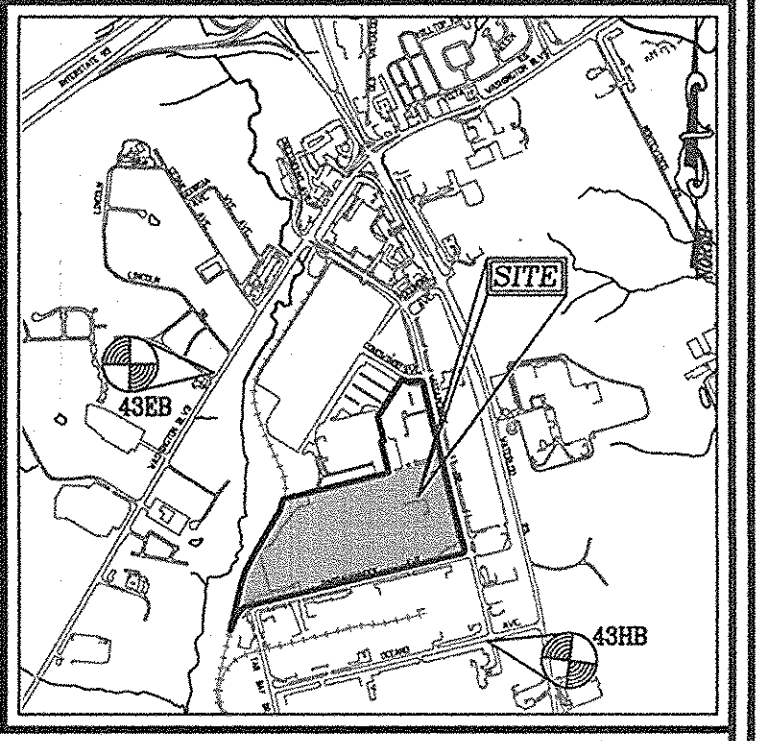


# MARYLAND FOOD CENTER AUTHORITY PARCEL 'J-1' EXISTING PARCEL J ENVIRONMENTAL CONCEPT PLAN



**VICINITY MAP**  
SCALE: 1"=200'  
ADC MAP COORDINATES: 34/08

**BENCHMARKS**  
HOWARD COUNTY BENCHMARK 43EB  
N 545663.6476 E 1371573.8400 ELEV.: 216.327'  
HOWARD COUNTY BENCHMARK 439B  
N 453166.729 E 1374425.0243 ELEV.: 251.627'

**SITE DATA**

LOCATION: JESSUP, MD.; TAX MAP 43, GRID 15, PARCEL 2, PARCEL J-1  
6TH ELECTION DISTRICT  
PRESENT ZONING: M-2  
LOCATION: 7600 ASSATEAGUE DRIVE  
SUBDIVISION: MD WHOLESALE FOOD CENTER  
TOTAL PARCEL AREA: 58.9 AC.  
PROPOSED PARCEL J-1 PARCEL AREA: 10.1 AC.  
SDP-82-45, SDP-80-56, SDP-83-148, DPZ REFERENCES: L14876/F.373, PLAT 19144, SDP-77-70, SDP-82-45, SDP-80-56, SDP-83-148, SDP-87-50, SDP-90-155

USE OF STRUCTURE: WAREHOUSE  
AREA OF WETLANDS AND BUFFERS: 0.00 AC.  
AREA OF STREAMS AND BUFFERS ON SITE: 0.00 AC.  
AREA OF 100 YEAR FLOODPLAIN ON SITE: 0.00 AC.  
AREA OF FOREST ON SITE: 0.00 AC.  
AREA OF STEEP SLOPES (25% OR GREATER) ON SITE: 0.00 AC.  
AREA OF ERODIBLE SOILS ON SITE: 0.00 AC.  
LIMIT OF DISTURBED AREA: 9.47 AC.  
EX. IMPERVIOUS AREA: 9.20 AC.  
EX. GREEN AREA: 1.27 AC.  
PROP. IMPERVIOUS AREA: 7.63 AC.  
PROP. GREEN AREA: 1.24 AC.

