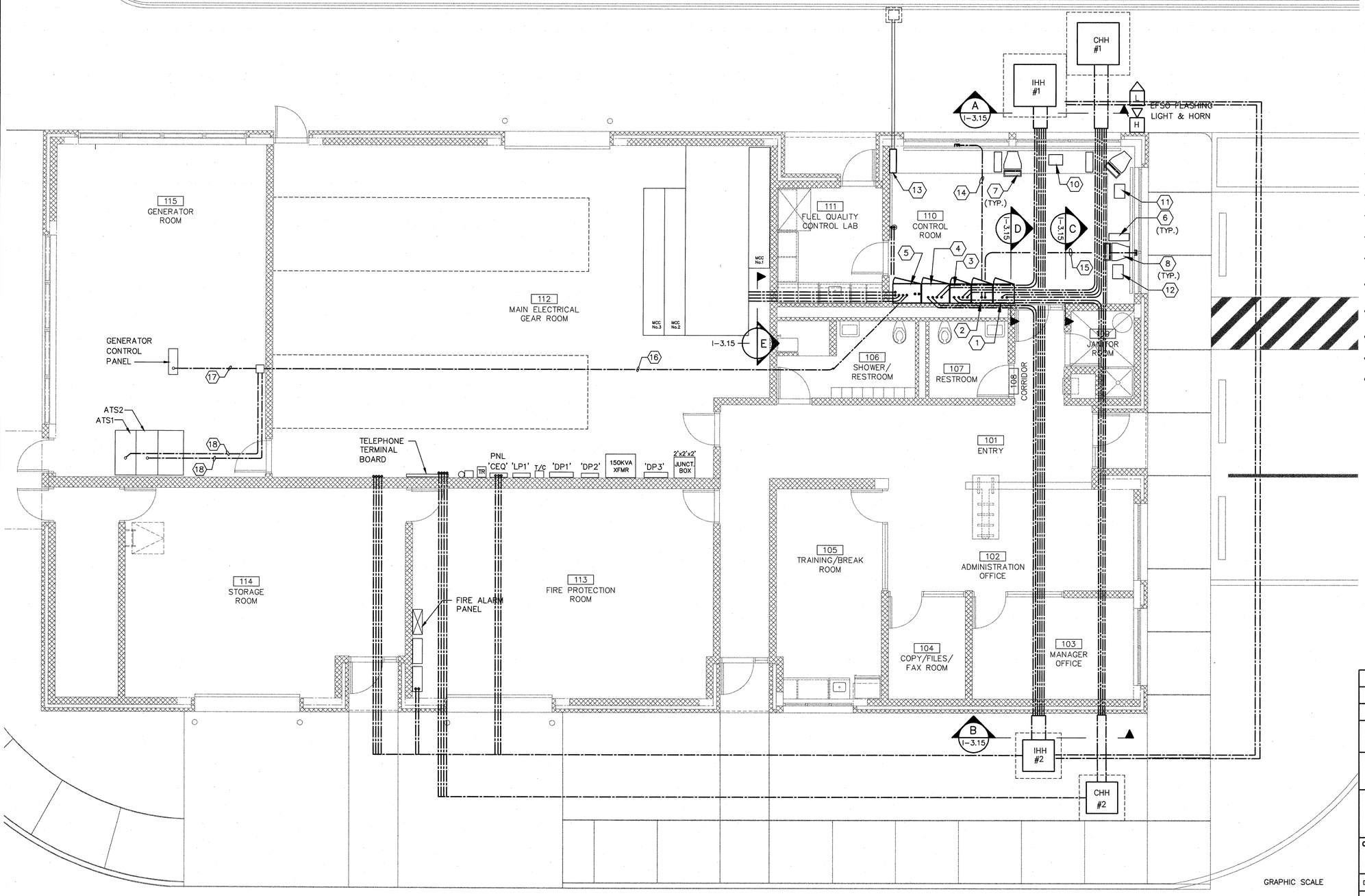




HYDRANT PUMP PAD



OPERATIONS BUILDING – CONTROL ROOM PARTIAL PLAN
SCALE: 1/4" = 1' – 0"

GRAPHIC SCALE
4' 0 2' 4'
1/4" = 1'-0"

Massachusetts Coordinate System

GENERAL NOTES:

1. REFER TO GENERAL NOTES ON SHEET I-1.01.
2. ALL CONDUITS AND DUCTBANKS SHOWN ARE TO BE INSTALLED BY OTHERS UNDER SEPARATE CONTRACT.

REFERENCE NOTES:

1. CONTROL CABINET BAY #1 – PLC COMPARTMENT.
2. CONTROL CABINET BAY #2 – COMMUNICATIONS COMPARTMENT.
3. CONTROL CABINET BAY #3 – DIGITAL COMPARTMENT.
4. CONTROL CABINET BAY #4 – 120V SIGNAL COMPARTMENT.
5. CONTROL CABINET BAY #5 – TERMINALS COMPARTMENT.
6. COMPUTER IN FULL TOWER CASE, BELOW COUNTER.
7. KEYBOARD ON COUNTER.
8. 21" SVGA COLOR MONIITOR.
9. EXISTING DATA AND POWER OUTLET (TYPICAL).
10. LASER REPORT PRINTER.
11. BUBBLE JET COLOR GRAPH PRINTER.
12. DOT MATRIX ALARM PRINTER.
13. VEEDER ROOT TLS-350 UNDERGROUND TANK LEAK DETECTION & LEVEL MONITORING CONTROL CABINET.
14. PROVIDE (2) CAT-5, 100-BASE-T CABLE AND (1) BELDEN No. 9463 IN ONE EX. 1" C.
15. PROVIDE (3) CAT-5, 100-BASE-T CABLE AND (1) BELDEN No. 9463 IN ONE EX. 1" C.
16. PROVIDE 10-#12 IN EX. 1" C. (ATS'S & GEN SIGNALS).
17. PROVIDE 2-#12 IN EX. 1" C. (GEN SIGNAL).
18. PROVIDE 4-#12 IN EX. 1" C. (ATS-N & ATS-E SIGNALS).

FOR REFERENCE ONLY

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
OPERATIONS BUILDING – CONTROL ROOM PARTIAL PLAN

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: CJL	CHKD. BY: CJL/DEV		DWG. NO:
SCALE: AS NOTED	APPROVED: TDT	DATE: AUG. 1996	I-6.05

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO: 182 OF 220

T:\BOSTON AB\BOSFUEL\FUELSTOR\INST-AB\I-605ABC.DWG 10/09/01 13:31

PANELBOARD 'CEQ'

MAINS: 100A MCB
VOLTAGE: 208Y/120 **PHASE:** 3Ø, 4W

LOCATION: ELECTRICAL ROOM
MOUNTING: SURFACE

CKT NO	DESCRIPTION	BREAKER POLE	BREAKER AMP	KVA		BREAKER AMP	BREAKER POLE	DESCRIPTION	CKT NO
1	MAIN	1	20	1.5	0.7	20	1	TANK #1 RECTIFIER UNIT	2
3	MAIN	1	20	1.5	0.7	20	1	TANK #2 RECTIFIER UNIT	4
5	MAIN	1	20	1.5	0.7	20	1	TANK #3 RECTIFIER UNIT	6
7	TANK #1 MOUNTED INSTRUMENTS	1	20	1.5	0.7	20	1	TANK #4 RECTIFIER UNIT	8
9	TANK #2 MOUNTED INSTRUMENTS	1	20	1.0	1.5	20	1	F/S 1,3 INSTRUMENTS	10
11	TANK #3 MOUNTED INSTRUMENTS	1	20	1.0	1.5	20	1	F/S 5,7 INSTRUMENTS	12
13	TANK #4 MOUNTED INSTRUMENTS	1	20	1.5	1.5	20	1	F/S 9,11 INSTRUMENTS	14
15	SPARE IN MANHOLE IHH-2	1	20	1.0	1.5	20	1	F/S 2,4 INSTRUMENTS	16
17	SPARE	1	20	–	1.5	20	1	F/S 6,8 INSTRUMENTS	18
19	SPARE IN MANHOLE IHH-2	1	20	–	1.5	20	1	F/S 10,12 INSTRUMENTS	20
21	LEVEL ALARM CABINETS	1	20	1.5	1.5	20	1	F/S 10,12 INSTRUMENTS	22
23	OIL/WATER SEP. RECOVERY TANK	1	20	1.5	–	20	1	SPARE IN MANHOLE IHH-2	24
25	INBOUND FILTRATION	1	20	1.5	1.5	20	1	ENRAF PRODUCT RECOVERY	26
27	SPARE	1	20	–	–	20	1	SPARE AT REFUELLER CABINET	28
29	SPARE	1	20	–	–	20	1	SPARE	30
31	SPARE	1	20	–	–	20	1	SPARE	32
33	SPARE	1	20	–	–	20	1	SPARE	34
35	SPARE	1	20	–	–	20	1	SPARE	36
37	SPARE	1	20	–	–	20	1	SPARE	38
39	SPARE	1	20	–	–	20	1	SPARE	40
41	IMS FEED	1	20	1.5	1.5	20	1	CARD READER	42
43	SPARE	1	20	–	–	20	1	SPARE	44
45	DISPENSER	1	20	1.5	–	20	1	SPARE	46

CONNECTED LOAD 32.3 KVA

NOTES:

1. ALL BREAKERS SHALL HAVE AN INTERRUPTING RATING 22,000 AMPS SYMM.

INSTRUMENTATION – POWER PANEL SCHEDULE
NOT TO SCALE

FOR REFERENCE ONLY

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	3/99	CONTRACTOR'S AS-BUILT CONDITIONS	JTV/CGH	JTV	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
POWER PANEL SCHEDULE

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
EDWARDS AND KELCEY INC. BOSTON, MASSACHUSETTS

DRAWN BY: SAD	CHKD. BY: CJL/DEV		DWG. NO:
SCALE: NONE	APPROVED: TDT	DATE: 2/97	I-6.06

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 190 OF 220

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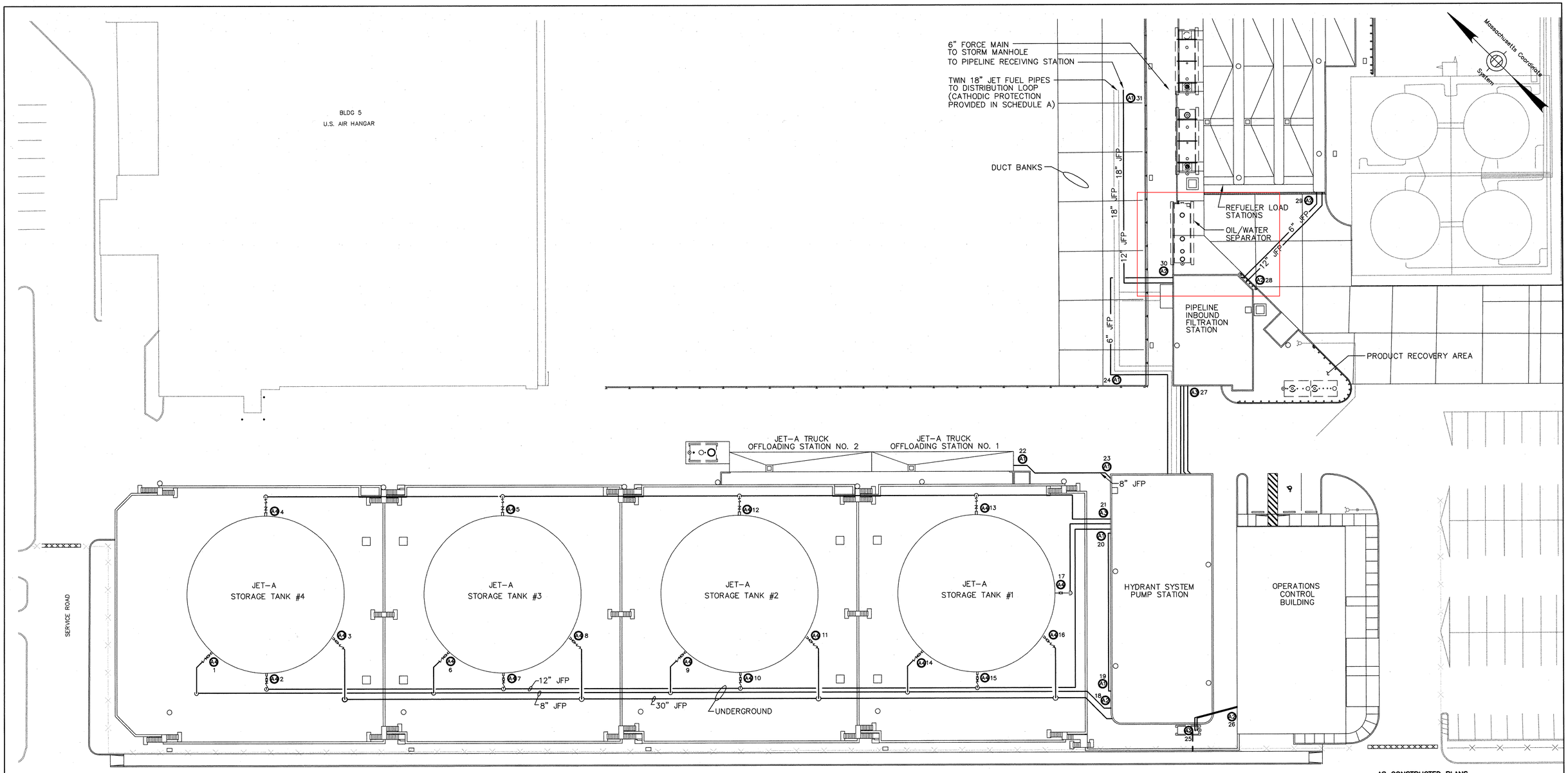
AS BUILT



INSTALLATION NOTES:

1. CONTRACTOR SHALL VERIFY SITE CONDITIONS AND THE LOCATION OF ALL EXISTING UNDERGROUND STRUCTURES PRIOR TO EXCAVATING.
2. LOCATION OF CATHODIC PROTECTION COMPONENTS SHOWN IS APPROXIMATE. MINOR DEVIATION FROM THE POSITIONS SHOWN TO AVOID EXISTING STRUCTURES WILL BE PERMITTED WITH APPROVAL OF THE ARCHITECT/ENGINEER.
3. ANODES SHALL BE INSTALLED IN THE VERTICAL POSITION, WITH THE TOP OF THE ANODE APPROXIMATELY 3 FEET BELOW THE PIPE'S OUTER SURFACE. ANODES MAY ONLY BE INSTALLED HORIZONTALLY IF SPECIFICALLY AUTHORIZED IN WRITING BY THE ARCHITECT/ENGINEER.
4. ANODES SHALL BE INSTALLED IN A HOLE NOT LESS THAN 2 INCHES LARGER IN DIAMETER THAN THE ANODE. THE ANODE LEAD WIRE SHALL NOT BE USED TO LIFT OR OTHERWISE SUPPORT THE ANODE DURING INSTALLATION. NATIVE NATURAL SAND SOIL MATERIAL SHALL BE PLACED AROUND THE ANODE IN 6 INCH LAYERS AND EACH LAYER THOROUGHLY COMPACTED. WHEN COMPLETELY BACKFILLED, NO LESS THAN 5 GALLONS OF WATER SHALL BE POURED INTO THE HOLE. THE BACKFILL MATERIAL SHALL BE THOROUGHLY SATURATED AND ADDITIONAL MATERIAL ADDED, AS NECESSARY, TO COMPENSATE FOR SHRINKAGE.
5. ANODE, PIPE AND REFERENCE CELL LEAD WIRES SHALL BE INSTALLED IN TRENCHES NOT LESS THAN 24 INCHES DEEP. EXCAVATION AND BACKFILLING OF TRENCHES SHALL BE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
6. PERMANENT REFERENCE CELLS SHALL BE INSTALLED HORIZONTALLY, 6 INCHES BELOW THE PIPE'S OUTER SURFACE IN NATIVE NATURAL SAND SOIL AND NO CLOSER THAN 20' TO A MAGNESIUM ANODE. THE BACKFILL MATERIAL AROUND THE REFERENCE CELL SHALL BE THOROUGHLY COMPACTED. WHEN THE REFERENCE CELL IS COMPLETELY COVERED, NO LESS THAN 5 GALLONS OF WATER SHALL BE POURED INTO THE HOLE. THE BACKFILL MATERIAL SHALL BE THOROUGHLY SATURATED AND ADDITIONAL MATERIAL ADDED, AS NECESSARY, TO COMPENSATE FOR SHRINKAGE.
7. TEST STATIONS SHALL BE PROVIDED WITH A 1 INCH WIDE BY 2 INCH LONG TYPE 316 STAINLESS STEEL TAG, PERMANENTLY ATTACHED TO THE ANODE LEAD WIRE INSIDE THE TEST STATION. INFORMATION ENGRAVED ON THIS TAG SHALL INCLUDE THE TEST STATION NUMBER AND ASSOCIATED STRUCTURES.
8. LEAD WIRE TERMINATIONS TO THE TEST STATION TERMINAL BLOCK SHALL BE MADE USING APPROPRIATELY SIZED, TINNED SOLID COPPER, RING TONGUE, SOLDERLESS CRIMP-TYPE CONNECTORS. INSTALLATION OF THE CONNECTORS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDED TOOLS.
9. COMPLETE ELECTRICAL ISOLATION OF ALL STEEL PIPING SHALL BE OBTAINED BY MAINTAINING A MINIMUM OF 6" CLEARANCE WITH ALL FOREIGN METALLIC STRUCTURES AND INSTALLATION OF FLANGE INSULATION KITS AT ALL ENDPOINTS.

JET FUEL PIPING
SCALE: 1"=20'-0"

LEGEND	
A1	SEE DETAIL 4 ON SHEET CP3.02 (ANODES 19, 20, 22, 23, 24 & 31)
A2	SEE DETAIL 5 ON SHEET CP3.02 (ANODES 18, 25, 26, 28, 29 & 30)
A3	SEE DETAIL 6 ON SHEET CP3.02 (ANODES 21 & 27)
A4	SEE DETAIL 7 ON SHEET CP3.02 (ANODES 1 – 17)

NOTE:

UTILITY LOCATIONS ARE SHOWN FOR REFERENCE ONLY. REFER TO ASSOCIATED CONSTRUCTION DRAWINGS FOR UTILITY LOCATIONS.

GRAPHIC SCALE
20' 0 10' 20'
SCALE: 1"=20'-0"

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated
URS Greiner Woodward Clyde, Inc.
BY _____ DATE 12/96

FOR REFERENCE ONLY

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

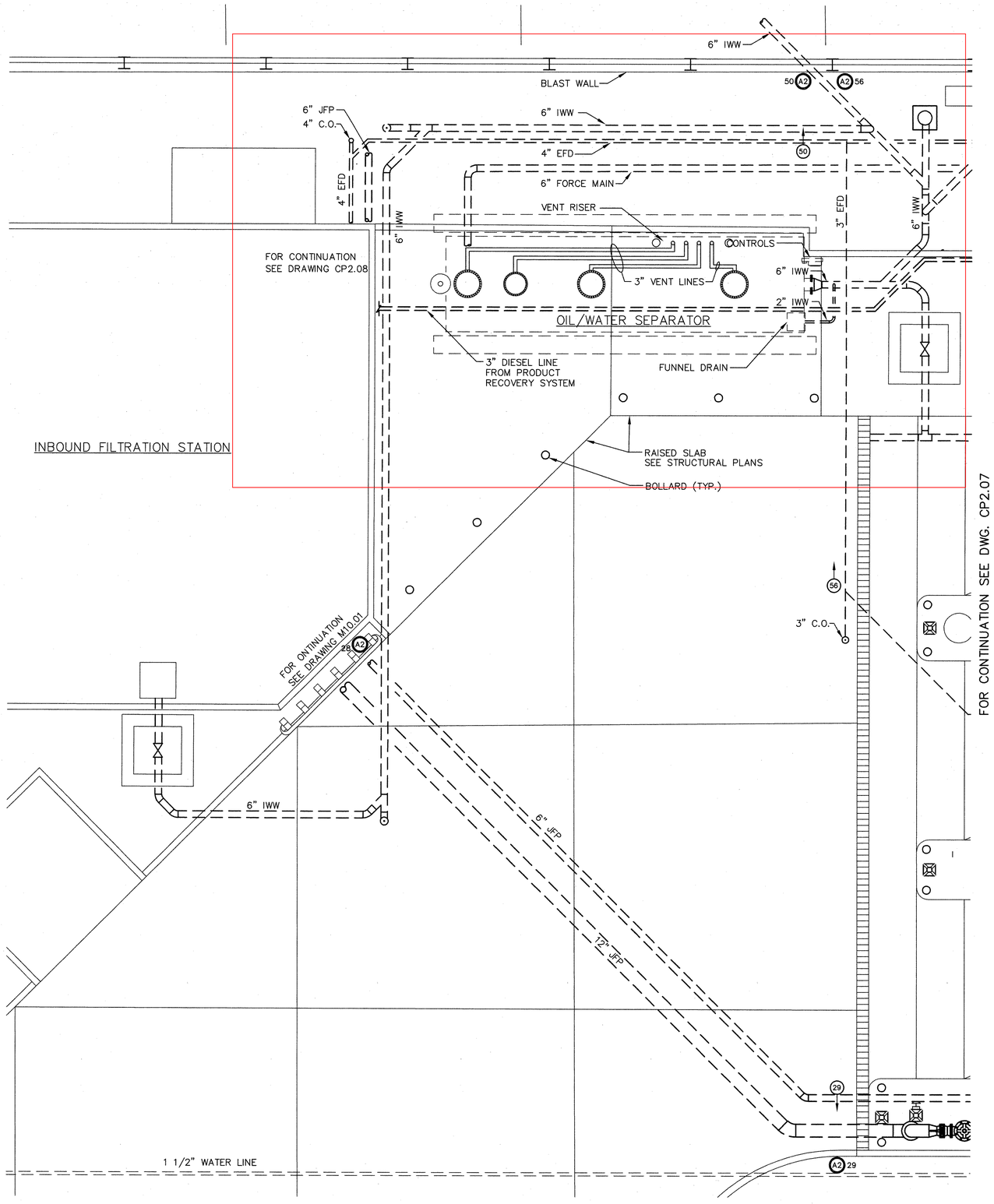
AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
CATHODIC PROTECTION SYSTEM – JET FUEL PIPING

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
SOUTHERN CATHODIC PROTECTION ATLANTA, GEORGIA

DRAWN BY:	EW	CHKD. BY:	JFF	DWG. NO:
SCALE: AS SHOWN	APPROVED: JLP	DATE:	2/97	CP2.02

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 14 OF 20

AS BUILT



REFUELER LOADING STATION PARTIAL AREA PLAN
SCALE: 1/4"=1'-0"

Massachusetts Coordinate System

INSTALLATION NOTES:

1. CONTRACTOR SHALL VERIFY SITE CONDITIONS AND THE LOCATION OF ALL EXISTING UNDERGROUND STRUCTURES PRIOR TO EXCAVATING.
2. LOCATION OF CATHODIC PROTECTION COMPONENTS SHOWN IS APPROXIMATE. MINOR DEVIATION FROM THE POSITIONS SHOWN TO AVOID EXISTING STRUCTURES WILL BE PERMITTED WITH APPROVAL OF THE ARCHITECT/ENGINEER.
3. ANODES SHALL BE INSTALLED IN THE VERTICAL POSITION, WITH THE TOP OF THE ANODE APPROXI-MATELY 3 FEET BELOW THE PIPE'S OUTER SURFACE. ANODES MAY ONLY BE INSTALLED HORIZONTALLY IF SPECIFICALLY AUTHORIZED IN WRITING BY THE ARCHITECT/ENGINEER.
4. ANODES SHALL BE INSTALLED IN A HOLE NOT LESS THAN 2 INCHES LARGER IN DIAMETER THAN THE ANODE. THE ANODE LEAD WIRE SHALL NOT BE USED TO LIFT OR OTHERWISE SUPPORT THE ANODE DURING INSTALLATION. NATIVE NATURAL SAND SOIL MATERIAL SHALL BE PLACED AROUND THE ANODE IN 6 INCH LAYERS AND EACH LAYER THOROUGHLY COMPACTED. WHEN COMPLETELY BACKFILLED, NO LESS THAN 5 GALLONS OF WATER SHALL BE POURED INTO THE HOLE. THE BACKFILL MATERIAL SHALL BE THOROUGHLY SATURATED AND ADDITIONAL MATERIAL ADDED, AS NECESSARY, TO COMPENSATE FOR SHRINKAGE.
5. ANODE, PIPE AND REFERENCE CELL LEAD WIRES SHALL BE INSTALLED IN TRENCHES NOT LESS THAN 24 INCHES DEEP. EXCAVATION AND BACKFILLING OF TRENCHES SHALL BE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
6. PERMANENT REFERENCE CELLS SHALL BE INSTALLED HORIZONTALLY, 6 INCHES BELOW THE PIPE'S OUTER SURFACE IN NATIVE NATURAL SAND SOIL AND NO CLOSER THAN 20' TO A MAGNESIUM ANODE. THE BACKFILL MATERIAL AROUND THE REFERENCE CELL SHALL BE THOROUGHLY COMPACTED. WHEN THE REFERENCE CELL IS COMPLETELY COVERED, NO LESS THAN 5 GALLONS OF WATER SHALL BE POURED INTO THE HOLE. THE BACKFILL MATERIAL SHALL BE THOROUGHLY SATURATED AND ADDITIONAL MATERIAL ADDED, AS NECESSARY, TO COMPENSATE FOR SHRINKAGE.
7. TEST STATIONS SHALL BE PROVIDED WITH A 1 INCH WIDE BY 2 INCH LONG TYPE 316 STAINLESS STEEL TAG, PERMANENTLY ATTACHED TO THE ANODE LEAD WIRE INSIDE THE TEST STATION. INFORMATION ENGRAVED ON THIS TAG SHALL INCLUDE THE TEST STATION NUMBER AND ASSOCIATED STRUCTURES.
8. LEAD WIRE TERMINATIONS TO THE TEST STATION TERMINAL BLOCK SHALL BE MADE USING APPROPRIATELY SIZED, TINNED SOLID COPPER, RING TONGUE, SOLDERLESS CRIMP-TYPE CONNECTORS. INSTALLATION OF THE CONNECTORS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDED TOOLS.
9. COMPLETE ELECTRICAL ISOLATION OF ALL STEEL PIPING SHALL BE OBTAINED BY MAINTAINING A MINIMUM OF 6" CLEARANCE WITH ALL FOREIGN METALLIC STRUCTURES AND INSTALLATION OF FLANGE INSULATION KITS AT ALL ENDPOINTS.

