DRAFT FINAL
REMEDIAL ACTION WORK PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004
Contract Task Order: N4008518F6147

Document Control Number: APTIM-9004-F6147-001

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Acronyms and Abbreviations

%	percent
°F	degrees Fahrenheit
ac.	acres
APP	Accident Prevention Plan
APTIM	Aptim Federal Services, LLC
ASTM	American Society for Testing Materials
bgs	Below Ground Surface
CCR	Construction Completion Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Coder of Federal Regulations
COC	Contaminants of Concern
CY	cubic yard
E&S	Erosion and Sediment
EPP	Environmental Protection Plan
ER	Environmental Restoration
ESCP	E&S Control Plan
ft^3	cubic feet
ft.	feet
gal	gallon
GCL	Geosynthetic Clay Liner
in.	inches
in^2	square inch
kg	kilogram
lb	pounds
LF	linear feet
mg	milligram
mm	millimeter
msl	Mean Sea Level
NAVFAC	Naval Facilities Engineering Command
Navy	U.S. Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPS	nominal pipe size
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration

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Acronyms and Abbreviations Continued

OU	Operable Unit
oz.	ounce
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PQCP	Project Quality Control Plan
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plans
QC	Quality Control
RAWP	Remedial Action Work Plan
RCP	Reinforced Concrete Pipe
RLS	Registered Land Surveyor
ROD	Record of Decision
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SF	square feet
SSHO	Site Safety and Health Officer
SVOC	Semi-Volatile Organic Compound
SWPPP	Stormwater Pollution Prevention Plan
TAGM	Technical and Administrative Guidance Memorandum
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCP	Traffic Control Plan
UFGS	Unified Facilities Guide Specifications
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WMP	Waste Management Plan
yd^2	square yard

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1.0 Introduction

This Remedial Action Work Plan (RAWP) presents the specific tasks and procedures that will be implemented by Aptim Federal Services, LLC (APTIM) during the remedial action for Site 1 at Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage in Bethpage, New York. The remedial action is being performed for the U.S. Department of the Navy (Navy) Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, under Contract No. N62470-16-D-9004, Contract Task Order N4008518F6147. This work is being performed under the Navy Environmental Restoration (ER) Program.

This work will be executed to fulfill the requirements outlined in the Operable Unit (OU) 4 Record of Decision (ROD) (Navy, 2018) by completion of the remedial action in accordance with the Final Remedial Design (Tetra Tech, 2018a), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The work at Site 1 shall be executed to fulfill the requirements of the OU4 ROD (Navy, 2018). The 2018 OU4 ROD selected remedy includes excavation and either on-site reuse or off-site disposal of polychlorinated biphenyl (PCB)-contaminated soils and installation of a reduced permeability cover. The cover will reduce leaching of contaminants from unsaturated soil to groundwater.

1.1 Project Summary Scope of Work

The objective of the selected remedy outlined in the OU4 ROD is to excavate and dispose of PCB-contaminated soils and install a reduced permeability cover. The cover will reduce leaching of contaminants from unsaturated soil to groundwater. Prior to intrusive activities, a truck scale, decontamination pad, and sheet piling will be installed to assist in safely implementing the selected remedy.

APTIM and its subcontractors will implement the selected remedy by conducting a limited excavation to remove PCB-contaminated soil as follows:

- Concentrations greater than one-milligram/kilogram (mg/kg) to a depth of two-feet (ft.) below ground surface (bgs);
- Concentrations greater than 10-mg/kg to a depth of 10-ft. bgs;

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- Concentrations greater than 50-mg/kg to a depth of 20-ft. bgs at Site 1; and
- Concentrations greater than 50 mg-kg to a depth of 30-ft. bgs at Dry Well 20-08.

Clean, overburden soils with less than 10 mg/kg PCBs (to a depth of 10-ft.) or 50 mg/kg (at depths over 10-ft.) will be reused as backfill and/or consolidated on-site.

The selected remedy also includes installation of a reduced permeability cover (geosynthetic clay liner [GCL]) in areas requiring excavation to a depth of or greater than 20-ft. bgs. Upon completion of the excavation and GCL installation, all disturbed areas will be restored to include re-grading and re-vegetation, as appropriate for planned future use. APTIM will be responsible for the characterization, transportation, and disposal of generated, contaminated material. This work will be performed in compliance with federal, state, and local regulations as they pertain to the environment.

Final approval of this RAWP is required by NAVFAC Mid-Atlantic and the New York State Department of Environmental Conservation (NYSDEC).

1.2 Work Plan Organization

This RAWP consists of the following sections and provides descriptions of the specific activities involved in the implementation of the remedial action. This RAWP is organized as follows:

- **Section 1.0, Introduction**—Section 1.0 provides an introduction, project organization, Work Plan organization, and site safety.
- **Section 2.0, Site Conditions and Background**—Section 2.0 presents the site location, description, history, and site chemical characteristics.
- **Section 3.0, Regulatory Framework**—Section 3.0 describes the regulatory process, Remedial Action Objectives, and anticipated waste streams.
- **Section 4.0, Project Requirements**—Section 4.0 describes the required supporting project documents.
- **Section 5.0, Pre-Construction Activities**—Section 5.0 describes the pre-construction activities, mobilization, site preparation, utility relocation, and site safety and security.
- **Section 6.0, Remedy Implementation**—Section 6.0 describes the all associated construction activities; installation of sheet piling, waste characterization sampling, excavation, installation of the GCL, transportation and disposal of soil and debris, backfilling, and site restoration.
- **Section 7.0, Project Management Plan**—Section 7.0 presents the project responsibilities, data management, document control, and meetings and reports.

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- **Section 8.0, Reporting Requirements**—Section 8.0 describes the reporting requirements including a comprehensive Construction Completion Report (CCR).
- **Section 9.0, References**—Section 9.0 includes a list of documents used to compile this RAWP.
- **Appendix A, Project Schedule**
- **Appendix B, Project Specifications and Design Drawings**
- **Appendix C, Project Quality Control (QC) Plan (PQCP)**
- **Appendix D, Environmental Protection Plan (EPP)**
- **Appendix E, Waste Management Plan (WMP)**
- **Appendix F, Response to Comments**

1.3 Site Safety

Occupational Safety and Health Administration (OSHA) excavation regulations and notification requirements will be followed. Excavations will be conducted in accordance with the U.S. Army Corps of Engineers (USACE) *Safety and Health Requirements Manual EM 385-1-1* (2014), and the *Unified Facilities Guide Specifications (UFGS) Section 01 35 26 Governmental Safety Requirements* (NAVFAC, 2012).

Field activities will be conducted in accordance with the *Accident Prevention Plan (APP), Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil, Naval Weapons Industrial Reserve Plant, Bethpage, New York* (APTIM, 2018a).

1.4 Supporting Documents

Supporting documents in addition to this RAWP include the Sampling and Analysis Plan (SAP), Traffic Control Plan (TCP), and Stormwater Pollution Prevention Plan (SWPPP). The supporting documents are provided in conjunction with this RAWP to provide further details regarding sampling analysis/methods, traffic procedures, and stormwater protection measures to be implemented throughout the project duration. Additional details regarding these supporting documents are provided in Section 4.0.

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2.0 Site Conditions and Background

This section presents a general description of the site, the history, topography and site features, climate, geology, hydrogeology, hydrology, and contaminants of concern (COCs).

2.1 Site Location

The former NWIRP Bethpage is located in east-central Nassau County, Long Island, New York, approximately 30-miles east of New York City (Figure 1). NWIRP Bethpage is bordered on the north, west, and south by property owned, or formerly owned, by Northrop Grumman that covered approximately 500-acres (ac.), and, on the east, by a residential neighborhood (Figure 2).

Site 1 is situated along the eastern boundary of the former NWIRP Bethpage and is a relatively flat area with a four-ft. vegetated windrow located along the eastern end of the site and is mounded on the north by a partially buried abandoned sanitary settling tank.

The Site is enclosed by a facility perimeter fence along the north, east, and south and an interior facility fence along the west. The interior fence was installed in 1998 as an interim measure to restrict facility personnel from areas with residual soil contamination. The area bounded by this fence is lightly vegetated and the remainder of Site 1 is covered with concrete or gravel. Dry Well 20-08 is located outside of the fenced area, but is underneath the interim soil cover that was placed over PCB-contaminated soil in 1993. The existing conditions at Site 1 is provided on Drawing C-100 of the Design Drawings (Appendix B).

The land surrounding the nine-ac Bethpage facility in all directions is primarily industrial and residential. Operations at the Site 1 are currently limited to soil vapor control, control of vegetation, and fence repair. Security is provided by Steel Equities.

2.2 Site Description and History

The former NWIRP Bethpage was located adjacent to the Grumman facility, and was operated by Grumman and later Northrop Grumman from 1942 to the mid-1990s. The plant's primary mission was the research prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. In 1996, operations ended at the facility. At that time, the NWIRP was approximately 109.5-ac. in size. In 2002, 4.5-ac. of the property were transferred to Nassau County. In February 2008, the Navy transferred an additional 96-ac. of the remaining 105-ac. main parcel to Nassau County. The remaining nine-ac. parcel is being retained by the Navy for environmental investigation and remediation.

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From the early 1950's to 1978, drums containing liquid wastes were stored on a cinder-covered area over a cesspool leach field. This leach field may have been used to discharge process wastewater. In 1978, the drum storage area was moved a few yards to the south to a 100- by 100-ft. concrete pad. In 1982, the drum storage area was moved to its present location at Site 3. Transformers and PCB-filled autoclaves were also stored at the site. The waste drums reportedly contained chlorinated and non-chlorinated solvents, and liquid cadmium and chromium wastes. In addition, underlying most of Site 1 are approximately 120 abandoned cesspools that were designed to discharge sanitary wastewaters from Plant No. 3 that were in use from the early 1950s to 1978. These cesspools were approximately 10-inches (in.) in diameter and 16-ft. deep. Based on field observations, the cesspools were filled with soil between 1978 and 1986. It is possible that non-sanitary wastes may have been discharged into this system. The drum marshalling areas and the leach field were the initial extent of Site 1.

The site was originally identified and investigated as part of the facility-wide investigations. A ROD for Site 1 soil was signed in 1995 to address PCB- and volatile organic compound (VOC) - contaminated soil. Residual soil contamination noted in the ROD consists of metals, VOC, polynuclear aromatic hydrocarbon (PAH), and PCBs at concentrations greater than protective levels listed in Technical and Administrative Guidance Memorandum (TAGM) 4046. Levels of these constituents also exceed the NYSDEC Part 375 Soil Cleanup Objectives, an Applicable or Relevant Appropriate Requirements promulgated in 2006. Groundwater contamination above the TAGM 4046 and Part 375 NYSDEC Cleanup Objectives consisting of metals, VOCs and PAHs was also noted in the ROD.

In June/July 2009, buildings, tanks, and concrete aprons within the fenced portion of Site 1 were demolished and disposed/recycled offsite.

In 2012, at the request of the property leases to allow additional parking for facility tenants and with concurrence from NYSDEC, the southern section of the Site 1 interior facility fence was moved to the north approximately 100 feet and the western section of the fence was moved to the east approximately 30 ft. This new access area was covered with gravel and asphalt in accordance with the OU1 ROD, (NYSDEC, 1995). In April 2012, the current property owner, Steel Equities, uncovered two intact Underground Storage Tanks (USTs) that were found to contain residual solvent material. The USTs and contents were removed in September 2012 and post-removal soil samples were collected. As of 2013, the area within the interior facility fence is lightly vegetated soil.

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2.3 Topography and Site Features

The former NWIRP Bethpage is located on a relatively flat, featureless, glacial outwash plain (Resolution, 2016). The site and nearby vicinity are highly urbanized. Because of this, most of the natural physical features have been reshaped or destroyed. Elevations range from greater than 140-ft. above mean sea level (msl) in the north to less than 110-ft. above msl at the southwest corner.

2.4 Climate

The climate of NWIRP Bethpage is considered to be humid subtropical/continental, and is moderated by its proximity to the Atlantic Ocean, the Long Island Sound, and Great South Bay. There are generally warm to hot and humid summers, and warm to cold winters. In Bethpage (Farmingdale, NY), the warmest and coldest months of the year are August (mean temperature of 78 degrees Fahrenheit [°F]) and February (mean temperature of 29°F), respectively. Annual precipitation averages 43.74-in. (usclimatedata, 2016).

2.5 Geology

The Upper Glacial Formation (commonly referred to as glacial deposits) forms the surface deposits across the entire NWIRP. The glacial deposits beneath the site consist of coarse sands and gravels. These deposits are generally about 40- to 45-ft. thick; local variations in thickness are more common due to the irregular and undulating contact of the glacial deposits with the underlying Magothy Formation. The contact between the two formations was defined as the horizon where gravel becomes rare to absent, and finer sands, silts, and clay predominate (Resolution, 2016).

2.6 Hydrogeology

The Upper Glacial Formation and the Magothy Formation comprise the aquifer of concern at the NWIRP. Regionally, these formations are generally considered to form a common, interconnected aquifer, as the coarse nature of each unit near their contact, and the lack of a confining clay unit, allows for the unrestricted flow of groundwater between formations.

The water table at the NWIRP occurs below the glacial deposits. The glacial deposits are highly permeable, allowing for rapid recharge of precipitation to the underlying Magothy Formation. In addition, large quantities of water withdrawn from the Magothy are recharged back to the Magothy aquifer from the Upper Glacial Formation via the recharge basins at the NWIRP (Resolution, 2016). The Magothy aquifer is a major source of public water for Nassau County.

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2.7 Contaminants of Concern

COCs were identified in the 2018 OU4 ROD Draft (Navy, 2018). The ROD specifically addresses the following:

- PCBs, VOCs, semi-volatile organic compounds (SVOCs), metals (arsenic, chromium, and hexavalent chromium), and pesticides in soils from ground surface to 65-ft. bgs;
- Residual PCB-contaminated soil associated with Dry Well 20-08 which was added to Site 1 because of proximity and similarity in COC, concentrations, and depth;
- PCB- and metal (total chromium and hexavalent chromium)-contaminated on NWIRP groundwater associated with Site 1, which was not addressed in the 1995 OU 1 ROD or the 2003 OU 2 ROD (NYSDEC, 1995);
- VOCs in Site 1 soil vapor that could result in vapor intrusion. The 1995 ROD did not address soil vapor intrusion as a pathway (NYSDEC, 1995).

These contaminated media represent potential threats to human health through ingestion, dermal contact, and dust inhalation of contaminated soils; inhalation of soil vapor; and inhalation of volatiles and ingestion of groundwater.

However, based on previous investigations detailed in the 2018 ROD (Navy, 2018), there are no cleanup levels for this remedial action. The selected remedy will address contaminated soils only and focuses on PCBs because these compounds are present throughout much of Site 1, representing the majority of COC mass, are persistent in the environment, and are detected in groundwater. The COCs will be fully addressed upon the completion of excavation and installation of the GCL.

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3.0 Regulatory Framework

Section 104 of the CERCLA and Superfund Amendments and Reauthorization Act (SARA) of 1986 allow an authorized agency to provide for remedial or removal actions and to remove, or arrange for removal of, hazardous substances, pollutants, or contaminants at any time, or to take any other response measures consistent with the NCP as deemed necessary to protect public health or welfare and the environment. The NCP, Title 40 of the Code of Federal Regulations (CFR), Section 300, provides regulations for implementing CERCLA and SARA and regulations specific to removal actions. The NCP defines a removal action as:

> [The] cleanup or removal of released hazardous substances from the environment, such actions as may be necessary to monitor, assess, and evaluate the threat of release of hazardous substances; the disposal of removed material; or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release.

3.1 Regulatory Process

The Navy is directing this remedial action under the Navy ER Program in accordance with requirements of CERCLA and the NCP. The work will be executed in accordance with Section 121(e) of CERCLA (42 United States Code [USC], Section 9621[e]), as amended, which states that no federal, state, or local permits shall be required for the portion of any removal or remedial action conducted entirely on site. Because the work under this RAWP is executed to support a remedial action, permits are not required for remedial action activities conducted entirely on site. All substantive requirements will be met. Required Town of Oyster Bay permits for work affecting public roads are detailed in Section 5.1.

3.2 Remedial Action Objectives

As stated in the OU4 ROD (Navy, 2018), the primary objective of the remedial action is to remove PCB-contaminated soil with concentrations greater than one-mg/kg to a depth of two-ft. bgs and 10-mg/kg to a depth of 10-ft. bgs; and to excavate PCB-contaminated soil with concentrations greater than 50-mg/kg to a depth of 20-ft. bgs at Site 1 and to a depth of 30-ft. bgs at Dry Well 20-08. Other COCs identified during previous investigations co-located with PCBs will be removed as a result of excavation.

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4.0 Project Requirements

Required project plans are discussed in this section.

4.1 Project Schedule

The project schedule is provided as Appendix A of this RAWP. The schedule provides a detailed listing of project components and the projected time to completion.

4.2 Sampling and Analysis Plan

A SAP, which includes a Field Sampling Plan and Quality Assurance Project Plan (QAPP), is provided in conjunction with this RAWP (ATPIM, 2018b). The SAP was developed in accordance with the Uniform Federal Policy guiding the development of QAPPs and the Department of Defense Policy and Guidelines for Acquisitions Involving Environmental Sampling and Testing.

4.3 Accident Prevention Plan

An APP is provided in conjunction with this RAWP (APTIM, 2018a). The APP was prepared to support fieldwork for the remedial action in accordance with the *Safety and Health Requirements Manual EM 385-1-1* (USACE, 2014) and *UFGS Section 01 35 26 Governmental Safety Requirements* (NAVFAC, 2012). The APP includes a Site Safety and Health Plan, Activity Hazard Analyses, and Health, Safety, and Environment Procedures.

4.4 Project Quality Control Plan

A PQCP is provided as Appendix C of this RAWP. The PQCP details definable features of work, phases of control, and QC procedures which will be implemented throughout the remedial action and during restoration activities.

4.5 Environmental Protection Plan

An EPP is provided as Appendix D. The EPP outlines the specific environmental concerns that will be addressed during the implementation of the remedial action, including personnel training, site corrective actions, erosion and sediment (E&S) control, contamination prevention, spill control, and air pollution and noise control. The EPP was developed in accordance with all applicable local, state, and federal regulations.

4.6 Storm Water Pollution Prevention Plan

A SWPPP is provided in conjunction to this RAWP (APTIM, 2018c). The SWPPP describes the management that will be implemented throughout construction activities to prevent storm water

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pollution from entering the municipal storm systems and ultimately, larger bodies of water. The SWPPP was prepared to support field work for the remedial action in accordance with New York's State Pollution Discharge Elimination Systems Private/Commercial/Institutional General Permit. An E&S Control Plan (ESCP) is provided as Appendix B to the SWPPP.

4.7 Traffic Control Plan

A TCP is provided in conjunction to this RAWP (APTIM, 2018d). The TCP describes the traffic management and materials that will be implemented throughout construction activities. A Site Agreement will be provided in conjunction with the TCP for review by the Town of Oyster Bay.

4.8 Waste Management Plan

A WMP is provided as Appendix E of this RAWP. The WMP documents all contractual, legal, and risk-management requirements in the generation, storage, sampling and analysis, waste typing, transportation, treatment, and ultimate disposal of all waste during the remedial action. The WMP includes the following:

- description of the wastes expected by types;
- description of minimization techniques for reducing the generated quantities of investigation derived waste;
- review of applicable federal, state, and local regulatory criteria governing the management of these materials;
- characterization rationale for solid and liquid waste materials; and
- rationale for on-site management of each expected waste type; and waste transportation, treatment, and disposal methods.

4.9 Site Plan

The Site Plan is provided as Figure 3. The Site Plan presents proposed work areas, including loading areas, decontamination areas, staging areas, and equipment lay down areas.

4.10 Operation and Maintenance Plan

An Operation and Maintenance (O&M) Plan will be provided following completion of construction activities. The O&M Plan will describe the actions to be completed during the 30-month period following post-construction activities, including inspections to be performed, the mechanism for the making of repairs, and actions to be taken to establish long-term success of vegetation.

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5.0 Pre-Construction Activities

Pre-construction activities are discussed in the following subsections.

5.1 Permitting and Notifications

APTIM will obtain all necessary authorizations from NAVFAC Mid-Atlantic for performing the remedial action at Site 1. Prior to field activities, APTIM will notify the Navy Remedial Project Manager (RPM), NWIRP Bethpage Project personnel, and appropriate personnel, as applicable, as to the nature of the anticipated work. APTIM will also contact New York 811 one-call, in addition to contracting a private utility locator to perform a utility mark out at Site 1.

Road permits associated with Aerospace Boulevard and 11th Street will be acquired, prior to mobilization. APTIM will provide the project information/drawings and necessary applications and fees to obtain applicable permits from the Town of Oyster Bay. Additional details regarding the required permits are discussed below.

Work will be conducted in accordance with Section 121(e) of CERCLA (42 USC, Section 9621[e]), as amended, which states that no federal, state, or local permits shall be required for the portion of any removal or remedial action conducted entirely on site. Because the work under this RAWP is executed to support a remedial action, no other permits and fees are required for remedial action activities conducted entirely on site.

5.1.1 Street Opening and Partial Street Closure Permits

During site preparation activities, concrete traffic barriers and temporary fencing will be placed on the existing curb, gutter, and site perimeter parallel to 11th Street. Approximately 65 traffic barriers (10-ft. long and three feet high) will be positioned along the length of the street (approximately 650-ft.) using a wheeled loader.

In addition to the jersey barriers, approximately 650-ft. of freestanding eight-ft. high temporary chain link fence with link panels will be installed along the curb, parallel to 11th Street. Each fence post will be installed 10-ft. off center into a galvanized steel pipe base. The temporary fence will be in accordance with Drawing C-501 of the Design Drawings (Appendix B).

Due to the site preparation activities on 11th Street, a partial street closure will be required to safely install the traffic barriers and temporary fencing. At the conclusion of the installation, the barrier will occupy approximately 18-in. of 11th street.

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Prior to work on 11th Street, a Street Opening and Partial Street Closure Permit will be obtained from the Town of Oyster Bay. Traffic control procedures and operations will be conducted as described in the TCP (APTIM, 2018d).

5.2 Preparatory Activities and Meetings

Prior to mobilization, pre-construction and mutual understanding meetings will be held leading up to the project to establish and review the work schedule, discuss project-related topics, and activities.

Additional meetings will be held for the duration of the project to review QC, health and safety performance, sample results, and other pertinent project information. Details regarding the meetings to be held during field activities are provided in Section 7.3.

5.2.1 Pre-Construction and Mutual Understanding Meeting – Navy

A pre-construction and mutual understanding meeting will be held prior to mobilization of equipment and personnel. The purpose of the meeting will be to discuss project-specific topics, roles, and responsibilities of all project personnel, project schedule, health and safety concerns, and other topics that require discussion before field mobilization. The pre-construction meeting will be attended by representatives of the following:

- Navy RPM, NWIRP Bethpage project personnel, others as applicable
- APTIM [Project Manager, Deputy Project Manager, Site Construction Manager, Project QC Manager, and Site Safety and Health Officer (SSHO)]
- Subcontractors as appropriate

5.2.2 Pre-Construction and Mutual Understanding Meeting – Town of Oyster Bay

A pre-construction and mutual understanding meeting will also be conducted with Town of Oyster Bay personnel prior to mobilization of equipment and field crew. This meeting, conducted with the Navy, will serve to coordinate activities with the Town of Oyster Bay and discuss project schedule, activities, and impacts to traffic patterns when import and export of materials is ongoing.

5.3 Mobilization

At least two weeks prior to mobilization, the Navy RPM will be notified regarding the planned schedule for mobilization and site remediation activities. Upon receipt of the appropriate authorizations, permits, licenses and training certificates, field personnel, temporary facilities, and required construction materials will be mobilized to the site. Mobilization activities will include site preparation, movement of equipment, materials, and temporary facilities to the site,

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establishment of an equipment decontamination area, and orientation and training of field personnel.

5.4 Site Preparation

Site preparation activities include mobilization of temporary construction facilities/equipment to the site, construction of an equipment decontamination area, utility clearance/relocation, and site set-up. Site preparation activities are discussed in the following subsections.

5.4.1 Pre-Construction Survey

A photographic pre-construction survey of Site 1 will be performed to document the conditions of the site prior to earth-disturbing work. Upon completion of the project scope of work, data from the pre-construction survey will be used to restore impacted areas to pre-existing conditions.

5.4.2 Temporary Construction Facilities

An exclusion zone will be established as necessary around work areas and delineated with high visibility temporary fencing, or equivalent, and have the appropriate signage posted (Figure 3). Work performed in or near roadways will be coordinated with the Construction Manager, local tenants, and other site users to implement the TCP and coordinate road closures as needed for site personnel safety. Traffic control facilities and signs will be established in accordance with the TCP (APTIM, 2018d).

Temporary facilities to be mobilized to the site will include a contractor and NAVFAC field office, portable toilets, hand washing stations, a secure storage (conex) box for short- and long-term storage of materials, signage, fencing, truck scale, and designated construction roads and parking areas. APTIM will provide electricity and potable water required for the project operations.

The site layout for Site 1 is shown on Figure 3.

5.4.2.1 Material Handling and Storage Areas

The material handling and storage areas will be installed at the locations shown in Figure 3. The excavated materials storage area will be constructed using 40-millimeter (mm)-thick polyethylene liner and contained using five-ft. tall concrete barriers. This approach will ensure a longer life cycle than hay bales and will provide a more durable barrier to protect against contaminant migration. Stockpile slopes will be less than 2H:1V and will be covered with 10-mm-thick polyethylene sheeting and secured with sandbags when not in use.

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Excavated materials to be stockpiled in the material storage areas include concrete, asphalt, and soils. Each material type will be segregated in respective piles and labeled for tracking purposes while awaiting disposal.

5.4.2.2 Equipment Decontamination Area

Prior to beginning project activities, an equipment decontamination pad will be constructed at the location shown on Figure 3. The decontamination area will be constructed using eight-ounce (oz.) nonwoven geotextile, six-mm polyethylene sheeting, one- to four-in. aggregate, and wooden mats. Decontamination water will be pumped from the decontamination pad using a six-in. diesel pump with a 25-ft. hose through a 10-oz. filter bag to be stored in a 20,000-gallon (gal) portable storage tank. Prior to off-site disposal, stored decontamination water will be sampled for waste characterization analysis.

All vehicles and equipment utilized in the Exclusion Zone will be decontaminated in the equipment decontamination area prior to leaving the site. Site materials such as dirt and mud from vehicles will be removed via power washer prior to accessing a public roadway. Equipment contacting known or suspected PCB-impacted material shall be decontaminated at the work area prior to relocation to the support zone. Equipment decontamination will be conducted in accordance with the EPP.

5.4.2.3 Truck Scale and Appurtenances

A weight facility including a scale house, scales, scale pit, and approach slabs will be constructed by a qualified subcontractor to manage the truck traffic during material export. Certified design drawings of the scale pit and approach slabs will be signed and sealed by a Professional Engineer Registered in the state of New York prior to the construction of the truck scale and appurtenances. An O&M manual will be prepared following the installation to include required cuts, drawings, equipment list, descriptions, maintenance and lubrication schedules, troubleshooting guides, spare parts lists, etc., that are required to instruct personnel unfamiliar with the equipment.

5.4.2.3.1 Scale House

The scale house will be a portable office trailer, approximately 10-ft. by 10-ft. located adjacent to the truck scale. The scale house will serve as the scale operator booth and house the scale software equipment, readouts, and printers associated with the truck scale. The scale software equipment (Fairbanks, Model No 8811; Toledo, Model TSM 3000 and 8132, or equal) will include an electronic solid state, digital indicator that will be located on a counter top and arranged with a readout window and operating panel with control buttons and switches at the front. The software equipment will be capable of storing weights in memory, accumulating product code net weights,

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displaying net weights of a gross load, and self-diagnostics. The printer will be used to print weight tickets and will be a solid state, microprocessor design capable of printing a minimum of 40 characters per line and a minimum of four copies.

An additional surge voltage system will be furnished and installed to protect the equipment from surges in the power supply. The system will be a two-stage type with a response time of less than one-millionth of a second. Surge voltage protection will be Fairbanks, Model No 1403; Toledo, Model 913, or equal.

5.4.2.3.2 Installation

The scale pit will be installed to accommodate a BTek Centurion AT Truck Scale. The scale pit foundation will be designed and installed for a frost depth of 54-inches below finished grade and have a bearing capacity of 2.0 kilo-pounds per square foot (SF). The subgrade will be prepared to the required dimensions to house the truck scale prior to completion of concrete placement. Class A, American Society for Testing Materials (ASTM) C 150 Type II Portland Cement will be cast-in.-place following subgrade preparation and have a minimum compressive strength (28-day) of 4,000-pounds (lb) per square inch (in^2). Associated weighing levers will be high strength cast iron or steel.

The approach slabs will be cast-in.-place utilizing the same concrete material as the scale pit. Approximately 374-cubic feet (ft^3) of concrete will be required to install two approach slabs at a maximum grade of seven percent (%).

In addition, a load cell cable to include conduit, installation of load cable, and connecting cable from scale to operations will be furnished and installed.

5.4.2.3.3 Inspections

Following installment of the truck scale, a factory representative with complete knowledge of the proper O&M will inspect the final installation, calibrate the equipment, and supervise a test run of the equipment over a period of three days.

The truck scale will meet the performance and design criteria provided in Specification 10 88 00 of the Project Specifications (Appendix B). The Specifications conform to or exceed the requirements of National Bureau of Standards Handbook 44 for use in commerce.

5.4.2.4 Haul Road

A 12-ft. wide haul road will be constructed within the excavation boundary along western edge, running north to south (Figure 3). The haul road will be used to transport soil, using disposal trucks,

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from the material storage area to the truck scale. The haul road will be constructed in accordance with the Stabilized Construction Access Detail provided on Drawing C-500 of the Design Drawings (Appendix B).

The haul road soils within the excavation area will be the last excavated once all other materials have been transported offsite.

5.4.3 Land Surveying

Land surveys will be performed for the duration of the project by a Registered Land Surveyor (RLS) licensed and registered in New York. Grid spacing for surveys will be a maximum of 50-ft. with survey points at the top, mid-point, and bottom of each slope, along each linear feature and at locations required to define the surfaces. At a minimum, the following surveys will be performed:

- Existing ground surface prior to earth-disturbing activities.
- Ground surface after excavation prior to backfilling and GCL placement, if applicable.
- Top of the soil cover, other surface materials, and all other finished grades at the completion of backfilling activities.
- Exposed and underground linear features prior to backfilling at 50-ft. maximum intervals, changes in slope and/or direction and intersections with other linear features.

The RLS will verify all excavation depths throughout construction activities, including establishing survey points at the top, mid-point, and bottom of each slope, document the limits of the GCL, mark the locations of all replaced underground utilities, and conduct a final as-built survey at the completion of construction.

Surveying will be performed in accordance with Section 01 71 23 of the Project Specifications (Appendix B) by a RLS licensed and registered New York.

5.4.4 Erosion and Sediment Control Measures

E&S controls will be performed in accordance with the approved ESCP (found in Appendix B of the SWPPP) and as described in the following sections. E&S control measures will be installed at the locations shown on Figure 3 (Appendix B of the SWPPP). E&S control measures will be inspected and maintained to ensure they are functioning as designed. Monitoring and maintenance activities associated with the E&S control are described in the ESCP (Appendix B of SWPPP) (APTIM, 2018c).

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5.4.5 Utility Survey and Relocation

Prior to beginning earth-disturbing work, gas and water lines within the limits of the excavation will be relocated and a storm drain will be removed and relocated. In addition to contacting the New York 811 one-call center prior to any intrusive activities, APTIM will contract a private utility locator to perform a utility mark out at Site 1. A field inspection to verify the locations of the utilities, if present, will be conducted prior to removal activities. Any underground utilities that are impacted by soil removal activities will be relocated or removed in accordance with the following sections.

5.4.5.1 Water Line Relocation

An existing water main and two fire hydrants are located within the boundary of the Dry Well 20-08 excavation. Location of the water main and fire hydrant are shown on Existing Conditions Site Plan (Drawing C-100 of the Design Drawings [Appendix B]). Prior to earth-disturbing work at Dry Well 20-08, the fire hydrants will be relocated/removed, the existing water main will be removed, and a new fire main will be installed.

The eastern-most fire hydrant will be removed. The western-most fire hydrant will be relocated approximately 20-ft. due-west and installed with a 10-in. gate valve. Prior to removal, the existing water main will be shut off and capped in accordance with APTIM's Control of Hazardous Energy Procedure (AMS-710-02-PR-01500). The water main will be removed using an excavator to extract the existing pipe, and will be stored in the laydown area to be disposed of off-site. Approximately 200-linear feet (LF) of the water line will be removed and replaced with approximately 275-LF of polyvinyl chloride (PVC) pipe.

The nominal pipe size (NPS) for the PVC to be installed will be 10-NPS. Approximately two 90-degree and one 11.25-degree connectors with corresponding thrust blocks will be installed. Thrust blocks will be approximately 13.125-ft.^{3} and two-ft.^{3} for the 90-degree and 11.25-degree, respectively.

Locations for pipe installation will be trenched to the required alignment grade as specified on Drawing C-503 of the Design Drawings (Appendix B). In invert elevations where rock or unsuitable/unstable conditions are encountered, a minimum of one-ft. and maximum of two-ft. of material will be excavated and replaced with select granular fill.

A minimum10-ft. horizontal and 1.5-ft. vertical separation distances will be maintained in areas requiring storm drain conduit installations parallel to water mains.

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Water line relocation will be performed as specified on Drawing C-504 of the Design Drawings (Appendix B).

5.4.5.2 Gas Line Relocation

The existing gas line intersects the western portion of the Dry Well 20-08 area. Prior to intrusive activities, the existing gas line will be removed and approximately 265-ft. will be installed outside of the excavation boundary. Gas line relocation activities may be performed in concurrence with water line relocation activities. Gas line relocation activities will be performed by National Grid, in accordance with their current standards and procedures at the time of installation.

5.4.5.3 Storm Drain Utilities

Reinforced concrete pipe (RCP) storm drains intersect the Dry Well 20-08 area and will require abandonment/removal and replacement. Approximately 110-LF and 220-LF of RCP pipe will be removed and abandoned, respectively.

Storm drain installation activities will be performed in accordance with Section 33 44 00 of the Project Specifications (Appendix B).

5.4.5.3.1 Materials

Prior to shipment of materials to the site, precast concrete will be subject to material testing. Manufacturer(s) of the material to be used will conduct slump, temperature, compressive strength, air content, and unit weight tests and provide the corresponding reports. Tests will be performed in accordance with ASTM standards, as applicable. Each shipment of precast concrete will be accompanied with a QC signed or stamped delivery ticket providing the description and list of the products.

Piping materials will be inspected for defects upon receipt and prior to installation.

5.4.5.3.2 Installation of Pipe

Installation of the pipe, to include pipe laying and jointing, will be performed in accordance with the manufacturer's recommendations. Pipe installation will begin at the lowest point and proceed toward higher elevations. In invert elevations where rock or unsuitable/unstable conditions are encountered, a minimum of one foot and maximum of two foot of material will be excavated and replaced with select granular fill.

Approximately 274-LF of 36-in. diameter pipe will be installed at a 0.34% slope to the east of the Dry Well 20-08 excavation footprint. An additional manhole will be installed approximately 163-

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LF from the southern end of the new pipe. The northern and southern ends of the pipes will be connected to the existing manholes from the current system.

Approximately 70-LF of 15-in. diameter pipe will be installed from the newly installed manhole in the western direction. An additional storm inlet grate will be installed at the western end of the pipe. Due to the location of the 15-in. pipe, installation will be performed post-excavation of Dry Well 20-08.

Pipes will be temporarily braced and secured in position at the correct alignment and grade until backfilling activities are complete.

5.4.5.3.3 Backfilling and Compaction

Following excavation and installation of the RCP, compact backfill will be placed in the trench surrounding the pipe. Backfill materials will be in accordance with Section 31 23 00 of the Project Specifications (Appendix B).

5.4.5.4 Force Main Removal

The existing force main is located along the northern boundary of Dry Well 20-08. The force main has been previously abandoned and will be removed using an excavator. Approximately 160-ft. of the previously abanodoned force main will be removed.

5.5 Site Safety and Security

APTIM is responsible for the security and safety of all APTIM equipment and facilities, and will confine all operations, including the storage of materials, to the designated areas of the site as shown in Figure 3. Tools and small equipment will be secured daily in the locked conex storage box. All heavy equipment will be stored in the designated equipment laydown area shown in Figure 3. Incidents such as theft and notable damage will be reported to the APTIM Project Manager, who will inform the Navy.

Vehicular access to the site shall be restricted to authorized vehicles only. APTIM will allow entrance only to authorized persons with proper identification. All personnel having access to the site will sign in and sign out on a log, including the time of entry and departure from the site each day. All approved visitors to the site will be briefed by APTIM on safety and security, provided with temporary identification and safety equipment, and escorted by APTIM throughout the visit. Visitors will require Level D personal protective equipment to enter the site, including a hard hat, steel-toed boots, safety glasses, and a high visibility vest, to ensure safety of all personnel.

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5.6 Clean Import Fill Materials

Sources for imported clean fill materials will be identified upon mobilization to the site and/or during construction activities, as needed. All analytical requirements and procedures for clean fill verifications are provided in the SAP (APTIM, 2018b). Imported common fill and topsoil will meet the requirements found in Project Specifications Section 31 23 00 (Appendix B). All testing will be document on the Testing Plan and Log included as Exhibit V-1 of the PQCP (Appendix C). The name of the vendor and copy of the analytical results will be provided to the Navy and NYSDEC for review and acceptance prior to importing the materials.

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6.0 Remedy Implementation

This section describes the specific construction activities and procedures to implement the remedial action requirements.

6.1 Site Clearing

Clearing will be performed in two phases. During the initial phase all vegetation will be cleared with the exception of the trees and shrubs located along the eastern perimeter of the site. The shrubs and trees within 20-ft. of 11th Street will be remain as a barrier until the deep excavation and backfilling have been completed. During the second phase, the perimeter vegetation will be cleared to complete the two-ft. deep excavation along the eastern border of the site.

Chainsaws and line trimmers/brush hogs will be used to clear the vegetation from within the limits of excavation in the phases explained above. Trees, limbs, and brush smaller than 12-in. in diameter will be chipped and placed at the material storage area to facilitate composting. Compost will be tested during compost operations for the parameters listed in Table 1 of Specification 31 10 00 of the Project Specifications (Appendix B) at a rate of one sample per 2,000-cubic yards (CY). Compost QC testing will be document on the Testing Plan and Log included as Exhibit V-1 of the PQCP (Appendix C). Soil-impacted root balls will be downsized using the excavator and transported and disposed of in accordance with applicable state, federal, and local requirements.

Approximately 1,890-ft. of existing fence within the excavation footprint will also be removed and recycled off-site.

6.2 Demolition of Existing Tank

The remaining former settling tank located under the raised berm along the northern boundary will be demolished during the northern phase of excavation. Upon location of the tank, soil coverage will be stripped away using an excavator to expose the limits of the tank. The excavator bucket will be used to break apart the exposed walls and demolish the tank to below finish grade elevation (approximately two-ft. bgs).

Concrete removed from the tank will be downsized into manageable pieces using the excavator bucket and stockpiled in approximately 500-CY piles in the northern material storage area. The concrete stockpile will be labeled to track and manage the generated waste prior to off-site recycling. Chip samples will be collected from the concrete and analyzed in accordance with the SAP (APTIM, 2018b).

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6.3 Installation of Excavation Shoring/Sheet Piling

Prior to excavation in Dry Well 20-08, after utility relocation, and concurrent to excavation in the northern area, sheet piling will be installed around the perimeter of the Dry Well. Approximately 430-LF of 48-ft. vertical depth interlocking AZ26 sheet piling (or equivalent) will be installed around the Dry Well 20-08 excavation area. Approximately 270-LF of 50-ft. vertical depth interlocking SZ-14.5RU steel sheet piling (or equivalent) will be installed along the western boundary of the main excavation area. Sheet piling will be constructed in accordance with Section 31 41 16 of the Project Specifications (Appendix B) and installed in accordance with the subcontractor's approved Shoring Plan. Sheet piling locations are provided in Figure 4.

Concrete barriers will be installed around the Dry Well 20-08 excavation area and along the north-south sheet pile where the excavation may be greater than five-ft. deep for fall protection. All sheet piling will be installed by a qualified subcontractor. Information regarding drawings, design calculations, product data, details of installation, installation equipment, and construction procedures will be submitted to the Navy for approval prior to sheet piling activities.

Following completion of the excavation and backfilling activities, the sheet piling will remain in place. However, the sheets will be cut off approximately three-ft. bgs to limit impacts to future activities.

6.4 Excavation

All excavation activities will be performed in accordance with Section 31 23 00 of the Project Specifications (Appendix B). For constructability, the main excavation area has been divided into three areas; northern, central, and southern (Figure 4). Excavation activities will begin in the northern area and continue towards the southern area. By beginning in the northern area, clean fill for backfilling activities can be imported without crossing contaminated areas.

In order to maintain a cut slope of less than or equal to 1.5H:1V for Type C soil, excavation areas 20-ft. in depth or less will be sloped in accordance with 29 Code of Federal Regulations 1926 Subpart P Appendix B (OSHA, 2010), except where protected by sheet piling.

Overburden soils are anticipated to be encountered from two- to 10-ft. bgs in excavations where a depth of 20-ft. bgs is required and from surface to 20-ft. bgs in Dry Well 20-08. The overburden soils from these areas are considered clean and will be stockpiled for reuse as backfill during site restoration. During excavation of the clean overburden material, field personnel will observe the depths to ensure contaminated soils are not comingled.

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Clean overburden and contaminated materials will be stockpiled as discussed in the following sections. Contaminated excavated soil will be sampled for waste characterization as discussed in Section 6.6 and then transported offsite to an approved disposal facility as discussed in Section 6.8. Table 1 details the volumes calculated for excavation activities.

6.4.1 Northern Area Excavation

Excavation in the northern area will be concurrent with sheet piling installation and excavation at Dry Well 20-08. The northern area is approximately 1.23-ac. and will be excavated to a depth of two-ft. bgs using an excavator. Within the northern area excavation, there are five areas where excavation to a depth of 10-ft. bgs and three areas where excavation to a depth of 10- to 20-ft. bgs is required. As noted on Figure 4, two areas requiring excavation to a depth of 10-ft. bgs are within the boundaries of areas requiring excavation to a depth of 20-ft. bgs. In these areas, the inner and outer boundaries will be staked by a surveyor prior to excavation.

Following excavation to a depth of two-ft. bgs over the entire northern area, excavations in overlapping areas will be conducted. The inner area will be excavated to the designed depth of 10-ft. bgs. Following the excavation and stockpiling of soils from the inner boundary, excavation of the outer boundary footprint will continue to the inner boundary footprint to the designed depth of 20-ft. bgs.

Contaminated material excavated from the northern area will be stockpiled in the material storage area located on the pavement in the southern area awaiting waste characterization sampling and off-site disposal. The excavated clean overburden material from the outer boundary from two- to 10-ft. bgs will be stockpiled within the northern area to be reused as backfill during site restoration activities.

Excavation locations and depths within the northern area are shown on Figure 4.

6.4.2 Dry Well 20-08 Excavation

Following the excavation of soils in the northern area, relocation of underground utilities, and installation of sheet piling, the excavation of Dry Well 20-08 will commence. The Dry Well 20-08 excavation area is approximately 0.2-ac.

Pavement located in the northeast portion of the Dry Well area will be stripped using the excavator and broken into manageable pieces to be recycled at an approved, off-site facility. A long reach excavator will begin excavation of the soil from the southern portion, moving north. The clean overburden material from the surface to 20-ft. bgs in the Dry Well area will be excavated and directly relocated into the completed northern excavations to be used to partially backfill the

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northern portion of the site. Contaminated material will be excavated from 20- to 30-ft. bgs and stockpiled within the southern material storage area in approximately 500-CY piles awaiting waste characterization sampling and off-site disposal (Figure 3).

Upon completion of excavation in the Dry Well and northern area and backfilling in the northern area, excavation activities will commence in the central area.

6.4.3 Central Area Excavation

The central area is approximately 1.74-ac. and will be excavated to a depth of two-ft. bgs using an excavator. Within the limits of the central area excavation, there is one area where excavation to a depth of 10-ft. bgs and two areas where excavation to a depth of 10- to– 20-ft. bgs is required. As noted on Figure 4, two areas requiring excavation to a depth of 20-ft. bgs are within the boundaries of the area requiring excavation to a depth of 10-ft. bgs. In these areas, the inner and outer boundaries will be staked by a surveyor prior to excavation.

Pavement bordering the west of the central area will be stripped using the excavator and broken into manageable pieces to be recycled at an approved, off-site facility during excavation to two-ft. bgs. Following excavation to a depth of two-ft. bgs over the entire central area, excavations in overlapping areas will be conducted. Both inner and outer areas will be excavated to the designed depth of 10-ft. bgs.

Areas where clean overburden material is present from two- to 10-ft. bgs will be excavated first to prevent cross contamination and stockpiled in the northern area to be used as backfill. Following excavation of clean overburden material, contaminated material will be excavated to the design limits to a depth of 10-ft. bgs and the soil stockpiled as described below. Excavation of contaminated material to the design depth of 20-ft. bgs will then proceed in the designated areas.

Excavated contaminated material will be stockpiled in the material storage area located on the pavement in the southern area awaiting waste characterization sampling and off-site disposal.

Excavation locations and depths within the central area are shown on Figure 4.

When excavation in the central area is completed to the designed depths, intrusive activities in the southern area of the site will commence.

6.4.4 Southern Area Excavation

The southern area is approximately 1.26-ac. Soils in the southern portion of the site will be excavated from east to west to a depth of two-ft. bgs. Contaminated soil excavated from the

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southern area will be stockpiled in the material storage area located on the pavement on the western border of the area awaiting waste characterization sampling and off-site disposal.

Pavement bordering the west and gravel located in the southern portion of the central area will be removed using the excavator and broken into manageable pieces to be recycled and disposed of with the excavated soil, respectively, at approved, off-site facilities.

During excavation activities in each area, a New York RLS will verify the tops, mid-slope, and depths of the excavations as discussed in Section 5.4.3.

6.4.5 Cesspool Removal

Approximately 120 cesspools are located within the excavation boundaries and require removal. Upon identification, the cesspools will be removed to the designated excavation depth of the area it is located within. The materials and soil associated with cesspool removal have the potential to contain elevated PCB concentrations, and therefore, will be stockpiled and sampled for waste characterization separately from other excavated materials within the southern material storage area.

6.4.6 Piezometer Decommissioning

Eight piezometers within the excavation footprint will be decommissioned during intrusive activities. The locations of the piezometers can be found on Figure 4.

Piezometers will be decommissioned in accordance with the CP-43 Groundwater Monitoring Well Decommissioning Policy (NYSDEC, 2009). One or more decommissioning methods will be selected to ensure the piezometers are properly removed to prevent contaminant migration into a potential groundwater pathway. The selection process for decommissioning procedures is provided by the flow chart in Table 2.

6.5 Geosynthetic Clay Liner

A GCL will be installed by a qualified installer above the 20-ft. depth excavations and above the Dry Well 20-08 excavation to reduce leaching of contaminants from unsaturated soil to the groundwater. Approximately 34,000-SF and 16,000-SF of GCL will be installed over the 10- to 20-ft. excavations in the northern and central areas and Dry Well 20-08, respectively. The 20-ft. depth excavations and the Dry Well 20-08 are depicted on Figure 4.

6.5.1 GCL Material

The GCL to be used to line the appropriate excavations will be a combination of polypropylene geotextiles and high swelling bentonite manufactured using the needle punch process. The GCL

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will be formulated with two major components; encapsulating geotextile and reinforced bentonite geocomposite liner.

The geotextile will be made of polypropylene. The non-woven component will be a minimum of six-oz. per square yard (yd^2) needle punched geotextile and the woven component will be a minimum of 3.2-oz./yd^2 silt film woven geotextile.

The reinforced bentonite geocomposite liner will be BENTOMATE ST manufactured by Colloid Environmental Technologies Company of Arlington Heights, Illinois BENTOFIX NSL by National Seal Company of Aurora, Illinois.

Rolls of GCL will be manufactured with minimum specifications of 12-ft. wide by 120-ft. long and packaged in photo degradation-resistant packaging. Handling and storage of the GCL will be in accordance with the manufacturer's recommendations and ASTM D5888 Guidance. The rolls of GCL will be protected from puncture, dirt, grease, water, moisture, mud, mechanical abrasions, excessive heat, and ultraviolet rays. The rolls will be stored on a prepared surface elevated a minimum of three-in. above ground surface and will not be stacked more than three rolls high. A tarpaulin will be used over the stacked rolls to provide extra protection for GCL stored outdoors.

6.5.2 GCL Installation

GCL's will be installed at each excavation during backfilling activities. The GCL will be placed over the soil fill at an elevation of 118.5-ft. below finished grade and will extend approximately five-ft. from the excavation boundaries.

Prior to placement, GCL material will be inspected to ensure no rips or tears are present within the liner. This inspection will be documented in a condition report, which will include photographs. The panels will be placed will be placed with the non-woven side of the liner against the subgrade and the woven side oriented upwards. GCL will not be installed on side slopes.

Where required, seams will overlap a minimum of 12-in. and verified by the installer. Contacting surfaces will be cleaned of dirt, soil, and rock prior to overlap with all edges pulled tight to maximize contact and to smooth wrinkles/creases. To ensure seam integrity, granular bentonite of the same type used within the composite liner will be dispersed evenly from the panel edge to the lap line at a minimum rate of 0.25-lb/LF. Approximately 900-lb of granular bentonite will be required within the seam areas.

Upon installation, the elevation and extent of the GCL will be recorded by a land surveyor and documented within as-built drawings for inclusion in the Construction Completion Report. GCL

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materials and installation will be in accordance with Section 31 30 00 of the Project Specifications (Appendix B).

6.5.3 GCL Maintenance

Visible large rips and tears will be repaired by completely exposing the affected area, removing large rocks/soil, and placing a large pass over the damage with a minimum 12-in. overlap from the edges. Granular bentonite will be placed at the overlaps at the frequency described in section 6.5.2.

6.6 Waste Characterization Sampling

Waste characterization samples will be collected from soil, concrete, and decontamination water as described below. All waste characterization samples will be collected and analyzed in accordance with the approved SAP (APTIM, 2018b). All testing will be document on the Testing Plan and Log included as Exhibit V-1 of the PQCP (Appendix C).

6.6.1 Soil

Waste characterization sampling and analysis will be conducted on all excavated soil at a frequency of one sample per 500-CY. The samples will be collected as composite and discrete grab samples from the stockpiles of excavated soil located in the material storage areas. The purpose of the composite sample is to characterize the soil excavated by collecting a sample that would represent the average concentration of the soil to be disposed.

Composite waste characterization samples will be analyzed for PCBs, ignitability, corrosiveness, reactivity, Toxicity Characteristic Leaching Procedure (TCLP) metals, target compound list (TCL) SVOCs, pesticides, and herbicides and discrete waste characterization samples will be analyzed for VOCs to characterize the material for disposal. Additional sampling and comparison values may be required based upon the proposed approved facility requirements.

6.6.2 Concrete

Discrete grab chip samples will be collected from concrete removed from the limits of excavation and analyzed for PCBs, ignitability, corrosiveness, reactivity, TCLP metals, TCL VOCs, TCL SVOCs, pesticides, and herbicides to analyze the material for disposal. Approximately 200-CY of concrete will be removed and require recycling.

A hammer and chisel or a hammer drill will be used to chip the sampling area to a maximum depth of 0.5-in. with a maximum chip size of 0.5-in.. Non-plastic bristle brushes will be used to sweep the sample onto a dustpan and transferred from the dustpan into the sample jar using the bristle brush.

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6.6.3 Decontamination Water

Discrete grab samples will be collected from the storage tank to analyze the decontamination water prior to off-site disposal. Approximately 30,000-gal of decontamination water generated throughout the project will required transportation and disposal. One discrete grab sample will be collected per 20,000-gal storage tank of containerized decontamination water. The discrete grab sample will be collected directly from the storage tank and analyzed for PCBs, ignitability, corrosiveness, reactivity, TCLP metals, TCL VOCs, TCL SVOCs, pesticides, and herbicides.

6.7 Transportation and Disposal of Soil

After review of the analytical results from the waste characterization samples, materials will be transported for disposal/recycling at approved, off-site facilities. Transportation and disposal activities will be continuous throughout the duration of the project due to the anticipated volume of soil. Table 3 provides anticipated volumes and waste types requiring disposal/recycling.

During transportation and disposal activities, haul trucks will be loaded with excavated material using an excavator and/or wheeled loader from the material storage areas. Following loading, all trucks will be inspected, decontaminated, and weighed at the truck scale prior to leaving the site. A dedicated laborer will be assigned to manage the documentation of all exported materials. Trucks entering and exiting the site will follow procedures outlined in the TCP to prevent impacting roadways (APTIM, 2018d).

Water that may accumulate in the decontamination process will be stored in a 20,000-gal storage tank before it is sampled and characterized for disposal. Waste disposition will be completed 15-days following receipt of final waste disposition sample results. At the end of field activities, the tank will be cleaned prior to being demobilized from the site.

Proposed disposal and recycling facilities will be selected dependent on the analytical results from the waste characterization samples. The proposed facilities are provided in Section 4.3.5 of the WMP (Appendix E).

Transportation and disposal of soil and other waste will be performed in accordance with Section 02 81 02 of the Project Specifications (Appendix B).

6.8 Backfilling

All excavated areas will be backfilled within five unique phases:

- Phase I – Northern Area
- Phase II – Central Area

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- Phase III – Southern Area
- Phase IV – Dry Well Excavation; Deep Area
- Phase V – Dry Well Excavation; Shallow Area

Each of these phases will encompass the zero- to two-ft., two- to 10-ft., 10- to 20-ft., and 20- to 30-ft. excavations. The 20-ft. excavations will be backfilled to an elevation of 118.5-ft. for the installation of the GCL as described in Section 6.5.2. Following the installation of the GCL, the excavations will then be backfilled to within six-in. of the surface. Clean, overburden materials excavated from the 20-ft. excavation areas will be reused as backfill.

Additional clean fill material imported to the site will be spread in 12-in. lifts using an excavator or dozer. Following each lift, a roller or compactor will be used to compact the material, with one-half of the passes in a direction perpendicular to the other passes. Density and moisture content of fill placement will be tested in accordance with ASTM D 6938 at a rate of three tests for every 20,000-SF per lift. Lift thickness will be measured in each lift.

General clean fill will be followed by the placement of a six-in. topsoil layer to support vegetative growth, with the exception of Dry Well 20-08. At the Dry Well, base course will be placed prior to restoring the disturbed footprint with asphalt.

Following completion of backfilling activities, a topographic survey of the site will be conducted to confirm that elevations are consistent with the pre-existing grade.

The general fill and topsoil data analysis and soil classification results will be included in a final CCR. Backfill samples will be collected and analyzed in accordance with the approved SAP (APTIM, 2018b) and the NYSDEC Table 375-6.8(b) Restricted Use Soil Clean-Up Objectives for residential use (NYSDEC, 2010).

Imported fill material will meet the requirements in Section 31 23 00 of the Project Specifications (Appendix B). All fill material testing will be documented on the Testing Plan and Log included as Exhibit V-1 of the PQCP (Appendix C).

6.9 Site Restoration

Site restoration activities will begin within 15 days of closure of the soil excavations. Finished grade will be within the acceptable +/- three-in. from the required elevations. The site will be graded to promote positive drainage towards the west.

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Areas disturbed during the remedial action will be stabilized by hydroseeding with native species of grasses in the soil removal areas. Additionally, trees removed during clearing activities will be replaced with trees of similar types and numbers along the eastern border of the site, where a berm will also be constructed. Asphalt removed from the Dry Well area will be restored to pre-construction conditions. The truck scales and appurtenances will be deconstructed and demobilized.

Trees delivered to the site for restoration activities will be healthy, shapely, well-rooted and free of infestations and diseases. A tree replacement plan is provided as Drawing C-110 of the Design Drawings (Appendix B).

Seeds and trees delivered to the site during restoration activities will be in accordance with Specification 32 92 19 and 32 93 43 of the Project Specifications, respectively (Appendix B).

After planting has been completed, a chain link fence and gates will be installed around the site, the unnamed roads used for the transportation and disposal route repaired, if needed, and paved areas will be restored with either bituminous concrete or an aggregate surface.

6.9.1 Construction of the Berm

The berm located on the eastern perimeter of the site will be re-constructed and re-vegetated as described below. Clean soil will be used to construct a berm approximately 375-ft. long and five-ft. high to re-establish the barrier.

6.9.2 Vegetation and Planting

Seeds and trees to be planted during site restoration activities will be in accordance with Specifications 32 92 19 and 32 93 43 of the Project Specifications, respectively (Appendix B).

6.9.2.1 Seeding

Permanent grass will be established in disturbed areas using a hydroseeding mixture of seed, mulch, fertilizer, and lime. Seeds will meet the requirement of Section 713 of the New York State Department of Transportation (NYSDOT) Standard Specifications (NYSDOT, 2018) and will be planted during the first optimum planting season following completion of work within the site. Seed mixtures will be applied in a uniform manner in conformance with the application rates and procedures provided by the manufacturer. If required, additional E&S controls such as temporary erosion control blankets or mulch will be placed immediately after seeding to protect the areas.

6.9.2.2 Trees and Shrubs

Established trees and shrubs will be delivered and planted on the eastern portion of the site in accordance with Drawing C-110 of the Design Drawings (Appendix B). Vegetation will be planted

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as nursery stock plants to develop normal habitats of growth and will be nursery grown. Upon delivery, vegetation will be inspected and verified to be healthy, shapely, well-rooted, and roots show no evidence of having been restricted or deformed at any time. Trees will be 2.5- to three-in. in diameter and be 12- to 15- ft in height. Trees and shrubs that are damaged upon delivery will be rejected.

Vegetation will be planted within six hours of delivery to the site. Approximately 17 trees will be planted 25-ft. off center on top of the established berm and approximately 25 trees will be planted at 25-ft. off center between the fence and back of the curb on 11th Street. Openings will be constructed using an auger attachment with a small excavator and the trees will be planted and secured until they become established. Trees and shrubs will be set in the center of pits, plumb, and straight prior to backfilling the hole with soil. The root ball will be watered and organic mulch of wood chips and leaves will be applied at the base of the plant.

6.9.3 Chain Link Fence Installation

Approximately 650-LF of six-ft. high permanent chain link fencing and gates will be installed by a qualified subcontractor along the eastern perimeter of the site during site restoration activities. Fence materials include a fence fabric manufactured of nine gauge galvanized steel wires, two-in. mesh and round, hot-dipped galvanized steel pipe (schedule 40), conforming to ASTM F 1083. Hole posts will be dug approximately 18-in. deep and 12-in. wide, and filled with Type I Portland concrete. The concrete mix will be proportioned such that the 28-day compressive strength of moist-cured laboratory samples achieves not less than 3,000 lb/in^2. Posts will be centered and aligned three-in. above the bottom of the postholes and installed 10-ft. off center.

Gates will be installed at the discretion of the Navy and Steel Equities. If required, the gates will be installed plumb, level, and secure to ensure full opening without interference.

Installation of the fence and gates will be in accordance with Specification 32 31 13 of the Project Specifications and Drawing C-500 of the Design Drawings (Appendix B).

6.9.4 Dry Well 20-08 Restoration

Following backfilling of Dry Well 20-08 with clean fill material, additional base course approximately three-in. in thickness consisting of sand, gravel, or crushed stone will be placed within the limits of disturbance prior to asphalt placement. The proposed base course material will meet the requirements for Graded Aggregate Base in Section 304 of the NYSDOT Standard Specifications (NYSDOT, 2018) and for Bases in ASTM D 2940.

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Surface course will be placed above the base course at an approximate thickness of two-in.. Asphalt cement percent by weight of total mix will be 4% to 8%. The surface course will meet the requirements for Hot Mix Asphalt Surface – Course in Section 702 of the NYSDOT Standard Specifications (NYSDOT, 2018).

Pavement tests will be performed to ensure the quality of the material and placement procedures. Variations in the binder course surface will not exceed 0.25-in. from the lower edge of the 10-ft. straightedge in areas where there are no slope changes. Irregularities greater than the above specification will be corrected. Testing will be performed at a frequency of one per 1,000-SF of base course and one per 1,000-SF of surface course placed using the Nuclear Method described in ASTM D 2950. All testing will be document on the Testing Plan and Log included as Exhibit V-1 of the PQCP (Appendix C).

Asphalt materials and installation procedures will be in accordance with Specification 32 12 16 of the Project Specifications (Appendix B).

6.9.5 Roadway Repair

Asphalt on the unnamed streets from the site to Aerospace Boulevard used during transportation and disposal activities will be repaired/repaved to meet existing conditions, if required. Asphalt repairs will be conducted in a manner to have minimal impact on traffic and will be coordinated with applicable Navy personnel, Steel Equities, and the Town of Oyster Bay.

6.10 Post-Construction Maintenance

Post-construction maintenance will be performed for a period of 30-months following completion of on-site work and final acceptance of construction activities. Site maintenance will include mowing the grass to develop grass growth, reseeding in areas with poor vegetative growth, erosion control maintenance, settlement and subsidence control, and routine fence/gate inspections and repairs. APTIM will provide NAVFAC a written notice 30-days prior to the date of intended transfer of site monitoring and maintenance responsibility.

Post-construction maintenance will be performed as detailed in Section 02 01 51 of the Project Specifications (Appendix B).

6.11 Demobilization

Demobilization will consist of decontaminating and removing all construction equipment and materials, cleaning the project site, inspecting the site, and issuing a certification of completion. Demobilization activities will also involve collection and disposal of all contaminated materials,

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including decontamination water and disposable equipment for which decontamination is inappropriate.

Site cleaning activities will include repair of any erosion or runoff related damage; removal of all materials such as excess construction material, wood, debris, and other foreign material; and removal of all construction equipment and storage boxes. Within 14-days after the project activities are completed, APTIM will submit a written notice to NAVFAC and schedule a pre-final inspection to determine the status of completion. During the pre-final inspection, a site-walk will be conducted to determine whether the project work is consistent with the drawings and specifications and conform to the requirements of the NYSDEC.

When determined all work is completed in accordance with the specifications and drawings, a final inspection will be conducted and additional final administrative closeout submittals will be requested.

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7.0 Project Management Plan

The project management team will be responsible for all technical and administrative aspects of the site activities. Included among the team's responsibilities are the project schedule, staffing, data management, document control, project meetings, and reporting.

7.1 Key Project Personnel

Table 4 includes a list of the key project and regulatory contacts.

7.2 Document Control

APTIM's internal document control procedures will be followed for the duration of the project. Management of internal and external correspondence will be administered at the home office in Norfolk, Virginia. Document control will include assigning alphanumeric codes to each submittal. Project files will be maintained in a secure, dry area at the field office.

7.2.1 Photographic Documentation

Photographs of the site will be collected during the performance of the remedial action activities. Photographs will be taken during each feature of work in order to provide a detailed photographic history of the remedial action. Electronic versions of the photographs will be sorted by date and accompanied by a Project Photographic Log providing the date, location, and a description of the activities shown in each photo.

7.3 Meetings and Reports

Project status/contractor QC meetings will be held bi-weekly at the field office during the field construction activities. At a minimum, the Navy RPMs and the Project QC Manager will attend this meeting. The Project Manager, Deputy Project Manager, Construction Manager and other selected individuals will also attend these meetings with the RPM and Project QC Manager. All QC related documents and discussion are provided in the PQCP (Appendix C).

Daily reports will be prepared by the Construction Manager and the Project QC Manager and submitted to the RPM and FEAD by 1000-hours the following workday. Weekly reports will be prepared by the Project Manager and submitted to the Navy RPM and FEAD. The weekly reports will include work completed by the end of each week and work that is planned for the following week.

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7.3.1 Construction Quality Control Meetings

A contractor QC meeting will be held on a bi-weekly basis throughout the course of fieldwork to discuss the progress of the project. At a minimum, the Navy RPM and the Project QC Manager will attend this meeting. APTIM site personnel, NWIRP Bethpage project personnel, subcontractors and vendor representatives, and Navy personnel will also attend as appropriate.

7.3.2 Health and Safety Meetings

Daily tailgate safety meetings will be held before starting work. Construction staff, including subcontractors, will attend these meetings and sign a tailgate safety meeting form. The meetings will be held by the SSHO, or his or her qualified designee, and will cover various safety issues. Any subcontractor, inspector, agency, or Navy personnel that visit the site during the course of the day will be required to review and sign the tailgate form prior to entering the work site.

7.4 Project Schedule

Project plans and field mobilization is scheduled to be completed in February 2019. Field work will be conducted from February 2019 to January 2020. Site restoration and demobilization are scheduled for February 2020. The complete schedule for Site 1 is included as Appendix A.

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8.0 Reporting Requirements

Upon completion of construction activities, APTIM will prepare a CCR. The CCR will contain the site conditions and background, description of field methods and procedures, approved fieldwork variances, summary remedial action construction activities, waste characterization testing results, import fill testing results (if applicable), disposal activities and waste manifests, conclusions and recommendations, and references.

This report will specifically include the following:

- A statement that the work was conducted in accordance with the RAWP, with any exceptions noted
- Geographical Information Systems and appropriate data management requirements to load information into Navy Installation Restoration Information System
- A summary of volumes of material shipped and dispose at each location
- As-built survey of the final site conditions
- Photographs documenting the field activities
- Copies of analytical reports from characterization of soil/waste
- Copies of Manifests/Bills of Lading, and certified weight slips
- Copies of Certificates of Treatment/Disposal

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9.0 References

APTIM. 2018a. Accident Prevention Plan, Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil, Naval Weapons Industrial Reserve Plant, Bethpage, New York.

APTIM. 2018b. Sampling and Analysis Plan, Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil, Naval Weapons Industrial Reserve Plant, Bethpage, New York.

APTIM. 2018c. Stormwater Pollution Prevention Plan, Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil, Naval Weapons Industrial Reserve Plant, Bethpage, New York.

APTIM. 2018d. Traffic Control Plan, Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil, Naval Weapons Industrial Reserve Plant, Bethpage, New York.

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Navy. 2018. Record of Decision Operable Unit 4 Naval Weapons Industrial Reserve Plant, Bethpage, New York.

NYSDEC, 1995. Record of Decision Operable Unit 1 NWIRP Bethpage, NY. March

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NYSDEC, 2010. DER-10, Technical Guidance for Site Investigation and Remediation. May.

NYSDOT, 2018. Standard Specifications (US Customary Units) Construction and Materials. September.

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Resolution, 2016. Resolution Consultants, Bethpage Water District Well 6-2 Pilot Test Report.

