



# ARM Group Inc.

Engineers and Scientists

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November 14, 2018

Ms. Barbara Brown  
Project Coordinator  
Maryland Department of the Environment  
1800 Washington Boulevard  
Baltimore, MD 21230

Re: Response and Development Work Plan  
Addendum – Comment Response Letter  
Area A: Sub-Parcel A8-1  
Tradepoint Atlantic  
Sparrows Point, MD 21219

Dear Ms. Brown:

On behalf of EnviroAnalytics Group, LLC (EAG), ARM Group Inc. (ARM) is pleased to provide the following responses to comments received from the Maryland Department of the Environment (MDE) in an email dated October 22, 2018. The MDE provided comments regarding the previous Response and Development Work Plan (RADWP) Addendum submission (dated October 11, 2018) for Sub-Parcel A8-1 (the Site) of the Tradepoint Atlantic property located in Sparrows Point, Maryland. Based on the minor nature of the comments, the Sub-Parcel A8-1 RADWP Addendum itself will not be updated, but this Comment Response Letter serves the purpose of providing additional details as requested by the MDE. Relevant attachments including development plan figures and details are referenced herein. Responses to the MDE comments are provided below; the original comments are included in italics with responses following.

A revised development figure for the Site is attached to this letter as **Figure 1**. Please note that the lease line and layout of the proposed building and parking areas were not modified; however minor changes to the proposed utility alignments are reflected in the updated development plan. The limit of disturbance (LOD) was slightly modified, but the total area within the LOD remains the same as in the previous RADWP Addendum submission (5.0 acres). This revised figure supersedes **Figure 1** of the recent RADWP Addendum submission (dated October 11, 2018) for Sub-Parcel A8-1.

1. *Please submit a figure that depicts construction details for the new stormwater outfall on the western portion of the property.*

As requested, additional construction details for the new stormwater outfall proposed to the west of the main development area are provided in **Attachment 1** and **Attachment 2**. The drawings in **Attachment 1** show pervious and impervious areas around the Site and the stormwater drainage network that leads to the new proposed outfall. **Attachment 2** provides a storm drain profile for the main line leading to the new outfall (highlighted in yellow in **Attachment 1**) including the gradient of the gravity flow stormwater system as well as the length, width, and thickness of the riprap protection surrounding the outfall.

2. *Determine if this stormwater outfall will intersect the groundwater table.*

According to development plans provided by Tradepoint Atlantic, the stormwater outfall and portions of the drainage network appear to be proposed to be installed below the groundwater table. **Attachment 2** shows the stormwater outfall and drainage network profile. Since the potentiometric surface in the vicinity of the proposed outfall was approximately 9 feet above mean sea level (amsl) (refer to the Parcel A8 Phase II Investigation Report) and the outfall has a proposed bottom elevation of approximately 5 feet amsl, the outfall will likely be submerged.

3. *Regarding the exposure days listed for the Construction Worker (storm drain and stormwater) in the approved RADWP, will the duration remain the same?*

The agency-approved Sub-Parcel A8-1 RADWP (Revision 0) dated February 15, 2018 stated that intrusive activities associated with the installation of storm drains and stormwater structures had an estimated exposure duration of 18 days. The RADWP also provided a maximum allowable exposure duration of 45 days before site-specific health and safety requirements would be warranted. Tradepoint Atlantic has indicated that the revised exposure days for the stormwater system will be 36 days; since this does not exceed the allowable limit of 45 days there are no significant concerns.

If you have any questions, or if we can provide any additional information at this time, please do not hesitate to contact ARM Group Inc. at 410-290-7775.

Respectfully submitted,  
ARM Group Inc.



Taylor R. Smith  
Project Engineer



T. Neil Peters, P.E.  
Senior Vice President



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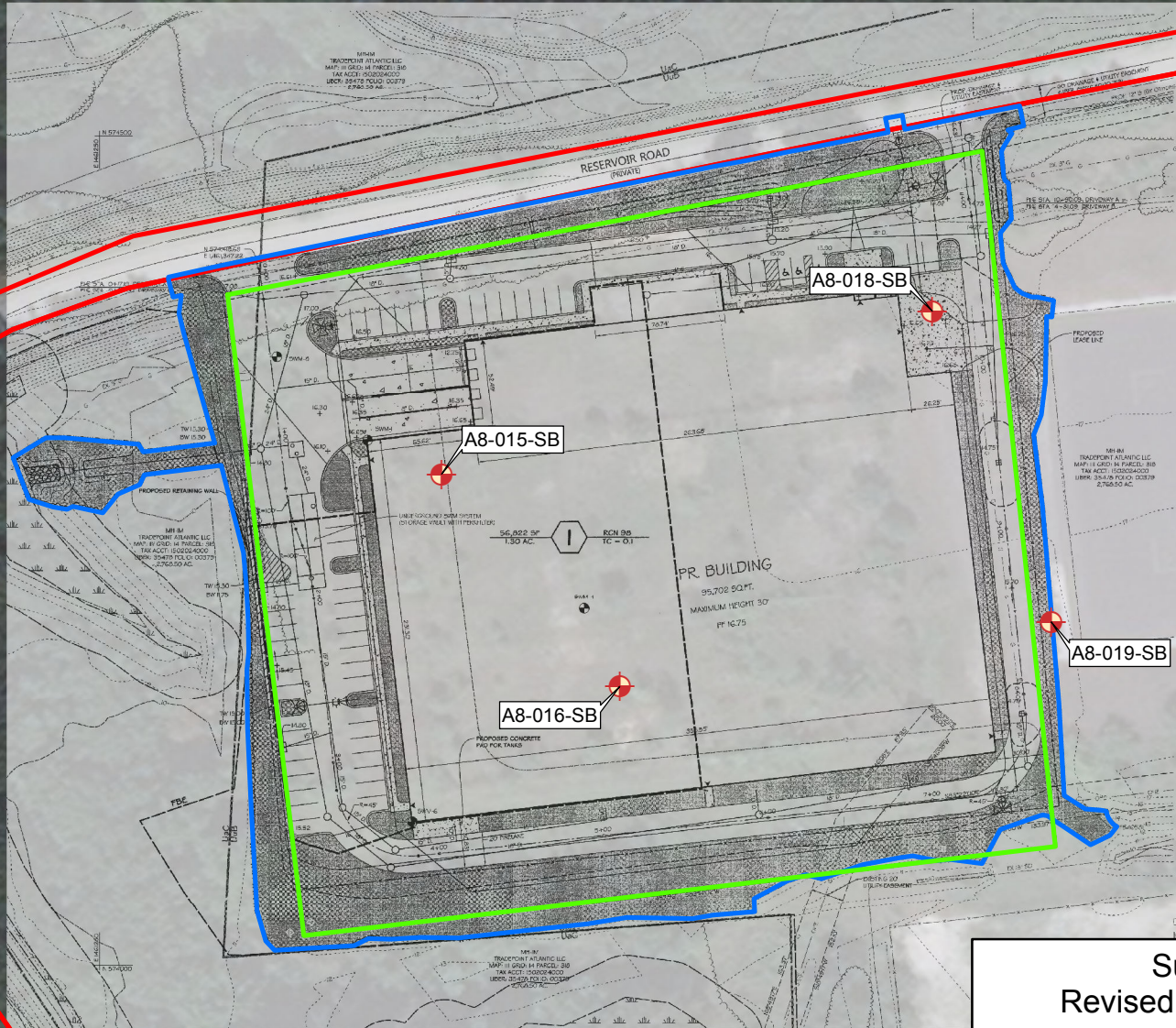
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## **FIGURES**

