

# **Area 1, Phase 2 Detailed Development Plan Parcel 3 Development**

**Honeywell Baltimore Works Site  
Baltimore, Maryland**

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## Acronyms and Abbreviations

<b><u>Name</u></b>	<b><u>Description</u></b>
AST	Aboveground Storage Tank
bgs	Below ground surface
BMPs	Best Management Practices
° C	Degrees Celsius
CAMP	Construction Air Monitoring Plan
CDP	Conceptual Development Plan
CFR	Code of Federal Regulations
CHASP	Contractor Health and Safety Plan
COC	Contaminant of Concern
COMAR	Code of Maryland Regulations
COPR	Chromium Ore Process Residue
CR	Crusher Run
CrVI	Hexavalent Chromium
CSSA	Cover Soil Stockpile Area
DDP	Detail Development Plan
DOT	U.S. Department of Transportation

<b><u>Name</u></b>	<b><u>Description</u></b>
DW	Deep Well
EC	Emergency Coordinator
EE	Engineering Evaluation
EMMP	Environmental Media Monitoring Plan
EPS	Expanded Polystyrene
ERM	Environmental Resources Management, Inc.
ERP	Emergency Response Plan
ERS	Environmental Remediation System
ESC	Erosion and Sediment Control
EWMI	Environmental Waste Minimization, Inc.
F	Fahrenheit
GCL	Geosynthetic Clay Liner
GGMP	Groundwater Gradient Monitoring Plan
H&S	Health and Safety
HASP	Health and Safety Plan
HAZMAT	Hazardous Materials
HAZWOPER	Hazardous Waste Operations and Emergency Response
HB	Hydraulic Barrier
HDPE	High Density Polyethylene
HMS	Head Maintenance System
Honeywell	Honeywell International Inc.
HPD	Harbor Point Development LLC
HSC	Health and Safety Coordinator
HSG	Health and Safety Guidance
HW	Hazardous Waste
IC	Ion Chromatography
LLDPE	Linear Low Density Polyethylene
LOD	Limits of Disturbance
m	Meter
m <sup>3</sup>	Cubic Meters
MDE	Maryland Department of the Environment
MDOT	Maryland Department of Transportation
MD SWM	Maryland Stormwater Design Manual
mg	Milligram
MHMP	Material Handling and Management Plan
MLW	Mean Low Water

<b><u>Name</u></b>	<b><u>Description</u></b>
MMC	Multimedia Cap
MPs	Monitoring Plates
MSDSs	Material Safety Data Sheets
msl	Mean Sea Level
MSS	Master Supervisory Station
NAAQS	National Ambient Air Quality Standard
NELAP	National Environmental Laboratory Accreditation Program
ng	Nanogram
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OCP	Oil Control Program
OSHA	Occupational Safety and Health Administration
oz/sy	Ounce per square yard
PAHs	Polycyclic Aromatic Hydrocarbons
PAM	Perimeter Air Monitor
PE	Professional Engineer
PELs	Permissible Exposure Limits
PM	Project Manager
PM <sub>10</sub>	Particulate Matter with aerodynamic diameter <10 micrometer
PPE	Personal Protection Equipment
psf	Pounds per square foot
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RAMs	Real-time Aerosol Monitors
RCRA	Resource Conservation and Recovery Act
RIC	Remote Intelligent Controllers
RQ	Reportable Quantity
S-B	Soil-bentonite
SWP	Solid Waste Program
SPCC	Spill Prevention, Control, and Countermeasure
SPRP	Spill Prevention and Response Plan
SSMP	Surface Soil Monitoring Plan
SSO	Site Safety Officer

<b><u>Name</u></b>	<b><u>Description</u></b>
SW	Shallow Well
SWM	Stormwater Management
SWPPP	Stormwater Pollution Prevention Plan
µg	Microgram
µg/m <sup>3</sup>	Micrograms per cubic meter
µm	Micrometer
USDOJ	U.S. Department of Justice
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
VCP	Voluntary Clean-up Program

## 1. INTRODUCTION

Harbor Point Parcel 3 Development, LLC and its consultants have prepared this Detail Development Plan (DDP) for the second phase (Phase 2) of development on Area 1 at the former AlliedSignal Baltimore Works Site (Site), located in Baltimore, Maryland. For prior environmental remediation purposes, the Site is divided into three Areas (Areas 1, 2, and 3); each Area is comprised of a different environmental remedy including different engineered caps. Area 1 is bounded by Will Street to the east, Dock Street to the north and the Patapsco River to the northwest, west and south and has the most robust environmental remedy. Area 1 has a multimedia cap (MMC) and is referred to as the “on-cap” Area. Area 1 is approximately 15 acres and is divided into five separate lots/parcels. Areas 2 and 3 are located east of Wills Street, as shown on Site Constraints Plan (C100) and have soil caps.

The first phase of development on Area 1 (i.e., Area 1, Phase 1) was comprised of the Exelon Tower and Central Plaza Garage. Area 1, Phase 1 occupied Parcels 2 and 5, and the project was completed in 2016. This second phase of development on Area 1 (i.e., Area 1, Phase 2) is within Parcel 3 of Area 1 (i.e., defined as the “Project”) was described in the Conceptual Development Plan (CDP) submitted to the U.S. Environmental Protection Agency (USEPA) and Maryland Department of Environment (MDE) in December 2020. This DDP builds on and enhances the CDP. The limits of Parcel 3 is shown on Existing Condition Plan (C110).

The Project will consist of constructing two seven-story office buildings, an open space public area referred to as “Point Park”, a promenade along the bulkheaded shoreline, and general site development, such as sidewalks, landscaping, a parking garage, a drop-off area, and other ancillary features. These components are entirely located within Area 1.

The Site is located on a peninsula along the northeastern shore of the Patapsco River at the Inner Harbor in the Fells Point section of Baltimore City. This is the location of a former chrome ore processing facility (Baltimore Works) which consisted of production and numerous support buildings on an area that covered the original and made-land. The Site is surrounded by open water on the west and the south and the Living Classrooms facility to the north along a tidal inlet are referred to as the Back Basin. A portion of the Project area currently contains asphalt paved surfaces that are presently being used as active surface parking lots. The Project area is adjacent to prior development projects at the Site, including Thames Street Wharf (completed in 2010) and Wills Wharf (completed in 2020) to the east, 1405 Point (completed in 2018) to the northeast, and the Exelon Tower and Central Plaza & Garage (completed in 2016) to the north. These projects were governed and/or documented by USEPA and MDE-approved plans and construction completion reports.

An environmental remediation system (ERS) was completed in 1999 by Honeywell pursuant to a 1989 Consent Decree between the USEPA, U.S. Department of Justice (USDOJ), MDE, and Allied-Signal (Honeywell). The ERS is currently maintained and operated by Honeywell to contain chromium contaminated groundwater and reduce human exposure to impacted soils within the limits of Areas 1, 2, and 3. Area 1 is the focus of this development Project, and the principal contaminants of concern identified within Area 1 are hexavalent chromium and polycyclic aromatic hydrocarbons (PAHs). The Area 1 ERS components consist of a Multimedia cap (MMC), a Hydraulic Barrier (HB), a Head Maintenance System (HMS) and an Outboard Embankment. Drawings C100 and C110 present the existing conditions, ERS components, and other pertinent site features within the footprint of the proposed Parcel 3 development Project.

Several Project features may impact components of the existing ERS. However, the Consent Decree requires that the overall Site development must not interfere with the efficacy of the corrective measures or with Honeywell’s ability to comply with the performance standards defined in the Consent Decree, including the various media monitoring plans and performance requirements. Consequently, this DDP



presents the known conflicts, proposed HMS modifications and the means and methods that will be implemented to mitigate these interferences and maintain compliance with the requirements in the Consent Decree. In addition, Honeywell retains perpetual responsibility for operating the ERS and monitoring environmental media to demonstrate continued attainment of Consent Decree performance criteria, and therefore has imposed covenants on any development of the property. These covenants are described in Exhibit C (Construction Requirements) of the Environmental Agreement between Honeywell and the Developer (hereinafter referred to as the "Honeywell Requirements"). Under the Honeywell Requirements, the Developer also has responsibility to protect the instituted remedy, including: (a) conform to the requirements of the Consent Decree; (b) maintain and preserve the integrity of the ERS; (c) preserve the efficacy and function of the ERS and its remedial components; (d) preserve Honeywell's access to, and maintenance of the ERS and its remedial components; (e) preserve and protect Honeywell's ability to comply with the performance standards of the remedy; (f) preserve and protect Honeywell's ability to execute Consent Decree plans; and, (g) prevent an unacceptable level of incremental risk to human health or the environment through exposure to, or release of, contaminants from the site, based upon the requirements of the Consent Decree, Environmental Requirements, Governmental Requirements, and standards, criteria and guidance derived therefrom. Compliance with these covenants and remedy protection are also integral to this DDP.

The Project will be the second major construction activity in Area 1, scheduled for commencement in January 2022. Phase 1 of construction in Area 1 included the Exelon Tower and Central Plaza, completed in 2016 in accordance with the USEPA and the MDE approved plans, including the CDP, DDP and subsequent minor modifications of the DDP. The Construction Completion Report for Phase 1 Area 1 construction was approved by USEPA and MDE in January 2017. This Phase 2 incorporates many similar components as implemented in Phase 1, including pile foundations with cap penetrations, MMC repairs, HMS modifications, material management, and air monitoring. Many of the previous USEPA and MDE-approved modifications to the ERS will therefore be re-applied during Phase 2. However, several additional elements are unique to Phase 2, such as Point Park and development over low-strength subsurface materials. Designs for these new challenges are also presented in this DDP. In summary, this DDP presents the potential impacts to the ERS, design elements necessary for the modifications to the ERS, and means and methods that will be implemented during construction.

## 2. PROJECT TEAM/ROLES

The stakeholders responsible for the preparation, review and approval of this DDP are identified below:

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### 3. EXISTING ENVIRONMENTAL REMEDIATION SYSTEM

The Consent Decree requires Honeywell to maintain an inward gradient in the coarse sand and gravel formation of the Cretaceous sands (Stratum S4) and the shallow Pleistocene sands (Strata S2 and S3) along Wills Street (see Drawings FO.100, FO-104, FO-105 and FO.200 for geologic plans and cross sections of the site). The inward gradient is intended to maintain hydraulic control of hexavalent chromium contaminated groundwater from within the containment for Area 1 into the groundwater and surface water in the areas surrounding the site. The inward hydraulic gradient is maintained by the ERS, which consists of the following components:

1. Outboard Embankment;
2. Hydraulic Barrier;
3. Head Maintenance System; and
4. Area 1 – Multimedia Cap.

The limits of disturbance lie entirely within Area 1 and will not affect the Transfer Station, Transfer Station Truck Pad (located in the Exelon Tower), Area 2 or Area 3. Each component of the ERS within the limits of disturbance is described below for reference purposes; however, not all components of the ERS located within the limits will be disturbed during Parcel 3 development. Annotation of the ERS and the affected components are depicted on Drawing FO.106. Typical details for ERS components that fall within the Site are shown on Drawing FO.300.

#### 3.1 Outboard Embankment

The north, west, and south perimeters of the Site were originally defined by bulkhead structures located along the Patapsco River and the Inner Harbor. These structures were constructed in a period from the 1890's to the 1950's.

Subsequent to the Baltimore Works site structures decommissioning, a zoned granular fill embankment was constructed during a two-year period from the fall of 1990 to the winter 1992 to stabilize the bulkheads and provide land area for the construction of a perimeter cutoff wall outboard of the former bulkheads. Construction consisted of:

1. From (former) Point Street to Wills Street on the south side, a large low water platform structure (Bowie Smith Pier) was removed to expose timber cutoff sheeting at the inboard edge of the embankment.
2. All other bulkhead structures were left in place and buried inboard of the perimeter embankment.
3. Soft compressible clay was dredged prior to embankment fill placement. The embankment fill was then placed by bottom dump barge and clamshell. "Wall Zone" fill placed against the bulkhead was a sand and gravel sized crushed stone blend designed to support construction of a slurry-supported trench excavation for groundwater cutoff construction. Larger sized "Core Stone," the bulk of the embankment volume, was placed outboard of the wall zone.
4. Above Elev. -10, in the wave zone, rip rap was placed for erosion control and the embankment fill included a coarse filter stone gradation to separate fine gravel sized Wall Zone fill from the coarse Core Stone.

The Outboard Embankment is present along the entire south and west perimeter of the Area 1, Phase 2 project.

## 3.2 Hydraulic Barrier

The Hydraulic Barrier (HB) was placed at the outboard perimeter of Area 1 to isolate groundwater below Area 1 from the Patapsco River/Inner Harbor surface water and the surrounding groundwater. The HB restricts groundwater flow into and out of Area 1 by creating a low permeability barrier. The HB was constructed from the summer of 1994 to spring of 1996.

The HB consists of a soil-bentonite (S-B) backfilled slurry trench which is keyed about 2 feet into the top of decomposed rock. It was constructed by excavating a 36-inch wide trench filled with slurry to engage the top of decomposed rock (between 60 and 85 feet below construction grade), and placing low permeability backfill in the trench as the permanent barrier. Laboratory testing demonstrated low permeability of the backfill before placement. The designed top of the HB in the embankment is at about Elev. +5 (BC&CMD<sup>1</sup>).

Along the Outboard Embankment, the backfill contains a substantial amount of crushed stone from the embankment portion of the excavation spoils. As much as 50 percent of the backfill material, by dry weight, was allowed to be gravel size.

