GRACE TECH PARK, PARCEL A OFFICE BUILDING SITE DEVELOPMENT PLAN

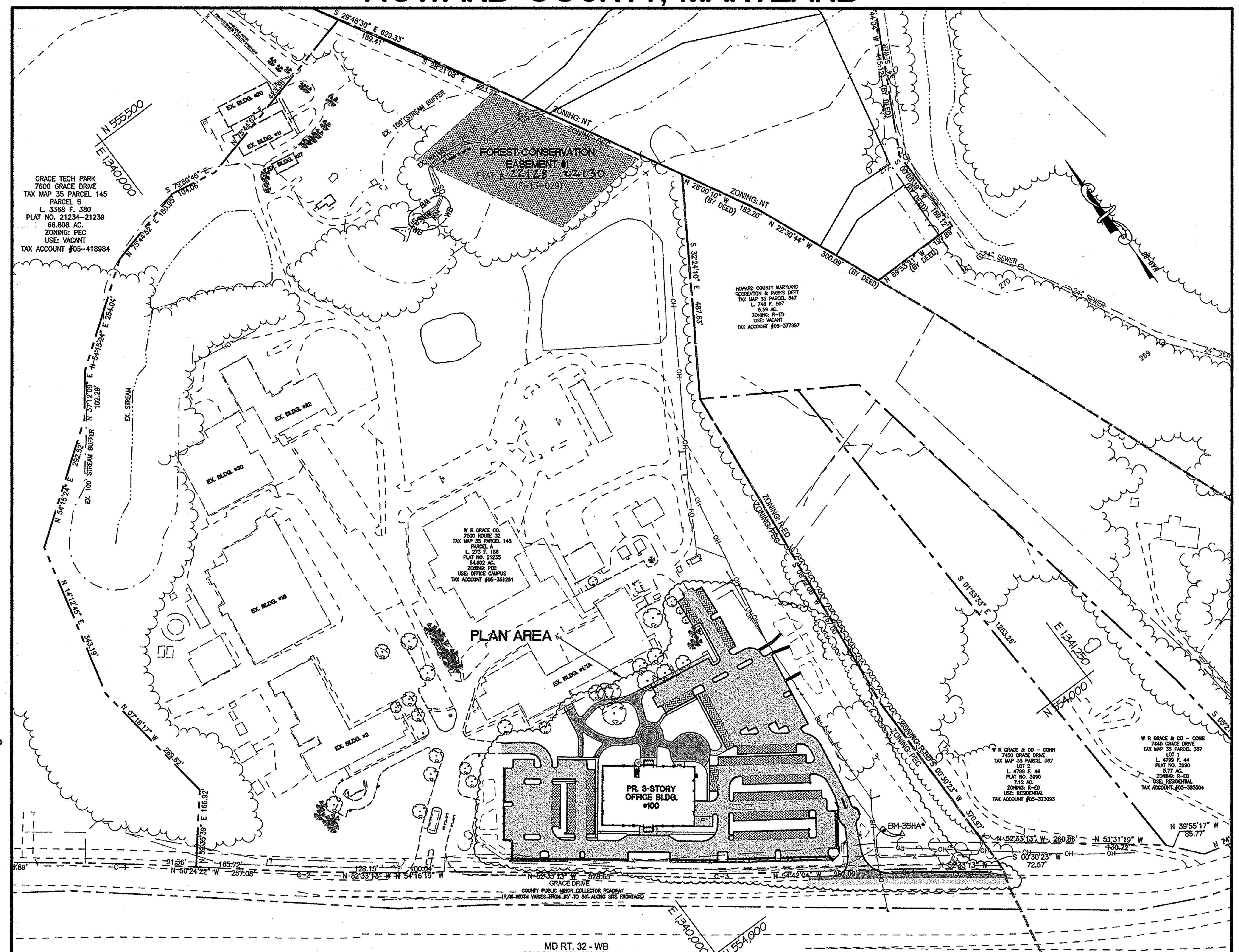
HOWARD COUNTY, MARYLAND

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY AND MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410.313.1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
3. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1.800.257.7777 AT LEAST FOURTY-EIGHT (48) HOURS PRIOR TO ANY WORK BEING DONE.
4. LABELED DIMENSIONS GOVERN OVER SCALED DIMENSIONS.
5. TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT. ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED ("QUICK PUNCH"), SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) – 3' LONG. THE ANCHOR SHALL NOT EXTEND MORE THAN TWO "QUICK PUNCH" HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
6. ALL PLAN DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
7. THE EXISTING TOPOGRAPHY IS A COMBINATION OF AERIAL GIS SURVEY AND FIELD RUN SURVEY WITH 2' CONTOUR INTERVALS PREPARED BY MORRIS & RITCHIE ASSOCIATES, INC. DATED JULY 3, 2008.
8. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM (NAD 83/07, NAVD 88). HOWARD COUNTY MONUMENT NUMBERS 35HA AND 35HB WERE USED FOR THIS PROJECT.
9. ALL PROPOSED WATER IS PRIVATE, CONNECTING TO EXISTING ONSITE PRIVATE WATER. EXISTING ONSITE PRIVATE WATER IS SERVICED THROUGH AN EXISTING PUBLIC METER OFF OF PUBLIC 12" WATER MAIN (44-3283-D) LOCATED ON GRACE DRIVE.
10. ALL PROPOSED SEWER IS PRIVATE, CONNECTING TO EXISTING ONSITE PRIVATE SEWER. EXISTING ONSITE PRIVATE SEWER IS SERVICED BY EXISTING PUBLIC 24" SEWER MAIN, CONT. 30-1002.
11. THIS PROJECT UTILIZES ENVIRONMENTAL SITE DESIGN FOR ALL STORM WATER MANAGEMENT PRACTICES, INCLUDING BIO-SWALES (M-8), PERMEABLE PAVEMENTS (A-2), RAINWATER HARVESTING (M-1), AND MICRO BIORETENTION FACILITIES (M-6). ALL SWM DEVICES WILL BE PRIVATELY OWNED AND MAINTAINED.
12. EXISTING UTILITIES ARE BASED ON FIELD RUN SURVEYS BY A/I/DATA, DATED 9/23/11, AND MORRIS & RITCHIE ASSOCIATES, INC, DATED JULY 3, 2008.
13. THERE IS NO FLOODPLAIN ON THIS PROJECT SITE AREA PER FEMA FIRM MAP 240044 0033 B.
14. THERE ARE NO WETLANDS OR STEEP SLOPES BEING IMPACTED ON THIS PROJECT.
15. THE TRAFFIC STUDY FOR THIS PROJECT WAS PREPARED BY THE TRAFFIC GROUP, DATED JULY 15, 2011.
16. NO NOISE STUDY IS REQUIRED FOR THIS PROJECT.
17. THE GEOTECHNICAL REPORT FOR THIS PROJECT WAS PREPARED BY GEO-TECHNOLOGY ASSOCIATES, INC., DATED SEPTEMBER 24, 2008.
18. A GEO-TECHNICAL STUDY WAS CONDUCTED FOR THIS PROJECT BY GEO-TECHNOLOGY ASSOCIATES, INC. DATED DECEMBER 27, 2011.
19. CONTRACTOR IS RESPONSIBLE FOR ALL SITE CONDITIONS, CONSTRUCTION REQUIREMENTS, AND SHALL CONFORM TO ALL STATE, FEDERAL, AND COUNTY CONSTRUCTION REGULATIONS. THE CONTRACTOR IS NOT RELIEVED OF RESPONSIBILITY SHOULD ANY REQUIRED ITEMS PERTAINING TO SITE CONSTRUCTION NOT BE INCLUDED ON THESE PLANS. CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS NECESSARY TO COMPLETE THE SITE IMPROVEMENTS AS SHOWN ON THESE PLANS.
20. ANY DAMAGE TO EXISTING UTILITIES, PAVEMENT, OR CURB AND GUTTER DUE TO CONSTRUCTION ACTIVITY OUTSIDE THE LIMITS OF DISTURBANCE IS TO BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.
21. WHERE NECESSARY, THE CONTRACTOR SHALL TEST PIT ALL EXISTING UTILITIES AT LEAST FIVE (5) DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE DRAWINGS.
22. CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY PROPERTY MONUMENTS, MARKERS, SIGNS, LIGHTS, OR ANY OTHER EXISTING SITE FEATURES DISTURBED DURING CONSTRUCTION.
23. ALL WORK SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE "1994 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROLS" PUBLISHED JOINTLY BY THE WATER RESOURCES ADMINISTRATION, SOIL CONSERVATION SERVICE, AND STATE SOIL CONSERVATION COMMITTEE.
24. TRENCH COMPACTION FOR STORM DRAINS WITHIN ROADWAYS AND PARKING AREAS SHALL BE IN ACCORDANCE WITH HOWARD COUNTY DESIGN MANUAL, VOL. IV, STANDARD NO. G-2.01.
25. ALL COMPACTED FILL SHALL BE IN ACCORDANCE WITH AASHTO T-180 REQUIREMENTS.
26. EXISTING ON-SITE FOREST AREAS ARE BASED UPON A FOREST STAND DELINEATION (FSD) PLAN PREPARED BY GEO-TECHNOLOGY ASSOCIATES DATED AUGUST 2012.
27. SOILS SHOWN ON THIS PLAN ARE MAPPED AND LABELED IN ACCORDANCE WITH THE UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE'S WEB SOIL SURVEY.
28. THE PROJECT AREA DRAINS TO USE CLASS I-P WATERS.
29. THERE ARE NO SPECIES LISTED UNDER THE JURISDICTION OF NOAA'S NATIONAL MARINE FISHERIES SERVICES KNOWN TO OCCUR WITHIN THE VICINITY OF THIS PROJECT.
30. PER MERLIN ON-LINE, THERE ARE NO HISTORIC OR CULTURAL RESOURCES ON-SITE.
31. THERE ARE NO OUTCROPPINGS ON THIS PROPERTY.
32. THERE ARE 17 SPECIMEN TREES WITHIN THE PROJECT AREA. THERE ARE 21 SPECIMEN TREES WITHIN THE PROPOSED ON-SITE FOREST RETENTION AREA.
33. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAM(S) OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100 YEAR FLOODPLAIN.
34. BOUNDARY INFORMATION IS BASED ON A FIELD RUN BOUNDARY SURVEY PERFORMED BY MORRIS & RITCHIE ASSOCIATES, INC. IN NOVEMBER, 2008, AND MDR PLAT NO. 21234, RECORDED AUGUST 12, 2010.
35. THE PROPOSED ENTRANCE ONTO GRACE DRIVE REPLACES AN EXISTING GATED ENTRANCE.
36. THE SUBJECT PROPERTY IS ZONED PEC PER THE JULY 28, 2006 COMPREHENSIVE ZONING PLAN.
37. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.
38. THIS BUILDING WILL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
39. THE ~~1.6 ACRES OF REQUIREMENT FOREST CONSERVATION WILL BE PROVIDED ON SITE.~~ This project complies with Section 16.1200 of the Howard County Code for forest conservation by providing 1.6 acres of on-site forest retention.
40. THE FOREST CONSERVATION EASEMENT IS RECORDED AS PLAT #22128 - 22130 (F-13-029) AND IS PROVIDED IN ACCORDANCE WITH WAIVER PETITION WP-13-031.
41. WAIVER PETITION WP-09-227, APPROVED JULY 15, 2009, INCLUDED WAIVERS TO THE FOLLOWING SECTIONS: 1) SEC. 16.144(B) – REQUIREMENT TO SUBMIT A SKETCH PLAN OR PRELIMINARY EQUIVALENT SKETCH PLAN FOR THE PROPOSED NON-RESIDENTIAL SUBDIVISION; 2) SEC. 16115(D) – REQUIREMENT TO DELINEATE FLOODPLAIN LIMITS OR A 100 YEAR FLOODPLAIN, DRAINAGE AND UTILITY EASEMENT ON A FINAL PLAT; 3) SEC. 16.147(C) – REQUIREMENT TO SHOW THE LOCATIONS OF FLOODPLAINS, WETLANDS, WETLAND BUFFERS, STREAMS AND STREAM BUFFERS ON A FINAL PLAT; 4) SEC. 16.147(D) – REQUIREMENT TO SUBMIT CONSTRUCTION DRAWINGS AND DOCUMENTS CONCURRENT WITH THE SUBMISSION OF THE FINAL PLAT; AND 5) SEC. 16.1101(A) – REQUIREMENT TO BE TESTED FOR ADEQUATE ROAD FACILITIES AS A CONDITION OF SUBDIVISION APPROVAL. THE CONDITIONS OF THIS APPROVAL ARE AS FOLLOWS: 1) A COMPLETED FOREST CONSERVATION "DECLARATION OF INTENT FOR SUBDIVISION FOR REAL ESTATE TRANSACTION" HAS BEEN SUBMITTED WITH THE FINAL SUBDIVISION PLAT, 2) ANY RESUBDIVISION PLAT SUBMISSION OR SITE DEVELOPMENT PLAN SUBMISSION FOR PARCEL A OR PARCEL B SHALL BE TESTED FOR ADEQUATE ROAD FACILITIES AND INCLUDE FOREST STAND DELINEATION, FOREST CONSERVATION AND LANDSCAPE PLANS FOR THE ENTIRE PARCEL PER THE REQUIREMENTS OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE FINAL PLAN OR SITE DEVELOPMENT PLAN APPLICATION AND CHECKLIST; 3) ANY RESUBDIVISION PLAT SUBMISSION OR SITE DEVELOPMENT PLAN SUBMISSION FOR PARCEL A OR PARCEL B SHALL INDICATE/DELINEATE ANY FLOODPLAIN, 100 YEAR FLOODPLAIN, DRAINAGE AND UTILITY EASEMENTS, WETLANDS, WETLAND BUFFERS, STREAMS, STREAM BUFFERS PER THE REQUIREMENTS OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE FINAL PLAN OR SITE DEVELOPMENT PLAN APPLICATION AND CHECKLIST; AND 4) COMPLIANCE WITH THE ENCLOSED DED COMMENT OF 06/24/09, WHICH STATES THAT ALL REGULATIONS AS REQUIRED BY SECTIONS 16.144(B), 16.144(D) AND 16.1101(A) SHALL BE COMPLIED WITH UPON RESUBDIVISION AND/OR ADDITIONAL DEVELOPMENT OF THE SUBJECT PROPERTY.
42. A DESIGN MANUAL WAIVER TO VOLUME II, CHAPTER 2.9C – OFF-STREET PARKING LOTS, TO REDUCE THE MINIMUM STANDARD PARKING SPACE DEPTHS FROM 18' TO 16' AND TO REDUCE THE MINIMUM DRIVE AISLE WIDTH FROM 24' TO 22' WAS DENIED ON 09/11/12.
43. A DESIGN MANUAL WAIVER TO VOLUME II, CHAPTER 1.4A – PUBLIC WATER TO ALLOW A LOT OR PARCEL CREATED THROUGH THE SUBDIVISION PROCESS TO NOT BE DIRECTLY CONNECTED TO THE PUBLIC WATER SYSTEM AND CHAPTER 3.4 – FIRE HYDRANTS TO ALLOW THE PROPERTY TO CONTINUE TO OPERATE WITH PRIVATE FIRE HYDRANTS WAS APPROVED ON 09/15/12.
44. ALL REFUSE AND RECYCLING COLLECTION WILL BE PRIVATE. NO COUNTY COLLECTION WILL BE PROVIDED.
45. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $21,420.00 (49) SHADE TREES @ $300.00 EA., 13 ORNAMENTAL/EVERGREEN TREES @ $150.00 EA., AND 149 SHRUBS @ $30.00 EA.).
46. LIGHT TRESPASS ONTO A PROPERTY IN THE R-ED ZONING DISTRICT SHALL BE LIMITED TO 0.1 FOOT CANDLES. LIGHT TRESPASS ONTO ANY PROPERTY ZONED OR USED FOR RESIDENTIAL PURPOSES SHALL BE LIMITED TO 0.5 FOOT CANDLES.
47. PER WAIVER PETITION WP-13-031, DATED 09/12/12, THIS REVISION PLAT IS EXEMPT FROM THE FOLLOWING SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SECTIONS: A) 16.115(D) – REQUIRES DELINEATION OF FLOODPLAIN ON FINAL PLATS AND SITE DEVELOPMENT PLAN; B). 16.157(B)(11) – REQUIRES THE DELINEATION OF PONDS, WETLANDS, WETLAND BUFFERS, STREAMS AND STREAM BUFFERS ON THE SITE DEVELOPMENT PLAN; C). 16.1204(C) – REQUIRES A FOREST STAND DELINEATION TO BE CONDUCTED ON THE ENTIRE PROPERTY TO BE DEVELOPED; D). 16.1201(N) – DEFINITIONS "NET TRACT AREA" AND 16.1202(B)(1)(L): APPLICABILITY; EXEMPTION; DECLARATION OF INTENT TO ALLOW THE LIMITS OF DISTURBANCE TO SERVE AS THE NET TRACT AREA WHEN DETERMINING THE FOREST CONSERVATION EASEMENT OBLIGATION; AND E). 16.1205(A)(7) AND 16.1205(A)(10) – TO ALLOW THE REMOVAL OF SPECIMEN TREES. THE CONDITIONS OF APPROVAL FOR WAIVER PETITION WP-13-031, ARE: 1). THE AREA OF PLAN SUBMISSION SHALL NOT EXCEED 8.40 ACRES AS SHOWN ON SDP-12-077 (GRACE TECH PARK); 2). A FOREST STAND DELINEATION, FOREST CONSERVATION PLAN AND WETLAND DELINEATION REPORT SHALL BE CONDUCTED FOR THE PROJECT AREA OF 8.40 ACRES AND SHALL BE SUBMITTED AND APPROVED UNDER SDP-12-077 (GRACE TECH PARK); 3). FOREST CONSERVATION SHALL BE ADDRESSED FOR THE 8.40 ACRES OF PLAN SUBMISSION ASSOCIATED WITH SDP-12-077. A FOREST CONSERVATION RETENTION EASEMENT SHALL BE PROVIDED ON-SITE (ON PARCEL 'A') WITHIN THE PEC ZONING DISTRICT; AND 4). REMOVAL OF SPECIMEN TREES SHALL BE LIMITED TO ONLY SPECIMEN TREE NUMBERS #1-4, #12 AND #17, AS SHOWN ON THE FOREST CONSERVATION PLAN SUBMITTED WITH THE WAIVER PETITION AND WITH SDP-12-077.
48. A WETLAND REPORT WAS PREPARED BY GEO-TECHNOLOGY ASSOCIATES IN AUGUST 2012. THE REPORT COVERS 15.3 ACRES OF PARCEL 'A', INCLUDING THE 8.40 ACRES OF PLAN SUBMISSION COVERED BY THIS SDP AS WELL AS THE 1.6 ACRES OF PROPOSED FOREST CONSERVATION DELINEATION ON THE FOREST CONSERVATION PLAN.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12 DATE
[signature] CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
[signature] CHIEF, DIVISION & LAND DEVELOPMENT	11/19/12 DATE



LOCATION PLAN

SCALE: 1" = 150'

BENCH MARKS

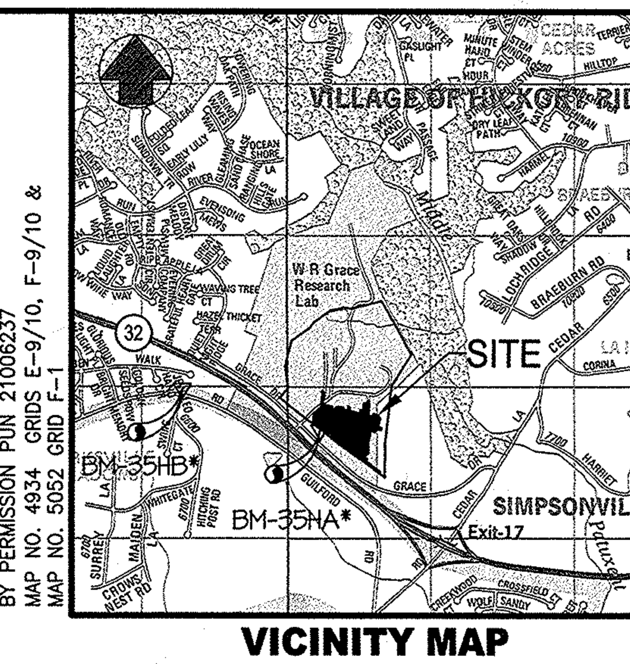
BM 35HA*
N 553,966.7457 E 1,340,476.9524
NAD 83 (Adj 07)
NAVD 88
ELEV. 404.584

BEING A STAMPED BRASS OR ALUMINUM DISC SET ON TOP OF A 3 FOOT DEEP COLUMN OF CONCRETE APPROXIMATELY 90'± NORTH OF GRACE DRIVE AND 160'± EAST OF THE EASTERN MOST ENTRY DRIVE FOR THE PROPERTY. (ALSO KNOWN AS "R-109" AND "0068").

BM 35HB*
N 554,836.4156 E 1,337,888.3861
NAD 83 (Adj 07)
NAVD 88
ELEV. 449.699

BEING A STAMPED BRASS OR ALUMINUM DISC SET ON TOP OF A 3 FOOT DEEP COLUMN OF CONCRETE AT THE INTERSECTION OF GUILFORD ROAD AND WHITEGATE ROAD, APPROXIMATELY 5'± NORTH OF GUILFORD ROAD.

© ADC, THE MAP PEOPLE, BY PERMISSION PUN 21006237
MAP NO. 4934 GRIDS E-9/10, F-9/10 &
MAP NO. 5052 GRID F-1



VICINITY MAP

SCALE: 1" = 2,000'

SITE ANALYSIS DATA CHART

1. TOTAL PROJECT AREA: 54.80 ACRES
2. AREA OF PLAN SUBMISSION: 8.40 ACRES
3. LIMIT OF DISTURBANCE: 8.40 ACRES
4. PRESENT ZONING: PEC
5. PROPOSED USE: OFFICE CAMPUS
6. PROPOSED FLOOR SPACE:

BASEMENT	STORAGE	9,199 s.f.
1st FLOOR	ASSEMBLY	26,559 s.f. (NOT AVAILABLE TO THE PUBLIC)
2nd FLOOR	BUSINESS	26,015 s.f.
3rd FLOOR	BUSINESS	25,698 s.f.
	TOTAL	87,471 s.f.

7. BULK REGULATIONS

	REQUIRED	PROVIDED
A. OPEN SPACE (BASED ON TOTAL PROJECT AREA)	25% (13.7 AC)	34% (18.5 AC)
B. MAX. BUILDING HEIGHT	50'*	64'
C. MIN. DISTRICT SIZE	50 AC	121.61 AC (PARCELS A & B)
D. STRUCTURES AND USE SETBACKS		
1. FROM RESIDENTIAL DISTRICTS	103'*	103'
2. FROM ALL OTHER DISTRICTS	30'	N/A
3. FROM PUBLIC STREET (EXCLUDING PARKING)	30'	30'
4. FROM PUBLIC STREET (PARKING)	10'	10'

*BUILDING HEIGHT MAY BE INCREASED UP TO 80' SO LONG AS THE BUILDING SETBACK FROM A RESIDENTIAL DISTRICT IS INCREASED 2' FOR EACH ADDITIONAL 1' OF BUILDING HEIGHT OVER 50'. A 64' HIGH BUILDING WOULD REQUIRE A 103' BUILDING SETBACK FROM THE RESIDENTIAL DISTRICT.

8. TOTAL NUMBER OF PARKING SPACES REQUIRED: 408
(149 SPACES FOR EX. BUILDING TO BE REMOVED AND REPLACED)
(259 SPACES REQUIRED FOR BLDG. ADDITION FOR OFFICE (78,272 SF) @ 3.3 SPACES/1,000 SF)
9. TOTAL NUMBER OF HANDICAP ACCESSIBLE SPACES REQUIRED PER COMAR 05.02.02.06 TABLE 1:
(149 SPACES FOR EX. BUILDING: 101 TO 150 = 5 SPACES)
(258 SPACES FOR BLDG. ADDITION: 201 TO 300 = 7 SPACES)
TOTAL OF 12 HANDICAP ACCESSIBLE SPACES REQUIRED
10. PARKING SPACES PROVIDED: 408 (INCL. 12 HC SPACES AND 75 COMPACT PARKING SPACES)
11. DPZ FILE REFERENCES:

SDP-84-255	SDP-84-256	SDP-85-206	SDP-87-032	SDP-87-042
SDP-87-237	SDP-88-42	SDP-88-193	ADP-90-037	SDP-90-116
SDP-94-051	SDP-91-090	SDP-93-024	SDP-93-025	SDP-94-029
SDP-95-014	SDP-95-017	PB-168	PB-267	PB-212
BA-83-54E	BA-85-30E	VP-82-92	VP-84-32	VP-84-70
S-87-36	WP-95-26	WP-00-52	WP-09-227	ECP-12-014
F-10-023	FDP-1	FDP-PEC-1-A		

12. SANITARY SEWER/WATER SERVICE: PRIVATE/PRIVATE

NOTE:
THE LOWER LEVEL OF THE BUILDING (BASEMENT) IS TO BE UTILIZED FOR STORAGE AND MECHANICAL EQUIPMENT ONLY. THIS AREA DOES NOT COUNT TOWARDS FLOOR AREA RATIO (F.A.R.) CALCULATIONS AND DOES NOT REQUIRE PARKING. HOWEVER, IF ANY PORTION OF THE LOWER LEVEL IS CONVERTED TO BECOME OFFICE USE IN THE FUTURE, THEN A RED-LINE REVISION TO THE APPROVED SDP MUST BE SUBMITTED FOR PROCESSING THAT RE-COMPUTES THE F.A.R. AND THE PARKING CALCULATIONS FOR THE PORTION CONVERTED TO EMPLOYMENT USES.

LEGEND

- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. EASEMENT
- EX. ZONING LINE
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. SEWER LINE
- EX. STREAM
- EX. STREAM BUFFER
- EX. TREE LINE
- EX. GUARD RAIL
- EX. LIGHT POLES
- EX. GAS LINE
- PR. BUILDING FOOTPRINT
- PR. BUILDING OVERHANG
- PR. BUILDING SETBACK
- PR. EDGE OF CONCRETE
- PR. CURB
- PR. SIDEWALK
- PR. RETAINING WALL
- PR. POROUS PAVEMENT
- PR. MEDIUM DUTY PAVEMENT
- PR. CONCRETE PAVEMENT
- PR. PAVEMENT MILL AND OVERLAY
- PR. TREELINE
- PR. HEDGEROW
- PR. SWM FACILITY
- PR. BRICK PAVERS OVER CONCRETE
- PR. PERMEABLE PAVERS

CURVE	RADIUS	DELTA	ARC	TANGENT	CHORD BEARING	CHORD
C-1	3849.00'	2°08'51"	144.27'	72.14'	S51°28'48"E	144.26'
C-2	3791.00'	2°08'51"	142.10'	71.06'	S51°28'48"E	142.09'
C-3	3788.00'	2°08'51"	141.98'	71.00'	S53°37'39"E	141.97'
C-4	3852.00'	2°08'51"	144.37'	72.20'	S53°37'39"E	144.37'

ADDRESS CHART

PARCEL #	STREET ADDRESS
P-A / P-145	7500 GRACE DRIVE

PERMIT INFORMATION CHART

SUBDIVISION NAME					PARCEL NO.
W R GRACE & CO.					PARCEL 145
PLAT NO. OR L/F	GRID #	ZONING	TAX MAP NO.	ELECT. DIST.	CENSUS TRACT
PLAT NO. 21235 & 21236	21 & 22	PEC	35	5	6055.11
WATER CODE: 6580000			SEWER CODE: E-24		

SHEET INDEX

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AS-BUILT PLAN

FOR AS-BUILT
[seal: STATE OF MARYLAND, THOMAS C. NEUGEBAUER, 29203, PROFESSIONAL ENGINEER] 7-7-14

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

NOTE:
THIS SITE COMPLIES WITH THE HOWARD COUNTY GREEN BUILDING LAW SET FORTH UNDER TITLE 3, SUBTITLE 10 OF THE HOWARD COUNTY CODE AND SECTION 3.1005(a) OF THE CODE. REGISTRATION WITH THE GREEN BUILDING COUNCIL AND THE APPLICABLE LEED REGISTRATION FEE WAS PAID ON JANUARY 13, 2012. THE LEED NEW CONSTRUCTION CHECKLIST WAS PREPARED, SIGNED AND DATED BY THE PROJECT LEED ACCREDITED PROFESSIONAL AND WAS RECEIVED BY DPZ ON JULY 18, 2012. THE PROPOSED BUILDING IS TENTATIVELY CERTIFIED BY LEED WITH A SILVER RATING.

SHEET: SDP-01

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

[seal: STATE OF MARYLAND, THOMAS C. NEUGEBAUER, 29203, PROFESSIONAL ENGINEER] 10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

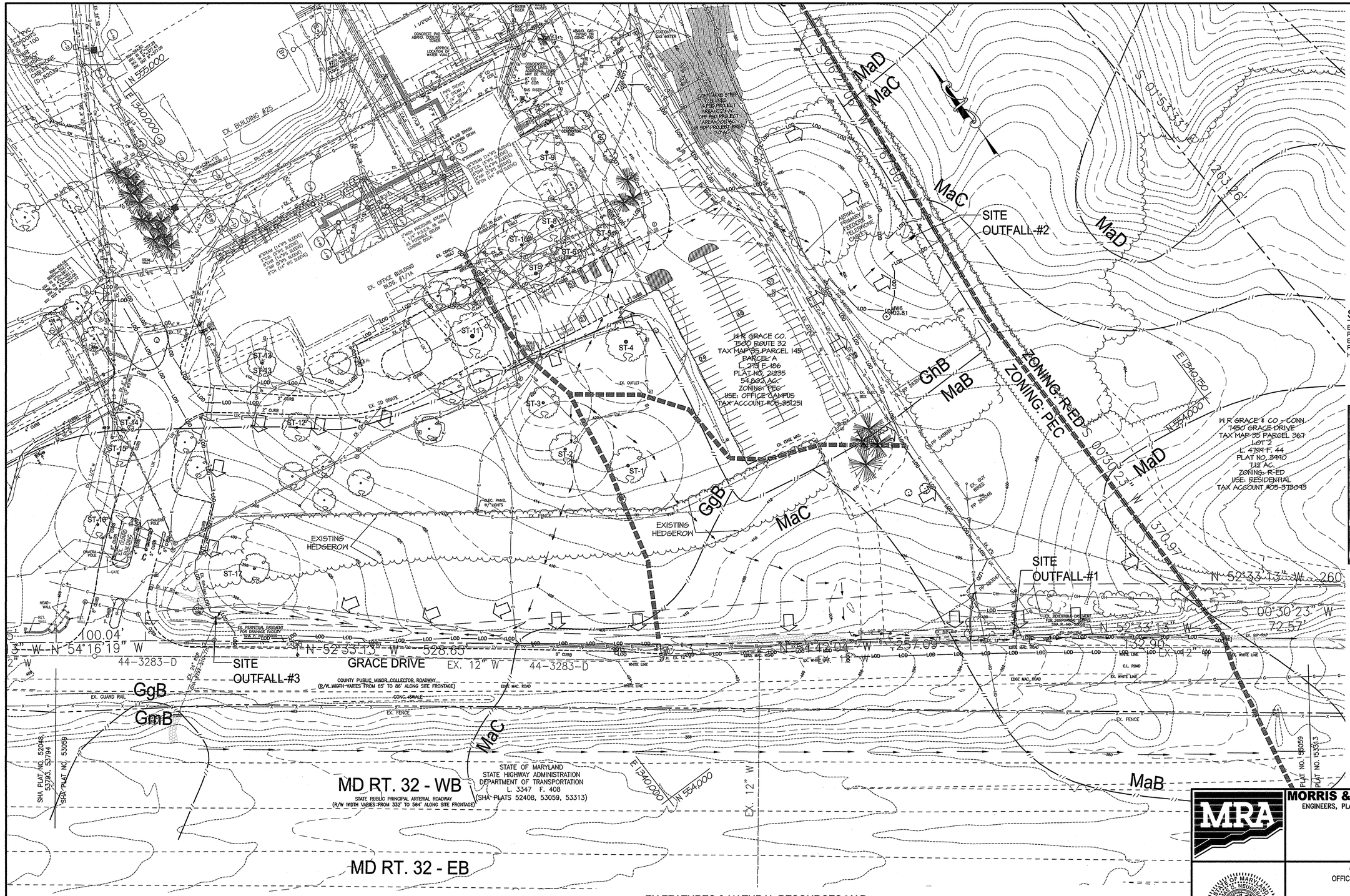
COVER SHEET

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
07/07/14	AS-BUILT INFORMATION ADDED TO PLAN	JOB NO.:	12039
		SCALE:	AS SHOWN
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	1 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-01-COVER.dwg, 10/17/2012 9:18:51 AM, RHall, 1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



LEGEND

10	EX. 10' CONTOUR
2	EX. 2' CONTOUR
	EX. PROPERTY LINE
	EX. ADJACENT PROPERTY LINE
	EX. RIGHT OF WAY
	EX. EASEMENT
	EX. ZONING LINE
	EX. BUILDING
	EX. CONCRETE
	EX. PAVEMENT
X	EX. FENCE
OH	EX. OVERHEAD LINE
W	EX. WATER LINE
S	EX. SEWER LINE
	EX. STREAM
	EX. STREAM BUFFER
	EX. RIP-RAP CHANNEL
	EX. TREE LINE
G	EX. GUARD RAIL
E	EX. ELECTRIC CONDUIT
	EX. LIGHT POLES
G	EX. GAS LINE
S	EX. STORM DRAIN
C	EX. CONDUIT
FO	EX. FIBER OPTIC
TV	EX. TV LINE
E	EX. ELECTRIC MANHOLE
T	EX. TELEPHONE MANHOLE
UK	EX. UNKNOWN UTILITY
	DRAINAGE PATTERN-CONCENTRATED FLOW
	DRAINAGE PATTERN-SHEET FLOW
LOD	LIMIT OF DISTURBANCE-PROJECT AREA
	EX. SOILS LINE
GhB	EX. SOIL DESCRIPTION

SITE DATA

EXISTING SITE AREA:	54.802 AC.
PROPOSED DISTURBED AREA:	8.40 AC.
EXISTING IMPERVIOUS AREA:	1.75 AC.
PROPOSED IMPERVIOUS AREA:	3.90 AC.
HYDROLOGICAL SOIL GROUP:	B (100%)

SOILS MAP

EX FEATURES & NATURAL RESOURCES MAP

SCALE: 1"=50'

SOILS CHART

SYMBOL [1]	NAME/DESCRIPTION [1]	SOIL TYPE	HYDRIC [2] SOIL	K [1] FACTOR
GgB	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	NO	0.20
GhB	GLENELG-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	B	NO	NONE LISTED
MaB	MANOR LOAM, 3 TO 8 PERCENT SLOPES	B	NO	0.24
MaC	MANOR LOAM, 8 TO 15 PERCENT SLOPES	B	NO	0.24
MaD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	NO	0.24

1. SOURCE: K FACTOR VALUES FOR WHOLE SOIL FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE'S WEB SOIL SURVEY, CONSULTED ON MAY 30, 2011. AVAILABLE ON-LINE AT <HTTP://WEBSOILSURVEY.NRCS.USDA.GOV/>
2. HYDRIC SOILS INFORMATION ADAPTED FROM THE NATURAL RESOURCE CONSERVATION SERVICE'S NATIONAL HYDRIC SOILS LIST, CONSULTED ON MAY 5, 2011, AVAILABLE ON-LINE AT <HTTP://SOILS.USDA.GOV/USE/HYDRIC/>.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	DATE 11/29/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 11/14/12
CHIEF, DIVISION & LAND DEVELOPMENT	DATE 11/19/12

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

STATE OF MARYLAND · THOMAS G. NEUGER · 29203 · PROFESSIONAL ENGINEER

MD PROFESSIONAL CERTIFICATION: 10-17-12

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. 29203, EXPIRATION DATE: 06/16/2013.

SHEET: SDP-02

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

EX. FEATURES, SOILS & RESOURCES MAP

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	1" = 50'
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	2 OF 46

SDP-12-077

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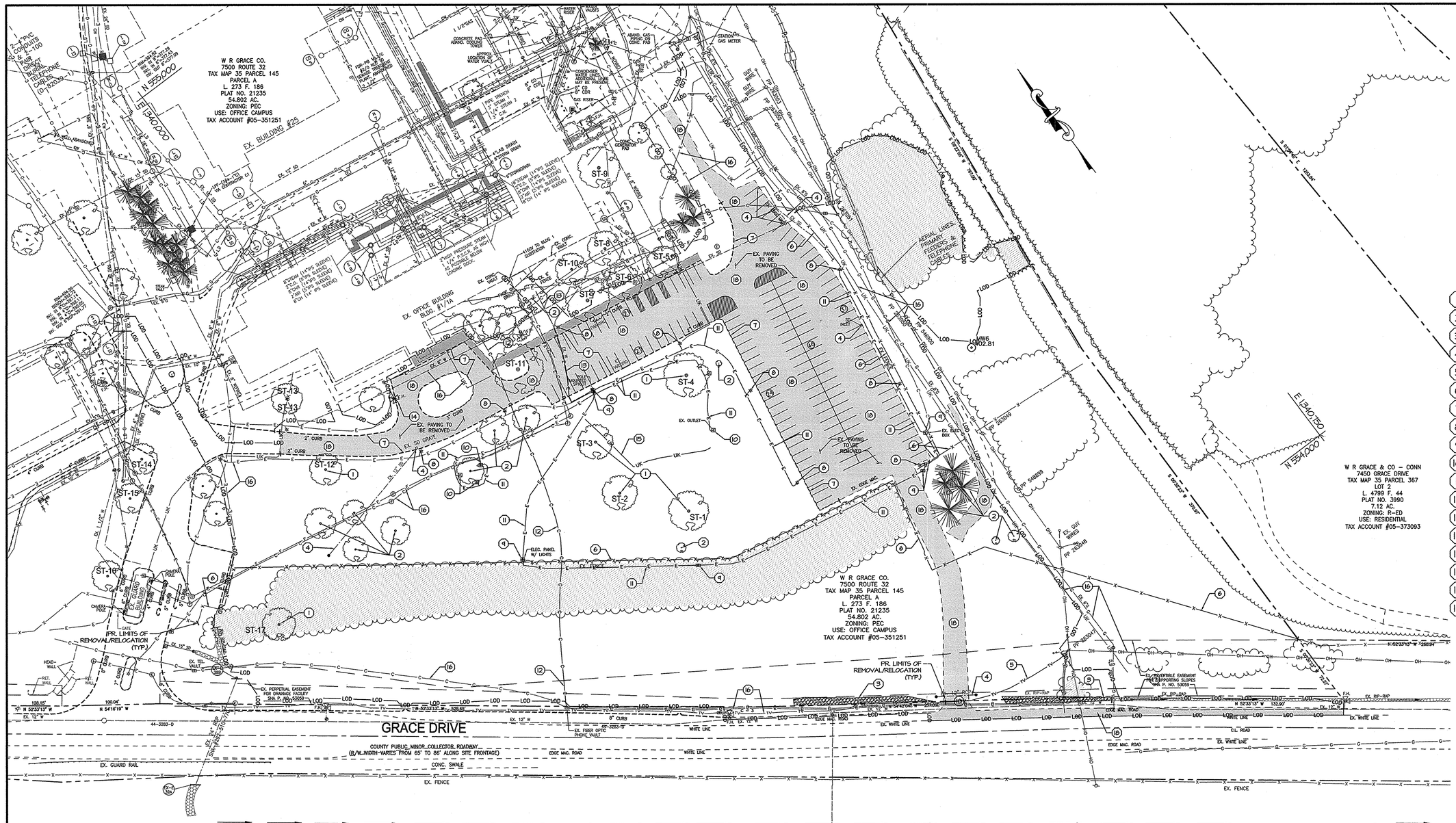
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



LEGEND

- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. EASEMENT
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. OVERHEAD LINE
- EX. WATER LINE
- EX. SEWER LINE
- EX. STREAM
- EX. STREAM BUFFER
- EX. RIP-RAP CHANNEL
- EX. TREE LINE
- EX. GUARD RAIL
- EX. ELECTRIC CONDUIT
- EX. LIGHT POLES
- EX. GAS LINE
- EX. STORM DRAIN
- EX. CONDUIT
- EX. FIBER OPTIC
- EX. TV LINE
- EX. ELECTRIC MANHOLE
- EX. TELEPHONE MANHOLE
- EX. UNKNOWN UTILITY
- EX. CONCRETE TO BE REMOVED
- EX. PAVING TO BE REMOVED
- EX. WOODS TO BE REMOVED
- PR. LIMIT OF DISTURBANCE
- PR. TREELINE
- PR. HEDGEROW

DEMOLITION NOTES

1. EXISTING SPECIMEN TREE TO BE REMOVED.
2. EXISTING TREE OR SHRUB TO BE REMOVED.
3. EXISTING RIP-RAP TO BE REMOVED.
4. EXISTING STORM DRAIN TO BE REMOVED.
5. EXISTING CATV LINE TO BE RELOCATED.
6. EXISTING FENCE TO BE REMOVED.
7. EXISTING CURB TO BE REMOVED.
8. EXISTING LIGHT POLE AND BASE TO BE REMOVED.
9. EXISTING ELECTRIC BOX TO BE REMOVED.
10. EXISTING ELECTRIC OUTLET TO BE REMOVED.
11. EXISTING ELECTRIC LINE TO BE REMOVED.
12. EXISTING FIBER OPTIC TO BE REMOVED. COORDINATE WITH VERIZON ON RELOCATION.
13. EXISTING WATER TO TO BE REMOVED.
14. EXISTING FIRE HYDRANT TO BE REMOVED & CAPPED.
15. EXISTING UNKNOWN UTILITY TO BE REMOVED.
16. EXISTING UTILITY TO REMAIN.
17. EXISTING RIP-RAP TO REMAIN.
18. EXISTING PAVING TO BE REMOVED.

DEMOLITION PLAN

SCALE: 1"=50'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/29/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/9/12

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

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STATE OF MARYLAND — MICHAEL KEITH — 29203 — PROFESSIONAL ENGINEER — 10-17-12

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
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GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

DEMOLITION PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	1" = 50'
		DATE:	10/16/2012
		DRAWN BY:	MK/RAH
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	3 OF 46

SHEET: SDP-03

SDP-12-077

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NOTE:
ALL SEDIMENT CONTROLS THAT MAY BE DAMAGED DURING CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY.

PHASE-I EROSION & SEDIMENT CONTROL PLAN

SCALE: 1"=40'

SEQUENCE OF CONSTRUCTION

PHASE-I

1. OBTAIN GRADING PERMIT. — 1 DAY
2. CLEAR FOR AND INSTALL STABILIZED CONSTRUCTION ENTRANCE, TEMPORARY ACCESS ROAD, PERIMETER SEDIMENT CONTROLS, SUPER SILT FENCE, MOUNTABLE BERM, CONTRACTOR STAGING AREA, STOCKPILE AREA, AND SEDIMENT TRAPS #1, 2 & 3. — 3 WEEKS
3. CONSTRUCT PROPOSED STORM DRAIN SYSTEM, M-1 TO HW-1, I-26 TO ES-13, & I-9 TO ES-2. INSTALL INLET BLOCKING. — 1 WEEK
4. INSTALL EARTH DIKES AND TEMPORARY SWALES. INSTALL ASPHALT BERM FOR CLEAR WATER DIVERSION. — 1 WEEK
5. WITH HOWARD COUNTY SEDIMENT CONTROL INSPECTOR'S PERMISSION, PROCEED WITH PHASE-II. — 1 DAY

PHASE-II

1. CLEAR & GRUB, BEGIN ROUGH GRADING OF SITE. REMOVE EX. PAVEMENT AND REMOVE EX. UTILITIES. SEE DEMOLITION PLAN. EXCAVATE & BEGIN CONSTRUCTION OF BUILDING FOUNDATION. — 4 WEEKS
2. CONVERT SEDIMENT TRAP-#3 TO #3B. — 3 DAYS
3. CONSTRUCT RETAINING WALLS #1 - 3. — 1 WEEK
4. BEGIN UTILITY CONSTRUCTION AND COMPLETE STORM DRAIN SYSTEM, INSTALL INLET PROTECTION AS STORM DRAIN INSTALLATION PROCEEDS. INLETS I-5 & I-11 SHALL ALSO BE WRAPPED IN SUPER SILT FENCE. INSTALL RAINWATER HARVESTING CISTERNS. — 6 WEEKS
5. FINE GRADE AND INSTALL CURB AND GUTTER, AND BASE PAVING AT ENTRANCE. — 1 MONTH

PHASE-III

1. BEGIN BUILDING CONSTRUCTION. INSTALL SEDIMENT CONTROLS FOR THE BUILDING CONSTRUCTION AS SHOWN ON SHEET SDP-08. — 3 MONTHS
2. INSTALL PLAZA AREA, POROUS PAVEMENT AND CONCRETE PAVEMENT SECTIONS. — 2 WEEKS
3. CONSTRUCT ROAD IMPROVEMENT ON GRACE DRIVE. — 1 WEEK
4. WHEN RECEIVING AREA IS STABILIZED, REMOVE INLET PROTECTION AND FLUSH STORM DRAINAGE SYSTEM. — 1 WEEK
5. WITH HOWARD COUNTY SEDIMENT CONTROL INSPECTOR'S PERMISSION, REMOVE SEDIMENT TRAPS, EARTH DIKES, TEMPORARY SWALES & SUPER SILT FENCE. — 2 WEEKS
6. CONSTRUCT RETAINING WALL #4. — 2 DAYS
7. INSTALL MICRO BIORETENTION FACILITIES AND BIO-SWALES. — 3 WEEKS
8. STABILIZE REMAINING AREAS AND BEGIN LANDSCAPING. — 5 DAYS

BY THE DEVELOPER

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

10/16/2012
SIGNATURE OF DEVELOPER — DATE
Nizam Usta
GRACE

BY THE ENGINEER

"I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

10/17/2012
SIGNATURE OF ENGINEER — DATE
THOMAS C. NEUGEBAUER, P.E. MD LICENSE #29203

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

10/23/12
HOWARD S.C.D. — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

11/29/12
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE

11/14/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

11/19/12
CHIEF, DIVISION & LAND DEVELOPMENT — DATE

SUMMARY TABLE PIPE OUTLET SEDIMENT TRAP ST-1	
SEDIMENT TRAP NO.	1
DRAINAGE AREA (PHASE I)	2.36 ACRES
DRAINAGE AREA (PHASE II)	3.81 ACRES
TOTAL STORAGE REQUIRED	13,716 C.F.
TOTAL STORAGE PROVIDED	13,750 C.F.
WET STORAGE REQUIRED	6,858 C.F.
WET STORAGE PROVIDED	6,858 C.F.
DRY STORAGE REQUIRED	6,858 C.F.
DRY STORAGE PROVIDED	6,892 C.F.
TRAP BOTTOM ELEVATION	394.0'
TRAP BOTTOM DIMENSION	166'X28'
RISER CREST (DRY STORAGE) ELEVATION	397.0'
OUTLET (WET STORAGE) ELEVATION	395.69'
CLEANOUT ELEVATION	394.85'
TOP OF EMBANKMENT ELEVATION	398.0'
SIDE SLOPE	2:1
EMBANKMENT WIDTH	4.0'
RISER DIAMETER	24"
BARREL DIAMETER	21" CMP
TRASH RACK DIAMETER	36"
TRASH RACK HEIGHT	21"
OUTLET PROTECTION-LENGTH	10'
OUTLET PROTECTION-WIDTH	5'
OUTLET PROTECTION-DEPTH	19"

SUMMARY TABLE PIPE OUTLET SEDIMENT TRAP ST-1	
SEDIMENT TRAP NO.	3
DRAINAGE AREA (PHASE I)	2.29 ACRES
DRAINAGE AREA (PHASE II)	1.97 ACRES
TOTAL STORAGE REQUIRED	8,244 C.F.
TOTAL STORAGE PROVIDED	14,572 C.F.
WET STORAGE REQUIRED	4,122 C.F.
WET STORAGE PROVIDED	5,461 C.F.
DRY STORAGE REQUIRED	4,122 C.F.
DRY STORAGE PROVIDED	9,111 C.F.
TRAP BOTTOM ELEVATION	394.0'
TRAP BOTTOM DIMENSION	82'X46'
RISER CREST (DRY STORAGE) ELEVATION	397.50'
OUTLET (WET STORAGE) ELEVATION	395.50'
CLEANOUT ELEVATION	394.66'
TOP OF EMBANKMENT ELEVATION	398.50'
SIDE SLOPE	2:1
EMBANKMENT WIDTH	4.0'
RISER DIAMETER	18"
BARREL DIAMETER	15" CMP
TRASH RACK DIAMETER	27"
TRASH RACK HEIGHT	16"
OUTLET PROTECTION-LENGTH	10'
OUTLET PROTECTION-WIDTH	5'
OUTLET PROTECTION-DEPTH	19"

SUMMARY TABLE TEMPORARY SWM FOR TRAP-#1	
DRAINAGE AREA (ULTIMATE)	3.81 ACRES
RAINFALL FREQUENCY	1 YEAR
24 HOUR RAINFALL	2.6"
RUNOFF CURVE NUMBER	80
Q1 PEAK INFLOW	5.60 cfs
Q1 PEAK OUTFLOW	0.50 cfs
Q1 REQUIRED STORAGE VOLUME	0.1728 ac-ft.
CLEANOUT VOLUME & ELEV. PROVIDED	0.0798 ac-ft @ 394.85'
WET STORAGE & ELEV. PROVIDED	0.1574 ac-ft @ 395.69'
DRY STORAGE & ELEV. PROVIDED	0.1582 ac-ft @ 397.00'
TOTAL SWM STORAGE & ELEV. PROVIDED	0.1728 ac-ft @ 397.10'

SOILS LEGEND		
SYMBOL	NAME/DESCRIPTION	SOIL TYPE
BaA	BAILE SILT LOAM, 0-3% SLOPES	C
Co	CODORUS & HATBORO SILT LOAM, 0-3% SLOPES	B
GgB	GLENELG LOAM, 3-8% SLOPES	B
GhB	GLENELG-URBAN LAND COMPLEX, 0-8% SLOPES	B
GmB	GLENVILLE SILT LOAM, 3-8% SLOPES	C
GmC	GLENVILLE SILT LOAM, 8-15% SLOPES	B
GuB	GLENVILLE-URBAN LAND-UDORTHENTS COMPLEX, 0-8% SLOPES	C
MaB	MANOR LOAM, 3-8% SLOPES	B
MaC	MANOR LOAM, 8-15% SLOPES	B
MaD	MANOR LOAM, 15-25% SLOPES	B
MkF	MANOR-BRINKLOW COMPLEX, 25-65% SLOPES, VERY ROCKY	B

LEGEND

- EX. 10' CONTOUR
- EX. 2' CONTOUR
- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. OVERHEAD LINE
- EX. WATER LINE
- EX. SEWER LINE
- EX. STREAM
- EX. STREAM BUFFER
- EX. RIP-RAP CHANNEL
- EX. TREE LINE
- EX. GUARD RAIL
- EX. ELECTRIC CONDUIT
- EX. LIGHT POLES
- EX. GAS LINE
- EX. STORM DRAIN
- EX. CONDUIT
- EX. FIBER OPTIC
- EX. TV LINE
- EX. ELECTRIC MANHOLE
- EX. TELEPHONE MANHOLE
- EX. UNKNOWN UTILITY
- EX. SOILS LINE
- GhB — EX. SOIL DESCRIPTION
- PR. 1' CONTOUR (ESC)
- PR. 2' CONTOUR (ESC)
- PR. 10' CONTOUR (ESC)
- PR. EARTH DIKE
- PR. TEMPORARY SWALE
- LOD — PR. LIMITS OF DISTURBANCE
- SSF — PR. SUPER SILT FENCE
- SFOP — PR. SILT FENCE ON PAVEMENT
- TP — PR. TREE PROTECTION FENCE
- RPS — REMOVAL PUMPING STATION
- CD — PR. STONE CHECK DAM
- SCE — PR. STABILIZED CONSTRUCTION ENTRANCE
- PR. SEDIMENT TRAP DRAINAGE AREA
- PR. TREELINE
- PR. HEDGEROW

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-04

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GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

PHASE-I EROSION & SEDIMENT CONTROL PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — 29203 — PROFESSIONAL ENGINEER
10-17-12

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DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	1" = 40'
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		DRAWN BY:	MK
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SDP-12-077

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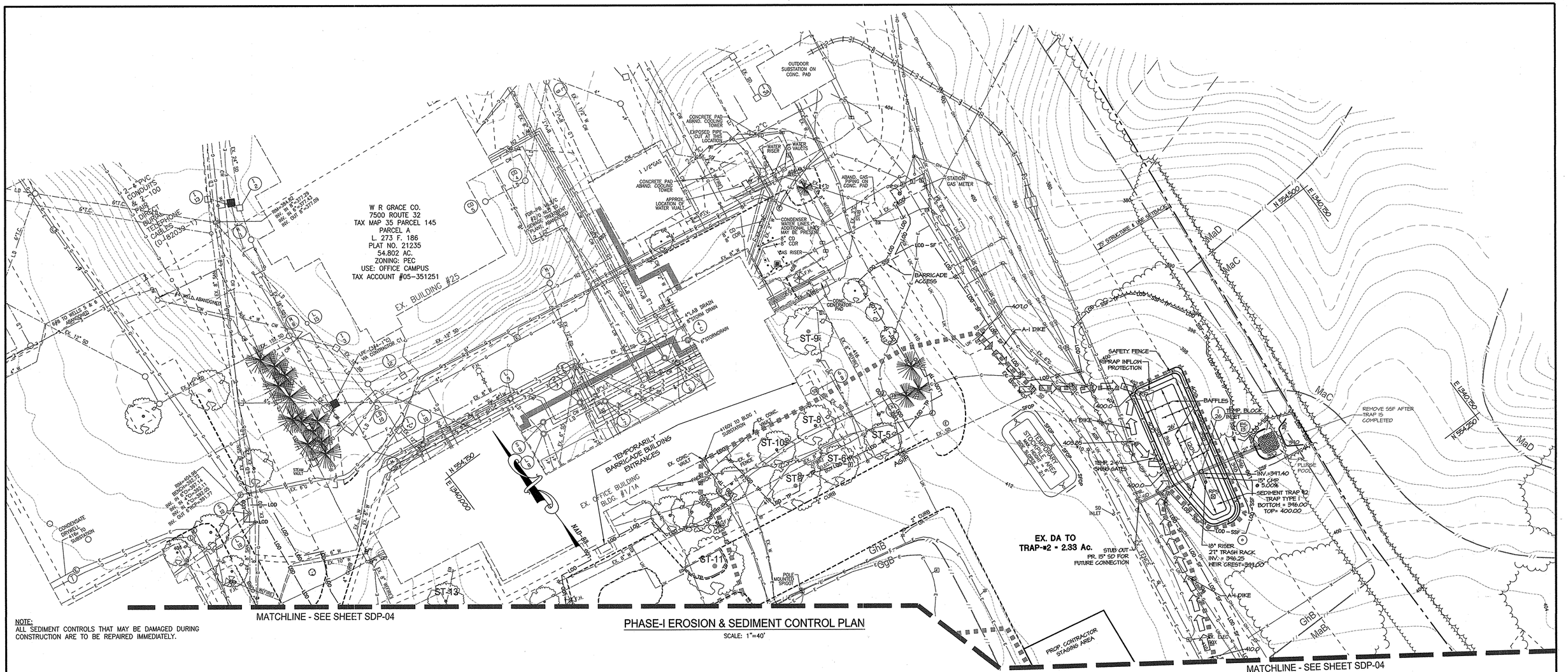

