



Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION
MANAGEMENT

530 Broadway
Providence, RI 02909
T: 401.421.4140
F: 401.751.8613
www.gza.com



September 12, 2016
File No. 03.0033554.60

Mr. Neal Personeus
Office of Water Resources
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908

Re: Water Quality Certification and RIPDES Construction General Permit Application
Liquefaction Plant
Providence, Rhode Island

Dear Mr. Personeus:

On behalf of our Client, The Narragansett Electric Company, dba National Grid, this application is being submitted under the coordinated stormwater permitting process by GZA GeoEnvironmental, Inc. (GZA), pursuant to the *Water Quality Regulations* (amended December 2010), and the Rhode Island Pollutant Discharge Elimination System (RIPDES) Program.

The proposed project involves constructing a natural gas liquefaction plant at the existing Liquefied Natural Gas (LNG) facility in Providence, Rhode Island. The liquefaction plant will tie into the existing high pressure gas line that enters the Site from the east (Providence River). The liquefaction plant will be used to fill the existing LNG tank during low-demand summer months, so that there is a stable and sufficient supply of natural gas for heating during high-demand winter months. The project will result in the creation of more than 10,000 square feet of impervious area and will include a new storm water outfall into the Providence River. The new outfall will direct treated stormwater runoff from the Site onto an energy dissipation pad and into the River. This will trigger the need for a Water Quality Certification (WQC) from RIDEM. This project will also disturb more than 1-acre during construction, and will be defined as a Redevelopment Project under the *Rhode Island Stormwater Design and Installation Standards Manual* dated 2015 (RISDISM). Therefore, this project will also require a Construction General Permit (CGP) under the RIPDES program.

The stormwater management system for the proposed project has been designed in accordance with the RISDISM. A Stormwater Management Plan (SWMP) and Sediment and Erosion Control Plan (SESC) have been prepared for the project and are enclosed with this application. The plans provide an estimate of anticipated runoff volumes during various storm events, detail the design of the collection and treatment system (lined sand filter) and outlines the best management practices that will be used during construction activities to minimize migration of sediment to the waters of the State.



We trust that this application will satisfactorily address the requirements for the WQC and RIPDES CGP. If you have any questions or require any additional information regarding this application, please contact Igor Runge at igor.runge@gza.com or (401)427-2710.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read "S. Haupt".

Sara Haupt, EIT
Project Engineer

A handwritten signature in blue ink, appearing to read "Igor Runge".

Igor Runge, Ph.D., P.H.
Consultant/Reviewer

A handwritten signature in blue ink, appearing to read "Margaret Kilpatrick".

Margaret Kilpatrick, P.E.
Associate Principal

Attachments: Water Quality Certification Application Form
Application Fee \$400.00
Stormwater Management Plan

J:\ENV\33554.60.MSK\WORK\CRMC PERMITTING\STORMWATER\SWMP\33554.60 WQC RIPDES COVER LETTER FINAL.DOCX



RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office Of Water Resources

235 Promenade Street, Providence, RI 02908-5767
 Telephone: 401-222-6820, Telecommunication Device for the Deaf: 401-831-5508, FAX: 401-222-6177

WATER QUALITY CERTIFICATION PROGRAM APPLICATION

This form is to be completed for all applications to the Department of Environmental Management (DEM), Office of Water Resources, for Water Quality Certification as specified in Rule 13 of the DEM "Water Quality Regulations." Reference the "Rules and Regulations Governing the Establishment of Various Fees" for fees listed below. Attach a non-refundable check payable to "General Treasurer, State of RI."

FOR DEM USE ONLY Date Received _____
Amount Paid: _____ Check #: _____ File #: _____

PURPOSE OF APPLICATION (Check only one) AND FEES:

- Application for Water Quality Certification:
 - Submit required documentation for Estimated Construction Costs (See Note 1)
 - Fee: \$200. for estimated construction costs < \$250,000.
 - \$400. for estimated construction costs ≥ \$250,000.
- Request Renewal of Water Quality Certification: File # _____
 - Fee: No fee
- Request Modification of Water Quality Certification: File # _____
 - Fee: One-half of original fee noted above

(A.) PROJECT NAME AND LOCATION:

Liquefaction Plant	Plat 56 Lots 5, 316, and 317 Plat 101 Lot 1
(Project Name)	(Tax Assessor's Plat(s) and Lot No.(s))
642 Allens Avenue	Providence 02905
(Project Location)	(Street Address) (City/Town) (ZIP)

(B.) APPLICANT: (Note: Applicant must be the owner of the property on which the activity is proposed.)

William Howard	40 Sylvan Road	Waltham	MA	02451
(Name)	(Mailing Address)	(City/Town)	(State)	(ZIP)
Nation Grid LNG, LLC	(401) 784-7490			
(Company/Organization)	(Area Code & Telephone Number)			

(C.) CONTACT TO ANSWER QUESTIONS REGARDING APPLICATION (If different than Section B):

Igor Runge	530 Broadway	Providence RI	02909
(Name)	(Mailing Address)	(City/Town)	(State) (ZIP)
GZA GeoEnvironmental Inc.	Senior Project Manager	(401) 427-2710	
(Company/Organization)	(Title)	(Area Code & Telephone Number)	

(D.) PROJECT TYPE/ACTIVITY (Check All That Apply):

- | | |
|--|---|
| <input type="checkbox"/> Filling of Waters of the State | <input type="checkbox"/> Marinas – New construction or expansion |
| <input checked="" type="checkbox"/> Any project \geq five (5) acres disturbance | <input type="checkbox"/> Residential Development: six (6) or more dwellings |
| <input checked="" type="checkbox"/> Commercial, Industrial, State or Municipal Development | <input checked="" type="checkbox"/> Site Disturbances |
| <input type="checkbox"/> Flow Alterations | |
| <input type="checkbox"/> Harbor Management Plan | <input type="checkbox"/> Other _____ |

(E.) GENERAL INFORMATION: Check program and list number(s) of other applications associated with this project.

- Coastal Resources Management Council _____
- US Army Corps of Engineers _____
- Other _____

(F.) CERTIFICATION OF APPLICANT:

I hereby certify that I have requested and authorized the investigation, compilation, and submission of all the information, in whatever form, contained in this Application; that I have personally examined and am familiar with the information submitted herein; and that such information is true, accurate and complete to the best of my knowledge.

Signature of Applicant: _____ Date: 9/7/2016

Print Name: William Howard

Please return completed form to: Rhode Island Department of Environmental Management
Office of Water Resources, Water Quality Certification Program
235 Promenade Street, Suite 260
Providence, RI 02908-5767

Office Use Only:

Suitable for Public Notice Date: _____

Certification Determination: Approved
Date: _____ Denied
 Withdrawn
 Closed

_____ Project Reviewer:

Note 1: Documentation of Estimated Construction Costs (ECC) will be required unless the ECC is \geq \$250,000. ECCs include all costs of construction activities such as materials, labor, and equipment. ECC shall not include the cost of land acquisition and consultant fees for planning, design, and construction supervision. The ECC for proposed projects must be documented and prepared by an appraiser, general contractor, engineer, land surveyor, architect, landscape architect, or another appropriate qualified professional. Such documentation must be submitted by the applicant with the application. All ECCs are subject to the review and acceptance by the Department.



Proactive by Design



STORMWATER MANAGEMENT PLAN (SWMP) LIQUEFACTION PLANT

**642 Allens Avenue
Providence, Rhode Island**

September 12, 2016

GZA File No.: 03.0033554.60



PREPARED FOR:

Rhode Island Department of Environmental
Management (RIDEM) – Office of Water Resources
Providence, Rhode Island

ON BEHALF OF:

nationalgrid

GZA GeoEnvironmental, Inc.

530 Broadway | Providence, RI 02909
401-421-4140



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1.0 INTRODUCTION

On behalf of our client, National Grid LNG, LLC (NGLNG), GZA has prepared this Stormwater Management Plan (SWMP) for construction activities associated with a proposed Liquefaction Plant on The Narragansett Electric Company (TNEC) property located at 642 Allens Avenue in Providence, Rhode Island (the Site). NGLNG has proposed to construct a natural gas liquefaction plant on a portion (approximately 3.11 acres) of their property at their Liquefied Natural Gas (LNG) facility. The Limit of Work for this project occupies approximately 14 acres of the 42-acre property. A locus plan is included as Figure 1. The proposed stormwater management system to service the proposed liquefaction plant is the subject of this SWMP. The proposed stormwater management system has been designed to implement stormwater best management practices (BMPs) to convey and treat stormwater runoff in accordance with the State of Rhode Island Stormwater Design and Installation Standards Manual, amended 2015 (SDISM) and the current edition of State of Rhode Island Soil Erosion and Sediment Control Handbook (Erosion Control Handbook), revised 2014. Contact information for the Site owner and design professional is listed in the following table.

	Organization	Contact Person	Address	Phone Number
<i>Applicant</i>	National Grid LNG, LLC (NGLNG)	William Howard	40 Sylvan Road, Waltham, MA	401-784-7490
<i>Engineer</i>	GZA GeoEnvironmental, Inc. (GZA)	Igor Runge	530 Broadway Providence, RI	401-427-2710

This SWMP is subject to the Limitations included in Appendix A.

The existing site conditions, proposed conditions, supporting infrastructure, and proposed stormwater management system are shown in the Plan Set.

In accordance with the SDISM, a completed Stormwater Management Checklist is included in Appendix B.

2.0 BACKGROUND

The Site is located at 642 Allens Avenue in the southeastern portion of the City of Providence, Rhode Island. The Site is identified as Plat 56, Lots 5, 316 and 317, and Plat 101, Lot 1. The area comprising the Site consists of approximately 42 acres of land with frontage on Allens Avenue to the west, and bounded to the east by the Providence River (tidally influenced water body). It is adjoined to the northwest by Motiva Enterprises, LLC, and to the south by Terminal Road, the former Sun Oil/Providence Port facility, and New England Bituminous Terminal Corporation. Currently, active natural gas regulation and distribution, a compressed natural gas (CNG) fueling station, (LNG) storage and distribution, and cement storage and distribution activities are conducted at the 642 Allens Avenue property.

The Site slopes at approximately 2.0% to the north. The property is within zoning district W3, which is a waterfront development district in the Port of Providence with no lot size limits. The Site is entirely enclosed and secured by chain-link fencing with barbed wire. The soil generally consists of urban fill underlain by organic silt, glacial outwash and glacial till. The depth to bedrock is typically more than 100 feet below ground surface (bgs). Groundwater underlying the Site is classified as GB or not suitable for drinking water use. Groundwater flow is generally towards the Providence River.



From 1910 until 1954 a manufactured gas plant (MGP) occupied the Site. Other occupants included B.P. Clapp in 1910 (ammonia works, including the recycling and sale of ammonia by-products), and in 1918, the United States Government operated a toluene facility. Portions of the Site included the Sassafra Point Rifle Range, which was a small arms range that operated during the late 1800s. The LNG facility has occupied the eastern/southeastern portion of the Site since 1972, and Holcim (formerly St. Lawrence Cement Company) has occupied the southeastern portion of the Site since 1961. National Grid's Natural Gas Regulation Facility occupies the remainder of the Site. National Grid also operates a Compressed Natural Gas (CNG) fueling station at the Site.

The Site is listed with the Rhode Island Department of Environmental Management (RIDEM) due to contaminants present in soil and groundwater at concentrations that represent Method 1 exceedances as defined in the Remediation Regulations as a result of MGP waste residuals and/or historical industrial activities. The construction of the liquefaction plant will be conducted in accordance with the Soil Management Plan (SMP) that was submitted to RIDEM in September 2012. In addition, an evaluation of the applicability of Air Pollution Control Regulation No. 9 will be submitted to RIDEM's Office of Air Resources, as well as an application for a Temporary Groundwater Discharge Approval from RIDEM's Office of Waste Management under Rule 13 of the October 2014 Rules for the Discharge of Non-Sanitary Wastewater and Other Fluid to or Below the Ground Surface.

Portions of the liquefaction plant area are located within the 200-foot Coastal Resource Management Council (CRMC) jurisdictional buffer. Currently stormwater runoff generated within the liquefaction plant area either infiltrates in areas with crushed stone or sheet flows to the Providence River.

3.0 PROPOSED SITE DEVELOPMENT COMPONENTS

Mobilization is expected to begin in January 2017 and be complete by the end of February 2016. Mobilization will consist of the following:

- Install sediment and erosion controls around the perimeter of the Site and existing catch basins.
- Install crushed stone over the temporary laydown area.
- Construct the temporary office building, break room building, safety building, and warehouse.

Construction activities are expected to begin in February 2017, and will consist of the following:

- Stripping the existing crushed stone within the limit of disturbance and preparing the liquefaction area for construction is expected to be complete by March 2017.
- Relocating the fire suppression water line is expected to be complete by May of 2017.
- Pile driving for the liquefaction area is expected to be complete by September 2017.
- Raising the grade of the liquefaction area will begin in February 2017, and be complete by May 2017.
- The revetment wall will be completed by June 2017.
- Installation of the stormwater collection system will begin in April 2017, and be complete by November 2017.
- The sand filter and sediment forebay treatment system will be completed by August 2018.
- The cast in place concrete foundations for the liquefaction plant equipment are expected to be complete by March 2018.
- The equipment for the liquefaction plant will be installed by March 2018.
- The final Site stabilization including paving access roads and placing crushed stone and gravel at the Site will be complete by November 2018.



Demobilization will begin in December 2018, and will consist of the following:

- Removing the temporary office building, break room building, safety building, and warehouse.
- Removing the erosion and sediment controls.

The SDISM, Section 3, entitled: “Stormwater Management Standards and Performance Criteria” requires that stormwater management systems associated with proposed development projects must meet certain stormwater management performance standards. The following sections summarize the minimum stormwater management performance standard applicability, post-development hydrologic and hydraulic analysis, and a description of the proposed stormwater management system.

3.1 MINIMUM STANDARD APPLICABILITY

The State of Rhode Island requires that qualifying new development and redevelopment projects within the state must meet the requirements of the latest version (2015) of the SDISM. The SDISM defines redevelopment as construction activities on commercial/industrial properties that disturb 10,000 square feet or more of existing impervious areas; this project will disturb approximately 130,000 square feet (3 acres). As shown on Figure 3 in the attached plan set the 42-acre property is approximately 47% impervious. Consistent with the SDISM’s minimum standards for a redevelopment site, this project is only required to meet Minimum Stormwater Management Standards 2, 3, and 7-11. The following summarizes the minimum performance standard, followed by a description of how each requirement will be met. The delineation of existing Site wide impervious surfaces and proposed impervious surfaces as well as impervious area coverage calculations are provided on Figures 3 and 15, respectively.

3.1.1 Minimum Standard 2: Groundwater Recharge

Minimum Standard 2 requires that stormwater be recharged within the same sub-watershed to maintain groundwater base flow at pre-development recharge levels to the maximum extent practicable. Adhering to this standard ensures that the level of the groundwater table, stream base flow, and soil moisture remain the same for pre- and post-development Site conditions. Due to the presence of soil contamination in the area of the proposed sand filter treatment system, the sand filter will be lined and will not allow stormwater to infiltration. However, precipitation that falls in areas where it currently infiltrates that will remain pervious will continue to allow infiltration.

3.1.2 Minimum Standard 3: Water Quality

The intent of this standard is to protect the waters of the state by reducing the mass of pollutants discharged to surface waters and to reduce the risk of erosion and sedimentation by implementing the BMPs outlined in the SDISM. These BMPs must be designed to accommodate the Water Quality Volume (WQ_v), which is the runoff from the first 1.2 inches of precipitation (1.0 inch of runoff) that falls on impervious surfaces (existing and proposed). New impervious areas over existing impervious are required to treat 50% of the WQ_v . New impervious areas over existing pervious areas must treat 100% of the WQ_v . The WQ_v is referred to as the first flush and has been shown to contain the majority of contaminants from a typical stormwater runoff event. The selection process for proposed BMPs implemented on the Site is dependent on the anticipated contaminants present in the first flush. Once a BMP is selected it must be sized appropriately to contain or treat the WQ_v .

The WQ_v calculations are included as Appendix C. The contaminants of concern in stormwater generated from the liquefaction plant area are total solids and possibly oil and petroleum sheens. The stormwater management system selected for this project consists of a series of catch basins that collect runoff and direct the runoff to a concrete forebay (total solids removal) and a lined sand filter (total solids, oil and sheen removal). As shown in the attached stormwater design calculations, these BMP devices have been hydraulically sized to collect, convey, and treat the WQ_v for the project



as well as the water quality volume from potential future development. Calculations for the WQ_v and BMP Devices are attached as Appendix C. The layout of the proposed stormwater management system is shown on the attached Plan Set.

3.1.3 Minimum Standard 7: Pollution Prevention

All development sites require the use of source control and pollution prevention measures to minimize the impact that the land use may have on stormwater runoff quality. The intent of this standard is to prevent, to the maximum extent practicable, pollutants from coming into contact with stormwater runoff. A Site specific Soil Erosion and Sediment Control (SESC) Plan has been developed in general accordance with the Erosion Control Handbook. The SESC Plan will serve to manage erosion and prevent the migration of sediment off-site during runoff events until final project stabilization is achieved. The SESC Plan is provided in Appendix D

3.1.4 Minimum Standard 8: Land Uses with Higher Potential Pollutant Loads

Land uses with higher potential pollutant loads (LUHPPLs) generally have a higher risk of discharging pollutants to the waters of the state. The proposed use of the Site is not considered a LUHPPL Site.

3.1.5 Minimum Standard 9: Illicit Discharges

This standard is meant to eliminate illicit discharges to stormwater management systems. Illicit discharges include, but are not limited to, on-Site wastewater treatment system (OWTS) discharges, discharge from sub-surface drains, and discharge from French Drains. The stormwater management system has been designed to collect, convey, and discharge stormwater runoff generated from the proposed liquefaction plant. There will be no sanitary wastewater discharged in the stormwater system and there will be no French Drains or subsurface drains at the liquefaction plant.

3.1.6 Minimum Standard 10: Construction Erosion and Sedimentation Control

This standard requires that during construction and other land disturbing activities, sedimentation and erosion control systems be in place and sized to accommodate and convey the peak flow from a 10-year storm event. A Site specific SESC Plan for construction activities has been prepared. The SESC Plan details the sedimentation and erosion control practices that will be used during construction of the proposed liquefaction plant. The SESC Plan is provided in Appendix D.

3.1.7 Minimum Standard 11: Stormwater Management System Operation and Maintenance

This standard requires that an operations and maintenance plan is developed to ensure that stormwater management systems function properly for the lifetime of the system.

BMPs selected for this project include a concrete forebay, and sand filtration. The owner of the Site will be the responsible party to operate and maintain the proposed stormwater management system. The project Stormwater Management System Operations and Maintenance Manual is attached as Appendix E.

3.2 SITE HYDROLOGIC AND HYDRAULIC MODELING

A hydrologic and hydraulic analysis¹ (H&H) was performed in accordance with the Design Manual. Modeling was performed to estimate the pre- and post- development peak stormwater runoff rate for the proposed liquefaction plant

¹ H&H analysis was performed by Kiewit Engineering and Design Co.



area. This post development analysis was utilized to hydraulically size the proposed conveyance for the stormwater management system.

The contributing sub-drainage areas were delineated based on topography for pre and post development conditions. A composite runoff coefficient “C” value was generated for each sub-drainage area based on the surface cover. Peak storm water runoff rates were evaluated primarily utilizing the Storm and Sanitary Analysis (SSA) modeling software, and Hydraflow Storm Sewers and Hydraflow Express modeling software as a check. The SSA report for post-development stormwater modeling is included in Appendix F. Design storm events were modeled using the National Oceanic and Atmospheric Administration (NOAA) 5-minute Intensity Duration Frequency (IDF) curve, for the 10, 25, and 100-year storm events (7.236, 8.868, and 11.388 inches/hour, respectively). These values were obtained from the Point Precipitation Frequency Estimates for Providence, RI available at NOAA’s website². These values were selected over the values specified in Table 3-1 of the SDISM because they are more conservative rainfall intensities.

3.2.1 Post-Development Hydrologic and Hydraulic Summary

The post-development watershed/drainage areas were delineated according to proposed Site grading and stormwater management improvements. Of the 3 acres being disturbed, the post development watershed drainage area contributing stormwater runoff to the proposed stormwater management system is 1.30 acres. Stormwater will sheet flow from the paved areas and equipment in the liquefaction plant to a series of catch basins that will direct the discharge to the concrete forebay. The first inch of stormwater runoff that enters the forebay will be metered to an off-line sand filter for treatment and ultimately will be collected by the underdrain and discharged to the Providence River. The excess stormwater (runoff in excess of the required WQ_v) will be discharged from an overflow bypass in the forebay to an outfall to the Providence River.

The pre- and post-development watershed areas are included in the stormwater modeling report in Appendix F. The following table summarizes the pre- and post- development peak stormwater runoff discharge rates for the total proposed drainage area and the design storm frequencies:

	10-year	25-year	100-year
Pre-development (ft ³ /sec)	17.47	21.41	27.49
Post-development (ft ³ /sec)	17.94	21.99	28.24

3.3 PROPOSED STORMWATER COLLECTION SYSTEM

Stormwater runoff from the liquefaction area will be collected by a series of catch basins. The forebay will be hydraulically connected with 24-inch diameter pipe. The WQ_v will be conveyed to a lined off-line sand filter. Excess stormwater will flow to the outfall via a 24-inch diameter overflow bypass installed in the forebay system adjacent to the sand filter, ultimately discharging to the Providence River. The overflow weir has been hydraulically sized to convey the peak stormwater runoff rate associated with the 10-year design event in accordance with the Design Manual. The sand filter has been sized to treat the WQ_v . The outfall for the proposed system include a siphon in order to pass flow underneath a high pressure gas line.

3.4 PROPOSED WATER QUALITY TREATMENT

The stormwater treatment system has been sized to treat the WQ_v from the liquefaction plant and WQ_v for potential future development. The construction of the liquefaction plant will result in the creation or redevelopment of

² http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ri



approximately 54,454 square feet of impervious area. The WQ_v for this impervious area is approximately 4,881 cubic feet. A sand filter BMP has been selected for this project and has been designed in accordance with Section 5.5 of the SDISM. The pre-treatment storage volume for a sand filter system must be equal to a minimum of 25% of the WQ_v . This results in a minimum pre-treatment storage volume of 1,220.5 cubic feet. The sand filter and pretreatment system must be sized to store 75% of the water quality volume. Therefore, the required storage volume in the sand filter is 2,440.5 cubic feet.

3.4.1 Concrete Forebays

The design intent of the concrete forebay is to provide initial pretreatment (removal of large particles, floatables) of stormwater runoff prior to discharging to the proposed sand filter. The forebay has a total storage volume of 2,145 cubic feet, which is greater than the required minimum storage volume of 1,221 cubic feet (25% of the total WQ_v). A weir will be installed to meter the WQ_v to the sand filter. An upward facing 24-inch diameter HDPE 90-degree fitting will be installed in the forebay as an overflow weir to convey stormwater in excess of the WQ_v to the Providence River outfall.

3.4.2 Off-Line Sand Filter

To be conservative the sand filter has been oversized to treat more than the WQ_v required by Section 5.5 of the Design Manual. The storage volume provided in the sand filter is 3,976 cubic feet, which is greater than the required volume of 2,440.5 cubic feet. The water quality elevation has been designed at elevation 9.35 feet MSL, therefore, the filter area will flood with approximately 9 inches of standing water before the system overflows to the Providence River outfall. The filter will be constructed with an 18-inch thick layer of C-33 filter sand.

3.4.3 Proposed Stormwater Overflow Protection

The stormwater management systems overflow protection will be provided by an upward facing 24-inch diameter HDPE 90 degree fitting which will hydraulically functions as a weir. The overflow will be installed in the forebay system directly adjacent to the sand filter. The overflow will discharge to a manhole and will ultimately discharge to the Providence River. The overflow bypass drain line has the capacity to convey the peak stormwater runoff rate generated by the 10-year design event. Based on a review of the H&H analysis, the stormwater conveyance system safely passes the 10-year storm event.



FIGURES

NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND SEPTEMBER 2016

PREPARED FOR:

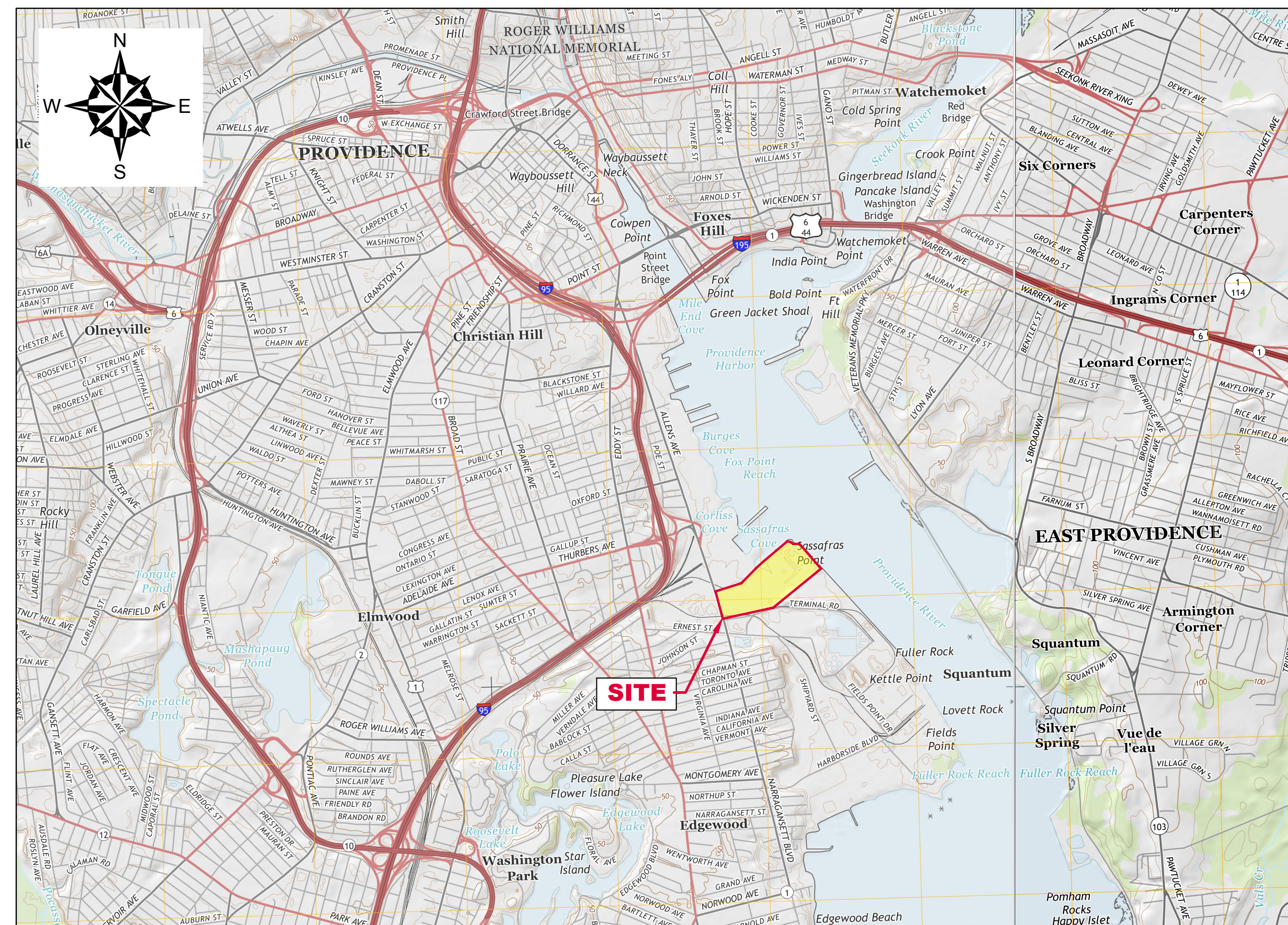


PREPARED BY:

GZA GEOENVIRONMENTAL, INC.
530 BROADWAY
PROVIDENCE, RHODE ISLAND 02909

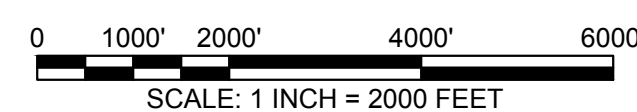
DESIGNED BY:

KIEWIT ENGINEERING AND DESIGN CO.
9401 RENNER BOULEVARD
LENEXA, KANSAS 66219



PROJECT LOCUS MAP

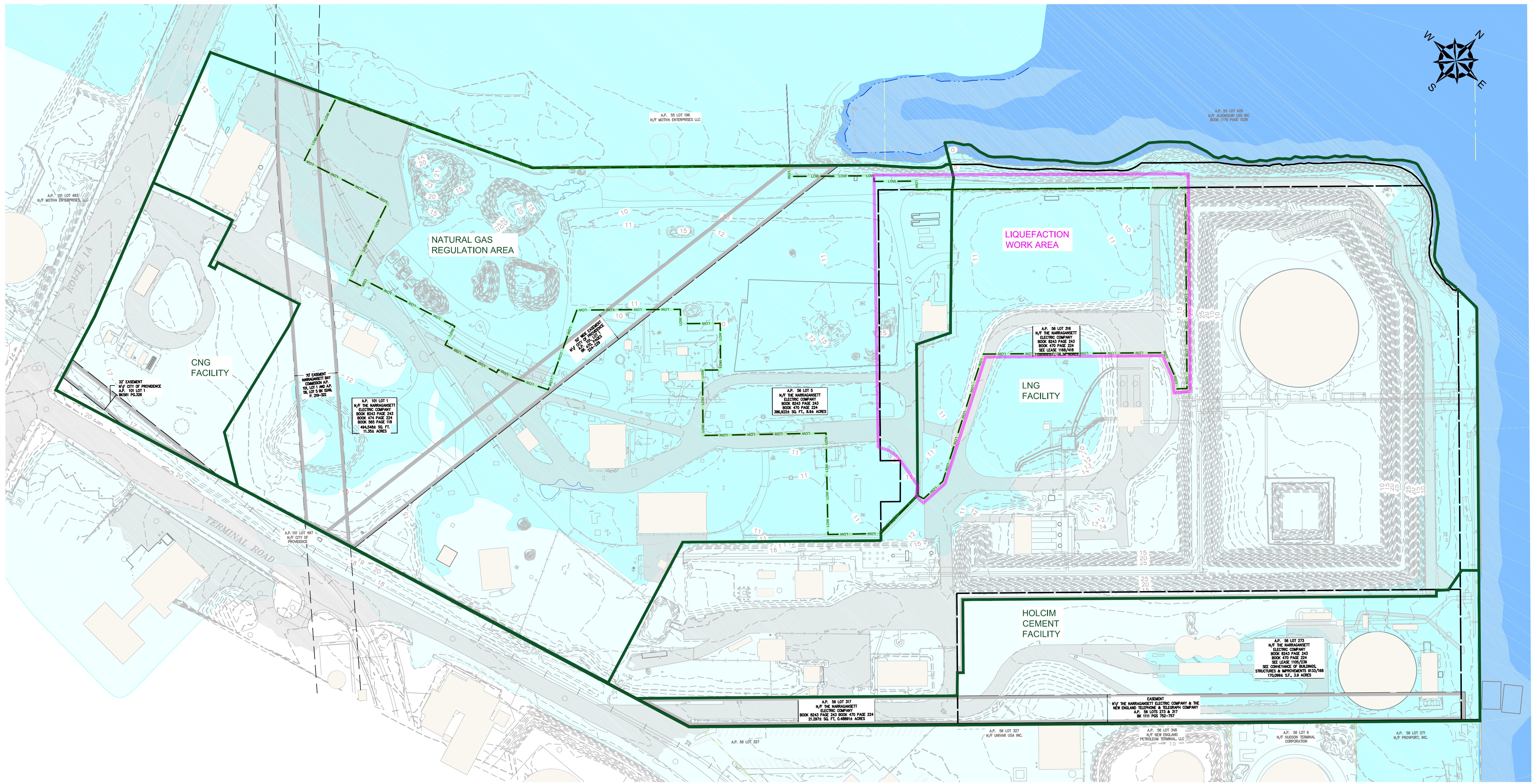
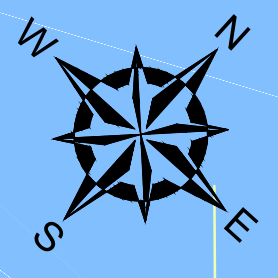
SOURCE: USGSSTORE.GOV



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FOR PERMITTING
ONLY

THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.



GENERAL NOTES:

- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY YANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
 - ELECTRONIC CAD FILE 14-152_SU1_REV2.DWG, TITLED "TOPOGRAPHIC SURVEY PLAN, PORTION OF A.P. 56 LOT 5" DATED OCTOBER 27, 2014 AND PROVIDED BY NATIONAL GRID.
 - ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 16, 2014 AND PROVIDED BY NATIONAL GRID.
- 2) HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- 3) VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- 4) ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.
- 5) PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
- 6) SITE BOUNDARIES ARE APPROXIMATE.
- 7) FLOOD ZONE HAZARD AREA DATA WERE PROVIDED BY RHODE ISLAND GEOGRAPHIC INFORMATION SYSTEM (RIGIS) AND DERIVED FROM STATEWIDE DIGITAL FLOOD INSURANCE RATE MAP (DFIRM) DATABASE, ORIGINALLY PUBLISHED BY FEMA IN OCTOBER 2015.

LEGEND:

- EXISTING BUILDING
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- PAVEMENT
- EASEMENT AREA
- PROPERTY LINE
- INTERIOR PROPERTY LINE
- LIMIT OF WORK
- ABUTTING PROPERTY LINE
- EDGE OF WATER
- EXISTING RAILROAD TRACKS
- EXISTING FENCE
- OPERATIONS BOUNDARY
- LIQUEFACTION WORK AREA
- EXISTING CONCRETE PAD
- UTILITY POLE
- LIGHT POLE
- HYDRANT

FLOOD HAZARD AREAS:

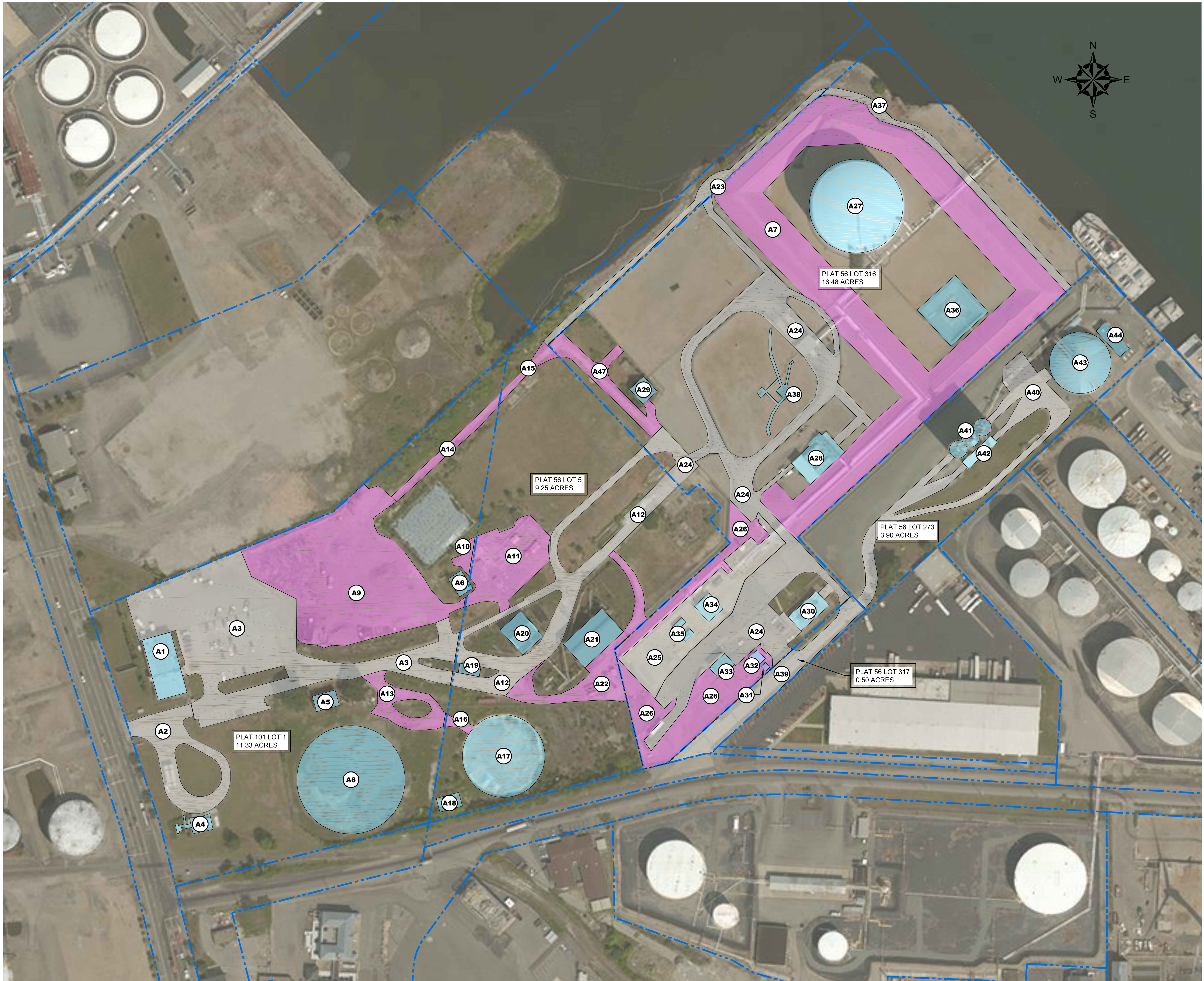
- FLOOD ZONE VE (EL. 14)
- FLOOD ZONE AE (EL. 12)
- FLOOD ZONE X (EL. 14)

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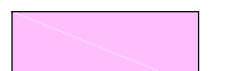
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
EXISTING CONDITIONS PLAN			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: 	PROJECT NO.: 33554.60	SHEET NO. 2 OF 15
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 1	FIGURE 2

FOR PERMITTING ONLY

2016 - GZA GeoEnvironmental, Inc. GZA-2A-DNA-33554.60-MSK-TOURER-CAD-DWG-33554.60-CRMC-FPL-EX-FINAL_3-1-2016.DWG EX COND SEPTEMBER 7, 2016 2:53 PM USA THERMAL



LEGEND

-  PROPERTY LINES
-  STRUCTURE
-  ASPHALT
-  OTHER

REFERENCE NOTES:



1. THIS MAP CONTAINS THE ESRI ARCGIS ONLINE BING MAPS AERIAL LAYER PACKAGE. IMAGE COURTESY OF USGS EARTHSTAR GEOGRAPHICS SIO © MICROSOFT CORPORATION 2015.
2. PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
3. SITE BOUNDARIES ARE APPROXIMATE.

IMPERVIOUS AREAS				
PLAT	LOT	NO.	AREA (SQ. FT.)	SURFACE TYPE
101	1	A1	8,037.44	ROOF
101	1	A2	17,913.35	ASPHALT
101	1	A3	90,158.79	ASPHALT
101	1	A4	1,786.65	STRUCTURE
101	1	A5	1,640.44	ROOF
101	1	A6	1,445.11	STRUCTURE
56	1	A7	156,852.04	CONTAINMENT DIKE
101	1	A8	39,796.73	TANK FOUNDATION
101	1	A9	79,909.64	COMPACTED GRAVEL
101	1	A10	1,933.34	COMPACTED GRAVEL
56	5	A11	21,898.19	COMPACTED GRAVEL
56	5	A12	33,764.16	ASPHALT
101	1	A13	8,857.25	COMPACTED GRAVEL
101	1	A14	5,114.04	COMPACTED GRAVEL
56	5	A15	2,860.86	COMPACTED GRAVEL
56	5	A16	1,196.51	COMPACTED GRAVEL
56	5	A17	23,127.00	TANK FOUNDATION
56	5	A18	1,425.31	STRUCTURE
56	5	A19	898.87	ROOF
56	5	A20	4,099.05	ROOF
56	5	A21	7,273.42	ROOF
56	5	A22	16,442.64	COMPACTED GRAVEL
56	5	A23	11,249.94	ASPHALT
56	316	A24	93,429.89	ASPHALT
56	316	A25	29,735.26	CONCRETE
56	316	A26	40,494.92	COMPACTED GRAVEL
56	316	A27	29,930.34	LNG TANK
56	316	A28	6,084.97	STRUCTURE
56	316	A29	1,686.87	ROOF
56	316	A30	3,197.19	ROOF
56	316	A31	164.24	ROOF
56	316	A32	638.42	ROOF
56	316	A33	1,346.21	ROOF
56	316	A34	1,845.52	ROOF
56	316	A35	712.24	ROOF
56	316	A36	10,912.10	SUMP PIT
56	316	A37	10,655.36	ASPHALT
56	316	A38	2,392.36	STRUCTURE
56	317	A39	18,586.35	ASPHALT
56	273	A40	28,623.42	ASPHALT
56	273	A41	3,112.29	STRUCTURE
56	273	A42	1,576.65	ROOF
56	273	A43	12,924.79	TANK
56	273	A44	1,893.69	STRUCTURE
56	316	A47	10,294.60	COMPACTED GRAVEL
TOTAL IMPERVIOUS			847,918.45	

847918.45 SQ. FT. IMPERVIOUS AREA
1807724.79 SQ. FT. TOTAL AREA = 46.91% IMPERVIOUS

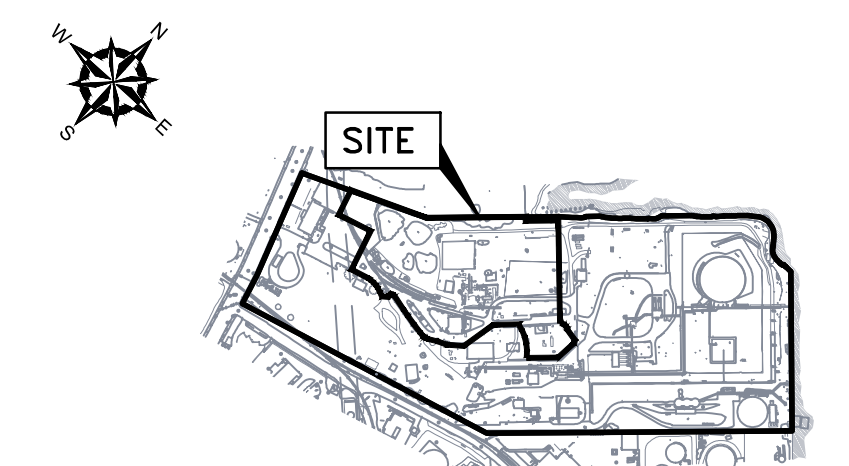
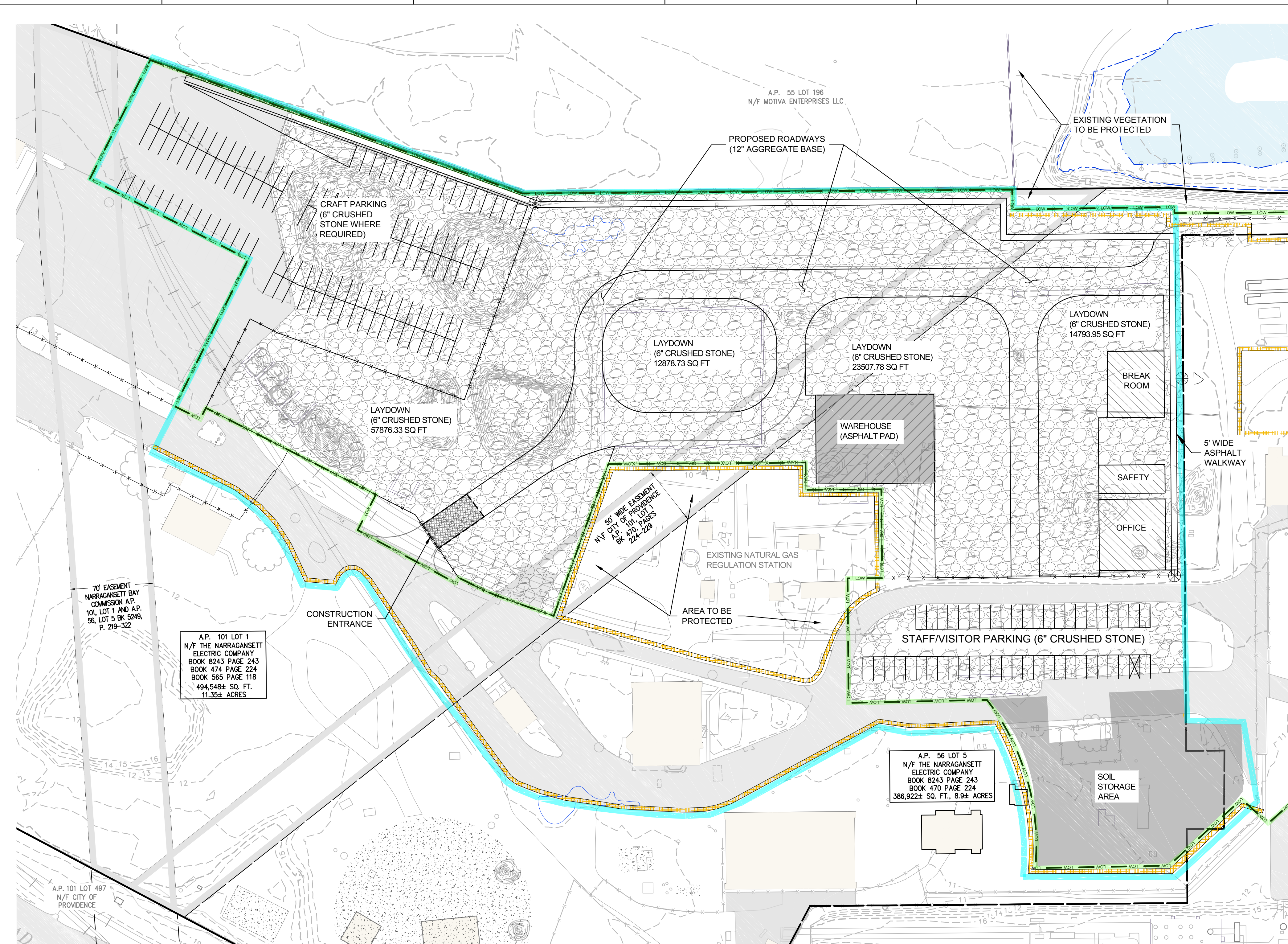


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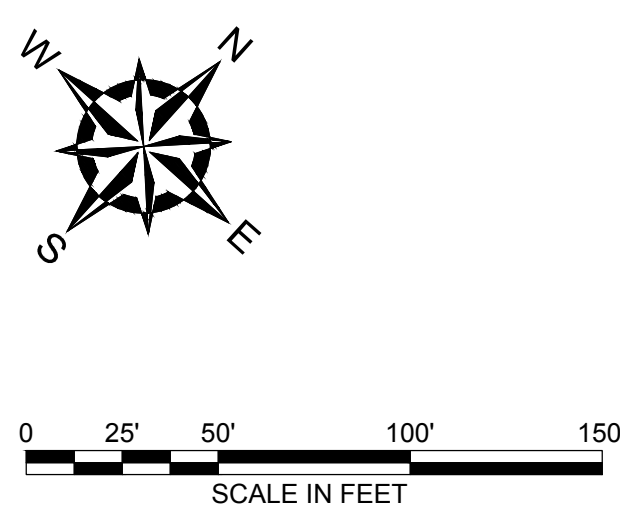
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
EXISTING IMPERVIOUS CONDITIONS PLAN			
PREPARED BY:  GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: 		
PROJ MGR: MSK DESIGNED BY: SJM DATE: SEPTEMBER, 2016	REVIEWED BY: SJM DRAWN BY: LDT PROJECT NO: 33554.60	CHECKED BY: JR SCALE: AS NOTED REVISION NO: 0	FIGURE 3 SHEET NO. 3 OF 15

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DRAWING NAME: I:\102761-National_Grid_Liquefaction\CAD Exchange\102761-08-31-GZA_Liq_Permit Package\33554-60_CEMC PERMITTING_FOR STAMPING-AMS.dwg
 SEP 06 2016 - 9:03am



- KEY PLAN:**
SCALE: 1"=800'
- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 10 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - EXISTING PAVEMENT
 - EASEMENT AREA
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - TEMPORARY LAYDOWN AREA
 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED TEMPORARY PAVEMENT
 - PROPOSED TEMPORARY BUILDING
 - PROPOSED CRUSHED STONE
 - STAKED FILTREXX SOXX (SEE DETAIL ON SHEET 5)
 - LIMIT OF WORK
 - CONSTRUCTION ENTRANCE



GENERAL NOTES:

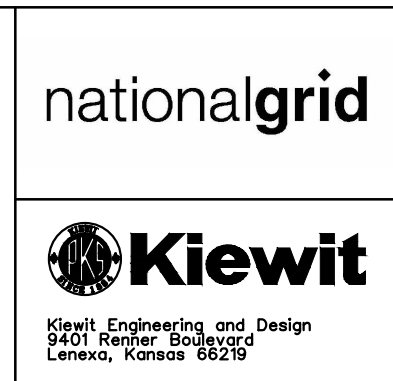
- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
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- ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILES PROVIDED BY KIEWIT
 1. "ACAD-102761-CIV_SITE.DWG"
 2. "2007EXP_102761-CIV_LAYDOWN.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "A2007EXP_102761-CIV_STORM.DWG"
 6. "ACAD-102761-CIV_SURFACING.DWG"
 7. "ACAD-102761-PROP-CONT_DWG"
 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"
- PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
 1. "CATCH BASINS AND SANITARY SEWER SYSTEM" PREPARED BY PROVIDENCE GAS COMPANY, DATED SEPTEMBER 25, 1981.
 2. "PLAN SHOWING UNDERGROUND UTILITIES LNG FACILITY" DATED OCTOBER 6, 1983, "SUBSURFACE UTILITY ENGINEERING" PREPARED BY BAYSTATE SUBSURFACE INVESTIGATION, INC., DATED MAY 17, 2005.
- 2) HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- 3) VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- 4) SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. **OTHER LOCATIONS MAY EXIST.**
- 5) ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.
- 6) PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
- 7) SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL

THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY REQUIREMENT AND SUBJECT TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

REV	DATE	REVISION INFORMATION	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

GENERAL NOTES AND COMMENTS:



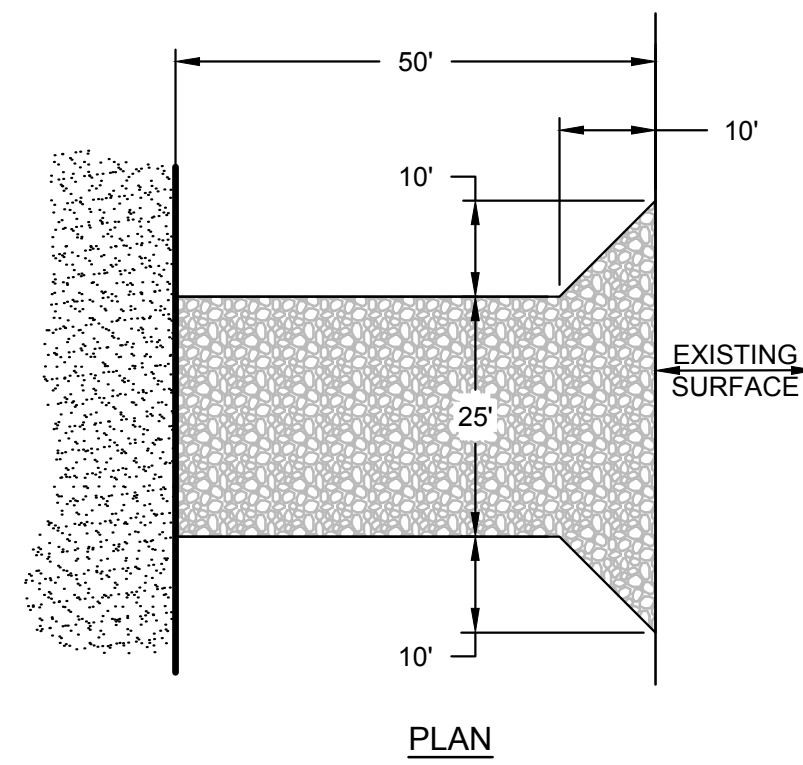
SEAL AND STAMP:
 ASHLEY STUTZMAN
 No. 11512
 REGISTERED PROFESSIONAL ENGINEER
 CIVIL

PROFESSIONAL CERTIFICATION:
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A LICENSED PROFESSIONAL ENGINEER OF THIS STATE.
 LICENSE NO. 11512
 EXPIRATION DATE 06/30/2017

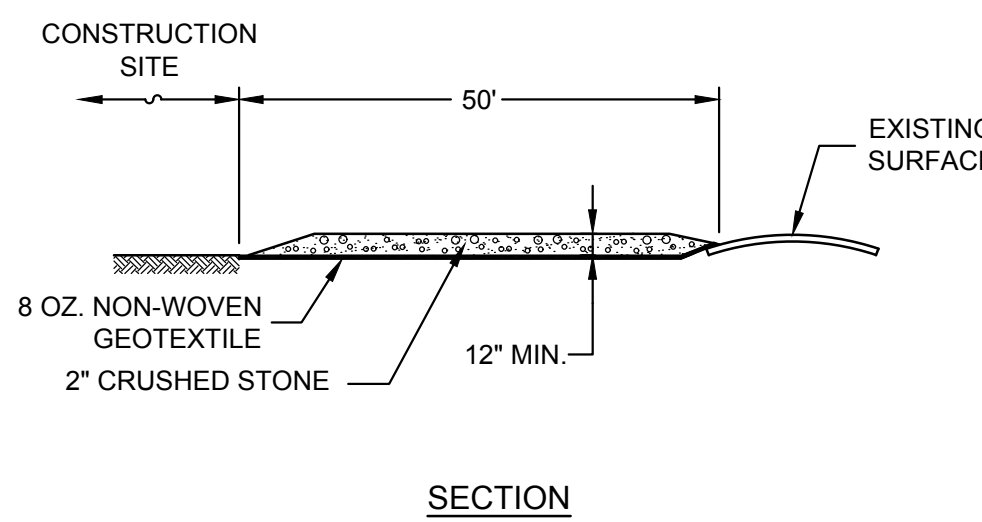
NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
TEMPORARY LAYDOWN AREA			
EROSION AND SEDIMENTATION CONTROLS			
DRAWING NO:	PROJECT NO:	SHT:	REV.
FIGURE 4	33554.60	4 OF 15	0

WHEEL WASH/CONSTRUCTION ENTRANCE NOTES

- ENTRANCE WIDTH SHALL BE TWENTY-FIVE (25) FEET MINIMUM.
- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT OUT OF THE LIMITS OF WORK. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED OUT OF THE LIMITS OF WORK MUST BE REMOVED IMMEDIATELY. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.

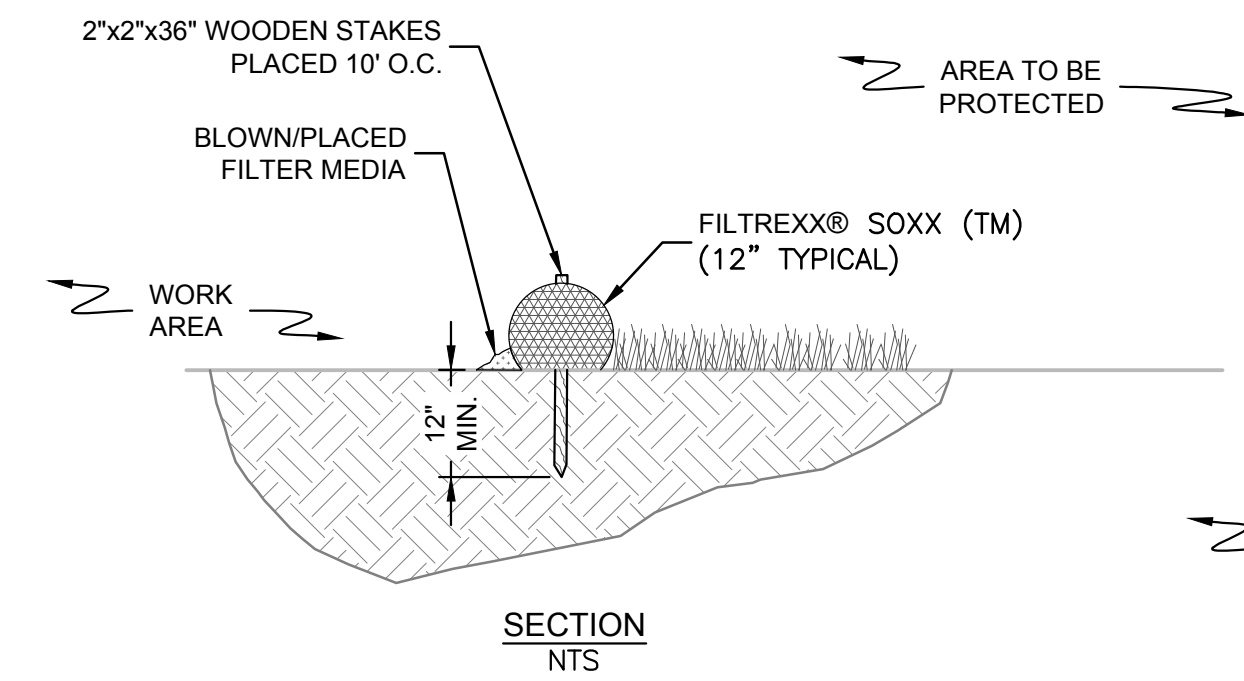


PLAN

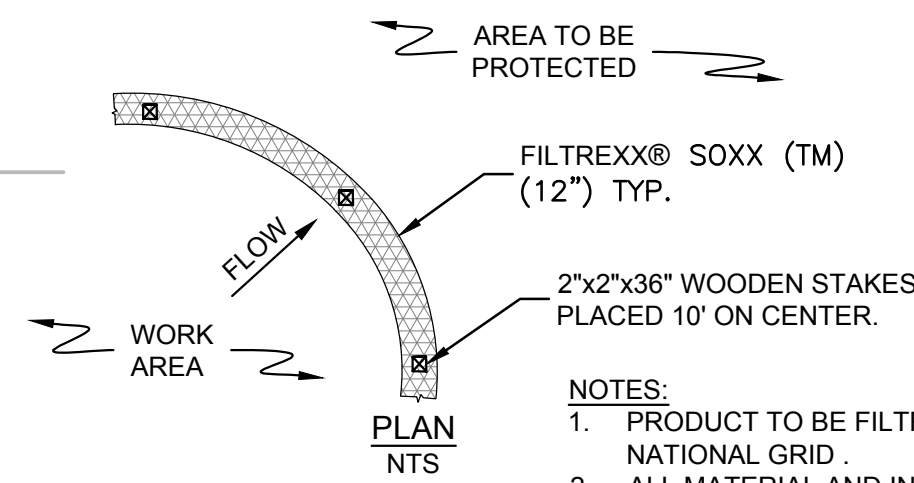


SECTION

WHEEL WASH/CONSTRUCTION ENTRANCE/EXIT
NOT TO SCALE



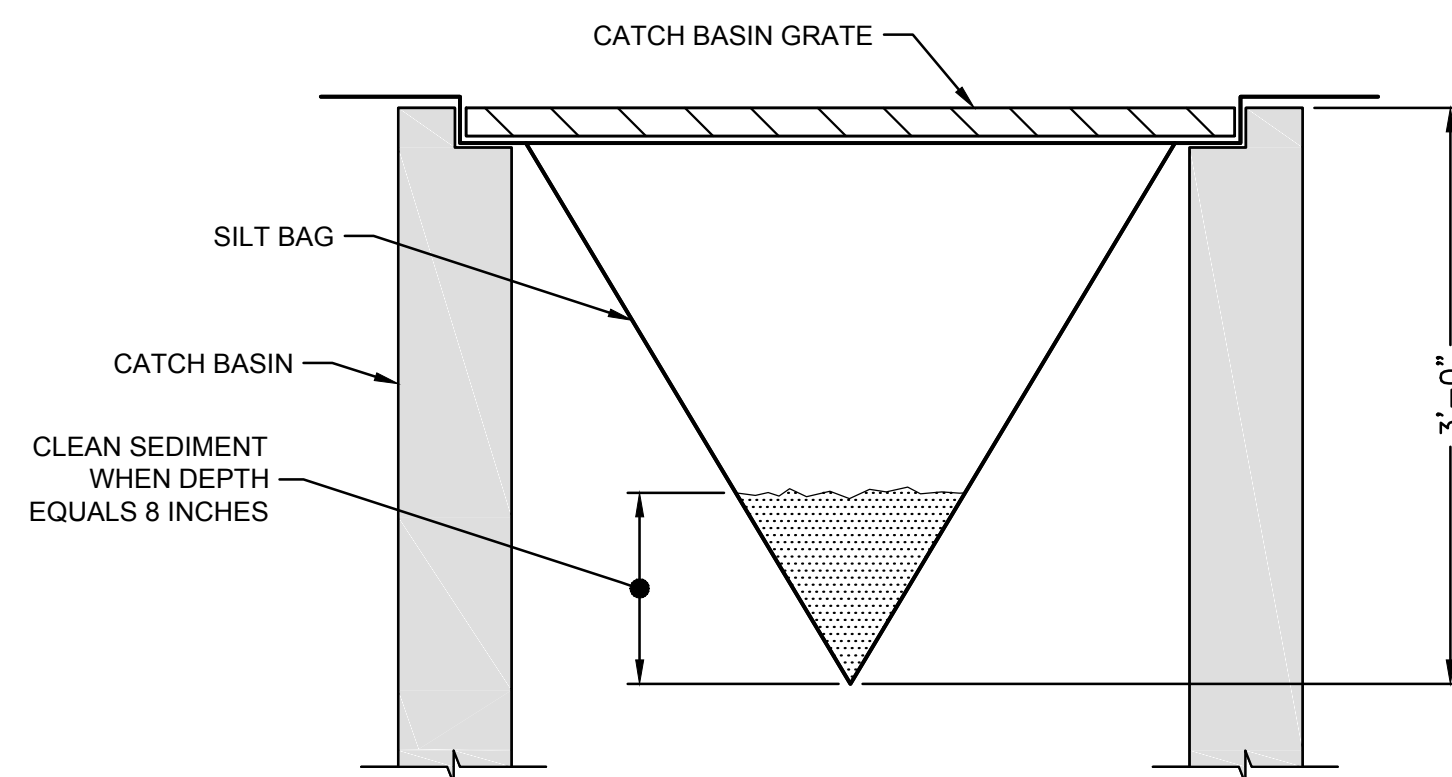
SECTION
NTS



PLAN
NTS

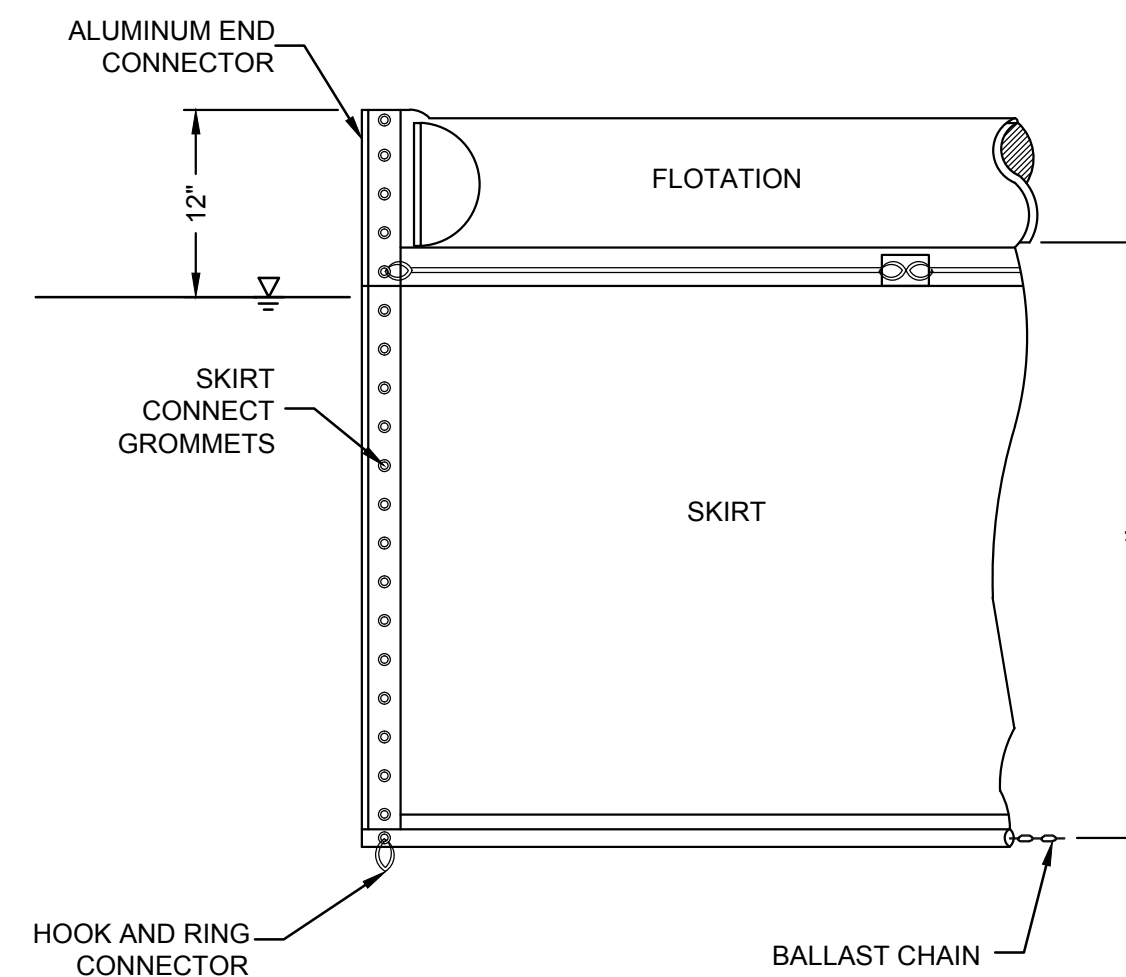
FILTREXX® SOXX SEDIMENT CONTROL DETAIL
NOT TO SCALE

- NOTES:**
- PRODUCT TO BE FILTREXX SILT SOXX OR APPROVED EQUAL BY NATIONAL GRID.
 - ALL MATERIAL AND INSTALLATION TO MEET FILTREXX® SPECIFICATIONS.
 - FILTER MEDIA FILL TO MEET APPLICATION REQUIREMENTS.
 - COMPOST MATERIAL TO BE DISPERSED ON SITE AS DETERMINED BY NATIONAL GRID.



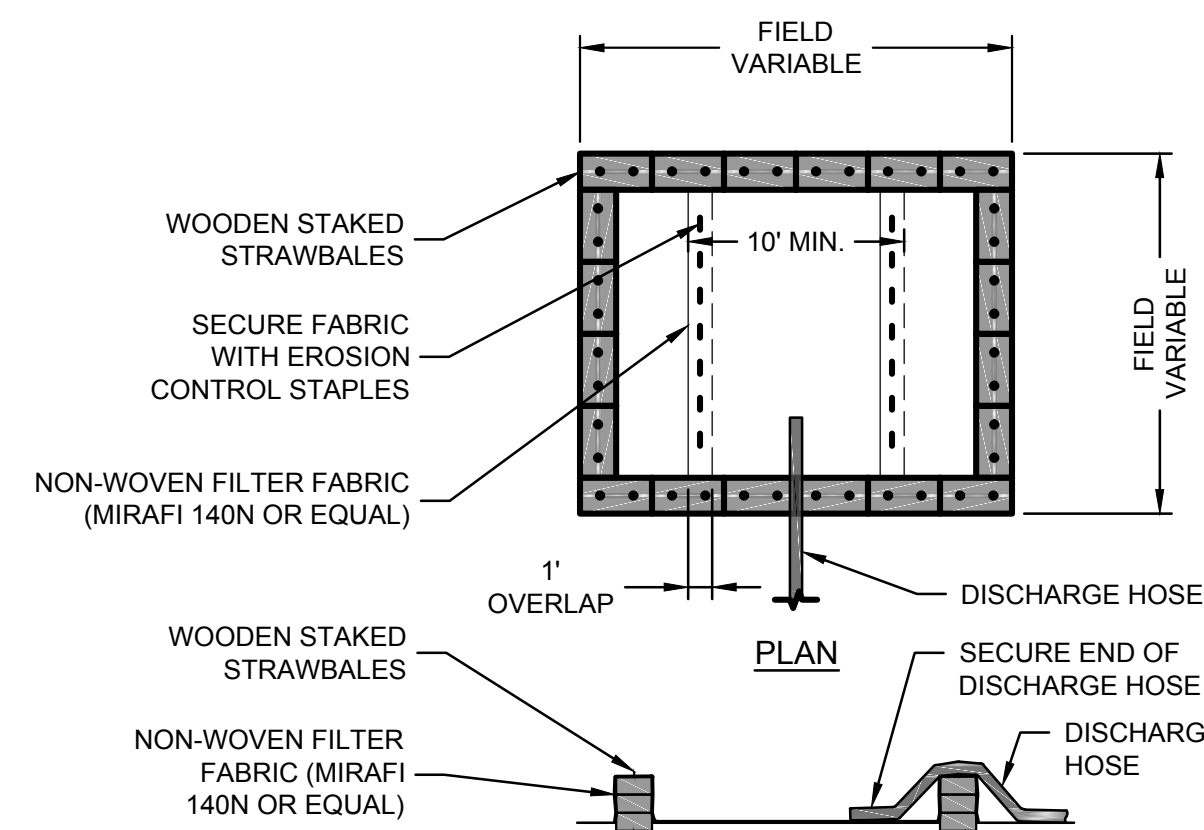
NOTE:
SEDIMENT BAG INLET PROTECTION TO BE SILTSACK MANUFACTURED BY ATLANTIC CONSTRUCTION FABRICS INC. RICHMOND, VA OR APPROVED EQUAL.

SILT SACK DETAIL
NOT TO SCALE

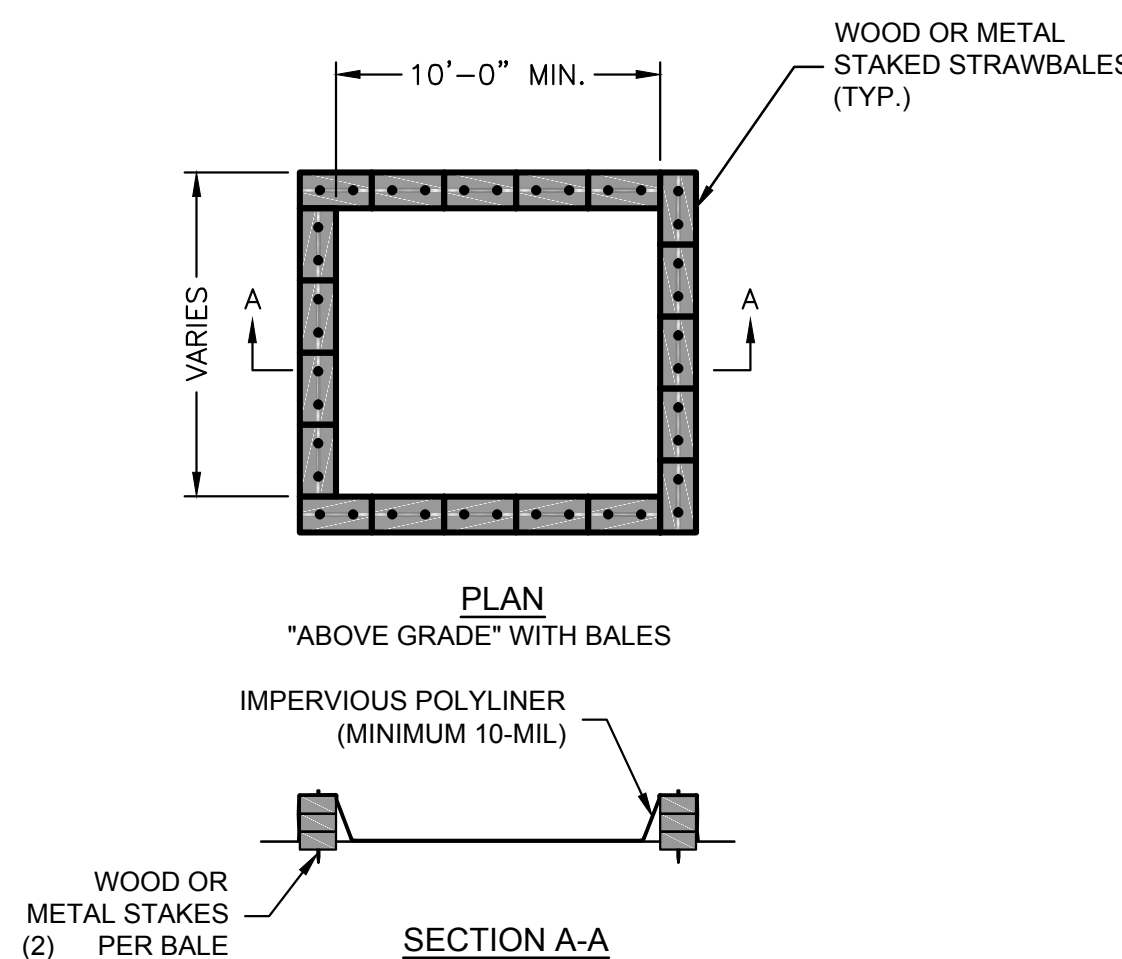


TURBIDITY CURTAIN DETAIL
NOT TO SCALE

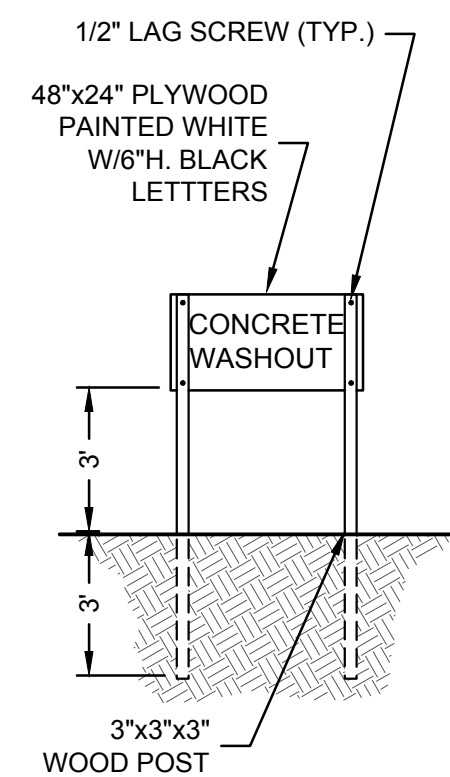
- NOTES:**
- ANCHOR CURTAIN ENDS AT BULKHEAD AND SHORELINE.
 - ANCHOR CURTAIN AT INTERMEDIATE POINTS WITH CONCRETE ANCHOR BLOCKS.



DEWATERING BASIN (SMALL SCALE)
NOT TO SCALE



CONCRETE WASHOUT
NOT TO SCALE



CONCRETE WASHOUT SIGN DETAIL
(OR EQUIVALENT)

SLOPE INSTALLATION DETAIL OF EROSION CONTROL BLANKET

NOT TO SCALE

NOTES:

- PRODUCT TO BE NORTH AMERICAN GREEN EROSION CONTROL BLANKET OR APPROVED EQUAL BY NATIONAL GRID.
- IN LOOSE SOIL CONDITIONS, THE USE OF STAPLES OR STAKE LENGTHS GREATER THAN 6" (15 cm) MAY BE NECESSARY TO PROPERLY SECURE THE RECPS.

INSTALLATION NOTES:

- PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
- BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECPS IN A 6" (15cm) DEEP x 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECPS EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECPS WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF RECPS BACK OVER SEED AND COMPACTED SOIL. SECURE RECPS OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE RECPS.
- ROLL THE RECPS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECPS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE(tm). WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
- THE EDGES OF PARALLEL RECPS MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5cm - 12.5cm) OVERLAP DEPENDING ON RECPS TYPE.
- CONSECUTIVE RECPS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5cm) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE RECPS WIDTH.

TURBIDITY CURTAINS NOTES

TURBIDITY CURTAIN SPECIFICATIONS

- THE HEIGHT OF THE CURTAIN SHALL BE 20 PERCENT GREATER THAN THE DEPTH OF THE WATER TO ALLOW FOR WATER LEVEL FLUCTUATIONS.
- THE AREA THAT THE TURBIDITY CURTAIN PROTECTS SHALL NOT CONTAIN LARGE CULVERTS OR DRAINAGE AREA THAT IS FLOWS OCCUR BEHIND THE CURTAIN WOULD CAUSE A BREACH OR LOST CONTACT AT THE BOTTOM SURFACE.
- AT A MINIMUM THE CURTAIN MATERIAL SHALL BE SUPPORTED BY A FLOTATION MATERIAL HAVING AT LEAST 29 LBS PER FOOT OF BUOYANCY. THE FLOATING CURTAIN SHALL HAVE AT LEAST A 5/16" GALVANIZED CHAIN AS BALLAST AND AT LEAST DUAL 5/16" GALVANIZED WIRE ROPES WITH A HEAVY VINYL COATING AS LOAD LINES.
- THE CURTAIN SHALL BE MADE OF A TIGHTLY WOVEN NYLON, PLASTIC OR OTHER NON-DETERIORATING MATERIAL MEETING THE FOLLOWING SPECIFICATIONS:
 - GRAB TENSILE STRENGTH:
 - MACHINE DIRECTION (MD) -370 LBS
 - CROSS MACHINE DIRECTION (CD) -250 LBS
 - MULLEN BURST STRENGTH: 480 PSI
 - TRAPEZOID TEAR STRENGTH:
 - MD-100 LBS
 - CD-60LBS
 - APPARENT OPENING SIZE: 70 US STANDARD SIEVE
 - PERCENT OPEN AREA: 4%
 - PERMISSIVITY: 0.28 SEC-1

TURBIDITY CURTAIN INSTALLATION REQUIREMENTS

- THE AREA OF THE PROPOSED INSTALLATION SHALL BE INSPECTED FOR OBSTACLES THAT COULD DAMAGE THE CURTAIN OR IMPAIR ITS EFFECTIVENESS.
- THE CURTAIN SHALL BE FIRMLY ANCHORED IN PLACE. SHALLOW INSTALLATIONS CAN BE MADE BY SECURING THE CURTAIN BY STAKING RATHER THAN USING A FLOTATION SYSTEM.
- SUPPLEMENTAL ANCHORS SHALL BE USED AS NEEDED DEPENDING ON WATER SURFACE DISTURBANCES SUCH AS BOATS AND WAVE ACTION BY WINDS.

TURBIDITY CURTAIN MAINTENANCE

- THE TURBIDITY CURTAIN SHALL BE INSPECTED DAILY AND REPAIRED OR REPLACED IMMEDIATELY.
- IF THE CURTAIN IS ORIENTED IN A MANNER THAT FACES THE PREVAILING WINDS, FREQUENT CHECKS OF THE ANCHORAGE SHALL BE MADE.
- ANY NECESSARY SEDIMENT REMOVAL MUST BE DONE BY HAND BEFORE THE CURTAIN IS REMOVED.
- THE BARRIER SHALL BE REMOVED BY PULLING IT TOWARD THE CONSTRUCTION SITE TO MINIMIZE THE RELEASE OF ATTACHED SEDIMENT.

CONCRETE WASHOUT NOTES

CONCRETE WASHOUT SPECIFICATIONS

- LOCATE WASHOUT AREA AT LEAST 50 FEET FROM SENSITIVE AREAS SUCH AS STORM DRAINS, OPEN DITCHES, OR WATER BODIES INCLUDING JURISDICTIONAL WETLANDS.
- ALLOW CONVENIENT TRUCK ACCESS.
- THE NUMBER OF FACILITIES SHOULD DEPEND ON THE DEMAND FOR STORAGE CAPACITY.
- CONCRETE WASHOUT FACILITIES SHALL BE CONSTRUCTED AND MAINTAINED IS SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED.

CONCRETE WASHOUT INSTALLATION REQUIREMENTS

- THE CONCRETE WASHOUT SHOULD BE A MINIMUM OF 10 FOOT BY 10 FOOT AREA.
- THE WASHOUT WILL BE CONSTRUCTED WITH STRAW BALES ARRANGED AROUND THE PERIMETER AND LINED WITH TWO LAYERS OF 10 MIL POLYETHYLENE SHEETING. THE POLYETHYLENE SHEETING WILL WRAP OVER THE STRAW BALES (OR APPROVED EQUAL) AND WILL BE SECURED WITH SAND BAGS.
- THE WASHOUT SHALL BE SIZED TO ACCOMMODATE ALL OF THE WASHOUT WATER AND CONCRETE AND SHOULD INCLUDE 12-INCHES OF FREEBOARD ABOVE THE WASHOUT WASTE.

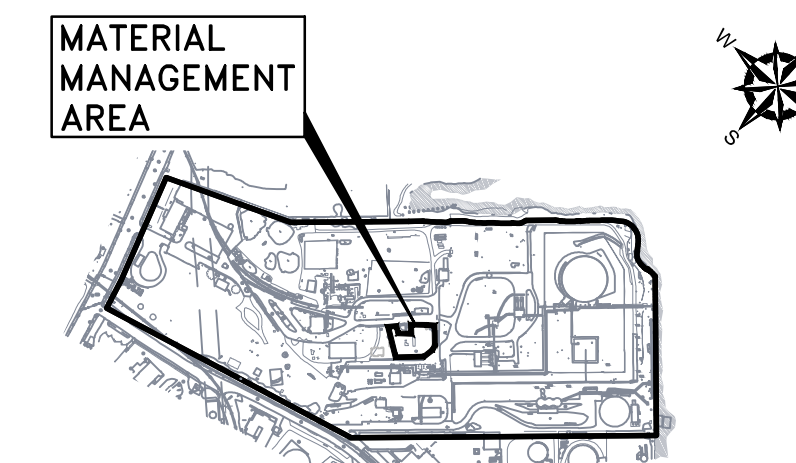
CONCRETE WASHOUT MAINTENANCE

- INSPECT AND VERIFY THAT THE CONCRETE WASHOUT HAS BEEN PROPERLY CONSTRUCTED PRIOR TO THE COMMENCEMENT OF CONCRETE WORK.
- INSPECT DAILY FOR DAMAGE OR ISSUES.
- CHECK REMAINING CAPACITY.
- VERIFY THAT LINERS ARE INTACT.
- WASHOUT FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED ONCE THE WASHOUT IS 75% FULL.
- IF WASHOUT IS NEARING CAPACITY, VACUUM AND DISPOSE OF THE WASTE MATERIAL IN AN APPROVED MANNER.
- DO NOT DISCHARGE LIQUID OR SLURRY TO WATERWAYS, STORM DRAINS, OR ONTO THE GROUND SURFACE.
- COVER THE WASHOUT WITH A NON-WATER COLLECTING COVER PRIOR TO STORM EVENTS TO PREVENT OVERFLOW.
- REMOVE AND DISPOSE OF HARDENED CONCRETE AND RETURN THE WASHOUT TO FUNCTIONAL CONDITION.

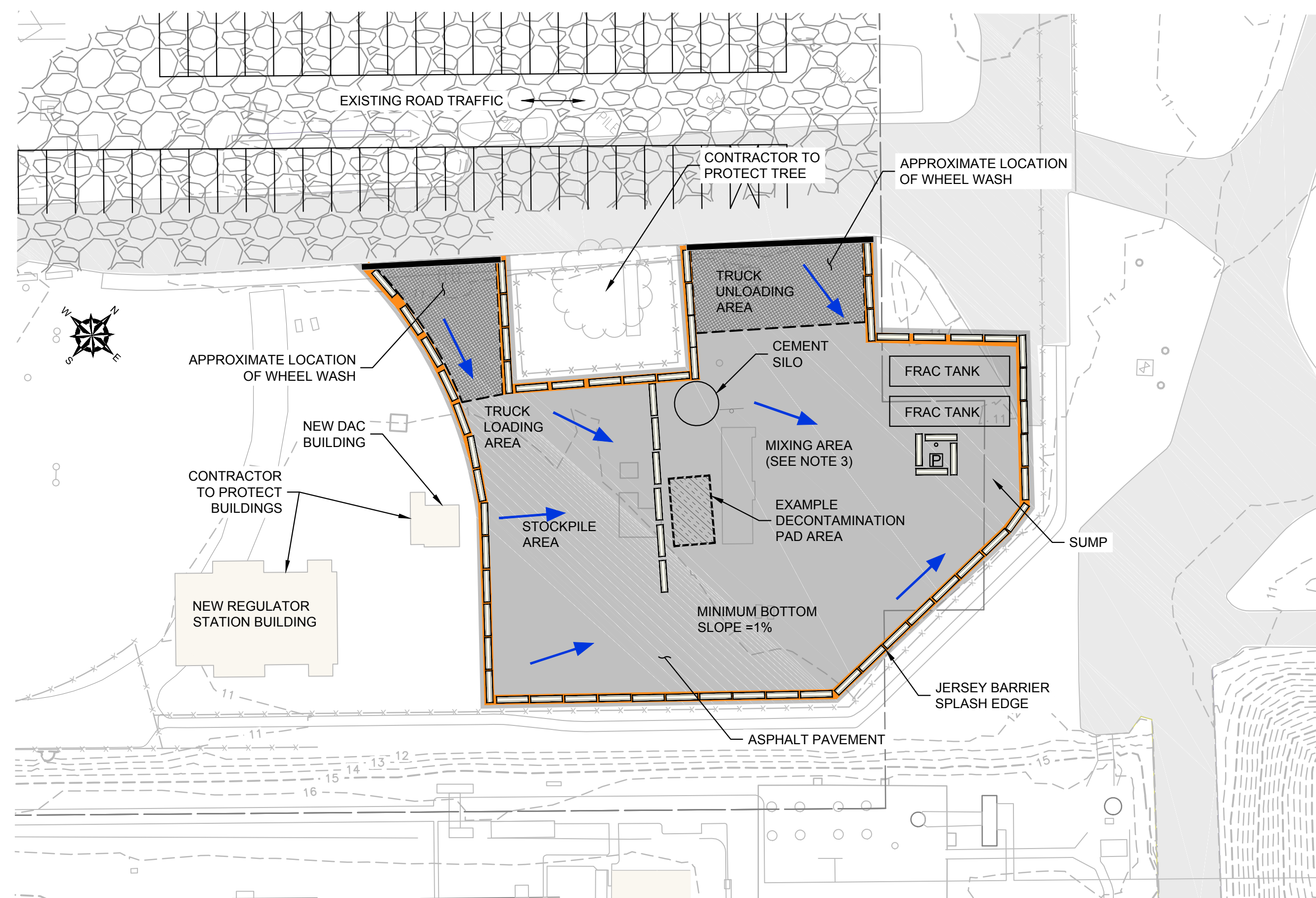
THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
TEMPORARY SEDIMENTATION AND EROSION CONTROL DETAILS			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: 		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 5 SHEET NO. 5 OF 15

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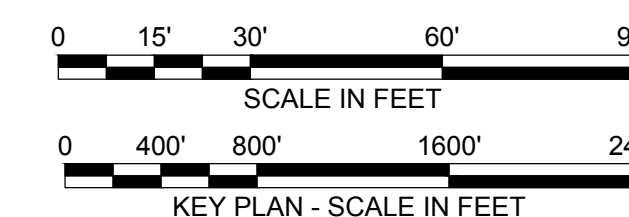


KEY PLAN:
SCALE: 1"=800'



MATERIAL MANAGEMENT AREA: PLAN VIEW
SCALE: 1"=30'

- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - EXISTING PAVEMENT
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED CRUSHED STONE
 - PROPOSED GRAVEL
 - EXISTING FENCE
 - JERSEY BARRIERS
 - JERSEY BARRIER SPLASH EDGE
 - WHEEL WASH
 - PROPOSED GRADING
 - DECONTAMINATION PAD



GENERAL NOTES:

1) BASE MAP DEVELOPED FROM THE FOLLOWING:

- ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
- DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
- ELECTRONIC CAD FILE 14-152_SU1_REV2.DWG, TITLED "TOPOGRAPHIC SURVEY PLAN, PORTION OF A.P. 56 LOT 5" DATED OCTOBER 27, 2014 AND PROVIDED BY NATIONAL GRID.

• ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.

- ELECTRONIC CAD FILES PROVIDED BY KIEWIT
 1. "ACAD-102761-CIV_SITE.DWG"
 2. "2007EXP_102761-CIV_LAYDOWN.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "2007EXP_102761-CIV_STORM.DWG"
 6. "ACAD-102761-CIV_SURFACING.DWG"
 7. "ACAD-102761-PROP-CONT.DWG"
 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"

• PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID

1. "CATCH BASINS AND SANITARY SEWER SYSTEM" PREPARED BY PROVIDENCE GAS COMPANY, DATED SEPTEMBER 25, 1981.
2. "PLAN SHOWING UNDERGROUND UTILITIES LNG FACILITY" DATED OCTOBER 6, 1983, "SUBSURFACE UTILITY ENGINEERING" PREPARED BY BAYSTATE SUBSURFACE INVESTIGATION, INC., DATED MAY 17, 2005.

2) HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.

3) VERTICAL DATUM IS BASED ON NAVD 1988 (MSL) FROM BASE MAPPING PROVIDED BY VHB.

4) SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. **OTHER LOCATIONS MAY EXIST.**

5) ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.

6) PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.

7) SITE BOUNDARIES ARE APPROXIMATE.

MATERIAL MANAGEMENT AREA NOTES:

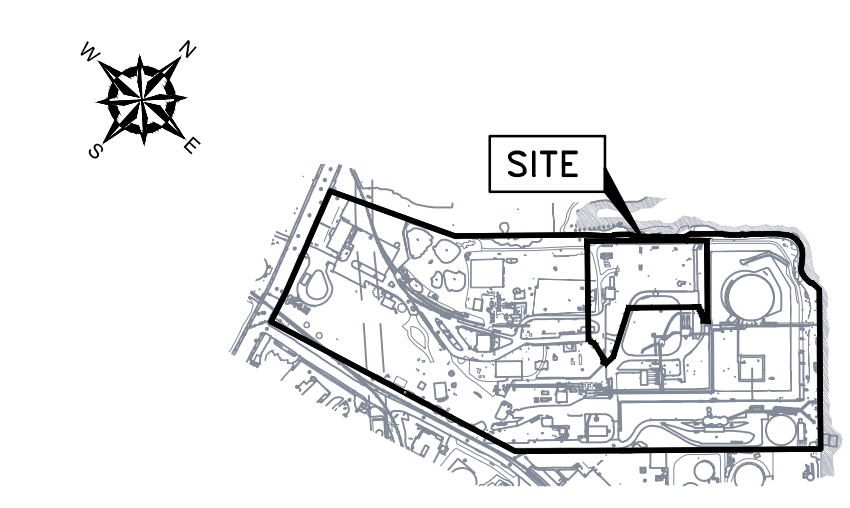
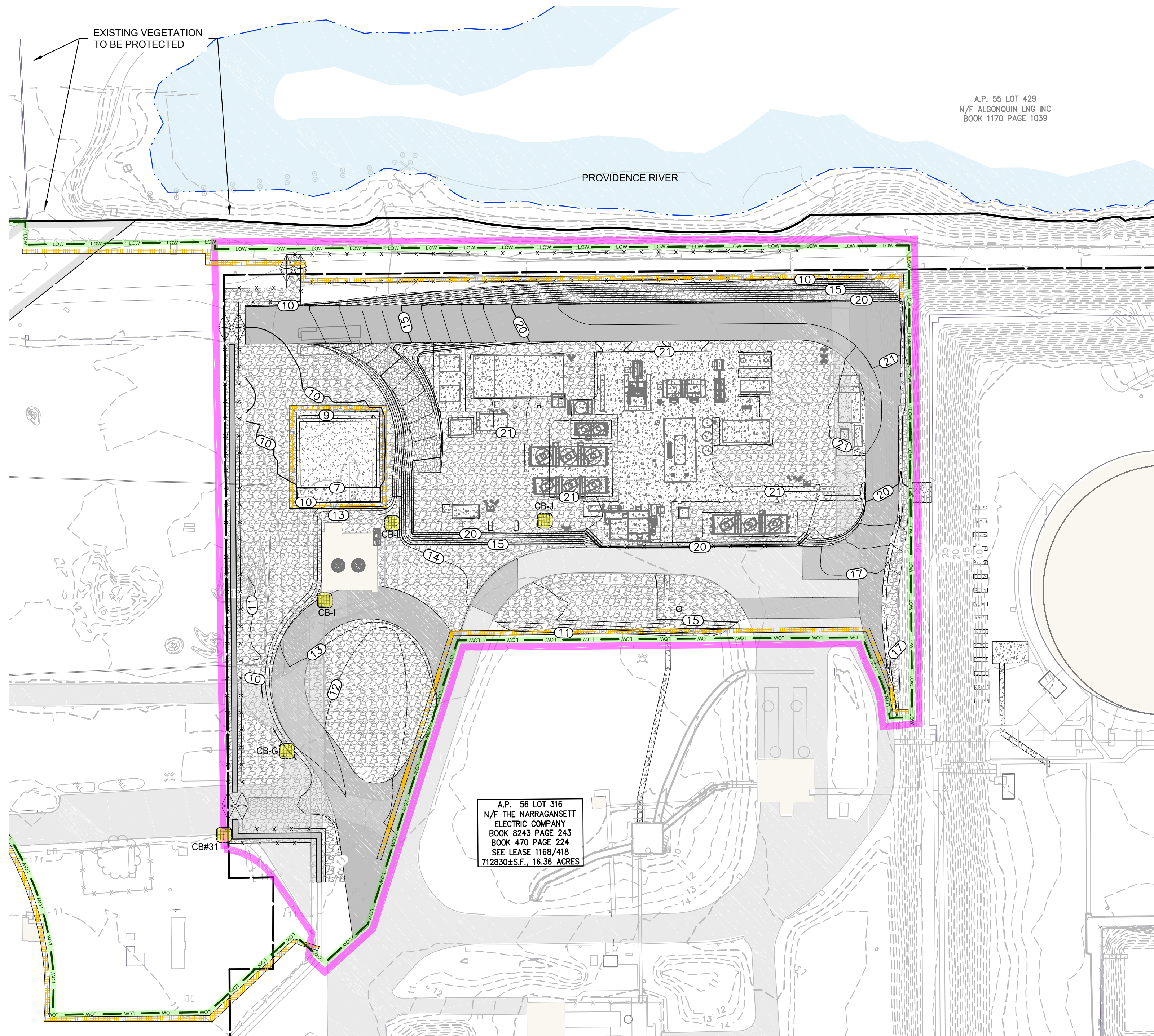
1. REGRADE LAND TO FACILITATE DRAINAGE TO THE SUMP, REMOVE EXISTING PAVEMENT AS NEEDED. THE MINIMUM BOTTOM SLOPE OF THE PAVED SURFACE SHALL BE 1%.
2. TRUCK LOADING AND UNLOADING AREAS SHALL BE USED AS WHEEL WASH AREAS. AS NECESSARY TRUCK UNLOADING AREA SHALL BE CONSTRUCTED WITH A MINIMUM BOTTOM SLOPE OF 1% TO DRAIN INTO SUMP.
3. MIXING AREA SHALL BE USED AS DECONTAMINATION PAD. PRIOR TO USE AS A DECONTAMINATION PAD, THE SURFACE SHALL BE POWER WASHED TO REMOVE ANY REMAINING MATERIAL.
4. IF THE MIXING AREA IS NOT USED AS A DECONTAMINATION PAD, CONSTRUCT STAND-ALONE DECONTAMINATION PAD, AS SHOWN IN DETAIL ON SHEET ENV-3.

THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

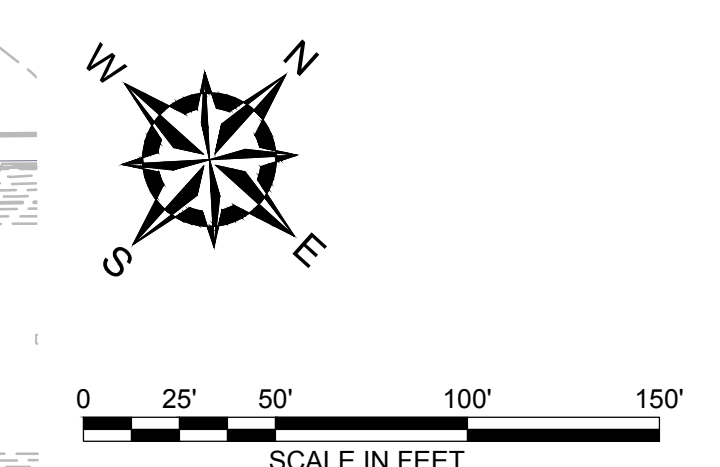
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
SOIL STORAGE AREA PLAN			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: 	
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 6 SHEET NO. 6 OF 15

FOR PERMITTING ONLY

DRAWING NAME: I:\102761-National_Grid_Liquefaction\CAD Exchange\102761-08-31-GZA_Liq_Permit Package\33554-60_CEMC PERMITTING_FOR STAMPING-AMS.dwg
SEP 06 2016 - 9:03am



- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - EXISTING PAVEMENT
 - EASEMENT AREA
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - LIQUEFACTION WORK AREA
 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
 - PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
 - PROPOSED GRAVEL
 - STAKED FILTREXX SOXX (SEE DETAIL ON SHEET 5)
 - LIMIT OF WORK
 - PROPOSED CONCRETE
 - PROPOSED SAND FILTER
 - CATCH BASIN FRAME AND GRATE
 - CATCH BASIN TO BE PROTECTED WITH SILT SACK DURING CONSTRUCTION (SEE DETAIL ON SHEET 5)



GENERAL NOTES:

- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
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- ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.
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 2. "2007EXP_102761-CIV_LAYDOWN.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "2007EXP_102761-CIV_STORM.DWG"
 6. "2007EXP-102761-CIV_SURFACING.DWG"
 7. "102761-CIV_GRADING.DWG"
 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"
- PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
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- 4) SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. **OTHER LOCATIONS MAY EXIST.**
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- 7) SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL

THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY AGREEMENT AND SUBJECT TO THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

REV	DATE	ISSUED FOR PERMIT	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

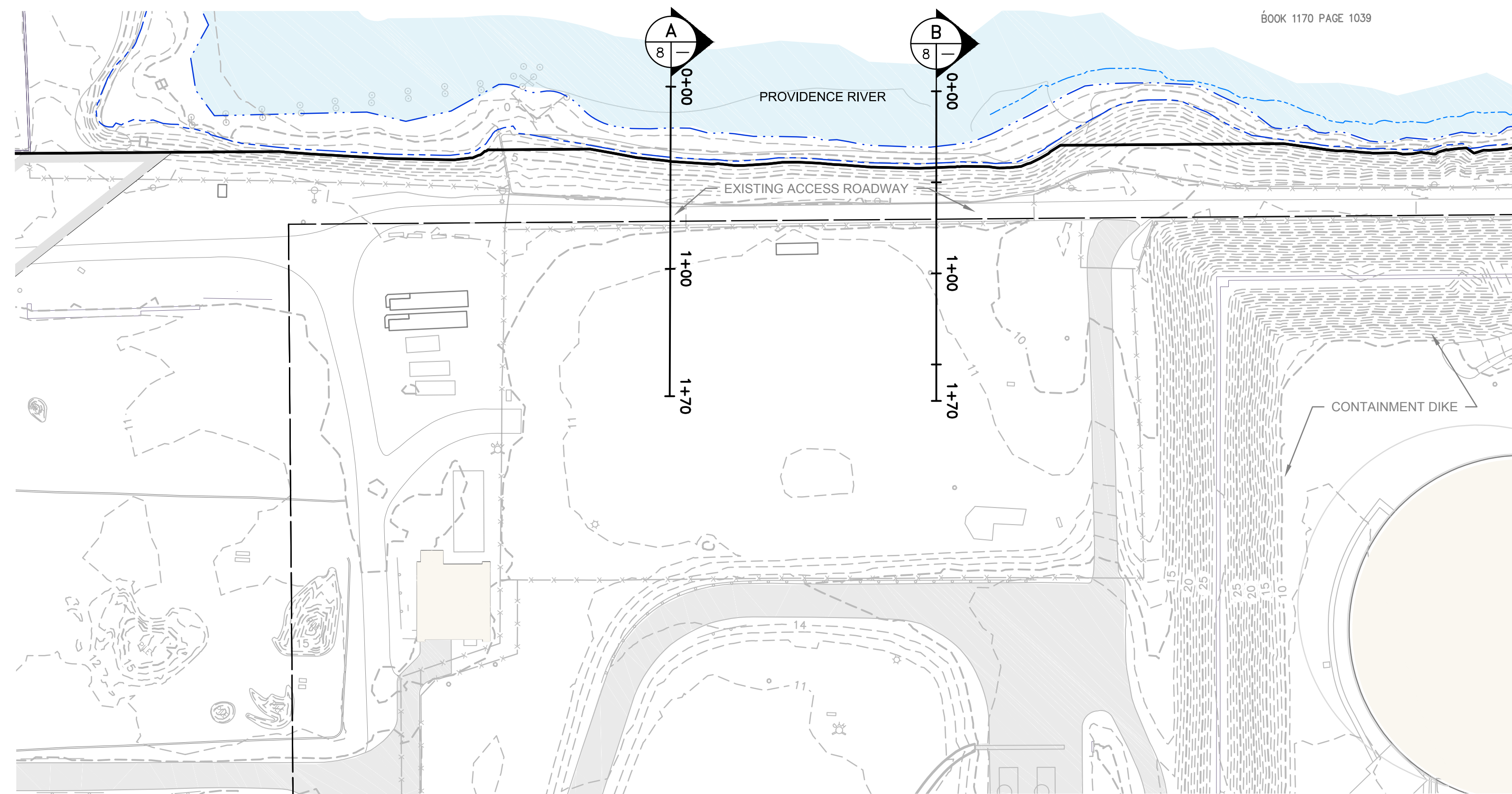
GENERAL NOTES AND COMMENTS:



SEAL AND STAMP:
ASHLEY STUTZMAN
No. 11512
REGISTERED
PROFESSIONAL ENGINEER
CIVIL

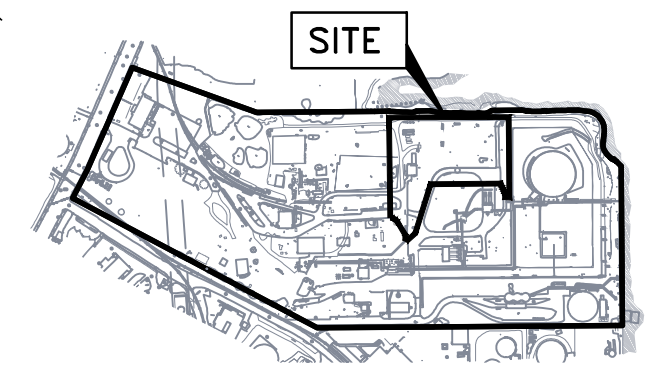
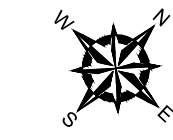
PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A LICENSED PROFESSIONAL ENGINEER OF THE STATE OF RHODE ISLAND.
LICENSE NO. 11512
EXPIRATION DATE 06/30/2017

NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
LIQUEFACTION WORK AREA			
EROSION AND SEDIMENTATION CONTROLS			
DRAWING NO:	PROJECT NO:	SHEET:	REV.
FIGURE 7	33554.60	7 OF 15	0



PLAN VIEW OF EXISTING REVETMENT
SCALE: 1"=50'

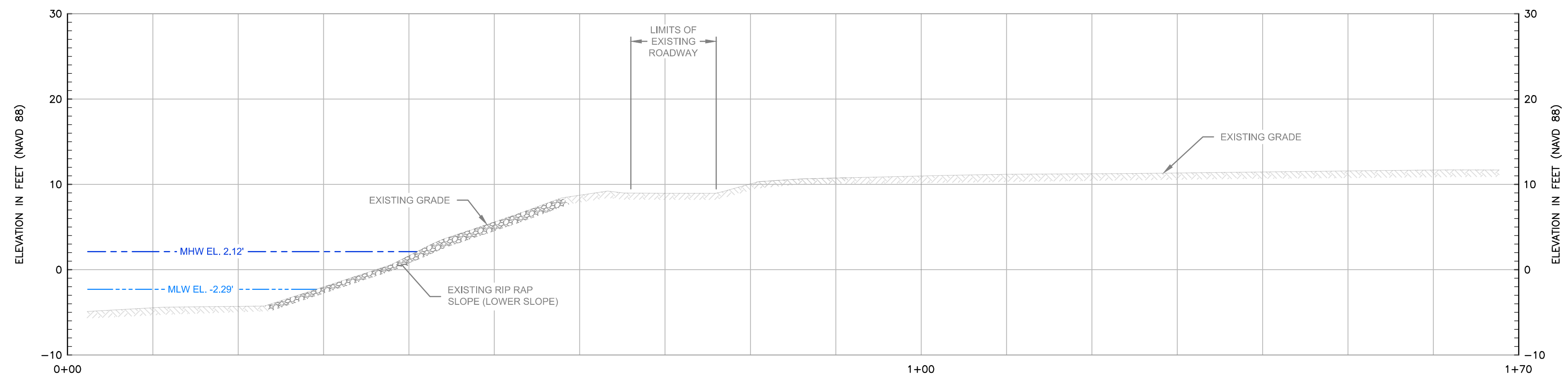
- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - EXISTING PAVEMENT
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - MHW
 - MLW
 - EASEMENT AREA



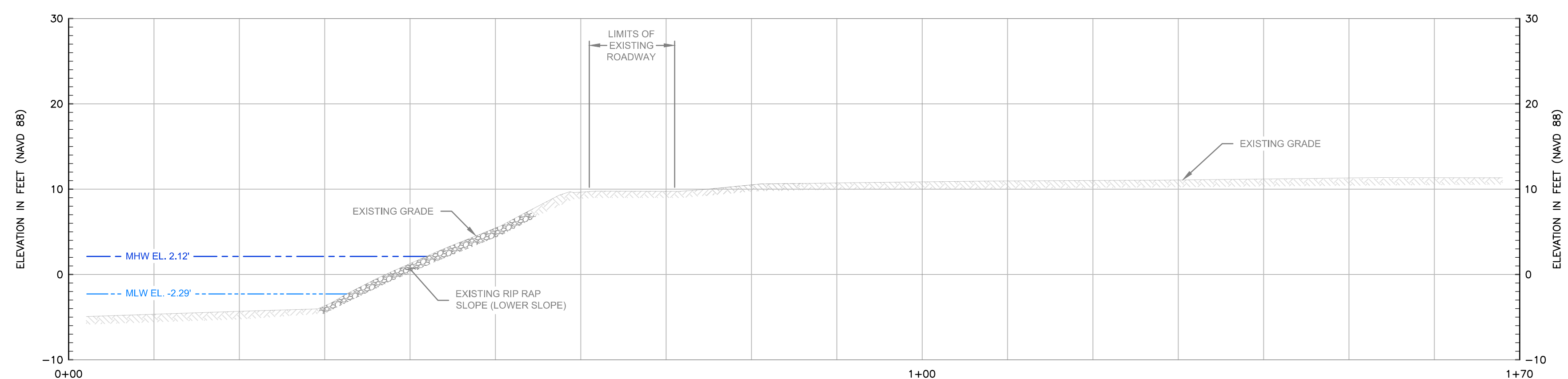
KEY PLAN:
SCALE: 1"=800'

GENERAL NOTES:

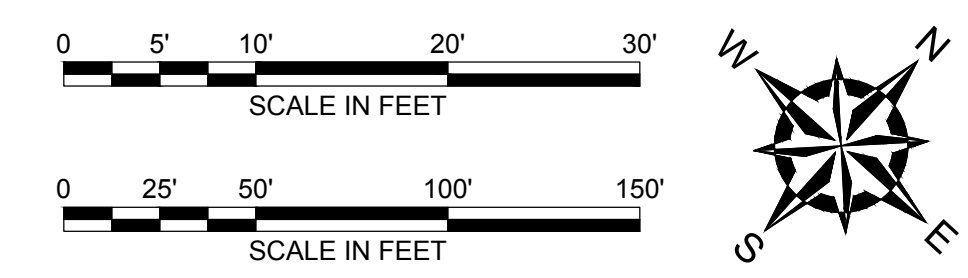
- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
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 - ELECTRONIC CAD FILE 5153_C00.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.
 - ELECTRONIC CAD FILES PROVIDED BY KIEWIT
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 2. "2007EXP_102761-CIV_LAYDOWN.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "A2007EXP_102761-CIV_STORM.DWG"
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- 7) SITE BOUNDARIES ARE APPROXIMATE.