### 3.2.1 Sheet Pile Augmentation

Steel AZ17-700 sheet piles were installed within the Hydraulic Barrier to permit installation of driven piles within 30 feet of the Hydraulic Barrier for the past three development projects. The overlying Multimedia Cap (MMC) was restored above in kind and a Bridge Slab was constructed above. Sheet pile augmentation has been performed in three parts to date:

1. Area 1, Phase 1 Exelon Project (2014-2015): from about HB STA 2+20 to about HB STA 5+17 and about HB STA 26+20 to HB STA 30+87;
2. Point Street Apartments (2016): from about HB STA 25+33 to HB STA 26+20; and
3. Wills Wharf Hotel and Office Building Projects (2018): from about HB STA 22+93 to HB STA 25+33.

## 3.3 Head Maintenance System

The HMS maintains an inward gradient for Area 1 using shallow and deep extraction wells. Water levels inside and outside the HB are monitored at piezometer pairs spaced midway between extraction wells; the piezometers signal pumps to commence extraction of groundwater when the piezometer pairs indicate that groundwater levels outboard of the HB are approaching the groundwater level inside the HB. The HMS was constructed in the late 1990s and is comprised of:

1. Extraction System;
2. Monitoring and Control System;
3. Conveyance System; and
4. Transfer Station and Truck Pad (beyond the limits of disturbance and not discussed herein).

The Groundwater Gradient Monitoring Plan (GGMP) documents the means and methods to monitor compliance with the Groundwater Gradient Performance Standard and to assess the performance of the HMS.

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<sup>1</sup> All elevations in this report refer to the Baltimore City and County Metropolitan Datum (BC&CMD). All coordinates in this report refer to the Baltimore City Grid Meridian.

The rate of groundwater extraction increases during low tides to maintain an inward gradient. Greater quantities of groundwater are generally pumped in the winter and spring when Inner Harbor water levels are about 6 inches lower than in the summer and fall months. Extracted groundwater is conveyed to the storage tanks located at the Transfer Station for periodic loading into tanker trucks for off-site treatment at a permitted hazardous waste treatment facility.

### **3.3.1 Extraction System**

The extraction system consists of 16 wells (some within and some beyond the limits of the Project area) installed at regular spacing around the perimeter of Area 1. The extraction wells are housed inside concrete vaults and contain either pneumatic bladder or electric-powered piston pumps and water level measurement devices. Single and double well vaults exist at the Site. The inside dimensions for the double extraction well vaults vary from 11 feet long by 7 feet wide by 7 feet high to 14 feet long by 7 feet wide by 9 feet high. The single well vaults have dimensions of 8 feet long by 8 feet wide by 7 feet high.

The extraction wells include 12 deep wells designated DW1 through DW12. The remaining 4 extraction wells are shallow wells designated as SW1 through SW4. The shallow wells are located on the Wills Street side of Area 1 in Vaults V-1, V-2, V-3, and V-4. The well locations are shown in DrawingFO.106.

The deep wells are screened in Stratum S4 at a depth of approximately 50 to 80 feet below ground surface (bgs). The shallow wells are screened in Strata S2 and S3 at a depth of approximately 20 to 40 feet bgs.

All extraction wells consist of 6-inch diameter well screens and casing. Each well includes a filter piezometer that allows for the assessment of the condition of the filter pack of the well. Each extraction well contains a water level transducer and a pneumatic or electric-powered piston pump. The transducers are used to monitor groundwater drawdown during pumping. Compressed air is supplied to the pneumatic pumps through 1-inch inner diameter pipe. The air is supplied by a compressor located in the Transfer Station.

Vault sump pumps are located in all concrete extraction well vaults. The electric pumps located in sumps are actuated by the sump water level indicator to primarily maintain the well in a dewatered condition, and secondarily to control the shallow water level in the fill beneath the vaults, effectively operating as an underdrain. In addition, subgrade areas draining to sumps connect to the perimeter HMS pipe trenches to provide shallow groundwater control in the fill around the perimeter.

### **3.3.2 Monitoring and Control System**

The HMS monitoring and control system provides a means to remotely check and execute HMS system controls. The system includes remote intelligent controllers (RIC) or nodes placed in vaults for input/output connections. The system is monitored with the Master Supervisory Station (MSS) located in the Transfer Station. The monitored piezometer pairs are located approximately 10 feet on either side of the HB (a total of 20 feet apart) at midpoints between extraction wells. The piezometer pairs, located inboard and outboard of the HB, are numbered 1 through 12 and 1S through 4S, similar to the extraction well numbering.

When the gradient measured at any piezometer pair is below the minimum inward gradient criteria of one tenth of a foot, pumps on either side of that piezometer pair are activated until the measured gradient meets the established criteria.

This MSS enables a view of the hydraulic gradient, and pumping activity at each piezometer and vault location. The controller at each vault sends signals to execute pumping at each location. The MSS can activate alarms related to maintenance and operational issues.

### 3.3.3 Conveyance System

HMS piping connecting the pumping vaults was placed below the MMC geosynthetic layers at the site perimeter. Oversized conduits were placed between the vault and manhole structures to house the compressed air and water pipes. The groundwater conveyance pipes are comprised of three 1 ½-inch diameter high density polyethylene (HDPE) continuous pipes, placed within 8-inch diameter conduits. The design allows some differential settlement of the HMS force main pipes and replacement of the pipes and electrical lines, if required. Leakage from pressurized groundwater conveyance piping, if occurring, is collected in the outer conduit and discharged back to the well casing.

### 3.3.4 Stormwater Infiltration System

Although not part of the original HMS system, the existing infiltration system has been recognized as a tool to manage inward gradient. The stormwater infiltration system has been integrated into the HMS operation to supplement gradient control by connecting potable water into the infiltration system which is located outboard of the HB wall.

## 3.4 Area 1 Multimedia Cap

The MMC is designed to reduce infiltration to Area 1. Existing MMC components are illustrated on Drawing FO.300. A functional analysis of features of the MMC and the final development cap is provided in *Table 1*.

Following dismantlement of the structures on-Site in 1997, the MMC was constructed in 1997 and 1998, consisting of a layering of nine (9) components. In some areas asphalt paving has been placed over the MMC to facilitate foot traffic and automobile parking. From top to bottom the MMC consists of:

1. CR-6: 6 inches thick, the CR-6 consists of Maryland Department of Transportation (MDOT) Crusher Run 6 material placed to promote sheet drainage and provide stability for traffic over the MMC.
2. Separation Geotextile: Woven Geotextile placed to prevent comingling of the CR-6 with underlying materials.
3. Cover Soil: Minimum 24 inches thick, the cover soil consists of a mixture of sand, silt and clay placed to provide thermal protection and prevent mechanical damage to underlying Geosynthetic layers.
4. Warning Layer: orange snow fence or woven mesh located within the Cover Soil about 12 inches above the Geosynthetic layer. The Warning Layer is placed to provide a warning that sensitive materials are below.
5. Cover Geotextile: 20 ounce per square yard (oz./sy.) non-woven geotextile placed to prevent the migration of fines from the Cover Soil.
6. Drainage Net: HDPE plastic mesh placed across the site to permit drainage of storm water infiltration. The Drainage Net is heat bonded to the Cover Geotextile.
7. Geomembrane: 60-mil thick linear low density polyethylene (LLDPE) plastic liner placed to mitigate surface water from infiltrating the subgrade.
8. Geosynthetic Clay Liner (GCL): A thin layer of non-hydrated clay sandwiched between non-woven fabrics placed to mitigate infiltration into the subgrade as a secondary measure.
9. Cushion Geotextile: 20 oz/sy non-woven geotextile placed to prevent damage to GCL from underlying materials.
10. Capillary Break: 6 inches of ¾-inch clean durable stone placed to prevent upward migration of chromium contaminated water.

11. Base Geotextile: 20 oz/sy non-woven geotextile placed to prevent comingling of the Capillary Break with natural and man-made underlying materials.

In general, the majority of the Site during remediation activities was covered with a surface of asphalt at about Elev. +5. Controlled compacted fill was placed over the asphalt to create a crown at the center of the site with the bottom of the MMC at about Elev. +11.5. The MMC was then constructed on top of the crowned fill which slopes down toward the perimeter to about Elev. +5 at the HB. Surface-water infiltration through the Cover Soil is collected in the Drainage Net which overlies the Geomembrane. The Drainage Net conveys collected non-contaminated infiltration water to a drainage system (refer Section 3.4.4) at the perimeter of Area 1 outboard of the HB. At present, in the area of Parcel 3, much of the MMC is overlain at the ground surface by an asphalt parking lot or driveways for parking and interim construction access.

### **3.4.1 Abandoned Structures below MMC**

Several structures were demolished during the plant decommissioning performed in 1997. Demolition materials were removed from the Site, but foundations and ground floor slabs were left in place and intact. Local depressions (e.g. tanks, pits, and stairwells) were punctured to facilitate gravity drainage and filled with crushed stone. Existing foundations, typically consisting of timber or concrete piles, reinforced concrete pile caps and slabs, were abandoned in place. In addition to structures onsite at the time of remediation, older structures which preceded the industrial development of the site are probably present and are likely to consist of brick and rubble stone foundations, railroad tracks and ties, and potentially abandoned steel plate boxes.

The abandoned foundations represent obstructions to pile driving. Locations of abandoned foundations from the previous industrial development of the Site including footprints, elevation, and obstruction thickness as generally known, are shown on Drawing FO.101, which have been used to support planning of the layout of the new building construction.

The former pile supported bulkhead structures to the west of the former Bowie-Smith Pier, see Drawing FO.201, were left in place. They define the inboard edge of the HB in most areas along the shoreline. HMS conveyance pipes overlie the bulkhead structures along the west end of the southern perimeter of the Site.

### **3.4.2 Ground Conditions below MMC in Parcel 3 and Open Space**

In general, fill placement, traffic, construction surcharge, and new structure loads are limited by the flow of water through the Drainage Net to less than 2,000 pounds per square foot (psf), which includes the MMC cover materials. Additionally, much of the Parcel 3 development is underlain by compressible clay of Stratum O (see Drawing FO.100 for approximate Stratum O extent) which further limits loading to prevent settlement of the MMC and overlying structures.

The area of the Site underlain by Stratum O includes areas with abandoned bulkheads (Bulkhead Types G, H, F2, and K), pile supported relieving platforms in varying conditions (Intact Covered Slip, Collapsed Covered Slip, Type J Platform), abandoned pile supported structures with intact concrete slabs (Building 23), pre-consolidated compressible deposits (foot of former Point Street), or normally consolidated compressible deposits. Load limitations for the Site are summarized on Drawing FO.102. The former elements still in place below the MMC within the Project limits are summarized in the subsections below and approximate locations are depicted on Drawing FO.101. Net acceptable loadings noted hereunder are in accordance with the Honeywell Requirements.



### 3.4.2.1 Bulkhead Type G

Bulkhead Type G was constructed circa 1966, is 363 feet long and was installed approximately 80 feet outboard of the older Type H bulkhead which was left in place. Bulkhead Type G consists of six 45.8 foot diameter cellular cofferdams, spaced approximately 49.5 feet on center. The cells are connected to each other, on the outboard side only, by steel sheet pile arcs. The rounded closure to the bulkhead south of the cells is formed by a partial cell installed to overlap the cell immediately to the north. The outboard edge of the cells and the intermediate sheet pile bulkheads indicate the steel sheet piles are MP-112 sections, 54 feet long along the outboard face and 48 feet long along the sides and back. The cells are shown to have been backfilled with sand and gravel. Borings indicate compressible clay may remain in place below the sand and gravel backfill.

Net permanent loading of up to 1,250 psf of load permitted on the MMC Geosynthetic Layers, inclusive of Cover Soil. Granular fill is permitted in this area.

### 3.4.2.2 Bulkhead Type H

The bulkhead was reconstructed circa 1948 and extends 106 feet north and 140 feet east. The bulkhead is a tied-back gravity type reinforced concrete headwall with a 7.5 feet wide base slab located just above mean low water (MLW). The headwall and base slab are supported by three longitudinal rows of timber piles. Below the headwall, the upland soil is supported by timber sheeting located immediately inboard of the first outboard row of piles.

Net permanent loading of up to 500 psf is permitted on the MMC Geosynthetic Layers, inclusive of Cover Soil. Granular fill is permitted in this area.

### 3.4.2.3 Covered Slip

This area is an abandoned slip for docking vessels delivering materials to the former timber and ice storage facilities prior to 1948. The platform is approximately 72 feet long along the south face and consists of a low-level timber deck and timber pile caps supported by timber piles. Pile caps are oriented generally parallel to the outboard face. A concrete headwall at the face retains the soil fill above the deck and timber sheet pile bulkheads along the east and west faces of the slip support the soil beyond. Voids of unknown size exist below the timber deck. Attempts were made during the demolition of on-Site structures to fill the void space with grout, but were incomplete. During initial condition surveys performed in 1989 and 1990, the Covered Slip timber foundations were observed to be in poor to fair condition.

There are three existing load conditions for the Covered Slip:

- “Protected” – the northern portions are shielded from load by the abandoned Building 23 foundations;
- “Un-Protected” – an intact L-shaped section south of the abandoned Building 23 foundations is not shielded from load; and
- “Collapsed” – the southernmost section which collapsed during Phase I and II remediation

### *Protected Covered Slip*

Net permanent loading of up to 500 psf is permitted on the MMC Geosynthetic Layers, inclusive of Cover Soil.

