

RESPONSE AND DEVELOPMENT WORK PLAN

AREA A: SUB-PARCEL A4-2
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

Prepared For:



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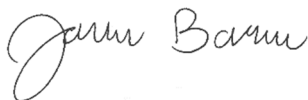
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Revision 1 – April 8, 2022

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1.0 INTRODUCTION

ARM Group LLC (ARM), on behalf of Tradepoint Atlantic, has prepared this Response and Development Work Plan (RADWP) for a portion of the Tradepoint Atlantic property that has been designated as Area A: Sub-Parcel A4-2 (the Site). Tradepoint Atlantic submitted a letter (dated March 23, 2022; **Appendix A**) requesting an expedited plan review to achieve construction deadlines for the proposed development on this Site. As shown on **Figure 1**, Sub-Parcel A4-2 consists of approximately 8.05 acres located primarily within Parcel A4, but extending slightly into Parcel A1, Parcel B6, Parcel B8, and Parcel B14 (not within the Humphreys Impoundment), of the approximately 3,100-acre former steel plant property.

As shown on **Figure 2** and **Figure 3**, Sub-Parcel A4-2 is slated for development and occupancy as a vehicle storage and laydown area. Associated water lines, stormwater lines, electric lines, and sanitary sewer lines are also proposed. The planned development activities will generally include paving, installation of utilities, and installation of a guard shack and 5,000 square foot garage. Subsequent site-use will involve truck drivers entering and leaving the Site.

The conduct of any environmental assessment and cleanup activities on the Tradepoint Atlantic property, as well as any associated development, is subject to the requirements outlined in the following agreements:

- Administrative Consent Order (ACO) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the Maryland Department of the Environment (MDE), effective September 12, 2014; and
- Settlement Agreement and Covenant Not to Sue (SA) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the United States Environmental Protection Agency (USEPA), effective November 25, 2014.

An application to enter the full Tradepoint Atlantic property (3,100 acres) into the MDE Voluntary Cleanup Program (MDE-VCP) was submitted to the MDE on June 27, 2014. The property's current and anticipated future use is Tier 3 (Industrial) and plans for the property include demolition and redevelopment over the next several years.

A portion of Sub-Parcel A4-2 is part of the acreage that was removed (Carveout Area) from inclusion in the Multimedia Consent Decree between Bethlehem Steel Corporation, the USEPA, and the MDE (effective October 8, 1997) as documented in correspondence received from USEPA on September 12, 2014. Based on this agreement, USEPA determined that no further investigation or corrective measures will be required under the terms of the Consent Decree for the Carveout Area. However, the SA reflects that the property within the Carveout Area will remain subject to the USEPA's Resource Conservation and Recovery Act (RCRA) Corrective Action authorities.

The other portion of Sub-Parcel A4-2 is part of the acreage that remains subject to the requirements of the Multimedia Consent Decree between Bethlehem Steel Corporation, the USEPA, and the MDE (effective October 8, 1997) as documented in correspondence received from the USEPA on September 12, 2014.

In consultation with the MDE, Tradepoint Atlantic affirms that it desires to accelerate the assessment, remediation, and redevelopment of certain sub-parcels within the larger site due to current market conditions. To that end, the MDE and Tradepoint Atlantic agree that the Controlled Hazardous Substance (CHS) Act (Section 7-222 of the Environment Article) and the CHS Response Plan (Code of Maryland Regulations (COMAR) 26.14.02) shall serve as the governing statutory and regulatory authority for completing the development activities on Sub-Parcel B21-1 and complement the statutory requirements of the VCP (Section 7-501 of the Environment Article). Upon submission of a RADWP and completion of any remedial activities for the sub-parcel, the MDE shall issue a No Further Action Letter (NFA) upon a recordation of an Environmental Covenant describing any necessary land use controls for the specific sub-parcel. At such time that all the sub-parcels within the larger parcel have completed remedial activities, Tradepoint Atlantic shall submit to the MDE a request for issuing a Certificate of Completion (COC) as well as all pertinent information concerning completion of remedial activities conducted on the parcel. Once the VCP has completed its review of the submitted information it shall issue a COC for the entire parcel described in Tradepoint Atlantic's VCP application.

Alternatively, Tradepoint Atlantic or other entity may elect to submit an application for a specific sub-parcel and submit it to the VCP for review and acceptance. If the application is received after the cleanup and redevelopment activities described in this RADWP are implemented and a NFA is issued by the MDE pursuant to the CHS Act, the VCP shall prepare a No Further Requirements Determination for the sub-parcel.

If Tradepoint Atlantic or other entity has not carried out cleanup and redevelopment activities described in the RADWP, the cleanup and redevelopment activities may be conducted under the oversight authority of either the VCP or the CHS Act, so long as those activities comport with this RADWP.

This RADWP provides a Site description and history; summary of environmental conditions identified by the Phase I Environmental Site Assessment (ESA); summary of relevant findings and environmental conditions identified by the relevant Phase II Investigations; a human health Screening Level Risk Assessment (SLRA) conducted for the identified conditions; and any necessary engineering and/or institutional controls to facilitate the planned development and address the impacts and potential human health exposures. These controls include work practices and applicable protocols that are submitted for approval to support the development and use of the Site. Engineering/institutional controls approved and installed for this RADWP shall be described in closure certification documentation submitted to the MDE demonstrating that exposure pathways on the Site are addressed in a manner that protects public health and the environment.

The entirety of Parcel A4 have been previously developed under the Cold Mill Building Redevelopment Work Plan (Revision 0 dated November 23, 2016; as amended by the RADWP Addendum dated November 29, 2016 and two Comment Response Letters dated November 14, 2017 and January 15, 2018). Development of Parcel A4 was completed and a Development Completion Report (Revision 1 dated September 13, 2021) and Intuitional Controls and Operations & Maintenance Plan (Revision 1 dated September 13, 2021) was submitted. Subsequently, the Supplemental Construction Plan Letter (Revision 1 dated September 24, 2021) proposed construction of a drop lot and realignment of Cold Mill Road. This RADWP will supersede the previous Parcel A4 RADWP for the portion of Parcel A4 that is within this proposed Sub-Parcel (A4-2).

The remainder of Parcel A1, Parcel B6, Parcel B8, and Parcel B14 will be addressed in separate development plans in accordance with the requirements of the ACO, which may include RADWPs, if necessary. This work will include assessments of risk and, if necessary, RADWPs to address unacceptable risks associated with future land use. As discussed below, temporary external construction worker areas with a total area of 3.75 acres will be utilized to install subgrade utility connections for the project outside of the sub-parcel. The temporary work outside of the boundary of the Site is not intended to be the basis for the issuance of a NFA or a COC, although the scope of construction is covered by this RADWP.

2.0 SITE DESCRIPTION AND HISTORY

2.1 SITE DESCRIPTION

The Sub-Parcel A4-2 development project consists of approximately 8.05 acres comprising a significant portion of Parcel A4 as well as small portions of Parcel A1, Parcel B6, Parcel B8, and Parcel B14 (**Figure 1**). The development will include completion of an automotive parking lot or laydown area. (**Figure 2** and **Figure 3**). Outside of the main development area designated as Sub-Parcel A4-2, temporary external construction worker areas (not intended for permanent occupancy) with a total area of approximately 3.75 acres within the construction LOD will be utilized to install the facility entrance and subgrade utility connections for the project. The Site is currently zoned Manufacturing Heavy-Industrial Major (MH-IM), and is not occupied. There is no groundwater use on-site or within the surrounding Tradepoint Atlantic property.

Ground surface elevations at the Site range from approximately 0 to 14 feet above mean sea level (amsl), with the majority of the Site being relatively flat, but with southeast corner running along the northside of the Humphrey Impoundment berm. According to Figure B-2 of the property Stormwater Pollution Prevention Plan (SWPPP) Revision 9 dated September 27, 2021, surface water runoff from the Site flows through National Pollutant Discharge Elimination System (NPDES) permitted Outfall 014 beyond the Humphrey Creek Wastewater Treatment Plant (HCWWTP), which discharges to Bear Creek.

2.2 SITE HISTORY

From the late 1800s until 2012, the production and manufacturing of steel was conducted at Sparrows Point. Iron and steel production operations and processes at Sparrows Point included raw material handling, coke production, sinter production, iron production, steel production, and semi-finished and finished product preparation. In 1970, Sparrows Point was the largest steel facility in the United States, producing hot and cold rolled sheets, coated materials, pipes, plates, and rod and wire. The steel making operations at the facility ceased in fall 2012.

Parcel A4 was formerly occupied by the New Cold Mill Complex (NCMC) which contained numerous steel manufacturing processes. The NCMC was constructed in 2000. Former operations at the NCMC delivered cold flat-rolled sheeting for either sale or further coating operations conducted elsewhere on the property. The western portion of Parcel A4 historically operated as a pipe production facility (Pipe Mill) beginning in the 1940s. In May 1984, the Pipe Mill was closed under a Closure Plan approved by the MDE on December 12, 1983. Closure activities occurred on the Site and surrounding area through the 1980s and 1990s. In 1998, the Pipe Mill was demolished. More information regarding previous steel finishing activities can be found in the Phase II Investigation Work Plan – Area A: Parcel A4 (Revision 2 dated October 29, 2015).

3.0 ENVIRONMENTAL SITE ASSESSMENT RESULTS

3.1 PHASE I ENVIRONMENTAL SITE ASSESSMENT RESULTS

A Phase I ESA was completed by Weaver Boos Consultants for the entire Sparrows Point property on May 19, 2014. Weaver Boos completed site visits of Sparrows Point from February 19 through 21, 2014, for the purpose of characterizing current conditions at the former steel plant. The Phase I ESA identified particular features across the Tradepoint Atlantic property which presented potential risks to the environment. These Recognized Environmental Conditions (RECs) included buildings and process areas where releases of hazardous substances and/or petroleum products potentially may have occurred. The Phase I ESA also relied upon findings identified during a previous visual site inspection (VSI) conducted in 1991 as part of the RCRA Facility Assessment (RFA) prepared by A.T. Kearney, Inc. dated August 1993, for the purpose of identifying Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) on the property. This VSI is regularly cited in DCC Report.

Weaver Boos' distinction of a REC or Non-REC was based upon the findings of the DCC Report (which was prepared when the features remained on-site in 1998) or on observations of the general area during their site visit. Weaver Boos made the determination to identify a feature as a REC based on historical information, observations during the site visit, and prior knowledge and experience with similar facilities. There were no RECs identified within the Parcel A4 development boundaries. The following SWMUs/AOCs were identified within the Development Area:

- Pipe Mill Trenches/Sumps (SWMU 49)
- Hydraulic Oil Storage Area (AOC O)

3.2 PHASE II INVESTIGATION RESULTS – SUB-PARCEL A4-2

Phase II Investigations specific to soil and groundwater conditions were performed for the property area including Sub-Parcel A4-2 in accordance with the requirements outlined in the ACO as further described in the following agency-approved Phase II Investigation Work Plans:

- Area A: Parcel A4 (Revision 2) dated October 29, 2015
- Area B: Parcel B14 (Revision 0) dated August 3, 2017

All soil samples and groundwater samples were collected and analyzed in accordance with agency-approved protocols during the Phase II Investigations, the specific details of which can be reviewed in each agency-approved Work Plan. Each Phase II Investigation was developed to target specific features which represented a potential release of hazardous substances and/or petroleum products to the environment, including RECs, SWMUs, and AOCs, as applicable, as well as numerous other targets identified from former operations that would have the potential for environmental

contamination. Samples were also collected at site-wide locations to ensure full coverage of each investigation area. The full analytical results and conclusions of each investigation have been presented to the agencies in the following Phase II Investigation Reports:

- Area A: Parcel A4 (Revision 3) dated December 20, 2019
- Area B: Parcel B14 (Revision 0) dated March 27, 2018

This RADWP summarizes the relevant soil and groundwater findings from these Phase II Investigations with respect to the proposed development of Sub-Parcel B21-1.

3.2.1 Phase II Soil Investigation Findings

Based on the scope of development for Sub-Parcel B4-2, 15 soil samples collected from seven soil borings (including three soil borings from the Parcel A4 Phase II Investigation and four soil borings from the Parcel B14 Phase II Investigation) were included in this evaluation of Sub-Parcel A4-2. The seven boring locations are shown on **Figure 4**, and the samples obtained from these borings provided relevant analytical data for discussion of on-site conditions.

Soil samples collected during the Phase II Investigation were analyzed for the Target Compound List (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs) and polynuclear aromatic hydrocarbons (PAHs), Oil & Grease, Target Analyte List (TAL) metals, hexavalent chromium, and cyanide. Shallow soil samples (0 to 1 foot below ground surface (bgs)) were analyzed for polychlorinated biphenyls (PCBs). Soil sampling targets with potential petroleum contamination were also analyzed for total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO). The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports are included as electronic attachments. The Data Validation Reports contain qualifier keys for the flags assigned to individual results in the attached summary tables.

Soil sample results were screened against the Project Action Limits (PALs) established in the property-wide Quality Assurance Project Plan (QAPP) dated April 5, 2016, or based on other direct agency guidance. Several PALs have been adjusted based on revised toxicity data published by the USEPA (May 2021). **Table 1** and **Table 2** provide summaries of the detected organic compounds and inorganics in the soil samples collected from the soil borings relevant for this Site evaluation. **Figure S1** and **Figure S2** present the soil sample results that exceeded the PALs among these soil borings. PAL exceedances consisted of two SVOCs (benzo[a]pyrene, dibenz[a,h]anthracene) and five inorganics (arsenic, cadmium, hexavalent chromium, lead, and manganese).

Non-aqueous phase liquid (NAPL) was not observed in any of the Phase II soil boring location.

3.2.2 Phase II Groundwater Investigation Findings

Groundwater conditions were investigated as reported in the A4 Phase II Investigation Report (Revision 3 dated December 20, 2019) and the B14 Phase II Investigation Report (Revision 0 dated March 27, 2018). These reports included aqueous sample data from two wells sampled during A4 Phase II Investigation (A4-012-PZ and A4-013-PZ) and one well sampled during the B14 Phase II Investigation (HI04-PZM006) and one well sampled as part of the Humphrey Impoundment Corrective Measure Study Investigation (HI19-MWS). The four monitoring points provide relevant analytical data for the proposed Sub-Parcel A4-2 development project and are shown on **Figure 5**. There is no direct exposure risk for future Composite Workers at the Site because there is no use of groundwater on the Tradepoint Atlantic property; however, groundwater may be encountered in the sub-parcel during some construction tasks. If groundwater is encountered, it will be managed to prevent exposures in accordance with the dewatering requirements outlined in Section 5.2. Additionally, vapor intrusion (VI) risks are evaluated in Section 3.2.3.

Each groundwater monitoring point was inspected for evidence of NAPL using an oil-water interface probe prior to sampling. None of the monitoring points relevant for the proposed development project showed evidence of NAPL during these checks. The groundwater samples were analyzed for TCL-VOCs, TCL-SVOCs and PAHs. Parcel A4 piezometers were also sampled for Oil & Grease, TAL-dissolved metals, and total cyanide. Parcel B14 wells were also sampled for TPH-DRO/GRO, Oil & Grease, TAL-dissolved/total metals, hexavalent chromium, and total/available cyanide. The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports are included as electronic attachments. The Data Validation Reports contain qualifier keys for the flags assigned to individual results in the attached summary tables.

The Phase II Investigation groundwater results were screened against the PALs established in the property-wide QAPP dated April 5, 2016, or based on other direct agency guidance. Similar to the evaluation of soil data, several PALs have been adjusted based on revised toxicity data published by the USEPA (May 2021). **Table 3** and **Table 4** provide summaries of the detected organic compounds and inorganics in the groundwater samples submitted for laboratory analysis, and **Figure GW1** presents the groundwater results that exceeded the PALs. PAL exceedances in the Phase II Investigation groundwater samples collected in the vicinity of the proposed development project consisted of one VOC (benzene), three SVOCs (benz[a]anthracene, naphthalene, and pentachlorophenol), and two total and/or dissolved metals (manganese and vanadium). For simplicity, the inorganic PAL exceedances shown on **Figure GW1** do not include duplicate exceedances of total/dissolved metals. If both total and dissolved concentrations exceeded the PAL, the value for total metals is displayed.

3.2.3 Locations of Potential Concern

The Parcel A4 Phase II investigation identified an elevated concentration of cadmium (33,600 mg/kg) within the subsurface soil sample collected from the 3 to 4 feet bgs interval from A4-013-

SB, located within the Sub-Parcel A4-2. Excavation of the soil containing elevated concentrations of cadmium was selected as the preferred remedial response action to address the impacts in the vicinity of A4-013-SB. To delineate the elevated cadmium impacts at location A4-013-SB, a total of 67 supplemental borings (including resampling at the original location) were completed between December 8, 2016 and December 20, 2016. **Figure K1** shows these delineation boring locations, as well as the locations that yielded soil concentrations above the delineation criterion. Delineation boring data are included in **Table 2B**. Following delineation, remedial excavation was implemented on October 3, 2019 in accordance with the approved Work Plan entitled Delineation Activities and Proposed Excavation of Cadmium Impacted Soil for Parcel A4 (dated April 21, 2017).

The completed excavation activities were documented in the Response Action Completion Report: A4-013 Cadmium Response Area (dated July 14, 2020 and approved on September 14, 2020). As shown on **Figure K2**, a total of approximately 26 cubic yards (bank) of soil was removed from two locations designated as “northern” and “southern” during excavation. Waste characterization sample results indicated that approximately 11 cubic yards (bank) of the excavated material, all of which originated from the southern excavation, was hazardous (with a reported cadmium Toxicity Characteristic Leaching Procedure concentration of 10 milligrams per liter [mg/L]) and was hauled offsite on for disposal at Envirite of Pennsylvania, Inc. in York, PA. The non-hazardous excavated material was disposed of onsite at Greys Landfill. Additional details, including the disposal manifest and Land Disposal Restriction and Certification forms are provided in the Response Action Completion Report. As shown on **Figure K3**, post-excavation sidewall and bottom samples were collected to confirm removal above the excavation criterion (determined through preliminary risk screening) of 550 mg/kg. Confirmation sample data are included in **Table 2B**. Both the northern and southern excavations were backfilled to the existing grade with clean fill. Backfilling was conducted on February 21, 2020 by ECLS. **Figure K4** shows that no utilities are proposed near the cadmium excavation areas.

Groundwater data were screened to determine whether any sample results exceeded the USEPA Vapor Intrusion TCR (Target Cancer Risk; carcinogen) or THQ (Target Hazard Quotient; non-carcinogen) Screening Levels. The VI risk evaluation is summarized in **Table 5**. When the aqueous results were summed by sample location, none of the cumulative VI cancer risks exceeded $1E-5$. However, one cumulative VI non-cancer Hazard Index (HI) value (A4-012-PZ) exceeded 1. This exceedance was driven by total cyanide. Elevated total cyanide concentrations have previously been identified at the Site, and sampling for available cyanide was previously completed at various locations, including at HI04-PZM006, to show that a significant portion of the observed total cyanide is not bioavailable. Additionally, the location of the exceedance at A4-012-PZ is within the external construction area, significantly south of the Sub-Parcel boundary. Furthermore, no permanent structures are proposed as part of the development of the Site. Therefore, there are no concerns related to potential VI risks/hazards at the Site.

Other locations of potential concern which are subject to special requirements could include elevated lead, PCBs, or TPH/Oil & Grease in soil. The soil data for Sub-Parcel A4-2 were evaluated to determine the presence of any such locations of potential concern including: lead concentrations above 10,000 mg/kg, PCB concentrations above 50 mg/kg, or TPH/Oil & Grease concentrations above 6,200 mg/kg. There were no soil concentrations of lead, PCBs, or TPH/Oil & Grease above the specified criteria.

Locations with physical evidence of NAPL are also considered to be locations of potential concern with respect to proposed development. NAPL was not detected in any soil borings or on the water table in any piezometers or monitoring wells within the proposed development area.

3.3 HUMAN HEALTH SCREENING LEVEL RISK ASSESSMENT

3.3.1 Analysis Process

A human health Screening Level Risk Assessment (SLRA) has been completed based on the analytical data obtained from the characterization of surface and subsurface soils. The SLRA was conducted to evaluate the existing soil conditions to determine if any response measures are necessary. It should be noted that industrial fill including processed slag aggregate sourced from the Tradepoint Atlantic property will be used at the Site; therefore, regardless of the findings of the Composite Worker baseline SLRA, Sub-Parcel A4-2 will be subject to surface engineering controls (i.e., capping) unless separate approvals are received from the MDE following appropriate laboratory testing of the industrial fill materials.

The SLRA included the following evaluation process:

Identification of Exposure Units (EUs): The SLRA was evaluated using a single site-wide Exposure Unit (EU1) with an area of 8.05 acres. The Construction Worker SLRA was evaluated using a slightly expanded EU (EU1-EXP), covering 11.8 acres in total which includes the 3.75 acres of additional construction worker areas incorporated within the LOD to include the facility entrance and utility connections outside of the sub-parcel. Note that the SLRA does not include soil data from boring locations A4-013-SB or A4-013Q-SB because these areas were excavated as part of the cadmium excavation as described in Section 3.2.3.

Identification of Constituents of Potential Concern (COPCs): For the project-specific SLRA, COPC screening was completed assuming a Target Risk (TR) of 1E-6 and Target Hazard Quotient (THQ) of 0.1. The initial screening also identified parameters detected at a frequency greater than 5%. Based on that data set, parameters were identified as COPCs if:

- The compound was detected in soil at a frequency of greater than 5%;

- The maximum detection exceeded the USEPA’s Composite Worker Soil Regional Screening Levels (RSLs).

A COPC screening analysis is provided in **Table 6** to identify all compounds above the relevant screening levels.

All aroclor mixtures (e.g., Aroclor 1248, Aroclor 1260) are taken into account for the reported concentrations of total PCBs. The total PCBs concentrations are used to evaluate the carcinogenic risk associated with PCBs.

Exposure Point Concentrations (EPCs): The COPC soil datasets for the site-wide EU were divided into surface (0 to 2 feet bgs), subsurface (>2 feet bgs), and pooled depths for estimation of potential EPCs. Thus, there are three soil datasets associated with both site-wide EUs. A statistical analysis was performed for each COPC dataset using the ProUCL software (version 5.0) developed by the USEPA to determine representative reasonable maximum exposure (RME) values for the EPC for each constituent. The RME value is typically the 95% Upper Confidence Limit (UCL) of the mean. For lead, the arithmetic mean for each depth was calculated for comparison to the Adult Lead Model (ALM)-based values (presented in **Table 7**).

Risk Ratios: The surface soil EPCs, subsurface soil EPCs, and pooled soil EPCs were compared to the USEPA RSLs for the Composite Worker and to site-specific Soil Screening Levels (SSLs) for the Construction Worker based on equations derived in the USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (OSWER 9355.4-24, December 2002). Risk ratios were calculated with a cancer risk of $1E-6$ and a non-cancer HQ of 1. The risk ratios for the carcinogens were summed to develop a screening level estimate of the baseline cumulative cancer risk. The risk ratios for the non-carcinogens were segregated and summed by target organ to develop a screening level estimate of the baseline cumulative non-cancer Hazard Index (HI).

For the Construction Worker, site-specific risk-based evaluations were completed for a range of potential exposure frequencies to determine the maximum allowable exposure frequency for the site-wide EU that would result in risk ratios equivalent to a cumulative cancer risk of $1E-5$ or HI of 1 for the individual target organs. This analysis indicated that the allowable exposure frequency before additional worker protections or more detailed job safety evaluations might be needed is 40 days.

There is no potential for direct human exposure to groundwater for a Composite Worker since groundwater is not used on the Tradepoint Atlantic property (and is not proposed to be utilized). In the event that construction/excavation leads to a potential Construction Worker exposure to groundwater during development, health and safety plans and management procedures shall be followed to limit exposure risk.

Assessment of Lead: For lead, the arithmetic mean concentrations for surface soils, subsurface soils, and pooled soils for the site-wide EU were compared to the applicable RSL (800 mg/kg) as an initial screening. If the mean concentrations for the EU were below the applicable RSL, the EU was identified as requiring no further action for lead. If a mean concentration exceeded the RSL, the mean values were compared to calculated ALM values (ALM Version dated 6/21/2009 updated with the 5/17/2017 OLEM Directive) with inputs of 1.8 for the geometric standard deviation and a blood baseline lead level of 0.6 ug/dL. The ALM calculation generates a soil lead concentration of 1,050 mg/kg, which is the most conservative (i.e., lowest) concentration which would yield a probability of 5% of a blood lead concentration of 5 ug/dL. If the arithmetic mean concentrations for the EU were below 1,050 mg/kg, the EU was identified as requiring no further action for lead. The lead averages are presented for surface, subsurface, and pooled soils in **Table 7**. Neither surface, subsurface, nor pooled soils exceeded an average lead concentration of 800 mg/kg.

Assessment of TPH/Oil & Grease: EPCs were not calculated for TPH/Oil & Grease. Instead, the individual results were compared to the PAL set to a HQ of 1 (6,200 mg/kg). There were no soil sampling results with concentrations above the PAL.

Risk Characterization Approach: Generally, if the baseline risk ratio for each non-carcinogenic COPC or cumulative target organ does not exceed 1, and the sum of the risk ratios for the carcinogenic COPCs does not exceed a cumulative cancer risk of 1E-5, then a no further action determination will be recommended. If the baseline estimate of cumulative cancer risk exceeds 1E-5 but is less than or equal to 1E-4, then capping of the EU will be considered to be an acceptable remedy for the Composite Worker. The efficacy of capping for elevated non-cancer hazard will be evaluated in terms of the magnitude of exceedance and other factors such as bioavailability. For the Construction Worker, cumulative cancer risks exceeding 1E-5 (but less than or equal to 1E-4) or HI values exceeding 1 will be mitigated via site-specific health and safety requirements.

It should be noted that industrial fill including processed slag aggregate sourced from the Tradepoint Atlantic property will be used at the Site; therefore, regardless of the findings of the Composite Worker baseline assessment, Sub-Parcel A4-2 will be subject to surface engineering controls (i.e., capping) unless separate approvals are received from the MDE following appropriate laboratory testing of the industrial fill materials. The goal of the SLRA is therefore to determine whether additional response actions beyond capping may be needed due to current conditions at the Site.

The USEPA's acceptable risk range is between 1E-6 and 1E-4. If the sum of the risk ratios for carcinogens exceeds a cumulative cancer risk of 1E-4, further analysis of site conditions will be required including the consideration of toxicity reduction in any proposal for a remedy. The magnitude of any non-carcinogen HI exceedances and bioavailability of the

COPC will also dictate further analysis of site conditions including consideration of toxicity reduction in any proposal for a remedy.

3.3.2 SLRA Results and Risk Characterization

Soil data were divided into three datasets (surface, subsurface, and pooled) for Sub-Parcel A4-2 to evaluate potential exposure scenarios. Due to the grading activities including cut and fill which will be implemented during development at the Site, each of these potential exposure scenarios is relevant for the SLRA.

EPCs were calculated for each soil dataset (i.e., surface, subsurface, and pooled soils) in the site-wide EU. ProUCL output tables (with computed UCLs) derived from the data for each COPC in soils are provided as electronic attachments, with computations presented and EPCs calculated for COPCs within each of the datasets. The ProUCL input tables are also included as electronic attachments. The results were evaluated to identify any samples that may require additional assessment or special management based on the risk characterization approach. The calculated EPCs for the surface, subsurface, and pooled exposure scenarios are provided in **Table 8**.

As indicated above, the EPCs for lead are the average (i.e., arithmetic mean) values for each dataset. A lead evaluation spreadsheet, providing the computations to determine lead averages for each dataset, is also included as an electronic attachment. The average and maximum lead concentrations are presented for each dataset in **Table 7**, which indicates that neither surface, subsurface, nor pooled soils exceeded an average lead concentration of 800 mg/kg.

Composite Worker Assessment:

Risk ratios for the estimates of potential EPCs for the Composite Worker baseline scenario prior to the placement of industrial fill at the Site are shown in **Table 9** (surface), **Table 10** (subsurface), and **Table 11** (pooled). The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Composite Worker	EU1 (8.05 acres)	Surface Soil	none	4E-6
		Subsurface Soil	none	3E-6
		Pooled Soil	none	5E-6

Based on the risk ratios for Sub-Parcel A4-2, capping is not necessary to be protective of future Composite Workers for the surface, subsurface, and pooled exposure scenarios. None of the cancer risk values exceeded 1E-5 and none of the non-carcinogenic HI values exceeded 1. However, slag aggregate will be used as the primary fill material and pavement subbase at the Site. Therefore, environmental capping will be required to be protective of future Composite Workers.

Construction Worker Assessment:

Ground intrusive activities which could result in potential Construction Worker exposures are expected to be limited primarily to utility installation tasks performed by specific work crews. Construction Worker risks were evaluated for several different exposure scenarios to determine the maximum exposure frequency for the site-wide EU1-EXP that would result in risk ratios equivalent to a cumulative cancer risk of 1E-5 or HI of 1 for any individual target organ. Risk ratios for the Construction Worker scenario using the selected duration (40 days) are shown in **Table 12** (surface), **Table 13** (subsurface), and **Table 14** (pooled). The variables entered for calculation of the site-specific Construction Worker SSLs (EU area, input assumptions, and exposure frequency) are indicated as notes on the tables. The spreadsheet used for computation of the site-specific Construction Worker SSLs is included as **Appendix B**. The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Construction Worker	EU1-EXP (11.8 acres) (40 exposure days)	Surface Soil	none	2E-7
		Subsurface Soil	none	2E-7
		Pooled Soil	none	2E-7

Using the selected exposure duration for the site-wide EU1-EXP (40 days), the carcinogenic risks were all less than 1E-5, and none of the non-carcinogens caused a cumulative HI to exceed 1 for any target organ system. These findings are below the acceptable limits for no further action established by the agencies. This evaluation indicates that additional site-specific health and safety requirements (beyond standard Level D protection) would be required only if the allowable exposure duration of 40 days were to be exceeded for an individual worker.

No activities at the Site are expected to exceed the allowable duration; however, upgraded Personal Protective Equipment (PPE) beyond standard Level D protection will be used for the entire scope of intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The modified Level D PPE requirements which will be applied immediately and throughout this project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE Standard Operational Procedure (SOP) provided as **Appendix C**.

Institutional controls will be required to be established for the protection of future Construction Workers in the event of any future long-term construction projects which could include intrusive activities. The anticipated institutional controls, including notification requirements, health and safety requirements, and materials management requirements, are specified in Section 5.4.

3.3.3 Evaluation of RCRA Criteria

Tradepoint Atlantic will be using industrial fill (including processed slag aggregate) throughout the Site. Therefore, environmental capping is required within the development area to mitigate potential Composite Worker risks. The entirety of the Site (8.05 acres) will therefore require a remedy of capping with institutional controls to mitigate potential Composite Worker risks.

Site-specific health and safety controls will be implemented to mitigate Construction Worker risks within the sub-parcel. This includes using modified Level D PPE. The modified Level D PPE requirements will be implemented throughout the project duration in accordance with the PPE SOP provided as **Appendix C**. Institutional controls will also be required to be established for the protection of future Construction Workers in the event of any future long-term construction projects which could include intrusive activities.

The proposed VCP capping remedy with institutional controls was evaluated for consistency with the RCRA Threshold Criteria and Balancing Criteria. The Threshold Criteria assess the overall protection of human health and the environment, as well as achievement of media cleanup objectives and control of sources of releases at the Site. The Balancing Criteria assess long-term effectiveness and permanence; reduction of toxicity, mobility or volume; short-term effectiveness; implementability; cost effectiveness; and community and State acceptance.

Threshold Criteria:

Protect Human Health and the Environment: The assessment against this criterion evaluates how the remedy, as a whole, protects and maintains protection of human health and the environment. This criterion is satisfied when response actions are complete. The purpose of this remedy is to provide a protective barrier between human site users and impacted materials, and to protect the environment by preventing surface water from contacting potentially impacted materials in place. The capping and institutional control remedy would eliminate risk to current and future industrial workers by preventing exposure to areas of the Site where processed slag aggregate has been placed or where soil concentrations exceed a cancer risk of $1E-5$ or a HI of 1. Groundwater does not present a direct human health hazard since there is no groundwater use on the property. Implementation of the proposed use restrictions will address the residual risk and will also protect future workers by eliminating or controlling potential exposure pathways, thus, reducing potential intake and contact of soil/groundwater COPCs by human receptors.

Achieve Media Cleanup Objective: The assessment against this criterion describes how the remedy meets the cleanup objective, which is risk reduction, appropriate for the expected current and reasonably anticipated future land use. The objective is to protect current/future Composite Workers and Construction Workers from potential exposures to COPCs present in soil or groundwater at levels that may result in risks of adverse health

effects. Given the controlled access and use restrictions, the proposed remedy will attain soil and groundwater objectives. The activity use restrictions will eliminate current and future unacceptable exposures to both soil and groundwater.

Control the Source of Releases: In its RCRA Corrective Action proposed remedies, USEPA seeks to eliminate or reduce further releases of hazardous wastes or hazardous constituents that may pose a threat to human health and the environment. Controlling the sources of contamination relates to the ability of the proposed remedy to reduce or eliminate, to the maximum extent practicable, further releases. Sampling results did not indicate localized, discernible source areas associated with the soil conditions observed at the Site. The control measures included in the proposed remedy, such as Materials Management Plan requirements and groundwater use restrictions, provide a mechanism to control and reduce potential further releases of COPCs. This is achieved by eliminating the potential for groundwater use and requiring proper planning for intrusive activities.

Balancing Criteria:

Long-Term Reliability and Effectiveness: The assessment against this criterion evaluates the long-term effectiveness of the remedy in maintaining protection of human health and the environment after the response objectives have been met. The primary focus of this criterion is the extent and effectiveness of the controls that may be required to manage the risk posed by slag aggregate, treatment residuals, and/or untreated wastes. The proposed capping remedies have been proven to be effective in the long-term at similar sites with similar conditions. The capping remedy will permanently contain the slag aggregate and other potentially contaminated media in place. In order for the cap to effectively act as a barrier, regular inspections will be performed pursuant to the Institutional Control Operations and Maintenance Plan (O&M Plan).

Institutional controls will be implemented to protect future Composite and Construction Workers against inadvertent contact with potentially impacted media. The anticipated institutional controls are specified in Section 5.4. The Tenant will be required to sign onto the Environmental Covenant with restriction in the NFA. The proposed remedy will maintain protection of human health and the environment over time by controlling exposures to the hazardous constituents potentially remaining in slag aggregate or existing on-site media. The long-term effectiveness is high, as use restrictions are readily implementable and easily maintained. Given the historical, heavily industrial uses of the Site and the surrounding area, including the presence of landfills, land and groundwater use restrictions are expected to continue in the long term.

Reduction of Toxicity, Mobility, or Volume of Waste: The assessment against this criterion evaluates the anticipated performance of specific technologies that a remedial action alternative may employ. The capping remedy will prevent the spread of contaminants in wind-blown dust or stormwater and will prevent infiltration through the

unsaturated zone from carrying contaminants to the groundwater. Thus, the mobility of contaminants will be reduced by the capping remedy.

Short-term Effectiveness: The assessment against this criterion examines how well the proposed remedy protects human health and the environment during the construction and implementation until response objectives have been met. This criterion also includes an estimate of the time required to achieve protection for either the entire site or individual elements associated with specific site areas or threats. The risks to the Construction Worker during remedy implementation are mitigated by executing the modified Level D PPE requirements outlined in **Appendix C**. The short-term risk to site workers following these upgraded health and safety measures during implementation of the remedy will be low, leading to a high level of short-term effectiveness for protection of future site users and the environment. Short-term effectiveness in protecting on-site workers and the environment will be achieved through establishing appropriate management, construction, health and safety, and security procedures. Proper water management protocols will be implemented to prevent discharges offsite. Security and fences will be used to maintain controlled access during construction.

Implementability: The assessment against this criterion evaluates the technical and administrative feasibility, including the availability of trained and experienced personnel, materials, and equipment. Technical feasibility includes the ability to construct and operate the technology, the reliability of the technology, and the ability to effectively monitor the technology. Administrative feasibility includes the capability of obtaining permits, meeting permit requirements, and coordinating activities of governmental agencies. The proposed capping remedy for the Composite Worker area will use readily available, typically acceptable, and proven technologies.

Cost Effectiveness: The assessment against this criterion evaluates the capital costs, annual O&M costs, and the net present value (NPV) of this remedy relative to alternatives. The capping remedy remedial costs would be incurred as part of the proposed site development, regardless of the findings of the SLRA.

State Support / Agency Acceptance: MDE has been involved throughout the Site investigation process. The proposed use restrictions included in the proposed remedy are generally recognized as commonly employed measures for long-term stewardship.

A capping remedy with institutional controls would satisfy the CERCLA Threshold Criteria and the Balancing Criteria and would do so in a manner that ensures reliable implementation and effectiveness. The remedy is cost-effective and consistent with the proposed development plan.

4.0 PROPOSED SITE DEVELOPMENT PLAN

Tradepoint Atlantic is proposing a vehicle storage and laydown area on Sub-Parcel A4-2. The proposed development will include permanent improvements on approximately 8.05 acres of land intended for occupancy. The proposed future use of Sub-Parcel A4-2 is Tier 3 – Industrial. The remainder of Parcel A1, Parcel B6, Parcel B8, and Parcel B14 will be addressed in separate development plans in accordance with the requirements of the ACO that will include RADWPs, if necessary. Outside of the main development area, temporary external construction worker areas with a total area of approximately 3.75 acres will be utilized to install subgrade utility connections for the project. The temporary work outside of the boundary of the Site is not intended to be the basis for the issuance of a NFA or a COC, although the scope of construction work is covered by this RADWP. The Site (8.05 acres encompassing Sub-Parcel A4-2; excluding the temporary construction worker areas) will be fully capped by surface engineering controls.

Certain compounds are present in the soils located near the surface and in the subsurface at concentrations in excess of the PALs. Therefore, soil is considered a potential media of concern. Potential risks to future adult workers associated with impacts to soil and groundwater exceeding the PALs will be addressed through a remedy consisting of surface engineering controls (capping of the entire area) and institutional controls (deed restrictions). The development plan provides for a containment remedy and institutional controls that will mitigate future adult workers from contacting impacted soil at the Site. In addition, Tradepoint Atlantic has proposed the use of processed slag aggregate as the primary fill material and pavement subbase at the Site. The placement of materials other than approved clean fill, such as slag aggregate, requires the installation of surface engineering controls regardless of the existing soil conditions.

Future Construction Workers may contact impacted surface and/or subsurface soil during earth movement activities associated with construction activities, including within the temporary external construction worker areas outside of the primary development area. The findings of the Construction Worker SLRA indicated that using the site-specific 40-day exposure frequency for the site-wide EU1-EXP, the screening level estimates of Construction Worker cancer risk were less than 1E-5 and no HI values above 1 were identified for any target organ system (the acceptable thresholds for no further action).

No activities at the Site are expected to exceed the allowable duration; however, upgraded PPE beyond standard Level D protection will be used in conjunction with the property-wide Health and Safety Plan (HASP) for the entire scope of intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The modified Level D PPE requirements which will be applied throughout this project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE SOP provided as **Appendix C**.

A restriction prohibiting the use of groundwater for any purpose at the Site will be included as an institutional control in the NFA and COC issued by the MDE, and a deed restriction prohibiting the use of groundwater will be filed. The groundwater use restriction will protect future Composite Workers from potential direct exposures. Proper water management is required to prevent unacceptable discharges or risks to Construction Workers during development. Work practices and health and safety plans governing groundwater encountered during excavation activities will provide protection for Construction Workers involved with development at the Site.

The development plan for the Site is shown on **Figure 2** and **Figure 3**. The process of constructing the proposed vehicle storage and laydown area will involve the tasks listed below. Documentation of the outlined tasks and procedures will be provided in a Sub-Parcel A4-2 Development Completion Report.

4.1 RESPONSE PHASE – GROUNDWATER NETWORK MODIFICATION

Permanent groundwater monitoring wells HI04-PZM006, HI04-034, and HI19-MWS, shown on **Figure 5**, are the only three existing wells located inside of the development boundary. These wells are proposed to be maintained in order to be used for future groundwater monitoring. The wells will be converted to flush mounts during the course of development. No further groundwater network abandonment is necessary as part of this redevelopment.

4.2 DEVELOPMENT PHASE

4.2.1 Erosion and Sediment Control Installation

Installation of erosion and sediment controls will be completed in accordance with the requirements of the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control prior to any construction at the Site. Any soils which are disturbed during the installation of erosion and sediment controls will be placed on-site below the cap.

4.2.2 Grading and Site Preparation

Grading activities including both cut and fill will occur within the Sub-Parcel A4-2 boundary. Any material that is not suitable for compaction will be excavated and replaced with subbase material, although it is not anticipated that poor soils will be encountered. Borrow materials will be obtained from MDE-approved sources and will be documented prior to transport to the Site. Processed slag aggregate sourced from the Tradepoint Atlantic property will be used as fill. Other materials approved by the MDE for industrial use may also be used as fill, but the placement of materials other than approved clean fill will necessitate that the Site will be subject to surface engineering controls (i.e., capping). Fill sources shall be free of organic material, frozen material, or other deleterious material. In the case that there is excess material (not anticipated), the spoils will be stockpiled at a suitable location and dealt with in accordance with the Materials Management Plan (MMP) for the Sparrows Point Facility (Jenkins Environmental, Inc., August 17, 2021). This work

will be coordinated with MDE accordingly. No excess material will leave the 3,100-acre property without prior approval from MDE.

4.2.3 Installation of Structures and Underground Utilities

The lots and other infrastructure associated with the development of Sub-Parcel A4-2 will be installed as shown on the **Figure 2** and **Figure 3**. Details for the fabric building structure shown on these figures are included as **Appendix D**. Soils relocated or removed during construction or utility trenches may be replaced on-site below the cap based on field observations by the Environmental Professional (EP). Additional protocols for soil monitoring during the installation of utilities at the Site are provided in Section 5.1.2. Any water removed will be sampled (if necessary) as described in Section 5.2 and (if acceptable) sent to the on-site Humphrey Creek Wastewater Treatment Plant (HCWWTP).

4.2.4 Paving

The entirety of the Site will be covered with paving. The paved areas will receive a layer of subbase material which will consist of compacted aggregate base, which may include processed slag aggregate sourced from the Tradepoint Atlantic property. The placement of processed slag aggregate or materials other than MDE-approved clean fill will necessitate that the Site will be subject to surface engineering controls (i.e., capping).

The required minimum thicknesses of all site-wide pavement sections which will serve as surface engineering controls are shown in the minimum capping section details provided in **Appendix E**. According to the development plans, all paved areas at the Site will be installed with a minimum of 4 inches of compacted aggregate base and a minimum of 4 inches of overlying pavement surface (asphalt or concrete), which meet these required minimum thicknesses.

4.2.5 Stormwater Management

New stormwater infrastructure will be installed throughout the Site and will discharge to the Tin Mill Canal. Based on the shallow groundwater elevation measurements collected during the site-wide groundwater elevation investigation, excavations may encounter groundwater. As shown on **Figure 7**, the shallow groundwater elevations range from approximately 6 feet amsl (in the northwest) to 0 ft amsl (in the east). Any water removed will be sampled (if necessary) as described in Section 5.2 and (if acceptable) sent to the on-site HCWWTP.

Tradepoint Atlantic is working with the MDE Industrial & General Permits Division to renew the property-wide NPDES permit. The stormwater management systems for each parcel are reviewed and approved by Baltimore County for each individual development project.

5.0 DEVELOPMENT IMPLEMENTATION PROTOCOLS

5.1 DEVELOPMENT PHASE

This plan presents protocols for the handling of soils and fill materials in association with the development of Sub-Parcel A4-2. In particular, this plan highlights the minimum standards for construction practices and managing potentially contaminated materials to reduce potential risks to workers and the environment.

Several exceedances of the PALs were identified in soil samples across the Site. The PALs are set based on USEPA's RSLs for industrial soils, or other direct guidance from the MDE. Because PAL exceedances can present potential risks to human health and the environment at certain concentrations, this plan presents material management and other protocols to be followed during the work to adequately mitigate potential risks from such materials remaining on-site during the development phase. There were no locations in the proposed Site boundary with soil exceedances of the special management criteria for PCBs (50 mg/kg), lead (10,000 mg/kg), or TPH/Oil & Grease (6,200 mg/kg). NAPL was not detected in any soil borings or on the water table in any piezometers or monitoring wells within the proposed development area.

Following completion of the SLRA, the findings of the Construction Worker evaluation indicated that using the site-specific 40-day exposure frequency for the site-wide EU1-EXP, the screening level estimates of Construction Worker cancer risk were less than 1E-5 and no HI values above 1 were identified for any target organ system (the acceptable thresholds for no further action). Certain activities at the Site may exceed the allowable duration of 40 days, and if that were the case, Construction Worker risks must be mitigated to facilitate the proposed construction. Upgraded PPE beyond standard Level D protection will be used in conjunction with the HASP for the entire scope of intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The modified Level D PPE requirements which will be applied throughout this project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE SOP provided as **Appendix C**.

Based on the characterization of surface and subsurface soils and the associated SLRA findings, surface engineering controls are an acceptable remedy to be protective of future adult Composite Workers at the Site. In addition, Tradepoint Atlantic has proposed the use of processed slag aggregate as the primary fill material and pavement subbase at the Site. The placement of materials other than approved clean fill, such as slag aggregate, requires the installation of surface engineering controls (i.e., capping) regardless of the existing soil conditions. The proposed capping sections will meet the required minimum thicknesses for surface engineering controls, which are provided in **Appendix E**.

5.1.1 Erosion/Sediment Control

Erosion and sediment controls will be installed prior to commencing work in accordance with the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The erosion and sediment controls will be approved by the MDE. In addition, the following measures will be taken to prevent contaminated soil from exiting the Site:

- Stabilized construction entrance will be placed at site entrance.
- A dry street sweeper will be used as necessary on adjacent roads, and the swept dust will be collected and properly managed.
- Accumulated sediment removed from silt fence, and sediment traps if applicable, shall be periodically removed and returned to the Site.

5.1.2 Soil Excavation and Utility Trenching

A pre-excavation meeting shall be held to address proper operating procedures for working on-site and monitoring excavations and utility trenching in potentially contaminated material. This meeting shall include the construction manager and the EP providing oversight on the project. During the meeting, the construction manager and the EP shall review the proposed excavation/trenching locations and any associated utility invert elevations. The construction manager will be responsible for conveying all relevant information regarding excavation/grading and/or utility work to the workers who will be involved with these activities. The HASP and PPE SOP for the project shall also be reviewed and discussed.

The EP will provide oversight of soil excavation/trenching activities as described in Section 5.6. Soil excavation/trenching will occur during various phases of construction. In general, and based on the existing sampling information, all excavated materials are expected to be suitable for replacement on the Site. However, the EP will monitor the soil excavation activities for signs of significantly contaminated material which may not be suitable for reuse (as described below). The EP will also be responsible for monitoring organic vapor concentrations in the worker breathing zone within utility trenches and excavations to determine whether any increased level of health and safety protection is required.

To the extent practical, all excavation activities should be conducted in a manner to minimize double or extra handling of materials. Stockpiles shall be stored in a location that is not subjected to concentrated stormwater runoff. Stockpiles shall be managed as necessary to prevent the erosion and off-site migration of stockpiled materials, and in accordance with the applicable provisions of the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. Soil designated for replacement on-site which does not otherwise exhibit evidence of contamination (as determined by the EP) may be managed in large stockpiles (no size restriction) as long as they remain within the erosion and sediment controls.

All utility trenches will be backfilled with bedding and backfill materials approved by the MDE for industrial use. A general utility cross section is provided as **Appendix F**. Additional preventative measures will be required if evidence of petroleum contamination is encountered, to prevent the discharge to, or migration of, petroleum product along a utility conduit. Contingency measures have been developed to ensure that utilities will be constructed in a manner that will prevent the migration of any encountered NAPL, and that excavated material will be properly managed. The Utility Excavation NAPL Contingency Plan (**Appendix G**) provides protocols to be followed if NAPL is encountered during the construction activities. Preventative measures to inhibit the spread of petroleum product will be conducted in accordance with this plan.

The EP will monitor all soil excavation and utility trenching activities for signs of potential contamination. In particular, soils will be monitored with a hand-held photoionization detector (PID) for potential VOCs and will also be visually inspected for the presence of staining, petroleum waste materials, or other indications of significant contamination. If screening of excavated materials by the EP indicates the presence of conditions of potential concern (i.e., sustained PID readings greater than 10 ppm, visual staining, unsuitable waste materials, etc.), such materials shall be segregated for additional sampling and special management.

Excavated material exhibiting evidence of significant contamination shall be placed in stockpiles (not to exceed 500 cubic yards) on polyethylene sheeting and covered with polyethylene sheeting to minimize potential exposures and erosion when not in use. Materials stockpiled due to evidence of contamination will be sampled in accordance with waste disposal requirements and transported to an appropriate permitted disposal facility. Plans for analysis of segregated soils for any use other than disposal must be submitted to the MDE for approval.

Excavated material that is visibly impacted by NAPL will be segregated and managed in accordance with the requirements specified in the Utility Excavation NAPL Contingency Plan. Excavated material with indications of possible NAPL contamination will also be containerized or placed in a stockpile (not to exceed 500 cubic yards) on polyethylene sheeting and covered with polyethylene sheeting until the material can be analyzed for TPH/Oil & Grease and PCBs (total) to characterize the material for appropriate disposal. The MDE will be notified if such materials are encountered during excavation or utility trenching activities.

5.1.3 Soil Sampling and Disposal

Excavated materials that are determined by the EP to warrant sampling and analysis because of elevated PID readings or other indications of potential contamination shall be sampled and analyzed to determine how the materials should be managed. If excavated and stockpiled, such materials should be placed on a polyethylene or equivalent tarp and covered with the same to minimize potential exposures and erosion. All stockpiled soil may be considered for use as fill at this Site or on other areas of the property depending on the analytical results. A summary of sampling including a description of the material, estimated volume, and sampling parameters will

be submitted to the MDE for approval to determine the suitability of the material for reuse. If the MDE determines that the materials are unsuitable for reuse, the materials will be sampled to determine alternative disposal options.

Soil material may be taken to an appropriate non-hazardous landfill (including Greys Landfill) for proper disposal if the concentrations of excavated sampled materials indicate that the materials are not hazardous, but still are not suitable for reuse. Soil material that is determined to be a hazardous waste shall be shipped off-site in accordance with applicable regulations to an appropriate and permitted RCRA disposal facility. The quantities of all materials that require disposal, if any, will be recorded and identified in the Development Completion Report.

5.1.4 Fill

Processed slag aggregate sourced from the Tradepoint Atlantic property will be used as the primary fill material for this project. The placement of processed slag aggregate or materials other than approved clean fill will necessitate that the Site will be subject to surface engineering controls (i.e., capping). Soil excavated on the Sub-Parcel has been determined to be suitable for re-use at the Site below the surface engineering controls (capping), unless such materials are determined by the EP/MDE to be unsuitable for use as outlined in Section 5.1.2 and Section 5.1.3.

All over-excavated utility trenches will be backfilled with bedding and backfill approved by the MDE for industrial use. Soil removed from utility trenches cannot be used as fill within the utility trenches unless such materials are approved for this use by the VCP. As with structural fill, processed slag aggregate and other materials approved for industrial use can be used as backfill in utility trenches if the area will be covered by a VCP cap. Any utility backfill which will extend into the cap (i.e., top 2 feet of backfill in landscaped areas) must meet the VCP clean fill requirements, and a geotextile marker fabric will be placed between the VCP clean fill and any underlying material. Materials permanently placed in areas outside of the Site boundary (i.e., within the temporary external construction worker areas outside of Sub-Parcel A4-2) must meet the VCP clean fill requirements or be otherwise approved by the MDE prior to placement. A general utility detail drawing is provided as **Appendix F**. Material imported to the Site will be screened according to MDE guidance for suitability.

5.1.5 Dust Control

General construction operations, including soil excavation and transport, and trenching for utilities will be performed at the Site. These activities are anticipated to be performed in areas of soil impacted with COPCs. Best management practices should be undertaken at the Sparrows Point property as a whole to prevent the generation of dust which could impact other areas of the property outside of the immediate work zone. To limit worker exposure to contaminants borne on dust and windblown particulates, dust monitoring will be performed in the immediate work zone and at the upwind and downwind perimeter of the Site, and dust control measures will be implemented if

warranted based on the monitoring results. The action level proposed for the purpose of determining the need for dust suppression techniques (e.g. watering and/or misting) during the development activities at the Site will be 3.0 mg/m³. The lowest of the site-specific dust action levels, OSHA Permissible Exposure Limits (PELs), and ACGIH Threshold Limit Value (TLV) was selected as the proposed action level.

The EP will be responsible for the dust monitoring program. Air monitoring will be performed using Met One Instruments, Inc. E-Sampler dust monitors or equivalent real-time air monitoring devices. The EP will set-up dust monitoring equipment at the outset of ground intrusive work or other dust-generating activities, and continuous dust monitoring will be performed during this work. In addition to work area monitoring, a dust monitor will be placed at selected perimeter locations that will correspond to the upwind and downwind boundaries based on the prevailing wind direction predicted for that day. The prevailing wind direction will be assessed during the day, and the positions of the perimeter monitors will be adjusted if there is a substantial shift in the prevailing wind direction.

Once all dust-generating activities are complete (which may occur at a later stage of the project once ground intrusive work has been completed or after the Site has been capped), the dust monitoring program may be discontinued. If additional dust-generating activities commence, additional dust monitoring activities will be performed.

If sustained dust concentrations exceed the action level (3.0 mg/m³) at any of the monitoring locations as a result of conditions occurring at the Site, operations will be stopped temporarily until dust suppression can be implemented. Operations may be resumed once monitoring indicates that dust concentrations are below the action level. The background dust concentration will be utilized to evaluate whether Site activities are the source of the action level exceedance. The background dust concentration will be based on measurements over a minimum of a 1-hour period at the upwind Site boundary. The upwind data will be used to calculate a time weighted average background dust concentration. As noted above, the locations of the perimeter dust monitors may be adjusted periodically if there is a substantial shift in the prevailing wind direction.

As applicable, air monitoring will be conducted during development implementation activities to assess levels of exposure to Site workers, establish that the work zone designations are valid, and verify that respiratory protection being worn by personnel, if needed, is adequate. Concurrent with the work zone air monitoring, perimeter air monitoring will also be performed at the upwind and downwind Site boundaries to ensure contaminants are not migrating off-site. The concentration measured at the downwind perimeter shall not exceed the action level of 3.0 mg/m³, unless caused by background dust from upwind of the Site. If exceedances of the action level are identified downwind for more than five minutes, the background dust concentration shall be evaluated to determine whether the action level exceedances are attributable to Site conditions. If on-site activities are the source of the exceedances, dust control measures and additional monitoring will

be implemented. The dust suppression measures may include wetting or misting using a hose connected to a water supply or a water truck stationed at the Site.

Dust control measures will be implemented as described above to address dust generated as a result of construction activities conducted at the Site. However, based on the nature of the area and/or ongoing activities surrounding the Site, it is possible that windblown particulates may come from surrounding areas. As discussed above, the dust concentration in the upwind portion of the Site will be considered when monitoring dust levels in the work area. A pre-construction meeting will be held to discuss the potential of windblown particulates from other activities impacting the air monitoring required for this RADWP. Site contact information will be provided to address the possibility of upwind dust impacts. If sustained dust is observed above the action level (3.0 mg/m^3) and it is believed to originate from off-site (i.e., upwind) sources, this will immediately be reported to TPA and the MDE-VCP team, as well as the MDE Air and Radiation Administration (ARA).

5.2 WATER MANAGEMENT

This plan presents the protocols for handling any groundwater or surface water that needs to be removed to facilitate construction of the proposed Sub-Parcel A4-2 development.

5.2.1 Groundwater PAL Exceedances

Groundwater samples were collected during the preceding Phase II Investigations from ten temporary piezometers and monitoring wells within and surrounding the Site. Aqueous PAL exceedances in groundwater in the vicinity of the development LOD included both inorganics and organic compounds. The aqueous PAL exceedances obtained during the Phase II Investigations are summarized on **Figure GW1**. There are no concerns related to potential VI risks/hazards at the Site.