A TYPICAL REVETMENT SECTION
SCALE: 1"=10'



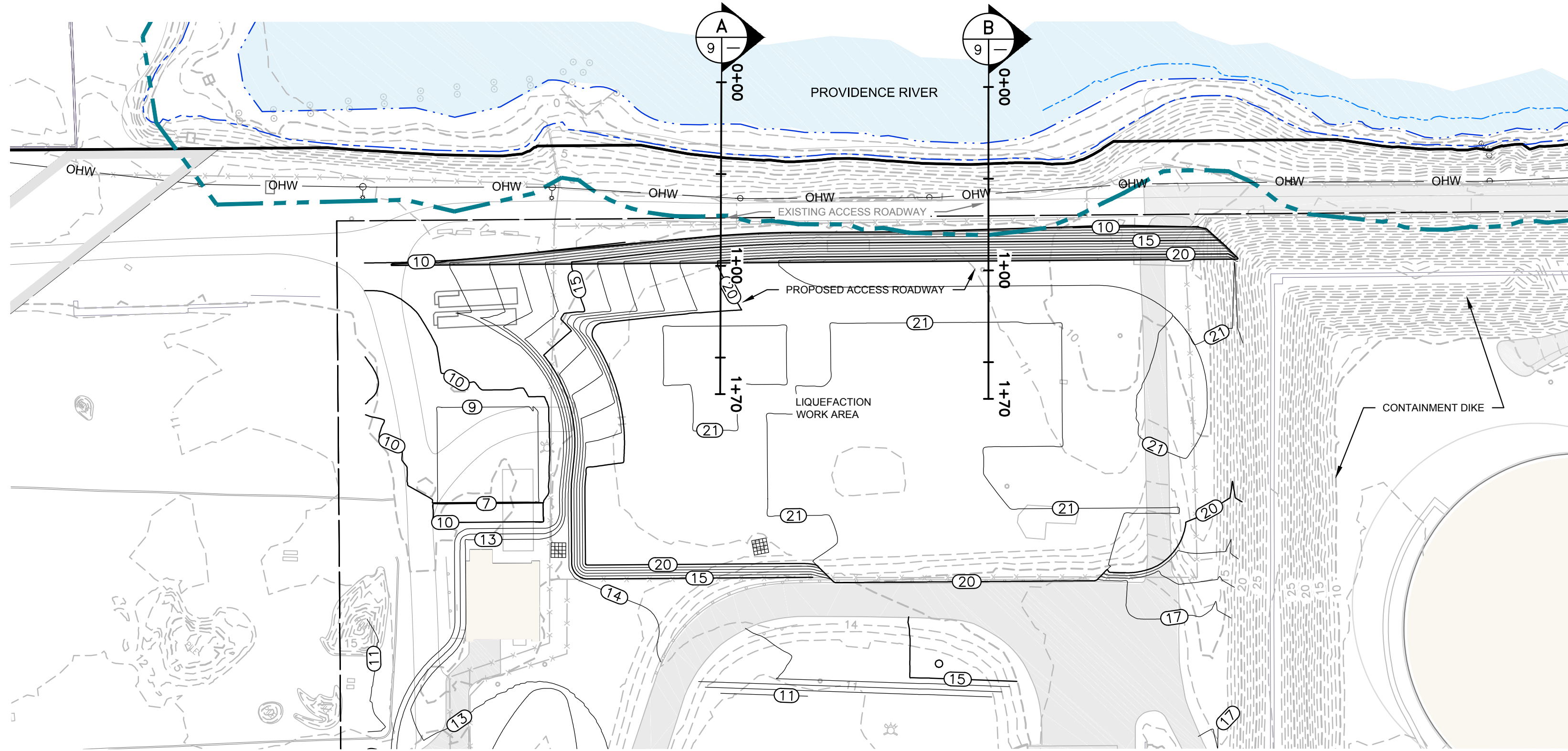
B TYPICAL REVETMENT SECTION
SCALE: 1"=10'



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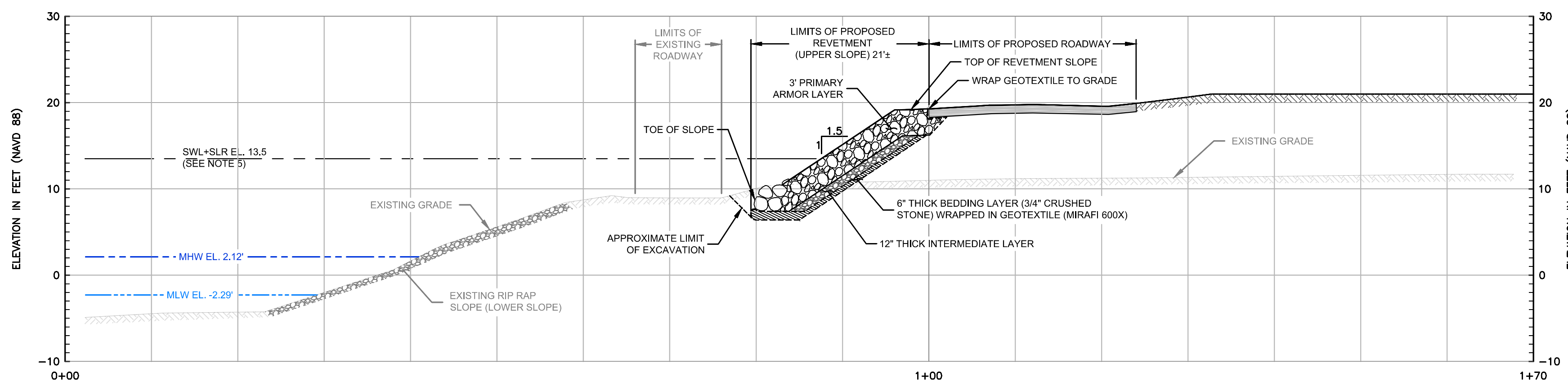
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
LIQUEFACTION WORK AREA - EXISTING REVETMENT WALL AND CROSS SECTIONS			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 8 SHEET NO. 8 OF 15

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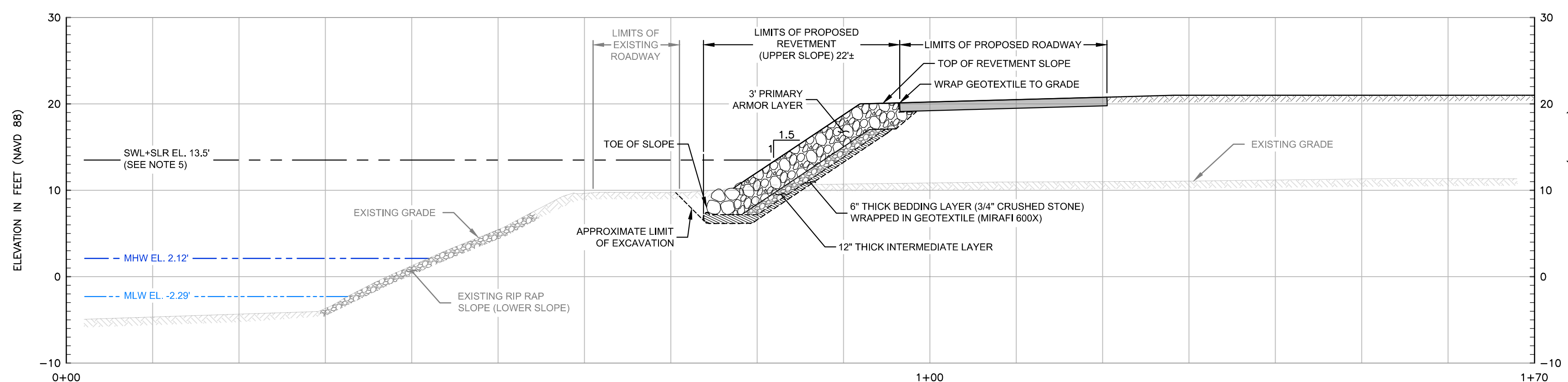
PLAN VIEW OF PROPOSED REVETMENT AND REVETMENT IMPROVEMENTS

SCALE: 1"=50'



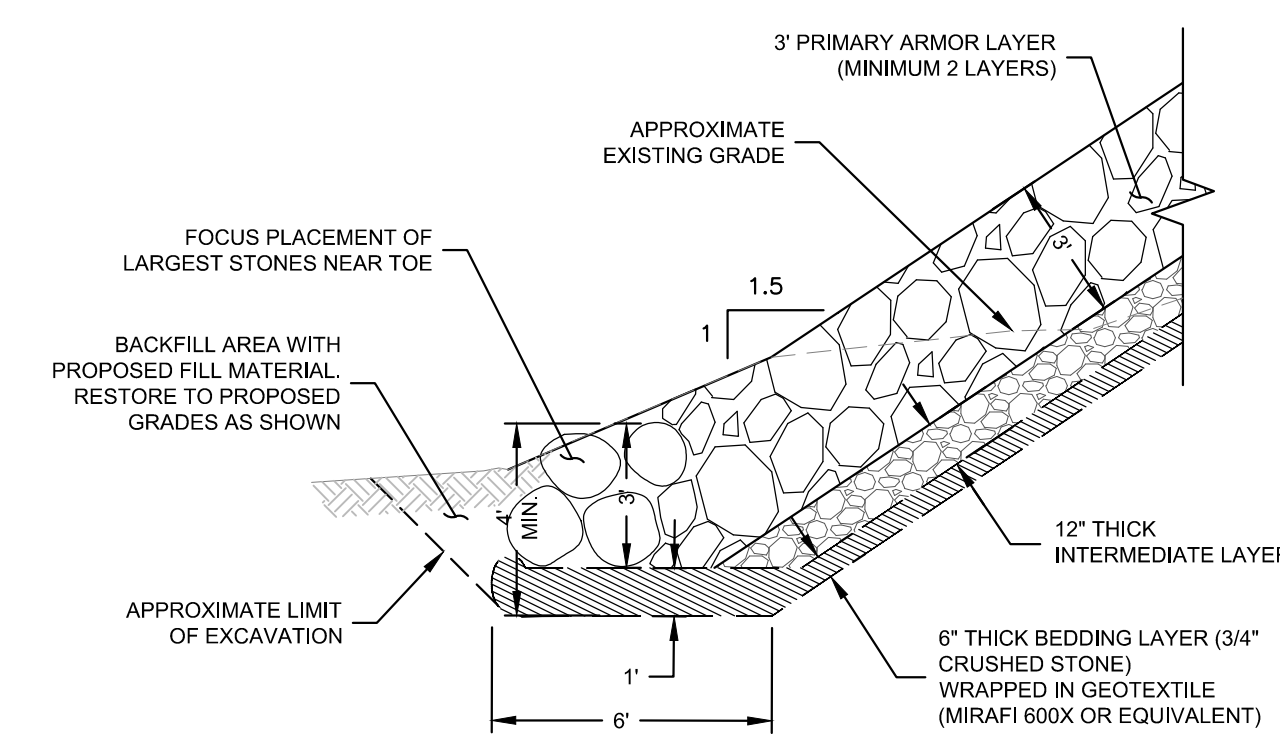
TYPICAL REVETMENT SECTION A-A

SCALE: 1"=10'



TYPICAL REVETMENT SECTION B-B

SCALE: 1"=10'



PROPOSED REVETMENT (UPPER SLOPE) (TYP.)

SCALE: 1"=4'

RIP RAP GRADATION REQUIREMENTS			
PRIMARY ARMOR LAYER		INTERMEDIATE LAYER	
RIDOT R-6		RIDOT R-2	
% LESS THAN	STONE SIZE (IN.)	% LESS THAN	STONE SIZE (IN.)
0-15%	8	0-15%	1
0-50%	13	0-50%	2
100%	26	100%	4

3/4" CRUSHED STONE GRADATION REQUIREMENTS	
% LESS THAN	SIEVE SIZE
100	3/4 INCH
90-100	1/2 INCH
30-60	3/8 INCH
0-15	No. 4
0-5	No. 8

LEGEND:

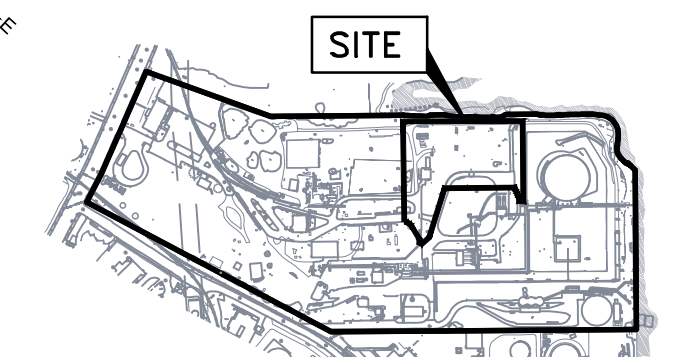
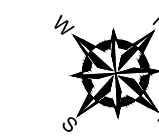
- EXISTING BUILDING
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- 50-FOOT SETBACK
- EXISTING PAVEMENT
- UTILITY POLE
- LIGHT POLE
- HYDRANT
- PROPERTY LINES
- INTERIOR PROPERTY LINE
- MHW
- MLW
- EASEMENT AREA
- PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
- PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
- STILL WATER LEVEL AND PREDICTED SEA LEVEL RISE (SEE NOTE #5)
- OHW
- LIMIT OF PROPOSED REVETMENT (UPPER SLOPE)

NOTE:

- TO CONVERT FROM NAVD88 TO MLW ADD 2.29 FT.
- TIDAL DATUM BASED UPON NOAA STATION 8454000.

NAVD 88	MLW
+2.37' (MHHW)	+4.66' (MHHW)
+2.12' (MHW)	+4.41' (MHW)
0.0' (NAVD 88)	+2.29'
-2.29' (MLW)	0.0' (MLW)
-2.47' (MLLW)	-0.18' (MLLW)

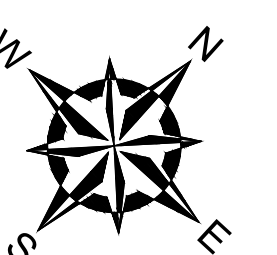
TIDAL DATUM



KEY PLAN:
SCALE: 1"=600'

GENERAL NOTES:

- BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
 - ELECTRONIC CAD FILE 14-152_SU1_REV2.DWG, TITLED "TOPOGRAPHIC SURVEY PLAN, PORTION OF A.P. 56 LOT 5" DATED OCTOBER 27, 2014 AND PROVIDED BY NATIONAL GRID.
 - ELECTRONIC CAD FILE 5153_C00.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.
 - ELECTRONIC CAD FILES PROVIDED BY KIEWIT
 - "ACAD-102761-CIV_SITE.DWG"
 - "2007EXP_102761-CIV_LAYDOWN.DWG"
 - "102761 MEC_STR_BASE.DWG"
 - "102761-SURVEY_SITE.DWG"
 - "A2007EXP_102761-CIV_STORM.DWG"
 - "ACAD-102761-CIV_SURFACING.DWG"
 - "ACAD-102761-PROP-CONT.DWG"
 - "POST DEVELOPMENT DRAINAGE MAP.DWG"
 - PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
 - "CATCH BASINS AND SANITARY SEWER SYSTEM" PREPARED BY PROVIDENCE GAS COMPANY, DATED SEPTEMBER 25, 1981.
 - "PLAN SHOWING UNDERGROUND UTILITIES LNG FACILITY" DATED OCTOBER 6, 1983, "SUBSURFACE UTILITY ENGINEERING" PREPARED BY BAYSTATE SUBSURFACE INVESTIGATION, INC., DATED MAY 17, 2005.
- HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. OTHER LOCATIONS MAY EXIST.
- ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.
- PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
- SITE BOUNDARIES ARE APPROXIMATE.

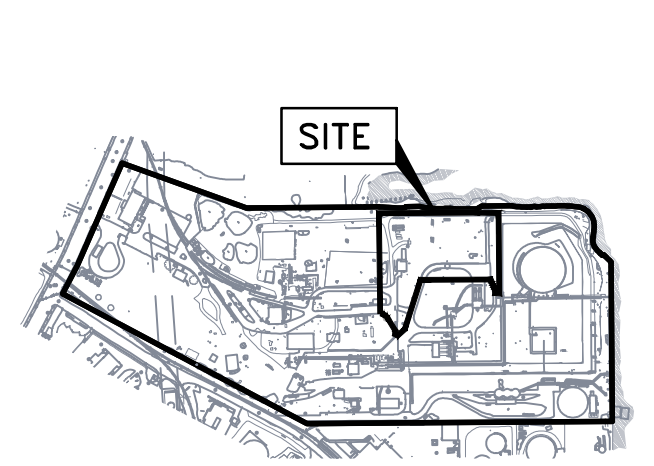
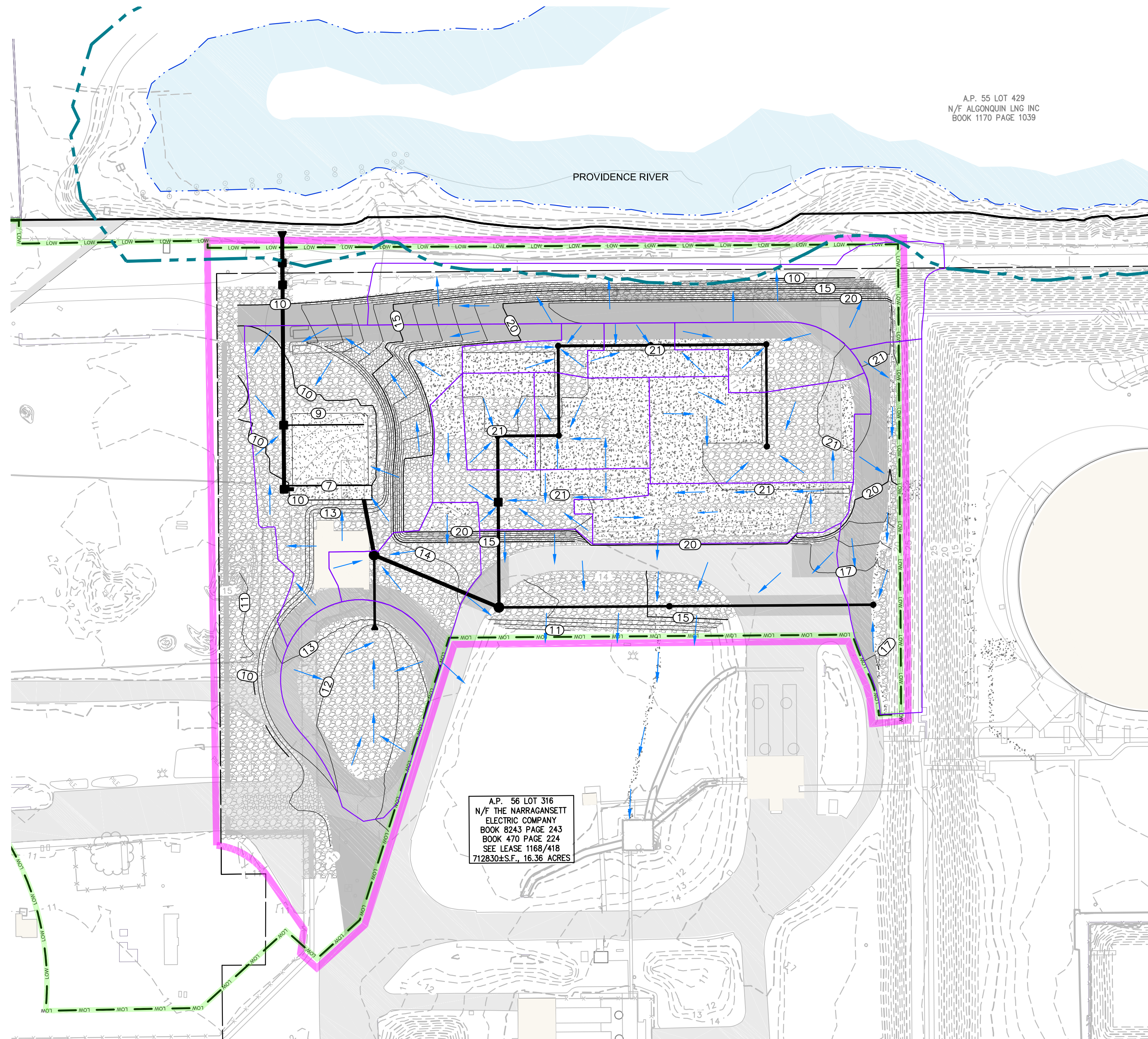


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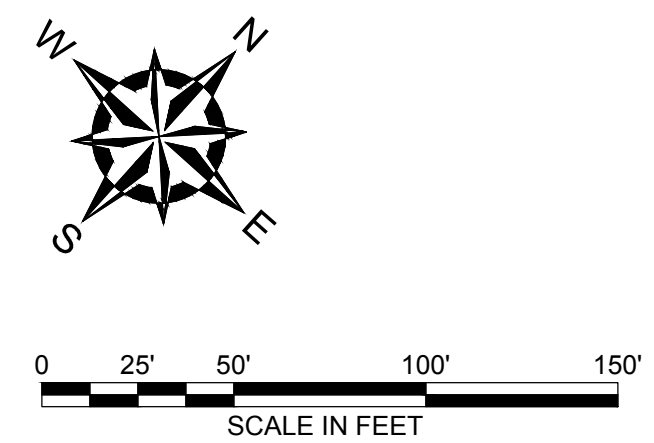
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND	
LIQUEFACTION WORK AREA - PROPOSED SLOPE ARMORING, EXISTING REVETMENT AND CROSS SECTIONS	
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60
CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE <b style="font-size: 24pt;">9 SHEET NO. 9 OF 15

DRAWING NAME: I:\102761-National_Grid_Liquefaction\CAD Exchange\102761-08-31-GZA Lic Permit Package\33554-60_CEMC PERMITTING_FOR STAMPING-AMIS.dwg
 SEP 06 2016 - 9:02am



- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - 50-FOOT SETBACK
 - EXISTING PAVEMENT
 - EASEMENT AREA
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
 - PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED GRAVEL
 - PROPOSED CONCRETE
 - PROPOSED SAND FILTER
 - LIQUEFACTION WORK AREA
 - LIMIT OF WORK
 - FLOW DIRECTION

A.P. 56 LOT 316
 N/F THE NARRAGANSETT
 ELECTRIC COMPANY
 BOOK 8243 PAGE 243
 BOOK 470 PAGE 224
 SEE LEASE 1168/418
 712830&SF., 16.36 ACRES



GENERAL NOTES:

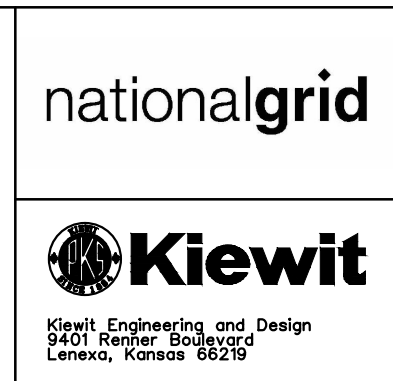
- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE "1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
- ELECTRONIC CAD FILE 14-152_SU1_REV2.DWG, TITLED "TOPOGRAPHIC SURVEY PLAN, PORTION OF A.P. 56 LOT 5" DATED OCTOBER 27, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILES PROVIDED BY KIEWIT
 1. "ACAD-102761-CIV_SITE.DWG"
 2. "2007EXP_102761-CIV_SURFACING.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "A2007EXP_102761-CIV_STORM.DWG"
 6. "ACAD-102761-CIV_SURFACING.DWG"
 7. "ACAD-102761-PROP-CONT.DWG"
 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"
- PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
 1. "CATCH BASINS AND SANITARY SEWER SYSTEM" PREPARED BY PROVIDENCE GAS COMPANY, DATED SEPTEMBER 25, 1981.
 2. "PLAN SHOWING UNDERGROUND UTILITIES LNG FACILITY" DATED OCTOBER 6, 1983, "SUBSURFACE UTILITY ENGINEERING" PREPARED BY BAYSTATE SUBSURFACE INVESTIGATION, INC., DATED MAY 17, 2005.
- 2) HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- 3) VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- 4) SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. **OTHER LOCATIONS MAY EXIST.**
- 5) ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.
- 6) PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
- 7) SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL

THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY AGREEMENT AND SUBJECT THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

REV	DATE	REVISION INFORMATION	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

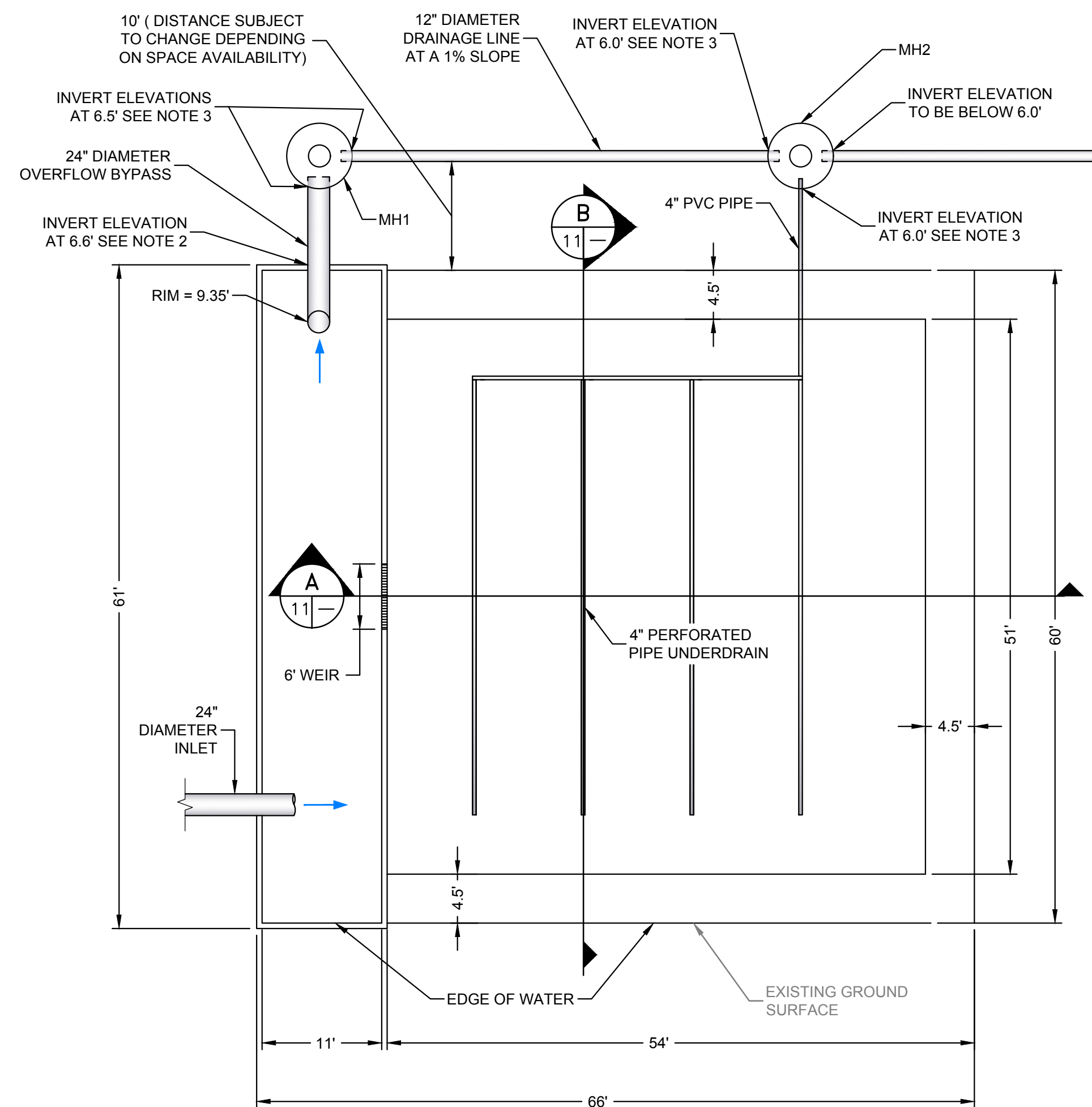
GENERAL NOTES AND COMMENTS:



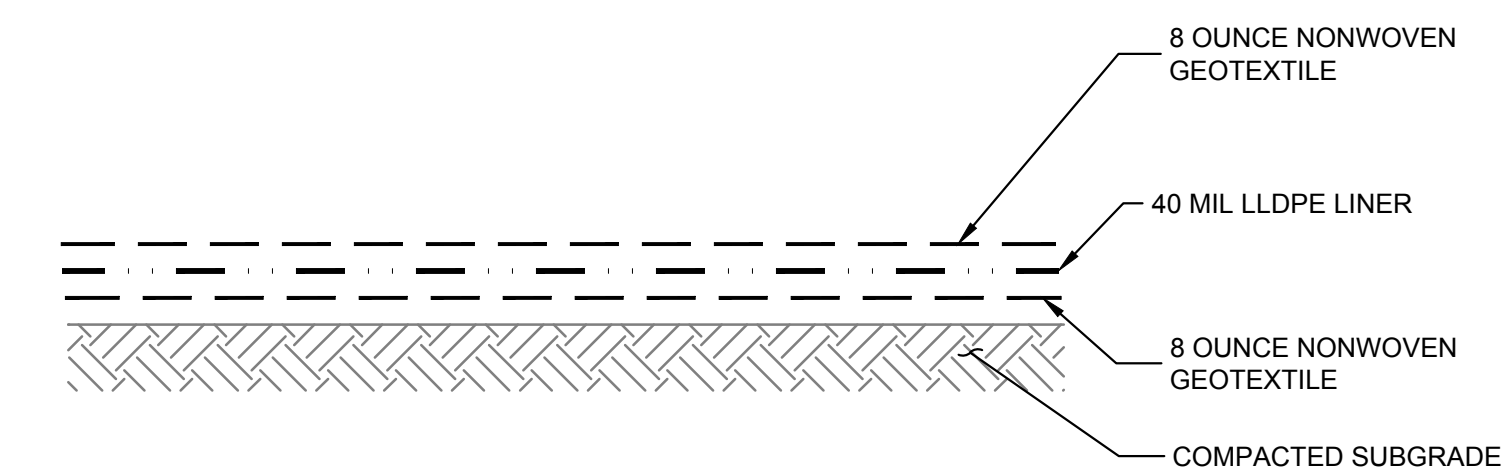
SEAL AND STAMP:
 ASHLEY STUTZMAN
 No. 11512
 REGISTERED PROFESSIONAL ENGINEER
 CIVIL

PROFESSIONAL CERTIFICATION:
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A LICENSED PROFESSIONAL ENGINEER OF THE STATE OF RHODE ISLAND.
 LICENSE NO. 11512
 EXPIRATION DATE 06/30/2017
 ENG/DESIGN ORIG: A. STUTZMAN
 LEAD ENG: A. STUTZMAN
 ENG. MGR: J. BOCKELMAN
 PROJ. MGR: A. PARRACK

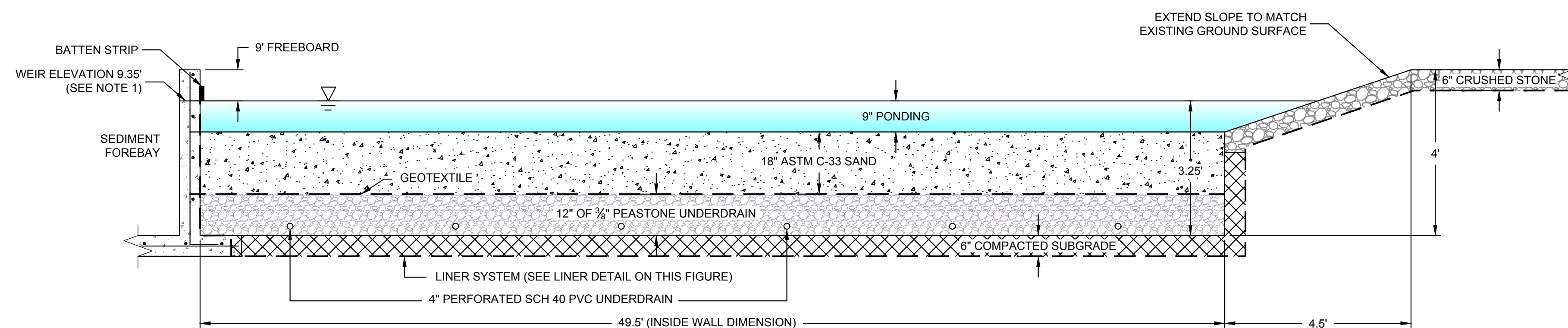
NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
STORMWATER MANAGEMENT PLAN			
DRAWING NO:	PROJECT NO:	SHT:	REV.
FIGURE 10	33554.60	10 OF 15	0



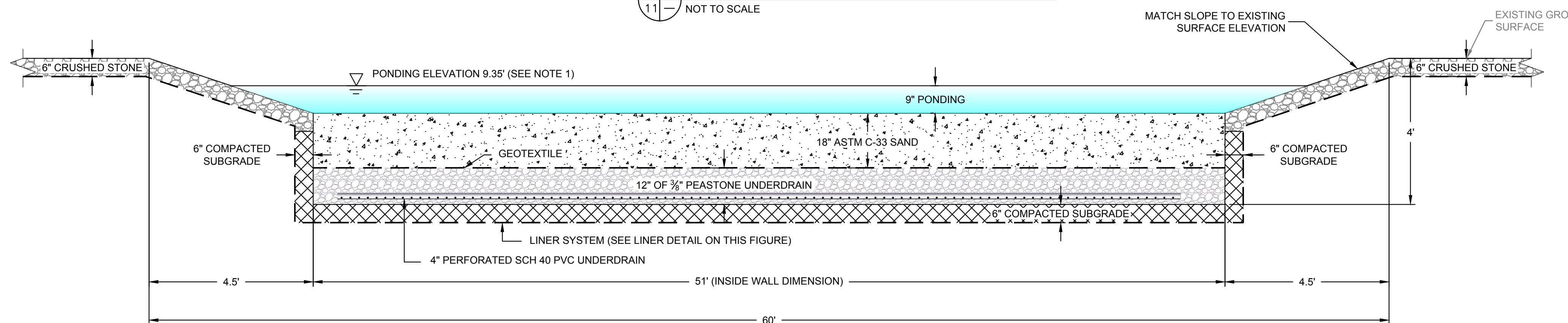
PLAN VIEW - SEDIMENT FOREBAY AND SAND FILTER
SCALE: 1"=10'



SECTION - LINER DETAIL
NOT TO SCALE



A SECTION - SAND FILTER (EARTHEN W/ CONCRETE FOREBAY)
NOT TO SCALE



B SECTION - SAND FILTER (EARTHEN)
NOT TO SCALE

NOTES:

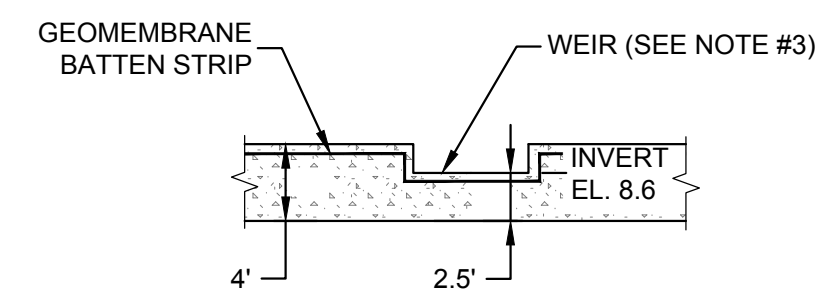
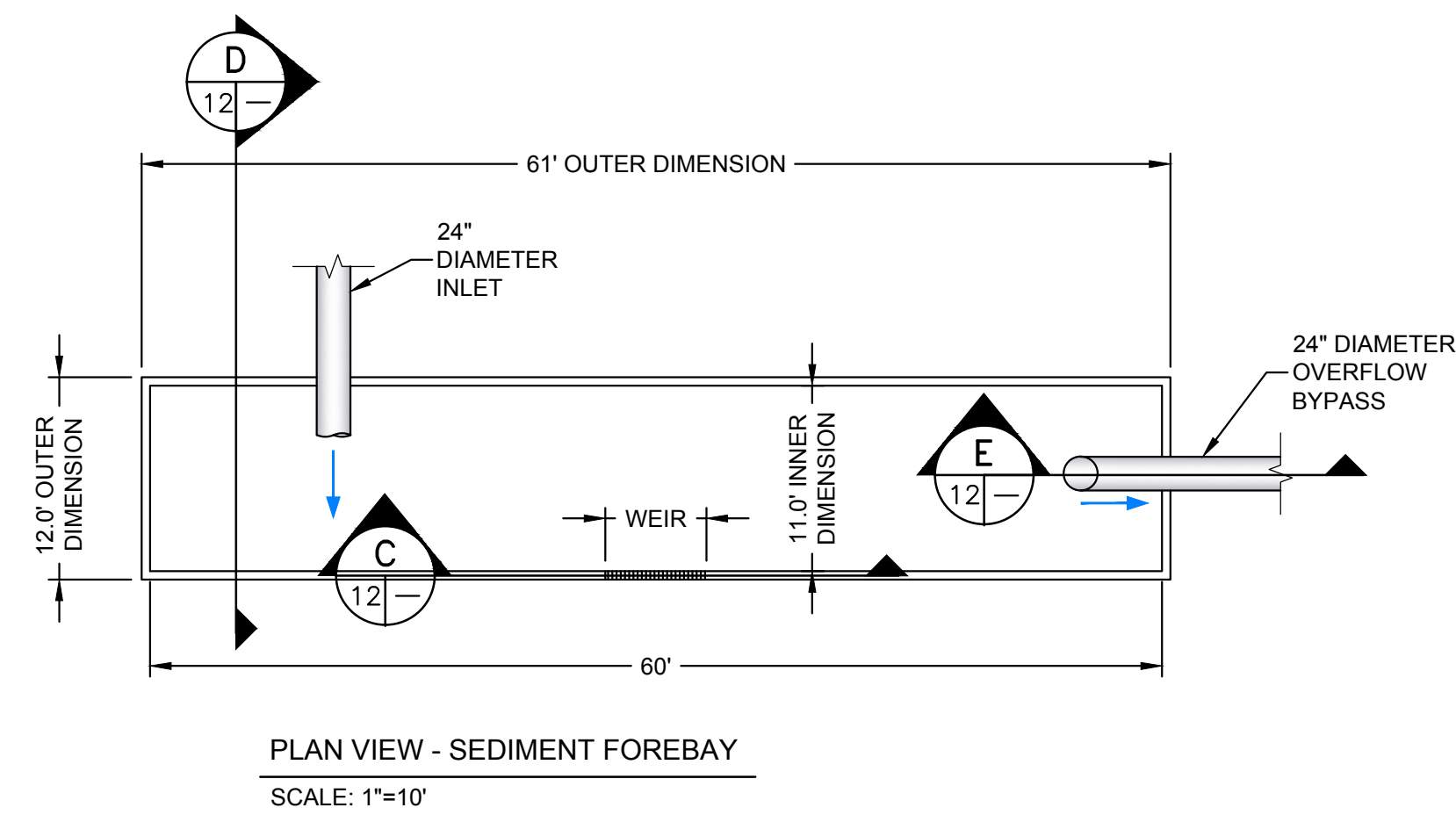
1. PONDING ELEVATION TO BE SET AT INLET INVERT ELEVATION (CURRENTLY SET AT 9.35' BASED ON AUGUST 31, 2016 DRAINAGE CALCULATIONS).
2. OUTLET INVERT ELEVATION FOR 24" OVERFLOW BYPASS TO BE 2.75' BELOW PONDING ELEVATION.
3. INVERT ELEVATIONS TO BE SET BASED ON AUGUST 31, 2016 DRAINAGE CALCULATIONS.



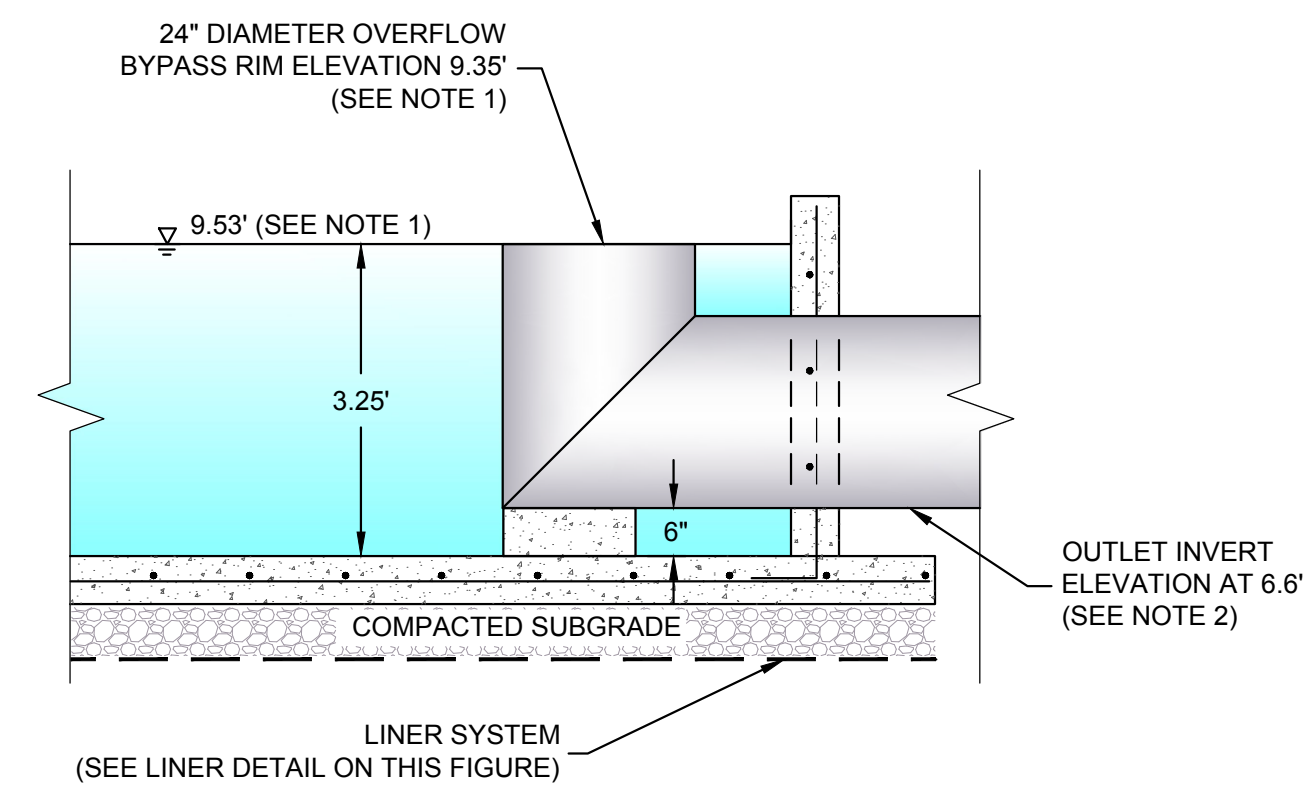
THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
STORMWATER MANAGEMENT DETAILS SAND FILTER			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 11 SHEET NO. 11 OF 15

FOR PERMITTING ONLY

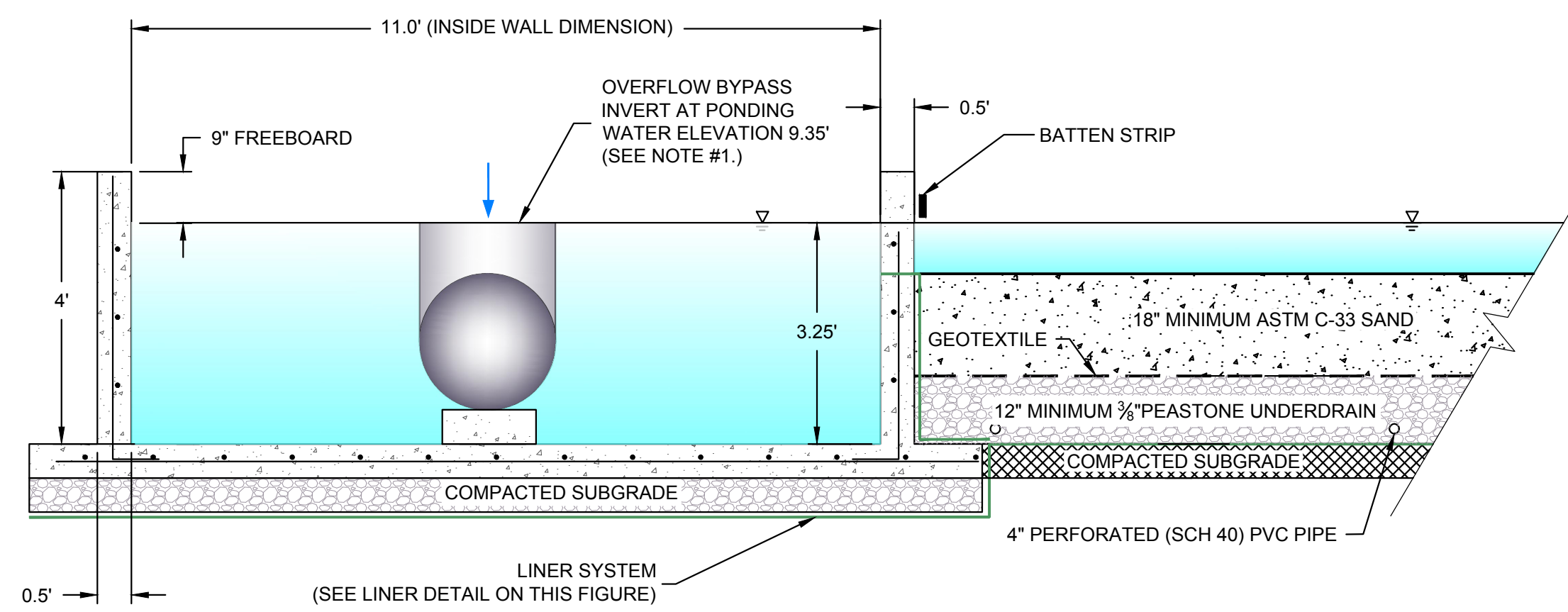


C SECTION - SEDIMENT FOREBAY
SCALE: 1"=10'



NOTE:

OVERFLOW BYPASS PIPE DIAMETER TO BE SIZED FOR 100-YEAR PEAK FLOW RATE



D SECTION - SEDIMENT FOREBAY DETAIL
NOT TO SCALE

NOTES:

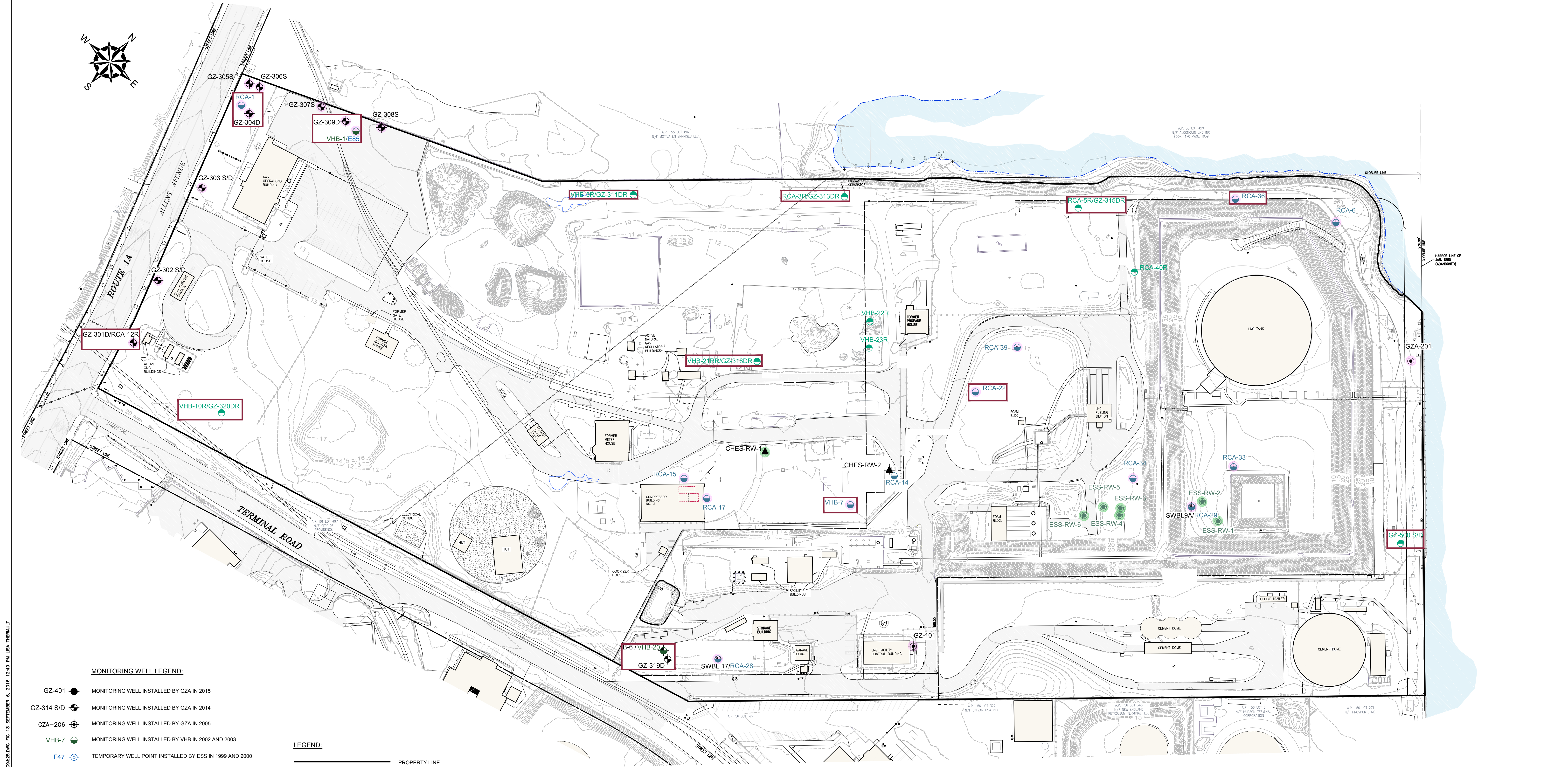
- PONDING ELEVATION TO BE SET AT INLET INVERT ELEVATION (CURRENTLY SET AT 9.35' BASED ON AUGUST 31, 2016 DRAINAGE CALCULATIONS).
- OUTLET INVERT ELEVATION FOR 24" OVERFLOW BYPASS TO BE 2.75' BELOW PONDING ELEVATION.
- SIZE WIDTH OF WEIR BASED ON WATER QUALITY PEAK FLOW RATE.



THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
STORMWATER MANAGEMENT DETAILS CONCRETE FOREBAY			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 12 SHEET NO. 12 OF 15

FOR PERMITTING ONLY



MONITORING WELL LEGEND:

- GZ-401 ● MONITORING WELL INSTALLED BY GZA IN 2015
- GZ-314 S/D ● MONITORING WELL INSTALLED BY GZA IN 2014
- GZA-206 ● MONITORING WELL INSTALLED BY GZA IN 2005
- VHB-7 ● MONITORING WELL INSTALLED BY VHB IN 2002 AND 2003
- F47 ● TEMPORARY WELL POINT INSTALLED BY ESS IN 1999 AND 2000
- 1 ● TEMPORARY WELL POINT INSTALLED BY ESS IN 1999
- RCA-40 ● MONITORING WELL INSTALLED BY ESS IN 1996
- RW-1 ▲ RECOVERY WELL INSTALLED BY CHES OBSERVED BY GZA IN 2014
- CHES-RW-1 ▲ RECOVERY WELL INSTALLED BY CHES OBSERVED BY VHB IN 2002
- ESS-RW-1 ● RECOVERY WELL INSTALLED BY ESS IN 1999 AND 2000
- GZ-311DR ● MONITORING WELLS TO BE INSTALLED AFTER CONTRACTOR DEMOBILIZATION

MONITORING WELL LEGEND CONTINUED:

- ACTIVE MONITORING WELLS
- RECOVERY WELLS
- MONITORING WELL TO BE INSTALLED AFTER CONTRACTOR DEMOBILIZATION
- WELL IS PLANNED TO BE INCLUDED IN ANNUAL GROUNDWATER MONITORING PROGRAM AFTER CONTRACTOR DEMOBILIZATION

LEGEND:

- PROPERTY LINE
- - - INTERIOR PROPERTY LINE
- EXISTING BUILDING
- STEEL POST
- PILING
- EDGE OF WATER
- FENCE
- RAILROAD TRACKS
- - - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- - - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- PAVEMENT
- CONCRETE PAD

GENERAL NOTES:

- 1) EXISTING CONDITIONS BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG
 - ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2015.
- 2) PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3.
- 3) EXPLORATION LOCATION PLANS WERE DEVELOPED FROM THE FOLLOWING:
 - SITE PLANS PROVIDED BY RCA IN THE RIDEM-SUBMITTED JUNE 28, 1998 "PHASE IB FIELD CHARACTERIZATION INVESTIGATION" PREPARED ON BEHALF OF THE PROVIDENCE GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - SITE PLANS PROVIDED BY VHB IN THE RIDEM-SUBMITTED NOVEMBER 2002 "REMEDIATION ACTION CLOSURE REPORT" PREPARED ON BEHALF OF THE NEW ENGLAND GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - FIGURE 3 "EXPLORATION LOCATION PLAN" PREPARED BY GZA GEOENVIRONMENTAL, INC. (GZA) ON BEHALF OF CHICAGO BRIDGE AND IRON (C&I) IN JULY 2005. PLANS PROVIDED BY NATIONAL GRID.
 - FIGURE 35 "TEST BORINGS UNDER SASSAFRAS POINT PLAT" DATED JUNE 5, 1912 PREPARED BY THE PROVIDENCE GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - DRAWING 3 "WHARF FACILITIES - BULKHEAD REBUILDING - CROSS SECTIONS" DATED JANUARY 11, 1973 PREPARED BY PARSONS, BRINCKERHOFF, QUADE AND DOUGLAS ON BEHALF OF THE PROVIDENCE GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
- 4) ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
- 5) THE LOCATION OF THE EXPLORATIONS AND MONITORING WELLS AT THE SITE WERE APPROXIMATELY DETERMINED AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
- 6) HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- 7) VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- 8) SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. OTHER LOCATIONS MAY EXIST.

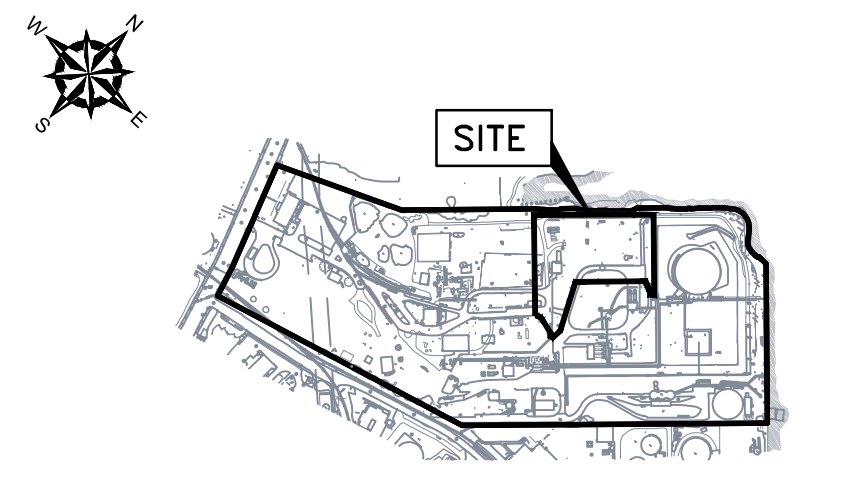
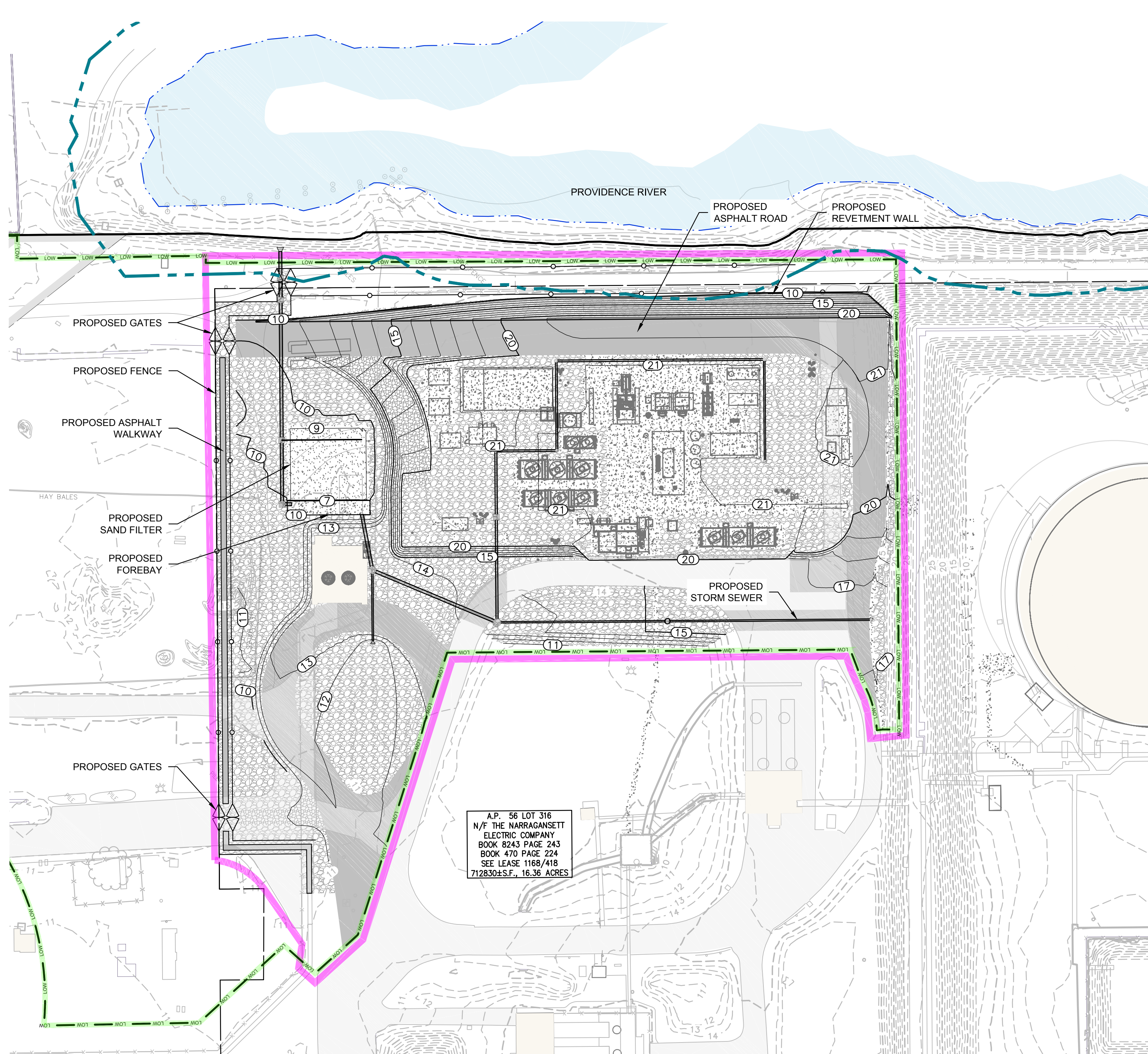


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NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
PROPOSED MONITORING WELL RE-INSTALLATION PLAN			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 13 SHEET NO. 13 OF 15

FOR PERMITTING ONLY

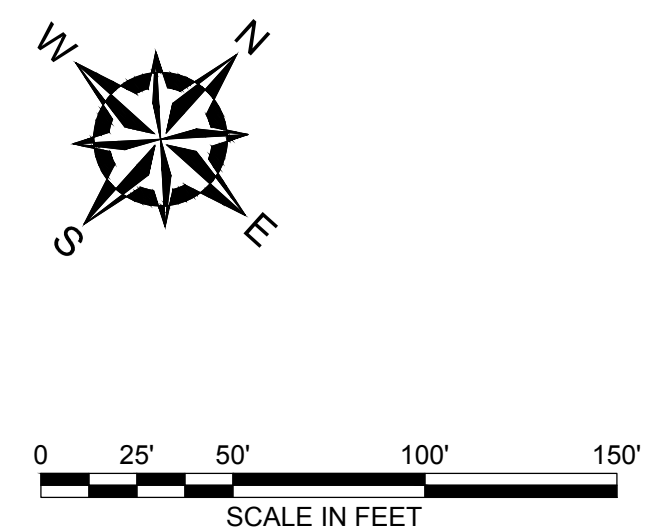
DRAWING NAME: I:\02761-National_Grid_Liquefaction\CAD Exchange\In\2016-08-31_GZA_Liq_Permit_Package\33554-60_CIMC_PERMITTING_FOR_STAMPING-AMS.dwg
 SEP 06 2016 - 1:30pm



KEY PLAN:
SCALE: 1"=800'

LEGEND:

- EXISTING STRUCTURE
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- 50-FOOT SETBACK
- EXISTING PAVEMENT
- EASEMENT AREA
- UTILITY POLE
- LIGHT POLE
- HYDRANT
- PROPERTY LINES
- INTERIOR PROPERTY LINE
- PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
- PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
- PROPOSED PERMANENT PAVEMENT
- PROPOSED GRAVEL
- PROPOSED CONCRETE
- PROPOSED SAND FILTER
- LIQUEFACTION WORK AREA
- LIMIT OF WORK
- LIMIT OF PROPOSED REVETMENT (UPPER SLOPE)
- PROPOSED ROUND CATCH BASIN
- PROPOSED SQUARE CATCH BASIN



A.P. 56 LOT 316
 N/F THE NARRAGANSETT
 ELECTRIC COMPANY
 BOOK 6243 PAGE 243
 BOOK 470 PAGE 224
 SEE LEASE 1168/418
 712830±S.F., 16.36 ACRES

GENERAL NOTES:

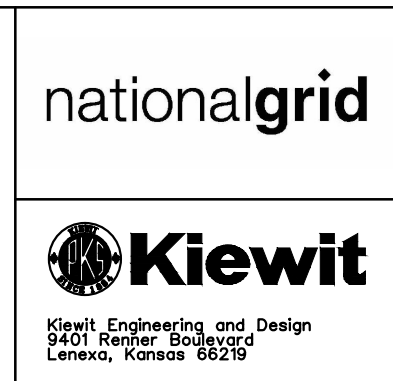
- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
- ELECTRONIC CAD FILE 14-152_SU1_REV2.DWG, TITLED "TOPOGRAPHIC SURVEY PLAN, PORTION OF A.P. 56 LOT 5" DATED OCTOBER 27, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILES PROVIDED BY KIEWIT
 1. "ACAD-102761-CIV_SITE.DWG"
 2. "2007EXP_102761-CIV_SURFACING.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "A2007EXP_102761-CIV_STORM.DWG"
 6. "ACAD-102761-CIV_SURFACING.DWG"
 7. "ACAD-102761-PROP-CONT.DWG"
 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"
- PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
 1. "CATCH BASINS AND SANITARY SEWER SYSTEM" PREPARED BY PROVIDENCE GAS COMPANY, DATED SEPTEMBER 25, 1981.
 2. "PLAN SHOWING UNDERGROUND UTILITIES LNG FACILITY" DATED OCTOBER 6, 1983, "SUBSURFACE UTILITY ENGINEERING" PREPARED BY BAYSTATE SUBSURFACE INVESTIGATION, INC., DATED MAY 17, 2005.
- HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. **OTHER LOCATIONS MAY EXIST.**
- ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.
- PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
- SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL

THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY AGREEMENT AND SUBJECT THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

REV	DATE	REVISION INFORMATION	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

GENERAL NOTES AND COMMENTS:

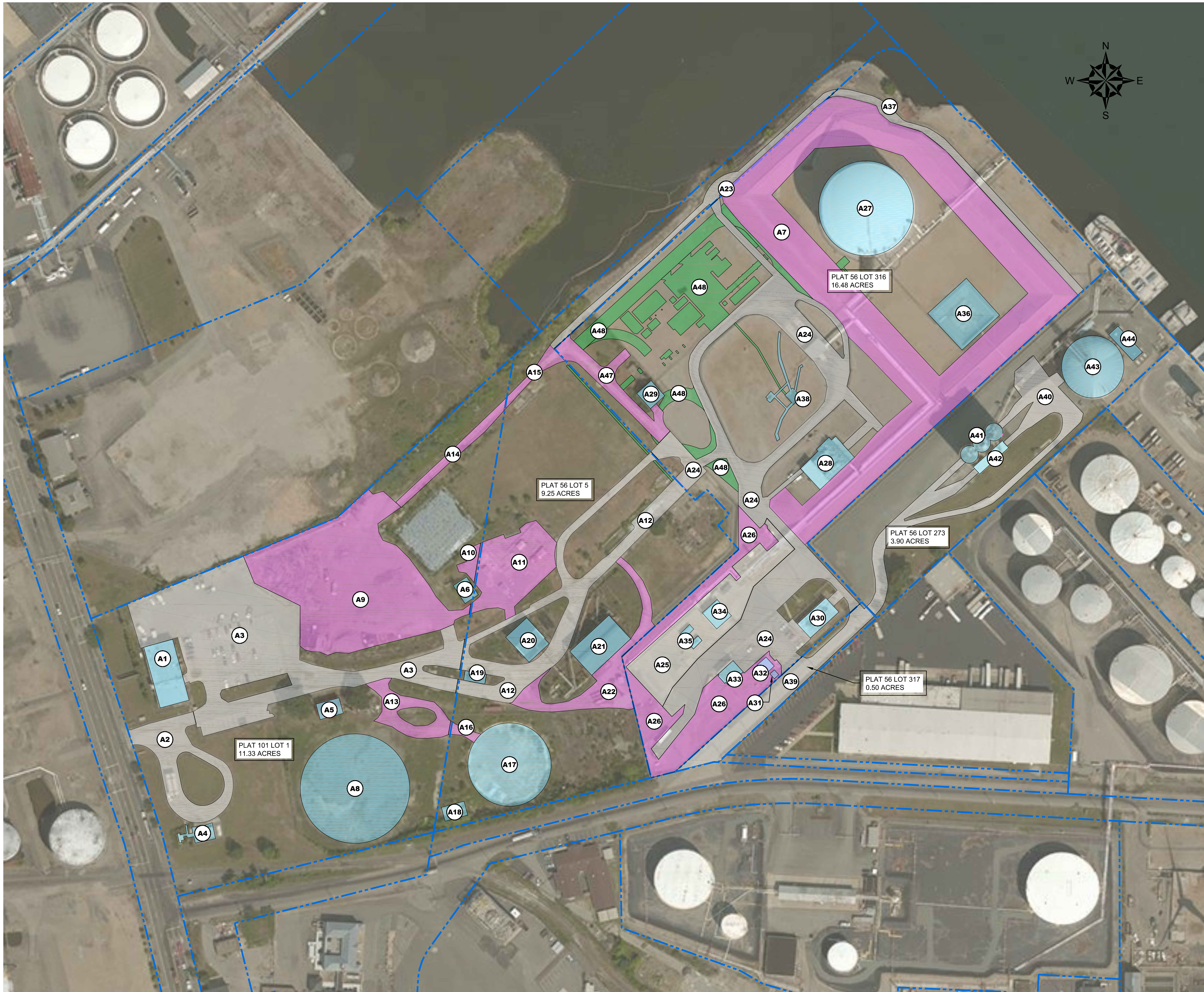


SEAL AND STAMP:
 ASHLEY STUTZMAN
 No. 11512
 REGISTERED
 PROFESSIONAL ENGINEER
 CIVIL

PROFESSIONAL CERTIFICATION:
 I HEREBY CERTIFY THAT THESE DOCUMENTS
 WERE PREPARED OR APPROVED BY ME, AND
 THAT I AM A LICENSED PROFESSIONAL
 ENGINEER OF THIS STATE.
 LICENSE NO. 11512
 EXPIRATION DATE 06/30/2017

NATIONAL GRID LNG LLC
 FIELDS POINT LIQUEFACTION PROJECT
 PROPOSED FINAL CONDITIONS PLAN

DRAWING NO:	PROJECT NO:	SHT:	REV.
FIGURE 14	33554.60	14 OF 15	0



LEGEND

	PROPERTY LINES
	PERVIOUS PROPOSED TO BE IMPERVIOUS
	STRUCTURE
	ASPHALT
	OTHER

- REFERENCE NOTES:**
- THIS MAP CONTAINS THE ESRI ARCGIS ONLINE BING MAPS AERIAL LAYER PACKAGE. IMAGE COURTESY OF USGS EARTHSTAR GEOGRAPHICS SIO © MICROSOFT CORPORATION 2015.
 - PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
 - SITE BOUNDARIES ARE APPROXIMATE.

IMPERVIOUS AREAS				
PLAT	LOT	NO.	AREA (SQ. FT.)	SURFACE TYPE
101	1	A1	8,037.44	ROOF
101	1	A2	17,913.35	ASPHALT
101	1	A3	90,158.79	ASPHALT
101	1	A4	1,786.65	STRUCTURE
101	1	A5	1,640.44	ROOF
101	1	A6	1,445.11	STRUCTURE
56	316	A7	156,852.04	CONTAINMENT DIKE
101	1	A8	39,796.73	TANK FOUNDATION
101	1	A9	78,909.64	COMPACTED GRAVEL
101	1	A10	1,933.34	COMPACTED GRAVEL
56	5	A11	21,898.19	COMPACTED GRAVEL
56	5	A12	37,777.70	ASPHALT
101	1	A13	8,857.25	COMPACTED GRAVEL
101	1	A14	5,114.04	COMPACTED GRAVEL
56	5	A15	2,860.86	COMPACTED GRAVEL
56	5	A16	1,196.51	COMPACTED GRAVEL
56	5	A17	23,127.00	TANK FOUNDATION
56	5	A18	1,923.75	STRUCTURE
56	5	A19	898.87	ROOF
56	5	A20	4,099.05	ROOF
56	5	A21	7,273.42	ROOF
56	5	A22	12,124.48	COMPACTED GRAVEL
56	5	A23	11,249.94	ASPHALT
56	316	A24	92,586.35	ASPHALT
56	316	A25	29,735.26	CONCRETE
56	316	A26	40,494.92	COMPACTED GRAVEL
56	316	A27	29,930.34	LNG TANK
56	316	A28	6,084.97	STRUCTURE
56	316	A29	1,686.87	ROOF
56	316	A30	3,197.19	ROOF
56	316	A31	164.24	ROOF
56	316	A32	638.42	ROOF
56	316	A33	1,346.21	ROOF
56	316	A34	1,845.52	ROOF
56	316	A35	712.24	ROOF
56	316	A36	10,912.10	SUMP PIT
56	316	A37	12,642.27	ASPHALT
56	316	A38	2,392.36	STRUCTURE
56	317	A39	17,080.05	ASPHALT
56	273	A40	28,623.42	ASPHALT
56	273	A41	3,112.29	STRUCTURE
56	273	A42	1,576.65	ROOF
56	273	A43	12,924.79	TANK
56	273	A44	1,893.69	STRUCTURE
56	273	A46	10,294.60	COMPACTED GRAVEL
56	316	A47	54,454.00	NEW IMPERVIOUS AREAS
TOTAL IMPERVIOUS			902,203.34	

894480.34 SQ. FT. IMPERVIOUS AREA = 49.48% IMPERVIOUS
 1807724.79 SQ. FT. TOTAL AREA



THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

NATIONAL GRID
 LIQUEFACTION PLANT
 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND

PROPOSED IMPERVIOUS CONDITIONS PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid
PROJ MGR: MSK DESIGNED BY: SJM DATE: SEPTEMBER, 2016	CHECKED BY: IR SCALE: AS NOTED REVISION NO. 0

FOR PERMITTING ONLY



APPENDIX A

LIMITATIONS



GEOHYDROLOGICAL LIMITATIONS

Use of Report

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client, National Grid for the 642 Allens Avenue Site identified in the SWMP. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

Standard of Care

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Proposal for Services and/or Report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made. Specifically, GZA does not and cannot represent that the Site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its study. Additionally, GZA makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a local, state or federal agency.
4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

Subsurface Conditions

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further

exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

6. Water level readings have been made, as described in this Report, in and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The observed water table may be other than indicated in the Report.

Compliance with Codes and Regulations

7. We used reasonable care in identifying and interpreting applicable codes and regulations necessary to execute our scope of work. These codes and regulations are subject to various, and possibly contradictory, interpretations. Interpretations and compliance with codes and regulations by other parties is beyond our control.

Screening and Analytical Testing

8. GZA collected environmental samples at the locations identified in the Report. These samples were analyzed for the specific parameters identified in the report. Additional constituents, for which analyses were not conducted, may be present in soil, groundwater, surface water, sediment and/or air. Future Site activities and uses may result in a requirement for additional testing.
9. Our interpretation of field screening and laboratory data is presented in the Report. Unless otherwise noted, we relied upon the laboratory's QA/QC program to validate these data.
10. Variations in the types and concentrations of contaminants observed at a given location or time may occur due to release mechanisms, disposal practices, changes in flow paths, and/or the influence of various physical, chemical, biological or radiological processes. Subsequently observed concentrations may be other than indicated in the Report.

Interpretation of Data

11. Our opinions are based on available information as described in the Report, and on our professional judgment. Additional observations made over time, and/or space, may not support the opinions provided in the Report.

Additional Information

12. In the event that the Client or others authorized to use this report obtain additional information on environmental or hazardous waste issues at the Site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in

this report.

Additional Services

13. GZA recommends that we be retained to provide services during any future investigations, design, implementation activities, construction, and/or property development/ redevelopment at the Site. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.



APPENDIX B

STORMWATER MANAGEMENT CHECKLIST

APPENDIX A: STORMWATER MANAGEMENT CHECKLIST

The first thing that applicants and designers must do before beginning a project is to make sure they are familiar with the 11 minimum standards listed in Manual Chapter Three, as all projects must meet each of the 11 standards unless otherwise exempted. Next, designers should review the available LID site planning and design strategies and BMPs in Manual Chapters Four through Seven to determine which would work best at their site. This checklist serves as a guide for engineers and designers to refer to during all stages of a project to ensure that they are meeting all applicable requirements. In addition, designers must include a completed checklist with their final stormwater management plan.

A.1 STORMWATER SITE PLANNING, ANALYSIS, AND DESIGN

A.1.1 General Information

- Applicant name, mailing address, and telephone number
- Contact information for the licensed professional(s) responsible for site plans and stormwater management plan
- Common address and legal description of project site
- Vicinity map
- Existing zoning and land use at the project site
- Proposed land use – indicate if land use meets definition of a LUHPPL (see Manual Table 3-2)
- General Project Narrative
- Project type (new development or redevelopment)
- Site Disturbance \geq 1 acre or Site Disturbance $<$ 1 acre

A.1.2 Existing and Proposed Mapping and Plans

- Existing and proposed mapping and plans (scale not greater than 1" = 40') with North arrow that illustrate at a minimum:
 - Existing and proposed site topography (2-foot contours required). 10-foot contours accepted for off-site areas.
 - Existing and proposed drainage area delineations and drainage flow paths, mapped according to the DEM *Guidance for Preparation of Drainage Area Maps* (included in Appendix K). Drainage area boundaries need to be complete; include off-site areas in both mapping and analyses, as applicable.

-
- Perennial and intermittent streams, in addition to areas subject to storm flowage (ASSFs)
 - Mapping of predominant soils from USDA soil surveys, especially hydric soil groups as well as location of site-specific borings and/or test pits (on drainage area maps only – not site plans)
 - Boundaries of existing predominant vegetation and proposed limits of clearing
 - Location and field-verified boundaries of resource protection areas such as freshwater and coastal wetlands, lakes, ponds, coastal shoreline features and required setbacks (e.g., buffers, water supply wells, septic systems)
 - Location of floodplain and, if applicable, floodway limits and relationship of site to upstream and downstream properties and drainages
 - Location of existing and proposed roads, buildings, and other structures including limits of disturbance
 - Existing and proposed utilities (e.g., water, sewer, gas, electric) and easements
 - Location of existing and proposed conveyance systems such as grass channels, swales, and storm drains
 - Location and dimensions of channel modifications, such as bridge or culvert crossings. **Not Applicable**
 - Location, size, and limits of proposed LID planning and site design techniques (type of practice, depth, area). LID techniques should be labeled clearly on the plan and a key should be provided that corresponds to a tabular description. **Not Applicable**
 - Location, size, and limits of disturbance of proposed stormwater treatment practices (type of practice, depth, area). Stormwater treatment practices (BMPs) should be labeled with numbers that correspond to Table A.2-1.
 - Soils information from test pits or borings at the location of proposed stormwater management facilities, including but not limited to soil descriptions, depth to seasonal high groundwater, depth to bedrock, and estimated hydraulic conductivity. Soils information will be based on site test pits or borings logged by a DEM-licensed Class IV soil evaluator or RI-registered P.E.

A.1.3 Minimum Stormwater Management Standards

Minimum Standard 1: LID Site Planning and Design Strategies

Document specific LID site planning and design strategies and associated methods that were employed for the project in the following table. If a redevelopment project site has 40% or more existing impervious surface coverage, Minimum Standard 1: LID Site Planning and Design Strategies does not apply. **Not Applicable**

Table A.1-1 LID Site Planning and Design Checklist

The applicant must document specific LID site planning and design strategies applied for the project (see Manual Chapter Four and the *RI Community LID Guidance Manual* for more details regarding each strategy). If a particular strategy was not used, a justification and description of proposed alternatives must be provided. If a strategy is not applicable (N/A), applicants must describe why a certain method is not applicable at their site. For example, preserving wetland buffers may be not applicable for sites located outside any jurisdictional wetland buffers. In communities where conservation development or other low-impact development site planning and design processes exist, following the local community conservation development option may help a project achieve this standard.

1. Strategies to Avoid the Impacts

A. Preservation of Undisturbed Areas

Not Applied or N/A. *Use space below to explain why:*

Select from the following list:

- Limits of disturbance clearly marked on all construction plans.
- Mapped soils by Hydrologic Soil Group (HSG).
- Building envelopes avoid steep slopes, forest stands, riparian corridors, HSG D soils, and floodplains.
- New lots, to the extent practicable, have been kept out of freshwater and coastal wetland jurisdictional areas.
- Important natural areas (i.e., undisturbed forest, riparian corridors, and wetlands) identified and protected with permanent conservation easement.
- Percent of natural open space calculation is provided.
- Other (describe):

Explain constraints when a strategy is applied and/or proposed alternatives in space below:

Table A.1-1 LID Site Planning and Design Checklist

B. Preservation of Buffers and Floodplains

Not Applied or N/A. *Use space below to explain why:*

Select from the following:

- Applicable vegetated buffers of coastal and freshwater wetlands and perennial and intermittent streams have been preserved, where possible.
- Limits of disturbance included on all construction plans that protect applicable buffers
- Other (describe):

Explain constraints and/or proposed alternatives in space below:

C. Minimized Clearing and Grading

Not Applied or N/A. *Use space below to explain why:*

Select from the following list:

- Site fingerprinting to extent needed for building footprints, construction access and safety (i.e., clearing and grading limited to 15 feet beyond building pad or 5 feet beyond road bed/shoulder).
- Other (describe):

Explain constraints and/or proposed alternatives in space below:

D. Locating Sites in Less Sensitive Areas

Not Applied or N/A. *Use space below to explain why:*

Select from the following list:

- A site design process, such as conservation development, used to avoid or minimize impacts to sensitive resources such as floodplains, steep slopes, erodible soils, wetlands, hydric soils, surface waters, and their riparian buffers.
- Development located in areas with least hydrologic value (e.g., soil groups A and B)
- Development on steep slopes, grading and flattening of ridges has been avoided to the maximum extent practicable.
- Other (describe):

Explain constraints and/or proposed alternatives in space below:

Table A.1-1 LID Site Planning and Design Checklist**E. Compact Development**

Not Applied or N/A. *Use space below to explain why:*

Select from the following list:

- A site design technique (e.g., conservation development) used to concentrate development to preserve as much undisturbed open space as practicable and reduce impervious cover.
- Reduced setbacks, frontages, and right-of-way widths have been used where practicable.
- Other (describe):

Explain constraints and/or proposed alternatives in space below:

F. Work with the Natural Landscape Conditions, Hydrology, and Soils

Not Applied or N/A. *Use space below to explain why:*

Select from the following list:

- Stormwater management system mimics pre-development hydrology to retain and attenuate runoff in upland areas (e.g., cuts and fills limited and BMPs distributed throughout site; trees used for interception and uptake).
- The post-development time of concentration (t_c) should approximate pre-development t_c .
- Flow velocity in graded areas as low as practicable to avoid soil erosion (i.e., slope grade minimized). Velocities shall not exceed velocities in Appendix B, Table B-2.
- Plans show measures to prevent soil compaction in areas designated as Qualified Pervious Areas (QPAs) for better infiltration.
- Site designed to locate buildings, roadways and parking to minimize grading (cut and fill quantities)
- Other (describe):

Explain constraints and/or proposed alternatives in space below:

2. Strategies to Reduce the Impacts**A. Reduce Impervious Cover**

Not Applied or N/A. *Use space below to explain why:*

Select from the following list:

- | | | |
|---|--|---|
| <input type="checkbox"/> Reduced roadway widths | <input type="checkbox"/> Reduce driveway areas | <input type="checkbox"/> Reduced building footprint |
| <input type="checkbox"/> Reduced sidewalk area | <input type="checkbox"/> Reduced cul-de-sacs | <input type="checkbox"/> Reduced parking lot area |
| <input type="checkbox"/> Other (describe): | | |

Explain constraints and/or proposed alternatives in space below:

Table A.1-1 LID Site Planning and Design Checklist

3. Strategies to Manage the Impacts

A. Disconnecting Impervious Area

Not Applied or N/A. *Use space below to explain why:*

Select from the following list:

- Impervious surfaces have been disconnected to QPAs to the extent possible.
- Other (describe):

Explain constraints and/or proposed alternatives in space below:

B. Mitigation of Runoff at the point of generation

Not Applied or N/A. *Use space below to explain why:*

Select from the following list:

- Roof runoff has been directed to a QPA, such as a yard or vegetated area.
- Roof runoff has been directed to a lower impact practice such as a rain barrel or cistern.
- A green roof has been designed to reduce runoff.
- Small-scale BMPs applied at source.
- Other (describe):

Explain constraints and/or proposed alternatives in space below:

C. Stream/Wetland Restoration

Not Applied or N/A. *Use space below to explain why:*

Select from the following list:

- Historic drainage patterns have been restored by removing closed drainage systems and/or restoring degraded stream channels and/or wetlands.
- Removal of invasive species.
- Other (describe):

Explain constraints and/or proposed alternatives in space below:

Table A.1-1 LID Site Planning and Design Checklist

D. Reforestation

Not Applied or N/A. Use space below to explain why:

Select from the following list:

- Low maintenance, native vegetation has been proposed.
- Trees are proposed to be planted or conserved to reduce runoff volume, increase nutrient uptake, and provide shading and habitat.
- Other (describe):

Explain constraints and/or proposed alternatives in space below:

Table A.1-2 LID Stormwater Credit

Description of stormwater credit, if applicable. Label qualifying pervious areas (QPAs) on the site map, and document that all stormwater credit requirements listed in Manual Section 4.6 are met. For each QPA, note the impervious area (in acres) that drains to it, and place a check in the appropriate box to demonstrate that it meets the following criteria:

	QPA 1	QPA 2	QPA 3	QPA 4
Impervious Area Draining to QPA (acres)				
QPA Criteria	Criterion Met?			
Construction vehicles shall not be allowed to drive over the QPA during construction. If the area becomes compacted, soil must be suitably amended, tilled, and revegetated once construction is complete to restore infiltration capacity.				
QPA infiltration area is at least 10ft from building foundation.				
Contributing impervious area does not exceed 1,000 ft ² .				
Length of QPA in feet is equal to or greater than the contributing rooftop area in ft ² divided by 13.3. The maximum contributing flow path from non-rooftop impervious areas is 75ft.				
QPA does not overlap any other QPA.				

	QPA 1	QPA 2	QPA 3	QPA 4
Lot is greater than 6,000 ft ² .				
The slope of the QPA is less than or equal to 5.0%.				
Disconnected downspouts draining to QPA are at least 10 feet away from the nearest impervious surface.				
Runoff from rooftops without gutters / downspouts that drains to QPA flows away from the structure as low-velocity sheet flow.				
QPA is located on Hydrologic Soil Group (HSG) A or B soils.				
Depth to groundwater within QPA is 18 inches or greater (has been confirmed by evaluation by a DEM-licensed Class IV soil evaluator or RI-registered PE).				
Runoff is directed over soft shoulders, through curb cuts or level spreaders to QPA.				
Measures are employed at discharge point to prevent erosion and promote sheet flow.				
The flow path through the QPA complies with the setback requirements for structural infiltration BMPs.				
Rooftop runoff draining to QPA from LUHPPLs does not commingle with runoff from any paved surface or areas that may generate higher pollutant loads				
Inspection and maintenance of the QPA is included in the site Operation and Maintenance Plan (Minimum Standard 11).				
The QPA is owned or controlled by the property owner				
There is no history of groundwater seepage and / or basement flooding on the property				

 Minimum Standard 2: Groundwater Recharge

Demonstrate that groundwater recharge criteria for the site have been met.

Include: **Not Applicable**

- The required recharge volume (Re_v) in acre-feet (See Manual Section 3.3.2)
- LID Stormwater Credit from Table A.1-2 to be applied to recharge requirement, if applicable, with the following calculations (See Manual Section 4.6.1):
 - the recharge area (Re_a) in acres for the site
 - the site impervious area draining to QPAs
 - the new Re_v requirement
- Specific BMPs from Table A.2-1 that will be used to meet the recharge requirement. *Note: Only BMPs listed in Manual Table 3-5, List of BMPs Acceptable for Recharge may be used to meet the recharge requirement.*

 Minimum Standard 3: Water Quality

Demonstrate that the water quality criteria for the site have been met. Include:

- Required water quality volume (WQ_v) in acre-feet or ft^3 (see Manual Section 3.3.3).
- LID Stormwater Credit from Table A.1-2 to be applied to water quality requirement, if applicable, with the following calculations (see Manual Section 4.6.1):
 - the new impervious area (in acres) for the site
 - the new WQ_v in acre-feet or ft^3
- Specific BMPs from Table A.2-1 that will be used to meet water quality volume requirement. *Note: Only BMPs listed in Manual Table 3-6, Acceptable BMPs for Water Quality Treatment may be used to meet the water quality requirement.*
- Specify any additional pollutant-specific requirements and/or pollutant removal efficiencies applicable to the site as the result of SAMP, TMDL, or other watershed-specific requirements.

 Minimum Standard 4: Conveyance and Natural Channel Protection

Demonstrate that the conveyance and natural channel protection criteria for the site have been met. Include: **Not Applicable**

- Justification for channel protection criterion waiver, if applicable (see Manual Section 3.3.4).
- Required channel protection volume (CP_v) (see Manual Section 3.3.4).
- Specific BMPs from Table A.2-1 that will be used to meet the channel protection requirement. Hydrologic and hydraulic site evaluation as described

in Manual Section 3.3.4 should be included in Table A.2-1 for each channel protection BMP.

Minimum Standard 5: Overbank Flood Protection

Demonstrate that the overbank flood protection criteria for the site have been met. Include: **Not Applicable**

- Justification for overbank flood protection criterion waiver, if applicable (see Manual Section 3.3.5).
- Pre- and post-development peak discharge rates.
- Specific BMPs from Table A.2-1 that will be used to meet the overbank flood protection requirement. Hydrologic and hydraulic site evaluation as described in Manual Section 3.3.5 should be included in Table A.2-1 for each overbank flood protection BMP.

Minimum Standard 6: Redevelopment and Infill Projects

Determine if project meets the criteria for redevelopment and/or infill projects. If applicable, include:

- Description of site that meets redevelopment/infill definition.
- Approved off-site location within watershed where stormwater management requirements will be met, if applicable (see Manual Section 3.2.6).
- Not Applicable.

Minimum Standard 7: See page A-15

Minimum Standard 8: LUHPPLs

Demonstrate that the project meets the criteria for LUHPPLs, if applicable. Include:

- Description of any land use activities considered stormwater LUHPPL (see Manual Table 3-2).
- Specific BMPs listed in Table A.2-1 that receive stormwater from LUHPPL drainage areas. These BMP types must be listed in Manual Table 3-3, "Acceptable BMPs for Use at LUHPPLs."
- Additional BMPs, if any, that meet RIPDES MSGP requirements.
- Not Applicable.

Minimum Standard 9: Illicit Discharges

Applicant asserts that no illicit discharges exist or are proposed to the stormwater

management system in accordance with State regulations.

Minimum Standard 10: See page A-13 Minimum Standard 11: See p. A-15

A.2 BEST MANAGEMENT PRACTICES

Provide detailed information for all structural stormwater best management practices (BMPs) to be implemented. *Note: If a BMP cannot meet the required design criteria in Manual Chapters Five, Six and Seven, a different BMP should be considered.*

Table A.2-1 Best Management Practices

Fill in the following table to document which proposed practices meet which requirement(s). Number each BMP and label them accordingly on the site map:

BMP No.	Type of BMP	Check the function provided by the BMP				
		Pretreatment	Re _v	WQ _v	CP _v	Q _p
	Sand filter	No		2,440.5 ft ³		
	Sediment forebay	Yes		1,220.25 ft ³		
	Catch basins	yes				

In addition, for all structural components of stormwater system (e.g., storm drains, open channels, swales, stormwater BMPs, etc.) provide the following, if applicable:

- Hydrologic and hydraulic analysis, including:
 - Study design/analysis points. The existing and proposed condition analyses need to compare the same overall area; thus, common study points are needed for both existing and proposed conditions.
 - Existing condition analysis for drainage area boundaries, curve numbers, times of concentration, runoff rates, volumes, velocities, and water surface elevations showing methodologies used and supporting calculations.
 - Proposed condition analysis for drainage area boundaries, curve numbers, times of concentration, runoff rates, volumes, velocities, water surface elevations, and routing showing the methodologies used and supporting calculations.
 - Downstream Analysis, where required (see Manual Section 3.3.6).
 - Final sizing calculations for structural stormwater BMPs including, contributing drainage area, storage, and outlet configuration.
 - Stage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities (e.g., detention, retention, or infiltration facilities).
 - Dam breach analysis, where necessary, for earthen embankments over six (6) feet in height, or a capacity of 15 acre-feet or more, and that is a significant or high hazard dam.
- Drainage Area Maps prepared in accordance with DEM's *Guidance for Preparation of Drainage Area Maps* (included in Appendix K).
- Representative cross-section and profile drawings, notes and details of structural stormwater management practices and conveyances (i.e., storm drains, open channels, swales, etc.), which include:
 - Locations, cross sections, and profiles of all streams and drainage swales and their method of stabilization.
 - Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.).
 - Design water surface elevations.
 - Structural details of outlet structures, embankments, spillways, stilling basins, grade control structures, conveyance channels, etc.
 - Logs of borings and/or test pit investigations along with supporting soils/geotechnical report.
- Planting plans for structural stormwater BMPs, including: **Not Applicable**
 - Species, size, planting methods, and maintenance requirements of proposed planting.

-
- Structural calculations, where necessary.
 - Applicable construction specifications.
 - Identification of all anticipated applicable local and State permits.
 - Identification of all anticipated legal agreements related to stormwater (e.g., off-site easements, deed restrictions, and covenants).

A.3 EROSION AND SEDIMENT CONTROL (ESC) AND STORMWATER POLLUTION PREVENTION PLANS (SWPPP)

A.3.1 All Projects

Minimum Standard 10: Construction Erosion and Sedimentation Control

All projects must demonstrate that ESC practices will be used during the construction phase and land disturbing activities. Include:

- Description of temporary sediment trapping and conveyance practices, including sizing calculations and method of temporary and permanent stabilization (see Manual Section 3.2.10 and *the Rhode Island Soil Erosion and Sediment Control Handbook*).
- Description of sequence of construction. Activities should be phased to avoid compacting soil during construction, particularly in the location of infiltrating stormwater practices and qualifying pervious areas for stormwater credits.
- Location of construction staging and material stockpiling areas.

A.3.2 Construction Projects Disturbing \geq 1 Acre

Demonstrate the project meets the criteria of the Rhode Island Pollutant Discharge Elimination System (RIPDES) General Permit for Stormwater Discharge Associated with Construction Activity (RIPDES Construction General Permit). A ***Stormwater Pollution Prevention Plan (SWPPP)*** must be kept on-site during the active construction phase of the project. Include:

- Estimates of the total area of the site and the total area of the site that is expected to undergo soil disturbance.
- A determination regarding whether or not the site is within or directly discharges to a Natural Heritage Area (NHA) or has discharge related activities that potentially affect a listed or proposed to be listed endangered or threatened species or its critical habitat. To determine if your site is within or directly discharges to an NHA complete the following steps:
 1. Go to <http://www.dem.ri.gov/maps/index.htm>
 2. Click on the "Environmental Resource Map" link.
 3. Open the "Regulatory Overlays" Group/Folder listed under the LAYERS heading.

4. Select Natural Heritage Area – Rare Species as a visible layer from the menu and press the “Refresh Map” button (*Note: Menu may not list all layers if scale factor is too large. If this is the case, then use the “zoom in” feature until all layers are listed in menu).
5. Select any other layer that may be useful in determining the location of the construction activity relative to a NHA (such as roads).
6. Check the appropriate box to indicate whether or not your site is located within or directly discharges to an NHA or has discharge related activities that potentially affect a listed or proposed to be listed endangered or threatened species or its critical habitat.

Yes or No

If Yes, your project requires an additional review and approval by the DEM. In order to begin this process, the Stormwater Management Plan must include a specific request for NHA review and approval of the proposed project.

- Description of potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site, such as exposed, unstabilized soil stockpiles.
- Existing data on the quality of any known discharges from the site if available.
- List of sources of allowable non-stormwater discharges, as described in Part I.B.2 of the 2008 RIPDES Construction General Permit (except flows from fire fighting activities). If allowable non-stormwater discharges are occurring at the site, then the SWPPP shall identify how such discharges shall be visually observed and recorded in accordance with the weekly inspection procedures contained in the 2008 RIPDES Construction General Permit.
- Description of how wastes generated at the site will be disposed of in a manner consistent with State Law and/or regulations.
- Spill Prevention and Response Procedure which meets the following minimum requirements: Areas where potential spills can occur, and their accompanying drainage points, shall be identified clearly in the Stormwater Pollution Prevention Plan (SWPPP). The potential for spills to enter the stormwater drainage system shall be eliminated wherever feasible. Where appropriate, specific material handling procedures, storage requirements, and procedures for cleaning up spills shall be identified in the SWPPP and made available to the appropriate personnel. The necessary equipment to implement a cleanup must also be made available to personnel.
- Description of how construction waste is managed and properly disposed of at the end of each working day and how the operator will minimize the exposure of construction debris to precipitation, including, but not limited to, insulation, wiring, paints and paint cans, solvents, wall board, etc.
- Graveled access entrance and exit drives and parking areas to reduce the tracking of sediment onto public and private roads in accordance with the

Rhode Island Soil Erosion and Sediment Control Handbook, as amended.

- Appropriate vegetative practices on all disturbed areas as soon as possible, but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased, unless the activity is to resume within twenty one (21) days.
- Provisions for all stormwater control measures, disturbed areas, areas used for the storage of materials that are exposed to precipitation (including unstabilized soil stockpiles), discharge locations, and locations where vehicles enter or exit the site to be inspected by or under the supervision of the applicant at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event which generates at least 0.25 inches of rainfall per twenty four (24) hour period and/or after a significant amount of runoff.
- Procedures for maintaining inspection reports which summarize the inspection and corrective actions taken in accordance with Part II.B and C of the 2008 RIPDES Construction General Permit. These inspection reports and associated records must be retained for five (5) years from the date that the site has undergone final stabilization.

A.4 OPERATION & MAINTENANCE AND POLLUTION PREVENTION PLANS

Minimum Standard 7: Pollution Prevention

Demonstrate that the project meets the criteria for pollution prevention.

Include:

- Appendix G Pollution Prevention and Source Controls
- If applicable, a RIPDES Industrial Stormwater Pollution Prevention Plan as required by the Multi-Sector General Permit for Stormwater Discharge Associated with Industrial Activity. **Not Applicable**

Minimum Standard 11: Stormwater Management System Operation and Maintenance (O&M) See Appendix E for guidance

Provide a stormwater management system operation and maintenance plan that at a minimum includes:

- Name, address, and phone number of responsible parties for maintenance
- 8-1/2 X 11 inch plan depicting the locations of all BMPs requiring O&M as numbered in Table A.2-1.
- Description of annual maintenance tasks
- Description of applicable easements **Not Applicable**
- Description of funding source
- Minimum vegetative cover requirements **Not Applicable**
- Access and safety issues



APPENDIX C

CALCULATIONS FOR STORMWATER DESIGN

Water Quality Volume for liquefaction plant

Redevelopment Areas (treat 50% of stormwater)	
Liquefaction plant ¹ (impervious over existing impervious)	8,219 ft ²
Total	8,219 ft ²
WQ_v	343 ft³

New Impervious Areas (treat 100% of stormwater)	
Liquefaction Plant	54,454 ft ²
Total	54,454 ft ²
WQ_v	4,538 ft³

Total WQ_v = 4,881 ft³

Sediment Forebay (25% WQ _v)	
Volume Required	1220.25 ft ³
Depth	3.25 ft
Area	376 ft ²
Inner Dimensions	11 ft x 60 ft
Outer Dimensions	12 ft x 61 ft
Volume provided	2145 ft³

Sand Filter (50% WQ _v)	
Volume Required	2,440.5 ft ³
Depths	
Ponding	0.75 ft
Topsoil/vegetation	0.5 ft
sand	1 ft
drainage	1 ft
Effective Depth	1.575 ft
Area	1,550 ft ²
Inner Dimension	49.5ft x 51 ft
Outer Dimension	54 ft x 60 ft
Volume Provided	3,976 ft³

¹ Areas provided by Kiewit on 8/01/2016



APPENDIX D

SITE SPECIFIC SOIL EROSION AND SEDIMENTATION CONTROL (SESC) PLAN

Soil Erosion and Sediment Control Plan
Liquefaction Plant: National Grid LNG, LLC
642 Allens Avenue, Providence, RI

Soil Erosion and Sediment Control Plan

For: National Grid LNG, LLC

Liquefaction Plant

642 Allens Avenue

Providence, RI, 02905

Plat 56 Lots 5, 273, 316, 317 and Plat 101 Lot 1

Owner:

National Grid LNG, LLC
William R. Howard
40 Sylvan Road
Waltham, MA
401-784-7490
william.howard@nationalgrid.com

Operator:

*TO BE DETERMINED UPON
CONTRACT AWARD*

Kiewit
Name
Address
City, State, Zip Code
Telephone Number
Email Address

Estimated Project Dates:

Start Date: January 2017
Completion Date: November 2018

SESC Plan Prepared By:

GZA GeoEnvironmental
Igor Runge
530 Broadway
Providence, RI, 02909
401-421-4140
igor.runge@gza.com

**SESC Plan
Preparation Date:**

September 2016

SESC Plan Revision

Date:

OWNER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate 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 am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am aware that it is the responsibility of the site owner and operator to implement and amend the Soil Erosion and Sediment Control Plan as appropriate in accordance with the requirements of the RIPDES Construction General Permit.