**GENERAL NOTES**

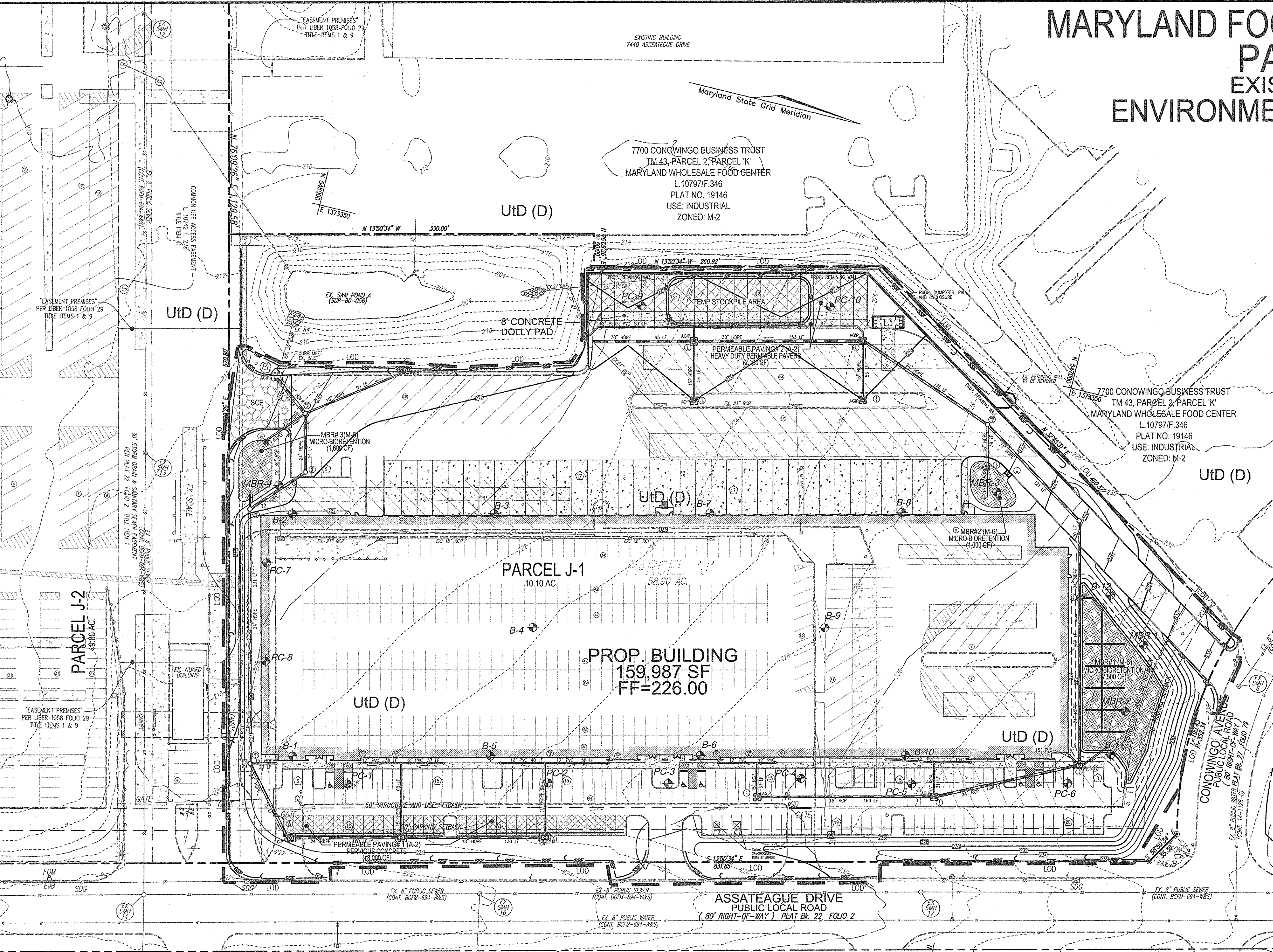
1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY STANDARDS AND SPECIFICATIONS. ALL WORK AND MATERIALS SHALL COMPLY WITH O.S.S.A. STANDARDS.
2. EXISTING UTILITIES LOCATED FROM ROAD CONSTRUCTION PLANS, FIELD SURVEYS, PUBLIC WATER AND AND SEWER EXISTING PLANS AND AVAILABLE RECORD DRAWINGS. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN FOR THE CONTRACTOR'S INFORMATION. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
3. THE EXISTING TOPOGRAPHY SHOWN HEREON IS TAKEN FROM A FIELD RUM TOPOGRAPHIC SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC. PERFORMED ON OCTOBER 10, 2014.
4. COORDINATES AND ELEVATIONS ARE BASED ON MARYLAND COORDINATE SYSTEM - NAD83(1991) AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS 43EB AND 439B.
5. ALL ELEVATIONS ARE TO FLOWLINE/BOTTOM OF CURB UNLESS OTHERWISE NOTED.
6. THE GEOTECHNICAL ENGINEER TO CONFIRM PAVING SECTION PRIOR TO CONSTRUCTION. ALL PAVING TO BE PAVED PER GEOTECHNICAL RECOMMENDATIONS.
7. THE SUBJECT PROPERTY IS ZONED M-2 PER THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.
8. PUBLIC WATER AND SEWER AVAILABLE THROUGH CONTRACT BGM-694-W&S.
9. THERE ARE NO BURIAL GROUNDS, CEMETERIES OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
10. ANY EXISTING STREET TREES DAMAGED OR DESTROYED DURING CONSTRUCTION WILL BE REPLACED BY THE CONTRACTOR.
11. WAIVER PETITION WP-16-014 TO ALLOW FOREST OBLIGATION TO BE DETERMINED BASED ON LIMIT OF DISTURBANCE WAS SUBMITTED ON AUGUST 3, 2015 AND IS CURRENTLY UNDER REVIEW.
12. THIS PROJECT IS SUBJECT TO COMPLIANCE WITH THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. DEVELOPMENT OR CONSTRUCTION ON THIS PROPERTY MUST COMPLY WITH SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION APPLICATION OR BUILDING/ GRADING PERMIT APPLICATIONS.
13. A KNOX BOX IS REQUIRED TO BE PLACED ON THE FRONT OF THE BUILDING. IT SHALL BE PLACED TO THE RIGHT OF THE MAIN ENTRANCE AT A RANGE OF 4'-5" IN HEIGHT AND NO MORE THAN 8' LATERNALLY FROM THE DOOR. ITS LOCATION IS SHOWN ON THESE PLANS. THE BOX SHALL BE ELECTRONICALLY SUPERVISED TO NOTIFY THE OWNER THAT IT IS BEING ACCESSSED (INTEGRATED WITH THE FIRE ALARM SYSTEM).
14. LANDSCAPING NOT PERMITTED WITHIN 7'-1/2' OF EACH SIDE OF THE FIRE DEPARTMENT CONNECTION PROVIDE A CLEAR UNOBSTRUCTED ACCESS PATH TO THE FIRE DEPARTMENT CONNECTION. NEPA-1.13.1.4
15. FIRE LINES SHOULD BE PROVIDED IN THIS SITE TO ALLOW EMERGENCY VEHICLE ACCESS. EITHER FIRE LANE OR SIGNAGE SHOULD BE INSTALLED. THE CURBS SHOULD BE PAINTED IN RED AND STENCILED TO IDENTIFY THE ROAD AS A FIRE LANE.
16. ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL PERFORATED SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL PERFORATED SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
17. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY SITE DEVELOPMENT MANUAL, VOLUME III (2000). SECTION 5.5.A. A MINIMUM OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
18. STORMWATER MANAGEMENT FOR THIS PROJECT IS BEING PROVIDED BY ENVIRONMENTAL SITE DESIGN UTILIZING MICRO-BIOTENTION FACILITIES, POROUS PAVING AND A WATCH STORMWATER VAULT TO DISCOMMODATE THE TOTAL ESD VOLUME REQUIRED. SWM FACILITIES TO BE PRIVATELY OWNED AND MAINTAINED.
19. TRASH AND RECYCLING COLLECTION TO BE PRIVATE.
20. THE PROPOSED BUILDING WILL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
21. THERE ARE NO SPECIMEN OR CHAMPION TREES WITHIN THE LOD.
22. SIGNAGE SHALL BE PROVIDED ON THE BUILDING IDENTIFYING THE BUILDING ADDRESS, AND EACH SUITE SEPARATED BY LETTERS.
23. APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN/PAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PAT AND/OR SITE DEVELOPMENT PLAN STAGES AND/OR RED-LINE REVISION PROCESS. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED REVIEW COMMENTS (INCLUDING COMMENTS THAT MAY ALTER THE OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.
24. THERE ARE NO ENVIRONMENTAL FEATURES INCLUDING FLOODPLAIN, WETLANDS, STREAMS, STEEP SLOPES, SPECIEM TREES, OR FOREST THAT EXISTS ON THIS PROPERTY OR WITHIN THE DEVELOPED AREA.
25. NO ENVIRONMENTAL FEATURES ARE LOCATED ONSITE.

