RESPONSE AND DEVELOPMENT WORK PLAN

PROJECT HUDDELL
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

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TABLE OF CONTENTS

1.0 Introduction 1
2.0 Site Description and History 4
2.1 Site Description 4
2.2 Site History 4
2.2.1 Sparrows Point Shipyard Property 4
2.2.2 Sparrows Point Steel Mill Property (Parcels B17 and B1) 6
3.0 Environmental Site Assessment Results 7
3.1 Phase I Environmental Site Assessment Results 7
3.2 Phase II Investigation Results – Project Huddell 8
3.2.1 Phase II Soil Investigation Findings 8
3.2.2 Phase II Groundwater Investigation Findings 9
3.2.3 Parcel B17 Supplemental Investigation Findings 11
3.2.4 Locations of Potential Concern 11
3.3 Human Health Screening Level Risk Assessment 12
3.3.1 Analysis Process 12
3.3.2 SLRA Results and Risk Characterization 15
3.3.3 Evaluation of RCRA Criteria 17
4.0 Proposed Site Development Plan 21
4.1 Response Phase – Groundwater Network Abandonment 22
4.2 Development Phase 22
4.2.1 Erosion and Sediment Control Installation 22
4.2.2 Grading and Site Preparation 22
4.2.3 Installation of Foundations, Structures, and Underground Utilities 23
4.2.4 Floor Slabs and Paving 23
4.2.5 Landscaping 24
4.2.6 Stormwater Management 24
5.0 Development Implementation Protocols 25
5.1 Development Phase 25
5.1.1 Erosion/Sediment Control 26
5.1.2 Soil Excavation and Utility Trenching 26
5.1.3 Soil Sampling and Disposal 27
5.1.4 Fill 28
5.1.5 Dust Control 28
5.2 Water Management 30
5.2.1 Groundwater PAL Exceedances 30
5.2.2 Dewatering 30
5.3 Health and Safety 31
5.4 Institutional Controls (Future Land Use Controls) 32
5.5 Post Remediation Requirements 33
5.6 Construction Oversight 33
6.0 Permits, Notifications and Contingencies 35
7.0 Implementation Schedule 36

TABLE OF CONTENTS
(CONT.)

FIGURES

Figure 1	Area A & Area B Parcels	Following Text
Figure 2	Development Plan	Following Text
Figure 3	Phase II Investigation: Soil Boring Locations	Following Text
Figure S1	Phase II Investigation: Soil SVOC PAL Exceedances	Following Text
Figure S2	Phase II Investigation: Soil PCB PAL Exceedances	Following Text
Figure S3	Phase II Investigation: Soil O&G PAL Exceedances	Following Text
Figure S4	Phase II Investigation: Soil Inorganic PAL Exceedances	Following Text
Figure 4	Phase II Investigation: Groundwater Sample Locations	Following Text
Figure GW1	Phase II Investigation: GW PAL Exceedances	Following Text
Figure 5	Shallow Groundwater Contour Map	Following Text
Figure 6	Locations of Potential Concern	Following Text
Figure 7	B17 Excavation Locations	Following Text
Figure 8	Proposed Capping Plan	Following Text

TABLES

Table 1	Summary of Organics Detected in Soil	Following Text
Table 2	Summary of Inorganics Detected in Soil	Following Text
Table 3	Summary of Organics Detected in Groundwater	Following Text
Table 4	Summary of Inorganics Detected in Groundwater	Following Text
Table 5	Cumulative Vapor Intrusion Criteria Comparison	Following Text
Table 6	COPC Screening Analysis	Following Text
Table 7	Assessment of Lead	Following Text
Table 8	Soil Exposure Point Concentrations	Following Text
Table 9	Risk Ratios – Composite Worker Surface Soil	Following Text
Table 10	Risk Ratios – Composite Worker Subsurface Soil	Following Text
Table 11	Risk Ratios – Composite Worker Pooled Soil	Following Text
Table 12	Risk Ratios – Construction Worker Surface Soil	Following Text
Table 13	Risk Ratios – Construction Worker Subsurface Soil	Following Text
Table 14	Risk Ratios – Construction Worker Pooled Soil	Following Text

TABLE OF CONTENTS
(CONT.)

APPENDICES

Appendix A CHS Request Letter from Tradepoint Atlantic ..... Following Text
Appendix B Construction Worker SSL Calculation Sheet ..... Following Text
Appendix C Personal Protective Equipment Standard Operational Procedure ..... Following Text
Appendix D Development Plan Drawings ..... Following Text
Appendix E Minimum Capping Section Details ..... Following Text
Appendix F Utility Trench Section Detail ..... Following Text
Appendix G Utility Excavation NAPL Contingency Plan ..... Following Text

ELECTRONIC ATTACHMENTS

Soil Laboratory Certificates of Analysis ..... Electronic Attachment
Soil Data Validation Reports ..... Electronic Attachment
Groundwater Laboratory Certificates of Analysis ..... Electronic Attachment
Groundwater Data Validation Reports ..... Electronic Attachment
ProUCL Input Tables (formatted soil analytical data) ..... Electronic Attachment
ProUCL Output Tables ..... Electronic Attachment
Lead Evaluation Spreadsheet ..... Electronic Attachment
Health and Safety Plan ..... Electronic Attachment
Materials Management Plan ..... Electronic Attachment

1.0 INTRODUCTION

ARM Group LLC (ARM), on behalf of Hellenic Cables America Inc. (Hellenic), has prepared this Response and Development Work Plan (RADWP) for a portion of Sparrows Point that has been designated as Project Huddell (the Site). Hellenic is preparing to enter into a lease agreement with Tradepoint Atlantic (TPA), the property owner, for the Site. Tradepoint Atlantic submitted a letter (**Appendix A**) requesting an expedited plan review to achieve construction deadlines for the proposed development on this Site. As shown on **Figure 1**, Project Huddell consists of approximately 35.0 acres, 25.1 acres located within the former Sparrows Point Shipyard Property, and 9.9 acres located within the former Sparrows Point Steel Mill property (mostly on Parcel B17 and slightly into Parcel B1). Both properties are zoned as Tier 3 (Industrial) and plans for the property include demolition and redevelopment over the next several years.

The Sparrows Point Shipyard Property was accepted into the MDE Voluntary Cleanup Program (MDE-VCP) on December 5, 2011. The Response Action Plan (Environmental Resources Management, R1 on June 9, 2014) was approved by MDE on August 16, 2016. Four Response Action Plan Addenda were also filed and approved by MDE: Response Action Plan Addendum #1 (EEC Environmental, May 12, 2017), Response Action Plan Addendum #2 (EEC Environmental, November 8, 2017), Response Action Plan Addendum #3 (EEC Environmental, March 22, 2018), and Response Action Plan Addendum #4 (AKRF, June 17, 2020). All completed remedial actions are summarized in the Remedial Action Plan (RAP) Completion Report (AKRF Inc., September 2020). Remediation performed at the Shipyard Property included excavation, transportation, and disposal of contaminated material identified from previous investigations; import of certified clean soil to pre-remediation grades; capping with an asphalt barrier; and soil venting. The RAP requested a Certificate of Completion (COC) from MDE, with the understanding that land use restrictions (including institutional controls) would remain in place. In addition, an Inspection, Operations, and Maintenance Plan was submitted to MDE on April 5, 2021 by AKRF, Inc on behalf of TPA. On December 15, 2021, MDE issued a COC with the following requirements: use remains restricted industrial (Tier 3B), record an environmental covenant, and complies with land use requirements as laid out in the COC.

An application to enter the 3,100-acre former Sparrows Point Steel Mill property into the VCP was submitted to the MDE on June 27, 2014. Parcel B1 and B17 are 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 the United States Environmental Protection Agency (USEPA) on September 12, 2014. Based on this agreement, the 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 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.

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).

As shown on **Figure 2**, Project Huddell is slated for development and occupancy as a cable manufacturing facility. The primary manufacturing facility will include manufacturing and warehouse space, with an area of approximately 440,000 square feet. A secondary building with an area of approximately 32,000 square feet will also be completed to the north of the main building. Associated water lines, sanitary sewer lines, storm drains, parking, access roads, and interior roads are also proposed. The planned development activities will generally include grading; building construction; installation of utilities; paving of parking areas and roadways; and landscaping. Subsequent site-use will generally involve industrial workers in the on-site buildings. A potential expansion area located north of the main development area and totaling approximately 3.18 acres may be used for future development and is included in this RADWP.

Upon submission of a RADWP and completion of any remedial activities for the Site, 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 Site. When the Site has completed remedial activities, TPA and/or Hellenic shall submit to the MDE a request for issuing a COC as well as all pertinent information concerning completion of remedial activities conducted on the Site.

Alternatively, Hellenic 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 Hellenic 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 Assessments (ESAs); 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 remainder of Parcel B1 and Parcel B17 will be addressed in separate development plans in accordance with the requirements of the ACO that will include RADWPs, if necessary. This work will include assessments of risk and, if necessary, RADWPs to address unacceptable risks associated with future land use.

2.0 SITE DESCRIPTION AND HISTORY

2.1 SITE DESCRIPTION

The Project Huddell development project consists of approximately 35.0 acres comprising a significant portion of the Sparrows Point Shipyard Property and Parcel 17 as well as a small portion of Parcel B1 (**Figure 1**). The development will include construction of a manufacturing facility (**Figure 2** and **Figure 3**). A potential expansion area with a total area of approximately 3.18 acres is located to the north and included in the overall 35.0 acre development area. This area is included in the RADWP. 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 8 to 12 feet above mean sea level (amsl) and are generally flat. According to Figure B-2 of the property Stormwater Pollution Prevention Plan (SWPPP) Revision 8 dated April 30, 2020, a portion of surface water runoff from the Site flows through National Pollutant Discharge Elimination System (NPDES) permitted Outfall 013, which discharges to Bear Creek.

2.2 SITE HISTORY

2.2.1 Sparrows Point Shipyard Property

Historically, the Sparrows Point Shipyard Property has been excluded from the remainder of the Sparrows Point peninsula for environmental reports.

The Sparrows Point Shipyard Property was operated as a Shipyard from 1880, with operations relating to the repair, upgrading, and dismantling of ships. The facility also had the capacity to build ships. Reportedly, no ships have been built onsite since the mid-1980s. The Shipyard Property changed owners several times, with recent work completed to rehabilitate the Shipyard for future redevelopment and reuse. Within the Project Huddell development area, there were multiple buildings and warehouses, including Buildings 46 (Former Drum Storage), 73 (Storage Building), 58 (Sheet Metal Shop), 44 (Electric Shop), 43 (Substation No. 7), 19, 60 (North Yard Substation), 65 (Shipyard Warehouse), 11 (Warehouse No. 6 and Lean-to), 67 (Warehouse No. 5), 73 (Storage Building), and 74 (Truck Weight Station and Trailer).

The Sparrows Point Shipyard Property was accepted into the MDE Voluntary Cleanup Program (MDE-VCP) on December 5, 2011. Previous documents completed include a Phase I ESA (Weaver Boos Consultants, April 16, 2018), a Phase II ESA (GZA GeoEnvironmental, Inc, April 2005), and a Human Health Risk Assessment (Environmental Resources Management, October 6, 2011). The Response Action Plan (Environmental Resources Management, R1 on June 9, 2014) was approved by MDE on August 16, 2016. Four Response Action Plan Addenda were also filed

and approved by MDE: Response Action Plan Addendum #1 (EEC Environmental, May 12, 2017), Response Action Plan Addendum #2 (EEC Environmental, November 8, 2017), Response Action Plan Addendum #3 (EEC Environmental, March 22, 2018), and Response Action Plan Addendum #4 (AKRF, June 17, 2020). All completed remedial actions are summarized in the Remedial Action Plan (RAP) Completion Report (AKRF Inc., September 2020). Remediation performed at the Shipyard Property included excavation, transportation, and disposal of contaminated material identified from previous investigations; import of certified clean soil to pre-remediation grades; capping with an asphalt barrier; and soil venting. The RAP requested a COC from MDE, with the understanding that land use restrictions (including institutional controls) would remain in place. In addition, an Inspection, Operations, and Maintenance Plan (IOMP) was submitted to MDE on April 5, 2021 by AKRF, Inc on behalf of TPA.

The HHRA and RAP Completion Report concluded that potential construction worker exposures could occur as a result of dermal contact with the groundwater and inhalation of vapors released from the soils and/or groundwater that could be present in trenches/excavations. The HHRA identified that a HASP will be required to protect future construction workers from groundwater and/or soil vapor. The RAP Completion Report also recommended institutional controls for the Sparrows Point Shipyard Property to restrict the use of groundwater at the Sparrows Point Shipyard Property except for maintaining a hydraulic head at the grave dock. Dewatering discharge shall be treated and comply with the NPDES permit. Within the Project Huddell boundary, there is one location (B-20, GZ-23, and GZ-38 historical boring location) with residual contamination addressed with a MDE-approved cap. The MDE-approved cap requires inspections on an annual basis (by end of the calendar year), with submission of the inspection log to MDE by January 31 of the following year.

On December 15, 2021, MDE issued a COC with the following requirements: land use remains restricted industrial (Tier 3B), record an environmental covenant, and complies with land use requirements as laid out in the COC. Land use requirements include: prohibition on the use of groundwater except to maintain the Graving Dock, HASP for any excavation activities, requirements for excavations encountering groundwater, requirements for notification of excavations in the capped areas, soil disposal requirements, asphalt cap maintenance / inspection, submit an annual summary report beginning in January 2022 (to include all required inspections, maintenance, and data collected during the calendar year), and soil vapor investigation for future construction. The soil vapor requirements include: collection of soil gas samples from the footprint of any proposed buildings in accordance with a MDE approved Work Plan, determination of vapor barrier requirements, and indoor air monitoring prior to occupancy if a vapor barrier is required.

Soil and groundwater sampling results from within the Shipyard Property will be excluded from the SLRA, as a complete Human Health Risk Assessment (HHRA), Response Action Plan, and RAP Completion Report was already completed for the Shipyard Property, and a COC has been issued from MDE. Therefore, Sections 3.1 through 3.3 below will focus only on the portions of

the Project Huddell development area that are included in the former Sparrows Point Steel Mill property.

2.2.2 Sparrows Point Steel Mill Property (Parcels B17 and B1)

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.

Several iron and steel work processes were completed within the boundary of Parcel B17. Parcel B17 was formerly occupied by a Machine Shop (Machine Shop No. 2). There is little information known about the specific processes conducted in the Machine Shop No. 2. Parcel B17 also included an Old Service Building, Old Blacksmith Shop, and a Heat Treating Plant.

The Machine Shop No. 2 was partially demolished by a service provider contracted by RG Steel during the RG Steel ownership period. The more valuable components of the building were salvaged, and the resulting debris was abandoned in numerous piles. During the Phase I Environmental Site Assessment (ESA) site visit conducted by Weaver Boos in February 2014, the Machine Shop No. 2 was observed to be demolished. Demolition material piles were observed where the Machine Shop No. 2 historically stood. Asbestos-containing debris was observed in the demolition piles at this time. Weaver Boos reported that the abandoned debris was the subject of an enforcement action by the MDE, which was resolved at the time by the combined efforts of Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and MCM Management Corporation (MCM).

The environmental response by Tradepoint Atlantic and MCM in this area included, among other efforts, the removal of drums, cylinders, and other containers present in the Machine Shop No. 2 area, sampling and analysis of petroleum product remaining in surface pits (sampling results were reportedly provided to the MDE), and removal of free-phase product and contaminated water from pits/sumps. On January 2, 2014, prior to the Phase II Investigation, cleanup was completed for four exposed pits/sumps at the Site (designated as #10, 11, 12, and 17) which had evidence of oil staining and petroleum impacts. Free oil and visibly impacted materials were removed from the subgrade structures and the structures were steam cleaned prior to backfilling. A total of approximately 1,212 gallons of free-phase product and contaminated water were recovered and sent for off-site disposal. Oily pits/sumps were also identified in the Machine Shop No. 2 area within Weaver Boos' Phase I ESA. The referenced cleanup of the oily pits/sumps had already been conducted at the time of Weaver Boos' Phase I ESA. The demolition debris piles from the Machine Shop No. 2 (main building) were still on-site at the time of this cleanup work.

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 former Sparrows Point Steel Mill 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 steel mill 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. The following RECs were identified at the Site from information presented in the Phase I ESA:

Machine Shop No. 2 Asbestos Demolition Piles (REC 14A, Finding 250):
During the Phase I ESA site visit conducted by Weaver Boos, the Machine Shop No. 2 was observed to be demolished. Demolition material piles were observed where the Machine Shop No. 2 historically stood. Asbestos-containing debris was observed in the demolition piles at this time (Finding 250). Weaver Boos reported that the abandoned debris was the subject of an enforcement action by the MDE, which was resolved at the time by the combined efforts of Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and MCM Construction Inc. (MCM). During the ARM site visit conducted on June 1, 2016, there were no demolition stockpiles remaining.

Machine Shop No. 2 Oily Pits/ Sumps (REC 14B, Finding 251):
During the Phase I ESA site visit, oily pits/sumps were observed in the Machine Shop No. 2 area. At that time, clean up and remediation had not been conducted. Due to safety reasons, Weaver Boos did not conduct further field investigation of this oily material during the site visit. Weaver Boos stated that it appeared that the oily pits/sumps had no historical records of assessing the oily materials. During the ARM site visit conducted on June 1, 2016, the oily pits and sumps were not present at the Site.

3.2 PHASE II INVESTIGATION RESULTS – PROJECT HUDDELL

Phase II Investigations specific to soil and groundwater conditions on the former steel mill portion of the Project Huddell Site were performed in accordance with the requirements outlined in the ACO as further described in the following agency-approved Phase II Investigation Work Plans:

- Area B: Parcel B1 (Revision 3) dated March 3, 2016
- Area B: Parcel B17 (Revision 1) dated July 10, 2017
- Area B Groundwater Investigation (Revision 3) dated October 6, 2015

All soil samples and groundwater samples were collected and analyzed in accordance with the agency-approved protocols during the Phase II Investigations, the specific details of which can be reviewed in each agency-approved Work Plan and the QAPP. 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 B: Parcel B1 (Revision 1) dated August 7, 2019
- Area B: Parcel B17 (Revision 1) dated August 7, 2019
- Area B Groundwater Investigation Report (Revision 0) dated September 30, 2016

This RADWP summarizes the relevant soil and groundwater findings from these Phase II Investigations with respect to the proposed development of Project Huddell.

3.2.1 Phase II Soil Investigation Findings

Based on the scope of development for Project Huddell, 35 soil samples collected from 19 soil borings (including one soil boring from the Parcel B1 Phase II Investigation and 18 soil borings from the Parcel B17 Phase II Investigation) were included in this evaluation of the former steel mill portion of the Project Huddell Site. The 19 boring locations are shown on **Figure 4**, and the samples obtained from these borings provided relevant analytical data for discussion of on-site conditions. Note that two of the selected soil borings (B1-141-SB and B17-014-SB) are located outside of the Project Huddell lease boundary; however, data from these locations have been included in this evaluation because they are close to the development limit of disturbance (LOD).

Soil samples collected during the Phase II Investigations were analyzed for the Target Compound List (TCL) semi-volatile organic compounds (SVOCs) and polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO), 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). Samples from any depth interval with a sustained photoionization detector (PID) reading above 10 ppm were also analyzed for TCL volatile organic compounds (VOCs). The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports (50% validated soil data) 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 19 soil borings relevant for this Site evaluation. **Figure S1** through **Figure S4** present the soil sample results that exceeded the PALs among these soil borings. PAL exceedances consisted of five SVOCs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and naphthalene), two PCB mixtures (Aroclor 1254 and total PCBs), Oil & Grease, and three inorganics (arsenic, lead, and manganese).

Evidence of non-aqueous phase liquid (NAPL) was observed at three Phase II soil boring locations: B17-007-SB, B17-011-SB, and B17-012-SB. A temporary NAPL screening piezometer was installed at these locations to identify the presence of NAPL on the water table, as described in the following Section 3.2.2. Contingency measures to address the presence of NAPL which could be encountered during construction are addressed in subsequent sections of this RADWP.

3.2.2 Phase II Groundwater Investigation Findings

Groundwater conditions in the former steel mill portion of the Project Huddell site were investigated as reported in the Area B Groundwater Phase II Investigation Report (Revision 0 dated September 30, 2016), the Finishing Mills Groundwater Phase II Investigation Report (Revision 0 dated November 30, 2016), and the Area B: Parcel B2 Phase II Investigation Report (Revision 2 dated October 12, 2018). These reports included aqueous sample data from three wells sampled during Area B Groundwater Phase II Investigation (SW-079-MWS, SW-079-MWI, and SW-057-MWS), six wells sampled during the Finishing Mills Groundwater Investigation (FM-01-PZM003, FM-01-PZM041, FM-003-PZS, FM-003-PZI, FM-016-PZS, and FM-016-PZI), and one piezometer (B2-051-PZ) which was sampled during the Parcel B2 Phase II Investigation. The ten monitoring points provide relevant analytical data for the proposed Sub-Parcel B21-1 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 well was inspected for evidence of NAPL using an oil-water interface probe prior to sampling. None of the monitoring wells relevant for the proposed development project showed evidence of NAPL during these checks. While NAPL was observed at soil boring B2-051-SB, the temporary piezometer B2-051-PZ indicated no NAPL thickness or sheen, and a groundwater sample was collected for analysis. The groundwater samples were analyzed for TCL-VOCs, TCL-SVOCs and PAHs, TPH-DRO/GRO, Oil & Grease, TAL-dissolved/total metals, hexavalent chromium, and total cyanide. The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports (50% to 100% validated groundwater data) 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 five VOCs (1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, benzene, and chloroform), four SVOCs (1,4-dioxane, benz[a]anthracene, naphthalene, and pentachlorophenol), TPH-DRO, and six total and/or dissolved metals (arsenic, cobalt, iron, manganese, thallium, 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.

During the Phase II Investigation, the potential mobility of NAPL to groundwater at the Site was investigated via the installation of three temporary NAPL piezometers: B17-008-PZ, B17-011-PZ, and B17-012-PZ. Locations B17-007-SB and B17-021-SB were further investigated via the completion of test pits, and a piezometer installation was not warranted at location B17-013-SB because there was no physical evidence of NAPL observed in the soil cores and the intermediate soil sample at this location suggested that the elevated Oil & Grease impacts were limited to the shallow soil. During test pitting at location B17-007-SB, a subgrade structure was identified containing NAPL-impacted material. All impacted debris, soil, and aqueous material was removed from the subgrade structure, and the structure was cleaned prior to backfilling. There was little to no evidence of petroleum impacts identified during the test pitting at location B17-021-SB.

3.2.3 Parcel B17 Supplemental Investigation Findings

The Parcel B17 Phase II Investigation identified elevated lead and arsenic concentrations in the subsurface soil samples obtained from boring locations B17-014-SB and B17-019-SB. A Work Plan for the Delineation/Characterization of Lead & Arsenic Impacted Soil at B17-014-SB and B17-019-SB dated February 16, 2018 was submitted to the MDE and USEPA. The Work Plan was formally approved by the agencies on June 27, 2018. The delineation soil boring locations are shown on **Figure 7**. Based on these delineation results, which are summarized in the Parcel B17 Supplemental Investigation Report for Lead and Arsenic Impacted Soil (dated August 7, 2019), excavation of the impacted material was proposed at these locations, as well as at boring B17-008-SB, which contained elevated PAHs. The Excavation Work Plan (dated February 12, 2020) was implemented, and the results are summarized in the Parcel B17 Excavation Completion Report (Revision 1, dated November 11, 2020). Confirmation sample locations are shown on **Figure 7**. Note that one of the original delineation samples, B17-019D-SB-5, exhibited a lead concentration of 10,400 mg/kg, which exceeds the 10,000 mg/kg threshold. However it was located at a depth of 5 ft bgs and was left in place during the excavation and backfilled with MDE approved material.

NAPL was first identified at SW-027-MWS on August 11, 2020. Following this observation, temporary piezometers were installed, and test pits were completed in order to identify the extent of this NAPL. NAPL observations are summarized on **Figure 6**.

3.2.4 Locations of Potential Concern

An area within the Shipyard Property was previously identified as a Location of Potential Concern in the RAP Completion Report. This area is identified on **Figure 6**. This area was previously capped due to DRO contaminated soil in the vicinity of historic soil boring GZ-38 and metals (manganese and vanadium) contaminated soil in the vicinity of historic soil borings B-20, GZ-23, and GZ-38. The IOMP for the Sparrows Point Shipyard Property specifies that if cracks, settlement, holes, or other signs are observed that indicate the MDE-approved caps have been compromised (or may become compromised), MDE shall be notified within 30 days and the requisite maintenance (e.g., asphalt patch, concrete patch, etc.) will be completed in a timely fashion and in consultation with MDE. The cap will be repaired following any development in this location and will be maintained as specified in this RADWP.

Groundwater data were screened to determine whether any sample results exceeded the USEPA Vapor Intrusion TCR (carcinogen) or Target Hazard Quotient (THQ) (non-carcinogen) Screening Levels. None of the individual sample results exceeded the VI TCR or THQ criteria. When the aqueous results were summed by sample location, none of the cumulative VI cancer risks exceeded 1E-5, and none of the cumulative VI non-cancer Hazard Index (HI) values exceeded 1. There are no concerns related to potential VI risks/hazards at the Site. The VI risk evaluation is summarized in **Table 5**.

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 Project Huddell 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. The results are shown on **Figure 6**. There were no soil concentrations of PCBs above the specified criteria; however, one location (B17-019D-SB-5), exhibited a lead exceedance and three locations (B17-008-SB, B17-013-SB, and B17-021-SB), exhibited Oil & Grease exceedances.

Locations with physical evidence of NAPL are also considered to be locations of potential concern with respect to proposed development. Three soil borings (B17-007-SB, B17-011-SB, and B17-012-SB) had visual observations of NAPL as shown on **Figure 6**. Additionally, NAPL was identified in monitoring well SW-026-MWS, in a Geotechnical Boring Monitoring Point, and in five test pits, as shown on **Figure 6**.

3.3 HUMAN HEALTH SCREENING LEVEL RISK ASSESSMENT

3.3.1 Analysis Process

A human health Screening Level Risk Assessment (SLRA) for the former steel mill portion of the Project Huddell Site 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 IF industrial fill (including processed slag aggregate sourced from the Tradepoint Atlantic property) is used at the Site, then the Site will be subject to surface engineering controls (i.e., capping) regardless of the findings of the Composite Worker baseline SLRA.

The SLRA included the following evaluation process:

Identification of Exposure Units (EUs): The SLRA evaluated both the Composite Worker and Construction Worker using a single site-wide EU (EU1) with an area of 9.86 acres. The potential expansion area is included in this exposure unit area. Note that, as shown on **Figure 2**, this exposure unit area evaluated in the SLRA covers only the former steel mill portion of the Project Huddell site and not the Sparrows Point Shipyard portion. As noted previously, the shipyard property is not part of the ACO and was already addressed by a Response Action Plan under the VCP as discussed in Section 2.

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 1254, 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. Note that the non-cancer component of risk for Aroclor 1254 was evaluated separately.

Exposure Point Concentrations (EPCs): The COPC soil datasets for the site-wide EU1 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 the site-wide EU1. 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 EU1 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 80 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 EU1 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**. Arithmetic mean concentrations exceeded 1,050 mg/kg for sub-surface and pooled soils. Due to these exceedances, capping will be required to be protective of the future Composite Worker.

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). As described in Section 3.2.4, Oil & Grease exceedances were observed at B17-008-SB, B17-013-SB, and B17-021-SB. Additionally, physical evidence of NAPL was identified at B17-007-SB, B17-011-SB, and B17-012-SB. NAPL was identified in monitoring well SW-026-MWS, in a Geotechnical Boring Monitoring Point, and in five test pits. Contingency measures to address the potential presence of NAPL which could be encountered during construction are addressed in subsequent sections of this RADWP.

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, Project Huddell 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 Project Huddell 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 EU1. 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 subsurface and pooled soils exceeded an average lead concentration of 1,050 mg/kg. Based on these exceedances, capping will be required to be protective of the future Composite Worker.

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 (9.86 acres)	Surface Soil	none	1E-5
		Subsurface Soil	none	3E-5
		Pooled Soil	none	2E-5

Based on the risk ratios for Project Huddell, environmental capping (100% of the Site) is an acceptable remedy to be protective of future Composite Workers for the surface, subsurface, and pooled exposure scenarios. None of the non-carcinogenic HI values exceeded 1. However, the carcinogenic risk estimates for the subsurface and pooled Composite Worker scenarios were greater than the acceptable risk level of 1E-5 but below the secondary risk level of 1E-4 which would warrant consideration of toxicity reduction. The proposed capping remedy will provide adequate protection from the carcinogenic risk exceedance. Capping and institutional controls (to maintain the integrity of the cap) are suitable measures for the protection of the future Composite Worker for both cancer risks and non-cancer hazards. The capping remedy will additionally be protective of observed lead exceedances and slag aggregate which will be used as the primary fill material and pavement subbase at the Site.

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 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 (80 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 (9.86 acres) (80 exposure days)	Surface Soil	none	7E-7
		Subsurface Soil	none	2E-6
		Pooled Soil	none	1E-6

Using the selected exposure duration for the site-wide EU1 (80 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 80 days were to be exceeded for an individual worker.

Certain activities at the Site may exceed the allowable duration; if so, then Construction Worker risks must be mitigated to facilitate the proposed construction work. At that point additional site-specific health and safety requirements are warranted to be protective of workers. 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

Based on the data obtained from the characterization of surface and subsurface soils, results from the SLRA indicate that environmental capping is required within the development area to mitigate potential Composite Worker risks. Additionally, industrial fill (including processed slag aggregate) will be used throughout the Site. The entirety of the Site (35.0 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 Site. 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 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 (IC/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. Hellenic will 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 reduce 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 IC/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 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

Hellenic Cables America Inc. is proposing to construct a manufacturing facility totaling approximately 440,000 square feet on Project Huddell, with a secondary building totaling approximately 32,000 square feet. The proposed development will include permanent improvements on approximately 35.0 acres of land intended for occupancy. The proposed future use of Project Huddell is Tier 3 – Industrial. The remainder of the Sparrows Point Shipyard Property, Parcel B1, and Parcel B17 will be addressed in separate development plans in accordance with the requirements of the ACO that will include RADWPs, if necessary. The Site 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, the use of processed slag aggregate has been proposed 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. The findings of the Construction Worker SLRA indicated that using the site-specific 80-day exposure frequency for the site-wide EU1, 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; if so, then Construction Worker risks must be mitigated to facilitate the proposed construction work. At that point additional site-specific health and safety requirements are warranted to be protective of workers. 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 the detailed development drawings (provided by Stantec Consulting) are included as **Appendix D**. The process of constructing the proposed manufacturing facility will involve the tasks listed below. Documentation of the outlined tasks and procedures will be provided in a Project Huddell Development Completion Report.

4.1 RESPONSE PHASE – GROUNDWATER NETWORK ABANDONMENT

Permanent groundwater monitoring well SW-026-MWS, shown on **Figure 4** is the only well located inside of the development boundary. However, the geotechnical boring monitoring point and test pit monitoring points will also need to be abandoned. The well and observation points will be properly abandoned prior to mass grading. Additionally, any remaining monitoring wells located within the Shipyard portion of the Site will also be properly abandoned.

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 may be placed on-site below the cap.

4.2.2 Grading and Site Preparation

As indicated on the development plans in **Appendix D**, grading activities including both cut and fill will occur within the Project Huddell 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 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 (Papadopulos & Associates, et al., June 17, 2015). The MMP is included as an electronic attachment to this RADWP. This work will be coordinated with MDE accordingly. No excess material will leave the property without prior approval from MDE.

4.2.3 Installation of Foundations, Structures, and Underground Utilities

The manufacturing facility buildings, parking lots, and other infrastructure associated with the development of Project Huddell will be installed as shown on the drawings in **Appendix D**. Soils relocated or removed during construction may be replaced on-site below the cap, but 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. Additional protocols for 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).

It is anticipated that the manufacturing facilities will require the installation of deep foundation piles, The installation method will be dependent upon local soil conditions encountered during construction. Four methods that could be utilized are: the driven pile method; the dry construction method; the casing construction method; and the wet construction method. A combination of any of these four methods (or others approved by the geotechnical engineer) could be used depending on the soil conditions at the site of the building foundation pilings. These methods are further described below:

- The driven pile method would consist of driving the pile into the existing soils. This method would not generate drill cuttings.
- The dry construction method consists of augering the shaft through soils and will be used when the soils are stable. This method would generate drill cuttings that would be staged on polyethylene sheeting and characterized for disposal.
- The casing construction method consists of advancing a steel casing while augering the drilled shaft to maintain the integrity of the shaft in unstable soils. This casing will either be left in place permanently or removed as concrete is placed. This method would generate drill cuttings that would be staged on polyethylene sheeting and characterized for disposal.
- The wet construction method consists of a wet slurry material (drilling mud) being placed while augering the drilled shaft to maintain the integrity of the shaft. This method will be used when drilling through unstable soils. A casing will be placed at the top of the shaft to contain the soil spoils and slurry. As concrete is placed in the shaft, the displaced materials will be collected and pumped from the casing to a local temporary containment area prior to removal to a permanent disposal site.

4.2.4 Floor Slabs and Paving

Much of the Site will be covered with floor slabs or paving as indicated in the development plans provided in **Appendix D**. 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**. All paved areas at the Site will be installed with at least a minimum of 4 inches of compacted aggregate base and a minimum of 4 inches of overlying pavement surface (asphalt or concrete), to meet required minimum thicknesses.

4.2.5 Landscaping

As shown on **Figure 8**, the areas not covered by the building, asphalt, or concrete will be covered by landscaped caps. The required minimum thicknesses of all site-wide landscaping sections which will serve as surface engineering controls are shown in the minimum capping section details provided in **Appendix E**. All landscaped areas at the Site will be installed with a minimum of 24 inches of clean fill, with an underlying geotextile marker fabric between the clean fill and the existing underlying material, which meet the minimum capping requirements.

4.2.6 Stormwater Management

The proposed stormwater utility layout for the Site is provided on the development plan drawings in **Appendix D**.

The stormwater management systems for the proposed development will be reviewed and approved by Baltimore County for each individual development project. The manufacturing facility will file a notice of intent to be covered under the General Permit for Industrial Sources that Discharge Stormwater Only.

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 Project Huddell. 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). As noted above, there was one lead exceedance observed and three Oil & Grease exceedances observed. Additionally, NAPL was identified at several soil borings, test pits, and groundwater monitoring locations relevant for the Site.

Following completion of the SLRA, the findings of the Construction Worker evaluation indicated that using the site-specific 80-day exposure frequency for EU1, 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 80 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 who otherwise could potentially contact surface soil (or relocated subsurface soil) at the Site. In addition, the use of processed slag aggregate as the primary fill material and pavement subbase is proposed 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 Environmental Professional (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. Any stockpiles shall be kept within the Site footprint, and 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 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 covered with a polyethylene tarp 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 sampling Work Plan including a description of the material, estimated volume, and sampling parameters will be submitted to the MDE for approval. The

resulting analytical data will be submitted to the MDE 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. 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/m^3. 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/m^3) 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/m^3, 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 Tradepoint Atlantic 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 Project Huddell development.

5.2.1 Groundwater PAL Exceedances

Groundwater samples were collected during the preceding Phase II Investigations from 11 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**. With the possible exception of NAPL, 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, installation of underground utilities, and within excavations/trenches. **Figure 5** 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, 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, following any pretreatment, if necessary. 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.

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

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 80 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 5.4. 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 IC/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 IC/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 5.3; 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:

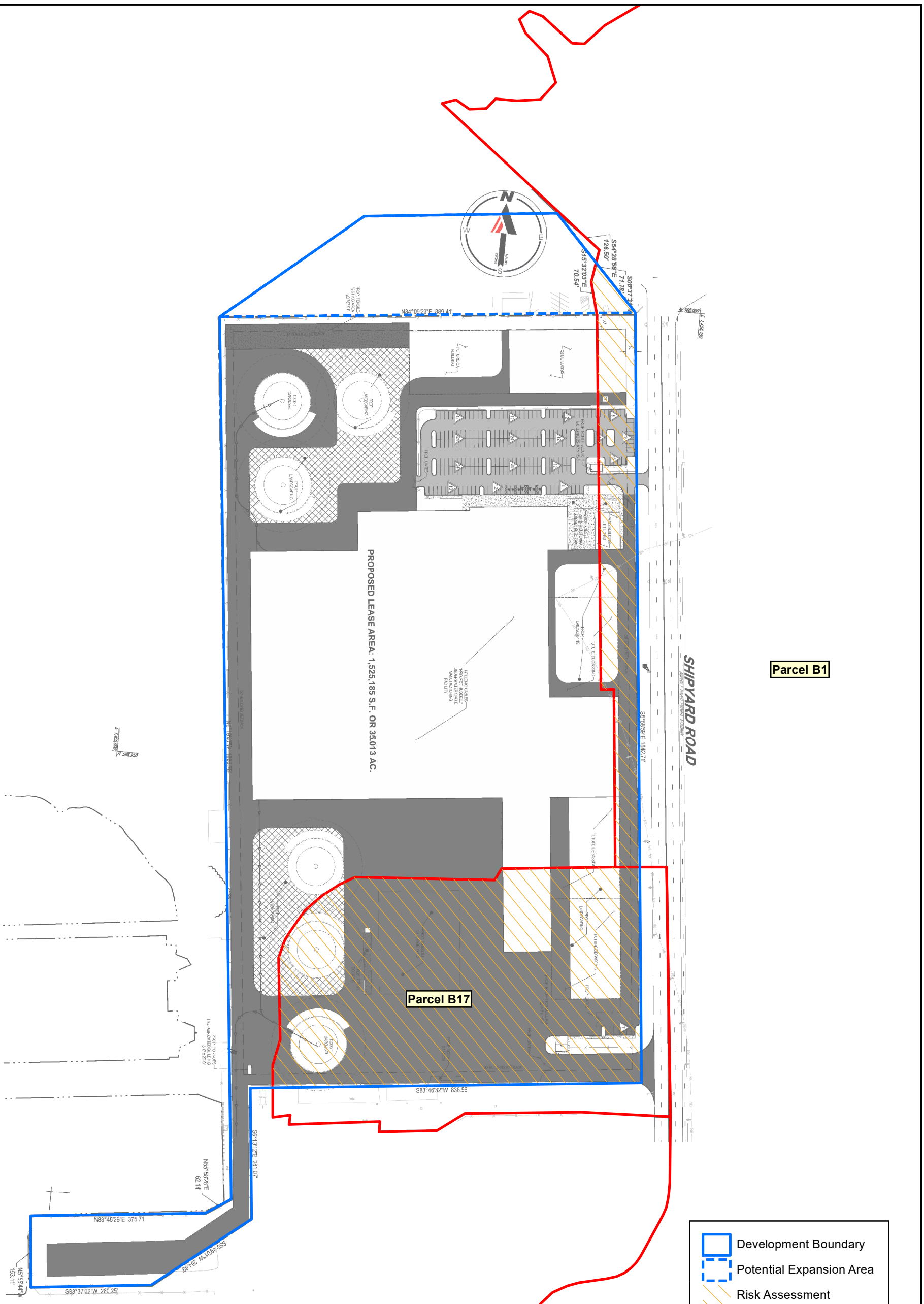
Task	**Proposed Completion Date**
Anticipated RADWP Approval	February 15, 2022
Response:	
Groundwater Network Abandonments	March 2022
Soil Gas Sampling (from footprint of proposed buildings)	March 2022
Development:	
Installation of Erosion and Sediment Controls	March 2022 (start)
Slag (or Alternative Fill) Delivery and Placement	April 2022 (start)
Grading	May 2022 (start)
Utility Installations	June 2022 (start)
Submittal of Development Completion Report/ Notice of Completion of Remedial Actions*	September 2022

Request for NFA from the MDE	December 2022
Recordation of institutional controls in the land records office of Baltimore County	Within 30 days of receiving the 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


Project Huddell Boundary
Potential Expansion Area
Site Boundary
Parcel Boundaries
Private Property
Parcel A9
Parcel A13
Parcel A5
Parcel A7
Parcel A14
Parcel A11
Parcel A8
Parcel A12
Parcel A15
Parcel A2
Parcel A17
Parcel A18
Parcel A16
Parcel A6
Parcel A10
Parcel A4
Parcel A3
Parcel A1
Parcel B6
Parcel B8
Parcel B14
Parcel B21
Parcel B22
Parcel B16
Parcel B24
Parcel B15
Parcel B23
Parcel B7
Parcel B25
Parcel B1
Parcel B2
Parcel B3
Parcel B17
Parcel B19
Shipyard
Parcel B4
Parcel B5
Parcel B9
Parcel B18
Parcel B10
Parcel B13
Parcel B20
Parcel B11
Parcel B12
Area A and Area B Parcels
November 12, 2021
Figure
1
ARM Group LLC
Engineers and Scientists
0 500 1,000 2,000
Feet
Hellenic Cables America Inc.
Sparrows Point
Baltimore County, MD
Project Huddell: Project 21010640



Project Huddell Development Plan January 18, 2022	**Figure** 2
ARM Group LLC Engineers and Scientists	Hellenic Cables America Inc.
	Sparrows Point
	Baltimore County, MD
	ARM Project 21010640


Parcel B1
B1-141-SB
Parcel B17
B17-001-SB
B17-012-SB
B17-013-SB
B17-002-SB
B17-004-SB
B17-020-SB
B17-018-SB
B17-019-SB
B17-021-SB
B17-007-SB
B17-009-SB
B17-008-SB
B17-011-SB
B17-005-SB
B17-017-SB
B17-006-SB
B17-010-SB
B17-014-SB
Soil Boring
Development Boundary
Potential Expansion Area
Risk Assessment
Parcel Boundary
Project Huddell
Phase II Soil Boring Locations
January 18, 2022
Figure
3
ARM Group LLC
Engineers and Scientists
0
75
150
300
Feet
Hellenic Cables America Inc.
Sparrows Point
Baltimore County, MD
ARM Project 21010640

Parcel B1

B1-141-SB-1

B17-001-SB-1
Benzo[a]pyrene: 6.3

B17-002-SB-1

B17-002-SB-5

B17-004-SB-1

B17-004-SB-4

B17-005-SB-2

B17-005-SB-4

B17-011-SB-1.5

B17-011-SB-5

B17-012-SB-1.5

B17-012-SB-4

B17-013-SB-1.5

B17-013-SB-4

B17-014-SB-1.5

B17-014-SB-5

B17-017-SB-1.5

B17-017-SB-6

B17-018-SB-1.5

B17-018-SB-4

B17-020-SB-1.5
Benzo[a]pyrene: 7.6

B17-020-SB-4

B17-021-SB-1.5
Naphthalene: 8.8

B17-021-SB-5

B17-009-SB-1.5

B17-009-SB-4

B17-006-SB-1.5

B17-006-SB-4

B17-007-SB-1

B17-010-SB-2

B17-010-SB-8

Soil Boring
Development Boundary
Potential Expansion Area
Parcel Boundary

Project Huddell
Soil SVOC PAL Exceedances (mg/kg)
January 18, 2022

Figure
S1

ARM Group LLC
Engineers and Scientists

0 75 150 300
Feet

Hellenic Cables America Inc.

Sparrows Point

Baltimore County, MD

ARM Project 21010640


Parcel B1
B1-141-SB-1
B17-001-SB-1
B17-002-SB-1
B17-012-SB-1.5
B17-013-SB-1.5
B17-020-SB-1.5
Aroclor 1254: 2.3
PCBs (total): 2.3 J
B17-004-SB-1
B17-018-SB-1.5
B17-009-SB-1.5
B17-021-SB-1.5
B17-007-SB-1
B17-006-SB-1.5
B17-011-SB-1.5
B17-005-SB-2
B17-017-SB-1.5
B17-010-SB-2
B17-014-SB-1.5
Soil Boring
Development Boundary
Potential Expansion
Parcel Boundary
Project Huddell
Soil PCB PAL Exceedances (mg/kg)
January 18, 2022
Figure
S2
ARM Group LLC
Engineers and Scientists
0 75 150 300
Feet
Hellenic Cables America Inc.
Sparrows Point
Baltimore County, MD
ARM Project 21010640


Parcel B1
B1-141-SB-1
B17-012-SB-1.5
B17-012-SB-4
B17-013-SB-1.5
OG: 8,630 J-
B17-013-SB-4
B17-001-SB-1
B17-002-SB-1
B17-002-SB-5
B17-004-SB-1
B17-004-SB-4
B17-021-SB-1.5
OG: 8,860 J+
B17-021-SB-5
B17-018-SB-1.5
B17-018-SB-4
B17-020-SB-1.5
B17-020-SB-4
B17-009-SB-1.5
B17-009-SB-4
B17-007-SB-1
B17-005-SB-2
B17-005-SB-4
B17-006-SB-1.5
B17-006-SB-4
B17-010-SB-2
B17-010-SB-8
B17-017-SB-1.5
B17-017-SB-6
B17-011-SB-1.5
B17-011-SB-5
B17-014-SB-1.5
B17-014-SB-5
Soil Boring
Soil Boring (NAPL Observed)
Development Boundary
Potential Expansion
Parcel Boundary
Project Huddell
Soil O&G PAL Exceedances (mg/kg)
January 18, 2022
Figure
S3
ARM Group LLC
Engineers and Scientists
0
75
150
300
Feet
Hellenic Cables America Inc.
Sparrows Point
Baltimore County, MD
ARM Project 21010640

Parcel B1

B1-141-SB-1
Arsenic: 10.3

B17-012-SB-1.5
Arsenic: 18.3
Lead: 1,580

B17-012-SB-4
Arsenic: 38.6
Lead: 4,010

B17-013-SB-1.5
Arsenic: 4.3

B17-013-SB-4
Arsenic: 5.7

B17-001-SB-1
Arsenic: 30.7

B17-002-SB-1
Arsenic: 17.2

B17-002-SB-5
Arsenic: 8.3

B17-020-SB-1.5
Arsenic: 11.3

B17-020-SB-4
Arsenic: 12.3

B17-004-SB-1

B17-004-SB-4
Arsenic: 39.6

B17-018-SB-1.5
Arsenic: 4.6

B17-018-SB-4

B17-021-SB-1.5

B17-021-SB-5
Arsenic: 13.0

B17-009-SB-1.5
Arsenic: 27.7

B17-009-SB-4
Manganese: 36,900

B17-007-SB-1

B17-005-SB-2
Arsenic: 9.9

B17-005-SB-4
Arsenic: 14.9

B17-010-SB-2
Arsenic: 4.8

B17-010-SB-8
Arsenic: 20.0

B17-006-SB-1.5
Arsenic: 8.8

B17-006-SB-4
Arsenic: 12.8

B17-011-SB-1.5
Arsenic: 13.7

B17-011-SB-5
Arsenic: 12.8

B17-014-SB-1.5
Arsenic: 38.0
Lead: 1,360 J

B17-014-SB-5
Arsenic: 204
Lead: 9,720 J

B17-017-SB-1.5
Arsenic: 21.1

B17-017-SB-6
Arsenic: 5.2

Soil Boring
Development Boundary
Potential Expansion Area
Parcel Boundary

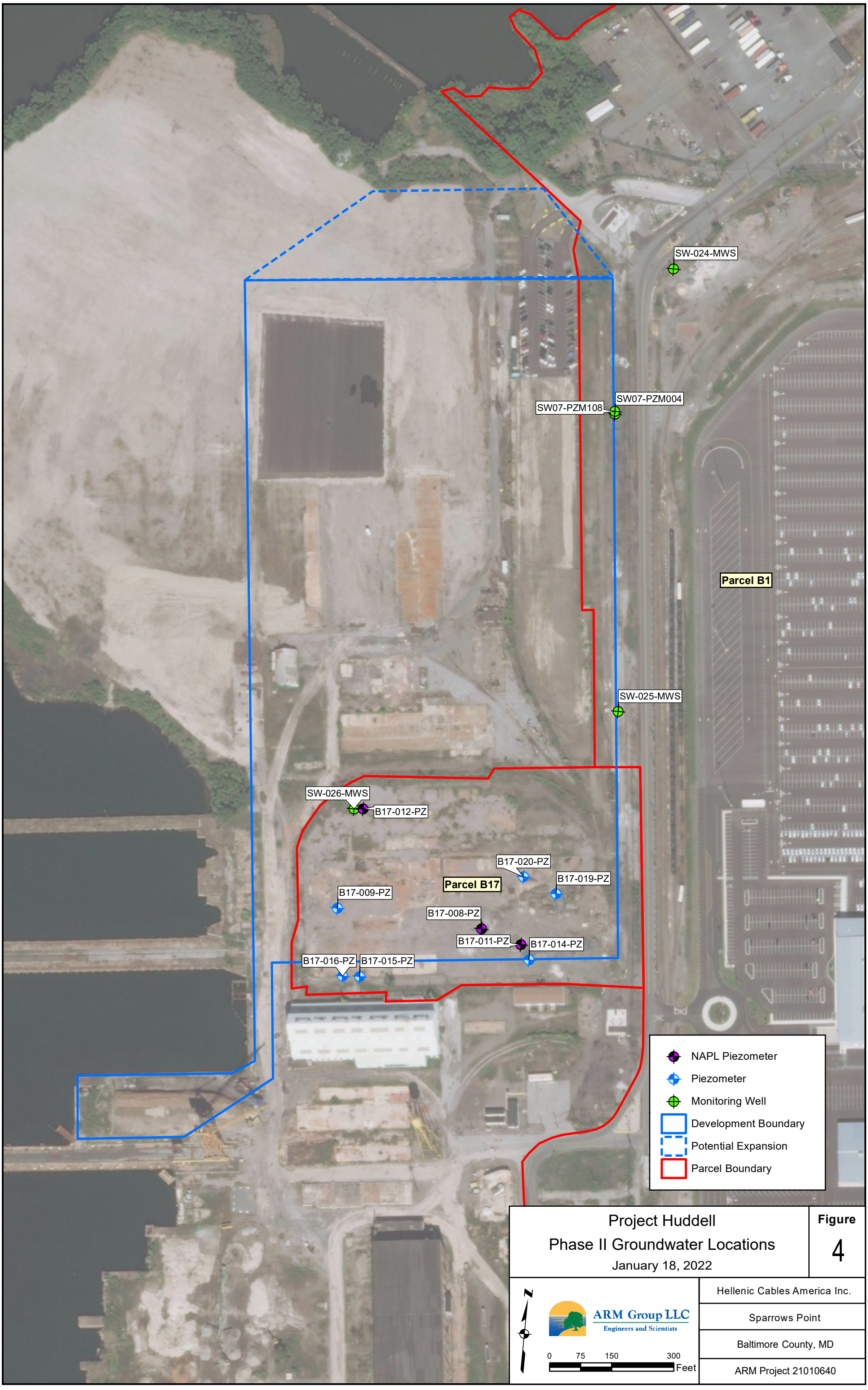
Project Huddell
Soil Inorganic PAL Exceedances (mg/kg)
January 18, 2022

Figure
S4

ARM Group LLC
Engineers and Scientists

0 75 150 300
Feet

Hellenic Cables America Inc.
Sparrows Point
Baltimore County, MD
ARM Project 21010640



Project Huddell
Phase II Groundwater Locations
January 18, 2022

Figure 4

Hellenic Cables America Inc.