Owner Signature:

Date

Owner Name: William R. Howard

Owner Title: Environmental Manager

Company Name: National Grid LNG, LLC

Address: 40 Sylvan Road Waltham, MA

Phone Number: 401-784-7490

Email Address: william.howard@nationalgrid.com

OPERATOR CERTIFICATION

Upon contract award, the OPERATOR must sign this certification statement before construction may begin.

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate 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 am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am aware that it is the responsibility of the owner/operator to implement and amend the Soil Erosion and Sediment Control Plan as appropriate in accordance with the requirements of the RIPDES Construction General Permit.

Operator Signature:

Date

Contractor Representative: Name

Contractor Title: Title

Contractor Company Name: Company Name (if applicable)

Address: Mailing Address

Phone Number: Phone Number

Email Address: Email

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642 Allens Avenue, Providence, RI

INTRODUCTION

This Construction Site Soil Erosion and Sediment Control Plan (SESC Plan) has been prepared for National Grid LNG, LLC (NG LNG) for the construction of the liquefaction plant at 642 Allens Avenue in Providence, RI. In accordance with the RIDEM Rhode Island Pollutant Discharge Elimination System (RIPDES) General Permit for Stormwater Discharge Associated with Construction Activity (RIPDES Construction General Permit ("CGP")), projects that disturb one (1) or more acres require the preparation of a SESC Plan. This SESC Plan provides guidance for complying with the terms and conditions of the RIPDES Construction General Permit and Minimum Standard 10 of the RI Stormwater Design and Installation Standards Manual. In addition, this SESC Plan is also consistent with Part D of the *RI SESC Handbook* entitled "Soil Erosion and Sediment Control Plans". This document does not negate or eliminate the need to understand and adhere to all applicable RIPDES regulations.

The purpose of erosion, runoff, and sedimentation control measures is to prevent pollutants from leaving the construction site and entering waterways or environmentally sensitive areas during and after construction. This SESC Plan has been prepared prior to the initiation of construction activities to address anticipated worksite conditions. The control measures depicted on the site plan and described in this narrative should be considered the minimum measures required to control erosion, sedimentation, and stormwater runoff at the site. Since construction is a dynamic process with changing site conditions, it is the operator's / contractor's responsibility to manage the site during each construction phase so as to prevent pollutants from leaving the site. This may require the operator to revise and amend the SESC Plan during construction to address varying site and/or weather conditions, such as by adding or realigning erosion or sediment controls to ensure the SESC Plan remains compliant with the RIPDES Construction General Permit. Records of these changes must be added to the amendment log attached to the SESC Plan, and to the site plans as "red-lined" drawings. Please Note: **Even if practices are correctly installed on a site according to the approved plan, the site is only in compliance when erosion, runoff, and sedimentation are effectively controlled throughout the entire site.**

It is the responsibility of the site owner and the site operator to maintain the SESC Plan at the site, including all attachments, amendments and inspection records, and to make all records available for inspection by RIDEM during and after construction. (RIPDES CGP - Part III.G)

The site owner, the site operator, and the designated site inspector are required to review the SESC Plan and sign the Party Certification pages (Section 8). The primary contractor (if different) and all subcontractors (if applicable) involved in earthwork or exterior construction activities are also required to review the SESC Plan and sign the certification pages before construction begins.

ADDITIONAL RESOURCES

Rhode Island Department of Environmental Management
Office of Water Resources
235 Promenade Street
Providence, RI 02908-5767
phone: 401-222-4700
email: water@dem.ri.gov

RIDEM *RI Stormwater Design and Installation Standards Manual* (RISDISM) (as amended)
<http://www.dem.state.ri.us/programs/benviron/water/permits/ripdes/stwater/t4guide/desman.htm>

RI Soil Erosion and Sediment Control Handbook
<http://www.dem.state.ri.us/soilerosion2014final.pdf>

RIDEM 2013 RIPDES Construction General Permit
<http://www.dem.ri.gov/pubs/regs/regs/water/ripdesca.pdf>

Rhode Island Department of Transportation *Standard Specifications for Road and Bridge Design and Other Specifications* and *Standard Details*
<http://www.dot.ri.gov/business/bluebook.php>

RIDEM Office of Water Resources Coordinated Stormwater Permitting website
<http://www.dem.state.ri.us/programs/benviron/water/permits/swcoord/index.htm>

RIDEM RIPDES Stormwater website
<http://www.dem.state.ri.us/programs/benviron/water/permits/ripdes/stwater/index.htm>

RIDEM Water Quality website (for 303(d) and TMDL listings)
<http://www.dem.ri.gov/programs/benviron/water/quality/index.htm>

RIDEM Rhode Island Natural Heritage Program
<http://www.dem.ri.gov/programs/bpoladm/plandev/heritage/index.htm>

RIDEM Geographic Data Viewer – Environmental Resource Map
<http://www.dem.ri.gov/maps/index.htm>

Natural Resources Conservation Service - Rhode Island Soil Survey Program
<http://www.ri.nrcs.usda.gov/technical/soils.html>

EPA NPDES – Stormwater Discharges from Construction Activities webpage:
<http://water.epa.gov/polwaste/npdes/stormwater/Stormwater-Discharges-From-Construction-Activities.cfm>

EPA Construction Site Stormwater Runoff Control BMP Menu
<http://water.epa.gov/polwaste/npdes/swbmp/Construction-Site-Stormwater-Run-Off-Control.cfm>

SECTION 1: SITE DESCRIPTION

1.1 *Project/Site Information*

Project/Site Name: Liquefaction Plant

The Site is located at 642 Allens Avenue in the City of Providence, Rhode Island. The Site is identified as Plat 56, Lots 5, 316 and 317, and Plat 101, Lot 1. The area comprising the Site consists of approximately 42 acres of land with frontage on Allens Avenue to the west, and bounded to the east by the Providence River (Tidally influenced water body). It is adjoined to the northwest by Motiva Enterprises, LLC, and to the south by Terminal Road, the former Sun Oil/Providence Port facility, and New England Bituminous Terminal Corporation. Currently, active natural gas regulation and distribution, a compressed natural gas (CNG) fueling station, (LNG) storage and distribution, and cement storage and distribution activities are conducted at the 642 Allens Avenue property.

The property is located in zoning district W3, which is a waterfront development district in the Port of Providence with no lot size limits. The Site is entirely enclosed and secured by chain-link fencing and barbed wire. The soil generally consists of urban fill underlain by organic silt, glacial outwash and glacial till. The depth to bedrock is typically more than 100 feet below ground surface (bgs). Groundwater underlying the Site is classified as GB or not suitable for drinking water use without treatment. Groundwater flow is generally towards the Providence River.

From 1910 until 1954 a manufactured gas plant (MGP) occupied the Site. Other occupants included B.P. Clapp in 1910 (ammonia works, including the recycling and sale of ammonia by-products), and in 1918, the United States Government operated a toluene facility. Portions of the Site included the Sassafras Point Rifle Range which was a small arms range that operated during the late 1800s. The LNG facility has occupied the eastern/southeastern portion of the Site since 1972, and Holcim (formerly St. Lawrence Cement Company) has occupied the southeastern portion of the Site since 1961. National Grid's Natural Gas Regulation Facility occupies the remainder of the Site. As part of the facility, National Grid also operates a Compressed Natural Gas (CNG) fueling station.

The Site is listed with the Rhode Island Department of Environmental Management (RIDEM) due to contaminants present in soil and groundwater at concentrations that represent Method 1 exceedances as defined in the Remediation Regulations as a result of MGP waste residuals and/or historical industrial activities. The liquefaction plant construction will be conducted in accordance with the Soil Management Plan (SMP) that was submitted to RIDEM in September 2012. In addition, an evaluation of the applicability of Air Pollution Control Regulation No. 9 will be submitted to RIDEM's Office of Air Resources, as well as an application for a Temporary Groundwater Discharge Approval from RIDEM's Office of Waste Management under Rule 13 of the October 2014 Rules for the Discharge of Non-Sanitary Wastewater and Other Fluid to or Below the Ground Surface.

The proposed liquefaction plant will tie into the high pressure gas line located along the Providence River on the northern border of the Site. The liquefaction plant will cool and compress the natural gas into a liquid. The LNG will then be pumped to the existing LNG tank for storage.

Sequence and Schedule

Mobilization (Construction Phase 1) is expected to begin in January 2017 and be complete by the end of February 2017. Mobilization will consist of the following:

- Install sediment and erosion controls around the perimeter of the Site and existing catch basins.
- Install crushed stone over the temporary laydown area.
- Construct the temporary office building, break room building, safety building, and warehouse.

Liquefaction plant construction activities (Construction Phase 2) are expected to begin in February 2017, and will consist of the following:

- Stripping the existing crushed stone and preparing the liquefaction area for construction is expected to be complete by March 2017.

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- Relocating the fire suppression water line is expected to be complete by May of 2017.
- Pile driving for the liquefaction area is expected to be complete by September 2017.
- Raising the grade of the liquefaction area will begin in February 2017, and be complete by May 2017.
- The revetment wall will be completed by June 2017.
- Installation of the stormwater collection system will begin in April 2017, and be complete by November 2017.
- The sand filter and sediment forebay treatment system will be completed by June 2018.
- The cast in place concrete foundations for the liquefaction plant equipment are expected to be complete by March 2018.
- The equipment for the liquefaction plant will be installed by March 2018.
- The final Site stabilization including paving access roads and placing crushed stone and gravel at the Site will be complete by November 2018.

Demobilization (Construction Phase 3) will begin in December 2018, and will consist of the following:

- Removing the temporary office building, break room building, safety building, and warehouse.
- Removing the erosion and sediment controls.

Project Street/Location:

- 642 Allens Ave, Providence, RI 02905



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The following are estimates of the construction site area:

- Total Property Area 42 acres
- Total Limit of Work During Construction 13.5 acres
- Total Project Area to be Disturbed 3.11 acres
 - New Asphalt Paving/Equipment (Impervious) 1.30 acres

1.2 Receiving Waters

RIPDES CGP - Parts IV.A.7 & IV.A.8

- Under the existing conditions, site stormwater from the liquefaction plant area ponds in various depressions located within the site area and ultimately infiltrates through the onsite soils.
- As part of the site redevelopment, a stormwater management system will be constructed to collect and treat stormwater runoff from the proposed liquefaction plant area. The system will treat the water quality volume (WQV) generated by the proposed new impervious areas using the following water quality treatment devices: concrete forebay (total solids removal); and a sand filter (total solids, oil and sheen removal). Stormwater runoff generated at the liquefaction plant will be directed to the treatment system via a series of catch basins.

Description of receiving waters that may be impacted during construction:

- The section of the Providence River (water body ID RI0007020E-01B) that abuts the Site is considered to be impaired due to fecal coliform, total nitrogen, and dissolved oxygen and is classified as a SB1{a} water body.

Are any of the receiving waters in the vicinity of the proposed construction project listed as being impaired or subject to a TMDL?

Yes No

If yes, List/provide description of 303(d)/TMDL waters and applicable TMDL requirements that must be addressed during construction:

- A TMDL has not yet been established for any of the above listed contaminants.

1.3 Natural Heritage Area Information

RIPDES CGP - Part III.H

Are there any Natural Heritage Areas being disturbed by the construction activity or will discharges be directed to the Natural Heritage Area as a result of the construction activity?

Yes No

If yes, describe or refer to documentation which determines the likelihood of an impact on this area and the steps that will be taken to address any impacts.

- N/A

1.4 Historic Preservation/Cultural Resources

Are there any historic properties, historic cemeteries or cultural resources on or near the construction site?

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Yes No

Describe how this determination was made and summarize state or tribal review comments:

- Based on historic mapping and documented property use within the Project area, the property has been utilized for industrial activities since the late 1800s.

If yes, describe or refer to documentation which determines the likelihood of an impact on this historic property, historic cemetery or cultural resource and the steps taken to address that impact including any conditions or mitigation measures that were approved by other parties.

- N/A

1.5 Site Features and Constraints

List All Site Constraints and Sensitive Areas that require avoidance and protection through the implementation of control measures:

- No site constraints or sensitive areas are present on the site.

SECTION 2: EROSION, RUNOFF, AND SEDIMENT CONTROL

RIPDES Construction General Permit – Part III.J.1

The purpose of erosion controls is to prevent sediment from being detached and moved by wind or the action of raindrop, sheet, rill, gully, and channel erosion. Properly installed and maintained erosion controls are the primary defense against sediment pollution.

Runoff controls are used to slow the velocity of concentrated water flows. By intercepting and diverting stormwater runoff to a stabilized outlet or treatment practice or by converting concentrated flows to sheet flow erosion and sedimentation are reduced.

Sediment controls are the last line of defense against moving sediment. The purpose is to prevent sediment from leaving the construction site and entering environmentally sensitive areas.

This section describes the set of control measures that will be installed before and during the construction project to avoid, mitigate, and reduce impacts associated with construction activity. Specific control measures and their applicability are contained in Section Four: Erosion Control Measures, Section Five: Runoff Control Measures, and Section Six: Sediment Control Measures of the *RI SESC Handbook*. The *RI SESC Handbook* can be found at the following address:

<http://www.dem.ri.gov/soilerosion2014final.pdf>.

2.1 Avoid and Protect Sensitive Areas and Natural Features

Areas of existing and remaining vegetation and areas that are to be protected are shown on the attached Figures. Prior to any land disturbance activities commencing on the site, the Contractor shall physically mark limits of disturbance (LOD) on the site and any areas to be protected within the site, so that workers can clearly identify the areas to be protected.

Filtrexx Soxx™ or an approved equivalent will be installed along the site perimeter in areas where there is potential for sediment to be carried off site. Filtrexx Soxx, when properly used, serve to both control and filter runoff. Large debris in runoff is easily caught and retained, and a portion of the smaller suspended solids may be filtered out. Filtrexx Soxxs will be placed in a single row, lengthwise on the contour, with ends of adjacent wattles overlapping. Filtrexx Soxxs will be installed in accordance with manufacturer's specifications and will be securely anchored by at least two stakes driven through the middle of the sediment control device at a maximum of 6-8 feet on center. In the event that staking is not possible (i.e., when the

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sediment controls are installed on pavement), heavy concrete blocks will be used behind the sediment control device to help stabilize during rainfall/runoff events.

Filtrexx Soxxs will be installed as indicated on the attached Plan Set and around the perimeter of temporary stockpiles. Filtrexx Soxx details are included on the attached Plan Set

Silt sacks will be installed in catch basins within the limits of the site disturbance. A silt sack is a sediment control device used to prevent silt and sediment from entering drainage systems by catching the silt and sediment while allowing water to pass through freely. They must be maintained on a regular basis to function properly.

Silt sacks will be installed in catch basins by removing the grate and placing the sack in the opening. Six inches of the sack and the sack handles will extend outside the frame. This is the area of the lifting straps. The sack is held in place by the weight of catch basin grate. Silt sack details are included on the attached Plan Set.

Feature Requiring Protection	Construction Phase #	Method of Protection	Plan Set #
Catch Basins	1	Silt Sacks	5
Off Site Vegetated Areas	1	Filtrexx Soxx	4 & 7
Proposed Sand Filter	2	Will be constructed last	7

2.2 Minimize Area of Disturbance

Will >5 acres be disturbed in order to complete this project?

Yes No

Will <5 acres be disturbed at one time or will disturbance activities be completed within a six (6) month window?

Yes No

Based on the answers to the above questions will phasing be required for this project?

Yes No

PHASING PLAN

Construction phasing is not required for this project.

2.3 Minimize the Disturbance of Steep Slopes

Are steep slopes (>15%) present within the proposed project area?

Yes No

Slopes will be protected using erosion blankets as needed.

2.4 **Preserve Topsoil**

Site owners and operators must preserve existing topsoil on the construction site to the maximum extent feasible and as necessary to support healthy vegetation, promote soil stabilization, and increase stormwater infiltration rates in the post-construction phase of the project.

Will existing topsoil be preserved at the site?

Yes No

The site is currently covered with crushed stone, asphalt pavement, and urban fill. Very little top soil is present within the limits of work for the site. In addition, this project will be performed in accordance with a Soil Management Plan (SMP) that was submitted to RIDEM in September 2012. In accordance with the Remediation Regulations, existing surface soils cannot be reused to construct the proposed remedial caps except as subgrade material underneath final remedial caps.

2.5 **Stabilize Soils**

Upon completion and acceptance of site preparation and initial installation of erosion, runoff, and sediment controls and temporary pollution prevention measures, the operator shall initiate appropriate temporary or permanent stabilization practices during all phases of construction on all disturbed areas as soon as possible, but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased or in accordance with construction specifications, whichever is more stringent.

Any disturbed areas that will not have active construction activity occurring within 14 days must be stabilized using the control measures depicted in the SESC Site Plans, in accordance with the *RI SESC Handbook*, and per manufacturer product specifications.

Only areas that can be reasonably expected to have active construction work being performed within 14 days of disturbance will be cleared/grubbed at any one time. It is NOT acceptable to clear and grub the entire construction site if portions will not be active within the 14-day time frame. Proper phasing of clearing and grubbing activities shall include temporary stabilization techniques for areas cleared and grubbed that will not be active within the 14-day time frame.

All disturbed soils exposed prior to October 15 of any calendar year shall be seeded by that date if vegetative measures are the intended soil stabilization method. Any such areas that do not have adequate vegetative stabilization, as determined by the site operator or designated inspector, by November 15, must be stabilized through the use of non-vegetative erosion control measures. If work continues within any of these areas during the period from October 15 through April 15, care must be taken to ensure that only the area required for that day's work is exposed, and all erodible soil must be restabilized within 5 working days. In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed.

The majority of the site area will be covered with asphalt pavement or crushed stone at the completion of construction activities. Temporary erosion controls will not be utilized in these areas.

Temporary Vegetative Control Measures

- Temporary vegetative erosion control measures will not be utilized on this site.

Temporary Non-Vegetative Control Measures

- Crushed stone will be placed over the laydown area to protect contractors from onsite soils and to prevent soil erosion and offsite tracking of sediment during construction.
- Erosion-control blankets are used to help limit erosion on slopes and in ditches where conventional seeding and/or structural methods would be inadequate. By reducing the negative effects of rainfall impact and runoff, erosion-control blankets provide slopes and ditches with a temporary, stable

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environment. Temporary erosion-control blankets are constructed of a variety of materials, including straw, wood excelsior, coconut or some combination thereof. These materials usually are stitched or glued to some type of synthetic or natural fiber netting, which is either biodegradable or photodegradable.

The blanket should be anchored into a 6-inch deep by 6-inch wide trench. The anchor trench should be backfilled and compacted after stapling the blanket with staples or stakes located no further than 12 inches apart. The blanket should then be rolled out in the direction of flow. The ends and side seams should overlap by a minimum of 12 inches if additional rolls are needed. The upstream roll should be placed on top of the new roll and stapled with a double row of staples staggered 4 inches apart. The terminal end of the blankets must be anchored as stated above. In all cases, temporary erosion control netting shall be installed in accordance with the manufactures installation guidelines and the project specific construction specifications.

Temporary erosion netting will be inspected after every storm event or daily during long-duration storm events. It must be replaced when it has become too damaged to function properly. The ends should be checked to ensure that they are still properly anchored and the overlaps checked to determine that they are still properly stapled. Ripped or torn sections of the blanket should be removed and replaced.

Permanent Vegetative Control Measures

- Permanent vegetative erosion control measures will not be utilized on this site.

Permanent Non-Vegetative Control Measures

- Approximately 1.30 acres of the liquefaction plant work area will be covered with new asphalt pavement or concrete equipment foundations. The remainder of the liquefaction area will be covered with crushed stone. Presently this area is unpaved and contains environmental monitoring wells. The limits of paving are shown on the attached Figure 7. The liquefaction area will be raised by 9 to 11 feet. The imported fill used for raising the area will be certified clean in accordance with the SMP. Areas that will not be raised will be finished with a remedial soil cap. Approved remedial cap sections will consist of compacted geotechnically suitable site soils overlain by either four inches of asphalt pavement, concrete equipment foundations, 12 inches of clean fill over geotextile fabric, or two feet of clean fill. In certain areas where a geomembrane liner will be installed, a minimum of 8 inches of processed gravel will be placed between the liner and the asphalt pavement.
- The laydown area (approximately 9.41 acres) will be covered with crushed stone. Presently this area is covered with vegetation in poor condition. The limits of the crushed stone and riprap areas are shown on the attached Figure 4. The crushed stone will also help to protect contractors from exposure to onsite soils during construction, and will prevent soil erosion and offsite tracking of sediment during construction.

2.6 Protect Storm Drain Outlets

Temporary or permanent outlet protection must be used to prevent scour and erosion at discharge points through the protection of the soil surface, reduction in discharge velocities, and through the promotion of infiltration. Outlets often have high velocity, high volume flows, and require strong materials that will withstand the forces of stormwater. Storm drain outlet control measures also offer a last line of protection against sediment entering environmentally sensitive areas.

All stormwater outlets that may discharge sediment-laden stormwater flow from the construction site must be protected using the control practices depicted on the approved plan set and in accordance with the *RI SESC Handbook*.

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Will temporary or permanent point source discharges be generated at the site as the result of construction of sediment traps or basins, diversions, and conveyance channels?

Yes No

Upon project completion stormwater that has passed through the sand filter and overflow from the concrete forebay will be discharged to the Providence River through a new outfall. The outfall will be equipped with a rip-rap apron to prevent erosion.

2.7 *Establish Temporary Controls for the Protection of Post-Construction Storm Water Treatment Practices*

Temporary measures shall be installed to protect permanent or long-term stormwater control and treatment measures as they are installed and throughout the construction phase of the project so that they will function properly when they are brought online.

Stormwater runoff generated from the proposed site redevelopment (paved areas and equipment) will be collected by catch basins installed at grade. The series of catch basins that will collect stormwater runoff will be protected during construction with silt sacks. During construction activities stormwater runoff will be directed to the concrete forebay where sediment will be allowed to settle out before the stormwater is discharged. Once construction is complete the concrete forebay and catch basins will be cleaned with a vactor truck to remove any accumulated sediment before the sand filter is brought online.

Will long-term stormwater treatment practices be installed at the site?

Yes No

The proposed stormwater management system consist of the following components:

- **Concrete Forebay:** The design intent of the concrete forebay is to provide pretreatment of stormwater runoff prior to discharging to the proposed sand filter. The forebay has a total storage volume of 2,145 cubic feet, which is greater than the required minimum storage volume of 1,220.5 cubic feet (25% of the total water quality volume). A weir will be installed to meter the WQV to the sand filter. An upward facing 24-inch diameter HDPE 90-degree fitting will be installed in the forebay as an overflow weir to convey stormwater to the outfall.
- **Sand Filter:** The sand filter has been hydraulically sized to treat the first inch of runoff (WQV) generated by the proposed liquefaction plant and runoff from potential future development in accordance with Section 5.5 of the Design Manual. The water quality elevation has been designed at elevation 9.35 feet (NAVD88), therefore the filter area will flood with approximately 9 inches of standing water before the system overflows to the bypass drain line. The filter will be constructed with an 18-inch thick layer of C33 filter sand.
- **Proposed Stormwater Overflow Protection:** The stormwater management systems overflow protection will be provided by an upward facing 24-inch diameter HDPE 90-degree fitting which will hydraulically function as a weir. The overflow will be installed in the forebay system directly adjacent to the sand filter. The overflow will discharge to the Providence River through a new outfall. The overflow bypass line has the capacity to safely convey the peak stormwater runoff rate generated by the 10-year design event.

2.8 Divert or Manage Run-on from Up-gradient Areas

Is stormwater from off-site areas anticipated to flow onto the project area or onto areas where soils will be disturbed?

Yes No

Post Construction sub-watershed maps are included in the Stormwater Management Plan (SWMP) submittal.

2.9 Retain Sediment Onsite through Structural and Non-Structural Practices

SEDIMENT BARRIERS must be installed along the perimeter areas of the site that will receive stormwater from disturbed areas. This also may include the use of sediment barriers along the contour of disturbed slopes to maintain sheet flow and minimize rill and gully erosion during construction. Installation and maintenance of sediment barriers must be completed in accordance with the maintenance requirements specified by the product manufacturer or the *RI SESC Handbook*.

Will sediment barriers be utilized at the toe of slopes and other downgradient areas subject to stormwater impacts and erosion during construction?

Yes No

Filtrexx Soxx™ or an approved equivalent will be installed along the site perimeter in areas where there is potential for sediment to migrate off site and along slopes within the work zone. Filtrexx Soxx, when properly used, serve to both control and filter runoff. Large debris in runoff is easily caught and retained, and a portion of the smaller suspended solids may be filtered out. Filtrexx Soxxs will be placed in a single row, lengthwise on the contour, with ends of adjacent wattles overlapping. Filtrexx Soxxs will be installed in accordance with manufacturer's specifications and will be securely anchored by at least two stakes driven through the middle of the sediment control device at a maximum of 6-8 feet on center. In the event that staking is not possible (i.e., when the sediment controls are installed on pavement), heavy concrete blocks will be used behind the sediment control device to help stabilize during rainfall/runoff events.

Filtrexx Soxxs will be installed around the perimeter of temporary stockpiles and the work limit. Filtrexx Soxx details and alignment are shown on the attached construction drawings.

Will sediment barriers be utilized along the contour of slopes to maintain sheet flow and minimize rill and gully erosion during construction?

Yes No

There will be no slopes longer than 40 feet in length that will not be paved as part of construction activities. Sediment barriers will not be necessary to stabilize these areas.

SEDIMENT BARRIERS			
Construction Phase #	Sediment Barrier Type	Sediment Barrier is Labeled on Sheet #	Detail is on Sheet #
1	Filtrexx Soxx	4 & 7	5

INLET PROTECTION will be utilized to prevent soil and debris from entering storm drain inlets. These measures are usually temporary and are implemented before a site is disturbed. ALL stormwater inlets and/or catch basins that are operational during construction and have the potential to receive sediment-

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laden stormwater flow from the construction site must be protected using control measures outlined in the *RI SESC Handbook*.

For more information on inlet protection refer to the *RI SESC Handbook*, Inlet Protection control measure.

Silt sacks will be installed in catch basins within the limits of the site disturbance. A silt sack is a sediment control device used to prevent silt and sediment from entering drainage systems by catching the silt and sediment while allowing water to pass through freely. They must be maintained on a regular basis to function properly.

Silt sacks will be installed in catch basins by removing the grate and placing the sack in the opening. Six inches of the sack and the sack handles will extend outside the frame. This is the area of the lifting straps. The sack is held in place by the weight of catch basin grate.

Maintenance

The operator must clean, or remove and replace the inlet protection measures as sediment accumulates, the filter becomes clogged, and/or as performance is compromised. Accumulated sediment adjacent to the inlet protection measures should be removed by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible. Silt sacks should be cleaned or replaced when the total sediment accumulation depth is greater than 8 inches.

Do inlets exist adjacent to or within the project area that require temporary protection?

Yes No

The following lists the proposed storm drain inlet types selected from Section Six of the *RI SESC Handbook*. Each row is unique for each phase and inlet protection type.

INLET PROTECTION			
Construction Phase #	Inlet Protection Type	Inlet Protection is labeled on Sheet #	Detail(s) is/are on Sheet #
1 & 2	Silt Sack	7	5

CONSTRUCTION ENTRANCES/EXITS will be used in conjunction with the stabilization of construction roads to reduce the amount of sediment tracking off the project. This project has avoided placing construction entrances on poorly drained soils where possible. Where poorly drained soils could not be eliminated, the detail includes subsurface drainage.

Any construction site access point must employ the control measures as shown on the construction drawings and described in the construction specifications and in accordance with the *RI SESC Handbook*. Stabilized construction entrances/exits shall be used in conjunction with the stabilization and regular cleaning of construction roads to reduce the amount of mud picked up by construction vehicles. All construction access roads shall be constructed prior to any roadway accepting routine construction traffic.

The site owner and operator must:

1. Restrict construction vehicle use to properly designated exit points, as shown on the attached Figure 4.
2. Use properly designed and constructed construction entrances at all points that exit onto paved roads so that sediment removal occurs prior to vehicle exit. Construction entrance details are shown on the attached Figure 5
3. When and where necessary, as directed by the construction inspector use additional controls to remove sediment from vehicle tires prior to exit (i.e. wheel washing racks, rumble strips, and rattle plates).

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4. Where sediment has been tracked out from the construction site onto the surface of off-site streets, other paved areas, and sidewalks, the deposited sediment must be removed by the end of the same work day in which the track out occurs. Track-out must be removed by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal.

Will construction entrances be utilized at the proposed construction site?

Yes No

CONSTRUCTION ENTRANCE			
Construction Phase #	Soil Type at the Entrance	Entrance is located on Sheet #	Detail is on Sheet #
1	Crushed Stone	4	5

As indicated on Figure 4, tracking pads will be installed at each entrance to the site to mitigate the transmission of on-site soils beyond the limits of work. The tracking pads will consist of crushed stone as indicated on the details included in the Plan Set. If sediment is tracked off site, the sediment must be removed by sweeping, shoveling, or vacuuming by the end of the work day.

At the conclusion of the construction activities or whenever heavy equipment or tools leave the site, they shall be clean of visual soil residuals. At a minimum, soil shall be brushed from the equipment and re-used as backfill or placed in stockpiles to be managed as described herein. Vehicles are not to leave the site with visible soil residues on the exterior.

STOCKPILE CONTAINMENT will be used on site to minimize or eliminate the discharge of soil, topsoil, base material or rubble, from entering drainage systems or surface waters. All stockpiles must be located within the limit of disturbance, protected from run-on with the use of temporary sediment barriers and provided with cover or stabilization to avoid contact with precipitation and wind where and when practical.

Stockpile management consists of procedures and practices designed to minimize or eliminate the discharge of stockpiled material (soil, topsoil, base material, rubble) from entering drainage systems or surface waters.

For any stockpiles or land clearing debris composed, in whole or in part, of sediment or soil, you must comply with the following requirements:

1. Locate piles within the designated limits of disturbance.
2. Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier.
3. Provide cover or appropriate temporary vegetative or structural stabilization to avoid direct contact with precipitation or to minimize sediment discharge.
4. NEVER hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or surface water.
5. To the maximum extent practicable, contain and securely protect from wind.

Excavated materials will be stockpiled with the soil storage area shown on attached Figures 4 and 5. Stockpiles will be equipped with appropriate perimeter erosion and sediment controls to limit soil migration resulting from stormwater erosion. These controls will include the installation of Filtrexx Soxh surrounding

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the perimeter of the stockpiles. Stockpiles will be inspected daily by Site personnel. Should the perimeter erosion controls be damaged or sediment has accumulated to more than 1/2 the height of the erosion control device, repairs to the erosion controls and or sediment removal will be made as soon as practical. These inspections will be documented in daily field reports. If windblown dust is generated from the piles, the piles will be covered with 6 mil polyethylene to prevent stockpile soil loss.

STOCKPILE CONTAINMENT				
Construction Phase #	Run-on measures necessary? (yes/no)	Stabilization or Cover Type	Stockpile Containment Measure	Sheet #
1	Yes	6 Mil Polyethylene	Filtrexx Soxx	4 & 5

2.10 Erosion, Runoff, and Sediment Control Measure List

It is expected that this table and corresponding Inspection Reports will be amended as needed throughout the construction project as control measures are added or modified.

Location/Station	Control Measure Description/Reference	Maintenance Requirement
Site Perimeter Locations and Soil Stockpiles	Filtrexx Soxx - Section Six: Sediment Control Measures, Straw Wattles, Compost Tubes and Fiber Rolls - <i>RI SESC Handbook</i> .	Inspection should be made after each storm event or 1/week and repair or replacement should be made promptly as needed. Cleanout of accumulated sediment behind the Filtrexx Soxx if sediment accumulates to at least ½ the distance between the top of Soxx and ground surface.
Laydown area Construction Entrance	Stone Stabilized Pad - Section Six: Sediment Control Measures – Construction Entrances – <i>RI SESC Handbook</i> .	The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto paved surfaces. Provide periodic top dressing with additional stone or additional length as conditions demand. Roads adjacent to entrance shall be clean at the end of each day. If maintenance alone is not enough to prevent excessive track out, increase length of entrance, modify construction access road surface, or install wash rack or mud rack.
Providence River Outfall Rip rap apron	Turbidity Curtains - Section Six: Sediment Control Measures – Turbidity Curtains – <i>RI SESC Handbook</i> .	The silt curtain shall be inspected daily and repaired or replaced immediately. If the curtain is oriented in a manner that faces the prevailing winds, frequent checks of the anchorage shall be made. It is not normally necessary to remove sediment deposited behind the curtain; but, when necessary, removal is usually done by hand prior to removal of the barrier. All removed silt is

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		<p>stabilized away from the waterbody. Sediment removal will be at the direction of the regulatory agency.</p> <p>The barrier shall be removed by carefully pulling it toward the construction site to minimize the release of attached sediment. Any floating construction or natural debris shall be immediately removed to prevent damage to the curtain.</p>
<p>Catch Basins Located within the liquefaction plant work area</p> <p>Silt Sacks</p>	<p>Manufactured Inlets - Section Six: Sediment Control Measures – Inlet Protection –<i>RI SESC Handbook</i>.</p>	<p>Inspection should be made after each storm event or 1/week and repair or replacement should be made promptly as needed.</p> <p>Lift internal inlet filters carefully from the drainage structure. Remove any accumulated sediment and reinsert device into the drain opening. Replace damaged silt sacks.</p>
<p>Vegetated Areas on northern Border</p> <p>Filtrexx Soxx</p>	<p>Filtrexx Soxx - Section Six: Sediment Control Measures, Straw Wattles, Compost Tubes and Fiber Rolls - <i>RI SESC Handbook</i>.</p>	<p>Inspection should be made after each storm event or 1/week and repair or replacement should be made promptly as needed.</p> <p>Cleanout of accumulated sediment behind the Filtrexx Soxx if sediment accumulates to at least ½ the distance between the top of Soxx and ground surface.</p>

SECTION 3: CONSTRUCTION ACTIVITY POLLUTION PREVENTION

The purpose of construction activity pollution prevention is to prevent day to day construction activities from causing pollution.

This section describes the key pollution prevention measures that must be implemented to avoid and reduce the discharge of pollutants in stormwater. Example control measures include the proper management of waste, material handling and storage, and equipment/vehicle fueling/washing/maintenance operations.

3.1 Existing Data of Known Discharges from Site

Are there known discharges from the project area?

Yes No

Describe how this determination was made:

- Site visits determined that there are existing catch basins at the Site and two sump pits that ultimately discharge stormwater to the Providence River.

If yes, list discharges and locations:

- The existing series of catch basins is located on the western portion of the Site.
- One of the sump pits is located within the diked area on the eastern portion of the Site.

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- The second sump pit is located next to the truck scales south of the proposed Liquefaction Plant in the center of the Site.

Is there existing data on the quality of the known discharges?

Yes No

If yes, provide data:

- N/A

3.2 Prohibited Discharges

The following discharges are prohibited at the construction site:

- Contaminated groundwater, unless specifically authorized by RIDEM.
- Wastewater from washout of concrete, unless the discharge is contained and managed by appropriate control measures.
- Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials.
- Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance. Proper storage and spill prevention practices must be utilized at all construction sites.
- Soaps or solvents used in vehicle and equipment washing.
- Toxic or hazardous substances from a spill or other release.

All types of waste generated at the site shall be disposed of in a manner consistent with State Law and/or regulations and in accordance with the construction specifications.

Will any of the above listed prohibited discharges be generated at the site?

Yes No

During construction if dewatering is required, the contaminated groundwater will be containerized for either off-site transport and disposal or treatment and discharge to the ground surface. Under the on-site discharge option, the contaminated groundwater will be treated in accordance with a Temporary Groundwater Discharge Permit, and will be allowed to infiltrate in a non-erosive manner.

3.3 Proper Waste Disposal

Building materials and other construction site wastes must be properly managed and disposed of in a manner consistent with State Law and/or regulations.

- A waste collection area shall be designated on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a waterbody or storm drain.
- All waste containers shall be covered to avoid contact with wind and precipitation.
- Waste collection shall be scheduled frequently enough to prevent containers from overflowing.
- All construction site wastes shall be collected, removed, and disposed of in accordance with applicable regulatory requirements and only at authorized disposal sites.
- Equipment and containers shall be checked for leaks, corrosion, support or foundation failure, or other signs of deterioration. Those that are found to be defective shall be immediately repaired or replaced.

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Is waste disposal a significant element of the proposed project?

Yes No

Wastes generated on-site during the construction process, including building materials and other construction wastes, will be disposed off-site according to applicable regulations. Waste containers will be covered to avoid contact with wind and precipitation and collection of containers will be scheduled frequently enough to prevent containers from overflowing. Following waste pickup, and at least once per week, all waste containers will be checked for leaks, corrosion, support or foundation failure, and other signs of deterioration. Any containers found to be defective will be immediately repaired or replaced.

3.4 Spill Prevention and Control

All chemicals and/or hazardous waste material must be stored properly and legally in covered areas, with containment systems constructed in or around the storage areas. Areas must be designated for materials delivery and storage. All areas where potential spills can occur and their accompanying drainage points must be described. The owner and operator must establish spill prevention and control measures to reduce the chance of spills, stop the source of spills, contain and clean-up spills, and dispose of materials contaminated by spills. The operator must establish and make highly visible location(s) for the storage of spill prevention and control equipment and provide training for personnel responsible for spill prevention and control on the construction site.

Are spill prevention and control measures required for this particular project?

Yes No

3.5 Control of Allowable Non-Stormwater Discharges

Are there allowable non-Stormwater discharges present on or near the project area?

Yes No

List of allowable non-stormwater discharge(s) and the associated control measure(s):

Allowable Non-Stormwater Discharge	Occur on-Site?
Vehicle wash-down/no detergents	YES
External building wash-down/no detergents	NO
Dust control/water truck	YES
Firefighting activities	NO
Fire hydrant flushing	NO
Natural springs	NO
Uncontaminated groundwater	NO
Lawn watering	NO
Potable water sources/waterline flushing	NO
Irrigation drainage	NO
Pavement wash water	NO
Uncontaminated foundation/footing drains	NO

Are there any known or proposed contaminated discharges, including anticipated contaminated dewatering operations, planned on or near the project area?

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Yes No

If yes, list the discharge types and the RIPDES individual permit number(s) or RIPDES Remediation General Permit Authorization number(s) associated with these discharges.

- Discharge Type and RIPDES Individual Permit number : N/A
- Discharge Type and RIPDES Remediation General Permit Authorization number: N/A
- A Temporary Groundwater Discharge Permit will be obtained from RIDEM if dewatering is necessary. Management of dewatering water will be performed in accordance with the Temporary Groundwater Discharge Permit. Dewatering water will be containerized in a fractionation tank (or equivalent) to allow settling of sediment, then passed through a bag filter and granular activated carbon filter for treatment, and then discharged to an infiltration basin where the water will be allowed to infiltrate non-erosively. The Temporary Groundwater Discharge Permit will be maintained with this plan as Attachment E.

3.6 Control Dewatering Practices

Site owners and operators are prohibited from discharging groundwater or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, unless such waters are first effectively managed by appropriate control measures.

Examples of appropriate control measures include, but are not limited to, temporary sediment basins or sediment traps, sediment socks, dewatering tanks and bags, or filtration systems (e.g. bag or sand filters) that are designed to remove sediment. Uncontaminated, non-turbid dewatering water can be discharged without being routed to a control.

At a minimum the following discharge requirements must be met for dewatering activities:

1. Do not discharge visible floating solids or foam.
2. To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. In no case will surface waters be considered part of the treatment area.
3. At all points where dewatering water is discharged, utilize velocity dissipation devices.
4. With filter backwash water, either haul it away for disposal or return it to the beginning of the treatment process.
5. Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.
6. Dewatering practices must involve the implementation of appropriate control measures as applicable (i.e. containment areas for dewatering earth materials, portable sediment tanks and bags, pumping settling basins, and pump intake protection.)

Is it at all likely that the site operator will need to implement construction dewatering in order to complete the proposed project?

Yes No

Review of existing groundwater data suggest that dewatering may be required during construction activities. If excess groundwater is encountered during excavation, a dewatering system will be implemented. Construction dewatering will consist of using a sump pump to remove water from the excavation. The sump pump will discharge to frac tanks and groundwater will either be disposed of at a properly licensed off-site disposal facility or treated in accordance with the Temporary Groundwater Discharge Permit and allowed to infiltrate onsite. Approval from RIDEM may be sought to infiltrate dewatering discharge on-site if the total dewatering volume is too large to store in containers.

3.7 Establish Proper Building Material Staging Areas

All construction materials that have the potential to contaminate stormwater must be stored properly and legally in covered areas, with containment systems constructed in or around the storage areas. Areas must be designated for materials delivery and storage. Designated areas shall be approved by the site owner/engineer. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in the discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

Any building materials (i.e. cement, paints, and/or solvents) stored on site will be stored such that they are not exposed to precipitation. This project does not anticipate storing materials that have the potential to contaminate stormwater.

3.8 Minimize Dust

Dust control procedures and practices shall be used to suppress dust on a construction site during the construction process, as applicable. Precipitation, temperature, humidity, wind velocity and direction will determine amount and frequency of applications. However, the best method of controlling dust is to prevent dust production. This can best be accomplished by limiting the amount of bare soil exposed at one time. Dust Control measures outlined in the *RI SESC Handbook* shall be followed. Other dust control methods include watering, chemical application, surface roughening, wind barriers, walls, and covers.

Dust control measures will be employed to mitigate the release of airborne particulate matter beyond the limits of the Site. Methods of dust control will consist of sprinkling the ground surface with water, covering of temporary stockpiles, mulching, or similar methods.

Dust controls will be implemented when visible dust in the air is observed. If excessive dust generation occurs and cannot be reasonably controlled, the job shall be shut down until control is achieved.

3.9 Designate Washout Areas

At no time shall any material (concrete, paint, chemicals) be washed into storm drains, open ditches, streets, streams, wetlands, or any environmentally sensitive area. The site operator must ensure that construction waste is properly disposed of, to avoid exposure to precipitation, at the end of each working day.

Will washout areas be required for the proposed project?

Yes No

Concrete washout water cannot be discharged off-site without treatment. Concrete washouts shall be managed to contain all liquid and concrete waste generated by washout operations.

3.10 Establish Proper Equipment/Vehicle Fueling and Maintenance Practices

Vehicle fueling shall not take place within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system. Designated areas shall be depicted on the SESC drawings, or shall be approved by the site owner.

Vehicle maintenance and washing shall occur off-site, or in designated areas depicted on the SESC drawings or approved of by the site owner. Maintenance or washing areas shall not be within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system. Maintenance areas shall be clearly designated, and barriers shall be used around the perimeter of the maintenance area to prevent stormwater contamination.

Soil Erosion and Sediment Control Plan
Liquefaction Plant: National Grid LNG, LLC
642 Allens Avenue, Providence, RI

Construction vehicles shall be inspected frequently for leaks and repairs shall take place immediately. Disposal of all used oil, antifreeze, solvents and other automotive-related chemicals shall be according to applicable regulations; at no time shall any material be washed down the storm drain or in to any environmentally sensitive area.

Storage of fuel on-site shall be in covered areas. A spill kit will be maintained in the refueling area. No significant maintenance of vehicles or equipment shall be performed off-site.

3.11 Chemical Treatment for Erosion and Sediment Control

Chemical stabilizers, polymers, and flocculants are readily available on the market and can be easily applied to construction sites for the purposes of enhancing the control of erosion, runoff, and sedimentation. The following guidelines should be adhered to for construction sites that plan to use treatment chemicals as part of their overall erosion, runoff, and sedimentation control strategy.

The U.S. Environmental Protection Agency has conducted research into the relative toxicity of chemicals commonly used for the treatment of construction stormwater discharges. The research conducted by the EPA focused on different formulations of chitosan, a cationic compound, and both cationic and anionic polyacrylamide (PAM). In summary, the studies found significant toxicity resulting from the use of chitosan and cationic PAM in laboratory conditions, and significantly less toxicity associated with using anionic PAM. EPA's research has led to the conclusion that the use of treatment chemicals for erosion, runoff, and sedimentation control requires proper operator training and appropriate usage to avoid risk to aquatic species. In the case of cationic treatment chemicals additional safeguards may be necessary.

Application/Installation Minimum Requirements

If a site operator plans to use polymers, flocculants, or other treatment chemicals during construction the SESC plan must address the following:

1. Treatment chemicals shall not be applied directly to or within 100 feet of any surface water body, wetland, or storm drain inlet.
2. Use conventional erosion, runoff, and sedimentation controls prior to and after the application of treatment chemicals. Use conventional erosion, runoff, and sedimentation controls prior to chemical addition to ensure effective treatment. Chemicals may only be applied where treated stormwater is directed to a sediment control (e.g. temporary sediment basin, temporary sediment trap or sediment barrier) prior to discharge.
3. Sites shall be stabilized as soon as possible using conventional measures to minimize the need to use chemical treatment.
4. Select appropriate treatment chemicals. Chemicals must be selected that are appropriately suited to the types of soils likely to be exposed during construction and to the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or treatment area. **Soil testing is essential. Using the wrong form of chemical treatment will result in some form of performance failure and unnecessary environmental risk.**
5. Minimize discharge risk from stored chemicals. Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures (e.g., spill berms, decks, spill containment pallets), or provide equivalent measures, designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means (e.g., storing chemicals in covered areas or having a spill kit available on site).
6. Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier. You must also use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal

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 Liquefaction Plant: National Grid LNG, LLC
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design specifications provided by the supplier of the applicable chemicals, or document specific departures from these practices or specifications and how they reflect good engineering practice.

Will chemical stabilizers, polymers, flocculants or other treatment chemicals be utilized on the proposed construction project?

Yes No

3.12 Construction Activity Pollution Prevention Control Measure List

It is expected that this table will be amended as needed throughout the construction project.

Location/Station	Control Measure Description/Reference	Maintenance Requirement
Soil Stockpiles - Sheet No. 6	Temporary Soil Stockpile - Section Three: Pollution Prevention and Good Housekeeping, <i>RI SESC Handbook</i> .	<p>Inspect and verify that activity-based measures are in place prior to the commencement of associated activities.</p> <p>While activities associated with the measure are under way, inspect daily during the rainy season and of two-week intervals in the non-rainy season to verify continued measure implementation.</p> <p>Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.</p> <p>After the stockpile has been removed, the site should be graded and permanently stabilized.</p>
Concrete Washout Area	Prefabricated Concrete Washout Container with Ramp. Used to contain concrete washout during concrete pouring operations - Section Three: Pollution Prevention and Good Housekeeping, <i>Concrete Washouts, RI SESC Handbook</i> .	Verify that concrete washout container(s) are in place prior to pouring concrete. Inspect daily to verify continued proper performance. Check remaining capacity during pouring operations. Check for leaks periodically.
Waste Management Area	Waste Management Area - Section Three: Pollution Prevention and Good Housekeeping, <i>Waste Management, RI SESC Handbook</i> .	<p>All waste containers will be covered to avoid contact with wind and precipitation. Waste collection will be scheduled frequently enough to prevent containers from overflowing.</p> <p>All construction site wastes will be collected, removed, and disposed of in accordance with applicable regulatory requirements and only at authorized disposal sites.</p>

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		<p>Inspect storage and use areas and identify containers or equipment that could malfunction and cause leaks or spills.</p> <p>Check equipment and containers for leaks, corrosion, support or foundation failure, or other signs of deterioration, and test them for soundness.</p> <p>Repair or replace any that are found to be defective as soon as practical.</p>
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SECTION 4: CONTROL MEASURE INSTALLATION, INSPECTION, and MAINTENANCE

4.1 Installation

Complete the installation of temporary erosion, runoff, sediment, and pollution prevention control measures by the time each phase of earth-disturbance has begun. All stormwater control measures must be installed in accordance with good judgment, including applicable design and manufacturer specifications. Installation techniques and maintenance requirements may be found in manufacturer specifications and/or the *RI SESC Handbook*, in the project construction specifications and on the attached construction drawings.

4.2 Monitoring Weather Conditions

Anticipating Weather Events - Care will be taken to the best of the operator's ability to avoid disturbing large areas prior to anticipated precipitation events. Weather forecasts must be routinely checked, and in the case of an expected precipitation event of over 0.25-inches over a 24-hour period, it is highly recommended that all control measures should be evaluated and maintained as necessary, prior to the weather event. In the case of an extreme weather forecast (greater than one-inch of rain over a 24-hour period), additional erosion/sediment controls may need to be installed.

Storm Event Monitoring For Inspections - At a minimum, storm events must be monitored and tracked in order to determine when post-storm event inspections must be conducted. Inspections must be conducted and documented at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event, which generates at least 0.25 inches of rainfall per twenty-four (24) hour period and/or after a significant amount of runoff or snowmelt.

The weather gauge station and website that will be utilized to monitor weather conditions on the construction site is as follows:

College Hill, Providence, RI, www.wunderground.com,

4.3 Inspections

Minimum Frequency - Each of the following areas must be inspected by or under the supervision of the owner and operator at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event, which generates at least 0.25 inches of rainfall per twenty-four (24) hour period and/or after a significant amount of runoff or snowmelt:

- a. All areas that have been cleared, graded, or excavated and where permanent stabilization has not been achieved;

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- b. All stormwater erosion, runoff, and sediment control measures (including pollution prevention control measures) installed at the site;
- c. Construction material, unstabilized soil stockpiles, waste, borrow, or equipment storage, and maintenance areas that are covered by this permit and are exposed to precipitation;
- d. All areas where stormwater typically flows within the site, including temporary drainage ways designed to divert, convey, and/or treat stormwater ;
- e. All points of discharge from the site;
- f. All locations where temporary soil stabilization measures have been implemented; and
- g. All locations where vehicles enter or exit the site.

Reductions in Inspection Frequency - If earth disturbing activities are suspended due to frozen conditions, inspections may be reduced to a frequency of once per month. The owner and operator must document the beginning and ending dates of these periods in an inspection report.

Qualified Personnel – The site owner and operator are responsible for designating personnel to conduct inspections and for ensuring that the personnel who are responsible for conducting the inspections are “qualified” to do so. A “qualified person” is a person knowledgeable in the principles and practices of erosion, runoff, sediment, and pollution prevention controls, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of the permit.

Recordkeeping Requirements - All records of inspections, including records of maintenance and corrective actions must be maintained with the SESC Plan. Inspection records must include the date and time of the inspection, and the inspector’s name, signature, and contact information.

General Notes

- A separate inspection report will be prepared for each inspection.
- The Inspection Reference Number shall be a combination of the RIPDES Construction General Permit No - consecutively numbered inspections. ex/ Inspection reference number for the 4th inspection of a project would be: RIR10####-4
- Each report will be signed and dated by the Inspector and must be kept onsite.
- Each report will be signed and dated by the Site Operator.
- The corrective action log contained in each inspection report must be completed, signed, and dated by the site operator once all necessary repairs have been completed.
- It is the responsibility of the site operator to maintain a copy of the SESC Plan, copies of all completed inspection reports, and amendments as part of the SESC Plan documentation at the site during construction.

Failure to make and provide documentation of inspections and corrective actions under this part constitutes a violation of your permit and enforcement actions under 46-12 of R.I. General Laws may result.

4.4 Maintenance

Maintenance procedures for erosion and sedimentation controls and stormwater management structures/facilities are described on the SESC drawings and in the *RI SESC Handbook*.

Site owners and operators must ensure that all erosion, runoff, sediment, and pollution prevention controls remain in effective operating condition and are protected from activities that would reduce their effectiveness. Erosion, runoff, sedimentation, and pollution prevention control measures must be maintained throughout the course of the project.

4.5 Corrective Actions

If, in the opinion of the designated site inspector, corrective action is required, the inspector shall note it on the inspection report and shall inform the site operator that corrective action is necessary. The site operator must make all necessary repairs whenever maintenance of any of the control measures instituted at the site is required.

In accordance with the *RI SESC Handbook*, the site operator shall initiate work to fix the problem immediately after its discovery, and complete such work by the close of the next work day, if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.

When installation of a new control or a significant repair is needed, site owners and operators must ensure that the new or modified control measure is installed and made operational by no later than seven (7) calendar days from the time of discovery where feasible. If it is infeasible to complete the installation or repair within seven (7) calendar days, the reasons why it is infeasible must be documented in the SESC Plan along with the schedule for installing the control measures and making it operational as soon as practicable after the 7-day timeframe. Such documentation of these maintenance procedures and timeframes should be described in the inspection report in which the issue was first documented. If these actions result in changes to any of the control measures outlined in the SESC Plan, site owners and operators must also modify the SESC Plan accordingly within seven (7) calendar days of completing this work.

SECTION 5: AMENDMENTS

This SESC Plan is intended to be a working document. It is expected that amendments will be required throughout the active construction phase of the project. **NOTE: Even if practices are installed on a site according to the approved plan, the site is only in compliance when erosion, runoff, and sedimentation are effectively controlled throughout the entire site for the entire duration of the project.**

The SESC Plan shall be amended within seven (7) days whenever there is a change in design, construction, operation, maintenance or other procedure which has a significant effect on the potential for the discharge of pollutants, or if the SESC Plan proves to be ineffective in achieving its objectives (i.e. the selected control measures are not effective in controlling erosion or sedimentation).

In addition, the SESC Plan shall be amended to identify any new operator that will implement a component of the SESC Plan.

All revisions must be recorded in the Record of Amendments Log Sheet, which is contained in Attachment D of this SESC Plan, and dated red-lined drawings and/or a detailed written description must be appended to the SESC Plan. Inspection Forms must be revised to reflect all amendments. Update the Revision Date and the Version # in the footer of the Report to reflect amendments made.

All SESC Plan Amendments, except minor non-technical revisions, must be approved by the site owner and operator. Any amendments to control measures that involve the practice of engineering must be reviewed, signed, and stamped by a Professional Engineer registered in the State of RI.

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The amended SESC plan must be kept on file at the site while construction is ongoing and any modifications must be documented.

SECTION 6: RECORDKEEPING

RIPDES Construction General Permit – Parts III.D, III.G, III.J.3.b.iii, & V.O

It is the site owner and site operator's responsibility to have the following documents available at the construction site and immediately available for RIDEM review upon request:

- A copy of the fully signed and dated SESC Plan, which includes:
 - A copy of Site Plans and Construction Specifications
INCLUDED AS ATTACHMENT A
 - A copy of the RIPDES Construction General Permit
INCLUDED AS ATTACHMENT B
 - Completed Inspection Reports w/Completed Corrective Action Logs
INCLUDED AS ATTACHMENT C
 - SESC Plan Amendment Log
INCLUDED AS ATTACHMENT D
 - A copy of any regulatory permits (CRMC Federal Consistency Review, RIDEM Water Quality Certification, RIDEM Groundwater Discharge Permit, RIPDES Construction General Permit authorization letter, etc.)
INCLUDED AS ATTACHMENT E

SECTION 7: PARTY CERTIFICATIONS

RIPDES Construction General Permit – Part V.G

All parties working at the project site are required to comply with the Soil Erosion and Sediment Control Plan (SESC Plan including SESC Site Plans) for any work that is performed on-site. The site owner, site operator, contractors and sub-contractors are encouraged to advise all employees working on this project of the requirements of the SESC Plan. A copy of the SESC Plan is available for your review at the following location: Project Construction Trailer, or may be obtained by contacting the site owner or site operator.

The site owner and site operator and each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement.

I acknowledge that I have read and understand the terms and conditions of the Soil Erosion and Sediment Control (SESC) Plan for the above designated project and agree to follow the control measures described in the SESC Plan and SESC Site Plans.

Site Owner:

National Grid LNG, LLC
William Howard
40 Sylvan Road
Waltham, MA

signature/date

Site Operator: To be Determined

Soil Erosion and Sediment Control Plan
Liquefaction Plant: National Grid LNG, LLC
642 Allens Avenue, Providence, RI

Insert Company or Organization Name

Insert Name & Title

Insert Address

Insert City, State, Zip Code

Insert Telephone Number, Insert Fax/Email

signature/date

Designated Site Inspector:

GZA GeoEnvironmental

530 Broadway

Providence, RI 02909

401-421-4140,

signature/date

Subcontractor SESC Plan Contact:

Insert Company or Organization Name

Insert Name & Title

Insert Address

Insert City, State, Zip Code

Insert Telephone Number, Insert Fax/Email

signature/date

LIST OF ATTACHMENTS

Attachment A - Site Plans

**Attachment B - Copy of RIPDES Construction General Permit and
Authorization to Discharge**

Attachment C - Inspection Reports w/ Corrective Action Log

Attachment D - SESC Plan Amendment Log

Attachment E - Copy of Other Regulatory Permits

NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND SEPTEMBER 2016

PREPARED FOR:

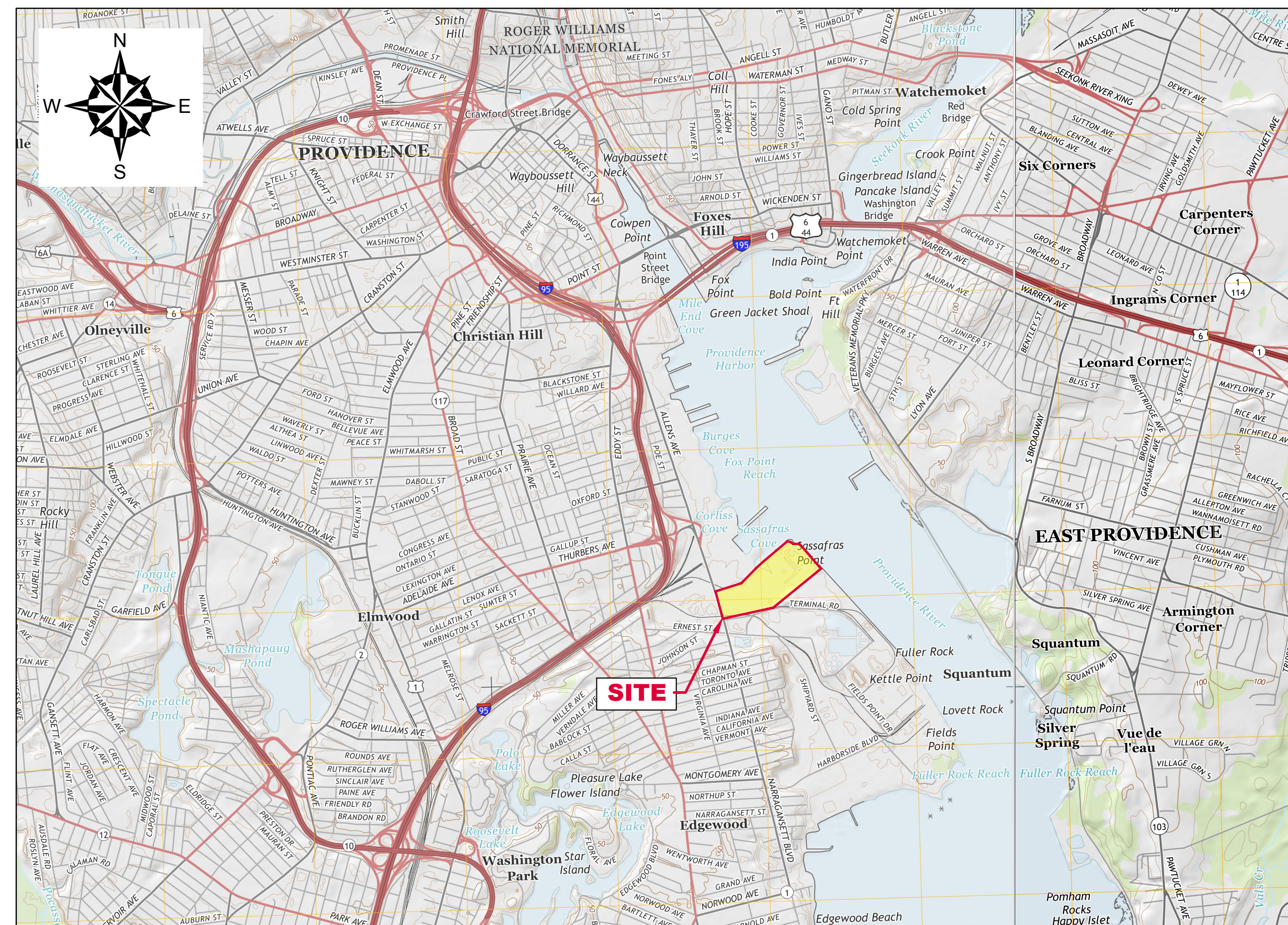
nationalgrid

PREPARED BY:

GZA GZA GEOENVIRONMENTAL, INC.
530 BROADWAY
PROVIDENCE, RHODE ISLAND 02909

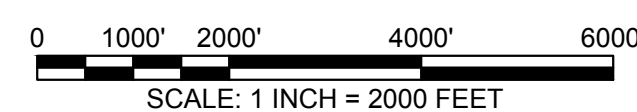
DESIGNED BY:

KIEWIT ENGINEERING AND DESIGN CO.
9401 RENNER BOULEVARD
LENEXA, KANSAS 66219



PROJECT LOCUS MAP

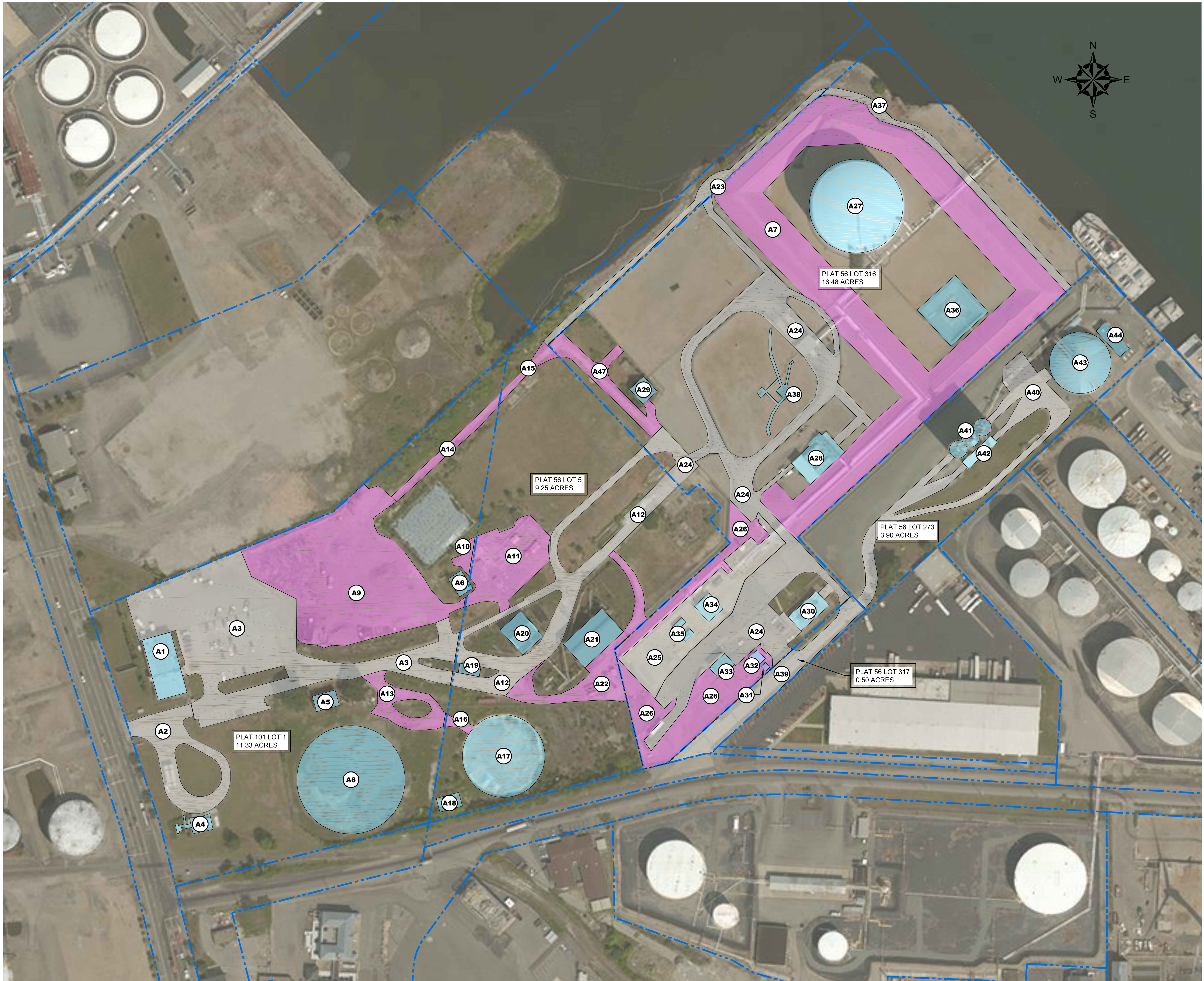
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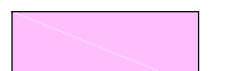
INDEX OF DRAWINGS	
Sheet #	Sheet Title
1	COVER
2	EXISTING CONDITIONS PLAN
3	EXISTING IMPERVIOUS CONDITIONS PLAN
4	TEMPORARY LAYDOWN AREA EROSION AND SEDIMENTATION CONTROLS
5	TEMPORARY SEDIMENTATION AND EROSION CONTROL DETAILS
6	SOIL STORAGE AREA PLAN
7	LIQUEFACTION WORK AREA - EROSION AND SEDIMENTATION CONTROLS
8	LIQUEFACTION WORK AREA - EXISTING REVETMENT WALL AND CROSS SECTIONS
9	LIQUEFACTION WORK AREA - PROPOSED SLOPE ARMORING, EXISTING REVETMENT AND CROSS SECTIONS
10	STORMWATER MANAGEMENT PLAN
11	STORMWATER MANAGEMENT DETAILS - SAND FILTER
12	STORMWATER MANAGEMENT DETAILS - CONCRETE FOREBAY
13	PROPOSED MONITORING WELL RE-INSTALLATION PLAN
14	PROPOSED FINAL CONDITIONS PLAN
15	PROPOSED IMPERVIOUS CONDITIONS PLAN

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LEGEND

-  PROPERTY LINES
-  STRUCTURE
-  ASPHALT
-  OTHER

REFERENCE NOTES:



1. THIS MAP CONTAINS THE ESRI ARCGIS ONLINE BING MAPS AERIAL LAYER PACKAGE. IMAGE COURTESY OF USGS EARTHSTAR GEOGRAPHICS SIO © MICROSOFT CORPORATION 2015.
2. PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
3. SITE BOUNDARIES ARE APPROXIMATE.

IMPERVIOUS AREAS					
PLAT	LOT	NO.	AREA (SQ. FT.)	SURFACE TYPE	
101	1	A1	8,037.44	ROOF	
101	1	A2	17,913.35	ASPHALT	
101	1	A3	90,158.79	ASPHALT	
101	1	A4	1,786.65	STRUCTURE	
101	1	A5	1,640.44	ROOF	
101	1	A6	1,445.11	STRUCTURE	
56	1	A7	156,852.04	CONTAINMENT DIKE	
101	1	A8	39,796.73	TANK FOUNDATION	
101	1	A9	79,909.64	COMPACTED GRAVEL	
101	1	A10	1,933.34	COMPACTED GRAVEL	
56	5	A11	21,898.19	COMPACTED GRAVEL	
56	5	A12	33,764.16	ASPHALT	
101	1	A13	8,857.25	COMPACTED GRAVEL	
101	1	A14	5,114.04	COMPACTED GRAVEL	
56	5	A15	2,860.86	COMPACTED GRAVEL	
56	5	A16	1,196.51	COMPACTED GRAVEL	
56	5	A17	23,127.00	TANK FOUNDATION	
56	5	A18	1,425.31	STRUCTURE	
56	5	A19	898.87	ROOF	
56	5	A20	4,099.05	ROOF	
56	5	A21	7,273.42	ROOF	
56	5	A22	16,442.64	COMPACTED GRAVEL	
56	5	A23	11,249.94	ASPHALT	
56	316	A24	93,429.89	ASPHALT	
56	316	A25	29,735.26	CONCRETE	
56	316	A26	40,494.92	COMPACTED GRAVEL	
56	316	A27	29,930.34	LNG TANK	
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56	316	A30	3,197.19	ROOF	
56	316	A31	164.24	ROOF	
56	316	A32	638.42	ROOF	
56	316	A33	1,346.21	ROOF	
56	316	A34	1,845.52	ROOF	
56	316	A35	712.24	ROOF	
56	316	A36	10,912.10	SUMP PIT	
56	316	A37	10,655.36	ASPHALT	
56	316	A38	2,392.36	STRUCTURE	
56	317	A39	18,586.35	ASPHALT	
56	273	A40	28,623.42	ASPHALT	
56	273	A41	3,112.29	STRUCTURE	
56	273	A42	1,576.65	ROOF	
56	273	A43	12,924.79	TANK	
56	273	A44	1,893.69	STRUCTURE	
56	316	A47	10,294.60	COMPACTED GRAVEL	
TOTAL IMPERVIOUS			847,918.45		

847918.45 SQ. FT. IMPERVIOUS AREA
1807724.79 SQ. FT. TOTAL AREA = 46.91% IMPERVIOUS

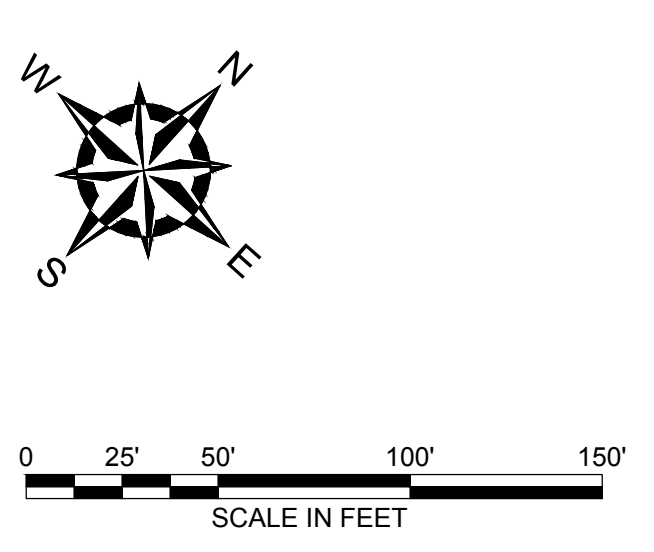
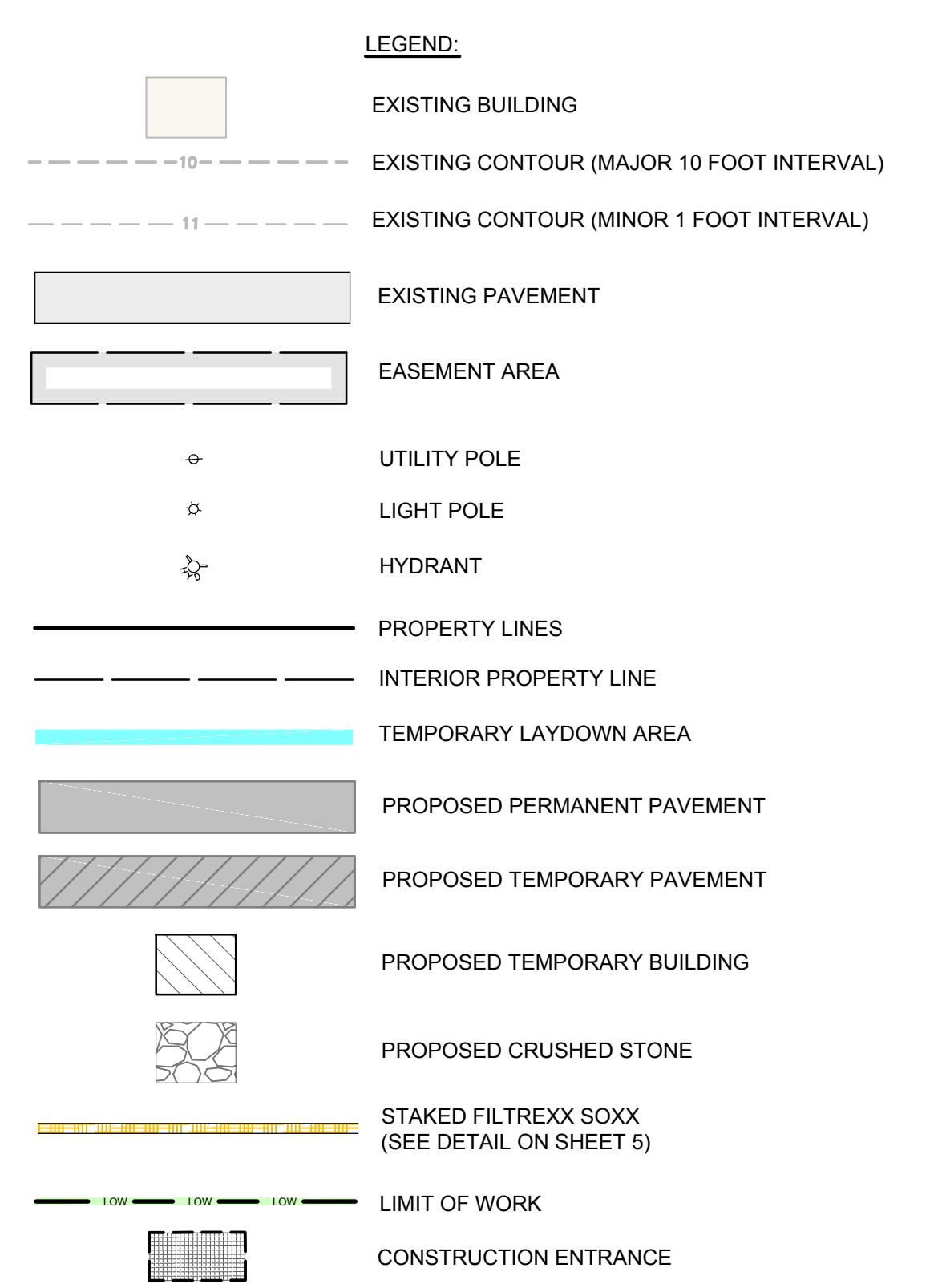
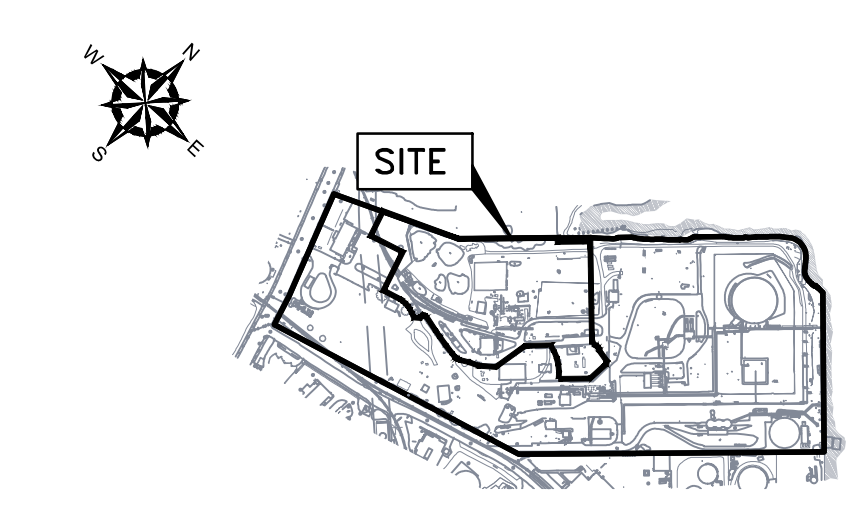
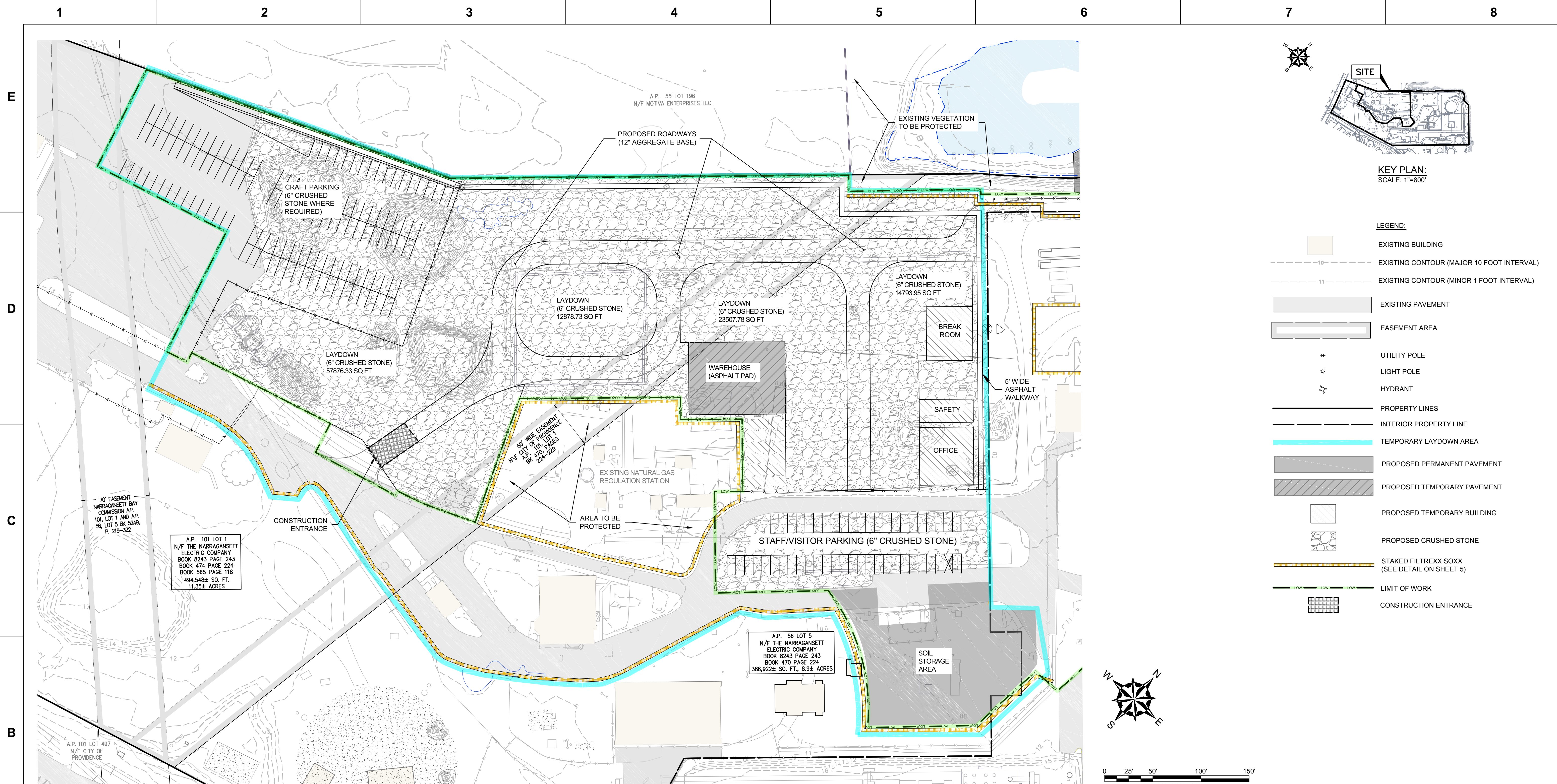


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NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
EXISTING IMPERVIOUS CONDITIONS PLAN			
PREPARED BY:  GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: 		
PROJ MGR: MSK DESIGNED BY: SJM DATE: SEPTEMBER, 2016	REVIEWED BY: SJM DRAWN BY: LDT PROJECT NO: 33554.60	CHECKED BY: JR SCALE: AS NOTED REVISION NO: 0	FIGURE 3 SHEET NO. 3 OF 15

FOR PERMITTING ONLY

DRAWING NAME: I:\102761-National_Grid_Liquefaction\CAD Exchange\102761-08-31-GZA_Liq_Permit Package\33554-60_CEMC PERMITTING_FOR STAMPING-AMS.dwg
 SEP 06 2016 - 9:03am

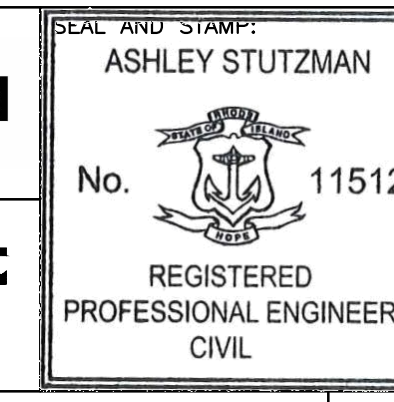
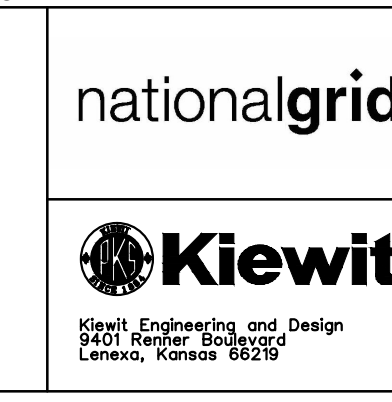


- GENERAL NOTES:**
- BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
 - ELECTRONIC CAD FILE 14-152_SU1_REV2.DWG, TITLED "TOPOGRAPHIC SURVEY PLAN, PORTION OF A.P. 56 LOT 5" DATED OCTOBER 27, 2014 AND PROVIDED BY NATIONAL GRID.
 - ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.
 - ELECTRONIC CAD FILES PROVIDED BY KIEWIT
 - "ACAD-102761-CIV_SITE.DWG"
 - "2007EXP_102761-CIV_LAYDOWN.DWG"
 - "102761_MEC_STR_BASE.DWG"
 - "102761-SURVEY_SITE.DWG"
 - "A2007EXP_102761-CIV_STORM.DWG"
 - "ACAD-102761-CIV_SURFACING.DWG"
 - "ACAD-102761-PROP-CONT_DWG"
 - "POST DEVELOPMENT DRAINAGE MAP.DWG"
 - PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
 - "CATCH BASINS AND SANITARY SEWER SYSTEM" PREPARED BY PROVIDENCE GAS COMPANY, DATED SEPTEMBER 25, 1981.
 - "PLAN SHOWING UNDERGROUND UTILITIES LNG FACILITY" DATED OCTOBER 6, 1983, "SUBSURFACE UTILITY ENGINEERING" PREPARED BY BAYSTATE SUBSURFACE INVESTIGATION, INC., DATED MAY 17, 2005.
 - HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
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 - ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.
 - PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
 - SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL
 THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY REQUIREMENT AND SUBJECT THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

REV	DATE	REVISION INFORMATION	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

GENERAL NOTES AND COMMENTS:

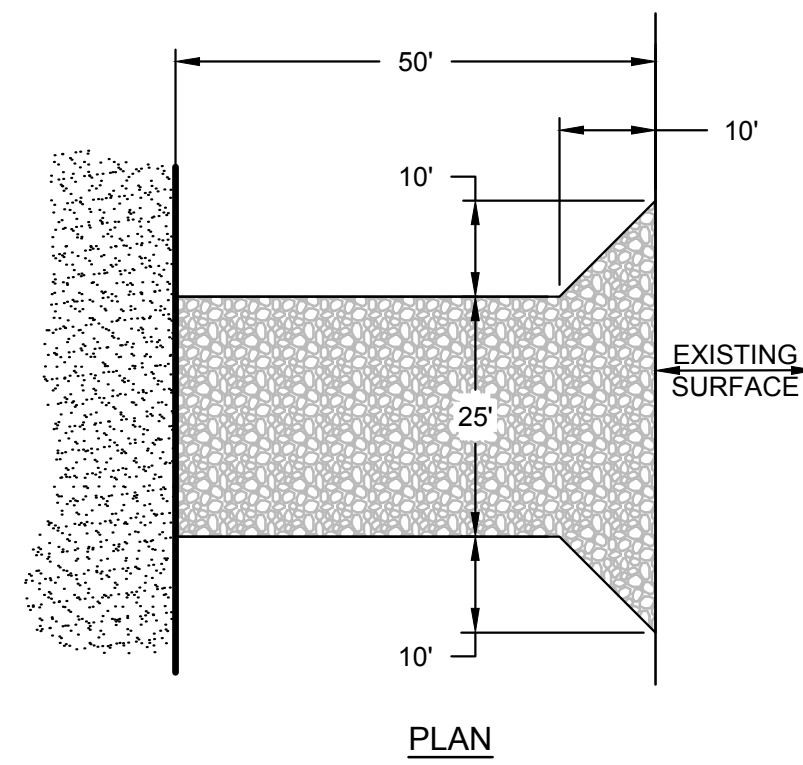


PROFESSIONAL CERTIFICATION:
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A LICENSED PROFESSIONAL ENGINEER OF THIS STATE.
 LICENSE NO. 11512
 EXPIRATION DATE 06/30/2017

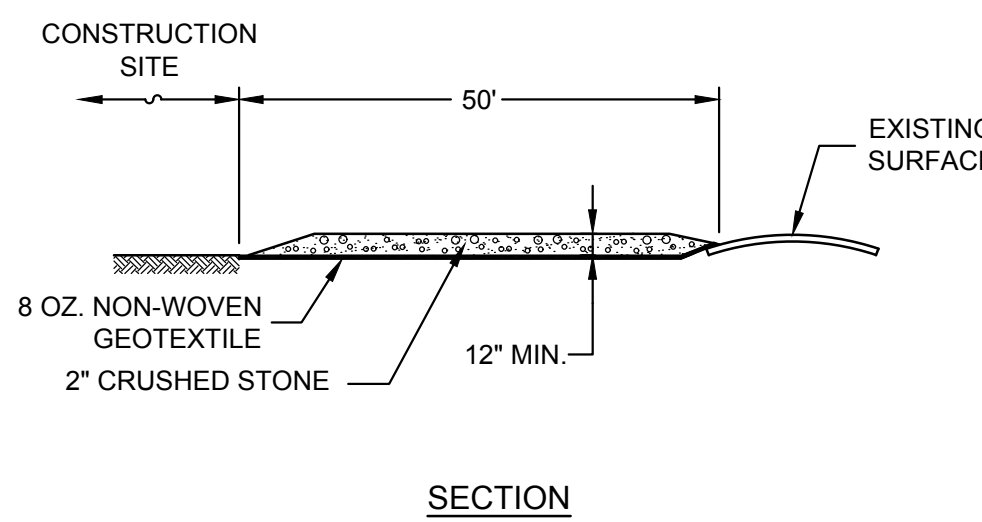
NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
TEMPORARY LAYDOWN AREA			
EROSION AND SEDIMENTATION CONTROLS			
DRAWING NO:	PROJECT NO:	SHT:	REV.
FIGURE 4	33554.60	4 OF 15	0

WHEEL WASH/CONSTRUCTION ENTRANCE NOTES

- ENTRANCE WIDTH SHALL BE TWENTY-FIVE (25) FEET MINIMUM.
- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT OUT OF THE LIMITS OF WORK. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED OUT OF THE LIMITS OF WORK MUST BE REMOVED IMMEDIATELY. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.

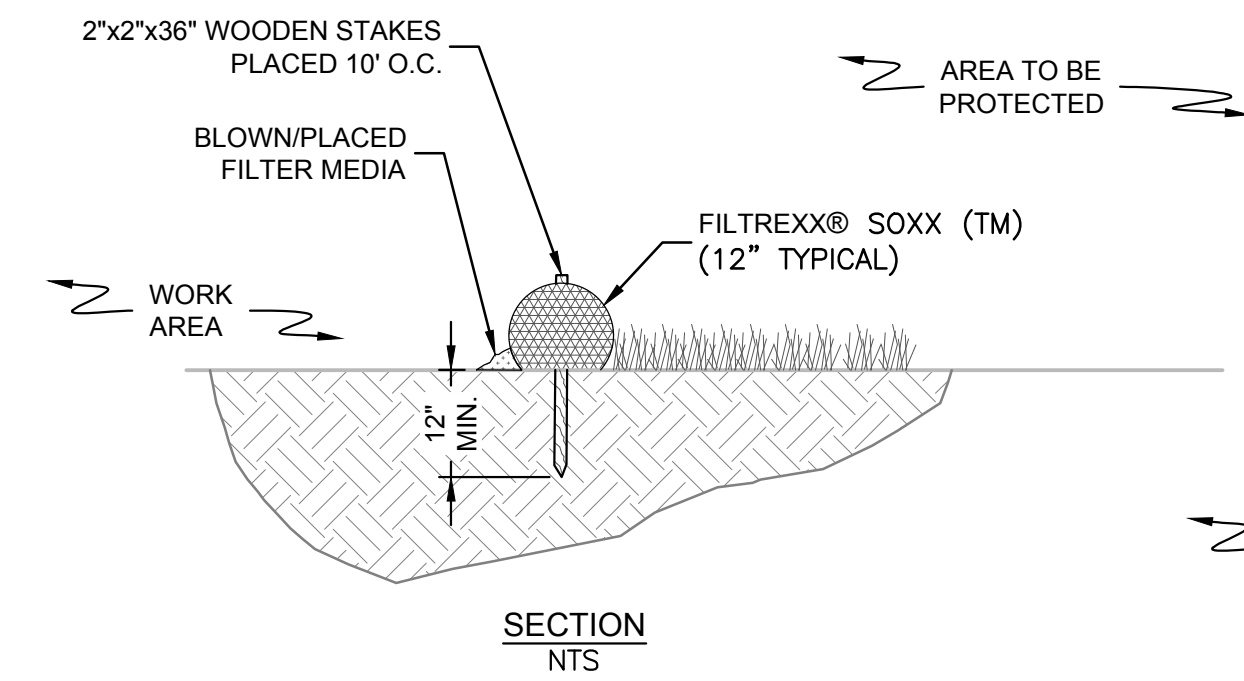


PLAN

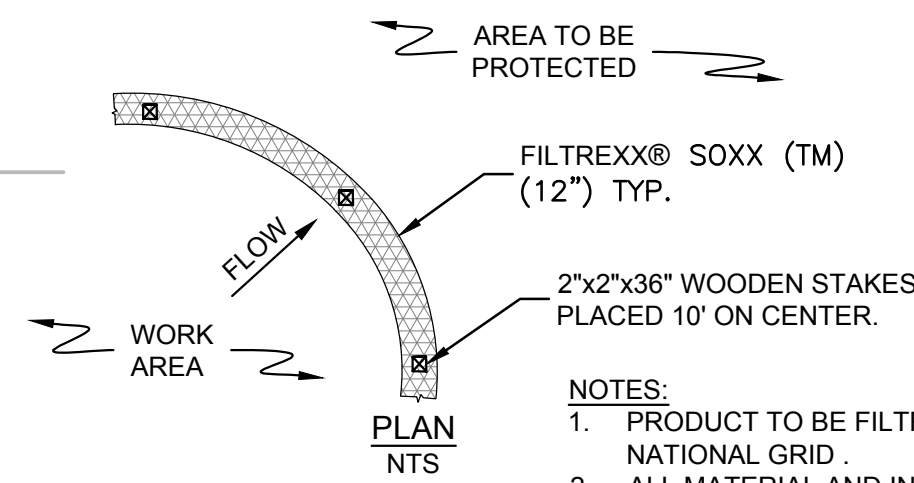


SECTION

WHEEL WASH/CONSTRUCTION ENTRANCE/EXIT
NOT TO SCALE



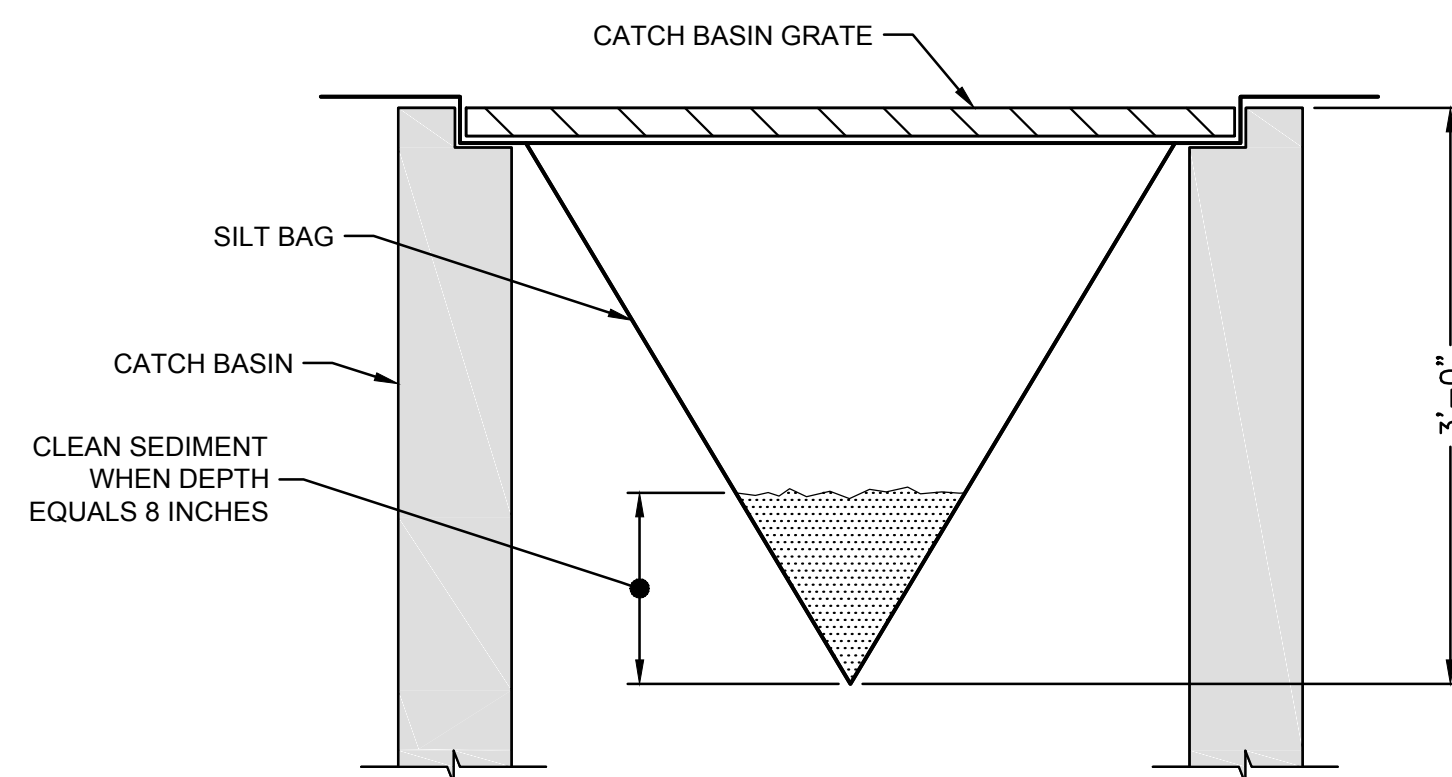
SECTION
NTS



PLAN
NTS

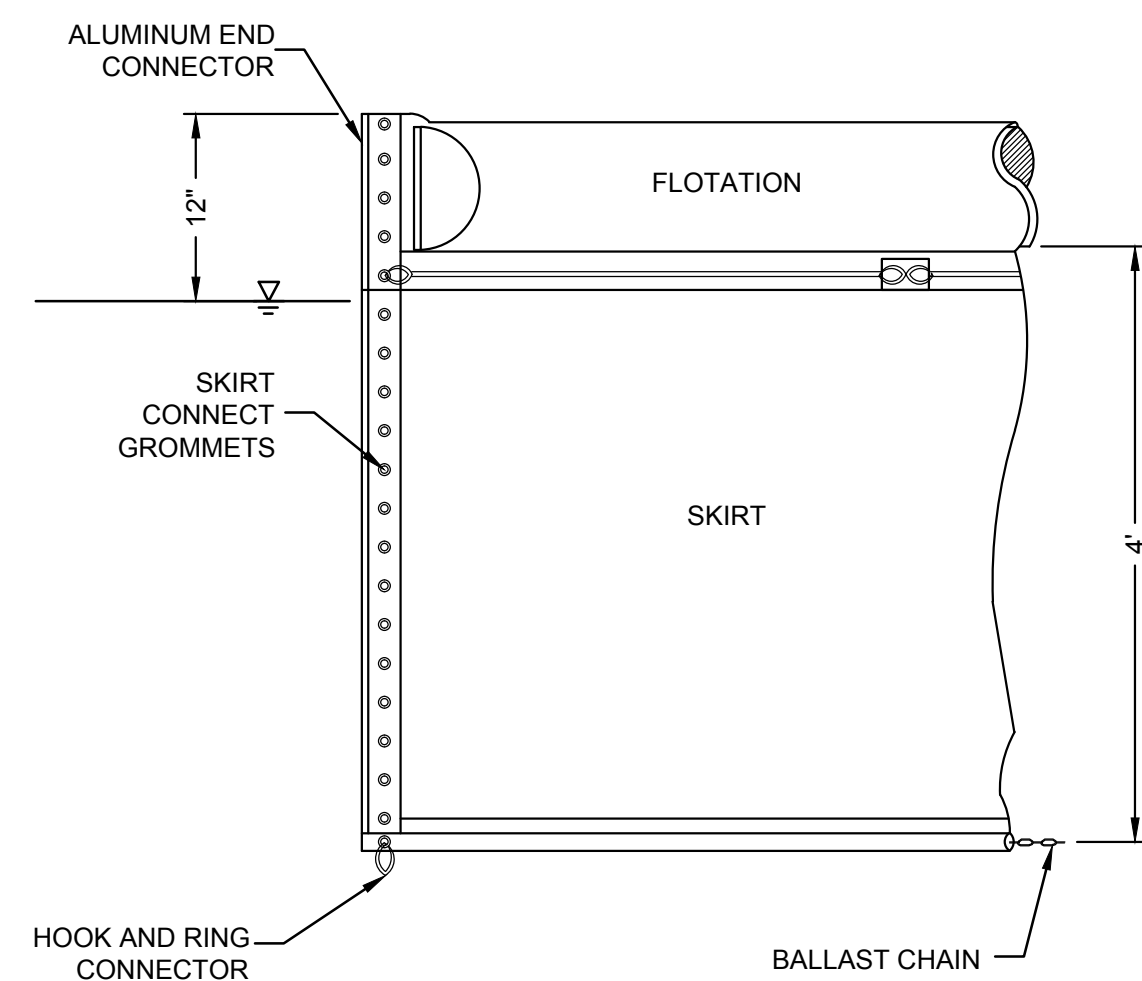
FILTREXX® SOXX SEDIMENT CONTROL DETAIL
NOT TO SCALE

- NOTES:**
- PRODUCT TO BE FILTREXX SILT SOXX OR APPROVED EQUAL BY NATIONAL GRID.
 - ALL MATERIAL AND INSTALLATION TO MEET FILTREXX® SPECIFICATIONS.
 - FILTER MEDIA FILL TO MEET APPLICATION REQUIREMENTS.
 - COMPOST MATERIAL TO BE DISPERSED ON SITE AS DETERMINED BY NATIONAL GRID.



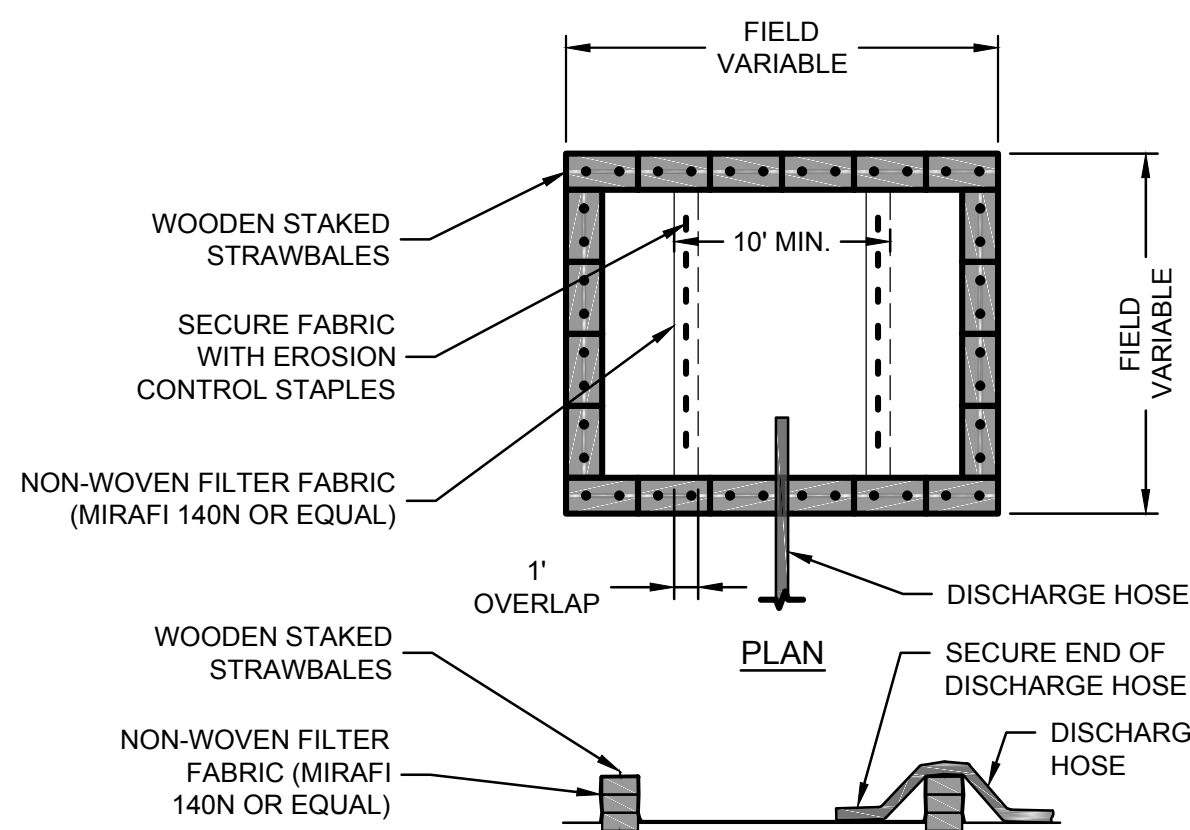
NOTE:
SEDIMENT BAG INLET PROTECTION TO BE SILTSACK MANUFACTURED BY ATLANTIC CONSTRUCTION FABRICS INC. RICHMOND, VA OR APPROVED EQUAL.