**SEDIMENT CONTROL NOTES:**

1. SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
2. SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 35 FEET APART.
3. DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
4. CONTRACTOR TO PROVIDE IMMEDIATE REPAIR OF ANY EARTH DIKES INTERRUPTED DURING CONSTRUCTION.
5. LOCATE STOCKPILE AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR. STOCKPILES EXCEEDING 15 FEET IN HEIGHT SHALL BE BENCHED.

**ENVIRONMENTAL SITE DESIGN-NARRATIVE**

1. THE PROPERTY, WITH THE EXCEPTION OF THE EXISTING STORMWATER POND AND GRASSED MEDIANS AND SETBACKS IS PAVED AND IMPERVIOUS. NO WETLANDS, BUFFERS, FOREST OR SPECIEM TREES ARE PRESENT ON THE SITE. THE TOPOGRAPHY DOES NOT RESULT IN ANY STEEP SLOPES. THERE ARE NO NATURAL RESOURCES LOCATED ON THIS PROPERTY.
2. THE SITE'S NATURAL SLOPES FROM NORTH TO SOUTH OF THE SITE HAS BEEN DESIGNED TO ALSO MAINTAIN THESE NATURAL FLOW PATTERNS.
3. THE CONCEPTUAL REDUCTION IN IMPERVIOUS AREA THROUGH BETTER SITE DESIGN IS ACHIEVED THROUGH THE ENVIRONMENTAL SITE DESIGN (ESD) FOR THE PROJECT TO THE MAXIMUM EXTENT PRACTICABLE (MEP). THE ESD CONCEPT PROPOSES THE USE OF MICRO-BIOTENTION FACILITIES (M-6), PERVIOUS PAVING (A-2), THE PROPOSED ESD PRACTICES SHALL BE PRIVATELY OWNED AND MAINTAINED.
4. SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE OF PERIMETER CONTROLS (SILT FENCE, SUPER SILT FENCE & EARTH DIKES) AND INLET PROTECTION. SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH THE CURRENT REQUIREMENTS AND SHALL BE APPROVED BY THE HOWARD SOIL CONSERVATION DISTRICT.
5. AS STATED IN #3 ABOVE, STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF MICRO-BIOTENTION FACILITIES (M-6), PERVIOUS PAVING (A-2) AND A CONTECH STORMWATER VAULT.
6. REFERENCE GENERAL NOTE 11, ABOVE REGARDING THE WAIVER FOR FOREST CONSERVATION. WE ANTICIPATE NOT OTHER WAIVERS TO FULFILL THIS CONCEPT.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Chad E. Johnson*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 8-21-15