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Figures

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Figure 1
General Location Map

Figure 2
Site Location Map

Figure 3
Site Plan

Figure 4
Excavation Phase and Depths

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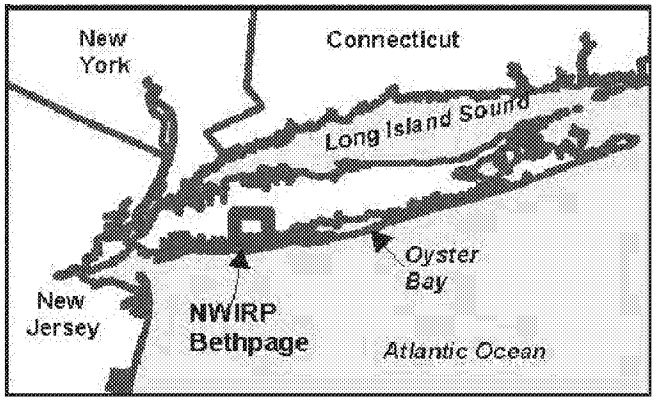

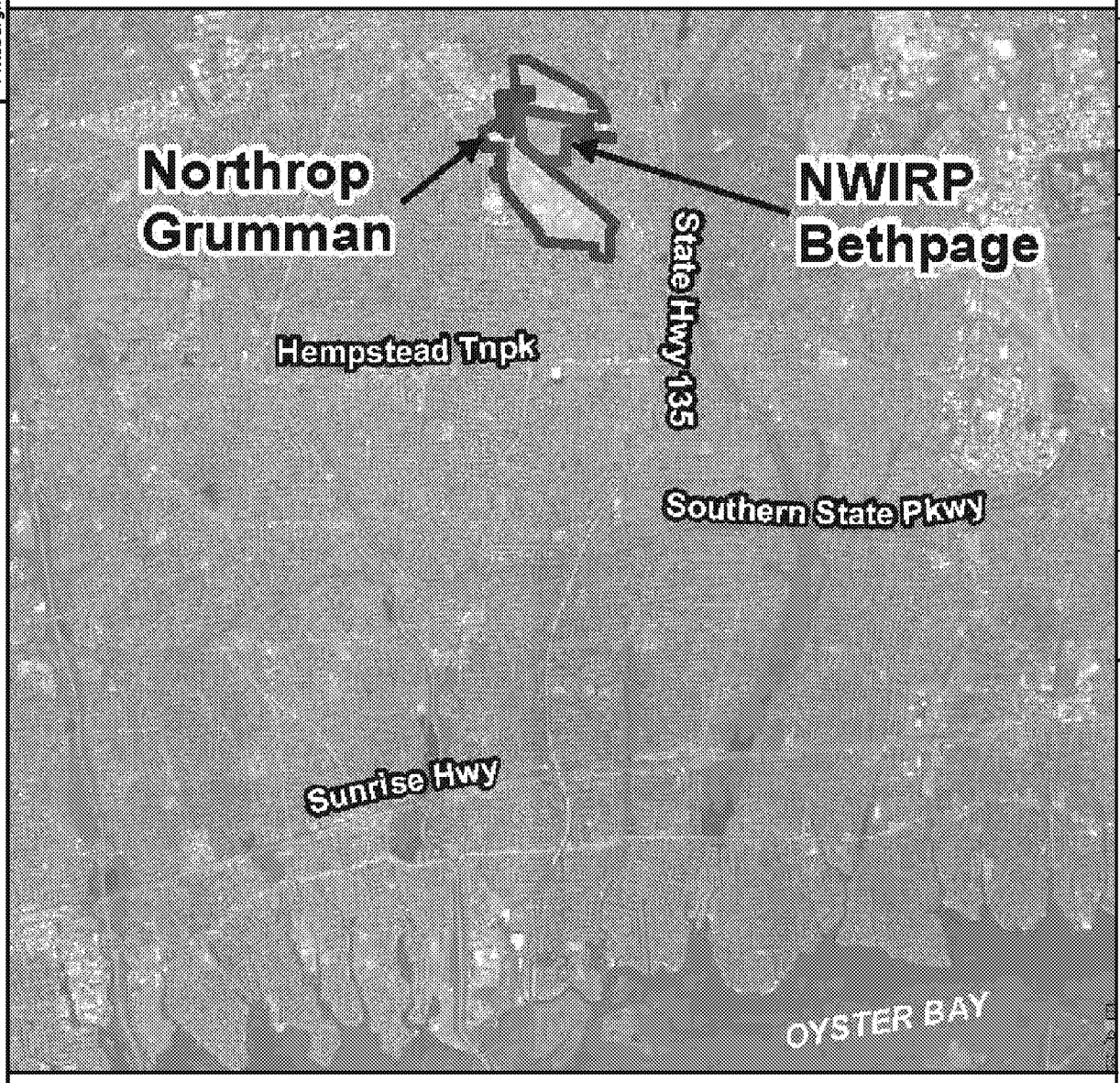

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SCALE

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OFFICE: Pittsburgh, PA

DRAWING NUMBER: 501164-A1

REVISIONS

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

APTIM Federal Services, LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

DESIGNED BY	DATE	CHECKED BY	DATE
M. Smith	8/8/18		
DRAWN BY	DATE	APPROVED BY	DATE
B. O'Connor	8/8/18		

NAVFAC
Naval Facilities Engineering Command
Mid-Atlantic

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK
SITE 1 - FORMER DRUM MARSHALLING AREA

GENERAL LOCATION MAP

SCALE: AS SHOWN
SIZE: A
DELIVERY ORDER NO. F6147
CONSTR. CONTRACT NO. N62470–16–D–9004
NAVFAC DRAWING NO. --
SHEET I.D. FIGURE 1

Xref:
Image: APTIM Logo Standard Color.jpg
Figure 1 General Location Map.jpg
Figure 2 Site Location Map.jpg
Figure 3 Site Layout Plan.jpg
Figure 4 Traffic Plan.jpg
Figure 5 Excavation Depths.jpg
N90845_002083 Proposed Plan Regarding Site 1, Soil, Soil Vapor and Shallow 2018–1101.jpg
NAVFAC Logo.jpg

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Plotted By: bernadette.oconnor

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Plot Date/Time: Aug 30, 2018 – 5:09pm
Plotted By: bernadette.oconnor

OFFICE	DRAWING NUMBER
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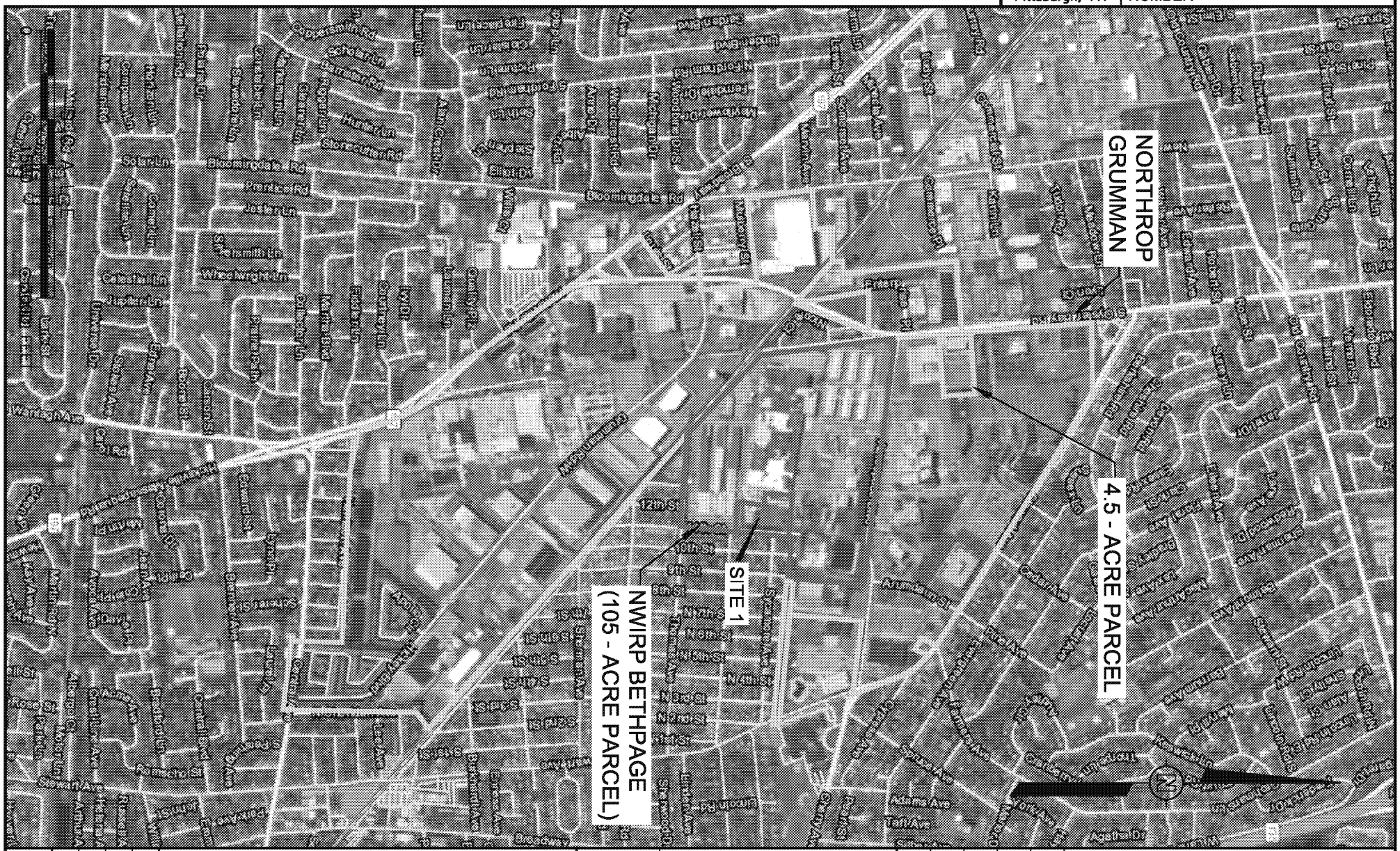

NAVFAC
NAVAL FACILITIES ENGINEERING COMMAND
MID ATLANTIC

APTIM

APTIM Federal Services, LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK
SITE 1 - FORMER DRUM MARSHALLING AREA

SITE LOCATION MAP

DESIGNED BY	DATE	CHECKED BY	DATE
M. Smith	8/27/18		
DRAWN BY	DATE	APPROVED BY	DATE
B. O'Connor	8/27/18		

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

REVISIONS

SCALE: AS SHOWN
SIZE: A
DELIVERY ORDER NO. F6147
CONTR. CONTRACT NO. N62470-16-D-9004
NAVFAC DRAWING NO. —
SHEET I.D. FIGURE 2

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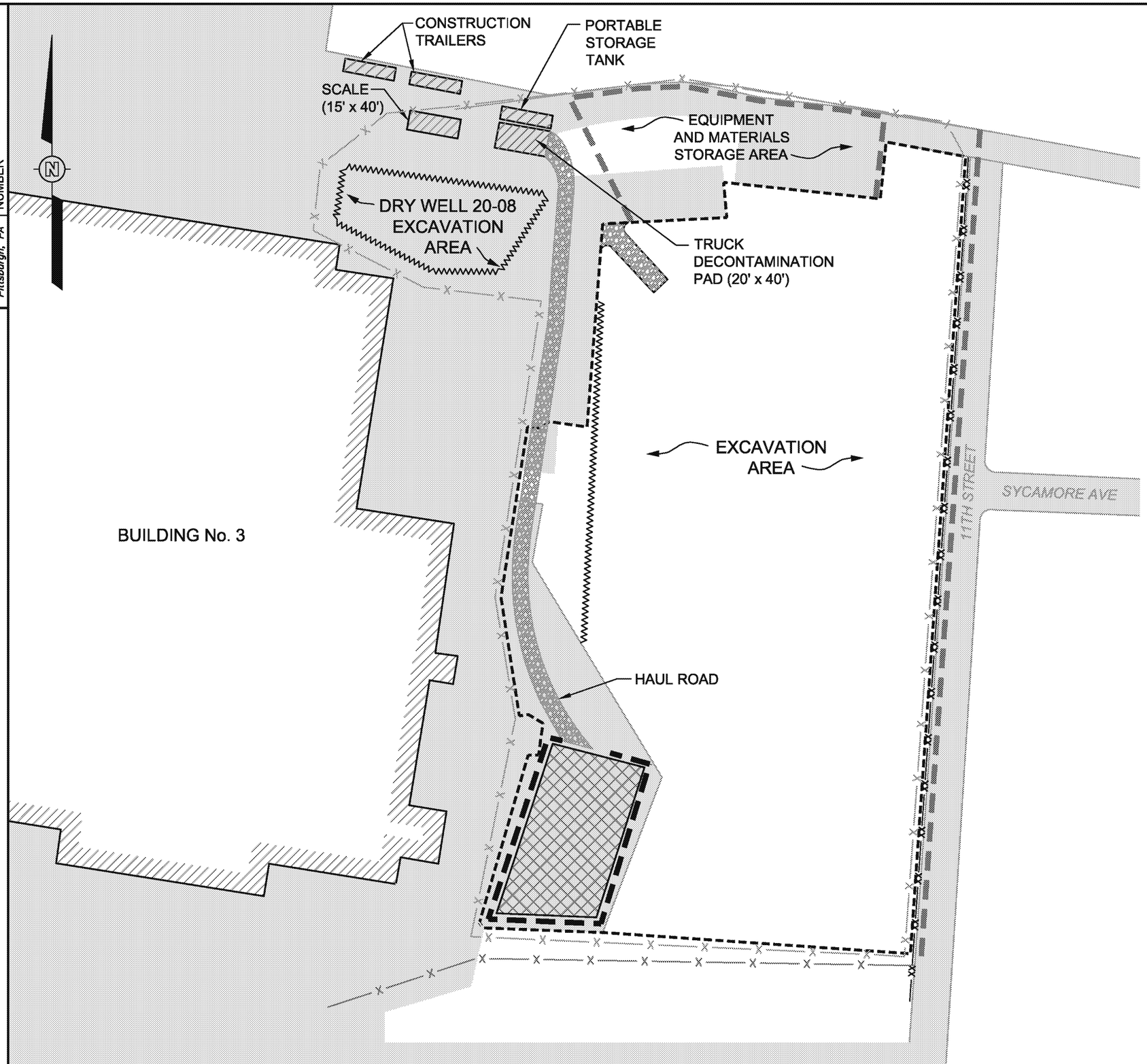

LEGEND:

- LIMITS OF EXCAVATION
- TEMPORARY 8' HIGH FREESTANDING CHAIN LINK FENCE PANELS ALONG CURB
- HIGH VISIBILITY FENCE
- FENCELINE
- STEEL SHEET PILE
- PAVEMENT
- ROCK CONSTRUCTION ENTRANCE/EXIT AND HAUL ROAD
- MATERIAL STORAGE AREA
- CONCRETE BARRIERS (3 FT. HIGH)
- CONCRETE BARRIERS (5 FT. HIGH)

SCALE

0 80 160 FEET

DRAWING NUMBER 501164-A1

OFFICE Pittsburgh, PA

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

REVISIONS

APTIM Federal Services, LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

DESIGNED BY M. Smith DATE 8/6/18 CHECKED BY DATE
DRAWN BY B. O'Connor DATE 8/6/18 APPROVED BY DATE

NAVFAC Naval Facilities Engineering Command Washington

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK
SITE 1 - FORMER DRUM MARSHALLING AREA
SITE PLAN

SCALE: AS SHOWN SIZE: B
DELIVERY ORDER NO. F6147
CONSTR. CONTRACT NO. N62470-16-D-9004
NAVFAC DRAWING NO. ---
SHEET I.D. FIGURE 3

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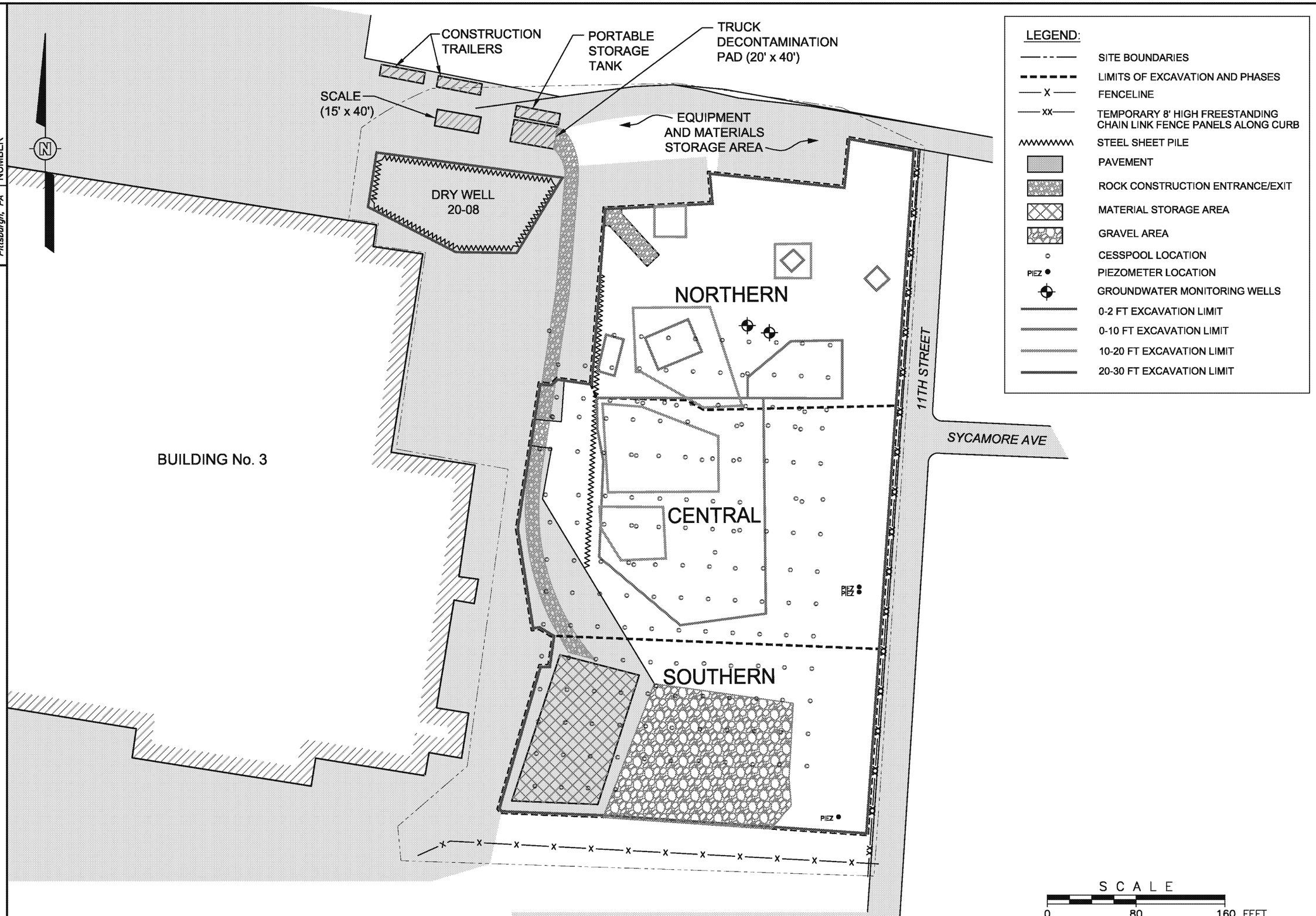

OFFICE Pittsburgh, PA

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REVISIONS

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APTIM Federal Services, LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

DESIGNED BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
M. Smith	8/28/18				

DRAWN BY	DATE
B. O'Connor	8/28/18

NAVFAC

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK
SITE 1 - FORMER DRUM MARSHALLING AREA
EXCAVATION PHASES AND DEPTHS

SCALE: AS SHOWN
SIZE: B
DELIVERY ORDER NO. F6147
CONSTR. CONTRACT NO. N62470-16-D-9004
NAVFAC DRAWING NO. —
SHEET I.D. FIGURE 4

Tables

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Table 1
Excavation Volumes

Material Type	Northern Area	Central Area	Southern Area	Dry Well 20-08
Total Clean Overburden	13,119 CY	14,483 CY	1,666 CY	6,974 CY
0' – 2' Contaminated	3,896 CY	5,591 CY	4,434 CY	--
2' – 10' Contaminated	1,895 CY	8,591 CY	--	--
10' – 20' Contaminated	4,065 CY	3,688 CY	--	--
20' – 30' Contaminated	--	--	--	3,487 CY
Total Excavated	22,975 CY	32,352 CY	6,100 CY	10,461 CY

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Table 2

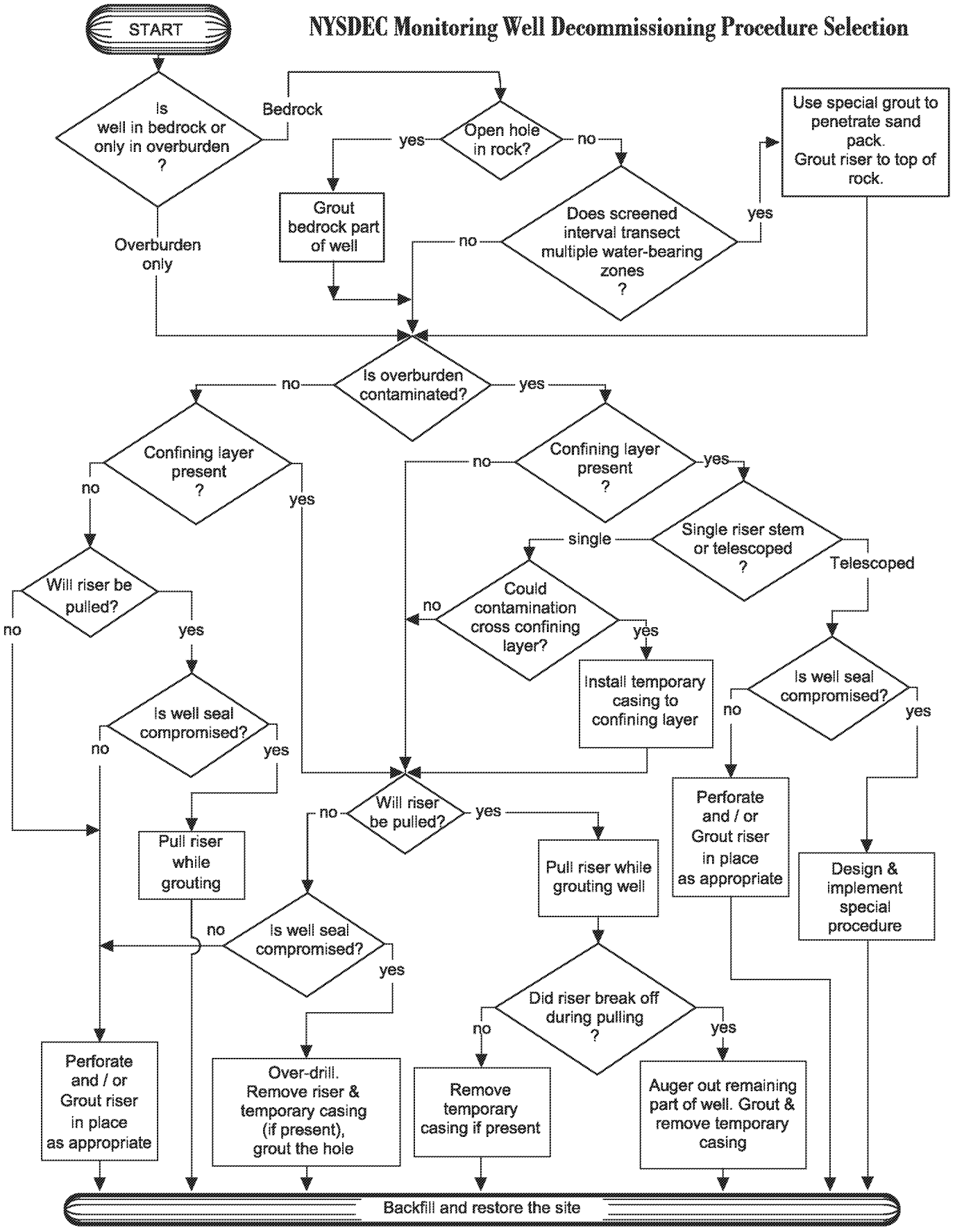
START
NYSDEC Monitoring Well Decommissioning Procedure Selection
Is well in bedrock or only in overburden ?
Bedrock
Overburden only
Open hole in rock?
yes
no
Grout bedrock part of well
Does screened interval transect multiple water-bearing zones ?
yes
no
Use special grout to penetrate sand pack. Grout riser to top of rock.
Is overburden contaminated?
no
yes
Confining layer present ?
no
yes
Will riser be pulled?
no
yes
Is well seal compromised?
no
yes
Pull riser while grouting
Confining layer present ?
no
yes
Single riser stem or telescoped ?
single
Telescoped
Could contamination cross confining layer?
no
yes
Install temporary casing to confining layer
Is well seal compromised?
no
yes
Perforate and / or Grout riser in place as appropriate
Design & implement special procedure
Will riser be pulled?
no
yes
Pull riser while grouting well
Is well seal compromised?
no
yes
Did riser break off during pulling ?
no
yes
Perforate and / or Grout riser in place as appropriate
Over-drill. Remove riser & temporary casing (if present), grout the hole
Remove temporary casing if present
Auger out remaining part of well. Grout & remove temporary casing
Backfill and restore the site

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Table 3
Anticipated Waste Streams and Volumes

Waste Type	Anticipated Volume
Concrete Debris	200-CY
Vegetative Debris	2 40-CY roll-offs
Metals Recycling	5-Tons
Asphalt Recycling	460-CY
Non-Hazardous Soil	31, 947-Tons
TSCA Hazardous	15,521-Tons
RCRA Hazardous	2,512-Tons
Decontamination Water	30,000-Gallons

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ED_002631_00003610-00068

Table 4
Key Project Personnel

Agency	Contact	Project Title
NAVFAC Mid-Atlantic Gilbert Street Building N26 Norfolk, Virginia 23511	Brian.S.Murray 757.341.0491 Brian.s.murray@navy.mil	Navy Remedial Project Manager
New London Public Works Naval Submarine Base New London PWD EV, Room 104 439 Tautog Avenue, Box 400 Groton, Connecticut 06349	TBD 860.694.5649	Department Support Construction Manager
NAVFAC Mid-Atlantic Gilbert Street Building N26 Norfolk, Virginia 23511	Crystal Godwin 757.341.1980 Crystal.godwin@navy.mil	Contracting Officer
NAVFAC Mid-Atlantic Gilbert Street Building N26 Norfolk, Virginia 23511	Brett Garnett 757.341.1986 Brett.garnett@navy.mil	Contract Specialist
CH2M Hill 5701 Cleveland Street, Suite 200 Virginia Beach, Virginia 23462	Monica Marrow 757.671.6213 adminrec@ch2m.com	Navy Installation Restoration Information System Representative
Division of Environmental Remediation New York State Department of Environmental Conservation 625 Broadway Albany, New York 12233	Jason Pelton 518.402.9478 Jason.pelton@dec.ny.gov	New York State Department of Environmental Conservation Project Manager
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	William L. Deane, Jr., PE 757.640.6956 (office) 973.615.6635 (mobile) william.deane@aptim.com	Program Manager
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	Monica L. Smeal, E.I.T. 757.640.6943 (office) 757.390-6043 (mobile) monica.smeal@aptim.com	Deputy Project Manager
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	James Kinley 570.660.0747 james.kinley@aptim.com	Construction Manager
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	Natasha Sullivan 410.529.7598 (office) 410.804.5642 (mobile) natasha.sullivan@aptim.com	Program Chemist

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Table 4 (continued)
Key Project Personnel

Agency	Contact	Project Title
APTIM 500 Penn Center Boulevard, Suite 900 Pittsburg, Pennsylvania 15235	Bill Squire, P.G. 412.858.1638 (office) 412.736.0930 (mobile) william.squire@aptim.com	Program QC Manager
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	TBN	Project QC Manager
APTIM 16380 U.S. Route 224 East, Suite 100 Findlay, OH 45840	David Mummert 419.429.5509 (office) 419.348.1544 (mobile) david.mummert@aptim.com	CIH
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	TBN	SSHO

Notes:

CIH	*Certified Industrial Hygienist*
MDE	*Maryland Department of Environment*
SSHO	*Site Safety and Health Officer*
TBN	*To be named*
QC	*Quality Control*

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Appendix A
Project Schedule

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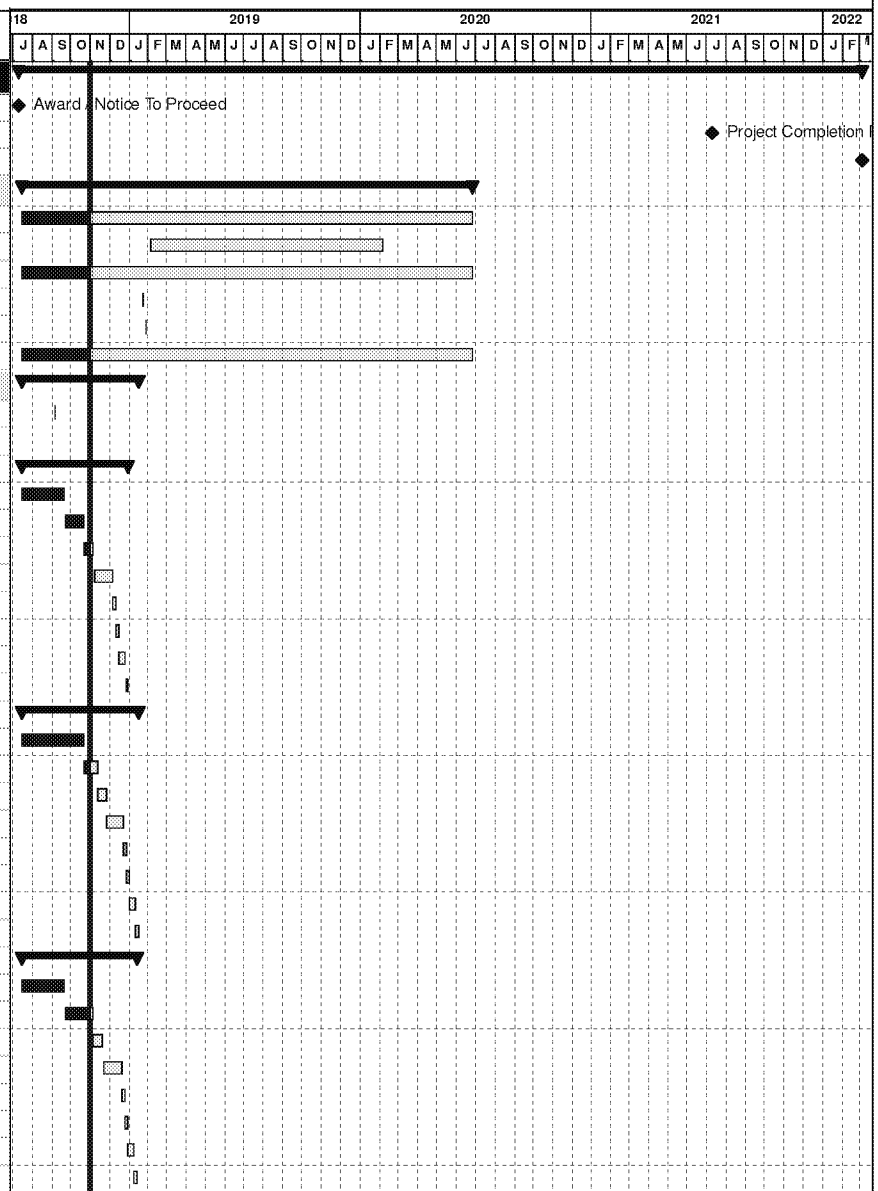
ED_002631_00003610-00072

F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY		1328	1220	12-Jul-18 A	04-Mar-22
331000	Award / Notice To Proceed	0	0	12-Jul-18 A	
331010	Project Completion Per PWS	0	0		10-Jul-21
331020	Project Completion Per Schedule	0	0		04-Mar-22
WE01: Project Management, Administrative Support, and Meetings		713	605	15-Jul-18 A	27-Jun-20
31221000	Project Management	713	605	15-Jul-18 A	27-Jun-20
31222000	Field Supervision	367	367	04-Feb-19	05-Feb-20
31223000	Project Meetings & Public Affairs	713	605	15-Jul-18 A	27-Jun-20
31223010	Preconstruction Meeting - Navy	1	1	24-Jan-19	24-Jan-19
31223020	Preconstruction Meeting - TOB	1	1	29-Jan-19	29-Jan-19
31223030	RAB Meetings	713	605	15-Jul-18 A	27-Jun-20
WE02: Plans and Preconstruction Activities		185	77	15-Jul-18 A	16-Jan-19
310103	NYDEC Approval of Basis of Design	1	0	06-Sep-18 A	06-Sep-18 A
31010305	Site Visit	1	1	01-Nov-18	01-Nov-18
Remedial Action Work Plan		169	61	15-Jul-18 A	31-Dec-18
31010310	Internal Draft RAWP	46	0	15-Jul-18 A	21-Sep-18 A
31010311	NAVFAC Review Internal Draft RAWP	30	0	22-Sep-18 A	22-Oct-18 A
31010312	Response To Comments/ Submit Draft RAWP	15	6	23-Oct-18 A	06-Nov-18
31010313	NYSDEC Review Draft RAWP	30	30	07-Nov-18	06-Dec-18
31010315	Response To Comments/ Submit Draft Final RAWP	5	5	07-Dec-18	11-Dec-18
31010316	Regulatory Review Draft RAWP	5	5	12-Dec-18	16-Dec-18
31010317	Response to NYSDEC Comments Draft RAWP	10	10	17-Dec-18	26-Dec-18
31010318	Submit Final RAWP	5	5	27-Dec-18	31-Dec-18
Sampling and Analysis Plan		185	77	15-Jul-18 A	16-Jan-19
31010320	Internal Draft SAP	46	0	15-Jul-18 A	22-Oct-18 A
31010321	NAVFAC Review Internal Draft SAP	21	12	23-Oct-18 A	12-Nov-18
31010322	Response To Comments/ Submit Draft SAP	15	15	13-Nov-18	27-Nov-18
31010323	NYSDEC Review Draft SAP	25	25	28-Nov-18	22-Dec-18
31010325	Response To Comments/ Submit Draft Final SAP	5	5	23-Dec-18	27-Dec-18
31010326	Regulatory Review Draft SAP	5	5	28-Dec-18	01-Jan-19
31010327	Response to NYSDEC Comments Draft SAP	10	10	02-Jan-19	11-Jan-19
31010328	Submit Final SAP	5	5	12-Jan-19	16-Jan-19
Health and Safety Plan		183	75	15-Jul-18 A	14-Jan-19
31010330	Internal Draft HSP	46	0	15-Jul-18 A	21-Sep-18 A
31010331	NAVFAC Review Internal Draft HSP	30	5	22-Sep-18 A	05-Nov-18
31010332	Response To Comments/ Submit Draft HSP	15	15	06-Nov-18	20-Nov-18
31010333	NYSDEC Review Draft HSP	30	30	21-Nov-18	20-Dec-18
31010334	Response To Comments/ Submit Draft Final SAP	5	5	21-Dec-18	25-Dec-18
31010335	Regulatory Review Draft Final HSP	5	5	26-Dec-18	30-Dec-18
31010336	Response to NYSDEC Comments Draft HSP	10	10	31-Dec-18	09-Jan-19
31010337	Submit Final HSP	5	5	10-Jan-19	14-Jan-19



Remaining Level of Effort
Actual Work
Actual Level of Effort
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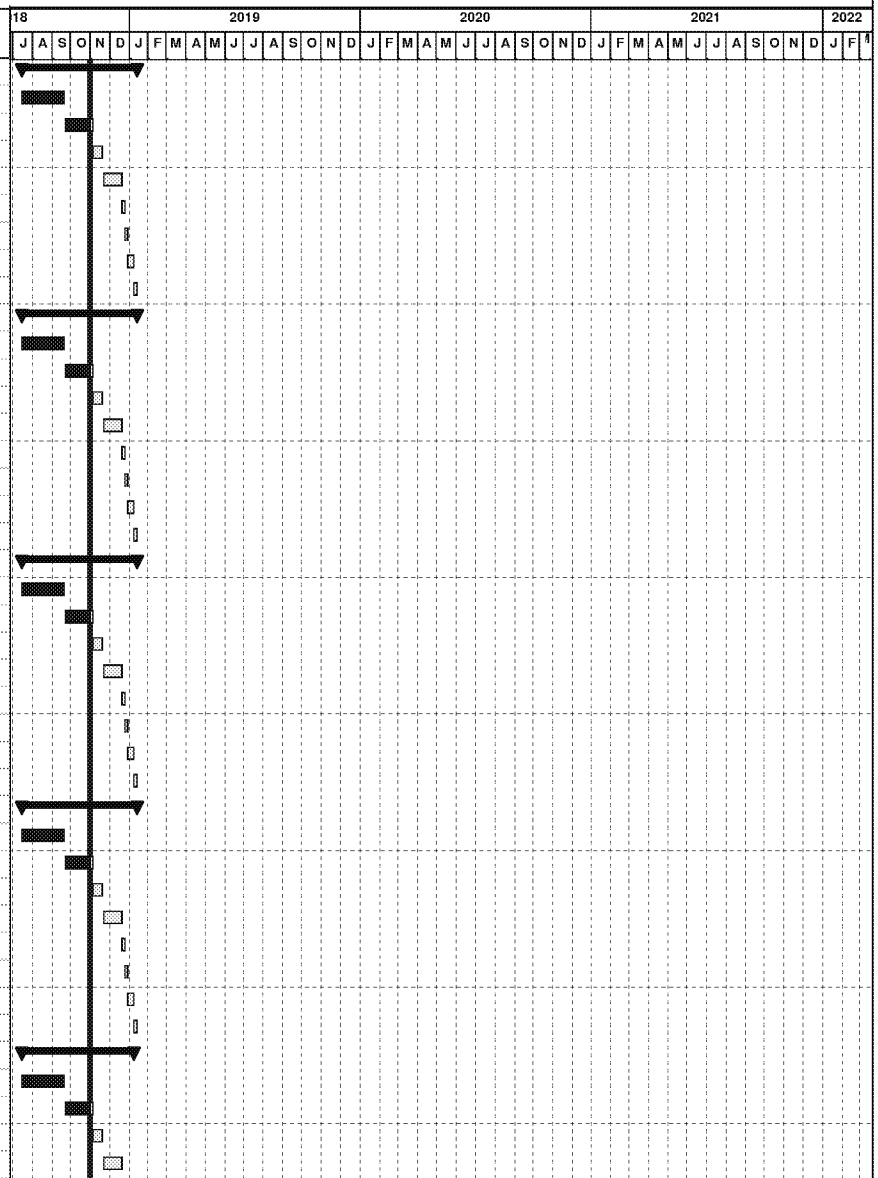
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
Waste Management Plan		183	75	15-Jul-18 A	14-Jan-19
31010340	Internal Draft WMP	46	0	15-Jul-18 A	21-Sep-18 A
31010341	NAVFAC Review Internal Draft WMP	30	5	22-Sep-18 A	05-Nov-18
31010342	Response To Comments/ Submit Draft WMP	15	15	06-Nov-18	20-Nov-18
31010343	NYSDEC Review Draft WMP	30	30	21-Nov-18	20-Dec-18
31010345	Response To Comments/ Submit Draft Final WMP	5	5	21-Dec-18	25-Dec-18
31010346	Regulatory Review Draft WMP	5	5	26-Dec-18	30-Dec-18
31010347	Response to NYSDEC Comments Draft WMP	10	10	31-Dec-18	09-Jan-19
31010348	Submit Final WMP	5	5	10-Jan-19	14-Jan-19
Construction Daily Control Plan		183	75	15-Jul-18 A	14-Jan-19
31010350	Internal Draft CDCP	46	0	15-Jul-18 A	21-Sep-18 A
31010351	NAVFAC Review Internal Draft CDCP	30	5	22-Sep-18 A	05-Nov-18
31010352	Response To Comments/ Submit Draft CDCP	15	15	06-Nov-18	20-Nov-18
31010353	NYSDEC Review Draft CDCP	30	30	21-Nov-18	20-Dec-18
31010355	Response To Comments/ Submit Draft Final CDCP	5	5	21-Dec-18	25-Dec-18
31010356	Regulatory Review Draft CDCP	5	5	26-Dec-18	30-Dec-18
31010357	Response to NYSDEC Comments Draft CDCP	10	10	31-Dec-18	09-Jan-19
31010358	Submit Final CDCP	5	5	10-Jan-19	14-Jan-19
Environmental Protection Plan		183	75	15-Jul-18 A	14-Jan-19
31010360	Internal Draft EPP	46	0	15-Jul-18 A	21-Sep-18 A
31010361	NAVFAC Review Internal Draft EPP	30	5	22-Sep-18 A	05-Nov-18
31010362	Response To Comments/ Submit Draft EPP	15	15	06-Nov-18	20-Nov-18
31010363	NYSDEC Review Draft EPP	30	30	21-Nov-18	20-Dec-18
31010365	Response To Comments/ Submit Draft Final EPP	5	5	21-Dec-18	25-Dec-18
31010366	Regulatory Review Draft EPP	5	5	26-Dec-18	30-Dec-18
31010367	Response to NYSDEC Comments Draft EPP	10	10	31-Dec-18	09-Jan-19
31010368	Submit Final EPP	5	5	10-Jan-19	14-Jan-19
Storm Water Polution Prevention Plan		183	75	15-Jul-18 A	14-Jan-19
31010370	Internal Draft SWPPP	46	0	15-Jul-18 A	21-Sep-18 A
31010371	NAVFAC Review Internal Draft SWPPP	30	5	22-Sep-18 A	05-Nov-18
31010372	Response To Comments/ Submit Draft SWPPP	15	15	06-Nov-18	20-Nov-18
31010373	NYSDEC Review Draft SWPPP	30	30	21-Nov-18	20-Dec-18
31010375	Response To Comments/ Submit Draft Final SWPPP	5	5	21-Dec-18	25-Dec-18
31010376	Regulatory Review Draft SWPPP	5	5	26-Dec-18	30-Dec-18
31010377	Response to NYSDEC Comments Draft SWPPP	10	10	31-Dec-18	09-Jan-19
31010378	Submit Final SWPPP	5	5	10-Jan-19	14-Jan-19
Traffic Plan		178	70	15-Jul-18 A	09-Jan-19
31010380	Internal Draft TP	46	0	15-Jul-18 A	21-Sep-18 A
31010381	NAVFAC Review Internal Draft TP	30	5	22-Sep-18 A	05-Nov-18
31010382	Response To Comments/ Submit Draft TP	15	15	06-Nov-18	20-Nov-18
31010383	NYSDEC Review Draft TP	30	30	21-Nov-18	20-Dec-18



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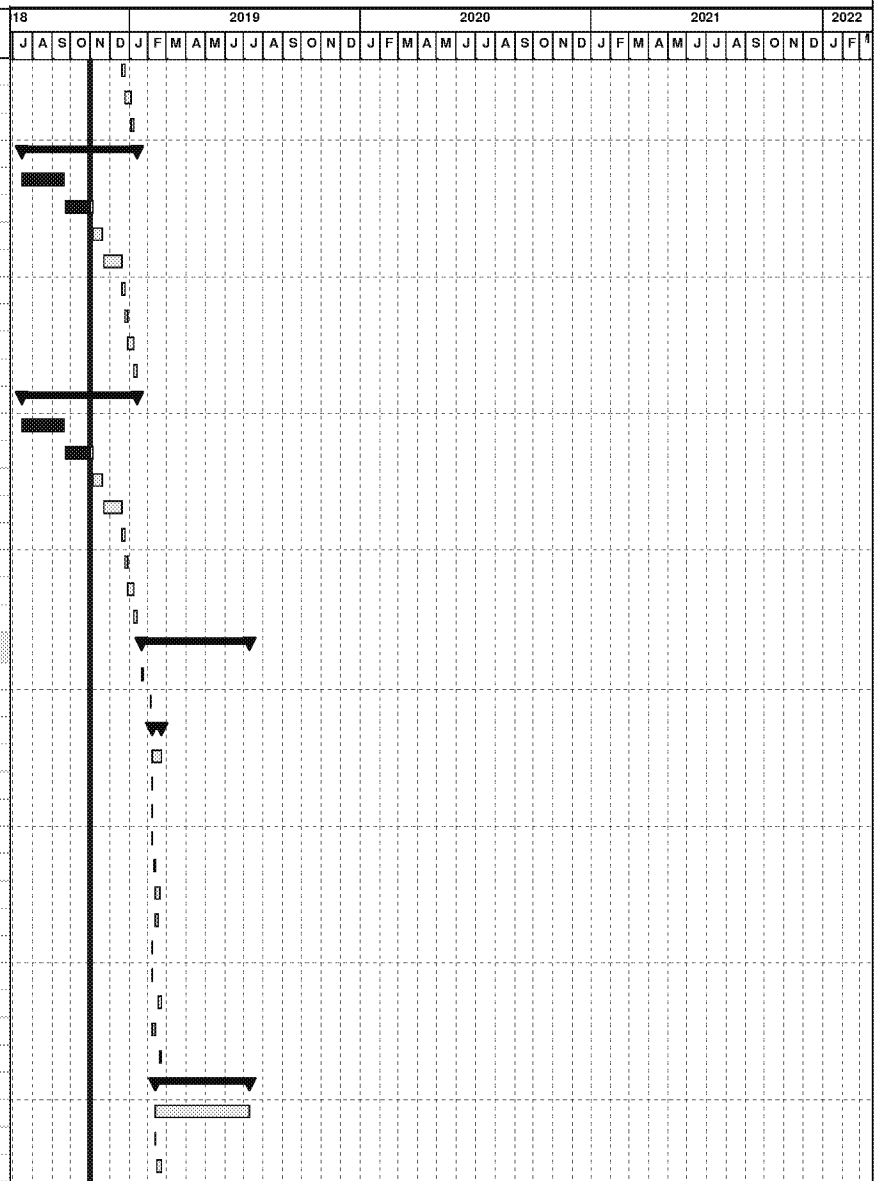
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
31010386	Regulatory Review Draft TP	5	5	21-Dec-18	25-Dec-18
31010387	Response to NYSDEC Comments Draft TP	10	10	26-Dec-18	04-Jan-19
31010388	Submit Final TP	5	5	05-Jan-19	09-Jan-19
Site Plan		183	75	15-Jul-18 A	14-Jan-19
31010390	Internal Draft SP	46	0	15-Jul-18 A	21-Sep-18 A
31010391	NAVFAC Review Internal Draft SP	30	5	22-Sep-18 A	05-Nov-18
31010392	Response To Comments/ Submit Draft SP	15	15	06-Nov-18	20-Nov-18
31010393	NYSDEC Review Draft SP	30	30	21-Nov-18	20-Dec-18
31010395	Response To Comments/ Submit Draft Final SP	5	5	21-Dec-18	25-Dec-18
31010396	Regulatory Review Draft SP	5	5	26-Dec-18	30-Dec-18
31010397	Response to NYSDEC Comments Draft SP	10	10	31-Dec-18	09-Jan-19
31010398	Submit Final SP	5	5	10-Jan-19	14-Jan-19
Operation and Maintenance Plan - Post Construction		183	75	15-Jul-18 A	14-Jan-19
310103951	Internal Draft O&M Plan	46	0	15-Jul-18 A	21-Sep-18 A
310103952	NAVFAC Review Internal Draft O&M Plan	30	5	22-Sep-18 A	05-Nov-18
310103953	Response To Comments/ Submit Draft O&M Plan	15	15	06-Nov-18	20-Nov-18
310103954	NYSDEC Review Draft O&M Plan	30	30	21-Nov-18	20-Dec-18
310103955	Response To Comments/ Submit Draft Final O&M Plan	5	5	21-Dec-18	25-Dec-18
310103956	Regulatory Review Draft O&M Plan	5	5	26-Dec-18	30-Dec-18
310103957	Response to NYSDEC Comments Draft O&M Plan	10	10	31-Dec-18	09-Jan-19
310103958	Submit Final O&M Plan	5	5	10-Jan-19	14-Jan-19
WE03: Mobilization and Setup Activities		169	169	22-Jan-19	09-Jul-19
3101	Navy Notice to Mobilize	1	1	22-Jan-19*	22-Jan-19
31010200	Mobilization or Personnel	2	2	04-Feb-19	05-Feb-19
Site Setup / Temporary Construction Facilities		15	15	06-Feb-19	20-Feb-19
31010400	Site Setup / Temporary Construction Facilities	11	11	06-Feb-19	20-Feb-19
31010410	Utility Clearance	2	2	06-Feb-19	07-Feb-19
31010420	Administrative Setup	1	1	06-Feb-19	06-Feb-19
31010423	Site Facilities	1	1	07-Feb-19	07-Feb-19
31010425	Electrical	5	5	08-Feb-19	12-Feb-19
31010430	Truck Scale Installation	5	5	12-Feb-19	19-Feb-19
31010440	Fencing Setup	3	3	12-Feb-19	15-Feb-19
31010450	Decontamination Pad	1	1	07-Feb-19	07-Feb-19
31010460	EZ Setups	1	1	07-Feb-19	07-Feb-19
31010470	Laydown and Holding Cells	3	3	15-Feb-19	20-Feb-19
31010480	Haul Route Construction	3	3	07-Feb-19	11-Feb-19
31010490	Site Signage	1	1	19-Feb-19	20-Feb-19
Utility Relocation		149	149	11-Feb-19	09-Jul-19
31010600	Utility Relocation	107	107	11-Feb-19	09-Jul-19
31010610	Gas Line Relocation	2	2	11-Feb-19	12-Feb-19
31010620	Storm Sewer (Phase I)	5	5	14-Feb-19	20-Feb-19



Remaining Level of Effort
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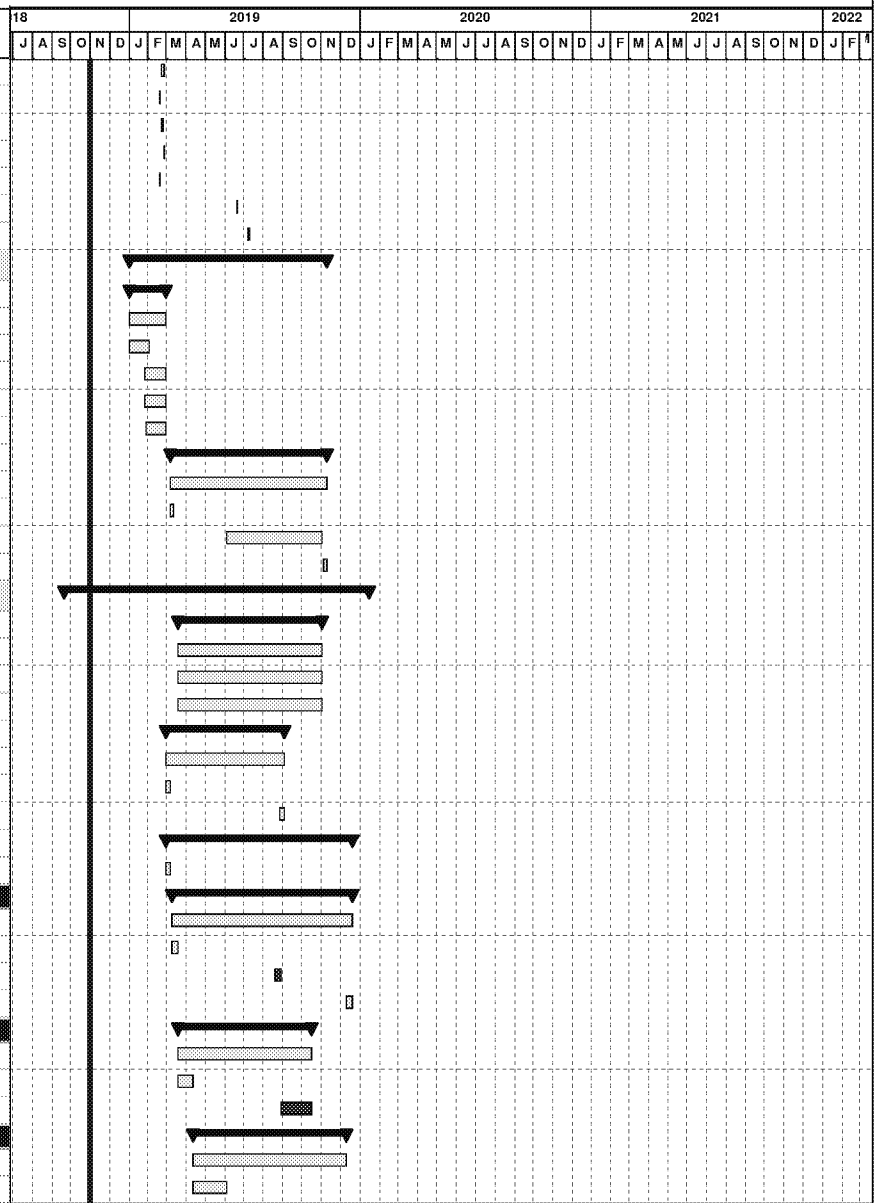
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
31010630	Storm Sewer (Phase II)	4	4	21-Feb-19	26-Feb-19
31010640	Telephone	1	1	19-Feb-19	19-Feb-19
31010650	Electrical	3	3	20-Feb-19	22-Feb-19
31010660	Abandonment Force Main	1	1	25-Feb-19	25-Feb-19
31010670	Temporary Northern Water Line Relocation	1	1	18-Feb-19	18-Feb-19
31010680	Permanent Northern Water Line Relocation	1	1	21-Jun-19	21-Jun-19
31010690	Drywell Water Line Relocation	1	1	08-Jul-19	09-Jul-19
WE04: Permits and Surveys		312	312	01-Jan-19	08-Nov-19
Permits		59	59	01-Jan-19	28-Feb-19
31012000	Permitting	59	59	01-Jan-19	28-Feb-19
31012010	SWPPP / Discharge Permit	32	32	01-Jan-19	01-Feb-19
31012020	Street Opening Permit (Aerospace Blvd)	35	35	25-Jan-19	28-Feb-19
31012030	Street Partial Closure Permit (11th Street)	35	35	25-Jan-19	28-Feb-19
31012040	Weight Permits (Aerospace Blvd)	32	32	28-Jan-19	28-Feb-19
Surveys		176	176	08-Mar-19	08-Nov-19
31013000	Surveying	176	176	08-Mar-19	08-Nov-19
31013010	Initial Topo & Excavation Layout	2	2	08-Mar-19	11-Mar-19
31013020	Excavation Verification Survey	108	108	05-Jun-19	01-Nov-19
31013030	Final As-Built Survey	5	5	04-Nov-19	08-Nov-19
WE05: Remedy Implementation		482	442	21-Sep-18 A	16-Jan-20
Truck Scale Operation		164	164	19-Mar-19	01-Nov-19
31080000	Truck Scale Operation	164	164	19-Mar-19	01-Nov-19
31080010	Truck Scale O&M - Personnel / ODCs	164	164	19-Mar-19	01-Nov-19
31080020	Scale Shack	164	164	19-Mar-19	01-Nov-19
Site Clearing		133	133	01-Mar-19	03-Sep-19
31030200	Site Clearing	133	133	01-Mar-19	03-Sep-19
31030210	Clearing / Grubbing Phase I	5	5	01-Mar-19	07-Mar-19
31030220	Clearing / Grubbing Phase II (Perimeter Trees)	5	5	28-Aug-19	03-Sep-19
Excavation & Fill		295	295	01-Mar-19	20-Dec-19
310801	Overburden Excavation	6	6	01-Mar-19	08-Mar-19
Excavate 0-2 Feet		285	285	11-Mar-19	20-Dec-19
31080100	Excavate 0-2 Feet	205	205	11-Mar-19	20-Dec-19
31080101	Excavate Northern Phase (Phase I)	6	6	11-Mar-19	18-Mar-19
31080102	Excavate Central Phase (Phase II)	8	8	19-Aug-19	28-Aug-19
31080103	Excavate Southern Phase (Phase III)	7	7	11-Dec-19	20-Dec-19
Excavate 2-10 Feet		212	212	19-Mar-19	16-Oct-19
31080110	Excavate 2-10 Feet	152	152	19-Mar-19	16-Oct-19
31080111	Excavate Northern Phase (Phase I)	18	18	19-Mar-19	11-Apr-19
31080112	Excavate Central Phase (Phase II)	35	35	29-Aug-19	16-Oct-19
Excavate 10-20 Feet		244	244	12-Apr-19	11-Dec-19
31080120	Excavate 10-20 Feet	174	174	12-Apr-19	11-Dec-19
31080121	Excavate Northern Phase (Phase I)	36	36	12-Apr-19	03-Jun-19



Remaining Level of Effort
Actual Level of Effort
WBS Summary
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Remaining Work
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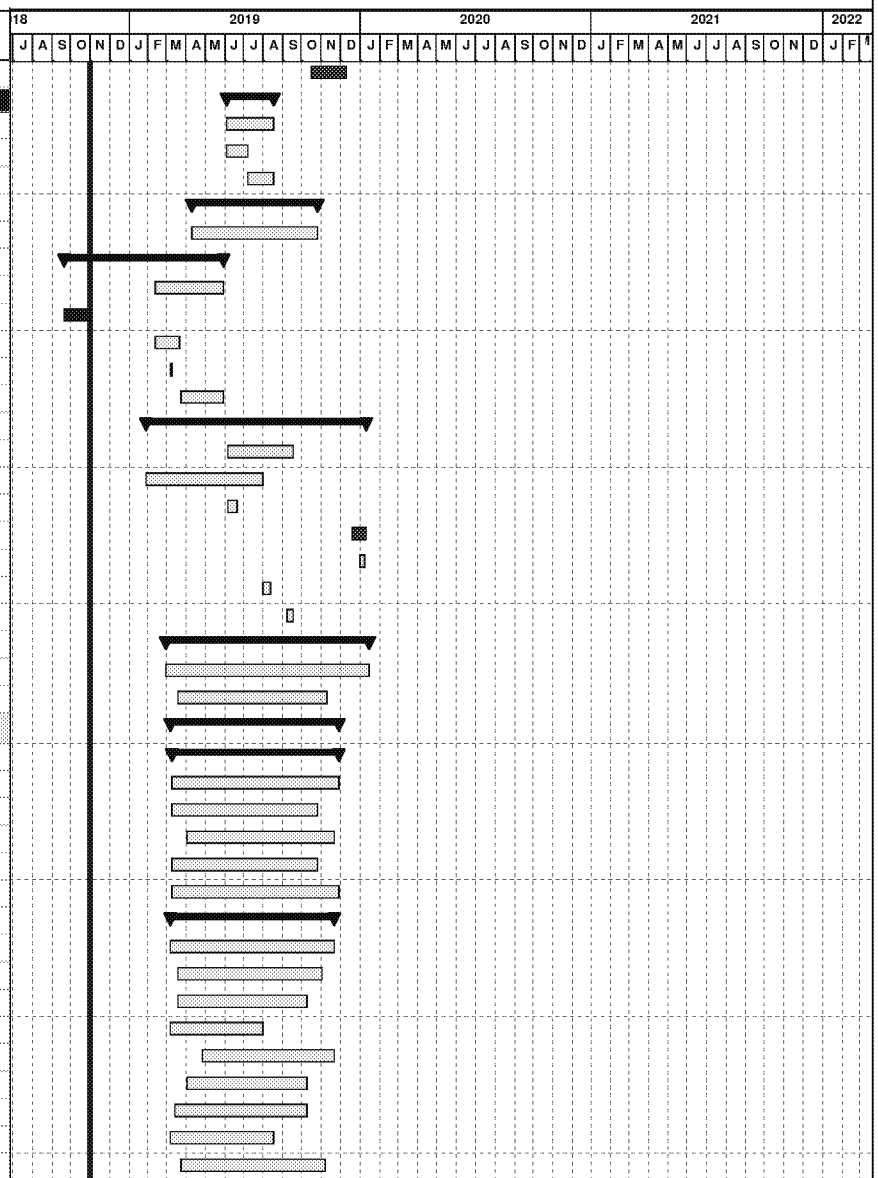
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
31080122	Excavate Central Phase (Phase II)	40	40	17-Oct-19	11-Dec-19
Excavate Drywell 20-08 Area		75	75	04-Jun-19	17-Aug-19
31080130	Excavate Drywell 20-08 Area	54	54	04-Jun-19	17-Aug-19
31080131	Excavate Phase IV (Clean Phase)	24	24	04-Jun-19	08-Jul-19
31080132	Excavate Phase V (Dirty Phase)	35	35	08-Jul-19	17-Aug-19
Geosynthetic Clay Liner		143	143	10-Apr-19	25-Oct-19
31080500	Geosynthetic Clay Liner Installation	143	143	10-Apr-19	25-Oct-19
Sheet Piling		252	212	21-Sep-18 A	31-May-19
31081000	Sheet Piling	80	80	11-Feb-19	31-May-19
31081010	Shoring Plan	0	0	21-Sep-18 A	01-Nov-18
31081020	Installation of Sheet Piling 20' Area	30	30	11-Feb-19	22-Mar-19
31081030	Installation of Sheet Piling Protection of Infrastructure	2	2	08-Mar-19	09-Mar-19
31081035	Installation of Sheet Piling Dry Well Area	50	50	25-Mar-19	31-May-19
Backfilling		250	250	28-Jan-19	10-Jan-20
31081500	Backfilling	75	75	06-Jun-19	18-Sep-19
31081520	Clean Fill Sampling	133	133	28-Jan-19	31-Jul-19
31081530	Phase I	11	11	06-Jun-19	20-Jun-19
31081540	Phase II	16	16	19-Dec-19	10-Jan-20
31081550	Phase III	6	6	01-Jan-20	09-Jan-20
31081560	Phase IV	8	8	01-Aug-19	13-Aug-19
31081570	Phase V	8	8	09-Sep-19	18-Sep-19
Erosion Control		230	230	01-Mar-19	16-Jan-20
31082000	Erosion Control	230	230	01-Mar-19	16-Jan-20
31082010	Work Zone Traffic Control	169	169	19-Mar-19	08-Nov-19
WE06: Transport and Disposal of Material		191	191	08-Mar-19	29-Nov-19
Waste Characterization Sampling		190	190	11-Mar-19	29-Nov-19
31190000	Waste Characterization Sampling	190	190	11-Mar-19	29-Nov-19
31190020	Disposal Sampling - Soil	165	165	11-Mar-19	25-Oct-19
31190030	Disposal Sampling - Water	168	168	02-Apr-19	21-Nov-19
31190040	Disposal Sampling - Concrete Wipe Samples	165	165	11-Mar-19	25-Oct-19
31190050	Data Management / Analysis	190	190	11-Mar-19	29-Nov-19
Waste Handling, Transport and Disposal		185	185	08-Mar-19	21-Nov-19
31190010	Waste Handling, Transport & Disposal	185	185	08-Mar-19	21-Nov-19
31190060	Waste Handling Process	164	164	19-Mar-19	01-Nov-19
31190070	Concrete Disposal	147	147	19-Mar-19	09-Oct-19
31190080	Vegetative Debris	105	105	08-Mar-19	01-Aug-19
31190090	Water Disposal	150	150	26-Apr-19	21-Nov-19
31190100	Metal Recycling	138	138	02-Apr-19	10-Oct-19
31190110	CD Disposal	150	150	15-Mar-19	10-Oct-19
31190120	Asphalt Recycling	116	116	08-Mar-19	16-Aug-19
31190130	Non-Hazardous Waste	164	164	25-Mar-19	07-Nov-19



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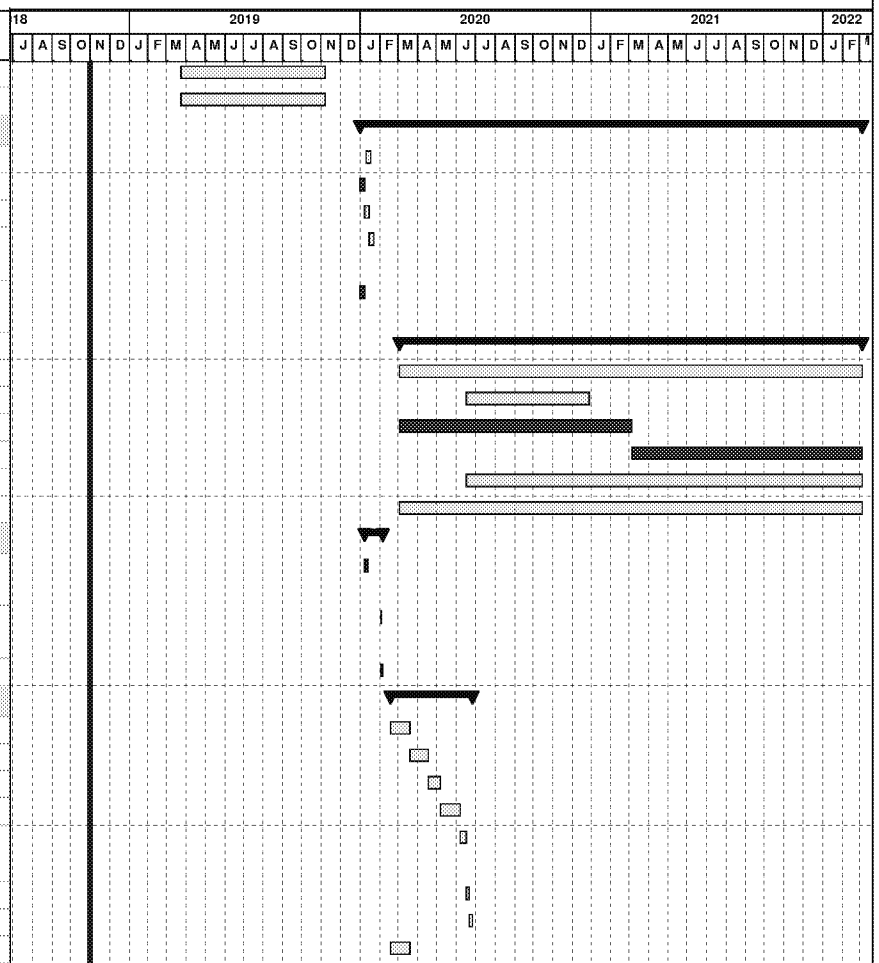
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
31190140	TSCA PCB Waste	164	164	25-Mar-19	07-Nov-19
31190150	TSCA PCB/RCRA Metals Waste	164	164	25-Mar-19	07-Nov-19
WE07: Site Restoration		567	567	01-Jan-20	04-Mar-22
31200410	Seeding for Grass Estabilishment (Hydroseeding)	5	5	10-Jan-20	17-Jan-20
31200420	Trees & Tree Planting	5	5	01-Jan-20	08-Jan-20
31200430	Site Fencing & Installation	5	5	08-Jan-20	15-Jan-20
31200440	Haul Road Restoration (Stone Recycling, Removal & Restoration)	5	5	15-Jan-20	22-Jan-20
31201000	Bituminous Concrete Pavement & Aggregate Surfacing (Base Course Install, Binder Course & Surface Course)	5	5	01-Jan-20	08-Jan-20
Operation & Maintenance of Remedy		522	522	04-Mar-20	04-Mar-22
31083000	Operation & Maintenance	522	522	04-Mar-20	04-Mar-22
31083010	Bi-Annual Mowing	138	138	17-Jun-20	28-Dec-20
31083020	Monthly Inspections (Annual)	261	261	04-Mar-20	04-Mar-21
31083030	Quarterly Inspections (Months 13-30)	261	261	04-Mar-21	04-Mar-22
31083040	Rain Inspections	447	447	17-Jun-20	04-Mar-22
31083050	Maintenance Events (Fencing, E&S, Soil/Veg Repair)	522	522	04-Mar-20	04-Mar-22
WE08: Demobilization		20	20	08-Jan-20	05-Feb-20
31210110	Removal of Truck Scales/Foundation Pit/Approach Slabs & Related Equipment	4	4	08-Jan-20	14-Jan-20
31210400	Demobilization of Construction Equipment & Temporary Facilities	1	1	03-Feb-20	04-Feb-20
31210500	Demobilization of Personnel	1	1	04-Feb-20	05-Feb-20
WE09: Post Construction Deliverables		130	130	18-Feb-20	27-Jun-20
31210610	Internal Draft CCR	30	30	18-Feb-20	19-Mar-20
31210611	NAVFAC Review Internal Draft CCR	30	30	19-Mar-20	18-Apr-20
31210612	Response to NAVFAC Comments / Submit Draft CCR	20	20	18-Apr-20	08-May-20
31210613	Regulatory Review Draft CCR	30	30	08-May-20	07-Jun-20
31210614	Response to Regulator Comments / Submit Draft Final CCR	10	10	07-Jun-20	17-Jun-20
31210615	Regulatory Review Draft Final CCR	5	5	17-Jun-20	22-Jun-20
31210618	Final CCR	5	5	22-Jun-20	27-Jun-20
31210620	NIRIS Update	30	30	18-Feb-20	19-Mar-20



Remaining Level of Effort
Actual Level of Effort
WBS Summary
Actual Work
Remaining Work
Critical Remain...

Data Date: 31-Oct-18

Appendix B
Project Specifications and Design Drawings

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SPECIFICATIONS

for

SITE 1 – FORMER DRUM MARSHALLING AREA
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

Prepared by:
Tetra Tech, Inc.
661 Andersen Drive
Pittsburgh, PA 15220-2700

May 25, 2018

Professional Engineer Certification:

Name (typed or printed): _____

By: _____(SEAL)
(Individual's signature)

Title: _____

Date: _____

NY P.E. License # _____

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SITE 1 – FORMER DRUM MARSHALLING AREA
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

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01 71 23	Construction Surveying
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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

1.01.1 Project Description

The project requires the removal of PCB-impacted soil from Site 1 - the former drum marshalling area at the Naval Weapons Industrial Reserve Plant (NWIRP) located in Bethpage, New York. The Work includes obtaining required permits; mobilizing personnel, equipment, and materials to conduct the Work; site preparation activities and set up of temporary facilities; locating and protecting existing utilities; establishing and maintaining erosion and sediment controls; implementing the Health and Safety Plan (HASP); implementing the air monitoring plan; maintaining site access and traffic control; clearing and grubbing; shoring and sheeting as required; excavating, staging (as required), sampling, loading, transporting, and offsite disposal of PCB-impacted soil; backfilling the excavations with excavated soil not requiring offsite disposal and imported soil fill; installing the low-permeability cover; site restoration; demobilizing personnel, equipment, and remaining materials; and incidental related work.

1.01.2 Location

The Work shall be located at the Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, New York, as indicated.

1.02 WORK BY OTHERS

A. In its program to implement the remedy for Site 1 – Former Drum Marshalling Area, Naval Facilities Engineering Command (NAVFAC) – Mid-Atlantic may award contract(s) for work at the Site included in the Drawings and Specifications not covered by this Contract. The work under these contract(s) may be included in the Drawings and Specifications to provide for completeness and clarity of the overall project. The work under these contract(s) would be indicated within these Specifications as "work by others", "performed by others", or similar.

B. In its program to implement improvements at the Site, NAVFAC may from time to time, award contracts for additional work at the Site not covered by this Contract nor indicated in the Drawings and Specifications for Site 1 – Former Drum Marshalling Area.

1.03 OCCUPANCY OF PREMISES

A. Before work is started, the Contractor shall arrange with NAVFAC a sequence of procedure, means of access, space for storage of materials and equipment, and use of roads.

1.04 EXISTING WORK

A. Preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. Remove trees only when specifically authorized to do so by NAVFAC, and avoid damaging vegetation that will remain in place. If any limbs or branches of trees

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are broken during contract performance, or by the careless operation of equipment, or by workmen, trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by NAVFAC.

B. Protect from damage all existing improvements and utilities 1) at or near the work site and 2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. Repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, NAVFAC may have the necessary work performed and charge the cost to the Contractor.

C. Remove or alter existing Work in such a manner as to prevent injury or damage to any portions of the existing Work which remain.

D. Repair or replace portions of existing Work which have been altered during construction operations to match existing or adjoining Work, as approved by the Contracting Officer. At the completion of operations, existing Work shall be in a condition equal to or better than that which existed before new Work started.

1.05 LOCATION OF UNDERGROUND UTILITIES AND WELLS

Obtain site digging permits, if required, prior to start of excavation by contacting NAVFAC 15 calendar days in advance. Mark the surface of the ground or paved surface where existing underground utilities are discovered. Verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated to be specified or removed but indicated or discovered during scanning in locations to be traversed by work to be conducted or installed. Verify elevations before installing new Work closer than nearest manhole, well or other structure at which an adjustment in grade can be made.

1.05.1 Notification Prior to Excavation or Work at Wells

Notify NAVFAC at least 15 days prior to starting excavation work. Contact utility owners at least 10 working days prior to excavating. Contractor is responsible for marking all existing utilities. If wells need to be modified, contact NAVFAC at least 90 days in advance so that approvals can be obtained.

1.06 STORM PROTECTION

Contractor shall conduct storm protection measures as specified herein.

1.06.1 Hurricane Condition of Readiness

Unless directed otherwise, comply with:

A. Condition ONE (sustained winds of 50 knots or greater expected within 12 hours): Secure the jobsite, and leave NAVFAC premises.

B. Condition TWO (sustained winds of 50 knots or greater expected within 24 hours): Curtail or cease routine activities until securing operation is complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to remove hazards and loose equipment from general station areas. Contact NAVFAC for weather and condition of readiness (COR) updates and completion of required actions.

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C. Condition THREE (sustained winds of 50 knots or greater expected within 48 hours): Maintain Condition FOUR requirements and commence securing operations necessary for Condition ONE which cannot be completed within 18 hours. Cease routine activities which might interfere with securing operations. Commence securing and stow gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to Condition TWO and continue action as necessary to attain Condition THREE readiness. Contact NAVFAC for weather and COR updates and completion of required actions.

D. Condition FOUR (sustained winds of 50 knots or greater expected within 72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 4 feet high. Remove debris, trash, or objects that could become missile hazards. Contact NAVFAC for COR updates and completion of required actions.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

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SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:

1. Health and Safety

2. Remedial Action Work Plan

3. Construction Progress Schedule

4. Preconstruction and Progress Meetings

5. Project Coordination

1.02 HEALTH AND SAFETY

A. All work shall be performed in accordance with the requirements set forth in NAVFAC's Site Conditions document, including all referenced applicable safety and health regulations, codes and standards. Site Conditions document is attached to this Section.

B. Contractor shall develop and submit his/her own health and safety plan that is consistent with NAVFAC's Site Conditions document, all required job hazard analyses, and other documentation to provide for the safe execution of the Work. Submit the documentation to NAVFAC for approval prior to commencement of the Work. Contractor will be solely responsible for Contractor's health and safety.

1.03 REMEDIAL ACTION WORK PLAN

A. Contractor shall submit a Remedial Action Work Plan (RAWP) to the Engineer and NAVFAC for review not more than 14 days after issuance of the Notice to Proceed and prior to the scheduled pre-construction meeting.

B. The RAWP shall indicate how the construction activities are to be implemented and coordinated, and shall include the following at a minimum:

1. Identification of key project personnel and lines of authority, and descriptions of duties of the key personnel, and an organizational chart.

2. Proposed work days and hours.

3. Procedures for project communication and coordination.

4. A diagram of the work site with a layout showing existing site conditions, and the location of anticipated haul routes, staging areas, office trailers, and access to the

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Site. The Contractor shall mark-up one or more of the Drawings to develop this diagram.

5. Contractor quality control procedures.

6. Lists of construction equipment, systems and materials to be used for the Work.

7. Description of temporary facilities and utilities required to conduct the Work.

8. Staging of operations, including sequencing of the Work, impact of Work on streets and properties, required timing and location of street closures if any, and routing of haul vehicles and construction equipment.

9. Identification of areas for parking of equipment and personal vehicles and storage of materials.

10. Traffic diversion and control plan, including a map with traffic patterns, description of signage, other required controls and route monitoring. Traffic controls must comply with the requirements specified in Section 01 50 00 and Section 32 17 20.

11. Procedures for characterization of excavated material and transportation and disposal procedures for material requiring offsite disposal.

1.04 CONSTRUCTION PROGRESS SCHEDULE

A. Contractor shall submit initial Construction Progress Schedule (otherwise designated as the baseline schedule) to the Engineer and NAVFAC for review not more than 14 days after issuance of the Notice to Proceed and prior to the scheduled pre-construction meeting.

B. Contractor shall prepare the Construction Progress Schedule in the form of a horizontal bar chart. The Construction Progress Schedule is to be used as the baseline/target schedule.

C. The Construction Progress Schedule shall show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration. Identify all Critical Path elements.

D. The Construction Progress Schedule shall be in accordance with the required work sequence and completion dates specified.

E. The Construction Progress Schedule shall be revised as required to indicate anticipated and actual durations and sequence of activities. Copies of revised Schedules shall be provided to the Engineer at the time of Progress Meetings for review and comment.

F. The Construction Progress Schedule shall indicate estimated percentage of completion for each item of Work at each submission. Schedule updates shall present baseline/target bars for individual construction activities directly beneath current timeline bars for comparison purposes.

G. Whenever it becomes apparent from the current Construction Progress Schedule that delays

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to the Critical Path have resulted, and hence, that the contract completion date will not be met, Contractor shall submit to NAVFAC and Engineer for approval a written Recovery Plan stating the steps Contractor intends to take to remove or arrest the delay to the Critical Path in the Construction Progress Schedule. The Contractor shall take some or all of the following actions at no additional cost to the Project:

1. Increased construction manpower in such quantities and crafts as will substantially eliminate, in the judgment of NAVFAC and Engineer, the backlog of work.

2. Increase the number of working hours per shift, shifts per working days per week, the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate, in the judgment of NAVFAC and Engineer, the backlog of work (as allowed by local ordinances and the requirements of the Contract Documents).

3. Reschedule activities to achieve maximum practical concurrence of accomplishment of activities, and comply with the revised Construction Progress Schedule.

H. The Contract Time will be adjusted by NAVFAC and Engineer only as defined in the Contract Documents. If NAVFAC and Engineer find that the Contractor is entitled to any extension of the Contract Time under the provisions of this Contract, NAVFAC's and Engineer's determination as to the total number of days extensions will be based upon the currently approved Construction Progress Schedule and on all data relevant to the request for extension.

1.05 PRE-CONSTRUCTION MEETING

A. The Engineer or NAVFAC will schedule and administer a pre-construction meeting as specified in the following paragraphs.

B. The location of the pre-construction meeting will be at the Site at a location determined by the Engineer or NAVFAC.

C. Parties responsible for attending the pre-construction meeting are representatives of NAVFAC, Contractor, Engineer, primary subcontractors, and other parties as determined by the Engineer and NAVFAC.

D. Agenda:

1. Distribution of copies of the Contract Documents (if necessary)

2. Designation of project personnel in attendance

3. Site walk as necessary

4. Review and clarification of the responsibilities of project personnel

5. Review and clarification of the lines of communication

6. Review of: Contractor's Construction Management Plan; Construction Progress Schedule (baseline schedule); and other initial submittals as appropriate

7. Procedures for submission and processing of submittals

8. Procedures for measurement and payment, including the Schedule of Values, applications for payment, and contract modifications

9. Procedures for Contractor's submittal of requests for information (RFIs), and Engineer's issuance of Field Orders, interpretations and clarifications

10. Discussion of construction quality assurance and quality control procedures

11. Site health and safety, including emergency procedures and contacts

12. Use of premises, including work areas, storage areas, temporary facilities, and housekeeping procedures

13. Site security and work hours

14. Scheduling for progress meetings

15. Other items as appropriate

E. Meeting minutes will be recorded by a representative of the Engineer or NAVFAC and distributed to all parties that attend the meeting.

1.06 PROGRESS MEETINGS

A. The Engineer or NAVFAC will schedule and administer regular progress meetings. The progress meetings will be held as determined by the Engineer or NAVFAC.

B. The location of the progress meetings will be at the Site at a location determined by the Engineer or NAVFAC.

C. Attendance: Representatives of the Engineer, Contractor, NAVFAC, and other parties as appropriate.

D. Agenda:

1. Minutes of previous meeting

2. Health and safety issues

3. Community and/or public issues

4. Construction progress review:

a. Contractor's estimate of planned percent completion compared to actual percent completion

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b. Review of activities completed since last meeting

c. Two-week "look-ahead" of anticipated work items

5. Materials and Products:

a. Status of submittal reviews

b. Substitutions

c. Ordering of materials and products, and delivery issues

d. Storage and protection of materials and products

6. Deficiencies:

a. Identification of deficiencies

b. Status of correction

c. Field observations, problems, and conflicts

d. Regulatory and/or environmental issues (permits, etc.)