SILT SACK DETAIL
NOT TO SCALE

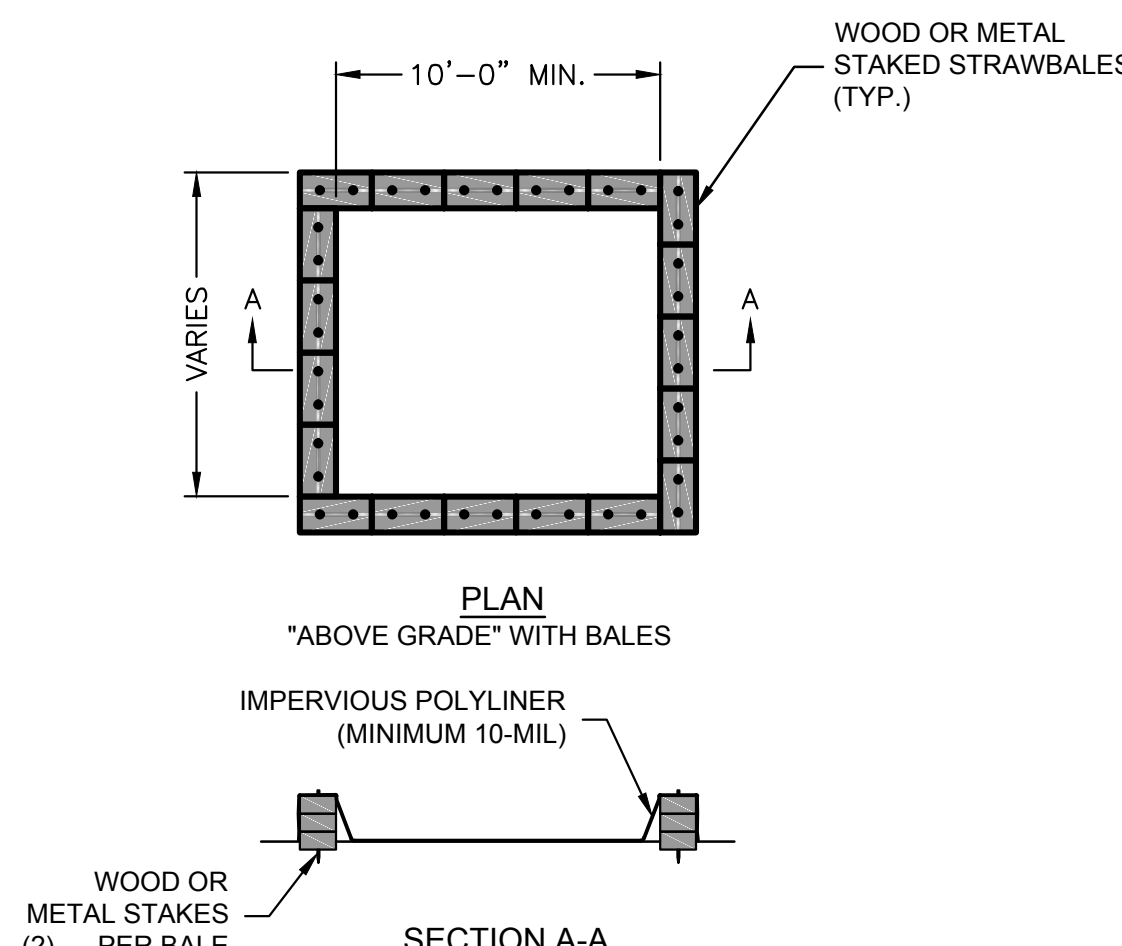


TURBIDITY CURTAIN DETAIL
NOT TO SCALE

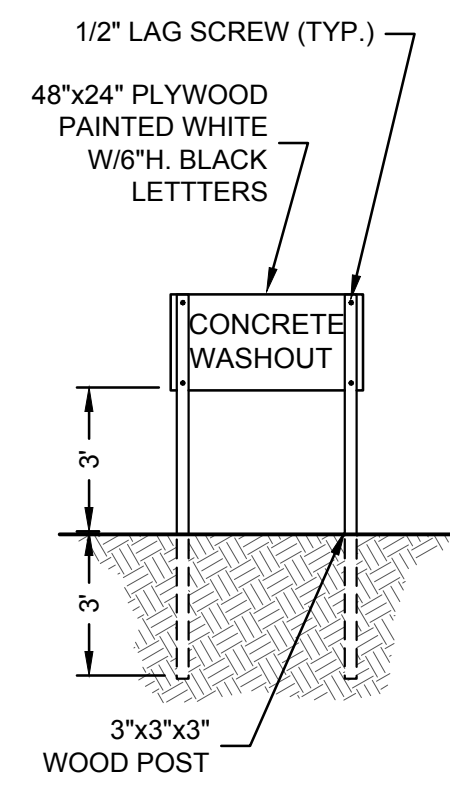
- NOTES:**
- ANCHOR CURTAIN ENDS AT BULKHEAD AND SHORELINE.
 - ANCHOR CURTAIN AT INTERMEDIATE POINTS WITH CONCRETE ANCHOR BLOCKS.



DEWATERING BASIN (SMALL SCALE)
NOT TO SCALE



CONCRETE WASHOUT
NOT TO SCALE



CONCRETE WASHOUT SIGN DETAIL
(OR EQUIVALENT)

SLOPE INSTALLATION DETAIL OF EROSION CONTROL BLANKET

NOT TO SCALE

NOTES:

- PRODUCT TO BE NORTH AMERICAN GREEN EROSION CONTROL BLANKET OR APPROVED EQUAL BY NATIONAL GRID.
- IN LOOSE SOIL CONDITIONS, THE USE OF STAPLES OR STAKE LENGTHS GREATER THAN 6" (15 cm) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

INSTALLATION NOTES:

- PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
- BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15cm) DEEP x 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE RECP's.
- ROLL THE RECP's (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE(tm). WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
- THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5cm - 12.5cm) OVERLAP DEPENDING ON RECP's TYPE.
- CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5cm) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE RECP's WIDTH.

TURBIDITY CURTAINS NOTES

TURBIDITY CURTAIN SPECIFICATIONS

- THE HEIGHT OF THE CURTAIN SHALL BE 20 PERCENT GREATER THAN THE DEPTH OF THE WATER TO ALLOW FOR WATER LEVEL FLUCTUATIONS.
- THE AREA THAT THE TURBIDITY CURTAIN PROTECTS SHALL NOT CONTAIN LARGE CULVERTS OR DRAINAGE AREA THAT IS FLOWS OCCUR BEHIND THE CURTAIN WOULD CAUSE A BREACH OR LOST CONTACT AT THE BOTTOM SURFACE.
- AT A MINIMUM THE CURTAIN MATERIAL SHALL BE SUPPORTED BY A FLOTATION MATERIAL HAVING AT LEAST 29 LBS PER FOOT OF BUOYANCY. THE FLOATING CURTAIN SHALL HAVE AT LEAST A 5/16" GALVANIZED CHAIN AS BALLAST AND AT LEAST DUAL 5/16" GALVANIZED WIRE ROPES WITH A HEAVY VINYL COATING AS LOAD LINES.
- THE CURTAIN SHALL BE MADE OF A TIGHTLY WOVEN NYLON, PLASTIC OR OTHER NON-DETERIORATING MATERIAL MEETING THE FOLLOWING SPECIFICATIONS:
 - GRAB TENSILE STRENGTH:
 - MACHINE DIRECTION (MD) -370 LBS
 - CROSS MACHINE DIRECTION (CD) -250 LBS
 - MULLEN BURST STRENGTH: 480 PSI
 - TRAPEZOID TEAR STRENGTH:
 - MD-100 LBS
 - CD-60LBS
 - APPARENT OPENING SIZE: 70 US STANDARD SIEVE
 - PERCENT OPEN AREA: 4%
 - PERMISSIVITY: 0.28 SEC-1

TURBIDITY CURTAIN INSTALLATION REQUIREMENTS

- THE AREA OF THE PROPOSED INSTALLATION SHALL BE INSPECTED FOR OBSTACLES THAT COULD DAMAGE THE CURTAIN OR IMPAIR ITS EFFECTIVENESS.
- THE CURTAIN SHALL BE FIRMLY ANCHORED IN PLACE. SHALLOW INSTALLATIONS CAN BE MADE BY SECURING THE CURTAIN BY STAKING RATHER THAN USING A FLOTATION SYSTEM.
- SUPPLEMENTAL ANCHORS SHALL BE USED AS NEEDED DEPENDING ON WATER SURFACE DISTURBANCES SUCH AS BOATS AND WAVE ACTION BY WINDS.

TURBIDITY CURTAIN MAINTENANCE

- THE TURBIDITY CURTAIN SHALL BE INSPECTED DAILY AND REPAIRED OR REPLACED IMMEDIATELY.
- IF THE CURTAIN IS ORIENTED IN A MANNER THAT FACES THE PREVAILING WINDS, FREQUENT CHECKS OF THE ANCHORAGE SHALL BE MADE.
- ANY NECESSARY SEDIMENT REMOVAL MUST BE DONE BY HAND BEFORE THE CURTAIN IS REMOVED.
- THE BARRIER SHALL BE REMOVED BY PULLING IT TOWARD THE CONSTRUCTION SITE TO MINIMIZE THE RELEASE OF ATTACHED SEDIMENT.

CONCRETE WASHOUT NOTES

CONCRETE WASHOUT SPECIFICATIONS

- LOCATE WASHOUT AREA AT LEAST 50 FEET FROM SENSITIVE AREAS SUCH AS STORM DRAINS, OPEN DITCHES, OR WATER BODIES INCLUDING JURISDICTIONAL WETLANDS.
- ALLOW CONVENIENT TRUCK ACCESS.
- THE NUMBER OF FACILITIES SHOULD DEPEND ON THE DEMAND FOR STORAGE CAPACITY.
- CONCRETE WASHOUT FACILITIES SHALL BE CONSTRUCTED AND MAINTAINED IS SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED.

CONCRETE WASHOUT INSTALLATION REQUIREMENTS

- THE CONCRETE WASHOUT SHOULD BE A MINIMUM OF 10 FOOT BY 10 FOOT AREA.
- THE WASHOUT WILL BE CONSTRUCTED WITH STRAW BALES ARRANGED AROUND THE PERIMETER AND LINED WITH TWO LAYERS OF 10 MIL POLYETHYLENE SHEETING. THE POLYETHYLENE SHEETING WILL WRAP OVER THE STRAW BALES (OR APPROVED EQUAL) AND WILL BE SECURED WITH SAND BAGS.
- THE WASHOUT SHALL BE SIZED TO ACCOMMODATE ALL OF THE WASHOUT WATER AND CONCRETE AND SHOULD INCLUDE 12-INCHES OF FREEBOARD ABOVE THE WASHOUT WASTE.

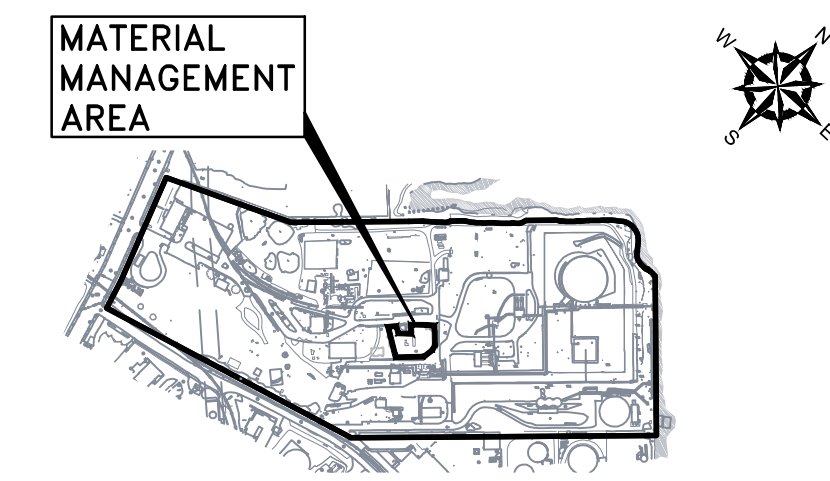
CONCRETE WASHOUT MAINTENANCE

- INSPECT AND VERIFY THAT THE CONCRETE WASHOUT HAS BEEN PROPERLY CONSTRUCTED PRIOR TO THE COMMENCEMENT OF CONCRETE WORK.
- INSPECT DAILY FOR DAMAGE OR ISSUES.
- CHECK REMAINING CAPACITY.
- VERIFY THAT LINERS ARE INTACT.
- WASHOUT FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED ONCE THE WASHOUT IS 75% FULL.
- IF WASHOUT IS NEARING CAPACITY, VACUUM AND DISPOSE OF THE WASTE MATERIAL IN AN APPROVED MANNER.
- DO NOT DISCHARGE LIQUID OR SLURRY TO WATERWAYS, STORM DRAINS, OR ONTO THE GROUND SURFACE.
- COVER THE WASHOUT WITH A NON-WATER COLLECTING COVER PRIOR TO STORM EVENTS TO PREVENT OVERFLOW.
- REMOVE AND DISPOSE OF HARDENED CONCRETE AND RETURN THE WASHOUT TO FUNCTIONAL CONDITION.

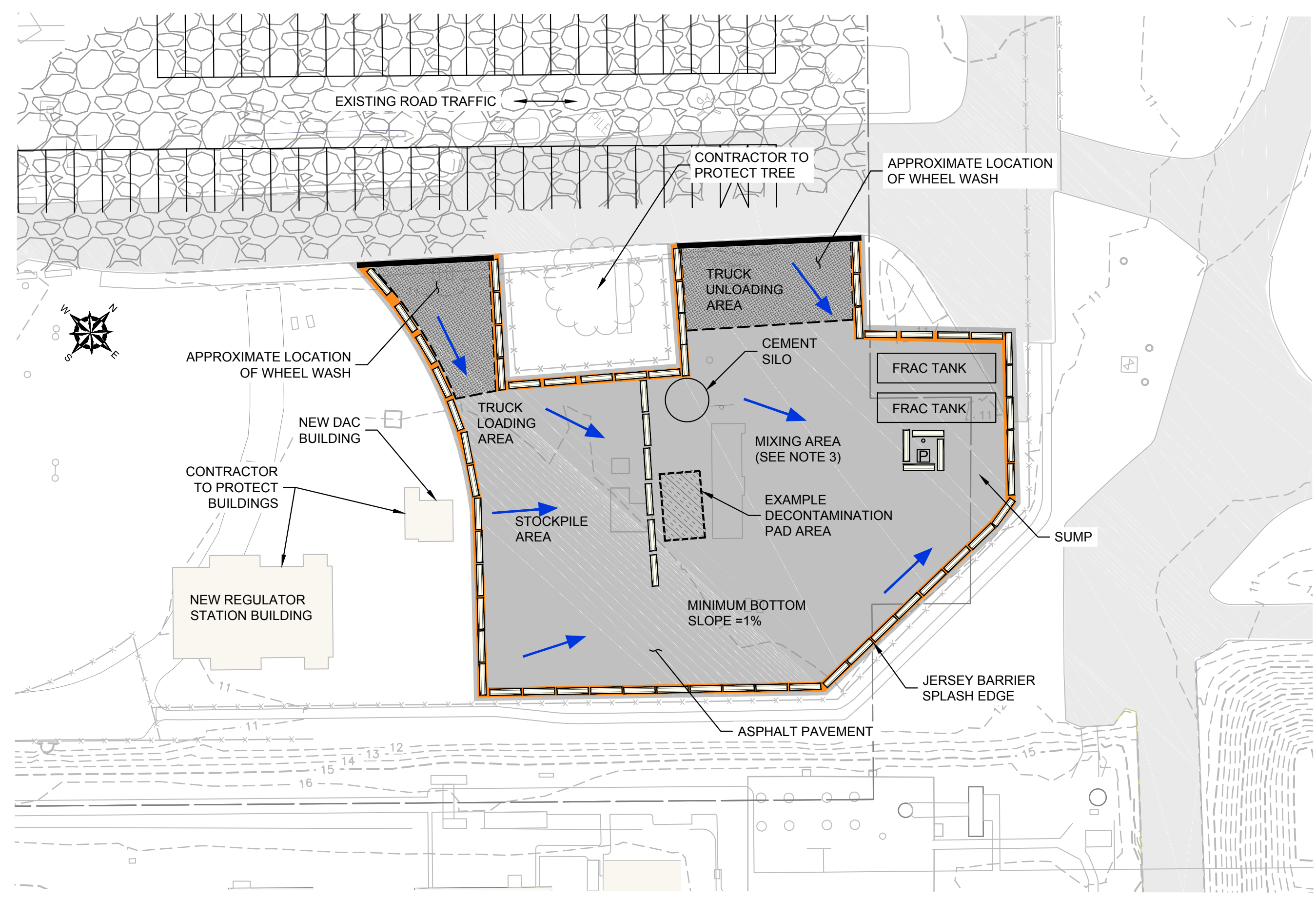
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NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
TEMPORARY SEDIMENTATION AND EROSION CONTROL DETAILS			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: 		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 5 SHEET NO. 5 OF 15

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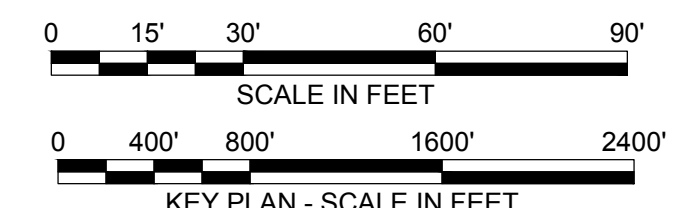
KEY PLAN:
SCALE: 1"=800'



MATERIAL MANAGEMENT AREA: PLAN VIEW
SCALE: 1"=30'

LEGEND:

	EXISTING BUILDING
	EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
	EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
	EXISTING PAVEMENT
	UTILITY POLE
	LIGHT POLE
	HYDRANT
	PROPERTY LINES
	INTERIOR PROPERTY LINE
	PROPOSED PERMANENT PAVEMENT
	PROPOSED CRUSHED STONE
	PROPOSED GRAVEL
	EXISTING FENCE
	JERSEY BARRIERS
	JERSEY BARRIER SPLASH EDGE
	WHEEL WASH
	PROPOSED GRADING
	DECONTAMINATION PAD



GENERAL NOTES:

- BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
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 - "102761_MEC_STR_BASE.DWG"
 - "102761-SURVEY_SITE.DWG"
 - "2007EXP_102761-CIV_STORM.DWG"
 - "ACAD-102761-CIV_SURFACING.DWG"
 - "ACAD-102761-PROP-CONT.DWG"
 - "POST DEVELOPMENT DRAINAGE MAP.DWG"
- PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
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- SITE BOUNDARIES ARE APPROXIMATE.

MATERIAL MANAGEMENT AREA NOTES:

- REGRADE LAND TO FACILITATE DRAINAGE TO THE SUMP, REMOVE EXISTING PAVEMENT AS NEEDED. THE MINIMUM BOTTOM SLOPE OF THE PAVED SURFACE SHALL BE 1%.
- TRUCK LOADING AND UNLOADING AREAS SHALL BE USED AS WHEEL WASH AREAS. AS NECESSARY TRUCK UNLOADING AREA SHALL BE CONSTRUCTED WITH A MINIMUM BOTTOM SLOPE OF 1% TO DRAIN INTO SUMP.
- MIXING AREA SHALL BE USED AS DECONTAMINATION PAD. PRIOR TO USE AS A DECONTAMINATION PAD, THE SURFACE SHALL BE POWER WASHED TO REMOVE ANY REMAINING MATERIAL.
- IF THE MIXING AREA IS NOT USED AS A DECONTAMINATION PAD, CONSTRUCT STAND-ALONE DECONTAMINATION PAD, AS SHOWN IN DETAIL ON SHEET ENV-3.

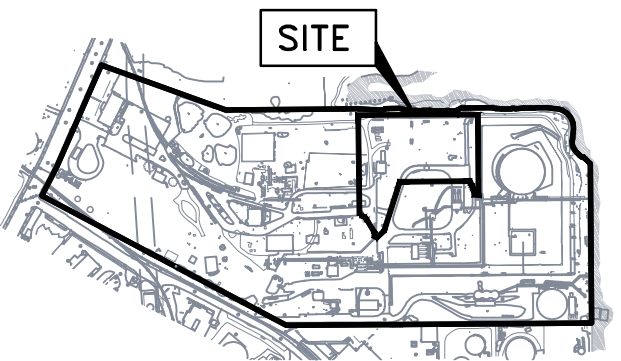
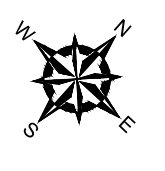
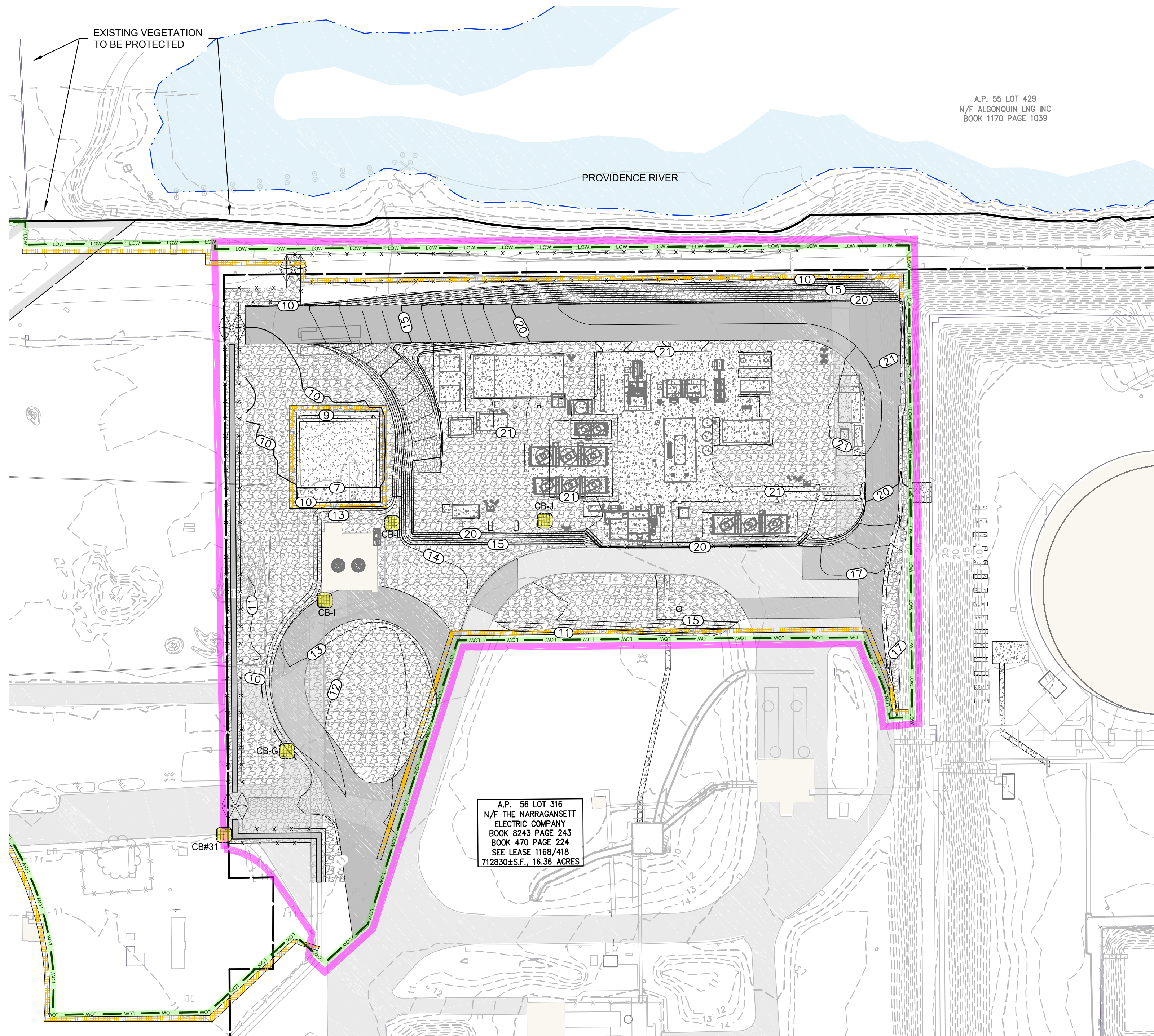
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NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
SOIL STORAGE AREA PLAN			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 6 SHEET NO. 6 OF 15

FOR PERMITTING ONLY

2016 - GZA GeoEnvironmental, Inc. C:\Users\jsh\Documents\33554\33554_60_MSK\POBRES\CAD\DWG\SOIL_STORAGE-F6_SEPT2016_16_12:23 PM_LISA_THERIAULT

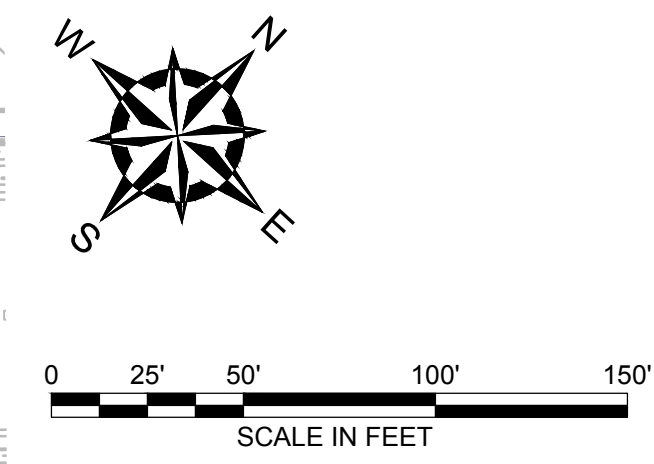
DRAWING NAME: I:\102761-National_Grid_Liquefaction\CAD Exchange\102761-08-31-GZA_Liq_Permit Package\33554-60_CEMC PERMITTING_FOR STAMPING-AMS.dwg
SEP 06 2016 - 9:03am



KEY PLAN:
SCALE: 1"=800'

LEGEND:

- EXISTING BUILDING
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- EXISTING PAVEMENT
- EASEMENT AREA
- UTILITY POLE
- LIGHT POLE
- HYDRANT
- PROPERTY LINES
- INTERIOR PROPERTY LINE
- LIQUEFACTION WORK AREA
- PROPOSED PERMANENT PAVEMENT
- PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
- PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
- PROPOSED GRAVEL
- STAKED FILTREXX SOXX (SEE DETAIL ON SHEET 5)
- LIMIT OF WORK
- PROPOSED CONCRETE
- PROPOSED SAND FILTER
- CATCH BASIN FRAME AND GRATE
- CATCH BASIN TO BE PROTECTED WITH SILT SACK DURING CONSTRUCTION (SEE DETAIL ON SHEET 5)



GENERAL NOTES:

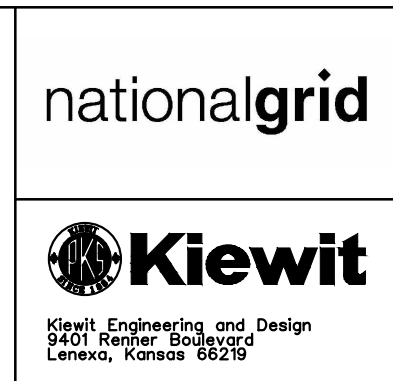
- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
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 2. "2007EXP_102761-CIV_LAYDOWN.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "2007EXP_102761-CIV_STORM.DWG"
 6. "2007EXP-102761-CIV_SURFACING.DWG"
 7. "102761-CIV_GRADING.DWG"
 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"
- PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
 1. "CATCH BASINS AND SANITARY SEWER SYSTEM" PREPARED BY PROVIDENCE GAS COMPANY, DATED SEPTEMBER 25, 1981.
 2. "PLAN SHOWING UNDERGROUND UTILITIES LNG FACILITY" DATED OCTOBER 6, 1983, "SUBSURFACE UTILITY ENGINEERING" PREPARED BY BAYSTATE SUBSURFACE INVESTIGATION, INC., DATED MAY 17, 2005.
- 4) SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. **OTHER LOCATIONS MAY EXIST.**
- 5) ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.
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- 7) SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL

THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY AGREEMENT AND SUBJECT TO THE OBLIGATION OF CONFIDENTIALITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

REV	DATE	ISSUED FOR PERMIT	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

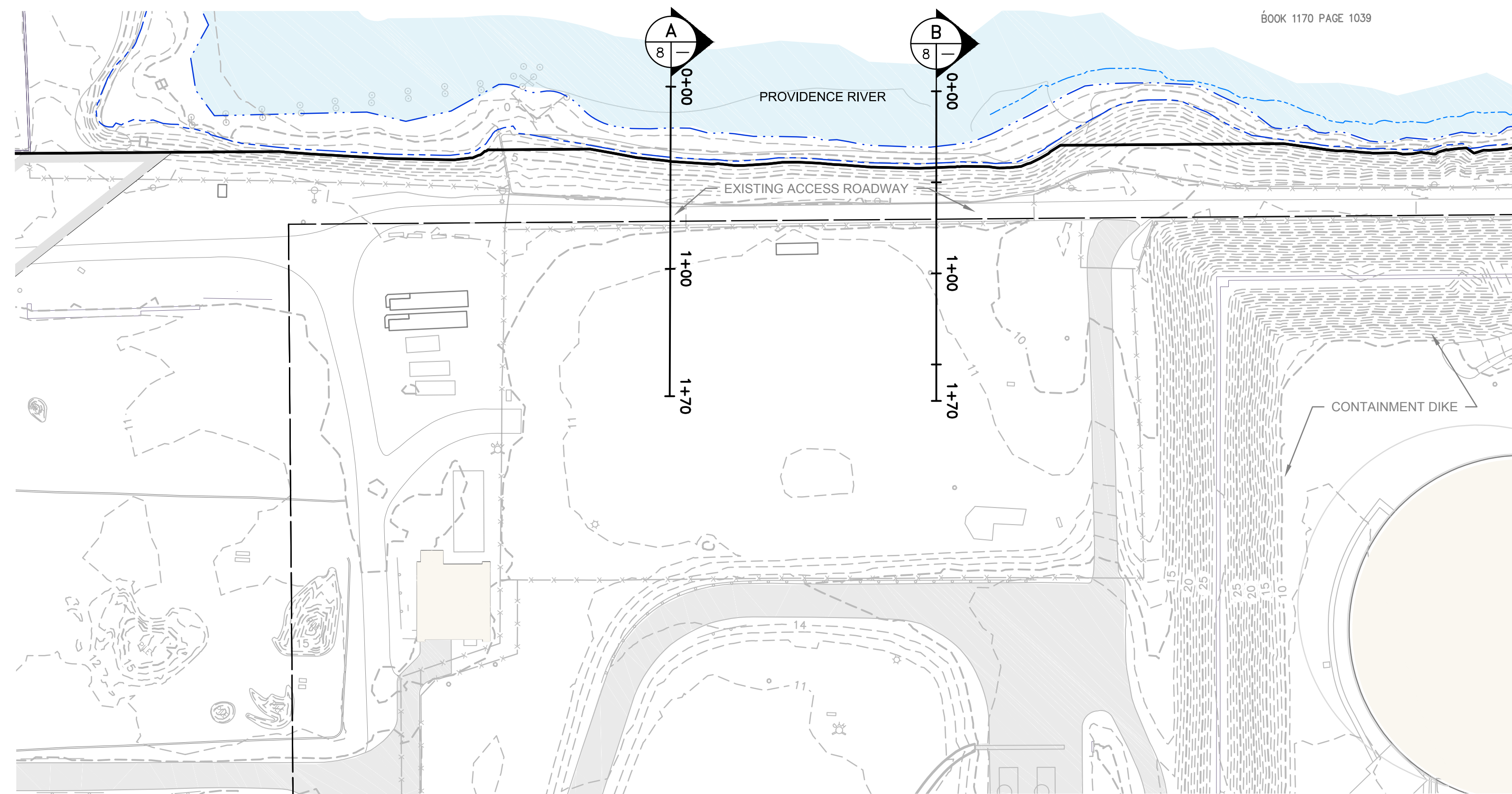
GENERAL NOTES AND COMMENTS:



SEAL AND STAMP:
ASHLEY STUTZMAN
No. 11512
REGISTERED
PROFESSIONAL ENGINEER
CIVIL

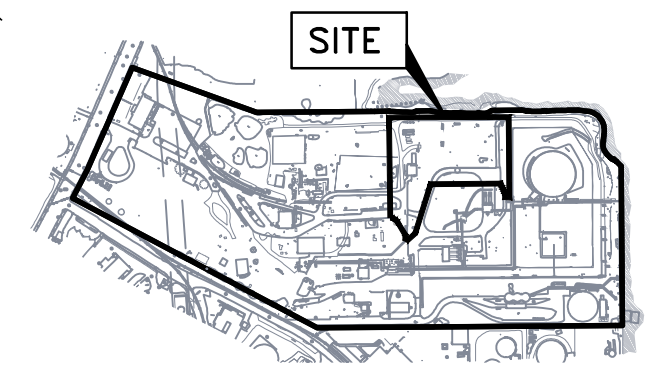
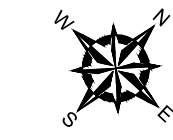
PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A LICENSED PROFESSIONAL ENGINEER OF THE STATE OF RHODE ISLAND.
LICENSE NO. 11512
EXPIRATION DATE 06/30/2017

NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
LIQUEFACTION WORK AREA			
EROSION AND SEDIMENTATION CONTROLS			
DRAWING NO:	PROJECT NO:	SHEET:	REV.
FIGURE 7	33554.60	7 OF 15	0



PLAN VIEW OF EXISTING REVETMENT
SCALE: 1"=50'

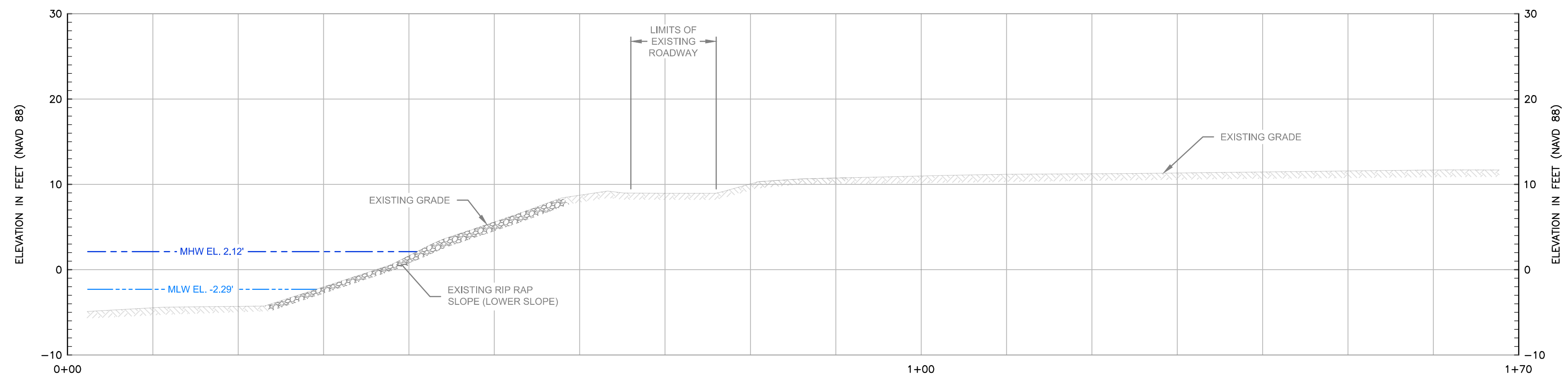
- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - EXISTING PAVEMENT
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - MHW
 - MLW
 - EASEMENT AREA



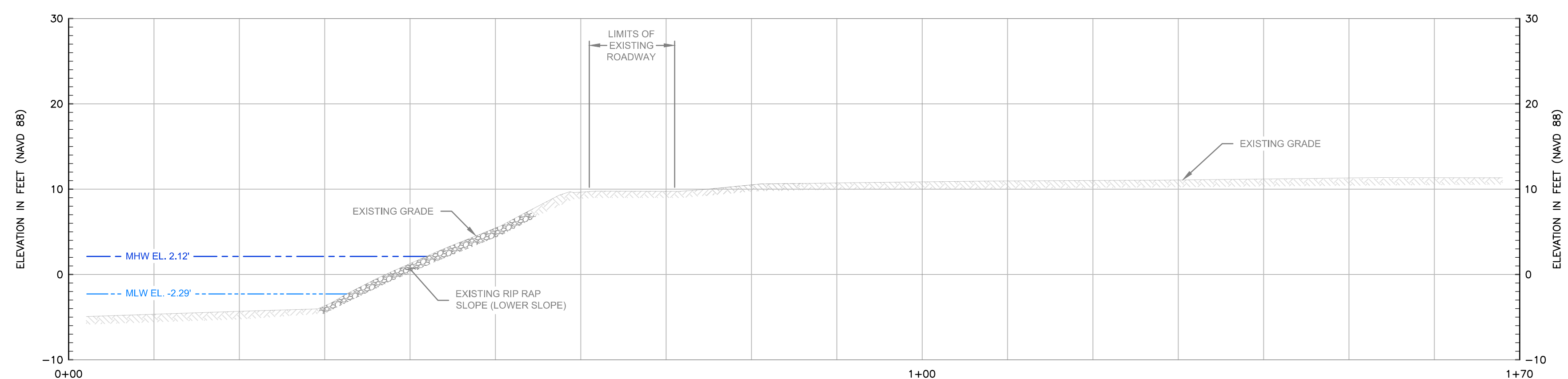
KEY PLAN:
SCALE: 1"=800'

GENERAL NOTES:

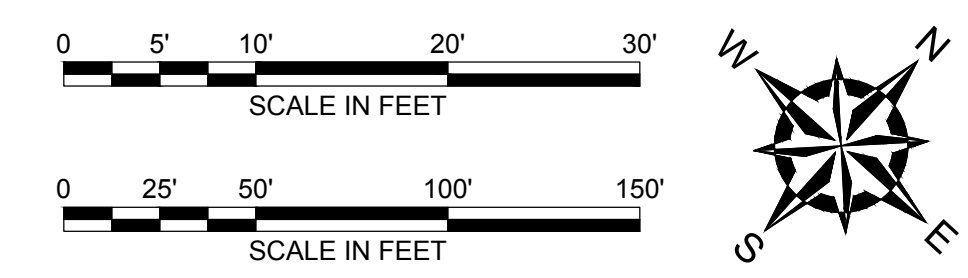
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 5. "A2007EXP_102761-CIV_STORM.DWG"
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 7. "ACAD-102761-PROP-CONT.DWG"
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- 7) SITE BOUNDARIES ARE APPROXIMATE.



A TYPICAL REVETMENT SECTION
SCALE: 1"=10'



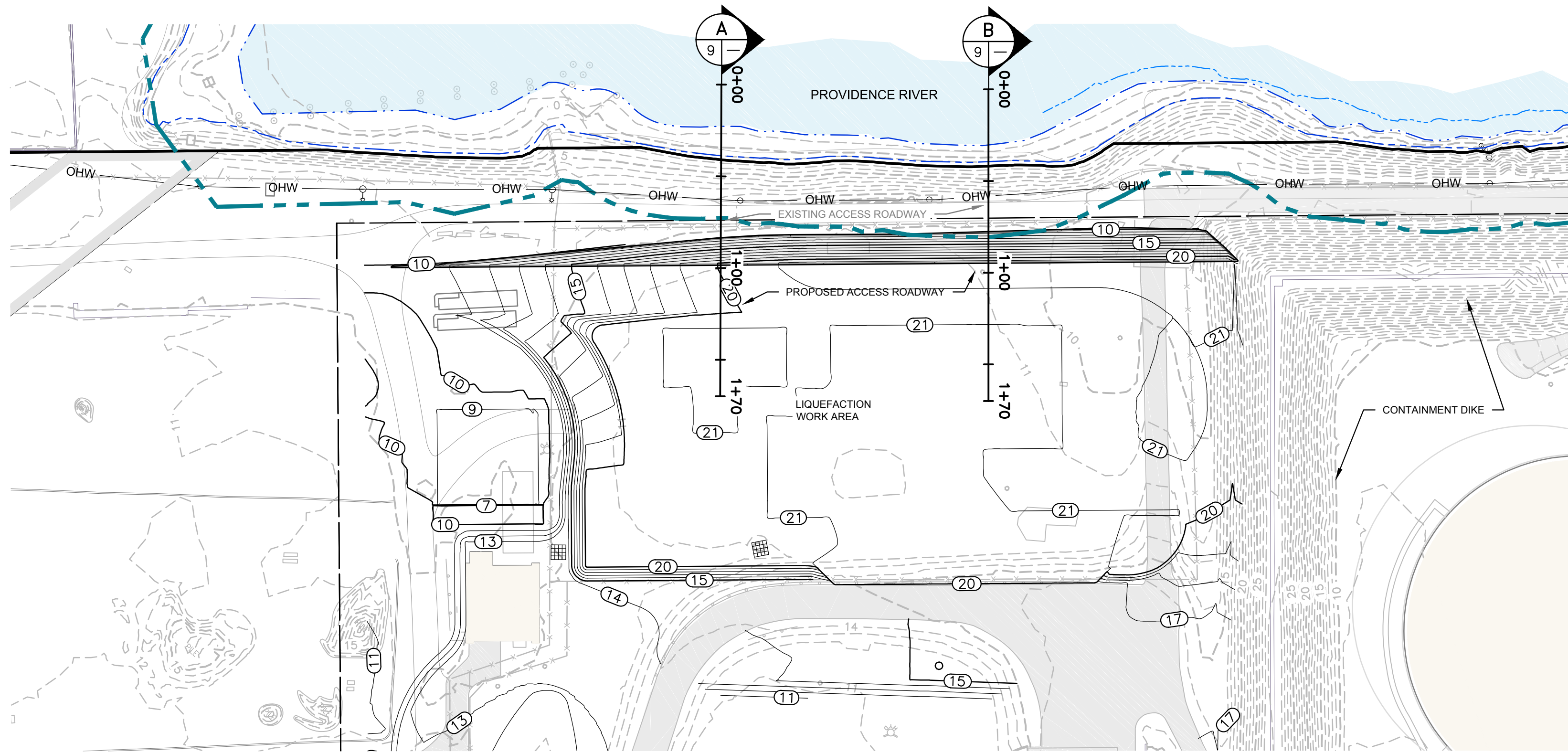
B TYPICAL REVETMENT SECTION
SCALE: 1"=10'



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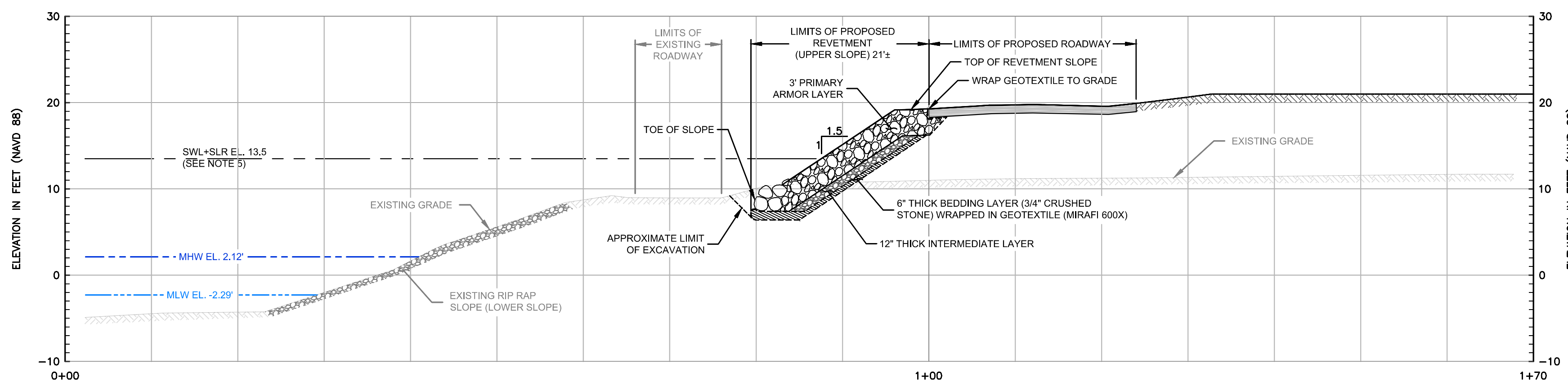
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
LIQUEFACTION WORK AREA - EXISTING REVETMENT WALL AND CROSS SECTIONS			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 8 SHEET NO. 8 OF 15

FOR PERMITTING ONLY



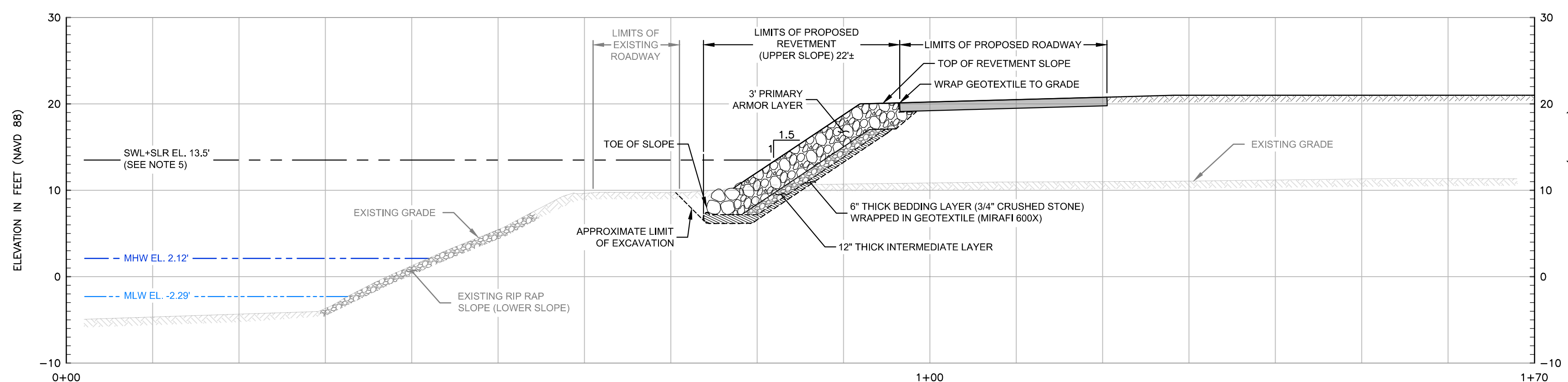
PLAN VIEW OF PROPOSED REVETMENT AND REVETMENT IMPROVEMENTS

SCALE: 1"=50'



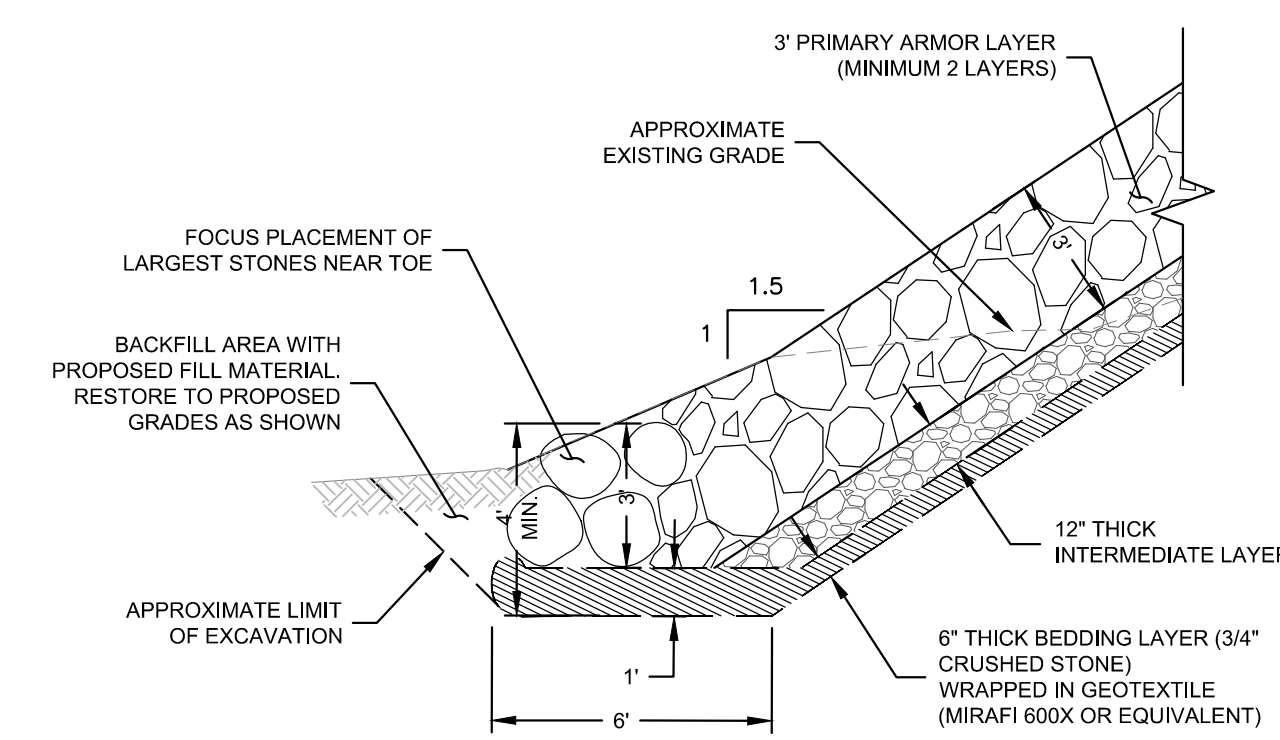
TYPICAL REVETMENT SECTION A-A

SCALE: 1"=10'



TYPICAL REVETMENT SECTION B-B

SCALE: 1"=10'



PROPOSED REVETMENT (UPPER SLOPE) (TYP.)

SCALE: 1"=4'

RIP RAP GRADATION REQUIREMENTS			
PRIMARY ARMOR LAYER		INTERMEDIATE LAYER	
RIDOT R-6		RIDOT R-2	
% LESS THAN	STONE SIZE (IN.)	% LESS THAN	STONE SIZE (IN.)
0-15%	8	0-15%	1
0-50%	13	0-50%	2
100%	26	100%	4

3/4" CRUSHED STONE GRADATION REQUIREMENTS	
% LESS THAN	SIEVE SIZE
100	3/4 INCH
90-100	1/2 INCH
30-60	3/8 INCH
0-15	No. 4
0-5	No. 8

LEGEND:

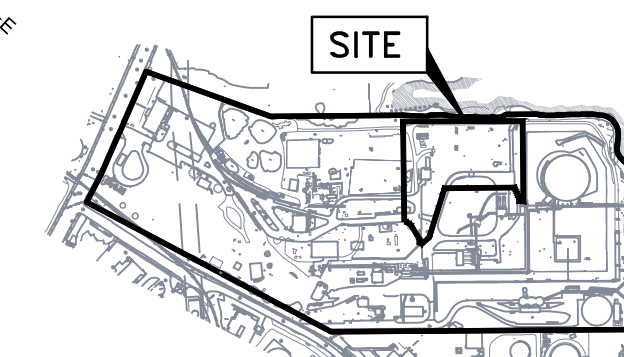
- EXISTING BUILDING
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- 50-FOOT SETBACK
- EXISTING PAVEMENT
- UTILITY POLE
- LIGHT POLE
- HYDRANT
- PROPERTY LINES
- INTERIOR PROPERTY LINE
- MHW MEAN HIGH WATER
- MLW MEAN LOW WATER
- EASEMENT AREA
- PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
- PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
- STILL WATER LEVEL AND PREDICTED SEA LEVEL RISE (SEE NOTE #5)
- OHW EXISTING OVERHEAD WIRE
- LIMIT OF PROPOSED REVETMENT (UPPER SLOPE)

NOTE:

1. TO CONVERT FROM NAVD88 TO MLW ADD 2.29 FT.
2. TIDAL DATUM BASED UPON NOAA STATION 8454000.

NAVD 88	MLW
+2.37' (MHHW)	+4.66' (MHHW)
+2.12' (MHW)	+4.41' (MHW)
0.0' (NAVD 88)	+2.29'
-2.29' (MLW)	0.0' (MLW)
-2.47' (MLLW)	-0.18' (MLLW)

TIDAL DATUM



KEY PLAN:
SCALE: 1"=600'

GENERAL NOTES:

- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
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0 2' 4' 8' 12'

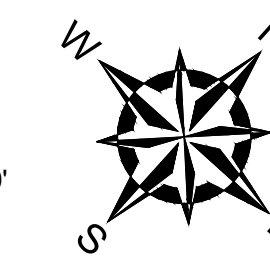
SCALE IN FEET 1"=4'

0 5' 10' 20' 30'

SCALE IN FEET 1"=10'

0 25' 50' 100' 150'

SCALE IN FEET 1"=50'

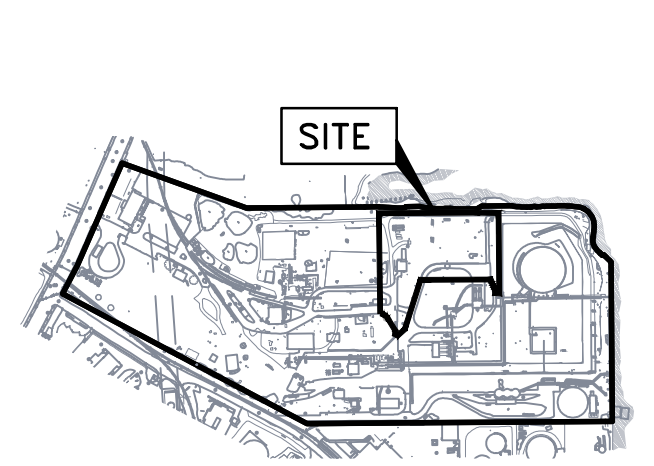
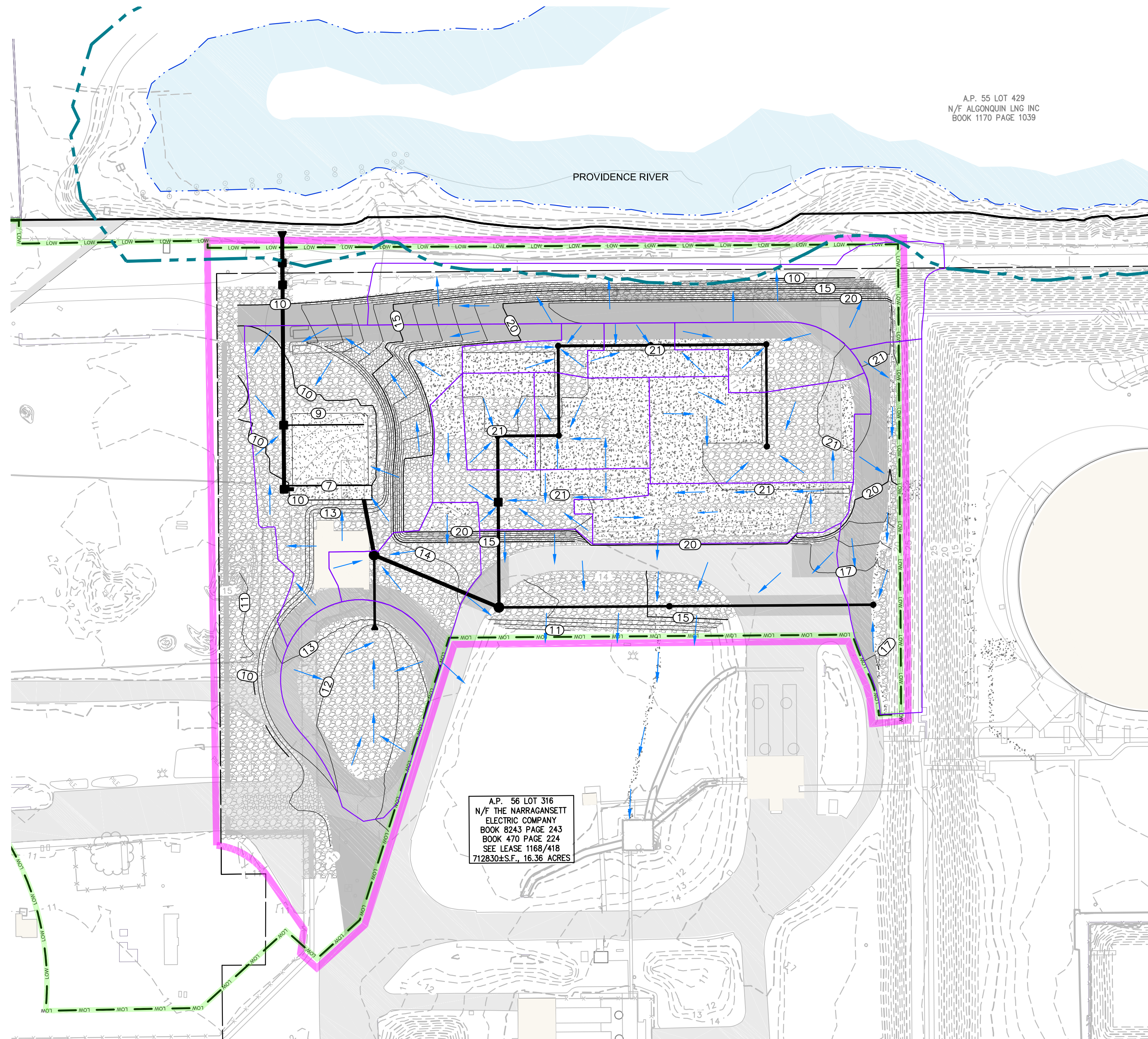


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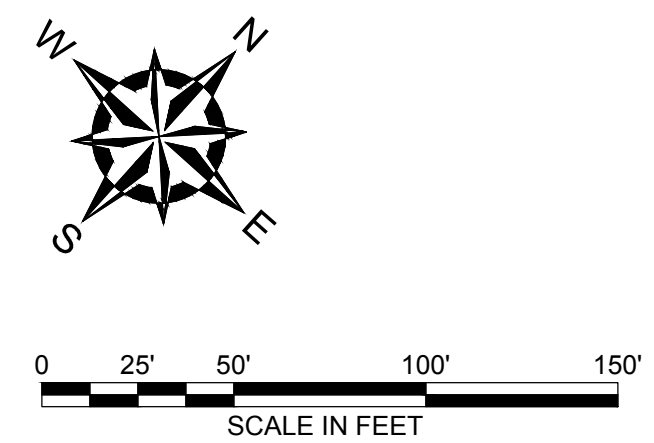
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND	
LIQUEFACTION WORK AREA - PROPOSED SLOPE ARMORING, EXISTING REVETMENT AND CROSS SECTIONS	
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60
CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 9 SHEET NO. 9 OF 15

DRAWING NAME: I:\102761-National_Grid_Liquefaction\CAD Exchange\102761-08-31-GZA Lic Permit Package\33554-60_CEMC PERMITTING_FOR STAMPING-AMS.dwg
 SEP 06 2016 - 9:02am



- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - 50-FOOT SETBACK
 - EXISTING PAVEMENT
 - EASEMENT AREA
 - UTILITY POLE
 - LIGHT POLE
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 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED GRAVEL
 - PROPOSED CONCRETE
 - PROPOSED SAND FILTER
 - LIQUEFACTION WORK AREA
 - LIMIT OF WORK
 - FLOW DIRECTION

A.P. 56 LOT 316
 N/F THE NARRAGANSETT
 ELECTRIC COMPANY
 BOOK 8243 PAGE 243
 BOOK 470 PAGE 224
 SEE LEASE 1168/418
 712830&SF., 16.36 ACRES



GENERAL NOTES:

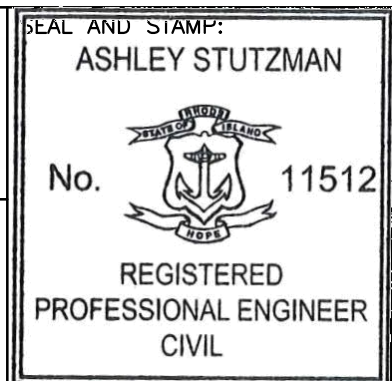
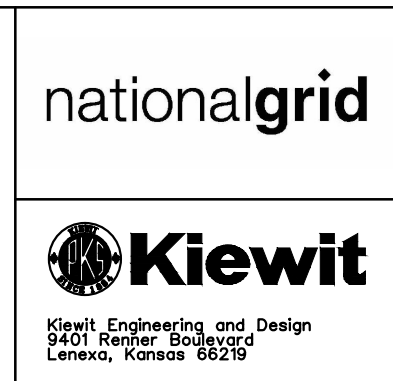
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- 10) PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
- 11) SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL

THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY AGREEMENT AND SUBJECT THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

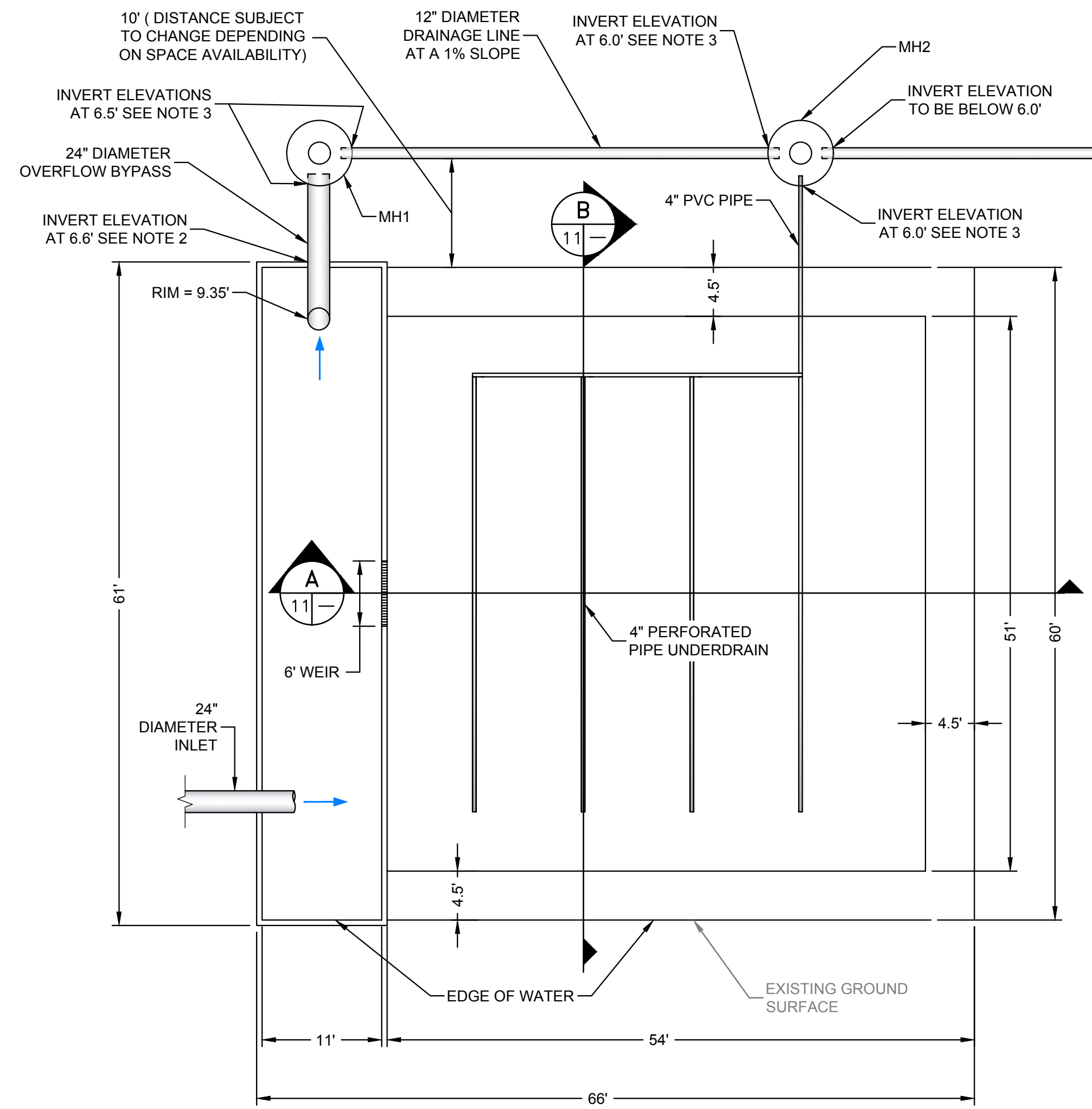
REV	DATE	REVISION INFORMATION	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

GENERAL NOTES AND COMMENTS:

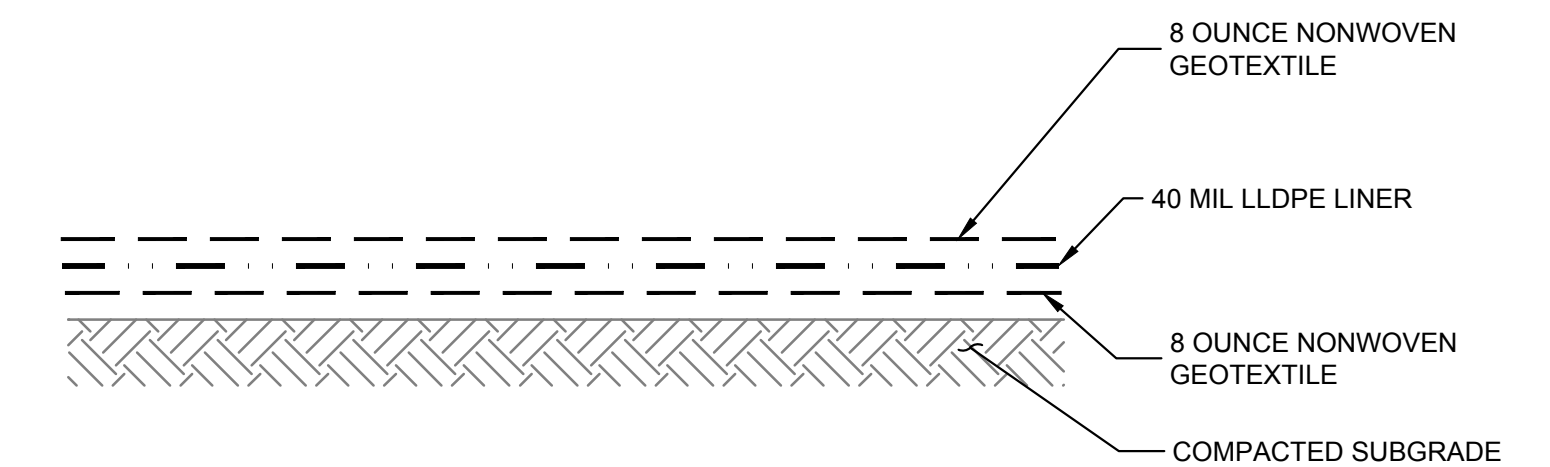


PROFESSIONAL CERTIFICATION:
 I HEREBY CERTIFY THAT THESE DOCUMENTS
 WERE PREPARED OR APPROVED BY ME, AND
 THAT I AM A LICENSED PROFESSIONAL
 ENGINEER OF THE STATE OF
 RHODE ISLAND.
 LICENSE NO. 11512
 EXPIRATION DATE 06/30/2017

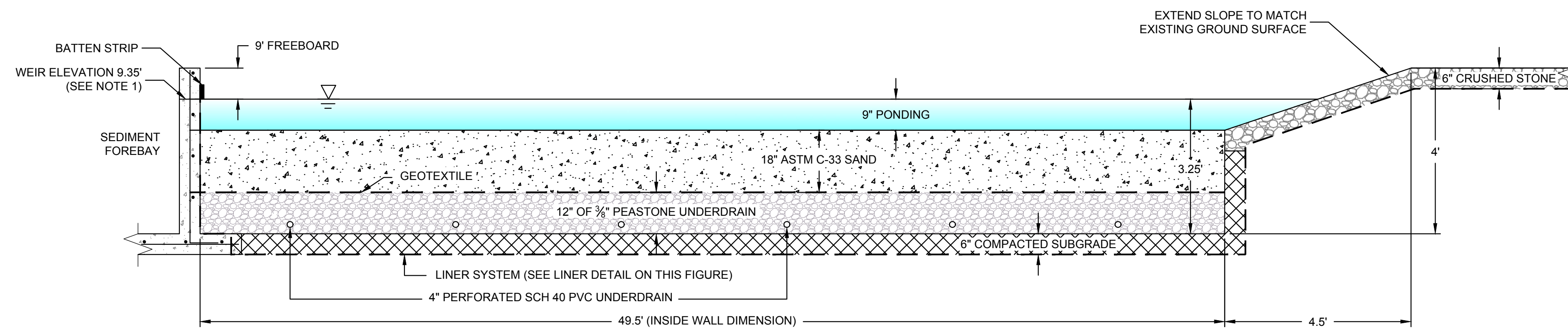
NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
STORMWATER MANAGEMENT PLAN			
DRAWING NO:	PROJECT NO:	SHT:	REV.
FIGURE 10	33554.60	10 OF 15	0



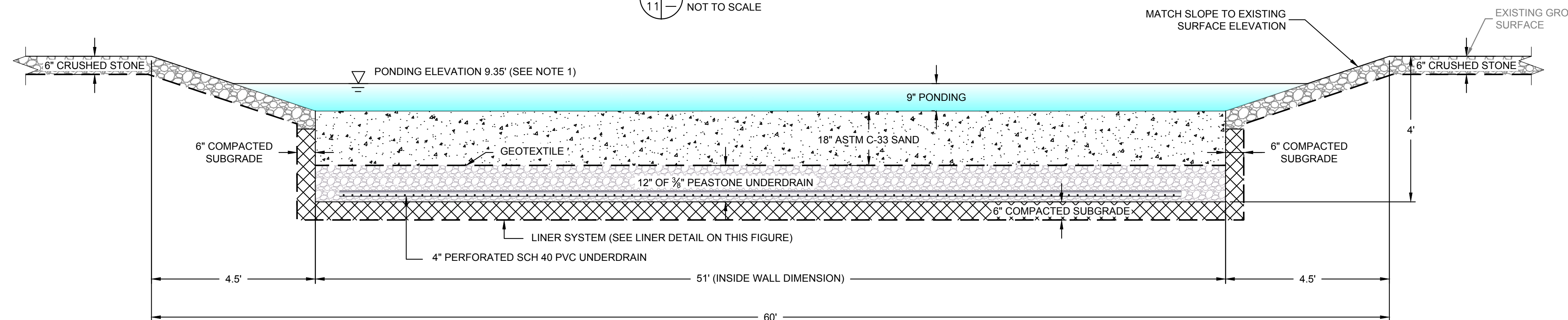
PLAN VIEW - SEDIMENT FOREBAY AND SAND FILTER
SCALE: 1"=10'



SECTION - LINER DETAIL
NOT TO SCALE



A SECTION - SAND FILTER (EARTHEN W/ CONCRETE FOREBAY)
NOT TO SCALE



B SECTION - SAND FILTER (EARTHEN)
NOT TO SCALE

NOTES:

1. PONDING ELEVATION TO BE SET AT INLET INVERT ELEVATION (CURRENTLY SET AT 9.35' BASED ON AUGUST 31, 2016 DRAINAGE CALCULATIONS).
2. OUTLET INVERT ELEVATION FOR 24" OVERFLOW BYPASS TO BE 2.75' BELOW PONDING ELEVATION.
3. INVERT ELEVATIONS TO BE SET BASED ON AUGUST 31, 2016 DRAINAGE CALCULATIONS.

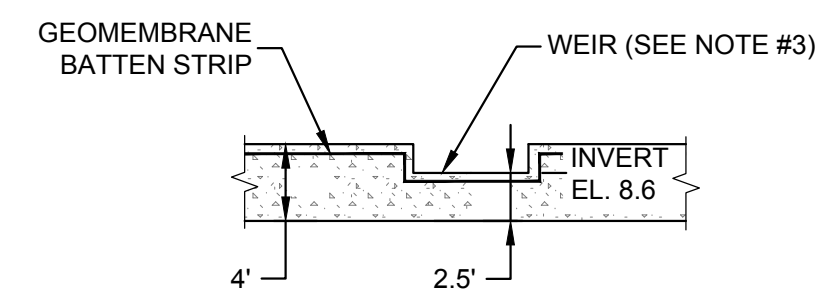
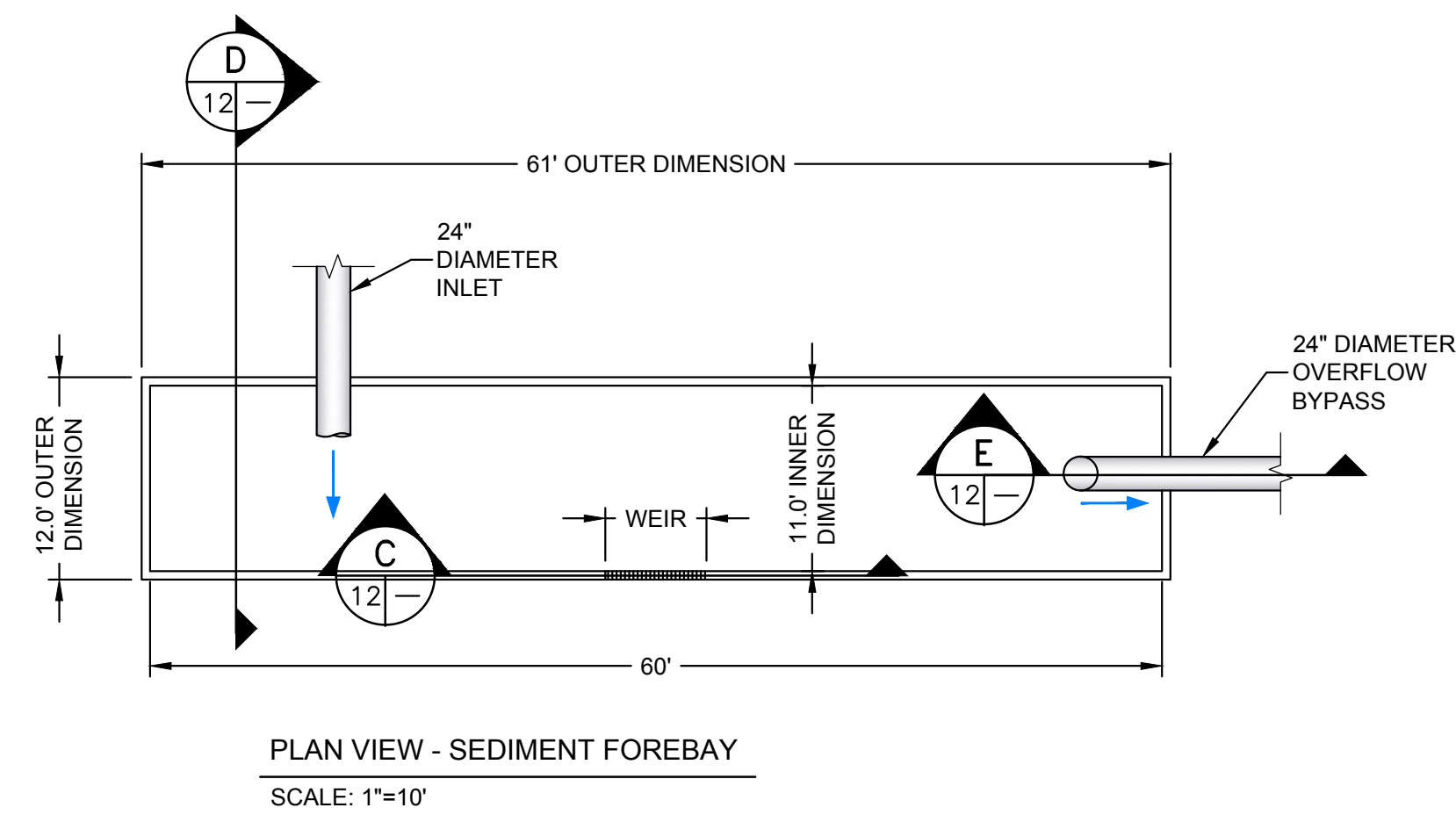


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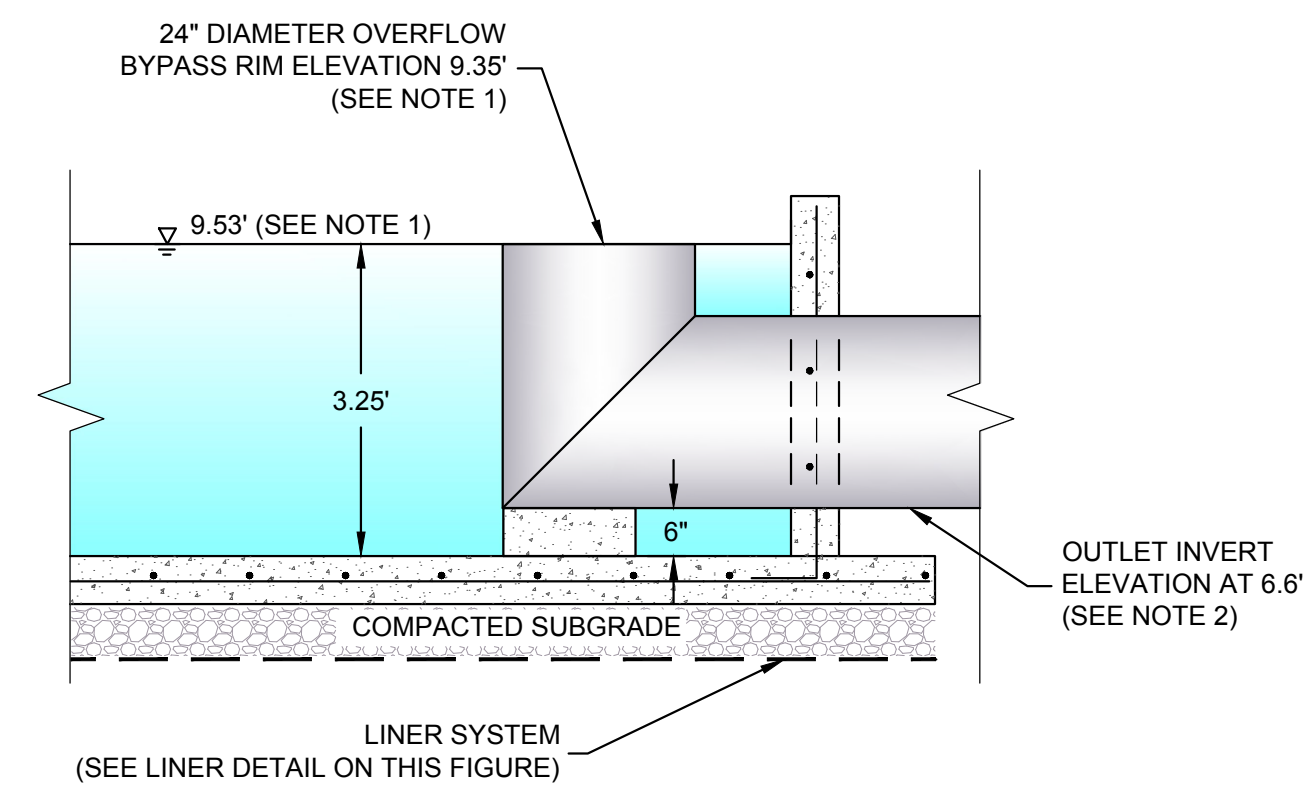
NATIONAL GRID
LIQUEFACTION PLANT
642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND
STORMWATER MANAGEMENT DETAILS
SAND FILTER

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid		
PROJ MGR: MSK	REVIEWED BY: SJH	CHECKED BY: IR	FIGURE
DESIGNED BY: SJH	DRAWN BY: LDT	SCALE: AS NOTED	11
DATE: SEPTEMBER 2016	PROJECT NO.: 33554.60	REVISION NO.: 0	SHEET NO. 11 OF 15

FOR PERMITTING ONLY

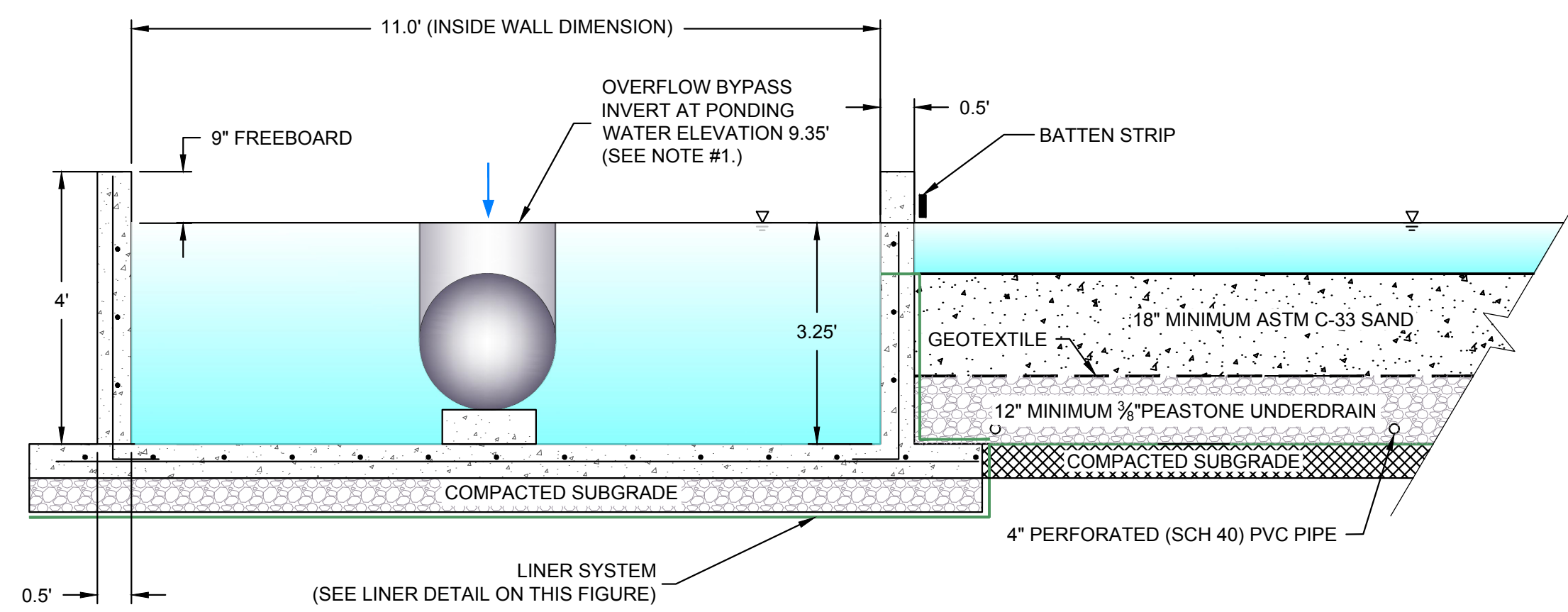


C SECTION - SEDIMENT FOREBAY
SCALE: 1"=10'



NOTE:

OVERFLOW BYPASS PIPE DIAMETER TO BE SIZED FOR 100-YEAR PEAK FLOW RATE



D SECTION - SEDIMENT FOREBAY DETAIL
NOT TO SCALE

NOTES:

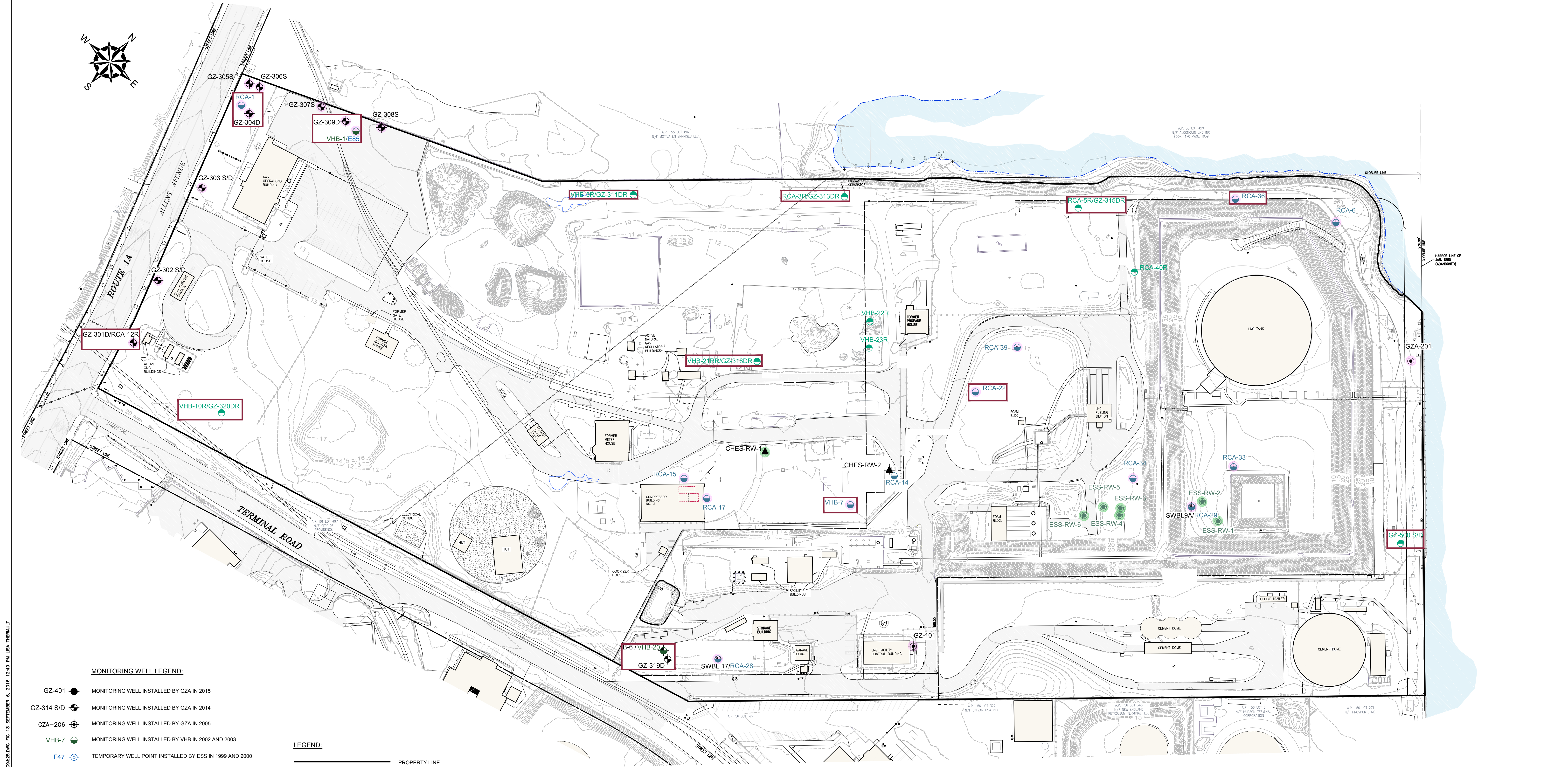
- PONDING ELEVATION TO BE SET AT INLET INVERT ELEVATION (CURRENTLY SET AT 9.35' BASED ON AUGUST 31, 2016 DRAINAGE CALCULATIONS).
- OUTLET INVERT ELEVATION FOR 24" OVERFLOW BYPASS TO BE 2.75' BELOW PONDING ELEVATION.
- SIZE WIDTH OF WEIR BASED ON WATER QUALITY PEAK FLOW RATE.



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NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
STORMWATER MANAGEMENT DETAILS CONCRETE FOREBAY			
PREPARED BY:	GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR:	nationalgrid
PROJ MGR: MSK	REVIEWED BY: SJH	CHECKED BY: IR	FIGURE
DESIGNED BY: SJH	DRAWN BY: LDT	SCALE: AS NOTED	12
DATE: SEPTEMBER, 2016	PROJECT NO. 33554.60	REVISION NO. 0	SHEET NO. 12 OF 15

FOR PERMITTING ONLY



MONITORING WELL LEGEND:

- GZ-401 ● MONITORING WELL INSTALLED BY GZA IN 2015
- GZ-314 S/D ● MONITORING WELL INSTALLED BY GZA IN 2014
- GZA-206 ● MONITORING WELL INSTALLED BY GZA IN 2005
- VHB-7 ● MONITORING WELL INSTALLED BY VHB IN 2002 AND 2003
- F47 ● TEMPORARY WELL POINT INSTALLED BY ESS IN 1999 AND 2000
- 1 ● TEMPORARY WELL POINT INSTALLED BY ESS IN 1999
- RCA-40 ● MONITORING WELL INSTALLED BY ESS IN 1996
- RW-1 ▲ RECOVERY WELL INSTALLED BY CHES OBSERVED BY GZA IN 2014
- CHES-RW-1 ▲ RECOVERY WELL INSTALLED BY CHES OBSERVED BY VHB IN 2002
- ESS-RW-1 ● RECOVERY WELL INSTALLED BY ESS IN 1999 AND 2000
- GZ-311DR ● MONITORING WELLS TO BE INSTALLED AFTER CONTRACTOR DEMOBILIZATION

MONITORING WELL LEGEND CONTINUED:

- ACTIVE MONITORING WELLS
- RECOVERY WELLS
- MONITORING WELL TO BE INSTALLED AFTER CONTRACTOR DEMOBILIZATION
- WELL IS PLANNED TO BE INCLUDED IN ANNUAL GROUNDWATER MONITORING PROGRAM AFTER CONTRACTOR DEMOBILIZATION

LEGEND:

- PROPERTY LINE
- - - INTERIOR PROPERTY LINE
- EXISTING BUILDING
- STEEL POST
- PILING
- EDGE OF WATER
- FENCE
- RAILROAD TRACKS
- - - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- - - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- PAVEMENT
- CONCRETE PAD

GENERAL NOTES:

- 1) EXISTING CONDITIONS BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG
 - ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2015.
- 2) PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3.
- 3) EXPLORATION LOCATION PLANS WERE DEVELOPED FROM THE FOLLOWING:
 - SITE PLANS PROVIDED BY RCA IN THE RIDEM-SUBMITTED JUNE 28, 1998 "PHASE IB FIELD CHARACTERIZATION INVESTIGATION" PREPARED ON BEHALF OF THE PROVIDENCE GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - SITE PLANS PROVIDED BY VHB IN THE RIDEM-SUBMITTED NOVEMBER 2002 "REMEDIATION ACTION CLOSURE REPORT" PREPARED ON BEHALF OF THE NEW ENGLAND GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - FIGURE 3 "EXPLORATION LOCATION PLAN" PREPARED BY GZA GEOENVIRONMENTAL, INC. (GZA) ON BEHALF OF CHICAGO BRIDGE AND IRON (C&I) IN JULY 2005. PLANS PROVIDED BY NATIONAL GRID.
 - FIGURE 35 "TEST BORINGS UNDER SASSAFRAS POINT PLAT" DATED JUNE 5, 1912 PREPARED BY THE PROVIDENCE GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - DRAWING 3 "WHARF FACILITIES - BULKHEAD REBUILDING - CROSS SECTIONS" DATED JANUARY 11, 1973 PREPARED BY PARSONS, BRINCKERHOFF, QUADE AND DOUGLAS ON BEHALF OF THE PROVIDENCE GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
- 4) ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
- 5) THE LOCATION OF THE EXPLORATIONS AND MONITORING WELLS AT THE SITE WERE APPROXIMATELY DETERMINED AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
- 6) HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- 7) VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- 8) SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. OTHER LOCATIONS MAY EXIST.

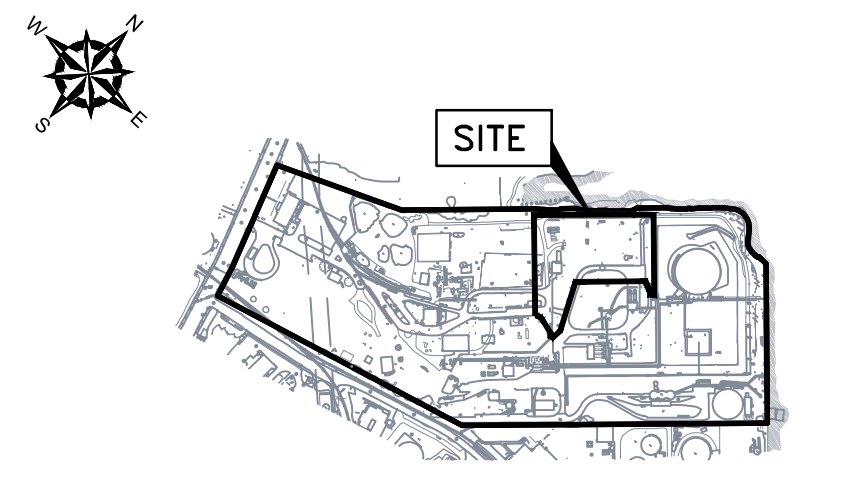
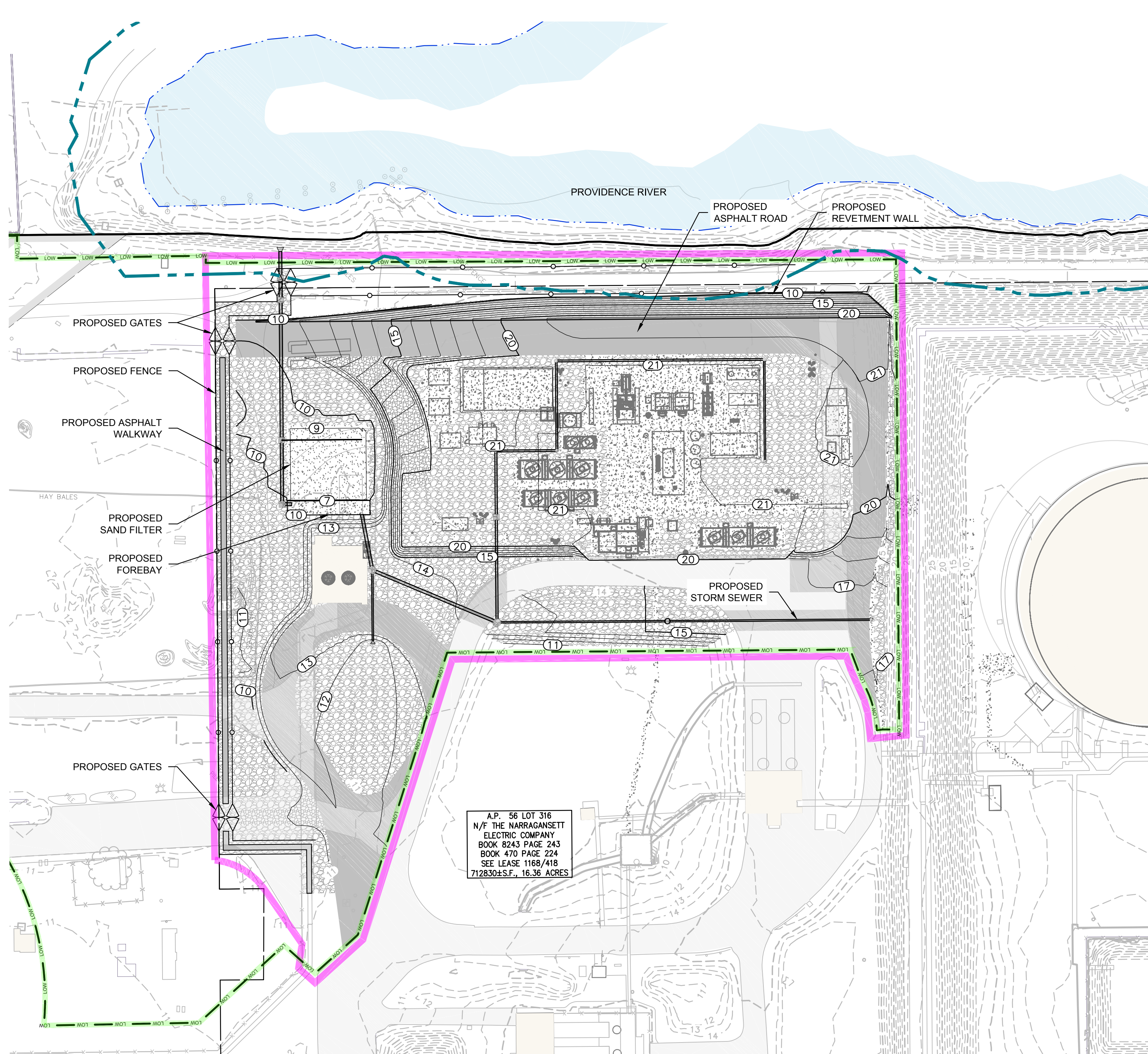


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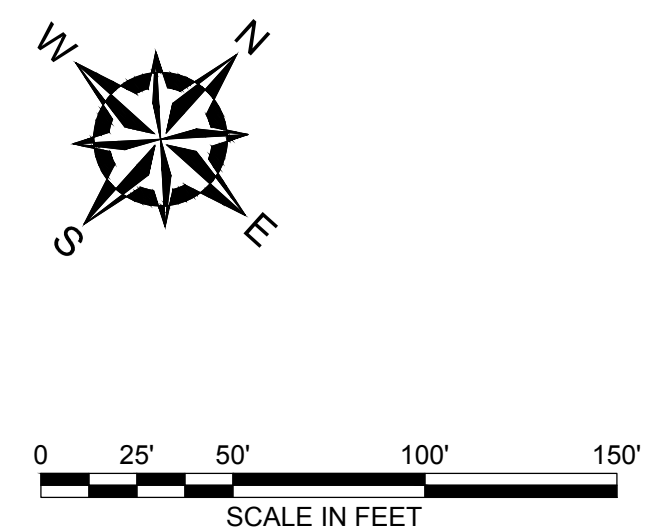
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
PROPOSED MONITORING WELL RE-INSTALLATION PLAN			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: 		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 13 SHEET NO. 13 OF 15

FOR PERMITTING ONLY

DRAWING NAME: I:\02761-National_Grid_Liquefaction\CAD Exchange\In\2016-08-31_GZA_Liq_Permit_Package\33554-60_CIMC_PERMITTING_FOR_STAMPING-AMS.dwg
 SEP 06 2016 - 1:30pm



- LEGEND:**
- EXISTING STRUCTURE
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - 50-FOOT SETBACK
 - EXISTING PAVEMENT
 - EASEMENT AREA
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
 - PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED GRAVEL
 - PROPOSED CONCRETE
 - PROPOSED SAND FILTER
 - LIQUEFACTION WORK AREA
 - LIMIT OF WORK
 - LIMIT OF PROPOSED REVETMENT (UPPER SLOPE)
 - PROPOSED ROUND CATCH BASIN
 - PROPOSED SQUARE CATCH BASIN



GENERAL NOTES:

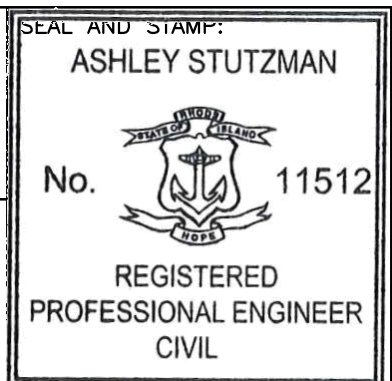
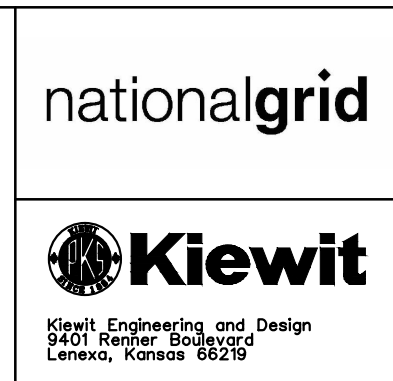
- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
- ELECTRONIC CAD FILE 14-152_SU1_REV2.DWG, TITLED "TOPOGRAPHIC SURVEY PLAN, PORTION OF A.P. 56 LOT 5" DATED OCTOBER 27, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILES PROVIDED BY KIEWIT
 1. "ACAD-102761-CIV_SITE.DWG"
 2. "2007EXP_102761-CIV_SURFACING.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "A2007EXP_102761-CIV_STORM.DWG"
 6. "ACAD-102761-CIV_SURFACING.DWG"
 7. "ACAD-102761-PROP-CONT.DWG"
 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"
- PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
 1. "CATCH BASINS AND SANITARY SEWER SYSTEM" PREPARED BY PROVIDENCE GAS COMPANY, DATED SEPTEMBER 25, 1981.
 2. "PLAN SHOWING UNDERGROUND UTILITIES LNG FACILITY" DATED OCTOBER 6, 1983, "SUBSURFACE UTILITY ENGINEERING" PREPARED BY BAYSTATE SUBSURFACE INVESTIGATION, INC., DATED MAY 17, 2005.
- HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. **OTHER LOCATIONS MAY EXIST.**
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- SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL

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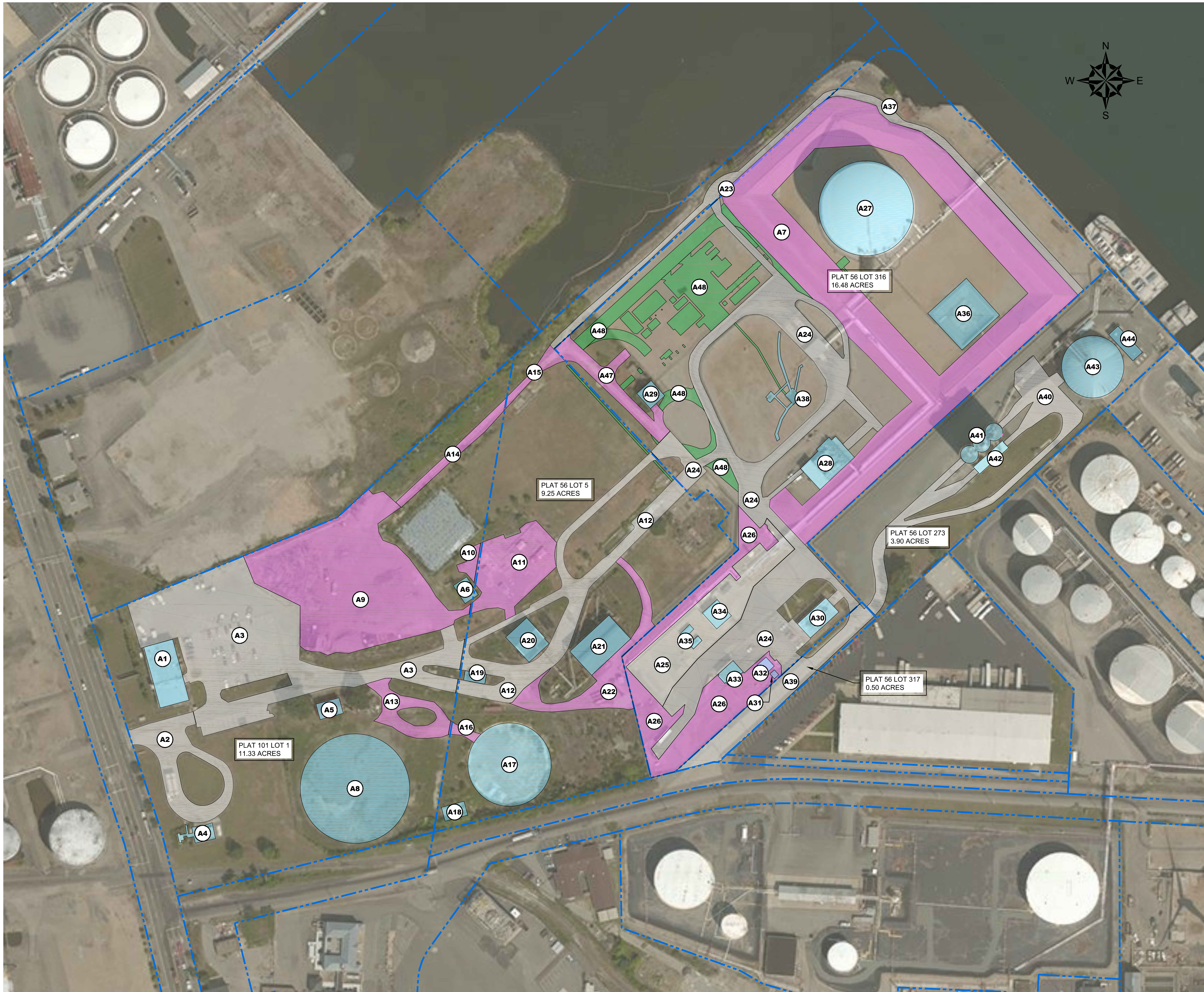
REV	DATE	REVISION INFORMATION	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

GENERAL NOTES AND COMMENTS:



PROFESSIONAL CERTIFICATION:
 I HEREBY CERTIFY THAT THESE DOCUMENTS
 WERE PREPARED OR APPROVED BY ME, AND
 THAT I AM A LICENSED PROFESSIONAL
 ENGINEER OF THIS STATE.
 LICENSE NO. 11512
 EXPIRATION DATE 06/30/2017
 ENG/DESIGN ORIG: A. STUTZMAN
 LEAD ENG: A. STUTZMAN
 ENG. MGR: J. BOCKELMAN
 PROJ. MGR: A. PARRACK

NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
PROPOSED FINAL CONDITIONS PLAN			
DRAWING NO:	PROJECT NO:	SHT:	REV.
FIGURE 14	33554.60	14 OF 15	0



LEGEND

	PROPERTY LINES
	PERVIOUS PROPOSED TO BE IMPERVIOUS
	STRUCTURE
	ASPHALT
	OTHER

- REFERENCE NOTES:**
- THIS MAP CONTAINS THE ESRI ARCGIS ONLINE BING MAPS AERIAL LAYER PACKAGE. IMAGE COURTESY OF USGS EARTHSTAR GEOGRAPHICS SIO © MICROSOFT CORPORATION 2015.
 - PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
 - SITE BOUNDARIES ARE APPROXIMATE.