### *Unprotected Covered Slip*

The Unprotected section is L-shaped the Covered Slip fully supports the MMC and is known to be in a fragile condition. This section is identified on Drawing FO.101. At present, the settlement monitoring data indicates that this area is stable. However, it was last observed to be in a deteriorated condition and will likely fail from natural decay of the underlying timber platform and piles at some point in the future. This area will need to be supported by a pile supported concrete relieving platform and the MMC reconstructed above the platform.

### *Collapsed Covered Slip*

The bulkhead edge of the Covered Slip collapsed during dredging for construction of the Outboard Embankment. The collapse was attributed to instability of the thick compressible Stratum O clay within the slip. After construction of the MMC over the southern end of the Covered Slip, a portion of the timber platform adjacent to the former Fuel Oil Pump House and former Storage Tank collapsed under the weight of the MMC. The collapsed timber deck and debris pile was left in place and the affected area was repaired by placing EPS geofam blocks to support the MMC and limit load applied to the compressible deposits below. The EPS was covered with a reinforced membrane and oil barrier prior to reconstruction of the overlying MMC.

The original timber deck of the Covered Slip remains in place supporting the MMC north of the collapse area and was last observed in the late 1990s when the collapsed section was covered by the MMC. There is believed to be a 3 to 12-foot void (or water filled void) below the deck structures, underlain by a soft clay mudline. Settlement monitoring points have been established for routine monitoring by Honeywell in this area and must be protected. For approximate extents of collapsed covered slip and settlement monitoring point locations, see Drawing FO.101.

No net loading or unloading of this area is permitted.

#### *3.4.2.4 Bulkhead Types F2 and K*

These structures are a tied-back steel sheet pile bulkhead which has two types of sheeting (Type F2 and Type K). The bulkhead is approximately 87 feet long and was constructed circa 1965, just inboard of the bulkhead line established in the late 1940's. Portions of the Type J Platform were removed when these bulkheads were constructed.

Net permanent loading of up to 500 psf is permitted on the MMC Geosynthetic Layers, inclusive of Cover Soil. Granular fill is permitted in this area.

#### *3.4.2.5 Type J Platform*

This structure, along the west side of the South Slip adjacent to the Bowie Smith Pier, is a low-level timber relieving platform constructed circa 1948. The platform is about 250 to 265 feet long, varies in width from about 30 to 40 feet, and consists of two, 3-inch-thick timber deck layers, just above MLW, supported by timber pile caps and timber piles. Pile caps are oriented in the east-west direction. Pile and pile cap spacing is typically about 4 feet on center. A concrete headwall at the outboard face and a timber sheet pile bulkhead along the inboard edge retain the soil above the platform and to the west, respectively. A void exists below the southern half of the platform up to about 11 feet deep.

During condition surveys performed in 1989 and 1990, the Type J Platform timber foundations were observed to be in good condition.

Net permanent loading of up to 500 psf is permitted on the MMC Geosynthetic Layers, inclusive of Cover Soil. Granular fill is permitted in this area.

### 3.4.2.6 *Abandoned Foundations over Compressible Deposits*

The western interior portion of the proposed Point Park overlies the abandoned pile supported foundation and intact ground floor slab of Building 23 constructed in 1951. The building is supported on 30-ton Raymond Concrete step taper piles. Condition surveys in 1989 and 1990 observed concrete piles to be in fair condition.

Net permanent loading of up to 1,250 psf of load permitted on the MMC Geosynthetic Layers, inclusive of Cover Soil. Granular fill is permitted in this area.

### 3.4.2.7 *Pre-Consolidated Compressible Deposits*

A portion of the south-center part of Parcel 3 was improved to support the existing conditions. Vertical drains and surcharge fill techniques were used to pre-load the compressible clay to allow construction of the MMC with minimal settlement. These ground improvement areas are illustrated in Drawing FO.101. Settlement for construction of the MMC loading was estimated for design of the membrane slope and the HMS conveyance piping.

Net permanent loading of up to 800 psf is permitted on the MMC Geosynthetic Layers, inclusive of Cover Soil. Granular fill is permitted in this area.

### 3.4.2.8 *Normally Consolidated Compressible Deposits*

The southeast corner of Parcel 3 in the area of the former Bowie Smith Pier lies over normally consolidated compressible deposits.

Net permanent loading of up to 500 psf is permitted on the MMC Geosynthetic Layers, inclusive of Cover Soil. Granular fill is permitted in this area.

## 3.4.3 *Methane Gas Venting System*

The organic clay of Stratum O may generate methane gas as decomposition of the organic components continues over time. A vent pipe was placed in the capillary break gravel, at the highpoint of the cap, to allow methane gas to escape from below the Geomembrane. The Methane Gas Vent was re-located to the south as part of the development of the Central Plaza Garage. The existing vent location is within the Parcel 3 development Project area.

## 3.4.4 *Perimeter Drain*

The perimeter drain is perforated polyvinyl chloride (PVC) pipe embedded in a stone-filled trench on the landward perimeter, i.e., east boundary, and is also referred to as the Toe Drain. The perimeter drain along the waterfront perimeter, i.e., south and west boundaries, consists of stone-filled trench only and is also referred to as the Infiltration Trench. It should be noted that the Infiltration Trench along the northern perimeter consists of a perforated HDPE pipe embedded in the drainage stone along the northern portion of the Infiltration Trench. The perimeter drain was placed at the perimeter of the Geomembrane outboard of the HB. It is located around the entire perimeter and allows stormwater infiltration to the cap drainage layer above the MMC Geomembrane to discharge outboard of the HB. Drainage layer monitoring points are located along the perimeter drain (see Section 3.5.2).

### 3.4.5 Existing MMC Concrete Protections

As part of the Area 1, Phase 1 project, concrete slabs were placed to provide additional protection for the Geosynthetic Layers of the MMC. For locations, see Drawing FO.106. These include:

1. Protection Slab: a 6-inch thick epoxy coated welded wire fabric slab placed to provide a physical barrier to excavation. The protection slab is located within Dock Street and Wills Street public right of way. The elevation of the protection slab varies throughout the site, but is a minimum of 3 feet below existing grade.
2. Bridge Slab: a 15-foot wide, 12-inch thick epoxy coated reinforced concrete slab constructed centered on the Hydraulic Barrier to distribute fill and live loads outside of the influence of the Hydraulic Barrier. The Bridge Slab is located along the Hydraulic Barrier alignment from about STA 0+25 to STA 5+15 and STA 21+65 to STA 31+50, where STA 0+25 and STA 31+50 are coincident in the northeast corner of Area 1 and stations increase in a counter-clockwise direction. Hydraulic Barrier stationing is indicated on Drawing FO.106.

## 3.5 Monitoring of Environmental Media

The integrity of the remedial components is demonstrated through routine testing of environmental media; i.e., air, surface water, groundwater, and surface soil. The Consent Decree requires sampling, analysis, and monitoring of these environmental media. Compliance monitoring continues to be performed at the Site to ensure the continued protectiveness of the remedy while Site development activities are performed. These monitoring programs are designed to demonstrate that the performance goals of the MMC, the HMS, and the hydraulic barrier are maintained. The various monitoring plans required as part of the Consent Decree, and which are continued to be implemented post-remediation and during development activities, are briefly discussed below.

### 3.5.1 Environmental Media Monitoring Plan

The Environmental Media Monitoring Plan (EMMP), which was updated in 2012, defines the monitoring program for air, surface water, and groundwater at the Site. The monitoring programs consist of air sampling for hexavalent chromium and total dust/particulates during the performance of intrusive activities; i.e., whenever the MMC is penetrated. In accordance with the revised EMMP, surface water (SW) is sampled quarterly (four times a year) within one foot of the surface and at the bottom of the water column within the river at prescribed locations around the perimeter of the Site. Surface-water samples are collected from 10 locations; SW-1 through SW-9, and one background location; BG-1 (see Appendix E for SW monitoring locations) and analyzed for total dissolved chromium. Similarly, groundwater is sampled semi-annually from the existing network of monitoring wells and analyzed for chromium and, in specific locations, for cyanide. Appendix E presents the configuration of the groundwater monitoring locations. A request was submitted to the USEPA and MDE proposing to discontinue sediment monitoring as the sediment-monitoring requirement in the Consent Decree has been satisfied. In April 2021, USEPA and MDE approved the request to discontinuing sediment monitoring.

### 3.5.2 Surface Soil Monitoring Plan

The Surface Soil Monitoring Plan (SSMP) documents the methodology to monitor the MMC performance, and its ability to prevent infiltration and the upward migration of contaminants. Monitoring areas include the MMC, toe drain outlets, drainage layer, settlement of capped areas, surface covers, and cap penetrations. Five surface soil drainage layer monitoring points (SSMPs) located in the perimeter infiltration trench are used to monitor water from the drainage layer of the MMC. Similarly, ten settlement

monitoring plates (MPs) are used to monitor settlement of capped area. The SSMPs and MPs are presented on Drawing DDP-C100.

### **3.5.3 Groundwater Gradient Monitoring Plan**

The Groundwater Gradient Monitoring Plan documents the methodology to monitor the groundwater gradient and assess the performance of the vertical hydraulic barrier and HMS at the Site relative to the compliance standards. The inward groundwater gradient across the hydraulic barrier is maintained with controlled pumping via the HMS and supplemental support of the existing infiltration system (stormwater/potable water).

## 4. DEVELOPMENT PLAN AND SCHEDULE

### 4.1 Scope of the Project

The Parcel 3 development Project on the Baltimore Works Site includes construction of two seven-story interconnected office buildings with under-structure parking, a restaurant, Point Park with a promenade along the shoreline, and other supporting Site development features, such as a drop off area, parking garage, ramps, sidewalks, landscaping, utilities, and other related elements. No new roads are anticipated for the Project, but minor modifications to the existing roadways will be incorporated into the final design. There will be a vehicular access ramp from Wills Street into the parking garage. Similarly, a loading area for the proposed building will be accessible from Wills Street. To the north, a small area of Point Street will be slightly extended to create a passenger drop off area at the proposed ground level of the office buildings. The major project components are briefly discussed below. General foundations and geotechnical recommendations are provided in MRCE geotechnical report “Geotechnical Report and Foundations Recommendations Harbor Point – Parcel 3 Buildings and Harbor Point Park” dated December 31, 2020.

#### 4.1.1 Office Buildings and Restaurant

The office buildings are separate seven-story structures interconnected by a bridge at floors 2 to 5. A restaurant will be located in the southern region of the building footprint. The aggregate building footprint is approximately 450,000 square feet (sf). The buildings will be located in the northeast corner of Parcel 3 along Wills Street and will abut the Central Plaza Garage (Site Plan, Drawing C 210). The lowest level of the office buildings will be comprised of a contiguous parking garage which will be connected to the existing central plaza parking garage to the north with retail to the most southern areas. The first floor will be commercial retail and office space. Floors 2 to 7 will be commercial retail space. The elevation of the parking garage is anticipated to be at or higher than the existing ground elevation and approximately the same the elevation as the Central Plaza garage; however, pile foundations will penetrate the existing MMC, which will require repair and restoration. The southern limit of the pile foundations for the Project will be a minimum of 30 feet from the HB wall and, therefore, HB wall sheet pile augmentation is not anticipated.

#### 4.1.2 Point Park/Lawn

Point Park/lawn will be an open green space with walkways and a promenade along the shoreline. The Park will be located in the southwest corner of Parcel 3 (Site Plan, Drawing C210 and Overall Park Plan L-1.00d). The Park will be accessed from the promenade along the southern shoreline and from Point Street. In addition to open space vegetation/landscaping and walkways, the park will accommodate emergency vehicle access. The park is partially located within areas of low strength subgrade soils, and therefore a geotechnical evaluation was conducted (EE Memo 3) to assess the allowable loads and/or engineering modifications necessary for construction in this area.

## 4.2 Schedule

The targeted date for occupancy of the Office Buildings is January 2024. Project milestones through this date include:

- Initial DDP submittal to USEPA/MDE: August 2021;
- USEPA/MDE approval of the DDP: October 2021;
- Construction Commencement: December 2021; and
- Construction Completion: January 2024.

## 5. DEVELOPMENT IMPLEMENTATION ACTIVITIES

### 5.1 Site Logistics

In general, construction will proceed from east to west to maintain construction access from the west. Portions of the proposed park will be designated as construction support areas, including material laydown, soil stockpile and/or soil management area, contact and non-contact water management areas, decontamination pads, material delivery, office trailers, equipment storage, and construction access roads. The locations for these items considers the static and dynamic load limitations for the Site. A dedicated concrete washout station will be constructed in the material delivery area. Concrete barricades will be set along the south and west perimeter of the site to demarcate a 10-foot HMS exclusion zone and to isolate the Unprotected and Collapsed sections of the Covered Slip. Work outside of the barricades will proceed with equipment with a ground pressure limited to 5 psi.

General load limitations associated with these and other uses and proposed location of site logistics items are depicted on Drawing FO.107. Load limitations are derived from the geotechnical evaluations presented in EE Memo 3. Settlement monitoring will be performed at the corners of each of the paved areas. For details of optical monitoring program, see Section 7.6.

### 5.2 Earthwork

Excavations within the Cover Soil and below the existing Geomembrane will be required to facilitate installation of pile foundations, construction of the pile supported Covered Slip Relieving Platform, relocation of the Methane Gas Vent, construction of pile caps, and utility vaults. Excavations within the Cover Soil above the Geomembrane will be required to facilitate installation of, shallow foundations for park and promenade structures, utilities, and utility vaults, replacement of Cover Soil with Lightweight Fill and fine grading for slab construction and landscape finishes for proposed structures for the Parcel 3 development. In general, excavations which disturb portions of the MMC will be restored as described in Table 1. Detailed descriptions of excavations are described below. Earthwork requirements are denoted on Drawings FO.001 and 002. Areas where the Geomembrane will be penetrated are depicted on Drawing FO.108. Areas where the MMC will be protected with supplemental or replacement materials are depicted on Drawing FO.109. Typical required sequences for excavations, MMC repair details, and MMC protections are depicted on Drawings FO.310, 311, 312, 313, 320 and 321.