PHASE-I EROSION & SEDIMENT CONTROL PLAN

SCALE: 1"=40'

NOTE:
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BY THE DEVELOPER

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Nizam Usta — 10/16/12
SIGNATURE OF DEVELOPER — DATE
Nizam Usta
GRACE

BY THE ENGINEER

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10/17/2012
SIGNATURE OF ENGINEER — DATE
THOMAS C. NEUGEBAUER, P.E. MD LICENSE #29203

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

10/25/12
HOWARD S.C.D. — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — 11/9/12 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 11/14/12 DATE

CHIEF, DIVISION & LAND DEVELOPMENT — 11/9/12 DATE

SUMMARY TABLE
PIPE OUTLET SEDIMENT TRAP ST-1

SEDIMENT TRAP NO.	2
DRAINAGE AREA (PHASE I)	2.33 ACRES
DRAINAGE AREA (PHASE II)	1.90 ACRES
TOTAL STORAGE REQUIRED	8,388 C.F.
TOTAL STORAGE PROVIDED	11,393 C.F.
WET STORAGE REQUIRED	4,194 C.F.
WET STORAGE PROVIDED	6,228 C.F.
DRY STORAGE REQUIRED	4,194 C.F.
DRY STORAGE PROVIDED	5,165 C.F.
TRAP BOTTOM ELEVATION	396.0'
TRAP BOTTOM DIMENSION	120'X26'
RISER CREST (DRY STORAGE) ELEVATION	399.0'
OUTLET (WET STORAGE) ELEVATION	397.80'
CLEANOUT ELEVATION	396.80'
TOP OF EMBANKMENT ELEVATION	400.0'
SIDE SLOPE	2:1
EMBANKMENT WIDTH	4.0'
RISER DIAMETER	18"
BARREL DIAMETER	15" CMP
TRASH RACK DIAMETER	27"
TRASH RACK HEIGHT	16"
OUTLET PROTECTION-LENGTH	PLUNGE POOL
OUTLET PROTECTION-WIDTH	PLUNGE POOL
OUTLET PROTECTION-DEPTH	PLUNGE POOL

SOILS LEGEND

SYMBOL	NAME/DESCRIPTION	SOIL TYPE
BaA	BAILE SILT LOAM, 0–3% SLOPES	C
Co	CODORUS & HATBORO SILT LOAM, 0–3% SLOPES	B
GgB	GLENELG LOAM, 3–8% SLOPES	B
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MaC	MANOR LOAM, 8–15% SLOPES	B
MaD	MANOR LOAM, 15–25% SLOPES	B
MkF	MANOR–BRINKLOW COMPLEX, 25–65% SLOPES, VERY ROCKY	B

LEGEND

- EX. 10' CONTOUR
- EX. 2' CONTOUR
- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. OVERHEAD LINE
- EX. WATER LINE
- EX. SEWER LINE
- EX. STREAM
- EX. STREAM BUFFER
- EX. RIP-RAP CHANNEL
- EX. TREE LINE
- EX. GUARD RAIL
- EX. ELECTRIC CONDUIT
- EX. LIGHT POLES
- EX. GAS LINE
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- EX. CONDUIT
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- EX. SOILS LINE
- GhB EX. SOIL DESCRIPTION

- PR. 1' CONTOUR (ESC)
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- PR. EARTH DIKE
- PR. TEMPORARY SWALE
- PR. LIMITS OF DISTURBANCE
- PR. SUPER SILT FENCE
- PR. SILT FENCE ON PAVEMENT
- PR. TREE PROTECTION FENCE
- RPS REMOVAL PUMPING STATION
- CD PR. STONE CHECK DAM
- SCD PR. STABILIZED CONSTRUCTION ENTRANCE
- PR. SEDIMENT TRAP DRAINAGE AREA
- PR. TREELINE
- PR. HEDGEROW

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-05

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — 29203 — PROFESSIONAL ENGINEER
10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

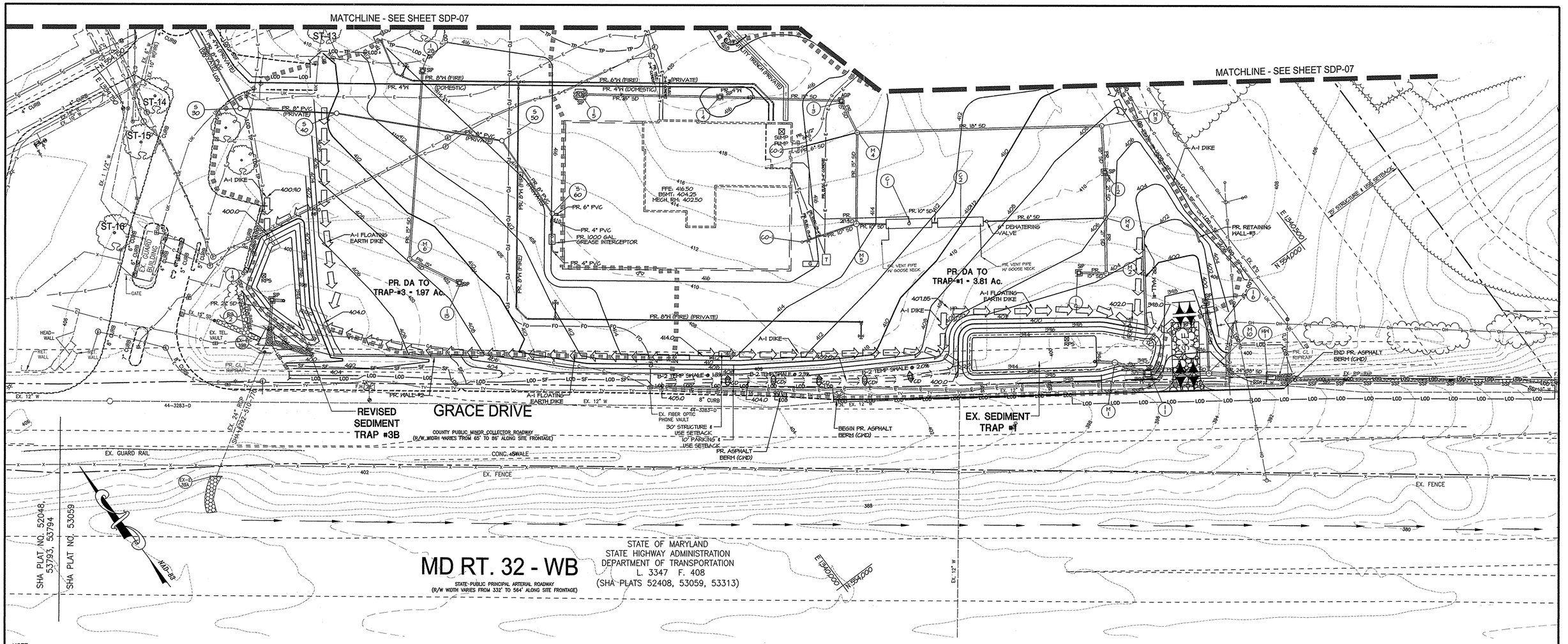
PHASE-I EROSION & SEDIMENT CONTROL PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	1" = 40'
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	5 OF 46

SDP-12-077

P:\PROJ\2039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\2039-SDP-05-PH1-ESC PLAN.dwg, 10/16/2012 2:21:56 PM, Rholl,
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



NOTE:
ALL SEDIMENT CONTROLS THAT MAY BE DAMAGED DURING CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY.

PHASE-II EROSION & SEDIMENT CONTROL PLAN

SCALE: 1"=40'

BY THE DEVELOPER

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF DEVELOPER — DATE 10/16/2012
NIZAM USTA
GRACE

BY THE ENGINEER

"I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF ENGINEER — DATE 10/17/2012
THOMAS C. HEDGEBAUER, P.E. MD LICENSE #29203

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD S.C.D. — DATE 10/23/12

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/09/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

SUMMARY TABLE
PIPE OUTLET SEDIMENT TRAP ST-1

SEDIMENT TRAP NO.	3B (REVISED)
DRAINAGE AREA (PHASE I)	2.29 ACRES
DRAINAGE AREA (PHASE II)	1.97 ACRES
TOTAL STORAGE REQUIRED	7,092 C.F.
TOTAL STORAGE PROVIDED	7,108 C.F.
WET STORAGE REQUIRED	3,546 C.F.
WET STORAGE PROVIDED	3,560 C.F.
DRY STORAGE REQUIRED	3,546 C.F.
DRY STORAGE PROVIDED	3,548 C.F.
TRAP BOTTOM ELEVATION	394.0'
TRAP BOTTOM DIMENSION	84'X30'
RISER CREST (DRY STORAGE) ELEVATION	397.0'
OUTLET (WET STORAGE) ELEVATION	395.70'
CLEANOUT ELEVATION	394.95'
TOP OF EMBANKMENT ELEVATION	398.0'
SIDE SLOPE	2:1
EMBANKMENT WIDTH	4.0'
RISER DIAMETER	18"
BARREL DIAMETER	15" CMP
TRASH RACK DIAMETER	27"
TRASH RACK HEIGHT	16"
OUTLET PROTECTION-LENGTH	10'
OUTLET PROTECTION-WIDTH	5'
OUTLET PROTECTION-DEPTH	19"

ESD CONVERSION INSTALLATION SEQUENCE

1. PUMP-OUT ANY REMAINING WATER. IF NECESSARY USE A FLOCCULENT TO CLEAR WATER PRIOR TO PUMPING. FILTER PUMP EFFLUENT THROUGH SILT SACKS. DRY-OUT POND BOTTOM AND REMOVE ANY UNSUITABLE SOILS TO FINAL GRADES.
2. REMOVE DEWATERING DEVICES AND INSTALL POND DRAIN SYSTEM. INSTALL TRASH RACKS AND UNBLOCK ORIFICES. REMOVE ANY REMAINING RISER BLOCKING.
3. INSTALL FOREBAYS, GABION WALLS, BERMS, GABION MATTRESSES, AND STABILIZE BERMS IMMEDIATELY USING SOD. DISC BOTTOM OF INFILTRATION BASIN AREA. INSTALL ACCESS ROADS, FENCES AND GATES.
4. STABILIZE ALL SLOPES AND POND BOTTOMS AND FOREBAY AREAS WITH SEED AND MULCH. SLOPES 3:1 WILL REQUIRE SOD STABILIZATION. CLOSE POND DRAIN VALVES.
5. REQUEST ENGINEER TO PERFORM FINAL SWM SURVEY AND INSPECTION.

LEGEND

- EX. 10' CONTOUR
- EX. 2' CONTOUR
- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. OVERHEAD LINE
- EX. WATER LINE
- EX. SEWER LINE
- EX. STREAM
- EX. STREAM BUFFER
- EX. RIP-RAP CHANNEL
- EX. TREE LINE
- EX. GUARD RAIL
- EX. ELECTRIC CONDUIT
- EX. LIGHT POLES
- EX. GAS LINE
- EX. STORM DRAIN
- EX. CONDUIT
- EX. FIBER OPTIC
- EX. TV LINE
- EX. ELECTRIC MANHOLE
- EX. TELEPHONE MANHOLE
- EX. UNKNOWN UTILITY

- PR. 1' CONTOUR (ESC)
- PR. 2' CONTOUR (ESC)
- PR. 10' CONTOUR (ESC)
- PR. EARTH DIKE
- PR. TEMPORARY SWALE
- PR. LIMITS OF DISTURBANCE
- PR. SUPER SILT FENCE
- PR. TREE PROTECTION FENCE
- RPS — REMOVAL PUMPING STATION
- CD — PR. STONE CHECK DAM
- SCE — PR. STABILIZED CONSTRUCTION ENTRANCE
- PR. SEDIMENT TRAP DRAINAGE AREA
- PR. TREELINE
- PR. HEDGEROW
- PR. ELECTRIC CONDUIT
- PR. TELEPHONE CONDUIT
- PR. FIBER OPTIC
- PR. GAS
- PR. SANITARY SEWER
- PR. STORM DRAIN
- PR. WATER LINE

OWNER / APPLICANT / DEVELOPER:

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COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-06

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FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND — THOMAS C. HEDGEBAUER — 29203 — PROFESSIONAL ENGINEER — 10-17-12

MD PROFESSIONAL CERTIFICATION:

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GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

PHASE-II EROSION & SEDIMENT CONTROL PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

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		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	6 OF 46

SDP-12-077

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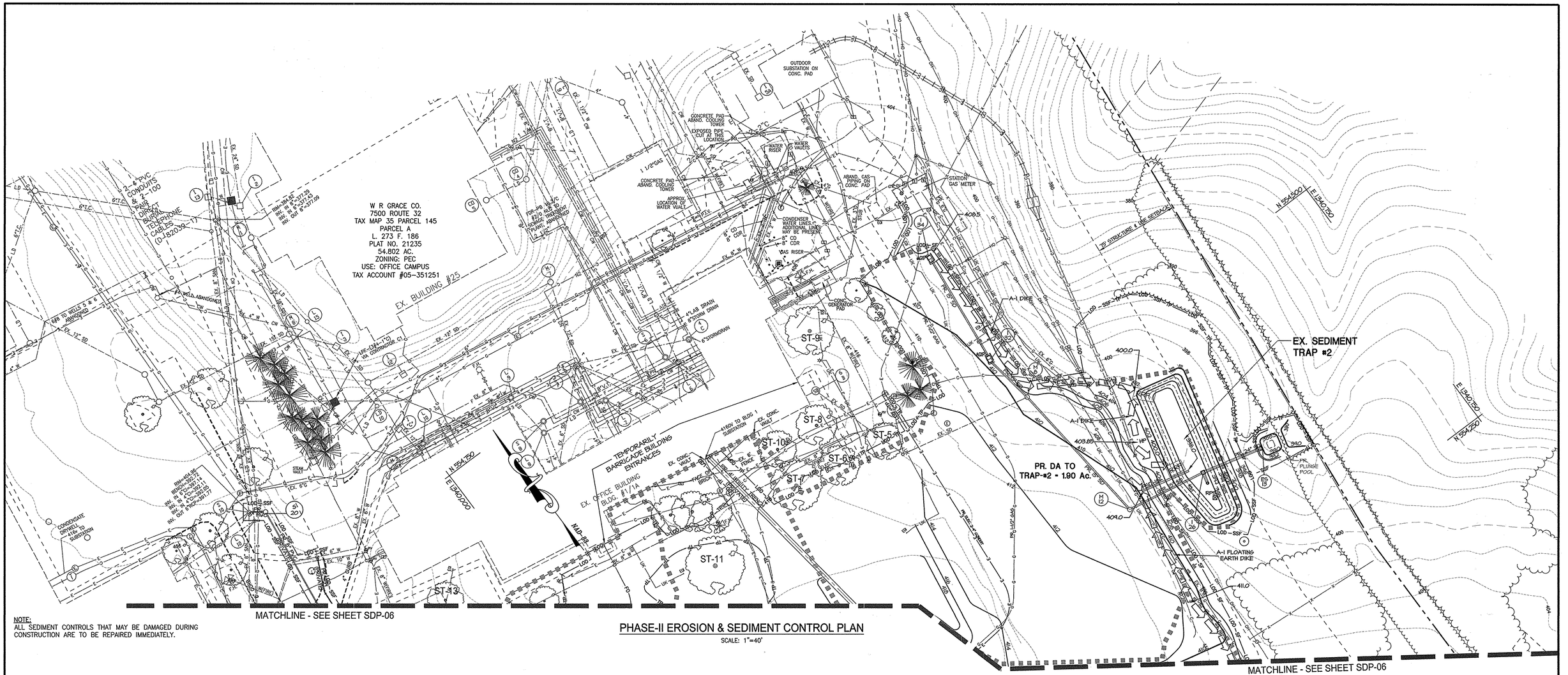
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



NOTE:
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PHASE-II EROSION & SEDIMENT CONTROL PLAN

SCALE: 1"=40'

LEGEND

10 / 2	EX. 10' CONTOUR / EX. 2' CONTOUR
	EX. PROPERTY LINE
	EX. ADJACENT PROPERTY LINE
	EX. RIGHT OF WAY
	EX. BUILDING
	EX. CONCRETE
	EX. PAVEMENT
X X	EX. FENCE
OH OH	EX. OVERHEAD LINE
	EX. WATER LINE
	EX. SEWER LINE
	EX. STREAM
	EX. STREAM BUFFER
	EX. RIP-RAP CHANNEL
	EX. TREE LINE
	EX. GUARD RAIL
E E	EX. ELECTRIC CONDUIT
	EX. LIGHT POLES
G G	EX. GAS LINE
S S	EX. STORM DRAIN
C C	EX. CONDUIT
FO FO	EX. FIBER OPTIC
TV TV	EX. TV LINE
E	EX. ELECTRIC MANHOLE
T	EX. TELEPHONE MANHOLE
UK	EX. UNKNOWN UTILITY
	PR. 1' CONTOUR (ESC)
	PR. 2' CONTOUR (ESC)
	PR. 10' CONTOUR (ESC)
	PR. EARTH DIKE
	PR. TEMPORARY SWALE
LOD LOD	PR. LIMITS OF DISTURBANCE
SSF SSF	PR. SUPER SILT FENCE
TP TP	PR. TREE PROTECTION FENCE
RPS	REMOVAL PUMPING STATION
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	PR. SEDIMENT TRAP DRAINAGE AREA
	PR. TREELINE
	PR. HEDGEROW
E E	PR. ELECTRIC CONDUIT
T T	PR. TELEPHONE CONDUIT
FO FO	PR. FIBER OPTIC
G G	PR. GAS
	PR. SANITARY SEWER
	PR. STORM DRAIN
	PR. WATER LINE

BY THE DEVELOPER

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SIGNATURE OF DEVELOPER — DATE 10/16/2012
Nizam Usta
GRACE

BY THE ENGINEER

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SIGNATURE OF ENGINEER — DATE 10/17/2012
THOMAS C. NEUGEBAUER, P.E. MD LICENSE #29203

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HOWARD S.C.D. — DATE 10/23/12

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/29/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/16/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

ESD CONVERSION INSTALLATION SEQUENCE

1. PUMP-OUT ANY REMAINING WATER. IF NECESSARY USE A FLOCCULENT TO CLEAR WATER PRIOR TO PUMPING. FILTER PUMP EFFLUENT THROUGH SILT SACKS. DRY-OUT POND BOTTOM AND REMOVE ANY UNSUITABLE SOILS TO FINAL GRADES.
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5. REQUEST ENGINEER TO PERFORM FINAL SWM SURVEY AND INSPECTION.

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-07

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
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(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — 29203 — PROFESSIONAL ENGINEER — 10-17-12

MD. PROFESSIONAL CERTIFICATION:
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GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

PHASE-II EROSION & SEDIMENT CONTROL PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

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		DESIGN BY:	MK
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		SHEET:	7 OF 46

SDP-12-077

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11", Copyright 2012 Morris & Ritchie Associates, Inc.

MATCHLINE - SEE SHEET SDP-09

MATCHLINE - SEE SHEET SDP-09

PR. 3-STORY OFFICE BLDG.
BLDG #100
107,471 S.F.
FFE: 416.50
BSMT: 404.25
MECH. RM: 40250

PR. SCREEN WALL
SEE ARCHITECTURE PLANS

TEMPORARY STOCKPILE

PR. RETAINING WALL #1

PR. RETAINING WALL #2

PR. RETAINING WALL #3

PR. RETAINING WALL #4

PR. GUARDRAIL

PR. GUARD RAIL

PR. SCREEN WALL

6" DEWATERING VALVE

PR. VENT PIPE W/ GOOSE NECK

PR. VENT PIPE W/ GOOSE NECK

SUMP PUMP

GRACE DRIVE

COUNTY PUBLIC MINOR COLLECTOR ROADWAY
(R/W WIDTH VARIES FROM 65' TO 86' ALONG SITE FRONTAGE)

EDGE MAC. ROAD

30' STRUCTURE & USE SETBACK

10' PARKING & USE SETBACK

8" CURB

WHITE LINE

EX. FIBER OPTIC PHONE VAULT

EX. GUARD RAIL

CONC. SWALE

EX. FENCE

EX. WHITE LINE

C.L. ROAD

EX. RIP-RAP

EX. GUY WIRES

PP 548899

PP 263048

PP 263045

PP 263046

EX. 24" RCP

EX. 36"

MD-85

SHA PLAT NO. 52048, 53793, 53794

SHA PLAT NO. 53059

MD RT. 32 - WB

STATE-PUBLIC PRINCIPAL ARTERIAL ROADWAY
(R/W WIDTH VARIES FROM 332' TO 564' ALONG SITE FRONTAGE)

STATE OF MARYLAND
STATE HIGHWAY ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
L. 3347 F. 408
(SHA PLATS 52408, 53059, 53313)

E 1340500
N 544000

E 1340500
N 544000

30' STRUCTURE & USE SETBACK

S 16°30'53" W 370.87'

S 73°29'07" E 74.51'

N 52°33'13" W 528.85'

N 54°16'19" W 100.04'

N 52°33'13" W 152.90'

N 54°42'04" W 200.00'

128.15'

NOTE:
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PHASE-III EROSION & SEDIMENT CONTROL PLAN
SCALE: 1"=40'

LEGEND

10	EX. 10' CONTOUR
2	EX. 2' CONTOUR
	EX. PROPERTY LINE
	EX. ADJACENT PROPERTY LINE
	EX. RIGHT OF WAY
	EX. EASEMENT
	EX. BUILDING
	EX. CONCRETE
	EX. PAVEMENT
X X	EX. FENCE
OH OH	EX. OVERHEAD LINE
	EX. WATER LINE
	EX. SEWER LINE
	EX. STREAM
	EX. STREAM BUFFER
	EX. RIP-RAP CHANNEL
	EX. TREE LINE
	EX. GUARD RAIL
E E	EX. ELECTRIC CONDUIT
	EX. LIGHT POLES
G G	EX. GAS LINE
	EX. STORM DRAIN
C C	EX. CONDUIT
FO FO	EX. FIBER OPTIC
TV TV	EX. TV LINE
E	EX. ELECTRIC MANHOLE
T	EX. TELEPHONE MANHOLE
UK	EX. UNKNOWN UTILITY
2	PR. 2' CONTOUR
10	PR. 10' CONTOUR
1	PR. 1' CONTOUR
LOD LOD	PR. LIMIT OF DISTURBANCE
SSF SSF	PR. SUPER SILT FENCE
TP TP	PR. TREE PROTECTION

	PR. BUILDING FOOTPRINT
	PR. BUILDING OVERHANG
	PR. BUILDING SETBACK
	PR. EDGE OF CONCRETE
	PR. CURB
	PR. SIDEWALK
	PR. RETAINING WALL
	PR. TREELINE
	PR. HEDGEROW
	PR. SWM FACILITY
FO FO	PR. FIBER OPTIC
G G	PR. GAS
	PR. SANITARY SEWER
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	PR. WATER LINE

BY THE DEVELOPER

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SIGNATURE OF DEVELOPER — DATE 10/16/2012
Nizam Usta
GRACE

BY THE ENGINEER

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PHONE: 617-277-2145

SHEET: SDP-08

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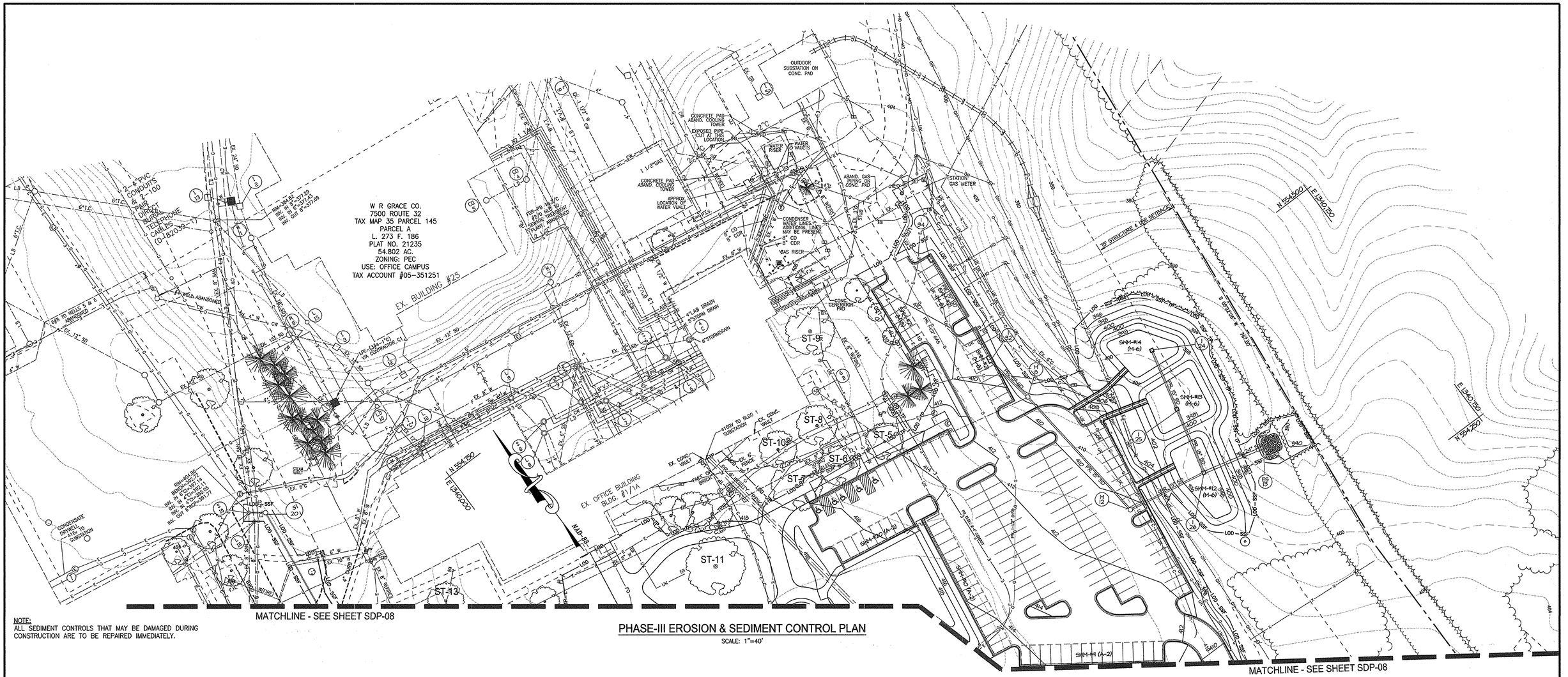
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



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PHASE-III EROSION & SEDIMENT CONTROL PLAN

SCALE: 1"=40'

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Nizam Usta
GRACE

BY THE ENGINEER

"I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF ENGINEER — DATE 10/17/2012
THOMAS C. NEUGEBAUER, P.E. MD LICENSE #29203

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD S.C.D. — DATE 10/23/12

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/25/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

ESD CONVERSION INSTALLATION SEQUENCE

1. PUMP-OUT ANY REMAINING WATER. IF NECESSARY USE A FLOCCULENT TO CLEAR WATER PRIOR TO PUMPING. FILTER PUMP EFFLUENT THROUGH SILT SACKS. DRY-OUT POND BOTTOM AND REMOVE ANY UNSUITABLE SOILS TO FINAL GRADES.
2. REMOVE DEWATERING DEVICES AND INSTALL POND DRAIN SYSTEM. INSTALL TRASH RACKS AND UNBLOCK ORIFICES. REMOVE ANY REMAINING RISER BLOCKING.
3. INSTALL FOREBAYS, GABION WALLS, BERMS, GABION MATTRESSES, AND STABLIZE BERMS IMMEDIATELY USING SOD. DISC BOTTOM OF INFILTRATION BASIN AREA. INSTALL ACCESS ROADS, FENCES AND GATES.
4. STABILIZE ALL SLOPES AND POND BOTTOMS AND FOREBAY AREAS WITH SEED AND MULCH. SLOPES 3:1 WILL REQUIRE SOD STABILIZATION. CLOSE POND DRAIN VALVES.
5. REQUEST ENGINEER TO PERFORM FINAL SWM SURVEY AND INSPECTION.

LEGEND

10	EX. 10' CONTOUR
2	EX. 2' CONTOUR
	EX. PROPERTY LINE
	EX. ADJACENT PROPERTY LINE
	EX. RIGHT OF WAY
	EX. EASEMENT
	EX. BUILDING
	EX. CONCRETE
	EX. PAVEMENT
X X	EX. FENCE
OH OH	EX. OVERHEAD LINE
	EX. WATER LINE
	EX. SEWER LINE
	EX. STREAM
	EX. STREAM BUFFER
	EX. RIP-RAP CHANNEL
	EX. TREE LINE
	EX. GUARD RAIL
E E	EX. ELECTRIC CONDUIT
	EX. LIGHT POLES
G G	EX. GAS LINE
	EX. STORM DRAIN
C C	EX. CONDUIT
FO FO	EX. FIBER OPTIC
TV TV	EX. TV LINE
E	EX. ELECTRIC MANHOLE
T	EX. TELEPHONE MANHOLE
UK	EX. UNKNOWN UTILITY
2	PR. 2' CONTOUR
10	PR. 10' CONTOUR
1	PR. 1' CONTOUR
LOD LOD	PR. LIMIT OF DISTURBANCE
SSF SSF	PR. SUPER SILT FENCE
TP TP	PR. TREE PROTECTION
	PR. BUILDING FOOTPRINT
	PR. BUILDING OVERHANG
	PR. BUILDING SETBACK
	PR. EDGE OF CONCRETE
	PR. CURB
	PR. SIDEWALK
	PR. RETAINING WALL
	PR. TREELINE
	PR. HEDGEROW
	PR. SWM FACILITY
FO FO	PR. FIBER OPTIC
G G	PR. GAS
	PR. SANITARY SEWER
	PR. STORM DRAIN
	PR. WATER LINE

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-09

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — 29203 — PROFESSIONAL ENGINEER — 10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

PHASE-III EROSION & SEDIMENT CONTROL PLAN

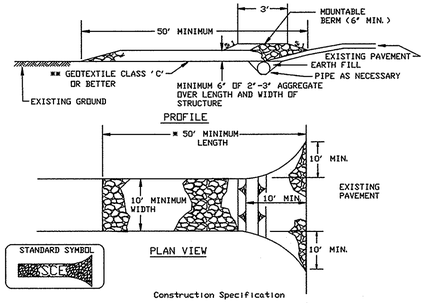
TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	1" = 40'
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	9 OF 46

SDP-12-077

P:\PROJ\12039_GRACE\PLANS\IDE\SDP\PLOT\Plot Sets\12039-SDP-09-PH3-ESC PLAN.dwg, 10/16/2012 2:28:50 PM, RHall, 1:1, Copyright 2012 Morris & Ritchie Associates, Inc.

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE

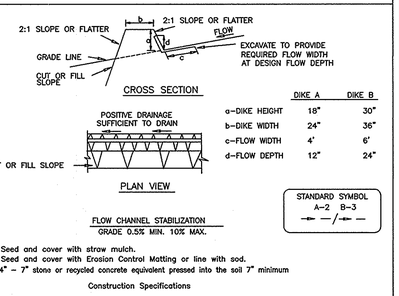


Construction Specification

1. Length - minimum of 50' (*30' for single residence lot).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (Filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable bern with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey, a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 17 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 1 - EARTH DIKE



	DIKE A	DIKE B
a-DIKE HEIGHT	18"	30"
b-DIKE WIDTH	24"	36"
c-FLOW WIDTH	4'	6'
d-FLOW DEPTH	12"	24"

STANDARD SYMBOL A-2 B-3

FLOW CHANNEL STABILIZATION
GRADE 0.5% MIN. 10% MAX.

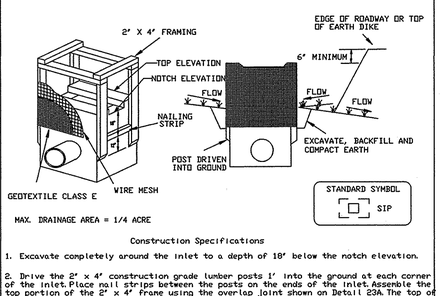
1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" - 7" stone or recycled concrete equivalent pressed into the soil 7" minimum

Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.
2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.
3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.
5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fill shall be compacted by earth moving equipment.
7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.
8. Inspection and maintenance must be provided periodically and after each rain event.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE A-1-6	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 23A - STANDARD INLET PROTECTION

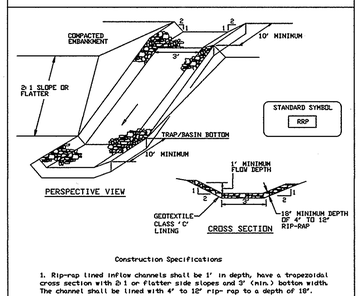


Construction Specifications

1. Excavate completely around the inlet to a depth of 18" below the notch elevation.
2. Drive the 2" x 4" construction grade lumber posts 1' into the ground at each corner of the inlet. Place nail strips between the posts on the ends of the inlet. Assemble the top portion of the 2" x 4" frame using the overlap joint shown on Detail 23A. The top of the frame (weir) must be 6" below adjacent roadways where flooding and safety issues may arise.
3. Stretch the 1/2" x 1/2" wire mesh tightly around the frame and fasten securely. The ends must meet and overlap at a post.
4. Stretch the Geotextile Class E tightly over the wire mesh with the geotextile extending from the top of the frame to 18" below the inlet notch elevation. Fasten the geotextile firmly to the frame. The ends of the geotextile must meet at a post, be overlapped and folded, then fastened down.
5. Backfill around the inlet in compacted 6" layers until the layer of earth is level with the notch elevation on the ends and top elevation on the sides.
6. If the inlet is not in a sump, construct a compacted earth dike across the ditch line directly below it. The top of the earth dike should be at least 6" higher than the top of the frame.
7. The structure must be inspected periodically and after each rain and the geotextile replaced when it becomes clogged.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 16 - 5	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 5 - RIP-RAP INFLOW PROTECTION

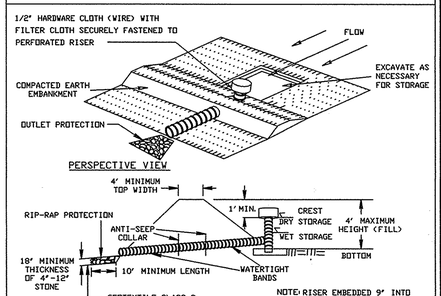


Construction Specifications

1. Rip-rap lined inflow channels shall be 1' in depth, have a trapezoidal cross section with 2:1 or flatter side slopes and 3' (min.) bottom width. The channel shall be lined with 4" to 12" rip-rap to a depth of 18".
2. Filter cloth shall be installed under all rip-rap. Filter cloth shall be Geotextile Class C.
3. Entrance and exit sections shall be installed as shown on the detail section.
4. Rip-rap used for the lining may be recycled for permanent outlet protection if the basin is to be converted to a stormwater management facility.
5. Gabion Inflow Protection may be used in lieu of Rip-rap Inflow Protection.
6. Rip-rap should blend into existing ground.
7. Rip-rap Inflow Protection shall be used where the slope is between 4:1 and 10:1, for slopes flatter than 10:1 use Earth Dike or Temporary Swale lining criteria.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE B-6-2	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 8 - PIPE OUTLET SEDIMENT TRAP - ST I



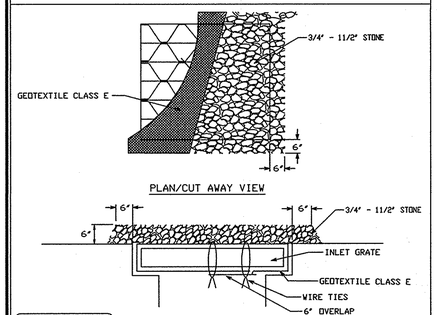
NOTE: RISER EMBEDDED 9" INTO CONCRETE OR 1/4" STEEL PLATE ATTACHED TO RISER WITH A CONTINUOUS WELD ON BOTTOM AND 2" OF STONE PLACED ON STEEL PLATE TWICE THE RISER DIAMETER (MIN.)

Construction Specifications

1. The area under the embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots or other woody vegetation as well as oversized stones, rocks, organic material, or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.
3. The total trap volume as measured from the bottom to riser crest elevation shall be 3600 cubic feet per acre of drainage area (see Table 9). The top of embankment must be 1' above the riser crest elevation.
4. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half of the wet storage depth of the trap (900cf/ac). The sediment shall be deposited in a suitable area and in such a manner that it will not erode.
5. The structure shall be inspected periodically and after each rain and repairs made as necessary.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 9 - 7	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 23B - AT GRADE INLET PROTECTION

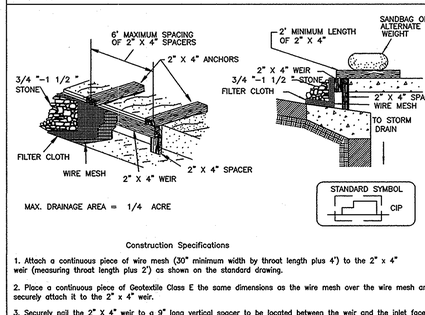


Construction Specifications

1. Lift grate and wrap with Geotextile Class E to completely cover all openings, then set grate back in place.
2. Place 3/4" to 11/2" stone, 4"-6" thick on the grate to secure the fabric and provide additional filtration.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 16 - 5A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 23C - CURB INLET PROTECTION (COG OR COS INLETS)

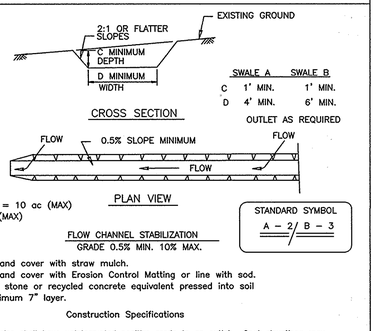


Construction Specifications

1. Attach a continuous piece of wire mesh (30" minimum width by throat length plus 4") to the 2" x 4" weir (measuring throat length plus 2') as shown on the standard drawing.
2. Place a continuous piece of Geotextile Class E the same dimensions as the wire mesh over the wire mesh and securely attach it to the 2" x 4" weir.
3. Securely nail the 2" X 4" weir to a 9" long vertical spacer to be located between the weir and the inlet face (max. 4' apart).
4. Place the assembly against the inlet throat and nail (minimum 2' lengths of 2" x 4" to the top of the weir at spacer locations). These 2" x 4" anchors shall extend across the inlet top and be held in place by sandbags or alternate weight.
5. The assembly shall be placed so that the end spacers are a minimum 1' beyond both ends of the throat opening.
6. Form the 1/2" x 1/2" wire mesh and the geotextile fabric to the concrete gutter and against the face of the curb on both sides of the inlet. Place clean 3/4" x 1 1/2" stone over the wire mesh and geotextile in such a manner to prevent water from entering the inlet under or around the geotextile.
7. This type of protection must be inspected frequently and the filter cloth and stone replaced when clogged with sediment.
8. Assure that storm flow does not bypass the inlet by installing a temporary earth or asphalt dike to direct the flow to the inlet.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E-16-5B	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 2 - TEMPORARY SWALE



FLOW CHANNEL STABILIZATION
GRADE 0.5% MIN. 10% MAX.

1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4"-7" stone or recycled concrete equivalent pressed into soil in a minimum 7" layer.

Construction Specifications

1. All temporary swales shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.
2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.
3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed stabilized area at a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the swale.
5. The swale shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fill, if necessary, shall be compacted by earth moving equipment.
7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the swale.
8. Inspection and maintenance must be provided periodically and after each rain event.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE A-2-4	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

STANDARD RESPONSIBILITY NOTES

I/WE CERTIFY THAT:

1. A. ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE IN ACCORDANCE WITH THIS SEDIMENT AND EROSION CONTROL PLAN, AND FURTHER, AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY ANNE ARUNDEL SOIL CONSERVATION DISTRICT BOARD OF SUPERVISORS OR THEIR AUTHORIZED AGENTS.

   B. ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE FROM THE MARYLAND DEPARTMENT OF THE ENVIRONMENT'S APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT.

   RESPONSIBLE PERSONNEL ON SITE: _____

   C. IF APPLICABLE, THE APPROPRIATE ENCLOSURE WILL BE CONSTRUCTED AND MAINTAINED ON SEDIMENT BASIN(S) INCLUDED IN THIS PLAN. SUCH STRUCTURE(S) WILL BE IN COMPLIANCE WITH THE ANNE ARUNDEL COUNTY CODE.
2. THE DEVELOPER IS RESPONSIBLE FOR THE ACQUISITION OF ALL EASEMENTS, RIGHT, AND / OR RIGHTS-OF-WAY THAT MAY BE REQUIRED FOR THE SEDIMENT AND EROSION CONTROL PRACTICES, STORMWATER MANAGEMENT PRACTICES AND THE DISCHARGE OF STORMWATER ONTO OR ACROSS ADJACENT OR DOWNSTREAM PROPERTIES INCLUDED IN THIS PLAN.
3. INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT STABILIZATION SHALL BE COMPLETED WITHIN SEVEN SEVEN CALENDAR DAYS FOR THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3" HORIZONTAL TO 1" VERTICAL (3:1) AND FOURTEEN DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. THE SEDIMENT CONTROL APPROVALS ON THIS PLAN EXTEND ONLY TO AREAS AND PRACTICES IDENTIFIED AS PROPOSED WORK.
5. THE APPROVAL OF THIS PLAN FOR SEDIMENT AND EROSION CONTROL DOES NOT RELIEVE THE DEVELOPER/CONSULTANT FROM COMPLYING WITH FEDERAL, STATE, OR COUNTY REQUIREMENTS APPERTAINING TO ENVIRONMENTAL ISSUES.
6. THE DEVELOPER MUST REQUEST THAT THE DEPARTMENT OF INSPECTIONS AND PERMITS APPROVE WORK COMPLETED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, THE GRADING OR BUILDING PERMIT, AND THE ORDINANCE.
7. ALL MATERIAL SHALL BE TAKEN TO A SITE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN.
8. ON ALL SITES WITH DISTURBED AREA IN EXCESS OF 2 ACRES, APPROVAL OF THE DEPARTMENT OF INSPECTIONS AND PERMITS SHALL BE REQUIRED ON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THE INITIAL APPROVAL BY THE DEPARTMENT OF INSPECTIONS AND PERMITS IS GIVEN.
9. APPROVAL SHALL BE REQUESTED ON FINAL STABILIZATION OF ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES BEFORE REMOVAL OF CONTROLS.
10. EXISTING TOPOGRAPHY MUST BE FIELD VERIFIED BY RESPONSIBLE PERSONNEL TO THE SATISFACTION OF THE SEDIMENT CONTROL INSPECTOR PRIOR TO COMMENCING WORK.

SIGNATURE(S) OF DEVELOPER/OWNER/APPLICANT DATE

NAME: MR. NIZAM USTA
TITLE: DIRECTOR, FACILITIES
AFFILIATION: GRACE
ADDRESS: 7500 GRACE DRIVE, COLUMBIA, MARYLAND. 21044
TELEPHONE: 617-277-2145

PIPE OUTLET SEDIMENT TRAP - ST I

6. Construction operations shall be carried out in such a manner that erosion and water pollution are abated. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. Points of concentrated inflow shall be protected in accordance with Grade Stabilization Structure criteria. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon trap completion and monitored and maintained erosion free during the life of the trap.
7. The structure shall be removed and area stabilized when the drainage area has been properly stabilized.
8. All cut and fill slopes shall be 2:1 or flatter.
9. All pipe connections shall be watertight.
10. Above the wet storage elevation, the riser shall be perforated with 1/2" wide by 6" long slits or 1" diameter holes spaced 6" vertically and horizontally. No perforations will be allowed within 6" of the horizontal barrel.
11. The riser shall be wrapped with 1/2" hardware cloth (wire) then wrapped with Geotextile Class E. The filter cloth shall extend 6" above the highest slit and 6" below the lowest slit. Where ends of filter cloth come together, they shall be overlapped, folded and fastened to prevent bypass. Filter cloth shall be replaced as necessary to prevent clogging.
12. Straps or connecting bands shall be used to hold the filter cloth and wire fabric in place. They shall be placed at the top and bottom of the cloth.
13. Fill material around the pipe spillway shall be hand compacted in 4" layers. A minimum of 2' of hand-compacted backfill shall be placed over the pipe spillway before crossing it with construction equipment.
14. The riser shall be anchored with either a concrete base or steel plate base to prevent flotation. Concrete bases shall be at least twice the riser diameter and 12" deep with the riser embedded 9". Steel plate bases shall be at least twice the riser diameter, 1/4" minimum thickness and attached to the bottom of the riser by a continuous weld to form a watertight connection. Then place 2' of stone, gravel or tamped earth on the plate.
15. Anti seep collars shall be constructed in accordance with plans (ref. table 16 and Details 13 and 14).
16. Concentric trash rack and anti-vortex device design details are on Detail 16.
17. Refer to Section D for dewatering requirements of sediment traps.
18. Outlet - An outlet shall be provided, which includes a means of conveying the discharge in an erosion free manner to an existing stable channel.
19. Where discharge occurs at the property line, local ordinances and drainage easement requirements shall be met.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 9 - 7A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

BY THE DEVELOPER

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF DEVELOPER — DATE 10/16/2012
NIZAM USTA
GRACE

BY THE ENGINEER

"I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

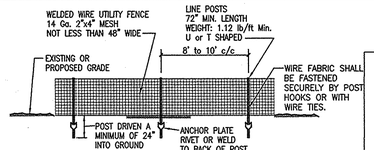
SIGNATURE OF ENGINEER — DATE 10/17/2012
THOMAS C. NEUGEBAUER, P.E. MD LICENSE #29203

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD S.C.D. — DATE 10/23/12

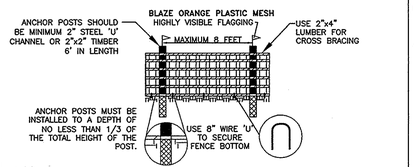
APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/9/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12
CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/9/12



TEMPORARY SAFETY FENCE DETAIL

NOT TO SCALE



TREE PROTECTION FENCE

TYPICAL DETAIL N.T.S.

NOTES:
1. FOREST RETENTION DEVICE ONLY
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

SOURCE: PRINCE GEORGE'S COUNTY, MARYLAND: WOODLAND CONSERVATION MANUAL

NOTE: TREE PROTECTION FENCE (TP) IS TO BE INSTALLED BEHIND RSF, SSF, EARTH DIKES OR OTHER PERIMETER CONTROLS WHERE THEY ABUT EX. WOODED AREAS TO REMAIN.

H.S. STANDARDS AND SPECIFICATIONS FOR DUST CONTROL

Definition

Controlling the suspension of dust particles from construction activities.

Purpose

To prevent blowing and movement of dust from exposed soil surfaces to reduce on and off-site damage including health and traffic hazards.

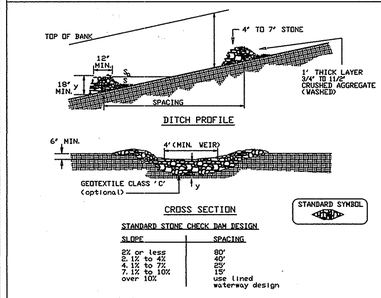
Conditions Where Practice Applies

Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

Specifications

1. Mulches: See Section B-4-2 Soil Preparation, Topsoiling, and Soil Amendments, Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization. Mulch must be anchored to prevent blowing.
2. Vegetative Cover: See Section B-4-4 Temporary Stabilization.
3. Tillage: Till to roughen surface and bring clods to the surface. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment that may produce the desired effect.
4. Irrigation: Sprinkle site with water until the surface is moist. Repeat as needed. The site must not be irrigated to the point that runoff occurs.
5. Barriers: Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing.
6. Chemical Treatment: Use of chemical treatment requires approval by the appropriate plan review authority.

DETAIL 7 - STONE CHECK DAM



STANDARD STONE CHECK DAM DESIGN

SLOPE	SPACING
2% or less	80'
2.1% to 5%	40'
5.1% to 7%	25'
7.1% to 10%	15'
over 10%	use lined waterway design

Construction Specifications

1. Swales and ditches shall be prepared in accordance with the construction specifications described in Section A-2, Standards and Specifications For Temporary Swale.
2. The check dam shall be constructed of 4"-7" stone. The stone shall be placed so that it completely covers the width of the channel and keyed into the channel banks.
3. The top of the check dam shall be constructed so the the center is approximately 6" lower than the outer edges, forming a weir that water can flow across.
4. The maximum height of the check dam at the center shall not exceed 2'.
5. The upstream side of the check dam shall be lined with approximately 3" of 3/4" to 1-1/2" crushed aggregate.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE B-8-5	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-10

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — 29203 — PROFESSIONAL ENGINEER — 10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

EROSION & SEDIMENT CONTROL NOTES & DETAILS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS	JOB NO.: 12039
		SCALE: AS SHOWN
		DATE: 10/16/2012
		DRAWN BY: MK
		DESIGN BY: MK
		REVIEW BY: TCN
		SHEET: 10 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-10-ESC NOTES & DETAILS.dwg, 10/16/2012 2:15:26 PM, RHall
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.

HOWARD SOIL CONSERVATION DISTRICTS
STANDARD SEDIMENT CONTROL NOTES

1. A MIN. OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD CO. DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855)

2. ALL VEGETATION AND STRUCTURAL ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.

3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

4. ALL BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THE PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12 OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.

5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. 51), SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.

6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM HOWARD COUNTY SEDIMENT CONTROL INSPECTOR

7. SITE ANALYSIS:

AREA DISTURBED	8.40 AC.
AREA TO BE ROOFED OR PAVED	5.48 AC.
AREA TO BE VEGETATIVELY STABILIZED	2.92 AC.
TOTAL CUT	13,068 CU. YDS.*
TOTAL FILL	17,979 CU. YDS.*
TOTAL TOPSOIL	4,048 CU. YDS.*

OFF SITE WASTE/BORROW AREA LOCATION TO BE A SITE WITH AN APPROVED SEDIMENT CONTROL PERMIT.

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTRIBUTED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.

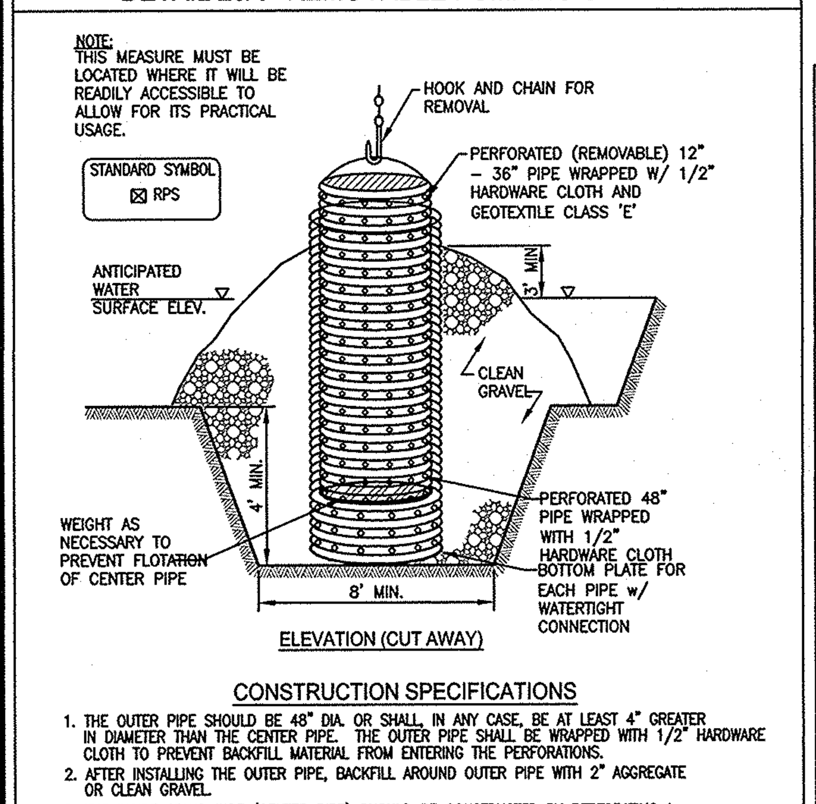
9. ADDITIONAL SEDIMENT MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

10. ON ALL SITES WITH DISTURBED AREAS IN ACCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.

11. TRENCHES FOR THE UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORK DAY, WHICHEVER IS SHORTER.

* THE EARTHWORK QUANTITIES SHOWN HEREON ARE FOR INFORMATION PURPOSES ONLY. MRA MAKES NO GUARANTEE OF ACCURACY OF QUANITIES OR BALANCE OF SITE. THE DEVELOPER AND CONTRACTOR SHALL TAKE FULL RESPONSIBILITY OF ACTUAL EARTHWORK QUANTITIES ENCOUNTERED DURING CONSTRUCTION.