IMPERVIOUS AREAS				
PLAT	LOT	NO.	AREA (SQ. FT.)	SURFACE TYPE
101	1	A1	8,037.44	ROOF
101	1	A2	17,913.35	ASPHALT
101	1	A3	90,158.79	ASPHALT
101	1	A4	1,786.65	STRUCTURE
101	1	A5	1,640.44	ROOF
101	1	A6	1,445.11	STRUCTURE
56	316	A7	156,852.04	CONTAINMENT DIKE
101	1	A8	39,796.73	TANK FOUNDATION
101	1	A9	78,909.64	COMPACTED GRAVEL
101	1	A10	1,933.34	COMPACTED GRAVEL
56	5	A11	21,898.19	COMPACTED GRAVEL
56	5	A12	37,777.70	ASPHALT
101	1	A13	8,857.25	COMPACTED GRAVEL
101	1	A14	5,114.04	COMPACTED GRAVEL
56	5	A15	2,860.86	COMPACTED GRAVEL
56	5	A16	1,196.51	COMPACTED GRAVEL
56	5	A17	23,127.00	TANK FOUNDATION
56	5	A18	1,923.75	STRUCTURE
56	5	A19	898.87	ROOF
56	5	A20	4,099.05	ROOF
56	5	A21	7,273.42	ROOF
56	5	A22	12,124.48	COMPACTED GRAVEL
56	5	A23	11,249.94	ASPHALT
56	316	A24	92,586.35	ASPHALT
56	316	A25	29,735.26	CONCRETE
56	316	A26	40,494.92	COMPACTED GRAVEL
56	316	A27	29,930.34	LNG TANK
56	316	A28	6,084.97	STRUCTURE
56	316	A29	1,686.87	ROOF
56	316	A30	3,197.19	ROOF
56	316	A31	164.24	ROOF
56	316	A32	638.42	ROOF
56	316	A33	1,346.21	ROOF
56	316	A34	1,845.52	ROOF
56	316	A35	712.24	ROOF
56	316	A36	10,912.10	SUMP PIT
56	316	A37	12,642.27	ASPHALT
56	316	A38	2,392.36	STRUCTURE
56	317	A39	17,080.05	ASPHALT
56	273	A40	28,623.42	ASPHALT
56	273	A41	3,112.29	STRUCTURE
56	273	A42	1,576.65	ROOF
56	273	A43	12,924.79	TANK
56	273	A44	1,893.69	STRUCTURE
56	273	A46	10,294.60	COMPACTED GRAVEL
56	316	A47	54,454.00	NEW IMPERVIOUS AREAS
TOTAL IMPERVIOUS			902,203.34	

894480.34 SQ. FT. IMPERVIOUS AREA = 49.48% IMPERVIOUS
 1807724.79 SQ. FT. TOTAL AREA



THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

NATIONAL GRID
 LIQUEFACTION PLANT
 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND

PROPOSED IMPERVIOUS CONDITIONS PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid
PROJ MGR: MSK DESIGNED BY: SJM DATE: SEPTEMBER, 2016	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0

FOR PERMITTING ONLY

**AUTHORIZATION TO DISCHARGE UNDER THE
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM**

**GENERAL PERMIT FOR STORMWATER DISCHARGE ASSOCIATED WITH
CONSTRUCTION ACTIVITY**

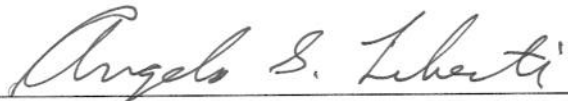
In compliance with the provisions of Chapter 46-12 of the Rhode Island general Laws, as amended, except as provided in Part I.B.3 of the permit, operators of stormwater discharges associated with construction activity located in the State of Rhode Island are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of stormwater discharges associated with construction activity within Rhode Island who intend to be authorized by this general permit must meet the application requirements outlined in Part I.D.1 of the permit. Authorization to discharge shall be granted in accordance with Part I.D of this permit.

This general permit shall become effective on September 26, 2013.

The general permit and the authorization to discharge expire at midnight, five years from the effective date, or September 25, 2018.

Signed this *24th* day of September, 2013.



Angelo S. Liberti, PE
Chief of Surface Water Protection
Office of Water Resources
Rhode Island Department of Environmental Management
Providence, Rhode Island

**General Permit
Rhode Island Pollutant Discharge Elimination System
Stormwater Discharge Associated with Construction Activity**

Effective Date: September 26, 2013



Valid ONLY in accordance with Part I.D.

Expiration Date: September 25, 2018

**Rhode Island Department of Environmental Management
Office of Water Resources
Permitting Section
RIPDES Program**

**GENERAL PERMIT
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM
STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITY**

PLEASE READ THIS PERMIT CAREFULLY!

The RIPDES Program of the Office of Water Resources realizes that effective regulatory mechanisms to control erosion and sedimentation are currently required by the RIDEM Freshwater Wetland Program, the RIDEM Water Quality Certification Program, the RIDEM UIC/Ground Permit Program, the RI Coastal Resources Management Council (CRMC); and in those towns/cities which have a Qualifying Local Program (QLP) that has been formally approved by the Department (see RIPDES Rule 15.01(i) for the definition of Qualifying State, or Local Programs). **Regardless of the means of obtaining approval, the permittee is still responsible for complying with all terms and conditions of this permit and any other applicable State, local and/or federal regulations. The Department will be held harmless for any failure of the permittee to comply with this permit.**

I. GENERAL COVERAGE UNDER THIS PERMIT

A. Permit Area. This permit applies to all areas of the State of Rhode Island.

B. Eligibility

1. Allowable Stormwater Discharges. Subject to compliance with the terms and conditions of this permit, you are authorized to discharge the following:

a. All new and existing stormwater discharges associated with construction, including, but not limited to, clearing, grading, excavation, and filling, where total land disturbance is equal to or greater than one (1) acres including construction activities involving soil disturbance's of less than one (1) acre of disturbance if that construction is part of a larger common plan of development or sale that would disturb one (1) or more acre, and the discharge is composed entirely of stormwater. A discharge shall be considered composed entirely of stormwater if there is adequate access to sample the stormwater discharge covered under this permit prior to mixing with a discharge which is authorized and in compliance with an existing RIPDES permit or the discharge is listed in Part I.B.2. below.

b. Stormwater Discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging areas, material storage areas, excavated material disposal areas, borrow areas) provided:

i. The support activity is directly related to the construction site required to have a RIPDES permit coverage for discharges of stormwater associated with construction activity;

ii. The support activity is not a commercial operation serving multiple unrelated construction projects by different operators, and does not operate beyond the completion of the construction at the last construction project it supports; and

iii. Appropriate controls and measures are identified in a Soil Erosion

and Sediment Control Plan covering the discharges from the support activity areas; and

- c. Discharges composed of allowable discharges listed in Part I.B.2 of this permit commingled with a discharge authorized by a different RIPDES permit and/or discharge that does not require a RIPDES permit authorization.

2. Allowable Non-Stormwater Discharges. Allowable non-stormwater discharges under this permit are limited to discharges from the following:

- a. washing of vehicles provided chemicals, soaps, detergents, steam, or heated water are not used; cleaning is restricted to the outside of the vehicle (e.g., no engines, transmissions, undercarriages, or truckbeds); or washing is not used to remove accumulated industrial materials, paint residues, heavy metals or any other potentially hazardous materials from surfaces;
- b. the use of water to control dust;
- c. fire fighting activities;
- d. fire hydrant flushings;
- e. natural springs; uncontaminated groundwater;
- f. lawn watering;
- g. potable water sources including waterline flushings; irrigation drainage;
- h. pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled materials have been removed) and where detergents are not used;
- i. foundation or footing drains where flows are not contaminated with process materials such as solvents, or contaminated by contact with soils where spills or leaks of toxic or hazardous materials has occurred.

If any of these discharges may reasonably be expected to be present and to be mixed with stormwater discharges, they must be specifically identified in the site's Soil Erosion and Sediment Control Plan as described in Part III of this permit.

3. Limitations of Coverage. The following discharges associated with construction are not authorized by this permit.

- a. Stormwater discharges associated with construction that the Director of the Department of Environmental Management has found to be or may reasonably be expected to be contributing to a violation of water quality standards, or to be a significant contributor of pollutants;
- b. Stormwater discharges associated with construction, allowable non-

stormwater discharges and discharge related activities that adversely affect a listed, or a proposed to be listed, endangered or threatened species or its critical habitat;

- c. Stormwater associated with construction discharging into any water for which a Total Maximum Daily Load (TMDL) has been either established or approved by the EPA or other water quality determination unless the Stormwater Management Plan incorporates measures or controls that meet the requirements of this permit and are consistent with the assumptions and requirements of the TMDL and Minimum Standard 3: Water Quality of the RIDISM or the project was authorized and has maintained coverage under the 2008 permit (e.g. timely re-application to RIPDES or a RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval remains in effect). If the EPA approved or established TMDL or other water quality determination specifically prohibits the discharges, the discharges are not eligible for coverage under this permit.
- d. Stormwater associated with construction discharging into any Impaired water listed on the latest State of Rhode Island 303(d) List of Impaired Waters, unless the Stormwater Management Plan incorporates measures or controls that meet the requirements of this permit and address the pollutant(s) of concern as required by Standard 3: Water Quality of the RISDISM or if the project was authorized and has maintained coverage under the 2008 permit (e.g. timely re-application to RIPDES or a RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval remains in effect).
- e. Post-construction discharges that originate from the site after construction activities have been completed and the site has achieved final stabilization, including any temporary support activity. Post-construction stormwater from industrial sites may need to be covered by a separate RIPDES individual permit or may need to obtain authorization to discharge under the RIPDES Multi-Sector General Permit for Stormwater Discharge Associated with Industrial Activity. Guidance for managing discharges from industrial sites can be found in Part II.C of this permit.

C. Definition of "Owner" & "Operator":

- 1. For the purposes of this permit, the "owner" of a property is the person, as defined by Rule 3 of the RIPDES Regulations, holding the title, deed, or legal document to the regulated property, facility, or activity, including a party working under an easement on the property.
- 2. The "operator" is defined as the person who has operational control over plans and specifications, or the person who has day-to-day supervision and control of activities occurring at the site. Further, for purposes of this permit, the operator is the owner if that person is performing all work related to complying with this permit.

Where a new operator is selected after the submittal of an NOI and that new

operator is directly responsible for performing the work necessary to comply with this permit, prior to performing any work at the site the new operator must sign and certify within the Soil Erosion and Sediment Control Plan document that they are the operator of the site as defined above.

D. Authorization. To be covered under this general permit, owners or operators of stormwater discharges associated with construction activities that disturb one (1) or more acres or less than one (1) acre if that construction is part of a larger common plan of development or sale that would disturb one (1) or more acre, must comply with the applicable sections below.

1. Application Requirements

a. Sites Previously Authorized under the 2008 Construction Activity General Permit– Only those owners/operators listed below are required to submit a complete NOI form.

i. Construction activities that disturb greater than one (1) acre that did not obtain a RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval.

b. New Applications – Submittal of a NOI is only required for construction activities that disturb greater than one (1) acre that are not required to obtain a RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval. Specific application requirements are as follows:

i. Construction activities that disturb an area equal to or greater than five (5) acres are required to submit a complete NOI form and supporting documentation required in Part IV of this permit.

ii. Construction activities that disturb an area equal to or greater than one (1) acre and less than five (5) acres are required to submit a complete NOI form, project narrative and site plan/map showing flow paths, discharges, and receiving waters.

2. Deadlines for Requesting Authorization

a. For stormwater discharges associated with construction activities which were authorized under the 2008 Construction Activity General Permit which are expected to continue beyond the effective date of this permit and the owner is required to reapply, an NOI must be submitted within sixty (60) days of the effective date of this permit to maintain permit coverage in accordance with Part I.D.3 of this permit.

b. For stormwater discharges associated with construction activities which commence after the effective date of this permit, and are required to submit an NOI in accordance with Part I.D.1.b of this permit, an NOI must be submitted at least thirty (30) days prior to the commencement of land disturbing activities.

3. Granting of Authorization

- a. Owners and operators previously authorized under the 2008 Construction Activity General Permit with an active RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval will be authorized upon the effective date of this permit. Previously authorized projects must modify their existing Stormwater Management Plan to comply with Part II.B of this permit within sixty (60) days of the effective date in order to maintain permit coverage.
- b. Owners and operators previously authorized under the 2008 Construction Activity General Permit and required to resubmit a NOI under Part I.D.1.a.i will be authorized upon resubmittal of the NOI. Previously authorized projects must modify their existing Stormwater Management Plan to comply with Part II.B of this permit within sixty (60) days of the effective date in order to maintain permit coverage.
- c. Construction activities that disturb an area equal to or greater than one (1) acre that are required to obtain a RIDEM Freshwater Wetlands permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval are authorized to discharge stormwater from construction activities under the terms and conditions of this permit upon receipt of all of the applicable permits listed here.
- d. For construction activities that disturb an area equal to or greater than five (5) acres and are not required to obtain one of the approvals listed above in Part I.D.3.c, authorization to discharge will only be granted upon notification from the Director after review of the NOI and Stormwater Management Plan.
- e. For construction activities that disturb an area equal to or greater than one (1) acre and less than five (5) acres and are not required to obtain one of the approvals listed in Part I.D.3.c automatic authorization to discharge will be granted upon receipt of the information required in Part I.D.1.b.ii unless notified to the contrary by the Director.

E. Termination of Coverage. Upon achieving final site stabilization, owners and operators of stormwater discharges associated with construction must submit to the DEM a completed Notice of Termination (NOT). At a minimum, the following information is required to terminate coverage under this permit:

1. The owner's name, mailing address, email address, and telephone number,
2. The operator's name, mailing address, email address, and telephone number
3. The name and location of the facility,
4. The RIPDES Construction General Permit authorization number,
5. A signed certification by the owner and operator that the stormwater discharge associated with construction activity no longer exists at the site.

Upon DEM receipt of the completed NOT coverage under this permit is terminated.

- F. Failure to Notify. Owners or operators who fail to notify the Director of their intent to be covered under a general permit, and discharge pollutants to the waters of the State or to a separate storm sewer system without a RIPDES permit, are in violation of Chapter 46-12 of Rhode Island General Laws and the Clean Water Act (CWA).

II. PERMIT LIMITS AND CONDITIONS

If your project was previously authorized under the 2008 Construction General Permit your Stormwater Management Plan must only be revised as necessary to comply with Part II.B of this permit. The Stormwater Management Plan shall be modified to comply with Part II.B within sixty (60) days of the effective date of this permit. A Stormwater Pollution Prevention Plan (SWPPP) developed under the previous (2008) construction general permit may serve to satisfy Part III of this permit, provided it adequately addresses all new requirements.

To be covered under this permit you must develop a Stormwater Management Plan prior to submitting your NOI or your application for RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval. In accordance with the *Rhode Island Stormwater Design and Installation Standards Manual* (RISDISM), the Stormwater Management Plan must include the following major elements, which serve to satisfy the eleven Minimum Standards outlined in the RISDISM, as well as comply with specific criteria for the site planning process, groundwater recharge, water quality, channel protection, and peak flow control requirements:

- A. **Stormwater Site Planning, Analysis, and Design** – This element of the Stormwater Management Plan must address the following Minimum Standards and include supporting documentation and calculations:

1. Minimum Standard 1: LID Site Planning and Design Strategies
2. Minimum Standard 2: Groundwater Recharge,
3. Minimum Standard 3: Water Quality,
4. Minimum Standard 4: Conveyance and Natural Channel Protection,
5. Minimum Standard 5: Overbank Flood Protection,
6. Minimum Standard 6: Redevelopment and Infill Projects.
7. Minimum Standard 8: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)
8. Minimum Standard 9: Illicit Discharges

In addition, the following Appendices from the RISDISM provide additional guidance on how to comply with the above listed standards:

1. Appendix B: Vegetation Guidelines and Planting List
2. Appendix C: Guidance for Retrofitting Existing Development for Stormwater Management
3. Appendix F: Guidance on BMP Construction Specifications
4. Appendix I: Rhode Island River and Stream Order
5. Appendix K: Hydrologic and Hydraulic Modeling Guidance

- B. **Soil Erosion, Runoff, and Sediment Control** – In order to comply with this permit a component of the Stormwater Management Plan must address two sources of stormwater pollution: (1) pollution caused by soil erosion, runoff, and sedimentation during construction and (2) stormwater pollution generated as a direct result of the construction activity itself (i.e. stormwater contaminated by construction wastes and practices). The Stormwater

Management Plan must satisfy Part III of this permit and Minimum Standard 10 of the RISDISM – Construction Erosion and Sedimentation Control. In order to facilitate an expeditious DEM review and make it easier for the site owner and operator to comply with applicable soil erosion and sediment control requirements, it is recommended that a Soil Erosion and Sediment Control Plan be developed as a stand alone document.

- C. **Post Construction Operation and Maintenance** – The Stormwater Management Plan must address *Minimum Standard 11: Stormwater Management System Operation and Maintenance* of the RISDISM to ensure that the stormwater management system constructed will continue to function as designed. The Plan must address the O&M requirements for each stormwater management practice in Chapter 5 of the RISDISM. Additional guidance on developing O&M plans can be found in Appendix E of the RISDISM. In addition the Plan must address *Minimum Standard 7: Pollution Prevention* of the RISDISM by incorporating source control and pollution prevention measures to minimize the impact that the land use may have on stormwater runoff quality after the construction development activities have been completed and the site is fully stabilized. Additional guidance can be found in Appendix G of the RISDISM. In order to facilitate an expeditious DEM review and make it easier for the site owner(s) to comply with applicable Operation and Maintenance requirements, it is recommended that an Operation and Maintenance Plan be developed as a stand alone document.

The facility may be required to obtain authorization to discharge under the RIPDES Multi-Sector General Permit for Stormwater Discharge Associated with Industrial Activity depending on the Standard Industrial Classification that will be applicable to the site when construction is complete. In these cases the Stormwater Management Plan should address the requirements of the RIPDES Multi-Sector General Permit for Stormwater Discharge Associated with Industrial Activity.

III. SOIL EROSION AND SEDIMENT CONTROL (SESC) PLAN REQUIREMENTS

- A. The Soil Erosion and Sediment Control (SESC) Plan shall describe and ensure the implementation of stormwater control measures which are to be used to reduce or eliminate pollutants in stormwater discharge(s) from the site and assure compliance with the terms and conditions of this permit. Control practice selection shall include an evaluation of the effectiveness of available practices and be made with proper references.
- B. Soil erosion, runoff, sediment, and pollution prevention control measures must be designed, implemented, and maintained in accordance with the requirements of this permit and in accordance with the design specifications and guidance contained in the *Rhode Island Soil Erosion and Sediment Control (RISESC) Handbook* (as amended) and the *Rhode Island Stormwater Design and Installation Standards Manual (RISDISM)* (as amended).
- C. The SESC Plan shall be stamped and signed by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Stormwater Quality (CPSWQ), or a Registered Landscape Architect certifying that the SESC Plan meets all requirements of this permit. SESC Plans which require the practice of engineering must be stamped and signed by a Registered Professional Engineer.
- D. If the SESC Plan is not required to be submitted along with the NOI (see Part I.D of this permit), then the owner, operator, or other designated person under the supervision of the

owner or operator shall make it available to the Department upon request.

- E. If the SESC Plan is requested and reviewed by the Director, he or she may notify the permittee at any time that it does not meet one or more of the minimum requirements of this permit. After such notification from the Director, the permittee shall amend the SESC Plan and shall submit to the Director, within seven (7) days of the notification, a written certification that the required changes have been made.
- F. The owner and operator shall amend the SESC Plan within seven (7) days whenever there is a change in design, construction, operation, maintenance or other procedure which has a significant effect on the potential for the discharge of pollutants, or if the SESC Plan proves to be ineffective in achieving its objectives. In addition, the SESC Plan shall be amended to identify any new operator that will implement a component of the SESC Plan. The amended SESC Plan must be kept on file at the construction site and any SESC Plan modifications must be documented. Any amendments to control measures which involved the practice of engineering, must first be reviewed, signed, and stamped by a Professional Engineer registered in the State of Rhode Island. The DEM reserves the right to review any SESC Plan amendments in the same manner as described in paragraph III.E (above).
- G. A copy of the SESC Plan including site plans, amendments to the SESC Plan and site plans, records of inspections, maintenance, and corrective actions, a copy of the NOI, and any regulatory permits granted must be kept on site at all times during the extent of coverage under this permit. The site operator as defined by Part I.C.2 of this permit must maintain a copy of the SESC Plan at a central location on-site for the use of all those identified as having responsibilities under the SESC Plan whenever they are on the construction site. If an on-site location is unavailable to store the SESC Plan and associated records when no personnel are present, notice of the SESC Plan's location must be posted near the main entrance of the construction site.
- H. Each project authorized under this permit must determine if the site is within or directly discharges to a Natural Heritage Area (NHA). DEM Natural Heritage Areas include known occurrences of state and federal rare, threatened and endangered species. Review DEM NHA maps to determine if there are natural heritage areas on or near the construction site.
- I. List and provide existing data (if available) on the quality of known discharges from the site. The SESC Plan must identify any stormwater discharge associated with industrial activity other than construction if applicable.
- J. Soil Erosion and Sediment Control Plans: Required Contents
 - 1. **Erosion, Runoff, and Sediment Control Requirements** – Owners and Operators must design, install, and maintain effective erosion, runoff, and sediment controls that address the nature of stormwater run-on and runoff at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. If stormwater flow will be channelized at the site, site owners and operators must design temporary stormwater controls that will control peak flow rates and total stormwater volume, to minimize channel and stream bank erosion in the immediate vicinity of discharge points. These controls must be designed to address the range of soil particle sizes expected to be present, site soils, slope, and the expected amount, frequency, intensity, and duration of precipitation. At a minimum the following must be addressed:

- a. Phase Construction Activity – describe the intended construction sequencing and timing of major activities, including grading activities, road and utility installation, and building phases. The estimated timetable and sequence of construction activities must address the following key activities:
 - i. Installation of erosion, runoff, and sediment controls and temporary pollution prevention measures.
 - ii. Protection of planned infiltration sites and qualifying pervious areas from compaction.
 - iii. Inspection and maintenance of erosion, runoff, sediment controls and other temporary pollution prevention measures.
 - iv. Final site stabilization and removal of temporary erosion, runoff, and sediment controls and temporary pollution prevention measures.
- b. Control Stormwater Flowing Onto and Through the Project – Describe controls that will be used to divert flows from exposed soils, retain or detain flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. A description of controls, including design specifications and details must be provided.
- c. Stabilize Soils – Describe controls that will be used to stabilize soils throughout the entire duration of the construction project, including phased clearing/grubbing, initiating stabilization practices, and maintaining stabilization practices. Soil stabilization of disturbed areas must, at a minimum be initiated immediately whenever any clearing, grading, excavating or other earth disturbance activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding fourteen (14) calendar days. Stabilization must be completed using vegetative stabilization measures or using alternative measures whenever vegetative measures are deemed impracticable or during periods of drought.
- d. Protect Storm Drain Inlets – Describe controls, including design specifications and details, that will be used to prevent soil and debris from entering storm drain inlets. If stormwater discharges from the construction site have the potential to enter storm drain inlets that then discharge to a surface water, the site owner and operator must:
 - i. *Installation Requirements:* Install inlet protection practices that remove sediment from the discharge prior to entry into the storm drain inlet.
 - ii. *Maintenance Requirements:* Clean, or remove and replace, the protection practices as sediment accumulates, the filter becomes clogged, and/or performance is compromised.

Accumulated sediment adjacent to the inlet protection measures should be removed by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible.

- e. Protect Storm Drain Outlets - Describe controls, including design specifications and details, to be used to protect outlets discharging stormwater from the project. Outfall protection must be used to prevent scour or severe erosion at discharge points. The function of the specified controls must be to protect the soil surface, reduce velocity, and promote infiltration.
- f. Establish Perimeter Controls and Sediment Barriers – Describe controls, including selection criteria and details, to be used to prevent soil erosion, filter, and trap sediment before it leaves the construction site.
 - i. *Installation Requirements:* Sediment controls must be installed along those perimeter areas of the site that will receive stormwater from earth disturbing activities.
 - ii. *Maintenance Requirements:* Maintenance of perimeter controls and sediment barriers must be completed in accordance with the maintenance requirements specified in the RISESC Handbook (as amended).
- g. Establish Temporary Controls For The Protection of Post Construction Stormwater Practices – Identify the temporary practices that will be installed to protect permanent or long-term stormwater practices as they are installed and throughout the construction phase of the project so that they will function properly when they are brought online. Examples of long-term practices that may require protection include: infiltration basins, open vegetated swales and natural depressions, vegetated buffer strips, and permanent detention/retention structures. Examples of temporary control measures that can be used to protect permanent stormwater control measures include: establishing temporary sedimentation barriers around infiltrating practices, ensuring proper material staging areas and equipment routing (i.e. do not allow construction equipment to compact areas where infiltrating practices will be installed), and by conducting final cleaning of structural long term practices after construction is completed.
- h. Temporary Sediment Trapping and Temporary Stormwater Conveyance Practices – Describe the need for temporary sediment trapping and temporary stormwater conveyance practices, and if required include design specifications and details which demonstrate that they comply with Minimum Standard 10 of the RISDISM.
- i. Utilize Surface Outlets – To the maximum extent practicable, outlet structures must be utilized that withdraw water from the surface of temporary sedimentation basins, in order to minimize the discharge of pollutants. Exceptions may include periods of extended cold weather, where alternate outlets are required during frozen periods. If such a device

is infeasible for portions of or the entire construction period justification must be made in the SESC Plan.

- j. Properly Use Treatment Chemicals - If the owner and/or operator plans to utilize polymers, flocculants, or other treatment chemicals at the construction site (e.g. dewatering, temporary sediment traps, stormwater conveyance practices, soil stabilization), the use of such chemicals must be managed in accordance with current best management practices and in accordance with the requirements of the *Rhode Island Soil Erosion and Sediment Control (RISESC) Handbook* (as amended).

2. **Construction Activity Pollution Prevention Requirements** – The purpose of pollution prevention is to prevent daily construction activities from causing pollution. The owner and operator must design, install, implement, and maintain effective pollution prevention practices to minimize the discharge of pollutants. Pollution prevention practices must be described that will serve to control pollutants used at the site. At a minimum pollution prevention measures must address the following:

- a. Prohibited Discharges - The following discharges are prohibited at the construction site:
 - i. Contaminated groundwater, unless specifically authorized by the DEM. These types of discharges may only be authorized under a separate DEM RIPDES permit.
 - ii. Wastewater from washout of concrete, unless the discharge is contained and managed by appropriate controls.
 - iii. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials.
 - iv. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance. Proper storage and spill prevention practices must be utilized at all construction sites.
 - v. Soaps or solvents used in vehicle and equipment washing.
 - vi. Toxic or hazardous substances from a spill or other release.
- b. Minimize Off-Site Tracking of Sediments – Describe the location(s) of vehicle entrance(s) and exit(s), and stabilization practices used to prevent sediment from being tracked off-site. Sediment track-out must be minimized onto off-site streets, other paved areas, and sidewalks from vehicles exiting the construction site. Site owners and operators must:
 - i. Restrict vehicle use to properly designated exit points.
 - ii. Use properly designed and constructed construction entrances at all points that exit onto paved roads so that sediment removal occurs prior to vehicle exit.

- iii. When and where necessary, use additional controls to remove sediment from vehicle tires prior to exit (i.e. wheel washing racks, rumble strips, and rattle plates).
 - iv. Where sediment has been tracked out from the construction site onto the surface of off-site streets, other paved areas, and sidewalks, the deposited sediment must be removed by the end of the same work day in which the trackout occurs. Track-out must be removed by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. Operators are prohibited from hosing or sweeping tracked-out sediment into any stormwater conveyance, storm drain inlet, or surface water.
- c. Proper Waste Disposal – Identify potential building materials and other construction wastes and document how these wastes will be properly managed and disposed of at the construction site. All types of wastes generated at the site must be disposed of in a manner consistent with State Law and/or regulations.
 - d. Spill Prevention and Control – All chemicals and/or hazardous waste material must be stored properly and legally in covered areas, with containment systems constructed in or around the storage areas. Areas must be designated for materials delivery and storage. All areas where potential spills can occur, and their accompanying drainage points must be described. The owner and operator must establish spill prevention and control measures to reduce the chance of spills, stop the source of spills, contain and clean-up spills, and dispose of materials contaminated by spills. The operator must establish and make highly visible location(s) for the storage of spill prevention and control equipment and provide training for personnel responsible for spill prevention and control on the construction site.
 - e. Control of Allowable Non-Stormwater Discharges – Allowable non-stormwater discharges as established in Part I.B.2 of this permit should be kept separate from stormwater flow through the use of appropriate control measures. The owner and operator must identify all allowable non-stormwater discharges associated with construction activity and describe the controls and measures that will be implemented at those locations to minimize pollutant contamination where applicable.
 - f. Control Dewatering Practices – Describe dewatering practices that will be implemented if water must be removed from an area so that construction activity can continue. Site owners and operators are prohibited from discharging groundwater or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, unless such waters are first effectively managed by appropriated control measures. Examples of appropriate control measures include, but are not limited to, temporary sediment basins or sediment

traps, sediment socks, dewatering tanks and bags, or filtration systems (e.g. bag or sand filters) that are designed to remove sediment. Uncontaminated, non-turbid dewatering water can be discharged without being routed to a control. At a minimum the following discharge requirements must be met for dewatering activities:

- i. Do not discharge visible floating solids or foam.
 - ii. To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. In no case will surface waters be considered part of the treatment area.
 - iii. At all points where dewatering water is discharged utilize velocity dissipation devices.
 - iv. With filter backwash water, either haul it away for disposal or return it to the beginning of the treatment process.
 - v. Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.
 - vi. Dewatering practices must involve the implementation of appropriate control measures as applicable (i.e. containment areas for dewatering earth materials, portable sediment tanks and bags, pumping settling basins, and pump intake protection).
- g. Establish Proper Building Material Staging Areas - Describe construction materials expected to be stored on-site and procedures for storage of materials to minimize exposure of the materials to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).
- h. Control Discharges from Stockpiled Sediment or Soil - Stockpile management consists of procedures and practices designed to minimize or eliminate the discharge of stockpiled material (soil, topsoil, base material, rubble) from entering drainage systems or surface waters. For any stockpiles or land clearing debris composed, in whole or in part, of sediment or soil, you must comply with the following requirements:
- i. Locate piles within the designated limits of disturbance.
 - ii. Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier.
 - iii. Where practicable provide cover or appropriate temporary

vegetative or structural stabilization to avoid direct contact with precipitation or to minimize the discharge of sediments.

- iv. Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or surface water.
- v. To the maximum extent practicable, contain and securely protect from wind.
- i. Minimize Dust – describe dust control procedures and practices that will be used to suppress dust and limit its generation (i.e. applying water, limiting the amount of bare soil exposed at one time etc.).
- j. Designate Washout Areas – describe the controls that will be used to minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, washout areas for concrete mixers, paint, stucco, etc. The recommended location(s) of washout areas should be identified, or at a minimum the locations where these washout areas should not be sited should be called out.
- k. Establish Proper Equipment/Vehicle Fueling and Maintenance Practices – Describe equipment/vehicle fueling and maintenance practices that will be implemented to prevent pollutants from mixing with stormwater (e.g. secondary containment, drip pans, spill kits, etc.). Provide recommended location(s) of fueling/maintenance areas, or, at minimum, locations where fueling/maintenance should be avoided.

3. **Control Practice Installation, Inspection, and Maintenance Requirements**

- a. Installation Requirements - Complete the installation of temporary erosion, runoff, sediment, and pollution prevention control measures by the time each phase of earth-disturbance has begun. All stormwater controls must be installed in accordance with good engineering practices, including applicable design specifications. Design specifications may be found in manufacturer specifications and/or the *Rhode Island Soil Erosion and Sediment Control (RISESC) Handbook* (as amended). Any departures from such specifications must be provided and demonstrated to reflect good engineering practices.
- b. Inspection Requirements
 - i. *Minimum Frequency* - Each of the following areas must be inspected by or under the supervision of the owner and operator at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event which generates at least 0.25 inches of rainfall per twenty-four (24) hour period and/or after a significant amount of runoff:
 - a. All areas that have been cleared, graded, or excavated and that have not yet completed

stabilization;

- b. All stormwater erosion, runoff, and sediment control measures (including pollution prevention practices) installed at the site to comply with this permit;
 - c. Construction material, unstabilized soil stockpiles, waste, borrow, or equipment storage, and maintenance areas that are covered by this permit and are exposed to precipitation;
 - d. All areas where stormwater typically flows within the site, including temporary drainage ways designed to divert, convey, and/or treat stormwater;
 - e. All points of discharge from the site;
 - f. All locations where temporary or permanent soil stabilization measures have been implemented.
 - g. All locations where vehicles enter or exit the site.
- ii. *Qualified Personnel* – The site owner and operator are responsible for designating personnel to conduct inspections and for ensuring that the personnel who are responsible for conducting the inspections are “qualified” to do so. A “qualified person” is a person knowledgeable in the principles and practices of erosion, runoff, sediment, and pollution prevention controls, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.
- iii. *Recordkeeping Requirements* - All records of inspections, including records of maintenance and corrective actions must be maintained with the SESC Plan. Inspection records must include the date and time of the inspection, and the inspector’s name, signature, and contact information.
- iv. *Reductions in Inspection Frequency* - If earth disturbing activities are suspended due to frozen conditions, inspections may be reduced to a frequency of once per month. The owner and operator must document the beginning and ending dates of these periods in the SESC Plan.
- v. Failure to make and provide documentation of inspections under

this part constitutes a violation of this permit and enforcement actions under 46-12 of R.I. General Laws may result.

- c. **Maintenance Requirements** – Site owners and operators must ensure that all erosion, runoff, sediment, and pollution prevention controls remain in effective operating condition and are protected from activities that would reduce their effectiveness. Site owners and operators must ensure that all erosion, runoff, sediment, and pollution prevention controls are inspected at the frequency established in Part III.J.3.b of this permit. If the designated site inspector finds a problem (i.e. erosion, runoff, sediment or pollution prevention controls require replacement, repair, or maintenance), the owner and operator must ensure that the necessary repairs or modifications are made in accordance with the following:
 - i. Initiate work to fix the problem immediately after discovering the problem, and complete such work by the close of the next work day, if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.
 - ii. When installation of a new control or a significant repair is needed, site owners and operators must ensure that the new or modified control practice is installed and made operational by no later than seven (7) calendar days from the time of discovery where feasible. If it is infeasible to complete the installation or repair within seven (7) calendar days, the reasons why it is infeasible must be documented in the SESC Plan along with the schedule for installing the stormwater control(s) and making it operational as soon as practicable after the 7-day timeframe. Where these actions result in changes to any of the stormwater control measures outlined in the SESC Plan, site owners and operators must modify the SESC Plan accordingly within seven (7) calendar days of completing this work in accordance with Part III.F.
 - iii. If corrective actions are required, the site owner and operator must ensure that all corrective actions are documented on the inspection report in which the problem was first discovered. These corrective actions must be documented, signed, and dated by the site operator once all necessary repairs have been completed.
- 4. **Site Plan Requirements** – Site Plans must depict all of the control measures required to meet the SESC Plan requirements of this permit. Depending on the complexity, the SESC Plan may reference the complete construction plan set prepared as part of the overall Stormwater Management Plan, and/or may have a specific SESC Plan Set developed. The SESC Plan should indicate the plan type (General, Drainage & Utility, SESC Plan, etc.) and sheet numbers where the following required information can be found:
 - a. Title & Date of Plan Set(s).

- b. Total Project Area, including all grading and/or excavation, and a defined Limit of Disturbance.
- c. Pre- and post-development drainage patterns.
- d. The location and name of the receiving waters and/or separate storm sewer system and the ultimate receiving waters that may be impacted during construction.
- e. Location of environmentally sensitive features and areas to be preserved and/or protected.
- f. Locations where stormwater discharges to a surface water or wetland.
- g. Location of all existing and proposed impervious surfaces/structures.
- h. Locations of potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site (i.e. exposed, unstabilized soil stockpiles and construction material and waste collection areas).
- i. Locations and timing of stabilization practices including phased clearing and grubbing based on scheduled activities.
- j. The location of all erosion, runoff, sediment, and pollution prevention control measures, including the location of temporary sediment basins, diversions, or other water quality, peak discharge, and volume control structures
- k. Areas within the project limits which are unsuitable for material storage areas, equipment storage areas, designated concrete washout collection areas, dumpsters, stockpiles, fueling locations, etc. (i.e. locations where these activities shall not occur, and recommendations of where they may occur).
- l. The location of spill prevention and response equipment.
- m. The location of all proposed post-construction best management practices including locations of infiltrating practices and prohibited traffic areas.

IV. NOTICE OF INTENT REQUIREMENTS

A. Contents of the Notice of Intent:

- 1. The owner's name, mailing address, telephone number, email address, contact person, and billing address.

2. The operator's name, mailing address, telephone number, email address, and contact information.
3. Construction site information, including the street address, latitude and longitude, nearest utility pole number, and Assessors plat and lot.
4. Information for construction sites that are part of a larger common plan of development or sale, including the name of the larger common plan of development and total disturbed area of the larger common plan.
5. The projected or actual construction commencement date and the projected construction completion date.
6. The total area of the site and total disturbed acres.
7. The name of the receiving water(s), or if the discharge is through a separate storm sewer system, the name of the operator of the separate storm sewer system and the ultimate receiving water(s), including the water body ID number, and whether the water body is a cold or warm water fishery.
8. Indicate whether or not the water body is considered impaired, provide the list of impairments if applicable, indicate whether or not the water body is an SRPW or if a TMDL has been completed for the receiving water body.
9. Indicate whether or not the proposed project is associated with a DEM Office of Waste Management (OWM) site?
10. Indicate whether or not the proposed project is associated with a previously submitted permit application or DEM enforcement action.
11. Identify whether or not the project meets the criteria for a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined by the *Rhode Island Stormwater Design and Installation Standards Manual* (as amended).
12. Will the site require a separate permit for the proposed industrial activity under Rule 31(b)15 of the RIPDES Regulations? If yes, describe.
13. Is the site within or directly discharging to a Natural Heritage Area (NHA)?
14. A signed certification by the Owner and Operator that the NOI and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. That the information submitted on the NOI and all attachments is true, accurate, and complete. In addition, the Owner and Operator indicate that a stormwater permit is contingent upon approval from the reviewing agency and that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. The Owner and Operator must also certify that they are aware that it is their responsibility to implement and amend the Soil Erosion and Sediment Control Plan as appropriate in accordance with the requirements of this permit.

15. A signed certification by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Stormwater Quality (CPSWQ), or a Registered Landscape Architect certifying that the construction activity is located completely outside of and does not discharge directly to a Natural Heritage Area found on RIDEM's web site [under Maps, Environmental Resource Map, Regulatory Overlays, Natural Heritage Area – Rare Species]. For projects that propose a stormwater or allowable non-stormwater discharge to a Natural Heritage Area, or has discharge related activities that potentially affect a listed or proposed to be listed endangered or threatened species or its critical habitat, the owner must submit a map showing the location of the construction site, including the street, nearest utility pole number, Assessors plat and lot, total area of the site, and the limits of disturbance.
16. A signed certification by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Stormwater Quality (CPSWQ), or a Registered Landscape Architect, that the SESC Plan has been developed in accordance to the requirements of this permit as well as all applicable guidelines of the *Rhode Island Soil Erosion and Sediment Control Handbook* (as amended) and the *Rhode Island Stormwater Design and Installation Standards Manual* (as amended). If the SESC Plan requires the practice of engineering, the NOI must be signed by a Registered Professional Engineer.
17. For construction activities that disturb an area greater than or equal to five (5) acres and are not required to obtain a RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP, the NOI must include a completed Stormwater Management Checklist as provided in Appendix A of the *Rhode Island Stormwater Design and Installation Standards Manual* (as amended) and a copy of the Stormwater Management Plan.
18. After review of the NOI, additional information may be required by this office to determine whether or not to authorize the discharge under this permit.

B. Where to Submit. A completed and signed NOI must be submitted to:

R.I. Department of Environmental Management
Office of Water Resources
RIPDES Permitting Program
235 Promenade Street
Providence, RI 02908

C. Additional Notification. Construction sites discharging stormwater must submit a copy of the NOI to the applicable Town or City Department in which the construction activity and the point of discharge is located.

D. Deficient If the NOI does not meet one or more of the minimum requirements of this permit, then the applicant will be notified as such by a deficiency letter at any point during the review period. It is the responsibility of the applicant to make all required changes in the plan and resubmit the application. The review period will recommence upon the departmental receipt of the revised application.

V. **GENERAL REQUIREMENTS**

- A. Duty to Comply. The permittee must comply with all conditions of this permit and any other applicable State, local and/or federal regulations. Any permit noncompliance constitutes a violation of Chapter 46-12 of the Rhode Island General Laws and the CWA and is grounds for enforcement action which may include, permit termination, revocation and reissuance, modification, or for the denial of a permit renewal application and the imposition of penalties.
1. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate this requirement.
 2. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such sections in a permit issued under Section 402 of the CWA. Any person who violates any condition of this permit is subject to a civil penalty of up to \$25,000 per day of such violation, as well as any other appropriate sanctions provided by Section 309 of the CWA. Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of up to \$10,000 or by imprisonment of not more than two (2) years, or by both.
 3. Chapter 46-12 of the R.I. General Laws provides that any person who violates a permit condition is subject to a civil penalty of not more than \$25,000 per day of such violation. Any person who willfully or negligently violates a permit condition is subject to a criminal penalty of not more than \$25,000 per day of such violation and imprisonment for not more than five (5) years, or both. Any person who knowingly makes any false statement in connection with the permit is subject to a criminal penalty of not more than \$5,000 for each instance of violation or by imprisonment for not more than thirty (30) days, or both.
- B. Continuation of the Expired General Permit. Provided the permittee has reapplied in accordance with paragraph C. below, an expired general permit continues in force and effect until a new general permit is issued. Only those construction sites previously authorized to discharge under the expired permit are covered by the continued permit.
- C. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain coverage under a new permit. The permittee shall submit a complete Notice of Intent at least thirty (30) days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director.
- D. Need to Halt or Reduce Activity Not a Defense. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- E. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any

discharge in violation of this permit, which has a reasonable likelihood of adversely affecting human health or the environment.

- F. Duty to Provide Information. The permittee shall furnish to the Department, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall furnish to the Director any documents that are required to be kept as part of this permit.
- G. Signatory Requirements. All Notices of Intent, Stormwater Management Plans, Soil Erosion and Sediment Control Plans, inspection reports, certifications, or other information submitted to the Director, or that this permit requires be maintained by the permittee shall be signed and certified in accordance with Rule 12 of the RIPDES regulations. R.I. General Laws, Chapter 46-12 provides that any person who knowingly makes any false statements, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$5,000 per violation, or by imprisonment for not more than thirty (30) days per violation, or by both.
- H. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the CWA.
- I. Release in Excess of Reportable Quantities. If a release in excess of a reportable quantity occurs, this office must be notified immediately. This permit does not relieve the permittee of the reporting requirements of 40 CFR 117 and 40 CFR 302. The discharge of hazardous substances in the stormwater discharge(s) from a facility shall be minimized in accordance with the applicable stormwater management plan for the facility, and in no case, during any twenty four (24) hour period, shall the discharge(s) contain a hazardous substance equal to or in excess of reportable quantities.
- J. Property Rights. The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.
- K. Severability. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.
- L. Transfers. This permit is not transferable to any person except after notice to the Director. The Director may require the owner and operator to apply for and obtain an individual RIPDES permit as stated in Part V.T. of this permit.
- M. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law.

N. Proper Operations and Maintenance. The permit shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the requirements of this permit.

O. Record Keeping

1. The permittee shall retain records of all inspections and reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the report or application. The records must be kept at the construction site at all times. If an on-site location is deemed impractical, notice of the location of the required records must be posted near the main entrance to the construction site. Once the construction project is complete and the permit has been terminated, records must be kept at either the completed project location or the records must be maintained by the owner of record at the time that the construction project was active. This period may be extended by request of the Director at any time.

P. Bypass of Stormwater Control

1. *Anticipated Bypass.* If the permittee knows in advance of the need for a bypass, he or she shall notify this Department in writing at least ten (10) days prior to the date of the bypass. Such notice shall include the anticipated quantity and the anticipated effect of the bypass.
2. *Unanticipated Bypass.* The permittee shall submit notice of an unanticipated bypass. Any information regarding the unanticipated bypass shall be provided orally within twenty four (24) hours from the time the permittee became aware of the circumstances. A written submission shall also be provided within five (5) days of the time the permittee became aware of the bypass. The written submission shall contain a description of the bypass and its cause; the period of the bypass; including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate and prevent reoccurrence of the bypass.
3. *Prohibition of Bypass.*
 - a. Bypass is prohibited and enforcement action against the permittee may be taken for the bypass unless:
 - i. The bypass was unavoidable to prevent loss of life, personal injury or severe property damage;
 - ii. The permittee submitted notices as required in paragraphs P.1. and P.2. above.
 - b. The Director may approve an unanticipated bypass after considering its adverse effects, if the Director determines that it will meet the two conditions in paragraph P.3.a. above.

Q. Upset Conditions

1. An upset constitutes an affirmative defense to an action brought for non-compliance with technology based permit limitations if the requirements of paragraph 2 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
 2. A permittee who wishes to establish an affirmative defense of an upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence, that:
 - a. An upset occurred and the permittee can identify the specific causes(s) of the upset;
 - b. The permittee facility was at the time being properly operated;
 - c. The permittee submitted notice of the upset as required in Rule 14.08 of the RIPDES Regulations; and
 - d. The permittee complied with any remedial measures required under Rule 14.05 of the RIPDES Regulations.
 3. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.
- R. Inspection and Entry. The permittee shall allow the Director, upon the presentation of credentials and other documents as may be required by law, to:
1. Enter upon the permittee's premises where a regulated activity is conducted, or where records must be kept under the conditions of this permit;
 2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 3. Inspect at reasonable times any equipment, practices, or operations regulated or required under this permit; and
 4. Sample or monitor any substances or parameters at any location, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA or R.I. law.
- S. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause, including but not limited to: violation of any terms or conditions of this permit; obtaining this permit by misrepresentation or failure to disclose all relevant facts; or a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
- T. Requiring an Individual Permit or an Alternative General Permit
1. The Director of the Department of Environmental Management (DEM) may require any owner or operator authorized to discharge stormwater under this permit to apply for and obtain either an individual or an alternative RIPDES general permit. Any interested person may petition the Director to take action under this paragraph. The Director may determine at his or her own discretion that an individual or an alternative general permit is required (see RIPDES Rule 32 for reasons why an

alternative permit may be required).

2. Any owner or operator authorized to discharge stormwater by this permit may request to be excluded from coverage of this permit by applying for coverage under an individual permit or an alternative general permit. The request shall be granted by the issuance of an individual permit only if the reasons cited by the owner or operator are adequate to support the request. The Director shall notify the permittee within a timely fashion as to whether or not the request has been granted.
3. If a facility requests or is required to obtain coverage under an individual or an alternative general permit, then authorization to discharge stormwater under this permit shall automatically be terminated on the date of issuance of the individual or the alternative general permit. Until such time as an alternative permit is issued, the existing general permit remains fully in force.

U. Reopener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with construction covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part V.T. of this permit or the permit may be modified to include different limitations and/or requirements.
2. Permit modification or revocation will be conducted in accordance with 40 CFR 122.62, 122.63, 122.64 and 124.5.

V. Availability of Reports. Except for data determined to be confidential under Part W.1. below, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the DEM at 235 Promenade Street, Providence, Rhode Island. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA and under Chapter 46-12-14 of the Rhode Island General Laws.

W. Confidentiality of Information

1. Any information submitted to DEM pursuant to these regulations may be claimed as confidential by the submitter, consistent with Rhode Island General Law 38-2-2. Any such claim must be asserted at the time of the submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, DEM may make the information available to the public without further notice.
2. Claims of confidentiality for the following information will be denied:
 - a. The name and address of any permit application or permittee;
 - b. Permit applications, permits and any attachments thereto; and
 - c. RIPDES effluent data.

- X. Right to Appeal. Within thirty (30) days of receipt of notice of final authorization, the permittee or any interested person may submit a request to the Director for an adjudicatory hearing to reconsider or contest that decision. The request for a hearing must conform to the requirements of Rule 49 of the RIPDES Regulations.

SUMMARY OF SIGNIFICANT CHANGES TO THE RIPDES CONSTRUCTION GENERAL PERMIT

Several significant changes from the previous (2008) General Permit for Construction Activities have been incorporated into the draft 2013 Permit. The Permit has been amended to be consistent with the 2010 *Rhode Island Stormwater Design and Installation Standards Manual* (RISDISM), to incorporate the 2009 EPA Federal effluent limitation guidelines (ELGs) and new source performance standards (NSPS) for the Construction and Development Point Source Category, and to streamline the permit application and authorization process. This document is not a comprehensive list of all edits and changes that have been made to the 2008 permit in the 2013 permit. Please carefully review the actual documents for this level of detail. The most significant changes are listed below:

1. Part I.B.1.a the following language was deleted If a construction site is within the jurisdiction of a Qualifying Local Program (QLP), and the operator of the construction activity is not required to obtain a RIDEM Freshwater Wetlands Permit, Coastal Resources Management Council (CRMC) permit, or a RIDEM Water Quality Certification, the operator must apply for QLP approval unless the operator is a Federal or State agency that has obtained RIPDES permit authorization from the Department. For sites requiring QLP approval, all conditions of this permit apply, with the exception of Parts V.L. and V.T. This permit does not pre-empt or supersede or expand the authority of local agencies to prohibit, restrict, or control discharges of storm-water to storm drains or other water courses within their jurisdiction;
2. Part I.B.2 Allowable non-stormwater discharges was amended to be consistent with allowable non-stormwater discharges in the RIPDES MSGP and MS4 permits.
3. Part I.B.3.c Limitations on Coverage has been modified and Part 1.B.3.d was added to reflect the requirements applicable to discharges to impaired waterbodies with or without a TMDL as specified in RISDISM Minimum Standard 3: Water Quality.
4. Part I.C. was amended to add a definition of owner/operator.
5. In order to align the permit requirements with the 2010 RISDISM which became effective in December 2010:
 - a. Part I.D. *Authorization* was amended to reflect application and permit streamlining in the Office of Water Resources and CRMC permitting programs since the issuance of the RISDISM.

The revised permit reduces the need for multiple applications to State Agencies by adding the Underground Injection Control (UIC) and Ground Permit to the list of permits that also serve as RIPDES permits and eliminates the requirement for activities in CRMC and WQC jurisdiction to submit an application to RIPDES.

This section was also re-organized to have separate sections for application requirements, deadlines to request authorization and a clear description of how and when projects will obtain authorization.

Owners and operators of construction activities that disturb greater than one (1) acre whose projects were previously authorized under the 2008 Construction Activity General Permit that obtained a RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, RI CRMC Assent or QLP approval are not required to re-apply in order to continue to be authorized under this permit. Owners and operators of construction activities that disturb greater than one (1) acre whose projects were previously authorized under the 2008 Construction Activity General Permit that did not obtain one of the above-mentioned permits are required to submit a NOI to continue to be authorized.

If your project was previously authorized under the 2008 Construction General Permit your Stormwater Management Plan must only be revised as necessary to comply with Part II.B of this permit. The Stormwater Management Plan shall be modified to comply with Part II.B within sixty (60) days of the effective date of this permit. A Stormwater Pollution Prevention Plan (SWPPP) developed under the previous (2008) construction general permit may serve to satisfy Part III of this permit, provided it adequately addresses all new requirements.

For new applications, submittal of a NOI is only required for construction activities that disturb greater than one (1) acre that are not required to obtain a RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval.

Application requirements for Construction activities that disturb an area equal to or greater than one (1) acre and less than five (5) acres were amended to include a project narrative and site plan/map showing flow paths, discharges, and receiving waters with the a complete NOI form.

- b. Part II. *Permit Limits and Conditions*, Part A. was amended to clarify that a Stormwater Management Plan consistent with the RISDISM must be developed for each construction project seeking coverage under this permit and provides an outline of the three (3) elements of a Stormwater Management Plan: 1) Stormwater Site Planning, Analysis, and Design, 2) Soil Erosion, Runoff, and Sediment Control, and 3) Post Construction Operation and

Maintenance. In cases where a project was previously authorized under the 2008 Construction General Permit the Stormwater Management Plan only has to be revised as necessary to comply with Part II.B (Soil Erosion, Runoff, and Sediment Control) within 60 days of the effective date of this permit. A Stormwater Pollution Prevention Plan (SWPPP) developed under the previous (2008) construction general permit may serve to satisfy Part III (Soil Erosion and Sediment Control Plan Requirements) of this permit, provided it adequately addresses all new requirements.

- c. Part II *Permit Limit and Conditions* has also been amended to refer to Minimum Standard 10 – Construction Erosion and Sedimentation Control and Minimum Standard 11: Operation and Maintenance and Minimum Standard 7: Pollution Prevention of the RISDISM.
 - d. Part III. *SOIL EROSION AND SEDIMENT CONTROL (SESC) PLAN REQUIREMENTS* has been amended to change the name of the plan required to address pollution associated with construction activity from a Stormwater Pollution Prevention Plan to a Soil Erosion and Sediment Control Plan. This name change has been made to better align the permit with the requirements of the RISDISM. Part III B requires measures to be designed, implemented and maintained in accordance with the RI Soil Erosion and Sediment Control (RISESC) Handbook in order to be consistent with Standard 10 of the RISDISM which also contains this requirement.
6. The Soil Erosion and Sediment Control Plan (SESC Plan) (formerly known as a Stormwater Pollution Prevention Plan) has undergone some minor enhancements to be consistent with the RISDISM and the RISESC Handbook. The SESC Plan as required by Part III of the general permit must address :
- a. The required elements of SESC Plans are specifically listed in Part III.J of the permit and additional guidance has been included to better clarify the intent of these required elements.
 - b. More prescriptive installation and maintenance requirements have been established for storm drain inlets and perimeter controls and sediment barriers (see Part III.J.1.d and f, respectively).
 - c. Clearer maintenance requirements have been established in the draft permit to ensure that work is initiated to fix a problem immediately after it is discovered, and that the owner/operator complete such work by the close of the next work day, if the control practice problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.
 - d. The requirements for pollution prevention and good housekeeping have been re-organized in Part III.J.2 of the permit entitled “Construction Activity Pollution Prevention Requirements”.

7. On December 1, 2009, EPA published in the Federal Register (74 FR 62995) effluent limitation guidelines (ELGs) and new source performance standards (NSPS) for the Construction and Development Point Source category. These requirements are referred to as “the C&D rule”. The required narrative standards contained in the C&D rule have been incorporated into this draft permit either directly as specific permit requirements or by reference to relevant design and guidance documents already in existence. Rule 15 of the RI Water Quality Regulations addresses procedures for the review of applications, and states that in consideration of an application the Department may use but is not limited to, a variety of design documents including: the *Rhode Island Soil Erosion and Sediment Control (RISESC) Handbook* (as amended) and the *Rhode Island Stormwater Design and Installation Standards Manual (RISDISM)* (as amended). In addition, a specific permit requirement has been added which requires control measures to be designed, implemented, and maintained in accordance with these two design documents. Listed below in *italics* are each of the C&D rule narrative requirements and a description of how these requirements have been addressed in the draft permit:

- a. *Erosion and Sediment Controls. Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:*
 - i. *Control stormwater volume and velocity within the site to minimize soil erosion in order to minimize pollutant discharges.* This narrative requirement is addressed through required compliance with in RISDISM Minimum Standard 10 – Construction Erosion and Sedimentation Control.
 - ii. *Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize channel and streambank erosion in the immediate vicinity of discharge points.* This narrative requirement is addressed through required compliance with RISDISM Minimum Standard 10 – Construction Erosion and Sedimentation Control.
 - iii. *Minimize the amount of soil exposed during construction activity.* This narrative requirement is addressed through required compliance with RISDISM Minimum Standard 1, Low Impact Development Site Planning and Design Strategies, Section 3.3.1.3, Appendix A Checklist 1.D. Locating Sites in Less Sensitive Areas, and Section 4.5.1 that require that land disturbance be minimized.
 - iv. *Minimize the disturbance of steep slopes.* This narrative requirement is addressed through required compliance with RISDISM Minimum Standard 1, Low Impact Development Site Planning and Design Strategies, Section 3.3.1.3 and Appendix A Checklist 1.D Locating Sites

in Less Sensitive Areas, and Section 4.5.1 Avoid the Impacts which requires that development on steep slopes be avoided to the maximum extent practicable.

- v. *Minimize sediment discharges from the site. The design, installation, and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.* This narrative requirement is addressed through required compliance with RISDISM Minimum Standard 10 – Construction Erosion and Sedimentation Control.

- vi. *Provide and maintain natural buffers around waters of the United States, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce pollutant discharges, unless infeasible.* This narrative requirement is addressed through the DEM Freshwater Wetlands regulations and Coastal Resources Management Council regulations for inland and coastal buffers. These Regulations also require compliance with RISDISM Minimum Standard 1, Low Impact Development (LID) Site Planning and Design Strategies and Section 4.5 LID Site Planning and Design Criteria which requires applicants to maximize the protection of natural drainage areas, streams, surface waters, and jurisdictional wetland buffers. Section 4.5.1 Avoid the Impacts, also requires the preservation of buffers and floodplains by delineating and preserving naturally vegetated riparian buffers and floodplains and implementing measures to ensure that buffers and native vegetation are protected throughout planning, design, construction, and occupancy.

- vii. *Minimize soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it can be compacted. Unless infeasible, preserve topsoil. Preserving topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed.* These narrative requirements are addressed through required compliance with RISDISM Minimum Standard 1, LID Site Planning and Design Strategies. Section 3.3.1 LID Site Planning and Design Criteria requires the minimization of soil compaction and restoration of soils compacted as a result of construction activities or prior development. In addition, Appendix B of the RISDISM, General Planting Guidance for LID Practices specifically requires that whenever possible, topsoil should be spread to a depth of four inches (two inch minimum) over the entire area to be planted.

b. Soil Stabilization. *Stabilization of disturbed areas must, at a minimum, be*

initiated immediately whenever any clearing, grading, excavating, or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be employed as specified by the permitting authority. Stabilization must be completed within a period of time determined by the permitting authority. In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed. This narrative requirement is addressed directly by a specific permit requirement in Part III.J.1.c.

- c. Dewatering. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls. This narrative requirement is addressed directly by a specific permit requirement in Part III.J.2.f of the Soil Erosion and Sediment Control Plan requirements.*
- d. Pollution Prevention Measures. Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:
 - i. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provide equivalent or better treatment prior to discharge;*
 - ii. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).*
 - iii. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.**

These narrative requirements are addressed directly by specific permit requirements in Part III.J.2.c & d of the Soil Erosion and Sediment Control Plan requirements entitled: Construction Activity Pollution Prevention Requirements, Proper Waste Disposal and Spill Prevention and Control, respectively.

e. Prohibited Discharges. *The following discharges are prohibited:*

- iv. *Wastewater from washout of concrete, unless managed by an appropriate control;*
- v. *Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;*
- vi. *Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and*
- vii. *Soaps or solvents used in vehicle and equipment washing*

These narrative requirements are addressed directly by specific permit requirements in Part III.J.2.a of the Soil Erosion and Sediment Control Plan requirements, Prohibited Discharges.

f. Surface Outlets. *When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface, unless infeasible.* This narrative requirement is addressed directly by specific permit requirements in Part III.J.1.i of the Soil Erosion and Sediment Control Plan requirements.

FACT SHEET
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM
STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITY
(Revised September 2013)

BACKGROUND

In 1987, amendments to the CWA added Section 402(p), which set up the framework to regulate stormwater under the National Pollutant Discharge Elimination System (NPDES) program. In 1990, EPA issued final regulations that established application requirements for stormwater permits. These regulations require owners or operators of specific categories of industrial activities (see 40 CFR 122.26(b)(14)), which discharge stormwater directly to the waters of the United States, or indirectly through a separate storm sewer system, via a point source conveyance to obtain a NPDES stormwater permit. Construction activities that disturb at least five acres of land and have point source discharges to waters of the United States are included as an "industrial activity (see 40 CFR 122.26(b)(14)(x)). On December 8, 1999, EPA issued the Phase II final regulations, which require permit applications for point source stormwater discharges from small construction activities resulting from land disturbances greater than or equal to one acre and less than five acres (small construction activity is defined in 40 CFR 122.26(b)(15)(i)).

As an EPA delegated state, Rhode Island is authorized to issue individual or general permits under the Rhode Island Pollutant Discharge Elimination System (RIPDES) to cover discharges of industrial stormwater and small construction activity. In 1993, RIDEM's Office of Water Resources (OWR) developed a state wide General Permit to cover stormwater discharges from construction sites, which disturb five acres or more of land. The Department reissued this general permit on September 9, 2003, with changes to authorize stormwater discharges from construction sites which disturb one or more acres of land. Again in September 2008 the Department reissued this general permit in order to continue to be able to issue authorizations to discharge stormwater from construction sites which disturb one or more acres of land.

At this time the Department is proposing to reissue a draft General Permit to continue authorization of stormwater discharges from construction sites which disturb one or more acres of land. The requirements set forth in this permit are from the State's Water Quality Regulations and the State's Regulations for the Rhode Island Pollutant Discharge Elimination System, both filed pursuant to RIGL Chapter 46-12, as amended. The Office has determined that all permit limitations are consistent with the Rhode Island Antidegradation policy. The final effluent limitations, permit conditions, monitoring and reporting requirements may be found in the permit. The general and specific conditions of the permit are based on the RIPDES regulations as well as 40 CFR Parts 122 through 125 and consist primarily of management requirements common to all permits.

On December 1, 2009, EPA published in the Federal Register (74 FR 62995) effluent limitation guidelines (ELGs) and new source performance standards (NSPS) for the Construction and Development Point Source category. These requirements are referred to as "the C&D rule".

States, including Rhode Island, are required to incorporate requirements consistent with the new EPA C&D rule requirements, or narrative standards, into any reissued NPDES construction stormwater permits. The required narrative standards contained in the C&D rule have been incorporated into this draft permit either directly as specific permit requirements or by reference to relevant design and guidance documents already in existence. Rule 15 of the RI Water Quality Regulations addresses procedures for the review of applications, and states that in consideration of an application the Department may use but is not limited to, a variety of design documents including: the *Rhode Island Soil Erosion and Sediment Control (RISESC) Handbook* (as amended) and the *Rhode Island Stormwater Design and Installation Standards Manual (RISDISM)* (as amended). In addition, a specific permit requirement has been added which requires control measures to be designed, implemented, and maintained in accordance with these two design documents.

The draft permit proposed will be effective for a five year period, the maximum allowable under Federal NPDES Rules

For all construction activities required to submit a Notice of Intent (NOI) to RIPDES (see Part I.D of the Permit), the owner and/or operator must fill out and submit a standardized NOI form to:

RI Department of Environmental Management
Office of Water Resources – RIPDES Permitting Program
235 Promenade Street
Providence, RI 02908

To terminate coverage under this Permit at the end of a project, an owner and/or operator must submit a completed standardized Notice of Termination (NOT) form to the same address in accordance with Part I.E of the permit. Upon DEM receipt of the completed NOT, coverage under this general permit is terminated.

AUTHORIZATION (Part I.D.)

For Construction Activities that were authorized under the 2008 General Permit that are expected to continue beyond the expiration date of the 2008 permit, only activities that did not obtain a RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval must submit an NOI within sixty (60) days of the effective date of this Permit to continue coverage and will be authorized upon re-submittal of the NOI.

Construction Activities previously authorized under the 2008 Construction Activity General Permit that are expected to continue beyond the expiration date of the 2008 permit that have an active RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval are not required to re-submit a NOI and will be authorized upon the effective date of the permit.

All previously authorized projects must modify their existing Stormwater Management Plan to comply with Part II.B *Soil Erosion, Runoff, and Sediment Control* of this permit within sixty (60)

days of the effective date in order to maintain permit coverage.

All previously authorized projects that discharge to impaired waters with or without an approved TMDL or other water quality determination and have maintained coverage under the 2008 permit (e.g. timely re-application to RIPDES or a RIDEM Freshwater Wetlands Permit, RIDEM Water Quality Certification, RIDEM UIC/Ground Permit, CRMC Assent or QLP approval that remains in effect), are eligible for coverage and are not required to modify their existing Stormwater Management Plan except as mentioned above.

For construction activities that commence after the effective date of this Permit and are required to submit an NOI to RIPDES (see Part I.D of the Permit), the NOI must be submitted at least thirty (30) days prior to the commencement of land disturbing activities. Authorization will be granted in accordance with Part I.D.3.

Regardless of the means of obtaining approval, the permittee is still responsible for complying with all terms and conditions of this permit and any other applicable State, local and/or federal regulations. The Department will be held harmless for any failure of the permittee to comply with this Permit. Regardless of whether or not the NOI is reviewed by this Office, the permittee is responsible for complying with all terms and conditions of this permit and any other applicable State or federal regulations.

PERMIT LIMITS AND CONDITIONS (Part II)

Water Quality Based Effluent Limits:

Part I.B.3.c. and d. of the Permit requires that in order to be eligible for authorization, activities that discharge Stormwater associated with construction to impaired waters identified in the latest State of Rhode Island 303(d) List of Impaired Waters, must implement a Stormwater Management Plan in accordance with the RISWDISM that addresses the Stormwater Management Standards applicable to new and redevelopment and the pollutant(s) of concern. If the site will discharge into any water for which there is an EPA approved or established Total Maximum Daily Load (TMDL) or other water quality determination, the Stormwater Management Plan must incorporate measures or controls that are consistent with the assumptions and requirements of the TMDL.

2009 effluent limitation guidelines (ELGs) and new source performance standards (NSPS):

The Permit has been amended to incorporate the 2009 EPA Federal effluent limitation guidelines (ELGs) and new source performance standards (NSPS) for the Construction and Development Point Source Category.

Listed below in *italics* are each of the C&D rule narrative requirements and a description of how these requirements have been addressed in the draft permit:

- a. *Erosion and Sediment Controls. Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:*
- i. *Control stormwater volume and velocity within the site to minimize soil erosion in order to minimize pollutant discharges.* This narrative requirement is addressed through compliance with RISDISM Minimum Standard 10 – Construction Erosion and Sedimentation Control.
 - ii. *Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize channel and streambank erosion in the immediate vicinity of discharge points.* This narrative requirement is addressed through compliance with RISDISM Minimum Standard 10 – Construction Erosion and Sedimentation Control.
 - iii. *Minimize the amount of soil exposed during construction activity.* This narrative requirement is addressed through compliance with RISDISM Minimum Standard 1, Low Impact Development Site Planning and Design Strategies, Section 3.3.1.3., Appendix A Checklist 1.D. Locating Sites in Less Sensitive Areas and Section 4.5.1 that require that land disturbance be minimized.
 - iv. *Minimize the disturbance of steep slopes.* This narrative requirement is addressed through compliance with RISDISM Minimum Standard 1, Low Impact Development Site Planning and Design Strategies, Section 3.3.1.3 and Appendix A Checklist 1.D. Locating Sites in Less Sensitive Areas, and Section 4.5.1 Avoid the Impacts that require that Development on Steep Slopes avoided to the maximum extent practicable.
 - v. *Minimize sediment discharges from the site. The design, installation, and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.* This narrative requirement is addressed through compliance with RISDISM Minimum Standard 10 – Construction Erosion and Sedimentation Control.
 - vi. *Provide and maintain natural buffers around waters of the United States, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce pollutant discharges, unless infeasible.* This narrative requirement is addressed through the DEM Freshwater Wetlands regulations and Coastal Resources Management Council regulations for inland and coastal buffers. These Regulations also require compliance with RISDISM Minimum Standard 1, Low Impact Development (LID) Site Planning and Design Strategies and Section 4.5 LID Site Planning and Design Criteria which requires applicants to maximize the protection of natural drainage areas, streams, surface waters,

and jurisdictional wetland buffers. Section 4.5.1 Avoid the Impacts, also requires the preservation of buffers and floodplains by delineating and preserving naturally vegetated riparian buffers and floodplains and implementing measures to ensure that buffers and native vegetation are protected throughout planning, design, construction, and occupancy.

- vii. *Minimize soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it can be compacted. Unless infeasible, preserve topsoil. Preserving topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed.* These narrative requirements are addressed through compliance with RISDISM. Minimum Standard 1, LID Site Planning and Design Strategies, Section 3.3.1.4 LID Site Planning and Design Criteria that requires the minimization of soil compaction and restoration of soils compacted as a result of construction activities or prior development. In addition, Appendix B of the RISDISM, General Planting Guidance for LID Practices specifically requires that whenever possible, topsoil should be spread to a depth of four inches (two inch minimum) over the entire area to be planted.
- b. *Soil Stabilization. Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating, or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be employed as specified by the permitting authority. Stabilization must be completed within a period of time determined by the permitting authority. In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed.* This narrative requirement is addressed directly by a specific permit requirement in Part III.J.1.c.
- c. *Dewatering. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls.* This narrative requirement is addressed directly by a specific permit requirement in Part III.J.2.f of the Soil Erosion and Sediment Control Plan requirements.
- d. *Pollution Prevention Measures. Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:*
 - i. *Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provide equivalent or better treatment prior to discharge;*

- ii. *Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).*
- iii. *Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.*

These narrative requirements are addressed directly by specific permit requirements in Part III.J.2.c&d of the Soil Erosion and Sediment Control Plan requirements entitled: Construction Activity Pollution Prevention Requirements, Proper Waste Disposal and Spill Prevention and Control respectively.

- e. Prohibited Discharges. *The following discharges are prohibited:*
 - iv. *Wastewater from washout of concrete, unless managed by an appropriate control;*
 - v. *Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;*
 - vi. *Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and*
 - vii. *Soaps or solvents used in vehicle and equipment washing*

These narrative requirements are addressed directly by specific permit requirements in Part III.J.2.a of the Soil Erosion and Sediment Control Plan requirements, Prohibited Discharges.

- f. Surface Outlets. *When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface, unless infeasible.* This narrative requirement is addressed directly by specific permit requirements in Part III.J.1.i of the Soil Erosion and Sediment Control Plan requirements.

SOIL EROSION AND SEDIMENT CONTROL (SESC) PLAN REQUIREMENTS (Part III)

The Soil Erosion and Sediment Control (SESC) Plan shall describe and ensure the implementation of stormwater control measures which are to be used to reduce or eliminate pollutants in stormwater discharge(s) from the site and assure compliance with the terms and conditions of this permit. Control practice selection shall include an evaluation of the effectiveness of available practices and be made with proper references.

Soil erosion, runoff, sediment, and pollution prevention control measures must be designed, implemented, and maintained in accordance with the requirements of this permit and in accordance with the design specifications and guidance contained in the *Rhode Island Soil Erosion and Sediment Control (RISESC) Handbook* (as amended) and the *Rhode Island Stormwater Design and Installation Standards Manual (RISDISM)* (as amended).

Part III. J. 1. contains the following Erosion, Runoff, and Sediment Control Requirements:

- 1) Phase Construction Activity
- 2) Control Stormwater Flowing Onto and Through the Project
- 3) Stabilize Soils
- 4) Protect Storm Drain Inlets
- 5) Protect Storm Drain Outlets
- 6) Establish Perimeter Controls and Sediment Barriers
- 7) Establish Temporary Controls For The Protection of Post Construction Stormwater Practices
- 8) Temporary Sediment Trapping and Temporary Stormwater Conveyance Practices
- 9) Utilize Surface Outlets
- 10) Properly Use Treatment Chemicals

Part III. J. 2. contains the following Construction Activity Pollution Prevention Requirements:

- 1) Prohibited Discharges
- 2) Minimize Off-Site Tracking of Sediments
- 3) Proper Waste Disposal
- 4) Spill Prevention and Control
- 5) Control of Allowable Non-Stormwater Discharges
- 6) Control Dewatering Practices
- 7) Establish Proper Building Material Staging Areas
- 8) Control Discharges from Stockpiled Sediment or Soil
- 9) Minimize Dust
- 10) Designate Washout Areas
- 11) Establish Proper Equipment/Vehicle Fueling and Maintenance Practices

Part III.J.3 contains the following Control Practice Installation, Inspection, and Maintenance Requirements:

- 1) Installation Requirements - Complete the installation of temporary erosion, runoff, sediment, and pollution prevention control measures by the time each phase of earth-disturbance has begun. All stormwater controls must be installed in accordance with good engineering practices, including applicable design specifications. Design specifications may be found in manufacturer specifications and/or the *Rhode Island Soil Erosion and Sediment Control (RISESC) Handbook* (as amended).
- 2) Inspection Requirements : Sites must be inspected by or under the supervision of

the owner and operator at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event which generates at least 0.25 inches of rainfall per twenty-four (24) hour period and/or after a significant amount of runoff.

- 3) Maintenance Requirements – Site owners and operators must ensure that all erosion, runoff, sediment, and pollution prevention controls remain in effective operating condition and are protected from activities that would reduce their effectiveness.

Part III.J.4 outlines the contents of Site Plan Requirements

Part IV. outlines the Notice of Intent Requirements

CHANGES IN THIS PERMIT

The Permit has been amended to be consistent with the 2010 *Rhode Island Stormwater Design and Installation Standards Manual* (RISDISM), to incorporate the 2009 EPA effluent limitation guidelines (ELGs) and new source performance standards (NSPS), and to streamline the Application and Authorization process. A detailed summary of changes can be found on RIDEM's website at <http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/index.htm>

COMMENT PERIOD, HEARING REQUESTS, AND PROCEDURES FOR FINAL DECISIONS

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period no later than 4:00 pm on September 13, 2013, to the Rhode Island Department of Environmental Management, Office of Water Resources, 235 Promenade Street, Providence, Rhode Island, 02908-5767.

Commenters may request a longer comment period if necessary to provide a reasonable opportunity to comply with these requirements. Comments should be directed to Rhode Island Department of Environmental Management, RIPDES Program Permitting Section - Office of Water Resources, 235 Promenade Street, Providence, RI 02908-5767. In reaching a final decision on the draft permit the Director will respond to all significant comments and make these responses available to the public at DEM's Providence Office.

Pursuant to Chapter 42-17.4 of the Rhode Island General Laws a public hearing has been scheduled to consider these permits **if requested**. Requests for a Public Hearing must be submitted in writing to the attention of Brian D. Lafaille at the address indicated above. Notice should be taken that **if DEM receives a request** from twenty-five (25) people, a governmental agency or subdivision, or an association having no less than twenty-five (25) members on or before 4:00 p.m., September 9, 2013, a public hearing will be held at the following time and place:

September 12, 2013 at 5:00 p.m.
Room 280

235 Promenade Street
Providence, Rhode Island 02908

Interested persons should contact DEM to confirm if a hearing will be held at the time and location noted above.

Following the close of the comment period, and after a public hearing, **if such hearing is held**, the Director will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within thirty (30) days following the notice of the final permit decision any interested person may submit a request for a formal hearing to reconsider or contest the final decision. Requests for formal hearings must satisfy the requirements of Rule 49 of the Regulations for the Rhode Island Pollutant Discharge Elimination System.

DEM CONTACTS

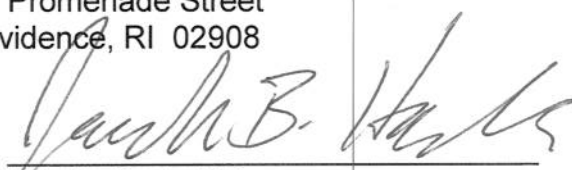
Additional information concerning the General Permit may be obtained by contacting Brian Lafaille, PE Senior Sanitary Engineer via email at brian.lafaille@dem.ri.gov or by telephone at (401) 222-4700 ext. 7731, between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday, excluding holidays, or by writing to the Office at:

RI Department of Environmental Management
Office of Water Resources – RIPDES Permitting Program
235 Promenade Street
Providence, RI 02908

Date

9/24/13

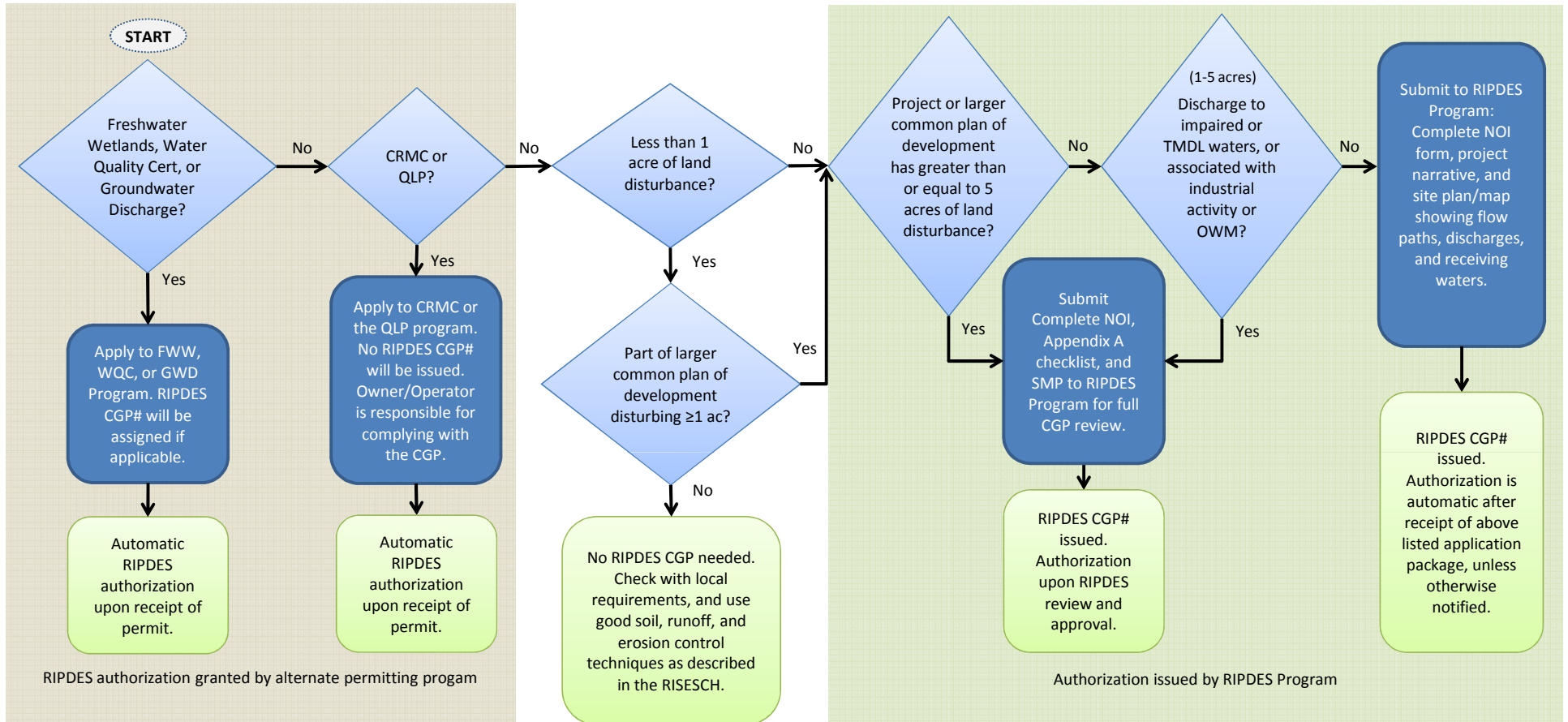
for


Eric A. Beck, PE
Supervising Sanitary Engineer
Permitting Section
Office of Water Resources
Department of Environmental Management



Rhode Island Pollutant Discharge Elimination System (RIPDES) 2013 Construction General Permit (CGP) APPLICATION GUIDANCE

To whom and what to submit to obtain authorization from RIPDES to discharge stormwater associated with construction activity.



ACRONYMS AND ABBREVIATIONS:

CGP - Construction General Permit (RIPDES)
 CRMC - Coastal Resources Management Council
 FWW - Freshwater Wetlands Program
 GWD - Groundwater Discharge Program (includes UIC)
 NOI - Notice of Intent (RIPDES permit application form)
 NOT - Notice of Termination (RIPDES permit termination form)
 OWM - Office of Waste Management (RIDEM)
 QLP - Qualified Local Program

RIDEM - Rhode Island Department of Environmental Management
 RIPDES - Rhode Island Pollutant Discharge Elimination System
 RISDISM - Rhode Island Stormwater Design and Installation Standards Manual
 RISESCH - Rhode Island Soil Erosion and Sediment Control Handbook
 SMP - Stormwater Management Plan
 TMDL - Total Maximum Daily Load
 UIC - Underground Injection Control
 WQC - Water Quality Certification Program

Permit applications to the RIPDES Program must be submitted at least **thirty (30) days prior** to the commencement of land disturbing activities, per Part I.D.2.b of the CGP entitled "Deadlines for Requesting Authorization."

Regardless of the permit issuing program, owners/operators must submit a **Notice of Termination (NOT)** form to the RIPDES Program upon completion of construction and final stabilization of all permitted project sites.



RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767

TDD 401-222-4462

Dear Applicant:

Section 46-12-15(b) of the Rhode Island General laws of 1956, Title 46, Chapter 12 entitled Water Pollution, as amended, prohibits the discharge of pollutants into waters of the State. The only exceptions are discharges in compliance with the terms and conditions of a Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit issued in accordance with State Regulations.

Rule 31 of the RIPDES Regulations, requires permit coverage for construction sites disturbing equal to and greater than one acre, as well as sites less than one acre of total land area that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one acre.

To request authorization under the General Permit for Stormwater Discharge Associated with Construction Activity, which was reissued and became effective on September 26, 2013, applicants must follow the submission requirements under Part I.D of the permit. Enclosed with this letter is a copy of the Construction General Permit Notice of Intent (NOI) Application Form. Provided all the required information is submitted and it is determined that a general permit is appropriate for the proposed site, authorization will be granted in accordance with Part I.D. of this permit. The 2013 Construction General Permit expires at midnight September 25, 2018.

A non-refundable application fee is due at the time the NOI is submitted to this office in the form of a check or money order, payable to the General Treasurer of the State of Rhode Island (**note: no fee if only an NOI is required to be submitted, \$400 fee if a NOI and a Stormwater Management Plan is required to be submitted**). The review for completeness of the application will not be made until the fee is paid. The check of money order and the attached Application(s) Fee Form must be submitted to:

Department of Environmental Management
Office of Management Services
235 Promenade Street
Providence, RI 02908

Return the completed NOI form to:

Department of Environmental Management
Office of Water Resources
RIPDES Program
235 Promenade Street
Providence, RI 02908

Any questions about the General Permit or the NOI Form should be directed to the RIPDES Program Staff, Permitting Section at (401) 222-4700.

Sincerely,

Eric A. Beck, P.E.
Supervising Sanitary Engineer



RHODE ISLAND POLLUTANT DISCHARGE
ELIMINATION SYSTEM (RIPDES)
NOTICE OF INTENT (NOI)
STORMWATER GENERAL PERMIT FOR
CONSTRUCTION ACTIVITY
(Revised September 2013)

DEM USE ONLY

Date NOI Received _____

Date Fee Received _____

RIPDES# RIR _____

CHECK ONLY ONE ITEM	<input type="checkbox"/> New Request for Permit Authorization
	<input type="checkbox"/> Re-Application for RIPDES Authorization No. RIR _____, which expires on September 25, 2013.
	<input type="checkbox"/> Amendment to RIPDES Authorization No. RIR _____.

I. OWNER

Name:			
Mailing Address:			
City:	State:	Zip:	Phone: ()
Contact Person:	Title:		
Email Address of Contact Person:			
Billing Address (if different than above):			
City:	State:	Zip:	

II. OPERATOR (if different from Owner)

Name:			
Local Mailing Address:			
City:	State:	Zip:	Phone: ()
Contact Person:	Title:		
Email Address of Contact Person:			

III. CONSTRUCTION SITE INFORMATION

Site's Official or Legal Name:			
Street Address:			
City:	State:	Zip:	Phone:
Latitude (to nearest 15 sec.) _____ Deg. _____ Min. _____ Sec.		Longitude (to nearest 15 sec.) _____ Deg. _____ Min. _____ Sec.	
Nearest Utility Pole Number:	Assessors Plat:	Lot:	

Is the construction site part of a larger common plan of development or sale? YES NO

List Name of Larger Common Plan: _____ Total Disturbed Acres of Common Plan _____ Acres

Projected or Actual Construction Commencement Date _____
MM/DD/YY

Projected Construction Completion Date _____
MM/DD/YY

Area of Site: Total Acres: _____ Proposed Area of Disturbance in Acres: _____

IV. DISCHARGE LOCATION INFORMATION

Note: If stormwater from the site discharges to a Combined Sewer Overflow a RIPDES authorization for the construction activity is not necessary, please confirm that the discharge will enter a combined sewer system with the appropriate sewer authority.

Separate Storm Sewer System (MS4) Name: _____

Unnamed stream or wetlands connected to named receiving water body. Name: _____

Ultimate Receiving Water Body Name: _____ Water Body ID#: _____

Is the receiving water body classified as a Cold or Warm Water Fishery? Cold Water Warm Water Unassessed

Is the receiving water body on the most recent State of RI 303(d) List of Impaired Waters?

YES NO

If yes, list any applicable impairments:

Is the Receiving Water(s) designated as a Special Resource Protection Water (SRPW)? YES NO

Has a TMDL been completed for the receiving water body? YES NO

If yes, list any applicable impairments:

Is the project associated with a DEM Office of Waste Management (OWM) site? YES NO ;

If yes, please describe and provide a DEM OWM contact:

Is the proposed project associated with a previous permit application or enforcement action? YES NO ;

If yes, please describe: _____

Does the project meet the criteria for a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined by the RI Stormwater Design & Installation Standards Manual (as amended)?

YES NO If yes, describe:

Will the site require a separate permit for the proposed industrial activity under Rule 31(b)15 of the RIPDES Regulations? YES NO

If yes, describe:

Is the site within or directly discharging to a Natural Heritage Area (NHA)?

YES NO

V. OWNER/OPERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate 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 am aware that if review of the Stormwater Management Plan is performed by the DEM RIPDES Permitting Program, Freshwater Wetlands Section, Water Quality Certification Program, the UIC/Ground Permit Program, Coastal Resources Management Council, or by a city/town which has adopted a DEM approved Soil Erosion and Sediment Control Ordinance, then a Stormwater Permit from this office is contingent upon approval from the reviewing agency. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am aware that it is the responsibility of the owner/operator to implement and amend the Soil Erosion and Sediment Control Plan as appropriate in accordance with the requirements of the General Permit.

Print Owner Name & Company _____

Print Owner Title _____

Signature _____ Date _____

Print Operator Name & Company _____

Print Operator Title _____

Signature _____ Date _____

VI. PROFESSIONAL CERTIFICATION - NATURAL HERITAGE AREAS

I certify under penalty of law that the Natural Heritage Area Information under Section IV of this NOI was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate 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 at the time this application is made. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name of Professional & Company _____

Print Professionals Title* _____

Registration or License Number _____

Signature _____ Date _____

*Must be signed by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ), or a Registered Landscape Architect.

VII. PROFESSIONAL CERTIFICATION - SOIL EROSION AND SEDIMENT CONTROL PLAN DEVELOPMENT

Note: The purpose of this certification is to document that a site specific Soil Erosion and Sediment Control Plan was prepared consistent with the requirements of the General Permit. This certification by a professional does not alleviate or in any way limit the liability and sole responsibility of the Owner and Operator to properly implement the Soil Erosion and Sediment Control Plan and to amend the Soil Erosion and Sediment Control Plan as site conditions may require, so as to effectively control stormwater discharges leaving the site during the construction period.

I certify under penalty of law that a site specific Soil Erosion and Sediment Control Plan was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for developing the Soil Erosion and Sediment Control Plan, the Soil Erosion and Sediment Control Plan is, to the best of my knowledge and belief, true, accurate, and complete at the time this certification is made and has been developed in accordance to the requirements of the Permit as well as all applicable guidelines in the *Rhode Island Soil Erosion and Sediment Control (RISESC) Handbook* (as amended) and the *Rhode Island Stormwater Design and Installation Standards Manual* (as amended). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name of Professional & Company _____

Print Professionals Title* _____

Registration or License Number _____

Signature _____ Date _____

*Must be signed by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Stormwater Quality (CPSWQ), or a Registered Landscape Architect. If the Stormwater Management Plan requires the practice of engineering, this must be signed by a Registered Professional Engineer.

Note: Upon completion of the permitted project, the DEM must be notified via the submittal of a completed Notice of Termination. In accordance with Construction Activity General Permit Part V.L., this permit is not transferable to any person or group except after due notice to the Director. If no such notice is given, the named owner will be held liable for all fees and expenses levied to this permit.



RHODE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office of Water Resources



APPLICATION FEE FORM

Please complete the information below and **submit this completed form and your check (payable to "R.I. General Treasurer") for the appropriate fee directly to:**

R.I. Department of Environmental Management
Office of Management Services
235 Promenade Street
Providence, RI 02908

***** FEES ARE NOT REFUNDABLE *****

OWNER

Name:			
Mailing Address:			
City:	State:	Zip:	Phone: ()
Contact Person:	Title:		
Email Address of Contact Person:			
Billing Address (if different than above):			
City:	State:	Zip:	

CONSTRUCTION SITE INFORMATION

Site's Official or Legal Name:			
Street Address:			
City:	State:	Zip:	Phone:
Latitude (to nearest 15 sec.) ____ Deg. ____ Min. ____ Sec.	Longitude (to nearest 15 sec.) ____ Deg. ____ Min. ____ Sec.		
Nearest Utility Pole Number:	Assessors Plat:	Lot:	

APPLICATION TYPE: RIPDES Construction General Permit

NOTE: The application and all accompanying documents should be submitted to the appropriate section of the Office of Water Resources, 235 Promenade Street, Providence, RI 02908-5767. Application review will be initiated only upon receipt of the complete application fee.

FOR OFFICE USE ONLY

OMS Receipt Date: _____

Fee Amount Received: _____

Processor Initials: _____



RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office of Water Resources



INSTRUCTIONS FOR THE RI POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES)
NOTICE OF INTENT (NOI) - STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY

Who Must File A Notice of Intent (NOI) Form

Discharges of stormwater associated with construction activity to a water body of the State of Rhode Island are prohibited without a Rhode Island Pollutant Discharge Elimination System (RIPDES) permit. The operator of a construction activity that has such a stormwater discharge must obtain coverage under the RIPDES Stormwater General Permit. If you have questions about whether you need a permit under the RIPDES Stormwater program contact the Rhode Island Department of Environmental Management (RIDEM), Office of Water Resources, Permitting Section at (401) 222-4700.

If required to be submitted per Part I.D.1 of the permit, the original NOI form must be sent to:

RIDEM
Office of Water Resources
RIPDES Program
Permitting Section
235 Promenade Street
Providence, RI 02908

Please be sure to keep a copy for your files.

Completing the Form

You must type or print in the appropriate areas only. Abbreviate if necessary to save space.

Section I - Owner Information

Give the legal name of the person, firm, public (municipal) organization, or any other entity that owns the site described in this application (RIPDES Rules 3 & 12). The name of the owner may or may not be the same as the name of the site. Do not use a colloquial name. Enter the complete address and telephone number of the owner. Provide the name and email address of person to be contacted to answer questions on the construction project.

Section II - Operator Information

If the operator is the same as the owner do not complete this section. If the operator is different from the owner, provide the legal name of the person, firm, public (municipal) organization, or any other entity that has legal responsibility for the day-to-day operations of the site described in this application (RIPDES Rules 3 & 12). Enter the complete name, address, telephone number, and email address of the operator.

Section III - Construction Site Information

Enter the site's official or legal name and complete street address and telephone number, if available. Enter the latitude and longitude of the site (see next section,

Section IV for a link to the RIDEM ArcGIS map server tutorial which provides instructions on how to quickly obtain this information). Enter the number of the utility pole closest to the site and the assessor's plat and lot numbers of the site. Indicate if the site is part of a larger development by checking yes or no. If yes, please enter the name of the development and total area of disturbance of the larger common plan. Indicate the projected or actual construction commencement date and the projected construction completion date using the 2-digit code format for month/day/year (e.g. 01/31/09 for January 31, 2009). Enter the total area of the site (acres), and the area of disturbed land (acres).

Section IV - Discharge Location Information

An ArcGIS map server has been developed for use by the public to assist in obtaining pertinent regulatory and environmental information. The ArcGIS Environmental Resource Map can be found at the following web address:

<http://www.dem.ri.gov/maps/index.htm>

In addition, a tutorial with step by step instructions has been developed by the RIPDES Permitting Program to assist in completing this NOI by using the information available at the ArcGIS website. For access to this tutorial please refer to the following website: <http://www.dem.ri.gov/programs/benviron/water/permits/rripdes/index.htm>

If the stormwater from your site has the potential to discharge to a separate storm sewer system check the box and enter the name of the operator of the storm sewer system and enter the name of the ultimate surface water.

If the site discharges stormwater directly to a surface water body check the box and enter the name of the receiving water. Provide the ultimate receiving water body name and water body ID if different from the one already provided. Determine the water body ID number, if the receiving water body is a cold water or warm water fishery, if it is impaired, and if it is classified as an SRPW, or if is subject to a TMDL.

Identify if the project is associated with a DEM Office of Waste Management site, if yes provide a description and a DEM Office of Waste Management contact person.

If the project is associated with a previously submitted permit application or it is related to a DEM enforcement action please indicate.

Does the project meet the criteria for a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined by the RI Stormwater Design and Installation Standards Manual (as amended)?

<http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/stwater/t4guide/desman.htm>

If yes, describe.

Identify whether or not the site will require a separate permit for the proposed industrial activity under Rule 31(b)15 of the RIPDES Regulations by going to the following website:

<http://www.dem.ri.gov/pubs/regs/regs/water/ripdes03.pdf>

Or by referring to the RIPDES Multi-Sector General Permit for Stormwater Discharge Associated with Industrial Activity which can be found at the following website:

<http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/index.htm>

Determine if your site is within or directly discharging to a NHA. After obtaining this information from the ArcGIS webpage, check the appropriate box to indicate whether or not your site is within or directly discharging to an NHA.

Certification

State and federal statutes provide for severe penalties for submitting false information on this application form. State and federal regulations require this application to be signed as follows and in accordance with RIPDES Rule 12;

Section V - Owner/Operator Certification

Owner:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor;

For a Municipality, State, Federal or other public site: by either a principal executive officer or ranking elected official.

Operator:

This part needs to be filled out by the entity or the individuals that will have an ongoing role in the management and operation of the site during construction.

Section VI – Professional Certification - Natural Heritage Areas

This section must be signed/certified by a Registered Professional Engineer, a Certified Professional in Soil Erosion and Sediment Control (CPESC), or a Certified Professional in Stormwater Quality (CPSWQ), or a Registered Landscape Architect.

Section VII – Professional Certification - Soil Erosion and Sediment Control Plan Development

This section must be signed/certified by a Registered Professional Engineer, a Certified Professional in Soil Erosion and Sediment Control (CPESC), or a Certified Professional in Stormwater Quality (CPSWQ), or a Registered Landscape Architect. The purpose of this certification is to document that a site specific Soil Erosion and Sediment Control Plan was prepared consistent with the requirements of the General Permit prior to filing the NOI. This certification by a professional does not alleviate or in any way limit the liability and sole responsibility of the Owner/Operator to properly implement the Soil Erosion and Sediment Control Plan and to amend the Soil Erosion and Sediment Control Plan as site conditions may require, so as to effectively control stormwater discharges leaving the site during the construction period.

Paperwork Reduction Act Notice

Public burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. EPA determined this time estimate for the Federal NOI form and although the Rhode Island form requires additional information, it is considered minor and therefore this time estimate is believed to be valid for the State NOI form. Send comments regarding the burden estimate any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

ArcGIS Environmental Resource Map Tutorial

Overview

The RIDEM is providing access to ArcGIS on its website www.dem.ri.gov in order to provide the public with easier access to pertinent regulatory and environmental information. For the purposes of completing a permit application or notice of intent which may be required by the RIDEM RIPDES permitting program ArcGIS is a very useful tool. ArcGIS makes it easy to identify the latitude and longitude of particular location, obtain a wide variety of information regarding the receiving water, watershed name, TMDL status etc.

Provided below is a step by step tutorial on how to access the commonly sought after pieces of information that may be required to complete a RIPDES Permit application. For further assistance you may also contact the DEM RIPDES Permitting Program staff directly at Tel. (401) 222-4700.

Getting Started

To access the ArcGIS map server click on the “Maps” link which can be found on the RIDEM home page www.dem.ri.gov.

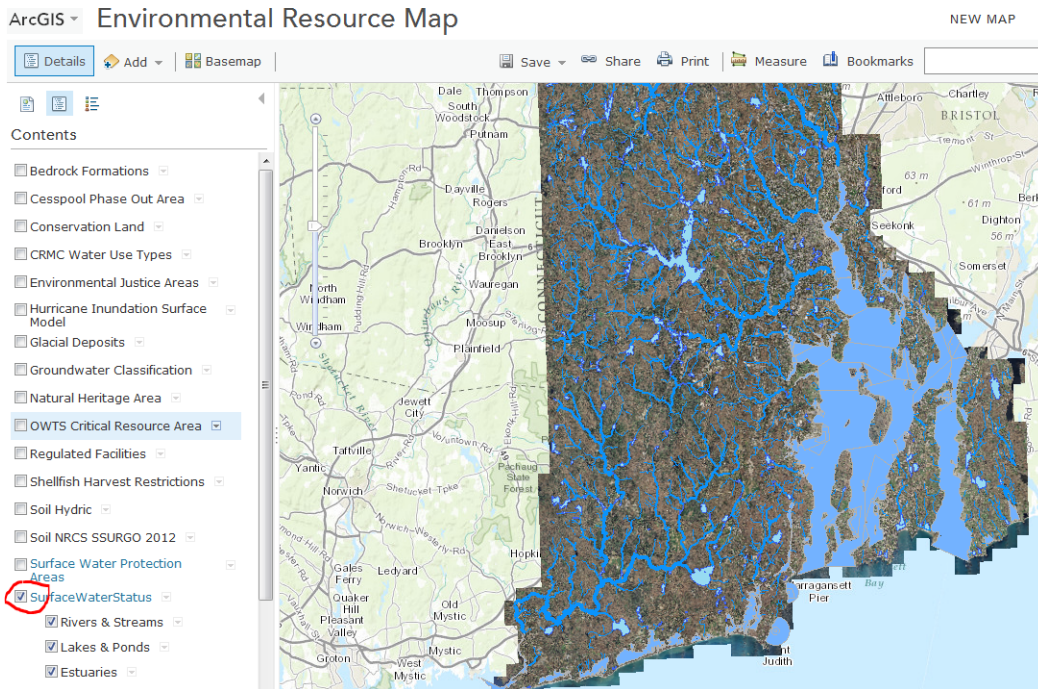


Next click on “Environmental Resource Map”

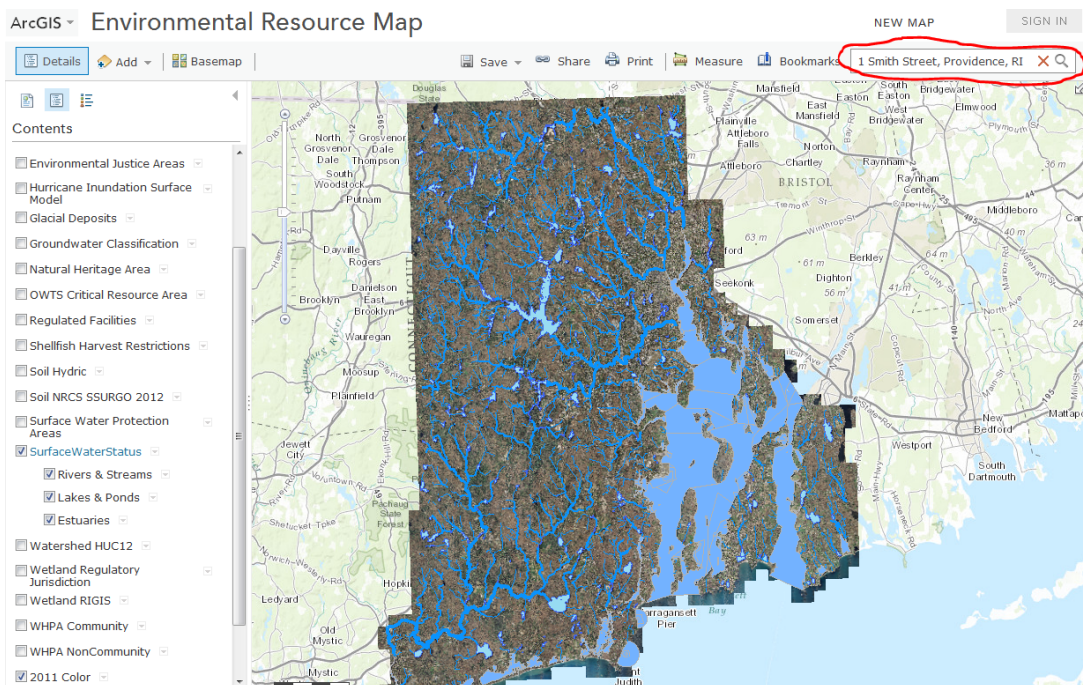
Once the map is open click on the “Show Contents of Map” icon located toward the upper left-hand side of the screen. You will then be able to display various ArcGIS layers provided by RIDEM.

Receiving Water Characteristics

For waterbody specific information such as water body name, water body ID, cold/warm water fishery designation etc. simply activate the “**Surface Water Status**” layer as shown below.



To locate your site and the receiving waters adjacent to it, type in the site address in the upper right hand corner search box and press enter.

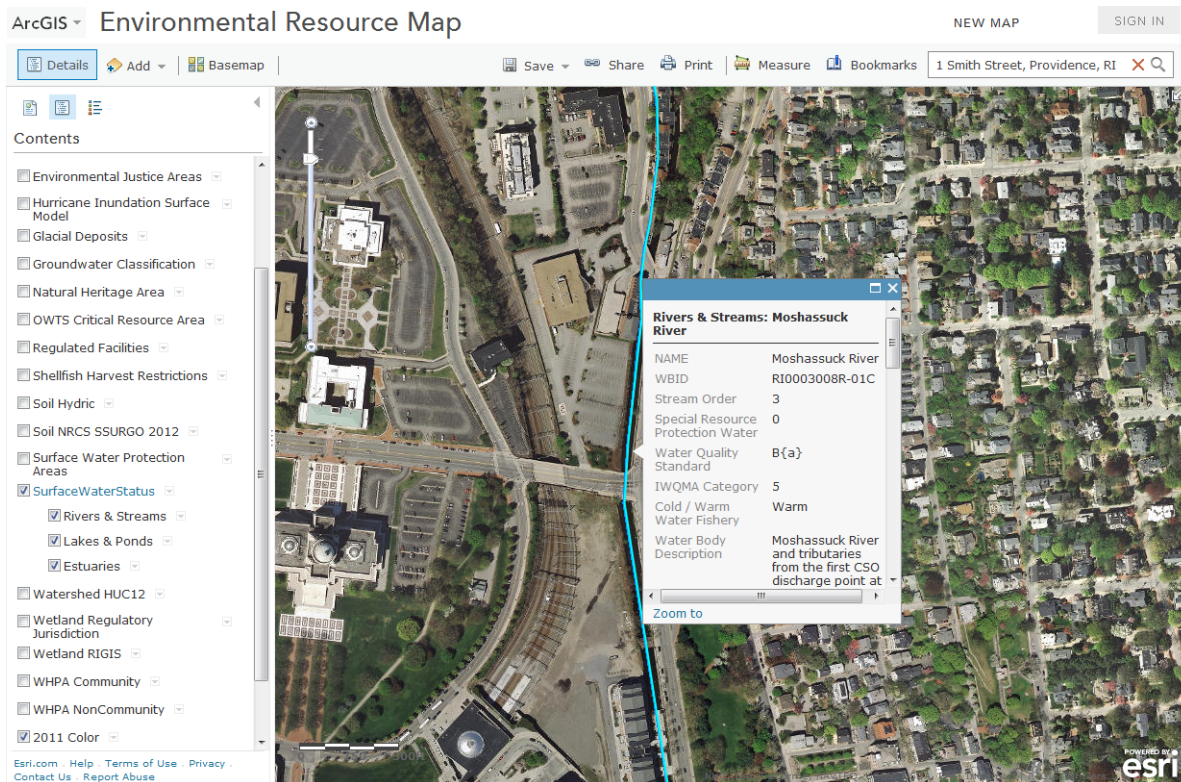


To identify specific information in regard to the water body adjacent to your construction site simply click once on the water body segment applicable to your site and a window will open providing a wide variety of information specific to the selected waterbody (i.e. name of water body, water body identification number (WBID), SRPW designation, impairments, TMDL status etc..)