Sparrows Point

Baltimore County, MD

ARM Project 21010640

SW-024-MWS
VOC

SVOC
Naphthalene: 0.5

TPH/OG
DRO: 130 J

Inorganic
Cyanide: 296

SW07-PZM108
VOC

SVOC
Benz[a]anthracene: 0.072 J

TPH/OG
DRO: 80.9 J

Inorganic
Lead (T): 35.7

SW07-PZM004
VOC

SVOC

TPH/OG

Inorganic
Manganese (T): 619 J

Parcel B1

SW-026-MWS
VOC

SVOC
Benz[a]anthracene: 0.043 J
Naphthalene: 0.36

TPH/OG
DRO: 530 J

Inorganic

SW-025-MWS
VOC

SVOC
Benz[a]anthracene: 0.046 J

TPH/OG

Inorganic
Manganese (T): 1,360

B17-020-PZ
VOC

SVOC

TPH/OG

Inorganic
Manganese (D): 448

B17-009-PZ
VOC

SVOC
Naphthalene: 0.27

TPH/OG

Inorganic

Parcel B17

B17-019-PZ
VOC

SVOC

TPH/OG
DRO: 238 J

Inorganic
Manganese (D): 514

B17-014-PZ
VOC

SVOC

TPH/OG

Inorganic

B17-016-PZ
VOC

SVOC
Benz[a]anthracene: 0.45
Benzo[a]pyrene: 0.37
Benzo[b]fluoranthene: 0.8
Dibenz[a,h]anthracene: 0.097 J
Indeno[1,2,3-c,d]pyrene: 0.25

TPH/OG
DRO: 159

Inorganic
Manganese (D): 682

B17-015-PZ
VOC

SVOC
Benz[a]anthracene: 0.19
Benzo[a]pyrene: 0.21
Benzo[b]fluoranthene: 0.38
Dibenz[a,h]anthracene: 0.048 J

TPH/OG
DRO: 148

Inorganic
Manganese (D): 627

Groundwater Well
Piezometer
Development Boundary
Potential Expansion Area
Parcel Boundary

(T) = Total
(D) = Dissolved

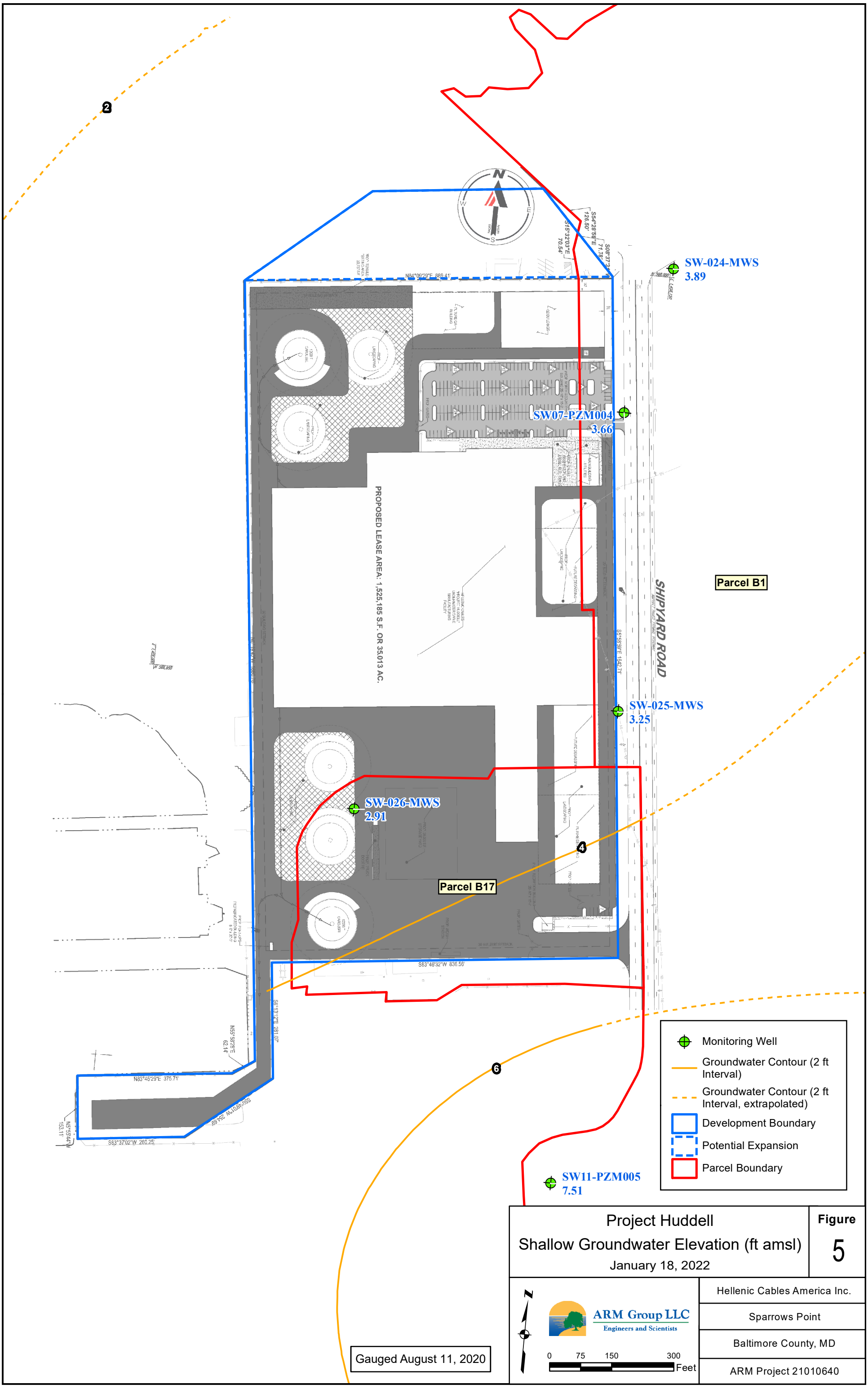
Project Huddell
Groundwater PAL Exceedances (ug/L)
January 18, 2022

Figure
GW1

ARM Group LLC
Engineers and Scientists

0 75 150 300
Feet

Hellenic Cables America Inc.
Sparrows Point
Baltimore County, MD ARM
Project 21010640

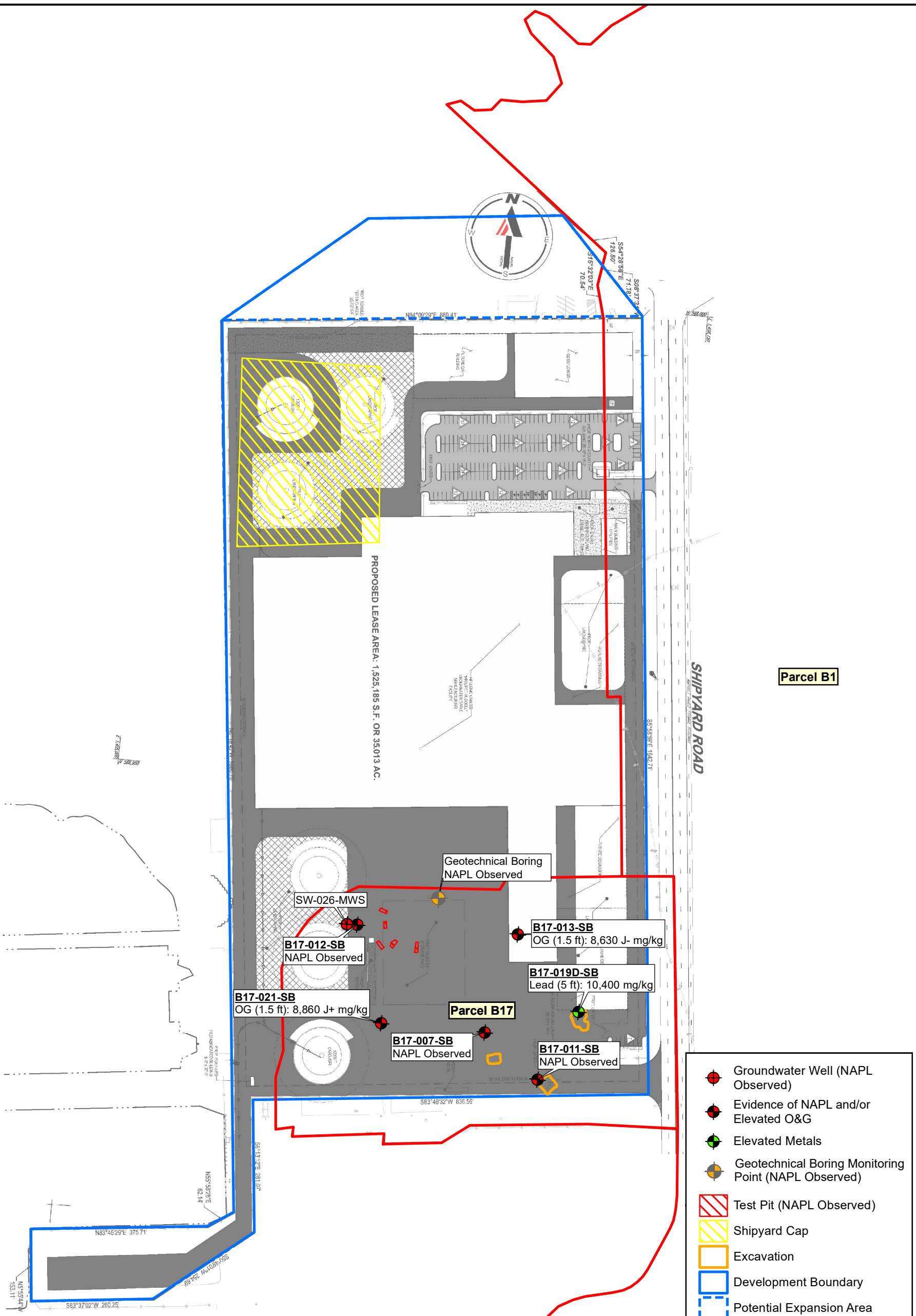


Project Huddell
Shallow Groundwater Elevation (ft amsl)
January 18, 2022

Figure 5

ARM Group LLC
Engineers and Scientists

Hellenic Cables America Inc.
Sparrows Point
Baltimore County, MD
ARM Project 21010640

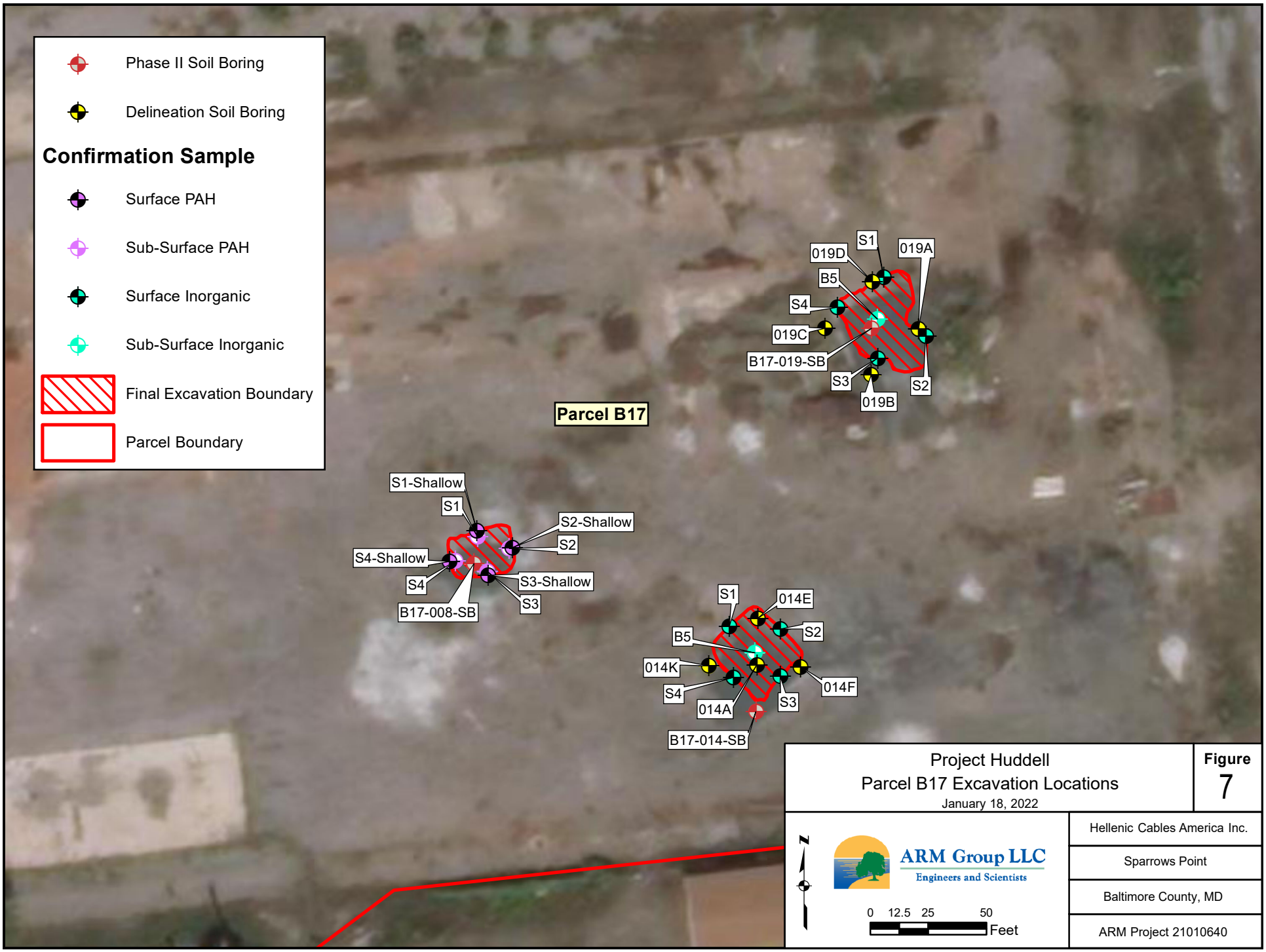


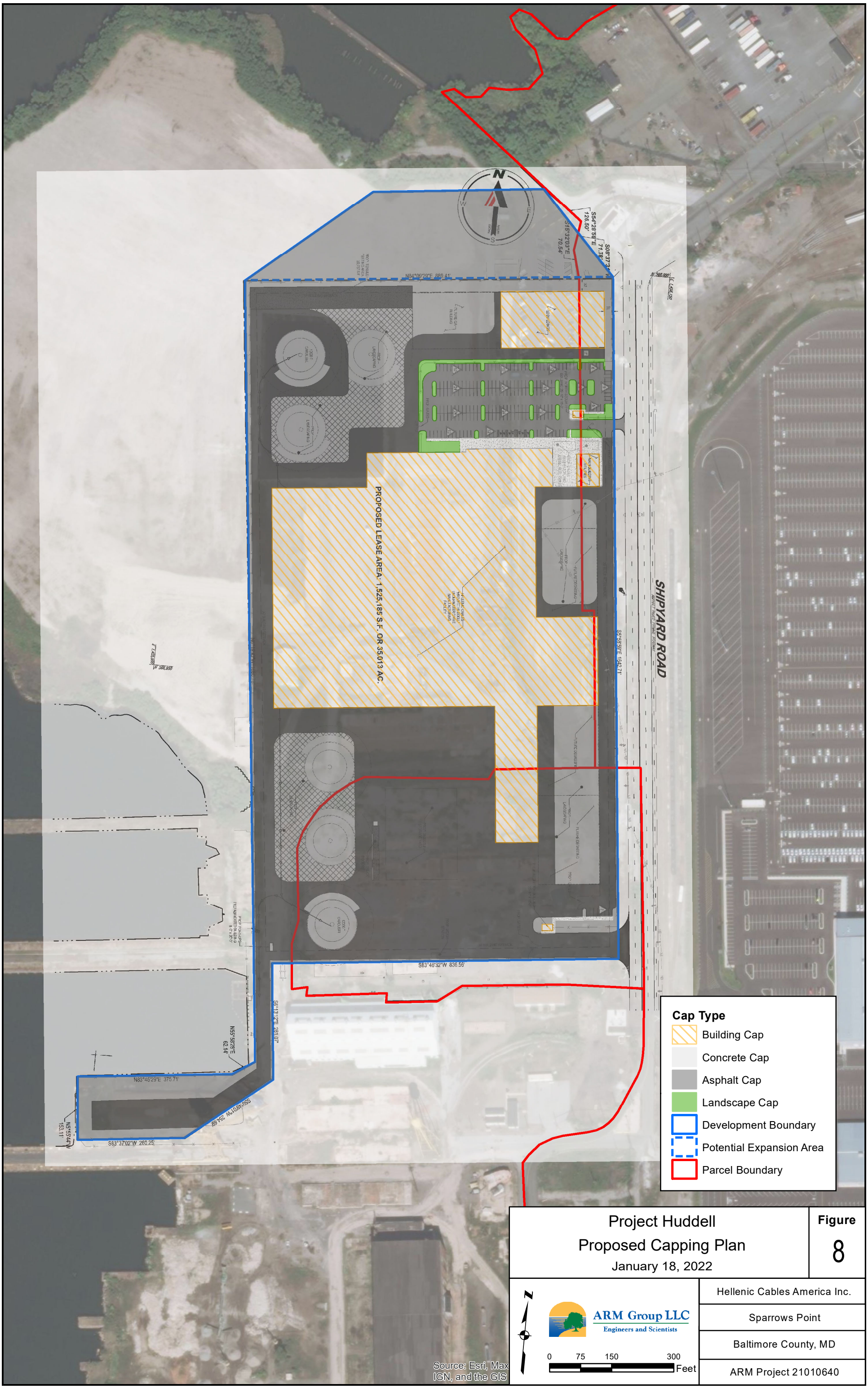
Project Huddell
Locations of Potential Concern
January 18, 2022

Figure 6

ARM Group LLC
Engineers and Scientists

Hellenic Cables America Inc.
Sparrows Point
Baltimore County, MD
ARM Project 21010640


Phase II Soil Boring
Delineation Soil Boring
Confirmation Sample
Surface PAH
Sub-Surface PAH
Surface Inorganic
Sub-Surface Inorganic
Final Excavation Boundary
Parcel Boundary
Parcel B17
S1
019D
019A
B5
S4
019C
B17-019-SB
S3
S2
019B
S1-Shallow
S1
S2-Shallow
S2
S4-Shallow
S3-Shallow
S4
S3
B17-008-SB
S1
014E
S2
B5
014K
014F
S4
S3
014A
B17-014-SB
Project Huddell
Parcel B17 Excavation Locations
January 18, 2022
Figure
7
ARM Group LLC
Engineers and Scientists
0 12.5 25 50
Feet
Hellenic Cables America Inc.
Sparrows Point
Baltimore County, MD
ARM Project 21010640



Project Huddell
Proposed Capping Plan
January 18, 2022

Figure 8

Hellenic Cables America Inc.

Sparrows Point

Baltimore County, MD

ARM Project 21010640

TABLES

Table 1A - Project Huddell
Summary of Organics Detected in Soil (Phase II Samples)

Parameter	Units	PAL	B1-141-SB-1* 3/17/2016	B17-001-SB-1 9/21/2017	B17-002-SB-1 9/21/2017	B17-002-SB-5 9/21/2017	B17-004-SB-1 9/20/2017	B17-004-SB-4 9/20/2017	B17-005-SB-2 9/18/2017	B17-005-SB-4 9/18/2017	B17-006-SB-1.5 9/20/2017	B17-006-SB-4 9/20/2017	B17-007-SB-1* 9/19/2017
Volatile Organic Compounds													
2-Butanone (MEK)	mg/kg	190,000	0.011 U	N/A	N/A	0.011 U	N/A	0.012 U	0.015 U	0.015 U	N/A	0.016 U	N/A
2-Hexanone	mg/kg	1,300	0.011 U	N/A	N/A	0.011 U	N/A	0.012 U	0.015 U	**0.0021 J**	N/A	0.016 U	N/A
4-Methyl-2-pentanone (MIBK)	mg/kg	56,000	0.011 U	N/A	N/A	0.011 U	N/A	0.012 U	0.015 U	0.015 U	N/A	0.016 U	N/A
Acetone	mg/kg	670,000	0.011 U	N/A	N/A	**0.023**	N/A	0.012 U	**0.043**	0.015 U	N/A	0.016 U	N/A
Benzene	mg/kg	5.1	0.0054 U	N/A	N/A	0.0055 U	N/A	0.0061 U	**0.023**	**0.0047 J**	N/A	0.0082 U	N/A
Carbon disulfide	mg/kg	3,500	0.0054 U	N/A	N/A	0.0055 U	N/A	0.0061 UJ	0.0073 UJ	0.0076 U	N/A	0.0082 UJ	N/A
Cyclohexane	mg/kg	27,000	0.011 U	N/A	N/A	0.011 UJ	N/A	0.012 UJ	**0.0037 J**	0.015 U	N/A	0.016 UJ	N/A
Toluene	mg/kg	47,000	0.0054 U	N/A	N/A	0.0055 U	N/A	0.0061 U	**0.0031 J**	0.0076 U	N/A	0.0082 U	N/A
Semi-Volatile Organic Compounds^													
1,1-Biphenyl	mg/kg	200	0.074 U	1.4 U	**0.019 J**	0.078 U	0.071 U	0.072 U	**0.016 J**	0.077 U	0.072 U	**0.021 J**	1.5 U
2,4-Dimethylphenol	mg/kg	16,000	0.074 U	1.4 U	0.072 U	0.078 U	0.071 R	0.072 U	0.07 R	0.077 U	0.072 U	0.083 U	1.5 U
2,4-Dinitrophenol	mg/kg	1,600	0.19 U	3.6 U	0.18 U	0.2 U	0.18 R	0.18 U	0.18 R	0.19 U	0.18 U	**0.067 J**	3.8 U
2-Chloronaphthalene	mg/kg	60,000	0.074 U	1.4 U	0.072 U	0.078 U	0.071 U	0.072 U	0.07 U	0.077 U	0.072 U	0.083 U	1.5 U
2-Methylnaphthalene	mg/kg	3,000	**0.061**	**0.83**	**0.087**	**0.051**	**0.0035 J**	**0.021**	**0.16**	**0.0083**	**0.069 J**	**0.32**	**0.015 J**
2-Methylphenol	mg/kg	41,000	0.074 U	1.4 U	0.072 U	0.078 U	0.071 R	0.072 U	0.07 R	0.077 U	0.072 U	0.083 U	1.5 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.15 U	2.9 U	0.14 U	0.16 U	0.14 R	0.14 U	0.14 R	0.15 U	0.14 U	0.16 U	3 U
Acenaphthene	mg/kg	45,000	**0.0036 J**	**0.083**	**0.0052 J**	**0.0035 J**	0.0071 U	**0.0028 J**	**0.014**	**0.0053 J**	**0.0087 J**	**0.012**	**0.013 J**
Acenaphthylene	mg/kg	45,000	**0.044**	**4.4**	**0.075**	**0.019**	**0.0011 J**	**0.0028 J**	**0.022**	**0.0023 J**	**0.041 J**	**0.024**	**0.0061 J**
Acetophenone	mg/kg	120,000	0.074 U	1.4 U	**0.023 J**	**0.028 J**	0.071 U	**0.028 J**	**0.027 J**	0.077 U	0.072 U	**0.037 J**	1.5 U
Anthracene	mg/kg	230,000	**0.046**	**1.5**	**0.046 J**	**0.014**	**0.0024 J**	**0.0057 J**	**0.082**	**0.00099 J**	**0.041 J**	**0.022**	**0.046 J**
Benz[a]anthracene	mg/kg	21	**0.096**	**6.7**	**0.31**	**0.06**	**0.0077**	**0.025**	**0.33**	**0.004 J**	**0.32**	**0.36**	**0.076**
Benzaldehyde	mg/kg	120,000	0.074 U	1.4 U	0.072 U	**0.02 J**	0.071 R	**0.018 J**	0.07 R	0.077 R	**0.017 J**	**0.042 J**	1.5 U
Benzo[a]pyrene	mg/kg	2.1	**0.14**	**6.3**	**0.32**	**0.062**	**0.0055 J**	**0.026**	**0.29**	**0.0034 J**	**0.31**	**0.39**	**0.034 J**
Benzo[b]fluoranthene	mg/kg	21	**0.43**	**14.2**	**0.73**	**0.13**	**0.016**	**0.052**	**0.61**	**0.0091**	**0.66**	**0.99**	**0.1**
Benzo[g,h,i]perylene	mg/kg		**0.067**	**3.5**	**0.2**	**0.043**	**0.0045 J**	**0.019**	**0.18**	**0.0045 J**	**0.18**	**0.21**	**0.03 J**
Benzo[k]fluoranthene	mg/kg	210	**0.43**	**8.9**	**0.51**	**0.092**	**0.011**	**0.036**	**0.46**	**0.0064 J**	**0.46**	**0.66**	**0.071 J**
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.074 U	1.4 U	0.072 U	0.078 U	0.071 U	0.072 U	0.07 U	0.077 U	0.072 U	0.083 U	1.5 U
Caprolactam	mg/kg	400,000	0.19 U	3.6 U	**0.029 J**	0.2 U	0.18 U	0.18 U	**0.057 J**	0.19 U	0.18 U	0.21 U	3.8 U
Carbazole	mg/kg		0.074 U	**0.7 J**	**0.063 J**	0.078 U	0.071 U	0.072 U	**0.12**	0.077 U	**0.034 J**	**0.02 J**	1.5 U
Chrysene	mg/kg	2,100	**0.14**	**5.4**	**0.32**	**0.064**	**0.009**	**0.036**	**0.34**	**0.0077**	**0.33**	**0.38**	**0.075**
Dibenz[a,h]anthracene	mg/kg	2.1	**0.03**	**1.4**	**0.07 J**	**0.016**	0.0071 U	**0.0064 J**	**0.067**	**0.0016 J**	**0.077**	**0.093**	0.075 U
Fluoranthene	mg/kg	30,000	**0.15**	**11.1**	**0.46**	**0.091**	**0.02**	**0.038**	**0.55**	**0.012**	**0.43**	**0.47**	**0.31**
Fluorene	mg/kg	30,000	0.0034 B	**0.33**	**0.0058 J**	**0.0059 J**	0.0071 U	**0.0052 J**	**0.02**	**0.0035 J**	**0.0089 J**	**0.011**	**0.024 J**
Hexachloroethane	mg/kg	8	0.074 U	1.4 U	0.072 U	0.078 U	0.071 U	0.072 U	**0.027 J**	0.077 U	0.072 U	0.083 U	1.5 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.066**	**3.5**	**0.19**	**0.041**	**0.0038 J**	**0.016**	**0.14**	**0.0029 J**	**0.17**	**0.24**	**0.028 J**
Naphthalene	mg/kg	8.6	**0.049**	**1.6**	**0.076**	**0.041**	**0.0051 J**	**0.018**	**0.14**	**0.015**	**0.074**	**0.21**	0.075 U
N-Nitrosodiphenylamine	mg/kg	470	0.074 U	1.4 U	0.072 U	0.078 U	0.071 U	0.072 U	0.07 U	0.077 U	0.072 U	0.083 U	1.5 U
Phenanthrene	mg/kg		**0.081**	**3.8**	**0.16**	**0.07**	**0.016**	**0.05**	**0.59**	**0.022**	**0.23**	**0.35**	**0.25**
Phenol	mg/kg	250,000	0.074 U	1.4 U	0.072 U	0.078 U	0.071 R	0.072 U	0.07 R	0.077 U	0.072 U	0.083 U	1.5 U
Pyrene	mg/kg	23,000	**0.15**	**9**	**0.39**	**0.081**	**0.016**	**0.03**	**0.4**	**0.0079**	**0.37**	**0.41**	**0.21**
PCBs													
Aroclor 1254	mg/kg	0.97	0.0595 U	0.018 U	0.018 U	N/A	0.018 U	N/A	0.018 U	N/A	0.018 U	N/A	**0.095**
Aroclor 1260	mg/kg	0.99	0.0595 U	0.018 U	0.018 U	N/A	0.018 UJ	N/A	0.018 UJ	N/A	0.018 UJ	N/A	0.019 U
Aroclor 1268	mg/kg		0.0595 U	0.018 U	0.018 U	N/A	0.018 UJ	N/A	0.018 U	N/A	0.018 UJ	N/A	0.019 U
PCBs (total)	mg/kg	0.97	0.0595 U	0.16 U	0.16 U	N/A	0.12 U	N/A	0.12 U	N/A	0.12 U	N/A	**0.095 J**
TPH/Oil & Grease													
Diesel Range Organics	mg/kg	6,200	75.8 B	**445 J**	**32.9 J**	**23.5 J**	**20.9 J**	**27.6 J**	**75.6 J**	**70.3 J**	**34.7 J**	**34.1 J**	**128**
Gasoline Range Organics	mg/kg	6,200	12.5 U	5.6 B	3 B	2.5 B	10.9 U	6.5 B	**19.8 J**	**30**	4.6 B	6.7 B	9.4 U
Oil & Grease	mg/kg	6,200	N/A	**5,320 J+**	**146 J+**	**77.8 J+**	**170 J-**	**137 J-**	**150 J-**	**170 J-**	**192 J-**	**262 J-**	**347**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
^PAH compounds were analyzed via SIM
*indicates non-validated data

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 actual quantitation/detection limit may be higher than reported.
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.
J+: The positive result reported for this analyte is a quantitative estimate, but may be biased high.
R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this analyte in the sample.
B: This analyte was not detected substantially above the level of the associated method or field blank.

Table 1A - Project Huddell
Summary of Organics Detected in Soil (Phase II Samples)

Parameter	Units	PAL	B17-009-SB-1.5	B17-009-SB-4	B17-010-SB-2	B17-010-SB-8	B17-011-SB-1.5	B17-011-SB-5	B17-012-SB-1.5	B17-012-SB-4	B17-013-SB-1.5	B17-013-SB-4	B17-014-SB-1.5
			9/20/2017	9/20/2017	9/21/2017	9/21/2017	9/18/2017	9/18/2017	9/20/2017	9/20/2017	9/20/2017	9/20/2017	9/18/2017
Volatile Organic Compounds													
2-Butanone (MEK)	mg/kg	190,000	N/A	0.011 U	N/A	**0.012 J**	N/A	N/A	N/A	N/A	0.012 U	0.011 U	0.012 U
2-Hexanone	mg/kg	1,300	N/A	0.011 U	N/A	0.016 U	N/A	N/A	N/A	N/A	0.012 U	0.011 U	0.012 U
4-Methyl-2-pentanone (MIBK)	mg/kg	56,000	N/A	0.011 U	N/A	0.016 U	N/A	N/A	N/A	N/A	0.012 U	0.011 U	0.012 U
Acetone	mg/kg	670,000	N/A	0.0099 B	N/A	**0.11 J**	N/A	N/A	N/A	N/A	0.012 U	0.011 U	**0.046**
Benzene	mg/kg	5.1	N/A	0.0056 U	N/A	0.0082 U	N/A	N/A	N/A	N/A	0.0061 U	0.0056 U	0.0061 U
Carbon disulfide	mg/kg	3,500	N/A	0.0056 UJ	N/A	**0.029 J**	N/A	N/A	N/A	N/A	0.0061 UJ	0.0056 UJ	0.0061 U
Cyclohexane	mg/kg	27,000	N/A	0.011 UJ	N/A	0.016 UJ	N/A	N/A	N/A	N/A	0.012 UJ	0.011 UJ	0.012 U
Toluene	mg/kg	47,000	N/A	0.0056 U	N/A	0.0082 U	N/A	N/A	N/A	N/A	0.0061 U	0.0056 U	0.0061 U
Semi-Volatile Organic Compounds^													
1,1-Biphenyl	mg/kg	200	**0.057 J**	0.076 U	0.078 U	**0.047 J**	**0.029 J**	**0.054 J**	**0.016 J**	**0.042 J**	1.5 U	0.078 U	1.5 U
2,4-Dimethylphenol	mg/kg	16,000	0.079 U	0.076 U	0.078 U	0.082 U	0.076 UJ	**0.02 J**	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U
2,4-Dinitrophenol	mg/kg	1,600	0.2 U	0.19 U	0.19 U	0.21 U	0.19 UJ	0.19 U	0.18 U	0.19 U	3.8 U	0.2 U	3.8 U
2-Chloronaphthalene	mg/kg	60,000	**0.15**	0.076 U	0.078 U	0.082 U	**0.078**	**0.25**	0.073 U	**0.13**	1.5 U	0.078 U	1.5 U
2-Methylnaphthalene	mg/kg	3,000	**0.22**	**0.024**	**0.033**	**0.21**	**0.16**	**0.11**	**0.043 J**	**0.092**	**0.11**	**0.016**	**0.58**
2-Methylphenol	mg/kg	41,000	0.079 U	0.076 U	0.078 U	0.082 U	0.076 UJ	**0.026 J**	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.16 U	0.15 U	0.15 U	0.16 U	0.15 UJ	**0.046 J**	0.15 U	0.15 U	3 U	0.16 U	3 U
Acenaphthene	mg/kg	45,000	**0.026 J**	**0.0035 J**	**0.0041 J**	**0.017**	**0.0098 J**	**0.0021 J**	**0.027 J**	**0.0037 J**	**0.029 J**	**0.0015 J**	**0.01 J**
Acenaphthylene	mg/kg	45,000	**0.059 J**	**0.0057 J**	**0.022**	**0.027**	**0.038 J**	**0.011**	**0.012 J**	**0.035**	**0.023 J**	**0.0046 J**	**0.039 J**
Acetophenone	mg/kg	120,000	**0.046 J**	0.076 U	0.078 U	**0.057 J**	**0.05 J**	**0.069 J**	**0.02 J**	**0.053 J**	1.5 U	0.078 U	1.5 U
Anthracene	mg/kg	230,000	**0.079**	**0.0099**	**0.025**	**0.074**	**0.094**	**0.024**	**0.13**	**0.044**	**0.087**	**0.0055 J**	**0.15**
Benz[a]anthracene	mg/kg	21	**0.56**	**0.068**	**0.14**	**0.23**	**0.42**	**0.065**	**0.34**	**0.26**	**0.3**	**0.034**	**0.58**
Benzaldehyde	mg/kg	120,000	**0.072 J**	**0.021 J**	0.078 U	**0.12 J**	**0.093 J**	**0.085 J**	**0.022 J**	**0.13 J**	1.5 U	0.078 U	1.5 R
Benzo[a]pyrene	mg/kg	2.1	**0.39**	**0.052**	**0.17**	**0.21**	**0.56**	**0.054**	**0.31**	**0.24**	**0.27**	**0.033**	**0.65**
Benzo[b]fluoranthene	mg/kg	21	**1.4**	**0.19**	**0.31**	**0.52**	**1.2**	**0.13**	**0.64**	**0.58**	**0.6**	**0.069**	**1.5**
Benzo[g,h,i]perylene	mg/kg		**0.35**	**0.048**	**0.13**	**0.14**	**0.43**	**0.042**	**0.18**	**0.15**	**0.11**	**0.019**	**0.55**
Benzo[k]fluoranthene	mg/kg	210	**0.96**	**0.13**	**0.22**	**0.33**	**0.81**	**0.089**	**0.45**	**0.37**	**0.42**	**0.048**	**1.1**
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.079 U	0.076 U	0.078 U	0.082 U	0.076 U	0.076 U	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U
Caprolactam	mg/kg	400,000	**0.2**	0.027 B	0.19 U	**0.19 J**	0.19 U	**0.05 J**	0.035 B	0.19 U	3.8 U	0.2 U	3.8 U
Carbazole	mg/kg		**0.033 J**	0.076 U	0.078 U	**0.023 J**	**0.084**	**0.021 J**	**0.017 J**	**0.037 J**	1.5 U	0.078 U	1.5 U
Chrysene	mg/kg	2,100	**0.73**	**0.1**	**0.14**	**0.49**	**0.54**	**0.13**	**0.37**	**0.37**	**0.39**	**0.039**	**0.84**
Dibenz[a,h]anthracene	mg/kg	2.1	**0.14**	**0.021**	**0.038**	**0.073**	**0.13**	**0.02**	**0.068 J**	**0.064**	**0.049 J**	**0.0076 J**	**0.21**
Fluoranthene	mg/kg	30,000	**1.2**	**0.13**	**0.21**	**0.37**	**0.46**	**0.079**	**0.66**	**0.45**	**0.54**	**0.054**	**0.82**
Fluorene	mg/kg	30,000	**0.024 J**	**0.0037 J**	**0.0054 J**	**0.034**	**0.015 J**	**0.01**	**0.038 J**	**0.012**	**0.032 J**	**0.0019 J**	**0.022 J**
Hexachloroethane	mg/kg	8	0.079 U	0.076 U	0.078 U	**0.019 J**	0.076 U	0.076 U	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.32**	**0.042**	**0.12**	**0.12**	**0.38**	**0.03**	**0.17**	**0.15**	**0.11**	**0.018**	**0.48**
Naphthalene	mg/kg	8.6	**0.19**	**0.014**	**0.029**	**0.17**	**0.15**	**0.058**	**0.057 J**	**0.062**	**0.078**	**0.0081**	**1.9**
N-Nitrosodiphenylamine	mg/kg	470	0.079 U	0.076 U	0.078 U	**0.021 J**	0.076 U	0.076 U	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U
Phenanthrene	mg/kg		**0.97**	**0.099**	**0.12**	**0.68**	**0.91**	**0.28**	**0.51**	**0.52**	**0.45**	**0.039**	**1.3**
Phenol	mg/kg	250,000	0.079 U	0.076 U	0.078 U	0.082 U	0.076 UJ	0.076 U	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U
Pyrene	mg/kg	23,000	**1.5**	**0.2**	**0.19**	**0.31**	**0.42**	**0.071**	**0.51**	**0.33**	**0.45**	**0.046**	**0.64**
PCBs													
Aroclor 1254	mg/kg	0.97	0.02 U	N/A	0.019 U	N/A	0.019 U	N/A	0.018 U	N/A	0.019 U	N/A	0.019 U
Aroclor 1260	mg/kg	0.99	0.02 UJ	N/A	0.019 U	N/A	0.019 UJ	N/A	0.018 UJ	N/A	0.019 UJ	N/A	0.019 UJ
Aroclor 1268	mg/kg		0.02 UJ	N/A	0.019 U	N/A	0.019 U	N/A	**0.22 J**	N/A	**0.31 J**	N/A	0.019 U
PCBs (total)	mg/kg	0.97	0.14 U	N/A	0.17 U	N/A	0.13 U	N/A	**0.22**	N/A	**0.31**	N/A	0.13 U
TPH/Oil & Grease													
Diesel Range Organics	mg/kg	6,200	**85.9 J**	**17 J**	**97.8 J**	**75.5 J**	**158 J**	**89.8 J**	**51.9 J**	**27.6 J**	**129 J**	7.7 B	**144 J**
Gasoline Range Organics	mg/kg	6,200	2.1 B	3.5 B	20.2 U	4.4 B	**6 J**	24.4 U	5 B	4.2 B	4.1 B	4.2 B	**2.7 J**
Oil & Grease	mg/kg	6,200	**245 J-**	**166 J-**	**236 J+**	**75.2 J+**	**740 J-**	**156 J-**	**233 J-**	**172 J-**	**8,630 J-**	**152 J-**	**207 J-**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
^PAH compounds were analyzed via SIM
*indicates non-validated data

Table 1A - Project Huddell
Summary of Organics Detected in Soil (Phase II Samples)

Parameter	Units	PAL	B17-014-SB-5 9/18/2017	B17-017-SB-1.5 9/18/2017	B17-017-SB-6 9/18/2017	B17-018-SB-1.5* 9/19/2017	B17-018-SB-4* 9/19/2017	B17-019-SB-4* 9/19/2017	B17-020-SB-1.5* 9/19/2017	B17-020-SB-4* 9/19/2017	B17-021-SB-1.5 9/21/2017	B17-021-SB-5 9/21/2017
Volatile Organic Compounds												
2-Butanone (MEK)	mg/kg	190,000	0.014 U	0.017 U	0.012 U	0.012 U	0.014 U	0.014 U	N/A	0.021 U	**0.063**	0.019 U
2-Hexanone	mg/kg	1,300	0.014 U	0.017 U	0.012 U	0.012 U	0.014 U	0.014 U	N/A	0.021 U	**0.014**	0.019 U
4-Methyl-2-pentanone (MIBK)	mg/kg	56,000	0.014 U	0.017 U	0.012 U	0.012 U	0.014 U	0.014 U	N/A	0.021 U	**0.0054 J**	0.019 U
Acetone	mg/kg	670,000	**0.052**	**0.065**	**0.096**	**0.027**	0.014 U	0.014 U	N/A	**0.11**	**0.26 J**	**0.023**
Benzene	mg/kg	5.1	0.0069 U	0.0086 U	**0.002 J**	0.006 U	0.0072 U	0.0071 U	N/A	**0.011**	0.0049 U	0.0096 U
Carbon disulfide	mg/kg	3,500	0.0069 U	0.0086 U	**0.025**	**0.0084**	**0.004 J**	0.0071 U	N/A	0.011 U	**0.042 J**	0.0096 U
Cyclohexane	mg/kg	27,000	0.014 U	0.017 U	0.012 U	0.012 U	0.014 U	0.014 U	N/A	0.021 U	0.0098 UJ	0.019 UJ
Toluene	mg/kg	47,000	0.0069 U	**0.0028 J**	**0.0036 J**	0.006 U	0.0072 U	0.0071 U	N/A	0.011 U	0.0049 U	0.0096 U
Semi-Volatile Organic Compounds^												
1,1-Biphenyl	mg/kg	200	0.075 U	1.5 U	1.5 U	**0.059 J**	0.078 U	0.08 U	1.5 U	1.5 U	**4.9**	**0.035 J**
2,4-Dimethylphenol	mg/kg	16,000	0.075 U	1.5 U	1.5 U	0.073 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 R	0.074 U
2,4-Dinitrophenol	mg/kg	1,600	0.19 U	3.8 U	3.7 U	0.18 U	0.2 U	0.2 U	3.8 U	3.9 U	0.18 R	0.18 U
2-Chloronaphthalene	mg/kg	60,000	0.075 U	1.5 U	1.5 U	0.073 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 U	0.074 U
2-Methylnaphthalene	mg/kg	3,000	**0.015**	**2.2**	**0.41**	**0.27**	**0.02**	**0.014**	**0.22**	**0.13**	**14.5**	**0.44**
2-Methylphenol	mg/kg	41,000	0.075 U	1.5 U	1.5 U	0.073 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 R	0.074 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.15 U	3.1 U	3 U	0.15 U	0.16 U	0.16 U	3 U	3.1 U	0.14 R	0.15 U
Acenaphthene	mg/kg	45,000	0.0077 U	**0.22**	**0.11**	**0.093**	**0.0054 J**	**0.0018 J**	**0.54**	**0.072 J**	**5.8**	**0.3**
Acenaphthylene	mg/kg	45,000	0.0077 U	**0.048 J**	**0.028 J**	**0.011**	**0.00056 J**	**0.0011 J**	**0.13 J**	**0.035 J**	**0.39**	**0.11**
Acetophenone	mg/kg	120,000	0.075 U	1.5 U	1.5 U	0.073 U	0.078 U	0.08 U	1.5 U	1.5 U	**0.029 J**	**0.021 J**
Anthracene	mg/kg	230,000	**0.0027 J**	**0.19**	**0.065 J**	**0.027**	**0.0021 J**	**0.0088**	**2.4**	**0.27**	**4**	**1.1**
Benz[a]anthracene	mg/kg	21	**0.045**	**0.51**	**0.34**	**0.12**	**0.007 J**	**0.027**	**10**	**0.85**	**5.4**	**2.3**
Benzaldehyde	mg/kg	120,000	0.075 R	1.5 R	1.5 R	0.073 U	0.078 U	**0.028 J**	1.5 U	1.5 U	**0.019 J**	**0.037 J**
Benzo[a]pyrene	mg/kg	2.1	**0.055**	**0.31**	**0.23**	**0.012**	0.0078 U	**0.022**	7.6	**0.73**	**1.6**	**1.6**
Benzo[b]fluoranthene	mg/kg	21	**0.11**	**0.79**	**0.58**	**0.2**	**0.01**	**0.065**	**18.6**	**1.5**	**7.3**	**3.6**
Benzo[g,h,i]perylene	mg/kg		**0.041**	**0.2**	**0.12**	**0.026**	**0.0014 J**	**0.021**	**1.6**	**0.24**	**0.87**	**0.95**
Benzo[k]fluoranthene	mg/kg	210	**0.08**	**0.55**	**0.4**	**0.14**	**0.0072 J**	**0.045**	**12.3**	**1.1**	**4.8**	**2.5**
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.075 U	1.5 U	1.5 U	**0.065 J**	0.078 U	0.08 U	1.5 U	1.5 U	0.07 UJ	0.074 U
Caprolactam	mg/kg	400,000	0.19 U	3.8 U	3.7 U	0.18 U	0.2 U	0.2 U	3.8 U	3.9 U	0.18 U	**0.042 J**
Carbazole	mg/kg		0.075 U	1.5 U	1.5 U	0.073 U	0.078 U	0.08 U	**5.5**	1.5 U	0.07 U	**0.028 J**
Chrysene	mg/kg	2,100	**0.046**	**0.84**	**0.41**	**0.2**	**0.01**	**0.071**	**8.8**	**0.81**	**5.5**	**2.2**
Dibenz[a,h]anthracene	mg/kg	2.1	**0.012**	**0.11**	**0.05 J**	**0.011**	0.0078 U	**0.012**	**0.82**	**0.1**	**0.44**	**0.39**
Fluoranthene	mg/kg	30,000	**0.037**	**1.5**	**1**	**1.1**	**0.046**	**0.056**	**17.8**	**2**	**32.9**	**4.9**
Fluorene	mg/kg	30,000	0.0077 U	**0.15**	**0.07 J**	**0.012**	**0.00077 J**	**0.0027 J**	**0.38 J**	**0.074 J**	**5.4**	**0.39**
Hexachloroethane	mg/kg	8	0.075 U	1.5 U	1.5 U	0.073 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 U	0.074 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.036**	**0.15**	**0.12**	**0.03**	**0.0016 J**	**0.0098**	**1.8**	**0.25**	**1**	**0.93**
Naphthalene	mg/kg	8.6	**0.044**	**1.5**	**0.48**	**0.1**	**0.01**	**0.011**	**0.2**	**0.15**	8.8	**0.44**
N-Nitrosodiphenylamine	mg/kg	470	0.075 U	1.5 U	1.5 U	0.073 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 U	0.074 U
Phenanthrene	mg/kg		**0.025**	**4**	**1.6**	**2.9**	**0.13**	**0.079**	**9.5**	**1.5**	**62.6**	**4.8**
Phenol	mg/kg	250,000	0.075 U	1.5 U	1.5 U	0.073 U	0.078 U	0.08 U	1.5 U	1.5 U	**0.045 J**	0.074 U
Pyrene	mg/kg	23,000	**0.035**	**1.1**	**0.9**	**0.74**	**0.031**	**0.06**	**14.6**	**1.6**	**25**	**3.6**
PCBs												
Aroclor 1254	mg/kg	0.97	N/A	0.019 U	N/A	0.018 U	N/A	N/A	2.3	N/A	0.18 U	N/A
Aroclor 1260	mg/kg	0.99	N/A	0.019 UJ	N/A	0.018 U	N/A	N/A	0.38 U	N/A	0.18 U	N/A
Aroclor 1268	mg/kg		N/A	0.019 U	N/A	0.018 U	N/A	N/A	0.38 U	N/A	0.18 U	N/A
PCBs (total)	mg/kg	0.97	N/A	0.13 U	N/A	0.13 U	N/A	N/A	**2.3 J**	N/A	1.6 U	N/A
TPH/Oil & Grease												
Diesel Range Organics	mg/kg	6,200	**9.4 J**	**746 J**	**515 J**	**168**	**26.9**	**42.9**	**483**	**171**	**3,320 J**	**93.5 J**
Gasoline Range Organics	mg/kg	6,200	14.3 U	**31.8**	**7.7 J**	**5.5 J**	17.2 U	18.8 U	**4.9 J**	**3.4 J**	2.6 B	13.8 U
Oil & Grease	mg/kg	6,200	**163 J-**	**1,650 J-**	**1,490 J-**	**559**	**195**	**83 J**	**2,050**	**1,660**	**8,860 J+**	**123 J+**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
^PAH compounds were analyzed via SIM
*indicates non-validated data