While the concentrations of PAL exceedances are not deemed to be a significant human health hazard for future workers since there is no on-site groundwater use which could lead to direct exposures, proper water management is required during construction to prevent unacceptable discharges or risks to Construction Workers.

5.2.2 Dewatering

Dewatering may be necessary to facilitate the placement and compaction of structural fill and during the stormwater pond construction, installation of underground utilities, and within excavations/trenches. **Figure 7** displays the groundwater elevations underlying the Site for the shallow aquifer zone, based on prior investigation data. If dewatering is required during construction, it shall be done in accordance with all local, state, and federal regulations. Water that collects in excavations/trenches due to intrusion of groundwater, stormwater, and/or dust control waters will be transported to the HCWWTP via the TMC, following any pretreatment, if

necessary. The water will be treated and discharged in accordance with NPDES Permit No. 90-DP-0064A; I. Special Conditions; A.4; Effluent Limitations and Monitoring Requirements.

It is the intent that any water that must be removed will be ultimately sent (via pumping or trucking) to the HCWWTP via the TMC, following any pretreatment, if necessary. Water in the TMC feeds into the HCWWTP where it is treated prior to release into Bear Creek. Dewatering fluids will be evaluated and then tested (if required) pursuant to the HCWWTP Constituent Threshold Limits for Dewatering Activities related to Remediation, Development, and Capping Protocol. If the groundwater does not meet the constituent threshold limits specified in the protocol, the groundwater will be pre-treated. Any water discharged to the TMC will be pumped through a filter bag or equivalent to remove suspended solids prior to discharge.

Note that additional analyses could be required if warranted based on field observations by the EP. The EP will inspect any water that collects in the excavations/trenches. If the water exhibits indications of significant contamination (sheen, odor, discoloration, presence of product), the water may be sampled and analyzed for some or all of the analyses listed below. In such case, the analyses run will be dependent on the suspected source of contamination and local site conditions. The EP will oversee oil/water separation and disposal of NAPL as necessary.

The results of the analyses will be reviewed by the HCWWTP operator to determine if any wastewater treatment system adjustments are necessary. If the results of the analyses are above the threshold levels listed below, the water will be further evaluated to confirm acceptable treatment at the HCWWTP, or will be evaluated to design an appropriate pre-treatment option. Alternatively, the water may be disposed of at an appropriate off-site facility.

<u>Analysis</u>	<u>Threshold Levels</u>
• <u>Total metals by USEPA Method 6020A</u>	<u>1,000 ppm</u>
• <u>PCBs by USEPA Method 8082</u>	<u>>Non-Detect</u>
• <u>SVOCs by USEPA Method 8270C</u>	<u>1 ppm</u>
• <u>VOCs by USEPA Method 8260B</u>	<u>1 ppm</u>
• <u>Oil & Grease by USEPA Method 1664</u>	<u>200 ppm</u>
• <u>TPH-DRO by USEPA Method 8015B</u>	<u>200 ppm</u>
• <u>TPH-GRO by USEPA Method 8015B</u>	<u>200 ppm</u>

Documentation of any water testing, as well as the selected disposal option, will be reported to the MDE in the Development Completion Report. Any permits or permit modifications related to dewatering will be provided to the agencies as addenda to this RADWP.

5.3 HEALTH AND SAFETY

A property-wide HASP has been developed and is provided with this RADWP (as an electronic attachment) to present the minimum requirements for worker health and safety protection for all development projects. All contractors working on the Site must prepare their own HASP that provides a level of protection at least as much as that provided by the attached HASP. Alternately, on-site contractors may elect to adopt the HASP provided.

General health and safety controls (level D protection) are adequate to mitigate potential risk to Construction Workers conducting ground intrusive activities for a duration of up to 40 exposure days. However, certain ground intrusive activities at the Site (utility installations for specific crews) may exceed the allowable duration. Therefore, modified Level D PPE will be used for the entire scope of intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. Health and safety controls outlined in the HASP and PPE SOP will mitigate any potential risk to Construction Workers from contacting impacted soil and groundwater during development. The modified Level D PPE requirements planned for this development project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE SOP provided as **Appendix C**. The EP will be responsible for monitoring organic vapor concentrations in the worker breathing zone within the utility trenches and excavations to determine whether any increased level of health and safety protection (including engineering controls and/or PPE) is required.

Prior to commencing work, the contractor must conduct an on-site safety meeting for all personnel. All personnel must be made aware of the HASP and the PPE SOP. Detailed safety information shall be provided to personnel who may be exposed to COPCs. Workers will be responsible for following established safety procedures to prevent contact with potentially contaminated material.

5.4 INSTITUTIONAL CONTROLS (FUTURE LAND USE CONTROLS)

Long-term conditions related to future use of the Site will be placed on the RADWP approval, NFA, and COC. These conditions are anticipated to include the following:

- A restriction prohibiting the use of groundwater for any purpose at the Site and a requirement to characterize, containerize, and properly dispose of groundwater in the event of deep excavations encountering groundwater.
- Notice to the MDE at least 30 days prior to any future soil disturbances that are expected to breach the approved capping remedy (i.e., through the pavement cap or marker fabric in landscaped areas).
- Notice to the USEPA at least 30 days prior to any future soil disturbances that are expected to breach the approved capping remedy, only if the proposed duration of ground intrusive

activity would exceed the allowable exposure duration determined in the SLRA and the contractor will not use the modified Level D PPE specified in the approved SOP.

- Requirement for a HASP in the event of any future excavations at the Site.
- Complete appropriate characterization and disposal of any material excavated/pumped at the Site in accordance with applicable local, state, and federal requirements.
- Implementation of inspection procedures and maintenance of the containment remedies.

The owner/operator will file the above deed restrictions as defined by the MDE-VCP in the NFA and COC. The Tenant will be required to sign onto the Environmental Covenant with restriction in the NFA. Tradepoint Atlantic will notify the Tenant of this requirement and will provide MDE with contact information for the Tenant prior to issuance of the NFA.

5.5 POST REMEDIATION REQUIREMENTS

Post remediation requirements will include compliance with the conditions specified in the NFA, COC, and the deed restrictions recorded for the Site. Deed restrictions will be recorded within 30 days after receipt of the final NFA. In addition, the MDE and USEPA will be provided with a written notice of any future excavations (as applicable) in accordance with the requirements given in Section 5.5. Written notice of planned excavation activities will include the proposed date(s) for the excavation, location of the excavation, health and safety protocols (as required), clean fill source (as required), and proposed characterization and disposal requirements. Written notice may consist of email correspondence and/or hard copy correspondence.

Additional requirements will include inspection procedures and maintenance of the containment remedies to minimize degradation which could lead to future exposures, as well as continued perimeter groundwater monitoring. An O&M Plan will be submitted for MDE approval and will include long-term inspection and maintenance requirements for the capped areas of the Site. The responsible party will perform cap inspections, perform maintenance of the cap, and retain inspection records, as required by the O&M Plan.

5.6 CONSTRUCTION OVERSIGHT

Construction Oversight by an EP will ensure and document that the project is built as designed and appropriate environmental and safety protocols are followed. Upon completion, the EP will certify that the project is constructed in accordance with this RADWP.

The EP will monitor all soil excavation and utility trenching activities for signs of contamination that may indicate materials that are not suitable for reuse. In particular, soils will be monitored with a hand-held PID for potential VOC impacts, and will also be visually inspected for staining, petroleum waste materials, or other indications of significant contamination. If screening of excavated materials by the EP indicates the presence of conditions of potential concern (i.e.,

sustained PID readings greater than 10 ppm, visual staining, unsuitable waste materials, etc.), such materials shall be segregated for additional sampling and special management (as described in Section 5.1.2; Soil Excavation and Utility Trenching). The EP will also perform routine periodic breathing zone monitoring and PPE spot checks during ground intrusive activities. The EP will also inspect any water that collects in the excavations/trenches on an as-needed basis to coordinate appropriate sampling prior to disposal (as described in Section 5.2.2; Dewatering).

Daily inspections, as necessary, will be performed during general site grading and cap construction activities to verify that appropriate fill materials are being used (as described in Section 5.1.4; Fill), dust monitoring and control measures are being implemented as appropriate (as described in Section 5.1.5; Dust Control), the requirements of the HASP and the PPE SOP are being enforced by the designated Site Safety Officer (as described in Section 5.4; Health and Safety), and surface engineering controls are being installed with the appropriate thicknesses (shown on the RADWP attachments). Oversight by an EP will not be required during construction activities which do not have a significant environmental component, such as above-grade construction.

Records will be developed by the EP to document:

- Compliance with soil screening requirements
- Proper water management, including documentation of any testing and water disposal
- Observations of construction activities during site grading and cap construction
- Proper cap thickness and construction

6.0 PERMITS, NOTIFICATIONS AND CONTINGENCIES

The participant and their contractors will comply with all local, state, and federal laws and regulations by obtaining any necessary approvals and permits to conduct the activities contained herein. Any permits or permit modifications from State or local authorities will be provided as addenda to this RADWP.

A grading permit is required if the proposed grading disturbs over 5,000 square feet of surface area or over 100 cubic yards of earth. A grading permit is required for any grading activities in any watercourse, floodplain, wetland area, buffers (stream and within 100 feet of tidal water), habitat protection areas or forest buffer areas (includes forest conservation areas). Based on the scope of proposed earth disturbance, a grading permit will be required as part of this development project. Erosion and Sediment Control Plans will be submitted to, and approved by, the MDE prior to initiation of land disturbance for development.

Contingency measures will include the following:

1. The MDE will be notified immediately of any previously undiscovered contamination, previously undiscovered storage tanks and other oil-related issues, and citations from regulatory entities related to health and safety practices.
2. Any significant change to the implementation schedule will be noted in the progress reports to MDE.
3. Modified Level D PPE will be used for the entire scope of ground intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The modified Level D PPE requirements which will be applied during this project are outlined in the PPE SOP provided as **Appendix C**. If it is not possible to implement the PPE SOP as provided, the agencies will be notified and a RADWP Addendum will be submitted to detail any appropriate mitigative measures.

7.0 IMPLEMENTATION SCHEDULE

Progress reports will be submitted to the MDE on a quarterly basis. Each quarterly progress report will include, at a minimum, a discussion of the following information regarding tasks completed during the specified quarter:

- Development Progress
- Soil Management (imported materials, screening, stockpiling)
- Soil Sampling and Disposal
- Water Management
- Dust Monitoring
- Notable Occurrences (if applicable)
- Additional Associated Work (if applicable)

The proposed implementation schedule is shown below:

Task	Proposed Completion Date
Anticipated RADWP Approval	April 2022
Groundwater Well Modifications	April 2022
<i>Development:</i>	
Installation of Erosion and Sediment Controls	April 2022 (start)
Slag (or Alternative Fill) Delivery and Placement	April 2022 (start)
Site Preparation / Grading	May 2022 (start)
Utility Installations	May 2022 (start)
Submittal of Development Completion Report/ Notice of Completion of Remedial Actions*	September 2022
Request for NFA from the MDE	September 2022
Recordation of institutional controls in the land records office of Baltimore	Within 30 days of receiving the

Tradepoint Atlantic

RADWP – Area A: Sub-Parcel A4-2
Revision 1 – April 8, 2022

County

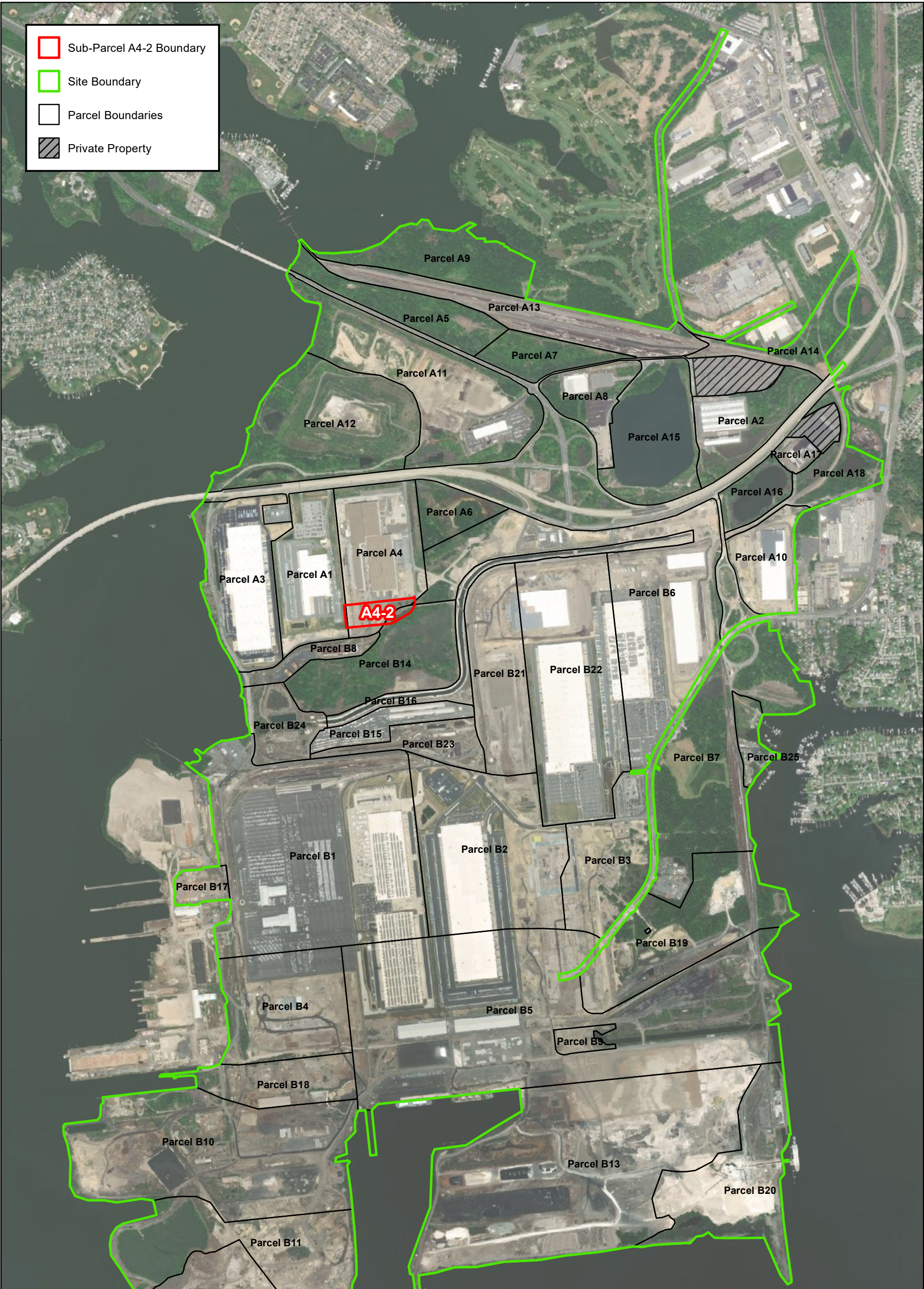
approval of NFA from the MDE

Submit proof of recordation with
Baltimore County

Upon receipt from Baltimore County

*Notice of Completion of Remedial Actions will be prepared by Professional Engineer registered in Maryland and submitted with the Development Completion Report to certify that the work is consistent with the requirements of this RADWP and the Site is suitable for occupancy and use.




FIGURES

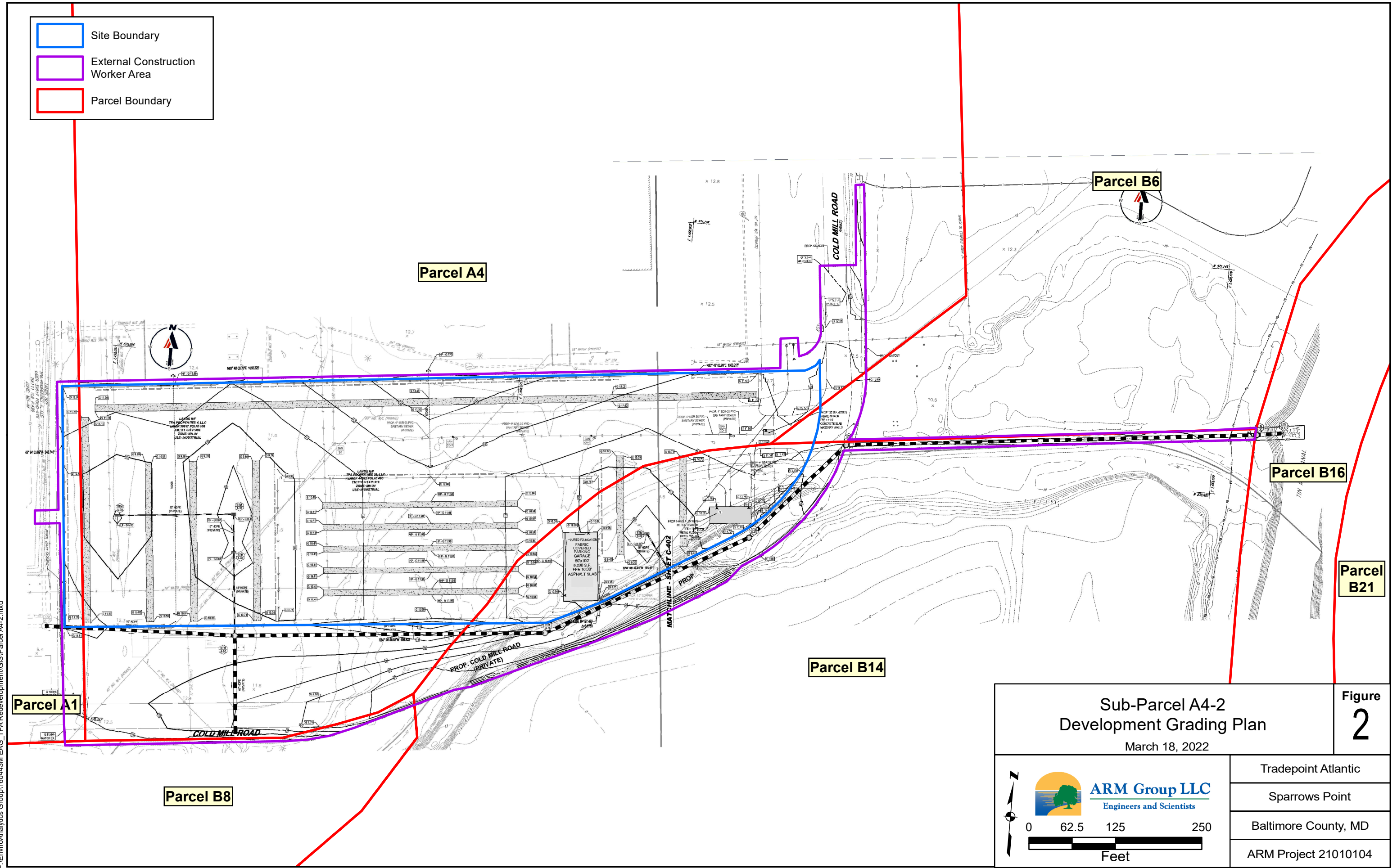


- Sub-Parcel A4-2 Boundary
- Site Boundary
- Parcel Boundaries
- Private Property

Tradepoint Atlantic Area A and Area B Parcels March 18, 2022		Figure 1
 ARM Group LLC Engineers and Scientists		Tradepoint Atlantic Sparrows Point Baltimore County, MD
 		Area A: Project 210101 Area B: Project 210102

Source: Esri, IGN, and the



 Site Boundary
 External Construction Worker Area
 Parcel Boundary

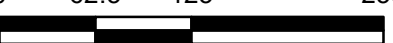


Sub-Parcel A4-2
Development Grading Plan

March 18, 2022

Figure
2

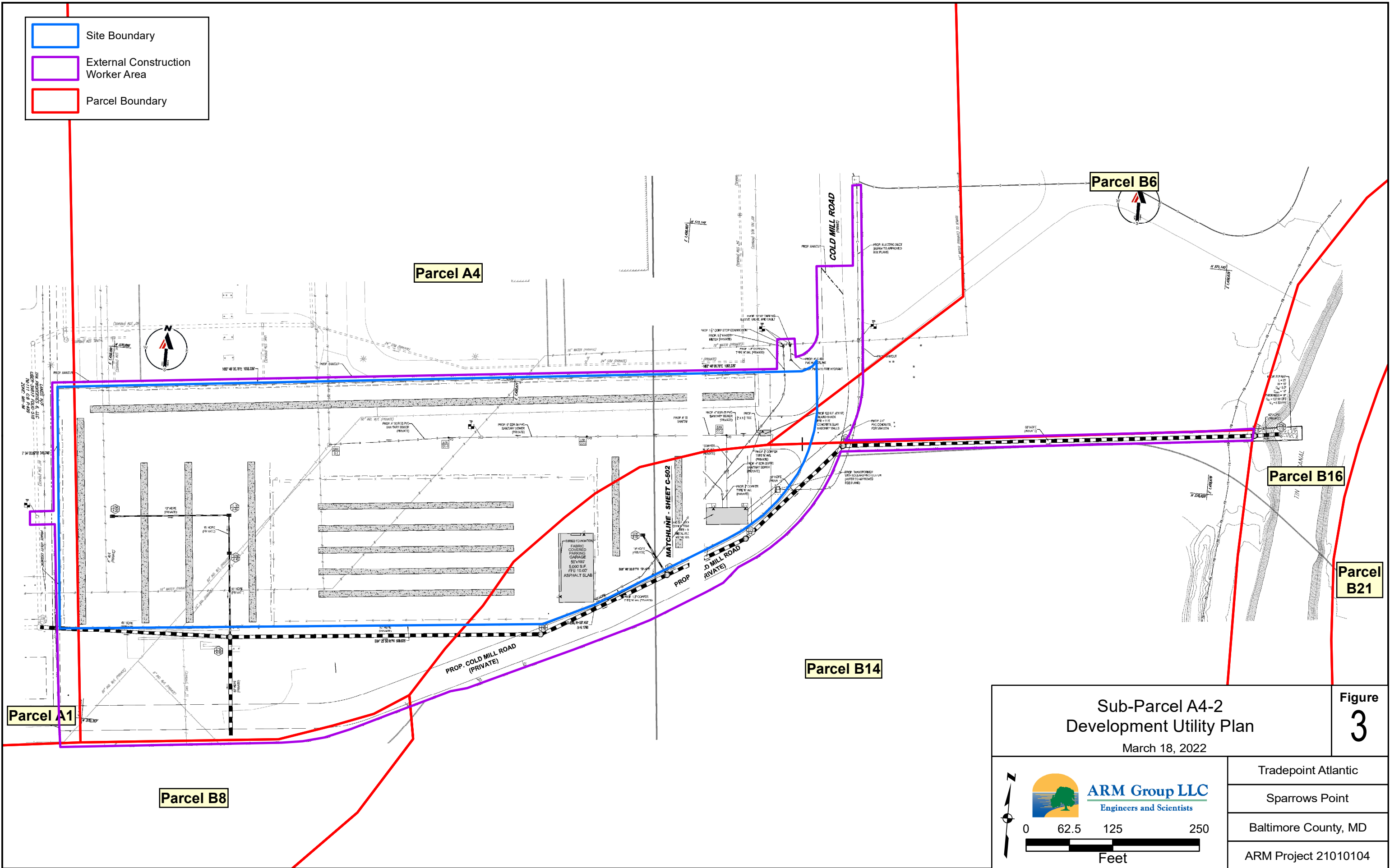


ARM Group LLC
 Engineers and Scientists

0 62.5 125 250

 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104

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Site Boundary
 External Construction Worker Area
 Parcel Boundary




Sub-Parcel A4-2
Development Utility Plan





March 18, 2022

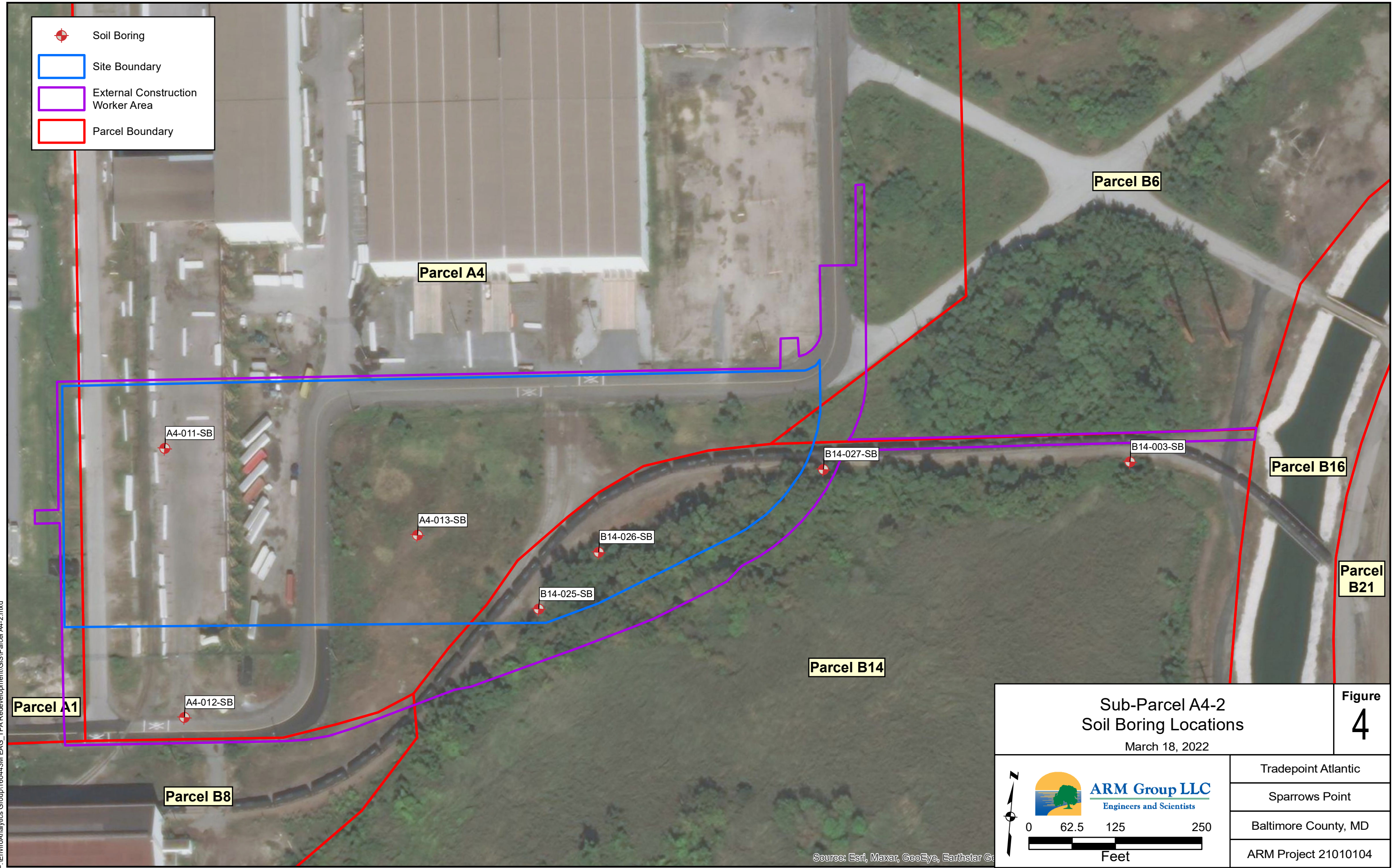
Figure
3


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 Engineers and Scientists

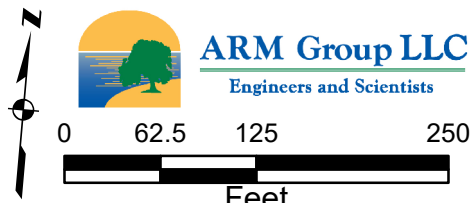

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 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104





-  Soil Boring
-  Site Boundary
-  External Construction Worker Area
-  Parcel Boundary

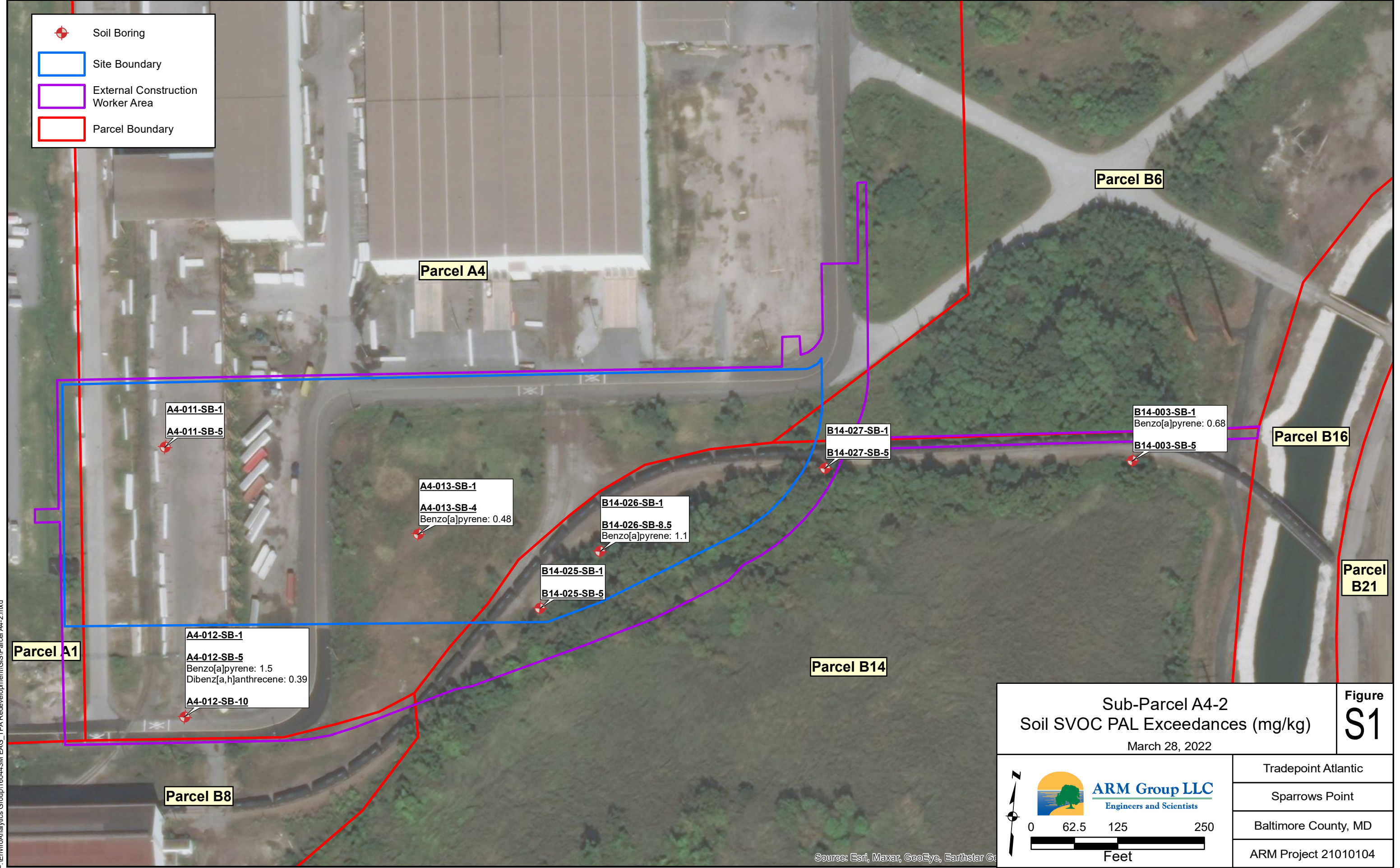


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<p>Sub-Parcel A4-2 Soil Boring Locations March 18, 2022</p>		<p>Figure 4</p>
	Tradepoint Atlantic	
	Sparrows Point	
	Baltimore County, MD	
	ARM Project 21010104	

Source: Esri, Maxar, GeoEye, Earthstar G



 Soil Boring
 Site Boundary
 External Construction Worker Area
 Parcel Boundary



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Sub-Parcel A4-2
 Soil SVOC PAL Exceedances (mg/kg)
 March 28, 2022





Figure S1

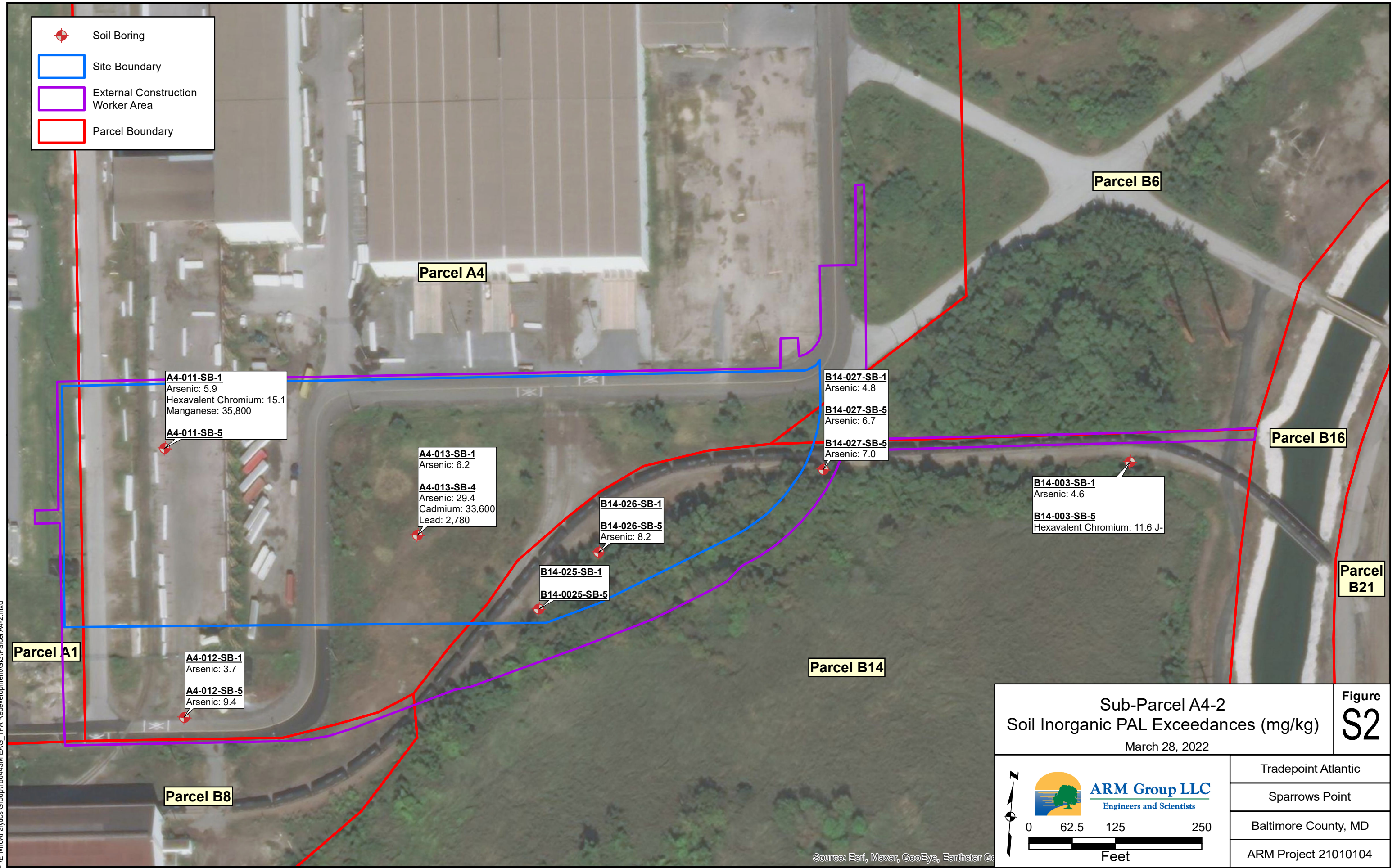


ARM Group LLC
 Engineers and Scientists

0 62.5 125 250
 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104

Source: Esri, Maxar, GeoEye, Earthstar G



 Soil Boring
 Site Boundary
 External Construction Worker Area
 Parcel Boundary



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Sub-Parcel A4-2
 Soil Inorganic PAL Exceedances (mg/kg)
 March 28, 2022






Figure S2

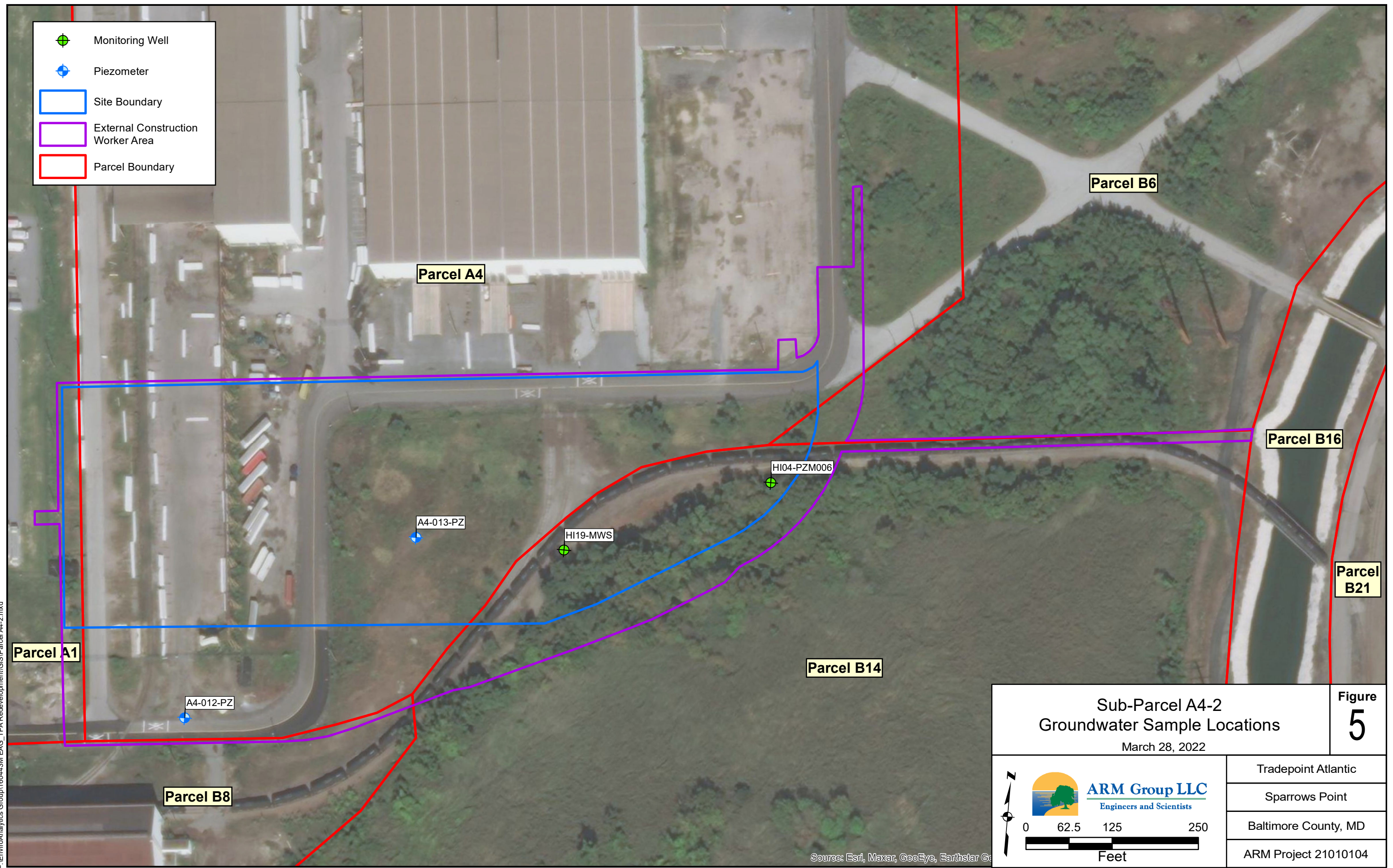


ARM Group LLC
 Engineers and Scientists

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 Feet

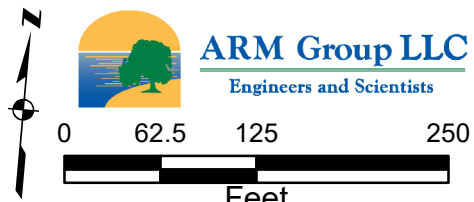

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104

Source: Esri, Maxar, GeoEye, Earthstar G






-  Monitoring Well
-  Piezometer
-  Site Boundary
-  External Construction Worker Area
-  Parcel Boundary

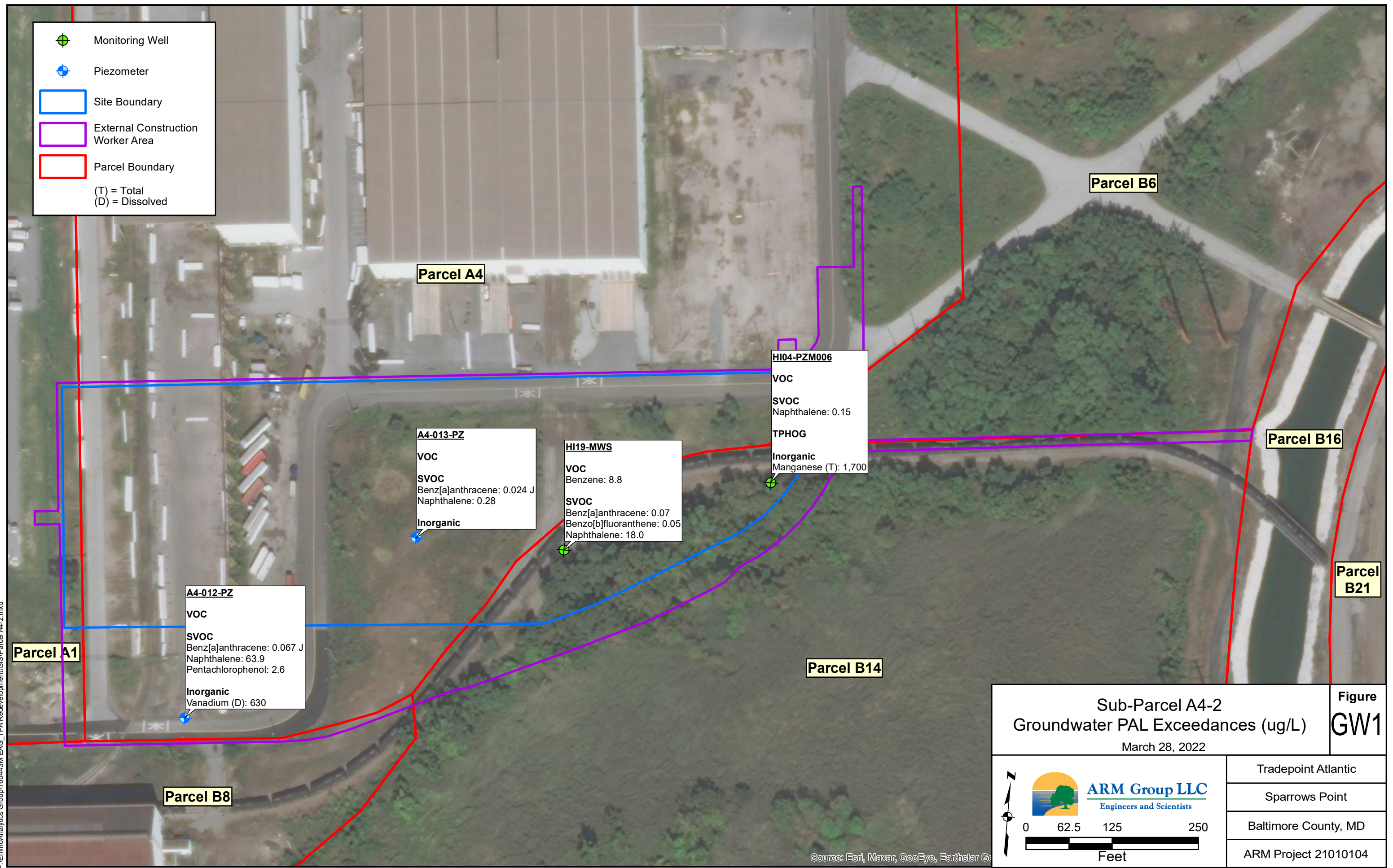


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<p>Sub-Parcel A4-2 Groundwater Sample Locations March 28, 2022</p>		<p>Figure 5</p>
		
	<p>Tradepoint Atlantic</p>	
	<p>Sparrows Point</p>	
	<p>Baltimore County, MD</p>	
<p>ARM Project 21010104</p>		

Source: Esri, Maxar, GeoEye, Earthstar G

 Monitoring Well
 Piezometer
 Site Boundary
 External Construction Worker Area
 Parcel Boundary
 (T) = Total
 (D) = Dissolved



A4-013-PZ
VOC
SVOC
 Benz[a]anthracene: 0.024 J
 Naphthalene: 0.28
Inorganic


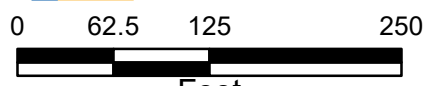
HI19-MWS
VOC
 Benzene: 8.8
SVOC
 Benz[a]anthracene: 0.07
 Benzo[b]fluoranthene: 0.05
 Naphthalene: 18.0

HI04-PZM006
VOC
SVOC
 Naphthalene: 0.15
TPHOG
Inorganic
 Manganese (T): 1,700

A4-012-PZ
VOC
SVOC
 Benz[a]anthracene: 0.067 J
 Naphthalene: 63.9
 Pentachlorophenol: 2.6
Inorganic
 Vanadium (D): 630

Sub-Parcel A4-2
 Groundwater PAL Exceedances (ug/L)
 March 28, 2022

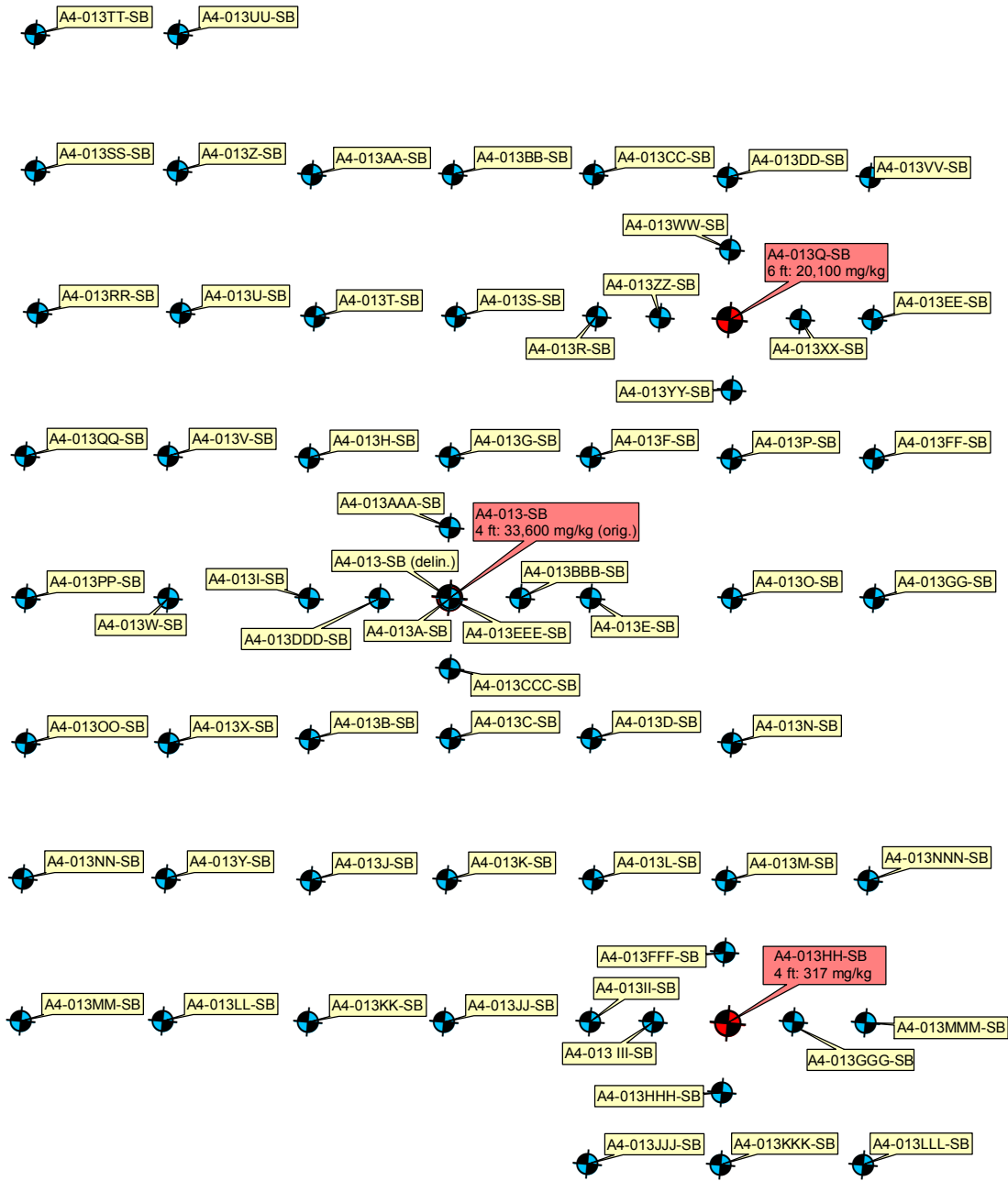
Figure
GW1



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Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104

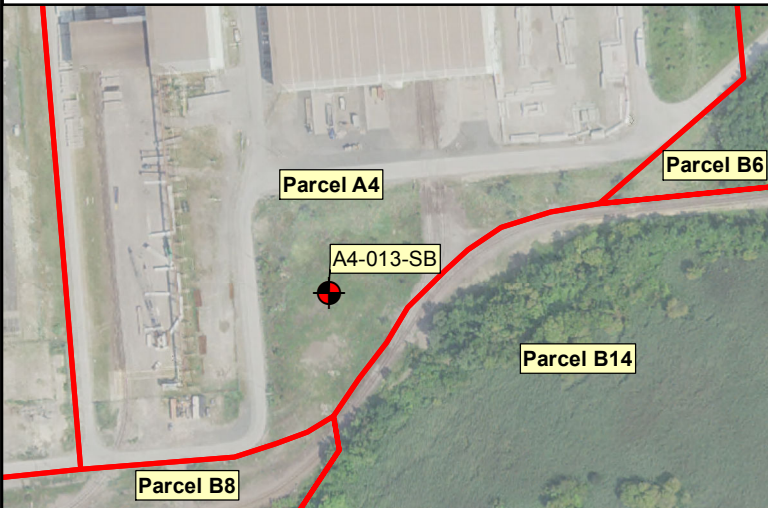
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Source: Esri, Maxar, GeoEye, Earthstar G



- Above Delineation Criteria
- Below Delineation Criteria
- Parcel Boundary

Original Cadmium Delin. Criterion
Results > 154 mg/kg



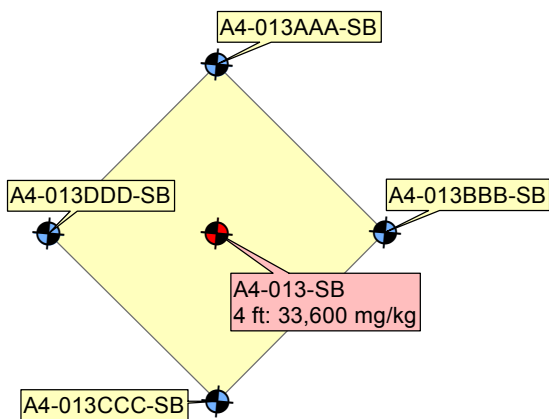
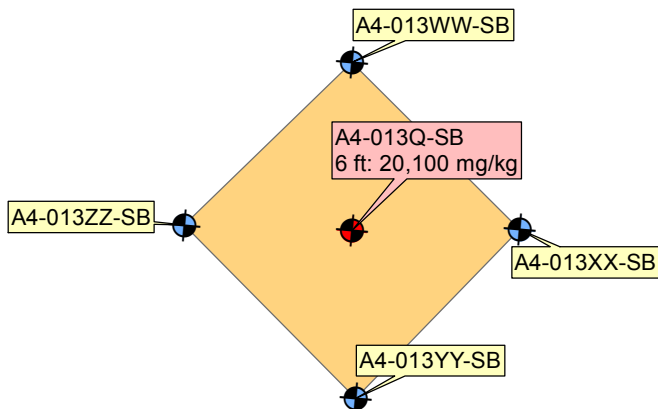
Parcel A4 Cadmium Delineation
Analytical Results
March 28, 2022

Figure
S1

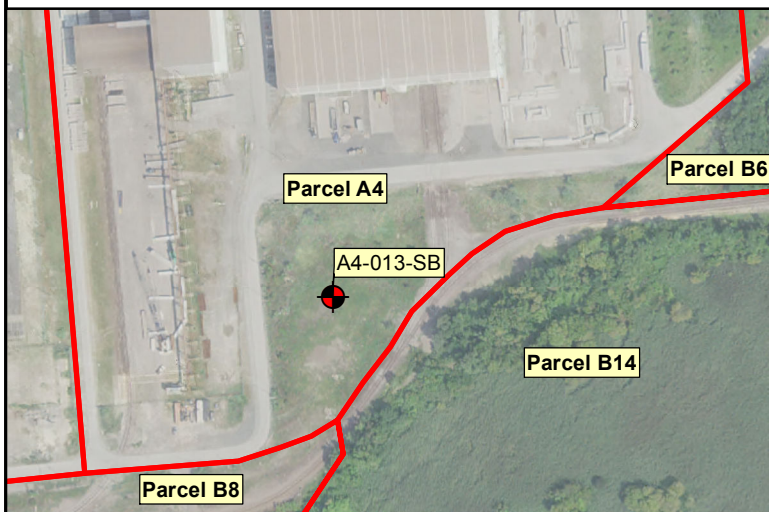
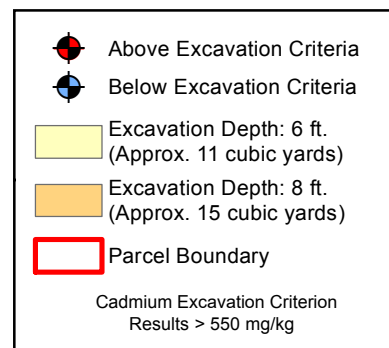
ARM Group LLC
Engineers and Scientists

0 3.75 7.5 15
Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104



Excavated sample data not included in SLRA.

