

SHEET INDEX	
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4	SCHEMATIC SEDIMENT AND EROSION CONTROL PLAN
5	STORMWATER MANAGEMENT NOTES AND DETAILS SHEET

# ENVIRONMENTAL CONCEPT PLAN

## EDEN BROOK

### LOTS 1 THRU 24 AND OPEN SPACE LOTS 25 THRU 27 (AGE-RESTRICTED ADULT HOUSING) R-12 (RESIDENTIAL: SINGLE DISTRICT) TAX MAP No. 42 GRID No. 7 PARCEL NO. 269

# HOWARD COUNTY, MARYLAND

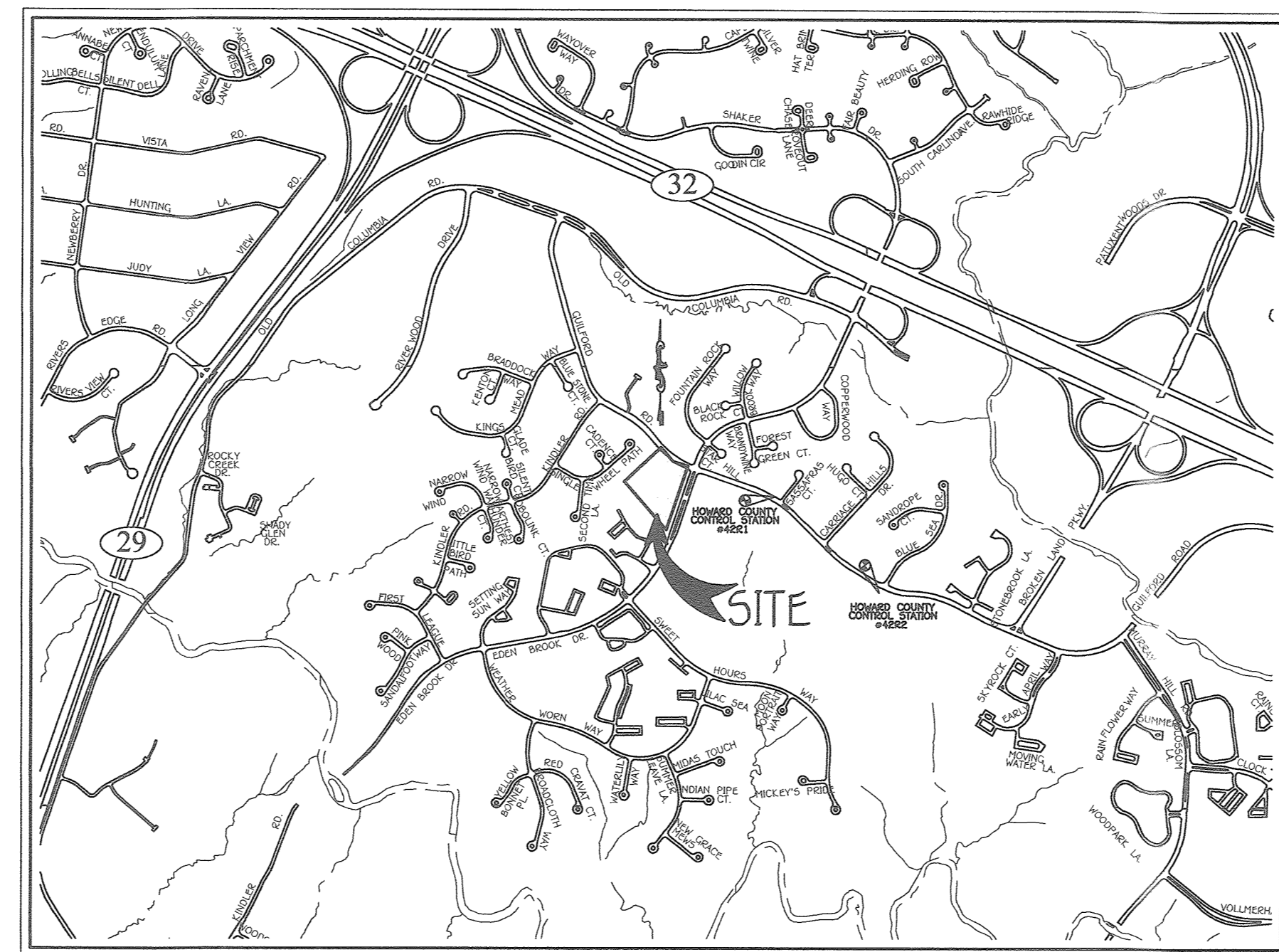
Approved: Department Of Planning And Zoning  
  
 Chief, Development Engineering Division 11-9-18 Date  
  
 Chief, Division Of Land Development 11-06-18 Date

#### GENERAL NOTES

- SUBJECT PROPERTY ZONED R-12 PER 10/06/2013 COMPREHENSIVE ZONING PLAN
- COORDINATES BASED ON NAD '83, MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NOS:  
 CONTROL STATION NO. 4221 NORTH 547,820.227 FEET ELEV. 375.806  
 EAST 1,351,171.620 FEET  
 CONTROL STATION NO. 4222 NORTH 546,946.793 FEET ELEV. 331.466  
 EAST 1,352,118.601 FEET
- BOUNDARY INFORMATION IS BASED ON A SURVEY PERFORMED ON OR ABOUT MAY, 2017 BY FISHER, COLLINS & CARTER, INC.
- TOPOGRAPHY INFORMATION SHOWN IS TAKEN FROM A FIELD RUN TOPOGRAPHIC SURVEY PERFORMED ON OR ABOUT MAY, 2017 BY FISHER, COLLINS & CARTER, INC.
- EXISTING USE: RESIDENTIAL
- PROPOSED USE: CONDITIONAL USE AGE RESTRICTED RESIDENTIAL PER BA-17-030C
- STORM WATER MANAGEMENT IS IN ACCORDANCE WITH THE H.D.E. STORM WATER DESIGN MANUAL, VOLUMES I & II, REVISED 2009. WE ARE PROVIDING STORM WATER MANAGEMENT BY THE USE OF 2 AREAS OF (A-2) PERMEABLE PAVING, 10 (M-5) DRYWELLS, 3 (M-6) MICRO-BIORETENTION FACILITIES AND 2 (F-6) BIO-RETENTION FACILITIES TO MEET AND EXCEED THE REQUIRED 550 VOLUME.
- THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT. PUBLIC WATER AND PUBLIC SEWER WILL BE UTILIZED FOR THIS PROJECT.
- LANDSCAPING WILL BE PROVIDED AT THE PRELIMINARY EQUIVALENT SKETCH PLAN STAGE OF THIS PROJECT. FOREST CONSERVATION WILL BE PROVIDED AT THE PRELIMINARY EQUIVALENT SKETCH PLAN STAGE OF THIS PROJECT.
- REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBMISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE FINAL PLAN STAGE. THEREFORE, THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED COMMENTS (INCLUDING THOSE THAT MAY ALTER OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES.
- SOIL BORING INFORMATION WILL BE PROVIDED AT THE PRELIMINARY EQUIVALENT SKETCH PLAN STAGES OF THIS PROJECT.
- APPROVAL OF THIS ECP DOES NOT CONSTITUTE APPROVAL OF SUBSEQUENT OR ASSOCIATED SUBMISION OR SITE DEVELOPMENT PLANS.
- FOREST STAND DELINEATION PLAN AND A WETLAND REPORT DATED: 5/25/17 WERE PREPARED BY ECO-SCIENCE PROFESSIONALS INC. AND HAVE BEEN PROVIDED WITH THIS SUBMISSION.
- FOR FLAG OR PIPE STEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF FLAG OR PIPE STEM AND ROAD RIGHT-OF-WAY LINE ONLY AND NOT ONTO THE FLAG OR PIPE STEM LOT DRIVEWAY.
- DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO ENSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING (MINIMUM) REQUIREMENTS:  
 A. WIDTH - 12 FEET (16 FEET SERVING MORE THAN ONE RESIDENCE);  
 B. SURFACE - SIX (6") INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CHIP COATING.  
 (1 - 1/2" MINIMUM);  
 C. GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND 45-FOOT TURNING RADIUS;  
 D. STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25-LOADING);  
 E. DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER SURFACE;  
 F. STRUCTURE CLEARANCES - MINIMUM 12 FEET;  
 G. MAINTENANCE - SUFFICIENT TO ENSURE ALL WEATHER USE.
- ANY DAMAGE TO THE COUNTY'S RIGHT-OF-WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE WETLANDS, STREAMS OR THEIR REQUIRED BUFFERS, FOREST CONSERVATION ESCAPEMENT AREAS AND 100 YEAR FLOODPLAIN.