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Parcel A7



-  Soil Boring
-  Lease Line
-  Limit of Disturbance
-  Parcel Boundary

Parcel A8

Sub-Parcel A8-1  
Revised Development Layout

November 8, 2018

Figure

1



**ARM Group Inc.**  
Engineers and Scientists

0 25 50 100  
Feet

Tradepoint Atlantic

Baltimore County, MD

EnviroAnalytics Group

ARM Project 160443M-8

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# Attachment 1

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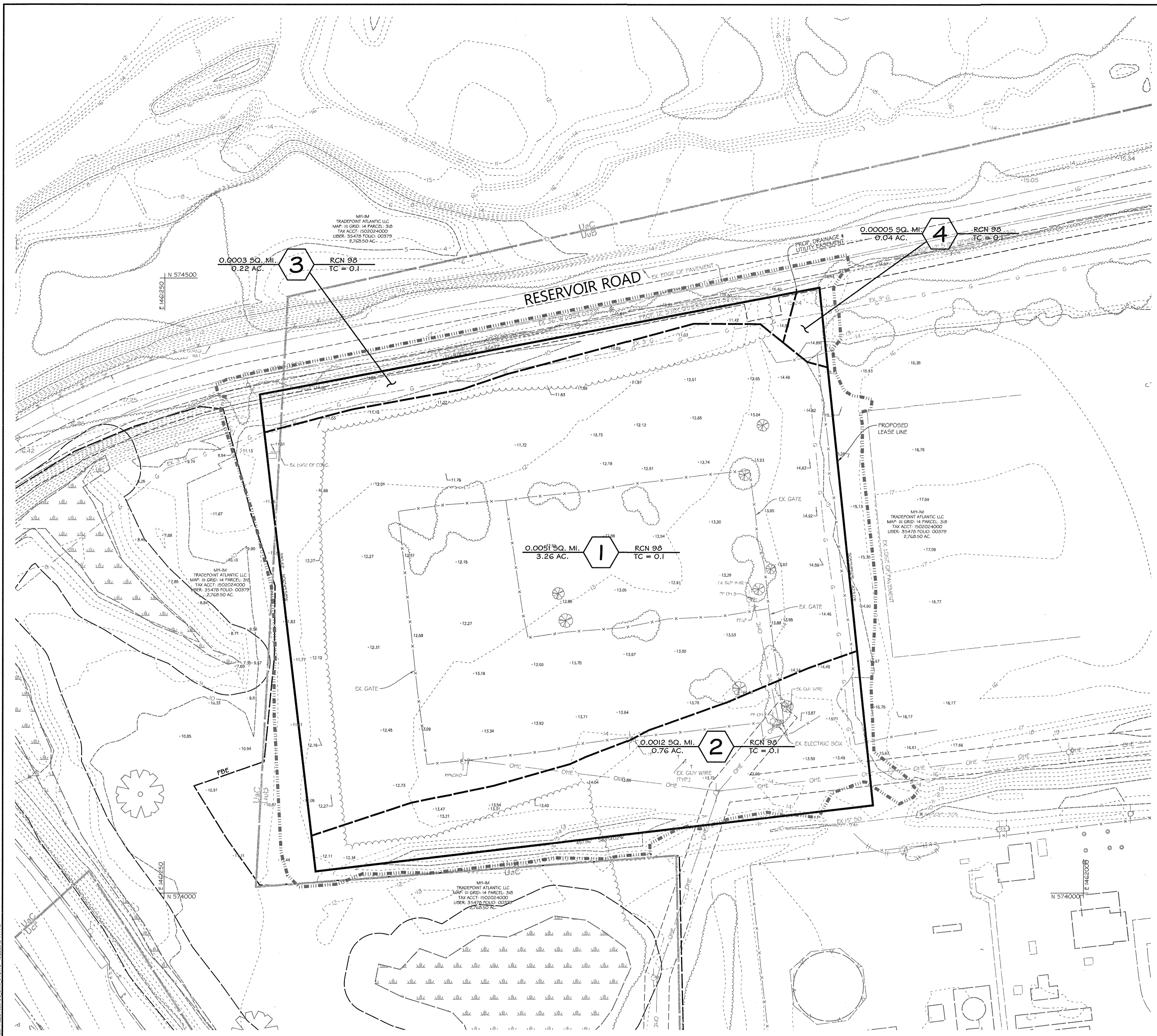
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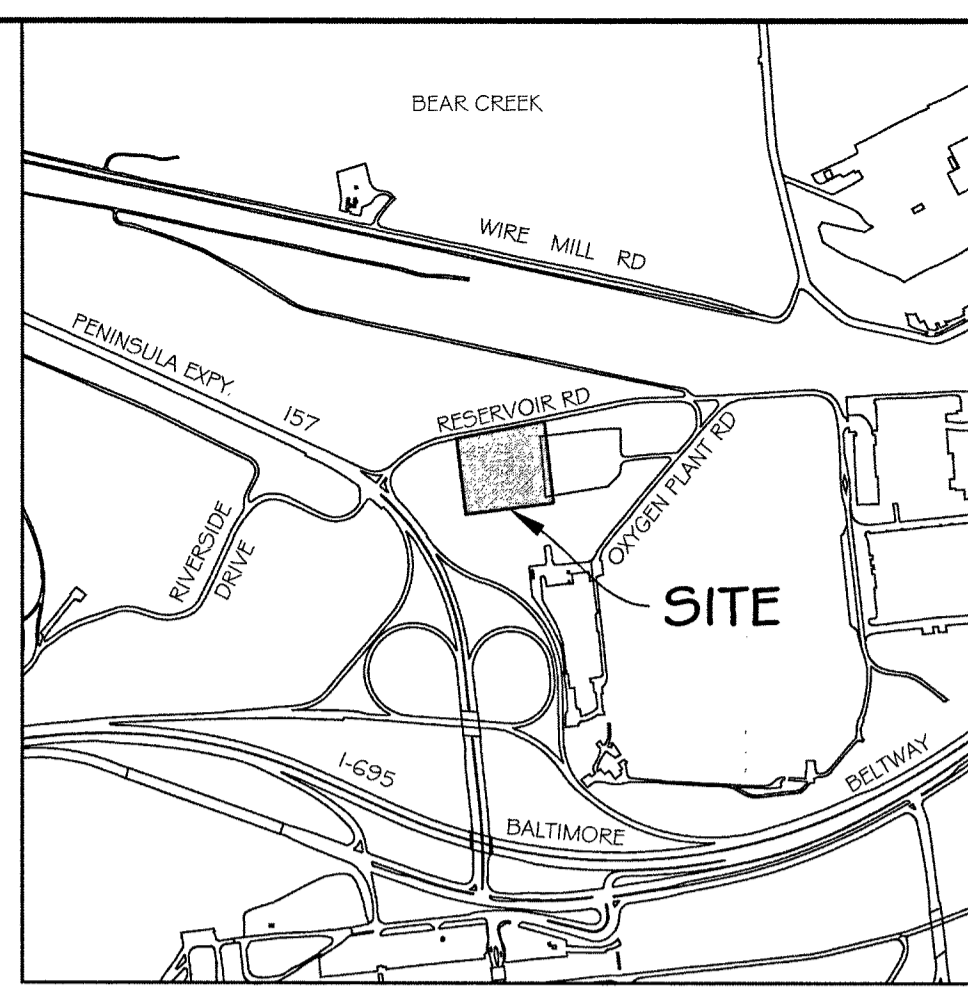
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**LEGEND**