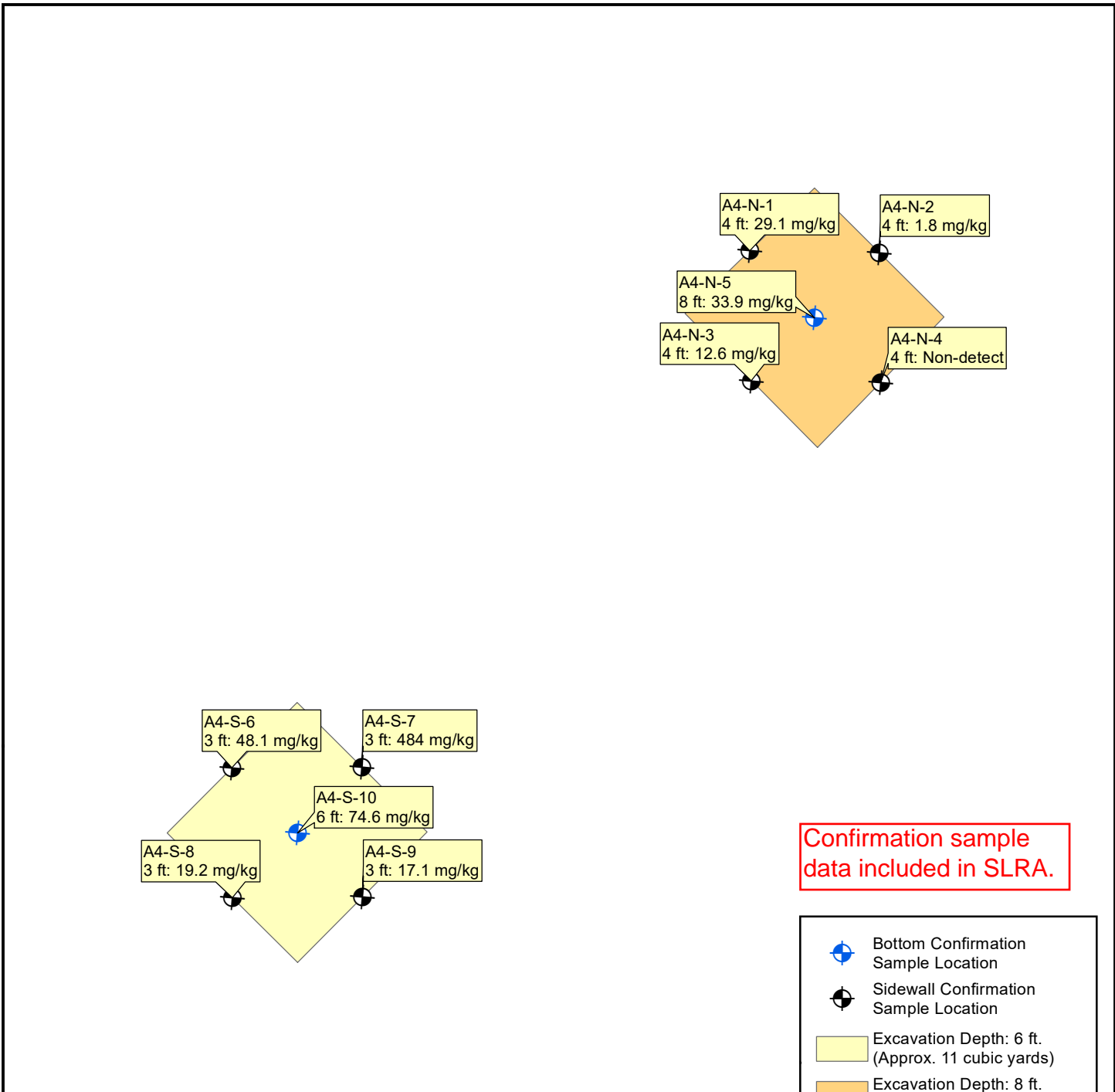


Parcel A4 Cadmium
Excavation Boundaries
March 28, 2022

Figure
SG

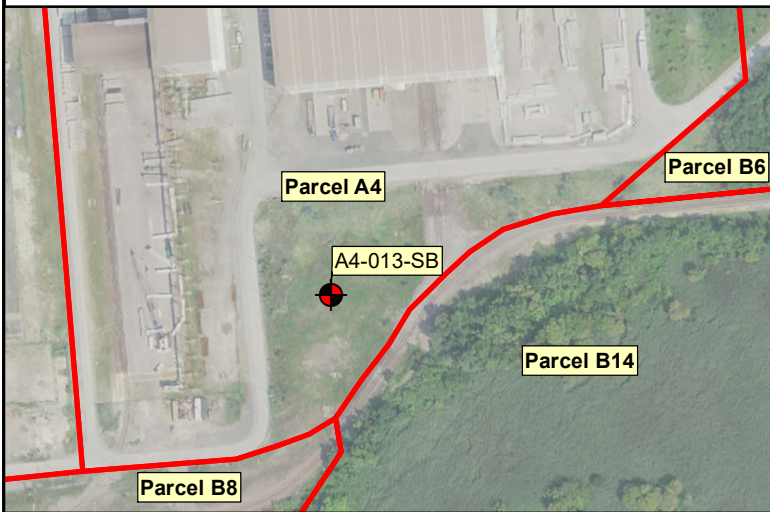
0 1.25 2.5 5 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104



Confirmation sample data included in SLRA.

Bottom Confirmation Sample Location
 Sidewall Confirmation Sample Location
 Excavation Depth: 6 ft. (Approx. 11 cubic yards)
 Excavation Depth: 8 ft. (Approx. 15 cubic yards)
 Parcel Boundary
 Cadmium Excavation Criterion Results > 550 mg/kg



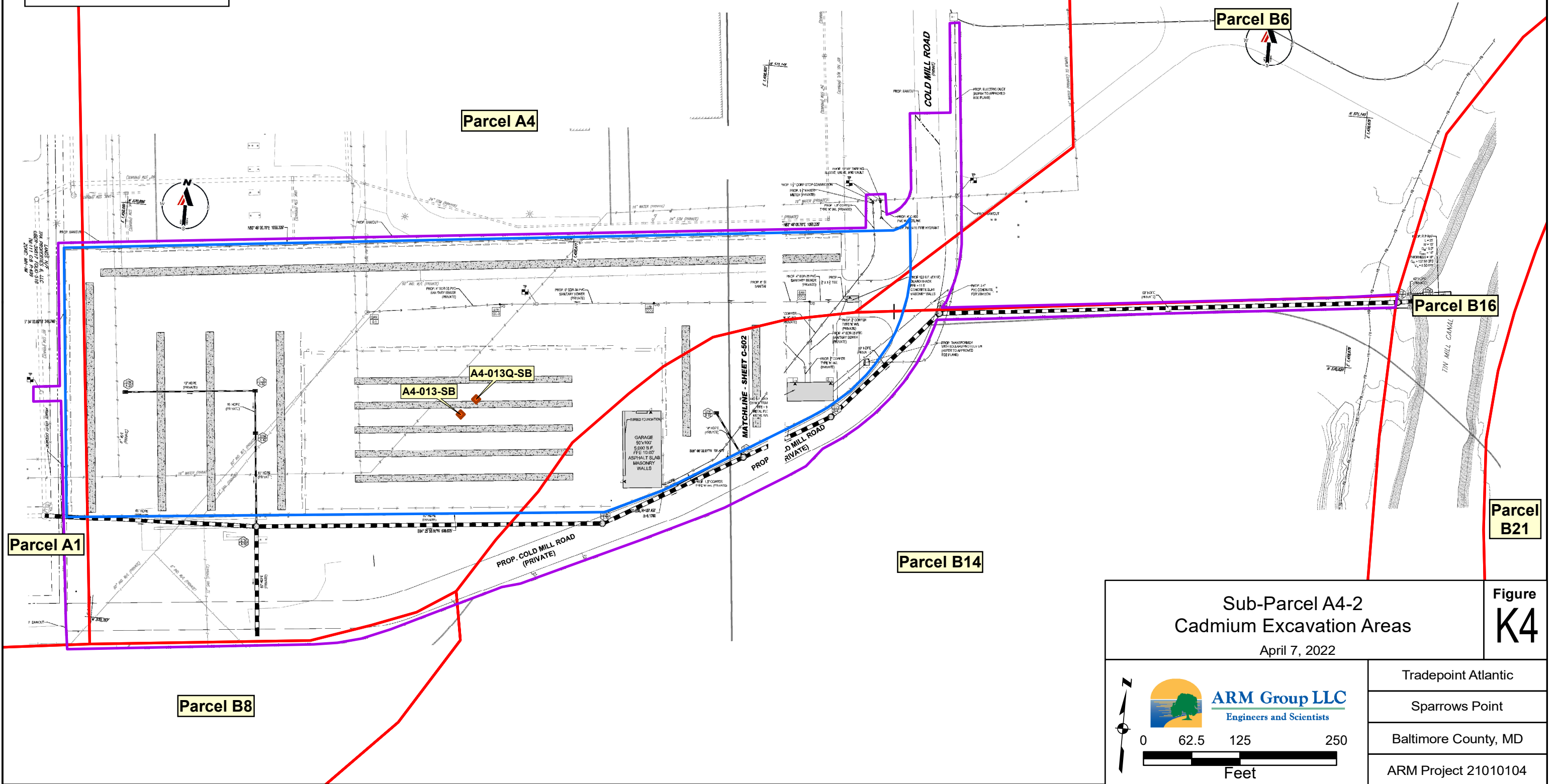
Parcel A4 Cadmium Excavation Confirmation Samples
March 28, 2022

Figure SH

ARM Group LLC
 Engineers and Scientists
 0 1.25 2.5 5 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104

- Cadmium Excavation Area
- External Construction Worker Area
- Site Boundary
- Parcel Boundary



Sub-Parcel A4-2
Cadmium Excavation Areas

April 7, 2022





Figure
K4

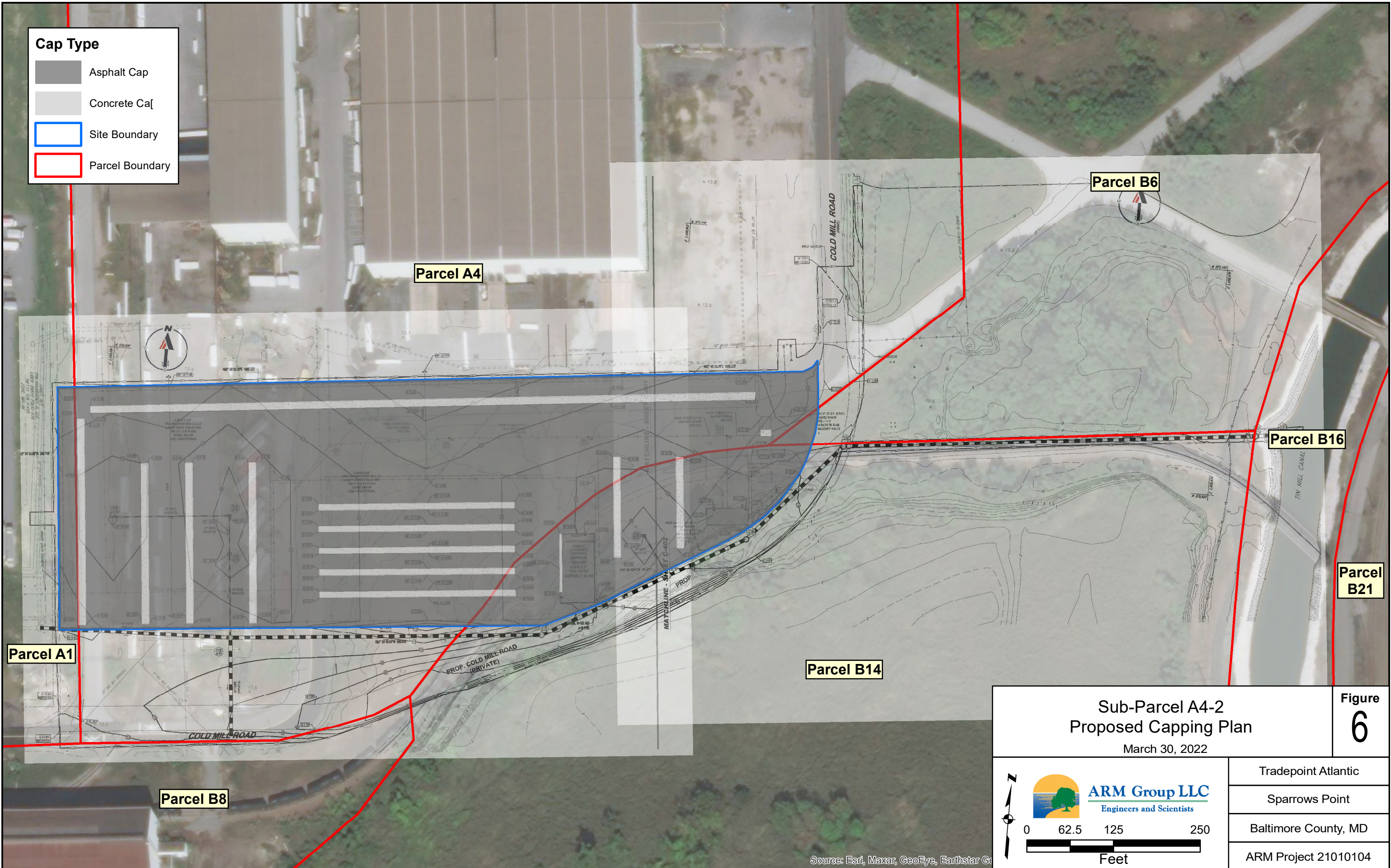
ARM Group LLC
Engineers and Scientists

0 62.5 125 250
Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104

Cap Type



-  Asphalt Cap
-  Concrete Cap
-  Site Boundary
-  Parcel Boundary



**Sub-Parcel A4-2
Proposed Capping Plan**

March 30, 2022

**Figure
6**

ARM Group LLC
Engineers and Scientists

0 62.5 125 250
Feet

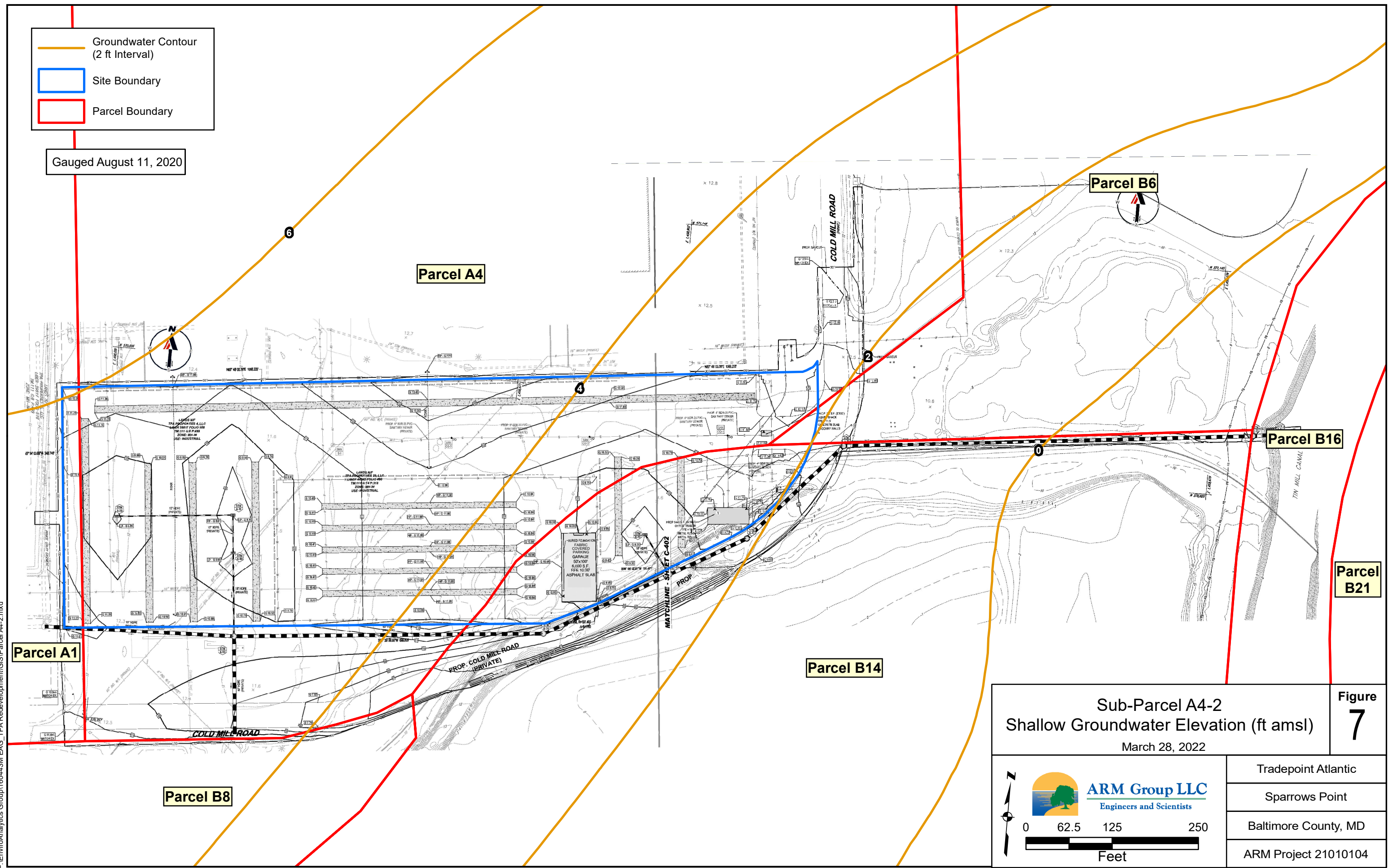
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104

Groundwater Contour (2 ft Interval)

Site Boundary

Parcel Boundary

Gauged August 11, 2020



Sub-Parcel A4-2
Shallow Groundwater Elevation (ft amsl)
March 28, 2022

Figure
7

ARM Group LLC
Engineers and Scientists

0 62.5 125 250
Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010104

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TABLES

**Table 2A - Sub-Parcel A4-2
Summary of Inorganics Detected in Soil**

Parameter	Units	PAL	A4-011-SB-1 11/2/2015	A4-011-SB-5 11/2/2015	A4-012-SB-1 11/5/2015	A4-012-SB-5 11/5/2015	A4-013-SB-1 11/5/2015	A4-013-SB-4 11/5/2015	B14-003-SB-1 9/13/2017	B14-003-SB-5 9/13/2017	B14-025-SB-1 9/14/2017	B14-025-SB-5 9/14/2017	B14-026-SB-1 9/14/2017	B14-026-SB-8.5 9/14/2017	B14-027-SB-1 9/14/2017	B14-027-SB-5 9/14/2017	B14-027-SB-10 9/14/2017
Metals																	
Aluminum	mg/kg	1,100,000	8,040	20,600	15,600	11,800	12,100	4,840	11,300	4,700	43,400	21,900	16,600	25,400	13,200	18,200	N/A
Antimony	mg/kg	470	3.1 UJ	2.4 UJ	3.1 UJ	2 UJ	3.3 UJ	7.8 J	1.7 J	4.4 J	2.4 UJ	2.4 UJ	2.6 UJ	3 UJ	2.7 UJ	2.7 UJ	N/A
Arsenic	mg/kg	3.0	5.9	2.8	3.7	9.4	6.2	29.4	4.6	2.4	2 U	2.2	2.6	8.2	4.8	6.7	7.0
Barium	mg/kg	220,000	41.5 J	214 J	124	173	157	90.8	135	63.4	461 J	267 J	92.9 J	359 J	70.5 J	132 J	N/A
Beryllium	mg/kg	2,300	1 U	1.2	1.1	1.0	1.6	0.28 J	1.2	0.87 U	7.5	3.6	0.86 B	3.5	0.72 B	1.1	N/A
Cadmium	mg/kg	980	0.7 J	0.65 J	0.76 B	11.7	1.4 B	33,600	0.73 J	0.56 J	1.2 U	1 J	1.9	3	0.85 J	0.62 J	N/A
Chromium	mg/kg	120,000	1,810	31.3	687	399	89	126	611 J	1,050 J	48.6 J	502 J	236 J	35.3 J	84.4 J	77.7 J	N/A
Chromium VI	mg/kg	6.3	15.1	1.1 U	1 UJ	1.1 UJ	1.1 UJ	1.3 UJ	0.62 B	11.6 J-	0.52 B	0.57 B	0.55 B	0.63 B	0.57 B	0.53 B	N/A
Cobalt	mg/kg	350	5.2 U	9.1	4.7 B	14.2	9.5	70.9	3 J	1.3 J	0.89 J	4.2	5.1	12.5	6.2	8.1	N/A
Copper	mg/kg	47,000	17.5 J	72.4 J	23.5 J	70.7 J	49.4 J	10,700 J	34.2	18.3	5.1	42.6	28.5	36.8	30.9	26.2	N/A
Iron	mg/kg	820,000	177,000	25,700	79,600	73,100	38,700	255,000	94,800	124,000	20,100	98,700	43,800	33,900	27,500	35,200	N/A
Lead	mg/kg	800	3.4	235	68	228	115	2,780	43.5	24.6	6.7 J	116 J	111 J	393 J	162 J	79.3 J	N/A
Manganese	mg/kg	26,000	35,800	1,370	16,100 J	9,020 J	3,060 J	3,580 J	12,600	17,700	3,820	10,800	5,160	2,240	1,340	1,650	N/A
Mercury	mg/kg	350	0.1 UJ	0.017 J	0.031 J	0.054 J	0.027 J	0.89 J	0.073 J	0.1 U	0.11 U	0.065 J	0.11 J	1 J	0.12 J	0.033 J	N/A
Nickel	mg/kg	22,000	13.8 J	14.9 J	13	35.8	24.4	213	19.8	13.3	4.8 J	21.5	13.6	12.4	14	14.5	N/A
Silver	mg/kg	5,800	2.9 J	2.4 U	3.1 U	2 U	3.3 U	14.3	22.5	24.2	10.8 J	15.6 J	7.4 J	10.7 J	4.5 J	4.4 J	N/A
Vanadium	mg/kg	5,800	630	121	324 J	1,060 J	228 J	106 J	462 J	564 J	30.8 J	302 J	212 J	60 J	147 J	145 J	N/A
Zinc	mg/kg	350,000	29.8	236	208	1,250	308	62,400	220 J	151 J	48.2	613	1,160	567	299	275	N/A
Other																	
Cyanide, Total	mg/kg	150	0.65 U	0.59 U	0.18 J	0.49 J	0.28 J	0.72 U	0.53 J	1 U	0.84 J-	0.45 J-	0.41 J-	0.5 J-	1.1 UJ	0.95 UJ	N/A

Detections in bold

N/A: This parameter was not analyzed for this sample

Values in red indicate an exceedance of the Project Action Limit (PAL)

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.

UJ: This analyte was not detected in the sample. The quantitation/detection limit may be higher than reported.

B: The analyte was not detected substantially above the level of the associated method blank or field blank.

J-: The positive result for this analyte is a quantitative estimate but may be biased low.

J: The positive result for this analyte is a quantitative estimate.

A4-013-SB has been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013-SB (original)		A4-013-SB		A4-013A-SB		A4-013B-SB		A4-013C-SB		A4-013D-SB	
Sample Date	11/5/2016		12/8/2016		12/8/2016		12/8/2016		12/8/2016		12/8/2016	
Included In SLRA?	No		No		Yes		Yes		Yes		Yes	
Depth (ft)	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag
1	1.4	B					1.2	J				
2									1.3		22	
3					72.3				7.5			
4	33,600		0.51	J			0.72	J			4	
5			101						11.9			
6					13.7						11.8	
7					0.77	J						
8												
9												
10												

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013E-SB		A4-013F-SB		A4-013G-SB		A4-013H-SB		A4-013I-SB		A4-013J-SB	
Sample Date	12/8/2016		12/8/2016		12/8/2016		12/8/2016		12/8/2016		12/8/2016	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag
1			1.2	J			1.3	B				
2					4						4.3	
3	6.3								13.2			
4					4.5		3.3		0.59	B	10.1	
5			46.9						0.98	J		
6	6.8				2.3		3.9					
7	8.3											
8			61									
9												
10												

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013K-SB		A4-013L-SB		A4-013M-SB		A4-013N-SB		A4-013O-SB		A4-013P-SB	
Sample Date	12/8/2016		12/9/2016		12/9/2016		12/9/2016		12/9/2016		12/9/2016	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag
1			1.1	J					0.41	J		
2					1.1	J	0.64	J				
3	0.83	J	4.3				0.92	J	0.83	J		
4											8.1	
5	6.2				49.5		4.9				6.1	
6			7.1						8.9			
7					5.8						1.7	
8												
9												
10												

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013Q-SB		A4-013R-SB		A4-013S-SB		A4-013T-SB		A4-013U-SB		A4-013V-SB	
Sample Date	12/9/2016		12/9/2016		12/9/2016		12/9/2016		12/9/2016		12/9/2016	
Included In SLRA?	No		Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag
1	1	J					0.74	B			5	
2			2.6				5		12.4			
3					54.5				14.9		8	
4	15.5											
5			1.8		0.86	B					0.85	J
6	20,100		1	J	16				36.2			
7							39.3					
8												
9												
10												

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013W-SB		A4-013X-SB		A4-013Y-SB		A4-013Z-SB		A4-013AA-SB		A4-013BB-SB	
Sample Date	12/9/2016		12/9/2016		12/9/2016		12/9/2016		12/9/2016		12/9/2016	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag
1							6.1		2.9			
2			2.7									
3	3										4.7	
4					51		35.7					
5									37.9			
6	13.8		5.7		1.3							
7					4.1						2.8	
8									9.8		1.6	
9												
10												

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013CC-SB		A4-013DD-SB		A4-013EE-SB		A4-013FF-SB		A4-013GG-SB		A4-013HH-SB	
Sample Date	12/9/2016		12/12/2016		12/12/2016		12/12/2016		12/12/2016		12/12/2016	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag
1	1.2	J	1.5	B			1.4	B				
2					2.9				0.53			
3			1.4	B							0.84	B
4	3.9				1.8		9.1				317	
5									3.9			
6	1.2	B	81.7						6.2			
7					1.5	B					4.8	
8							12.7					
9												
10												

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013II-SB		A4-013JJ-SB		A4-013KK-SB		A4-013LL-SB		A4-013MM-SB		A4-013NN-SB	
Sample Date	12/12/2016		12/12/2016		12/12/2016		12/12/2016		12/12/2016		12/12/2016	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag
1			1.1	B	0.85	B			1.7	B		
2	1.4	B					8.7				0.94	B
3					8							
4	4		14.2						1.1	B		
5							27					
6											14.7	
7					5.9							
8												
9											6.2	
10												

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013OO-SB		A4-013PP-SB		A4-013QQ-SB		A4-013RR-SB		A4-013SS-SB		A4-013TT-SB	
Sample Date	12/12/2016		12/12/2016		12/12/2016		12/12/2016		12/12/2016		12/12/2016	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag
1							10.7					
2			50.5						10.4			
3	10.1		1.7	B							8.4	
4	9.8											
5					52.3		69.4		52.6			
6					25.8							
7	0.54	B			38.6						139	
8			7.9				28.9					
9									2.1		2	
10												

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013UU-SB		A4-013VV-SB		A4-013WW-SB		A4-013XX-SB		A4-013YY-SB	
Sample Date	12/12/2016		12/20/2016		12/20/2016		12/20/2016		12/20/2016	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag	Result (mg/kg)	Flag
1	4.6		0.2	B	3.9		0.69	B	1.4	B
2	5.5									
3	28.5		3.6						1.2	U
4										
5			6.4		1.8	U	2.3		21.6	
6										
7							1.4	U		
8					1.2	U				
9										
10										

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013ZZ-SB		A4-013AAA-SB-1		A4-013BBB-SB		A4-013CCC-SB		A4-013DDD-SB	
Sample Date	12/20/2016		12/20/2016		12/20/2016		12/20/2016		12/20/2016	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Result (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Result (mg/kg)	Flag	Results (mg/kg)	Flag
1	1.5	B	0.71	B	1	B	1.4		0.54	J
2										
3							11.1			
4										
5	3.2		1.2	U	48.5		1	J	0.26	J
6										
7					9				7	
8	0.73	B	2.2							
9										
10										

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013EEE-SB		A4-013FFF-SB		A4-013GGG-SB		A4-013HHH-SB		A4-013III-SB	
Sample Date	12/20/2016		12/20/2016		12/20/2016		12/20/2016		12/20/2016	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag
1	0.37	J	1.2	U	0.33	J	2.2		0.56	B
2										
3							1.2	U		
4										
5	0.44	J	2.8		1.3	U	1.4	U	3.7	
6										
7			9.1						2.9	
8	1	J			56.7					
9										
10										

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-013JJJ-SB		A4-013KKK-SB		A4-013LLL-SB		A4-013MMM-SB		A4-013NNN-SB	
Sample Date	12/20/2016		12/20/2016		12/20/2016		12/20/2016		12/20/2016	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag
1	0.99	B	0.62	B	1.2	U	1.3	U	0.26	B
2										
3										
4										
5	0.85	B	0.38	B	0.54	J	1.3	U	0.35	B
6										
7	99.1				0.39	J	0.19	B		
8			0.21	B						
9									2.8	
10										

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-N-1		A4-N-2		A4-N-3		A4-N-4		A4-N-5	
Sample Date	10/3/2019		10/3/2019		10/3/2019		10/3/2019		10/3/2019	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag
1										
2										
3										
4	29.1		1.8		12.6		1.2	U		
5										
6										
7										
8									33.9	
9										
10										

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 2B - Sub-Parcel A4-2
Delineation and Confirmation Soil Sample Cadmium Results**

Boring ID	A4-S-6		A4-S-7		A4-S-8		A4-S-9		A4-S-10	
Sample Date	10/3/2019		10/3/2019		10/3/2019		10/3/2019		10/3/2019	
Included In SLRA?	Yes		Yes		Yes		Yes		Yes	
Depth (ft)	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag	Results (mg/kg)	Flag
1										
2										
3	48.1		484		19.2		17.1			
4										
5										
6									74.6	
7										
8										
9										
10										

Grey cells indicate that analytical data is not available (collected/analyzed) at this depth

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit

J: The positive result reported for this analyte is a quantitative estimate

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank

Sample locations have been excavated due to elevated levels of cadmium and is not included in the SLRA

**Table 3 - Sub-Parcel A4-2
Summary of Organics Detected in Groundwater**

Parameter	Units	PAL	A4-012-PZ 11/10/2015	A4-013-PZ 11/11/2015	HI04-PZM006 10/16/2017	HI19-MWS 2/16/2022
Volatile Organic Compounds						
2-Butanone (MEK)	µg/L	5,600	10 U	10 U	936	0.75 U
Acetone	µg/L	14,000	10 U	10 U	1,080	5 U
Benzene	µg/L	5.0	2.1	1 U	1 U	8.8
Bromomethane	µg/L	7.5	1 U	1 U	1.3	1 U
Ethylbenzene	µg/L	700	0.56 J	1 U	1 U	0.5 U
Toluene	µg/L	1,000	1.6	0.31 J	1 U	3.0
Xylenes	µg/L	10,000	3.6	3 U	3 U	2 J
Semi-Volatile Organic Compounds*						
1,1-Biphenyl	µg/L	0.83	0.39 J	1 U	0.98 U	2 U
2,3,4,6-Tetrachlorophenol	µg/L	240	0.33 J	1 U	0.98 U	5 U
2,4-Dimethylphenol	µg/L	360	1.2	1 U	3.1	6.4
2-Methylnaphthalene	µg/L	36	2.9	0.064 J	0.098 U	1.9
2-Methylphenol	µg/L	930	0.3 J	1 U	0.26 J	5 U
3&4-Methylphenol(m&p Cresol)	µg/L	930	1.4 J	2 U	0.26 J	3.1 J
Acenaphthene	µg/L	530	2.3	0.056 J	0.63	0.38
Acenaphthylene	µg/L	530	0.41	0.02 J	0.098 U	0.26
Anthracene	µg/L	1,800	0.6	0.057 J	0.24	0.17
Benz[a]anthracene	µg/L	0.012	0.067 J	0.024 J	0.098 U	0.07
Benzo[a]pyrene	µg/L	0.20	0.0082 J	0.0097 J	0.098 U	0.04 J
Benzo[b]fluoranthene	µg/L	0.034	0.026 J	0.1 U	0.098 U	0.05
Benzo[k]fluoranthene	µg/L	0.34	0.023 J	0.1 U	0.098 U	0.02 J
Benzaldehyde	µg/L	1,900	1 U	1 U	0.76 J	5 U
bis(2-Ethylhexyl)phthalate	µg/L	6.0	0.26 J	1 U	0.41 J	3 U
Carbazole	µg/L		4.7	1 U	0.98 U	0.64 J
Chrysene	µg/L	3.4	0.067 J	0.011 J	0.098 U	0.05 J
Di-n-ocylphthalate	µg/L	200	1 U	1 U	0.18 J	5 U
Fluoranthene	µg/L	800	0.77	0.054 J	0.082 J	0.38
Fluorene	µg/L	290	2.3	0.085 J	0.096 J	0.56
Naphthalene	µg/L	0.12	63.9	0.28	0.15	18.0
Pentachlorophenol	µg/L	1.0	2.6	2.5 U	2.5 U	10 U
Phenanthrene	µg/L		4.4	0.17	0.038 J	0.89
Phenol	µg/L	5,800	1 U	1 U	0.1 J	0.83 J
Pyrene	µg/L	120	0.51	0.047 J	0.076 J	0.27
TPH						
Diesel Range Organics	µg/L	47	N/A	N/A	1,570	N/A

Detection in bold

Values in red indicate an exceedance of the Project Action Limit (PAL)

*PAH compounds were analyzed via SIM

N/A: this parameter was not analyzed for this sample

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.

J: The positive result for this analyte is a quantitative estimate.

**Table 4 - Sub-Parcel A4-2
Summary of Inorganics Detected in Groundwater**

Parameter	Units	PAL	A4-012-PZ 11/10/2015	A4-013-PZ 11/11/2015	HI04-PZM006 10/16/2017	HI19-MWS 2/16/2022
Metals, Total						
Aluminum	µg/L	20,000	N/A	N/A	461	N/A
Arsenic	µg/L	10	N/A	N/A	3.1 J	N/A
Barium	µg/L	2,000	N/A	N/A	208	N/A
Cadmium	µg/L	5.0	N/A	N/A	0.92 J	N/A
Chromium	µg/L	100	N/A	N/A	23.7	N/A
Copper	µg/L	1,300	N/A	N/A	3.5 J	N/A
Iron	µg/L	14,000	N/A	N/A	7,260	N/A
Lead	µg/L	15	N/A	N/A	9.3	N/A
Manganese	µg/L	430	N/A	N/A	1,700	N/A
Nickel	µg/L	390	N/A	N/A	4.5 J	N/A
Vanadium	µg/L	86	N/A	N/A	9.3	N/A
Zinc	µg/L	6,000	N/A	N/A	108	N/A
Metals, Dissolved						
Aluminum, Dissolved	µg/L	20,000	677	31.3 J	817	N/A
Arsenic, Dissolved	µg/L	10	5.0	5 U	5 U	N/A
Barium, Dissolved	µg/L	2,000	38.1	29.2	208	N/A
Chromium, Dissolved	µg/L	100	1 B	0.91 B	30.3	N/A
Copper, Dissolved	µg/L	1,300	1.5 B	5 U	4 J	N/A
Iron, Dissolved	µg/L	14,000	22.3 B	326	7,810	N/A
Lead, Dissolved	µg/L	15	5 U	5 U	7.9	N/A
Manganese, Dissolved	µg/L	430	0.88 B	282	1,660	N/A
Nickel, Dissolved	µg/L	390	10 U	10 U	5.7 J	N/A
Vanadium, Dissolved	µg/L	86	630	63.7	9.9	N/A
Zinc, Dissolved	µg/L	6,000	10 U	10 U	116	N/A
Other						
Cyanide, Available	µg/L	200	N/A	N/A	4.5	N/A
Cyanide, Total	µg/L	200	20.6	4.9 J	8.3 J	N/A

Detections in bold

Values in red indicate an exceedance of the Project Action Limit (PAL)

N/A: this parameter was not analyzed for this sample

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.

B: This analyte was not detected substantially above the level of the associated method blank or field blank.

J: The positive result for this analyte is a quantitative estimate.

**Table 5 - Sub-Parcel A4-2
Cumulative Vapor Intrusion Comparison**

				A4-012-PZ		A4-013-PZ		HI04-PZM006		HI19-MWS	
				11/10/2015		11/11/2015		10/16/2017		2/16/2022	
Parameter	Type	Organ Systems	VI Screening Criteria (ug/L)	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard
Cancer Risk											
Benzene	VOC	Immune	69	2.1	3.04E-07	1 U	0	1 U	0	8.8	1.28E-06
Ethylbenzene	VOC	Developmental; Hepatic; Urinary	150	0.56 J	3.73E-08	1 U	0	1 U	0	0.5 U	0
Naphthalene	SVOC	Nervous; Respiratory	200	63.9	3.20E-06	0.28	1E-08	0.15	7.5E-09	18	9E-07
Cumulative Vapor Intrusion Cancer Risk				4E-06		1E-08		8E-09		2E-06	
Non-Cancer Risk											
Cyanide, Available		Reproductive	3.5	N/A	0	N/A	0	4.5	1.29	N/A	0
Cyanide, Total		Reproductive	3.5	20.6	5.89	4.9 J	1.40	N/A	0	N/A	0
Cumulative Vapor Intrusion Non-Cancer Hazard				6		1		1		0	

Yellow highlighted values indicate exceedances of the cumulative vapor intrusion criteria: TCR>1E-05 or THI>1
Conc. = Concentration

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
J: The positive result reported for this analyte is a quantitative estimate.

**Table 6 - Sub-Parcel A4-2
COPC Screening Analysis**

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
1,1-Biphenyl	92-52-4	A4-012-SB-5	0.079	J	0.019	0.05	13	23.08	410	20	no
1,2-Dichlorobenzene	95-50-1	A4-012-SB-1	0.0021	J	0.0021	0.002	4	25.00		930	no
2-Butanone (MEK)	78-93-3	A4-012-SB-5	0.0058	J	0.0037	0.004	4	100.00		19,000	no
2-Methylnaphthalene	91-57-6	B14-026-SB-8.5	2.5		0.005	0.54	12	41.67		300	no
Acenaphthene	83-32-9	B14-026-SB-8.5	11.4		0.00087	1.283	12	75.00		4,500	no
Acenaphthylene	208-96-8	B14-026-SB-8.5	0.39		0.002	0.087	12	83.33			no
Acetone	67-64-1	A4-011-SB-5	0.046	J	0.029	0.04	4	100.00		67,000	no
Acetone	67-64-1	A4-012-SB-5	0.046	J	0.029	0.04	4	100.00		67,000	no
Acetophenone	98-86-2	A4-012-SB-5	0.037	J	0.031	0.03	13	15.38		12,000	no
Aluminum	7429-90-5	B14-025-SB-1	43,400		4,700	17,562	12	100.00		110,000	no
Anthracene	120-12-7	B14-026-SB-8.5	2.9		0.0046	0.37	12	83.33		23,000	no
Antimony	7440-36-0	B14-003-SB-5	4.4	J	1.7	3.05	12	16.67		47	no
Aroclor 1254	11097-69-1	B14-003-SB-1	0.097	J	0.097	0.10	6	16.67	0.97	1.5	no
Aroclor 1260	11096-82-5	B14-027-SB-1	0.092	J	0.08	0.09	6	33.33	0.99		no
Arsenic	7440-38-2	A4-012-SB-5	9.4		2.2	5.03	13	92.31	3	48	YES (C)
Barium	7440-39-3	B14-025-SB-1	461	J	41.5	178	12	100.00		22,000	no
Benz[a]anthracene	56-55-3	A4-012-SB-5	1.5		0.0026	0.39	12	100.00	21		no
Benz[a]anthracene	56-55-3	B14-026-SB-8.5	2		0.003	0.39	12	100.00	21		no
Benzaldehyde	100-52-7	A4-011-SB-5	0.057	J	0.018	0.04	3	100.00	820	12,000	no
Benzo[a]pyrene	50-32-8	A4-012-SB-5	1.5		0.057	0.43	12	91.67	2.1	22	no
Benzo[b]fluoranthene	205-99-2	B14-026-SB-8.5	2.6		0.011	0.73	12	100.00	21		no
Benzo[g,h,i]perylene	191-24-2	A4-012-SB-5	0.85		0.0039	0.24	12	100.00			no
Benzo[k]fluoranthene	207-08-9	B14-026-SB-8.5	2		0.009	0.49	12	100.00	210		no
Beryllium	7440-41-7	B14-025-SB-1	7.5		1	2.53	12	66.67	6,900	230	no
Cadmium	7440-43-9	A4-S-7	484		0.26	17.9	206	79.61	9,300	98	YES (C/NC)
Carbazole	86-74-8	A4-012-SB-5	0.27	J	0.16	0.22	13	15.38			no
Chromium	7440-47-3	A4-011-SB-1	1,810		31.3	464	12	100.00		180,000	no

**Table 6 - Sub-Parcel A4-2
COPC Screening Analysis**

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
Chromium VI	18540-29-9	A4-011-SB-1	15.1		11.6	13.4	12	16.67	6.3	350	YES (C)
Chrysene	218-01-9	A4-012-SB-5	1.5		0.0072	0.39	12	100.00	2100		no
Chrysene	218-01-9	B14-026-SB-8.5	1.5		0.0072	0.39	12	100.00	2,100		no
Cobalt	7440-48-4	A4-012-SB-5	14.2		0.89	6.46	12	83.33	1,900	35	no
Copper	7440-50-8	A4-011-SB-5	72.4	J	5.1	33.9	12	100.00		4,700	no
Cyanide	57-12-5	B14-025-SB-1	0.84	J-	0.18	0.49	12	58.33		120	no
Cyclohexane	110-82-7	A4-012-SB-5	0.0017	J	0.00072	0.001	4	50.00		2,700	no
Dibenz[a,h]anthracene	53-70-3	A4-012-SB-5	0.39		0.011	0.10	12	83.33	2		no
Ethylbenzene	100-41-4	A4-011-SB-1	0.005	J	0.005	0.01	4	25.00	25	2,000	no
Fluoranthene	206-44-0	B14-026-SB-8.5	6.1		0.012	0.91	12	100.00		3,000	no
Fluorene	86-73-7	B14-026-SB-8.5	3.7		0.00074	0.43	12	75.00		3,000	no
Indeno[1,2,3-c,d]pyrene	193-39-5	A4-012-SB-5	1		0.039	0.27	12	83.33	21		no
Iron	7439-89-6	A4-011-SB-1	177,000		20100	69,450	12	100.00		82,000	YES (NC)
Lead^	7439-92-1	B14-026-SB-8.5	393	J	3.4	123	12	100.00		800	no
Manganese	7439-96-5	A4-011-SB-1	35,800		1340	9,800	12	100.00		2,600	YES (NC)
Mercury	7439-97-6	B14-026-SB-8.5	1	J	0.017	0.17	12	75.00		35	no
Naphthalene	91-20-3	B14-026-SB-8.5	1.3		0.0083	0.23	12	75.00	8.6	59	no
Nickel	7440-02-0	A4-012-SB-5	35.8		4.8	15.95	12	100.00	64,000	2,200	no
PCBs (total)*	1336-36-3	B14-027-SB-1	0.092	J	0.08	0.09	6	33.33	0.94		no
Phenanthrene	85-01-8	B14-026-SB-8.5	4.8		0.022	0.72	12	83.33			no
Phenol	108-95-2	A4-012-SB-5	0.031	J	0.031	0.03	11	9.09		25,000	no
Pyrene	129-00-0	B14-026-SB-8.5	4.3		0.0065	0.72	12	100.00		2,300	no
Silver	7440-22-4	B14-003-SB-5	24.2		2.9	11.4	12	75.00		580	no
Toluene	108-88-3	A4-011-SB-1	0.08		0.08	0.08	4	25.00		4,700	no
Vanadium	7440-62-2	A4-012-SB-5	1,060	J	31	338	12	100.00		580	YES (NC)
Xylenes	1330-20-7	A4-011-SB-1	0.028	J	0.028	0.03	4	25.00		250	no
Zinc	7440-66-6	A4-012-SB-5	1,250		29.8	421	12	100.00		35,000	no

J: The positive result reported for this analyte is a quantitative estimate.

J-: The positive result reported for this analyte is a quantitative estimate, but may be biased low.

COPC = Constituent of Potential Concern

C = Compound was identified as a cancer COPC

TR = Target Risk

NC = Compound was identified as a non-cancer COPC

HQ = Hazard Quotient

*PCBs (total) include the sum of all detected aroclor mixtures, including those without RSLs (e.g. Aroclor 1262, Aroclor 1268) which are not displayed.

^Lead is assessed separately through the ALM and IEUBK models.

**Table 7 - Sub-Parcel A4-2
Assessment of Lead**

Exposure Unit	Surface/Sub-Surface	Maximum Concentration (mg/kg)	Arithmetic Mean (mg/kg)
EU1 (8.05 ac.)	Surface	111	40.4
	Sub-Surface	393	248
	Pooled	393	144
EU1-EXP (11.8 ac.)	Surface	162	65.8
	Sub-Surface	393	179
	Pooled	393	123

**Table 8 - Sub-Parcel A4-2
Soil Exposure Point Concentrations**

Parameter	EU1 (8.05 ac.)					
	EPCs - Surface Soils		EPCs - Sub-Surface Soils		EPCs - Pooled Soils	
	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)
Arsenic	Maximum Value	5.90	Maximum Value	8.20	Maximum Value	8.20
Cadmium	95% H-UCL	3.68	KM H-UCL	32.1	KM H-UCL	20.3
Chromium VI	Maximum Value	15.1	Maximum Value	1.10	Maximum Value	15.1
Iron	Maximum Value	177,000	Maximum Value	98,700	Maximum Value	177,000
Manganese	Maximum Value	35,800	Maximum Value	10,800	Maximum Value	35,800
Vanadium	Maximum Value	630	Maximum Value	302	Maximum Value	630

Bold indicates maximum value used as the EPC

**Table 8 - Sub-Parcel A4-2
Soil Exposure Point Concentrations**

Parameter	EU1-EXP (11.8 ac.)					
	EPCs - Surface Soils		EPCs - Sub-Surface Soils		EPCs - Pooled Soils	
	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)
Arsenic	Maximum Value	5.90	Maximum Value	11.7	95% KM (t) UCL	5.90
Cadmium	KM H-UCL	3.76	KM H-UCL	31.0	KM H-UCL	19.0
Chromium VI	Maximum Value	15.1	Maximum Value	11.6	Maximum Value	15.1
Iron	Maximum Value	177,000	Maximum Value	124,000	95% Student's-t UCL	94,343
Manganese	Maximum Value	35,800	Maximum Value	17,700	95% Student's-t UCL	15,010
Vanadium	Maximum Value	630	Maximum Value	1,060	95% Student's-t UCL	493

Bold indicates maximum value used as the EPC

**Table 9 - Sub-Parcel A4-2
Surface Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	EU1 (8.05 ac.)				
		EPC (mg/kg)	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	5.90	3.00	480	2.0E-06	0.01
Cadmium	Urinary	3.68	9,300	980	4.0E-10	0.004
Chromium VI	Respiratory	15.1	6.30	3,500	2.4E-06	0.004
Iron	Gastrointestinal	177,000		820,000		0.2
Manganese	Nervous	35,800		26,000		1
Vanadium	Dermal	630		5,800		0.1
					4E-06	↓

RSLs were obtained from the EPA Regional Screening Levels at
https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Bold indicates maximum value

EPC: Exposure Point Concentration

HQ: Hazard Quotient

HI: Hazard Index

Total HI	Cardiovascular	0
	Dermal	0
	Gastrointestinal	0
	Nervous	1
	Urinary	0
	Respiratory	0

**Table 10 - Sub-Parcel A4-2
Subsurface Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	EU1 (8.05 ac.)				
		EPC (mg/kg)	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	8.20	3.00	480	2.7E-06	0.02
Cadmium	Urinary	32.1	9,300	980	3.5E-09	0.03
Chromium VI	Respiratory	1.10	6.30	3,500	1.7E-07	0.0003
Iron	Gastrointestinal	98,700		820,000		0.1
Manganese	Nervous	10,800		26,000		0.4
Vanadium	Dermal	302		5,800		0.1
					3E-06	↓

RSLs were obtained from the EPA Regional Screening Levels at
https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Bold indicates maximum value

EPC: Exposure Point Concentration

HQ: Hazard Quotient

HI: Hazard Index

Total HI	Cardiovascular	0
	Dermal	0
	Gastrointestinal	0
	Nervous	0
	Urinary	0
	Respiratory	0

**Table 11 - Sub-Parcel A4-2
Pooled Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	EU1 (8.05 ac.)				
		EPC (mg/kg)	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	8.20	3.00	480	2.7E-06	0.02
Cadmium	Urinary	20.3	9,300	980	2.2E-09	0.02
Chromium VI	Respiratory	15.1	6.30	3,500	2.4E-06	0.004
Iron	Gastrointestinal	177,000		820,000		0.2
Manganese	Nervous	35,800		26,000		1
Vanadium	Dermal	630		5,800		0.1
					5E-06	↓

RSLs were obtained from the EPA Regional Screening Levels at
https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Bold indicates maximum value

EPC: Exposure Point Concentration

HQ: Hazard Quotient

HI: Hazard Index

Total HI	Cardiovascular	0
	Dermal	0
	Gastrointestinal	0
	Nervous	1
	Urinary	0
	Respiratory	0

**Table 12 - Sub-Parcel A4-2
Surface Soils
Construction Worker Risk Ratios**

40 Day		EU1-EXP (11.8 ac.)				
Parameter	Target Organs	EPC (mg/kg)	Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	5.90	94.5	598	6.2E-08	0.01
Cadmium	Urinary	3.76	90,328	1,820	4.2E-11	0.002
Chromium VI	Respiratory	15.1	131	4,992	1.2E-07	0.003
Iron	Gastrointestinal	177,000		1,503,383		0.1
Manganese	Nervous	35,800		24,054		1
Vanadium	Dermal	630		9,836		0.06
					2E-07	↓

SSLs calculated using equations in 2002 EPA Supplemental Guidance

Guidance Equation Input Assumptions:

5 cars/day (2 tons/car)

5 trucks/day (20 tons/truck)

3 meter source depth thickness

EPC: Exposure Point Concentration

HQ: Hazard Quotient

HI: Hazard Index

Total HI	Cardiovascular	0
	Dermal	0
	Gastrointestinal	0
	Nervous	1
	Urinary	0
	Respiratory	0

**Table 13 - Sub-Parcel A4-2
Subsurface Soils
Construction Worker Risk Ratios**

40 Day		EU1-EXP (11.8 ac.)				
Parameter	Target Organs	EPC (mg/kg)	Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	11.7	94.5	598	1.2E-07	0.02
Cadmium	Urinary	31.0	90,328	1,820	3.4E-10	0.02
Chromium VI	Respiratory	11.6	131	4,992	8.9E-08	0.002
Iron	Gastrointestinal	124,000		1,503,383		0.08
Manganese	Nervous	17,700		24,054		0.7
Vanadium	Dermal	1,060		9,836		0.1
					2E-07	↓

SSLs calculated using equations in 2002 EPA Supplemental Guidance

Guidance Equation Input Assumptions:

5 cars/day (2 tons/car)

5 trucks/day (20 tons/truck)

3 meter source depth thickness

EPC: Exposure Point Concentration

HQ: Hazard Quotient

HI: Hazard Index

Total HI	Cardiovascular	0
	Dermal	0
	Gastrointestinal	0
	Nervous	1
	Urinary	0
	Respiratory	0

**Table 14 - Sub-Parcel A4-2
Pooled Soils
Construction Worker Risk Ratios**

40 Day		EU1-EXP (11.8 ac.)				
Parameter	Target Organs	EPC (mg/kg)	Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	5.90	94.5	598	6.2E-08	0.01
Cadmium	Urinary	19.0	90,328	1,820	2.1E-10	0.01
Chromium VI	Respiratory	15.1	131.00	4,992	1.2E-07	0.003
Iron	Gastrointestinal	94,343		1,503,383		0.06
Manganese	Nervous	15,010		24,054		0.6
Vanadium	Dermal	493		9,836		0.05
					2E-07	↓

SSLs calculated using equations in 2002 EPA Supplemental Guidance

Guidance Equation Input Assumptions:

5 cars/day (2 tons/car)

5 trucks/day (20 tons/truck)

3 meter source depth thickness

EPC: Exposure Point Concentration

HQ: Hazard Quotient

HI: Hazard Index

Total HI	Cardiovascular	0
	Dermal	0
	Gastrointestinal	0
	Nervous	1
	Urinary	0
	Respiratory	0

APPENDIX A



**TRADEPOINT
ATLANTIC**

1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

March 23, 2022

Maryland Department of Environment
1800 Washington Boulevard
Baltimore MD, 21230

Attention: Ms. Barbara Brown

Subject: Request to Enter Temporary CHS Review
Tradepoint Atlantic Parcel A4-2

Dear Ms. Brown:

The conduct of any environmental assessment and cleanup activities on the Tradepoint Atlantic property, as well as any associated development, is subject to the requirements outlined in the following agreements:

- Administrative Consent Order (ACO) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the Maryland Department of the Environment (effective September 12, 2014); and
- Settlement Agreement and Covenant Not to Sue (SA) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the United States Environmental Protection Agency (effective November 25, 2014).

On September 11, 2014, Tradepoint Atlantic submitted an application to the Maryland Department of the Environment's (Department) Voluntary Cleanup Program (VCP).

In consultation with the Department, Tradepoint Atlantic affirms that it desires to accelerate the assessment, remediation, and redevelopment of certain sub-parcels within the larger site due to current market conditions. To that end, the Department and Tradepoint Atlantic agree that the Controlled Hazardous Substance (CHS) Act (Section 7-222 of the Environment Article) and the CHS Response Plan (COMAR 26.14.02) shall serve as the governing statutory and regulatory authority for completing the development activities on Parcel A4-2 and complement the statutory requirements of the Voluntary Cleanup Program (Section 7-501 of the Environment Article). Upon submission of a Site Response and Development Work Plan and completion of the remedial activities for the sub-parcel, the Department shall issue a "No Further Action" letter upon a recordation of an environmental covenant describing any necessary land use controls for the specific sub-parcel. At such time that all the sub-parcels within the larger parcel have completed remedial activities, Tradepoint Atlantic shall submit to the Department a request for issuing a Certificate of Completion (COC) as well as all pertinent information concerning completion of remedial activities conducted on the parcel. Once the VCP has completed its review of the



submitted information it shall issue a COC for the entire parcel described in Tradepoint Atlantic's VCP application.

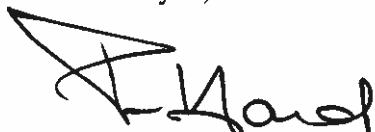
Alternatively, Tradepoint Atlantic, or another entity may elect to submit an application for a specific sub-parcel and submit it to the VCP for review and acceptance. If the application is received after the cleanup and redevelopment activities described in this work plan are implemented and a No Further Action letter is issued by the Department pursuant to the CHS Act, the VCP shall prepare a No Further Requirements Determination for the sub-parcel.

If Tradepoint Atlantic or other entity has not carried out cleanup and redevelopment activities described in the work plan, the cleanup and redevelopment activities may be conducted under the oversight authority of either the VCP or the CHS Act, so long as those activities comport with this work plan.

Engineering and institutional controls approved as part of this Site Response and Development Work Plan shall be described in documentation submitted to the Department demonstrating that the exposure pathways on the sub-parcel are addressed in a manner that protects public health and the environment. This information shall support Tradepoint Atlantic's request for the issuance of a COC for the larger parcel.

Please do not hesitate to contact Tradepoint Atlantic for further information.