*Kevin J. Johnson*  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 8-20-15

| SOILS LEGEND |   |       |
|--------------|---|-------|
| SYMBOL       | NAME / DESCRIPTION                                    | GROUP |
| U1D          | URBAN LAND-UDORTHEMIS COMPLEX, 0 TO 15 PERCENT SLOPES | D     |

| SHEET INDEX                        |           |           |
|------------------------------------|-----------|-----------|
| DESCRIPTION                        | SHEET NO. | SHEET NO. |
| COVER SHEET, ECP PLAN              | 1 OF 2    | 1 OF 2    |
| SWM DRAINAGE AREA MAP, SWM DETAILS | 2 OF 2    | 2 OF 2    |

| LEGEND |                                  |
|--------|----------------------------------|
|        | EXISTING CONTOUR                 |
|        | PROPOSED CONTOUR                 |
|        | EXISTING CURB AND GUTTER         |
|        | PROPOSED CURB AND GUTTER         |
|        | EXISTING UTILITY POLE            |
|        | EXISTING LIGHT POLE              |
|        | EXISTING SIGN                    |
|        | EXISTING SANITARY MANHOLE        |
|        | EXISTING SANITARY LINE           |
|        | EXISTING CLEANOUT                |
|        | EXISTING FIRE HYDRANT            |
|        | EXISTING WATER LINE              |
|        | EXISTING FENCE                   |
|        | PROPERTY LINE                    |
|        | RIGHT-OF-WAY LINE                |
|        | SOILS BOUNDARY                   |
|        | PROPOSED SIDEWALK                |
|        | PROPOSED STORM DRAIN             |
|        | PROPOSED STORM DRAIN INLET       |
|        | SILT FENCE                       |
|        | SUPER SILT FENCE                 |
|        | LIMIT OF DISTURBANCE             |
|        | STANDARD INLET PROTECTION        |
|        | CURB INLET PROTECTION            |
|        | AT GRADE INLET PROTECTION        |
|        | STABILIZED CONSTRUCTION ENTRANCE |
|        | PROPOSED BORING                  |
|        | PROP. PERVIOUS PAVING            |

NO. REVISION DATE

**ENVIRONMENTAL CONCEPT PLAN**  
**COVER SHEET AND ESD CONCEPT PLAN**

**MARYLAND FOOD CENTER AUTHORITY - PARCEL 'J-1'**  
EXISTING PARCEL J  
7600 ASSATEAGUE DRIVE  
JESSUP, MD 20794  
ZONED: M-2  
L14876/F.373-PLAT 19144

TAX MAP 43 BLOCK 15  
6TH ELECTION DISTRICT

PARCEL 2, PARCEL J-1  
HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
8407 MAIN STREET  
ELLCOTT CITY, MD 21043  
TEL: 410.461.7666  
FAXI: 410.461.8961

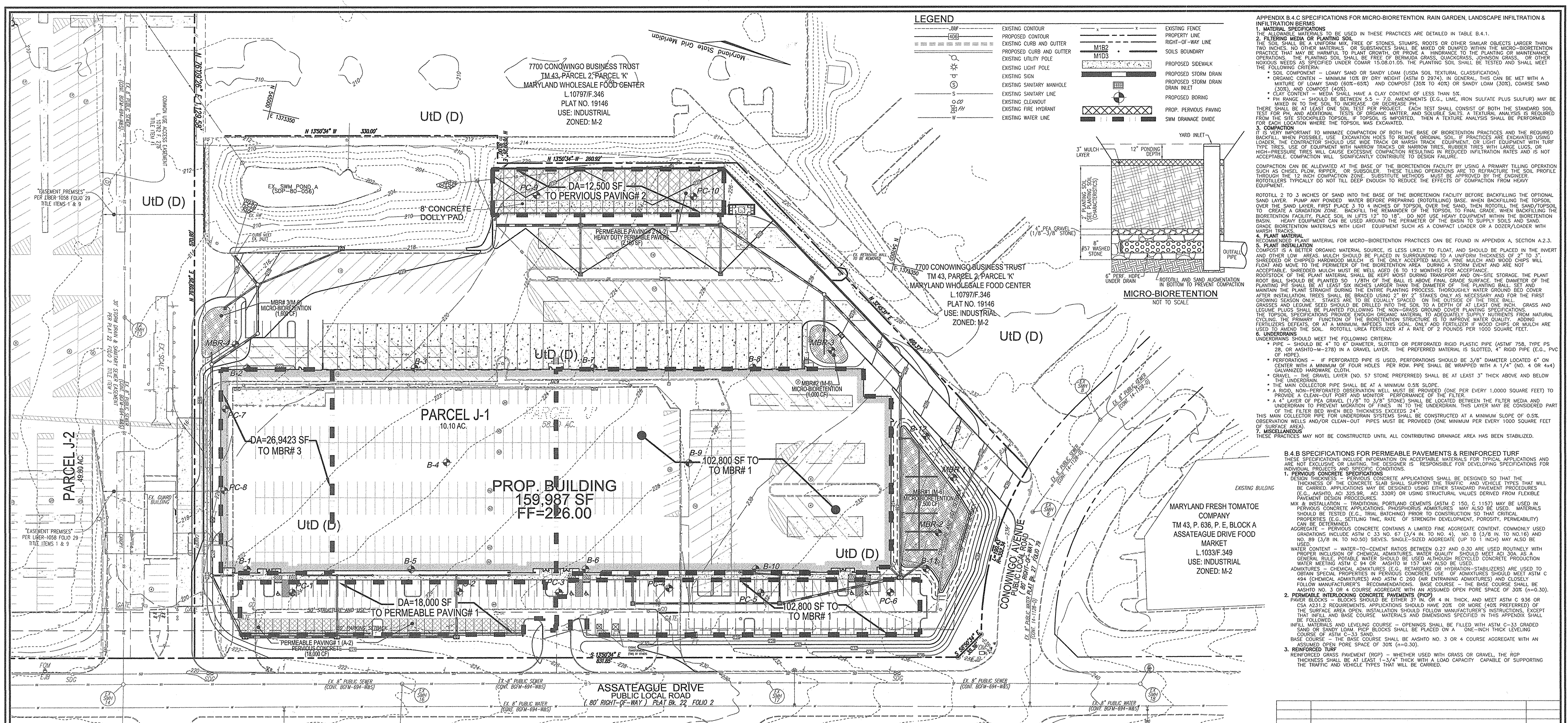
PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A duly licensed PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
EXPIRATION DATE: 09-27-2016

