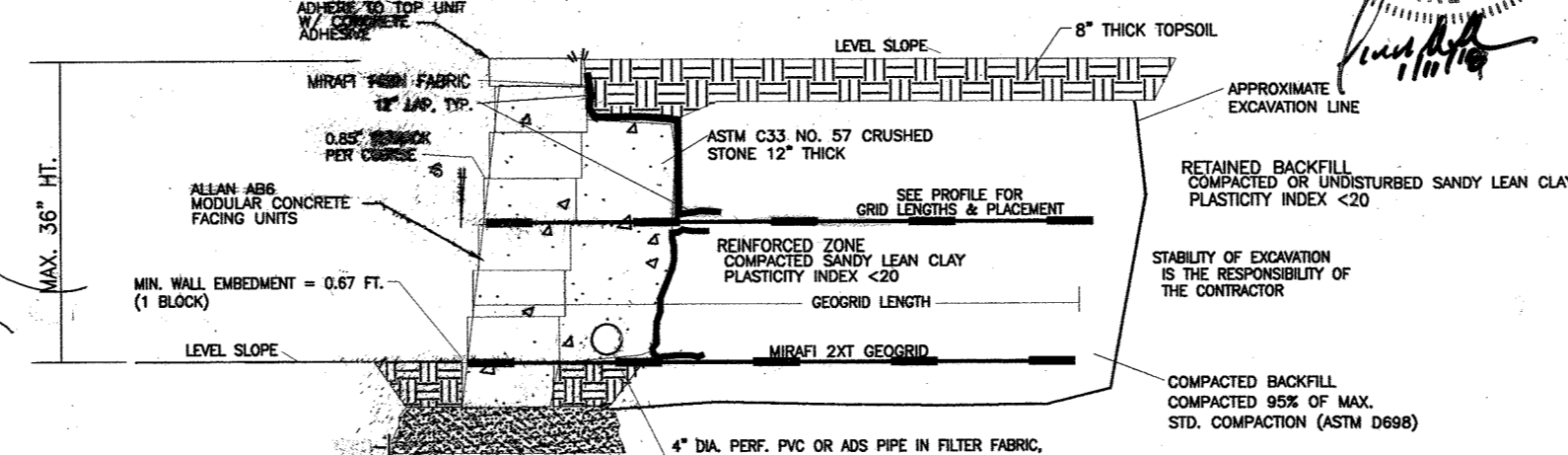


VICINITY MAP
SCALE: 1" = 200'

SCOTT MILLER CONSULTING ENGINEER
P.O. Box 56429
North Little Rock, AR 72190
501-374-3546



TYPICAL ALLAN AGG REINFORCED WALL SECTION
SCALE: NONE

PROPOSED RETAINING WALL SEE SHEETS 2, 3 THRU 14 FOR DETAILS.

GENERAL NOTES

- The land included on this plan is zoned: N.T. (SFA)
- All coordinates are based on the Maryland State Grid System.
- Tax Map No. 36
- Total Area: 5.576 Ac - 0.077 Acres to be revised
- All roadways are public & existing.
- Any damage to county owned rights of way shall be corrected at the Developer's expense.
- Number of Units Shown: 71
- Number of Parking Spaces Required: 142; Provided: 159
- Parking Tabulation:

Garage Parking:	32
Driveway Parking:	32
Surface Parking:	95
Total Parking:	159
- The lots shown are covered by F.D.P. Phase 190
- Building Coverage: 1.45 Ac. (Area of Bldgs) = 10,286
7,256 Ac. (Area of Site) = 10,286
- Garage shall be used for parking purposes only in accordance with Section 123.B.2.b. (b) of Zoning Regulations and Section 9B-2. of FDP
- Storm Water Management Provided in Central Facility in VDR# 5/2 - F-85-131.
- Lots B-1-B-7, B-22-B-33 and B-59-B-71 are garage units without basements.
- Utility Shed = 400 sq

SEDIMENT & EROSION CONTROLS FOR THIS SITE ARE PROVIDED FOR BY PREVIOUSLY APPROVED ROAD CONSTRUCTION PLAN F-86-39.

Note: Approved Road Construction Plans shall be used for installation of Public Utilities.

Public Water & Sewer shown for reference only. See Water & Sewer Plans Contr. #

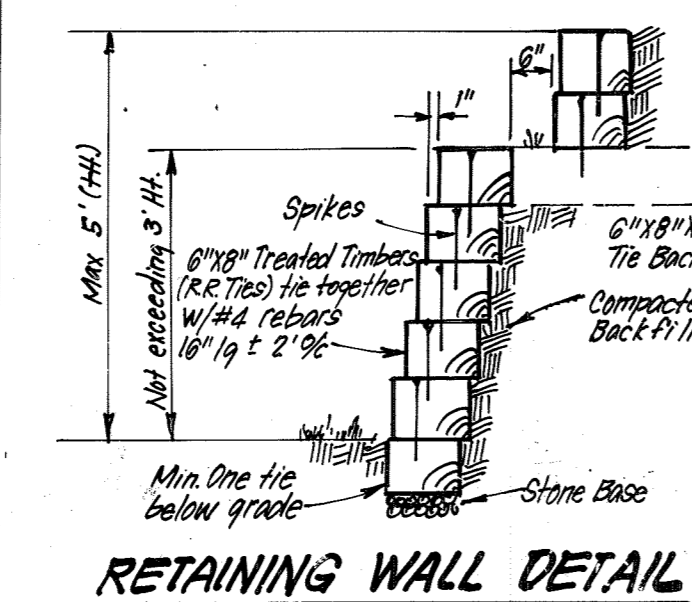
- LEGEND**
- Contour Interval 2 Ft.
 - Existing Contour
 - Proposed Contour
 - Spot Elevation
 - Direction of Drainage
 - Walk Out Basement
 - 100 Yr. Flood Plain Elevation
 - Retaining Wall
 - Existing Trees to be Saved

SURVEYOR'S CERTIFICATE

I hereby certify that the information contained hereon is the same as shown on a previously approved SDP 86-68 C with the following exceptions:

- A 20'x20' Storage Shed with driveway and proposed grading has been added.
- The building coverage has been increased by 0.03 ac. (400 sq).

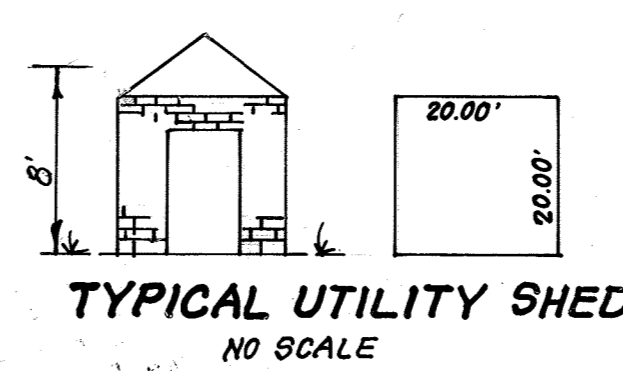
I further certify that the Sediment and Erosion control measures, as previously approved, will not be affected, the grading is substantially the same as originally approved, the building setbacks comply with Howard County Zoning and Subdivision Regulations, and the lot has the same geometric configuration as shown on the respective recorded subdivision plot.



NO.	DESCRIPTION	DATE
1	ADD RETAINING WALL BEHIND LOTS B-18 & B-17	JUNE 4, 2020

June 3, 1986
Date

STATE OF MARYLAND
PROFESSIONAL LAND SURVEYOR
No. 6059



Reviewed for: Howard County, S.C.D.
Name
and meet Technical Requirements
Signature Date 7/1/86
U.S. Soil Conservation Service

Approved: [Signature] Date 7/1/86
S.C.D.

SUBDIVISION NAME	SECT / AREA	LOT/PARCEL #
VILLAGE OF HICKORY RIDGE	5 / 2	LOT B-72
PLAT OR L/P	BLOCK & LOT <td>TAX ZONE MAP </td>	TAX ZONE MAP
6540	7 (SFA)	36
WATER CODE	E-28	SEWER CODE
		55210000

APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS,
HOWARD COUNTY HEALTH DEPARTMENT

[Signature] 7-14-86
COUNTY HEALTH OFFICER DATE

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

[Signature] 7-15-86
PLANNING DIRECTOR DATE

[Signature] 7-15-86
CHIEF DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION DATE

APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE,
STORM DRAINAGE SYSTEMS AND PUBLIC ROADS
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

[Signature] 7-10-86
DIRECTOR DATE

[Signature] 7-10-86
CHIEF BUREAU OF ENGINEERING DATE

APPROVED
PLANNING BOARD
OF HOWARD COUNTY

DATE 6-25-86

CLARK • FINEFROCK & SACKETT
ENGINEERS • PLANNERS • SURVEYORS

11315 LOCKWOOD DRIVE • SILVER SPRING, MARYLAND 20904 • (301) 593-3400

DESIGNED: JME
DRAWN: KIW
CHECKED: JME
DATE: 5-26-86

REVISED SITE DEVELOPMENT PLAN
UTILITY SHED

COLUMBIA
VILLAGE OF HICKORY RIDGE
SECTION 5 AREA 2
5TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FOR: COLUMBIA BUILDERS, INC.
3 Lakefront North, Suite 200
Columbia, Md. 21046

SCALE: 1" = 30'
DRAWING: 10P/6
JOB NO.: 85-040
FILE NO.: 85-040-X

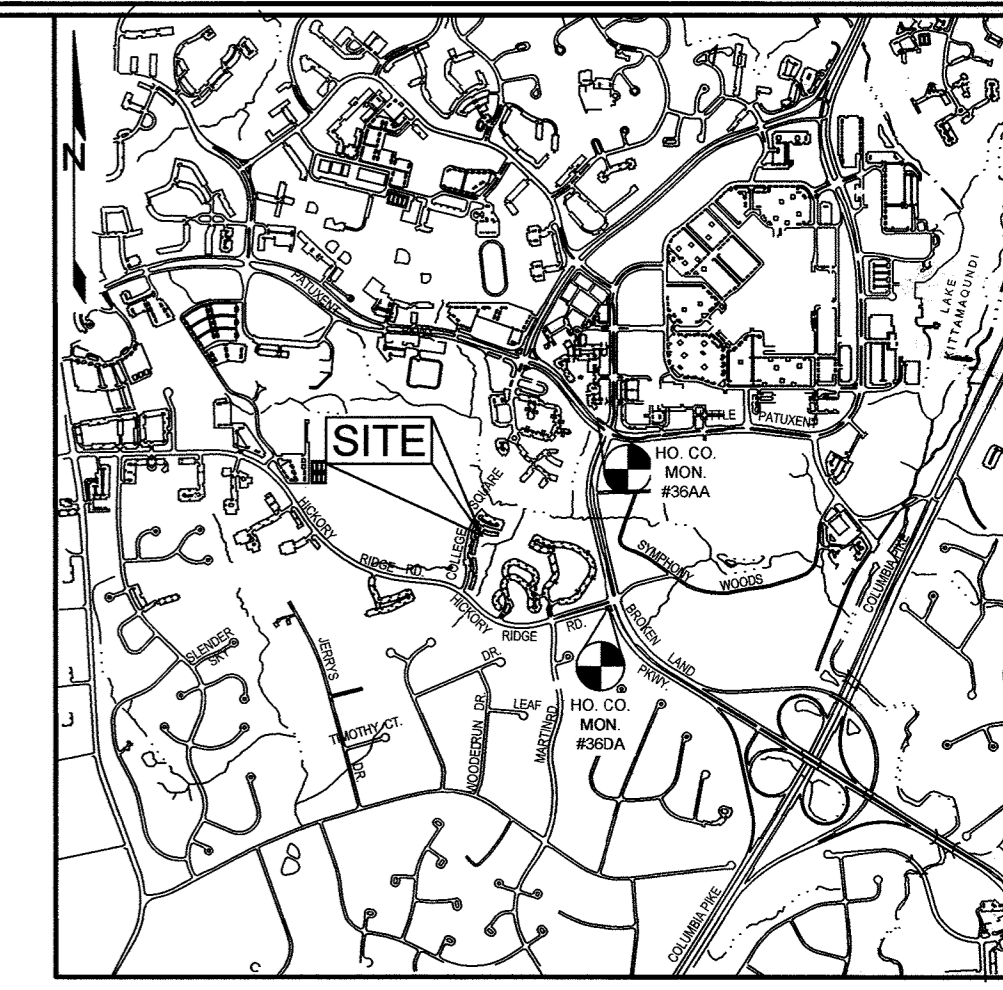
S.D.P. 86-260 C

SOILS LEGEND			
SYMBOL	NAME / DESCRIPTION	GROUP	'K' FACTOR
GfB	GLASTONE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	A	0.32
GmB	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C/D	0.55
GnB	GLENVILLE-BAILE SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	0.43