Determining Water Quality Impairments and Total Maximum Daily Load (TMDL) Status

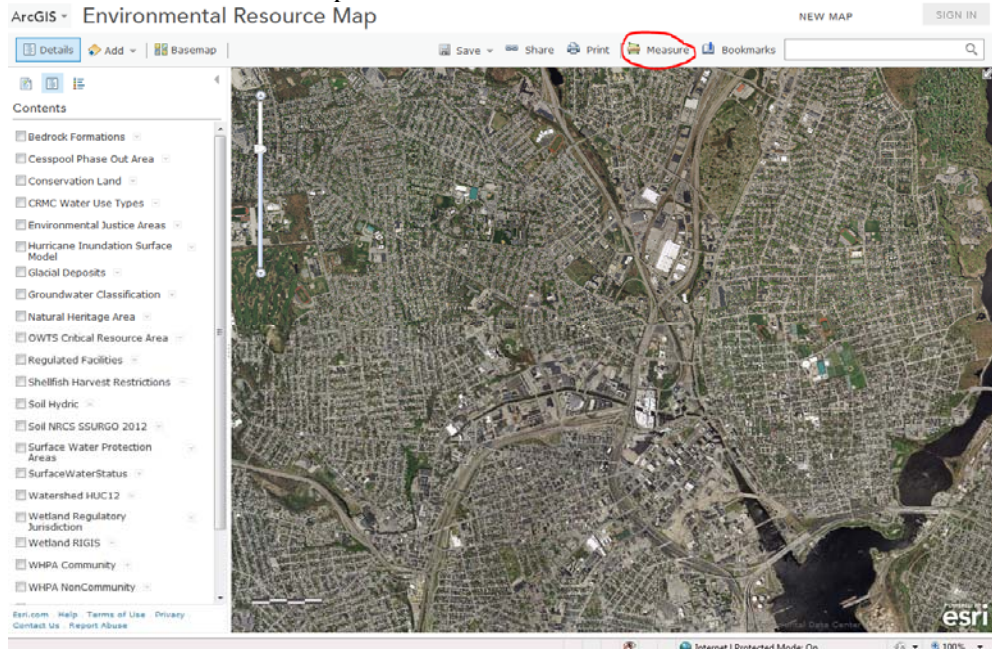
To determine if the receiving water is on the state’s most recent 303(d) List of Impaired Waters, refer to the Integrated Water Quality Monitoring and Assessment Report (Integrated Report, IR) Category. The IR Category 5 is the 303(d) List of Impaired Waters. IR Category 5 consists of those water bodies that are impaired and require development of a TMDL. The list of Impairments for which a TMDL must be developed, will be shown for waterbodies in Category 5.

To determine if a TMDL has been completed for a waterbody, a list of Impairments will be shown at the bottom of the box under ‘TMDL completed’.

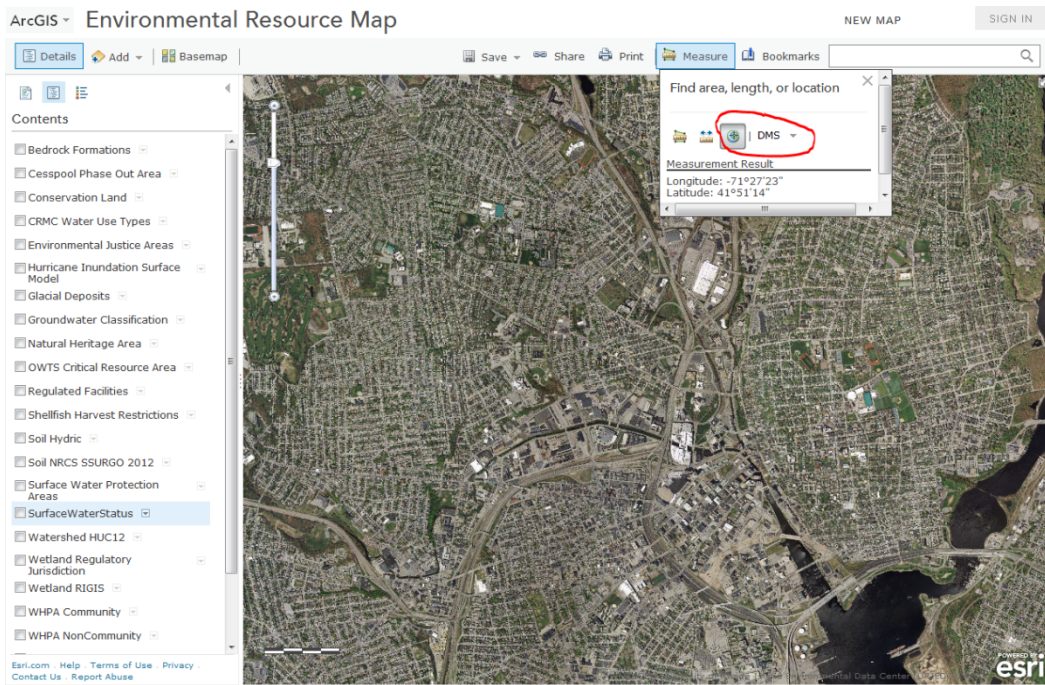


Determining Latitude and Longitude

Begin by zooming in to the location for which you want to identify the latitude and longitude. Next click on the “**Measure**” tool located at the top of the screen.

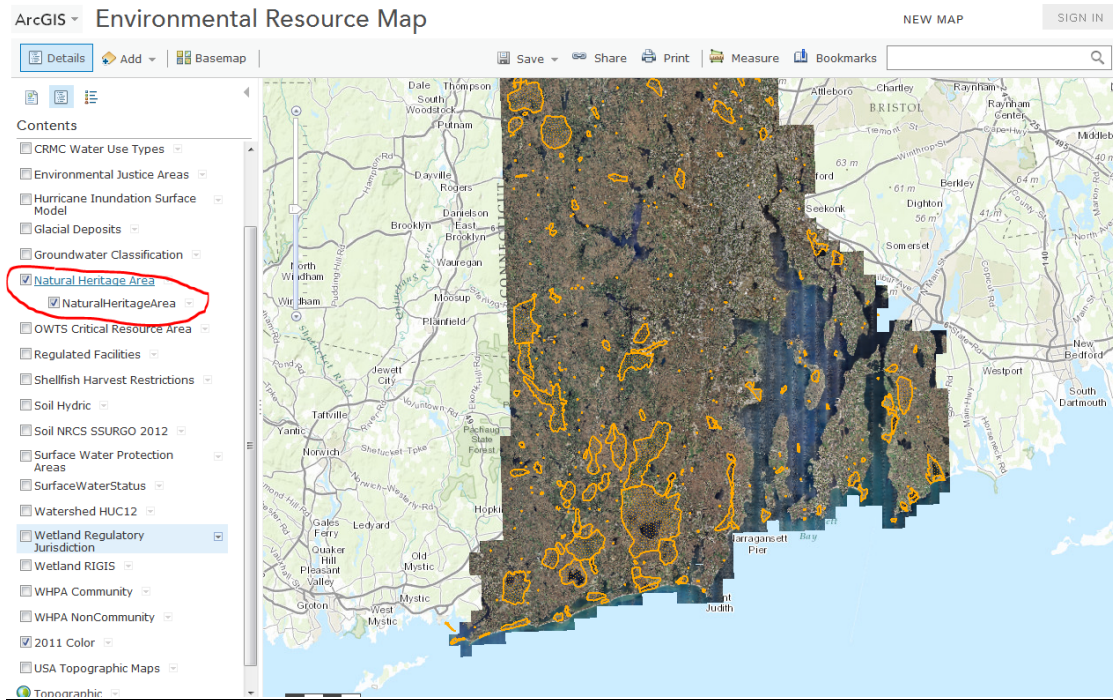


Next select the latitude/longitude icon and activate the units in DMS (degrees, minutes, seconds). Now simply move your cursor over the location in question and click on it. At this point the latitude and longitude will be shown in the measurement window.



Determining whether or not your site is within or discharges directly to a Natural Heritage Area (NHA).

Begin by selecting “Show Contents of Map” Icon, then click on “Natural Heritage Area”.



Next zoom in to the location for which you want investigate the NHA status. If you determine based on the information contained in ArcGIS that your construction project is located within or directly discharges to an NHA or has discharge related activities that potentially affect a listed or proposed to be listed endangered or threatened species or its critical habitat your project requires an additional review and approval by the DEM. In order to begin this process, the Stormwater Management Plan must include a specific request for NHA review and approval of the proposed project.



RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office of Water Resources



NOTICE OF TERMINATION (NOT)

**STORMWATER GENERAL PERMIT
FOR CONSTRUCTION ACTIVITY
(Revised – September 2013)**

RIPDES Permit Authorization to be terminated: No. RIR _____

I. OWNER

Name:	Email:		
Mailing Address:			
City:	State:	Zip:	Phone: ()
Contact Person:	Title:		

II. OPERATOR (if different from Owner)

Name:	Email:		
Mailing Address:			
City:	State:	Zip:	Phone: ()
Contact Person:	Title:		

III. CONSTRUCTION SITE INFORMATION

Street Address:			
City:	State:	Zip:	Phone:
Nearest Utility Pole Number:	Assessor's Plat:	Lot:	
Date land disturbing activities ceased:			
Date final site stabilization was achieved:			

IV. OWNER & OPERATOR CERTIFICATION

I certify under penalty of law that all disturbed soils at the construction site have been stabilized and temporary erosion and sediment control measures have been removed and all stormwater discharges associated with construction activity from the construction site that are authorized by the General Permit have been eliminated. The burden of operating in compliance with applicable RIPDES Regulations is my responsibility. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Owner Name _____

Print Owner Title _____

Owner Signature _____ Date _____

Print Operator Name _____

Print Operator Title _____

Operator Signature _____ Date _____

SESC Plan Inspection Report

Project Information			
Name			
Location			
DEM Permit No.			
Site Owner	Name	Phone	Email
Site Operator	Name	Phone	Email
Inspection Information			
Inspector Name	Name	Phone	Email
Inspection Date		Start/End Time	
Inspection Type <input type="checkbox"/> Weekly <input type="checkbox"/> Pre-storm event <input type="checkbox"/> During storm event <input type="checkbox"/> Post-storm event <input type="checkbox"/> Other			
Weather Information			
Last Rain Event Date: Duration (hrs): Approximate Rainfall (in):			
Rain Gauge Location & Source:			
Weather at time of this inspection:			

Check statement that applies then sign and date below:

I, as the designated Inspector, certify that this site has been inspected as required by regulation and I have determined that maintenance and corrective actions are not required at this time.

I, as the designated Inspector, certify that this site has been inspected as required by regulation and I have made the determination that the site requires corrective actions. The required corrective actions are noted within this inspection report.

Inspector:	Print Name	Signature	Date
<p>The Site Operator acknowledges by his/her signature, the receipt of this SESC Plan inspection report and its findings. He/she acknowledges that all recommended corrective actions must be completed and documentation of all such corrective actions must be made in this inspection report per applicable regulations.</p>			
Operator:	Print Name	Signature	Date

Site-specific Control Measures

Number the structural and non-structural stormwater control measures identified in the SESC Plan and on the SESC Site Plans and list them below (add as necessary). Bring a copy of this inspection form and any applicable SESC Site Plans with you during your inspections. This list will assist you to inspect all control measures at your site.

FILL THIS TABLE USING THE SESC PLAN TABLES 2.11 & 3.12.

	Location/Station	Control Measure Description	Installed & Operating Properly?	Assoc. Photo/ Figure #	Corrective Action Needed (Yes or No; if 'Yes', please detail action required)
1	Site Perimeter Locations and Temporary Soil Stockpiles Fiber rolls	Fiber rolls Section Six: Sediment Control Measures, Straw Wattles, Compost Tubes and Fiber Rolls - RI SESC Handbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2	Construction Entrance	Stone Stabilized Pad. Section Six: Sediment Control Measures – Construction Entrances –RI SESC Handbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3	Exposed slopes Erosion Control blankets	Section Four: Erosion Control Measures – Slope Protection –RI SESC Handbook	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4			<input type="checkbox"/> Yes <input type="checkbox"/> No		
5			<input type="checkbox"/> Yes <input type="checkbox"/> No		
6			<input type="checkbox"/> Yes <input type="checkbox"/> No		
7			<input type="checkbox"/> Yes <input type="checkbox"/> No		
8			<input type="checkbox"/> Yes <input type="checkbox"/> No		
9			<input type="checkbox"/> Yes <input type="checkbox"/> No		
10			<input type="checkbox"/> Yes <input type="checkbox"/> No		
11			<input type="checkbox"/> Yes <input type="checkbox"/> No		
12			<input type="checkbox"/> Yes <input type="checkbox"/> No		
13			<input type="checkbox"/> Yes <input type="checkbox"/> No		

General Site Issues

Below are some general site issues that should be assessed during inspections. Please **customize** this list as needed for conditions at the site.

	Compliance Question		Assoc. Photo/ Figure #	Corrective Action Needed (If 'Yes', please detail action required and include location/station)
1	Have all control measures been installed as specified in the RISESC Handbook and prior to any earth disturbing activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
2	Are appropriate limits of disturbance (LOD) established?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
3	Are controls that limit runoff from exposed soils by diverting, retaining, or detaining flows (such as check dams, sediment basins, etc.) in place?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
4	Are all temporary conveyance practices installed correctly and functioning as designed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
5	Has maintenance been performed as required to ensure continued proper function of all temporary conveyances practices?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
6	Were all exposed soils seeded by October 15 th ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
7	Have soils been stabilized where earth disturbance activities have permanently or temporarily ceased on any portion of the site and will not resume for more than 14 days?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
8	In instances where adequate vegetative stabilization was not established by November 15 th , have non-vegetative erosion control measures must be employed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
9	If work is to continue from October 15 th through April 15 th , are steps taken to ensure that only the day's work area will be exposed and all erodible soil is stabilized within 5 working days?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
10	Have inlet protection measures (such as fabric drop inlet protection, curb drop inlet protection, etc.) been properly installed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
11	Has the operator cleaned and maintained inlet protection measures when needed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
12	Has the operator removed accumulated sediment adjacent to inlet protection measures within 24 hours of detection?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		

	Compliance Question		Assoc. Photo/ Figure #	Corrective Action Needed (If 'Yes', please detail action required and include location/station)
13	Has the operator properly installed outlet protection (such as riprap, turf mats, etc.) at all temporary and permanent discharge points?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
14	Are all outlet protection measures functioning properly in order to reduce discharge velocity, promote infiltration, and eliminate scour?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
15	Have all discharge points been inspected to ensure the prevention of scouring and channel erosion?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
16	Have sediment controls been installed along perimeter areas that will receive stormwater from earth disturbing activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
17	Is the operator maintaining sediment controls in accordance with the requirements in the <i>RI SESC Handbook</i> ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
18	Have temporary sediment barriers been installed around permanent infiltration areas (such as bioretention areas, infiltration basins, etc.)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
19	Have staging areas and equipment routing been implemented to avoid compaction where permanent infiltration areas will be located?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
20	Are surface outlet structures (such as skimmers, siphons, etc.) installed for each temporary sediment basin? [Exception: frozen conditions]	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
21	Have all temporary sediment basins or traps been inspected and maintained as required to ensure proper function?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
22	Does the project include the use of polymers, flocculants, or other chemicals to control erosion, sedimentation, or runoff from the site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
23	Are all chemicals being managed in accordance with Appendix J of the <i>RI SESC Handbook</i> and current best management practices?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
24	Has the site operator taken steps to prohibit the following pollutant discharges on the site?			
a	Contaminated groundwater.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		

	Compliance Question		Assoc. Photo/ Figure #	Corrective Action Needed (If 'Yes', please detail action required and include location/station)
b	Wastewater from washout of concrete; unless properly contained, managed, and disposed of.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
c	Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction products.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
d	Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
e	Soaps or solvents used in vehicle and equipment washing.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
f	Toxic or hazardous substances from a spill or other release.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
25	Is the operator using properly constructed entrances/exits to the site so sediment removal occurs prior to vehicles exiting?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
26	If needed, are additional controls (such as rumble strips, rattle plates, etc.) in place to remove sediment from tires prior to exiting?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
27	Is sediment track-out being removed by the end of the same workday in which it occurs (via sweeping, shoveling, or vacuuming)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
28	Are all wastes generated at the site being managed and properly disposed of by the end of each workday?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
29	Are all chemicals and hazardous waste materials stored properly in covered areas and surrounded by containment control systems?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
30	Has the operator established highly visible locations for the storage of spill prevention and control equipment on the construction site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
31	Are allowable non-stormwater discharges being managed properly with adequate controls?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
32	Is the site operator properly managing groundwater or stormwater that is removed from excavations, trenches, or similar points of accumulation?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
33	Are proper procedures and controls in place for the storage of materials that may discharge pollutants if	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		

PROJECT:

INSPECTION DATE:

	Compliance Question		Assoc. Photo/ Figure #	Corrective Action Needed (If 'Yes', please detail action required and include location/station)
	exposed to stormwater?			
	Are stockpiles located within the limits of disturbance?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	Are stockpiles being protected from contact with stormwater using a temporary sediment barrier?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	Where needed, has cover or appropriate temporary vegetative or structural stabilization been utilized for stockpiles?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	Is the operator effectively managing the generation of dust through the use of water, chemicals, or minimization of exposed soil?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	Are designated washout areas (such as wheel washing stations, washout for concrete, paint, stucco, etc.) clearly marked on the site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
	Are vehicle fueling and maintenance areas properly located to prevent pollutants from impacting stormwater and sensitive receptors?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		

General Field Comments:

PROJECT:

INSPECTION DATE:

Photos:

(Associated photos – each photo should be dated and have a unique identification # and written description indicating where it is located within the project area. If a close up photo is required, it should be preceded with a photo including both the detail area and some type of visible fixed reference point. Photos should be annotated with Station numbers and other identifying information where needed.)

Photo #: (insert Photo here)	Station:
	Description:

Photo #: (insert Photo here)	Station:
	Description:

Photo #: (insert Photo here)	Station:
	Description:

Photo #: (insert Photo here)	Station:
	Description:

Photo #: (insert Photo here)	Station:
	Description:

Photo #: (insert Photo here)	Station:
	Description:

(add more as necessary)

PROJECT:

Amendment Log

TO BE FILLED OUT BY SITE OPERATOR

Describe amendment(s) to be made to the SESC Plan, the date, and the person/title making the amendment. ALL amendments must be approved by the Site Owner.

#	Date	Description of Amendment	Amended by: Person/Title	Site Owner Must Initial
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Add more lines/pages as necessary



APPENDIX E

PROJECT STORMWATER MANAGEMENT SYSTEM OPERATIONS AND MAINTENANCE PLAN



Proactive by Design

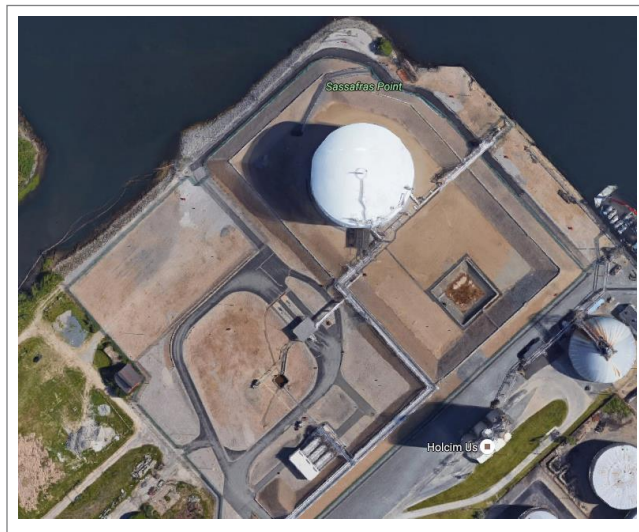


OPERATION AND MAINTENANCE (O&M) PLAN LIQUEFACTION PLANT

**642 Allens Avenue
Providence, Rhode Island**

September 12, 2016

GZA File No.: 03.0033554.60



PREPARED FOR:

Rhode Island Department of Environmental
Management (RIDEM) – Office of Water Resources
Providence, Rhode Island

ON BEHALF OF:

nationalgrid

GZA GeoEnvironmental, Inc.

530 Broadway | Providence, RI 02909
401-421-4140



1.0	INTRODUCTION	1
2.0	CONCRETE FOREBAYS.....	1
3.0	SAND FILTER	1
4.0	CATCH BASINS	1
5.0	OUTFALL.....	2
6.0	FUNDING SOURCES	2

ATTACHMENTS

ATTACHMENT A	INSPECTION FORM
ATTACHMENT B	PLAN SET



1.0 INTRODUCTION

Standard 11 of the *Rhode Island Stormwater Design and Installation Standards Manual* (Stormwater Design Manual) requires that an operations and maintenance plan is developed to ensure that stormwater management systems function properly for the lifetime of the system.

The Site (Assessor's Plat 56 Lots 5, 273, 316 and 317 and Plat 101 Lot 1) is located on Allens Avenue in Providence, Rhode Island. The stormwater management system for the Site consists of a series of catch basins, a concrete forebay, piping and a sand filter. The system is owned and operated by The Narragansett Electric Company dba National Grid. National Grid representatives will be responsible for inspecting and maintaining the stormwater management system. The sand filter will be constructed at the end of the project in order to prevent compaction/damage to the treatment system. The catch basins and concrete forebay will be cleaned of sediment before the sand filter is brought online.

2.0 CONCRETE FOREBAYS

The concrete forebay will require routine rehabilitation which includes the removal of sediment from the forebay bottom with a vactor truck. Sediment should be vactored from the forebay bottom when sediment accumulation is equal or greater than one third of the unit height. Concrete forebays should be inspected for accumulated sediment at least four (4) times per year and after each 1 year, 24-hour type III storm event. The Stormwater Design Manual stipulates that for Providence County the 1 year, 24-hour type III storm event results in 2.7 inches of rainfall.

3.0 SAND FILTER

The sand filter will require routine rehabilitation which includes the removal of sediment from the top of the sand filter when total sediment accumulation is greater than 1-inch in depth. If water ponds on the sand filter surface for more than 48-hours, the top few inches of sand should be removed and replaced with clean ASTM C33 Sand. Erosion rills and washouts on the sand filter surface should be stabilized as necessary. Sand filters should be inspected for accumulated sediment and/or signs of erosion at least twice (2) per year, and after each 1 year, 24-hour type III storm events. During the first 6 months after construction, the sand filter should be inspected following the first two rain events of at least 1-inch.

4.0 CATCH BASINS

Catch basins will require routine rehabilitation, which includes the removal of sediment from basins with a vactor truck. Sediment should be vactored from the units when sediment accumulation is equal or less than 4-inches below the units outlet pipe invert. Catch basins should be inspected for accumulated sediment at least four (4) times per year, and after each 1 year, 24-hour type III storm event. The Storm water Design Manual stipulates that for Providence County the 1 year, 24-hour type III storm event results in 2.7 inches of rainfall. The catch basins are equipped with grate covers for inspection and access.



5.0 OUTFALL

The outfall to Providence River will require routine rehabilitation, which includes the manual removal of debris from the outfall. The outfall should be inspected for accumulated debris at least four (4) times per year, and after each 1 year, 24-hour type III storm event. The outfall is equipped with rip rap apron to prevent erosion.

The outfall will require routine rehabilitation, which includes placing additional rip rap as needed. The outfall should be inspected for erosion at least four (4) times per year, and after each 1 year, 24-hour type III storm event. The storm water Design Manual stipulates that for Providence County the 1 year, 24-hour type III storm event results in 2.7 inches of rainfall.

6.0 FUNDING SOURCES

Funding for routine inspections and maintenance of the stormwater management system will be provided by The Narragansett Electric Company. Inspections will be conducted on a monthly basis and documented accordingly. Silt and sediment removal from the catch basins and forebay will be conducted annually. The estimated annual budget for the inspections and silt removal is \$34,000.00 per year.

STORMWATER MANAGEMENT SYSTEM INSPECTION SHEET
LIQUEFACTION PLANT
642 ALLENS AVENUE
PROVIDENCE, RHODE ISLAND

DATE:

TIME:

INSPECTOR:

REASON FOR INSPECTION: **ANNUAL** **CORRECTIVE**

The Stormwater management system should be inspected after the 1-year, 24-hour Type III storm events, and as specified below. The Stormwater Design Manual stipulates that for Providence County the 1-year, 24-hour type III storm event results in 2.7 inches of rainfall.

Maintenance Item	Condition	Corrective action needed
Catch Basin - Inspection to be completed monthly		
1. Clear of debris		
2. No significant standing water after storm events		
3. No signs of sediment accumulation		
Sand Filter – Inspection to be completed monthly		
1. Inspect for accumulated sediment		
2. Inspect for standing water – note ponding duration		
3. Inspect for signs of erosion/gullyng		

Maintenance Item	Condition	Corrective action needed
Sediment Forebay – Inspection to be completed monthly		
1. Inspect for accumulated sediment		
2. Inspect for debris and liter		
Outfall – Inspection to be completed monthly		
1. Inspect for signs of erosion		
2. Inspect for debris and liter		

ADDITIONAL COMMENTS

NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND SEPTEMBER 2016

PREPARED FOR:

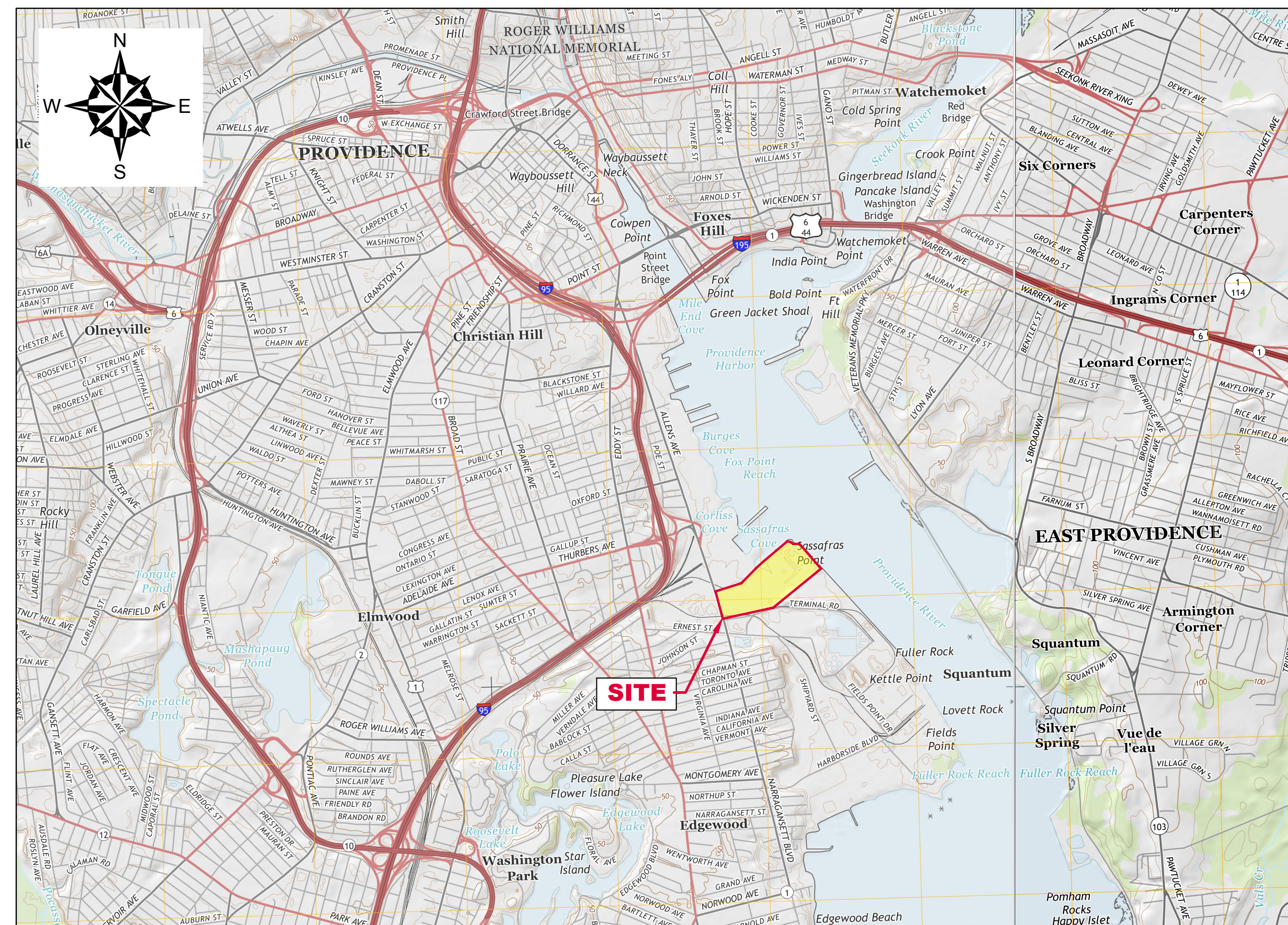


PREPARED BY:

GZA GEOENVIRONMENTAL, INC.
530 BROADWAY
PROVIDENCE, RHODE ISLAND 02909

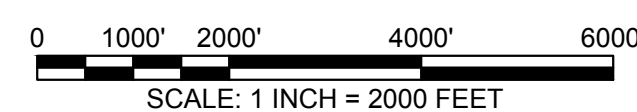
DESIGNED BY:

KIEWIT ENGINEERING AND DESIGN CO.
9401 RENNER BOULEVARD
LENEXA, KANSAS 66219



PROJECT LOCUS MAP

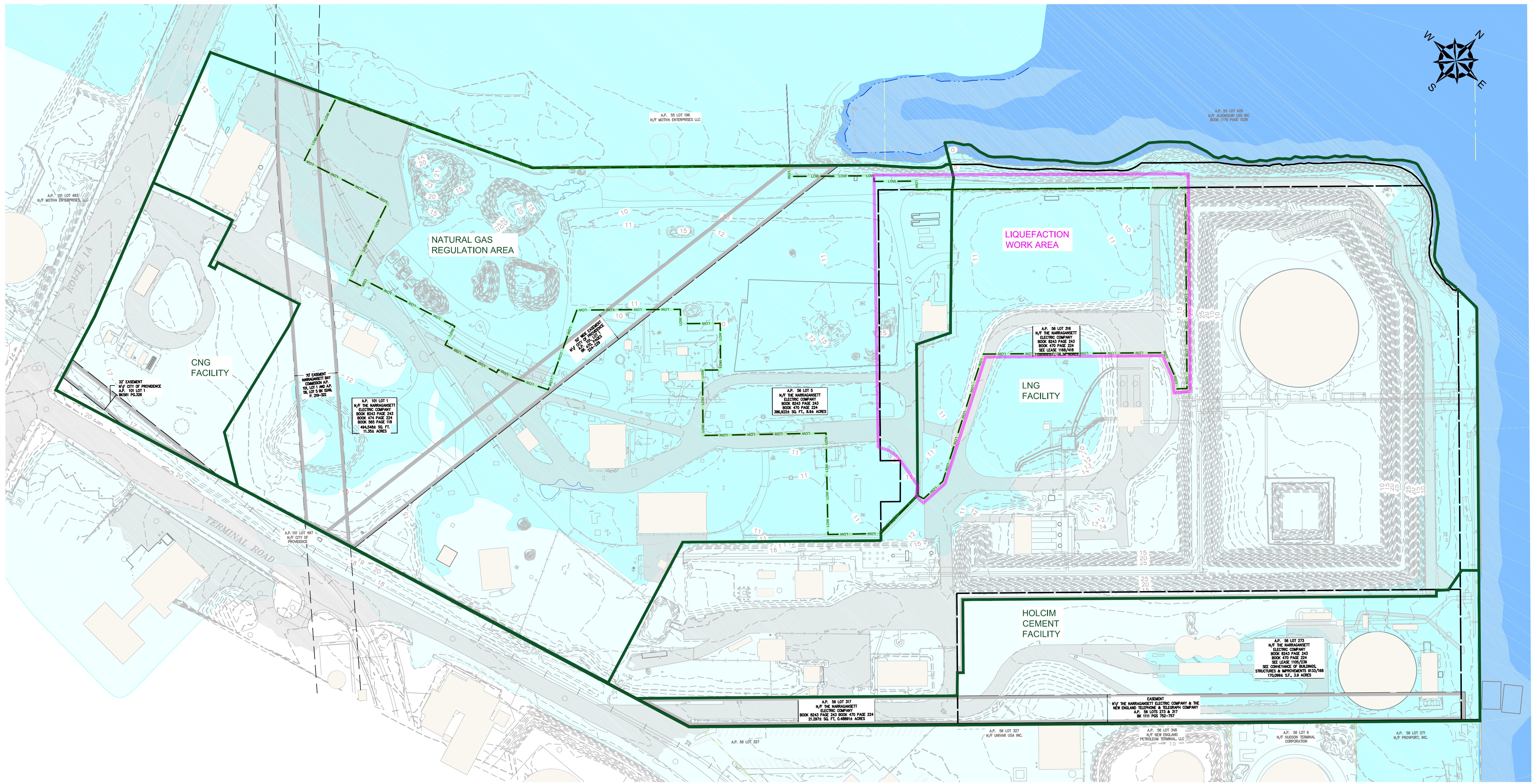
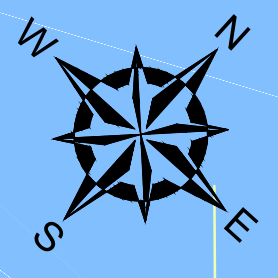
SOURCE: USGSSTORE.GOV



INDEX OF DRAWINGS	
Sheet #	Sheet Title
1	COVER
2	EXISTING CONDITIONS PLAN
3	EXISTING IMPERVIOUS CONDITIONS PLAN
4	TEMPORARY LAYDOWN AREA EROSION AND SEDIMENTATION CONTROLS
5	TEMPORARY SEDIMENTATION AND EROSION CONTROL DETAILS
6	SOIL STORAGE AREA PLAN
7	LIQUEFACTION WORK AREA - EROSION AND SEDIMENTATION CONTROLS
8	LIQUEFACTION WORK AREA - EXISTING REVETMENT WALL AND CROSS SECTIONS
9	LIQUEFACTION WORK AREA - PROPOSED SLOPE ARMORING, EXISTING REVETMENT AND CROSS SECTIONS
10	STORMWATER MANAGEMENT PLAN
11	STORMWATER MANAGEMENT DETAILS - SAND FILTER
12	STORMWATER MANAGEMENT DETAILS - CONCRETE FOREBAY
13	PROPOSED MONITORING WELL RE-INSTALLATION PLAN
14	PROPOSED FINAL CONDITIONS PLAN
15	PROPOSED IMPERVIOUS CONDITIONS PLAN

FOR PERMITTING
ONLY

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GENERAL NOTES:

- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY YANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
 - ELECTRONIC CAD FILE 14-152_SU1_REV2.DWG, TITLED "TOPOGRAPHIC SURVEY PLAN, PORTION OF A.P. 56 LOT 5" DATED OCTOBER 27, 2014 AND PROVIDED BY NATIONAL GRID.
 - ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 16, 2014 AND PROVIDED BY NATIONAL GRID.
- 2) HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- 3) VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- 4) ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.
- 5) PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
- 6) SITE BOUNDARIES ARE APPROXIMATE.
- 7) FLOOD ZONE HAZARD AREA DATA WERE PROVIDED BY RHODE ISLAND GEOGRAPHIC INFORMATION SYSTEM (RIGIS) AND DERIVED FROM STATEWIDE DIGITAL FLOOD INSURANCE RATE MAP (DFIRM) DATABASE, ORIGINALLY PUBLISHED BY FEMA IN OCTOBER 2015.

LEGEND:

- | | | | |
|--|--|--|--------------------------|
| | EXISTING BUILDING | | ABUTTING PROPERTY LINE |
| | EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL) | | EDGE OF WATER |
| | EXISTING CONTOUR (MINOR 1 FOOT INTERVAL) | | EXISTING RAILROAD TRACKS |
| | PAVEMENT | | EXISTING FENCE |
| | EASEMENT AREA | | OPERATIONS BOUNDARY |
| | PROPERTY LINE | | LIQUEFACTION WORK AREA |
| | INTERIOR PROPERTY LINE | | EXISTING CONCRETE PAD |
| | LIMIT OF WORK | | UTILITY POLE |
| | | | LIGHT POLE |
| | | | HYDRANT |

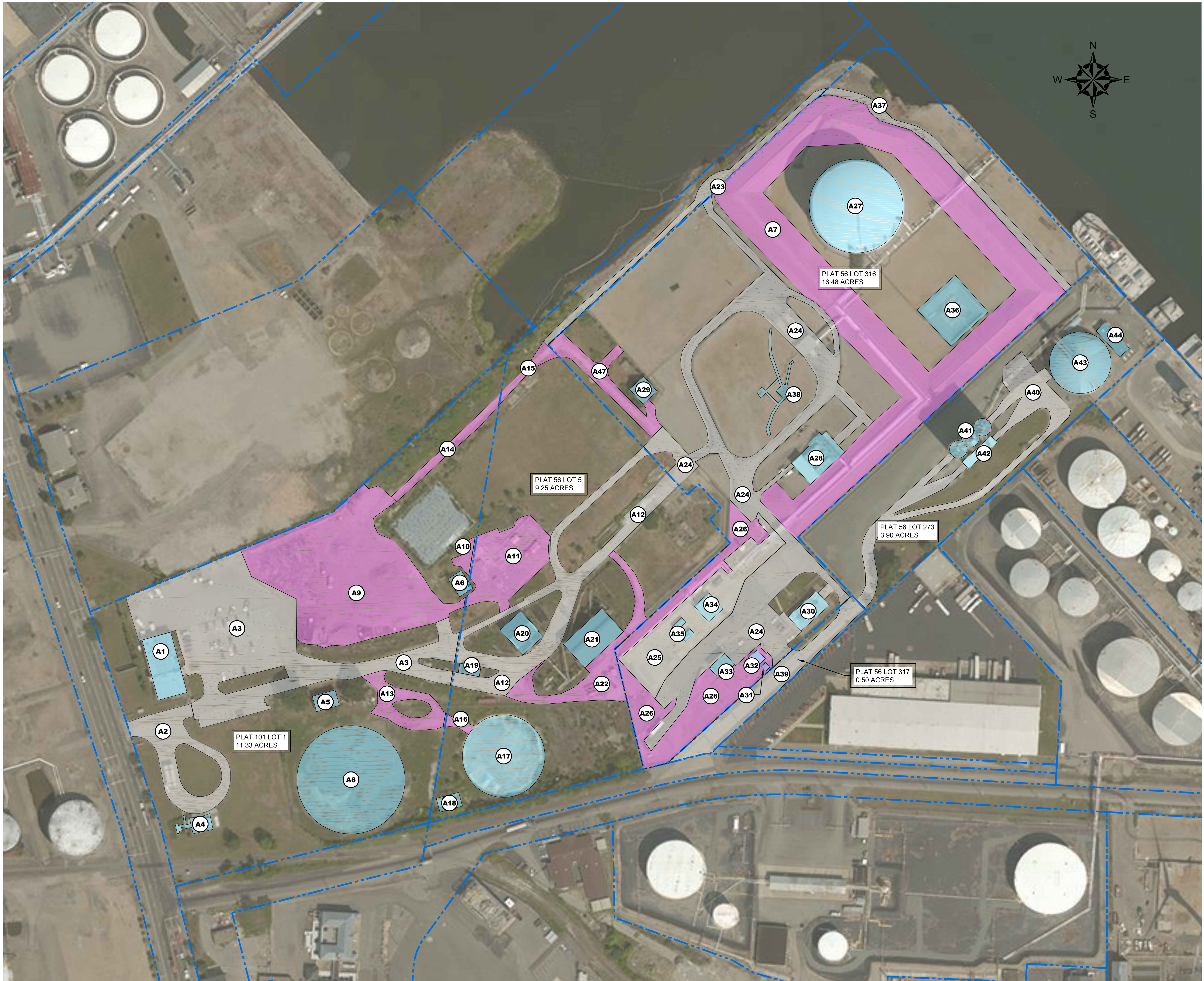
FLOOD HAZARD AREAS:

- | | |
|--|------------------------|
| | FLOOD ZONE VE (EL. 14) |
| | FLOOD ZONE AE (EL. 12) |
| | FLOOD ZONE X (EL. 14) |

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NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
EXISTING CONDITIONS PLAN			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid	PROJECT NO.: 33554.60	SHEET NO. 2 OF 15
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 1	FIGURE 2

FOR PERMITTING ONLY



LEGEND

- PROPERTY LINES
- STRUCTURE
- ASPHALT
- OTHER

REFERENCE NOTES:

1. THIS MAP CONTAINS THE ESRI ARCGIS ONLINE BING MAPS AERIAL LAYER PACKAGE. IMAGE COURTESY OF USGS EARTHSTAR GEOGRAPHICS SIO © MICROSOFT CORPORATION 2015.
2. PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
3. SITE BOUNDARIES ARE APPROXIMATE.

IMPERVIOUS AREAS				
PLAT	LOT	NO.	AREA (SQ. FT.)	SURFACE TYPE
101	1	A1	8,037.44	ROOF
101	1	A2	17,913.35	ASPHALT
101	1	A3	90,158.79	ASPHALT
101	1	A4	1,786.65	STRUCTURE
101	1	A5	1,640.44	ROOF
101	1	A6	1,445.11	STRUCTURE
56	1	A7	156,852.04	CONTAINMENT DIKE
101	1	A8	39,796.73	TANK FOUNDATION
101	1	A9	79,909.64	COMPACTED GRAVEL
101	1	A10	1,933.34	COMPACTED GRAVEL
56	5	A11	21,898.19	COMPACTED GRAVEL
56	5	A12	33,764.16	ASPHALT
101	1	A13	8,857.25	COMPACTED GRAVEL
101	1	A14	5,114.04	COMPACTED GRAVEL
56	5	A15	2,860.86	COMPACTED GRAVEL
56	5	A16	1,196.51	COMPACTED GRAVEL
56	5	A17	23,127.00	TANK FOUNDATION
56	5	A18	1,425.31	STRUCTURE
56	5	A19	898.87	ROOF
56	5	A20	4,099.05	ROOF
56	5	A21	7,273.42	ROOF
56	5	A22	16,442.64	COMPACTED GRAVEL
56	5	A23	11,249.94	ASPHALT
56	316	A24	93,429.89	ASPHALT
56	316	A25	29,735.26	CONCRETE
56	316	A26	40,494.92	COMPACTED GRAVEL
56	316	A27	29,930.34	LNG TANK
56	316	A28	6,084.97	STRUCTURE
56	316	A29	1,686.87	ROOF
56	316	A30	3,197.19	ROOF
56	316	A31	164.24	ROOF
56	316	A32	638.42	ROOF
56	316	A33	1,346.21	ROOF
56	316	A34	1,845.52	ROOF
56	316	A35	712.24	ROOF
56	316	A36	10,912.10	SUMP PIT
56	316	A37	10,655.36	ASPHALT
56	316	A38	2,392.36	STRUCTURE
56	317	A39	18,586.35	ASPHALT
56	273	A40	28,623.42	ASPHALT
56	273	A41	3,112.29	STRUCTURE
56	273	A42	1,576.65	ROOF
56	273	A43	12,924.79	TANK
56	273	A44	1,893.69	STRUCTURE
56	316	A47	10,294.60	COMPACTED GRAVEL
TOTAL IMPERVIOUS			847,918.45	

847918.45 SQ. FT. IMPERVIOUS AREA
1807724.79 SQ. FT. TOTAL AREA = 46.91% IMPERVIOUS

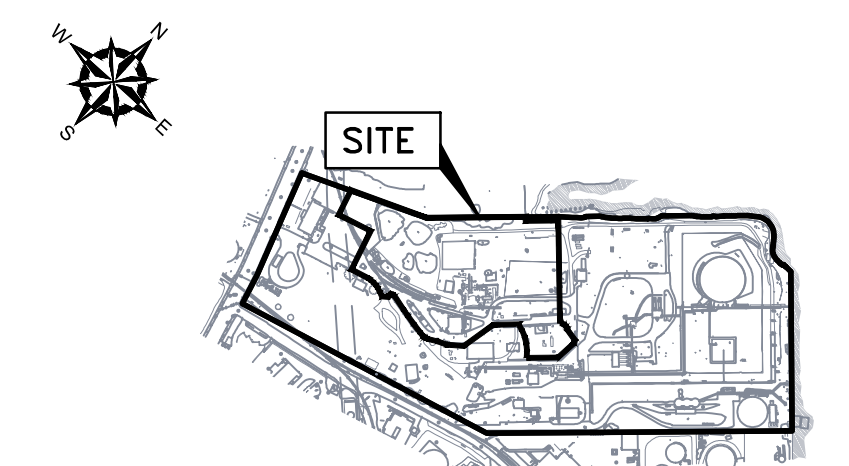
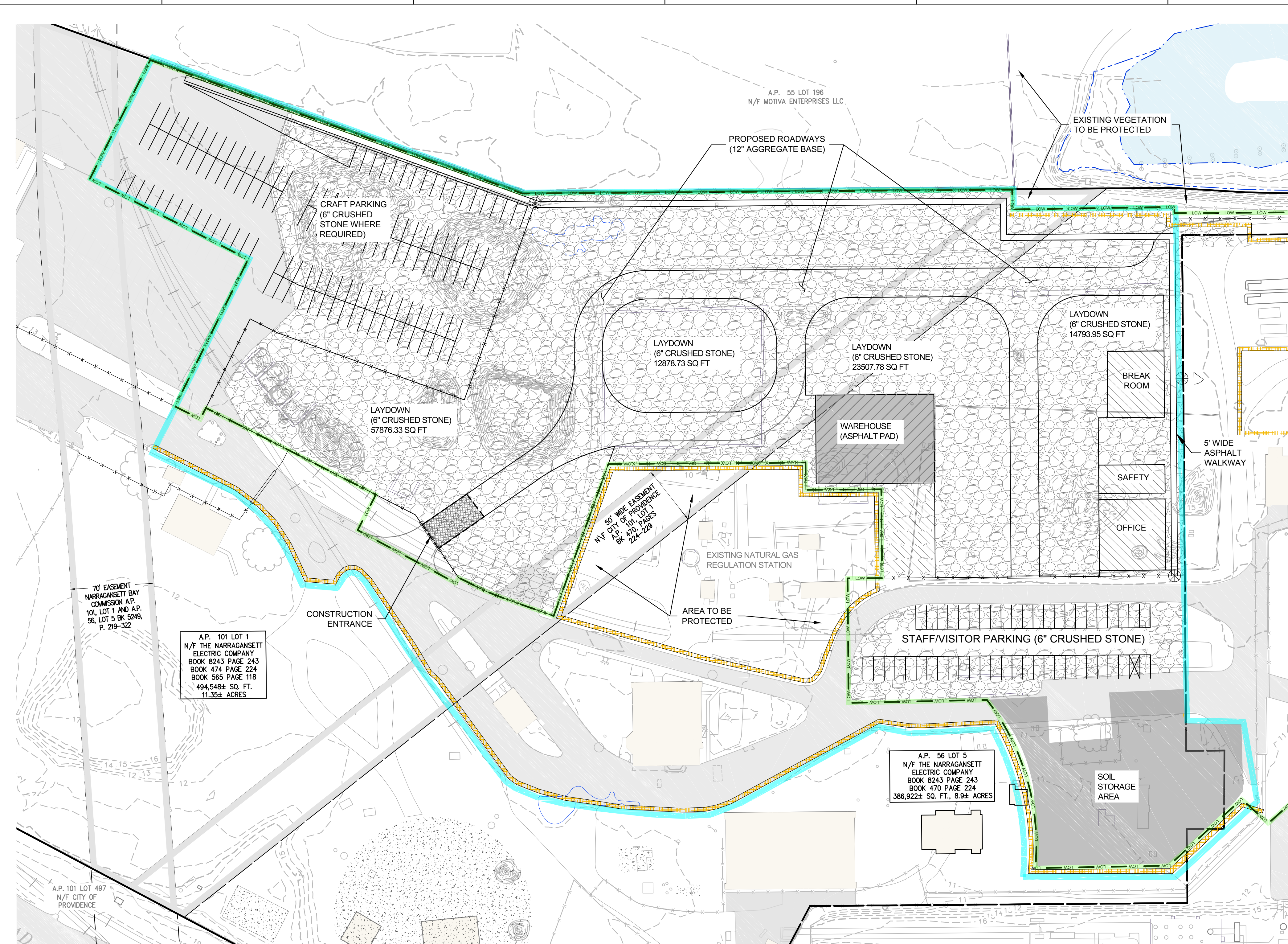


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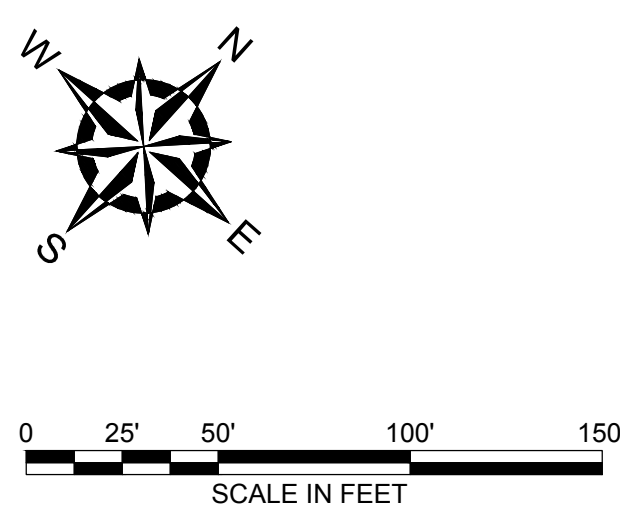
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
EXISTING IMPERVIOUS CONDITIONS PLAN			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: 		
PROJ MGR: MSK DESIGNED BY: SJM DATE: SEPTEMBER, 2016	REVIEWED BY: SJM DRAWN BY: LDT PROJECT NO: 33554.60	CHECKED BY: JR SCALE: AS NOTED REVISION NO: 0	FIGURE 3 SHEET NO. 3 OF 15

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DRAWING NAME: I:\102761-National_Grid_Liquefaction\CAD Exchange\102761-08-31-GZA_Liq_Permit Package\33554-60_CEMC PERMITTING_FOR STAMPING-AMS.dwg
 SEP 06 2016 - 9:03am



- KEY PLAN:**
SCALE: 1"=800'
- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 10 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - EXISTING PAVEMENT
 - EASEMENT AREA
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - TEMPORARY LAYDOWN AREA
 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED TEMPORARY PAVEMENT
 - PROPOSED TEMPORARY BUILDING
 - PROPOSED CRUSHED STONE
 - STAKED FILTREXX SOXX (SEE DETAIL ON SHEET 5)
 - LIMIT OF WORK
 - CONSTRUCTION ENTRANCE



GENERAL NOTES:

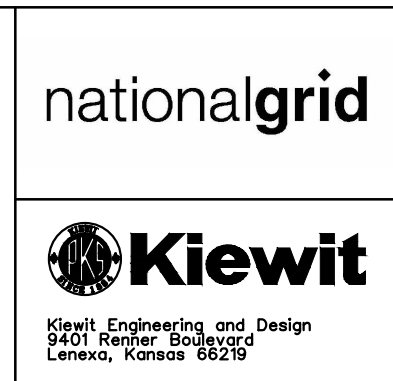
- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
- ELECTRONIC CAD FILE 14-152_SU1_REV2.DWG, TITLED "TOPOGRAPHIC SURVEY PLAN, PORTION OF A.P. 56 LOT 5" DATED OCTOBER 27, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILES PROVIDED BY KIEWIT
 1. "ACAD-102761-CIV_SITE.DWG"
 2. "2007EXP_102761-CIV_LAYDOWN.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "A2007EXP_102761-CIV_STORM.DWG"
 6. "ACAD-102761-CIV_SURFACING.DWG"
 7. "ACAD-102761-PROP-CONT_DWG"
 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"
- PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
 1. "CATCH BASINS AND SANITARY SEWER SYSTEM" PREPARED BY PROVIDENCE GAS COMPANY, DATED SEPTEMBER 25, 1981.
 2. "PLAN SHOWING UNDERGROUND UTILITIES LNG FACILITY" DATED OCTOBER 6, 1983, "SUBSURFACE UTILITY ENGINEERING" PREPARED BY BAYSTATE SUBSURFACE INVESTIGATION, INC., DATED MAY 17, 2005.
- 2) HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- 3) VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- 4) SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. **OTHER LOCATIONS MAY EXIST.**
- 5) ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.
- 6) PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
- 7) SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL

THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY REQUIREMENT AND SUBJECT THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

REV	DATE	REVISION INFORMATION	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

GENERAL NOTES AND COMMENTS:



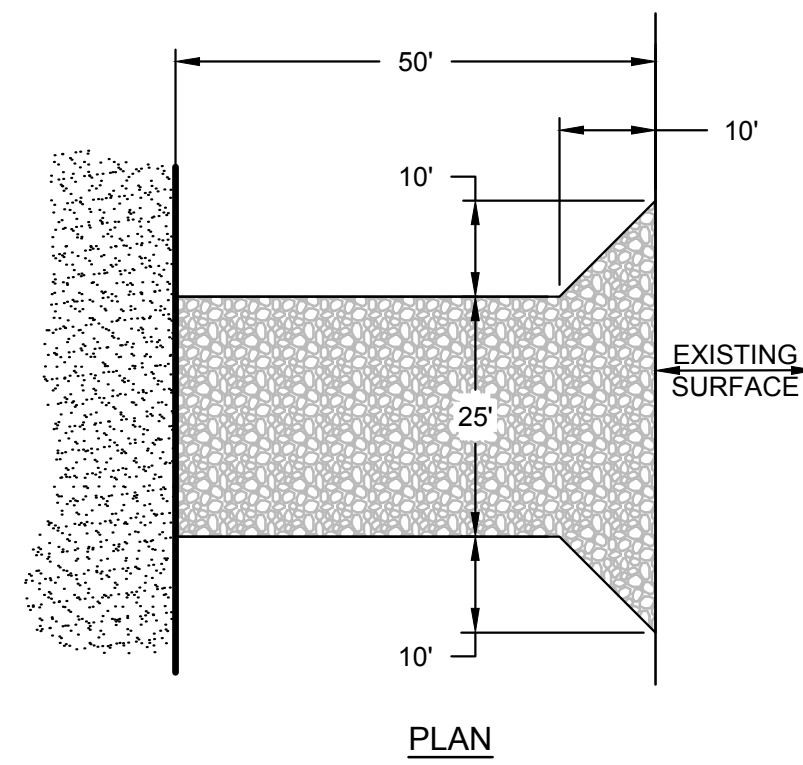
SEAL AND STAMP:
 ASHLEY STUTZMAN
 No. 11512
 REGISTERED PROFESSIONAL ENGINEER
 CIVIL

PROFESSIONAL CERTIFICATION:
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A LICENSED PROFESSIONAL ENGINEER OF THIS STATE.
 LICENSE NO. 11512
 EXPIRATION DATE 06/30/2017

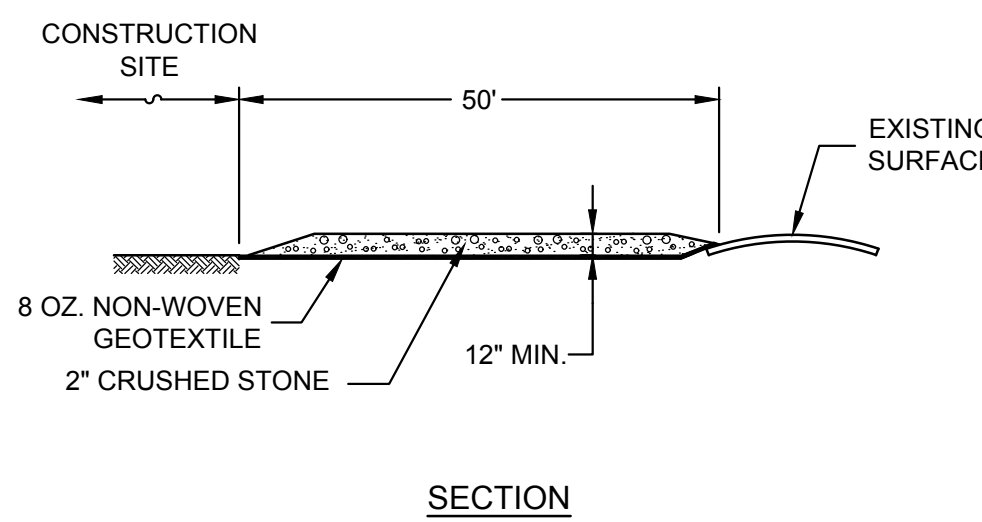
NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
TEMPORARY LAYDOWN AREA			
EROSION AND SEDIMENTATION CONTROLS			
DRAWING NO:	PROJECT NO:	SHT:	REV.
FIGURE 4	33554.60	4 OF 15	0

WHEEL WASH/CONSTRUCTION ENTRANCE NOTES

- ENTRANCE WIDTH SHALL BE TWENTY-FIVE (25) FEET MINIMUM.
- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT OUT OF THE LIMITS OF WORK. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED OUT OF THE LIMITS OF WORK MUST BE REMOVED IMMEDIATELY. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.

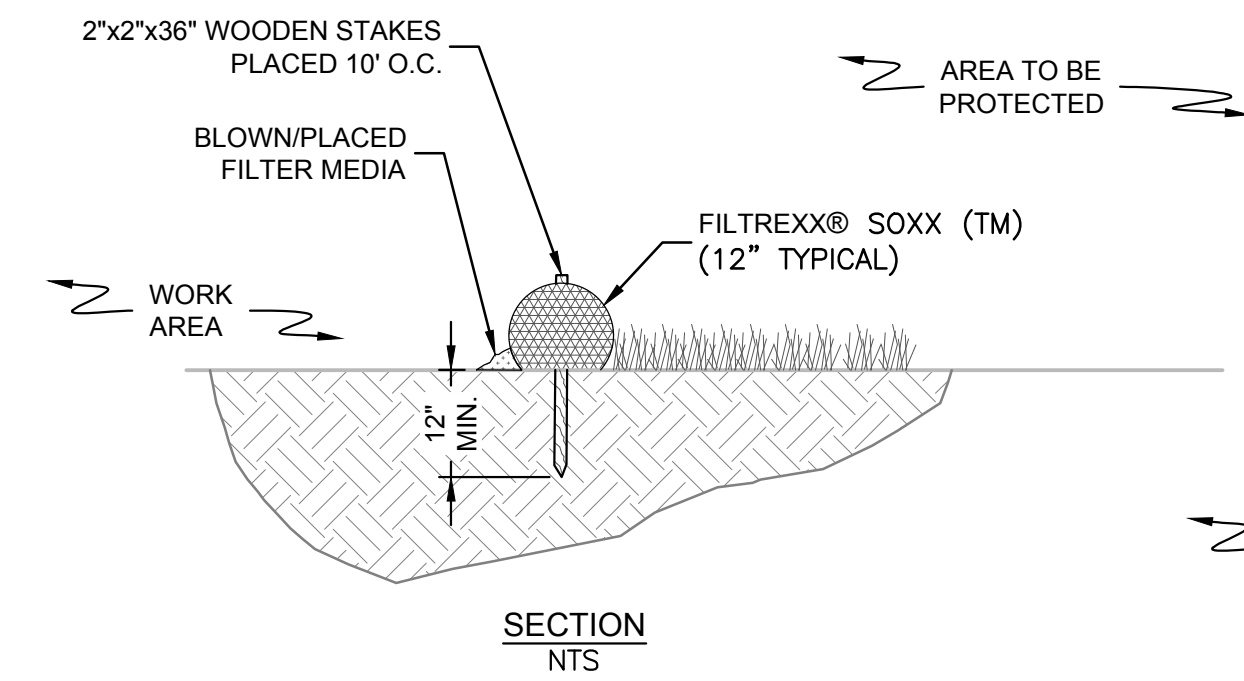


PLAN

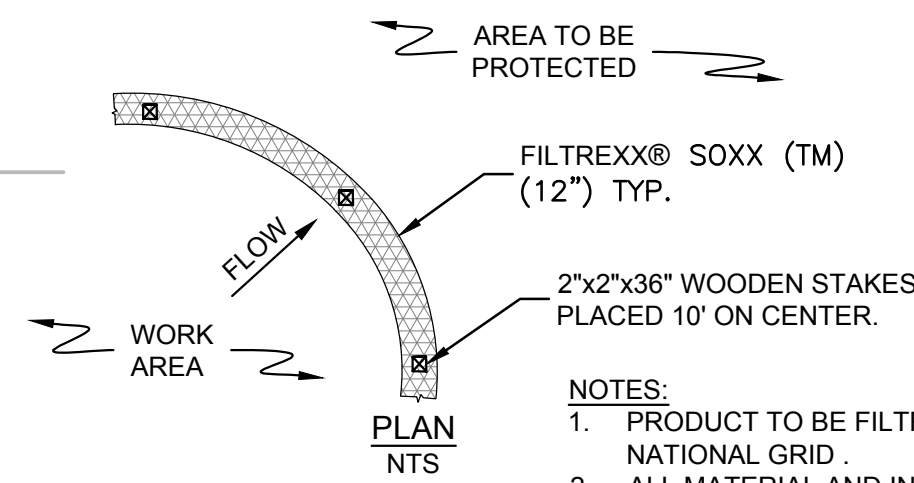


SECTION

WHEEL WASH/CONSTRUCTION ENTRANCE/EXIT
NOT TO SCALE



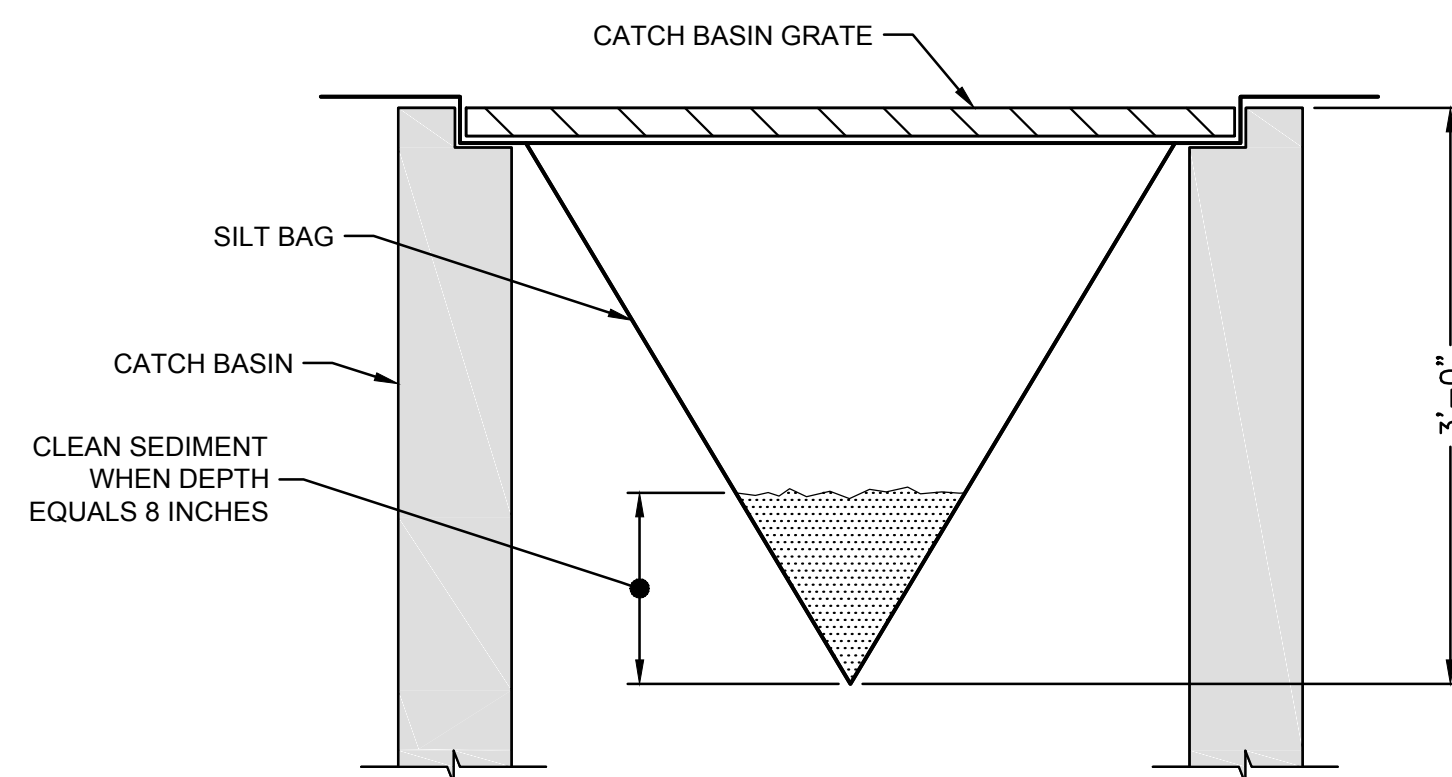
SECTION
NTS



PLAN
NTS

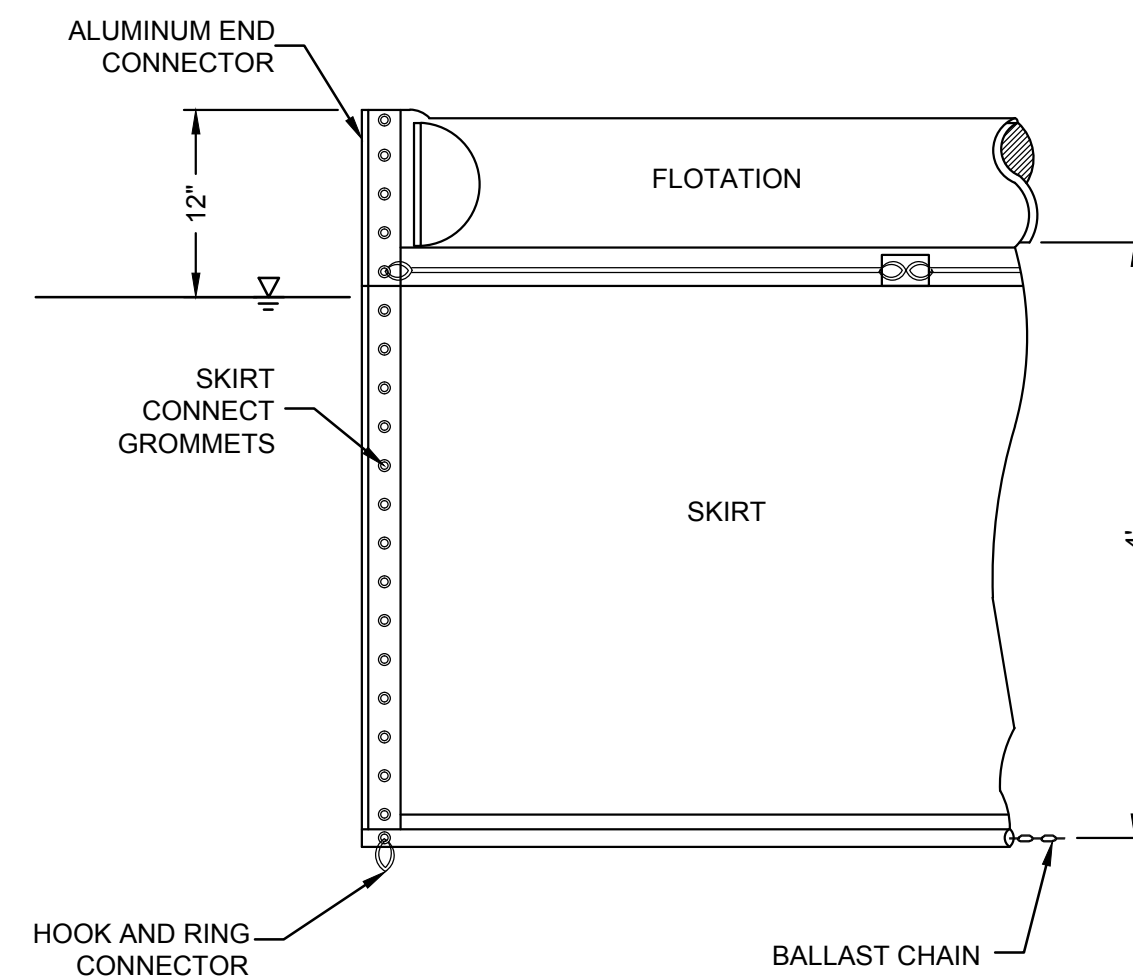
FILTREXX® SOXX SEDIMENT CONTROL DETAIL
NOT TO SCALE

- NOTES:**
- PRODUCT TO BE FILTREXX SILT SOXX OR APPROVED EQUAL BY NATIONAL GRID.
 - ALL MATERIAL AND INSTALLATION TO MEET FILTREXX® SPECIFICATIONS.
 - FILTER MEDIA FILL TO MEET APPLICATION REQUIREMENTS.
 - COMPOST MATERIAL TO BE DISPERSED ON SITE AS DETERMINED BY NATIONAL GRID.



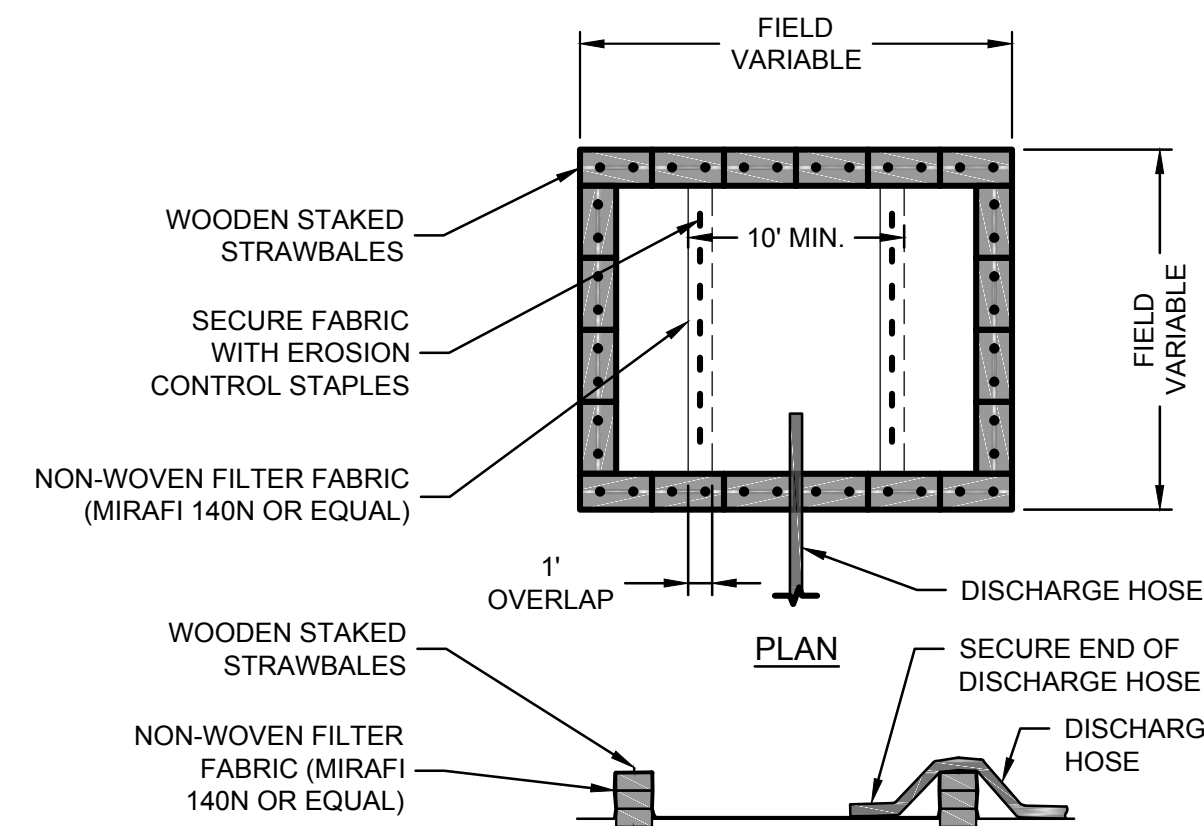
NOTE:
SEDIMENT BAG INLET PROTECTION TO BE SILTSACK MANUFACTURED BY ATLANTIC CONSTRUCTION FABRICS INC. RICHMOND, VA OR APPROVED EQUAL.

SILT SACK DETAIL
NOT TO SCALE

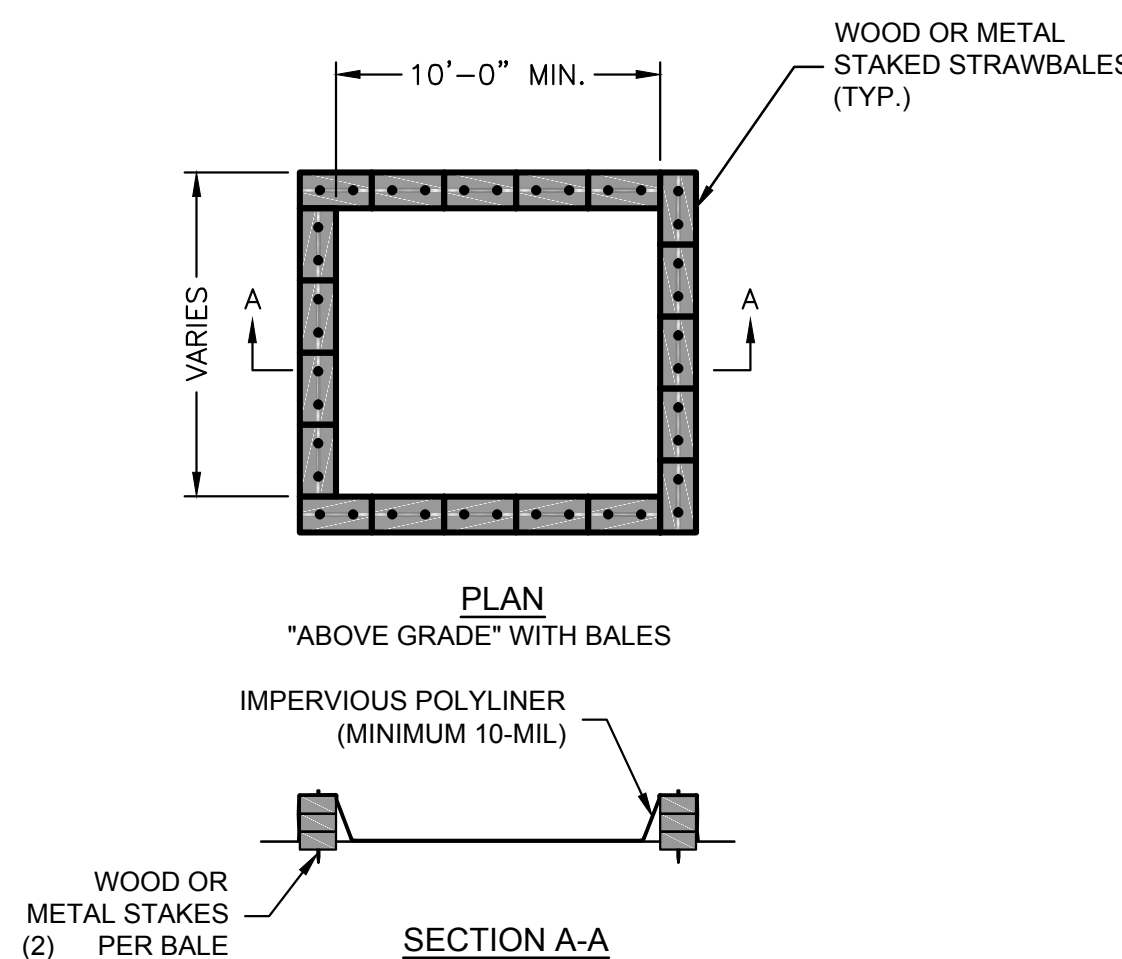


TURBIDITY CURTAIN DETAIL
NOT TO SCALE

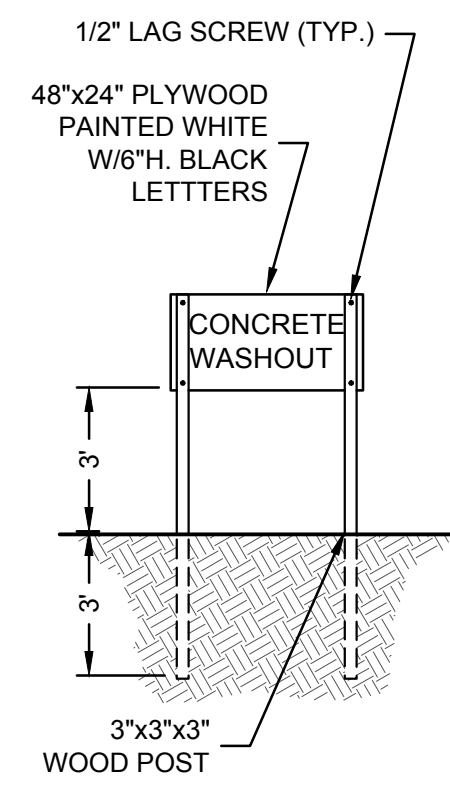
- NOTES:**
- ANCHOR CURTAIN ENDS AT BULKHEAD AND SHORELINE.
 - ANCHOR CURTAIN AT INTERMEDIATE POINTS WITH CONCRETE ANCHOR BLOCKS.



DEWATERING BASIN (SMALL SCALE)
NOT TO SCALE



CONCRETE WASHOUT
NOT TO SCALE



CONCRETE WASHOUT
SIGN DETAIL
(OR EQUIVALENT)

SLOPE INSTALLATION DETAIL OF EROSION CONTROL BLANKET

NOT TO SCALE

NOTES:

- PRODUCT TO BE NORTH AMERICAN GREEN EROSION CONTROL BLANKET OR APPROVED EQUAL BY NATIONAL GRID.
- IN LOOSE SOIL CONDITIONS, THE USE OF STAPLES OR STAKE LENGTHS GREATER THAN 6" (15 cm) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

INSTALLATION NOTES:

- PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
- BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15cm) DEEP x 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE RECP's.
- ROLL THE RECP's (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE(tm). WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
- THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5cm - 12.5cm) OVERLAP DEPENDING ON RECP's TYPE.
- CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5cm) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE RECP's WIDTH.

TURBIDITY CURTAINS NOTES

TURBIDITY CURTAIN SPECIFICATIONS

- THE HEIGHT OF THE CURTAIN SHALL BE 20 PERCENT GREATER THAN THE DEPTH OF THE WATER TO ALLOW FOR WATER LEVEL FLUCTUATIONS.
- THE AREA THAT THE TURBIDITY CURTAIN PROTECTS SHALL NOT CONTAIN LARGE CULVERTS OR DRAINAGE AREA THAT IS FLOWS OCCUR BEHIND THE CURTAIN WOULD CAUSE A BREACH OR LOST CONTACT AT THE BOTTOM SURFACE.
- AT A MINIMUM THE CURTAIN MATERIAL SHALL BE SUPPORTED BY A FLOTATION MATERIAL HAVING AT LEAST 29 LBS PER FOOT OF BUOYANCY. THE FLOATING CURTAIN SHALL HAVE AT LEAST A 5/16" GALVANIZED CHAIN AS BALLAST AND AT LEAST DUAL 5/16" GALVANIZED WIRE ROPES WITH A HEAVY VINYL COATING AS LOAD LINES.
- THE CURTAIN SHALL BE MADE OF A TIGHTLY WOVEN NYLON, PLASTIC OR OTHER NON-DETERIORATING MATERIAL MEETING THE FOLLOWING SPECIFICATIONS:
 - GRAB TENSILE STRENGTH:
 - MACHINE DIRECTION (MD) -370 LBS
 - CROSS MACHINE DIRECTION (CD) -250 LBS
 - MULLEN BURST STRENGTH: 480 PSI
 - TRAPEZOID TEAR STRENGTH:
 - MD-100 LBS
 - CD-60LBS
 - APPARENT OPENING SIZE: 70 US STANDARD SIEVE
 - PERCENT OPEN AREA: 4%
 - PERMISSIVITY: 0.28 SEC-1

TURBIDITY CURTAIN INSTALLATION REQUIREMENTS

- THE AREA OF THE PROPOSED INSTALLATION SHALL BE INSPECTED FOR OBSTACLES THAT COULD DAMAGE THE CURTAIN OR IMPAIR ITS EFFECTIVENESS.
- THE CURTAIN SHALL BE FIRMLY ANCHORED IN PLACE. SHALLOW INSTALLATIONS CAN BE MADE BY SECURING THE CURTAIN BY STAKING RATHER THAN USING A FLOTATION SYSTEM.
- SUPPLEMENTAL ANCHORS SHALL BE USED AS NEEDED DEPENDING ON WATER SURFACE DISTURBANCES SUCH AS BOATS AND WAVE ACTION BY WINDS.

TURBIDITY CURTAIN MAINTENANCE

- THE TURBIDITY CURTAIN SHALL BE INSPECTED DAILY AND REPAIRED OR REPLACED IMMEDIATELY.
- IF THE CURTAIN IS ORIENTED IN A MANNER THAT FACES THE PREVAILING WINDS, FREQUENT CHECKS OF THE ANCHORAGE SHALL BE MADE.
- ANY NECESSARY SEDIMENT REMOVAL MUST BE DONE BY HAND BEFORE THE CURTAIN IS REMOVED.
- THE BARRIER SHALL BE REMOVED BY PULLING IT TOWARD THE CONSTRUCTION SITE TO MINIMIZE THE RELEASE OF ATTACHED SEDIMENT.

CONCRETE WASHOUT NOTES

CONCRETE WASHOUT SPECIFICATIONS

- LOCATE WASHOUT AREA AT LEAST 50 FEET FROM SENSITIVE AREAS SUCH AS STORM DRAINS, OPEN DITCHES, OR WATER BODIES INCLUDING JURISDICTIONAL WETLANDS.
- ALLOW CONVENIENT TRUCK ACCESS.
- THE NUMBER OF FACILITIES SHOULD DEPEND ON THE DEMAND FOR STORAGE CAPACITY.
- CONCRETE WASHOUT FACILITIES SHALL BE CONSTRUCTED AND MAINTAINED IS SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED.

CONCRETE WASHOUT INSTALLATION REQUIREMENTS

- THE CONCRETE WASHOUT SHOULD BE A MINIMUM OF 10 FOOT BY 10 FOOT AREA.
- THE WASHOUT WILL BE CONSTRUCTED WITH STRAW BALES ARRANGED AROUND THE PERIMETER AND LINED WITH TWO LAYERS OF 10 MIL POLYETHYLENE SHEETING. THE POLYETHYLENE SHEETING WILL WRAP OVER THE STRAW BALES (OR APPROVED EQUAL) AND WILL BE SECURED WITH SAND BAGS.
- THE WASHOUT SHALL BE SIZED TO ACCOMMODATE ALL OF THE WASHOUT WATER AND CONCRETE AND SHOULD INCLUDE 12-INCHES OF FREEBOARD ABOVE THE WASHOUT WASTE.

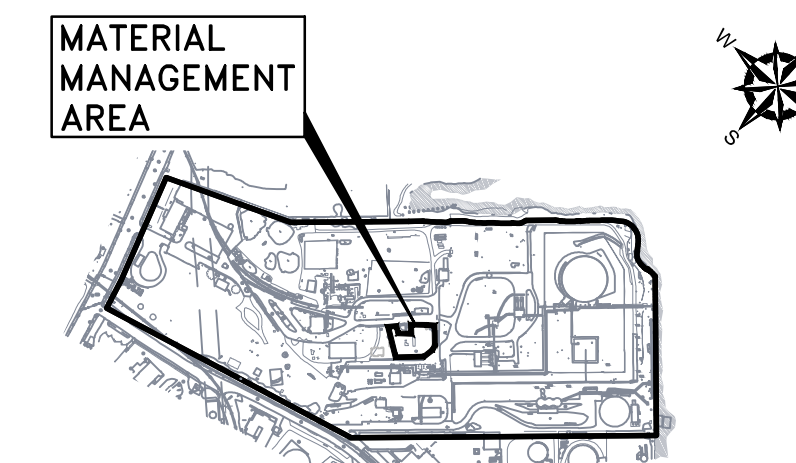
CONCRETE WASHOUT MAINTENANCE

- INSPECT AND VERIFY THAT THE CONCRETE WASHOUT HAS BEEN PROPERLY CONSTRUCTED PRIOR TO THE COMMENCEMENT OF CONCRETE WORK.
- INSPECT DAILY FOR DAMAGE OR ISSUES.
- CHECK REMAINING CAPACITY.
- VERIFY THAT LINERS ARE INTACT.
- WASHOUT FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED ONCE THE WASHOUT IS 75% FULL.
- IF WASHOUT IS NEARING CAPACITY, VACUUM AND DISPOSE OF THE WASTE MATERIAL IN AN APPROVED MANNER.
- DO NOT DISCHARGE LIQUID OR SLURRY TO WATERWAYS, STORM DRAINS, OR ONTO THE GROUND SURFACE.
- COVER THE WASHOUT WITH A NON-WATER COLLECTING COVER PRIOR TO STORM EVENTS TO PREVENT OVERFLOW.
- REMOVE AND DISPOSE OF HARDENED CONCRETE AND RETURN THE WASHOUT TO FUNCTIONAL CONDITION.

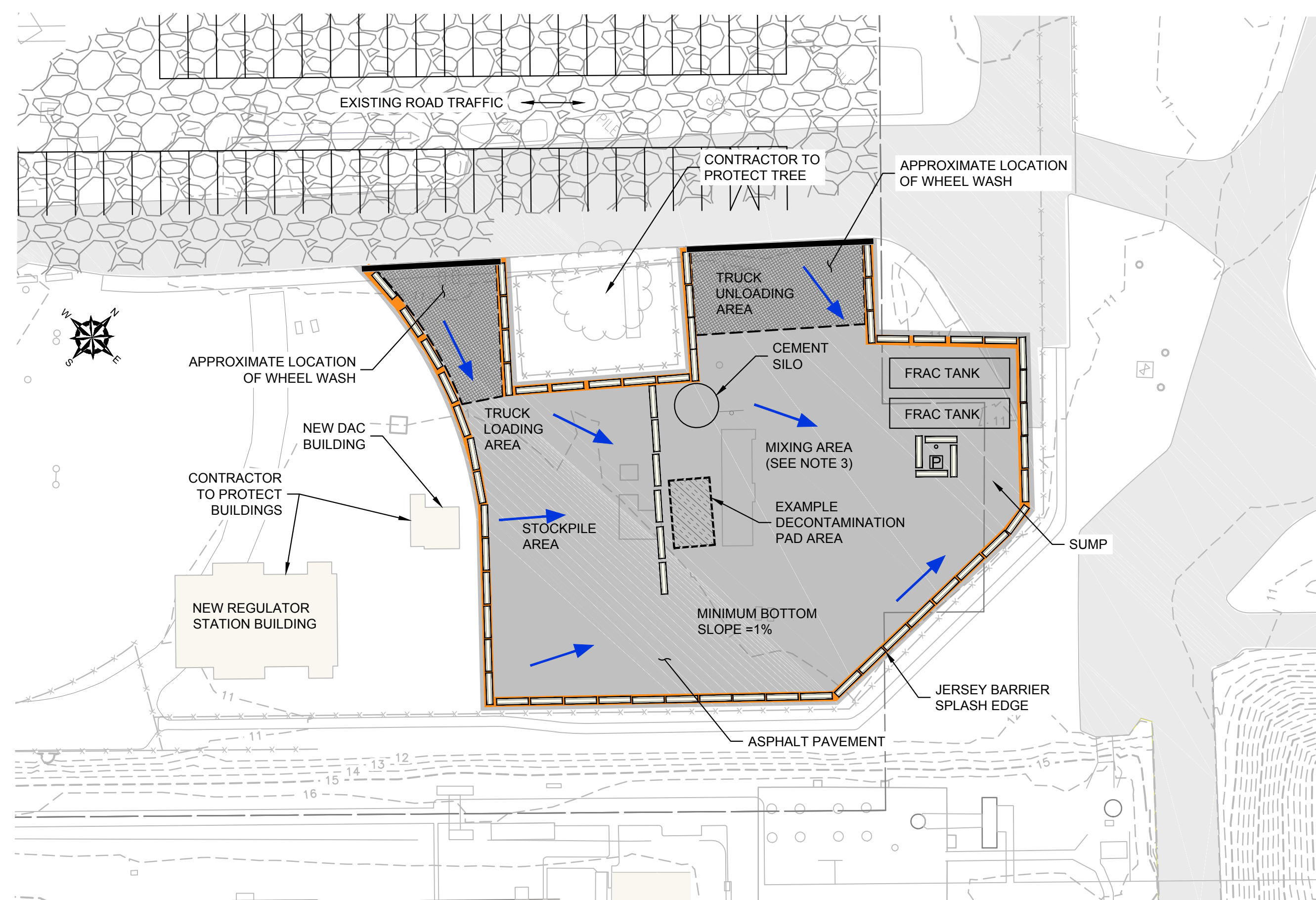
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NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
TEMPORARY SEDIMENTATION AND EROSION CONTROL DETAILS			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: 		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 5 SHEET NO. 5 OF 15

FOR PERMITTING ONLY

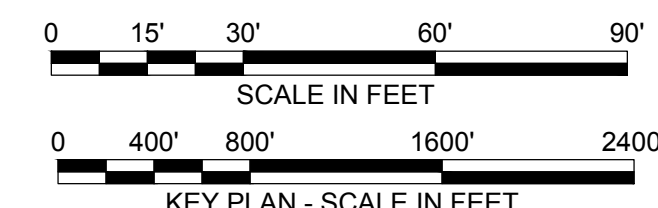


KEY PLAN:
SCALE: 1"=800'



MATERIAL MANAGEMENT AREA: PLAN VIEW
SCALE: 1"=30'

- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - EXISTING PAVEMENT
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED CRUSHED STONE
 - PROPOSED GRAVEL
 - EXISTING FENCE
 - JERSEY BARRIERS
 - JERSEY BARRIER SPLASH EDGE
 - WHEEL WASH
 - PROPOSED GRADING
 - DECONTAMINATION PAD



GENERAL NOTES:

- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
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- ELECTRONIC CAD FILES PROVIDED BY KIEWIT
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 2. "2007EXP_102761-CIV_LAYDOWN.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "2007EXP_102761-CIV_STORM.DWG"
 6. "ACAD-102761-CIV_SURFACING.DWG"
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 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"
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- 3) VERTICAL DATUM IS BASED ON NAVD 1988 (MSL) FROM BASE MAPPING PROVIDED BY VHB.
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- 7) SITE BOUNDARIES ARE APPROXIMATE.

MATERIAL MANAGEMENT AREA NOTES:

1. REGRADE LAND TO FACILITATE DRAINAGE TO THE SUMP, REMOVE EXISTING PAVEMENT AS NEEDED. THE MINIMUM BOTTOM SLOPE OF THE PAVED SURFACE SHALL BE 1%.
2. TRUCK LOADING AND UNLOADING AREAS SHALL BE USED AS WHEEL WASH AREAS. AS NECESSARY TRUCK UNLOADING AREA SHALL BE CONSTRUCTED WITH A MINIMUM BOTTOM SLOPE OF 1% TO DRAIN INTO SUMP.
3. MIXING AREA SHALL BE USED AS DECONTAMINATION PAD. PRIOR TO USE AS A DECONTAMINATION PAD, THE SURFACE SHALL BE POWER WASHED TO REMOVE ANY REMAINING MATERIAL.
4. IF THE MIXING AREA IS NOT USED AS A DECONTAMINATION PAD, CONSTRUCT STAND-ALONE DECONTAMINATION PAD, AS SHOWN IN DETAIL ON SHEET ENV-3.