Table 1B - Project Huddell
Summary of Organics Detected in Soil (Confirmation Samples)

Parameter	Units	PAL	B17-008-S1*	B17-008-S1-SHALLOW*	B17-008-S2*	B17-008-S2-SHALLOW*	B17-008-S3*	B17-008-S3-SHALLOW*	B17-008-S4*	B17-008-S4-SHALLOW*
			6/2/2020	6/3/2020	6/2/2020	6/3/2020	6/2/2020	6/3/2020	6/2/2020	6/3/2020
PAHs^										
2-Methylnaphthalene	mg/kg	3,000	**0.18**	**0.21**	**0.63**	**0.32**	**0.14**	**0.022**	**0.16**	**0.02**
Acenaphthene	mg/kg	45,000	0.076 U	**0.13**	0.08 U	**0.1**	0.0076 U	0.0078 U	**0.011**	0.0071 U
Acenaphthylene	mg/kg	45,000	**0.055 J**	**0.31**	**0.087**	**0.12**	**0.0042 J**	**0.038**	**0.017**	**0.0096**
Anthracene	mg/kg	230,000	**0.067 J**	**0.88**	**0.15**	**0.3**	**0.023**	**0.034**	**0.029**	**0.021**
Benz[a]anthracene	mg/kg	21	**0.19**	**1.2**	0.08 U	**0.59**	**0.078**	**0.017**	**0.16**	**0.012**
Benzo[a]pyrene	mg/kg	2.1	0.076 U	**0.91**	**1.3**	**0.5**	**0.055**	**0.14**	**0.14**	**0.1**
Benzo[b]fluoranthene	mg/kg	21	0.076 U	**3.4**	**1.1**	**1.1**	**0.15**	**0.31**	**0.22**	**0.084**
Benzo[g,h,i]perylene	mg/kg		0.076 U	**0.98**	0.08 U	**0.44**	**0.059**	**0.094**	**0.11**	**0.021**
Benzo[k]fluoranthene	mg/kg	210	0.076 U	**0.88**	**0.46**	**0.31**	**0.014**	**0.032 J**	**0.072**	**0.011 J**
Chrysene	mg/kg	2,100	**0.51**	**1.8**	**3.3**	**0.61**	**0.31**	**0.078**	**0.26**	**0.11**
Dibenz[a,h]anthracene	mg/kg	2.1	0.076 U	**0.31**	0.08 U	**0.14**	**0.045**	**0.027**	**0.038**	0.0071 U
Fluoranthene	mg/kg	30,000	**0.22**	**2.4**	**0.94**	**1.4**	**0.099**	**0.029**	**0.2**	**0.022**
Fluorene	mg/kg	30,000	0.076 U	**0.19**	0.08 U	**0.11**	**0.0093**	0.0078 U	0.008 U	0.0071 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	0.076 U	**1.1**	0.08 U	**0.53**	**0.042**	**0.13**	**0.11**	**0.023**
Naphthalene	mg/kg	8.6	**0.21**	**0.29**	**0.79**	**0.52**	**0.15**	**0.023**	**0.29**	**0.02**
Phenanthrene	mg/kg		**0.4**	**2.2**	**1.1**	**1.4**	**0.32**	**0.029**	**0.33**	**0.017**
Pyrene	mg/kg	23,000	**0.33**	**4.9**	**1**	**1.4**	**0.083**	**0.44**	**0.18**	**0.2**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
^PAH compounds were analyzed via SIM
*indicates non-validated data
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 2A - Project Huddell
Summary of Inorganics Detected in Soil (Phase II Samples)

Parameter	Units	PAL	B1-141-SB-1* 3/17/2016	B17-001-SB-1 9/21/2017	B17-002-SB-1 9/21/2017	B17-002-SB-5 9/21/2017	B17-004-SB-1 9/20/2017	B17-004-SB-4 9/20/2017	B17-005-SB-2 9/18/2017	B17-005-SB-4 9/18/2017	B17-006-SB-1.5 9/20/2017
Metals											
Aluminum	mg/kg	1,100,000	**29,000**	**16,700**	**25,800**	**17,400**	**14,600**	**22,600**	**17,500**	**9,290**	**15,000**
Antimony	mg/kg	470	2.9 U	2.6 UJ	2.4 UJ	2.8 UJ	2.5 UJ	**5.7 J**	**1.4 J**	**5.3 J**	2.4 UJ
Arsenic	mg/kg	3	**10.3**	**30.7**	**17.2**	**8.3**	2.1 U	**39.6**	**9.9**	**14.9**	**8.8**
Barium	mg/kg	220,000	**300**	**226 J**	**432 J**	**228 J**	**79.1**	**681**	**204 J**	**303 J**	**151**
Beryllium	mg/kg	2,300	**2.7**	**1.6**	**2.2**	**0.93**	0.85 U	**1.2**	**1.4**	**0.49 J**	**1.1**
Cadmium	mg/kg	980	**2.7**	**9.3**	**1.7**	**0.68 J**	**0.66 J**	**0.62 J**	1.3 U	1.4 U	1.2 U
Chromium	mg/kg	120,000	**136**	**181 J**	**75.6 J**	**314 J**	**894**	**698**	**69.6 J**	**29.5 J**	**32.4**
Chromium VI	mg/kg	6.3	1.1 U	0.58 B	0.44 B	0.65 B	**3.5 J-**	0.49 B	0.55 B	0.74 B	0.64 B
Cobalt	mg/kg	350	**10.7**	**180**	**11.2**	**15.4**	**3 J**	**8.2**	**18.4**	**28.7**	**8.6**
Copper	mg/kg	47,000	**91**	**290**	**110**	**62.4**	**46 J**	**281 J**	**109 J**	**203 J**	**142 J**
Iron	mg/kg	820,000	**63,300**	**246,000**	**93,000**	**40,700**	**249,000**	**139,000**	**146,000**	**248,000**	**80,900**
Lead	mg/kg	800	**148**	**387 J**	**140 J**	**74.2 J**	**7.5**	**468**	**34.4 J**	**23.7 J**	**46.4**
Manganese	mg/kg	26,000	**2,940**	**6,050**	**7,580**	**14,700**	**20,800**	**25,800**	**4,860**	**6,740**	**3,900**
Mercury	mg/kg	350	**0.0045 J**	**4.9**	**0.053 J**	**0.031 J**	**0.0065 J**	**0.0084 J**	**0.008 J**	**0.016 J**	**0.078 J**
Nickel	mg/kg	22,000	**34.8**	**94.1**	**22.4**	**96.9**	**23.6 J**	**12.6 J**	**32.6**	**19.9**	**11.6 J**
Selenium	mg/kg	5,800	**2.9 J**	**6.2**	2.2 B	3.7 U	3.4 U	3.4 U	**2 J**	**3.4 J**	**2.3 J**
Silver	mg/kg	5,800	2.9 U	**12.4**	**17.9**	**7.3**	**19.9**	**24.3**	**12.9 J**	**11 J**	**11.1**
Vanadium	mg/kg	5,800	**81.2**	**449**	**201**	**49.1**	**465**	**153**	**65.8 J**	**99.3 J**	**55.8**
Zinc	mg/kg	350,000	**523**	**1,610 J**	**331 J**	**145 J**	**165**	**221**	**117 J**	**147 J**	**90.2**
Other											
Cyanide	mg/kg	150	**3.9**	**1.4 J-**	**0.44 J-**	**1.7 J-**	1.1 UJ	**0.88 J-**	**0.21 J-**	**0.34 J-**	**1 J-**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data
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 actual quantitation/detection limit may be higher than reported.
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.
B: This analyte was not detected substantially above the level of the associated method or field blank.

Table 2A - Project Huddell
Summary of Inorganics Detected in Soil (Phase II Samples)

Parameter	Units	PAL	B17-006-SB-4 9/20/2017	B17-007-SB-1* 9/19/2017	B17-009-SB-1.5 9/20/2017	B17-009-SB-4 9/20/2017	B17-010-SB-2 9/21/2017	B17-010-SB-8 9/21/2017	B17-011-SB-1.5 9/18/2017
Metals									
Aluminum	mg/kg	1,100,000	**15,600**	**25,500**	**14,500**	**38,500**	**53,700**	**4,770**	**14,200**
Antimony	mg/kg	470	2.8 UJ	2.6 U	**5.3 J**	**34.2 J**	2.8 UJ	2.9 UJ	2.6 UJ
Arsenic	mg/kg	3	**12.8**	2.2 U	**27.7**	2.2 U	**4.8**	**20**	**13.7**
Barium	mg/kg	220,000	**148**	**66.5**	**159**	**304**	**609 J**	**103 J**	**215 J**
Beryllium	mg/kg	2,300	**1.3**	0.86 U	**1.5**	**2.1**	**2.5**	**0.71 J**	**0.93**
Cadmium	mg/kg	980	**0.73 J**	**0.63 J**	**0.67 J**	**0.69 J**	**0.9 J**	**1.2 J**	**1.1 J**
Chromium	mg/kg	120,000	**16**	**1,070**	**1,430**	**11,200**	**388 J**	**13.9 J**	**29.1 J**
Chromium VI	mg/kg	6.3	0.61 B	**2.6**	3.5 B	0.89 B	0.7 B	0.56 B	0.57 B
Cobalt	mg/kg	350	**10.1**	**2 J**	**13.6**	**15.5**	**14.3**	**6.1**	**4.7**
Copper	mg/kg	47,000	**116 J**	**33.2**	**82.9 J**	**99.9 J**	**72.2**	**72**	**83.4 J**
Iron	mg/kg	820,000	**65,500**	**198,000**	**30,100**	**119,000**	**27,500**	**11,100**	**40,500**
Lead	mg/kg	800	**95.4**	**12.7**	**145**	**44.1**	**135 J**	**372 J**	**559 J**
Manganese	mg/kg	26,000	**6,140**	**25,400**	**11,400**	**36,900**	**4,630**	**123**	**7,490**
Mercury	mg/kg	350	**0.019 J**	**0.0044 J**	**0.13**	**0.005 J**	**0.06 J**	**0.06 J**	**0.015 J**
Nickel	mg/kg	22,000	**11.9 J**	**15.9**	**67.5 J**	**43.6 J**	**94.8**	**19.3**	**10.5**
Selenium	mg/kg	5,800	3.7 U	3.4 U	3.6 U	3.5 U	**4.7**	3.9 U	3.5 U
Silver	mg/kg	5,800	**8.6**	**20.4**	**15.7**	**84**	**25.6**	**2.7 J**	**12.7 J**
Vanadium	mg/kg	5,800	**32.5**	**522**	**80.8**	**417**	**42.9**	**19.1**	**107 J**
Zinc	mg/kg	350,000	**425**	**133**	**249**	**139**	**174 J**	**217 J**	**743 J**
Other									
Cyanide	mg/kg	150	**1 J-**	**0.13 J**	**3.2 J-**	**0.68 J-**	**7 J-**	1.3 UJ	**0.27 J-**

Detections in bold
Values in red indicate an exceedance of the Project
N/A indicates that the parameter was not analyzed for t
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U: This analyte was not detected in the sample. The nu
UJ: This analyte was not detected in the sample. The ac
J: The positive result reported for this analyte is a quan
J-: The positive result reported for this analyte is a quar
B: This analyte was not detected substantially above th

Table 2A - Project Huddell
Summary of Inorganics Detected in Soil (Phase II Samples)

Parameter	Units	PAL	B17-011-SB-5 9/18/2017	B17-012-SB-1.5 9/20/2017	B17-012-SB-4 9/20/2017	B17-013-SB-1.5 9/20/2017	B17-013-SB-4 9/20/2017	B17-014-SB-1.5 9/18/2017	B17-014-SB-5 9/18/2017	B17-017-SB-1.5 9/18/2017	B17-017-SB-6 9/18/2017
Metals											
Aluminum	mg/kg	1,100,000	**4,900**	**15,500**	**14,800**	**27,900**	**14,900**	**3,570**	**3,790**	**13,900**	**15,800**
Antimony	mg/kg	470	2.7 UJ	2.6 UJ	2.6 UJ	2.6 UJ	**1.6 J**	**5.5 J**	**30 J**	**1.2 J**	2.7 UJ
Arsenic	mg/kg	3	**12.8**	**18.3**	**38.6**	**4.3**	**5.7**	**38**	**204**	**21.1**	**5.2**
Barium	mg/kg	220,000	**60.3 J**	**217**	**399**	**613**	**62.2**	**175 J**	**382 J**	**138 J**	**176 J**
Beryllium	mg/kg	2,300	**0.45 J**	**1.1**	**1.4**	**2.2**	**0.59 J**	**0.36 J**	**0.56 J**	**1.6**	**1.6**
Cadmium	mg/kg	980	1.4 U	**5.2**	**11.8**	**1.5**	**4**	**1 J**	**4**	**0.76 J**	**0.76 J**
Chromium	mg/kg	120,000	**9.9 J**	**50.5**	**18**	**93.9**	**28.4**	**6.1 J**	**7.9 J**	**15.1 J**	**146 J**
Chromium VI	mg/kg	6.3	0.63 B	0.55 B	0.56 B	0.6 B	0.95 B	0.74 B	0.73 B	0.53 B	0.84 B
Cobalt	mg/kg	350	**5.2**	**11**	**11.9**	**19.4**	**5.4**	**10.1**	**35.1**	**15**	**5.4**
Copper	mg/kg	47,000	**50.6 J**	**199 J**	**251 J**	**84.5 J**	**18.6 J**	**169 J**	**708 J**	**159 J**	**66.9 J**
Iron	mg/kg	820,000	**17,600**	**105,000**	**153,000**	**27,200**	**25,500**	**83,500**	**375,000**	**86,500**	**66,200**
Lead	mg/kg	800	**55.6 J**	**1,580**	**4,010**	**472**	**22.3**	**1,360 J**	**9,720 J**	**344 J**	**172 J**
Manganese	mg/kg	26,000	**159**	**11,600**	**7,970**	**4,280**	**413**	**1,170**	**3,270**	**2,670**	**4,820**
Mercury	mg/kg	350	**0.04 J**	**0.036 J**	**0.039 J**	**0.062 J**	**0.046 J**	**0.3**	**0.0076 J**	**0.0049 J**	**0.024 J**
Nickel	mg/kg	22,000	**12.8**	**32.1 J**	**14.7 J**	**28.7 J**	**16.5 J**	**11.7**	**19.4**	**14.3**	**9.4**
Selenium	mg/kg	5,800	3.6 U	3.5 U	**2.6 J**	**1.8 J**	3.7 U	**2.4 J**	**3.1 J**	**2.3 J**	3.6 U
Silver	mg/kg	5,800	**2.7 J**	**17.8**	**15.3**	**19.7**	**3.5**	**2.9 J**	**7.9 J**	**6.4 J**	**7.7 J**
Vanadium	mg/kg	5,800	**12.9 J**	**114**	**70.3**	**99.3**	**29.2**	**14 J**	**43.4 J**	**23.8 J**	**79.1 J**
Zinc	mg/kg	350,000	**64.2 J**	**2,040**	**7,040**	**210**	**461**	**580 J**	**6,300 J**	**540 J**	**486 J**
Other											
Cyanide	mg/kg	150	1.1 UJ	**0.8 J-**	**1.3 J-**	**1.8 J-**	**0.33 J-**	**0.54 J-**	1.1 UJ	**0.96 J-**	**1.4 J-**

Detections in bold
Values in red indicate an exceedance of the Project A
N/A indicates that the parameter was not analyzed for t
*indicates non-validated data
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UJ: This analyte was not detected in the sample. The ac
J: The positive result reported for this analyte is a quant
J-: The positive result reported for this analyte is a quar
B: This analyte was not detected substantially above th

Table 2A - Project Huddell
Summary of Inorganics Detected in Soil (Phase II Samples)

Parameter	Units	PAL	B17-018-SB-1.5* 9/19/2017	B17-018-SB-4* 9/19/2017	B17-019-SB-4* 9/19/2017	B17-020-SB-1.5* 9/19/2017	B17-020-SB-4* 9/19/2017	B17-021-SB-1.5 9/21/2017	B17-021-SB-5 9/21/2017
Metals									
Aluminum	mg/kg	1,100,000	**42,000**	**45,000**	**5,790**	**32,400**	**20,800**	**15,200**	**5,040**
Antimony	mg/kg	470	2.5 U	2.8 U	**12.1**	**2.4 J**	**1.2 J**	2.5 UJ	2.5 UJ
Arsenic	mg/kg	3	**4.6**	2.3 U	**218**	**11.3**	**12.3**	2 U	**13**
Barium	mg/kg	220,000	**578**	**600**	**968**	**569**	**435**	**137 J**	**130 J**
Beryllium	mg/kg	2,300	**2.8**	**2.6**	**0.56 J**	**1.8**	**1.8**	**0.71 J**	**0.5 J**
Cadmium	mg/kg	980	1.3 U	1.4 U	**4.1**	**2.4**	**1.5**	**3.9**	**1.4**
Chromium	mg/kg	120,000	**11.3**	**2.8**	**6.2**	**669**	**80.7**	**3,310 J**	**36.3 J**
Chromium VI	mg/kg	6.3	0.65 B	0.62 B	0.72 B	0.67 B	0.59 B	0.62 B	0.57 B
Cobalt	mg/kg	350	**4 J**	**2.1 J**	**26.8**	**38.7**	**8.2**	**73.1**	**12.3**
Copper	mg/kg	47,000	**56.3**	**38.1**	**786**	**487**	**189**	**162**	**197**
Iron	mg/kg	820,000	**46,600**	**10,400**	**327,000**	**105,000**	**60,100**	**85,700**	**59,600**
Lead	mg/kg	800	**31.6**	2.3 U	**6,780**	**580**	**614**	**188 J**	**274 J**
Manganese	mg/kg	26,000	**4,280**	**3,350**	**4,360**	**3,910**	**9,380**	**12,200**	**2,920**
Mercury	mg/kg	350	**0.032 J**	0.11 U	**0.012 J**	**0.056 J**	**0.28**	**0.025 J**	**0.62**
Nickel	mg/kg	22,000	**7.6 J**	**4.5 J**	**21**	**337**	**12**	**491**	**25.3**
Selenium	mg/kg	5,800	**4.4**	**8.2**	3.8 U	2.3 B	3.6 U	3.3 U	1.7 B
Silver	mg/kg	5,800	**11**	**11.6**	**2.3 J**	**9.9**	**10.6**	**20.6**	**4.3**
Vanadium	mg/kg	5,800	**20.6**	**13.8**	**30.1**	**41.5**	**48.9**	**149**	**30**
Zinc	mg/kg	350,000	**33.8**	**69.1**	**2,170**	**839**	**762**	**358 J**	**359 J**
Other									
Cyanide	mg/kg	150	**0.55 J**	**0.14 J**	**0.24 J**	**0.43 J**	**1.9**	**0.43 J-**	**0.93 J-**

Detections in bold
Values in red indicate an exceedance of the Project A
N/A indicates that the parameter was not analyzed for t
*indicates non-validated data
U: This analyte was not detected in the sample. The nu
UJ: This analyte was not detected in the sample. The ac
J: The positive result reported for this analyte is a quan
J-: The positive result reported for this analyte is a quar
B: This analyte was not detected substantially above th

Table 2B - Project Huddell
Summary of Inorganics Detected in Soil (Delineation Samples)

Parameter	Units	PAL	B17-014-SB-2	B17-014-SB-5	B17-014-SB-9	B17-014A-SB-1	B17-014A-SB-5	B17-014A-SB-8.5	B17-014B-SB-1	B17-014B-SB-5
			5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018
Metals										
Arsenic	mg/kg	3	**6**	**3.7**	**63.7**	**112**	**94**	**170**	**26.1**	**142**
Lead	mg/kg	800	**363**	**111**	**1,180**	**4,230**	**3,430**	**7,600**	**198**	**3,920**

Parameter	Units	PAL	B17-014B-SB-8	B17-014C-SB-1	B17-014C-SB-5	B17-014C-SB-9	B17-014D-SB-1	B17-014D-SB-5	B17-014D-SB-9	B17-014E-SB-2
			5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018	6/12/2018
Metals										
Arsenic	mg/kg	3	**44.3**	**3.1**	**74.8**	**140**	**2.5**	**8.6**	**5.1**	**9.6**
Lead	mg/kg	800	**1,070**	**29**	**2,740**	**8,810**	**59.6**	**275**	**123**	**482**

Parameter	Units	PAL	B17-014E-SB-5	B17-014E-SB-9.5	B17-014F-SB-2.5	B17-014F-SB-5	B17-014F-SB-7	B17-014G-SB-1	B17-014G-SB-5	B17-014G-SB-7.5
			6/12/2018	6/12/2018	6/12/2018	6/12/2018	6/12/2018	6/12/2018	6/12/2018	6/12/2018
Metals										
Arsenic	mg/kg	3	**23.2**	**16.6**	**7.8**	**16.1**	**31.2**	2.1 U	**68.6**	**12.7**
Lead	mg/kg	800	**1,300**	**1,740**	**34.3**	**358**	**342**	**56.5**	**1,120**	**248**

Parameter	Units	PAL	B17-014H-SB-1	B17-014H-SB-5	B17-014H-SB-8.5	B17-014I-SB-1	B17-014I-SB-5	B17-014I-SB-9.5	B17-014J-SB-1	B17-014J-SB-5
			6/12/2018	6/12/2018	6/12/2018	6/12/2018	6/12/2018	6/12/2018	6/12/2018	6/12/2018
Metals										
Arsenic	mg/kg	3	**7.9**	**23.4**	**14**	**4.5**	**44**	**28.3**	**6.1**	**2.9**
Lead	mg/kg	800	**284**	**1,160**	**102**	**144**	**480**	**676**	**257**	**26.9**

Parameter	Units	PAL	B17-014J-SB-9	B17-014K-SB-1	B17-014K-SB-5	B17-019-SB-1.5	B17-019-SB-4	B17-019-SB-5	B17-019-SB-8	B17-019A-SB-1
			6/12/2018	6/12/2018	6/12/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018
Metals										
Arsenic	mg/kg	3	**14**	**5.1**	**10.8**	**76.3**	**57.9**	**3.9**	**52.1**	**12.6**
Lead	mg/kg	800	**191**	**1,750**	**491**	**217**	**1,370**	**5.9**	**650**	**277**

Parameter	Units	PAL	B17-019A-SB-5	B17-019A-SB-8.5	B17-019B-SB-1	B17-019B-SB-5	B17-019B-SB-9	B17-019C-SB-1	B17-019C-SB-5	B17-019C-SB-8
			5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018	5/4/2018
Metals										
Arsenic	mg/kg	3	**7.4**	**59.6**	**25.9**	**62**	**20**	**38.7**	**9.9**	**89.3**
Lead	mg/kg	800	**189**	**47.4**	**370**	**1,050**	**371**	**2,980**	**33.5**	**2,510**

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

Table 2B - Project Huddell
Summary of Inorganics Detected in Soil (Delineation Samples)

Parameter	Units	PAL	B17-019D-SB-1	B17-019D-SB-5	B17-019D-SB-9	B17-019E-SB-1.5	B17-019E-SB-5	B17-019E-SB-8.5	B17-019F-SB-2	B17-019F-SB-5
			5/4/2018	5/4/2018	5/4/2018	6/12/2018	6/12/2018	6/12/2018	6/12/2018	6/12/2018
Metals										
Arsenic	mg/kg	3	**37.5**	**189**	**82.4**	**2.9**	**13.1**	**42.3**	**12.5**	**46.2**
Lead	mg/kg	800	**1,230**	**10,400**	**2,440**	**38.8**	**372**	**301**	**254**	**24.9**

Parameter	Units	PAL	B17-019F-SB-7.5	B17-019G-SB-2	B17-019G-SB-5	B17-019G-SB-7.5	B17-019H-SB-2	B17-019H-SB-5	B17-019H-SB-9	B17-019I-SB-2
			6/12/2018	6/12/2018	6/12/2018	6/12/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018
Metals										
Arsenic	mg/kg	3	**217**	**28.8**	**6.8**	**18.9**	**12.7**	**44.6**	**750**	**10.4**
Lead	mg/kg	800	**4,070**	**1,460**	**69.2**	**3,090**	**373**	**1,520**	**77.5**	**181**

Parameter	Units	PAL	B17-019I-SB-5	B17-019I-SB-9	B17-019J-SB-2	B17-019J-SB-5	B17-019J-SB-7.5	B17-019K-SB-2	B17-019K-SB-5	B17-019K-SB-7.5
			6/29/2018	6/29/2018	7/16/2018	7/16/2018	7/16/2018	7/16/2018	7/16/2018	7/16/2018
Metals										
Arsenic	mg/kg	3	**27.2**	**14.4**	**68.1**	**79.2**	**27.8**	**4.2**	**21.4**	**65.2**
Lead	mg/kg	800	**759**	**105**	**1,210**	**3,800**	**263**	**180**	**22.1**	**94.8**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
*indicates non-validated data

Table 2C - Project Huddell
Summary of Inorganics Detected in Soil (Confirmation Samples)

Parameter	Units	PAL	B17-014-S1* 6/2/2020	B17-014-S2* 6/2/2020	B17-014-S3* 6/2/2020	B17-014-S4* 6/2/2020	B17-014-B5* 6/2/2020	B17-019-S1* 6/2/2020	B17-019-S2* 6/2/2020	B17-019-S3* 6/2/2020	B17-019-S4* 6/2/2020	B17-019-B5* 6/2/2020
Metals												
Arsenic	mg/kg	3	**10.6**	**11.7**	2.1 U	**25**	**125**	**10.6**	**12.1**	**21.2**	**54.5**	**51.8**
Lead	mg/kg	800	**628**	**416**	**321**	**1,170**	**6,990**	**246**	**519**	**1,200**	**948**	**1,270**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
*indicates non-validated data

Table 3 - Project Huddell
Summary of Organics Detected in Groundwater

Parameter	Units	PAL	B17-009-PZ 10/11/2017	B17-014-PZ* 10/10/2017	B17-015-PZ* 10/10/2017	B17-016-PZ* 10/10/2017	B17-019-PZ 10/11/2017	B17-020-PZ 10/11/2017	SW-024-MWS 2/10/2016	SW-025-MWS 2/11/2016	SW-026-MWS 3/30/2016	SW07-PZM004 12/11/2015	SW07-PZM108 12/9/2015
Volatile Organic Compounds													
Acetone	µg/L	14,000	10 UJ	**4.8 J**	**3.8 J**	**3.8 J**	8 B	5.5 B	10 R	10 R	10 R	10 UJ	10 R
Isopropylbenzene	µg/L	450	1 U	1 U	1 U	1 U	1 U	1 U	1 U	**0.29 J**	1 U	1 U	1 U
Toluene	µg/L	1,000	1 U	1 U	1 U	1 U	1 U	1 U	**0.34 J**	1 U	1 U	1 U	1 U
1,4-Dioxane	µg/L	0.46	0.1 U	0.1 U	0.1 U	**0.03 J**	**0.032 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Semi-Volatile Organic Compounds^													
2-Methylnaphthalene	µg/L	36	**0.06 J**	0.1 U	0.1 U	0.1 U	0.098 U	0.1 U	**0.084 J**	0.1 U	**0.97**	0.1 U	0.1 U
Acenaphthene	µg/L	530	**0.056 J**	0.1 U	0.1 U	0.1 U	0.098 U	0.1 U	0.1 U	0.1 U	**0.12**	0.1 U	0.1 U
Acenaphthylene	µg/L	530	**0.077 J**	0.1 U	**0.04 J**	**0.037 J**	0.098 U	0.1 U	**0.041 J**	0.1 U	**0.02 J**	0.1 U	0.1 U
Acetophenone	µg/L	1,900	1 U	1 U	1 U	1 U	0.98 U	1 U	**0.36 J**	1 U	1 U	1 U	1 U
Anthracene	µg/L	1,800	**0.084 J**	0.1 U	**0.085 J**	**0.18**	0.098 U	0.1 U	**0.028 J**	**0.02 J**	**0.15**	0.1 U	**0.014 J**
Benz[a]anthracene	µg/L	0.03	0.1 U	0.1 U	**0.19**	**0.45**	0.098 U	0.1 U	0.1 U	**0.046 J**	**0.043 J**	0.1 U	**0.072 J**
Benzo[a]pyrene	µg/L	0.2	0.1 U	0.1 U	**0.21**	**0.37**	0.098 U	0.1 U	0.1 U	**0.046 J**	0.1 U	0.1 U	**0.068 J**
Benzo[b]fluoranthene	µg/L	0.25	0.1 U	0.1 U	**0.38**	**0.8**	0.098 U	0.1 U	0.1 U	**0.17**	0.1 U	0.1 U	**0.085 J**
Benzo[g,h,i]perylene	µg/L		0.1 U	0.1 U	**0.18**	**0.27**	0.098 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.062 J**
Benzo[k]fluoranthene	µg/L	2.5	0.1 U	0.1 U	**0.36**	**0.76**	0.098 U	0.1 U	0.1 U	**0.12**	0.1 U	0.1 U	**0.047 J**
bis(2-Ethylhexyl)phthalate	µg/L	6	1 U	1 U	1 U	1 U	0.98 U	1 U	1 U	1 U	**0.21 J**	1 U	1 U
Chrysene	µg/L	25	0.1 U	0.1 U	**0.19**	**0.5**	0.098 U	0.1 U	0.1 U	0.041 B	**0.021 J**	0.1 U	**0.055 J**
Dibenz[a,h]anthracene	µg/L	0.025	0.1 U	0.1 U	**0.048 J**	**0.097 J**	0.098 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	µg/L	800	**0.075 J**	0.1 U	**0.31**	**0.88**	**0.07 J**	0.1 U	**0.039 J**	**0.032 J**	**0.051 J**	0.1 U	**0.11**
Fluorene	µg/L	290	**0.11**	0.1 U	0.1 U	0.1 U	0.098 U	0.1 U	**0.018 J**	0.1 U	**0.2**	0.1 U	0.1 U
Indeno[1,2,3-c,d]pyrene	µg/L	0.25	0.1 U	0.1 U	**0.15**	**0.25**	0.098 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.051 J**
Naphthalene	µg/L	0.12	**0.27**	0.1 U	0.1 U	**0.11**	0.098 U	0.1 U	**0.5**	0.025 B	**0.36**	0.045 B	0.042 B
Phenanthrene	µg/L		**0.23**	0.1 U	**0.11**	**0.59**	0.098 U	0.1 U	0.1 U	**0.034 J**	**0.7**	0.1 U	**0.074 J**
Pyrene	µg/L	120	0.1 U	0.1 U	**0.29**	**0.66**	**0.065 J**	0.1 U	**0.063 J**	**0.025 J**	**0.09 J**	0.1 U	**0.11**
TPH													
Diesel Range Organics	µg/L	47	77.1 B	84.4 B	**148**	**159**	**238 J**	75.5 B	**130 J**	102 UJ	**530 J**	101 UJ	**80.9 J**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
^PAH compounds were analyzed via SIM
*indicates non-validated data

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 actual quantitation/detection limit may be higher than reported.
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 or field blank.
R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this analyte in the sample.

Table 4 - Project Huddell
Summary of Inorganics Detected in Groundwater

Parameter	Units	PAL	B17-009-PZ 10/11/2017	B17-014-PZ* 10/10/2017	B17-015-PZ* 10/10/2017	B17-016-PZ* 10/10/2017	B17-019-PZ 10/11/2017	B17-020-PZ 10/11/2017	SW-024-MWS 2/10/2016	SW-025-MWS 2/11/2016	SW-026-MWS 3/30/2016	SW07-PZM004 12/11/2015	SW07-PZM108 12/9/2015
Total Metals													
Aluminum	µg/L	20,000	N/A	N/A	N/A	N/A	N/A	N/A	**182**	**125**	**726**	49.2 B	**1,290**
Arsenic	µg/L	10	N/A	N/A	N/A	N/A	N/A	N/A	4 B	5 U	5 U	5 U	5 U
Barium	µg/L	2,000	N/A	N/A	N/A	N/A	N/A	N/A	**39**	**69.4**	**54.9**	**31.5**	**58.5**
Cadmium	µg/L	5	N/A	N/A	N/A	N/A	N/A	N/A	3 U	3 U	3 U	**0.5 J**	3 U
Chromium	µg/L	100	N/A	N/A	N/A	N/A	N/A	N/A	3.8 B	1.1 B	**1.1 J**	5 U	**9.3**
Cobalt	µg/L	6	N/A	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	1.3 B	1.9 B
Copper	µg/L	1,300	N/A	N/A	N/A	N/A	N/A	N/A	5 U	3.9 B	5 U	2.2 B	**29.9**
Iron	µg/L	14,000	N/A	N/A	N/A	N/A	N/A	N/A	**727**	**765**	65.4 B	**3,150**	**5,610**
Lead	µg/L	15	N/A	N/A	N/A	N/A	N/A	N/A	5 U	**14**	5 U	5 U	**35.7**
Manganese	µg/L	430	N/A	N/A	N/A	N/A	N/A	N/A	**264**	**1,360**	**11.2**	**619 J**	**399**
Mercury	µg/L	2	N/A	N/A	N/A	N/A	N/A	N/A	0.2 U	0.2 U	0.2 U	0.2 U	0.06 B
Nickel	µg/L	390	N/A	N/A	N/A	N/A	N/A	N/A	10 U	0.8 B	10 U	10 U	7 B
Selenium	µg/L	50	N/A	N/A	N/A	N/A	N/A	N/A	3.6 B	8 U	4 B	8 U	8 U
Vanadium	µg/L	86	N/A	N/A	N/A	N/A	N/A	N/A	**8.5**	5 U	5 U	0.65 B	4.2 B
Zinc	µg/L	6,000	N/A	N/A	N/A	N/A	N/A	N/A	1.4 B	**19.2**	**1.5 J**	2.2 B	**52.4**
Dissovled Metals													
Aluminum, Dissolved	µg/L	20,000	50 U	**21.1 J**	50 U	50 U	**34.6 J**	**27.2 J**	**149**	**21.5 J**	**582**	50 U	50 U
Arsenic, Dissolved	µg/L	10	5 U	**6.8**	5 U	**2.9 J**	5 U	5 U	4 B	5 U	5 U	5 U	5 U
Barium, Dissolved	µg/L	2,000	**23.3**	**58.9**	**79.9**	**76.9**	**111**	**112**	**34.5**	**69.3**	**52.2**	**28.4**	**20.2**
Chromium VI, Dissolved	µg/L	0.035	8.5 B	7.4 B	8.5 B	7.4 B	9.6 B	8.5 B	N/A	N/A	N/A	N/A	N/A
Chromium, Dissolved	µg/L	100	5 U	5 U	5 U	5 U	5 U	5 U	1.6 B	5 U	1 B	0.9 B	3.1 B
Cobalt, Dissolved	µg/L	6	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.5 B	5 U
Copper, Dissolved	µg/L	1,300	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.8 B
Iron, Dissolved	µg/L	14,000	**12.7 J**	**311**	**284**	**643**	**516**	**153**	**249**	**263**	**21.3 J**	**1,150**	34.6 B
Manganese, Dissolved	µg/L	430	**309**	**389**	**627**	**682**	**514**	**448**	**245**	**1,320**	1.4 B	**600 J**	**13.1 J**
Nickel, Dissolved	µg/L	390	10 U	10 U	10 U	10 U	10 U	10 U	0.8 B	0.7 B	0.78 B	10 U	10 U
Vanadium, Dissolved	µg/L	86	**0.78 J**	**0.64 J**	5 U	5 U	5 U	5 U	**7.7**	5 U	5 U	5 U	1 B
Zinc, Dissolved	µg/L	6,000	10 U	**1.6 J**	**2.5 J**	**2.9 J**	1.1 B	10 U	1.2 B	**1.5 J**	10 U	10 U	10 U
Other													
Available Cyanide	µg/L	200	**0.92 J**	**2.4**	2 U	**0.57 J**	**1.6 J**	**1.9 J**	N/A	N/A	N/A	N/A	N/A
Cyanide	µg/L	200	10 U	**3.5 J**	10 U	10 U	**6.6 J+**	**4.9 J+**	**296**	10 U	10 U	10 U	10 U

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the 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 reported for this analyte is a quantitative estimate.
J+: The positive result reported for this analyte is a quantitative estimate, but may be biased high.
B: This analyte was not detected substantially above the level of the associated method or field blank.

Table 5 - Project Huddell
Cumulative Vapor Intrusion Comparison

				B17-009-PZ 10/11/2017		B17-014-PZ 10/10/2017		B17-015-PZ 10/10/2017		B17-016-PZ 10/10/2017		B17-019-PZ 10/11/2017		B17-020-PZ 10/11/2017	
Parameter	Type	Organ Systems	VI Screening Criteria	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard
Cancer Risk															
1,4-Dioxane	SVOC		130,000	0.1 U	0	0.1 U	0	0.1 U	0	0.03 J	2.3E-12	0.032 J	2.5E-12	0.1 U	0
Naphthalene	SVOC		200	0.27	1.4E-08	0.1 U	0	0.1 U	0	0.11	5.5E-09	0.098 U	0	0.1 U	0
Cumulative Vapor Intrusion Risk =					1E-08		0		0		6E-09		2E-12		0
Non-Cancer Hazard															
Cyanide	Other	Reproductive	840	10 U	0	3.5 J	0.000004	10 U	0	10 U	0	6.6 J+	0.000008	4.9 J+	0.000006
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0		0		0		0		0

				SW-024-MWS 2/10/2016		SW-025-MWS 2/11/2016		SW-026-MWS 3/30/2016		SW07-PZM004 12/11/2015		SW07-PZM108 12/9/2015	
Parameter	Type	Organ Systems	VI Screening Criteria	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard
Cancer Risk													
1,4-Dioxane	SVOC		130,000	0.1 U	0	0.1 U	0	0.1 U	0	0.1 U	0	0.1 U	0
Naphthalene	SVOC		200	0.5	2.5E-08	0.025 B	0	0.36	1.8E-08	0.045 B	0	0.042 B	0
Cumulative Vapor Intrusion Risk =					3E-08		0		2E-08		0		0
Non-Cancer Hazard													
Cyanide	Other	Reproductive	840	296	0.4	10 U	0	10 U	0	10 U	0	10 U	0
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0		0		0		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.
B: This analyte was not detected substantially above the level of the associated method or field blank.
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 high.