7. Requests for information

8. Progress payments

9. Contract modifications

10. Action items

11. Other business

E. Meeting minutes will be recorded by a representative of the Engineer (unless otherwise determined) and distributed to all parties that attend each meeting.

1.07 PROJECT COORDINATION

A. Contractor shall coordinate scheduling, submittals, and Work of the various sections of the Specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. It is the responsibility of the Contractor performing the defined Scope of Work to coordinate the Work with the other trades in order to accomplish the completion of the total Project within the time required by the overall Project Schedule.

C. Contractor shall initiate the Work in accordance with the Project Schedule, and shall thereafter proceed and complete performance of the Work promptly, diligently and in such

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a manner and sequence with the work of other contractors in order to permit completion of the Project within the required schedule.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

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SECTION 01 35 26

HEALTH AND SAFETY PLAN

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Site specific health and safety procedures including a detailed accident prevention plan are required for work performed in areas with potentially hazardous conditions. These procedures shall be described in a Health and Safety Plan (HASP) prepared by the Contractor. The HASP shall be submitted to the Engineer and be reviewed for concurrence by the Engineer and NAVFAC before any work that may be affected by hazardous material can be initiated. Implement, maintain and enforce the HASP procedures at the appropriate time prior to and during all phases of the work.

1.02 RELATED WORK

A. Summary of Work is included in Section 01 11 02.

1.03 REGULATORY REQUIREMENTS AND APPLICABLE PUBLICATIONS

A. The site-specific HASP shall be consistent with the requirements of:

1. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926), which includes 29 CFR 1910.120 "Hazardous Waste Operations and Emergency Response" (HAZWOPER).

2. United States Environmental Protection Agency (USEPA) Standard Operating Guidelines.

B. The HASP shall include, but not necessarily be limited to, the following components as required by OSHA 29 CFR 1910.120(i)(2):

1. Names and organization chart of key personnel and alternates responsible for site safety and health (responsibilities and chain of command)

2. Safety and health hazard assessment and risk analysis for each site task and operation (Accident Prevention Plan)

3. Site Description and Evaluation

4. Education and Training

5. Personnel Protective Equipment

6. Medical Surveillance

7. Air Monitoring

8. Standard Operating Procedures, Engineering Controls and Work Practices

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9. Site Control Measures (Work Zones, Communications and Security)

10. Personnel Hygiene and Decontamination

11. Equipment Decontamination and Record Keeping

12. Emergency Equipment and First Aid Requirements

13. Emergency Response Plan and Contingency Procedures

14. Heat/Cold Stress Monitoring

15. Logs, Reports and Record Keeping

C. Electronic copies of the site-specific HASP shall be submitted to NAVFAC and Engineer at least 45 days prior to the commencement of any on-site work in the affected areas.

D. Standards delineated in this Section are in addition to or an amplification of procedures and requirements of the above-referenced regulations and documents.

E. Should any unforeseen or site-specific safety related factor, hazard, or condition become evident during the performance of work at this site, it shall be the Contractor's responsibility to bring such to the attention of the Engineer both verbally and in writing as quickly as possible, for resolution. In the interim, the Contractor shall take prudent action to establish and maintain safe working conditions and to safeguard employees, the public and the environment.

F. Should the Contractor seek relief from, or substitution for, any portion or provision of the HASP, such relief or substitution shall be requested of the Engineer in writing and if approved, be authorized in writing by NAVFAC.

G. The HASP developed by the Contractor shall include provisions for work related to initial site preparation and utilities relocation or replacement. It shall be the responsibility of the Contractor to conduct whatever testing and monitoring is deemed necessary to assure a safe operation during the initial site preparation and utilities work.

H. Any temporary facilities or special construction procedures required to construct the work zones shall be the responsibility of the Contractor and shall be delineated in the HASP.

1.04 SITE CONTROL

A. Work Zones

1. Clearly layout and identify the work zones in the field and limit equipment, operations and personnel in the zones as required by the HASP.

B. Communications

1. Provide portable two-way radio or portable vehicle telephone communication at the site and emergency numbers, including police, fire, ambulance, hospital and NAVFAC, shall be prominently posted near the radio or telephone.

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1.05 TRAINING

A. Certify that all personnel assigned to enter the work zones have received appropriate safety training in accordance with 29 CFR 1910.120 - PERSONAL PROTECTIVE EQUIPMENT.

B. Provide all on-site personnel with appropriate personal safety equipment and protective clothing, and ensure that all safety equipment and protective clothing is kept clean and well maintained.

C. Certify that all personnel assigned to enter work zones have received 40-hour general site worker training, OSHA 1910.120(e)(3) HAZWOPER, and are current with the 8-hour HAZWOPER refresher.

D. Certify that all personnel assigned to enter work zones have received medical surveillance in accordance with 1910.120(f).

E. Certify that the construction manager/superintendent, QC manager, and site health and safety officer (SHSO) have received general site worker supervisory training in accordance with 1910.120(e)(4).

F. Certify that designated excavation safety competent personnel have the appropriate training.

G. Certify that designated first aid/CPR/AED and bloodborne pathogen competent personnel have the appropriate training.

1.06 PERSONAL HYGIENE AND DECONTAMINATION

A. All on-site personnel performing or supervising remedial work within a hazardous work area, or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids, shall observe and adhere to the personnel hygiene-related provisions stated in the HASP.

1.07 EQUIPMENT DECONTAMINATION

A. All vehicles and equipment used in the Exclusion Zone shall be decontaminated prior to leaving the site. The procedures for decontamination of vehicles and equipment shall be outlined in the HASP. Monitor all vehicle decontamination prior to vehicles exiting the site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:

1. Regulatory requirements

2. References

3. Submittals

4. Source quality control testing

5. Quality control of installation

6. Quality control services

7. Qualifications and duties of QC firms and laboratories

8. Limits on authority of QC firms and laboratories

9. Contractor's responsibilities

1.02 REGULATORY REQUIREMENTS

A. Comply with all applicable local and federal standards and regulations.

1.03 REFERENCES

A. Conform to latest edition of reference industry standards as of date of the Contract Documents or date otherwise specified in specification sections.

B. If specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 SUBMITTALS

A. Prior to start of Work, submit qualifications information for each testing firm and laboratory proposed to be retained. Submit the following information to the Engineer for review and approval:

1. Name, address, and telephone number of each testing firm and laboratory.

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2. Name of responsible officer for each testing firm and laboratory.

3. Documentation that testing firms and laboratories comply with the qualifications specified in paragraph "QUALIFICATIONS OF QC FIRMS AND LABORATORIES".

4. Names and qualifications statements (resumes) of all quality control personnel to be on the Site, showing compliance with the required experience.

B. Contractor shall submit the Quality Control (QC) firms' testing reports to Engineer as specified in individual sections.

1.05 SOURCE QUALITY CONTROL TESTING

A. Materials forming the Work under this Contract are subject to inspection and testing at the point of manufacture or fabrication if determined necessary by the Engineer. Standard specifications for quality and workmanship are indicated in the Contract Documents.

B. Provide statements or certificates from the manufacturers, fabricators and/or suppliers as specified in individual sections.

1.06 QUALITY CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply fully with manufacturers' instructions, including each step in sequence.

C. If manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Work shall be performed by persons qualified to produce workmanship of specified quality.

1.07 QUALITY CONTROL SERVICES

A. Contractor shall provide approved QC staff and/or employ and pay for the services of approved Quality Control (QC) firm and laboratory to perform specified inspection and testing of the Work as applicable.

B. Qualifications, duties and responsibilities of the QC firms and laboratories are specified in paragraph "QUALIFICATIONS OF QC FIRMS AND LABORATORIES".

1.08 QUALIFICATIONS OF QC FIRMS AND LABORATORIES

A. Each testing firm and laboratory shall be an approved organization, independent from the

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Contractor, with a minimum of five years of documented laboratory experience in analytical and material testing of the type required for this Project.

1.09 DUTIES OF QC FIRMS AND LABORATORIES

A. QC Firm(s) shall:

1. Provide qualified personnel at the site.

2. Cooperate with Engineer and Contractor in performance of services.

3. Perform specified inspection, sampling, and testing of products in accordance with specified standards.

4. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or Products.

5. Perform additional inspections and tests required by the Engineer and NAVFAC.

B. QC firms shall not approve or accept any portion of the Work, and shall not assume any duties of Contractor, Engineer or NAVFAC.

1.10 CONTRACTOR RESPONSIBILITIES

A. Furnish incidental labor and facilities:

1. To provide access to work to be tested

2. To obtain and handle samples at the Site or at the source of products to be tested

3. To facilitate inspections and tests

4. To store and cure test samples as required

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:

1. Submittals
2. Mobilization
3. Temporary utilities
4. Temporary sanitation facilities
5. Protection of existing utilities and surface facilities
6. Protection of installed work
7. Temporary signage
8. Fencing and other barriers
9. Public traffic control
10. Construction roads and parking
11. Site access and security
12. Site housekeeping
13. Noise control
14. Surface water control
15. Control of pollutants
16. Field offices

1.02 SUBMITTALS

A. In addition to the initial submittals designated in Sections 01 31 00 and 01 40 00, the following submittals referenced in this Section shall be submitted by the Contractor to the Engineer and NAVFAC for review not more than 14 days after issuance of the Notice to Proceed and prior to the scheduled pre-construction meeting:

1. Traffic Control Plan (see paragraph "PUBLIC TRAFFIC CONTROL")

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2. Spill Prevention, Control and Countermeasures Plan (see paragraph "CONTROL OF POLLUTANTS")

B. Contractor shall submit the following submittals to the Engineer and NAVFAC for review at least 14 days prior to fabrication and shipment of products to the Site, or as otherwise indicated:

1. Shop drawings of proposed temporary signage (paragraph "TEMPORARY SIGNAGE")

1.03 MOBILIZATION

A. Contractor shall mobilize to the Site and be prepared to initiate the construction activities within 14 days after receiving Notice to Proceed from NAVFAC.

B. Mobilization shall not proceed until the Contractor has:

1. Obtained all permits, licenses and OSHA training certificates necessary to perform the Work, where required.

2. Submitted all required initial submittals as specified and receive approval prior to mobilization.

3. Received approval from NAVFAC and Engineer for the location of temporary structures (including field offices) and storage areas.

C. Mobilization includes, but is not necessarily limited to: transportation of personnel, equipment, and operating supplies to the Site; establishment of offices, buildings, and all necessary temporary utilities; installation and relocation of necessary facilities at the Site; and other preparatory work at the Site.

D. All construction equipment mobilized to the Site shall be inspected by the Contractor to verify the condition of the equipment to ensure that it is free of obvious mechanical defects and safety deficiencies. Concurrent with the inspection of incoming equipment, a safety inspection and an inspection of emergency equipment shall be conducted on each piece of equipment by the Contractor.

E. An equipment decontamination area shall be established by the Contractor on the Site at a location to be designated. The area shall be used to remove site materials such as dirt and mud from vehicles prior to accessing a public roadway. Equipment contacting known or suspected PCB-impacted material shall be decontaminated at the work area prior to relocation to the support zone.

1.04 TEMPORARY UTILITIES

A. Temporary Power and Lighting

1. Contractor shall provide temporary electrical service and distribution system for power and lighting requirements. This may involve bringing in power on

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temporary poles or using a generator.

2. Contractor shall provide for temporary electrical utilities to be installed by a licensed electrician. All electrical connections shall meet appropriate NEMA ratings consistent with the intended service. Comply with National Electrical Code (NEC) and all other applicable local codes and regulations.

3. Contractor shall provide and maintain adequate lighting for construction operations and field offices in accordance with applicable codes and regulations.

4. Contractor shall pay costs for power service until completion of the Work.

B. Temporary Water

1. Contractor shall provide potable water for drinking and for other construction operations. Pay all costs for water delivery until completion of the Work.

C. Contractor shall provide adequate fire protection at the Site as required by local fire codes and standards.

D. Temporary Telephone and Internet Service: Contractor shall provide, maintain, and pay for telephone and internet service until completion of the Work. The Contractor will not be required to have a long-distance phone on the work site. The Contractor shall select the most efficient internet services available.

1.05 TEMPORARY FACILITIES

A. Contractor shall provide and maintain (as applicable) temporary potable water, portable toilets, washing facilities, and other sanitation facilities on construction sites in accordance with 29 CFR 1926.51 and all other applicable regulations.

B. Contractor shall provide and pay for adequate drinking water for construction personnel.

C. Job sites without a temporary sanitary sewer, Contractor shall provide portable toilet facilities such as chemical toilets, recirculating toilets or combustion toilets in accordance with local codes and regulations. Portable toilets shall be cleaned and serviced a minimum of one time per week by a licensed portable toilet facility provider in compliance with applicable local regulations. Provide a sufficient number of portable toilet facilities for Contractor's work crews, representatives of the Engineer, NAVFAC and other authorized visitors. The number of toilets per employee shall conform to the requirements of 29 CFR 1926.51 at a minimum.

D. The temporary sanitation facilities shall be provided by the Contractor at the time of mobilization and maintained in a clean and sanitary condition for the duration of the Work.

1.06 PROTECTION OF EXISTING UTILITIES

A. Contractor shall protect all existing active and inactive utilities from damage during the Work unless indicated to be removed or abandoned on the Drawings or in these Specifications. If damaged, the utilities shall be repaired at the Contractor's expense.

B. Contact and cooperate with NAVFAC and the utility companies to locate all utilities (including pipelines, cables, power poles and other structures) on the Site in accordance with all applicable regulations prior to beginning the Work.

1.07 PROTECTION OF EXISTING SURFACE FACILITIES

A. Contractor shall protect all existing surface facilities (including but not limited to roadways, curbs and gutters), both onsite and offsite, from damage during the Work unless otherwise indicated to be removed or abandoned.

B. Contractor shall provide protection for plant life designated to remain (or not designated for removal) as specified in Section 31 10 00.

C. Contractor shall repair or replace any existing pavement, culverts, curbs and gutters, and other surface facilities that are cracked, broken or otherwise damaged by Contractor, to original condition, or better, in accordance with local requirements at no additional cost to the Project.

1.08 PROTECTION OF INSTALLED WORK

A. Contractor shall protect installed Work and provide special protection where required in individual specification sections.

B. Contractor shall provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.

1.09 TEMPORARY SIGNAGE

A. Contractor shall provide temporary on-site signage at the start of construction as needed to direct personnel to designated parking areas, field office trailers and site exits.

B. The Contractor may be permitted to install promotional signage for their firm, joint venture, or project team, subject to approval by NAVFAC.

C. For all proposed signage, Contractor shall submit four copies of shop drawings showing the following information for review by NAVFAC prior to ordering the signage: proposed location and size of signage; and a letter size copy of proposed signage including all text, logos and color.

D. Temporary signage shall be maintained throughout the Contractor's on-site activities. Any signs that are damaged or faded shall be replaced. Temporary signage, including promotional signage, shall be removed in conjunction with demobilization activities, or earlier if directed by NAVFAC.

1.10 FENCING AND OTHER BARRIERS

A. Contractor shall install permanent security chain link fencing as specified in Section 32 31 13 and shown on the Drawings to control access to the Site along the site's eastern boundary (11th Street). Contractor shall install temporary fencing to control access to the work area and maintain separation of the work area from the remainder of the property. Maintain

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fencing on a daily basis and replace or repair damaged materials.

B. Contractor shall clearly mark and protect open excavations using barriers, signs and other markers in accordance with all applicable regulations. Install high-visibility fencing (such as orange high density polyethylene safety fencing), caution tape, suitable barricades, "No Trespassing" and other warning signs as required. An excavation shall be classified as "deep" if it presents a trip or fall hazard or as otherwise defined in applicable OSHA regulations. Maintain barriers and signs on a daily basis at each excavation and replace damaged materials until excavation has been backfilled.

1.11 PUBLIC TRAFFIC CONTROL

A. Contractor shall coordinate with the local jurisdictions and comply with applicable requirements for maintaining and protecting traffic on all affected public roads during the Work. A Traffic Control Plan shall be developed and submitted to the Engineer and NAVFAC for review. Contractor shall submit the Traffic Control Plan to the local jurisdiction for approval and permitting as required.

B. Contractor shall protect and divert pedestrian and vehicular traffic when needed in compliance with the requirements of local authorities having jurisdiction. Traffic control shall include: provision of properly trained and equipped flagmen; erection of barricades; placing of lights around and in front of equipment and the Work; and the erection and maintenance of adequate warning, danger, and directional signs. Pedestrians and the traveling public shall be protected from injury or damage.

C. Contractor shall obtain and pay for all required road/lane closure permits, haul route permits, and other traffic control permits required for execution of the Work.

D. Traffic control devices shall comply with the "Manual on Uniform Traffic Control Devices", Part 6 Temporary Traffic Control, published by U.S. Department of Transportation, latest edition.

1.12 CONSTRUCTION ROADS AND PARKING

A. Contractor's vehicles shall enter and exit the Site only at the locations designated on the Drawings, unless otherwise approved by NAVFAC.

B. Contractor shall construct and maintain access roads on the Site as indicated on the Drawings and in accordance with the specifications. Designated existing roads shall be used for construction traffic.

C. Contractor shall construct temporary parking and laydown areas at designated location(s) as approved by the Engineer and NAVFAC. Vehicles shall not be parked in any locations where they impede traffic or access by emergency vehicles.

D. Contractor shall repair existing roads damaged by operation of construction equipment as determined by the Engineer and NAVFAC in compliance with the applicable requirements of the local jurisdiction.

1.13 SITE ACCESS AND SECURITY

A. Contractor's use of the premises shall be limited to the Work being performed under the Contract Documents. Contractor shall confine all operations, including the storage of materials, to the designated areas of the Site as shown on the Drawings, or as otherwise approved in writing by the Engineer and NAVFAC. Contractor shall be responsible for arranging for and paying the costs of any necessary off-site storage.

B. Contractor shall be responsible for the security and safety of Contractor's equipment and facilities. Contractor acknowledges that the site is active and that various entities conduct daily business at the site. Contractor is responsible for maintaining separation of the site from adjacent areas during the work. The Engineer and NAVFAC will not be liable for loss or damage of Contractor's tools, equipment or materials, whatever the cause.

C. Access to the Site shall be as identified on the Drawings. The Site entrance shall be maintained to provide safe and efficient traffic flow. Alternative entrances shall only be used if approved by NAVFAC.

D. Contractor shall provide security and facilities to protect the Site from unauthorized entry, vandalism or theft. Initiate security program at job mobilization and maintain the security throughout the duration of the Work.

E. Vehicular access to the site shall be restricted to authorized vehicles only. Contractor shall allow entrance only to authorized persons with proper identification. Maintain a log of security incidents. Require all visitors having access to the Site to sign in and sign out on a log. Visitors shall include on the log the time of entry and departure from the Site.

F. Contractor shall report security-related incidents as defined in paragraph H.1. to NAVFAC immediately. Contractor shall submit a written summary report to NAVFAC within 24 hours of the security-related incident.

G. All approved visitors to the Site shall be briefed by Contractor on safety and security and provided with temporary identification and safety equipment by the Contractor's Site Health and Safety Officer (SHSO), and escorted by the Contractor throughout their visit.

H. Contractor shall maintain records of security-related incidents in compliance with all applicable laws and regulations, and submit monthly reports as described below:

1. Incidents to be recorded include, but are not limited to: thefts, robberies and burglaries; evidence of unlawful Site entry; security barrier destruction or damage; severe weather, bomb threats, and other Site disturbances; contacts and responses of federal and local law enforcement agencies; and contacts and responses of local medical service providers for accidents and medical emergencies.

2. Incidents shall be documented on forms approved by the Engineer and NAVFAC.

3. Summaries of the recorded incidents shall be included in monthly reports and submitted to the Engineer.

1.14 SITE HOUSEKEEPING

A. Contractor shall maintain a high standard of cleaning (housekeeping) on the Site and implement measures necessary to manage the impact of the Work on public roads and rights-of-way or adjacent properties.

B. Site housekeeping shall be utilized to ensure that the Site is kept in a clean and orderly condition throughout the Work. Contractor shall comply with, at a minimum, the following requirements:

1. Supply all covered containers required for collection, storage and removal of trash, rubbish and debris resulting from the Work. No containers will be supplied by NAVFAC. Burying of trash, debris, or similar by-products of the Work is strictly prohibited.

2. All waste materials shall be collected and stored in a securely lidded metal dumpster. The dumpster shall meet all solid waste management regulations. All trash and construction debris from the Site shall be deposited in the dumpster.

3. Clean areas as directed by NAVFAC or Engineer to address health and safety or public relation concern.

C. Bermed containment areas or equivalent shall be provided for washing concrete truck chutes and other placement equipment. Disposal of excess concrete or drum washout water shall not be allowed onsite.

D. Contractor shall implement measures to ensure that public roads and rights-of-way and adjacent properties are kept free of any impact due to the Work. These measures shall include, but shall not be limited to, the following:

1. Construction and operation of construction exit(s) to prevent tracking of materials off-site.

2. Covering all trucks transporting materials to and from the Site.

3. Controlling dust, smoke, or other emissions from the Site as a result of the Work.

4. Keeping public rights-of-way free of debris and refuse from the Site.

E. Any impact to public roads, rights-of-way or adjacent properties shall require immediate attention and corrective action by the Contractor at no cost to NAVFAC.

1.15 NOISE CONTROL

A. Contractor is responsible for controlling noise levels by utilizing appropriate noise control on equipment and by complying with required work hour restrictions and other limitations imposed by authorities having jurisdiction.

B. Contractor's vehicles and equipment shall have appropriate noise reduction and protection devices that conform to the latest OSHA standards (including 29 CFR 1926.52), and other applicable local ordinance requirements.

C. For work performed near the property boundary or near inhabited areas, the Contractor shall consider additional noise mitigation measures if warranted by offsite property uses.

D. Noise mitigation measures shall include, but shall not be limited to, utilizing noise control devices, limiting night work hours for noisy activities, and scheduling and controlling traffic.

E. Contractor shall coordinate with NAVFAC to revise work procedures and hours as needed to address noise complaints, if received, while implementing methods to preserve the project schedule without additional cost to NAVFAC.

1.16 SURFACE WATER CONTROL

A. Contractor shall provide methods to control surface water to prevent damage to the Work, the Site, and adjoining properties as indicated on the Drawings.

B. Contractor shall divert water away from excavations and other construction areas, and direct drainage to proper runoff courses as required to prevent any erosion, damage or nuisance to adjacent areas. Contractor shall be responsible for damages caused by water disposal operations.

C. Contractor shall provide, operate and maintain equipment and facilities of adequate size to control water.

1.17 CONTROL OF POLLUTANTS

A. If fuel or other petroleum-based products will be stored on-site to support the equipment fleet, Contractor shall prepare and implement a Spill Prevention, Control and Countermeasures Plan (SPCC Plan) in accordance with the provisions of 40 CFR Part 112, Oil Pollution Prevention, latest edition. The SPCC Plan shall be submitted by the Contractor to the Engineer for review, and shall include, but shall not be limited to, the following:

1. Provisions for the prevention of spills as well as clean-up of spills of gasoline, diesel fuel, hydraulic fluids, and lubricants.

2. Names and telephone numbers of local and State officials to be contacted in the event of a spill.

3. List of subcontractors that may be used to manage offsite impacts of spills.

4. Fire prevention and firefighting measures to be employed for responses to fires that may occur in equipment, or elsewhere on the Site.

5. Services available from the local fire department and coordination with services of the Contractor's on-site personnel.

B. Contractor shall prevent disposal of wastes, effluents, chemicals, or other such substances into sanitary or storm sewers discharging offsite without regulatory approval.

C. Fueling of equipment shall be performed away from storm drain inlets. If aboveground fuel

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storage tanks (ASTs) are present onsite, the ASTs shall be stored in approved secondary containment areas.

D. Contractor shall provide systems for control of atmospheric pollutants. Contractor shall prevent dust, smoke or other emissions from interfering with the construction operations or impacting adjacent properties. Contactor shall prevent toxic concentrations of chemicals, and prevent harmful dispersal of pollutants into the atmosphere.

E. During construction, the Contractor shall (at a minimum) implement, monitor and maintain best management practices (BMPs) for erosion and sediment control, including airborne transport of sediment (dust carried by wind) and physical transport by vehicles as specified in Sections 01 57 13 and 31 23 00, and as indicated on the Drawings.

F. Contractor's equipment used during construction shall conform to all current federal and local laws and regulations.

1.18 FIELD OFFICES

A. Contractor shall furnish and maintain field office trailers for Contractor's and NAVFAC's and Engineer's use. The field office trailers shall be structurally sound, secure, and weather-tight, with floors raised above ground, and conform to all applicable regulations for the occupancy classification.

B. The field office trailers shall be equipped with sufficient lighting, electrical outlets, restrooms (or separate portable toilets), and heating, cooling and ventilating equipment and vents. All systems shall comply with applicable codes, laws and regulations.

C. Contractor shall provide a separate trailer for use by the Engineer and NAVFAC, equipped with sturdy office furniture, two offices with locking doors, a common meeting area and telephone and internet service in addition to the utilities listed above.

D. The field office trailers shall be located in an area accessible by passenger vehicles at a location approved by the Engineer and NAVFAC.

E. Contractor shall provide and maintain all required utilities for the temporary field offices and associated facilities necessary to support work crews in compliance with applicable codes, laws and regulations and as acceptable to NAVFAC and Engineer from time of mobilization until Substantial Completion of the Work.

F. Contractor shall prepare and submit a layout plan of all proposed field offices, and related amenities and utilities to be used for the duration of the Project. The layout plan shall be included in the Construction Management Plan as specified in Section 01 31 00. Contractor shall not proceed with furnishing and installation of the temporary field offices prior to NAVFAC and Engineer approval of location(s).

G. Contractor shall clean field offices and surrounding areas as specified in paragraph "SITE HOUSEKEEPING".

H. Contractor shall maintain the temporary field offices and related temporary utilities until Substantial Completion of the Work, at which time the temporary facilities shall be

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removed.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

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SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. Contractor shall implement and maintain best management practices (BMPs) and perform other required activities as indicated.

B. Related Sections:

1. Section 31 23 00 – Excavation and Fill

1.02 REFERENCES

A. ASTM International:

1. ASTM D 4355-07, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus

2. ASTM D 4491-99, Standard Test Methods for Water Permeability of Geotextiles by Permittivity

3. ASTM D 4533-11, Standard Test Method for Trapezoid Tearing Strength of Geotextiles

4. ASTM D 4632-08, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

5. ASTM D 4751-12, Standard Test Method for Determining Apparent Opening Size of a Geotextile

6. ASTM D 5261-10, Standard Test Method for Measuring Mass per Unit Area of Geotextiles

7. ASTM D 6241-04, Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

8. ASTM F 477-10, Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

B. Federal Highway Administration:

1. "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects", FP-03, Federal Highway Administration (FHWA Standard Specifications) (FHWA FP-03)

1.03 SUBMITTALS

A. Submit the following to the Engineer, for review and approval, prior to shipment of products to the Site:

1. Manufacturer's descriptive documentation (including material properties and technical data sheets) for geotextiles.

2. Manufacturer's descriptive documentation (including material properties and technical data sheets) for turf reinforcing matting.

3. Sample of turf reinforcing matting.

4. Sample of erosion control blanket.

1.04 PROJECT REQUIREMENTS

A. During construction, the Contractor shall (at a minimum) implement BMPs as indicated. The purpose of the provisions of the erosion and sediment control plan is to provide for the construction, monitoring (including reporting) and maintenance of temporary controls to control soil erosion and sediment transport within the Site and prevent the transport of sediment from the Site as a result of the Work.

B. The use of temporary controls shall be coordinated with the indicated permanent erosion control to the extent practical, to assure effective and continuous erosion control.

PART 2 PRODUCTS

2.01 GEOTEXTILE FOR ROCK CONSTRUCTION ENTRANCE

A. Geotextile Class "C" shall conform to Table 1 nonwoven geotextile.

2.03 GEOTEXTILE FOR SILT FENCE

A. Filter fabric or filter cloth conforming to Table 1 woven slit film geotextile.

2.04 GEOTEXTILE FOR SLOPE PROTECTION AND RIPRAP OUTLET PROTECTION

A. Geotextile conforming to Table 1 nonwoven geotextile.

2.05 GEOTEXTILE

A. Geotextile type as indicated for BMP, erosion and sediment control feature and with properties as indicated in Table 1.

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TABLE 1 GEOTEXTILE PROPERTIES							
		WOVEN SLIT FILM GEOTEXTILE		WOVEN MONOFILAMENT GEOTEXTILE		NONWOVEN GEOTEXTILE	
		MINIMUM AVERAGE ROLL VALUE[1]					
PROPERTY	TEST METHOD	MD	CD	MD	CD	MD	CD
Grab Tensile Strength	ASTM D 4632	200 lb	200 lb	370 lb	250 lb	200 lb	200 lb
Grab Tensile Elongation	ASTM D 4632	15%	10%	15%	15%	50%	50%
Trapezoidal Tear Strength	ASTM D 4533	75 lb	75 lb	100 lb	60 lb	80 lb	80 lb
Puncture Strength	ASTM D 6241	450 lb		900 lb		450 lb	
Apparent Opening Size[2]	ASTM D 4751	U.S. Sieve 30 (0.59 mm)		U.S. Sieve 70 (0.21 mm)		U.S. Sieve 70 (0.21 mm)	
Permittivity	ASTM D 4491	0.05 sec^{-1}		0.28 sec^{-1}		1.1 sec^{-1}	
Ultraviolet Resistance Retained at 500 hours	ASTM D 4355	70% strength		70% strength		70% strength	

[1] All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.

[2] Values for AOS represent the average maximum opening.

2.06 RIPRAP

A. Riprap shall conform to the requirements of Section 31 37 00.

2.07 DISTURBED AREA STABILIZATION WITH TEMPORARY SEEDING

A. Grass seed for temporary seeding shall be as indicated. Soil amendments (lime and fertilizer) shall conform to the requirements of Section 32 92 19.

2.08 DISTURBED AREA STABILIZATION WITH MULCH

A. Mulch shall be hydraulically applied wood fiber mulch or bonded fiber matrix (BFM) for the establishment of turf material.

2.09 TURF REINFORCING MATTING

A. Permanent, open weave, synthetic material consisting of non-degradable fibers or elements of uniform thickness and distribution of weave throughout conforming to FHWA FP-03 Section 713.18 Type 5.A (stable slopes up to 2H:1V and design shear stress up to 6.0 pounds per square foot).

B. Chemicals used in the mat must be non-leaching and non-toxic to vegetation and seed germination and non-injurious to the skin.

C. If present, netting must be extruded plastic with a maximum mesh opening of 2 by 2 inches and sufficiently bonded or sewn on 2 inch centers along longitudinal axis of the material to prevent separation of the netting from the parent material.

2.10 EROSION CONTROL BLANKET

A. Processed natural or polymer fibers mechanically-bound between two rapidly degrading, synthetic or natural fiber nettings to form a continuous matrix, with a 3-month typical functional longevity designed for use on geotechnically stable slopes with gradients up to 2H:1V.

B. Chemicals used in the mat must be non-leaching and non-toxic to vegetation and seed germination and non-injurious to the skin.

2.11 OTHER TEMPORARY CONTROLS

A. Furnish materials for other erosion and sediment controls as indicated.

PART 3 EXECUTION

3.01 GENERAL PROCEDURES

A. All Work under this Contract shall be performed in such a manner that objectionable sediment shall not be deposited in watercourses through or adjacent to the site.

B. Notify Engineer in the event of conflict between these specification requirements and pollution control laws, rules or regulations of federal and local agencies.

C. NAVFAC and Engineer shall have the authority to limit the surface area of erodible earth material exposed by clearing, excavation, borrow, and fill operations and to direct the Contractor to provide, at no additional cost to the Project, immediate, permanent or temporary controls to minimize effects on adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment.

D. Incorporate all permanent erosion and sediment control features (including seeding) into the Project at the earliest practical time upon NAVFAC's and Engineer's approval of grading and cap construction work.

3.02 CONSTRUCTION OF ROCK CONSTRUCTION ENTRANCE

A. As indicated.

3.03 INSTALLATION OF COMPOST FILTER SOCK

A. Prior to any land disturbance or as otherwise indicated on the Drawings, install compost filter sock as indicated.

B. At a minimum, compost filter sock shall be installed at all locations along the construction limits where surface water can leave the construction area. This applies to all locations shown or noted on the Drawings and in other areas determined in the field to require compost filter sock.

C. At the time of installation, the filter sock will be rejected if it has defects, deterioration or damage incurred during manufacture, transportation, storage or installation. Replace at no additional cost to the Project.

3.04 CONSTRUCTION OF RIPRAP OUTLET PROTECTION

A. As indicated.

3.05 CONSTRUCTION OF TURF REINFORCING MATTING

A. As indicated or per manufacturer's specifications.

3.06 CONSTRUCTION OF EROSION CONTROL BLANKET

A. As indicated or per manufacturer's instructions.

3.07 TEMPORARY SEEDING AND MULCHING

A. Application rates, locations and timing for soil amendments, temporary seeding and mulching shall be as indicated.

3.08 DUST CONTROL

A. During construction, the Contractor shall (at a minimum) implement, monitor and maintain best management practices (BMPs) for control of dust and physical transport by vehicles as specified in Section 31 23 00 and as indicated on the Drawings.

B. Control dust particles, smoke, aerosols and gaseous by-products from construction activities at all times, including weekends, holidays and hours when the Work is not in progress.

C. Maintain excavations, haul roads, stockpiles, and other areas within the Work area free from particulates which would cause the air pollution standards to be exceeded or cause a hazard or nuisance. Dust control shall also be implemented on public roads as approved by NAVFAC and Engineer.

D. Provide all labor, materials and equipment, including water trucks and dust suppressant, needed to limit visible dust generation during the Work.

3.09 CONSTRUCTION OF OTHER TEMPORARY CONTROLS

A. Install and construct other required erosion and sediment controls as indicated.

3.10 INSPECTION AND MAINTENANCE

A. Temporary erosion and sediment controls shall be inspected and maintained as indicated.

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3.11 REMOVAL OF TEMPORARY CONTROLS

A. Remove check dams, perimeter dike, sediment trap, rock construction entrance, and compost filter sock at completion of the Project when approved by NAVFAC and Engineer. The areas upgradient from the compost filter sock shall be sufficiently stabilized with permanent controls as specified and shown on the Drawings prior to removal.

END OF SECTION

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SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:

1. Definition of products

2. Transportation and handling

3. Storage and protection

4. Product options

5. Substitutions

1.02 DEFINITION OF PRODUCTS

A. The term "Products" refers to new material, components, equipment, fixtures, and systems forming the Work. Products do not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.

1.03 TRANSPORTATION AND HANDLING

A. Comply with the requirements of individual specification sections.

B. Transport and handle products in accordance with manufacturers' instructions.

C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

D. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, and damage.

1.04 STORAGE AND PROTECTION

A. Comply with the requirements of individual specification sections.

B. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.

C. For exterior storage of fabricated products, place on sloped supports, above ground.

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D. Provide off-site storage and protection when site does not permit on-site storage or protection.

E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store products by methods to prevent damage.

H. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1.05 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications; no options or substitutions allowed without written authorization by the Engineer.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

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SECTION 01 71 23

CONSTRUCTION SURVEYING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: field surveying for control and documentation of the lines, grades and elevations of the Work; and preparation of record survey drawings.

1.02 QUALITY CONTROL

A. Record surveys for review and approval shall be performed by an independent surveying firm with a Registered Land Surveyor (RLS) licensed and registered in New York, retained by the Contractor, and acceptable to NAVFAC and Engineer.

B. Day to day surveying for Contractor's control purposes can be performed by Contractor's own surveyors.

1.03 SUBMITTALS

A. Prior to start of the Work, submit the following qualifications documentation for proposed RLS: name, address, telephone number, and photocopy of registration of RLS.

B. At completion of the Work (or as otherwise requested by the Engineer), all field notes, computations, data logger information, and other survey records for the purposes of layout, initial, progress and final surveys shall be provided to the Engineer.

C. At designated stages in the Work, and at completion, submit record survey drawings certified by the RLS, along with computer files in AutoCAD Land Development as required in individual specification sections and generally discussed in paragraphs "RECORD SURVEYING DURING WORK EXECUTION" and "DOCUMENTATION OF THE WORK". Submit PDF files in addition to the AutoCAD files. One hard copy and two electronic copies (AutoCAD and PDF files) of each drawing shall be submitted. Redline mark-ups of the Drawings are not acceptable. A digitized tracing of a manually drawn record survey drawing, derived from non-digital surveying techniques, is also not acceptable.

1.04 SURVEY REFERENCE POINTS

A. NAVFAC's surveyor has established survey control monuments for vertical and horizontal control for the Work. Control datum for survey is that indicated on the Drawings.

B. Locate and protect survey control and reference points.

PART 2 PRODUCTS

Not used.

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PART 3 EXECUTION

3.01 GENERAL SURVEY REQUIREMENTS

A. Utilize recognized engineering survey practices appropriate for obtaining the information specified. The Contractor can use either an independent surveyor or their own employees and GPS equipment. The as-builts and payment surveys must be conducted by a New York licensed surveyor. NAVFAC has the right to confirm the survey/payment quantity through independent surveys.

B. Protect and preserve temporary and permanent reference points during construction. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated reference points based on original survey control. Make no changes without prior written notice to Engineer.

C. The Work shall be executed in conformance with the lines and grades shown on the Drawings, unless otherwise approved by the Engineer.

D. Establish elevations, lines and levels required for all items of the Work.

3.02 RECORD SURVEYING DURING WORK EXECUTION

A. Elevations of existing ground surface shall be surveyed prior to commencement of GCL installation and final cover placement.

B. Field surveys shall be performed during cover placement to accurately measure the depth of cover and to verify that the indicated minimum thickness of soil over the cover has been placed. Measurements and determinations of cover depth shall be performed in "real time" so as to expedite the approval of subdivided portions of the Site.

C. The surveys shall be accomplished using GPS equipment or other suitable survey equipment as approved by the Engineer.

D. All survey equipment shall be calibrated on-site on a daily basis and prior to any data collection.

E. Partial record surveys shall be provided to the Engineer and NAVFAC as specified in paragraph SUBMITTALS.

3.03 DOCUMENTATION OF THE WORK

A. Maintain a complete and accurate log of control and survey work as it progresses.

B. Record survey drawings shall be prepared to fully document the Work, as specified in individual specification sections.

C. The surveys shall be performed at the specified grid spacing, and at all changes of grade sufficient to define the subject topography.

D. Promptly submit the drawings (with computer files) to Engineer for review for each

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subdivided portion of the Site at critical stages of construction as specified.

E. Contractor's RLS shall prepare and certify the record survey drawings.

END OF SECTION

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SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:

1. Final cleaning and demobilization

2. Closeout requirements

3. Substantial completion procedures

4. Final inspection procedures

5. Closeout submittals

1.02 FINAL CLEANING AND DEMOBILIZATION

A. After completion of construction activities, Contractor shall be responsible for cleaning of the Site and demobilization prior to the Engineer's and NAVFAC's final acceptance of the Work.

B. Disturbed areas not otherwise addressed during construction shall be restored by Contractor to conditions that existed prior to the Work.

C. Any remaining excess erosion and sediment control materials, including riprap, may be staged by the Contractor at the Site at NAVFAC's discretion in the event that maintenance is required during the first year.

D. Demobilization shall include, but shall not be limited to, the following:

1. Removal of all of Contractor's equipment, office trailers, and materials from the Site.

2. Removal of temporary facilities.

3. Disconnection and removal of temporary utilities in accordance with the requirements of the local authorities.

4. Removal and disposal of all trash, excess materials and debris created by or brought on-site during the Work.

E. Final demobilization of personnel and equipment shall not proceed until all punch list items identified in the pre-final inspection (specified in subsection 1.04) have been performed to the satisfaction of NAVFAC, Engineer, and the NYSDEC.

1.03 CLOSEOUT REQUIREMENTS

A. Contractor shall comply with the requirements of the Contract Documents, and as herein specified, for substantial completion procedures, final inspection, final application for payment, final payment and acceptance, and related topics.

1.04 SUBSTANTIAL COMPLETION PROCEDURES

A. Within 14 days after substantial completion of the Work, Contractor shall submit a written notice to NAVFAC and Engineer.

B. Promptly after receipt of such notice, representatives of NAVFAC, Engineer, and NYSDEC, and other required parties will schedule a pre-final inspection to determine the status of completion. The inspection will consist of a walk-through of the Site, or designated portion thereof. The inspection is to determine whether the Work (or designated portion thereof) is substantially complete, is consistent with the Drawings and Specifications, and conforms to the requirements of NYSDEC.

C. If NAVFAC, Engineer, and other required parties determine that the Work is not substantially complete, the Contractor will be promptly notified in writing. Contractor shall remedy the deficiencies in the Work, and send a second written notice to the Engineer and NAVFAC. A re-inspection will then be made at the Contractor's cost.

D. When the NAVFAC, Engineer, and other required parties find that the Work is substantially complete, the Engineer will execute and deliver to the NAVFAC and the Contractor a Certificate of Substantial Completion with a list of items (punch list) to be completed or corrected.

1.05 FINAL INSPECTION PROCEDURES

A. When Contractor considers the Work is complete, and within 14 days after completing the punch list items, Contractor shall submit written certification that the Work is completed and ready for final inspection.

B. NAVFAC, Engineer, NYSDEC, and other required parties will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.

C. If NAVFAC, Engineer, and other required parties consider that the Work is incomplete or defective:

1. The Contractor will be promptly notified in writing, listing any incomplete or defective work.

2. Contractor shall take immediate steps to complete such Work or remedy the stated deficiencies, and send a second written certification to NAVFAC and Engineer that the Work is complete and ready for final inspection.

3. A re-inspection will then be made at the Contractor's cost.

D. When NAVFAC, Engineer, and other required parties find that the Work is acceptable,

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NAVFAC will request the Contractor to make final administrative closeout submittals.

1.06 CLOSEOUT SUBMITTALS

A. Contractor shall submit all required close-out documents required by NAVFAC, including but not limited to:

1. Final Application for Payment

2. Warranties

3. As-built documentation.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

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SECTION 02 01 51

POST-CONSTRUCTION MAINTENANCE

PART 1 GENERAL

1.01 SUMMARY

A. Section includes post-construction maintenance of the Site for a period of 30 months from completion of on-Site Work and final acceptance of site construction activities.

B. NAVFAC to provide an O&M Plan to Contractor prior to initiating the 30 month maintenance period. NYSDEC approval of the O&M Plan is expected within 6 months of completion of on-site Work and final acceptance of site construction activities.

C. Related Sections:

1. Section 31 23 00 - Excavation and Fill
2. Section 32 92 19 – Seeding
3. Section 02 93 43 - Trees

1.02 SUBMITTALS

A. Submit the following for review and approval during the Work:

1. Inspection reports

Contractor shall prepare a report for each inspection or repair performed in a format approved by NAVFAC and Engineer. These reports shall be submitted to the Engineer within seven calendar days of performing the inspection or repair.

1.03 MAINTENANCE REQUIREMENTS

A. The Contractor shall be responsible for the post-construction maintenance of the site in accordance with the requirements of this section for a period of 30 months from completion of on-site Work and final acceptance of site construction activities. Date of completion of on-site Work will be determined by the Engineer. The Contractor shall be responsible for all costs associated with operating equipment and to maintain the integrity of the site and any portions of the work. Specifically, but not limited to, the Contractor shall:

1. Maintain the integrity and effectiveness of the remedy, including making repairs to the soil cover as necessary to correct the effects of settling, subsidence, erosion, or other damage.
2. Prevent storm water runoff from eroding or otherwise damaging the soil cover.
3. Maintain erosion and sediment controls, as needed.
4. Remove accumulated sediment from erosion and sediment controls as needed to ensure sufficient retention.

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5. Maintain the storm water management system including channels, culverts, perimeter ditches, letdown structures, rip rap, slope protection, and inlet and outlet protection.

6. Maintain the integrity and effectiveness of the chain-link security fence and gates installed under this contract.

1.04 NOTIFICATION

A. The Contractor shall notify NAVFAC in writing 30 days prior to the date that the Contractor intends to transfer site monitoring and maintenance responsibility over to NAVFAC.

1.05 MAINTENANCE

A. During the maintenance period following the completion of construction, the following shall be addressed:

1. Cover Maintenance. The vegetative cover of slopes less than 3H:1V shall be mowed to develop good grass growth and control erosion. Mowing shall not cut vegetative cover down to less than three inches in height and care shall be taken to not create vegetation mats that hinder growth. A minimum of 2 mowings will be performed during the initial 12-month operation and maintenance period. Slopes steeper than 3H:1V will not be mowed during maintenance activities. Revegetation shall be performed for areas noted during inspection to have poor vegetative growth and the area maintained in accordance with the applicable provisions of Sections 01 57 13, 31 23 00, and 32 92 19.

2. Erosion Control Maintenance. Erosion identified during site inspections shall be repaired as needed in a manner which provides a long-term solution to such damage as approved by Engineer. The activities required to repair erosive damage to the soil cover will depend on the extent of the erosion. The disturbed area shall be revegetated in accordance with the applicable provisions of Sections 01 57 13, 31 23 00, and 32 92 19. The final grades of all repaired areas shall conform to the grades and slopes indicated on the Drawings.

3. Settlement and Subsidence Control. Settled areas that may require repair shall be investigated to assess the cause of the displacement and the need for corrective measures. If settlement occurs that indicates potential failure of the cover (i.e., a significant depression in the cover), the damaged area shall be repaired or replaced, as necessary. Repaired areas shall be regraded to blend with the uniform grades and slopes of the constructed cover. If relatively minor differential settlement occurs, topsoil or aggregate as required shall be placed on the affected area to bring it back to grade. The location and degree of settlement where repairs are made shall be documented. If necessary as determined by the Engineer, the settled area shall be surveyed to measure the actual extent of settlement. In the event of continued settlement in the same area, the degree of settlement will be assessed by the Engineer with respect to past settlement and appropriate repair action implemented by the Contractor after investigation. Repairs may include among other options, placing fill or aggregate, re-establish original

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grades, and vegetating disturbed areas.

4. Fence Maintenance. Routine fence and gate inspections will identify holes in the chain-link and erosion rills or animal burrows beneath the fence. Repairs shall be implemented within seven days of identification. Routine fence maintenance will include removing trees which fall over fence. Fence repairs shall be made to restore the fence to its original condition.

1.06 MAINTENANCE INSPECTIONS

A. All designated site features shall be inspected on a scheduled routine basis. Frequency of inspection shall be monthly from months 1 through 12 and quarterly from months 13 through 30. Additional inspections shall be conducted within 24 hours of each rainfall event that meets or exceeds 0.5 inch over a 24-hour period, as needed.

1.07 NOTIFICATION

A. The Contractor shall notify the Engineer in writing at least 10 working days in advance of conducting major maintenance activities. Major maintenance activities shall be defined as those activities that cannot be completed within one working day during the site inspection. The Contractor shall identify the maintenance activities to be conducted and the personnel, equipment, and materials that will be used to conduct the required maintenance. The Engineer will, at his discretion, approve the maintenance activity, or provide the Contractor with alternative specifications for the repairs to be conducted.

1.08 REPRESENTATION

A. A representative of NAVFAC may be present on site to witness maintenance activities. NAVFAC's representative will determine whether the maintenance activities have been completed in a manner acceptable to NAVFAC.

1.09 REPORTING

A. The Contractor shall prepare inspection reports that include, at a minimum, a completed Inspection Form, accident reports, if any, and documentation of any corrective measures needed or implemented since the previous inspection. The report shall also include a listing of equipment or materials used for the corrective measures and a description of the measures implemented. The Inspection Form shall be submitted to the Engineer within seven working days after completion of maintenance/repair activities.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

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SECTION 02 81 02

TRANSPORTATION AND DISPOSAL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, material, tools and equipment necessary for the transportation of contaminated materials. Work includes preparing Bills of Lading and Hazardous Waste Manifests as required and ensuring the material to be disposed conforms to the acceptance criteria for disposal in the approved disposal facilities.

1.02 RELATED WORK

A. Health and Safety Plan is included in Section 01 35 36.

B. Earthwork is included in Section 31 23 00.

1.03 SUBMITTALS

A. Submit to the Engineer for review, a single submittal, all pertinent information relating to the transport of materials specified herein, within 14 days after issuance of Contract Award. The information submitted shall include, at a minimum:

1. Name and address of all contaminated material and hazardous waste transporters to be used to complete the project.
2. New York Department of Transportation Transporter Identification Number and expiration date.
3. Proof of permit, license, or authorization to transport hazardous material in New York.

1.04 REGULATORY REQUIREMENTS

A. The requirements governing hazardous material health and safety contained in Section 01 35 26 Hazardous Materials Health and Safety Plan Requirements and all other applicable Federal, State and local laws, codes and ordinances, which govern or regulate hazardous materials and wastes, shall apply to the work of this Section, including the New York Hazardous Waste Regulations, United States Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) regulations at 40 CFR 261-268, and polychlorinated biphenyl (PCB) regulations at 40 CFR 761.

B. The contractor shall coordinate with NAVFAC and Engineer to deliver contaminated materials to approved disposal facilities upon suitable documentation that the properties of the materials to be disposed meet disposal facility requirements.

C. The Contractor shall obtain all Federal, State and local permits, as needed, required for the transport of contaminated material. The Contractor shall adhere to all permit requirements.

PART 2 PRODUCTS

2.01 GENERAL

A. All Contractor personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this Work as indicated in the Health and Safety Plan.

PART 3 EXECUTION

3.01 GENERAL

C. NAVFAC will be the generator and will sign waste profiles, hazardous waste manifests, non-hazardous waste manifests, bills of lading and material shipping records.

3.02 DISPOSAL FACILITY TESTING

A. The Contractor shall excavate contaminated soil material in accordance with the requirements of specification Section 31 23 00. The Contractor shall provide the means for, and be responsible for coordinating with NAVFAC, characterizing the soil for final disposal of hazardous materials, surplus soil, and unsuitable soil. The Contractor will collect soil samples to perform testing required for disposal.

B. Characterization sampling will be required for every 500 cubic yards of soil excavated. Characterization samples will be analyzed for PCBs, ignitability, corrosiveness, reactivity, TCLP metals, target compound list (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), pesticides, and herbicides.

3.03 WASTE PROFILES AND SHIPPING DOCUMENTS

A. Prepare all manifests and, if necessary, land ban certifications. Submit these to NAVFAC for review at least 3 days before transport.

B. Submit to NAVFAC and the Engineer documentation certifying that all materials were transported to and accepted at the disposal facility. Documentation to include:

1. Facility signed manifests, original bills of lading and material shipping records.

2. Certified tare and gross weights for each load.

3.04 TRANSPORT AND DISPOSAL

A. Transport in accordance with all United States Department of Transportation (DOT), USEPA and New York State regulations.

B. The Contractor shall be responsible for ensuring that free-liquid does not develop during transport. "Wet soils" shall not be loaded for transport. The Contractor shall be responsible to coordinate with NAVFAC to properly dispose of any free liquids that may result during transportation.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Section includes cast-in-place concrete construction of headwalls, endwalls, wingwalls, and miscellaneous structures.

B. Related Sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control
2. Section 31 23 00 – Excavation and Fill
3. Section 33 40 00 – Storm Drainage Utilities

1.02 REFERENCES

A. American Concrete Institute International (ACI)

1. ACI 318 (2011; Errata 2011; Errata 2012) Building Code Requirements for Structural Concrete and Commentary

B. ASTM International:

1. ASTM C 31-12, Standard Practice for Making and Curing Concrete Test Specimens in the Field
2. ASTM C 33, Standard Specification for Concrete Aggregates
3. ASTM C 39-12a, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
4. ASTM C 138 - 13a, Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
5. ASTM C 143 – 12, Standard Test Method for Slump of Hydraulic-Cement Concrete
6. ASTM C 150, Standard Specification for Portland Cement
7. ASTM C 173- 12, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
8. ASTM C 192 - 13a, Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

9. ASTM C 231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

10. ASTM C 1064 – 12, Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete

11. ASTM D 3212-07, Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

12. ASTM F 477-10, Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

C. NYSDOT Standard Specifications

1.03 SUBMITTALS

A. Submit the following to the Engineer, for review and approval, prior to shipment of materials to the Site:

1. Concrete mix designs

2. Manufacturer's product data sheets for reinforcing steel, concrete admixtures, curing aids, and other materials.

3. Provide shop drawings sealed by a registered Professional Engineer for headwalls, endwalls, wingwalls, or other concrete structure.

B. Submit the following during the Work:

1. Provide hardcopy delivery ticket with each batch of concrete before unloading at the placement site. Delivery ticket shall include the following:

i. Materials and quantities incorporated into the batch

ii. Arrival time at jobsite

iii. Time that concrete mix has been completely placed

iv. Number of revolutions upon arrival at the jobsite

v. Additional mixing revolutions when water is added

vi. Total number of revolutions at mixing and agitating speed

vii. Signature of the batcher responsible for production of the batch of concrete certifying/verifying the following:

1. the batch of concrete was produced in accordance with the Specifications

2. chloride test results on the delivery ticket meet the Specification requirements

3. design mix maximum specified water to cementitious materials ratio was not exceeded due to any jobsite adjustments to the batch of concrete

4. batch of concrete was delivered and placed as indicated.

2. Cast-in-place concrete sampling and testing for slump, air content, chloride content, density and yield, temperature, and compressive strength. Slump, air content, chloride content, density and yield, temperature, and compressive strength shall be determined at a frequency of one set of tests per 50 cubic yards of concrete, or one day's production, whichever is less.

1.04 QUALITY CONTROL

A. Contractor's QC Firm shall perform specified tests to determine conformance of the materials and constructed work with the Specifications.

B. Acquire cement and aggregate from one source each for Work.

1.05 PROJECT CONDITIONS

A. Concrete placement and finishing shall be performed only during periods of acceptable weather conditions.

B. Coordinate concrete construction with site grading work, pipe installation, and other related construction.

PART 2 PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials shall be approved by the Engineer as specified prior to delivery and use in the construction.

2.02 CAST-IN-PLACE FEATURES

A. Headwalls, endwalls, wingwalls, and other structures shall be designed in accordance with NYSDOT Standard Specifications. Wingwall skew and elevation (parallel or tapered) as required to meet site conditions.

B. Provide reinforced concrete curbing as required. Curbing width shall be eight inches or match the thickness of existing curb, and shall extend 8 inches above indicated final grade.

C. Design criteria for concrete structures as follows:

1. Settlement: no significant long-term settlement anticipated

2. Portland Cement Concrete:

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i. Environmental Class: aggressive environment

ii. Cement: ASTM C 150 Type II moderate heat of hydration (MH)

3. Class of Concrete:

i. Class A

ii. Mix proportions: as indicated

iii. Chloride content: 0.40 pounds per cubic yard maximum

iv. Slump: as indicated

v. Air content: as indicated

vi. Minimum compressive strength (28-day): 4,000 pounds per square inch

4. Reinforcing steel: Grade 60 in accordance with NYSDOT Specifications

5. Cover for reinforcing steel cover: 3 inches minimum

2.02 REINFORCEMENT STEEL FOR MISCELLANEOUS STRUCTURES

A. Reinforcement bars shall conform to the requirements of Section 556 of the NYSDOT Standard Specifications.

B. Furnish devices for elevating and supporting reinforcement in correct position.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. No concrete for a specific pour shall be ordered for delivery to the site until pertinent concrete mix design and specified materials are approved by the Engineer.

3.02 SUBGRADE PREPARATION

A. Verify that subgrade has been excavated, graded and compacted (as applicable) to the required elevations and dimensions indicated on the Drawings and as specified in Section 31 23 00.

B. Remove and dispose of debris and other unsuitable material from the subgrade surface.

C. Maintain subgrade in a smooth, compacted condition until completion of concrete placement. Subgrade shall be in a moist condition when concrete is placed.

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3.03 CONCRETE STRUCTURES

A. Section 550 of the NYSDOT Standard Specifications as applicable.

3.04 CORRECTION OF DEFECTIVE WORK

A. Concrete work that does not conform to the specified requirements (including strength, tolerances, and finishes) shall be corrected as determined by the Engineer.

END OF SECTION

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SECTION 10 88 00

TRUCK SCALE AND APPURTENANCES

PART 1 GENERAL

1.01 SCOPE OF WORK

D. Furnish all labor, materials, equipment and incidentals required and install, complete in every detail, truck scale with all appurtenances including scale pit and approach slabs as shown on the Drawings and as specified herein.

E. Provide the services of a Professional Engineer registered in the State of New York to be the Engineer of Record for the scale pit and approach slabs.

1.02 RELATED WORK

A. Earthwork is included in Section 31 23 00.

B. Bituminous Paving is included in Section 32 12 16.

C. Concrete and Reinforcing Steel is included in Section 03 30 00.

1.03 SUBMITTALS

A. Submit certified shop drawings and other material required to establish compliance with this Section. Shop drawings shall show details of design, materials, and dimensions of the equipment, complete electrical wiring diagrams and foundation, pit, approach slabs, anchor bolt-setting plans, and anchor bolt type and embedment. Submittals shall include the following:

3. A complete total bill of materials for all equipment.

4. A list of the manufacturer's recommended spare parts.

5. If conformance with certain details of this Section is not practical due to different manufacturing techniques, describe completely all non-conforming aspects.

6. Complete instructions for the assembly and installation of the equipment shall be furnished with the shop drawings. The instructions shall include specifications for the concrete and complete installation instructions for the concrete deck surface.

7. Operation and Maintenance Data

a. Submit an operation and maintenance manual prepared specifically for this installation, which shall include all required cuts, drawings, equipment list, descriptions, maintenance and lubrication schedules, trouble shooting guides, spare parts lists, etc., that are required to instruct personnel unfamiliar with such equipment.

b. A factory representative who has complete knowledge of the proper operation and maintenance shall be provided for up to 3 days to instruct representatives of NAVFAC and the Engineer on proper operation and maintenance. This work may be conducted in

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conjunction with the inspection of the installation and testing as provided under Paragraph 3.02 below. If there are difficulties in operation of the equipment due to the manufacturers' design or fabrication, additional service shall be provided at no additional cost to NAVFAC.

6. Drawings for the scale pit and approach slabs. Include plans, elevations, sections, details, and attachments to other work. All drawings shall be signed and sealed by a Professional Engineer registered in the state of New York.

B. P.E. Certification form signed and stamped by the Engineer of Record responsible for the design of the scale pit and approach slabs.

1.04 REFERENCE STANDARDS

A. ASTM International

1. ASTM A36 - Standard Specification for Carbon Structural Steel

B. The Society for Protective Coatings (SSPC)

8. SSPC SP6 - Surface Preparation Specification No. 6 Commercial Blast Cleaning

9. SSPC SP8 - Surface Preparation Specification No. 8 Pickling

C. American Institute of Steel Construction (AISC)

D. American Welding Society (AWS)

E. Where reference is made to one of the above standards, the revision in effect at the time of the Work shall apply.

1.05 QUALITY ASSURANCE

A. All the equipment specified herein shall be standard products in regular production and shall be furnished by a single manufacturer who is fully experienced, reputable and qualified in the manufacture of the equipment furnished.

1.06 SYSTEM DESCRIPTION

A. The truck scale shall meet the following performance and design criteria:

1.	Width:	11 ft
2.	Length:	72 ft
3.	Deck Thickness:	3/8 in
4.	End Plate Thickness:	3/4 in
5.	Concentrated Load Capacity (CLC):	100,000 lbs

6. End Wall – Load Cell Distance:	10 in
7. Structural Beams:	10 in
8. Load Cell Access:	Large Top Access Cover Plates
9. Steel Beam Preparation:	Shot Blast Cleaned to SSPC-SP6
10. Paint System:	Two Part Epoxy Primer & Two Part Polyurethane Coat
11. Foundation Access:	Center and Sectional Cover Plates
12. Load Cell Capacity:	75,000 lbs / Analog Compression Column
13. Load Cell Material / Sealing / IP Rating:	Stainless / Hermetically Sealed / IP68
14. Load Cell Cable:	Integral, Polymer Coater, Stainless Steel Sheathed Cable
15. Load Cell Summing Box:	Fiberglass Reinforced Plastic, NEMA 4 Protection
16. Summing Board:	4-Cell Summing Boards with GDT Surge Protection Devices
17. Indicator:	Dialogik Indicator
18. Printer:	Ticket Printer

B. Weighing shall be of the mechanical/electronic design using mechanical levers and an electronic load cell. Electronic signal shall be transmitted by an underground shielded cable to data center.

F. Data center appurtenances shall include a solid state data accumulator, digital indicator with keyboard, and printer. These appurtenances shall meet the following performance and design criteria.

1. Solid state data accumulator, indicator and keyboard unit:

   a. Digital display: 6 digits minimum
   b. Alpha display: 10 characters minimum
   c. Weight capacity range: 6 digits minimum
   d. Weight graduation increments: 20 pound maximum
   e. Inbound weight storage: 20 trucks minimum
   f. Product code accumulation: 40 products minimum
   g. Units: pounds with conversion capability to kilograms

2. Printer

   a. Paper size: 8-in by 5-1/2-in minimum ticket

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b. Print characters: 40 characters per line (minimum)
c. Print paper copies: minimum four copies

1.07 SCALE PIT AND APPROACH SLABS PERFORMANCE REQUIREMENTS

A. Scale pit shall be designed for maximum loads from the truck scales.

B. The approach slabs shall be designed in accordance with AASHTO requirements.

C. Design the scale pit for an allowable bearing capacity of 2.0 ksf.

D. Design scale pit foundation for a frost depth of 54" below finished grade.

E. Concrete design and details shall be in accordance with Section 03 30 00.

1.08 MAINTENANCE

A. Special tools if required for normal operation and maintenance shall be provided.

B. Furnish all spare parts recommended by the manufacturer for the normal operation and maintenance of the equipment and including the following minimum inventory:

1. Three typing ribbons

2. 1000 blank tickets (four carbon copy-type)

3. One set of printed circuit boards for all components

4. One load cell

PART 2 PRODUCTS

2.01 GENERAL

A. The equipment furnished shall be designed and constructed in accordance with the best practices and methods and to operate satisfactorily when installed as described herein.

B. All parts shall be designed and proportioned as to have liberal strength, stability, stiffness and to be especially adapted for the work to be done. Ample room and facilities shall be provided for inspection, repairs and adjustments.

C. This Section calls attention to certain features but does not purport to cover all details of construction of the equipment.

D. All structural steel used in the fabrication of the equipment shall conform to the requirements of the ASTM A36.

E. Design and fabrication of structural steel members shall be in accordance with the latest AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings".

F. All welding shall conform to the latest Standards of the AWS.

G. The scale and accessory equipment shall conform to or exceed the requirements of National Bureau of Standards Handbook 44 for use in commerce.

H. Weighing levers shall be high strength cast iron or steel and shall be guaranteed against structural defects for at least 15 years.

I. All other scale parts shall have at least a 1 year manufacturer guarantee.

J. Scale software equipment, readouts and printers shall be located in the elevated scale operator booth.

2.02 EQUIPMENT

A. The scale shall be BTek Centurion AT Truck Scale, or approved equal. The scale manufacturer shall provide all necessary pit coping and steel and foundation bolts and nuts.

B. Suspension connections between levers shall be adjustable to allow all parts to be kept in true vertical and horizontal position. The main lever suspension assembly shall have a vertical adjustment permitting leveling of the platform at all corners. All bearings shall be self-aligning to insure continuous full contact with knife edge pivots.

C. The scale deck shall be equipped with two access manhole rings and covers. The covers shall be of similar materials to the scale platform and shall be able to withstand full truck loadings.

D. The load cell shall measure and transmit the measurement through shielded flexible cables to the indicator. The cable shall be furnished by the manufacturer. Appropriate load cell linkage and junction box shall also be provided.

E. The weight shall be indicated by an electronic solid state, digital indicator located in the operator booth. The unit shall be mounted on a counter top and arranged with the readout window and operating panel with control buttons and switches at the front.

F. The equipment shall have the capability of storing inbound weights in memory with the ability to recall these weights and print a gross, tare, net weight ticket on the outbound weighment.

G. The equipment shall be capable of accumulating by product code net weights entering or leaving the facility. This information shall be available via a report as well as a report of total net pounds entering or leaving the facility.

H. The equipment shall be capable of displaying the net weights of a gross load on the scale by entering a known tare and print a gross, net, tare ticket.

I. The equipment shall be Fairbanks, Model No 8811; Toledo, Model TSM 3000 and 8132 or equal and equipped with automatic zero tracking system which continuously tracks slow zero balance drift of the system and automatically switches out of this mode of operation when a load is applied to the scale. Snow or dirt accumulation shall be automatically compensated for so that the scale remains balanced at zero.

J. In addition, the instrument shall be capable of self-diagnostics, equipped with an automatic tare range to full capacity, equipped with radio frequency and electrical interference, filtering.

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K. The printer shall be solid state, microprocessor design. The printing impact should be capable of adjustment to produce readable data through all copies. The printer shall print on command from either the digital indicator on its own print button.

L. A surge voltage protection system shall be furnished to protect the equipment from surges in the power supply due to lightning or power company surges. The system shall be two-stage type with a response time of less than one millionth of a second. Grounding rods shall be furnished at the load cell, at each pit corner, and each cable connecting point. Surge voltage protection shall be Fairbanks, Model No 1403; Toledo, Model 913 or equal.

M. Electrical power requirements shall be 120 VAC, 60 Hz.

N. A gravity scale pit drain shall be provided and located to be capable of evacuating all storm water from the scale pit.

2.03 PAINTING

A. All ferrous surfaces shall receive a prime coat and finish coat of paint at the manufacturer's shop. Prior to shop painting, all surfaces shall be thoroughly cleaned, dry, and free from all mill scale, rust, grease, dirt, paint and other foreign substances by sand blasting or pickling in accordance to SSPC-SP6 or SSPC-SP8, respectively.

B. Gears, bearing surfaces or other surfaces obviously not to be painted shall be given a heavy shop coat of grease or other rust resistant coating suitable for protection of the equipment during periods of storage and until such time as the equipment is started up for testing and operation.

PART 3 EXECUTION

3.01 INSTALLATION

A. Scale, scale pit, approach slabs, and accessories shall be installed where shown on the Drawings and in accordance with manufacturer's approved shop drawings and installation procedures.

B. Load cell cable shall be supplied under this Section including the furnishing and installation of conduit, installation of load cable, and connecting cable from scale to operations.

3.02 INSPECTION AND TESTING

A. The Contractor shall require the manufacturer to furnish the services of a factory representative for 3 days, who has complete knowledge of proper operation and maintenance to inspect the final installation, calibrate the equipment, and supervise a test run of the equipment.

B. If the scale or any electronic equipment does not meet the requirements specified herein, corrective measures shall be taken or the equipment removed and replaced with equipment which does meet these requirements.

3.03 RESTORATION

A. At project completion, Contractor shall remove and demobilize from Site as appropriate, scale, ancillary equipment, operator booth, foundations, and electrical power supply.

B. The scale area shall be returned to conditions that existed prior to scale installation, including pavement replacement as applicable.

END OF SECTION

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SECTION 31 10 00

SITE CLEARING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: clearing of trees and other vegetation within the designated "Limits of Disturbance".

B. Related Sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control

1.02 REFERENCES

A. U.S. Composting Council (UCC):

1. UCC Testing Methods for the Examination of Compost and Composting (TMECC) 02.02-B, "Sample Sieving for Aggregate Size Classification".

2. UCC TMECC 03.08-A, "Classification of Inerts by Sieve Size".

3. UCC TMECC 05.07-A, "Loss-On-Ignition Organic Matter Method (LOI)".

1.03 SUBMITTALS

A. Submit compost quality control test results during composting operation.

1.04 QUALITY ASSURANCE

A. Conform to applicable local codes for disposal of cleared and grubbed vegetation.

1.05 PROJECT CONDITIONS

A. Site clearing shall be performed in a manner that does not disturb designated areas (except as specified) and does not disturb existing facilities not indicated to be removed.

PART 2 PRODUCTS

2.01 SLASH MATERIAL

A. Slash material derived from site clearing and grubbing shall be comprised of trees, limbs, roots, stumps, brush and tops generated during land clearing. Slash material may be of various sizes less than 12 inches in diameter. Slash materials shall not contain rock, soil, or deleterious material. Material passing a four inch sieve shall not exceed 10 percent of the total slash material by volume.

2.02 COMPOSTED PRODUCTS

A. Compost products shall be the result of the biological degradation and transformation of organic materials under controlled conditions designed to promote aerobic decomposition. Compost shall be stable with regard to oxygen consumption and carbon dioxide generation. Compost shall be mature with regard to its suitability for serving as a soil amendment. The compost shall have a moisture content that has no visible free water or dust produced when handling the material.

B. Compost shall be a well decomposed, stable, organic matter source. Compost shall be derived from slash material, wood waste, land clearing, and green waste. Compost shall contain no substances toxic to plants, shall possess no objectionable odors, and shall not resemble the raw material from which it was derived.

C. Compost product properties shall be as indicated in Table 1.

TABLE 1
COMPOST PRODUCT GRADATION

PARAMETER	VALUE	TEST METHOD
Sieve Size	Percent Passing	
3 inches	100	UCC TMECC 02.02-B
2 inches	90 to 100	
1/4 inch	40 to 85	
pH	5.0 to 8.5	--
Manufactured inert material (plastic, concrete, ceramics, metal, etc.), dry weight basis, %	< 2	UCC TMECC 03.08-A
Organic matter, dry weight basis, %	30 to 65	UCC TMECC 05.07-A
Moisture content, %	30 to 60	--

PART 3 EXECUTION

3.01 PREPARATION

A. Implement temporary erosion and sediment control measures prior to large-scale clearing of vegetation as specified in Section 01 57 13.

3.02 PROTECTION OF VEGETATION

A. All trees and other vegetation beyond the designated Limits of Disturbance shall be protected and shall not be disturbed.

3.03 CLEARING

A. In all areas, clearing shall be limited to removal of vegetation by cutting, or otherwise removing materials to the surface so as not to allow for the potential accumulation of PCB-impacted material within the slash stockpile.

3.04 GRUBBING

A. Grubbing shall consist of the removal and disposal of stumps, roots larger than 2 inches in diameter, and matted roots from the indicated area.

B. Material to be grubbed, together with logs and other organic debris not suitable for compost purposes, shall be removed to a depth of not less than 18 inches below the original surface level of the ground in areas indicated to be grubbed and in areas indicated as construction areas under this contract so as not to allow for the potential accumulation of PCB-impacted material within the slash stockpile.

C. Remove trees with 30 percent or more of their root systems destroyed. Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain NAVFAC's approval before replacement.

3.05 DISPOSAL OF VEGETATION

A. All cleared and grubbed slash material shall be placed at one or more locations on-site as agreed to by NAVFAC that will facilitate composting.

B. On-site chipping, shredding and composting will be performed to generate compost material for use as per the design.

C. Burning of cleared materials will not be permitted.

3.06 FIELD QUALITY CONTROL

A. Compost shall be tested during compost operations for parameters listed in Table 1. Testing frequency shall be one sample per 2,000 cubic yards.

END OF SECTION

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SECTION 31 23 00

EXCAVATION AND FILL

PART 1 GENERAL

1.01 SUMMARY

A. Section includes requirements for: excavation of PCB-impacted soil; staging of excavated soil; characterization sampling for offsite disposal; loading, transportation, and offsite disposal of PCB-impacted soil; placement, grading, and compaction of natural and imported soils; and other specified site earthwork.

B. Related Sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control

2. Section 32 15 00 – Aggregate Surfacing

3. Section 33 40 00 – Storm Drainage Utilities

1.02 REFERENCES

A. ASTM International (latest version at time of project implementation):

1. ASTM D 422, Standard Test Method for Particle-Size Analysis of Soils

2. ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3 (600 kN-m/m3))

3. ASTM D 1140, Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75-µm) Sieve

4. ASTM D 1556, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

5. ASTM D 2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

6. ASTM D 4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

7. ASTM D 6938, Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.03 PROTECTION

A. Sheeting and Bracing

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1. Furnish, put in place and maintain such sheeting and bracing as shown on the Drawings to support the sides of excavations; to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction; and to protect adjacent structures from undermining or other damage. If the Engineer is of the opinion that sufficient or proper supports have not been provided, the Engineer may order additional supports put in, and compliance with such order shall not relieve or release the Contractor from its responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed. Where soil cannot be properly compacted to fill a void, lean concrete shall be used as backfill.

2. All sheeting and bracing not left in place shall be carefully removed in such a manner as not to endanger the construction or other structures, utilities, or property. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools specially adapted to that purpose, or otherwise as may be directed.

3. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on the Engineer's part to issue such orders and failure to exercise the Engineer's right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on part of the Contractor to leave in place sufficient sheeting and bracing to prevent any caving or ground movement.

4. No sheeting is to be withdrawn if driven below mid-diameter of any pipe and under no circumstances shall any sheeting be cut off at a level lower than 1 foot above the top of any pipe.

B. Pumping and Drainage

1. At all times during construction provide and maintain proper equipment and facilities to remove all water entering excavations and keep such excavations dry so as to obtain a satisfactory undisturbed subgrade condition until the fills, structures or pipes to be installed have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural levels.

2. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.

3. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps and pumped from the excavation to maintain a bottom free from standing water.

4. Take all additional precautions to prevent uplift of any structure during construction.

5. Drainage shall be disposed of in an approved area only so that flow or seepage back into the excavated area will be prevented.