Ur	LEASE BOUNDARY
G&B	SOILS
---	EXISTING TREE LINE
---	EXISTING MAJOR CONTOURS
---	EXISTING ODD CONTOURS
---	EXISTING MINOR CONTOURS
---	EXISTING BUILDINGS
---	EXISTING EDGE OF PAVING
OH/E	EXISTING OVERHEAD ELECTRIC
G	EXISTING GAS
---	EXISTING SANITARY SEWER
---	EXISTING WATER
---	EXISTING UTILITY EASEMENT
---	EXISTING DRAINAGE AREA
---	LIMIT OF DISTURBANCE



**VICINITY MAP**  
SCALE: 1" = 1,000'

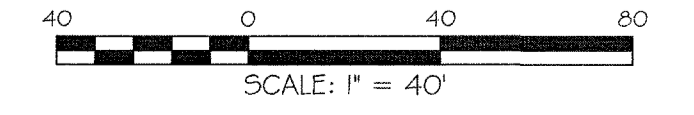
- ENVIRONMENTAL NOTES**
1. THERE ARE WETLANDS ADJACENT TO THIS SITE.
  2. THERE ARE REGULATED WATER RESOURCES ADJACENT TO THIS SITE.
  3. THE SITE WILL BE SERVED BY PUBLIC SANITARY SEWER.
  4. THERE ARE NO WELLS ON THE SITE. THE SITE WILL BE SERVED BY PUBLIC WATER.
  5. TO OUR KNOWLEDGE THERE ARE NO KNOWN UNDERGROUND STORAGE TANKS ON THIS SITE.
  6. THERE ARE KNOWN HAZARDOUS MATERIALS AS DEFINED BY SECTION 7-101 OF THE ENVIRONMENTAL ARTICLE OF THE ANNOTATED CODE OF MARYLAND ON THIS SITE. SITE CONSTRUCTION WILL BE GOVERNED BY A SITE SAFETY AND HEALTH PLAN ADMINISTERED BY THE LANDOWNER.
  7. THERE ARE NO KNOWN DESIGNATED AREA OF CRITICAL STATE CONCERN IDENTIFIED AS SUCH UNDER THE PROCEDURES OF SECTION 5-611 OF THE STATE FINANCE AND PROCUREMENT ARTICLE OF THE ANNOTATED CODE OF MARYLAND ON THIS SITE.
  8. THERE ARE NO KNOWN OCCURRENCES OR HABITATS OF RARE, THREATENED OR ENDANGERED SPECIES ON OR NEAR THIS SITE.
  9. THIS SITE IS NOT WITHIN THE CHESAPEAKE BAY CRITICAL AREA.
  10. FOREST AND SPECIMEN TREES WILL NOT BE IMPACTED BY THIS CONCEPT PLAN.
- II. WATERSHED - BALTIMORE HARBOR

**BENCHMARKS:**

STATION: G15-1A ELEVATION: 10.99' N: 562,923.39 E: 1,464,400.72 PID: AC76730 DESCRIPTION: NAIL	STATION: G15-2 ELEVATION: 9.95' N: 562,923.39 E: 1,464,400.72 PID: AC76730 DESCRIPTION: BRASS DISK
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- DATA SOURCE:**
1. EXISTING TOPOGRAPHY SHOWN HEREON TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY TRADEPOINT ATLANTIC DATED JANUARY 25, 2017 WITH AN ADDITIONAL SURVEY CONDUCTED BY MORRIS & RITCHE ASSOCIATES, INC. DATED JUNE 12, 2017 AND AUGMENTED WITH BALTIMORE COUNTY GIS.
  2. WETLAND LOCATIONS SHOWN HEREON SURVEYED BY MORRIS & RITCHE ASSOCIATES, INC. FROM A DELINEATION BY ECO-SCIENCE PROFESSIONALS, INC. ON AUGUST 29, 2017.
  3. UNDERGROUND UTILITY INFORMATION SHOWN HEREON PROVIDED BY TRADEPOINT ATLANTIC.

**EXISTING DRAINAGE AREA MAP**



**AS-BUILT CERTIFICATION**

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

SIGNATURE \_\_\_\_\_ P.E. NO. \_\_\_\_\_  
PRINT NAME \_\_\_\_\_ DATE \_\_\_\_\_

**ENGINEER'S CERTIFICATION**

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED BY ME OR UNDER MY SUPERVISION AND MEETS THE MINIMUM STANDARDS OF THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND THE BALTIMORE COUNTY SOIL CONSERVATION DISTRICT.

SIGNATURE *Jared L. Barnhart* 36725 P.E. NO.  
PRINT NAME **JARED L. BARNHART** 24 OCT 18 DATE

**LANDOWNER'S/DEVELOPER'S CERTIFICATION**

I/WE CERTIFY THAT ALL PROPOSED WORK SHOWN ON THESE CONSTRUCTION DRAWINGS AND ON THE APPROVED SEDIMENT CONTROL DRAWINGS WILL BE ACCOMPLISHED PURSUANT TO THESE PLANS. I/WE ALSO UNDERSTAND THAT IT IS MY/OUR RESPONSIBILITY TO HAVE THE CONSTRUCTION SUPERVISED AND CERTIFIED INCLUDING THE SUBMITTAL OF "AS-BUILT" PLANS WITHIN THIRTY (30) DAYS OF COMPLETION, BY A REGISTERED PROFESSIONAL ENGINEER.

OWNER/DEVELOPER \_\_\_\_\_ ADDRESS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

DESIGN # DRAWING BASED ON MARYLAND COORDINATE SYSTEM.

**PROFESSIONAL CERTIFICATION**

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36725, EXPIRATION DATE: 2/26/2019