In general, excavations and grading will begin in the northeast corner of the Site, proceed from north to south and then east to west. For general foundation excavation sequence see Drawing FO.108. Excavated materials will be managed or used as backfill in accordance with the Material Management and Handling Plan (see Section 7.3 below).

#### 5.2.1 Foundation Excavations

Excavations for pile caps, utility pits, and shallow foundations will be grouped into “excavation segments” with roughly 20 to 40 piles in each segment (i.e., a segment consists of six pile caps with four piles each, representing 24 piles). Preliminary excavation segments are identified on Drawing FO.108. Each segment will exist in one of six (6) stages at any one time, for details of each stage, see Drawing FO.310. The proposed Stages are:

1. Excavation Above Drainage Net;
2. Excavation Below Drainage Net – Open below Geomembrane;
3. Pile Driving and Subgrade Preparation – Open below Geomembrane;
4. Synthetic Layer Restoration – Open below Geomembrane;



5. Foundation Construction; and
6. Adjacent Grade Restoration.

Excavations for pile caps in a single column line will be combined to facilitate quicker and higher quality restoration of the Geosynthetic layers. Excavations for single piles will be excavated in isolated excavations with minimal opening of the Geomembrane. Excavations in stages 2, 3, and 4 will be limited to 7,250 square feet at the top of slope as described below in Excavation Dewatering Section 5.2.2. For the segment size of 20 to 40 piles, this equates to roughly three segments depicted on Drawing FO.108 in stages 2, 3, and 4 at any one time. For open area and sequence requirements, see Drawing FO.108. Based on the limits of minimum excavation interpreted from Drawing FO.310 and 320, there is minimal distance between excavation crests. By combining excavations, this reduces the amount of berm construction, temporary Drainage Net dam installations, total amount of Geomembrane extrusion welding to be performed, less mobilization time for pile driving and restoration crews. As discussed below in Dewatering, Section 5.2.2, less exposure leads to less stormwater infiltration below the Geomembrane and less stress on the HMS pumps. Existing asphalt pavement outside of the limits of excavations will remain until adjacent subgrade is prepared for slabs or landscaping features.

#### *5.2.1.2 Excavation above the Drainage Net*

Excavations above the Drainage Net will be performed throughout the site for shallow foundations, pile caps, single pile locations, utilities, utility pits, and general site grading. Excavation may proceed to the Warning Layer with smooth buckets. Where the Warning Layer is exposed, it will be cut and disposed. Below the Warning Layer, excavation must be performed with smooth buckets and hand assistance with shovels and spades. Excavation will be terminated at the shallower of excavation subgrade or the Drainage Net.

#### *5.2.1.3 Excavation below the Drainage Net*

Excavations below the Drainage Net will be performed at each pile cap, the proposed new Methane Vent location, and building utility pits.

#### *Preparation of Synthetic Layers*

At the perimeter of each excavation through the Cover Soil, the Drainage Net will be removed and the exposed edges will be covered by a non-woven geotextile to prevent migration of fines into the Drainage Net. Flow from the Drainage Net into the excavation will be dammed by either an HDPE pipe (single pile locations) or LLDPE sheet (all others) and laid on the excavation slope extrusion welded to the existing Geomembrane. The HDPE pipe (where used) will extend a minimum of 6 inches above existing grade and/or a soil berm will be constructed at the crest of the excavation and wrapped in a non-woven geotextile to prevent stormwater runoff from entering the excavations.

#### *Excavation below Synthetic Layers*

The Geomembrane, GCL, Cushion Geotextile, Capillary Break, and Base Geotextile will be removed. Excavation will proceed to the deeper of excavation subgrade or until encountered obstructions are removed. Geotechnically-suitable excavated materials, including soils above or below the Geomembrane, may be used as backfill after obstruction removal below the Geomembrane with a vibratory excavator attachment. Prior to pile driving, excavation subgrade will be covered with a non-woven geotextile and imported crushed stone to prevent human contact and dust generation. Obstructions are expected to be encountered below the MMC, see Section 5.2.3 below for details. Excavation spoils below the Capillary Break may contain impacted material. All material excavated will be handled in accordance with the MHMP.

#### **5.2.1.4 Pile Driving and Subgrade Preparation**

Where required, foundation piles will be driven through the crushed stone work surface to approximate tip elevations described on Drawing FO.102. The crushed stone will be left in place below the new development cap Geosynthetic layers and structural slab.

Upon completion of pile installation, excavation subgrade will be graded smooth and compacted with a walk behind vibrating pan. Compacted subgrade will be surveyed and Select Granular Fill will be placed and compacted to achieve final excavation subgrade.

#### **5.2.1.5 Synthetic Layer Restoration**

It is anticipated that after pile installation and final subgrade preparation, the temporary Drainage Net Dam and edge of existing Geomembrane may be damaged and will be need to be repaired. Upon approval of final excavation subgrade, the Cover Soil excavation will be expanded by about 12 inches around the perimeter of the excavation, the temporary Drainage Net dam will be removed and replaced by a permanent dam consisting of an LLDPE sheet extrusion welded to the existing Geomembrane. The edge of the existing Geomembrane will be trimmed, and the Base Geotextile, Capillary Break, Cushion Geotextile, and Geomembrane will be restored to existing with 6 inch minimum overlaps provided. A 16 oz./yd<sup>2</sup> non-woven geotextile will be placed over the restored Geomembrane as a Cover Geotextile. Within the limits of the Drainage Net dam, the Geosynthetic Clay Liner and Drainage Net will not be restored.

In general, subgrade around piles and pile caps will be lowered and hence settlement of the surrounding subgrade after MMC restoration will be negligible. Piles will be restored with pile LLDPE boots as discussed in Section 6.4.3. Details for MMC protection and restoration are depicted on Drawings FO.310, 311, 312, 320, 321, and 322.

#### **5.2.1.6 Foundation Construction**

Upon completion of Synthetic Layer restoration, a 4-inch thick un-reinforced concrete mud mat will be placed as a working surface. Reinforced concrete foundation elements will then be constructed on top of the mud mat.

#### **5.2.1.7 Adjacent Grade Restoration**

Upon allowing concrete to set, forms will be removed and adjacent grade will be backfilled with either Select Granular Fill, Select Structural Fill, or Lightweight Fill to subgrade for slab or landscaping materials.

### **5.2.2 Excavation Dewatering**

Open excavations throughout the Site will require detailed stormwater management control measures to be implemented. Table 2 provides an analysis of stormwater management under existing conditions, during construction, and post development. All excavation dewatering will be managed in accordance with the MHMP (Appendix A-1). Anticipated sources of dewatering are:

1. Stormwater Runoff;
2. Cover Soil Infiltration (above Geomembrane); and
3. Groundwater.

Stormwater entering excavations open above the Geomembrane (i.e., non-contract water) will be collected during construction and stored in a Modutank. For contingency purposes, two Modutanks will be provided for the Project. Each Modutank will be 50 feet square and 4 feet deep. The collected non-

contact water will be managed in accordance with the HHMP (Appendix A-1). Stormwater entering excavations open and contact impacted soil/debris below the Geomembrane (i.e., contact water) will be collected and stored in double-walled frac tanks. For contingency purposes, a minimum of two 15,000 – gallon frac tanks will be provided for the Project.

In the event of an extreme storm, one of the Modutank may be used for storage of contact water. Based on a high intensity, short duration (1-day) 100-year precipitation event or a low intensity, long duration (2-day) 100-year event with a maximum catchment area below the Geomembrane of 7,250 square feet, one Modutank for contact water and one Modutank for non-contact water will be required for management of storm water. After the precipitation event, the Modutank used to temporarily store contact water will be decontaminated for re-use with non-contact stormwater. The parameters for the precipitation event, catchment, and storage calculations are presented in EE Memo 1.

Experience from the Area 1, Phase 1 project indicates that stormwater run-on that drains below the Geomembrane and groundwater rise must be closely managed to reduce stress to the HMS gradient control. A number of measures were considered to mitigate stormwater flow into an open excavation and to improve management of water within the excavation and are detailed in the following sections:

### *5.2.2.1 Stormwater Run-On*

In general, the Site is graded to sheet drain radially from the center of the peninsula out to the harbor. Surface water run-on to excavations will be minimized by berms at the crest of excavations. Erosion of these berms will be minimized by covering the berm with a non-woven geotextile. Suitable excavated cover soil may be used for berm construction per the Material Handling and Management Plan (See Section 7.2 below).

Single pile locations were identified as a limited source of surface water infiltration. Where practical, single pile foundations were utilized to minimize the exposed area, see Drawing FO.320;

The proposed construction sequence group piles caps into single excavations to minimize the duration of exposure to larger excavations, see Drawing FO.108.

### *5.2.2.2 Cover Soil Infiltration (above Geomembrane)*

Stormwater infiltration collected in the Drainage Net will be diverted around local excavations by sealing the Drainage Net along excavation perimeter by extrusion welding a temporary supplemental sheet of 60-mil LLDPE Geomembrane as a “temporary dam”. A review of temporary and permanent dam locations and the resulting impedance to the drainage path in the Drainage Net is detailed in EE Memo 2.

The existing asphalt pavement surrounding foundation excavations will remain in place until final slab subgrade preparation to promote sheet flow across site towards the harbor, minimize erosion and minimize stormwater infiltration of the Cover Soil.

### *5.2.2.3 Groundwater Control*

Where excavations penetrate the Geomembrane, excavation will proceed to a minimum depth of 6 inches below the Capillary Break to minimize the migration of stormwater from the excavation area. Excavating below the Capillary Break has potential to encounter impacted soil beneath the MMC. Impacted soil excavated beneath the MMC will be managed in accordance with Section 4 of the MHMP (Appendix A-1). During rain events, pumps will be deployed to each excavation to collect stormwater for segregation, testing and disposal. This is necessitated by the hydraulic connection of the Capillary Break with sumps in the Vaults. Water collected by Vault sumps is pumped to the Transfer Station and managed as contaminated liquids, via off-site disposal at an approved facility.

Where the excavation depth is within two feet of the managed interior water level, local sumps will be placed to hold the water table below the excavation subgrade and maintain a stable working subgrade.

The pile volume driven below the managed water level inside the Site will need to be pre-pumped to minimize influence on the Hydraulic Gradient from pile driving. Based on the proposed number of piles, approximately 250,000 gallons of groundwater will be pumped in advance of excavation and pile driving installation;

Crushed stone excavation subgrade will promote drainage in excavations to a sump pit where sump pumps will be deployed during rain events to remove accumulated water in an excavation.

### **5.2.3 Obstruction Removal**

Concrete floor slabs, footings, and asphalt are expected at many pile locations. It is also likely that rubble and stone foundations are present in unknown locations. These obstructions will be removed at pile cap locations to facilitate pile driving by excavation and probing to at least Elev. +2. Known obstructions can be seen on Drawing FO.101, however other obstructions are likely present. At single pile locations where no known obstruction is expected, an initial attempt to drive the pile will be made. If the pile encounters refusal, the location will be expanded and probed for obstructions, the obstruction will be removed and the pile will be re-driven in the same location or piles will be added in the vicinity at offset locations. Otherwise, abandoned foundations will be left in place below the future structures. Penetration testing or pit excavations will be used to determine the presence of obstructions to pile driving at the time of excavation.

Shallow obstructions will be broken up and left in place or removed to an approved off-site disposal facility when the excavation is made. Dynamic hoe-ram will be used to demolish obstructions encountered during pile driving. Equipment used to demolish obstructions will be decontaminated in accordance with the "Pile Decontamination Plan" presented in the MHMP. Excavation and removal will be used only where necessary and will be performed with a sequence and process organized to protect against dust generation and cross-contamination of the cover soil. Excavated materials intended for proper off-site disposal will be properly characterized as required by the disposal facility. An existing historic groundwater well is known to lie within the limits of Area 1. During the initial remediation, it was not located. If encountered, this well will be abandoned as required.

### **5.2.4 Loads on the MMC**

Loads placed on the MMC require careful consideration of the long-term function of the various elements contained within it. Evaluations include:

1. Settlement of the subsurface materials and the resulting stress on the Synthetic Layers (EE Memo 3);
2. Compression of the Drainage Net and the resulting impedance to flow (EE Memo 4);
3. Thermal insulation of the Synthetic Layers (EE Memo 5); and
4. Evaluation of Existing Covered Slip and Type J Platform (EE Memo 6).

Loading on the MMC will come from building foundations, ground floor slab, park and promenade structures, fill placed to meet proposed grades, and live loading from construction equipment, events, pedestrians, maintenance vehicles, or emergency vehicle access. For a discussion of ground conditions below the MMC at the Site, see Section 3.4.2. For a pictorial assessment of the areas discussed, see Drawing FO.102. The evaluations performed considered existing known abandoned structures, geologic characteristics, and past loading history to estimate allowable loads, required load relieving structures,

and acceptable settlement in accordance with a post-construction monitoring plan discussed in Section 8. The resultant MMC protections are shown on Drawing FO.109.

Observations for settlement will be performed during construction; repair or addition of Synthetic Layers may be required, depending on location of the settlement in the developed cap. Based on evaluation of the slope on the drainage net (EE Memo 3), up to 2 inches of total settlement will be allowed which provides that the Geomembrane or HMS conveyance piping is not compromised and a slope is maintained for proper function of the Drainage Net.