DETAIL 20A - REMOVABLE PUMPING STATION



CONSTRUCTION SPECIFICATIONS

1. THE OUTER PIPE SHOULD BE 48" DIA. OR SHALL, IN ANY CASE, BE AT LEAST 4" GREATER IN DIAMETER THAN THE CENTER PIPE. THE OUTER PIPE SHALL BE WRAPPED WITH 1/2" HARDWARE CLOTH TO PREVENT BACKFILL MATERIAL FROM ENTERING THE PERFORATIONS.
2. AFTER INSTALLING THE OUTER PIPE, BACKFILL AROUND OUTER PIPE WITH 2" AGGREGATE OR CLEAN GRAVEL.
3. THE INSIDE STAND PIPE (CENTER PIPE) SHOULD BE CONSTRUCTED BY PERFORATING A CORRUGATED OR PVC PIPE BETWEEN 12" AND 36" IN DIAMETER. THE PERFORATIONS SHALL BE 1/2" X 6" SLITS OR 1" DIAMETER HOLES 6" ON CENTER. THE CENTER PIPE SHALL BE WRAPPED WITH 1/2" HARDWARE CLOTH FIRST, THEN WRAPPED AGAIN WITH GEOTEXTILE CLASS E
4. THE CENTER PIPE SHOULD EXTEND 12" TO 18" ABOVE THE ANTICIPATED WATER SURFACE ELEVATION OR RISER CREST ELEVATION WHEN DEWATERING A BASIN.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE D-12-5 MODIFIED	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

BY THE DEVELOPER

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

10/16/2012
SIGNATURE OF DEVELOPER DATE
Nizam Usta
GRACE

BY THE ENGINEER

"I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

10/17/2012
SIGNATURE OF ENGINEER DATE
THOMAS C. NEUGEBAUER, P.E. MD LICENSE #29203

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

10/23/12
HOWARD S.C.D. DATE

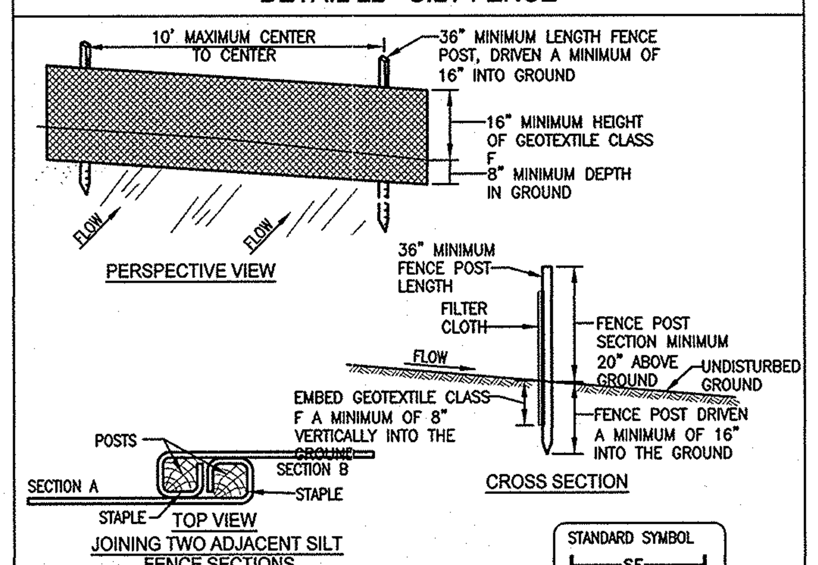
APPROVED: DEPARTMENT OF PLANNING AND ZONING

11/29/12
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING DATE

11/14/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION HSP DATE

11/19/12
CHIEF, DIVISION & LAND DEVELOPMENT DATE

DETAIL 22 - SILT FENCE



CONSTRUCTION SPECIFICATIONS

1. FENCE POSTS SHALL BE A MINIMUM OF 36" LONG DRIVEN 16" MINIMUM INTO THE GROUND. WOOD POSTS SHALL BE 1-1/2" X 1-1/2" SQUARE (MINIMUM) CUT, OR 1 3/4" DIAMETER (MINIMUM) ROUND AND SHALL BE OF SOUND QUALITY HARDWOOD. STEEL POSTS WILL BE STANDARD T OR U SECTION WEIGHING NOT LESS THAN 1.00 POUND PER LINEAR FOOT.
2. GEOTEXTILE SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION AND SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F:

TENSILE STRENGTH	50 LBS/IN (MIN.)	TEST: MSMT 509
TENSILE MODULUS	20 LBS/IN (MIN.)	TEST: MSMT 509
FLOW RATE	0.3 GAL FT^2/ MINUTE (MAX.)	TEST: MSMT 322
FILTERING EFFICIENCY	75% (MIN.)	TEST: MSMT 322

3. WHERE ENDS OF GEOTEXTILE FABRIC COME TOGETHER, THEY SHALL BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS.
4. SILT FENCE SHALL BE INSPECTED AFTER EACH RAINFALL EVENT AND MAINTAINED WHEN BULGES OCCUR OR WHEN SEDIMENT ACCUMULATION REACHES 50% OF THE FABRIC HEIGHT.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E-15-3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 22 - SILT FENCE

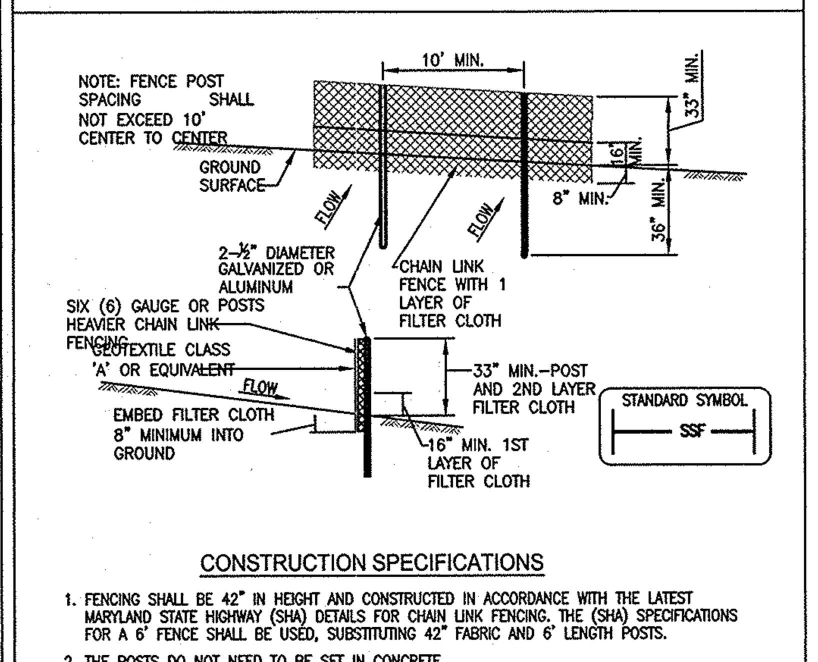
SILT FENCE DESIGN CRITERIA

SLOPE STEEPNESS	MAX. SLOPE LENGTH	MAX. SILT FENCE LENGTH
FLATTER THAN 50:1	UNLIMITED	UNLIMITED
50:1 - 10:1	125 FEET	1,000 FEET
10:1 - 5:1	100 FEET	750 FEET
5:1 - 3:1	60 FEET	500 FEET
3:1 - 2:1	40 FEET	250 FEET
2:1 AND STEEPER	20 FEET	125 FEET

NOTE: IN AREAS OF LESS THAN 2% SLOPE AND SANDY SOILS (USDA GENERAL CLASSIFICATION SYSTEM, SOIL CLASS A) MAXIMUM SLOPE LENGTH AND SILT FENCE LENGTH WILL BE UNLIMITED. IN THESE AREAS A SILT FENCE MAY BE THE ONLY PERIMETER CONTROL REQUIRED.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E-15-3A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL -33 SUPER SILT FENCE



CONSTRUCTION SPECIFICATIONS

1. FENCING SHALL BE 42" IN HEIGHT AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST MARYLAND STATE HIGHWAY (SHA) DETAILS FOR CHAIN LINK FENCING. THE (SHA) SPECIFICATIONS FOR A 6' FENCE SHALL BE USED, SUBSTITUTING 42" FABRIC AND 6' LENGTH POSTS.
2. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
3. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES.
4. FILTER CLOTH SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.
5. FILTER CLOTH SHALL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND.
6. WHEN TWO SECTIONS OF GEOTEXTILE FABRIC ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
7. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDUPS REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE, OR WHEN SILT REACHES 50% OF THE FENCE HEIGHT.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	H-26-3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINSTRATION

DETAIL 33 - SUPER SILT FENCE

SUPER SILT FENCE DESIGN CRITERIA

SLOPE	SLOPE STEEPNESS	SLOPE LENGTH (MAX.)	SILT FENCE LENGTH (MAX.)
0 - 10%	0 - 10:1	UNLIMITED	UNLIMITED
10 - 20%	10:1 - 5:1	200 FEET	1500 FEET
20 - 33%	5:1 - 3:1	100 FEET	1000 FEET
33 - 50%	3:1 - 2:1	100 FEET	500 FEET
50% & HIGHER	2:1 & STEEPER	50 FEET	250 FEET

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	H-26-3A MODIFIED	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

B-3 STANDARDS AND SPECIFICATIONS

FOR

LAND GRADING

Definition

Reshaping the existing land surface to provide suitable topography for building facilities and other site improvements.

Purpose

To provide erosion control and vegetative establishment for extreme changes in grade.

Conditions Where Practice Applies

Earth disturbances or extreme grade modifications on steep or long slopes.

Design Criteria

The grading plan should be based on the incorporation of building designs and street layouts that fit and utilize existing topography and desirable natural surroundings to avoid extreme grade modifications. Information submitted must provide sufficient topographic surveys and soil investigations to determine limitations that must be imposed on the grading operation related to slope stability, adjacent properties, drainage patterns, measures for water removal, and vegetative treatment, etc.

Many jurisdictions have regulations and design procedures already established for land grading that must be followed. The plan must show existing and proposed contours for the area(s) to be graded including practices for erosion control, slope stabilization, and safe conveyance of runoff (e.g., waterways, lined channels, reverse benches, grade stabilization structures). The grading/construction plans are to include the phasing of these practices and consideration of the following:

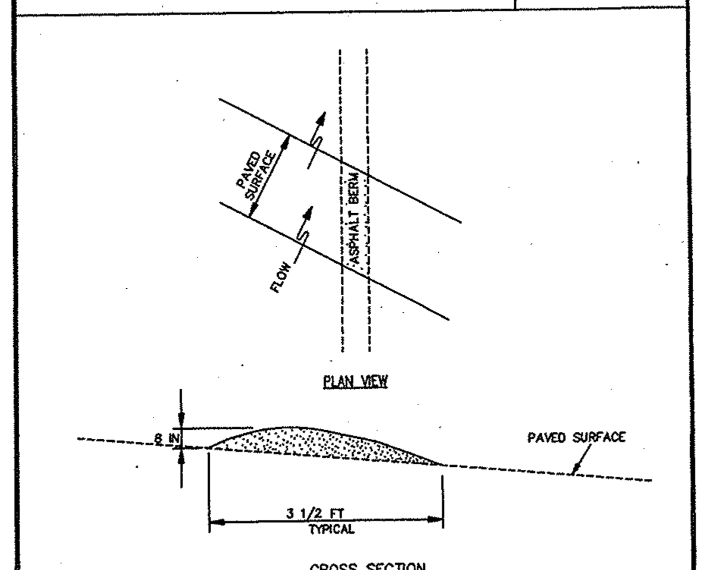
1. Provisions to safely convey surface runoff to storm drains, protected outlets or stable water courses to ensure that surface runoff will not damage slopes or other graded areas.
2. Cut and fill slopes, stabilized with grasses, no steeper than 2:1. (Where the slope is to be mowed, the slope should be no steeper than 3:1, but 4:1 is preferred because of safety factors related to mowing steep slopes.) Slopes steeper than 2:1 require special design and stabilization considerations to be shown on the plans.
3. Benching per Detail B-3-1 whenever the vertical interval (height) of any 2:1 slope exceeds 20 feet; for 3:1 slopes, when it exceeds 30 feet; and for 4:1 slopes, when it exceeds 40 feet. Locate benches to divide the slope face as equally as possible and to convey the water to a stable outlet. Soils, seeps, rock outcrops, etc. are to be taken into consideration when designing benches.
   a. Provide benches with a minimum width of six feet for ease of maintenance.
   b. Design benches with a reverse slope of 6:1 or flatter to the toe of the upper slope and with a minimum of one foot in depth. Grade the longitudinal slope of the bench between 2 percent and 3 percent, unless accompanied by appropriate design and computations.
   c. The maximum allowable flow length within a bench is 800 feet unless accompanied by appropriate design and computations.
4. Diversion of surface water from the face of all cut and fill slopes using earth dikes or swales. Convey surface water down slope using a designed structure, and:
   a. Protect the face of all graded slopes from surface runoff until they are stabilized.
   b. Do not subject the slope's face to any concentrated flow of surface water such as from natural drainage ways, graded swales, downspouts, etc.
   c. Protect the face of the slope by special erosion control materials to include, but not be limited to, approved vegetative stabilization practices, riprap or other approved stabilization methods.
5. Serrated slope as shown in Detail B-3-2. The steepest allowable slope for ripable rock is 1.5:1. For non rock surfaces, the slopes are to be 2:1 or flatter. These steps will weather and act to hold moisture, lime, fertilizer and seed thus producing a much quicker and longer lived vegetative cover and better slope stabilization.
6. Subsurface drainage provisions. Provide subsurface drainage where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet site conditions.
7. Proximity to adjacent property. Slopes must not be created close to property lines without adequate protection against sedimentation, erosion, slippage, settlement, subsidence, or other related damages.
8. Quality of fill material. Fill material must be free of brush, rubbish, logs, stumps, building debris, and other objectionable material. Do not place frozen materials in the fill nor place the fill material on a frozen foundation.
9. Stabilization. Stabilize all disturbed areas structurally or vegetatively in compliance with Section B-4 Standards and Specifications for Stabilization Practices.

Maintenance

The line, grade, and cross section of benching and serrated slopes must be maintained. Benches and serrated slopes must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization.

DETAIL C-5 TEMPORARY ASPHALT BERM

STANDARD SYMBOL
TAB



CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT BERM ON AN UNINTERRUPTED, CONTINUOUS GRADE.
2. INSTALL BERM TO CONFORM TO CROSS SECTION DIMENSIONS OF A UNIFORM HEIGHT OF 8 INCHES MINIMUM AND APPROXIMATE WIDTH OF 3½ FEET.
3. PROVIDE OUTLET PROTECTION AS REQUIRED ON PLAN.
4. COMPACT ASPHALT BERM.
5. REPAIR DAMAGED ASPHALT. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.
6. UPON REMOVAL OF ASPHALT BERM, RETURN TO ORIGINAL CONDITIONS OR AS SPECIFIED ON APPROVED PLAN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

B-4-3 STANDARDS AND SPECIFICATIONS

FOR

SEEDING AND MULCHING

Definition

The application of seed and mulch to establish vegetative cover.

Purpose

To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criteria

A. Seeding

1. Specifications
   a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
   b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
   c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
   d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

2. Application
   a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
      i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
      ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
   b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
      i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
      ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
   c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
      i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P_2O_5 (phosphorous), 200 pounds per acre; K_2O (potassium), 200 pounds per acre.
      ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
      iii. Mix seed and fertilizer on site and seed immediately and without interruption.
      iv. When hydroseeding do not incorporate seed into the soil.

B. Mulching

1. Mulch Materials (in order of preference)
   a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. **Note: Use only sterile straw mulch in areas where one species of grass is desired.**
   b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
      i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
      ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
      iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
      iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
      v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.

2. Application
   a. Apply mulch to all seeded areas immediately after seeding.
   b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
   c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.

3. Anchoring
   a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
      i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
      ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
      iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. **Use of asphalt binders is strictly prohibited.**
      iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4-2 STANDARDS AND SPECIFICATIONS

FOR

SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition

The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

A. Soil Preparation

1. Temporary Stabilization
   a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
   b. Apply fertilizer and lime as prescribed on the plans.
   c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
2. Permanent Stabilization
   a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
      i. Soil pH between 6.0 and 7.0.
      ii. Soluble salts less than 500 parts per million (ppm).
      iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
      iv. Soil contains 1.5 percent minimum organic matter by weight.
      v. Soil contains sufficient pore space to permit adequate root penetration.
   b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
   c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
   d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
   e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling

1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
   a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
   b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
   c. The original soil to be vegetated contains material toxic to plant growth.
   d. The soil is so acidic that treatment with limestone is not feasible.
4. Areas having slopes steeper than 2:1 require special consideration and design.
5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
   a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter.
   b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
   c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
6. Topsoil Application
   a. Erosion and sediment control practices must be maintained when applying topsoil.
   b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
   c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

C. Soil Amendments (Fertilizer and Lime Specifications)

1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

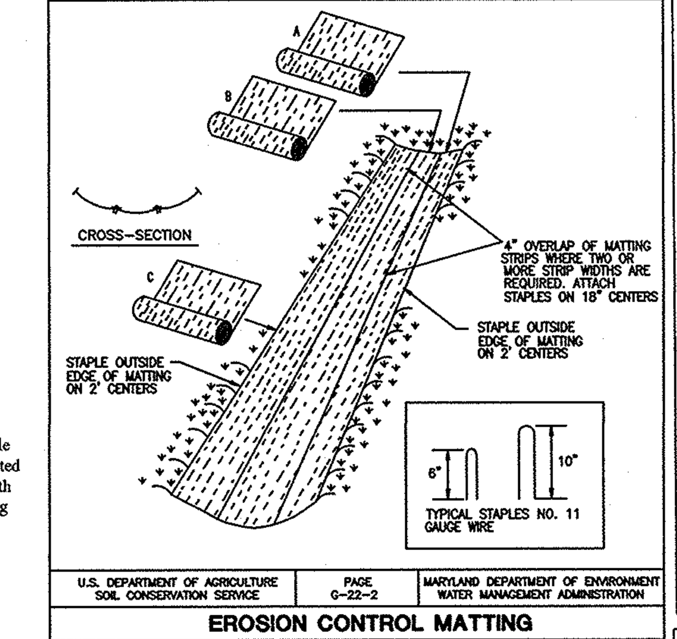
FOR UTILITY WORK ONLY OR FOR OFF-SITE UTILITY WORK

1. PLACE ALL EXCAVATED MATERIAL ON HIGH SIDE OF TRENCH.
2. ONLY DO AS MUCH WORK AS CAN BE DONE IN ONE DAY SO BACKFILLING FINAL GRADING, AND SEEDING AND MULCHING CAN OCCUR.
3. ANY SEDIMENT CONTROL MEASURES DISTURBED BY CONSTRUCTION WILL BE REPAIRED THE SAME DAY.

STOCKPILE NOTES

1. NO STOCKPILING ALLOWED ON ASPHALT.
2. ALL STOCKPILES LEFT AT THE END OF THE DAY NEED TO BE STABILIZED UNTIL THE NEXT REDISTURBANCE.

DETAIL 30 - EROSION CONTROL MATTING



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE G-22-2	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

EROSION CONTROL MATTING

CONSTRUCTION SPECIFICATIONS

1. KEY-IN THE MATTING BY PLACING THE TOP ENDS OF THE MATTING IN A NARROW TRENCH, 6" IN DEPTH. BACKFILL THE TRENCH AND TAMP FIRMLY TO CONFORM TO THE CHANNEL CROSS-SECTION. SECURE WITH A ROW OF STAPLES ABOUT 4" DOWN SLOPE FROM THE TRENCH. SPACING BETWEEN STAPLES IS 6".
2. STAPLE THE 4" OVERLAP IN THE CHANNEL CENTER USING AN 18" SPACING BETWEEN STAPLES.
3. BEFORE STAPLING THE OUTER EDGES OF THE MATTING, MAKE SURE THE MATTING IS SMOOTH AND IN FIRM CONTACT WITH THE SOIL.
4. STAPLES SHALL BE PLACED 2' APART WITH 4 ROWS FOR EACH STRIP, 2 OUTER ROWS, AND 2 ALTERNATING ROWS DOWN THE CENTER.
5. WHERE ONE ROLL OF MATTING ENDS AND ANOTHER BEGINS, THE END OF THE TOP STRIP SHALL OVERLAP THE UPPER END OF THE LOWER STRIP BY 4", SHIPLAP FASHION. REINFORCE THE OVERLAP WITH A DOUBLE ROW OF STAPLES SPACED 6" APART IN A STAGGERED PATTERN ON EITHER SIDE.
6. THE DISCHARGE END OF THE MATTING LINER SHOULD BE SIMILARLY SECURED WITH 2 DOUBLE ROWS OF STAPLES.

NOTE: IF FLOW WILL ENTER FROM THE EDGE OF THE MATTING THEN THE AREA EFFECTED BY THE FLOW MUST BE KEYED-IN.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE G-22-2A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 4 - PIPE SLOPE DRAIN

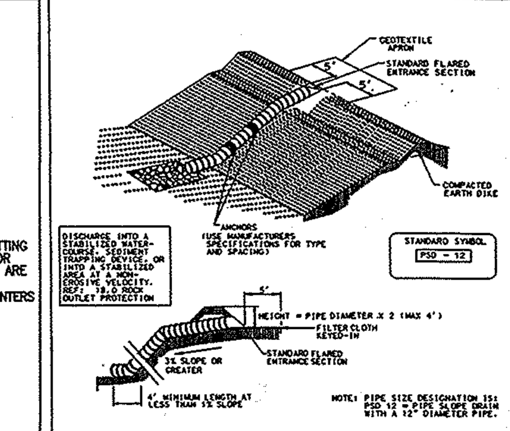


Table 6 Design Criteria for Pipe Slope Drain

Size	Pipe/Tubing Diameter (D) in	Maximum Drainage Area (Acres)
PSD-12	12	0.5
PSD-18	18	1.5
PSD-21	21	2.5
PSD-24	24	3.5
PSD-24 (2)	24	5.0

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE B-5-4	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

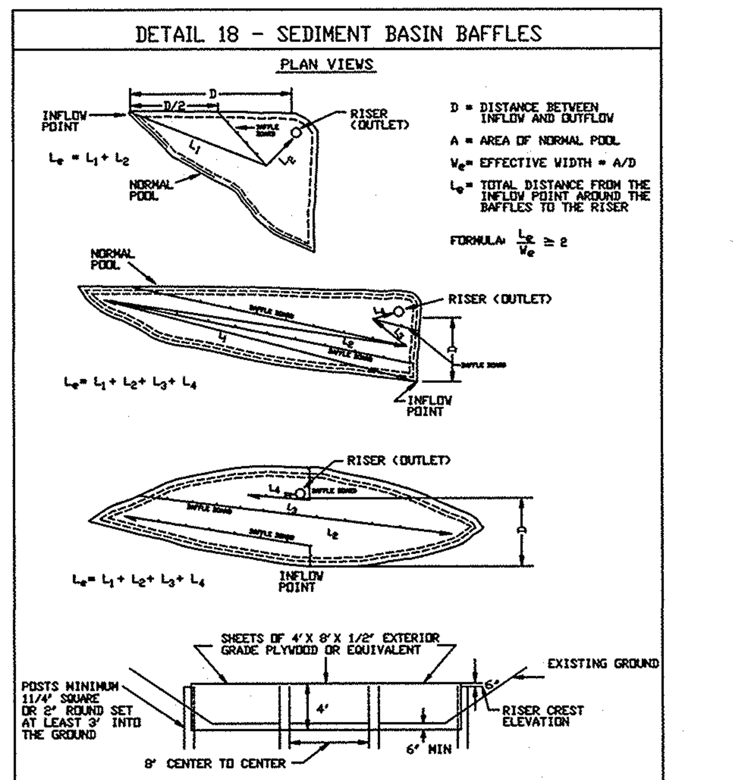
PIPE SLOPE DRAIN

Construction Specifications - Pipe Slope Drain

1. The Pipe Slope Drain (PSD) shall have a slope of 3 percent or steeper.
2. The top of the earth dike over the inlet pipe shall be at least 2 times the pipe diameter measured at the invert of the pipe.
3. Flexible tubing is preferred. However, corrugated metal pipe or equivalent PVC pipe can be used. All connections shall be watertight.
4. A flared end section shall be attached to the inlet end of pipe with a watertight connection. Filter cloth shall be placed under the inlet of the pipe slope drain and shall extend out 5' from the inlet. The filter cloth shall be "keyed in" on all sides.
5. The Pipe Slope Drain shall be securely anchored to the slope by staking at the grommets provided. Spacing for anchors shall be as provided by manufacturer's specification. In no case shall less than two (2) anchors be provided, equally spaced along the length of pipe. These details should be provided by pipe suppliers.
6. The soil around and under the pipe and end section shall be hand tamped in 4 inch lifts to the top of the earth dike.
7. All pipe connections shall be watertight.
8. Whenever possible where a PSD drains an unstabilized area, it shall outlet into a sediment trap or basin. If this is not possible then the slope drain will discharge into a stable conveyance that leads to a sediment trap or basin. When discharging into a trap or basin the PSD shall discharge at the same elevation as the wet pool elevation. The discharge from the PSD must be as far away from the sediment control outlet as possible.
9. When the drainage area is stabilized, the PSD shall discharge onto a stabilized area at a non-erosive velocity.
10. Inspection and any required maintenance shall be performed periodically and after each rain event.
11. The inlet must be kept open at all times.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE B-5-4A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 18 - SEDIMENT BASIN BAFFLES



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 18 - 28	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

OWNER / APPLICANT / DEVELOPER:

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COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-11

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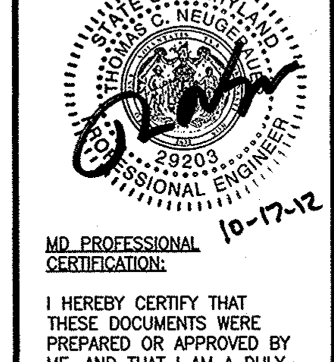


10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

EROSION & SEDIMENT CONTROL NOTES & DETAILS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	AS SHOWN
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	11 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-11-ESC NOTES & DETAILS.dwg, 10/16/2012 2:14:36 PM, RHall, 1:1, Copyright 2012 Morris & Ritchie Associates, Inc.

LEGEND

- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. EASEMENT
- EX. ZONING LINE
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. STREAM
- EX. STREAM BUFFER
- EX. RIP-RAP CHANNEL
- EX. TREE LINE
- EX. GUARD RAIL
- EX. STEEP SLOPES

- PR. BUILDING FOOTPRINT
- PR. BUILDING OVERHANG
- PR. BUILDING SETBACK
- PR. EDGE OF CONCRETE
- PR. CURB
- PR. SIDEWALK
- PR. RETAINING WALL
- PR. BRICK PAVERS OVER CONCRETE
- PR. PERMEABLE PAVERS
- PR. POROUS PAVEMENT
- PR. MEDIUM DUTY PAVEMENT
- PR. CONCRETE PAVEMENT
- PR. PAVEMENT MILL AND OVERLAY
- PR. TREELINE
- PR. HEDGEROW
- PR. SWM FACILITY
- PR. COMPACT PARKING
- PR. STREET LIGHT
- PR. HAND BOX

NOSE-DOWN PROP. CURB
CONTINUOUS STEEP SLOPES IN FSD PROJECT AREA=0.21± AC. OFF FSD PROJECT AREA=0.01± AC. IN SDP PROJECT AREA = 0.0 AC.
CONCRETE GENERATOR PAD
ST-9
ST-8
ST-10
ST-5
ST-6
ST-7
ST-11
ST-12
ST-13
ST-14
ST-15
ST-16
EX. CONC. VAULT
EX. 6' FENCE
FACE OF BRICK
EX. OFFICE BUILDING BLDG. #1/1A
N 554,150
E 1,340,000
PROP. BRICK PAVERS OVER CONCRETE
PROP. PERMEABLE PAVERS
PROPOSED PLAZA
PROP. CURB TO MEET & MATCH EX. CURB FOR LINE & GRADE (TYP.)
PR. CONC. FLUME (TYP.)
PR. 3-STORY OFFICE BLDG.
BLDG #100
87,471 S.F.
FFE: 416.50
BSMT: 404.25
MECH. RM: 402.50
PR. SCREEN WALL SEE ARCHITECTURE PLAN
PIPE BOLLARDS (TYP.) SEE DETAIL SHT. 24
PR. RAMP (TYP.)
PR. DUMPSTER
PR. SCREEN WALL
5' CONC. SIDEWALK
DEPRESS CURB & GUTTER
PROP. ACCESS DRIVE
PR. CURB CUT (TYP.)
PR. RETAINING WALL #3
PR. RETAINING WALL #4
PR. GUARDRAIL
EX. PERPETUAL EASEMENT FOR DRAINAGE FACILITY SHA P. NO. 53059
PROP. 5' ORNAMENTAL METAL FENCE
CONNECT PROP. FENCE TO EXISTING FENCE
EX. GUARD BUILDING
GATE
EX. GUARD RAIL
EX. FENCE
CONC. SWALE
GRACE DRIVE
COUNTY PUBLIC MINOR COLLECTOR ROADWAY (R/W WIDTH VARIES FROM 65' TO 86' ALONG SITE FRONTAGE)
EDGE MAC. ROAD
30' STRUCTURE & USE SETBACK
10' PARKING & USE SETBACK
WHITE LINE
EX. PAVEMENT
EX. WHITE LINE
EX. SHOULDER
FULL DEPTH SAW CUT
C.L. ROAD
PROP. ENTRANCE STA 0+00 = GRACE DRIVE STA 33+84.91
N 553,936.24
E 1,340,338.10
PAVEMENT SECTION P-4
EX. REVERTIBLE EASEMENT FOR SUPPORTING SLOPES SHA P. NO. 53059
SEE GRACE DRIVE PLAN AND PROFILE SHEET SDP-19 FOR ENTRANCE PLAN
MD RT. 32 - WB
STATE PUBLIC PRINCIPAL ARTERIAL ROADWAY (R/W WIDTH VARIES FROM 332' TO 564' ALONG SITE FRONTAGE)
STATE OF MARYLAND
STATE HIGHWAY ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
L. 3347 F. 408
(SHA PLATS 52408, 53059, 53313)
E 1340000
N 554000
MAP-88

SITE LAYOUT PLAN
SCALE: 1"=40'

LINE TABLE		
LINE	LENGTH	BEARING
L-1	35.06	N35°17'56"E
L-2	55.48	N27°23'57"E
L-3	47.92	N09°13'32"E

CURVE TABLE						
NAME	DELTA	RADIUS	LENGTH	BEARING	CHORD	TANGENT
C-1	7°53'59"	200.00'	27.58'	N 31°20'57" E	27.55'	13.81'
C-2	18°10'25"	312.00'	98.96'	N 18°18'45" E	98.55'	49.90'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/28/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

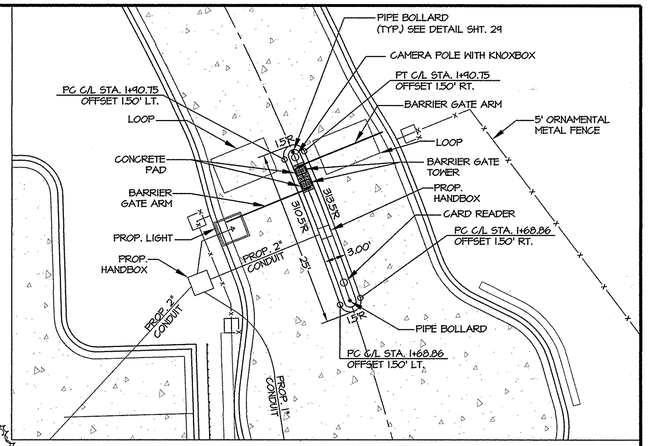
CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

SHEET NOTES:

1. FOR CONCRETE PAVEMENT AND CURB DETAILS SEE PLAN SHEET SDP-18.
2. FOR PROPOSED PLAZA LAYOUT SEE PENNONI PLAN SET.
3. FOR NEW ENTRANCE AND GRACE DRIVE WIDENING SEE PLAN SHEET SDP-19.
4. PROPOSED GUARDRAIL, SEE MD. SHA DETAIL MD-605.27.
5. LIGHT TRESPASS ONTO A PROPERTY IN THE R-ED ZONING DISTRICT SHALL BE LIMITED TO 0.1 FOOTCANDLES. LIGHT TRESPASS ONTO ANY PROPERTY ZONED OR USED FOR RESIDENTIAL PURPOSES SHALL BE LIMITED TO 0.5 FOOTCANDLES.
6. FOR PROPOSED FENCE DETAIL SEE SDP-23
7. FOR SITE LIGHTS SEE ARCH. / MEP PLANS.

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145



ENTRANCE GATE DETAIL
SCALE: 1"=10'

ENTRANCE CONTROL SPECIFICATIONS

BARRIER GATE – LIFE MASTER MEGA ARM TOWER – 12' ALUMINUM BARRIER ARM 500 WATT HEATER 120 VAC
CARD READER – LIFE MASTER
CAMERA POLE – 3" DIA. GALVANIZED STEEL SCH. 40 WITH GALVANIZED CAP
KNOX BOX – RAPID ENTRY SYSTEM SERIES 3200, SURFACE MOUNTED ON CAMERA POLE
LOOP DETECTOR – CHAMBERLAIN, COMPATIBLE WITH LIFT MASTER GATE

FOR AS-BUILT
STATE OF MARYLAND — MORRIS C. NEUBERGER — 29203 — PROFESSIONAL ENGINEER
7-7-14

AS-BUILT PLAN

MRA

MORRIS & RITCHIE ASSOCIATES, INC.
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STATE OF MARYLAND — MORRIS C. NEUBERGER — 29203 — PROFESSIONAL ENGINEER
10-17-12

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GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

SITE LAYOUT PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MOR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS
07/07/14	AS-BUILT INFORMATION ADDED TO PLAN

JOB NO.:	12039
SCALE:	1" = 40'
DATE:	10/16/2012
DRAWN BY:	MK
DESIGN BY:	MK
REVIEW BY:	TCN
SHEET:	12 OF 46

SHEET: SDP-12

SDP-12-077

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LEGEND

Existing	Proposed
EX. 10' CONTOUR	PR. 2' CONTOUR
EX. 2' CONTOUR	PR. 10' CONTOUR
EX. PROPERTY LINE	PR. 1' CONTOUR
EX. ADJACENT PROPERTY LINE	PR. SPOT ELEVATION
EX. RIGHT OF WAY	PR. LIMIT OF DISTURBANCE
EX. EASEMENT	PR. ELECTRIC CONDUIT
EX. ZONING LINE	PR. TELEPHONE CONDUIT
EX. BUILDING	PR. FIBER OPTIC
EX. CONCRETE	PR. GAS
EX. PAVEMENT	PR. SANITARY SEWER
EX. FENCE	PR. STORM DRAIN
EX. OVERHEAD LINE	PR. WATER LINE
EX. WATER LINE	PR. BUILDING FOOTPRINT
EX. SEWER LINE	PR. BUILDING OVERHANG
EX. STREAM	PR. BUILDING SETBACK
EX. STREAM BUFFER	PR. EDGE OF CONCRETE
EX. RIP-RAP CHANNEL	PR. CURB
EX. TREE LINE	PR. SIDEWALK
EX. GUARD RAIL	PR. RETAINING WALL
EX. ELECTRIC CONDUIT	PR. TREELINE
EX. LIGHT POLES	PR. HEDGEROW
EX. GAS LINE	PR. SWM FACILITY
EX. STORM DRAIN	
EX. CONDUIT	
EX. FIBER OPTIC	
EX. TV LINE	
EX. ELECTRIC MANHOLE	
EX. TELEPHONE MANHOLE	
EX. UNKNOWN UTILITY	

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/28/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
CHIEF, DIVISION & LAND DEVELOPMENT	11/19/12 DATE

SITE GRADING & STORM DRAIN PLAN

SCALE: 1"=40'

OWNER / APPLICANT / DEVELOPER:
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7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
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10-17-12

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SHEET: SDP-13

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

SITE GRADING & STORM DRAIN PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
07/07/14	AS-BUILT INFORMATION ADDED TO PLAN	JOB NO.:	12039
		SCALE:	1" = 40'
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		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	13 OF 46

SDP-12-077

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LEGEND

EX. PROPERTY LINE	PR. ELECTRIC CONDUIT
EX. ADJACENT PROPERTY LINE	PR. TELEPHONE CONDUIT
EX. RIGHT OF WAY	PR. FIBER OPTIC
EX. ZONING LINE	PR. GAS
EX. BUILDING	PR. SANITARY SEWER
EX. CONCRETE	PR. STORM DRAIN
EX. PAVEMENT	PR. WATER LINE
EX. FENCE	PR. STREET LIGHT
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EX. SEWER LINE	PR. EDGE OF CONCRETE
EX. STREAM	PR. CURB
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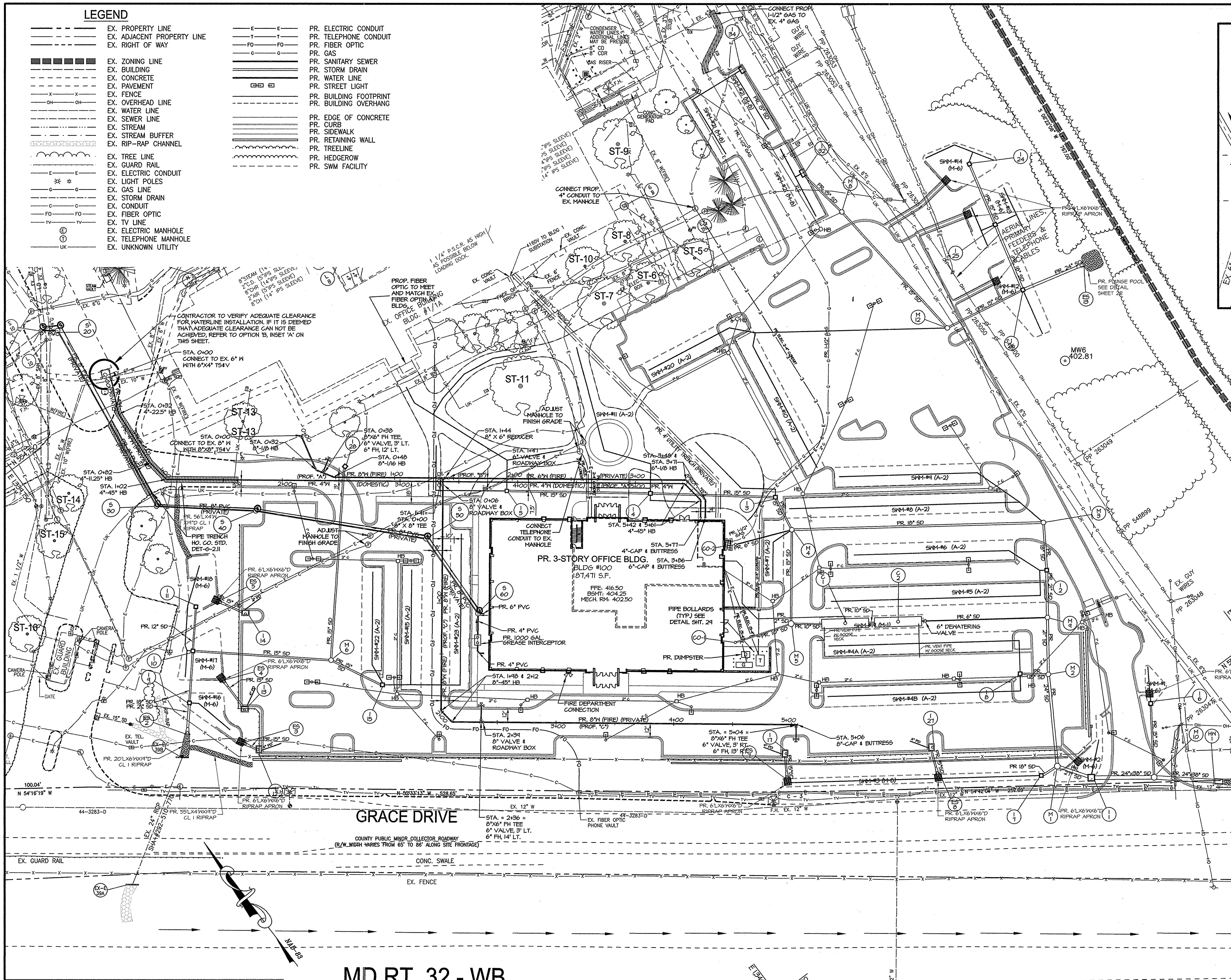
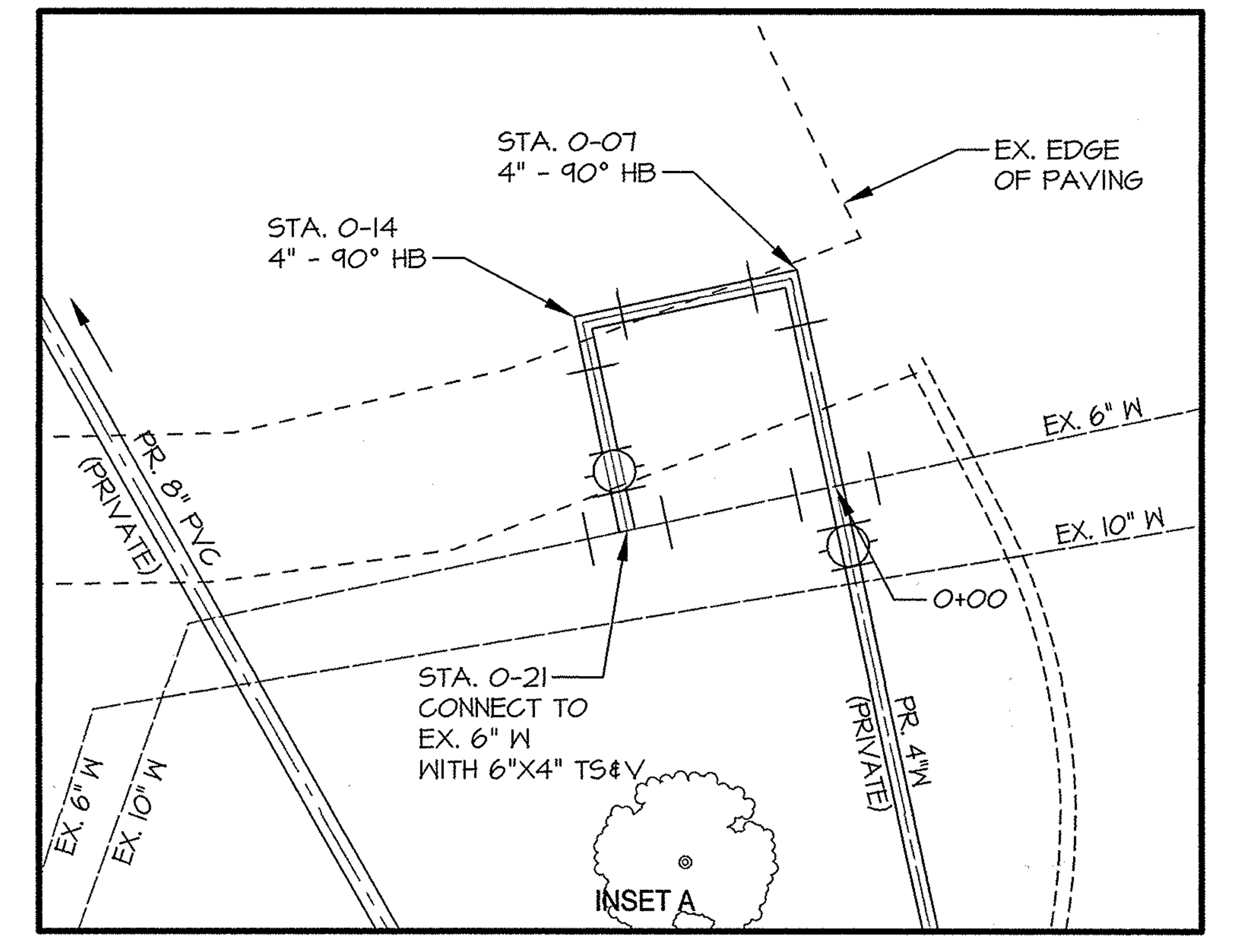
EX. TREE LINE	PR. TREELINE
EX. GUARD RAIL	PR. HEDGEROW
EX. ELECTRIC CONDUIT	PR. SWM FACILITY
EX. LIGHT POLES	
EX. GAS LINE	
EX. STORM DRAIN	
EX. CONDUIT	
EX. FIBER OPTIC	
EX. TV LINE	
EX. ELECTRIC MANHOLE	
EX. TELEPHONE MANHOLE	
EX. UNKNOWN UTILITY	





OPTION 'B'

SCALE: 1"=5'

NOTES:

1. SEE SHEET SDP-23 FOR SEWER PROFILES.
2. SEE SHEET SDP-24 FOR WATER PROFILES.
3. FOR 4' UTILITY TRENCH, REFER TO MEP PLANS.
4. FOR GAS SERVICE SPECIFICATIONS, REFER TO MEP PLANS.
5. FOR ELECTRIC SERVICE SPECIFICATIONS, REFER TO MEP PLANS.
6. FIBER OPTIC – CONTRACTOR TO COORDINATE WITH VERIZON AT OWNERS EXPENSE.

FOR AS-BUILT
STATE OF MARYLAND THOMAS C. NEUGEBAUER 29203 PROFESSIONAL ENGINEER
7-7-14

AS-BUILT PLAN

SITE UTILITY PLAN

SCALE: 1"=40'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/28/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
CHIEF, DIVISION & LAND DEVELOPMENT	11/9/12 DATE

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-14

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND THOMAS C. NEUGEBAUER 29203 PROFESSIONAL ENGINEER
10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

SITE UTILITY PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
07/07/14	AS-BUILT INFORMATION ADDED TO PLAN	JOB NO.:	12039
		SCALE:	1" = 40'
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	14 OF 46

SDP-12-077

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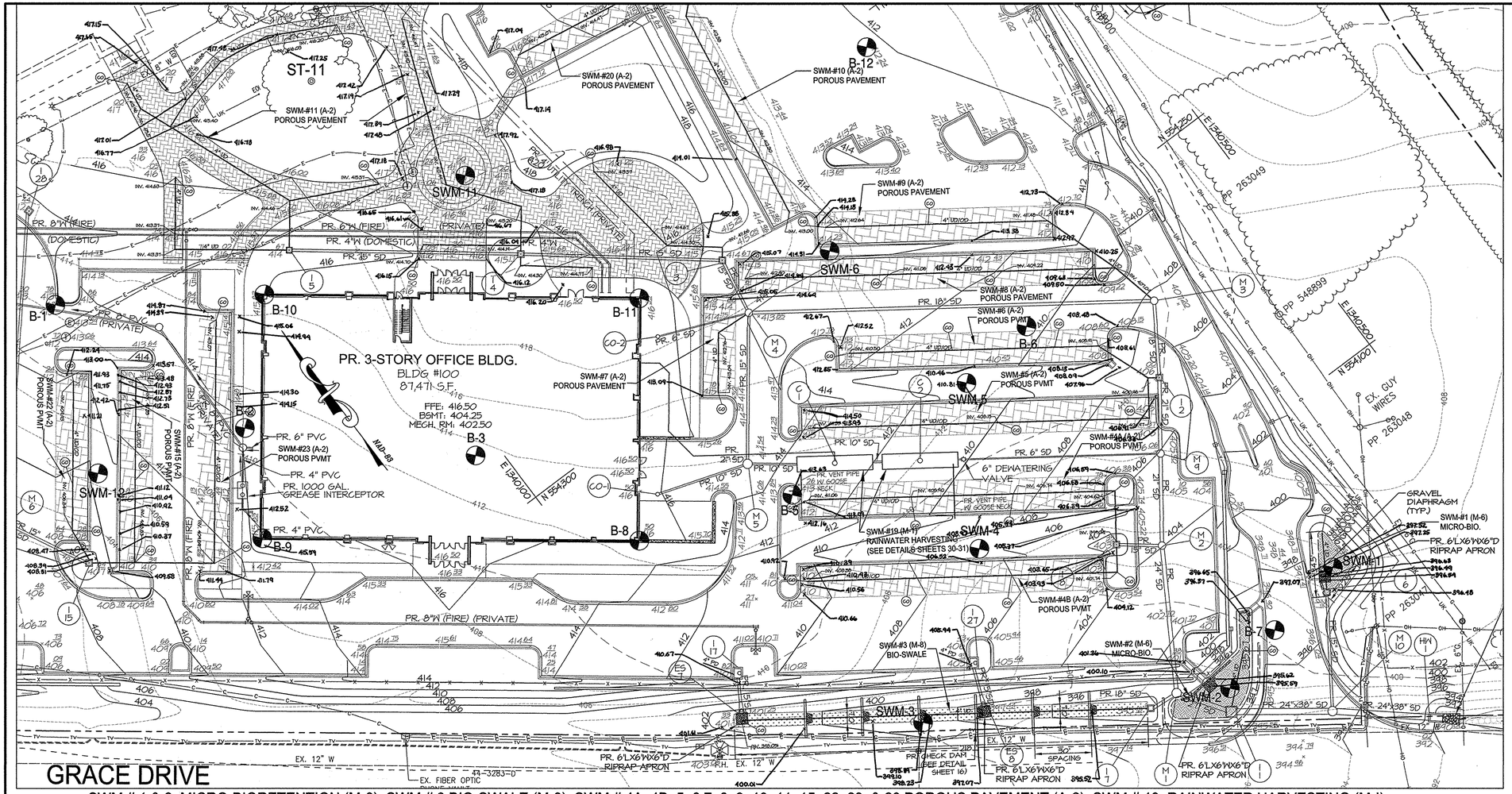
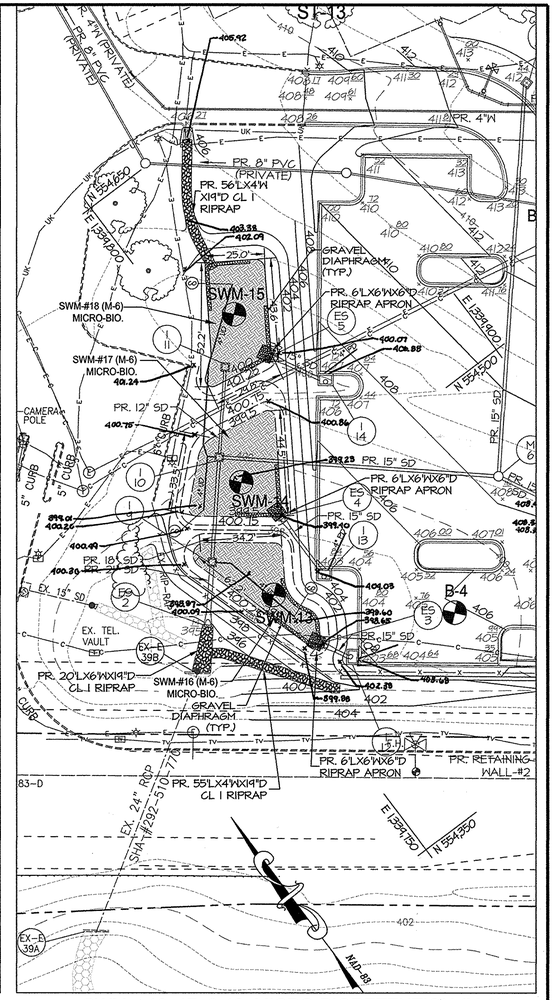
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



SWM # 1 & 2: MICRO-BIORETENTION (M-6), SWM # 3 BIO-SWALE (M-8), SWM # 4A, 4B, 5, 6,7, 8, 9, 10, 11, 15, 22, 23, & 20 POROUS PAVEMENT (A-2), SWM # 19: RAINWATER HARVESTING (M-I)

SCALE: 1" = 30'

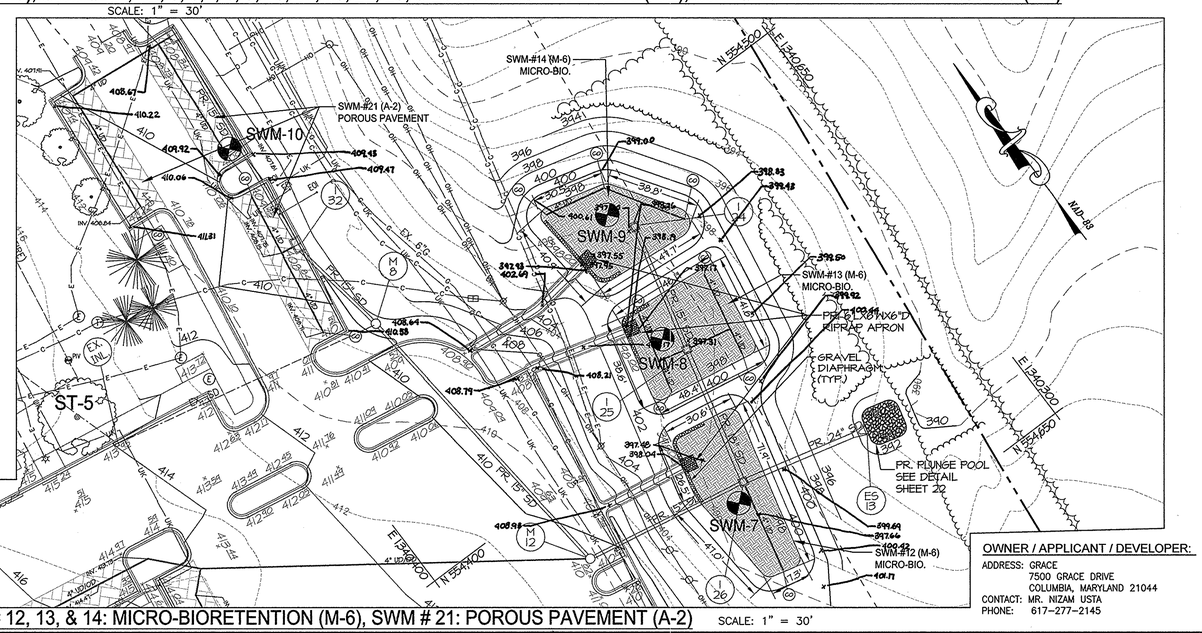


SWM # 16, 17, & 18: MICRO-BIORETENTION (M-6)

SCALE: 1" = 30'

LEGEND

EX. 10' CONTOUR	PR. 2' CONTOUR
EX. 2' CONTOUR	PR. 10' CONTOUR
EX. PROPERTY LINE	PR. 1' CONTOUR
EX. ADJACENT PROPERTY LINE	PR. SPOT ELEVATION
EX. RIGHT OF WAY	PR. BUILDING FOOTPRINT
EX. BUILDING	PR. BUILDING OVERHANG
EX. CONCRETE	PR. BUILDING SETBACK
EX. PAVEMENT	PR. EDGE OF CONCRETE
	PR. CURB
EX. OVERHEAD LINE	PR. SIDEWALK
EX. WATER LINE	PR. RETAINING WALL
EX. SEWER LINE	PR. TREELINE
EX. GAS LINE	PR. HEDGEROW
EX. STREAM	PR. SANITARY SEWER
EX. STREAM BUFFER	PR. STORM DRAIN
EX. RIP-RAP CHANNEL	PR. WATER LINE
EX. TREE LINE	PR. MICRO BIORETENTION FACILITY
EX. GUARD RAIL	PR. BIO-SWALE FACILITY
EX. ELECTRIC CONDUIT	PR. POROUS PAVEMENT
EX. LIGHT POLES	PR. PERMEABLE PAVERS
EX. GAS LINE	
EX. STORM DRAIN	
EX. CONDUIT	
EX. FIBER OPTIC	
EX. TV LINE	
EX. ELECTRIC MANHOLE	
EX. TELEPHONE MANHOLE	
EX. UNKNOWN UTILITY	



SWM # 12, 13, & 14: MICRO-BIORETENTION (M-6), SWM # 21: POROUS PAVEMENT (A-2)

SCALE: 1" = 30'

NOTES:

1. THE CONCRETE FLUME OUTFALLS TO SWM #1, 2, 12, 13 AND 14 HAVE GRAVEL DIAPHRAGM. SEE SDP-16 FOR DETAILS.
2. SEE STORM DRAIN PROFILES ON SDP-03 THRU SDP-22 FOR RIP-RAP SIZING AT PIPE OUTFALLS TO STORM WATER MANAGEMENT FACILITIES.
3. SEE SDP-22 FOR PLUNGE POOL DETAIL.