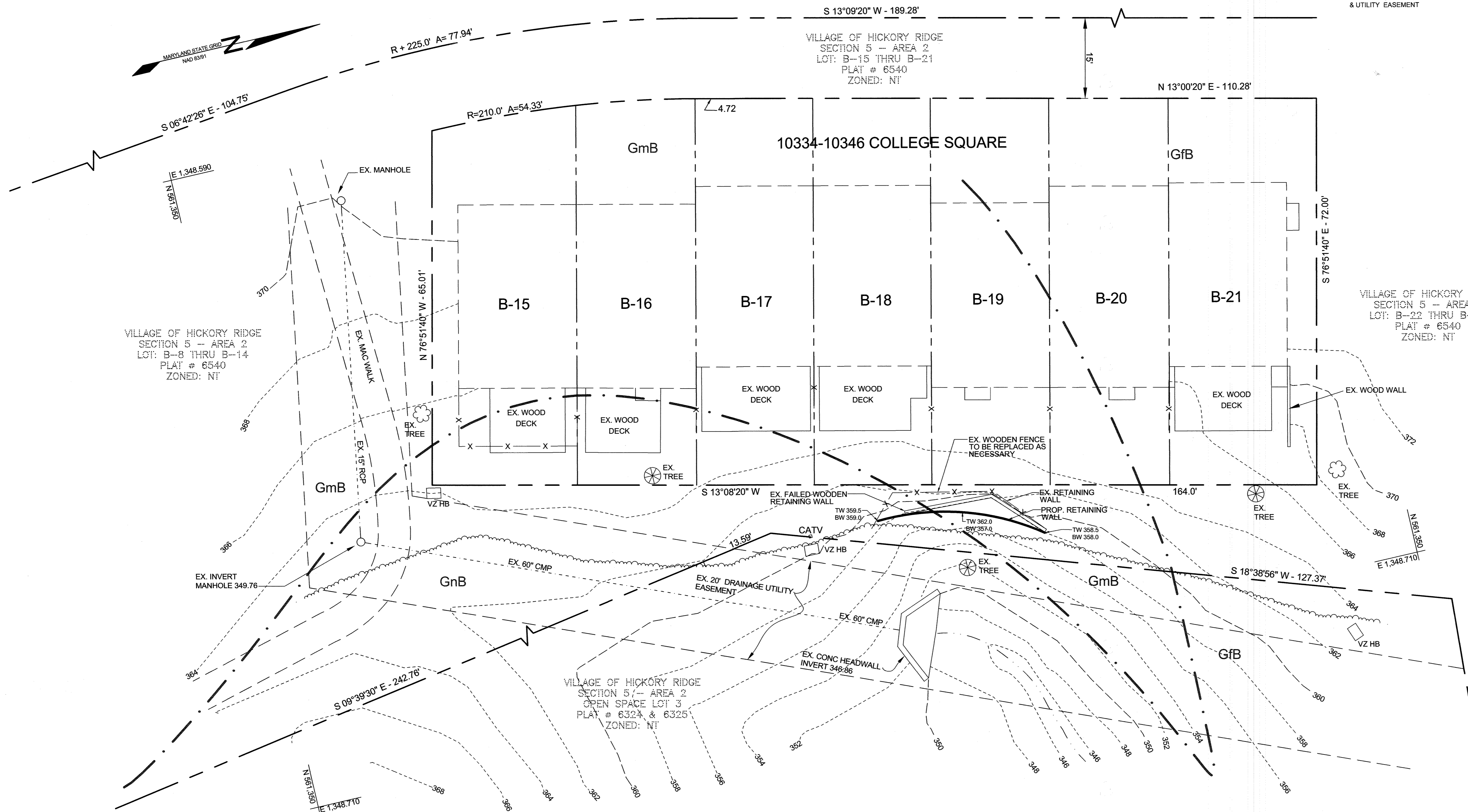
NOTES:
 1) SOIL INFORMATION HAS BEEN TAKEN FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, WEB SOIL SURVEY.
 2) HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR 'K' GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT.

LEGEND

- EXISTING CONTOUR
- EXISTING TREELINE
- EX. TREE
- EX. EVERGREEN TREE
- STREAM
- EX. BOUNDARY LINE
- EX. LOT LINE
- EX. BUILDING
- EX. FENCE
- EX. RETAINING WALL
- SOIL BOUNDARY
- EX. WATER, SEWER, DRAINAGE & UTILITY EASEMENT



**COLLEGE SQUARE
50' R/W - LOCAL COUNTY ROAD**



VILLAGE OF HICKORY RIDGE
SECTION 5 - AREA 2
LOT: B-15 THRU B-21
PLAT # 6540
ZONED: NT

VILLAGE OF HICKORY RIDGE
SECTION 5 - AREA 2
LOT: B-8 THRU B-14
PLAT # 6540
ZONED: NT

VILLAGE OF HICKORY RIDGE
SECTION 5 - AREA 2
LOT: B-22 THRU B-26
PLAT # 6540
ZONED: NT

VILLAGE OF HICKORY RIDGE
SECTION 5 - AREA 2
OPEN SPACE LOT 3
PLAT # 6324 & 6325
ZONED: NT

BENCHMARKS				
NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
36DA	560,849.32	1,350,037.51	363.65	CORNER OF HICKORY RIDGE ROAD & BROKEN LAND PKWAY
36AA	562,804.84	1,349,906.24	359.16	CORNER OF LITTLE PATUXENT PKWAY & BROKEN LAND PKWAY

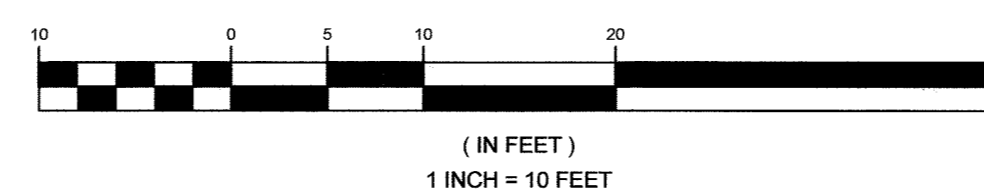
GENERAL NOTES

- SUBJECT PROPERTY ZONED NT PER THE 10/06/2013 COMPREHENSIVE ZONING PLAN.
- REFERENCE LOTS B-1 TO B-73 A RESUBDIVISION OF PARCEL B VILLAGE OF HICKORY RIDGE, SECTION 5, AREA 2 RECORDED ON PLAT # 6540.
- THE SITE IS ON PUBLIC WATER AND PUBLIC SEWER.
- THE BOUNDARY SHOWN HEREON IS BASED ON THE RECORDED PLAT # 6540 A RESUBDIVISION OF PARCEL B VILLAGE OF HICKORY RIDGE, SECTION 5, AREA 2.
- THE TOPOGRAPHY SHOWN HEREON HAS BEEN FIELD RUN BY NTT ASSOCIATES IN FEBRUARY 2020.
- THE SOILS SHOWN HAVE BEEN TAKEN FROM THE US DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, WEB SOIL SURVEY WEBSITE, HOWARD COUNTY SOILS GRID 13, SUB-GRID 117.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED ON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENTS NUMBERS 3TR2 AND 37B4 WERE USED FOR THIS PROJECT.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAMS, OR THEIR REQUIRED BUFFERS, FLOODPLAIN AND FOREST CONSERVATION EASEMENT AREAS, UNLESS WAIVERS HAVE BEEN APPROVED OR ACTIVITIES HAVE BEEN DETERMINED ESSENTIAL BY THE DEPARTMENT OF PLANNING AND ZONING.

PLAN VIEW

SCALE: 1"=50'

GRAPHIC SCALE



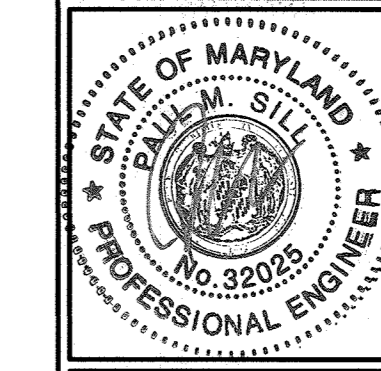
**RETAINING WALL PLAN
COLUMBIA VILLAGE OF HICKORY RIDGE
SECTION 5 - AREA 2**

TAX MAP 36 GRID 7
5TH ELECTION DISTRICT

PARCEL 489
HOWARD COUNTY, MARYLAND

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] 6.27.20
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
 [Signature] 6/29/2020
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE
 [Signature] 6/29/2020
 DIRECTOR DATE

OWNER / DEVELOPER
 COLLEGE SQUARE TOWNHOUSE
 HOMEOWNERS' ASSOCIATION INC.
 8310 GUILFORD RD, UNIT B
 COLUMBIA MD 21046



SILL ENGINEERING GROUP, LLC
 16005 Frederick Road, 2nd Floor
 Woodbine, MD 21797
 Phone: 413.325.9076
 Fax: 410.696.2022
 Email: info@sillengineering.com
 Civil Engineering for Land Development