Thank you,



Peter Haid

Vice President Environmental
TRADEPOINT ATLANTIC
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219
T 443.649.5055 C 732.841.7935
phaid@tradepointatlantic.com

APPENDIX B

**Construction Worker Soil Screening Levels
Maximum Allowable Work Day Exposure
Calculation Spreadsheet - Sub-Parcel A4-2**

Description	Variable	Value
Days worked per week	DW	5
Exposure duration (yr)	ED	1
Hours worked per day	ET	8
A/constant (unitless) - particulate emission factor	Aconst	12.9351
B/constant (unitless) - particulate emission factor	Bconst	5.7383
C/constant (unitless) - particulate emission factor	Cconst	71.7711
Dispersion correction factor (unitless)	FD	0.185
Days per year with at least .01" precipitation	P	130
Target hazard quotient (unitless)	THQ	1
Body weight (kg)	BW	80
Averaging time - noncancer (yr)	ATnc	1
Soil ingestion rate (mg/d)	IR	330
Skin-soil adherence factor (mg/cm ²)	AF	0.3
Skin surface exposed (cm ²)	SA	3300
Event frequency (ev/day)	EV	1
Target cancer risk (unitless)	TR	01E-06
Averaging time - cancer (yr)	ATc	70
A/constant (unitless) - volatilization	Aconstv	2.4538
B/constant (unitless) - volatilization	Bconstv	17.566
C/constant (unitless) - volatilization	Cconstv	189.0426
Dry soil bulk density (kg/L)	Pb	1.5
Average source depth (m)	ds	3
Soil particle density (g/cm ³)	Ps	2.65
Total soil porosity	Lpore/Lsoil	0.43
Air-filled soil porosity	Lair/Lsoil	0.28

**Construction Worker Soil Screening Levels
Maximum Allowable Work Day Exposure
Calculation Spreadsheet - Sub-Parcel A4-2**

Area of site (ac)	Ac	11.8	→ EU1-EXP
Overall duration of construction (wk/yr)	EW	8	
Exposure frequency (day/yr)	EF	40	
Cars per day	Ca	5	
Tons per car	CaT	2	
Trucks per day	Tru	5	
Tons per truck	TrT	20	
Mean vehicle weight (tons)	w	11	
Derivation of dispersion factor - particulate emission factor (g/m ² -s per kg/m ³)	Q/Csr	15.0	
Overall duration of construction (hr)	tc	1,344	
Overall duration of traffic (s)	Tt	1,152,000	
Surface area (m ²)	AR	47,753	
Length (m)	LR	219	
Distance traveled (km)	ΣVKT	87	
Particulate emission factor (m ³ /kg)	PEFsc	84,848,482	
Derivation of dispersion factor - volatilization (g/m ² -s per kg/m ³)	Q/Csa	8.19	
Total time of construction (s)	Tcv	1,152,000	

Input
Calculation

Chemical	RfD & RfC Sources	¹ Ingestion SF (mg/kg-day)	¹ Inhalation Unit Risk (ug/m ³) ⁻¹	¹ Subchronic RfD (mg/kg-day)	¹ Subchronic RfC (mg/m ³)	¹ GIABS	Dermally Adjusted RfD (mg/kg-day)	¹ ABS	¹ RBA	¹ Dia	¹ Diw	¹ Henry's Law Constant (unitless)	¹ Kd	¹ Koc	DA	Volatilization Factor - Unlimited Reservoir (m ³ /kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				94.7	37,812	94.5	609	34,841	598
Cadmium	A/I	-	1.80E-03	1.00E-03	1.00E-05	0.025	2.50E-05	0.001	1			-	7.50E+01					90,328	90,328	1,975	23,227	1,820
Chromium(VI)	A/C/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	0.01	1			-	1.90E+01			141	1,936	131	5,028	696,818	4,992	
Iron	P	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							1,503,383	1,503,383	
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							30,338	116,136	24,054
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	0.01	1			-	1.00E+03							10,271	232,273	9,836

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at <https://www.epa.gov/risk/regional-screening-levels-rsls>
¹chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search
I: chemical specific parameters found in the IRIS at <https://www.epa.gov/iris>
C: chemical specific parameters found in Cal EPA at <https://www.dtsc.ca.gov/AssessingRisk>
A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf
P: chemical specific parameters found in the Database of EPA PPRTVs at <https://hhprtv.ornl.gov/quickview/pprtv.php>

APPENDIX C

Sparrows Point Development - PPE Standard

Operational Procedure, Revision 3

Planning, Tracking/Supervision, Enforcement, and Documentation

Planning

- Response and Development Work Plan (RDWP) for each individual redevelopment sub-parcel identifies and documents site conditions.
- RDWP is reviewed and approved by regulators.
- Contractor HASP to address site-specific conditions and PPE requirements:
 - Contractor H&S professional to sign-off on PPE requirements for site workers;
 - Job Safety Analysis (JSA) to be performed for ground intrusive work.
- Project Environmental Professional (EP) assigned to each construction project – monitors project during environmentally sensitive project phases and is available to construction contractor on an as needed basis. EP responsibilities include the following:
 - Dust monitoring
 - Routine ground intrusive breathing space air monitoring
 - Soil tracking
 - Water handling oversight
 - Ground intrusive work observation
 - Notification for unexpected conditions
- Pre-construction meeting identifies EP roles and responsibilities and reviews site conditions.
- Contractor to perform job-site HazCom. HazCom to be addressed in Contractor HASP and include:
 - PPE requirements,
 - Exposure time limits,
 - Identification of chemicals of concern and potential effects of over-exposure (adverse reactions),
 - Methods and routes of potential exposure.
- All personnel that will be performing ground intrusive work within impacted soils shall sign-off on HazCom.
- If, based on a thorough review of Site conditions, it is expected that construction workers will have the potential to encounter materials considered hazardous waste under RCRA or DOT regulations, HAZWOPER-trained personnel will be utilized.

Tracking/Supervision

- Contractor to record any day that there is ground intrusive work and confirm that proper PPE is being worn.
- EP will note ground intrusive work on daily work sheets and perform at least one spot check per day.
- EP will log on daily work sheets PPE compliance for all intrusive work areas at least once per day.

- EP to take example photos of Exclusion Zones/Contamination Reduction Zones periodically.

Work Zones Delineation

- Exclusion Zone – The Exclusion Zones will include the areas proposed for excavation or with active trenches, excavations, or ground intrusive work, at a minimum. Personnel working within the exclusion zone will be required to wear Modified Level D PPE as described in this SOP. EP to take example photos of Exclusion Zones/Contamination Reduction Zones periodically. The Exclusion Zones will be identified each work day.
- Contamination Reduction Zone – This work zone is located outside of the exclusion zone, but inside of the limits of development (LOD). The Contamination Reduction Zone will be located adjacent to the Exclusion Zone, and all personal decontamination including removal of all disposable PPE/removal of soil from boots will be completed in the Contamination Reduction Zone.

Documentation

- Contractor HASP and HazCom.
- Contractor ground intrusive tracking record.
- HASP and HazCom sign-in sheets.
- EP pre-con memos.
- EP daily work sheets.
- Records documenting intrusive work and proper PPE use to be provided in completion report.

Enforcement

- Non-compliance of PPE requirements will result in disciplinary action up to and including prohibition from working on Sparrows Point.

Unknown and/or Unexpected Conditions

If unknown and/or unexpected conditions are encountered during the project that the EP determines to have a reasonable potential to significantly impact construction worker health and safety, the following will be initiated:

1. Job stoppage,
2. TPA and MDE notification,
3. Re-assessment of conditions.

Work will not continue until EP has cleared the area. If hazardous waste is identified, a HAZWOPER contractor will be brought in to address. The approved contingency plan will be implemented, where appropriate.

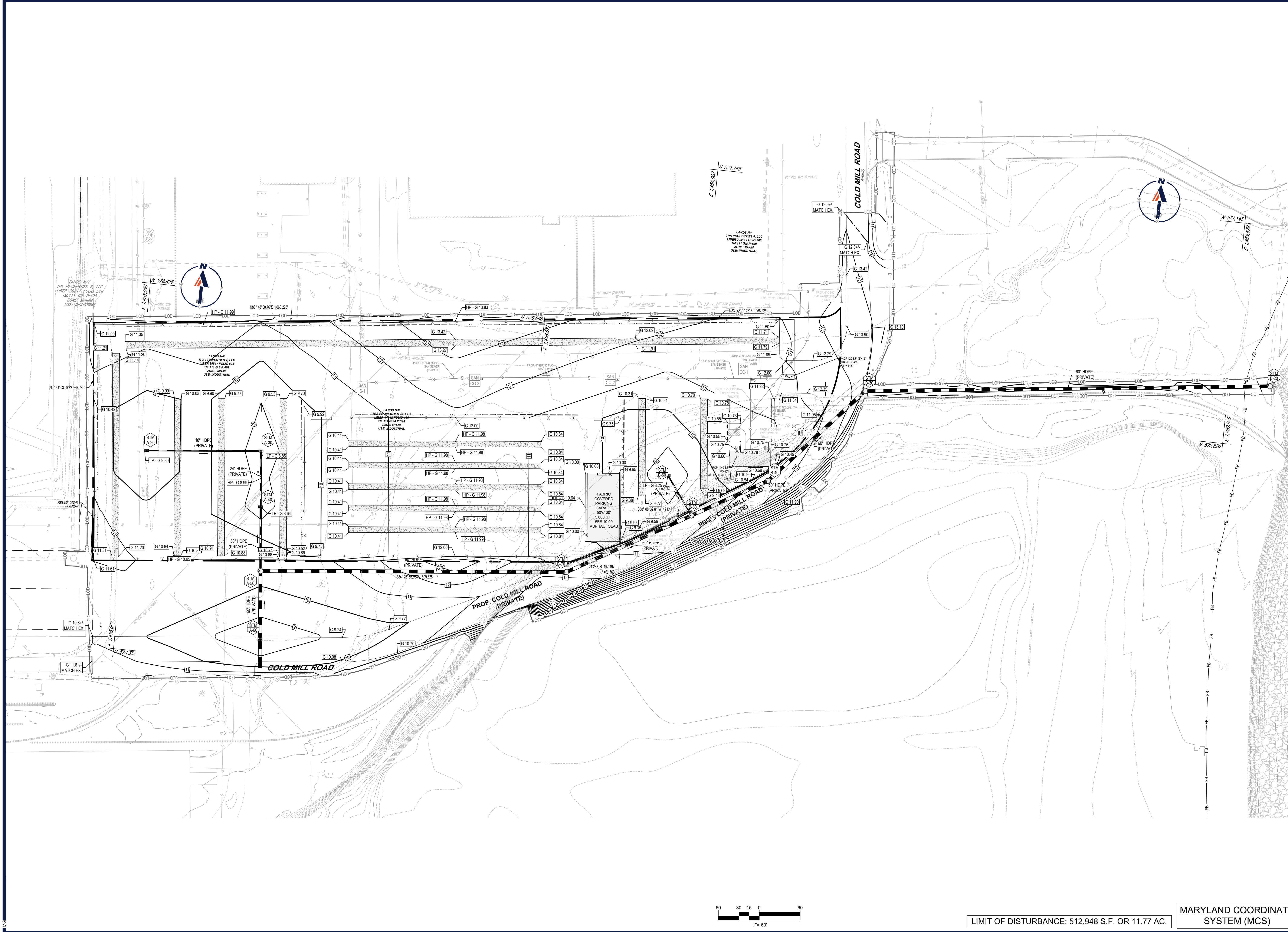
Modified Level D PPE

Modified Level D PPE will include, at a minimum, overalls such as polyethylene-coated Tyvek or clean washable cloth overalls, latex (or similar) disposable gloves (when working in wet/chemical surroundings) or work gloves, steel-toe/steel-shank high ankle work boots with taped chemical-protective over-boots (as necessary), dust mask, hard hat, safety glasses with

side shields, and hearing protection (as necessary). If chemical-protective over-boots create increased slip/trip/fall hazardous, then standard leather or rubber work boots could be used, but visible soils from the sides and bottoms of the boots must be removed upon exiting the Exclusion Zone.

SP Development PPE Procedure 4-3-19

APPENDIX D



REVISIONS

REV	DATE	COMMENT	CHECKED BY	DRAWN BY
1	3/10/22	REV. PER COUNTY COMMENTS	DMD	MJG

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 Know what's below.
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THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT NO.:	MD16206641
DRAWN BY:	MJG
CHECKED BY:	MJG
DATE:	01/28/22
CAD ID:	MD16206641 - SITE - 0

PROJECT
EAST COAST WAREHOUSE (ECW) F.K.A COLD MILL "DROP LOT"
 FOR

TRADEPOINT ATLANTIC
 ECW SCAN YARD
 F.K.A COLD MILL "DROP LOT"
 6151 COLD MILL ROAD
 BALTIMORE, MD 21219
 TM 111, GRID 14 PARCEL 318
 ELECTION DISTRICT 15
 COUNCILMANIC DISTRICT 7
 BALTIMORE COUNTY

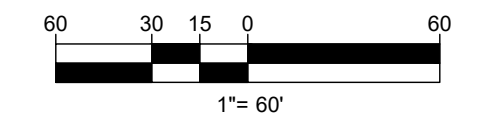
BOHLER
 901 DULANEY VALLEY ROAD, SUITE 801
 TOWSON, MARYLAND 21204
 Phone: (410) 821-7900
 Fax: (410) 821-7987
 MGESELL@BOHLERENG.COM

M.J. GESELL
 PROFESSIONAL ENGINEER
 MARYLAND LICENSE No. 44097
 PROFESSIONAL CERTIFICATION
 I, MICHAEL J. GESELL, HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 44097, EXPIRATION DATE: 6/30/23

SHEET TITLE:
FINAL GRADING PLAN

SHEET NUMBER:
C-401

REVISION 1 - 3/10/22



LIMIT OF DISTURBANCE: 512,948 S.F. OR 11.77 AC.

MARYLAND COORDINATE SYSTEM (MCS)

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

DEFINITION
USING VEGETATION AS COVER TO PROTECT EXPOSED SOIL FROM EROSION.

PURPOSE
TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL.

CONDITIONS WHERE PRACTICE APPLIES
ON ALL DISTURBED AREAS NOT STABILIZED BY OTHER METHODS. THIS SPECIFICATION IS DIVIDED INTO SECTIONS ON INCREMENTAL STABILIZATION, SOIL PREPARATION, SOIL AMENDMENTS AND TOPSOILING, SEEDING AND MULCHING, TEMPORARY STABILIZATION, AND PERMANENT STABILIZATION.

EFFECTS ON WATER QUALITY AND QUANTITY
STABILIZATION PRACTICES ARE USED TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL. WHEN SOIL IS STABILIZED WITH VEGETATION, THE SOIL IS LESS LIKELY TO ERODE AND MORE LIKELY TO ALLOW INFILTRATION OF RAINFALL, THEREBY REDUCING SEDIMENT LOADS AND RUNOFF TO DOWNSTREAM AREAS.

ADAPTING VEGETATIVE ESTABLISHMENT
INSPECT SEEDING AREAS FOR VEGETATIVE ESTABLISHMENT AND MAKE NECESSARY REPAIRS, REPLACEMENTS, AND RESEEDINGS WITHIN THE PLANTING SEASON.

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

DEFINITION
ESTABLISHMENT OF VEGETATIVE COVER ON CUT AND FILL SLOPES.

PURPOSE
TO PROVIDE TIMELY VEGETATIVE COVER ON CUT AND FILL SLOPES AS WORK PROGRESSES.

CONDITIONS WHERE PRACTICE APPLIES
ANY CUT OR FILL SLOPE GREATER THAN 15 FEET IN HEIGHT. THIS PRACTICE ALSO APPLIES TO STOCKPILES.

- CRITERIA
A. INCREMENTAL STABILIZATION - CUT SLOPES
1. EXCAVATE AND STABILIZE CUT SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDED AND APPLY SEED AND MULCH ON ALL CUT SLOPES AS THE WORK PROGRESSES.

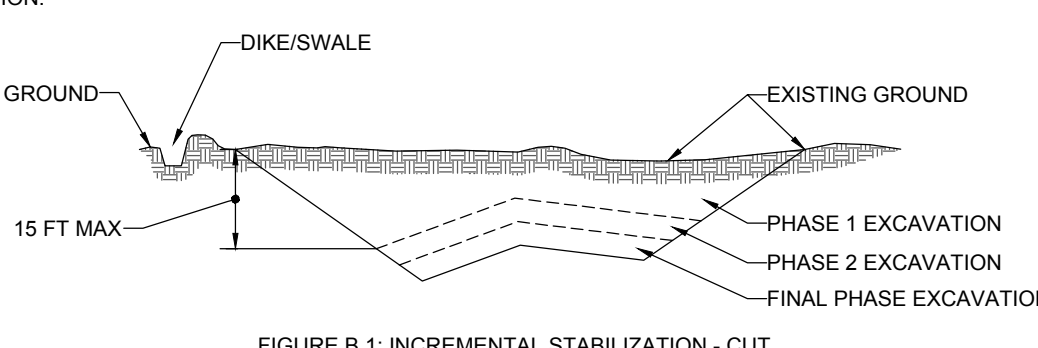


FIGURE B.1: INCREMENTAL STABILIZATION - CUT

- B. MULCHING (IN ORDER OF PREFERENCE)
1. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR, STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY.

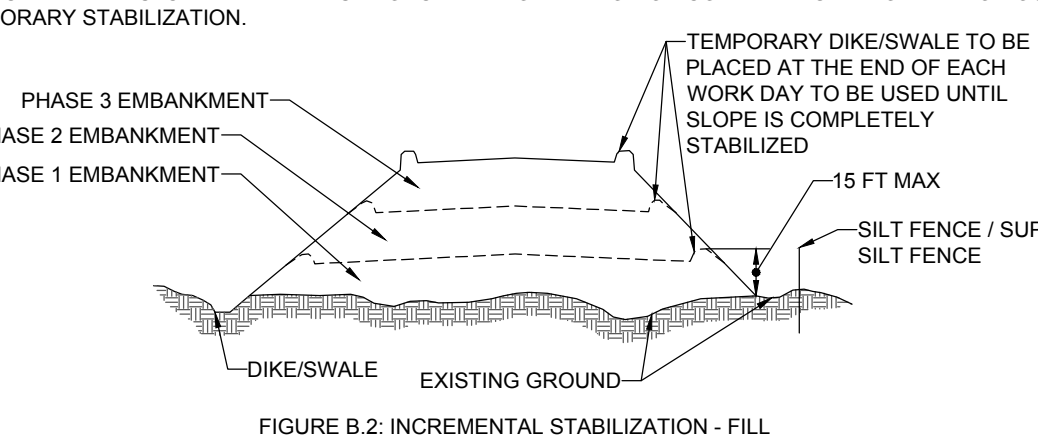


FIGURE B.2: INCREMENTAL STABILIZATION - FILL

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

DEFINITION
THE PROCESS OF PREPARING THE SOILS TO SUSTAIN ADEQUATE VEGETATIVE STABILIZATION.

PURPOSE
TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH.

CONDITIONS WHERE PRACTICE APPLIES
WHERE VEGETATIVE STABILIZATION IS TO BE ESTABLISHED.

- CRITERIA
A. SOIL PREPARATION
1. TEMPORARY STABILIZATION
a. SEEDED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

DEFINITION
TO STABILIZE DISTURBED SOILS WITH VEGETATION FOR UP TO 6 MONTHS.

PURPOSE
TO USE FAST GROWING VEGETATION THAT PROVIDES COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES
EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.

- CRITERIA
1. SELECT ONE OR MORE OF THE SPECIES OR SEED MIXTURES LISTED IN TABLE B.4.1 FOR THE APPROPRIATE PLANT HARDNESS ZONE (FROM FIGURE B.3), AND ENTER THEM IN THE TEMPORARY SEEDING SUMMARY BELOW ALONG WITH APPLICATION RATES, SEEDING DATES AND SEEDING DEPTHS. IF THIS SUMMARY IS NOT PUT ON THE PLAN AND COMPLETED, THEN TABLE B.4 PLUS FERTILIZER AND LIME RATES MUST BE PUT ON THE PLAN.

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

DEFINITION
TO STABILIZE DISTURBED SOILS WITH PERMANENT VEGETATION.

PURPOSE
TO USE LONG-LIVED PERENNIAL GRASSES AND LEGUMES TO ESTABLISH PERMANENT GROUND COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES
EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

CRITERIA
A. SEED MIXTURES

- 1. GENERAL USE
a. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED IN TABLE B.4.3 FOR THE APPROPRIATE PLANT HARDNESS ZONE (FROM FIGURE B.3) AND BASED ON THE SITE CONDITION OR PURPOSE FOUND ON TABLE B.2. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.

Table: PERMANENT SEEDING SUMMARY. Columns include NO., SPECIES, APPLICATION RATE (LB/AC), SEEDING DATES, SEEDING DEPTHS, N, P2O5, K2O, LIME RATE. Rows list various grass species like Tall Fescue, Kentucky Bluegrass, Perennial Ryegrass, etc.

- NOTES:
1. THE PLANTING DATES LISTED ARE AVERAGES FOR EACH ZONE. THESE DATES MAY REQUIRE ADJUSTMENT TO REFLECT LOCAL CONDITIONS. SPECIALLY NEAR THE BOUNDARIES OF THE ZONES, WHEN SEEDING TOWARD THE END OF THE LISTED PLANTING DATES, OR WHEN CONDITIONS ARE EXPECTED TO BE LESS THAN OPTIMAL, SELECT AN APPROPRIATE NURSE CROP FROM TABLE B.1 TEMPORARY SEEDING FOR SITE STABILIZATION AND PLANT TOGETHER WITH THE PERMANENT SEEDING MIX.

- 2. SOIL INSTALLATION
a. DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, LIGHTLY IRRIGATE THE SUBSOIL IMMEDIATELY PRIOR TO LAYING THE SOD. LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO IT AND TIGHTLY WEDGED AGAINST EACH OTHER.

B-4-6 STANDARDS AND SPECIFICATIONS FOR SOIL STABILIZATION MATTING

DEFINITION
MATERIAL USED TO TEMPORARILY OR PERMANENTLY STABILIZE CHANNELS OR STEEP SLOPES UNTIL GROUND COVER IS ESTABLISHED.

PURPOSE
TO PROTECT THE SOILS UNTIL VEGETATION IS ESTABLISHED.

- CONDITIONS WHERE PRACTICE APPLIES
ON NEWLY SEEDED SURFACES TO PREVENT THE APPLIED SEED FROM WASHING OUT; IN CHANNELS AND ON STEEP SLOPES WHERE THE FLOW HAS EROSION VELOCITIES OR CONVEYS CLEAR WATER; ON TEMPORARY SWALES, EARTH DICES, AND PERIMETER DIKE SWALES AS REQUIRED BY THE RESPECTIVE DESIGN STANDARD; AND, ON STREAM BANKS WHERE MOVING WATER IS LIKELY TO WASH OUT NEW VEGETATIVE PLANTINGS.

- DESIGN CRITERIA
1. THE SOIL STABILIZATION MATTING THAT IS USED MUST WITHSTAND THE FLOW VELOCITIES AND SHEAR STRESSES DETERMINED FOR THE AREA, BASED ON THE 2-YEAR, 24-HOUR FREQUENCY STORM FOR TEMPORARY APPLICATIONS AND THE 10-YEAR, 24-HOUR FREQUENCY STORM FOR PERMANENT APPLICATIONS. DESIGNATE ON THE PLAN THE TYPE OF SOIL STABILIZATION MATTING USING THE STANDARD SYMBOL AND INCLUDE THE CALCULATED SHEAR STRESS FOR THE RESPECTIVE TREATMENT AREA.

MAINTENANCE
VEGETATION MUST BE ESTABLISHED AND MAINTAINED SO THAT THE REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

BOHLER logo with vertical text: SITE CIVIL AND CONSULTING ENGINEERING, PROGRAM MANAGEMENT, LANDSCAPE ARCHITECTURE, SUSTAINABLE DESIGN, PERMITTING SERVICES, TRANSPORTATION SERVICES.

REVISIONS

Table with columns: REV, DATE, COMMENT, DRAWN BY, CHECKED BY. Contains several blank rows for revisions.

811 logo with text: Know what's below. Call before you dig. ALWAYS CALL 811. It's fast. It's free. It's the law.

PROJECT: EAST COAST WAREHOUSE (ECW) F.K.A COLD MILL "DROP LOT" FOR TRADEPOINT ATLANTIC ECW SCAN YARD.

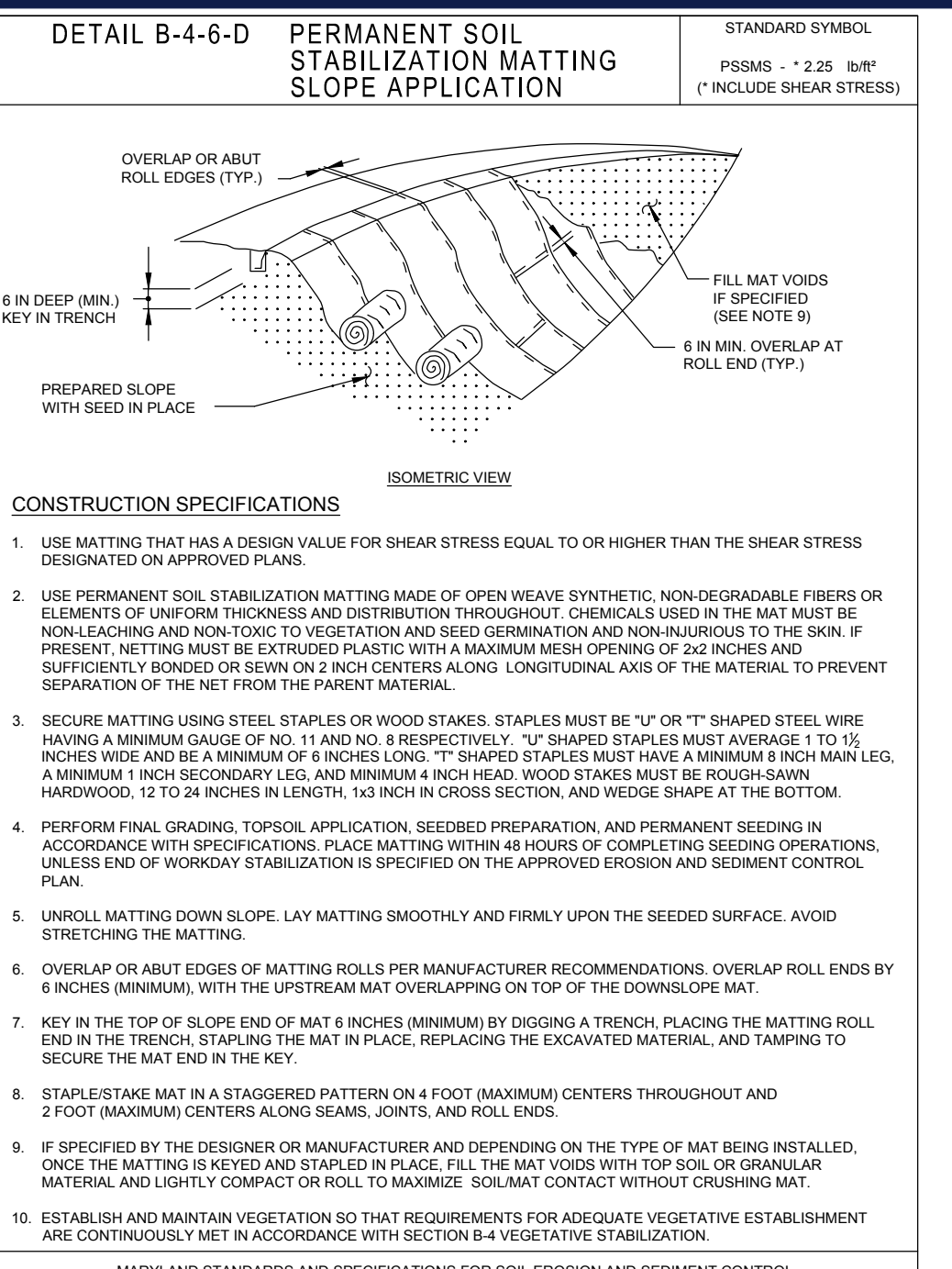
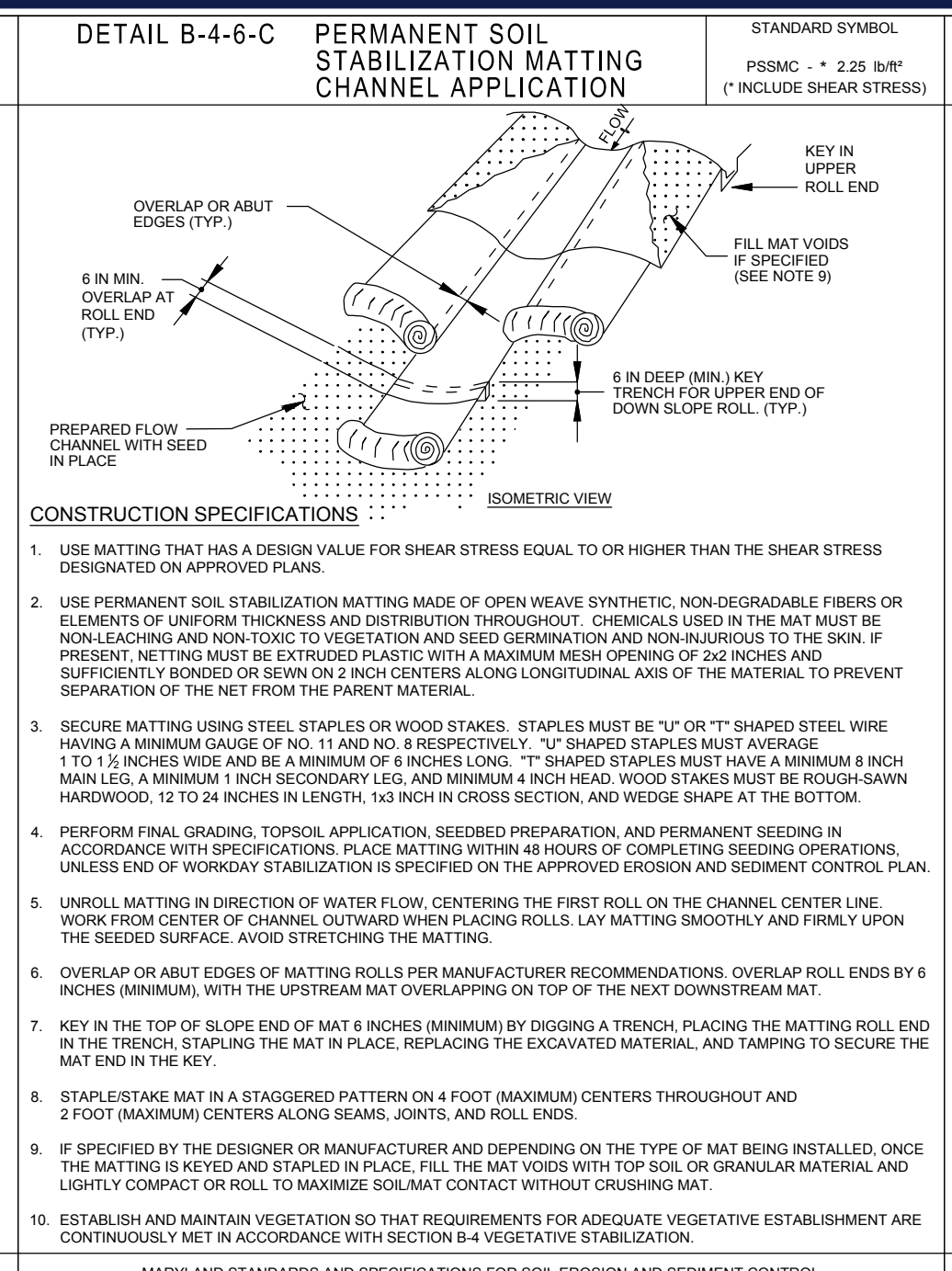
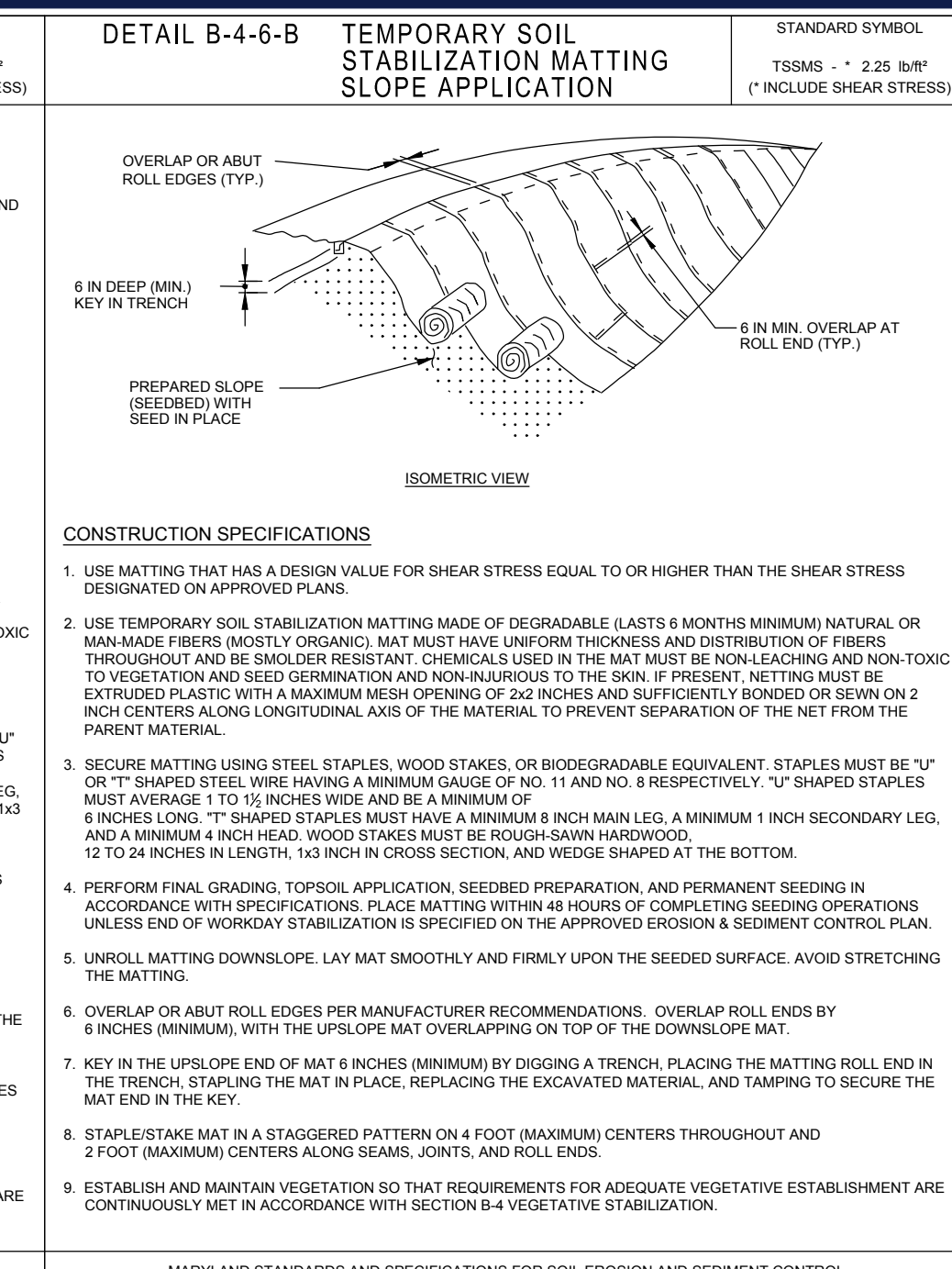
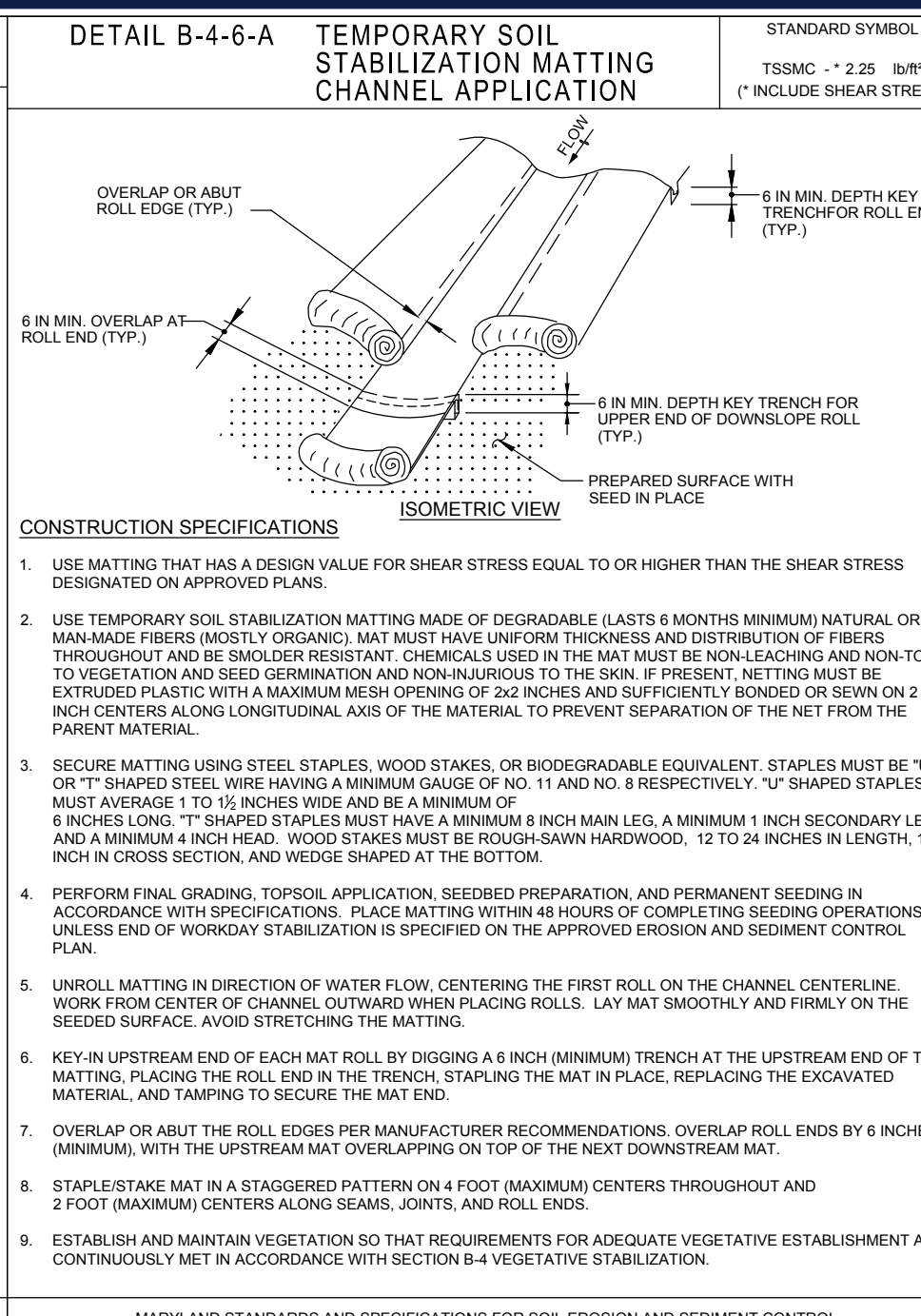
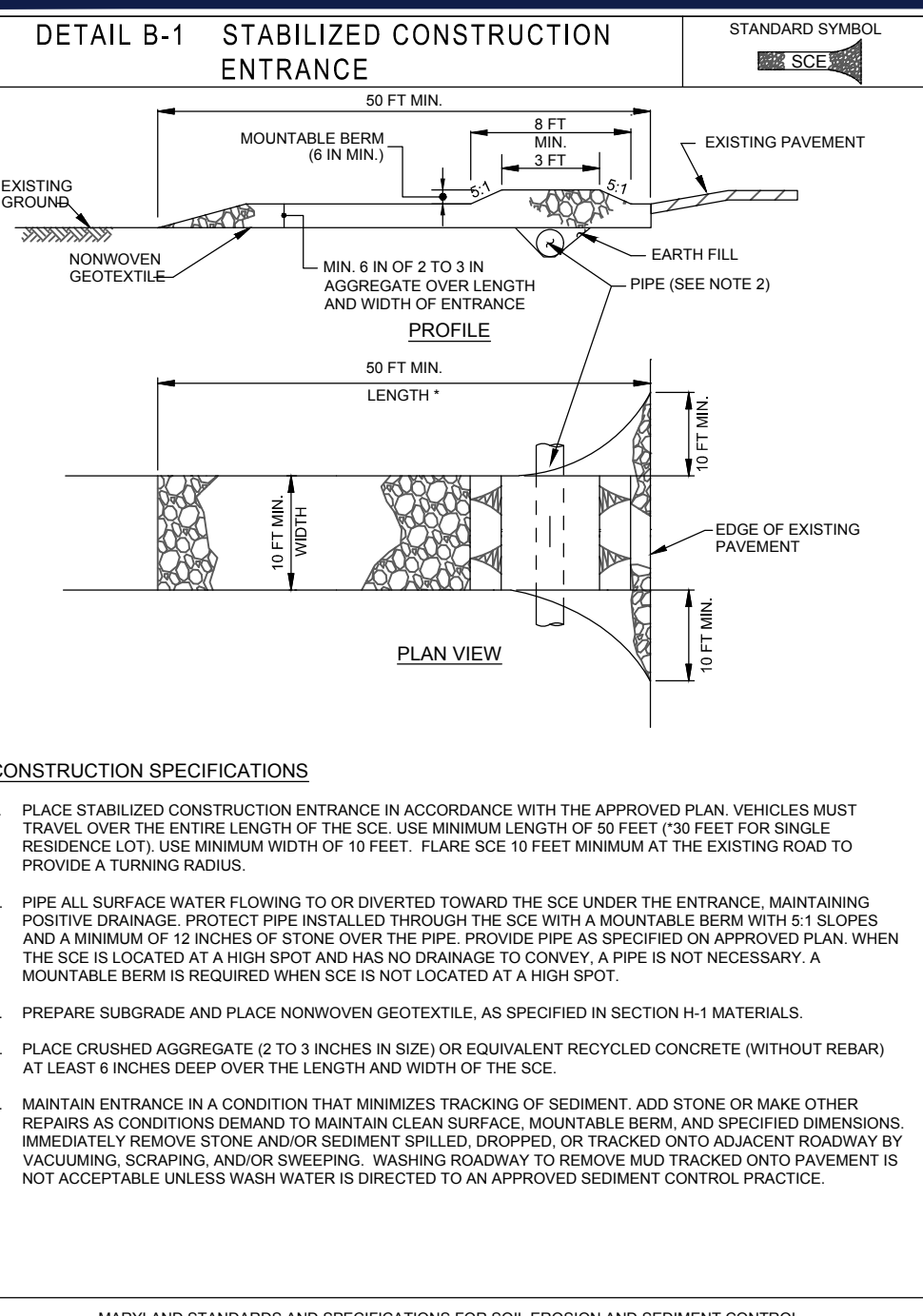
PROJECT: EAST COAST WAREHOUSE (ECW) F.K.A COLD MILL "DROP LOT" FOR TRADEPOINT ATLANTIC ECW SCAN YARD. 6151 COLD MILL ROAD, BALTIMORE, MD 21219.

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M.J. GESELL PROFESSIONAL ENGINEER. PROFESSIONAL CERTIFICATION. LICENSE NO. 44091, EXPIRATION DATE: 6/23/21.

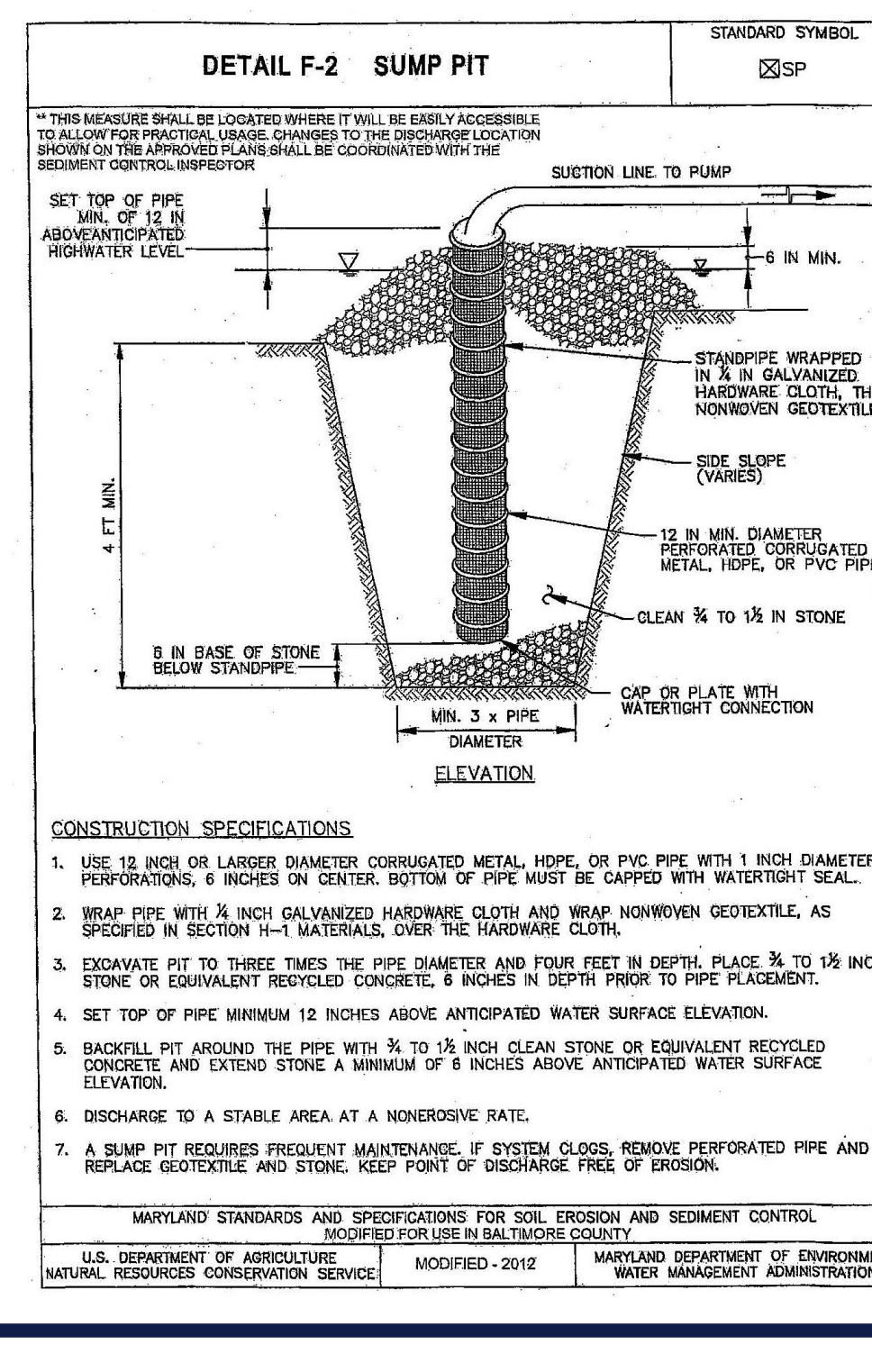
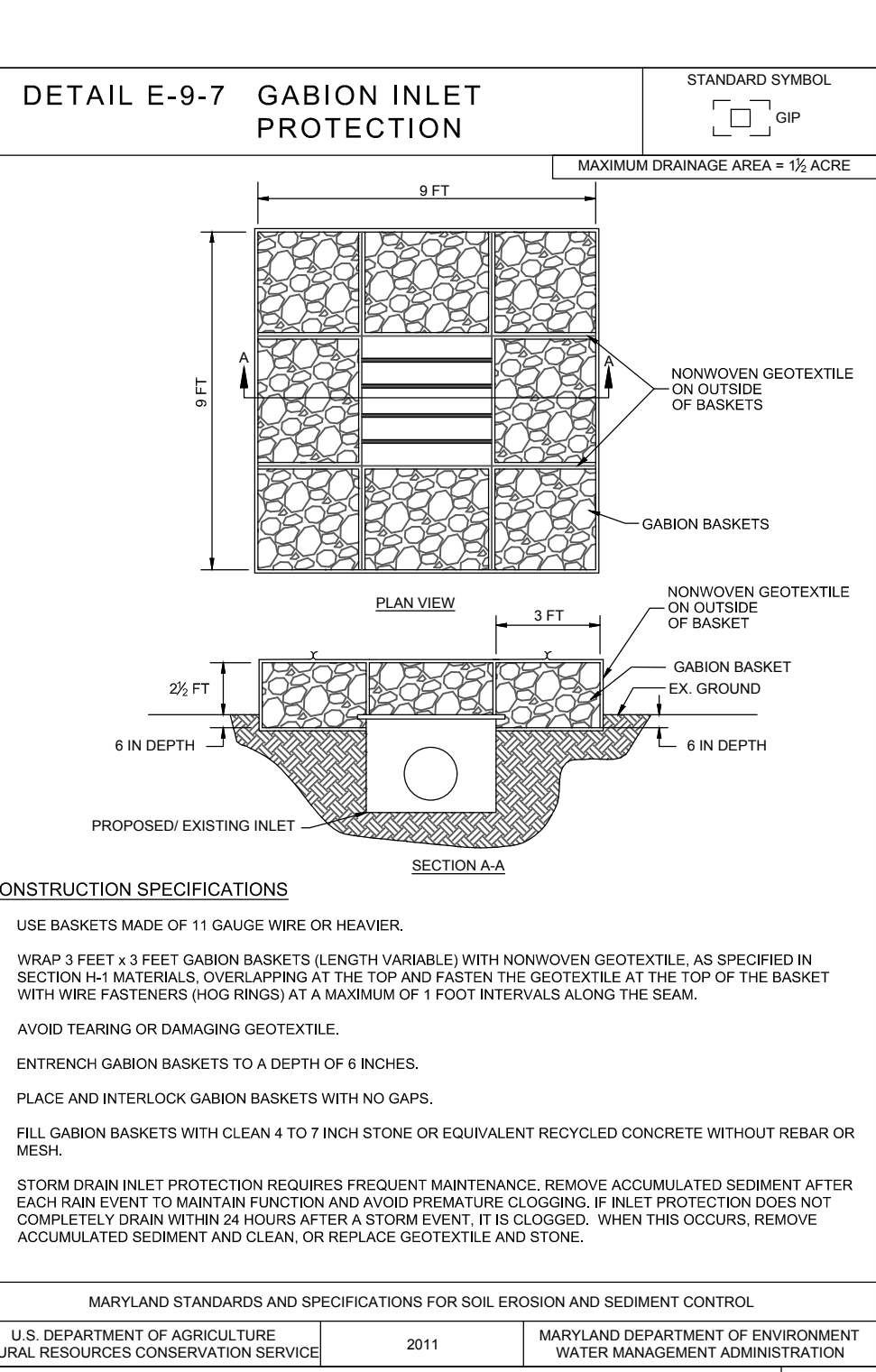
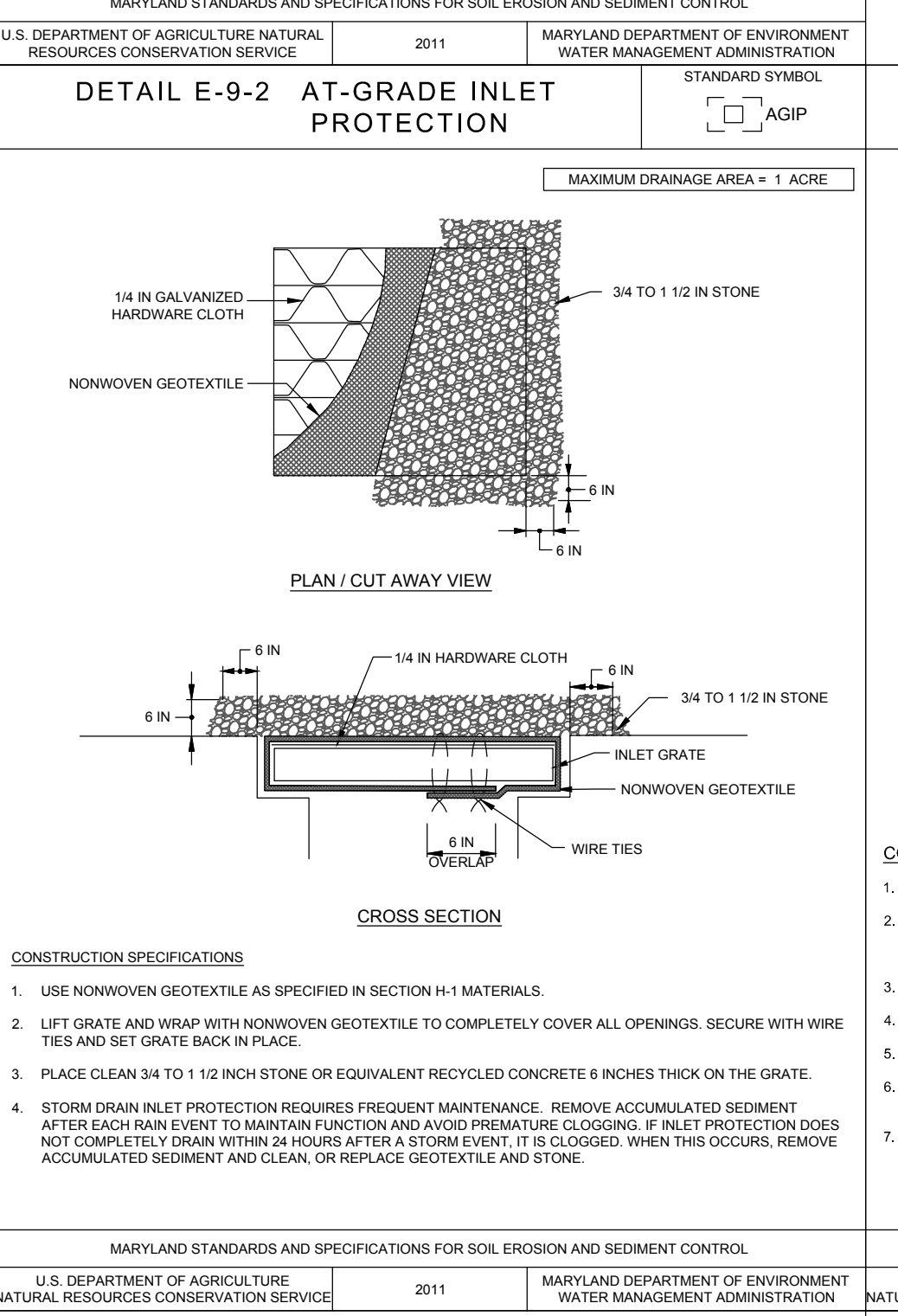
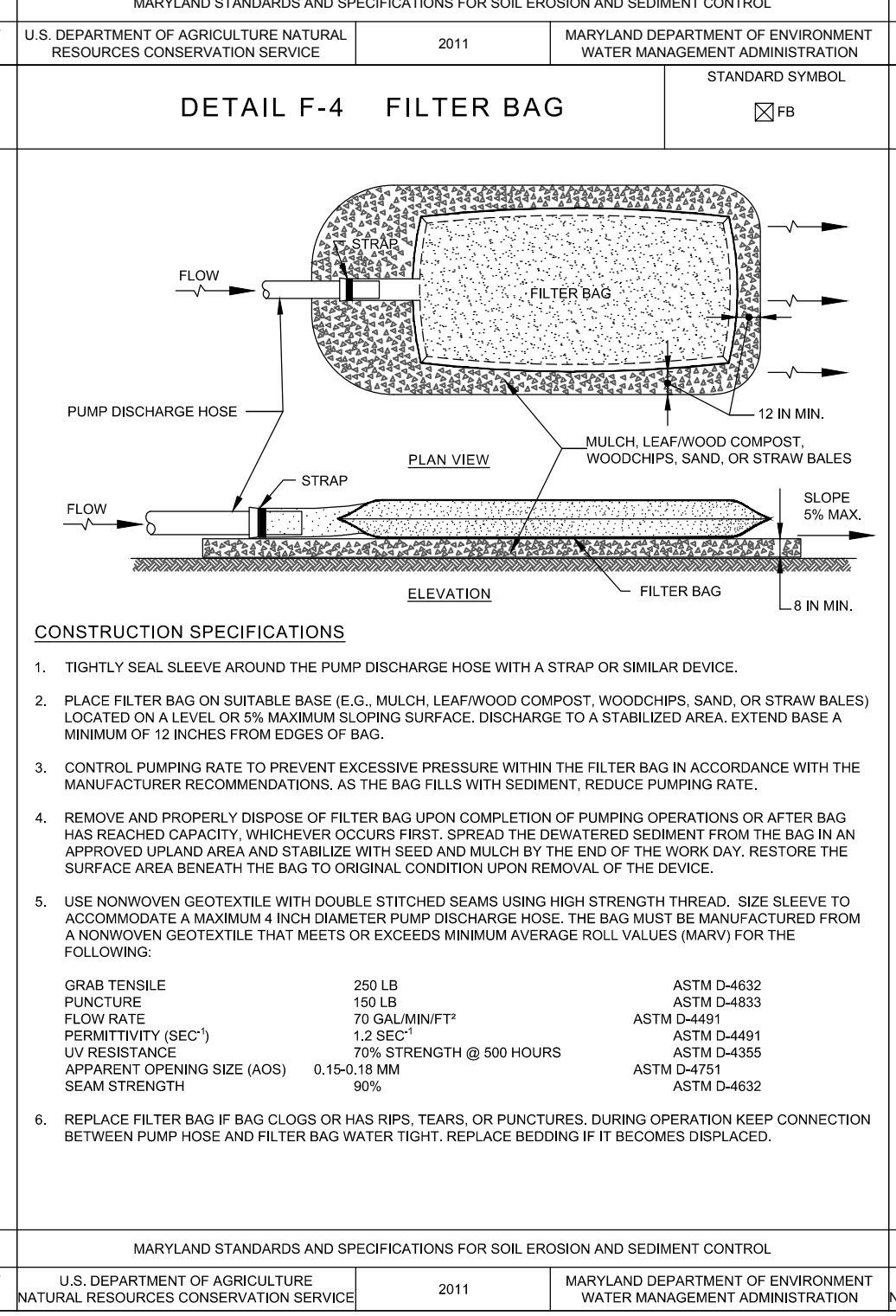
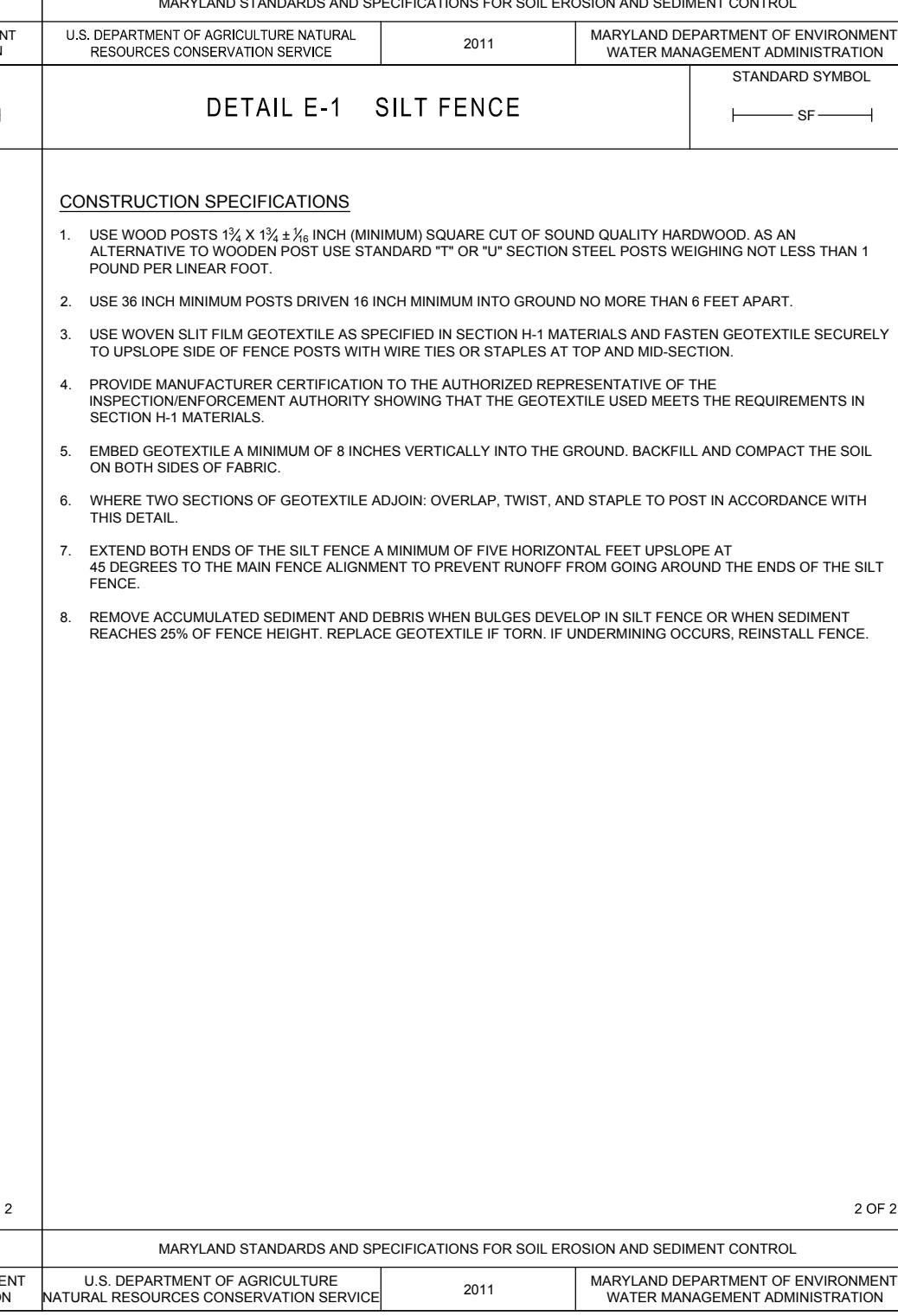
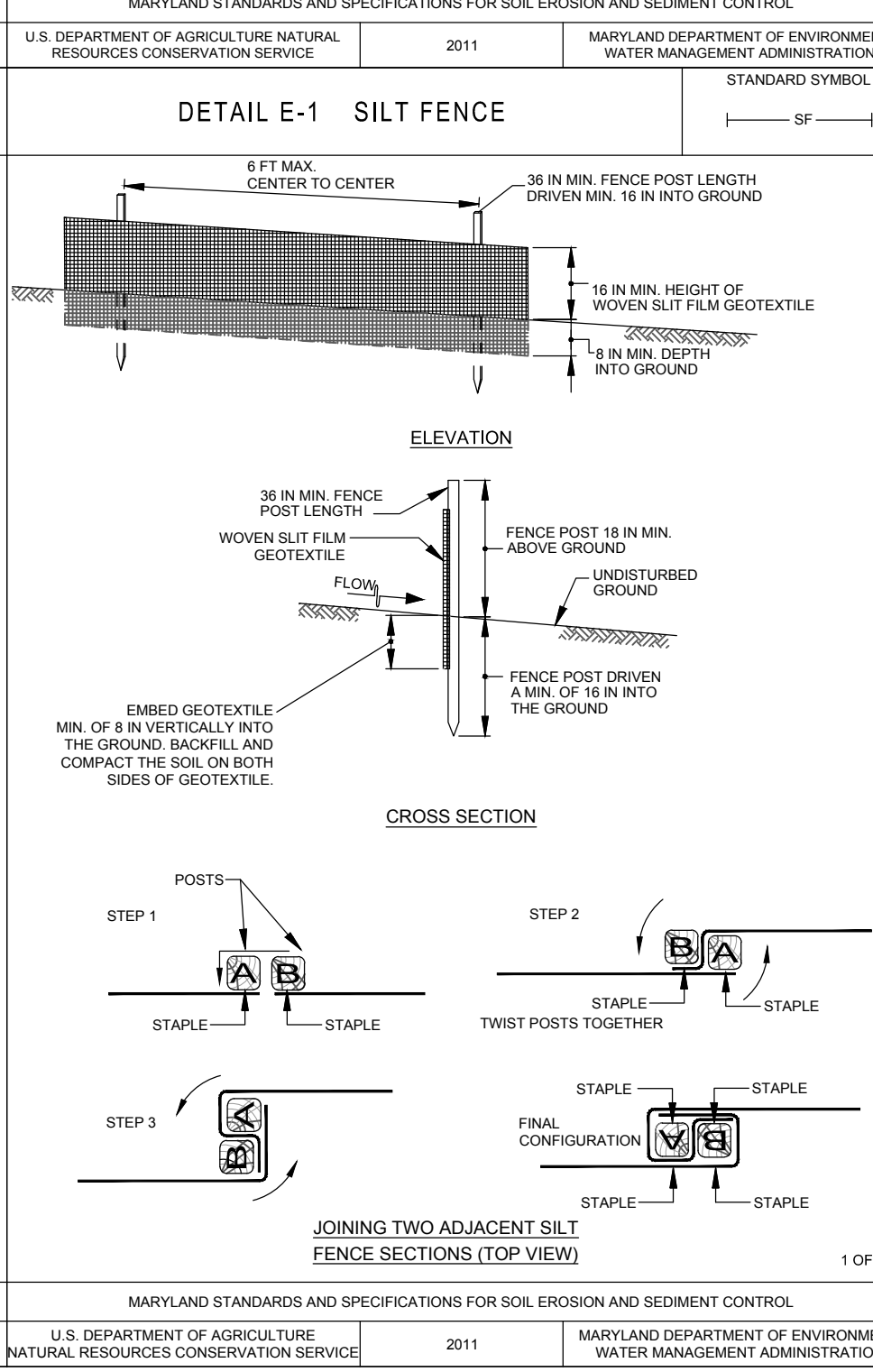
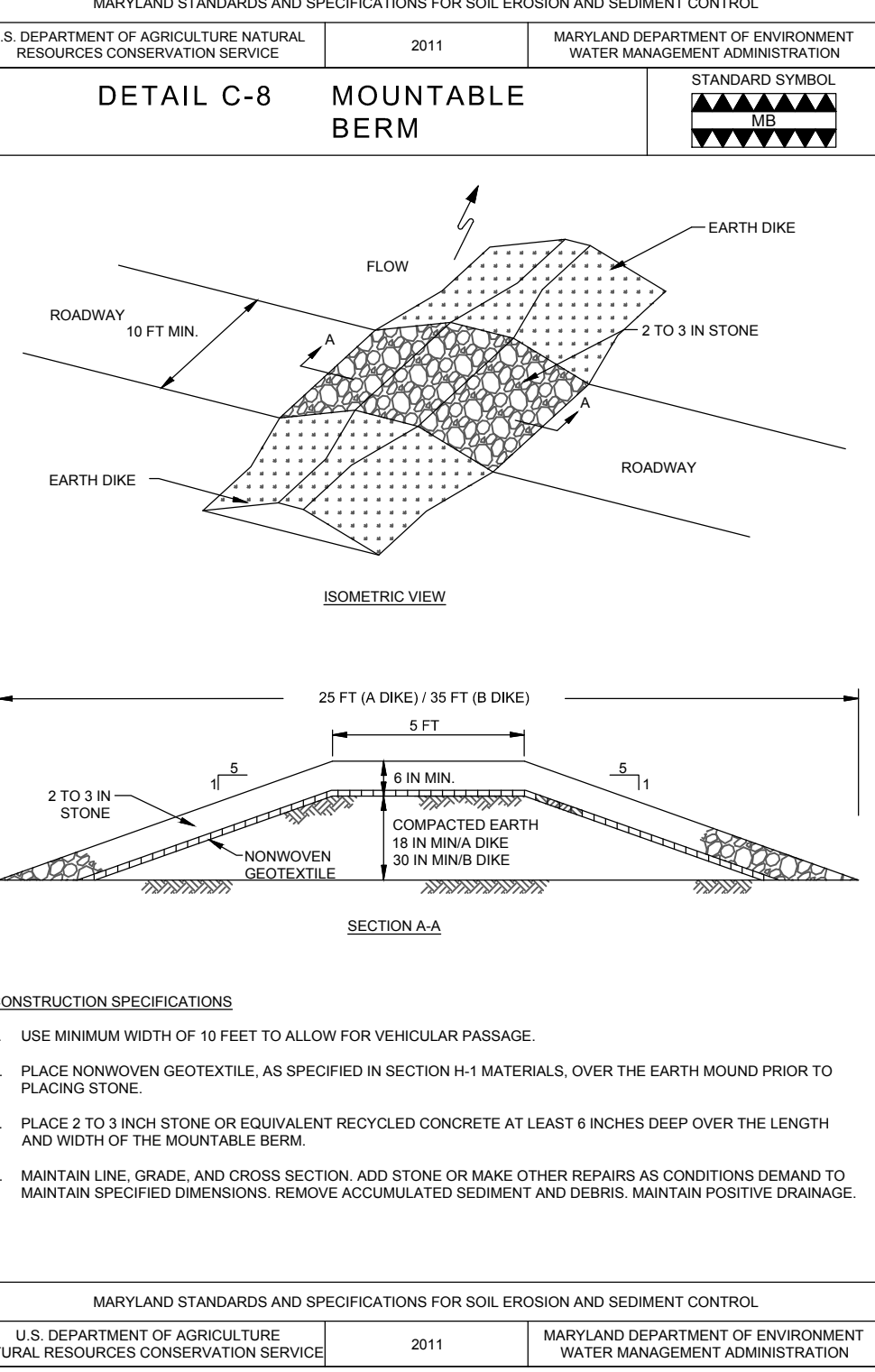
SHEET TITLE: EROSION AND SEDIMENT CONTROL NOTES AND DETAILS. SHEET NUMBER: C-607.