FOR AS-BUILT
STATE OF MARYLAND
MICHAEL C. NEUBERT
29203
PROFESSIONAL ENGINEER
7-7-14

AS-BUILT PLAN

SHEET: SDP-15

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
CHIEF, DIVISION & LAND DEVELOPMENT	11/9/12 DATE

MORRIS & RITCHIE ASSOCIATES, INC.
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STATE OF MARYLAND
MICHAEL C. NEUBERT
29203
PROFESSIONAL ENGINEER
10-17-12

MD. 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

ESD FACILITIES

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS
07/07/14	AS-BUILT INFORMATION ADDED

JOB NO.: 12039
SCALE: 1" = 30'
DATE: 10/16/2012
DRAWN BY: RAH
DESIGN BY: MK
REVIEW BY: TCN
SHEET: 15 OF 46

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-15-ESD FACILITIES.dwg, 10/17/2012 9:33:23 AM, Rhall, 1:1, Copyright 2012 Morris & Ritchie Associates, Inc.

CONSTRUCTION SPECIFICATIONS FOR MICRO-BIORETENTION AND BIOSWALE FACILITIES

1. MATERIAL SPECIFICATIONS

THE ALLOWABLE MATERIALS TO BE USED IN MICRO-BIORETENTION AND BIOSWALE AREAS ARE DETAILED IN TABLE B.4.1. (SEE THIS SHEET)

2. FILTER MEDIA OR PLANTING SOIL

THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION AND BIOSWALE PRACTICES THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON 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 CONTENT – LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION)
- ORGANIC CONTENT – MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35%-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 INTO THE SOIL TO INCREASE OR DECREASE pH.

THERE 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 SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

3. COMPACTION

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

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE MICRO-BIORETENTION AND BIOSWALE FACILITIES BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACTURE THE SOIL PROFILE THROUGH 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.

WHEN BACKFILLING THE MICRO-BIORETENTION AND BIOSWALE FACILITIES, PLACE SOIL IN LIFTS OF 12" to 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE MICRO-BIORETENTION OR BIOSWALE BASINS. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS. GRADE MICRO-BIORETENTION AND BIOSWALE 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 AND BIOSWALE AREAS CAN BE FOUND ON THE LANDSCAPE PLANS FOUND HEREIN.

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 AREAS 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 MICRO-BIORETENTION AND BIOSWALE AREAS DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.

ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8th 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 PLUGS 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 MICRO-BIORETENTION AND BIOSWALE STRUCTURES IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

6. UNDERDRAINS

UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:

- PIPE – SHOULD BE 4"-6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTMF 758, TYPE PS 28, OR AASHTO-M-78) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OR 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 HARDWARE CLOTH.
- GRAVEL – THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.
- A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT 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 MIGRATION OF FINES INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

7. MISCELLANEOUS

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

TABLE B.4.1 MATERIAL SPECIFICATIONS FOR MICRO-BIORETENTION AND BIOSWALE FACILITIES

MATERIAL	SPECIFICATION	SIZE	NOTES
PLANTINGS	SEE APPENDIX A, TABLE A.4	N/A	PLANTINGS ARE SITE-SPECIFIC
PLANTING SOIL [2' TO 4' DEEP]	LOAMY SAND (60-65%) & COMPOST (35-40%) OR SANDY LOAM (30%), COARSE SAND (30%) & COMPOST (40%)	N/A	USDA SOILS TYPES LOAMY SAND OR SANDY LOAM; CLAY CONTENT < 5%
ORGANIC CONTENT	MIN. 10% BY DRY WEIGHT (ASTM D 2974)		
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM; NO PINE OR WOOD CHIPS
PEA GRAVEL DIAPHRAGM / BRIDGING LAYER	PEA GRAVEL: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
RIPRAP APRON/RIVER ROCK CHANNEL	ORNAMENTAL STONE: WASHED COBBLES	STONE: 1.5" TO 6"	RIVER ROCK CHANNEL AND NON-CLASS I RIPRAP OUTFALLS
GEOTEXTILE		N/A	PE TYPE 1 NONWOVEN
GRAVEL (UNDERDRAINS AND INFILTRATION BERMS)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" TO 3/4")	
UNDERDRAIN PIPING & OBSERVATION WELL	F 758, TYPE PS 28 OR AASHTO M-278	4" TO 6" RIGID SCHEDULE 40 PVC OR SDR35	SLOTTED OR PERFORATED PIPE; 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 PSI @ 28 DAYS, NORMAL WEIGHT, AIR ENTRAINED; REINFORCING TO MEET ASTM-615-60	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 (BASE AND SOIL PRESSURES); AND ANALYSIS OF POTENTIAL CRACKING.
SAND	AASHTO-M-6 OR ASTM-C-33	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE (AASHTO) #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.

INSPECTION REQUIREMENTS FOR MICRO-BIORETENTION AND BIOSWALE FACILITIES

REGULAR INSPECTIONS SHALL BE MADE DURING THE FOLLOWING STAGES OF CONSTRUCTION:

1. DURING EXCAVATION TO SUBGRADE AND PLACEMENT AND BACKFILL OF UNDERDRAIN SYSTEMS.
2. DURING PLACEMENT OF FILTER MEDIA.
3. DURING CONSTRUCTION OF APPURTENANT CONVEYANCE.
4. UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.

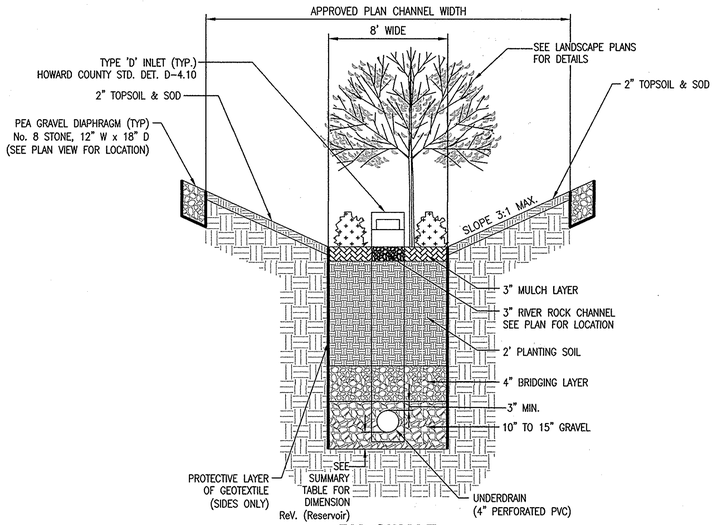
OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6) AND BIOSWALE FACILITIES (M-8)

THE FOLLOWING ITEMS SHOULD BE ADDRESSED TO ENSURE PROPER MAINTENANCE AND LONG-TERM PERFORMANCE OF MICRO-BIORETENTION AND BIOSWALE PRACTICES:

1. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A4.1 AND 4.2.
2. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
3. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.
4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS , WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

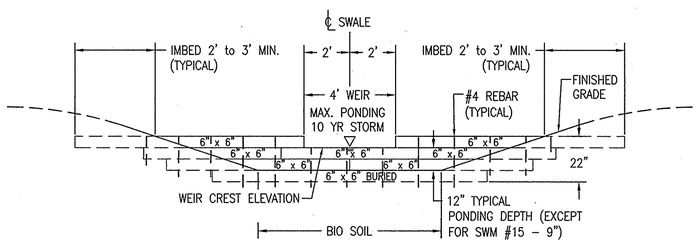
APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	DATE 11/9/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 11/14/12
CHIEF, DIVISION & LAND DEVELOPMENT	DATE 11/9/12

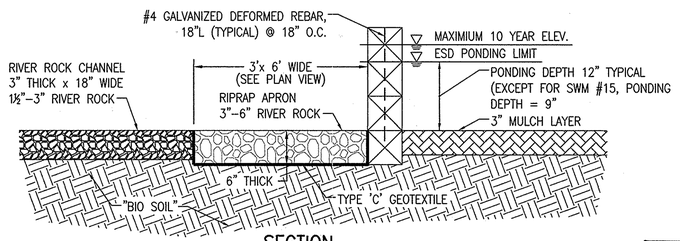


BIO-SWALE

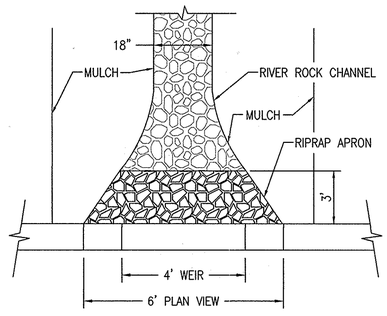
MDE CLASSIFICATION M-8
(TYPICAL SECTION)
N.T.S.



ELEVATION



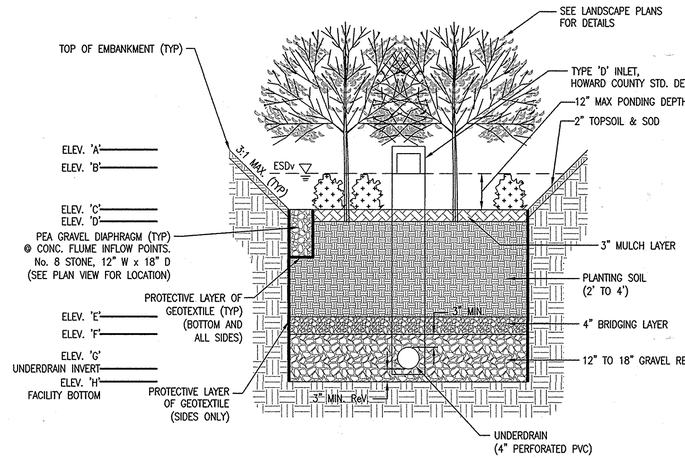
SECTION



PLAN VIEW

CHECK DAM DETAIL

NOT TO SCALE



MICRO-BIORETENTION

MDE CLASSIFICATION M-6
(TYP. SECTION)
N.T.S.

MICRO-BIORETENTION SCHEDULE

FACILITY NUMBER	TOP OF EMBANKMENT ELEV 'A'	ESDv PONDING ELEV 'B'	FACILITY SURFACE ELEV 'C'	PLANTING MEDIA TOP ELEV 'D'	PLANTING MEDIA BOTTOM ELEV 'E'	BRIDGING LAYER BOTTOM ELEV 'F'	UNDERDRAIN INVERT ELEV 'G'	STONE BOTTOM ELEV 'H'	FILTER BED AREA PROVIDED (SF)
							~~391.97~~		
SWM #1	397.41	397.25	396.50	396.25	393.25	392.92	~~392.33~~	391.67	372
SWM #2	396.90	396.42~~60~~	395.67~~56~~	395.42	392.42	392.09	391.50~~39~~	390.84	924
SWM #12	400.00	398.56~~30~~	~~398.06~~397.70	397.75	393.75	393.42	392.83~~97~~	392.33	1,855
SWM #13	400.00	398.58~~30~~	~~398.08~~397.60	397.75	394.75	394.42	393.83~~23~~	393.33	1,877
SWM #14	400.00	398.75~~40~~	~~398.08~~397.60	397.75	395.75	395.42	394.83~~06~~	394.33	1,552
SWM #16	400.25	400.~~08~~27	~~399.08~~398.90	398.75	396.75	396.42	~~396.08~~38.78	395.08	1,036
*SWM #17	400.75	400.56~~52~~	399.50~~30~~	399.25	397.25	396.92	396.33~~26~~	396.08	1,331
SWM #18	401.25	400.56~~52~~	~~400.06~~399.80	399.75	397.75	397.42	396.33+	395.83	1,191

*DUE TO LOW INFILTRATION RATE AT SWM #17, THERE WILL BE NO RECHARGE BELOW THE UNDERDRAIN.
+THE UNDERDRAIN FROM SWM#18 WILL TIE INTO THE UNDERDRAIN IN SWM#17 AND OUTFALL INTO I-10 AS SHOWN IN PLAN VIEW.

BIO-SWALE SUMMARY

FACILITY NUMBER	SWALE LENGTH (LF)	SWALE WIDTH (LF)	PLANTING SOIL DEPTH (FT)	GRAVEL BELOW UNDERDRAIN (INCH)	OVERFLOW INLET NO.	CHECK DAM SPACING (FT)	PONDING DEPTH (INCH)	UNDERDRAIN INVERT @ INLET	FACILITY SLOPE	FILTER BED AREA PROVIDED (SF)
								~~393.01~~		
SWM #3	218.0	7	2	6	I-7	30	12	~~392.72~~	3%	1,527

F-R AS-BUILT
STATE OF MARYLAND
THOMAS C. NEUGEBAUER
29203
PROFESSIONAL ENGINEER
7-7-14

AS-BUILT PLAN

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

STATE OF MARYLAND
THOMAS C. NEUGEBAUER
29203
PROFESSIONAL ENGINEER
10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

SHEET: SDP-16

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

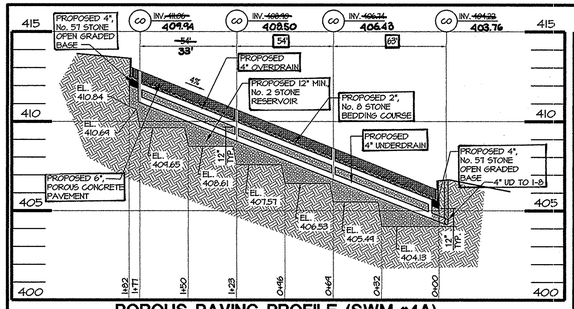
BIO SWALE & MICRO BIO DETAILS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS	
		JOB NO.: 12039
07/07/14	AS-BUILT INFORMATION ADDED TO PLAN	SCALE: AS SHOWN
		DATE: 10/16/2012
		DRAWN BY: MK
		DESIGN BY: MK
		REVIEW BY: TCN
		SHEET: 16 OF 46

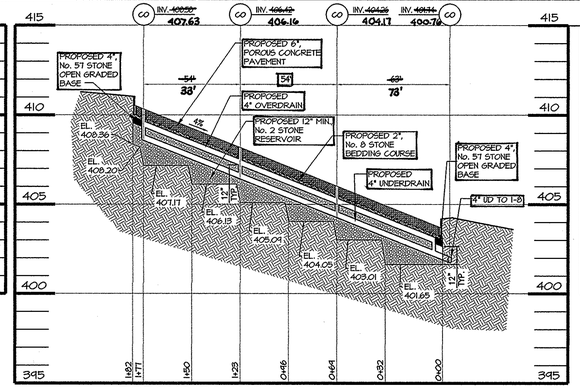
SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plot Sets\12039-SDP-16-ESD DETAILS.dwg, 10/17/2012 9:33:55 AM, RHall,
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



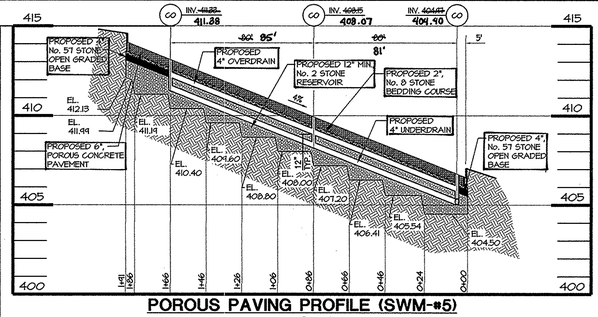
POROUS PAVING PROFILE (SWM-#4A)

HOR. 1" = 40'
VERT. 1" = 4'



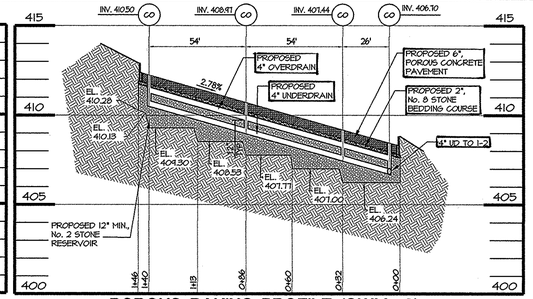
POROUS PAVING PROFILE (SWM-#4B)

HOR. 1" = 40'
VERT. 1" = 4'



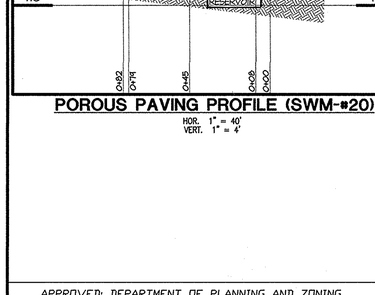
POROUS PAVING PROFILE (SWM-#5)

HOR. 1" = 40'
VERT. 1" = 4'



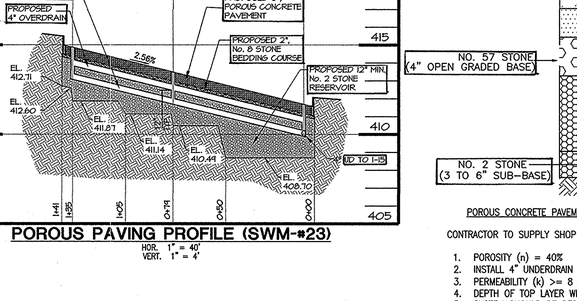
POROUS PAVING PROFILE (SWM-#6)

HOR. 1" = 40'
VERT. 1" = 4'



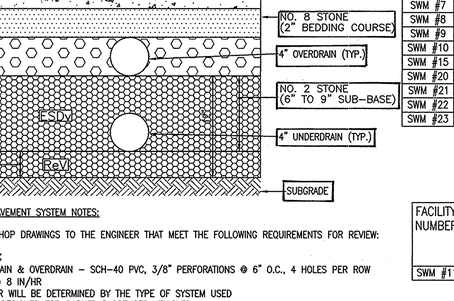
POROUS PAVING PROFILE (SWM-#7)

HOR. 1" = 40'
VERT. 1" = 4'



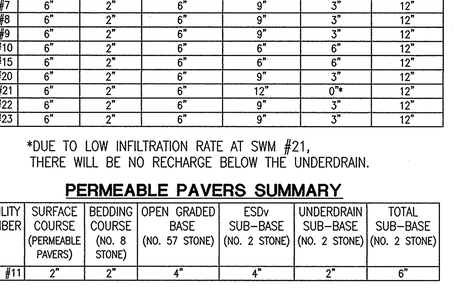
POROUS PAVING PROFILE (SWM-#8)

HOR. 1" = 40'
VERT. 1" = 4'



POROUS PAVING PROFILE (SWM-#9)

HOR. 1" = 40'
VERT. 1" = 4'



POROUS PAVING PROFILE (SWM-#10)

HOR. 1" = 40'
VERT. 1" = 4'

POROUS PAVING PROFILE (SWM-#15)

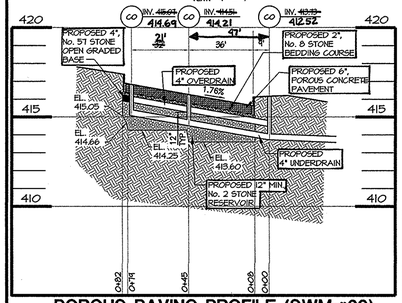
HOR. 1" = 40'
VERT. 1" = 4'

POROUS PAVING PROFILE (SWM-#21)

HOR. 1" = 40'
VERT. 1" = 4'

POROUS PAVING PROFILE (SWM-#22)

HOR. 1" = 40'
VERT. 1" = 4'



POROUS PAVING PROFILE (SWM-#20)

HOR. 1" = 40'
VERT. 1" = 4'

POROUS PAVING PROFILE (SWM-#23)

HOR. 1" = 40'
VERT. 1" = 4'

POROUS CONCRETE PAVEMENT SYSTEM NOTES:

CONTRACTOR TO SUPPLY SHOP DRAWINGS TO THE ENGINEER THAT MEET THE FOLLOWING REQUIREMENTS FOR REVIEW:

1. POROSITY (n) = 40%
2. INSTALL 4" UNDERDRAIN & OVERDRAIN – SCH-40 PVC, 3/8" PERFORATIONS @ 6" O.C., 4 HOLES PER ROW
3. PERMEABILITY (k) >= 8 IN/HR
4. DEPTH OF TOP LAYER WILL BE DETERMINED BY THE TYPE OF SYSTEM USED
5. SYSTEM SHOULD BE DESIGNED FOR PARKED PASSENGER VEHICLES
6. IF PERMEABLE PAVER IS CHOSEN, CONTRACTOR TO PROVIDE EDGE TREATMENT DETAILS

PERMEABLE PAVEMENT SECTION
MDE CLASSIFICATION A 2

NOT TO SCALE

NOTES:

1. SEE SHEET 18 FOR PLAN VIEW.
2. ALL CLEANOUTS SHALL BE 4" PVC.
3. SEE SHEET 18 FOR POROUS CONCRETE SPECIFICATIONS.

PERMEABLE PAVEMENT SUMMARY

FACILITY NUMBER	SURFACE COURSE (PERVIOUS CONCRETE)	BEDDING COURSE (NO. 8 STONE)	OPEN GRADED BASE (NO. 57 STONE)	ESDv SUB-BASE (NO. 2 STONE)	UNDERDRAIN SUB-BASE (NO. 2 STONE)	TOTAL SUB-BASE (NO. 2 STONE)
SWM #4A	6"	2"	6"	6"	6"	12"
SWM #4B	6"	2"	6"	6"	6"	12"
SWM #5	6"	2"	6"	9"	3"	12"
SWM #6	6"	2"	6"	9"	3"	12"
SWM #7	6"	2"	6"	9"	3"	12"
SWM #8	6"	2"	6"	9"	3"	12"
SWM #9	6"	2"	6"	9"	3"	12"
SWM #10	6"	2"	6"	6"	6"	12"
SWM #15	6"	2"	6"	6"	6"	12"
SWM #20	6"	2"	6"	9"	3"	12"
SWM #21	6"	2"	6"	12"	0"*	12"
SWM #22	6"	2"	6"	9"	3"	12"
SWM #23	6"	2"	6"	9"	3"	12"

*DUE TO LOW INFILTRATION RATE AT SWM #21, THERE WILL BE NO RECHARGE BELOW THE UNDERDRAIN.

PERMEABLE PAVERS SUMMARY

FACILITY NUMBER	SURFACE COURSE (PERMEABLE PAVERS)	BEDDING COURSE (NO. 8 STONE)	OPEN GRADED BASE (NO. 57 STONE)	ESDv SUB-BASE (NO. 2 STONE)	UNDERDRAIN SUB-BASE (NO. 2 STONE)	TOTAL SUB-BASE (NO. 2 STONE)
SWM #11	2"	2"	4"	4"	2"	6"

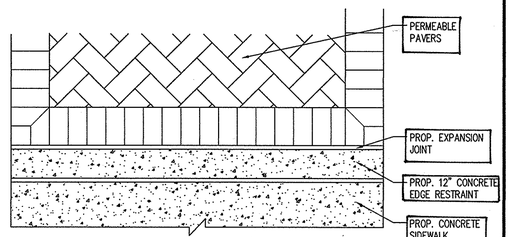
OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

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

THE FOLLOWING ITEMS SHOULD BE ADDRESSED TO ENSURE PROPER MAINTENANCE AND LONG-TERM PERFORMANCE OF PERMEABLE PAVEMENT:

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



PERMEABLE PAVER DETAIL

NOT TO SCALE

AS-BUILT PLAN

FOR AS-BUILT
STATE OF MARYLAND — NIZAM C. USTA — 29203 — REGISTERED PROFESSIONAL ENGINEER
7-7-14

STATE OF MARYLAND — NIZAM C. USTA — 29203 — REGISTERED PROFESSIONAL ENGINEER
10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/29/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

PERMEABLE PAVEMENT NOTES & DETAILS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS
07/07/14	AS-BUILT INFORMATION ADDED TO PLAN

JOB NO.: 12039
SCALE: AS SHOWN
DATE: 10/16/2012
DRAWN BY: PES
DESIGN BY: PES
REVIEW BY: TCN
SHEET: 17 OF 46

SHEET: SDP-17

SDP-12-077

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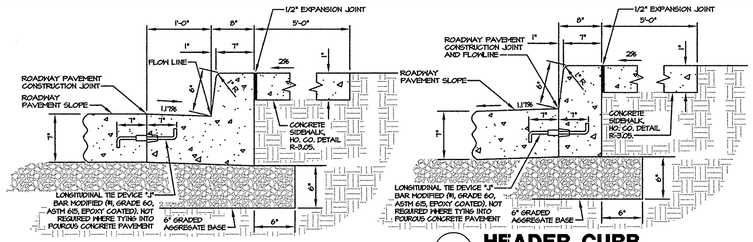
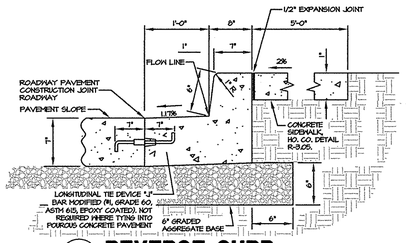
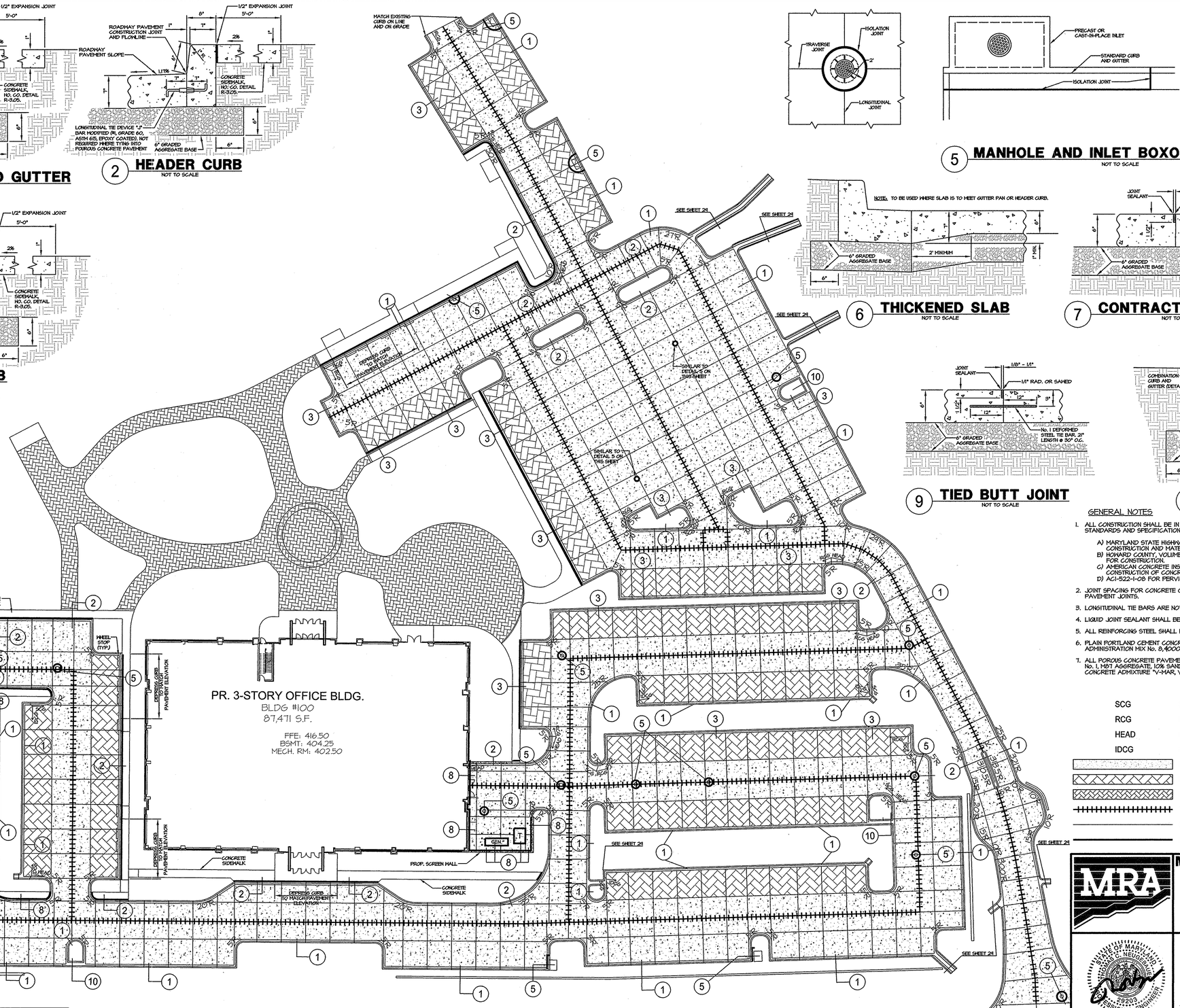


1 COMBINATION CURB AND GUTTER
NOT TO SCALE

2 HEADER CURB
NOT TO SCALE



3 REVERSE CURB AND GUTTER
NOT TO SCALE

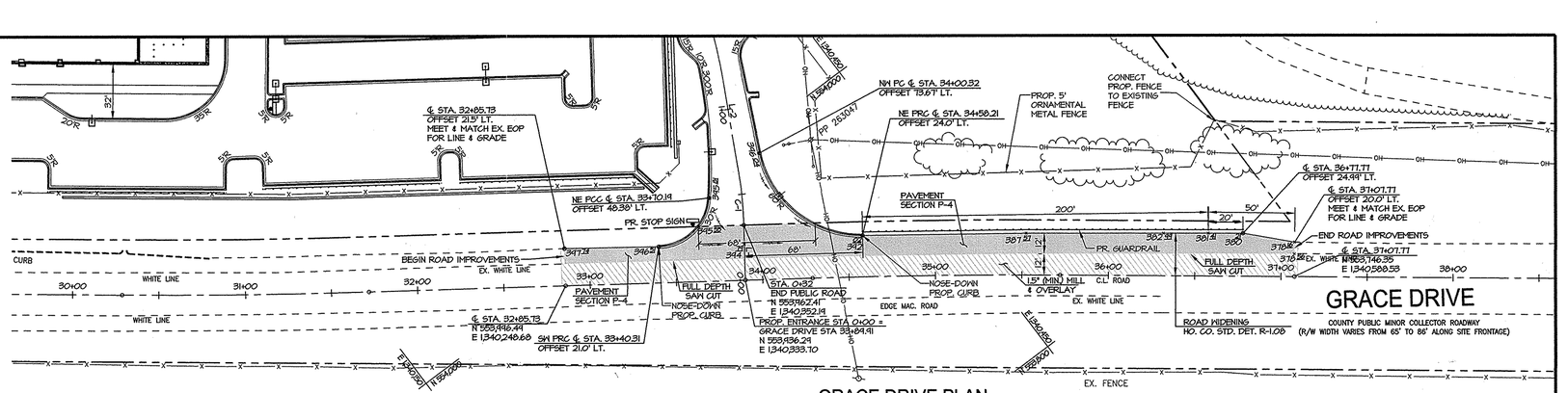

MATCH EXISTING CURB ON LINE AND GRADE
SEE SHEET 29
SEE SHEET 29
SEE SHEET 29
SEE SHEET 29
REVERSE CURB TO MATCH PAVEMENT ELEVATION
SIMILAR TO DETAIL 5 ON THIS SHEET
SIMILAR TO DETAIL 5 ON THIS SHEET
100'R
200'R
CONCRETE SIDEWALK
MATCH EXISTING CURB ON LINE AND GRADE
WHEEL STOP (TYP.)
DEPRESS CURB TO MATCH PAVEMENT ELEVATION
PR. 3-STORY OFFICE BLDG.
BLDG #100
87,471 S.F.
FFE: 416.50
BSMT: 404.25
MECH. RM: 402.50
DEPRESS CURB TO MATCH PAVEMENT ELEVATION
GEN.
CONCRETE SIDEWALK
PROP. SCREEN WALL
DEPRESS CURB TO MATCH PAVEMENT ELEVATION
CONCRETE SIDEWALK
SIMILAR TO DETAIL 5 ON THIS SHEET
SEE SHEET 29
SEE SHEET 29
SEE SHEET 29
SEE SHEET 29

LEGEND

- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. OVERHEAD LINE
- EX. WATER LINE
- EX. SEWER LINE
- EX. STREAM
- EX. STREAM BUFFER
- EX. TREE LINE
- EX. GUARD RAIL
- EX. ELECTRIC CONDUIT
- EX. LIGHT POLES
- EX. GAS LINE
- EX. STORM DRAIN
- EX. CONDUIT
- EX. FIBER OPTIC
- EX. ELECTRIC MANHOLE
- EX. TELEPHONE MANHOLE
- PR. BUILDING FOOTPRINT
- PR. BUILDING OVERHANG
- PR. EDGE OF CONCRETE
- PR. CURB
- PR. SIDEWALK
- PR. RETAINING WALL
- PR. MEDIUM DUTY PAVEMENT
- PR. PAVEMENT MILL AND OVERLAY
- PR. TREELINE
- PR. HEDGEROW
- PR. STREET LIGHT

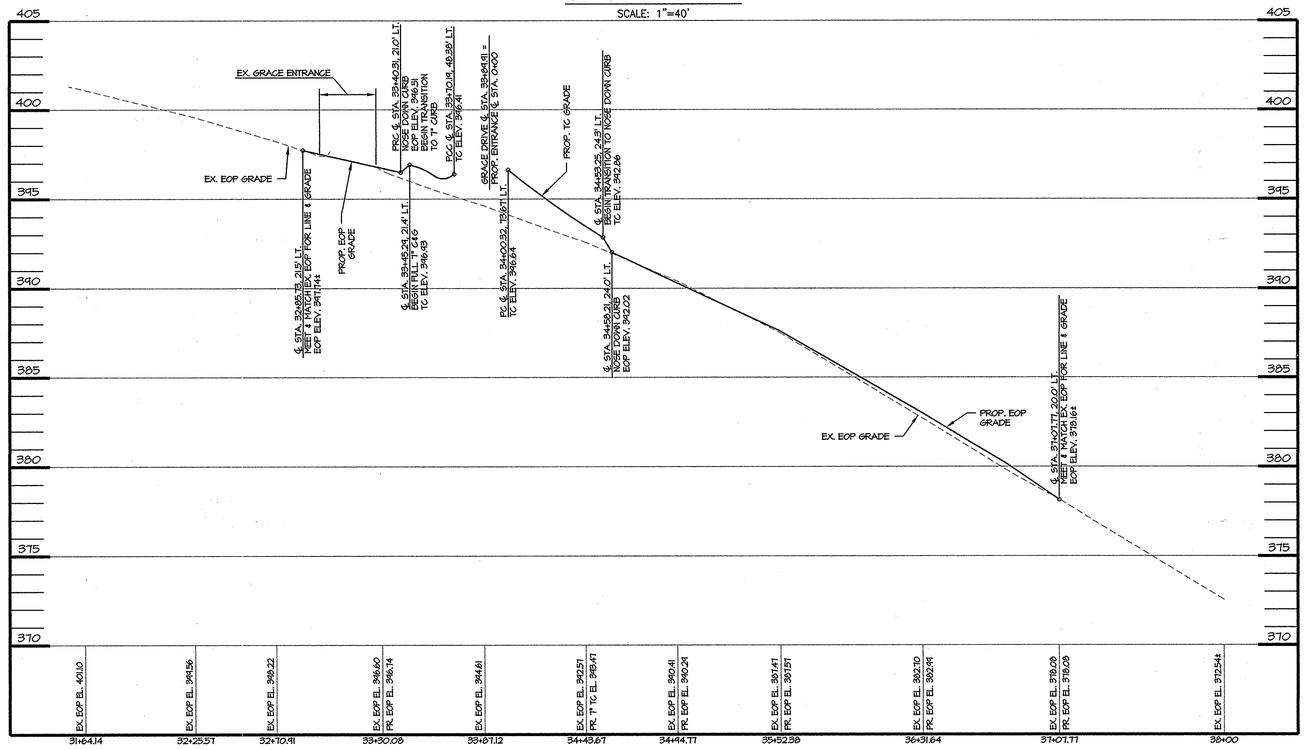
LINE TABLE		
LINE	LENGTH	BEARING
L-1	35.06	N35°17'56"E
L-2	55.48	N27°23'57"E

CURVE TABLE						
NAME	DELTA	RADIUS	LENGTH	BEARING	CHORD	TANGENT
C-1	7°53'59"	200.00'	27.58'	N 31°20'57" E	27.55'	13.81'



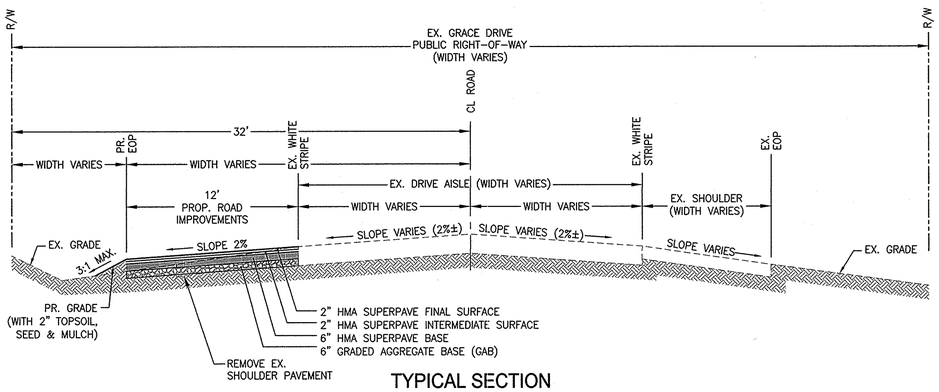
GRACE DRIVE PLAN

SCALE: 1"=40'



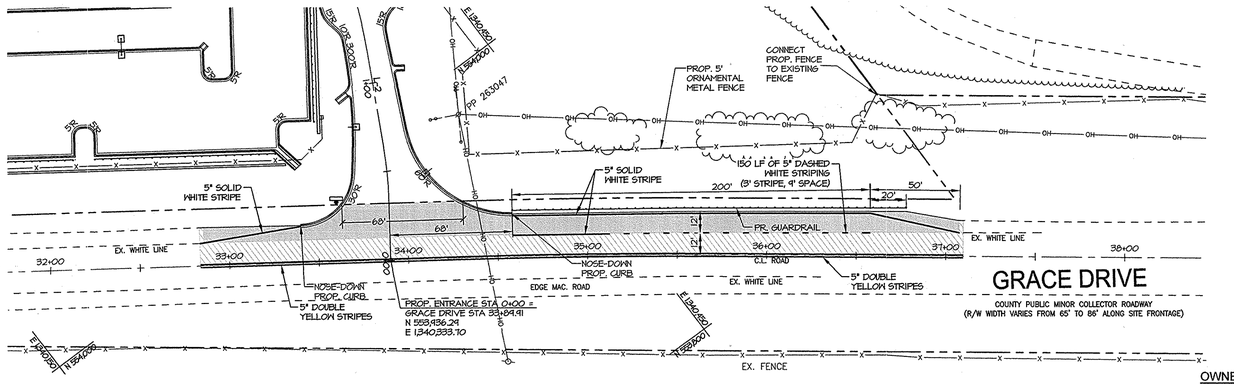
GRACE DRIVE TOP OF CURB PROFILE

HOR. 1" = 40'
VERT. 1" = 4'



TYPICAL SECTION
PROPOSED GRACE DRIVE ROAD IMPROVEMENTS

NOT TO SCALE



GRACE DRIVE PAVEMENT MARKING PLAN

SCALE: 1"=40'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/28/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-19

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
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FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND — TIMOTHOY C. NEWCOMB — 29203 — PROFESSIONAL ENGINEER — 10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

GRACE DRIVE PLAN & PROFILE

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	AS SHOWN
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	19 OF 46

SDP-12-077

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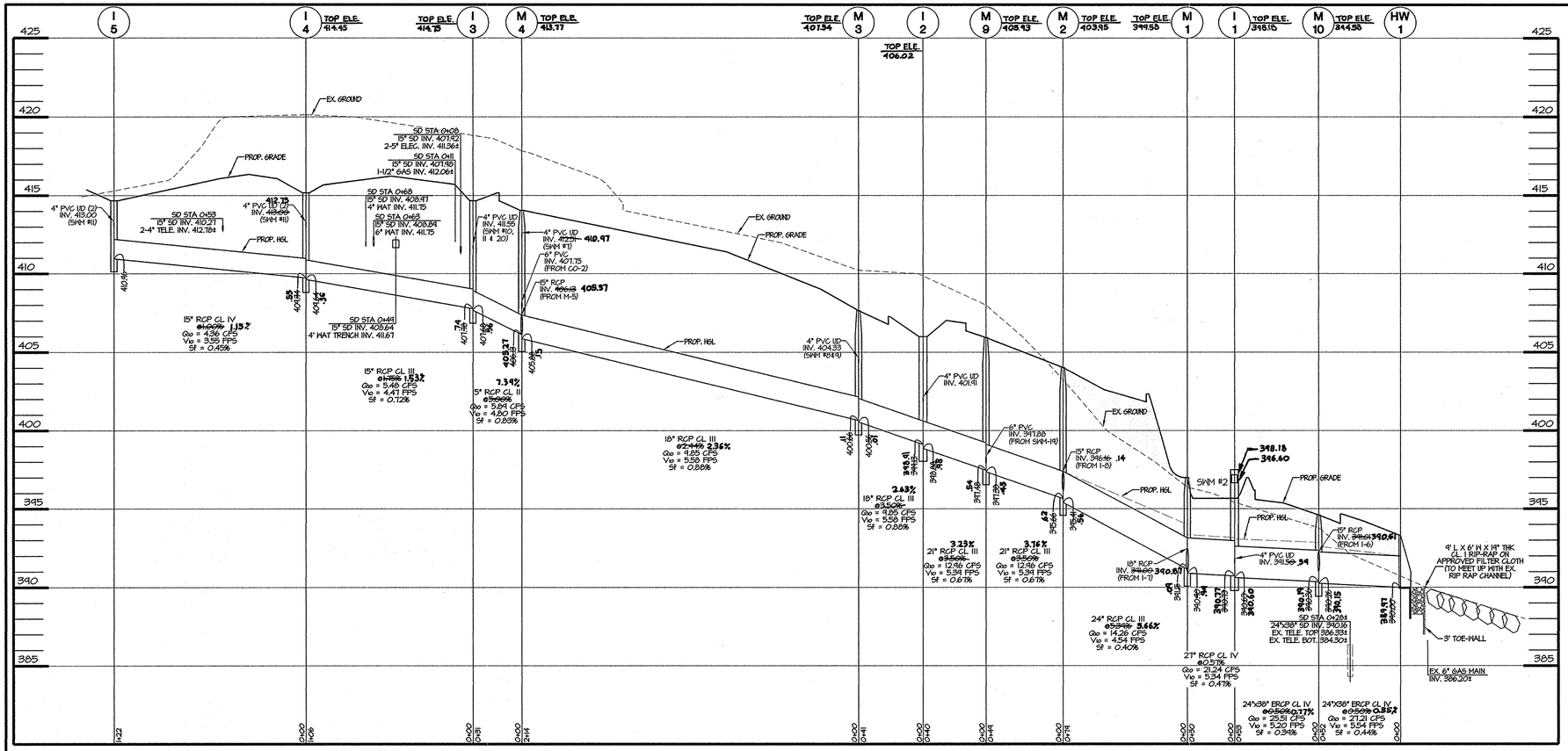
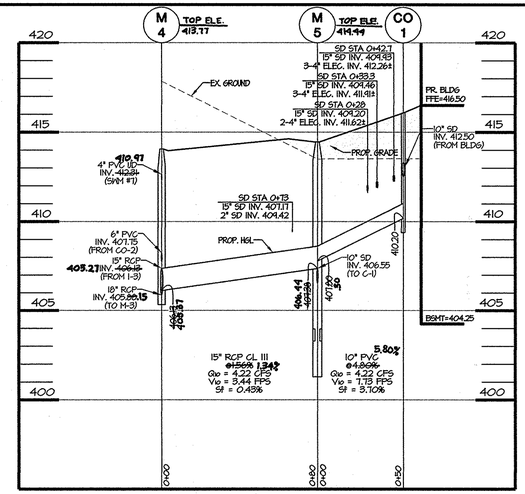
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



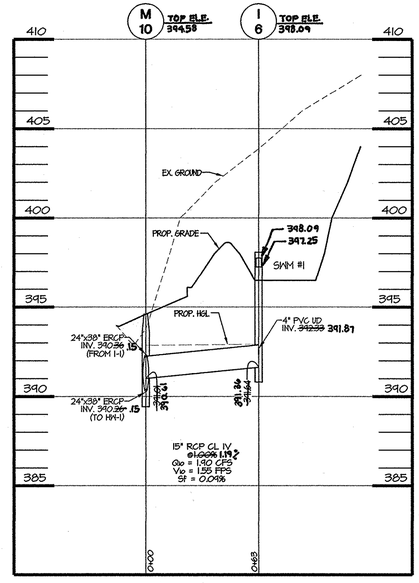
I-5 TO HW-1 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



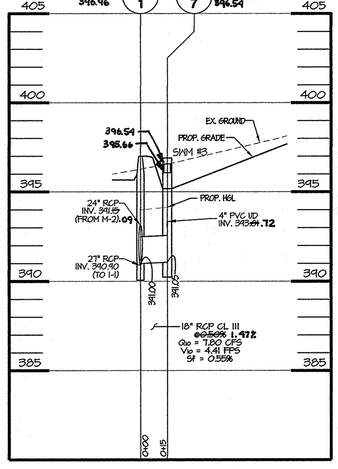
M-4 TO CO-1 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



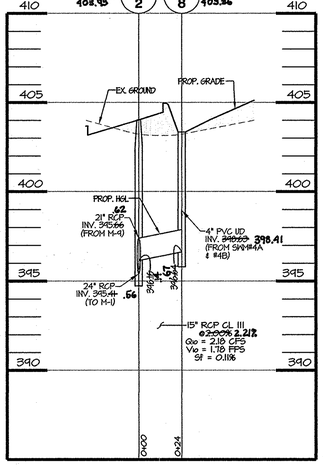
M-10 TO I-6 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



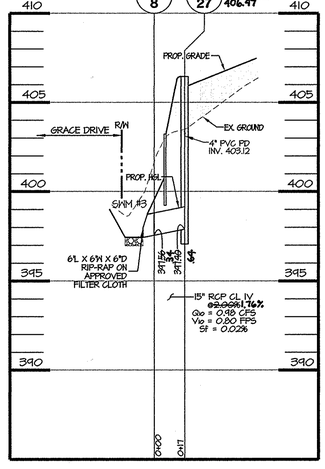
M-1 TO I-7 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



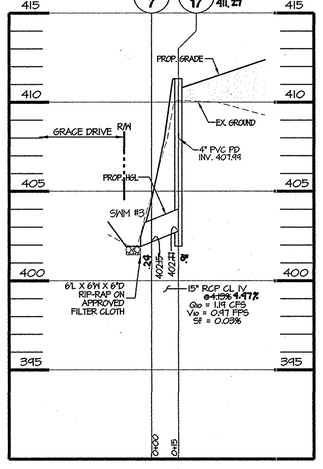
M-2 TO I-8 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



ES-8 TO I-27 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



ES-7 TO I-17 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'

FOR AS-BUILT
STATE OF MARYLAND
THOMAS C. NEUGEBAUER
29203
PROFESSIONAL ENGINEER
7-7-14

AS-BUILT PLAN

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
CHIEF, DIVISION & LAND DEVELOPMENT	11/9/12 DATE

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

STATE OF MARYLAND
THOMAS C. NEUGEBAUER
29203
PROFESSIONAL ENGINEER
10-17-12

MD. 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. 29203, EXPIRATION DATE: 06/16/2013.