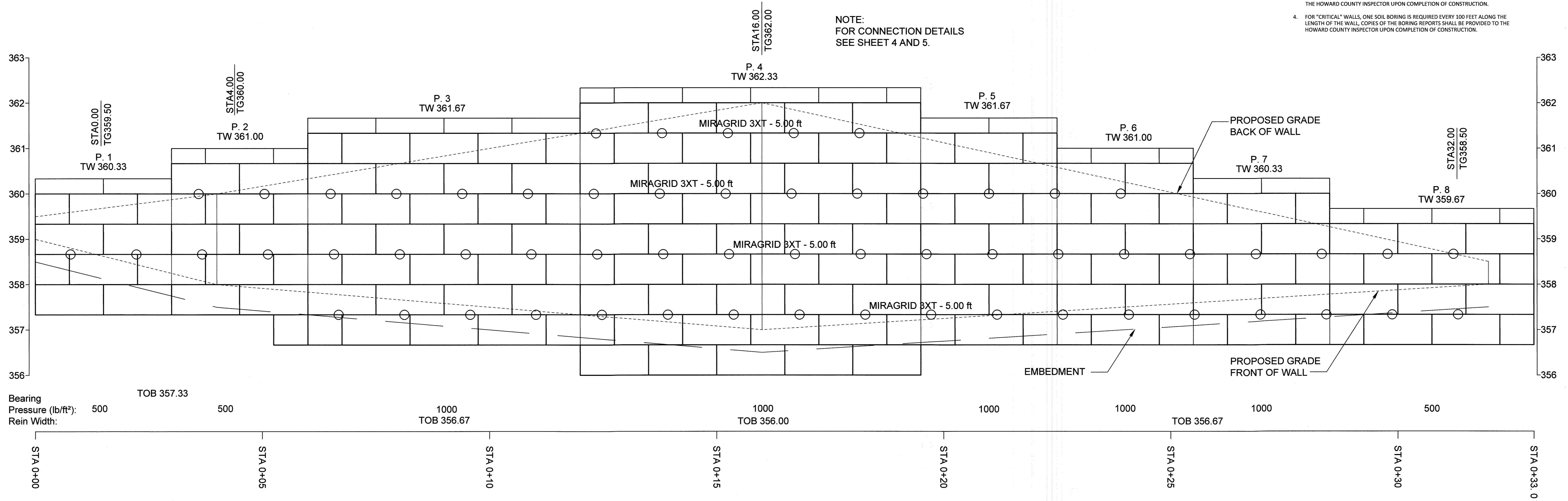
DESIGN BY: PS
 DRAWN BY: DCL
 CHECKED BY: PS
 SCALE: AS SHOWN
 DATE: JUNE 6, 2020
 PROJECT #: 19-060
 SHEET #: 2 of 6

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32025, EXPIRATION DATE JUNE 20, 2021

GENERAL NOTES

1. RETAINING WALL SHALL ONLY BE CONSTRUCTED UNDER THE OBSERVATION OF A REGISTERED PROFESSIONAL ENGINEER AND A (NICET, WACEL OR EQUIVALENT) CERTIFIED SOIL TECHNICIAN.
2. THE REQUIRED BEARING PRESSURE BENEATH THE FOOTING OF THE WALL SHALL BE VERIFIED IN THE FIELD BY A CERTIFIED SOILS TECHNICIAN. TESTING DOCUMENTATION SHALL BE PROVIDED TO HOWARD COUNTY INSPECTOR PRIOR TO THE START OF CONSTRUCTION. THE REQUIRED TEST PROCEDURE SHALL BE THE DYNAMIC CONE PENETROMETER TEST ASTM STP-399.
3. THE SUITABILITY OF FILL MATERIAL SHALL BE CONFIRMED BY THE ONSITE SOILS TECHNICIAN. EACH EIGHT (8) INCH LIFT SHALL BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY AND THE TESTING REPORT SHALL BE MADE AVAILABLE TO THE HOWARD COUNTY INSPECTOR UPON COMPLETION OF CONSTRUCTION.
4. FOR "CRITICAL" WALLS, ONE SOIL BORING IS REQUIRED EVERY 100 FEET ALONG THE LENGTH OF THE WALL. COPIES OF THE BORING REPORTS SHALL BE PROVIDED TO THE HOWARD COUNTY INSPECTOR UPON COMPLETION OF CONSTRUCTION.

NOTE:
FOR CONNECTION DETAILS
SEE SHEET 4 AND 5.



RETAINING WALL ELEVATION
SCALE: HORIZONTAL: 1"=1'
VERTICAL: 1"=1'

DIAMOND PRO® PS STRAIGHT II FACE RETAINING WALL SYSTEM DPPS2T

RETAINING WALL ELEVATION
COLUMBIA VILLAGE OF HICKORY RIDGE
SECTION 5 - AREA 2

TAX MAP 36 GRID 7 5TH ELECTION DISTRICT PARCEL 489 HOWARD COUNTY, MARYLAND

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] DATE: 6/22/20
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] DATE: 6/22/2020
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] DATE: 6/22/2020
 DIRECTOR

OWNER / DEVELOPER
 COLLEGE SQUARE TOWNHOUSE
 HOMEOWNERS' ASSOCIATION INC.
 8310 GUILFORD RD, UNIT B
 COLUMBIA MD 21046

RETAINING WALL AND DETAILS DESIGNED BY:

geolab
 GEOTECHNICAL LABORATORIES, INC.
 ENGINEERS • GEOLOGISTS • CONSULTANTS
 8980 STATE ROUTE 108, SUITE D
 COLUMBIA, MARYLAND 21045
 O: 410-772-2220 F: 410-772-2221
 geolab@verizon.net

SILL ENGINEERING GROUP, LLC
 16005 Frederick Road, 2nd Floor
 Woodbine, MD 21797
 Phone: 443.325.5076
 Fax: 410.696.2022
 Email: info@sillengineering.com
 Civil Engineering for Land Development

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 55429, EXPIRATION DATE DECEMBER 16, 2021

DESIGN BY: PS
 DRAWN BY: DCL
 CHECKED BY: PS
 SCALE: AS SHOWN
 DATE: JUNE 6, 2020
 PROJECT #: 19-060
 SHEET #: 3 of 5

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32225, EXPIRATION DATE JUNE 20, 2021

SECTION 32 32 32
CONCRETE SEGMENTAL RETAINING WALL SYSTEM
PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work consists of furnishing and construction of an Anchor Diamond Pro PS Retaining Wall System in accordance with these specifications and in general conformity with the lines, grades, design, and dimensions shown on the plans.
- B. Earthwork includes:
- Preparing Foundation Soil and Retained Soil to the lines and grades shown on the construction drawings;
 - Furnishing and installing Leveling Pad, Reinforced Fill (where required) and Low Permeability Soil (where required) to the lines and grades shown on the construction drawings; and,
 - Installation work includes:
 - Furnishing and installing Diamond Pro PS Concrete Facing Units and Unit Fill to achieve the lines and grades shown on the construction drawings.
 - Furnishing and installing Geosynthetic Reinforcement and Separation Geotextile of the type, size, location and lengths designated on the construction drawings (if required).
 - Furnishing and installing Subsurface Drainage System, including necessary fittings, of the type, size, and location designated on the construction drawings.

1.02 RELATED SECTIONS

- A. Section 02300 – Earthwork

1.03 REFERENCES

- A. American Association of State Highway Transportation Officials (AASHTO)
- AASHTO Standard Specifications for Highway Bridges
 - AASHTO M 282 Geotextile Specifications for Highway Applications
 - AASHTO M 282 Corrugated Polyethylene Drainage Pipe
 - AASHTO National Transportation Product Evaluation Program (NTEP)
- B. American Society for Testing and Materials (ASTM)
- ASTM C140 Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
 - ASTM C1262 Standard Test Method for Evaluating the Freeze-Thaw Durability of Manufactured Concrete Masonry Units and Related Concrete Units
 - ASTM C1372 Standard Specification for Segmental Retaining Wall Units
 - ASTM D448 Standard Classification for Sizes of Aggregate for Road and Bridge Construction
 - ASTM D598 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/3300 kN-m/m³)
 - ASTM D1556 Standard Test Method for Density and Unit Weight of Soil In Place by the Sand Cone Method
 - ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/32700 kN-m/m³)
 - ASTM D2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
 - ASTM D2922 Standard Test Methods for Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth)
 - ASTM D4475 Standard Test Method for Apparent Horizontal Shear Strength of Pultruded Reinforced Plastic Rods By the Short-Beam Method
 - ASTM D4476 Standard Test Method for Flexural Properties of Fiber Reinforced Pultruded Plastic Rods
 - ASTM D3034 Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer pipe and Fittings
 - ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 - ASTM D4491 Standard Test Method for Water Permeability of Geotextiles by the Permittivity Method
 - ASTM D4595 Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method
 - ASTM D4873 Standard Guide for Identification, Storage and Handling of Geosynthetics
 - ASTM D5084 Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.

- ASTM D5262 Standard Test Method for Evaluating the Unconfined Tension Creep Behavior of Geosynthetics
- ASTM D5321 Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
 - ASTM D5818 Standard Practice for Obtaining Samples of Geosynthetics from a Test Section for Assessment of Installation Damage
 - ASTM D6637 Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method
 - ASTM D6638 Standard Test Method for Determining Connection Strength Between Geosynthetic Reinforcement and Segmental Concrete Units
 - ASTM D6916 Standard Test Method for Determining the Shear Strength Between Segmental Concrete Units
 - ASTM D8706 Standard Test Method for Measuring Geosynthetic Pullout Resistance in Soil
 - ASTM F405 Standard Specification for Corrugated Polyethylene (PE) Tubings and Fittings
 - ASTM G51 Standard Test Method for Measuring pH of Soil for Use in Corrosion Testing

- C. Federal Highway Administration
- Samtani, Naresh C., Christopher, B., and Berg, R., "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes", Volumes 1 and 2, Federal Highway Administration Report Nos. FHWA-NHI-10-024 and FHWA-NHI-10-025, November 2009.
 - Elias, V., Fishman, K., Christopher, B., and Berg, R., "Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes", Federal Highway Administration Report No. FHWA-NHI-09-087, November 2009.

- D. National Concrete Masonry Association (NCMA)
- NCMA Design Manual for Segmental Retaining Walls, Third Edition, 2010

1.04 DEFINITIONS

- A. Segmental Retaining Wall (SRW) Units: Dry-stacked concrete masonry units used as the retaining wall fascia.
- B. Shear/location connectors: Polyester resin pultruded fiberglass reinforcement rods to provide connection between vertically and horizontally adjacent units
- C. Reinforced Fill: Soil which is used as fill behind the SRW unit and within the reinforced soil mass (if applicable).
- D. Unit Fill and Drainage Aggregate: Material used (if applicable) within, between, and directly behind the concrete retaining wall units.
- E. Geotextile Separation Fabric: Material used for separation and filtration of dissimilar soil types.
- F. Foundation Soil: Soil mass supporting the leveling pad and reinforced soil zone of the retaining wall system.
- G. Retained Soil: The soil mass located behind the reinforced soil zone, either undisturbed native soils or compacted fill.
- H. Leveling Pad: A level surface consisting of crushed stone, sand and gravel or unreinforced concrete placed to provide a working surface for placement of the SRW unit.
- I. Geosynthetic Reinforcement: Polymeric material designed specifically to reinforce the soil mass.
- J. Pre-fabricated Drainage Composite: three-dimensional geosynthetic drainage medium encapsulated in a geotextile filter, used to transport water.
- K. Subsurface Drainage System: horizontal pipe encapsulated within drainage aggregate at or near the base of the reinforced soil to facilitate removal of water from the wall system.
- L. Low Permeability Soil: Clay soil or low permeability geosynthetic used to prevent water percolation into the drainage zone and reinforced backfill behind the wall.

- M. Global Stability: The general mass movement of a soil reinforced segmental retaining wall structure and adjacent soil mass.
- N. Project Geotechnical Engineer: A registered engineer who provides site observations, recommendations for foundation support/global stability, and verifies soil shear strength parameters.