6. Remove the dewatering equipment after the system is no longer required.

7. Take all necessary precautions to preclude the accidental discharge of fuel, oil, etc., in order to prevent adverse effects on groundwater quality.

1.04 SUBMITTALS

A. Submit the following for review prior to commencement of the work of this Section:

1. Proposed offsite source(s) of fill material.

2. For offsite fill source, a letter prepared and signed by the supplier or Contractor certifying that the fill material to be used has been obtained from a commercial borrow source and that levels of potentially hazardous constituents are expected to be within the range of naturally occurring background concentrations for soils in the region.

3. Source quality control test results (physical testing and chemical analysis) for proposed borrow source materials as specified in this Section.

4. Moisture density relationship for fill.

B. Submit the following during the Work:

1. Record survey drawings as specified in this Section.

2. Density test results for fill material.

1.05 DELIVERY, STORAGE AND HANDLING

A. Soil to be used for the fill material shall be adequately protected to preserve the fitness and quality of the material and prevent any mixing with other materials.

1.06 QUALITY CONTROL

A. Contractor shall perform specified tests to determine conformance of the materials and constructed work with the Specifications.

1.07 BORROW AREAS

A. Contractor shall identify and request approval for use of intended offsite borrow source(s) from Engineer and NAVFAC at least 3 calendar days prior to disturbance.

1.08 PROJECT CONDITIONS

A. Work shall be performed in a manner that does not disturb existing survey monuments, utilities, or other facilities not indicated to be removed.

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B. Materials to be encountered may include both natural soils and soil-like materials.

C. Refer to NAVFAC's Site Conditions document regarding protection of workers on this Site.

PART 2 PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials and source of supply shall be approved by the Engineer as specified, prior to delivery and use in the Work. Proposed fill materials shall be virgin material from a pit or mining operation; recycled materials used previously for construction at other locations will not be accepted.

2.02 COMMON FILL

A. Common fill shall consist of mineral soil, substantially free of clay, organic material, loam, wood, trash and other objectionable material which may be compressible, or which cannot be compacted properly. Acceptable USCS soil classifications for common fill potentially include GW, GP, GM, GC, SW, SP, SM, SC, ML, and CL. Common fill shall not contain stones larger than 6-in or 2/3 the loose thickness of each lift, whichever is smaller and shall have a minimum of 75 percent passing the No. 40 sieve and a maximum of 48 percent passing the No. 200 sieve. Common fill shall not contain granite blocks, broken concrete, masonry rubble or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling. Snow, ice and frozen soil will not be permitted.

2.03 TOPSOIL

A. Topsoil may be obtained from either, or a combination of, the following:

1. Imported topsoil.

2. Topsoil manufactured by addition of composted slash material, organic material, compost or commercially available soil amendments.

B. Topsoil shall be medium textured loam, have organic content between 2.5 and 10.0 percent, pH between 4.5 and 8.5, and maximum particle size of 3 inches.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Surveying shall be performed to monitor as-built graded elevations, and record survey drawings shall be submitted to the Engineer for review and approval. Maximum survey grid spacing shall be 50 feet. In addition, at a minimum, survey points shall be established at the top, mid-point, and bottom of each slope, along the alignment of each linear feature and at other points as required to define the surfaces. The following shall be surveyed:

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1. Existing ground surface prior to earth disturbance activities.

2. Ground surface after excavation prior to placement of fill or low-permeability cover.

3. Top of the soil cover, other surface materials, and all other finish grades at completion of site earthwork.

4. Exposed and underground linear features prior to backfilling at 50 feet maximum intervals, at changes in slope, at changes in direction, and at intersections with other linear features.

B. Fill Density Tests

For fill placement, test density and moisture content in accordance with ASTM D 6938. When ASTM D 6938 tests are used, verify density test results by performing an ASTM D 2937 density test at a location already ASTM D 6938 tested as specified herein. Perform an ASTM D 2937 density test at the start of the job, and for every 5 acre area on which common fill is placed.

a. Fill placement: Three tests for every 20,000 square feet per lift.

b. Lift thickness shall be measured in each lift.

3.02 GENERAL REQUIREMENTS FOR GRADING OF SITE MATERIALS

A. Excavate and relocate site materials and grade the exposed subgrade as necessary to achieve the required subgrade elevations for placement of the overlying materials to the indicated final elevations.

B. During excavation and relocation of site materials and placement of fill, protect and condition the materials to control fugitive dust and to limit erosion of the exposed surfaces. If the surfaces are dry and dust is observed, apply water to effectively moisture condition the materials as approved by NAVFAC and Engineer. Conform to the requirements for dust control specified in Section 01 57 13 and in the erosion and sediment control plan. Additional measures may be required to control dust as approved by NAVFAC and Engineer.

C. Where a change of slope is indicated on the Drawings, construct a rolled transition section having a minimum radius of approximately eight feet, unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage.

D. Positive site drainage shall be maintained as much as practical at all times and especially overnight to avoid saturation of the work area.

3.03 FILL PLACEMENT

A. Provide fill as indicated. Place in 12-inch loose lifts. Compact areas not accessible to rollers or compactors with mechanical tampers. Aerate material excessively moistened by rain to a satisfactory moisture content. Finish to a smooth surface by blading, rolling with a smooth roller, or both.

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3.04 COMPACTION

A. General Site

Compact fill to 90 percent of ASTM D 698.

3.05 PLACEMENT OF EXCAVATED NATURAL SOILS

A. Excavated natural soil shall be prepared for reuse as fill by moisture conditioning, as required.

B. Moisture conditioned natural soil shall be spread in 8-inch maximum loose lifts and compacted to 90 percent per ASTM D 698.

C. Compacted surface shall provide a firm, stable, and unyielding surface subject to the approval of the Engineer. Operate the compaction equipment in a systematic manner to ensure that the minimum indicated coverage is provided over all areas, and at speeds between 2 1/2 to 3 1/2 miles per hour. When compacting, one-half of the passes made with the equipment shall be in a direction perpendicular to the other passes. Rutting or pumping of material shall be undercut as directed by the Engineer and replaced with approved fill.

3.06 PLACEMENT OF SOIL COVER

A. Soil cover shall be compacted with 100 percent minimum coverage using a tracked dozer with minimum ground pressure of 6.0 psi.

B. Finished grade shall not vary more than three inches above or below required elevations unless otherwise approved by the Engineer. However, in all cases, the minimum thickness of the soil cover shall be no less than indicated.

3.07 MAINTENANCE AND PROTECTION

A. Protect graded surface from erosion and keep free from accumulation of debris.

B. Replace and regrade displaced and eroded areas as required until project completion. Displaced materials shall be reused where possible.

END OF SECTION

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SECTION 31 30 00

GEOSYNTHETIC CLAY LINER (GCL)

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment, and incidentals required to install Geosynthetic Clay Liner (GCL) as shown on the Drawings and as specified herein. The work shall include unloading, storing placement, seaming, and anchoring of the GCL, field quality control, and all other work as shown on the Drawings and as specified herein.

B. Sufficient material and accessory bentonite shall be furnished to cover all areas as shown on the Drawings, including overlaps at field seams.

1.02 RELATED WORK

A. Section 31 23 00 - Excavation and Fill

1.03 SUBMITTALS

A. Submit the following information for review prior to initiating Work under this section:

1. Submittals relating to GCL liner manufacturer and GCL liner:

a. Corporate Background

b. Manufacturing capabilities:
   1) Information on factory size, equipment, personnel, number of shifts per day and production capacity per shift.
   2) List of material properties and samples of liner with attached certified test results.
   3) Manufacturer's quality control program and manual including description of laboratory facilities.
   4) A list of ten similarly completed facilities totaling a minimum of ten million square feet, for which the manufacturer has manufactured a GCL. The following information shall be provided for each facility.
      a) Name and purpose of facility, its location and date of installation
      b) Name of Owner, project manager, design engineer and installer
      c) GCL surface area
      d) Information on performance of the facility

c. The origin of the bentonite and geotextiles to be used in the manufacturing of the GCL including the suppliers name and production plant, as well as brand name and number.

d. Manufacturer's literature including:
   1) Material samples.
   2) Technical data including Minimum Average Roll Values (MARVs) for the geotextile used in the manufacture of the GCL.

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3) Material Warranty covering materials and workmanship of the GCL, including batch identifications and associated roll numbers.
4) Certificate of permeability and bentonite content per square foot of mat.
5) Copy of quality control certificates in conformance with Paragraphs 2.01 and 2.02.

2. Submittals relating to installing Contractor

a. Background Information

b. Installed capabilities:

1) Information on equipment and personnel.
2) Anticipated average daily production.

c. Shop drawings, including:

1) A proposed plan detailing GCL storage location and methods.
2) A proposed plan for placement and a proposed panel layout showing the installation layout identifying field seams as well as any variance or additional details which deviate from the Drawings.
3) Details of seaming the GCL, anchoring, connections, penetrations, and other construction details.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM D413 - Standard Test Method for Rubber Property – Adhesion to Flexible Substrate.

2. ASTM D421 - Standard Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants.

3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft^3 [2,700 kN-m/m^3]).

4. ASTM D2216 - Standard Test Method for Determination of Water (Moisture) Content of Soil and Rock by Mass.

5. ASTM D3776 - Standard Test Method for Mass per Unit Area (Weight) of Fabric.

6. ASTM D3786 - Standard Test Methods for Hydraulic Bursting Strength of Textile Fabrics – Diaphragm Bursting Tester Method.

7. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

8. ASTM D5261 - Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

9. ASTM D5321 - Standard Test for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method.

10. ASTM D5888 – Standard Guide for Storage and Handling of Geosynthetic Clay Liners.

11. ASTM D5890 - Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners.

12. ASTM D5891 - Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners.

B. Where reference is made to one of the above standards, the revisions in effect at the time of the Work shall apply.

1.05 QUALITY ASSURANCE

A. The material supplied under these specifications shall be first quality product designed and manufactured specifically for the purposes of this work and which has been satisfactorily demonstrated by prior use to be suitable and durable for such purposes.

B. These specifications cover the lining application as described herein. All work shall be performed in strict accordance with the lines, grades, and dimensions shown on the Drawings.

C. Sufficient liner material and accessory bentonite shall be furnished to cover all areas to be lined as shown on the Drawings, including overlaps at field seams.

D. Shop drawing submittal shall be as provided in Section 01 60 00.

E. Field quality control requirements are specified in Paragraph 3.04. The purpose of field quality control procedures is to assure that the GCL has been installed in accordance with the specifications and manufacturer's recommendations.

1.06 QUALIFICATIONS

A. Manufacturer

1. The manufacturer of the GCL described hereunder shall have previously demonstrated the ability to produce this GCL by having at least two years continuous experience in the manufacturing of GCLs and successfully manufactured a minimum of 10 million square feet of GCL material.

B. Installer

1. The installer shall be the manufacturer or an installer certified by the manufacturer to install the GCL. Installation shall be performed under the constant direction of a single installation supervisor who shall remain on site and be in responsible charge, throughout the GCL installation, for GCL layout, seaming, patching, testing, repairs and all other activities required by the installer.

2. GCL Installer shall either have installed GCL on at least 5 projects and at least 2 million square feet of GCL, or shall provide to the Engineer satisfactory evidence, through similar

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experience in the installation of other types of geosynthetics, that the GCL will be installed in a competent, professional manner.

1.07 DELIVERY, STORAGE, AND HANDLING

A. The bentonite mat rolls shall be packaged and shipped by appropriate means to prevent damage. The manufacturer shall ensure that proper methods of securing and fastening the rolls of GCL during shipping will be implemented. The Engineer will inspect the liner material as it arrives on site for any damage to the liner. Straps securing the liner during shipping shall not cut into the liner material. Rolls that appear damaged as a result of tight fastening, or otherwise, may be rejected at the discretion of the Engineer. The Contractor shall be responsible for replacing all damaged or unacceptable material at no cost to NAVFAC.

1. Handling and storage of materials shall be in accordance with manufacturer's recommendations and ASTM D5888 Guidance and is the responsibility of the Contractor.

2. Materials shall be protected from UV and rain during storage and shall be kept dry before and during periods of rain. An additional tarpaulin or plastic sheet shall be used over the stacked rolls to provide extra protection for GCL material stored outdoors.

B. No off-loading shall be performed unless the Engineer is present. Damage during off-loading shall be documented by the Engineer. All damaged rolls must be separated from the undamaged rolls until the proper disposition of that material has been determined by the Engineer.

C. The GCL rolls shall be stored so as to be protected from puncture, dirt, grease, water, moisture, mud, mechanical abrasions, excessive heat, and UV rays. The rolls shall be stored on a prepared surface and shall not be stacked more than three rolls high. Rolls shall be at higher ground elevations or elevated above ground surface (a minimum of 3 inches) to protect the GCL from standing water.

D. The GCL shall be wound around a cardboard core 4 inches in diameter to facilitate handling. The core is not intended to support the roll for lifting but should be sufficiently strong to prevent collapse during transit.

PART 2 PRODUCTS

2.01 MATERIALS

A. General

1. The GCL shall be formulated and manufactured from polypropylene geotextiles and high swelling sodium bentonite.

    a. The materials shall be manufactured by the mechanical bonding using the needle punch process to enhance the shear strength of the liner and to maintain the integrity of the liner under hydration. No glues or adhesives shall be used in lieu of the needle punch process so as to retain these characteristics.
    b. Needle punched bentonite geocomposites are those which, by the process of a needling board (similar to that used in the manufacture of standard non-woven geotextiles) have fibers of a non-woven geotextile pushed through the bentonite clay

core and integrated into a woven or non-woven geotextile without the use of any chemical binders or adhesives.

2. No disassociation of geotextile components from the bentonite core shall occur under any conditions.

3. The bentonite-geotextile liner shall be manufacturer utilizing a 0.75% lbs/sf (as per ASTM D5261) of high swelling sodium montmorillonite clay (also known as Wyoming bentonite) at a 12% moisture content (as per ASTM 2216). If the liner is manufactured at a higher moisture content, it shall have a minimum of one pound per square foot of bentonite when adjusted to a 12% moisture level. The bentonite shall have the following base mineralogical composition:

   a. Free Swell: minimum 24 ml/ 2 grams (ASTM D5890) Chemical Composition:

Silica	63.02%
Alumina	21.08%
Iron (ferric)	3.25%
Iron (ferrous)	0.35%
Magnesium	2.67%
Sodium	2.57%
Calcium	0.65%
Crystal Water	5.64%
Trace Elements	0.72%

4. Rolls shall be manufactured a minimum of 12 feet wide and 120 feet long. All rolls shall be labeled and bagged in packaging that is resistant to photo degradation by ultraviolet (UV) light.

5. The encapsulating geotextile shall be polypropylene. The non-woven component of the geocomposite shall be a minimum 6 oz. per square yard needle punched geotextile. The woven component of the geocomposite shall be a minimum 3.2 oz. per square yard silt film woven geotextile.

6. The reinforced bentonite geocomposite liner shall be BENTOMAT ST, as manufactured by Colloid Environmental Technologies Company (CETCO) of Arlington Heights, IL BENTOFIX NSL by National Seal Company of Aurora, IL, or approved equal.

7. The accessory granular bentonite shall be similar to that used in the liner or as recommended by the manufacturer for site specific use.

2.02 QUALITY CONTROL DOCUMENTATION

A. Prior to installation commencement of any GCL material, the Contractor shall provide to NAVFAC the following information certified by the manufacturer for the delivered GCL:

1. Origin, identification, and production of the bentonite (supplier's name, brand name and production plant).

2. Copies of quality control certificates issued by the bentonite supplier.

3. Each roll delivered to the Project site shall have the following identification information:

   a. Manufacturer's name
   b. Product identification
   c. GCL roll weight
   d. Roll number
   e. Lot number
   f. Roll dimensions

4. Quality control certificates, signed by the manufacturer's quality assurance manager. Each certificate shall have roll identification number, sampling procedures, frequency, and test results.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Rolls shall be storage on a flat dry surface, such that the stored materials-and-packing are not subject to bending and unnecessary stresses. The materials shall be protected from rain during storage.

B. The GCL will be placed over the prepared soil fill. GCL will not be installed on side slopes. The geotextile shall be inspected and approved by the Engineer before GCL placement.

C. Rolls shall be handled utilizing a solid steel bar inserted through the core bar and slings or chains attached to the ends of the bar. The core bar shall be suspended from a spreader bar so that the edges of the liner are not damaged by the suspending straps or chains. Panels shall be placed with the non-woven side against the subgrade and the woven side oriented upwards.

D. Seam areas or runs shall be flat and clear of any large rocks, debris or ruts. Contacting surfaces shall be clean and clear of dirt or native soil with all edges pulled tight to maximize contact and to smooth out any wrinkles or creases. Overlaps shall be minimum of 12-inches and verified by the Engineer. A proper seam shall cover the 12-inch lap line.

E. Seams shall be augmented with granular bentonite to insure seam integrity. Granular bentonite shall be dispersed evenly from the panel edge to the lap line at a minimum rate of $^1/_4$ pound per lineal foot continuously along all seams or overlap areas. Accessory bentonite shall be of the same type of the material within the composite liner itself. Adhesives may be used on seams to keep panels in contact during backfill operations if necessary.

F. GCL shall not get wet before, during and after installation. It shall not be installed during periods of rain, nor shall it be installed in standing water. Only a quantity that can be covered with fill material

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shall be installed each day. The Engineer will decide if any wetted material shall be used or removed from the premises.

G. Large rips or tears shall be repaired by completely exposing the affected area, removing all foreign objects or soil, and then placing a patch over the damage, with a minimum overlap of 12-inches on all edges. Accessory bentonite shall be placed between the patch and the repaired material at a rate of $^1/_4$ pound per lineal foot of edge, spread in a 6-inch width.

H. GCL shall not be covered until inspected and approved by the Engineer.

3.02 FIELD SEAMS

A. Individual panels of GCL shall be laid out and overlapped by a minimum of 12-inches prior to seaming. The area to be seamed shall be cleaned and prepared prior to placement of granular bentonite.

B. All seams shall have a seam number that corresponds with the panel layout numbers. The numbering system shall be used in the development of the record drawings. Seam numbers shall be derived from the combination of the two panel numbers that are to be seamed.

C. Seam areas or runs shall also be flat and clear of any large rocks, debris, or ruts. Contacting surfaces shall be clean and clear of dirt or native soil with all edges pulled tight to maximize contact and to smooth out any wrinkles or creases. Overlaps shall be a minimum of 12 inches.

D. Seams shall be augmented with granular bentonite to ensure seam integrity. Granular bentonite shall be dispersed evenly from the panel edge to the lap line at a minimum rate of 1/4 pound per lineal foot continuously along all seams or overlap areas. Accessory bentonite shall be of the same type as the material within the composite liner itself.

E. On gently sloping areas (gentler than 6H:1V) where seams may be placed across the slope, overlaps should be "shingled" so as to prevent flow into the seam.

3.03 DISPOSAL OF WASTE MATERIAL

A. Upon completion of installation, the Contractor shall dispose of all trash, waste material and equipment used in connection with the performed work and shall leave the premises in a neat and acceptable condition.

3.04 FIELD QUALITY CONTROL

A. Repair Procedures

1. All portions of the GCL exhibiting signs of defect shall be repaired. The following procedure shall be used to repair these areas. The final decision as to the appropriate repair procedure shall be made by the Engineer.

2. Large rips or tears shall be repaired by completely exposing the affected area, removing all foreign objects or soil, and by then placing a patch over the damage, with a minimum overlap of 12 inches on all edges. Accessory bentonite shall be placed between the patch and the repaired material at a rate of 1/4 pound per lineal foot of edge, spread in a 6-inch width. The above procedures shall also be implemented if a rip or tear occurs on a sloped surface. In this

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instance, the edges of the patch shall be fastened to the repaired liner with construction adhesive, in addition to the bentonite-enhanced seam.

END OF SECTION

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SECTION 31 35 20

EROSION CONTROL MATTING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes furnishing and installing erosion control blankets.

B. Related Sections:

1. Section 32 92 19 – Seeding and Mulching

1.02 REFERENCES

A. "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects", FP-03, Federal Highway Administration (FHWA Standard Specifications)

1.03 SUBMITTALS

A. Submit the following to the Engineer, for review and approval, prior to shipment of products to the Site:

1. Manufacturer's descriptive documentation (including material properties and technical data sheets) for each product to be furnished.

2. Sample of each product.

PART 2 PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials shall be approved by the Engineer as specified prior to delivery and use in the construction.

2.02 EROSION CONTROL BLANKETS

A. Erosion control blankets (ECB) shall be biodegradable wood excelsior, straw or coconut-fiber matting enclosed in biodegradable or photodegradable netting conforming to the requirements of Subsection 713.17 of the FHWA Standard Specifications for temporary erosion control products, Type 3.B (extended term erosion control blankets), and meeting the following specifications:

1. Typical functional longevity: 24 months

2. Minimum permissible shear stress in 30-minute period (non-vegetated): 2.0 psf

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B. Approved manufacturers and products for ECB:

1. Curlex® II , manufactured by American Excelsior Company

2. SC150BN or SC150, manufactured by North American Green

3. Substitutes may be proposed for review and approval by the Engineer.

C. Furnish manufacturer's recommended steel wire staples, six-inch minimum length.

PART 3 EXECUTION

3.01 SITE PREPARATION

A. Redirect runoff away from the areas on which ECB is to be installed.

B. Grade surface of installation area, shaping and smoothing the soil. Remove significant soil clods, rocks, roots, trash, and vehicle imprints.

C. Distribute and incorporate soil amendments into the prepared soil and distribute seed as specified in Section 32 92 19 prior to placement of ECB.

3.02 INSTALLATION OF EROSION CONTROL BLANKETS

A. Install ECB as required to protect seeded areas and in accordance with the manufacturer's recommendations.

B. Roll ECB over the prepared soil surface using sequence, arrangement, and overlapping of adjacent sections recommended by the manufacturer. Construct check slots and anchor slots as required. Secure with staples. ECB shall be overlapped in the direction of the slope.

C. Installed ECB shall lay flush with the soil surface, in correct alignment and location, and properly anchored to prevent displacement.

3.03 MAINTENANCE

A. Protect installed ECB from damage.

B. No heavy earthwork equipment shall be allowed on the installed erosion control matting.

END OF SECTION

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SECTION 31 37 00

RIPRAP

PART 1 GENERAL

1.01 SUMMARY

A. Section includes placement of riprap for outlet protection, slope protection, and as indicated.

B. Related Sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control

2. Section 31 23 00 – Excavation and Fill

1.02 REFERENCES

A. State of New York Department of Transportation (NYSDOT):

1. Section 733 NYSDOT Standard Specifications

1.03 SUBMITTALS

A. Submit the following to the Engineer, for review and approval, prior to shipment of materials to the Site:

1. Written documentation (including gradation test results) signed by the material producer, indicating that riprap meets or exceeds the specified requirements.

2. Riprap producer, specific gravity and gradation.

PART 2 PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials shall be approved by the Engineer as specified prior to delivery and use in the construction.

B. Riprap shall meet specified gradation prior to placement. All processing shall be completed at the source.

2.02 GEOTEXTILE

A. Section 01 57 13 Temporary Erosion and Sediment Control.

2.03 RIPRAP

A. Composed of a well graded mixture of stone sized so that a minimum of 50 percent of the pieces, by weight, are larger than the size determined by using the charts. A well graded

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mixture is defined as a mixture composed primarily of larger stone sizes but with a sufficient mixture of other sizes to fill the smaller voids between the stones. This is the size for which 50 percent, by weight, will be smaller and 50 percent will be larger.

B. Stone for riprap shall be field stone or rough and hewn quarry stone. The stone shall be hard and angular and of a quality that will not disintegrate with exposure to water or weathering. The specific gravity of the individual stones shall be at least 2.5.

PART 3 EXECUTION

3.01 PREPARATION OF SUBGRADE

A. Prior to placing riprap, the subgrade shall be excavated, graded and compacted to the lines and grades required for placement of riprap to the depths indicated on the Drawings.

3.02 PLACEMENT OF GEOTEXTILE

A. Install geotextile on graded surface prior to placement of riprap as indicated.

B. Subgrade shall be smooth and free of litter, sharp protrusions, and large stones prior to geotextile placement.

C. The geotextile shall be placed loosely upon the slope so that placement of the overlying materials do not stretch or tear the fabric.

D. Bury the upper edges of the geotextile a minimum of six inches below grade at outer edges of installed material. Overlap adjacent sections or rolls of geotextile down the slope. Anchor geotextile at overlaps using approved pins or staples. Overlaps shall be a minimum of one foot.

3.03 PLACEMENT OF RIPRAP

A. Riprap shall be placed in a manner as to produce a well-graded, stable mass of rock with the minimum practicable percentage of voids. Riprap placement shall start at the toe of the slope and progress up the slope. Subsequent loads of material shall be placed against previously placed material in such a manner as to ensure a relatively homogenous mass. Riprap placement shall be to the full thickness in one operation, and in such a manner as to avoid displacing the underlying material. The larger riprap shall be well distributed and the entire mass of riprap in their position shall be graded to conform to the indicated gradation. The finished riprap surface shall be free from objectionable pockets of small stones and clusters of larger stones. Stone shall be keyed and interlocked with adjacent stone. Placing some of the designated size in layers will not be permitted.

B. The desired distribution of the various sizes of riprap throughout the mass shall be obtained by selective loading of the material at the quarry or other source; by controlled dumping of successive loads during the placement; or by other methods of placement which will produce the specified results.

C. Placing riprap by dumping it into chutes, or by similar methods likely to cause segregation of the various sizes, shall not be permitted. Placing riprap by dumping it at the top of the

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slope and pushing it down the slope shall not be permitted. No stone shall be dropped through air from a height greater than 3 feet.

D. Care shall be exercised when placing stones adjacent to existing trees, by protecting trees using hand placement until there is adequate cover for protection.

E. Rearranging of individual stones by mechanical equipment or by hand will be required to obtain a well-graded distribution of stone sizes.

F. No equipment shall be operated directly on the riprap surface.

G. The Contractor shall maintain the stone protection until accepted and any material displaced by any cause shall be replaced at Contractor's expense to the indicated lines and grades.

END OF SECTION

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SECTION 31 41 16

SHEET PILING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The work covered in this section consists of all considerations necessary for the proper construction of the sheet pile walls and anchor and tie rod systems as described herein and shown on the Drawings.

B. The Contractor shall furnish all labor, equipment, material and incidentals required to handle, store and install all steel sheet piling and anchor systems as shown on the Drawings and specified herein.

C. Steel sheet piling and all necessary structural shapes, bracing, tie rods, bolts, washers, nuts, connections and miscellaneous appurtenances shall be of the form, weights, grades, shapes and lengths as specified herein.

D. Comply with all applicable State and local requirements and codes.

E. Engage the service of a Professional Engineer registered in the State of New York to prepare the design and submittals described herein and obtain all permits to perform work. Any additional investigations or design shall be paid for by the Contractor.

1.02 RELATED WORK

A. Earthwork is included in Section 31 23 00.

1.03 REFERENCED STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM A572, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural.

2. ASTM A6, Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.

3. ASTM A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

4. ASTM A690 - Standard Specification for High-Strength Low-Alloy Nickel, Copper, Phosphorus Steel pipe piles and Sheet Piling with Atmospheric Corrosion Resistance for Use in Marine Environments.

1.04 SUBMITTALS

A. Submit for Engineer's approval shop drawings, design calculations, and product data stamped by a Professional Engineer registered in the State of New York showing materials of construction,

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details of installation, installation equipment and construction procedures as follows:

1. Details and description of pile driving equipment, including manufacturer's specification and rated energy of hammer.

2. Details and description of pre-drilling equipment and methods, including auger type and size and pre-drilling methods, depths and locations.

3. Schedule of procedures and operations.

4. Sheet piling and tie rods installation sequence.

5. Method of achieving and verifying minimum pile penetration and alignment tolerances.

6. Method and equipment of lifting, handling, driving and cutting off of sheet piling.

7. Method and equipment for pile removal.

8. Method, materials and equipment for anchor installation.

9. Design calculations for the sheet pile wall shall include:

   a. Construction sequence and loads on the sheet pile wall for all stages of excavation, bracing removal, and backfilling, including material and equipment loads on adjacent ground during construction.
   b. Design of wall and all bracing members including all details for all stages of construction.
   c. Theoretical deflections of sheet piling and deformation of structures, pipelines, and other improvements located within the area of influence of the wall system.

B. Coordinate with Earthwork submittals.

C. The Contractor's Engineer shall design detail and submit all parts of connections not fully detailed on the Drawings. Design detail and connection submittal shall be stamped by a Professional Engineer registered in the state of New York.

D. Certificates

1. Certification from the manufacturer attesting to the rated energy of the proposed hammer.

2. Certification that materials meet ASTM requirement.

E. Submit Contractor's and Design Engineer's qualifications as described in herein. Submit welder qualifications and weld procedures in accordance with AWS D1.1.

F. Copies of all permit applications related to the work, and any additional calculations and/or testing required to obtain permit.

1.05 PROJECT RECORD DOCUMENTS

A. Within 2 weeks after the completion of driving of all piles, provide the Engineer with a drawing showing the mark number of all piles and their as-driven location with respect to the specified tolerances.

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B. Provide a record copy of each pile driven. The records shall include the pile mark number, driving resistance record, pile length as driven, date and time of driving, time delays during driving, tip and cut-off elevations, deviations from drawing location and from plumb, hammer data and any other applicable data. The record shall show any unusual events during installation including interruptions during driving, obstructions, re-driving, etc.

1.06 QUALITY ASSURANCE

A. Comply with all applicable State and local requirements and codes.

B. The Contractor shall have at least five (5) years of experience with compatible work, shown and specified, employing labor and supervisory personnel who are similarly experienced in this type of work.

C. Design shall be performed by a Professional Engineer registered in the State of New York with at least five (5) years of experience in design of similar systems and shall have completed not less than five (5) successful projects of similar type, size, and complexity to that require for the work.

D. The welder shall be certified by the American Welding Society.

E. Approval given by the inspection agencies shall not relieve the Contractor of his/her responsibilities for performing the work in accordance with this Section and the Drawings.

1.07 DELIVERY, STORAGE AND HANDLING

A. Piles shall be stored in orderly groups above ground and shall be blocked to minimize distortion and bending. Storage of sheet piling and other bracing materials shall be such that sagging, which would produce permanent deformation, shall be prevented.

B. Handling shall minimize bending stresses in the piles. Concentrated loads, which occur during stacking or lifting, shall be kept below the level that would produce permanent deformation of the material.

1.08 LINES AND GRADES

A. Employ a registered land surveyor or a registered professional engineer licensed in the State of New York experienced in this type of work. The surveyor shall establish lines and levels, and be responsible for the correct location of the piles. The engineer shall keep a record of all piles driven.

B. A baseline and datum elevation shall be established by the Contractor, as approved by the Engineer. Piles shall be located and staked by the Contractor. Maintain all location stakes and establish all elevations required, including the elevation of the top of the pile prior to cutting off any length of pile.

C. Within one working day after all sheet piles have been driven, provide the Engineer with a written tabulation indicating the following information for each sheet pile:

1. Pile number.

2. Elevation of top of pile prior to cutting or build up (measured to nearest 0.10 ft).

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3. Elevation of top of pile after cutting or build up (measured to nearest 0.10 ft).

4. Deviation from plan location at cutoff grade (measured to nearest 0.01 ft).

D. Within 2 weeks after the completion of driving of all sheet piles, provide the Engineer with a plan certified by said surveyor showing the as driven location of all sheet piles driven.

PART 2 PRODUCTS

2.01 MATERIALS

A. All manufactured materials incorporated into permanent construction shall be new.

B. Steel Sheet Piling

1. Steel sheet piling shall be hot rolled steel sections having a continuous, integral interlock type sections with cross section and geometrical properties as set out on the plans and conforming to the provisions of ASTM A690 Grade 50, Standard Specifications for Steel Sheet Piling.

2. Steel sheet piles shall be of the types and sizes indicated on the drawings and shall be of a design such that when in place they will be continuously interlocked throughout their entire length. All piles shall be provided with standard handling holes located approximately four (4) inches below the top of the pile unless otherwise shown or directed. All handling holes below cutoff elevation after installation shall be covered and sealed.

C. All sheet piling shall be new material with all interlocks in good condition and free of rust and pitting. Used sheet piling shall not be permitted.

D. All structural steel for wales, plates, and angles for fabricated connections, and bearing plates shall conform to ASTM A36.

E. Tie rods shall be 150 ksi all thread rods meeting the requirements of ASTM A615.

F. Nuts, washers and high strength steel bolts shall conform to the requirements of ASTM A490.

G. All bolts, nuts, washer and plates shall be galvanized.

H. Splices are not allowed.

2.02 EQUIPMENT

A. Changes in the selected pile driving equipment shall not be allowed after the equipment has been approved except as directed by the Engineer. No additional contract time shall be allowed for Contractor-proposed changes to the methods, materials, and equipment.

B. Piles shall be installed with a vibratory hammer of sufficient capacity (force and amplitude) to drive the piles to the required depth.

C. All pile driving hammers shall be maintained by the Contractor in good operating condition and operated according to the manufacturer's recommendations.

D. Pre-drilling equipment shall be capable of drilling to the depth(s) shown on the approved plans or as indicated herein.

PART 3 EXECUTION

3.01 CONSTRUCTION

A. The Contractor shall be responsible for the selection of methods and procedures for driving piles, pre-drilling, and for the design of templates and bracing, that will advance the piles within the tolerances required by this Section. The methods, procedures, and bracing shall be subject to review and approval by the Engineer and shall be consistent with the requirements set out in these Section. All piles shall be kept under close observation during driving in order that drift or other tendency toward misalignment may be detected and corrections made before misalignment becomes serious. When misalignments occur, the Engineer may order the Contractor to modify his methods and rigging.

B. Templates and guides shall be used while driving all steel sheet piling. The design, arrangement, and anchoring of templates and guides shall be adequate to ensure that the piling will be driven to the proper location, and as otherwise required by this Section.

C. Sheet piling shall be driven by approved methods in such a manner as not to subject the piles to damage and to ensure interlocking throughout the length of the piles. Pile hammers shall be of the size and type necessary to install the piles to the required penetration with minimum damage to the piles. Hammers shall be maintained in proper alignment with the piles during driving operations. A protective driving cap of approved design shall be used, as required, to minimize damage to the tops of piles. All piling shall be driven without the aid of jetting.

D. Sheet piling shall be driven plumb with each sheet pile interlocked with adjoining piles for its entire length to form a continuous diaphragm throughout the length of each run of wall, bearing tightly against original ground. Exercise care in driving so that interlocking members can be extracted without damaging adjacent structures or utilities. If sheet piling becomes progressively out of plumb during driving, means shall be employed to correct the condition, or the sheet piling shall be withdrawn and re-driven so that no part of any pile is more than three (3) inches from the design location of the sheet pile wall alignment at completion of the work.

E. If piling is damaged during installation or driven out of interlock for any reason, it shall be removed and replaced at the Contractor's expense.

F. Jetting will not be permitted.

G. Install steel sheet piling to the minimum embedment depths as shown on the Drawings.

3.02 OBSTRUCTIONS

A. Where obstructions make it impossible to drive certain piles at the locations shown to the required tip elevation or where an obstruction which may cause damage to the pile tip or cause the pile to drift off location, the following procedure will be used:

1. Clear the obstruction by auguring or drilling.

2. Spud the location using an approved steel spud.

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3. Excavate the obstruction.

The determination of the method best suited to a particular obstruction will be determined by the Engineer.

B. Care shall be taken when obstructions are removed by excavation so as not to eliminate lateral support of adjacent piles or structures. Excavated areas shall be backfilled prior to re-driving the pile.

C. If, in the opinion of the Engineer, a pile has been damaged by an obstruction during driving, it shall be removed and a replacement pile driven.

D. The Contractor shall have on hand suitable equipment for removing obstructions and shall employ this equipment in a manner satisfactory to the Engineer.

3.03 ACCEPTANCE CRITERIA

A. Piles that are damaged below cut-off elevation during driving will be rejected. The Contractor will be compensated for rejected piles that are not a result of the Contractor's error.

B. Piles indicating a sudden or peculiar decrease in penetration resistance during driving will be assumed to be broken or damaged and will be rejected unless the Engineer's review of available data indicates that the sudden decrease in driving resistance is due to natural, subsurface conditions and continued acceptable driving behavior is observed.

C. The contractor shall be compensated only for rejected piles that are driven within the specified tolerances and whose damage in not attributable to the Contractor's error in the opinion of the Engineer.

D. The installation of replacement piles and other corrective measures shall in all cases be in accordance with designs provided by the Engineer and at no additional cost to NAVFAC.

3.04 SHEET PILING CUTOFF

A. For sheet piling that is not completely removed, Contractor shall cutoff sheet piling to the grades established on the Drawings or a minimum of six (6) feet below finished grade.

B. Cutoffs are the property of the Contractor and shall be disposed of offsite.

3.05 CLEAN UP

A. Remove from the site all waste, damaged sheet piling and surplus materials and all debris from the operation. The debris and waste materials shall be legally disposed of offsite.

END OF SECTION

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SECTION 32 12 16

BITUMINOUS CONCRETE PAVEMENT

PART 1 GENERAL

1.01 REFERENCES: The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

A. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

1. ASTM D 2940 - (1992) Graded Aggregate Material for Bases or Subbases for Highways or Airports

2. ASTM D 2950 - (1991) Density of Bituminous Concrete in Place by Nuclear Methods

B. State of New York Department of Transportation (NYSDOT):

1. Standard Specifications (2014)

1.02 SUBMITTALS

A. Test Reports: Submit reports for field and lab tests specified in paragraph 3.4 Field Quality Control. Lab test results shall be submitted within 24 hours of test completion. Field test results shall be submitted to the Engineer immediately upon test completion.

B. Mix Designs: Submit proposed mixed design and verification testing for the binder and surface courses. Testing shall have been performed within the last year. Information submitted shall demonstrate that the proposed materials meet the specification requirements.

C. Prime Coat: Submit certification from manufacturer that the prime coat meets project specification requirements.

PART 2 PRODUCTS

2.01 BASE COURSE

A. New Base Course materials obtained from offsite shall consist of sand, gravel or crushed stone composed of tough, durable particles and shall be reasonably free of thin, flat and elongated pieces. The material shall contain no organic matter, soft friable particles or other deleterious materials in quantities considered objectionable to the Engineer. The materials shall meet the requirements for Graded Aggregated Base in Section 304 of the NYSDOT Standard Specifications and for Bases in ASTM D 2940. They shall be reasonably well graded within the limits specified below.

Sieve Size U.S. Standard	Percent Passing by Dry Weight
2	100
1-1/2 inch	95-100
3/4 inch	70-92
3/8 inch	50-70
No. 4	35-55
No. 30	12-25
No. 200	0-8

2.02 PRIME COAT

A. Prime coat shall meet Section 702 of the NYSDOT Standard Specifications.

2.03 BINDER COURSE

A. Binder course shall meet the requirements for Hot Mix Asphalt Base - Course (BC) in Section 702 of the NYSDOT Standard Specifications. Asphalt cement percent by weight of total mix shall be 4 to 8 percent.

2.04 SURFACE COURSE

A. Surface course shall meet the requirements for Hot Mix Asphalt Surface - Course (SC) in Section 702 of the NYSDOT Standard Specifications. Asphalt cement percent by weight of total mix shall be 5 to 9 percent.

PART 3 EXECUTION

3.01 PRIME COAT

A. Prime coat shall be produced and applied in accordance with Sections 702 and 407 of the NYSDOT Standard Specifications. Under-primed areas (base absorbs all material in less than three hours) shall be primed again. Over-primed areas shall be blotted with fine sand or mineral dust.

3.02 BINDER COURSE

A. Base course shall be at least 3 inches thick. It shall be produced and placed in accordance with Sections 702 and 302 of the NYSDOT Standard Specifications.

3.03 SURFACE COURSE

A. Surface course shall be at least 2 inches thick. It shall be produced and placed in accordance with Sections 702 and 410 of the NYSDOT Standard Specifications.

3.04 FIELD QUALITY CONTROL

A. Earthwork Tests: Gradation and density testing (95%) of base course materials shall be the responsibility of the Contractor.

B. Pavement Tests: The compacted surface of the binder course and wearing course shall be tested using a straightedge as work progresses. Variations in the binder course surface shall not be more than ¼-inch from the lower edge of the 10-foot straightedge in areas where there are no slope changes. Pavement showing irregularities greater than that specified shall be corrected. The in-place density of the binder and surface courses shall be measured using the Nuclear Method described in ASTM D 2950. One test shall be performed on each 1000 square feet of binder course and each 1000 square feet of surface course placed. The field density divided by the laboratory density at optimum asphalt content determined during mix design shall be 95 percent or greater.

END OF SECTION

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SECTION 32 15 00

AGGREGATE SURFACING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: construction of aggregate surface for access road and laydown area.

B. Related Sections:

1. Section 31 23 00 - Excavation and Fill

1.02 SUBMITTALS

A. Submit the following for review prior to commencement of the work of this Section:

1. Aggregate grain size distribution.

B. Submit the following to the Engineer, for review and approval, prior to shipment of materials to the Site:

1. Written certifications, signed by material producers, documenting that the proposed materials to be furnished for this Project meet or exceed the specified requirements.

PART 2 PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials and source of supply shall be approved by the Engineer as specified prior to delivery and use in the construction.

B. Aggregate shall meet specified gradation prior to placement. All processing shall be completed at the source.

2.02 AGGREGATE

A. Limestone crusher tailings with maximum particle size of 1 inch. Locally available crusher run material will be acceptable to use as aggregate.

2.03 NON-WOVEN GEOTEXTILE – ACCESS ROADS

A. Fabric shall be a non-woven needle punched material consisting of continuous filaments formed into a stable network. The material shall be non-biodegradable, resistant to ultraviolet light exposure, insect and rodent resistant and conform to the minimum properties in the following table:

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		MINIMUM AVERAGE ROLL VALUES	
PROPERTIES	**TEST**	**UNIT**	**MIN AVG ROLL VALUE**
Fabric Weight	ASTM D3776	oz./yd2	9.8
Thickness	ASTM D5199	mils	110
Grab Tensile Strength	ASTM D4632	lbs	250
Grab Elongation at Break	ASTM D4632	%	50
Puncture Resistance	ASTM D4833	lbs	125
Mullen Burst Strength	ASTM D3786	psi	450
Trapezoid Tear Strength	ASTM D4533	lbs	100
Water Flow Rate	ASTM D4491	gpm/ft2	80
Hydraulic Permittivity	ASTM D4491	sec-1	1.1
Coef. Of Permeability	ASTM D4491	Sm/sec	0.3
Apparent Opening Size	ASTM D4751	mm	0.180

B. Unless noted otherwise these values represent the minimum average roll values (i.e., the average roll value of the lot shall meet or exceed the minimum values listed).

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Unless otherwise determined by the Engineer, adequate compaction will be considered to have been reached when the aggregate surface is tightly bound and shows no detectable rutting or movement under operation of compaction equipment with a minimum of 200 percent coverage by a minimum 5-ton smooth drum roller.

B. Aggregate thickness, surface elevations and uniformity of surface shall be checked during construction.

C. No mechanical equipment shall be driven directly on top of geotextile.

3.02 PREPARATION

A. Excavation, grading, proof-rolling, filling, and compaction of the base shall be in accordance with Section 31 23 00.

B. Verify that subgrade and base slope and elevations are correct, and that base is ready for placement of aggregate surfacing material.

3.03 AGGREGATE PLACEMENT AND COMPACTION

A. Aggregate surfacing shall be constructed to the indicated total depths. Place in uniform horizontal lifts with each lift having a maximum compacted thickness of six inches.

B. Place, spread, shape, and compact the aggregate as continuously as practicable during each day's operations. Place the material in a manner to avoid segregation. Uncontrolled spreading shall not be permitted.

C. Level and contour surfaces to achieve the indicated final grades, slope, and cross-sections.

D. Each layer shall be compacted to achieve the results specified in paragraph "FIELD QUALITY CONTROL".

E. Areas of aggregate surfacing that do not meet the requirements of paragraph "FIELD QUALITY CONTROL" shall be re-compacted until the surface is tightly bound and shows no detectable rutting or movement under operation of compaction equipment.

F. At the time aggregate is placed, it shall have a moisture content sufficient to obtain the required compaction. If necessary, uniformly apply water over the aggregate during compaction. Prevent free water from appearing on the surface during, or subsequent to, compaction operations. Compaction shall follow the spreading operation closely to prevent loss of contained moisture and displacement of material.

3.04 GEOTEXTILE PLACEMENT

A. Geotextiles shall be continuously sewn or overlapped a minimum of 18 inches. If during placement of overlying cover material, the Contractor cannot maintain an overlap for the geotextile, sewing will be required.

B. Any holes or tears in the geotextile shall be repaired by using a patch made from the geotextile, which shall be spot-seamed over the hole or tear with a minimum of 24 inch overlap in all directions, or sewn.

3.05 MAINTENANCE AND PROTECTION

A. The completed aggregate surfacing shall be maintained until completion of construction.

B. Damaged areas shall be repaired using methods approved by the Engineer.

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3.06 THICKNESS TOLERANCE

A. Finished surface shall not vary more than one inch from the indicated elevation.

END OF SECTION

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SECTION 32 17 20

WORK ZONE TRAFFIC CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Work zone traffic control shall consist of all work necessary to provide for the safe and efficient movement of traffic through or around work zones, and to protect workers and the public from damage to person and property which may result, directly or indirectly, from any construction operations. Work zone traffic control shall be completed under the direction of a trained, competent person, as shown in the contract documents, the Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) and as directed by the Engineer. The duration of this work shall be from the date any work is started on the contract site, including mobilization of equipment, signs, offices, and shops until the date of contract final acceptance. Temporary materials and components that are furnished by the Contractor shall remain the property of the Contractor.

B. Basic Work Zone Traffic Control: Work shall consist of controlling traffic over a reasonably smooth traveled way which shall be marked by signs, delineators, channelizing devices, pavement markings, and other devices as shown in the contract documents or as directed by the Engineer. Work after sunset and before sunrise shall include additional requirements for nighttime operations including, but not limited to, a written plan for nighttime operations, additional worker and equipment protection, additional channelizing devices and contract site patrol.

   1. The Contractor shall conduct its operations to ensure the safety and convenience of travelers and abutting property owners as well as the safety of all workers on the contract. Travelers include, but may not be limited to motorists, motorcyclists, bicyclists and pedestrians.

   2. Work shall be scheduled to keep the time and distance that existing pavement is removed or substantially disturbed to a minimum and consistent with the physical requirements of the contract. Unless otherwise indicated in the contract documents, the distance over which traffic is maintained on an unpaved surface shall not exceed $^1/_2$ mile at any one time. During seasonal shutdown periods, no part of the highway shall be closed to traffic unless provided for in the contract documents, or the Contractor has submitted and the Engineer has approved a detailed schedule of operations reflecting a proposal to close the highway to traffic.

C. Basic work zone traffic control shall include the following:

   1. Surface Condition, Debris, Drainage and Dust Control: Work shall consist of maintaining the surface condition of the traveled way, including detours, consistent with the preconstruction posted speed limit; including maintaining positive drainage, dust control and keeping the roadway free from debris and materials spilled from or tracked by vehicles or equipment. Debris and dust shall be controlled on all operations.

   2. Maintain Public Access: Work shall consist of maintaining public access to intersecting roads, residences, business establishments, adjacent property, bus stops and transportation facilities for vehicles, pedestrians, and bicyclists.

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3. Maintain Existing Roadside Signs, Delineators and Markers: Work shall consist of maintaining, in their existing condition, existing highway signs, delineators, and markers within the contract limits.

4. Maintain Existing Guide Rail: Work shall consist of maintaining existing traffic barriers and other safety devices, in their existing condition, within the contract limits.

5. Construction Vehicles and Equipment: Work shall consist of equipping construction vehicles and equipment with warning lights and reflective markings; and maintenance of vehicles and equipment in safe operating condition.

6. Barrier/Shadow Vehicles:

   a. Barrier Vehicles: Work shall consist of furnishing barrier vehicles to guide traffic and protect workers in stationary lane and shoulder closures and other stationary temporary traffic control zones, as shown in the contract documents or as directed by the Engineer.

   b. Shadow Vehicles: Work shall consist of furnishing shadow vehicles to guide traffic and to protect workers in mobile or short duration work zones not protected by stationary lane or shoulder closures, as shown in the contract documents or as directed by the Engineer.

D. Construction Signs: Work shall consist of furnishing, installing, moving, maintaining, deactivating, and removing construction signs, including warning lights, as shown in the contract documents or as directed by the Engineer.

E. Arrow Panels: Work shall consist of furnishing, installing, maintaining, and removing arrow panels as shown in the contract documents or as directed by the Engineer. Arrow panels are used to warn and guide traffic when travel lanes are temporarily closed by construction activities.

F. Channelizing Devices: Work shall consist of furnishing, placing, maintaining and removing channelizing devices, with warning lights where required, including drums, vertical panels, construction barricades, cones, and temporary tubular markers. Type III construction barricades and interim tubular markers may be specified.

G. Pavement Edge Drop-Off Protection: Work shall consist of furnishing and maintaining protection for edge drop-offs adjacent to the pavement or shoulder.

H. Flagging and Traffic Control: Work shall consist of furnishing the necessary traffic control equipment and flaggers for adequate traffic control.

I. Contract Site Patrol: Work shall consist of furnishing personnel to patrol the contract area as necessary to ensure conditions on the site are adequate for public safety and convenience at all times.

J. Temporary Pavement Markings: Work shall consist of furnishing and applying temporary pavement markings as shown in the contract documents or as directed by the Engineer. The work for removable pavement tape, removable wet-night reflective tape, temporary overlay markers and removable raised pavement markers shall include removal. Temporary pavement markings are intended for use on any new pavement or milled surface until the subsequent course is placed or interim pavement markings or final pavement markings are installed.

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K. Portable Variable Message Signs (PVMS): Work shall consist of furnishing, installing, operating, maintaining, relocating, and removing PVMSs as shown in the contract documents or as directed by the Engineer.

L. PVMSs are intended to supplement other traffic control devices by displaying symbolic or word messages, but are not to be used alone to replace conventional traffic control devices.

M. Traffic Control Supervisor: Work shall consist of providing a full-time traffic control supervisor having adequate training, experience, and authority to implement and maintain all traffic control operations, as shown in the contract documents or as directed by the Engineer.

PART 2 PRODUCTS

2.01 MATERIALS

A. All materials used shall comply with the requirements of the following subsections of Section 700 *Materials and Manufacturing* of the NYSDOT Standard Specifications, or as established by this section, the applicable NYSDOT Standard Sheets, and the contract documents.

Material	NYSDOT Specification Section
Removable Pavement Tape	727-06
Removable Wet-Night Reflective Tape	727-07
Permanent Wet-Night Reflective Tape	727-08
Traffic Paint	727-09
Drums	729-01
Cones	729-02
Temporary Tubular Markers	729-03
Vertical Panels	729-04
Stop/Slow Paddles	729-05
Temporary Sign Supports	729-09
Temporary Impact Attenuators – Re-directive	729-10
Temporary Impact Attenuators - Gating	729-11
Truck-Mounted Impact Attenuators	729-12
Arrow Panels	729-15
Portable Variable Message Signs	729-16
Warning Lights	729-18
Aluminum Sign Panels	730-01
Temporary Rigid Lightweight Sign Panels	730-03
Reflective Sheeting	730-05

Reflectorized Sheeting Sign Characters (Type IV)	730-12
Reflectorized Sheeting Sign Characters (Type V)	730-13
Temporary Wooden Sign Posts	730-19
Stiffeners, Overhead Brackets & Misc. Hardware	
Fiberglass Reinforced Plastic Sign Panels	730-23
Type A Sign Supports	730-24
Type B Sign Supports	730-25

2.02 BASIC WORK ZONE TRAFFIC CONTROL

A. Surface Condition, Debris, Drainage and Dust Control: Materials used to repair pavement surfaces shall be compatible with the pavement. In general, plant-mixed hot mix asphalt is suitable for all pavement surfaces to be repaired. Material other than plant-mixed hot mix asphalt may be used if approved by the Engineer.

   Environmentally compatible, approved dust palliatives may be used in conformance with any conditions placed on their use.

B. Maintain Public Access: None Specified.

C. Maintain Existing Roadside Signs, Delineators and Markers: All materials used to maintain existing roadside appurtenances shall be consistent with the features to be maintained.

D. Maintain Existing Guide Rail: All materials used to maintain existing roadside appurtenances shall be consistent with the features to be maintained.

E. Construction Vehicles and Equipment: All vehicles with a GVWR greater than 10,000 lbs and with restricted visibility to the rear shall be equipped with an operational audible backup alarm. Any vehicle with a non-operational backup alarm shall be taken out of service until the alarm is repaired.

   All vehicles and equipment within the contract limits and on the roadway shall be equipped with a rotating amber or flashing Light Emitting Diode (LED) beacon visible from all directions for a minimum of 1,000 feet during daylight. Flashing LED beacons shall meet the requirements of SAE J845 Class 2. Strobe lights shall not be used.

   All trucks with a GVWR greater than 10,000 lbs shall display a minimum 2-inch wide band of reflective sheeting on the front, rear and each side. The sheeting need not be continuous, but the sum of the length of the segments shall be at least one-half the length of the body or trailer. The centerline of the sheeting shall be between 15 inches and 60 inches above the ground. All other construction equipment shall display a minimum 2-inch wide band of reflective sheeting on the front and rear (100 square inches per end minimum) as practicable. Reflective markings on construction vehicles and equipment shall conform to NYSDOT Standard Specifications Section 730-05 *Reflective Sheeting*, ASTM Type III, Type VII or Type IX.

F. Barrier/Shadow Vehicles: Barrier/Shadow vehicles shall weigh a minimum of 18,000 lb and shall be equipped with a Type B or Type C Arrow Panel. Ballast may be used to bring a lighter vehicle up to the indicated weight provided the ballast is securely contained within an enclosed body or otherwise securely fastened to the vehicle such that the ballast will not separate from the vehicle upon impact. Barrier/shadow vehicles shall be equipped with a Test Level-2 truck mounted or trailer mounted impact attenuator. Impact attenuators meeting the requirements of NCHRP 350 Test Level 3 are also acceptable as Test Level 2 devices.

Where a barrier vehicle remains stationary for extended periods of time, the Contractor may utilize a barrier trailer in lieu of a barrier vehicle. A barrier trailer is a trailer that may be detached from the tow vehicle and that meets barrier vehicle weight, arrow board, and attenuator placement distance requirements.

G. Construction Signs: Fabrication of all components shall produce a finished sign panel. Holes may be punched or drilled. Edges shall be smooth and true and free from burrs or ragged breaks. Sign panels, including face shape, color, dimensions, and characters shall be fabricated using colors, character series, character sizes, symbols, route shields and borders as shown in the MUTCD or in the contract documents.

1. Sign Panels: Modification of sign legends by overlaying an existing legend with a revised legend, changing a single word or distance, such as changing LEFT to RIGHT or 1,000 to 1,500 will be permitted if the overlay is a match to the rest of the sign in terms of legend size and type, sheeting color and reflectivity. The overlay shall be firmly adhered to the underlying panel. Any such overlays shall provide a visual match to the rest of the sign when viewed from a distance of 100 feet or greater during all periods in which the sign will be used.

   a. Rigid Sign Panels: Rigid sign panels shall be aluminum, fiberglass, plywood, or lightweight plastic. Orange signs on rigid panels shall conform to NYSDOT Standard Specification Section 730-05 *Reflective Sheeting* fluorescent-orange ASTM Type IX (Class E) sheeting. All other colors of construction sign faces on rigid panels shall conform to NYSDOT Standard Specification Section 730-05 *Reflective Sheeting* ASTM Type III (Class B) sheeting. White characters and borders shall conform to NYSDOT Standard Specification Section 730-12 *Reflectorized Sheeting Sign Characters (Type IV)* or NYSDOT Standard Specification Section 730-13 *Reflectorized Sheeting Sign Characters (Type V).* Shields shall be either demountable or directly applied panels and shall conform to NYSDOT Standard Specification Section 730-13 *Reflectorized Sheeting Sign Characters (Type V).* Black sign characters and background shall be non-reflective and shall conform to NYSDOT Standard Specification Section 730-13 *Reflectorized Sheeting Sign Characters (Type V).*

   Flexible Sign Panels: Flexible sign panels shall be a solid, fluorescent-orange, durable elastomeric material. Flexible panels fabricated from mesh will not be allowed. Flexible sign panels shall be mounted on supports with adequate bracing, so as to minimize flutter and to support the intended shape of the sign.

2. Mounting Temporary Signs: Temporary sign supports shall meet the following requirements for portable or fixed supports. If rigid diagonal bracing is used, the high end of the bracing shall face away from approaching traffic. All wood supports shall be painted white.

a. Portable Temporary Sign Supports: Ballast used to stabilize supports shall be bagged sand or other suitable material, and shall be located at ground level. Portable supports shall be a configuration which is NCHRP 350 approved, or be constructed in accordance with the NYSDOT Standard Sheets, Section 619.

b. Fixed Temporary Sign Supports: The Contractor shall provide NCHRP 350 approved Type A, Type B or wooden sign posts in accordance with NYSDOT Standard Specification Section 730-19 *Temporary Wooden Sign Posts*, NYSDOT Standard Specification Section 730-24 *Type A Sign Supports*, or NYSDOT Standard Specification Section 730-25 *Type B Sign Supports* as appropriate.

3. Sign Covers: Covers used to inactivate unneeded construction signs shall be a single dark color, opaque material containing no wording or images. Rigid covers shall match the size and shape of the sign panel(s). Fabric sign covers may require more than one layer of fabric to prevent legibility of the sign being covered. Rigid Lightweight panels used as covers shall meet the requirements NYSDOT Standard Specification Section 730-03 *Temporary Rigid Lightweight Sign*. Signs hinged on the back side of the sign face to fold at the center and completely cover the sign face may be used.

H. Arrow Panels: Arrow panels shall be in accordance with NYSDOT Standard Specification Section 729-15, *Arrow Panels.*

I. Channelizing Devices: Drums shall be in accordance with NYSDOT Standard Specification Section 729-01 *Drums*. Standard cones, tall cones and extra tall cones shall be in accordance with NYSDOT Standard Specification Section 729-02 *Cones*. Temporary tubular markers shall be in accordance with NYSDOT Standard Specification Section 729-03 *Temporary Tubular Markers*. Standard and oversized vertical panels shall be in accordance with NYSDOT Standard Specification Section 729-04 *Vertical Panels*.

J. Pavement Edge Drop-off Protection: None Specified.

K. Flagging and Traffic Control: Hand signaling devices used to control traffic shall meet the requirements of the MUTCD. The standard signaling device shall be STOP/SLOW signal paddles in accordance with NYSDOT Standard Specification Section 729-05 *Stop/Slow Paddles*. Red signal flags shall be a minimum of 24 inches x 24 inches. Automated Flagging Assistance Devices shall be in accordance with NYSDOT Standard Specification Section 729-19 *Automated Flagging Assistance Devices*. Portable traffic signals shall be in accordance with NYSDOT Standard Specification Section 729-20 *Portable Traffic Signals*.

L. Contract Site Patrol: None Specified.

M. Temporary Pavement Markings: Temporary pavement markings shall consist of removable raised pavement markers in accordance with NYSDOT Standard Specification Section 727-02 *Removable Raised Pavement Markers*, or removable pavement tape in accordance with NYSDOT Standard Specification Section 727-06 *Removable Pavement Tape*.

N. Portable Variable Message Boards (PVMS): Portable Variable-Message Signs shall be in accordance with NYSDOT Standard Specification Section 729-16 *Portable Variable-Message Signs (PVMS)*.

O. Temporary Impact Attenuator: Temporary impact attenuators shall be in accordance with §729-10 Temporary Impact Attenuators – Re-directive or NYSDOT Standard Specification Section 729-11 *Temporary Impact Attenuators - Gating*.

P. Traffic Control Supervisor: None Specified.

PART 3 EXECUTION

3.01 GENERAL

The Contractor shall designate a work zone traffic control competent person who has the primary responsibility and sufficient authority for implementing the work zone traffic control plan and other safety and mobility aspects as necessary. The Contractor's work zone traffic control competent person shall be appropriately experienced and adequately trained in traffic control operations by recognized training programs, including the American Traffic Safety Services Association (ATSSA) "Traffic Control Supervisor", the National Safety Council, unions, or construction industry associations, or by an individual instructor from such a program in accordance with the level of decisions that the individual will be required to make, reflecting current industry practices.

The Contractor shall generally maintain a traveled way suitable for moving traffic, in accordance with the contract documents and ensure construction equipment, vehicles, and materials are safely stored beyond the clear zone or behind protective barrier during non-working hours so as not to constitute a hazard to vehicles, bicycles and pedestrians. Construction operations shall be conducted to ensure a minimum of delay to traffic. Stopping traffic for more than 5 minutes shall not be permitted unless specifically authorized in the contract documents or in writing by the Engineer. All operations shall be carried out in a manner that provides workers with safe access to the worksite and protects workers from moving traffic. The work zone traffic control competent person shall routinely inspect all work zone traffic control equipment and devices to make sure they are in a safe operating condition. Unless otherwise noted, temporary items supplied in accordance with this section shall remain the property of the Contractor.

Where pedestrian access is prohibited, workers shall not cross or enter travel lanes open to traffic.

The requirements in this section refer to posted speed limits. If prevailing or operating speeds for a highway exceed the preconstruction posted limits, the contract documents may direct the Contractor to assume that the preconstruction posted speed limits are different than posted.

3.02 BASIC WORK ZONE TRAFFIC CONTROL

A. The Contractor shall control traffic so that a person who has no knowledge of conditions may safely and with a minimum of discomfort and inconvenience ride, drive, or walk, day or night, over all or any portion of the highway and/or structure under construction where traffic is to be maintained.

B. The Contractor shall cease operations and restore the traveled way to safe operating condition during any specific periods listed in the contract documents, at such times as traffic renders conditions unsafe to continue work, and during periods of darkness (before sunrise or after sunset), fog, snow or rain, high winds, or other inclement weather that renders conditions unsafe to continue work, for either the traveling public or the workers. The Engineer will determine when traffic or weather conditions render work operations unsafe.

C. Surface Condition, Debris, Drainage and Dust Control: The traveled way shall be kept reasonably smooth and hard at all times, and shall be well drained and free of potholes, bumps, irregularities, and depressions that hold water. Except when construction operations necessitate disturbance of the normal surface, the Contractor shall maintain the pavement surface in such a condition as to permit the safe, comfortable passage of vehicles at the posted speed limit. A satisfactory riding surface shall be maintained both when work is underway, and when work is inactive. Special attention shall be given to maintenance of the traveled surface during hours of inactivity, including nights, weekends, holidays, and the winter season.

D. Transverse bumps or vertical faces, unpaved surfaces, milled or grooved pavement, rough pavement, and other surface irregularities 1 inch or more in height shall be adequately sloped or tapered, or BUMP (W8-1) or other appropriate warning signs shall be posted in advance of the condition. A Type 1 Object Marker (OM1-3) or a drum with a flashing warning light shall be installed on the right side of the roadway at the bump or other condition.

E. The Contractor shall keep the traveled way free of construction materials and foreign objects that fall from vehicles or equipment. Materials spilled by, dropped from, or tracked by traffic or by any vehicle used in the Contractor's operations along or across any public traveled way shall be removed immediately.

F. The Contractor shall keep all surface drainage facilities operative at all times. Positive drainage shall be provided at all times, even during grading operations and periods of accumulated plowed snow, to adequately drain the traveled way and the remainder of the right-of-way areas. Maintaining positive drainage shall include cleaning of drainage grates on roadway pavements. Cleaning of drainage structures and drainage pipes of material not deposited due to the Contractor's operations will be paid for separately. Repair of drainage structures will be paid for separately.

G. Dust control measures shall be applied to control dust resulting from traffic on unpaved surfaces and from Contractor operations on or adjacent to the roadway. Dust control shall be adequate to prevent dust which hinders driver visibility or which creates a nuisance condition for property owners and residents adjacent to the contract. Dusty conditions resulting from the Contractor's operations may be corrected by the use of calcium chloride and/or water. If used, water shall be distributed uniformly using a suitable spray head or spray bar.

H. Maintain Public Access: The Contractor shall provide and maintain at all times safe and adequate ingress and egress for intersecting roads, residences, business establishments, adjacent properties, bus stops and other transportation facilities for vehicles, pedestrians and bicycles; at existing or at new access points, consistent with the work, unless otherwise authorized by the Engineer. Whenever construction operations disrupt or interfere with normal traffic patterns, intersections, business establishment access points, and driveways shall be clearly marked using channelizing devices. Where bicycles are not prohibited from the highway, adequate accommodations for bicyclists shall be maintained in the travel lanes, on the shoulder, or on alternate paths or facilities.

I. Maintain Existing Roadside Signs, Delineators and Markers: Existing NYSDOT authorized signs, delineators, markers and their supports within the contract limits shall remain under the control and jurisdiction of the Engineer. Signs not authorized by the NYSDOT shall be removed from the right of way, as directed by the Engineer.

    1. Maintenance: Existing signs, delineators, markers and their supports shall be maintained by the Contractor. Adequate visibility of route markers and directional signing shall be provided

for drivers at all times. If relocation of route markers and directional signing is necessary to accommodate construction operations, the temporary or new locations shall be subject to approval by the Engineer. Existing roadside delineators shall be removed or relocated only to the minimum extent necessary to accommodate the work. Where contract operations require the temporary removal of existing delineators to facilitate work operations, temporary roadside delineation consisting of the existing delineators, temporary delineators, or channelizing devices shall be in place each night and at any time work operations at that location are suspended. Temporary devices shall be placed at the outer edge of the shoulder at a spacing similar to the existing delineator spacing.

2. Storage: Existing signs, delineators, markers, and their supports which directly interfere with the construction operations shall be removed, stored, protected, cleaned and replaced. Existing signs, delineators and markers removed for the Contractor's convenience shall be stored, cleaned and replaced at no additional cost to NAVFAC. Existing signs, delineators and markers lost or damaged due to negligence of the Contractor shall be replaced at no additional cost to NAVFAC.

J. Maintain Existing Guide Rail: When construction operations require the temporary removal of existing guide rail, the Contractor shall schedule operations to minimize the time period that rail is not installed. Unless otherwise specified in the contract documents, guide rail shall be replaced or the location otherwise protected within 14 calendar days.

During non-work hours when traffic is being maintained on the facility, all temporary ends (free ends) of guide rail shall be temporarily terminated and marked with a channelizing drum or object marker equipped with a Type A flashing warning light. Corrugated beam guide rail shall be temporarily terminated by having the exposed ends (free ends) dropped to the ground and pinned.

During any overnight period when existing guide rail is temporarily removed, the Contractor shall install channelizing devices in the location where the guide rail was removed.

K. Construction Vehicles and Equipment: All construction vehicles and equipment operating within the contract limits, whether in the work space, in the traffic space, in spoil areas, in storage areas, or any other areas under the contract, shall be operated at all times with due consideration for the safety of the public and workers.

All vehicles and equipment within the contract limits and on the roadway shall operate a rotating or flashing amber beacon. If visibility of the beacon is blocked by a portion of the vehicle or equipment, additional beacons shall be provided. Beacons shall be mounted in a manner which does not cause glare for the driver or operator. Short-term delivery vehicles not equipped with rotating or flashing amber beacon shall display four-way emergency flashers when in the temporary traffic control zone.

Other than vehicles registered and meeting all applicable requirements of the NYS Vehicle and Traffic Law, no construction vehicle or equipment used in the performance of the work shall be permitted to operate in travel lanes or shoulders open to traffic unless proper traffic control devices and other safety measures are in place to warn drivers of the presence of the equipment.

On any highway where the posted speed limit is 45 mph or higher, no construction vehicle or equipment shall operate in a travel lane or shoulder open to and unimpeded by traffic at a speed less than 15 mph slower than the posted speed limit unless followed by a vehicle equipped with flashing

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warning lights and SLOW MOVING VEHICLE (W21-4) sign on the rear.

The Contractor shall ensure that all construction vehicles and equipment are safely stored beyond the clear zone during non-working hours so as not to constitute a hazard to vehicles and pedestrians, unless protected by traffic barrier.

L. Barrier/Shadow Vehicles:

1. Barrier Vehicles: The Contractor shall provide barrier vehicles to guide traffic and protect workers at the beginning of stationary shoulder closures, lane closures and other stationary work zones in accordance with the contract documents. When located in the taper of a lane closure and another arrow panel is not present, arrow panels on barrier vehicles shall be operated in the appropriate flashing arrow mode. For all other applications, arrow panels shall either display the four-corner flashing caution mode, or shall be turned off. Barrier vehicles should normally be unoccupied, with transmission in gear, parking brakes set and wheels straight, except when being moved. Barrier trailers should have parking brakes set and arrow panels shall be operated in the appropriate flashing arrow mode. Barrier vehicles and barrier trailers shall be moved if necessary as the work progresses. The placement distance of barrier vehicles shall be as shown in the contract drawings.

2. Shadow Vehicles: The Contractor shall provide shadow vehicles to guide traffic and protect workers conducting mobile or short duration work operations except where the travel lane is closed to traffic by traffic barriers or by channelizing devices, including, but not limited to, pavement marking application, pavement marking removal and sweeping.

   When located in an open travel lane of a multilane roadway, the shadow vehicle shall display the flashing arrow panel in the appropriate mode. When located in a travel lane closed by barrier or channelizing devices, on a shoulder, otherwise not in an open travel lane, or on a two-lane, two-way roadway, the arrow panel shall either display the four-corner flashing caution mode or be turned off.

   The shadow vehicle shall be moved as necessary to keep pace with the work operations.

M. Construction Signs: The Contractor shall install and maintain construction signs in good condition to adequately and safely inform and direct motorists, bicyclists and pedestrians. Existing and construction signs shall indicate actual roadway conditions, and shall be covered, uncovered, changed, relocated, or removed immediately to reflect current conditions. Construction signs shall be covered or removed when they no longer indicate actual conditions.

The Contractor shall provide measures to protect workers during placement and removal of construction signs adequate for the prevailing speed, volume of traffic and roadway geometry where the work is to occur. Such protection may include, but is not limited to, the use of flaggers, spotters, and shadow vehicles equipped with truck-mounted or trailer mounted attenuators. Where pedestrian access is prohibited, workers shall not cross or enter travel lanes open to traffic.

All signs shall be kept clean, mounted at the required height on acceptable supports, and installed in the proper position, alignment and orientation so as to give maximum visibility. Construction signs will be evaluated for acceptability in accordance with the American Traffic Safety Services Association (ATSSA) *Quality Guidelines for Work Zone Traffic Control Devices*. When auxiliary

panels are mounted above or below a warning or regulatory sign, they shall not cover any part of the warning or regulatory sign. Signs shall be placed so that each sign is visible at night, at the desired distance, without being obscured by another sign, existing features on the highway, or foliage. The faces of stored signs shall not be visible to traffic in any direction, regardless of the orientation of the sign.

N. Sign Panels: Panels shall be flat and shall not be bowed or warped. Panel shapes shall not be altered, such as trimming corners of diamond shaped panels. If insufficient clearance exists, rectangular and/or smaller signs shall be used to obtain proper clearance. Panels with any wrinkling, delamination, or lack of adhesion of the reflective sheeting or legend will be evaluated for acceptability in accordance with the American Traffic Safety Services Association (ATSSA) *Quality Guidelines for Work Zone Traffic Control Devices*. Signs shall not bear any advertising message or any other message. A non-retroreflective logo or identifying information of the owner may be located on the back of the sign. The logo shall not exceed 1 square foot. The owner information shall not exceed 2 inches in height.

   Flexible, or roll-up, sign panels shall only be used for short-term, daytime use. All flexible sign panels shall be mounted on supports with adequate bracing, so as to minimize flutter and to support the intended shape of the sign. Fluorescent-orange colored flexible sign panels shall be approved by the Engineer prior to and for the duration of their use.

O. Mounting Temporary Signs: Unless otherwise noted in the contract documents or in the MUTCD, construction signs shall be mounted on a separate support. In cases where construction signs on an existing support will replace or supplement existing sign(s), they shall be mounted in accordance with the NYSDOT Standard Sheet(s). The type of temporary sign supports used shall be selected by the Contractor. Signs that are erected and removed or relocated on a daily basis, or that must be frequently relocated to adjust to the location of construction operations, may be mounted on portable temporary sign supports. If rigid diagonal bracing is used, the high end of the bracing shall face away from approaching traffic. Signs that are to remain at one location may be supported on fixed temporary sign supports.

   When not in service, temporary signs mounted on portable temporary sign supports shall be stored in such a manner and location that they do not interfere with or present a hazard to vehicular, bicycle or pedestrian traffic. No signs or supports shall be stored on the traveled way, shoulders or sidewalks during non-working hours. Portable temporary sign supports stored within the clear zone shall be laid flat such that no part of the support is more than 4 inches above the ground. No portable temporary sign supports shall be leaned against or overhang the traffic side of traffic barrier.

   All mounting heights are measured from the bottom of the lower sign panel to the nearest edge of pavement or to the ground directly below the sign, whichever results in a higher mounting. Rigid sign panels shall have a minimum mounting height of 5 feet. For signs incorporating an auxiliary panel below the primary panel, the minimum mounting heights shall be 4 feet.