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY _____ DATE 10/62

LEGEND

- (A1) SEE DETAIL 4 ON SHEET CP3.02
- (A2) SEE DETAIL 5 ON SHEET CP3.02
- (#) MAGNESIUM ANODE BAG # ARROW POINTS TO TEST STATION LOCATION

GRAPHIC SCALE
4' 0 2' 4'
1/4" = 1'-0"

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

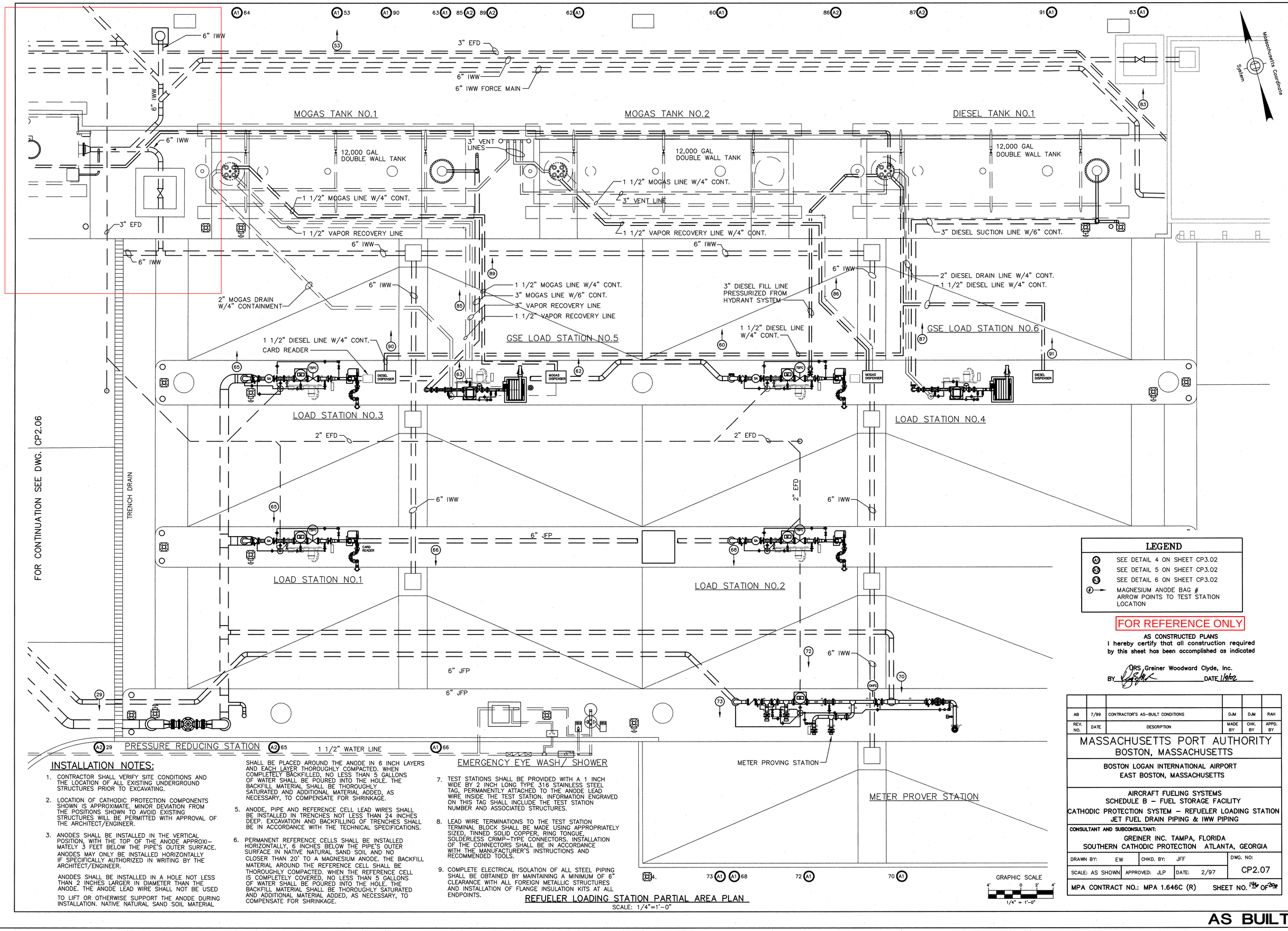
AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
CATHODIC PROTECTION SYSTEM – REFUELER LOADING STATION
PARTIAL SITE PLAN – JFP & IWW PIPING

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
SOUTHERN CATHODIC PROTECTION ATLANTA, GEORGIA

DRAWN BY: EW	CHKD. BY: JFF		DWG. NO:
SCALE: 1/4"=1'-0"	APPROVED: JLP	DATE: 2/97	CP2.06

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 145 OF 260

AS BUILT



INSTALLATION NOTES:

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2. LOCATION OF CATHODIC PROTECTION COMPONENTS SHOWN IS APPROXIMATE. MINOR DEVIATION FROM THE POSITIONS SHOWN TO AVOID EXISTING STRUCTURES WILL BE PERMITTED WITH APPROVAL OF THE ARCHITECT/ENGINEER.
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REFUELER LOADING STATION PARTIAL AREA PLAN

SCALE: 1/4"=1'-0"

GRAPHIC SCALE 4' 0 2' 4' 1/4" = 1'-0"

LEGEND

A1	SEE DETAIL 4 ON SHEET CP3.02
A2	SEE DETAIL 5 ON SHEET CP3.02
A3	SEE DETAIL 6 ON SHEET CP3.02
F	MAGNESIUM ANODE BAG # ARROW POINTS TO TEST STATION LOCATION

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

BY ORS Greiner Woodward Clyde, Inc. DATE 1/96

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

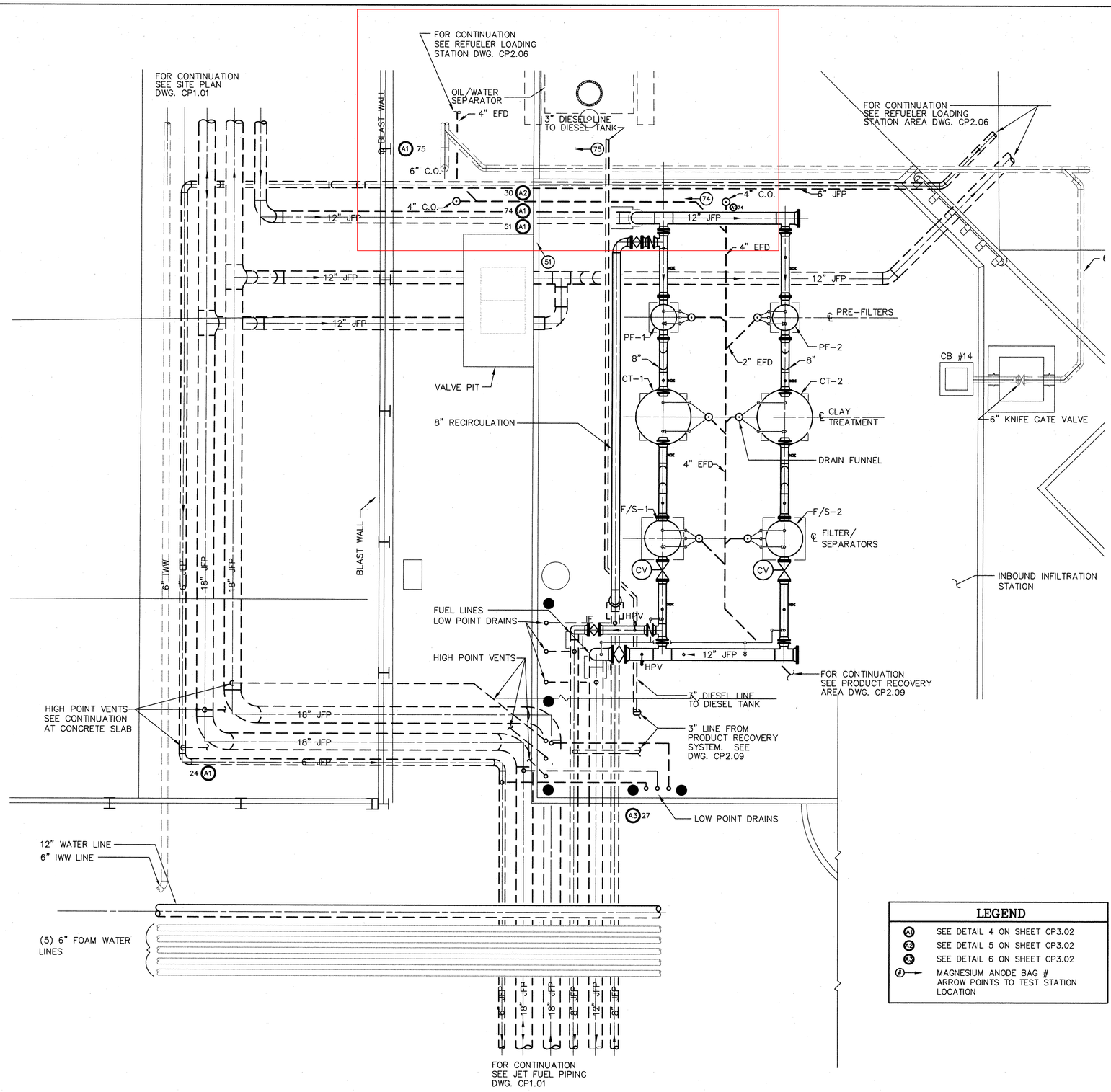
AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
CATHODIC PROTECTION SYSTEM – REFUELER LOADING STATION
JET FUEL DRAIN PIPING & IWW PIPING

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
SOUTHERN CATHODIC PROTECTION ATLANTA, GEORGIA

DRAWN BY: EW	CHKD. BY: JFF		DWG. NO: CP2.07
SCALE: AS SHOWN	APPROVED: JLP	DATE: 2/97	

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 14 OF 22

AS BUILT



INBOUND FILTRATION / PIPELINE CORRIDOR PARTIAL PLAN
SCALE: 1/4" = 1'-0"

Massachusetts Coordinate System

INSTALLATION NOTES:

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LEGEND

A1	SEE DETAIL 4 ON SHEET CP3.02
A2	SEE DETAIL 5 ON SHEET CP3.02
A3	SEE DETAIL 6 ON SHEET CP3.02
#	MAGNESIUM ANODE BAG # ARROW POINTS TO TEST STATION LOCATION

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

URS Greiner Woodward Clyde, Inc.
BY _____ DATE 1/9/02

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

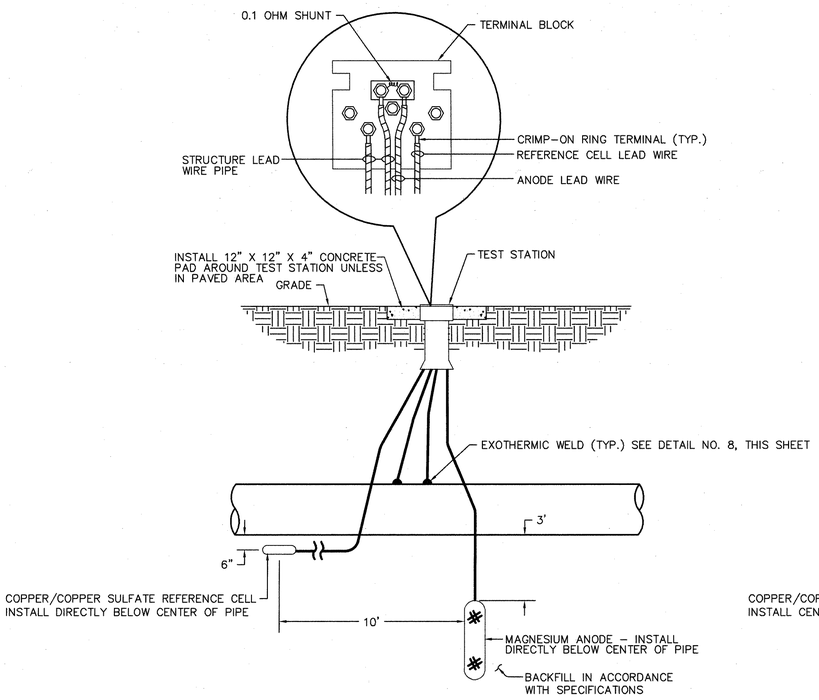
AIRCRAFT FUELING SYSTEMS
SCHEDULE B – FUEL STORAGE FACILITY
INBOUND FILTRATION / PIPELINE CORRIDOR PARTIAL PLAN
JFP, JET FUEL DRAIN PIPING & IWW PIPING

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
SOUTHERN CATHODIC PROTECTION ATLANTA, GEORGIA

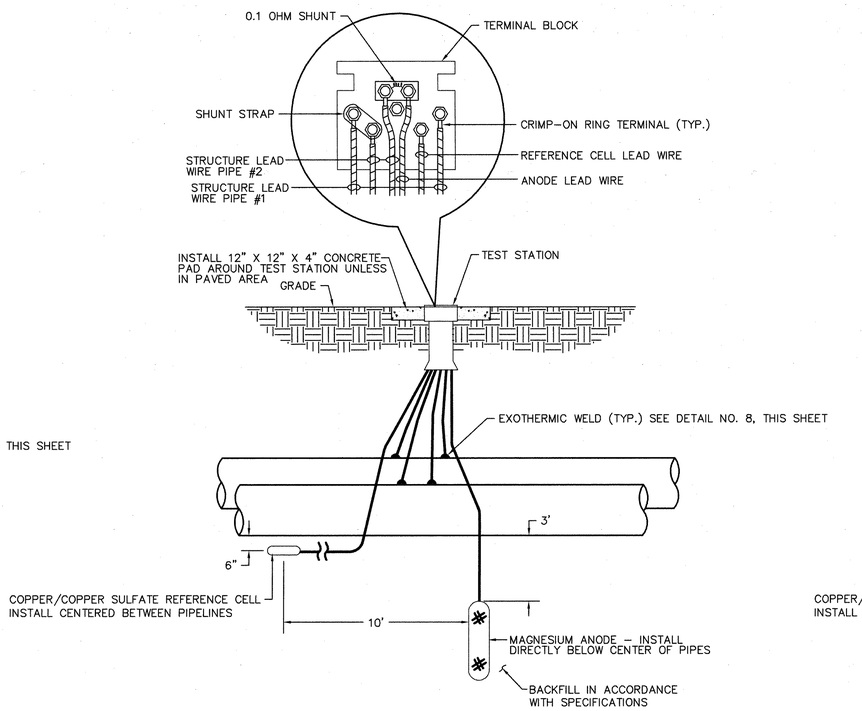
DRAWN BY: EW	CHKD. BY: JFF			DWG. NO: CP2.08
SCALE: AS SHOWN	APPROVED: JLP	DATE: 2/97		
MPA CONTRACT NO.: MPA 1.646C (R)			SHEET NO. 147 OF 252	

GRAPHIC SCALE
4' 0 2' 4'
1/4"=1'-0"

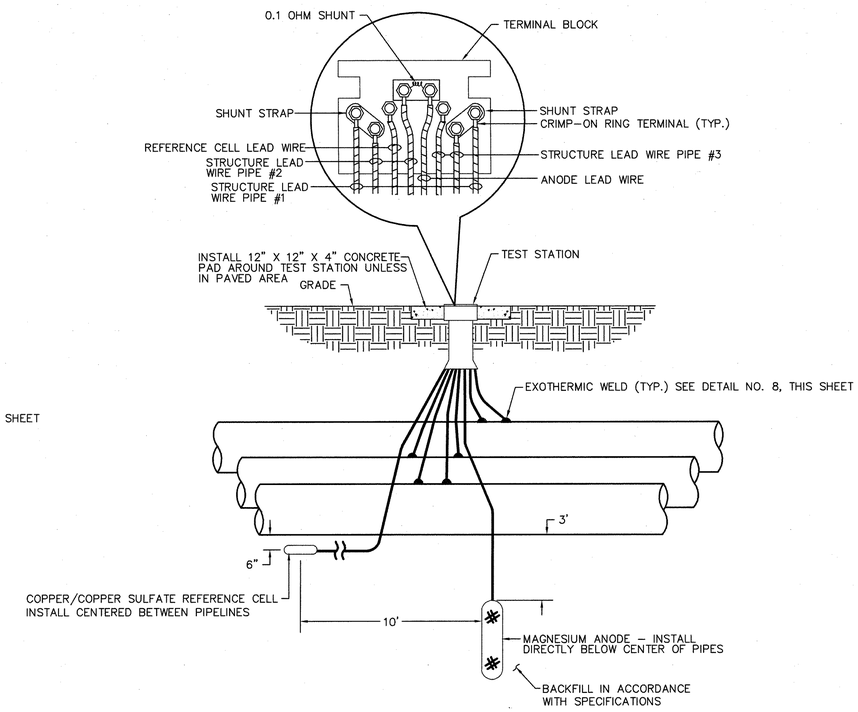
AS BUILT



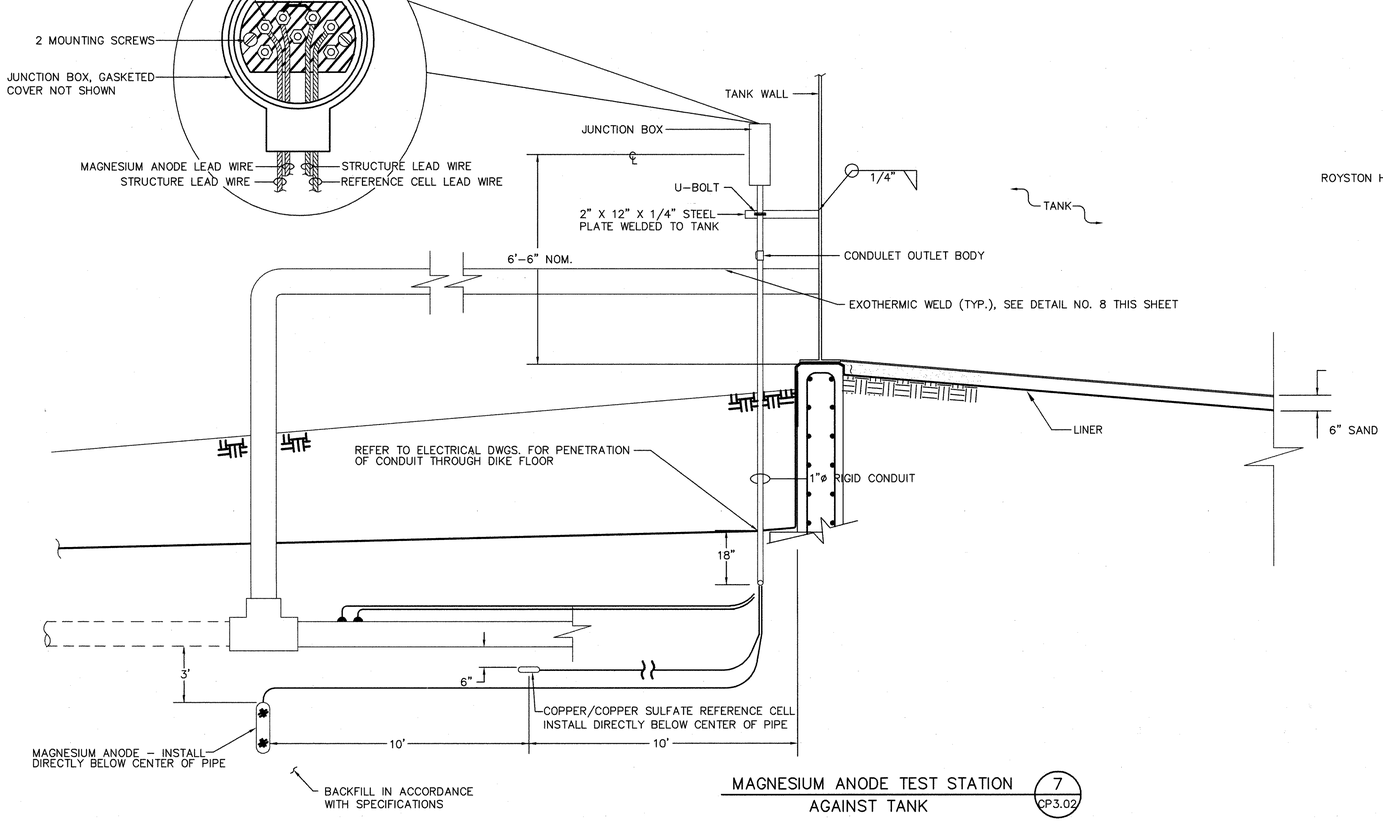
MAGNESIUM ANODE TEST STATION DETAIL 4
SINGLE PIPELINE
CP3.02



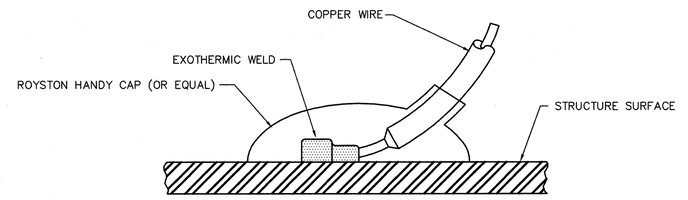
MAGNESIUM ANODE TEST STATION DETAIL 5
DOUBLE PIPELINE
CP3.02



MAGNESIUM ANODE TEST STATION DETAIL 6
TRIPLE PIPELINE
CP3.02



MAGNESIUM ANODE TEST STATION
AGAINST TANK
7
CP3.02



NOTES:

1. METAL SURFACE TO BE DRY AND FREE OF ALL FOREIGN MATERIAL.
2. CABLE CONNECTION TO HAVE MINIMUM 1/2" INSULATION REMOVED.