STORMWATER MANAGEMENT PRACTICES									
AREA ID	LOCATION	DRAINAGE AREA	% IMPERVIOUS	ESDv REQUIRED CUFT.	ESDv PROVIDED CUFT.	DRY WELLS H-5 (Y/N)	BIO-RETENTION M-6 (Y/N)	BIO-RETENTION F-6 (Y/N)	PERMEABLE A-2 (Y/N)
A	O.S. LOT 25	36,165	57%	3,032	3,103				
B	O.S. LOT 25	68,221	55%	5,671	5,694			Y	
C	O.S. LOT 27	8,426	50%	481	1,142		Y		
D	O.S. LOT 25	13,486	62%	1,121	1,455		Y		
E	O.S. LOT 25	10,583	73%	1,110	1,202		Y		
F	O.S. LOT 27	2,343	60%	202	395				Y
G	O.S. LOT 27	3,305	68%	319	359				Y
H	LOT 17	923	100%	132	140	Y			
I	LOT 17	982	100%	140	140	Y			
J	LOT 18	926	100%	132	140	Y			
K	LOT 19	982	100%	140	140	Y			
L	LOT 20	926	100%	132	140	Y			
M	LOT 21	982	100%	140	140	Y			
N	LOT 22	930	100%	133	140	Y			
O	LOT 22	979	100%	140	140	Y			
P	LOT 23	977	100%	140	140	Y			
Q	LOT 24	921	100%	132	140	Y			

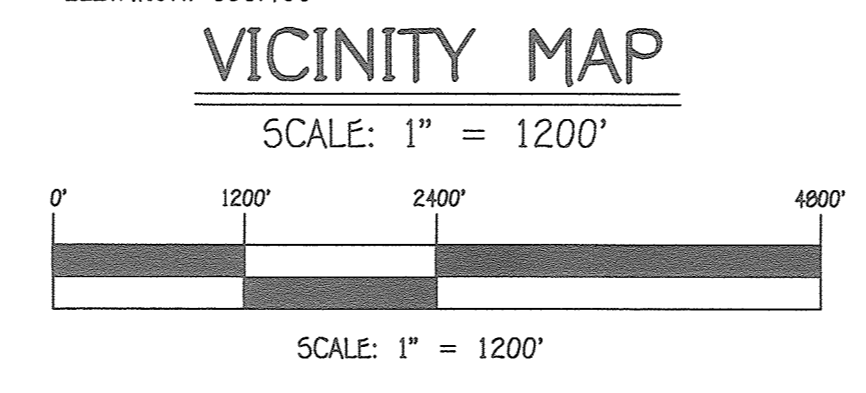
SOILS LEGEND			
SOIL	NAME	CLASS	K*VALUE
GhB	Glenn-Urbn land complex, 0 to 8 percent slopes	B	0.26
GhC	Glenn-Urbn land complex, 8 to 15 percent slopes	C	0.32



HOWARD COUNTY GEODETIC SURVEY CONTROL NO. 42R1  
 N 547,820.227' E 1,351,171.620'  
 ELEVATION: 375.806'

HOWARD COUNTY GEODETIC SURVEY CONTROL NO. 42R2  
 N 546,946.793' E 1,352,118.601'  
 ELEVATION: 331.466'

REFER TO HOWARD CO. ADC MAP 33-E8 & 40-E1



LEGEND	
SYMBOL	DESCRIPTION
--- 490 ---	EXISTING CONTOUR 2' INTERVAL
--- 490 ---	EXISTING CONTOUR 10' INTERVAL
--- 482 ---	PROPOSED CONTOUR 10' INTERVAL
--- 480 ---	PROPOSED CONTOUR 2' INTERVAL
X 362.2	SPOT ELEVATION
18" 50	EXISTING STORM DRAIN
D/W	EXISTING WATER
27.5	EXISTING SEWER
18" 3000	PROPOSED STORM DRAIN PIPE
8" S	PROPOSED SEWER
8" W	PROPOSED WATER
---	PROPOSED TREELINE
---	EXISTING TREELINE
---	LIMIT OF DISTURBANCE
---	SUPER SILT FENCE
---	SILT FENCE
---	OPEN SPACE AREAS
---	DRAINAGE DIVIDE
---	DRYWELL (M-5)-TYPICAL
---	PERMEABLE PAVING (A-2)
---	BIO RETENTION FACILITY (F-6) OR (M-6) AS NOTED
---	PROPOSED ROOF LEADER
---	DENOTES EXISTING TREES TO BE REMOVED
---	DENOTES EXISTING TREES TO REMAIN
---	PROPOSED PAVING
---	EXISTING PAVING

#### SITE ANALYSIS DATA CHART

- PROPERTY ZONED: R-12 PER 10/6/13.
- PROPOSED CONDITIONAL USE AGE RESTRICTED
- GROSS TRACT ACREAGE - 4.96 ACRES (APPROXIMATE)
- LIMIT OF DISTURBANCE - 4.57 ACRES (APPROXIMATE)
- FLOODPLAIN AREA = 0 AC.
- STEEP SLOPES AREA = 0 AC.
- NET TRACT AREA = 4.96 ACRES
- MAXIMUM DENSITY: 4.96 ACRES x 5 UNITS / NET ACRE = 24.8 OR 24 UNITS
- OPEN SPACE TABULATION:
  - OPEN SPACE REQUIRED = 1.74 AC. (4.56 AC x 39%)
  - TOTAL OPEN SPACE PROVIDED = 1.98 AC.
    - CREDITED OPEN SPACE 1.77 AC.
    - NON CREDITED OPEN SPACE = 0.21 AC
- COMMUNITY BUILDING AREA REQUIRED = 480 SQ.FT. (24 UNITS X 20 SQ.FT./UNIT)  
 COMMUNITY BUILDING PROVIDED = 1,380 SQ.FT.
- PARKING TABULATION:
  - PARKING SPACE REQUIRED = 61 SPACES
    - (24 UNITS X 2 SPACES/UNIT) = 48 SPACES
    - (COMMUNITY BUILDING) (480 SQ.FT. x 10 SPACES PER 1,000 SQ. FT.) = 5 SPACES
  - OVERFLOW VISITOR PARKING (24 UNITS x 0.3 SPACES/UNIT) = 8 SPACES
- PARKING SPACES PROVIDED = 110 SPACES
  - (24 UNITS x 4 (2 CAR GARAGE) (2 SPACES IN DRIVE) = 96 SPACES
  - COMMUNITY BUILDING = 5 SPACES
  - OVERFLOW VISITOR PARKING = 9 SPACES

#### STORMWATER MANAGEMENT DESIGN NARRATIVE

**INTRODUCTION:**  
 This report will demonstrate how the criteria set forth in the Maryland Stormwater Design Manual, Volumes I and II (effective October 200, revised May 2009) will be satisfied for this project. The goal of creating hydrology similar to that of "Woods in Good Condition" will be accomplished through the use of dry wells, permeable paving and bio-retention facilities as suggested within Chapter 5 of previously mentioned manual. The achievement of this goal will remove the requirement of providing Channel Projection Volume.

**GENERAL SITE CONDITIONS:**  
 The Eden Brook project is zoned R-12 and located on Tax Map 42, Parcel No. 269 of the Howard County, Maryland Tax Map Database System. This property consists of 4.96 acres of which no acres are encumbered with a Preservation Easement dedicated to Howard County Maryland Agricultural Land Preservation Program. The Eden Brook project is located at the southwest corner of the intersection of Guilford Road and Eden Brook Drive. The south and east boundary lines are bordered by Howard County Maintained Open Space Lot 269 of the Village of Kings Contrivance, the west boundary line is adjacent to Lots 76-80 of the Village of Kings Contrivance, and the north boundary line runs along Guilford Road. This site also contains a historic structure titled the Wildwood House (HO-257), which along with a smokehouse, is being preserved as part of the Eden Brook Project. This historic structure will be utilized as a community center and a focal point for the Eden Brook project. Both the vertical and horizontal location of the proposed private road, grades, and overall layout have been influenced by the location and elevation of the historic Wildwood house.

**I. NATURAL RESOURCE PROTECTION:**  
 Natural resources on this site are limited to specimen trees, the bulk of which are centrally located and proposed to be removed with the filing of an alternative compliance at the preliminary equivalent sketch plan phase of this project.

**II. MAINTENANCE OF NATURAL FLOW PATTERNS:**  
 The proposed development's road and residential lots are designed to create drainage areas similar to the natural flow patterns on-site while simultaneously treating stormwater before leaving the project boundary. With respect to the horizontal and vertical location of the historic structure being preserved, this site is limited in the flexibility of its drainage divides.

**III. REDUCTION OF IMPERVIOUS AREAS THROUGH BETTER SITE DESIGN, ALTERNATIVE SURFACES AND NONSTRUCTURAL PRACTICES**  
 This site proposes the minimum impervious areas necessary to provide adequate access to the proposed lots. All proposed impervious surfaces are receiving treatment through the use of ESD stormwater management facilities. Permeable paving is being utilized where possible to reduce the amount of impervious area as well as the amount of runoff to bio-retention facilities.

**IV. INTEGRATION OF EROSION AND SEDIMENT CONTROLS INTO STORMWATER STRATEGY:**  
 Sediment and Erosion controls for this project have been designed utilizing the Stormwater Management drainage divides.

**V. IMPLEMENTATION OF ESD PLANNING TECHNIQUES AND PRACTICES TO THE MAXIMUM EXTENT PRACTICABLE (MEP)**  
 This submission will propose drywells, 2 bio-retention facilities, 3 micro bio-retention facility and permeable paving to meet and exceed Environmental Site Design to the Maximum Extent Practicable (ESD to the MEP).

**VI. REQUEST FOR DESIGN MANUAL WAIVER:**  
 No waivers are expected to be requested on this project relating to SWM requirements.



**PROFESSIONAL CERTIFICATION**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21476, EXPIRATION DATE: 7/14/19.  
 Frank J. Marziano, L.L.C.  
 11/18  
 Date

**OWNER**  
 ESTATE OF  
 FRANCES ANNE NAHRGANG  
 14722 DORSEY MILL ROAD  
 GLENELG, MD 21075

**DEVELOPER**  
 H&H ROCK COMPANIES  
 8800 DEERPATH ROAD #100  
 ELK RIDGE, MD 21075  
 (410)-567-1045

**TITLE SHEET**  
**EDEN BROOK**  
 LOTS 1 THRU 24, OPEN SPACE LOTS 25 THRU 27  
 (AGE-RESTRICTED ADULT HOUSING)  
 8580 GUILFORD ROAD  
 PREVIOUS HOWARD COUNTY FILE NO. BA-17-030C  
 TAX MAP NO.: 42 GRID NO.: 7 PARCEL NO.: 269  
 ZONED R-12  
 SIXTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 SCALE: AS SHOWN DATE: OCTOBER, 2018  
 SHEET 1 OF 5 **ECP-18-051**

**FISHER, COLLINS & CARTER, INC.**  
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
 CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE  
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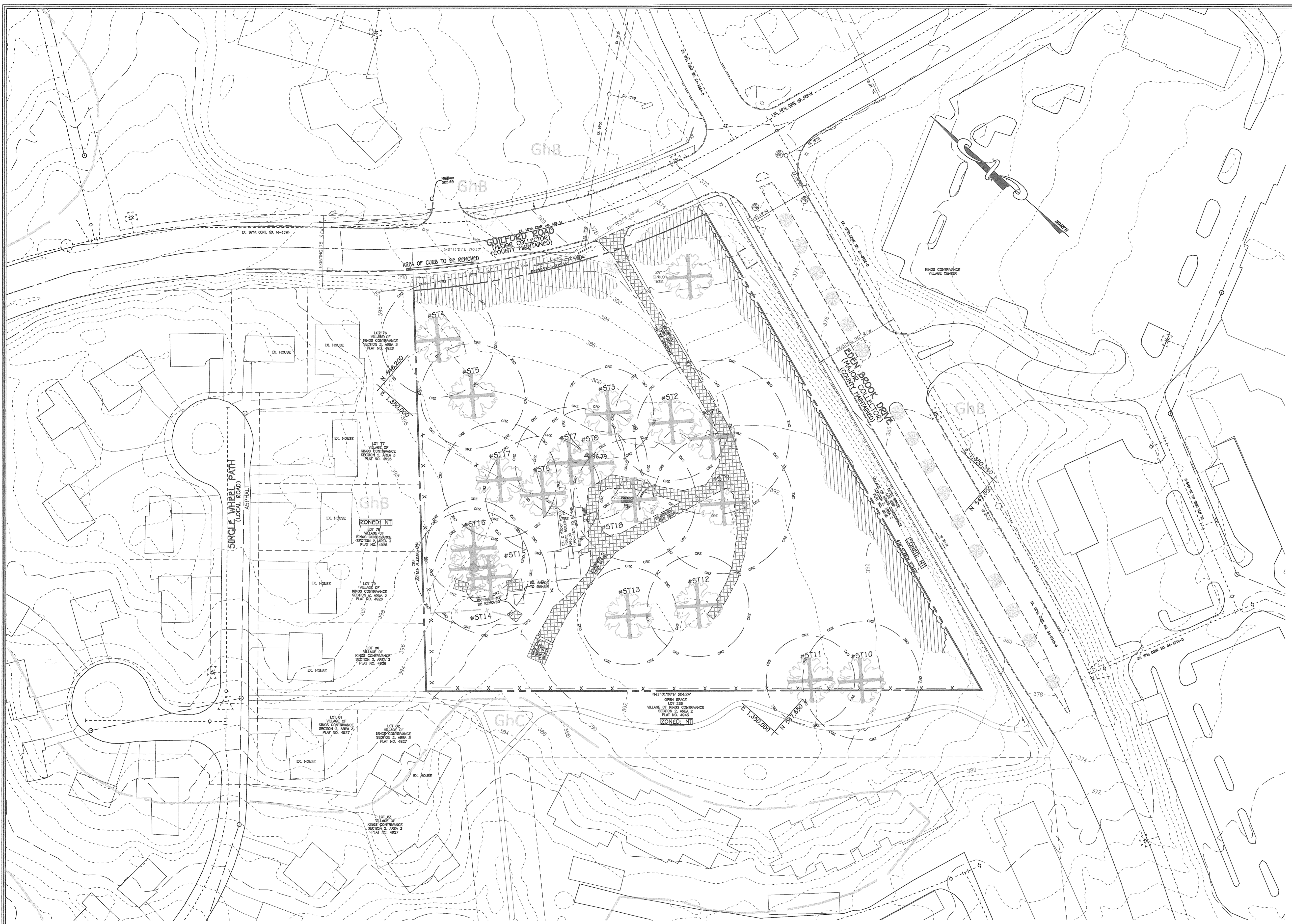


SOILS LEGEND			
SOIL	NAME	CLASS	K-VALUE
GhB	Glenelg-Urban land complex, 0 to 8 percent slopes	B	0.28
GhC	Glenelg-Urban land complex, 8 to 15 percent slopes	C	0.32

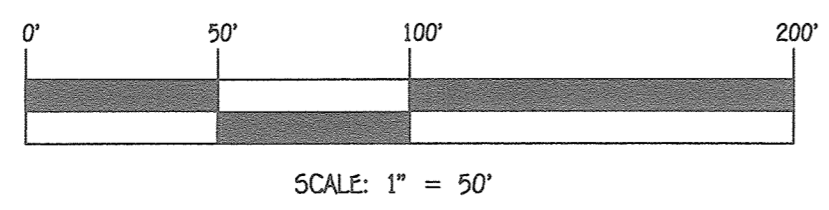
Specimen Tree Chart

Key (X#)	Species	Size (in dbh)	CRZ (feet radius)	Comments
1	White oak	54	81	
2	White oak	40.5	60.75	fair, trimmed
3	Hemlock	31.5	47.25	fair, one sided due to shading
4	Pignut hickory	40	60	
5	White oak	36.5	54.75	
6	White oak	40.5	60.75	fair, some rot noted
7	White oak	38.5	57.75	fair, limb damage noted
8	White oak	39	58.5	
9	White oak	49	73.5	very poor, major trunk rot
10	Norway maple	41	61.5	fair, not native
11	Sycamore	31	46.5	fair, some rot noted, limited crown
12	White oak	35.5	53.25	
13	American Beech	34	51	
14	White oak	40	60	fair, one sided canopy
15	White oak	40.5	60.75	fair, one sided canopy
16	White oak	34	51	fair, one sided canopy
17	White pine	33.5	50.25	
18	White oak	43	64.5	

LEGEND	
SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 2' INTERVAL
---	EXISTING CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 2' INTERVAL
x362.2	SPOT ELEVATION
---	LIMIT OF DISTURBANCE
---	EXISTING WATER & SEWER UTILITY EASEMENT
---	EXISTING STORM DRAIN
---	EXISTING WATER
---	EXISTING SEWER
---	BUILDINGS AND DRIVEWAYS TO BE REMOVED
---	SUPER SILT FENCE
---	SILT FENCE
---	NOTES EXISTING FOREST TO BE REMOVED
---	NOTES EXISTING TREES TO BE REMOVED
---	NOTES EXISTING TREES TO REMAIN
---	EXISTING PAVING
---	EXISTING FENCE LINES
---	SOILS LINES AND TYPE



PLAN  
SCALE: 1" = 50'



EXISTING CONDITIONS, SOILS  
 AND DEMOLITION PLAN  
**EDEN BROOK**  
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 SHEET 2 OF 5 **ECP-10-051**

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 Frank John Manlansan II  
 FRANK MANLANSAN, II  
 Date: 11/1/19

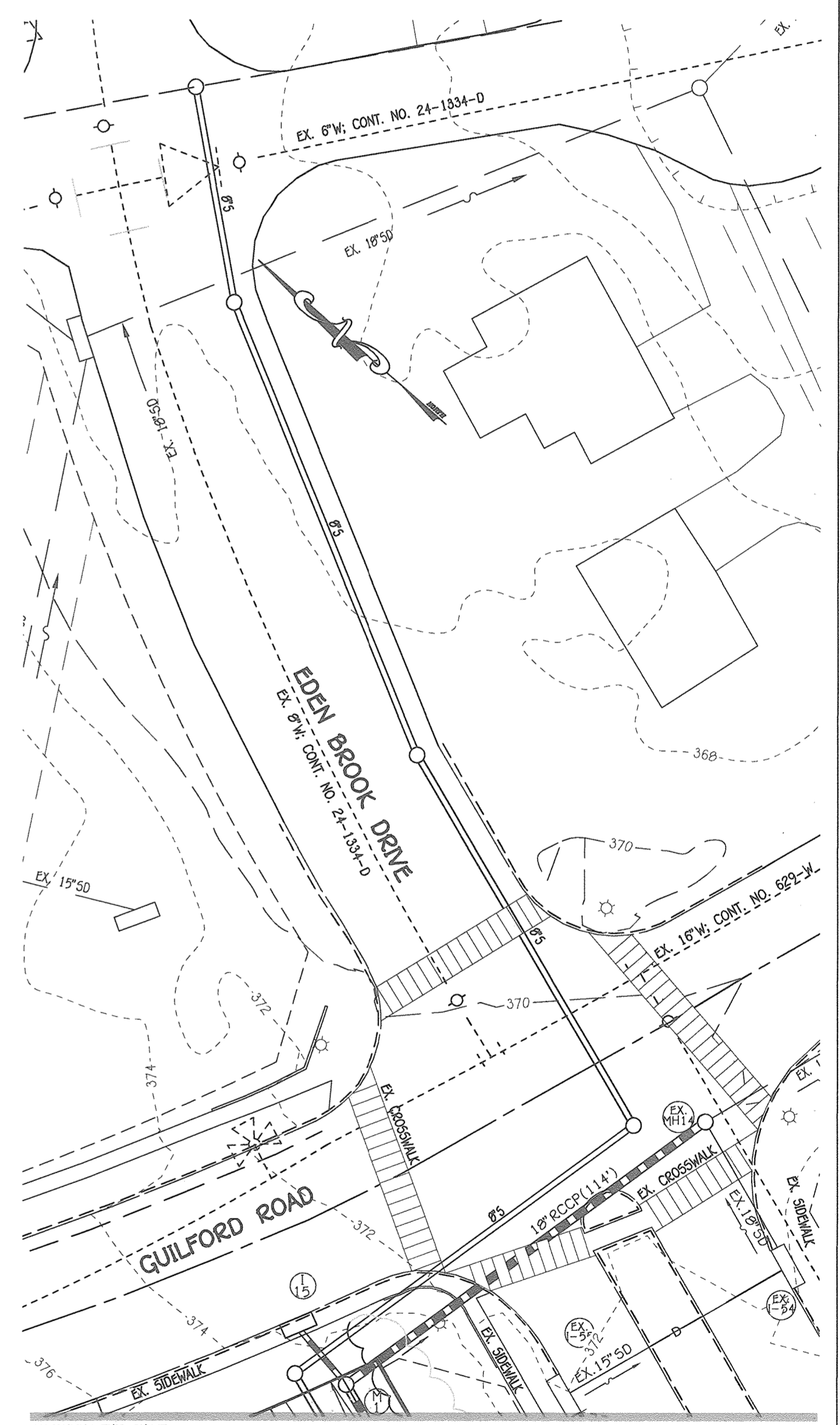
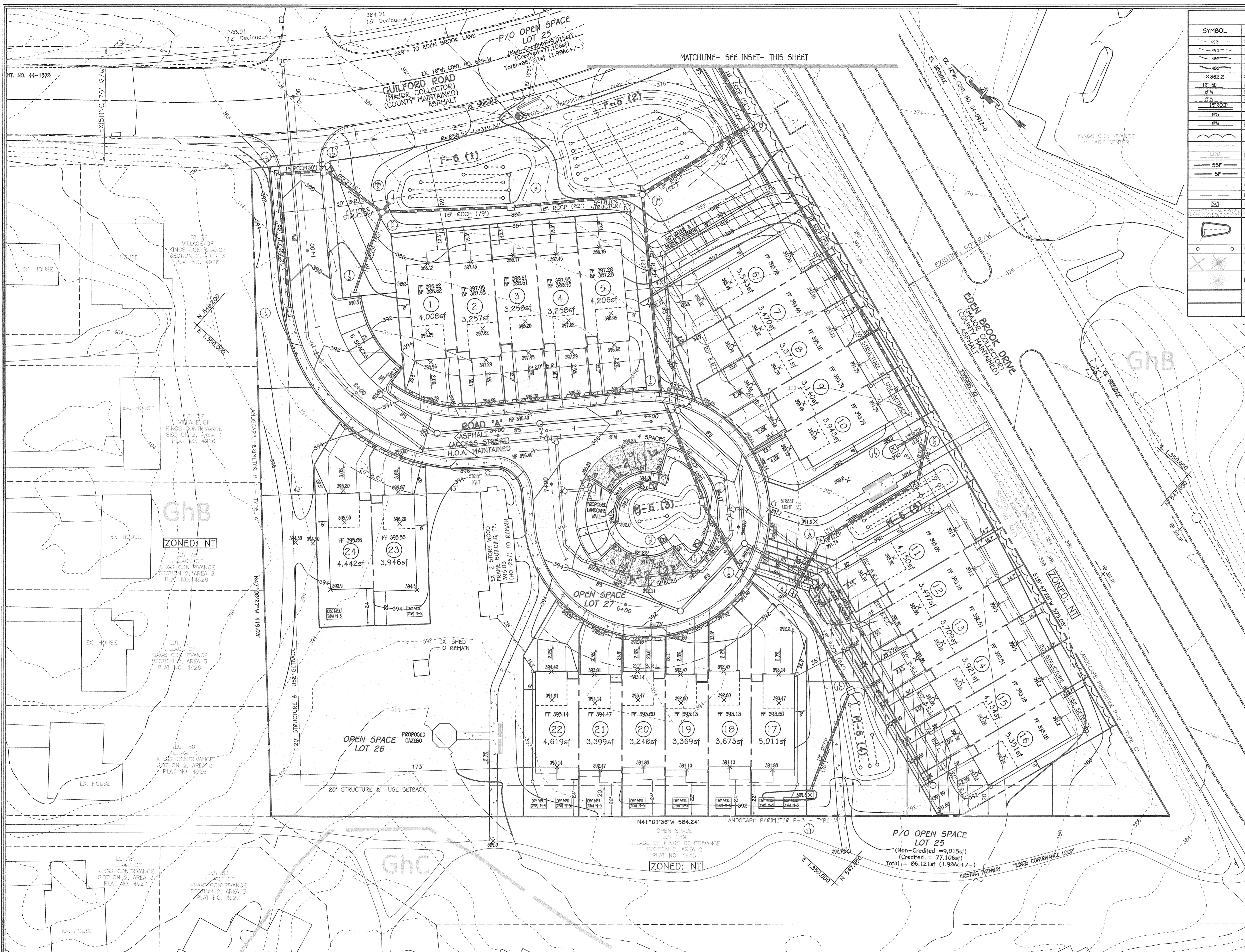
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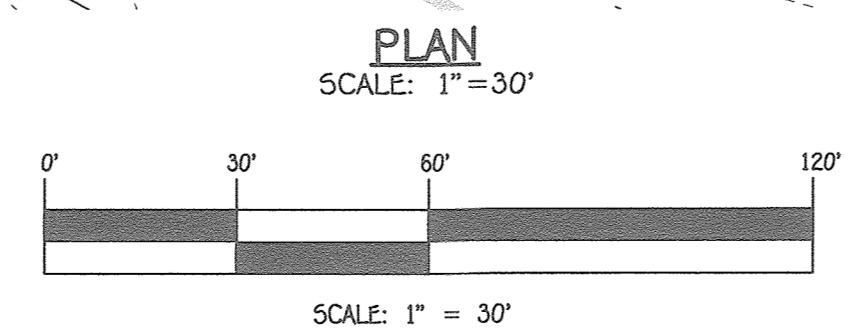
11/2017/17007/Engineering/Dwg/ECP Plan\_Sht17007 Demo and Existing Conditions Plan\_SHEET 2.dwg, C 02 Demo, 1:1



LEGEND	
SYMBOL	DESCRIPTION
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	DENOTES EXISTING TREES TO REMAIN
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	EXISTING PAVING



SOILS LEGEND			
SOIL	NAME	CLASS	"K" VALUE
GhB	Glenelg-Urban land complex, 0 to 8 percent slopes	B	0.29
GhC	Glenelg-Urban land complex, 8 to 15 percent slopes	C	0.32



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Frank John Mawalan, II  
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MATCHLINE- SEE INSET- THIS SHEET  
 PLAN  
 SCALE: 1" = 30'  
**ENVIRONMENTAL CONCEPT PLAN**  
**EDEN BROOK**  
 LOTS 1 THRU 24, OPEN SPACE LOTS 25 THRU 27  
 (AGE-RESTRICTED ADULT HOUSING)  
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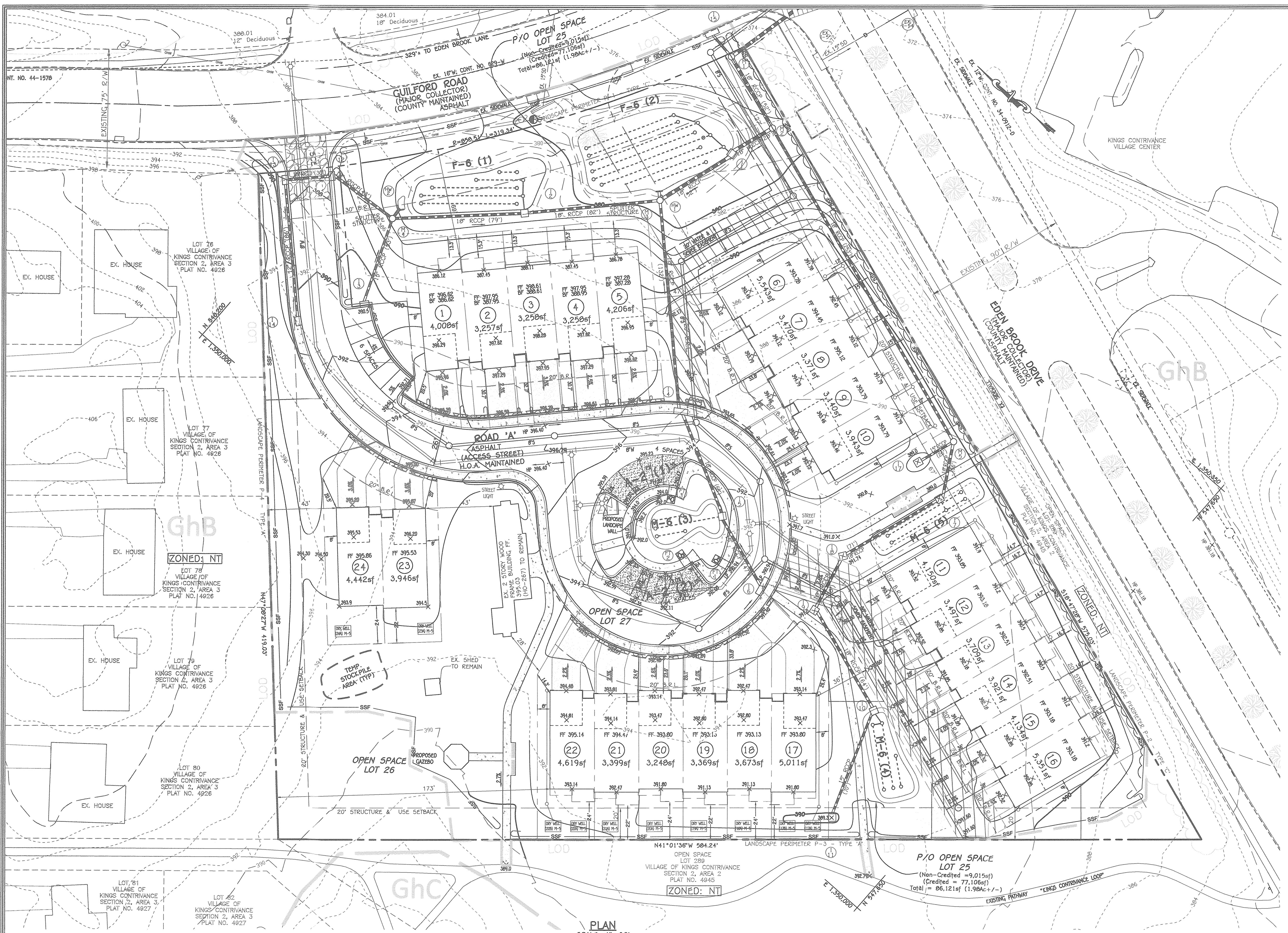


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18" SD	EXISTING STORM DRAIN
8" W	EXISTING WATER
8" S	EXISTING SEWER
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X	DEMOTES EXISTING TREES TO BE REMOVED
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---	PROPOSED PAVING
---	EXISTING PAVING

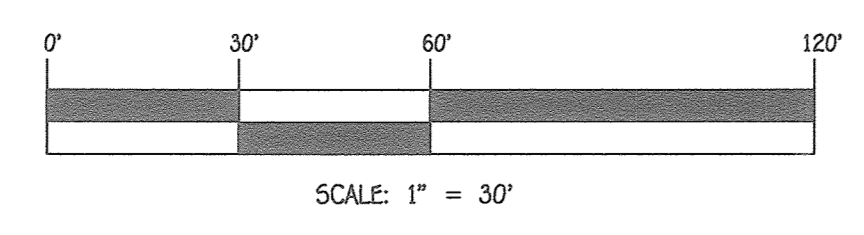
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SOIL	NAME	CLASS	'C' VALUE
GhB	Glennel-Urban land complex, 0 to 8 percent slopes	B	0.28
GhC	Glennel-Urban land complex, 8 to 15 percent slopes	C	0.32

**SEDIMENT CONTROL NOTE:**  
TO THE EXTENT PRACTICAL, PROPOSED STORMWATER MANAGEMENT FACILITIES SHALL BE UTILIZED IN THE INTERIM CONDITION FOR SEDIMENT CONTROL.

**SCHEMATIC SEDIMENT AND EROSION CONTROL PLAN**  
**EDEN BROOK**  
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*Frank Masalanski*  
FRANK MASALANSKI, I.L.  
11/1/18  
Date

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**INFILTRATION AND FILTER SYSTEM CONSTRUCTION SPECIFICATIONS**

INFILTRATION AND FILTER SYSTEMS EITHER TAKE ADVANTAGE OF EXISTING PERMEABLE SOILS OR CREATE A PERMEABLE MEDIUM SUCH AS SAND FOR WC, AND RE V. IN SOME INSTANCES WHERE PERMEABILITY IS GREAT, THESE FACILITIES MAY BE USED FOR QP AS WELL. THE MOST COMMON SYSTEMS INCLUDE INFILTRATION TRENCHES, INFILTRATION BASINS, SAND FILTERS, AND ORGANIC FILTERS.

WHEN PROPERLY PLANTED, VEGETATION WILL THRIVE AND ENHANCE THE FUNCTIONING OF THESE SYSTEMS. FOR EXAMPLE, PRE-TREATMENT BUFFERS WILL TRAP SEDIMENTS THAT OFTEN ARE BOUND WITH PHOSPHOROUS AND METALS. VEGETATION PLANTED IN THE FACILITY WILL AID IN NUTRIENT UPTAKE AND WATER STORAGE. ADDITIONALLY, PLANT ROOTS WILL PROVIDE AERATION FOR STORED WATER TO PERMEATE SOIL FOR GROUNDWATER RECHARGE. FINALLY, SUCCESSFUL PLANTINGS PROVIDE AESTHETIC VALUE AND WILDLIFE HABITAT MAKING THESE FACILITIES MORE DESIRABLE TO THE PUBLIC.

**DESIGN CONSTRAINTS:**

- > PLANTING BUFFER STRIPS OF AT LEAST 20 FEET WILL CAUSE SEDIMENTS TO SETTLE OUT BEFORE REACHING THE FACILITY, THEREBY REDUCING THE POSSIBILITY OF CLOGGING.
- > DETERMINE AREAS THAT WILL BE SATURATED WITH WATER AND WATER TABLE DEPTH SO THAT APPROPRIATE PLANTS MAY BE SELECTED (HYDROLOGY WILL BE SIMILAR TO BIORETENTION FACILITIES, SEE FIGURE A.5 AND TABLE A.4 FOR PLANTING MATERIAL GUIDANCE).
- > PLANTS KNOWN TO SEND DOWN DEEP TAPROOTS SHOULD BE AVOIDED IN SYSTEMS WHERE FILTER FABRIC IS USED AS PART OF FACILITY DESIGN.
- > TEST SOIL CONDITIONS TO DETERMINE IF SOIL AMENDMENTS ARE NECESSARY.
- > PLANTS SHALL BE LOCATED SO THAT ACCESS IS POSSIBLE FOR STRUCTURE MAINTENANCE.
- > STABILIZE HEAVY FLOW AREAS WITH EROSION CONTROL MATS OR SOI.
- > TEMPORARILY DIVERT FLOWS FROM SEEDING AREAS UNTIL VEGETATION IS ESTABLISHED.
- > SEE TABLE A.5 FOR ADDITIONAL DESIGN CONSIDERATIONS.

**BIO-RETENTION SOIL BED CHARACTERISTICS**

THE CHARACTERISTICS OF THE SOIL FOR THE BIORETENTION FACILITY ARE PERHAPS AS IMPORTANT AS THE FACILITY LOCATION, SIZE, AND TREATMENT VOLUME. THE SOIL MUST BE PERMEABLE ENOUGH TO ALLOW RUNOFF TO FILTER THROUGH THE MEDIA, WHILE HAVING CHARACTERISTICS SUITABLE TO PROMOTE AND SUSTAIN A ROBUST VEGETATIVE COVER CROP. IN ADDITION, MUCH OF THE NUTRIENT POLLUTANT UPTAKE (NITROGEN AND PHOSPHORUS) IS ACCOMPLISHED THROUGH ABSORPTION AND MICROBIAL ACTIVITY WITHIN THE SOIL PROFILE. THEREFORE, SOILS MUST BALANCE THEIR CHEMICAL AND PHYSICAL PROPERTIES TO SUPPORT BIOTIC COMMUNITIES ABOVE AND BELOW GROUND.

THE PLANTING SOIL SHOULD BE A SANDY LOAM, LOAMY SAND, LOAM (USDA), OR A LOAM/SAND MIX (SHOULD CONTAIN A MINIMUM 35 TO 60% SAND, BY VOLUME). THE CLAY CONTENT FOR THESE SOILS SHOULD BE LESS THAN 25% BY VOLUME (ENVIRONMENTAL QUALITY RESOURCES (EQR), 1996; ENGINEERING TECHNOLOGY INC. AND BIOHABITATS, INC. (ETAB), 1993). SOILS SHOULD FALL WITHIN THE SM, ML, SC CLASSIFICATIONS OR THE UNIFIED SOIL CLASSIFICATION SYSTEM (USCS). A PERMEABILITY OF AT LEAST 1.0 FEET PER DAY (0.57 INH) IS REQUIRED (A CONSERVATIVE VALUE OF 0.5 FEET PER DAY IS USED FOR DESIGN). THE SOIL SHOULD BE FREE OF STONES, STUMPS, ROOTS, OR OTHER WOODY MATERIAL OVER 1" IN DIAMETER. BRUSH OR SEEDS FROM NOXIOUS WEEDS (E.G., JOHNSON GRASS, MUGWORT, NUTSEDGE, AND CANADA THISTLE OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.) SHOULD NOT BE PRESENT IN THE SOILS. PLACEMENT OF THE PLANTING SOIL SHOULD BE IN 12 TO 18 LIFTS THAT ARE LOOSELY COMPACTED (TAMPED LIGHTLY WITH A BACKHOE BUCKET OR TRAVERSED BY DOZER TRACKS). THE SPECIFIC CHARACTERISTICS ARE PRESENTED IN TABLE A.3.

**TABLE A.3 PLANTING SOIL CHARACTERISTICS**

PARAMETER	VALUE
PH RANGE	5.2 TO 7.00
ORGANIC MATTER	1.5 TO 4.0% (BY WEIGHT)
MAGNESIUM	35 LBS. PER ACRE, MINIMUM
PHOSPHORUS (PHOSPHATE - P2O5)	75 LBS. PER ACRE, MINIMUM
POTASSIUM (POTASH - K2O)	85 LBS. PER ACRE, MINIMUM
SOLUBLE SALTS	500 PPM
CLAY	10 TO 25 %
SILT	30 TO 55 %
SAND	35 TO 60%

**MULCH LAYER**

THE MULCH LAYER PLAYS AN IMPORTANT ROLE IN THE PERFORMANCE OF THE BIORETENTION SYSTEM. THE MULCH LAYER HELPS MAINTAIN SOIL MOISTURE AND AVOIDS SURFACE SEALING, WHICH REDUCES PERMEABILITY. MULCH HELPS PREVENT EROSION, AND PROVIDES A MICROENVIRONMENT SUITABLE FOR SOIL BIOTA AT THE MULCH/SOIL INTERFACE. IT ALSO SERVES AS A PRETREATMENT LAYER, TRAPPING THE FINER SEDIMENTS, WHICH REMAIN SUSPENDED AFTER THE PRIMARY PRETREATMENT.

THE MULCH LAYER SHOULD BE STANDARD LANDSCAPE STYLE, SINGLE OR DOUBLE SHREDDED HARDWOOD MULCH OR CHIPS. THE MULCH LAYER SHOULD BE WELL AGED (STOCKPILED OR STORED FOR AT LEAST 12 MONTHS), UNIFORM IN COLOR, AND FREE OF OTHER MATERIALS, SUCH AS WEED SEEDS, SOIL, ROOTS, ETC. THE MULCH SHOULD BE APPLIED TO A MAXIMUM DEPTH OF THREE INCHES. GRASS CLIPPINGS SHOULD NOT BE USED AS A MULCH MATERIAL.

**PLANTING GUIDANCE**

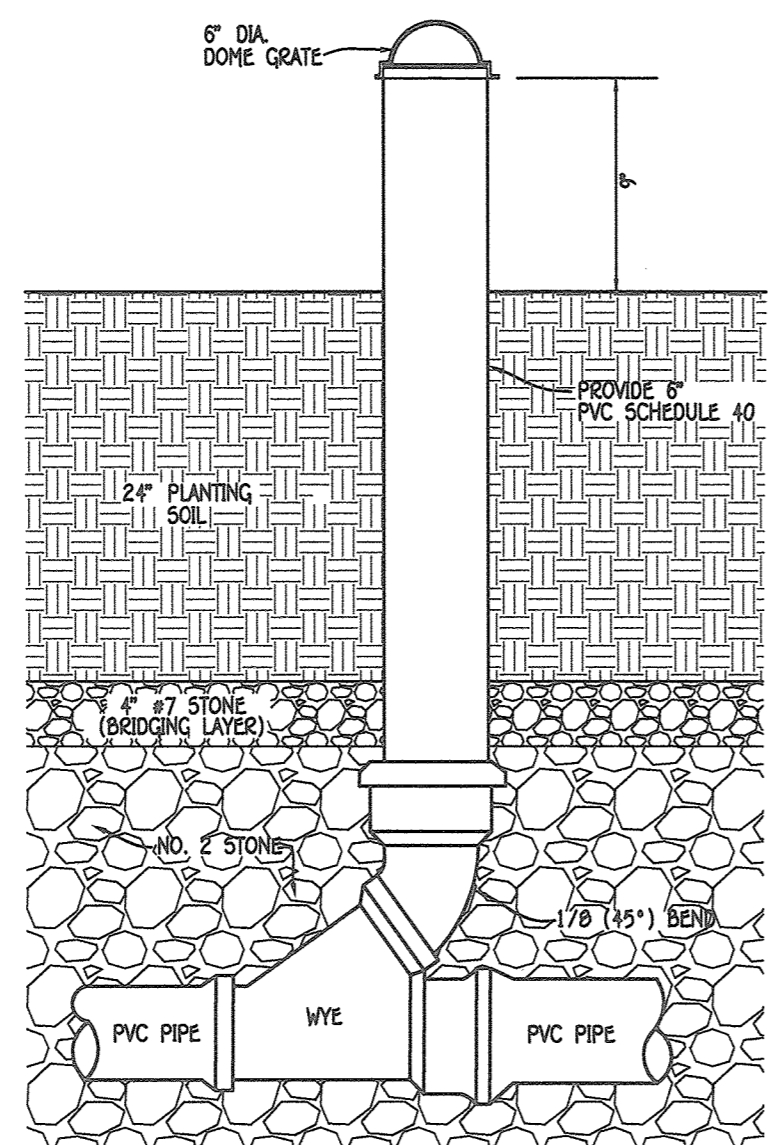
PLANT MATERIAL SELECTION SHOULD BE BASED ON THE GOAL OF SIMULATING A TERRESTRIAL FORESTED COMMUNITY OF NATIVE SPECIES. BIORETENTION SIMULATES AN UPLAND-SPECIES ECOSYSTEM. THE COMMUNITY SHOULD BE DOMINATED BY TREES, BUT HAVE A DISTINCT COMMUNITY OF UNDERSTORY TREES, SHRUBS AND HERBACEOUS MATERIALS. BY CREATING A DIVERSE, DENSE PLANT COVER, A BIORETENTION FACILITY WILL BE ABLE TO TREAT STORMWATER RUNOFF AND WITHSTAND URBAN STRESSES FROM INSECTS, DISEASE, DROUGHT, TEMPERATURE, WIND, AND EXPOSURE.

THE PROPER SELECTION AND INSTALLATION OF PLANT MATERIALS IS KEY TO A SUCCESSFUL SYSTEM. THERE ARE ESSENTIALLY THREE ZONES WITHIN A BIORETENTION FACILITY (FIGURE A.5). THE LOWEST ELEVATION SUPPORTS PLANT SPECIES ADAPTED TO STANDING AND FLUCTUATING WATER LEVELS. THE MIDDLE ELEVATION SUPPORTS PLANTS THAT LIKE DRIER SOIL CONDITIONS, BUT CAN STILL TOLERATE OCCASIONAL INUNDATION BY WATER. THE OUTER EDGE

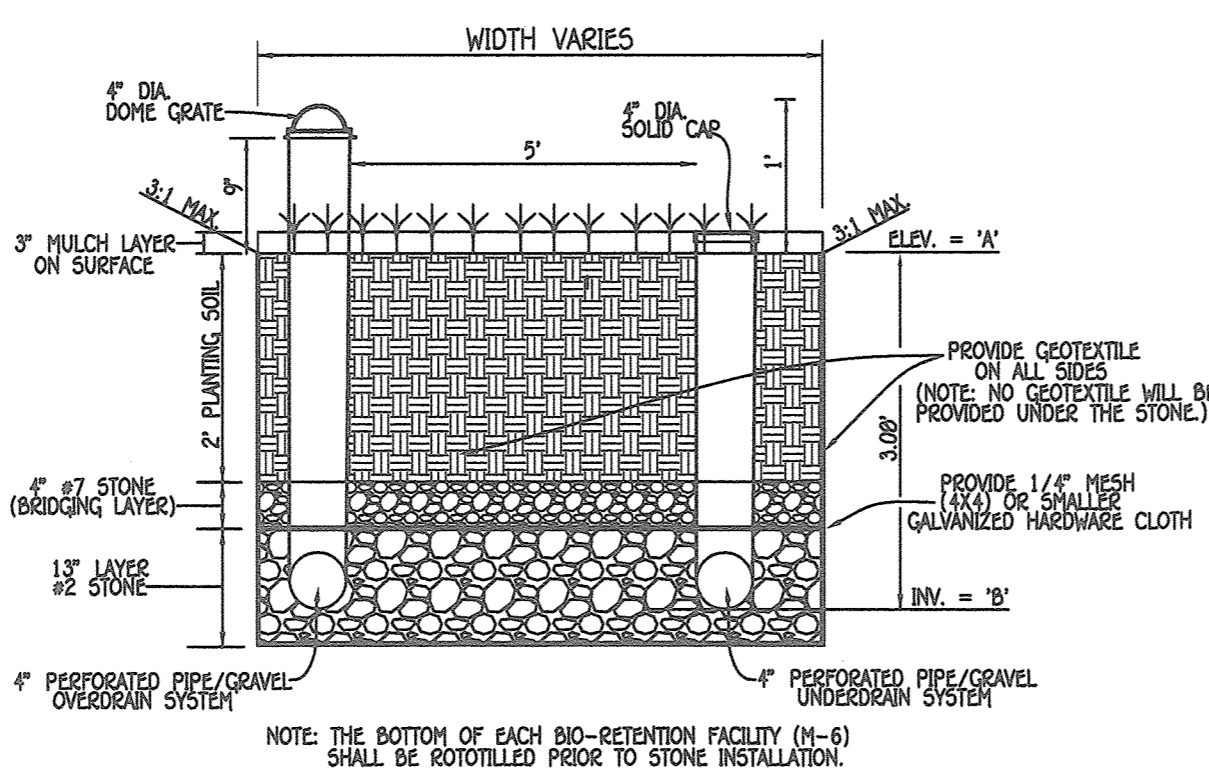
IS THE HIGHEST ELEVATION AND GENERALLY SUPPORTS PLANTS ADAPTED TO DRIER CONDITIONS. A SAMPLE OF APPROPRIATE PLANT MATERIALS FOR BIORETENTION FACILITIES ARE INCLUDED IN TABLE A.4. THE LAYOUT OF PLANT MATERIAL SHOULD BE FLEXIBLE, BUT SHOULD FOLLOW THE GENERAL PRINCIPALS DESCRIBED IN TABLE A.5. THE OBJECTIVE IS TO HAVE A SYSTEM, WHICH RESEMBLES A RANDOM, AND NATURAL PLANT LAYOUT, WHILE MAINTAINING OPTIMAL CONDITIONS FOR PLANT ESTABLISHMENT AND GROWTH. FOR A MORE EXTENSIVE BIORETENTION PLAN, CONSULT ETAB, 1993 OR CLAYTOR AND SCHUELER, 1997.

**OPERATION AND MAINTENANCE SCHEDULE FOR BIO-RETENTION AREAS (M-6) AND (F-6)**

1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. 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 AND PRUNING.
2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION BEYOND TREATMENT. TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRES.
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
4. SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS. WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

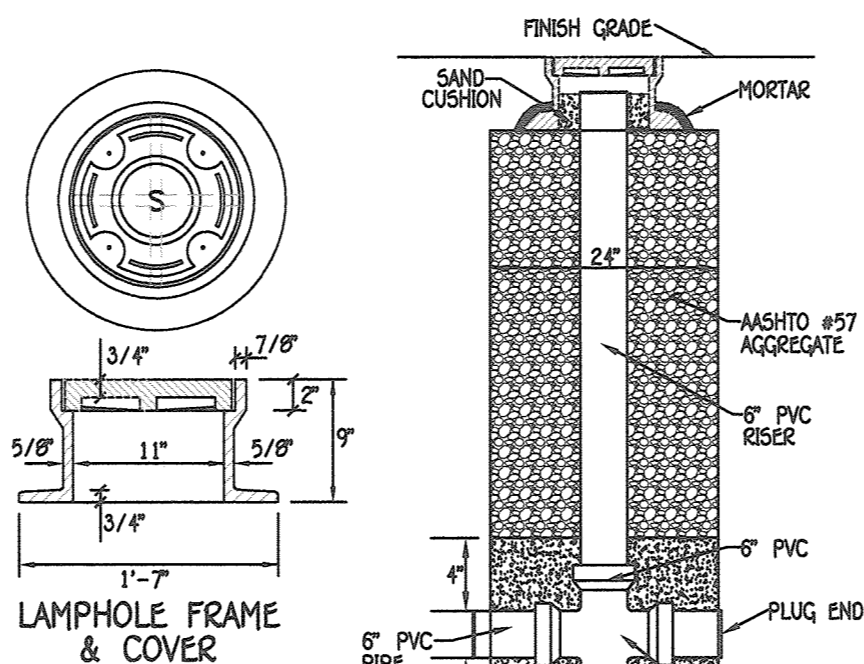


**TYPICAL CLEAN-OUT DETAIL**  
NO TO SCALE

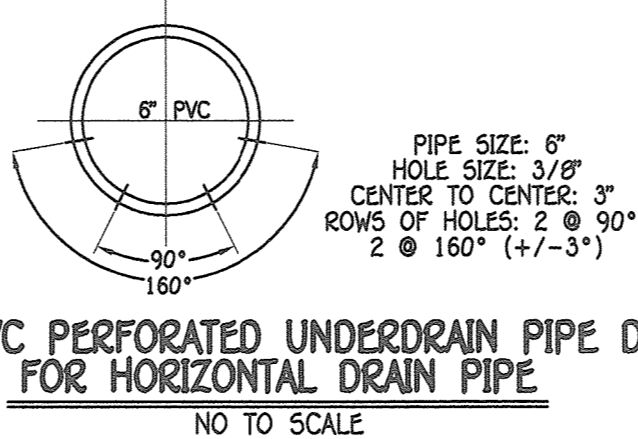


**TYPICAL SECTION BIO-RETENTION FACILITY (F-6)**  
NO NOT SCALE

DRY WELL CHART							
LOT NO.	DRYWELL NUMBER	NO. OF DOWNSPOUTS	AREA OF ROOF	VOLUME REQUIRED	VOLUME PROVIDED	AREA OF STORAGE	NO. OF DRYWELLS
17	M-5 (17A)	2	923 SqFt	132 CuFt	140 CuFt	100%	1
17	M-5 (17B)	2	982 SqFt	140 CuFt	140 CuFt	100%	1
18	M-5 (18A)	2	926 SqFt	132 CuFt	140 CuFt	100%	1
19	M-5 (19A)	2	982 SqFt	140 CuFt	140 CuFt	100%	1
20	M-5 (20A)	2	926 SqFt	132 CuFt	140 CuFt	100%	1
21	M-5 (21A)	2	982 SqFt	140 CuFt	140 CuFt	100%	1
22	M-5 (22A)	2	930 SqFt	133 CuFt	140 CuFt	100%	1
22	M-5 (22B)	2	979 SqFt	140 CuFt	140 CuFt	100%	1
23	M-5 (23A)	2	977 SqFt	140 CuFt	140 CuFt	100%	1
24	M-5 (24A)	2	921 SqFt	132 CuFt	140 CuFt	100%	1



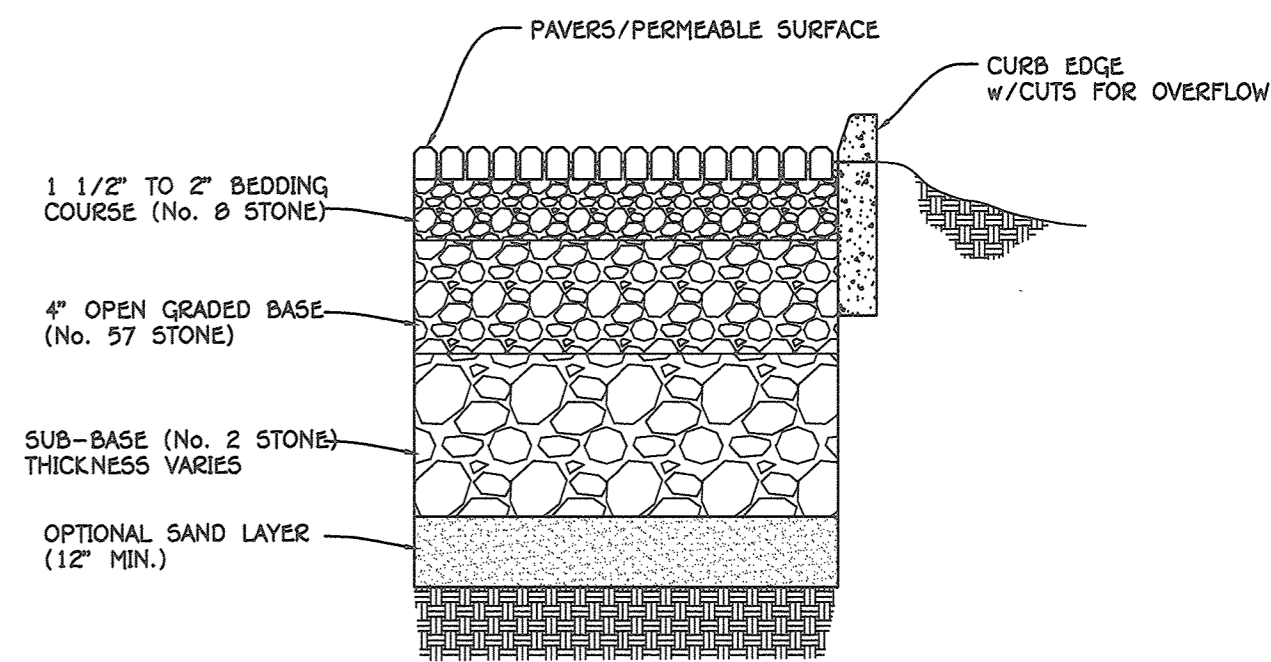
**CLEANOUT/WATER QUALITY SAMPLING PORT DETAIL**  
NOT TO SCALE



**SCH40 PVC PERFORATED UNDERDRAIN PIPE DETAIL FOR HORIZONTAL DRAIN PIPE**  
NO TO SCALE

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

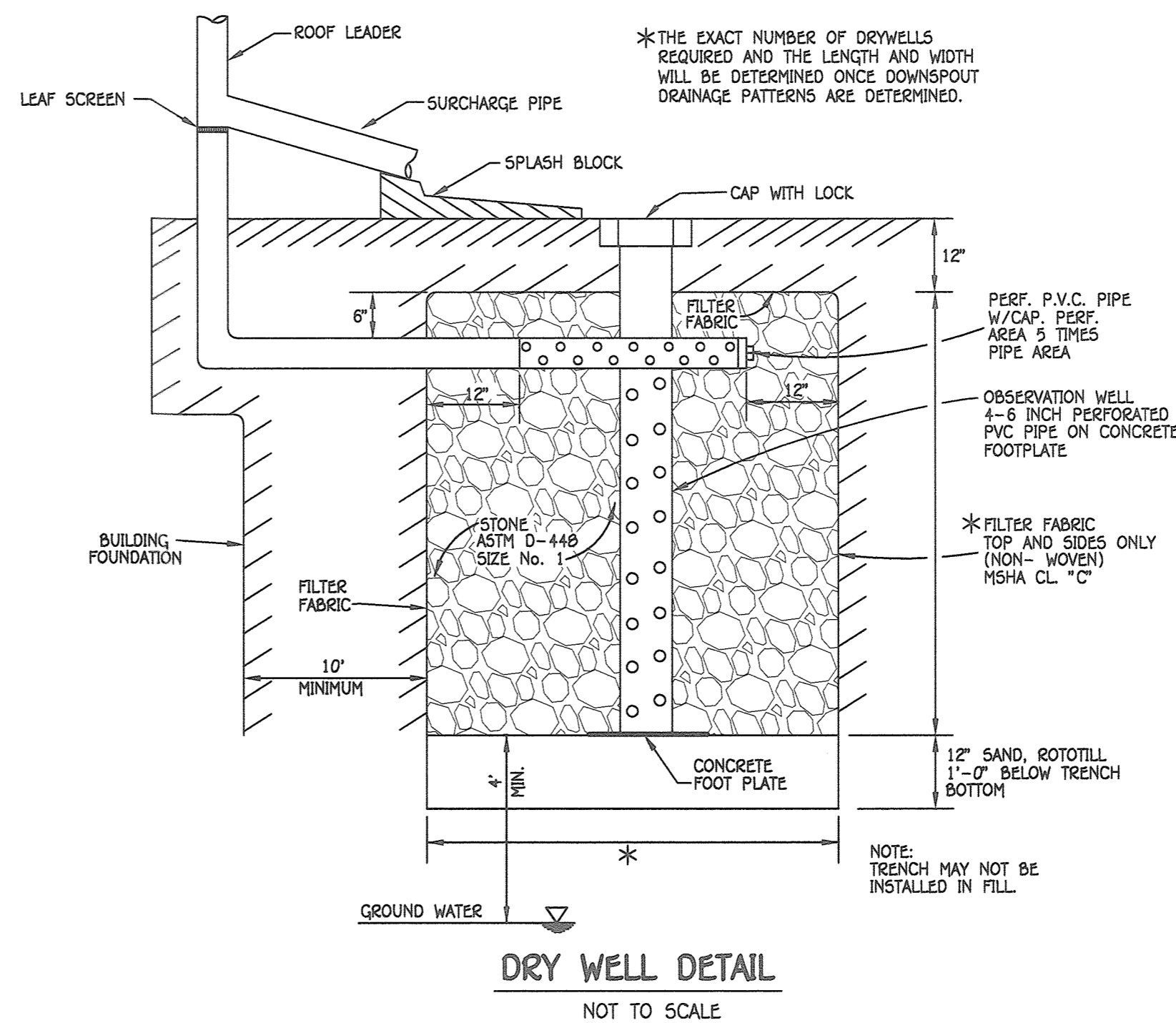
- a. The owner shall periodically sweep (or vacuum porous concrete pavement) the pavement surfaces to reduce sediment accumulation and insure continued surface porosity. Sweeping should be performed at least twice annually with a commercial cleaning unit. Washing or compressed air units should not be used to perform surface cleaning.
- b. The owner shall periodically clean drainage pipes, inlets, stone edge drains and other structures within or draining to the subbase.
- c. The owner shall use deicers in moderation. Deicers should be non-toxic and be applied either as calcium magnesium acetate or as pretreated salt.
- d. The owner shall ensure snow plowing is performed carefully with blades set one inch above the surface. Flowed snow piles and snowmelt should not be directed to permeable pavement.



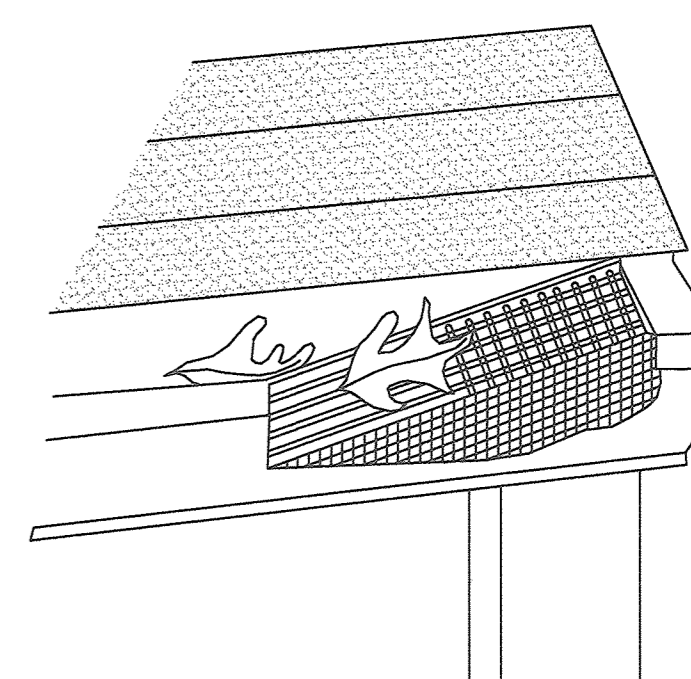
**TYPICAL SECTION - PERMEABLE PAVEMENT**  
NO SCALE

**OPERATION & MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DRY WELLS (M-5)**

- A. THE OWNER SHALL INSPECT THE MONITORING WELLS AND STRUCTURES ON A QUARTERLY BASIS AND AFTER EVERY HEAVY STORM EVENT.
- B. THE OWNER SHALL RECORD THE WATER LEVELS AND SEDIMENT BUILD UP IN THE MONITORING WELLS OVER A PERIOD OF SEVERAL DAYS TO ENSURE TRENCH DRAINAGE.
- C. THE OWNER SHALL MAINTAIN A LOG BOOK TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
- D. WHEN THE FACILITY BECOMES CLOGGED SO THAT IT DOES NOT DRAIN DOWN WITHIN A SEVENTY-TWO (72) HOUR TIME PERIOD, CORRECTIVE ACTION SHALL BE TAKEN.
- E. THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.



**DRY WELL DETAIL**  
NOT TO SCALE



**GUTTER DRAIN FILTER DETAIL**  
NOT TO SCALE

\*A GUTTER GUARD OR A SUITABLE EQUIVALENT SHALL BE USED FOR EACH DOWNSPOUT DIRECTED TO A DRYWELL

\*PERF. P.V.C. PIPE W/CAP, PERF AREA 5 TIMES PIPE AREA

\*OBSERVATION WELL 4-6 INCH PERFORATED PVC PIPE ON CONCRETE FOOTPLATE

\*FILTER FABRIC TOP AND SIDES ONLY (NON-WOVEN) MSHA CL. "C"

\*TRENCH MAY NOT BE INSTALLED IN FILL.

**STORMWATER MANAGEMENT NOTES AND DETAILS**

**EDEN BROOK**  
LOTS 1 THRU 24, OPEN SPACE LOTS 25 THRU 27 (AGE-RESTRICTED ADULT HOUSING)  
8580 GUILFORD ROAD  
PREVIOUS HOWARD COUNTY FILE No. BA-17-030C  
TAX MAP NO.: 42 GRID NO.: 7 PARCEL NO.: 269  
ZONED R-12  
SIXTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
SCALE: AS SHOWN DATE: OCTOBER, 2018  
SHEET 5 OF 5



**PROFESSIONAL CERTIFICATION**  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21476, EXPIRATION DATE: 7/14/19.

Frank Mahalansky  
FRANK MAHALANSKY, L.S.

**OWNER**  
ESTATE OF  
FRANCES ANNE MAHRGANG  
14722 DORSEY MILL ROAD  
GLENELG, MD 21738

**DEVELOPER**  
H&H ROCK COMPANIES  
6800 DEERPATH ROAD #100  
ELKSDORGE, MD 21075  
(410)-567-1045

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