1.05 SUBMITTALS / CERTIFICATION

- A. Product Data
- Product Data: Material description and installation instructions for each manufactured product specified
 - Name and address of the production facility where the proposed facing units will be manufactured. All units shall be manufactured at the same facility.
 - Notarized letter from the facing unit manufacturer stating that the units supplied for this project are manufactured in complete compliance with this specification. The letter shall state that the units shown in the attached test reports are representative samples of the plants normal mix design and regular production runs.
 - Notarized letter from the reinforcement manufacturer stating that the geosynthetic reinforcement has been manufactured in complete compliance with the reinforcement manufacturer's current NTEP report.
- B. Samples:
- Contractor shall submit to the owner for approval, and retain for the balance of the project, a minimum of one SRW unit that represents the range of texture and color permitted.
- C. Test Reports:
- Independent Laboratory reports indicating compressive strength, moisture absorption and freeze-thaw durability of the concrete retaining wall units from the proposed production facility.
 - Independent test reports verifying the long-term design strength properties (creep, installation damage, and durability) and soil interaction properties of the geosynthetic reinforcement.
 - Independent test reports verifying the connection capacity between the geosynthetic reinforcement and the concrete retaining wall units.
- D. Wall Design Engineer Qualifications:
- Current insurance policy verifying professional liability and errors and omissions insurance coverage for an aggregate and per claim limit of at least one million dollars (\$1,000,000).
 - Notarized letter certifying the proposed retaining wall Design Engineer is a licensed professional engineer in the state of wall installation and has a minimum of 4 years and 200,000 square feet of retaining wall system design experience.
- E. Retaining Wall Contractor Qualifications:
- Notarized statement showing that the retaining wall contractor has installed a minimum of 100,000 square feet of segmental retaining walls.
 - The Retaining Wall installer shall furnish five (5) project references of similar size and scope to this project including the wall(s) height and square footage. References shall include the contact information of Owner or General Contractor.
- F. Retaining Wall Design:
- Shop Drawings: One digitally signed set of the retaining wall system design, including wall elevation views, geosynthetic reinforcement layout, pertinent details, and drainage provisions. A registered professional engineer licensed in the state of wall installation shall sign and certify that the shop drawings are designed in accordance with the project civil plans and specifications.
 - Design Calculations: One digitally signed set of engineering design calculations prepared in accordance with the NCMA Design Manual for Segmental Retaining Walls, 3rd Edition or the AASHTO Standard Specifications for Highway Bridges (whichever is applicable). Analysis shall include Internal, External and Bearing Capacity Calculations and include the short term and long term loading conditions on the wall. A Global Stability analysis should be coordinated with the project geotechnical engineer and incorporated into the wall design.

1.06 DELIVERY, STORAGE AND HANDLING

- A. SRW Units and Accessories: Deliver, store, and handle materials in accordance with manufacturer's recommendations, in such a manner as to prevent damage. Check the materials upon delivery to assure that proper material has been received. Store SRW units above ground on wood pallets or blocking. Remove damaged or otherwise unsuitable material, when so determined, from the site.
- B. Exposed faces of SRW units shall be relatively free of chips, cracks, stains, and other imperfections detracting from their appearance, when viewed from a distance of 20 feet under diffused lighting.
- C. Prevent mud, wet cement, adhesives and similar materials that may harm appearance of SRW units, from coming in contact with system components.
- D. Geosynthetics (including geosynthetic reinforcement, geotextile filter, pre-fabricated drainage composite) shall be delivered, stored, and handled in accordance with ASTM D4873.

1.07 EXTRA MATERIALS

- A. Furnish Owner with 3 replacement SRW units identical to those installed on the Project.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. SRW Units: Anchor Diamond Pro PS Retaining Wall Units" as manufactured under license from Anchor Wall Systems.
- Physical Requirements
 - Meet requirements of ASTM C1372, except the unit height dimensions shall not vary more than plus or minus 1/16 inch from that specified in the ASTM reference, not including textured face.
 - Unit Face Area: Not less than 1.0 square foot.
 - Color: Selected by the [Architect] [Engineer] [Owner] from manufacturer's full range of standard colors.
 - Face Pattern Geometry: Straight
 - Texture: Split Rock Face.
 - Batter: Include a shear connection locator to provide a 14 inch setback for each wall course.
- B. Shear Connectors: Shear connectors shall be 5 inches long and have a 1/2-inch diameter and consist of polyester resin pultruded fiberglass reinforcement rods specifically supplied to work with the system, in order to provide connection between vertically and horizontally adjacent units with the following requirements:
- Flexural Strength in accordance with ASTM D4476: 128,000 psi minimum;
 - Short Beam Shear in accordance with ASTM D4475: 6,400 psi minimum
- C. Geosynthetic Reinforcement: Polyester fiber geogrid or geotextile, or polypropylene woven geotextile, as shown on the Drawings.
- D. Leveling Pad
- Aggregate Base: Crushed stone or granular fill meeting the following gradation as determined in accordance with ASTM D448:
- | Sieve Size | Percent Passing |
|------------|-----------------|
| 1 inch | 100 |
| No. 4 | 35 to 70 |
| No. 40 | 10 to 35 |
| No. 200 | 3 to 10 |
- Base Thickness: 6 inches (minimum compacted thickness).
 - Concrete Base: Non-reinforced lean concrete base.
- Compressive Strength: 3,000 psi (maximum).
 - Base Thickness: At least 2 inches.

Unit fill and drainage aggregate: clean crushed stone or granular fill meeting the following gradation as determined in accordance with ASTM D448:

SIEVE SIZE	PERCENT PASSING
1 INCH	100
3/4 INCH	75 TO 100
NO. 4	0 TO 60
NO. 40	0 TO 50
NO. 200	0 TO 5

- F. Reinforced Fill: Soil free of organics and debris and consisting of either GP, GW, SP, SW, or SM type, classified in accordance with ASTM D2487 and the USCS classification system and meeting the following gradation as determined in accordance with ASTM D448:

Sieve Size	Percent Passing
1 inch	100
No. 4	20 to 100
No. 40	0 to 60
No. 200	0 to 35

- Plasticity Index (PI) < 6 per ASTM D4318.
 - Maximum particle size for backfill is 1 inch unless field tests have been performed to evaluate potential strength reduction to the geosynthetic reinforcement due to damage during construction per ASTM D5818.
 - Unsuitable soils are organic soils and those soils classified as SC, CL, CH, OH, MH, OL, or PT.
- G. Low Permeability Soil: Clayey soil or other similar material which will prevent percolation into the drainage zone behind the wall.
- H. Drainage Pipe: Perforated or slotted PVC or corrugated HDPE pipe manufactured in accordance with D3034 and/or ASTM F405. All connectors and fittings shall match the piping material.
- I. Geotextile Separation Fabric: Geotextile Separation fabric shall be minimum 4.0 oz/sy, polypropylene, needle-punched nonwoven fabric.
- J. Construction Adhesive: Exterior grade adhesive as recommended by the retaining wall unit manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Prior to commencing work, the retaining wall contractor shall examine the areas and conditions under which the retaining wall system is to be erected, and notify the Engineer in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Promptly notify the wall design engineer of site conditions which may affect wall performance, soil conditions observed other than those assumed, or other conditions that may require a reevaluation of the wall design.
- C. Verify the location of existing structures and utilities prior to excavation.

3.02 PREPARATION

- A. Ensure surrounding structures are protected from the effects of wall excavation.
- B. Excavation support, if required, is the responsibility of the Contractor, including the stability of the excavation and its influence on adjacent properties and structures.

3.03 EXCAVATION

- A. Excavate to the lines and grades shown on the Drawings. Over-excavation not approved by the Engineer will not be paid for by the Owner. Replacement of these soils with compacted fill and/or wall system components will be required at the Contractor's expense. Use care in excavating to prevent disturbance of the base beyond the lines shown.

3.04 FOUNDATION PREPARATION

- A. Excavate foundation soil as required for footing or base dimension shown on the Drawings, or as directed by the Project geotechnical engineer.
- B. The Project geotechnical engineer will examine foundation soil to ensure that the actual foundation soil strength meets or exceeds that indicated on the Drawings (1500 PSF). At the direction of the project geotechnical engineer, remove soil not meeting the required strength. Oversize resulting excavation sufficiently from the front of the block to the back of the reinforcement, and backfill with suitable compacted backfill soils.
- C. The Project geotechnical engineer will determine if the foundation soils will require special treatment or correction to control total and differential settlement.
- D. Fill over-excavated areas with suitable compacted backfill, as recommended by the Project geotechnical engineer.

3.05 LEVELING PAD PREPARATION

- A. Place base materials to the depths and widths shown on the Drawings, upon undisturbed soils, or foundation soils prepared in accordance with Article 3.04.
- Extend the leveling pad laterally at least 6 inches in front and behind the lowermost SRW unit.
 - Provide aggregate base compacted to 6 inches thick (minimum) or as shown on the drawings.
 - The Contractor may at their option, provide a concrete leveling pad as specified in Subparagraph 2.01.C.2, in lieu of the aggregate base.
4. Where a reinforced footing is required by local code official, place footing below frost depth.
- B. Compact aggregate base material to provide a level, hard surface on which to place the first course of SRW units.
- C. Prepare base materials to ensure complete contact with SRW units. Gaps are not allowed.

3.06 ERECTION

- A. General: Erect SRW units in accordance with manufacturer's instructions and recommendations, and as specified herein.
- B. Place first course of concrete wall units on the prepared base material. Check units for level and alignment. Maintain the same elevation at the top of each unit within each section of the base course.
- C. Ensure that foundation units are in full contact with the leveling pad.
- D. Place concrete wall units side-by-side for full length of wall alignment. Alignment may be done by using a string line measured from the back of the block. Gaps are not allowed between the foundation concrete wall units.
- E. Place drainage aggregate between and directly behind the SRW. Fill any voids in SRW units with drainage aggregate. Provide a drainage zone behind the SRW units a minimum of 12 inches wide to within 8 inches of the final grade. Cap the backfill and drainage aggregate zone with separation fabric and then 8 inches of low permeability soil.
- F. Install drainage pipe at the lowest elevation possible to maintain gravity flow of water to outside of the reinforced zone. slope the main collection drainage pipe 2 percent (minimum) to provide gravity flow to the daylighted areas. daylight the main collection drainage pipe through the face of the wall, and/or to an appropriate location away from the wall system at each low point or at 50 foot (maximum) intervals along the wall. alternately, the drainage pipe can be connected to a storm sewer system at 50 foot (maximum) intervals.
- G. Remove excess fill from top of srw units, place shear/location devices and install next course. ensure drainage aggregate and backfill are compacted before installation of next course.
- H. Check each course for level and alignment. adjust srw units as necessary to maintain level and alignment prior to proceeding with each additional course.

Install each succeeding course. backfill as each course is completed. pull the srw units forward until the locating surface of the srw unit contacts the shear connector in the preceding course. interlock wall segments that meet at corners by overlapping successive courses. attach srw units at exterior corners with adhesive specified.

- J. Install geosynthetic reinforcement in accordance with geosynthetic manufacturer's recommendations and the shop drawings.

- Orient geosynthetic reinforcement with the highest strength axis perpendicular to the wall face.
- Prior to geosynthetic reinforcement placement, place the backfill and compact to the elevation of the top of the wall units at the elevation of the geosynthetic reinforcement.
- Place geosynthetic reinforcement at the elevations and to the lengths shown on the Drawings.
- Lay geosynthetic reinforcement horizontally on top of the SRW units and the compacted backfill soils. Place the geosynthetic reinforcement within one inch of the face of the SRW units. Place the next course of SRW units on top of the geosynthetic reinforcement.
- The geosynthetic reinforcement shall be in tension and free from wrinkles prior to placement of the backfill soils. Pull geosynthetic reinforcement hand-taut and secure in place with staples, stakes, or by hand-tensioning until the geosynthetic reinforcement is covered by 6 inches of loose fill.
- The geosynthetic reinforcements shall be continuous throughout their embedment lengths. Splices in the geosynthetic reinforcement strength direction are not allowed.
- Do not operate tracked construction equipment directly on the geosynthetic reinforcement. At least 6 inches of compacted backfill soil is required prior to operation of tracked vehicles over the geosynthetic reinforcement. Keep turning of tracked construction equipment to a minimum.
- Rubber-tired equipment may pass over the geosynthetic reinforcement at speeds of less than 10 miles per hour. Turning of rubber-tired equipment is not allowed on the geosynthetic reinforcement.