**OWNER/DEVELOPER**

TRADEPOINT ATLANTIC LLC  
ATTN: STEVE BERNSTEIN  
1600 SPARROWS POINT BLVD  
BALTIMORE, MARYLAND 21219

LIMIT OF DISTURBANCE = 217,475 SF / 4.99 AC ±  
BALTIMORE HARBOR WATERSHED

501 FAIRMOUNT AVENUE SUITE 300 TOWSON, MD 21286  
P. 410 296 3333 F. 410 296 4705 WWW.DMW.COM

**STORMWATER MANAGEMENT  
FINAL DESIGN - EXISTING  
CONDITIONS DRAINAGE AREA MAP**

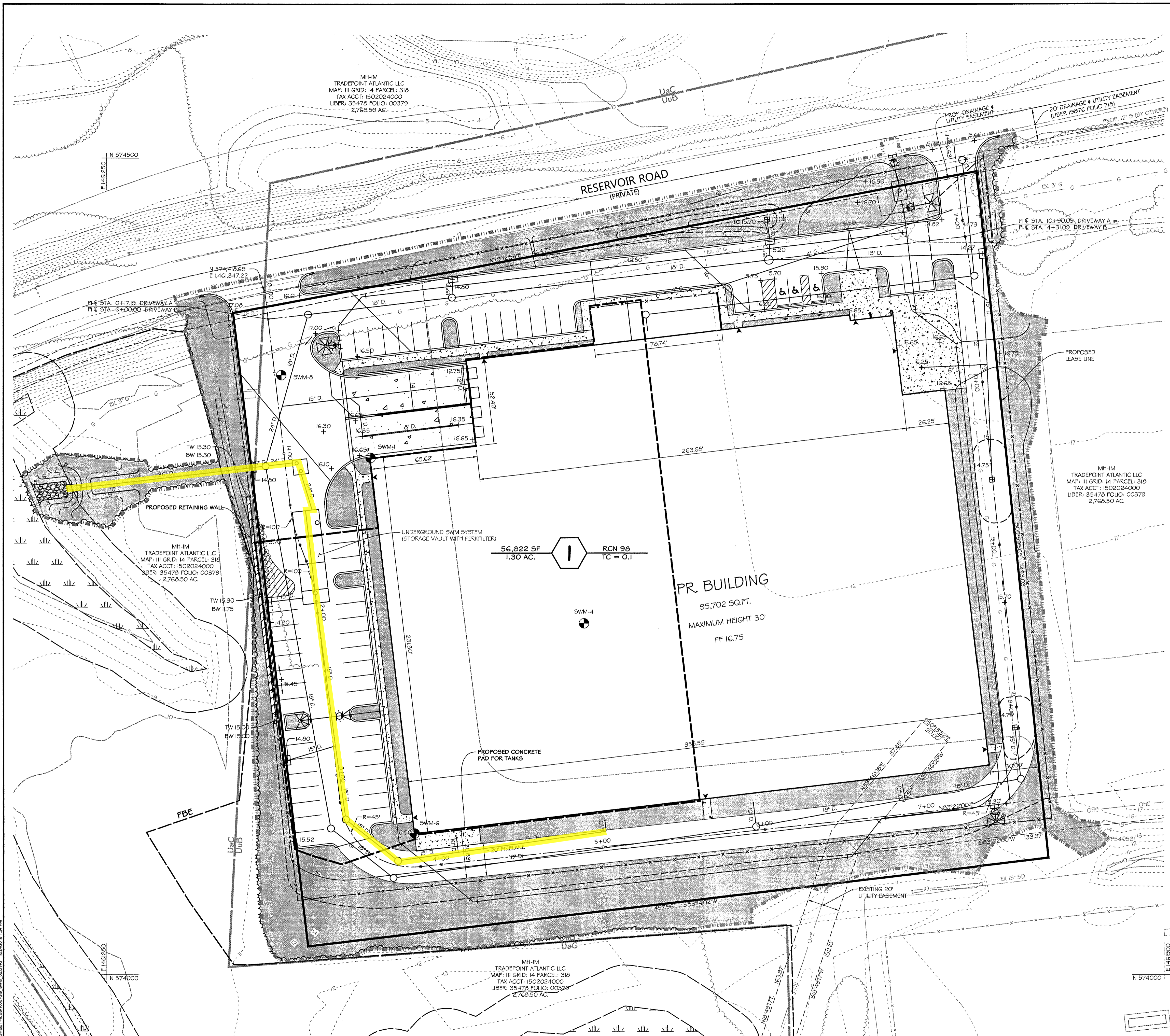
**GOTHAM GREENS**  
RESERVOIR ROAD  
BALTIMORE, MD 21219-1022

15 ELECTION DISTRICT  
7 COUNCILMANIC DISTRICT BALTIMORE COUNTY, MARYLAND

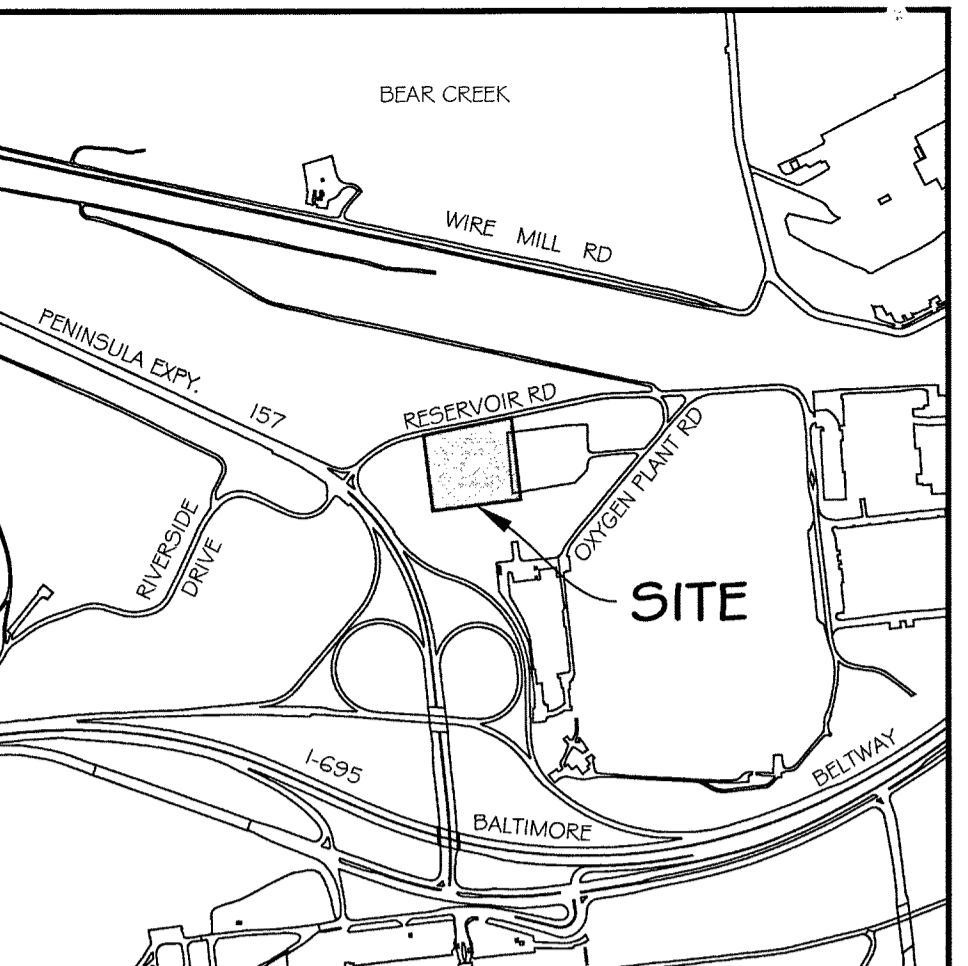
DATE	BY	REVISIONS

<b>ISSUE DATES</b>		BASE: JDS
REVIEW: 10/23/18	DRAWN: CHP	
BID: _____	DESIGNED: LNU/JLB	
PERMIT: _____	CHECKED BY: JLB	
CONSTRUCTION: _____	DATE CHECKED: 24 OCT 18	
SCALE: 1" = 40'	DRAWING: _____	
PROJECT NO: 16007.GG		<b>1 of 4</b>