MDE PROJECT # ESC 8 OF 9. REVIEWED AND APPROVED FOR SEDIMENT CONTROL UNDER SECTION 4-105. MARYLAND DEPARTMENT OF THE ENVIRONMENT. ORG. DATE - 01/28/22.



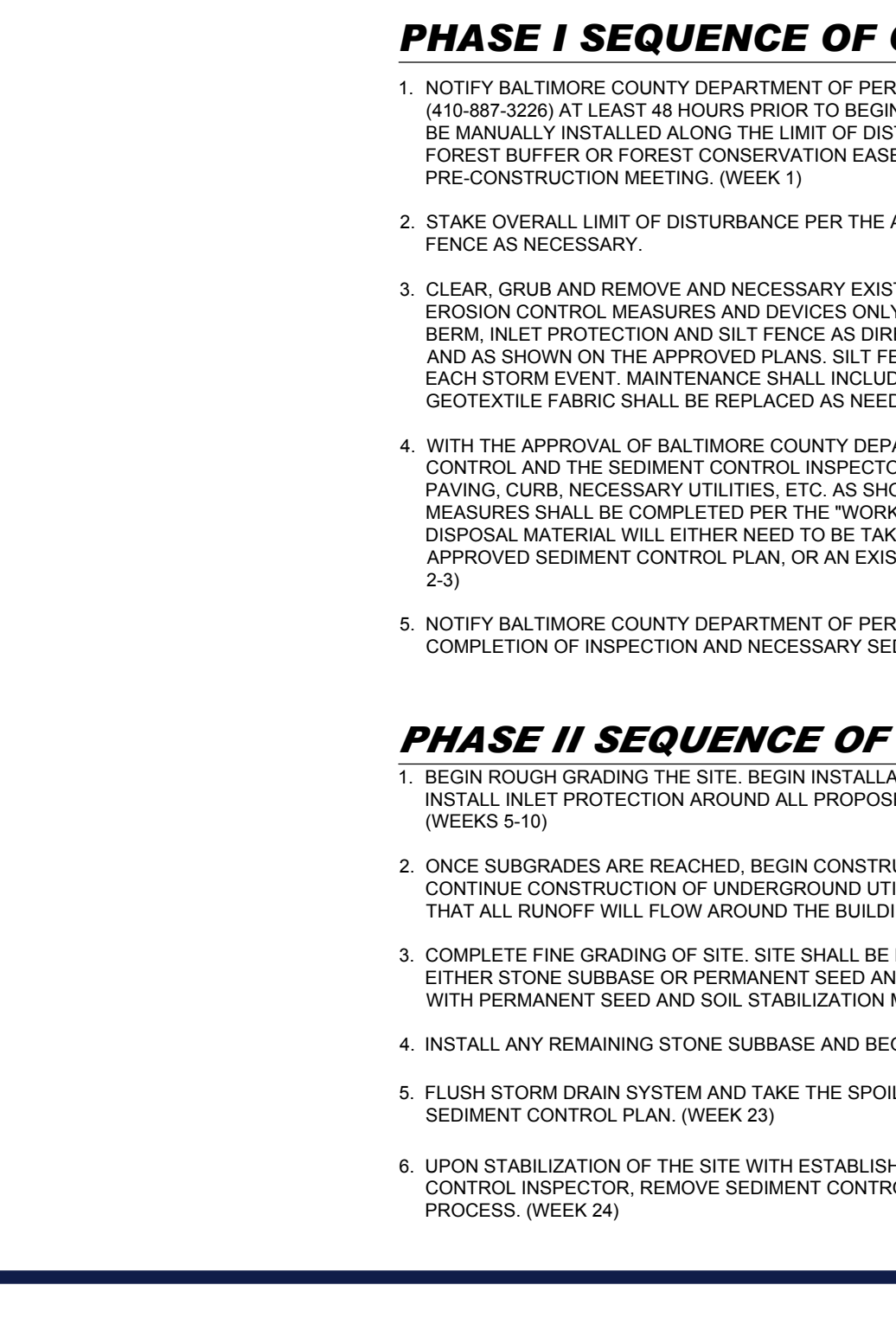
BALTIMORE COUNTY EROSION AND SEDIMENT CONTROL NOTES

- REFER TO 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN.
- WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, MINOR FIELD ADJUSTMENTS CAN AND WILL BE MADE TO INSURE THE CONTROL OF ANY SEDIMENT. CHANGES IN SEDIMENT CONTROL PRACTICES REQUIRE PRIOR APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE).
- AT THE END OF EACH WORKING DAY, ALL SEDIMENT CONTROL PRACTICES WILL BE INSPECTED AND LEFT IN OPERATIONAL CONDITION.
- FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN A THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROL S, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN THREE HORIZONTAL TO ONE VERTICAL (3:1), AND SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
- ANY CHANGE TO THE GRADING PROPOSED ON THIS PLAN REQUIRES RE-SUBMISSION TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FOR APPROVAL.
- DUST CONTROL WILL BE PROVIDED FOR ALL DISTURBED AREAS. REFER TO 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL - PG. H-22, FOR ACCEPTABLE METHODS AND SPECIFICATIONS FOR DUST CONTROL.
- ANY VARIATIONS FROM THE SEQUENCE OF OPERATIONS STATED ON THIS PLAN REQUIRES THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) PRIOR TO THE INITIATION OF THE CHANGE.
- EXCESS CUT OR BORROW MATERIAL SHALL GO TO, OR COME FROM, RESPECTIVELY, A SITE WITH AN OPEN GRADING PERMIT AND APPROVED SEDIMENT CONTROL PLAN.
- THE FOLLOWING ITEM MAY BE USED AS APPLICABLE: REFER TO "MARYLAND'S GUIDELINES TO THE CONSTRUCTION OF THE SEDIMENT CONTROL OF THE ENVIRONMENT, REVISED NOVEMBER 2008, FOR STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN FOR WATERWAY CONSTRUCTION.
- PUMPING SEDIMENT-LADEN WATER INTO WATERS OF THE STATE IS STRICTLY PROHIBITED. ANY PORTABLE DEWATERING DEVICE MUST BE WITHIN THE LIMIT OF DISTURBANCE.



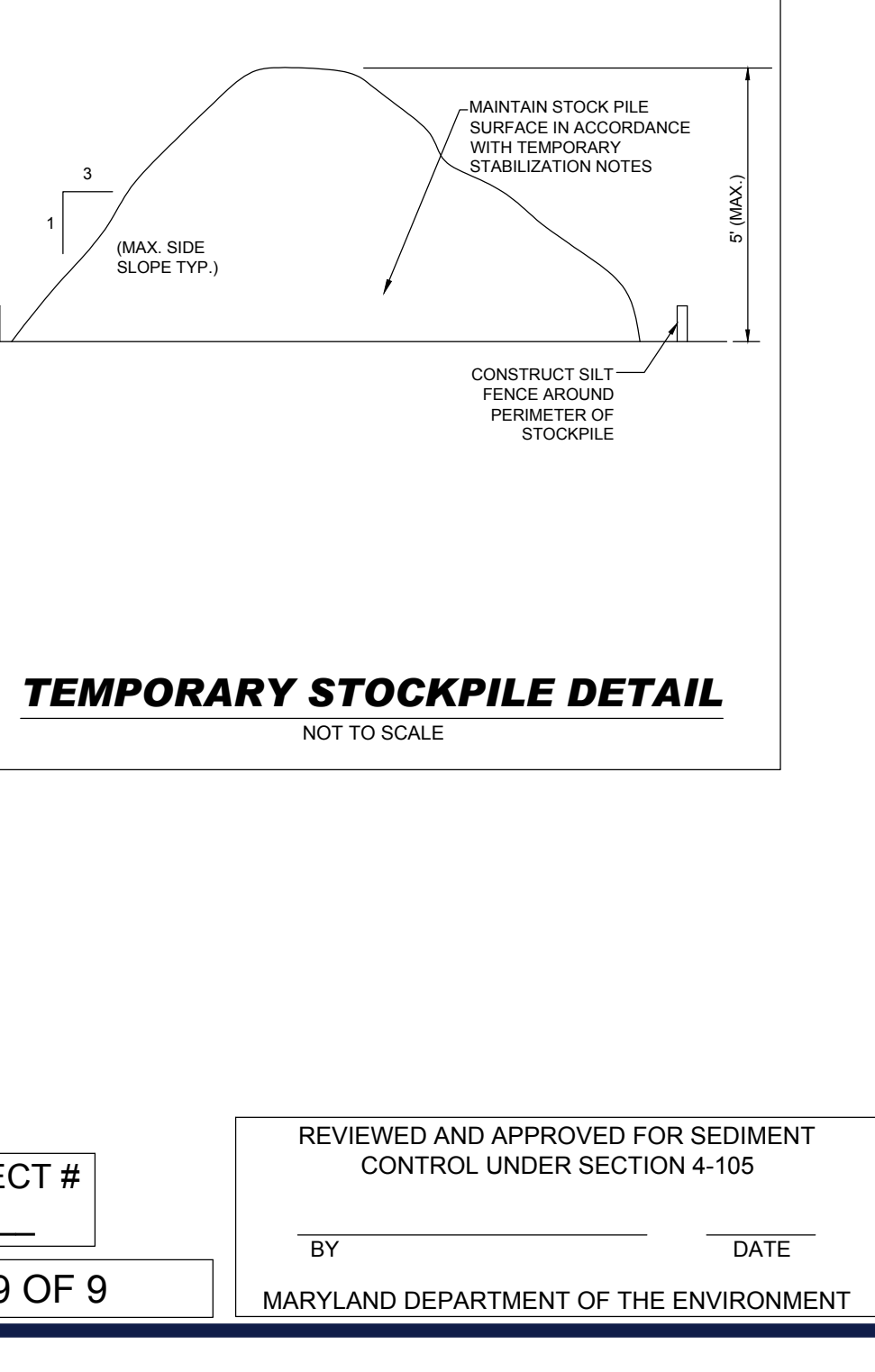
PHASE I SEQUENCE OF CONSTRUCTION:

- NOTIFY BALTIMORE COUNTY DEPARTMENT OF PERMITS, APPROVALS, AND INSPECTIONS, SEDIMENT CONTROL (410-887-3226) AT LEAST 48 HOURS PRIOR TO BEGINNING WORK ON SITE. HIGH VISIBILITY ORANGE SAFETY FENCE SHALL BE MANUALLY INSTALLED ALONG THE LIMIT OF DISTURBANCE (LOD) WHEREVER THE LOD IS WITHIN 50 FEET OF ANY FOREST BUFFER OR FOREST CONSERVATION EASEMENT. THIS FENCE SHALL BE INSPECTED BY DEPS AT THE PRE-CONSTRUCTION MEETING. (WEEK 1)
- STAKE OVERALL LIMIT OF DISTURBANCE PER THE APPROVED EROSION AND SEDIMENT CONTROL PLANS. INSTALL SAFETY FENCE AS NECESSARY.
- CLEAR, GRUB AND REMOVE AND NECESSARY EXISTING FEATURES INTERFERING WITH PERIMETER SEDIMENT AND EROSION CONTROL MEASURES AND DEVICES ONLY. INSTALL STABILIZED CONSTRUCTION ENTRANCE WITH MOUNTABLE BERM, INLET PROTECTION AND SILT FENCE AS DIRECTED BY THE BALTIMORE COUNTY SEDIMENT CONTROL INSPECTOR AND AS SHOWN ON THE APPROVED PLANS. SILT FENCE SHALL BE INSPECTED AND MAINTAINED EACH DAY AND AFTER EACH STORM EVENT. MAINTENANCE SHALL INCLUDE BUT NOT LIMITED TO REMOVAL OF ALL ACCUMULATED SEDIMENT. GEOTEXTILE FABRIC SHALL BE REPLACED AS NEEDED TO ENSURE PROPER FUNCTION (WEEK 1)
- WITH THE APPROVAL OF BALTIMORE COUNTY DEPARTMENT OF PERMITS, APPROVALS, AND INSPECTIONS, SEDIMENT CONTROL AND THE SEDIMENT CONTROL INSPECTOR CLEAN AND GRUB REMAINDER OF THE SITE. REMOVE REMAINDER OF PAVING, CURB, NECESSARY UTILITIES, ETC. AS SHOWN ON THE PLANS. ALL AREAS OUTSIDE OF THE PERIMETER CONTROL MEASURES SHALL BE COMPLETED PER THE "WORK OUTSIDE PERIMETER CONTROL NOTES" AND "UTILITY NOTES". DISPOSAL MATERIAL WILL EITHER NEED TO BE TAKEN TO A RUBBLE LANDFILL WITH AN ACTIVE GRADING PERMIT AND APPROVED SEDIMENT CONTROL PLAN, OR AN EXISTING ASPHALT RECYCLING FACILITY SUBJECT TO THE SAME. (WEEKS 2-3)
- NOTIFY BALTIMORE COUNTY DEPARTMENT OF PERMITS, APPROVALS AND INSPECTIONS, SEDIMENT CONTROL UPON COMPLETION OF INSPECTION AND NECESSARY SEDIMENT CONTROL REPAIRS. (WEEK 4)



PHASE II SEQUENCE OF CONSTRUCTION:

- BEGIN ROUGH GRADING THE SITE. BEGIN INSTALLATION OF UNDERGROUND UTILITIES. IMMEDIATELY UPON INSTALLATION, INSTALL INLET PROTECTION AROUND ALL PROPOSED INLETS. CONTRACTOR TO MAINTAIN POSITIVE FLOW TO ALL INLETS. (WEEKS 5-10)
- ONCE SUBGRADES ARE REACHED, BEGIN CONSTRUCTION OF TRAILER, SHACK, AND CONCRETE CURB AND GUTTER. CONTINUE CONSTRUCTION OF UNDERGROUND UTILITIES. GRADES AROUND THE BUILDING SHOULD BE DESIGNED SUCH THAT ALL RUNOFF WILL FLOW AROUND THE BUILDING. (WEEKS 10-12)
- COMPLETE FINE GRADING OF SITE. SITE SHALL BE BROUGHT TO GRADE AS SOON AS POSSIBLE AND STABILIZED WITH EITHER STONE SUBBASE OR PERMANENT SEED AND MULCH. AREAS WITH SLOPES 3:1 OR STEEPER SHALL BE STABILIZED WITH PERMANENT SEED AND SOIL STABILIZATION MATTING. (WEEKS 13-17)
- INSTALL ANY REMAINING STONE SUBBASE AND BEGIN PAVING. (WEEKS 18-22)
- FLUSH STORM DRAIN SYSTEM AND TAKE THE SPOIL TO A SITE WITH AN ACTIVE GRADING PERMIT AND AN APPROVED SEDIMENT CONTROL PLAN. (WEEK 23)
- UPON STABILIZATION OF THE SITE WITH ESTABLISHED VEGETATION AND WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL MEASURES AND STABILIZE THOSE AREAS DISTURBED BY THIS PROCESS. (WEEK 24)



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EAST COAST WAREHOUSE (ECW) F.K.A COLD MILL "DROP LOT"

PROJECT: MD16206641 MUG
DRAWN BY: 01/28/22
DATE: 01/28/22
CAD ID: MD16206641 - CND5 - 0

TRADEPOINT ATLANTIC
ECW SCAN YARD
F.K.A COLD MILL "DROP LOT"
6151 GOLD MILL ROAD
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

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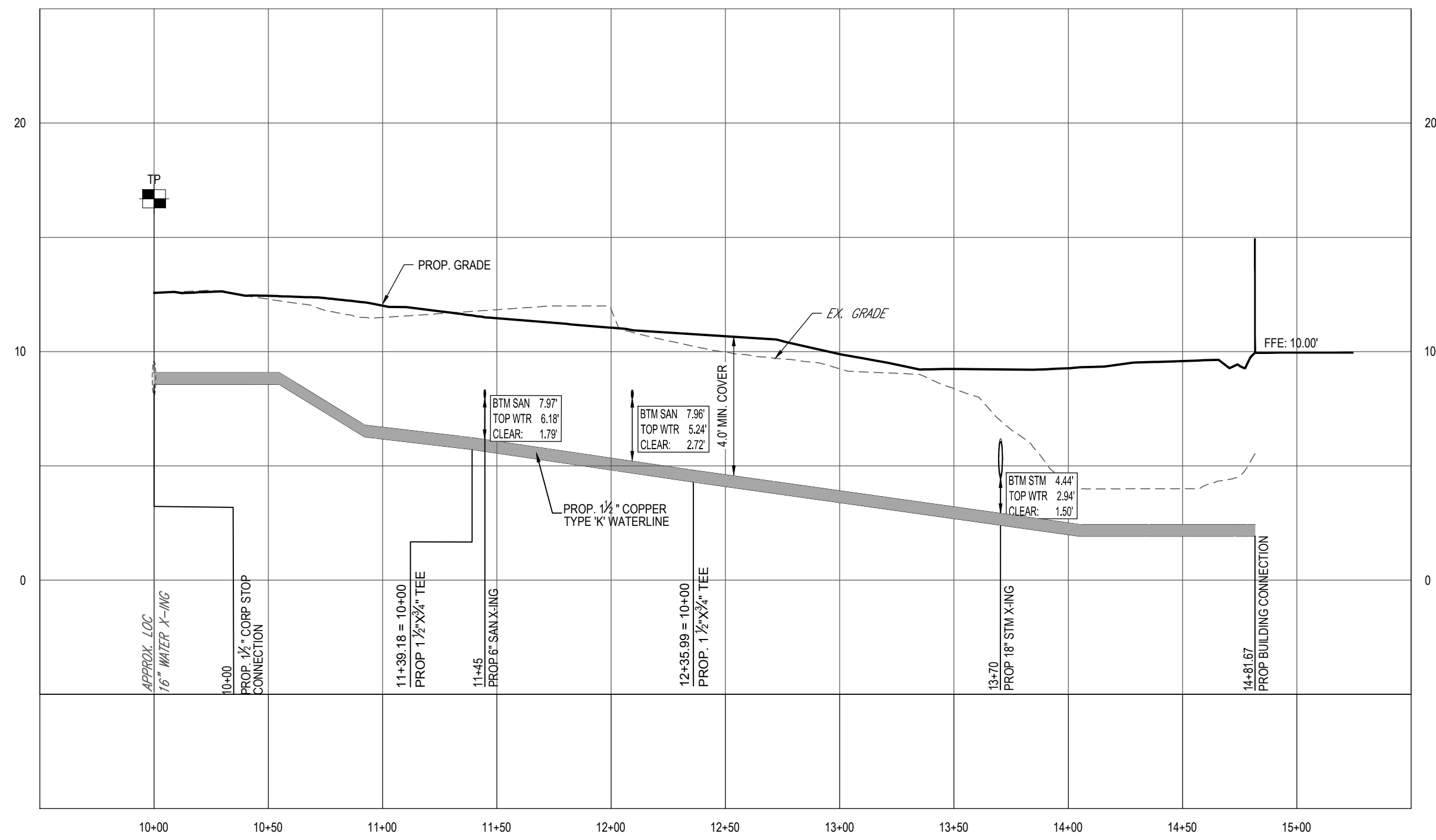
M.J. GESELL

PROFESSIONAL ENGINEER
MARYLAND LICENSE # 4497
PROFESSIONAL CERTIFICATION
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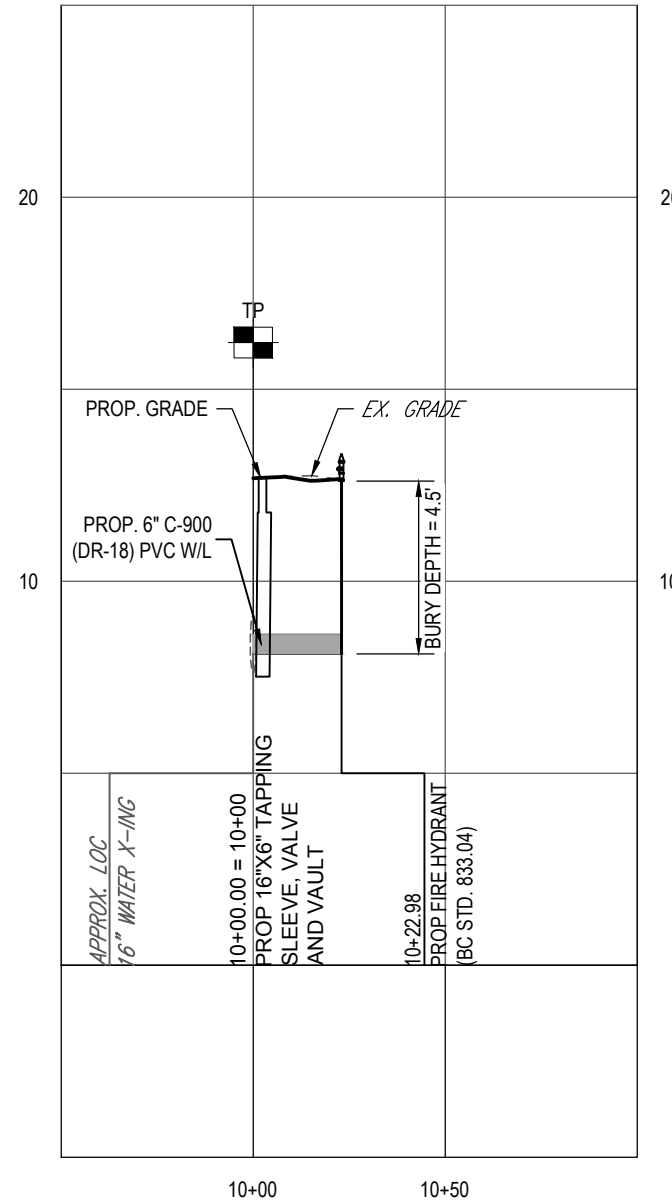
SHEET TITLE: **EROSION AND SEDIMENT CONTROL NOTES AND DETAILS**

SHEET NUMBER: **C-608**

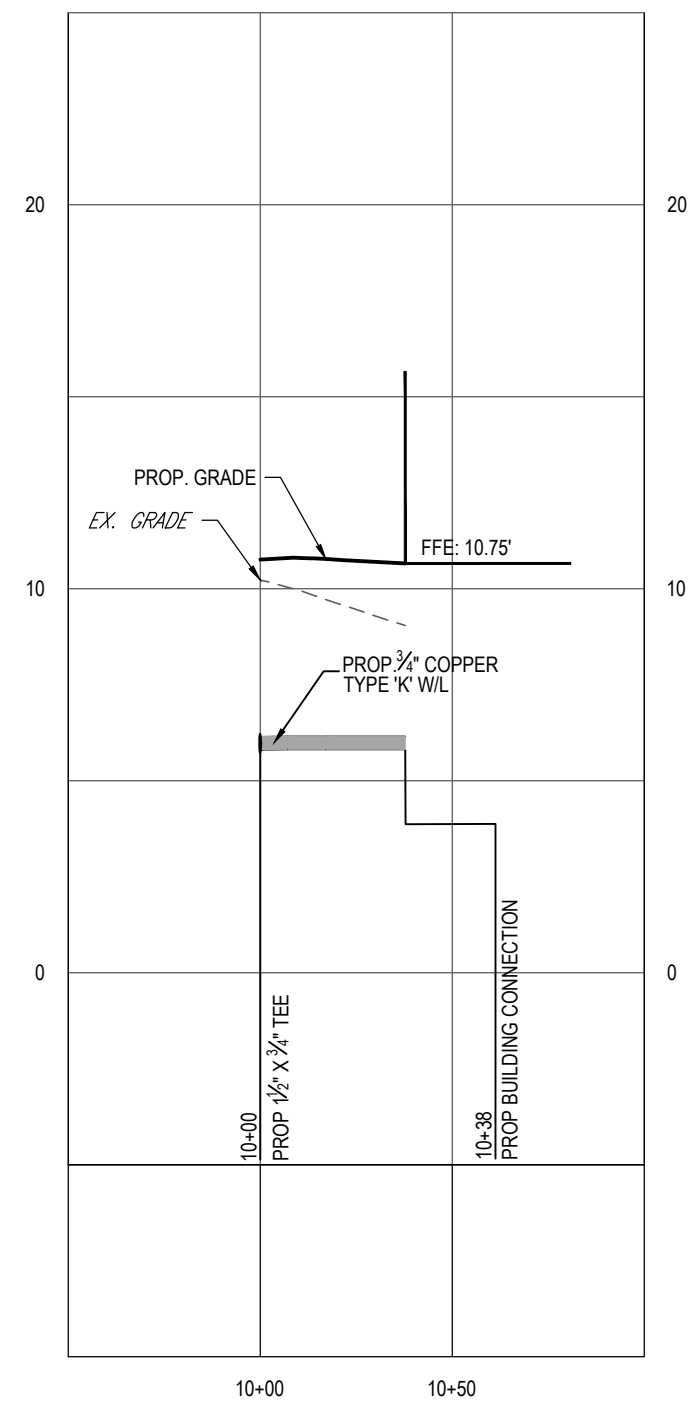
ORG. DATE - 01/28/22



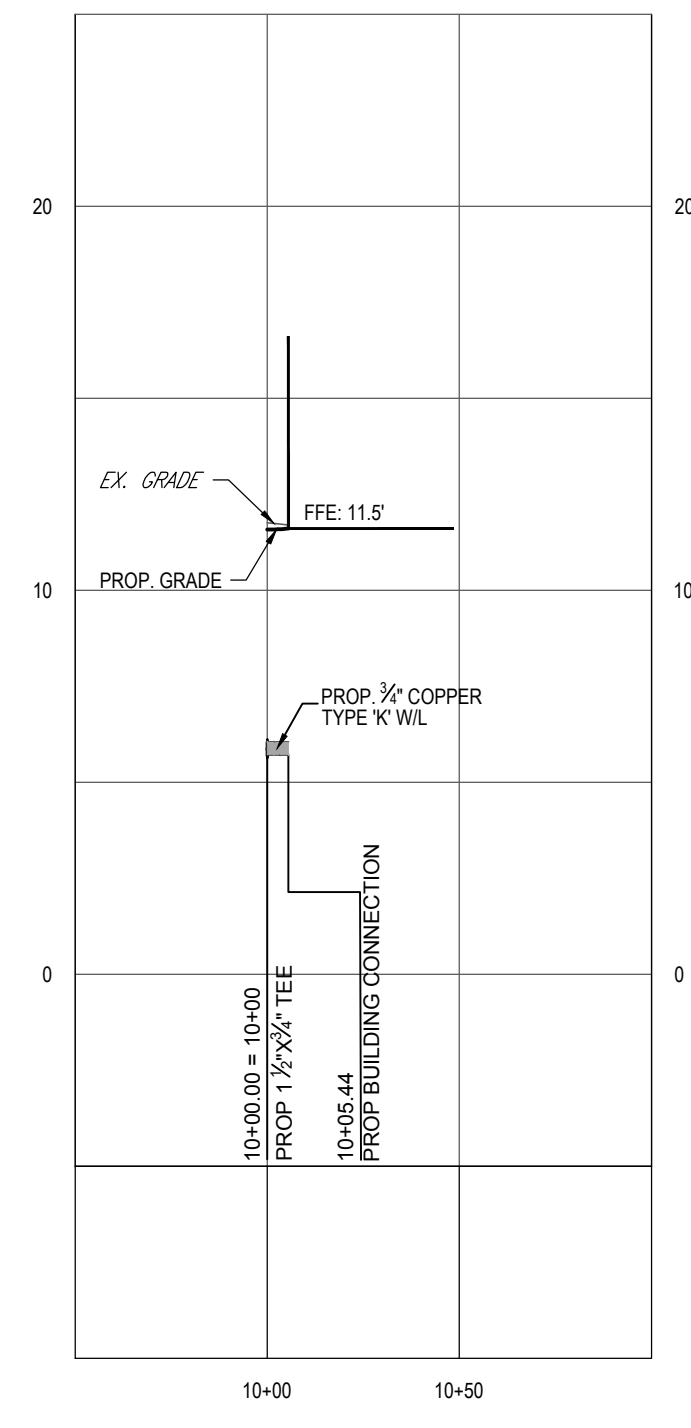
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SCALE: 1"= 50' HORIZONTAL
1"= 5' VERTICAL




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SCALE: 1"= 50' HORIZONTAL
1"= 5' VERTICAL

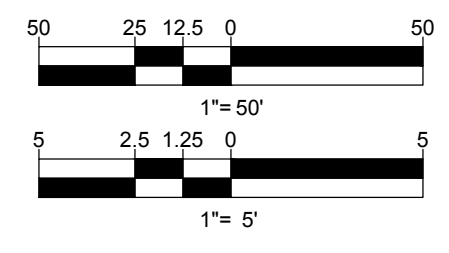


PROPOSED WATERLINE - B
SCALE: 1"= 50' HORIZONTAL
1"= 5' VERTICAL



PROPOSED WATERLINE - GUARD SHACK
SCALE: 1"= 50' HORIZONTAL
1"= 5' VERTICAL

TEST PIT NOTE
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 DRAWN BY: MJG
 CHECKED BY: MJG
 DATE: 01/28/22
 CAD ID: MD16206641 - PWAT - 0

PROJECT
EAST COAST WAREHOUSE (ECW) F.K.A COLD MILL "DROP LOT" FOR

TRADEPOINT ATLANTIC
 ECW SCAN YARD
 F.K.A COLD MILL "DROP LOT"
 6151 COLD MILL ROAD
 BALTIMORE, MD 21219
 TM 111, GRID 14 PARCEL 318
 ELECTION DISTRICT 15
 COUNCILMANIC DISTRICT 7
 BALTIMORE COUNTY

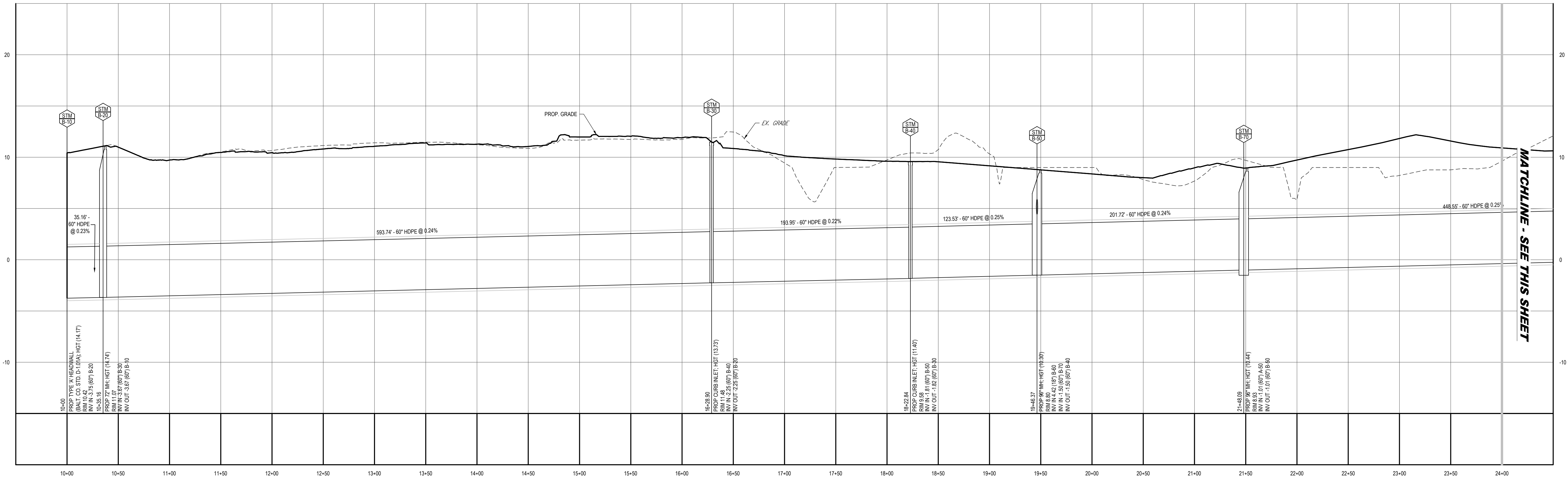
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 MARYLAND LICENSE # 4409
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SHEET TITLE:
WATERLINE PROFILES

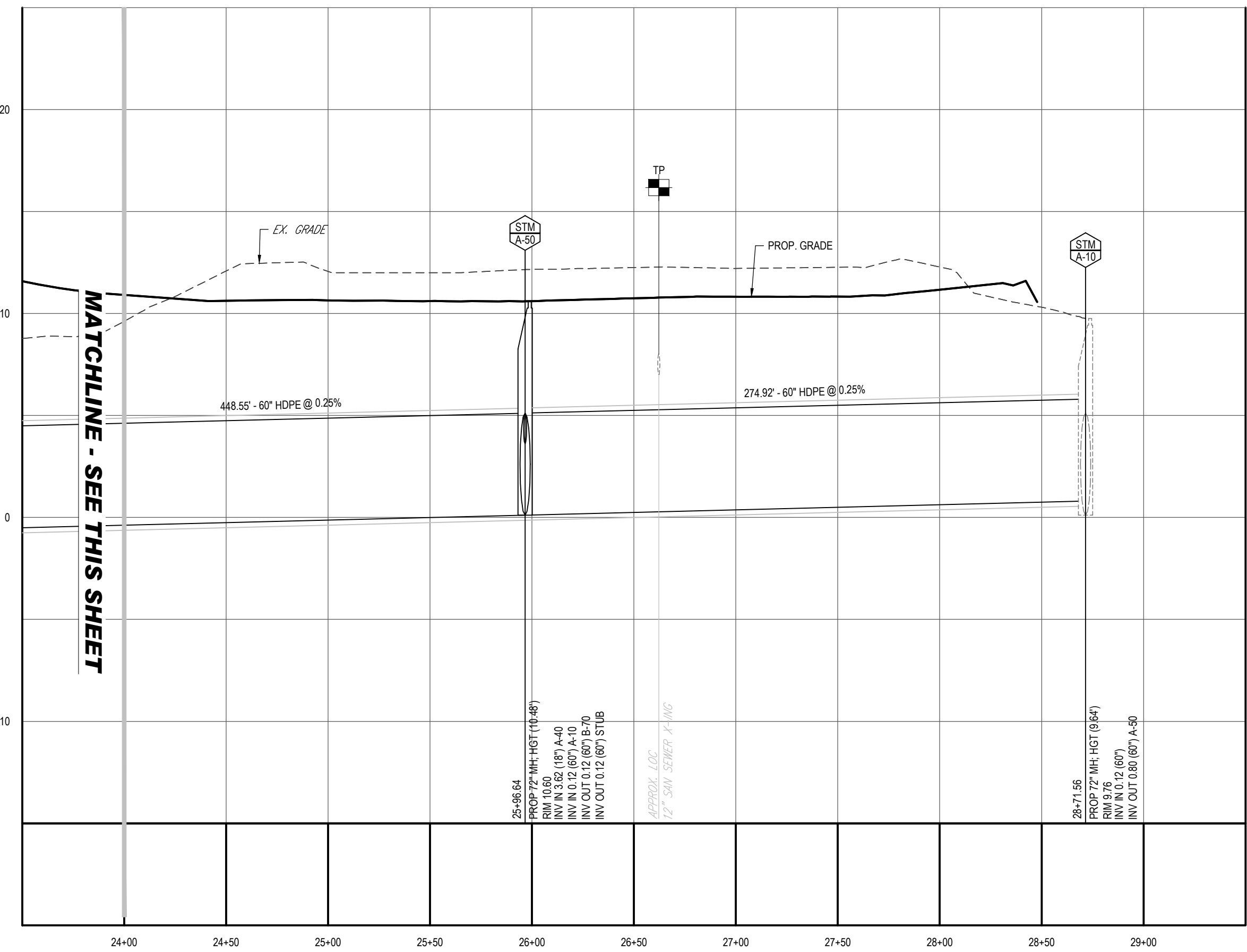
SHEET NUMBER:
C-801

ORG. DATE - 01/28/22



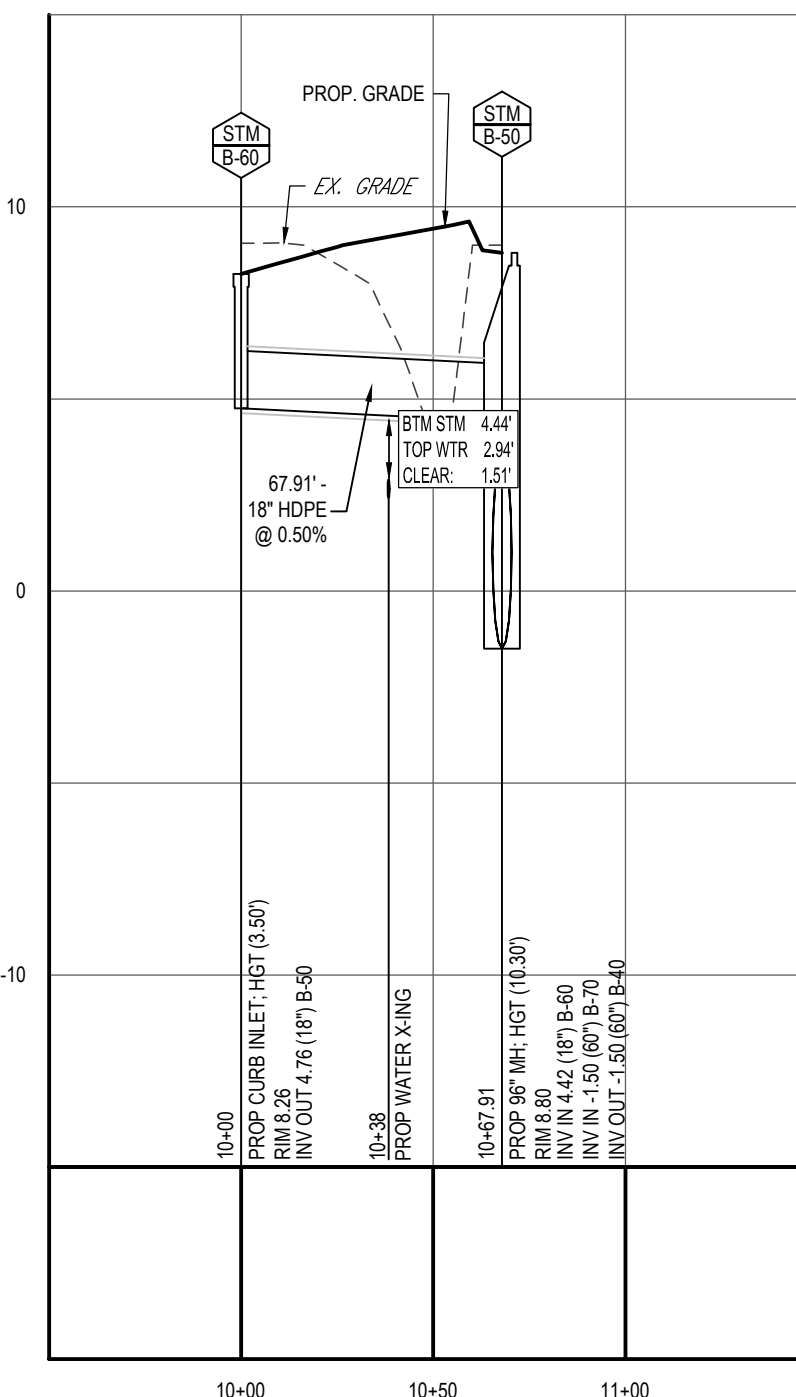
PROPOSED STORM DRAIN - B-10 TO A-10

SCALE: 1"=50' HORIZONTAL
1"=5' VERTICAL



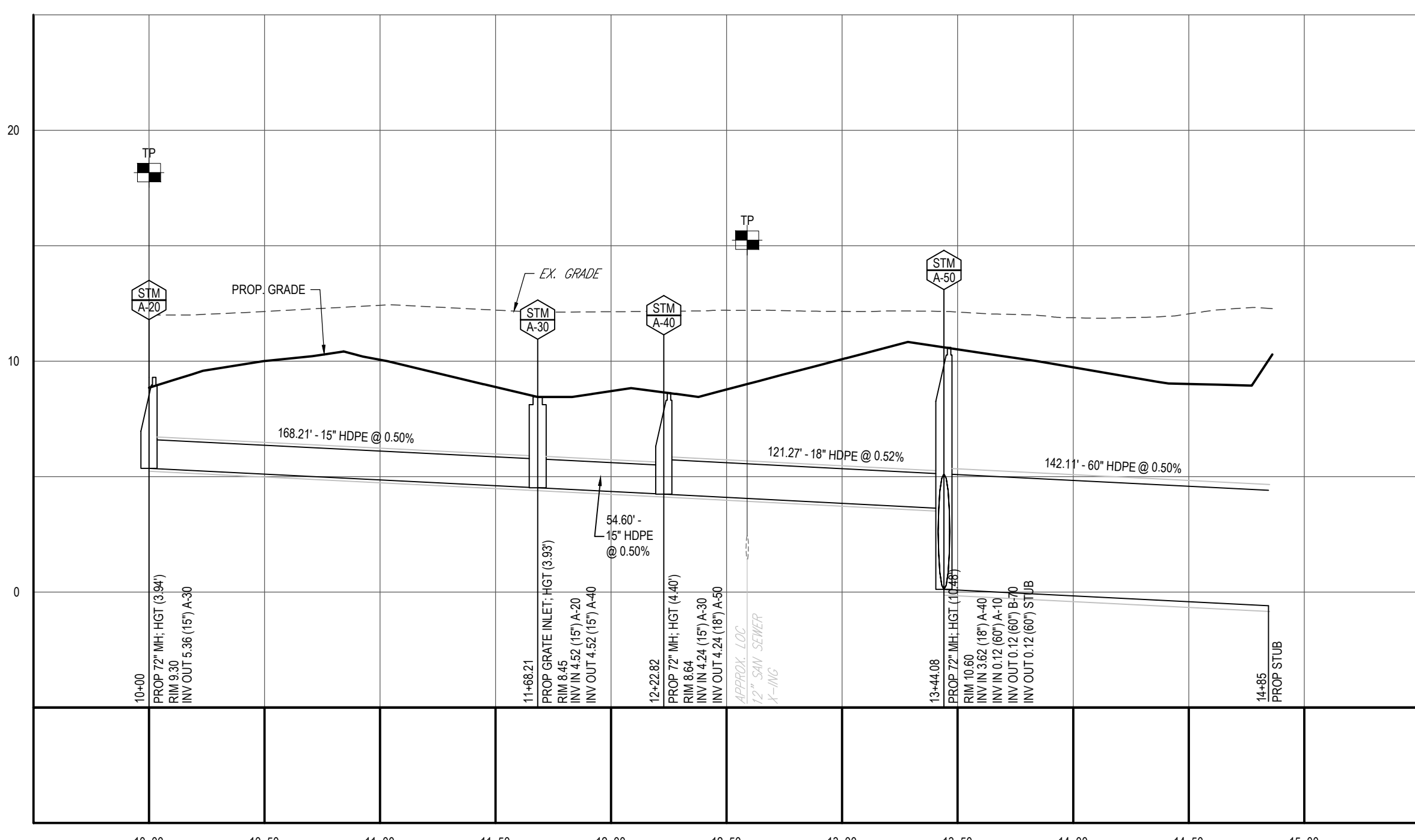
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SCALE: 1"=50' HORIZONTAL
1"=5' VERTICAL



PROPOSED STORM DRAIN - B-60 TO B-50

SCALE: 1"=50' HORIZONTAL
1"=5' VERTICAL

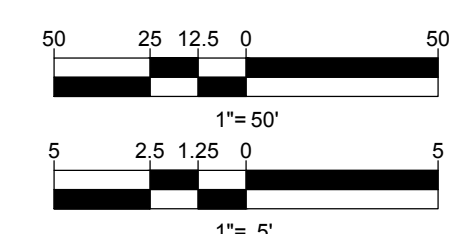


PROPOSED STORM DRAIN - A-20 TO STUB

SCALE: 1"=50' HORIZONTAL
1"=5' VERTICAL

TEST PIT NOTE

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 CAD ID: MD16206641 - PSTM - 0