3.07 BACKFILL PLACEMENT

- A. Place reinforced fill, spread and compact in a manner that will minimize slack in the reinforcement.
- B. Place fill within the reinforced zone and compact in lifts not exceeding 6 inches (loose thickness) where hand-operated compaction equipment is used, and not exceeding 12 inches (loose thickness) where heavy, self-propelled compaction equipment is used.
- Only lightweight hand-operated compaction equipment is allowed within 3 feet of the back of the retaining wall units. If the specified compaction cannot be achieved within 3 feet of the back of the retaining wall units, replace the reinforced soil in this zone with drainage aggregate material.
 - Compaction testing shall be done in accordance with ASTM D1556 or ASTM D2922.
- D. Minimum Compaction Requirements for Fill Placed in the Reinforced and Retained Zone.
- The minimum compaction requirement shall be determined by the project geotechnical engineer testing the compaction. At no time shall the soil compaction requirements be less than 95 percent of the soil's standard Proctor maximum dry density (ASTM D698) [modified Proctor maximum dry density (ASTM D1557)] for the entire wall height.
 - Utility Trench Backfill: Compact utility trench backfill in or below the reinforced soil zone to 98 percent of the soil's standard Proctor maximum dry density (ASTM D698) [modified Proctor maximum dry density (ASTM D1557)] or as recommended by the Project geotechnical engineer. If the height from the utility to finish grade is higher than 30 feet, increase compaction to 100 percent of the standard Proctor density [modified Proctor density].
- Utilities must be properly designed (by others) to withstand all forces from the retaining wall units, reinforced soil mass, and surcharge loads, if any.
 - Moisture Content: Within 2 percentage points of the optimum moisture content for all wall heights. These specifications may be changed based on recommendations by the Project geotechnical engineer.
 - If changes are required, the Contract Sum will be adjusted by written Change Order.
- E. At the end of each day's operation, slope the last level of compacted backfill away from the interior (concealed) face of the wall to direct surface water runoff away from the wall face.
- The General Contractor is responsible for ensuring that the finished site drainage is directed away from the retaining wall system.
 - In addition, the General Contractor is responsible for ensuring that surface water runoff from adjacent construction areas is not allowed to enter the retaining wall area of the construction site.
- F. Refer to Article 3.10 for compaction testing.

3.08 CAP UNIT INSTALLATION

- A. Apply adhesive to the top surface of the SRW unit below and place the cap unit into desired position.
- B. Cut cap SRW units as necessary to obtain the proper fit.
- C. Backfill and compact to top of SRW unit.

3.09 SITE CONSTRUCTION TOLERANCES

- A. Site Construction Tolerances
- Vertical Alignment: Plus or minus 1-1/2 inches over any 10-foot distance, with a maximum differential of 3 inches over the length of the wall.
 - Horizontal Location Control from Grading Plan
- Straight Lines: Plus or minus 1-1/2 inches over any 10-foot distance.
 - Corner and Radius Locations: Plus or minus 12 inches.
 - Curves and Serpentine Radii: Plus or minus 2 feet.
 - Immediate Post Construction Wall Batter: Within 2 degrees of the design batter of the concrete retaining wall units.
 - Bulging: Plus or minus 1-1/4 inches over any 10-foot distance.

3.10 FIELD QUALITY CONTROL

- A. Installer is responsible for quality control of installation of system components.
- B. The Owner or General Contractor, at their expense, will retain a qualified professional to perform quality assurance checks of the installer's work.
- C. Correct work which does not meet these specifications or the requirements shown on the Drawings at the installer's expense.
- D. Perform compaction testing of the reinforced backfill placed and compacted in the reinforced backfill zone.
- Testing Frequency
 - One test for every 2 feet (vertical) of fill placed and compacted, for every 50 lineal feet of retaining wall.
- Vary compaction test locations to cover the entire area of the reinforced soil zone, including the area compacted by the hand-operated compaction equipment.

3.11 ADJUSTING AND CLEANING

- A. Replace damaged SRW units with new units as the work progresses.
- B. Remove debris caused by wall construction and leave adjacent paved areas broom clean.

DIAMOND PRO® PS STRAIGHT II FACE RETAINING WALL SYSTEM DPPS2T

RETAINING WALL SPECIFICATION
COLUMBIA VILLAGE OF HICKORY RIDGE
SECTION 5 - AREA 2

TAX MAP 36 GRID 7 5TH ELECTION DISTRICT PARCEL 489 HOWARD COUNTY, MARYLAND

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 6/22/20
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 6/22/20
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 6/29/2020
DIRECTOR DATE

OWNER / DEVELOPER
COLLEGE SQUARE TOWNHOUSE
HOMEOWNERS' ASSOCIATION INC.
8310 GULFORD RD, UNIT B
COLUMBIA MD 21046

RETAINING WALL AND DETAILS DESIGNED BY:

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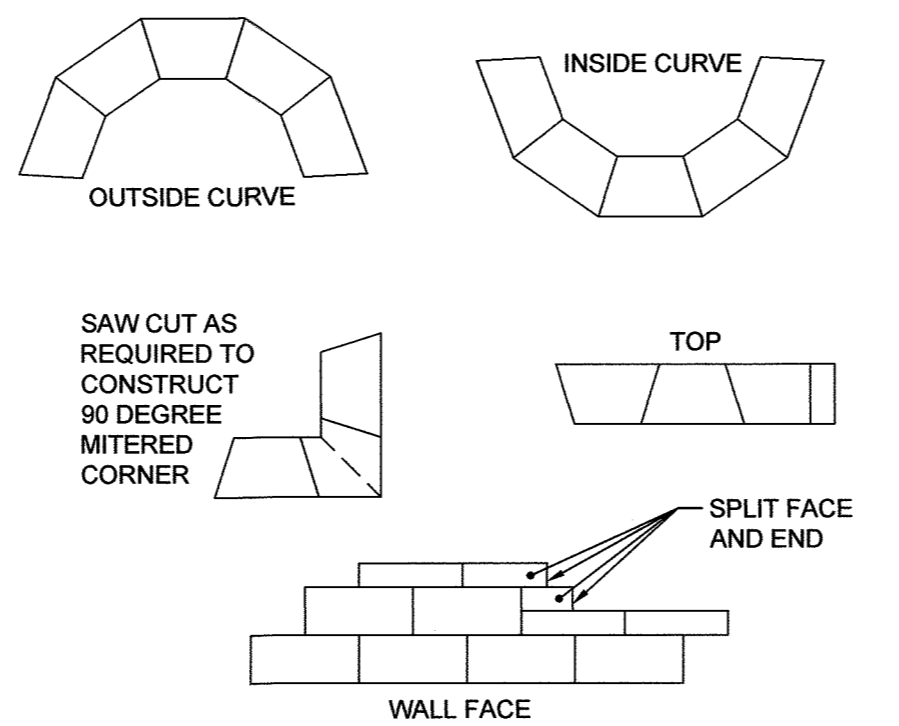
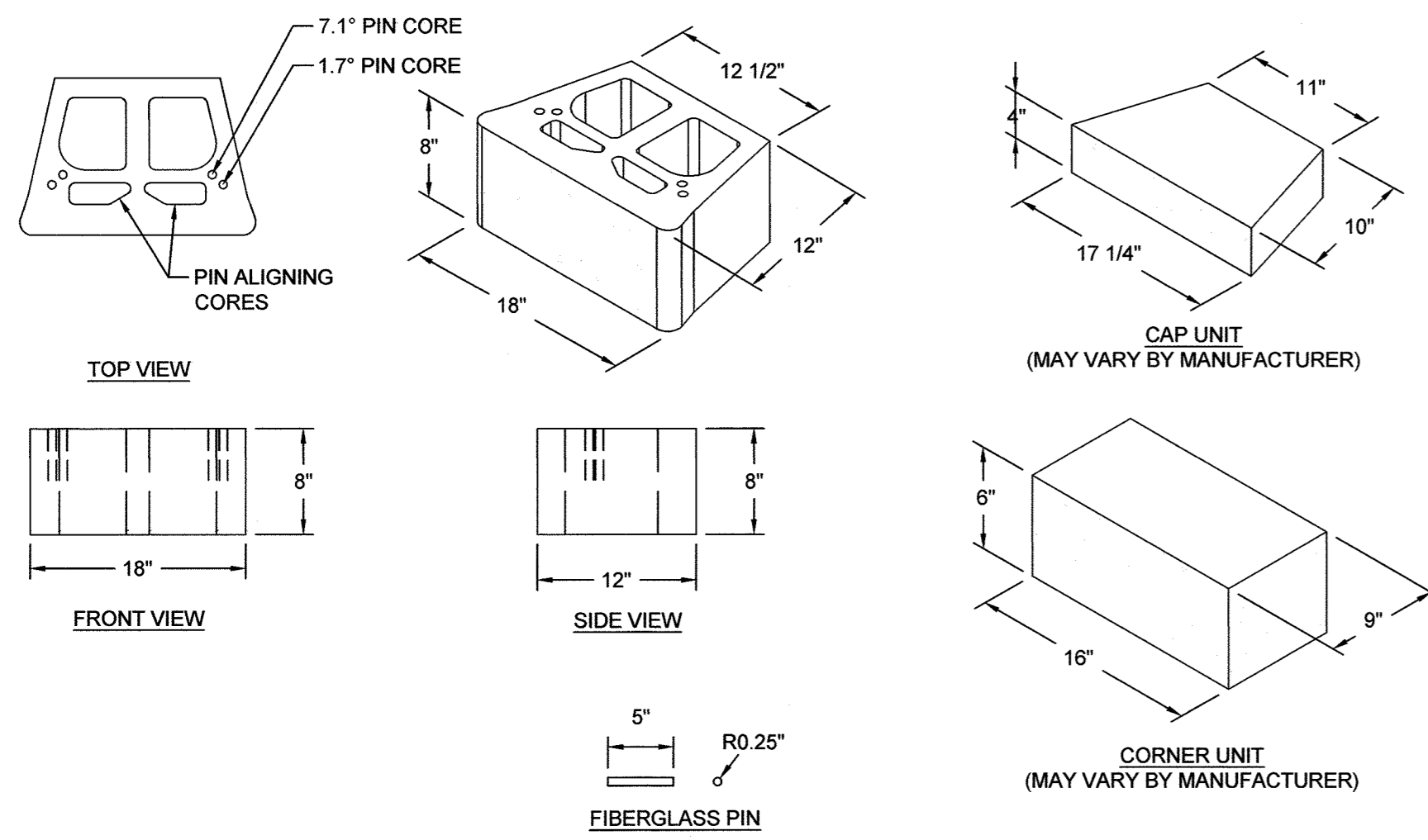
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BRIAN J. LUOMA, P.E. DATE: 6/15/20