- LEGEND:**
- 10 --- EXISTING MAJOR CONTOUR
  - 9 --- EXISTING MINOR CONTOUR
  - PROP. 12" S (BY OTHERS) --- PROPOSED SEWER
  - E 4.15.50 --- EXISTING STORM DRAIN
  - E --- EXISTING ELECTRIC
  - G --- EXISTING GAS
  - UG --- EXISTING UNDERGROUND ELECTRIC
  - E 30' W --- EXISTING WATER
  - E --- EXISTING TREELINE
  - FBE --- FOREST BUFFER
  - UaC --- SOIL LINES
  - UaB --- SOIL LINES
  - 15 --- PROPOSED MAJOR ODD CONTOURS
  - 10 --- PROPOSED MAJOR CONTOURS
  - 8 --- PROPOSED MINOR CONTOURS
  - 7 --- PROPOSED ODD CONTOURS
  - --- PROPOSED CURB
  - --- PROPOSED SIDEWALK
  - --- PROPOSED PARKING STRIPING
  - --- LIMIT OF DISTURBANCE
  - --- PROPOSED FENCE
  - --- PROPOSED TREELINE
  - 8" S --- PROPOSED SEWER
  - 18" D --- 15" D --- PROPOSED STORM DRAIN
  - 8" W --- PROPOSED WATER
  - PR. GAS --- PROPOSED GAS
  - --- PROPOSED DRAINAGE AREA
  - --- PERVIOUS AREA
  - SWM-1 --- PROPOSED SOIL BORING



**VICINITY MAP**  
SCALE: 1" = 1,000'

**BENCHMARKS:**

STATION: GS-1A ELEVATION: 10.59'	STATION: GS-2 ELEVATION: 9.95'
N: 562,923.39 E: 1,455,314.56 PID: AC7730 DESCRIPTION: NAIL	N: 565,182.39 E: 1,464,480.72 PID: AC7655 DESCRIPTION: BRASS DISK

- NOTES**
- THE PROPOSED GRADING SHOWN ON THIS PLAN MEETS THE REQUIREMENTS SET FORTH BY BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND COMPLIES WITH ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE. HOWEVER, DUE TO BUILDING TYPES AND LAYOUT, SOME FIELD ADJUSTMENTS MAY BE REQUIRED. ALL CHANGES MUST COMPLY WITH THE ABOVE MENTIONED REQUIREMENTS.
  - ALL SWALES HAVE BEEN DESIGNED BY THE ENGINEER TO CONVEY RUNOFF ACCORDING TO BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS DESIGN STANDARDS.
  - THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EASEMENT OR OTHER FOREST RETENTION AREAS, EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
  - STORMWATER MANAGEMENT HAS BEEN ADDRESSED BY A STORMWATER MANAGEMENT VARIANCE.
  - ACCORDING TO FEMA FLOODMAP 2400010556 THIS SITE IS NOT WITHIN A FLOODPLAIN.

**ESD TREATMENT SUMMARY**

FACILITY: PF #1	DRAINAGE AREA: 1.30 AC.	56,822 SF PROVIDED
		4,771 C.F. REQUIRED
		4,311 C.F. PROVIDED
	IMPERVIOUS AREA TREATED =	54,265 C.F.

**UNIFIED STORMWATER SIZING CRITERIA**

SIZING CRITERIA	REQUIRED	PROVIDED
WATER QUALITY VOLUME (WQV) (CFT)		
RECHARGE VOLUME (RE <sub>v</sub> ) (CFT)	4,771	4,311
CHANNEL PROTECTION VOLUME (CPV)		
ENVIRONMENTAL SITE DESIGN (ESD)		
OVERBANK FLOOD PROTECTION VOLUME (OFV)	N/A	N/A
EXTREME FLOOD VOLUME (EFV)	N/A	N/A

- STORMWATER MANAGEMENT GENERAL NOTES**
- UNLESS OTHERWISE NOTED, ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH:
    - BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION 1976, ERRATA AND ADDENDA.
    - MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION, OCTOBER, 1993 STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS.
  - THIS SITE LIES WITHIN THE GWYNNS FALLS WATERSHED.
  - STORMWATER MANAGEMENT IS APPROVED UNDER BILL NO. 25-10.
  - THESE FACILITIES ARE PRIVATE AND SHALL BE MAINTAINED BY THE OWNER.
  - ALL CONSTRUCTION MUST BE SUPERVISED BY A GEOTECHNICAL ENGINEER.
  - 10- AND 100-YEAR STORMWATER MANAGEMENT IS REQUIRED AND PROVIDED. ENVIRONMENTAL SITE DESIGN IS REQUIRED AND PROVIDED.

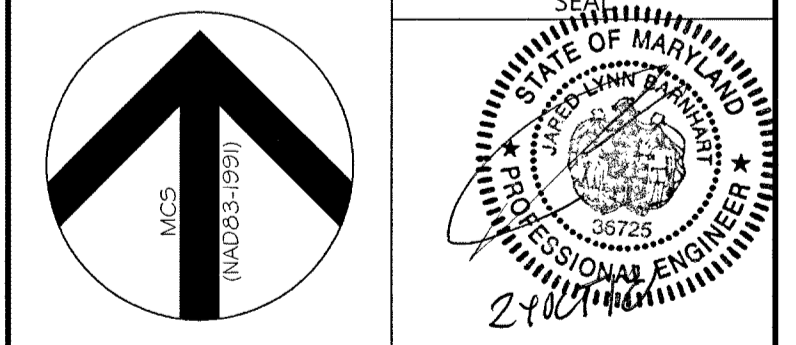
- SEQUENCE OF CONSTRUCTION**
- OBTAIN ALL NECESSARY PERMITS FROM FEDERAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION OVER THE PROPOSED CONSTRUCTION.
  - NOTIFY BALTIMORE COUNTY DEPARTMENT OF PERMITS, APPROVALS AND INSPECTIONS, SEDIMENT CONTROL DIVISION (410-687-3226) AT LEAST 48 HOURS PRIOR TO BEGINNING WORK AND THE MARYLAND REGISTERED ENGINEER CERTIFYING AS-BUILT.
  - CLEAR, GRUB AND INSTALL SEDIMENT CONTROL MEASURES ONLY.
  - CLEAR AND GRUB REMAINDER OF SITE DESIGNATED FOR DISTURBANCE.
  - EXCAVATE TO BOTTOM OF PROPOSED UNDERGROUND FACILITIES AND VERIFY ELEVATION AND AREA PRIOR TO PLACEMENT.
  - AFTER VERIFICATION OF PLAN ELEVATIONS, INSTALL UNDERGROUND FACILITIES PER PLAN. MEASUREMENTS SHALL BE TAKEN TO CONFIRM DIMENSIONS AND PER PLAN. THE ENGINEER IN CHARGE SHALL CONDUCT A VISUAL OBSERVATION OF EACH ELEMENT OF THE PROPOSED FACILITIES.
  - WHEN UPSTREAM DRAINAGE AREAS ARE STABILIZED, EXCAVATE THE MICRO-BIORETENTION FACILITIES TO SUB-GRADE.
  - INSTALL INLET STRUCTURES AND APPURTENANCES (UNDERDRAINS, CLEANOUTS, ETC.).
  - CONDUCT PARTIAL "AS-BUILT" SURVEY OF ALL STRUCTURES. CHECK STORAGE VOLUMES, ADJUST ELEVATIONS, INVERTS AND GRADING AS NEEDED.
  - INSTALL FILTER MEDIA AND ASSOCIATED LAYERS. CONDUCT PARTIAL "AS-BUILT" DURING FILTER MEDIA INSTALLATION. STABILIZE DISTURBED AREAS WITH SEED AND MULCH.
  - WITH PRIOR APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, REMOVE ALL SEDIMENT CONTROL MEASURES AFTER DISTURBED AREAS HAVE BEEN STABILIZED.
  - FINE GRADE AND STABILIZE ALL REMAINING DISTURBED AREAS.
  - CONDUCT "AS-BUILT" SURVEY OF FACILITIES' FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.