SHEET: SDP-20

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

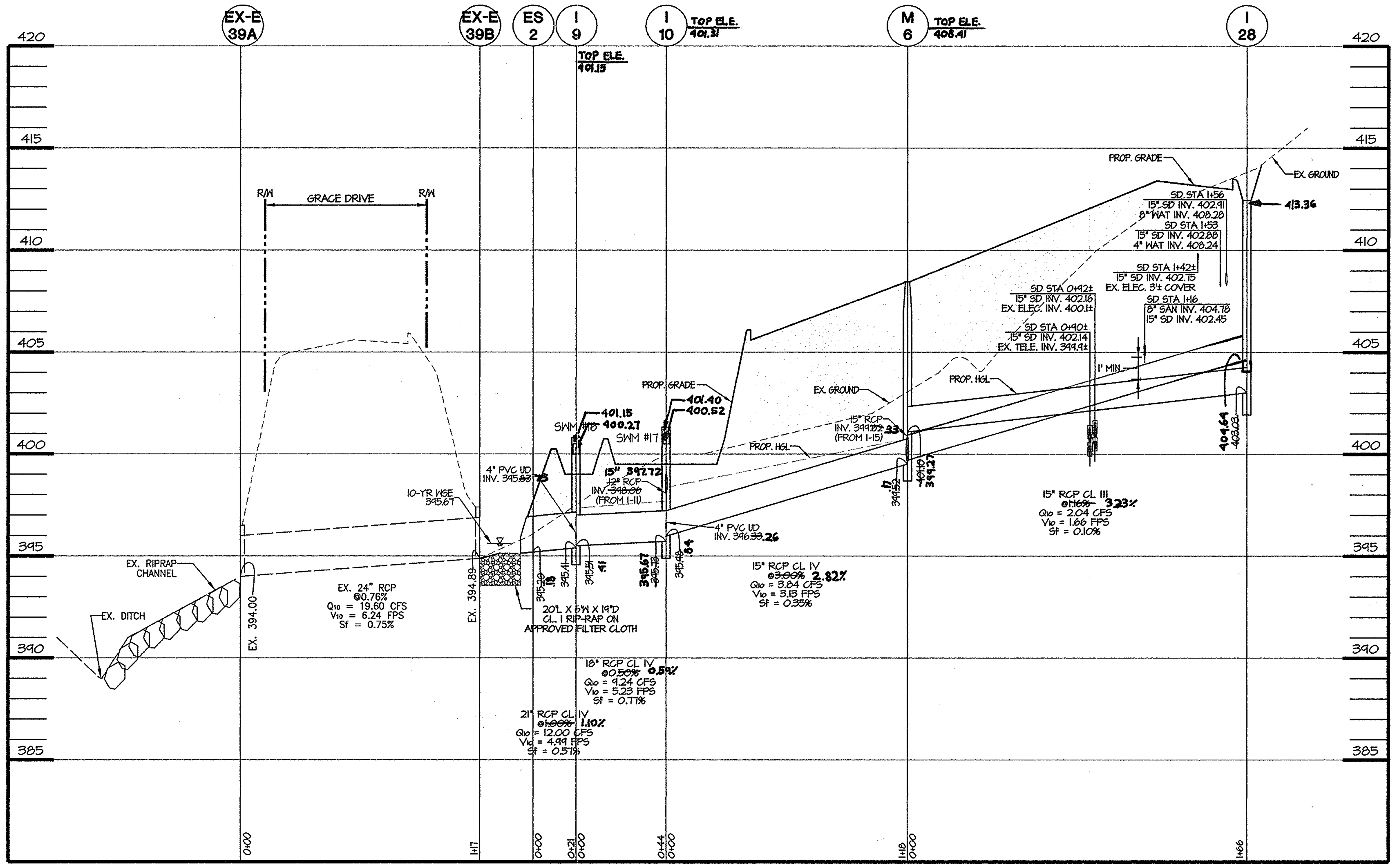
STORM DRAIN PROFILES

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
07/07/14	AS-BUILT INFORMATION ADDED TO PLAN	SCALE:	AS SHOWN
		DATE:	10/16/2012
		DRAWN BY:	MK/RAH
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	20 OF 46

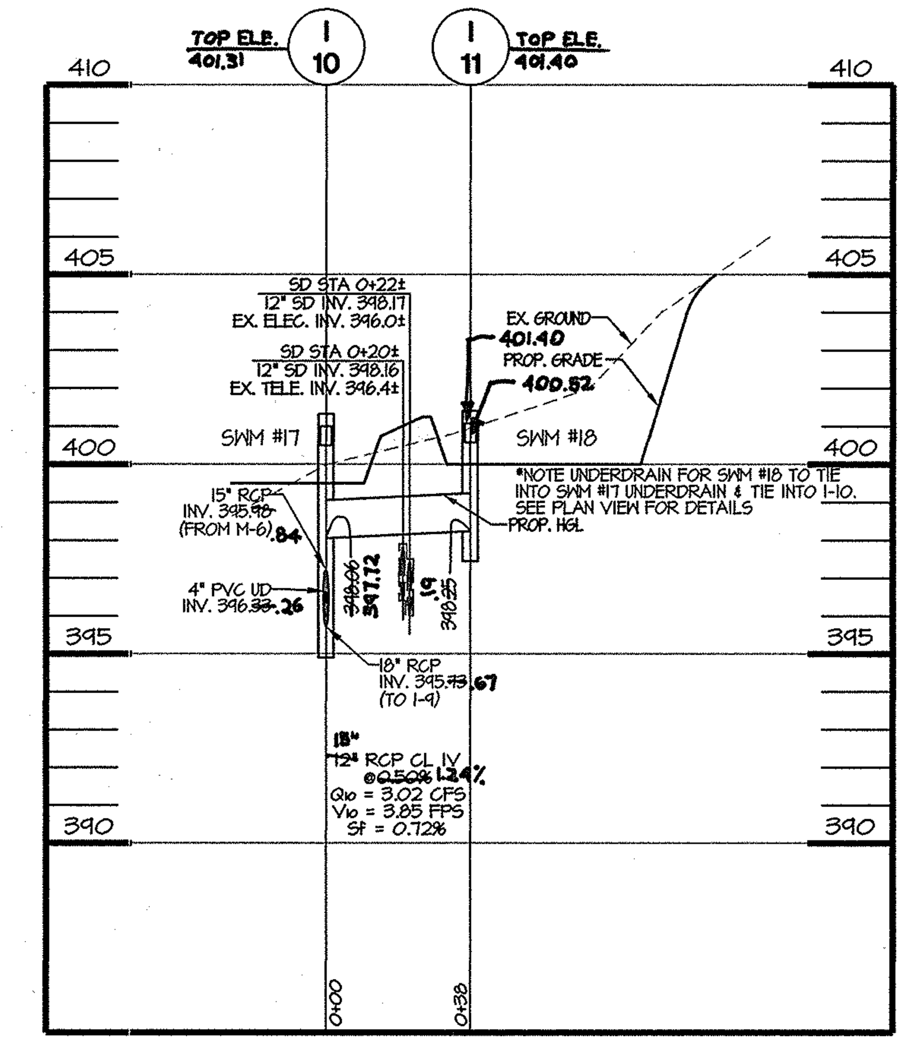
SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDR\SDP\PLOT\Plan Sets\12039-SDP-20-STORM DRAIN-PROFILES.dwg, 10/17/2012 9:46:23 AM, Rhoit.
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



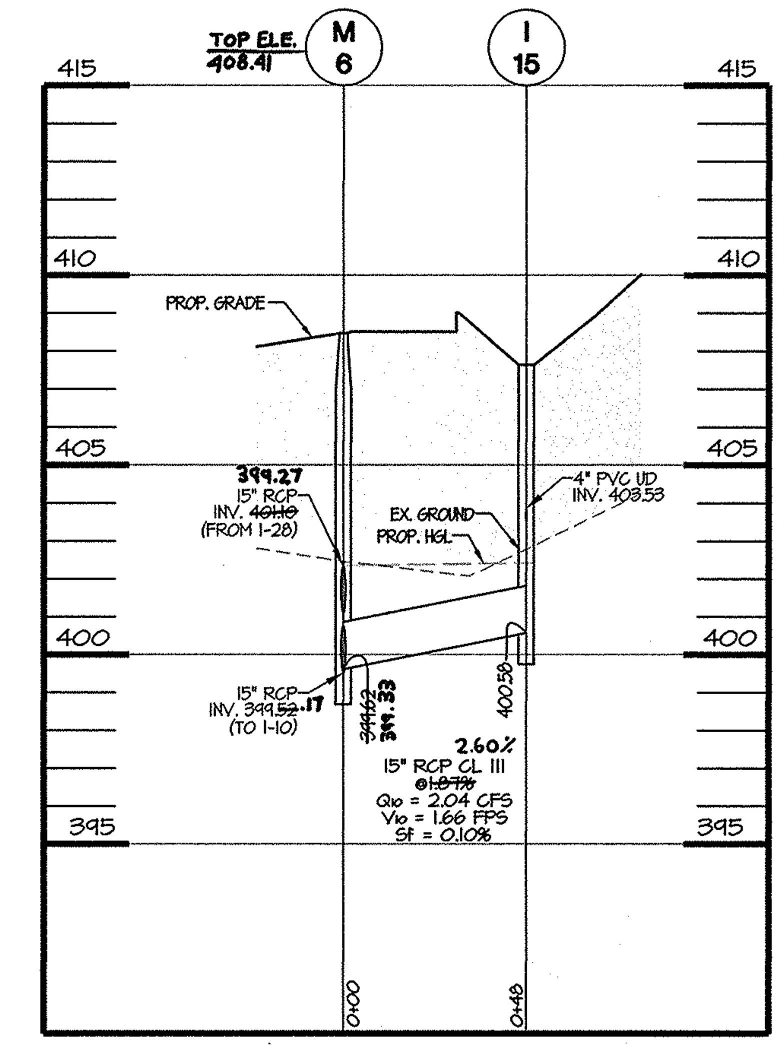
ES-2 TO I-28 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



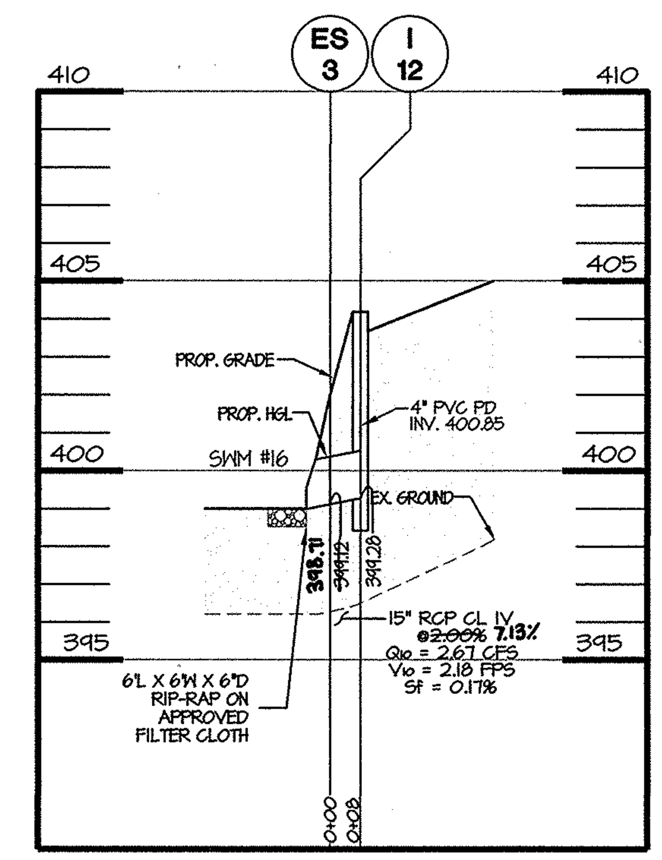
I-10 TO I-11 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



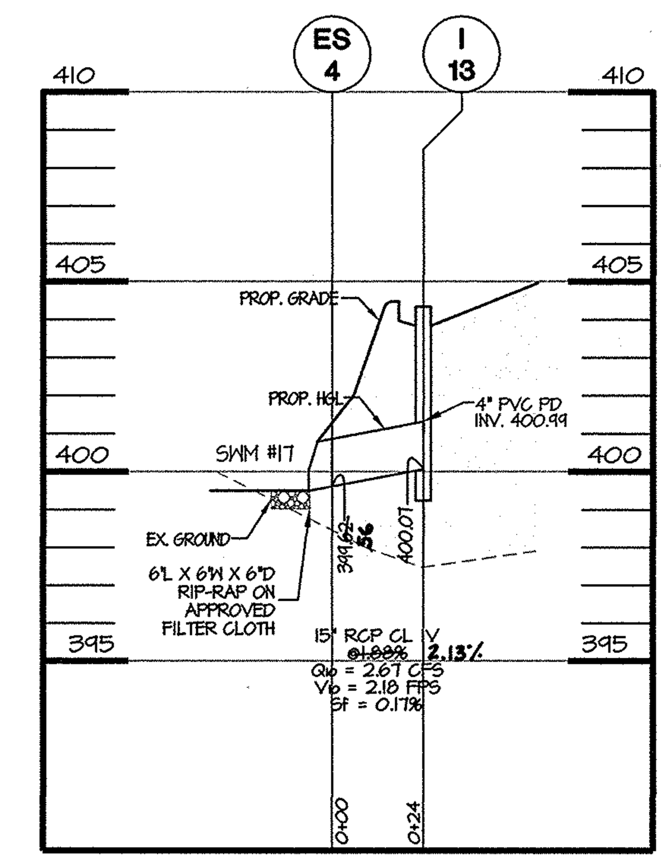
M-6 TO I-15 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



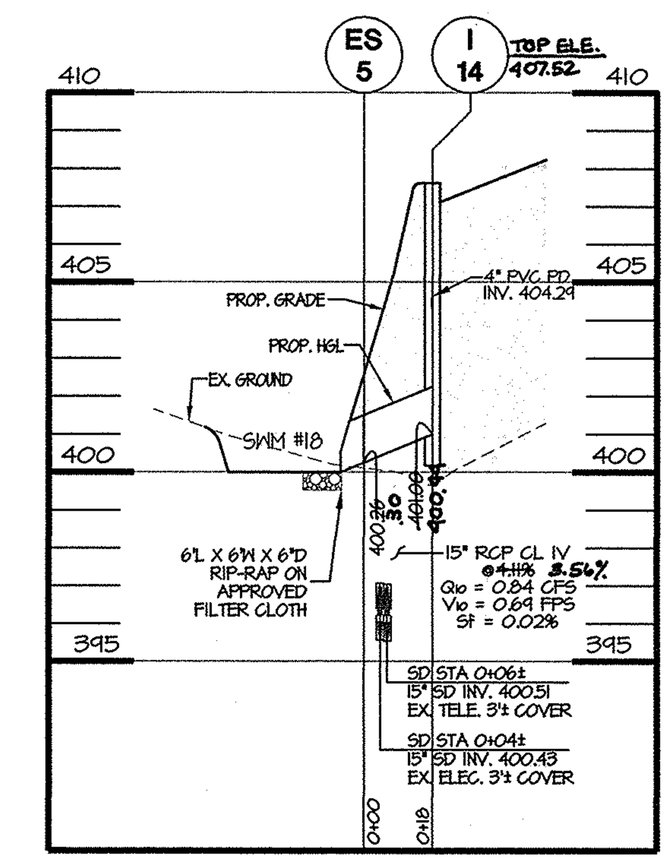
ES-3 TO I-12 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



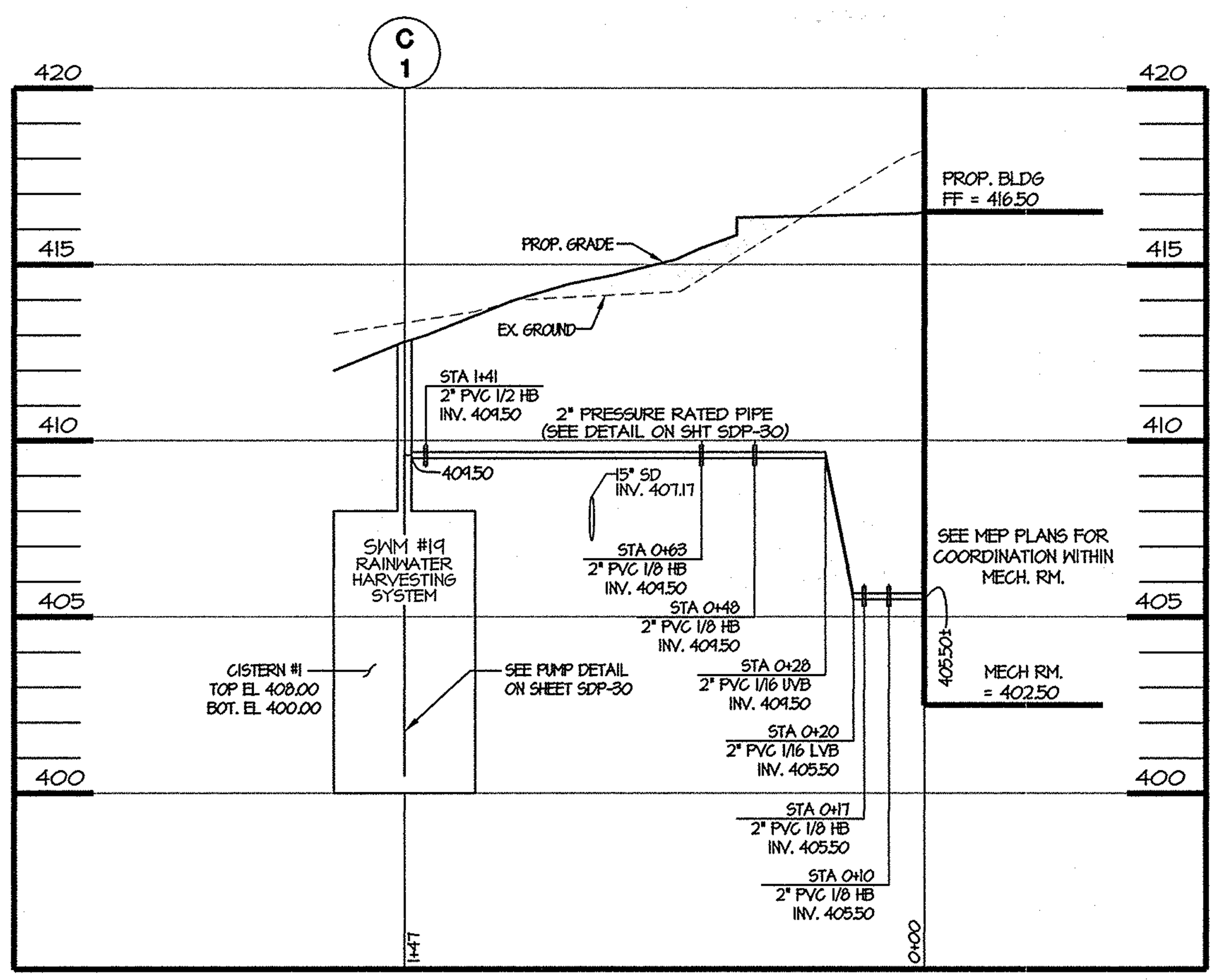
ES-4 TO I-13 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



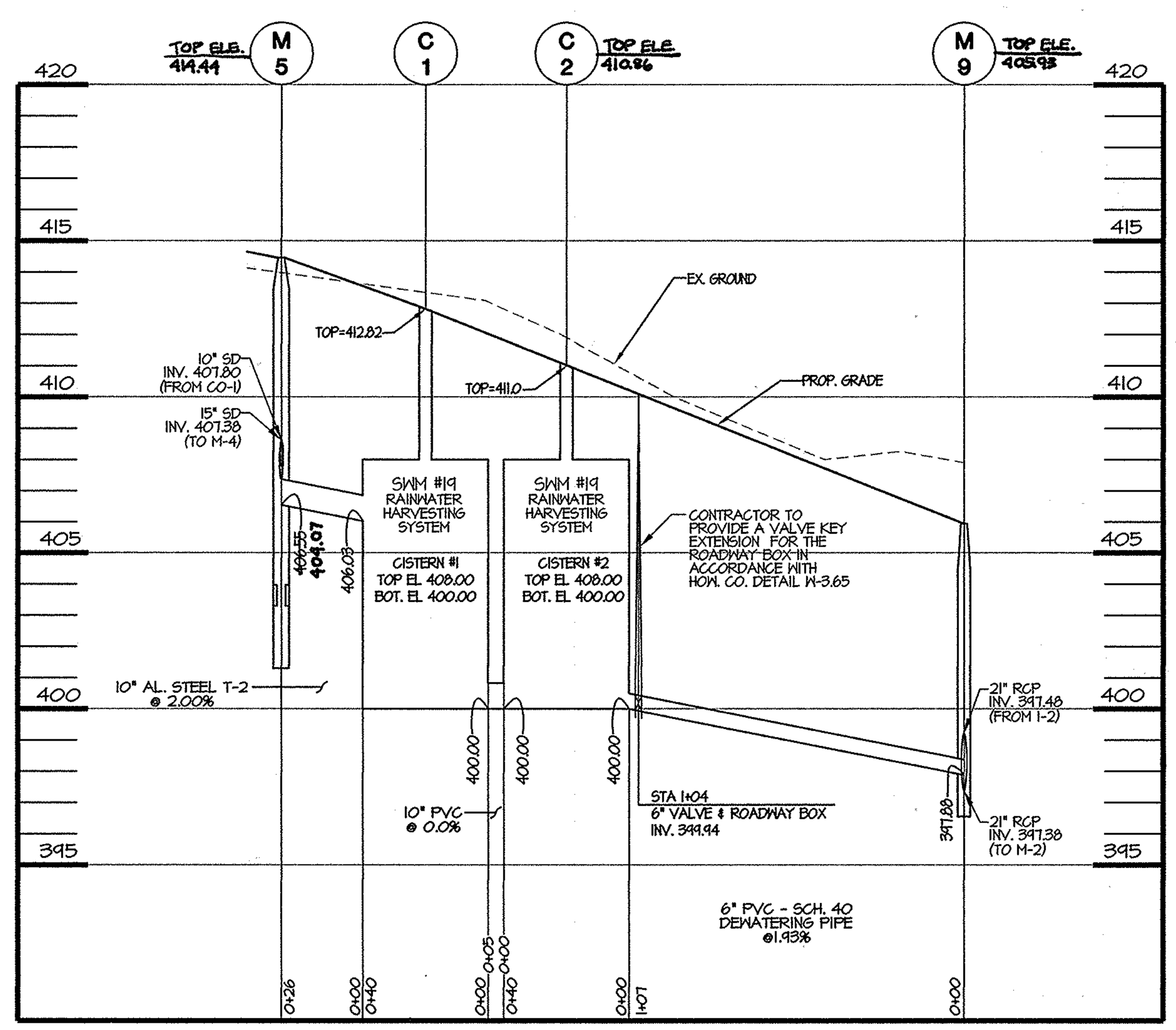
ES-5 TO I-14 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



M-5 TO BLDG (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



M-5 TO M-9 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'

FOR AS-BUILT
STATE OF MARYLAND THOMAS C. NEUGEBAUER 29203 PROFESSIONAL ENGINEER
7-7-14

AS-BUILT PLAN

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
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STATE OF MARYLAND THOMAS C. NEUGEBAUER 29203 PROFESSIONAL ENGINEER
10-17-12

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SHEET: SDP-21

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STORM DRAIN PROFILES

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		SHEET:	21 OF 46

SDP-12-077

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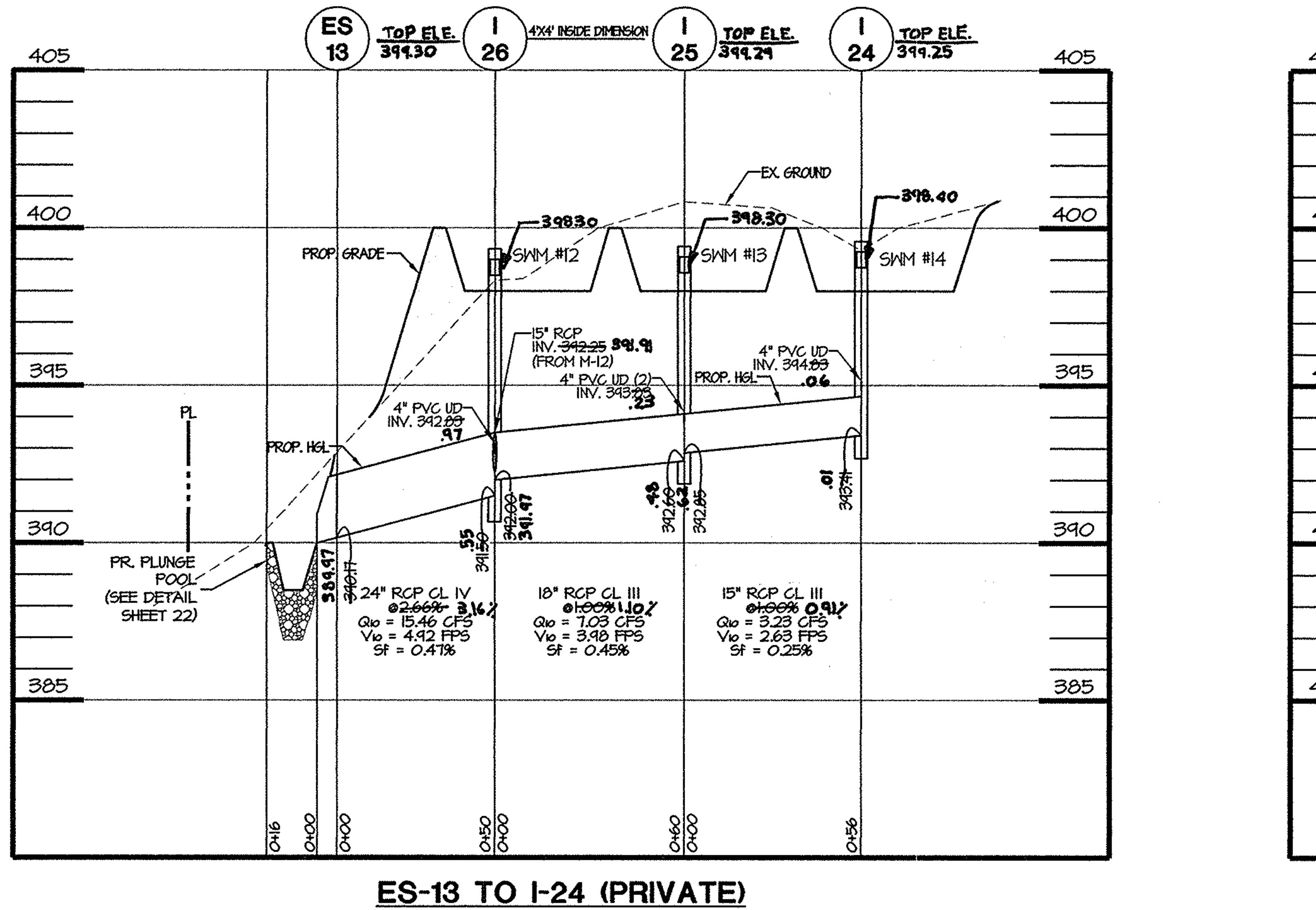
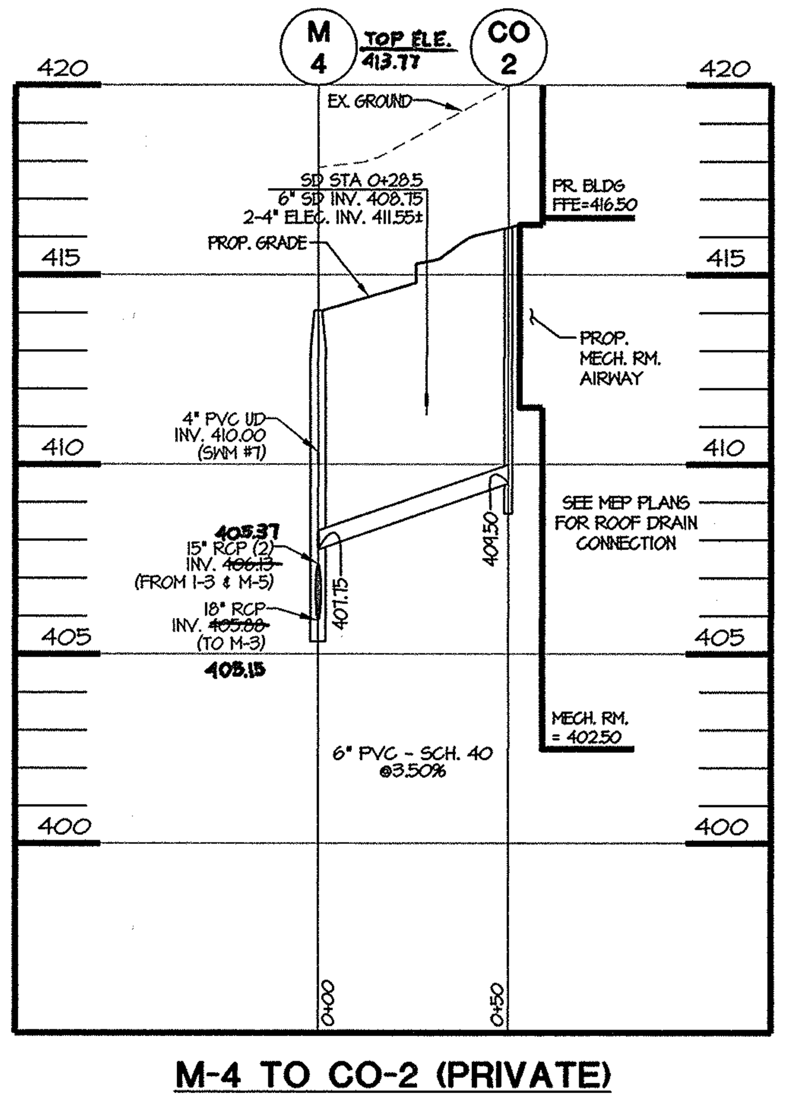


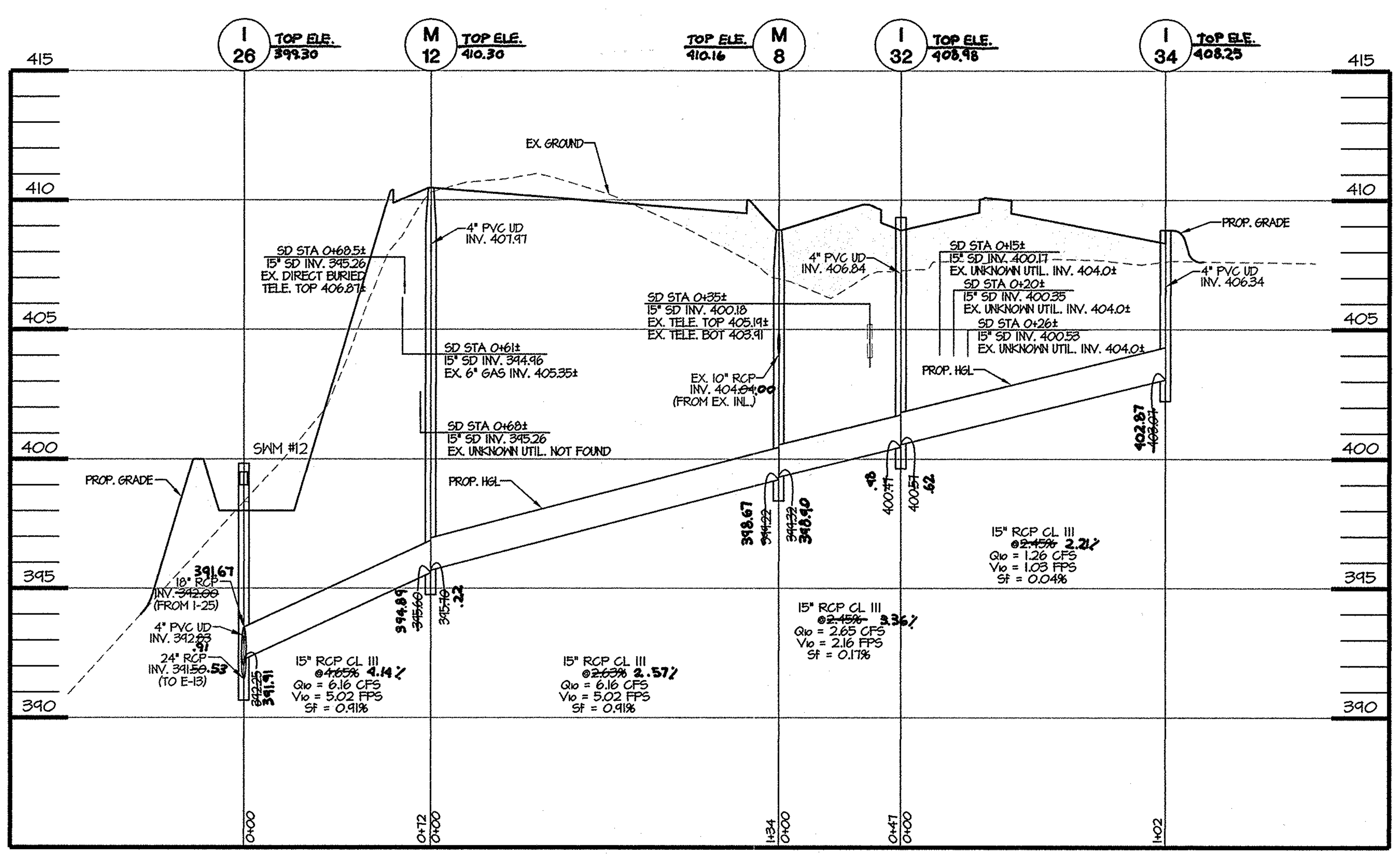
ES-13 TO I-24 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'



M-4 TO CO-2 (PRIVATE)

HOR. 1" = 40'



I-26 TO I-34 (PRIVATE)

HOR. 1" = 40'
VERT. 1" = 4'

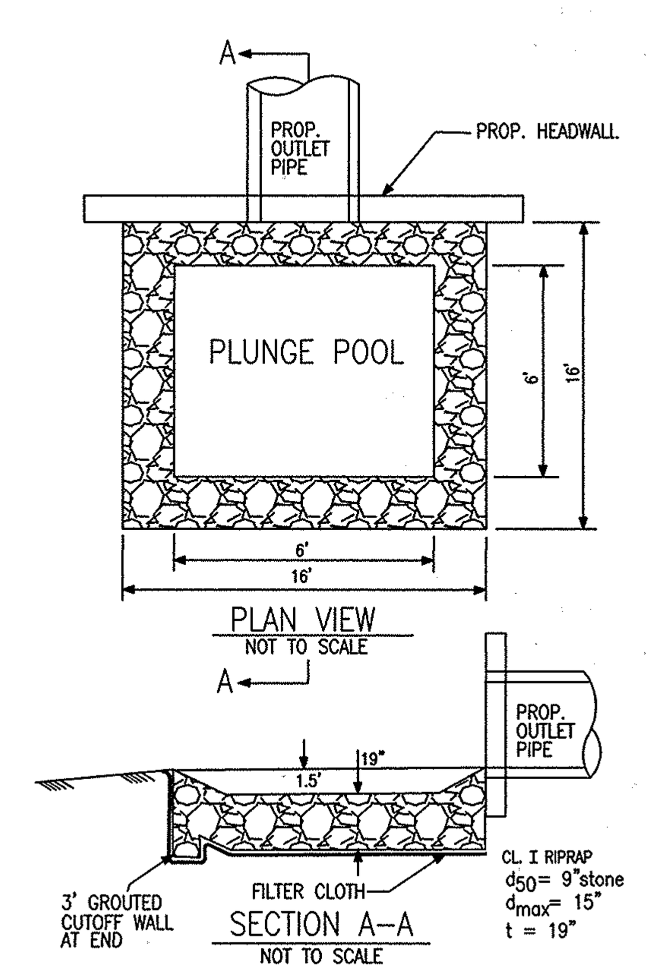
COORDINATES TO CENTER OF STRUCTURE FOR YARD INLETS, CLEANOUTS & CISTERNS.
● COORDINATES AT CENTER AT FACE OF CURB FOR CURB INLETS.
COORDINATES AT CENTER OF END OF STRUCTURE FOR END SECTIONS & HEADWALLS.

TOP ELEVATIONS FOR:
'A-5' & 'WR' = TOP OF CURB AT CENTER OF STRUCTURE AT FLOWLINE
'D' INLETS = TOP OF SLAB
'S' & YARD INLETS = TOP OF GRATE AT CENTER OF STRUCTURE
MANHOLES = TOP OF RIM

STORM DRAIN STRUCTURE SCHEDULE (PRIVATE)

STR NO.	TOP ELEV	INV. IN	INV. IN	INV. IN	INV. IN	INV. OUT	INV. OUT	TYPE	REMARKS	● LOCATION NORTHING	EASTING
C-1	—	—	—	—	406.03	—	400.00	CONTECH 96" DIA. URBANGREEN UGM CISTERN, SEE DETAIL SHEET SDP-31		554,214.43	1,340,233.34
C-2	—	—	—	—	400.00	—	400.00	CONTECH 96" DIA. URBANGREEN UGM CISTERN, SEE DETAIL SHEET SDP-31		554,224.22	1,340,240.28
CO-1	416.08	—	—	—	412.50	—	410.20	STANDARD 10" PVC CLEANOUT, WITH TRAFFIC BEARING FRAME & COVER		554,262.45	1,340,152.28
CO-2	416.25	—	—	—	—	—	409.50	STANDARD 6" PVC CLEANOUT		554,329.08	1,340,202.75
				.09	.87		.94				
M-1	397.00	—	—	~~391.13~~	~~390.98~~	—	~~390.88~~	5' DIA. SHALLOW PRECAST MANHOLE, HOWARD COUNTY STANDARD DETAIL G-5.13		554,013.61	1,340,307.60
M-2	404.03	—	—	~~396.16~~ .19	~~395.66~~ .62	—	~~395.41~~ .56	STANDARD PRECAST MANHOLE, HOWARD COUNTY STANDARD DETAIL G-5.12		554,080.64	1,340,348.51
M-3	407.66	—	—	~~404.33~~ .50	~~400.66~~ .11	—	~~400.56~~ .61	STANDARD PRECAST MANHOLE, HOWARD COUNTY STANDARD DETAIL G-5.12		554,186.63	1,340,423.12
M-4	414.06	410.00	407.75	406.13	406.13	—	405.88	STANDARD PRECAST MANHOLE, HOWARD COUNTY STANDARD DETAIL G-5.12		554,316.71	1,340,239.50
M-5	414.46	—	—	—	407.80	407.38	~~406.55~~ 404.07	CONTECH DETAIL CDS2020-5-C, SEE DETAIL SHEET SDP-30		554,241.18	1,340,195.58
M-6	408.47	—	~~399.27~~	~~401.10~~	399.62 .33	—	~~399.52~~ .17	STANDARD PRECAST MANHOLE, HOWARD COUNTY STANDARD DETAIL G-5.12		554,456.95	1,339,868.81
M-8	408.85	—	—	404.04 .00	~~399.32~~	~~398.90~~	~~399.22~~ 398.67	STANDARD PRECAST MANHOLE, HOWARD COUNTY STANDARD DETAIL G-5.12		554,501.25	1,340,445.45
M-9	405.94	—	—	397.88	397.48	—	397.38	STANDARD PRECAST MANHOLE, HOWARD COUNTY STANDARD DETAIL G-5.12		554,119.93	1,340,377.12
M-10	394.60	—	—	390.99 .61	~~390.34~~ .19	—	~~390.24~~ .15	5' DIA. SHALLOW PRECAST MANHOLE, HOWARD COUNTY STANDARD DETAIL G-5.13		553,956.57	1,340,367.55
M-12	410.47	—	—	407.97	~~395.70~~ .22	—	~~395.60~~ 404.07	STANDARD PRECAST MANHOLE, HOWARD COUNTY STANDARD DETAIL G-5.12		554,368.22	1,340,457.64
				.39	.77		.60				
I-1	397.50	—	—	~~391.50~~	~~390.71~~	—	~~390.61~~	MODIFIED TYPE 'D' INLET, SEE DETAIL SHEET SDP-29	1	553,988.46	1,340,324.74
I-2	406.00	—	—	401.41 .79	~~399.13~~ 398.91	—	~~398.88~~ 398.83	TYPE 'S' INLET, HOWARD COUNTY STANDARD DETAIL D-4.22		554,152.50	1,340,400.90
I-3	414.67	—	~~410.91~~	~~411.55~~	~~407.78~~ .74	—	~~407.68~~ .56	TYPE 'S' INLET, HOWARD COUNTY STANDARD DETAIL D-4.22		554,340.79	1,340,254.05
I-4	415.17	~~412.75~~	~~413.00~~	413.00	~~409.74~~ .65	—	~~409.64~~ .36	TYPE 'S' INLET, HOWARD COUNTY STANDARD DETAIL D-4.22		554,407.38	1,340,171.13
I-5	414.67	—	—	413.00	413.00	—	410.96	STANDARD YARD INLET, HOWARD COUNTY STANDARD DETAIL D-4.14		554,482.44	1,340,074.91
I-6	~~398.08~~ .09	—	—	—	~~392.33~~	~~391.87~~	~~391.62~~ 391.36	PRECAST TYPE 'D' INLET, HOWARD COUNTY STANDARD DETAIL D-4.10		554,008.61	1,340,403.09
I-7	396.18	—	—	—	~~393.01~~	~~392.72~~	~~391.05~~ .09	PRECAST TYPE 'D' INLET, HOWARD COUNTY STANDARD DETAIL D-4.10		554,015.49	1,340,291.93
I-8	403.35	—	—	.75	~~398.63~~ .41	—	~~396.64~~ .67	TYPE 'S' INLET, HOWARD COUNTY STANDARD DETAIL D-4.22		554,095.54	1,340,329.66
I-9	400.83	—	—	~~395.83~~	~~395.51~~ .41	—	395.41	PRECAST TYPE 'D' INLET, HOWARD COUNTY STANDARD DETAIL D-4.10		554,500.41	1,339,750.95
I-10	401.33	~~397.72~~	398.06	~~396.33~~ .8	~~395.48~~ .86	—	~~395.73~~ .67	PRECAST TYPE 'D' INLET, HOWARD COUNTY STANDARD DETAIL D-4.10		554,533.86	1,339,779.88
I-11	401.41	—	—	—	—	—	~~398.25~~ .14	PRECAST TYPE 'D' INLET, HOWARD COUNTY STANDARD DETAIL D-4.10		554,562.53	1,339,804.68
I-12	404.14	—	—	—	400.85	—	399.28	PRECAST TYPE 'A-5' INLET, HOWARD COUNTY STANDARD DETAIL D-4.01		554,432.90	1,339,774.58
I-13	404.34	—	—	—	400.99	—	400.07	PRECAST TYPE 'A-5' INLET, HOWARD COUNTY STANDARD DETAIL D-4.01		554,469.94	1,339,786.79
I-14	407.62	—	—	—	404.29	—	~~401.00~~ 400.94	PRECAST TYPE 'A-5' INLET, HOWARD COUNTY STANDARD DETAIL D-4.01		554,535.04	1,339,836.65
I-15	407.64	—	—	—	403.53	—	400.58	TYPE 'S' INLET, HOWARD COUNTY STANDARD DETAIL D-4.22		554,413.99	1,339,891.10
I-17	411.32	—	—	—	407.99	—	~~402.77~~ .91	PRECAST TYPE 'A-5' INLET, HOWARD COUNTY STANDARD DETAIL D-4.01		554,162.94	1,340,127.08
I-24	399.58	—	—	—	~~394.83~~ .06	—	~~393.41~~ .01	PRECAST TYPE 'D' INLET, HOWARD COUNTY STANDARD DETAIL D-4.10		554,468.67	1,340,556.64
I-25	399.41	—	~~393.83~~ .56	~~393.83~~ .23	~~392.85~~ .33	—	392.60	PRECAST TYPE 'D' INLET, HOWARD COUNTY STANDARD DETAIL D-4.10		554,414.30	1,340,543.07
I-26	399.33	—	~~392.83~~	~~392.25~~	~~392.00~~	~~391.67~~	~~391.50~~ .55	PRECAST TYPE 'D' INLET, HOWARD COUNTY STANDARD DETAIL D-4.10 (4' X 4' INSIDE DIMENSION)		554,355.62	1,340,528.43
I-27	406.45	—	.97	391.91	403.12	—	~~397.40~~ .64	PRECAST TYPE 'A-5' INLET, HOWARD COUNTY STANDARD DETAIL D-4.01		554,090.55	1,340,230.89
I-28	412.44	—	—	—	—	—	~~403.03~~ 404.69	TYPE 'S' INLET, HOWARD COUNTY STANDARD DETAIL D-4.22		554,581.76	1,339,977.72
I-32	409.34	—	—	406.84	~~400.57~~	.62	~~400.47~~ .48	PRECAST DOUBLE 'WR' INLET, HOWARD COUNTY STANDARD DETAIL D-4.35		554,547.39	1,340,440.69
I-34	408.84	—	—	—	406.34	—	~~403.07~~ 402.87	PRECAST DOUBLE 'WR' INLET, HOWARD COUNTY STANDARD DETAIL D-4.35		554,649.10	1,340,452.40
HW-1	393.33	—	—	—	—	—	~~390.00~~ 389.97	TYPE 'O' HEADWALL, HOWARD COUNTY STANDARD DETAIL D-5.43 & D-5.44		553,918.66	1,340,411.74
ES-2	—	—	—	—	—	—	~~395.20~~ .18	STANDARD CONCRETE END SECTION, HOWARD COUNTY STANDARD DETAIL D-5.51		554,479.86	1,339,733.18
ES-3	—	—	—	—	—	—	~~399.12~~ 398.71	STANDARD CONCRETE END SECTION, HOWARD COUNTY STANDARD DETAIL D-5.51		554,447.13	1,339,766.09
ES-4	—	—	—	—	—	—	~~399.62~~ .56	STANDARD CONCRETE END SECTION, HOWARD COUNTY STANDARD DETAIL D-5.51		554,498.12	1,339,785.42
ES-5	—	—	—	—	—	—	~~400.26~~ .30	STANDARD CONCRETE END SECTION, HOWARD COUNTY STANDARD DETAIL D-5.51		554,554.01	1,339,823.10
ES-7	—	—	—	—	—	—	~~401.25~~ 402.24	STANDARD CONCRETE END SECTION, HOWARD COUNTY STANDARD DETAIL D-5.51		554,143.42	1,340,117.98
ES-8	—	—	—	—	—	—	397.56	STANDARD CONCRETE END SECTION, HOWARD COUNTY STANDARD DETAIL D-5.51		554,069.35	1,340,222.32
ES-13	—	—	—	—	—	—	~~390.17~~ 389.97	STANDARD CONCRETE END SECTION, HOWARD COUNTY STANDARD DETAIL D-5.51		554,342.04	1,340,582.88

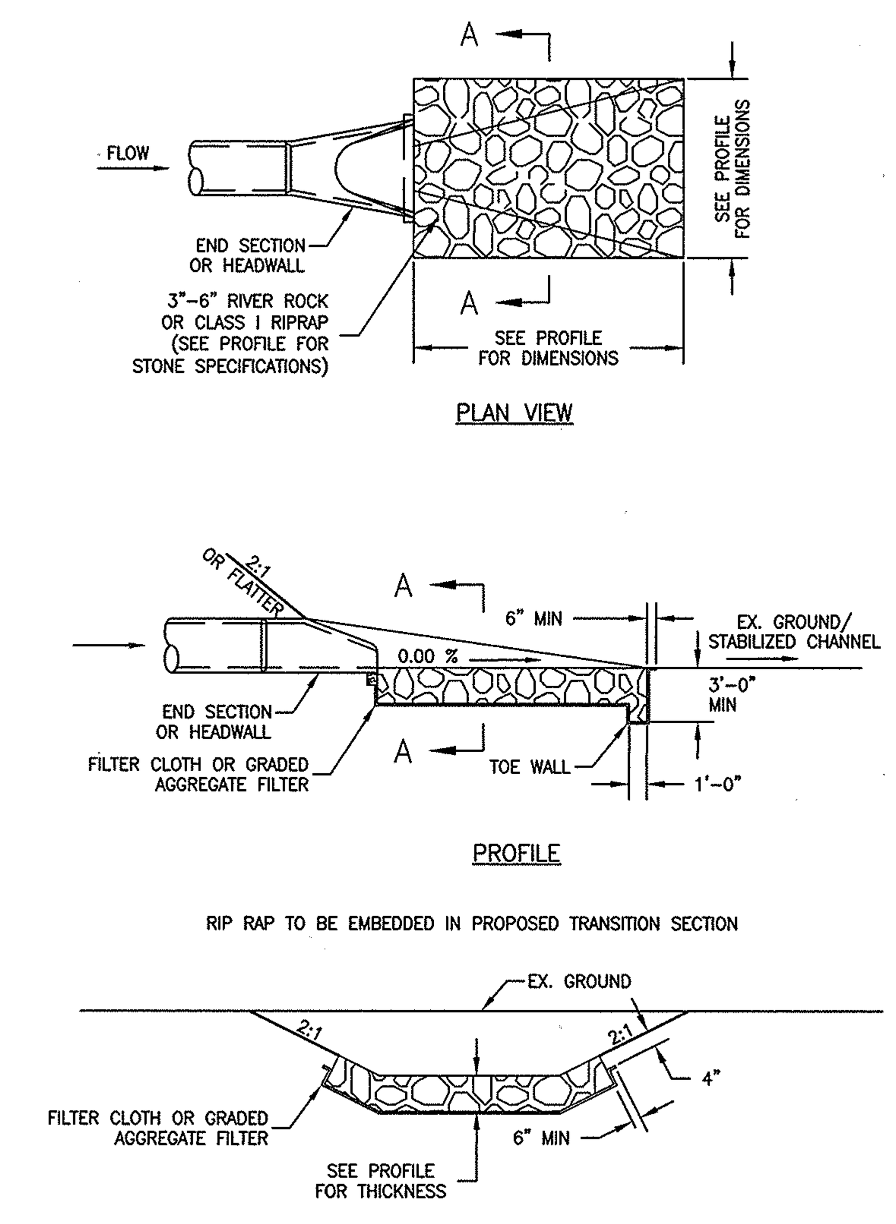
REMARKS:
1). THROAT ON 2 SIDES THAT ARE OPEN TO SWM FACILITY.



TYPICAL PLUNGE POOL DETAIL

NOT TO SCALE

CL. I RIPRAP
d_{50}= 9"stone
d_{max}= 15"
t = 19"



STORM DRAIN RIP RAP OUTFALL

NOT TO SCALE

STORM DRAIN PIPE SUMMARY TABLE (PRIVATE)

SIZE	TYPE	LENGTH
4"	PERFORATED PVC - SCH. 80	86 LF
4"	PERFORATED PVC - SCH. 40	4,436 LF
4"	SOLID PVC - SCH. 40	696 LF
6"	SOLID PVC - SCH. 40	157 LF
10"	SOLID PVC - SCH. 40	55 LF
10"	AL. STEEL T-2	26 LF
12"	RCP CL IV	38 LF
15"	RCP CL III	873 LF
15"	RCP CL IV	385 LF
18"	RCP CL III	330 LF
18"	RCP CL IV	44 LF
21"	RCP CL III	89 LF
21"	RCP CL IV	21 LF
24"	RCP CL III	79 LF
24"	RCP CL IV	50 LF
27"	RCP CL IV	30 LF
24"X38"	ERCP CL IV	105 LF

FOR AS-BUILT
STATE OF MARYLAND THOMAS C. NEUGEBAUER 29203 PROFESSIONAL ENGINEER
7-7-14

AS-BUILT PLAN

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DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12 DATE
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		DESIGN BY:	MK
		REVIEW BY:	TCN
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SHEET: SDP-22

SDP-12-077

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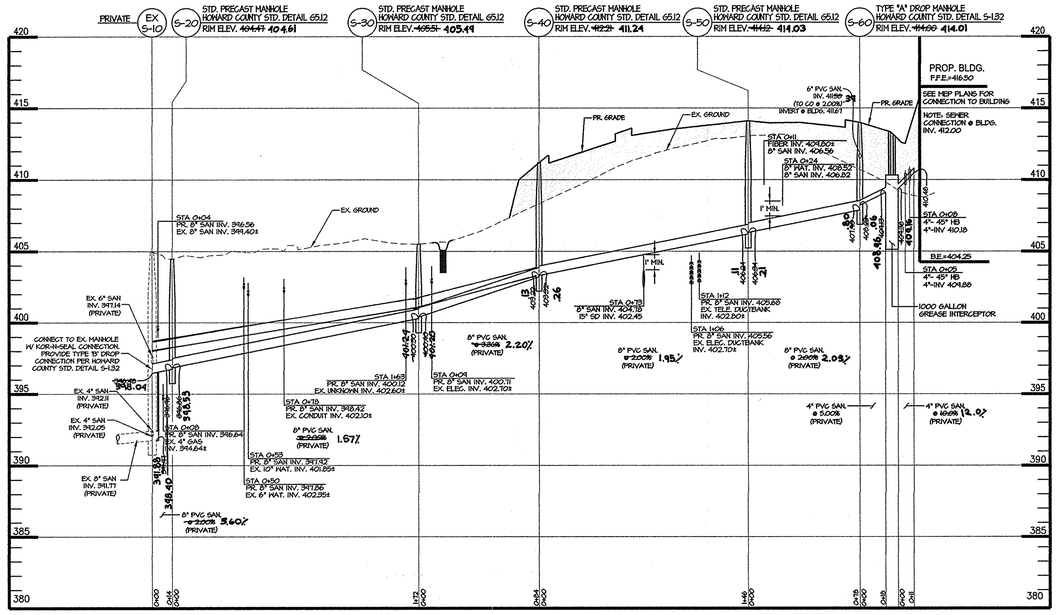

SANITARY PROFILE (PRIVATE)
FROM EX. S-10 TO PROP. BLDG.

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SANITARY SEWER PIPE SCHEDULE (PRIVATE)

SIZE	TYPE	LENGTH
4"	PVC (SDR-35)	29 FT
8"	PVC (SDR-35)	494 FT

SANITARY SEWER GREASE INTERCEPTOR SCHEDULE

● LOCATION

STR NO.	TOP ELEV	INV IN	INV IN	INV OUT	TYPE	NORTHING	EASTING
#1	413.80V	---	409.~~36~~16	~~409.15~~ 408.96	1000 GALLON NON TRAFFIC BEARING TANK – MAYER BROS. INC.	554,395.84	1,339,978.81

1.) TOP ELEVATION OF GREASE INTERCEPTOR IS AT CENTER OF STRUCTURE.

● COORDINATES TO CENTERLINE OF STRUCTURE

SANITARY SEWER STRUCTURE SCHEDULE (PRIVATE)

● LOCATION

STR NO.	TOP ELEV	INV IN	INV IN	INV OUT	TYPE	REMARKS	NORTHING	EASTING
S-20	404.~~47~~61	--~~398.53~~	~~398.88~~	~~398.76~~ 398.40	H.C. STD. DETAIL G5.12	STANDARD PRECAST MH	554,821.31	1,339,852.37
S-30	405.~~51~~49	--~~401.24~~	~~400.40~~	~~400.30~~ 401.28	H.C. STD. DETAIL G5.12	STANDARD PRECAST MH	554,651.09	1,339,829.46
S-40	411.~~22~~24	---	403.~~32~~13	403.~~22~~24	H.C. STD. DETAIL G5.12	STANDARD PRECAST MH	554,597.16	1,339,894.42
S-50	414.~~12~~03	---	406.~~24~~11	406.~~24~~21	H.C. STD. DETAIL G5.12	STANDARD PRECAST MH	554,491.33	1,339,995.62
S-60	414.~~00~~01	411.~~69~~37	408.~~23~~06	407.~~80~~80	H.C. STD. DETAIL S1.32	TYPE "A" DROP MH	554,413.71	1,339,992.50

1.) TOP ELEVATION IS RIM ELEVATION AT THE CENTER OF STRUCTURE.

● COORDINATES TO CENTERLINE OF STRUCTURE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/29/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/16/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

GENERAL NOTES

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO TEST PIT TO DETERMINE EXACT DEPTH, LOCATION AND SIZE FOR ALL PROPOSED UTILITY CROSSINGS WITH EXISTING UTILITIES.
3. ALL EXISTING VALVES TO BE RAISED TO PROPOSED GRADE, BY CONTRACTOR, AS NEEDED.
4. THIS PLAN ASSUMES DEMOLITION/RELOCATION OF EXISTING UTILITIES, PAVING, STREET SIGNS, CULVERTS, ETC. WITHIN THE AREA OF R/W IMPROVEMENTS HAS ALREADY BEEN PERFORMED.
5. SEE PUBLIC ROAD & STORM DRAIN PLANS FOR R/W IMPROVEMENTS.
6. SEE CONTRACT NO. 24-4376-D FOR CONTINUATION OF PRIVATE WATER & SEWER.
7. ALL SEWER HOUSE CONNECTIONS SHALL BE IN ACCORDANCE WITH HOWARD COUNTY STANDARD DETAILS S2.11 & S2.22.
8. TRAFFIC BEARING CLEANOUT COVERS PER HOWARD COUNTY STANDARD DETAIL S3.21 ARE TO BE USED FOR CLEANOUTS LOCATED IN PAVED AREAS.

FOR AS-BUILT

STATE OF MARYLAND · JAMES C. NEUGENT · 29203 · PROFESSIONAL ENGINEER

7-7-14

AS-BUILT PLAN

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

CONTROLLED AND 95% COMPACTED FILL PER AASHTO T-180, TO BE CERTIFIED BY AN APPROVED ON-SITE GEOTECHNICAL ENGINEER

COMPACTED SPECIFICATIONS FOR UTILITIES IN FILL

WHERE UTILITY PIPES ARE TO BE PLACED ON COMPACTED FILL, THE FOLLOWING APPLIES:

A. PRIOR TO PLACEMENT OF COMPACTED FILL, ANY SOFT OR OTHERWISE UNSUITABLE SOILS ENCOUNTERED AT THE EXISTING RAVINE BOTTOM OR SLOPE, SHALL BE UNDERCUT AND REMOVED FROM THE CONSTRUCTION AREA.

B. ACCEPTABLE COMPACTED FILL SHALL BE PLACED IN SIX INCH THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY A.A.S.H.T.O. METHOD T-180.

C. THE COMPACTED FILL SHALL BE BENCHED INTO THE EXISTING VIRGIN SLOPES WITH EACH LIFT PLACED TO A SMOOTH TRANSITION FROM VIRGIN TO FILL SOILS.