#### *5.2.4.1 Building Foundations*

Building foundations will utilize driven piles to transfer column loads to competent bearing strata below fill and compressible clay deposits. The building loads will not add load to the MMC.

#### *5.2.4.2 Ground Floor Slab*

In the approximate northern one-third of the buildings there is no organic clay and the ground can support the ground floor as a slab on grade. In the southern two-thirds of the buildings there is a soft compressible organic clay deposit and the ground cannot support the ground floor, requiring a pile supported structural slab. In all areas of the building, portions of the existing Cover Soil will be removed and will result a net-zero or net unloading of the MMC. To provide adequate thermal insulation of the Synthetic Layers, a 1-inch thick EPS insulation layer will be placed on subgrade in areas where the ground floor slab subgrade is within 12 inches of the Drainage Net (i.e., below the Warning Layer).

#### *5.2.4.3 Park and Promenade Structures*

Park and promenade structures will be supported on shallow foundations bearing within the Cover Soil or core stone of the Outboard Embankment. Bearing for these structures is limited as shown on Drawing FO.102. Load added produces settlement of the Geomembrane less than 2 inches.

#### *5.2.4.4 Fill Placement*

Fill placement will occur throughout the site either to backfill over-excavation for obstruction removal, to backfill against foundations, to backfill utility excavations, or to raise grades for the park and promenade. Fill materials may be recycled Cover Soil, imported soil, or lightweight fill such as expanded shale, foam glass aggregate or EPS. Fill materials placed above the Geosynthetic layers will be tested using the MDE Voluntary Cleanup Program "Clean Imported Fill Material" guidance document prior to importing. Fill placed will not exceed the load limitations depicted on Drawing FO.102.

Fill types described below are specified on Drawing FO.001:

- Backfill of over-excavation for obstruction removal will be placed by excavators using excavated Cover Soil and compacted by a plate excavator attachment.
- Backfill adjacent to foundations and utility excavations will be placed by excavator, leveled by shovels and compacted with walk behind compactors.
- Park grades will be raised where allowable under the Honeywell Requirements using Select Granular Fill, expanded shale Lightweight Structural Fill, Lightweight Landscaping Fill, or Topsoil placed by low pressure dump truck and spread by low pressure bull dozer and compacted by either wheeled or walk behind compaction equipment. Where fill subgrade is less than 30 inches above Geomembrane, low pressure or walk behind equipment will be used to place and compact fill.

Expanded shale Lightweight Structural Fill will be required in three places, for delineation of Lightweight Structural Fill placement, see Drawing FO.109:

1. Grand Staircase – Expanded shale Lightweight Structural Fill will be placed to accommodate live load requirements and maintain a net loading at the Drainage Net of less than 2,000 psf.
2. South of Buildings at Promenade – Expanded shale Lightweight Structural Fill will be placed to maintain settlement of the Geomembrane less than 2 inches.
3. Collapsed Covered Slip and L-Shaped Area to the North – Expanded shale Lightweight Structural Fill or Lightweight Landscaping Fill will be placed to maintain a net-zero loading of the area.

### *Grand Staircase Lightweight Structural Fill Placement*

Existing asphalt within the limits of the grand staircase and ramp will be removed and disposed. Within the areal extents where finished grade exceeds Elev. +23, a non-woven geotextile will be placed on subgrade. Expanded shale Lightweight Structural Fill will then be placed in lifts not to exceed 12 inches and compacted with vibratory compaction equipment. Upon placing four feet of Lightweight Structural Fill, the area will be covered by a non-woven geotextile extending a minimum of 12 inches beyond extents. Select Granular Fill will then be placed in lifts not to exceed 12 inches and compacted with walk behind vibratory compaction equipment to landscaping subgrade. For details, see Drawing FO.333.

### *South of Buildings at Promenade Lightweight Structural Fill Placement*

Existing asphalt within the limits of the area south of buildings at promenade will be removed and disposed. The existing Cover Soil will be removed to within 6 inches of the Drainage Net as confirmed by test pits. Expanded shale Lightweight Structural Fill will be placed in lifts not to exceed 12 inches and compacted with vibratory compaction equipment. Upon placing 3 feet of Lightweight Structural Fill, the area will be covered by a non-woven geotextile extending a minimum of 12 inches beyond extents. Select Granular Fill will then be placed in lifts not to exceed 12 inches and compacted with walk behind vibratory compaction equipment to landscaping subgrade. For details, see Drawing FO.333. Two (2) settlement monitoring points will be added within this area to monitor for subsidence. For details, see Sections 6.5, and 7.6.

### *Type J Platform Lightweight Structural Fill Placement*

Existing asphalt within the limits of the Type J Platform will be removed and disposed in accordance with the MHMP. The existing Cover Soil will be removed to within 6 inches of the Drainage Net as confirmed by test pits. Expanded shale Lightweight Structural Fill will be placed in lifts not to exceed 12 inches and compacted with vibratory compaction equipment. Upon placing 3 feet of Lightweight Structural Fill, the area will be covered by a non-woven geotextile extending a minimum of 12 inches beyond extents. Select Granular Fill will then be placed in lifts not to exceed 12 inches and compacted with walk behind vibratory compaction equipment to landscaping subgrade. For details, see Drawing FO.333. Four (4) settlement monitoring points will be added within this area to monitor for subsidence. For details, see Sections 6.5, and 7.6.

### *Collapsed Covered Slip*

Existing asphalt, sand, and CR-6 within the limits of the Collapsed section of the Covered Slip will be removed, the subgrade will be covered with a non-woven Separation Geotextile, and covered by up to 12 inches of topsoil to facilitate planting of meadow grasses. Topsoil placed will be roughly equivalent in load to the material removed to provide no net loading or unloading. Planting meadow grasses will reduce the

incidence of live loading from public assembly. Two (2) settlement monitoring point will be added within this area to monitor for subsidence. For details, see Sections 6.5, and 7.6.

#### 5.2.4.5 Live Loads

Live loads are expected throughout the Site for the duration of construction and after construction is complete. Live load limitations on the Drainage Net are as follows:

1. Live load will be limited to 2,000 psf on the Drainage Net during construction with exception to the Unprotected Covered Slip and Collapsed Covered Slip.
2. The Unprotected Covered Slip and Collapsed Covered Slip will be limited to 720 psf live load on the Drainage Net during construction of the proposed Collapsed Covered Slip Relieving Platform.
3. The entire Site, excluding roadways and emergency egress routes, will be limited to 150 psf live load on the Drainage Net after construction, which represents public assembly for concerts.
4. Roadways and emergency egress routes will be limited to 2,000 psf live loading at the Drainage Net after construction.

Access to the area by construction equipment will be restricted by concrete barricades placed approximately 10 feet outside the area along its' perimeter, see Drawing FO.107. Sidewalks and promenade paths include bollards on either side of the area which restrict vehicular access to the area.

Where vehicular or promenade access crosses over the Hydraulic Barrier, a 15-foot wide, 12-inch thick epoxy coated reinforced concrete slab will be placed at the centerline of the Hydraulic Barrier and will be designated as a Bridge Slab.

#### 5.2.4.6 Cover Soil Stockpile

Excavations throughout the site will remove the existing Cover Soil. Excavation Cover Soil will be stored within Area 1 in the northwest portion of the site in the area designated on Drawing FO.107. The height of the Cover Soil stockpile is dictated by the 2,000 psf load limitation on the Drainage Net. The Cover Soil stockpile will be placed starting from existing grade and is limited to a maximum average height of 13.5 feet above existing grade at about Elev. +15, corresponding to a maximum at about Elev. +28.5.

#### 5.2.4.7 Stability of the Unprotected Covered Slip

As described in Section 3.4.2.3, the Unprotected section of the Covered Slip north of the Collapsed section and south of the Protected section below the abandoned Building 23 pile caps and structural slab has been identified as likely to collapse without load relief (EE Memo 6). To mitigate this, a pile supported concrete relieving platform will be constructed within this area (see Drawing FO.114). The extent of the area will be confirmed by test pits as detailed on Drawing FO.311. Piles will be installed through the Covered Slip by excavating shored pits, cutting a hole in the platform, isolating the hole with sacrificial HDPE casing, backfilling the shored pit, temporarily restoring the MMC, installing the piles, removal of the MMC within the extents of the proposed platform, constructing the platform, then restoring the MMC to its' existing grades. For details of the sequence, see Drawing FO.211.

### 5.3 Geomembrane Concrete Protections

Concrete slabs placed on top of the Drainage Net or a Cover Geotextile will be utilized throughout the site to protect the Geomembrane as described below. For extents of concrete protections, see Drawing FO.109. For details of concrete protections, see Drawing FO.331.

### 5.3.1 *Mud Mat*

Where pile caps or utility pits subgrade is within 6 inches of the Geomembrane, a 4-inch thick unreinforced concrete mud mat will be constructed to provide a protection to the Geomembrane from accidental puncture and to provide a working surface for concrete formwork and reinforcing placement. The mud mat will be placed with Ready Mix concrete delivered on trucks, bleed from concrete is expected to be low. Mud mat will only be placed in locations that have been isolated from the Drainage Net utilizing an LLDPE flap extrusion welded to the existing Geomembrane blocking flow from the Drainage Net. For details, see Drawing FO.313.

### 5.3.2 *Bridge Slab*

Where promenade structures or pathways cross over the Hydraulic Barrier, a Bridge Slab will be constructed consistent with the existing Bridge Slab.

### 5.3.3 *Protection Slab*

Where utilities are within public streets or within the park where utilities go below the Warning Layer, a Protection Slab will be constructed to a minimum of 5 feet beyond the plan location of the utility.

### 5.3.4 *Tree Slab*

Where trees are present a 9-inch thick 10 feet square concrete slab will be placed above the Drainage Net centered under the tree and covered by a 20 square foot root barrier which prevents water infiltration and root penetration.

## 5.4 Foundations

Foundation recommendations are provided in MRCE geotechnical report “Geotechnical Report and Foundations Recommendations Harbor Point – Parcel 3 Buildings and Harbor Point Park” dated December 31, 2020. Geologic sections are provided in Drawing FO.200 with a plan for section locations and boring locations on Drawing FO.100. The following sections described the selected foundations.

### 5.4.1 *Pile Selection*

Piles will be conical pointed tip closed-end pipe piles filled with concrete similar to prior projects at the Site. Driven piles will meet criteria previously developed by static load test, and quality control will be supplemented by dynamic load tests performed on a minimum of 2% of the driven piles. Pile caps have been offset from adjacent structures by a minimum of 10 feet to facilitate driven pile installation.

Pipe piles will bear in Pleistocene deposits of Strata S3 or M inboard of the historic shoreline and in the Cretaceous deposits of Stratum S-4 outboard of the historic shoreline. Penetration of Stratum M clay is not of environmental significance in Area 1 which is enclosed by the HB and is managed by pumping to maintain an inward gradient. Estimated pile tip elevation for the eastern buildings was established based the as-built pile tip elevation for the Wills Street retaining wall piles. Estimated pile tip elevation for the west building will be established by a line of indicator piles driven with dynamic testing along a single North-South column line of the western building to help determine drive lengths prior to ordering piles for the western building. For estimated pile tip elevation, see Drawing FO.102. For pile locations, see Drawing S1.00.

Pipe piles will be filled with concrete for structural purposes. The concrete fill also prevents vertical migration of water. The top of the pile will be filled with a high strength non-shrink epoxy to reduce evaporation and control capillary uptake of chromium within the concrete core. Each pile will be sealed



with a field fabricated Geomembrane boot extrusion welded to the restored Geomembrane and mechanically clamped to the pile. All piles observed to be damaged will be cutoff and filled with concrete a minimum of 12 inches below the restored Geomembrane. In the event that a pile needs to be extracted, decontamination will be performed in accordance with the MHMP, substantively consistent with the approach used for the Exelon Project.

#### **5.4.2 Pile Caps and Utility Pits**

Pile caps will be placed below columns at the interior and perimeter of the proposed office buildings and exterior foundation walls along the south and west sides and supported on driven piles. Utility pits will be installed between pile caps and in line with pile caps along north-south oriented column lines and supported on driven piles or connected to structural slabs. Pile caps and utility pits will be protected against chromium uptake by restoring the Base Geotextile, Capillary Break, Cushion Geotextile, Geomembrane and Cover Geotextile. The existing Drainage Net will be dammed permanently at the cap perimeter to prevent flow of water into pile cap depressions. For pile cap and utility pit locations, see Drawing S1.00.

The GCL component of the existing MMC in the area of the pile caps will not be restored and is consistent with the previously approved approach used for the Exelon project. As discussed in Table 1, the infiltration is prevented by the structure or foundation element. In the post-construction condition, the building above these areas becomes the primary means of restricting infiltration to the subsurface and the Geomembrane thus becomes the secondary barrier; therefore, replacement of the GCL is not required.

Tower cranes will be used for the Parcel 3 development. The existing tower crane pile cap located adjacent to the west side of the Wills Wharf project may be re-used for logistics access on the east side of the site and a new tower crane pile cap will be constructed near the center of the development site. For approximate proposed and existing tower crane locations, see Drawing FO.107.

#### **5.4.3 Ground Floor Slab**

The ground floor slab covers an area which is inboard of the historic shoreline without compressible clay deposits (northern portion) and an area which is outboard of the historic shoreline containing compressible clay deposits (southern portion). The northern portion will be a reinforced concrete slab supported on or near existing grade. The southern portion will be supported on a pile supported structural slab with single piles between pile caps to support long spans. The ground floor slab will be entirely above the existing Geomembrane. All utilities except floor area drains will be located above the ground floor slab. For ground floor slab extents and types, see Drawing S1.00.