501 FAIRMOUNT AVENUE SUITE 300 TOWSON, MD 21286  
P: 410 296 3333 F: 410 296 4705 WWW.DMW.COM

**STORMWATER MANAGEMENT  
FINAL DESIGN - PROPOSED  
CONDITIONS DRAINAGE AREA MAP  
GOTHAM GREENS**

15 ELECTION DISTRICT  
7 COUNCILMANIC DISTRICT BALTIMORE COUNTY, MARYLAND



DATE	BY	REVISIONS

ISSUE DATES		BASE:	
REVIEW:	10/24/18	BASE:	JDS
BID:		DRAWN:	CHP
PERMIT:		DESIGNED:	LNL/JLB
CONSTRUCTION:		CHECKED BY:	JLB
SCALE:	AS SHOWN	DATE CHECKED:	
PROJECT NO:	16007.GG	DRAWING:	2 of 4

**CONTRACTOR'S "AS-BUILT" NOTE**

AS-BUILT PLANS AND CERTIFICATION ARE REQUIRED FOR THIS STORMWATER MANAGEMENT FACILITY. THESE MUST BE PREPARED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER. BALTIMORE COUNTY WILL NOT PERFORM THE INSPECTION OR PREPARE THE AS-BUILT PLANS OR CERTIFICATION. THE STORMWATER MANAGEMENT PERMIT SECURITY WILL NOT BE RELEASED UNTIL THE AS-BUILT PLANS AND CERTIFICATION ARE APPROVED BY BALTIMORE COUNTY.

IN ORDER TO PREPARE THE REQUIRED AS-BUILT PLANS AND CERTIFICATION, THIS STORMWATER MANAGEMENT FACILITY MUST BE INSPECTED BY THE ENGINEER AT SPECIFIC STAGES DURING CONSTRUCTION AS REQUIRED BY THE CURRENT BALTIMORE COUNTY STORMWATER MANAGEMENT POLICY AND DESIGN MANUAL. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST FIVE (5) WORKING DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE PLANS.

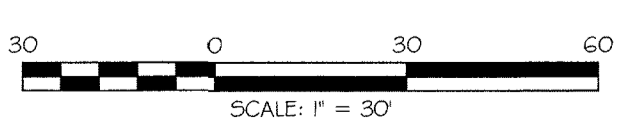
**OWNER/DEVELOPER**  
TRADEPOINT ATLANTIC LLC  
ATTN: STEVE BERNSTEIN  
1600 SPARROWS POINT BLVD  
BALTIMORE, MARYLAND 21219

**PROFESSIONAL CERTIFICATION**  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36725, EXPIRATION DATE: 2/26/2019.

**LIMIT OF DISTURBANCE = 217,475 SF / 4.99 AC ±**  
BALTIMORE HARBOR WATERSHED

**MISS UTILITY NOTE**

CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF WORK. THE EXCAVATOR MUST NOTIFY ALL PUBLIC UTILITY COMPANIES WITH UNDERGROUND FACILITIES IN THE AREA OF PROPOSED EXCAVATION AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION.





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## **Attachment 2**

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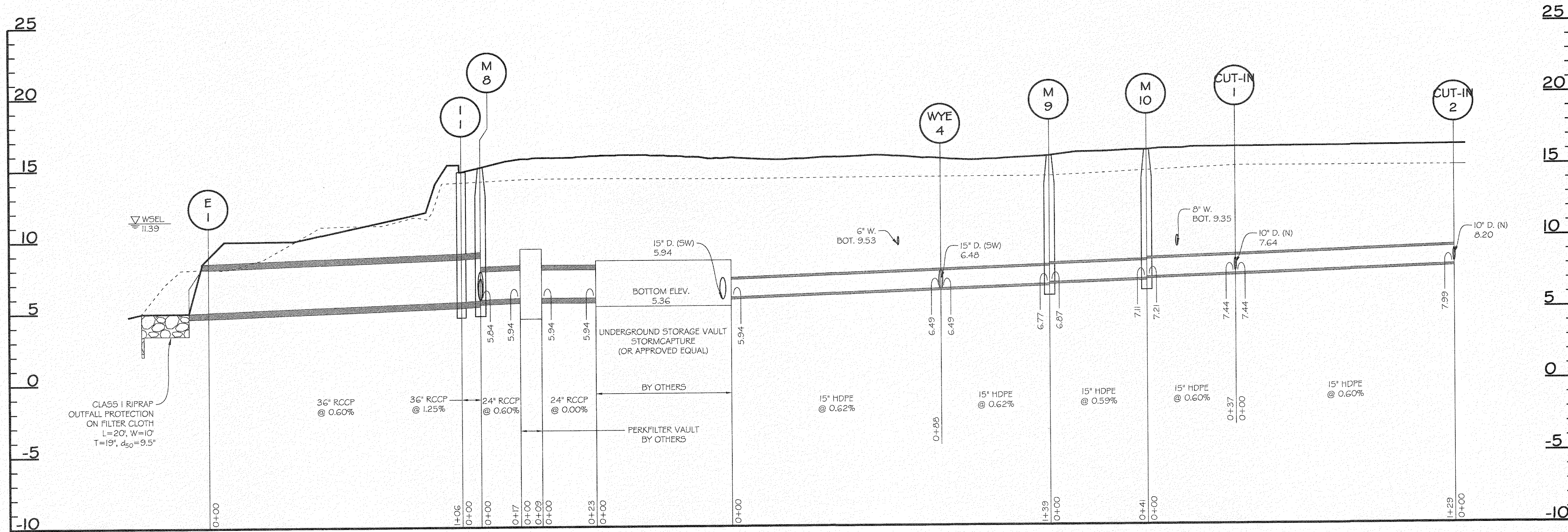
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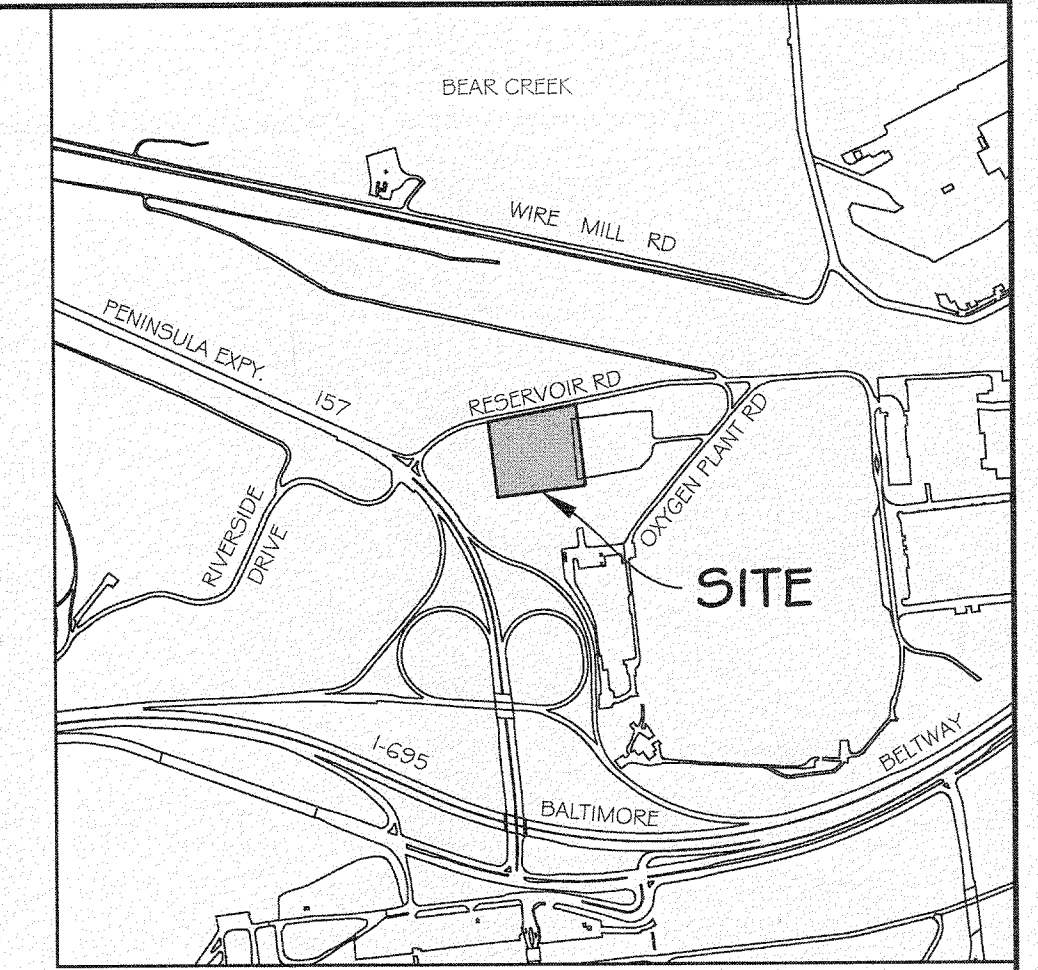
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**STORM DRAIN M8 TO CUT-IN 2**  
SCALE: HORIZ. 1"=30'  
VERT. 1"=5'