DESIGN BY: RHV  
DRAWN BY: KG  
CHECKED BY: RHV  
DATE: AUGUST 2015  
SCALE: AS SHOWN  
W.O. NO.: 13-42

1 SHEET OF 2

OWNER/DEVELOPER  
MCA ASSATEAGUE HOLDING LLC  
9601 ROBERT FULTON DR  
SUITE 200  
COLUMBIA, MD 21046  
410-290-1400





**LEGEND**

|     |                           |     |                            |
|-----|---------------------------|-----|----------------------------|
| --- | EXISTING CONTOUR          | --- | EXISTING FENCE             |
| --- | PROPOSED CONTOUR          | --- | PROPERTY LINE              |
| --- | EXISTING CURB AND GUTTER  | --- | RIGHT-OF-WAY LINE          |
| --- | PROPOSED CURB AND GUTTER  | --- | SOILS BOUNDARY             |
| --- | EXISTING UTILITY POLE     | --- | PROPOSED SIDEWALK          |
| --- | EXISTING LIGHT POLE       | --- | PROPOSED STORM DRAIN       |
| --- | EXISTING SIGN             | --- | PROPOSED STORM DRAIN INLET |
| --- | EXISTING SANITARY MANHOLE | --- | PROPOSED BORING            |
| --- | EXISTING SANITARY LINE    | --- | PROP. PERVIOUS PAVING      |
| --- | EXISTING CLEANOUT         | --- | SNM DRAINAGE DIVIDE        |
| --- | EXISTING FIRE HYDRANT     | --- |                            |
| --- | EXISTING WATER LINE       | --- |                            |

**APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS**

1. MATERIAL SPECIFICATIONS  
 THE FOLLOWING MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR PLANTING SOIL  
 THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR COVERED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE MIXTURE SHALL BE A UNIFORM MIX OF PERVIOUS SAND, WASHED SAND, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05. THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

• SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION)  
 • ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (40% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).  
 • PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.  
 • MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.  
 • PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.

3. COMPACTION  
 THERE SHALL BE AT LEAST ONE SOIL TEST PER PRACTICE. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILE TO BE SUBMITTED. THE FOLLOWING TESTS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION AIDS TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTROLLER SHOULD USE WIDE TRACK OR MARSH EQUIPMENT OR LIGHT EQUIPMENT WITH TURF TIRE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACURE THE SOIL PROFILE THROUGHOUT THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