#### **5.4.4 Shallow Foundations for Park and Promenade Structures**

Shallow foundations will be used to support park and promenade structures in areas where load restriction allows with bearing stress limited as depicted on Drawing FO.102. Shallow foundations for park structures include concrete sidewalks, light pole, and grand staircase foundations. These foundations will bear on either Cover Soil or EPS. For park structure locations and details, see Drawings S9.00 and S9.01.

Shallow foundations for promenade structures include mechanically stabilized earth wall, concrete upslope bulkhead, cantilevered timber walkway, and concrete amphitheater. For promenade structure locations, sections, and details, see Drawings FO.110, 111, 112, 210, 330, 331, 332, and 333.

## 5.5 Utilities

The proposed site utility systems for the Parcel 3 development will include storm drains, sanitary sewer, domestic water, natural gas, electric and telecommunications. The utility infrastructure already exists within the vicinity of the Project as it is servicing previous development projects. Existing utilities will be extended from the Exelon Tower and Central Plaza garage in the north and from Wills Street in the east to service the Project. A detailed utility plan is provided in Drawing C410 showing the planned utility network connecting the planned on-site utilities between the development parcel and existing utilities adjacent to the Site. Utility profiles are provided in Drawings C435, C455, and C495.

No utilities will be installed beneath the MMC Geomembrane layer. Where utilities will be installed below the existing warning layer, a Protection Slab will be installed below any required utility bedding to provide a physical barrier to prevent inadvertent penetration of the Geomembrane during utility installation or future repairs. For locations of Protection Slab, see Drawing FO.109.

Assessments in EE Memo 3 indicate that positive slope is maintained at less than 2 inches of settlement. Proposed lines and grades have been set such that less than 2 inches of settlement is expected. Accommodations for the MMC drainage layer will be incorporated to enable continued drainage over the Geomembrane.

## 5.6 Park and Roads

The parking garage will be the first level within the footprint of the two Office Buildings; no other parking lot will be constructed. Similarly, no new roads will be constructed except temporary access roads and temporary parking spaces during construction. The two Office Buildings are located at the intersection of Wills Street and Point Street and are also accessible from Central Avenue. These streets were constructed, extended, or improved during prior development projects. The parking garage and loading area of the Office Buildings will be accessed from Wills Street. Minor extensions, such as ramps, will be constructed to connect the garage space to Wills Street. To the north, a small portion of Point Street will be enlarged as a passenger drop-off area at the proposed ground level of the Office Buildings.

Portions of the park will include emergency vehicular access (see Drawing L-1.00d) and may require concrete slabs in roadways and segments where access crosses the HB. Where concrete slabs are needed, the Cover Soil will be removed and the slabs will be constructed on top of the Drainage Net and Cover Soil restored.

Trees that will be planted in the Park area will include root barrier/protection against root penetration into the Drainage Net (Drawing L-3.00). The root protection will include installing a root barrier under the area to be planted at a dimension of 30' x 30', centered on the proposed trunk location. The ends of the root barrier will bend vertically upward on all sides to prevent any potential lateral migration of roots. Further, chemically impregnated Biobarrier Geotextile mat will be installed above the root barrier continuously. The combination of these two systems will provide both a physical and chemical barrier to root intrusion. Further, 8" thick concrete slab (10'x10') will be installed over the protective barrier noted above (trunk to be centered). The slab will receive embedded steel plate anchors (3 per slab) to which guy wire will be secured to anchor tree. The purpose of this slab is to provide resistance against the potential overturning of trees in windthrow events and the downward thrust of severed roots that may result. Drain mat (miradrain 6000 or equal) shall be installed over the concrete slab to facilitate drainage along its surface.

### **5.6.1 Promenade Structures**

The proposed promenade will generally follow the crest of the Outboard Embankment and in areas will cross over the Hydraulic Barrier. The promenade will incorporate structures for seating, viewing, and shoreline access to future waterfront features. Structures will be supported on concrete spread footings or slabs bearing on the core stone of the Outboard Embankment or in the Cover Soil above the Geomembrane and spanning over the Hydraulic Barrier. No driven piles will be installed for promenade structure foundations and foundations will not penetrate below the Geomembrane or impede the Infiltration Trench. To facilitate review of embankment performance from the additional load of fill and permanent structures, eight (8) monitoring point pairs will be established along the promenade. For details of additional monitoring, see Sections 6.5 and 8.

## 6. DESIGN MEASURES TO PROTECT THE ERS

The following sections present the design measures taken to protect the efficacy of the ERS throughout construction and after completion of the development. A summary of all ERS components and the impacts thereto are depicted on Drawing FO.106.

### 6.1 Outboard Embankment

Prior to construction of promenade structures, the rip rap slope will be inspected within the Limits of Disturbance and deficient areas will be identified and rip rap stone will be re-set or supplemented to restore required slopes, see Drawing FO.002. To accommodate promenade features and to facilitate future uses along the shoreline rip rap will be (see Drawing FO.210): (1) amended as needed to restore original design condition; (2) removed and replaced to accommodate construction of promenade foundations; (3) supplemented with additional rip rap at the same slope to minimize wave forces at the underside of timber decks; (4) covered by promenade walkway structures; and (5) covered by planting beds.

### 6.2 Hydraulic Barrier (HB)

The HB provides great efficiency to the inward gradient obligation of the Consent Decree. To reduce vibration-related densification settlement of the HB's S-B backfill, Honeywell requires monitoring and construction controls to curtail vibrations above 2 inches/second at the ground surface above the barrier.

In accordance with the Honeywell Requirements, the proposed development will not install piles within 30 feet of the HB. Vibration monitoring will be provided at existing ground surface using a mobile geophone and seismograph unit for all pile locations within 50 feet of the HB.

A Bridge Slab as described in Sections 3.4 and 5.3.2 will be constructed where vehicular access is required to cross over the HB, consisting of a 12-inch thick epoxy coated reinforced concrete slab.

### 6.3 Head Maintenance System (HMS)

The HMS will be maintained in full operation at all times during construction. Minor improvements will be implemented to accommodate the proposed development, as summarized below.

#### 6.3.1 Extraction System

The ground surface around HMS Vaults 5, 6, 7 and 8 will be raised to be level with the manhole covers to accommodate Honeywell access and landscaping. Grading around the vaults will be designed to minimize stormwater flow over manhole covers. During original construction, the grade was kept lower than the top of the Vault and therefore, due to the raising of the grades, Vault roofs and manhole lids will need to be waterproofed. This will be accomplished by:

- Demolishing the existing light pole bases affixed to the top of the vault roof. Each light pole base will be completely cut through prior to lifting.
- Demolishing the existing block and mortar manhole extension and replacing with a concrete extension doveled into the roof of the existing vault. The construction joint will be roughened and treated with a strip hydrophilic waterstop. Existing manhole covers will be replaced with traffic rated manhole covers with water tight seals.

- Removing Cover Soil around the perimeter of the vault to a depth of about 12 inches below the joint between the vault roof and vault walls and installing a Geomembrane skirt affixed to the Vault exterior wall with a steel batten strip.
- Vault entry doors will be replaced with traffic-rated manhole covers with water tight seals.

### 6.3.2 *Monitoring and Control System*

The ground surface in the vicinity of Junction Boxes and Piezometers will be raised in some areas, which will require extension of standpipes and manhole access. Grading around the Piezometers and Junction Boxes will be designed to minimize stormwater flow over piezometer covers. Manhole covers and concrete pads will be reset at the final grade up to about 2 feet above existing. Steel casing will be extended with couplers to maintain a rim elevation 6 inches  $\pm$  below the manhole cover. Extension of Piezometers will require brief periods to install extended cables and wiring. Work will be sequenced to minimize the time period that the cables and piezometers are not functional.

### 6.3.3 *Conveyance System*

To reduce disturbance to the Conveyance System, Honeywell requires that no penetrations below the MMC are permitted within 10 feet. The proposed development will not require penetration below the MMC within 10 feet of the conveyance pipes and related components. Portions of the finished grade will be covered by landscaping pavers, concrete sidewalks, and plantings. These plantings will need to be removed in the event access to the Conveyance System at those locations will be necessary.

## 6.4 *Area 1 – Multimedia Cap*

A review and analysis of the MMC performance in its existing use and the future development application is provided in Table 1. The MMC was designed to protect against stormwater infiltration, thermal and mechanical damage, and human exposure. For the proposed development, overlying structures and storm drains will manage much of the stormwater flow from the MMC thus removing much of the demand on the Drainage Net (see Section 6.4.4). Overlying hard structures and management control provided by the development will protect against human exposure and errant excavation.

### 6.4.1 *Excavation Protection*

The MMC will be protected throughout construction. Localized surgical cuts of the Geosynthetics will be made for pile driving and related development construction but will be restored as described below in Section 6.4.3.

Where utilities which are deeper than the Warning Layer are required on the MMC, a 6-inch thick epoxy coated reinforced concrete slab (Protection Slab) will be constructed a minimum of 5 feet beyond the extents of the vehicular access or utility.

### 6.4.2 *Temporary Construction Traffic*

Construction equipment, including dozers, excavators, trucks, cranes, and other traditional development equipment, will be traversing Area 1 throughout construction activities. A minimum soil thickness of 24 inches will be in place to protect the Geosynthetic layers against damage due to equipment applications with a ground pressure of less than 20 pounds per square inch (psi); however, additional fill material or the use of mats will be employed for temporary support of larger equipment such as mobile cranes.

In general, all wheeled construction vehicles will operate on temporary access roads. All equipment not rated to be driven on city streets will be evaluated to confirm bearing stress at the Drainage Net is less than 2,000 psf.

### **6.4.3 Foundation Penetrations and MMC Restoration**

Where the MMC is disturbed outside of the building limits, it will be restored in its' entirety as depicted on Drawing FO.333. Where the MMC is disturbed within the building limits it will be restored as described below. Where possible, the existing MMC will be protected and used for the development cap.

Connections at pile penetrations and the perimeter of pile caps will only be made to the Geomembrane layer, in accordance with provisions provided in Table 1.

The Geomembrane will be protected against mechanical damage by providing adequate soil cover/thermal insulation. The Geomembrane will also be protected by a Cushion Geotextile below and a Cover Geotextile above for abrasion control, and mud mat for structural and puncture control. Where public utility Right of Way is located on fill above the MMC, a Protection Slab will be placed above the Drainage Net to protect the MMC against damage caused by excavation for installation or maintenance of utilities.

Pile penetrations will be sealed using a Geomembrane "boot"; extrusion welded to the existing Geomembrane layer, and sealed using a field fabricated mechanical boot to the pile. Extrusion welds will be vacuum box or spark tested and all mechanical pile connections will be vacuum box tested using the same setup as was done for the Exelon Tower and Central Plaza Garage project, with exception to piles requiring a tension connection. Tension pile boots will be spark tested only. The GCL will not be replaced beneath the new buildings, as indicated in Table 1 and discussed above in Section 5.4.2.

Importantly, excavation of Cover Soil below the warning layer will be performed where the Geosynthetic Layers are intended to survive construction. The Geosynthetic Layers will be protected by cutting without tension stress or tearing and by using flat plate buckets and spotters indicating hand digging where necessary. Repairs will be made by extrusion welding new Geomembrane sections.

### **6.4.4 Capillary Break**

The existing Capillary Break may be used as a means for control of groundwater originating from below the Geomembrane during pile driving. Upon completion of pile driving, the underlying Base Geotextile will be restored by overlapping with existing a minimum of 6 inches, placing Capillary Break gravel and restoring the Cushion Geotextile by overlapping with existing a minimum of 6 inches.

### **6.4.5 Drainage Net**

The crown of the Geomembrane is upgradient (north) of the Site. EE Memo 2 provides an assessment of flow through the drainage net and indicates there will be a down slope away from the building. Since there is always a down slope away from the building there will not be any water originating outside the Project Area draining under the building.

### **6.4.6 Methane Gas Venting System**

The Methane Gas Vent is in the limits of proposed structures and will be relocated to the east as shown on Drawing FO.108 and detailed on Drawing FO.333. The new location will be within the Elev. +13 contour of the As-Built Geomembrane contours, representing the highest elevation of the existing Geomembrane. The new location will incorporate two bends of 90° total to vent to an above grade space. The new vent will be installed prior to, or concurrent with, demolition of the existing vent.

### **6.4.7 Perimeter Drain**

Portions of the Infiltration Trench section of the Perimeter Drain will be covered over by timber decking and crossed over by site storm drains and promenade shallow foundations. The Infiltration Trench will not be modified.

## 6.5 Surface Soil Monitoring Program Elements

Settlement monitoring points MP-3 thru MP-5 and MP-7 thru MP-11 will be re-set and ten additional monitoring points, MP-12 thru MP-21 will be added in the area of the Collapsed Covered Slip, Type J platform, and proposed light weight fill. New monitoring points will be installed prior to the start of construction and monitored throughout. For details of optical monitoring program, see Section 7.6. For details of monitoring point construction, see Drawing FO.333.

Settlement monitoring points MP-4 and MP-11 will be demolished during construction of the proposed Covered Slip Relieving Platform. Monitoring points will be monitored until they are demolished and replaced with offset settlement monitoring prior to construction of the Covered Slip Relieving Platform.

Surface Soil Monitoring Points SSMP-2 and SSMP-3 manhole covers and risers will be extended in the same fashion as piezometer cover raising. For details, see Drawing FO.333.