EXOTHERMIC WELD DETAIL 8
CP3.02

FOR REFERENCE ONLY

AS CONSTRUCTED PLANS
I hereby certify that all construction required by this sheet has been accomplished as indicated

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BY _____ DATE 1/9/98

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY
AB	7/99	CONTRACTOR'S AS-BUILT CONDITIONS	DJM	DJM	RAH

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

BOSTON LOGAN INTERNATIONAL AIRPORT
EAST BOSTON, MASSACHUSETTS

AIRCRAFT FUELING SYSTEMS
SCHEDULE B - FUEL STORAGE FACILITY
CATHODIC PROTECTION SYSTEM - DETAILS

CONSULTANT AND SUBCONSULTANT:
GREINER INC. TAMPA, FLORIDA
SOUTHERN CATHODIC PROTECTION ATLANTA, GEORGIA

DRAWN BY: EW	CHKD. BY: JFF		DWG. NO:
SCALE: AS SHOWN	APPROVED: JLP	DATE: 2/97	CP3.02

MPA CONTRACT NO.: MPA 1.646C (R) SHEET NO. 151 OF 200

AS BUILT

ATTACHMENT C

RAIN FOR RENT ENGINEERING
Western Oilfields Supply Company
3404 State Road; Bakersfield, CA 93308
Phone: 661-399-9128, Fax: 661-399-3211

Liquid Ingenuity©

ENGINEER: Meagan White
DATE: 3/4/2020
ENG JOB NO: 01-20135
ENG DOC NO: 01-20135-01-01
QUOTE NO: -
REVISION: **Original**

To: Nick Gamache
Branch: 1054
Customer: Bond Brothers
Project: BOS NWMS

GIVEN INFORMATION:

This recommendation is for dewatering an excavation with dimensions no larger that 94' long x 47' wide x 17' deep. The existing grade elevation is 12' above sea level (ASL) and groundwater is at 11' ASL. The underlying stratigraphy of the soil is mostly sandy clay and medium dense sand with silt.

ENGINEERED SOLUTION:

Professionally engineered solution to ensure a safely designed, and operable system.

PUMPS, PIPE, & HOSE: (approximate total lengths)

(2) BBA wellpoint dewatering pumps (1 primary, 1 back-up)
70 +/- wellpoints, 22 ft deep, 4 ft spacing
6inch wellpoint header pipe

***Spillguards, PipeStax, and Hose Bridges are recommended**

SYSTEM DESIGN NARRATIVE:

The Rain for Rent Engineering Department is proposing a wellpoint dewatering system around the perimeter of the excavation. Wellpoints will be spaced 4' center to center and jetted to a depth of 22' or until refusal. From past experience well-points can typically be self-jetted successfully in soils with an “N” value of 15 blows/foot or less. If the points are unable to be injected, drilling will be required at an additional expense. The system shall consist of 70 +/- well points with one (1) primary and one (1) backup BBA PT90 or PT150 dewatering pumps and 6" HDPE SDR 17 wellpoint header pipe. The discharge off each pump shall be 6" pipe/hose discharging into a nearby frac tank. Air/vacuum vents are required at the pump station and at high points along the pipeline.

If deemed necessary, sumps and/or a French Drain can be used to get rid of any nuisance water and/or aid in the dewatering process. If a French Drain is used it should be filled with gravel to help reduce erosion and sloped in such a way to allow groundwater to travel to low point(s). Small submersible pumps should be placed in every low point to remove the perched water. If higher than expected flows are encountered an optional backup pump can be operated for the first few days to help reduce the draw-down time. Constant monitoring and fine-tuning of the dewatering system is vital. Please note Rain for Rent recommends a minimum of seven days of draw-down time. Actual draw-down time may vary depending on site conditions.

The analytical model used to design the above dewatering system can be found in the text Construction Dewatering and Groundwater Control New Methods and Applications. The general parameters for the wellpoint system described above are as follows: an unconfined aquifer with dimensions of 94' long x 47' wide, grade elevation of 12' ASL, and a ground water elevation of 11' ASL. For design purposes the saturated soil is assumed to be silty medium dense sand and sandy clay, with a storage coefficient of 0.2 and a hydraulic conductivity ranging from 50-400 gpd/ft2 estimated from the boring logs provided in the geotechnical report. Based upon these assumptions the required steady-state flow-rate for entire excavation will range from 38-179 gpm. Flow-rates may vary substantially depending on actual soil and ground water conditions.

It should be noted that the above steady-state flow rates are greatly impacted by the storage coefficient, height of water table, soil hydraulic conductivity, aquifer thickness, sources of recharge, the time the dewatering system is operating, and several other factors. Also, a considerably higher initial in-flow should be anticipated.

Performance of the dewatering system is not guaranteed. Changes to site conditions, unknown site conditions, and/or changes to design assumptions will impact the performance of the system, and may require additional equipment, changes to dewatering methods, and or changes in construction methods. All associated project cost and impact remains the customers responsibility. Rain for Rent will issue a Change Order to the Customer prior to providing additional equipment and/or labor. Customer retains all geotechnical responsibility associated with the project, including, but not limited to, any and all subsidence.
The recommendations contained herein were derived from calculations using published pump curves and information provided by customers, end users, project engineers, and/or other sources. Actual pump and system performance may vary. Any variations of the system's characteristics, including but not limited to, flow, suction lift, discharge distance, and/or submergence may require changes to the system(s). Any system recommendation changes may result in additional cost. In such cases, a change order will be required to proceed. All information contained herein or disclosed by this document is considered confidential and proprietary. Any disclosure, reproduction and/or distribution of this document in whole or in part without the written authorization from Rain for Rent's Engineering Department is prohibited. Please see your estimate and rental agreement for additional terms and conditions, these recommendations are incorporated as a part of those contractual documents.

Equivalent Well Model

AREA

$$r_s = \sqrt{\frac{ab}{\pi}}$$

PERIMETER

$$r_s = \frac{a+b}{\pi}$$

a = 94 ft
b = 47 ft
r_s = excavation equivalent radius

area r_s = 37.50 ft
perimeter r_s = 44.88 ft

a/b = 2.00

Radius of Influence R_o

$$R_0 = r_s + \sqrt{\frac{Tt}{C_4 C_s}}$$

T = 8,400 gpd/ft
t = 10,080 min
C_4 = 4,790

T = KB = transmissivity
t = pumping time
C_4 = Jacob Plots Constant
K = hydraulic conductivity
B = aquifer depth
C_s = storage coefficient

C_s = 0.05 to 0.2 {Unconfined Aquifer}
C_s = 0.0005 to 0.001 {Confined Aquifer}

Q_w = frictionless flow at equilibrium
H = original saturated thickness
h_w = height of water at the well
rw = radius of the well = rs in equivalent well modeling

grade: 12 ft (MSL)
groundwater: 11 ft (MSL)
device depth: 22 ft

H = 21 ft
h_w = 5 ft
K = 400 gpd/ft^2
B = 21 ft
x = 94.00 ft

Radial Flow, Confined Aquifer Q_w = 128.98 gpm
R_o = 4,249 ft r_s = 44.88 ft C_s = 0.001

Radial Flow, Unconfined Aquifer Q_w = 178.86 gpm
R_o = 342 ft r_s = 44.88 ft C_s = 0.2

Radial Flow, Mixed Aquifer Q_w = 155.35 gpm
R_o = 465 ft r_s = 44.88 ft C_s = 0.1

Line Flow, Confined Aquifer Q_w/x= 0.04 gpm/ft
L = 2,114 ft r_s = 23.50 ft C_s = 0.001

Line Flow, Unconfined Aquifer Q_w/x = 0.36 gpm/ft
L = 160 ft r_s = 23.50 ft C_s = 0.2

End Effects (Line Flow), Unconfined Aquifer = 139.00 gpm
R_o = 321 ft r_s = 23.50 ft C_s = 0.2

ANALYTICAL MODELING

Q_w = **179** gpm wells / points: 70 Q_w per well/point: 2.56 gpm

***Q =** **358** gpm *estimated startup flow rate Q per well/point: 5.11 gpm

Well / Wellpoint Design

Q_w = 7.00 gpm

$$Q_w = 0.035 l_w r_w \sqrt{K}$$

l_w = 5 ft
r_w = 2 in

Well Spacing = **4** ft

Equivalent Well Model

AREA

$$r_s = \sqrt{\frac{ab}{\pi}}$$

PERIMETER

$$r_s = \frac{a+b}{\pi}$$

a = 94 ft
b = 47 ft
r_s = excavation equivalent radius

area r_s = 37.50 ft
perimeter r_s = 44.88 ft

a/b = 2.00

Radius of Influence R_o

$$R_0 = r_s + \sqrt{\frac{Tt}{C_4 C_s}}$$

T = 1,050 gpd/ft
t = 10,080 min
C_4 = 4,790

T = KB = transmissivity
t = pumping time
C_4 = Jacob Plots Constant
K = hydraulic conductivity
B = aquifer depth
C_s = storage coefficient

C_s = 0.05 to 0.2 {Unconfined Aquifer}
C_s = 0.0005 to 0.001 {Confined Aquifer}

Q_w = frictionless flow at equilibrium
H = original saturated thickness
h_w = height of water at the well
rw = radius of the well = rs in equivalent well modeling

grade: 12 ft (MSL)
groundwater: 11 ft (MSL)
device depth: 22 ft

H = 21 ft
h_w = 5 ft
K = 50 gpd/ft^2
B = 21 ft
x = 94 ft

Radial Flow, Confined Aquifer Q_w = 20.78 gpm
R_o = 1,531 ft r_s = 44.88 ft C_s = 0.001

Radial Flow, Unconfined Aquifer Q_w = 37.64 gpm
R_o = 150 ft r_s = 44.88 ft C_s = 0.2

Radial Flow, Mixed Aquifer Q_w = 31.08 gpm
R_o = 194 ft r_s = 44.88 ft C_s = 0.1

Line Flow, Confined Aquifer Q_w/x= 0.02 gpm/ft
L = 755 ft r_s = 23.50 ft C_s = 0.001

Line Flow, Unconfined Aquifer Q_w/x = 0.11 gpm/ft
L = 64 ft r_s = 23.50 ft C_s = 0.2

End Effects (Line Flow), Unconfined Aquifer = 26.72 gpm
R_o = 129 ft r_s = 23.50 ft C_s = 0.2

ANALYTICAL MODELING

Q_w = **38** gpm wells / points: 70 Q_w per well/point: 0.54 gpm

***Q =** **75** gpm *estimated startup flow rate Q per well/point: 1.08 gpm

Well / Wellpoint Design

Q_w = 2.47 gpm

$$Q_w = 0.035 l_w r_w \sqrt{K}$$

l_w = 5 ft
r_w = 2 in

Well Spacing = **4** ft

RAIN FOR RENT ENGINEERING
Western Oilfields Supply Company
3404 State Road; Bakersfield, CA 93308
Phone: 661-399-9128, Fax: 661-399-3211

Liquid Ingenuity

To: Nick Gamache
Branch: 1054
Customer: Bond Brothers
Project: BOS NWMS

ENGINEER: Meagan White
DATE: 3/4/2020
ENG JOB NO: 01-20135
ENG DOC NO: 01-20135-01-01
OPPORTUNITY NO: -
REVISION: Original

SITE CONDITIONS

Site Dimensions:	94 ft long	Grade Elevation:	12 ft (ASL)	K Value:	400 gpd/ft^2
	47 ft wide	Groundwater Elevation:	11 ft (ASL)		
		Device Depth:	22 ft		

ANALYTICAL MODEL

Radial Flow, Unconfined Aquifer

$$Q_w = \frac{K(H^2 - h_w^2)}{458 \ln(R_o/r_w)}$$

Q_w =	**179** gpm	Wells/wellpoints	70	Q_w per well:	**2.6** gpm
**Q =	358 gpm	**estimated startup flow rate		Q per well:	5.1 gpm

POTENTIAL INDIVIDUAL WELL PERFORMANCE

$$Q_w = 0.035\, l_w\, r_w\, \sqrt{K}$$

l_w =	5 ft	Q_w =	**7** gpm
r_w =	2 in	Spacing =	**4.0** ft

Performance of the dewatering system is not guaranteed. Changes to site conditions, unknown site conditions, and/or changes to design assumptions will impact the performance of the system, and may require additional equipment, changes to dewatering methods, and or changes in construction methods. All associated project cost and impact remains the customers responsibility. Rain for Rent will issue a Change Order to the Customer prior to providing additional equipment and/or labor. Customer retains all geotechnical responsibility associated with the project, including, but not limited to, any and all subsidence.
The recommendations contained herein were derived from calculations using published pump curves and information provided by customers, end users, project engineers, and/or other sources. Actual pump and system performance may vary. Any variations of the system's characteristics, including but not limited to, flow, suction lift, discharge distance, and/or submergence may require changes to the system(s). Any system recommendation changes may result in additional cost. In such cases, a change order will be required to proceed. All information contained herein or disclosed by this document is considered confidential and proprietary. Any disclosure, reproduction and/or distribution of this document in whole or in part without the written authorization from Rain for Rent's Engineering Department is prohibited. Please see your estimate and rental agreement for additional terms and conditions, these recommendations are incorporated as a part of those contractual documents.

RAIN FOR RENT ENGINEERING
Western Oilfields Supply Company
3404 State Road; Bakersfield, CA 93308
Phone: 661-399-9128, Fax: 661-399-3211

Liquid Ingenuity

To: Nick Gamache
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ENGINEER: Meagan White
DATE: 3/4/2020
ENG JOB NO: 01-20135
ENG DOC NO: 01-20135-01-01
OPPORTUNITY NO: -
REVISION: Original

SITE CONDITIONS

Site Dimensions:	94 ft long	Grade Elevation:	12 ft (ASL)	K Value:	50 gpd/ft^2
	47 ft wide	Groundwater Elevation:	11 ft (ASL)		
		Device Depth:	22 ft		

ANALYTICAL MODEL

Radial Flow, Unconfined Aquifer

$$Q_w = \frac{K(H^2 - h_w^2)}{458 \ln(R_o/r_w)}$$

Q_w =	**38** gpm	Wells/wellpoints	70	Q_w per well:	**0.5** gpm
**Q =	75 gpm	**estimated startup flow rate		Q per well:	1.1 gpm

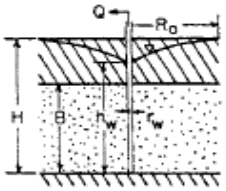
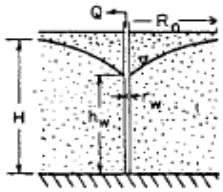
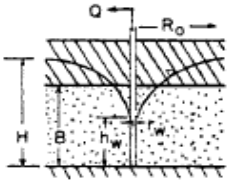
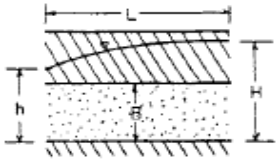
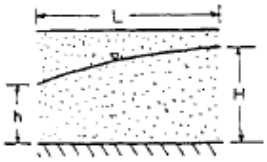
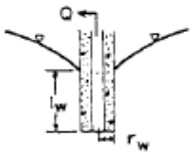
POTENTIAL INDIVIDUAL WELL PERFORMANCE

$$Q_w = 0.035\, l_w\, r_w\, \sqrt{K}$$

l_w =	5 ft	Q_w =	**2** gpm
r_w =	2 in	Spacing =	**4.0** ft

Performance of the dewatering system is not guaranteed. Changes to site conditions, unknown site conditions, and/or changes to design assumptions will impact the performance of the system, and may require additional equipment, changes to dewatering methods, and or changes in construction methods. All associated project cost and impact remains the customers responsibility. Rain for Rent will issue a Change Order to the Customer prior to providing additional equipment and/or labor. Customer retains all geotechnical responsibility associated with the project, including, but not limited to, any and all subsidence.
The recommendations contained herein were derived from calculations using published pump curves and information provided by customers, end users, project engineers, and/or other sources. Actual pump and system performance may vary. Any variations of the system's characteristics, including but not limited to, flow, suction lift, discharge distance, and/or submergence may require changes to the system(s). Any system recommendation changes may result in additional cost. In such cases, a change order will be required to proceed. All information contained herein or disclosed by this document is considered confidential and proprietary. Any disclosure, reproduction and/or distribution of this document in whole or in part without the written authorization from Rain for Rent's Engineering Department is prohibited. Please see your estimate and rental agreement for additional terms and conditions, these recommendations are incorporated as a part of those contractual documents.

Table 6.1 Summary of Analytical Models

Model	Basic equation	U.S. units[a]	Metric units[b]
	$Q_w = \frac{2\pi KB(H - h_w)}{\ln R_0/r_w}$	$Q_w = \frac{KB(H - h_w)}{229 \ln R_0/r_w}$	$Q_w = \frac{KB(H - h_w)}{2.65 \times 10^{-6} \ln R_0/r_w}$
Radial flow, confined aquifer	K = hydraulic conductivity		
	$Q_w = \frac{\pi K(H^2 - h_w^2)}{\ln R_0/r_w}$	$Q_w = \frac{K(H^2 - h_w^2)}{458 \ln R_0/r_w}$	$Q_w = \frac{K(H^2 - h_w^2)}{5.31 \times 10^{-6} \ln R_0/r_w}$
Radial flow, water table aquifer	K = hydraulic conductivity		
	$Q_w = \frac{\pi K(2BH - B^2 - h_w^2)}{\ln R_0/r_w}$	$Q_w = \frac{K(2BH - B^2 - h_w^2)}{458 \ln R_0/r_w}$	$Q_w = \frac{K(2BH - B^2 - h_w^2)}{5.31 \times 10^{-6} \ln R_0/r_w}$
Radial flow, mixed aquifer	K = hydraulic conductivity		
	$\frac{Q}{x} = \frac{KB(H - h)}{L}$	$\frac{Q}{x} = \frac{KB(H - h)}{1440L}$	$\frac{Q}{x} = \frac{KB(H - h)}{1.67 \times 10^{-5} L}$
Confined flow from a line source to a drainage trench	x = unit length of trench, for flow from 2 sides, use twice the indicated value K = hydraulic conductivity		
	$\frac{Q}{x} = \frac{K(H^2 - h^2)}{2L}$	$\frac{Q}{x} = \frac{K(H^2 - h^2)}{2880L}$	$\frac{Q}{x} = \frac{K(H^2 - h^2)}{3.34 \times 10^{-5} L}$
Water table flow from a line source to a drainage trench	x = unit length of trench, for flow from 2 sides, use twice the indicated value K = hydraulic conductivity		
	$Q = 2\pi l_w r_w C\sqrt{K}$ C = empirical coefficient	$Q_w = 0.035 l_w r_w \sqrt{K}$ r_w in in. l_w in ft	$Q_w = 24.91 l_w r_w \sqrt{K}$ r_w in mm l_w in m
Recommended flow per unit length of wet borehole (Sichart)			

[a] Except where noted: Q in gpm; H, B, R_0, r_w in ft; K in gpd/ft^2
[b] Except where noted: Q in L/min; H, B, R_0, r_w in m; K in m/sec

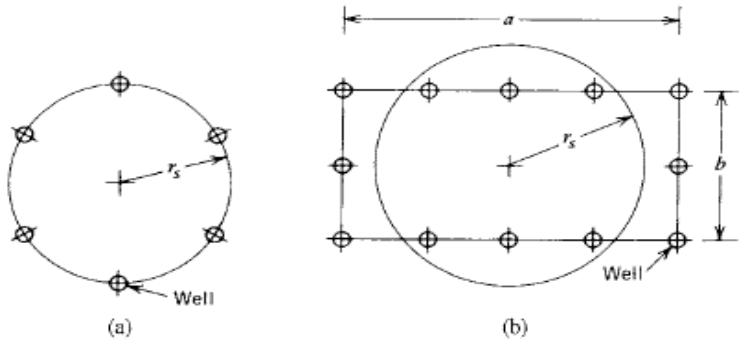


Figure 6.7 Approximation of equivalent radius r_s (a) Circular systems. (b) Rectangular systems.

$$r_s = \sqrt{\frac{ab}{\pi}} \tag{6.8}$$

Some analysts prefer to consider a rectangular system to act as a circular system with the same perimeter:

$$r_s = \frac{a + b}{\pi} \tag{6.9}$$

Either Eq. 6.8 or 6.9 gives reasonable approximations when the wells are spaced closely, when R_0 is great in relation to r_s, and when the ratio a/b is less than about 1.5. If the wells are widely spaced, the actual Q will be significantly higher than that estimated for the equivalent well.

ATTACHMENT D

Anthony Rossato

From: Little, Shauna <Little.Shauna@epa.gov> on behalf of Little, Shauna
Sent: Tuesday, May 12, 2020 1:04 PM
To: Anthony Rossato
Cc: Jacob Butterworth
Subject: RE: M948 - NOI Receiving Water Body Sampling

Yes, saltwater dilution is zero. The WQBELs will still be calculated to determine if they apply. It mostly depends on the concentrations in your influent and whether or not that exceeds the water quality criteria. If you have a copy of the excel spreadsheet, enter your data and the preliminary results are shown in the saltwater results tab. EPA checks those entries when confirming limits in your authorization, so please be sure to attach that excel file.

Regards,

Shauna Little
Physical Scientist
Water Division
U.S. EPA Region 1
Phone: (617) 918-1989

From: Anthony Rossato <arossato@sage-enviro.com>
Sent: Tuesday, May 12, 2020 12:54 PM
To: Little, Shauna <Little.Shauna@epa.gov>
Cc: Jacob Butterworth <jbutterworth@sage-enviro.com>
Subject: RE: M948 - NOI Receiving Water Body Sampling

Shauna,
We just received our source water laboratory data and are planning to utilize the previously discussed data for the receiving water. As the source water is proposed to be discharged to a saltwater body, am I correct in assuming that a dilution factor does not apply and that the TBEL will apply to our discharge?

Regards,
Anthony

From: Little, Shauna <Little.Shauna@epa.gov>
Sent: Tuesday, May 5, 2020 10:17 AM
To: Anthony Rossato <arossato@sage-enviro.com>
Cc: Jacob Butterworth <jbutterworth@sage-enviro.com>
Subject: RE: M948 - NOI Receiving Water Body Sampling

Yes, that's fine.