Table 6 - Project Huddell
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	B17-021-SB-1.5	4.9		0.016	0.56	35	37.14	410	20	no
2,4-Dimethylphenol	105-67-9	B17-011-SB-5	0.02	J	0.02	0.02	32	3.13		1,600	no
2,4-Dinitrophenol	51-28-5	B17-006-SB-4	0.067	J	0.067	0.07	32	3.13		160	no
2-Butanone (MEK)	78-93-3	B17-021-SB-1.5	0.063		0.012	0.04	23	8.70		19,000	no
2-Chloronaphthalene	91-58-7	B17-011-SB-5	0.25		0.078	0.15	35	11.43		6,000	no
2-Hexanone	591-78-6	B17-021-SB-1.5	0.014		0.0021	0.008	23	8.70		130	no
2-Methylnaphthalene	91-57-6	B17-021-SB-1.5	14.5		0.0035	1.02	35	100.00		300	no
2-Methylphenol	95-48-7	B17-011-SB-5	0.026	J	0.026	0.03	32	3.13		4,100	no
4-Methyl-2-pentanone (MIBK)	108-10-1	B17-021-SB-1.5	0.0054	J	0.0054	0.005	23	4.35		14,000	no
Acenaphthene	83-32-9	B17-008-SB-1.5	11.4		0.0015	0.61	35	94.29		4,500	no
Acenaphthylene	208-96-8	B17-001-SB-1	4.4		0.00056	0.20	35	97.14			no
Acetone	67-64-1	B17-021-SB-1.5	0.26	J	0.023	0.09	23	60.87		67,000	no
Acetophenone	98-86-2	B17-011-SB-5	0.069	J	0.02	0.04	35	37.14		12,000	no
Aluminum	7429-90-5	B17-010-SB-2	53,700		3,570	18,393	35	100.00		110,000	no
Anthracene	120-12-7	B17-008-SB-1.5	29.7		0.00099	1.27	35	100.00		23,000	no
Antimony	7440-36-0	B17-009-SB-4	34.2	J	1.2	8.75	35	37.14		47	no
Aroclor 1254	11097-69-1	B17-020-SB-1.5	2.3		0.095	1.20	17	11.76	0.97	1.5	YES (C/NC)
Arsenic	7440-38-2	B17-019H-SB-9	750		2.5	43.3	112	93.75	3	48	YES (C/NC)
Barium	7440-39-3	B17-019-SB-4	968		60.3	318	35	100.00		22,000	no
Benz[a]anthracene	56-55-3	B17-020-SB-1.5	10.0		0.004	0.85	40	97.50	21		YES (C)
Benzaldehyde	100-52-7	B17-012-SB-4	0.13	J	0.017	0.05	26	57.69	820	12,000	no
Benzene	71-43-2	B17-005-SB-2	0.023		0.002	0.01	23	17.39	5.1	42	no
Benzo[a]pyrene	50-32-8	B17-020-SB-1.5	7.60		0.0034	0.69	40	97.14	2.1	22	YES (C/NC)
Benzo[b]fluoranthene	205-99-2	B17-020-SB-1.5	18.6		0.0091	1.65	40	97.50	21		YES (C)
Benzo[g,h,i]perylene	191-24-2	B17-008-SB-1.5	6.4		0.0014	0.51	40	100.00			no
Benzo[k]fluoranthene	207-08-9	B17-008-SB-1.5	47.4		0.0064	2.73	40	100.00	210		no
Beryllium	7440-41-7	B17-018-SB-1.5	2.8		0.25	1.31	35	94.29	6,900	230	no
bis(2-Ethylhexyl)phthalate	117-81-7	B17-018-SB-1.5	0.065	J	0.065	0.07	35	2.86	160	1,600	no
Cadmium	7440-43-9	B17-012-SB-4	11.8		0.62	2.50	35	82.86	9,300	98	no
Caprolactam	105-60-2	B17-009-SB-1.5	0.2		0.029	0.09	35	17.14		40,000	no

Table 6 - Project Huddell
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?
Carbazole	86-74-8	B17-008-SB-1.5	9.4		0.017	1.13	35	42.86			no
Carbon disulfide	75-15-0	B17-021-SB-1.5	0.042	J	0.004	0.02	23	26.09		350	no
Chromium	7440-47-3	B17-009-SB-4	11,200		2.8	608	35	100.00		180,000	no
Chromium VI	18540-29-9	B17-004-SB-1	3.5	J-	2.6	3.05	35	5.71	6.3	350	no
Chrysene	218-01-9	B17-008-SB-1.5	39.6		0.0077	2.20	35	100.00	2,100		no
Cobalt	7440-48-4	B17-001-SB-1	180		2	19.8	32	100.00	1,900	35	YES (NC)
Copper	7440-50-8	B17-019-SB-4	786		18.6	178	35	100.00		4,700	no
Cyanide	57-12-5	B17-010-SB-2	7	J-	0.13	1.21	35	80.00		120	no
Cyclohexane	110-82-7	B17-005-SB-2	0.0037	J	0.0037	0.004	23	4.35		2,700	no
Dibenz[a,h]anthracene	53-70-3	B17-001-SB-1	1.4		0.0016	0.28	40	85.00	2.1		YES (C)
Fluoranthene	206-44-0	B17-008-SB-1.5	108		0.012	5.97	35	100.00		3,000	no
Fluorene	86-73-7	B17-008-SB-1.5	12.1		0.00077	0.63	35	91.43		3,000	no
Hexachloroethane	67-72-1	B17-005-SB-2	0.027	J	0.019	0.02	35	5.71	8	46	no
Indeno[1,2,3-c,d]pyrene	193-39-5	B17-008-SB-1.5	8.4		0.0016	0.58	35	100.00	21		no
Iron	7439-89-6	B17-014-SB-5	375,000		10,400	107,234	32	100.00		82,000	YES (NC)
Lead^	7439-92-1	B17-014-SB-5	9,720	J	7.5	1,019	35	97.14		800	YES (NC)
Manganese	7439-96-5	B17-019-SB-2	36,900		123	8,194	32	100.00		2,600	YES (NC)
Mercury	7439-97-6	B17-001-SB-1	4.9		0.0044	0.21	35	97.14		35	no
Naphthalene	91-20-3	B17-021-SB-1.5	8.8		0.0051	1.01	40	97.50	8.6	59	YES (C)
Nickel	7440-02-0	B17-021-SB-1.5	491		4.5	49.4	35	100.00	64,000	2,200	no
N-Nitrosodiphenylamine	86-30-6	B17-010-SB-8	0.021	J	0.021	0.02	35	2.86	470		no
PCBs (total)*	1336-36-3	B17-020-SB-1.5	2.3		0.095	0.73	17	23.53	0.94		YES (C)
Phenanthrene	85-01-8	B17-008-SB-1.5	121		0.016	6.87	35	100.00			no
Phenol	108-95-2	B17-008-SB-1.5	0.74	J	0.045	0.42	33	9.09		25,000	no
Pyrene	129-00-0	B17-008-SB-1.5	80.4		0.0079	4.55	35	100.00		2,300	no
Selenium	7782-49-2	B17-018-SB-4	8.2		1.8	3.56	35	37.14		580	no
Silver	7440-22-4	B17-009-SB-4	84		2.3	13.8	35	97.14		580	no
Toluene	108-88-3	B17-017-SB-6	0.0036	J	0.0028	0.003	23	13.04		4,700	no
Vanadium	7440-62-2	B17-007-SB-1	522		12.9	108	35	100.00		580	no
Zinc	7440-66-6	B17-012-SB-4	7,040		33.8	888	35	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
TR = Target Risk
HQ = Hazard Quotient
C = Compound was identified as a cancer COPC
NC = Compound was identified as a non-cancer COPC

*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 - Project Huddell
Assessment of Lead

Exposure Unit	Surface/Sub-Surface	Maximum Concentration (mg/kg)	Arithmetic Mean (mg/kg)
Site-Wide EU1 (9.86 ac.)	Surface	2,980	507
	Sub-Surface	10,400	1,571
	Pooled	10,400	1,125

Table 8 - Project Huddell
Soil Exposure Point Concentrations

	Site-Wide EU1 (9.86 ac.)					
	EPCs - Surface Soils		**EPCs - Sub-Surface Soils**		**EPCs - Pooled Soils**	
Parameter	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)
Arsenic	95% GROS Adjusted Gamma UCL	21.1	KM H-UCL	82.6	KM H-UCL	51.0
Cobalt	95% Chebyshev (Mean, Sd) UCL	71.4	95% Student's-t UCL	17.5	95% H-UCL	27.3
Iron	95% Adjusted Gamma UCL	141,826	95% Adjusted Gamma UCL	204,296	95% Adjusted Gamma UCL	142,221
Manganese	95% Adjusted Gamma UCL	11,636	95% Adjusted Gamma UCL	17,516	95% Adjusted Gamma UCL	11,518
Total PCBs	Gamma Adjusted KM-UCL	0.87	N/A	N/A	Gamma Adjusted KM-UCL	0.87
Aroclor 1254	Maximum Detection	**2.30**	N/A	N/A	Maximum Detection	**2.30**
Benz[a]anthracene	95% Chebyshev (Mean, Sd) UCL	3.85	Gamma Adjusted KM-UCL	0.74	95% KM (Chebyshev) UCL	2.21
Benzo[a]pyrene	95% Chebyshev (Mean, Sd) UCL	2.92	Gamma Adjusted KM-UCL	0.63	95% KM (Chebyshev) UCL	1.71
Benzo[b]fluoranthene	95% Chebyshev (Mean, Sd) UCL	7.25	Gamma Adjusted KM-UCL	1.20	95% KM (Chebyshev) UCL	4.17
Dibenz[a,h]anthracene	95% KM (Chebyshev) UCL	0.52	Gamma Adjusted KM-UCL	0.12	KM H-UCL	0.31
Naphthalene	95% KM (Chebyshev) UCL	2.59	95% Adjusted Gamma UCL	0.30	95% KM (Chebyshev) UCL	1.45

Bold indicates maximum value used as the EPC
NA = No Detections

Table 9 - Project Huddell
Surface Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Site-Wide EU1 (9.86 ac.)				
			Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	**Cardiovascular; Dermal**	21.1	3.00	480	7.0E-06	0.04
Cobalt	**Thyroid**	71.4	1,900	350	3.8E-08	0.2
Iron	**Gastrointestinal**	141,826		820,000		0.2
Manganese	**Nervous**	11,636		26,000		0.4
PCBs (Total)		0.87	0.94		9.3E-07	
Aroclor 1254	**Dermal; Immune; Ocular**	**2.30**	NE	15.0		0.2
Benz[a]anthracene		3.85	21.0		1.8E-07	
Benzo(a)pyrene	**Developmental**	2.92	2.10	220	1.4E-06	0.01
Benzo[b]fluoranthene		7.25	21.0		3.5E-07	
Dibenz[a,h]anthracene		0.52	2.10		2.5E-07	
Naphthalene	**Nervous; Respiratory**	2.59	8.60	590	3.0E-07	0.004
					1E-05	↓

NE = Not Evaluated
Bold indicates maximum value used as the EPC
RSLs were obtained from the EPA Regional Screening Levels at
https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Ocular	0
	Developmental	0
	Respiratory	0

Table 10 - Project Huddell
Sub-Surface Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Site-Wide EU1 (9.86 ac.)				
			Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	**Cardiovascular; Dermal**	82.6	3.00	480	2.8E-05	0.2
Cobalt	**Thyroid**	17.5	1,900	350	9.2E-09	0.05
Iron	**Gastrointestinal**	204,296		820,000		0.2
Manganese	**Nervous**	17,516		26,000		0.7
PCBs (Total)		N/A	0.94		NA	
Aroclor 1254	**Dermal; Immune; Ocular**	N/A	NE	15.0		NA
Benz[a]anthracene		0.74	21.0		3.5E-08	
Benzo(a)pyrene	**Developmental**	0.63	2.10	220	3.0E-07	0.003
Benzo[b]fluoranthene		1.20	21.0		5.7E-08	
Dibenz[a,h]anthracene		0.12	2.10		5.7E-08	
Naphthalene	**Nervous; Respiratory**	0.30	8.60	590	3.5E-08	0.0005
					3E-05	↓

NE = Not Evaluated
NA = No Detections
RSLs were obtained from the EPA Regional Screening Levels at
https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Immune	NA
	Ocular	NA
	Developmental	0
	Respiratory	0

Table 11 - Project Huddell
Pooled Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Site-Wide EU1 (9.86 ac.)				
			Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	**Cardiovascular; Dermal**	51.0	3.00	480	1.7E-05	0.11
Cobalt	**Thyroid**	27.3	1,900	350	1.4E-08	0.08
Iron	**Gastrointestinal**	142,221		820,000		0.2
Manganese	**Nervous**	11,518		26,000		0.4
PCBs (Total)		0.87	0.94		9.3E-07	
Aroclor 1254	**Dermal; Immune; Ocular**	**2.30**	NE	15.0		0.2
Benz[a]anthracene		2.21	21.0		1.1E-07	
Benzo(a)pyrene	**Developmental**	1.71	2.10	220	8.1E-07	0.008
Benzo[b]fluoranthene		4.17	21.0		2.0E-07	
Dibenz[a,h]anthracene		0.31	2.10		1.5E-07	
Naphthalene	**Nervous; Respiratory**	1.45	8.60	590	1.7E-07	0.002
					2E-05	↓

NE = Not Evaluated
Bold indicates maximum value used as the EPC
RSLs were obtained from the EPA Regional Screening Levels at
https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Ocular	0
	Developmental	0
	Respiratory	0

Table 12 - Project Huddell
Surface Soils
Construction Worker Risk Ratios

80 Day		Site-Wide EU1 (9.86 ac.)				
			Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	**Cardiovascular; Dermal**	21.1	47.2	299	4.5E-07	0.07
Cobalt	**Thyroid**	71.4	8,397	2,803	8.5E-09	0.03
Iron	**Gastrointestinal**	141,826		751,692		0.2
Manganese	**Nervous**	11,636		11,841		1
PCBs (Total)		0.87	14.7		5.9E-08	
Aroclor 1254	**Dermal; Immune; Ocular**	**2.30**	NE	23.4		0.1
Benz[a]anthracene		3.85	456		8.4E-09	
Benzo(a)pyrene	**Developmental**	2.92	53.5	20.8	5.5E-08	0.1
Benzo[b]fluoranthene		7.25	532		1.4E-08	
Dibenz[a,h]anthracene		0.52	55.7		9.3E-09	
Naphthalene	**Nervous; Respiratory**	2.59	41.6	66.3	6.2E-08	0.04
					7E-07	↓

NE = Not Evaluated
Bold indicates maximum value used as the EPC
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

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Ocular	0
	Developmental	0
	Respiratory	0

Table 13 - Project Huddell
Sub-Surface Soils
Construction Worker Risk Ratios

80 Day		Site-Wide EU1 (9.86 ac.)				
			Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	**Cardiovascular; Dermal**	82.6	47.2	299	1.8E-06	0.3
Cobalt	**Thyroid**	17.5	8,397	2,803	2.1E-09	0.006
Iron	**Gastrointestinal**	204,296		751,692		0.3
Manganese	**Nervous**	17,516		11,841		1
PCBs (Total)		N/A	14.7		NA	
Aroclor 1254	**Dermal; Immune; Ocular**	N/A	NE	23.4		NA
Benz[a]anthracene		0.74	456		1.6E-09	
Benzo(a)pyrene	**Developmental**	0.63	53.5	20.8	1.2E-08	0.03
Benzo[b]fluoranthene		1.20	532		2.3E-09	
Dibenz[a,h]anthracene		0.12	55.7		2.2E-09	
Naphthalene	**Nervous; Respiratory**	0.30	41.6	66.3	7.2E-09	0.005
					2E-06	↓

NE = Not Evaluated
NA = No Detections
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

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Immune	NA
	Ocular	NA
	Developmental	0
	Respiratory	0

Table 14 - Project Huddell
Pooled Soils
Construction Worker Risk Ratios

80 Day		Site-Wide EU1 (9.86 ac.)				
			Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	**Cardiovascular; Dermal**	51.0	47.2	299	1.1E-06	0.2
Cobalt	**Thyroid**	27.3	8,397	2,803	3.3E-09	0.01
Iron	**Gastrointestinal**	142,221		751,692		0.2
Manganese	**Nervous**	11,518		11,841		1
PCBs (Total)		0.87	14.7		5.9E-08	
Aroclor 1254	**Dermal; Immune; Ocular**	**2.30**	NE	23.4		0.1
Benz[a]anthracene		2.21	456		4.8E-09	
Benzo(a)pyrene	**Developmental**	1.71	53.5	20.8	3.2E-08	0.08
Benzo[b]fluoranthene		4.17	532		7.8E-09	
Dibenz[a,h]anthracene		0.31	55.7		5.6E-09	
Naphthalene	**Nervous; Respiratory**	1.45	41.6	66.3	3.5E-08	0.02
					1E-06	↓

NE = Not Evaluated

Bold indicates maximum value used as the EPC

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

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Ocular	0
	Developmental	0
	Respiratory	0

APPENDIX A

TRADEPOINT
ATLANTIC
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

January 18, 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 B17-1

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 B17-1 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

TRADEPOINT
ATLANTIC
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

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 - Project Huddel

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/cm2)	AF	0.3
Skin surface exposed (cm2)	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/cm3)	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 - Project Huddel

Area of site (ac)	Ac	9.86
Overall duration of construction (wk/yr)	EW	16
Exposure frequency (day/yr)	EF	**80**
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/m2-s per kg/m3)	Q/Csr	**15.3**
Overall duration of construction (hr)	tc	**2,688**
Overall duration of traffic (s)	Tt	**2,304,000**
Surface area (m2)	AR	**39,902**
Length (m)	LR	**200**
Distance traveled (km)	ΣVKT	**160**
Particulate emission factor (m3/kg)	PEFsc	**78,876,066**
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	**8.43**
Total time of construction (s)	Tcv	**2,304,000**

Input
Calculation

Chemical	RfD & RfC Sources	^Ingestion SF ($(mg/kg\text{-}day)^{-1}$)	^Inhalation Unit Risk ($(ug/m^3)^{-1}$)	^Subchronic RfD (mg/kg-day)	^Subchronic RfC (mg/m^3)	^GIABS	Dermally Adjusted RfD (mg/kg-day)	^ABS	^RBA	*Dia	*Diw	*Henry's Law Constant (unitless)	*Kd	*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				47.4	17,575	47.2	304	16,194	299
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	0.01	1			-	4.50E+01					8,397	8,397	3,222	21,592	2,803
Iron	P	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							751,692		751,692
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							15,169	53,981	11,841
PCB Total	I	2.00E+00	5.71E-04	-	-	1		0.14	1	2.40E-02	6.30E-06	1.70E-02	4.68E+02	7.80E+04	4.66E-08	1.89E+4	27.3	31.8	14.7			
Aroclor 1254	A/I	2.00E+00	5.71E-04	3.00E-05	-	1	3.00E-05	0.14	1	2.40E-02	6.10E-06	1.16E-02	7.80E+02	1.30E+05	1.91E-08	2.95E+4	27.3	49.6	NE	23.4		23.4
Benz[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	1.58E+5	557	2,514	456			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	8.40E+5	55.7	1,327	53.5	239	22.8	20.8
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	7.57E+5	557	11,980	532			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	2.01E+6	55.7	125,955	55.7			
Naphthalene	C/I/A	1.20E-01	3.40E-05	2.00E-02	3.00E-03	1	2.00E-02	0.13	1	6.00E-02	8.40E-06	1.80E-02	9.00E+00	1.50E+03	6.35E-06	1.62E+3	464	45.7	41.6	15,915	66.6	66.3

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at https://www.epa.gov/risk/regional-screening-levels-rsls
^chemical 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://hhpprtv.ornl.gov/quickview/pprtv.php

NE = Not Evaluated. Aroclor 1254 was included for non-cancer hazard only. The carcinogenic risk is evaluated with total PCBs.

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.

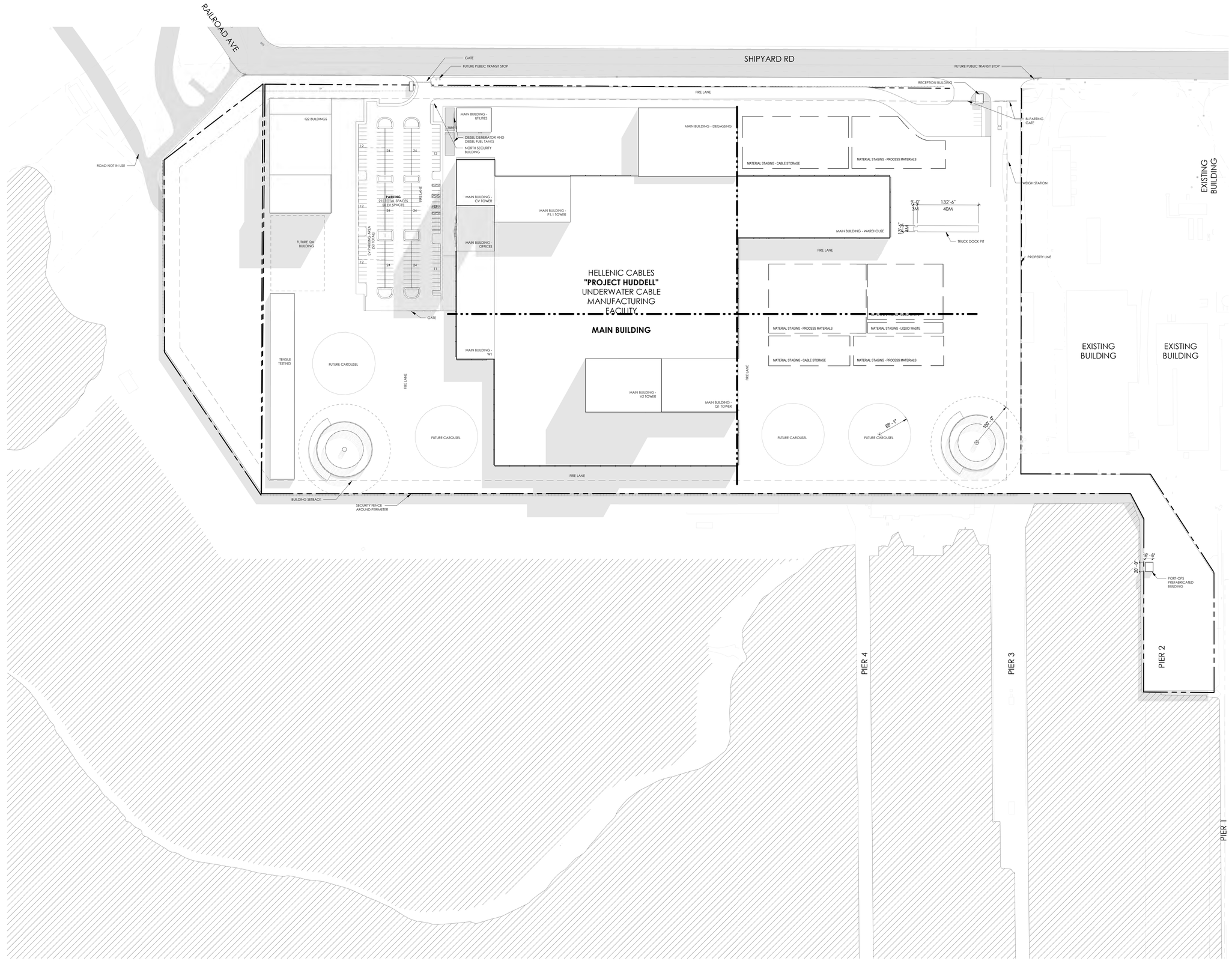
Work will not continue until EP has cleared the area. If hazardous waste is identified, a HAZWOPER contractor will be brought in to address. The approved contingency plan will be implemented, where appropriate.

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

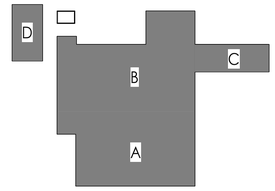
side shields, and hearing protection (as necessary). If chemical-protective over-boots create increased slip/trip/fall hazardous, then standard leather or rubber work boots could be used, but visible soils from the sides and bottoms of the boots must be removed upon exiting the Exclusion Zone.

APPENDIX D



1 AP-001 **SITE LAYOUT**
1" = 80'-0"

TRUE NORTH



KEY PLAN

Stantec

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650 Smithfield Street Suite 2500
Pittsburgh, 15222-3900
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Notes

Issued/Revision	By	Appd	YYYY.MM.DD
1 Rev A - Progress Review			2021.10.13

File Name: N/A	Author	Designer	Checker	08/27/21
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

PRELIMINARY NOT FOR CONSTRUCTION

Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

Client/Project Logo

Client/Project

PROJECT HUDDELL

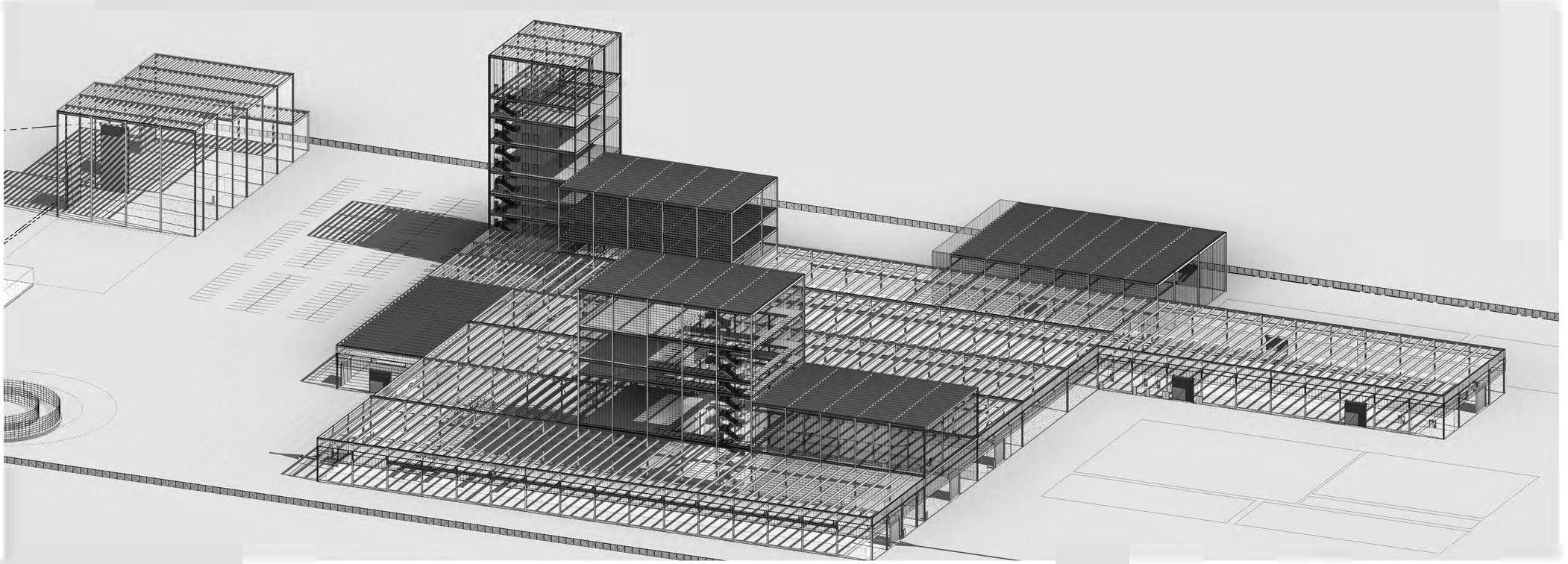
Title

SITE - HELLENIC PROVIDED LAYOUT

Project No.	Scale
191508204	1" = 80'-0"

Revision	Drawing No.
1	AP-001

ORIGINAL SHEET - ARCH E1



1 S-006 ISOMETRIC VIEW

NOTE: ISOMETRIC VIEW IS FOR GENERAL REFERENCE ONLY AND SHALL NOT BE USED FOR BIDDING, CONSTRUCTION, OR PERMITTING, ETC.

SHEET LIST

SHEET NUMBER	SHEET NAME
S-001	GENERAL NOTES & DESIGN DATA
S-002	COMPONENTS & CLADDING & DECK SCHEDULES
S-003	LOADING PLANS
S-004	SPECIAL INSPECTIONS
S-4XX	CANOPY FRAMING PLAN AND DETAILS
S-005	SPECIAL INSPECTIONS
S-006	ISOMETRIC VIEW
S-007	COLUMN SCHEDULE
S-008	BASE PLATE & COLUMN SPLICE DETAILS
S-101	LEVEL 1 - FOUNDATION OVERALL PLAN
S-101A	LEVEL 1-FOUNDATION PARTIAL PLAN A
S-101B	LEVEL 1-FOUNDATION PARTIAL PLAN B
S-101C	LEVEL 1-FOUNDATION PARTIAL PLAN C
S-102	LEVEL 1.5 - CRANE OVERALL LAYOUT
S-102A	LEVEL 1.5 - CRANE LEVEL PARTIAL PLAN A
S-102B	LEVEL 1.5 - CRANE LEVEL PARTIAL PLAN B
S-103	ROOF FRAMING PLAN OVERALL
S-103A	ROOF PARTIAL PLAN A
S-103B	ROOF PARTIAL PLAN B
S-103C	LEVEL 2 - ROOF PARTIAL PLAN C
S-201	BRACED FRAME ELEVATIONS
S-202	TYPICAL FRAME CONNECTION DETAILS
S-301	MEZZANINE SECTIONS
S-302	STRUCTURAL SECTIONS
S-401	Q2 BUILDINGS - ENLARGED FRAMING PLANS
S-402	CV TOWER - ENLARGED FRAMING PLANS
S-403	CV TOWER - ENLARGED FRAMING PLANS
S-404	Q1 TOWER - ENLARGED FRAMING PLAN
S-405	V2 TOWER - ENLARGED FRAMING PLAN
S-406	V2 & P1.1 TOWERS - ENLARGED FRAMING PLAN
S-501	TYPICAL PILE CAP DETAILS
S-502	FOUNDATION DETAILS
S-503	FOUNDATION DETAILS
S-504	TYPICAL FOUNDATION DETAILS
S-505	TYPICAL SLAB ON GRADE DETAILS
S-506	TYPICAL SLAB REPAIR DETAILS
S-507	TYPICAL COLUMN SHORING DETAILS
S-521	SLAB EDGE DETAILS
S-522	TYPICAL SLAB ON DECK DETAILS
S-523	TYPICAL STEEL DETAILS
S-524	TYPICAL CRANE FRAMING DETAILS
S-525	ROOF FRAMING DETAILS
S-526	TYPICAL ROOF DETAILS
S-527	TYPICAL JOIST PROFILES
S-601	GUARD HOUSE PLANS AND DETAILS
S-602	FIRE PUMP HOUSE PLANS AND DETAILS

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Issued/Revision	
1 REV A - PROGRESS REVIEW	2013/10/18
	YYYY.MM.DD

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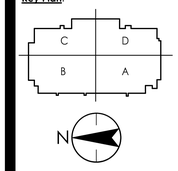


Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204

Scale:

DATE: 11/20/14

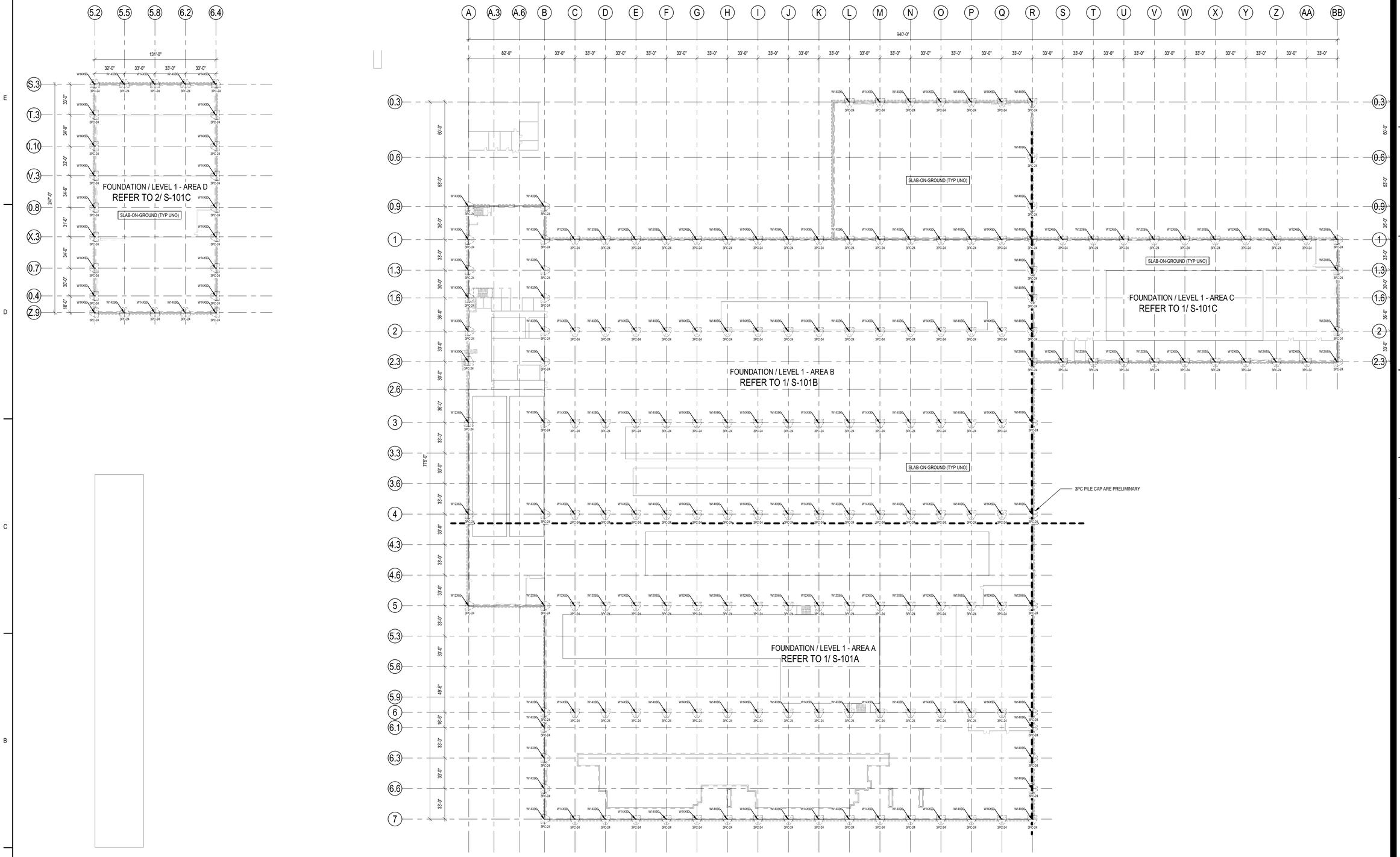
Title
ISOMETRIC VIEW

Revision: 1

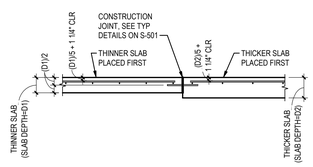
Drawing No.
S-006

10/13/2021 3:44:27 PM

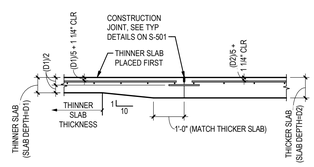
ORIGINAL SHEET - ARCH E1



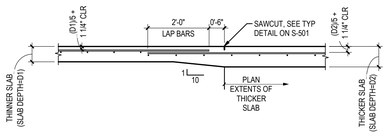
1 S-101 LEVEL 1-FOUNDATION OVERALL PLAN
1" = 40'-0"



2 S-101 WAREHOUSE SLAB THICKNESS CHANGE AT CONSTRUCTION JOINT TYPICAL DETAIL - THICKER SLAB PLACED FIRST
1/2" = 1'-0"



3 S-101 WAREHOUSE SLAB THICKNESS CHANGE AT CONSTRUCTION JOINT TYPICAL DETAIL - THINNER SLAB PLACED FIRST
1/2" = 1'-0"



4 S-101 WAREHOUSE SLAB THICKNESS CHANGE AT CONTRACTION JOINT TYPICAL DETAIL
1/2" = 1'-0"

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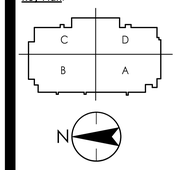
Issued/Revision	
1 REV A - PROCURES REVIEW	2011.10.13 YYYY.MM.DD

Permit/Seal

Key Plan:



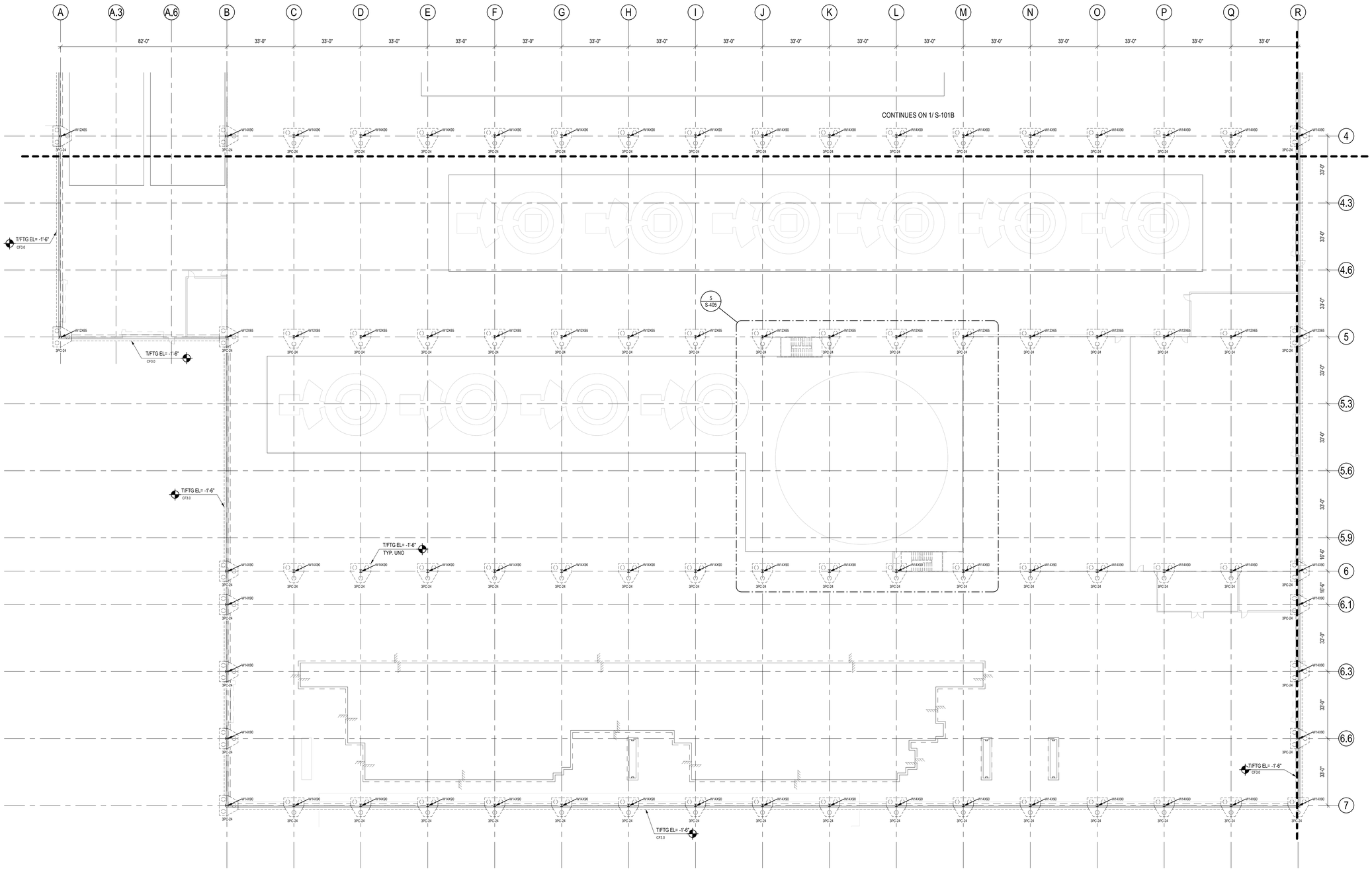
Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204
Scale: As indicated
DATE: 10/17/11

Title
LEVEL 1 - FOUNDATION OVERALL PLAN

Revision: 1
Drawing No.
S-101

ORIGINAL SHEET - ARCH E1



1 S-101A LEVEL 1-FOUNDATION PARTIAL PLAN A
1" = 20'-0"

FOUNDATION LEGEND:

	=	INDICATES 10" THICKENED SLAB @ PRE-ENG MEZZ. REINF W/ 16x16 - D14xD14 (OR #3 @ 15" C/C E.W.) WWF PREFERRED FOR EASE OF FINISHING
CJ	=	CONTRACTION JOINT
CFX.X	=	CONTINUOUS FOOTING, SEE SCHEDULE
FX.X	=	SPREAD FOOTING, SEE SCHEDULE

FOUNDATION NOTES:

1. SLAB ON GRADE SHALL BE A MINIMUM 7" THICK WITH #3 @ 16" C/C E.W. @ TOP 1/3 DEPTH, UNO.
2. MAX CONTRACTION JOINT SPACING SHALL BE 15'-0".
3. F.F.E = 0'-0" WHICH REFERS TO FFE ON CIVIL. REF CIVIL DRAWINGS. ELEVATIONS SHOWN HERE ARE RELATIVE TO 0'-0"
4. FOR TOP OF EXTERIOR FOUNDATIONS, SEE PLAN. TYP -1'-6".
5. TOP OF INTERIOR FOUNDATIONS SHALL BE -1'-6", TYP, UNO ON PLANS.
6. PROVIDE (2) #3 @ ALL RE-ENTRANT CORNERS, PLACED DIAGONALLY TO CORNER. SEE "TYPICAL SLAB RE-ENTRANT CORNER DETAIL".
7. SLAB SHALL BE PLACED ON 10 MIL VAPOR BARRIER OVER 6" COMPACTED GRANULAR BASE. REFER TO GEOTECHINCAL REPORT FOR COMPACTION REQUIRMENTS.
8. EXTERIOR WALLS SHALL BE INSULATED METAL PANEL. REF PANEL ELEVATIONS FOR REQUIRMENTS.
9. FOR ELEVATOR PIT WALL REINFORCING, SEE TYPICAL ELEVATOR PIT DETAIL.
10. CONTRACTOR SHALL COORDINATE SLAB SLOPES, FLOOR DRAINS, AND RECESSES WITH ARCHITECTURAL AND PLUMBING DRAWINGS.

FOUNDATION SCHEDULE

TYPE	WIDTH	LENGTH	COUNT	THICKNESS	REINFORCING (IMPERIAL)	REINFORCING (METRIC)
CF3.0	3'-0"		17	1'-0"	(4) #5 CONT & #5 @ 24" C/C S.W. - TOP & BOTT.	(4) #16 CONT & #16 @ 61 CM C/C S.W. - & BOTT.

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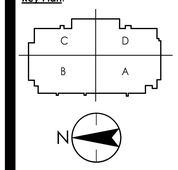
Issued/Revision		
1	REV A - PROGRESS REVIEW	2021.10.13 YYYY.MM.DD

Permit/Seal

Key Plan:



Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204

Scale: As indicated

DATE: 04/10/20

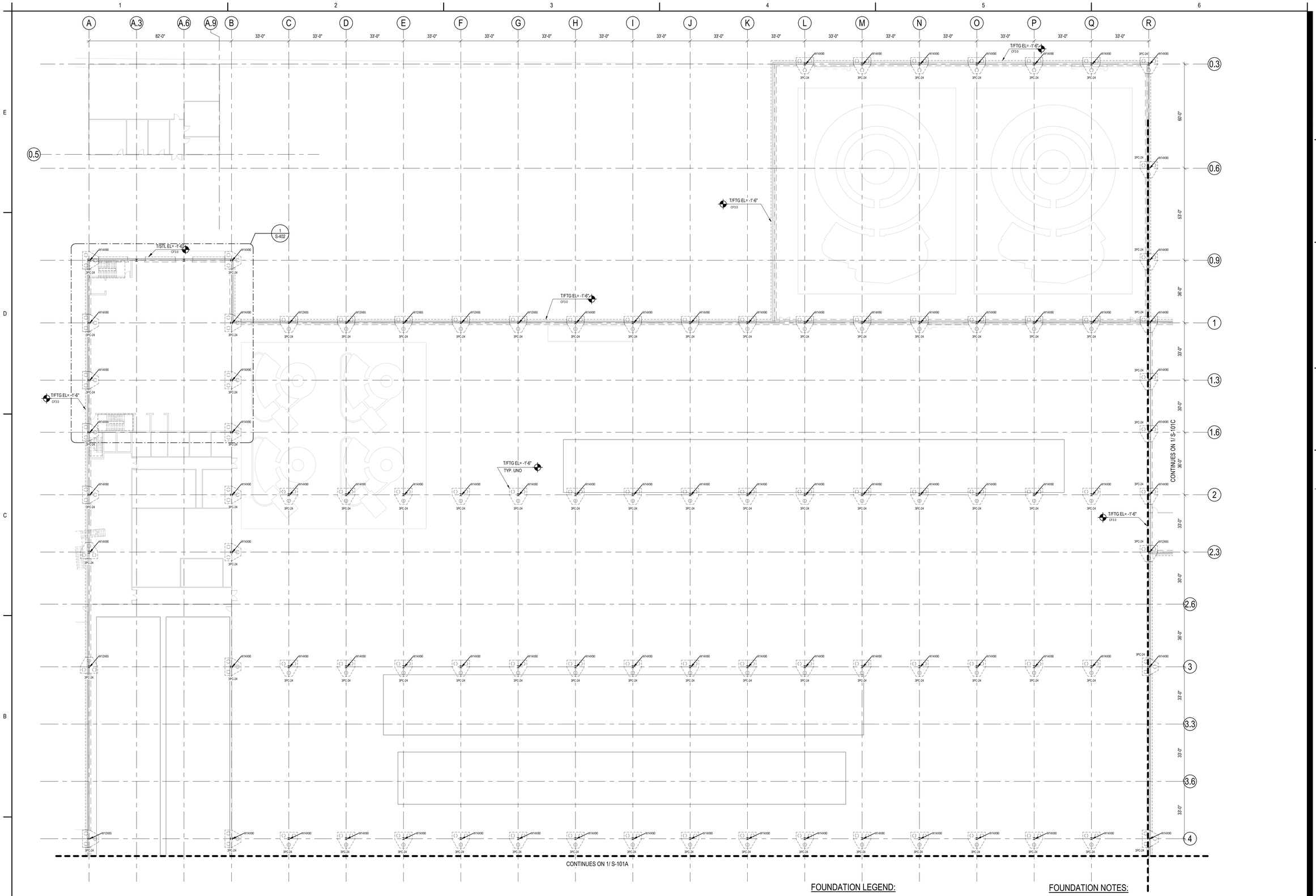
Title
LEVEL 1-FOUNDATION PARTIAL PLAN A

Revision: 1

Drawing No.
S-101A

10/13/2021 3:44:34 PM

ORIGINAL SHEET - ARCH E1



1 S-101B LEVEL 1-FOUNDATION PARTIAL PLAN B
1" = 20'-0"

FOUNDATION LEGEND:

	=	INDICATES 10" THICKENED SLAB @ PRE-ENG MEZZ. REINF W/ 16x16 - D14xD14 (OR #3 @ 15" C/C E.W.) WWF PREFERRED FOR EASE OF FINISHING
CJ	=	CONTRACTION JOINT
CFX.X	=	CONTINUOUS FOOTING, SEE SCHEDULE
FX.X	=	SPREAD FOOTING, SEE SCHEDULE

FOUNDATION NOTES:

1. SLAB ON GRADE SHALL BE A MINIMUM 7" THICK WITH #3 @ 16" C/C E.W. @ TOP 1/3 DEPTH, UNO.
2. MAX CONTRACTION JOINT SPACING SHALL BE 15'-0".
3. F.F.E = 0'-0" WHICH REFERS TO FFE ON CIVIL. REF CIVIL DRAWINGS. ELEVATIONS SHOWN HERE ARE RELATIVE TO 0'-0"
4. FOR TOP OF EXTERIOR FOUNDATIONS, SEE PLAN. TYP -1'-6".
5. TOP OF INTERIOR FOUNDATIONS SHALL BE -1'-6", TYP, UNO ON PLANS.
6. PROVIDE (2) #3 @ ALL RE-ENTRANT CORNERS, PLACED DIAGONALLY TO CORNER. SEE "TYPICAL SLAB RE-ENTRANT CORNER DETAIL".
7. SLAB SHALL BE PLACED ON 10 MIL VAPOR BARRIER OVER 6" COMPACTED GRANULAR BASE. REFER TO GEOTECHINCAL REPORT FOR COMPACTION REQUIRMENTS.
8. EXTERIOR WALLS SHALL BE INSULATED METAL PANEL. REF PANEL ELEVATIONS FOR REQUIRMENTS.
9. FOR ELEVATOR PIT WALL REINFORCING, SEE TYPICAL ELEVATOR PIT DETAIL.
10. CONTRACTOR SHALL COORDINATE SLAB SLOPES, FLOOR DRAINS, AND RECESSES WITH ARCHITECTURAL AND PLUMBING DRAWINGS.

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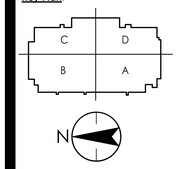
Issued/Revision	
1 REV A - PROGRESS REVIEW	2021.10.13 YYYY.MM.DD

Permit/Seal

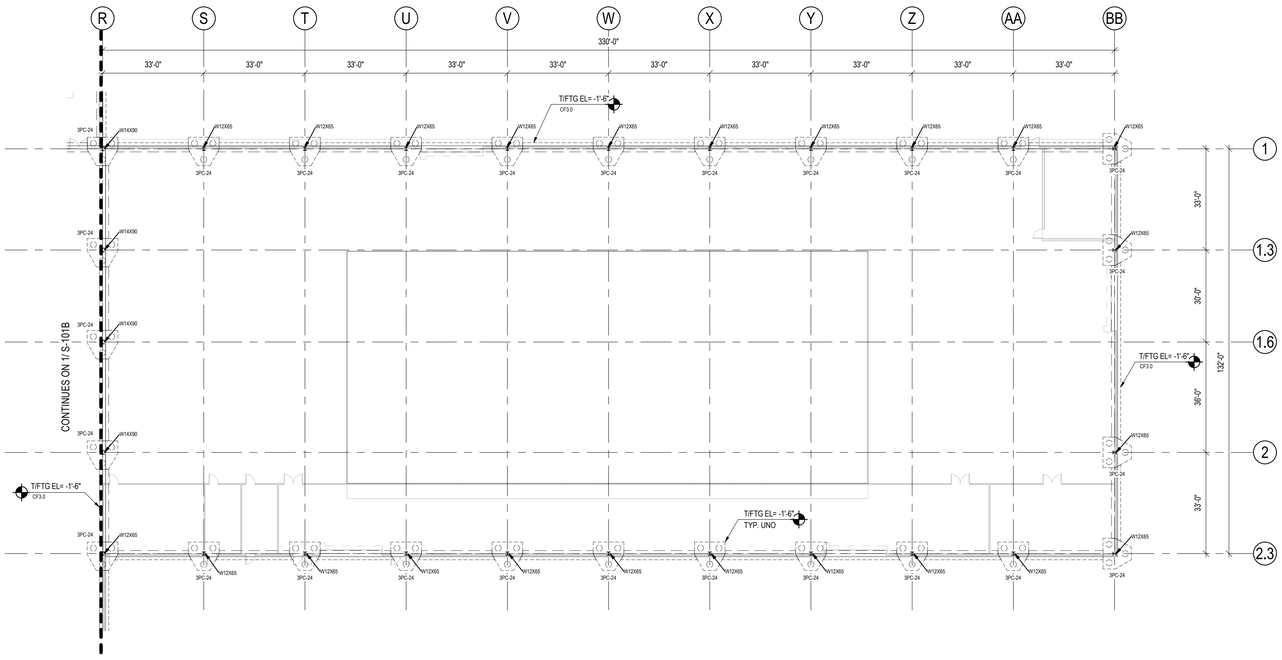
Key Plan:



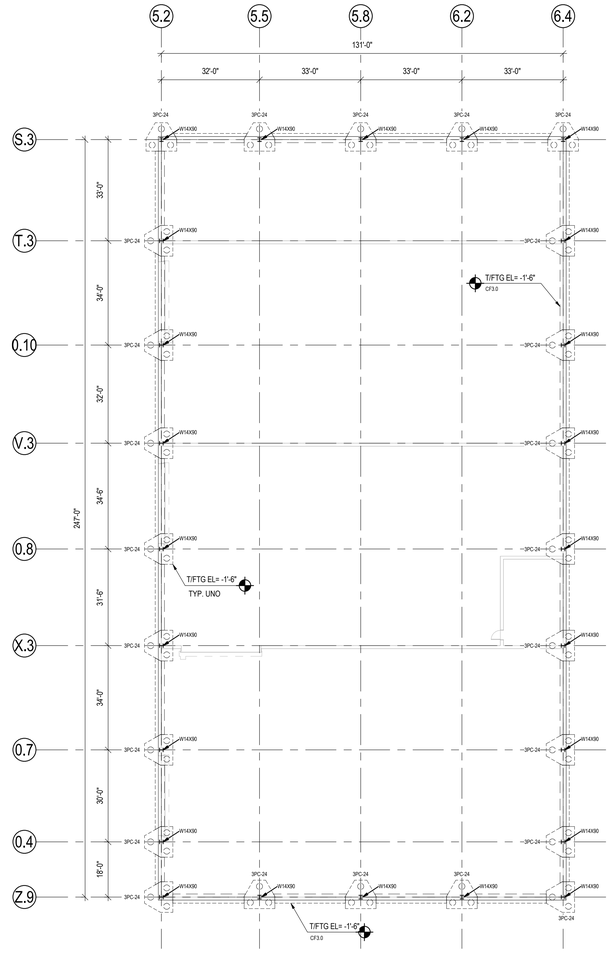
Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204
Scale: As indicated
DATE: 04/10/20
Title
LEVEL 1-FOUNDATION PARTIAL PLAN B
Revision: 1
Drawing No.
S-101B

10/13/2021 3:44:37 PM
ORIGINAL SHEET - ARCH E1



1 S-101C LEVEL 1-FOUNDATION PARTIAL PLAN P6
1" = 20'-0"



2 S-101C LEVEL 1-FOUNDATION PARTIAL PLAN AUXILIRAY BUILDING
1" = 20'-0"

FOUNDATION LEGEND:

	=	INDICATES 10" THICKENED SLAB @ PRE-ENG MEZZ. REINF W/ 16x16 - D14xD14 (OR #3 @ 15" C/C E.W.) WWF PREFERRED FOR EASE OF FINISHING
CJ	=	CONTRACTION JOINT
CFX.X	=	CONTINUOUS FOOTING, SEE SCHEDULE
FX.X	=	SPREAD FOOTING, SEE SCHEDULE

FOUNDATION NOTES:

1. SLAB ON GRADE SHALL BE A MINIMUM 7" THICK WITH #3 @ 16" C/C E.W. @ TOP 1/3 DEPTH, UNO.
2. MAX CONTRACTION JOINT SPACING SHALL BE 15'-0".
3. F.F.E = 0'-0" WHICH REFERS TO FFE ON CIVIL. REF CIVIL DRAWINGS. ELEVATIONS SHOWN HERE ARE RELATIVE TO 0'-0"
4. FOR TOP OF EXTERIOR FOUNDATIONS, SEE PLAN. TYP -1'-6".
5. TOP OF INTERIOR FOUNDATIONS SHALL BE -1'-6", TYP, UNO ON PLANS.
6. PROVIDE (2) #3 @ ALL RE-ENTRANT CORNERS, PLACED DIAGONALLY TO CORNER. SEE "TYPICAL SLAB RE-ENTRANT CORNER DETAIL".
7. SLAB SHALL BE PLACED ON 10 MIL VAPOR BARRIER OVER 6" COMPACTED GRANULAR BASE. REFER TO GEOTECHINCAL REPORT FOR COMPACTION REQUIRMENTS.
8. EXTERIOR WALLS SHALL BE INSULATED METAL PANEL. REF PANEL ELEVATIONS FOR REQUIRMENTS.
9. FOR ELEVATOR PIT WALL REINFORCING, SEE TYPICAL ELEVATOR PIT DETAIL.
10. CONTRACTOR SHALL COORDINATE SLAB SLOPES, FLOOR DRAINS, AND RECESSES WITH ARCHITECTURAL AND PLUMBING DRAWINGS.