   Flexible panel and lightweight rigid panel signs shall be mounted at the same height as rigid panel signs, except they may be mounted, when approved by the Engineer, as low as 1 foot when all the following conditions are met:

   - On two-lane, two-way roadways
   - Where there will be no parked vehicles to obstruct the view

- Where the first warning sign(s) of a work zone warning sign sequence is mounted at a height of 5 feet or higher, and is located in advance of any flexible signs to alert motorists that they are entering a temporary traffic control zone
- When the lower mounting height does not adversely affect visibility of the sign by motorists

P. Sign Covers: Covers for unneeded construction and/or permanent signs shall be attached in such a manner to cover the entire sign face including auxiliary panels above or below the main sign panel. The cover shall be firmly attached to the sign in a secure manner using straps, small hand clamps, small brackets or other means to prevent dislodging. Sign covers shall be maintained in good condition to present a neat appearance and minimize distraction to motorists. Damaged covers which are no longer effective shall be promptly replaced.

Q. State Law Signs: Signs advising motorists of increased fines or license suspension for speeding within the work zone shall be installed in accordance with the contract documents. The LICENSE SUSPENDED AFTER TWO WORK ZONE SPEEDING TICKETS (NYR9-11) or the FINES DOUBLED FOR SPEEDING IN WORK ZONES (NYR9-12) sign shall be posted in advance of work zones not having a reduced regulatory speed limit. The FINES DOUBLED FOR SPEEDING IN WORK ZONES (NYR9-12) sign shall be posted in advance of work zones having a reduced regulatory speed limit. The state law sign shall be installed approximately 1,000 feet upstream of the first construction warning sign on highways with preconstruction posted speed limits equal to or greater than 45 mph.

R. Special Use Work Zone Signs:

Reduced regulatory speed limits in work zones shall be posted in accordance with contract documents with SPEED LIMIT signs (R2-1) supplemented with WORK ZONE plaques (G20-5aP) of the same width mounted above the speed limit signs. The work zone plaques shall be placed on the same post and as the speed limit signs. REDUCED SPEED LIMIT AHEAD sign(s) (W3-5) shall be posted in advance of the first speed limit sign reducing the speed limit in a work zone.

The END WORK ZONE SPEED LIMIT signs (R2-12) or the preconstruction posted speed limit sign (R2-1) shall be posted 100 ft beyond the end of a work zone activity area having a reduced regulatory speed limit. An END HIGHER FINES sign (R2-11) shall be placed 200 feet beyond the END WORK ZONE SPEED LIMIT sign.

Where shown in the contract documents, the Contractor shall install BE PREPARED TO STOP (W3-4) signs to inform oncoming traffic of potential stopped, queued or very slow conditions upstream of advanced warning signs. Multiple signs may be installed and covered for later use. A PVMS may be used for the sign or as a supplement.

Each BE PREPARED TO STOP sign shall be mounted on a temporary sign support, and shall be equipped with a pair of orange warning flags. For approaches on expressways and freeways with three lanes or more, both sides of the approach shall be signed unless the median is too narrow to fit the sign and the support.

The BE PREPARED TO STOP signs shall be posted approximately $^1/_2$ mile in advance of the anticipated end of the queue. If the end of the queue is beyond the sign, the sign location shall be adjusted for the subsequent work day until the desired advance warning reflects typical conditions

for that location. If the resulting adjustment places the sign in advance of the first warning sign, the Contractor shall also furnish and place a ROAD WORK (W20-1) sign approximately 1,000 feet in advance of the BE PREPARED TO STOP signs.

S. Arrow Panels: The Contractor shall provide, operate and maintain arrow panels, also known as arrow boards, on highways having two or more travel lanes in the same direction, where the posted speed limit is 40 mph or higher, whenever a lane or lanes are closed to traffic and vehicles are required to merge with traffic in adjacent lanes. One arrow panel shall be provided for each lane closed to traffic regardless of the duration. Arrow panels shall be mounted so that the base of the panel is at least 7 feet above the pavement surface. Arrow panels shall be legible continuously from any point within the roadway (inclusive of shoulders) from 1,500 feet in advance of the lane closure taper to the beginning of the lane closure taper. Any arrow panel which cannot provide a sufficiently bright and clearly legible arrow display at any point within the roadway within the above distance shall be immediately repaired or replaced.

T. Channelizing Devices: Where construction operations obliterate pavement markings, or otherwise change or disrupt the normal traffic pattern, the Contractor shall use channelizing devices to physically separate traffic from portions of the roadway not available for travel; to separate traffic from hazards adjacent to the roadway; to separate opposing or adjacent travel lanes; to mark the location of hazards within or adjacent to the roadway; and to clearly define the intended travel path for vehicles, bicycles, and pedestrians. Spacing of devices shall be sufficiently close at all times to provide clear and adequate guidance to ensure that vehicles, bicycles, and pedestrians follow the intended travel path. Channelizing device spacing requirements are stated in center-to-center distances.

Channelizing devices shall be maintained upright, at proper spacing, in proper alignment and orientation, and kept clean. Channelizing devices used at night shall be retroreflective. Channelizing devices shall not bear any advertising or other message. A non-retroreflective logo or identifying information of the owner may be located on the back, base or top of channelizing devices where it does not obstruct the face, color, or reflectivity. The logo shall not exceed 1 square foot. The owner information shall not exceed 2 inches in height. The Contractor shall make frequent checks commensurate with traffic conditions to identify and reset channelizing devices dislodged by traffic. Deformed or damaged devices and devices that do not maintain appearance, color, and reflectivity will be evaluated for acceptability in accordance with the American Traffic Safety Services Association (ATSSA) *Quality Guidelines for Work Zone Traffic Control Devices*. Ballast and/or mailboxes shall not be placed on top of a device or at any point above ground level. Ballast rings may be added to traffic cones, or traffic cones may be doubled, with one cone on top of the other, to serve as ballast.

One Type A flashing warning light shall be installed on the first channelizing device in each series of a night-work shoulder or travel lane closure. One Type A flashing warning light shall be installed on channelizing devices used to mark the location of hazards in or adjacent to the travel lane, including, but not limited to, pavement discontinuities, drainage structures, excavations, fixed objects, and other obstructions and potential hazards remaining at the end of the work shift. Where the placement of numerous Type A flashing warning lights may present a distraction to motorists, flashing warning lights may be eliminated at intermediate locations such as driveway entrances or intersections.

Cones may be used in work zones where workers are not exposed to traffic, where the cones are placed to protect the work, and the placement does not create a hazard for traffic. In this application, cones are not considered channelizing devices.

Channelizing device application is summarized in Table 3.2-1 *Channelizing Device Applications for Work Zones*. Where permitted, the Contractor may opt to substitute interim tubular markers or Type III construction barricades for other channelizing devices at no additional cost to the Client.

Table 3.2-1: Channelizing Device Applications for Work Zones

Work Zone Provisions	Max. Device Spacing (center to center)	Drums	Standard Cones	Tall Cones	Extra Tall Cones	Temporary Tubular Markers	Vertical Panels
Shoulder/Merging/Shifting Tapers (< 40mph)	20'	X					
Shoulder/Merging/Shifting Tapers (≥40mph)	40'	X					
One-Lane Taper for Alternating Two-Way Traffic	20'	X					
Longitudinal Lane or Shoulder Closure w/Workers	40'	X		X	X		
Longitudinal Lane or Shoulder Closure w/o Workers	80'	X		X	X		
Roadway Edge Exposed with no Edgeline or Permanent Delineators	200'	X		X	X		X
Roadway Intersection or Driveway Radii	6'	X			X		
Pavement Drop-offs	(See Plans)						

Note: X = Allowed Blank = Not Allowed

U. Pavement Edge/Drop-off Protection: A drop-off is an abrupt difference in surface elevation of more than 2 inches at approximately 1V:3H or steeper. In the absence of adequate Traffic Control Plans in the contract documents, the Contractor shall submit alternate Traffic Control Plans to the Engineer for approval at least 30 calendar days prior to proposed work which will create a drop-off of over 24 inches within 10 feet from the edge of the traveled way for durations longer than one shift.

The Contractor shall provide pavement edge drop-off protection in accordance with Table 3.2-2 *Pavement Edge Drop-Off Protection*. Channelizing devices used to mark drop-offs shall be placed, as practicable, to not reduce the available travel lane width, at the elevation of the open travel lane in

order to provide maximum target value and visibility for motorists.

A drop-off of greater than 24 inches within 10 feet from the edge of the traveled way to remain at the end of the work shift shall be separated from traffic with temporary or permanent barrier. For posted speed limit of 45 mph and less, a drop-off of greater than 24 inches within 10 feet from the edge of the traveled way that is 100 feet or less in length will be allowed with channelizing devices consisting of drums, extra tall cones or oversized vertical panels only at a maximum spacing of 20 feet for short durations not to exceed one work shift.

Unless otherwise noted in the contract documents, the Contractor shall begin work to eliminate unprotected drop-offs created by contract work within 7 calendar days of the completion of the work creating the drop-off. Work shall continue in a timely manner until such time as the unprotected drop-off condition is eliminated.

Where pavement edge lines are not provided, channelizing devices shall be preceded by a NO SHOULDER (W8-23) sign. Where pavement edge lines are provided, channelizing devices shall be preceded by a SHOULDER DROP-OFF (W8-17) sign.

Table 3.2-2: Pavement Edge Drop-off Protection

Drop-off Height	Edge Line Pavement Markings	Spacing (ft)				Signs
		Drums	Vertical Panels	Tubular Markers	Tall Cones	
Within 4 ft from Travel Lane						
2" to 6"	Yes	100	100	N/A	N/A	W8-17
	No	40	40	N/A	N/A	W8-23
6" to 24"	Yes	40	40	N/A	N/A	W8-17
	No	20	20	N/A	N/A	W8-23
More than 4 ft from Travel Lane						
2" to 6"	Yes	200	200	100	100	W8-17
	No	100	100	40	40	W8-23
6" to 24"	Yes	40	40	N/A	N/A	W8-17
	No	40	40	N/A	N/A	W8-23

V. Flagging and Traffic Control: The Contractor shall provide an adequate number of competent flaggers to control traffic when it is necessary to maintain alternating one-way traffic in one lane of a two-

lane, two-way roadway, and at all other locations where construction operations, construction vehicles and equipment, and temporary traffic patterns related to the construction operations require positive temporary traffic control for safe, efficient traffic operations. These locations include, but are not limited to, locations where construction traffic enters, exits, or crosses open traffic lanes, locations of temporary stoppage of traffic for work operations, rail crossings, locations requiring slowing of traffic adjacent to work operations, on-ramps with restricted site distance, pedestrian crossings, intersections, and other locations where traffic needs to be alerted to unexpected conditions ahead.

Multiple lane approaches shall be reduced to a single lane prior to a flagger station. Automated flagger assistance devices (AFAD), portable traffic signals, and temporary traffic signals used to control traffic at the Contractor's option in lieu of flaggers shall be at no additional expense.

W. Flagger Training: All flaggers shall be adequately trained in flagging operations by recognized training programs, including the American Traffic Safety Services Association, the National Safety Council, unions, or construction industry associations, or by an individual who holds a current certification as a flagger training instructor from such a program. Prior to the start of flagging operations, the Contractor shall provide to the Engineer a list of certified flaggers to be used in the operation, identifying the source of flagger training for each individual. When requested by the Engineer, flaggers shall demonstrate their competency in flagging procedures. Flaggers not competent in flagging procedures shall be retrained or replaced at once.

X. Flagger Equipment: Flaggers shall wear orange protective helmets and traffic control apparel in accordance with '107-05A *High Visibility Apparel*. Flaggers shall be appropriately dressed, including apparel that covers the legs, torso and arms with sleeves a minimum of 4 inches long and appropriate footwear. Immodest or sloppy dress will not be permitted. Flaggers shall be equipped with an emergency air horn to alert workers of errant vehicles or other dangerous situations. Where flaggers are not within sight of each other, each flagger shall be equipped with a communication device, such as portable phone or two-way radio. The communication device shall only be used to communicate with other flaggers, other workers, or supervisor(s) regarding the flagging operations.

The standard signaling device for flagging operations, where one or more flaggers are controlling a single stream of traffic or two alternating streams of traffic in opposite directions, shall be STOP/SLOW signal paddles. Red signal flags may be used where display of the STOP and SLOW faces in opposite directions may be inappropriate or misleading.

Y. Operational Control: Flaggers shall be located in a position clearly visible to, but not in the path of, approaching traffic, with an available escape path to avoid an oncoming errant vehicle. The number of flaggers to be furnished for each operation shall be sufficient to provide safe, efficient flow of vehicle and pedestrian traffic. A spotter is not a flagger, and shall only direct construction vehicles or equipment, and shall not direct traffic in any manner.

Work zones utilizing flaggers shall comply with the Standard Sheet for flagger operation and a Flagger symbol (W20-7) sign shall be provided in advance of each flagger.

For control of alternating one-way traffic, one flagger shall be provided at each end of the one-way section, with additional flaggers provided to control traffic entering the one-way section from intermediate intersections and major commercial driveways.

The Contractor shall provide enhanced flagger stations consisting of a Flag Tree (6F.57) and

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additional cones at all approaches to flaggers, in accordance with the NYSDOT Standard Sheets, in order to provide effective advanced warning to motorists. Flag Trees shall display a minimum of 3 orange warning flags, with the flags mounted such that the lowest corners of the flags are at a minimum height of 8 feet.

Flaggers shall be alert at all times, and shall not stand with their backs to approaching traffic. Flaggers shall only direct traffic to stop, to slow or to proceed, using hand signals to supplement the signaling device in accordance with the flagging procedures shown in the MUTCD. Flaggers shall be provided periodic breaks (minimum 15 minutes every 4 hours) throughout the work day, with competent substitutes provided during breaks to maintain continuous coverage of the flagging operation.

A spotter shall be provided at all locations where construction vehicles or equipment must back across or into open travel lanes, sidewalks, or pedestrian walkways. A spotter shall only direct construction vehicles or equipment, and shall not direct traffic in any manner.

For ongoing flagging operations at a specific location, the Contractor may request approval from the Engineer to substitute portable traffic signals in lieu of flaggers.

Z. Contract Site Patrol: The Contractor shall provide adequate personnel and supervision to conduct operations and patrol the contract site to ensure that conditions are adequate for public safety and convenience at all times. The Contractor shall patrol the site as often as necessary during working and non-working hours to adjust and maintain signs, channelizing devices, and other traffic control devices and safety features.

AA. Temporary Pavement Markings: The Contractor shall install and maintain temporary pavement markings in accordance with the contract documents, using patterns and colors shown in the MUTCD to establish temporary traffic pattern(s) during construction on any pavement, including milled or grooved surface, resurfaced, new pavement, or other paved surface without pavement markings, for a maximum of 14 calendar days.

Within 14 calendar days after placement, the Contractor shall either: (1) install the succeeding pavement course or (2) install the remaining temporary pavement markings including edge lines, stop bars, and simple crosswalks, with no hatching. Pavements which will be open to traffic shall be properly marked before being opened, before nightfall, or before the end of the work day, whichever is soonest, except areas that are open during the work shift and delineated with channelizing devices or flaggers.

Removable pavement tape, removable wet-night reflective tape and removable raised pavement markers shall be removed before placing a subsequent course at no additional cost.

Temporary pavement marking stripes shall be a minimum of 4 inches in width. Temporary pavement markings shall be applied to a clean, dry pavement in accordance with the manufacturer's recommendations. Hatch lines and symbols will not be required as temporary pavement markings unless required by the contract documents.

If unanticipated weather or other conditions prevent the application of temporary pavement markings, the Contractor shall apply 2 foot removable pavement tape markings at 40 foot spaces at no additional cost, for a maximum of 3 days until such time as temporary pavement markings may be applied, or the next pavement course is installed.

For two-lane, two-way highways, the Contractor shall install temporary pavement markings consisting of full barrier centerline markings in no passing zones and 2-foot broken line markings at 40 foot spacing in passing zones.

Two-lane, two-way highways may for a maximum of 3 days have the centerline marked with yellow 2-foot by 4-inch removable pavement tape or yellow temporary overlay markers at 40-foot spaces with NO CENTER STRIPE (W8-12) signs and DO NOT PASS (R4-1) signs. A NO CENTER STRIPE sign shall be installed in advance of the area marked with yellow 2-foot removable pavement tape markings or temporary overlay markers, as well as after intersections. A DO NOT PASS sign shall be installed within 100 feet of the beginning of the area with the removable pavement tape markings or temporary overlay markers. On an approach without centerline pavement markings where passing will not be permitted, a black on orange NO PASSING ZONE (W14-3) pennant shaped sign shall be installed on that approach. Full barrier, partial barrier or broken line temporary centerline pavement markings shall be placed within three calendar days.

BB. Portable Variable Message Boards (PVMS): The Contractor shall provide, operate and maintain PVMSs for the duration of the contract until the progress of work no longer requires their use. The Contractor shall relocate or reorient PVMSs, as conditions dictate, at no additional cost. The message to be displayed shall be as required by the contract documents and may change on a daily basis or more frequently as conditions dictate.

If the contract requires a NTCIP compliant PVMS the Contractor shall provide the Engineer with the model, manufacture date and manufacturer of the NTCIP compliant PVMS the Contractor plans to use from the NYSDOT Approved List. Prior to acceptance of the NTCIP compliant PVMS the Contractor shall allow the NYSDOT Regional Transportation Management Center (TMC) to conduct operations and communications tests on one or more samples of the NTCIP compliant PVMS supplied by the Contractor. The testing will be used to determine if the proposed PVMS meets the TMC's operational requirements by demonstrating remote communications to and from the TMC using NTCIP compliant operating software.

The Contractor shall provide, operate, and maintain PVMSs at the general location and duration stated in the contract documents. The message to be displayed shall be as required by the contract documents or as directed by the Engineer.

When in use, PVMS shall be placed so that the base of the message panel is at least 7 feet above the adjacent pavement surface and aligned to provide optimum viewing by approaching motorists.

The Contractor shall supply the Engineer with an accurate log of the text of all messages and times messages were displayed monthly, not later than the 15th of the following month. The log of messages may be either a listing in a manual register or printouts from the control software. The Contractor shall inform the Engineer of PVMS locations and update as they are relocated and removed. PVMS with Cellular Communications Option shall have cellular telephone service provided by the Contractor. The Contractor shall supply the Engineer with a copy of control software a minimum of 14 calendar days prior to installation of the first unit.

CC. Temporary Impact Attenuator: The Contractor shall install temporary impact attenuators in accordance with the contract documents, the manufacturer's instructions and materials details. The Contractor shall provide the Engineer a copy of the manufacturer's materials details and installation

instructions a minimum of 7 calendar days prior to use, to allow verification of the attenuator supplied and proper installation. The selection of the manufacturer and model of temporary impact attenuator shall be at the Contractor's option, provided the attenuator supplied is of the type indicated, gating or re-directive; shields the hazard; and fits in the location without encroachment into travel lanes or required offsets.

The Contractor shall maintain temporary impact attenuators for continuous operation. If an attenuator is out of operation, the Contractor shall immediately mark the hazard with drums, vertical panels and or extra tall cones until repairs are made or a new attenuator is installed. The Contractor shall promptly begin repairs to damaged attenuators, and shall complete repairs to a damaged attenuator or mitigate the hazard within 1 work day. Attenuators damaged beyond repair shall be replaced within 3 work days.

When temporary impact attenuators are removed or moved to another location, the Contractor shall restore the location to match the surrounding area.

DD. Traffic Control Supervisor: When indicated in the contract documents, the Contractor shall provide a dedicated traffic control supervisor having adequate training, experience, and authority to implement and maintain all traffic control operations. The traffic control supervisor shall not be assigned other duties that interfere with performance as a traffic control supervisor. The traffic control supervisor shall be adequately trained in traffic control operations by recognized training programs, including the American Traffic Safety Services Association "Traffic Control Supervisor", the National Safety Council, unions, or construction industry associations, or by an individual instructor from such a program. Traffic control supervisors not competent to the satisfaction of the Engineer shall be replaced immediately.

During setup and removal of lane closures and other traffic control setups, the traffic control supervisor shall be assisted by additional workers as necessary. The traffic control supervisor shall patrol the contract area to ensure that conditions on the site are adequate for public safety and convenience at all times, to monitor worker safety from intrusions into the work area, and to ensure that the work adheres to the provisions for work zone traffic control. The traffic control supervisor shall ensure signs, channelizing devices, barricades, barrier, impact attenuators and other traffic control devices are adjusted and maintained as necessary. The Contractor shall provide workers to install, maintain, adjust, and remove traffic control devices as required by the work operations.

When the work does not require closure of an active lane, roadway, or ramp; when no construction operations occur within 30 feet of active traffic lanes; and when there is no delivery of materials or equipment; the Engineer may waive the requirements for a traffic control supervisor.

END OF SECTION

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes furnishing and installation of new perimeter security chain link fencing.

B. Related Sections:

1. Section 31 10 00 – Site Clearing

1.02 REFERENCES

A. ASTM International:

1. ASTM A 392, Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric

2. ASTM A 824, Standard Specification for Metallic-Coated Steel Marcelled Tension Wire for Use With Chain Link Fence

3. ASTM C 33, Standard Specification for Concrete Aggregates

4. ASTM C 150, Standard Specification for Portland Cement

5. ASTM F 567, Standard Practice for Installation of Chain-Link Fence

6. ASTM F 626, Standard Specification for Fence Fittings

7. ASTM F 900, Standard Specification for Industrial and Commercial Swing Gates

8. ASTM F 1043, Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework

9. ASTM F 1083, Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

1.03 SUBMITTALS

A. Submit the following to the Engineer for review and approval prior to shipment of products to the Site:

1. Product data and shop drawings showing materials, finishes and dimensions for fencing and gates.

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PART 2 PRODUCTS

2.01 FENCE FABRIC

A. Height of fence fabric shall be 6 feet as indicated on the Drawings.

B. Fence fabric shall be fabricated of number 9 gage (0.148 inch) (coated wire size) galvanized steel wires, 2-inch mesh. Fabric shall be galvanized after weaving with a minimum of 1.2 ounces of zinc per square foot of surface area and conform to ASTM A 392, Class 1.

C. Fabric shall be barbed and twisted at both selvages (top and bottom edges).

2.02 FENCE POSTS

A. All fence posts (including gate posts) shall be round hot-dipped galvanized steel pipe, standard weight (Schedule 40), conforming to ASTM F 1083 (ASTM F 1043, Group 1A), with a minimum average zinc coating of 1.8 ounces per square foot of surface area. Coating shall be applied after welding.

B. Line posts shall have a minimum nominal outside diameter (O.D.) of 1.900 inches for fabric heights 6 feet or less.

C. End, corner, and pull posts shall have a minimum nominal O.D. of 2.375 inches for fabric heights 6 feet or less.

D. Gate post sizes shall be as follows for one single gate leaf or one leaf of double gate installations on fence heights of 6 feet or less:

1. For gate leaf width up to 4 feet, posts shall be not less than 2.375 inches nominal O.D.

2. For gate leaf width over 4 feet up to 10 feet, posts shall be not less than 2.875 inches nominal O.D.

3. For gate leaf width over 10 feet up to 18 feet, posts shall be not less than 4.000 inches nominal O.D.

2.03 TOP AND BRACE RAILS

A. Unless otherwise determined by the NAVFAC and Engineer, furnish top rail for the entire length of chain link fencing. Furnish brace rails for installation at all end and corner posts. Rails shall conform to the same material requirements for fence posts specified in subsection 2.02, except minimum nominal O.D. shall be 1.66 inches.

B. Rails shall be furnished in manufacturer's longest lengths, with expansion type couplings approximately six inches long for each joint. Furnish materials for attaching rails securely to posts as specified in subsection 3.02.

2.04 TENSION WIRE

A. Furnish tension wire for bottom of fence fabric.

B. Tension wire shall be number 7 gauge marcelled wire conforming to ASTM A 824. Match coating type to that of the chain link fabric. Furnish galvanized toes or clips for attaching wires to chain link fabric.

2.05 FENCE FITTINGS AND MISCELLANEOUS MATERIALS

A. Fence fittings (including post and line caps, rail and brace ends, top rail sleeves, tension and brace bands, tension bars, and truss rod assemblies) shall conform to ASTM F 626.

2.06 GATES

A. Gates shall have the same type of fabric as for fence, unless otherwise indicated. Gates shall be swing as shown on the Drawings and as specified in the following paragraphs. Gate widths shall be as indicated on the Drawings.

B. Swing gates shall conform to ASTM F 900, and shall be complete with latches, stops, keepers, hinges, and other standard gate hardware as specified in the following paragraphs.

C. Gate Hardware: Furnish galvanized steel or malleable iron hardware and accessories for each gate, consisting of hinges, latches, stops and keepers as specified in paragraphs 1 through 4 below, and as applicable.

1. Hinges (for swing gates): Shall be of adequate strength for gate, and with large bearing surfaces for clamping in position. The hinges shall not twist or turn under the action of the gate. The gates shall be capable of being opened and closed easily by one person.

2. Latches: Shall have a plunger-bar arranged to engage the center stop (for double swing gates), or other standard latch for sliding gates as approved by the Engineer. A forked latch may be provided for single swing gates of openings less than 10 feet wide. Latch shall permit operation from either side of gate. Include locking device and padlock eyes as an integral part of the latch, using one padlock for locking each gate.

3. Center Stops: For double swing gates, provide a center stop consisting of a device arranged to be set in concrete and to engage a plunger bar of the latch. No stop is required on single swing gates.

4. Hold-Open Keepers: Shall consist of a mechanical device for securing the free end of each swing gate leaf when in the full open position.

2.07 CONCRETE FOR POST FOOTINGS

A. Concrete shall consist of Type I Portland cement complying with ASTM C 150, one-inch maximum size aggregates complying with ASTM C 33, and clean water. Concrete mix shall be proportioned such that the 28-day compressive strength of moist-cured laboratory samples achieves not less than 3,000 pounds per square inch (psi).

PART 3 EXECUTION

3.01 PREPARATION

A. The ground surface along the alignment of the fencing shall be cleared as specified in Section 31 10 00, and graded as necessary to produce a relatively even surface for proper fence construction.

B. Place aggregate to fill minor depressions, and riprap or other free draining stone for larger depressions and drainage channels, so that fence fabric will be within two inches of the finish ground surface in all locations.

C. The required fence alignment and gate locations are shown on the Drawings.

3.02 FENCE INSTALLATION

A. Construct fencing in accordance with ASTM F 567, as recommended by the fence manufacturer, and as indicated on the Drawings. Provide all necessary hardware for a complete installation.

B. Line posts shall be installed at spacing not greater than ten feet on center.

C. All posts shall have concrete encasement as specified in the following paragraphs:

1. Excavate holes to the diameter and depth indicated on the Drawings.

2. Center and align posts in holes four inches above bottom of excavations. Place concrete around posts in a continuous pour to required height above finish grade. Vibrate or tamp concrete for consolidation. Check each post for vertical and top alignment, and hold in position during concrete placement and finishing operations. Provide crown on finished surface of concrete as indicated.

3. Do not install fence fabric and framework until concrete has cured for a minimum of two days.

D. If solid rock is encountered, set posts into the solid rock to a minimum depth of three times the largest cross-section of the posts. The diameter of the hole shall be 1/2 inch greater than the largest cross-section of the post. Posts shall be inserted into the holes, and then leveled, plumbed, and aligned. The annular space shall be filled solid with a quick-setting hydraulic cement or non-shrink grout.

E. Alternate materials and methods of post anchorage may be used if approved by the Engineer.

F. Top rail shall be installed through line post to form a continuous brace from end to end of each stretch of fence. Secure rail to terminal posts using brace bands and rail end firings.

G. For fences without bottom rail, install tension wire 4 inches up from the bottom of the fabric. Stretch tension wire(s) taut, independently and prior to stretching of the fabric, between the terminal posts. Secure to each terminal post using a brace band. Fasten tension wire to fabric

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using 9-gauge hog rings at 18 inches on center and to each line posts using tie wires.

H. Stretch chain link fabric taut in accordance with industry standards. Fabric shall be attached to and supported by terminal posts (end, corner, pull and gate posts) by means of specified tension bars.

I. Fabric shall be fastened to line posts (and to the top and bottom rails if furnished) by means of tie wire, wrapped twice around the fabric, and spaced approximately 24 inches on center. Post bracing and other structural members shall be located on the inside of the fence.

J. All end, corner and pull posts shall be suitably braced with brace rail pipe set in horizontal position, with adjustable truss braces between terminal and first line posts, complete with all fittings.

3.03 GATE INSTALLATION

A. Install gates as indicated on the Drawings and in conformance with gate manufacturer's recommendations and acceptable industry practice.

B. Install gates plumb, level, and secure for full opening without interference. Install ground-set items in concrete for anchorage as recommended by the fence manufacturer. Adjust hardware for smooth operation and lubricate where necessary.

END OF SECTION

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SECTION 32 92 19

SEEDING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes establishing permanent grass on completed and graded areas to be vegetated. This Section shall be considered as supplementary to the requirements presented in the erosion and sediment control plan.

B. Related Sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control

2. Section 31 23 00– Excavation and Fill

1.02 REFERENCES

A. State of New York Department of Transportation (NYSDOT):

1. NYSDOT Standard Specifications

1.03 SUBMITTALS

A. Submit the following to the Engineer, for review and approval, prior to shipment of materials to the Site:

1. Soil sample analysis results and recommendations for soil amendments.

B. Submit the following for approval at time of shipment of materials to the Site:

1. Certification of grass seed from seed vendor for each grass seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination and weed seed.

2. Manufacturer's certification for lime and fertilizer showing compliance with the specifications.

3. Bag tags, receipts, truck weight tickets, and other information necessary to confirm application rates and types for all seed, lime and fertilizer.

1.04 QUALITY ASSURANCE

A. Seeding shall be accomplished according to standard local practice and in compliance with the requirements indicated on the Drawings.

B. Contractor shall retain the services of a qualified testing firm approved by the Engineer to

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perform analysis of soil samples to determine nutrient content and recommendations for soil amendments as specified in this Section.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver packaged materials in containers showing weight, analysis and name of manufacturer/supplier.

B. Protect materials from deterioration during delivery and while stored at the Site.

1.06 PROJECT CONDITIONS

A. Perform seedbed preparation and seeding as soon as possible after completion of grading in each area.

B. Seeding shall be performed only during the appropriate growing season for the particular seed mixture.

PART 2 PRODUCTS

2.01 FERTILIZER AND LIME

A. Fertilizer shall be uniform in composition, free flowing, suitable for accurate application by appropriate equipment, and meet the requirements of Section 713 of the NYSDOT Standard Specifications.

B. Lime materials shall be agricultural grade ground limestone which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone shall be ground to such fineness that at least 50 percent will pass through a U.S. Standard No. 100 sieve and 98 to 100 percent will pass through a U.S. Standard No. 20 sieve. Hydrated or burnt lime may be substituted for ground limestone except when amendments are applied via hydroseeding.

2.02 SEED

A. Seed shall meet the requirements of Section 713 of the NYSDOT Standard Specifications. Temporary and permanent seed mixtures shall be as indicated.

2.03 MULCH

A. Mulch shall be hydraulically applied wood fiber mulch or bonded fiber matrix (BFM) for the establishment of turf material.

PART 3 EXECUTION

3.01 SOIL SAMPLING

A. Fertilizer and lime ratios and application rates shall be determined by soil analyses performed by a recognized private or commercial Engineer approved laboratory at a frequency of one sample per disturbed acre.

3.02 PREPARATION

A. Maintain temporary erosion and sediment control measures as specified in Section 01 57 13 and as indicated on the Drawings until a satisfactory permanent stand of grass has been established.

B. Fill and topsoil placement and grading shall be completed as specified in Section 31 23 00. Surfaces shall be reasonably smooth and free of litter, large clods, roots, sharp protrusions, and large stones.

C. For seeding methods other than hydroseeding, graded surfaces shall be scarified to an approximate depth of three inches.

3.03 SEED APPLICATION TIMES

A. Seeding for permanent vegetation shall be performed during the first optimum planting season following completion of work in an area.

3.04 APPLICATION OF SOIL AMENDMENTS

A. As indicated.

3.05 APPLICATION OF PERMANENT SEEDING

A. Uniformly apply seed for permanent vegetation in conformance with the application rates and procedures indicated on the Drawings, unless otherwise approved by the Engineer.

B. Immediately after seeding, protect seeded areas with mulch or temporary erosion control blankets as indicated.

C. Install erosion control blankets where indicated on the Drawings and as specified in Section 31 35 20.

3.06 HYDROSEEDING

A. Fertilizer, seed and mulch may be placed using hydroseeding or other suitable mechanical methods that will not damage the completed Work.

3.07 ESTABLISHMENT OF GRASS

A. Begin maintenance of seeded areas immediately after seed placement. Water, repair washed or eroded areas, and otherwise protect and maintain the seeded areas for a minimum of one month after seed placement has been completed or until final acceptance of grassed areas.

B. Final acceptance of seeded areas will not be made by NAVFAC, Engineer, or NYSDEC until a satisfactory stand of grass is obtained in all areas identified to be seeded as indicated on the Drawings. A satisfactory stand of grass is defined as a cover of healthy plants as indicated on the Drawings, after true leaves are formed of the seed species applied, in which gaps larger than one square foot do not occur. Bare spots shall be scattered, and the total bare areas shall not comprise more than one percent of the total seeded area.

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C. During the establishment period, reseed bare and eroded areas as determined necessary by NAVFAC or Engineer. Repair of washed or eroded areas and reseeding of bare areas shall be performed at no additional cost to the Project.

D. Water required to promote a satisfactory and rapid growth shall be furnished and applied by the Contractor until final acceptance of seeded areas, and will not be measured for payment. The Contractor is responsible for locating a water source.

E. At locations where repeated applications of hydroseeding fail to result in an acceptable cover of grass, these areas shall be repaired using methods other than hydroseeding.

END OF SECTION

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SECTION 32 93 43

TREES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes furnishing all equipment, tools, materials and labor necessary for the planting of trees and shrubs on the backfilled and graded surface.

B. Related Sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control

2. Section 32 92 19 – Seeding

1.02 REFERENCES

A. State of New York Department of Transportation (NYSDOT):

1. NYSDOT Standard Specifications

1.03 SUBMITTALS

A. Submit the following to the Engineer, for review and approval, prior to shipment of materials to the Site:

1. Soil sample analysis results and recommendations for soil amendments.

1.04 QUALITY ASSURANCE

A. Tree and shrub planting shall be accomplished according to standard local practice and in compliance with the requirements indicated on the Drawings.

1.05 DELIVERY, STORAGE, AND HANDLING

A. During delivery, trees and shrubs shall be protected from drying and contamination by detrimental material.

B. Trees and shrubs shall be inspected upon arrival at the site; unacceptable materials shall be immediately removed from the site by the Contractor.

PART 2 PRODUCTS

2.01 MATERIALS

A. Trees and shrubs shall be true to type and nomenclature and typical of their species or variety. They shall be planted as nursery stock plants able to develop a normal habit of

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growth with well-developed branch systems and vigorous root systems. They shall be sound, healthy and vigorous, free from defects, disfiguration, injury, disease of any kind, insect eggs, borers and any infestation. All nursery stock plants shall be nursery grown. They shall be acclimated to the conditions to those of the locality of this project for at least 1 year prior to planting. It will be the responsibility of the Contractor to inspect the trees before removal from the nursery where they have been grown to make sure that they meet these requirements. All trees and shrubs shall be fresh and no heeled in or cold storage trees will be accepted. Trees shall be 12-15 feet tall and have a diameter of 2.5 to 3 inches.

B. Soil shall be mixed with compost to provide nutrients and retain moisture. Soil amendments and fertilizer shall be added at the rates specified by the supplier to ensure plant health.

C. Fertilizer shall be controlled-release, commercial grade, granular free flowing, uniform in composition, delivered in fully labeled sealed containers, and shall conform to applicable New York and federal regulations. Fertilizer shall bear the manufacturer's guaranteed statement of analysis.

D. Natural limestone shall contain not less than 85 percent of total carbonates and ground to such fineness that not less than 98 percent passes a No. 20-mesh sieve and not less than 50 percent passes a No. 100-mesh sieve.

E. Soil shall meet the following minimum conditions for permanent vegetative establishment:

1. Soil pH shall be between 6.0 and 7.0.
2. Soluble salts shall be less than 500 ppm.
3. Soil shall contain less than 40 percent clay, but sufficient fine-grained material to maintain moisture.
4. Soil shall contain 3.0 percent minimum, and 20 percent maximum, organic matter by weight.
5. Soil must contain sufficient pore space to permit adequate root penetration.
6. If these soil conditions cannot be met by on-site soil, adding topsoil, compost or other soil amendments will be required.

F. Mulch shall be hydraulically applied wood fiber mulch or bonded fiber matrix (BFM) for the establishment of turf material.

G. Water shall be of a quality suitable for irrigation and such that it will promote growth of plants.

PART 3 EXECUTION

3.01 TREES AND SHRUBS

A. Trees and shrubs shall be handled with care at all times to avoid damage to the roots and branches. Trees with broken leaders will be rejected. Plants shall be protected from sun and wind; nursery stock plants shall be kept damp or wet during the interim period from delivery to planting. When transporting plants to the site, provisions shall be made to protect the plants from wind damage.

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B. No tree or shrub shall be transported to the planting area that is not thoroughly wet. Any plant that is dry or in a wilted condition when delivered to the planting area, or has been damaged, will not be accepted, and shall be replaced by the Contractor.

C. Each tree and shrub shall be handled and packed in the approved manner for that species or variety, and all necessary precautions shall be taken to ensure that the plants will arrive at the site in proper condition for successful growth. Trucks used for transporting plants shall be equipped with covers to protect plants from windburn.

D. Trees and shrubs shall be promptly planted. If planting is delayed more than 6 hours after delivery to the planting area, trees and shrubs shall be set in shade, protected from weather and mechanical damage, and roots shall be kept moist by covering with mulch, burlap, or other acceptable means of retaining moisture.

E. Trees and shrubs shall comply with federal and state laws requiring inspection for plant diseases and infestations. Inspection certificates shall accompany the plants upon delivery.

F. Trees and shrubs shall be healthy, shapely, well-rooted, and roots shall show no evidence of having been restricted or deformed at any time. Plants shall be well-grown and free from insects and disease.

G. Trees and shrubs shall be set in the center of pits, plumb and straight. Backfill soil shall be worked into the pit and water-settled to eliminate air pockets. Any wire or twine wrapped around the base of the plant shall be removed.

H. For planting trees and shrubs, a hole shall be dug at least twice as wide as the root mass and 6 inches deeper. The Contractor shall place the top portion of the root ball slightly higher than the surrounding ground and not cover the top with soil. The root ball shall be watered and an organic mulch of wood chips and leaves shall be applied.

I. As planting is completed, each tree and shrub shall be watered thoroughly to settle the plants and eliminate air pockets. All plants shall be watered after planting regardless of soil moisture conditions.

3.02 PROTECTION AND CLEANUP

A. After planting has been completed, barricades, fences, and approved warning signs shall be erected by the Contractor as required to protect against traffic and trespass. Excess material from planting and all debris shall be cleaned up and disposed offsite by the Contractor.

3.03 ESTABLISHMENT AND MAINTENANCE PERIOD

A. The Contractor is responsible for the establishment and maintenance of the trees and shrubs for a minimum of one year from the date of the confirmed establishment of the plants. No stressed trees or shrubs shall be observed.

B. Maintenance activities include replacement of trees and shrubs that have died.

END OF SECTION

SECTION 33 40 00

STORM DRAINAGE UTILITIES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes furnishing and installation of storm drainage utilities, including reinforced concrete pipe, precast box culvert sections, and miscellaneous storm drainage utilities.

B. Related Sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control

2. Section 03 30 00 – Cast-in-Place Concrete

3. Section 31 23 00 – Excavation and Fill

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):

1. AASHTO M 294, Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter

B. American Concrete Institute International (ACI)

1. ACI 318 (2011; Errata 2011; Errata 2012) Building Code Requirements for Structural Concrete and Commentary

C. ASTM International:

1. ASTM C 31-12, Standard Practice for Making and Curing Concrete Test Specimens in the Field

2. ASTM C 33, Standard Specification for Concrete Aggregates

3. ASTM C 39-12a, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

4. ASTM C 138 - 13a, Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

5. ASTM C 143 – 12, Standard Test Method for Slump of Hydraulic-Cement Concrete

6. ASTM C 150, Standard Specification for Portland Cement

7. ASTM C 173- 12, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

8. ASTM C 192 - 13a, Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

9. ASTM C 231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

10. ASTM C 1064 – 12, Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete

11. ASTM D 3212-07, Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

12. ASTM F 477-10, Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

13. ASTM F 2306-13 Standard Specification for 12 to 60 in. [300 to 1500 mm] Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications

D. State of New York Department of Transportation (NYSDOT):

1. NYSDOT Standard Specifications)

1.03 SUBMITTALS

A. Submit the following documentation to the Engineer for review prior to shipment of materials to the Site:

1. Manufacturers' documentation (including product data sheets) for all specified products.

2. Precast concrete plant certification. The precast concrete producer shall be certified by the National Precast Concrete Association's (NPCA) and/or the American Concrete Pipe Association's (ACPA) Plant Certification Program and be included on the FDOT's current list of Producers with Accepted Quality Control Programs prior to and during production of the products for this project. Submit notarized statement to Engineer from a precast concrete producer designated representative certifying that the plant will manufacture the precast concrete products as indicated and in accordance with the plant's approved Quality Control (QC) Plan.

3. Precast concrete plant QC Plan. Submit quality control procedures established by the precast concrete producer in accordance with NPCA QC Manual and/or ACPA QPC. Show that the following QC tests are performed as required and in accordance with the ASTM standards indicated.

a. Slump: Perform a slump test for each 150 cubic yards of concrete produced, or once a day, whichever comes first. Perform slump tests in accordance with ASTM C 143.

b. Temperature: Measure the temperature of fresh concrete when slump or air content tests are made and when compressive test specimens are made in accordance with ASTM C 1064.

c. Compressive Strength: Make at least four compressive strength specimens for each 150 cubic yards of concrete of each mix in accordance with ASTM C 31, ASTM C 192, and ASTM C 39.

d. Air Content: Perform tests for air content on air-entrained, wet-cast concrete for each 150 cubic yards of concrete, but not less often than once each day when air-entrained concrete is used. Determine the air content in accordance with either ASTM C 231 or ASTM C 173 for normal weight aggregates and ASTM C 173 for lightweight aggregates.

e. Unit Weight: Perform tests for unit weight a minimum of once per week to verify the yield of batch mixes. Perform unit weight tests for each 100 cubic yards of lightweight concrete in accordance with ASTM C 138.

4. Precast concrete plant test reports.

a. Material certifications and/or laboratory test reports, including mill tests and all other test data, for Portland cement, blended cement, pozzolans, ground granulated blast furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on this project.

b. Test reports showing that the mix has been successfully tested to produce concrete with the properties specified and will be suitable for the job conditions. Such tests may include compressive strength, flexural strength, plastic or hardened air content, freeze thaw durability, abrasion and absorption. Clearly detail in the specifications special tests for precast concrete or cast-in items.

c. Sufficient documentation, when the use of self-consolidating concrete (SCC) is proposed, showing a minimum of 30-days production track records demonstrating that SCC is appropriate for casting of the product.

d. In-plant QA/QC inspection reports, upon the request of the Engineer.

5. Shop drawings, cut sheets, and design calculations for precast concrete items. Design standard precast concrete units to withstand indicated design load conditions in accordance with applicable industry design standards including ACI 318. Design shall also consider stresses induced during handling, shipping and installation as to avoid product cracking or other handling damage. Indicate design loads for precast concrete units on the shop drawings. Submit shop drawings for standard precast concrete units furnished by the precast concrete producer for approval by the

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Engineer. Shop drawings shall demonstrate that the applicable industry design standards have been met. Shop drawings shall include, but not be limited to, installation and construction information, details of steel reinforcement size and placement as well as supporting design calculations, if appropriate, layout, lifting devices, and description of casting method. Shop drawings shall be signed and sealed by a registered Professional Engineer. Produce precast concrete units in accordance with the approved shop drawings. Submit cut sheets, for standard precast concrete units, showing conformance to project drawings and requirements, and to applicable industry design standards. Submit design calculations for custom-made precast units, prepared and sealed by a registered professional engineer, for approval prior to fabrication. Include in the calculations the analysis of units for lifting stresses and the sizing of lifting devices.

6. Precast concrete mix proportions. Base selection of proportions for precast concrete on NYSDOT Standard Specifications as indicated. Develop the concrete proportions using the same type and brand of cement, the same type and brand of pozzolan, the same type and gradation of aggregates, and the same type and brand of admixture that will be used in the manufacture of precast concrete units for the project. At a minimum of thirty days prior to precast concrete unit manufacturing, submit a mix design and proportions for each strength and type of concrete that will be used. Furnish a complete list of materials, including quantity, type, brand and applicable data sheets for all mix design constituents as well as applicable reference specifications.

7. Each shipment of precast concrete shall be accompanied with a QC signed or stamped delivery ticket providing the description and the list of the products.

B. Submit the following at completion of the Work:

1. Record survey drawing showing installed storm drainage utilities as specified in this Section.

1.04 QUALITY ASSURANCE

A. Manufacturers shall have manufacturing and quality control facilities capable of producing and assuring the quality of storm drainage utilities.

1.05 DELIVERY, STORAGE AND HANDLING

A. During loading, transporting and unloading, exercise care to prevent damage to products.

B. Pipe shall be marked with manufacturer's identification symbol, size, date of manufacture, class of pipe and applicable product specification identification number.

C. All products shall be inspected upon delivery to the Site. Damaged or defective materials shall be rejected and shall be replaced with new materials.

PART 2 PRODUCTS

2.01 CORRUGATED POLYETHYLENE PIPE

A. AASHTO M294, Type S (full circular cross-section with an outer corrugated pipe wall and a smooth inner liner). Joints shall meet the requirements of AASHTO M294 and ASTM D 3212 for soil tight joints and shall consist of an in-line integral bell and spigot with a flexible elastomeric seal (gasket) that conforms to ASTM F 477.

2.02 SEDIMENT BASIN OUTLET WORKS

A. Barrel, riser and fittings for sediment basins shall meet AASHTO M294, Type S (full circular cross-section with an outer corrugated pipe wall and a smooth inner liner) and of the size indicated.

B. Pipe joints shall be flared bell and tapered spigot, water tight and shall conform to the requirements in ASTM F 2306. Water tight joints shall be made using rubber gaskets as recommended by the pipe manufacturer. Rubber gaskets shall conform to ASTM F 477.

2.03 REINFORCED CONCRETE PIPE

A. Section 706 of the NYSDOT Standard Specifications except ASTM C 150 Type II moderate heat of hydration (MH) cement, minimum 3 inch cover for reinforcing steel, and water-tight joints.

2.04 BOX CULVERT

A. Precast box culvert sections and specials in accordance with Section 706 of the NYSDOT Standard Specifications.

1. Design criteria as follows:

a. Precast Box Section: Type A single cell monolithic (four sided)

b. Box culvert span and rise and design earth cover as indicated

c. Loading: AASHTO HL-93 live load and dead load for the most critical design loading combination. Contractor shall provide for supporting construction loads that exceed AASHTO HL-93 and any construction load applied prior to two feet of compacted fill placed above the box culvert sections.

d. Settlement: no significant long-term settlement anticipated

e. Portland Cement Concrete: Section 500 of the NYSDOT Standard Specifications

i. Environmental Class: aggressive environment

ii. Cement: ASTM C 150 Type II moderate heat of hydration (MH)

f. Class of Concrete:

i. Class A

ii. Mix proportions: as indicated

iii. Chloride content: 0.40 pounds per cubic yard maximum

iv. Slump: as indicated

v. Air content: as indicated

vi. Minimum compressive strength (28-day): 4,000 pounds per square inch

g. Reinforcing steel: Grade 60 in accordance with NYSDOT Specifications

h. Cover for reinforcing steel cover: 3 inches minimum

i. Joints: tongue and groove, watertight with joint sealant and external sealing bands.

B. Provide geotextile separation layer over all transverse, longitudinal, and construction joints.

C. Flexible plastic gasket, AASHTO M198 75-1, Type B.

2.05 HEADWALLS (NON-BOX CULVERT APPLICATIONS)

A. Headwalls at pipe ends shall be either precast or cast-in-place reinforced concrete end sections conforming to the applicable requirements of the NYSDOT Standard Specifications. Headwalls shall be constructed to fit the pipe sizes indicated on the Drawings.

2.06 PIPE TRENCH MATERIALS

A. Soil bedding and backfill materials shall be as specified in Section 31 23 00. Pipe trench finish where trenches cross access roads shall be as indicated for bituminous concrete surfaced access roads.

PART 3 EXECUTION

3.01 EXCAVATION AND BEDDING

A. Excavate for installation of pipe and end features as specified in Section 31 23 00 to the required alignment, grade, and dimensions as shown on the Drawings.

3.02 INSTALLATION OF PIPE

A. Installation of pipe shall be subject to the review of the Engineer. Pipe installation, including pipe laying and jointing, shall conform to the pipe manufacturer's recommendations and as indicated.

B. Inspect pipe for defects before lowering into trench. Do not install damaged or defective pipe.

C. Field cutting of piping, where required, shall be performed in accordance with the manufacturer's instructions. Cuts shall be carefully done, without damage to piping, so as to leave a smooth end at right angles to the axis of the piping. Piping damaged by improper or careless methods of cutting shall be replaced or repaired at no additional cost to NAVFAC.

D. Interior of all piping and mating surfaces shall be inspected and all debris shall be removed from the interior and mating surfaces before installation.

E. Install buried piping accurately to line and grade shown. Start laying piping at lowest point and proceed toward the higher elevations. Slope piping uniformly between indicated elevations.

F. Pipe shall be temporarily braced and secured in position at correct alignment and grade until backfilling has been completed.

3.03 CONSTRUCTION OF STORM DRAINAGE UTILITY END FEATURES

A. Construct end features at the locations indicated on the Drawings and as specified in the following paragraphs.

B. Box culvert end features in accordance with Section 03 30 00 Cast-in-Place Concrete.

C. Miscellaneous storm water drainage features other than box culvert end features. Set each precast concrete headwall on prepared subgrade at the proper elevation, carefully leveled and aligned.

D. Lifting holes shall not penetrate completely through structure walls. All lifting holes shall be completely filled with non-shrink grout after installation of the structure.

3.05 BACKFILLING AND COMPACTING

A. Place and compact backfill over pipes and around structures as specified in Section 31 23 00.

3.06 RECORD DRAWINGS

A. During the progress of the storm drainage system installation, record installed locations, elevations, and all changes and deviations from the original design by marking up the Drawings. Mark-ups shall show the following information: surveyed locations and invert elevations for pipes; pipe diameter; structural dimensions; and material type. Show all deviations from the Drawings.

END OF SECTION

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SECTION 43 11 23

DUST CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. Work covered in this Section shall consist of furnishing the labor, materials, tools, equipment, incidentals, and services necessary to control fugitive dust emissions, as directed by the Engineer. Air monitoring of dust will be conducted during the Contractor's execution of Work that will result in the disturbance of soils. The Contractor shall be responsible for the appropriate use of the products and methods described herein, and as directed by the Engineer, to mitigate visible airborne dust. The Contractor shall make no claim for additional payment for down-time resulting from a stop-work order from the Engineer due to the insufficient or inappropriate use of the products and methods described herein.

PART 2 PRODUCTS

2.01 GENERAL

A. Dust control materials shall consist of potable water subject to the approval of the Engineer.

PART 3 EXECUTION

3.01 WATERING

A. Watering for dust control is subject to the approval of the Engineer. Work practice controls and wind screens are among alternative methods that may be employed in conjunction with watering.

B. Water shall be distributed on the site via water truck or other approved methods in order to prevent fugitive emission of dust during the Work.

C. Care shall be taken during water application to avoid over-saturation of materials and generation of runoff.

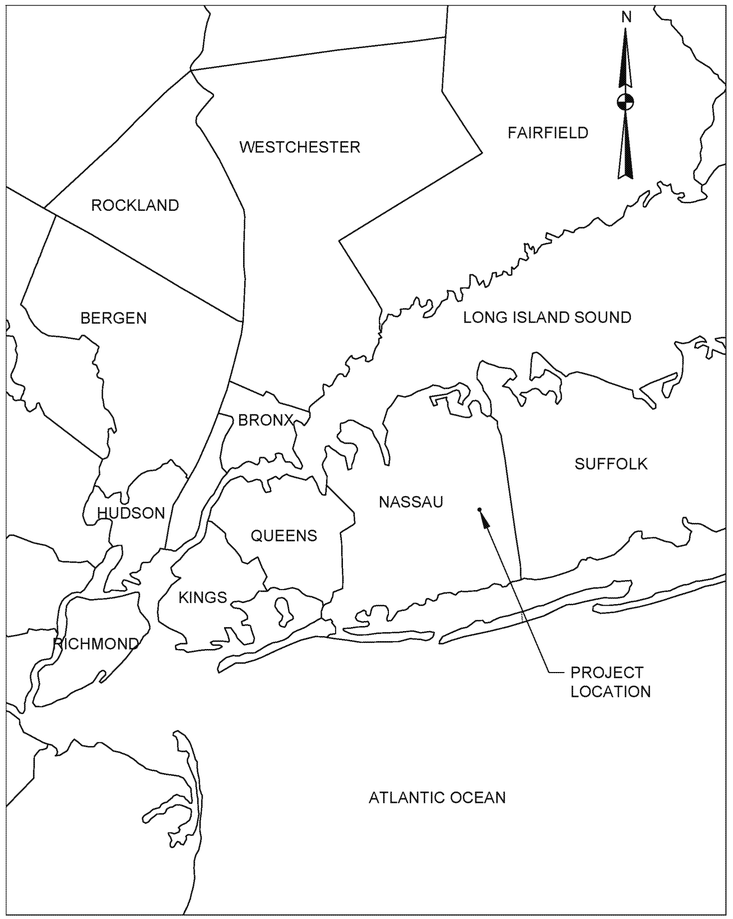
D. Contractor's methods shall be subject to approval by the Engineer.

E. Contractor shall stop work immediately upon notification from the Engineer that applicable dust monitoring thresholds have been exceeded.

END OF SECTION

REMEDIAL DESIGN
SITE 1 SOIL EXCAVATION
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

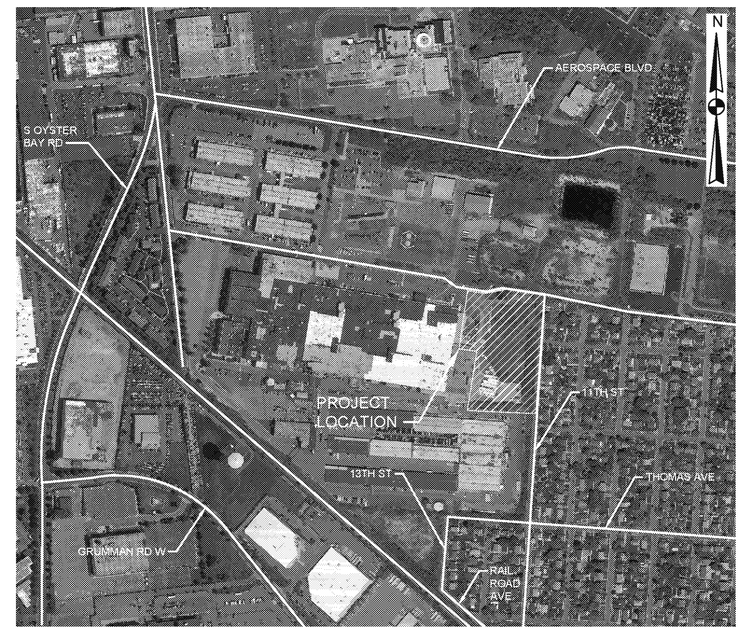
MAY 2018



PROJECT VICINITY MAP
NOT TO SCALE

DRAWING INDEX

NAVFAC DWG. No.	SHEET No.	SHEET TITLE
--------	G-000	COVER
--------	G-001	GENERAL NOTES, LEGEND AND ABBREVIATIONS
--------	C-100	EXISTING CONDITIONS PLAN
--------	C-101	0'-2' EXCAVATION HORIZONTAL CONTROL PLAN
--------	C-102	2'-10' EXCAVATION HORIZONTAL CONTROL PLAN
--------	C-103	10'-20' EXCAVATION HORIZONTAL CONTROL PLAN
--------	C-104	20'-30' EXCAVATION HORIZONTAL CONTROL PLAN
--------	C-105	SITE LAYOUT PLAN
--------	C-106	FINAL GRADING PLAN
--------	C-107	TRAFFIC CONTROL PLAN
--------	C-108	OVERALL EXCAVATIONS HORIZONTAL CONTROL PLAN
--------	C-109	UTILITIES RELOCATION PLAN - DRY WELL 20-08 EXCAVATION
--------	C-110	TREE REPLACEMENT PLAN
--------	ESC-100	EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN
--------	ESC-101	EROSION, SEDIMENTATION & POLLUTION CONTROL NOTES
--------	ESC-102	EROSION, SEDIMENTATION & POLLUTION CONTROL NOTES
--------	C-300	SECTIONS
--------	C-500	DETAILS
--------	C-501	DETAILS
--------	C-502	DETAILS
--------	C-503	DETAILS
--------	C-504	DETAILS
--------	C-505	DETAILS
--------	S-100	SHEET PILE PLAN
--------	S-101	SHEET PILE DETAILS



PROJECT LOCATION MAP
NOT TO SCALE

NO.	DESCRIPTION	DATE	APPR.

NAVFAC

SEAL

SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY : SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES DR MF

CHK TWS QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST IPT.
NWIRP BETHPAGE

NAVAL FACILITIES ENGINEERING COMMAND
NAVAL STATION - NORFOLK, VIRGINIA
MID-ATLANTIC
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

COVER

CODE ID NO. 80091 SIZE D

SCALE: ---

MAX/MO NO. ---

JOB ORDER NO. ---

SPEC NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

G-000

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

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GENERAL NOTES

CONSTRUCTION SEQUENCE

GENERAL: THE REMOVAL OF THE IMPACTED MATERIAL REQUIRES SEQUENTIAL EXCAVATION PROCEDURES TO EFFICIENTLY ENABLE EXCAVATION AND STAGING OF MATERIAL FOR CHARACTERIZATION FROM VARIOUS DEPTHS OVER THE SITE. THIS CONSTRUCTION SEQUENCE IS PRESENTED TO ASSIST THE CONTRACTOR WITH UNDERSTANDING THE COMPLEXITIES OF WORKING AT THE SITE; HOWEVER, THIS SEQUENCE IS NOT MEANT AS A SUBSTITUTE FOR THE CONTRACTOR'S WORK PLAN OR TO DICTATE THE CONTRACTOR'S MEANS AND METHODS TO COMPLETE THE WORK. THE ACCESS ROUTE INTO THE SITE AND FOR OFFSITE TRANSPORTATION AND DISPOSAL OF THE MATERIAL IS LOCATED AT THE SITE'S NORTHWEST LIMIT; THEREFORE, IT WILL GENERALLY BE PREFERABLE TO CONDUCT THE WORK FROM THE SOUTH TO THE NORTH TO PREVENT TRACKING POTENTIALLY IMPACTED MATERIAL ACROSS COMPLETED WORK AREAS. IT IS EXPECTED THAT THE CONTRACTOR WILL CONDUCT SOME OF THE TASKS LISTED BELOW CONCURRENTLY, E.G., EXCAVATION AND OFFSITE TRANSPORTATION AND DISPOSAL.

1. CONDUCT SITE PREPARATION AND SETUP, ESTABLISH SITE ACCESS AND TRUCK ROUTE, AND INSTALL EROSION AND SEDIMENT CONTROLS.
2. CLEAR TREES AND VEGETATION TO ALLOW DEEPER EXCAVATION. LEAVE TREES AND VEGETATION ON THE SITE'S EASTERN BOUNDARY IN PLACE. PROTECT STRUCTURES TO REMAIN.
3. WORKING SOUTH TO NORTH, CONDUCT EXCAVATION WHERE REQUIRED IN THE 20-FOOT DEPTH EXCAVATION AREAS (DESIGNATED "C" AREAS ON DRAWING C-103). SEGREGATE MATERIAL FROM 0 TO 2 FEET IN DEPTH AND 2 TO 10 FEET IN DEPTH LOCATED ATOP THE 20-FOOT EXCAVATION AREAS. MATERIAL IN THE 2 TO 10-FOOT DEPTH, WHICH IS NOT DESIGNATED AS IMPACTED, WILL BE USED FOR FUTURE BACKFILL. STAGE IMPACTED MATERIAL FOR CHARACTERIZATION AND FINAL DISPOSITION. SEGREGATE THE CESSPOOL AREAS FROM OTHER EXCAVATED MATERIAL AS THIS MATERIAL HAS THE POTENTIAL TO CONTAIN ELEVATED PCB CONCENTRATIONS AND SHALL NOT BE MIXED WITH OTHER MATERIAL. SLOPE EXCAVATIONS AS REQUIRED WITHIN THE 2 TO 10-FOOT DEPTH TO ALLOW EXCAVATION OF THE 10 TO 20-FOOT DEPTH AREAS SAFELY.
4. BASED ON CHARACTERIZATION RESULTS, IMPLEMENT OFFSITE TRANSPORTATION AND DISPOSAL OF IMPACTED MATERIAL. CONTINUE AS REQUIRED UNTIL THE MATERIAL REQUIRING OFFSITE TRANSPORTATION AND DISPOSAL IS COMPLETED.
5. COMPLETE THE 0 TO 10-FOOT EXCAVATION AREAS THAT ARE SEPARATE FROM THE 10 TO 20-FOOT EXCAVATION AREAS (DESIGNATED "B" AREAS ON DRAWING C-102). STAGE MATERIAL FOR CHARACTERIZATION AND FINAL DISPOSITION.
6. BACKFILL THE 10 TO 20-FOOT DEPTH EXCAVATIONS USING MATERIAL FROM THE 2 TO 10-FOOT DEPTH EXCAVATION AREAS AND MATERIAL FROM THE 0 TO 2-FOOT DEPTH EXCAVATION AREAS LOCATED OUTSIDE THE DEEPER EXCAVATION LIMITS.
7. PLACE THE GEOCOMPOSITE CLAY LINER (GCL) OVER THE 20-FOOT DEPTH EXCAVATION AREAS WHEN THE BACKFILL REACHES ELEVATION 118.5 FEET BELOW FINISHED GRADE. PLACEMENT OF GCL SHALL EXTEND 5 FEET BEYOND THE AREA LIMITS IN ALL DIRECTIONS OF THE 20-FOOT DEPTH EXCAVATION AREAS.
8. COMPLETE BACKFILL OF THE 20-FOOT DEPTH EXCAVATION AREAS TO TWO FEET BELOW FINAL GRADE ELEVATION TO COVER AND PROTECT THE GCL. BACKFILL CAN BE NON-IMPACTED MATERIAL FROM THE 0 TO 10-FOOT DEPTH EXCAVATION AREAS AND MATERIAL FROM THE 0 TO 2-FOOT DEPTH EXCAVATION AREAS.
9. CLEAR REMAINING TREES AND VEGETATION ALONG THE SITE'S EASTERN BOUNDARY, ESTABLISH EROSION AND SEDIMENT CONTROLS, REMOVE EXISTING FENCE, AND ESTABLISH TEMPORARY SECURITY TO COMPLETE THE 0 TO 2-FOOT DEPTH EXCAVATION AREAS.
10. COMPLETE THE 0 TO 2-FOOT DEPTH EXCAVATION AREAS. EXCAVATED MATERIAL TO BE USED AS BACKFILL FOR THE 0 TO 10-FOOT DEPTH AREAS.
11. COMPLETE BACKFILL FOR THE SITE TO 6 INCHES BELOW FINAL GRADE ELEVATION USING IMPORTED CLEAN BACKFILL. COMPLETE FINAL BACKFILL OF THE SITE WITH 6 INCHES OF AGGREGATE.
12. RESTORE SITE BY REPLACING REMOVED PAVEMENT, PERMANENT CHAIN-LINK FENCE, WINDROW ALONG THE SITE'S EASTERN BOUNDARY, AND TREES.
13. RELOCATE UTILITIES AT THE DRY WELL 20-08 AREA TO ALLOW IMPACTED MATERIAL REMOVAL.
14. INSTALL SHEET PILE AT THE DRY WELL 20-08 AREA.
15. COMPLETE DRY WELL 20-08 EXCAVATION. STAGE MATERIAL FOR CHARACTERIZATION AND FINAL DISPOSITION.
16. BASED ON CHARACTERIZATION RESULTS, IMPLEMENT OFFSITE TRANSPORTATION AND DISPOSAL OF IMPACTED MATERIAL.
17. BACKFILL THE EXCAVATION WITH IMPORTED CLEAN BACKFILL. REMOVE OR ABANDON THE SHEET PILE.
18. RESTORE THE DRY WELL 20-08 AREA BY REPLACING PAVEMENT.
19. CONDUCT FINAL SITE RESTORATION.

GENERAL LEGEND

- DRY WELL
- CESSPOOL
- MONITORING WELL
- LIGHT POLE
- SOIL VAPOR EXTRACTION WELL
- PIEZ. — PIEZOMETER WELL
- MANHOLE
- BOLL. — BOLLARD
- FIRE HYDRANT
- STORM MANHOLE W/GRATE
- WV — WATER VALVE
- EXISTING BUILDING
- SF — FILTER SOCK LIMIT
- TREELINE
- W — WATER LINE
- STORM DRAIN LINE
- E — ELECTRIC
- T — TELEPHONE
- G — EXISTING GAS LINE
- NEW GAS LINE
- SVE — SOIL VAPOR EXTRACTION FORCEMAIN
- FM — SANITARY FORCEMAIN
- UU — UNDER GROUND UTILITY
- X — FENCE LINE
- XX — TEMPORARY FENCE LINE
- PROPERTY LINE
- LIMIT OF DISTURBANCE
- LIMIT OF EXCAVATION
- 127 — EXISTING MINOR ELEVATION CONTOUR
- 125 — EXISTING MAJOR ELEVATION CONTOUR
- 125 — PROPOSED ELEVATION CONTOUR (5 FT. INTERVAL)
- 126 — PROPOSED ELEVATION CONTOUR (1 FT. INTERVAL)
- PROJECT SITE LIMIT

A6 — DRAWING GRID LOCATION OF DETAIL

C002 — DRAWING DETAIL IS LOCATED ON

SECTION & DETAIL IDENTIFIER

ABBREVIATIONS

&	AND
@	AT
°	DEGREES
'	FOOT, FEET
"	INCH, INCHES
#	NUMBER
%	PERCENT
AC	ACRE
ACP	ASBESTOS CEMENT PIPE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS INTERNATIONAL
BM	BENCHMARK
BOT	BOTTOM
C	CURB
C-C	CENTER TO CENTER
CFS	COMPOST FILTER SOCK
CIP	CAST IRON PIPE
CLR, CL	CLEAR
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
CONT	CONTINUOUS
CY	CUBIC YARD
DBL	DOUBLE
DET	DETAIL
DIP	DUCTILE IRON PIPE
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
E	EASTING
EL, ELEV	ELEVATION
EW	EACH WAY
FPS	FEET PER SECOND
FT	FOOT, FEET
G	GUTTER
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GCL	GEOSYNTHETIC CLAY LINER
HDPE	HIGH DENSITY POLYETHYLENE
HORIZ	HORIZONTAL
HP	HIGH POINT
ID	INSIDE DIAMETER
IN	INLET
INV	INVERT
lb/ft	POUND PER FOOT
LB, LBS	POUND, POUNDS
LF	LINEAR FEET
LOD	LIMIT OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
mm	MILLIMETER
MSL	MEAN SEA LEVEL
N	NORTHING (WHEN USED FOR GRID COORDINATE SYSTEM ON PLAN VIEW DRAWINGS)
NA	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NAVFAC	NAVAL FACILITIES ENGINEERING COMMAND
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NO.	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OUT.	OUTLET
OZ/SY	OUNCES PER SQUARE YARD
PE	POLYETHYLENE
PERF	PERFORATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
REINF	REINFORCED
REQD	REQUIRED
SAN	SANITARY
SCE	STABILIZED CONSTRUCTION ENTRANCE
SCH	SCHEDULE
SECT	SECTION
SF	SQUARE FOOT (WHEN USED TO INDICATE SURFACE AREA)
SHT	SHEET
SIM	SIMILAR
SPCS	STATE PLANE COORDINATE SYSTEM
SY	SQUARE YARD
TYP	TYPICAL
UE	UNDERGROUND ELECTRIC
UON	UNLESS OTHERWISE NOTED
US	UNITED STATES
VERT	VERTICAL
W	WIDTH
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
W/	WITH
W/O	WITHOUT
WT	WEIGHT
YR	YEAR

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

MIS	DATE	APPR.	DESCRIPTION

NAVFAC

SEAL

SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY : SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES | DR MF

CHK TWS | QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL STATION, NORFOLK, VIRGINIA
NORTHEAST PT.
BETHPAGE, NEW YORK
NWIRP BETHPAGE

SITE 1 REMEDIATION PLANS

GENERAL NOTES, LEGEND AND ABBREVIATIONS

CODE ID NO. 80091 | SIZE D

SCALE: ---

MAX.IMO NO. ---

JOB ORDER NO. ---

SPEC. NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

G-001

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CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

MKS	DESCRIPTION	DATE	APPR

NAVFAC

SEAL

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FIRM MEMBER DATE

APPROVED

ACTIVITY : SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES	DR	MF
CHK TWS	QC	

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DIR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST PT.
NWIRP BETHPAGE

NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION, NORFOLK, VIRGINIA
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

EXISTING CONDITIONS SITE PLAN

CODE ID NO. 80091 SIZE D

SCALE: ---

MAX.MO NO. ---

JOB ORDER NO. ---

SPEC. NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

C-100

G:\Projects\NWIRP Bethpage\Site 1\CAD\SheetFiles\C-100.dwg, 4/27/2018 3:49:35 PM, Matthew.Zikeli

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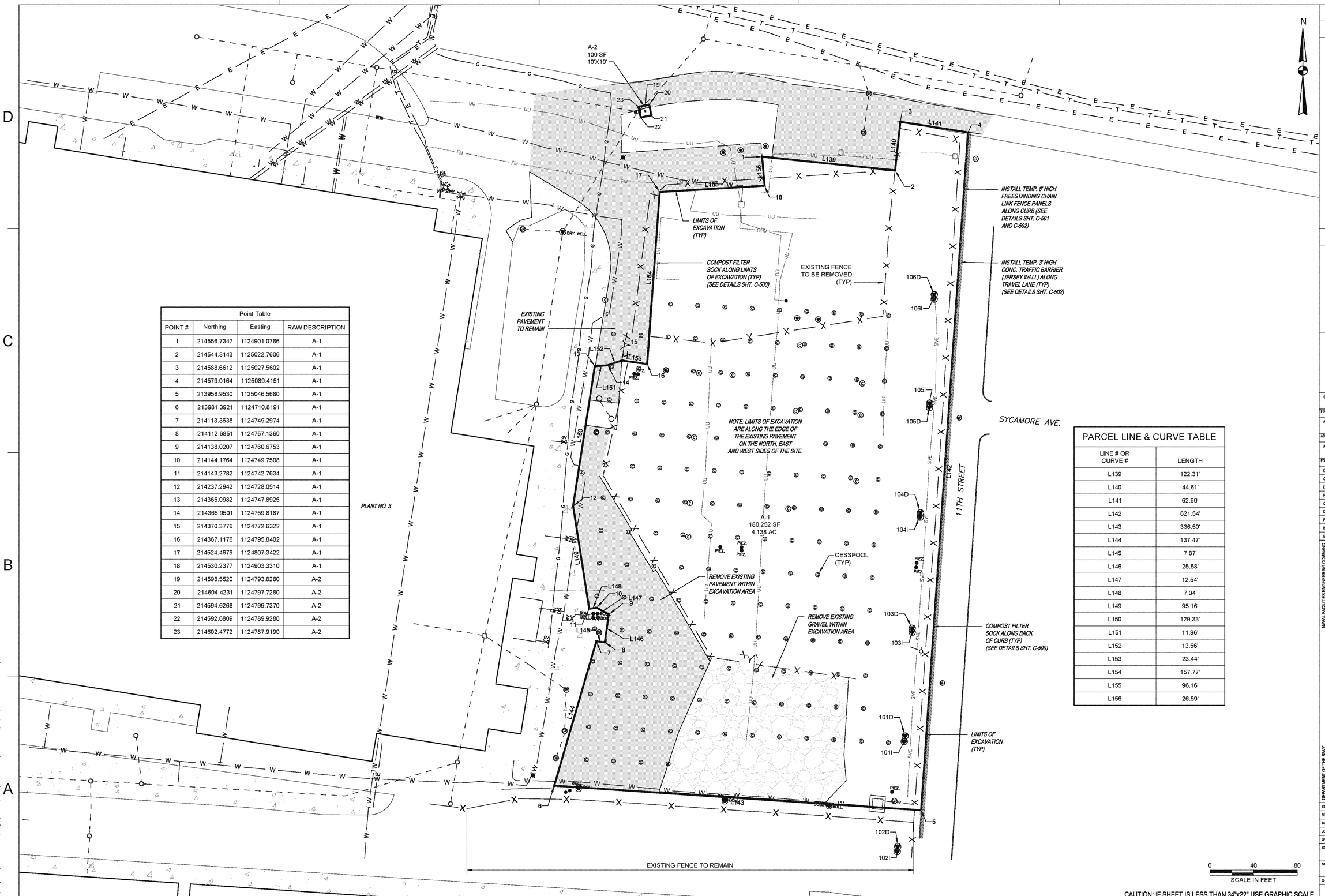

Point Table			
POINT #	Northing	Easting	RAW DESCRIPTION
1	214556.7347	1124901.0786	A-1
2	214544.3143	1125022.7606	A-1
3	214588.6612	1125027.5602	A-1
4	214579.0164	1125089.4151	A-1
5	213958.9530	1125046.5680	A-1
6	213981.3921	1124710.8191	A-1
7	214113.3638	1124749.2974	A-1
8	214112.6851	1124757.1360	A-1
9	214138.0207	1124760.6753	A-1
10	214144.1764	1124749.7508	A-1
11	214143.2782	1124742.7634	A-1
12	214237.2942	1124728.0514	A-1
13	214365.0982	1124747.8925	A-1
14	214365.9501	1124759.8187	A-1
15	214370.3776	1124772.6322	A-1
16	214367.1176	1124795.8402	A-1
17	214524.4679	1124807.3422	A-1
18	214530.2377	1124903.3310	A-1
19	214598.5520	1124793.8280	A-2
20	214604.4231	1124797.7280	A-2
21	214594.6268	1124799.7370	A-2
22	214592.6809	1124789.9280	A-2
23	214602.4772	1124787.9190	A-2

PARCEL LINE & CURVE TABLE	
LINE # OR CURVE #	LENGTH
L139	122.31'
L140	44.61'
L141	62.60'
L142	621.54'
L143	336.50'
L144	137.47'
L145	7.87'
L146	25.58'
L147	12.54'
L148	7.04'
L149	95.16'
L150	129.33'
L151	11.96'
L152	13.56'
L153	23.44'
L154	157.77'
L155	96.16'
L156	26.59'

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

SYM	DESCRIPTION	DATE	APPR.