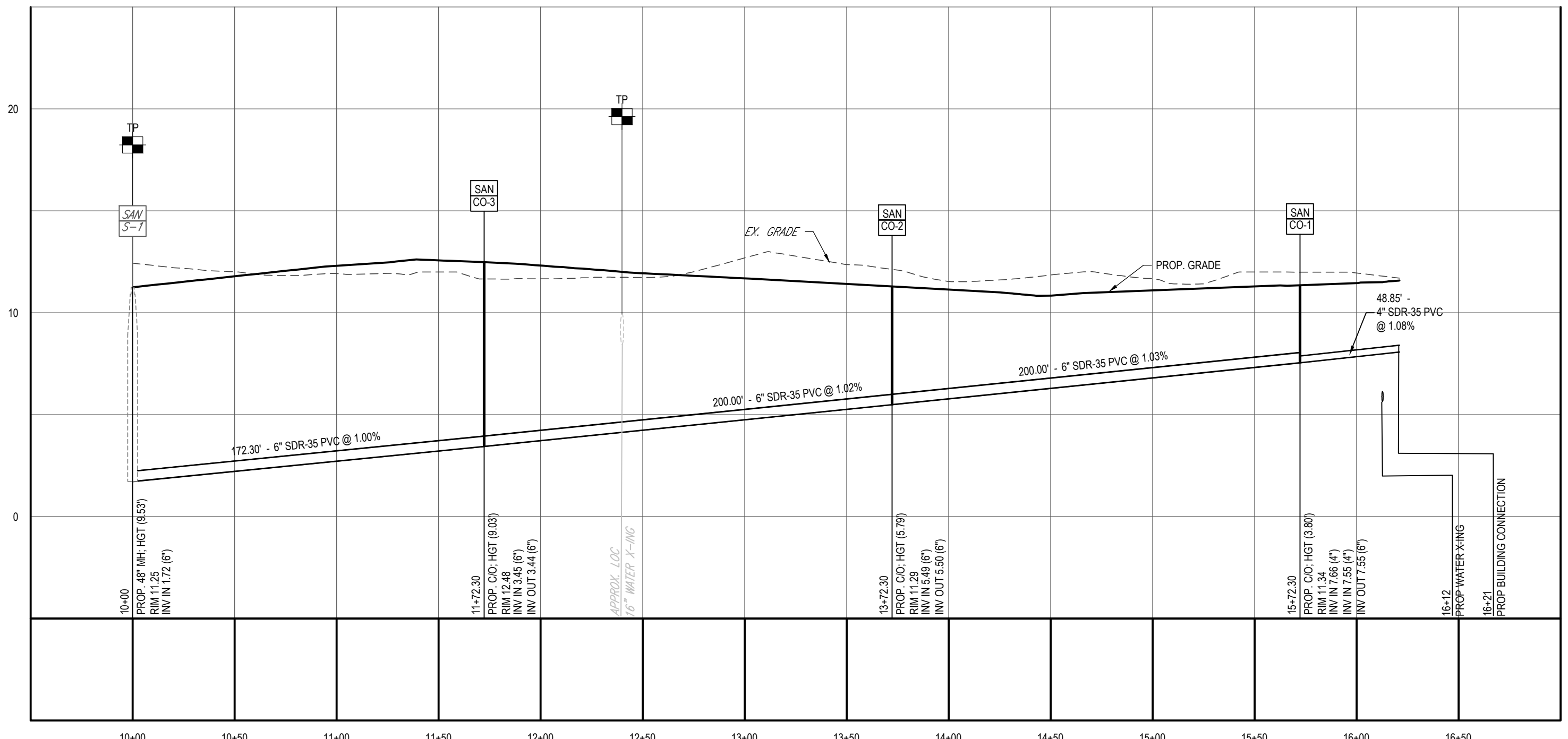
EAST COAST WAREHOUSE (ECW) F.K.A COLD MILL "DROP LOT"
 FOR

TRADEPOINT ATLANTIC
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 F.K.A COLD MILL "ROAD"
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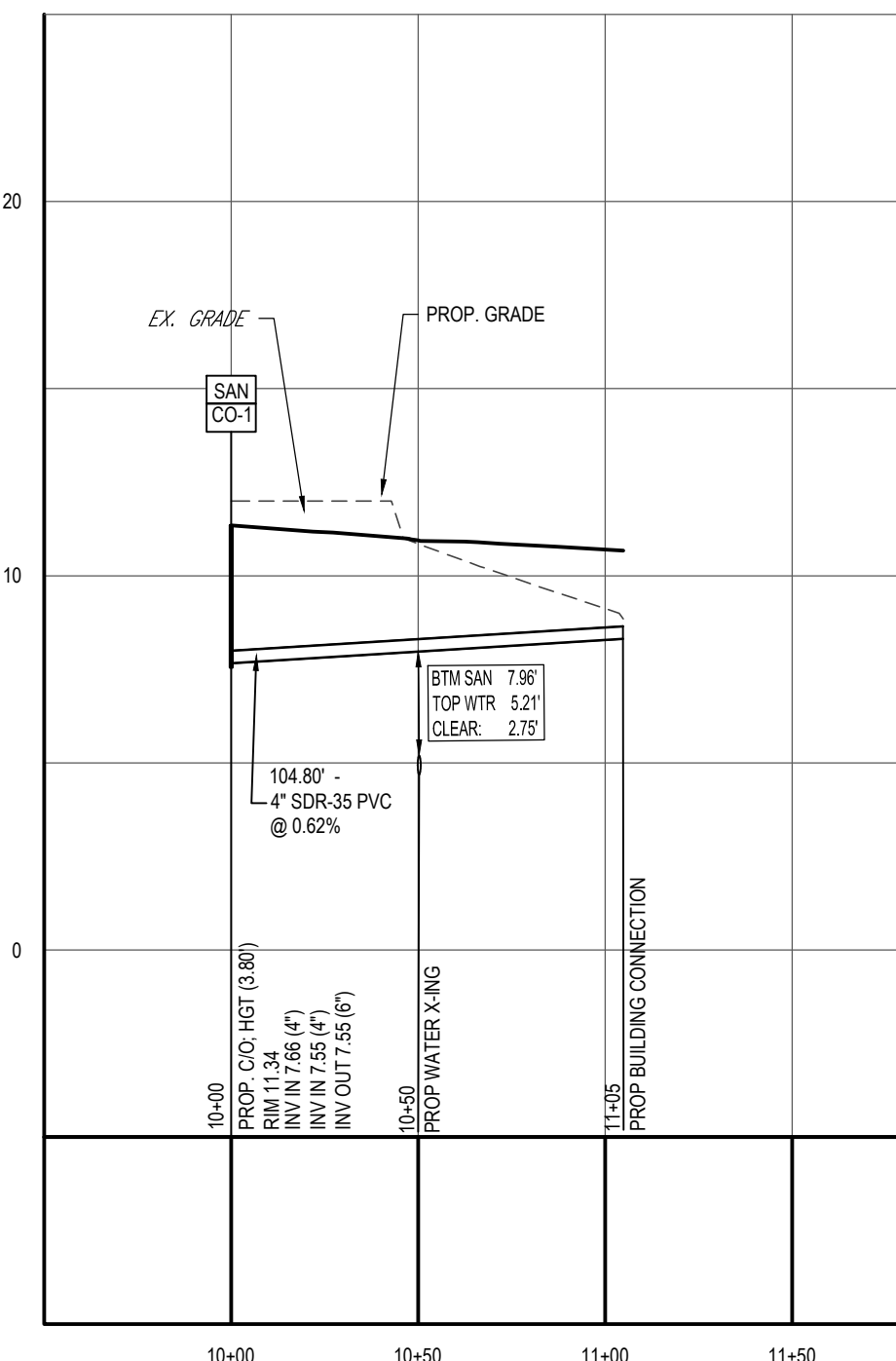
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 PROFESSIONAL ENGINEER
 MARYLAND LICENSE NO. 4497
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SHEET TITLE:
STORM DRAIN PROFILES
 SHEET NUMBER:
C-802
 ORG. DATE - 01/28/22



PROPOSED SANITARY SEWER - A

SCALE: 1"= 50' HORIZONTAL
1"= 5' VERTICAL

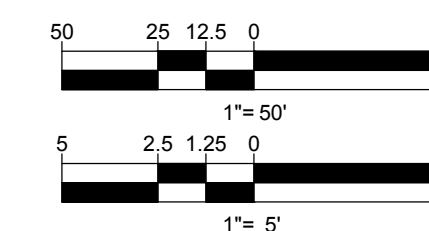


PROPOSED SANITARY SEWER - B

SCALE: 1"= 50' HORIZONTAL
1"= 5' VERTICAL

TEST PIT NOTE

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 CAD I.D.: MD16206641 - PSAN - 0

PROJECT
EAST COAST WAREHOUSE (ECW) F.K.A COLD MILL "DROP LOT"
 FOR

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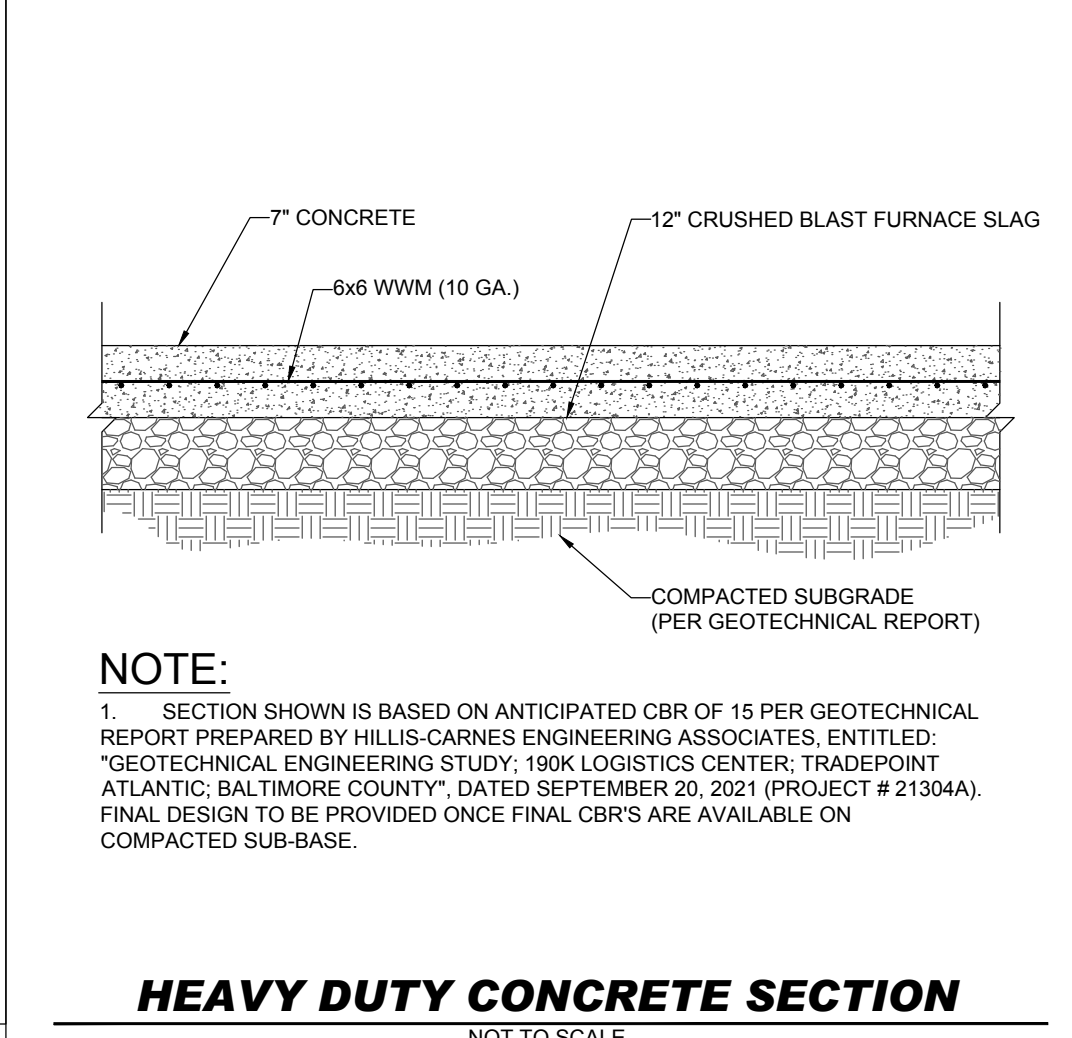
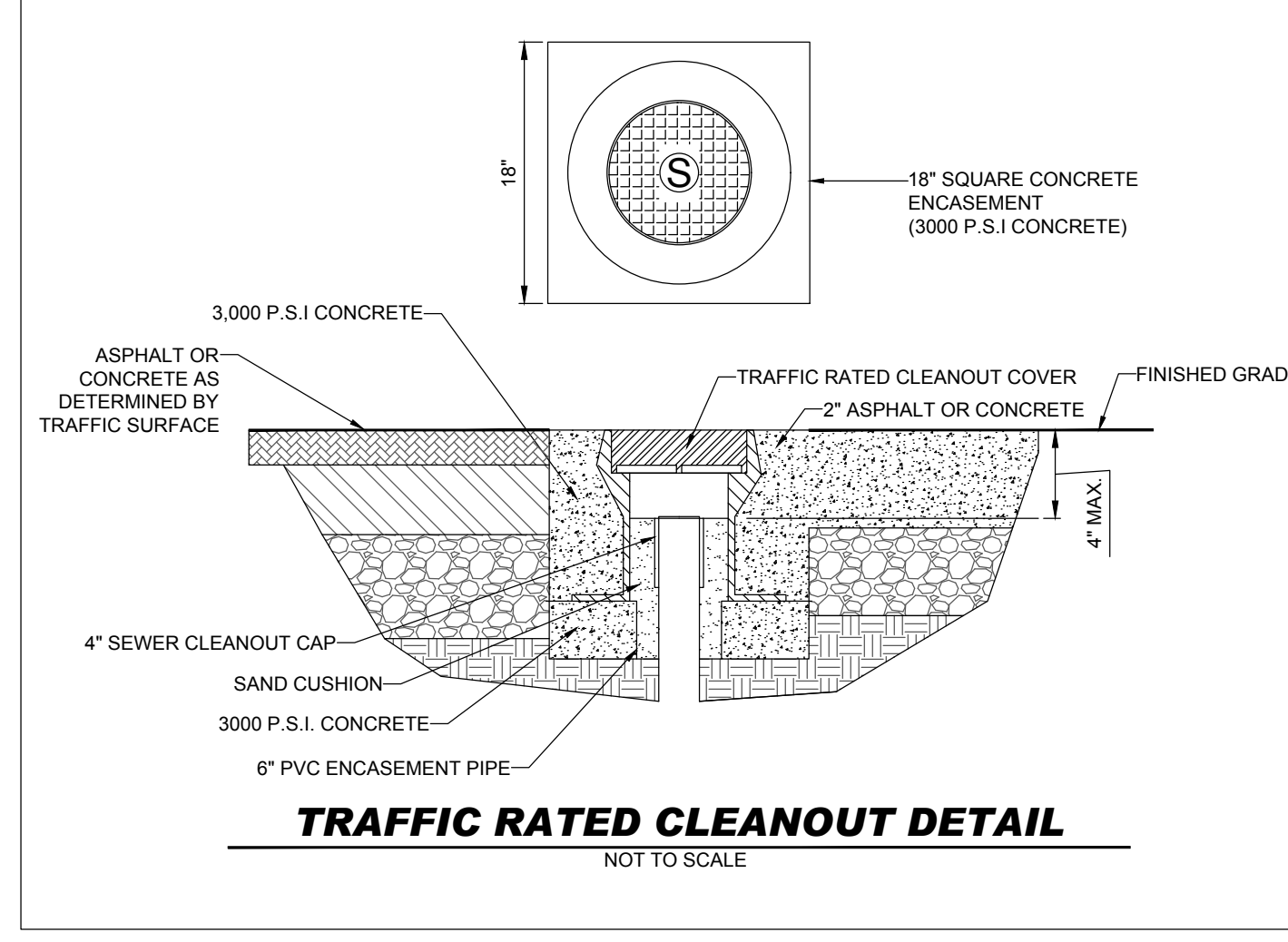
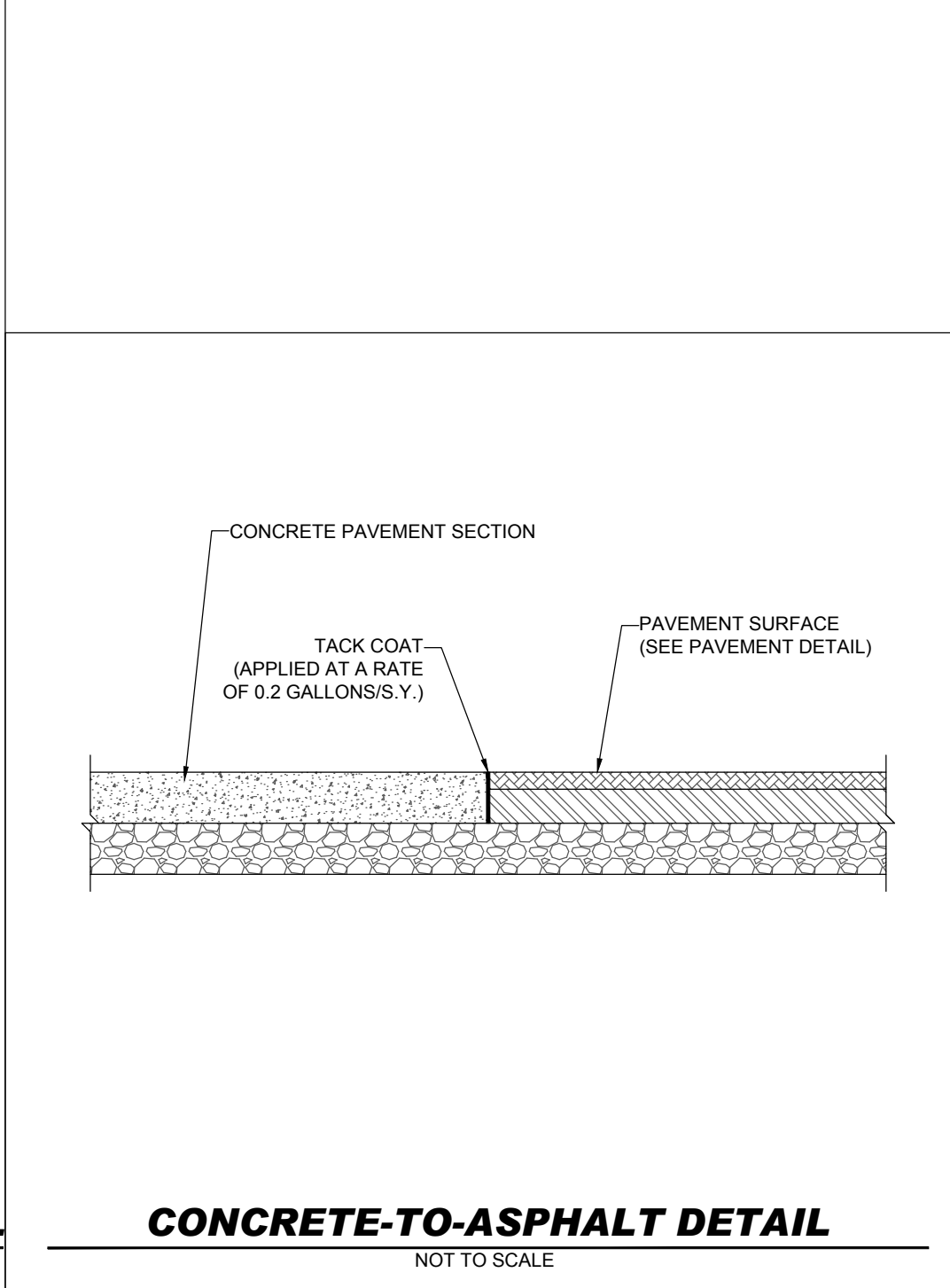
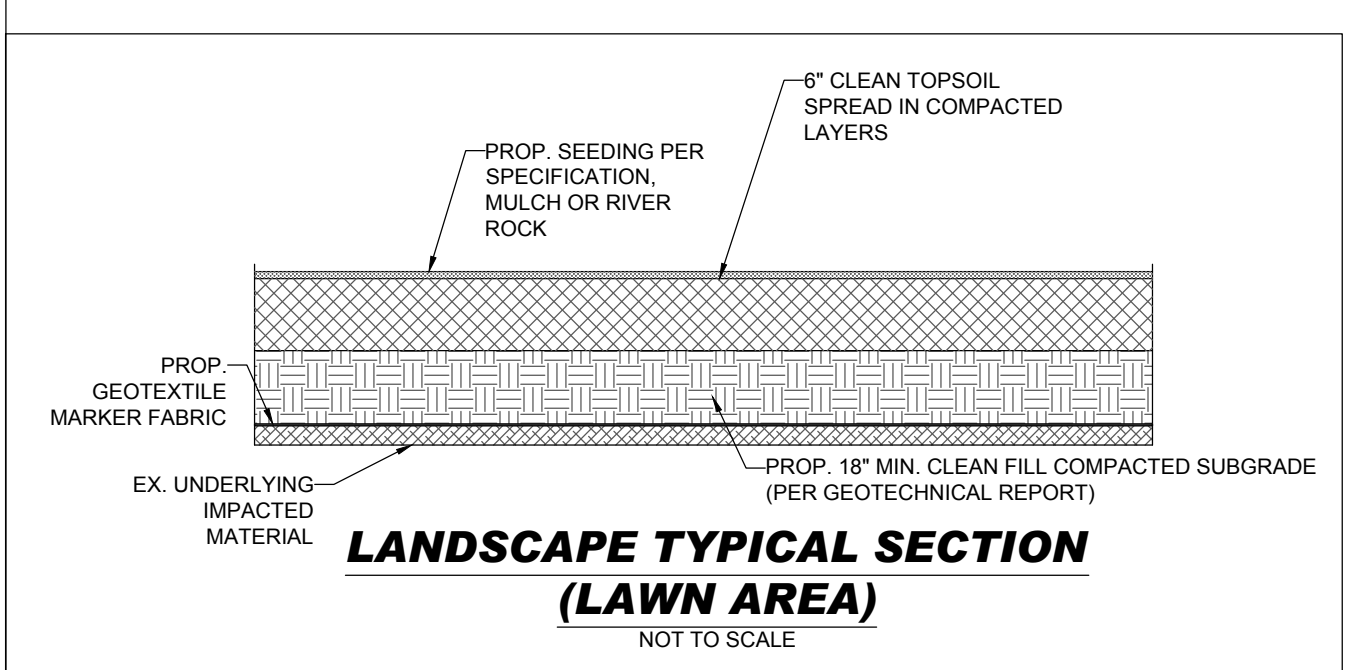
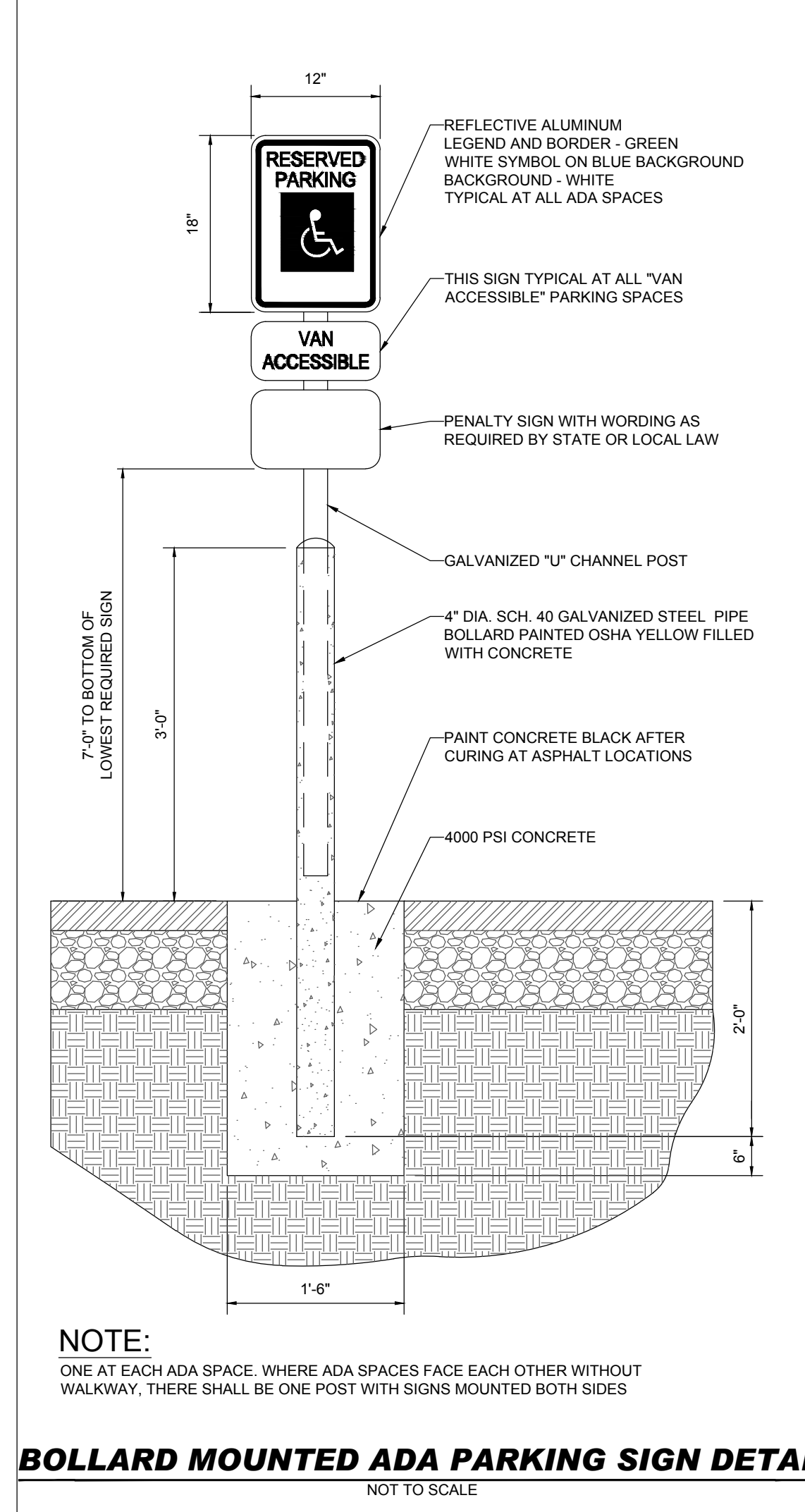
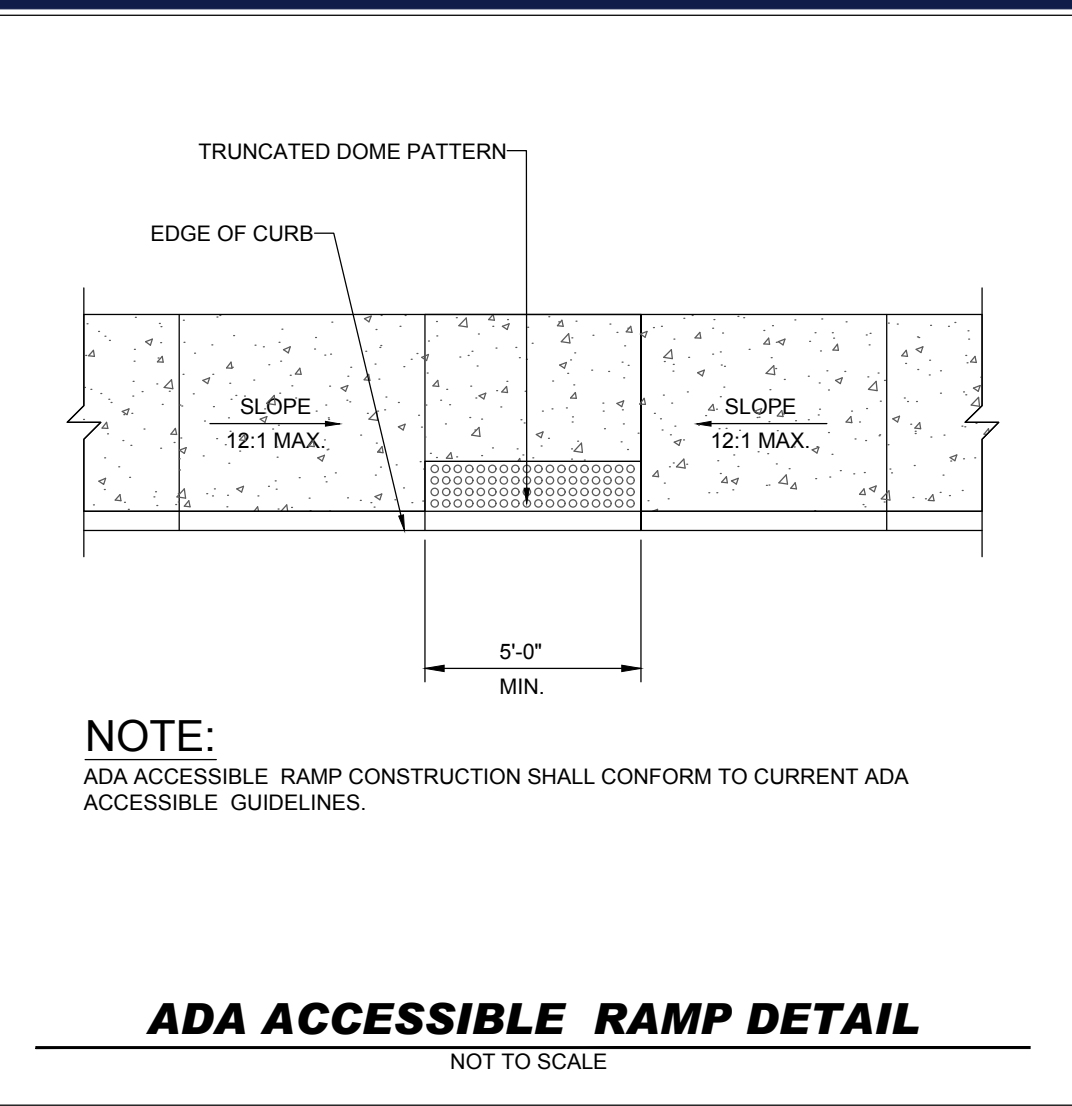
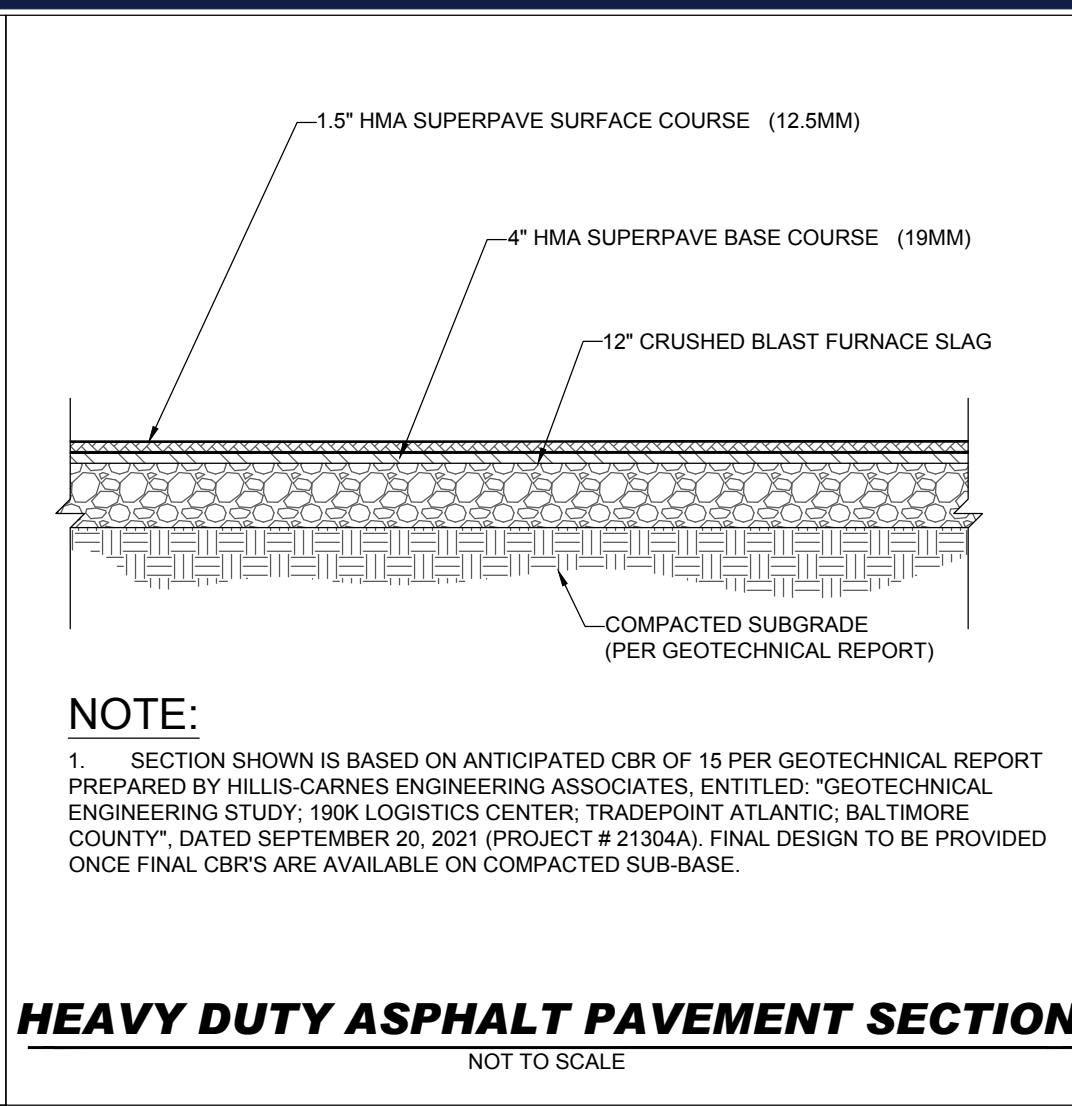
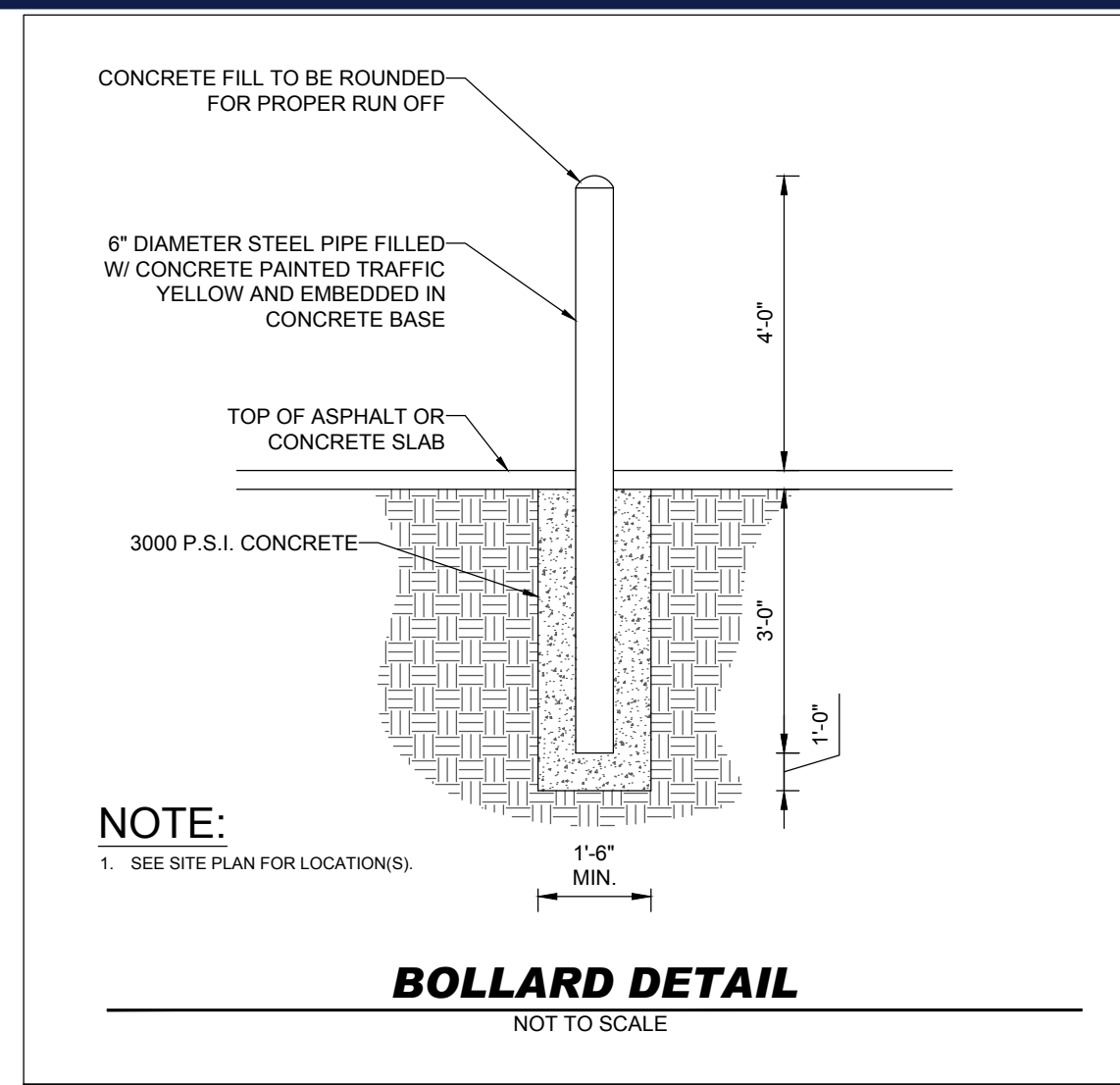
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 MARYLAND LICENSE No. 44097
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SHEET TITLE:
SANITARY SEWER PROFILES

SHEET NUMBER:
C-803

ORG. DATE - 01/28/22



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PROJECT No.: MD16206641
DRAWN BY: MJG
CHECKED BY: MJG
DATE: 01/28/22
CAD I.D.: MD16206641 - C0003S-0

TRADEPOINT ATLANTIC
ECW SCAN YARD
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TM 111, GRID 14 PARCEL 318
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I, MICHAEL J. GESELL, HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 44097, EXPIRATION DATE: 6/30/23

SHEET TITLE:
CONSTRUCTION DETAILS
SHEET NUMBER:
C-901
ORG. DATE - 01/28/22

DWG #	DRAWING TITLE	REV	DATE	REV	DATE	REV	DATE	REV	DATE	REV	DATE
SECTION 1 – PROJECT INFORMATION											
1.0	DRAWING SCHEDULE	1	26 NOV 21	2	07 DEC 21	3	15 DEC 21				
1.1	PROJECT LAYOUT	1	26 NOV 21	2	07 DEC 21	3	15 DEC 21				
1.2	DESIGN CRITERIA	1	26 NOV 21								
1.3	STRUCTURE SPECIFICATIONS	1	26 NOV 21								
SECTION 2 – FOUNDATION INTERFACE											
2.0	BASE PLATE LAYOUT	1	26 NOV 21								
2.1	BASE PLATE DETAILS	1	26 NOV 21								
SECTION 3 – PRIMARY STRUCTURE											
3.0	BUILDING PROFILE	1	26 NOV 21								
3.1	BRACING LAYOUT	1	26 NOV 21								
3.2	STANDARD DETAILS 1	1	26 NOV 21								
3.3	STANDARD DETAILS 2	1	26 NOV 21								
3.4	STANDARD DETAILS 3	1	26 NOV 21								
SECTION 4 – ENDWALLS											
4.0	ENDWALL 1	1	26 NOV 21	2	07 DEC 21	3	15 DEC 21				
4.1	ENDWALL 2	1	26 NOV 21	2	15 DEC 21						
4.2	ENDWALL DETAILS	1	26 NOV 21								

Reviewed for record only as building is proprietary design. Foundations and structural design responsibility of structure vendor

REVIEWED

By Rob Hofmann at 5:00 pm, Dec 27, 2021



3815 Wanuskewin Road
Saskatoon, SK, Canada S7P 1A4
Phone: 306.385.2888
Fax: 306.385.2717
www.norsemanstructures.com

DRAWING TITLE:
DRAWING SCHEDULE

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DWG REV	REVISED BY: DESCRIPTION	DATE
1	FA: RELEASED	26 NOV 21
2	FA: REVISED DRAWING SCHEDULE	07 DEC 21
3	FA: REVISED DRAWING SCHEDULE	15 DEC 21
PROJECT ID: - ORDER ID: 16129 DRAWING: 1.0 REV: 3		

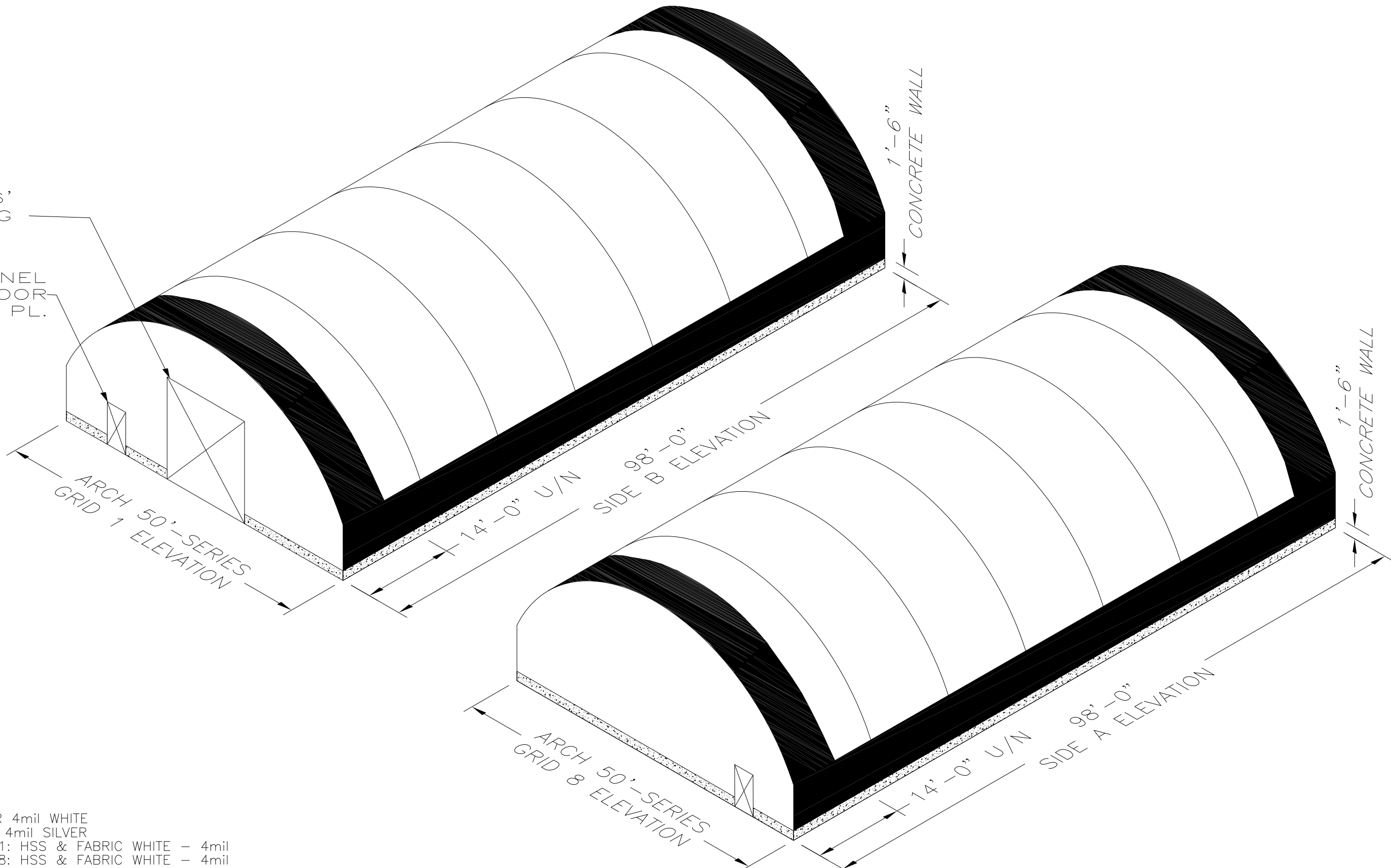
DEALER:
STRUCTURES UNLIMITED
STRATFORD, WI

CUSTOMER:
TRADEPOINT ATLANTIC
SPARROWS POINT, MD

PROJECT:
ARCH 50L x 98' @ 14'
-

14'x16'
OPENING

PERSONNEL
DOOR
TYP. 2 PL.



BUILDING COVER 4mil WHITE
 FLAP & APRON 4mil SILVER
 ENDWALL GRID 1: HSS & FABRIC WHITE - 4mil
 ENDWALL GRID 8: HSS & FABRIC WHITE - 4mil



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1	FA: RELEASED	26 NOV 21
2	FA: REVISED PROJECT LAYOUT	07 DEC 21
3	FA: REVISED PERSONNEL DOOR LOCATION	15 DEC 21
PROJECT ID: -		ORDER ID: 16129
DRAWING: 1.1		REV: 3

DEALER:
 STRUCTURES UNLIMITED
 STRATFORD, WI

CUSTOMER:
 TRADEPOINT ATLANTIC
 SPARROWS POINT, MD

PROJECT:
 ARCH 50L x 98' @ 14'
 -

This project has been designed and fabricated in accordance with the following:

1. DESCRIPTION

Owner's Name and Address: Tradepoint Atlantic
6200 Cold Mill Rd Sparrow Point, MD 21219

Building Supplier's Name and Address: Structures Unlimited LLC
Stratford, WI 54484

Manufacturer's Name and Address: Norseman Structures
3815 Wanuskewin Rd. Saskatoon, SK

Building Size: 50'-3" x 98'-4 1/4"

Truss Spacing: 14'-0"

Intended Use and Occupancy: S-2 - Storage Low hazard

Construction Type: Type V B

Fabric Type: Non-FR

2. DESIGN STANDARDS

International Building Code 2015 (IBC 2015), Chapter 16: Structural Design
ANSI/AISC 360-05, Specification for Structural Steel Buildings
ANSI-Truss, North American Specification for the Design of Cold-Formed Steel Structural Members
ASCE 7-10 Minimum Design Loads for Buildings and Other Structures
Maryland Building Code

3. MANUFACTURING STANDARDS

Fabrication in accordance with ANSI/AISC 360-05 and ANSI-Truss, as applicable.
Welding in accordance with AWS D1.3 Structural Welding Code and ANSI-Truss, as applicable
Norseman Structures is a AWS approved fabricator as per B5.17 and QC17 standards
Welders have been qualified in accordance with QC7-93

4. DESIGN CRITERIA

Exposure Category: Exposure C - Fully Exposed
Enclosure Category: Fully Enclosed
Risk Category: II

A) DEAD LOADS

I) Self-weight of building components
II) Collateral (hanging) load, not to exceed 0.25 psf as an allowance for mechanical, electrical, ceiling, sprinklers, etc, or any combination thereof

B) LIVE LOADS

Live loads determined in accordance with Section 1607 of IBC 2015
Minimum roof live load 12.0 psf

C) SNOW LOADS

Snow loads determined in accordance with Section 1608 of IBC 2015
Ground Snow Load, Pg (1/50) 25.0 psf
Roof Snow, Pf 18.9 psf
Exposure Factor, Ce 0.9
Thermal Factor, Ct 1.2
Importance Factor, Is 1.0

D) WIND LOADS

Wind loads determined in accordance with section 1609 of IBC 2015
Wind Speed (3-sec Gust) 115 mph
Basic Wind Pressure, qh 26.2 psf
Exposure Coefficient, Kh 0.91
Topographic Factor, Kzt 1.0
Directionality Factor, Kd 0.85

E) LOAD COMBINATIONS

Load combinations determined in accordance with section 1605 of IBC 2015

F) SEISMIC LOADS

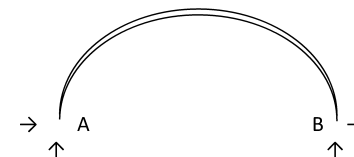
By inspection, wind loads govern over seismic loads by a wide margin, therefore no further seismic calculations are necessary

5. FOUNDATION LOADS

The maximum forces at the foundation/supports due to the site loads listed are as follows:
Foundation loads listed below are unfactored and have not been combined with any other load case.
Foundation designer to combine and factor as necessary.

LOAD CASE:	SIDE A		SIDE B	
	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL
	X _A (kips)	Y _A (kips)	X _B (kips)	Y _B (kips)
DEAD	0.15	0.53	-0.15	0.53
COLLATERAL	0.04	0.14	-0.04	0.14
LIVE	1.89	5.27	-1.89	5.27
SNOW BALANCED	2.19	4.50	-2.19	4.50
SNOW UNBALANCED	1.34	1.58	-1.34	4.45
WIND: PERPENDICULAR	-5.70	-5.91	0.12	-5.57
WIND: PARALLEL	1.00	-5.20	-1.00	-5.20
WIND: INTERNAL (+)	0.01	-1.64	-0.01	-1.64
WIND: INTERNAL (-)	-0.01	1.64	0.01	1.64

Note:
Negative values of Y reactions indicates uplift forces.



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STRUCTURES UNLIMITED
STRATFORD, WI

CUSTOMER:
TRADEPOINT ATLANTIC
SPARROWS POINT, MD

PROJECT:
ARCH 50L x 98' @ 14'
-

DWG REV	REVISED BY: DESCRIPTION	DATE
1	FA: RELEASED	26 NOV 21
PROJECT ID: -	ORDER ID: 16129	DRAWING: 1.2
		REV: 1

GENERAL

THIS DRAWING INCLUDING INFORMATION HEREON, REMAINS THE PROPERTY OF NORSEMAN STRUCTURES, IT IS PROVIDED SOLELY FOR ERECTING THE BUILDING DESCRIBED IN THE SALES ORDER AND SHALL NOT BE MODIFIED, REPRODUCED OR USED FOR ANY OTHER PURPOSE WITHOUT PRIOR WRITTEN APPROVAL OF NORSEMAN STRUCTURES

THE GENERAL CONTRACTOR AND/OR THE ERECTOR IS SOLELY RESPONSIBLE FOR ACCURATE, GOOD QUALITY WORKMANSHIP IN ERECTING THIS BUILDING IN CONFORMANCE WITH THIS DRAWING, DETAILS REFERENCED IN THIS DRAWING AND INDUSTRY STANDARDS PERTAINING TO PROPER ERECTION INCLUDING THE PROPER USE OF TEMPORARY BRACING.

THIS BUILDING IS NOT DESIGNED TO BE LIFTED AS AN ASSEMBLED UNIT. NORSEMAN STRUCTURES IS NOT RESPONSIBLE FOR LOSSES AND/OR DAMAGE AS A RESULT OF LIFTING THIS BUILDING. IF, HOWEVER, IT HAS BEEN DETERMINED TO LIFT THIS BUILDING IT IS THE RESPONSIBILITY OF THE PERSON, FIRM OR COMPANY CONTRACTED TO LIFT THE BUILDING TO SECURE THE SERVICES OF A QUALIFIED ENGINEER TO ENSURE THE LIFT DOES NOT DAMAGE THE BUILDING AND TO DETERMINE AND FINALIZE ALL ASPECTS OF THE LIFT INCLUDING ALL PARTS/CONNECTIONS TO BE ADDED TO THE BUILDING TO FACILITATE THE LIFT.

NORSEMAN STRUCTURES IS NOT RESPONSIBLE FOR ERRORS, OMISSIONS OR DAMAGES INCURRED IN THE ERECTION OF THE COMPONENTS SHOWN ON THIS DRAWING, NOR FOR THE INSPECTION OF ERECTED COMPONENTS TO DETERMINE SAME.

THIS CERTIFICATION AND ENGINEERING SEAL APPLIES ONLY TO PRODUCTS DESIGNED AND FABRICATED BY NORSEMAN STRUCTURES FOR THE LOADING CONDITIONS DESIGNATED ON THESE DRAWINGS. CONCRETE FOUNDATIONS, STEEL COMPONENTS BY OTHERS AND ERECTION SUPERVISION ARE NOT THE RESPONSIBILITIES OF NORSEMAN STRUCTURES OR THE CERTIFYING ENGINEER. ALL DOORS, WINDOWS AND ROLL-UP CURTAINS MUST BE DESIGNED TO SUPPORT THE SITE WIND LOADING AND ARE RELIED ON TO BE CLOSED IN THE EVENT OF HIGH WINDS.

ANCHOR BOLTS
ANCHOR BOLT DIAMETERS ARE DETERMINED IN ACCORDANCE WITH AISC OR ASTM F1554 STANDARD USING $F_y = 36$ KSI (248 MPa). ANCHOR BOLT LENGTHS AND LOAD TRANSFER TO THE FOUNDATION ARE TO BE DETERMINED BY OTHERS.

ANCHOR BOLT PROJECTIONS BASED ON NO GROUT ARE AS FOLLOWS: MIN. 2" – MAX. 3 1/2"

FOUNDATION MUST BE LEVEL, SQUARE AND SMOOTH. ANCHOR BOLTS MUST BE ACCURATELY PLACED AS SHOWN ON THE DRAWINGS.

FINISHED FLOOR ELEVATIONS AND UNDERSIDE OF BASE PLATE IS 100'-0" (1000.000mm) UNLESS NOTED. ERECTION

THE ERECTOR MUST PROVIDE SAFE WORKING CONDITIONS AND PRACTICES CONFORMING TO ALL SAFETY REGULATIONS. ALL LIFTING DEVICES ARE TO BE SPECIFICALLY DESIGNED TO LIFT THE VARIOUS BUILDING COMPONENTS. SLINGS AND SPEADERS BARS TO BE USED TO PREVENT PERMANENT DEFORMATION OF ALL STRUCTURAL COMPONENTS.

ERECTION SHOULD START AT A BRACED BAY. ERECT AND TEMPORARILY SUPPORT TRUSSES. USE TEMPORARY BRACING AS REQUIRED TO ENSURE STABILITY OF THE FRAMES. INSTALL PURLINS AND CROSS BRACING. PLUMB AND SQUARE TRUSSES IN ACCORDANCE WITH CAN/CSA-S16.1 AND OSHA 29 CFR PART 1926 – SAFETY STANDARD FOR STEEL ERECTION.

ENSURE ALL PURLINS REMAIN PARALLEL

STRUCTURAL FRAMING MEMBERS ARE CONSIDERED PLUMB, LEVEL AND ALIGNED WHEN VARIANCE DOES NOT EXCEED 1:500.

STRUCTURAL BOLTS.
BOLTS IN CONNECTIONS NOT SUBJECT TO TENSION LOADS, OR WHERE LOOSENING DUE TO VIBRATION OR LOAD FLUCTUATIONS ARE NOT DESIGN CONSIDERATIONS NEED ONLY BE SNUG TIGHTENED, WHICH IS DEFINED AS THE TIGHTNESS THAT EXISTS WHEN ALL PLIES IN A JOINT ARE IN FIRM CONTACT.

BOLTS IN CONNECTIONS SUBJECT TO TENSION LOADS REQUIRE PRE-TENSIONING TO MINIMUM TENSION. ALL OTHER DIA BOLTS CONFORM TO SAE GR.5 OR EQUIVALENT. ALL BOLTS SHALL BE PLATED / GALVANIZED OR SUNSEAL COATED. ALL BOLT REFERENCES REQUIRE BOTH BOLT AND NUT.

–VALUES AS SHOWN IN THE TABLE BELOW–.

SIZE		Gr 5/A325	
in	mm	kips	kN
5/8	16	18	80
3/4	19	28	125
7/8	22	39	174
1.0	25	51	227
1 1/8	29	56	249
1 1/4	32	71	316

TABLE B – BOLTED CONNECTION TORQUE VALUES

SIZE	Grade 5		
	Dia. Inch	Threads Per Inch	Min Tensile ksi
1/2	13	120	68
5/8	11	120	135
3/4	10	120	240
7/8	9	120	386

MATERIAL SPECIFICATIONS.

STRUCTURAL STEEL CONFORMS TO THE FOLLOWING SPECIFICATIONS:
PLATES – CSA G40.21 44W ASTM A 36 – GR 44W DESIGNED TO F_y 44ksi
H.S.S. > 3/16" WALL – ASTM A500 BUILDING DESIGNED TO F_y 50ksi F_u 60ksi
< 3/16" WALL (GATORSHIELD) – ASTM A500 GRADE C F_y 50ksi

STRUCTURAL CABLES CONFORM TO THE FOLLOWING SPECIFICATIONS:
THIMBLE – FEDERAL SPECIFICATION (USA) FF-T-276b
TURNBUCKLES – FEDERAL SPECIFICATION (USA) FF-T-791b
GALVANIZED CARBON STEEL CABLE – FEDERAL SPECIFICATION (USA) RR-W410D

PLATES & HSS VERTICALS
COATINGS OF STRUCTURAL PLATES AND HSS ARE HOT-DIPPED GALVANIZED TO A NORMAL COATING
ZINC WEIGHT OF 2.0oz/sq ft (600g/sq m) (3.4mil).

GATORSHIELD
H.S.S. ARE IN-LINE GALVANIZED TO A NOMINAL COATING ZINC WEIGHT OF 0.6oz/sq ft (180g/sq m)(1.0mil).

CHROMATE CONVERSION COATING APPLIED OVER GALVANIZED SURFACE TO PROVIDE ADDITIONAL CORROSION PROTECTION.