**VICINITY MAP**  
SCALE: 1" = 1,000'

**BENCHMARKS:**

STATION: G15-1A  
ELEVATION: 10.59'  
N: 562,923.39  
E: 1,465,314.56  
PID: AC7730  
DESCRIPTION: NAIL

STATION: G15-2  
ELEVATION: 9.95'  
N: 565,102.39  
E: 1,464,480.72  
PID: AC7685  
DESCRIPTION: BRASS DISK

**STRUCTURE BACKFILL**

BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A CONCRETE STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24\"/>

STRUCTURE BACKFILL MAY BE FLOWABLE FILL MEETING THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 313 AS MODIFIED. THE MIXTURE SHALL HAVE A 100-200 PSI; 28 DAY UNCONFINED COMPRESSIVE STRENGTH. THE FLOWABLE FILL SHALL HAVE A MINIMUM FH OF 40 AND A MINIMUM RESISTIVITY OF 2,000 OHM-CM. MATERIAL SHALL BE PLACED SUCH THAT A MINIMUM OF 6\"/>

**PIPE CONDUITS**

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION.

**REINFORCED CONCRETE PIPE - ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR REINFORCED CONCRETE PIPE:**

1. MATERIALS - REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-36.
2. BEDDING - REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING / CRADLE FOR THEIR ENTIRE LENGTH. THIS BEDDING / CRADLE SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 50% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 6 INCHES. WHERE A CONCRETE CRADLE IS NOT NEEDED FOR STRUCTURAL REASONS, FLOWABLE FILL MAY BE USED AS DESCRIBED IN THE "STRUCTURE BACKFILL" SECTION OF THIS STANDARD. GRAVEL BEDDING IS NOT PERMITTED.
3. LAYING PIPE - BELL AND SPIGOT PIPE SHALL BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHALL BE MADE IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE LINE, THE BEDDING SHALL BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHALL BE EXERCISED TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 4 FEET FROM THE RIGER.
4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".
5. OTHER DETAILS (ANTI-SLEEP COLLARS, VALVES, ETC) SHALL BE AS SHOWN ON THE DRAWINGS.

**PLASTIC PIPE - THE FOLLOWING CRITERIA SHALL APPLY FOR PLASTIC PIPE:**

1. MATERIALS - PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D-1785 OR ASTM D-2241. CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE, COUPLINGS AND FITTINGS SHALL CONFORM TO THE FOLLOWING: 4\"/>

DRAINAGE DIAPHRAGMS - WHEN A DRAINAGE DIAPHRAGM IS USED, A REGISTERED PROFESSIONAL ENGINEER WILL SUPERVISE THE DESIGN AND CONSTRUCTION INSPECTION.

**CONCRETE**

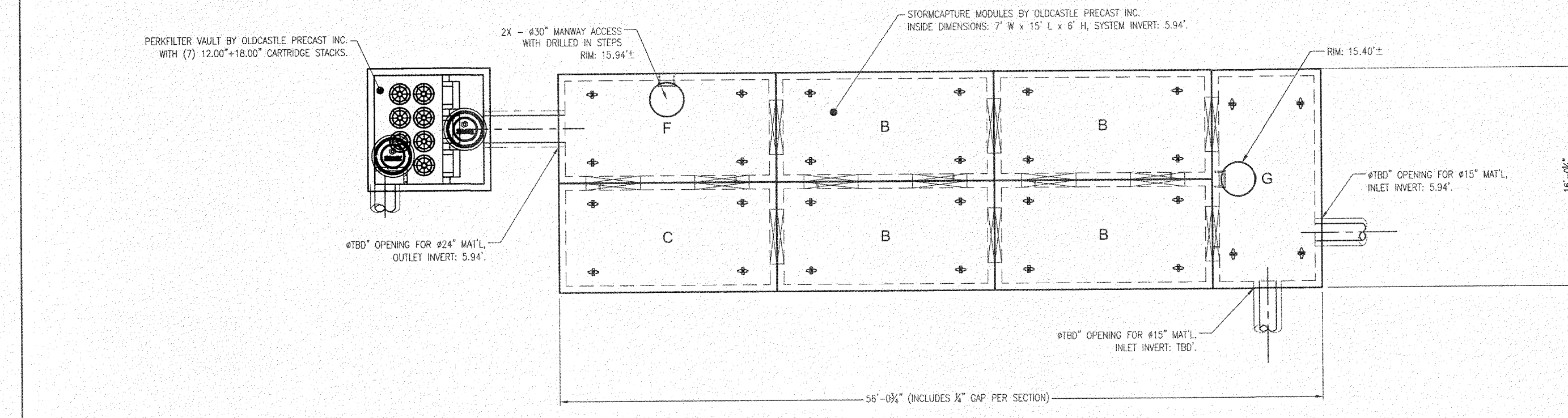
CONCRETE SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 414, MIX NO. 3.