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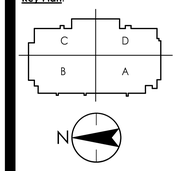
Issued/Revision	
1 REV A - PROGRESS REVIEW	2021.10.13 YYYY.MM.DD

Permit/Seal

Key Plan:



Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204

Scale: As indicated

DATE: 04/10/20

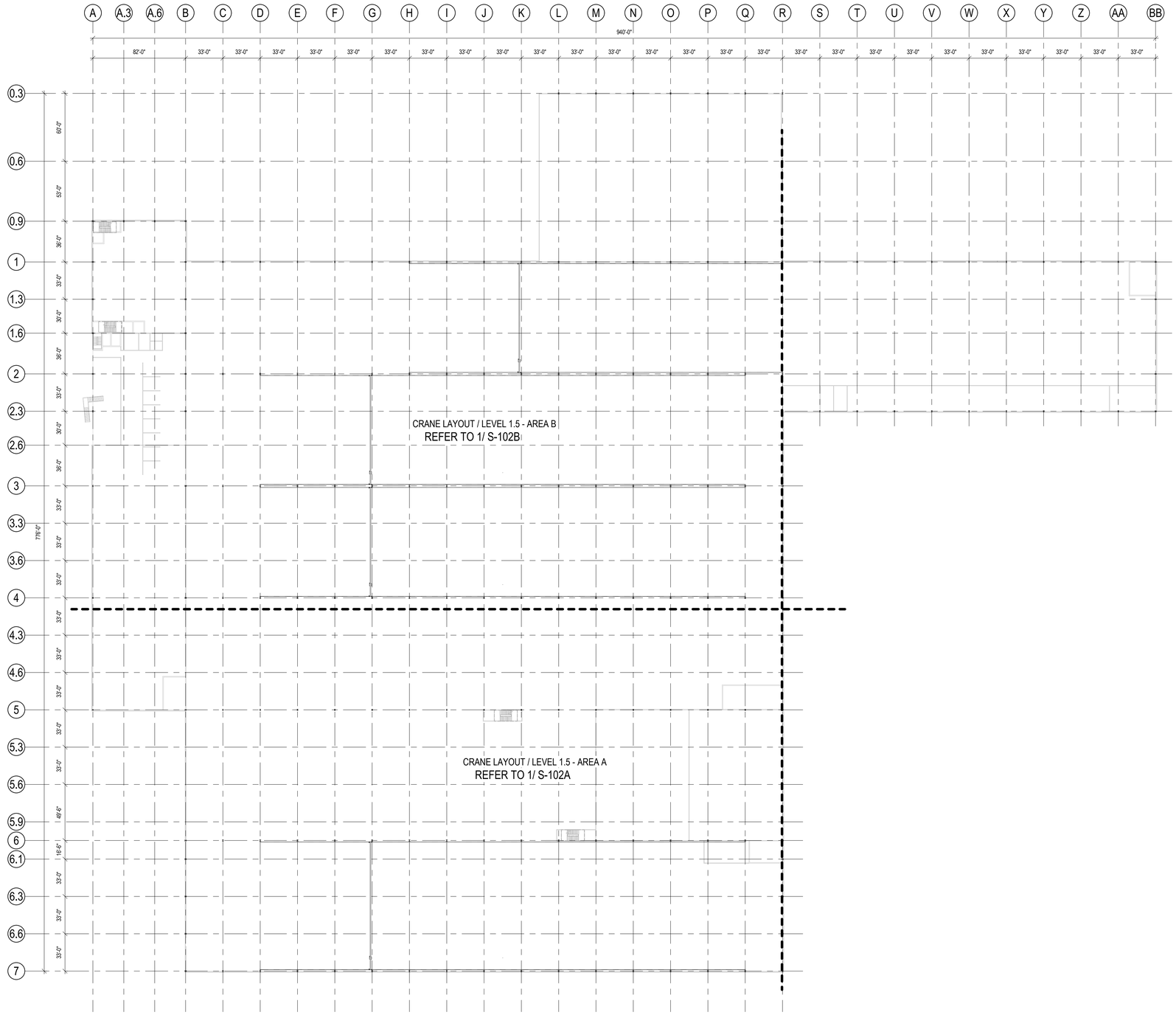
Title
LEVEL 1-FOUNDATION PARTIAL PLAN C

Revision: 1

Drawing No.
S-101C

10/13/2021 3:44:39 PM

ORIGINAL SHEET - ARCH E1



1 S-102 LEVEL 1.5-CRANE OVERALL LAYOUT
1" = 40'-0"

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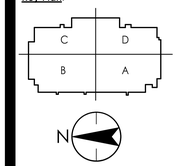
Issued/Revision		
1	REV A - PROGRESS REVIEW	2011.10.13
		YYYY.MM.DD

Permit/Seal

Key Plan:



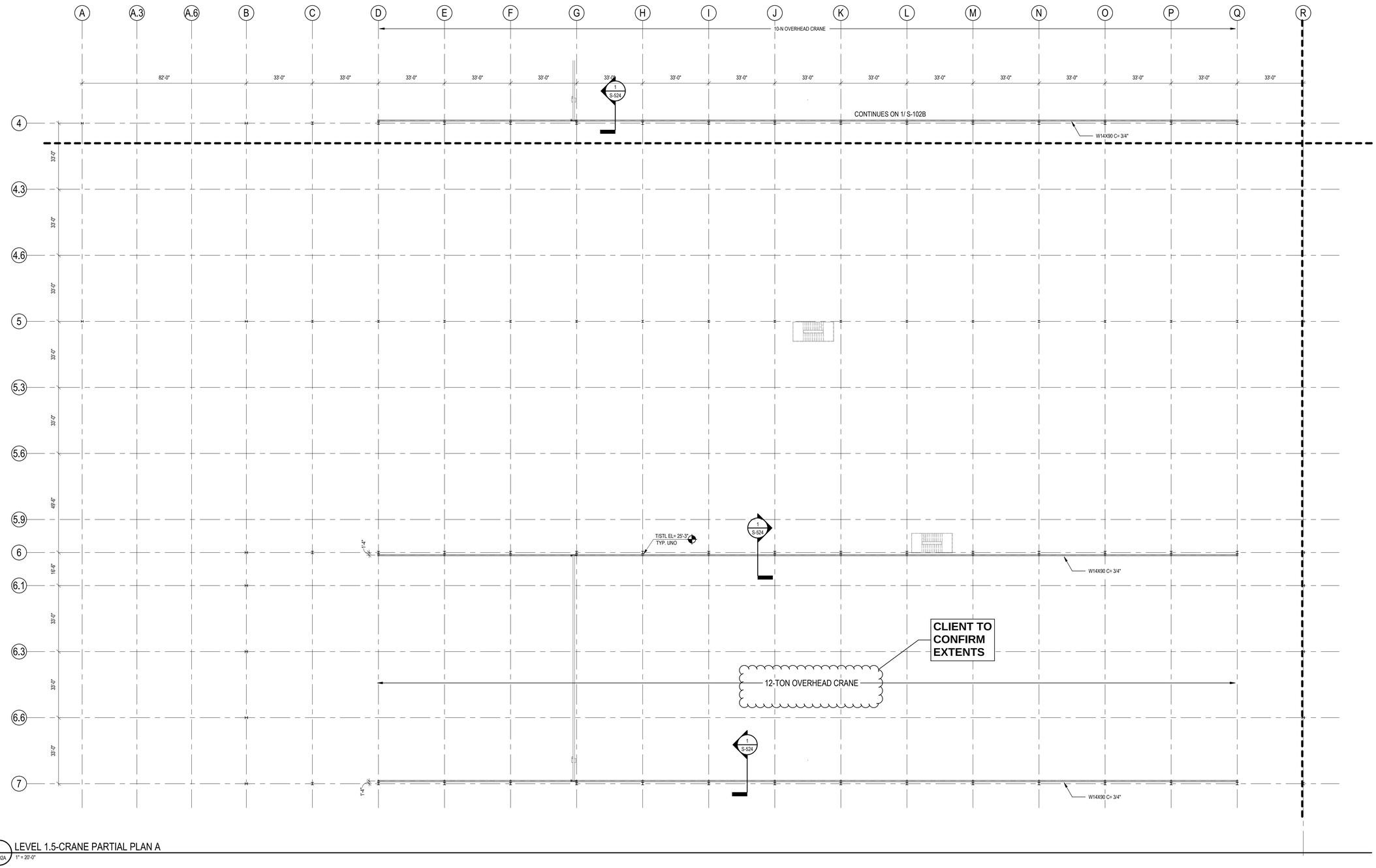
Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204
Scale: 1" = 40'-0"
DATE: 10/17/11

Title
LEVEL 1.5 - CRANE OVERALL LAYOUT

Revision:1
Drawing No.
S-102

10/13/2021 3:44:41 PM
ORIGINAL SHEET - ARCH E1



1 S-102A LEVEL 1.5-CRANE PARTIAL PLAN A
1" = 20'-0"

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No.	Issued/Revision	YYYY.MM.DD
1	REV 1 PROGRESS SET	2020.10.13

Permit/Seal

Key Plan:

Client/Project
GILBANE BUILDING COMPANY

PROJECT HUDDLE

BALTIMORE, MD

Project No.:191508204

Scale: 1" = 20'-0"

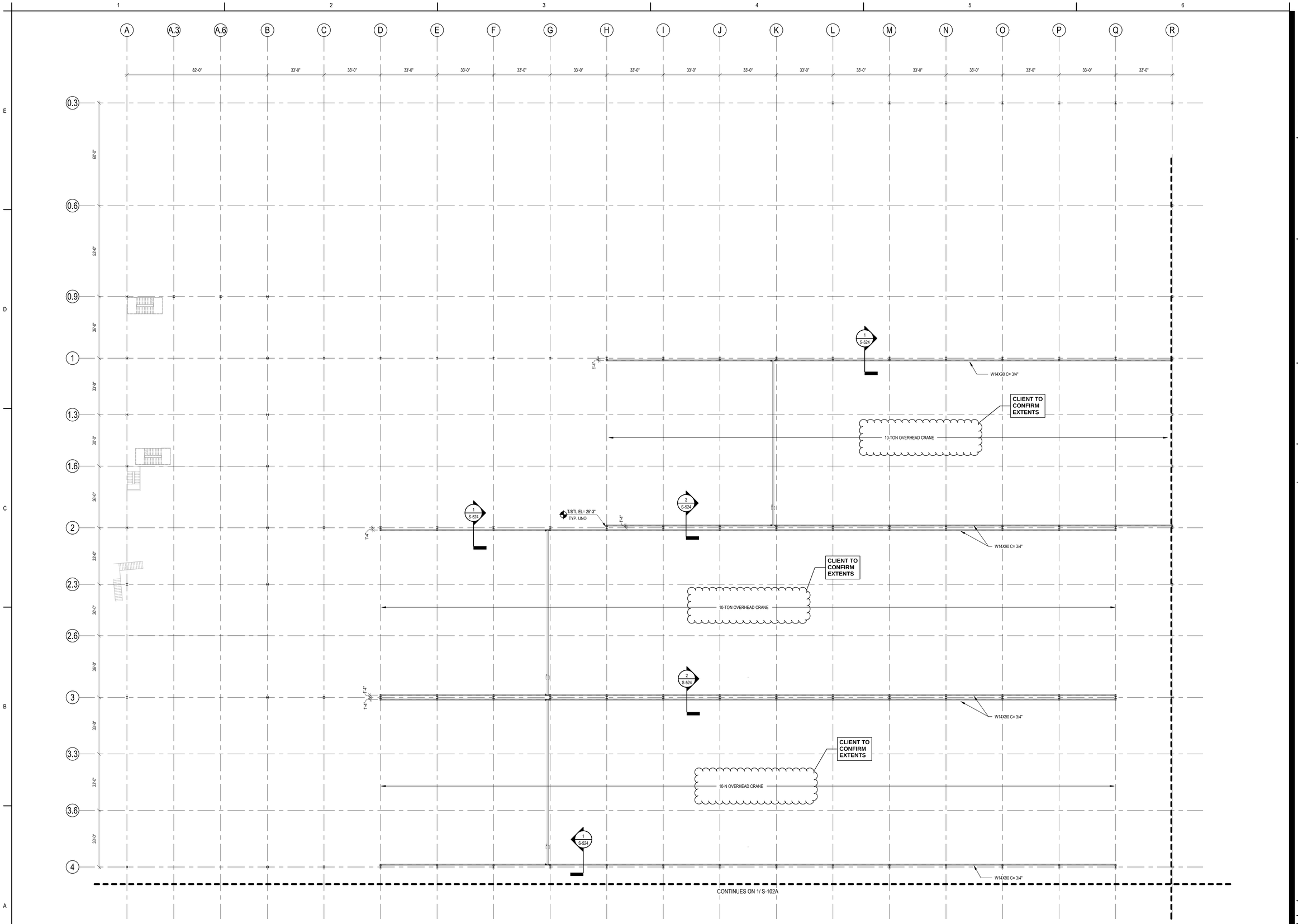
DATE: 04/10/20

Title
LEVEL 1.5 - CRANE
LEVEL PARTIAL PLAN A

Revision: 1

Drawing No.
S-102A

ORIGINAL SHEET - ARCH E1



1 S-102B LEVEL 1.5-CRANE PARTIAL PLAN B
1" = 20'-0"

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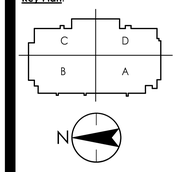
1	REV A - PROGRESS REVIEW
	2021.10.13
	YYYY.MM.DD

Issued/Revision

Permit/Seal

Key Plan:



Client/Project
GILBANE BUILDING COMPANY

PROJECT HUDDLE

BALTIMORE, MD

Project No.:191508204

Scale: 1" = 20'-0"

DATE: 04/10/20

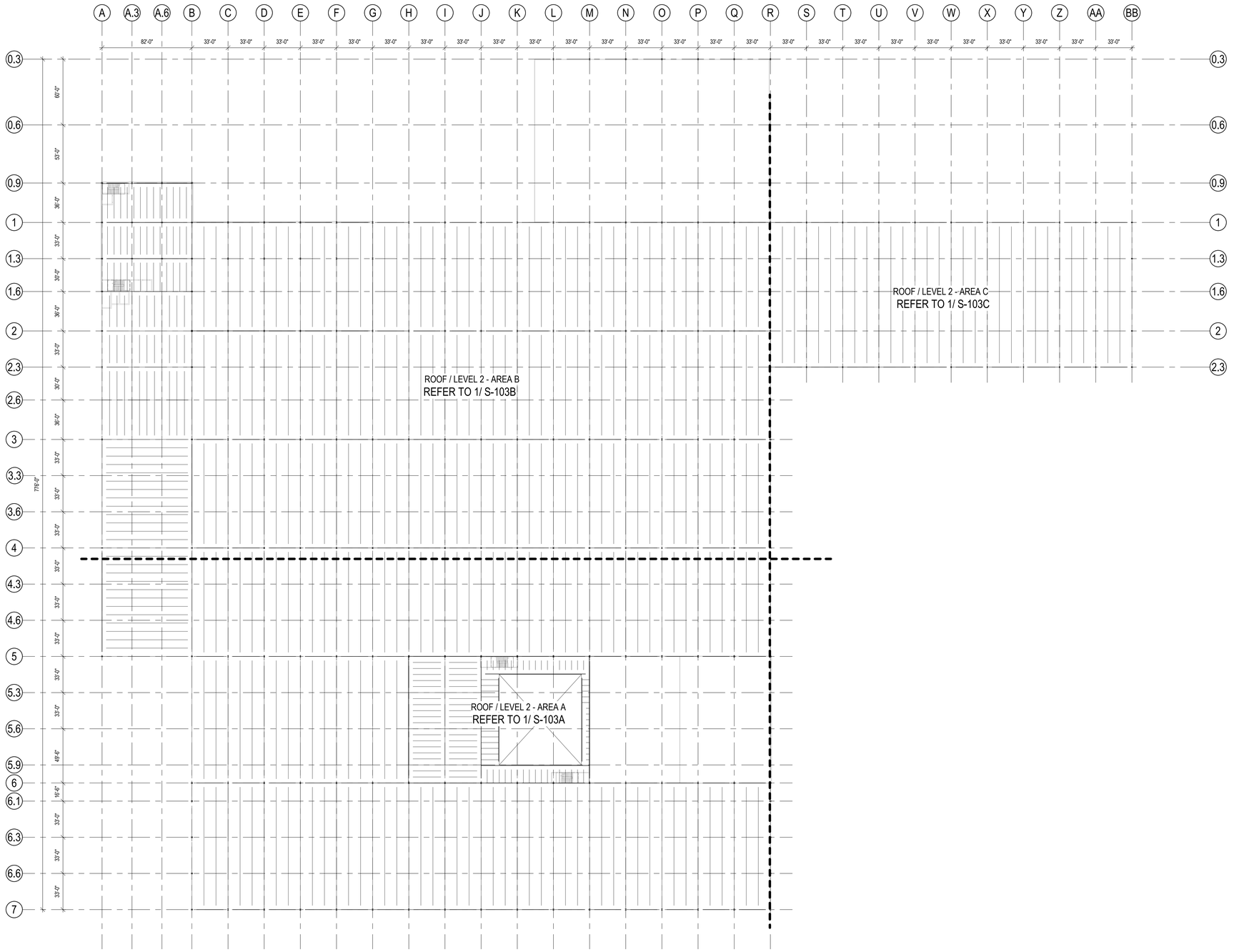
Title
LEVEL 1.5 - CRANE
LEVEL PARTIAL PLAN B

Revision:1

Drawing No.
S-102B

10/13/2021 3:44:44 PM

ORIGINAL SHEET - ARCH E1



1 S-103 LEVEL 2 - ROOF FRAMING PLAN OVERALL
1" = 40'-0"

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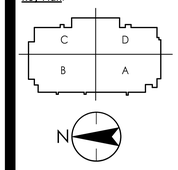
Issued/Revision	
1 REV A - PROGRESS REVIEW	2011.10.13 YYYY.MM.DD

Permit/Seal

Key Plan:



Client/Project
GILBANE BUILDING COMPANY

PROJECT HUDDLE

BALTIMORE, MD

Project No.:191508204

Scale: 1" = 40'-0"

DATE: 10/17/11

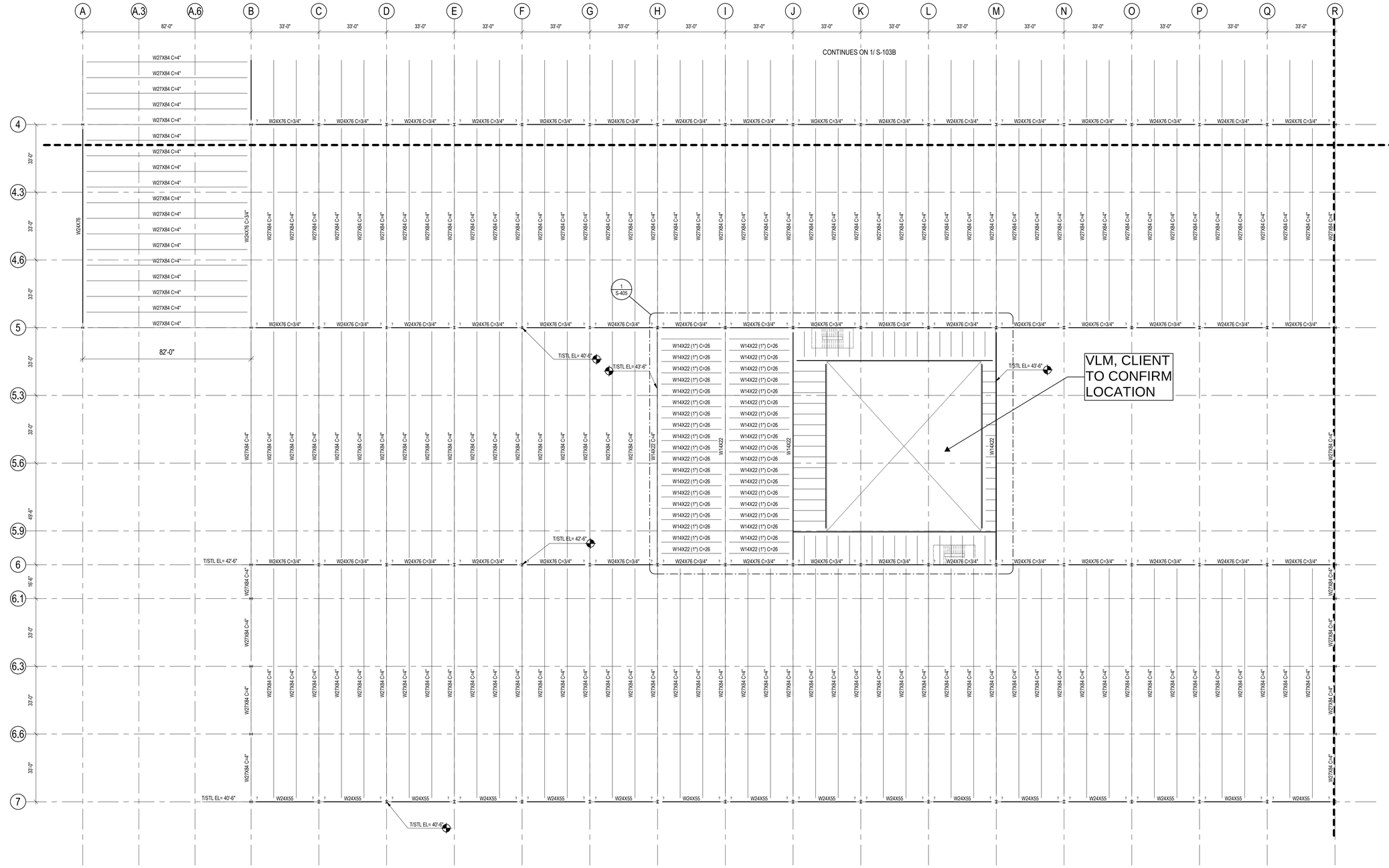
Title
ROOF FRAMING PLAN OVERALL

Revision: 1

Drawing No.
S-103

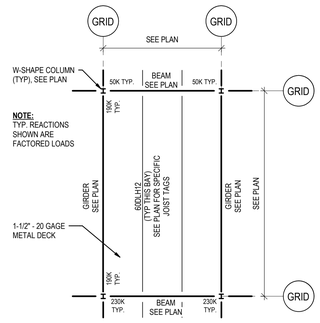
10/13/2021 3:44:44 PM

ORIGINAL SHEET - ARCH E1



1 S-103A LEVEL 2 - ROOF PARTIAL PLAN A

1" = 20'-0"



BID OPTION BAR JOIST ROOF

NOT TO SCALE

ROOF PLAN LEGEND:

D.E.	=	DECK EDGE DIMENSION
	=	DECK DIRECTION, SEE ROOF DECK ATTACHMENTSCHEDULE FOR FASTENING PATTERN
X" / 12"	=	ROOF SLOPE
	=	MOMENT FRAME, SEE ELEVATIONS
T/STL EL = X'-XX"	=	TOP OF STEEL FRAMING MEMBER ELEVATION

ROOF SHEET NOTES:

1. FOR ALL ROOF DECKS 3" 18GA TYPE B METAL ROOF DECK. DECK ANGLE SHALL BE L4x4x5/16" U.N.O., REFER TO DETAILS FOR ADDITIONAL INFO.
2. ROOF STRUCTURE SLOPES AT 1/4"/1 FT. SLOPE ALL BEAMS PERPENDICULAR WITH BEAMS AT SAME ELEVATION.
3. LH JOIST SEAT DEPTH SHALL BE 5" U.N.O.
4. PROVIDE JOIST BOTTOM CORD BRACES (BCBs) AT EVERY 3RD JOIST - STAGGER SIDES. REFER TO SECTIONS FOR JOIST (BCBs) AT EXTERIOR JOIST. COORDINATE LOCATIONS OF JOIST BRIDGING, SPRINKLER BRANCH LINES, AND SPRINKLER MAINS TO PROVIDE MINIMUM REQUIRED CLEARANCES.
5. FABRICATE ALL JOISTS AND JOIST GIRDERS W/ SJI RECOMMENDED CAMBER.
6. JOIST MANUFACTURER TO PROVIDE UPLIFT BRIDGING PER SJI.
7. ROOF BAR JOISTS DESIGNATED 'SP' SHALL RECEIVE ALL LOADS AS INDICATED ON S-003.
8. FILLER BEAMS & JOISTS SHALL BE SPACED EVENLY WITHIN BAYS UNO
9. SEE TYPICAL RTU FRAMING DETAIL ON S-525 FOR FRAMING UNDER RTUs.
10. ALWAYS SEE LATEST MECHANICAL DRAWINGS FOR LOCATIONS OF RTUs AND ROOFTOP EQUIPMENT. BACKGROUNDS ARE SHOWN HERE FOR REFERENCE ONLY AND ARE SUBJECT TO CHANGE ON THE MECHANICAL DRAWINGS. DO NOT USE STRUCTURAL ROOF PLANS FOR RTU LAYOUT.

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Issued/Revision	
100% SD	07/31/2020
90% CD	10/16/2020

Permit/Seal

Key Plan:

Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204

Scale: As indicated

DATE: 04/10/20

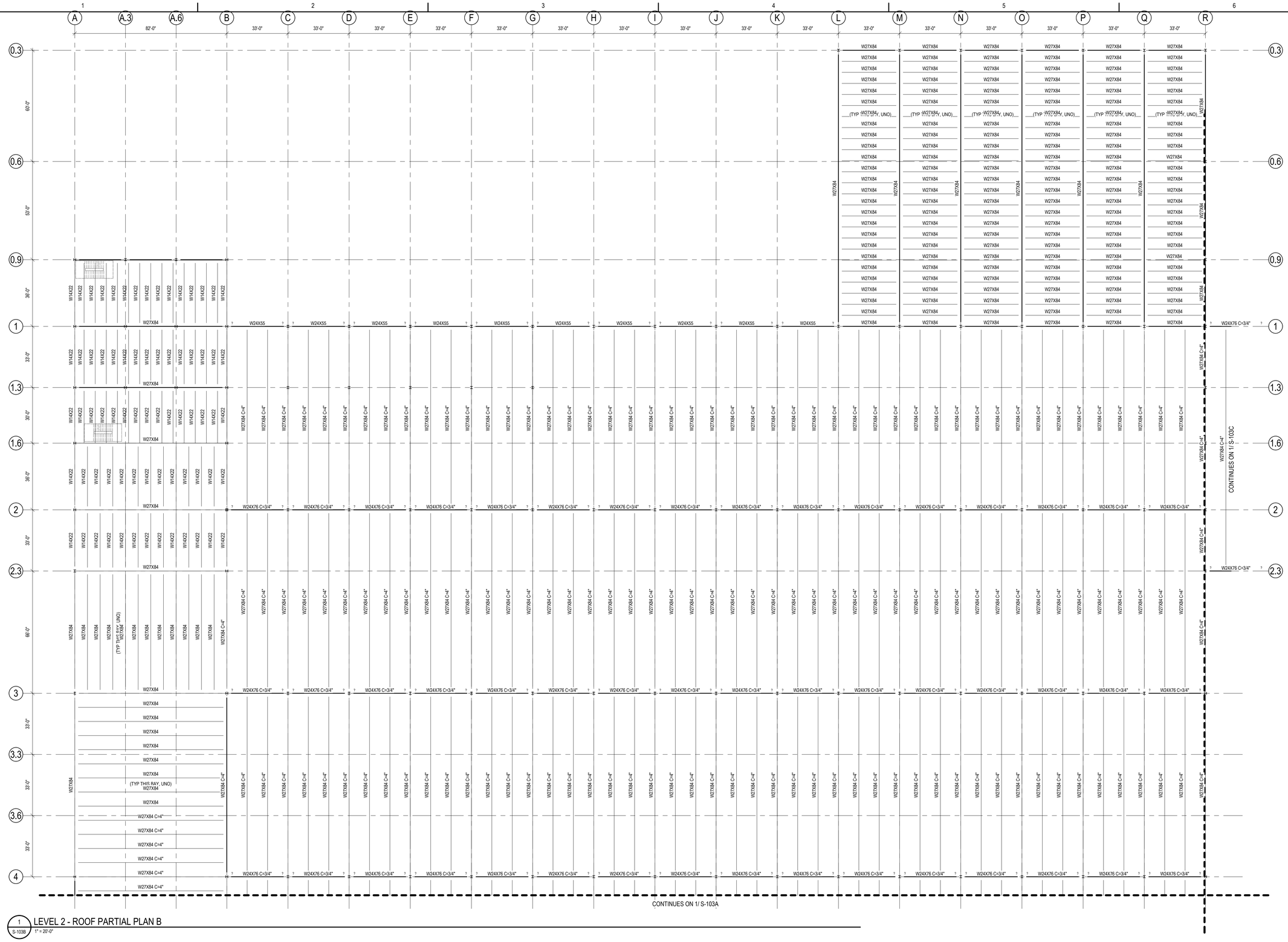
Title
ROOF PARTIAL PLAN A

Revision: 1

Drawing No.
S-103A

10/17/2020 3:44:47 PM

ORIGINAL SHEET - ARCH E1



1 S-103B LEVEL 2 - ROOF PARTIAL PLAN B
1" = 20'-0"

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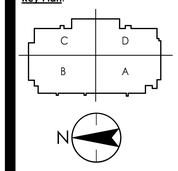
Issued/Revision	
1 REV A - PROGRESS REVIEW	2021.10.13 YYYY.MM.DD

Permit/Seal

Key Plan:



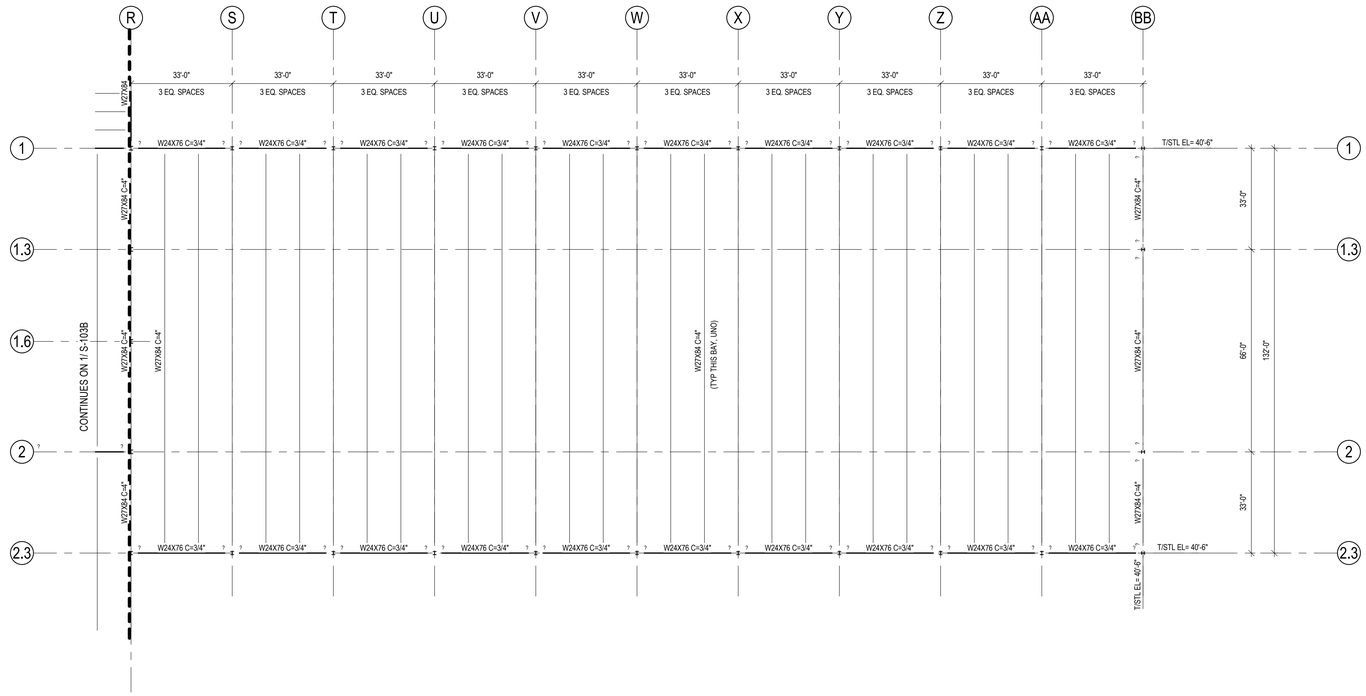
Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204
Scale: 1" = 20'-0"
DATE: 04/10/20

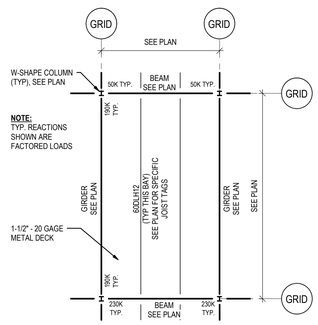
Title
ROOF PARTIAL PLAN B

Revision: 1
Drawing No.
S-103B

10/13/2021 3:44:52 PM
ORIGINAL SHEET - ARCH E1



1 S-103C LEVEL 2 - ROOF PARTIAL PLAN C
1" = 20'-0"



BID OPTION BAR JOIST ROOF
NOT TO SCALE

ROOF PLAN LEGEND:

D.E.	=	DECK EDGE DIMENSION
	=	DECK DIRECTION, SEE ROOF DECK ATTACHMENTSCHEDULE FOR FASTENING PATTERN
X" / 12"	=	ROOF SLOPE
	=	MOMENT FRAME, SEE ELEVATIONS
T/STL EL = X'-XX"	=	TOP OF STEEL FRAMING MEMBER ELEVATION

ROOF SHEET NOTES:

1. FOR ALL ROOF DECKS 3" 18GA TYPE B METAL ROOF DECK. DECK ANGLE SHALL BE L4x4x5/16" U.N.O., REFER TO DETAILS FOR ADDITIONAL INFO.
2. ROOF STRUCTURE SLOPES AT 1/4"/1 FT. SLOPE ALL BEAMS PERPENDICULAR WITH BEAMS AT SAME ELEVATION.
3. LH JOIST SEAT DEPTH SHALL BE 5" U.N.O.
4. PROVIDE JOIST BOTTOM CORD BRACES (BCBs) AT EVERY 3RD JOIST - STAGGER SIDES. REFER TO SECTIONS FOR JOIST (BCBs) AT EXTERIOR JOIST. COORDINATE LOCATIONS OF JOIST BRIDGING, SPRINKLER BRANCH LINES, AND SPRINKLER MAINS TO PROVIDE MINIMUM REQUIRED CLEARANCES.
5. FABRICATE ALL JOISTS AND JOIST GIRDERS W/ SJI RECOMMENDED CAMBER.
6. JOIST MANUFACTURER TO PROVIDE UPLIFT BRIDGING PER SJI.
7. ROOF BAR JOISTS DESIGNATED 'SP' SHALL RECEIVE ALL LOADS AS INDICATED ON S-003.
8. FILLER BEAMS & JOISTS SHALL BE SPACED EVENLY WITHIN BAYS UNO
9. SEE TYPICAL RTU FRAMING DETAIL ON S-525 FOR FRAMING UNDER RTUs.
10. ALWAYS SEE LATEST MECHANICAL DRAWINGS FOR LOCATIONS OF RTUs AND ROOFTOP EQUIPMENT. BACKGROUNDS ARE SHOWN HERE FOR REFERENCE ONLY AND ARE SUBJECT TO CHANGE ON THE MECHANICAL DRAWINGS. DO NOT USE STRUCTURAL ROOF PLANS FOR RTU LAYOUT.

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Issued/Revision	
100% DD	07/31/2020
95% CONSTRUCTION DOCUMENTS	06/19/2020

Permit/Seal

Key Plan:

Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204

Scale: As indicated

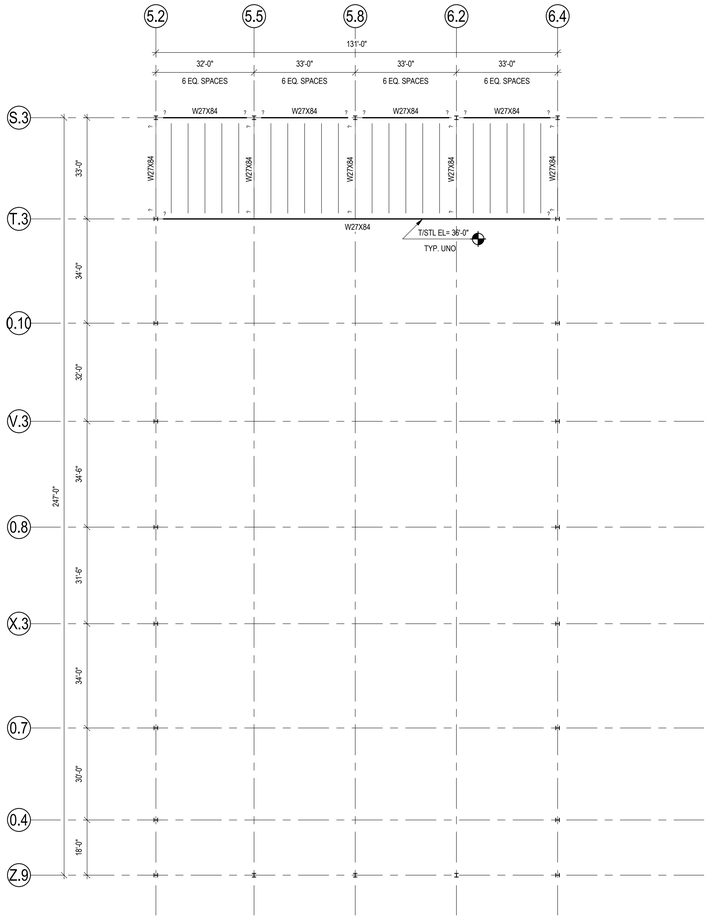
DATE: 04/10/20

Title
LEVEL 2 - ROOF PARTIAL PLAN C

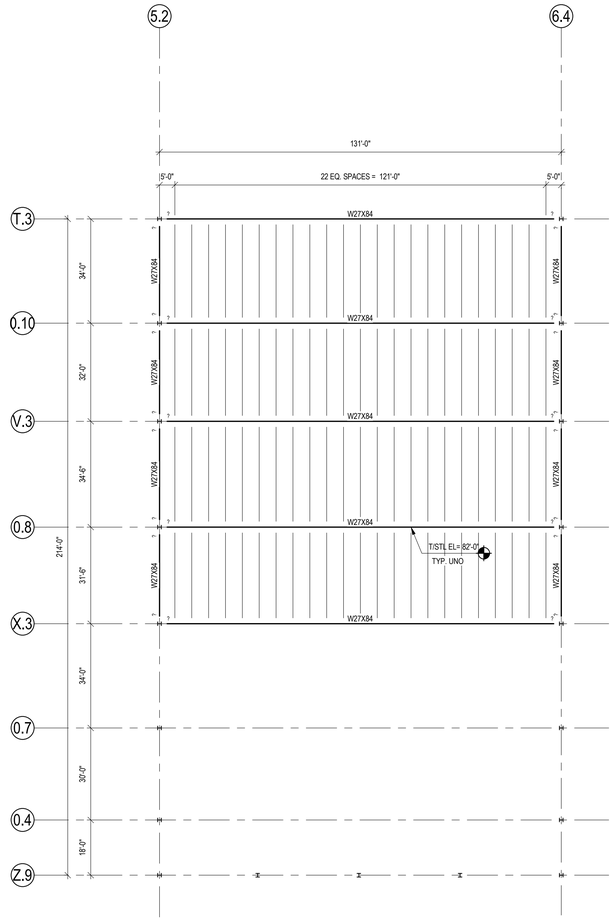
Revision: 1

Drawing No.
S-103C

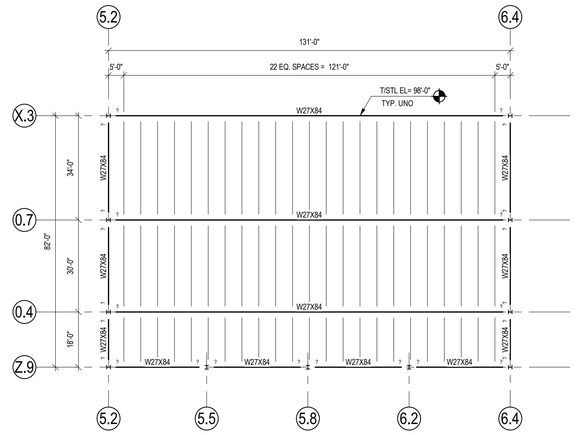
ORIGINAL SHEET - ARCH E1
6/17/2021 3:44:53 PM



1 S-401 Q2 BLDG - LOW ROOF
1" = 20'-0"



2 S-401 Q2 BLDG - MID ROOF
1" = 20'-0"



3 S-401 Q2 BLDG - HIGH ROOF
1" = 20'-0"

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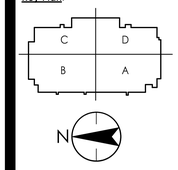
Issued/Revision		
1	REV A - PROGRESS REVIEW	2021.10.13 YYYY.MM.DD

Permit/Seal

Key Plan:



Client/Project
GILBANE BUILDING COMPANY

PROJECT HUDDLE

BALTIMORE, MD

Project No.:191508204

Scale: 1" = 20'-0"

DATE: 10/12/21

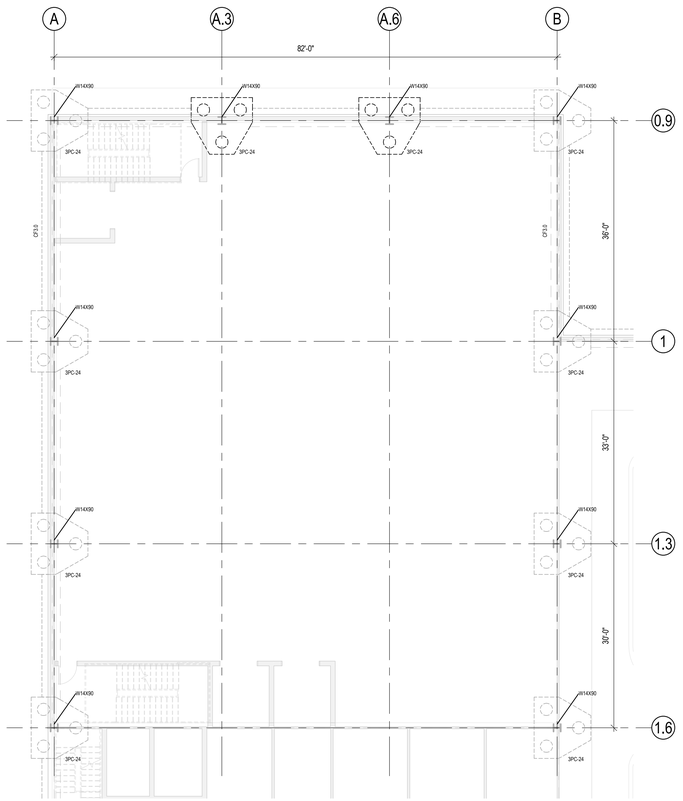
Title
Q2 BUILDINGS - ENLARGED FRAMING PLANS