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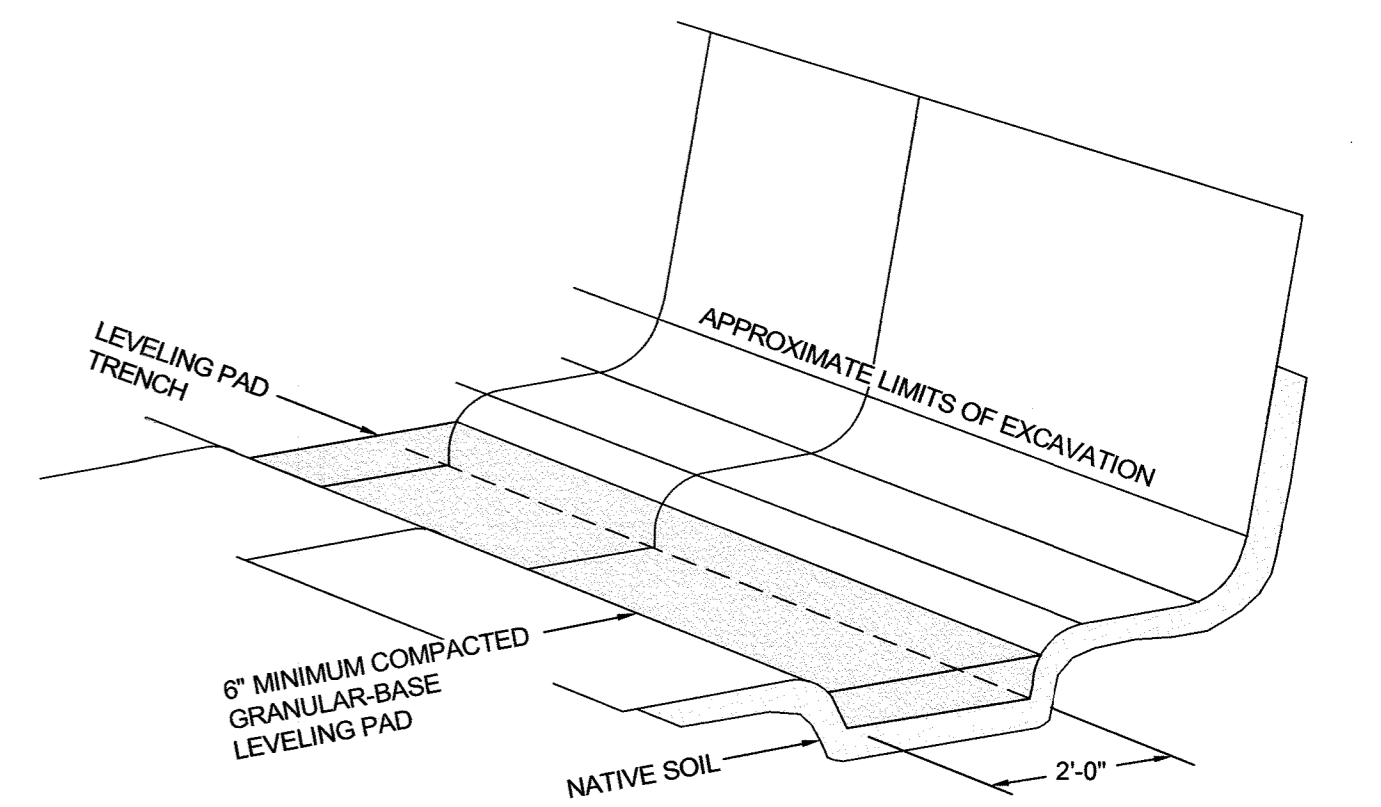
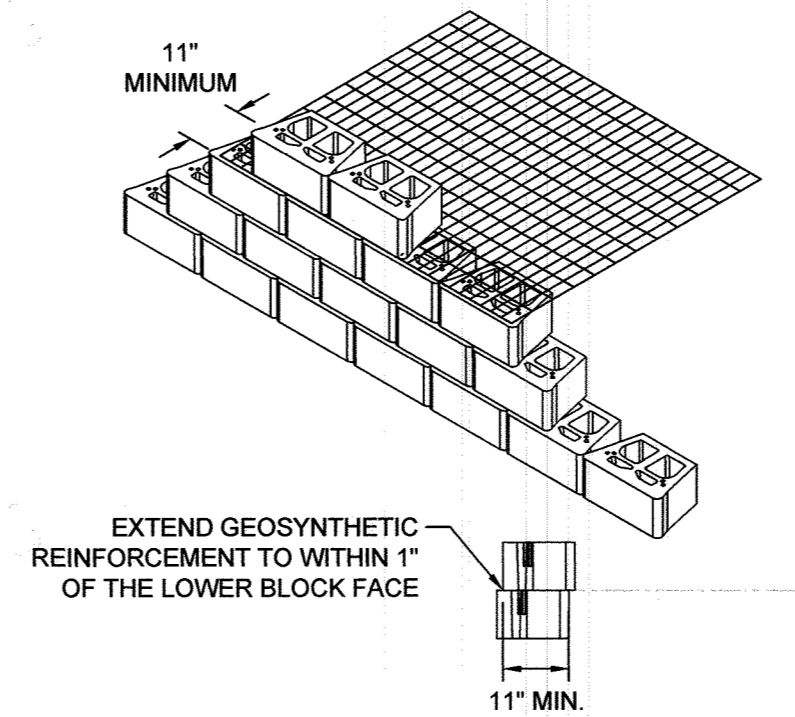
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Civil Engineering for Land Development

DESIGN BY: PS
DRAWN BY: DCL
CHECKED BY: PS
SCALE:
DATE: JUNE 6, 2020
PROJECT #: 19-060
SHEET #: 4 of 6

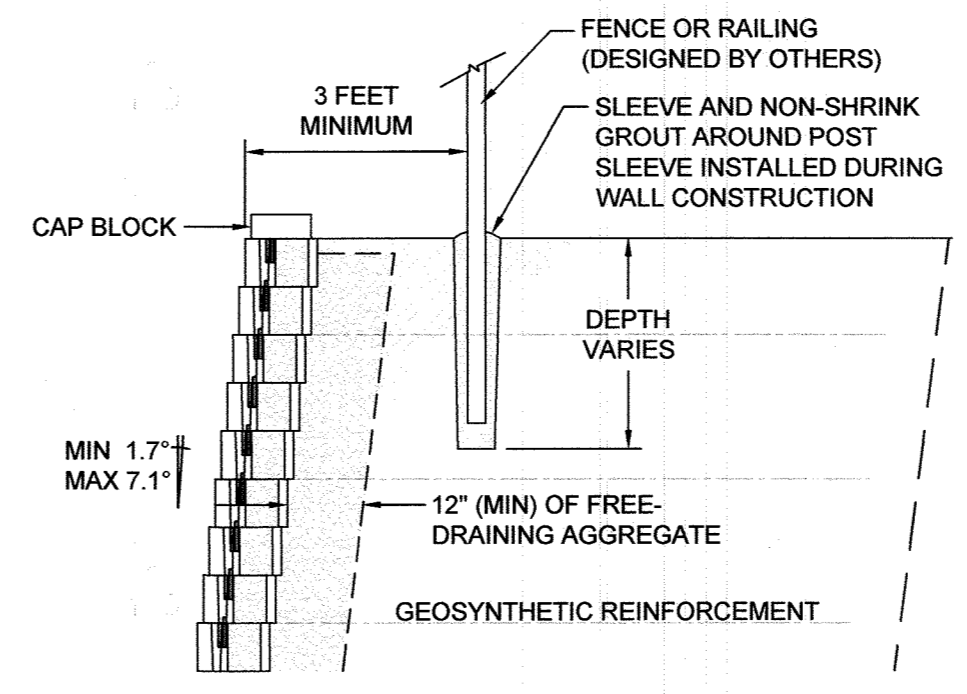
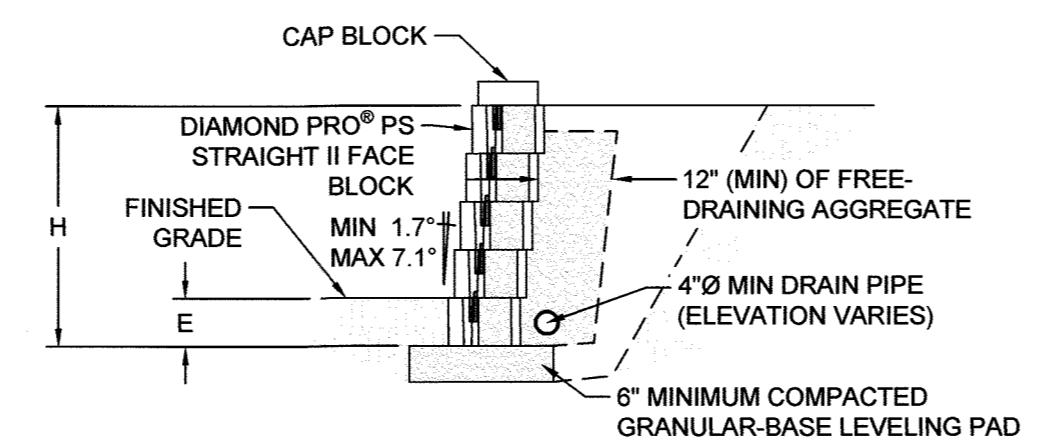
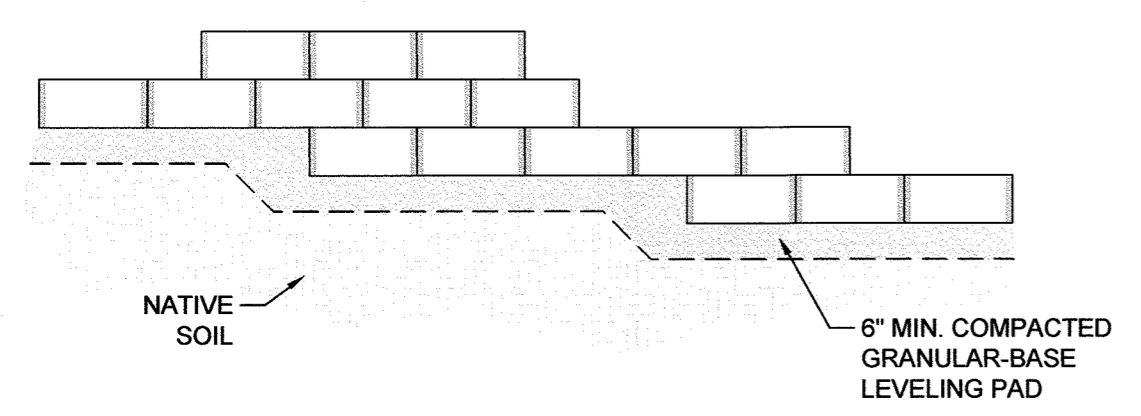
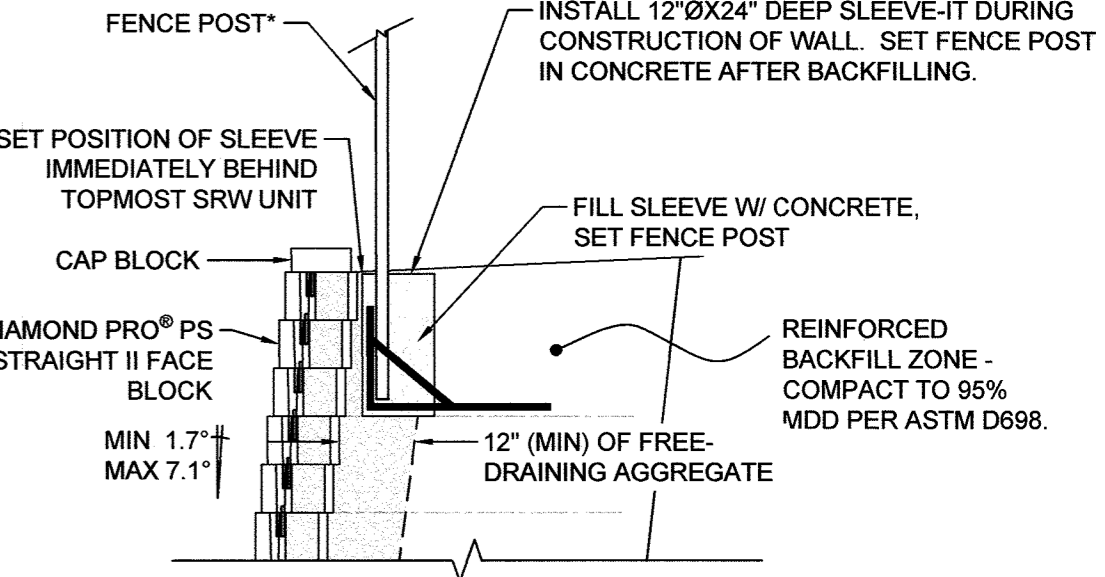
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1. ALWAYS START CAPPING WALL FROM THE LOWEST ELEVATION.
2. LAYOUT CAPS PRIOR TO USING ADHESIVE.
3. CUT CAPS TO FIT. VARIOUS COMBINATIONS OF LONG AND SHORT CAP FACES WILL BE NECESSARY FOR RADII GREATER THAN THE MINIMUM.
4. ALTERNATE SHORT AND LONG CAP FACES EVERY OTHER CAP TO ACHIEVE A STRAIGHT ROW OF CAPS.
5. USE EXTERIOR-GRADE CONSTRUCTION ADHESIVE TO SECURE CAPS.