NAVFAC

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FIRM MEMBER DATE

APPROVED

ACTIVITY : SATISFACTORY TO DATE

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FOR COMMANDER NAVFAC DATE

DES DR MF

CHK TWS QC

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REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

NAVAL FACILITIES ENGINEERING COMMAND

DEPARTMENT OF THE NAVY

NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC

NAVAL STATION, NORFOLK, VIRGINIA

NORTHEAST BT

BETHPAGE, NEW YORK

NWIRP BETHPAGE

SITE 1 REMEDIATION PLANS

0' - 2' EXCAVATION HORIZONTAL CONTROL PLAN

CODE ID NO. 80091 SIZE D

SCALE: ---

MAX.MO NO. ---

JOB ORDER NO. ---

SPEC. NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

C-101

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Point Table			
POINT #	Northing	Easting	RAW DESCRIPTION
1	214482.1000	1124972.5300	B-1A
2	214492.1700	1124983.8200	B-1A
3	214481.7800	1124993.0900	B-1A
4	214471.7100	1124981.8100	B-1A
5	214467.2400	1125050.4900	B-1B
6	214477.9600	1125061.9900	B-1B
7	214466.6100	1125072.5700	B-1B
8	214455.8900	1125061.0700	B-1B
9	214421.6700	1124809.9500	B-1C
10	214417.4300	1124826.0000	B-1C
11	214384.5800	1124817.3500	B-1C
12	214388.8100	1124801.2900	B-1C
13	214419.2100	1124845.8800	B-1D
14	214435.5800	1124885.6300	B-1D
15	214405.9300	1124897.8400	B-1D
16	214389.5700	1124858.0900	B-1D
17	214414.5700	1124981.7100	B-1E
18	214414.9200	1125028.4100	B-1E
19	214361.9700	1125027.5400	B-1E
20	214360.8300	1124940.7400	B-1E
21	214381.7600	1124940.5600	B-1E
22	214363.3500	1124801.1600	B-1F
23	214360.5800	1124954.9700	B-1F
24	214163.1800	1124955.1500	B-1F
25	214153.4600	1124876.1600	B-1F
26	214216.3100	1124801.8500	B-1F
27	214305.1900	1124806.1900	B-1F
28	214336.6200	1124801.1600	B-1F

PARCEL LINE & CURVE TABLE	
LINE # OR CURVE #	LENGTH
L1	13.93'
L2	15.13'
L3	13.92'
L4	15.12'
L5	15.52'
L6	15.72'
L7	15.52'
L8	15.72'
L9	16.61'
L10	33.98'
L11	16.60'
L12	33.97'
L13	32.06'
L14	42.99'
L15	32.07'
L16	42.99'
L17	20.93'
L18	52.63'
L19	46.70'
L20	52.96'
L21	72.58'
L22	14.23'
L23	88.99'
L24	31.83'
L25	26.73'
L26	139.60'
L27	197.40'
L28	79.59'
L29	97.32'

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

SYM	DESCRIPTION	DATE	APPR.

NAVFAC

SEAL

SUBMITTED BY
FIRM MEMBER DATE
APPROVED
ACTIVITY : SATISFACTORY TO DATE
APPROVED
FOR COMMANDER NAVFAC DATE
DES DR MF
CHK TWS QC
DESIGNER
REVIEWED BY
QC
DESIGN MANAGER ---
FIRE PROTECTION ---
BRANCH MANAGER ---
ENGINEERING DIR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST PT
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

2' - 10' EXCAVATION HORIZONTAL CONTROL PLAN

CODE ID NO. 80091 SIZE D
SCALE: ---
MAX.MO NO. ---
JOB ORDER NO. ---
SPEC NO. ---
CONSTR. CONTR. NO.
NAVFAC DRAWING NO.
SHEET OF

C-102

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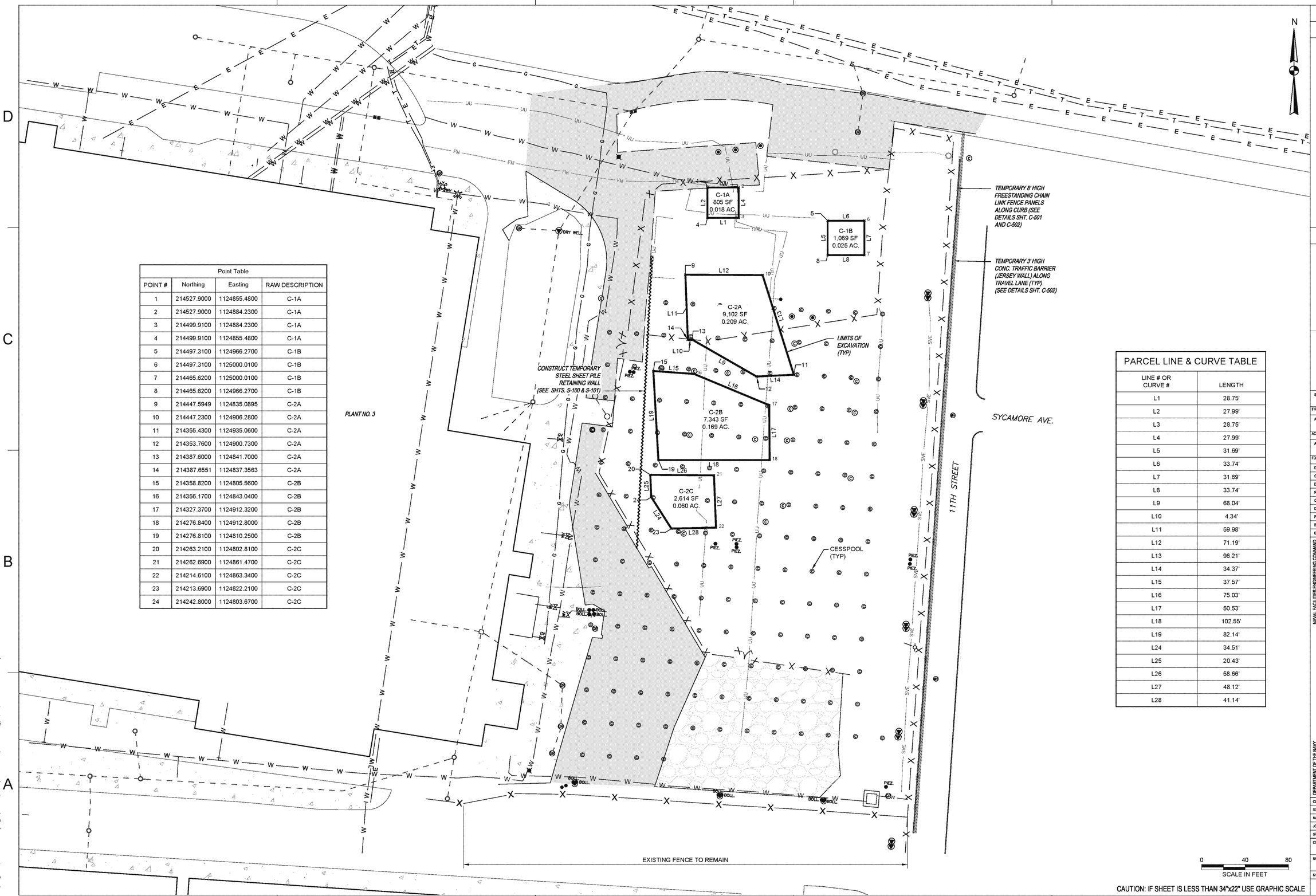

Point Table			
POINT #	Northing	Easting	RAW DESCRIPTION
1	214527.9000	1124855.4800	C-1A
2	214527.9000	1124884.2300	C-1A
3	214499.9100	1124884.2300	C-1A
4	214499.9100	1124855.4800	C-1A
5	214497.3100	1124966.2700	C-1B
6	214497.3100	1125000.0100	C-1B
7	214465.6200	1125000.0100	C-1B
8	214465.6200	1124966.2700	C-1B
9	214447.5949	1124835.0895	C-2A
10	214447.2300	1124906.2800	C-2A
11	214355.4300	1124935.0600	C-2A
12	214353.7600	1124900.7300	C-2A
13	214387.6000	1124841.7000	C-2A
14	214387.6551	1124837.3563	C-2A
15	214358.8200	1124805.5600	C-2B
16	214356.1700	1124843.0400	C-2B
17	214327.3700	1124912.3200	C-2B
18	214276.8400	1124912.8000	C-2B
19	214276.8100	1124810.2500	C-2B
20	214263.2100	1124802.8100	C-2C
21	214262.6900	1124861.4700	C-2C
22	214214.6100	1124863.4300	C-2C
23	214213.6900	1124822.2100	C-2C
24	214242.8000	1124803.6700	C-2C

PARCEL LINE & CURVE TABLE	
LINE # OR CURVE #	LENGTH
L1	28.75'
L2	27.99'
L3	28.75'
L4	27.99'
L5	31.69'
L6	33.74'
L7	31.69'
L8	33.74'
L9	68.04'
L10	4.34'
L11	59.98'
L12	71.19'
L13	96.21'
L14	34.37'
L15	37.57'
L16	75.03'
L17	50.53'
L18	102.55'
L19	82.14'
L24	34.51'
L25	20.43'
L26	58.66'
L27	48.12'
L28	41.14'

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

SYM	DESCRIPTION	DATE	APPR

NAVFAC

SEAL

SUBMITTED BY
FIRM MEMBER DATE
APPROVED
ACTIVITY : SATISFACTORY TO DATE
APPROVED
FOR COMMANDER NAVFAC DATE
DES DR MF
CHK TWS QC
DESIGNER
REVIEWED BY
QC
DESIGN MANAGER ---
FIRE PROTECTION ---
BRANCH MANAGER ---
ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORTHEAST BY:
NWIRP BETHPAGE
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL STATION - NORFOLK, VIRGINIA
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

10' - 20' EXCAVATION HORIZONTAL CONTROL PLAN

CODE ID NO. 80091 SIZE D
SCALE: ---
MAXIMO NO. ---
JOB ORDER NO. ---
SPEC NO. ---
CONSTR. CONTR. NO.
NAVFAC DRAWING NO.
SHEET OF
C-103

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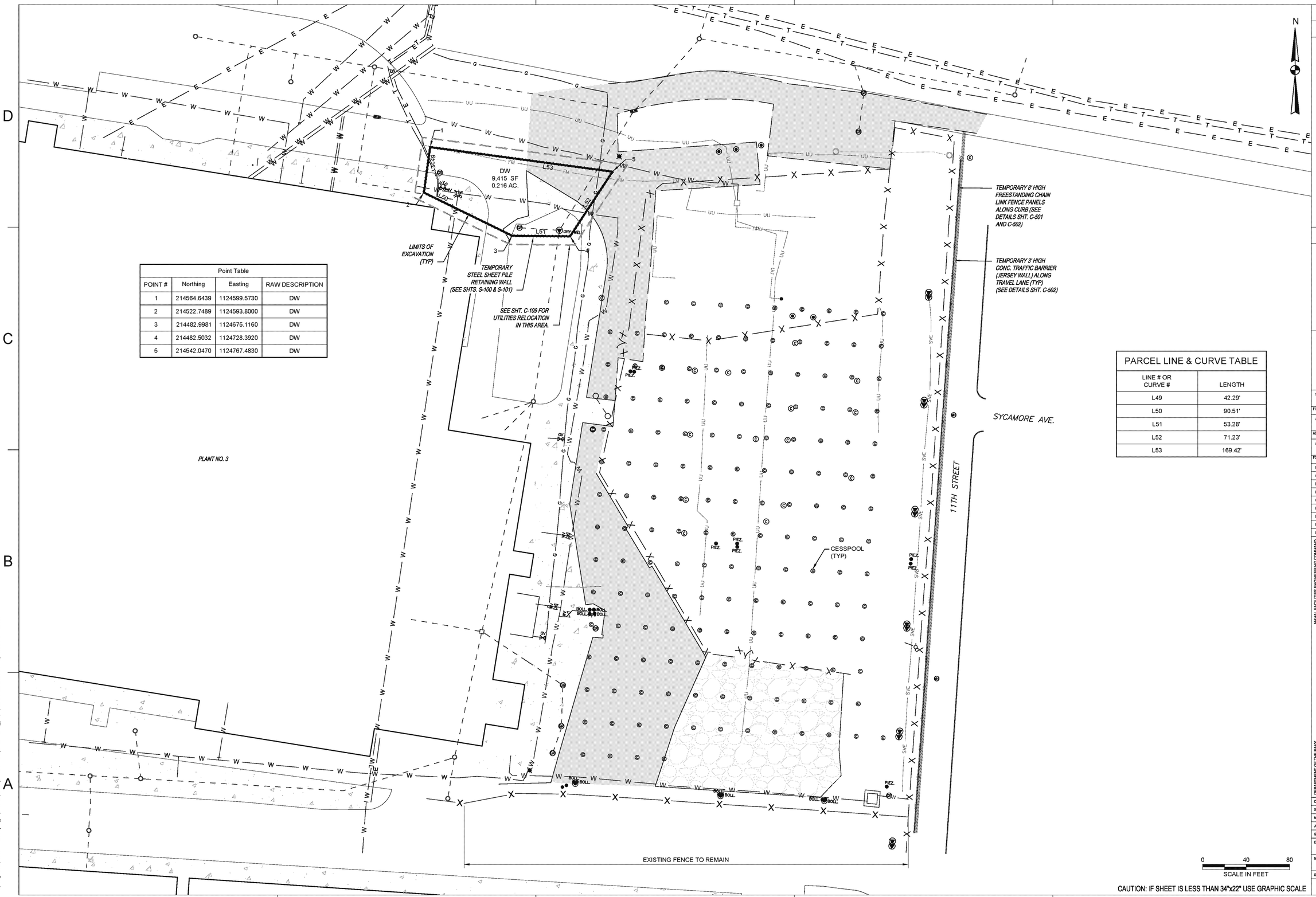

Point Table			
POINT #	Northing	Easting	RAW DESCRIPTION
1	214564.6439	1124599.5730	DW
2	214522.7489	1124593.8000	DW
3	214482.9981	1124675.1160	DW
4	214482.5032	1124728.3920	DW
5	214542.0470	1124767.4830	DW

PARCEL LINE & CURVE TABLE	
LINE # OR CURVE #	LENGTH
L49	42.29'
L50	90.51'
L51	53.28'
L52	71.23'
L53	169.42'

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

NAVFAC

SYM | DESCRIPTION | DATE | APPR

SEAL

SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY - SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES | DR MF

CHK TWS | QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DIR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORTHEAST PT
NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

20' - 30' EXCAVATION HORIZONTAL CONTROL PLAN

CODE ID NO. 80091 | SIZE D

SCALE: ---

MAX.MO NO. ---

JOB ORDER NO. ---

SPEC NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

C-104

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20'X40' TRUCK DECONTAMINATION PAD

15' x 40' SCALE

EQUIPMENT AND MATERIALS STORAGE AREA

CONSTRUCTION TRAILER (TYP)

EXISTING FENCE TO BE REMOVED (TYP)

TEMPORARY 8' HIGH FREESTANDING CHAIN LINK FENCE PANELS ALONG CURB (SEE DETAILS SHT. C-501 AND C-502)

TEMPORARY 3' HIGH CONC. TRAFFIC BARRIER (JERSEY WALL) ALONG TRAVEL LANE (TYP) (SEE DETAILS SHT. C-502)

ROCK CONSTRUCTION ENTRANCE/EXIT (SEE DETAIL SHT C-500)

TEMPORARY STEEL SHEET PILE RETAINING WALL (SEE SHTS. S-100 & S-101)

SEE SHT. C-109 FOR UTILITIES RELOCATION IN THIS AREA.

REMOVE AND REPLACE EXISTING PAVEMENTS WITHIN EXCAVATION AREA. NEW PAVEMENT SECTIONS TO MATCH EXISTING PAVEMENT SECTIONS.

EXISTING PAVEMENT TO REMAIN

COMPOST FILTER SOCK ALONG E.O.P. (TYP) (SEE DETAILS SHT. C-500)

11TH STREET

SYCAMORE AVE.

PLANT NO. 3

TEMPORARY STEEL SHEET PILE RETAINING WALL (SEE SHTS. S-100 & S-101)

COMPOST FILTER SOCK ALONG EDGE PF PAVEMENT (TYP)

PROJECT SITE LIMITS (TYP) (ALONG EDGE OF 11TH STREET ON EAST BOUNDARY)

EXISTING CESSPOOL (TYP) (SEE DETAIL SHT. C-501)

REMOVE EXISTING PAVEMENT WITHIN EXCAVATION AREA

EXISTING FENCE (TYP)

REMOVE EXISTING GRAVEL WITHIN EXCAVATION AREA

COMPOST FILTER SOCK ALONG BACK OF CURB (TYP) (SEE DETAILS SHT. C-500)

EXISTING FENCE TO REMAIN

0 40 80
SCALE IN FEET

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

APPR	DATE	DESCRIPTION	MAS

NAVFAC

SEAL

SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY : SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES DR MF

CHK TWS QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORTHEAST BY: NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

SITE LAYOUT PLAN

CODE ID. NO. 80091 SIZE D

SCALE: ---

MAXIMO NO. ---

JOB ORDER NO. ---

SPEC. NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

C-105

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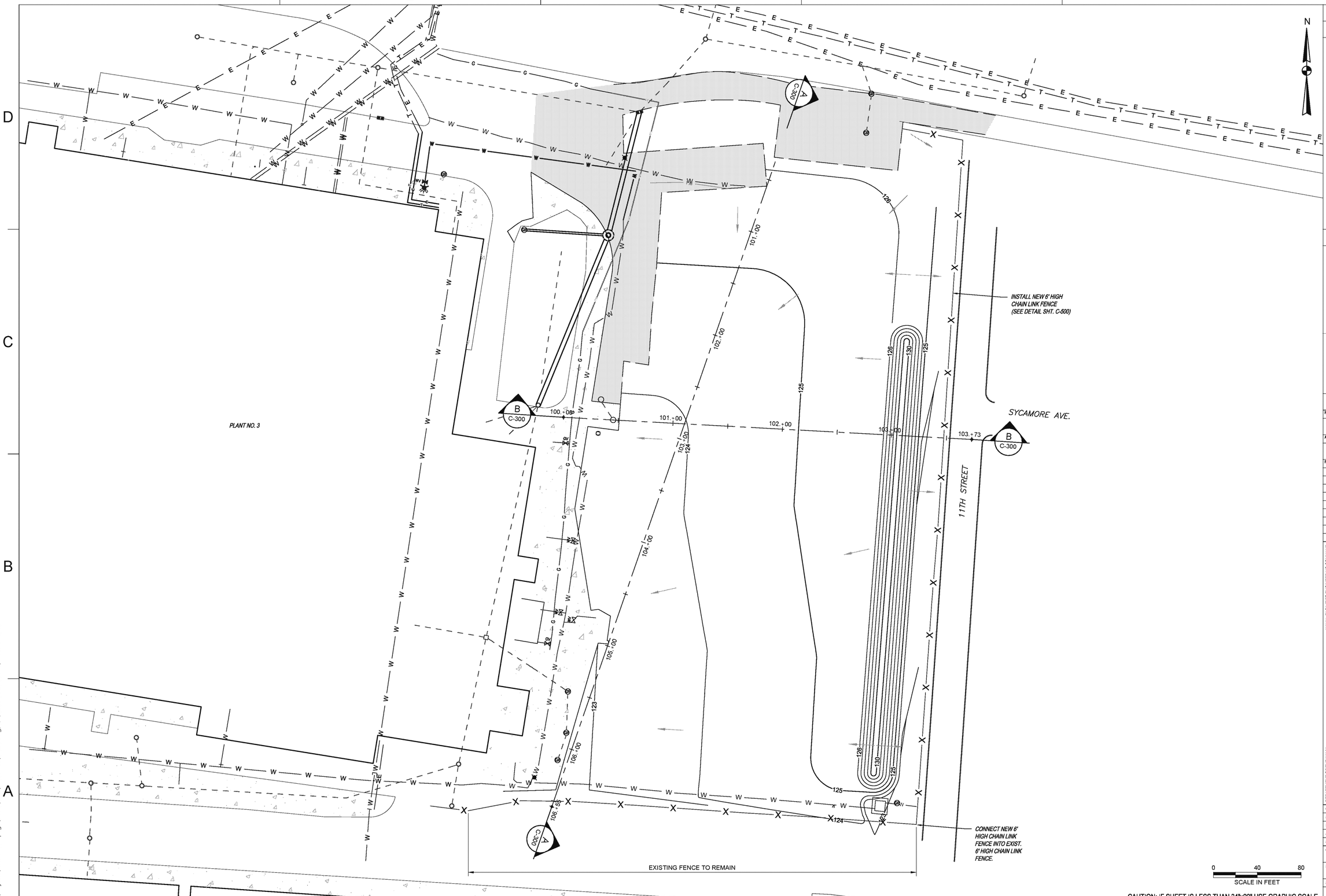

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

SYM	DESCRIPTION	DATE	APPR

NAVFAC

SEAL

SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY - SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES	DR MF
CHK TWS	QC
DESIGNER	
REVIEWED BY	
QC	
DESIGN MANAGER	---
FIRE PROTECTION	---
BRANCH MANAGER	---
ENGINEERING DIR	---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORTHEAST PT
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

FINAL GRADING PLAN

CODE ID NO 80091 SIZE D

SCALE: ---

MAX/MO NO. ---

JOB ORDER NO. ---

SPEC NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

C-106

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APPR	DATE	DESCRIPTION	BY

NAVFAC

SEAL

SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY SATISFACTORY TO DATE

APPROVED

FOR COMMANDER, NAVFAC DATE

DES | DR MF

CHK TWS | QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORTHEAST PT NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

TRAFFIC CONTROL PLAN

CODE ID. NO. 80091 SIZE D

SCALE: ---

MAXIMO NO. ---

JOB ORDER NO. ---

SPEC. NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

C-107

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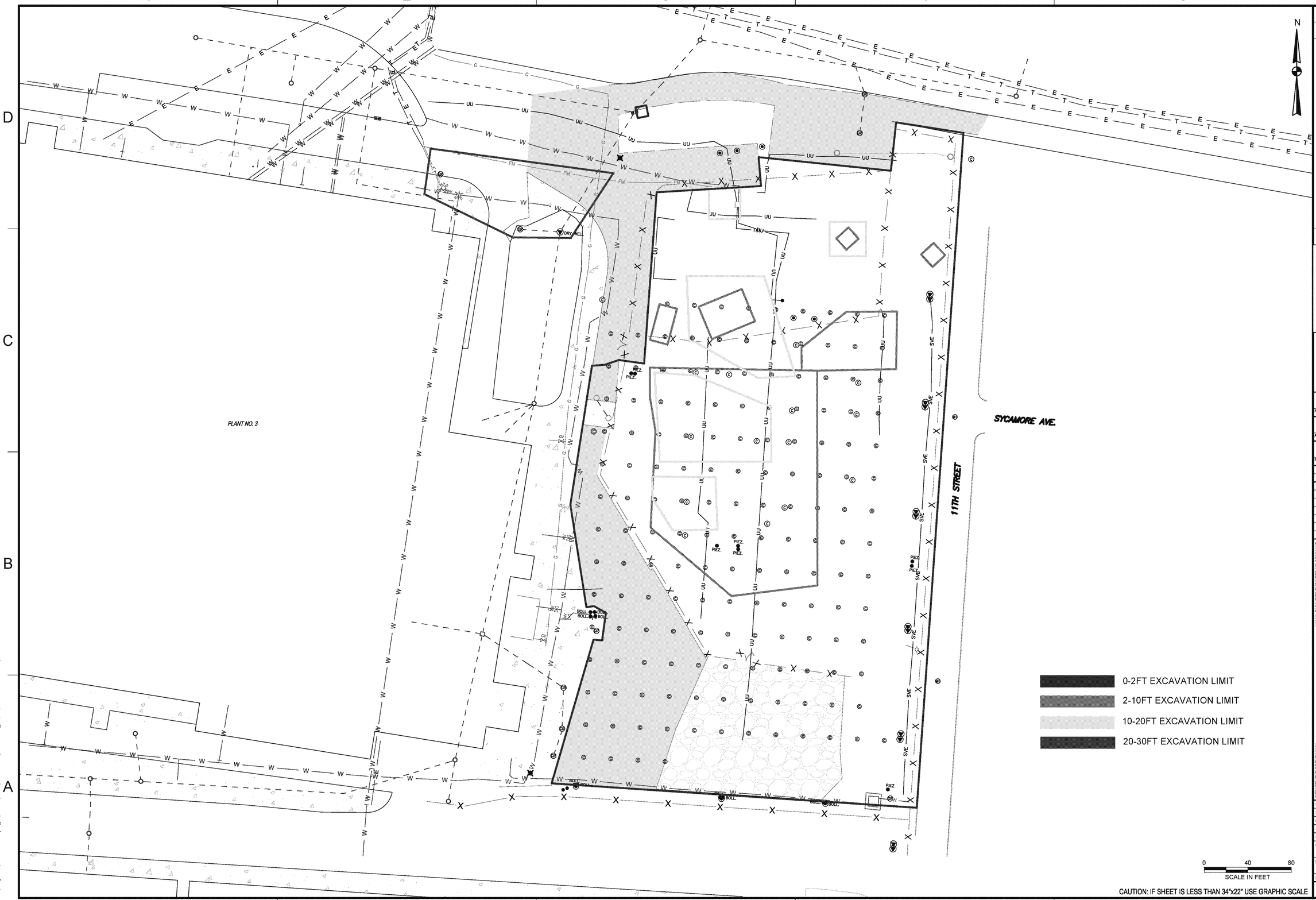

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FIRM MEMBER DATE

APPROVED

ACTIVITY - SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES | DR MF

CHK TWS | QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DIR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORTHEAST PT NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

OVERALL EXCAVATIONS HORIZONTAL CONTROL PLAN

CODE ID. NO. 80091 | SIZE D

SCALE: ---

MAXIMO NO. ---

JOB ORDER NO. ---

SPEC. NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

C-108

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CONNECT NEW GAS LINE INTO EXISTING GAS LINE

INSTALL 276'± ~ NEW 10" PVC FIREMAIN

RELOCATED FIRE HYDRANT W/NEW 10" GATE VALVE

REROUTE AND RECONNECT TELEPHONE AND ELECTRIC SERVICES

REMOVE EXIST. WM

REMOVE EXIST. FM

BM - P.K. NAIL
N:214,556.00'
E:1,124,773.67'
EL:125.22

"A" INLET
GR=124.64
INV IN=114.39(NE)
INV IN=113.96(SW)
INV OUT=113.96(W)

CONNECT NEW 36" RCP INTO EXIST. STORM INLET; INV. SW = 113.96

INSTALL NEW GAS LINE

REMOVE EXIST. GAS LINE

CONNECT NEW 10" FIREMAIN INTO EXIST. 10" FIREMAIN

INSTALL NEW STORM M.H.
RIM ELEV. = 124.0 ±
INV. 36" SW IN = 114.45 ±
INV. 15" W IN = 116.20 ±
INV. 36" NE OUT = 114.34 ±

EXIST. INLET W/ ROUND GRATE GR=122.27 (TO BE DEMOLISHED AND REPLACED)

EXIST. DRY WELL 20-08
TOP=123.28
INV IN=113.67(SW)
INV OUT=113.61(NE)
(TO BE DEMOLISHED)

EXISTING 6" STORM PIPE (TO BE REMOVED)

EXIST. FIRE HYDRANT TO BE RELOCATED

EXIST. FIRE HYDRANT TO BE REMOVED

INSTALL STORM INLET
GRATE ELEV. = 122.3 ±
INV. 15" E. = 116.48

INSTALL 70 LF ~ 15" RCP @0.40%

TEMP. STEEL SHEET PILE RETAINING WALL (TYP) (SEE SHTS. S-100 & S-101)

EXISTING 10" CIP FIREMAIN (ABANDONED)

EXISTING 10" CIP FIREMAIN

CONNECT NEW 36" RCP INTO EXIST. STORM M.H.; INV. N.E. = 115 ±

EXISTING STORM M.H. APPROXIMATE INV. OUT =115(NE)(PER RECORDS)

CONNECT NEW GAS LINE INTO EXISTING GAS LINE

PLANT NO. 3

SYCAMORE AVE.

11TH STREET

CESSPOOL (TYP)

N

0 40 80
SCALE IN FEET

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

DATE	DESCRIPTION	APPR.

NAVFAC

SEAL

SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY : SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES | DR MF

CHK TWS | QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST BY:
NWIRP BETHPAGE

NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

UTILITIES RELOCATION PLAN - DRY WELL 20-08 EXCAVATION

CODE ID NO. 80091 | SIZE D

SCALE: ---

MAX.MO NO. ---

JOB ORDER NO. ---

SPEC NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

C-109

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NOTE: TREES SHALL BE 2.5 TO 3 INCHES IN DIAMETER AND BE 12 TO 15 FEET IN HEIGHT.

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APPR	DATE	DESCRIPTION	SYM

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FIRM MEMBER DATE

APPROVED

ACTIVITY : SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES DR MF

CHK TWS QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST PT.
NWIRP BETHPAGE

NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

TREE REPLACEMENT PLAN

CODE ID NO. 80091 SIZE D

SCALE: ---

MAX/MO NO. ---

JOB ORDER NO. ---

SPEC. NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

C-110

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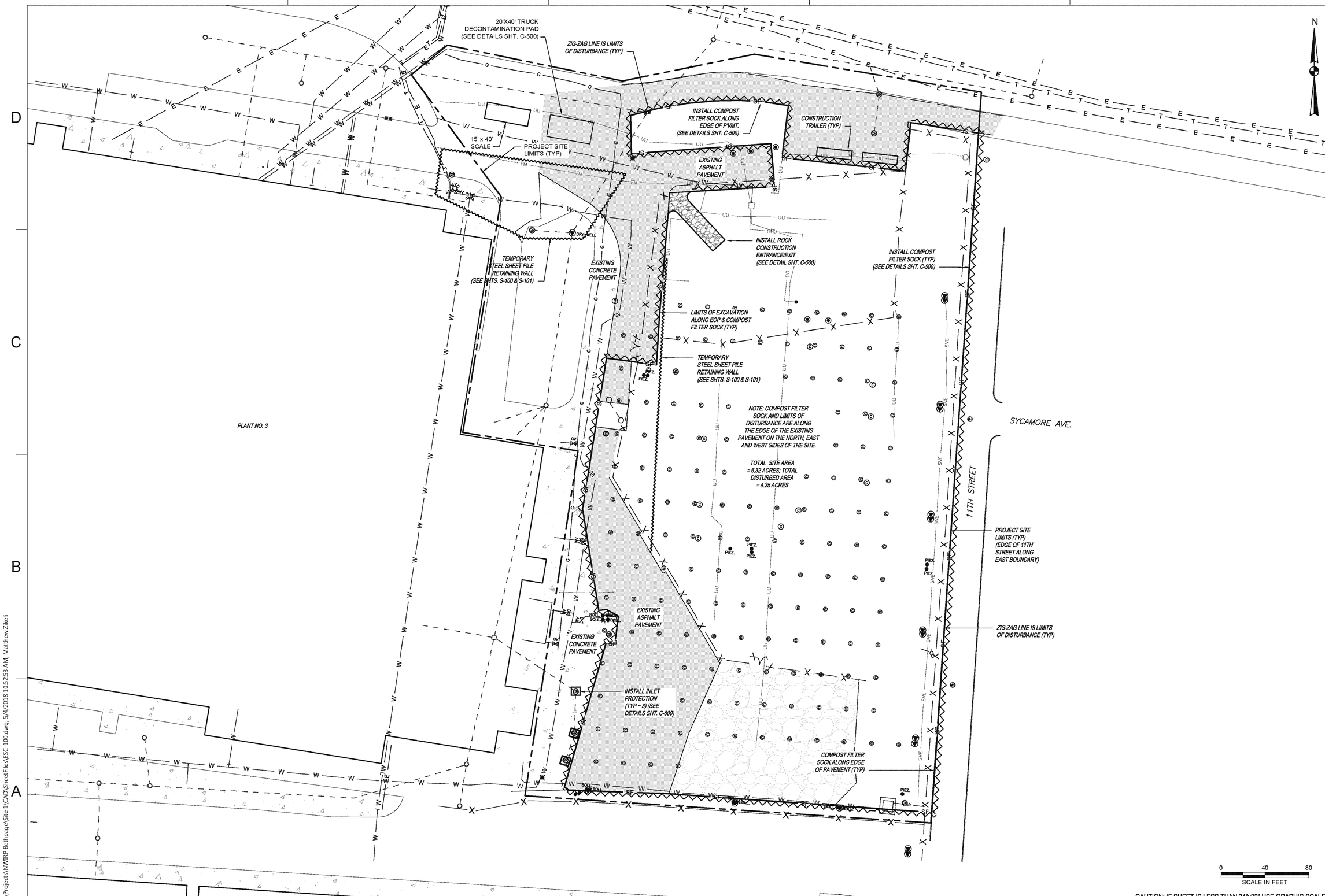

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

NAVFAC

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SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY - SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES DR MF

CHK TWS QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DIR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORTHEAST PT
NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

EROSION, SEDIMENTION AND POLLUTION CONTROL PLAN

CODE ID. NO. 80091 SIZE D

SCALE: ---

MAXIMO NO. ---

JOB ORDER NO. ---

SPEC. NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

ESC-100

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STORM WATER POLLUTION PREVENTION CONTROL NOTES

THE FOLLOWING NOTES PERTAIN TO EROSION, SEDIMENTATION, AND POLLUTION CONTROL BEST MANAGEMENT PRACTICES (BMPS) RELATING TO SITE CONSTRUCTION ACTIVITIES OF THIS PROJECT. FOR STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES) GENERAL PERMIT NOTES PER SPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITY GP-0-15-002, SEE BELOW.

GENERAL NOTES

1. THE SITE, DESIGNATED SITE 1 - FORMER DRUM MARSHALLING AREA, NAVAL WEAPONS INDUSTRIAL RESERVE PLANT, IS LOCATED IN THE VILLAGE OF BETHAGE, NEW YORK. THE SITE LIMITS ARE DEFINED BY THE "PROJECT SITE LIMITS" AS SHOWN ON THE PLAN. THE WORK INCLUDES EXCAVATION, FILL, GRADING, AND OTHER EARTHWORK REQUIRED. THE TOTAL SITE AREA IS 6.25 ACRES, AND THE TOTAL DISTURBED AREA IS 4.20 ACRES.
2. EACH CONTRACTOR OR SUBCONTRACTOR WILL BE PROVIDED A COPY OF THE EROSION CONTROL PLAN OR PORTION OF THE PLAN APPLICABLE TO THEIR SITE AND EACH CONTRACTOR AND SUBCONTRACTOR SHALL SIGN THE CERTIFICATION ON THIS DRAWING.
3. ANY AMENDMENT/REVISION TO THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN, WHICH HAS A SIGNIFICANT EFFECT ON BMPS WITH A HYDRAULIC COMPONENT, MUST BE CERTIFIED BY THE DESIGN PROFESSIONAL.
4. AFTER CONSTRUCTION, EROSION AND SEDIMENTATION SHALL BE MANAGED BY STABILIZED INSTALLATION OF PERMANENT VEGETATION, ROADS, AND OTHER PERMANENT SITE FEATURES.
5. MINIMIZING WIND EROSION AND CONTROLLING DUST SHALL BE ACCOMPLISHED BY ONE OR MORE OF THE FOLLOWING METHODS:
   A. COVERING 30% OR MORE OF THE SOIL SURFACE WITH NON-ERODIBLE MATERIAL.
   B. ROUGHENING THE SOIL TO PRODUCE RIDGES PERPENDICULAR TO THE PREVAILING WIND.
   C. FREQUENT WATERING OF EXCAVATION AND FILL AREAS.
   D. PROVIDING GRAVEL OR PAVING AT EXIT DRIVES.
6. THE CONTRACTOR SHALL MAINTAIN CAREFUL SCHEDULING AND PERFORMANCE TO ENSURE THAT LAND STRIPPED OF ITS NATURAL COVER IS EXPOSED ONLY IN SMALL QUANTITIES AND LIMITED DURATIONS BEFORE PERMANENT EROSION PROTECTION IS ESTABLISHED.
7. NAVFAC AGREES TO PROVIDE AND MAINTAIN OFF-STREET PARKING ON THE SUBJECT PROPERTY DURING THE ENTIRE CONSTRUCTION PERIOD.
8. A COPY OF THE APPROVED EROSION, SEDIMENTATION, AND POLLUTION PLAN AND SPDES GENERAL PERMIT NUMBER GP-0-15-002 SHALL BE PRESENT ON THE SITE AT ALL TIMES.
9. WASTE MATERIALS SHALL NOT BE DISCHARGED TO WATERS OF THE STATE.
10. THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH, LAND-DISTURBING ACTIVITIES.
11. EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.
12. ANY DISTURBED AREA LEFT EXPOSED FOR A PERIOD GREATER THAN 7 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING.

INITIAL PHASE EROSION CONTROL NOTES:

1. PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, RIBBONS, OR OTHER APPROPRIATE MEANS. THE LOCATION AND EXTENT OF ALL AUTHORIZED LAND DISTURBANCE ACTIVITY SHALL BE DEMARCATED FOR THE DURATION OF THE CONSTRUCTION ACTIVITY. NO LAND DISTURBANCE SHALL OCCUR OUTSIDE THE APPROVED LIMITS INDICATED ON THE APPROVED PLAN.
2. PRIOR TO ANY OTHER CONSTRUCTION, A STABILIZED CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT EACH POINT OF ENTRY TO OR EXIT FROM THE SITE OR ONTO ANY PUBLIC ROADWAY.

THE FOLLOWING INITIAL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED PRIOR TO ANY OTHER CONSTRUCTION ACTIVITY.

1. THE CONSTRUCTION ENTRANCE, CONSISTING OF A MINIMUM PAD SIZE OF 12 FEET BY 50 FEET WITH A MINIMUM OF 6" THICK STONE, SHALL BE PLACED AS SHOWN ON THE PLAN. THE ROCK OR RECLAIMED CONCRETE SHALL BE COURSE AGGREGATE GRADATION 1 TO 4 INCHES AND OVERLAIN ON A GEOTEXTILE UNDERLINER THAT SHALL MEET THE REQUIREMENTS OF THE NEW YORK STATE STANDARDS AND SPECIFICATION FOR EROSION AND SEDIMENT CONTROL FOR STABILIZED CONSTRUCTION ACCESS.
2. IMMEDIATELY AFTER THE ESTABLISHMENT OF THE CONSTRUCTION ENTRANCE, ALL PERIMETER EROSION CONTROL SHALL BE INSTALLED AFTER THE CLEARING AND GRUBBING NECESSARY FOR INSTALLATION OF THE COMPOST FILTER SOCK, BUT BEFORE THE CLEARING AND GRUBBING FOR THE REMAINING SITE, AS SHOWN ON THE PLAN.
3. THE COMPOST FILTER SOCK SHALL BE INSTALLED AT THE PERIMETER OF THE DISTURBED AREA AS SHOWN ON THE PLAN. THE COMPOST FILTER SOCK SHALL BE PLACED IN ACCORDANCE WITH THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL FOR STABILIZED CONSTRUCTION ACCESS. THE COMPOST FILTER SOCK SHALL BE REPAIRED WHEN REQUESTED BY THE SITE INSPECTOR OR THE DESIGN PROFESSIONAL OF RECORD OR WHEN NOTED BY THE CONTRACTOR THAT REPAIRS ARE NEEDED. SILT SHALL BE REMOVED WHEN ACCUMULATION REACHES ½ HEIGHT OF THE BARRIER. THE PERIMETER SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY FAILURES OF SAID COMPOST FILTER SOCK SHALL BE REPAIRED IMMEDIATELY.
4. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE CHECKED AFTER EACH RAIN EVENT. EACH DEVICE SHALL BE MAINTAINED OR REPLACED IF SEDIMENT ACCUMULATION HAS REACHED ONE-HALF THE CAPACITY OF THE DEVICE.
5. CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY OR STREETS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL AGGREGATE. ALL SEDIMENT SPILLED, DROPPED, OR WASHED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
6. CONTRACTOR SHALL INSPECT CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
7. EROSION CONTROL MEASURES SHALL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.
8. FAILURE TO INSTALL, OPERATE, OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB UNTIL SUCH MEASURES ARE CORRECTED BACK TO THE APPROVED EROSION CONTROL PLAN.
9. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL EROSION CONTROL MEASURES INCLUDING REPLACING OR REPAIRING ANY DAMAGED DEVICES DUE TO ANY CONSTRUCTION ACTIVITY BY OTHERS.

INTERMEDIATE-FINAL PHASE EROSION CONTROL NOTES:

THE FOLLOWING EROSION CONTROL MEASURES SHALL BE IMPLEMENTED DURING THE GRADING PHASE OF CONSTRUCTION.

1. DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN CAREFUL SCHEDULING AND PERFORMANCE TO ENSURE THAT LAND STRIPPED OF ITS NATURAL GROUND COVER IS EXPOSED ONLY IN SMALL QUANTITIES AND LIMITED DURATIONS BEFORE PERMANENT EROSION PROTECTION IS ESTABLISHED.
2. EROSION CONTROL DEVICES SHALL BE INSTALLED IMMEDIATELY AFTER GROUND DISTURBANCE OCCURS. THE LOCATION OF SOME OF THE EROSION CONTROL DEVICES MAY HAVE TO BE ALTERED FROM THAT SHOWN ON THE APPROVED PLAN IF DRAINAGE PATTERNS DURING CONSTRUCTION ARE DIFFERENT FROM THE PROPOSED DRAINAGE PATTERNS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES DURING CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF THE CONSTRUCTION SHALL IMMEDIATELY BE REPORTED TO THE DESIGN PROFESSIONAL WHO PREPARED THE PLAN.
3. THE COMPOST FILTER SOCK SHALL BE PLACED IN ACCORDANCE WITH THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL FOR STABILIZED CONSTRUCTION ACCESS. THE COMPOST FILTER SOCK SHALL BE REPAIRED WHEN REQUESTED BY THE SITE INSPECTOR OR THE DESIGN PROFESSIONAL OF RECORD. THE COMPOST FILTER SOCK SHALL BE MAINTAINED UNTIL PERMANENT GROUND COVER IS ESTABLISHED. SILT SHALL BE REMOVED WHEN ACCUMULATION REACHES ½ HEIGHT OF THE BARRIER. THE PERIMETER COMPOST FILTER SOCK SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY FAILURES OF SAID COMPOST FILTER SOCK SHALL BE REPAIRED IMMEDIATELY.
4. ANY DISTURBED AREA LEFT EXPOSED FOR A PERIOD GREATER THAN 7 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING OR GRAVEL COVER (AS APPLICABLE) UNLESS CONSTRUCTION ACTIVITY RESUMES WITHIN 14 DAYS FROM WHEN ACTIVITIES CEASED. ALL DISTURBED AREAS LEFT MULCHED AFTER 30 DAYS SHALL BE STABILIZED WITH TEMPORARY VEGETATION OR GRAVEL COVER AS APPLICABLE.
5. CUT AND FILL SLOPES ARE NOT TO EXCEED 2:1. EROSION CONTROL MATTING SHALL BE INSTALLED ON ALL SLOPES THAT EXCEED 2.5(H):1(V) AND ARE TEN FEET OR GREATER IN HEIGHT.
6. NO BURNING OF ONSITE VEGETATION OR BURY PIT CONSTRUCTION SHALL BE PERMITTED ON THE CONSTRUCTION SITE WITHOUT WRITTEN PERMISSION BY NAVFAC.
7. SEEDING OF ALL DRAINAGE SWALES SHALL BE PERFORMED TO ESTABLISH VEGETATIVE COVER AS SOON AS FINAL GRADE IS ACHIEVED. DRAINAGE SWALES WITH RIPRAP OR CONCRETE PROTECTION SHALL BE COMPLETED AS SOON AS POSSIBLE AFTER FINAL GRADE IS ACHIEVED.
8. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE CHECKED AFTER RAIN EVENTS. EACH DEVICE IS TO BE MAINTAINED OR REPLACED IF SEDIMENT ACCUMULATION HAS REACHED ONE-HALF THE CAPACITY OF THE DEVICE. ADDITIONAL DEVICES MUST BE INSTALLED IF NEW CHANNELS HAVE DEVELOPED.
9. CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY OR STREETS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL AGGREGATE. ALL SEDIMENT SPILLED, DROPPED, OR WASHED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
10. CONTRACTOR SHALL INSPECT CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
11. FAILURE TO INSTALL, OPERATE, OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB UNTIL SUCH MEASURES ARE CORRECTED BACK TO THE APPROVED EROSION CONTROL PLAN.
12. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL EROSION CONTROL MEASURES INCLUDING REPLACING OR REPAIRING ANY DAMAGED DEVICES DUE TO ANY CONSTRUCTION ACTIVITY BY OTHERS.

THE FOLLOWING EROSION CONTROL MEASURES SHALL BE IMPLEMENTED DURING THE FINAL EROSION CONTROL PHASE OF CONSTRUCTION.

1. PERMANENT VEGETATION SHALL BE ESTABLISHED ON ALL SLOPE AREAS AND ALL OTHER DESIGNED AREAS AS FINAL GRADE IS ACHIEVED. PERMANENT VEGETATION SHALL CONSIST OF A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70% AT A MINIMUM.
2. A 6-INCH THICK LAYER OF GRAVEL SHALL BE PLACED IN DESIGNATED AREAS INCLUDING ALL ACCESS ROADS.
3. WHEN THE ENTIRE SITE HAS BEEN FINALLY STABILIZED AND ALL STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY THAT ARE AUTHORIZED BY THIS PERMIT HAVE CEASED, CONTRACTOR SHALL SUBMIT A NOTICE OF TERMINATION (NOT).
4. UPON COMPLETION OF THE CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AND DISPOSE OF THEM UNLESS NOTED ON PLAN.

STORMWATER POLLUTION PREVENTION PLAN

1. THIS PLAN WAS PREPARED AS REQUIRED BY SPDES GENERAL PERMIT NUMBER GP-0-15-002. THESE PLAN SHEETS AND ALL REQUIREMENTS OF THE GENERAL PERMIT AS WELL AS LOCAL, STATE, AND FEDERAL REGULATIONS OR LAWS APPLY REGARDLESS OF SPECIFIC INCLUSION IN THE PLAN.

DEVELOPER: TO BE DETERMINED (TBD).

SITE DESCRIPTION

1. DEVELOPER AS PRIMARY PERMITTEE WILL OVERSEE SITE CONSTRUCTION. THE TOTAL SITE AREA IS 6.25 ACRES, AND THE TOTAL DISTURBED AREA IS 4.20 ACRES.
2. CONSTRUCTION WILL BEGIN WITH CLEARING NECESSARY FOR THE INSTALLATION OF PERIMETER COMPOST FILTER SOCK AND CONSTRUCTION ENTRANCES. AFTER THESE EROSION CONTROL BMPS HAVE BEEN INSTALLED, CLEARING OF VEGETATION WILL COMMENCE IN AREAS THAT ARE TO BE DISTURBED. SITE GRADING WILL BE PERFORMED, WHICH WILL INCLUDE EXCAVATION AND ON-SITE PLACEMENT OF MATERIALS, AND PLACEMENT AND GRADING OF FILL MATERIALS. ADDITIONAL SITE WORK WILL INCLUDE LOW PERMEABILITY LAYER PLACEMENT AND STORMWATER CONTROLS. FINAL GRADING AND SEEDING WILL BE PERFORMED AFTER ACHIEVEMENT OF FINAL GRADES IN EACH AREA.

ZONING

THE SITE IS ZONED: HEAVY MANUFACTURING AND INDUSTRIAL.

SURVEY INFORMATION

BOUNDARY INFORMATION BASED ON A SURVEY PERFORMED BY TETRA TECH.

RUNOFF COEFFICIENT

- WEIGHTED PRE CONSTRUCTION RUNOFF NUMBER: 85
- WEIGHTED POST CONSTRUCTION RUNOFF NUMBER: 85

SOIL TYPES

1. THE NWIRP IS UNDERLAIN BY 1,100 FEET OF UNCONSOLIDATED SEDIMENTS THAT OVERLIE BEDROCK. THE SEDIMENTS ARE COMPRISED OF FOUR UNITS, IN DESCENDING ORDER: UPPER GLACIAL FORMATION (30-45 FEET THICK), MAGOTHY FORMATION (100 FEET THICK), RARITAN CLAY (100-150 FEET THICK), AND LLOYD SAND (300 FEET THICK).

SOIL DISTURBING ACTIVITIES INCLUDE:

- INSTALLING A STABILIZED CONSTRUCTION ENTRANCE, PERIMETER AND OTHER EROSION AND SEDIMENT CONTROLS
- CLEARING AND GRUBBING
- SOIL EXCAVATION AND STAGING
- OFFSITE SOIL TRANSPORTATION AND DISPOSAL
- BACKFILL AND LOW-PERMEABILITY LAYER PLACEMENT
- FINAL GRADING AND PERMANENT SEEDING
- COMPLETION OF ON-SITE STABILIZATION

SEQUENCE OF MAJOR ACTIVITIES

SEE CONSTRUCTION SCHEDULE.

24-HOUR CONTACT: TBD

NAME OF RECEIVING WATERS

MUNICIPAL STORM DRAIN SYSTEM - ULTIMATE RECEIVING WATER: SOUTH OYSTER BAY

EROSION AND SEDIMENT CONTROLS

1. ALL PERIMETER COMPOST FILTER SOCK AND CONSTRUCTION ENTRANCES SHALL BE IN PLACE PRIOR TO ANY LAND DISTURBING ACTIVITIES.
2. EXISTING VEGETATION SHALL BE LEFT IN PLACE UNTIL SUCH TIME THAT LAND DISTURBING ACTIVITIES ARE TO TAKE PLACE UPON THAT PORTION OF THE SITE. WHEN CONSTRUCTION ACTIVITIES HAVE CEASED IN AN AREA, THAT AREA SHALL BE STABILIZED WITHIN 7 DAYS, UNLESS CONSTRUCTION ACTIVITY RESUMES WITH 14 DAYS FROM WHEN ACTIVITIES CEASED. IF THE AREA IS NOT YET TO FINAL GRADE, IT SHALL BE MULCHED. IF THE AREA IS TO FINAL GRADE, IT SHALL BE TEMPORARILY SEEDED OR GRAVEL COVER SHALL BE PLACED, AS APPLICABLE.
3. ALLOWABLE EXCEPTIONS FROM THE SPDES GENERAL PERMIT NUMBER GP-0-15-002 ARE NOTED BELOW.
4. WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 7TH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE IS PRECLUDED BY SNOW COVER, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE.
5. WHERE CONSTRUCTION ACTIVITY WILL RESUME ON A PORTION OF THE SITE WITHIN 14 DAYS FROM WHEN ACTIVITIES CEASED, (E.G., THE TOTAL TIME PERIOD THAT CONSTRUCTION ACTIVITY IS TEMPORARILY CEASED IS LESS THAN 14 DAYS), THEN STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE BY THE 8TH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARILY CEASED.
6. STORMWATER FROM THIS DEVELOPMENT WILL BE ROUTED VIA SURFACE SHEET FLOW TO EXISTING ON-SITE PONDS AND OTHER DRAINAGE FEATURES. SOME STORM WATER MAY FLOW OFF-SITE TO THE MUNICIPAL STORM DRAINAGE SYSTEM.

WASTE MATERIALS

1. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN A SECURELY LIDDED DUMPSTER. THE DUMPSTER SHALL MEET ALL SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER SHALL BE EMPTIED A MINIMUM OF ONCE PER WEEK OR MORE OFTEN IF NECESSARY, AND TRASH SHALL BE HAULED AS REQUIRED BY LOCAL REGULATIONS. NO CONSTRUCTION WASTE SHALL BE BURIED ONSITE.
2. ALL PERSONNEL SHALL BE INSTRUCTED ON PROPER PROCEDURES FOR WASTE DISPOSAL. A NOTICE STATING THESE PRACTICES SHALL BE POSTED AT THE JOBSITE, AND THE CONTRACTOR IS RESPONSIBLE FOR SEEING THAT THESE PROCEDURES ARE FOLLOWED.

HAZARDOUS WASTES

1. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL, STATE, AND/OR FEDERAL REGULATIONS. THE JOB SITE SUPERINTENDENT, WHO WILL ALSO BE RESPONSIBLE FOR SEEING THAT THESE PRACTICES ARE FOLLOWED, SHALL INSTRUCT SITE PERSONNEL IN THESE PRACTICES. SAFETY DATA SHEETS (SDS) FOR EACH SUBSTANCE WITH HAZARDOUS PROPERTIES THAT IS USED ON THE JOB SITE SHALL BE OBTAINED AND USED FOR THE PROPER MANAGEMENT OF POTENTIAL WASTES THAT MAY RESULT FROM THESE PRODUCTS. AN SDS SHALL BE POSTED IN THE IMMEDIATE AREA WHERE SUCH PRODUCT IS STORED AND/OR USED AND ANOTHER COPY OF EACH SDS SHALL BE MAINTAINED IN THE FILE AT THE JOB SITE CONSTRUCTION TRAILER OFFICE. EACH EMPLOYEE WHO MUST HANDLE A SUBSTANCE WITH HAZARDOUS PROPERTIES SHALL BE INSTRUCTED ON THE USE OF SDS AND THE SPECIFIC INFORMATION IN THE APPLICABLE SDS FOR THE PRODUCT HE/SHE IS USING, PARTICULARLY REGARDING SPILL CONTROL TECHNIQUES.
2. THE CONTRACTOR SHALL PREPARE AND IMPLEMENT A SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN AS APPLICABLE. CONTRACTOR SHALL TRAIN ALL PERSONNEL IN THE PROPER CLEANUP AND HANDLING OF SPILLED MATERIALS. NO SPILLED HAZARDOUS MATERIALS OR HAZARDOUS WASTES SHALL BE ALLOWED TO COME IN CONTACT WITH STORMWATER DISCHARGES. IF SUCH CONTACT OCCURS, THE STORMWATER DISCHARGE SHALL BE CONTAINED ON SITE UNTIL APPROPRIATE MEASURES IN COMPLIANCE WITH STATE AND FEDERAL REGULATIONS ARE TAKEN TO DISPOSE OF SUCH CONTAMINATED STORMWATER. IT SHALL BE THE RESPONSIBILITY OF THE JOB SITE SUPERINTENDENT TO PROPERLY TRAIN ALL PERSONNEL IN THE USE OF THE SPCC PLAN.
3. AN SPCC PLAN IS REQUIRED IF MORE THAN 1,320 GALLONS OF PETROLEUM IS STORED ONSITE (THIS INCLUDES CAPACITIES OF EQUIPMENT) OR IF ANY ONE PIECE OF EQUIPMENT HAS A CAPACITY GREATER THAN 660 GALLONS. IF EITHER OF THESE TWO CONDITIONS OCCUR, AN SPCC PLAN MUST BE PREPARED IN ACCORDANCE WITH APPLICABLE REGULATIONS.

SANITARY WASTES

1. A MINIMUM OF ONE PORTABLE SANITARY UNIT SHALL BE PROVIDED FOR EVERY TEN (10) WORKERS ON THE SITE. ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONE TIME PER WEEK BY A LICENSED PORTABLE FACILITY PROVIDER IN COMPLETE COMPLIANCE WITH LOCAL AND STATE REGULATIONS.
2. ALL SANITARY WASTE UNITS SHALL BE LOCATED IN AN AREA WHERE LIKELIHOOD OF THE UNIT CONTRIBUTING TO STORMWATER DISCHARGE IS NEGLIGIBLE. ADDITIONAL CONTAINMENT BMPS MUST BE IMPLEMENTED, SUCH AS GRAVEL BAGS OR SPECIFICALLY DESIGNED PLASTIC SKID CONTAINERS AROUND THE BASE, TO PREVENT WASTES FROM CONTRIBUTING TO STORMWATER DISCHARGES.

OFFSITE VEHICLE TRACKING

1. A STABILIZED CONSTRUCTION ENTRANCE HAS BEEN PROVIDED TO HELP REDUCE VEHICLE TRACKING OF SEDIMENT. SEE SHEETS ESC-100 AND C-500 FOR CONSTRUCTION ENTRANCE LOCATION AND DETAILS. THE PAVED STREET ADJACENT TO THE SITE EXIT SHALL BE INSPECTED DAILY FOR TRACKING OF MUD, DIRT OR ROCK. DUMP TRUCKS HAULING MATERIAL FROM THE CONSTRUCTION SITE SHALL HAVE LOADS COVERED WITH A TARPAULIN.

INVENTORY FOR POLLUTION PREVENTION PLAN

1. THE FOLLOWING MATERIALS ARE EXPECTED ONSITE DURING CONSTRUCTION: PETROLEUM-BASED FUELS AND LUBRICANTS FOR EQUIPMENT, ADDITIVES FOR SOIL STABILIZATION, FERTILIZERS, CRUSHED STONE, RIPRAP, AND METAL PIPES.

SPILL PREVENTION

1. PRACTICES SUCH AS GOOD HOUSEKEEPING, PROPER HANDLING OF HAZARDOUS PRODUCTS, AND PROPER SPILL CONTROL PRACTICES SHALL BE FOLLOWED TO REDUCE THE RISK OF SPILLS AND SPILLS DISCHARGING INTO STORMWATER RUNOFF.

GOOD HOUSEKEEPING

QUANTITIES OF PRODUCTS STORED ONSITE SHALL BE LIMITED TO THE AMOUNT NEEDED FOR THE JOB.

1. PRODUCTS AND MATERIALS SHALL BE STORED IN A NEAT, ORDERLY MANNER IN APPROPRIATE CONTAINERS PROTECTED FROM RAINFALL, WHERE POSSIBLE.
2. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH MANUFACTURER LABELS LEGIBLE AND VISIBLE.
3. PRODUCT MIXING, DISPOSAL, AND DISPOSAL OF PRODUCT CONTAINERS SHALL BE ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
4. THE CONTRACTOR SHALL INSPECT SUCH MATERIALS TO ENSURE PROPER USE, STORAGE, AND DISPOSAL.

PRODUCT SPECIFIC PRACTICES

1. PETROLEUM-BASED PRODUCTS - CONTAINERS FOR PRODUCTS SUCH AS FUELS, LUBRICANTS, AND TARS SHALL BE INSPECTED DAILY FOR LEAKS AND SPILLS. THIS INCLUDES ON-SITE VEHICLE AND MACHINERY DAILY INSPECTIONS AND REGULAR PREVENTATIVE MAINTENANCE OF SUCH EQUIPMENT. EQUIPMENT MAINTENANCE AREAS SHALL BE LOCATED AWAY FROM STATE WATER, NATURAL DRAINS, AND STORMWATER DRAINAGE INLETS. IN ADDITION, TEMPORARY FUELING TANKS SHALL HAVE A SECONDARY CONTAINER LINER TO PREVENT/MINIMIZE SITE CONTAMINATION.
2. DISCHARGE OF OILS, FUELS, AND DISPOSAL AS REQUIRED BY LOCAL AND STATE REGULATIONS.
3. FERTILIZER - THESE PRODUCTS SHALL BE APPLIED AT RATES THAT DO NOT EXCEED THE MANUFACTURER'S SPECIFICATIONS OR ABOVE THE GUIDELINES SET FORTH IN THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL. ANY STORAGE OF THESE MATERIALS SHALL BE UNDER ROOF IN SEALED CONTAINERS.

SOIL CLEANUP AND CONTROL PRACTICES

1. LOCAL, STATE, AND MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND PROCEDURES SHALL BE MADE AVAILABLE TO SITE PERSONNEL.
2. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREAS. TYPICAL MATERIALS AND EQUIPMENT INCLUDES, BUT IS NOT LIMITED TO, BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, CAT LITTER, SAND, SAWDUST, AND PROPERLY LABELED PLASTICS AND METAL WASTE CONTAINERS.

- SPILL PREVENTION PRACTICES AND PROCEDURES SHALL BE REVIEWED AFTER A SPILL AND ADJUSTED AS NECESSARY TO PREVENT FUTURE SPILLS.
- ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY UPON DISCOVERY. ALL SPILLS SHALL BE REPORTED AS REQUIRED BY LOCAL, STATE, AND FEDERAL REGULATIONS.
- FOR SPILLS THAT IMPACT SURFACE WATER (LEAVE A SHEEN ON SURFACE), THE NATIONAL RESPONSE CENTER (NRC) SHALL BE CONTACTED WITHIN 24 HOURS AT 1-800-424-8802.
- FOR SPILLS OF AN UNKNOWN AMOUNT, THE NRC SHALL BE CONTACTED WITHIN 24 HOURS AT 1-800-424-8802.
- FOR SPILLS GREATER THAN 25 GALLONS AND NO SURFACE WATER IMPACTS, THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (**NYSDEC**) SHALL BE CONTACTED WITHIN 24 HOURS.
- FOR SPILLS LESS THAN 25 GALLONS AND NO SURFACE WATER IMPACTS, THE SPILL SHALL BE CLEANED UP AND LOCAL AGENCIES SHALL BE CONTACTED AS REQUIRED.

INSPECTIONS

1. QUALIFIED PERSONNEL PROVIDED BY PERMITTEE SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM THAT IS 0.5 INCH OR GREATER OR EQUIVALENT SNOWFALL.
2. QUALIFIED PERSONNEL MEANS A PERSON KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICES OF EROSION AND SEDIMENT CONTROLS, SUCH AS A LICENSED PROFESSIONAL ENGINEER (P.E.), A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), A CERTIFIED EROSION AND SEDIMENT AND STORMWATER INSPECTOR (CESSWI), OR OTHER KNOWLEDGEABLE PERSON WHO POSSESSES THE SKILLS TO ASSESS CONDITIONS AT THE CONSTRUCTION SITE THAT COULD IMPACT STORMWATER QUALITY AND TO ASSESS THE EFFECTIVENESS OF ANY SEDIMENT AND EROSION CONTROL MEASURE SELECTED TO CONTROL THE QUALITY OF STORMWATER DISCHARGES FROM THE CONSTRUCTION ACTIVITIES.
3. DISTURBED AREAS AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING TO RECEIVING WATERS.
4. EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY.
5. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATERS.
6. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFFSITE SEDIMENT TRACKING.
7. BASED ON THE RESULTS OF THE INSPECTION, THE DESCRIPTION OF POTENTIAL POLLUTANT SOURCES IDENTIFIED IN THE PLAN IN ACCORDANCE WITH GENERAL PERMIT GP-0-15-002 SHALL BE REVISED AS APPROPRIATE AS SOON AS PRACTICABLE AFTER SUCH INSPECTION. SUCH MODIFICATIONS SHALL PROVIDE FOR TIMELY IMPLEMENTATION OF ANY CHANGES TO THE PLAN WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE INSPECTION.
8. A REPORT SUMMARIZING THE SCOPE OF EACH INSPECTION, NAME(S) AND QUALIFICATIONS OF PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF INSPECTION, MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE STORMWATER POLLUTION PREVENTION PLAN, AND ACTIONS TAKEN IN ACCORDANCE WITH PARAGRAPH 5 ABOVE SHALL BE MADE AND RETAINED AS A PART OF THE STORMWATER POLLUTION PREVENTION PLAN FOR AT LEAST THREE (3) YEARS FROM THE DATE THAT THE PERMIT COVERAGE EXPIRES OR IS TERMINATED. ALL INSPECTION REPORTS SHALL BE RETAINED AT THE CONSTRUCTION SITE. THE REPORT SHALL BE SIGNED IN ACCORDANCE WITH GENERAL PERMIT GP-0-15-002.
9. THE PERMITTEE SHALL NOTIFY THE APPROPRIATE AGENCY FIELD OPERATIONS SECTION OFFICE WITHIN 24 HOURS OF ANY INCIDENCE OF NONCOMPLIANCE FOR ANY VIOLATION OF THE STORMWATER POLLUTION PREVENTION PLAN OBSERVED DURING THE INSPECTION CONDUCTED, OR FOR VIOLATIONS OF ANY CONDITIONS OF THIS PERMIT. THE PERMITTEE SHALL COMPLETE AND SUBMIT WITHIN FIVE (5) DAYS AN "INCIDENCE OF NONCOMPLIANCE" REPORT FOR ANY VIOLATION OF THE STORMWATER POLLUTION PREVENTION PLAN OBSERVED DURING ANY INSPECTION CONDUCTED, OR FOR VIOLATIONS OF ANY CONDITIONS OF THIS PERMIT. SUBMISSION SHALL BE ON FORMS PROVIDED BY THE AGENCY AND INCLUDE SPECIFIC INFORMATION ON THE CAUSE OF NONCOMPLIANCE, ACTIONS WHICH WERE TAKEN TO PREVENT ANY FURTHER CAUSES OF NONCOMPLIANCE, AND STATEMENT DETAILING ANY ENVIRONMENTAL IMPACT THAT MAY HAVE RESULTED FROM THE NONCOMPLIANCE.
10. ALL REPORTS OF NONCOMPLIANCE SHALL BE SIGNED BY A RESPONSIBLE AUTHORITY AS DEFINED IN THE GENERAL PERMIT NUMBER GP-0-15-002.
11. AFTER THE INITIAL CONTACT HAS BEEN MADE WITH THE APPROPRIATE FIELD OPERATIONS SECTION OFFICE, ALL REPORTS OF NONCOMPLIANCE SHALL BE MAILED TO THE AGENCY AT THE FOLLOWING ADDRESS:

NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
REGION 1 - REGIONAL WATER ENGINEER - NYS SUNY, BLDG. 40
LOOP ROAD - STONY BROOK, NY 11790-2356
PHONE: (631) 444-0405; FAX: (631) 444-0373

CONTRACTORS AND SUBCONTRACTORS

NOTE: THIS MASTER LIST TO BE COMPLETED AND SIGNED BY THE CONTRACTOR AND KEPT IN THE "ON-SITE" CONSTRUCTION TRAILER.

CONTRACTORS AND SUBCONTRACTORS MUST SIGN THIS PLAN, WHEN RECEIVING THIS STORMWATER POLLUTION PREVENTION PLAN, AND READ THE FOLLOWING CERTIFICATION STATEMENT BEFORE CONDUCTING ANY PROFESSIONAL SERVICE AT THE SITE IDENTIFIED IN THE STORMWATER POLLUTION PREVENTION PLAN.

"I CERTIFY UNDER PENALTY OF LAW THAT I UNDERSTAND THE TERMS AND CONDITIONS OF THE GENERAL STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES) PERMIT NUMBER GP-0-15-002 THAT AUTHORIZES THE STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY FROM THE CONSTRUCTION SITE IDENTIFIED AS PART OF THIS CERTIFICATION."

NAME / COMPANY / ADDRESS / ADDRESS — PHONE: / EMAIL:
SIGNATURE

NAME / COMPANY / ADDRESS / ADDRESS — PHONE: / EMAIL:
SIGNATURE

NAME / COMPANY / ADDRESS / ADDRESS — PHONE: / EMAIL:
SIGNATURE

DESIGN PROFESSIONAL'S CERTIFICATION

"I CERTIFY UNDER THE PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS."

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

SYM	DESCRIPTION	DATE	APPR

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FIRM MEMBER	DATE
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FIRE PROTECTION	---
BRANCH MANAGER	---
ENGINEERING DIR	---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORTHEAST IPT
NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

EROSION, SEDIMENTATION & POLLUTION CONTROL NOTES

CODE ID. NO. 80091	SIZE D
SCALE:	---
MAXIMO NO.	---
JOB ORDER NO.	---
SPEC. NO.	---
CONSTR. CONTR. NO.	
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MAINTENANCE AND INSPECTION OF EROSION AND SEDIMENT CONTROLS

MAINTENANCE

1. CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY OR STREETS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL AGGREGATE. ALL SEDIMENT SPILLED, DROPPED, OR WASHING ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

2. COMPOST FILTER SOCKS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED. SHOULD THE SOCK DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE SOCK IS STILL NECESSARY, THE SOCK SHALL BE REPLACED PROMPTLY.

3. SEDIMENT SHOULD BE REMOVED FROM COMPOST FILTER SOCKS AFTER EACH RAINFALL. SEDIMENT MUST BE REMOVED WHEN THE LEVEL OF DEPOSITION REACHES APPROXIMATELY ONE-HALF THE HEIGHT OF THE COMPOST FILTER SOCK.

4. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE COMPOST FILTER SOCK IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, A SEEDBED PREPARED, AND THE SITE VEGETATED.

5. INSPECT RIPRAP OUTLET STRUCTURES AFTER HEAVY RAINS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

6. INSPECT ALL EROSION BLANKETS PERIODICALLY AND AFTER RAINSTORMS TO CHECK FOR DAMAGE DUE TO WATER RUNNING UNDER THE BLANKET OR IF THE BLANKETS HAVE BEEN DISPLACED. WHERE WATER HAS FLOWED UNDER THE BLANKET, MORE STAPLES MAY BE NEEDED PER GIVEN AREA OR MORE FREQUENT ANCHORING TRENCHES INSTALLED. IF SIGNIFICANT EROSION HAS OCCURRED UNDER THE BLANKET, THEN RESEEDING MAY BE NEEDED. ANY EROSION BLANKETS THAT HAVE BEEN DISPLACED WILL NEED TO BE PUT BACK AND RE-STAPLED.

7. MULCH, TEMPORARY SEEDING, OR GRAVEL COVER (AS APPLICABLE) SHALL BE APPLIED TO ALL EXPOSED AREAS WITHIN 7 DAYS OF DISTURBANCE. MULCH CAN BE USED AS A SINGULAR EROSION CONTROL DEVICE FOR UP TO SIX MONTHS, BUT IT SHALL BE APPLIED AT THE APPROPRIATE DEPTH, DEPENDING ON THE MATERIALS USED, ANCHORED, AND HAVE A CONTINUOUS 90% COVER OR GREATER OF THE SOIL SURFACE. MAINTENANCE SHALL BE REQUIRED TO MAINTAIN APPROPRIATE DEPTH AND 90% COVER. TEMPORARY VEGETATION OR GRAVEL COVER (AS APPLICABLE) MAY BE EMPLOYED INSTEAD OF MULCH IF THE AREA WILL REMAIN UNDISTURBED FOR LESS THAN SIX MONTHS. IF AN AREA WILL REMAIN UNDISTURBED FOR GREATER THAN SIX MONTHS, PERMANENT VEGETATION TECHNIQUES SHALL BE EMPLOYED OR GRAVEL COVER SHALL BE PLACED (AS APPLICABLE).

8. ALL MULCHES SHOULD BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS, TO CHECK FOR RILL EROSION. WHERE EROSION IS OBSERVED, ADDITIONAL MUCH SHOULD BE APPLIED.

9. PERMANENT VEGETATION SHALL BE APPLIED IMMEDIATELY TO ROUGH GRADED AREAS THAT WILL BE UNDISTURBED FOR LONGER THAN SIX MONTHS. THIS PRACTICE FOR SODDING SHALL BE APPLIED IMMEDIATELY TO ALL DESIGNATED AREAS AT FINAL GRADE. FINAL STABILIZATION MEANS THAT ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED, AND THAT FOR UNPAVED AREAS AND AREAS NOT COVERED BY GRAVEL COVER OR PERMANENT STRUCTURES, AT LEAST 70% OF THE SOIL SURFACE IS UNIFORMLY COVERED IN PERMANENT VEGETATION OR EQUIVALENT PERMANENT STABILIZATION MEASURES (SUCH AS THE USE OF RIPRAP, GABIONS, PERMANENT MULCHES, AND GEOTEXTILES) HAVE BEEN EMPLOYED. PERMANENT VEGETATION SHALL CONSIST OF PLANTED TREES, SHRUBS, PERENNIAL VINES, AND/OR A CROP OF PERENNIAL VEGETATION APPROPRIATE FOR THE FINAL STABILIZATION APPLICABLE TO EACH PHASE OF CONSTRUCTION. UNTIL THIS STANDARD IS SATISFIED AND PERMANENT CONTROL MEASURES AND FACILITIES ARE OPERATIONAL, INTERIM STABILIZATION MEASURES AND TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL NOT BE REMOVED.

COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS

1. THE CONTRACTOR SHALL OBTAIN COPIES OF ANY AND ALL LOCAL AND STATE REGULATIONS THAT ARE APPLICABLE TO STORMWATER MANAGEMENT, EROSION CONTROL, AND POLLUTION MINIMIZATION AT THIS JOB SITE AND SHALL COMPLY FULLY WITH SUCH REGULATIONS. THE CONTRACTOR SHALL SUBMIT WRITTEN EVIDENCE OF SUCH COMPLIANCE IF REQUIRED BY NAVFAC OR ANY AGENT OF A REGULATORY BODY. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS OF ANY AND ALL LOCAL, STATE, AND FEDERAL AGENCIES HAVING GOVERNING AUTHORITY AND ALLOW REGULATORY PERSONNEL ACCESS TO THE JOB SITE AND TO RECORDS IN ORDER TO DETERMINE COMPLIANCE.

RETENTION OF RECORDS

1. THE PERMITTEE SHALL RETAIN COPIES OF THE STORMWATER POLLUTION PREVENTION PLANS AND ALL REPORTS AND NOTICES REQUIRED BY THE SPDES GENERAL PERMIT NUMBER GP-0-15-002. RECORDS OF ALL DATA USED TO COMPLETE THE NOTICE OF INTENT (NOI) COVERED BY THIS PERMIT SHALL BE RETAINED FOR A PERIOD OF AT LEAST THREE (3) YEARS FROM THE DATE THAT THE PERMIT COVERAGE EXPIRES OR IS TERMINATED. THIS PERIOD MAY BE EXTENDED BY REQUEST OF THE AGENCY AT ANY TIME.

2. THE PERMITTEE SHALL RETAIN A COPY OF THE STORMWATER POLLUTION PREVENTION PLAN AND ANY REVISIONS TO SAID PLAN REQUIRED BY THIS PERMIT AT THE CONSTRUCTION SITE FROM THE DATE OF PROJECT INITIATION TO THE DATE OF FINAL STABILIZATION.

	DATE	APPR.

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SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY : SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES | DR MF

CHK TWS | QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST BY
NWIRP BETHPAGE

NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

EROSION, SEDIMENTATION & POLLUTION CONTROL NOTES

CODE ID NO. 80091 | SIZE D

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JOB ORDER NO. ---

SPEC NO. ---

CONSTR. CONTR. NO.

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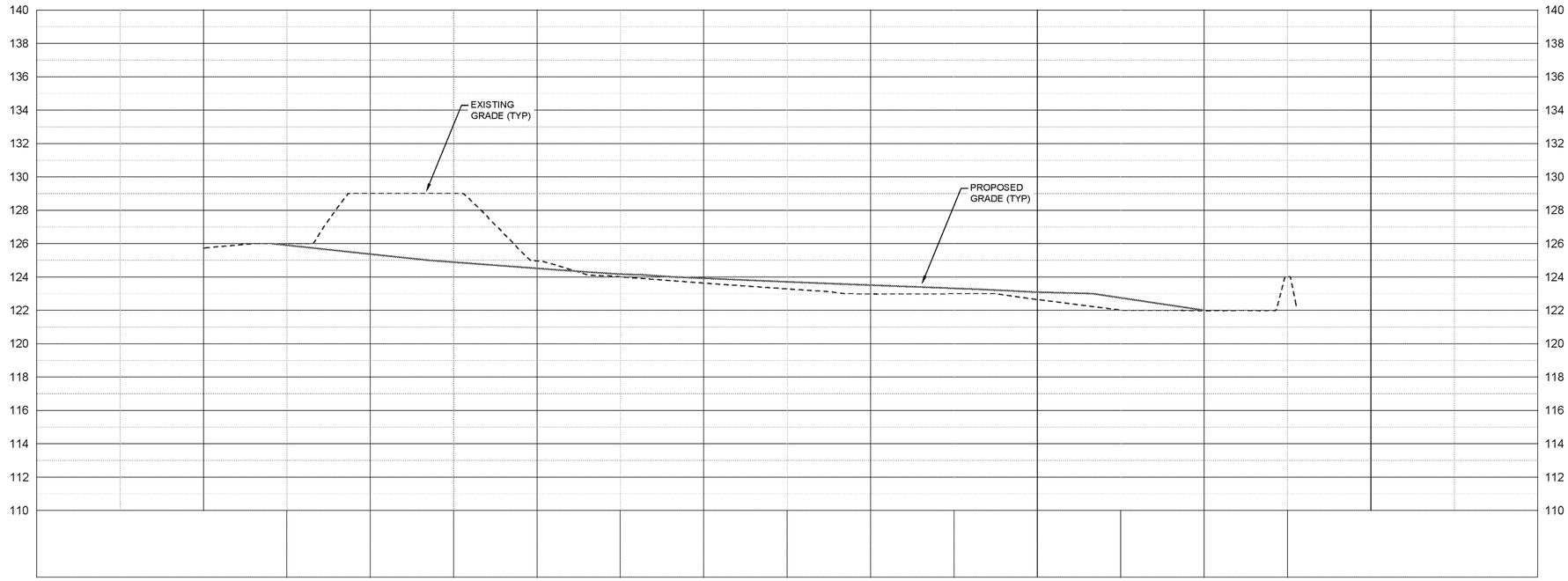
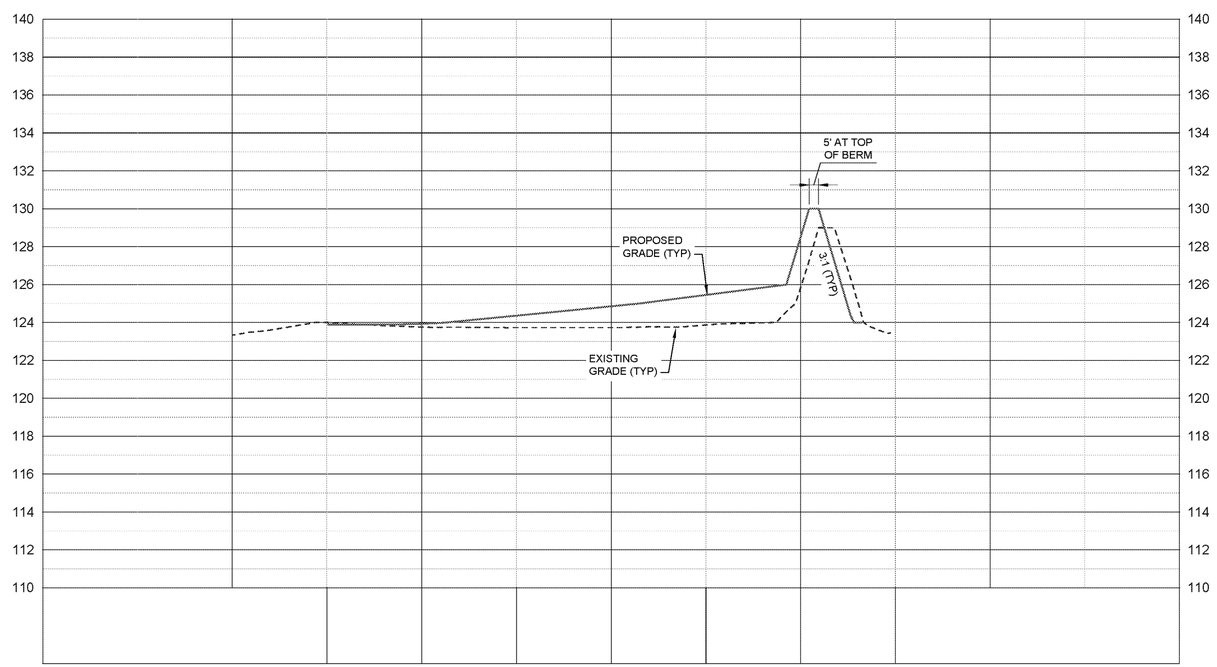


SECTION A-A

SCALE: H: 1" = 40' V: 1"=4'



SECTION B-B

SCALE: H: 1" = 40' V: 1"=4'

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ACTIVITY : SATISFACTORY TO DATE

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FOR COMMANDER NAVFAC DATE

DES | DR MF

CHK TWS | QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST BY
NWIRP BETHPAGE

NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

SECTIONS

CODE ID NO. 80091 | SIZE D

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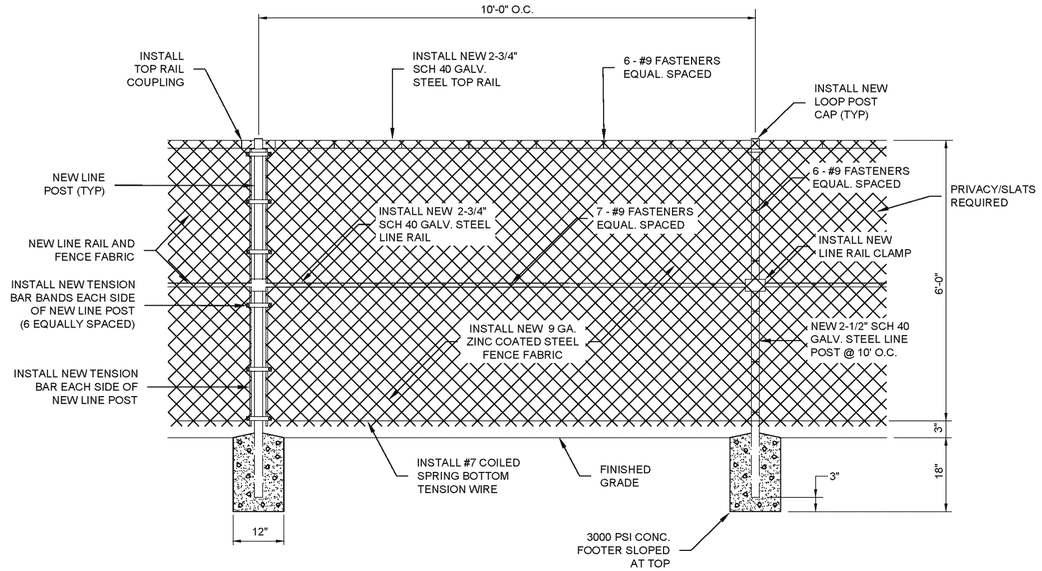

CHAIN LINK FENCE DETAIL

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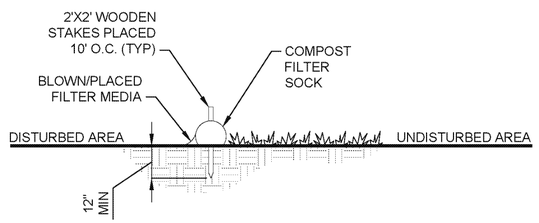
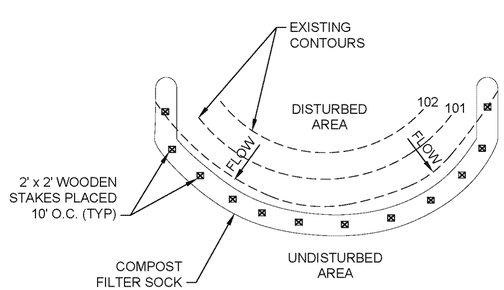


SECTION VIEW



PLAN VIEW

COMPOST FILTER SOCK DETAIL

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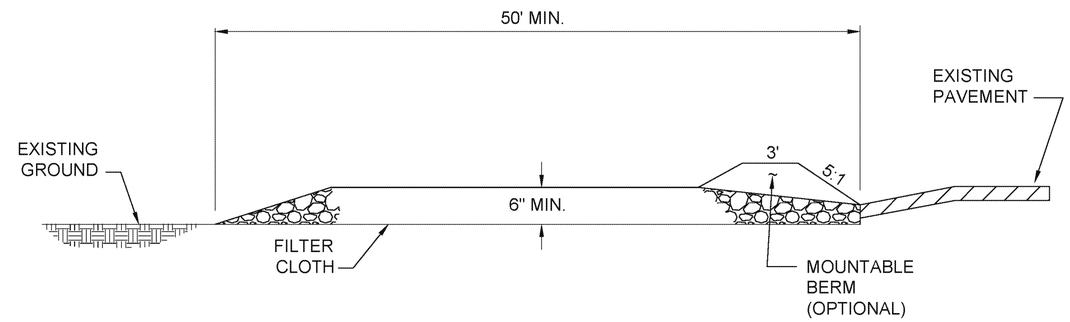
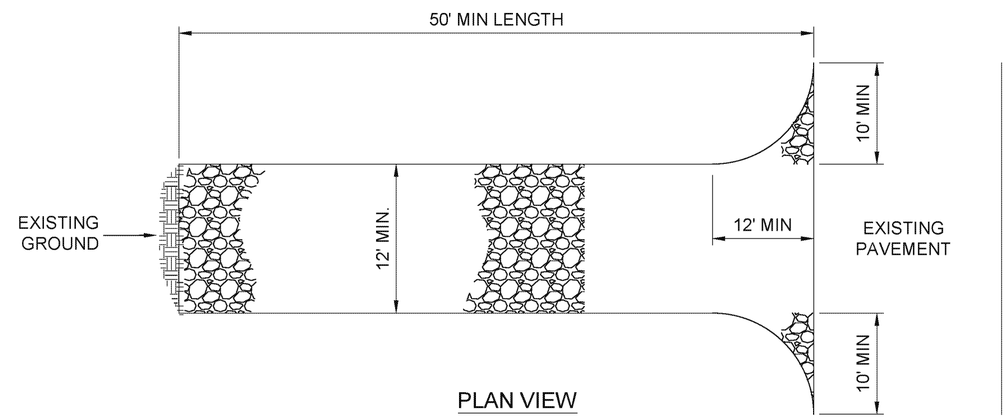


PROFILE



PLAN VIEW

CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE - USE 1 - 4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET.
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM.
5. GEOTEXTILE - WILL BE PLACED OVER THE AREA PRIOR TO PLACING STONE.
6. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED AS SOON AS PRACTICAL.
7. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED.

STABILIZED CONSTRUCTION ACCESS DETAILS

N.T.S.

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

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ACTIVITY : SATISFACTORY TO DATE
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FOR COMMANDER NAVFAC DATE
DES | DR MF
CHK TWS | QC
DESIGNER
REVIEWED BY
QC
DESIGN MANAGER ---
FIRE PROTECTION ---
BRANCH MANAGER ---
ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORTHEAST BY NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

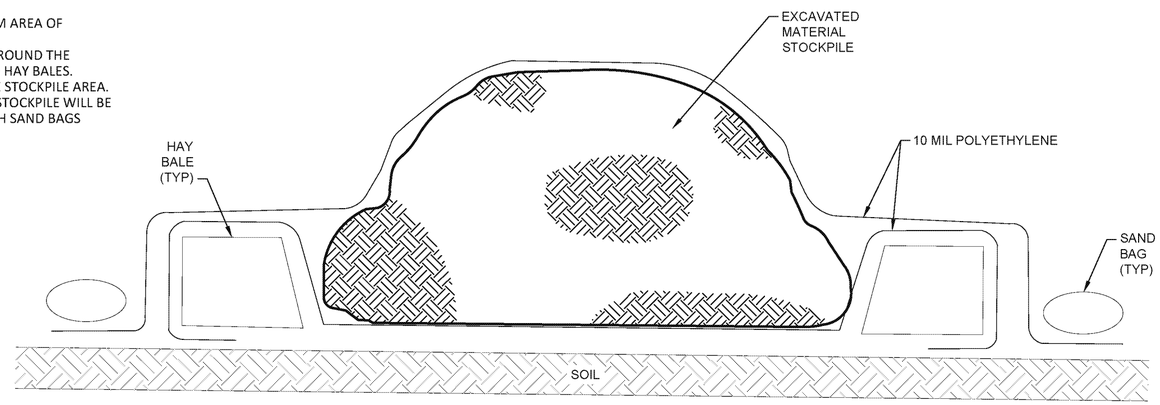
DETAILS

CODE ID NO. 80091 | SIZE D
SCALE: ---
MAX.MOD NO. ---
JOB ORDER NO. ---
SPEC NO. ---
CONSTR. CONTR. NO.
NAVFAC DRAWING NO.
SHEET OF

C-500

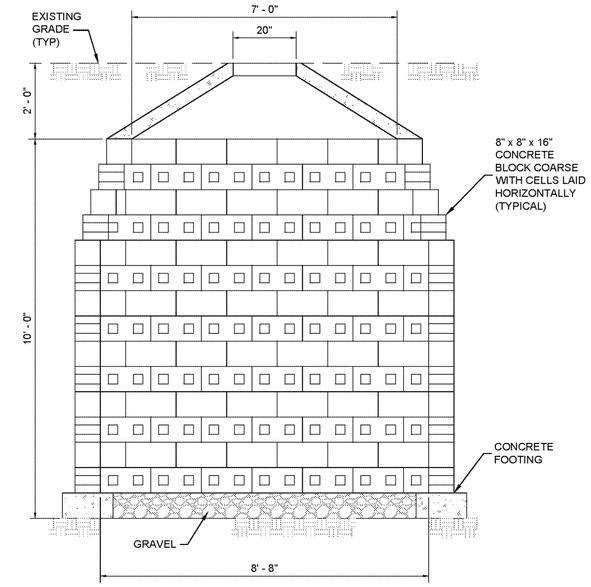
EXCAVATED MATERIAL STOCKPILE NOTES:

1. CONTRACTOR TO DETERMINE LOCATIONS BASED ON HIS WORK SEQUENCES.
2. THE CONTAINMENT AREA FOR THE EXCAVATED SOIL WILL HAVE EROSION CONTROLS IN PLACE PRIOR TO EXCAVATION.
3. ALL EXCAVATED SOIL WILL BE PLACED INSIDE A STOCKPILE AREA.
4. MULTIPLE CONTAINMENT AREAS MAY BE REQUIRED BASED ON THE CONTRACTOR'S REMOVAL SEQUENCE.
5. ALL EXCAVATED MATERIALS WILL BE COVERED IN INCLEMENT WEATHER, END OF THE WORK DAY, OR WHEN NOT IN USE.
6. ALL EXCAVATED SOILS NOT DIRECTLY LOADED INTO OFFSITE DISPOSAL TRUCKS WILL BE STOCKPILED WITHIN THE EXCAVATION AREAS.
   A. A 10-MIL POLYETHYLENE LINER SHALL COVER THE BOTTOM AREA OF THE SOILS STOCKPILE.
   B. A HAY BALE BARRIER 18 INCHES HIGH, SHALL BE PLACED AROUND THE STOCKPILE AREA WITH THE BOTTOM LINER COVERING THE HAY BALES.
   C. THE MATERIALS WILL BE PLACED ON THE LINER INSIDE THE STOCKPILE AREA. STOCKPILE SLOPES WILL NOT BE STEEPER THAN 2:1. THE STOCKPILE WILL BE COVERED WITH 10 MIL POLYETHYLENE AND SECURED WITH SAND BAGS AS NEEDED.



EXCAVATED MATERIAL STOCKPILE AREA DETAIL

NOT TO SCALE



DETAIL - EXISTING CESSPOOL

SCALE: 1" = 2'

TAPER METHOD VALUES		
DRIVEWAY CLASSIFICATION	TAPER (1:'T')	LAYOUT DISTANCE
RESIDENTIAL	1:2	28'
MINOR COMMERCIAL	1:1 $\frac{1}{2}$	41'

LAYOUT DISTANCE IS MEASURED FROM THE INSIDE EDGE OF OUTERMOST TRAVEL LANE, TO THE LAYOUT LINE.

TAPER METHOD OF LAYOUT:

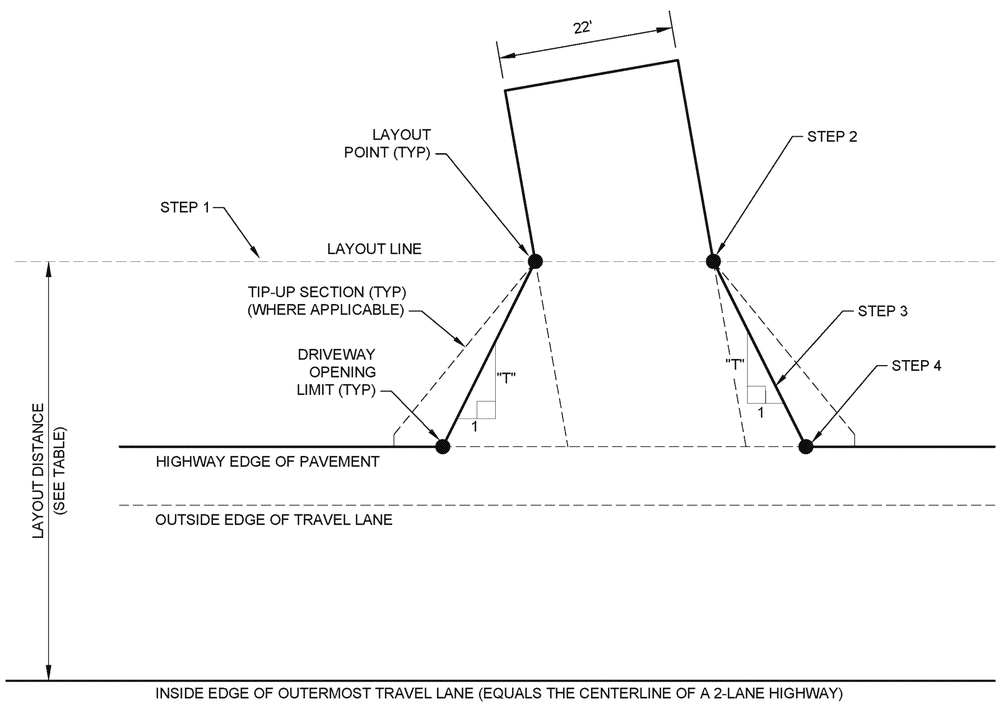
STEP 1. SCRIBE A LINE (LAYOUT LINE) OFFSET THE APPROPRIATE 'LAYOUT DISTANCE' (SEE TABLE) FROM THE INSIDE EDGE OF THE OUTERMOST TRAVEL LANE.

STEP 2. LOCATE THE TAPER LAYOUT POINT, WHICH IS AT THE INTERSECTION OF THE EDGE OF DRIVEWAY AND THE LAYOUT LINE.

STEP 3. SCRIBE A 1:'T' (SEE TABLE) TAPER FROM THE LAYOUT POINT TO THE EDGE OF PAVEMENT (WITH 'T' BEING PERPENDICULAR TO THE EDGE OF TRAVEL LANE).

STEP 4. FIND THE DRIVEWAY OPENING LIMIT POINT WHICH IS WHERE THE TAPER INTERSECTS THE EDGE OF PAVEMENT.

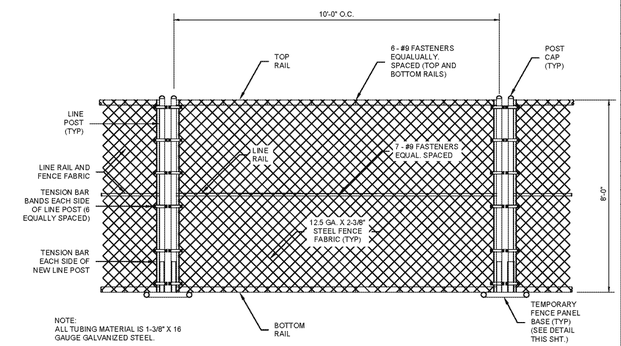
STEP 5. REPEAT STEPS 1 - 4 FOR THE OTHER SIDE OF THE DRIVEWAY OPENING.



HAUL ROAD CONNECTION DETAIL AT AEROSPACE BLVD.

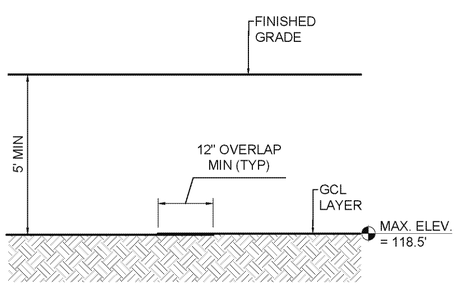
(FOR THE VALUE OF "T" SEE TABLE)

NOT TO SCALE



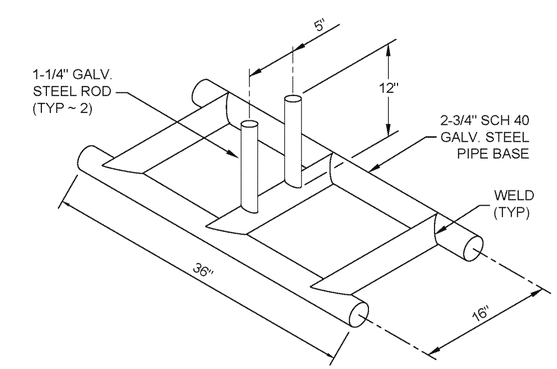
TEMPORARY FENCE PANEL DETAIL

N.T.S.



GCL LAYOUT

NOT TO SCALE



TEMPORARY FENCE PANEL BASE DETAIL

N.T.S.

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FOR COMMANDER NAVFAC DATE

DES		DR	MF
CHK	TWS	QC	

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST BY
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE
BETHPAGE, NEW YORK
SITE 1 REMEDIATION PLANS
DETAILS

CODE ID NO. 80091 SIZE D

SCALE: ---

MAX.NO NO. ---

JOB ORDER NO. ---

SPEC NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

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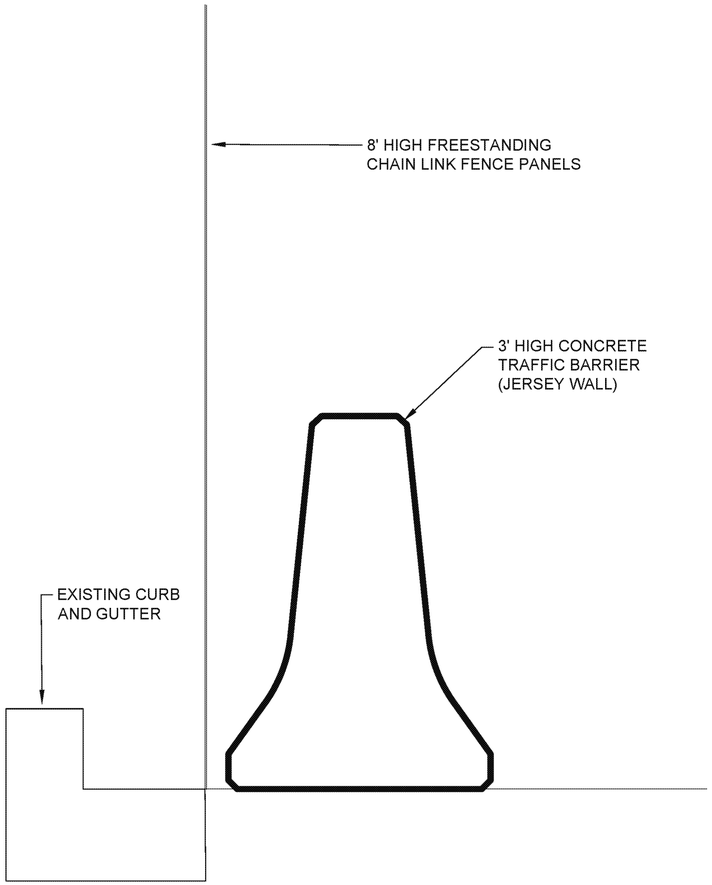
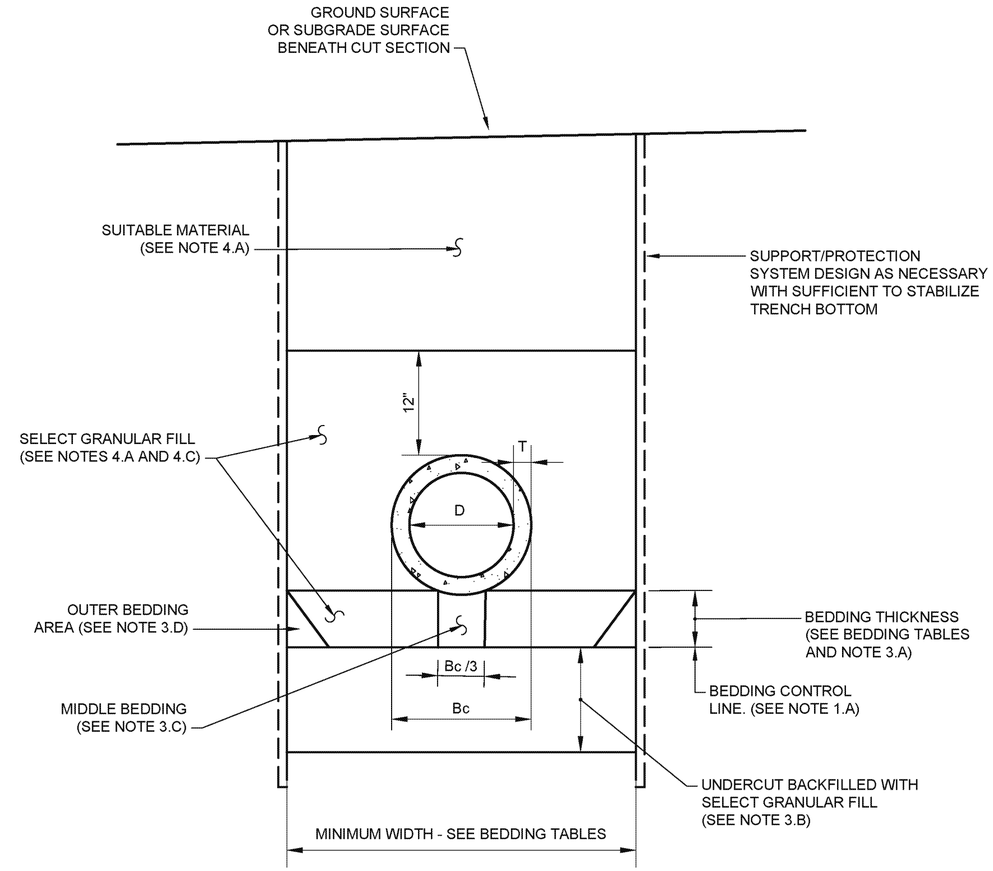


TEMPORARY FENCE/CONCRETE TRAFFIC BARRIER (JERSEY WALL) CONFIGURATION

NOT TO SCALE



INSTALLATION METHOD A-1
TRENCH AREA BENEATH ROADWAYS,
PAVEMENTS, AND SURFACE LOADS

NOT TO SCALE

1. GENERAL NOTES:

A. THE BEDDING CONTROL LINE (BCL) IS A HORIZONTAL LINE LOCATED BELOW THE INVERT WHICH REPRESENTS THE BOTTOM ELEVATION FOR BEDDING MATERIAL PLACEMENT AND THE TOP ELEVATION OF UNDERCUT BACKFILL WHERE REQUIRED. THE BCL IS ALSO USED FOR QUANTITY PAYMENT PURPOSES FOR "TRENCH AND CULVERT EXCAVATION" ITEMS, BEDDING MATERIAL PLACEMENT, AND UNDERCUT MATERIAL PLACEMENT. THE LOCATION OF THE BCL AND THE ACTUAL BEDDING THICKNESS VARY WITH PIPE SIZE AND WALL THICKNESS. SEE BEDDING THICKNESS TABLE.

2. EXCAVATION NOTES:

A. FOR PIPE INSTALLED IN A ROCK TRENCH, SIDE LINES FOR TRENCH EXCAVATION ARE THE SAME AS SHOWN FOR INSTALLATION METHOD A-1.
B. THE MINIMUM TRENCH WIDTH MAY BE ADJUSTED TO (Bc + 6"), IF CONTROLLED LOW STRENGTH MATERIAL (CLSM) IS TO BE USED AS BACKFILL. SEE MINIMUM BEDDING WIDTH TABLE.

3. BEDDING NOTES

A. USE THE BEDDING THICKNESS TABLE TO DETERMINE THE LOCATION OF THE BEDDING CONTROL LINE (BCL) AND THE MINIMUM BEDDING THICKNESS FOR THE GIVEN PIPE SIZE. COMPUTE THE ACTUAL BEDDING THICKNESS AS THE DISTANCE FROM INVERT TO BCL MINUS THE PIPE WALL THICKNESS.
B. TO ESTABLISH STABLE BEDDING CONDITIONS, AN UNDERCUT BACKFILLED WITH SELECT GRANULAR FILL MATERIAL MAY BE ORDERED BY THE ENGINEER IN CHARGE. THE MINIMUM DEPTH OF UNDERCUT AS MEASURED FROM THE BCL IS 12" AND THE MAXIMUM IS 24".
C. LOOSELY PLACE SELECT GRANULAR FILL IN MIDDLE BEDDING AREA (Bc/3), DO NOT COMPACT MIDDLE BEDDING AREA.
D. COMPACT THE OUTER BEDDING AREAS IN CONFORMANCE WITH THE REQUIREMENTS OF §203-3.15 OF NYSDOT STANDARD SPECIFICATIONS.

4. BACKFILL NOTES

A. COMPACT IN CONFORMANCE WITH THE REQUIREMENTS OF NYSDOT STANDARD SPECIFICATIONS §203-3.15.
B. COMPACT IN CONFORMANCE WITH THE REQUIREMENTS OF NYSDOT STANDARD SPECIFICATIONS §203-3.12.
C. CONTROLLED LOW STRENGTH MATERIAL (CLSM) PLACED IN CONFORMANCE WITH THE REQUIREMENTS OF SECTION 204 OF THE NYSDOT STANDARD SPECIFICATIONS AND APPLICABLE CLSM STANDARD SHEET MAY BE USED IN METHOD A-1.

MINIMUM BEDDING WIDTH TABLE

FOUNDATION TYPE	PIPE DIAMETER "D" OR SPAN (IN.)	WIDTH
SOIL	24" OR LESS	Bc + 2 * D OR Bc + 2 * SPAN
	GREATER THAN 24"	BC + 48"
ROCK	ALL SIZES	Bc + 24"

NOTE: Bc IS OUT TO OUT SPAN IN INCHES
(SEE NOTE 2 - B)

BEDDING THICKNESS TABLE

FOUNDATION TYPE	PIPE DIAMETER OR SPAN (IN)	D ≤ 12"	12" < D D ≤ 24"	24" < D D ≤ 36"	36" < D D ≤ 48"	48" < D D ≤ 60"	60" < D D ≤ 72"	72" < D D ≤ 84"	84" < D D ≤ 96"	96" < D D ≤ 108"	108" < D D ≤ 132"
SOIL	DISTANCE (IN) INVERT TO BCL	5"	6"	7"	8"	9"	11"	12"	13"	15"	18"
	MINIMUM THICKNESS	3"	3"	3"	3"	3"	3"	4"	5"	5"	6"
ROCK	DISTANCE (IN) INVERT TO BCL	8"	9"	10"	11"	12"	14"	16"	18"	20"	25"
	MINIMUM THICKNESS	6"	6"	6"	6"	6"	6"	8"	10"	10"	13"

TABLE VALUES ARE BASED ON WALL B THICKNESS FOR CIRCULAR PIPE.
FOR VERTICAL ELLIPTICAL PIPE, AN INCREASE OF ALL TABLE VALUES BY 1" IS REQUIRED.
FOR HORIZONTAL ELLIPTICAL PIPE: A DEDUCTION OF 1" FROM TABLE VALUES IS ALLOWED FOR SPANS GREATER THAN 48"
A DEDUCTION OF 2" FROM TABLE VALUES IS ALLOWED FOR SPANS GREATER THAN 108"

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NAVAL STATION - NORFOLK, VIRGINIA
BETHPAGE, NEW YORK
DEPARTMENT OF THE NAVY
NORTHEAST BY:
NWIRP BETHPAGE
SITE 1 REMEDIATION PLANS
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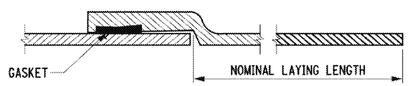
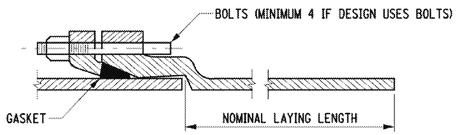
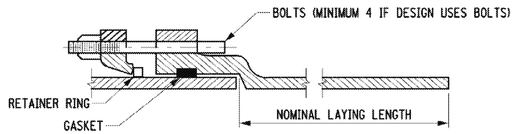


PUSH-ON JOINT FOR
DUCTILE IRON PIPE AND FITTINGS
NOTE: WILL VARY WITH SIZE AND MANUFACTURER

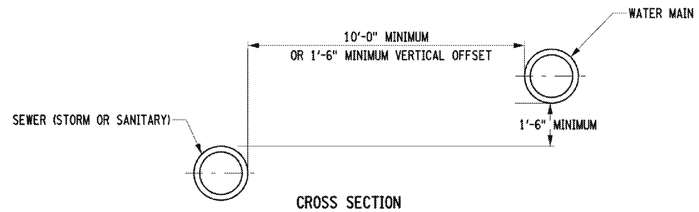


MECHANICAL JOINT (NON-RESTRAINED) FOR
DUCTILE IRON PIPE AND FITTINGS
NOTE: WILL VARY WITH SIZE AND MANUFACTURER

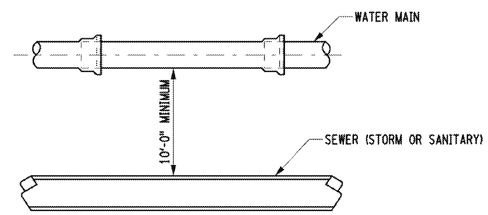


RESTRAINED MECHANICAL JOINT FOR
DUCTILE IRON PIPE AND FITTINGS
NOTE: WILL VARY WITH SIZE AND MANUFACTURER

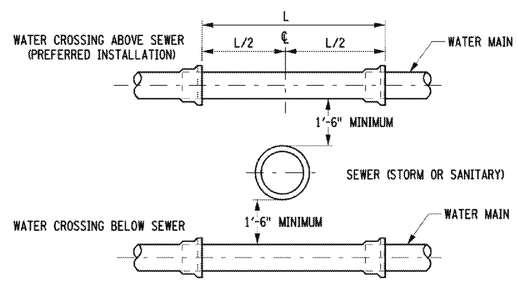
MECHANICAL JOINT BOLT TORQUE		
NPS SIZE	BOLT SIZE	TORQUE (LBF/FT)
3	5/8"	45-60
4-24	3/4"	75-90
30-36	1"	100-120
42-48	1 1/4"	120-150



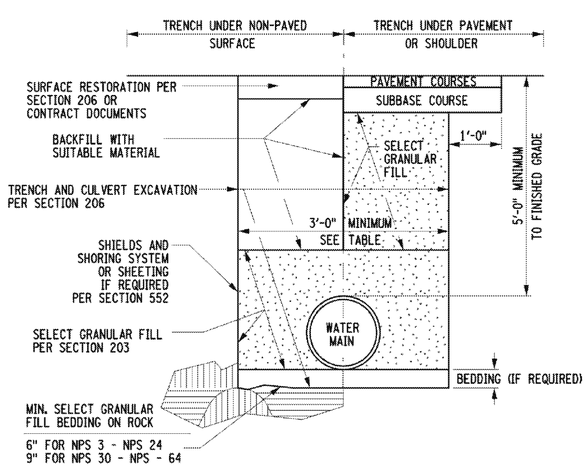
CROSS SECTION



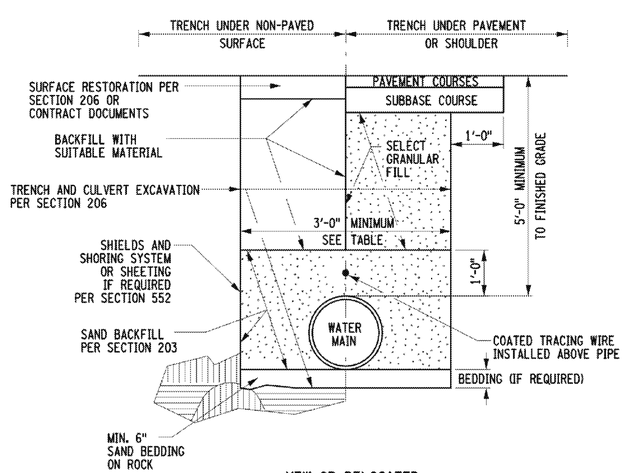
PLAN
WATER MAIN/SEWER
PARALLEL INSTALLATION



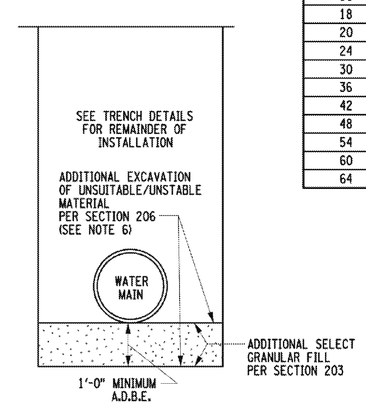
ELEVATION
WATER MAIN/SEWER
CROSSING



NEW OR RELOCATED
DUCTILE IRON OR STEEL WATER MAIN
TRENCH DETAIL



NEW OR RELOCATED
PLASTIC WATER/GAS
TRENCH DETAIL



WATER MAIN INSTALLATION IN
UNSTABLE OR UNSUITABLE SOIL CONDITIONS

NOTES

1. BEDDING BELOW THE PIPE INVERT SHALL BE REQUIRED ONLY WHEN ROCK OR UNSTABLE OR UNSUITABLE CONDITIONS ARE ENCOUNTERED.
2. IF UNSTABLE OR UNSUITABLE SOIL CONDITIONS ARE ENCOUNTERED NEAR THE INVERT ELEVATION, A MINIMUM OF 1' AND A MAXIMUM OF 2' OF MATERIAL SHALL BE EXCAVATED AND REPLACED WITH SELECT GRANULAR FILL.
3. NEW WATER MAINS INSTALLED PARALLEL TO STORM AND/OR SANITARY SEWER CONDUITS SHALL HAVE A MINIMUM OF 10' HORIZONTAL SEPARATION (MEASURED EDGE OF PIPE TO EDGE OF PIPE) WHENEVER POSSIBLE. WHEN 10' HORIZONTAL SEPARATION CANNOT BE MAINTAINED A VERTICAL SEPARATION OF AT LEAST 1'-6" BETWEEN BOTTOM WATER MAIN AND TOP SEWER PIPE SHALL BE MAINTAINED. IF NEITHER SEPARATION CAN BE MAINTAINED, THE WATER AND SEWER SHALL BE CONSTRUCTED AS SHOWN ON THE CONTRACT PLANS AND APPROVED BY THE APPROPRIATE HEALTH AGENCY.
4. BACKFILL SHALL BE INSTALLED AND COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS OF §203-3.15.
5. UPON COMPLETION OF ALL WATER SUPPLY RELATED CONSTRUCTION, INCLUDING BACKFILL, HYDROSTATIC TESTING SHALL BE PERFORMED IN ACCORDANCE WITH AWWA STANDARD C600 WITH THE MAINS THOROUGHLY FLUSHED PRIOR TO TESTING, UNLESS OTHERWISE NOTED. THE SYSTEM SHALL BE SUBJECTED TO A PRESSURE/LEAKAGE TEST WITH WATER UNDER A MINIMUM HYDROSTATIC PRESSURE OF 150 PSI FOR A MINIMUM OF TWO (2) HOURS.
6. UPON COMPLETION OF ALL WATER SUPPLY RELATED CONSTRUCTION, ALL MAINS, VALVES, HYDRANTS, AND OTHER APPURTENANCE BUILT UNDER THIS CONTRACT SHALL BE DISINFECTED, FLUSHED, AND TESTED FOR BACTERIOLOGICAL QUALITY IN ACCORDANCE WITH AWWA STANDARD C651. THE TABLET METHOD SHALL NOT BE USED FOR CHLORINATION OF SOLVENT WELDED PLASTIC OR SCREWED -JOINT STEEL PIPE DUE TO THE DANGER OF FIRE OR EXPLOSION FROM THE REACTION OF JOINT COMPOUNDS WITH CALCIUM HYPOCHLORITE.

MAXIMUM JOINT DEFLECTION			
NPS SIZE	PUSH-ON JOINTS		MJ JOINTS
	18' DI	20' DI	18/20 FT.
3	5°	5°	8°
4	5°	5°	8°
6	5°	5°	7°
8	5°	5°	5°
10	5°	5°	5°
12	5°	5°	5°
14	3°	3°	3.5°
16	3°	3°	3.5°
18	3°	3°	3°
20	3°	3°	3°
24	3°	3°	2°
30	3°	3°	N/A
36	3°	3°	N/A
42	3°	3°	N/A
48	N/A	3°	N/A
54	N/A	3°	N/A
60	N/A	3°	N/A
64	N/A	3°	N/A

EXCAVATION WIDTHS	
NPS SIZE	TRENCH WIDTH
3	3'-0"
4	3'-0"
6	3'-0"
8	3'-6"
10	4'-0"
12	4'-0"
14	4'-0"
16	4'-0"
18	4'-0"
20	4'-0"
24	4'-0"
30	4'-6"
36	5'-0"
42	5'-6"
48	6'-0"
54	6'-6"
60	7'-0"
64	7'-6"

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NWIRP BETHPAGE
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
BETHPAGE, NEW YORK
SITE 1 REMEDIATION PLANS
DETAILS

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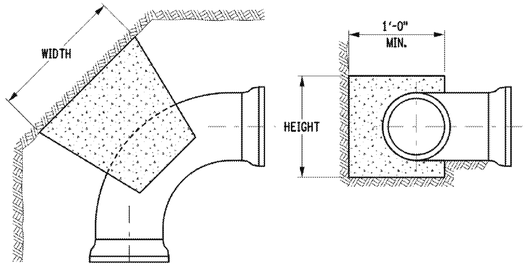
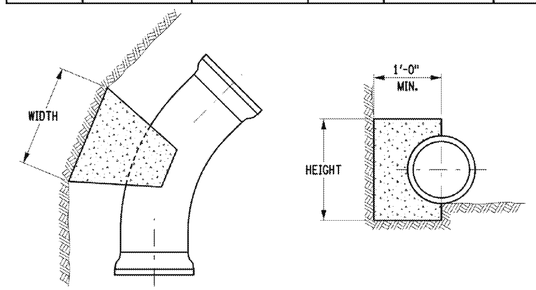


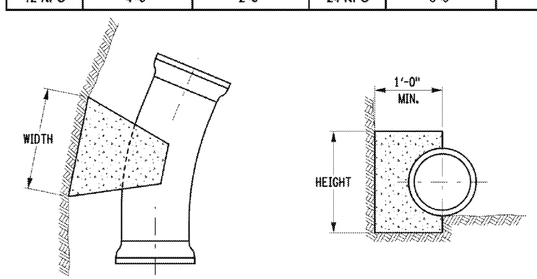
PLAN VIEW END VIEW

90° BEND THRUST BLOCK DIMENSIONING					
PIPE SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)	PIPE SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)
4 NPS	2'-3"	1'-3"	14 NPS	7'-3"	3'-6"
6 NPS	3'-3"	1'-9"	16 NPS	8'-3"	4'-0"
8 NPS	4'-3"	2'-3"	18 NPS	9'-3"	4'-6"
10 NPS	5'-3"	2'-6"	20 NPS	10'-6"	5'-0"
12 NPS	6'-0"	3'-3"	24 NPS	12'-6"	6'-0"



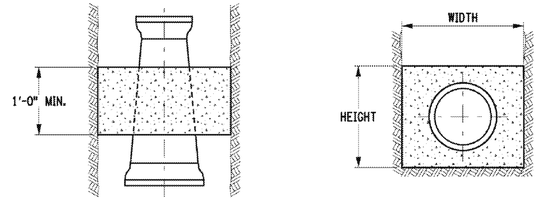
PLAN VIEW END VIEW

45° BEND THRUST BLOCK DIMENSIONING					
PIPE SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)	PIPE SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)
4 NPS	2'-0"	0'-9"	14 NPS	5'-3"	2'-6"
6 NPS	2'-6"	1'-3"	16 NPS	5'-6"	3'-3"
8 NPS	3'-3"	1'-9"	18 NPS	7'-3"	3'-3"
10 NPS	4'-0"	2'-0"	20 NPS	7'-3"	4'-0"
12 NPS	4'-6"	2'-3"	24 NPS	8'-9"	4'-6"



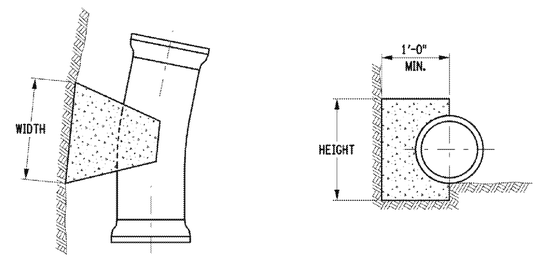
PLAN VIEW END VIEW

22½° BEND THRUST BLOCK DIMENSIONING					
PIPE SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)	PIPE SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)
4 NPS	1'-3"	0'-9"	14 NPS	3'-6"	2'-0"
6 NPS	2'-0"	0'-9"	16 NPS	4'-6"	2'-3"
8 NPS	2'-3"	1'-3"	18 NPS	5'-0"	2'-6"
10 NPS	3'-0"	1'-3"	20 NPS	5'-0"	3'-0"
12 NPS	3'-3"	1'-9"	24 NPS	6'-3"	3'-3"



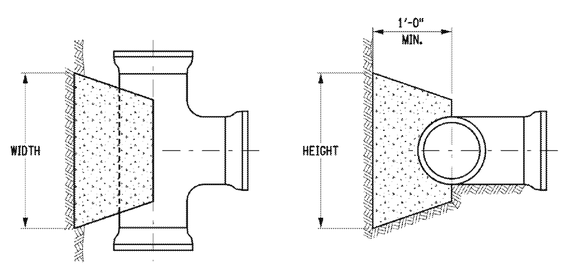
PLAN VIEW END VIEW

REDUCER THRUST BLOCK DIMENSIONING					
SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)	SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)
6x4 NPS	1'-6"	1'-6"	16x8 NPS	4'-6"	4'-6"
8x4 NPS	2'-3"	2'-3"	16x10 NPS	4'-0"	4'-0"
8x6 NPS	1'-9"	1'-9"	16x12 NPS	3'-6"	3'-6"
10x6 NPS	2'-6"	2'-6"	20x12 NPS	5'-0"	5'-0"
10x8 NPS	2'-0"	2'-0"	20x16 NPS	4'-0"	4'-0"
12x6 NPS	3'-3"	3'-3"	24x12 NPS	6'-6"	6'-6"
12x8 NPS	3'-0"	3'-0"	24x16 NPS	5'-9"	5'-9"
12x10 NPS	2'-3"	2'-3"	24x20 NPS	4'-6"	4'-6"



PLAN VIEW END VIEW

11¼° BEND THRUST BLOCK DIMENSIONING					
PIPE SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)	PIPE SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)
4 NPS	1'-0"	0'-6"	14 NPS	3'-0"	1'-3"
6 NPS	1'-3"	0'-9"	16 NPS	3'-3"	1'-9"
8 NPS	1'-9"	0'-9"	18 NPS	3'-6"	1'-9"
10 NPS	2'-0"	1'-0"	20 NPS	3'-6"	2'-0"
12 NPS	2'-3"	1'-3"	24 NPS	4'-6"	2'-3"



PLAN VIEW END VIEW

TEE/DEAD END THRUST BLOCK DIMENSIONING					
PIPE SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)	PIPE SIZE	WIDTH (FT-IN)	HEIGHT (FT-IN)
4 NPS	2'-0"	1'-0"	14 NPS	5'-6"	3'-3"
6 NPS	3'-0"	1'-3"	16 NPS	6'-6"	3'-6"
8 NPS	3'-3"	2'-0"	18 NPS	7'-6"	4'-0"
10 NPS	4'-3"	2'-3"	20 NPS	8'-6"	4'-3"
12 NPS	5'-3"	2'-6"	24 NPS	10'-3"	5'-3"

NOTES

1. CLASS A CONCRETE SHALL NOT BE PLACED UNDER WATER. THE CONTRACTOR SHALL DEWATER THE EXCAVATION OR PLACE TYPE G CONCRETE USING APPROPRIATE UNDERWATER PLACEMENT TECHNIQUES.
2. CONCRETE FOR TRUST BLOCKS SHALL NOT BE ALLOWED TO COVER OR INTERFERE WITH JOINT OR RESTRAINT HARDWARE. PLASTIC SHEETING OR BUILDING FELT MAY BE PLACED OVER PIPE OR FITTINGS TO PREVENT CONCRETE FROM ADHERING TO SURFACES. CONCRETE FOR TRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED SOIL.
3. FOR BENDS, BEARING AREA SHALL BE PARALLEL TO THE EDGE OF THE FITTING AT THE FITTING MIDPOINT.
4. FOR TEES, BEARING AREA SHALL BE PERPENDICULAR TO THE BRANCH (SINGLE LEG) AXIS.
5. FOR REDUCERS, BEARING AREA SHALL BE PERPENDICULAR TO THE FITTING AXIS. THE MINIMUM THICKNESS ALONG THE FITTING AXIS SHALL BE 1'-0" OR THE LENGTH BETWEEN THE BELLS, WHICHEVER IS SMALLER.
6. THRUST BLOCK SIZES AND MINIMUM RESTRAINED LENGTHS SHOWN ON THESE SHEETS ARE BASED UPON THE FOLLOWING STANDARD CONDITIONS:
   - 1.5 - SAFETY FACTOR
   - 5'-0" - DEPTH OF COVER
   - 200 PSI - WATER SYSTEM TEST PRESSURE
   - 14 PSI - SOIL BEARING CAPACITY
   - 90 LB/CF - SOIL UNIT WEIGHT

MINIMUM RESTRAINED LENGTH OF PIPE (FT-IN) L_R										
FITTING	4 NPS	6 NPS	8 NPS	10 NPS	12 NPS	14 NPS	16 NPS	18 NPS	20 NPS	24 NPS
11 ¼° BEND	1'-3"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-3"
22 ½° BEND	1'-3"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-6"
45° BEND	3'-0"	4'-0"	5'-3"	6'-3"	7'-6"	8'-6"	9'-6"	10'-6"	11'-6"	13'-6"
90° BEND	7'-0"	9'-9"	12'-6"	15'-6"	18'-0"	20'-0"	23'-0"	25'-6"	28'-0"	32'-6"
DEAD END	8'-6"	12'-6"	16'-0"	19'-3"	23'-0"	26'-0"	29'-6"	33'-0"	36'-0"	42'-0"
NOTE: PVC PIPE WILL TYPICALLY HAVE SLIGHTLY GREATER RESTRAINED LENGTH										
NOTE: FOR POLYETHYLENE WRAPPED PIPE, MULTIPLY VALUES IN TABLE BY 1.45										

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

APPR.	DATE	DESCRIPTION	BY

NAVFAC

SEAL

SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES DR MF

CHK TWS QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST BY
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
NWIRP BETHPAGE
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

DETAILS

CODE ID NO. 80091 SIZE D

SCALE: ---

MAX.NO NO. ---

JOB ORDER NO. ---

SPEC NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

C-504

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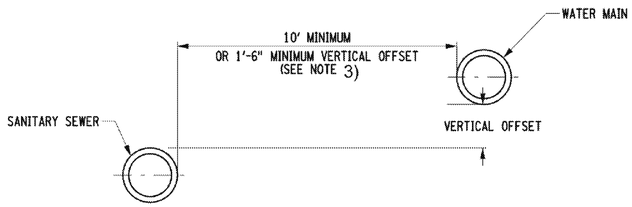
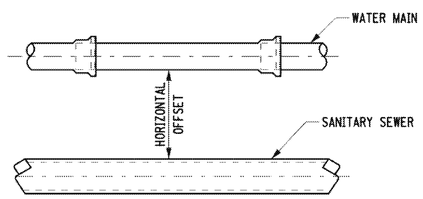
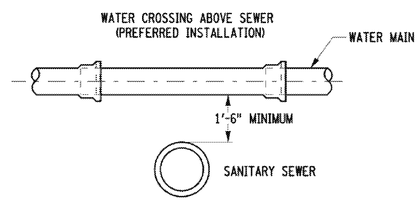


CROSS SECTION
SANITARY SEWER MAIN / WATER MAIN
PARALLEL INSTALLATION



PLAN
SANITARY SEWER MAIN / WATER MAIN
PARALLEL INSTALLATION

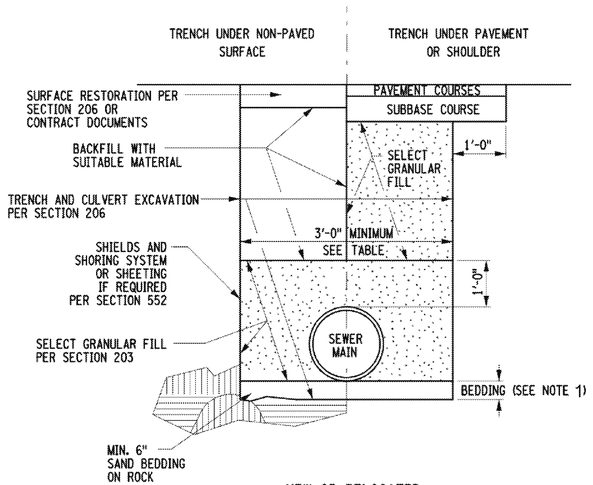


SANITARY SEWER MAIN / WATER MAIN
CROSSING

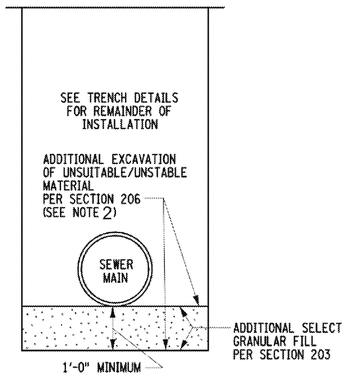
NOTES
1. BEDDING BELOW THE PIPE INVERT SHALL BE REQUIRED ONLY WHEN ROCK OR UNSTABLE OR UNSUITABLE CONDITIONS ARE ENCOUNTERED.
2. IF UNSTABLE OR UNSUITABLE SOIL CONDITIONS ARE ENCOUNTERED NEAR THE INVERT ELEVATION, A MINIMUM OF 1' AND A MAXIMUM OF 2' OF MATERIAL SHALL BE EXCAVATED AND REPLACED WITH SELECT GRANULAR FILL.
3. NEW SANITARY SEWER MAINS INSTALLED PARALLEL TO WATER MAINS SHALL HAVE A MINIMUM OF 10' HORIZONTAL SEPARATION (MEASURED EDGE OF PIPE TO EDGE OF PIPE OR EDGE OF STRUCTURE) WHENEVER POSSIBLE. WHEN 10' HORIZONTAL SEPARATION CANNOT BE MAINTAINED A VERTICAL SEPARATION OF AT LEAST 1'-6" BETWEEN BOTTOM WATER MAIN AND TOP OF SANITARY SEWER PIPE SHALL BE MAINTAINED. IF NEITHER SEPARATION CAN BE MAINTAINED, THE SANITARY SEWER MAIN AND WATER PIPE SHALL BE CONSTRUCTED AS SHOWN ON THE CONTRACT DOCUMENTS AS APPROVED BY THE APPROPRIATE HEALTH AGENCY.
4. BACKFILL SHALL BE INSTALLED AND COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 203.

EXCAVATION WIDTHS

NPS SIZE	TRENCH WIDTH
3	3'-0"
4	3'-0"
6	3'-0"
8	3'-6"
10	4'-0"
12	4'-0"
14	4'-0"
16	4'-0"
18	4'-0"
20	4'-0"
24	4'-0"
30	4'-6"
36	5'-0"
42	5'-6"
48	6'-0"
54	6'-6"
60	7'-0"
64	7'-6"



NEW OR RELOCATED
PLASTIC SANITARY SEWER MAIN
TRENCH DETAIL



SANITARY SEWER MAIN INSTALLATION IN
UNSTABLE OR UNSUITABLE SOIL CONDITIONS

DATE	APPR

DESCRIPTION

BY

NAVFAC

SEAL

SUBMITTED BY
FIRM MEMBER DATE
APPROVED
ACTIVITY : SATISFACTORY TO DATE
APPROVED
FOR COMMANDER NAVFAC DATE
DES DR MF
CHK TWS QC
DESIGNER
REVIEWED BY
QC
DESIGN MANAGER ---
FIRE PROTECTION ---
BRANCH MANAGER ---
ENGINEERING DIR. ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST IPT
NWIRP BETHPAGE
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
BETHPAGE, NEW YORK
SITE 1 REMEDIATION PLANS
DETAILS

CODE ID NO. 80091 SIZE D
SCALE: ---
MAXIMO NO. ---
JOB ORDER NO. ---
SPEC NO. ---
CONSTR. CONTR. NO.
NAVFAC DRAWING NO.
SHEET OF
C-505

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

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Point Table		
POINT #	Northing	Easting
1	214564.6439	1124599.5730
2	214522.7489	1124593.8000
3	214482.9981	1124675.1160
4	214482.5032	1124728.3920
5	214542.0470	1124767.4830
6	214464.4810	1124805.5681
7	214195.4882	1124790.4790

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

MIS	DESCRIPTION	DATE	APPR

NAVFAC

SEAL

SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY : SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES DR MF

CHK TWS QC

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST BY
NWIRP BETHPAGE

NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

SHEET PILE PLAN

CODE ID NO. 80091 SIZE D

SCALE: ---

MAX.MO NO. ---

JOB ORDER NO. ---

SPEC NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

S-100

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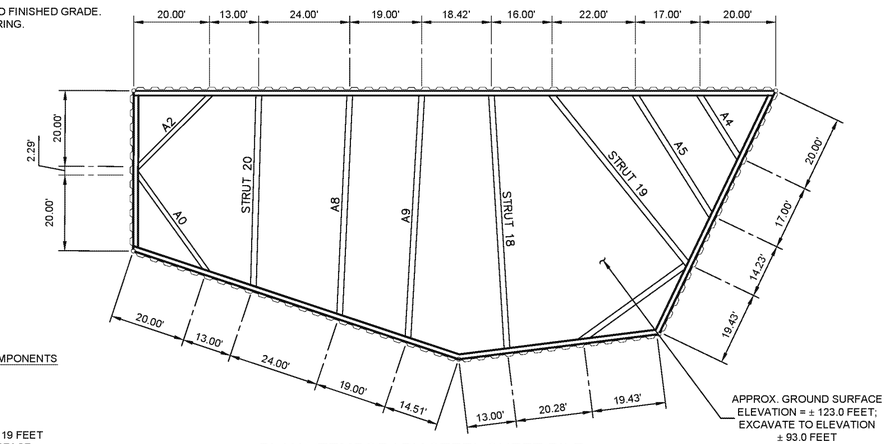
CONSTRUCTION SHALL BE PHASED AS FOLLOWS:

1) RELOCATE/RECONNECT EXISTING UTILITIES. (SEE SHEET C-109).
1) INSTALL SHEETING. (SEE NOTE 2 BELOW)
2) EXCAVATE TOP 20 FEET FOR REUSE (ELEV. 123' TO 103' ±).
3) UPON REMOVAL OF REQUIRED MATERIAL, EXCAVATE 20 - 30 FOOT (ELEV. 103' TO 93' ±) FOR OFFSITE DISPOSAL.
4) BACKFILL AND COMPACT TO FINISHED GRADE.
5) REMOVE SHEETING & SHORING.



APPROX. GROUND SURFACE ELEVATION = ± 123.0 FEET; EXCAVATE TO ELEVATION ± 93.0 FEET

SHEETING AND SHORING COMPONENTS

SHEET PILES: AZ26
STRUTS: PP24 X 0.375
WALERS: HP18 X 204

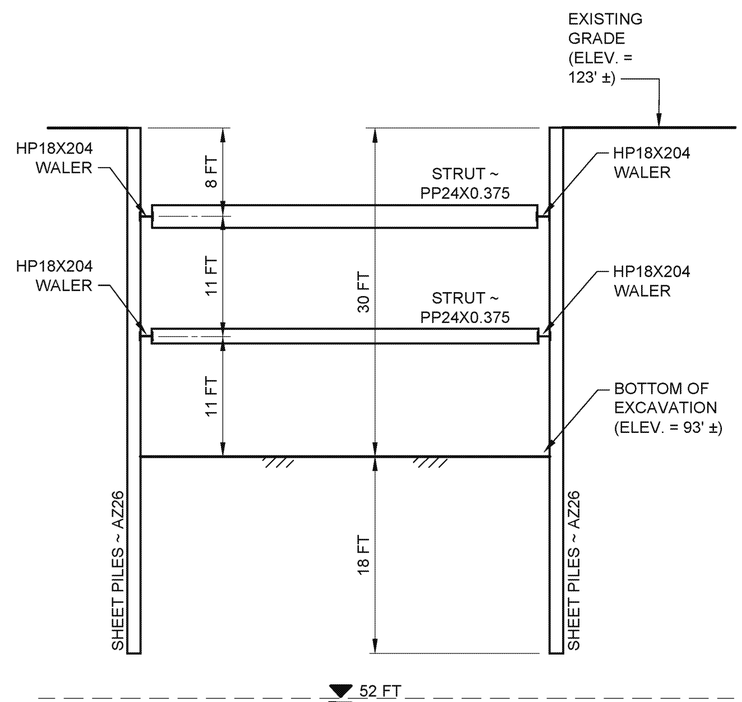
FRAMES AT (-) 8 FEET AND (-) 19 FEET BELOW EXISTING GRADE SURFACE

PLAN - TEMPORARY STEEL SHEET PILE RETAINING WALL #1 AT DRY WELL 20-08

SCALE: 1" = 20'

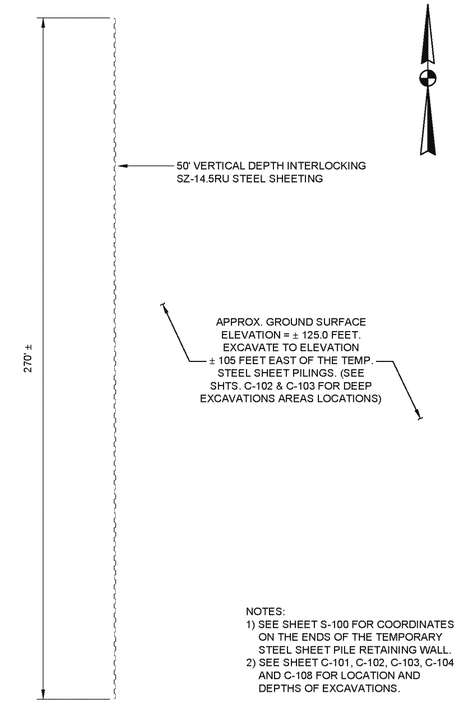
NOTES:

1) SEE SHEET S-100 FOR COORDINATES ON CORNERS OF TEMPORARY STEEL SHEET PILE RETAINING WALL.



TYP. SECTION - TEMPORARY STEEL SHEET PILE RETAINING WALL #1 AT DRYWELL 20-08

NOT TO SCALE



NOTES:
1) SEE SHEET S-100 FOR COORDINATES ON THE ENDS OF THE TEMPORARY STEEL SHEET PILE RETAINING WALL.
2) SEE SHEET C-101, C-102, C-103, C-104 AND C-108 FOR LOCATION AND DEPTHS OF EXCAVATIONS.

PLAN - TEMPORARY STEEL SHEET PILE RETAINING WALL #2 AT WEST SIDE OF MAIN EXCAVATION
SCALE: 1" = 30'

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

MAR	DESCRIPTION	DATE	APPR.

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SUBMITTED BY

FIRM MEMBER DATE

APPROVED

ACTIVITY : SATISFACTORY TO DATE

APPROVED

FOR COMMANDER NAVFAC DATE

DES		DR	MF
CHK	TWS	QC	

DESIGNER

REVIEWED BY

QC

DESIGN MANAGER ---

FIRE PROTECTION ---

BRANCH MANAGER ---

ENGINEERING DR. ---

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST IPT
NWIRP BETHPAGE

NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION - NORFOLK, VIRGINIA
BETHPAGE, NEW YORK

SITE 1 REMEDIATION PLANS

DETAILS

CODE ID NO. 80091 SIZE D

SCALE: ---

MAXIMO NO. ---

JOB ORDER NO. ---

SPEC NO. ---

CONSTR. CONTR. NO.

NAVFAC DRAWING NO.

SHEET OF

S-101

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Appendix C
Project Quality Control Plan

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PROJECT QUALITY CONTROL PLAN
REMEDIAL ACTION WORK PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004

Contract Task Order: N4008518F6147

Document Control Number: APTIM-9004-F6147-0002

September 2018

Submitted to:

NAVFAC Washington
1314 Harwood Street SE
Washington Navy Yard, D.C. 20374

Submitted by:
Aptim Federal Services LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

PROJECT QUALITY CONTROL PLAN

1.0 APTIM QUALITY POLICY AND STATEMENT

APTIM Federal Services, LLC (APTIM) implements a Quality Management System (QMS) based upon the business processes of APTIM and is supported by the APTIM Delivery System (ADS) to consistently provide services that meet the requirements of clients and regulatory requirements applicable to projects and corporate activities. APTIM is dedicated to effective application of the QMS, ADS, and process implementation to achieve continuous improvement of systems with the objective of enhancing the satisfaction of clients.

The QMS is supported by procedures, guidelines, work instructions, and forms for planning, implementation, measuring, monitoring, checking, reviewing, and improving the performance of APTIM.

This plan and the referenced ADS documents will be implemented by all APTIM personnel for work activities that affect quality. ADS procedures will be implemented by APTIM projects when determined applicable for the particular scope of work activities.

2.0 SCOPE OF WORK COVERED BY THE QUALITY CONTROL PLAN

APTIM has been selected by the Department of the Navy, Naval Facilities Engineering Command Mid-Atlantic, under Contract No. N62470-16-D-9004, Contract Task Order (CTO) N4008518F6147 to perform a remedial action for contaminated soil at the Site 1 – Former Drum Marshalling Area, Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage, New York.

This Project Quality Control (QC) Plan (PQCP) identifies the following Definable Features of Work (DFOW) for the CTO N4008518F6147 removal action to be performed at Site 1:

- Project Management, Administration Support, and Meetings
- Plans and Preconstruction Activities
- Mobilization and Setup
- Permits and Surveys
- Remedy Implementation
  - Site Clearing
  - Excavate Soils
  - Geosynthetic Clay Liner
  - Sheet Piling
  - Backfilling
- Transport and Disposal of Waste
- Site Restoration
- Demobilization
- Post Construction Deliverables

3.0 PROJECT QUALITY OBJECTIVES AND METRICS USED TO MONITOR PERFORMANCE

In accordance with this PQCP and parent Quality Control Program Plan (QCPP), the Project Quality Control Manager will implement a three-phase control system to manage each DFOW.

The procedure is described below:

Preparatory Phase: Prior to the start of a new DFOW, a preparatory meeting with the construction manager, project engineer, and associated subcontractors to review the work scope, quality

requirements, conditions of installation, preparation and installation or application procedures, and work coordination. A preparatory meeting agenda and document package will be generated. Documents, or sections of, may include:

- Work Plan
- Design Drawings and Specifications
- Any applicable Requests for Information (RFI)
- Approved Equipment and Material Submittals
- Inspection and Test Plans (ITPs)
- Statements of Qualification and/or Certifications

The meeting will be guided by the Preparatory Phase Checklist, provided as Exhibit IX-2. Before the meeting, the Project QC Manager will verify that the 1) required submittals have been transmitted and approved as required; 2) necessary prerequisite work has been completed; and 3) that the materials of construction and equipment for the DFOW are on hand. Agreement will be reached on any open items that must be addressed as well as a plan for completing the action(s). Preparatory meeting agenda and subsequent meeting minutes will be issued to all participants prior to starting the feature of work. Meeting minutes are documented using the Preparatory Phase Checklist.

Initial Phase: During the initial phase, the Project QC Manager will observe and inspect the initial portion of the work performed under a DFOW to establish the quality of the workmanship, to resolve conflicts in construction, and to ensure that testing, when required, is being done and certified by the approved laboratories. This Phase may also have a meeting held with the same attendees as those in the preparatory meeting. The initial phase inspection is guided by the Initial Phase Checklist, provided as Exhibit IX-3, and will be used to document the meeting minutes.

Work procedures will be checked to ascertain that the work conforms to quality and safety requirements. All nonconforming work requiring correction or rework will be documented and reported. All Initial Phase items, along with initial phase checklist and including date, will be provided in a daily report.

Follow-Up Phase: Follow-up inspections will continue to be performed until all work on a DFOW is complete. They ensure work complies with the above-stated requirements, that the quality of workmanship for all work is maintained, and all work being performed meets safety requirements. As part of the follow-up inspection, the inspectors will review the field documentation for accuracy and completeness. If required, field documentation will be returned to the originator for correction or completion. Follow up inspections are documented on the Contractor Quality Control Report, provided as Exhibit VIII-2.

Daily QC Reporting: The Project QC Manager will submit daily, a Contractor QC Report, which contains a summary of the daily QC activities performed by the Project QC Manager. All checklists and inspection documentation should be included with the Contractor Quality Control Report on the day which the checklist or inspection was completed. The report will be submitted to the Contracting Officer's designated representative by 1000 hours the following day.

Daily QC reports will include, but not be limited to the following three-phase control system QC information.

- Details of Preparatory Phase activities including:
  - Review of plans and specifications
  - Verification of approved submittals.
  - Verification of construction material compliance with plans and specifications.
  - Verification of proper material storage.
  - Verification of preliminary work.
  - Review of ITP.