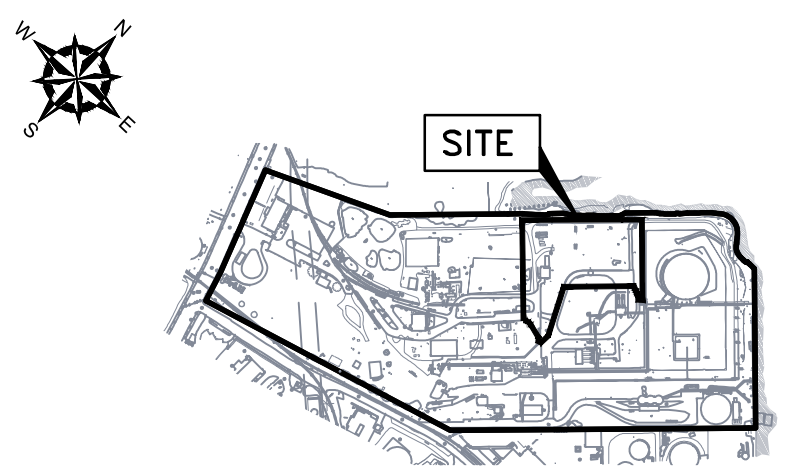
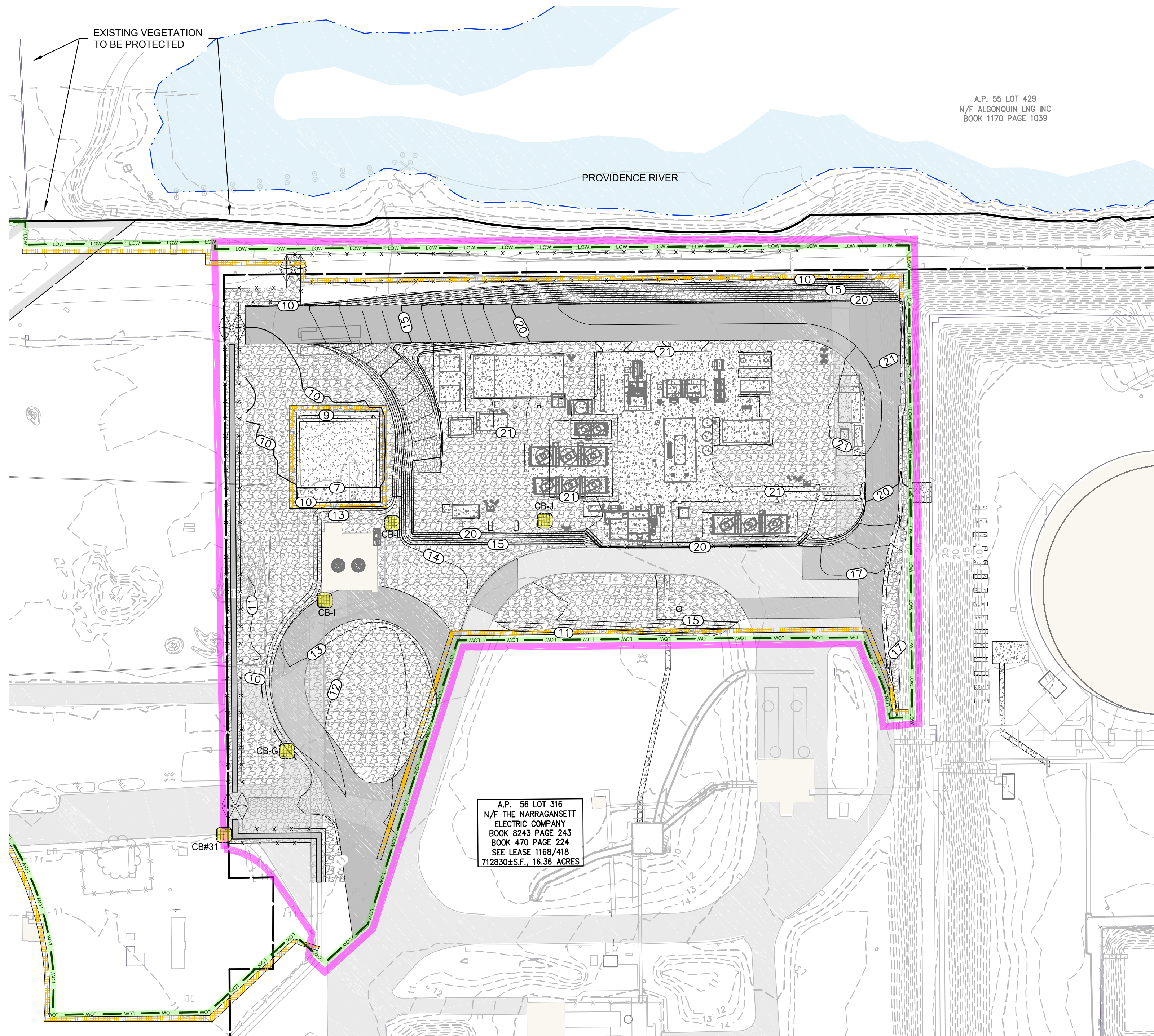
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NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
SOIL STORAGE AREA PLAN			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: nationalgrid	
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO. 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO. 0	FIGURE 6 SHEET NO. 6 OF 15

FOR PERMITTING ONLY

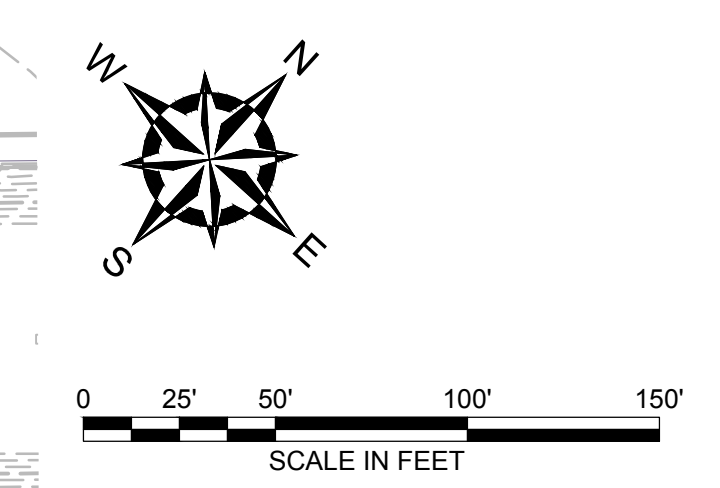
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DRAWING NAME: I:\102761-National_Grid_Liquefaction\CAD Exchange\In\2016-08-31_GZA_Liq_Permit Package\33554-60_CEMC PERMITTING_FOR STAMPING-AMS.dwg
SEP 06 2016 - 9:03am



KEY PLAN:
SCALE: 1"=800'

- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - EXISTING PAVEMENT
 - EASEMENT AREA
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - LIQUEFACTION WORK AREA
 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
 - PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
 - PROPOSED GRAVEL
 - STAKED FILTREXX SOXX (SEE DETAIL ON SHEET 5)
 - LIMIT OF WORK
 - PROPOSED CONCRETE
 - PROPOSED SAND FILTER
 - CATCH BASIN FRAME AND GRATE
 - CATCH BASIN TO BE PROTECTED WITH SILT SACK DURING CONSTRUCTION (SEE DETAIL ON SHEET 5)



GENERAL NOTES:

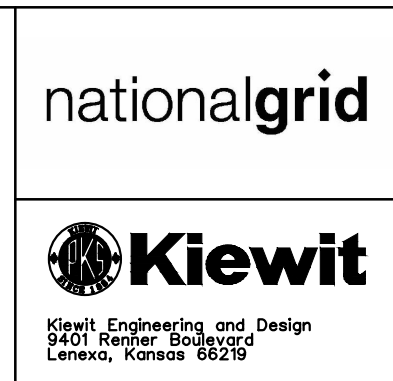
- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
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 4. "102761-SURVEY_SITE.DWG"
 5. "2007EXP_102761-CIV_STORM.DWG"
 6. "2007EXP_102761-CIV_SURFACING.DWG"
 7. "102761-CIV_GRADING.DWG"
 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"
- PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
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- 7) SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL

THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY AGREEMENT AND SUBJECT TO THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

REV	DATE	ISSUED FOR PERMIT	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

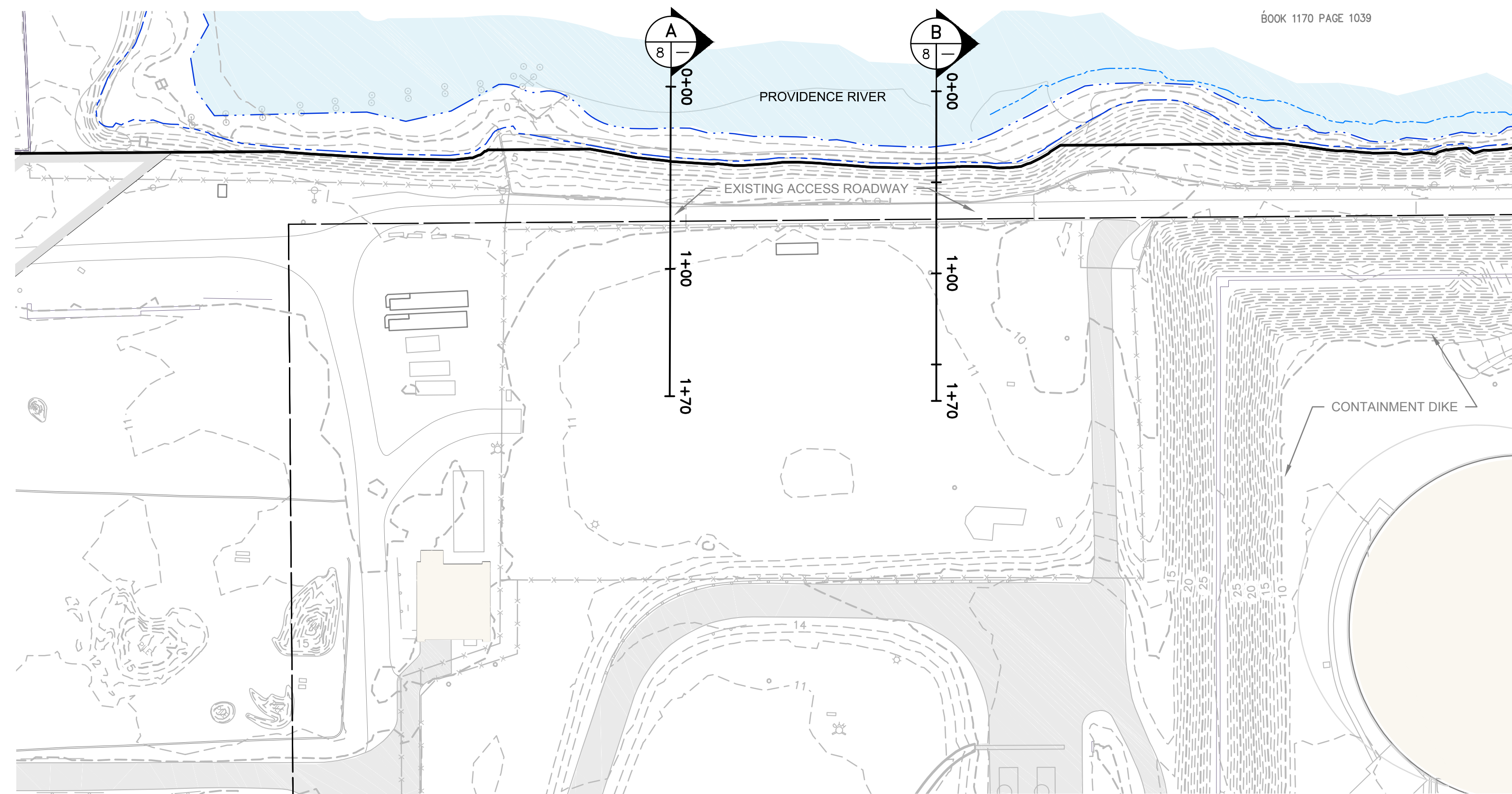
GENERAL NOTES AND COMMENTS:



SEAL AND STAMP:
ASHLEY STUTZMAN
No. 11512
REGISTERED
PROFESSIONAL ENGINEER
CIVIL

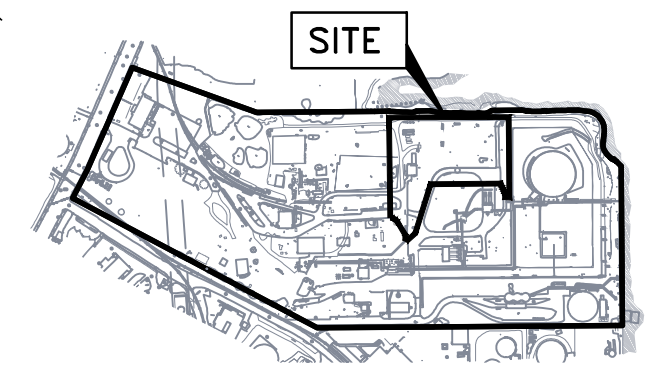
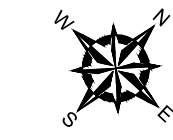
PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A REGISTERED PROFESSIONAL ENGINEER OF THE STATE OF RHODE ISLAND.
LICENSE NO. 11512
EXPIRATION DATE 06/30/2017

NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
LIQUEFACTION WORK AREA			
EROSION AND SEDIMENTATION CONTROLS			
DRAWING NO:	PROJECT NO:	SHT:	REV.
FIGURE 7	33554.60	7 OF 15	0



PLAN VIEW OF EXISTING REVETMENT
SCALE: 1"=50'

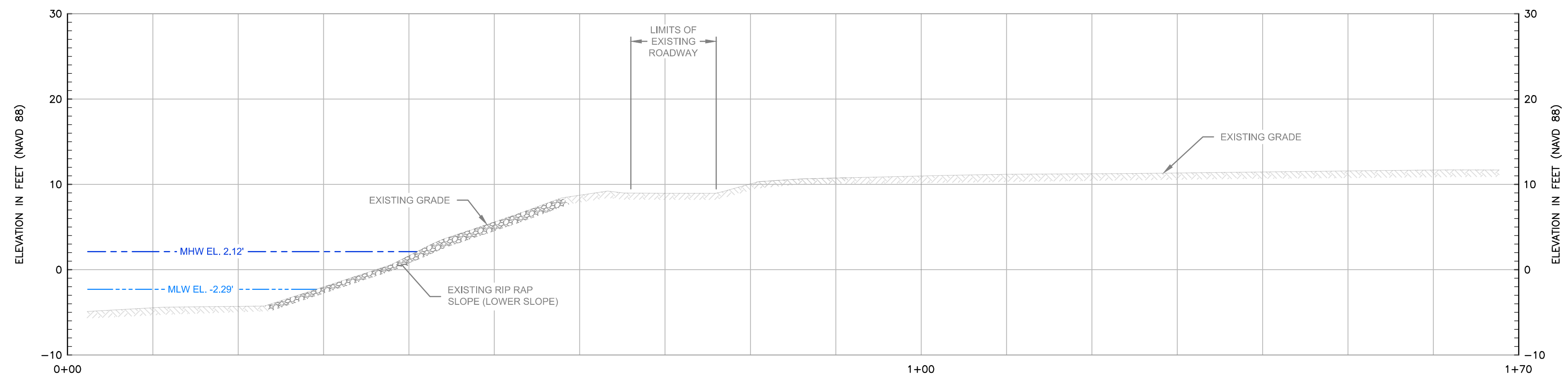
- LEGEND:**
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 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - EXISTING PAVEMENT
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - MHW
 - MLW
 - EASEMENT AREA



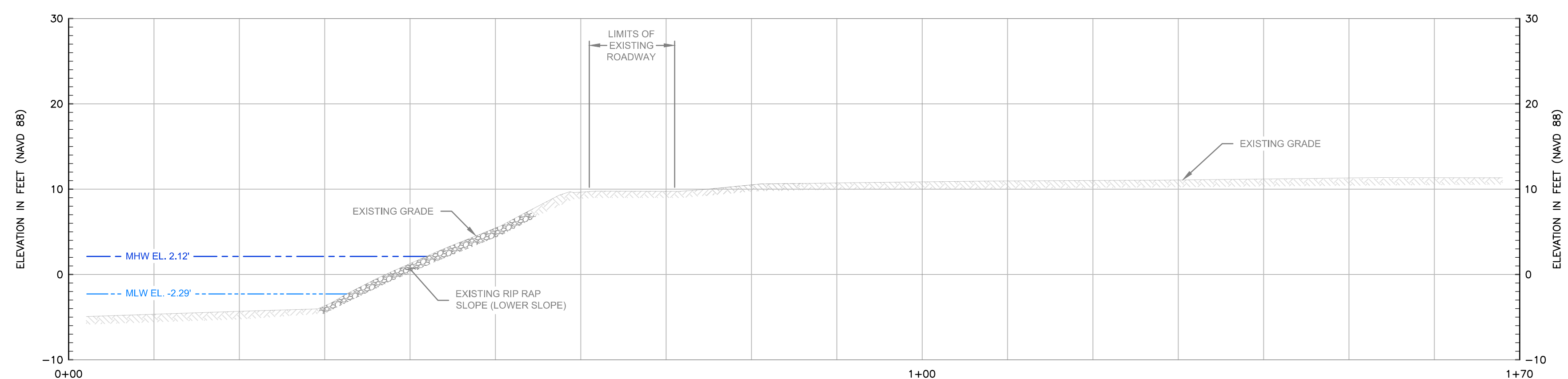
KEY PLAN:
SCALE: 1"=800'

GENERAL NOTES:

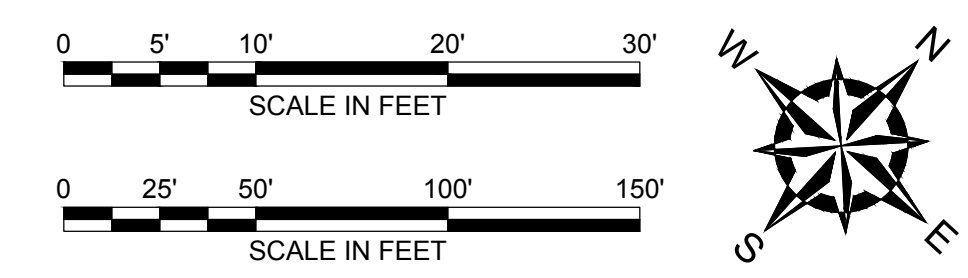
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A TYPICAL REVETMENT SECTION
SCALE: 1"=10'



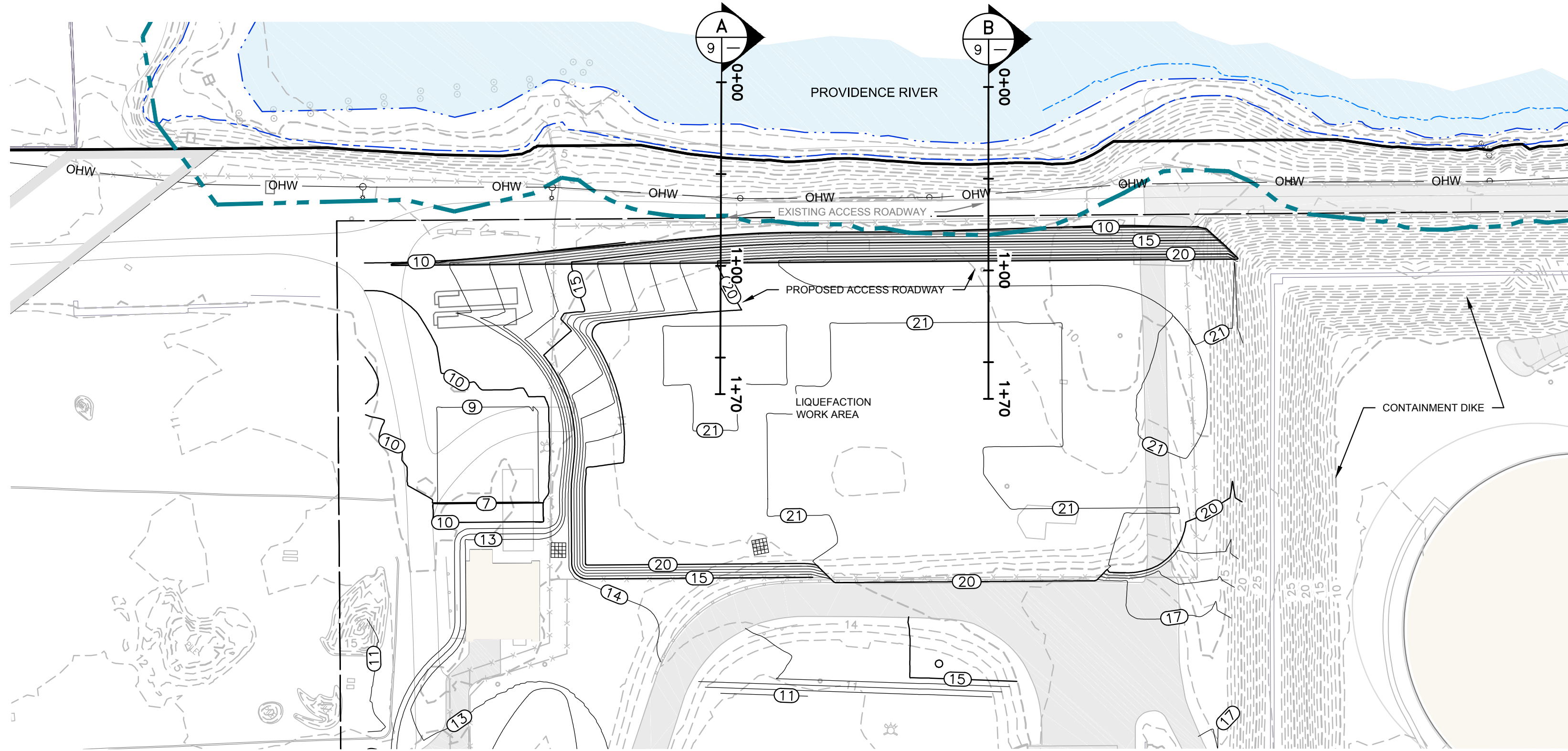
B TYPICAL REVETMENT SECTION
SCALE: 1"=10'



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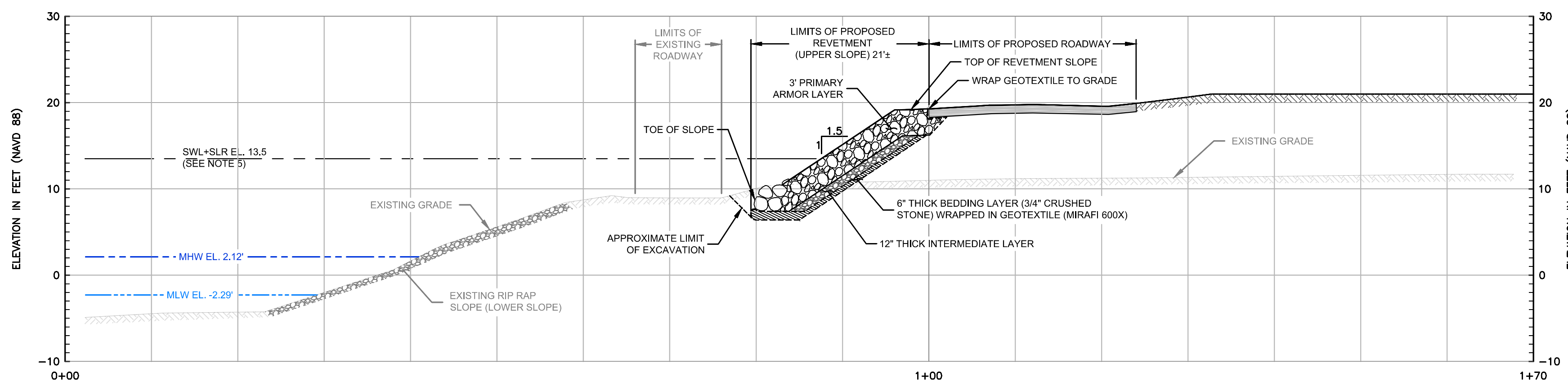
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
LIQUEFACTION WORK AREA - EXISTING REVETMENT WALL AND CROSS SECTIONS			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 8 SHEET NO. 8 OF 15

FOR PERMITTING ONLY



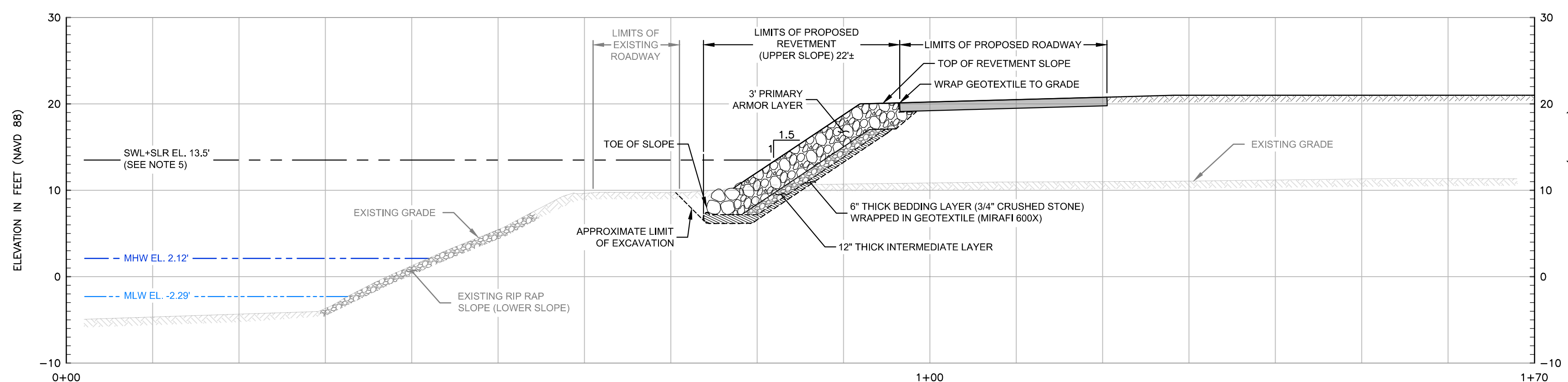
PLAN VIEW OF PROPOSED REVETMENT AND REVETMENT IMPROVEMENTS

SCALE: 1"=50'



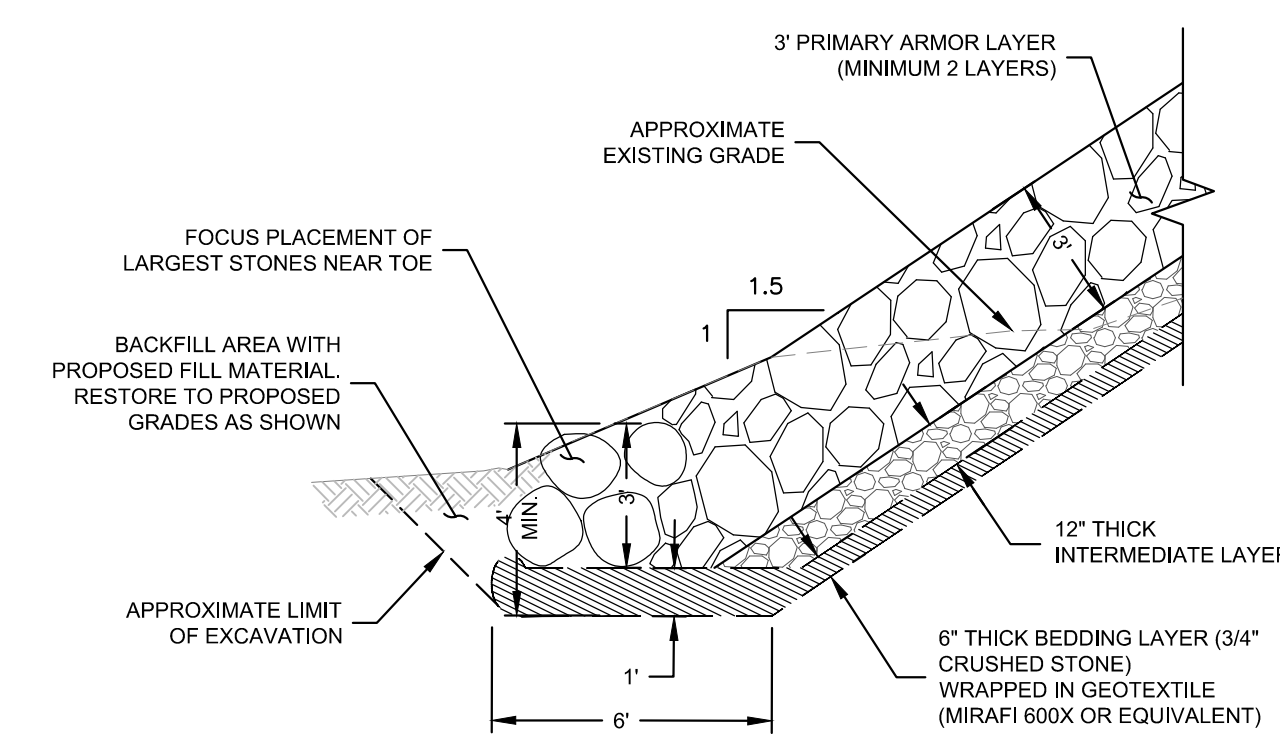
TYPICAL REVETMENT SECTION A-A

SCALE: 1"=10'



TYPICAL REVETMENT SECTION B-B

SCALE: 1"=10'



PROPOSED REVETMENT (UPPER SLOPE) (TYP.)

SCALE: 1"=4'

RIP RAP GRADATION REQUIREMENTS			
PRIMARY ARMOR LAYER		INTERMEDIATE LAYER	
RIDOT R-6		RIDOT R-2	
% LESS THAN	STONE SIZE (IN.)	% LESS THAN	STONE SIZE (IN.)
0-15%	8	0-15%	1
0-50%	13	0-50%	2
100%	26	100%	4

3/4" CRUSHED STONE GRADATION REQUIREMENTS	
% LESS THAN	SIEVE SIZE
100	3/4 INCH
90-100	1/2 INCH
30-60	3/8 INCH
0-15	No. 4
0-5	No. 8

LEGEND:

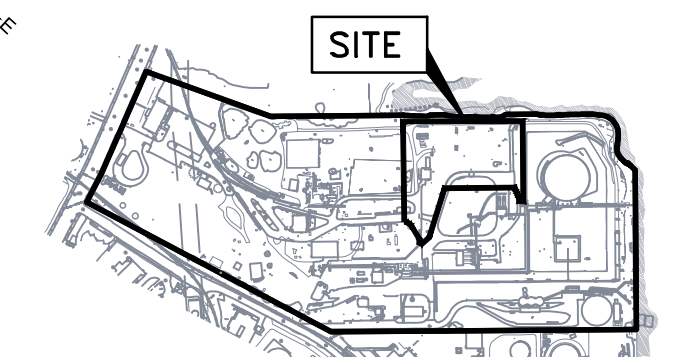
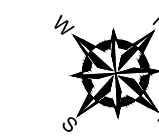
- EXISTING BUILDING
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- 50-FOOT SETBACK
- EXISTING PAVEMENT
- UTILITY POLE
- LIGHT POLE
- HYDRANT
- PROPERTY LINES
- INTERIOR PROPERTY LINE
- MHW
- MLW
- EASEMENT AREA
- PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
- PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
- STILL WATER LEVEL AND PREDICTED SEA LEVEL RISE (SEE NOTE #5)
- OHW
- LIMIT OF PROPOSED REVETMENT (UPPER SLOPE)

TIDAL DATUM

NOTE:

- TO CONVERT FROM NAVD88 TO MLW ADD 2.29 FT.
- TIDAL DATUM BASED UPON NOAA STATION 8454000.

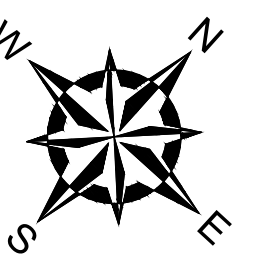
NAVD 88	MLW
+2.37' (MHHW)	+4.66' (MHHW)
+2.12' (MHW)	+4.41' (MHW)
0.0' (NAVD 88)	+2.29'
-2.29' (MLW)	0.0' (MLW)
-2.47' (MLLW)	-0.18' (MLLW)



KEY PLAN:
SCALE: 1"=600'

GENERAL NOTES:

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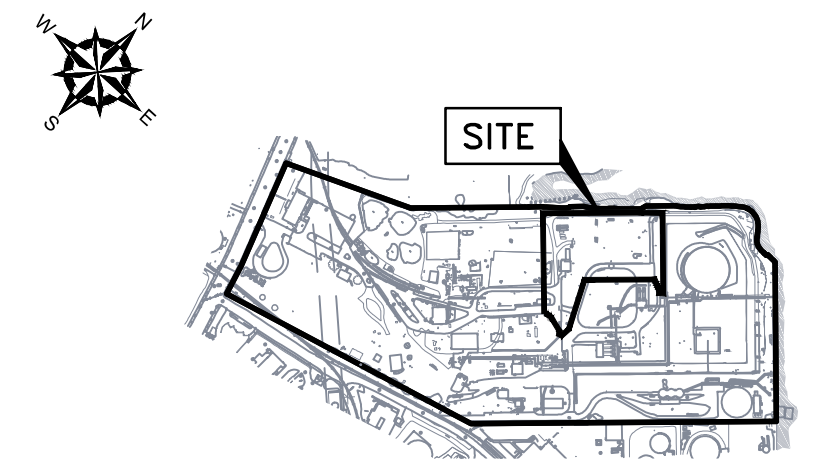
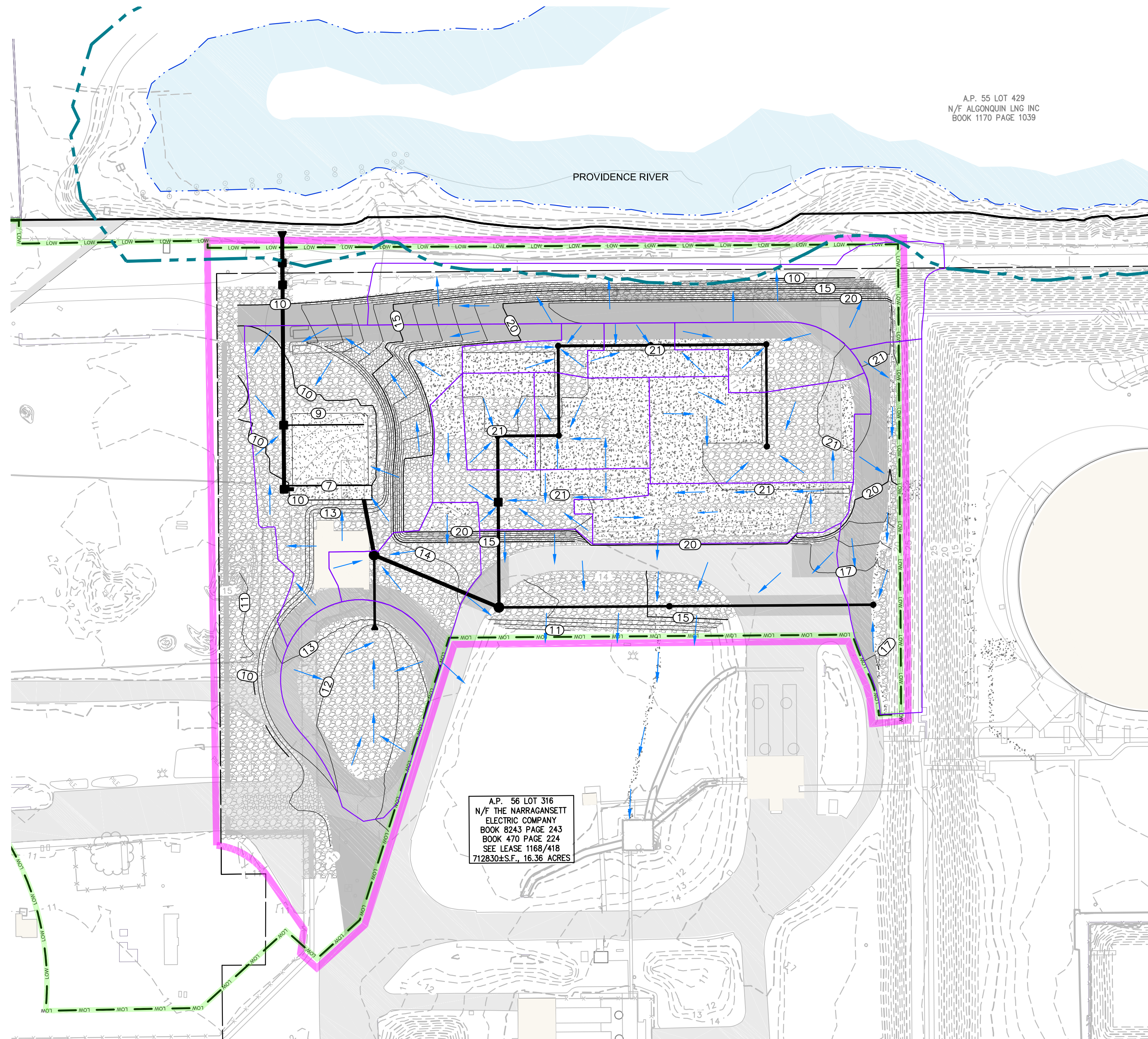


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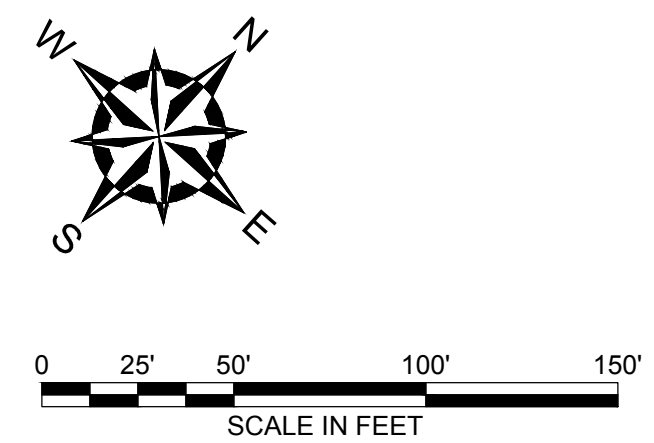
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND	
LIQUEFACTION WORK AREA - PROPOSED SLOPE ARMORING, EXISTING REVETMENT AND CROSS SECTIONS	
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60
CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 9 SHEET NO. 9 OF 15

DRAWING NAME: I:\102761-National_Grid_Liquefaction\CAD Exchange\102761-08-31-GZA Lic Permit Package\33554-60_CEMC PERMITTING_FOR STAMPING-AMIS.dwg
 SEP 06 2016 - 9:02am



KEY PLAN:
SCALE: 1"=800'

- LEGEND:**
- EXISTING BUILDING
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - 50-FOOT SETBACK
 - EXISTING PAVEMENT
 - EASEMENT AREA
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
 - PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED GRAVEL
 - PROPOSED CONCRETE
 - PROPOSED SAND FILTER
 - LIQUEFACTION WORK AREA
 - LIMIT OF WORK
 - FLOW DIRECTION



GENERAL NOTES:

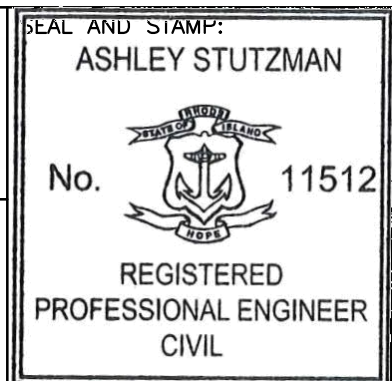
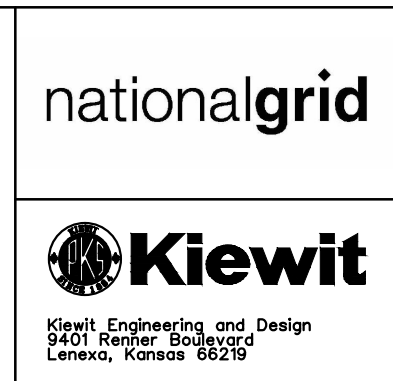
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THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY AGREEMENT AND SUBJECT THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

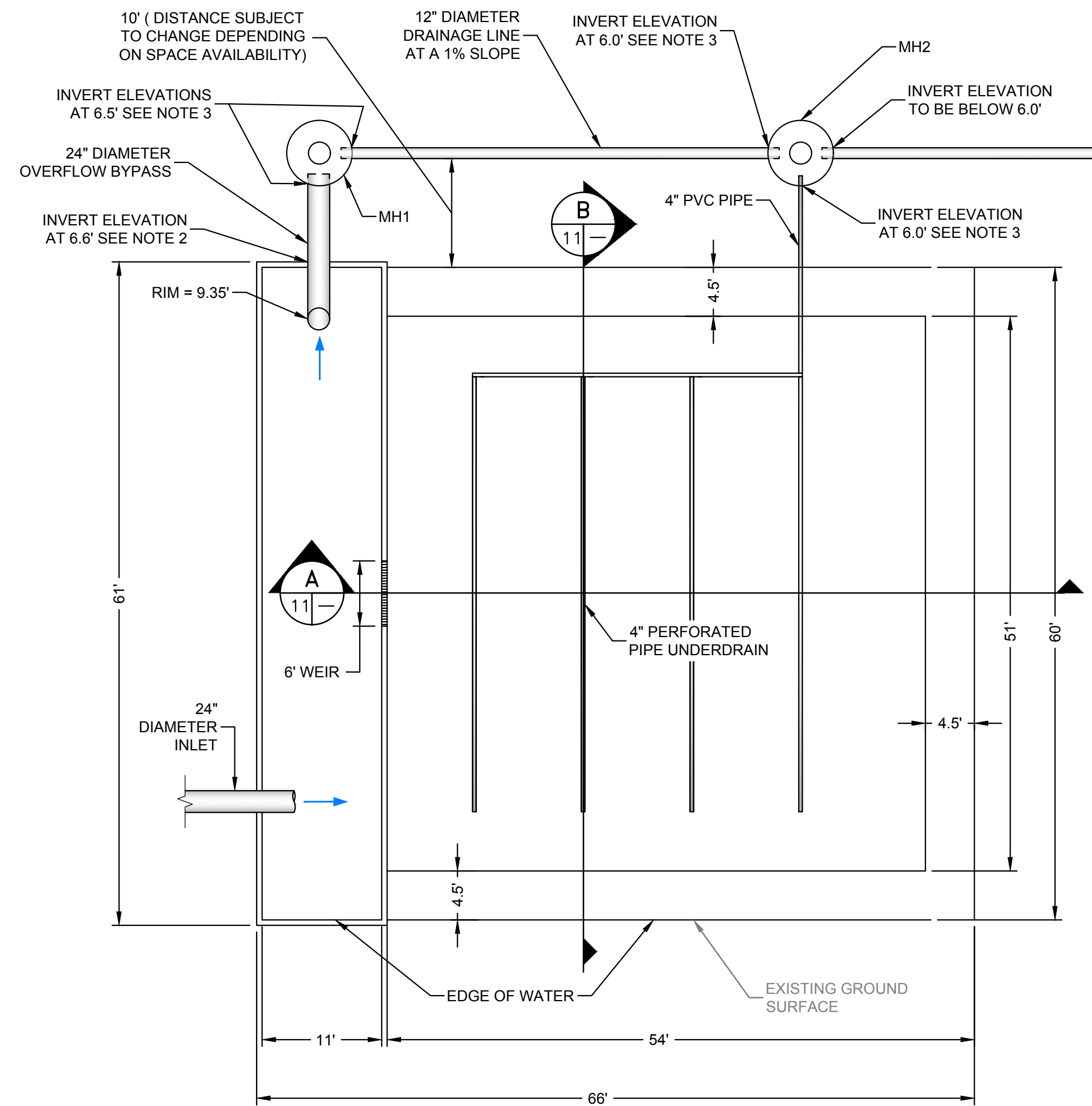
REV	DATE	REVISION INFORMATION	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

GENERAL NOTES AND COMMENTS:					

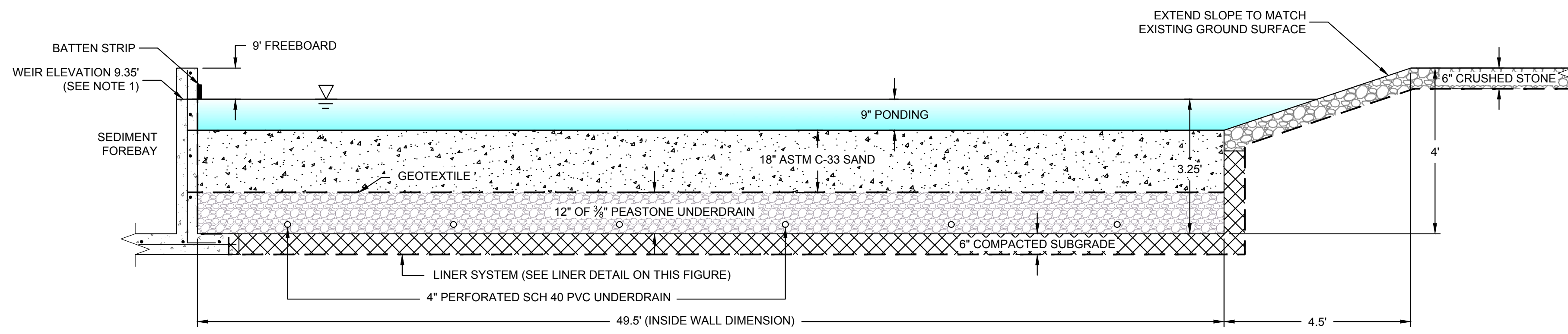


PROFESSIONAL CERTIFICATION:
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A LICENSED PROFESSIONAL ENGINEER OF THE STATE OF RHODE ISLAND.
 LICENSE NO. 11512
 EXPIRATION DATE 06/30/2017

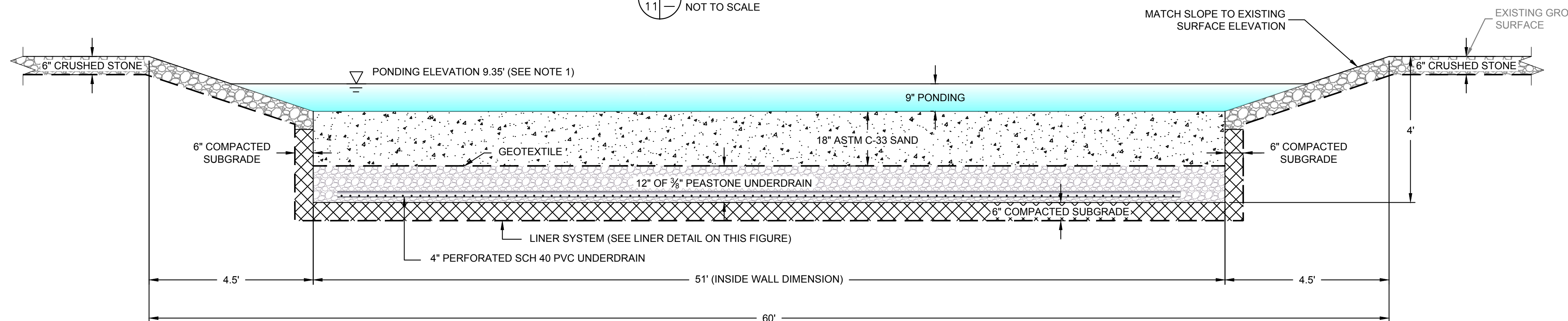
NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
STORMWATER MANAGEMENT PLAN			
DRAWING NO:	PROJECT NO:	SHT:	REV.
FIGURE 10	33554.60	10 OF 15	0



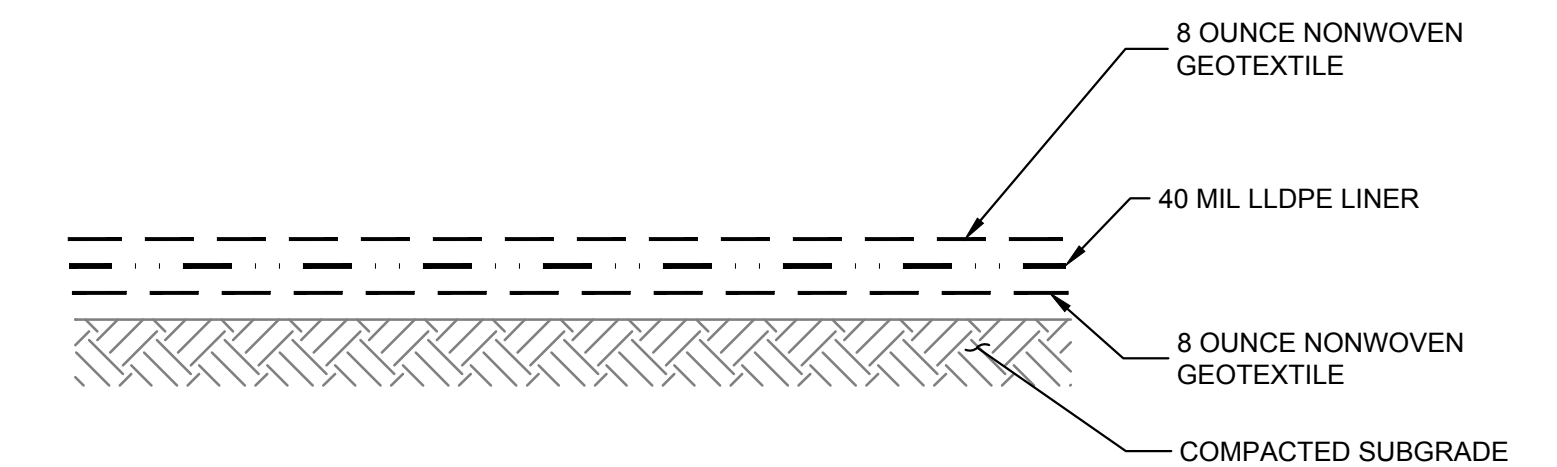
PLAN VIEW - SEDIMENT FOREBAY AND SAND FILTER
SCALE: 1"=10'



A SECTION - SAND FILTER (EARTHEN W/ CONCRETE FOREBAY)
NOT TO SCALE



B SECTION - SAND FILTER (EARTHEN)
NOT TO SCALE



SECTION - LINER DETAIL
NOT TO SCALE

NOTES:

1. PONDING ELEVATION TO BE SET AT INLET INVERT ELEVATION (CURRENTLY SET AT 9.35' BASED ON AUGUST 31, 2016 DRAINAGE CALCULATIONS).
2. OUTLET INVERT ELEVATION FOR 24" OVERFLOW BYPASS TO BE 2.75' BELOW PONDING ELEVATION.
3. INVERT ELEVATIONS TO BE SET BASED ON AUGUST 31, 2016 DRAINAGE CALCULATIONS.

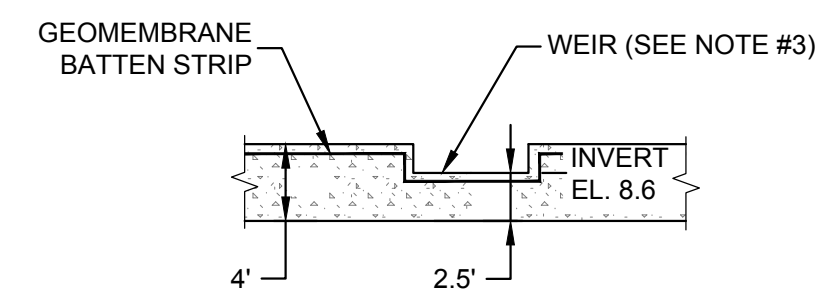
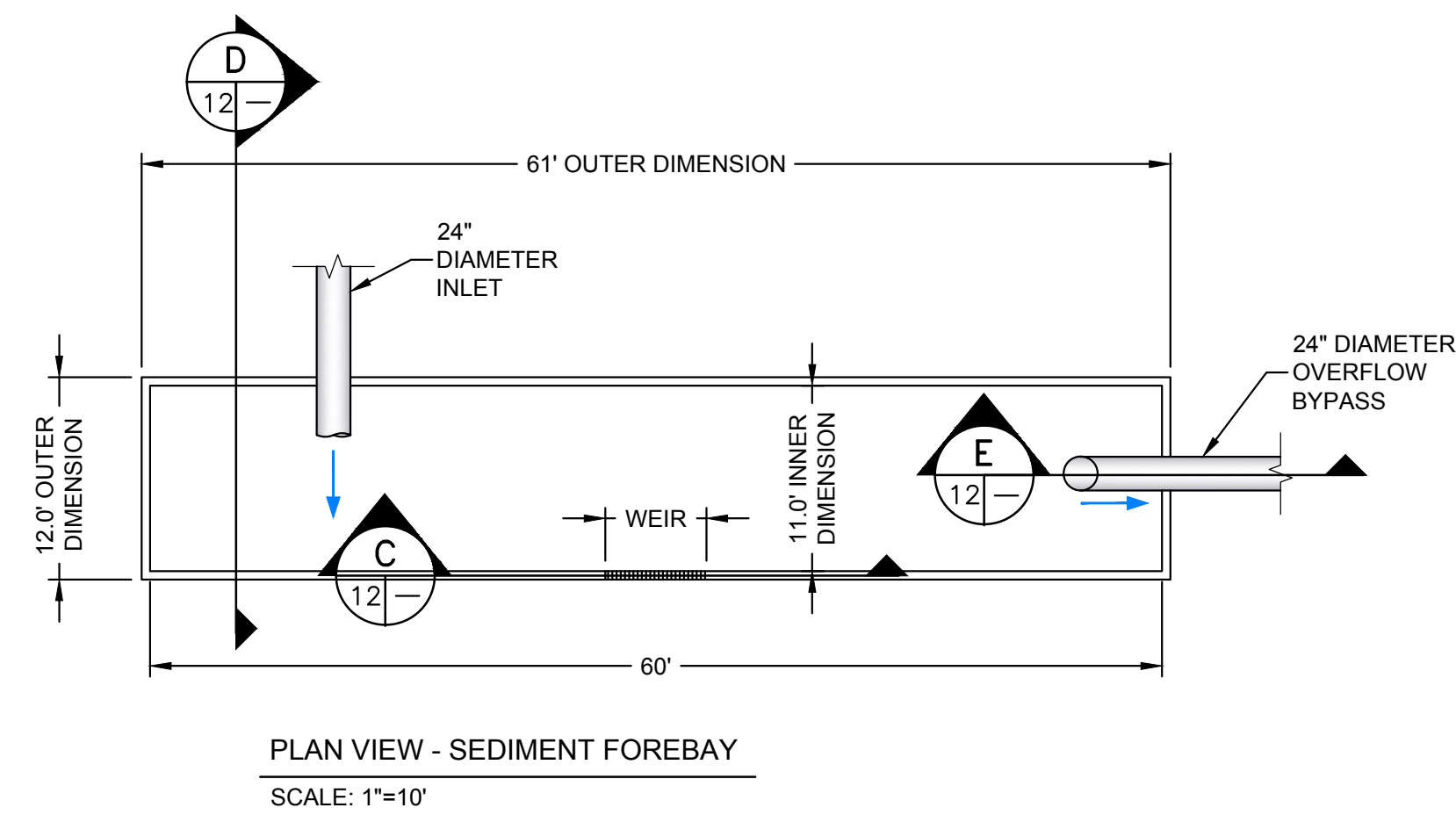


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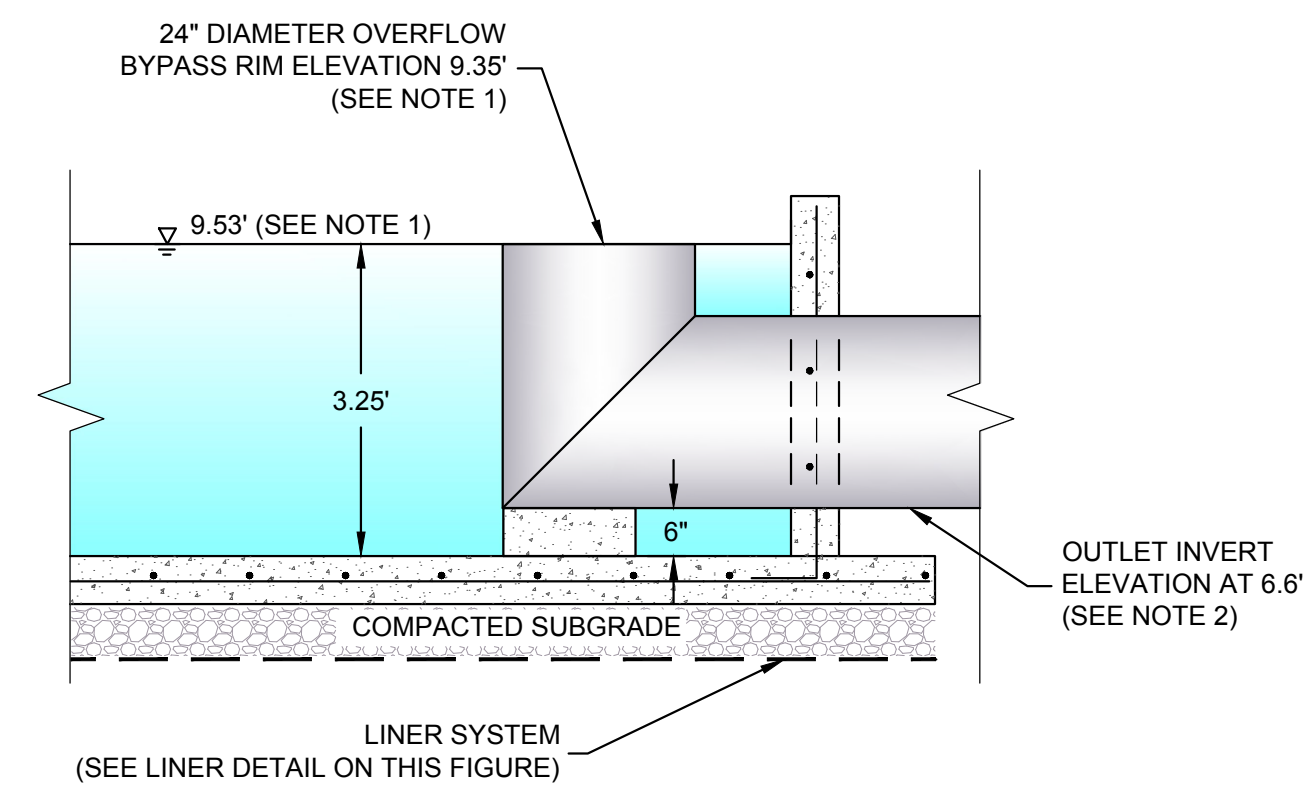
NATIONAL GRID
LIQUEFACTION PLANT
642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND
STORMWATER MANAGEMENT DETAILS
SAND FILTER

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid		
PROJ MGR: MSK	REVIEWED BY: SJH	CHECKED BY: IR	FIGURE
DESIGNED BY: SJH	DRAWN BY: LDT	SCALE: AS NOTED	11
DATE: SEPTEMBER 2016	PROJECT NO. 33554.60	REVISION NO. 0	SHEET NO. 11 OF 15

FOR PERMITTING ONLY

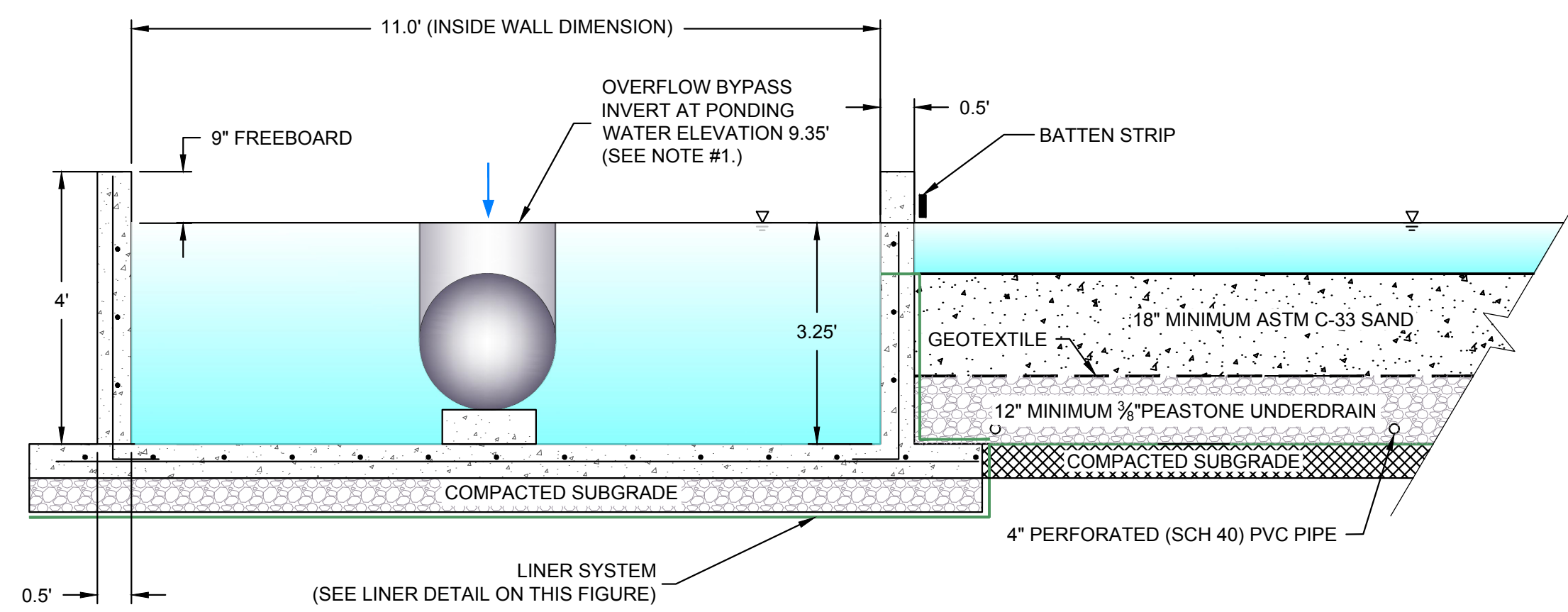


C SECTION - SEDIMENT FOREBAY
SCALE: 1"=10'



NOTE:

OVERFLOW BYPASS PIPE DIAMETER TO BE SIZED FOR 100-YEAR PEAK FLOW RATE



D SECTION - SEDIMENT FOREBAY DETAIL
NOT TO SCALE

NOTES:

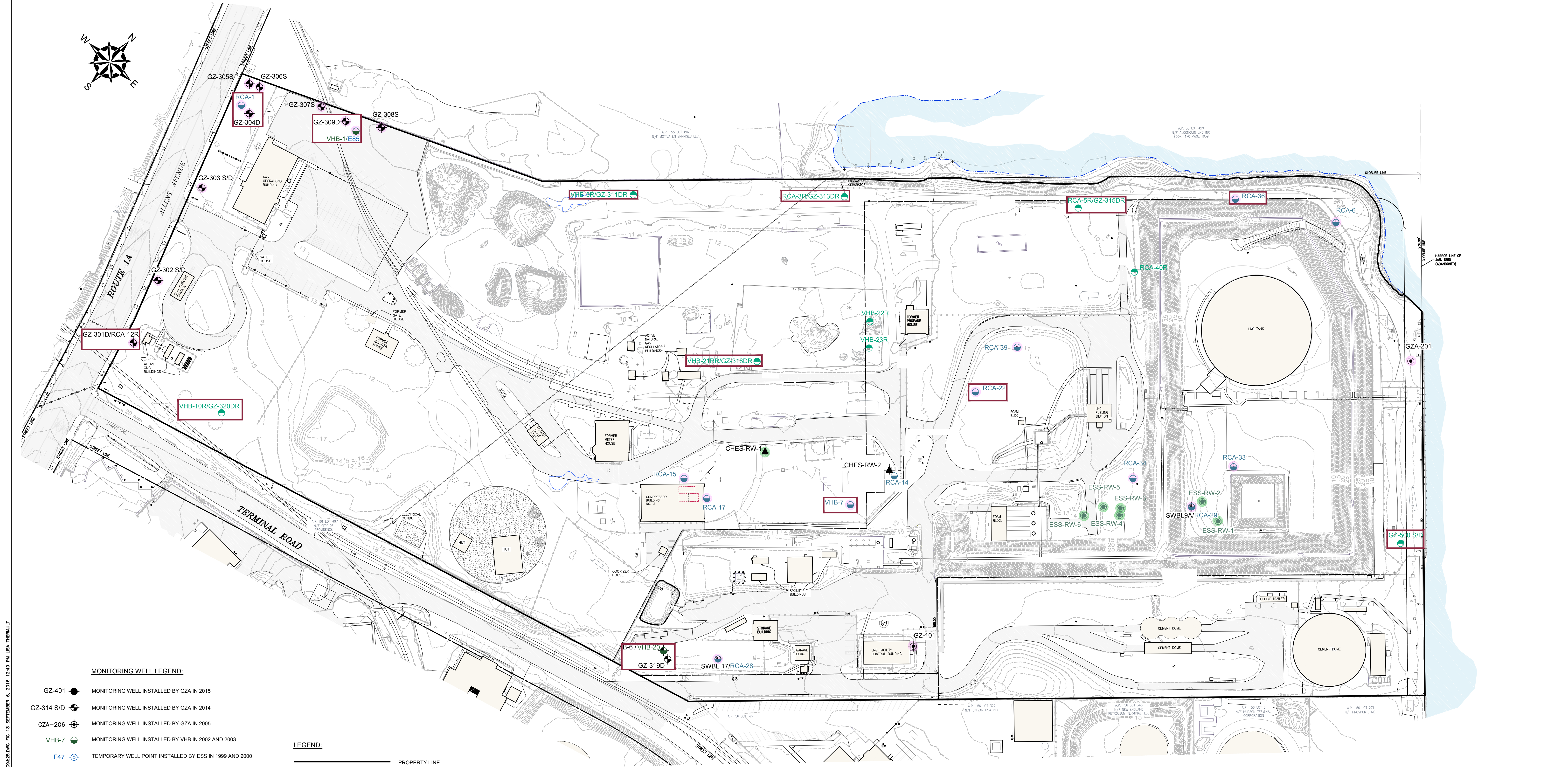
- PONDING ELEVATION TO BE SET AT INLET INVERT ELEVATION (CURRENTLY SET AT 9.35' BASED ON AUGUST 31, 2016 DRAINAGE CALCULATIONS).
- OUTLET INVERT ELEVATION FOR 24" OVERFLOW BYPASS TO BE 2.75' BELOW PONDING ELEVATION.
- SIZE WIDTH OF WEIR BASED ON WATER QUALITY PEAK FLOW RATE.



THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
STORMWATER MANAGEMENT DETAILS CONCRETE FOREBAY			
PREPARED BY:	GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR:	nationalgrid
PROJ MGR: MSK	REVIEWED BY: SJH	CHECKED BY: IR	FIGURE
DESIGNED BY: SJH	DRAWN BY: LDT	SCALE: AS NOTED	12
DATE: SEPTEMBER, 2016	PROJECT NO. 33554.60	REVISION NO. 0	SHEET NO. 12 OF 15

FOR PERMITTING ONLY



MONITORING WELL LEGEND:

- GZ-401 ● MONITORING WELL INSTALLED BY GZA IN 2015
- GZ-314 S/D ● MONITORING WELL INSTALLED BY GZA IN 2014
- GZA-206 ● MONITORING WELL INSTALLED BY GZA IN 2005
- VHB-7 ● MONITORING WELL INSTALLED BY VHB IN 2002 AND 2003
- F47 ● TEMPORARY WELL POINT INSTALLED BY ESS IN 1999 AND 2000
- 1 ● TEMPORARY WELL POINT INSTALLED BY ESS IN 1999
- RCA-40 ● MONITORING WELL INSTALLED BY ESS IN 1996
- RW-1 ▲ RECOVERY WELL INSTALLED BY CHES OBSERVED BY GZA IN 2014
- CHES-RW-1 ▲ RECOVERY WELL INSTALLED BY CHES OBSERVED BY VHB IN 2002
- ESS-RW-1 ● RECOVERY WELL INSTALLED BY ESS IN 1999 AND 2000
- GZ-311DR ● MONITORING WELLS TO BE INSTALLED AFTER CONTRACTOR DEMOBILIZATION

MONITORING WELL LEGEND CONTINUED:

- ACTIVE MONITORING WELLS
- RECOVERY WELLS
- MONITORING WELL TO BE INSTALLED AFTER CONTRACTOR DEMOBILIZATION
- WELL IS PLANNED TO BE INCLUDED IN ANNUAL GROUNDWATER MONITORING PROGRAM AFTER CONTRACTOR DEMOBILIZATION

LEGEND:

- PROPERTY LINE
- - - INTERIOR PROPERTY LINE
- EXISTING BUILDING
- STEEL POST
- PILING
- EDGE OF WATER
- FENCE
- RAILROAD TRACKS
- - - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- - - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- PAVEMENT
- CONCRETE PAD

GENERAL NOTES:

- 1) EXISTING CONDITIONS BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG
 - ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2015.
- 2) PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3.
- 3) EXPLORATION LOCATION PLANS WERE DEVELOPED FROM THE FOLLOWING:
 - SITE PLANS PROVIDED BY RCA IN THE RIDEM-SUBMITTED JUNE 28, 1998 "PHASE IB FIELD CHARACTERIZATION INVESTIGATION" PREPARED ON BEHALF OF THE PROVIDENCE GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - SITE PLANS PROVIDED BY VHB IN THE RIDEM-SUBMITTED NOVEMBER 2002 "REMEDIATION ACTION CLOSURE REPORT" PREPARED ON BEHALF OF THE NEW ENGLAND GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - FIGURE 3 "EXPLORATION LOCATION PLAN" PREPARED BY GZA GEOENVIRONMENTAL, INC. (GZA) ON BEHALF OF CHICAGO BRIDGE AND IRON (C&I) IN JULY 2005. PLANS PROVIDED BY NATIONAL GRID.
 - FIGURE 35 "TEST BORINGS UNDER SASSAFRAS POINT PLAT" DATED JUNE 5, 1912 PREPARED BY THE PROVIDENCE GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - DRAWING 3 "WHARF FACILITIES - BULKHEAD REBUILDING - CROSS SECTIONS" DATED JANUARY 11, 1973 PREPARED BY PARSONS, BRINCKERHOFF, QUADE AND DOUGLAS ON BEHALF OF THE PROVIDENCE GAS COMPANY. PLANS PROVIDED BY NATIONAL GRID.
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
- 4) ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014. ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
- 5) THE LOCATION OF THE EXPLORATIONS AND MONITORING WELLS AT THE SITE WERE APPROXIMATELY DETERMINED AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
- 6) HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- 7) VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- 8) SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. OTHER LOCATIONS MAY EXIST.

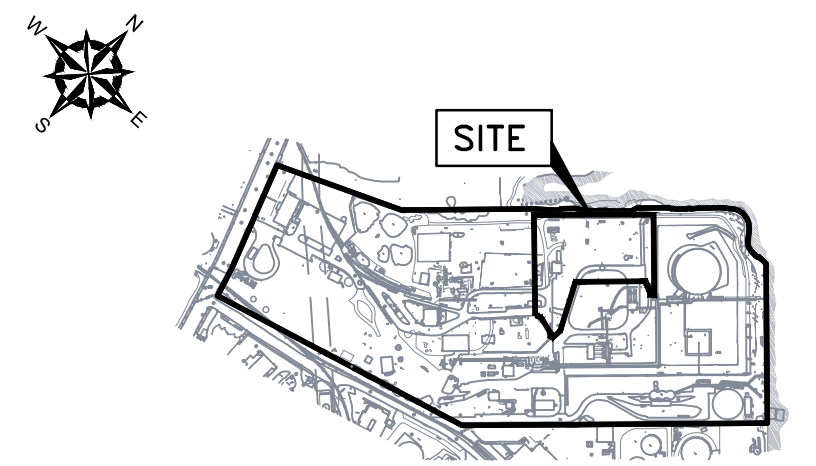
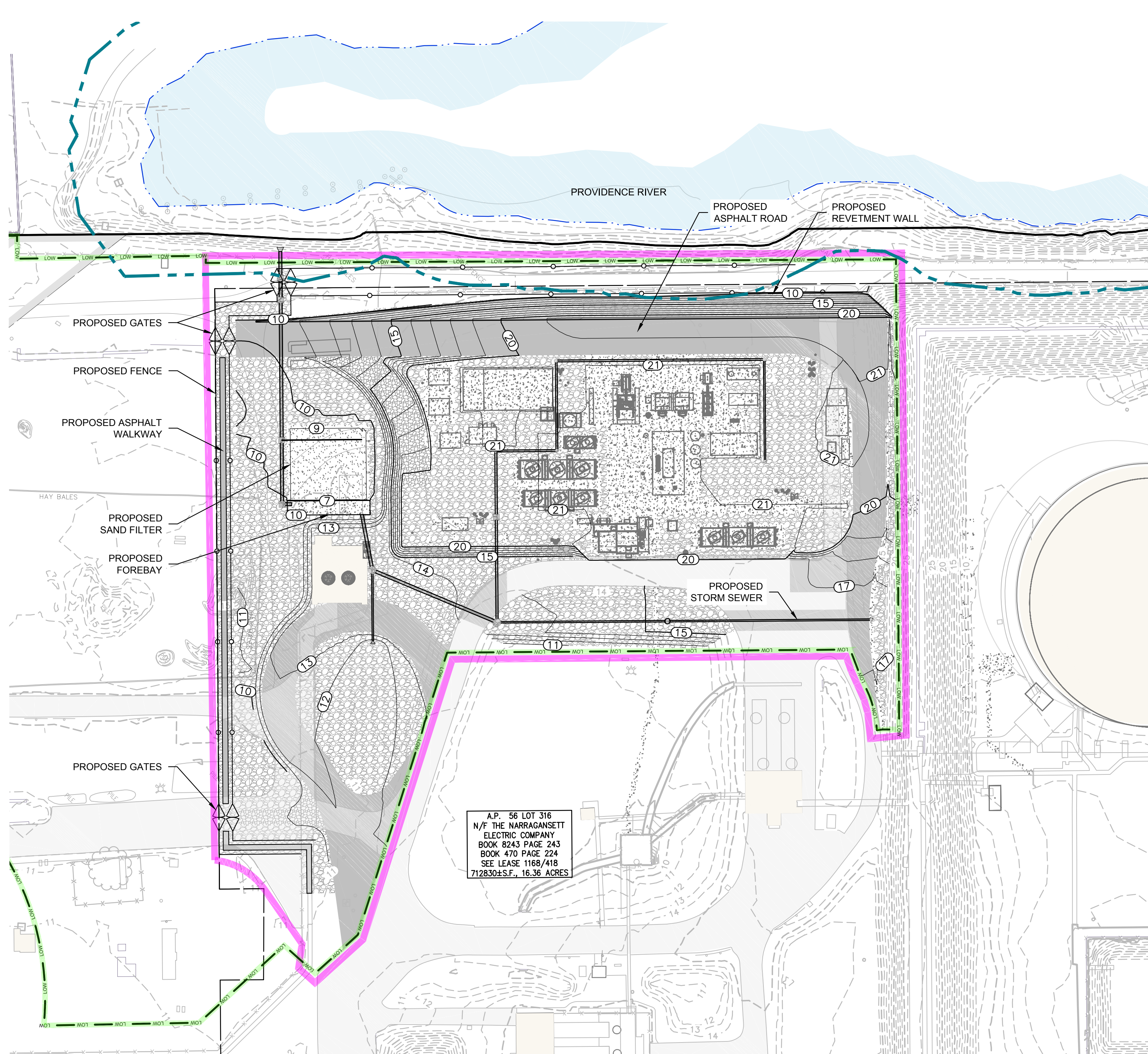


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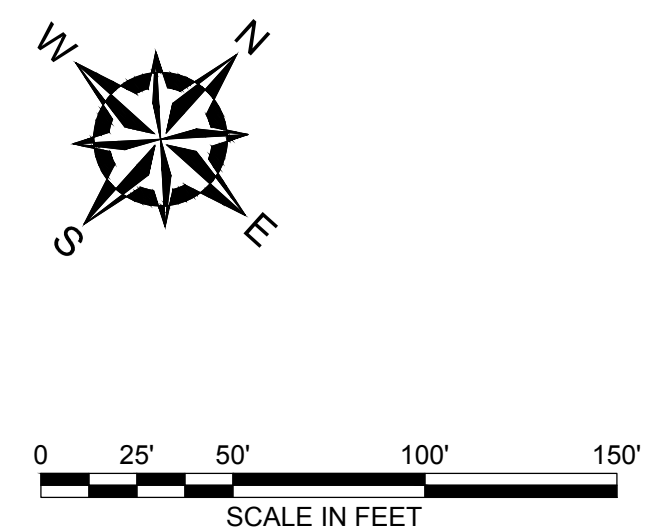
NATIONAL GRID LIQUEFACTION PLANT 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND			
PROPOSED MONITORING WELL RE-INSTALLATION PLAN			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: 		
PROJ MGR: MSK DESIGNED BY: SJH DATE: SEPTEMBER, 2016	REVIEWED BY: SJH DRAWN BY: LDT PROJECT NO.: 33554.60	CHECKED BY: IR SCALE: AS NOTED REVISION NO.: 0	FIGURE 13 SHEET NO. 13 OF 15

FOR PERMITTING ONLY

DRAWING NAME: I:\02761-National_Grid_Liquefaction\CAD Exchange\In\2016-08-31_GZA_Liq_Permit_Package\33554-60_CIMC_PERMITTING_FOR_STAMPING-AMS.dwg
 SEP 06 2016 - 1:30pm



- KEY PLAN:**
SCALE: 1"=800'
- LEGEND:**
- EXISTING STRUCTURE
 - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
 - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
 - 50-FOOT SETBACK
 - EXISTING PAVEMENT
 - EASEMENT AREA
 - UTILITY POLE
 - LIGHT POLE
 - HYDRANT
 - PROPERTY LINES
 - INTERIOR PROPERTY LINE
 - PROPOSED CONTOUR (MAJOR 5 FOOT INTERVAL)
 - PROPOSED CONTOUR (MINOR 1 FOOT INTERVAL)
 - PROPOSED PERMANENT PAVEMENT
 - PROPOSED GRAVEL
 - PROPOSED CONCRETE
 - PROPOSED SAND FILTER
 - LIQUEFACTION WORK AREA
 - LIMIT OF WORK
 - LIMIT OF PROPOSED REVETMENT (UPPER SLOPE)
 - PROPOSED ROUND CATCH BASIN
 - PROPOSED SQUARE CATCH BASIN



GENERAL NOTES:

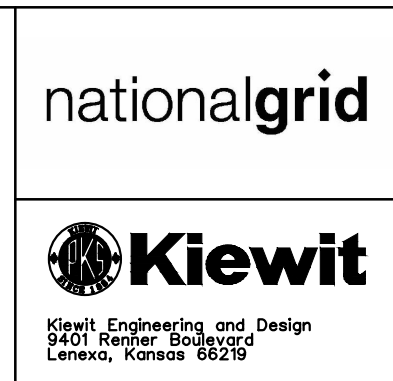
- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
 - ELECTRONIC CAD FILE "ACAD-7257PL.DWG" PROVIDED BY VANASSE HANGEN BRUSTLIN (VHB) ENTITLED "EXISTING CONDITIONS PLAN," PROJECT TITLE "NATIONAL GRID LNG TERMINAL ROAD LNG FACILITY" DATED MARCH 10, 2014, ORIGINAL SCALE 1" = 50', DRAWING NO. SV-1 THROUGH SV-3 AND AERIAL MAPPING BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED JANUARY 15, 2014 PREPARED FOR NATIONAL GRID LAND SURVEYING DEPARTMENT, WALTHAM, MASSACHUSETTS AND CAD FILE NO. 09303023.052-1.DWG. PLANS PROVIDED BY NATIONAL GRID.
 - DESCRIPTIONS PROVIDED IN THE CITY OF PROVIDENCE DEED BOOK (BK) 470 PAGES 224 - 229, BK 561 PAGES 326 - 328, BK 1111 PAGES 752 - 756 AND BK 5249 PAGES 219 - 322.
- ELECTRONIC CAD FILE 14-152_SU1_REV2.DWG, TITLED "TOPOGRAPHIC SURVEY PLAN, PORTION OF A.P. 56 LOT 5" DATED OCTOBER 27, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILE 5153_COO.DWG, TITLED "EXISTING CONDITIONS PLAN" PREPARED BY PROCESS PIPELINE SERVICES, DATED DECEMBER 18, 2014 AND PROVIDED BY NATIONAL GRID.
- ELECTRONIC CAD FILES PROVIDED BY KIEWIT
 1. "ACAD-102761-CIV_SITE.DWG"
 2. "2007EXP_102761-CIV_SURFACING.DWG"
 3. "102761_MEC_STR_BASE.DWG"
 4. "102761-SURVEY_SITE.DWG"
 5. "A2007EXP_102761-CIV_STORM.DWG"
 6. "ACAD-102761-CIV_SURFACING.DWG"
 7. "ACAD-102761-PROP-CONT.DWG"
 8. "POST DEVELOPMENT DRAINAGE MAP.DWG"
- PDFS OF THE FOLLOWING DRAWINGS PROVIDED BY NATIONAL GRID
 1. "CATCH BASINS AND SANITARY SEWER SYSTEM" PREPARED BY PROVIDENCE GAS COMPANY, DATED SEPTEMBER 25, 1981.
 2. "PLAN SHOWING UNDERGROUND UTILITIES LNG FACILITY" DATED OCTOBER 6, 1983, "SUBSURFACE UTILITY ENGINEERING" PREPARED BY BAYSTATE SUBSURFACE INVESTIGATION, INC., DATED MAY 17, 2005.
- 2) HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY VHB.
- 3) VERTICAL DATUM IS BASED ON NAVD 1988 FROM BASE MAPPING PROVIDED BY VHB.
- 4) SELECT PRESENTED SITE UTILITIES WERE TAKEN FROM HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND HAVE BEEN ALIGNED AND ADJUSTED FOR THE "BEST FIT" AND THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. UTILITIES ARE SHOWN FOR REFERENCE ONLY. **OTHER LOCATIONS MAY EXIST.**
- 5) ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2011 AND 2016.
- 6) PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
- 7) SITE BOUNDARIES ARE APPROXIMATE.

CONFIDENTIAL

THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY AGREEMENT AND SUBJECT THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

REV	DATE	REVISION INFORMATION	BY	CHK	APP.
0	09/06/16	ISSUED FOR PERMIT		DAC	AMS

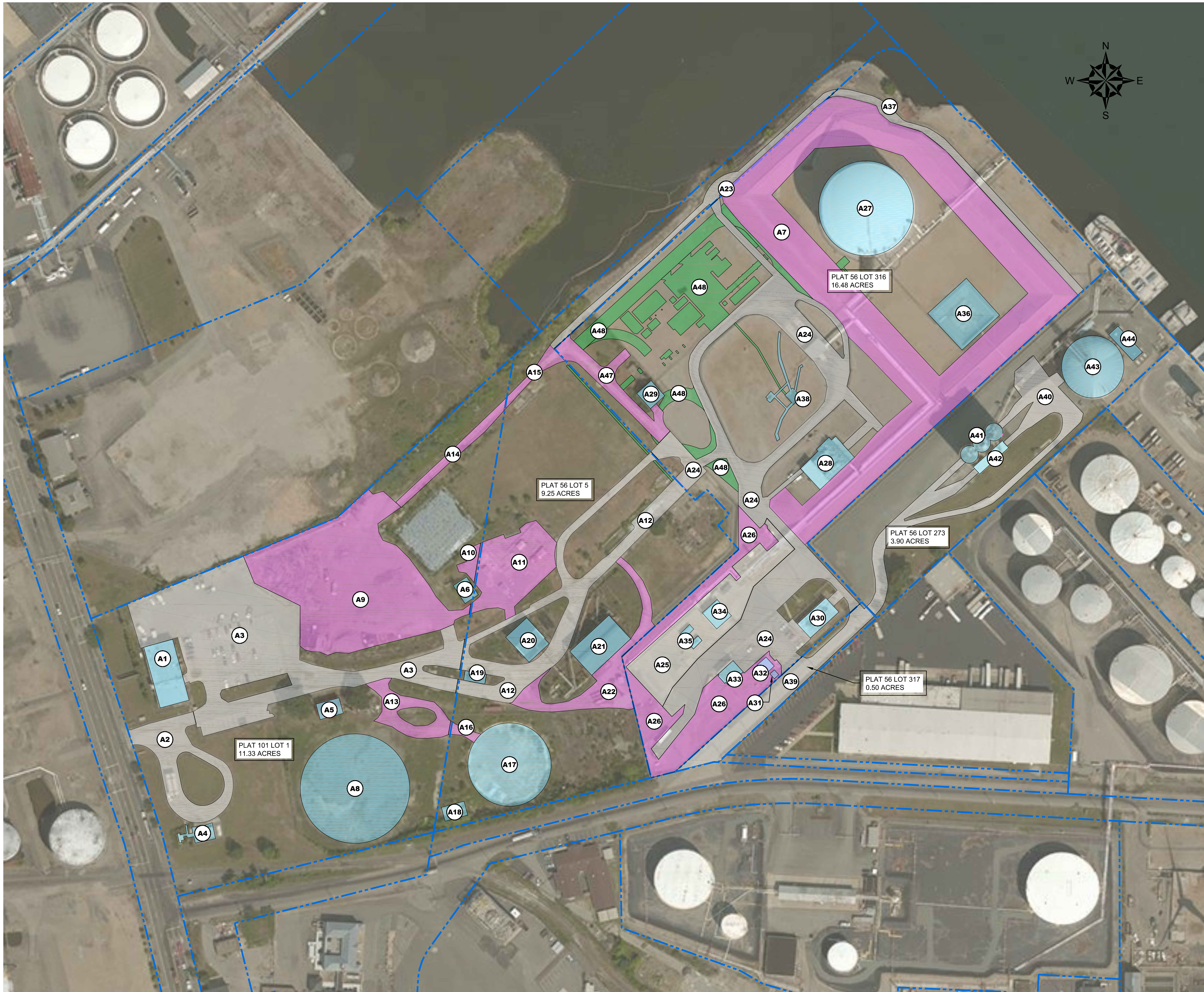
GENERAL NOTES AND COMMENTS:



SEAL AND STAMP:
 ASHLEY STUTZMAN
 No. 11512
 REGISTERED
 PROFESSIONAL ENGINEER
 CIVIL

PROFESSIONAL CERTIFICATION:
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A LICENSED PROFESSIONAL ENGINEER OF THIS STATE.
 LICENSE NO. 11512
 EXPIRATION DATE 06/30/2017
 ENG/DESIGN ORIG: A. STUTZMAN
 LEAD ENG: A. STUTZMAN
 ENG. MGR: J. BOCKELMAN
 PROJ. MGR: A. PARRACK

NATIONAL GRID LNG LLC			
FIELDS POINT LIQUEFACTION PROJECT			
PROPOSED FINAL CONDITIONS PLAN			
DRAWING NO:	PROJECT NO:	SHT:	REV.
FIGURE 14	33554.60	14 OF 15	0



LEGEND

	PROPERTY LINES
	PERVIOUS PROPOSED TO BE IMPERVIOUS
	STRUCTURE
	ASPHALT
	OTHER

- REFERENCE NOTES:**
- THIS MAP CONTAINS THE ESRI ARCGIS ONLINE BING MAPS AERIAL LAYER PACKAGE. IMAGE COURTESY OF USGS EARTHSTAR GEOGRAPHICS SIO © MICROSOFT CORPORATION 2015.
 - PARCEL DATA PROVIDED BY THE CITY OF PROVIDENCE PLANNING AND DEVELOPMENT DEPARTMENT. PARCELS OF REAL ESTATE ASSESSED AS OF DECEMBER 31, 2012. GIS DATA ARE FOR PLANNING PURPOSES ONLY. THESE DATA DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
 - SITE BOUNDARIES ARE APPROXIMATE.

IMPERVIOUS AREAS				
PLAT	LOT	NO.	AREA (SQ. FT.)	SURFACE TYPE
101	1	A1	8,037.44	ROOF
101	1	A2	17,913.35	ASPHALT
101	1	A3	90,158.79	ASPHALT
101	1	A4	1,786.65	STRUCTURE
101	1	A5	1,640.44	ROOF
101	1	A6	1,445.11	STRUCTURE
56	316	A7	156,852.04	CONTAINMENT DIKE
101	1	A8	39,796.73	TANK FOUNDATION
101	1	A9	78,909.64	COMPACTED GRAVEL
101	1	A10	1,933.34	COMPACTED GRAVEL
56	5	A11	21,898.19	COMPACTED GRAVEL
56	5	A12	37,777.70	ASPHALT
101	1	A13	8,857.25	COMPACTED GRAVEL
101	1	A14	5,114.04	COMPACTED GRAVEL
56	5	A15	2,860.86	COMPACTED GRAVEL
56	5	A16	1,196.51	COMPACTED GRAVEL
56	5	A17	23,127.00	TANK FOUNDATION
56	5	A18	1,923.75	STRUCTURE
56	5	A19	898.87	ROOF
56	5	A20	4,099.05	ROOF
56	5	A21	7,273.42	ROOF
56	5	A22	12,124.48	COMPACTED GRAVEL
56	5	A23	11,249.94	ASPHALT
56	316	A24	92,586.35	ASPHALT
56	316	A25	29,735.26	CONCRETE
56	316	A26	40,494.92	COMPACTED GRAVEL
56	316	A27	29,930.34	LNG TANK
56	316	A28	6,084.97	STRUCTURE
56	316	A29	1,686.87	ROOF
56	316	A30	3,197.19	ROOF
56	316	A31	164.24	ROOF
56	316	A32	638.42	ROOF
56	316	A33	1,346.21	ROOF
56	316	A34	1,845.52	ROOF
56	316	A35	712.24	ROOF
56	316	A36	10,912.10	SUMP PIT
56	316	A37	12,642.27	ASPHALT
56	316	A38	2,392.36	STRUCTURE
56	317	A39	17,080.05	ASPHALT
56	273	A40	28,623.42	ASPHALT
56	273	A41	3,112.29	STRUCTURE
56	273	A42	1,576.65	ROOF
56	273	A43	12,924.79	TANK
56	273	A44	1,893.69	STRUCTURE
56	273	A46	10,294.60	COMPACTED GRAVEL
56	316	A47	54,454.00	NEW IMPERVIOUS AREAS
TOTAL IMPERVIOUS			902,203.34	

894480.34 SQ. FT. IMPERVIOUS AREA = 49.48% IMPERVIOUS
 1807724.79 SQ. FT. TOTAL AREA



THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

NATIONAL GRID
 LIQUEFACTION PLANT
 642 ALLENS AVENUE PROVIDENCE, RHODE ISLAND

PROPOSED IMPERVIOUS CONDITIONS PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: nationalgrid
PROJ MGR: MSK DESIGNED BY: SJM DATE: SEPTEMBER, 2016	CHECKED BY: IR SCALE: AS NOTED REVISION NO. 0

FOR PERMITTING ONLY

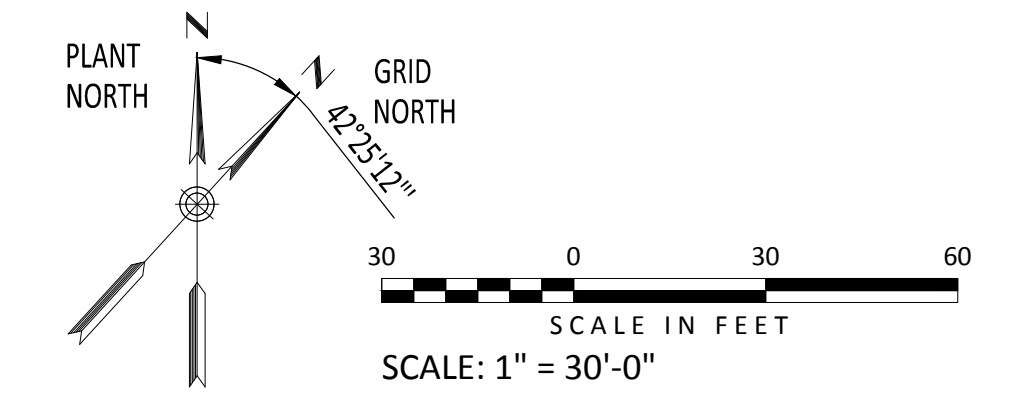
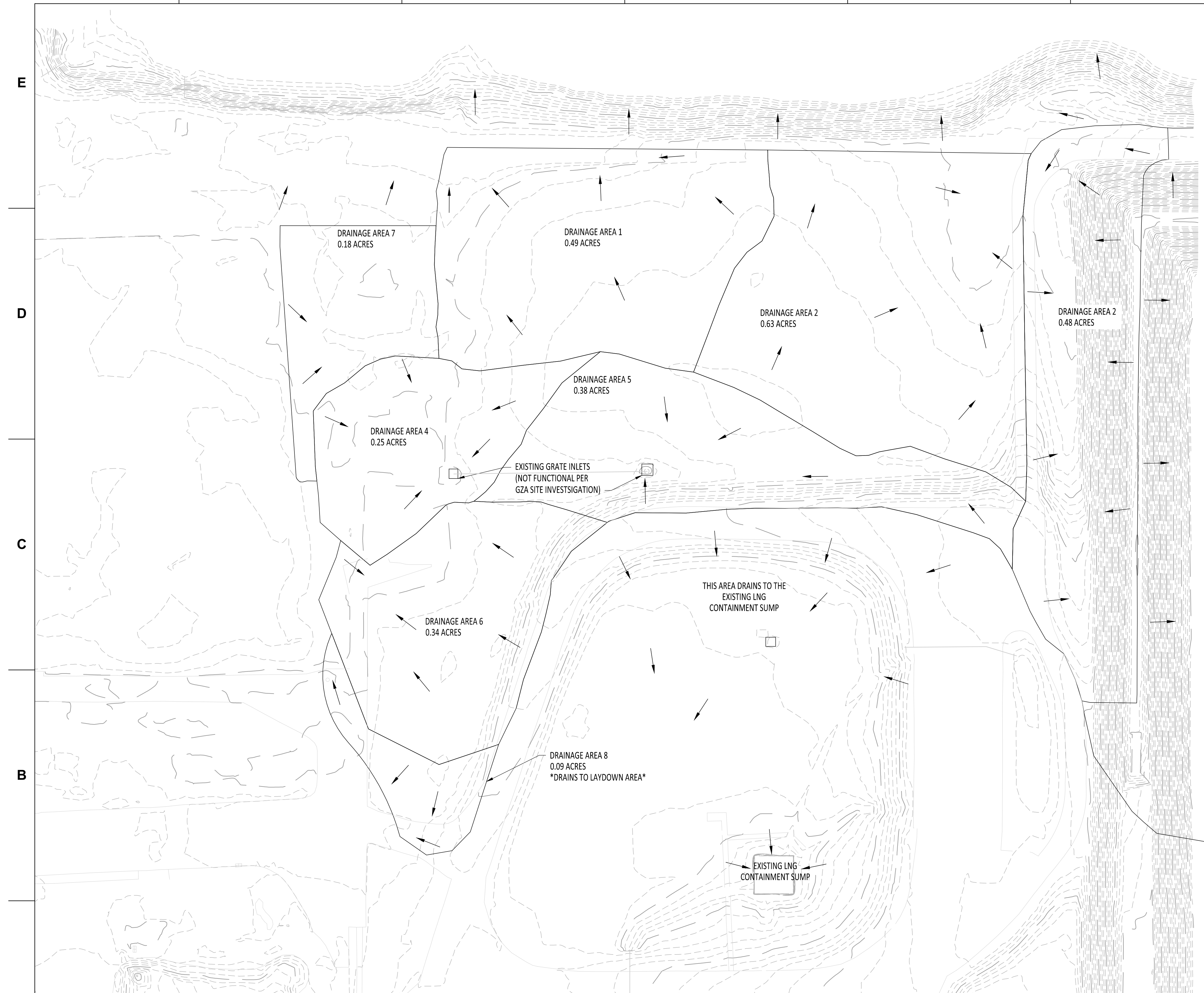
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APPENDIX F

HYDRAULIC ANALYSIS

AUG 31, 2016 - 4:33pm DRAWING NAME: I:\102761-National_Grid_Liquefaction\CIV\Drainage\Pre-Development Drainage Map.dwg

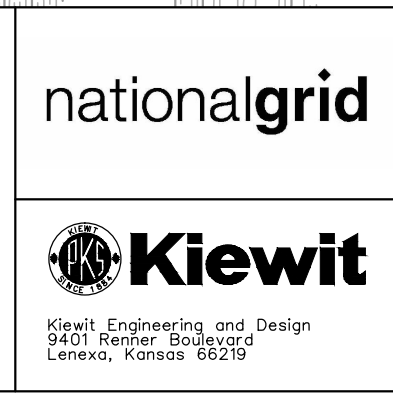


**- PRELIMINARY -
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CONFIDENTIAL
THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY REQUIREMENT AND SUBJECT THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECIPIENT SHALL CONSTITUTE AN ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE EXECUTED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

REV	DATE	REVISION INFORMATION	BY	CHK	APP.
A	08/31/16	ISSUED FOR PERMIT	NES	AMS	AMS

GENERAL NOTES AND COMMENTS:

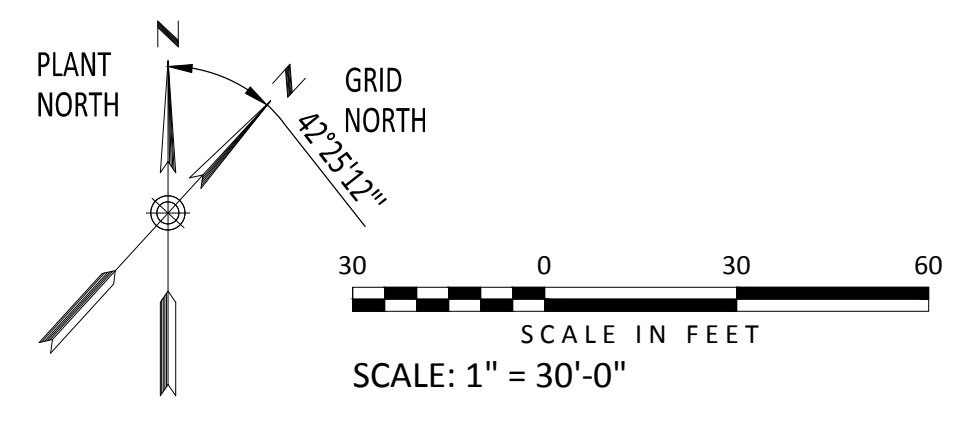
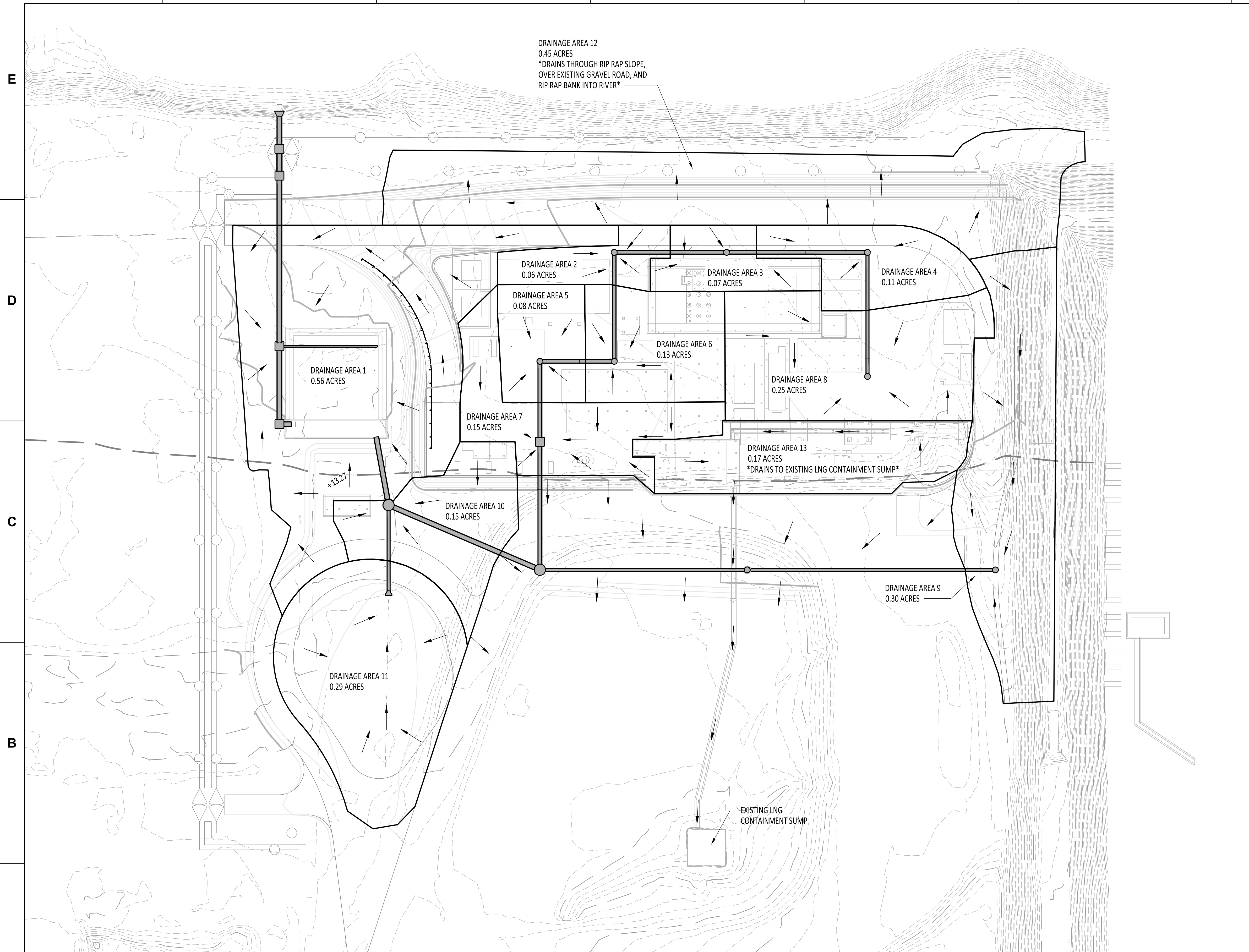


SEAL AND STAMP:
ASHLEY STUTZMAN
 No. 11512
 REGISTERED
 PROFESSIONAL ENGINEER
 CIVIL

PROFESSIONAL CERTIFICATION:
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A LICENSED PROFESSIONAL ENGINEER OF THE STATE OF MISSOURI.
 LICENSE NO. 11512
 EXPIRATION DATE 06/30/2017

NATIONAL GRID LNG LLC	
FIELDS POINT LIQUEFACTION PROJECT	
PERMITTING SKETCH -- PRE DEVELOPMENT MAP	
DRAWING NO:	SHIT: REV.
102761-B-00-0000-CIV-SK-6007	1 OF 2 A

DRAWING NAME: I:\102761-National_Grid_Liquefaction\CIV\Drainage\Post Development Drainage Map.dwg
AUG 31, 2016 - 4:30pm



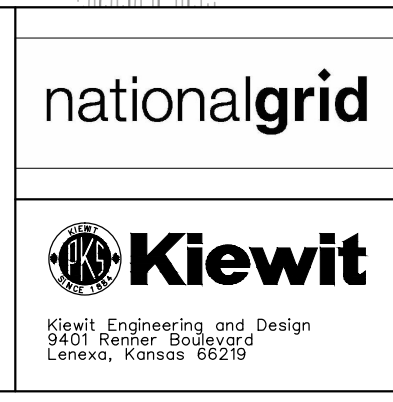
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REV	DATE	REVISION INFORMATION	BY	CHK	APP.
A	08/31/16	ISSUED FOR PERMIT	AMS	AMS	AMS

GENERAL NOTES AND COMMENTS:



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CIVIL

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LICENSE NO. 11512
EXPIRATION DATE 06/30/2017

NATIONAL GRID LNG LLC	
FIELDS POINT LIQUEFACTION PROJECT	
PERMITTING SKETCH -- POST DEVELOPMENT MAP	
DRAWING NO.: 102761-B-00-0000-CIV-SK-6007	SHT: 2 OF 2
REV.:	A

Liquefaction Plant Post-Development Flows

10 - Yr													
Drainage Area #	1	2	3	4	5	6	7	8	9	10	11	12	13
Composite C	0.88	0.91	0.94	0.90	0.89	0.92	0.88	0.92	0.89	0.88	0.88	0.88	0.91
I (in/hr)	7.236	7.236	7.236	7.236	7.236	7.236	7.236	7.236	7.236	7.236	7.236	7.236	7.236
A (ac)	0.5632	0.0578	0.0693	0.11	0.0828	0.1289	0.1504	0.25	0.3	0.15	0.2916	0.45	0.1708
Q (cfs)	3.601	0.379	0.473	0.719	0.536	0.861	0.962	1.657	1.929	0.953	1.867	2.878	1.129

25 - Yr													
Drainage Area #	1	2	3	4	5	6	7	8	9	10	11	12	13
Composite C	0.88	0.91	0.94	0.90	0.89	0.92	0.88	0.92	0.89	0.88	0.88	0.88	0.91
I (in/hr)	8.868	8.868	8.868	8.868	8.868	8.868	8.868	8.868	8.868	8.868	8.868	8.868	8.868
A (ac)	0.5632	0.0578	0.0693	0.11	0.0828	0.1289	0.1504	0.25	0.3	0.15	0.2916	0.45	0.1708
Q (cfs)	4.413	0.465	0.580	0.881	0.657	1.056	1.179	2.030	2.364	1.168	2.288	3.527	1.383

100 - Yr													
Drainage Area #	1	2	3	4	5	6	7	8	9	10	11	12	13
Composite C	0.88	0.91	0.94	0.90	0.89	0.92	0.88	0.92	0.89	0.88	0.88	0.88	0.91
I (in/hr)	11.388	11.388	11.388	11.388	11.388	11.388	11.388	11.388	11.388	11.388	11.388	11.388	11.388
A (ac)	0.5632	0.0578	0.0693	0.11	0.0828	0.1289	0.1504	0.25	0.3	0.15	0.2916	0.45	0.1708
Q (cfs)	5.667	0.597	0.745	1.131	0.843	1.355	1.514	2.607	3.036	1.500	2.939	4.529	1.777

Liquefaction Plant Pre-Development Flows

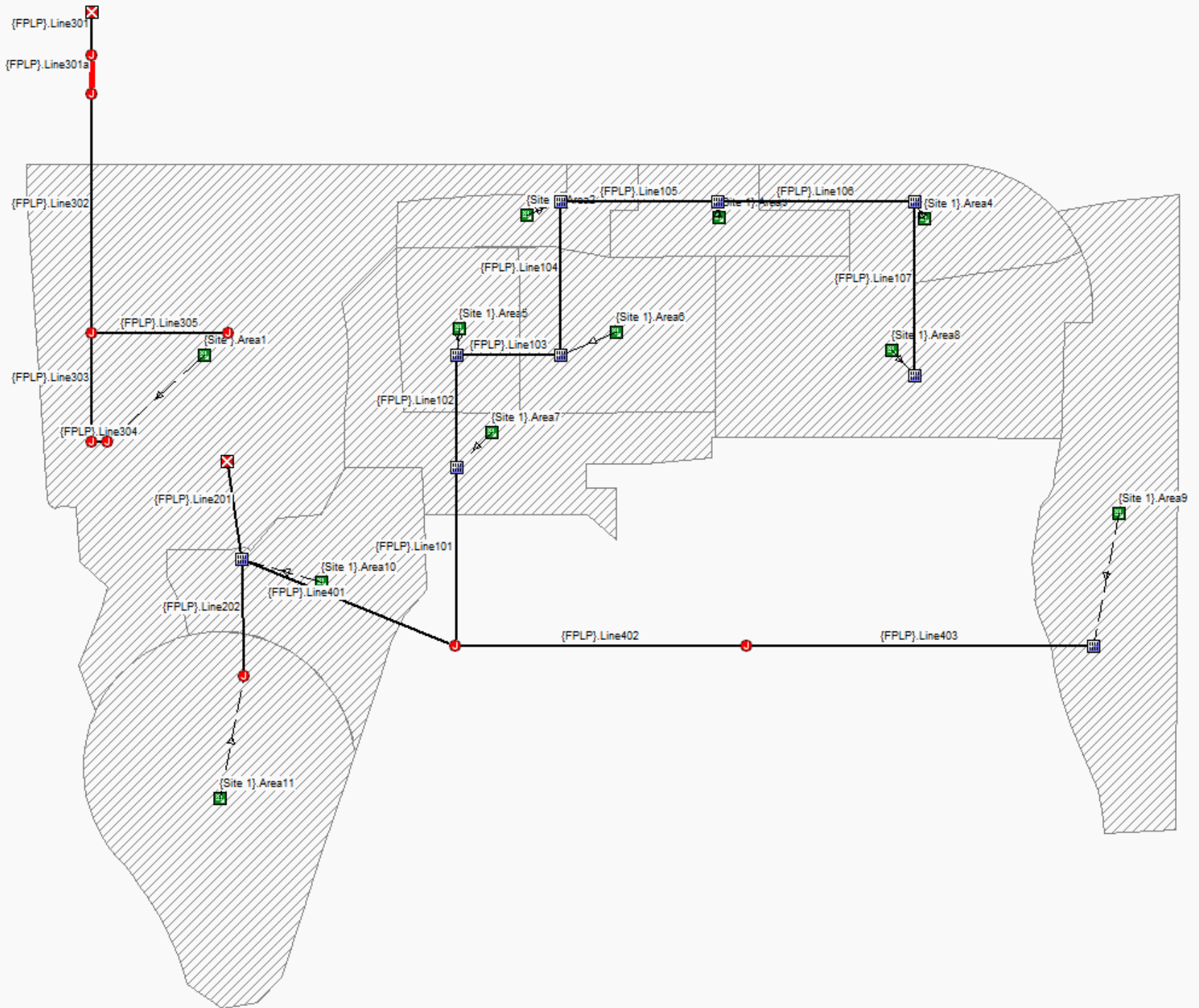
25 - Yr								
Drainage Area #	1	2	3	4	5	6	7	8
Composite C	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
I (in/hr)	8.868	8.868	8.868	8.868	8.868	8.868	8.868	8.868
A (ac)	0.49	0.63	0.48	0.25	0.38	0.34	0.18	0.09
Q (cfs)	3.694	4.749	3.618	1.884	2.864	2.563	1.357	0.678

100 - Yr								
Drainage Area #	1	2	3	4	5	6	7	8
Composite C	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
I (in/hr)	11.388	11.388	11.388	11.388	11.388	11.388	11.388	11.388
A (ac)	0.49	0.63	0.48	0.25	0.38	0.34	0.18	0.09
Q (cfs)	4.743	6.098	4.646	2.420	3.678	3.291	1.742	0.871

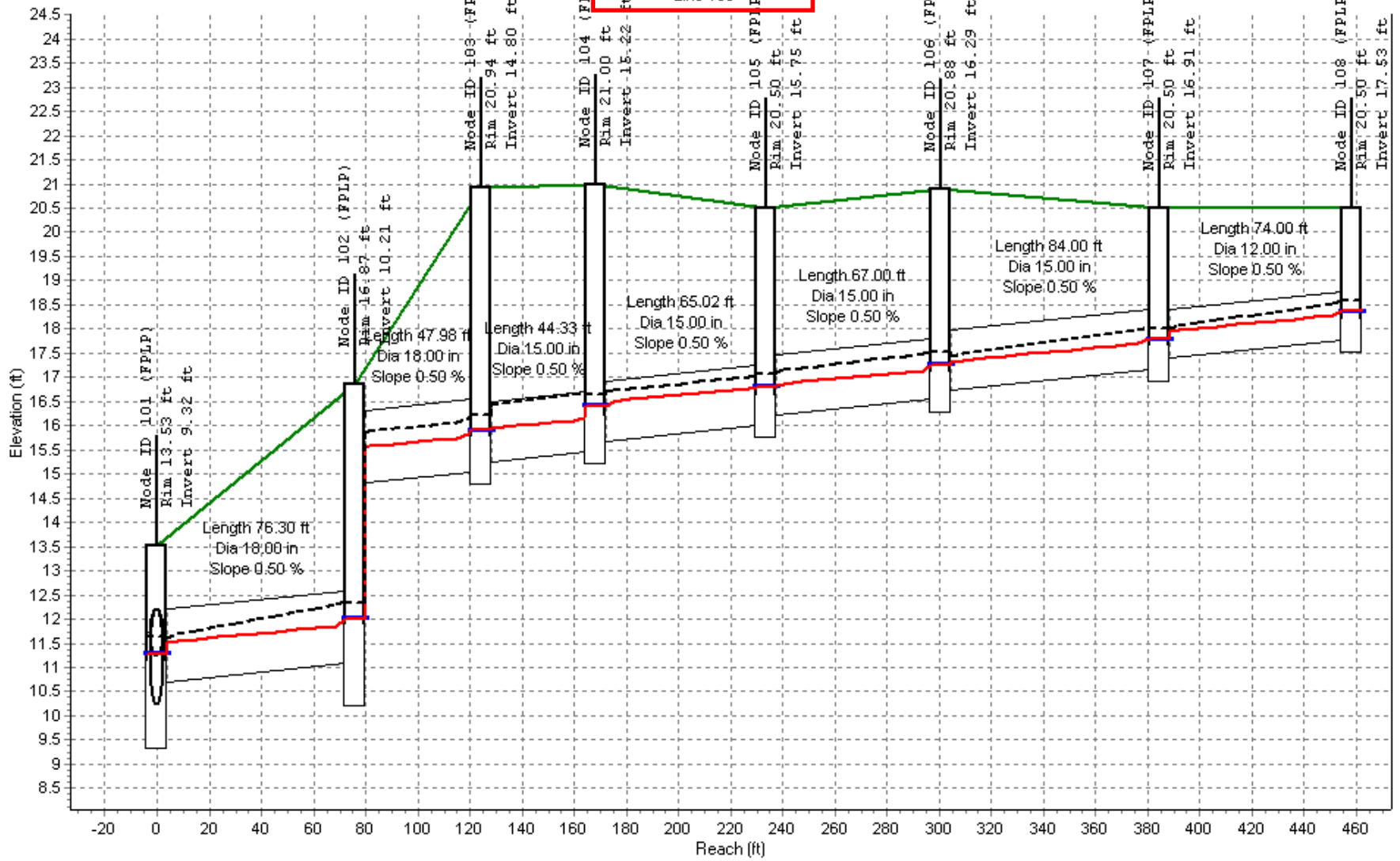
	Pre-Dev	Post-Dev	Δ
Total Area (ac)	2.84	2.77	-
Concrete Area (ac)	0	0.66	-
Asphalt Area (ac)	0	0.55	-
Gravel Area (ac)	2.84	1.57	-
Composite C	0.85	0.89	-
Q₁₀ (cfs)	17.47	17.94	-0.48
Q₂₅ (cfs)	21.41	21.99	-0.58
Q₁₀₀ (cfs)	27.49	28.24	-0.75

Concrete	0.95
Asphalt	0.95
Gravel	0.85

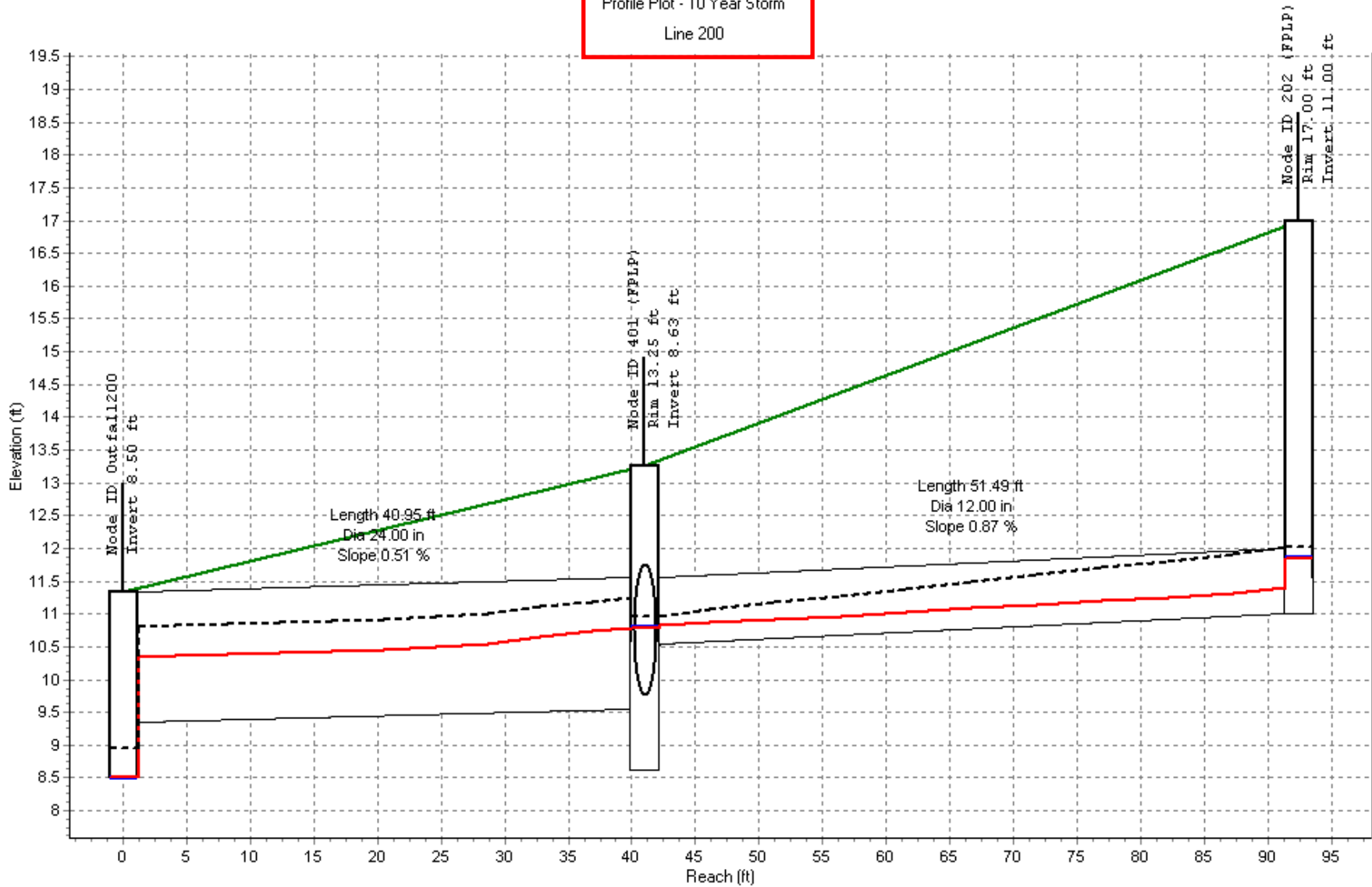
Drainage Areas 12 & 13 drain off site.