Revision:1

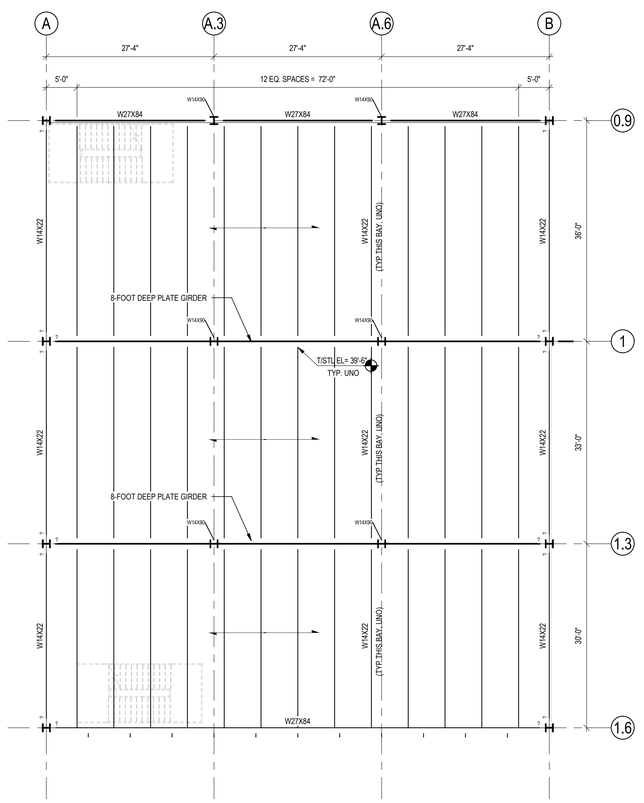
Drawing No.
S-401

10/13/2021 3:44:55 PM

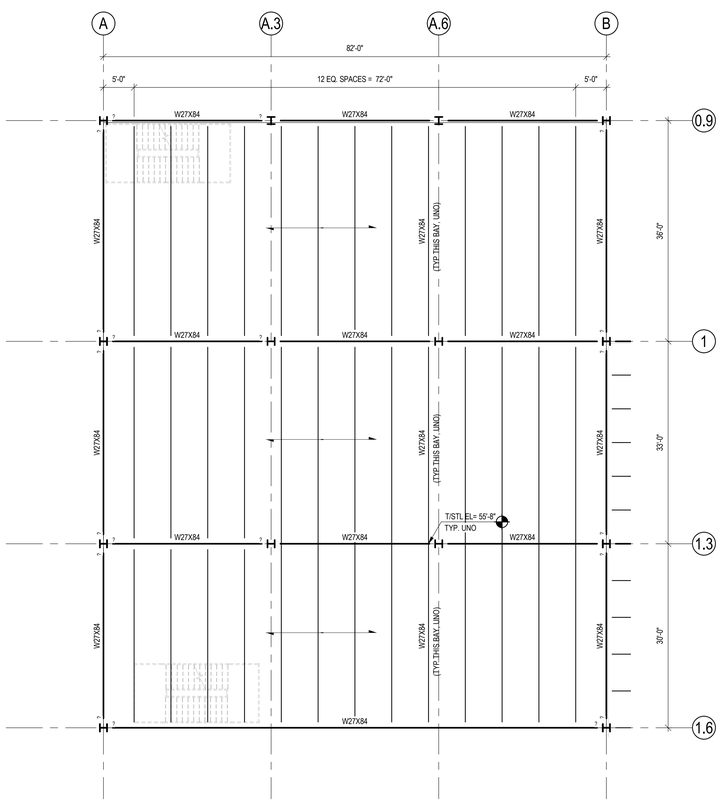
ORIGINAL SHEET - ARCH E1



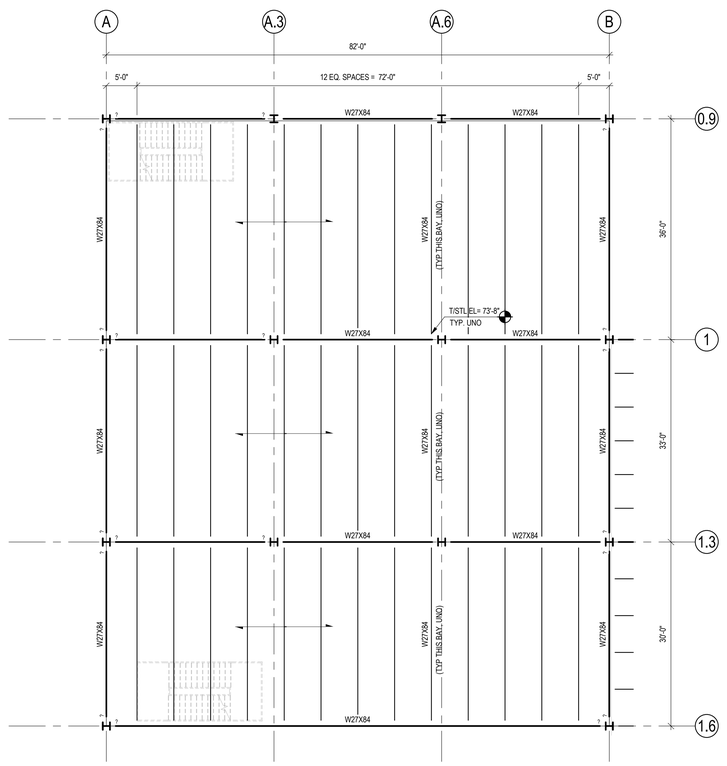
1 S-402 CV TOWER LEVEL 1 - FOUNDATION ENLARGED PLAN
1" = 10'-0"



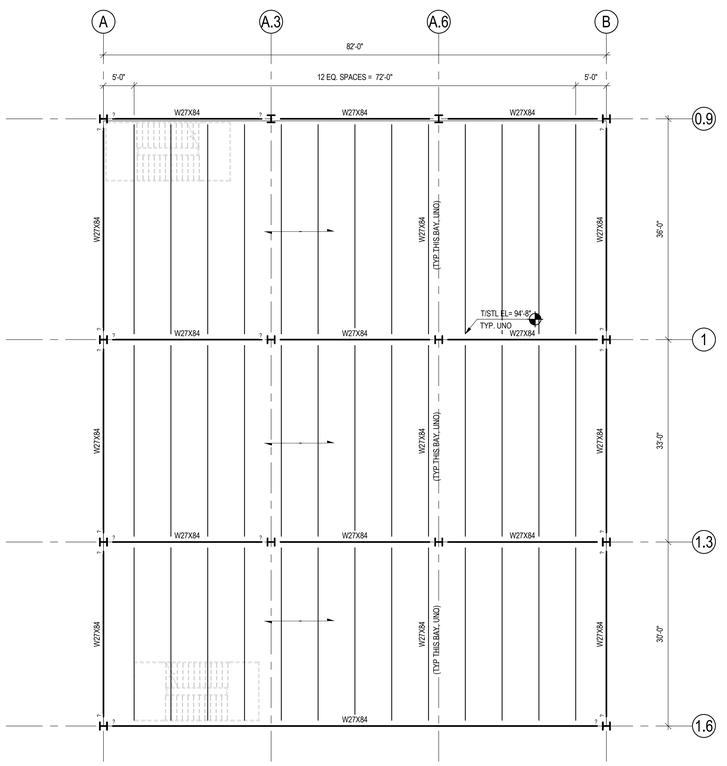
2 S-402 CV TOWER LEVEL 2 - ENLARGED FRAMING PLAN
1" = 10'-0"



3 S-402 CV TOWER LEVEL 3 - ENLARGED FRAMING PLAN
1" = 10'-0"



4 S-402 CV TOWER LEVEL 4 - ENLARGED FRAMING PLAN
1" = 10'-0"



5 S-402 CV TOWER LEVEL 5 - ENLARGED FRAMING PLAN
1" = 10'-0"

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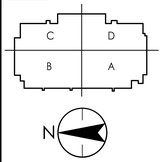
Issued/Revision	
1 REV A - PROGRESS REVIEW	2021.10.13 YYYY.MM.DD

Permit/Seal

Key Plan:



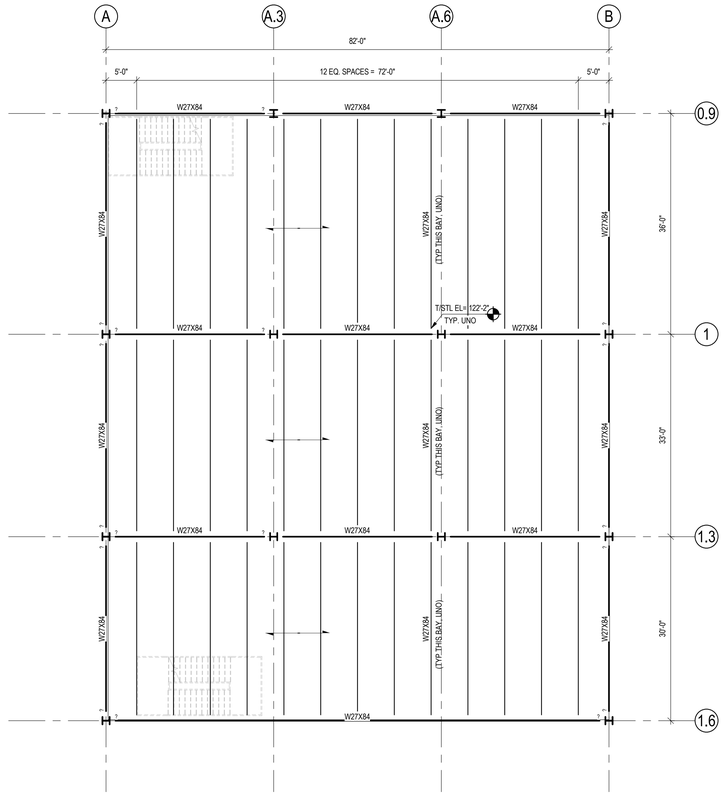
Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204
Scale: 1" = 10'-0"
DATE: 10/12/21

Title
CV TOWER - ENLARGED FRAMING PLANS

Revision:1
Drawing No.
S-402

10/13/2021 3:45:00 PM
ORIGINAL SHEET - ARCH E1


A
A.3
A.6
B
82'-0"
5'-0"
12 EQ. SPACES = 72'-0"
5'-0"
W27X84
W27X84
W27X84



1 S-404 Q1 TOWER - ROOF ENLARGED FRAMING PLAN
1" = 10'-0"

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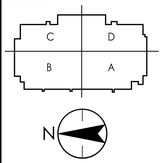
Issued/Revision	
1 REV A - PROGRESS REVIEW	2021.10.18 YYYY.MM.DD

Permit/Seal

Key Plan:



Client/Project
GILBANE BUILDING COMPANY

PROJECT HUDDLE

BALTIMORE, MD

Project No.:191508204

Scale: 1" = 10'-0"

DATE: 10/12/21

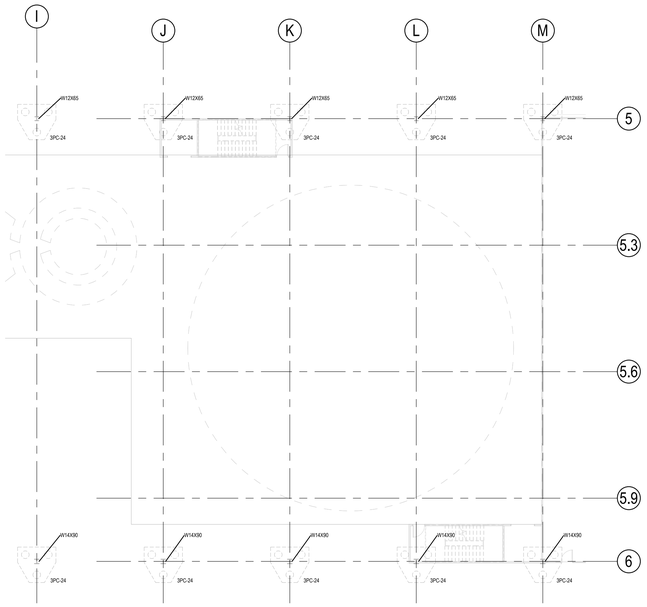
Title
Q1 TOWER - ENLARGED FRAMING PLAN

Revision:1

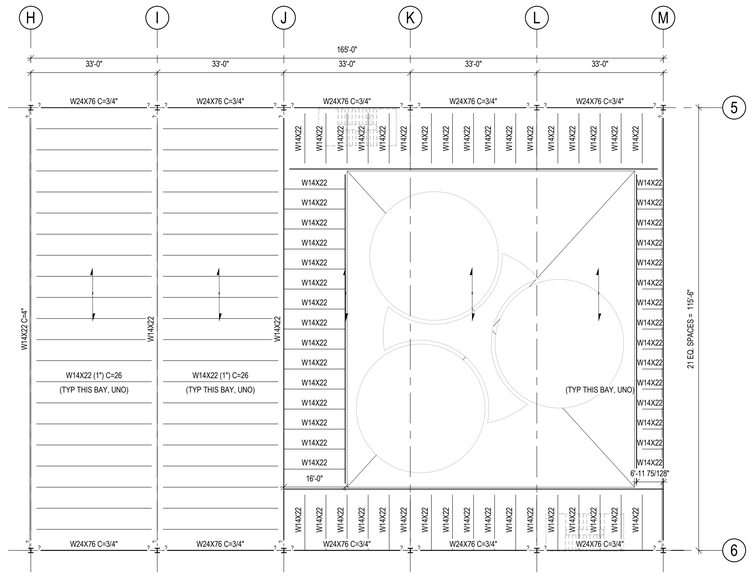
Drawing No.
S-404

10/13/2021 3:45:05 PM

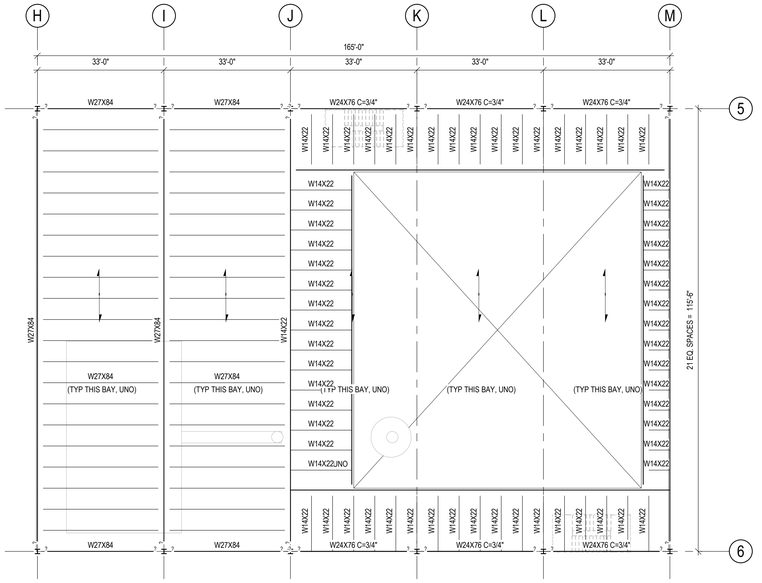
ORIGINAL SHEET - ARCH E1



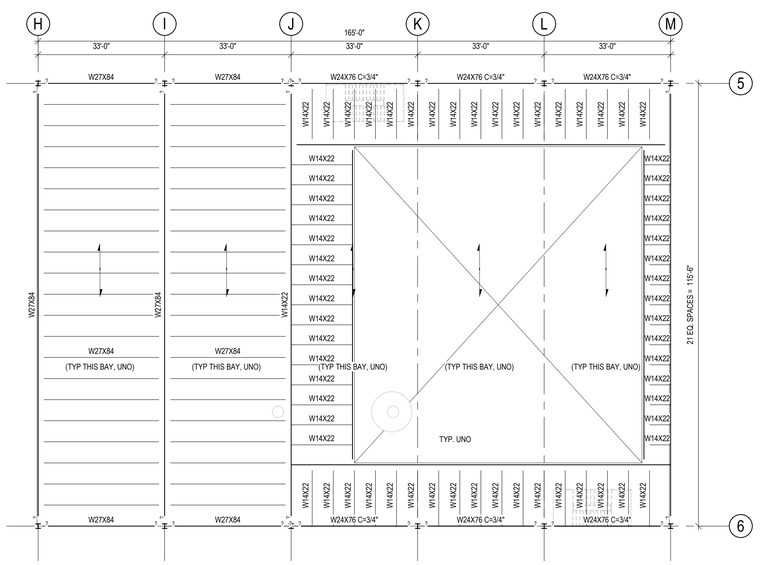
5 S-405 V2 TOWER - LEVEL 1 - FOUNDATION ENLARGED PLAN
1/16" = 1'-0"



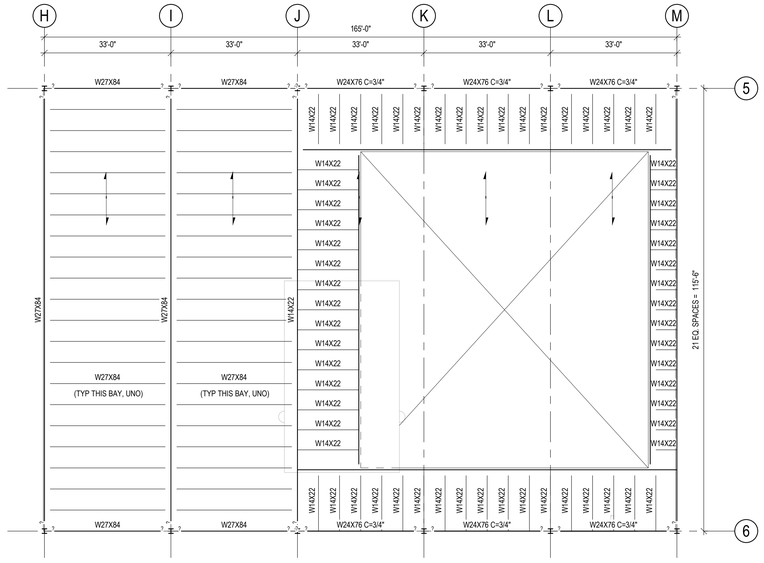
1 S-405 V2 TOWER - LEVEL 2 ENLARGED FRAMING PLAN
1/16" = 1'-0"



2 S-405 V2 TOWER - LEVEL 3 ENLARGED FRAMING PLAN
1/16" = 1'-0"



3 S-405 V2 TOWER - LEVEL 4 ENLARGED FRAMING PLAN
1/16" = 1'-0"



4 S-405 V2 TOWER - LEVEL 5 ENLARGED FRAMING PLAN
1/16" = 1'-0"

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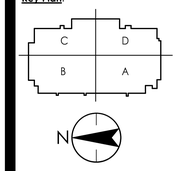
Consultant

1 REV A - PROCESS REVIEW	2021.10.13 YYYY.MM.DD

Issued/Revision

Permit/Seal

Key Plan:



Client/Project
GILBANE BUILDING COMPANY

PROJECT HUDDLE

BALTIMORE, MD

Project No.:191508204

Scale: 1/16" = 1'-0"

DATE: 10/12/21

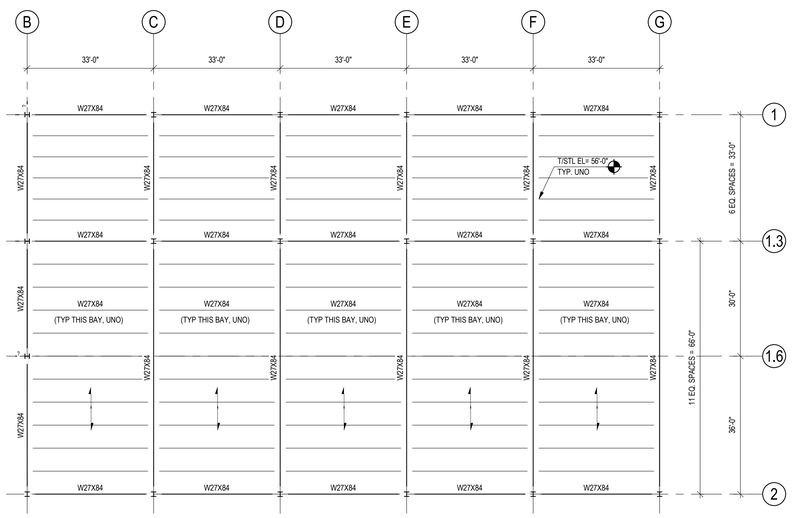
Title
V2 TOWER - ENLARGED FRAMING PLAN

Revision:1

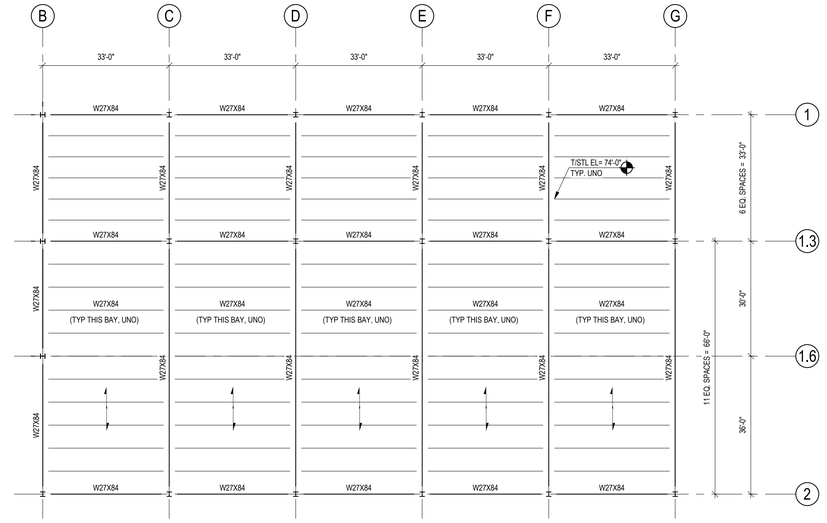
Drawing No.
S-405

10/13/2021 3:45:10 PM

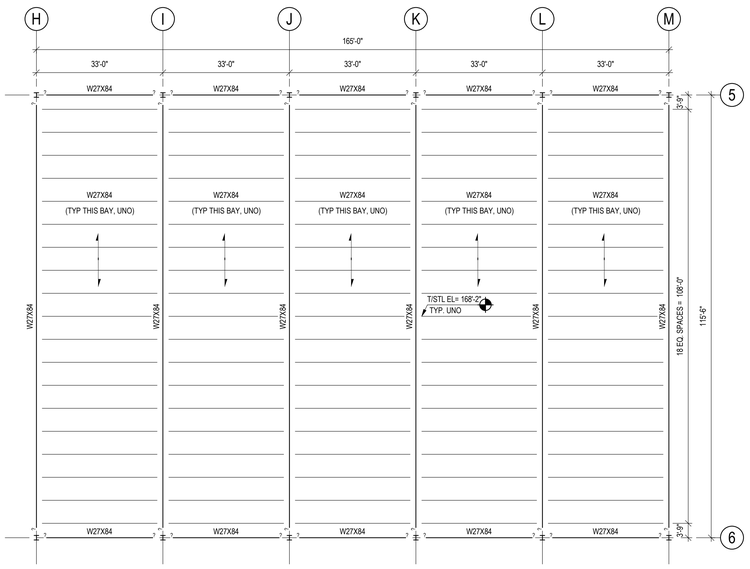
ORIGINAL SHEET - ARCH E1



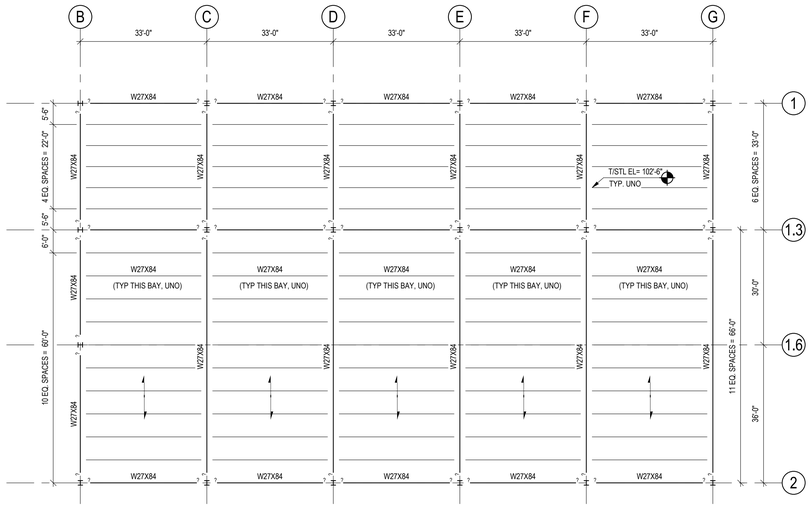
1 S-406 P1.1 TOWER LEVEL 3 - ENLARGED FRAMING PLAN
1/16" = 1'-0"



2 S-406 P1.1 TOWER LEVEL 4 - ENLARGED FRAMING PLAN
1/16" = 1'-0"



3 S-406 V2 ROOF
1/16" = 1'-0"



4 S-406 P1.1 TOWER - ROOF LEVEL ENLARGE FRAMING PLAN
1/16" = 1'-0"

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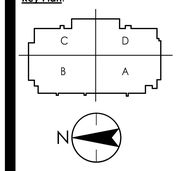
Issued/Revision	
1 REV A - PROGRESS REVIEW	2021.10.13 YYYY.MM.DD

Permit/Seal

Key Plan:



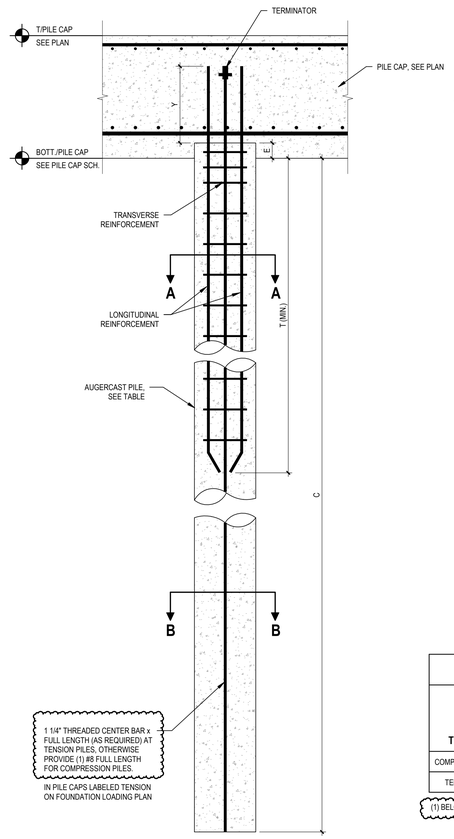
Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204
Scale: 1/16" = 1'-0"
DATE: 10/12/21

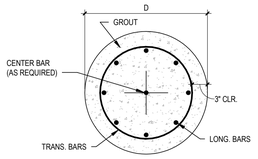
Title
V2 & P1.1 TOWERS - ENLARGED FRAMING PLAN

Revision:1
Drawing No.
S-406

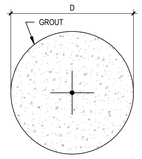
10/13/2021 3:45:11 PM
ORIGINAL SHEET - ARCH E1



8 S-501 AUGERCAST PILE DETAIL
1/2" = 1'-0"



SECTION A-A
NOT TO SCALE



SECTION B-B
NOT TO SCALE

GENERAL NOTES

1. REFER TO PLANS AND DETAILS FOR PILE LOCATIONS.
2. CONSTRUCTION TOLERANCE
   - A. CENTER OF TOP PILE WITHIN 3 INCHES OF DESIGN POSITION.
   - B. INCLINATION SHALL BE +/- 2 DEGREES OF VERTICAL.

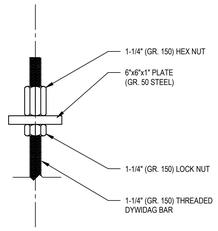
MATERIAL SPECIFICATIONS

GROUT

1. AUGERCAST PILE GROUT SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH AS INDICATED ON S-001

REINFORCING BARS

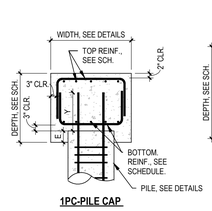
1. REINFORCING BARS SHALL MEET THE REQUIREMENTS OF ASTM A615, GRADE 60 (Fy = 60 KSI, Fu = 90 KSI) SOLID DEFORMED BARS.
2. THREADED CENTER BARS AT TENSION PILES (WHERE REQ'D) SHALL BE FULLY THREADED HOT ROLLED, HEAT TREATED, STRETCHED AND TEMPERED HIGH STRENGTH 150 KSI BARS WITH ANCHORAGE ACCESSORIES DESIGNED TO DEVELOP 100% OF THE RESPECTIVE BAR STRENGTH AND SHALL BE FULLY COMPLIANT WITH ASTM A722.



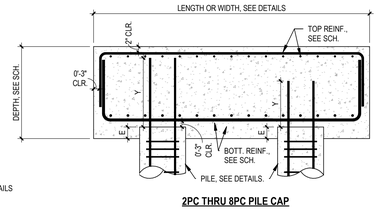
9 S-501 THREADED BAR TERMINATION
3" = 1'-0"

AUGERCAST PILE TABLE								ALLOWABLE LOADS (KIPS)
				REINFORCEMENT CAGE				ALLOWABLE LOAD PROVIDED BY GEOTECHNICAL ENGINEER OF RECORD SEE S-001 SECTION 03 "GEOTECHNICAL"
TYPE	DIAMETER "D" (INCHES)	EMBED. "E" (INCHES)	LENGTH "C" (DEPTH)	LONG.	TRANS.	LENGTH "T" (FEET)	EMBED. "Y" (FEET)	+ COMPRESSION KIPS - TENSION KIPS
COMPRESSION	24	3	TIP 40.0 ft. (1)	(8) #7	#3 AT 6" TOP 6'-0", REMAINDER AT 12"	15	2	+ 300
TENSION	24	3	TIP 40.0 ft. (1)	(8) #8	#3 AT 6" TOP 6'-0", REMAINDER AT 12"	25	2	+300 / -100

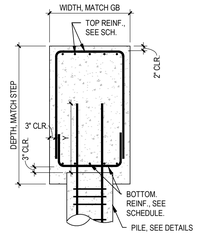
(1) BELOW EXISTING GRADE AT TIME OF GEOTECHNICAL ENGINEER'S EVALUATION AND NOTES ON S-010



1PC-PILE CAP



2PC THRU 8PC PILE CAP



1PC-PILE CAP AT STEPPED GRADE BEAM

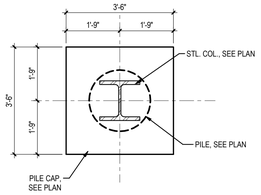
NOTE: PILE CAP DEPTH SHALL MATCH GRADE BEAM DEPTH. INCREASE PILE CAP DEPTH AS REQ'D AT LOCATIONS WHERE GRADE BEAM DEPTH EXCEEDS SPECIFIED PILE CAP DEPTH

PILE CAP SECTION VIEWS

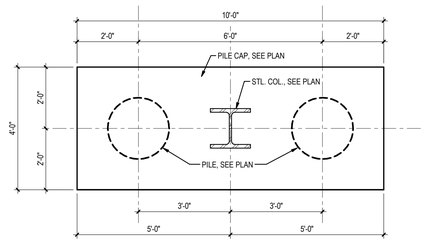
PILE CAP SCHEDULE			
PILE CAP	DEPTH	TOP REINFORCEMENT	BOTTOM REINFORCEMENT
1PC-24	3'-0"	(5) #8 EACH WAY, HOOKED AT ENDS	(5) #8 EACH WAY, HOOKED AT ENDS
2PC-24	3'-0"	(5) #8 LONG WAYS, HOOKED AT ENDS (11) #8 SHORT WAYS, HOOKED AT ENDS	(6) #8 LONG WAYS, HOOKED AT ENDS (11) #8 SHORT WAYS, HOOKED AT ENDS
3PC-24	3'-6"	(12) #8 EACH WAY, HOOKED AT ENDS	(13) #10 EACH WAY, HOOKED AT ENDS
4PC-24	4'-0"	(11) #9 EACH WAY, HOOKED AT ENDS	(12) #11 EACH WAY, HOOKED AT ENDS
5PC-24	5'-0"	(16) #9 EACH WAY, HOOKED AT ENDS	(18) #11 EACH WAY, HOOKED AT ENDS
L-5PC-24	5'-0"	(16) #9 EACH WAY, HOOKED AT ENDS	(18) #11 EACH WAY, HOOKED AT ENDS
6PC-24	5'-0"	(16) #9 LONG WAYS, HOOKED AT ENDS (21) #9 SHORT WAYS, HOOKED AT ENDS	(20) #11 LONG WAYS, HOOKED AT ENDS (24) #11 SHORT WAYS, HOOKED AT ENDS
L-6PC-24	5'-0"	(16) #9 LONG WAYS, HOOKED AT ENDS (21) #9 SHORT WAYS, HOOKED AT ENDS	(20) #11 LONG WAYS, HOOKED AT ENDS (24) #11 SHORT WAYS, HOOKED AT ENDS
7PC-24	5'-6"	(15) #11 EACH WAY, HOOKED AT ENDS	(20) #11 EACH WAY, HOOKED AT ENDS
8PC-24	5'-6"	(13) #11 LONG WAYS, HOOKED AT ENDS (15) #11 SHORT WAYS, HOOKED AT ENDS	(26) #11 LONG WAYS, HOOKED AT ENDS (30) #11 SHORT WAYS, HOOKED AT ENDS

NOTE: BOTTOM REINFORCEMENT AT ALL CAPS SHALL BE GRADE 60 PILE CAP DEPTH MAY BE INCREASED IF NEEDED.

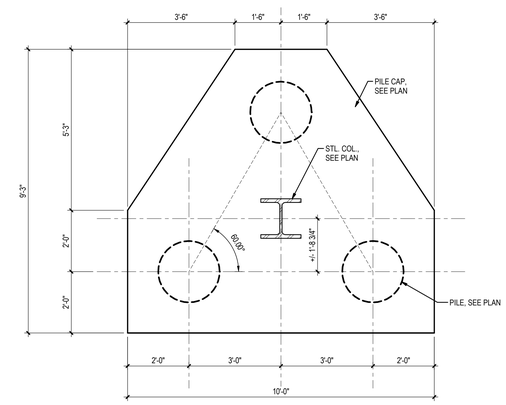
7 S-501 PILE CAP SCHEDULE
3/8" = 1'-0"



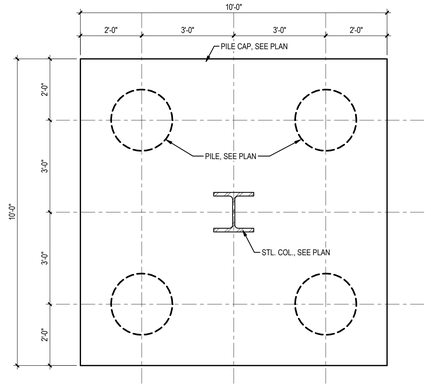
4 S-501 1PC-PLAN VIEW
1/2" = 1'-0"



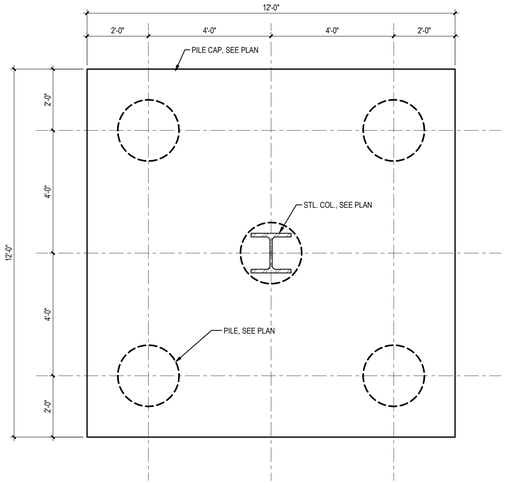
1 S-501 2PC-PLAN VIEW
1/2" = 1'-0"



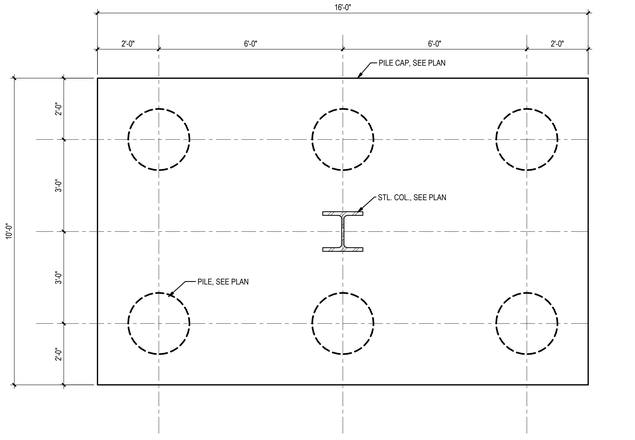
5 S-501 3PC-PLAN VIEW
1/2" = 1'-0"



6 S-501 4PC-PLAN VIEW
1/2" = 1'-0"



2 S-501 5PC-PLAN VIEW
1/2" = 1'-0"



3 S-501 6PC-PLAN VIEW
1/2" = 1'-0"

NOTE: WHERE MULTIPLE COLUMNS BEAR ON INDIVIDUAL PILE CAPS, PLACE CENTROID OF PILE CAP UNDER LARGEST COLUMN, U.N.O. ON FOUNDATION PLANS OR DETAILS.

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ISSUED/REVISION	DATE
IFC / ASI 13	07/27/21

Permit/Seal

Key Plan:

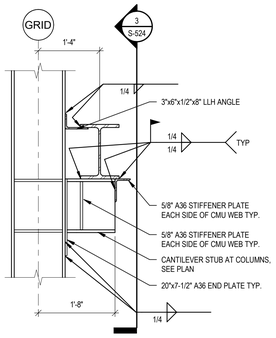
Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204
Scale: As indicated
DATE: 07/27/21

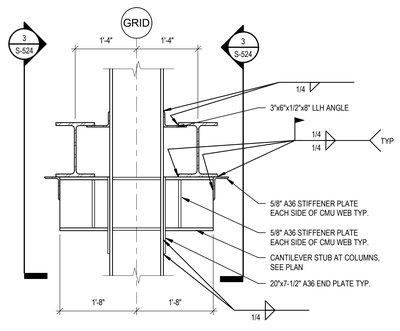
Title
TYPICAL PILE CAP DETAILS

Revision: 1
Drawing No.
S-501

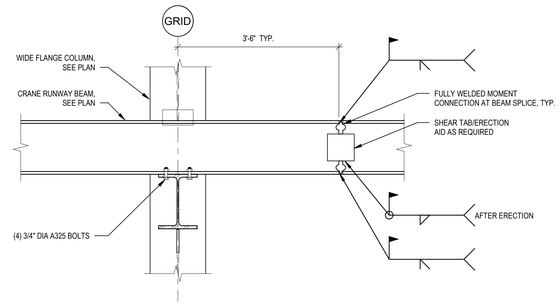
ORIGINAL SHEET - ARCH E1



1 S-524 TYPICAL CRANE SINGLE RAIL SUPPORT - SECTION
3/4" = 1'-0"



2 S-524 TYPICAL CRANE DOUBLE RAIL SUPPORT - SECTION
3/4" = 1'-0"



3 S-524 TYPICAL CRANERA RAIL SUPPORT - ELEVATION
3/4" = 1'-0"

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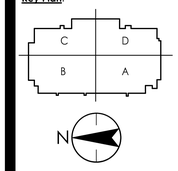
Issued/Revision		
1	REV A - PROGRESS REVIEW	2021.10.13 YYYY.MM.DD

Permit/Seal

Key Plan:



Client/Project
GILBANE BUILDING COMPANY
PROJECT HUDDLE
BALTIMORE, MD

Project No.:191508204

Scale: 3/4" = 1'-0"

DATE: 12/10/20

Title
TYPICAL CRANE FRAMING DETAILS

Revision:1

Drawing No.
S-524

10/13/2021 3:45:12 PM

ORIGINAL SHEET - ARCH E1

BUILDING CODE SUMMARY

APPLICABLE CODES/STANDARDS:

International Building Code, 2015 (amended by Baltimore County, Bill 40-15)
International Mechanical Code 2015 (amended by Baltimore County, Bill 40-15)
International Plumbing Code 2015 (amended by Baltimore County, Bill 41-15 and Bill 40-15 part 129.1 for equivalent fixture count)
International Energy Conservation Code, 2015 (amended by Baltimore County, Bill 40-15)
National Electric Code, 2020 (additional amendments in Bill 40-15)
2018 NFPA 101 - Life Safety - (amended by Baltimore County Bill 12-21)
2018 NFPA 1 - Fire Prevention - (amended by Baltimore County Bill 14-21)
ADAAG (Americans with Disabilities Act Accessibility Guidelines) 2010

OCCUPANCY CLASSIFICATION:
USE CLASSIFICATIONS:

INDUSTRIAL - GROUP **F-1** MODERATE HAZARD (PRIMARY)	IBC 306.2
BUSINESS - GROUP **B** (ACCESSORY)	IBC 304.1
ASSEMBLY - GROUP **A-2** (ACCESSORY)	IBC 303.3
ASSEMBLY - GROUP **A-3** (ACCESSORY)	IBC 303.4

CONSTRUCTION TYPE:
PRIMARY SHALL BE: **TYPE IIB** — IBC Table 601

BUILDINGS AND STRUCTURES DESIGNED TO HOUSE SPECIAL INDUSTRIAL PROCESSES THAT REQUIRE LARGE AREAS AND UNUSUAL BUILDING HEIGHTS TO ACCOMODATE CRANEWAYS OR SPECIAL MACHINERY AND EQUIPMENT...SHALL BE EXEMPT FROM THE BUILDING HEIGHT, NUMBER OF STORIES AND BUILDING AREA LIMITATIONS SPECIFIED IN 504 AND 506 (SECTION 503.1.1)

FIRE RESISTANCE RATINGS FOR BUILDING ELEMENTS: — IBC Table 601

PRIMARY FRAMES	**0-HR**
NON-BEARING WALL & PARTITIONS	
EXTERIOR	**0 HR**
INTERIOR	**0 HR**
FLOOR & SECONDARY MEMBERS	**0 HR**
ROOF & SECONDARY MEMBERS	**0 HR**

FIRE RESISTANCE RATINGS FOR ENCLOSURES:
FIRE BARRIERS:
OCCUPANCY SEPARATIONS: IBC 508.2, 508.3, & 507.1.1
-NON-SEPARATED (ALL B AND A-2/A-3 AREAS ARE ACCESSORY TO THE PRIMARY F-1 OCCUPANCY)

STAIRS AND SHAFTS: IBC 713.4
-1-HR CONNECTING < 4 STORIES

ELEVATOR: IBC 713.4
-1-HR CONNECTING < 4 STORIES

HORIZONTAL ASSEMBLIES: IBC 711.2.4
-0-HR

OPENING PROTECTION:
DOORS IN 2-HR BARRIER: **90 MIN. RATED** — IBC - TABLE 716.5
DOORS IN 1-HR BARRIER: **60 MIN. RATED** — IBC - TABLE 716.5

FIRE PROTECTION SYSTEMS:
AUTOMATIC SPRINKLER SYSTEM, FIRE ALARM AND DETECTION SYSTEMS, AND EMERGENCY ALARM SYSTEMS SHALL BE PROVIDED. — IBC 903.3.1.1, 907, 908

STANDPIPES ARE LOCATED IN AND NEAR STAIRS ENCLOSURES — IBC 905

PORTABLE FIRE EXTINGUISHERS: MAX TRAVEL DISTANCE = 75 FT. — IBC 906

TWO-WAY COMUNICATION SYSTEM SHALL BE PROVIDED AT ELEVATOR LANDINGS.
AREA OF REFUGE:

BUILDING HEIGHT AND AREA:
ALLOWABLE BUILDING HEIGHT AND AREA (Type IIB - Fully Sprinklered): — IBC Tables 504.3, 504.4, 506.2

OCCUPANCY	AREA/FLOOR	STORIES	HEIGHT
F-1	**UNLIMITED AREA***	3	75'

*TABULAR AREA OF 52,500 SF INCREASED TO UNLIMITED ALLOWED FOR ONE-STORY BUILDING — IBC 507.4

ACTUAL BUILDING AREA (FOOTPRINT): 422,500 SF
ACTUAL NUMBER OF STORIES: 8
ACTUAL BUILDING HEIGHT: 202'
MAINTAIN 60' FIRE AREA ALL AROUND FACILITY

MEANS OF EGRESS:
OCCUPANT LOADING: — IBC Table 1004.1.2

A-2 Assembly - Standing Space	5 SF Net
A-2/A-3 Assembly - Unconcentrated (Tables and Chairs):	15 SF Net
B Office Areas:	100 SF Gross
B Locker Rooms:	50 SF Gross
F-1 Industrial:	100 SF Gross
S-1 Warehouse:	500 SF Gross

MEANS OF EGRESS (CONTINUED):

MINIMUM NUMBER OF EXITS PER SPACE:		IBC Table 1006.2.1
<30 OCCUPANTS FOR S OCCUPANCIES	1 EXIT	
<50 OCCUPANTS FOR B OR A OCCUPANCIES	1 EXIT	
50 TO 500 OCCUPANTS	2 EXITS	IBC Table 1006.2.1.1
501 TO 1000 OCCUPANTS	3 EXITS	
MORE THAN 1,000	4 EXITS	
MINIMUM NUMBER OF EXITS PER STORY:		IBC Table 1006.3.1
1-500 OCCUPANTS	2 EXITS	
501-1,000 OCCUPANTS	3 EXITS	
MORE THAN 1,000	4 EXITS	
MINIMUM EGRESS WIDTH:		IBC 1005.3.1 & 1005.3.2
STAIRWAYS = 0.3" / OCCUPANT		
OTHER COMPONENTS = 0.2" / OCCUPANT		
STAIRWAY WIDTH: 44" MIN.		IBC 1011.2
GUARDS		
OPENING LIMITATIONS -		
CORRIDOR WIDTH: 44" MIN. (no projections below 34")		IBC 1010.1.1.1
EXCEPT 36" FOR SPACES WITH <30 OCCUPANTS		
ACCESSIBLE MEANS OF EGRESS IS REQUIRED FROM EACH SPACE 2 ARE REQUIRED IF MORE THAN 1 EXIT IS REQUIRED.		
AREAS OF REFUGE ARE NOT REQUIRED		IBC 1007.6.2
COMMON PATH OF EGRESS TRAVEL		IBC 11006.2.1
FOR SPACES WITH ONE EXIT:		
A -2 / A-3:	75' MAX.	
B	100' MAX	
F-1	100' MAX	
EXIT ACCESS TRAVEL DISTANCE:		IBC 1017.2
A-2 / A-3:	250' MAX.	
B:	300' MAX.	
F-1	400' MAX	
DEAD ENDS:		
F-1 & B:	50' MAX.	IBC 1020.4
A-2 / A-3:	20' MAX	

INTERIOR FINISHES:
WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY: — IBC 803.11

A-2/A-3:	EXIT ENCLOSURES -	**CLASS B**
	CORRIDORS -	**CLASS B**
	ROOMS AND ENCLOSED SPACES -	**CLASS C**
B:	EXIT ENCLOSURES -	**CLASS B**
	CORRIDORS -	**CLASS C**
	ROOMS AND ENCLOSED SPACES -	**CLASS C**
F-1:	EXIT ENCLOSURES -	**CLASS C**
	CORRIDORS -	**CLASS C**
	ROOMS AND ENCLOSED SPACES -	**CLASS C**

ENERGY CODE COMPLIANCE:
CLIMATE ZONE BASIS OF DESIGN: ZONE 4A

BUILDING ENVELOPE REQUIREMENTS:

	TYPE	MAX. U-FACTOR	MIN. R-VALUE	R-VALUE PROVIDED
INSULATION ENTIRELY ABOVE ROOF DECK			R-30 ci	
WALLS ABOVE GRADE	MASS	0.175	R-5.7 ci	
	METAL FRAMED		R-13 + 7.5 ci	
SLAB ON GRADE FLOORS			R-10 for 24" below	
NON-SWINGING OPAQUE DOORS			R-4.75	