Regards,

Shauna Little
Physical Scientist
Water Division
U.S. EPA Region 1
Phone: (617) 918-1989

From: Anthony Rossato <arossato@sage-enviro.com>
Sent: Tuesday, May 05, 2020 10:13 AM
To: Little, Shauna <Little.Shauna@epa.gov>
Cc: Jacob Butterworth <jbutterworth@sage-enviro.com>
Subject: M948 - NOI Receiving Water Body Sampling

Shauna,
We are currently working on a project which will require dewatering to a catch basin that discharges to an outfall on the Boston Inner Harbor and therefore will be preparing RGP documentation. We are collecting two groundwater samples from the source water today.

A NOI for a NPDES RGP, for a different project with the same receiving water body, was submitted to your department in August 2019. The receiving water body sampling, utilized in the August 2019 NOI, was conducted on June 24, 2019 and is analogous to the receiving water body for the outfall location in our application. Can we utilize the June 24, 2019 surface water data set in our NOI submittal? Please let me know if you have any questions. Thanks.

Regards,
Anthony

SAGE ENVIRONMENTAL

Anthony Rossato
Project Manager
Pawtucket / Taunton / Boston

O: (888) 723-9920 ext. 133
F: (401) 723-9973
C: (508) 282-2006
E: ARossato@Sage-Enviro.com
W: www.sage-enviro.com

ATTACHMENT E

Enter number values in green boxes below

Enter values in the units specified

↓

0	Q_R = Enter upstream flow in **MGD**
0.288	Q_P = Enter discharge flow in **MGD**
0	Downstream 7Q10

Enter a dilution factor, if other than zero

↓

0

Enter values in the units specified

↓

0	C_d = Enter influent hardness in **mg/L** $CaCO_3$
0	C_s = Enter receiving water hardness in **mg/L** $CaCO_3$

Enter **receiving water** concentrations in the units specified

↓

6.72	pH in **Standard Units**
0	Temperature in **°C**
0.989	Ammonia in **mg/L**
595	Hardness in **mg/L** $CaCO_3$
5.72	Salinity in **ppt**
0	Antimony in **µg/L**
3.03	Arsenic in **µg/L**
0	Cadmium in **µg/L**
0	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
5.22	Copper in **µg/L**
2780	Iron in **µg/L**
0	Lead in **µg/L**
0	Mercury in **µg/L**
2.18	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
41.9	Zinc in **µg/L**

Enter **influent** concentrations in the units specified

↓

0	TRC in **µg/L**
0.28	Ammonia in **mg/L**
0	Antimony in **µg/L**
0	Arsenic in **µg/L**
0	Cadmium in **µg/L**
0	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
0	Copper in **µg/L**
128	Iron in **µg/L**
0	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
5.8	Zinc in **µg/L**
0	Cyanide in **µg/L**
0	Phenol in **µg/L**
0	Carbon Tetrachloride in **µg/L**
0	Tetrachloroethylene in **µg/L**
0	Total Phthalates in **µg/L**
0	Diethylhexylphthalate in **µg/L**
0	Benzo(a)anthracene in **µg/L**
0	Benzo(a)pyrene in **µg/L**
0	Benzo(b)fluoranthene in **µg/L**
0	Benzo(k)fluoranthene in **µg/L**
0	Chrysene in **µg/L**
0	Dibenzo(a,h)anthracene in **µg/L**
0	Indeno(1,2,3-cd)pyrene in **µg/L**
0.6	Methyl-tert butyl ether in **µg/L**

Notes:

Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approved
Saltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry
Discharge flow is equal to the design flow or 1 MGD, whichever is less
Only if approved by State as the entry for Q_R; leave 0 if no entry

Saltwater (estuarine and marine): only if approved by the State
Leave 0 if no entry

Freshwater only

pH, temperature, and ammonia required for all discharges
Hardness required for freshwater
Salinity required for saltwater (estuarine and marine)
Metals required for all discharges if present and if dilution factor is > 1
Enter 0 if non-detect or testing not required

if >1 sample, enter maximum
if >10 samples, may enter 95th percentile
Enter 0 if non-detect or testing not required

Dilution Factor	0.0					
A. Inorganics	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
Ammonia	**Report**	mg/L	---			
Chloride	**Report**	µg/L	---			
Total Residual Chlorine	0.2	mg/L	**7.5**	µg/L	50	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	640	µg/L		
Arsenic	**104**	µg/L	36	µg/L		
Cadmium	**10.2**	µg/L	8.9	µg/L		
Chromium III	**323**	µg/L	100.0	µg/L		
Chromium VI	**323**	µg/L	50	µg/L		
Copper	**242**	µg/L	3.7	µg/L		
Iron	**5000**	µg/L	---	µg/L		
Lead	**160**	µg/L	8.5	µg/L		
Mercury	**0.739**	µg/L	1.11	µg/L		
Nickel	**1450**	µg/L	8.3	µg/L		
Selenium	**235.8**	µg/L	71	µg/L		
Silver	**35.1**	µg/L	2.2	µg/L		
Zinc	**420**	µg/L	86	µg/L		
Cyanide	**178**	mg/L	1.0	µg/L	---	µg/L
B. Non-Halogenated VOCs						
Total BTEX	**100**	µg/L	---			
Benzene	**5.0**	µg/L	---			
1,4 Dioxane	**200**	µg/L	---			
Acetone	**7.97**	mg/L	---			
Phenol	**1,080**	µg/L	300	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**		1.6	µg/L		
1,2 Dichlorobenzene	**600**	µg/L	---			
1,3 Dichlorobenzene	**320**	µg/L	---			
1,4 Dichlorobenzene	**5.0**	µg/L	---			
Total dichlorobenzene	**---**	µg/L	---			
1,1 Dichloroethane	**70**	µg/L	---			
1,2 Dichloroethane	**5.0**	µg/L	---			
1,1 Dichloroethylene	**3.2**	µg/L	---			
Ethylene Dibromide	**0.05**	µg/L	---			
Methylene Chloride	**4.6**	µg/L	---			
1,1,1 Trichloroethane	**200**	µg/L	---			
1,1,2 Trichloroethane	**5.0**	µg/L	---			
Trichloroethylene	**5.0**	µg/L	---			
Tetrachloroethylene	**5.0**	µg/L	3.3	µg/L		
cis-1,2 Dichloroethylene	**70**	µg/L	---			
Vinyl Chloride	**2.0**	µg/L	---			
D. Non-Halogenated SVOCs						
Total Phthalates	**190**	µg/L	---	µg/L		
Diethylhexyl phthalate	**101**	µg/L	2.2	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(a)pyrene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(b)fluoranthene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(k)fluoranthene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Chrysene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	**100**	µg/L	---			
Naphthalene	**20**	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	**0.000064**	µg/L	---		0.5	µg/L
Pentachlorophenol	**1.0**	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	**5.0**	mg/L	---			
Ethanol	**Report**	mg/L	---			
Methyl-tert-Butyl Ether	**70**	µg/L	20	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

ATTACHMENT F

CERTIFICATE OF ANALYSIS

Jacob Butterworth
Sage Environmental, Inc.
172 Armistice Boulevard
Pawtucket, RI 02860

RE: Logan - Bond (M948)
ESS Laboratory Work Order Number: 20E0082

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 2:22 pm, May 14, 2020

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: Sage Environmental, Inc.
Client Project ID: Logan - Bond

ESS Laboratory Work Order: 20E0082

SAMPLE RECEIPT

The following samples were received on May 05, 2020 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the 2017 Remediation General Permit under the National Pollutant Discharge Elimination System (NPDES).

ESS Laboratory is unable to achieve the required detection limit of 0.4 mg/L for Ethanol for the RGP permit. We have also been unable to procure a subcontract laboatory that is able to achieve this limit. The data for Ethanol has been reported using our current method reporting limit.

Revision 1 May 14, 2020: This report has been revised to split samples 20E0082-01 and 20E0082-02 into separate reports per the client's request.

Lab Number	Sample Name	Matrix	Analysis
20E0082-02	UNK-101	Ground Water	1664A, 200.7, 200.8, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608.3, 625.1 SIM, 8270D SIM, ASTM D3695, CALC

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond

ESS Laboratory Work Order: 20E0082

PROJECT NARRATIVE

524.2 Volatile Organic Compounds

DE00618-BS1 **Blank Spike recovery is above upper control limit (B+).**
Methyl tert-Butyl Ether (131% @ 70-130%)

625.1(SIM) Semi-Volatile Organic Compounds

20E0082-02 **Surrogate recovery(ies) above upper control limit (S+).**
2,4,6-Tribromophenol (128% @ 15-110%)

D0E0085-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4,6-Tribromophenol (60% @ 20%), Di-n-octylphthalate (24% @ 20%)

DE00602-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Benzo(a)pyrene (24% @ 20%), Benzo(b)fluoranthene (22% @ 20%), Benzo(g,h,i)perylene (21% @ 20%), Benzo(k)fluoranthene (23% @ 20%), Dibenzo(a,h)Anthracene (22% @ 20%), Di-n-octylphthalate (23% @ 20%), Indeno(1,2,3-cd)Pyrene (28% @ 20%)

Classical Chemistry

20E0082-02 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

No other 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: Sage Environmental, Inc.
Client Project ID: Logan - Bond

ESS Laboratory Work Order: 20E0082

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: Sage Environmental, Inc.
Client Project ID: Logan - Bond
Client Sample ID: UNK-101
Date Sampled: 05/05/20 11:45
Percent Solids: N/A

ESS Laboratory Work Order: 20E0082
ESS Laboratory Sample ID: 20E0082-02
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	KJK	05/07/20 18:04	100	10	DE00527
Arsenic	ND (2.5)		3113B		5	KJK	05/06/20 19:04	100	10	DE00527
Cadmium	ND (0.5)		200.8		5	KJK	05/06/20 14:31	100	10	DE00527
Chromium	ND (2.0)		200.7		1	KJK	05/07/20 18:04	100	10	DE00527
Chromium III	ND (10.0)		200.7		1	CCP	05/07/20 18:04	1	1	[CALC]
Copper	ND (2.0)		200.7		1	KJK	05/07/20 18:04	100	10	DE00527
Iron	**128** (10.0)		200.7		1	KJK	05/07/20 18:04	100	10	DE00527
Lead	ND (2.0)		200.7		1	KJK	05/07/20 18:04	100	10	DE00527
Mercury	ND (0.2)		245.1		1	MKS	05/06/20 10:00	20	40	DE00529
Nickel	ND (5.0)		200.7		1	KJK	05/07/20 18:04	100	10	DE00527
Selenium	ND (5.0)		3113B		5	KJK	05/06/20 23:01	100	10	DE00527
Silver	ND (1.0)		200.7		1	KJK	05/07/20 18:04	100	10	DE00527
Total Hardness	**131000** (499)		CALC		10	KJK	05/07/20 18:24	1	1	[CALC]
Zinc	**5.8** (5.0)		200.7		1	KJK	05/07/20 18:04	100	10	DE00527

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond
Client Sample ID: UNK-101
Date Sampled: 05/05/20 11:45
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 20E0082
ESS Laboratory Sample ID: 20E0082-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD

524.2 Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1-Trichloroethane	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
1,1,2-Trichloroethane	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
1,1-Dichloroethane	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
1,1-Dichloroethene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
1,2-Dichlorobenzene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
1,2-Dichloroethane	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
1,3-Dichlorobenzene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
1,4-Dichlorobenzene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Acetone	ND (5.0)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Benzene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Carbon Tetrachloride	ND (0.3)		524.2		1	05/06/20 16:43	D0E0081	DE00618
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Ethylbenzene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Methyl tert-Butyl Ether	**0.6** (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Methylene Chloride	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Naphthalene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Tetrachloroethene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Toluene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Trichloroethene	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Vinyl Chloride	ND (0.2)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Xylene O	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618
Xylene P,M	ND (0.5)		524.2		1	05/06/20 16:43	D0E0081	DE00618

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*94 %*		*80-120*
Surrogate: 4-Bromofluorobenzene	*94 %*		*80-120*

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond
Client Sample ID: UNK-101
Date Sampled: 05/05/20 11:45
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20E0082
ESS Laboratory Sample ID: 20E0082-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC
Prepared: 5/7/20 12:42

608.3 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		608.3		1	05/07/20 19:03		DE00708
Aroclor 1221	ND (0.09)		608.3		1	05/07/20 19:03		DE00708
Aroclor 1232	ND (0.09)		608.3		1	05/07/20 19:03		DE00708
Aroclor 1242	ND (0.09)		608.3		1	05/07/20 19:03		DE00708
Aroclor 1248	ND (0.09)		608.3		1	05/07/20 19:03		DE00708
Aroclor 1254	ND (0.09)		608.3		1	05/07/20 19:03		DE00708
Aroclor 1260	ND (0.09)		608.3		1	05/07/20 19:03		DE00708
Aroclor 1262	ND (0.09)		608.3		1	05/07/20 19:03		DE00708
Aroclor 1268	ND (0.09)		608.3		1	05/07/20 19:03		DE00708

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*78 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*77 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*77 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*89 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond
Client Sample ID: UNK-101
Date Sampled: 05/05/20 11:45
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20E0082
ESS Laboratory Sample ID: 20E0082-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 5/6/20 17:06

625.1(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acenaphthene	ND (0.19)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Acenaphthylene	ND (0.19)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Anthracene	ND (0.19)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Benzo(a)anthracene	ND (0.05)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Benzo(a)pyrene	ND (0.05)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Benzo(b)fluoranthene	ND (0.05)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Benzo(g,h,i)perylene	ND (0.19)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Benzo(k)fluoranthene	ND (0.05)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
bis(2-Ethylhexyl)phthalate	ND (2.34)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Butylbenzylphthalate	ND (2.34)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Chrysene	ND (0.05)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Dibenzo(a,h)Anthracene	ND (0.05)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Diethylphthalate	ND (2.34)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Dimethylphthalate	ND (2.34)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Di-n-butylphthalate	ND (2.34)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Di-n-octylphthalate	ND (2.34)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Fluoranthene	ND (0.19)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Fluorene	ND (0.19)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Indeno(1,2,3-cd)Pyrene	ND (0.05)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Naphthalene	ND (0.19)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Pentachlorophenol	ND (0.84)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Phenanthrene	ND (0.19)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602
Pyrene	ND (0.19)		625.1 SIM		1	05/06/20 22:27	D0E0085	DE00602

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*59 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*128 %*	*S+*	*15-110*
Surrogate: 2-Fluorobiphenyl	*77 %*		*30-130*
Surrogate: Nitrobenzene-d5	*92 %*		*30-130*
Surrogate: p-Terphenyl-d14	*111 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond
Client Sample ID: UNK-101
Date Sampled: 05/05/20 11:45
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 20E0082
ESS Laboratory Sample ID: 20E0082-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 5/6/20 15:45

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	05/07/20 3:56	D0E0092	DE00633

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*86 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond
Client Sample ID: UNK-101
Date Sampled: 05/05/20 11:45
Percent Solids: N/A

ESS Laboratory Work Order: 20E0082
ESS Laboratory Sample ID: 20E0082-02
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	**0.28** (0.10)		350.1		1	JLK	05/07/20 16:17	mg/L	DE00631
Chloride	**61.3** (5.0)		300.0		10	EEM	05/06/20 16:46	mg/L	DE00615
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	CCP	05/05/20 19:36	ug/L	DE00519
Phenols	ND (50)		420.1		1	EEM	05/07/20 14:00	ug/L	DE00719
Total Cyanide	ND (5.00)		4500 CN CE		1	EEM	05/07/20 11:30	ug/L	DE00717
Total Petroleum Hydrocarbon	ND (5)		1664A		1	LAB	05/07/20 14:10	mg/L	DE00609
Total Residual Chlorine	ND (20.0)		4500Cl D		1	CCP	05/05/20 18:08	ug/L	DE00518
Total Suspended Solids	ND (5)		2540D		1	CCP	05/05/20 18:19	mg/L	DE00514

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond
Client Sample ID: UNK-101
Date Sampled: 05/05/20 11:45
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 20E0082
ESS Laboratory Sample ID: 20E0082-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: CAD
Prepared: 5/7/20 7:00

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2-Dibromo-3-Chloropropane	ND (0.015)		504.1		1	05/07/20 10:58		DE00722
1,2-Dibromoethane	ND (0.015)		504.1		1	05/07/20 10:58		DE00722

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*99 %*		*30-150*
Surrogate: Pentachloroethane [2C]	*98 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond
Client Sample ID: UNK-101
Date Sampled: 05/05/20 11:45
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 20E0082
ESS Laboratory Sample ID: 20E0082-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: VSC
Prepared: 5/6/20 7:30

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	VSC	05/06/20 12:38		DE00614

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond

ESS Laboratory Work Order: 20E0082

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DE00527 - 3005A/200.7										
Blank										
Antimony	ND	10.0	ug/L							
Calcium	ND	0.020	mg/L							
Chromium	ND	2.0	ug/L							
Copper	ND	2.0	ug/L							
Iron	ND	10.0	ug/L							
Lead	ND	2.0	ug/L							
Magnesium	ND	0.020	mg/L							
Nickel	ND	5.0	ug/L							
Silver	ND	1.0	ug/L							
Zinc	ND	5.0	ug/L							
Blank										
Cadmium	ND	0.5	ug/L							
Blank										
Arsenic	ND	0.5	ug/L							
Selenium	ND	1.0	ug/L							
LCS										
Antimony	52.1	10.0	ug/L	50.00		104	85-115			
Chromium	48.8	2.0	ug/L	50.00		98	85-115			
Copper	50.7	2.0	ug/L	50.00		101	85-115			
Iron	251	10.0	ug/L	250.0		100	85-115			
Lead	51.9	2.0	ug/L	50.00		104	85-115			
Nickel	50.6	5.0	ug/L	50.00		101	85-115			
Silver	24.5	1.0	ug/L	25.00		98	85-115			
Zinc	51.4	5.0	ug/L	50.00		103	85-115			
LCS										
Arsenic	47.2	12.5	ug/L	50.00		94	85-115			
Selenium	88.7	25.0	ug/L	100.0		89	85-115			
LCS Dup										
Silver	25.3	1.0	ug/L	25.00		101	85-115	3	20	
LCS Dup										
Cadmium	22.5	2.5	ug/L	25.00		90	85-115	5	20	
Batch DE00529 - 245.1/7470A										
Blank										
Mercury	ND	0.2	ug/L							
LCS										
Mercury	5.3	0.2	ug/L	6.042		87	85-115			
LCS Dup										
Mercury	5.5	0.2	ug/L	6.042		92	85-115	5	20	
524.2 Volatile Organic Compounds										
Batch DE00618 - 524.2										

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond

ESS Laboratory Work Order: 20E0082

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch DE00618 - 524.2										
Blank										
1,1,1-Trichloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	0.5	ug/L							
1,1-Dichloroethane	ND	0.5	ug/L							
1,1-Dichloroethene	ND	0.5	ug/L							
1,2-Dichlorobenzene	ND	0.5	ug/L							
1,2-Dichloroethane	ND	0.5	ug/L							
1,3-Dichlorobenzene	ND	0.5	ug/L							
1,4-Dichlorobenzene	ND	0.5	ug/L							
Acetone	ND	5.0	ug/L							
Benzene	ND	0.5	ug/L							
Carbon Tetrachloride	ND	0.3	ug/L							
cis-1,2-Dichloroethene	ND	0.5	ug/L							
Ethylbenzene	ND	0.5	ug/L							
Methyl tert-Butyl Ether	ND	0.5	ug/L							
Methylene Chloride	ND	0.5	ug/L							
Naphthalene	ND	0.5	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tertiary-butyl Alcohol	ND	25.0	ug/L							
Tetrachloroethene	ND	0.5	ug/L							
Toluene	ND	0.5	ug/L							
Trichloroethene	ND	0.5	ug/L							
Vinyl Chloride	ND	0.2	ug/L							
Xylene O	ND	0.5	ug/L							
Xylene P,M	ND	0.5	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*4.99*		ug/L	*5.000*		*100*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.83*		ug/L	*5.000*		*97*	*80-120*			
LCS										
1,1,1-Trichloroethane	9.3	0.5	ug/L	10.00		93	70-130			
1,1,2-Trichloroethane	11.9	0.5	ug/L	10.00		119	70-130			
1,1-Dichloroethane	12.6	0.5	ug/L	10.00		126	70-130			
1,1-Dichloroethene	10.1	0.5	ug/L	10.00		101	70-130			
1,2-Dichlorobenzene	10.9	0.5	ug/L	10.00		109	70-130			
1,2-Dichloroethane	11.3	0.5	ug/L	10.00		113	70-130			
1,3-Dichlorobenzene	10.6	0.5	ug/L	10.00		106	70-130			
1,4-Dichlorobenzene	10.3	0.5	ug/L	10.00		103	70-130			
Acetone	52.8	5.0	ug/L	50.00		106	70-130			
Benzene	12.3	0.5	ug/L	10.00		123	70-130			
Carbon Tetrachloride	10.2	0.3	ug/L	10.00		102	70-130			
cis-1,2-Dichloroethene	11.2	0.5	ug/L	10.00		112	70-130			
Ethylbenzene	10.4	0.5	ug/L	10.00		104	70-130			
Methyl tert-Butyl Ether	13.1	0.5	ug/L	10.00		131	70-130			B+
Methylene Chloride	11.1	0.5	ug/L	10.00		111	70-130			
Naphthalene	10.9	0.5	ug/L	10.00		109	70-130			
Tertiary-amyl methyl ether	11.6	1.0	ug/L	10.00		116	70-130			