CLEAR ORGANIC POLYMER APPLIED AS THE TOP SURFACE COAT TO RETARD OXIDATION, ENHANCE SURFACE APPEARANCE AND PROVIDE PRIMER BASE.
RECONDITIONING OF TRUSS SURFACE AT WELD LOCATION AS PER NACE NO.1/SSPC-SP5 WHITE METAL BLAST CLEANING
THERMAL ZINC SPRAY AS PER SSPC-CS 23.00 / AWS C2.23 / NACE #12, SPECIFICATION FOR APPLICATION OF THERMAL SPRAY COATINGS.

ALL GATORSHIELD WILL DEMONSTRATE THE ABILITY TO WITHSTAND 1800 HOURS OF ACCELERATED SALT FOG TESTING TO THE CONDITION OF 5% SURFACE RED RUST, WHEN TESTED IN ACCORDANCE WITH ASTM B117 STANDARDS.

FABRIC / LINER NOTES
REMOVAL OF FABRIC OF ALTERATION WITHOUT PRIOR AUTHORIZATION IS PROHIBITED.
ALL TEARS MUST BE PATCHED IMMEDIATELY TO AVOID WARRANTY PROBLEMS.

EXTERIOR FABRIC WILL DEFLECT UNDER LOAD, THEREFORE ALL BUILDING ACCESSORIES (LIGHTING, HVAC, SPRINKLERS, ETC) MUST BE LOCATED BENEATH THE INNER CHORD OF THE TRUSS. ANYTHING ABOVE THIS MUST BE REVIEWED AND APPROVED IN WRITING BY NORSEMAN STRUCTURES OR SEVERE DAMAGE TO THE BUILDING AND ACCESSORIES MAY RESULT FROM FAILURE TO COMPLY WITH THIS REQUIREMENT.

ALL POLYETHYLENE MEMBRANES WILL POSSESS THE FOLLOWING MINIMUM SPECIFICATIONS:
FABRIC SPECIFICATIONS

PHYSICAL	PROPERTIES	DESCRIPTION	
BASE SCRIM	WOVEN HDPE SCRIM C/W UV/FR	HIGH DESITY POLYETHYLENE, WITH UV/FR INHIBITITORS.	
COATING THICKNESS	4 mil (94 gsm) EA. SIDE	AVERAGE 4 mil EXTERIOR COATING ON EACH SIDE OF BASE SCRIM	
SURFACE TYPE	MODIFIED LDPE C/W UV/FR	MODIFIED LOW DENSITY POLYETHYLENE COATING WITH UV/FR INHIBITORS	
TOTAL FABRIC WEIGHT	12.0 oz. / sq yd. (407 gsm)	AVERAGE ±5%	
STRENGTH		TEST STANDARD	
THICKNESS	23mils (0.59mm)	ASTM D-5199	
GRAB TENSILE STRENGTH	350 lbs (1555N)	ASTM D-5034	
TONGUE TEAR STRENGTH	110 lbs (489N)	ASTM D-2261	
STRIP TENSILE STRENGTH	240 lbs/inch (2100N/5cm)	ASTM D-5035	
MULLEN BURST	675 psi (4657 KPa)	ASTM D-3786	
COLD CRACK	PASS –60°C	ASTM D-2136	
% LIGHT TRANSMISSION	DWFR-11.4% WHITE/WHITE	ASTM E-903	
UV & WEATHERING	>90% STRENGTH RETENTION AFTER 2000HRS	ASTM G-151	
WATER VAPOR TRANSMISSION	0.038grains/h/ftsqa/inHg(perms)	ASTM E-96	
	2.16 ng/Pa/s/msq		
FIRE		TEST STANDARD	
SCALE FLAME SPREAD	FSCI: 5	SD: 95	CAN/ULC S-102-07
SMALL SCALE FLAME TEST	CHAR: 98mm AV.	DRIP: NO	CAN/ULC S-109-03
LARGE SCALE FLAME TEST	CHAR: 104mm AV.	DRIP: NO	CAN/ULC S-109-09

ROOF PLAN NOTES
UNLESS NOTED, USE ø5/8" (16mm) BOLTS FOR PURLIN TO TRUSS, CABLE OR ROD BRACING TO TRUSS AND ANGLES TO TRUSS FOR ALL CONNECTIONS.

CABLE / ROD AND PURLIN BRACING ARE AN INTEGRAL PART OF THE TRUSS STRUCTURAL SYSTEMS AND SHOULD BE PROPERLY INSTALLED PRIOR TO ERECTION OF FABRIC ROOF AND ENDWALL PANELS. REMOVAL OR ALTERATION OF ANY BRACING WITHOUT PRIOR AUTHORIZATION FROM NORSEMAN STRUCTURES INC. IS PROHIBITED.

ELEVATION NOTES HOLES REQUIRED IN HSS COLUMNS AND HEADERS FOR FRAMED OPENINGS, DOOR OR WINDOW POST CONNECTIONS TO BE BY ERECTOR.

WALK DOOR, WINDOW AND FRAMED OPENING POSTS TO BE FIELD ANCHORED TO CONCRETE, IN ACCORDANCE WITH "HILTI KWIK-BOLTS" SPECIFICATIONS OR SIMILAR.

PARTITION WALL NOTE
FIELD INSTALLATION OF PARTITION WALL TO UNDERSIDE OF ANY ARCH FRAMING MEMBERS MUST ALLOW FOR VERTICAL BUILDING DEFLECTION. CONTACT NORSEMAN STRUCTURES INC. FOR REQUIRED CLEARANCES.


MATERIAL STORAGE
GALVANIZED, ALUMINIZED, AND COLORED MATERIALS ARE SUBJECT TO CORROSION AND DISCOLORATION IF THEY ARE IMPROPERLY STORED. SHORT TERM JOB SITE STORAGE OF STEEL COMPONENTS MAY BE TOLERATED, PROVIDED CARE IS TAKEN TO KEEP MATERIALS DRY AT ALL TIMES. WHEN TRUSSES ARE TO BE STORED OUTDOORS, THEY SHOULD BE PLACED AT AN ANGLE SUFFICIENT TO PROMOTE GOOD DRAINAGE. IN ADDITION, SEVERAL INCHES OF CLEARANCE MUST BE PROVIDED BETWEEN THE LOWER END AND THE GROUND TO ALLOW VENTILATION.

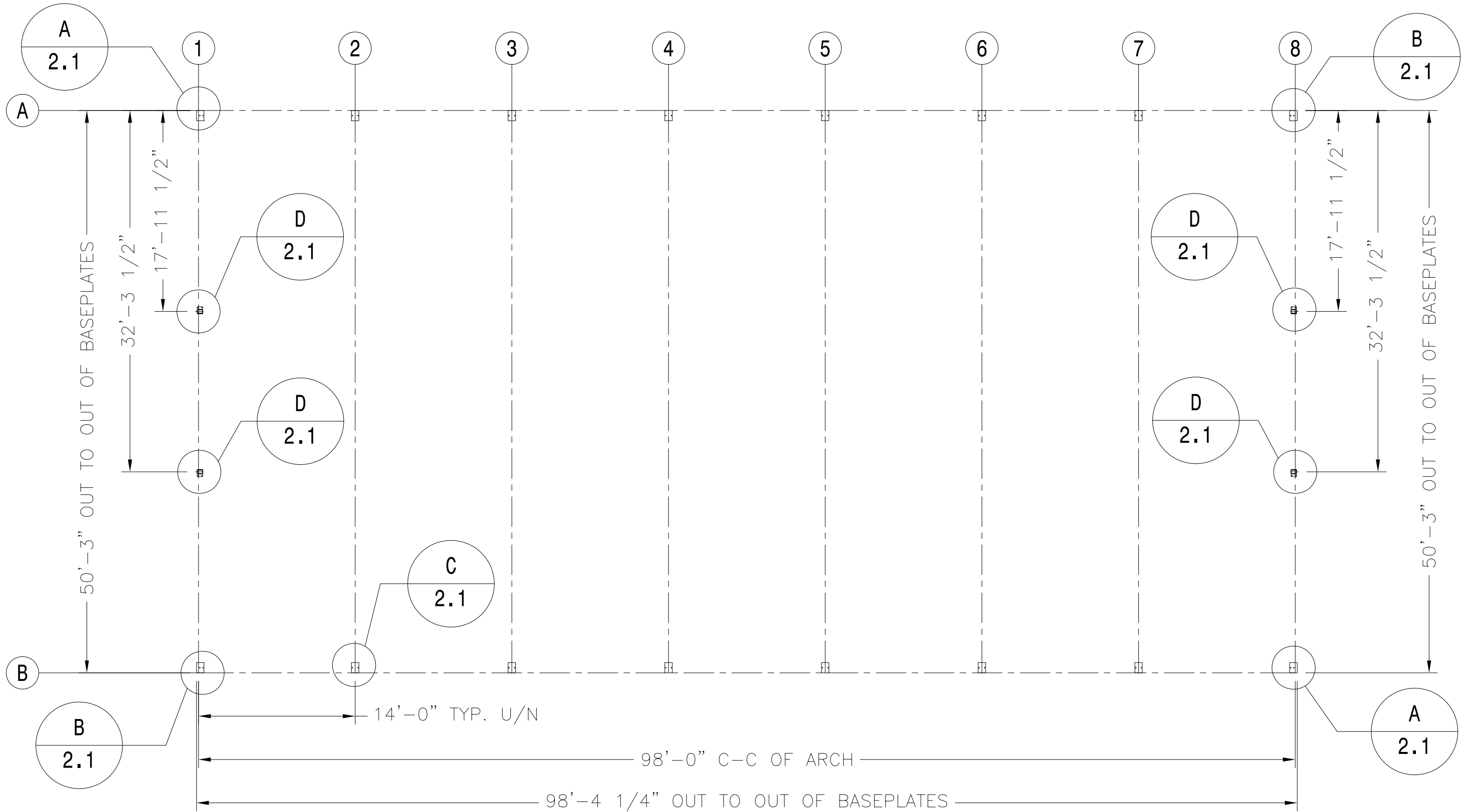
NOTE: NORSEMAN STRUCTURES WILL NOT BE HELD RESPONSIBLE FOR MATERIALS WHICH ARE IMPROPERLY PROTECTED AFTER DELIVERY.

MANUFACTURING STANDARDS.
FABRICATION IS IN ACCORDANCE WITH CAN/CSA-S16.1 AND CAN/CSA-S136, AS APPLICABLE.

MINIMUM FILLET WELD SIZE IS 3/16"

NORSEMAN STRUCTURES IS A CWB CERTIFIED DIVISION 2.1 MANUFACTURER.
ALL WELDS ARE COMPLETED IN SHOP AS PER CWB INDEPENDENT THIRD PARTY TESTS OUR WELDERS AND PROCEDURES AND AUDITS OUR FACILITIES. THIS CERTIFICATION MEETS WITH AWS D1.1 AND D1.3 CRITERIA.

	3815 Wanuskewin Road Saskatoon, SK, Canada S7P 1A4 Phone: 306.385.2888 Fax: 306.385.2717 www.norsemanstructures.com		DRAWING TITLE: STRUCTURE SPECIFICATIONS		DWG REV	REVISED BY: DESCRIPTION	DATE	
					1	FA: RELEASED	26 NOV 21	
DEALER: STRUCTURES UNLIMITED STRATFORD, WI	CUSTOMER: TRADEPOINT ATLANTIC SPARROWS POINT, MD	PROJECT: ARCH 50L x 98' @ 14' -	This drawing and the proprietary design is property of Norseman Structures any reproduction in whole or in part without the expressed written consent of Norseman Structures is prohibited. This drawing is not to scale unless otherwise noted.		PROJECT ID: -	ORDER ID: 16129	DRAWING: 1.3	REV: 1



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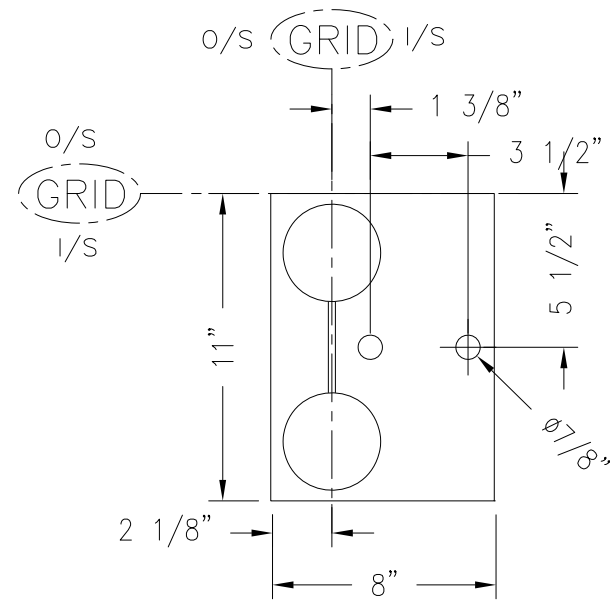
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BASEPLATE LAYOUT
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1	FA: RELEASED	26 NOV 21
PROJECT ID: -	ORDER ID: 16129	DRAWING: 2.0
		REV: 1

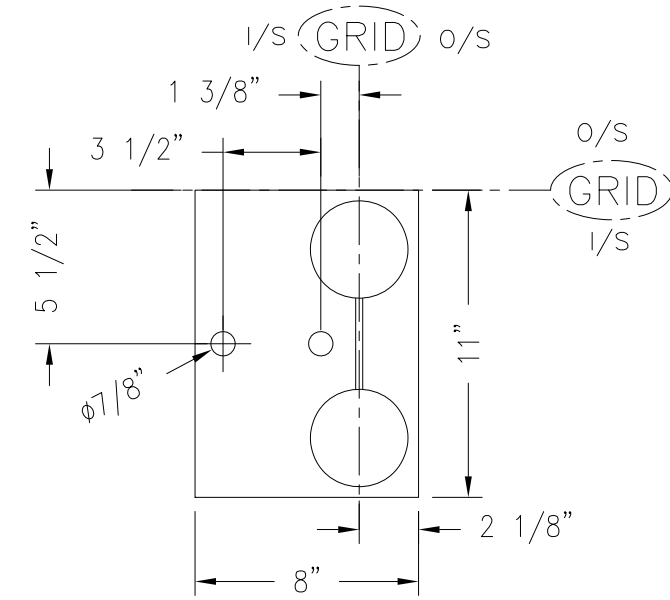
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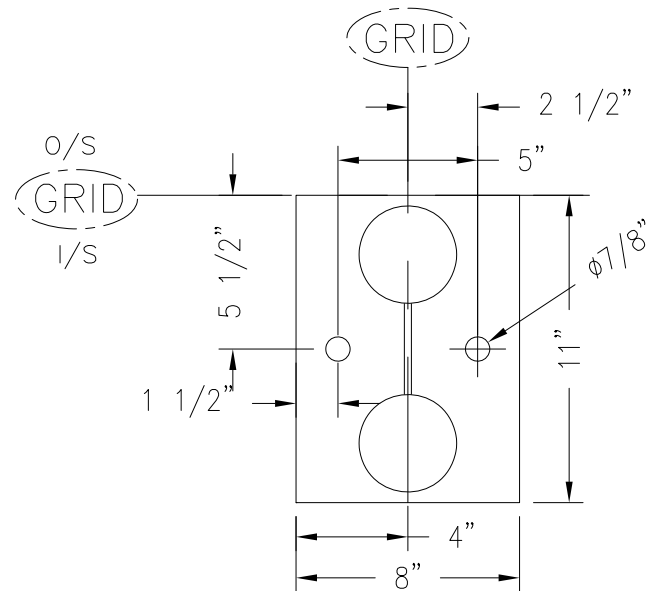
PROJECT:
ARCH 50L x 98' @ 14'
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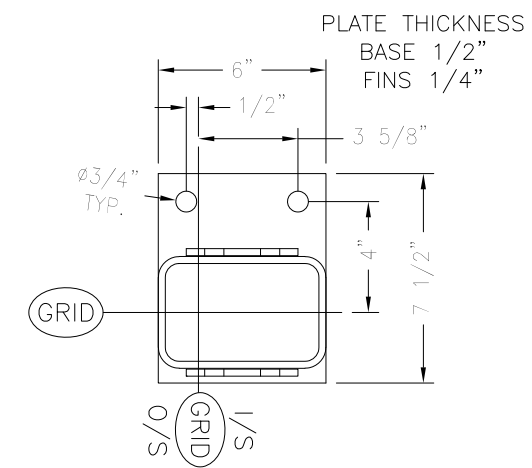
A 50' LEFT END TRUSS
2.1 BASEPLATE DETAIL



B 50' RIGHT END TRUSS
2.1 BASEPLATE DETAIL



C 50' COMMON TRUSS
2.1 BASEPLATE DETAIL



D 4x6 HSS ENDWALL
2.1 BASEPLATE DETAIL



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DRAWING TITLE:
BASEPLATE DETAIL

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SPARROWS POINT, MD

PROJECT:
ARCH 50L x 98' @ 14'
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DWG REV	REVISED BY: DESCRIPTION	DATE
1	FA: RELEASED	26 NOV 21
PROJECT ID: -	ORDER ID: 16129	DRAWING: 2.1 REV: 1

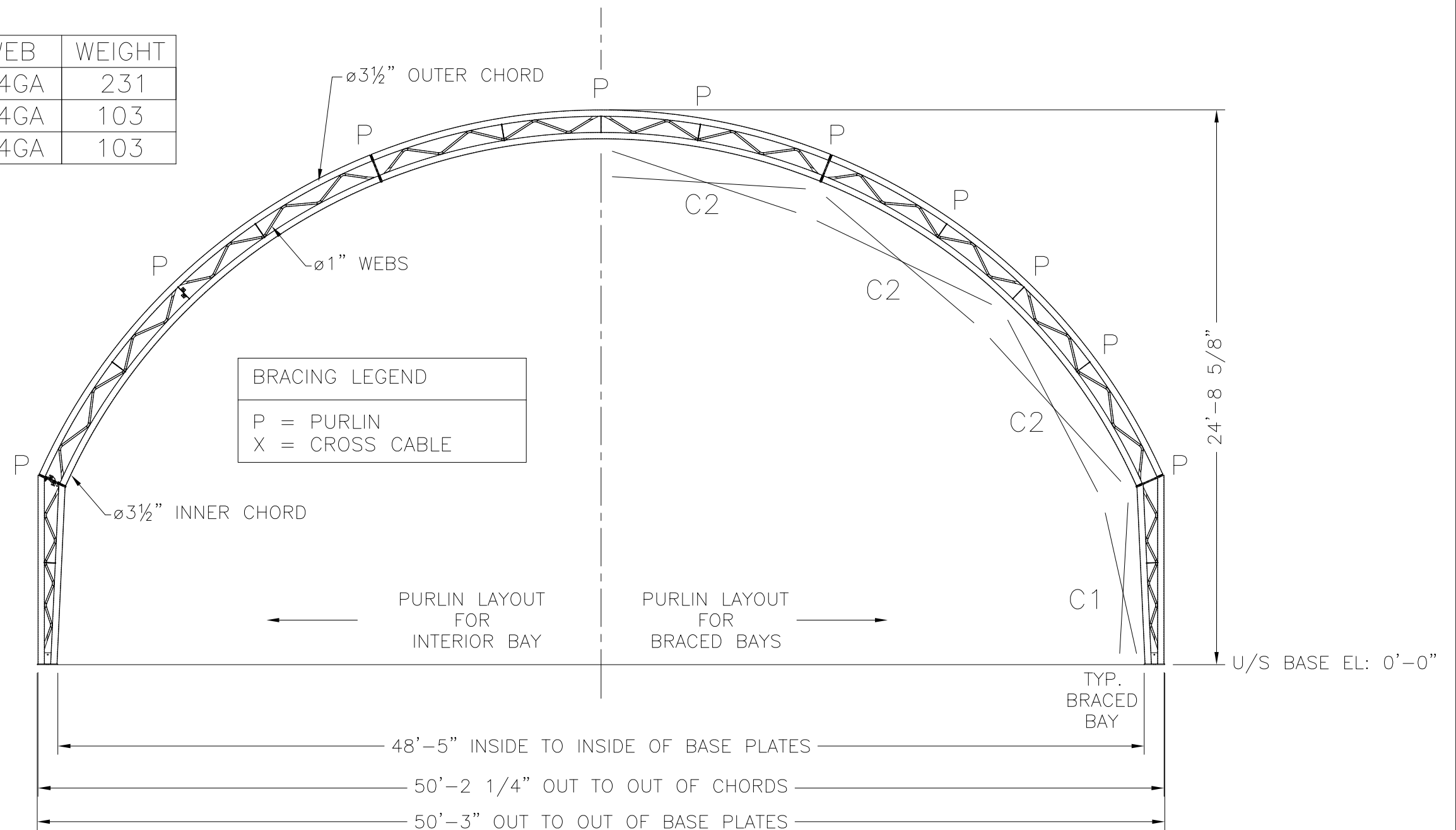
INTERIOR ARCH

ITEM#	QTY	OC	IC	WEB	WEIGHT
D30003032	3	10GA	10GA	14GA	232
D30003037	2	10GA	10GA	14GA	103

END ARCH

ITEM#	QTY	OC	IC	WEB	WEIGHT
D30003033	3	10GA	10GA	14GA	231
D30003038	1	10GA	10GA	14GA	103
D30003039	1	10GA	10GA	14GA	103

APPROX. WEIGHT
OF TRUSS ARCH
W/ BOLTS = 950LB



D50 c/w 8' Leg	5' BAY Item #	6' BAY Item #	7' BAY Item #	8' BAY Item #	9' BAY Item #	10' BAY Item #	11' BAY Item #	12' BAY Item #	13' BAY Item #	14' BAY Item #	15' BAY Item #	16' BAY Item #
C1	866107-9	866114-9	866121-9	866129-9	866138-9	866147-9	866157-9	866167-9	866177-9	866188-9	866198-9	866208-9
C2	866132-9	866138-9	866144-9	866151-9	866158-9	866166-9	866175-9	866184-9	866193-9	866203-9	866212-9	866222-9



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DRAWING TITLE:
BUILDING PROFILE
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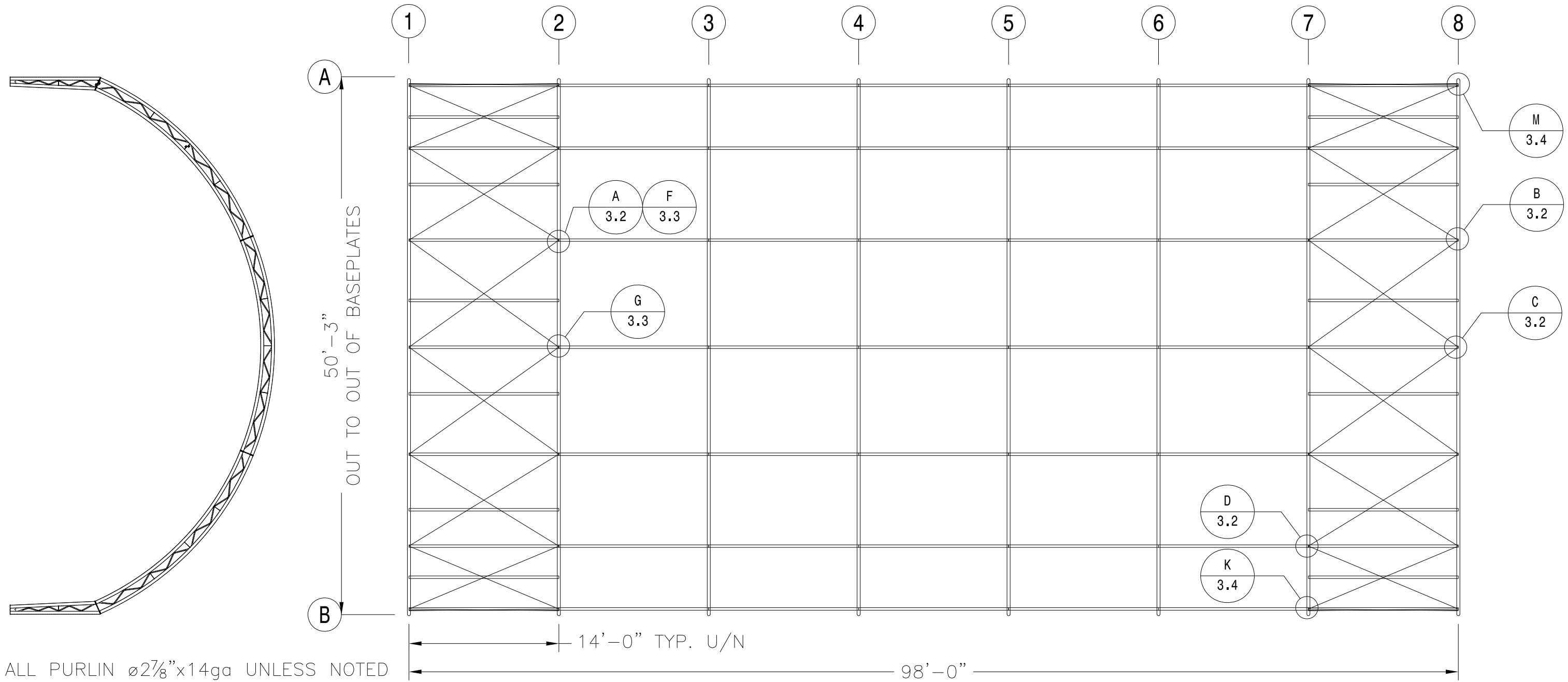
DWG REV	REVISED BY: DESCRIPTION	DATE
1	FA: RELEASED	26 NOV 21

PROJECT ID: -	ORDER ID: 16129	DRAWING: 3.0	REV: 1
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DEALER:
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CUSTOMER:
TRADEPOINT ATLANTIC
SPARROWS POINT, MD

PROJECT:
ARCH 50L x 98' @ 14'
-



ALL PURLIN $\phi 2\frac{7}{8}$ "x14ga UNLESS NOTED



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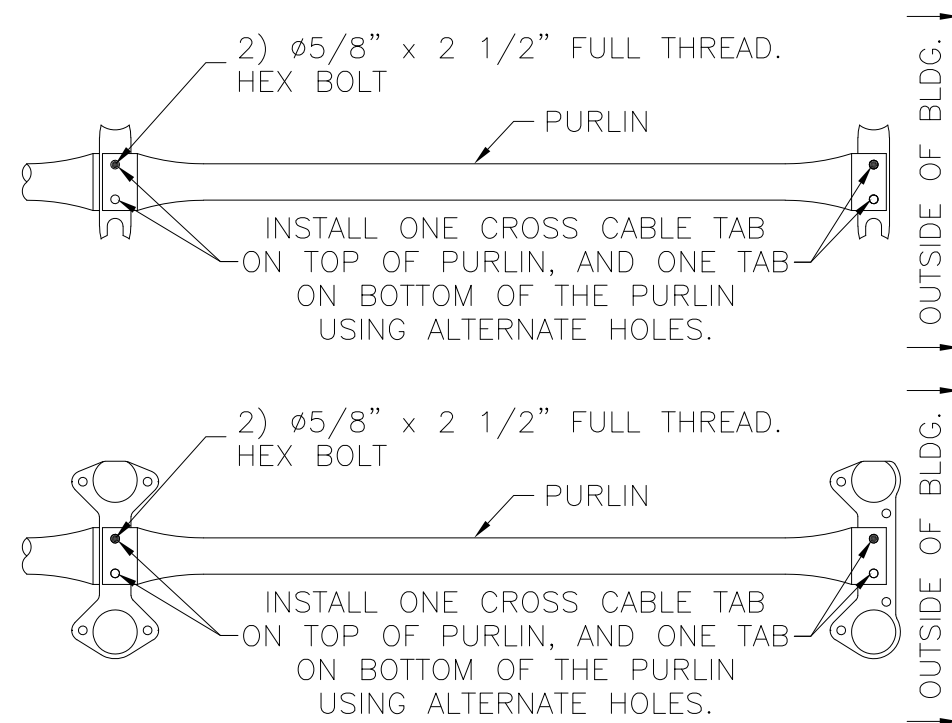
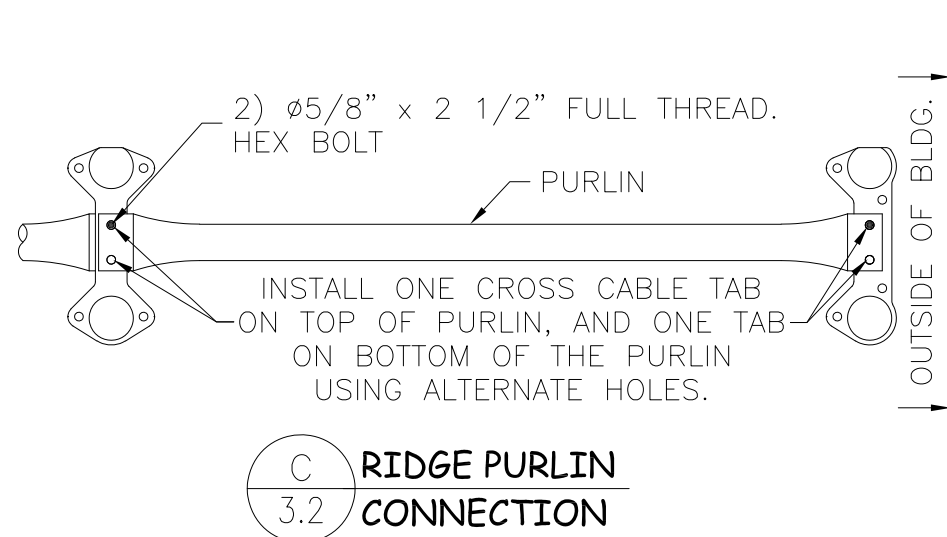
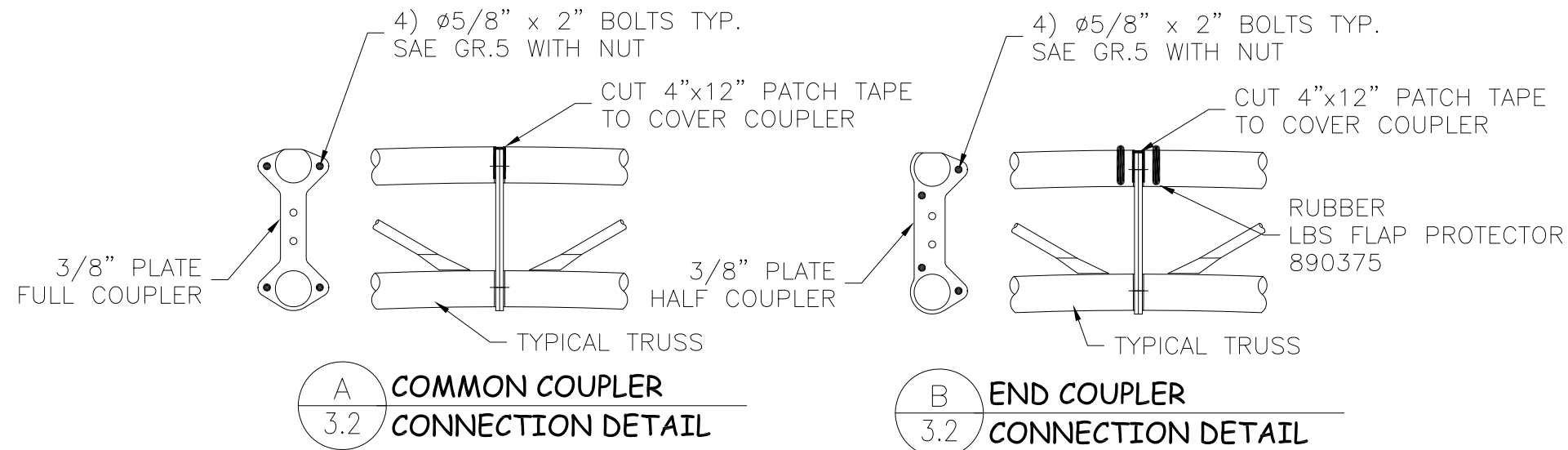
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BRACING LAYOUT
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SPARROWS POINT, MD

PROJECT:
ARCH 50L x 98' @ 14'
-



TIP FOR CABLE BRACED BAYS

INSTALL FIRST BAY PURLINS ON TOP OF COUPLER/KINGPIN WITH ONE TAB FACING UP AND ONE FACING DOWN
 INSTALL SECOND BAY PURLIN ON BOTTOM OF COUPLER/KINGPIN USING ONLY 1 BOLT AND ONE TAB FACING DOWN
 INSTALL THIRD BAY PURLIN ON TOP OF COUPLER/KINGPIN USING ONLY 1 BOLT AND ONE TAB FACING UP



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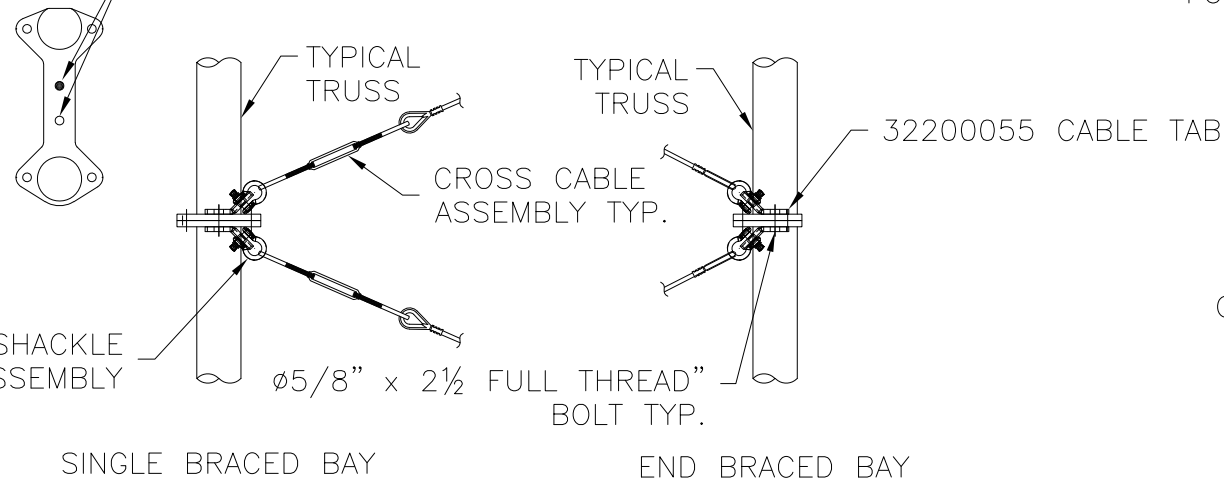
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PROJECT ID: -	ORDER ID: 16129	DRAWING: 3.2
		REV: 1

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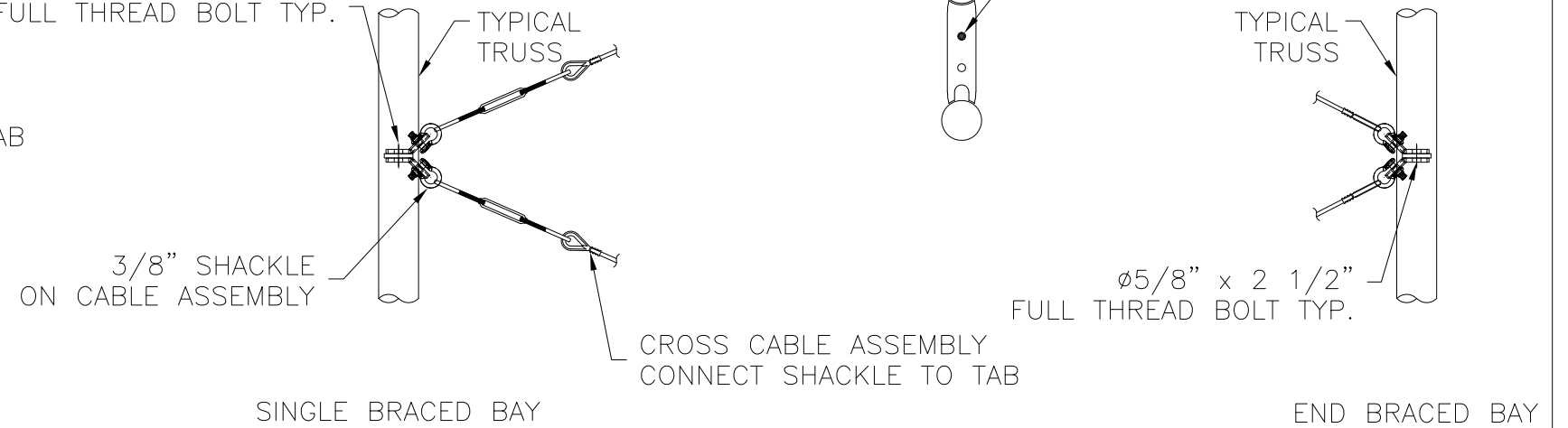
CUSTOMER:
 TRADEPOINT ATLANTIC
 SPARROWS POINT, MD

PROJECT:
 ARCH 50L x 98' @ 14'
 -

INSTALL ONE CROSS CABLE TAB ON WITH EACH PURLIN WHERE REQUIRED. ATTACH CABLE ASSEMBLY TO EACH TAB CROSS CABLE ASSEMBLY CONNECTION POINT



Ø5/8" x 2 1/2" FULL THREAD BOLT TYP.



NOTE:
 -INSTALL ALL TURNBUCKLES AT ONE END FOR EASE OF INSTALLATION.
 -PURLINS REMOVED FOR CLARITY.

NOTE:
 -INSTALL ALL TURNBUCKLES AT ONE END FOR EASE OF INSTALLATION.
 -PURLINS REMOVED FOR CLARITY.

F CROSS CABLE AT COUPLER
 3.3 CONNECTION

G CROSS CABLE AT MID TRUSS
 3.3 CONNECTION

Part no	Material
32200057	3/8" X 2" FB
32200055	3/8" X 2" FB



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DRAWING TITLE:
 STANDARD DETAILS 2

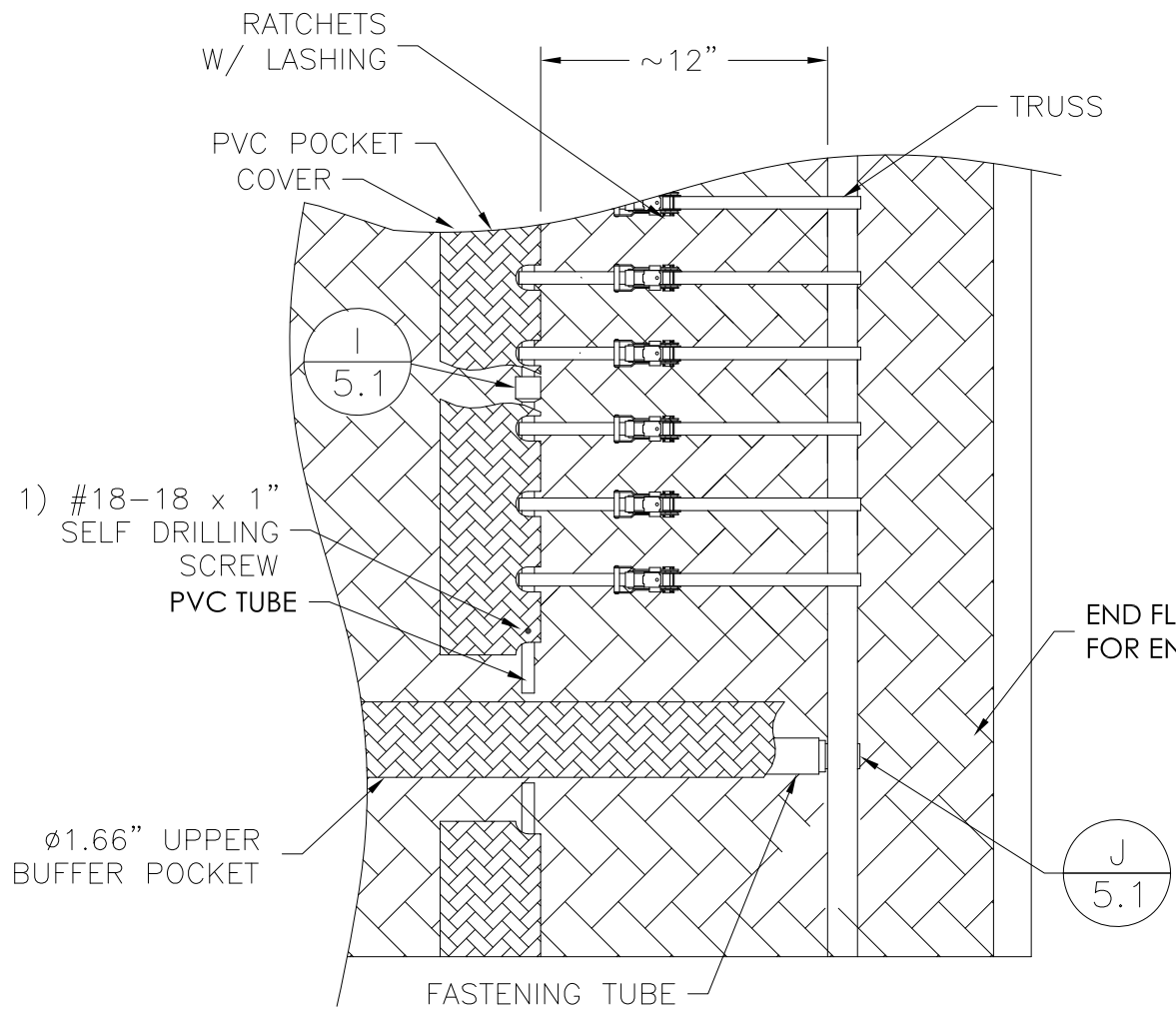
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PROJECT ID: -	ORDER ID: 16129	DRAWING: 3.3 REV: 1

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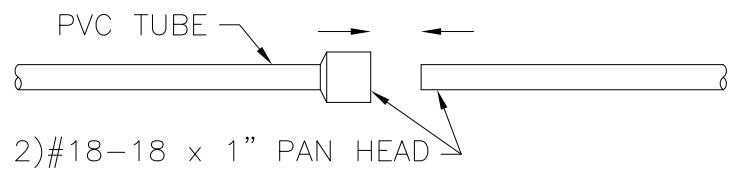
CUSTOMER:
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 SPARROWS POINT, MD

PROJECT:
 ARCH 50L x 98' @ 14'
 -

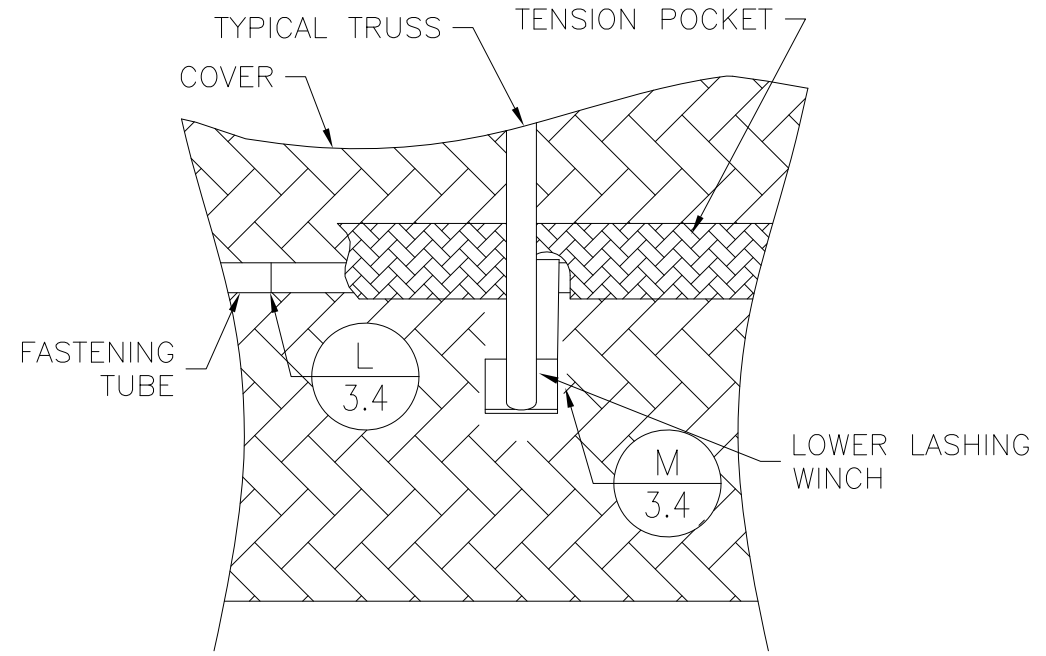


H
3.4
PVC TUBE CONNECTION TO BUILDING

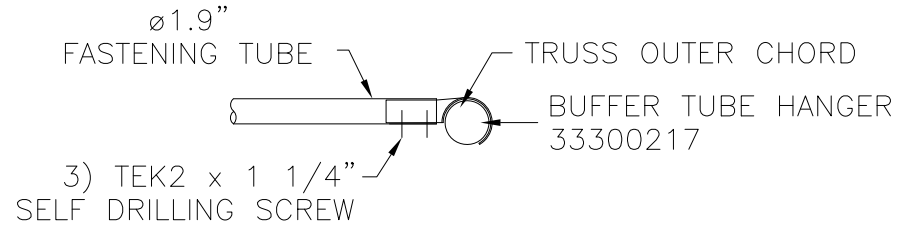
1) #18-18 x 1\"/>



I
3.4
PVC TUBE CONNECTION



K
3.4
FASTENING TUBE CONNECTION TO BUILDING

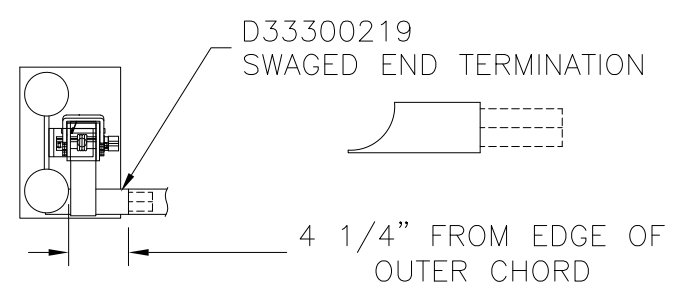


J
3.4
UPPER FASTENING TUBE END SADDLE BRACKET

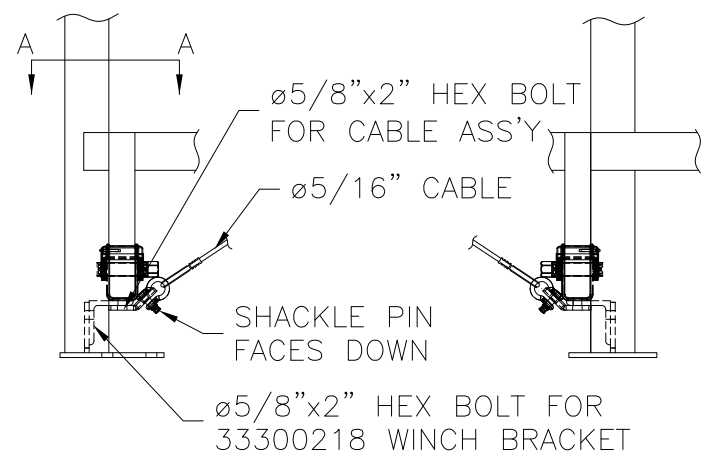


1) TEK2 x 1 1/4\"/>

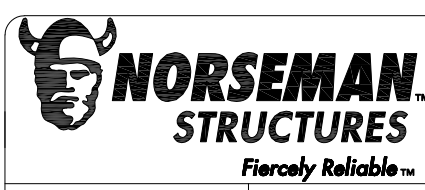
L
3.4
FASTENING TUBE CONNECTION



M
3.4
WINCH BRACKET CONNECTION



M
3.4
WINCH BRACKET CONNECTION



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STANDARD DETAILS 3
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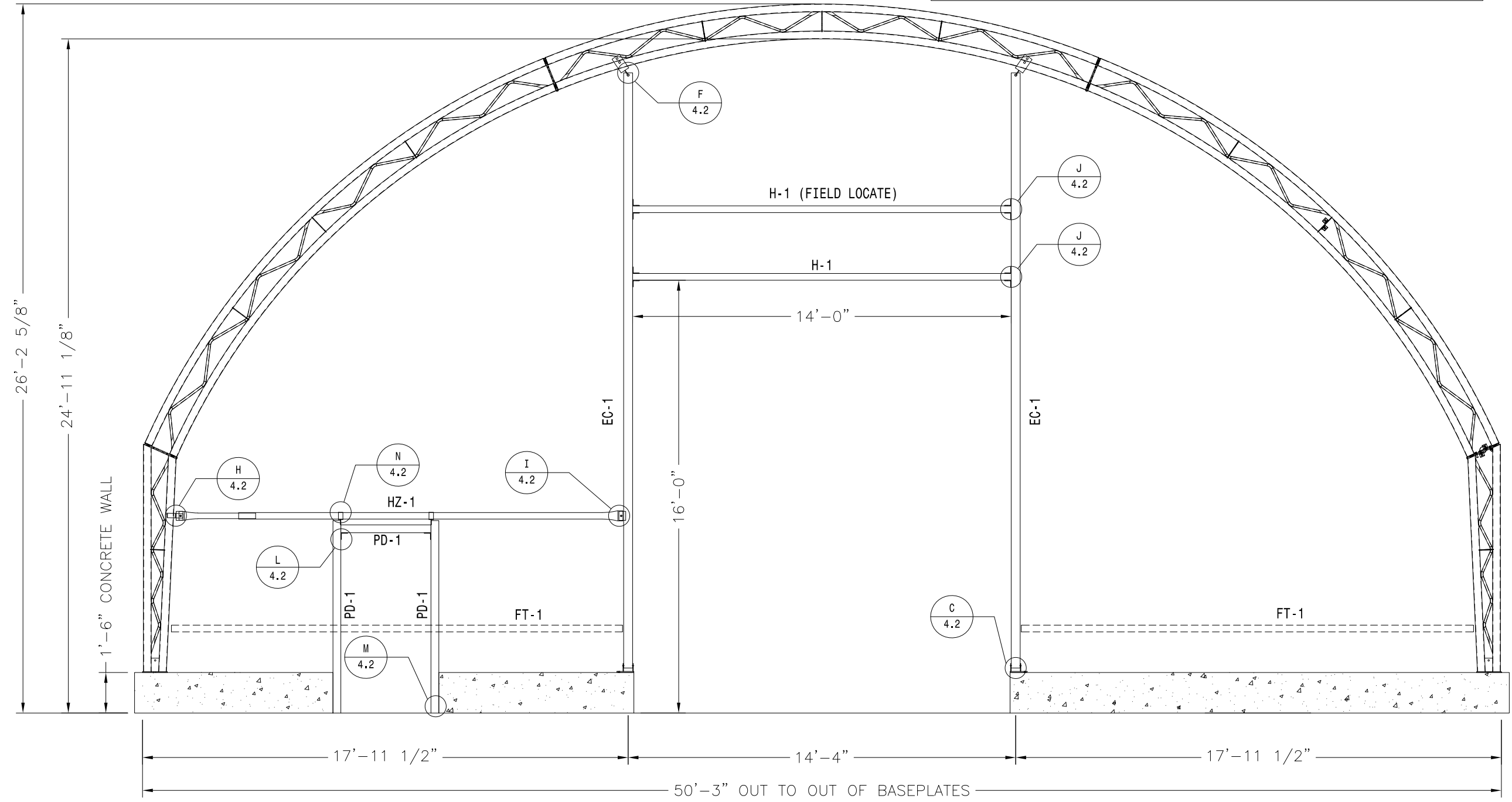
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CUSTOMER:
TRADEPOINT ATLANTIC
SPARROWS POINT, MD

PROJECT:
ARCH 50L x 98' @ 14'

DWG REV	REVISED BY: DESCRIPTION	DATE
1	FA: RELEASED	26 NOV 21
PROJECT ID: -	ORDER ID: 16129	DRAWING: 3.4
		REV: 1

Item	Qty	Description	Weight
EC-1	2	4x6x1/4x264" HSS VERTICAL	341
H-1	2	3x6x3/16x168" HSS HEADER	171
HZ-1	1	330550 (2-1/2"-14ga) + 32000065 (2-7/8"-14ga)	41
FT-1	2	2x3x14ga FASTENING TUBE CUT TO FIT	-
PD-1	1	6C14 PERSONNEL DOOR FRAMING	-



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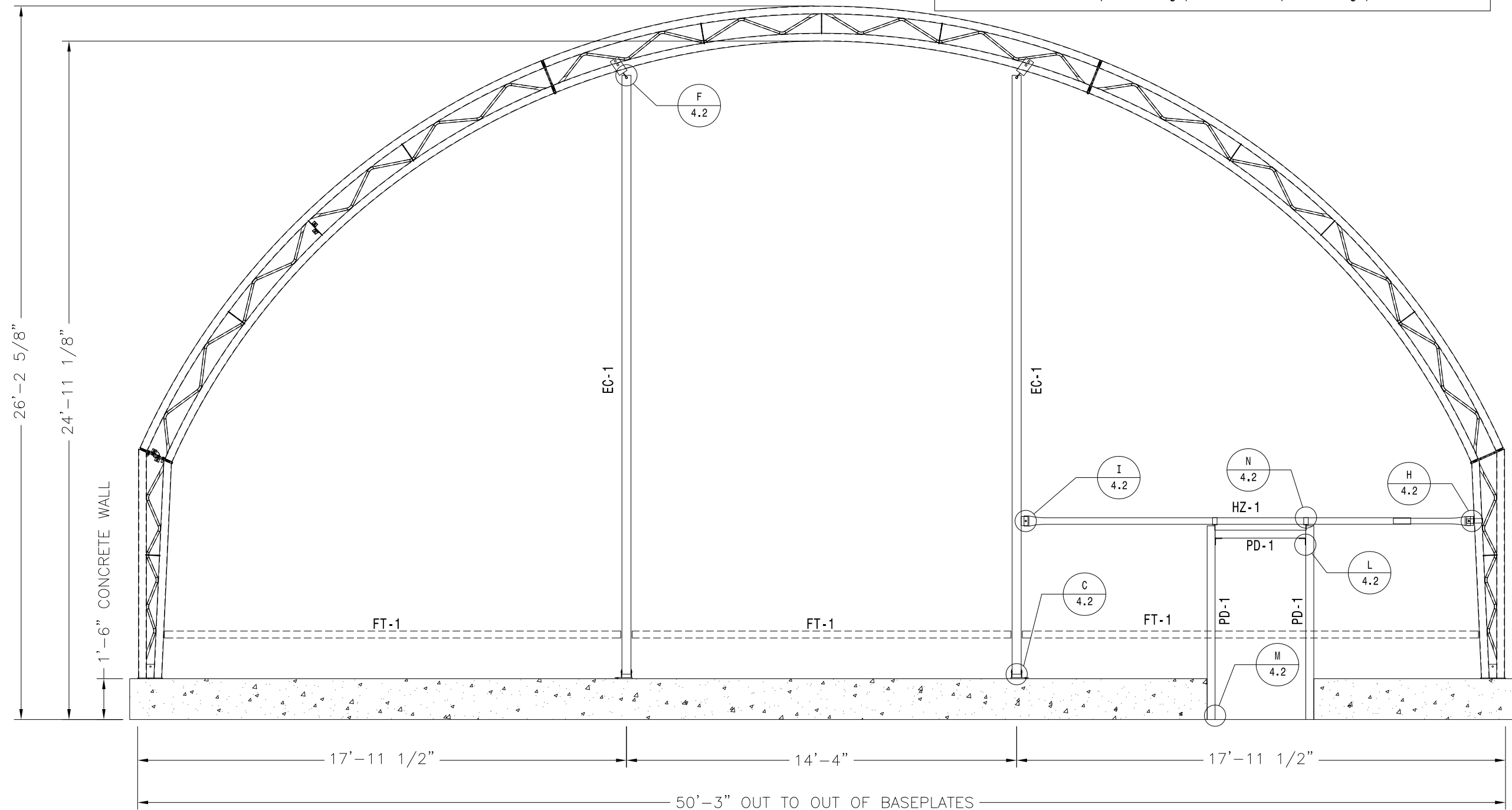
PROJECT:
 ARCH 50L x 98' @ 14'

DRAWING TITLE:
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1	FA: RELEASED	26 NOV 21
2	FA: REVISED ENDWALL 1	07 DEC 21
3	FA: REVISED ENDWALL 1	15 DEC 21

PROJECT ID: - ORDER ID: 16129 DRAWING: 4.0 REV: 3

Item	Qty	Description	Weight
EC-1	2	4x6x1/4x264" HSS VERTICAL	341
FT-1	3	2x3x14ga FASTENING TUBE CUT TO FIT	-
PD-1	1	6C14 PERSONNEL DOOR FRAMING	-
HZ-1	1	330550 (2-1/2"-14ga) + 32000065 (2-7/8"-14ga)	41