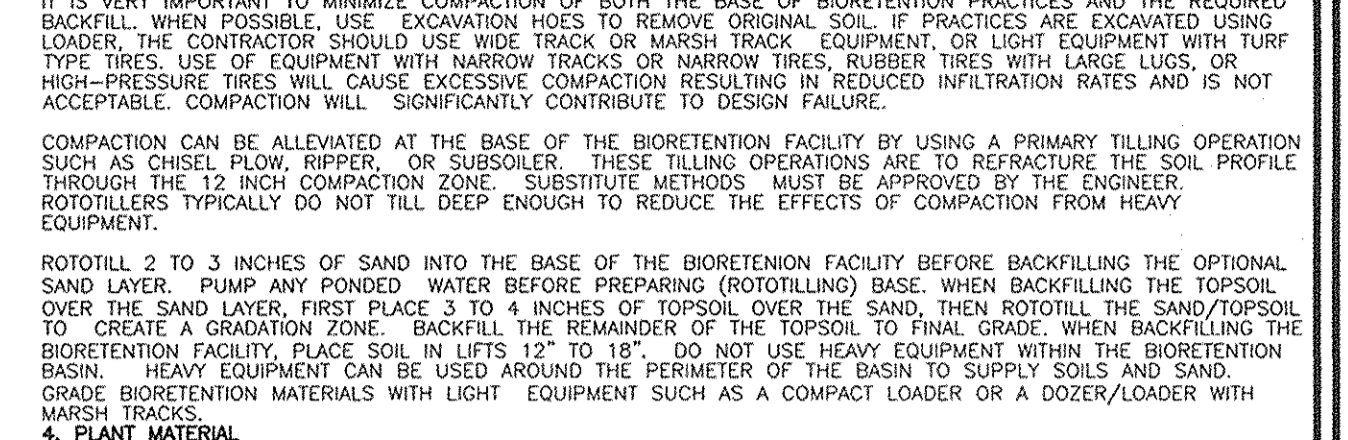
ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDING WATER BEFORE PREPARING (ROTOTILLING) BASE. WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FILL WITH TOPSOIL TO 1/8" ABOVE THE SAND. OVER THE SAND, BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE. WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TIRE.

4. PLANT MATERIAL  
 RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.

5. PLANT INSTALLATION  
 COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3" SHREDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIPHERY OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.  
 SHREDDING MULCH SHALL BE KEPT DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8" OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BEHIND COVER AFTER INSTALLATION. TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL. GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLANTS SHALL BE PLANTED FOLLOWING THE NON-GRASS ROUND COVER PLANTING SPECIFICATIONS.  
 THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS, DEFOLIANTS, OR AT A MINIMUM, WEEDS THIS YEAR. ONLY AGRI-FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

6. UNDERDRAINS  
 UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:  
 • PIPE SHOULD BE 4" TO 6" DIAMETER SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F 758, TYPE PS 28, OR ASHTO M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HOPE).  
 • PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (NO. 4 OR 4x4) GALVANIZED HARDWARE CLOTH.  
 • GRAVEL - THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.  
 • THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.  
 • A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,000 SQUARE FEET) TO PROVIDE A PORT AND MONITOR THE OPERATION OF THE FILTER.  
 • A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES IN TO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".  
 • OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS  
 THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.



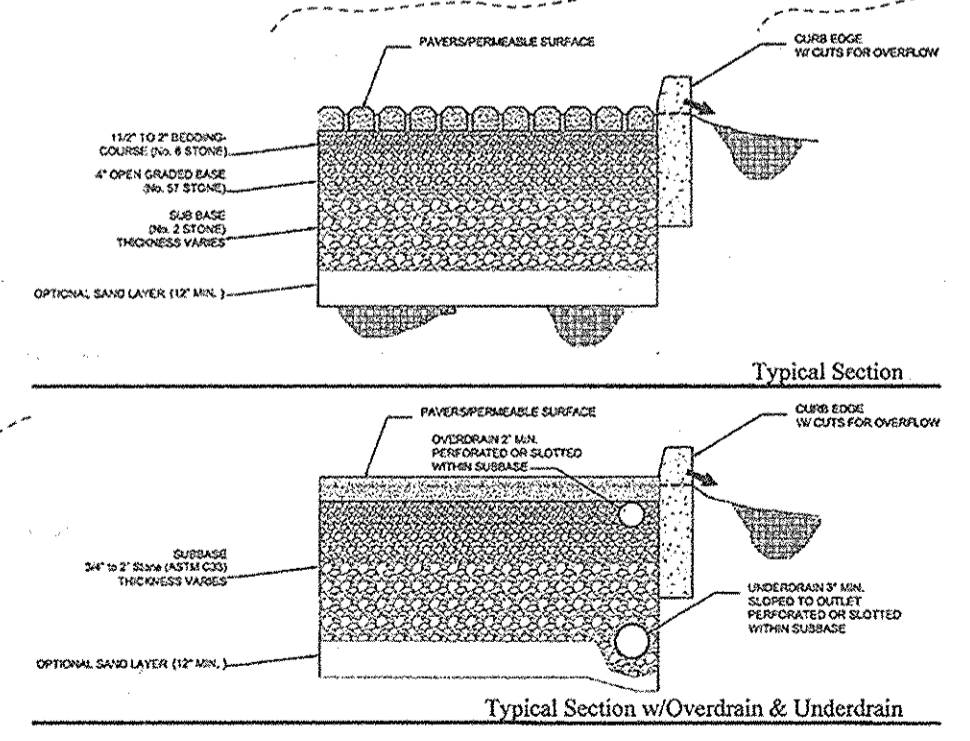
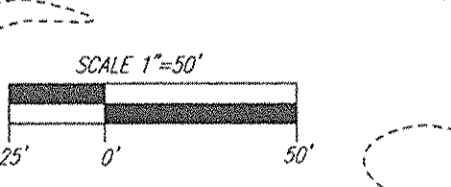
**B.4.B SPECIFICATIONS FOR PERMEABLE PAVEMENTS & REINFORCED TURF**

THESE SPECIFICATIONS INCLUDE INFORMATION ON ACCEPTABLE MATERIALS FOR TYPICAL APPLICATIONS AND ARE NOT EXCLUSIVE OR LIMITING THE DESIGNER. THE DESIGNER IS RESPONSIBLE FOR DEVELOPING SPECIFICATIONS FOR INDIVIDUAL PROJECTS AND SPECIFIC CONDITIONS.