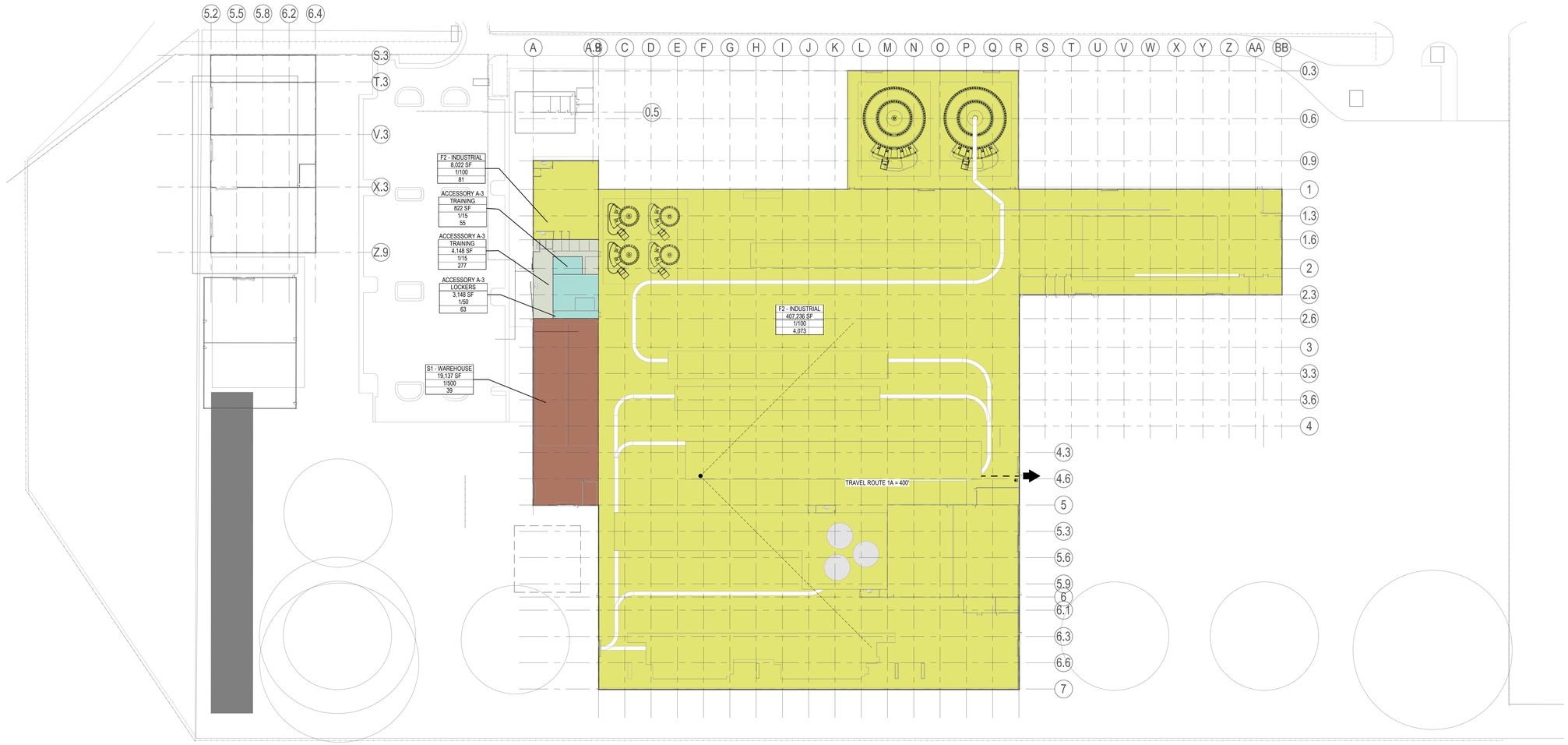
WALL COMPONENTS:
MASS WALL: ±10" CONCRETE WALL PANELS WITH INTERIOR RIGID INSULATION BOARD
MASS WALL WITH FINISHED INTERIOR SPACE: ±10" CONCRETE WALL PANELS WITH STUD FURRING FILLED WITH BATT INSULATION BETWEEN STUDS

LIFE SAFETY LEGEND

AREA NAME — AREA NAME
150 SF — TOTAL AREA OF SPACE
1/15 — OCCUPANCY LOAD FACTOR
10 — NUMBER OF OCCUPANTS IN SPACE
SMART OCCUPANCY AREA TAG

X / Y / W / Z
SMART EGRESS DOOR TAG:
W = WIDTH OF LIMITING COMPONENT IN INCHES.
DOOR CALC. = ACTUAL WIDTH - (DOOR THICKNESS + (2 x STOP DEPTH))
X = "ACTUAL EXIT CAPACITY" - PROPOSED NUMBER OF OCCUPANTS USING EXIT
Y = "CALCULATED EXIT CAPACITY" - MAX. NUMBER OF OCCUPANTS EXIT CAN ACCOMMODATE = W / Z
Z = EGRESS WIDTH PER OCCUPANT SERVED (INCHES PER OCCUPANT) PER TABLE 1005.1

TRAVEL DISTANCE - PATH OF TRAVEL
1 HR. FIRE PARTITION
2 HR. FIRE PARTITION
FEC FIRE EXTINGUISHER
FEC FIRE EXTINGUISHER
EXIT DISCHARGE
EXIT
EXIT ACCESS
LIGHTED EXIT SIGNS - NOT ALL SHOWN SEE ELECTRICAL LIGHTING PLANS AND PICK MODULE SHOP DRAWINGS



1 / A101 **LIFE SAFETY PLAN - LEVEL 1**
1" = 60'-0"

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No.	Issued/Revision	By	Appd	
1	Rev A - Progress Review			2021.10.13

File Name: N/A | Author Dwn. | Designer Dsgn. | Checker Chkd. | 10/05/21 YYYY.MM.DD

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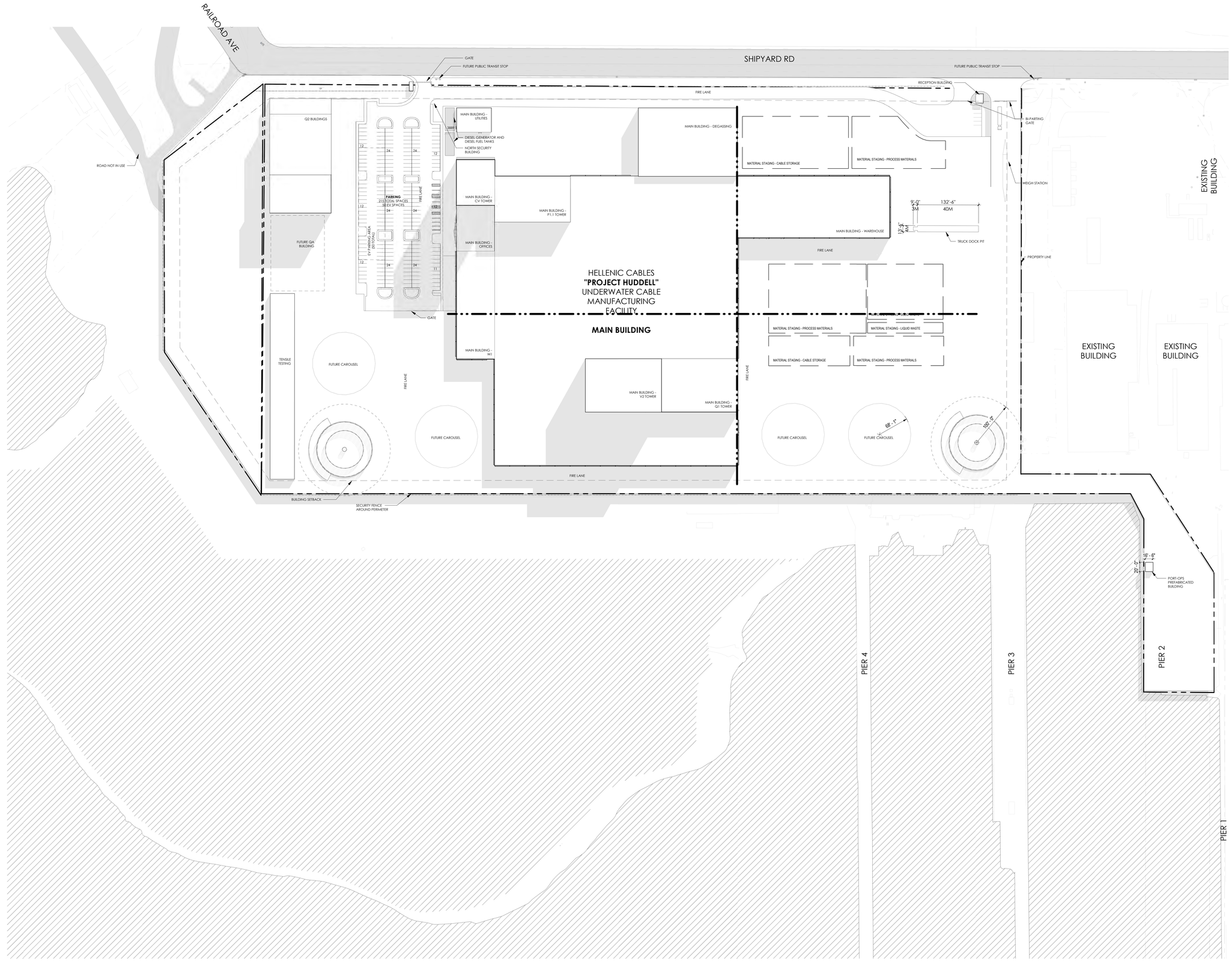
Client/Project Logo

Client/Project
PROJECT HUDDELL

Title
LIFE SAFETY PLANS

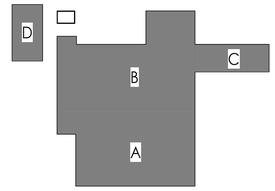
Project No. 191508204 | Scale As indicated
Revision 1 | Drawing No. **A101**

•Pick location in Project Information•
10/13/2021 4:25:53 PM
ORIGINAL SHEET - ARCH E1



1 AP-001 **SITE LAYOUT**
1" = 80'-0"

TRUE NORTH



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1 Rev A - Progress Review			2021.10.13

File Name: N/A	Author	Designer	Checker	08/27/21
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PROJECT HUDDELL

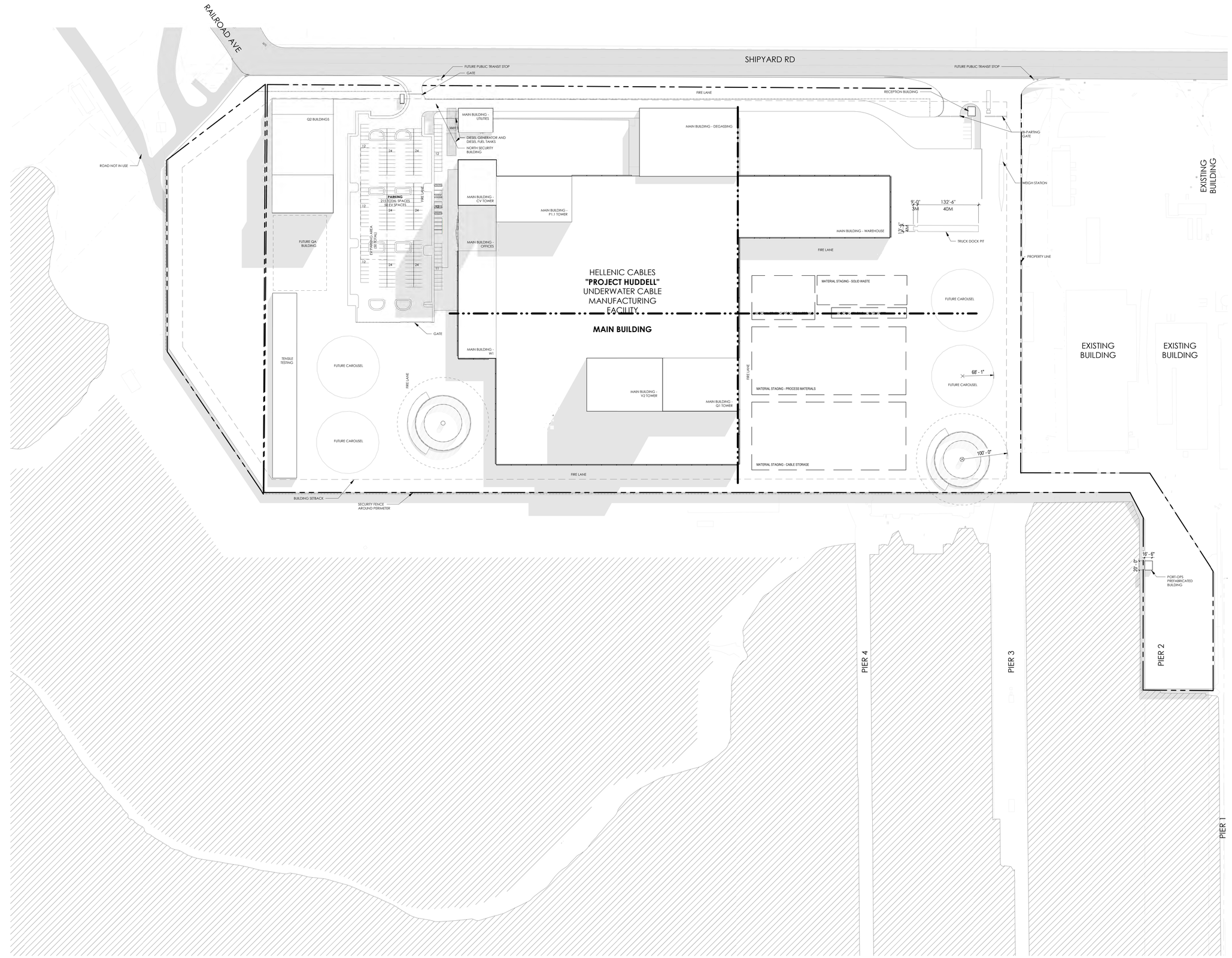
Title

SITE - HELLENIC PROVIDED LAYOUT

Project No.	Scale
191508204	1" = 80'-0"

Revision	Drawing No.
1	AP-001

ORIGINAL SHEET - ARCH E1



1 AP-003 **SITE LAYOUT**

1" = 80'-0"

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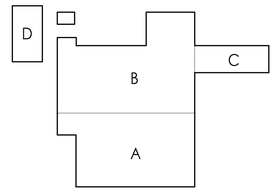

KEY PLAN

1	Rev A - Progress Review			2021.10.13
Issued/Revision		By	Appd	YYYY.MM.DD

File Name: N/A	Author	Designer	Checker	08/27/21
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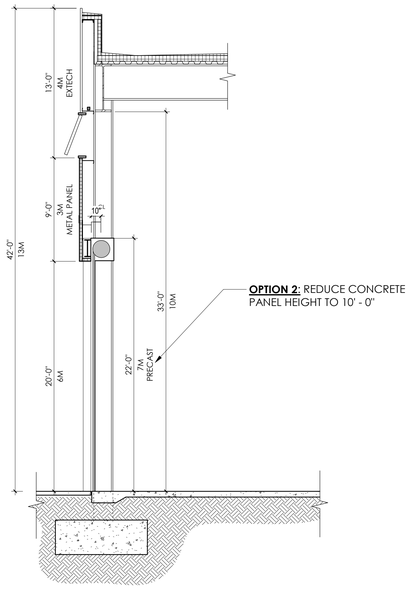
Title

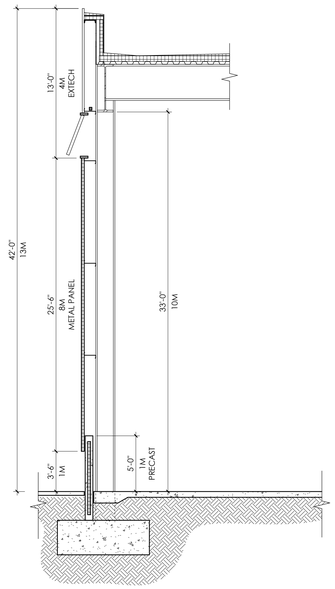
SITE - STANTEC PROPOSED LAYOUT

Project No. 191508204	Scale 1" = 80'-0"
Revision 1	Drawing No. **AP-003**

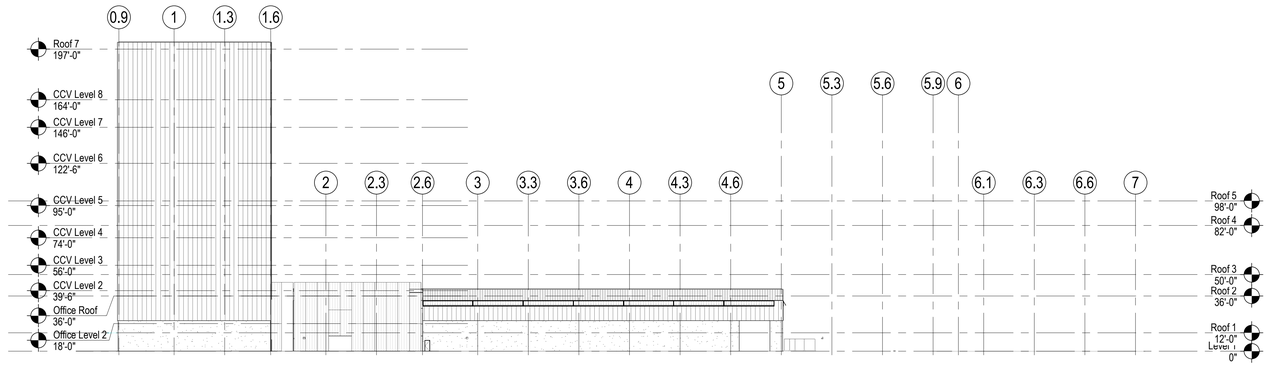
ORIGINAL SHEET - ARCH E1



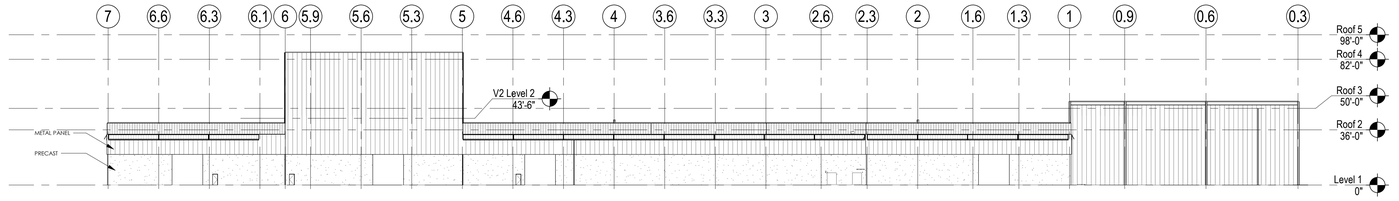
5 AP-004 **OPTION 1**
3/16" = 1'-0"



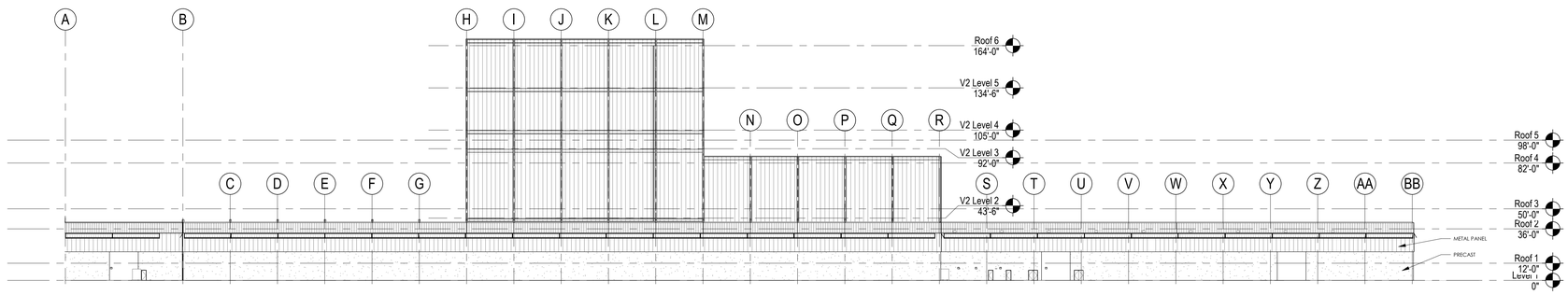
6 AP-004 **OPTION 3**
3/16" = 1'-0"



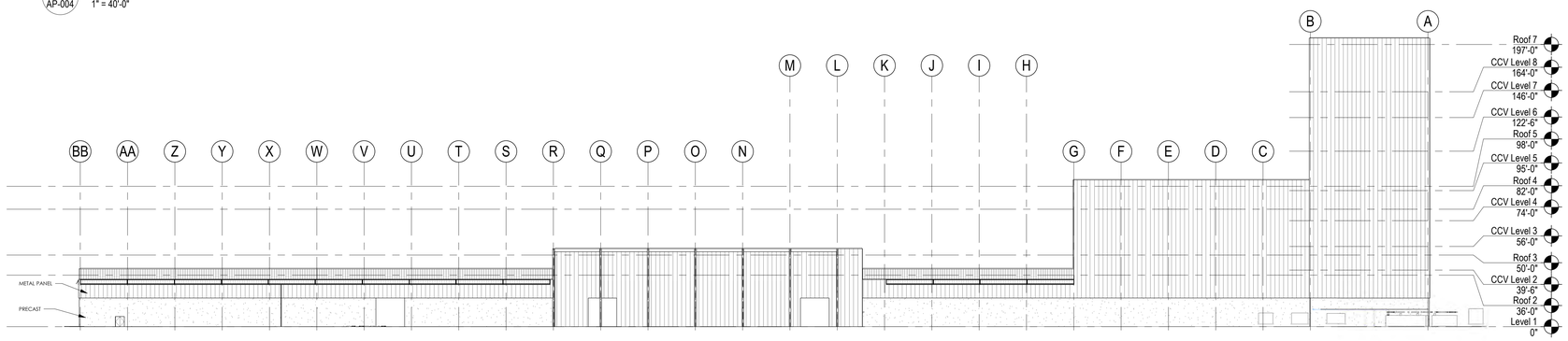
4 AP-004 **BUILDING ELEVATION - PLAN WEST**
1" = 40'-0"



2 AP-004 **BUILDING ELEVATION - PLAN EAST**
1" = 40'-0"



3 AP-004 **BUILDING ELEVATION - PLAN SOUTH**
1" = 40'-0"



1 AP-004 **BUILDING ELEVATION - PLAN NORTH**
1" = 40'-0"

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1 Rev A - Progress Review			2021.10.13

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Title

ELEVATIONS

Project No. 191508204

Scale As indicated

Revision 1

Drawing No. **AP-004**

ORIGINAL SHEET - ARCH E1

DEGASSING CAROUSELS

D1

CCV TOWER

CCV TUNNEL

31570 SF

700T CAROUSELS

P1.2

35810 SF

P1.1

16153 SF

RIGID CAGE STRANDER

P6

32503 SF

ALUMINUM BREAK DOWN

RAW MATERIAL IN

COPPER BREAK DOWN

INTERMEDIATE COPPER
BREAK DOWN?

P2

51882 SF

SCREENING LINE

PE PROFILE EXTRUSION LINE

PE PROFILE EXTRUSION LINE

ALPE LINE?

P3

51[illegible] SF

1000T CAROUSELS

1000T CAROUSELS
(FUTURE)

W1

18606 SF

P4

50668 SF

IN TO LAY UP

Q1

LAB 1 - 9432 SF

Q1

LAB 2 - 9360 SF

VERTICAL LAYUP

1000T CAROUSELS

V1

22629 SF

V2

18953 SF

OUT TO PRE-
ARMORED CAROUSEL

STEEL WIRE DRAWING

P5

58963 SF

CABLE ARMORING MACHINE

IN TO ARMORING
MACHINE

OUT TO FINISHED
PRODUCT

1 AP-006 **FLOOR PLAN 1 - FLOOR DIAGRAM**

1" = 30'-0"

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D
C
B
A

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1	Rev A - Progress Review			2021.10.13
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File Name: N/A	Author	Designer	Checker
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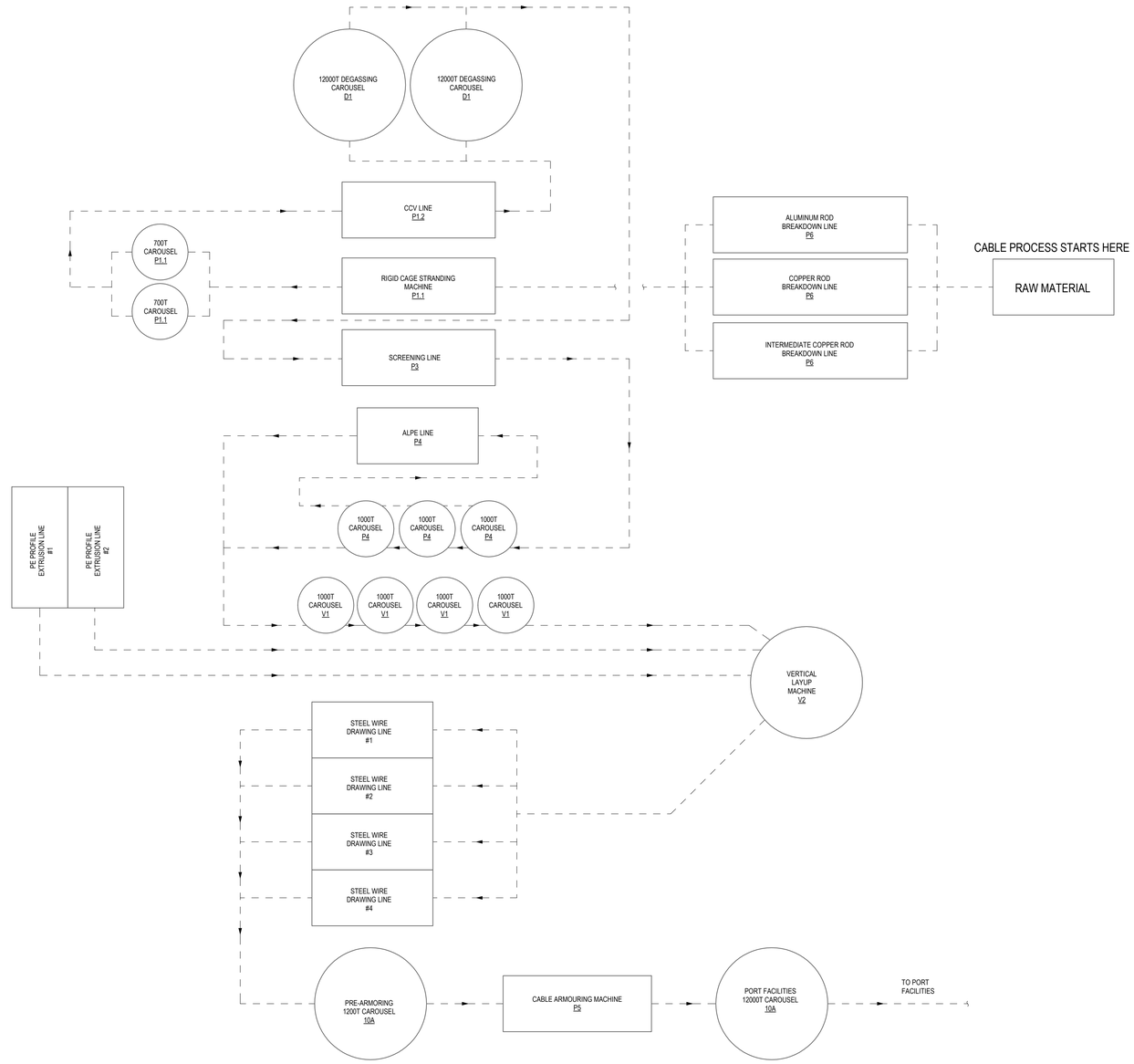
Title

PROCESS FLOW - STANTEC
PROPOSED LAYOUT

Project No. 191508204	Scale 1" = 30'-0"
Revision 1	Drawing No. **AP-006**

ORIGINAL SHEET - ARCH E1



1 PFD001 **PROCESS FLOW DIAGRAM - CABLING PROCESS**

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Project Huddell

Title

OVERALL PROCESS FLOW DIAGRAM

Project No. 191508204

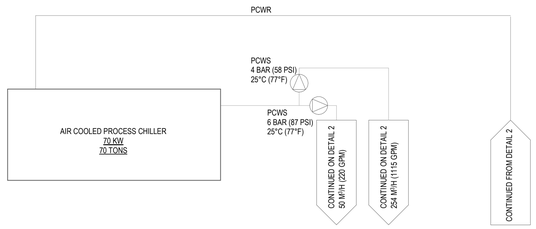
Scale NOT TO SCALE

Revision

Drawing No. **PFD001**

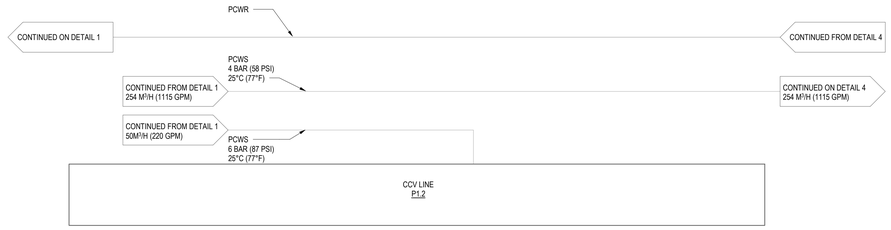
<Pick location in Project Information>
10/13/2021 12:06:57 PM

ORIGINAL SHEET - ARCH E1



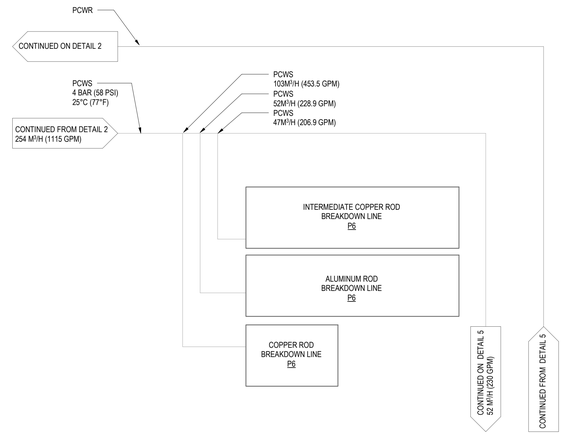
1 PFD002 PROCESS CHILLED WATER UTILITY BUILDING

NOT TO SCALE



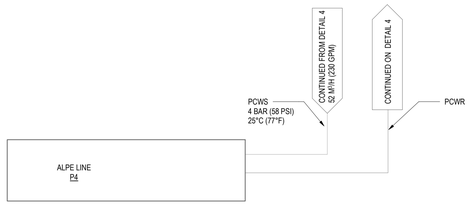
2 PFD002 PROCESS CHILLED WATER FLOW DIAGRAM - PRODUCTION HALL P1.1 / P1.2

NOT TO SCALE



4 PFD002 PROCESS CHILLED WATER FLOW DIAGRAM - PRODUCTION HALL P.6

NOT TO SCALE



5 PFD002 PROCESS CHILLED WATER FLOW DIAGRAM - PRODUCTION HALL P.3 / P.4

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Project Huddell

Project Huddell

Title

PROCESS CHILLED WATER FLOW DIAGRAM

Project No. 191508204

Scale NOT TO SCALE

Revision

Drawing No. **PFD002**

<Pick location in Project Information>
10/13/2021 12:06:58 PM
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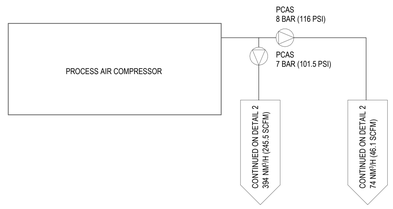
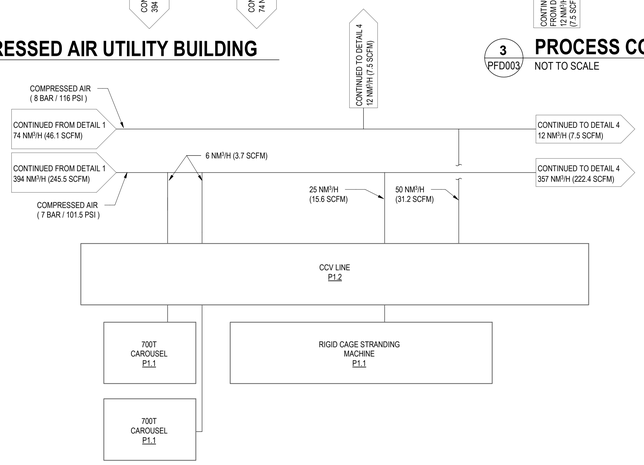


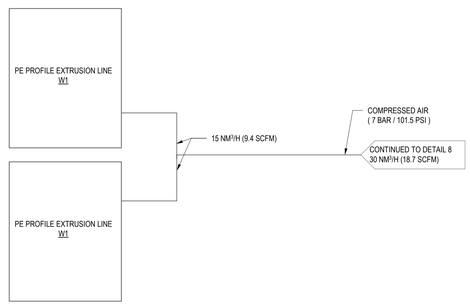
1 PFD003 PROCESS COMPRESSED AIR UTILITY BUILDING

NOT TO SCALE



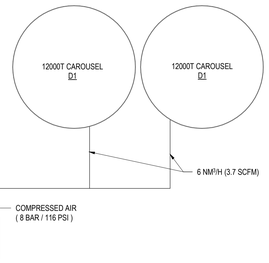
2 PFD003 PROCESS COMPRESSED AIR FLOW DIAGRAM - PRODUCTION HALL P1.1 / P1.2

NOT TO SCALE



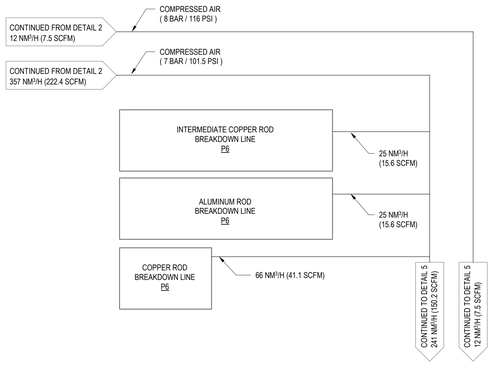
8 PFD003 PROCESS COMPRESSED AIR FLOW DIAGRAM - WAREHOUSE W.1

NOT TO SCALE



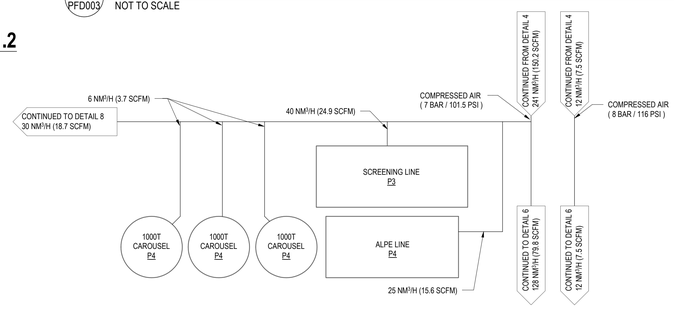
3 PFD003 PROCESS COMPRESSED AIR FLOW DIAGRAM - DEGASSING D.1

NOT TO SCALE



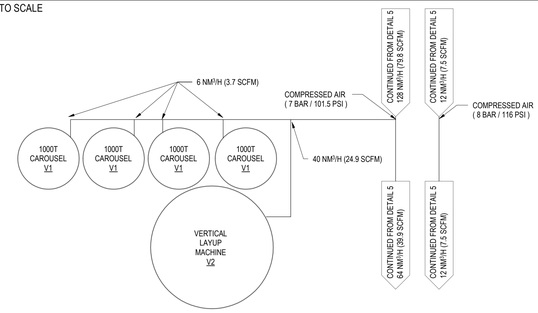
4 PFD003 PROCESS COMPRESSED AIR FLOW DIAGRAM - PRODUCTION HALL P.6

NOT TO SCALE



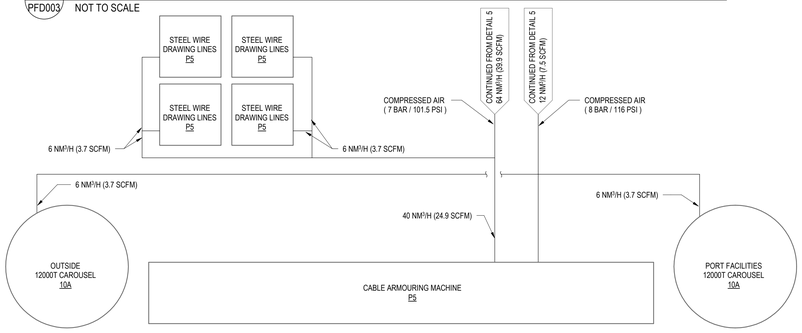
5 PFD003 PROCESS COMPRESSED AIR FLOW DIAGRAM - PRODUCTION HALL P.3 / P.4

NOT TO SCALE



6 PFD003 PROCESS COMPRESSED AIR FLOW DIAGRAM - PRODUCTION HALL V.1 / V.2

NOT TO SCALE



7 PFD003 PROCESS COMPRESSED AIR FLOW DIAGRAM - PRODUCTION HALL P.5 / OUTSIDE 10A

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File Name: N/A	Author Dwn.	Designer Dsgn.	Checker Chkd.
		09/15/21	YYYY.MM.DD

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Project Huddell

Project Huddell

Title
PROCESS COMPRESSED AIR FLOW DIAGRAM

Project No.	Scale
191508204	NOT TO SCALE
Revision	Drawing No.
	PFD003

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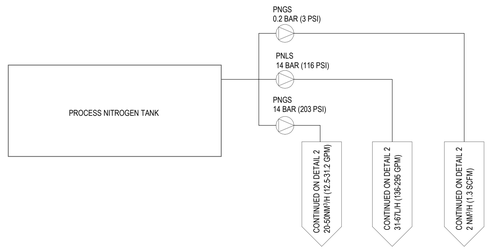
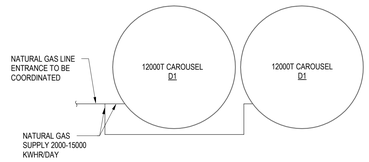


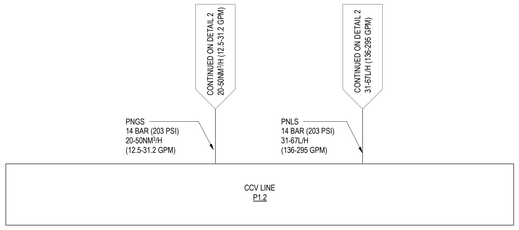
1 PROCESS NITROGEN UTILITY BUILDING

PFD004 NOT TO SCALE



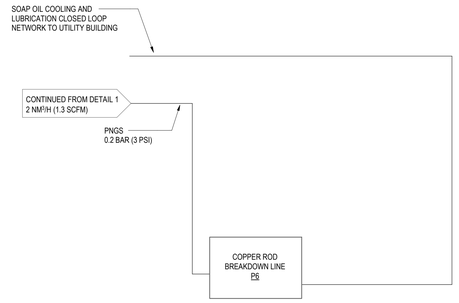
3 PROCESS NATURAL GAS FLOW DIAGRAM - DEGASSING D.1

PFD004 NOT TO SCALE



2 PROCESS NITROGEN FLOW DIAGRAM - PRODUCTION HALL P1.1 / P1.2

PFD004 NOT TO SCALE



4 PROCESS NITROGEN AND SOAP OIL FLOW DIAGRAM - PRODUCTION HALL P.6

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Issued/Revision	By	Appd	YYYY.MM.DD

File Name: N/A	Author	Designer	Checker	09/15/21
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

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Client/Project Logo

Client/Project
Project Huddell

Project Huddell

Title
PROCESS NITROGEN AND MISC
UTILITIES FLOW DIAGRAM

Project No.	Scale
191508204	NOT TO SCALE
Revision	Drawing No. **PFD004**

•Plot location in Project Information•
10/13/2021 12:06:39 PM

ORIGINAL SHEET - ARCH E1

SITE UTILITIES

- HANDHOLE
- SITE METER
- MANHOLE
- PRIMARY MANHOLE
- SECONDARY MANHOLE
- TELECOMMUNICATIONS MANHOLE

SITE UTILITY POLES

- CATV ONLY
- COMBINED SERVICES
- POWER ONLY
- RISER
- TELECOM ONLY
- STEPDOWN TRANSFORMER, POLE MOUNTED

ELECTRICAL EQUIPMENT

- 208V OR 240V POWER PANELBOARD
- 480V OR 600V POWER PANELBOARD
- EQUIPMENT CABINET OR PANEL
- EQUIPMENT CONNECTION, FILL INDICATES EMERGENCY CIRCUIT
- GROUND BAR
- MOTOR CONNECTION, 1Ø
- MOTOR CONNECTION, 3Ø
- BUS DUCT
- ATS — AUTOMATIC TRANSFER SWITCH
- BUS DUCT PLUG
- SPD — SURGE PROTECTIVE DEVICE
- T — TRANSFORMER, LESS THAN 30KVA, NOT TO SCALE
- TRANSFORMER, 30KVA OR GREATER, DRAWN TO SCALE
- AC/DC INVERTER
- AUTOMATIC TRANSFER SWITCH

ELECTRICAL CONTROLS

- NON-FUSED SAFETY SWITCH
- FUSED SAFETY SWITCH, FUSE RATING INDICATED
- COMBINATION MOTOR STARTER AND FUSED SAFETY SWITCH, FUSE RATING INDICATED
- MOTOR STARTER
- MANUAL MOTOR STARTER
- AUTOMATIC DOOR PUSHPLATE
- EMERGENCY SHUTDOWN
- ENCLOSED CIRCUIT BREAKER
- ENCLOSED CONTACTOR
- PUSH BUTTON CONTROL STATION
- TOGGLE SWITCH, MOTOR RATED
- DDC — DIRECT DIGITAL CONTROL PANEL
- R — RELAY
- T — THERMOSTAT
- TC — TIME CLOCK
- VFD — VARIABLE FREQUENCY DRIVE

FIRE ALARM

- FACP — FIRE ALARM CONTROL PANEL, SURFACE/RECESSED
- FAA — FIRE ALARM ANNUNCIATOR PANEL, RECESSED
- NAC — FIRE ALARM NOTIFICATION APPLIANCE CIRCUIT PANEL
- FATP — FIRE ALARM TRANSPONDER PANEL
- CM — FIRE ALARM CONTROL MODULE
- F — FIRE ALARM MANUAL PULLSTATION - WALL MOUNTED
- FIRE ALARM HORN/STROBE - CEILING MOUNTED
- FIRE ALARM HORN/STROBE - WALL MOUNTED
- S — FIRE ALARM SMOKE DETECTOR - CEILING MOUNTED
- S D — FIRE ALARM SMOKE DETECTOR - IN DUCT
- EOL — FIRE ALARM END-OF-LINE RESISTOR
- IAM — FIRE ALARM INDIVIDUAL ADDRESSABLE MODULE
- RAM — FIRE ALARM RELAY ADDRESSABLE MODULE
- HT — FIRE ALARM HEAT DETECTOR
- TS — FIRE ALARM TAMPER SWITCH
- FS — FIRE ALARM FLOW SWITCH
- RS — FIRE ALARM PRESSURE SWITCH
- RTS — FIRE ALARM REMOTE TEST SWITCH
- FIRE ALARM STROBE - CEILING MOUNTED
- FIRE ALARM STROBE - WALL MOUNTED
- RSFACU — RELEASING SERVICE FIRE ALARM CONTROL UNIT
- MM — FIRE ALARM MONITOR MODULE
- PRE-ACTION SOLENOID VALVE
- EPO — EPO KEY OPERATED BYPASS SWITCH
- K — PREACTION KEY OPERATED MAINTENANCE BYPASS SWITCH

RECEPTACLES

CIRCUITS EMERGENCY	CIRCUITS NORMAL	
		SINGLE RECEPTACLE, 120V
		SINGLE RECEPTACLE, CEILING MOUNTED
		DUPLEX RECEPTACLE, 120V
		DUPLEX RECEPTACLE, CEILING MOUNTED
		DOUBLE DUPLEX RECEPTACLE, 120V
		DOUBLE DUPLEX RECEPTACLE, CEILING MOUNTED
		SPLIT WIRED RECEPTACLE, 120V, TOP SWITCHED
		RECEPTACLE, NEMA #
		COMBINATION RECEPTACLE, 120V AND NEMA #
		FURNITURE SYSTEMS RECEPTACLE, 120V
N/A		INDICATES CONTROLLED
N/A		INDICATES 15A
N/A		INDICATES TWIST LOCK
N/A		INDICATES MOUNTED 3" (75 MM) ABOVE COUNTER BACKSPLASH OR MOUNTED AT 42" (1065 MM) IF NO COUNTER IN THE AREA
N/A		MULTI-SERVICE FLOOR BOX (RECEPTACLES/OUTLETS AS INDICATED)
N/A		MULTI-SERVICE POKE THRU (RECEPTACLES/OUTLETS AS INDICATED)
N/A		MULTI-SERVICE POWER POLE (RECEPTACLES/OUTLETS AS INDICATED)
N/A		MULTI-SERVICE ASSEMBLY (RECEPTACLES/OUTLETS AS INDICATED)
N/A		CLOCK RECEPTACLE, 120V
		CEILING CORD DROP, 120V

RECEPTACLE TYPES

- A — ARC FAULT CIRCUIT INTERRUPTER
- AT — ARC FAULT CIRCUIT INTERRUPTER AND TAMPER RESISTANT
- D — DEDICATED CIRCUIT
- G — GROUND FAULT CIRCUIT INTERRUPTER
- GT — GROUND FAULT CIRCUIT INTERRUPTER AND TAMPER RESISTANT
- IG — ISOLATED GROUND
- S — SURGE PROTECTOR
- T — TAMPER RESISTANT
- U — INTEGRAL USB PORT(S)
- WP — GROUND FAULT CIRCUIT INTERRUPTER WITH WEATHER RESISTANT COVER

CIRCUITS

- RACEWAY CONCEALED IN CEILING OR WALL. EXPOSED RACEWAY IS ALLOWED ONLY WHERE NOTED.
- UE — RACEWAY BELOW SLAB OR UNDERGROUND
- RACEWAY UP
- RACEWAY DOWN
- RACEWAY CONTINUATION
- RACEWAY STUB-OUT WITH BUSHING
- J — JUNCTION BOX, CEILING OR ABOVE CEILING MOUNTED
- J — JUNCTION BOX, WALL MOUNTED
- PB — PULL BOX
- ?????-##,?? — CIRCUIT DESIGNATION, ("PANEL NAME"-"CIRCUIT NUBMER","SWITCHING")
- ?????-##,?? — CIRCUIT DESIGNATION BY ROW
- XYZ — EQUIPMENT IDENTIFIER TAG, REFER TO SITE SPECIFIC EQUIPMENT SCHEDULES ON DRAWING E003

SITE/LANDSCAPE/GARAGE LUMINAIRES

- COBRA HEAD WALL MOUNT LED FIXTURE
- WALL PACK

LUMINAIRES

- LUMINAIRE IDENTIFICATION, SEE LUMINAIRES SCHEDULE
- L01 a — LOWER-CASE LETTER(S) NEAR LUMINAIRE DENOTE SWITCH LEG(S)
- RECESSED RECTANGULAR LUMINAIRE, DRAWN TO SCALE
- SURFACE MOUNTED RECTANGULAR LUMINAIRE, DRAWN TO SCALE
- RECESSED BASKET LUMINAIRE, DRAWN TO SCALE
- STRIP LUMINAIRE, LENGTH TO SCALE
- WALL MOUNTED RECTANGULAR LUMINAIRE, LENGTH TO SCALE (NUMBER OF MOUNTING POINTS WILL VARY WITH THE LUMINAIRE LENGTH AND ARE NOT INDICATED.)
- RECESSED DOWNLIGHT LUMINAIRE
- SURFACE MOUNTED DOWNLIGHT LUMINAIRE
- PENDANT MOUNTED LUMINAIRE
- LINEAR PENDANT MOUNTED LUMINAIRE, LENGTH TO SCALE (NUMBER OF MOUNTING POINTS WILL VARY WITH THE LUMINAIRE LENGTH AND ARE NOT INDICATED.)
- WALL MOUNTED LUMINAIRE
- WALL MOUNTED VERTICALLY ORIENTED LUMINAIRE
- WALL MOUNTED RECESSED LINEAR LUMINAIRE, LENGTH TO SCALE
- EXIT SIGN, FILLED SIDES INDICATE ILLUMINATED ANNOTATION, ARROWS INDICATE DIRECTIONAL GRAPHICS
- WALL MOUNTED EXIT SIGN, FILLED SIDES INDICATE ILLUMINATED ANNOTATION, ARROWS INDICATE DIRECTIONAL GRAPHICS
- WALL MOUNTED EMERGENCY BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
- RECESSED ACCENT LUMINAIRE
- SURFACE MOUNTED ACCENT LUMINAIRE
- PENDANT MOUNTED ACCENT LUMINAIRE
- CONTINUOUS SOURCE LUMINAIRE, PATH AS INDICATED