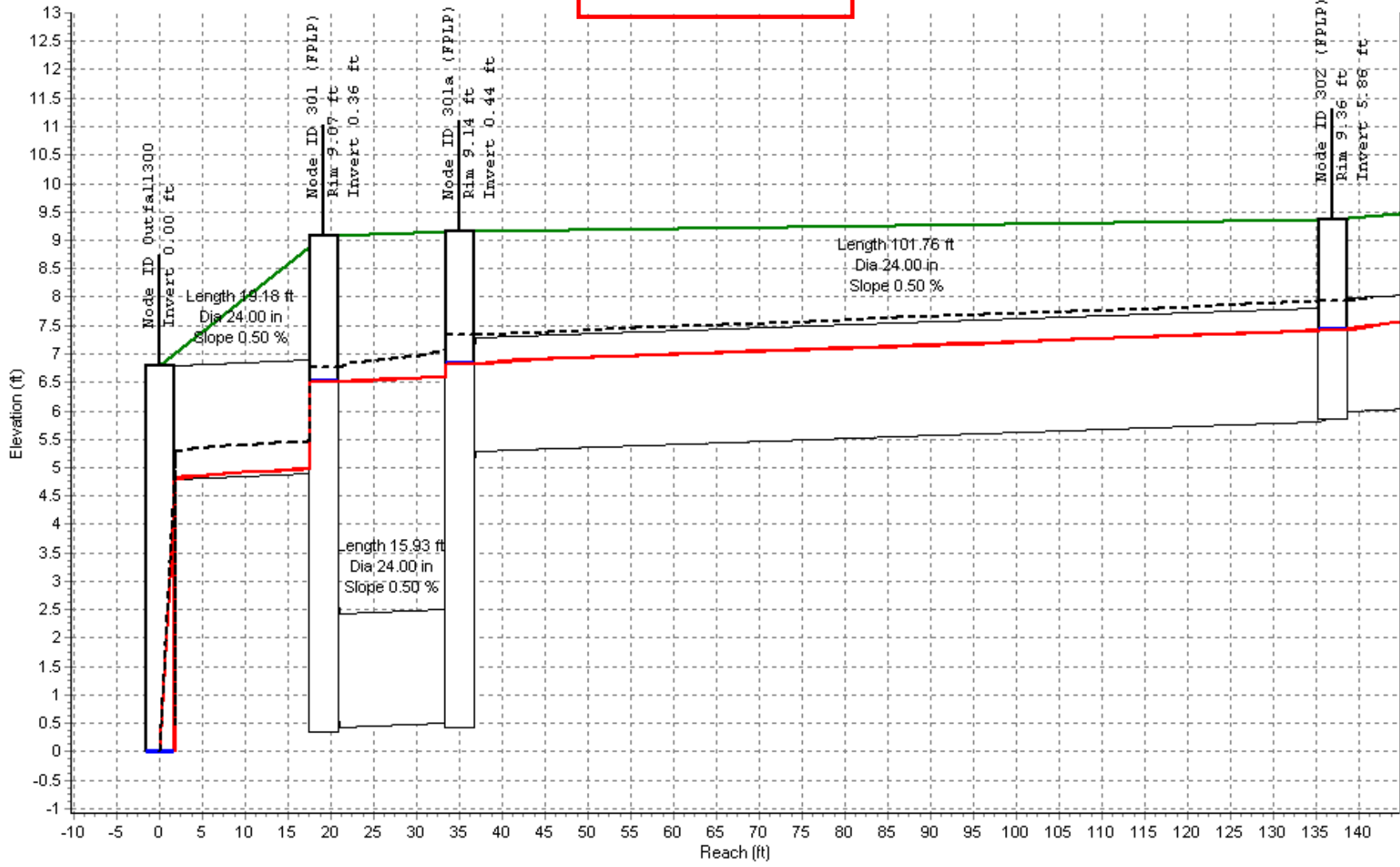
Profile Plot - 10 Year Storm
Line 100



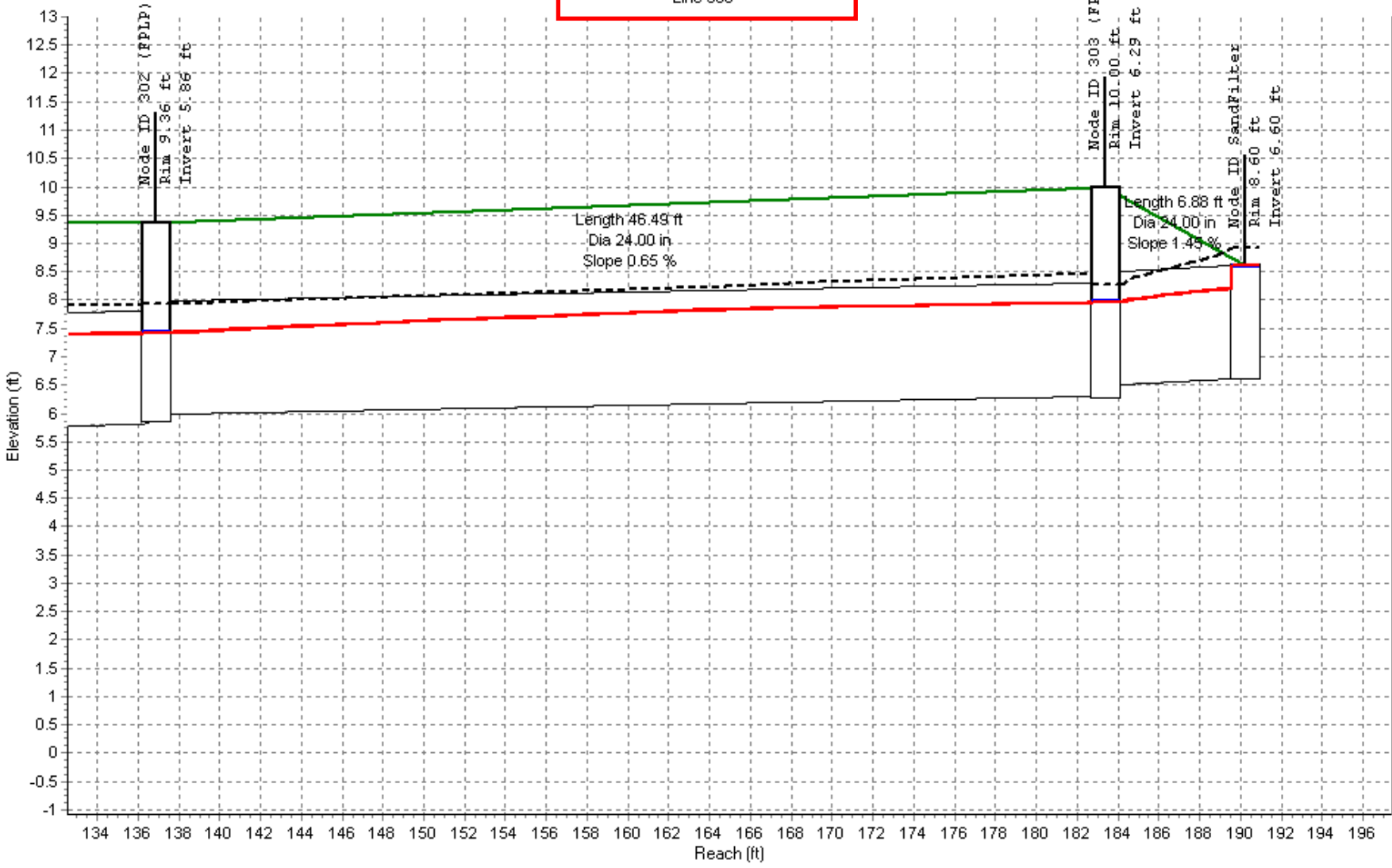
Profile Plot - 10 Year Storm
Line 200



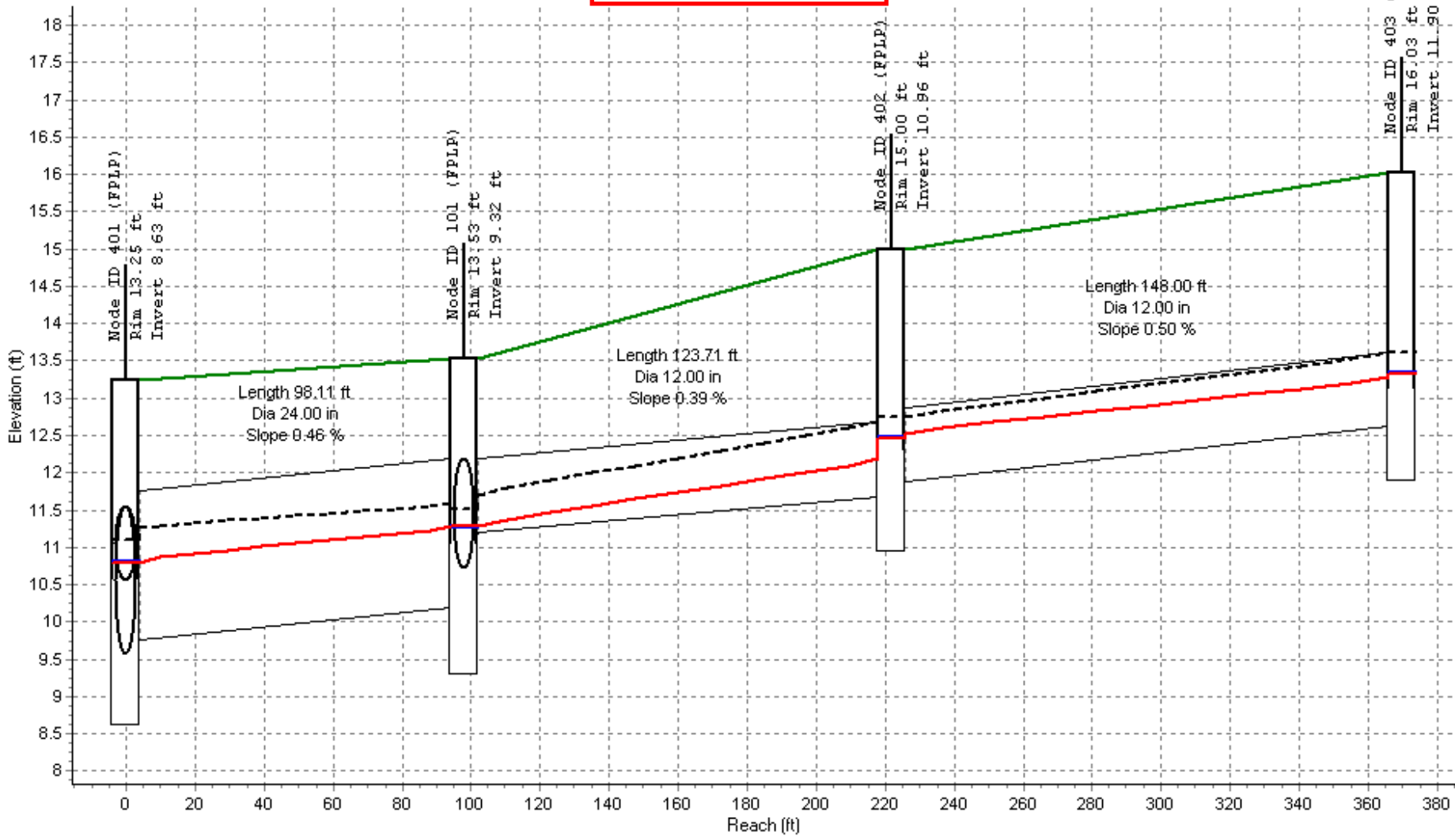
Profile Plot - 10 Year Storm
Line 300



Profile Plot - 10 Year Storm
Line 300



Profile Plot - 10 Year Storm
Line 400



Subbasin Summary

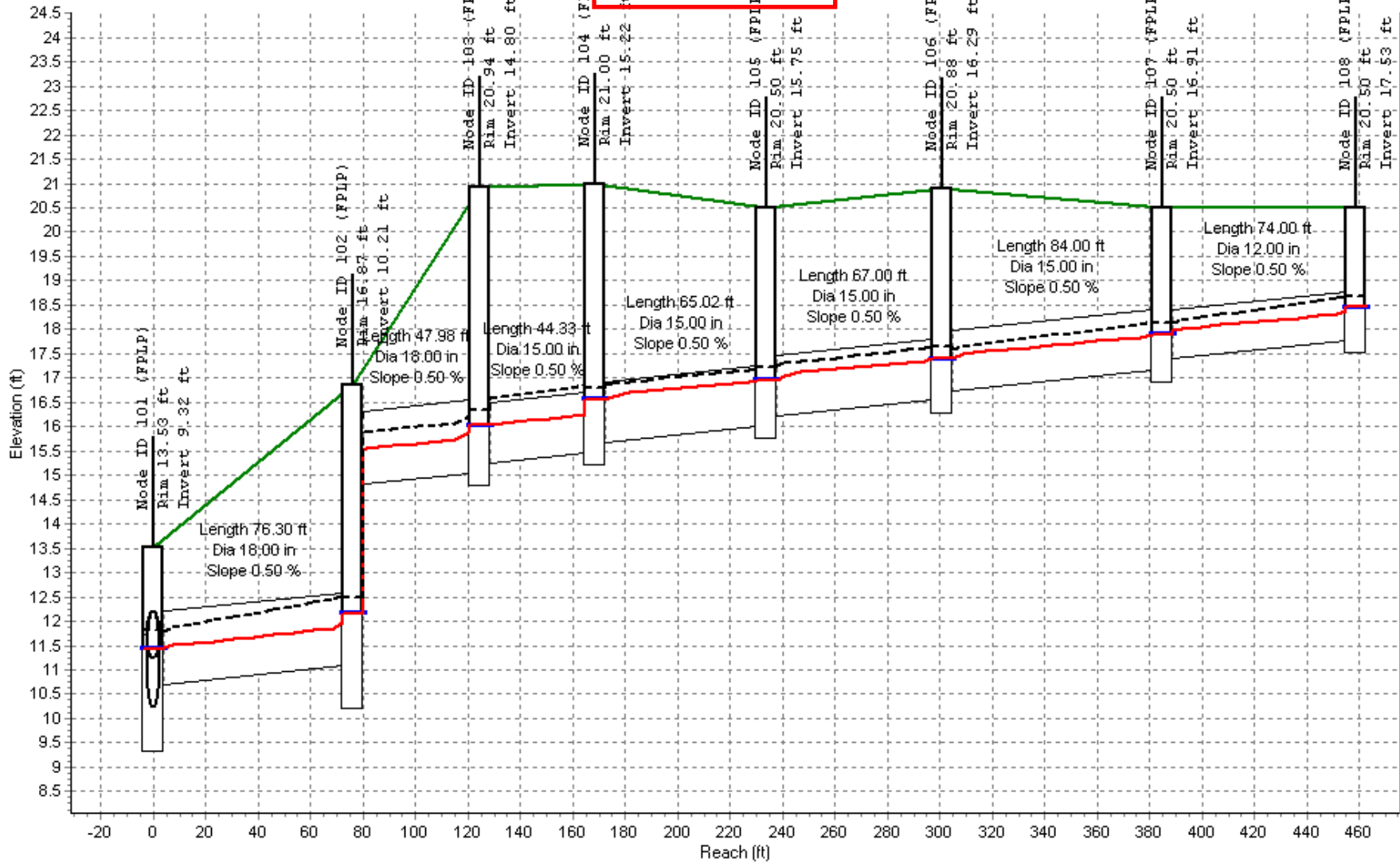
SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Area1	0.56	0.8800	0.60	0.53	0.30	3.57	0 00:05:00
2	Area10	0.15	0.8800	0.60	0.53	0.08	0.95	0 00:05:00
3	Area11	0.29	0.8800	0.60	0.53	0.15	1.85	0 00:05:00
4	Area2	0.06	0.9100	0.60	0.55	0.03	0.38	0 00:05:00
5	Area3	0.07	0.9400	0.60	0.57	0.04	0.47	0 00:05:00
6	Area4	0.11	0.9000	0.60	0.54	0.06	0.72	0 00:05:00
7	Area5	0.08	0.8900	0.60	0.54	0.04	0.53	0 00:05:00
8	Area6	0.13	0.9200	0.60	0.55	0.07	0.85	0 00:05:00
9	Area7	0.15	0.8800	0.60	0.53	0.08	0.95	0 00:05:00
10	Area8	0.25	0.9200	0.60	0.55	0.14	1.68	0 00:05:00
11	Area9	0.30	0.8900	0.60	0.54	0.16	1.91	0 00:05:00

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	External Inflow (cfs)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)
1	Line101	Pipe	102	101	76.30	11.08	10.70	0.5000	0.00	18.000	0.0100	4.94	9.62	0.51	4.81	0.85
2	Line102	Pipe	103	102	47.98	15.05	14.81	0.5000	0.00	18.000	0.0100	4.16	9.66	0.43	4.52	0.77
3	Line103	Pipe	104	103	44.33	15.47	15.25	0.5000	0.00	15.000	0.0100	3.73	5.94	0.63	4.37	0.82
4	Line104	Pipe	105	104	65.02	16.00	15.68	0.5000	0.00	15.000	0.0100	3.03	5.94	0.51	3.99	0.76
5	Line105	Pipe	106	105	67.00	16.54	16.21	0.5000	0.00	15.000	0.0100	2.72	5.94	0.46	4.18	0.65
6	Line106	Pipe	107	106	84.00	17.16	16.74	0.5000	0.00	15.000	0.0100	2.29	5.94	0.39	4.10	0.58
7	Line107	Pipe	108	107	74.00	17.78	17.41	0.5000	0.00	12.000	0.0100	1.63	3.28	0.50	3.79	0.54
8	Line201	Pipe	401	Outfall200	40.95	9.55	9.34	0.5100	0.00	24.000	0.0100	9.52	21.06	0.45	5.43	1.09
9	Line202	Pipe	401	202	51.49	11.00	10.55	0.8700	0.00	12.000	0.0100	1.77	4.33	0.41	3.31	0.65
10	Line301	Pipe	301	Outfall300	19.18	4.90	4.80	0.5000	0.00	24.000	0.0100	12.84	20.80	0.62	5.59	1.37
11	Line301a	Pipe	301a	301	15.93	0.52	0.44	0.5000	0.00	24.000	0.0130	12.84	15.93	0.81	4.09	2.00
12	Line302	Pipe	302	301a	101.76	5.80	5.29	0.5000	0.00	24.000	0.0100	12.90	21.91	0.59	5.77	1.55
13	Line303	Pipe	303	302	46.49	6.30	6.00	0.6500	0.00	24.000	0.0100	12.96	23.63	0.55	5.76	1.54
14	Line304	Pipe	303	SandFilter	6.88	6.60	6.50	1.4500	9.52	24.000	0.0100	12.98	35.45	0.37	4.50	1.73
15	Line305	Pipe	Opening300	302	58.07	6.00	6.00	0.0000	0.00	3.996	0.0100	0.00	0.01	0.00	0.00	0.00
16	Line401	Pipe	401	101	98.11	10.20	9.75	0.4600	0.00	24.000	0.0100	7.24	19.92	0.36	4.43	1.06
17	Line402	Pipe	402	101	123.71	11.68	11.20	0.3900	0.00	12.000	0.0100	2.28	2.89	0.79	3.80	0.72
18	Line403	Pipe	403	402	148.00	12.62	11.88	0.5000	0.54	12.000	0.0100	2.33	3.28	0.71	4.22	0.67

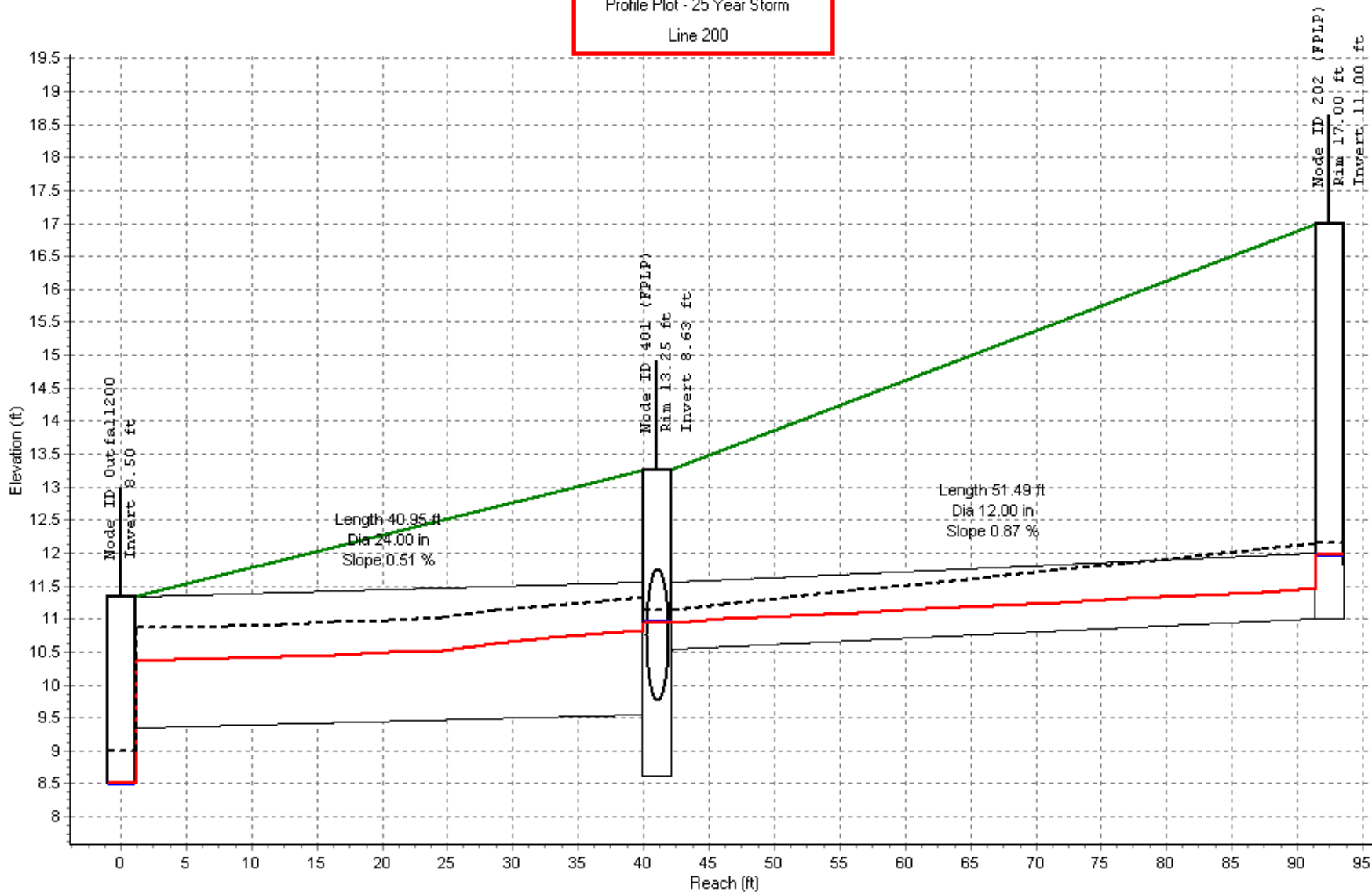
Profile Plot - 25 Year Storm

Line 100

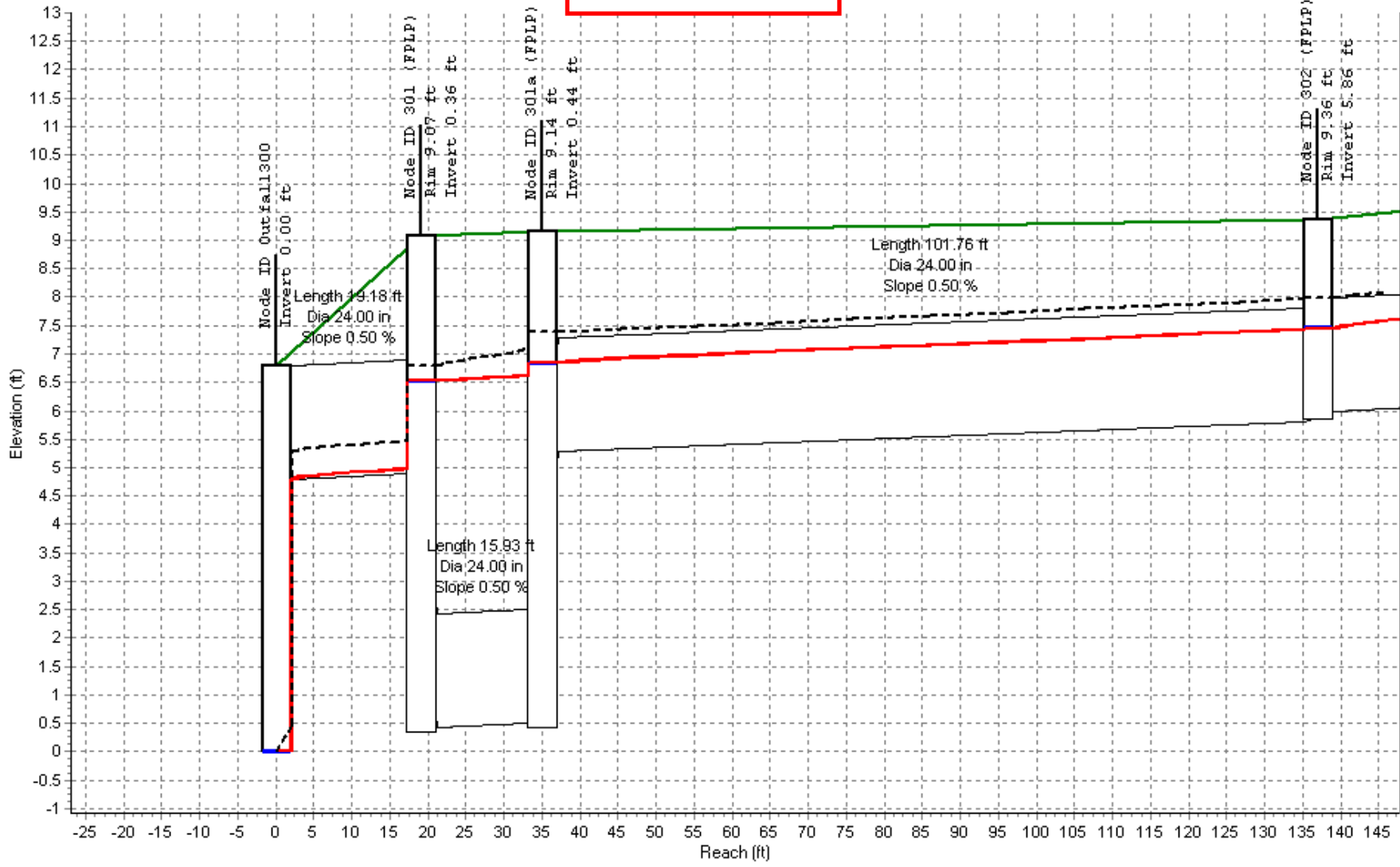


Profile Plot - 25 Year Storm

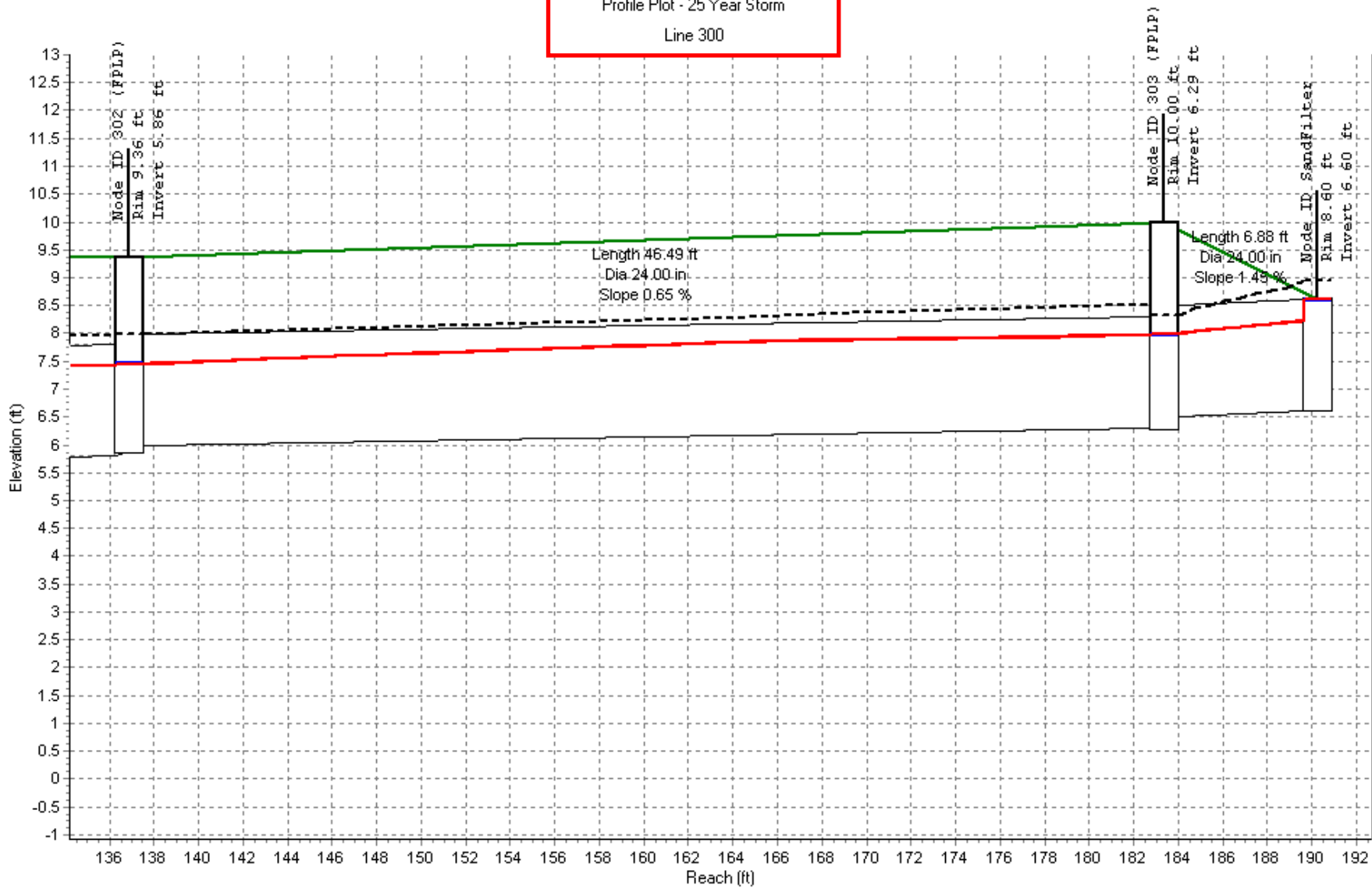
Line 200



Profile Plot - 25 Year Storm
Line 300

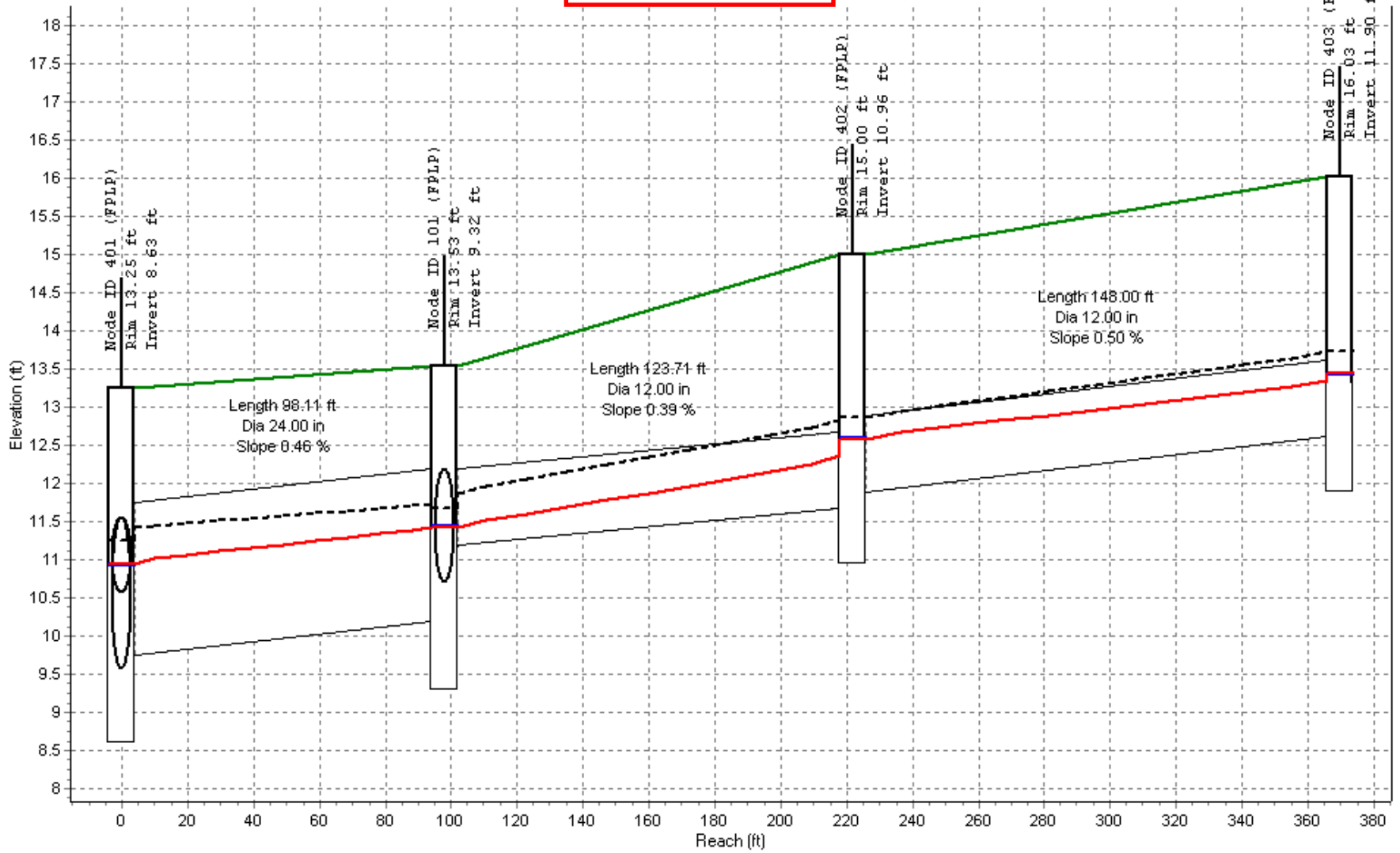


Profile Plot - 25 Year Storm
Line 300



Profile Plot - 25 Year Storm

Line 400



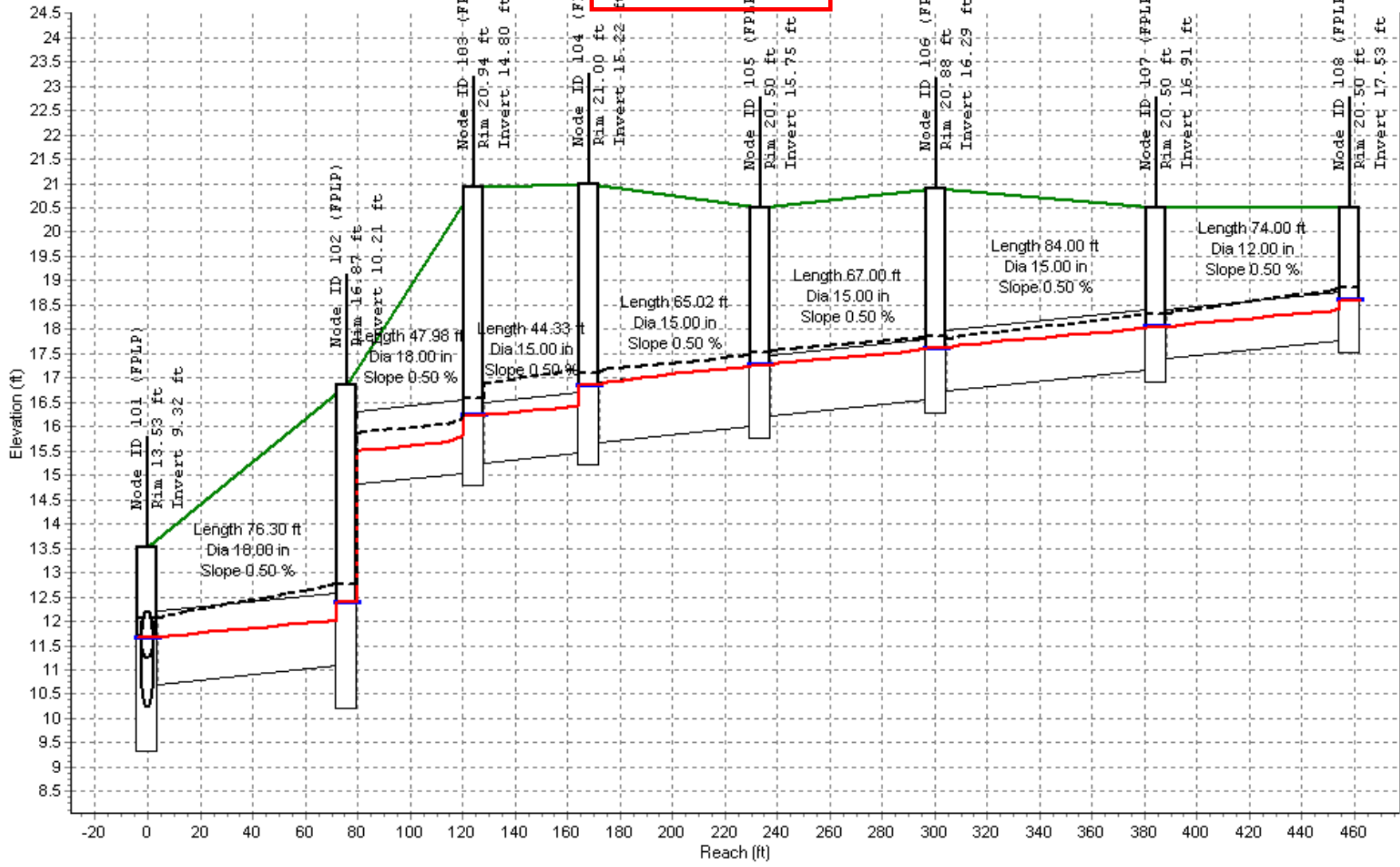
Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Area1	0.56	0.8800	0.74	0.65	0.36	4.37	0 00:05:00
2	Area10	0.15	0.8800	0.74	0.65	0.10	1.17	0 00:05:00
3	Area11	0.29	0.8800	0.74	0.65	0.19	2.26	0 00:05:00
4	Area2	0.06	0.9100	0.74	0.67	0.04	0.47	0 00:05:00
5	Area3	0.07	0.9400	0.74	0.69	0.05	0.57	0 00:05:00
6	Area4	0.11	0.9000	0.74	0.66	0.07	0.88	0 00:05:00
7	Area5	0.08	0.8900	0.74	0.66	0.05	0.65	0 00:05:00
8	Area6	0.13	0.9200	0.74	0.68	0.09	1.04	0 00:05:00
9	Area7	0.15	0.8800	0.74	0.65	0.10	1.17	0 00:05:00
10	Area8	0.25	0.9200	0.74	0.68	0.17	2.06	0 00:05:00
11	Area9	0.30	0.8900	0.74	0.66	0.19	2.34	0 00:05:00

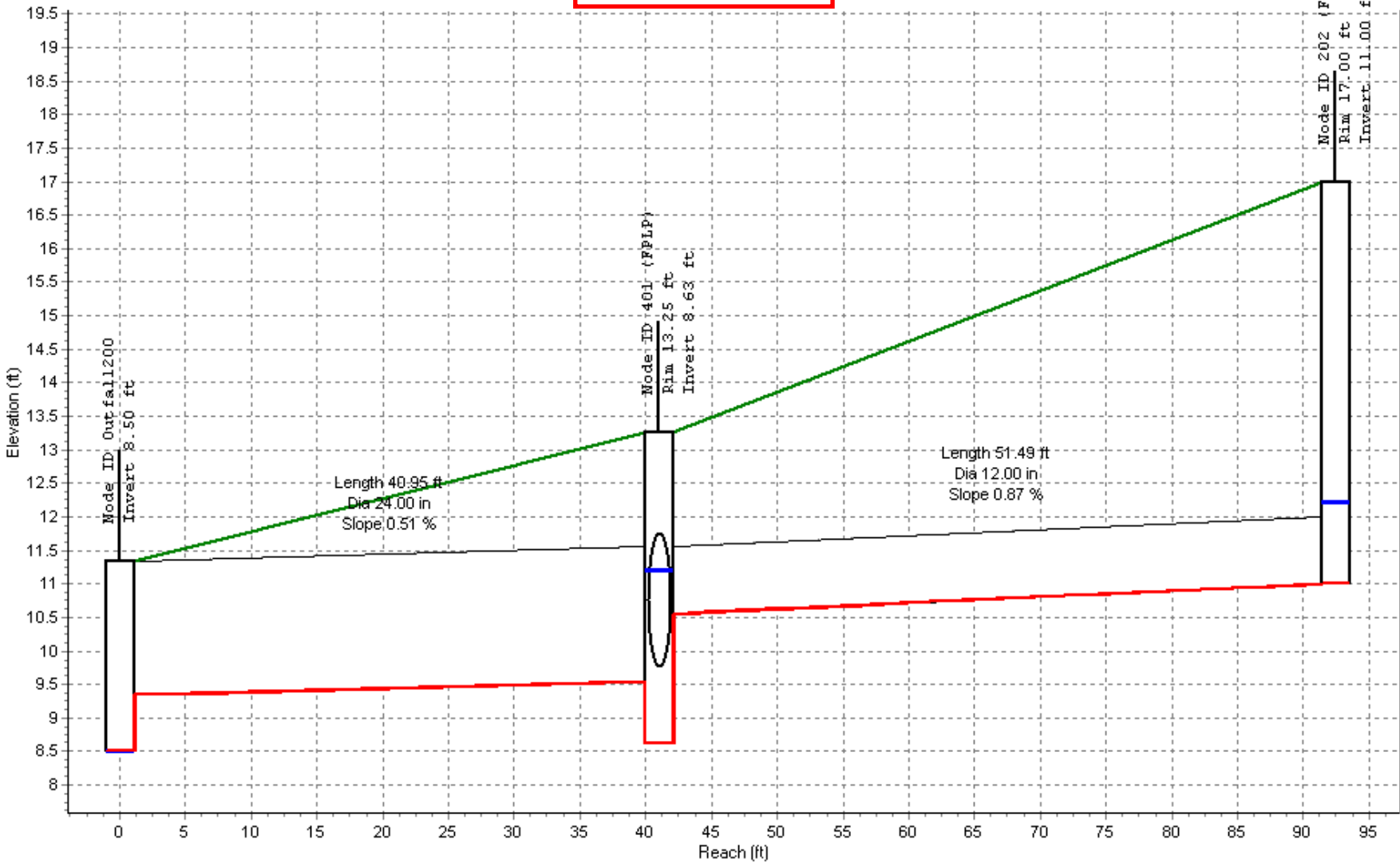
Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	External Inflow (cfs)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)
1	Line101	Pipe	102	101	76.30	11.08	10.70	0.5000	0.00	18.000	0.0100	5.98	9.62	0.62	5.00	0.96
2	Line102	Pipe	103	102	47.98	15.05	14.81	0.5000	0.00	18.000	0.0100	5.04	9.66	0.52	4.72	0.87
3	Line103	Pipe	104	103	44.33	15.47	15.25	0.5000	0.00	15.000	0.0100	4.51	5.94	0.76	4.50	0.95
4	Line104	Pipe	105	104	65.02	16.00	15.68	0.5000	0.00	15.000	0.0100	3.67	5.94	0.62	4.01	0.92
5	Line105	Pipe	106	105	67.00	16.54	16.21	0.5000	0.00	15.000	0.0100	3.32	5.94	0.56	4.15	0.79
6	Line106	Pipe	107	106	84.00	17.16	16.74	0.5000	0.00	15.000	0.0100	2.84	5.94	0.48	4.18	0.68
7	Line107	Pipe	108	107	74.00	17.78	17.41	0.5000	0.00	12.000	0.0100	1.99	3.28	0.61	3.95	0.62
8	Line201	Pipe	401	Outfall200	40.95	9.55	9.34	0.5100	0.00	24.000	0.0100	11.37	21.06	0.54	5.67	1.22
9	Line202	Pipe	401	202	51.49	11.00	10.55	0.8700	0.00	12.000	0.0100	2.20	4.33	0.51	3.54	0.74
10	Line301	Pipe	301	Outfall300	19.18	4.90	4.80	0.5000	0.00	24.000	0.0100	12.98	20.80	0.62	5.60	1.38
11	Line301a	Pipe	301a	301	15.93	0.52	0.44	0.5000	0.00	24.000	0.0130	12.98	15.93	0.81	4.13	2.00
12	Line302	Pipe	302	301a	101.76	5.80	5.29	0.5000	0.00	24.000	0.0100	12.98	21.91	0.59	5.88	1.57
13	Line303	Pipe	303	302	46.49	6.30	6.00	0.6500	0.00	24.000	0.0100	12.98	23.63	0.55	5.93	1.56
14	Line304	Pipe	303	SandFilter	6.88	6.60	6.50	1.4500	11.37	24.000	0.0100	12.98	35.45	0.37	4.75	1.74
15	Line305	Pipe	Opening300	302	58.07	6.00	6.00	0.0000	0.00	3.996	0.0100	0.00	0.01	0.00	0.00	0.00
16	Line401	Pipe	401	101	98.11	10.20	9.75	0.4600	0.00	24.000	0.0100	8.62	19.92	0.43	4.46	1.21
17	Line402	Pipe	402	101	123.71	11.68	11.20	0.3900	0.00	12.000	0.0100	2.63	2.89	0.91	3.91	0.80
18	Line403	Pipe	403	402	148.00	12.62	11.88	0.5000	0.54	12.000	0.0100	2.71	3.28	0.83	4.28	0.76

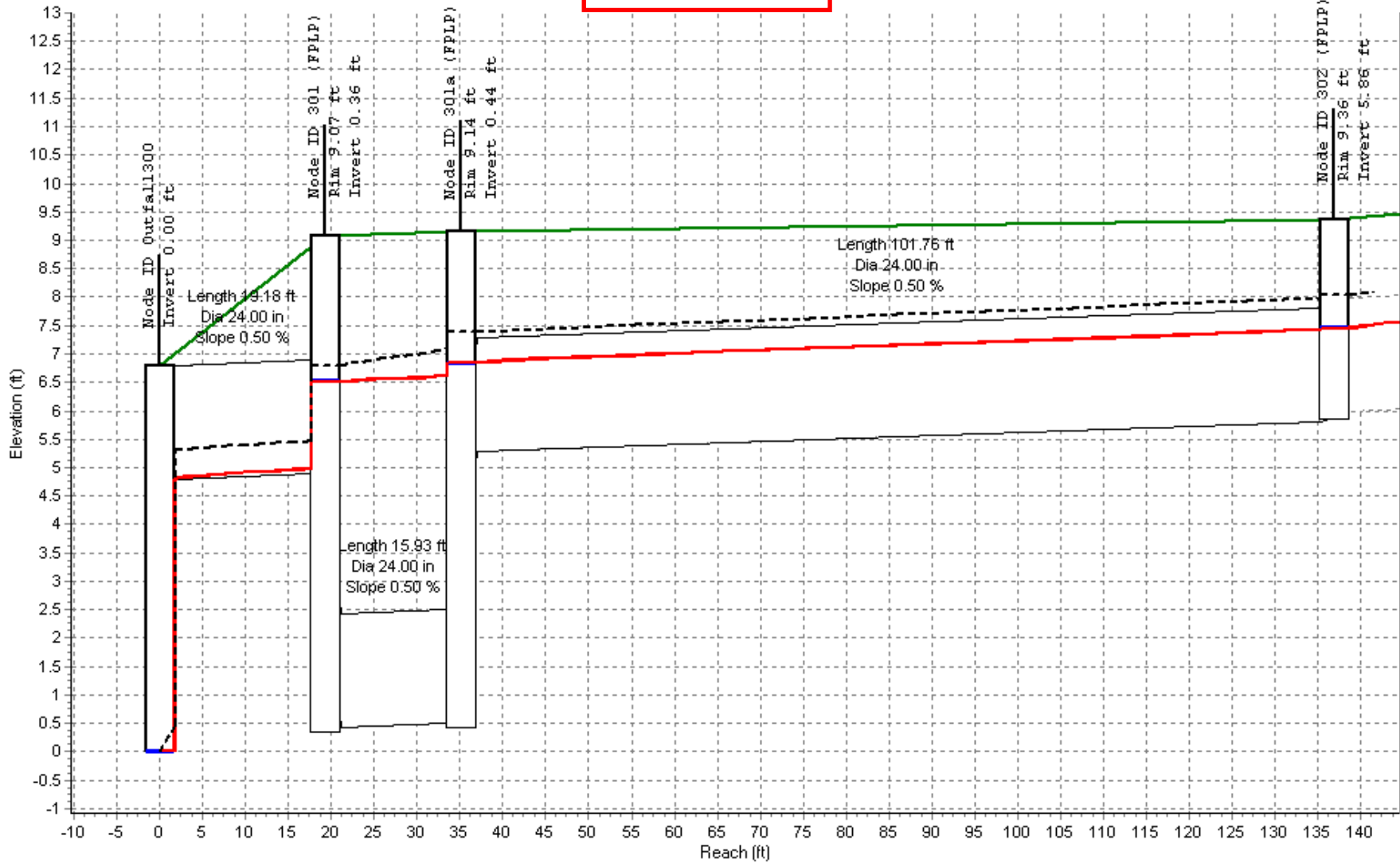
Profile Plot - 100 Year Storm
Line 100



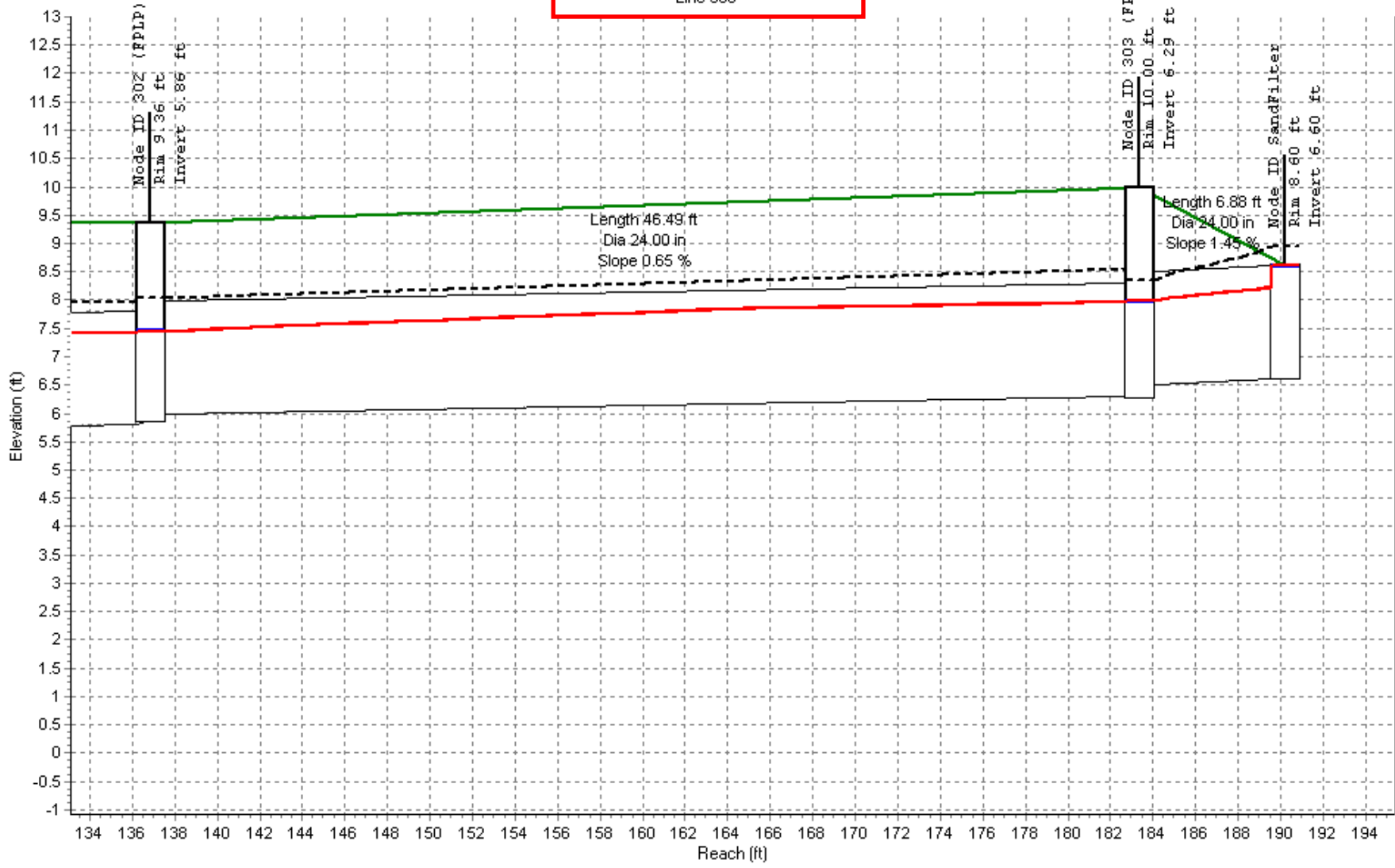
Profile Plot - 100 Year Storm
Line 200



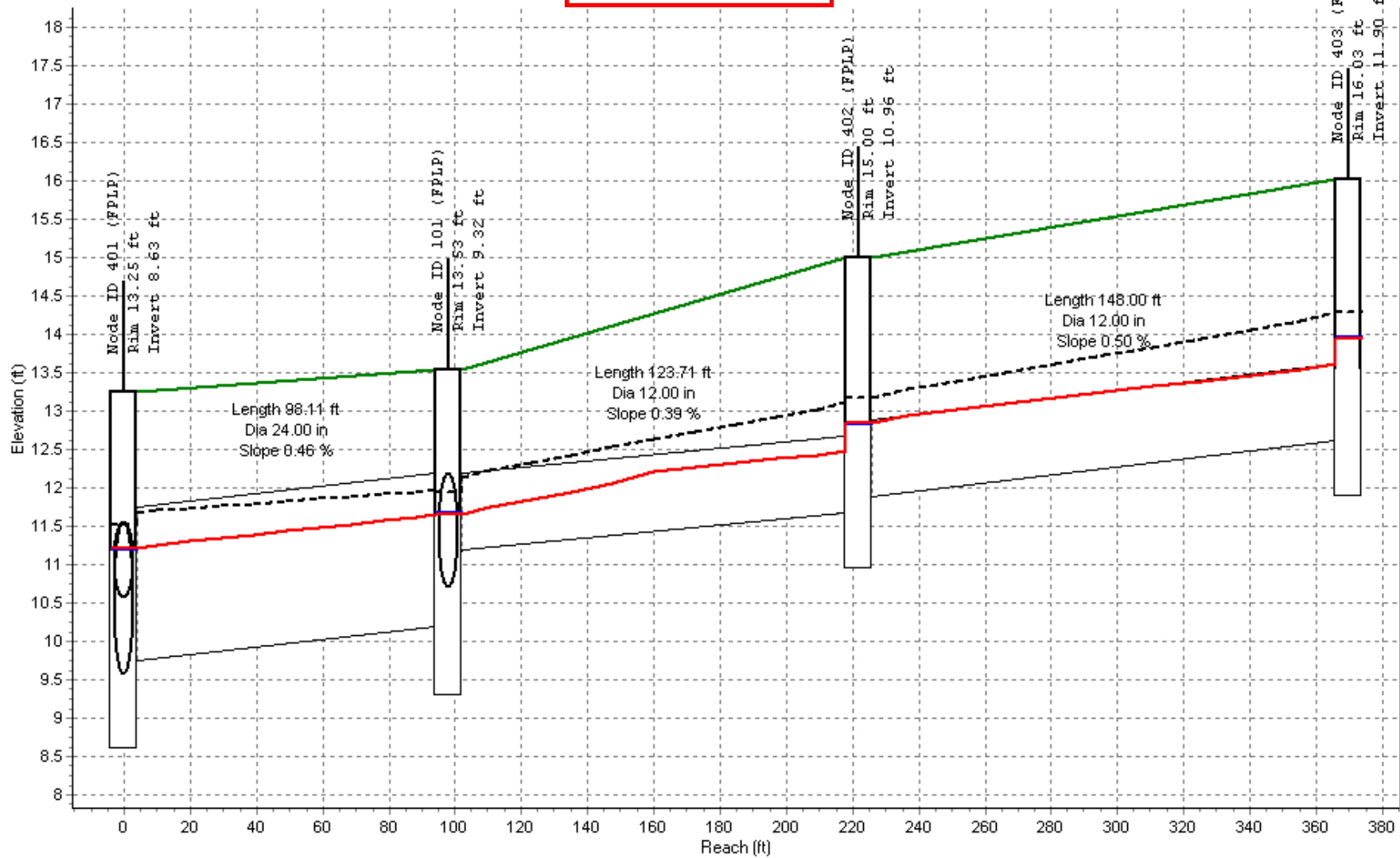
Profile Plot - 100 Year Storm
Line 300



Profile Plot - 100 Year Storm
Line 300



Profile Plot - 100 Year Storm
Line 400

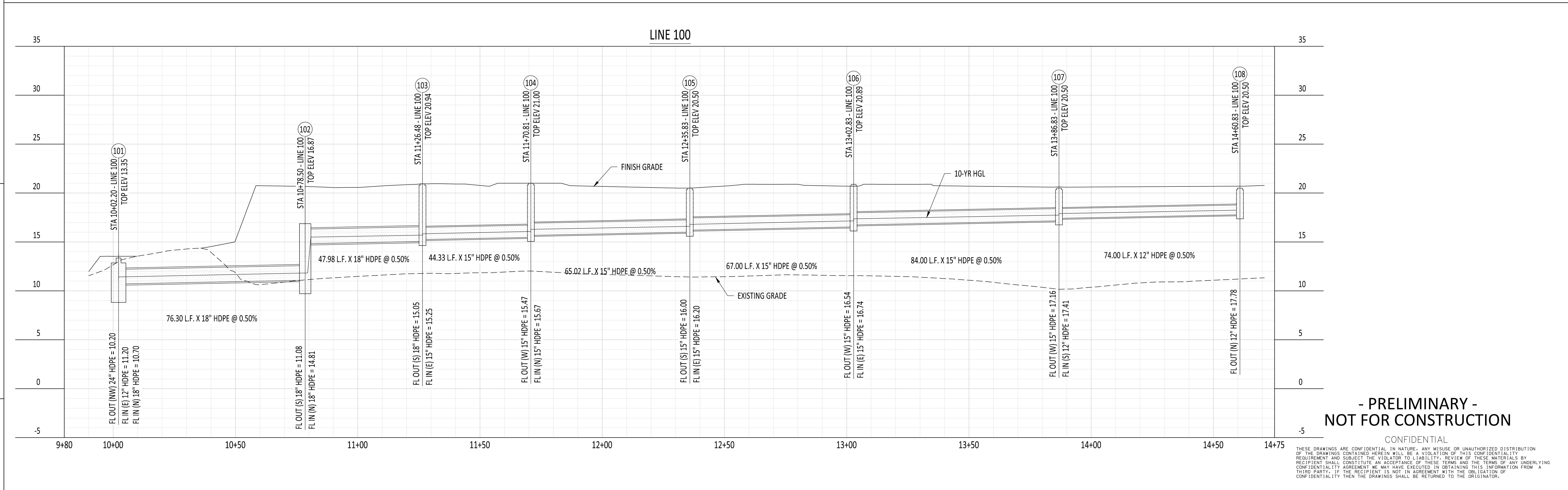
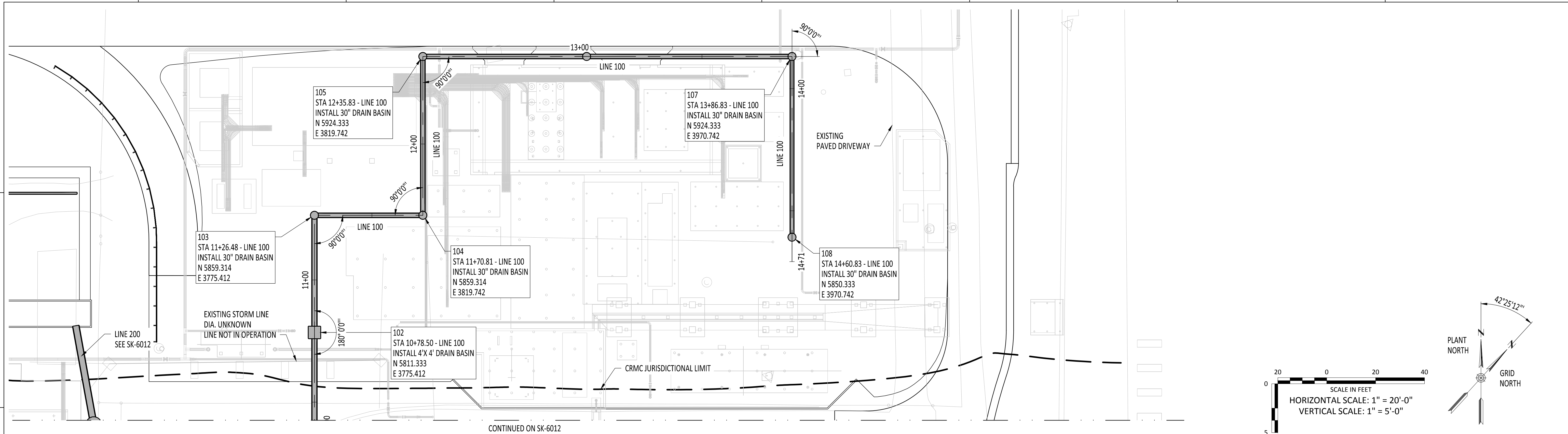


Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Area1	0.56	0.8800	0.94	0.83	0.47	5.59	0 00:05:00
2	Area10	0.15	0.8800	0.94	0.83	0.12	1.49	0 00:05:00
3	Area11	0.29	0.8800	0.94	0.83	0.24	2.89	0 00:05:00
4	Area2	0.06	0.9100	0.94	0.86	0.05	0.60	0 00:05:00
5	Area3	0.07	0.9400	0.94	0.89	0.06	0.73	0 00:05:00
6	Area4	0.11	0.9000	0.94	0.85	0.09	1.12	0 00:05:00
7	Area5	0.08	0.8900	0.94	0.84	0.07	0.84	0 00:05:00
8	Area6	0.13	0.9200	0.94	0.87	0.11	1.33	0 00:05:00
9	Area7	0.15	0.8800	0.94	0.83	0.12	1.49	0 00:05:00
10	Area8	0.25	0.9200	0.94	0.87	0.22	2.63	0 00:05:00
11	Area9	0.30	0.8900	0.94	0.84	0.25	2.99	0 00:05:00

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	External Inflow (cfs)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)
1	Line101	Pipe	102	101	76.30	11.08	10.70	0.5000	0.00	18.000	0.0100	7.49	9.62	0.78	5.15	1.15
2	Line102	Pipe	103	102	47.98	15.05	14.81	0.5000	0.00	18.000	0.0100	6.31	9.66	0.65	4.91	1.02
3	Line103	Pipe	104	103	44.33	15.47	15.25	0.5000	0.00	15.000	0.0100	5.63	5.94	0.95	4.89	1.11
4	Line104	Pipe	105	104	65.02	16.00	15.68	0.5000	0.00	15.000	0.0100	4.53	5.94	0.76	3.96	1.21
5	Line105	Pipe	106	105	67.00	16.54	16.21	0.5000	0.00	15.000	0.0100	4.11	5.94	0.69	4.14	1.05
6	Line106	Pipe	107	106	84.00	17.16	16.74	0.5000	0.00	15.000	0.0100	3.58	5.94	0.60	4.17	0.87
7	Line107	Pipe	108	107	74.00	17.78	17.41	0.5000	0.00	12.000	0.0100	2.53	3.28	0.77	4.09	0.74
8	Line201	Pipe	401	Outfall200	40.95	9.55	9.34	0.5100	0.00	24.000	0.0100	14.04	21.06	0.67	5.87	1.42
9	Line202	Pipe	401	202	51.49	11.00	10.55	0.8700	0.00	12.000	0.0100	2.89	4.33	0.67	4.29	0.83
10	Line301	Pipe	301	Outfall300	19.18	4.90	4.80	0.5000	0.00	24.000	0.0100	12.98	20.80	0.62	5.60	1.38
11	Line301a	Pipe	301a	301	15.93	0.52	0.44	0.5000	0.00	24.000	0.0130	12.98	15.93	0.81	4.13	2.00
12	Line302	Pipe	302	301a	101.76	5.80	5.29	0.5000	0.00	24.000	0.0100	12.99	21.91	0.59	5.97	1.57
13	Line303	Pipe	303	302	46.49	6.30	6.00	0.6500	0.00	24.000	0.0100	13.11	23.63	0.56	6.15	1.56
14	Line304	Pipe	303	SandFilter	6.88	6.60	6.50	1.4500	14.04	24.000	0.0100	12.98	35.45	0.37	4.80	1.74
15	Line305	Pipe	Opening300	302	58.07	6.00	6.00	0.0000	0.00	3.996	0.0100	0.00	0.01	0.00	0.00	0.00
16	Line401	Pipe	401	101	98.11	10.20	9.75	0.4600	0.00	24.000	0.0100	10.59	19.92	0.53	4.54	1.46
17	Line402	Pipe	402	101	123.71	11.68	11.20	0.3900	0.00	12.000	0.0100	3.11	2.89	1.08	4.25	0.88
18	Line403	Pipe	403	402	148.00	12.62	11.88	0.5000	0.54	12.000	0.0100	3.50	3.28	1.07	4.60	0.98



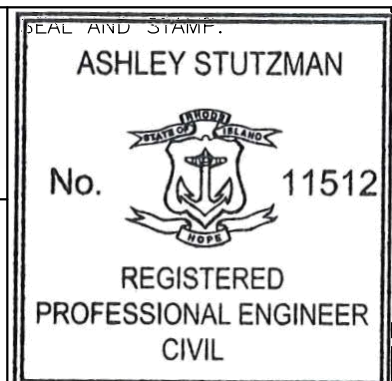
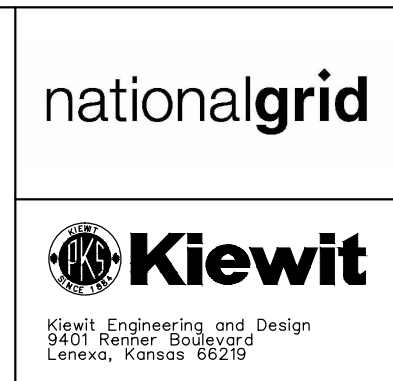
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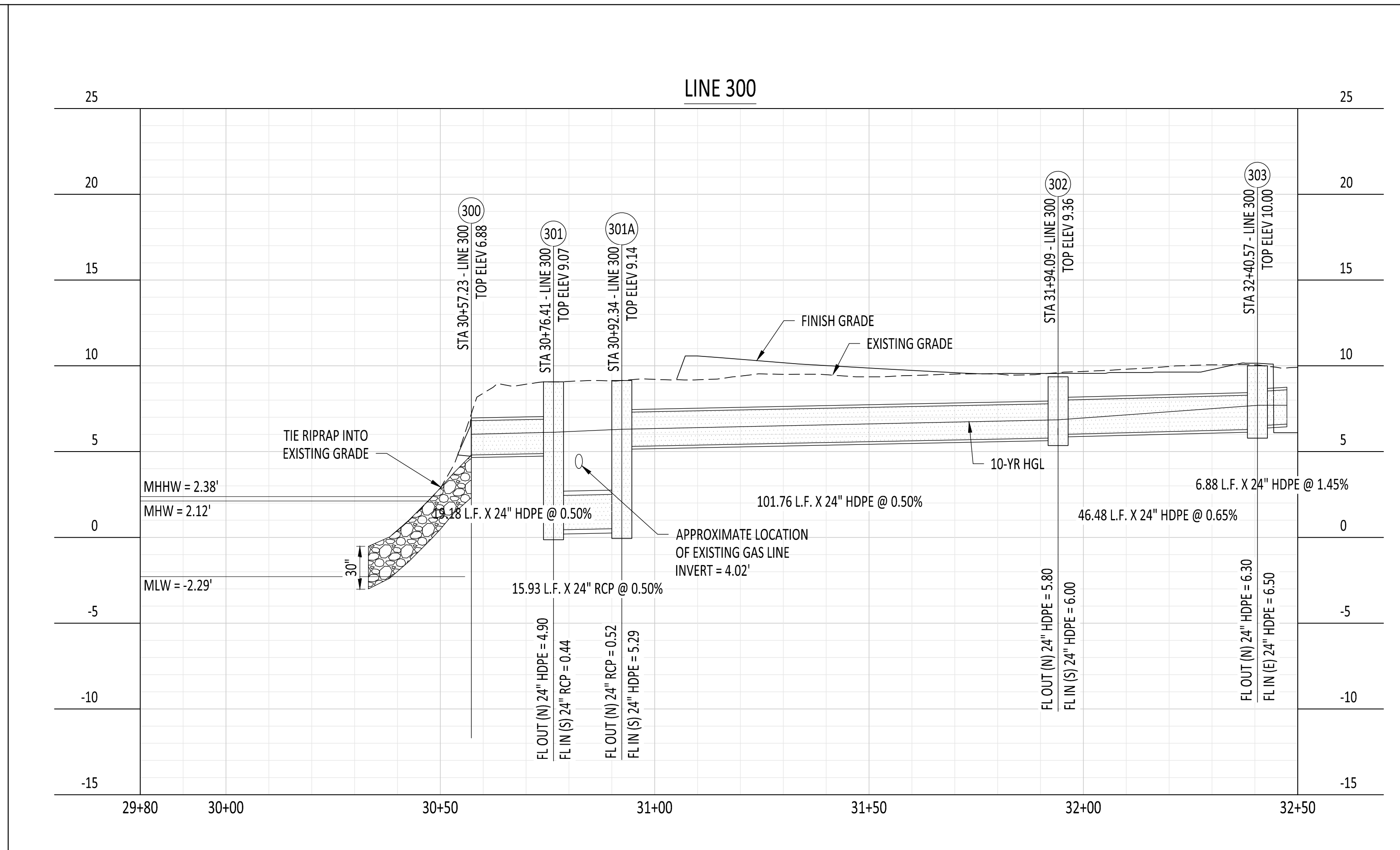
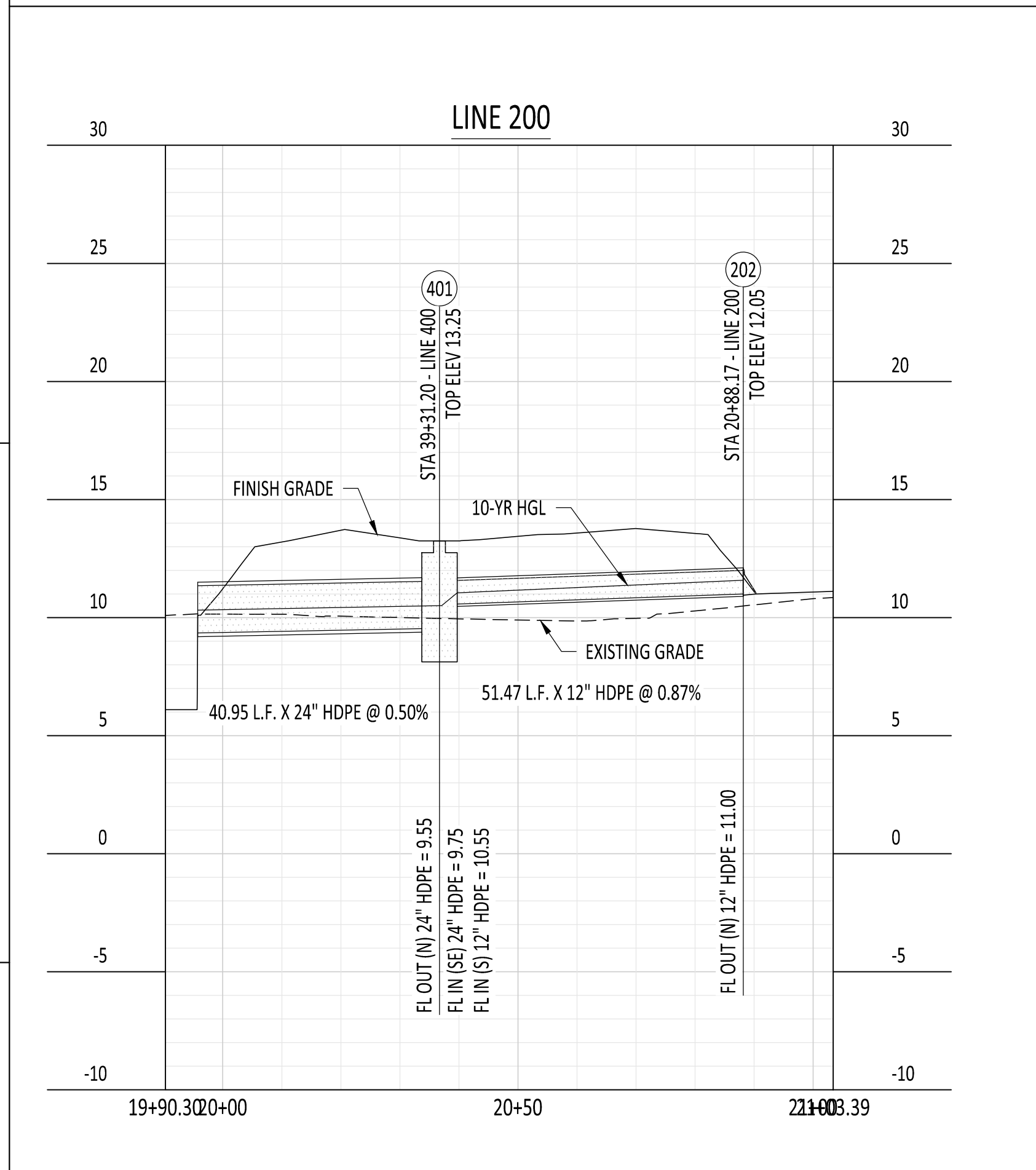
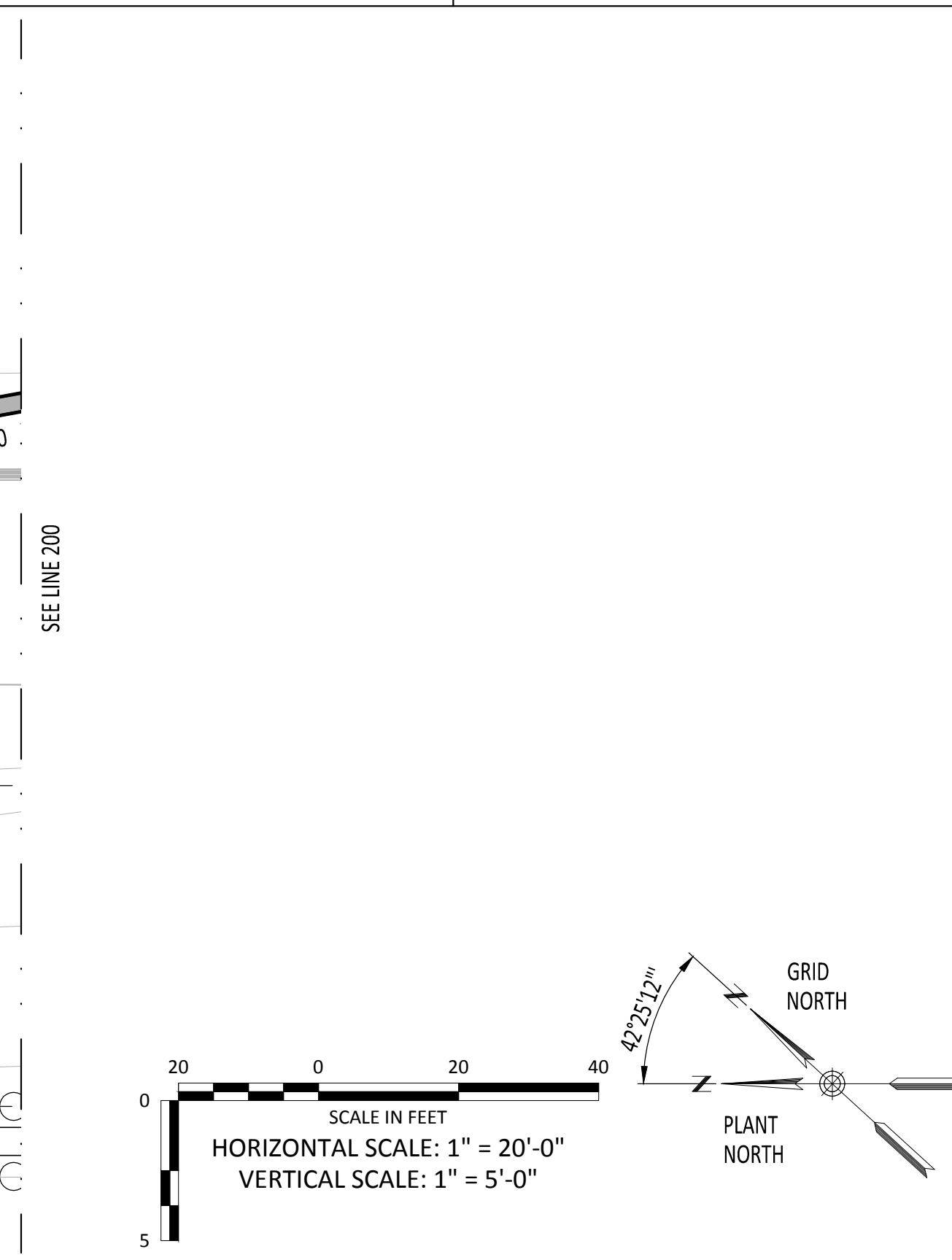
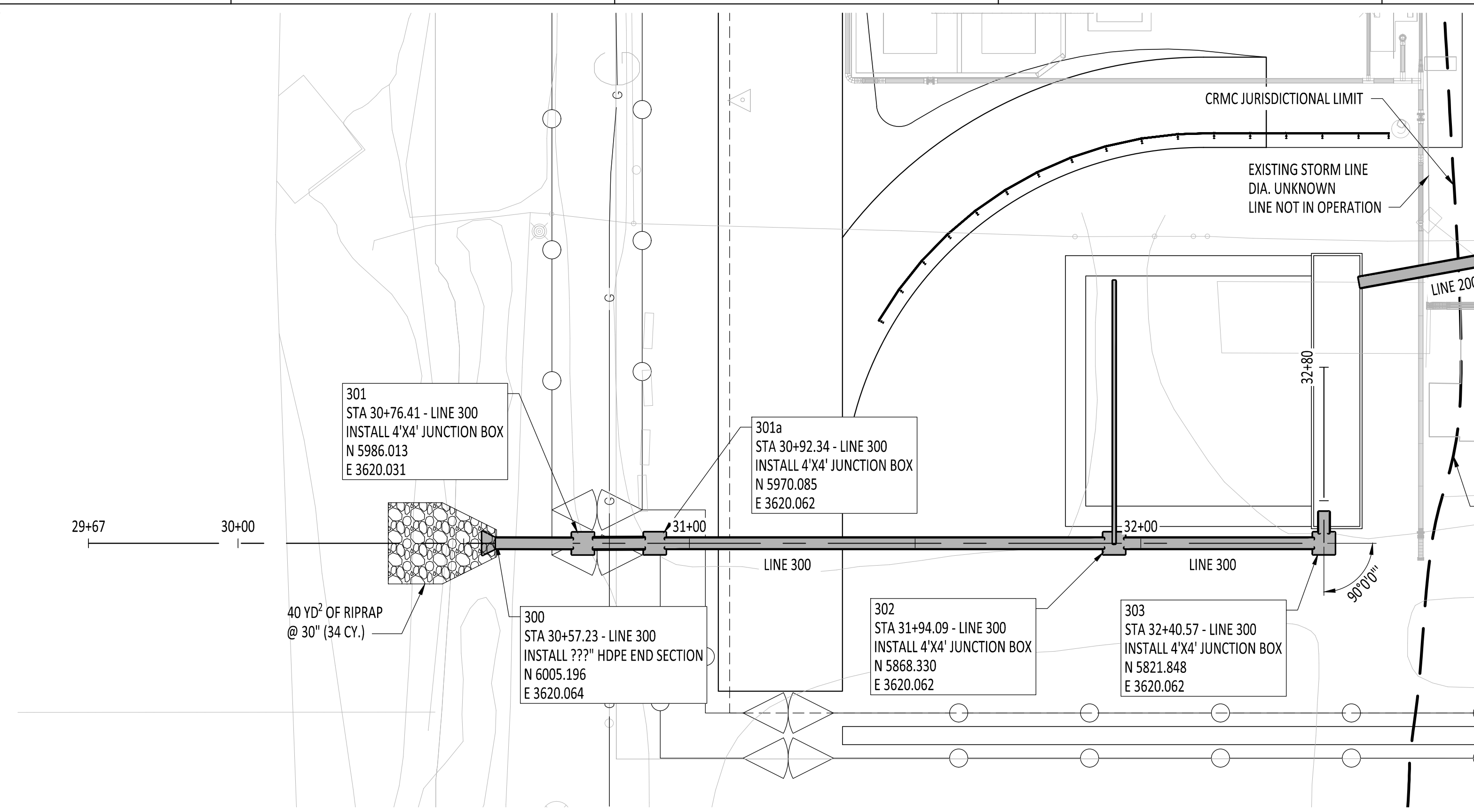
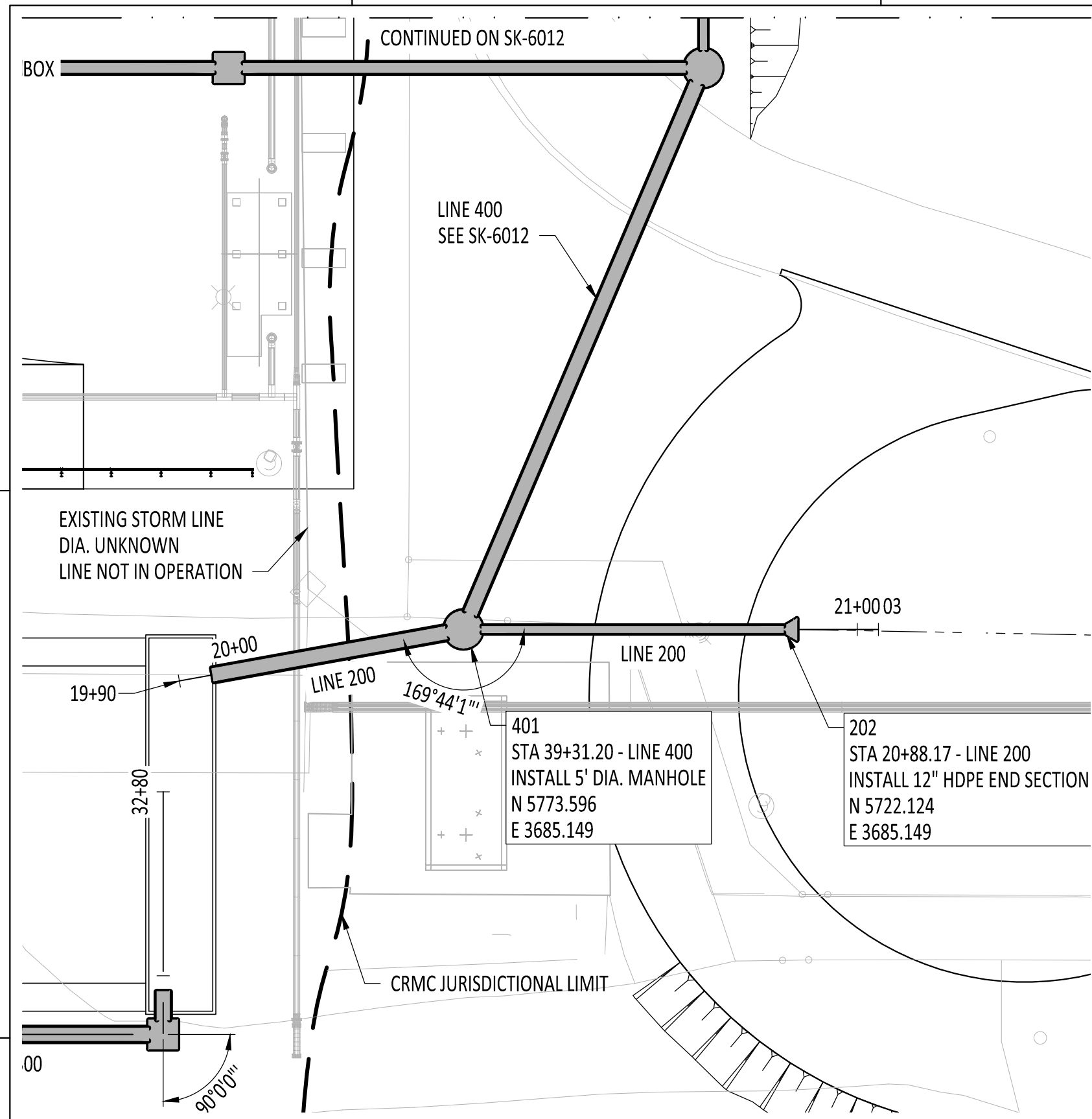
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STORM PLAN AND PROFILE - LINE 100	
DRAWING NO:	102761-B-00-0000-CIV-SK-6010
SHT:	1 OF 3
REV:	A

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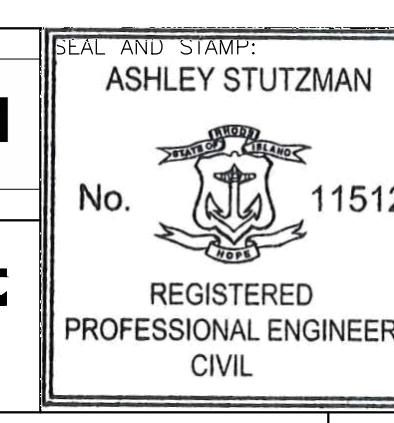
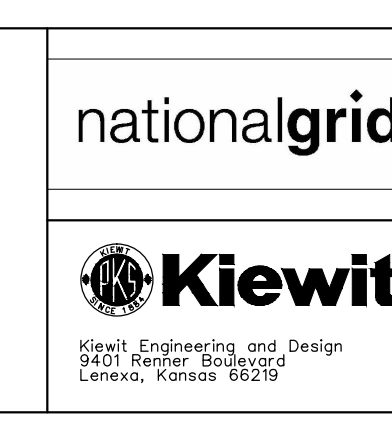
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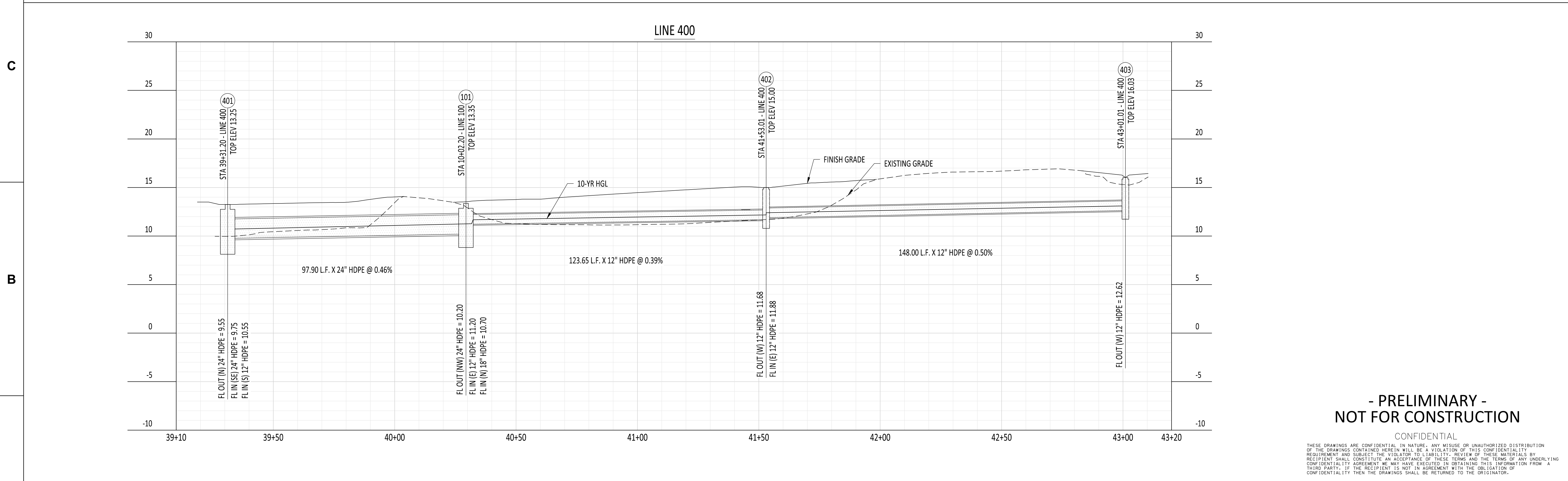
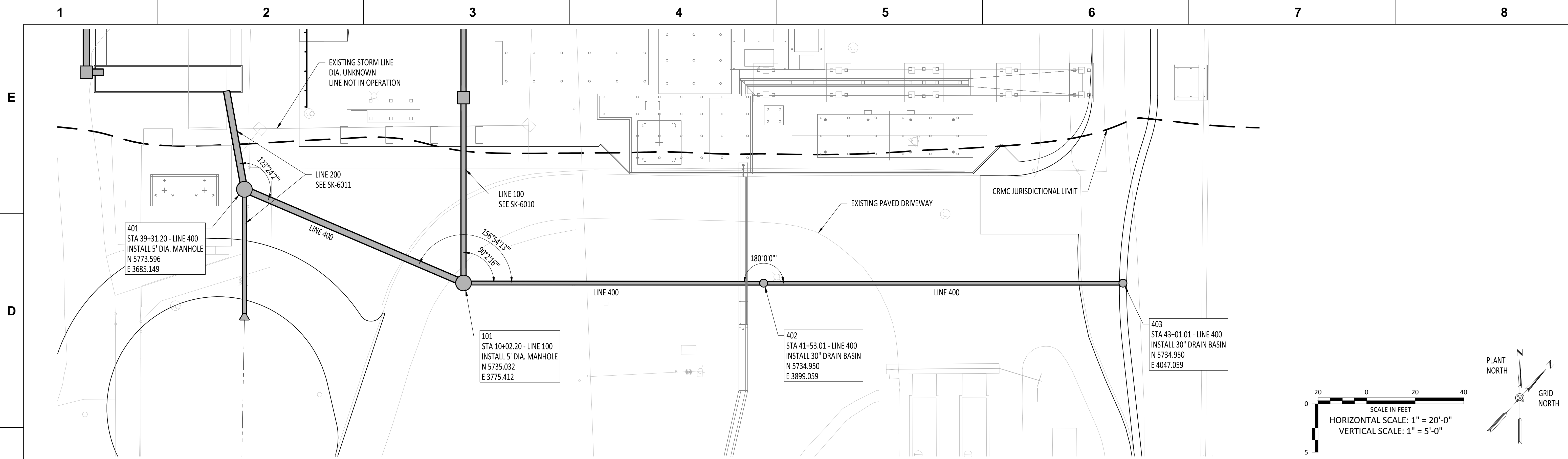
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STORM PLAN AND PROFILE - LINES 200 & 300	
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SHT:	2 OF 3
REV:	A

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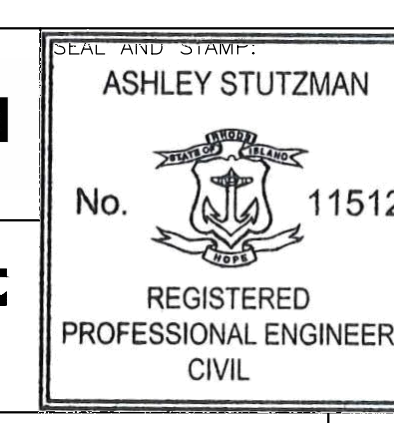
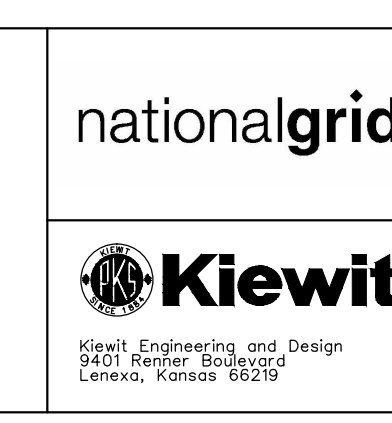
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NATIONAL GRID LNG LLC	
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STORM PLAN AND PROFILE - LINE 400	
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Water Quality Volume for liquefaction plant

Redevelopment Areas (treat 50% of stormwater)	
Liquefaction plant ¹ (impervious over existing impervious)	8,219 ft ²
Total	8,219 ft ²
WQ_v	343 ft³

New Impervious Areas (treat 100% of stormwater)	
Liquefaction Plant	54,454 ft ²
Total	54,454 ft ²
WQ_v	4,538 ft³

Total WQ_v = 4,881ft³

Sediment Forebay (25% WQ _v)	
Volume Required	1,220.25 ft ³
Depth	3.25 ft
Area	376 ft ²
Inner Dimensions	11ft x 60 ft
Outer Dimensions	12 ft x 61 ft
Volume provided	2145 ft³

Sand Filter (50% WQ _v)	
Volume Required	2,440.5 ft ³
Depths	
Ponding	0.75 ft
Topsoil/vegetation	0.5 ft
sand	1 ft
drainage	1 ft
Effective Depth	1.575 ft
Area	1,550 ft ²
Inner Dimension	49.5 ft x 51 ft
Outer Dimension	54 ft x 60 ft
Volume Provided	3,976 ft³

¹ Area provided on Pervious/Impervious Condition Comparison figure from Kiewit dated 6/1/16

****All design standards in accordance with the Federal Highway Administration.****

$$D_{50} = \frac{0.01(V^3)}{(d_{av}^{1.5} * K^{1.5})}$$

D₅₀ (ft) = Median riprap particle size

d_{av} (ft) = Average flow depth in the main flow channel

V (ft/s) = Average velocity in the main channel

$$K = 1 - \left(\frac{\sin^2 \theta}{\sin^2 \phi} \right)^{1.5}$$

θ = Bank angle with the horizontal

Φ = Riprap material's angle of repose

 Manually Entered

V (ft/s) =	5.58
d _{av} (ft) =	1
θ =	0.667
D (ft) =	2
Φ =	42

K =	0.33
D ₅₀ (in) =	11.25

Class	4
Apron Length (ft) =	12.00
Apron Depth (ft) =	2.06

Rip-Rap Classes and Apron Dimensions

Class	D ₅₀ (in)	Apron Length	Apron Depth
1	5	8	3.28
2	6	8	3.09
3	10	10	2.25
4	14	12	2.06
5	20	14	1.88
6	22	16	1.88

Gradation Requirements for Riprap

Class	Range of Intermediate Dimensions (inches)	Range of Rock Mass (pounds)
1	5 - 8	10 - 42
2	8 - 11	42 - 110
3	11 - 14	110 - 220
4	14 - 17	220 - 400
5	17 - 20	400 - 650
6	20 - 23	650 - 990
7	23 - 28	990 - 1800
8	28 - 35	1800 - 3500
9	35 - 41	3500 - 5600
10	41 - 48	5600 - 9000



APPENDIX G

NRCS SOIL REPORT



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

Custom Soil Resource Report

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

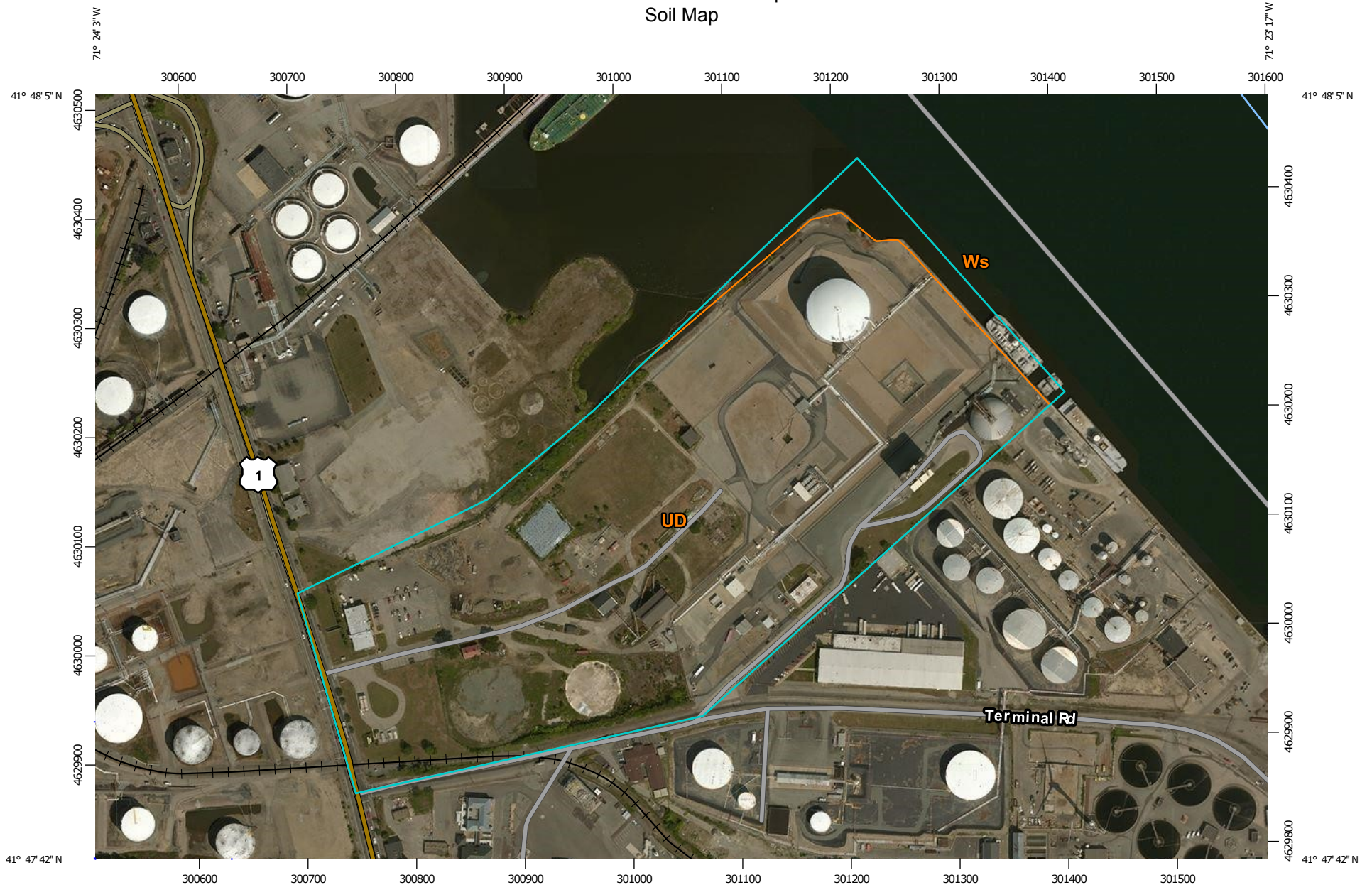
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:4,930 if printed on A landscape (11" x 8.5") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84



Custom Soil Resource Report


MAP LEGEND


Area of Interest (AOI)

 Area of Interest (AOI)


Soils


 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit


 Clay Spot


 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water


 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip

 Sodic Spot


 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot


 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties
 Survey Area Data: Version 14, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 8, 2011—Sep 7, 2013

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties (RI600)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
UD	Udorthents-Urban land complex	43.5	95.2%
Ws	Water, saline	2.2	4.8%
Totals for Area of Interest		45.7	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties

UD—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 9lxj
Mean annual precipitation: 44 to 50 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 120 to 211 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 70 percent
Urban land: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Human transported material

Typical profile

A - 0 to 12 inches: sandy loam
C1 - 12 to 25 inches: sandy loam
C2 - 25 to 60 inches: stratified sand to very gravelly coarse sand

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 42 to 54 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.5 inches)

Description of Urban Land

Setting

Parent material: Human transported material

Typical profile

R - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent
Landform: Kames, outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Quonset

Percent of map unit: 5 percent
Landform: Eskers, outwash plains, outwash terraces, terraces
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ws—Water, saline

Map Unit Setting

National map unit symbol: bqv1
Elevation: 0 to 20 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Water, saline: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Beaches, sandy surface

Percent of map unit: 5 percent
Landform: Barrier beaches, beaches, shores, back-barrier beaches
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: Unranked

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