SHEET: SDP-23

MRA

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395

MRAGTA.COM

STATE OF MARYLAND · JAMES C. NEUGENT · 29203 · PROFESSIONAL ENGINEER

10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

SEWER PROFILES

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS	JOB NO.: 12039
07/07/14	AS-BUILT INFORMATION ADDED TO PLAN	SCALE: AS SHOWN
		DATE: 10/16/2012
		DRAWN BY: MK
		DESIGN BY: MK
		REVIEW BY: TCN
		SHEET: 23 OF 46

SDP-12-077

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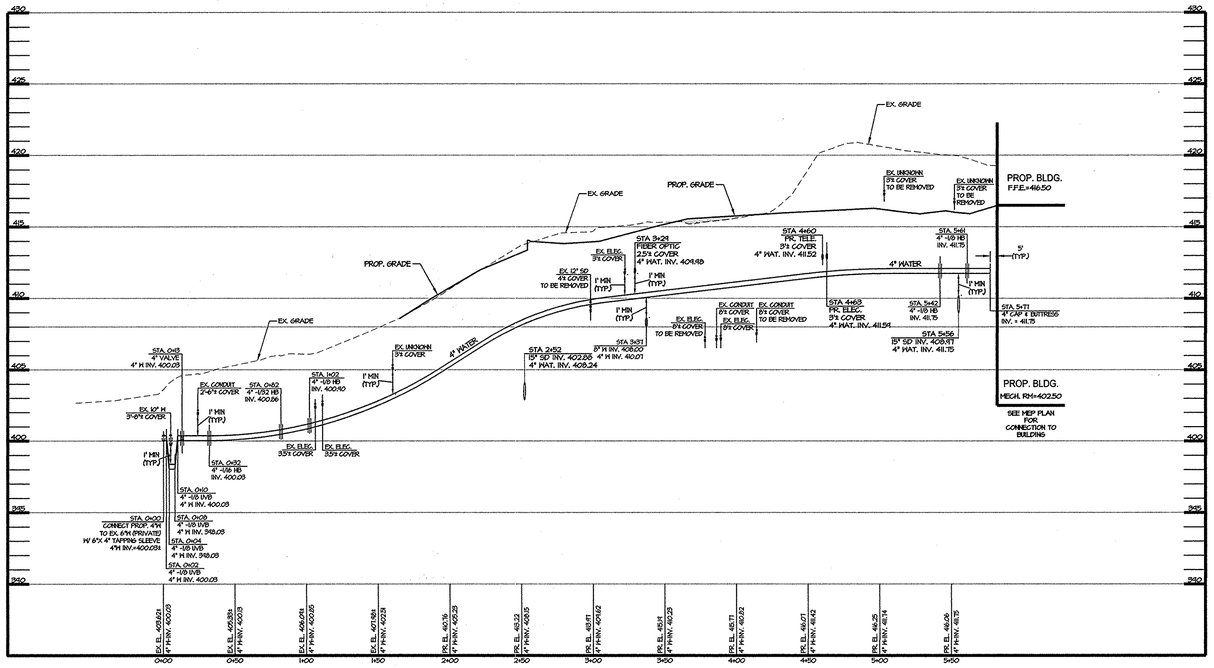
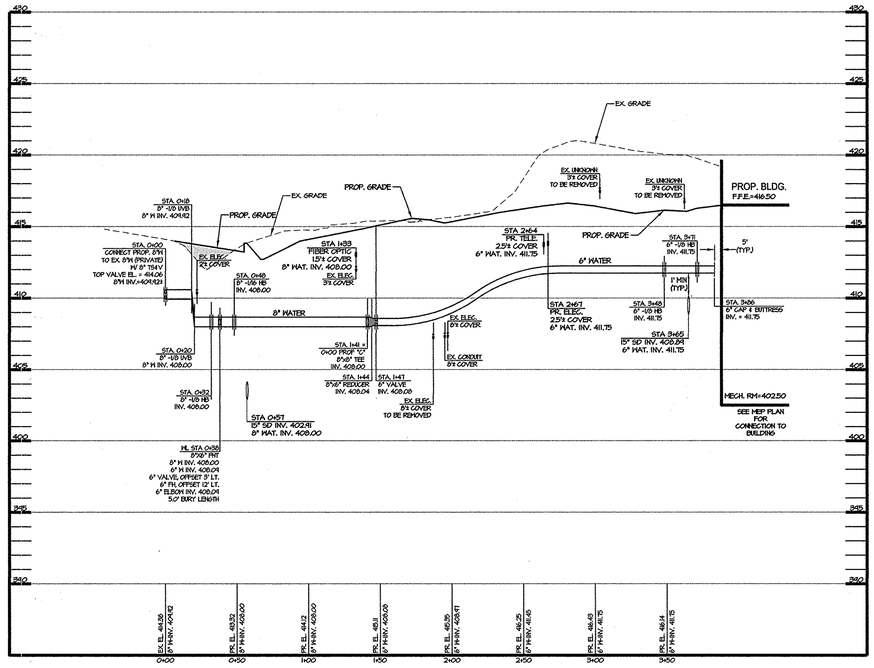
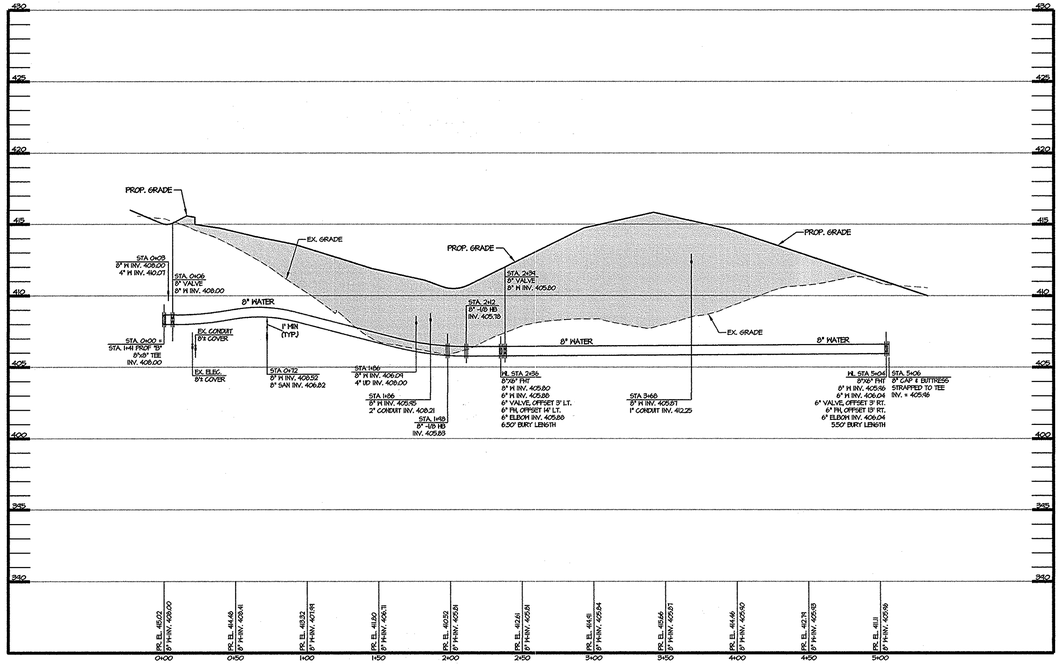
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



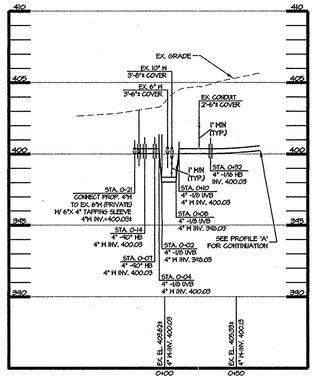
PROP. 4" WATER LINE (DOMESTIC)
PROFILE 'A'
SCALE: HOR. 1" = 50'
VERT. 1" = 5'



PROP. 8" & 6" WATER LINE (FIRE SERVICE)
PROFILE 'B'
SCALE: HOR. 1" = 50'
VERT. 1" = 5'



PROP. 8" WATER LINE (FIRE SERVICE)
PROFILE 'C'
SCALE: HOR. 1" = 50'
VERT. 1" = 5'



OPTION 'B'
PROFILE 'A'
SCALE: HOR. 1" = 50'
VERT. 1" = 5'

BILL OF MATERIALS
PRIVATE WATER

QUANTITY	SIZE	DESCRIPTION
576 LF	4"	WATER MAIN-D.I.P. CL. 50
283 LF	6"	WATER MAIN-D.I.P. CL. 50
650 LF	8"	WATER MAIN-D.I.P. CL. 50
1	6"x4"	TAPPING SLEEVE VALVE & VAULT
1	8"x8"	TAPPING SLEEVE & VALVE
3	6"	VALVE & ROADWAY BOX
2	8"	VALVE & ROADWAY BOX
1	8"x6"	REDUCER
3	6"	FIRE HYDRANT
3	4"	1/8 HORIZONTAL BEND
1	4"	1/16 HORIZONTAL BEND
1	4"	1/32 HORIZONTAL BEND
2	6"	1/8 HORIZONTAL BEND
4	8"	1/8 HORIZONTAL BEND
4	4"	1/8 VERTICAL BEND
2	8"	1/8 VERTICAL BEND
3	8"x6"	TEE
3	8"x8"	TEE
1	4"	CAP & BUTTRESS
1	6"	CAP & BUTTRESS
1	8"	CAP & BUTTRESS

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/28/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

STATE OF MARYLAND — THOMAS C. NEUBERT — 29203 — PROFESSIONAL ENGINEER — 10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

SHEET: SDP-24

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

WATER PROFILES

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	AS SHOWN
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	24 OF 46

SDP-12-077

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LOG OF BORING NO. B-1

Sheet 1 of 1

PROJECT: W.R. Grace Columbia Campus
PROJECT NO: 080972
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL: ▽ Dry ▽ Dry
DATE: 8/28/2008 8/29/2008
CAVED (ft): 5.5 5.5

DATE STARTED: August 28, 2008
DATE COMPLETED: August 28, 2008
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: P. Stephens
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING ▽: N/E
GROUND SURFACE ELEVATION: 411.8
DATUM: Survey
EQUIPMENT: CME 45
LOGGED BY: J. Cooper
CHECKED BY: R. Malviya

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	DESCRIPTION	REMARKS
1	0.0	14	4-7-8	15	411.8	0	SM	Brown, moist, medium dense, Silty SAND, trace rock fragments and mica.	Topsoil: 3 in.
2	2.5	17	7-7-12	19					
3	5.0	15	6-6-10	16		5			
4	8.5	18	7-8-8	16		10			
5	13.5	16	13-19-17	36	398.3	15	SM	Gray, moist, dense, Silty SAND, trace rock fragments and mica.	
6	18.5	18	18-19-19	38	391.8	20		Bottom of Hole at 20.0 Feet.	

NOTES:

LOBG 080972.GPJ 9/24/08

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. B-1
Sheet 1 of 1

LOG OF BORING NO. B-2

Sheet 1 of 1

PROJECT: W.R. Grace Columbia Campus
PROJECT NO: 080972
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL: ▽ Dry ▽ Dry
DATE: 8/29/2008 8/29/2008
CAVED (ft): 6.0 5.8

DATE STARTED: August 28, 2008
DATE COMPLETED: August 28, 2008
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: P. Stephens
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING ▽: N/E
GROUND SURFACE ELEVATION: 411.1
DATUM: Survey
EQUIPMENT: CME 45
LOGGED BY: J. Cooper
CHECKED BY: R. Malviya

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	DESCRIPTION	REMARKS
1	0.0	17	5-10-12	22	411.1	0	SM	Brown, moist, medium dense, Silty SAND, trace rock fragments and mica.	Topsoil: 3 in.
2	2.5	18	9-7-8	15					
3	5.0	18	5-5-6	11		5			
4	8.5	18	4-4-5	9	402.6	10	SM	Brown, moist, loose, Silty SAND, trace rock fragments and mica.	
5	13.5	18	4-4-4	8		15			
6	18.5	18	5-8-8	16	393.1		ML	Gray, moist, medium dense, Sandy SILT, trace rock fragments and mica.	
					391.1	20		Bottom of Hole at 20.0 Feet.	

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. B-2
Sheet 1 of 1

LOG OF BORING NO. B-3

Sheet 1 of 1

PROJECT: W.R. Grace Columbia Campus
PROJECT NO: 080972
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL: ▽ Dry ▽ Dry
DATE: 8/29/2008 9/2/2008
CAVED (ft): 8.0 8.0

DATE STARTED: August 29, 2008
DATE COMPLETED: August 29, 2008
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: P. Stephens
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING ▽: N/E
GROUND SURFACE ELEVATION: 418.0
DATUM: Survey
EQUIPMENT: CME 45
LOGGED BY: J. Cooper
CHECKED BY: R. Malviya

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	DESCRIPTION	REMARKS
1	0.0	15	3-5-7	12	418.0	0	ML	Brown, moist, medium dense, Sandy SILT, trace Rock Fragments and mica.	Topsoil: 3 in.
2	2.5	17	7-13-16	29					
3	5.0	18	9-11-11	22	413.0	5	SM	Orange to brown, moist, medium dense, Silty SAND, trace rock fragments and mica.	
4	8.5	18	7-5-7	12		10			
5	13.5	18	13-14-21	35	404.5	15	SM	Red, moist, dense, Silty SAND, trace rock fragments and mica.	
6	18.5	18	8-11-12	23	398.0	20		Bottom of Hole at 20.0 Feet.	

NOTES:

LOBG 080972.GPJ 9/24/08

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. B-3
Sheet 1 of 1

LOG OF BORING NO. B-4

Sheet 1 of 1

PROJECT: W.R. Grace Columbia Campus
PROJECT NO: 080972
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL: ▽ Dry ▽ Dry
DATE: 8/29/2008 9/2/2008
CAVED (ft): 5.4 5.2

DATE STARTED: August 29, 2008
DATE COMPLETED: August 29, 2008
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: P. Stephens
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING ▽: N/E
GROUND SURFACE ELEVATION: 398.8
DATUM: Survey
EQUIPMENT: CME 45
LOGGED BY: J. Cooper
CHECKED BY: R. Malviya

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	DESCRIPTION	REMARKS
1	0.0	17	4-8-7	15	398.8	0	ML	Brown, moist, medium dense, Sandy SILT.	Topsoil: 4 in.
2	2.5	18	7-10-13	23	396.3		SM	Brown to gray, moist, medium dense, Silty SAND, trace rock fragments and mica.	
3	5.0	18	10-9-9	18		5			
4	8.5	18	5-6-8	14		10			
5	13.5	18	5-7-7	14	383.8	15		Bottom of Hole at 15.0 Feet.	

NOTES:

LOBG 080972.GPJ 9/24/08

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. B-4
Sheet 1 of 1

LOG OF BORING NO. B-5

Sheet 1 of 1

PROJECT: W.R. Grace Columbia Campus
PROJECT NO: 080972
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL: ▽ Dry ▽
DATE: 8/29/2008
CAVED (ft): 7.0

DATE STARTED: August 29, 2008
DATE COMPLETED: August 29, 2008
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: P. Stephens
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING ▽: N/E
GROUND SURFACE ELEVATION: 413.3
DATUM: Survey
EQUIPMENT: CME 45
LOGGED BY: J. Cooper
CHECKED BY: R. Malviya

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	DESCRIPTION	REMARKS
1	0.0	15	2-6-10	16	413.3	0	ML	Brown, moist, medium dense, Sandy SILT, trace roots.	Root Mat: 3 in.
2	2.5	18	10-13-18	31	410.8		SM	Brown, moist, dense to medium dense, Silty SAND, trace rock fragments and mica.	
3	5.0	18	16-22-24	46		5			
4	8.5	18	10-10-8	18		10			
5	13.5	18	6-8-9	17	398.3	15		Bottom of Hole at 15.0 Feet.	

NOTES:

LOBG 080972.GPJ 9/24/08

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. B-5
Sheet 1 of 1

LOG OF BORING NO. B-6

Sheet 1 of 1

PROJECT: W.R. Grace Columbia Campus
PROJECT NO: 080972
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL: ▽ Dry ▽
DATE: 8/29/2008
CAVED (ft): 7.0

DATE STARTED: August 29, 2008
DATE COMPLETED: August 29, 2008
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: P. Stephens
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING ▽: N/E
GROUND SURFACE ELEVATION: 413.0
DATUM: Survey
EQUIPMENT: CME 45
LOGGED BY: J. Cooper
CHECKED BY: R. Malviya

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	DESCRIPTION	REMARKS
1	0.0	14	4-8-10	18	413.0	0	ML	Brown, moist, medium dense, Sandy SILT.	Topsoil: 4 in.
2	2.5	17	12-10-10	20	411.0		SM	Red to brown, moist, medium dense, Silty SAND, trace rock fragments and mica.	
3	5.0	18	8-9-10	19		5			
4	8.5	18	11-13-13	26	405.0	10	SM	Gray, moist, dense, Silty SAND, trace rock fragments and mica.	
5	13.5	18	16-21-16	37	398.0	15		Bottom of Hole at 15.0 Feet.	

NOTES:

LOBG 080972.GPJ 9/24/08

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. B-6
Sheet 1 of 1

LOG OF BORING NO. B-7

Sheet 1 of 1

PROJECT: W.R. Grace Columbia Campus
PROJECT NO: 080972
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL: ▽ Dry ▽
DATE: 8/29/2008
CAVED (ft): 6.2

DATE STARTED: August 29, 2008
DATE COMPLETED: August 29, 2008
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: P. Stephens
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING ▽: N/E
GROUND SURFACE ELEVATION: 400.0
DATUM: Survey
EQUIPMENT: CME 45
LOGGED BY: J. Cooper
CHECKED BY: R. Malviya

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	DESCRIPTION	REMARKS
1	0.0	18	3-11-11	22	400.0	0	SM	Brown to gray, moist, medium dense, Silty SAND, trace rock fragments and mica.	Topsoil: 4 in.
2	2.5	15	11-7-8	15					
3	5.0	18	6-6-7	13		5			
4	8.5	18	6-7-8	15		10			
5	13.5	18	7-8-8	16	385.0	15		Bottom of Hole at 15.0 Feet.	

NOTES:

LOBG 080972.GPJ 9/24/08

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. B-7
Sheet 1 of 1

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Signature	Date
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION HSP	11/14/12
CHIEF, DIVISION & LAND DEVELOPMENT	11/19/12

FOR LOCATIONS OF SOIL BORINGS SEE SHEETS SDP-15.

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-25

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND THOMAS C. NEUGEBAUER 29203 PROFESSIONAL ENGINEER 10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

GEOTECHNICAL BORING LOGS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	AS SHOWN
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	25 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-25-BORING-LOG.dwg, 10/17/2012 9:57:52 AM, RHall,
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LOG OF BORING NO. B-8

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/17/2011 11/18/2011
CAVED (ft): 21.4 21.3

DATE STARTED: November 17, 2011
DATE COMPLETED: November 17, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 412.5
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	16	3-5-5	10	410.5	0	ML		Brown, moist, loose, micaceous Sandy SILT with Weathered Rock Fragments, trace Organics (Root Fibers).	Topsoil: 8 in.
S-2	2.5	16	5-5-5	10			ML		Brown, moist, loose, micaceous Sandy SILT.	
S-3	5.0	16	3-3-4	7	405.5	5	SM		Tan, dry, loose to medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-4	8.5	18	3-4-4	8		10				
S-5	13.5	18	4-5-6	11		15				
S-6	18.5	18	4-7-8	15		20				
S-7	23.5	18	6-7-7	14	384.5	25				
S-8	28.5	18	9-11-13	24	382.5	30	SM		Reddish-Brown, dry, medium dense, micaceous Silty SAND.	
									Boring terminated at 30 feet.	

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. B-8

Sheet 1 of 1

LOG OF BORING NO. B-9

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/17/2011 11/18/2011
CAVED (ft): 15.5 15.5

DATE STARTED: November 17, 2011
DATE COMPLETED: November 17, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 408.9
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	14	3-4-5	9	406.9	0	ML		Reddish-Brown, moist, loose, micaceous Sandy SILT.	Topsoil: 3 in.
S-2	2.5	18	2-3-3	6	403.9	5	SM		Brown, moist, loose, micaceous Silty SAND, trace Organics (Root Fibers).	
S-3	5.0	18	3-3-3	6			SM		Light Brown and Gray, dry, loose, micaceous Silty SAND with Weathered Rock Fragments.	
S-4	8.5	18	3-3-4	7		10				
S-5	13.5	18	4-5-5	10	393.9	15	SM		Light Brown and Gray, dry, medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-6	18.5	16	5-8-8	16		20				
S-7	23.5	18	5-5-7	12	383.9	25			Boring terminated at 25 feet.	

NOTES:

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14280 Park Center Drive, Suite A
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LOG OF BORING NO. B-9

Sheet 1 of 1

LOG OF BORING NO. B-10

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/18/2011 11/19/2011
CAVED (ft): 20.3 20.2

DATE STARTED: November 18, 2011
DATE COMPLETED: November 18, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 414.5
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	14	2-2-2	4	409.5	0	SM		Reddish-Brown, moist, very loose to medium dense, micaceous Silty SAND, trace Weathered Rock Fragments.	Topsoil: 4 in.
S-2	2.5	14	5-5-8	13		5	SM		Brown with Red, dry, medium dense to dense, micaceous Silty SAND.	
S-3	5.0	18	7-8-10	18						
S-4	8.5	18	10-12-12	24		10				
S-5	13.5	18	10-22-25	47		15				
S-6	18.5	18	24-34-20	54	396.5	20			Brown with Red to Tan, dry, very dense, Highly Weathered ROCK.	
S-7	23.5	12	42-50/6"	50/6"						
S-8	28.5	18	24-37-39	76	384.5	30			Boring terminated at 30 feet.	

NOTES:

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14280 Park Center Drive, Suite A
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LOG OF BORING NO. B-10

Sheet 1 of 1

LOG OF BORING NO. B-11

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/18/2011 11/19/2011
CAVED (ft): 24.7 24.7

DATE STARTED: November 18, 2011
DATE COMPLETED: November 18, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 419.2
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	14	1-1-1	2	417.2	0	ML		Brown, moist, very loose to loose, micaceous Sandy SILT.	Topsoil: 8 in.
S-2	2.5	18	2-2-3	5		5	SM		Brown to Reddish-Brown, dry to moist, loose to medium dense, micaceous Silty SAND.	
S-3	5.0	18	4-4-4	8						
S-4	8.5	18	6-6-8	14	406.2	10	SM		Reddish-Brown, moist, dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-5	13.5	18	11-17-19	36		15				
S-6	18.5	18	12-15-22	37	397.2	20	SM		White, moist, medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-7	23.5	18	6-12-12	24						
S-8	28.5	18	6-8-9	17	387.2	30	SM		Brown, moist, dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-9	33.5	18	11-17-19	36	384.2	35			Boring terminated at 35 feet.	

NOTES:

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14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. B-11

Sheet 1 of 1

LOG OF BORING NO. B-12

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼
DATE: 11/18/2011 *
CAVED (ft): 5.3

DATE STARTED: November 18, 2011
DATE COMPLETED: November 18, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 413.0
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	12	2-2-2	4	408.0	0	ML		Reddish-Brown, moist, very loose to loose, micaceous Sandy SILT.	Asphalt: 5.5 in. Base: 4.5 in.
S-2	2.5	0	3-3-5	8		5	SM		Dark Brown with Red, dry, medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-3	5.0	14	5-5-7	12	405.0		SM		Reddish-Brown with Beige, dry, medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-4	8.5	18	6-7-9	16	403.0	10			Boring terminated at 10 feet.	
									* = The boring was backfilled and patched upon completion for safety reasons.	

NOTES:

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14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. B-12

Sheet 1 of 1

LOG OF BORING NO. SWM-1

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/16/2011 11/17/2011
CAVED (ft): 17.8 17.6

DATE STARTED: November 16, 2011
DATE COMPLETED: November 16, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 405.2
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	18	3-6-6	15	403.2	0	ML		Brown, moist, medium dense, micaceous Sandy SILT.	Topsoil: 5 in.
S-2	2.5	18	4-4-5	9			ML		Reddish-Brown, moist, loose, micaceous Sandy SILT, trace Weathered Rock Fragments.	
S-3	5.0	18	3-3-4	7	397.2	5			ELEV. 396.50 TOP OF STRUCTURE	
S-4	8.5	16	6-6-6	12		10	SM		White to Grayish-Brown and Tan, dry, medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-5	13.5	18	5-6-7	13		15			ELEV. 391.50 BOTTOM OF STRUCTURE	
S-6	18.5	18	5-5-7	12	385.2	20			Boring terminated at 20 feet.	
									Infiltration Test performed at 15 feet: Average Infiltration Rate > 15 in./hour	

NOTES:

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14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-1

Sheet 1 of 1

LOG OF BORING NO. SWM-2

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/16/2011 11/17/2011
CAVED (ft): 11.8 11.8

DATE STARTED: November 16, 2011
DATE COMPLETED: November 16, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 397.2
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	16	1-2-2	4	389.2	0	ML		Brown, moist, very loose to medium dense, micaceous Sandy SILT with Weathered Rock Fragments.	Topsoil: 6 in.
S-2	2.5	18	5-5-8	13					ELEV. 395.67 TOP OF STRUCTURE	
S-3	5.0	18	3-4-4	8		5			ELEV. 390.83 BOTTOM OF STRUCTURE	
S-4	8.5	16	5-5-5	10			SM		Tan with Dark Gray, moist, loose to medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-5	13.5	18	5-5-7	12	382.2	10			Boring terminated at 15 feet.	
						15			Infiltration Test performed at 7 feet: Average Infiltration Rate = 5.5 in./hour	

NOTES:

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LOG OF BORING NO. SWM-2

Sheet 1 of 1

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/29/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/9/12

FOR LOCATIONS OF SOIL BORINGS SEE SHEETS SDP-15.

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-26

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND — DOMINIC C. NEUGEBAUER — 29203 — PROFESSIONAL ENGINEER — 10-17-12

MD. 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

GEOTECHNICAL BORING LOGS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	AS SHOWN
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		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	26 OF 46

SDP-12-077

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LOG OF BORING NO. SWM-3

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/17/2011 11/18/2011
CAVED (ft): 10.9 10.9

DATE STARTED: November 17, 2011
DATE COMPLETED: November 17, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 399.1
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
									ELEV. 398.51 TOP OF STRUCTURE	
S-1	0.0	18	2-1-1	2	397.1	0	SM		Reddish-Brown, moist, very loose, micaceous Silty SAND with Weathered Rock Fragments.	Topsoil: 7 in.
S-2	2.5	18	4-4-6	10			SM		Reddish-Brown to Brown, moist, loose to medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-3	5.0	18	3-4-4	8		5			ELEV. 394.84 BOTTOM OF STRUCTURE	
S-4	8.5	18	6-12-13	25	387.1	10				
							ML		Reddish-Brown, moist, loose, micaceous Sandy SILT with Weathered Rock Fragments.	
S-5	13.5	18	4-5-5	10	384.1	15			Boring terminated at 15 feet.	
									Infiltration Test performed at 6 feet: Average Infiltration Rate > 15 in./hour	

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-3

Sheet 1 of 1

LOG OF BORING NO. SWM-4

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/16/2011 11/17/2011
CAVED (ft): 10.8 10.7

DATE STARTED: November 16, 2011
DATE COMPLETED: November 16, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 405.3
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
									ELEV. 404.82 TOP OF STRUCTURE	
S-1	0.0	14	3-7-8	15	403.3	0	ML		Brown, dry, medium dense, micaceous Sandy SILT, trace Weathered Rock Fragements.	Topsoil: 6 in.
S-2	2.5	12	5-3-3	6			ML		Reddish-Brown, moist, loose, micaceous Sandy SILT with Weathered Rock Fragments.	
S-3	5.0	12	7-7-7	14	400.3	5	SM		Reddish-Brown, moist, medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-4	8.5	18	7-8-8	16					ELEV. 401.24 BOTTOM OF STRUCTURE	
S-5	13.5	18	5-5-7	12	390.3	10				
						15			Boring terminated at 15 feet.	
									Infiltration Test performed at 6 feet: Average Infiltration Rate = 3.1 in./hour	

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-4

Sheet 1 of 1

LOG OF BORING NO. SWM-5

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/17/2011 11/18/2011
CAVED (ft): 10.2 10

DATE STARTED: November 17, 2011
DATE COMPLETED: November 17, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 413.3
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	18	3-5-5	10	411.3	0	ML		Brown, moist, stiff, micaceous Sandy SILT, trace Organics (Root Fibers).	Topsoil: 6 in.
S-2	2.5	16	9-12-13	25			ML		Reddish-Brown, dry, very stiff, micaceous Sandy SILT.	
S-3	5.0	18	5-6-6	12	408.3	5	SM		ELEV. 408.76 TOP OF STRUCTURE Brown to Reddish-Brown, dry, medium dense to dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-4	8.5	18	7-8-8	16					ELEV. 403.43 BOTTOM OF STRUCTURE	
S-5	13.5	18	12-17-21	38	398.3	10				
						15			Boring terminated at 15 feet.	
									Infiltration Test performed at 10 feet: Average Infiltration Rate = 3.8 in./hour	

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
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Laurel, Maryland 20707

LOG OF BORING NO. SWM-5

Sheet 1 of 1

LOG OF BORING NO. SWM-6

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/18/2011 11/19/2011
CAVED (ft): 9.1 9

DATE STARTED: November 18, 2011
DATE COMPLETED: November 18, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 415.3
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	18	1-1-2	3	413.3	0	ML		Reddish-Brown, moist, very loose, micaceous Sandy SILT, trace Organics (Root Fibers).	Topsoil: 6 in.
S-2	2.5	18	2-2-3	5			SM		Red, dry, loose, micaceous Silty SAND.	
S-3	5.0	18	4-4-5	9	410.3	5	SM		Reddish-Brown to White, moist, loose to medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-4	8.5	18	5-7-11	18		10				
S-5	13.5	18	7-7-10	17	400.3	15			Boring terminated at 15 feet.	
									Infiltration Test performed at 8 feet: Average Infiltration Rate = 2.3 in./hour	

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-6

Sheet 1 of 1

LOG OF BORING NO. SWM-7

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/18/2011 11/19/2011
CAVED (ft): 9.2 9

DATE STARTED: November 18, 2011
DATE COMPLETED: November 18, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 397.5
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
									ELEV. 398.00 TOP OF STRUCTURE	
S-1	0.0	16	1-1-2	3		0	ML		Brown, moist, very loose to loose, micaceous Sandy SILT.	Topsoil: 7 in.
S-2	2.5	18	2-2-3	5					ELEV. 392.50 BOTTOM OF STRUCTURE	
S-3	5.0	16	3-3-4	7	392.5	5	SM		Brown, moist, loose to medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-4	8.5	18	5-7-9	16		10				
S-5	13.5	14	5-9-5	14	382.5	15			Boring terminated at 15 feet.	
									Infiltration Test performed at 7 feet: Average Infiltration Rate = 5.2 in./hour	

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-7

Sheet 1 of 1

LOG OF BORING NO. SWM-8

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/17/2011 11/18/2011
CAVED (ft): 8.10 8.8

DATE STARTED: November 17, 2011
DATE COMPLETED: November 17, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 402.2
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	18	3-5-6	11		0	SM		Brown to Reddish-Brown, moist, medium dense, micaceous Silty SAND.	Topsoil: 5 in.
S-2	2.5	12	5-5-6	11					ELEV. 398.00 TOP OF STRUCTURE	
S-3	5.0	8	5-6-6	12	394.2	5			ELEV. 393.42 BOTTOM OF STRUCTURE	
S-4	8.5	18	7-10-11	21		10	SM		White and Beige, dry, medium dense to dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-5	13.5	16	17-27-15	42	387.2	15			Boring terminated at 15 feet.	
									Infiltration Test performed at 10 feet: Average Infiltration Rate > 15 in./hour	

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-8

Sheet 1 of 1

LOG OF BORING NO. SWM-9

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▼ Dry ▼ Dry
DATE: 11/17/2011 11/18/2011
CAVED (ft): 7.11 7.11

DATE STARTED: November 17, 2011
DATE COMPLETED: November 17, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 400.1
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
									ELEV. 398.00 TOP OF STRUCTURE	
S-1	0.0	16	2-2-2	4	398.1	0	SM		Brown, moist, very loose, micaceous Silty SAND.	Topsoil: 6 in.
S-2	2.5	16	5-5-7	12			SM		Brown, moist, medium dense, micaceous Silty SAND.	
S-3	5.0	14	7-9-9	18	392.1	5			ELEV. 394.33 BOTTOM OF STRUCTURE	
S-4	8.5	18	7-8-10	18		10	SM		Reddish-Brown, dry, medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-5	13.5	3	50/3"	50/3"	387.1	15			Beige, dry, very dense, Highly Weathered ROCK.	
					385.1				Boring terminated at 15 feet.	
									Infiltration Test performed at 7 feet: Average Infiltration Rate = 2.6 in./hour	

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-9

Sheet 1 of 1

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/29/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

FOR LOCATIONS OF SOIL BORINGS SEE SHEETS SDP-15.

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-27

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

GEOTECHNICAL BORING LOGS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

STATE OF MARYLAND — STEPHEN C. NEUBERG — 29203 — PROFESSIONAL ENGINEER

MD PROFESSIONAL CERTIFICATION: 10-17-12

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. 29203, EXPIRATION DATE: 06/16/2013.

DATE	REVISIONS

JOB NO.:	12039
SCALE:	AS SHOWN
DATE:	10/16/2012
DRAWN BY:	MK
DESIGN BY:	MK
REVIEW BY:	TCN
SHEET:	27 OF 46

SDP-12-077

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1:1, Copyright 2012 Morris & Ritchie Associates, Inc.

LOG OF BORING NO. SWM-10

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▽ Dry ▽ Dry
DATE: 11/18/2011 11/19/2011
CAVED (ft): 10.0 6

DATE STARTED: November 18, 2011
DATE COMPLETED: November 18, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 407.6
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

ELEV. 409.48 TOP OF STRUCTURE
ELEV. 407.48 BOTTOM OF STRUCTURE

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	6	5-6-6	12	405.6	0			Black, dry, medium dense, Silty GRAVEL. (Fill)	Graded Aggregate: 24 in.
S-2	2.5	16	4-4-5	9	403.6		ML		Brown, moist, stiff, micaceous Sandy SILT.	
S-3	5.0	14	4-4-6	10		5	SM		Reddish-Brown to Beige, dry, loose, micaceous Silty SAND with Weathered Rock Fragments.	
S-4	8.5	18	4-5-5	10	397.6	10				

Boring terminated at 10 feet.

Infiltration Test performed at 4.5 feet:
Average Infiltration Rate < 0.1 in./hour

NOTES:

LOBG 080972.1.GPJ 12/12/11

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-10
Sheet 1 of 1

LOG OF BORING NO. SWM-11

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▽ Dry ▽ Dry
DATE: 11/18/2011 11/19/2011
CAVED (ft): 8.7 8.6

DATE STARTED: November 18, 2011
DATE COMPLETED: November 18, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 419.7
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

ELEV. 417.38 TOP OF STRUCTURE
ELEV. 416.21 BOTTOM OF STRUCTURE

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	16	1-2-2	4	417.7	0	ML		Red, moist, very loose, micaceous Sandy SILT, trace Organics (Root Fibers).	Topsoil: 5 in.
S-2	2.5	18	3-3-4	7			SM		Red, moist, loose, micaceous Silty SAND.	
S-3	5.0	18	3-4-4	8	411.7	5				
S-4	8.5	18	8-6-5	11		10	SM		Red with White and Tan, moist, medium dense, micaceous Silty SAND.	
S-5	13.5	18	9-10-10	20	404.7	15				

Boring terminated at 15 feet.

Infiltration Test performed at 7 feet:
Average Infiltration Rate = 1.7 in./hour

NOTES:

LOBG 080972.1.GPJ 12/12/11

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-11
Sheet 1 of 1

LOG OF BORING NO. SWM-12

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▽ Dry ▽ Dry
DATE: 11/17/2011 11/18/2011
CAVED (ft): 5.4 5.3

DATE STARTED: November 17, 2011
DATE COMPLETED: November 17, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 405.8
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

ELEV. 408.44 TOP OF STRUCTURE

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	14	4-6-6	12	403.8	0	SM		Brown, moist, medium dense, micaceous Silty SAND, trace Organics (Root Fibers).	Topsoil: 4 in.
S-2	2.5	16	14-10-7	17	401.8		SM		Brown, moist, medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-3	5.0	18	6-7-9	16	398.8	5	SM		Light Brown, moist, medium dense, micaceous Silty SAND. ELEV. 402.52 BOTTOM OF STRUCTURE	
							SM		Tan and Beige, dry, loose, micaceous Silty SAND, trace Weathered Rock Fragments.	
S-4	8.5	18	4-4-4	8	395.8	10				

Boring terminated at 10 feet.

Infiltration Test performed at 4 feet:
Average Infiltration Rate = 1.5 in./hour

NOTES:

LOBG 080972.1.GPJ 12/12/11

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-12
Sheet 1 of 1

LOG OF BORING NO. SWM-13

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▽ Dry ▽ Dry
DATE: 11/17/2011 11/18/2011
CAVED (ft): 5.5 5.5

DATE STARTED: November 17, 2011
DATE COMPLETED: November 17, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 396.5
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

ELEV. 399.00 TOP OF STRUCTURE
ELEV. 395.08 BOTTOM OF STRUCTURE

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	18	1-2-2	4	394.5	0	SM		Brown, moist, very loose, micaceous Silty SAND.	Topsoil: 4 in.
S-2	2.5	18	2-2-4	6	392.5		ML		Brown, moist, medium stiff, micaceous Sandy SILT.	
S-3	5.0	18	6-6-8	14		5	SM		Light Brown to Tan, moist, loose to medium dense, micaceous Silty SAND with Weathered Rock Fragments.	
S-4	8.5	18	3-3-5	8	386.5	10				

Boring terminated at 10 feet.

Infiltration Test performed at 4.5 feet:
Average Infiltration Rate = 1.3 in./hour

NOTES:

LOBG 080972.1.GPJ 12/12/11

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-13
Sheet 1 of 1

LOG OF BORING NO. SWM-14

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▽ Dry ▽ Dry
DATE: 11/18/2011 11/19/2011
CAVED (ft): 5.11 5.10

DATE STARTED: November 17, 2011
DATE COMPLETED: November 17, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 397.8
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

ELEV. 399.50 TOP OF STRUCTURE
ELEV. 396.33 BOTTOM OF STRUCTURE

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	18	1-1-2	18		0	ML		Brown, moist, very loose to medium dense, micaceous Sandy SILT.	Topsoil: 5 in.
S-2	2.5	0	2-2-2	4	392.8					
S-3	5.0	12	3-6-7	13		5	SM		Light Brown to Gray and Tan, moist, loose to medium dense, micaceous Silty SAND.	
S-4	8.5	18	4-5-5	10	387.8	10				

Boring terminated at 10 feet.

Infiltration Test performed at 5.5 feet:
Average Infiltration Rate = 0.2 in./hour

NOTES:

LOBG 080972.1.GPJ 12/15/11

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-14
Sheet 1 of 1

LOG OF BORING NO. SWM-15

Sheet 1 of 1

PROJECT: Grace - Office Building
PROJECT NO: 080972.1
PROJECT LOCATION: Howard County, Maryland

WATER LEVEL (ft): ▽ Dry ▽ Dry
DATE: 11/18/2011 11/19/2011
CAVED (ft): 9.6 9.6

DATE STARTED: November 18, 2011
DATE COMPLETED: November 18, 2011
DRILLING CONTRACTOR: Geo-Technology Associates, Inc.
DRILLER: M. Fleming
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon

WATER ENCOUNTERED DURING DRILLING (ft)▽: Dry
GROUND SURFACE ELEVATION: 400.6
DATUM: Survey
EQUIPMENT: CME-550
LOGGED BY: J. Ermer
CHECKED BY: A. McKeen

ELEV. 400.00 TOP OF STRUCTURE

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	18	WOH-1-1	2		0	ML		Reddish-Brown to Brown, moist, very loose, micaceous Sandy SILT. ELEV. 396.50 BOTTOM OF STRUCTURE	Topsoil: 5 in.
S-2	2.5	18	2-2-2	4	395.6					
S-3	5.0	18	4-4-5	9		5	SM		Light Brown to Gray, moist, loose, micaceous Silty SAND.	
S-4	8.5	18	4-4-6	10		10				
S-5	13.5	18	4-4-5	9	385.6	15				

Boring terminated at 15 feet.

Infiltration Test performed at 10 feet:
Average Infiltration Rate = 7.2 in./hour

NOTES:

LOBG 080972.1.GPJ 12/12/11

GEO-TECHNOLOGY ASSOCIATES, INC.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707

LOG OF BORING NO. SWM-15
Sheet 1 of 1

FOR LOCATIONS OF SOIL BORINGS SEE SHEETS SDP-15.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Signature	Date
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12
CHIEF, DIVISION & LAND DEVELOPMENT	11/19/12

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — 29203 — PROFESSIONAL ENGINEER
10-17-12

SHEET: SDP-28

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

GEOTECHNICAL BORING LOGS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	AS SHOWN
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	28 OF 46

SDP-12-077

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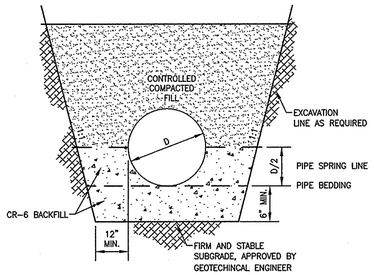
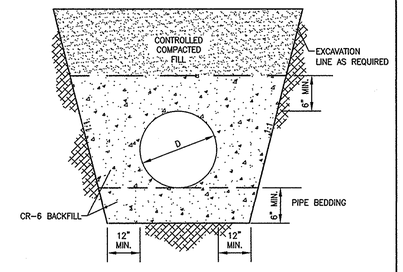
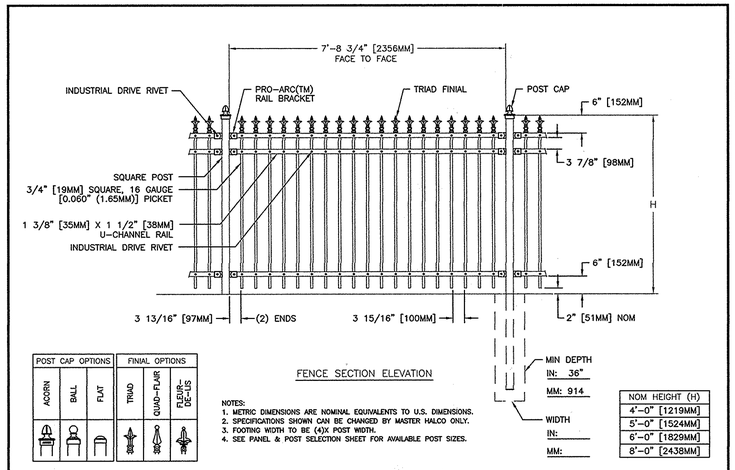


RCP STORM DRAIN PIPE BACKFILL DETAIL | N.T.S.



PVC/HDPE STORM DRAIN PIPE BACKFILL DETAIL | N.T.S.



FENCE SECTION ELEVATION

NOTES:
1. METRIC DIMENSIONS ARE NOMINAL EQUIVALENTS TO U.S. DIMENSIONS.
2. SPECIFICATIONS SHOWN CAN BE CHANGED BY MASTER HALCO ONLY.
3. FOOTING WIDTH TO BE (4)X POST WIDTH.
4. SEE PANEL & POST SELECTION SHEET FOR AVAILABLE POST SIZES.

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MONUMENTAL IRON WORKS
by Master Halco
Orange, CA
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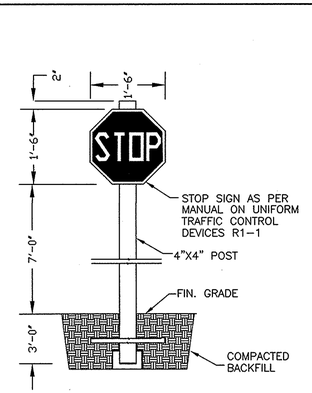
www.FenceOnline.com

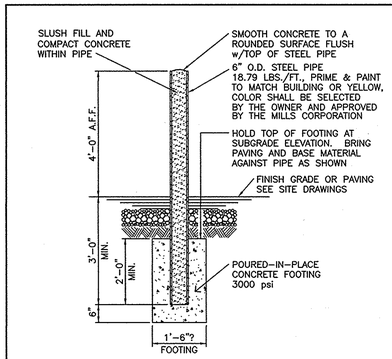
ESTATE FENCE – STYLE G

NOM 8' SECTION LENGTH – 3/4" PICKETS

BY:	JRR
DATE:	04-28-95
REV:	D
REV DATE:	06-18-08
DWG:	6-1510
LAYER:	1
SCALE:	1/2" = 1'-0"

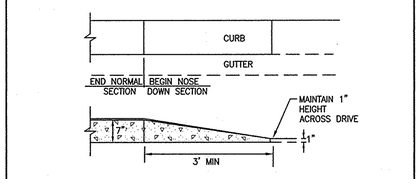


STOP SIGN | N.T.S.

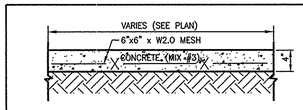


PIPE BOLLARD
NOT TO SCALE

PIPE BOLLARD | N.T.S.

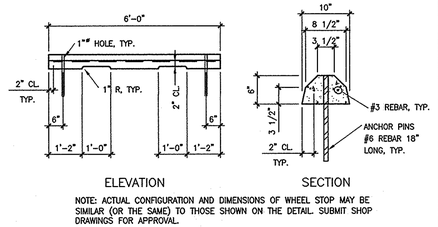


NOSE DOWN CURB | N.T.S.



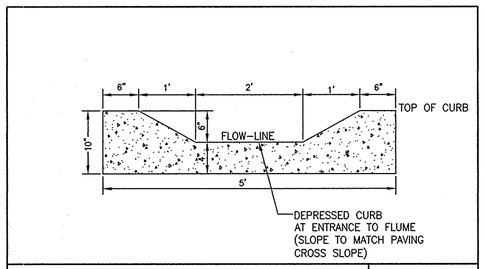
NOTES:
1. SIDEWALK TO BE SCRIBED IN 5'-0" MAXIMUM SQUARES.
2. EXPANSION JOINTS ACROSS THE SIDWALK NOT TO BE MORE THAN 15' APART.
3. SEE HOWARD COUNTY STD. DETAIL R-3.05 FOR FURTHER INFORMATION.

SIDEWALK SECTION | N.T.S.

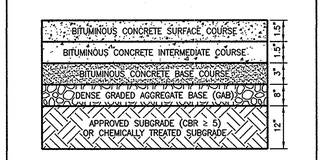


NOTE: ACTUAL CONFIGURATION AND DIMENSIONS OF WHEEL STOP MAY BE SIMILAR (OR THE SAME) TO THOSE SHOWN ON THE DETAIL. SUBMIT SHOP DRAWINGS FOR APPROVAL.

WHEELSTOP DETAIL | N.T.S.



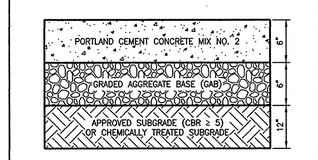
CONCRETE FLUME DETAIL | N.T.S.



PAVING THICKNESS IS PER GEO-TECHNOLOGY ASSOCIATES RECOMMENDATIONS. IF CHEMICALLY TREATED SUBGRADE IS CHOSEN, GAB IS NOT NEEDED.

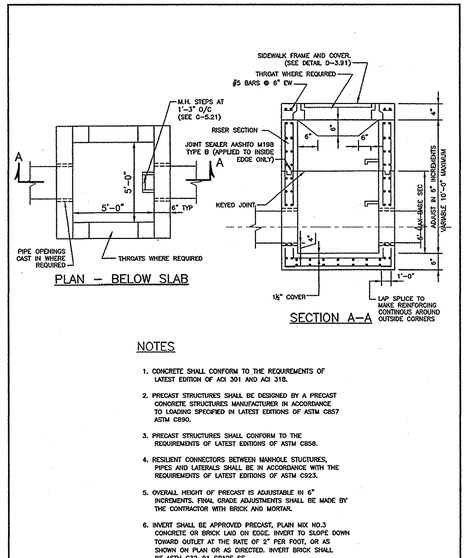
SEE HOWARD COUNTY STD. DETAIL R-2.01 FOR ADDITIONAL INFORMATION.

MEDIUM DUTY PAVING SECTION | N.T.S.



PAVING THICKNESS IS PER GEO-TECHNOLOGY ASSOCIATES RECOMMENDATIONS. IF CHEMICALLY TREATED SUBGRADE IS CHOSEN, GAB IS NOT NEEDED.

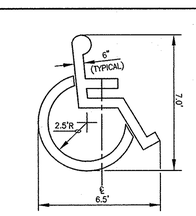
CONCRETE PAVING SECTION | N.T.S.



NOTES

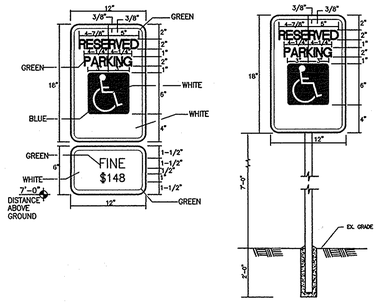
1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF LATEST EDITION OF ACI 301 AND ACI 318.
2. PRECAST STRUCTURES SHALL BE DESIGNED BY A PRECAST CONCRETE STRUCTURES MANUFACTURER IN ACCORDANCE TO LOADING SPECIFIED IN LATEST EDITIONS OF ASTM C857 ASTM C890.
3. PRECAST STRUCTURES SHALL CONFORM TO THE REQUIREMENTS OF LATEST EDITIONS OF ASTM C858.
4. RESILIENT CONNECTORS BETWEEN MANHOLE STUCTURES, PIPES AND LATERALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF LATEST EDITIONS OF ASTM C923.
5. OVERALL HEIGHT OF PRECAST IS ADJUSTABLE IN 6" INCREMENTS. FINAL GRADE ADJUSTMENTS SHALL BE MADE BY THE CONTRACTOR WITH BRICK AND MORTAR.
6. INVERT SHALL BE APPROVED PRECAST, PLAIN MIX NO.3 CONCRETE OR BRICK LAID ON EDGE. INVERT TO SLOPE DOWN TOWARD OUTLET AT THE RATE OF 2" PER FOOT, OR AS SHOWN ON PLAN OR AS DIRECTED. INVERT BRICK SHALL BE ASTM C32-91 GRADE SS.

MODIFIED TYPE 'D' INLET | N.T.S.

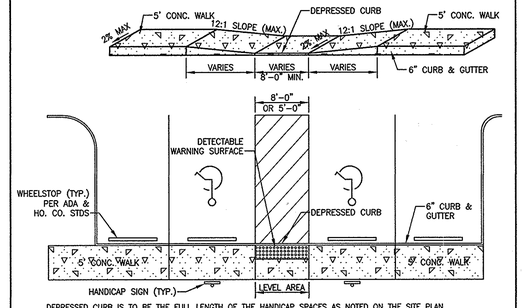


LOCATE AT EDGE OF PARKING SPACE UNLESS ACCOMPANIED BY "VAN" LETTERING, WHITE REFLECTIVE PAINT.

ACCESSIBLE PARKING SYMBOL | N.T.S.



HANDICAP SIGN DETAIL | N.T.S.



DEPRESSED CURB IS TO BE THE FULL LENGTH OF THE HANDICAP SPACES AS NOTED ON THE SITE PLAN. CONCRETE IN THIS AREA TO HAVE EXPOSED AGGR. OR HAVE A BROOM FINISH.

DEPRESSED CURB | N.T.S.

ADA NOTE:
ALL SIDEWALKS AND WALKWAYS ACROSS DRIVEWAY APRONS SHALL HAVE A MAXIMUM OF 2% CROSS SLOPE AND A MAXIMUM OF 5% LONGITUDINAL SLOPE.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/28/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
CHIEF, DIVISION & LAND DEVELOPMENT	11/19/12 DATE

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

STATE OF MARYLAND · THOMAS C. NEUGER · 29203 · PROFESSIONAL ENGINEER
10-17-12

SHEET: SDP-29

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

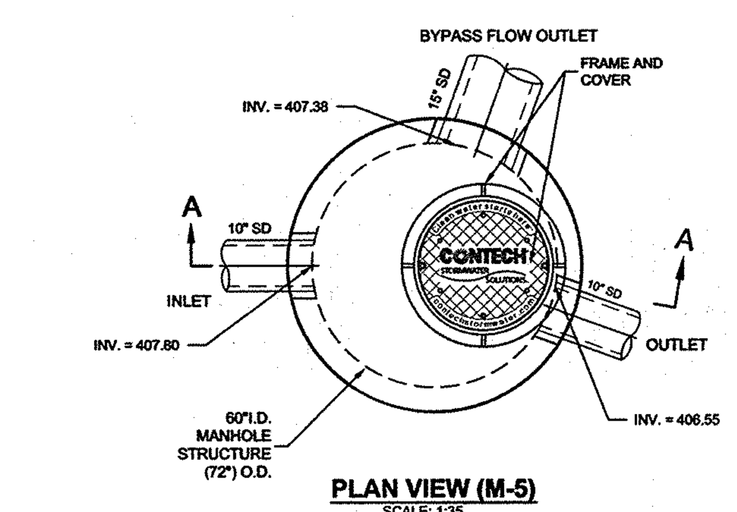
SITE DETAILS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

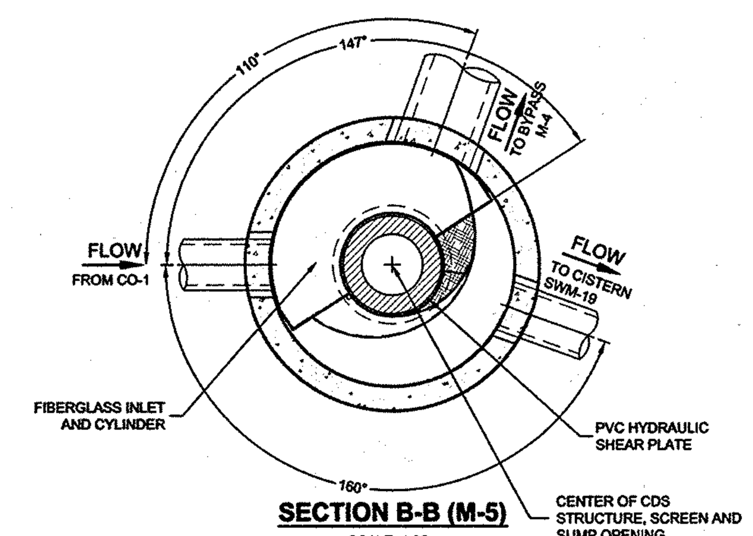
DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	AS SHOWN
		DATE:	10/16/2012
		DRAWN BY:	RAH
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	29 OF 46

SDP-12-077

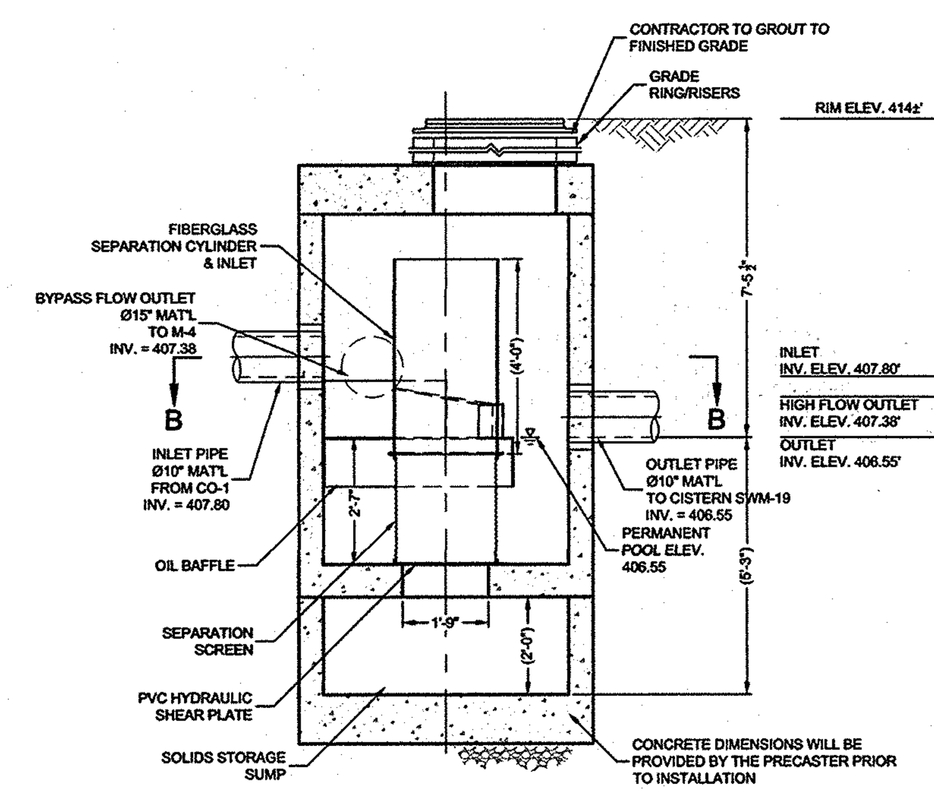
P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-29-SITE DETAILS.dwg, 10/17/2012 10:00:17 AM, Rholl
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



PLAN VIEW (M-5)
SCALE: 1:35



SECTION B-B (M-5)
SCALE: 1:35



SECTION A-A (M-5)
SCALE: 1:35

MATERIALS LIST - PROVIDED BY CONTECH

COUNT	DESCRIPTION	INSTALLED BY
1	FIBERGLASS INLET & CYLINDER	CONTECH
1	2400 MICRON SEP. SCREEN	CONTECH
1	SEALANT FOR JOINTS	CONTRACTOR
1	GRADE RINGS/ RISERS	CONTRACTOR
1	Ø30"x4" FRAME AND COVER	CONTRACTOR

SITE DESIGN DATA

WATER QUALITY FLOW RATE	0.84 CFS
PEAK FLOW RATE	4.22 CFS
RETURN PERIOD OF PEAK FLOW	10 YRS

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH STORMWATER SOLUTIONS REPRESENTATIVE. www.contechstormwater.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. *STRUCTURE AND CASTINGS SHALL MEET AASHTO HS20 LOAD RATING.*
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 15,000 LBS.