  - Discussion of work method and schedule to complete.
  - Review of Health, Safety and Environment (HSE) requirements and Job safety/hazard analysis.
- Details of Initial Phase activities including:
  - Verification of preliminary work.
  - Confirmation of satisfactory workmanship.
  - Review and acceptance of test results.
  - Verification of compliance with the project plans and specifications.
  - Verification of compliance with HSE requirements.
- Details of Follow-up Phase activities including:
  - Verification of compliance of the work with plans and specifications and the level of satisfactory workmanship established in the Initial Phase.
  - Verification of compliance with HSE requirements.

Bi-Weekly QC Meetings: The Project QC Manager will conduct biweekly QC meetings as determined by the Contracting Officers (CO). Meetings will be documented in the Contractors Quality Control Report. Meetings will be held at a designated site and will be attended by the Project QC Manager, Project Superintendent, Project Manager, and the CO designated representatives. A phone conference bridge will be provided for attendees to participate when not present. The following should be accomplished at each meeting:

- Review the minutes of the previous meeting.
- Review the Variance Request/Request for Information/Concurrence Letter status.
- Review schedule and status of work.
  - Work accomplished since last meeting providing the status within the three phase control.
  - Work to be accomplished before the next scheduled meeting.
  - Meeting and inspection schedule for three phases of control.
- Review Rework Status.
  - Rework items identified and pending completion
  - Rework items completed since last meeting
- Review status of submittals.
  - Submittals reviewed and approved since last meeting
  - Submittals pending approval
  - Submittals required in the near future
- Provide testing to include both on-site and off-site testing.
  - Testing performed since last meeting
  - Testing scheduled prior to the next meeting
  - Test results pending/ received since last meeting
- Review documentation required prior to next meeting.
- Review status of as-builts.
- Review QC and production issues discussed and resolutions accomplished.
- Review other items discussed (i.e. items that may require changes to the PQCP.)
- Review action items.
- Review date of next scheduled QC meeting.

Minutes of the meeting will be prepared by the Project QC Manager and distributed to the attendees within 2 working days of the meeting. Meeting minutes will be documented on the QC Meeting Agenda/Minutes form provided as Exhibit XI-1.

4.0 ORGANIZATION AND RESPONSIBILITIES FOR THE EXECUTION OF THE SCOPE

4.1 Project Quality Control Manager

The Project QC Manager will have the authority to implement and manage the PQCP, the three phases of quality control and the authority to stop work, which is not in compliance with the contract.

The Project QC Manager for this task order will be named prior to the start of work. Approval of this person will be sought prior to appointment by APTIM.

The Project QC Manager will be responsible for the PQCP implementation and quality reporting for this task order. He will work closely with the site personnel and the Project Manager, Monica Smeal, E.I.T, but will report directly to Mr. William Squire, QC Program Manager regarding QC related issues on the site.

The Project QC Manager's responsibilities for this Contract Task Order are examined further in Table 4.1.

Table 4.1 – Project QC Manager Responsibilities

Name	Title	Organizational Affiliation	Responsibilities
<TBN>	Project QC Manager	APTIM	• Manage the site specific QC requirements in accordance with the PQCP. • Attend the coordination and mutual understanding meeting. • Conduct QC Meetings. • Perform the three phases of control. • Perform submittal review. • Perform submittal approval except for submittals designated for Contracting Officer or designated representative approval. • Ensure testing is performed as required. • Prepare QC certifications and documentation required. • Verify that objective evidence has been provided to document satisfactory performance of the work (i.e. daily reporting and photo documentation). • Exercise authority to stop work or direct removal and replacement of non-conforming work. • Review results of on-site verification testing and inspection reports. • Maintain the latest drawings and specifications with amendments and/or approved modifications at the site and ensure they are used for shop drawings, fabrication, construction, inspections, and testing. • Maintain as-built drawings at the site, available for review by the Navy at all times. • Establish and maintain a Rework Item List of work that does not conform to specifications. Track and monitor these items to assure that the rework inspection and testing activities and frequencies are in accordance with contract requirements. • Attend and assist the government at the pre-final inspection and the final acceptance inspection. • Confirm the quality and quantity of materials delivered to the site as referenced by project specifications and/or design drawings. • Submit the QC reports to the COs representative and Project Manager on a daily basis.

4.2 Quality Control Program Manager

Mr. Squire, QC Program Manager will serve to resolve any QC related issues, which need his involvement. The Project QC Manager will have a direct line of communication to the QC Program Manager on QC issues.

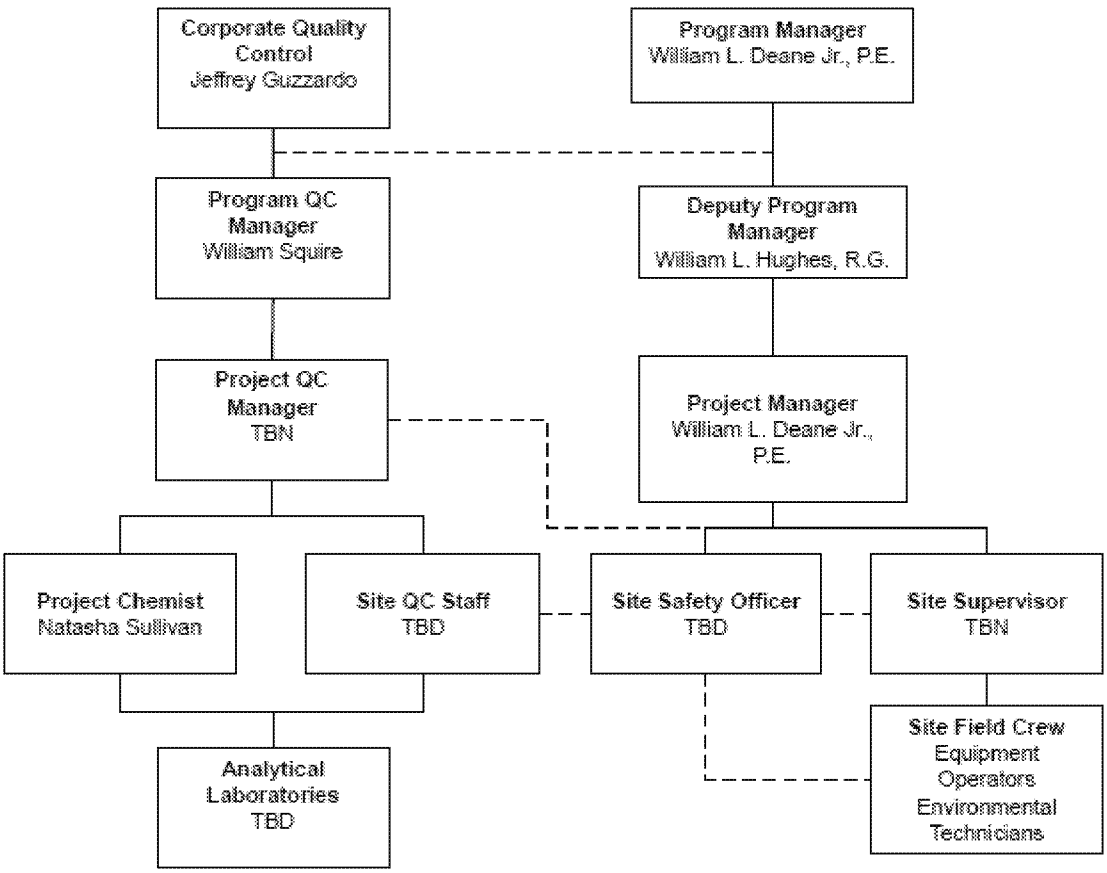
4.3 Alternate Quality Control Specialist

An Alternate QC Specialist will be assigned to assist the Project QC Manager during site construction. The resume of this person and appointment letter will be submitted for approval.

4.4 Organizational Chart

The relationship between the QC Organization, and Production Personnel of the Task Order, is presented in the Organizational Chart, Figure 4.4.

Figure 4.4 Project Organization Chart



4.5 Identification of Personnel Assigned to the QC Organization

The resume of the Project QC Manager will be submitted as Exhibit I-1 for approval prior to the commencement of work.

4.6 Appointment Letters

The Project QC Manager Appointment letter is provided as Exhibit II-1.

5.0 QUALITY PROCEDURES

The quality procedures for the PQCP are guided by the quality procedures set forth in the QCPP.

6.0 RELATED QUALITY CHECKLISTS / OTHER FORMS

6.1 Outside Organizations

A list of outside organizations such as subcontractors employed by APTIM for work under this CTO is provided in Exhibit III-1. This list provides each firm's name and address and a description of the services each firm will provide. This list will be maintained current and will be available for review.

6.2 Initial Submittal Register & Reviewer

6.2.1 Submittal Register

The Initial Submittal Register is provided as Exhibit IV-1. The status of each submittal will be recorded as changes occur.

6.2.2 Personnel Authorized to Review and Certify Submittals

Personnel authorized to review and certify submittals are identified on Exhibit IV-2. Any additional personnel assigned to perform submittal review and certification must be approved by the CO prior to performance.

6.3 Testing Laboratory Accreditation

The testing laboratory accreditation will be provided with the submittal of the Uniform Federal Policy (UFP) - Quality Assurance Project Plan (QAPP). The approval of the UFP-QAPP will serve as the approval of the laboratory for use in the project execution. The UFP-QAPP will be updated annually to include any updated accreditation or certifications.

6.4 Testing Plan and Log Preparation

A Testing Plan and Log has been prepared for this CTO and is provided as Exhibit V-1.

6.5 Requests for Information

When a project condition changes, a RFI will be submitted with a course of action for continuation. This RFI will be submitted to the CO for approval or direction. The RFI form is provided in Exhibit VI-1.

6.6 Rework Items

Rework Items will be documented on the Daily Contractor QC Report and on the Rework Items List. This list will be used to report and track Rework Items. The Rework Items List is provided as Exhibit VII-1.

6.7 Documentation Procedures

The Daily Contractor Production Report form and the Daily Contractor QC Report form will be used to document daily activities at the site. These forms are provided as Exhibits VIII-1 and VIII-2, respectively.

6.8 Quality Control Inspection Plan

The QC Inspection Plan, Exhibit IX-1, lists the Task Order Remedial Action Work Plan section and definable feature of work with provisions for recording the corresponding checklist/report for each phase of the three-phase control process. As each control phase is satisfactorily performed, the Project QC Manager will record the corresponding report number and date.

This list has been prepared to correspond to the scheduled remedial action activities. Each preparatory, initial and follow-up phase checklist/report will reflect the construction activity number derived from the construction schedule. As a part of the QC inspection plan, the Preparatory Phase and Initial Phase Checklists are provided as Exhibits IX-2 and IX-3 respectively.

6.9 Personnel Matrix

The personnel matrix, Exhibit X-1, shows each section of the Task Order Remedial Action Work Plan sections with identification of who will review and certify submittals, who will perform and document the three phases of control, and who will perform and document testing.

7.0 LIST OF EXHIBITS

Exhibit I-1	Project QC Manager Resume
Exhibit II-1	Project QC Appointment Letter
Exhibit III-1	Outside Organization/Subcontractor List
Exhibit IV-1	Submittal Register
Exhibit IV-2	List of Personnel Authorized to Review and Certify Submittals
Exhibit V-1	Testing Plan and Log
Exhibit VI-1	Request for Information Form
Exhibit VII-1	Rework Items List
Exhibit VIII-1	Contractor Production Report
Exhibit VIII-2	Contractor QC Report
Exhibit IX-1	QC Inspection Plan
Exhibit IX-2	Preparatory Phase Checklist
Exhibit IX-3	Initial Phase Checklist
Exhibit X-1	Personnel Matrix
Exhibit XI-1	QC Meeting Template

8.0 DEFINITIONS

Below is a list of acronyms and abbreviations, and their definitions, used in this document:

APTIM	APTIM Federal Services, LLC
ADS	APTIM Delivery System
CO	Contracting Officer
CTO	Contract Task Order
DFOW	Definable Feature of Work
HSE	Health, Safety, and Environment
ITP	Inspection and Test Plan
PQCP	Project Quality Control Plan
QC	Quality Control
QCPP	Quality Control Program Plan
QMS	Quality Management System
RFI	Request for Information
TBN	To Be Named
UFP-QAPP	Uniform Federal Policy for Quality Assurance Project Plan

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EXHIBIT III-1

OUTSIDE ORGANIZATION/SUBCONTRACTOR LIST APTIM Federal Services LLC Site 1 - Former Drum Marshalling Area NWIRP Bethpage Contract Task Order No. N4008518F6147	
COMPANY NAME AND ADDRESS	**DESCRIPTION OF SERVICES PROVIDED**
Onion Equipment Company Harris-Blade JRM Equipment	Equipment Rental and Service
Hager-Richter Geosciences	Utility Survey and Markout
Valente Electrical Contracting Corporation	Electrical Services
Residential Fences Corp	Fence Installation (Temporary and Permanent)
Along Road	Jersey Barriers
Advance Scale	Truck Scale Installation
National Grid	Gas Line Relocation
Banc 3 Engineering	Surveying
TBD	GCL Installation
TBD	Sheet Piling Installation
TBD	In-Place Density Testing
TBD	Transportation and Disposal

EXHIBIT III-1

OUTSIDE ORGANIZATION/SUBCONTRACTOR LIST APTIM Federal Services LLC Site 1 - Former Drum Marshalling Area NWIRP Bethpage Contract Task Order No. N4008518F6147	
COMPANY NAME AND ADDRESS	**DESCRIPTION OF SERVICES PROVIDED**
TBD	Hydroseeding
TBD	Curb Restoration
TBD	Bituminous Concrete Paving
TBD	Fill Materials (soil, riprap, aggregate)
SGS Accutest Laboratories - Orlando	Analytical Testing

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 Contract No. N62470-16-D-9004	APTIM Project No. 501164 Project Title: Site 1 - Former Drum Marshalling Area NWIRP Bethpage, New York	Revision No. 00 APTIM Federal Services LLC

Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority				Date Rcvd from Appx Auth	Remarks
							Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
	SD-01 Preconstruction														
01 31 00	Work Plan	1.03	G	E											
01 31 00 01 35 26	Accident Prevention Plan (includes Health and Safety Plan)	1.02 1.01-1.07	G, E												
01 31 00	Construction Quality Control Plan	1.03	G												
N/A	Sampling and Analysis Plan		G												
N/A	Waste Management Plan		G												
01 50 00	Environmental Protection Plan (Spill Prevention, Control and Countermeasures Plan)	1.02, 1.17	G	E											
N/A	Storm Water Pollution Prevention Plan		G												
01 31 00 01 50 00 32 17 20	Traffic Control Plan	1.03 1.02, 1.11 1.01-3.02	G	TOB, E											
01 31 00	Site Plan	1.03, 1.18	G, E												
01 31 00	Construction Progress Schedule	1.04	G	E											
01 50 00	Permits (Street Opening, Partial Street Closure, Weight)	1.11	TOB												
01 40 00	Testing firm and laboratory qualifications	1.04	E												
02 81 02	Certification of all waste transporters, including NYDOT identification number and expiration date, and proof of permit or authorization to transport hazardous waste in New York	1.03		E											
	SD-02 Shop Drawings														
01 50 00	Temporary signage	1.02, 1.09		G, E											
03 30 00	Headwalls, endwalls, wingwalls and all other cast-in-place concrete structures	1.03	E												
10 88 00	Truck scales, including scale pit and approach slabs	1.03													

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 Contract No. N62470-16-D-9004	APTIM Project No. 501164 Project Title: Site 1 - Former Drum Marshalling Area NWIRP Bethpage, New York	Revision No. 00 APTIM Federal Services LLC

Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority				Date Rcvd from Appx Auth	Remarks
							Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
31 30 00	Geosynthetic Clay Liner	1.03		E											
31 41 16	Sheet piling (plan)	1.04	E												
31 41 16	Sheet piling (as-built)														
32 31 13	Chain link fence and gates	1.03	E												
33 40 00	Precast concrete structures shop drawings, cut sheets, and design calculations	1.03	E												
	SD-03 Product Data														
01 57 13 31 35 20	Geotextiles and turf reinforcing matting material properties and technical data sheets	1.03 1.03	E												
03 30 00	Reinforcing steel, concrete admixtures, curing aids and all other materials used for cast-in-place concrete	1.03	E												
31 30 00	Geosynthetic Clay Liner, including origin of bentonite and geotextiles	1.03		E											
31 30 00	GCL technical data including MARVs	1.03		E											
31 35 20	Erosion control blankets	1.03	E												
31 41 16	Sheet piling	1.04	E												
10 88 00	Truck scale equipment	1.03													
32 93 43	Replacement trees and landscape features	3.04	G												
32 31 13	Chain link fence and gates	1.03	E												
33 40 00	All products used in storm drainage utilities	1.03		E											
	SD-04 Samples														
01 57 13	Turf Reinforcing Matting	1.03	E												
01 57 13 31 35 20	Erosion Control Matting	1.03	E												
31 30 00	Geosynthetic Clay Liner	1.03		E											

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 Contract No. N62470-16-D-9004	APTIM Project No. 501164 Project Title: Site 1 - Former Drum Marshalling Area NWIRP Bethpage, New York	Revision No. 00 APTIM Federal Services LLC

Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority				Date Rcvd from Appx Auth	Remarks
							Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
	SD-05 Design Data														
31 41 16	Sheet piling design calculations	1.04	E												
31 41 16	Sheet piling design detail and connections	1.04													
03 30 00	Cast-in-place concrete mix designs	1.03	E												
32 12 16	Bituminous concrete mix designs	1.02													
33 40 00	Precast concrete mix designs and proportions for each strength and type of concrete used	1.03		E											
	SD-06 Test Reports														
02 81 02	Laboratory waste profiling analysis	3.02	G												
03 30 00	Cast-in-place concrete test results (slump, air content, temperature, chloride content, density and yield, and compressive strength)	1.03													
31 10 00	Compost quality control test report	1.03													
31 23 00	Clean borrow/fill verification analysis	1.04		E											
31 23 00	Fill material density test reports	1.04		E											
32 12 16	Bituminous concrete pavement field and lab test reports	1.02													
33 40 00	Pre-cast concrete plant test reports	1.03		E											
32 92 19 32 93 43	Topsoil nutrient analysis	1.03 1.03	E												
10 88 00	Truck scale calibration test reports	3.02													
	SD-07 Certificates														
01 71 23	Registered Land Surveyor license and qualifications	1.03													
02 81 02	Treatment/disposal facility permits	1.04													
03 30 0	Concrete batch delivery ticket	1.03													
31 23 00	Supplier certification of borrow/fill material	1.04		E											

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 Contract No. N62470-16-D-9004	APTIM Project No. 501164 Project Title: Site 1 - Former Drum Marshalling Area NWIRP Bethpage, New York	Revision No. 00 APTIM Federal Services LLC

Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority				Date Rcvd from Appx Auth	Remarks
							Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
31 30 00	Certificate of permeability and bentonite content of GCL	1.03		E											
31 30 00	Bentonite QC certificates	2.02													
31 30 00	GCL QC certificates	2.02													
31 30 00	GCL warranty	1.03		E											
31 30 00	GCL manufacturer corporate background and manufacturing capabilities	1.03		E											
31 30 00	GCL installer corporate background information and installed capabilities	1.03		E											
31 37 00	Manufacturer certification of riprap, including specific gravity and gradation	1.03	E												
31 41 16	Manufacturer certification attesting to the rated energy of the proposed hammer for sheet piling installation	1.04													
31 41 16	Manufacturer certification that sheet piling equipment and materials meet ASTM requirements	1.04													
31 41 16	Certificate of sheet piling contractor, design engineer, and welder qualifications	1.04, 1.06													
31 41 16	Copies of all sheet piling permit applications, including calculations and testing required to obtain permit	1.04													
32 12 16	Manufacturer certification of bituminous concrete prime coat	1.02													
32 15 00	Manufacturer certification of aggregate surfacing materials, including grain size distribution	1.02	E												

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 Contract No. N62470-16-D-9004	APTIM Project No. 501164 Project Title: Site 1 - Former Drum Marshalling Area NWIRP Bethpage, New York	Revision No. 00 APTIM Federal Services LLC

Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority				Date Rcvd from Appx Auth	Remarks
							Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
32 92 19	Manufacturer certification of grass seed, lime, and fertilizer; application rate information	1.03	E												
33 40 00	Manufacturer certification of pre-cast concrete plant for storm drainage utilities	1.03		E											
33 40 00	Pre-cast concrete plant QC Plan	1.03		E											
	SD-08 Manufacturer's Instructions														
10 88 00	Truck scales list of manufacturer's spare parts and complete installation instructions	1.03													
	SD-09 Material Suppliers														
31 23 00	Offsite source(s) of borrow/fill material	1.04		E											
	SD-10 Operation and Maintenance Data														
10 88 00	Truck scale operation and maintenance manual	1.03													
	SD-11 Closeout Submittals														
N/A	Construction Completion Report		G												
01 31 00	QC Meeting Minutes	1.06													
N/A	Test Results Summary Report														
N/A	Daily Contractor Production Reports														
N/A	Daily QC Reports														
N/A	Rework Items List														
N/A	Documentation Photos														
01 71 23	Surveyor field notes, computations, data logger information, and other survey records	1.03													
01 71 23	Record survey drawings certified by RLS (AutoCAD computer file, PDF file, one hard copy)	1.03, 3.03		E											

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 Contract No. N62470-16-D-9004	APTIM Project No. 501164 Project Title: Site 1 - Former Drum Marshalling Area NWIRP Bethpage, New York	Revision No. 00 APTIM Federal Services LLC

Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority				Date Rcvd from Appx Auth	Remarks
							Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
01 77 00	Certification of work complete	1.05	G												
01 77 00	Final Application for Payment, warranties, as-built documentation	1.06	G												
02 01 51	Post-construction maintenance inspection/repair reports	1.02, 1.09	E												
02 81 02	Waste shipment manifests, original bills of lading, and material shipping records	3.03		G, E											
03 30 00	Hardcopy delivery tickets for each batch of concrete	1.03													
31 30 00	GCL QC Certificates and roll tags	2.02													
31 41 16	Record copy of each sheet pile driven, including pile mark number, driving resistance record, pile length as driven, date and time of driving, time delays during driving, tip and cut-off elevations, deviations from drawing location and from plumb, hammer data and any other applicable data.	1.05													
31 41 16	Survey drawing showing mark number of all sheet piles and as-driven locations, within two weeks of completion of sheet piling installation	1.05, 1.08													
32 92 19	Bag tags, receipts and truck weight tickets of all seed, lime, and fertilizer	1.03	E												
33 40 00	Survey drawings showing location of installed storm drainage utilities	1.03		E											

Notes:
Approved By:
G: Government
E: Engineer
TOB: Town of Oyster Bay

ACTION CODES
A: Approved
AN: Approved as Noted

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 Contract No. N62470-16-D-9004	APTIM Project No. 501164 Project Title: Site 1 - Former Drum Marshalling Area NWIRP Bethpage, New York	Revision No. 00 APTIM Federal Services LLC

							Contractor Action			Approving Authority					
Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action	Date Rcvd from Appx Auth	Remarks
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)

Blank: QC Manager

Reference; QMP-16.2 Submittal Management Process

NR: Not Reviewed

RR: Disapproved; Revise and Resubmit

EXHIBIT IV-2

LIST OF PERSONNEL AUTHORIZED TO REVIEW AND CERTIFY SUBMITTALS APTIM Federal Services LLC Site 1 - Former Drum Marshalling Area NWIRP Bethpage Contract Task Order No. N4008518F6147		
	SUBMITTAL TYPE:	AUTHORIZED PERSONNEL:
Work Plan Submittals	Preconstruction	Project Manager, FEAD, RPM
Work Plan or Construction	All Types	Project QC Manager, QC Program Manager, and Project Manager, FEAD, RPM

(1) Note: Submittals requiring Government approval - QC Manager shall perform the final review and certification.
Submittals requiring Contractor approval - QC Manager shall perform the final review and approval.

EXHIBIT V-1

TESTING PLAN AND LOG
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

CONTRACT NUMBER	PROJECT TITLE: Site 1 - Former Drum Marshalling Area
N62470-16-D-9004	LOCATION: NWIRP Bethpage, New York

WORK PLAN SECTION AND PARAGRAPH NUMBER	SPECIFICATION SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
				YES	NO			ON SITE	OFF SITE			
WP 5.6 SAP	32 92 19	Clean Fill Verification	VOCs, SVOCs, PCBs, TCL Metals, Pesticides	X					X			VOC samples will be collected at a rate of seven discrete grab samples for the first 1,000 cubic yards, and an additional two discrete grab samples for each additional 1,000 cubic yards. All other analytes will require two composite samples for the first 1,000 cubic yards, and an additional composite sample for each additional 1,000 cubic yards.
WP 6.9	32 92 19	Top Soil Verification	Soil nutrient analyses (calcium, chloride, magnesium, nitrate, phosphorous, potassium, sodium, sulfate, pH, salinity, TOC)	X					X			One sample per disturbed acre

EXHIBIT V-1

TESTING PLAN AND LOG
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

CONTRACT NUMBER	PROJECT TITLE: Site 1 - Former Drum Marshalling Area
N62470-16-D-9004	LOCATION: NWIRP Bethpage, New York

WORK PLAN SECTION AND PARAGRAPH NUMBER	SPECIFICATION SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
				YES	NO			ON SITE	OFF SITE			
WP 6.6 SAP	02 81 02 Part 3.02	Waste Characterization Sampling	PCBs, ignitability, corrosiveness, reactivity, TCLP metals, TCL VOCs, TCL SVOCs, pesticides, herbicides	X					X			Soil: One five-point composite sample will be collected per 500 cubic yards of soil excavated. Concrete: One discrete grab sample will be collected per 500 cubic yards of concrete removed using a hammer and chisel or hammer drill. Water: One discrete grab sample will be collected per 20,000 gallon storage tank of containerized decontamination water.
N/A	03 30 00 Part 1.03	Cast-in-place Concrete Sampling and Testing	- Slump by ASTM C 143-12 - Air content by ASTM C 138-13a, ASTM C 173-12, or ASTM C 231 - Temperature by ASTM C 1064-12 - Density and yield by ASTM C 138-13a - Compressive strength by ASTM C 39-12a		X			X				To be performed at a frequency of one set of tests per 50 cubic yards of concrete, or one day's production, whichever is less
N/A	03 30 00 Part 1.03	Cast-in-place Concrete Sampling and Testing	Chloride content	X					X			To be performed at a frequency of one test per 50 cubic yards of concrete, or one day's production, whichever is less

EXHIBIT V-1

TESTING PLAN AND LOG
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

CONTRACT NUMBER	PROJECT TITLE: Site 1 - Former Drum Marshalling Area
N62470-16-D-9004	LOCATION: NWIRP Bethpage, New York

WORK PLAN SECTION AND PARAGRAPH NUMBER	SPECIFICATION SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
				YES	NO			ON SITE	OFF SITE			
WP 6.1	31 10 00 Part 3.06	Compost Quality Control Testing	UCC TMECC 02.02-B UCC TMECC 03.08-A UCC TMECC 05.07-A Moisture Content	X					X			Testing frequency shall be one sample per 2,000 cubic yards of compost material.
WP 6.8	31 23 00 Part 3.01	Fill Material Density Tests	ASTM D 6938 ASTM D 2937		X			X				- Perform an ASTM D 2937 density test at the start of the job, and for every five-acre area on which common fill is placed. - Fill placement: Three tests for every 20,000 square feet per lift. - Lift thickness shall be measured in each lift
WP 6.8	31 23 00 Part ##	Compaction	ASTM D 698		X			X				Moisture condition soil as required; spread soil in 8-inch maximum loose lifts
WP 6.10	32 12 16 Part 3.04	Site Restoration	ASTM D 2950 - Density of Bituminous Concrete in Place by Nuclear Methods		X			X				One ASTM D 2950 Nuclear Method test shall be performed on each 1,000 square feet of binder course and each 1,000 square feet of surface course placed.

EXHIBIT VII-1

REWORK ITEMS LIST
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

Contract No. N62470-16-D-9004

Site 1 - Former Drum Marshalling Area

Location: NWIRP Bethpage, New York

NUMBER	DATE IDENTIFIED	DESCRIPTION	CONTRACT REQUIREMENT (Spec. Section and Par. No., Drawing No. and Detail No., etc.)	ACTION TAKEN BY QC MANAGER	RESOLUTION	DATE COMPLETED

EXHIBIT IX-1

QUALITY CONTROL INSPECTION PLAN
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

Specification/ Work Plan Section	Definable Feature of Work	Subtasks	Quality Objectives to be Verified	Control Check Verification					
				Date	Preparatory Phase Checklist/Report No.	Date	Initial Phase Checklist/Report No.		Follow-up Phase Checklist/Report No.
01 50 00 Part 1.03 WP 5.3	Mobilization	Mobilization	*Verify movement of equipment, materials, and field personnel to the project site.						
			*Orientation and training of field personnel.						
01 50 00 WP 5.4	Site Preparation	Preconstruction Survey	*Verify surveyor is licensed in the state of New York.						
			*Verify preconstruction survey defines existing site conditions.						
		Temporary Construction Facilities	*Verify temporary facilities located as agreed upon at pre-construction meeting.						
		Site Security / Exclusion Zones	*Site perimeter established using high-visibility and/or chain link fencing with required signage.						
			*Inspect regularly and repair as necessary.						
		Equipment Decontamination Area	*Verify the equipment decontamination area is installed IAW the HASP.						
		Utility Survey	*Submit application for excavation permit to FEAD representative.						
			*Verify completion of utility survey and markout.						
			*Submit utility survey to FEAD representative.						
			*Verify locations of the utilities; ensure underground utilities that will be impacted by soil removal are protected.						
		Material Handling and Storage Areas	*Inspect construction of excavated materials stockpile area.						
			*Ensure staged soil is covered.						
		Clean Fill Verification Sampling	*Sample clean fill and topsoil IAW Exhibit V-1.						
		Photographic Documentation	*Ensure photographs are taken during each feature of work.						
			*Sort electronic photographs and maintain project photo log.						

EXHIBIT IX-1

QUALITY CONTROL INSPECTION PLAN
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

Specification/ Work Plan Section	Definable Feature of Work	Subtasks	Quality Objectives to be Verified	Control Check Verification					
				Date	Preparatory Phase Checklist/Report No.	Date	Initial Phase Checklist/Report No.		Follow-up Phase Checklist/Report No.
01 50 00 WP 5.4 (cont.)	Site Preparation (cont.)	Permits	*Verify hot work permit obtained prior to performing any hot work.						
			*Verify street opening permit, partial street closure permit, and weight permit are obtained prior to implementing the site traffic control plan.						
WP 5.4.5	Utility Relocation	Utility Relocation	*Coordinate with utility providers to relocate utilities within excavation area and minimize impact to nearby businesses.						
31 10 00 WP 6.1	Site Clearing	Clearing Activities	*Verify trees and vegetation have been removed to an adequate distance to allow for safe equipment movement within and around the excavation area.						
10 88 00 WP 5.4.2.3	Truck Scale Operation	Truck Scale Operation	*Verify truck scale is installed and operated IAW Project Specifications.						
31 41 16 WP 6.3	Installation of Sheet Piling	Installation of Sheet Piling	*Verify sheet piles are installed in accordance with the approved Sheet Piling Installation Plan.						
01 57 13 31 35 20 31 37 00 WP 5.4.4	Erosion Control	Erosion and Sediment Control Measures	*Verify E&S controls are installed IAW the ESCP.						
32 17 20 Traffic Control Plan	Work Zone Traffic Control	Site Traffic Control	*Establish defined routes for material handling and movement around the site IAW the Traffic Control Plan.						
			*Where necessary, spotters used to guide heavy equipment and vehicles transporting materials in tight work areas.						
31 23 00 44 11 23 WP 6.4	Excavation	Contaminated Soil Removal	*Verify excavation area location and layout.						
			*Verify excavation extents and depths are achieved via field measurements.						
			*Verify dust control measures are implemented as necessary during excavation activities.						
			*Ensure excavation is benched in order to maintain a cut slope of less than or equal to 2:1.						

EXHIBIT IX-1

QUALITY CONTROL INSPECTION PLAN
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

Specification/ Work Plan Section	Definable Feature of Work	Subtasks	Quality Objectives to be Verified	Control Check Verification					
				Date	Preparatory Phase Checklist/Report No.	Date	Initial Phase Checklist/Report No.		Follow-up Phase Checklist/Report No.
31 23 00 44 11 23 WP 6.4 (cont.)	Excavation (cont.)	Excavated Material Staging	*Ensure roads are kept clear of loose dirt and debris.						
31 30 00 WP 6.5	Installation of Geosynthetic Clay Liner	Installation of Geosynthetic Clay Liner	*Verify installation of geosynthetic clay liner IAW Project Specifications.						
31 23 00 WP 6.8	Backfilling	Fill Material	*Verify all fill material sources have been approved.						
		Common Fill	*Verify excavation is backfilled to within 6 inches of final grade.						
		Topsoil	*Ensure placement of 6-inch top soil layer to support vegetative growth.						
02 81 02 Part 3.02 WP 6.6	Waste Characterization Sampling	Waste Characterization Sampling	*Sample excavated soil IAW Exhibit V-1.						
02 81 02 WP 6.7	Transportation and Disposal	Soil Disposal	*Verify acceptance of disposal facilities.						
		Concrete, Asphalt and Metal Recycling	*Verify acceptance of recycling facility.						
		Water Disposal	*Verify acceptance of disposal facility.						
		Documentation	*Verify acceptance of waste profile.						
			*Confirm that waste manifests are completed accurately and accompany each load of waste.						
		Transportation	*Inspect transport vehicle prior for DOT road worthiness prior to loading and departing off site.						
			*Ensure roads are kept clear of loose dirt and debris.						
32 93 43 32 92 19 WP 6.9.2	Tree Planting	Tree Planting	*Verify replacement of removed trees with similar native species and quantity.						
		Seeding	*Ensure all disturbed areas are stabilized with native grass seed.						
32 31 13 WP 6.9.3	Site Fencing	Site Fencing	*Verify the site is enclosed in chain link fence and gate IAW Project Specifications.						
01 77 00 WP 6.9.5	Haul Road Restoration	Haul Road Restoration	*Ensure that the haul road connecting to Aerospace Boulevard is restored to its former condition.						
32 12 16 32 15 00 WP 6.9	Bituminous Concrete Pavement and Aggregate Surfacing	Bituminous Concrete Pavement and Aggregate Surfacing	*Verify concrete and aggregate material properties are IAW Project Specifications.						
			*Ensure paved areas are restored IAW Project Specifications.						
02 01 51 WP 6.10	Post Construction Maintenance	Bi-Annual Mowing	*Ensure the site is mowed twice during the first year, in April and October.						

EXHIBIT IX-1

QUALITY CONTROL INSPECTION PLAN APTIM Federal Services LLC Site 1 - Former Drum Marshalling Area NWIRP Bethpage Contract Task Order No. N4008518F6147									
Specification/ Work Plan Section	Definable Feature of Work	Subtasks	Quality Objectives to be Verified	Control Check Verification					
				Date	Preparatory Phase Checklist/Report No.	Date	Initial Phase Checklist/Report No.		Follow-up Phase Checklist/Report No.
02 01 51 WP 6.10 (cont.)	Post Construction Maintenance (cont.)	Monthly Inspections (Year 1)	*Ensure monthly inspections are conducted during the first year of O&M.						
		Quarterly Inspections (Year 2)	*Ensure quarterly inspections are conducted between months 13 and 30 of O&M.						
		Rain Inspections	*Ensure the site is inspected following each rainfall event that meets or exceeds 0.5 inches over a 24-hour period.						
		Fence Maintenance	*Ensure fences are repaired to maintain the standards in Project Specifications.						
		E&S Maintenance	*Ensure E&S controls are maintained IAW Project Specifications.						
		Soil/Vegetation Repair	*Ensure soil and vegetation is maintained IAW the Site Restoration Plan.						
01 77 00 WP 6.11	Demobilization	Demobilize Personnel and Equipment	*Verify approval to remove E&S controls.						
			*Ensure removal of all E&S controls.						
			*Verify proper equipment decontamination.						
			*Verify completion of site cleanup, removal of temporary facilities, materials, debris, and equipment off site.						
			*Final Inspection and acceptance of final site conditions.						

EXHIBIT X-1

PERSONNEL MATRIX APTIM Federal Services LLC Site 1 - Former Drum Marshalling Area NWIRP Bethpage Contract Task Order No. N4008518F6147			
SPECIFICATION SECTION	SUBMITTALS TO BE REVIEWED BY:	THREE PHASE TO BE PERFORMED BY:	TESTING TO BE VERIFIED BY:
All Sections	Project QC Manager (1), QC Program Manager, Project Manager, RPM, or FEAD	Project QC Manager	Project QC Manager

(1) Note: Submittals requiring Government approval - Site QC Manager shall perform the initial review and certification.
Submittals requiring Contractor approval - Site QC Manager shall perform the final review and approval.

Appendix D
Environmental Protection Plan

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DRAFT FINAL
ENVIRONMENTAL PROTECTION PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004

Contract Task Order: N4008518F6147F6147

Document Control Number: APTIM-9004-F6147-0006

January 2019

Submitted to:

NAVFAC Mid-Atlantic
Gilbert Street, Building N26
Norfolk, VA 23511

Submitted by:
Aptim Federal Services, LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

DRAFT FINAL
ENVIRONMENTAL PROTECTION PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004

Contract Task Order: N4008518F6147

Document Control Number: APTIM-9004-F6147-0006

January 2019

Prepared by:_____ Date: _____
Arianne Reyes, E.I.T.
Engineer

Approved by:_____ Date: _____
William L. Deane, Jr., P.E.
Program Manager

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Acronyms and Abbreviations

APP	Accident Prevention Plan
APTIM	Aptim Federal Services, LLC
CM	Construction Manager
COR	Contracting Officer's Representative
EPP	Environmental Protection Plan
NWIRP	Naval Weapons Industrial Reserve Plant
OU	Operable Unit
QC	Quality Control
RAM	Real-time air monitor
ROD	Record of Decision
SDS	Safety Data Sheet
SSHO	Site Safety and Health Officer
SWPPP	Storm Water Pollution Prevention Plan
USEPA	U.S. Environmental Protection Agency

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1.0 Introduction

This Environmental Protection Plan (EPP) presents the environmental protection and pollution measures undertaken by Aptim Federal Services, LLC (APTIM) and its subcontractors while performing the remedial action. All work will be conducted in accordance with the Operable Unit (OU) 4 Record of Decision (ROD) (Navy, 2018) under Contract Task Order F6147, Contract Number N62470-16-D-9004.

APTIM will implement procedures and supply materials necessary for environmental protection for activities associated with the removal activities at Site 1. Principal concerns include small spills (e.g. fuel spills) and erosion and sediment controls. Additional information may be found in the *Accident Prevention Plan (APP) for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k (APTIM, 2018a) and the *Storm Water Pollution Prevention (SWPPP) Plan for Site 1 - Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k (APTIM, 2018c).

1.1 Project Summary Scope of Work

The objective of the remedial action is to address polychlorinated biphenyl contaminated soils located at depths varying from two-feet to 30-feet below ground surface. This work will consist of utility relocation, excavation, and installation of a reduced permeability cover. The cover will reduce leaching of contaminants from unsaturated soil to groundwater.

This work will be performed in compliance with federal, state, and local regulations as they pertain to the environment. The work plan was developed in accordance with the OU 4 ROD (Navy, 2018) and the *Specifications for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New York* (Tetra Tech, 2018).

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2.0 Project Personnel

All on-site personnel will be briefed by the Construction Manager (CM), Project Quality Control (QC) Manager, or designated personnel on the details of the EPP prior to commencing construction activities. APTIM and its subcontractors will attend initial training for all site personnel in the operating and maintenance of equipment to prevent the discharge or spill of fuels, oils, lubricants, or other hazardous materials. Additionally, control measures for the management of excavated soil will be addressed. The following personnel are responsible for providing EPP training:

- CM
- Project QC Manager

In the event that either the CM or Project QC Manager cannot provide EPP training, either manager can designate an approved alternate trainer.

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3.0 Site Corrective Action

Should any of the preceding provisions not satisfy contractual standards (established in the OU4 ROD (Navy, 2018); prompt action will be taken to correct the situation upon receipt of notification from the Contracting Officer's Representative (COR) or from the APTIM CM. Corrective measures will be proposed in writing to the COR for review and approval prior to being implemented.

Situations requiring immediate corrective action will be discussed with the COR and implemented as soon as possible. Written documentation of the action will be submitted to the COR within 24-hours of implementing the action.

Deficiencies identified for corrective action shall be noted on AMS-710-05-FM-01601, "HSE Corrective Action Tracking Register", which will include the following:

- Date deficiency/finding is identified
- Description of deficiency/finding
- Identification if deficiency/finding is an imminent hazard
- Corrective action plan
- Name of person responsible for action to correct deficiency
- Targeted corrective action date
- Date deficiency/finding corrective action completed
- Name of person approving the corrective action

The identified deficiencies with recommended corrective actions shall be conveyed to the responsible party (APTIM or subcontractor) for appropriate mitigation. All imminent hazard deficiencies/findings found during inspections shall be immediately corrected. All deficiencies and corrective actions must be noted on the Corrective Action Tracking Register, even if the deficiency was corrected immediately. It is the CM's and project manager's responsibility to ensure all deficiencies found during inspections are corrected in a timely manner.

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4.0 Storm Water Management and Erosion Control

All project work is anticipated to be performed in, or immediately adjacent to, well-developed areas. Construction runoff shall be controlled in such a manner to prevent significant migration from the site using a rock construction entrance, temporary seeding and mulch, storm drain inlet protection, and compost filter sock. Details, locations, and best management practices of specific erosion control features are identified in the Erosion and Sediment Control Plan of the SWPPP (APTIM, 2018c).

Except for designated work areas, the site will be preserved in its original condition. Temporary equipment and material storage areas will be identified and approved by the facility and the COR. Excavation activities will be conducted in a manner that minimizes environmental impact and protects the surrounding areas from being disturbed. Precautions to be taken to minimize impact will include, but are not limited to, the following:

- All heavy equipment and vehicle operations will be limited to designated roadways and predetermined routes.
- Debris from work activities will be collected daily.
- Proper guidance will be provided to heavy equipment operators to minimize impact to designated work areas. Equipment will be maintained such that dirt and debris will not be excessively spread onto roadways. An exclusion zone for equipment, vehicle, and personnel dry decontamination will be designated on the temporary haul road entering/exiting the removal area.

During excavation activities:

- Excavated soils will be placed in designated materials handling areas constructed as described in Section 5.4.7.
- The stockpile and equipment laydown area will be covered daily to prevent erosion of the stockpile and will control fugitive dust emissions or soil drift.

Additional erosion and sediment controls for Site 1 can be found in the SWPPP (APTIM, 2018c).

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5.0 Contamination Prevention Plan

All reporting requirements established for hazardous chemicals in accordance with the Emergency Planning and Community Right-to-Know Act regulation (U.S. Environmental Protection Agency [USEPA], 1998), and also known as Title III of the Superfund Amendments and Reauthorization Act of 1986, will be followed at the project site. Safety Data Sheets (SDS) of any hazardous chemicals used for this project, if any, meeting the Emergency Planning and Community Right-to-Know Act requirements, will be filed in APTIM's site trailer and will be updated regularly on-site. SDS's will include the following:

- Trade and/or chemical name
- Chemical abstract service number
- Classification
- Reportable quantity
- Maximum volume at the project site
- Average daily volume at the project site
- Total volume throughout the project

Hazardous substances will be stored in accordance with applicable regulations in an area approved by the Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage representative. NWIRP Bethpage representatives will be notified of expected use of any extremely hazardous substances. SDS's will be maintained on-site at all times for each material in accordance with Engineering Manual 385-1-1 (U.S. Army Corps of Engineers, 2014).

Employees will be trained to work safely with hazardous chemicals. Employee training will include the following:

- Methods that may be used to detect a release of a hazardous chemical in the workplace
- Physical and health hazards associated with chemicals
- Protective measures to be taken
- Safe work practices, emergency responses, and use of Personal Protective Equipment
- Information on the Hazard Communication standard including:

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- Labeling and warning system
- An explanation of SDS's

Employees working with a hazardous chemical may request a copy of the SDS. Requests for SDS's should be made to the Site Safety and Health Officer (SSHO). Any suspected or known leak or spill of these materials will be handled in accordance with Section 6.0 Spill Control, in such a manner as to prevent their introduction into the water or ground. In the event of a suspected airborne release, APTIM will monitor and measure the airborne contaminant with the appropriate air-sampling device as selected by the SSHO. Additionally, the SSHO will revise the Personal Protective Equipment required as needed. APTIM will inform bases representatives in a timely manner of a suspected or known release. All measures will be employed to contain and remove any airborne contaminant.

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6.0 Spill Control

Construction activities will be conducted in a manner to prevent fuels, oils, grease, and any other contaminated material from entering the ground or drainage areas. Absorbent material will be available for quick response to any release of fluids other than clean water.

In the event a leak occurs in these areas, absorbents will be used to prevent runoff. Ensuring that all contaminated waste is stored, handled, and transported on and off-site properly will protect water resources. Spill prevention control measures include proper equipment maintenance, and fueling of equipment in a limited area. In the event of a petroleum spill, the following procedures will be initiated.

Spill response reaction:

- Project personnel will stop the source of the spill, deactivate all applicable power sources, and/or activate all emergency stop buttons.
- Project personnel will isolate and secure the area and call the appropriate base representatives as directed by the COR.
- Absorbents will be placed to clean up all products and prevent further spread of contamination.
- All absorbent materials must contained in Department of Transportation-approved, open-top drums.
- All absorbent materials and fluids must be assumed contaminated until demonstrated otherwise.
- Drums shall be clearly marked according to contents, accumulation date, and known or suspected hazard(s). Drums shall be marked "Pending Analysis" until such time as results have been received from the laboratory. The 90-day hazardous waste accumulation area will be coordinated with the base hazardous waste manager.
- Drums shall be closed and sealed at the end of each day. Spill cleanup supplies will be maintained on site for use in an emergency.
- Drums shall be segregated into a separate, marked holding area.
- Samples of the spill residue and materials used in the spill cleanup must be collected.
- Materials shall be disposed of in accordance with USEPA requirements.

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- Copies of the sample analysis and a letter stating the disposition and location of the disposal will provided to the COR and the facility.

Additional information on spill prevention and control can be found in the APP (APTIM, 2018c).

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7.0 Air Pollution Control

The following section outlines the air pollution control measures that APTIM will implement throughout the project.

7.1 Dust Monitoring and Control

APTIM project personnel will take mitigation measures during construction and site preparation to control fugitive dust discharge as not to cause injury, detriment, or nuisance to the surrounding environment. Upwind, on-site,, downwind, and perimeter/neighborhood dust conditions will be visually monitored by the SSHO, and/or the CM. The two major contributing factors to materials becoming airborne are high wind speeds and unsecured materials. To mitigate this, APTIM will require all materials to be properly stored and disposed daily when necessary. Additionally, wind speed will be monitored continuously using a dedicated weather station at the field trailer and with hand-held wind meters in the field. Field operations will be evaluated if wind exceeds 25-miles per hour. Due to the hazardous nature of the contaminants and concentrations on-site, one 4,000-gallon capacity water truck will be used for dust suppression. Care shall be taken during water application to avoid over-saturation of materials and generation of runoff.

Air monitoring of dust will be conducted in accordance with the Site Safety and Health Plan, found in Appendix B of the APP (APTIM, 2018a). Real-time aerosol monitors (RAMs) will be used to measure particulate matter (dust) concentrations in air, and all direct readings will be documented on AMS-710-01-FM-00101, "Air Monitoring Data Sheet" (APP Appendix F [APTIM, 2018a]). RAMs will be zeroed as required, prepared for operation, operated, and maintained each day as recommended by the manufacturer and according to AMS-710-02-PR-02600, "Safety Instrument Calibration." The instrument check data shall be recorded in the AMS-710-02-FM-02602, "Safety Instrument Calibration Report" (APP Appendix F [APTIM, 2018a]). RAMs registering dust concentrations at or above 1.0 milligrams per cubic meter at the site perimeter locations and in areas where personnel are working require that additional dust suppression measures be immediately instituted. Indirect air sampling (time-integrated) personal and area air sampling will also be conducted to verify direct-reading instrumentation results and to determine compliance with federal regulations. Air monitoring will be measured upwind, on-site, and downwind, as well as at the perimeter to monitor any migration of dust off-site.

If it is determined that water dust control methods are insufficient, APTIM will stop work immediately and additional dust control alternatives will be evaluated, including tackifying

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applications such as Gorilla Snot. Refer to the Site Safety and Health Plan (APP Appendix B [APTIM, 2018a]), for more detailed information on air monitoring and dust control.

7.2 Emission Monitoring and Control

Heavy equipment exhaust will have the potential to produce visible emissions. The use of appropriate grades of diesel fuel and lubricated oil in heavy equipment will be implemented to reduce visible emissions.

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8.0 Noise Control

Due to the proximity of the site to developed neighborhoods, levels of noise from the project will be mitigated. Noise levels will be managed by utilizing appropriate noise control on equipment and by complying with required work hour restrictions, proposed to be 0700 – 1700 daily. Vehicles and equipment to be used on-site will have appropriate noise reduction and protection devices that conform the Occupational Safety and Health Administration standard to include 29 Code of Federal Regulations 1926.52, and other applicable local noise ordnance requirements.

The SSHO or designee(s) shall conduct site perimeter noise level surveys with a sound level meter and personal noise dosimetry with noise dosimeters as required by AMS-710-01-PR-00100, "Industrial Hygiene Sampling Methods" (APP Appendix G [APTIM, 2018a]). Noise levels shall not exceed 85 decibels at any site boundary. The required noise controls and hearing conservation procedures are specified in Section 10.1.1 and AMS-710-01-PR-00900, "Noise Control and Hearing Conservation" (APP Appendix G [APTIM, 2018a]). The SSHO is responsible for maintaining all noise monitoring records.

For work performed near the property boundary or near inhabited areas, APTIM will consider additional noise mitigation measures if warranted by off-site property uses. Noise mitigation measures shall include, but shall not be limited to, utilizing noise control devices, limiting night work hours for noisy activities, and scheduling and controlling traffic. APTIM will coordinate with Naval Facilities Engineering Command to revise work procedures and hours as needed to address noise complaints, if received.

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9.0 Emergency and Decontamination Equipment

The following sections describe decontamination procedures, temporary measures, and best management practices that will be implemented at the site.

9.1 Small-Scale Emergency Equipment

Small scale emergency equipment used on site will include the following equipment:

- First aid kit
- Bloodborne pathogen infection control kit
- 15-minute emergency eyewash station meeting American National Standards Institute/International Safety Equipment Association Z358.1-2009, Emergency Eyewash and Shower Equipment, specifications that is capable of delivering at least 0.4 gallons per minute of water available in the work area when there is potential for eye contact with hazardous chemicals
- Emergency shower meeting American National Standards Institute/International Safety Equipment Association Z358.1-2009, Emergency Eyewash and Shower Equipment, specifications available in the work area when there is potential for skin contact with corrosive or acutely toxic chemicals
- Emergency contact list with important telephone numbers (Table 4 of APP [APTIM, 2018a])
- Cellular telephones for emergency communications carried by all safety personnel, supervisory personnel, and at least one person in each work crew
- Spill control equipment, including:
    - Absorbent pads
    - Granular absorbent material (noncombustible)
    - Polyethylene sheeting
    - Shovels and assorted hand tools

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    - Five-gallon buckets

- Fire extinguisher with a minimum rating of 4-A:60-B:C in all active work areas, vehicles, and fueling areas

- Decontamination equipment

This equipment will be identified to, and available to, all onsite workers.

9.2 Large-Scale Emergency Equipment

Large-scale emergency equipment will be utilized only if such size and/or power are necessary.

9.3 Decontamination of Equipment

Equipment necessary for decontamination activities will be provided, installed, and verified in working order prior to site operations. Equipment in the decontamination area includes items such as brushes and waste containers, power washers, and/or equipment suitable for dry decontamination procedures.

The decontamination area will be used to remove site materials such as dirt and mud from vehicles prior to accessing a public roadway. Equipment contacting known or suspected contaminant-impacted material shall be decontaminated at the work area prior to relocation to the support zone.

A list of decontamination equipment and supplies can be found in Table 1 of the APP (APTIM, 2018a).

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10.0 Equipment Maintenance

Construction equipment will be properly maintained to ensure safe operation. All equipment will be regularly inspected and maintained (and documented in the inspection/maintenance log) in such manner as to minimize spillage or leakage which may occur during on site use or transportation.

Before any machinery or mechanized equipment is placed in use, it shall be inspected and tested in accordance with the manufacturer's recommendations and shall be certified in writing by a competent person to meet the manufacturer's recommendations. Subsequent re-inspections will be conducted at least annually thereafter. These inspections shall be documented on the "USACE Safety Inspection Checklist for Construction Equipment" (APP Appendix F [APTIM, 2018a]). All safety deficiencies noted during the inspection shall be corrected prior to the equipment being placed in service at the project. If at any time the machinery or mechanized equipment is removed and subsequently returned to the project (other than equipment removed for routine off-site operations as part of the project), it shall be re-inspected and recertified prior to use.

All heavy equipment shall be inspected by each operator prior to use on the project and shall then be inspected on a daily basis. Daily inspections shall be documented on AMS-710-02-FM-05701, "Mechanized and Marine Equipment Inspection Report" (APP Appendix F [APTIM, 2018a]). Deficiencies in the equipment shall be noted on the form. All inspection documentation shall be submitted to the SSHO prior to using the equipment if safety deficiencies are observed and at the end of the day if no safety deficiencies are observed.

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11.0 Housekeeping

APTIM employs housekeeping policies in which neat and orderly storage of materials, proper truck and tank placards, prompt removal of spillage, refuse pickup and disposal, maintenance of roads and surfaces, and provisions for the storage of material. A daily departure inspection will be performed by the Site Superintendent/CM.

Small spills may include solid or liquid materials being mishandled, dumped, leaked, knocked over, etc. Any material spillage, except for excavation material within the limits of excavation or storage, will immediately be contained and collected for disposal. Spills will be reported to the Navy Remedial Project Manager as necessary. Excavation will be performed such that source materials within the excavation or staging areas will be contained within appropriate staging areas or the excavation itself during construction activities, and covered at the end of each work day and secured. Any spilled liquids will be contained and collected by absorbent materials. Spilled fuel and impacted soil will be collected and staged for disposal.

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12.0 Waste Handling

Any transportation and disposal activities will be performed in accordance with local, state, and federal regulations as well as Navy contract requirements. Additional waste management procedures are discussed in the Waste Management Plan provided as an appendix to the *Remedial Action Work Plan for Site 1 – Former Drum Marshalling Area, Naval Industrial Reserve Plant Bethpage, Bethpage, New York* (APTIM, 2018b).

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13.0 References

APTIM, 2018a. *Accident Prevention Plan for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k, (draft) August.

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APTIM, 2018c. *Storm Water Pollution Prevention Plan for Site 1 - Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k, (draft) August.

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U.S. Army Corps of Engineers, 2014. Safety and Health Requirements Manual Engineering Manual 385-1-1.

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Appendix E
Waste Management Plan

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DRAFT FINAL
WASTE MANAGEMENT PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004
Contract Task Order: N4008518F6147

Document Control Number: APTIM-9004-F6147-010

January 2019

Submitted to:

NAVFAC Mid-Atlantic
Gilbert Street, Building N26
Norfolk, VA 23511

Submitted by:
Aptim Federal Services LLC
150 Bush Street, Suite 701
Norfolk, Virginia 23510

DRAFT FINAL
WASTE MANAGEMENT PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004
Contract Task Order: N4008518F6147

Document Control Number: APTIM-9004-F6147-010

January 2019

Prepared by:_____ Date: _____
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Program Manager

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List of Attachments

Attachment A AMS-710-04-WI-00305 Hazardous Waste Decontamination

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Acronyms and Abbreviations

AOC	Area of Concern
APTIM	Aptim Federal Services, LLC
CFR	Code of Federal Regulations
COC	Contaminants of Concern
ft.	feet
IDW	Investigation Derived Waste
NAVFAC	Naval Facilities and Engineering Command
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
OU	Operable Unit
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
ppm	parts per million
PWS	Performance Work Statement
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SVOC	Semi-Volatile Organic Compound
TAGM	Technical and Administrative Guidance Memorandum
TCL	Target Compound List
TSCA	Toxic Substances Control Act
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WMP	Waste Management Plan

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1.0 Introduction

This Waste Management Plan (WMP) describes the approach undertaken by Aptim Federal Services, LLC (APTIM) and its subcontractors while performing the remedial action. The remedial action is being performed for the U.S. Department of the Navy (Navy) Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, under Contract No. N62470-16-D-9004, Contract Task Order N4008518F6147. This work is being performed under the Navy Environmental Restoration Program.

This work will be executed to fulfill the requirements outlined in the Operable Unit (OU) 4 Record of Decision (ROD) (Navy, 2018) by completion of the remedial action in accordance with the Final Basis of Design (Tetra Tech, 2018a), the Comprehensive Environmental Response, Compensation and Liability Act, and the National Oil and Hazardous Substances Pollution Contingency Plan.

1.1 Project Summary Scope of Work

The objective of the remedial action is to address polychlorinated biphenyl (PCB)-contaminated soils located at depths varying from two- to 30-feet (ft.) below ground surface. This work will consist of utility relocation, excavation, and installation of a reduced permeability cover. The cover will reduce leaching of contaminants from unsaturated soil to groundwater. This work will be performed in compliance with federal, state, and local regulations as they pertain to the environment. The Remedial Action Work Plan (APTIM, 2018b) was developed in accordance with the PWS (NAVFAC, 2018) and the *Specifications for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage, New York* (Tetra Tech, 2018b).

The objective of the WMP is to document the contractual, legal, and risk-management requirements in the generation, storage, sampling and analysis, waste typing, transportation, treatment, and ultimate disposal of all waste for the task order. Additionally, the WMP is intended to assure that waste generated in the course of the fieldwork is safely managed and disposed of in accordance with all applicable laws and regulations.

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2.0 Site Conditions and Background

This section presents a general description of the site, the history, topography and site features, climate, geology, hydrogeology, hydrology, and contaminants of concern (COCs).

2.1 Site Location

The former NWIRP Bethpage is located in east-central Nassau County, Long Island, New York, approximately 30-miles east of New York City. NWIRP Bethpage is bordered on the north, west, and south by property owned, or formerly owned, by Northrop Grumman that covered approximately 500-acres, and, on the east, by a residential neighborhood.

Site 1 is situated along the eastern boundary of the former NWIRP Bethpage and is a relatively flat area with a four-foot vegetated windrow located along the eastern end of the site and is mounded on the north by a partially buried abandoned sanitary settling tank.

The site is enclosed by a facility perimeter fence along the north, east, and south and an interior facility fence along the west. The interior fence was installed in 1998 as an interim measure to restrict facility personnel from areas with residual soil contamination. The area bounded by this fence is lightly vegetated and includes Area of Concern (AOC) 23 Former Above Ground Storage Tanks; AOC 30 Unidentified Storage Sheds; and AOC 35 Former Sludge Drying Bed. The AOC 35 drying beds were closed and backfilled in 1980. The remainder of Site 1 is covered with concrete or gravel. Dry Wells 20-08 and 34-07 are located outside of the fenced area, but are underneath the interim soil cover that was placed over PCB contaminated soil in 1993.

The land surrounding the 9-acre Bethpage facility in all directions is primarily industrial and residential. Operations at the Site 1 are currently limited to environmental investigations, control of vegetation and fence repair. Security is provided by Steel Equities.

2.2 Site Description and History

The former NWIRP Bethpage was located adjacent to the Grumman facility, and was operated by Grumman and later Northrop Grumman from 1942 to the mid-1990s. The plant's primary mission was the research prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. In 1996, operations ended at the facility. At that time, the NWIRP was approximately 109.5-acres in size. In 2002, 4.5-acres of the property were transferred to Nassau County. In February 2008, the Navy transferred an additional 96-acres of the remaining 105-acre main parcel to Nassau County. The remaining 9-acre parcel is being retained by the Navy for environmental investigation and remediation.

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From the early 1950's to 1978, drums containing liquid wastes were stored on a cinder covered area over a cesspool leach field. This leach field may have been used to discharge process wastewater. In 1978, the drum storage area was moved a few yards to the south to a 100- by 100-foot concrete pad. In 1982, the drum storage area was moved to its present location at Site 3. Transformers and PCB-filled autoclaves were also stored at the site. The waste drums reportedly contained chlorinated and non-chlorinated solvents, and liquid cadmium and chromium wastes. In addition, underlying most of Site 1 are approximately 120 abandoned cesspools that were designed to discharge sanitary wastewaters from Plant No. 3 that were in use from the early 1950s to 1978. These cesspools were approximately 10-inches in diameter and 16-ft. deep. Based on field observations, the cesspools are currently filled with soil between 1978 and 1986. It is possible that non-sanitary wastes may have been discharged into this system. The drum marshalling areas and the leach field were the initial extent of Site 1.

The site was originally identified and investigated as part of the facility-wide investigations. A ROD for Site 1 soil was signed in 1995 to address PCB- and volatile organic compound (VOC) - contaminated soil (NYSDEC, 1995). Residual soil contamination noted in the ROD consists of metals, VOC, polynuclear aromatic hydrocarbon (PAH), and PCBs at concentrations greater than protective levels listed in Technical and Administrative Guidance Memorandum (TAGM) 4046. Levels of these constituents also exceed the New York State Department of Environmental Conservation (NYSDEC) Part 375 Soil Cleanup Objectives, an Applicable or Relevant Appropriate Requirements promulgated in 2006. Groundwater contamination above the TAGM 4046 and Part 375 NYSDEC Cleanup Objectives consisting of metals, VOCs and PAHs was also noted in the ROD.

In June/July 2009, buildings, tanks, and concrete aprons within the fenced portion of Site 1 were demolished and disposed/recycled offsite.

In 2012, at the request of the property leases to allow additional parking for facility tenants and with concurrence from NYSDEC, the southern section of the Site 1 interior facility fence was moved to the north approximately 100-ft. and the western section of the fence was moved to the east approximately 30-ft. This new access area was covered with gravel and asphalt in accordance with the OU 1 ROD. In April 2012, the current property owner, Steel Equities, uncovered two intact Underground Storage Tanks (USTs) that were found to contain residual solvent material. The USTs and contents were removed in September 2012 and post-removal soil samples were collected. As of 2013, the area within the interior facility fence is lightly vegetated soil.

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2.3 Contaminants of Concern

COCs identified in the 2018 OU 4 ROD (Navy, 2018). The ROD specifically addresses the following:

- PCBs, VOCs, semi-volatile organic compounds (SVOCs), metals (arsenic, chromium, and hexavalent chromium), and pesticides in soils from ground surface to 65-ft. below ground surface (bgs);
- Residual PCB-contaminated soil associated with Dry Wells 20-08 and 34-07, which were added to Site 1 because of proximity and similarity in COC, concentrations, and depth;
- PCB- and metal (total chromium and hexavalent chromium)-contaminated on-NWIRP groundwater associated with Site 1, which was not addressed in the 1995 OU 1 ROD or the 2003 OU 2 ROD;
- VOCs in Site 1 soil vapor that could result in vapor intrusion. The 1995 ROD did not address soil vapor intrusion as a pathway.

These contaminated media represent potential threats to human health through ingestion, dermal contact, and dust inhalation of contaminated soils; inhalation of soil vapor; and inhalation of volatiles and ingestion of groundwater.

However, based on previous investigations detailed in the 2018 ROD, there are no cleanup goals for this remedial action. This selected remedy will address contaminated soils only and focuses on PCBs because these compounds are present throughout much of Site 1, representing the majority of COC mass, are persistent in the environment, and are detected in groundwater. The COCs will be fully addressed upon the completion of excavation and installation of the geosynthetic clay liner.

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3.0 Anticipated Waste Streams

Several potential waste streams are anticipated to be generated during site activities. Wastes are anticipated to include, but are not limited to, the following:

- SVOC-, PCB-, pesticide-, inorganic constituent- impacted soil and sediment, including organic matter and debris;
- Water/rinsate collected from decontamination procedures;
- Investigation Derived Waste (IDW);
- Secondary refuse (office trash, personal protective equipment [PPE], etc.).

Excavated waste will be managed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 area of contamination policy as described in the 1996 policy memorandum (U.S. Environmental Protection Agency [USEPA], 1996). Waste disposal procedures implemented for the remedial action will be in accordance with the state and federal laws and regulations that govern offsite disposal, as well as NAVFAC and NWIRP Bethpage contract requirements.

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4.0 Waste Management Requirements

Contaminated soil and debris will be contained in stockpiles. In the event that hazardous waste is generated, it will be segregated from non-hazardous wastes. Additionally, incompatible wastes (e.g., flammable and corrosive wastes) will be segregated. Wastes of the same matrix, contamination, and the same source may be aggregated to facilitate storage and disposal. Wastes will be accumulated within the material storage area. Waste accumulation areas will contain appropriate emergency response equipment. The Accident Prevention Plan identifies the specific emergency response procedures and equipment (APTIM, 2018a). Hazardous waste accumulation areas will include fire extinguishers (in areas where wastes are known or suspected to be flammable or ignitable), decontamination equipment, and an alarm system (if radio equipment is not available to all staff working in accumulation area). Spill control equipment (e.g., sorbent pads) will be available in the waste accumulation areas, and where liquids are transferred from one vessel to another.

4.1 Regulatory Requirements

All wastes generated from the remediation action will be managed in accordance with all applicable federal, state, and local regulations. Wastes generated during project activities will be managed in accordance with New York Hazardous Waste Regulations, USEPA Resource Conservation and Recovery Act (RCRA) regulations (40 Code of Federal Regulations [CFR] 261-268), and PCB regulations (40 CFR 761).

4.2 Waste Characterization

Wastes will be characterized prior to transportation and disposal off-site. Prior to off-site disposal, composite samples will be collected for solid waste materials for waste characterization. The samples will be analyzed by an approved, certified analytical laboratory for the following parameters:

- PCBs
- Ignitability, corrosivity, reactivity
- Toxicity Characteristics Leaching Procedure Metals
- Target Compound List (TCL) VOCs
- TCL SVOCs
- Pesticides
- Herbicides

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Additional analytes will be added if site conditions indicate their necessity or as directed by the contracting officer. Samples will be collected and analyzed in accordance with the Sampling and Analysis Plan (APTIM, 2018c).

4.3 Waste Management

On-site wastes will be managed in accordance with all federal, state, and local regulations as it pertains to each waste type.

PCB-impacted soils and IDW will be identified in the field. These waste types will be segregated and will be managed as described in section 4.3.4. Equipment that has encountered PCB-impacted soils and IDW will first be dry-decontaminated in the field prior to exiting the site using brushes, and then will be decontaminated as described in section 4.3.1.

4.3.1 Rinsate Decontamination

All vehicles and equipment utilized in the Exclusion Zone will be decontaminated in the equipment decontamination area prior to leaving the site. Site materials such as dirt and mud from vehicles will be removed via power washer prior to accessing a public roadway as discussed in the following sections.

4.3.1.1 Decontamination Materials

Adequate supplies and materials will be available on-site for decontamination activities. Decontamination materials will include the following:

- Portable steam cleaner/power washer and related equipment, if necessary
- Potable water; must be from a municipal water supplier, otherwise an analysis must be run for appropriate volatile and semi-volatile organic compounds and inorganic chemicals (e.g., TCL chemicals)
- Phosphate-free detergent, such a Liquinox
- Buckets
- Brushes
- Squirt bottles, plastic bags, and sheets
- Distilled/de-ionized organic-free water
- American Society for Testing and Materials – Type II grade water
- Methanol (or similar material)

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- U.S. Department of Transportation (USDOT) – approved portable storage tank for disposal of waste

The wastes from decontamination procedures will be managed as IDW.

4.3.1.2 Decontamination Procedures

The standard procedures for full vehicle and equipment decontamination are provided below.

- Remove any solid particles from the equipment or material by brushing and then rinsing with available water. This initial step is performed to remove gross contamination.
- Wash equipment sampler with the soap or detergent solution.
- Rinse with tap water.
- Rinse with de-ionized water.
- Rinse with methanol (or similar material).
- Repeat entire procedure or any parts of the procedure if necessary.
- Allow the equipment or materials to air dry before reusing.
- Dispose of any soiled materials in the designated disposal container.

Decontamination procedures will be performed in accordance with APTIM's Hazardous Waste Decontamination Work Instruction (Attachment A).

4.3.2 Secondary Refuse

Solid and sanitary waste will be generated in the material storage area and within the site boundary from used PPE, miscellaneous office wastes, used paper towels, and segregated wastes. Wasted will be managed in a manner to prevent its release. Spilled materials, contaminated soil and water, absorbents, and miscellaneous spill-related debris require proper handling. APTIM will properly dispose of these and any other materials associated with spill containment and cleanup.

4.3.3 Storage and Labeling

Wastes will be removed from the site as soon as possible, but will not be accumulated for more than 90-days from the date of generation (i.e., the date that a waste was first placed in container – i.e., drum, roll-off box, tank, or a stockpile outside of the area of contamination). Waste containers will be labeled in accordance with 49 CFR 172, 173, and 178. Labels will include the type of waste, location from which the waste was generated, and accumulation start date. One of the following labels will be used on containers/drums, roll-off boxes, and tanks, as appropriate:

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- "Analysis Pending" or "Waste Material" – Temporary or handwritten label until analytical results are received and reviewed. This label will include the accumulation start date.
- "Non-Hazardous Waste" – pre-printed labels with the following information:
    - Accumulation start date
    - Generator name
    - USEPA ID number
    - Waste-specific information (e.g., soil)
- "Hazardous Waste" – pre-printed labels with the following information:
    - Accumulation start date
    - Generator name
    - USEPA ID number
    - Waste codes

Containers used for waste storage will be kept closed and locked at the end of each work day to prevent waste migration or spills.

4.3.4 Inspection of Waste Storage Areas

Waste accumulation areas will be inspected at least weekly for malfunctions, deterioration, discharges, and leaks that could result in a release.

- Containers will be inspected for leaks, signs of corrosion, or signs of general deterioration.
- Stockpiles will be inspected for liner and berm integrity.

Any deficiencies observed or noted during inspection will be corrected immediately. Appropriate measures may include transfer of waste from the leaking container to a new container, replacement of liner or cover, or repair of containment berm.

Inspections will be recorded in the Daily Quality Control Report and include any deficiencies and how issue was rectified. Copies of the report will be maintained onsite, and available for review.

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If operations are suspended for more than seven days, the regulatory compliance manager will be contacted and alternate inspection arrangements will be made. Prior to demobilization, all wastes will be removed from the site.

4.3.5 Transportation and Disposal

APTIM and its subcontractors will coordinate the transportation and disposal of the contaminated materials. Waste profiles, manifests, and bills of lading will be generated and provided for the soil waste classifications and accepting facilities, as applicable. The proposed facilities for transportation and disposal of RCRA-Hazardous, Toxic Substances Control Act (TSCA)-Hazardous, and non-hazardous soils are provided below. Applicable permits and documentations for the facilities are provided in Attachment B.

Non-Hazardous Soil

WM Fairless Landfill
1000 New Ford Mill Road
Morrisville, PA 19067
Phone: (800) 963-4776
PADEP Permit #: 101699

Hazelton Creek Properties
282 South Church Street
Hazelton Creek, PA 18201
Phone: (570) 501-5050

Municipal Solid Waste Landfill
420 Quarry Road,
Morgantown, PA 19543
Phone: (717) 246-4640
EPAID#: PA0000015867

Brookhaven Landfill Gas Recovery Facility
350 Horseblock Road,
Yaphank, NY 11980
Phone: (631) 704-6099
Permit ID#: 1-4722-00799/00013

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Gloucester County Solid Waste Complex
109 Budd Boulevard
Woodbury, NJ 08096
Phone: (856) 379-7391
EPAID#: LOP100003

RCRA Hazardous Soil

US Ecology Idaho
20400 Lemley Road,
Grand View, ID 83624
Phone: (800) 274-1516
EPAID#: IDD073114654

Envirosafe Services of Ohio
876 Otter Creek Road
Oregon, OH 43616
Phone: (215) 659-2001
EPAID#: OHD045243706

TSCA Hazardous Soil (PCB > 50 parts per million [ppm])

Heritage Subtitle C Landfill
4370 West Country Road 1275 North
Roachdale, IN 46172
EPAID#: IND980503890

US Ecology Michigan Landfill
49350 North I-94 Service Drive
Belleville, MI 48111
Phone: (800) 592-5489
EPAID#: MIS048090633

Alabama Department of Environmental Management
PO Box 55
Emelle, AL 35459
Phone: (404) 402-5732
EPAID#: ALD000622464

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TSCA Hazardous Soil (PCB > 1,000 ppm)

CWM Waste Management Emelle
36964 AL Hwy 17, PO Box 55
Emelle, AL 35459
Phone: (205) 652-9721
EPAID#: ALD000622464

During transportation and disposal activities, haul trucks will be loaded with excavated material using an excavator with bucket attachment from the material storage areas. Following loading, all trucks will be inspected, decontaminated, and weighed at the truck scale prior to leaving the site. A dedicated laborer will be assigned to manage the documentation of all exported materials and ensure trucks leaving the site are free of debris. Transportation and disposal activities will be coordinated and executed in accordance with Section 02 81 02 of the Project Specifications (Tetra Tech, 2018b), USDOT, USEPA, and New York State regulations, as applicable.

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5.0 References

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Navy, 2018. *Record of Decision Operable Unit 4 Naval Weapons Industrial Reserve Plant, Bethpage, New York.*

Tetra Tech, 2018b. *Specifications for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New York,* May 25.

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Appendix A
AMS-710-04-WI-00305 Hazardous Waste Decontamination

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Appendix F
Response to Comments

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