Survey points (SP) SP-1 thru 16 will be established in eight (8) pairs along completed Promenade Structures to monitor settlement of the Outboard Embankment from the additional load of fill and permanent structures. For locations, see Drawings FO.106, 110.

## 7. CONSTRUCTION AND ENVIRONMENTAL CONTROLS AND MONITORING

The following sections present the quality control and environmental monitoring program that will be implemented during construction. During extreme weather events, such as a hurricane, tropical storm or high wind velocities, all intrusive activities associated with any construction activity will cease and steps will be taken to mitigate the potential for soil dust migration beyond the work area. In the event of an extreme weather event, erosion and sediment controls and MMC sampling locations, as defined in the SSMP will be inspected to ascertain no erosional damage has occurred.

### 7.1 Construction Quality Assurance/Quality Control

The contract drawings and specifications will identify work items that require contractor Quality Control (QC) and items that require developer/owner Quality Assurance (QA). The Contractor will be required to prepare QA/QC Work Plans for operations that encounter the Environmental Remediation System (ERS). The Work Plan system will allow the Contractor to determine detailed means and methods for developer approval, and for the developer to control the work that protects the MMC and other ERS elements. QA/QC activities include inspections, testing, monitoring, and reporting. The Contractor's QC and the Developer's CQA teams will be comprised of the positions listed below.

#### 7.1.1 Contractor's QC Team

- Contractor's Project Manager: The Contractor's Project Manager is responsible for overall implementation and management of QC activities.
- Contractor's QC Manager (QC Manager): The QC Manager will report to the Contractor's Project Manager. The QC manager will perform and/or oversee all QC activities; coordinate QC activities with the Developer, and maintain copies of all QC records and test results. The QC Manager should not have any other duties other than QC.
- CQC Laboratory: The laboratory is an entity independent of the owner, developer and contractor, which will be responsible for conducting tests on materials, e.g., geosynthetics, to document conformance with the contract plans and specifications. The laboratory will be retained by the Contractor, and be located either on or off Site.

#### 7.1.2 Developer's QA Team

- Developer's QA Manager: The Developer's QA Manager is responsible for overall implementation and management of QA activities.
- Developer's Field QA Inspectors (QA Inspectors): QA Inspectors will report to the Developer's QA Manager and will inspect major construction activities for conformance with the Contract Plans and Specifications. The QA Inspectors will perform the following:
  - Visually observe imported materials for conformance with the specifications;
  - Observe CQC sampling;
  - Observe work performed on ERS components;
  - Observe CQC testing;
  - Record observations; and
  - Prepare weekly reports.



The Developer will provide QA Inspectors to manage, inspect and monitor construction on a daily basis throughout work that is conducted at or below ground surface and that potentially affects the ERS. Specific QA activities are summarized below:

- Inspect the work to confirm that construction complies with the Contract Documents and Specifications. Primary work elements that will be inspected include but are not limited to the following:
  - Exposure, removal or repair of any component of the ERS affected by the Project;
  - Installation of infrastructure that may affect the HMS, e.g., landscape and grading affecting select vaults, piezometers, junction box and other elements of HMS;
  - Modifying elements of the HMS such as extending vaults, piezometers, junction boxes to the finish grade;
  - Methane vent relocation; and
  - Other construction activities that directly affect the ERS.
- Prepare and archive daily construction reports to document the work, including date/time stamped photographs;
- Attend progress meetings;
- Review construction submittals to confirm compliance with the design;
- Collect and coordinate QA sampling and testing;
- Review QA/QC test results, including soil compaction, geosynthetic materials testing, geomembrane weld testing, concrete testing, and testing of other construction materials and completed portions of the project;
- Document materials management activities and adherence to the Materials Handling and Management Plan (MHMP), which is discussed further in Section 7.3. These activities include verifying waste management procedures, confirming that hazardous, non-hazardous, and clean materials are managed separately and profiled appropriately, documenting the quantity of waste materials (i.e., water and soil) removed from the Site and clean materials imported to the Site;
- Verify conformance with the project control plans, such as the Air Monitoring and Material Handling and Management Plans; and
- Confirm that vibration and settlement monitoring is being performed appropriately during construction activities.

In addition to the Contractor and Developer's QA/QC responsibilities, Honeywell or its designee will independently inspect the work, coordinate with the Developer's QA staff (QA Inspectors and QA Manager) regarding construction activities and QA/QC results, and document the activities. Honeywell will communicate with the Developer's QA staff and document any deficiencies, potential changes, and corrective actions required to meet the performance function of the ERS and the intent of this DDP. Honeywell may review any submittals, test results, changes, or other engineering or QA/QC documentation issued for the project.

Honeywell, or its designee, has the right to review and comment on Contractor's Work Plans, inspect the work, conduct inspections with EPA and MDE, submit required reports to the Agencies, and participate in progress meetings with the Agencies during construction. Honeywell, or its designee, will also have the right to issue a Stop Work notification for work that may significantly impact the ERS in a manner that is not consistent with this DDP. A Stop Work notification may be issued immediately upon learning of the

potential for any significant impact to the ERS. MDE's Field Representative will be notified by the Developer's QA Manager or designee at the time a Stop Work notification is issued to contractors in the field. MDE's Field Representative will then contact and relay the information to EPA's and MDE's Project Coordinators as deemed appropriate by the agency's field representative. The Stop Work procedures will include the following:

- *Stop Work Notification* - Written notification to stop work with a description of the issue and requirements (requirements may include time frames and/or actions associated with mitigating further impacts on the ERS);
- *Stop Work Compliance Response* - Written response that describes the planned corrective measures to address the issues described in the Stop Work Notification and a schedule for implementation; and
- *Stop Work Completion* - Written notification that the corrective measures have been completed, including a description of any deviations from the Compliance Response.

## 7.2 Air Monitoring and Dust Control

Air monitoring plans have been prepared for each of the prior projects at Harbor Point, including work on Area 1, as well as work outside Area 1 (i.e., Areas 2 and 3). The two prior projects that have comprised work within Area 1 include the Exelon Tower (Area 1, Phase 1) and Wills Wharf (only a small portion of Wills Wharf project was in Area 1). Air monitoring will focus on inhalable particulate matter with aerodynamic diameter less than 10 micrometer (PM<sub>10</sub>) and PM<sub>10</sub> hexavalent chromium (CrVI) concentrations. This Area 1, Phase 2 project will benefit from the knowledge developed during those efforts to improve the overall effectiveness and efficiency of the air monitoring program for the Parcel 3 project. Data from the previous Area 1 projects will be used to set air quality alert levels, work zone limitations, and other criteria. The Parcel 3 Construction Air Monitoring Plan (CAMP) will be no less protective than those implemented in support of the Exelon Tower and Wills Wharf development projects but efficiencies will be incorporated, as applicable, as discussed in Appendix A-5 (CAMP). The general approach is presented in this subsection. The detailed air monitoring program (including sample collection, meteorological monitoring, laboratory analyses, and reporting) is presented in the CAMP and its associated Quality Assurance Project Plan (QAPP) that accompany this DDP (CAMP, Attachment 1). For the purpose air monitoring, "intrusive activities" are considered to occur any time there is disturbance of materials immediately below the geomembrane of the MMC in Area 1. Real-time perimeter PM<sub>10</sub> monitoring will commence when earthmoving activities begin and continue for as long as potentially contaminated material is exposed to the atmosphere – regardless of whether or not construction activities are being performed. Work zone PM<sub>10</sub> and perimeter PM<sub>10</sub> CrVI monitoring will be implemented upon commencement of intrusive activities and will continue until the intrusive area is adequately covered with clean material or the geomembrane has been restored. Perimeter monitoring will continue until all materials removed from beneath the MMC geomembrane have been disposed offsite.

The potential CrVI exposure pathways of concern during intrusive operations are incidental inhalation, ingestion, and dermal contact via airborne dust. In addition to CrVI, inhalation of particulate matter may constitute a health risk. Both particle-bound CrVI and inhalable particulate matter are pollutant of interest.

A portable meteorological system will be employed to provide continuous onsite wind speed, wind direction and precipitation measurements. The meteorological system has an integral digital data logger. The data are also telemetered in real-time to a database server, which store the raw data prior to processing.

Air monitoring will be performed during all intrusive operations, at the work zone's downwind boundary, using continuous Real-time Aerosol Monitors, "RAM" (i.e., TSI DustTrak Model 8535, or equivalent), to determine if the 15-minute PM<sub>10</sub> concentration exceeds the 68 microgram per cubic meter (µg/m<sup>3</sup>) Alert

Level. If winds are strong enough to yield a definitive direction, the upwind PM<sub>10</sub> concentration is subtracted from the downwind measurements. Under low or calm wind conditions (i.e., less than five mile per hour), no adjustment will be made. RAMs will be installed downwind of intrusive construction zones. At least two downwind RAMs will be operated for each 75 feet of projected crosswind (i.e., orthogonal to wind direction) distance of intrusive operations. Additional RAM monitoring will be performed to the north of the clean soil stockpile and the contaminated soil container storage area. The RAM measurements will be telemetered to a database server in real-time, where they will be screened, and any appropriate alerts issued to field and project management staff via email and/or text message. One of the fixed perimeter monitors (described below) will serve as the “upwind” reference for computing the net impact of construction activities at each construction zone RAM for each 15-minute averaging period that wind speed exceeds five mile per hour.

The downwind construction work zone monitoring locations will be selected each work day, based on the local wind forecast. Sites will be relocated or added, as necessary to address changes in operating or meteorological conditions. For each 15-minute averaging period during which wind speed exceeds five miles per hour, and each perimeter RAM, a corresponding “upwind” monitoring site will be designated from one of the perimeter monitoring sites, to provide the basis for computing the net work-zone PM<sub>10</sub> impacts.

In addition to work zone monitoring, a network of at least five perimeter monitoring stations will be operated during each day that construction operations are performed. Each perimeter monitoring site will be equipped with a continuous RAM — providing 15-minute average PM<sub>10</sub> values— and an instrument capable of collecting a 24-hour integrated PM<sub>10</sub> filter sample, suitable for subsequent CrVI laboratory analysis. These functions may be combined within a single instrument. This may be a TSI DustTrak Model 8540 (a successor to the Model 8535), or equivalent. Real-time PM<sub>10</sub> monitoring will commence when earthmoving activities begin and continue for as long as potentially contaminated material is exposed to the atmosphere, regardless of whether or not construction activities are being performed.

As with the work zone RAM measurements, if onsite monitoring yield a definitive wind direction, the upwind PM<sub>10</sub> concentration will be subtracted from the downwind measurements for the real-time perimeter PM<sub>10</sub> monitors. Under low or calm wind conditions (i.e., less than five mile per hour), no adjustment will be made. The perimeter PM<sub>10</sub> alert level will be set at 150 µg/m<sup>3</sup>, 15-minute average. The CrVI samples are daily composites and will yield a 24-hour average concentration. Each monitoring filter sample will be analyzed for PM<sub>10</sub> hexavalent chromium by a subcontracted National Environmental Laboratory Accreditation Program-certified laboratory, using the ERG-specific method ERGMOR-063 based on ASTM Test Method D7614-12.

Perimeter monitoring locations will be fixed about the site perimeter. Sampling and analytical methods will be provided to USEPA and MDE for approval in the DDP. The CrVI alert level will be set at 0.178 ng/m<sup>3</sup>. This alert level was selected for the prior Exelon Building project and successfully utilized at the Site thereafter. Specifically, the action level value was set forth in accordance with US EPA correspondence from Mr. Russell Fish, dated 21 May 2014, to Mr. Jonathan Flesher (Appendix F). Since current technology makes real-time field monitoring of CrVI infeasible, the PAM sites will be equipped with instruments to collect filter samples that will be analyzed for CrVI in the laboratory for comparison to the alert level. If a sample exceeds the alert level, a review of operations will be triggered, and corrective actions will be implemented. Real-time PM<sub>10</sub> monitoring will be used as a surrogate for real-time CrVI impacts. This process is consistent with the prior approved method utilized for the Exelon project. Similarly for the workers, there are work zone monitors using the surrogacy concept, which is also consistent with the prior approved project. Drawing CAMP-02 (CAMP in Appendix A-5) illustrates the tentative location of the perimeter and soil stock pile fixed monitoring sites.

Soil handling practices that reduce dust generation and prevent excavation spoil deposition onto the adjacent surfaces will be implemented. Dust will be controlled by misting water during excavation as needed to keep exposed soil surfaces moist and mitigate the potential for migration of airborne particulate. Removal of sediment from asphalt surfaces utilizing water/sweeper trucks will also be used to reduce dust generation. Other potential dust control options such as foam spray, covering excavated surfaces and soil stockpiles with plastic sheets may also be utilized. These options will be discussed in the MHMP which is included as part of DDP.

The real-time PM<sub>10</sub> data provided by construction zone and perimeter Real-time Aerosol Monitors (RAMs) will be available to the project team via secure web site, to inform operational decisions on the required level of dust mitigation. Laboratory results will be posted to the web site as reports are received and processed. Real-time alerts will be issued automatically by the database server via email and text message to the responsible site management personnel. Response actions are detailed in Section 4 of the CAMP (Appendix A-5). Other authorized individuals (e.g., USEPA and MDE project staff) will also have access to the monitoring data website.

### 7.3 Material Handling and Management

The Material Handling and Management Plan (MHMP) addresses the handling and management of solids (asphalt, stone aggregates, concrete and wood debris, and soil) and liquids (stormwater and groundwater) that may be encountered throughout construction activities including, intrusive activities (below the geomembrane of MMC) and construction activities above the MMC geomembrane. Liquids encountered during construction are categorized into two categories: contact water and non-contact water. Contact water consists of groundwater from below MMC, stormwater that comes in contact with impacted materials below the MMC geomembrane, and equipment decontamination water. Non-contact water is surface water run-off that flows or accumulates over non-impacted materials or materials above the geomembrane. As discussed in the MHMP, a dedicated concrete wash location will be utilized and the concrete wash water will be managed in accordance with the MHMP. The MHMP also addresses the import of materials to the Project.