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DRAWING TITLE:
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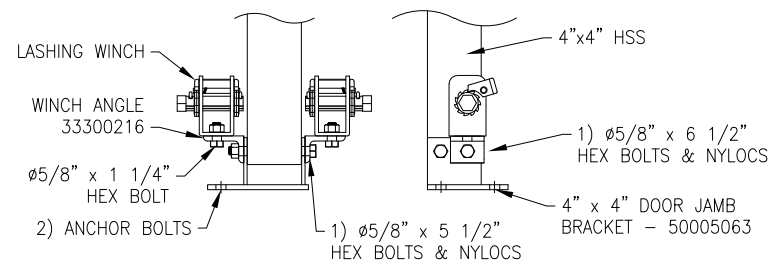
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2	FA: REVISED PERSONNEL DOOR	15 DEC 21
PROJECT ID: -	ORDER ID: 16129	DRAWING: 4.1 REV: 2

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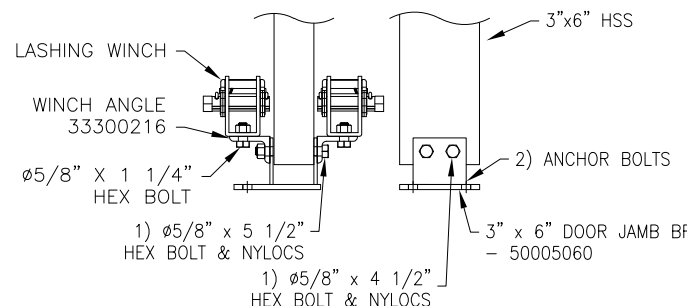
CUSTOMER:
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PROJECT:
 ARCH 50L x 98' @ 14'
 -

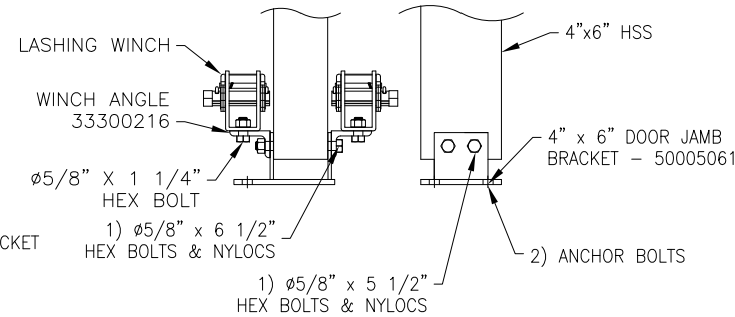
ADD WASHER ON BOLT SIDE WHEN USING ONLY ONE WINCH ANGLE



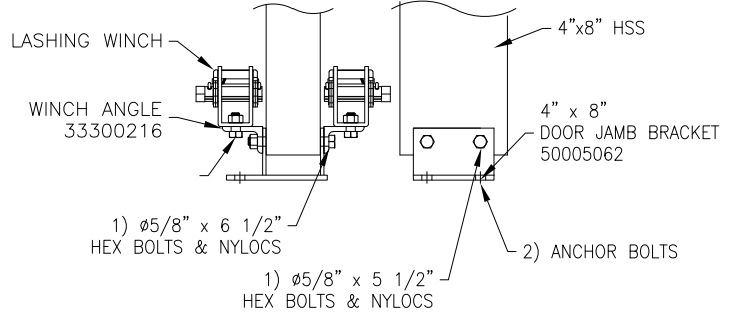
A
4.2 **4"x4" HSS JAMB
BASE CONNECTION**



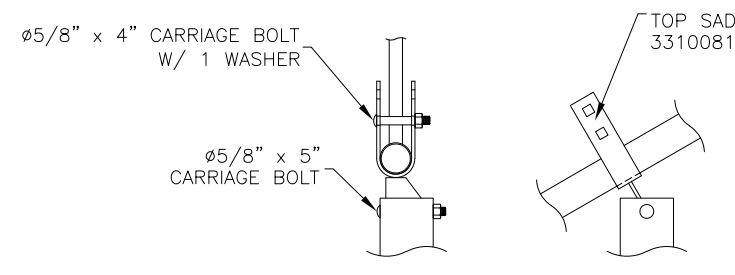
B
4.2 **3"x6" HSS WINDPOST
BASE CONNECTION**



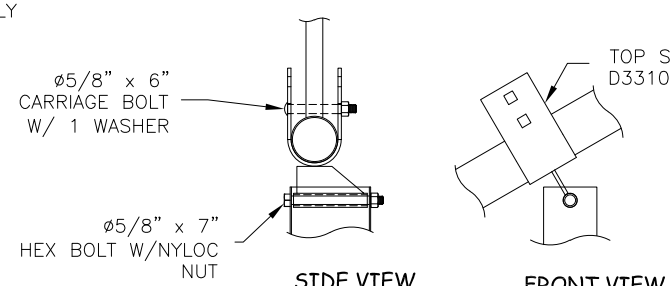
C
4.2 **4"x6" HSS JAMB
BASE CONNECTION**



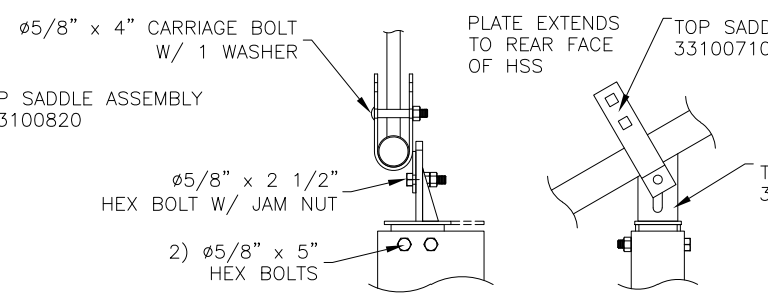
D
4.2 **4"x8" HSS JAMB
BASE CONNECTION**



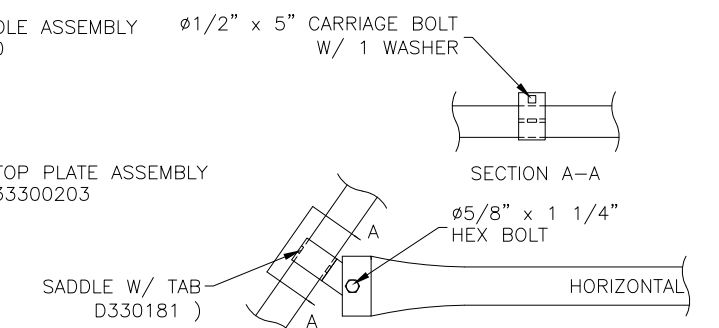
E
4.2 **4"x4" HSS WINDPOST
TOP CONNECTION**



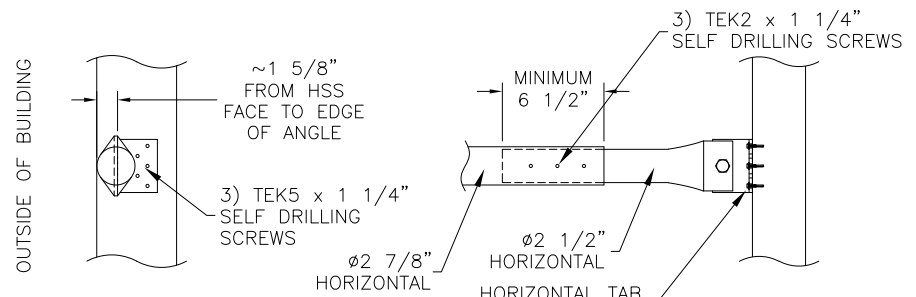
F
4.2 **3"x6"/4"x6" HSS WINDPOST
TOP CONNECTION**



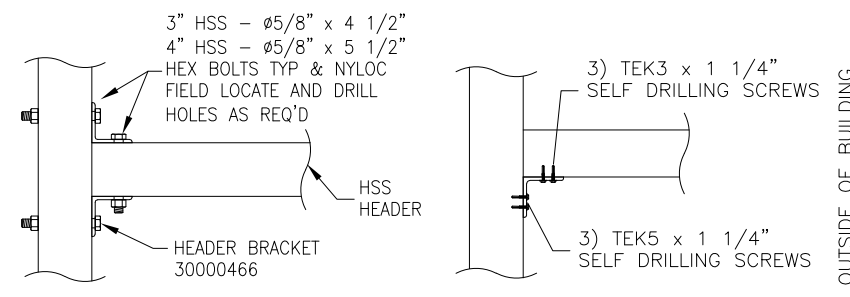
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4.2 **4"x8" HSS WINDPOST
TOP CONNECTION**



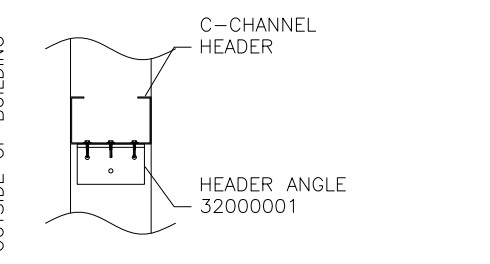
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4.2 **HORIZONTAL CONNECTION
TO TRUSS**



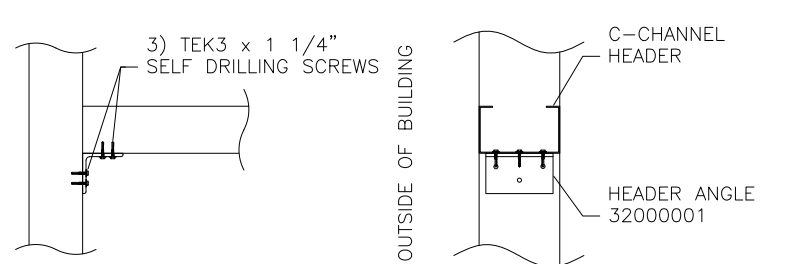
I
4.2 **HORIZONTAL
CONNECTIONS**



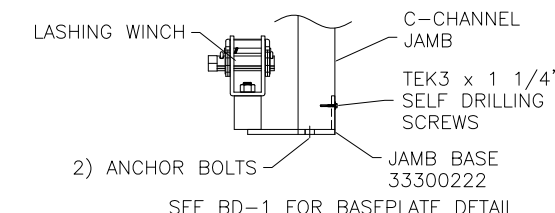
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4.2 **HSS HEADER
CONNECTION TO JAMB**



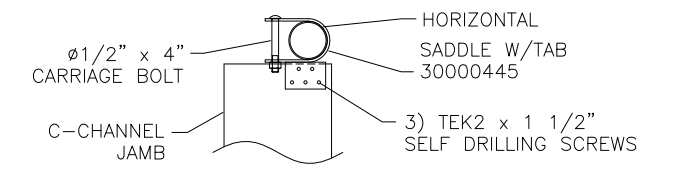
K
4.2 **C-CHANNEL HEADER CONNECTION
TO HSS WINDPOST/JAMB**



L
4.2 **C-CHANNEL HEADER CONNECTION
TO C-CHANNEL JAMB**



M
4.2 **C-CHANNEL JAMB
BASE CONNECTION**



N
4.2 **C-CHANNEL JAMB CONNECTION
TO HORIZONTAL**

Part Number	Material	Part Number	Material
33300216	L 2" x 3" x 3/8"	330182	3/16" x 2" // 1/4" x 2" FB
50005063	1/4" x 3 1/2" FB // 1/2" x 6" FB	32000085	L 3" x 3" x 1/4"
50005060	1/4" x 3 1/2" FB // 1/2" x 6" FB	33100740	L 3" x 3" x 1/4"
50005061	1/4" x 3 1/2" FB // 1/2" x 6" FB	30000465	1/4" x 6" FB
33100810	1/4" x 2" FB // 3/4" SCH 40	32000001	L 3" x 3" x 1/4"
33100815	1/4" x 2" FB // 3/4" SCH 40	33300222	2 1/2" SQ x 3/16" HSS // 3/8" x 4" FB // 1/4" x 2 1/2" FB
33100710	1/4" x 2" FB	30000445	3/16" x 3" FB // 3/16" x 2" FB
33300203	1/4" x 2 1/2" FB // 1/4" x 4" FB // 1/2" PLATE		



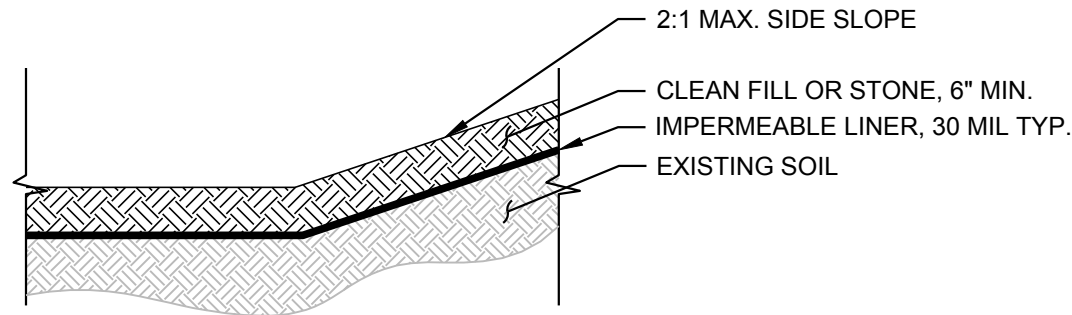
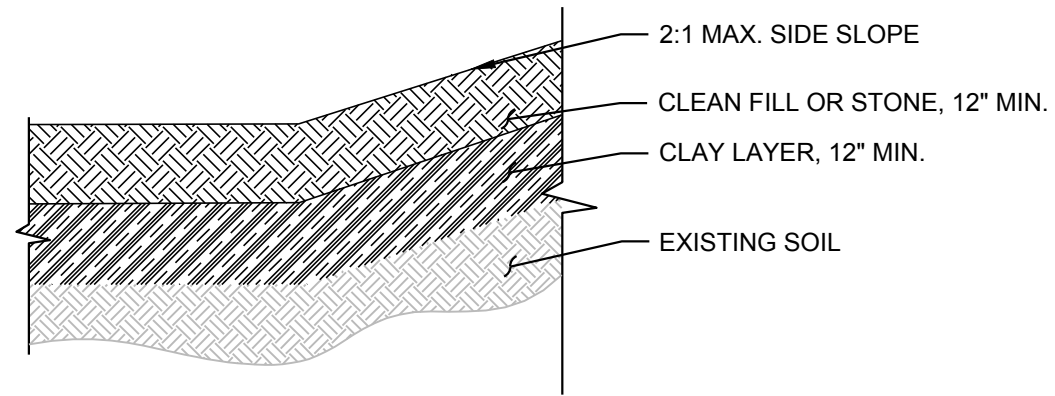
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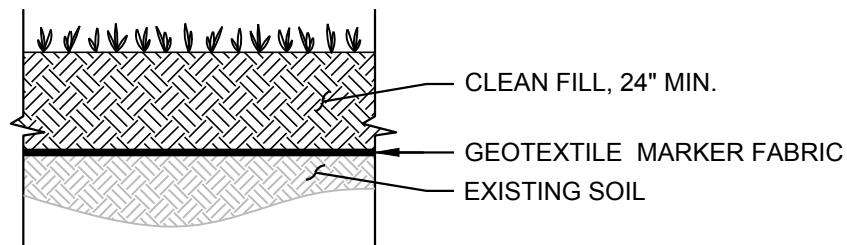
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		REV: 1

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CUSTOMER: TRADEPOINT ATLANTIC SPARROWS POINT, MD
PROJECT: ARCH 50L x 98' @ 14'

APPENDIX E



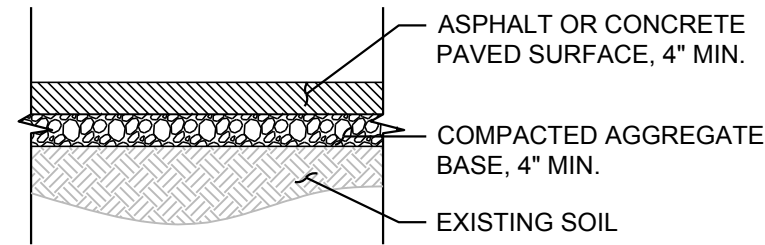
TYPICAL POND SECTIONS
NOT TO SCALE



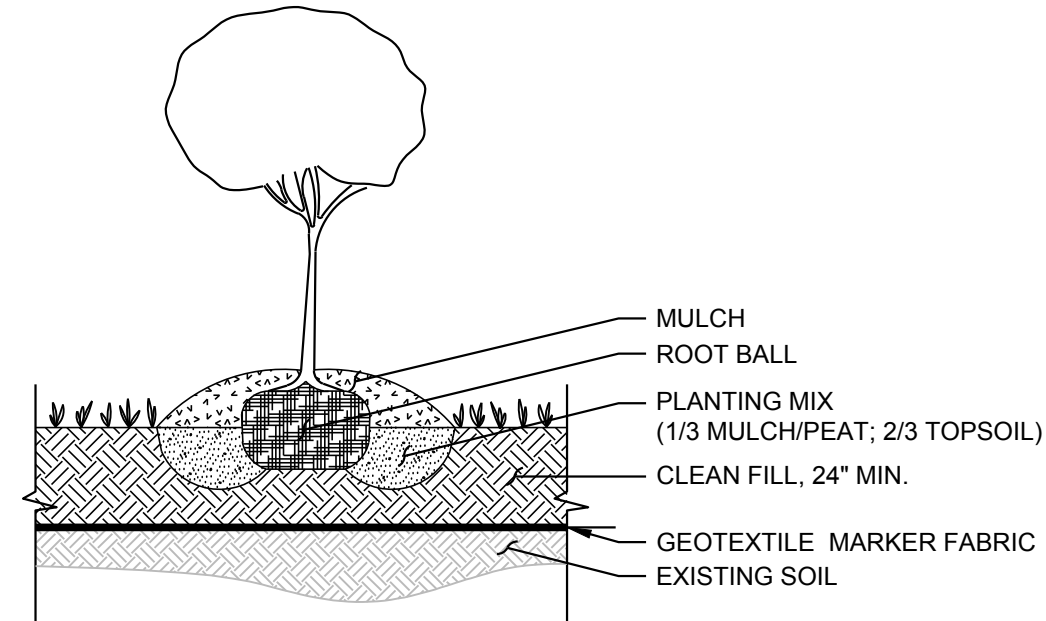
TYPICAL LANDSCAPE SECTION
NOT TO SCALE

GEOTEXTILE MARKER FABRIC SPECIFICATIONS

THE GEOTEXTILE MARKER FABRIC SHALL BE A NONWOVEN PERVIOUS SHEET OF POLYPROPYLENE MATERIAL. ADD STABILIZERS AND/OR INHIBITORS TO THE BASE MATERIAL, AS NEEDED, TO MAKE THE FILAMENTS RESISTANT TO DETERIORATION BY ULTRAVIOLET LIGHT, OXIDATION AND HEAT EXPOSURE. REGRIND MATERIAL, WHICH CONSISTS OF EDGE TRIMMINGS AND OTHER SCRAPS THAT HAVE NEVER REACHED THE CONSUMER, MAY BE USED TO PRODUCE THE GEOTEXTILE. POST-CONSUMER RECYCLED MATERIAL MAY BE USED. GEOTEXTILE SHALL BE FORMED INTO A NETWORK SUCH THAT THE FILAMENTS OR YARNS RETAIN DIMENSIONAL STABILITY RELATIVE TO EACH OTHER, INCLUDING THE EDGES. GEOTEXTILES SHALL MEET THE REQUIREMENTS SPECIFIED IN TABLE 1. WHERE APPLICABLE, TABLE 1 PROPERTY VALUES REPRESENT THE MINIMUM AVERAGE ROLL VALUES IN THE WEAKEST PRINCIPAL DIRECTION. VALUES FOR APPARENT OPENING SIZE (AOS) REPRESENT MAXIMUM AVERAGE ROLL VALUES



TYPICAL PAVING SECTION
NOT TO SCALE



TYPICAL PLANTING SECTION
NOT TO SCALE

TCDNG'3"

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	120 (534)	120 (534)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	lbs (N)	50 (223)	50 (223)
CBR Puncture Strength	ASTM D6241	lbs (N)	310 (1380)	
Maximum Opening Size				
Apparent Opening Size (AOS)	ASTM D4751	U.S. Sieve (mm)	70 (0.212)	
Minimum Roll Value				
Permittivity	ASTM D4491	sec ⁻¹	1.7	
Flow Rate	ASTM D4491	gal/min/ft ² (l/min/m ²)	135 (5500)	
Minimum Test Value				
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	

P:\EnviroAnalytics Group\60443M EAG_TPA Redevelopment\Drawg\B6\Production\Figure 6b - Environmental Capping Detail.dwg Plotted: April 9, 2019

scale	N/A
date	9/8/2020
project no.	160443M

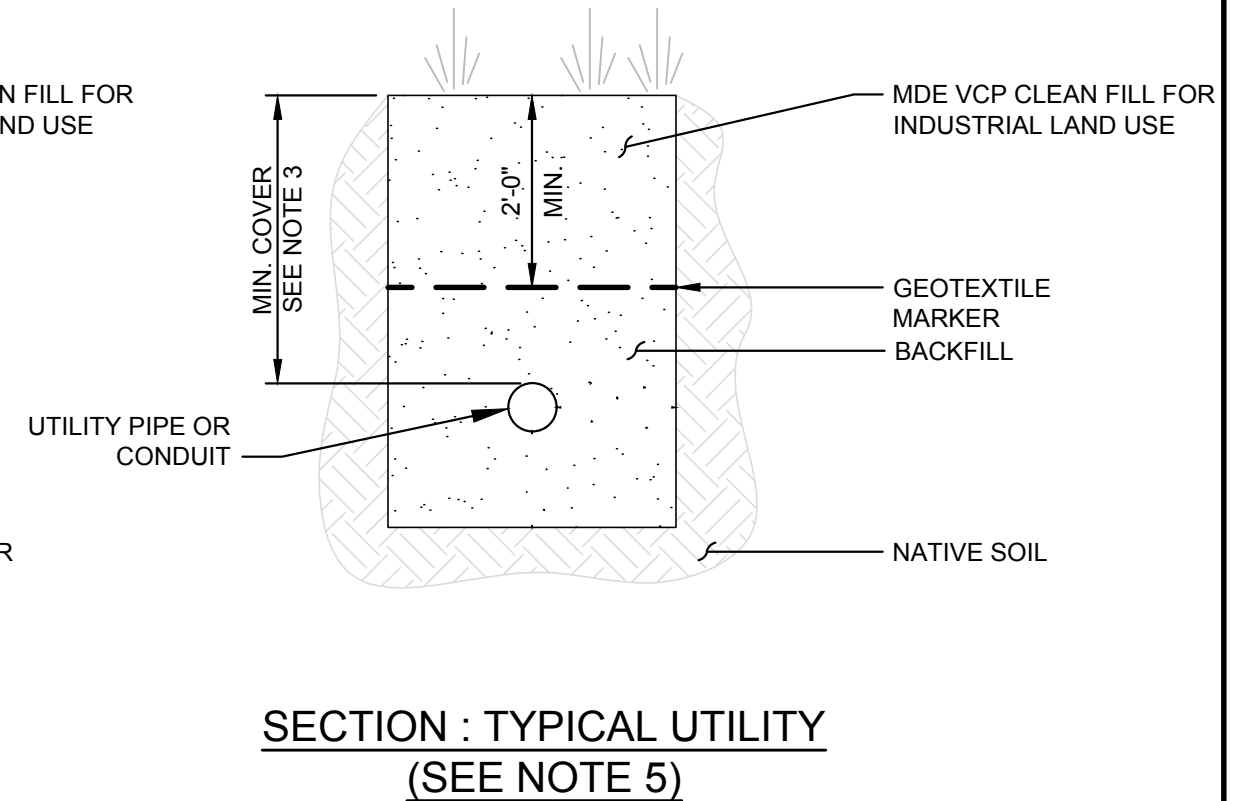
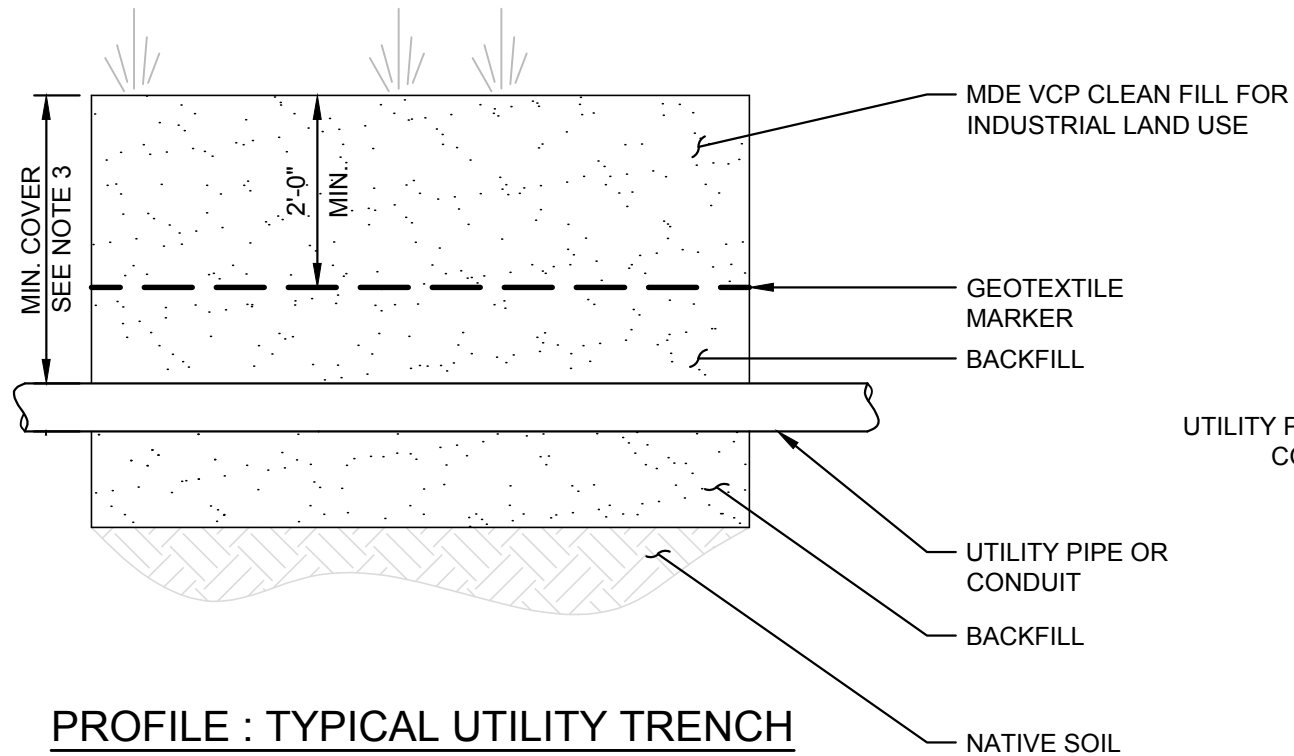
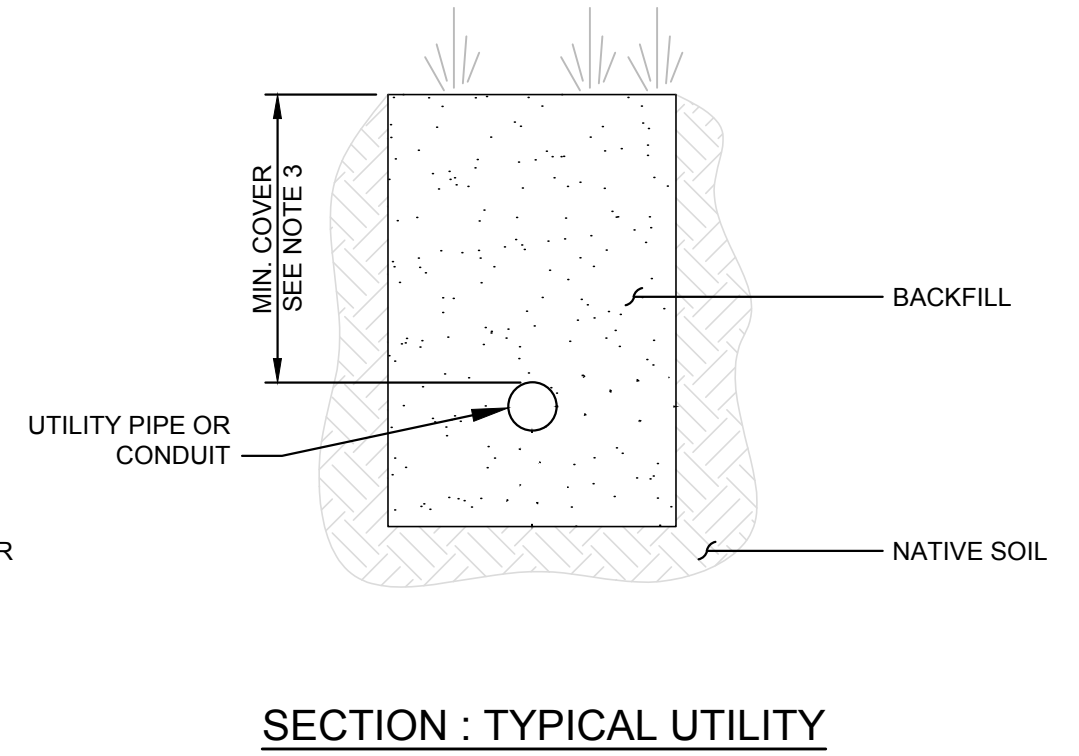
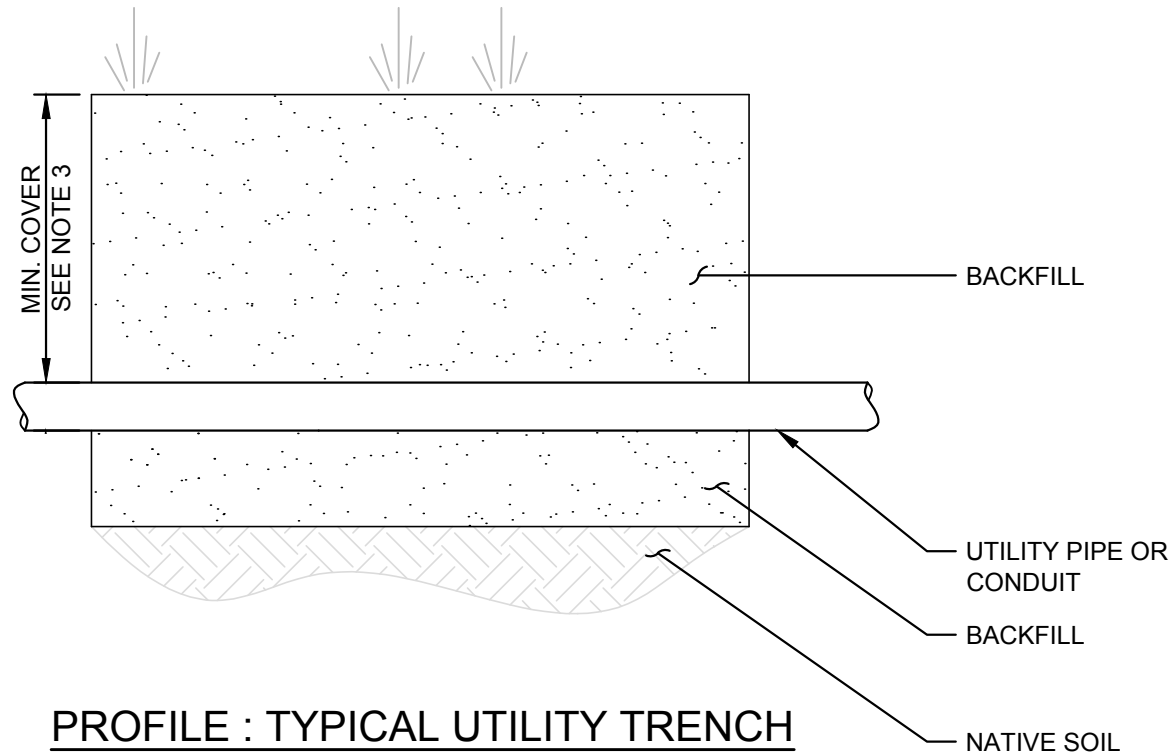
designed	RJC
checked	TNP
drawn	RJC

O R I O W O "CAPPING SECTION DETAILS
SPARROWS POINT
BALT. COUNTY, MARYLAND

APPENDIX F

GENERAL NOTES:

1. ALL PIPES OR CONDUIT SHALL BE LEAK-PROOF AND WATERTIGHT. ALL JOINTS SHALL BE SEALED OR GASKETED.
2. ALL PIPES SHALL BE PROPERLY PLACED AND BEDDED TO PREVENT MISALIGNMENT OR LEAKAGE. PIPE BEDDING SHALL BE INSTALLED IN SUCH A MANNER AS TO MINIMIZE THE POTENTIAL FOR ACCUMULATION OF WATER AND CONCENTRATED INFILTRATION.
3. MINIMUM COVER ABOVE UTILITY SHALL BE BASED ON SPECIFIC UTILITY REQUIREMENTS.
4. TRENCHES SHALL BE BACKFILLED WITH BEDDING AND MATERIALS APPROVED BY MDE.
5. FOR ANY UTILITY SEGMENT WHICH GOES THROUGH AN AREA WHICH IS DESIGNATED TO RECEIVE A LANDSCAPED CAP, THE UPPER 2 FEET OF BACKFILL MUST MEET THE REQUIREMENTS OF MDE VCP CLEAN FILL FOR INDUSTRIAL LAND USE. IN THIS CASE THE MDE VCP CLEAN FILL WILL BE UNDERLAIN BY A GEOTEXTILE MARKER FABRIC. UTILITY SEGMENTS WHICH GO THROUGH AREAS WHICH DO NOT REQUIRE CAPPING OR ARE DESIGNATED TO RECEIVED A PAVED CAP WILL BE BACKFILLED WITH MATERIALS APPROVED BY MDE FOR THIS USE.



\\armgroup\c\CompData\Projects\EnviroAnalytics\Group\160443M_EAG_TPA_Redevelopment\Drawings\Reference\Utility Cross Section_REV.dwg Plotted: January 11, 2018

CRRGP F KZ'I

''

Utility Excavation NAPL Contingency Plan

Revision 4 – June 19, 2017

Introduction:

Proposed underground utilities and excavations necessary for the redevelopment of the Tradepoint Atlantic property may encounter areas of petroleum and/or Oil & Grease contamination in soil. The assessment of total petroleum hydrocarbons (TPH) diesel range organics (DRO), gasoline range organics (GRO), Oil & Grease, and/or non-aqueous phase liquid (NAPL) completed as part of each Phase II Investigation includes the following:

- Each soil boring with evidence of NAPL (i.e., containing a sheen or free oil in the soil core), whether located near utilities or not, is investigated via the installation of a piezometer to assess mobility to groundwater. If measureable NAPL is present in the initial piezometer, additional soil borings and shallow temporary piezometers are installed surrounding the initial detection to delineate the impacts. Each piezometer installed to delineate the presence or absence of NAPL is checked with an oil-water interface probe immediately after installation, 48 hours after installation, and at least 30 days after installation.
- TPH-DRO/GRO and Oil & Grease data, once received, are assessed in their magnitude and location respective to subsurface utilities, stormwater conveyances, and surface waters.
- Locations that exhibit elevated detections of TPH/Oil & Grease or evidence of NAPL, that are within reasonable proximity (i.e. 25 feet) to subsurface utilities or stormwater conveyances and/or within reasonable proximity (i.e. 100 feet) to surface waters, are identified for further delineation and selective removal (if warranted).

Any NAPL identified in soil borings or piezometers during the Phase II Investigation would be noted on relevant logs and identified in Response and Development Work Plans for construction planning purposes. Despite these planning efforts, unidentified pockets of contamination (including NAPL) may still be encountered during construction. This contingency plan provides the procedures to be utilized during construction work to properly address response and construction techniques if any materials impacted with NAPL are encountered.

Objectives:

The purpose of this plan is to describe procedures to be followed in the event that NAPL is encountered in utility trenches or other excavations during development of the Tradepoint Atlantic property. The specific objectives of this plan and the procedures outlined herein are:

1. To ensure identification and proper management of Oil & Grease and petroleum-contaminated soils.
2. To ensure proper worker protection for working in areas of Oil & Grease and petroleum contamination.
3. To ensure that the installation of new utilities does not create new preferential flow paths for the migration of free-phase hydrocarbons (Oil & Grease, TPH-DRO/GRO, etc.) or soil vapors.

Identification of Oil & Grease and Petroleum Contaminated Soil:

An Environmental Professional (EP) will be on-site to determine if soils show evidence of the presence of Oil & Grease or TPH present as NAPL during installation of utility trenches or other excavation activities completed during development. Oil & Grease or petroleum-contaminated soils can be identified by the presence of free oil, oil staining, a petroleum odor, or any combination of these conditions. Free oil (NAPL) is liquid oil which could potentially be drained or otherwise extracted from the soil, and is the focus of this contingency plan, although severe staining accompanied by odors should be addressed via the same contingency measures provided herein (based on the judgement of the EP). The appearance of oil staining is not always consistent, but varies depending on the nature of the oil, the soil type, and the age of the release. Staining associated with old petroleum contamination often has a greenish hue, but may also be brown or black. The olfactory sense is the most sensitive instrument for identifying petroleum contamination in the field. Therefore, a petroleum odor may be noted although there is no visible sign of oil or staining. In some instances, decaying organic matter can produce an odor similar to petroleum, but this is rare.

If NAPL is encountered during construction, the extent of impacts shall be delineated by excavating trenches or installing four soil borings (two in each direction) perpendicular to the utility alignment or excavation to examine the soil for physical evidence of NAPL. Perpendicular transects will be investigated every 50 feet along the section of the utility trench or excavation where there is physical evidence of NAPL. Each transect will extend to a distance of 10 feet from the edge of the utility trench or excavation. This represents the maximum distance which would require mandatory excavation to mitigate potential migration risks (see below).

NAPL delineation will be guided primarily by screening observations from the perpendicular borings or trenches, and samples will be collected to test for extractable Oil & Grease or petroleum-contaminated soil using the Oil Sticks™ test kit. This test kit provides a determination of whether hydrocarbons are present in soil and extractable (i.e. could mobilize as a NAPL). Oil Sticks™ change from a pale blue to a deep blue color when they come in contact with free product. This instantaneous change in color occurs even when miniscule amounts of product come in contact with the strip. The sensitivity of Oil Sticks™ to determine the presence/absence of oil is reported by the manufacturer to be about 1,000 to 2,000 mg/kg. The

field test is performed by placing approximately 3 tablespoons of soil in a clean sample cup and adding enough water to cover the sample. After stirring the sample and waiting ~1 minute, the Oil Sticks™ test strip should be swished through the water, making sure to touch the strip to the sides of the cup where product may collect at the interface (meniscus) between the cup, water, and air. If the strip turns deep blue, or deep blue spots appear, oil or hydrocarbon is present. However, the MDE has observed that the Oil Sticks™ method may produce inconsistent results. Therefore, documentation of all screening methods is necessary during boring/trenching work. This documentation shall include an accurate record of visual and olfactory screening, along with a narrative with photographs. Field screening will be aided by photoionization detector (PID) results, and Oil Sticks™ samples should be biased to target elevated PID readings, if any. The agencies have requested that all soil samples prepared for the Oil Sticks™ field test be photographed for evidence of sheen/residue on the cup sides. Detailed records are required to be submitted with the project-specific Completion Report.

If petroleum or Oil & Grease impacts are identified in Site soils based on use of the Oil Sticks™ test kit or other field screening methods, disposal requirements will be determined using the quantitative PetroFLAG™ hydrocarbon analysis system or fixed laboratory analysis (see following section). The PetroFLAG™ hydrocarbon analysis system is a broad spectrum field test kit suitable for TPH contamination regardless of the source or state of degradation (Dexsil Corporation). PetroFLAG™ field test kits do not distinguish between aromatic and aliphatic hydrocarbons, but quantify all fuels, oils, and greases as TPH. Dilutions can be used to determine concentrations of TPH/Oil & Grease above the normal calibration range. Dexsil notes that positive results for TPH may occur if naturally occurring waxes and oils, such as vegetable oils, are present in the sample. Additional detail regarding the procedure for the PetroFLAG™ kit is given in **Attachment 1**.

Soil Excavation, Staging, Sampling and Disposal:

The EP will monitor all utility trenching and excavation activities for signs of potential contamination. In particular, soils will be monitored with a hand-held PID for potential VOCs, and will also be visually inspected for the presence of staining, petroleum waste materials, or other indications of NAPL contamination that may be different than what was already characterized. Excavated material that is visibly stained or that exhibits a sustained PID reading of greater than 10 ppm will be segregated and containerized or placed in a stockpile on polyethylene or impervious surface until the material can be analyzed using the PetroFLAG™ test kit to characterize the material for appropriate disposal. If a PetroFLAG™ test kit is not available to the contractor, or if the contractor prefers to use fixed laboratory analysis, samples may be characterized via submittal to a laboratory for TPH/Oil & Grease analysis. However, any excavated material containing NAPL (i.e., containing free oil) cannot be characterized for waste disposal using the PetroFLAG™ test kit and must instead be characterized via fixed laboratory analysis, as described in the final paragraph of this section. In addition, any hydrocarbon contaminated soil discovered during construction activities that was not previously

characterized must also be analyzed for PCBs prior to removal and transport to an appropriate disposal facility. If excavated and stockpiled, such materials will be covered with a plastic tarp so that the entire stockpile is encapsulated, and anchored to prevent the elements from affecting the integrity of the containment. The MDE will be notified if such materials are encountered during utility work.

Soil exhibiting physical evidence of NAPL contamination or elevated TPH/Oil & Grease with detections in the low percentage range, which is located within 10 feet of a proposed new utility or subsurface structure (i.e., foundation, sump, electrical vault, underground tank, etc.), will be excavated and segregated for disposal at the on-site nonhazardous landfill (Greys Landfill) or an off-site facility pending the completion of any required PCB analytical testing. Impacted soil which is located greater than 10 feet away from the proposed utility or subsurface structure may be left in place and undisturbed. The extent of the excavation will be determined in the field following visual/olfactory screening supplemented by the PID and Oil Sticks™ test kit, but soil disposal requirements will be determined with the PetroFLAG™ test kit (since the Oil Sticks™ method is not quantitative) or via fixed laboratory analysis for TPH/Oil & Grease (if preferred by the contractor or if the PetroFLAG™ test kit is unavailable to the contractor).

Any recovered NAPL will be collected for off-site disposal. As required by the appropriate and MDE approved facility, samples impacted by NAPL (i.e., containing free oil) will be collected for profiling/waste characterization and submitted to a fixed laboratory, as mentioned above, for the following analyses: metals, VOCs, TPH-DRO/GRO, and/or additional analysis required by the selected disposal facility. Upon receipt of any additional characterization analytical results, the MDE will be notified of the proposed disposal facility. Non-impacted material with no evidence of NAPL (i.e. soils that may contain measureable concentrations of TPH/Oil & Grease but below percentage levels) may be placed on the Site in areas to be paved or capped as long as all other requirements specified in the Response and Development Work Plan (or similar governing document) are met.

Initial Reporting:

If evidence of NAPL in soil or groundwater is encountered during excavation, it will be reported to the MDE within two hours. Information regarding the location and characteristics of any NAPL contaminated soil will be documented as follows:

- Location (exact stationing);
- Extent of contamination (horizontally and vertically – prepare a sketch including dimensions);
- Relative degree of contamination (i.e. free oil with strong odor vs. staining); and
- Visual documentation (take photographs and complete a photograph log)

Utility Installations in Impacted Areas:

Underground piping or conduits installed through areas of Oil & Grease or petroleum contamination shall be leak proof and water tight. All joints will be adequately sealed or gasketed, and pipes or conduits will be properly bedded and placed to prevent leakage. All trench backfill will meet the MDE definition of clean fill, or otherwise be approved by the MDE. Pipe bedding will be installed to minimize the potential for accumulation of water and concentrated infiltration. This can be achieved by using a relatively small amount of low-permeability pipe bedding; open-graded stone will be avoided or only used in thicknesses of 6 inches or less. Bedding must be properly placed and compacted below the haunches of the pipe. Clay, flowable fill, or concrete plugs will be placed every 100 feet across any permeable bedding to minimize the preferential flow and concentration of water along the bedding of such utilities.

If required, each trench plug will be constructed with a 2-foot-thick clay plug or 1-foot-thick flowable fill or concrete plug, perpendicular to the pipe, which extends at least 1 foot in all directions beyond the permeable pipe bedding. The plug acts as an anti-seep collar, and will extend above the top of the pipe. Installation of each trench plug will follow the completion of the trench excavation, installation of granular pipe bedding (because dense-graded aggregate or soil or other pipe bedding is difficult to properly compact below the haunches of the pipe), and seating of the pipe. The trench plug will then be installed by digging out a 1-foot trench below and around the pipe corridor, and placing clay, flowable fill, or concrete to construct the plug. A specification drawing for installation of the trench plug has been provided as **Figure 1**.

Attachment 1 - PetroFLAG™ Procedure

PetroFLAG™ field test kits use a proprietary turbidimetric reaction to determine the TPH concentration of solvent extracted samples (USEPA). Calibration standards provided with the unit are used to perform a two-point calibration for the PetroFLAG™. A blank and a 1,000 ppm standard are run by the analyzer unit to create an internal calibration curve.

Analysis of a soil sample is performed using three simple steps: extraction, filtration, and analysis. The PetroFLAG™ analysis is performed as follows:

- Place a 10 gram soil sample in a test tube.
- Add extraction solvent to the tube.
- Shake the tube intermittently for four minutes.
- Filter the extract into a vial that contains development solution
- Allow the solution to react for 10 minutes.

The filtration step is important because the PetroFLAG™ analyzer measures the turbidity or "optical density" of the final solution. Approximately 25 samples can be analyzed per hour. The vial of developed solution is placed in the meter, and the instrument produces a quantitative reading that reveals the concentration of hydrocarbons in the soil sample. The PetroFLAG™ method quantifies all fuels, oils, and greases as TPH between 15 and 2000 ppm (Dexsil Corporation). A 10x dilution of the filtered extraction solvent will be completed to allow for quantification of soil concentrations in excess of 10,000 ppm. The specially designed PetroFLAG™ analyzer allows the user to select, in the field, the response factor that is appropriate for the suspected contaminant at each site. Vegetable-based oils have been shown to exhibit a response factor of 18% (EPA Method 9074). Using the selected response factor, the analyzer compensates for the relative response of each analyte and displays the correct concentration in parts per million (ppm).

References:

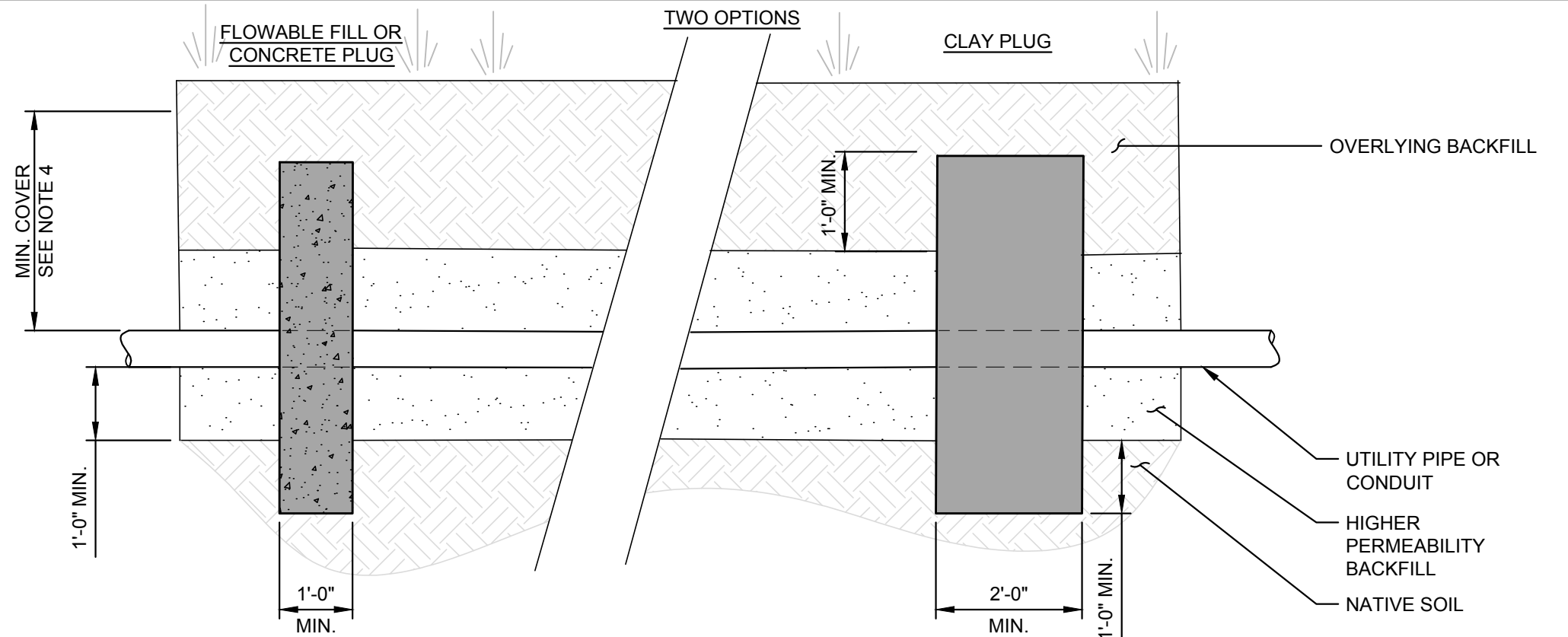
U.S. Environmental Protection Agency (EPA). Contaminated Site Clean-up Information (Clu-IN): Test Kits. Office of Superfund Remediation and Technology Innovation. <http://www.clu-in.net/characterization/technologies/color.cfm>

Dexsil Corporation. 2016. PetroFLAG Analyzer System (PF-MTR-01). http://www.dexsil.com/products/detail.php?product_id=23

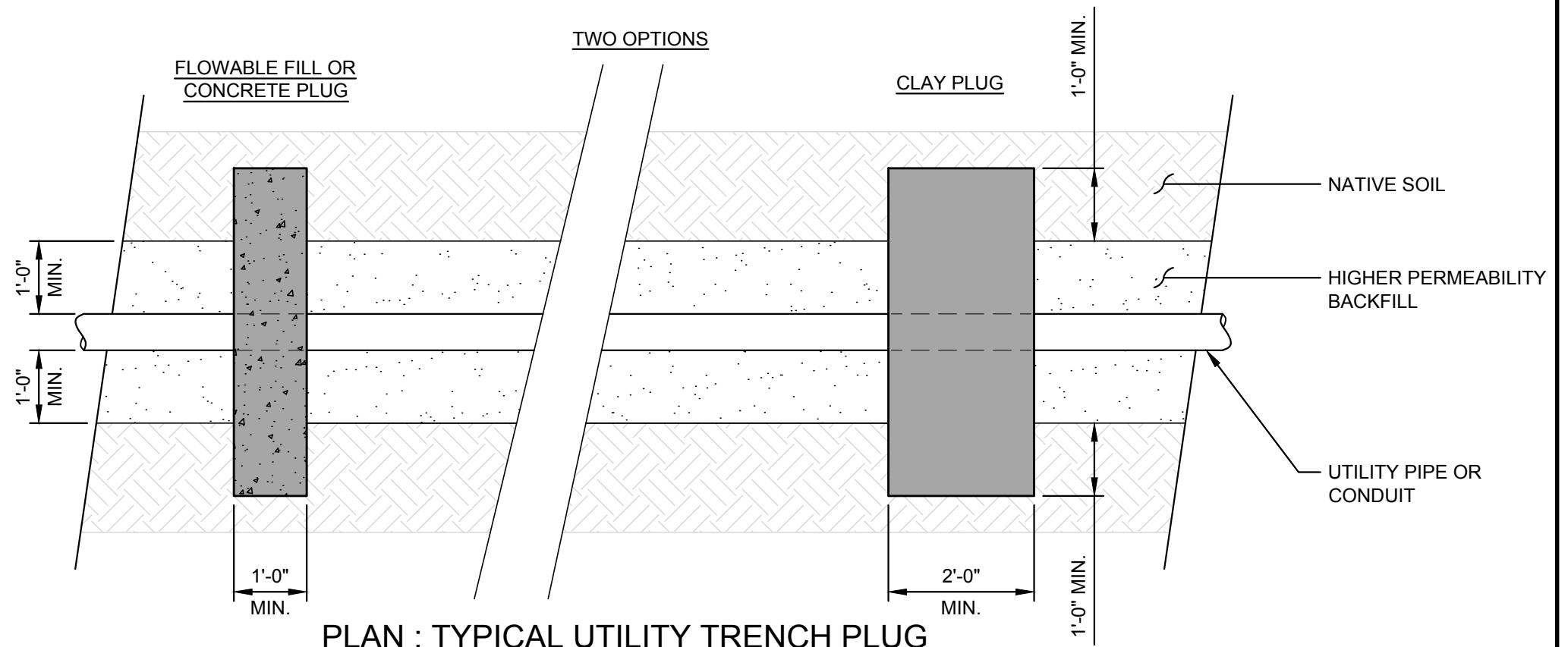
EPA SW-846 Method Number 9074 - Turbidimetric Screening Procedure for Total Recoverable Hydrocarbons in Soil

GENERAL NOTES:

1. ALL PIPES OR CONDUIT PASSING THROUGH AREAS OF PETROLEUM CONTAMINATION SHALL BE LEAK-PROOF AND WATERTIGHT. ALL JOINTS SHALL BE SEALED OR GASKETED.
2. ALL PIPES SHALL BE PROPERLY PLACED AND BEDDED TO PREVENT MISALIGNMENT OR LEAKAGE. PIPE BEDDING SHALL BE INSTALLED IN SUCH A MANNER AS TO MINIMIZE THE POTENTIAL FOR ACCUMULATION OF WATER AND CONCENTRATED INFILTRATION.
3. ANTI-SEEP COLLARS FROM THE PIPE MANUFACTURER, THAT ARE PRODUCED SPECIFICALLY FOR THE PURPOSE OF PREVENTING SEEPAGE AROUND THE PIPE, ARE ACCEPTABLE IF INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND ONLY WITH PRIOR APPROVAL BY TPA.
4. MINIMUM COVER ABOVE UTILITY SHALL BE BASED ON SPECIFIC UTILITY REQUIREMENTS.
5. TRENCHES SHALL BE BACKFILLED WITH BEDDING AND MATERIALS APPROVED BY MDE.
6. FOR ADDITIONAL REQUIREMENTS, INCLUDING THE USE OF MDE VCP CLEAN FILL FOR INDUSTRIAL LAND USE AND INSTALLATION OF GEOTEXTILE MARKER FABRIC, REFER TO NOTE 5 ON THE TYPICAL UTILITY CROSS SECTIONS.
7. ALL UTILITIES INSTALLED THROUGH AREAS CONTAINING NAPL OR ELEVATED CHEMICAL IMPACTS WITH THE POTENTIAL TO TRANSMIT VAPORS ALONG PREFERENTIAL FLOW PATHWAYS SHALL BE EITHER 1) BACKFILLED WITH LOW PERMEABILITY BACKFILL MATERIAL (LESS THAN OR EQUAL TO THE PERMEABILITY OF THE EXISTING SUBGRADE), OR 2) INSTALLED WITH TRENCH PLUGS ALONG THE ALIGNMENT IN ACCORDANCE WITH THE DETAILS SHOWN ON THIS PLAN AND THE FOLLOWING NOTES:
 - A.) UTILITY TRENCH PLUGS SHALL BE INSTALLED AT 100-FOOT (MAX.) INTERVALS THROUGH ALL AREAS OF NAPL CONTAMINATION.
 - B.) UTILITY TRENCH PLUGS SHALL EXTEND A MINIMUM OF 1-FOOT IN ALL DIRECTIONS BEYOND ANY HIGHER PERMEABILITY BACKFILL MATERIALS (I.E., MATERIALS EXCEEDING THE PERMEABILITY OF THE EXISTING SUBGRADE).



SECTION : TYPICAL UTILITY TRENCH PLUG



PLAN : TYPICAL UTILITY TRENCH PLUG

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