1. PERVIOUS CONCRETE SPECIFICATIONS  
 PERVIOUS CONCRETE APPLICATIONS SHALL BE DESIGNED SO THAT THE THICKNESS OF THE CONCRETE SLAB SHALL SUPPORT THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED. APPLICATIONS MAY BE DESIGNED USING EITHER STANDARD PAVEMENT PROCEDURES (E.G., ASHTO ACI 325.9R, ACI 330R) OR USING STRUCTURAL VALUES DERIVED FROM FLEXIBLE PAVEMENT DESIGN PROCEDURES.  
 MIX & INSTALLATION - TRADITIONAL PORTLAND CEMENTS (ASTM C 150, C 1157) MAY BE USED IN PERVIOUS CONCRETE APPLICATIONS. PHOSPHORUS AD MIXTURES MAY ALSO BE USED. MATERIALS SHOULD BE TESTED (E.G., TRENCHING) PRIOR TO CONSTRUCTION THAT CRITICAL PROPERTIES (E.G., SETTLING TIME, RATE OF STRENGTH DEVELOPMENT, POROSITY, PERMEABILITY) CAN BE DETERMINED.  
 AGGREGATE - PERVIOUS CONCRETE CONTAINS A LIMITED FINE AGGREGATE CONTENT. COMMONLY USED GRADATIONS INCLUDE ASTM C 33 NO. 67 (3/4" IN. TO NO. 4) AND (3/8" IN. TO NO. 16) AND NO. 88 (3/8" IN. TO NO. 50). SINGLE-SIZED AGGREGATE (UP TO 1 INCH) MAY ALSO BE USED.  
 WATER CONTENT - WATER-TO-CEMENT RATIOS BETWEEN 0.27 AND 0.30 ARE USED ROUTINELY WITH PROPER INCLUSION OF CHEMICAL AD MIXTURES. WATER QUALITY SHOULD MEET ACI 308.3A AS A GENERAL RULE. CLEAN WATER SHOULD BE USED ALTHOUGH RECYCLED CONCRETE PRODUCTION WATER MEETING ASTM C 94 OR ASHTO M 157 MAY ALSO BE USED.  
 AD MIXTURES - CHEMICAL AD MIXTURES (E.G., RETARDERS OR HYDRATION-STABILIZERS) ARE USED TO OBTAIN SPECIAL PROPERTIES IN PERVIOUS CONCRETE. AD MIXTURES SHOULD MEET ASTM C 494 (CHEMICAL AD MIXTURES) AND ASTM C 260 (AIR ENTRAINING AD MIXTURES) AND CLOSELY FOLLOW LOW-CURSOR RECOMMENDATIONS. BASE COURSE - THE BASE COURSE SHALL BE ASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).

2. PERMEABLE INTERLOCKING CONCRETE PAVEMENTS (PICP)  
 PERVIOUS CONCRETE BLOCKS SHALL BE 4 IN. THICK, AND MEET ASTM C 936 OR CSA A231.2 REQUIREMENTS. APPLICATIONS SHOULD HAVE 20% OR MORE (40% PREFERRED) OF THE SURFACE AREA OPEN TO ALLOW WATER TO INFILTRATE. THE BASE COURSE SHALL BE ASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).  
 INFILL MATERIALS AND LEVELING COURSE - OPENINGS SHALL BE FILLED WITH ASTM C-33 GRADED SAND OR SANDY LOAM. PICP BLOCKS SHALL BE PLACED ON A ONE-INCH THICK LEVELING COURSE OF ASTM C-33 SAND.  
 BASE COURSE - THE BASE COURSE SHALL BE ASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).

3. REINFORCED TURF  
 REINFORCED GRASS PAVEMENT (RGP) - WHETHER USED WITH GRASS OR GRAVEL, THE RGP REINFORCED GRASS SHALL BE AT LEAST 1-3/4" THICK WITH A LOAD CAPACITY CAPABLE OF SUPPORTING THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED.



**SWM DRAINAGE AREA MAP**  
 SCALE: 1"=50'

Appendix B.4. Construction Specifications for Environmental Site Design Practices