**CARE OF WATER DURING CONSTRUCTION**

ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DICES, LEVERS, COUNTERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE DIGAVATIONS, FOUNDATION, AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS AND SO AS NOT TO INTERFERE IN ANY WAY WITH THE OPERATION OR MAINTENANCE OF THE STRUCTURE. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FULL FLOW CAN BE PASSED THROUGH THE PERMANENT WORKS. THE REMOVAL OF WATER FROM THE REQUIRED EXCAVATION AND THE FOUNDATION SHALL BE ACCOMPLISHED IN A MANNER AND TO THE EXTENT THAT WILL MAINTAIN STABILITY OF THE EXCAVATED SLOPES AND BOTTOM REQUIRED EXCAVATIONS AND WILL ALLOW SATISFACTORY PERFORMANCE OF ALL CONSTRUCTION OPERATIONS. DURING THE PLACING AND COMPACTING OF MATERIAL IN REQUIRED EXCAVATIONS, THE WATER LEVEL AT THE LOCATIONS BEING REFILLED SHALL BE MAINTAINED BELOW THE BOTTOM OF THE EXCAVATION AT SUCH LOCATIONS WHICH MAY REQUIRE DRAINING THE WATER SUMPS FROM WHICH THE WATER SHALL BE PUMPED.

REVISIONS		
REVISION	DATE	REVISION
1	10/28/18	C/S
2	10/29/18	C/S

ADD: ADDITIONAL INVERT ELEVATION  
ADD: GROUNDWATER ELEVATION AND LINER



**Underground Filtration System**

PLAN VIEW  
SCALE: 1/8\"/>

STAGE-STORAGE		
STAGE HEIGHT (FT)	VOLUME (CF)	WQVF (%)
6.64	0	0.000
6.64	276	0.009
6.64	705	0.017
7.42	1,147	0.038
7.54	1,598	0.055
8.44	1,930	0.044
8.60	1,927	0.057
8.64	2,713	0.062
8.64	3,167	0.067
10.44	3,166	0.060
10.54	3,983	0.069
11.44	4,251	0.067
11.84	4,588	0.066

- DESIGN NOTES:**
1. DESIGN LOADINGS:
    - A. AASHTO HS-20-44 W/IMPACT
    - B. DEPTH OF COVER = 8\"/>
  2. CONCRETE 28 DAY COMPRESSIVE STRENGTH SHALL BE 6,000 PSI
  3. STEEL REINFORCEMENT: REBAR: ASTM A-615 OR A-710, GRADE 60
  4. MESH REINFORCEMENT: ASTM A-1064, S12, GRADE 60
  5. CEMENT: ASTM C-150 SPECIFICATION
  6. STORMCAPTURE MODULE TYPE = DETENTION
  7. REQUIRED BASE LAYER DEPTH = 2\"/>

- NOTES TO REVIEWING ENGINEER:**
1. THIS SYSTEM IS DESIGNED TO THE PARAMETERS NOTED. PLEASE VERIFY THAT THESE PARAMETERS MEET PROJECT REQUIREMENTS (I.E. LIVE LOAD AND FILL RANGE). IF DESIGN PARAMETERS ARE INCORRECT NOTIFY OLDCASTLE IMMEDIATELY FOR REDESIGN AND RE-PRICING.
  2. REVIEWING ENGINEER TO CONFIRM ALL PIPE PENETRATION LOCATIONS, SIZES, AND INVERTS.
  3. REVIEWING ENGINEER TO CONFIRM ALL MANNWAY ACCESS LOCATIONS AND RM ELEVATIONS.
  4. UNLESS OTHERWISE NOTED, ALL PIPE SUPPLIED AND INSTALLED BY OTHERS.
  5. THIS SYSTEM IS DESIGNED FOR A GROUNDWATER TABLE BELOW SYSTEM INVERT. REVIEWING ENGINEER TO VERIFY THAT THE DESIGN GROUNDWATER TABLE IS BELOW INVERT OF PRECAST. IF DESIGN PARAMETERS ARE INCORRECT NOTIFY OLDCASTLE IMMEDIATELY FOR REDESIGN AND REVISED PRICING.
  6. THIS SYSTEM IS DESIGNED WITHOUT A CONTAMINATION MEMBRANE LINER. IF A LINER IS NEEDED PLEASE CONTACT OLDCASTLE TO PROVIDE THIS OPTION IN THE FINAL DESIGN.

- PRELIMINARY -  
NOT FOR CONSTRUCTION

**Oldcastle Infrastructure**  
A CONCRETE COMPANY

Prepared by: Dan McCune Walker, Inc.  
Checked by: Gotham Greens - Baltimore, MD

NO.	REVISED	BY	DATE	DESCRIPTION
1		C/S	10/28/18	ISSUED FOR PERMIT
2		C/S	10/29/18	ADD: ADDITIONAL INVERT ELEVATION AND GROUNDWATER TABLE

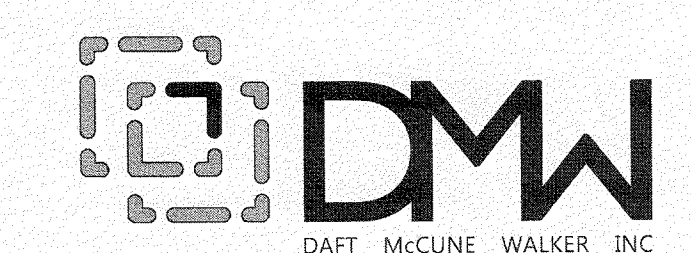
SCDD-1048-2-SC2-DT  
2 of 2



**OWNER/DEVELOPER**  
TRADEPOINT ATLANTIC LLC  
ATTN: STEVE BERNSTEIN  
1600 SPARROWS POINT BLVD  
BALTIMORE, MARYLAND 21219

**DATA SOURCE:**

1. EXISTING TOPOGRAPHY SHOWN HEREON TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY TRADEPOINT ATLANTIC DATED JANUARY 25, 2017 WITH AN ADDITIONAL SURVEY CONDUCTED BY MORRIS & RITCHE ASSOCIATES, INC. DATED JUNE 12, 2017 AND AUGMENTED WITH BALTIMORE COUNTY GIS.
2. WETLAND LOCATIONS SHOWN HEREON SURVEYED BY MORRIS & RITCHE ASSOCIATES, INC. FROM A DELINEATION BY ECO-SCIENCE PROFESSIONALS, INC. ON AUGUST 28, 2017.
3. UNDERGROUND UTILITY INFORMATION SHOWN HEREON PROVIDED BY TRADEPOINT ATLANTIC.



501 FAIRMOUNT AVENUE SUITE 300 TOWSON, MD 21286  
P: 410 296 3333 F: 410 296 4705 WWW.DMW.COM

**STORMWATER MANAGEMENT  
FINAL DESIGN -  
PROFILE, NOTES & DETAILS  
GOTHAM GREENS**

RESERVOIR ROAD  
BALTIMORE, MD 21219-1022

15 ELECTION DISTRICT  
7 COUNCILMANIC DISTRICT BALTIMORE COUNTY, MARYLAND

Professional Engineer Seal for Steve Bernstein, State of Maryland, License No. 20723, dated 10/27/15.

DATE	BY	REVISIONS

ISSUE DATES		BASE:
REVIEW:	10/23/18	JDS
BID:		CHP
PERMIT:		LNU/JLB
CONSTRUCTION:		JLB
SCALE:	AS SHOWN	DATE CHECKED:
PROJECT NO:	16007.GG	DRAWING: