

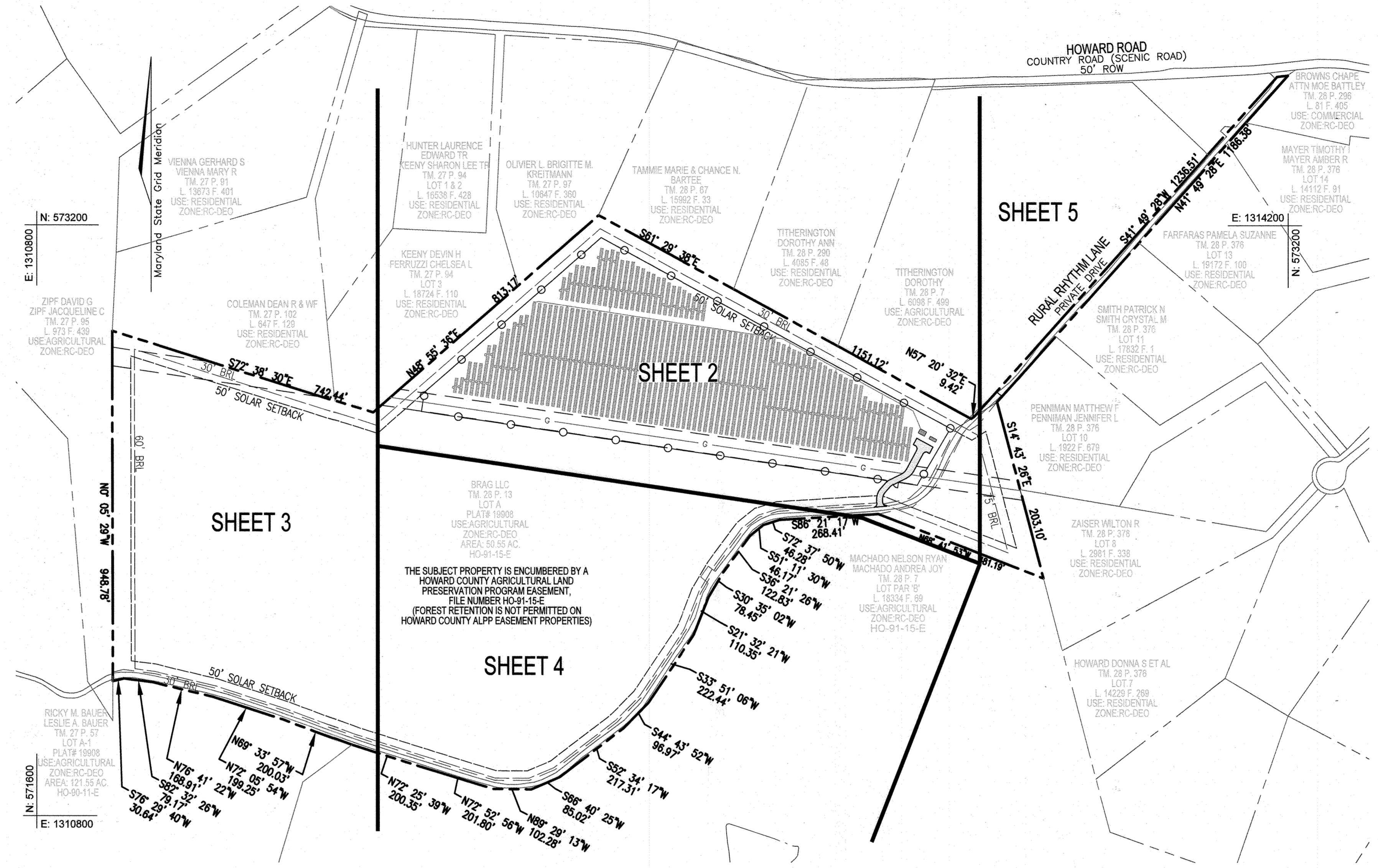
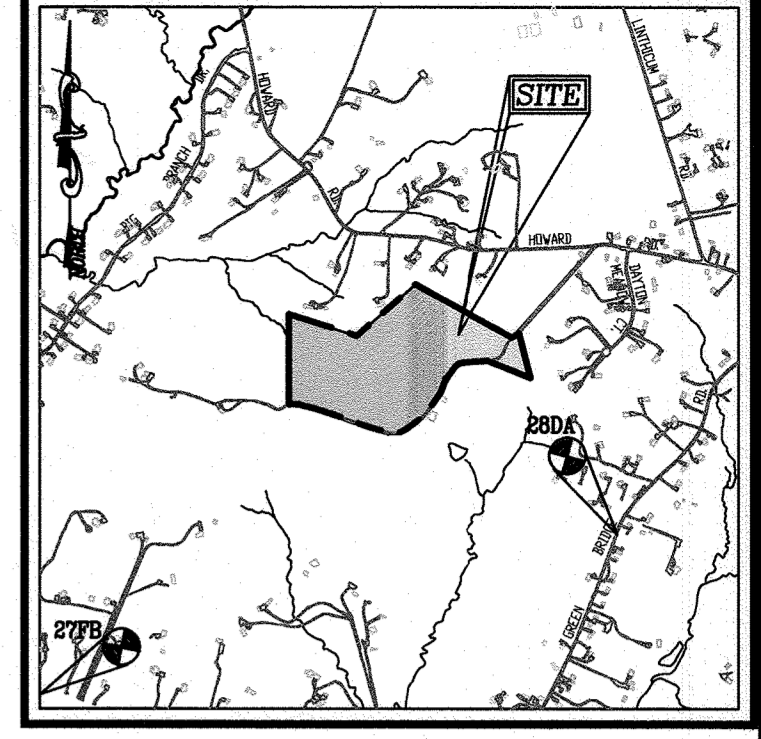
GENERAL NOTES

- THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
- THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON TOPOGRAPHY FROM HOWARD COUNTY GIS.
- BEARINGS AND DISTANCES SHOWN HEREON WERE ACQUIRED FROM RECORDED PLATS AND DEEDS.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 28DA AND 27FB WERE USED FOR THIS PROJECT.
- THE SUBJECT PROPERTY IS ZONED "RC-DEO" IN ACCORDANCE WITH THE 10/6/13 ZONING REGULATIONS, AND IS SUBJECT TO THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/2/03 PER COUNCIL BILL 75-2003.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE WETLANDS, STREAM(S) OR THEIR REQUIRED BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100-YEAR FLOODPLAIN. THE SIMPLIFIED FOREST STAND DELINEATION PLAN AND ENVIRONMENTAL REPORT WAS CREATED BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. BRODY MCALLISTER, DATED FEBRUARY 8, 2023.
- THERE IS NO 100-YEAR FLOODPLAIN LOCATED ON-SITE.
- NO STEEP SLOPES OVER 20,000 SF CONTIGUOUS ARE LOCATED WITHIN THE PROJECT AREA.
- FOREST CONSERVATION OBLIGATIONS FOR THIS PROJECT SHALL BE ADDRESSED BY A FOREST CONSERVATION PLAN SUBMITTED WITH THE FUTURE SITE DEVELOPMENT PLAN.
- THERE ARE NO WETLANDS, STREAMS OR THEIR BUFFERS LOCATED WITHIN THE PROJECT AREA.
- THE PROJECT SITE IS WITHIN THE TIER II WATERSHED.
- GEOTECHNICAL INVESTIGATIONS SHALL BE COMPLETED AND SUBMITTED WITH THE SITE DEVELOPMENT PLANS.
- A NOISE STUDY IS NOT REQUIRED FOR THIS SITE AS THIS IS A COMMERCIAL PROJECT.
- HOWARD ROAD IS CLASSIFIED AS A SCENIC ROAD.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
- STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF NON-STRUCTURAL PRACTICES AND MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA; THESE PRACTICES INCLUDE NON-ROOF TOP DISCONNECTION (N-2), BIORETENTION (F-6), AND LEVEL SPREADER. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
- APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN/PLAT 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 AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN 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.
- APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) BY THE HOWARD SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME. THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING AND ADDRESS THE PROJECT TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.
- ISOLATED, SURFACE SMOOTHING AND/OR FINE GRADING MAY BE REQUIRED TO SUPPORT SOLAR EQUIPMENT INSTALLATION. HOWEVER, NO MASS GRADING WILL BE REQUIRED. ISOLATED FINE GRADES WILL BE PROVIDED WITH SITE DEVELOPMENT PLAN SUBMISSION AS REQUIRED.
- THERE ARE EXISTING STRUCTURES LOCATED WITHIN THE PROPERTY BUT NOT WITHIN THE PROJECT AREA WHICH ARE TO REMAIN.
- ALL ACCESS DRIVES FROM THE PUBLIC ROAD TO THE EQUIPMENT PAD TO BE 16' MINIMUM WIDTH AND CAPABLE OF SUPPORTING FIRE DEPARTMENT VEHICLES.
- THIS PROJECT IS SUBJECT TO ZONING AND LAND USE BOARD OF APPEALS CASE BA-21-0100, ON JUNE 30, 2021; THE HOWARD COUNTY BOARD OF APPEALS GRANTED THE PETITION OF KDC SOLAR HR STREETLIGHTS, LLC., PROVIDED THAT THE PETITIONER MEET CERTAIN CONDITIONS:
 - THE COMMERCIAL SOLAR FACILITY CONDITIONAL USE SHALL BE CONDUCTED IN CONFORMANCE WITH THE PETITION AS SUBMITTED AND AS SHOWN ON THE CONDITIONAL USE PLAN DATED MARCH, 2021, AND NOT TO ANY OTHER ACTIVITIES, USES OR STRUCTURES ON THE PROPERTY.
 - PETITIONER SHALL COMPLY WITH ALL CONDITIONAL USE STANDARDS.
 - THE SITE DEVELOPMENT PLAN, OR ITS EQUIVALENT, SHALL INCLUDE A NOTE CONTAINING ALL CONDITIONS OF APPROVAL.
 - PETITIONER SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
 - THE SYSTEMS SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS AND PROVISIONS.
 - ANY COMMERCIAL SOLAR FACILITY THAT IS NO LONGER USED SHALL BE REMOVED BY THE PROPERTY OWNER FROM THE SITE WITHIN ONE YEAR OF THE DATE THAT THE USE CEASES.
 - THE PREMISES SHALL BE MAINTAINED AT ALL TIMES IN A CLEAN AND ORDERLY CONDITION, INCLUDING THE CARE OR REPLACEMENT OF PLANT MATERIALS REQUIRED IN THE LANDSCAPING PLAN. THE RESPONSIBILITY FOR COMPLIANCE WITH THIS PROVISION SHALL BE WITH ALL PARTIES HAVING A LEASE OR OWNERSHIP INTEREST IN THE COMMERCIAL SOLAR FACILITY.
 - THE PETITIONER SHALL REGISTER ALL SOLAR COLLECTORS WITH THE DEPARTMENT OF FIRE AND RESCUE SERVICES. THE REGISTRATION SHALL INCLUDE A MAP OF THE SOLAR FACILITY NOTING THE LOCATION OF THE SOLAR COLLECTORS AND THE PANEL DISCONNECT.
 - TREE REMOVAL SHALL BE MINIMIZED, AND REFORESTATION SHALL BE DONE IN ACCORDANCE WITH SECTION 16.1026 OF THE HOWARD COUNTY CODE.
 - ALL REQUIRED LANDSCAPING SHALL BE PROVIDED WITHIN 6 MONTHS OF INSTALLATION OF THE SOLAR PANELS.
 - PETITIONER SHALL REVISE THE CONDITIONAL USE PLAN (MARCH, 2021) TO INCLUDE THE SAME TYPE 'D' LANDSCAPE BUFFER ALONG THE SOUTHERN PERIMETER OF THE PROPOSED USE AS IS TO BE PROVIDED ALONG THE NORTHERN, EASTERN AND WESTERN PERIMETERS.
 - THE REVIEW OF ALL REQUIRED DEVELOPMENT PLANS SHALL INCLUDE MAPS WHICH DEPICT THE HOME AND THE WELL CONSTRUCTED ON THE DEVIN KEENEY PROPERTY IN 2020 IN THEIR PROPER LOCATION.
- ON FEBRUARY 3, 2023; THE HOWARD COUNTY BOARD OF APPEALS GRANTED THE PETITION AND AMENDED CONDITIONAL USE PLAN DATED DECEMBER 2021 OF KDC SOLAR HR STREETLIGHTS, LLC., PROVIDED THAT THE PETITIONER MEET CERTAIN CONDITIONS:
 - THE PETITIONER SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND COUNTY LAWS AND REGULATIONS.
- POINT DISCHARGE LOCATION COMPUTATIONS SHALL BE COMPLETED WITH THE SITE DEVELOPMENT PLAN STAGE.
- THE LOCATION REQUIRED FOR SHEEP GRAZING AND BEE POLLINATORS SHALL BE IDENTIFIED WITH THE SITE DEVELOPMENT PLAN STAGE.
- A FIRE TRUCK TURNING EXHIBIT SHALL BE COMPLETED WITH THE SITE DEVELOPMENT PLAN STAGE.

ENVIRONMENTAL CONCEPT PLAN HOWARD ROAD SOLAR THE OAKS AT BRIDLE CREEK, PARCEL 'A' HOWARD COUNTY, MARYLAND

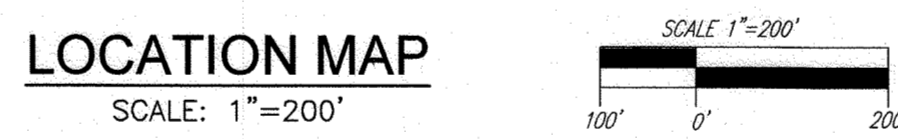
BENCHMARKS

HOWARD COUNTY BENCHMARK 28DA N 570,624.997 E 1,314,434.228	ELEV. 564.389
HOWARD COUNTY BENCHMARK 27FB N 568,975.151 E 1,308,421.569	ELEV. 512.223



SHEET INDEX

DESCRIPTION	SHEET NO.
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LAYOUT PLAN AND SITE DETAILS	5 OF 7
STORMWATER MANAGEMENT DRAINAGE AREA MAP	6 OF 7
STORMWATER MANAGEMENT NOTES AND DETAILS	7 OF 7



ENVIRONMENTAL SITE DESIGN NARRATIVE:

- THERE ARE NO ENVIRONMENTAL FEATURES LOCATED WITHIN THE PROJECT AREA. THERE IS AN EXISTING UNDERGROUND PIPELINE EASEMENT RUNNING THROUGH THE PROPOSED FENCE AREA.
- THE SITE HAS A HIGH POINT LOCATED AT THE NORTH EASTERN SIDE OF THE PROJECT AREA AND SLOPES WEST AND EAST BY SHEET FLOW. THE SITE HAS BEEN DESIGNED TO MAINTAIN THE NATURAL DRAINAGE PATTERNS.
- 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 RESULTS OF THE ENVIRONMENTAL SITE DESIGN FOR THIS PROJECT WILL REFLECT "WOODS IN GOOD CONDITION". THE ESD CONCEPT INCLUDES THE USE OF NON-ROOF TOP DISCONNECTION (N-2), BIORETENTION (F-6), AND LEVEL SPREADER.
- SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE PROPOSED SUPER SILT FENCE PERIMETER CONTROLS, TEMPORARY SOIL STABILIZATION MATTING AND CHECK DAMS. SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH CURRENT REQUIREMENTS AND SHALL BE APPROVED BY THE HOWARD SOIL CONSERVATION DISTRICT DURING THE FUTURE SITE DEVELOPMENT PLAN PHASE OF THE PROJECT.
- STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF NON-ROOF TOP DISCONNECTION (N-2), BIORETENTION (F-6), AND LEVEL SPREADER. PROPOSED PRACTICES HAVE BEEN MAXIMIZED TO THE EXTENT PRACTICAL. THE CALCULATED RAINFALL TARGET (PE) FOR THIS PROJECT IS 1.0", AND THE TOTAL RUNOFF VOLUME (ESD) REQUIRED IS 2,166 CF. THE CALCULATED RAINFALL PROVIDED (PE) FOR THIS PROJECT IS 1.18", AND THE TOTAL RUNOFF VOLUME (ESD) PROVIDED IS 2,439 CF.
- AT THIS CONCEPT STAGE OF DEVELOPMENT, NO DESIGN MANUAL WAIVERS ARE ANTICIPATED.

SITE ANALYSIS DATA CHART

A. TOTAL SITE AREA:	50.55± AC.
B. AREA OF PLAN SUBMISSION:	11.17 AC. (COMBINED LOD & SOLAR AREA)
C. COMMERCIAL SOLAR OPERATIONAL AREA:	9.27 AC.
D. AREA OF WETLANDS AND WETLAND BUFFERS:	192,533 SF± OR 4.42 AC.±
E. AREA OF FLOODPLAIN:	0.00 SF± OR 0.00 AC.±
F. AREA OF 75' STREAM BUFFER:	0.00 SF OR 0.00 AC.
G. AREA OF 100' STREAM BUFFER:	0.00 SF OR 0.00 AC.
H. AREA OF FOREST:	0.00 SF OR 0.00 AC.±
I. AREA OF MODERATE SLOPES (15%-24.99%):	41,250 SF OR 0.95 AC.±
J. AREA OF STEEP SLOPES (25% & GREATER):	0.00 SF OR 0.00 AC.±
K. ERODIBLE SOILS:	1,740,274 SF OR 39.95 AC.±
L. LIMIT OF DISTURBED AREA:	427,974 SF± OR 9.82 AC.±
M. PROPOSED USES FOR SITE AND STRUCTURES:	SOLAR FACILITY COMMERCIAL
N. GREEN OPEN AREA:	11.06 AC.± (COMBINED LOD & SOLAR AREA)
O. PROPOSED IMPERVIOUS AREA:	0.12 AC.± (COMBINED LOD & SOLAR AREA)
P. PRESENT ZONING DESIGNATION:	RC-DEO
Q. OPEN SPACE REQUIRED:	N/A
R. DPZ FILE REFERENCES:	BA-21-0100

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 7.11.23
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 7/12/23
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

- LEGENDS:**
- PARCEL BOUNDARY
 - ADJACENT BOUNDARY
 - 50' SOLAR SETBACK
 - BUILDING RESTRICTION LINE
 - EXISTING TREELINE
 - EXISTING FENCE
 - OPEN SPACE REQUIRED
 - PROPOSED PAVING

DEVELOPER
KDC SOLAR
HR STREETLIGHTS LLC
1420 US HIGHWAY 206
SUITE 120
BEDMINSTER, NJ 07921
PHONE: 908-955-4360

OWNER
BRAG LLC
13825 HOWARD ROAD
DAYTON, MD 21036

NO. _____ REVISION _____ DATE _____

ENVIRONMENTAL CONCEPT PLAN
COVER SHEET
HOWARD ROAD SOLAR
THE OAKS AT BRIDLE CREEK, PARCEL 'A'

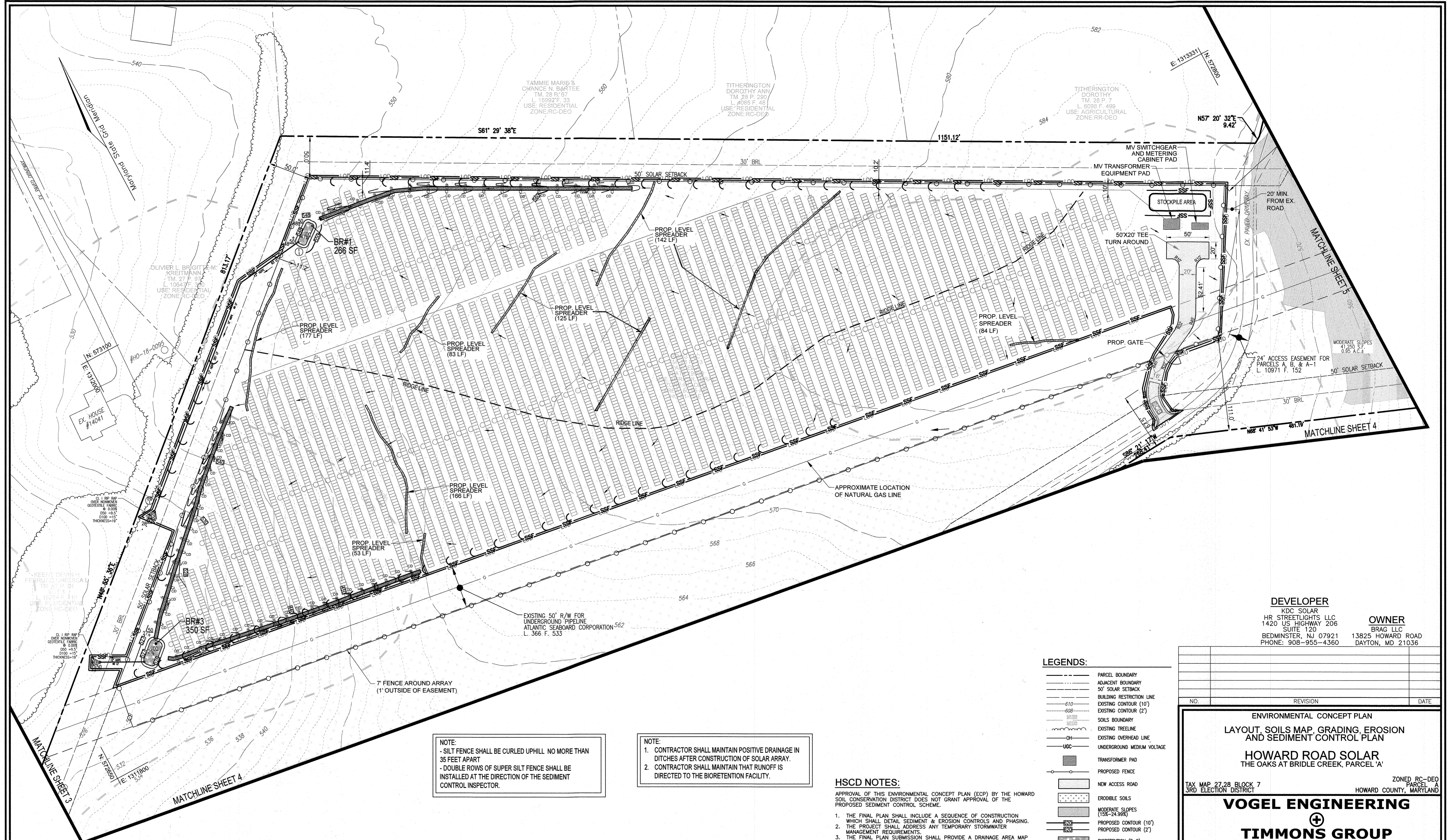
TAX MAP 27.28 BLOCK 7 3RD ELECTION DISTRICT ZONED RC-DEO PARCEL 'A' HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING
TIMMONS GROUP
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
P: 410.461.7666 F: 410.461.8961 www.timmons.com

PROFESSIONAL CERTIFICATE
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. 16193 EXPIRATION DATE: 08-27-2024

DESIGN BY: RHW
DRAWN BY: KG
CHECKED BY: RHW
DATE: JUNE 2023
SCALE: AS SHOWN
W.O. NO.: 46753

1 SHEET OF 7



NOTE:
 - SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 35 FEET APART
 - DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

NOTE:
 1. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE IN DITCHES AFTER CONSTRUCTION OF SOLAR ARRAY.
 2. CONTRACTOR SHALL MAINTAIN THAT RUNOFF IS DIRECTED TO THE BIORETENTION FACILITY.

HSCD NOTES:
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- THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING.
- THE PROJECT SHALL ADDRESS ANY TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.
- THE FINAL PLAN SUBMISSION SHALL PROVIDE A DRAINAGE AREA MAP SPECIFIC TO CHOSEN SEDIMENT CONTROLS.
- NO MASS GRADING PROPOSED WITHIN PROJECT BOUNDARY.

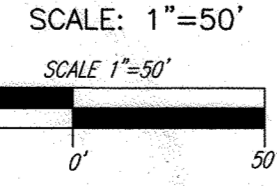
NOTES:

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- THERE ARE NO ENVIRONMENTAL FEATURES: FLOODPLAIN, WETLANDS, STREAMS, STEEP SLOPES OR FOREST THAT EXISTS WITHIN THE PROPOSED LIMIT OF DISTURBANCE.

SOILS LEGEND					
SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE	HYDRC
G _{1A}	BLENNELG LOAM, 0 TO 3 PERCENT SLOPES	B	0.37	NO	NO
G _{1B}	BLENNELG LOAM, 3 TO 8 PERCENT SLOPES	B	0.37	YES	NO
G _{1C}	BAILA LOAM, 8 TO 15 PERCENT SLOPES	B	0.55	YES	NO
M _{1C}	MANOR LOAM, 8 TO 15 PERCENT SLOPES	B	0.32	NO	NO
M _{1D}	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	0.32	YES	NO
G _{1B}	BLENNVILLE-BAILE SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	0.49	YES	YES

SOILS NOTE:
 HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT.

LAYOUT, SOILS MAP, GRADING, EROSION AND SEDIMENT CONTROL PLAN



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION *[Signature]* 7.11.23
 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* 6/26/23
 DATE

LEGENDS:

- PARCEL BOUNDARY
- ADJACENT BOUNDARY
- 50' SOLAR SETBACK
- BUILDING RESTRICTION LINE
- EXISTING CONTOUR (10')
- EXISTING CONTOUR (2')
- SOILS BOUNDARY
- EXISTING TREELINE
- EXISTING OVERHEAD LINE
- UCC UNDERGROUND MEDIUM VOLTAGE
- TRANSFORMER PAD
- PROPOSED FENCE
- NEW ACCESS ROAD
- ERODIBLE SOILS
- MODERATE SLOPES (15%-24.9%)
- PROPOSED CONTOUR (10')
- PROPOSED CONTOUR (2')
- BIORETENTION (F-6)
- NON-ROOFTOP DISCONNECTION (N-2)
- LIMIT OF DISTURBED AREA
- SUPER SILT FENCE
- TEMPORARY CHECK DAM
- SCS STABILIZED CONSTRUCTION ENTRANCE
- TEMPORARY SOIL STABILIZATION MATTING

DEVELOPER
 KDC SOLAR
 HR STREETLIGHTS LLC
 1420 US HIGHWAY 206
 SUITE 120
 BEDMINSTER, NJ 07921
 PHONE: 908-955-4360

OWNER
 BRAG LLC
 13825 HOWARD ROAD
 DAYTON, MD 21036

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
 LAYOUT, SOILS MAP, GRADING, EROSION AND SEDIMENT CONTROL PLAN

HOWARD ROAD SOLAR
 THE OAKS AT BRIDLE CREEK, PARCEL 'A'

TAX MAP 27.28, BLOCK 7, 3RD ELECTION DISTRICT
 ZONED RC-DEO PARCEL A
 HOWARD COUNTY, MARYLAND

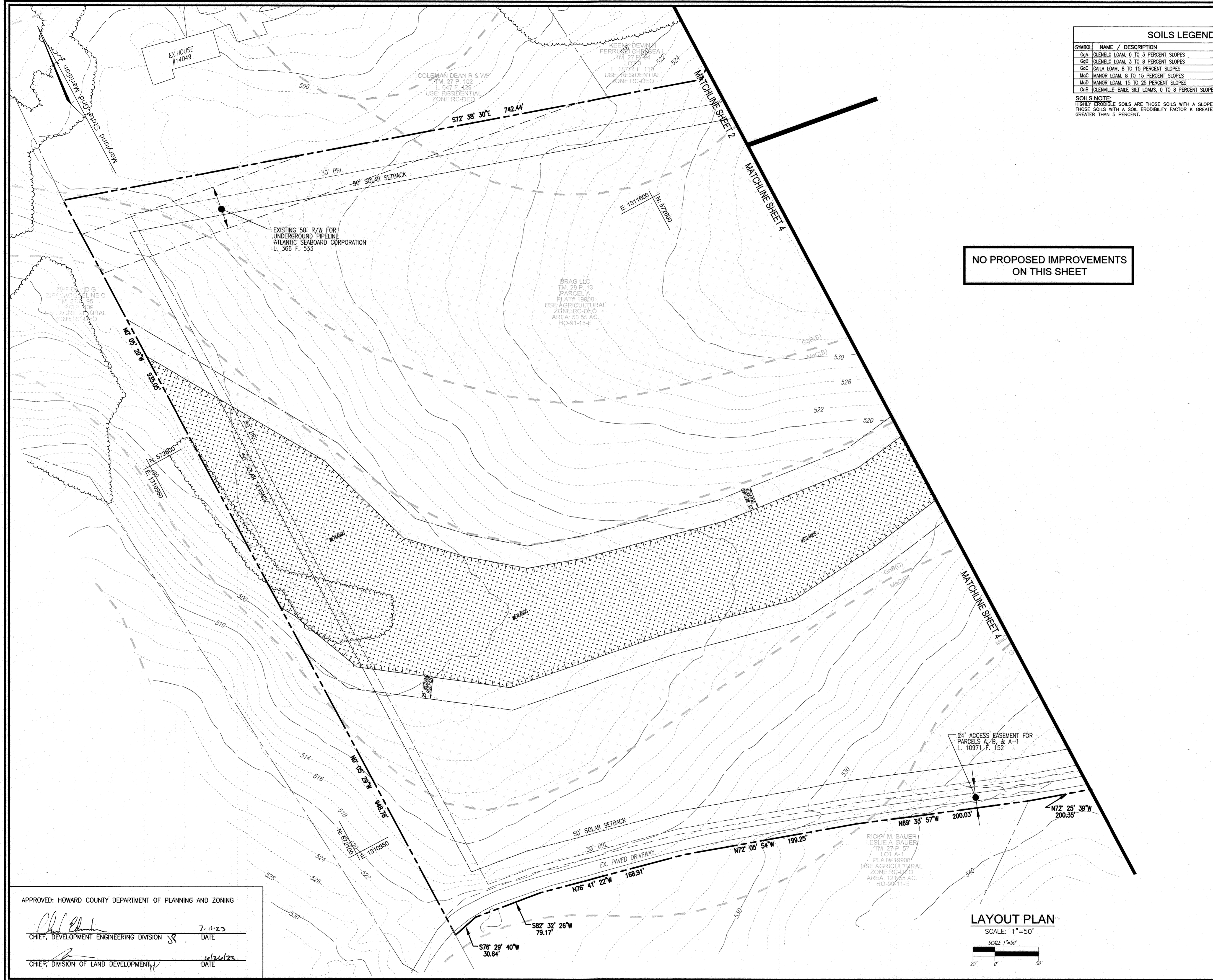
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 +
TIMMONS GROUP
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PROFESSIONAL CERTIFICATE

DESIGN BY: RHV
 DRAWN BY: KG
 CHECKED BY: RHV
 DATE: JUNE 2023
 SCALE: AS SHOWN
 W.O. NO.: 46753

STATE OF MARYLAND
 ROBERT H. VOGEL, PE No. 16193

2 SHEET OF 7



**NO PROPOSED IMPROVEMENTS
ON THIS SHEET**

SOILS LEGEND				
SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE / HYDRO
Ga	GLENELG LOAM, 0 TO 3 PERCENT SLOPES	B	0.37	NO / NO
Gp	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	0.37	YES / NO
Gc	GAILA LOAM, 8 TO 15 PERCENT SLOPES	B	0.55	YES / NO
Md	MANOR LOAM, 8 TO 15 PERCENT SLOPES	B	0.32	NO / NO
Md	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	0.32	YES / NO
Gh	GLENVILLE-BALE SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	0.49	YES / YES

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LEGENDS:	
	PARCEL BOUNDARY
	ADJACENT BOUNDARY
	50' SOLAR SETBACK
	BUILDING RESTRICTION LINE
	EXISTING CONTOUR (10')
	EXISTING CONTOUR (20')
	SOILS BOUNDARY
	EXISTING TREELINE
	EXISTING WETLANDS
	WETLAND BUFFER
	ERODIBLE SOILS

- NOTES:**
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DEVELOPER
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HR STREETLIGHTS LLC
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SUITE 120
BEDMINSTER, NJ 07921
PHONE: 908-955-4360

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13825 HOWARD ROAD
DAYTON, MD 21036

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ENVIRONMENTAL CONCEPT PLAN
LAYOUT PLAN

HOWARD ROAD SOLAR
THE OAKS AT BRIDLE CREEK, PARCEL 'A'

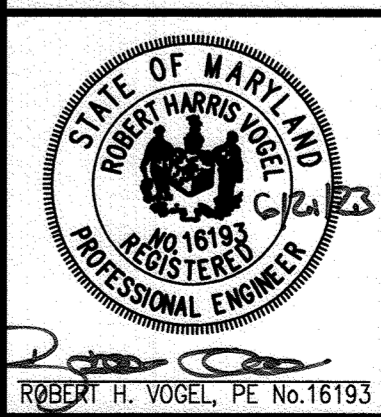
TAX MAP 27.28 BLOCK 7
3RD ELECTION DISTRICT

ZONED RC-DEO
PARCEL A
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING

TIMMONS GROUP

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EXPIRATION DATE: 09-27-2024

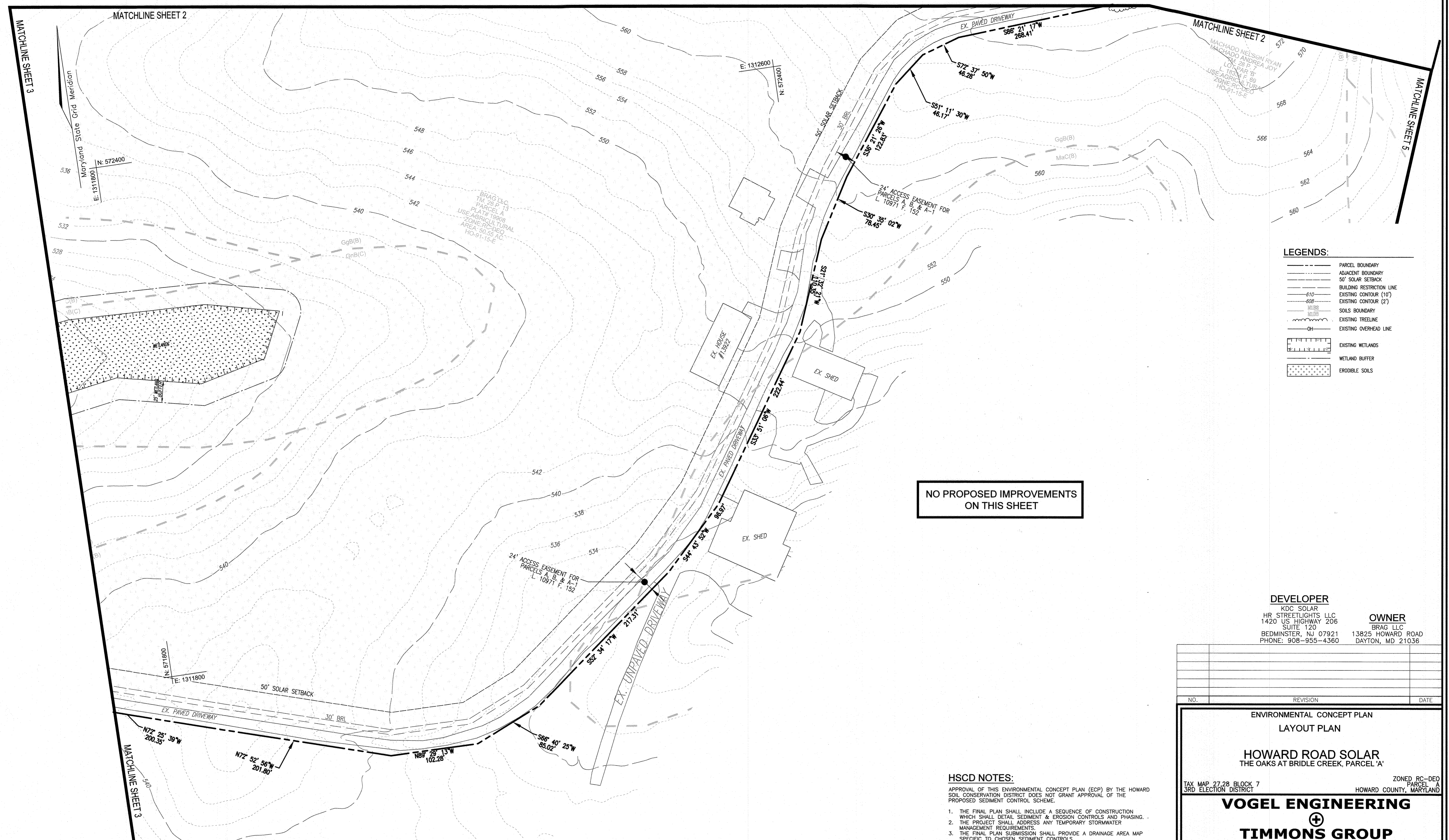
3 SHEET OF 7

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 7-11-23
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 6/26/23
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

LAYOUT PLAN
SCALE: 1"=50'
SCALE 1"=50'
25' 0' 50'



LEGENDS:

---	PARCEL BOUNDARY
---	ADJACENT BOUNDARY
---	50' SOLAR SETBACK
---	BUILDING RESTRICTION LINE
---	EXISTING CONTOUR (10')
---	EXISTING CONTOUR (2')
---	MLB2
---	MLB3
---	MLB4
---	SOILS BOUNDARY
---	EXISTING TREELINE
---	EXISTING OVERHEAD LINE
---	EXISTING WETLANDS
---	WETLAND BUFFER
---	ERODIBLE SOILS

NO PROPOSED IMPROVEMENTS ON THIS SHEET

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KDC SOLAR
HR STREETLIGHTS LLC
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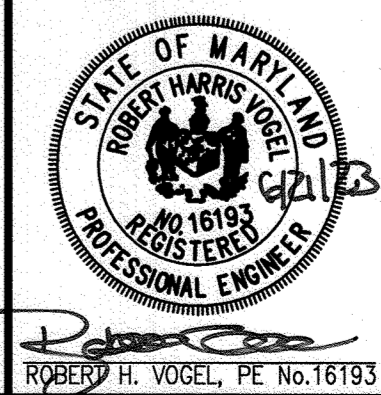
**ENVIRONMENTAL CONCEPT PLAN
LAYOUT PLAN**

HOWARD ROAD SOLAR
THE OAKS AT BRIDLE CREEK, PARCEL 'A'

TAX MAP 27.28 BLOCK 7
3RD ELECTION DISTRICT

ZONED RC-DEO
PARCEL A
HOWARD COUNTY, MARYLAND

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DATE: JUNE 2023
SCALE: AS SHOWN
W.O. NO.: 46753

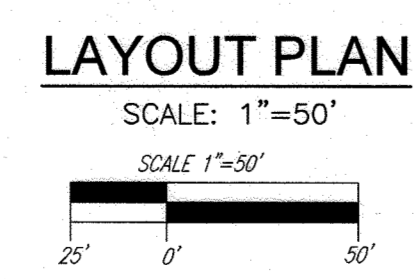
- HSCD NOTES:**
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- THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING PERMIT.
 - THE PROJECT SHALL ADDRESS ANY TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.
 - THE FINAL PLAN SUBMISSION SHALL PROVIDE A DRAINAGE AREA MAP SPECIFIC TO CHOSEN SEDIMENT CONTROLS.
 - NO MASS GRADING PROPOSED WITHIN PROJECT BOUNDARY.

- NOTES:**
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 - THERE ARE NO ENVIRONMENTAL FEATURES: FLOODPLAIN, WETLANDS, STREAMS, STEEP SLOPES OR FOREST THAT EXISTS WITHIN THE PROPOSED LIMIT OF DISTURBANCE.

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE	HYDRIC
GgA	GLENELG LOAM, 0 TO 3 PERCENT SLOPES	B	0.37	NO	NO
GgB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	0.37	YES	NO
GgC	GAULA LOAM, 8 TO 15 PERCENT SLOPES	B	0.55	YES	NO
MgC	MANOR LOAM, 8 TO 15 PERCENT SLOPES	B	0.32	NO	NO
MbD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	0.32	YES	NO
GhB	GLENNVILLE-BANKLE SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	0.49	YES	YES

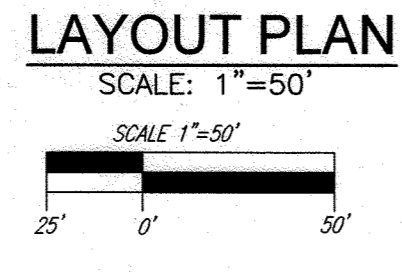
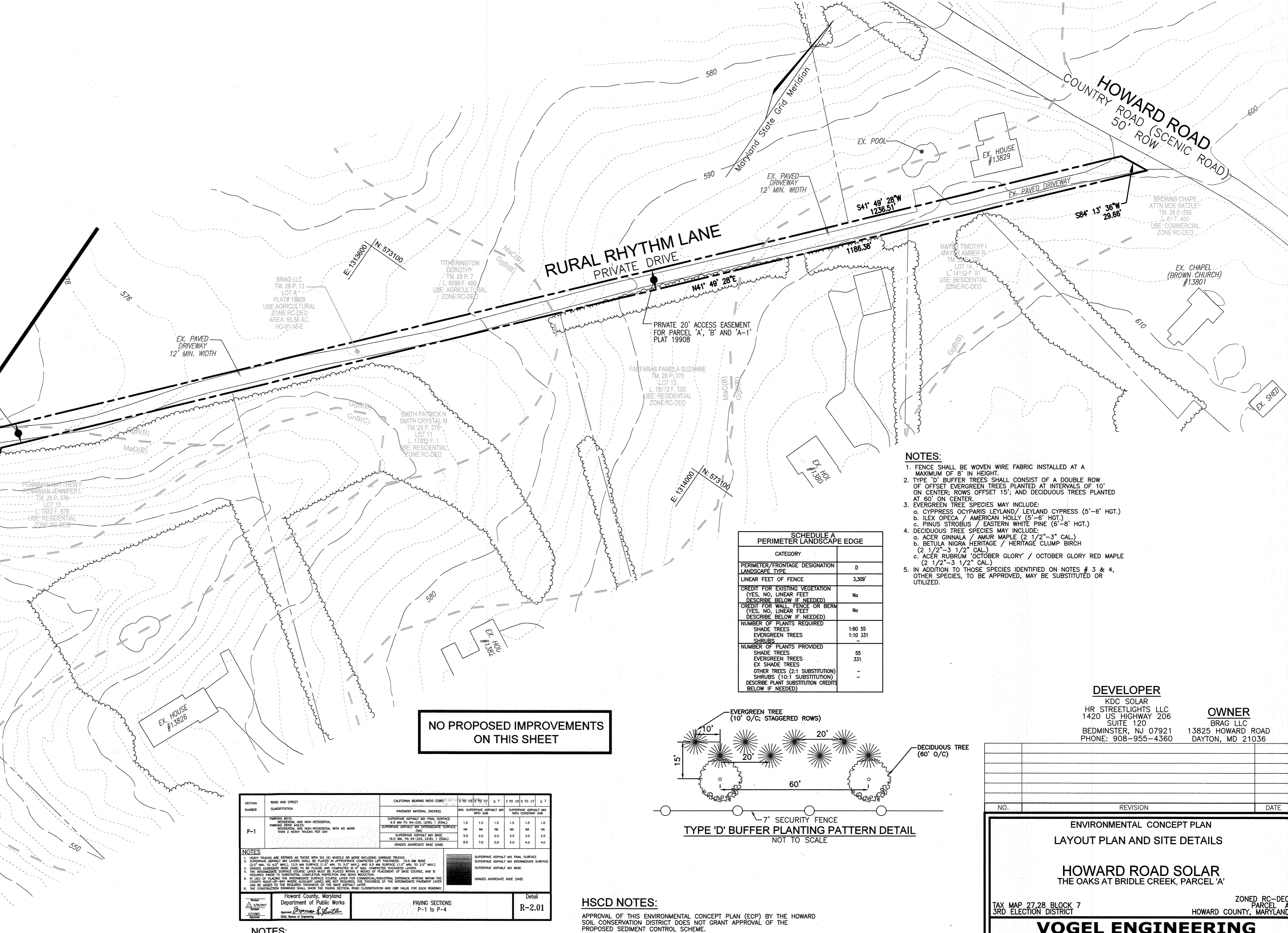
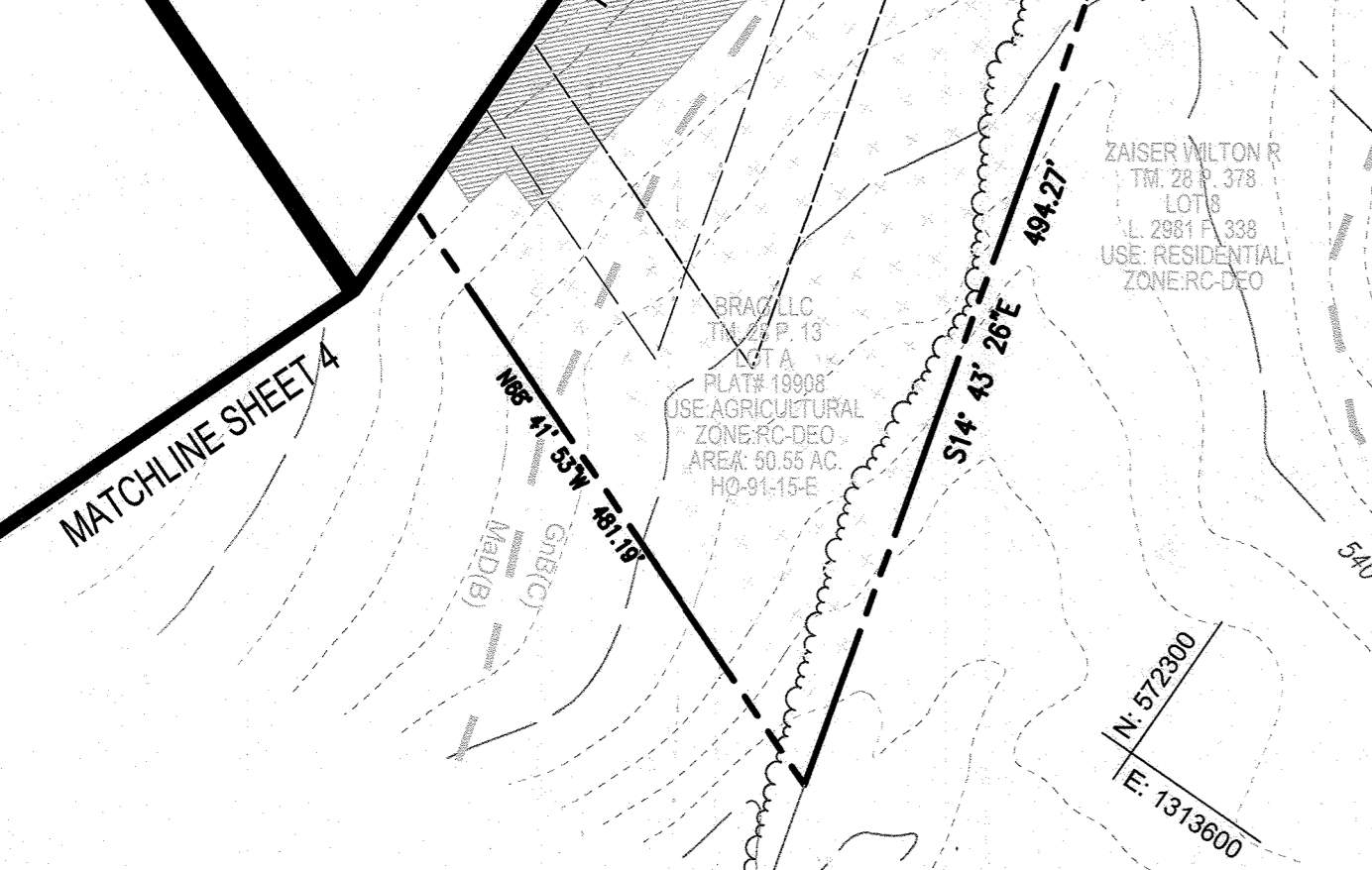
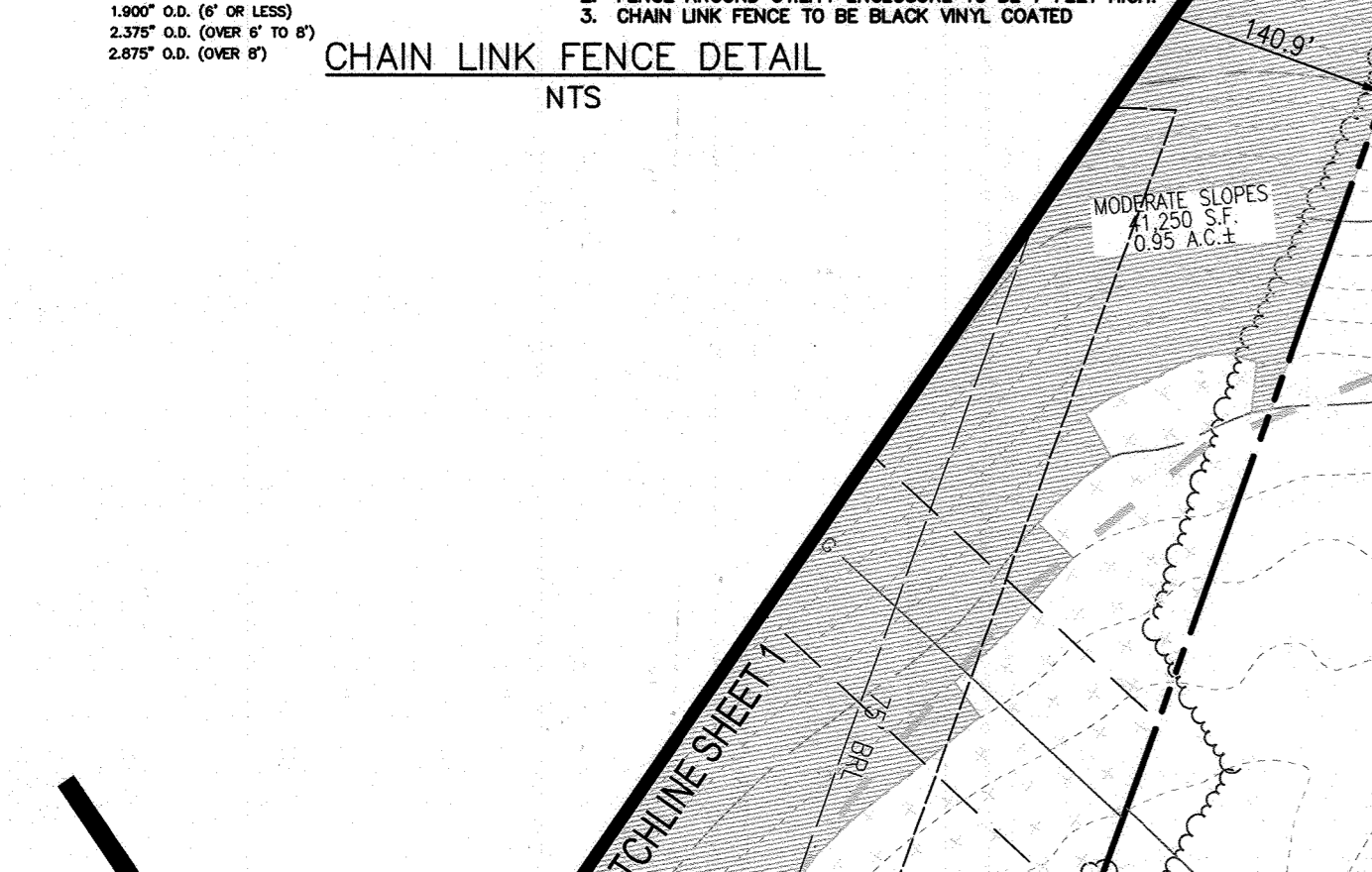
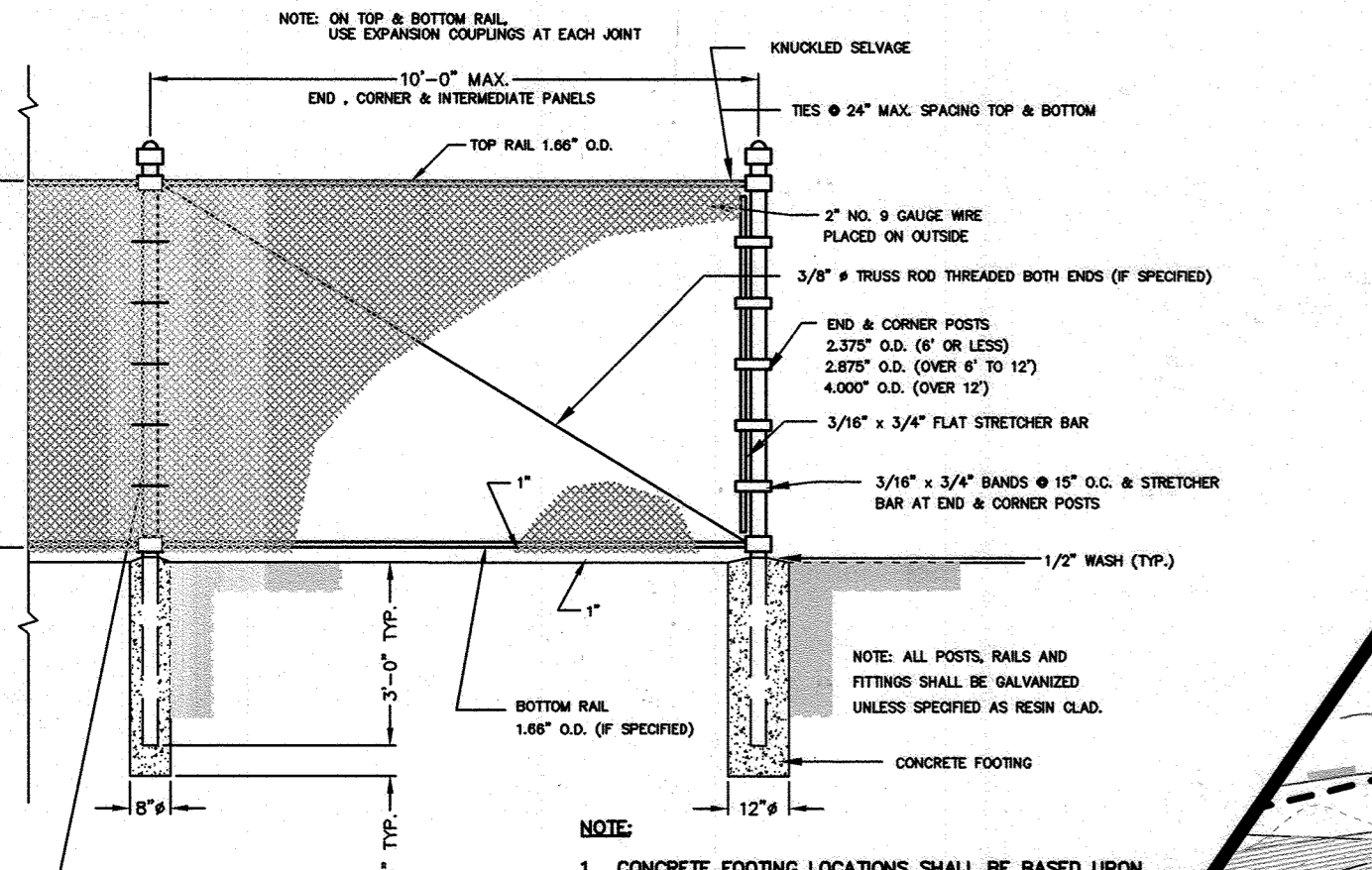
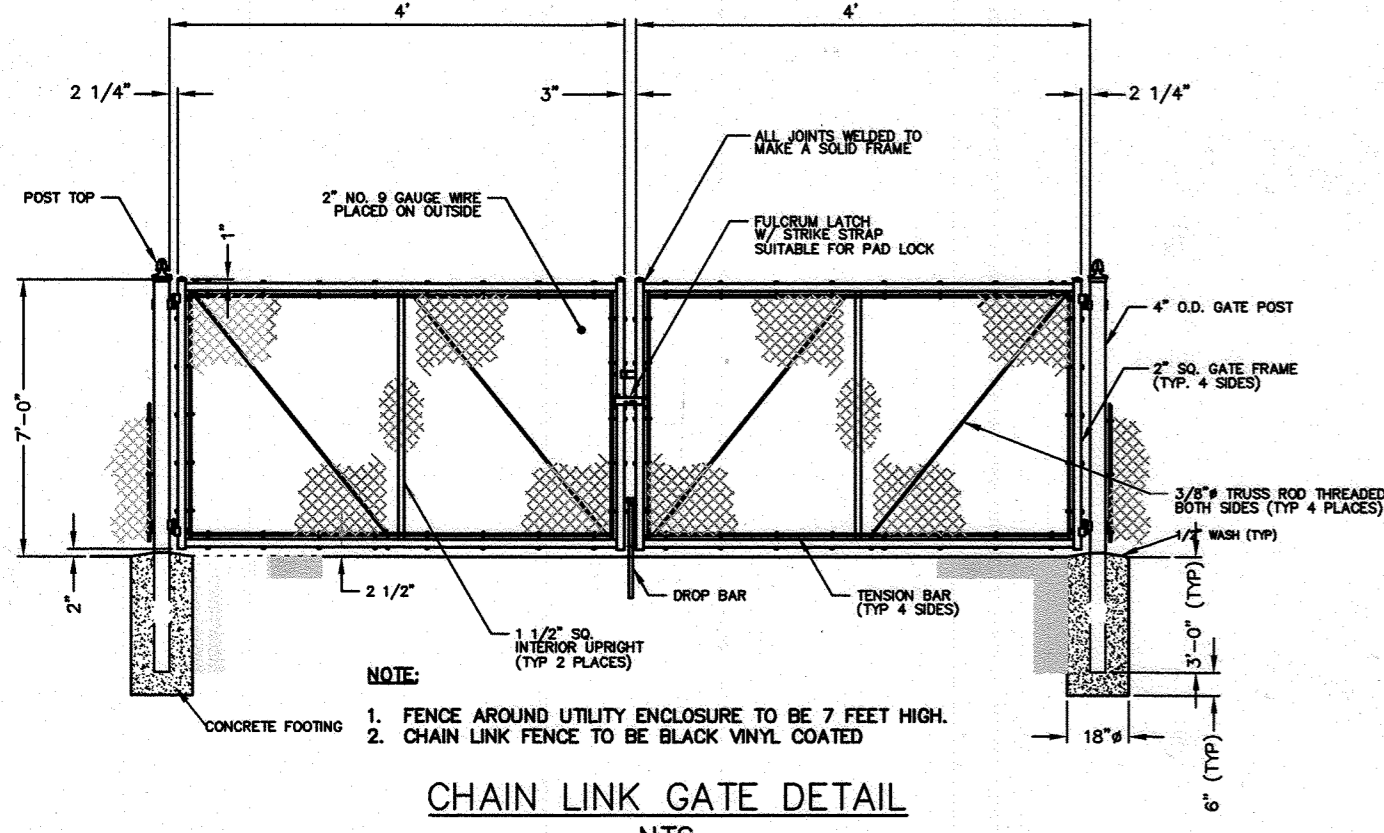
SOILS NOTE:
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APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature]
CHIEF, DEVELOPMENT ENGINEERING DIVISION
7.11.23
DATE

[Signature]
CHIEF, DIVISION OF LAND DEVELOPMENT
6/24/23
DATE



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION *[Signature]* 7.11.23 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* 6/26/23 DATE

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING (DBS)	PAVING MATERIAL (INCHES)	MIN. SUPERELEVATION PERCENT WITH USE	3 TO 45 (S) TO 3.7	3 TO 45 (S) TO 3.7	3 TO 45 (S) TO 3.7	3 TO 45 (S) TO 3.7
P-1	PAVING SIDEWALK, RESIDENTIAL AND NON-RESIDENTIAL PAVING SIDEWALK WITH NO MORE THAN 2\"/>							

NOTES:
1. PAVEMENT SURFACE SHALL BE DUST FREE.

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE	HYDRO
Ga1	BLEND LOAM, 0 TO 3 PERCENT SLOPES	B	0.37	NO	NO
Ga2	BLEND LOAM, 3 TO 8 PERCENT SLOPES	B	0.37	YES	NO
Ga3	GAILA LOAM, 8 TO 15 PERCENT SLOPES	B	0.55	YES	NO
MaC	MANOR LOAM, 8 TO 15 PERCENT SLOPES	B	0.32	NO	NO
MaD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	0.32	YES	NO
GhB	GLENNVILLE-BALLE SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	0.49	YES	YES

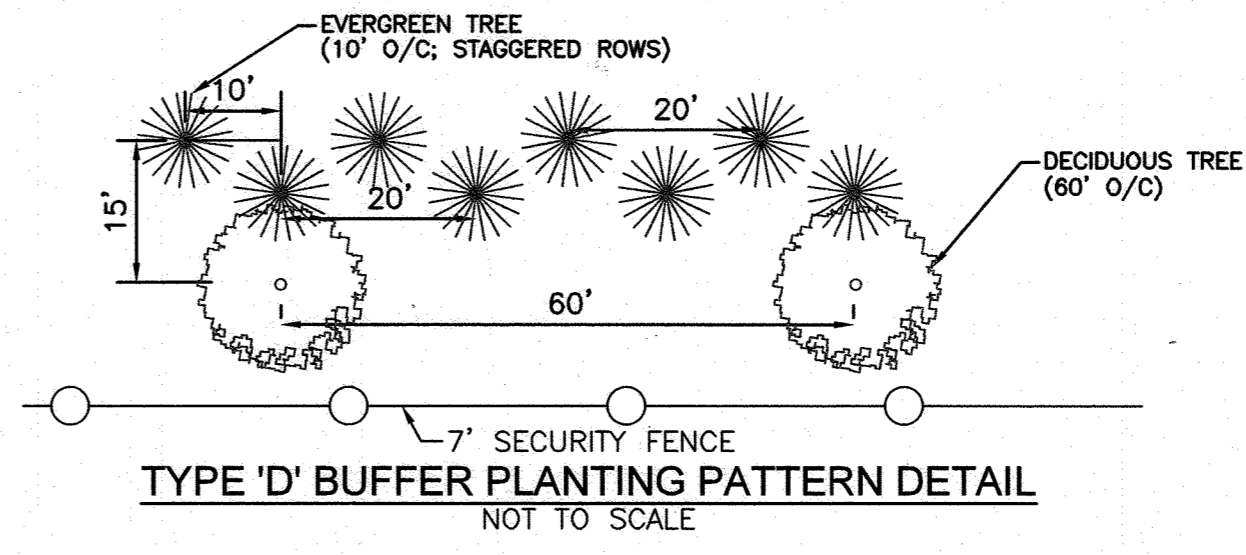
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SCHEDULE A PERIMETER LANDSCAPE EDGE	
CATEGORY	
PERIMETER/FRONTAGE DESIGNATION	D
LANDSCAPE TYPE	
LINEAR FEET OF FENCE	3,309'
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	No
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	No
NUMBER OF PLANTS REQUIRED	
SHADE TREES	1:80 55
EVERGREEN TREES	1:10 331
SHRUBS	-
NUMBER OF PLANTS PROVIDED	
SHADE TREES	55
EVERGREEN TREES	331
EX SHADE TREES	-
OTHER TREES (2:1 SUBSTITUTION)	-
SHRUBS (10:1 SUBSTITUTION)	-
DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED	

- NOTES:
- FENCE SHALL BE WOVEN WIRE FABRIC INSTALLED AT A MAXIMUM OF 8' IN HEIGHT.
 - TYPE 'D' BUFFER TREES SHALL CONSIST OF A DOUBLE ROW OF OFFSET EVERGREEN TREES PLANTED AT INTERVALS OF 10' ON CENTER; ROWS OFFSET 15'; AND DECIDUOUS TREES PLANTED AT 60' ON CENTER.
 - EVERGREEN TREE SPECIES MAY INCLUDE:
 - CYPRESS OCYPARIS LEYLAND / LEYLAND CYPRESS (5'-6' HGT.)
 - ILEX OPECA / AMERICAN HOLLY (5'-8' HGT.)
 - FINUS STROBUS / EASTERN WHITE PINE (6'-8' HGT.)
 - DECIDUOUS TREE SPECIES MAY INCLUDE:
 - ACER GINNALA / AMUR MAPLE (2 1/2'-3' CAL.)
 - BETULA NIGRA HERITAGE / HERITAGE CLUMP BIRCH (2 1/2'-3 1/2' CAL.)
 - ACER RUBRUM 'OCTOBER GLORY' / OCTOBER GLORY RED MAPLE (2 1/2'-3 1/2' CAL.)
 - IN ADDITION TO THOSE SPECIES IDENTIFIED ON NOTES # 3 & 4, OTHER SPECIES, TO BE APPROVED, MAY BE SUBSTITUTED OR UTILIZED.

DEVELOPER
KDC SOLAR
HR STREETLIGHTS LLC
1420 US HIGHWAY 206
SUITE 120
BEDMINSTER, NJ 07921
PHONE: 908-955-4360

OWNER
BRAG LLC
13825 HOWARD ROAD
DAYTON, MD 21036



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 - NO MASS GRADING PROPOSED WITHIN PROJECT BOUNDARY.

- LEGENDS:
- PARCEL BOUNDARY
 - ADJACENT BOUNDARY
 - 50' SOLAR SETBACK
 - BUILDING RESTRICTION LINE
 - EXISTING CONTOUR (10')
 - EXISTING CONTOUR (2')
 - SOILS BOUNDARY
 - EXISTING TREELINE
 - EXISTING OVERHEAD LINE
 - UGC UNDERGROUND MEDIUM VOLTAGE
 - ERODIBLE SOILS
 - MODERATE SLOPES (15%-24.99%)

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ENVIRONMENTAL CONCEPT PLAN
LAYOUT PLAN AND SITE DETAILS

HOWARD ROAD SOLAR
THE OAKS AT BRIDLE CREEK, PARCEL 'A'

TAX MAP 27.28, BLOCK 7
3RD ELECTION DISTRICT

ZONED RC-DEO
PARCEL 'A'
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING

TIMMONS GROUP

3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
P: 410.461.7666 F: 410.461.8961 www.timmons.com

PROFESSIONAL CERTIFICATE

DESIGN BY: RHV

DRAWN BY: KG

CHECKED BY: RHV

DATE: JUNE 2023

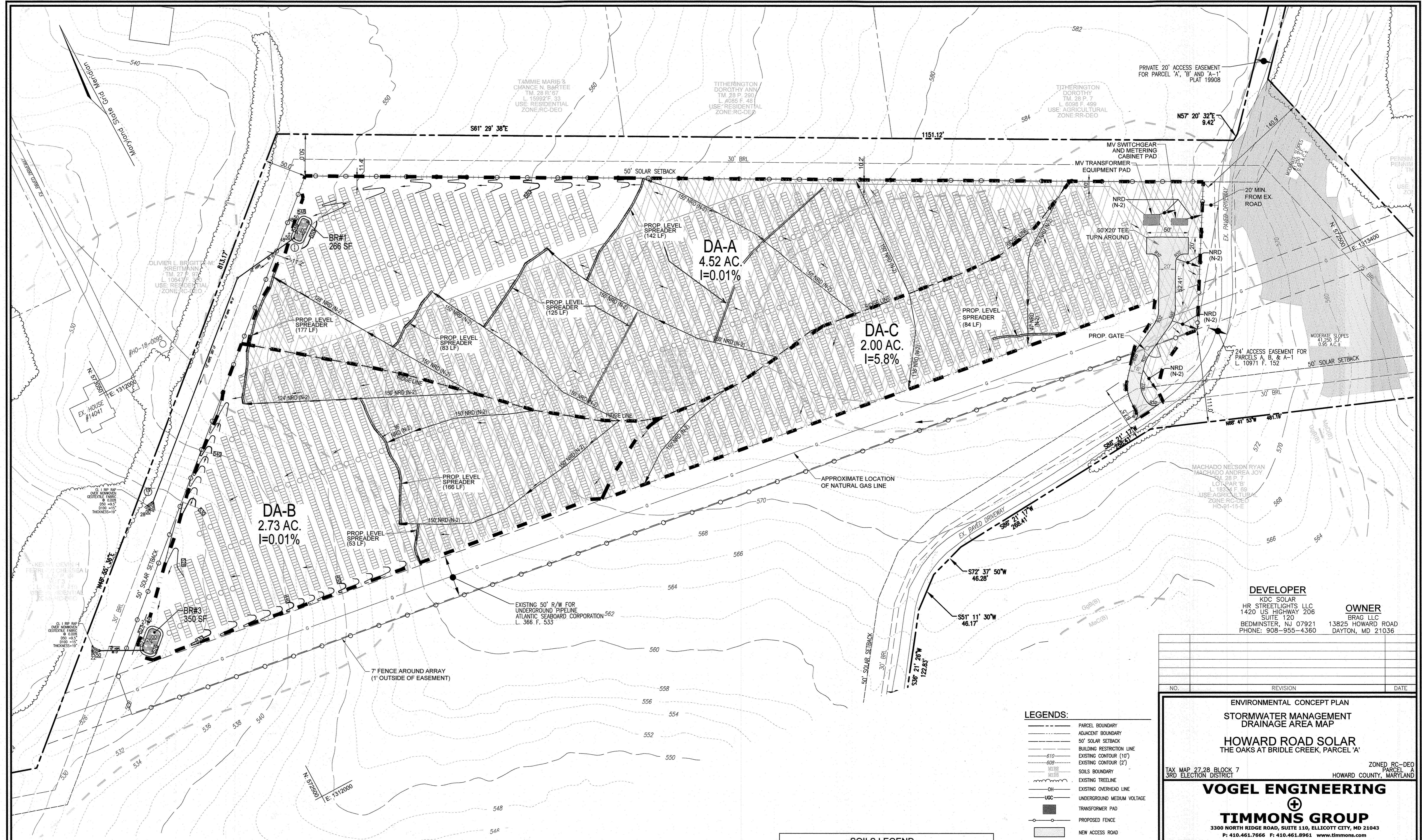
SCALE: AS SHOWN

W.O. NO.: 46753

STATE OF MARYLAND
ROBERT H. VOGEL, PE No. 16193

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. MY LICENSE NO. IS 16193. MY EXPIRATION DATE IS 09-27-2024.

5 SHEET OF 7



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Pank
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 7-11-23

clm
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 6/26/23

STORMWATER MANAGEMENT DRAINAGE AREA MAP

SCALE: 1"=50'

SOILS LEGEND				
SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE / HYDRIC
GGA	GLENELG LOAM, 0 TO 3 PERCENT SLOPES	B	0.37	NO NO
GBB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	0.37	YES NO
GCC	GALLA LOAM, 8 TO 15 PERCENT SLOPES	B	0.55	YES NO
MCc	MANOR LOAM, 8 TO 15 PERCENT SLOPES	B	0.32	NO NO
Md	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	0.32	YES NO
GcB	GLENNVILLE-BAILE SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	0.49	YES YES

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- LEGENDS:**
- PARCEL BOUNDARY
 - ADJACENT BOUNDARY
 - 50' SOLAR SETBACK
 - BUILDING RESTRICTION LINE
 - EXISTING CONTOUR (10')
 - EXISTING CONTOUR (2')
 - EXISTING TRELINE
 - EXISTING OVERHEAD LINE
 - UNDERGROUND MEDIUM VOLTAGE
 - TRANSFORMER PAD
 - PROPOSED FENCE
 - NEW ACCESS ROAD
 - MODERATE SLOPES (15%-24.95%)
 - PROPOSED CONTOUR (10')
 - PROPOSED CONTOUR (2')
 - DRAINAGE AREA
 - BORENTENTION (F-6)
 - NON-ROOFTOP DISCONNECTION (N-2)

DEVELOPER
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 HR STREETLIGHTS LLC
 1420 US HIGHWAY 206
 SUITE 120
 BEDMINSTER, NJ 07921
 PHONE: 908-955-4360

OWNER
 BRAG LLC
 13825 HOWARD ROAD
 DAYTON, MD 21036

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
STORMWATER MANAGEMENT DRAINAGE AREA MAP
HOWARD ROAD SOLAR
 THE OAKS AT BRIDLE CREEK, PARCEL 'A'

TAX MAP 27,28 BLOCK 7
 3RD ELECTION DISTRICT

ZONED RC-DEO
 PARCEL A
 HOWARD COUNTY, MARYLAND

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PROFESSIONAL CERTIFICATE

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 DRAWN BY: KG
 CHECKED BY: RHV
 DATE: JUNE 2023
 SCALE: AS SHOWN
 W.D. NO.: 46753

STATE OF MARYLAND
 ROBERT H. VOGEL, PE No. 16193
 PROFESSIONAL ENGINEER

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6 SHEET OF 7

N-2. DISCONNECTION OF NON ROOFTOP RUNOFF

CONSTRUCTION CRITERIA:
THE FOLLOWING ITEMS SHOULD BE ADDRESSED DURING THE CONSTRUCTION OF PROJECTS WITH PLANNED ROOFTOP DISCONNECTION:
-EROSION AND SEDIMENT CONTROL: EROSION AND SEDIMENT CONTROL PRACTICES (E.G., SEDIMENT TRAPS) SHALL NOT BE LOCATED IN VEGETATED AREAS RECEIVING DISCONNECTED RUNOFF
-SITE DISTURBANCE: CONSTRUCTION VEHICLES AND EQUIPMENT SHOULD AVOID AREAS RECEIVING DISCONNECTED RUNOFF TO MINIMIZE DISTURBANCE AND COMPACTION. SHOULD AREAS RECEIVING DISCONNECTED RUNOFF BECOME COMPACTED, SCARIFYING THE SURFACE OR ROTOTILLING THE SOIL TO A DEPTH OF FOUR TO SIX INCHES SHALL BE PERFORMED TO ENSURE PERMEABILITY. ADDITIONALLY, AMENDMENTS MAY BE NEEDED FOR TIGHT, CLAYEY SOILS.

INSPECTION:
A FINAL INSPECTION SHALL BE CONDUCTED BEFORE USE AND OCCUPANCY APPROVAL TO ENSURE THAT SIZING FOR TREATMENT AREAS HAS BEEN MET AND PERMANENT STABILIZATION HAS BEEN ESTABLISHED.

MAINTENANCE CRITERIA:
MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE OWNER SHALL ENSURE THE AREAS RECEIVING RUNOFF SHOULD BE PROTECTED FROM FUTURE COMPACTION (E.G., BY PLANTING TREES OR SHRUBS ALONG THE PERIMETER). IN COMMERCIAL AREAS, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

HOWARD COUNTY - OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DISCONNECTION OF NON ROOFTOP RUNOFF (N-2)

A. MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE OWNER SHALL ENSURE THE AREAS RECEIVING RUNOFF ARE PROTECTED FROM FUTURE COMPACTION OR DEVELOPMENT OF IMPERVIOUS AREA. IN COMMERCIAL AREAS, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

- 1. MATERIAL SPECIFICATIONS**
THE ALLOWABLE 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 USED WITHIN THE MICRO-BIORETENTION PRACTICE THROUGHOUT THE PLANTING GROWTH OR PROVIDE A HINDERANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BENZENE, CHLORINE, QUATERNARY JONSON GRASS, 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 1.0% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (80%-85%) AND COMPOST (20% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
 - * CLAY CONTENT - 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.
 THESE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. 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 STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS DIGESTED.

3. COMPACTION
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT OR LIGHT EQUIPMENT WITH TIRE TREADS. 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, ROLL, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO RESTRUCTURE 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 TO 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE. WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. 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 TRACKS.

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". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.
ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/3RD 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 BED 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 GROUND 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 DEFEATS, OR AT A MINIMUM, DEFERS THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL - ROTOTILL AREA 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 756, TYPE PS 28, OR AASHTO M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HDPE).
- * 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 HARMWARE CLOTH.
- * GRAVEL - THE GRAVEL LAYER (NO. 27 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 1000 SQUARE FEET) TO PROVIDE A CLEAR-OUT POINT AND MONITOR PERFORMANCE 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 MIXTURE OF FINES IN TO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

 THIS MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5% OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

8. EARTH FILL
MATERIAL - THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBER, STONES GREATER THAN 6", FROZEN OR OTHER UNDESIRABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH, OR CL AND MUST HAVE AT LEAST 30% PASSING THE #20 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGNED BY A GEOTECHNICAL ENGINEER. SUCH SPECIAL DESIGN MUST HAVE CONSTRUCTION SUPERVISED BY A GEOTECHNICAL ENGINEER. MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.

PLACEMENT - AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8 INCH THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST FAVORABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.

COMPACTION - THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE FILL SHALL BE CONTROLLED SO THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSED BY NOT LESS THAN ONE TREAD TRACK OF HEAVY EQUIPMENT OR COMPACTION SHALL BE ACHIEVED BY A MINIMUM OF FOUR COMPLETE PASSES OF A SHEEPFOOT, RUBBER TIRE OR VIBRATORY ROLLER. FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SUCH THAT THE REQUIRED DEGREE OF COMPACTION WILL BE OBTAINED WITH THE EQUIPMENT USED. THE FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SO THAT IT FORMS INTO A BALL IT WILL NOT CRUMBLE, YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT, WHICH REQUIRED BY THE REVIEWING AGENCY THE MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 85% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN 2% OF THE OPTIMUM. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PROCTOR).

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

Drainage #	% IMPERV	Rv	DA (SF)	DA (AC)	1.0" VOLUME	MAXIMUM VOLUME	VOLUME PROVIDED	Rev PROVIDED	IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS
A	0.01	0.0501	196940	4.52	822	2136	938		13	0.00	4.52	NON STRUCTURAL PRACTICE - NON-ROOFTOP DISCONNECT 583 CF - EACH 75' DISCONNECT
	0.01	0.0501	139780	3.21	583	1516	583		8	0.00	3.21	583 ESDv
	0.01	0.0501	57160	1.31	239	620	355	293	5	0.00	1.31	BR#1 - BIORETENTION (M-6) 355 266 Surface Area of M-2 @ 1.0 ponding (75% above) 293 266 Stone Below MBR (Includes Rev)
B	0.01	0.0501	119081	2.73	497	1292	684		11	0.00	2.73	NON STRUCTURAL PRACTICE - NON-ROOFTOP DISCONNECT 217 CF - EACH 75' DISCONNECT
	0.00	0.0500	52062	1.20	217	564	217		1	0.00	1.20	217 ESDv
	0.01	0.0501	67019	1.54	280	728	467	350	10	0.00	1.54	BR#2 - BIORETENTION (M-6) 467 350 Surface Area of M-2 @ 1.0 ponding (75% above) 350 350 Stone Below MBR (Includes Rev)
C	5.82	0.1024	87238	2.00	744	1935	744		5078	0.12	1.89	NON STRUCTURAL PRACTICE - NON-ROOFTOP DISCONNECT 744 CF - EACH 75' DISCONNECT
TOTAL	1.27	0.0614	403259	9.26	2063	5364	2366	643	5102	0.12	9.14	

1. MATERIAL SPECIFICATIONS
THE ALLOWABLE 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 USED WITHIN THE MICRO-BIORETENTION PRACTICE THROUGHOUT THE PLANTING GROWTH OR PROVIDE A HINDERANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BENZENE, CHLORINE, QUATERNARY JONSON GRASS, 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 1.0% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (80%-85%) AND COMPOST (20% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
- * CLAY CONTENT - 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.

 THESE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. 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 STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS DIGESTED.

3. COMPACTION
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT OR LIGHT EQUIPMENT WITH TIRE TREADS. 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, ROLL, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO RESTRUCTURE 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 TO 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE. WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. 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 TRACKS.

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". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.
ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/3RD 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 BED 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 GROUND 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 DEFEATS, OR AT A MINIMUM, DEFERS THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL - ROTOTILL AREA 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 756, TYPE PS 28, OR AASHTO M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HDPE).
- * 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 HARMWARE CLOTH.
- * GRAVEL - THE GRAVEL LAYER (NO. 27 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 1000 SQUARE FEET) TO PROVIDE A CLEAR-OUT POINT AND MONITOR PERFORMANCE 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 MIXTURE OF FINES IN TO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

 THIS MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5% OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

8. EARTH FILL
MATERIAL - THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBER, STONES GREATER THAN 6", FROZEN OR OTHER UNDESIRABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH, OR CL AND MUST HAVE AT LEAST 30% PASSING THE #20 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGNED BY A GEOTECHNICAL ENGINEER. SUCH SPECIAL DESIGN MUST HAVE CONSTRUCTION SUPERVISED BY A GEOTECHNICAL ENGINEER. MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.

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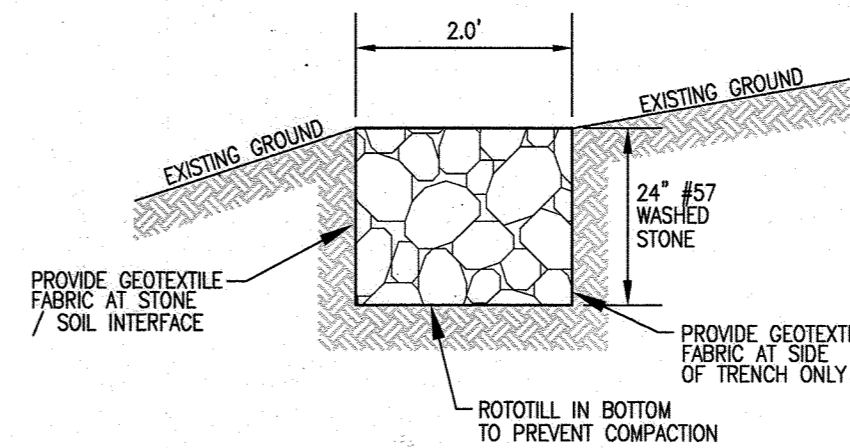
8. MISCELLANEOUS
THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

Table B.3.2 Materials Specifications for Bioretention

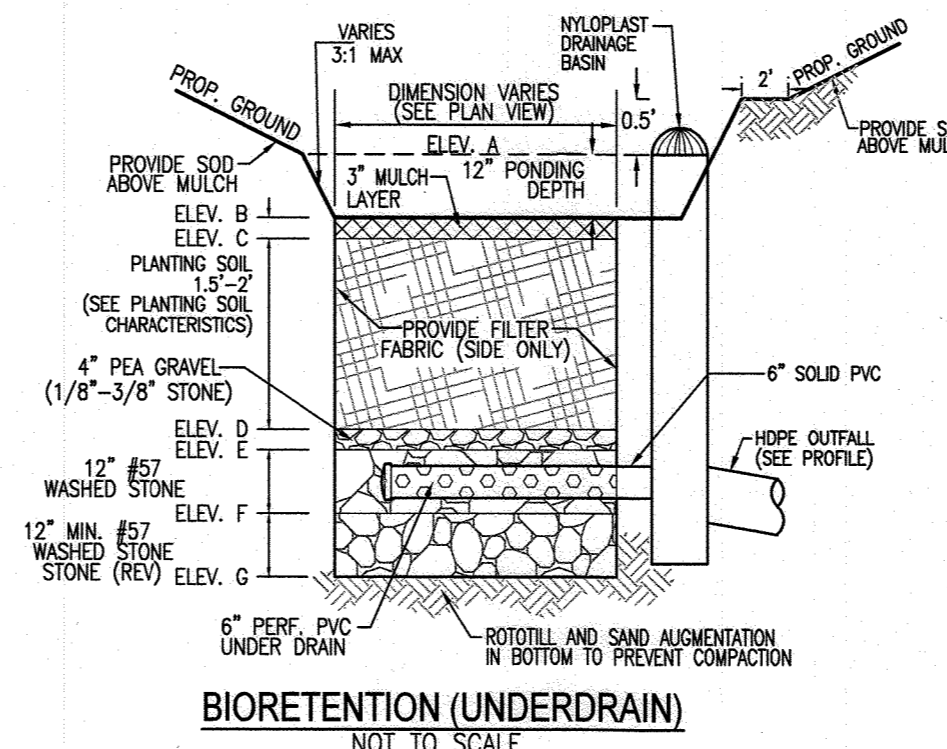
Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
planting soil (2.5' to 4' deep)	sand 35 - 60% silt 30 - 55% clay 10 - 25%	n/a	USDA soil types loamy sand, sandy loam or loam
mulch	shredded hardwood	pea gravel: No. 6 stone: 2" to 5"	aged 6 months, minimum
pea gravel diaphragm and curtain drain	pea gravel: ASTM-D-448	ornamental stone: washed cobbles	
geotextile	Class "C" - apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D-4632), puncture resistance (ASTM-D-4833)	n/a	for use as necessary beneath underdrains only
underdrain gravel	AASHTO M-43	0.375" to 0.75"	
underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500	n/a	on-site testing of poured-in-place concrete required: 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 ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
sand (1' deep)	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

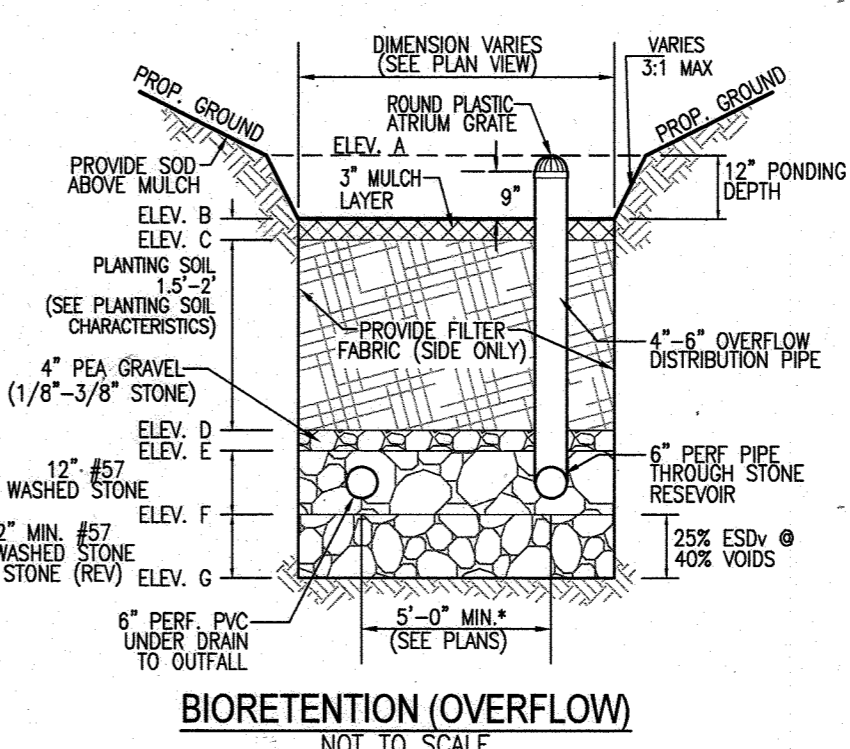
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DATE
7/12/23
DATE



LEVEL SPREADER NOT TO SCALE



BIORETENTION (UNDERDRAIN) NOT TO SCALE



BIORETENTION (OVERFLOW) NOT TO SCALE

DEVELOPER
KDC SOLAR
HR STREETLIGHTS LLC
1420 US HIGHWAY 206
SUITE 120
BEDMINSTER, NJ 07921
PHONE: 908-955-4360

OWNER
BRAG LLC
13825 HOWARD ROAD
DAYTON, MD 21036

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
STORMWATER MANAGEMENT
NOTES AND DETAILS

HOWARD ROAD SOLAR
THE OAKS AT BRIDLE CREEK, PARCEL 'A'

TAX MAP 27.28 BLOCK 7
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING
TIMMONS GROUP
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
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DESIGN BY: RHY
DRAWN BY: KG
CHECKED BY: RHY
DATE: JUNE 2023
SCALE: AS SHOWN
W.O. NO.: 46753

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A LEGALLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 16193 EXPIRATION DATE: 06-27-2024