Material handling and management is expected to occur in a manner similar to the procedures implemented on prior projects at Harbor Point with the incorporation of effective and efficient opportunities when applicable. The MHMP for the Project is included in Appendix A-1. Location of cover soil stockpile area, including equipment decontamination pad and concrete wash area are shown in Figure 1.

### 7.4 Hydraulic Gradient Monitoring

Performance of the Hydraulic Gradient will be reviewed weekly for all Site piezometers within 500 feet of the excavation or pile driving work. Where the Hydraulic Gradient is observed to be within 0.5 feet of the Groundwater Gradient Performance Standard, the Hydraulic Gradient will be reviewed daily to confirm that pile driving may commence. Required Hydraulic Gradient monitoring is denoted on Drawing FO.003.

### 7.5 Vibration Monitoring

Continuous vibration monitoring will be performed at the HB for each day of pile driving with pile locations driven within 50 feet of the HB and for all locations within 50 feet of HMS structures including Vaults for the duration of pile driving within 50 feet. Continuous vibration monitoring will also be performed for the Central Plaza Garage and new Wills Wharf Office and Hotel building to the east of Parcel 3 by mounting two (2) geophones to foundations at the lowest level with one geophone near the extremities of the adjacent structure for the duration of all pile driving. Required vibration monitoring is denoted on Drawing FO.003 and depicted on Drawing FO.113.

## 7.6 Optical Monitoring

A minimum of four (4) weeks prior to commencement of excavation, a baseline survey will be performed of all elements to be optically monitored. Elements will be surveyed as follows:

- HMS Vaults and Settlement Monitoring Plates within 100 feet of the work: weekly during excavation and twice weekly during all pile driving. Then once monthly for the 12 months, and once every three months for a minimum of the subsequent 24 months following completion of grading operations for Harbor Point Park.
- HB Centerline existing ground surface at a maximum spacing of 25 feet: The day following each day where piles were driving within 50 feet.
- Site Logistics Areas: corners – weekly for the duration of use. An area survey will be performed on a 25-foot grid spacing following construction of asphalt prior to use and immediately following termination of use.

Required optical monitoring is denoted on Drawing FO.003 and depicted on Drawing FO.113.

## 7.7 Spill Prevention and Response Plan

A project-specific Spill Prevention and Response Plan (SPRP) has been prepared (Appendix A-4) for the Project. The SPRP describes the measures to be implemented by the Developer and its Contractors to prevent hazardous material and petroleum product discharges (i.e., spills) from occurring, and to mitigate the effects of a discharge, should one occur. Spills are inclusive of solids and liquids. Contractors are required to notify as soon as possible the Developer's Field Representative and Honeywell's Resident Site Manager if a spill occurs that is subject to this SPRP.

In general, the handling of liquids and solids will be conducted in a manner such that contaminated material will be contained on the construction site and not allowed to flow or be placed 1) onto site areas where existing environmental protections will not be disturbed, 2) onto completed Work, or 3) off the Site as a surface-water discharge. These occurrences will be treated as a spill and addressed per the SPRP. Characterization and proper disposal of captured and stored liquids in accordance with the Material Handling & Management Plan is required.

## 7.8 Erosion and Sediment Control and Stormwater Management

Erosion and sediment control for the Project will be addressed through implementation of best management practices (BMPs) during construction, which includes silt fence, perimeter berms/swales, stabilized construction entrances, sediment tanks, inlet protection, and/or other similar BMPs. The DDP drawings DDP C-610 provides an erosion and sediment control (ESC) plan presenting the location of the proposed measures, whereas DDP drawings DDP C-600, DDP C-601 and DDP C-620 provides associated ESC notes and details. Prior to the initiation of any intrusive activities, the erosion and sediment controls and stormwater management features will be installed in accordance with the permit drawings to be prepared and submitted to the City of Baltimore, and in accordance with the General Permit to Discharge Storm Water associated with Construction Activities, to be submitted to the MDE Water Management Division.

The Site is considered development under the Baltimore City Code Article 7 (Natural Resources) Division 2 Section 23-7 (a) and, therefore, recharge volume, channel protection storage volume, and overbank flood protection volume requirements are anticipated to be waived. Additionally, per Section 23-7 (b), a combination of impervious area reduction and stormwater management implementation must be utilized to provide qualitative control for at least 50% of the Project's impervious area. Analysis of the post-

construction surface conditions suggests that the impervious area reduction may not achieve the 50% requirement; some water quality treatment will be provided through green roof and non-rooftop disconnect. The balance of the reduction requirements will be address by payment of fee-in-lieu into the Baltimore County Stormwater Management Fund.

The stormwater management (SWM) approach will be based on the MDE 2000 (revised 2009) Maryland Storm Water Design Manual and the Baltimore City's supplement to the MD SWM manual last amended by Ordinance 20-401.

## 7.9 Stormwater Pollution Prevention

A Storm Water Pollution Prevention Plan has been prepared outlining the controls for erosion, sediment and storm water during construction (Appendix A-3). The SWPPP was prepared in accordance with the United States Environmental Protection Agency (EPA) and Maryland Department of the Environment (MDE) regulations governing stormwater runoff.

A General Discharge Permit for Stormwater Associated with Construction Activities (General Discharge Permit) will be obtained for the Project. The management activities to be in compliance with the General Discharge Permit are provided in the Project's Erosion and Sediment Control Plan.

The Developer may also submit an application (Notice of Intent or "NOI") to MDE for coverage under Maryland's General Permit 17HT: General Permit for Discharges from Tanks, Pipes and Other Liquid Containment Structures, Dewatering Activities, and Groundwater Remediation (NPDES Permit No. MDG67 referred to herein as General Permit No. 17HT). All requirements of General Permit No. 11HT for monitoring and discharge limits will be followed during the Project.

The SWPPP includes the following elements:

1. Consistency of the SWPPP with other plans and control documents;
2. Identification of potential pollution sources;
3. BMPs for stormwater management controls, including during construction and post-construction; and
4. SWPPP team and training.

## 7.10 Health and Safety

The "Final, Master Health and Safety Plan" for Honeywell Baltimore Inner Harbor, revised June 2007, as prepared by CH2M Hill ( now Jacobs) and updated, will be the minimum standard for all work associated with the planned development. Additionally, a Health and Safety Guidance (HSG) Document has been prepared for the project (Appendix A-2). The purpose of this guidance document is to establish general personal protection standards and safety practices and procedures to be used as guidelines for project-related work. The guidance document is not intended to be and shall not be used as a Contractor Health and Safety Plan (CHASP); rather, the contractor will be required to prepare their own CHASP that meets or exceeds the requirements specified in the HSG.

Further, the guidance is not intended to be inclusive of all health and safety issues that may be encountered at the Site, such as those associated with general construction activities. Rather, the document is solely intended to provide guidance to Contractors by identifying environmental issues and constraints that Contractors at a minimum should include in their own CHASPs.

Contractors will be required to prepare and implement and comply with their own CHASP in accordance with all applicable federal, state and local regulations and standards of care. All Contractor-prepared CHASPs will be approved by the General Contractor, or its designee, prior to their personnel mobilizing to the Site.

## 7.11 Progress Submission and Reporting

### 7.11.1 Documentation

As described in Section 7.1, the Contractor's QC team and the Developer's QA team will prepare field records to document construction, Quality Control (QC), and Quality Assurance (QA) activities. Weekly reports will be prepared to summarize the major work activities, work approvals, construction issues, and corrective actions. Digital construction photographs will be included in weekly progress reports and posted on the Project website for public access.

From a geotechnical perspective, field staff will document the following elements:

1. Pile driving records;
2. Fill compaction testing;
3. Vibration Monitoring;
4. Ground and Instrument Settlement Monitoring; and
5. Multimedia Cap reconstruction and QA inspection of contractor's vacuum/spark QC testing for geomembrane field welds and boot penetration seals.

The Geotechnical Engineer will collect, review, and maintain documentation and incorporate the information into the routine project construction reports for Honeywell, USEPA, and MDE.

From an environmental perspective, field staff will collect and document the following elements:

1. Perimeter and Work Zone real-time air monitoring data and laboratory analytical results;
2. Source of clean fill/aggregates, type of material, and all laboratory analytical results used to certify that the material is suitable and "clean" for on-Site use;
3. Waste characterization analytical results;
4. Waste profile and facility acceptance of all materials to be transported and disposed off-Site;
5. Waste manifests; and
6. Approved work plans and material submittals.

The Environmental Engineer will collect, review, and maintain documentation and incorporate the information into the routine project construction reports for Honeywell, USEPA, and MDE.

Collectively, the geotechnical, environmental, and QA field staff will prepare the daily and weekly logs. At a minimum, the logs will identify the following:

- Work performed;
- Changed conditions;
- QA elements and deficiencies, if any;
- Monitoring results;
- Corrective actions;

- Design and construction modifications; and
- Other relevant design or construction activities.

### **7.11.2 Modifications to the DDP or Consent Decree Work Plans**

As discussed above in Section 3.5.2, the SSMP documents the methodology to monitor the MMC performance, and its ability to prevent infiltration and the upward migration of contaminants. The current SSMP does not address the post-development cap foundations and pile penetrations of the MMC, but allows the SSMP to be revised to address development. Minor modifications to the SSMP that will be necessary during the active phase of construction are identified in Section 8. Honeywell will submit a formal request for the minor modification to address SSMP activities during construction under separate cover. Upon completion of construction, a revised SSMP will be submitted by Honeywell for agency review and approval.

During the course of construction, if field conditions or construction activities warrant a modification to the elements presented in this DDP or any other minor modification to the Consent Decree Work Plans, HPD and Honeywell will notify USEPA and MDE, accordingly. The modification will be submitted to USEPA and MDE for review and approval.

### **7.11.3 Construction Completion Report**

A Construction Completion Report will be prepared and submitted to EPA, MDE and Honeywell. The report will be assembled and submitted upon completion of construction, construction-related monitoring, and receipt of all QA/QC test results. The report will document construction activities, compliance with the DDP, and any modifications. Specifically, the report will include the following information:

- Construction activities;
- QA/QC documentation;
- Documented deviations, if any, from the DDP;
- As-Built drawings related to the ERS components;
- Construction photographs;
- Monitoring data;
- Selected correspondence; and
- Other relevant construction and design information related to the modifications or restoration of the ERS.



## 8. POST-CONSTRUCTION PERFORMANCE MONITORING

As required in the agreement between Honeywell and the Developer, the development design will ensure that all ERS components will remain operable and accessible to currently established monitoring programs. Specifically, all of the monitoring requirements established in the EMMP, GGMP and SSMP including settlement monitoring will continue during and following construction of this development project. Ten (10) new settlement monitoring points, including replacement monitoring points for MP-4 and MP-11, will be added around the Covered Slip, Type J Platform and south of the building at the Promenade. Eight (8), two-monitoring point pairs will be added near the extents of proposed promenade structure types to monitor the Outboard Embankment at the completion of construction. The new settlement monitoring points will be monitored during and after construction, for details see Section 6.5 and Section 7.6. This includes a post- construction settlement monitoring in accordance with an updated SSMP. As noted in Section 7.11, the existing SSMP will require minor modification. The SSMP minor modification will include extension of drainage layer sample point (SSMP-2) to accommodate to final grade, re-establishing settlement monitoring plates (MP-3 through MP-5, and MP7 through MP-11), adding ten new settlement monitoring locations (MP-12 through MP-21), and adding thirty (30) new survey monitoring points along the HB. A revised SSMP will be submitted by Honeywell for agency review and approval following construction. There are no revisions required in the GGMP or the EMMP.

Honeywell will continue to implement all monitoring activities in accordance with these plans. Notification of subsurface activities will be provided to Honeywell's Site Manager (Jacobs) at a minimum of five days prior to the start of work. Immediate notification will be made to Honeywell's Site Manager in the case of emergencies. Honeywell will continue to report the results of the Site's performance monitoring in accordance with the Consent Decree.

## **TABLES**

**FIGURES**

## **APPENDIX A      PROJECT CONTROL DOCUMENTS**

Appendix A-1      Material Handling and Management Plan

Appendix A-2      Health and Safety Guidance

Appendix A-3      Stormwater Pollution Prevention Plan

Appendix A-4      Spill Prevention and Response Plan



Appendix A-5      Construction Air Monitoring Plan

**APPENDIX B      DRAWING INDEX  
(DRAWINGS UNDER SEPARATE COVER)**

## **APPENDIX C      CONSTRUCTION SCHEDULE**

## **APPENDIX D      ENGINEERING EVALUATION**

EE Memo 1      Storm Water Storage Demand

EE Memo 2      Impedance to the Drainage Net

EE Memo 3

Estimated Settlement Under Development Fill

EE Memo 4            Construction Vehicle Load Spreading Analysis and Road Layout



EE Memo 5

Slab-on-Grade Development Cap at Garage Level

EE Memo 6

Evaluation of Existing Covered Slip and Type J Platform

**APPENDIX E      SURFACE WATER AND GROUNDWATER MONITORING  
LOCATIONS**

**APPENDIX F            USEPA'S CORRESPONDENCE FROM MR. RUSSELL FISH,  
DATED 21 MAY 2014, TO MR. JONATHAN FLESHER**