- FOR MORE INFORMATION CONTACT:
STRATA GLOBAL SOLUTIONS
1-800-680-7750
- *FENCING SYSTEMS APPROVED FOR USE WITH SLEEVE-IT ARE LIMITED TO THE FOLLOWING HEIGHTS:
- A. CHAIN LINK UP TO 8 FEET ABOVE FINISHED GRADE WITH POST SPACING OF 8 FEET (MIN)
 - B. ORNAMENTAL (STEEL, ALUMINUM, WROUGHT IRON) POST UP TO 6 FEET ABOVE GRADE WITH POST SPACING OF 10 FEET (MIN)
 - C. OPEN BOARD / GAP BOARD (70% OPEN) POST UP TO 6 FEET ABOVE FINISHED GRADE WITH POST SPACING OF 6 FEET (MIN)

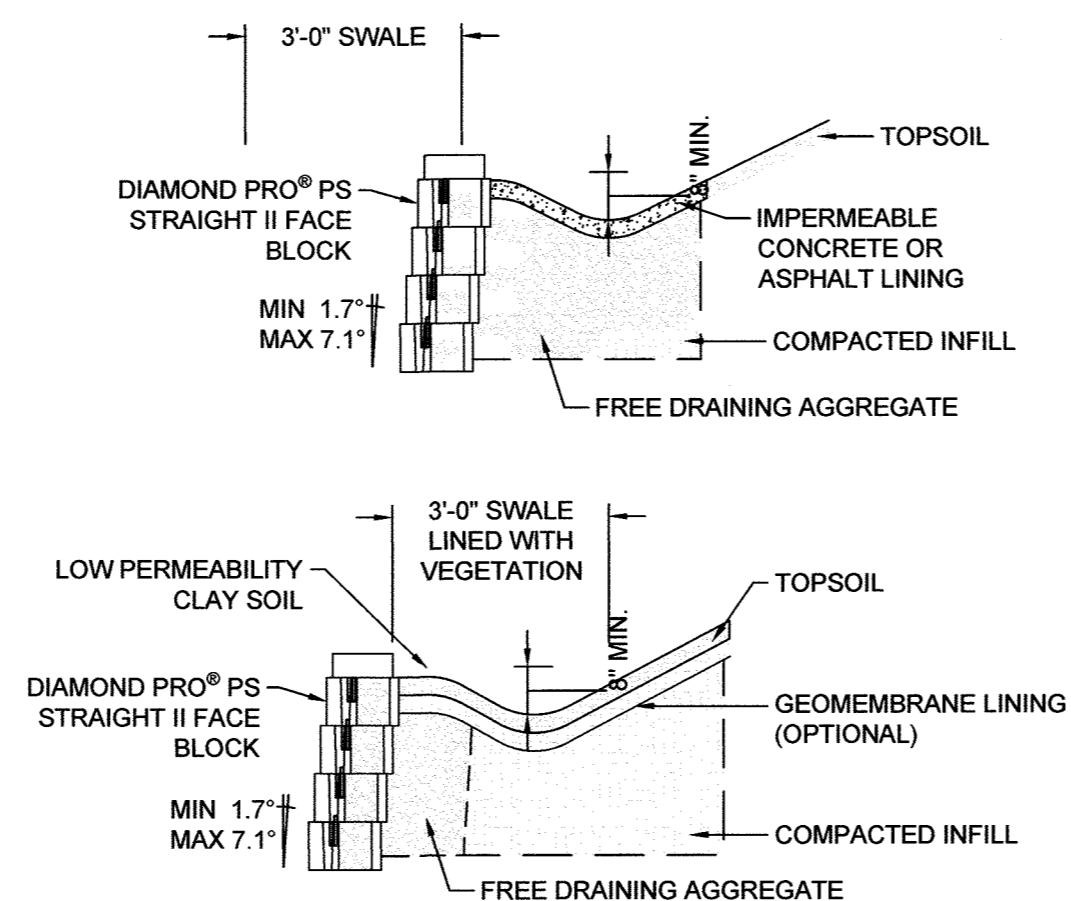
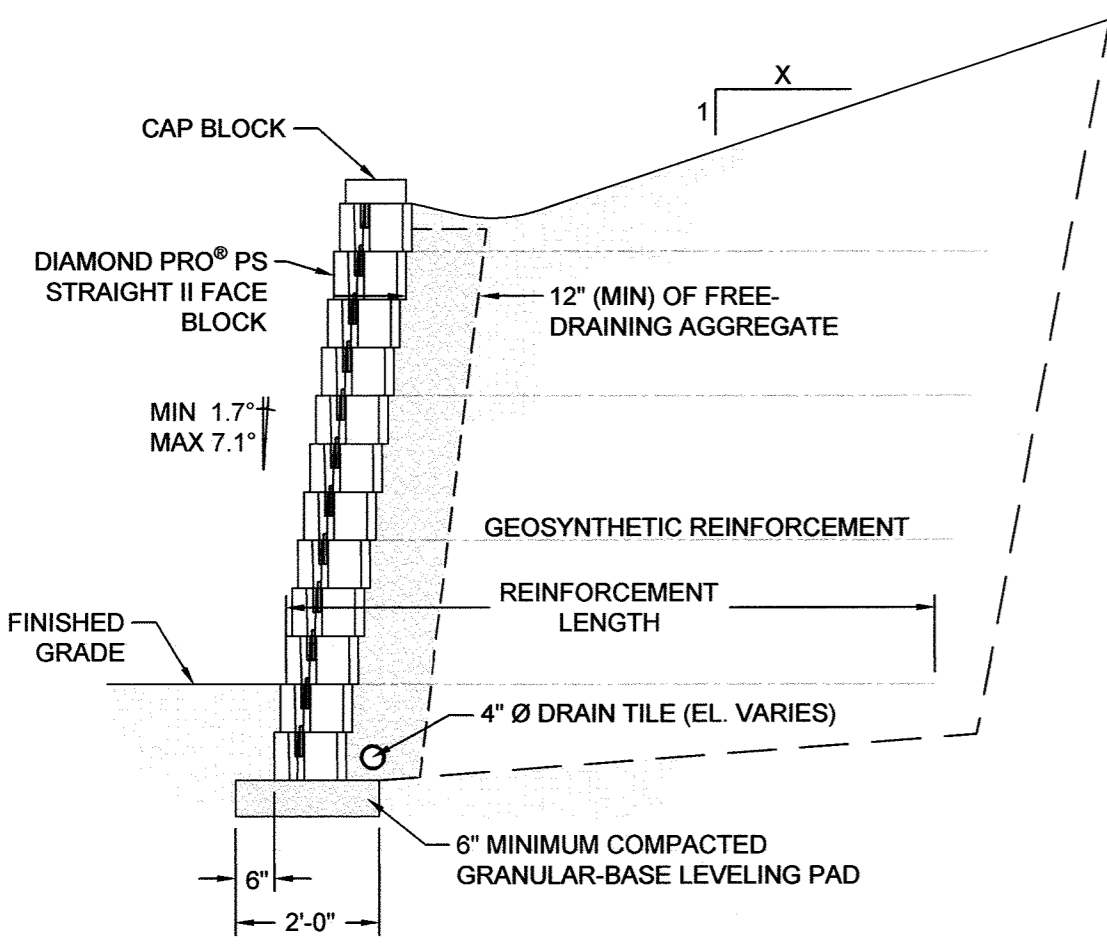