**Table B.4.1 Materials Specifications for Micro-Bioretentation, Rain Gardens & Landscape Infiltration-**

| Material                                    | Specification  | Note                                     | plantings are site-specific   |
|---|--|--|---|
| Plantings                                   | see Appendix A, Table A.4  | n/a                                      | USDA soil types loamy sand or sandy loam; clay content < 5%   |
| Planting soil (2" to 4" deep)               | loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (30%) coarse sand (30%) & compost (40%)                 | n/a                                      |   |
| Organic content                             | Min. 10% by dry weight (ASTM D 2974)   |  |   |
| Mulch                                       | Pea gravel (diaphragm)   | NO. 8 OR NO. 9 (1/8" TO 3/8")            | aged 6 months, minimum; no pine or wood chips   |
| Curtain drain                               | ornamental stone; washed cobble  | stone: 2" to 5"                          |   |
| Geotextile                                  | AASHTO M-43  | NO. 57 OR NO. 6 AGGREGATE (3/8" TO 3/4") | PE Type 1 nonwoven  |
| Gravel (underdrains and infiltration berms) | F 758, Type PS 28 or AASHTO M-278  | 4" to 6" rigid schedule 40 PVC or SDR35  |   |
| Underdrain piping                           |  |  | Slotted or perforated pipe; 3/8" per. @ 6" on center; 4 holes per row; minimum of 3" of gravel over pipe; not necessary underdrain pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth.   |
| Poured in place concrete (if required)      | MSHA Mix No. 3; F <sub>c</sub> = 3500 psi @ 28 days, normal weight, pre-stressed reinforcing to meet ASTM-615-60 | n/a                                      | 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved State or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland design to include meeting ACT Code 150.8-09; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressure); and analysis of potential cracking. Seed substitutions such as Diabase and Gneiss (AASHTO) #10 are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand. |
| Sand  | AASHTO M-6 or ASTM-C-33  | 0.02" to 0.04"                           |   |

**OPERATION AND MAINTENANCE SCHEDULE FOR LANDSCAPE INFILTRATION (M-3), MICRO-BIORETENTION (M-6), RAIN GARDENS (M-7), BIORETENTION SWALE (M-8) AND ENHANCED FILTERS (M-9)**

1. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL. PRUNING, ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.
2. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TRIM DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
3. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.
4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

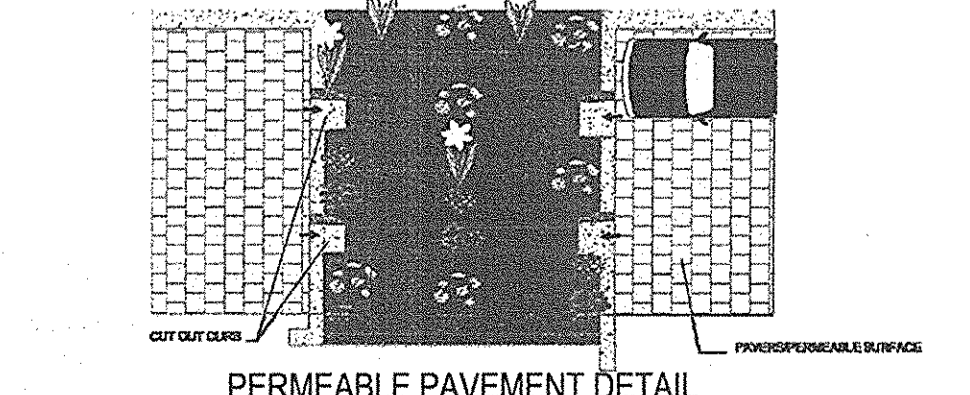
**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED PERMEABLE PAVEMENT (A-2)**

1. THE OWNER SHALL PERIODICALLY SWEEP FOR VACUUM POROUS CONCRETE PAVEMENT) THE PAVEMENT SURFACES TO REDUCE SEDIMENT ACCUMULATION AND ENSURE CONTINUED SURFACE POROSITY. SWEEPING SHOULD BE PERFORMED AT LEAST TWICE ANNUALLY WITH A COMMERCIAL CLEANING UNIT. WASHING OR COMPRESSED AIR UNITS SHOULD NOT BE USED TO PERFORM SURFACE CLEANING.
2. THE OWNER SHALL PERIODICALLY CLEAN DRAINAGE PIPES, INLETS, STONE EDGE DRAINS AND OTHER STRUCTURES WITHIN OR DRAINING TO THE SURFACE.
3. THE OWNER SHALL USE DECIDERS IN MODERATION. DECIDERS SHOULD BE NON-TOXIC AND BE APPLIED EITHER AS CALCIUM MAGNESIUM ACETATE OR AS PRETREATED SALT.
4. THE OWNER SHALL ENSURE SNOW PLOWING IS PERFORMED CAREFULLY WITH BLADES SET ONE INCH ABOVE THE SURFACE. PLOWED SNOW PILES AND SNOWMELT SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Chad Edelman* 8-21-15  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Kevin Landman* 8-20-15  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE



**PERMEABLE PAVEMENT DETAIL**  
 NOT TO SCALE

**OWNER/DEVELOPER**  
 MCA ASSATEAGUE HOLDING LLC  
 9601 ROBERTY FULTON DR  
 SUITE 200  
 COLUMBIA, MD 21046  
 410-290-1400

**ROBERT H. VOGEL ENGINEERING, INC.**  
 ENGINEERS • SURVEYORS • PLANNERS  
 8407 MAIN STREET  
 ELLICOTT CITY, MD 21043  
 TEL: 410.461.7666  
 FAX: 410.461.8961

**PROFESSIONAL CERTIFICATE**

DESIGN BY: RHV  
 DRAWN BY: KG  
 CHECKED BY: RHV  
 DATE: AUGUST 2015  
 SCALE: AS SHOWN  
 W.O. NO.: 13-42

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND I AM A duly licensed PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 1995, EXPIRATION DATE 09-27-2016.

2 SHEET OF 2