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Client Name: Sage Environmental, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch DE00618 - 524.2										
Tertiary-butyl Alcohol	53.9	25.0	ug/L	50.00		108	70-130			
Tetrachloroethene	10.1	0.5	ug/L	10.00		101	70-130			
Toluene	10.8	0.5	ug/L	10.00		108	70-130			
Trichloroethene	10.9	0.5	ug/L	10.00		109	70-130			
Vinyl Chloride	10.3	0.2	ug/L	10.00		103	70-130			
Xylene O	10.5	0.5	ug/L	10.00		105	70-130			
Xylene P,M	20.6	0.5	ug/L	20.00		103	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	*5.20*		ug/L	*5.000*		*104*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.71*		ug/L	*5.000*		*94*	*80-120*			
LCS Dup										
1,1,1-Trichloroethane	9.0	0.5	ug/L	10.00		90	70-130	3	20	
1,1,2-Trichloroethane	10.9	0.5	ug/L	10.00		109	70-130	9	20	
1,1-Dichloroethane	11.5	0.5	ug/L	10.00		115	70-130	10	20	
1,1-Dichloroethene	9.0	0.5	ug/L	10.00		90	70-130	12	20	
1,2-Dichlorobenzene	9.4	0.5	ug/L	10.00		94	70-130	14	20	
1,2-Dichloroethane	10.4	0.5	ug/L	10.00		104	70-130	8	20	
1,3-Dichlorobenzene	9.1	0.5	ug/L	10.00		91	70-130	15	20	
1,4-Dichlorobenzene	9.2	0.5	ug/L	10.00		92	70-130	11	20	
Acetone	43.8	5.0	ug/L	50.00		88	70-130	19	20	
Benzene	11.4	0.5	ug/L	10.00		114	70-130	7	20	
Carbon Tetrachloride	9.3	0.3	ug/L	10.00		93	70-130	8	20	
cis-1,2-Dichloroethene	10.0	0.5	ug/L	10.00		100	70-130	11	20	
Ethylbenzene	9.4	0.5	ug/L	10.00		94	70-130	10	20	
Methyl tert-Butyl Ether	11.2	0.5	ug/L	10.00		112	70-130	16	20	
Methylene Chloride	9.6	0.5	ug/L	10.00		96	70-130	15	20	
Naphthalene	10.3	0.5	ug/L	10.00		103	70-130	5	20	
Tertiary-amyl methyl ether	10.5	1.0	ug/L	10.00		105	70-130	10	20	
Tertiary-butyl Alcohol	48.7	25.0	ug/L	50.00		97	70-130	10	25	
Tetrachloroethene	9.6	0.5	ug/L	10.00		96	70-130	5	20	
Toluene	9.4	0.5	ug/L	10.00		94	70-130	13	20	
Trichloroethene	9.9	0.5	ug/L	10.00		99	70-130	9	20	
Vinyl Chloride	9.1	0.2	ug/L	10.00		91	70-130	13	20	
Xylene O	9.5	0.5	ug/L	10.00		95	70-130	10	20	
Xylene P,M	19.3	0.5	ug/L	20.00		96	70-130	7	20	
Surrogate: 1,2-Dichlorobenzene-d4	*4.82*		ug/L	*5.000*		*96*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.42*		ug/L	*5.000*		*88*	*80-120*			
608.3 Polychlorinated Biphenyls (PCB)										
Batch DE00708 - 3510C										
Blank										
Aroclor 1016	ND	0.10	ug/L							
Aroclor 1016 [2C]	ND	0.10	ug/L							
Aroclor 1221	ND	0.10	ug/L							
Aroclor 1221 [2C]	ND	0.10	ug/L							
Aroclor 1232	ND	0.10	ug/L							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
608.3 Polychlorinated Biphenyls (PCB)										
Batch DE00708 - 3510C										
Aroclor 1232 [2C]	ND	0.10	ug/L							
Aroclor 1242	ND	0.10	ug/L							
Aroclor 1242 [2C]	ND	0.10	ug/L							
Aroclor 1248	ND	0.10	ug/L							
Aroclor 1248 [2C]	ND	0.10	ug/L							
Aroclor 1254	ND	0.10	ug/L							
Aroclor 1254 [2C]	ND	0.10	ug/L							
Aroclor 1260	ND	0.10	ug/L							
Aroclor 1260 [2C]	ND	0.10	ug/L							
Aroclor 1262	ND	0.10	ug/L							
Aroclor 1262 [2C]	ND	0.10	ug/L							
Aroclor 1268	ND	0.10	ug/L							
Aroclor 1268 [2C]	ND	0.10	ug/L							
Surrogate: Decachlorobiphenyl	*0.0303*		ug/L	*0.05000*		*61*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0302*		ug/L	*0.05000*		*60*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0269*		ug/L	*0.05000*		*54*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0323*		ug/L	*0.05000*		*65*	*30-150*			
LCS										
Aroclor 1016	0.84	0.10	ug/L	1.000		84	50-140			
Aroclor 1016 [2C]	0.84	0.10	ug/L	1.000		84	50-140			
Aroclor 1260	0.85	0.10	ug/L	1.000		85	1-164			
Aroclor 1260 [2C]	0.86	0.10	ug/L	1.000		86	1-164			
Surrogate: Decachlorobiphenyl	*0.0372*		ug/L	*0.05000*		*74*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0368*		ug/L	*0.05000*		*74*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0387*		ug/L	*0.05000*		*77*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0420*		ug/L	*0.05000*		*84*	*30-150*			
LCS Dup										
Aroclor 1016	0.83	0.10	ug/L	1.000		83	50-140	1	36	
Aroclor 1016 [2C]	0.83	0.10	ug/L	1.000		83	50-140	1	36	
Aroclor 1260	0.91	0.10	ug/L	1.000		91	1-164	7	38	
Aroclor 1260 [2C]	0.93	0.10	ug/L	1.000		93	1-164	7	38	
Surrogate: Decachlorobiphenyl	*0.0423*		ug/L	*0.05000*		*85*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0428*		ug/L	*0.05000*		*86*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0348*		ug/L	*0.05000*		*70*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0379*		ug/L	*0.05000*		*76*	*30-150*			
625.1(SIM) Semi-Volatile Organic Compounds										
Batch DE00602 - 3510C										
Blank										
Acenaphthene	ND	0.20	ug/L							
Acenaphthylene	ND	0.20	ug/L							
Anthracene	ND	0.20	ug/L							

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Client Name: Sage Environmental, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625.1(SIM) Semi-Volatile Organic Compounds										
Batch DE00602 - 3510C										
Benzo(a)anthracene	ND	0.05	ug/L							
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
bis(2-Ethylhexyl)phthalate	ND	2.50	ug/L							
Butylbenzylphthalate	ND	2.50	ug/L							
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							
Diethylphthalate	ND	2.50	ug/L							
Dimethylphthalate	ND	2.50	ug/L							
Di-n-butylphthalate	ND	2.50	ug/L							
Di-n-octylphthalate	ND	2.50	ug/L							
Fluoranthene	ND	0.20	ug/L							
Fluorene	ND	0.20	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	0.05	ug/L							
Naphthalene	ND	0.20	ug/L							
Pentachlorophenol	ND	0.90	ug/L							
Phenanthrene	ND	0.20	ug/L							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*0.992*		ug/L	*2.500*		*40*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.73*		ug/L	*3.750*		*99*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.56*		ug/L	*2.500*		*62*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.13*		ug/L	*2.500*		*85*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.56*		ug/L	*2.500*		*102*	*30-130*			
LCS										
Acenaphthene	2.97	0.20	ug/L	4.000		74	40-140			
Acenaphthylene	3.29	0.20	ug/L	4.000		82	40-140			
Anthracene	3.61	0.20	ug/L	4.000		90	40-140			
Benzo(a)anthracene	3.56	0.05	ug/L	4.000		89	40-140			
Benzo(a)pyrene	3.81	0.05	ug/L	4.000		95	40-140			
Benzo(b)fluoranthene	3.94	0.05	ug/L	4.000		99	40-140			
Benzo(g,h,i)perylene	3.41	0.20	ug/L	4.000		85	40-140			
Benzo(k)fluoranthene	3.50	0.05	ug/L	4.000		88	40-140			
bis(2-Ethylhexyl)phthalate	4.61	2.50	ug/L	4.000		115	40-140			
Butylbenzylphthalate	4.54	2.50	ug/L	4.000		113	40-140			
Chrysene	3.72	0.05	ug/L	4.000		93	40-140			
Dibenzo(a,h)Anthracene	3.46	0.05	ug/L	4.000		86	40-140			
Diethylphthalate	3.93	2.50	ug/L	4.000		98	40-140			
Dimethylphthalate	3.87	2.50	ug/L	4.000		97	40-140			
Di-n-butylphthalate	4.15	2.50	ug/L	4.000		104	40-140			
Di-n-octylphthalate	4.30	2.50	ug/L	4.000		108	40-140			
Fluoranthene	4.15	0.20	ug/L	4.000		104	40-140			
Fluorene	3.45	0.20	ug/L	4.000		86	40-140			
Indeno(1,2,3-cd)Pyrene	3.75	0.05	ug/L	4.000		94	40-140			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625.1(SIM) Semi-Volatile Organic Compounds										
Batch DE00602 - 3510C										
Naphthalene	2.33	0.20	ug/L	4.000		58	40-140			
Pentachlorophenol	2.75	0.90	ug/L	4.000		69	30-130			
Phenanthrene	3.52	0.20	ug/L	4.000		88	40-140			
Pyrene	4.03	0.20	ug/L	4.000		101	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.51*		ug/L	*2.500*		*60*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.32*		ug/L	*3.750*		*89*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.98*		ug/L	*2.500*		*79*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.98*		ug/L	*2.500*		*79*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.57*		ug/L	*2.500*		*103*	*30-130*			
LCS Dup										
Acenaphthene	3.11	0.20	ug/L	4.000		78	40-140	5	20	
Acenaphthylene	3.45	0.20	ug/L	4.000		86	40-140	5	20	
Anthracene	3.63	0.20	ug/L	4.000		91	40-140	0.5	20	
Benzo(a)anthracene	3.09	0.05	ug/L	4.000		77	40-140	14	20	
Benzo(a)pyrene	3.01	0.05	ug/L	4.000		75	40-140	24	20	D+
Benzo(b)fluoranthene	3.16	0.05	ug/L	4.000		79	40-140	22	20	D+
Benzo(g,h,i)perylene	2.75	0.20	ug/L	4.000		69	40-140	21	20	D+
Benzo(k)fluoranthene	2.77	0.05	ug/L	4.000		69	40-140	23	20	D+
bis(2-Ethylhexyl)phthalate	3.96	2.50	ug/L	4.000		99	40-140	15	20	
Butylbenzylphthalate	3.99	2.50	ug/L	4.000		100	40-140	13	20	
Chrysene	3.23	0.05	ug/L	4.000		81	40-140	14	20	
Dibenzo(a,h)Anthracene	2.77	0.05	ug/L	4.000		69	40-140	22	20	D+
Diethylphthalate	4.06	2.50	ug/L	4.000		101	40-140	3	20	
Dimethylphthalate	4.09	2.50	ug/L	4.000		102	40-140	6	20	
Di-n-butylphthalate	4.28	2.50	ug/L	4.000		107	40-140	3	20	
Di-n-octylphthalate	3.42	2.50	ug/L	4.000		85	40-140	23	20	D+
Fluoranthene	4.14	0.20	ug/L	4.000		103	40-140	0.2	20	
Fluorene	3.61	0.20	ug/L	4.000		90	40-140	4	20	
Indeno(1,2,3-cd)Pyrene	2.84	0.05	ug/L	4.000		71	40-140	28	20	D+
Naphthalene	2.41	0.20	ug/L	4.000		60	40-140	3	20	
Pentachlorophenol	2.86	0.90	ug/L	4.000		71	30-130	4	20	
Phenanthrene	3.48	0.20	ug/L	4.000		87	40-140	0.9	20	
Pyrene	3.53	0.20	ug/L	4.000		88	40-140	13	20	
Surrogate: 1,2-Dichlorobenzene-d4	*1.35*		ug/L	*2.500*		*54*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.33*		ug/L	*3.750*		*89*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.93*		ug/L	*2.500*		*77*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.93*		ug/L	*2.500*		*77*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.07*		ug/L	*2.500*		*83*	*30-130*			
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch DE00633 - 3535A										
Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	*2.50*		ug/L	*5.000*		*50*	*15-115*			
LCS										

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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 DE00633 - 3535A										
1,4-Dioxane	8.24	0.250	ug/L	10.00		82	40-140			
Surrogate: 1,4-Dioxane-d8	*2.74*		ug/L	*5.000*		*55*	*15-115*			
LCS Dup										
1,4-Dioxane	9.33	0.250	ug/L	10.00		93	40-140	12	20	
Surrogate: 1,4-Dioxane-d8	*2.81*		ug/L	*5.000*		*56*	*15-115*			
Classical Chemistry										
Batch DE00514 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	86		mg/L	90.70		95	80-120			
Batch DE00518 - General Preparation										
Blank										
Total Residual Chlorine	ND	20.0	ug/L							
LCS										
Total Residual Chlorine	1.30		mg/L	1.300		100	85-115			
Batch DE00519 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	497	10.0	ug/L	499.8		99	90-110			
LCS Dup										
Hexavalent Chromium	507	10.0	ug/L	499.8		102	90-110	2	20	
Batch DE00609 - General Preparation										
Blank										
Total Petroleum Hydrocarbon	ND	5	mg/L							
LCS										
Total Petroleum Hydrocarbon	16	5	mg/L	19.38		80	66-114			
Batch DE00615 - General Preparation										
Blank										
Chloride	ND	0.5	mg/L							
LCS										
Chloride	9.7		mg/L	10.00		97	90-110			
Batch DE00631 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	1.00	0.10	mg/L	0.9994		100	80-120			
Batch DE00717 - TCN Prep										

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch DE00717 - TCN Prep										
Blank										
Total Cyanide	ND	5.00	ug/L							
LCS										
Total Cyanide	19.8	5.00	ug/L	20.06		99	90-110			
LCS										
Total Cyanide	148	5.00	ug/L	150.4		98	90-110			
LCS Dup										
Total Cyanide	148	5.00	ug/L	150.4		99	90-110	0.2	20	
Batch DE00719 - General Preparation										
Blank										
Phenols	ND	50	ug/L							
LCS										
Phenols	985	50	ug/L	1000		99	80-120			
504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane										
Batch DE00722 - 504/8011										
Blank										
1,2-Dibromo-3-Chloropropane	ND	0.015	ug/L							
1,2-Dibromo-3-Chloropropane [2C]	ND	0.015	ug/L							
1,2-Dibromoethane	ND	0.015	ug/L							
1,2-Dibromoethane [2C]	ND	0.015	ug/L							
Surrogate: Pentachloroethane	*0.148*		ug/L	*0.2000*		*74*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.147*		ug/L	*0.2000*		*74*	*30-150*			
LCS										
1,2-Dibromo-3-Chloropropane	0.074	0.015	ug/L	0.08000		92	70-130			
1,2-Dibromo-3-Chloropropane [2C]	0.064	0.015	ug/L	0.08000		80	70-130			
1,2-Dibromoethane	0.070	0.015	ug/L	0.08000		88	70-130			
1,2-Dibromoethane [2C]	0.065	0.015	ug/L	0.08000		81	70-130			
Surrogate: Pentachloroethane	*0.0786*		ug/L	*0.2000*		*39*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.0729*		ug/L	*0.2000*		*36*	*30-150*			
LCS										
1,2-Dibromo-3-Chloropropane	0.227	0.015	ug/L	0.2000		114	70-130			
1,2-Dibromo-3-Chloropropane [2C]	0.197	0.015	ug/L	0.2000		99	70-130			
1,2-Dibromoethane	0.195	0.015	ug/L	0.2000		98	70-130			
1,2-Dibromoethane [2C]	0.185	0.015	ug/L	0.2000		93	70-130			
Surrogate: Pentachloroethane	*0.216*		ug/L	*0.2000*		*108*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.224*		ug/L	*0.2000*		*112*	*30-150*			
Alcohol Scan by GC/FID										
Batch DE00614 - No Prep										

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond

ESS Laboratory Work Order: 20E0082

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Alcohol Scan by GC/FID										
Batch DE00614 - No Prep										
Blank										
Ethanol	ND	10	mg/L							
LCS										
Ethanol	761	10	mg/L	951.9		80	60-140			
LCS Dup										
Ethanol	755	10	mg/L	951.9		79	60-140	0.8	30	

CERTIFICATE OF ANALYSIS

Client Name: Sage Environmental, Inc.
Client Project ID: Logan - Bond

ESS Laboratory Work Order: 20E0082

Notes and Definitions

U	Analyte included in the analysis, but not detected
S+	Surrogate recovery(ies) above upper control limit (S+).
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B+	Blank Spike recovery is above upper control limit (B+).
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: Sage Environmental, Inc.
Client Project ID: Logan - Bond

ESS Laboratory Work Order: 20E0082

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: Sage Environmental, Inc. - ML

Shipped/Delivered Via: Client

ESS Project ID: 20E0082
Date Received: 5/5/2020
Project Due Date: 5/8/2020
Days for Project: 3 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: 4.1 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)
1	38860	Yes	N/A	Yes	1L Amber	NP	
1	38861	Yes	N/A	Yes	1L Amber	NP	
1	38862	Yes	N/A	Yes	1L Amber	NP	
1	38863	Yes	N/A	Yes	1L Amber	NP	
1	38864	Yes	N/A	Yes	1L Amber	NP	
1	38865	Yes	N/A	Yes	1L Amber	NP	
1	38872	Yes	N/A	Yes	1L Amber	H2SO4	
1	38873	Yes	N/A	Yes	1L Amber	H2SO4	
1	38876	Yes	N/A	Yes	1L Poly	NP	
1	38878	Yes	N/A	Yes	500 mL Poly	H2SO4	
1	38880	Yes	N/A	Yes	500 mL Poly	HNO3	
1	38882	Yes	N/A	Yes	250 mL Poly	HNO3	
1	38884	Yes	N/A	Yes	250 mL Poly	NaOH	**pH>12 JA**
1	38886	Yes	N/A	Yes	250 mL Poly	NP	
1	38888	Yes	No	Yes	VOA Vial	HCl	
1	38889	Yes	No	Yes	VOA Vial	HCl	
1	38890	Yes	No	Yes	VOA Vial	HCl	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Sage Environmental, Inc. - ML

ESS Project ID: 20E0082
Date Received: 5/5/2020

1	38891	Yes	No	Yes	VOA Vial	HCl	
1	38892	Yes	No	Yes	VOA Vial	HCl	
1	38893	Yes	No	Yes	VOA Vial	HCl	
1	38900	Yes	No	Yes	VOA Vial	NP	
2	38866	Yes	N/A	Yes	1L Amber	NP	
2	38867	Yes	N/A	Yes	1L Amber	NP	
2	38868	Yes	N/A	Yes	1L Amber	NP	
2	38869	Yes	N/A	Yes	1L Amber	NP	
2	38870	Yes	N/A	Yes	1L Amber	NP	
2	38871	Yes	N/A	Yes	1L Amber	NP	
2	38874	Yes	N/A	Yes	1L Amber	H2SO4	
2	38875	Yes	N/A	Yes	1L Amber	H2SO4	
2	38877	Yes	N/A	Yes	1L Poly	NP	
2	38879	Yes	N/A	Yes	500 mL Poly	H2SO4	
2	38881	Yes	N/A	Yes	500 mL Poly	HNO3	
2	38883	Yes	N/A	Yes	250 mL Poly	HNO3	
2	38885	Yes	N/A	Yes	250 mL Poly	NaOH	**pH>12 JA**
2	38887	Yes	N/A	Yes	250 mL Poly	NP	
2	38894	Yes	No	Yes	VOA Vial	HCl	
2	38895	Yes	No	Yes	VOA Vial	HCl	
2	38896	Yes	No	Yes	VOA Vial	HCl	
2	38897	Yes	No	Yes	VOA Vial	HCl	
2	38898	Yes	No	Yes	VOA Vial	HCl	
2	38899	Yes	No	Yes	VOA Vial	HCl	
2	38901	Yes	No	Yes	VOA Vial	NP	

2nd Review

Initials

Were all containers scanned into storage/lab? Yes / No
Are barcode labels on correct containers? Yes / No / NA
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

Completed By: _____ Date & Time: 5/5/20 1739

Reviewed By: _____ Date & Time: 5/5/20 1743

Delivered By: _____ 5/5/20 1743

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS LAB PROJECT ID: 2E00082

Turn Time ______ Standard Rush 72 hr Approved By: ______

State where samples were collected: (MA) NH

Is this project for: RGP

Reporting Limits -
Discharge into: Fresh Water ☐ Salt Water ☒

Electonic Deliverable Yes ✓ No ___
Format: (Excel) ___ Access ___ (PDF) ___ Other ___

Project Manager: Jacob Butterworth
Company: SAGE Environmental, Inc
Address: 172 Armistice Blvd
Pawtucket, RI

Project #: M948
Project Name: Logan-Bond
PO #: M948

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	RGP Metals Total	RGP Metals Dissolved	**Hardness (Calculation)**	Ethanol ASTM D3695	Chloride 300.0*	Total Cyanide 4500 LL	**TPH 1664**	**TSS 2540D***	**TRC 4500-CL D***	Ammonia 350.1	Tri Cr (Calc. MUST run T. Cr)	**Hex Cr 3500**	**Phenol 420.1**	**RGP VOC Long List 524**	1,4-Dioxane 8270-SIM	EDB 504.1	**RGP SVOC Log List 625-SIM**	PCB 608	Comment #
1	5-5-20	11:00			B107	22	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1,2,3
2	↓	11:45	G	AG	UNK-101	↓	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1,2,3
Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____							4	4	4	1	1	5	3	1	1	3	-	1	3	2	1	2	1	1	
Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA							P	P	P	V	P	P	AG	P	P	P	-	P	AG	V	AG	V	AG	AG	

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present X Yes ___ No
Seals Intact ___ Yes ___ No NA: ✓
Cooler Temperature: 4.1 3.9

Sampled by: [signature]

Comments: 1) RGP Metals include Sb, As, Cd, Cu, Fe, Pb, Ni, Se, Ag and Zn by 200.7/3113B and Hg by 245.1
2) Parameters in **BOLD** have Short hold-time ~~PERMIT ATTACHED~~ 3.) Saltwater discharge Reporting
*** TSS, TRC and Cl taken from the same container**

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	5-5-20 17:10	[signature] 5/5/20 17:17			
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Please E-mail all changes to Chain of Custody in writir

Page 1 of 1

ATTACHMENT G

Steel Tank

Bi-Level

Overview:

Store liquids in confidence with Rain for Rent's 21,000 gallon Steel Bi-level Tank. This mobile tank allows your jobsite to have flexibility in planning your project layout. The Bi-level Tank provides OSHA safe stairways and walkways to make sure your employees are safe when checking water levels or working on the tank. The Bi-level Tank incorporates a center v-sloped floor to drain the contents of the tank to its lowest level. Rain for Rent also offers internally epoxy coated Bi-level Tanks to keep your fluids clean for sensitive environmental applications and provide chemical resistance.

Features:

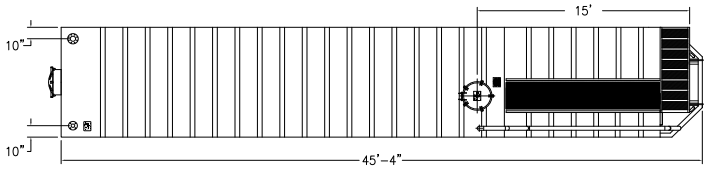
- Vapor Tight Tanks: rated to 16oz/in^2 of pressure and 0.4oz/in^2 of vacuum
- V-drain floor with front and rear 4" 150-lb flanges with lever operated butterfly valves
- OSHA Compliant Stairway
- 1.5" Steel SCH80 level gauge port
- 8" External manifold
- Front 3" Steel SCH40 fill line
- Rear top of tank has a 3" 150-lb flanged port
- Front of tank has (1) 4" 150-lb flanges and (1) 4" Steel SCH40 threaded connection
- Hatch gaskets and valve seats are Buna-N material
- Optional: Internal epoxy coating
- Optional: Steam Coils

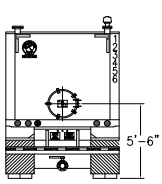
Specs:

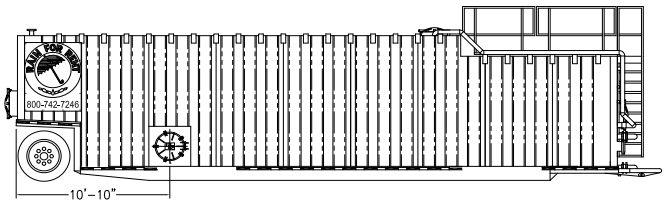
Material	1/4" A36 Steel, Epoxy Coated (Option)
Capacity	21,000-gallons
Manways	Four (4) 22" hatches
Dry weight	26,000-lbs
Footprint (LxWxH)	516" x 96" x 132"

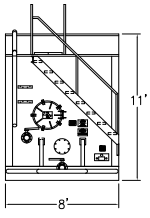
Accessories:

- Radar Level Gauges
- Mechanical Level Gauge
- E-CONTAIN® Spillguard
- SolidGroud® Traction Mats
- PipeStax®
- HoseTrax®
- Suction and Discharge Hose









PUMPS • TANKS • FILTRATION • PIPE • SPILLGUARDS

Liquid Ingenuity®

800-742-7246

rainforrent.com

Sewage and Trash Pump DV100c

Overview:

The 6” suction x 4” discharge self-priming centrifugal DV100c trash pump provides up to a maximum of 1,450 gallons per minute pumping and up to 165 feet of head. This pump is usually mounted on a trailer and features the standard PowerPrime Clean Prime Venturi priming system which allows it to run continuously, unattended and even run dry.