CONTECH
PROPOSAL
DRAWING

MARK	DATE	REVISION DESCRIPTION	BY

CDS2020-5-C - 455058-01
GRACE TECH PARK
COLUMBIA, MD
SITE DESIGNATION: M-5

CONTECH CONSTRUCTION PRODUCTS INC.
www.contech-cpi.com

DATE: 9/25/12	
DESIGNED: BCL	DRAWN: N/A
CHECKED:	APPROVED:
PROJECT No.: 455058	SEQUENCE No.: 01
SHEET: 1 OF #	

PUMP STATION SPECIFICATIONS:
NAME: GRACE TECH PARK
STATION MODEL: SHSTV-1-(30)O-3-460-3-25-55
STATION TOTAL PERFORMANCE: 25GPM @ 55PSI
PUMP HORSEPOWER:
PUMP NO.1 3HP (3600RPM, 155TDH)

MIN SUGGESTED CIRCUIT BREAKER: 30AMP
POWER REQUIREMENTS: 460V, 60HZ, 3PHZ, 15 FLA

DESCRIPTION OF OPERATION:
PUMP WILL START VIA PRESSURE DROP SENSED IN WATER MAINLINE AND REGULATE A CONSTANT PRESSURE AT VARIABLE FLOW RATE. PUMP WILL RETIRE BASED UPON AN ADJUSTABLE MINIMUM WATER DEMAND (FLOW) AND SUSTAINED REGULATE PRESSURE.

WATER WILL BE DRAWN OUT OF TANK. IF TANK LEVEL CONTINUES TO DROP PAST LOW LEVEL ALARM SET POINT PUMP WILL SHUT DOWN ON LOW LEVEL ALARM. PUMP WILL RE-ENABLE UPON USER ADJUSTABLE ALARM RE-SET LEVEL.

PUMP SYSTEM WILL TOTALIZE ALL WATER PUMPED AND ALL CITY MAKE UP WATER USED.

AUTOMATIC DISCHARGE FILTRATION SHALL BE FLUSHED UPON (3) INPUTS. DIFFERENTIAL PRESSURE, TOTAL GALLONS PUMPED, AND TIMED INTERVAL WHICHEVER OCCURS FIRST. FILTER SHALL ALSO HAVE ALARM AFTER (3) FLUSH CYCLES AND PRESSURE DIFFERENTIAL IS NOT RESTORED TO CLEAN SCREEN.

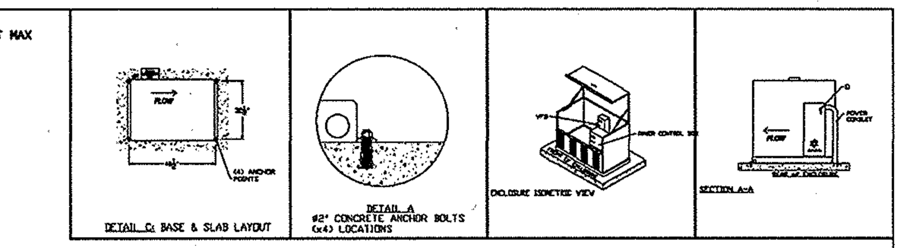
UV UNITS WILL BE ACTIVE 24/7 - 365. CHANGE BULB EVERY 365 DAYS. TIMER AND ALARM ARE INCLUDED TO NOTIFY USER.

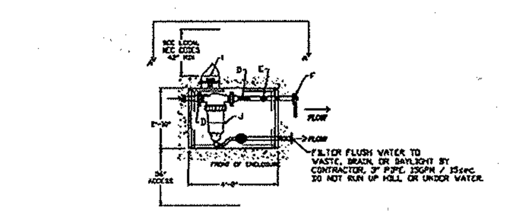
SYSTEM SHALL HAVE THE FOLLOWING ALARMS AT MINIMUM:
-HIGH DISCHARGE PRESSURE
-LOW DISCHARGE PRESSURE
-VFD FAULT
-LOW LOW LEVEL SHUT DOWN (HARD FAULT)
-LOW LEVEL ALARM (SOFT FAULT)
-FILTER ALARM
-PIPE FILL ALARM (SYSTEM CAN NOT PRESSURIZE)
-LOSS OF PHASE OR PHASE REVERSAL
-HIGH VOLTAGE
-LOW VOLTAGE
-CONTROL POWER ALARM

CONTROL PANEL TO INCLUDE:
-COLOR TOUCHSCREEN OPERATOR INTERFACE
-FILTER CONTROLS AND DISPLAY
-FLOW SENSOR DISPLAY AND TOTALIZERS
-PSI DISPLAY AND SET POINTS
-AUTO RE-ENABLING OF PUMP BASED UPON WATER AVAILABILITY
-PUMP RUNNING STATUS & RUN-TIME HRS
-LEVEL CONTROLS AND DISPLAY IN "INCHES" & "GALLONS"
-USER ABILITY TO ADJUST ALL SYSTEM PARAMETERS
-VFD PRESSURE REGULATION FOR ENERGY EFFICIENCY
-BRANCH CIRCUIT PROTECTION
-UL 508 LISTED CONTROL PANEL ASSEMBLY
-PROGRAMABLE PLC "programable logic controller"
-NON-FUSABLE MAIN DISCONNECT
-HOA (hand, off, auto) SWITCH FOR PUMP
-SERIAL MODBUS PLC CAPABILITY

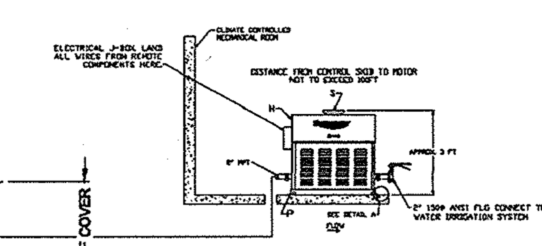
STATION COMPONENTS:
A 3HP PUMP AND MOTOR
B LOW LEVEL FLOAT
C PUMP DISCHARGE PIPE
D PRESSURE TRANSDUCER W/ GAUGE
E PUMP FLOW SENSOR
F DISCHARGE ISOLATION VALVE
G N/A
H PAINTED STEEL ENCLOSURE (GREEN)
I HIGH VOLTAGE POWER BOX
J AUTOMATIC FILTER W/ 100 MICRON SCREEN
K LEVEL TRANSDUCER
L N/A
M NEMA 4x REMOTE DISCONNECT
N NEMA 4x LOW VOLTAGE ELECTRICAL J-BOX
O DISCONNECT SWITCH
P PAINTED STEEL BASE (GREEN)
Q HDPE SLED & FLOW INDUCER SLEEVE FOR MOTOR COOLING
R 1" BLOW OUT PORT FOR WINTERIZATION
S 240CFM FAN, HOOD MOUNTED
T N/A
U PUMP INTAKE SCREEN
V N/A
W N/A
X CHECK VALVE
Y QUICK DISCONNECT

WIRE SCHEDULE:
LEVEL SENSOR: 18AWG (2) COND. SHIELDED 500FT MAX
LEVEL FLOAT: 14AWG (2) COND.
MOTOR: 10AWG (3) COND. W/ GROUND

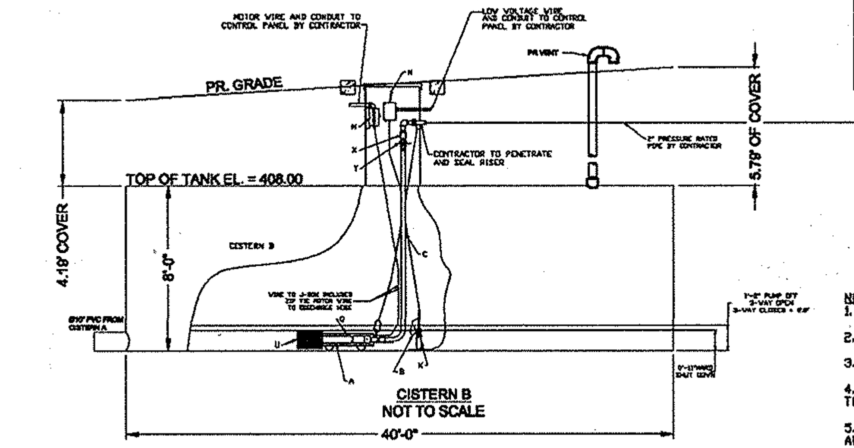




NOT TO SCALE



NOTE: SEE URBANGREEN UGM CISTERN DRAWING FOR INFORMATION SPECIFIC TO TANKS



CISTERN B
NOT TO SCALE

NOTES:
1. CONCEPT ONLY DRAWING NOT TO SCALE.
2. DO NOT RULER OR MEASURE IN A-CAD SPACE.
3. DO NOT RULER DRAWING.
4. ALL WIRE AND CONDUIT FROM REMOTE COMPONENTS TO CONTROL PANEL NOT SUPPLIED BY WATERTRONICS.
5. INSTALLATION OF PUMP EQUIPMENT SHALL BE BY EXPERIENCED AUTOMATIC PUMP/CONTROLS CONTRACTOR.

CONTECH
PROPOSAL
DRAWING

MARK	DATE	REVISION DESCRIPTION	BY

RWH PUMPS AND CONTROLS - 455058-003
GRACE TECH PARK PARCEL A
COLUMBIA, MD
SITE DESIGNATION: P&C

CONTECH CONSTRUCTION PRODUCTS INC.
URBANGREEN

DATE: 3/1/12	
DESIGNED: BCI	DRAWN: N/A
CHECKED: —	APPROVED: —
PROJECT No.: 455058	SEQUENCE No.: 003
SHEET: 1 OF 1	

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED RAINWATER HARVESTING FACILITY (M-1)

THE FOLLOWING ITEMS SHOULD BE ADDRESSED TO ENSURE PROPER OPERATION, MAINTENANCE AND LONG--TERM PERFORMANCE OF THE RAINWATER HARVESTING SYSTEM:

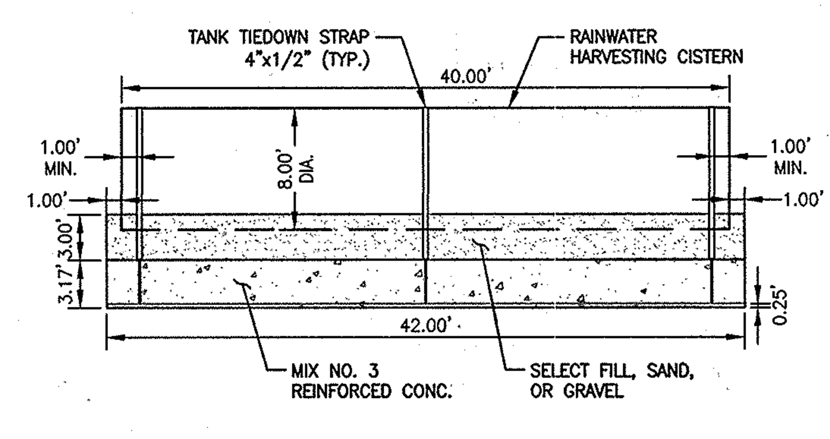
1. THE OWNER SHALL EMPTY TANKS ON A YEARLY BASIS FOR CLEANING AND INSPECTION. SET UP SAFETY AND WARNING EQUIPMENT AROUND ACCESS TO TANKS. OPEN GATE VALVE TO DRAIN TANKS. SHUT-OFF ELECTRIC FEED TO PUMP AT DISCONNECT SWITCH BEFORE ENTERING TANK.

2. THE OWNER SHALL VERIFY INTEGRITY OF THE TANK WALLS, PIPE CONNECTIONS, PUMP UNIT, DISCHARGE PIPE, WIRING, CALMING INLET. CLEAN AND REMOVE ANY DEBRIS AND SEDIMENT FROM TANKS AND COMPONENTS. REFER TO PUMP MANUAL FOR INSPECTION INSTRUCTIONS.

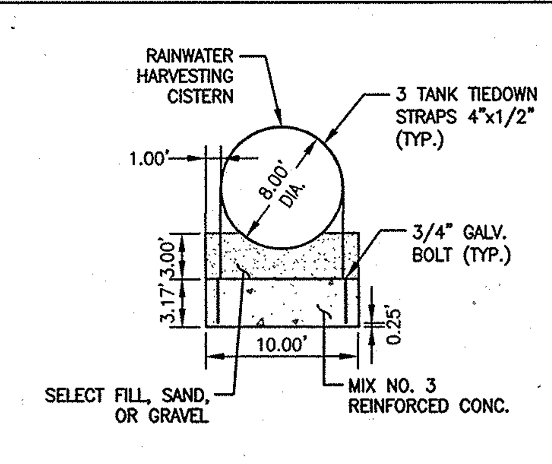
3. THE OWNER SHALL REPLACE DAMAGED COMPONENTS AND MAKE ANY NECESSARY REPAIRS AS NEEDED.

4. THE OWNER SHALL DISCONNECT THE ELECTRIC TO THE PUMP DURING WINTER OPERATION. ONCE TANK IS FULL, ALL STORMWATER WILL BYPASS THE TANKS INTO THE STORM DRAIN SYSTEM AT STRUCTURE M-5 (HYDRODYNAMIC SEPARATOR).

5. THE OWNER SHALL VACUUM AND REMOVE DEBRIS, SEDIMENT, TRASH, GREASE AND OILS COLLECTED IN STRUCTURE M-5 ONCE A YEAR. SET UP SAFETY AND WARNING EQUIPMENT AROUND ACCESS TO STRUCTURE M-5. THE OWNER SHALL VISUALLY INSPECT AND MAKE ANY NECESSARY REPAIRS AS NEEDED.



ELEVATION



CROSS SECTION

NOTES:
1. ALL STRAPS ARE TIGHTENED TO PRODUCE UNIFORM LOADING UPON EACH STRAP.
2. ALL STRAPS ARE VERTICAL AT THE POINT OF ANCHORAGE.
3. UNDERGROUND TANK TIE DOWN SYSTEMS SHOULD BE DESIGNED BY A LICENSED STRUCTURAL ENGINEER, DUE TO THE COMPLEXITY OF SOIL CONDITIONS. MATERIAL LISTED IS ONLY INTENDED AS A GUIDE.

RAINWATER HARVESTING CISTERN
ANTI-FLOTATION DEVICE DETAIL
NOT TO SCALE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	DATE 11/29/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 11/14/12
CHIEF, DIVISION & LAND DEVELOPMENT	DATE 11/19/12

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — 29203 — PROFESSIONAL ENGINEER
10-17-12

SHEET: SDP-30

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

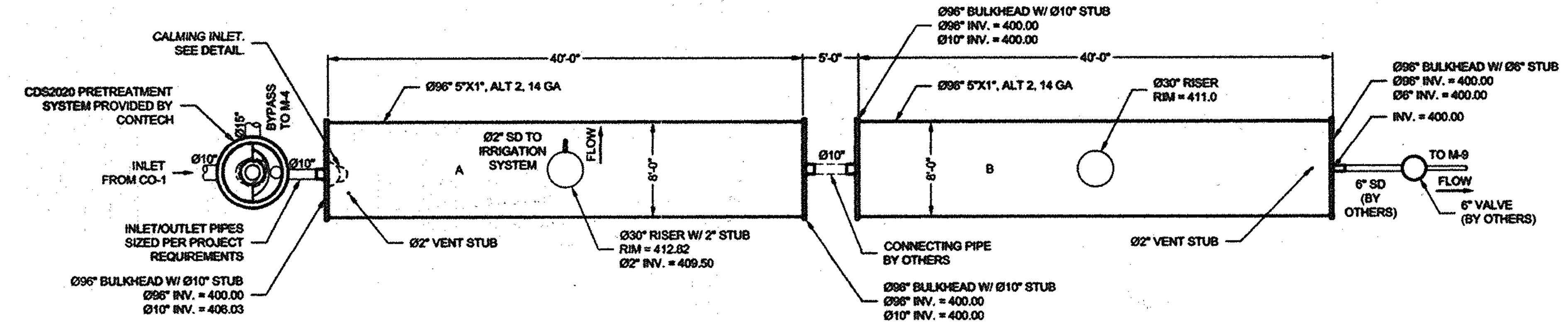
SITE DETAILS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	AS SHOWN
		DATE:	10/16/2012
		DRAWN BY:	RAH
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	30 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-30-SITE DETAILS.dwg, 10/17/2012 10:00:44 AM, RHall, 1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



ASSEMBLY (BMP TYPE M-1) △1

SCALE: 1" = 10'
VOLUME: 30,000 GALLONS
LOADING: H20/H25
SYSTEM INV = 400.00

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- FLOTATION CONTROL IS CRITICAL AND THE RESPONSIBILITY OF THE INSTALLER. THE INFORMATION IS SUBMITTED AS A GUIDELINE ONLY. CONTECH IS NOT RESPONSIBLE FOR THE USE AND INTERPRETATION OF THIS INFORMATION.

POLYUREA COATING NOTES

- MECHANICALLY ABRADE SURFACE 3" WIDE ON EACH SIDE OF LOCK SEAMS AND WELD SEAMS ON THE OUTSIDE OF THE PIPE TO A PROFILE OF 3 MILS, MIN.
- APPLY POLYUREA OVER LOCK SEAMS AND WELD SEAMS ON THE OUTSIDE OF THE PIPE TO A WIDTH OF 4" AND A THICKNESS OF 100 MILS, MIN.
- APPLY A SKIM COAT OF POLYUREA OVER PREVIOUSLY COATED LOCK SEAMS AND WELD SEAMS TO A WIDTH OF 8" AND THICKNESS OF 20 MILS, MIN.

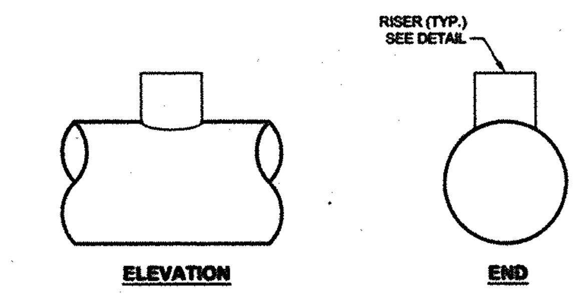
APPROXIMATE WEIGHT OF ONE TANK: 1,200 LBS

MARK	DATE	REVISION DESCRIPTION	BY
1	9/26/12	PER ENGINEER OF RECORD	NLE

CONTECH CONSTRUCTION PRODUCTS INC. www.contech-cpl.com 521 Progress Drive, Suite H, Linthicum, MD 21090 866-740-3318 410-796-5505 866-376-8511 FAX
URBANGREEN — CONTECH PROPOSAL DRAWING

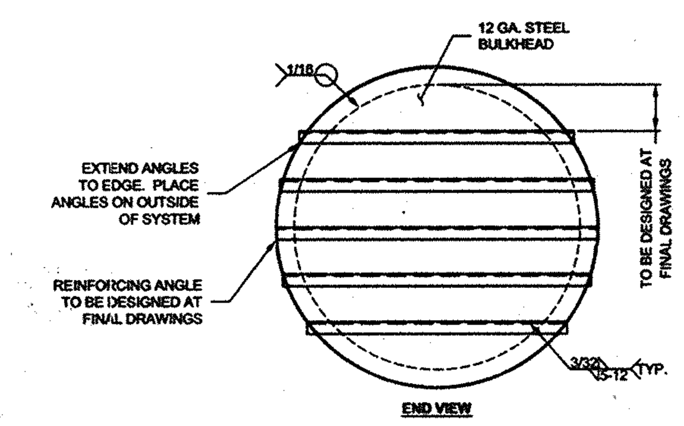
Ø96" URBANGREEN UGM CISTERN - 455058-002
GRACE TECH PARK PARCEL A
COLUMBIA, MD
SITE DESIGNATION: SWM-19

PROJECT No.: 455058 | SEQ. No.: 002 | DATE: 2/8/2012 | DESIGNED: BI | DRAWN: NLE | CHECKED: | APPROVED: | SHEET NO.: P1 OF 3



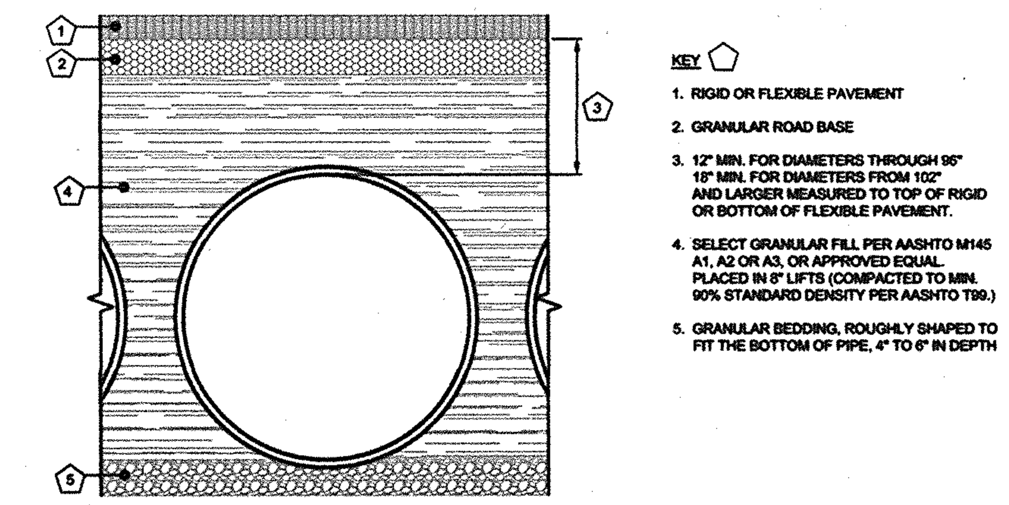
TYPICAL RISER DETAIL

SCALE: N.T.S.



TYPICAL BULKHEAD DETAIL

SCALE: N.T.S.



KEY

1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE
3. 12" MIN. FOR DIAMETERS THROUGH 96" 18" MIN. FOR DIAMETERS FROM 102" AND LARGER MEASURED TO TOP OF RIGID OR BOTTOM OF FLEXIBLE PAVEMENT.
4. SELECT GRANULAR FILL PER AASHTO M145 A1, A2 OR A3, OR APPROVED EQUAL. PLACED IN 8" LIFTS (COMPACTED TO MIN. 90% STANDARD DENSITY PER AASHTO T99.)
5. GRANULAR BEDDING, ROUGHLY SHAPED TO FIT THE BOTTOM OF PIPE, 4" TO 6" IN DEPTH

FOUNDATION/BEDDING PREPARATION

PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, 4" - 6" OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL

THE BACKFILL SHALL BE AN A1, A2 OR A3 GRANULAR FILL PER AASHTO M145, OR A WELL-GRADED GRANULAR FILL AS APPROVED BY THE SITE ENGINEER (SEE INSTALLATION GUIDELINES). THE MATERIAL SHALL BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 90% AASHTO T99 STANDARD PROCTOR DENSITY. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE DETENTION SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON THE PIPE.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.

1/P2 BACKFILL DETAIL

SCALE: N.T.S.

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Ø96" URBANGREEN UGM CISTERN - 455058-002
GRACE TECH PARK PARCEL A
COLUMBIA, MD
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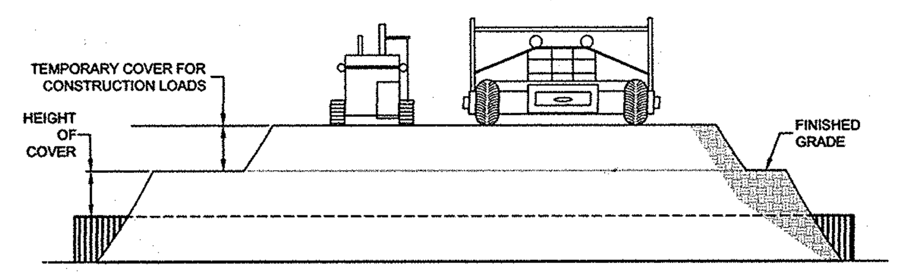
PROJECT No.: 455058 | SEQ. No.: 002 | DATE: 2/8/2012 | DESIGNED: BI | DRAWN: NLE | CHECKED: | APPROVED: | SHEET NO.: P2 OF 3



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

2/P3 CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

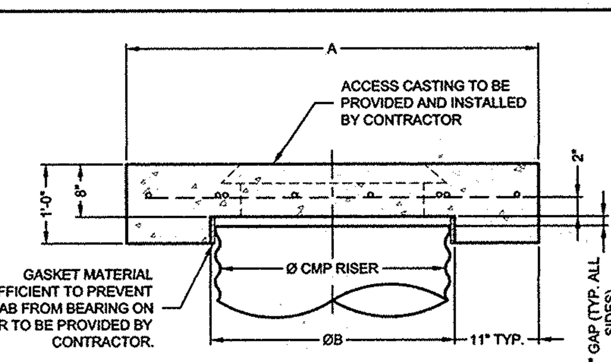
HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

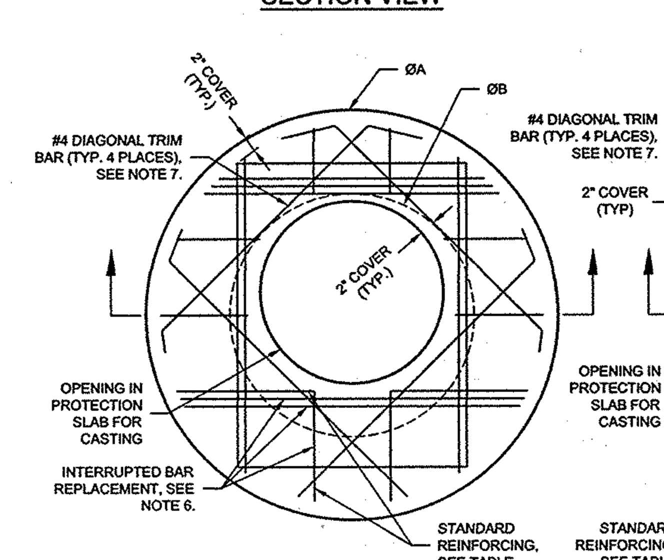


SECTION VIEW

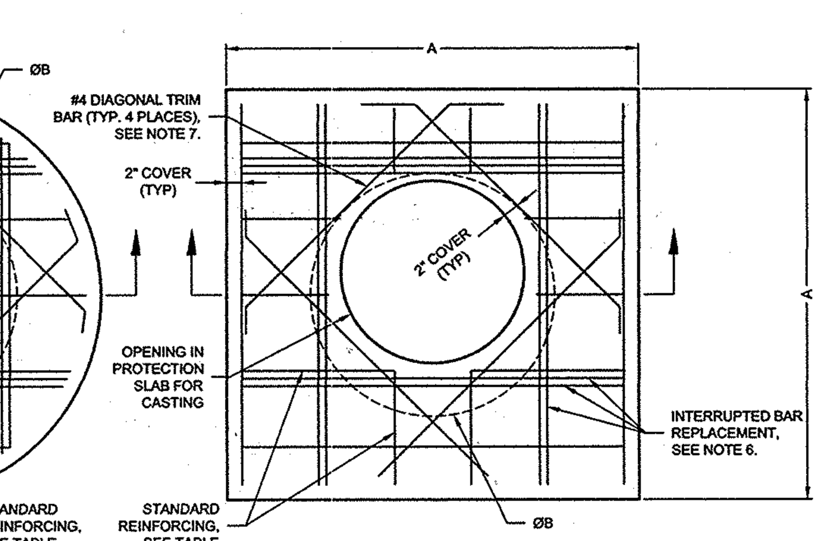
Ø CMP RISER	A	Ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	Ø 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	Ø 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	Ø 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	Ø 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	Ø 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

REINFORCING TABLE

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

3/P3 MANHOLE CAP DETAIL

SCALE: N.T.S.

MARK	DATE	REVISION DESCRIPTION	BY
1	9/26/12	PER ENGINEER OF RECORD	NLE

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URBANGREEN — CONTECH PROPOSAL DRAWING

Ø96" URBANGREEN UGM CISTERN - 455058-002
GRACE TECH PARK PARCEL A
COLUMBIA, MD
SITE DESIGNATION: SWM-19

PROJECT No.: 455058 | SEQ. No.: 002 | DATE: 2/8/2012 | DESIGNED: BI | DRAWN: NLE | CHECKED: | APPROVED: | SHEET NO.: P3 OF 3

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/29/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/4/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

SHEET: SDP-31

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

SITE DETAILS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

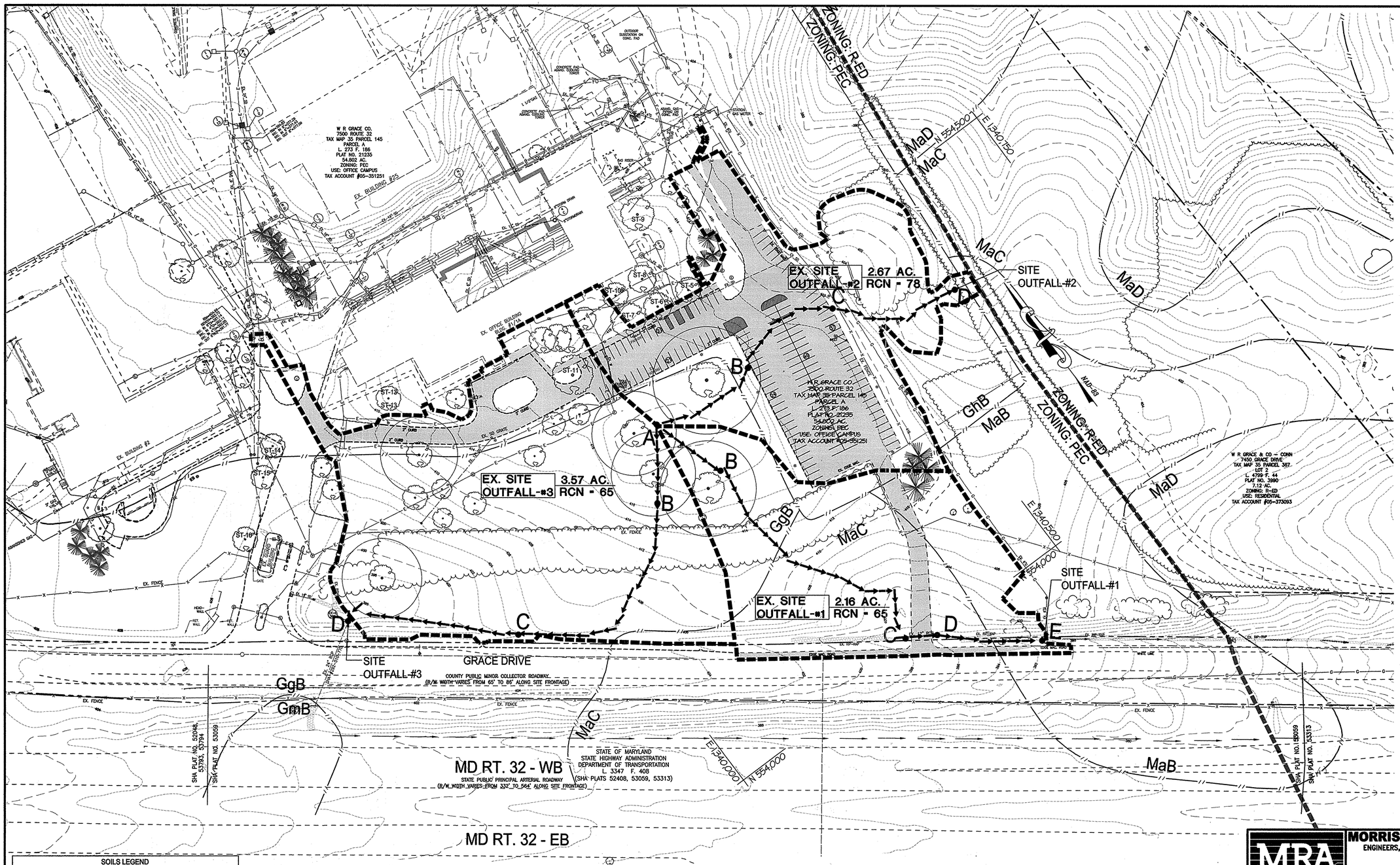
STATE OF MARYLAND — THOMAS C. NEUGEBAUER — 29203 — PROFESSIONAL ENGINEER — 10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	AS SHOWN
		DATE:	10/16/2012
		DRAWN BY:	RAH
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	31 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-31-SITE DETAILS.dwg, 10/17/2012 10:01:11 AM, RHall, 1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



EXISTING SITE OUTFALLS-# 1, 2, & 3

SCALE: 1" = 60'

SOILS LEGEND		
SYMBOL	NAME/DESCRIPTION	SOIL TYPE
BaA	BAILE SILT LOAM, 0-3% SLOPES	C
Co	CODORUS & HATBORO SILT LOAM, 0-3% SLOPES	B
GgB	GLENELG LOAM, 3-8% SLOPES	B
GhB	GLENELG-URBAN LAND COMPLEX, 0-8% SLOPES	B
GmB	GLENVILLE SILT LOAM, 3-8% SLOPES	C
GmC	GLENVILLE SILT LOAM, 8-15% SLOPES	B
GuB	GLENVILLE-URBAN LAND-UDORTHENTS COMPLEX, 0-8% SLOPES	C
MaB	MANOR LOAM, 3-8% SLOPES	B
MaC	MANOR LOAM, 8-15% SLOPES	B
MaD	MANOR LOAM, 15-25% SLOPES	B
MkF	MANOR-BRINKLOW COMPLEX, 25-65% SLOPES, VERY ROCKY	B

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	DATE 10/29/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 11/14/12
CHIEF, DIVISION & LAND DEVELOPMENT	DATE 11/19/12

SITE OUTFALL - #1, 2, & 3 SUMMARIES

SITE OUTFALL #1
THE EXISTING CONDITION AT SITE OUTFALL #1 HAS A DRAINAGE AREA OF 2.16 AC. WITH A PEAK DISCHARGE OF 5.32 CFS (10YR). THE PROPOSED DEVELOPMENT RESULTS IN A DRAINAGE AREA OF 4.00 AC. AND A PEAK PEAK DISCHARGE OF 14.08 CFS (10YR). THE APPLICATION OF VARIOUS MICRO-SCALE PRACTICES WILL DISCHARGE INTO A CLOSED STORM DRAIN SYSTEM AND OUTFALL INTO AN EXISTING OPEN CHANNEL ALONG THE NORTH SIDE OF GRACE DRIVE. THE EXISTING CHANNEL FOLLOWS ALONG GRACE DRIVE UNTIL DISCHARGING INTO THE MIDDLE PATUXENT RIVER. SITE OUTFALL #1 IS CURRENTLY STABLE WITH NO SIGN OF EROSION AND IS ALREADY LINED WITH RIP-RAP. THE CHANNEL SIZE AND EXISTING RIP-RAP WILL MAINTAIN THE STABILITY OF THE CHANNEL WITH THE INCREASED FLOWS ASSOCIATED WITH THE PROPOSED DEVELOPMENT.

SITE OUTFALL #2
THE EXISTING CONDITION AT SITE OUTFALL #2 HAS A DRAINAGE AREA OF 2.67 AC. WITH A PEAK DISCHARGE OF 10.85 CFS (10YR). THE PROPOSED DEVELOPMENT RESULTS IN A DRAINAGE AREA OF 2.15 AC. AND A PEAK DISCHARGE OF 6.36 CFS (10YR). THE APPLICATION OF VARIOUS MICRO-SCALE PRACTICES WILL DISCHARGE INTO A CLOSED STORM DRAIN SYSTEM AND OUTFALL INTO A PROPOSED PLUNGE POOL TO REDUCE VELOCITY BEFORE JOINING AN EXISTING OPEN CHANNEL BEYOND THE PROPERTY LINE. THIS EXISTING CHANNEL CONTINUES APPROXIMATELY 1,000 FT BEYOND THE LIMIT OF DISTURBANCE BEFORE JOINING THE MIDDLE PATUXENT RIVER. SITE OUTFALL #2 IS IN STABLE CONDITION WITH NO SIGN OF EROSION, AND THE DECREASED PEAK FLOWS UNDER THE PROPOSED CONDITION WILL MAINTAIN THE STABILITY OF THE OUTFALL.

SITE OUTFALL #3
THE EXISTING CONDITION AT SITE OUTFALL #3 HAS A DRAINAGE AREA OF 3.57 AC. WITH A PEAK DISCHARGE OF 8.76 CFS (10YR). THE PROPOSED DEVELOPMENT RESULTS IN A DRAINAGE AREA OF 2.25 AC. AND A PEAK DISCHARGE OF 7.88 CFS (10YR). THE APPLICATION OF VARIOUS MICRO-SCALE PRACTICES WILL DISCHARGE INTO CLOSED STORM DRAIN SYSTEM AND OUTFALL JUST UPSTREAM OF EXISTING CULVERT (SHA#292-510-770). THE CULVERT DISCHARGES INTO AN OPEN CHANNEL ALONG WESTBOUND MD RTE 32. SITE OUTFALL #3 IS CURRENTLY IN STABLE CONDITION WITH NO SIGN OF EROSION, AND THE DECREASED PEAK FLOWS UNDER THE PROPOSED CONDITION WILL MAINTAIN THE STABILITY OF THE OUTFALL.

EXISTING SITE OUTFALL-#1
(TR-55 HYDROLOGIC DATA)
DRAINAGE AREA: 2.16 AC
RCN: 65
SOIL TYPE: B
TIME OF CONCENTRATION: 0.12 HR
EXISTING SITE OUTFALL-#1 RUNOFF (TR-20)
Q_1 = 0.79 CFS
Q_{10} = 5.32 CFS

EXISTING SITE OUTFALL-#2
(TR-55 HYDROLOGIC DATA)
DRAINAGE AREA: 2.67 AC
RCN: 78
SOIL TYPE: B
TIME OF CONCENTRATION: 0.11 HR
EXISTING SITE OUTFALL-#2 RUNOFF (TR-20)
Q_1 = 3.33 CFS
Q_{10} = 10.85 CFS

EXISTING SITE OUTFALL-#3
(TR-55 HYDROLOGIC DATA)
DRAINAGE AREA: 3.57 AC
RCN: 65
SOIL TYPE: B
TIME OF CONCENTRATION: 0.12 HR
EXISTING SITE OUTFALL-#3 RUNOFF (TR-20)
Q_1 = 1.31 CFS
Q_{10} = 8.76 CFS

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

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STATE OF MARYLAND · THOMAS C. NEUBERGER · 29203 · PROFESSIONAL ENGINEER
10-17-12

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GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN
EXISTING SITE OUTFALLS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	1" = 60'
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	32 OF 46

SHEET: SDP-32

SDP-12-077

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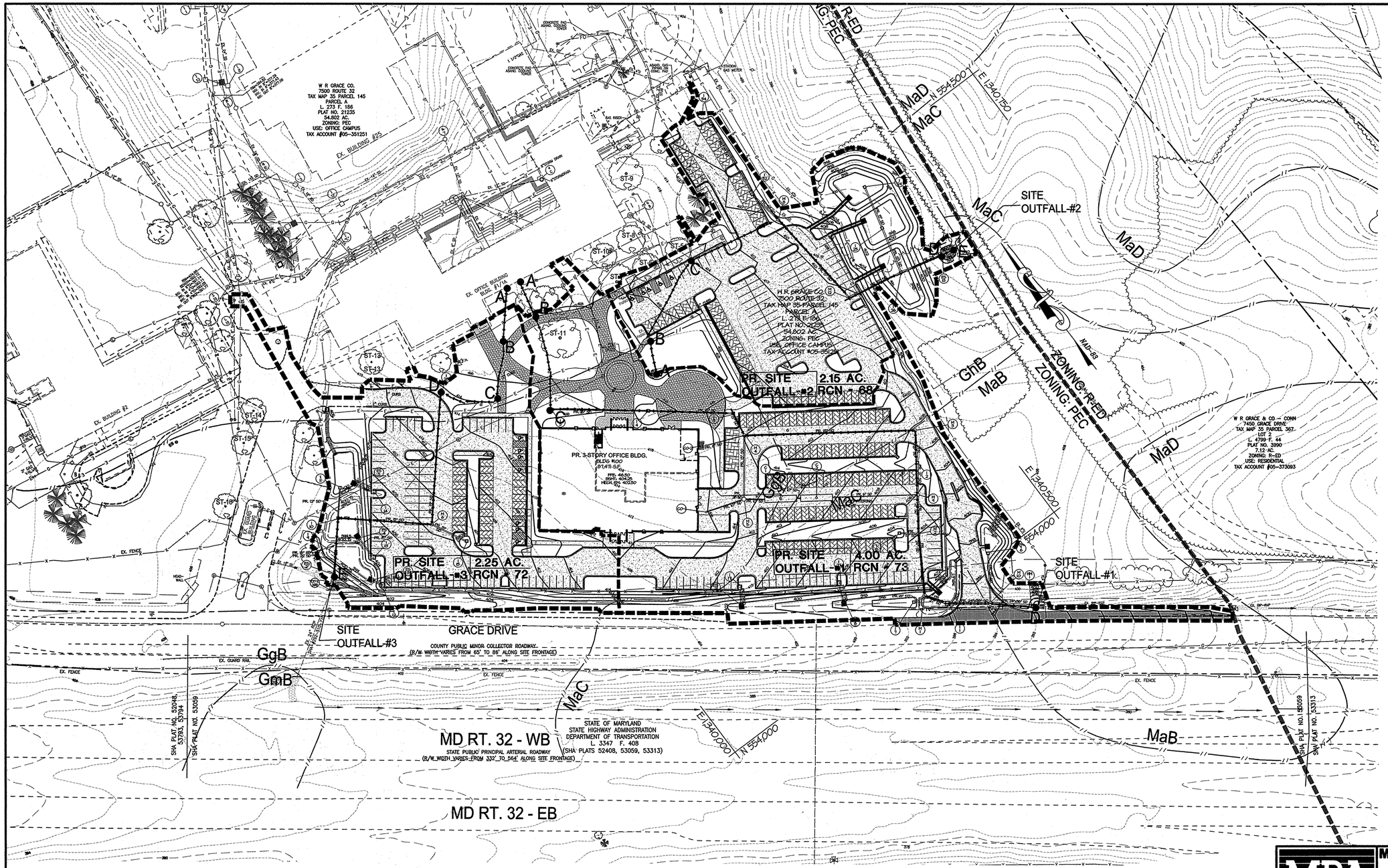

LEGEND

- EX. 10' CONTOUR
- EX. 2' CONTOUR
- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. EASEMENT
- EX. ZONING LINE
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. WATER LINE
- EX. SEWER LINE
- EX. STREAM
- EX. STREAM BUFFER
- EX. RIP-RAP CHANNEL
- EX. TREE LINE
- EX. GUARD RAIL
- EX. ELECTRIC CONDUIT
- EX. LIGHT POLES
- EX. GAS LINE
- EX. STORM DRAIN
- EX. CONDUIT
- EX. FIBER OPTIC
- EX. ELECTRIC MANHOLE
- EX. TELEPHONE MANHOLE
- EX. SOILS LINE
- GhB EX. SOIL DESCRIPTION
- PR. 2' CONTOUR
- PR. 10' CONTOUR
- PR. 1' CONTOUR
- PR. BUILDING FOOTPRINT
- PR. BUILDING OVERHANG
- PR. BUILDING SETBACK
- PR. EDGE OF CONCRETE
- PR. CURB
- PR. SIDEWALK
- PR. RETAINING WALL
- PR. POROUS PAVEMENT
- PR. MEDIUM DUTY PAVEMENT
- PR. CONCRETE PAVEMENT
- PR. TREELINE
- PR. HEDGEROW
- PR. STORM DRAIN
- PROP. DRAINAGE DIVIDE
- PROP. SUB DRAINAGE DIVIDE
- TIME OF CONCENTRATION PATH

PROPOSED SITE OUTFALL-#1
(TR-55 HYDROLOGIC DATA)

DRAINAGE AREA: 4.00 AC
CN REDUCTION: 73
SOIL TYPE: B
TIME OF CONCENTRATION: 0.12 HR

PROPOSED SITE OUTFALL-#1 RUNOFF (TR-20)

Q_1 = 3.42 CFS
Q_{10} = 13.60 CFS

PROPOSED SITE OUTFALL-#2
(TR-55 HYDROLOGIC DATA)

DRAINAGE AREA: 2.15 AC
CN REDUCTION: 68
SOIL TYPE: B
TIME OF CONCENTRATION: 0.10 HR

PROPOSED SITE OUTFALL-#2 RUNOFF (TR-20)

Q_1 = 1.25 CFS
Q_{10} = 6.36 CFS

PROPOSED SITE OUTFALL-#3
(TR-55 HYDROLOGIC DATA)

DRAINAGE AREA: 2.25 AC
CN REDUCTION: 72
SOIL TYPE: B
TIME OF CONCENTRATION: 0.10 HR

PROPOSED SITE OUTFALL-#3 RUNOFF (TR-20)

Q_1 = 1.86 CFS
Q_{10} = 7.61 CFS

SOILS LEGEND		
SYMBOL	NAME/DESCRIPTION	SOIL TYPE
BaA	BAILE SILT LOAM, 0-3% SLOPES	C
Co	CODORUS & HATBORO SILT LOAM, 0-3% SLOPES	B
GgB	GLENELG LOAM, 3-8% SLOPES	B
GhB	GLENELG-URBAN LAND COMPLEX, 0-8% SLOPES	B
GmB	GLENVILLE SILT LOAM, 3-8% SLOPES	C
GmC	GLENVILLE SILT LOAM, 8-15% SLOPES	B
GuB	GLENVILLE-URBAN LAND-UDORTHENTS COMPLEX, 0-8% SLOPES	C
MaB	MANOR LOAM, 3-8% SLOPES	B
MaC	MANOR LOAM, 8-15% SLOPES	B
MaD	MANOR LOAM, 15-25% SLOPES	B
MkF	MANOR-BRINKLOW COMPLEX, 25-65% SLOPES, VERY ROCKY	B

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	DATE 11/30/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 11/16/12
CHIEF, DIVISION & LAND DEVELOPMENT	DATE 11/19/12

PROPOSED SITE OUTFALLS-# 1, 2, & 3

SCALE: 1" = 60'

SITE OUTFALL - #1, 2, & 3 SUMMARIES

SITE OUTFALL #1

THE EXISTING CONDITION AT SITE OUTFALL #1 HAS A DRAINAGE AREA OF 2.16 AC. WITH A PEAK DISCHARGE OF 5.32 CFS (10YR). THE PROPOSED DEVELOPMENT RESULTS IN A DRAINAGE AREA OF 4.00 AC. AND A PEAK PEAK DISCHARGE OF 13.60 CFS (10YR). THE APPLICATION OF VARIOUS MICRO-SCALE PRACTICES WILL DISCHARGE INTO A CLOSED STORM DRAIN SYSTEM AND OUTFALL INTO AN EXISTING OPEN CHANNEL ALONG THE NORTH SIDE OF GRACE DRIVE. THE EXISTING CHANNEL FOLLOWS ALONG GRACE DRIVE UNTIL DISCHARGING INTO THE MIDDLE PATUXENT RIVER. SITE OUTFALL #1 IS CURRENTLY STABLE WITH NO SIGN OF EROSION AND IS ALREADY LINED WITH RIP-RAP. THE CHANNEL SIZE AND EXISTING RIP-RAP WILL MAINTAIN THE STABILITY OF THE CHANNEL WITH THE INCREASED FLOWS ASSOCIATED WITH THE PROPOSED DEVELOPMENT.

SITE OUTFALL #2

THE EXISTING CONDITION AT SITE OUTFALL #2 HAS A DRAINAGE AREA OF 2.67 AC. WITH A PEAK DISCHARGE OF 10.85 CFS (10YR). THE PROPOSED DEVELOPMENT RESULTS IN A DRAINAGE AREA OF 2.15 AC. AND A PEAK DISCHARGE OF 6.36 CFS (10YR). THE APPLICATION OF VARIOUS MICRO-SCALE PRACTICES WILL DISCHARGE INTO A CLOSED STORM DRAIN SYSTEM AND OUTFALL INTO A PROPOSED PLUNGE POOL TO REDUCE VELOCITY BEFORE JOINING AN EXISTING OPEN CHANNEL BEYOND THE PROPERTY LINE. THIS EXISTING CHANNEL CONTINUES APPROXIMATELY 1,000 FT BEYOND THE LIMIT OF DISTURBANCE BEFORE JOINING THE MIDDLE PATUXENT RIVER. SITE OUTFALL #2 IS IN STABLE CONDITION WITH NO SIGN OF EROSION, AND THE DECREASED PEAK FLOWS UNDER THE PROPOSED CONDITION WILL MAINTAIN THE STABILITY OF THE OUTFALL.

SITE OUTFALL #3

THE EXISTING CONDITION AT SITE OUTFALL #3 HAS A DRAINAGE AREA OF 3.57 AC. WITH A PEAK DISCHARGE OF 8.76 CFS (10YR). THE PROPOSED DEVELOPMENT RESULTS IN A DRAINAGE AREA OF 2.25 AC. AND A PEAK DISCHARGE OF 7.61 CFS (10YR). THE APPLICATION OF VARIOUS MICRO-SCALE PRACTICES WILL DISCHARGE INTO CLOSED STORM DRAIN SYSTEM AND OUTFALL JUST UPSTREAM OF EXISTING CULVERT (SHA#292-510-770). THE CULVERT DISCHARGES INTO AN OPEN CHANNEL ALONG WESTBOUND MD RTE 32. SITE OUTFALL #3 IS CURRENTLY IN STABLE CONDITION WITH NO SIGN OF EROSION, AND THE DECREASED PEAK FLOWS UNDER THE PROPOSED CONDITION WILL MAINTAIN THE STABILITY OF THE OUTFALL.