LIGHTING CONTROLS

- SINGLE POLE SWITCH
- INDICATES WIRELESS CONTROL
- LOWER-CASE LETTER(S) NEAR SWITCH DENOTE SWITCH LEG(S)
- 2 — DOUBLE POLE SWITCH
- 3 — THREE-WAY SWITCH
- 4 — FOUR-WAY SWITCH
- D — DIMMER SWITCH
- K — KEY OPERATED SWITCH
- LV — MOMENTARY CONTACT LOW VOLTAGE SWITCH
- O — OCCUPANCY SENSOR SWITCH
- OD — OCCUPANCY SENSOR/DIMMER SWITCH
- P — SWITCH WITH PILOT LIGHT
- PC — PHOTOCELL SWITCH
- S — SELECTOR SWITCH
- T — TIMER SWITCH
- LOW VOLTAGE CONTROL STATION, # INDICATES STATION IDENTIFICATION
- DSC — DIMMING SYSTEM CONTROL PANEL
- ELCU — EMERGENCY LIGHTING CONTROL UNIT
- LCP — LIGHTING CONTROL PANEL
- OS — OCCUPANCY SENSOR SWITCH, CEILING MOUNTED
- OSE — OCCUPANCY SENSOR SWITCH, CEILING MOUNTED, EXTENDED RANGE
- OSW — OCCUPANCY SENSOR SWITCH, WALL/CORNER MOUNTED
- PS — PHOTO SENSOR CONTROL
- PSC — PHOTO SENSOR CONTROL, CEILING MOUNTED
- R — RELAY
- T — LOW VOLTAGE TRANSFORMER

PANELBOARD DESIGNATIONS

NAME	NAME	NAME	NAME	NAME
225 A MCB	225 A MCB		225 A MCB	225 A MCB
480 V 3 Ø, 4 W	480 V 3 Ø, 4 W		480 V 3 Ø, 4 W	480 V 3 Ø, 4 W
PANEL, SINGLE TUB	PANEL, DOUBLE TUB, MAIN LUGS		PANEL, DOUBLE TUB, FEED THRU LUGS	

ELECTRICAL SCHEMATICS

- BATTERY
- CIRCUIT BREAKER, LOW VOLTAGE, DRAW OUT
- CIRCUIT BREAKER, LOW VOLTAGE, FIXED
- CIRCUIT BREAKER, LOW VOLTAGE, WITH LIMITER
- CIRCUIT BREAKER, MEDIUM VOLTAGE, DRAW OUT
- CIRCUIT BREAKER, MEDIUM VOLTAGE, FIXED
- CIRCUIT BREAKER, MEDIUM VOLTAGE, VACUUM INTERRUPTER
- CONNECTION, CONNECTED
- CONNECTION, DRAW OUT, DISCONNECTED
- CONNECTION, FEED FROM/TO
- CONNECTION, SPLICE
- CONTACT
- CURRENT TRANSFORMER
- DEAD BREAK ELBOW
- DRAW OUT FUSE AND POTENTIAL TRANSFORMER
- FUSE
- FUSED CUTOUT
- GROUND
- GROUND STUD
- LOAD BREAK ELBOW
- POTENTIAL TRANSFORMER
- POTHEAD
- STRESS CONE
- SWITCH, FUSED LOAD BREAK
- SWITCH, NON-FUSED LOAD BREAK
- SWITCH, NON-FUSED DOUBLE LOAD BREAK
- SWITCH, NON-FUSED LOAD BREAK WITH GROUNDING POSITION
- TRANSFORMER
- TRANSFORMER CONFIGURATION, DELTA
- TRANSFORMER CONFIGURATION, DELTA, OPEN
- TRANSFORMER CONFIGURATION, DELTA, CORNER GROUND
- TRANSFORMER CONFIGURATION, WYE
- TRANSFORMER CONFIGURATION, WYE, SOLID GROUND
- A — AMMETER
- AS — AMPERAGE METER SWITCH
- DMS — DIGITAL METERING SYSTEM
- G — GENERATOR
- K — KIRK KEY
- LSIG — RELAY, TRIP UNIT
- LSIG — DRAW OUT BREAKER C/W INTEGRAL SOLID STATE TRIP UNIT
- LSIG — DRAW OUT BREAKER C/W SERIES ELECTROMECHANICAL TRIP UNIT
- M — INLINE SOCKET METER
- METER — METER
- O/L — ELECTRONIC THERMAL OVERLOAD
- SB — SHORTING BLOCK
- Circuit Breaker — SPACE, DRAW OUT BREAKER
- SPACE — SPACE, FIXED BREAKER
- SPD — SURGE PROTECTION DEVICE
- TS — TEST SWITCH
- V — VOLTMETER
- VS — VOLTAGE METER SWITCH
- X — INDICATOR, VOLTAGE PRESENT

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Notes

Issued/Revision				
A Progress Review		CSA		2021.10.13
		By	Appd	YYYY.MM.DD

File Name: N/A	Author	Designer	Checker	10/13/21
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Title
ELECTRICAL SYMBOLS AND ABBREVIATIONS

Project No.	Scale
191508204	12" = 1'-0"
Revision: A	Drawing No.: E001

<Pcs location in Project Information>
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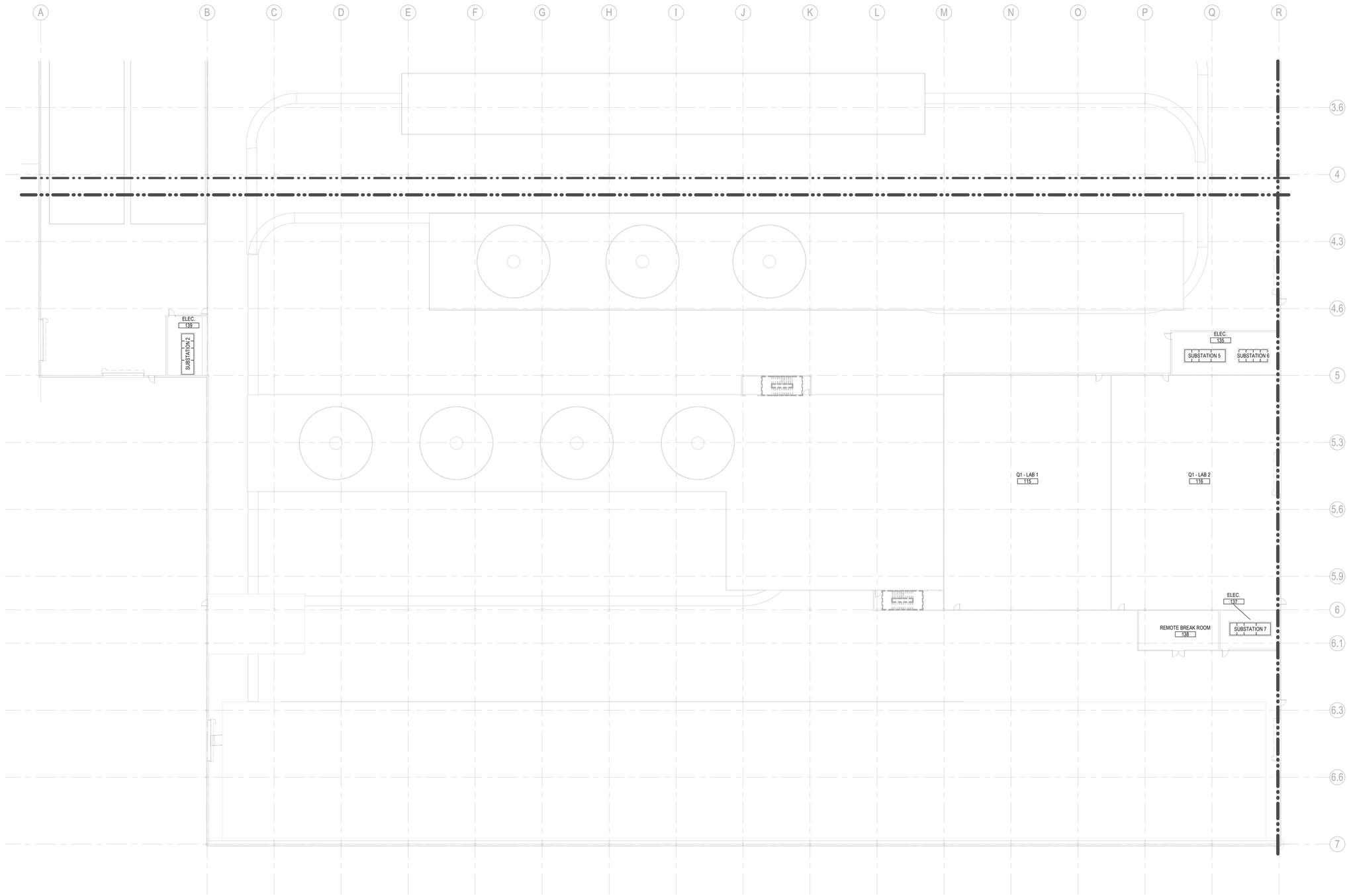

1 E201A **FIRST FLOOR PLAN - POWER - SECTOR A**
1" = 20'-0"

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Title
FIRST FLOOR PLAN - POWER - SECTOR A

Project No.	Scale
191508204	1" = 20'-0"
Revision	Drawing No.
A	**E201A**

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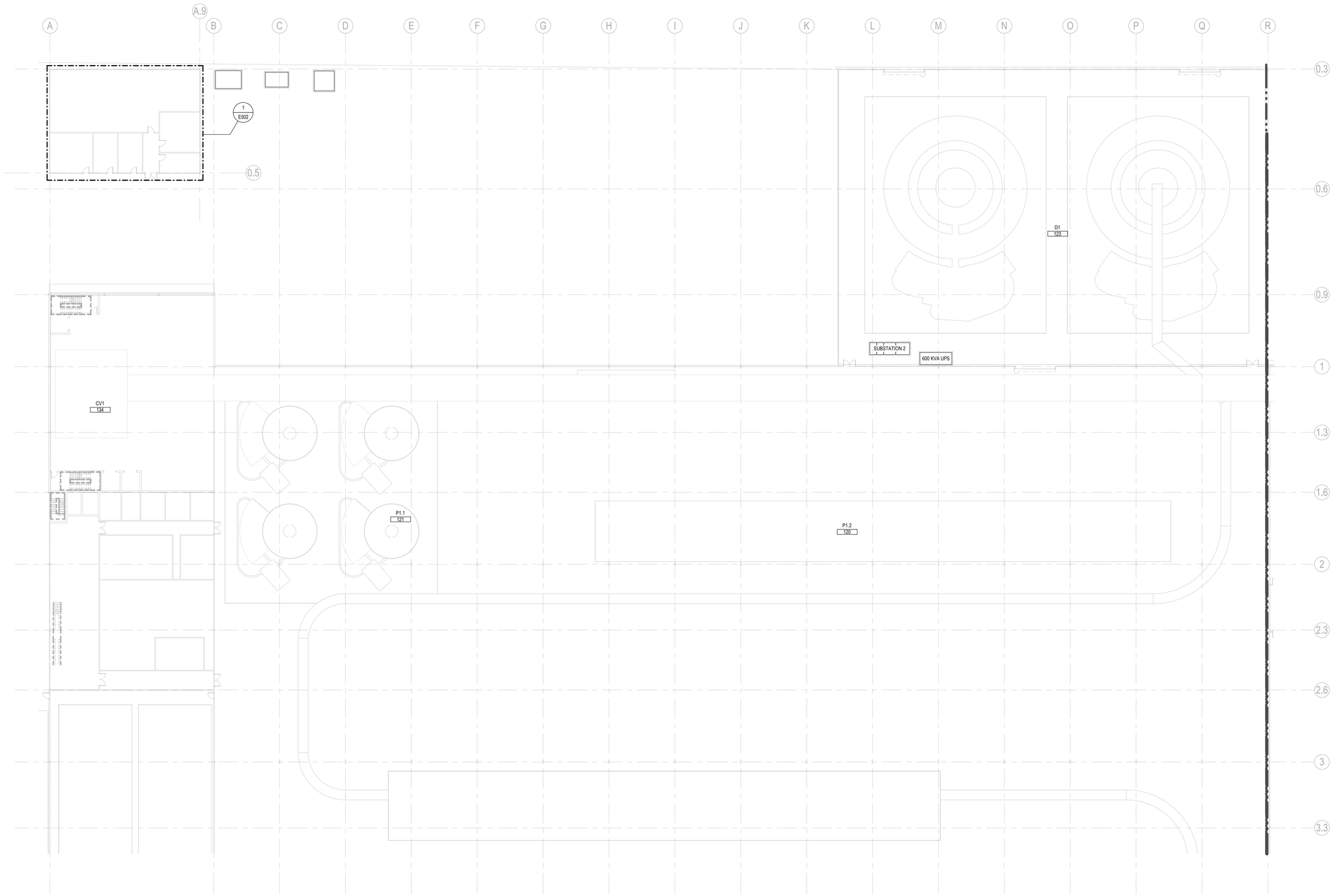

1 E201B **FIRST FLOOR PLAN - POWER - SECTOR B**

1" = 20'-0"

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Title
FIRST FLOOR PLAN - POWER - SECTOR B

Project No.
191508204

Scale
1" = 20'-0"

Revision
A

Drawing No.
E201B

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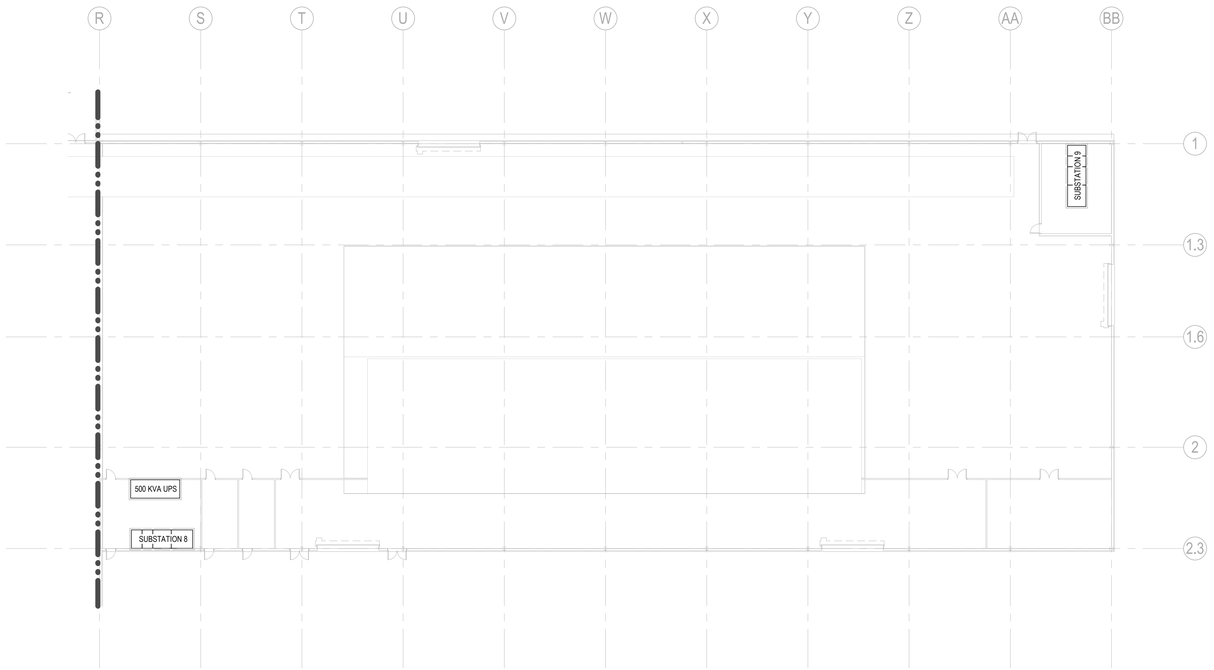

1 FIRST FLOOR PLAN - POWER - SECTOR C

E201C

1" = 20'-0"

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Title
FIRST FLOOR PLAN - POWER - SECTOR C

Project No. 191508204	Scale 1" = 20'-0"
Revision A	Drawing No. **E201C**

«Pick location in Project Information»
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ORIGINAL SHEET - ARCH E1



1 E201D **Q2 BUILDING**
1/8" = 1'-0"

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File Name: N/A	Author	Designer	Checker	10/12/21
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Project Huddell

Title
FIRST FLOOR PLAN - POWER - Q2 BUILDING

Project No.	Scale
191508204	1/8" = 1'-0"
Revision: A	Drawing No.: **E201D**

*Plot location in Project Information
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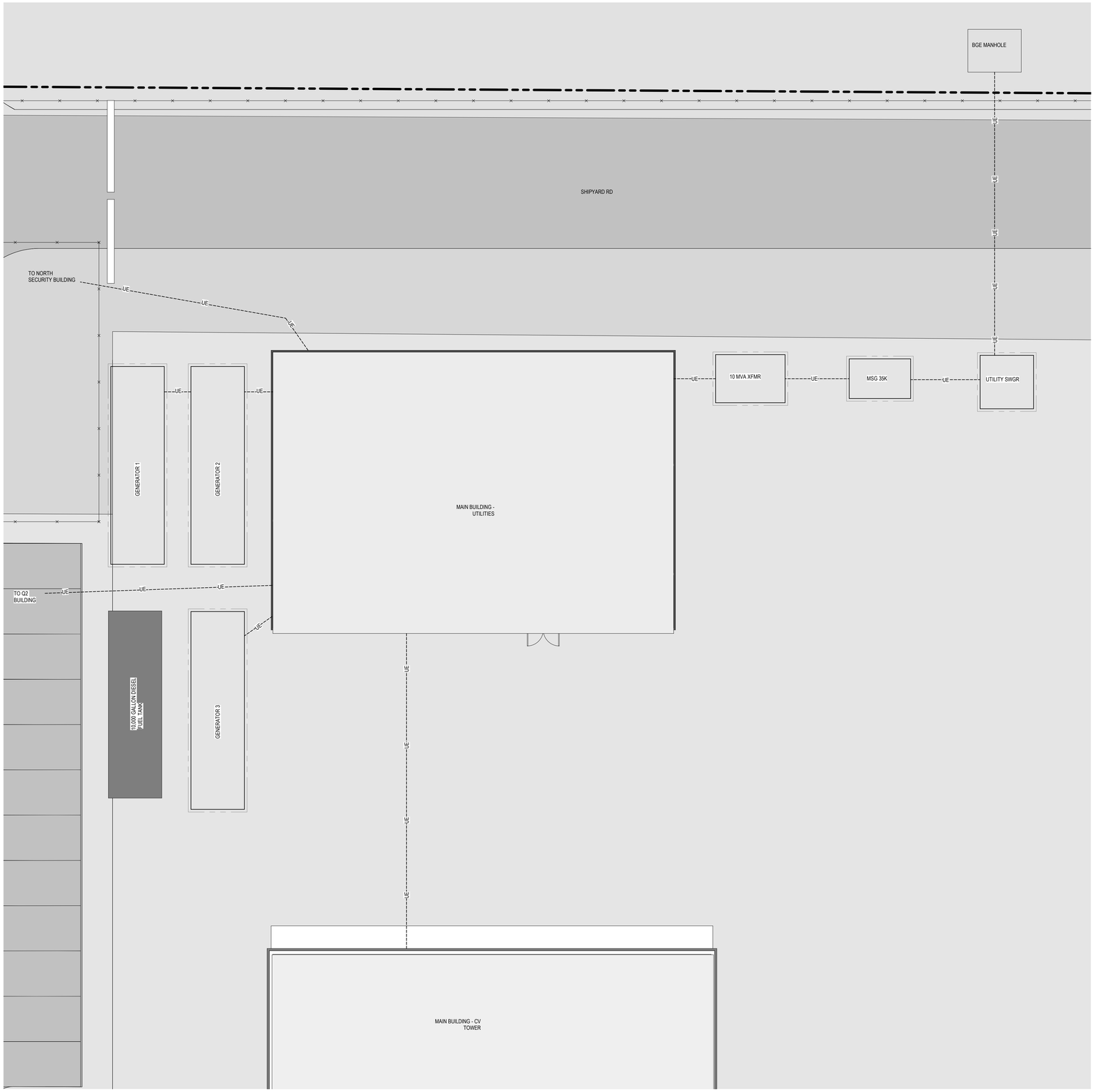

1 E501 **SITE PLAN-UTILITY BLDG**
1/8" = 1'-0"

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A Progress Review	CSA		2021.10.13

File Name: N/A	Author	Designer	Checker	10/11/21
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

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Title
UTILITY BUILDING - POWER - SITE PLAN

Project No. 191508204
Scale 1/8" = 1'-0"
Revision A
Drawing No. E501

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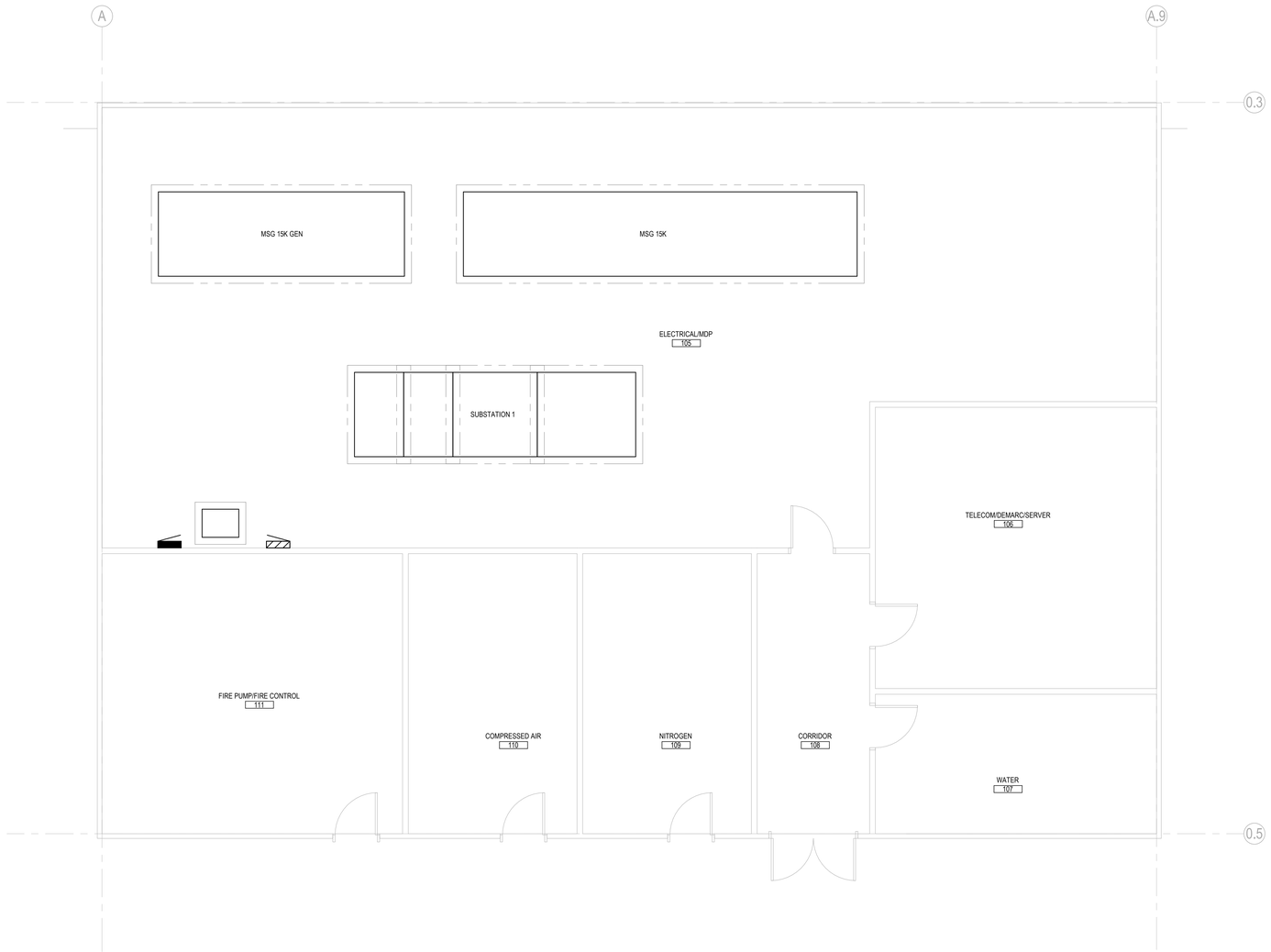

1 E502 **UTILITY BUILDING**

1/4" = 1'-0"

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Title

UTILITY BUILDING - POWER - ENLARGED PLAN

Project No.	Scale
191508204	1/4" = 1'-0"
Revision: A	Drawing No.: **E502**

Plot location in Project Information
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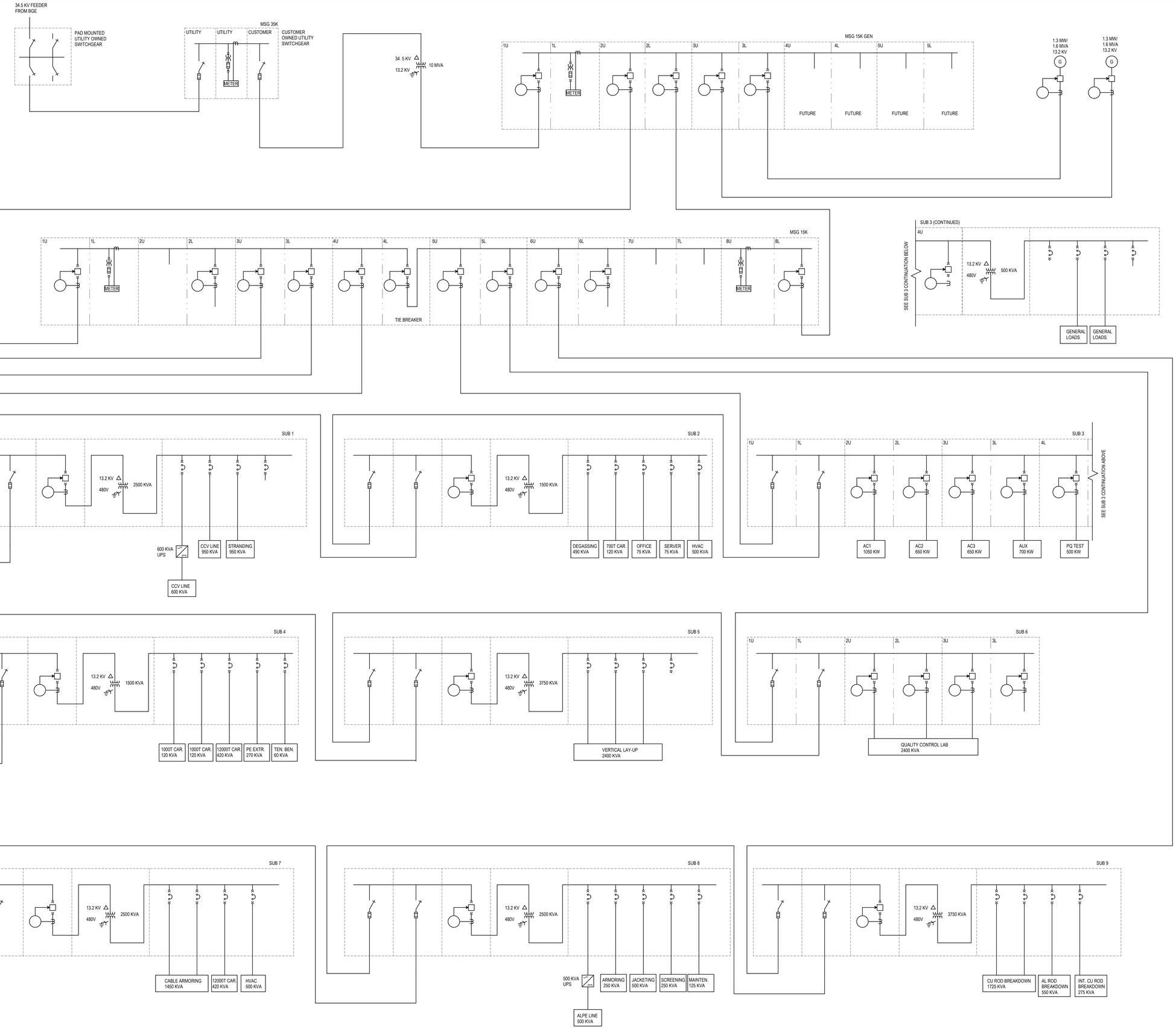

1 E600 SINGLE LINE DIAGRAM

SCALE: NTS

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Client/Project Logo

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Project Huddell

Project Huddell

Title
SINGLE LINE DIAGRAM

Project No.	Scale
191508204	NOT TO SCALE
Revision: A	Drawing No.: E600

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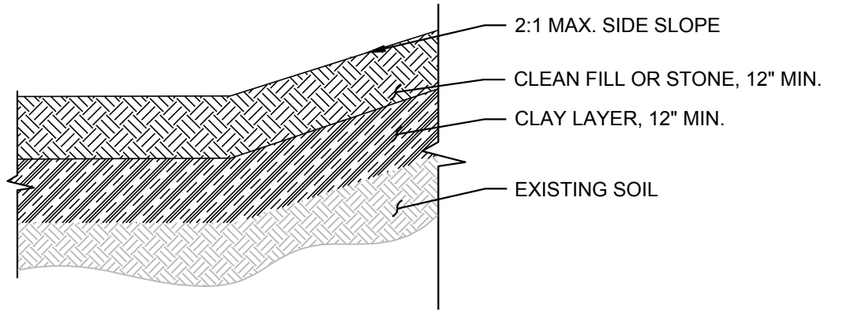
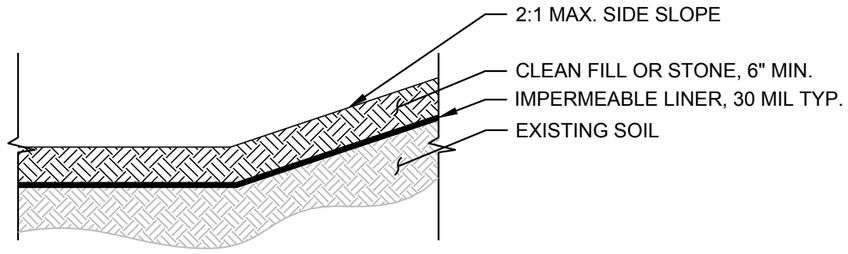
ORIGINAL SHEET - ARCH E1

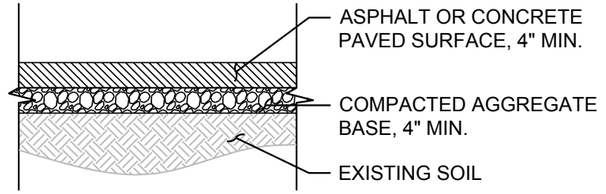
APPENDIX E





TYPICAL POND SECTIONS
NOT TO SCALE

TYPICAL LANDSCAPE SECTION
NOT TO SCALE



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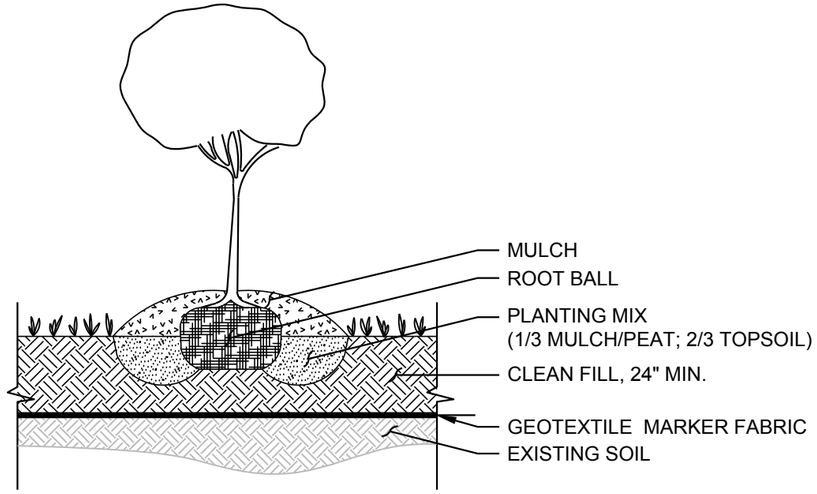


TYPICAL PLANTING SECTION
NOT TO SCALE

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

TABLE 1

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\160443M EAG_TPA Redevelopment\Dwg\B6\Production\Figure 6b - Environmental Capping Detail.dwg Plotted: April 9, 2019

ARM Group LLC
Engineers and Scientists

designed RJC
checked TNP
drawn RJC
scale N/A
date 9/8/2020
project no. 160443M

drawing title: MINIMUM CAPPING SECTION DETAILS

project title: SPARROWS POINT TRADEPOINT ATLANTIC

SPARROWS POINT
BALT. COUNTY, MARYLAND

Sheet 1

APPENDIX F

GENERAL NOTES:

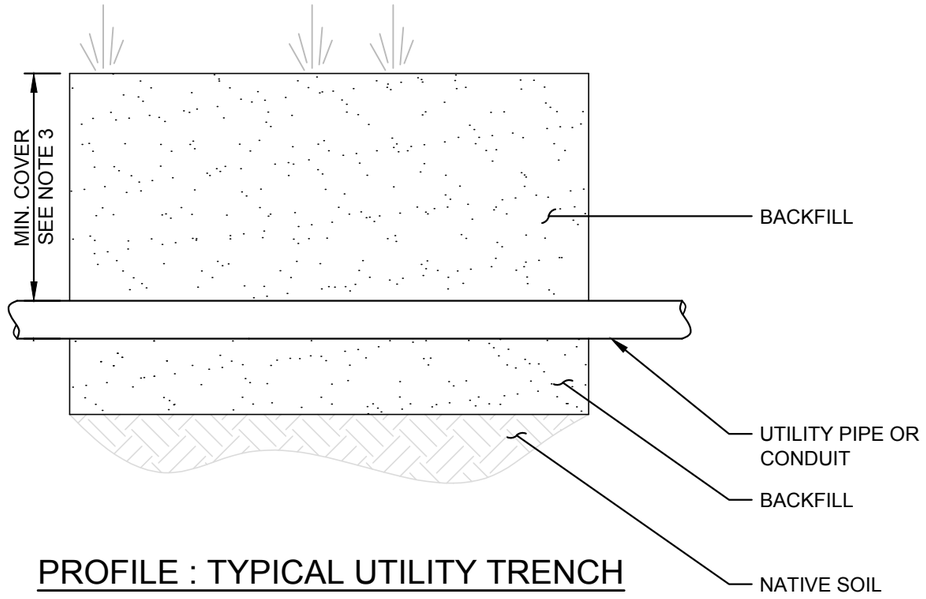
1. ALL PIPES OR CONDUIT SHALL BE LEAK-PROOF AND WATERTIGHT. ALL JOINTS SHALL BE SEALED OR GASKETED.

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.

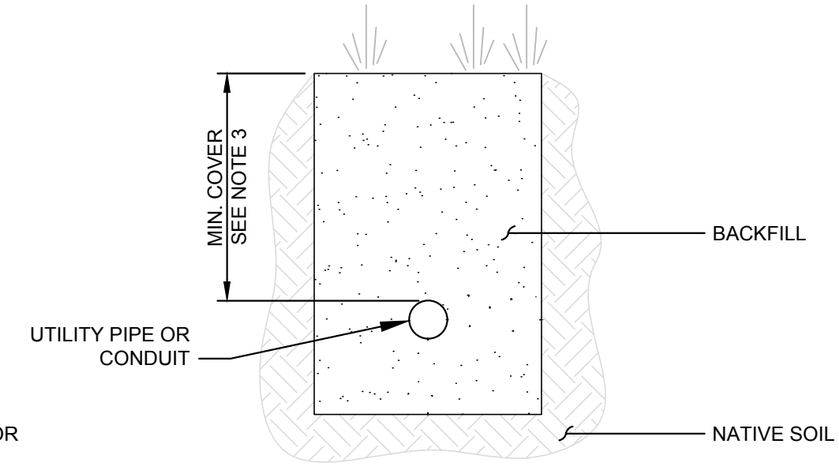
3. MINIMUM COVER ABOVE UTILITY SHALL BE BASED ON SPECIFIC UTILITY REQUIREMENTS.

4. TRENCHES SHALL BE BACKFILLED WITH BEDDING AND MATERIALS APPROVED BY MDE.

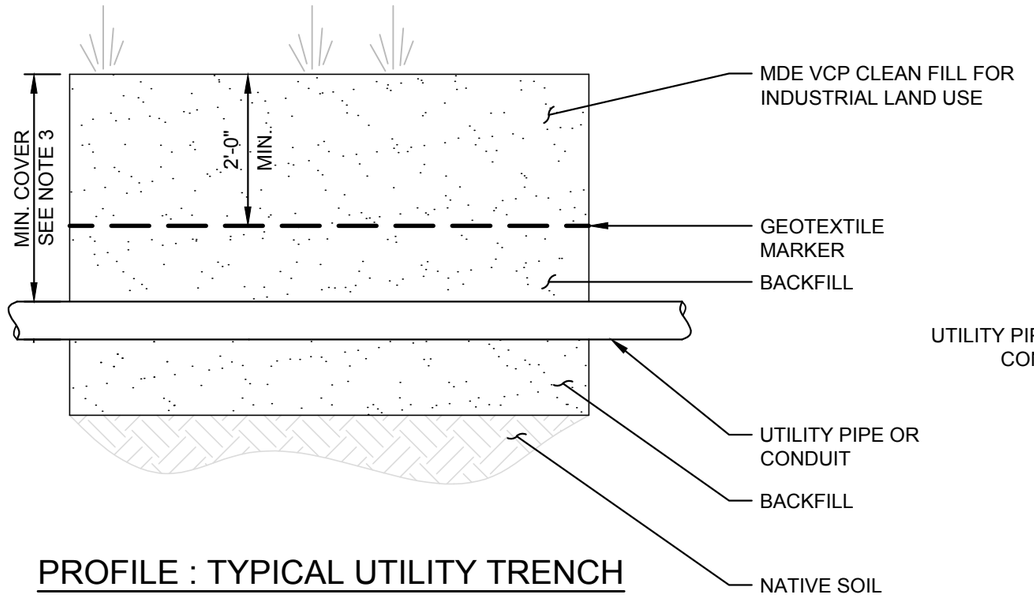
5. FOR ANY UTILITY SEGMENT WHICH GOES THROUGH AN AREA WHICH IS DESIGNATED TO RECEIVE A LANDSCAPED CAP, THE UPPER 2 FEET OF BACKFILL MUST MEET THE REQUIREMENTS OF MDE VCP CLEAN FILL FOR INDUSTRIAL LAND USE. IN THIS CASE THE MDE VCP CLEAN FILL WILL BE UNDERLAIN BY A GEOTEXTILE MARKER FABRIC. UTILITY SEGMENTS 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.



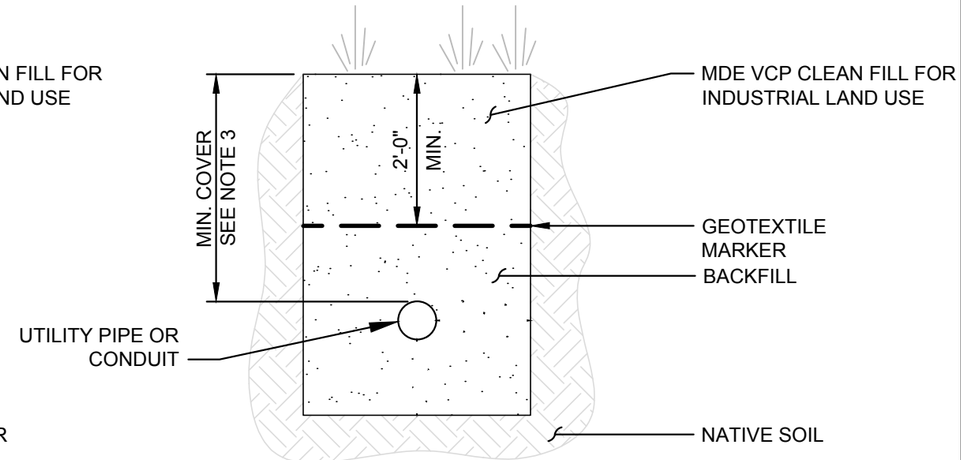
PROFILE : TYPICAL UTILITY TRENCH



SECTION : TYPICAL UTILITY



PROFILE : TYPICAL UTILITY TRENCH
(SEE NOTE 5)



SECTION : TYPICAL UTILITY
(SEE NOTE 5)

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ARM Group LLC
Engineers and Scientists

TYPICAL UTILITY
CROSS SECTIONS
Sparrows Point Site
Tradepoint Atlantic

September 2020
1/2" = 1'-0"
160443M

Figure
1

\\armgroup.lcl\CorpData\Projects\EnviroAnalytics Group\160443M EAG_TPA Redevelopment\Drwg\Reference\Utility Cross Section_REV.dwg Plotted: January 11, 2018

APPENDIX G

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.

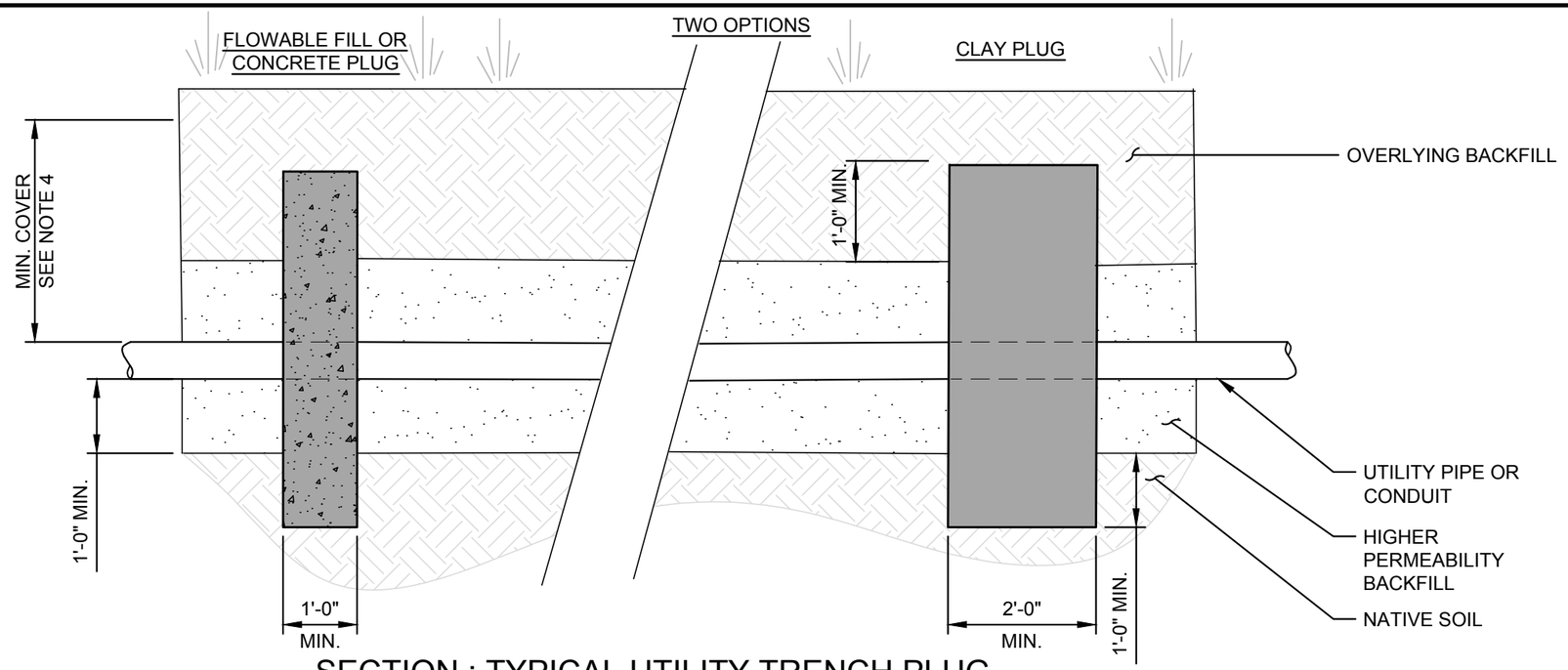
5. TRENCHES SHALL BE BACKFILLED WITH BEDDING AND MATERIALS APPROVED BY MDE.

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.

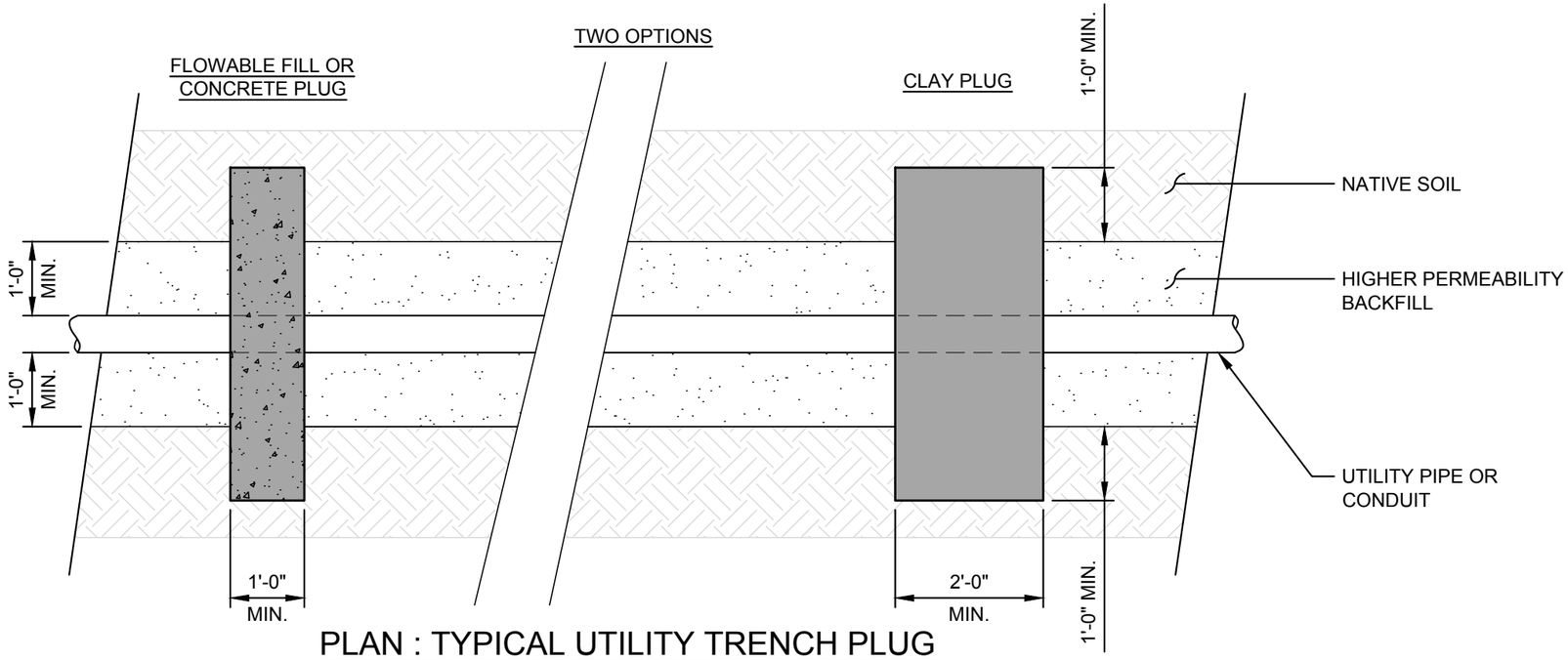
7. ALL UTILITIES INSTALLED THROUGH AREAS CONTAINING NAPL OR ELEVATED CHEMICAL IMPACTS WITH THE POTENTIAL TO TRANSMIT VAPORS ALONG PREFERENTIAL FLOW PATHWAYS SHALL BE EITHER 1) BACKFILLED WITH LOW PERMEABILITY BACKFILL MATERIAL (LESS THAN OR EQUAL TO THE PERMEABILITY OF THE EXISTING SUBGRADE), OR 2) INSTALLED 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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UTILITY TRENCH PLUG
Sparrows Point Site
Tradepoint Atlantic

September 2020	Figure
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