The DV100c is also available sound attenuated.

Features:

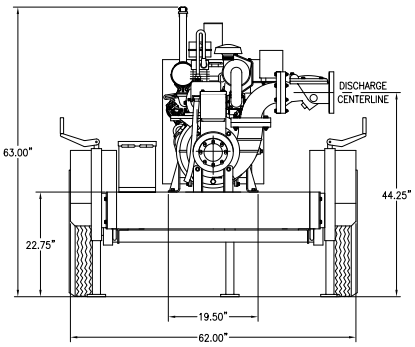
- Continuous self-priming
- Runs dry unattended
- 12 volt, eletric start with auto-start capable control panel
- Flex coupled to diesel engine
- 24-hour minimum capacity fuel tank
- Compressor/venturi automatic priming system
- Cast iron wet end with open impellers
- Replaceable wear plates
- SAE Mounted

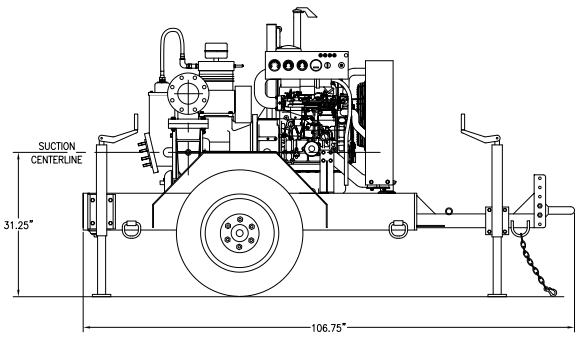
Specs:

Maximum Flow	1,450 GPM
Maximum Head	165 feet
Pump Size	6” x 4”
Maximum Solids Handling	3 inches
Dry weight	2,400lbs.
Footprint: Trailer mounted model	106.75” x 62”
Fuel tank	40 or 60 gallon
Fuel consumption	1.9 gph @ 2,500 RPM

Accessories:

- Spillguard
- Suction and Discharge Hoses
- Fuel Nurse Tank





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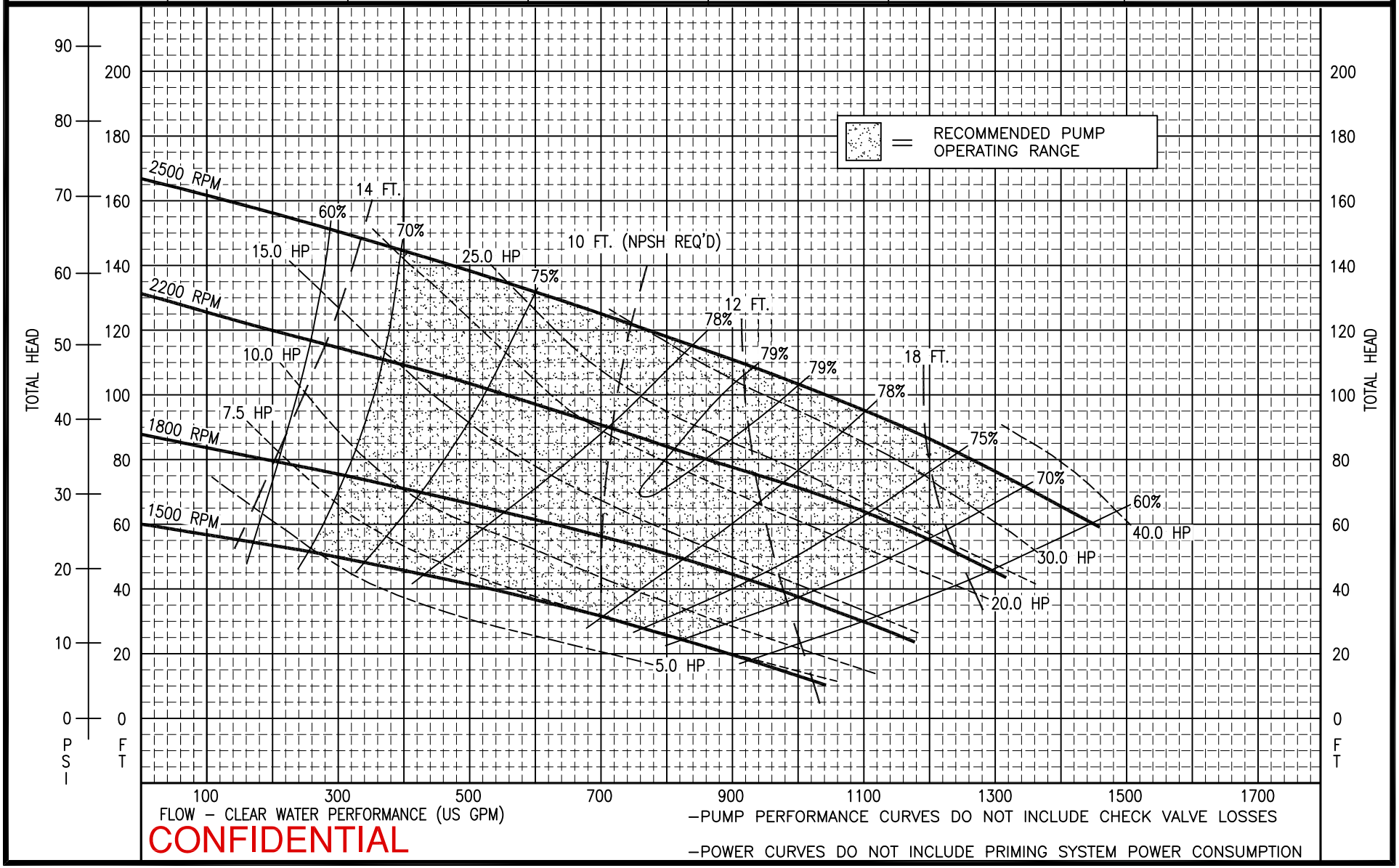
Rain For Rent

CURVE: 01-0133-02-20

PUMP : DV-100c

SUCTION	DISCHARGE	MAX. SPHERE	IMPELLER	IMPELLER	IMPELLER & WEAR RINGS
6"	4"	3"	ENCLOSED	8.25"	CAST IRON



CONFIDENTIAL

-PUMP PERFORMANCE CURVES DO NOT INCLUDE CHECK VALVE LOSSES

-POWER CURVES DO NOT INCLUDE PRIMING SYSTEM POWER CONSUMPTION

BF 400
Up to 400 GPM

Features

- Manifold connections are 6" 150 lb flanges
- Quadruple bag filter
- Bag filter for high solids holding capacity
- Replaceable bag filters from 100 to 1 micron nominal rating
- No moving parts
- Skid mounted

Technical

- Bag filter chambers connect in parallel
- Units are fitted with bleed valves and pressure gauges
- System can stand alone for sediment removal or be used in combination with filter equipment
- Footprint: 62" long x 36" wide x 61" high
- Dry weight: 1,150 lbs.

Material Specifications

- Chambers constructed of 304 Stainless Steel
- Piping constructed of 304 stainless steel
- Each bag filter chamber holds one (1) 7" x 30" double- stitched filter bag
- Maximum operating pressure: 125psi
- Stainless Steel inlet and outlet manifolds

Available Accessories

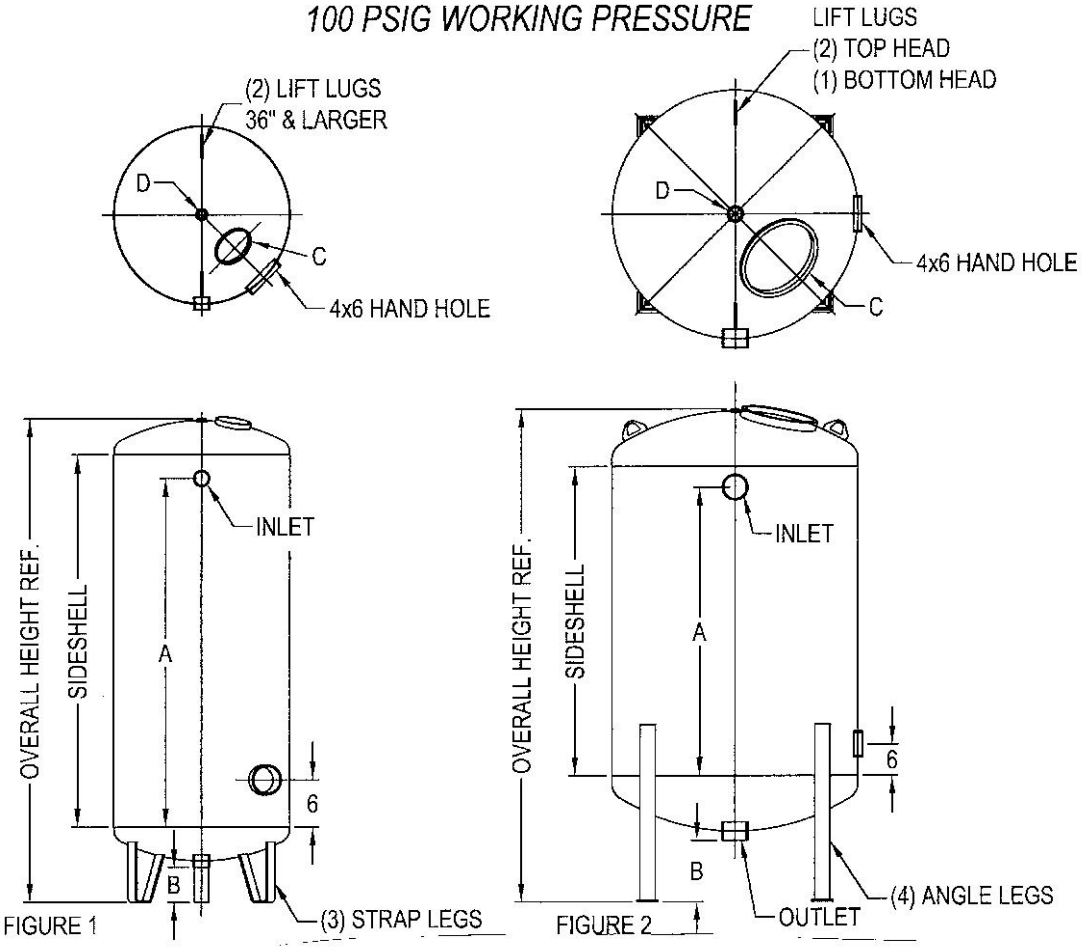
- Power Prime Pumps
- Spill Guard Containment berms
- Stainless Steel 304 and Carbon Steel storage tanks in
- Bi-Level, Mixer, Weir and Manifold configurations
- Polyethylene storage tanks
- Cartridge and bag filters
- HDPE pipe and fittings
- Roll off boxes, dewatering bins and vacuum boxes
- Flow meters and pressure reducing/ sustaining valves
- Aluminum Victaulic pipe and fittings
- Suction and discharge hose

Rain for Rent
P.O. Box 2248
Bakersfield CA 93303
800-742-7246
661-393-1542
FAX 661-393-1542
www.rainforrent.com
info@rainforrent.com

CARBON FILTRATION SYSTEMS INC.

LSHP – 100 PSI Series

EPOXY LINED & PRIMED OR FINISH COATED IN SAFETY BLUE EPOXY
NSF/ANSI STANDARD 61 CERTIFIED LINING
100 PSIG WORKING PRESSURE



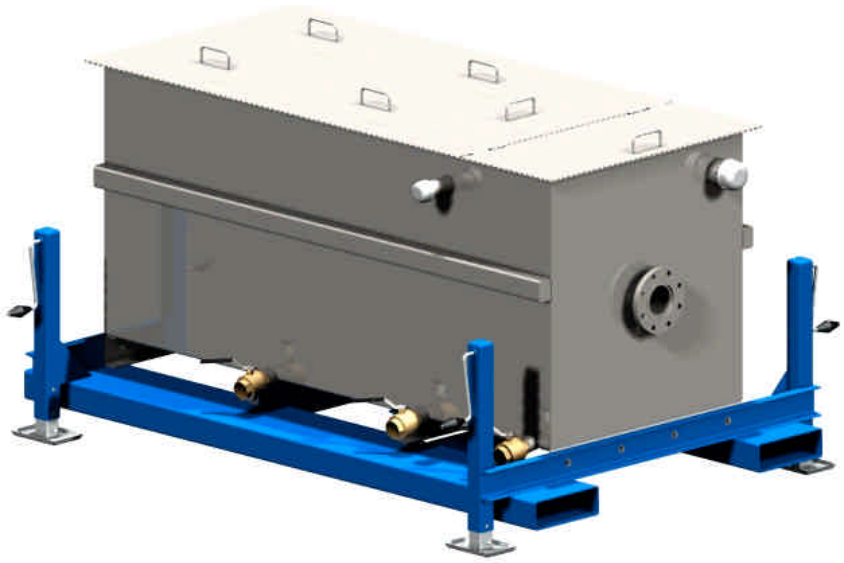
Model	LGAC(lbs.)	Flow Rate(gpm)	Diameter	OAH	Figure	Inlet/Outlet	C	D
LSHP-500	500	25	30”	73”	1	2” NPT	4”x6”	1”
LSHP-1000	1000	50	36”	86”	1	2” NPT	12”x16”	1”
LSHP-2000	2000	100	48”	108”	2	4” NPT	12”x16”	2”
LSHP-3000	3000	150	60”	100”	2	4” NPT	12”x16”	2”
LSHP-5000	5000	250	72”	117”	2	4” FNPT	12”x16”	2”

68 Mill Street · Johnston, Rhode Island 02919 · Phone: (401) 946-7838 or (401) 946-4847 · Fax: (401) 946-9722

OWS-100

Oil Water Separator

- Meets API 421 Specifications



FEATURES

- Removes free and dispersed non-emulsified oil
- Removes settleable solids
- Gravity flow oil skimmer
- Easy cleaning via removable vapor tight lids and 4 bottom drains
- No moving parts
- No power required
- Portable – skid mounted
- Leveling jackstands

TECHNICAL INFORMATION

- Parallel corrugated plate gravity displacement type separator.
- Designed in accordance with API 421 to remove free and dispersed non-emulsified oil and settleable solids
- 3 cubic feet sludge capacity

MATERIAL SPECIFICATIONS

- Chambers constructed of 304 stainless steel
- Coalescing packs are made of a special oil attracting material with ½" media standard
- OWS-100 Requires 6 coalescing packs
  Packs are supplied separately
  Each pack is 4' long x 1' wide x 1' tall
- Inlet and outlet are 4" 150# flanges
- Oil drain is 2" male threaded pipe
- Sludge drains are 2" ball valves, female threaded outlet
- Overflow drain is 3" male threaded pipe
- Separator footprint:
  96" Long x 66" Wide x 52" High
- Shipping Weight – 1,400 lbs. (Skid Mounted)

FLOW RATES ARE BASED UPON SPECIFIC GRAVITY, AS SHOWN BELOW				
SPECIFIC GRAVITY:	**0.7**	**0.85**	**0.9**	**0.95**
FLOW RATE (GPM):	**150**	**100**	**75**	**30**

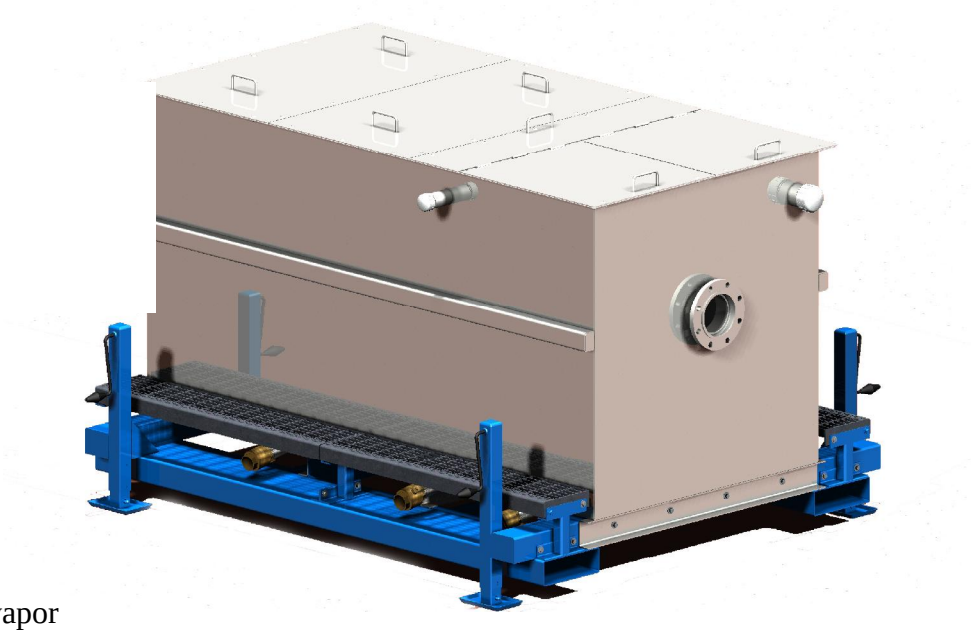
RAIN FOR RENT

Postal Box 2248 • Bakersfield CA 93303
800 742-7246 • 661 399-9124 • FAX 661 393-1542
Internet: www.rainforrent.com

OWS 200

Oil Water Separator

- Meets API 421 Specifications



FEATURES

- Removes free and dispersed non-emulsified oil
- Removes settleable solids
- Gravity flow oil skimmer
- Easy cleaning via removable vapor tight lids and 4 bottom drains
- No moving parts
- No power required
- Portable – skid mounted
- Leveling jackstands

TECHNICAL INFORMATION

- Parallel corrugated plate gravity displacement type separator.
- Designed in accordance with API 421 to remove free and dispersed non-emulsified oil and settleable solids
- 5 cubic feet sludge capacity

MATERIAL SPECIFICATIONS

- Chambers constructed of 304 stainless steel
- Coalescing packs are made of a special oil attracting material with ½" media standard
- OWS 200 requires 12 coalescing packs
  Packs are supplied separately
  Each pack is 4' long x 1' wide x 1' tall
- Inlet and outlet are 6" 150# flanges
- Oil drain is 2" male threaded pipe
- Sludge drains are 2" ball valves, female threaded outlet
- Overflow drain is 3" male threaded pipe
- Separator footprint:
  102" Long x 82" Wide x 64" High
- Dry shipping weight – 2,700 lbs. (Skid Mounted)

FLOW RATES ARE BASED UPON SPECIFIC GRAVITY, AS SHOWN BELOW				
SPECIFIC GRAVITY:	**0.7**	**0.85**	**0.9**	**0.95**
FLOW RATE (GPM):	**300**	**200**	**150**	**60**

RAIN FOR RENT

Postal Box 2248 • Bakersfield CA 93303
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Internet: www.rainforrent.com

HaloKlear®

NATURAL FLOCCULANTS

The best water treatment system for
your business and the environment

DUAL PRODUCT SYSTEM (DPS)

DOBER

WHAT WE DO

HaloKlear products are used to treat storm, industrial and municipal water, including pollutants in construction site runoff, by reversing the process of water contamination through a combination of advanced, environmentally friendly, natural flocculant technologies.

When it comes to handling dirty water, HaloKlear has built its reputation on creating reliable, effective and safe solutions that can solve all kinds of sediment control problems. HaloKlear's Dual Product System (DPS) uses natural flocculants that completely biodegrade through simple enzymatic activity, resulting in no bioaccumulation. The primary active ingredients are commonly used in the dietary supplement and food industries.

The HaloKlear Residual Test Kit is used to ensure excess flocculants are not leaving the site. This knowledge is comforting for regulators, contractors and the general public, who can rest assured that the products are not going to cause harm to the environment.

Most importantly, HaloKlear's DPS has a best-in-class performance and has proven itself under vastly varied conditions around the world. It is used in systems ranging from active treatment for mobile water treatment, semi-passive pumped water incorporating coarse filtration and geotextile bags, and completely passive models, such as bio-filtration and check dams. HaloKlear DPS is designed to give contractors and industries in need of water treatment solutions the essential tool they need to meet state and national discharge regulations, as well as EPA Effluent Limitation Guidelines (ELGs).

WE'VE NEVER KILLED A FISH

Don't just clean the water, clean the environment

Our chemistries are less toxic when water is returned to its natural environment. All of HaloKlear's products exhibit exceptionally low toxicity, and the **Dual Product System** has been proven to have **zero toxicity**.* No bioaccumulation concerns exist when and where HaloKlear products are used, and our products are 100% biodegradable through enzymatic activity.

* Third-party toxicity testing concluded that no fish were killed by the Dual Product System (DPS) when both parts were used in combination of following Best Management Practices.

Clean Water.
Naturally.

A CLEAR ADVANTAGE FOR YOUR OPERATION

We'll help you choose from a portfolio of HaloKlear biobased flocculants—from 100% biodegradable natural flocculants to hybrid flocculants—all of which offer a greener alternative to commodity chemicals.

- ✓ Effective alone or paired with other chemistries
- ✓ Appropriate for active, semi-passive and passive applications
- ✓ Use with existing equipment or as part of a customized product
- ✓ Ensure regulatory compliance with on-site residual testing capabilities

HaloKlear®
NATURAL FLOCCULANTS

DPS PRODUCTS

HaloKlear Dry and Liquid Formula Flocculants

The **Dual Product System (DPS)** uses biodegradable, natural flocculants that perform on a wide array of soil types and pH ranges. In contrast to other products on the market, the HaloKlear Dual Product System creates dense flocs with great shear strength and a low water content that settle very quickly. Solids can be efficiently removed from the water column – increasing performance and productivity while keeping costs low. In addition, the **HaloKlear DPS** is extremely flexible with a successful track record in active, passive, and semi-passive deployment.

LIQUID DPS SYSTEM

- LBP-2101
- LiquiFloc
- Functions in active treatment systems

DRY DPS SYSTEM

- DBP-2100 socks
- GelFloc socks
- Functions in active semi-passive and passive treatment environments

LOOSE DPS SYSTEM

- MB Kits
- Functions in passive treatment environments

PART ONE

LBP-2101 = Liquid
DBP-2100 = Dry socks
DBP-2100 MB = Loose, dry

PART TWO

LiquiFloc = Liquid
GelFloc = Dry socks
GelFloc MB = Loose, dry

COMPARISONS

VARIABLES	HALOKLEAR DPS	PAMs (POLYACRYLAMIDES) GRANULAR, POWDER & BLOCKS
Soil Types	The HaloKlear Formula works on all construction soil types	Highly soil-specific (100s of different formulations)
Soil Samples	There is no need to send soil samples. The HaloKlear DPS system works on all construction soil types	The majority of soil samples must be collected and shipped to manufacturer's lab for specific polyacrylamide selection, adding time and cost
Dose Rate Calculation	Dose rates can be rapidly determined in the field with the HaloKlear DPS Jar Test Kit	Dose rate calculation must be made by manufacturer after soil sample is received at factory and analyzed, adding time and cost
Organic & Biodegradable	Yes—manufactured from natural occurring flocculants, which degrade through enzymatic activity	Yes—derived from petroleum-based products
Residual Testing	HaloKlear offers an affordable residual test kit, which can be used in the field for immediate results	Laboratory analysis is needed, which can take several days, adding time and cost
Application Range	HaloKlear DPS can be applied on passive, semi-passive, and active treatment systems (Sand-Media, Bags, Cartridges, Screens, etc.). Active treatment systems will benefit due to the type of flock generated (stable and high sheer strength), its ability to retain finer solids, retain a lower percentage of water (i.e. drier solids), and easily be backwashed from the filter	Polyacrylamides can only be used with passive and semi-passive systems and not with active treatment systems, because they will usually produce a gelatinous flock which contains a high percentage of water and will stick/bind to the filtration media (i.e. Sand, Screens, etc.) making it difficult to backwash and clean

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APPLICATION METHODS

HaloKlear products achieve significant water quality results in active, semi-passive and passive treatment systems.

HaloKlear DPS "Passive" Treatment Model:

TYPICAL RESULTS: 50-250 NTU

- Acrylamide-free treatment system
- Lowest maintenance requirement
- No mechanized equipment requirement
- Can reduce footprint by up to 50%
- Minimizes or eliminates need for water storage
- Actual flow range dependent on Best Management Practice (BMP) design and frequency/severity of storm events
- Uses natural filtration and settling to reduce costs
- A cost-effective model for meeting EPA & ELG requirements
- Easily applied to new and existing BMPs
- Lowest cost treatment system

The bottle on the far left shows untreated water while the bottle on the right shows water treated with HaloKlear's new Dual Product System. The picture at right shows the "flocked" soil.

HaloKlear®
NATURAL FLOCCULANTS

HaloKlear DPS "Semi-Passive" Treatment Model:

TYPICAL RESULTS: 20-50 NTU

- Delivers consistent results
- Acrylamide-free treatment system
- Low maintenance requirement
- Low mechanized equipment requirement
- Significantly reduces footprint compared to traditional active treatment systems
- Does not require backwashing
- Requires HaloKlear SockMaster™ Manifold kit & pump; rated 100-500 GPM
- Low cost compared to traditional active treatment systems
- May use coarse filtration, settling, or both to improve cost effectiveness
- Plug-in-play a variety of configurations including: BMPs, dewatering bags, and recirculation systems
- May be used in conjunction with passive treatment models
- May involve contaminant and nutrient removal

HaloKlear DPS "Active" Treatment Model:

TYPICAL RESULTS: 10-35 NTU

- Delivers consistent results
- Acrylamide-free treatment system
- Identical footprint to traditional active treatment systems
- Reduced frequency of backwashing compared to traditional active treatment systems
- Actual flow range dependent on mechanized equipment and pumping capabilities
- Can reduce operational costs compared to traditional active treatment systems
- The use of HaloKlear natural flocculants enhances the efficiency of most filtration equipment used in active treatment systems, by aiding the capture of finer solids, reducing the frequency of back-wash, allowing faster settling of particles in settling tanks, and providing solids/contaminants that have a lower percentage of water, which reduces hauling and disposal costs.

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INDUSTRIES

In the field, we all face the same problem – we must return water to the environment that meets discharge guidelines. HaloKlear products are a complete line of cost-effective, innovative products that will meet your needs today. These products are not only safe for the environment, but they have helped our customers solve their discharge problems, while enhancing project economics in industries like:

ACCESSORIES

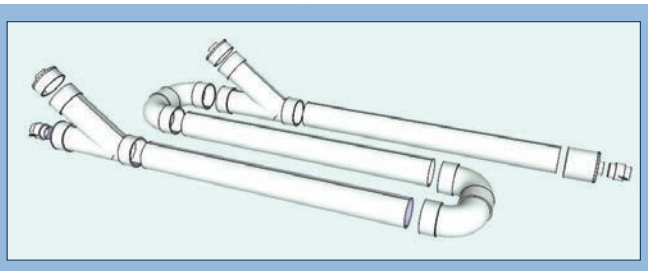
- Convenient
- Economical
- Reliable
- Dependable
- Added Safety Layer

HaloKlear Residual Test Kit

The HaloKlear Residual Test Kit uses proven test methods for detecting the presence of free residual chitosan before it can leave the job site. Compared to other test kits, this kit improves accuracy by up to 25%. You can achieve results without the hassle of using outside labs, while ensuring you are compliant with local and federal discharge regulations.

HaloKlear DPS Jar Test Kit

The HaloKlear DPS Jar Test Kit can be used with the HaloKlear DPS Dose Calculator to determine the proper flocculant dose for your water clarification needs. The HaloKlear DPS Dose Calculator, available for download at www.dober.com/water_treatment/haloklear.php, will provide the total quantity of products required in 275-gal totes, 55-gal drums, flocculant socks and dry powder/flake.



HaloKlear SockMaster Manifold Kit

The HaloKlear SockMaster Manifold Kit, combined with three 10-ft sections of 6-in PVC schedule-40 pipe obtained locally (not included), provides all of the parts required to quickly and easily assemble a complete HaloKlear SockMaster Manifold. The assembled manifold houses the HaloKlear Dual Product System (DPS) sock sets during semi-passive stormwater and wastewater treatment applications. The HaloKlear SockMaster Manifold Kit comes complete with easy to follow assembly instructions and diagram.

ACCREDITATIONS

Water Quality Association Gold Seal

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HaloKlear®
NATURAL FLOCCULANTS

OUR COMMITMENT TO OUR
CUSTOMERS

Additional Strategic Value

- ✓ We provide education and development for your sales team. Our team encourages you to reach out to schedule a joint sales call or request access to our Dober Digital Lab.
- ✓ In addition to your sales team, we provide on-site training and development for your field staff.
  - We treat your sample in our lab, and then work with you to apply our findings to your field site.

SEND US YOUR SAMPLE!

We will work directly with you on-site and in our corporate lab to make sure you have the best possible product and treatment.

11230 Katherine's Crossing | Woodridge, IL 60517

Phone: 630.410.7300 | Toll Free: 800.323.4983

www.dober.com

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Phone 856-881-2345 Fax 856-881-6859
Email: info@inversand.com • www.inversand.com

GREENSANDplus™

Performance Media for Water Filtration

Removes iron, manganese, hydrogen sulfide, arsenic and radium.

GreensandPlus™ is a black filter media used for removing soluble iron, manganese, hydrogen sulfide, arsenic and radium from groundwater supplies.

The manganese dioxide coated surface of GreensandPlus acts as a catalyst in the oxidation reduction reaction of iron and manganese.

The silica sand core of GreensandPlus allows it to withstand waters that are low in silica, TDS and hardness without breakdown.

GreensandPlus is effective at higher operating temperatures and higher differential pressures than standard manganese greensand. Tolerance to higher differential pressure can provide for longer run times between backwashes and a greater margin of safety.

Systems may be designed using either vertical or horizontal pressure filters, as well as gravity filters.

GreensandPlus is a proven technology for iron, manganese, hydrogen sulfide, arsenic and radium removal. Unlike other media, there is no need for extensive preconditioning of filter media or lengthy startup periods during which required water quality may not be met.

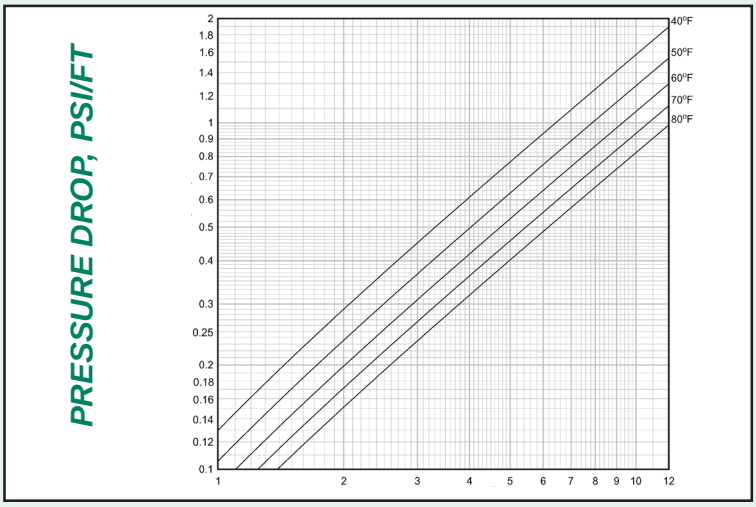
GreensandPlus is an exact replacement for manganese greensand. It can be used in CO or IR applications and requires no changes in backwash rate or times or chemical feeds.

GreensandPlus has the WQA Gold Seal Certification for compliance with NSF/ANSI 61.

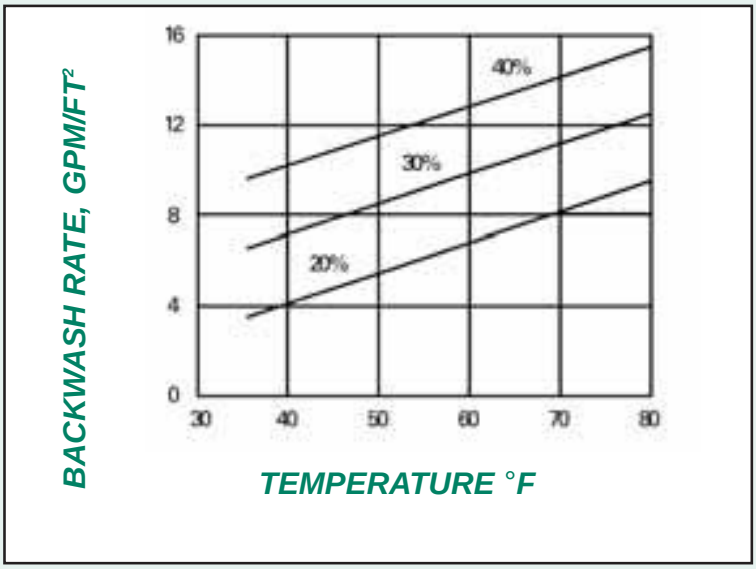
REACH Registration 01-2119452801-43-0020 for import to the EU.

Packaging is available in 1/2 cubic foot bags or 1 metric ton (2,205 lbs) bulk sacks.

GREENSANDPLUS PRESSURE DROP (CLEAN BED)



BED EXPANSION DURING BACKWASHING



PHYSICAL CHARACTERISTICS

Physical Form
Black, nodular granules shipped in a dry form

Apparent Density
88 pounds per cubic foot net (1410.26 kg/m3)

Shipping Weight
90 pounds per cubic foot gross (1442.31 kg/m3)

Specific Gravity
Approximately 2.4

Porosity
Approximately 0.45

Screen Grading (dry)
18 X 60 mesh

Effective Size
0.30 to 0.35 mm

Uniformity Coefficient
Less than 1.60

pH Range
6.2-8.5 (see General Notes)

MaximumT emperature
No limit

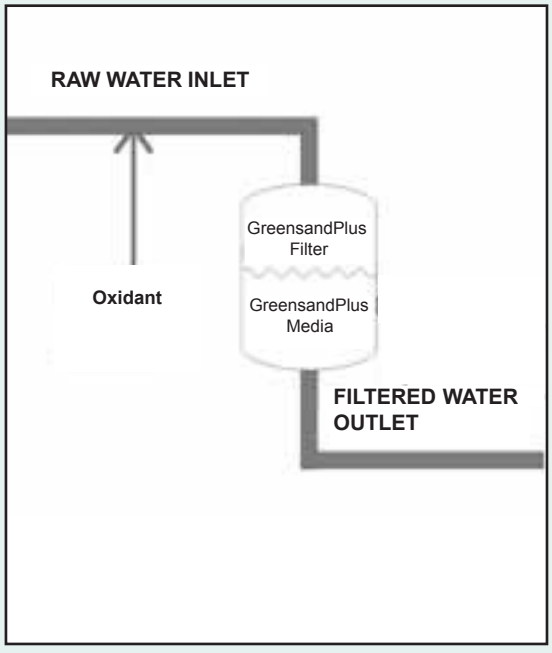
Backwash Rate
Minimum 12 gpm/sq. ft. at 55°F (29.4 m/hr @ 12.78°C) (see expansion chart)

Service Flow Rate
2 -12 gpm/sq. ft (4.9m/hr - 29.4 m/hr)

Minimum Bed Depth
15 inches (381 mm) of each media for dual media beds or 30 inches minimum (762 mm) of GreensandPlus alone.

METHOD OF OPERATION CO

GreensandPlus: Catalytic Oxidation (CO)



Catalytic Oxidation (CO) operation is recommended in applications where iron removal is the main objective in well waters with or without the presence of manganese. This method involves the feeding of a predetermined amount of chlorine (Cl_2) or other strong oxidant directly to the raw water before the GreensandPlus Filter.

Chlorine should be fed at least 10-20 seconds upstream of the filter, or as far upstream of the filter as possible to insure adequate contact time. A free chlorine residual carried through the filter will maintain GreensandPlus in a continuously regenerated condition.

For operation using chlorine, the demand can be estimated as follows:

mg/L Cl_2 = (1 x mg/L Fe) + (3 x mg/L Mn) + (6x mg/L H_2S) + (8 x mg/L NH_3)

SUGGESTED OPERATING CONDITIONS

Bed Type

Dual media: anthracite 15-18 in. (381 mm - 457 mm) and GreensandPlus 15-24 in. (381 mm - 610 mm)

Capacity

700-1200 grains of oxidized iron and manganese/sq.ft. of bed area based on oxidant demand and operation to iron break through or dp limitations.

Backwash

Sufficient rate using treated water to produce 40% bed expansion until waste water is clear, or for 10 minutes, whichever occurs first.

Air/Water Scour

Optional using 0.8-2.0 cfm/sq. ft. (15 m/hr - 7 m/hr) with a simultaneous treated water backwash at 4.0-4.5 gpm/sq. ft. (9.8 m/hr - 11.03 m/hr).

Raw Water Rinse

At normal service flow rate for 3 minutes or until effluent is acceptable.

Flow Rate

Recommended flow rates with CO operation are 2-12 gpm/sq. ft. (4.9 m/hr - 29.4 m/hr). High concentrations of iron and manganese usually require lower flow rates for equivalent run lengths. Higher flow rates can be considered with very low concentrations of iron and manganese. For optimizing design parameters, pilot plant testing is recommended.The run length between backwashes can be estimated as follows:

What is the run length for a water containing 1.7 mg/L iron and 0.3 mg/L manganese at a 4 gpm/sq. ft. service rate:

Contaminant loading

= (1 x mg/L Fe) + (2 x mg/L Mn)
= (1 x 1.7) + (2 x 0.3)
= (2.3 mg/L or 2.3/17.1 = 0.13 grains/gal. (gpg)

At 1,200 grains / sq. ft. loading ÷ 0.13 gpg = 9,230 gal./sq. ft.

At 4 gpm / sq. ft. service rate 9,230/4 = 2,307 min.

The backwash frequency is approximately every 32-38 hours of actual operation.

The Intermittent regeneration (IR) operation is available for certain applications. Contact your Inversand representative for additional information.

GENERAL NOTES

pH

Raw waters having natural pH of 6.2 or above can be filtered through GreensandPlus without pH correction. Raw waters with a pH lower than 6.2 should be pH-corrected to 6.5-6.8 before filtration. Additional alkali should be added following the filters if a pH higher than 6.5-6.8 is desired in the treated water. This prevents the possible adverse reaction and formation of a colloidal precipitate that sometimes occurs with iron and alkali at a pH above 6.8.

Initial Conditioning of GreensandPlus

GreensandPlus media must be backwashed prior to adding the anthracite cap. The GreensandPlus backwash rate must be a minimum of 12 gpm/sq. ft. @ 55°F.

After backwashing is complete, the GreensandPlus must be conditioned. Mix 0.5 gal. (1.9 L) of 6% household bleach or 0.2 gal (0.75 L) of 12% sodium hypochlorite for

Initial Conditioning of GreensandPlus

every 1 cu. ft. (28.3 L cu. m) of GreensandPlus into 6.5 gallons (25 L) of water.

Drain the filter enough to add the diluted chlorine mix. Apply the diluted chlorine to the filter being sure to allow the solution to contact the GreensandPlus media. Let soak for a minimum of 4 hours, then rinse to waste until the “free” chlorine residual is less than 0.2 mg/L. The GreensandPlus is now ready for service.

Radium and Arsenic Removal Using GreensandPlus

The GreensandPlus CO process has been found to be successful in removing radium and arsenic from well water. This occurs via adsorption onto the manganese and/or iron precipitates that are formed. For radium removal, soluble manganese must be present in or added to the raw water for removal to occur. Arsenic removal requires iron to be present in or added to the raw water to accomplish removal. Pilot plant testing is recommended in either case.

REFERENCES

USA

American Water Company, CA
San Jacinto, CA
City of Tallahassee, FL
Adedge Technologies, Inc., Buford, GA
City of Mason City, IL
City of Goshen, IN
City of Hutchinson, KS
City of Burlington, MA
Dedham Water Co., MA
Raynham Center, MA
Northbrook Farms, MD
Sykesville, MD
Tonka Equipment Company, Plymouth, MN
City of New Bern, NC
Onslow County, NC
Hungerford & Terry, Inc., Clayton, NJ
Fort Dix, NJ
Jackson Twsp. MUA, NJ

USA

Churchill County, NV
Suffolk County Water Authority, NY
City of Urbana, OH
Roberts Filter Group, Darby, PA

International

Watergroup, Saskatoon, SK Canada
BI Pure Water, Surrey, BC Canada
Sydney, Nova Scotia, Canada
PT Beta Pramesta, Jakarta, Indonesia
PT Besflo Prima, Jakarta, Indonesia
Eurotrol, Milanese, Italy
Gargon Industrial, Mexico City, Mexico
River Sands Pty. Ltd., Queensland, Australia
Filtration Tech, Auckland, New Zealand
Alamo Water Poland, Izabeln, Poland
Aquatrol Company, Moscow, Russia
Impulse Group, St. Petersburg, Russia
Brenntag Nordic, Taby, Sweden
EcoFilter Technology, Liechtenstein



The manufacturing of GreensandPlus is an ongoing, 24/7 process to ensure the highest quality water treatment media.

REACH Registration
01-2119452801-43-0020
for import to the EU.

Distributed by:

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HaloKlear DBP-2100 Socks

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 03/24/2016 Version: 1.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form	:	Substance
Substance name	:	HaloKlear DBP-2100 Socks
Chemical name	:	Xanthan Gum
CAS No	:	11138-66-2
Product code	:	210014

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Flocculant

1.3. Details of the supplier of the safety data sheet

Dober Chemical Corp.
11230 Katherine's Crossing
Suite 100
Woodridge, IL 60517 - USA
T 630-410-7300 - F 630-410-7444
regulatory@dobergroup.com - www.dober.com

1.4. Emergency telephone number

Emergency number	:	1-800-255-3924 / 1-813-248-0585 ChemTel

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not classified

2.2. Label elements

GHS-US labelling

No labelling applicable

2.3. Other hazards

Other hazards not contributing to the classification	:	May form combustible dust concentrations in air. May cause eye irritation.

2.4. Unknown acute toxicity (GHS-US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Substance type	:	Mono-constituent
Name	:	HaloKlear DBP-2100 Socks
CAS No	:	11138-66-2

Full text of H-statements: see section 16

3.2. Mixture

Not applicable

4.1. Description of first aid measures

First-aid measures general	:	Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
First-aid measures after inhalation	:	Allow breathing of fresh air. Allow the victim to rest.
First-aid measures after skin contact	:	Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.
First-aid measures after eye contact	:	Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.
First-aid measures after ingestion	:	Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Reactivity : The product is non-reactive under normal conditions of use, storage and transport.

5.3. Advice for firefighters

Firefighting instructions : Exercise caution when fighting any chemical fire. Eliminate all ignition sources if safe to do so. Use water spray or fog for cooling exposed containers.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

Other information : Spills produce extremely slippery surfaces. Avoid dust formation.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Ventilate area.

6.2. Environmental precautions

None known.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : On land, sweep or shovel into suitable containers. Minimize generation of dust. Store away from other materials.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour. No smoking.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep only in the original container in a cool, well-ventilated place. Keep container closed when not in use.

Incompatible products : Oxidizing agent.

Incompatible materials : Sources of ignition.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

HaloKlear DBP-2100 Socks (11138-66-2)	
ACGIH	Not applicable
OSHA	Not applicable

8.2. Exposure controls

Personal protective equipment	:	Avoid all unnecessary exposure.
Hand protection	:	Wear protective gloves/protective clothing/eye protection/face protection protective gloves.
Eye protection	:	Chemical goggles or safety glasses.
Respiratory protection	:	Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Other information	:	Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Solid
Colour	:	White to tan
Odour	:	odourless
Odour threshold	:	No data available
pH	:	approximately neutral (1% solution)
Relative evaporation rate (butylacetate=1)	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility	:	Water: 100 %
Log Pow	:	No data available
Log Kow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Avoid dust formation.

10.5. Incompatible materials

Oxidizing agent.

10.6. Hazardous decomposition products

Thermal decomposition generates : Carbon dioxide. Carbon monoxide. Fume.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	Not classified
Skin corrosion/irritation	:	Not classified pH: approximately neutral (1% solution)
Serious eye damage/irritation	:	Not classified pH: approximately neutral (1% solution)
Respiratory or skin sensitisation	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified
Potential adverse human health effects and symptoms	:	Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1. Toxicity

HaloKlear DBP-2100 Socks (11138-66-2)	
LC50 fish 1	491 mg/l Rainbow Trout; 96 hour

12.2. Persistence and degradability

HaloKlear DBP-2100 Socks (11138-66-2)	
Persistence and degradability	This product is biodegradable.

12.3. Bioaccumulative potential

HaloKlear DBP-2100 Socks (11138-66-2)	
Bioaccumulative potential	Inherently biodegradable.

12.4. Mobility in soil

HaloKlear DBP-2100 Socks (11138-66-2)	
Mobility in soil	Not available

12.5. Other adverse effects

Effect on the global warming	:	No known ecological damage caused by this product.
Other information	:	No other effects known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods	:	Dispose of contents/container in accordance with licensed collector's sorting instructions.
Ecology - waste materials	:	None known.

SECTION 14: Transport information

UN-No.(DOT)	:	Non Regulated
UN-No. (IMDG)	:	Non Regulated
UN-No. (IATA)	:	Non Regulated

14.2. UN proper shipping name

Proper Shipping Name (DOT)	:	Not applicable

Proper Shipping Name (IMDG) : Not applicable

Proper Shipping Name (IATA) : Not applicable

14.3. Transport hazard class(es)

Transport hazard class(es) (DOT) : Not applicable

:

Transport hazard class(es) (IMDG) : Not applicable

Transport hazard class(es) (IATA) : Not applicable

14.4. Packing group

Packing group (DOT) : Not applicable

Packing group (IMDG) : Not applicable

Packing group (IATA) : Not applicable

14.5. Environmental hazards

Marine pollutant(IMDG) : No

Marine pollutant(IATA) : No

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA
No additional information available

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

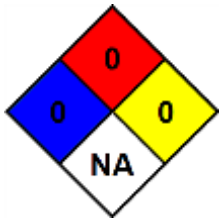
Other information : None.

NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

NFPA specific hazard : NA - Not Applicable



HMIS III Rating	
Health	: 0 - No significant risk to health
Flammability	: 0
Physical	: 0
Personal Protection	: B

Dober SDS US

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

HaloKlear®

PRODUCT FACTS

BHR-P50

HYBRID FLOCCULANT

Description

HaloKlear's unique hybrid flocculant, **BHR-P50**, offers a greener alternative to commodity chemicals. Our blend is free of acrylamide monomers and is part of our continued efforts to innovate towards more eco-friendly water treatment solutions. From industrial wastewater clarification to nutrient control in ponds and lakes, **BHR-P50** offers a wide range of performance benefits without increasing costs.

Industry Applications

- Stormwater management
- Construction
- Environmental Water remediation

Deployment Method

The liquid **BHR-P50** is deployed similar to commodity polyaluminum chloride. Typical application uses metering pumps. **BHR-P50** can be applied using several delivery methods, including semi-passive and active systems.

Packaging

Lot Number must be legible on each container. Container types: 275-gallon IBC tote with camlock or threaded outlet or 55-gallon drum.

Handling and Storage

All containers must be free of leaks, damage, and gross contamination. Product should be maintained between 40˚F and 90˚F. Keep from freezing.

Product Benefits

- **High Shear Strength & Filterability**
- **Dense Floc That is Easily Dewaterable**
- **Low Bioaccumulation of Inorganic Salts**
- **Low Ecotoxicity Profile**
- **Effective Across a Wide Spectrum of pH and Salinity.**
- **Tested & Approved to Standard 60 for Drinking Water Treatment**

Product Properties

Appearance	Homogenous white-to-yellow opaque liquid
Viscosity	500 – 1,300 cP
Specific Gravity	0.95 – 1.15
pH	2.3 – 3.7
LC50 fish 1	3222 ppm Rainbow Trout; 96 hour

Field Handling Recommendations

Keep out of direct sunlight. Some separation may occur but will not affect performance. For more information, contact your Dober representative.

Safety Data

BHR-P50 is a corrosive substance. Before handling this material read the corresponding Material Safety Data Sheet for safety and health data.

For additional information contact Dober at:
(800) 323-4983
info@dober.com
www.dober.com/water_treatment

Model PF 400

Particulate Filter

Features

- Quadruple bag and double cartridge filtration
- Four (4) bag filters for high solids holding capacity
- Two (2) multiple cartridge filters for fine solids removal
- Replaceable filtration cartridges from 100 to .5 micron nominal rating
- Manifold valving for ease of use
- Isolation valving for ease of service
- No moving parts
- Separate sampling ports for all chambers

Technical

- Bag filters are used with cartridge filters, in series, to provide efficient filtration
- Units fitted with bleed valves and pressure gauges
- Initial pressure drop is less than 5 psi at 400 gpm
- System can stand alone for sediment removal or be used in combination with media vessels
- Multiple cartridge filters provide large surface areafor longer service life
- Skid footprint: 90" long x 84" wide x 72" high
- Skid dry weight: 2,400 lbs

Material Specifications

- Chambers constructed of 304 Stainless Steel
- Piping constructed of 304 Stainless Steel
- 3", 150 lb flange inlet and outlet
- Each bag filter chamber holds one (1) 7” x 30” double-stitched filter bag
- Each cartridge chamber holds twelve (12) 40” single open-ended cartridges with 2-1/2” OD and 1” ID
- Maximum operating pressure: 125 psi
- HDPE pipe and fittingRoll off boxes, dewatering bins and vacuum boxes
- Flow meters and pressure reducing/ sustaining valves
- Aluminum Victaulic pipe and fittings
- Suction and discharge hose

Available Accessories

- Power Prime Pumps
- Spill Guard Containment berms
- Stainless Steel 304 and Carbon Steel storage tanks
- in Bi-Level, Mixer, Weir and Manifold configurations
- HDPE pipe and fittings
- Roll off boxes, dewatering bins and vacuum boxes
- Flow meters and pressure reducing/sustaining valves
- Aluminum Victaulic pipe and fittings
- Suction and discharge hose

Maximum PSI: 125
Maximum Flow: 400 GPM

Rain for Rent
P.O. Box 2248
Bakersfield CA 93303
800-742-7246
661-393-1542
FAX 661-393-1542
www.rainforrent.com
info@rainforrent.com

PRODUCT DATA SHEET

Purolite®
A600

Polystyrenic Gel, Type I Strong Base Anion Resin, Chloride form

PRINCIPAL APPLICATIONS

- Demineralization - Industrial
- Silica Removal

ADVANTAGES

- Efficient regeneration

REGULATORY APPROVALS

- IFANCA Halal Certified
- Kosher Certified

TYPICAL PACKAGING

- 1 ft³ Sack
- 25 L Sack
- 5 ft³ Drum (Fiber)
- 1 m³ Supersack
- 42 ft³ Supersack

TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS:

Polymer Structure	Gel polystyrene crosslinked with divinylbenzene
Appearance	Spherical Beads
Functional Group	Type I Quaternary Ammonium
Ionic Form	Cl^- form
Total Capacity	1.4 eq/L (30.6 Kgr/ft³) (Cl^- form)
Moisture Retention	43 - 48 % (Cl^- form)
Particle Size Range	300 - 1200 µm
< 300 µm (max.)	1 %
Uniformity Coefficient (max.)	1.7
Reversible Swelling, $Cl^- \rightarrow OH^-$ (max.)	20 %
Specific Gravity	1.09
Shipping Weight (approx.)	685 - 720 g/L (42.8 - 45.0 lb/ft³)
Temperature Limit	100 °C (212.0 °F) (Cl^- form)
Temperature Limit	60 °C (140.0 °F) (OH^- form)

Purolite®

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F +86 571 876 31385
asiapacific@purolite.com

Hydraulic Characteristics

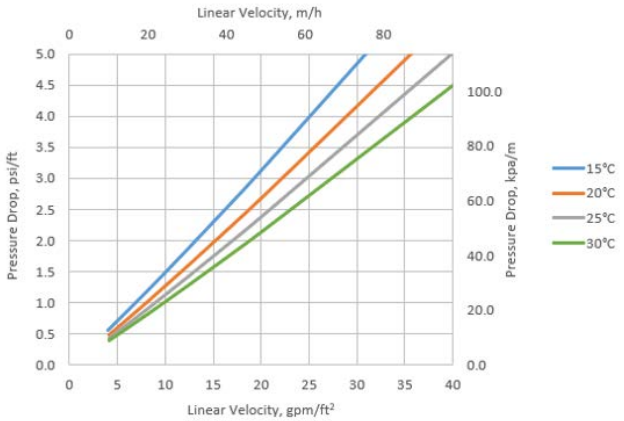
PRESSURE DROP

The pressure drop across a bed of ion exchange resin depends on the particle size distribution, bed depth, and voids volume of the exchange material, as well as on the flow rate and viscosity of the influent solution. Factors affecting any of these parameters—such as the presence of particulate matter filtered out by the bed, abnormal compressibility of the resin, or the incomplete classification of the bed—will have an adverse effect, and result in an increased head loss. Depending on the quality of the influent water, the application and the design of the plant, service flow rates may vary from 10 to 40 BV/h.

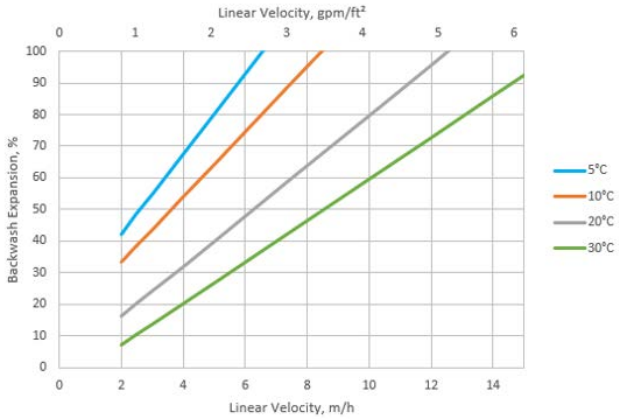
BACKWASH

During up-flow backwash, the resin bed should be expanded in volume between 50 and 70% for at least 10 to 15 minutes. This operation will free particulate matter, clear the bed of bubbles and voids, and reclassify the resin particles ensuring minimum resistance to flow. When first putting into service, approximately 30 minutes of expansion is usually sufficient to properly classify the bed. It is important to note that bed expansion increases with flow rate and decreases with influent fluid temperature. Caution must be taken to avoid loss of resin through the top of the vessel by over expansion of the bed.

PRESSURE DROP ACROSS RESIN BED



BACKWASH EXPANSION OF RESIN BED



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asiapacific@purolite.com

PRODUCT DATA SHEET

Purolite®
C100

Polystyrenic Gel, Strong Acid Cation Resin, Sodium form

PRINCIPAL APPLICATIONS

- Softening - Industrial
- Industrial demineralization when regenerated with acids

ADVANTAGES

- High operating capacity
- Good kinetic performance
- Excellent physical and chemical stability

SYSTEMS

- Coflow regenerated systems
- Conventional counterflow systems

REGULATORY APPROVALS

- IFANCA Halal Certified
- Kosher Certified
- Certified by the WQA to NSF/ANSI-61 Standard

TYPICAL PACKAGING

- 1 ft³ Sack
- 25 L Sack
- 5 ft³ Drum (Fiber)
- 1 m³ Supersack
- 42 ft³ Supersack
- Bulk Tanker (North America only)

TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS:

Polymer Structure	Gel polystyrene crosslinked with divinylbenzene
Appearance	Spherical Beads
Functional Group	Sulfonic Acid
Ionic Form	Na^+ form
Total Capacity	2.0 eq/L (43.7 Kgr/ft³) (Na^+ form)
Moisture Retention	44 - 48 % (Na^+ form)
Particle Size Range	300 - 1200 µm
< 300 µm (max.)	1 %
Uniformity Coefficient (max.)	1.7
Reversible Swelling, $Na^+ \rightarrow H^+$ (max.)	8 %
Specific Gravity	1.29
Shipping Weight (approx.)	800 - 840 g/L (50.0 - 52.5 lb/ft³)
Temperature Limit	120 °C (248.0 °F)

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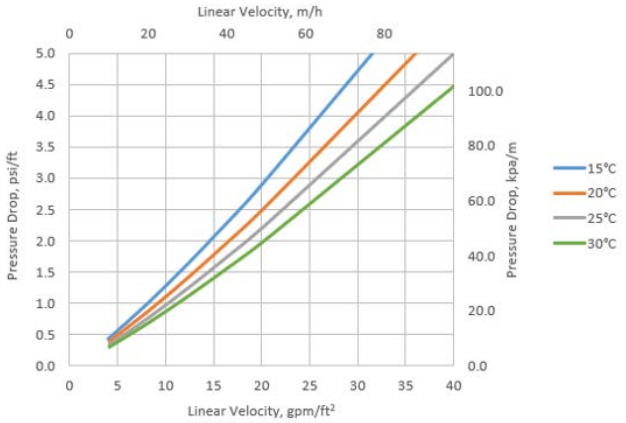
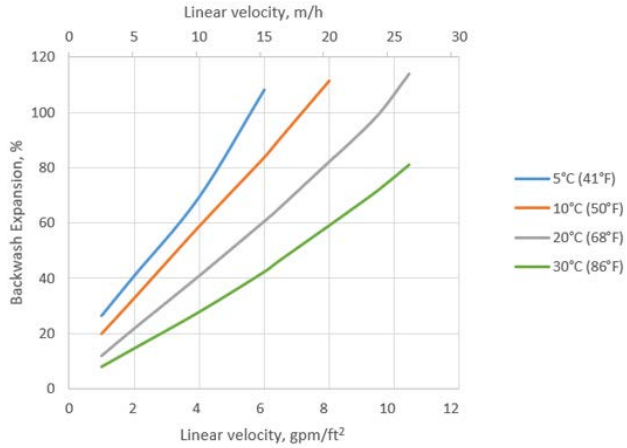
PRESSURE DROP ACROSS RESIN BED



BACKWASH EXPANSION OF RESIN BED



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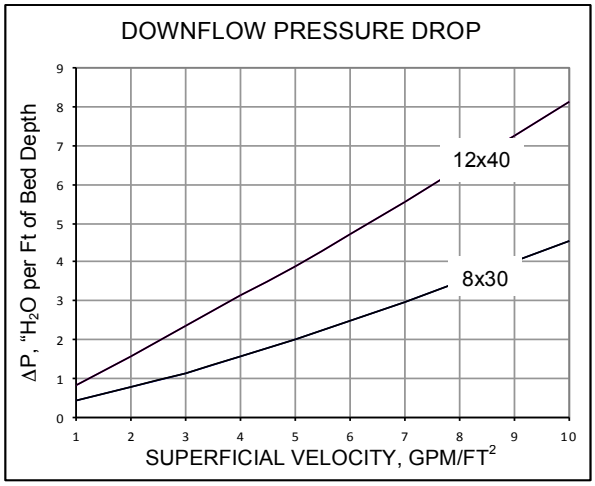
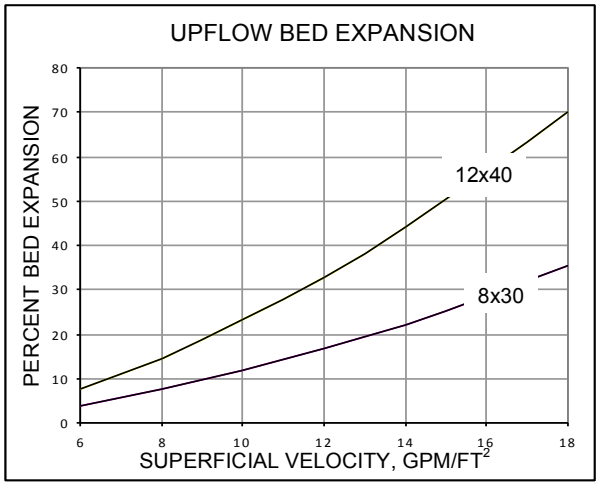
CARBON FILTRATION SYSTEMS INC.

COC – L 60

Coconut Shell Carbon for Water Purification

COC-L60 Granular Activated Carbon (GAC) is manufactured from select grades of coconut shell and features a high density, large micropore volume and high surface area. It's commonly used for the purification of potable water, beverage manufacture, dialysis, aquarium water and a variety of food grade applications. In properly designed systems, ***COC-L60*** will effectively remove chlorine, chloramines, lead, radon, TCE, PCE, THM's, Phenols, pesticides, detergents, taste & odor, etc. ***COC-L60*** meets AWWA Standard B-600-74, ANSI/NSF Standard 61 for drinking water applications.





TYPICAL PHYSICAL PROPERTIES / SPECIFICATIONS

Iodine Number	1100
Apparent Density (ASTM 2854), g/cc	0.48 – 0.50
lb/ft^3	29-31
Abrasion No., min.	85
Particle Size – mesh size	8x30
	12x40
	20x50
Total Surface Area (BET), m^2/g	1150 - 1200
Ash (ASTM D-2866) -%w/w	3.0
Moisture, max as packed- % w/w	3%

L

STANDARD PACKAGING:

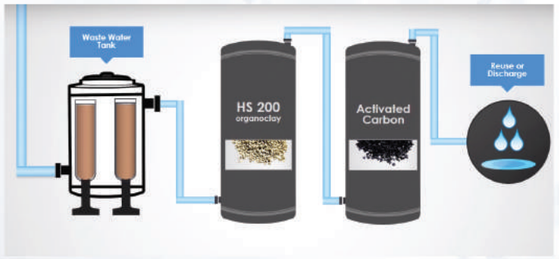
55lb or 27.5lb POLYLINED POLYPROPYLENE BAGS. 200lb FIBER DRUMS. 1100lb SUPERSACKS.

HS-200 Organoclay Series
Powerful, cost effective industrial water filtration & remediation media

The pressure to minimize water pollution is rising all the time. Stringent industrial water standards mean it's vital to have an effective water filtration system in place. Otherwise you risk liability costs, fines or even the total shutdown of your facility.

Hydrosil's HS-200 organoclay series is the ultimate water filtration material. Long lasting and cost effective, this zeolite based organoclay is an exceptional adsorbent of oil, heavy metals and other contaminants. HS-200 can adsorb up to 70% of its own weight in hydrocarbons and reduce your discharge to acceptable limits.

Hydrosil's HS-200 can be used as filtration media in tanks, upstream for pre-treatment or downstream of an oil-water separator. HS-200 provides highly effective water filtration & remediation that will minimize your environmental impact, avoid the risk of fines and enable you to meet your corporate responsibility goals.



HS-200
The ultimate water filtration material

HS-200's exceptional water cleansing qualities are a result of our proprietary modification process of zeolite. Zeolite has a high adsorption capacity with a porous surface, and our process enlarges its surface area to maximize the amount of pollutants that can be separated and locked away. It's ability to adsorb 70% of its weight makes HS-200 the best material available for separating hydrocarbons, ionic heavy metals, organics and other contaminants on contact.

HS-200 benefits

Highly adsorbent - Can adsorb heavy metals and up to 70% of its weight in hydrocarbons, heavy metals and other contaminants.

No shrinking or swelling - The crystalline rigid framework eliminates shrinking and swelling.

Cation exchange capacity - HS-200 can release beneficial elements while capturing waste products.

Longer lasting - Minimal maintenance and a longer lifespan than other processed organoclays.

More active ingredients - HS-200 provides 333% more active product ingredients per volume than organophilic clay.

Cost Savings - Long lifespan reduces replacement frequency and provides cost savings on labor and reduced wastewater treatment costs.

Customizable - Customized blends available to match your specific water filtration requirements.

Applications

- **Pipeline pressure testing runoff**
- **Dewatering**
- **Oil industry**
- **Pulp and paper mills**
- **Marine applications**
- **Protection of RO membranes**
- **Tank and storage vessel cleaning**
- **Pesticide removal**
- **Condensate systems**
- **Industrial water runoff**
- **Storm water runoff**
- **Cooling tower water**

Multiple ways in which HS-200 can be used in water filtration

Free standing - HS-200 can be loaded into wastewater holding tanks and used for still bed filtration.

Pre-Treatment - Bedded upstream to improve the performance of other filtration processes, including reverse osmosis, activated carbons and resins.

Post-Treatment - Used downstream of an oil-water separator or coalescence filter and used as a cleaning and polishing agent.

Please contact Hydrosil International Ltd. or your Local Distributor.

HYDROSIL
INTERNATIONAL LTD.

HS-200 Series Versatility

Free Standing Mode: Used on its own, HS-200 series can be loaded in drums for use as an efficient filtration media. Other applications include tank cleaning, oil spill mitigation, and lining/capping projects.

Pre-Treatment Mode: HS-200 Series can be used upstream to enhance the performance and extend the useful life of other filtration proceses and media such as reverse osmosis, activated carbon and resins.

Post-Treatment Mode: HS-200 Series utilized downstream of an oil-water separator or coalesce filter, has the ability to act as an effective cleaning and polishing agent.

Application Parameters:

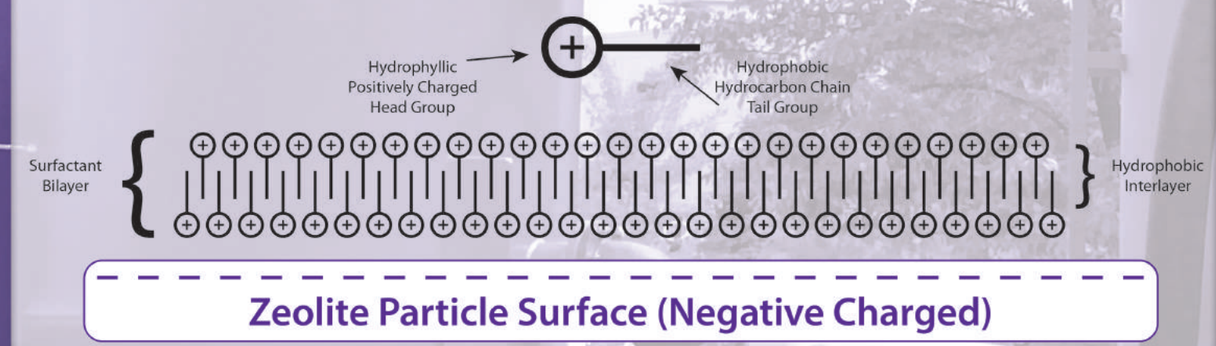
Bulk Density: 58 lbs/Ft^3 (929 kg/M^3)

10 - 15 minutes depending on concentration of contaminant(s) to be removed.

Temperature Range: 33 - 170 F^0 (1 -77 C^0)

pH Range: 4 -10

Pre-treatment prior to activated carbon and ion exchange resin columns; Pre-treatment for RO systems; Polishing for oil and water separators and DAF units.



Distributed by:

125 Prairie Lake Road, East Dundee, IL 60118 1.847.844.0680 Fax 1.847.844.0799
1.800.PURPLE.1 | Email sales@hydrosilintl.com | Website www.hydrosilintl.com

HYDROSIL
INTERNATIONAL LTD.

WATER FILTRATION AND REMEDIATION MEDIA

WHERE MEDIA IS KEY

ATTACHMENT H

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: May 13, 2020
Consultation Code: 05E1NE00-2020-SLI-2547
Event Code: 05E1NE00-2020-E-07653
Project Name: Logan International Airport - Wastewater Treatment Facility Improvements

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2020-SLI-2547

Event Code: 05E1NE00-2020-E-07653

Project Name: Logan International Airport - Wastewater Treatment Facility Improvements

Project Type: DREDGE / EXCAVATION

Project Description: Dewatering for Construction

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.375880057595815N71.02375528969503W

Counties: Suffolk, MA

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: May 13, 2020
Consultation Code: 05E1NE00-2020-SLI-2548
Event Code: 05E1NE00-2020-E-07655
Project Name: Logan International Airport - Wastewater Treatment Facility Improvements

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

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A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2020-SLI-2548

Event Code: 05E1NE00-2020-E-07655

Project Name: Logan International Airport - Wastewater Treatment Facility Improvements

Project Type: DREDGE / EXCAVATION

Project Description: Dewatering for Construction

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.35787796201252N71.02773645779624W

Counties: Suffolk, MA

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

ATTACHMENT I

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Boston; Place: East Boston; Street Name: prescott; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
BOS.29	Corsano, James Apartment Block	146 Gove St	Boston	1911
BOS.53	Ginsburg, Louis A. Three Decker	205-207 Lexington St	Boston	1901
BOS.54	Ginsburg, Louis A. Three Decker	209-211 Lexington St	Boston	1901
BOS.55	Ginsburg, Louis A. Three Decker	213 Lexington St	Boston	1901
BOS.56	Burnham, Lewis Three Decker	217 Lexington St	Boston	c 1890
BOS.57	Burnham, Lewis Three Decker	219 Lexington St	Boston	c 1890
BOS.50	Knowles, Paul House	220 Lexington St	Boston	c 1884
BOS.58	Burnham, Lewis Three Decker	221 Lexington St	Boston	c 1890
BOS.14173	Sheridan, Gen. Philip H. Elementary School	1 Prescott St	Boston	1914
BOS.135	McLaren, Alexander and John Building	263 Princeton St	Boston	1875
BOS.136	McLaren, Alexander and John Building	265 Princeton St	Boston	1875
BOS.131	Pinkham - Perry - Sanderson House	296-300 Princeton St	Boston	c 1860
BOS.152	Saint John the Baptist Roman Catholic Church	336 Saratoga St	Boston	1913
BOS.153	East Boston Chemical Company #7 Fire House	360 Saratoga St	Boston	1901