ALTERNATE FENCE CROSS SECTION

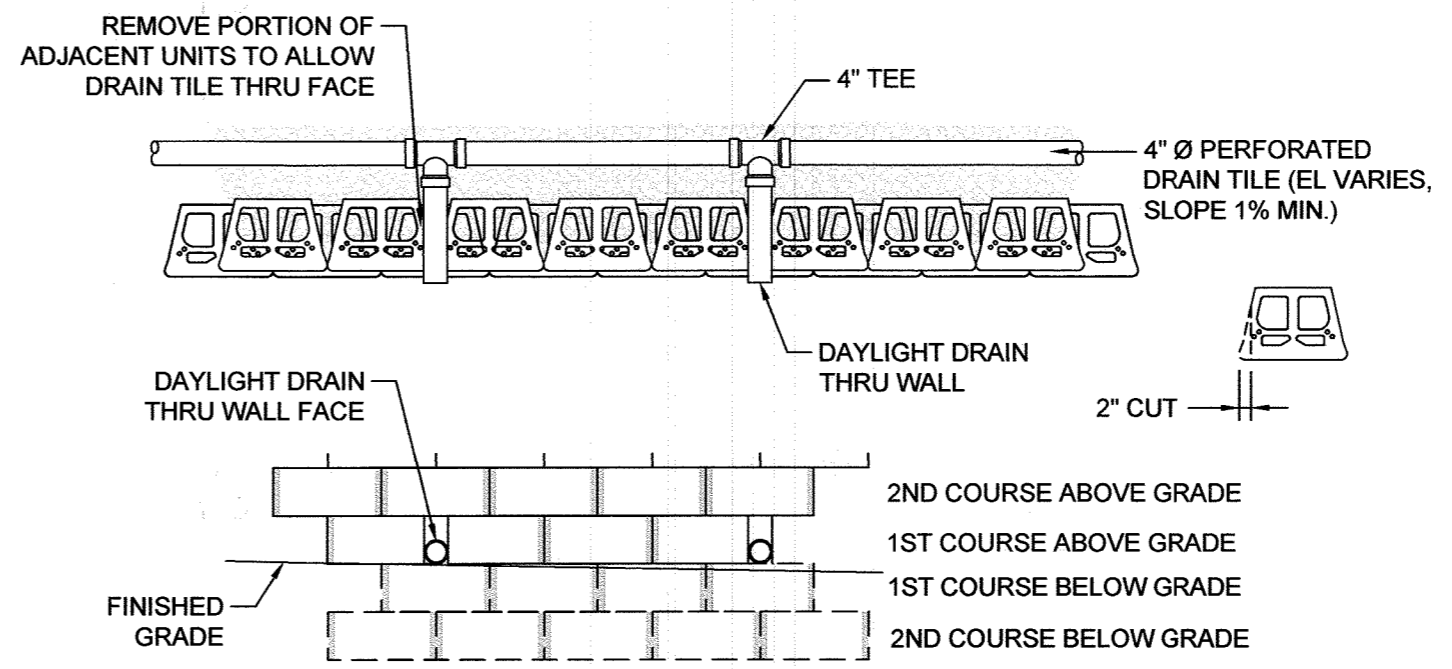
TYPICAL BASE STEP-UP

TYPICAL GRAVITY CROSS SECTION

TYPICAL FENCE CROSS SECTION



REFERENCE THE NCMA DESIGN MANUAL FOR ADDITIONAL DETAILS



DRAIN PIPE THROUGH WALL FACE

DIAMOND PRO® PS STRAIGHT II FACE RETAINING WALL SYSTEM DPPSST2

**REINFORCEMENT CONNECTION DETAILS
COLUMBIA VILLAGE OF HICKORY RIDGE
SECTION 5 - AREA 2**

TAX MAP 36 GRID 7
5TH ELECTION DISTRICT

PARCEL 489
HOWARD COUNTY, MARYLAND

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

DATE: 6/28/20

DATE: 6/28/2020

DATE: 6/29/2020

OWNER / DEVELOPER
COLLEGE SQUARE TOWNHOUSE HOMEOWNERS' ASSOCIATION INC.
8310 GUILFORD RD, UNIT B
COLUMBIA MD 21046

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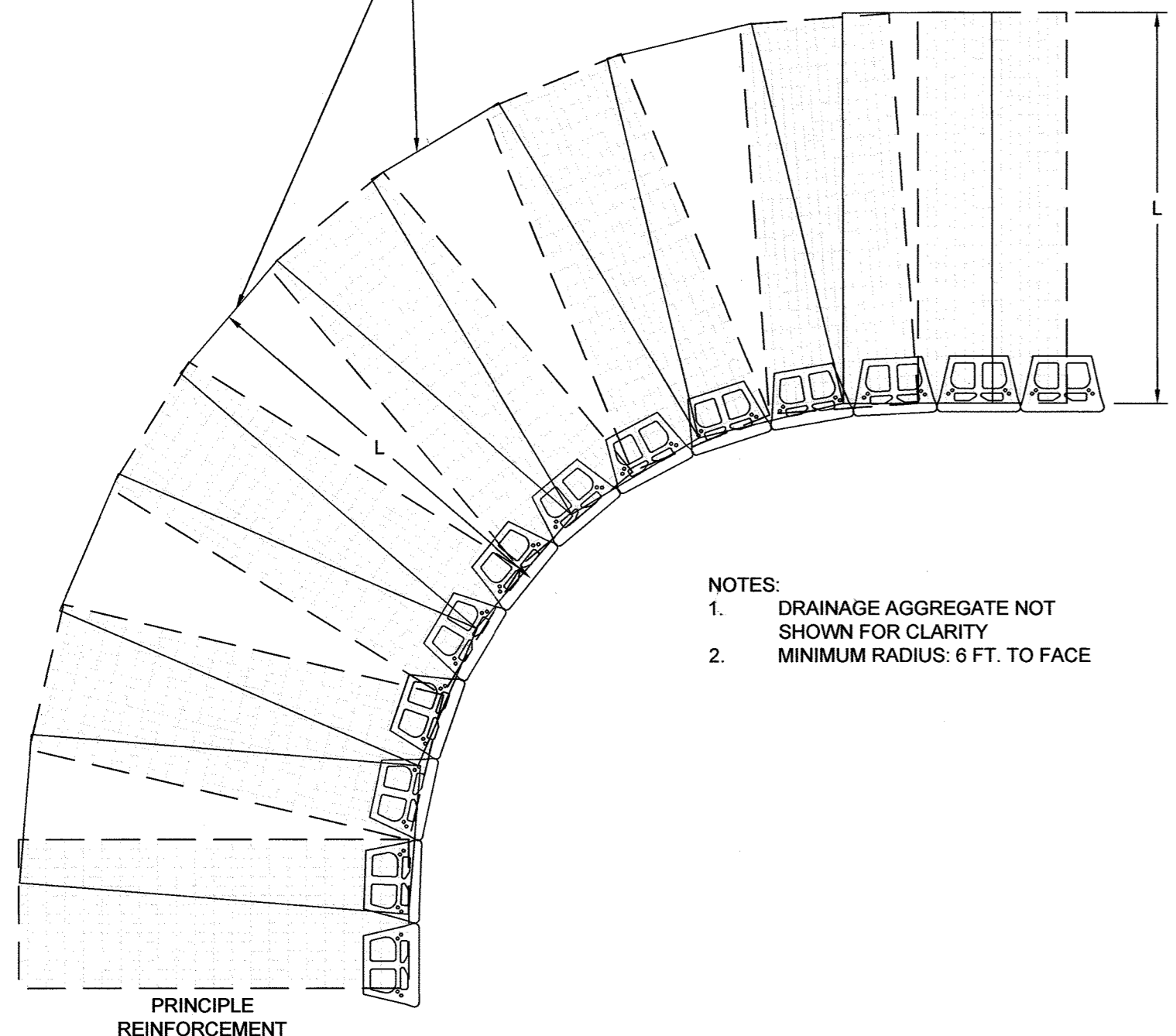
STATE OF MARYLAND
BRIAN J. LUCAS, P.E.
6/5/20

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Email: info@sillengineering.com
Civil Engineering for Land Development

DESIGN BY: PS
DRAWN BY: DCL
CHECKED BY: PS
SCALE: 3/18" = 1'-0"
DATE: JUNE 6, 2020
PROJECT #: 19-060
SHEET #: 5 of 8

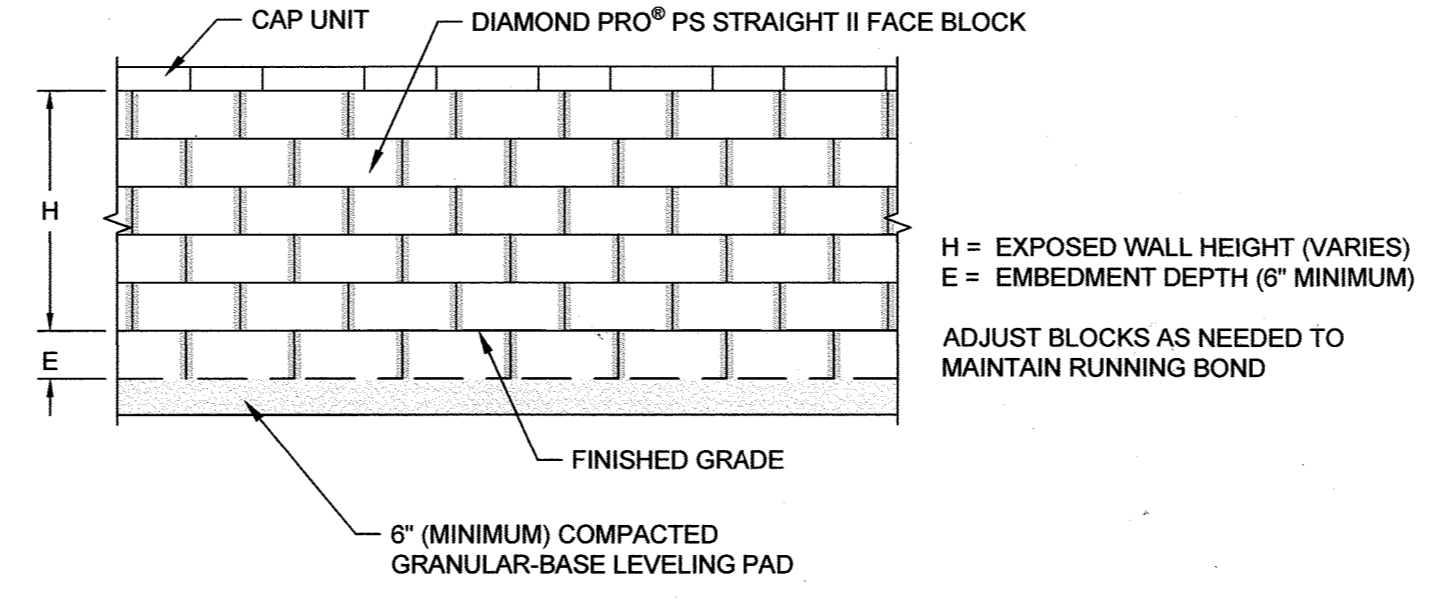
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PLACE ADDITIONAL REINFORCEMENT ON THE NEXT COURSE OF SEGMENTAL UNITS IMMEDIATELY ABOVE THE SPECIFIED PLACEMENT ELEVATION IN A MANNER THAT ELIMINATED GAPS LEFT BY THE PREVIOUS LAYER OF GEOSYNTHETIC AT THE SPECIFIED REINFORCEMENT ELEVATION.

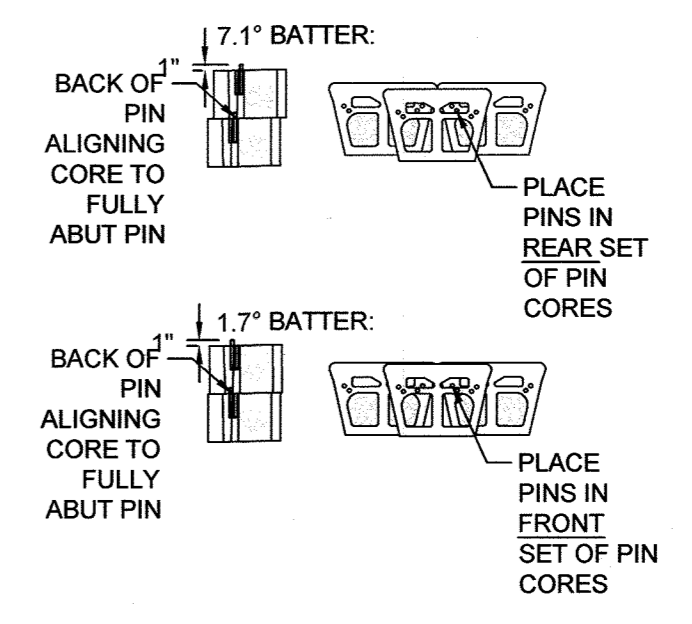


- NOTES:
1. DRAINAGE AGGREGATE NOT SHOWN FOR CLARITY
 2. MINIMUM RADIUS: 6 FT. TO FACE

INSIDE CURVES



TYPICAL ELEVATION VIEW



PIN INSTALLATION DETAIL

DIAMOND PRO® PS STRAIGHT II FACE RETAINING WALL SYSTEM DPPS2

REINFORCEMENT CONNECTION DETAILS
COLUMBIA VILLAGE OF HICKORY RIDGE
SECTION 5 - AREA 2

TAX MAP 36 GRID 7
5TH ELECTION DISTRICT

PARCEL 489
HOWARD COUNTY, MARYLAND

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature]
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE: 6/22/20

[Signature]
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE: 6/29/2020

[Signature]
DIRECTOR
DATE: 6/29/2020

OWNER / DEVELOPER
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STATE OF MARYLAND
BRIAN J. LUOMA, P.E.
PROFESSIONAL ENGINEER
DATE: 6/20/20

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Civil Engineering for Land Development

DESIGN BY: PS
DRAWN BY: DCL
CHECKED BY: PS
SCALE: 3/16" = 1'-0"
DATE: JUNE 6, 2020
PROJECT #: 19-060
SHEET #: 6 of 6

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