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND — THOMAS G. NEUBERGER — 29203 — PROFESSIONAL ENGINEER — 10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

PROPOSED SITE OUTFALLS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	1" = 60'
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	33 OF 46

SHEET: SDP-33

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\DES\SDP\PLOT\Plan Sets\12039-SDP-33-PR-SITE OUTFALL.dwg, 10/17/2012 10:04:12 AM, RHall
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PARCEL A
L. 273 F. 186
PLAT NO. 21235
54.802 AC.
ZONING: PEC
USE: OFFICE CAMPUS
TAX ACCOUNT #05-351251

EX. BUILDING #25

EX. OFFICE BUILDING
BLDG. #1/1A

PR. 3-STORY OFFICE BLDG.
BLDG #100
67,471 S.F.
FFE: 416.50
BSMT: 404.25
MECH. RM: 402.50

GRACE DRIVE

MD RT. 32 - WB

STATE OF MARYLAND
STATE HIGHWAY ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
L. 3347 F. 408
(SHA PLATS 52408, 53059, 53313)

ZONING: R-ED
ZONING: PEC

MW6
402.81

ST-5 ST-6 ST-7 ST-8 ST-9 ST-10 ST-11 ST-13

SWM#1 (A-2) POROUS PAVEMENT
SWM#2 (M-6) MICRO-BIO.
SWM#3 (M-3) BIO-SWALE
SWM#4A (A-2) POROUS PVMT
SWM#4B (A-2) POROUS PVMT
SWM#5 (A-2) POROUS PVMT
SWM#6 (A-2) POROUS PAVEMENT
SWM#7 (A-2) POROUS PAVEMENT
SWM#8 (A-2) POROUS PAVEMENT
SWM#9 (A-2) POROUS PAVEMENT
SWM#10 (A-2) POROUS PAVEMENT
SWM#11 (A-2) POROUS PAVEMENT
SWM#12 (M-6) MICRO-BIO.
SWM#13 (M-6) MICRO-BIO.
SWM#14 (M-6) MICRO-BIO.
SWM#15 (A-2) POROUS PAVEMENT
SWM#16 (M-6) MICRO-BIO.
SWM#17 (M-6) MICRO-BIO.
SWM#18 (M-6) MICRO-BIO.
SWM#19 (M-1) RAINWATER HARVESTING (SEE DETAIL SHEETS 30-31)
SWM#20 (A-2) POROUS PAVEMENT
SWM#21 (A-2) POROUS PAVEMENT
SWM#23 (A-2) POROUS PVMT

Drainage Areas			
Label	DA	A_I	%I
A	11,960 sf	4,380 sf	37%
B	17,955 sf	9,056 sf	50%
C	26,227 sf	11,053 sf	42%
D1	9,050 sf	4,932 sf	54%
D2	9,050 sf	4,932 sf	54%
E	3,263 sf	372 sf	11%
F	9,550 sf	6,030 sf	63%
G	2,982 sf	681 sf	23%
H	4,789 sf	368 sf	8%
I	2,438 sf	265 sf	11%
J	5,385 sf	978 sf	18%
K	37,766 sf	870 sf	2%
L	18,443 sf	10,626 sf	58%
M	18,915 sf	13,671 sf	72%
N	19,925 sf	14,178 sf	71%
O	4,966 sf	2,838 sf	57%
P	19,441 sf	14,827 sf	76%
Q	18,943 sf	14,827 sf	78%
R	19,520 sf	8,767 sf	45%
S	26,000 sf	26,000 sf	100%
T	5,848 sf	524 sf	9%
U	8,658 sf	4,925 sf	57%
V	3,793 sf	2,606 sf	69%
W	3,793 sf	2,606 sf	69%
Total	365,974 sf	160,062 sf	43.7%

Environmental Site Design Practices								
Label	Type	A_F	ESD_V (Req.)	ReV (Req.)	ReV (Prov.)	75%ESDv (Req.)	ESDv (Prov.)	P_E (Prov.)
SWM#1	M-6: Micro-Bioretention	372 sf	681 cf	98 cf	99 cf	511 cf	511 cf	1.35"
SWM#2	M-6: Micro-Bioretention	924 sf	1,357 cf	196 cf	511 cf	1,018 cf	1,156 cf	1.53"
SWM#3	M-3: Bio-Swale	1,527 sf	1,689 cf	244 cf	305 cf	1,267 cf	1,264 cf	1.35"
SWM#4A	A-2: Porous-Pavement	2,789 sf	591 cf	85 cf	282 cf	443 cf	828 cf	2.50"
SWM#4B	A-2: Porous-Pavement	2,728 sf	734 cf	108 cf	276 cf	550 cf	810 cf	2.50"
SWM#5	A-2: Porous-Pavement	2,421 sf	886 cf	128 cf	245 cf	664 cf	786 cf	2.50"
SWM#6	A-2: Porous-Pavement	2,421 sf	886 cf	128 cf	245 cf	664 cf	719 cf	2.50"
SWM#7	A-2: Porous-Pavement	891 sf	88 cf	13 cf	45 cf	66 cf	220 cf	2.50"
SWM#8	A-2: Porous-Pavement	3,186 sf	682 cf	99 cf	161 cf	512 cf	785 cf	2.50"
SWM#9	A-2: Porous-Pavement	2,117 sf	59 cf	08 cf	107 cf	44 cf	522 cf	2.50"
SWM#10	A-2: Porous-Pavement	2,261 sf	163 cf	24 cf	228 cf	122 cf	672 cf	2.50"
SWM#11	A-2: Porous-Pavement	15,610 sf	401 cf	58 cf	531 cf	301 cf	1,577 cf	2.50"
SWM#12	M-6: Micro-Bioretention	1,855 sf	1,573 cf	227 cf	371 cf	1,180 cf	1,445 cf	1.65"
SWM#13	M-6: Micro-Bioretention	1,877 sf	1,987 cf	287 cf	375 cf	1,491 cf	1,626 cf	1.47"
SWM#14	M-6: Micro-Bioretention	1,552 sf	2,063 cf	298 cf	310 cf	1,548 cf	1,661 cf	1.45"
SWM#15	A-2: Porous-Pavement	1,804 sf	420 cf	61 cf	182 cf	315 cf	536 cf	2.50"
SWM#16	M-6: Micro-Bioretention	1,036 sf	1,953 cf	282 cf	311 cf	1,465 cf	1,585 cf	1.46"
SWM#17	M-6: Micro-Bioretention	1,331 sf	2,144 cf	310 cf	00 cf	1,608 cf	1,662 cf	1.40"
SWM#18	M-6: Micro-Bioretention	1,191 sf	1,330 cf	192 cf	238 cf	997 cf	1,067 cf	1.44"
SWM#19	M-1: Rainwater-Harvesting	3,120 sf	3,705 cf	00 cf	00 cf	2,779 cf	4,021 cf	1.95"
SWM#20	A-2: Porous-Pavement	1,198 sf	129 cf	19 cf	25 cf	97 cf	235 cf	2.50"
SWM#21	A-2: Porous-Pavement	3,267 sf	730 cf	105 cf	00 cf	547 cf	575 cf	2.50"
SWM#22	A-2: Porous-Pavement	1,505 sf	82 cf	09 cf	76 cf	46 cf	371 cf	2.50"
SWM#23	A-2: Porous-Pavement	2,332 sf	380 cf	55 cf	118 cf	285 cf	575 cf	2.50"
Total	Total ESD Provisions	59,335 sf	24,355 cf	3,518 cf	5,041 cf	18,519 cf	25,207 cf	1.86"
	ESD Requirements	43,917 sf						1.80"

LEGEND

- EX. 10' CONTOUR
- EX. 2' CONTOUR
- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. EASEMENT
- EX. ZONING LINE
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. OVERHEAD LINE
- EX. WATER LINE
- EX. SEWER LINE
- EX. STREAM
- EX. STREAM BUFFER
- EX. RIP-RAP CHANNEL
- EX. TREE LINE
- EX. GUARD RAIL
- EX. ELECTRIC CONDUIT
- EX. LIGHT POLES
- EX. GAS LINE
- EX. STORM DRAIN
- EX. CONDUIT
- EX. FIBER OPTIC
- EX. TV LINE
- EX. ELECTRIC MANHOLE
- EX. TELEPHONE MANHOLE
- EX. UNKNOWN UTILITY
- PR. 2' CONTOUR
- PR. 10' CONTOUR
- PR. 1' CONTOUR
- PR. BUILDING FOOTPRINT
- PR. BUILDING OVERHANG
- PR. EDGE OF CONCRETE
- PR. CURB
- PR. SIDEWALK
- PR. RETAINING WALL
- PR. TREELINE
- PR. HEDGEROW
- PR. STORM DRAIN
- PR. MICRO BIORETENTION FACILITY
- PR. BIO-SWALE FACILITY
- PR. POROUS PAVEMENT
- PR. ESD DRAINAGE AREA DIVIDE
- PR. ESD DRAINAGE AREA NUMBER

SHEET: SDP-34

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 12/20/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

ESD DRAINAGE AREA MAP
SCALE: 1"=40'

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

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GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

ESD DRAINAGE AREA MAP

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

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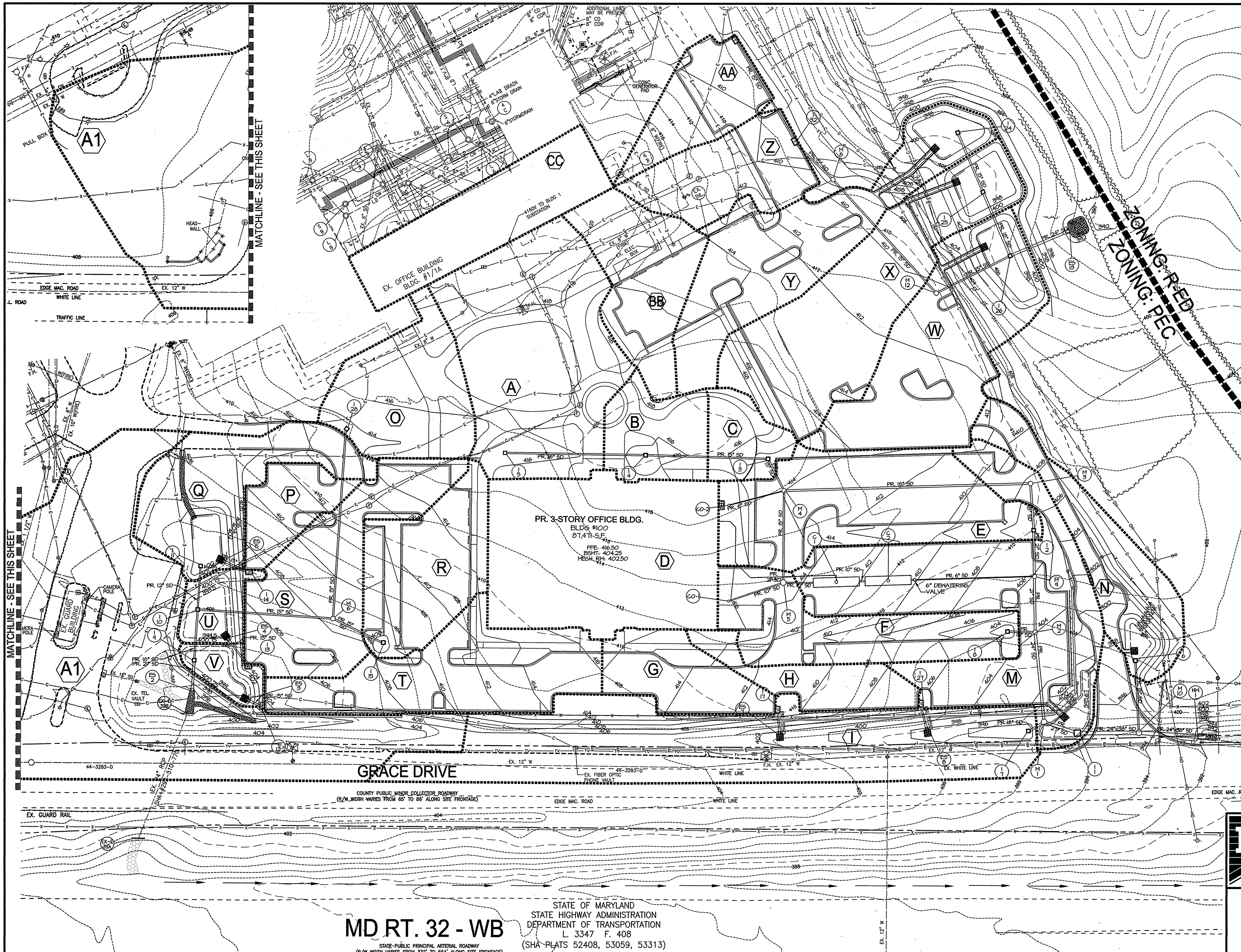
		SHEET:	34 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-34-ESD DA MAP.dwg, 10/17/2012 10:04:43 AM, Rholl,
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



STORM DRAIN DRAINAGE AREA MAP

SCALE: 1"=40'

LOCATION From	LOCATION To	AREA Number	ACRES Sub.	ACRES Total	COEFF. "C"	CA	CA	ΣCA	TIME CONC.-MIN. Inlet	Drain	Total	INTEN. "I"	INTEN. "I"	Q=CIA C.F.S.	PIPE n = .013 Size	S.* (%)	Vel.	Lgth.	Tc Min.	REMARKS
Grace Tech Park, Parcel A																				
@	I-5	A	0.62	—	0.72	0.446	0.513	—	5.00	—	5.00	8.50	9.76	4.36	—	—	—	—	—	20-YR SUMP
I-5	I-4	A	—	0.62	—	—		0.513	5.00	—	5.00	8.50		4.36	15	0.45	3.55	122	0.57	
@	I-4	B	0.16	—	0.72	0.115	0.132	—	5.00	—	5.00	8.50	9.76	1.12	—	—	—	—	—	20-YR SUMP
I-4	I-3	A-B	—	0.78	—	—		0.645	5.00	0.57	5.57	8.50		5.48	15	0.72	4.47	106	0.40	
@	I-3	C	0.11	—	0.72	0.079	0.091	—	5.00	—	5.00	8.50	9.76	0.77	—	—	—	—	—	20-YR SUMP
I-3	M-4	A-C	—	0.89	—	—		0.736	5.57	0.40	5.97	8.00		5.89	15	0.83	4.80	31	0.11	
@	CO-1	D	0.60	—	0.72	0.432	0.496	—	5.00	—	5.00	8.50	9.76	4.22	—	—	—	—	—	20-YR SUMP
CO-1	M-5	D	—	0.60	—	—		0.496	5.00	—	5.00	8.50		4.22	10	3.70	7.73	48	0.10	
M-5	M-4	D	—	0.60	—	—		0.496	5.00	0.10	5.10	8.50		4.22	15	0.43	3.44	87	0.42	
M-4	M-3	A-D	—	1.49	—	—		1.232	5.97	0.11	6.08	8.00		9.85	18	0.88	5.58	214	0.64	
M-3	I-2	A-D	—	1.49	—	—		1.232	6.08	0.64	6.72	8.00		9.85	18	0.88	5.58	38	0.11	
@	I-2	E	0.50	—	0.72	0.360	0.413	—	5.00	—	5.00	8.50	9.76	3.51	—	—	—	—	—	20-YR SUMP
I-2	M-9	A-E	—	1.99	—	—		1.645	6.72	0.11	6.83	8.00		13.16	21	0.69	5.47	43	0.13	
M-9	M-2	A-E	—	1.99	—	—		1.645	6.83	0.13	6.96	8.00		13.16	21	0.69	5.47	49	0.15	
@	I-8	F	0.48	—	0.72	0.346	0.397	—	5.00	—	5.00	8.50	9.76	3.37	—	—	—	—	—	20-YR SUMP
I-8	M-2	F	—	0.48	—	—		0.397	5.00	—	5.00	8.50		3.37	15	0.27	2.75	19	0.12	
M-2	M-1	A-F	—	2.47	—	—		2.042	6.96	0.15	7.11	7.60		15.52	24	0.47	4.94	89	0.30	
@	I-17	G	0.17	—	0.72	0.122	0.141	—	5.00	—	5.00	8.50	9.76	1.19	—	—	—	—	—	20-YR SUMP
I-17	ES-7	G	—	0.17	—	—		0.141	5.00	—	5.00	8.50		1.19	15	0.03	0.97	17	0.29	
@	I-27	H	0.18	—	0.72	0.130	0.149	—	5.00	—	5.00	8.50	9.76	1.26	—	—	—	—	—	20-YR SUMP
I-27	ES-8	H	—	0.18	—	—		0.149	5.00	0.00	5.00	8.50		1.26	15	0.04	1.03	19	0.31	
@	I-7	I	0.80	—	0.72	0.576	0.661	—	5.00	—	5.00	8.50	9.76	5.62	—	—	—	—	—	20-YR SUMP
I-7	M-1	G-I	—	1.15	—	—		0.951	5.00	—	5.00	8.50		8.08	18	0.59	4.57	7	0.03	
M-1	I-1	A-I	—	3.62	—	—		2.993	7.11	0.30	7.41	7.60		22.74	27	0.54	5.72	35	0.10	
@	I-19	L	0.23	—	0.72	0.166	0.190	—	5.00	—	5.00	8.50	9.76	1.62	—	—	—	—	—	20-YR SUMP
I-19	ES-9	L	—	0.23	—	—		0.190	5.00	—	5.00	8.50		1.62	15	0.06	1.32	8	0.10	
@	I-1	M	0.22	—	0.72	0.158	0.182	—	5.00	—	5.00	8.50	9.76	1.55	—	—	—	—	—	20-YR SUMP
I-1	M-10	A-M	—	4.07	—	—		3.365	7.41	0.10	7.51	7.60		25.57	30	0.39	5.21	53	0.17	Elliptical 30" equivalent
@	I-6	N	0.27	—	0.72	0.194	0.223	—	5.00	—	5.00	8.50	9.76	1.90	—	—	—	—	—	20-YR SUMP
I-6	M-10	N	—	0.27	—	—		0.223	5.00	—	5.00	8.50		1.90	15	0.09	1.55	63	0.68	
M-10	HW-1	A-N	—	4.34	—	—		3.588	7.51	0.17	7.68	7.60		27.27	30	0.44	5.56	48	0.14	Elliptical 30" equivalent
END OF STORM DRAIN SYSTEM TO SITE OUTFALL #1																				
@	I-34	AA	0.18	—	0.72	0.130	0.149	—	5.00	—	5.00	8.50	9.76	1.26	—	—	—	—	—	20-YR SUMP
I-34	I-32	AA	—	0.18	—	—		0.149	5.00	—	5.00	8.50		1.26	15	0.04	1.03	102	1.65	
@	I-32	Z	0.21	—	0.72	0.151	0.174	—	5.00	—	5.00	8.50	9.76	1.48	—	—	—	—	—	20-YR SUMP
I-32	M-8	Z-AA	—	0.39	—	—		0.322	5.00	1.65	6.65	8.00		2.58	15	0.16	2.10	47	0.37	
@	EX. 6-B	CC	0.31	—	0.72	0.223	0.256	—	5.00	—	5.00	8.50	9.76	2.18	—	—	—	—	—	20-YR SUMP
EX. 6-B	EX. INL.	CC	—	0.31	—	—		0.256	5.00	—	5.00	8.50		2.18	14	0.16	2.04	102	0.83	
@	EX. INL.	BB	0.27	—	0.72	0.194	0.223	—	5.00	—	5.00	8.50	9.76	1.90	—	—	—	—	—	20-YR SUMP
EX. INL.	M-8	BB-CC	—	0.58	—	—		0.480	5.00	0.83	5.83	8.50		4.08	10	3.46	7.47	120	0.27	
M-8	M-12	Z-CC	—	0.97	—	—		0.802	6.65	0.37	7.02	7.60		6.09	15	0.89	4.97	134	0.45	
M-12	I-26	Z-CC	—	0.97	—	—		0.802	7.02	0.45	7.47	7.60		6.09	15	0.89	4.97	72	0.24	
@	I-24	Y	0.47	—	0.72	0.338	0.389	—	5.00	—	5.00	8.50	9.76	3.30	—	—	—	—	—	20-YR SUMP
I-24	I-25	Y	—	0.47	—	—		0.389	5.00	0.00	5.00	8.50		3.30	15	0.26	2.69	56	0.35	
@	I-25	X	0.54	—	0.72	0.389	0.446	—	5.00	—	5.00	8.50	9.76	3.79	—	—	—	—	—	20-YR SUMP
I-25	I-26	X-Y	—	1.01	—	—		0.835	5.00	0.35	5.35	8.50		7.10	18	0.46	4.02	60	0.25	
@	I-26	W	0.48	—	0.72	0.346	0.397	—	5.00	—	5.00	8.50	9.76	3.37	—	—	—	—	—	20-YR SUMP
I-26	ES-13	W-CC	—	2.46	—	—		2.034	7.47	0.24	7.71	7.60		15.46	24	0.47	4.92	50	0.17	
END OF STORM DRAIN SYSTEM TO SITE OUTFALL #2																				
@	I-28	O	0.29	—	0.72	0.209	0.240	—	5.00	—	5.00	8.50	9.76	2.04	—	—	—	—	—	20-YR SUMP
I-28	M-6	O	—	0.29	—	—		0.240	5.00	—	5.00	8.50		2.04	15	0.10	1.66	165	1.66	
@	I-15	R	0.30	—	0.72	0.216	0.248	—	5.00	—	5.00	8.50	9.76	2.11	—	—	—	—	—	20-YR SUMP
I-15	M-6	R	—	0.30	—	—		0.248	5.00	—	5.00	8.50		2.11	15	0.11	1.72	53	0.51	
M-6	I-10	O&R	—	0.59	—	—		0.488	5.00	1.66	6.66	8.00		3.90	15	0.36	3.18	118	0.62	
@	I-14	P	0.14	—	0.72	0.101	0.116	—	5.00	—	5.00	8.50	9.76	0.98	—	—	—	—	—	20-YR SUMP
I-14	ES-5	P	—	0.14	—	—		0.116	5.00	—	5.00	8.50		0.98	15	0.02	0.80	20	0.42	
@	I-11	Q	0.30	—	0.72	0.216	0.248	—	5.00	—	5.00	8.50	9.76	2.11	—	—	—	—	—	20-YR SUMP
I-11	I-10	P-Q	—	0.44	—	—		0.364	5.00	—	5.00	8.50		3.09	12	0.75	3.94	38	0.16	
@	I-13	S	0.37	—	0.72	0.266	0.306	—	5.00	—	5.00	8.50	9.76	2.60	—	—	—	—	—	20-YR SUMP
I-13	ES-4	S	—	0.37	—	—		0.306	5.00	—	5.00	8.50		2.60	15	0.16	2.12	19	0.15	
@	I-10	U	0.08	—	0.72	0.058	0.066	—	5.00	—	5.00	8.50	9.76	0.56	—	—	—	—	—	20-YR SUMP
I-10	I-9	O-S&U	—	1.48	—	—		1.224	6.66	0.62	7.27	7.60		9.30	18	0.78	5.26	44	0.14	
@	I-12	T	0.38	—	0.72	0.274	0.314	—	5.00	—	5.00	8.50	9.76	2.67	—	—	—	—	—	20-YR SUMP
I-12	ES-3	T	—	0.38	—	—		0.314	5.00	—	5.00	8.50		2.67	15	0.17	2.18	8	0.06	
@	I-9	V	0.06	—	0.72	0.043	0.050	—	5.00	—	5.00	8.50	9.76	0.42	—	—	—	—	—	20-YR SUMP
I-9	ES-2	O-V	—	1.92	—	—		1.587	7.27	0.14	7.41	7.60		12.06	21	0.58	5.02	26	0.09	
@	EX-E39B	A1	1.81	—	0.48	0.864	0.992	—	5.00	—	5.00	8.50	9.76	8.43	—	—	—	—	—	20-YR SUMP
EX-E39B	EX-E39A	O-V & A1	—	3.73	—	—		2.579	7.41	0.09	7.50	7.60		19.60	24	0.75	6.24	117	0.31	
END OF STORM DRAIN SYSTEM TO SITE OUTFALL #3																				

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
CHIEF, DIVISION & LAND DEVELOPMENT	11/19/12 DATE

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-35

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND · THOMAS C. NEUGEBAUER · 29203 · PROFESSIONAL ENGINEER · 10-17-12

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

STORM DRAIN DRAINAGE AREA MAP

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	1" = 40'
		DATE:	10/16/2012
		DRAWN BY:	MK
		DESIGN BY:	MK
		REVIEW BY:	TCN
		SHEET:	35 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-35-SD-DA MAP.dwg, 10/17/2012 10:05:24 AM, RHall,
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.

LEGEND

- EX. 10' CONTOUR
- EX. 2' CONTOUR
- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. EASEMENT
- EX. ZONING LINE
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. OVERHEAD LINE
- EX. WATER LINE
- EX. SEWER LINE
- EX. STREAM
- EX. STREAM BUFFER
- EX. RIP-RAP CHANNEL
- EX. TREE LINE
- EX. GUARD RAIL
- EX. ELECTRIC CONDUIT
- EX. LIGHT POLES
- EX. GAS LINE
- EX. STORM DRAIN
- EX. CONDUIT
- EX. FIBER OPTIC
- EX. TV LINE
- EX. ELECTRIC MANHOLE
- EX. TELEPHONE MANHOLE
- EX. UNKNOWN UTILITY

ST-13 — EX. SPECIMEN TREE & CRITICAL ROOT ZONE

EX. DECIDUOUS TREE

EX. EVERGREEN TREE

- PR. POROUS PAVEMENT
- PR. 2' CONTOUR
- PR. 10' CONTOUR
- PR. 1' CONTOUR
- PR. LIMIT OF DISTURBANCE
- PR. BUILDING FOOTPRINT
- PR. BUILDING OVERHANG
- PR. EDGE OF CONCRETE
- PR. CURB
- PR. SIDEWALK
- PR. RETAINING WALL
- PR. PAVEMENT MILL AND OVERLAY
- PR. TREELINE
- PR. HEDGEROW
- PR. ELECTRIC CONDUIT
- PR. TELEPHONE CONDUIT
- PR. FIBER OPTIC
- PR. GAS
- PR. SANITARY SEWER
- PR. STORM DRAIN
- PR. WATER LINE
- PR. STREET LIGHT

LANDSCAPE LEGEND

PARKING LOT INTERNAL PLANTINGS

- SHADE TREE

PERIMETER LANDSCAPE BUFFER PLANTINGS

- SHADE TREE
- MINOR DECIDUOUS TREE
- EVERGREEN TREE
- SHRUB

STORMWATER PLANTINGS

- SHADE TREE
- EVERGREEN TREE
- SHRUB
- IVE - PERENNIAL
- LCA - PERENNIAL
- GRASS SEED MIX
- RIVER ROCK CHANNEL

LANDSCAPING BY OTHERS

- SHADE TREE
- ORNAMENTAL TREE
- EVERGREEN TREE
- SHRUBS
- PERENNIALS/GROUND COVER

DEVELOPER'S / BUILDER'S CERTIFICATE

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE LANDSCAPE MANUAL I/WE FURTHER CERTIFY THAT UPON COMPLETION A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

NAME Nizam Usta / Grace DATE 10/16/2012

SIGNATURE

EX. OFFICE BUILDING BLDG. #1/1A

PR. 3-STORY OFFICE BLDG. BLDG #100 107,471 S.F. FFE: 416.50 BSMT: 404.25 MECH. RM: 402.50

PR. SCREEN WALL SEE ARCHITECTURE PLANS

PIPE BOLLARDS (TYP.) SEE DETAIL SHT. 24

PR. DUMPSTER

PR. SCREEN WALL

PR. CONC. GENERATOR PAD

PR. CURB CUT (TYP.)

PR. RETAINING WALL #1

PR. RETAINING WALL #2

PR. RETAINING WALL #3

PR. CONC. RIP-RAP

EX. GUARD BUILDING

EX. GUARD RAIL

EX. FENCE

EX. FIBER OPTIC

EX. 12" W

EX. REVERSIBLE EASEMENT FOR SUPPORTING SLOPES SHA P. NO. 23059

EX. STRUCTURE & USE SETBACK

30' STRUCTURE & USE SETBK.

10' PARKING & USE SETBACK

100.04' N 54°16'19" W

N 52°33'13" W 528.65'

N 54°42'04" W 257.09'

N 52°33'13" W 132.90'

N 54°54'50" E 1384.50'

E 1340550

N 564000

E 1340000

N 564000

ST-8, ST-10, ST-9, ST-6, ST-7, ST-11, ST-13, ST-13, ST-14, ST-15, ST-16

2 ARU
91 MPE
24 CAL
4 MVI

229 LF EX. HEDGEROW MIN. 30' WIDE

S 67°07'27" W 350.87'

SWM FACILITY#14 MICRO-BIO

133 LCA
18 IVE

1 PAC

5 MVI

1 ARU

SWM FACILITY#13 MICRO-BIO

1 ARU
44 IVE
195 LCA
28 IVE

2 PAC

2 ARU

SWM FACILITY#12 MICRO-BIO

176 LCA
77 IVE
2 MVI

1 PAC
2 PAC

1 PAC
7 PAC

6 PAC

34 MPE
7 AGR
1 PAC

20 INE

11 IVI
2 ARU
60 IVE

SWM FACILITY#2 MICRO-BIO

SWM FACILITY#3 BIO-SWALE

SWM FACILITY#1 MICRO-BIO

11 MPE
13 IVI

BUFFER P-7 - 798'

380 LF EX. HEDGEROW MIN. 30' WIDE

179 LF 8' HT. BERM

ZONING: RSC ZONING: PEC

1 PAC
2 ARU
23 CAL

1 PAC

11 IVI
57 IVE

4 PAC

SWM FACILITY#18 MICRO-BIO
246 LCA
11 IVI
20 CAL
3 ARU

SWM FACILITY#17 MICRO-BIO
349 LCA
240 LCA

SWM FACILITY#16 MICRO-BIO

60 IVE
15 CAL
6 IVI
68 IVE

1 PAC
63 AGR

1 PAC
1 PAC

1 PAC
4 CCA
20 VDE

86 AGR 1 PAC

7 TCO
4 INE

9 TCO

SEED MIX

GRACE DRIVE

BUFFER P-1 - 90'

BUFFER P-2 - 250'

BUFFER P-3 - 90'

BUFFER P-4 - 342'

BUFFER P-5 42'

BUFFER P-6 306'

EDGE MAC. ROAD

WHITE LINE

MD RT. 32 - WB

STATE OF MARYLAND
STATE HIGHWAY ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
L. 3347 F. 408
(SHA PLATS 52408, 53059, 53313)

PLAN VIEW
SCALE: 1"=40'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/30/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
CHIEF, DIVISION & LAND DEVELOPMENT	11/19/12 DATE

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

STATE OF MARYLAND — COURTNEY M. MILLER — 9457 — LANDSCAPE ARCHITECT — 10.17.12

MD PROFESSIONAL CERTIFICATION:

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 3457, EXPIRATION DATE: 03/18/2014.

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
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(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

LANDSCAPE PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS

JOB NO.: 12039
SCALE: 1" = 40'
DATE: 10/16/2012
DRAWN BY: CMG
DESIGN BY: CMG
REVIEW BY: CMG
SHEET: 36 OF 46

SHEET: SDP-36

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-36-LP-PLAN.dwg, 10/16/2012 2:35:42 PM, Rhoh.
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.

LANDSCAPE NOTES

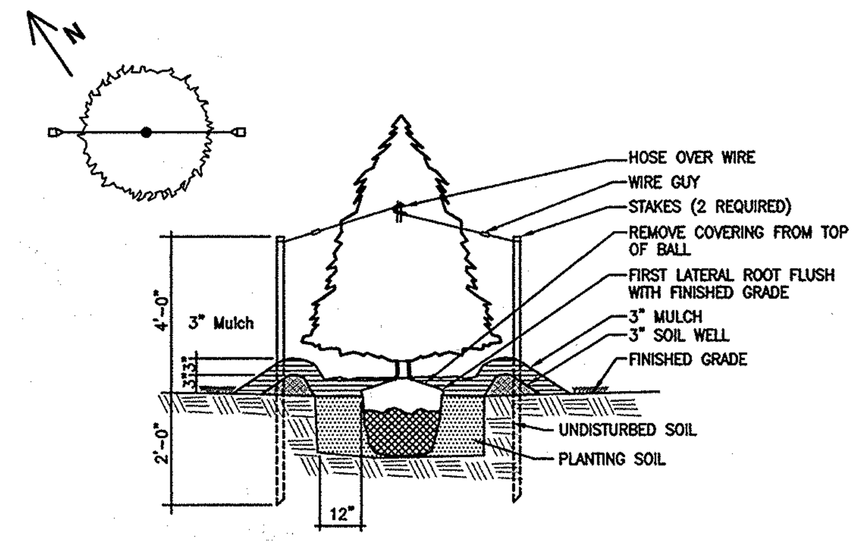
1. ALL PLANT MATERIAL SHALL BE NURSERY GROWN AND SHALL COMPLY WITH THE 'AMERICAN STANDARD FOR NURSERY STOCK' (ANSI Z60.1), LATEST EDITION, AND ALL ADENDDA PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
2. TREES AND SHRUBS SHALL BE TYPICAL OF THEIR SPECIES AND VARIETY, HAVE NORMAL GROWTH HABITS, WELL DEVELOPED, DENSELY FOLIATED BRANCHES, AND VIGOROUS, FIBROUS ROOT SYSTEMS.
3. TREES AND SHRUBS SHALL BE FRESHLY DUG AND NURSERY GROWN. THEY SHALL HAVE BEEN GROWN UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE IN THE LOCALITY OF THE PROJECT OR PROPERLY ACCLIMATED TO CONDITIONS OF THE LOCALITY OF THE PROJECT.
4. TREES AND SHRUBS SHALL BE FREE FROM DEFECTS AND INJURIES AND CERTIFIED BY APPROPRIATE FEDERAL AND STATE AUTHORITIES TO BE FREE OF DISEASES AND INSECT INFESTATIONS.
5. THE LANDSCAPE CONTRACTOR SHALL WARRANTY ALL PLANT MATERIAL FOR A PERIOD OF ONE (1) FULL YEAR AFTER THE DATE OF SUBSTANTIAL COMPLETION AGAINST DEFECTS, UNSATISFACTORY GROWTH, DISEASE OR DEATH. UNSATISFACTORY, UNHEALTHY, DYING OR DEAD PLANT MATERIAL (IN THE OPINION OF THE LANDSCAPE ARCHITECT) SHALL BE REPLACED WITH THE SAME SIZE AND SPECIES.
6. IT SHALL BE THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR TO ADEQUATELY AND PROPERLY MAINTAIN THE LANDSCAPED AREAS, WHICH SHALL INCLUDE WATERING, CLEANING OF WEEDS AND DEBRIS, PRUNING AND TRIMMING, REPLACEMENT OF DEAD OR DISEASED PLANTINGS, AND FERTILIZING TO MAINTAIN HEALTHY GROWTH FOR THE WARRANTY PERIOD.
7. THE LANDSCAPE CONTRACTOR SHALL STAKEOUT PLANT LOCATIONS IN THE FIELD. THE LANDSCAPE ARCHITECT OR HIS REPRESENTATIVE SHALL OBSERVE THESE LOCATIONS PRIOR TO COMMENCING PLANT PIT EXCAVATION. THE LANDSCAPE CONTRACTOR SHALL MAKE ANY ADJUSTMENTS AS REQUESTED BY THE LANDSCAPE ARCHITECT.
8. ALL PLANT SAUCERS AND PLANT BEDS SHALL BE MULCHED WITH DOUBLE SHREDDED HARDWOOD MULCH, A MINIMUM OF 3" IN DEPTH.
9. NO SUBSTITUTIONS OF PLANT MATERIAL SHALL BE PERMITTED WITHOUT WRITTEN AUTHORIZATION OF THE LANDSCAPE ARCHITECT OR HIS REPRESENTATIVE. THIS SHALL APPLY TO SUBSTITUTIONS OF SPECIES, LOCATION, SIZE, AND QUANTITY.
10. THE LANDSCAPE CONTRACTOR SHALL INSTALL SHREDDED HARDWOOD BARK MULCH TO A DEPTH OF 3" UNDER AND SURROUNDING ALL NEW LANDSCAPED MASS PLANTING AREAS TO PROVIDE A UNIFORM AND CONTINUOUS SURFACE AND APPEARANCE BETWEEN AND AROUND ALL PLANT MATERIAL, BUILDING LINES AND PAVED AREAS. IN GENERAL, THIS PERTAINS TO ALL PLANT MATERIAL THAT IS PLANTED CLOSER THAN SIX (6) FEET CENTER TO CENTER. IT IS THE INTENT OF THIS CONTRACT TO INSTALL LANDSCAPE MAT UNDER THE ENTIRE AREA OF SHREDDED BARK MULCH.
11. TREES SHALL BE LOCATED A MINIMUM OF 3' FROM SEWER/WATER CONNECTIONS. CONTRACTOR SHALL BE LIABLE FOR DAMAGE TO ANY AND ALL PUBLIC AND PRIVATE UTILITIES, WATER AND SEWER LINES.
12. ALL CONTAINER GROWN MATERIAL SHALL BE HEALTHY, VIGOROUS, WELL-ROOTED PLANTS AND ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD. THE PLANTS SHALL HAVE TOPS WHICH ARE GOOD QUALITY AND ARE IN A HEALTHY GROWING CONDITION.
13. CONTRACTOR SHALL SLIGHTLY ADJUST PLANT LOCATIONS IN THE FIELD AS NECESSARY TO BE CLEAR OF DRAINAGE SWALES AND UTILITIES. FINISHED PLANTING BEDS SHALL BE GRADED SO AS NOT TO IMPEDE DRAINAGE AWAY FROM BUILDINGS.
14. TREE STAKING AND GUYING SHALL BE DONE PER DETAILS. CONTRACTOR SHALL ENSURE THAT TREES REMAIN PLUMB AND UPRIGHT FOR THE DURATION OF THE GUARANTEE PERIOD.
15. ALL TREE PITS, SHRUB BEDS, AND PREPARED PLANTING BEDS ARE TO BE COMPLETELY EXCAVATED IN ACCORDANCE WITH THE PLANTING DETAILS.
16. CROWN OF ROOT BALL SHALL BE HIGHER (AFTER SETTING) THAN ADJACENT SOIL.
17. SHADE TREES: HEIGHT SHALL BE MEASURED FROM THE CROWN OF THE ROOT BALL TO THE TOP OF MATURE GROWTH. SPREAD SHALL BE MEASURED TO THE END OF BRANCHING EQUALLY AROUND THE CROWN FROM THE CENTER OF THE TRUNK. MEASUREMENTS ARE NOT TO INCLUDE ANY TERMINAL GROWTH. SINGLE TRUNK TREES SHALL BE FREE OF 'V' CROTCHES THAT COULD BE POINTS OF WEAK LIMB STRUCTURE OR DISEASE INFESTATION.
18. CONTRACTOR MUST CONTACT THE OWNER AT LEAST TEN WORKING DAYS IN ADVANCE TO SCHEDULE ACCEPTANCE INSPECTION(S). CONTRACTOR MUST REPLACE ALL DEAD OR UNACCEPTABLE PLANTS DURING THE FOLLOWING RECOMMENDED PLANTING SEASON.
19. TREES SHALL BE PLANTED DURING ACCEPTABLE PLANTING SEASONS: BETWEEN MARCH 15 AND MAY 15 AND BETWEEN AUGUST 15 AND NOVEMBER 15 OR AS APPROVED BY OWNERS REPRESENTATIVE.
20. ALL TREE STAKING AND GUYING SHALL BE REMOVED BY THE CONTRACTOR AFTER THE TREES ARE ESTABLISHED.
21. SEEDED AREAS THAT WASH OUT MUST BE FILLED AND GRADED AS NECESSARY AND THEN RESEEDED. SOME TYPE OF ANCHORING METHOD SHOULD THEN BE USED TO HOLD SEED AND MULCH IN PLACE; THIS IS ESPECIALLY IMPORTANT AROUND WATER COURSES, IN SWALES AND AREAS OF CONCENTRATED FLOWS, AND ON SLOPES.
22. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL
23. THE OWNER, TENANT AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING, INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIAL SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION AND WHEN NECESSARY, REPAIRED OR REPLACED.
24. AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPING MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES.
25. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $21,120.00 (49 SHADE TREES @ $300.00 EA., 13 ORNAMENTAL/EVERGREEN TREES @ $150.00 EA., AND 149 SHRUBS @ $30.00 EA.).

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/29/12

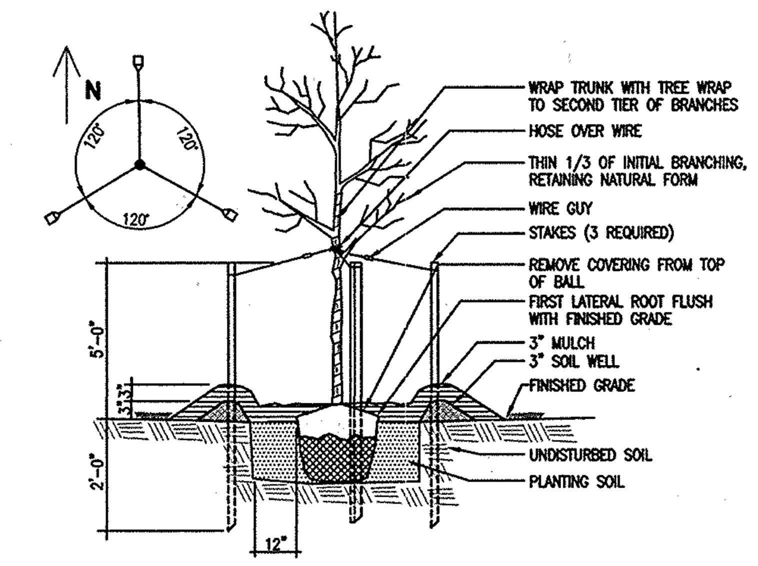
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12



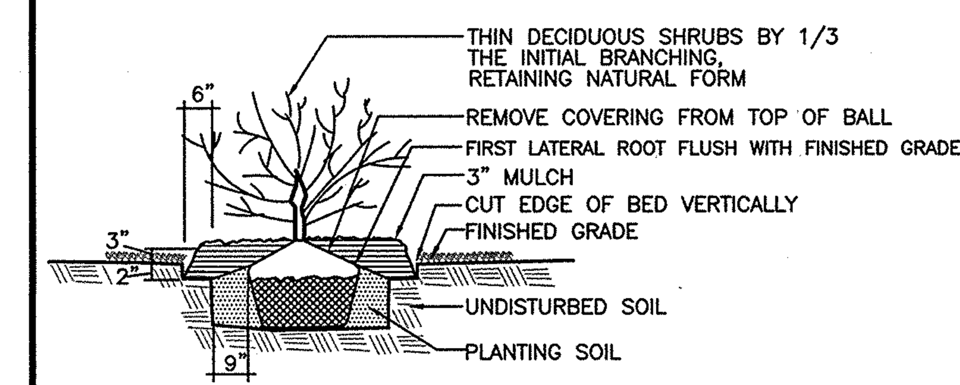
EVERGREEN TREE DETAIL

NOT TO SCALE



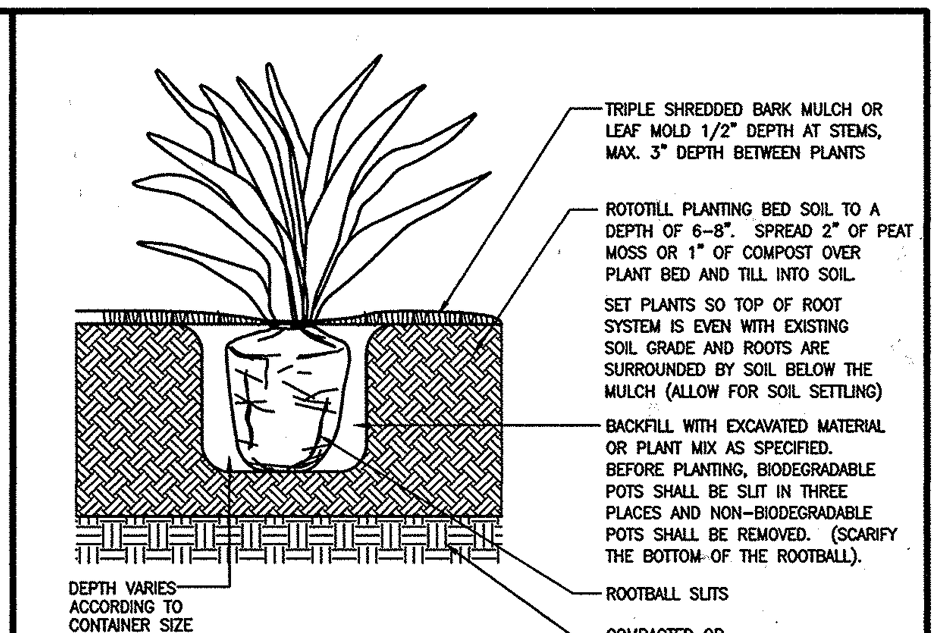
DECIDUOUS TREE DETAIL

NOT TO SCALE



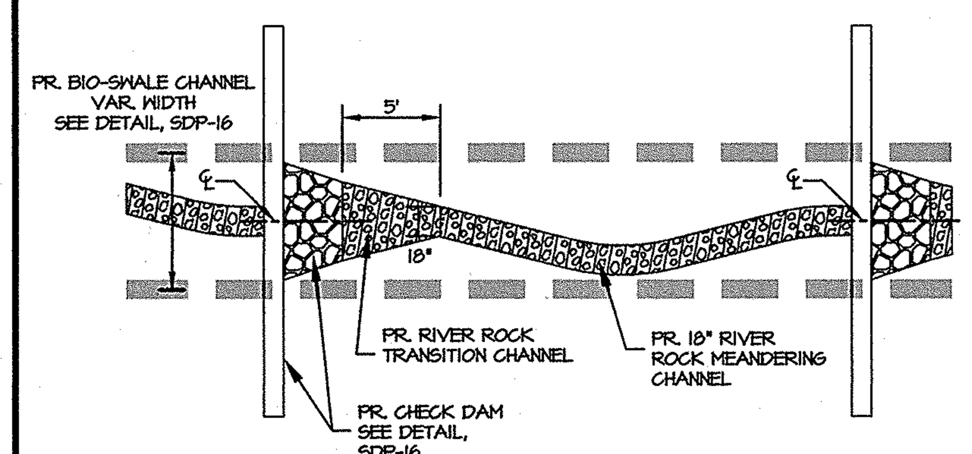
SHRUB DETAIL

NOT TO SCALE



PERENNIAL DETAIL

NOT TO SCALE



NOTES:
1. RIVER ROCK CHANNEL SHALL BE 3" DEEP.
2. STONE SHALL BE DELAWARE VALLEY RIVER ROCK, 1 1/2"-3" IN SIZE.
3. SEE LANDSCAPE PLAN, SDP-36, FOR CHANNEL LOCATIONS AND CONFIGURATIONS.

RIVER ROCK CHANNEL DETAIL

NOT TO SCALE

PARKING LOT INTERNAL LANDSCAPE REQUIREMENTS

NUMBER OF PARKING SPACES	408
NUMBER OF TREES REQUIRED	20
NUMBER OF TREES PROVIDED	
SHADE TREES	32
OTHER TREES (2:1 SUBSTITUTION)	0

PERIMETER LANDSCAPE BUFFER REQUIREMENTS

CATEGORY	P-1 ADJACENT TO ROADWAYS	P-2 PARKING ADJACENT TO ROADWAYS	P-3 ADJACENT TO ROADWAYS	P-4 PARKING ADJACENT TO ROADWAYS	P-5 ADJACENT TO ROADWAYS	P-6 ADJACENT TO ROADWAYS	P-7 ADJACENT TO PERIMETER PROPERTIES
LANDSCAPE TYPE - NON-RESIDENTIAL	B	E	B	E	B	B	C
LINEAR FEET OF ROADWAY FRONTAGE/ PERIMETER	90'	250'	90'	342'	42'	306'	798'
CREDIT FOR EXISTING VEGETATION	NO	NO	NO	NO	NO	NO	YES - 619 LF
CREDIT FOR WALL, FENCE OR BERM	NO	NO	NO	NO	NO	NO	YES - 179 LF
NUMBER OF PLANTS REQUIRED							
SHADE TREES	2 SHADE TREES	6 SHADE TREES	2 SHADE TREES	8 SHADE TREES	1 SHADE TREE	6 SHADE TREE	4 SHADE TREES*
EVERGREEN TREES	2 EVERGREENS	0 EVERGREENS	2 EVERGREENS	0 EVERGREENS	1 EVERGREEN	8 EVERGREENS	0 EVERGREENS**
SHRUBS	0 SHRUBS	63 SHRUBS	0 SHRUBS	86 SHRUBS	0 SHRUBS	0 SHRUBS	0 SHRUBS
NUMBER OF PLANTS PROVIDED							
SHADE TREES	1 SHADE TREE	***6 SHADE TREES		8 SHADE TREES	1 SHADE TREE	0 SHADE TREES	4 SHADE TREES
EVERGREEN TREES (2:1 SUBSTITUTION)	4 EVERGREENS	0 EVERGREEN		0 EVERGREEN	0 EVERGREENS	20 EVERGREENS	0 EVERGREENS
ORNAMENTAL TREES (2:1 SUBSTITUTION)			4 ORNAM. TREES				
SHRUBS (10:1 SUBSTITUTION)		63 SHRUBS	20 SHRUBS	86 SHRUBS	10 SHRUBS		
(DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)							

* 798 LF OF PERIMETER MINUS 619 LF OF EXISTING HEDGEROW (MIN. 30' WIDE) LEAVES 179 LF OF BUFFER TO BE SCREENED @ 1 SHADE TREE/40 LF (BERM CANNOT BE USED TO MEET SHADE TREE PLANTING REQUIREMENTS)
** 798 LF OF PERIMETER MINUS 619 LF OF EXISTING HEDGEROW (MIN. 30' WIDE) MINUS 179 LF OF MIN. 6' HT. BERM LEAVES 0 LF OF BUFFER TO BE SCREENED @ 1 EVERGREEN/20 LF
*** 1 SHADE TREE FROM BUFFER P-2 IS LOCATED IN BUFFER P-1

LANDSCAPE PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	SPACING
SHADE TREES - 61 TOTAL						
ARU	13	*Acer rubrum 'Red Sunset'*	Red Sunset' Red Maple	2 1/2" cal.	B&B	As Shown
PAC	32	*Platanus x acerifolia 'Bloodgood'*	Bloodgood' London Planetree	2 1/2" cal.	B&B	As Shown
TCO	16	*Tilia cordata 'Greenspire'*	Greenspire' Littleleaf Linden	2 1/2" cal.	B&B	As Shown
ORNAMENTAL TREES - 4 TOTAL						
CCA	4	*Cercis canadensis*	Eastern Redbud	8-10' ht.	B&B	As Shown
EVERGREEN TREES - 35 TOTAL						
INE	24	*Ilex 'Nellie R. Stevens'*	Nellie R. Stevens' Holly	6-8' ht.	B&B	As Shown
MVI	11	*Magnolia virginiana*	Sweetbay Magnolia	6-8' ht.	B&B	As Shown
SHRUBS - 446 TOTAL						
AGR	156	*Abelia x grandiflora*	Glossy Abelia	24"-30" ht.	cont.	As Shown
CAL	82	*Clethra alnifolia 'Hummingbird'*	Sweet pepperbush	24"-30" ht.	cont.	As Shown
IVI	52	*Itea virginica 'Henry's Garnet'*	Henry's Garnet Sweetspire	24"-30" ht.	cont.	As Shown
MPE	136	*Myrica pensylvanica*	Northern Bayberry	24"-30" ht.	cont.	As Shown
VDE	20	*Viburnum dentatum*	Arrowwood Viburnum	24"-30" ht.	cont.	As Shown
PERENNIALS - 1,751 TOTAL						
IVE	412	*Iris versicolor*	Blue Flag Iris	1 quart	cont.	24" O.C.
LCA	1339	*Lobelia cardinalis*	Cardinal Flower	1 quart	cont.	18" O.C.
GRASS						
	0.52 lb.	*Rain Garden Seed Mixture*		1,037 sf	seed	1 lb/2,000 sf

Rain Garden Seed Mixture (Ernst Conservation Seed Mix ERNMX-180 or approved equal)

24% River Oats, PA/VA Ecotype blend (Chasmanthium latifolium, PA/VA Ecotype blend)
20% Little Bluestem, 'Camper' (Schizachyrium scoparium, 'Camper')
15% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype)
5% Squarrose Sedge, VA Ecotype (Carex squarrosa, VA Ecotype)
5% Fox Sedge, PA Ecotype (Carex vulpinoidea, PA Ecotype)
4% Purple Coneflower (Echinacea purpurea)
3% Ohio Spiderwort, PA Ecotype (Tradescantia ohiensis, PA Ecotype)
3% Tall White Beardtongue, PA Ecotype (Penstemon digitalis, PA Ecotype)
3% Blackeyed Susan, Coastal Plain NC Ecotype (Rudbeckia hirta, Coastal Plain NC Ecotype)
3% Marsh (Dense) Blazing Star (Spiked Gayfeather), PA Ecotype (Liatris spicata, PA Ecotype)
2% Mistflower, VA Ecotype (Eupatorium coelestinum (Conoclinium c.), VA Ecotype)
2% Wild Senna, VA & WV Ecotype (Senna hebecarpa (Cassia h.), VA & WV Ecotype)
2% Zigzag Aster, PA Ecotype (Aster prenanthoides (Symphyotrichum p.), PA Ecotype)
2% Blue Vervain, PA Ecotype (Verbena hastata, PA Ecotype)
2% Golden Alexanders (Zizia aurea)
1% Blue 0 Indigo, Southern WV Ecotype (Baptisia australis, Southern WV Ecotype)
1% Swamp Milkweed, PA Ecotype (Asclepias incarnata, PA Ecotype)
1% Autumn Bentgrass, PA Ecotype (Agrostis perennans, PA Ecotype)
1% Early Goldenrod, PA Ecotype (Solidago juncea, PA Ecotype)
1% Wild Bergamot (Monarda fistulosa)

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-37

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND — COURTNEY M. GARBER — 3457 — LANDSCAPE ARCHITECT — 10.17.12

MD PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 3457, EXPIRATION DATE: 03/18/2014.

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

LANDSCAPE DETAILS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	N/A
		DATE:	10/16/2012
		DRAWN BY:	CMG
		DESIGN BY:	CMG
		REVIEW BY:	CMG
		SHEET:	37 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-37-LP-DETAILS.dwg, 10/17/2012 10:07:36 AM, RHall,
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.

GENERAL NOTES:

1. OWNER/APPLICANT: W.R. GRACE & CO.
   7500 GRACE DRIVE
   COLUMBIA, MARYLAND 21044
   ATTN: MR. NIZAM USTA
   PHONE: 617-277-2145

2. FSD PLAN PREPARED BY: GEO-TECHNOLOGY ASSOCIATES, INC. (GTA)
   14280 PARK CENTER DRIVE
   LAUREL, MARYLAND 20707
   ATTN: MR. FRANCESCO S. GENTILE, RLA
   PHONE: 410-792-9446

3. PROJECT TITLE/NAME: GRACE TECH PARK, PARCEL A, OFFICE BUILDING

4. SUBJECT PROPERTY: PROJECT AREA 1:
   P/O TAX MAP 35, PARCEL 145, PARCEL "A"

   PROJECT AREA 2:
   P/O TAX MAP 35, PARCEL 145, PARCEL "A"

5. SITE AREA: PROJECT AREA 1:
   12.6± ACRES

   PROJECT AREA 2:
   2.7± ACRES

6. ZONING: PROJECT AREA 1:
   PEC (PLANNED EMPLOYMENT CENTER DISTRICT)

   PROJECT AREA 2:
   PEC (PLANNED EMPLOYMENT CENTER DISTRICT)

7. USE: PROJECT AREA 1:
   EXISTING – OFFICE CAMPUS
   PROPOSED – OFFICE CAMPUS

   PROJECT AREA 2:
   EXISTING – VACANT
   PROPOSED – FOREST CONSERVATION

8. BOUNDARY INFORMATION SHOWN HEREON IS BASED ON A FIELD RUN BOUNDARY SURVEY PERFORMED BY MRA, IN NOVEMBER 2008. COORDINATES AND COURSES SHOWN HEREON ARE REFERRED TO THE MERIDIAN OF THE MARYLAND STATE PLANE COORDINATE SYSTEM (NAD 83/07) PROJECTED FROM THE FOLLOWING HOWARD COUNTY GEODETIC SURVEY CONTROL STATIONS: 35HA & 35HB. VERTICAL DATUM IS NAVD 88.

9. TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON FIELD SURVEYS PERFORMED BY MRA IN JULY 2008, DECEMBER 2008, MAY 2009 AND MARCH 2010. TOPOGRAPHIC INFORMATION HAS BEEN SUPPLEMENTED WITH HOWARD COUNTY GIS INFORMATION.

10. THE HORIZONTAL AND VERTICAL CONTROL SHOWN ON THESE PLANS REFERS TO THE MERIDIAN OF THE MARYLAND STATE PLANE COORDINATE SYSTEM (NAD 83/07 & NAVD 88) PROJECTED FROM THE FOLLOWING HOWARD COUNTY GEODETIC SURVEY CONTROL STATIONS: 35HA & 35HB.

11. SOILS SHOWN ON THIS PLAN ARE MAPPED AND LABELED IN ACCORDANCE WITH THE UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE'S WEB SOIL SURVEY. FOR PURPOSES OF ESTABLISHING TYPICAL FOREST COVER TYPES AND WOODLAND SUITABILITY INDEXES FOR FOREST AREAS REVIEWED, NEW SOIL TYPES WERE APPROXIMATELY CORRELATED WITH THE 1968 SOIL TYPES BY DIGITALLY OVERLAYING AND ALIGNING MAPS OF THE NEW AND OLD SOILS. BOTH THE NEW AND OLD SOIL TYPES ARE LISTED IN THE ACCOMPANYING FOREST STAND ANALYSIS TABLE.

12. BOTH PROJECT AREAS DRAIN TO THE PATUXENT RIVER AREA WATERSHED, BASIN NUMBER 02-13-11.

13. PER FEMA FLOODPLAIN MAP 240044 0033 B THERE IS NO FLOODPLAIN LOCATED WITHIN EITHER PROJECT AREA.

14. A WETLAND DELINEATION WAS PERFORMED BY GTA ON AUGUST 15, 2012. NO WETLANDS OR WATERS WERE IDENTIFIED WITHIN THE LIMITS OF THE PROJECT AREA #1. WETLANDS AND WATERS OF THE U.S. WERE DELINEATED WITHIN PROJECT AREA #2 AND ARE SHOWN ON SHEET 3. WETLAND FLAG LOCATIONS WERE LOCATED BY GTA USING A TRIMBLE PRO-XR, BACKPACK, GLOBAL POSITIONING SYSTEM (GPS) UNIT, ON AUGUST 15, 2012.

15. BOTH PROJECT AREAS ON THE SUBJECT PROPERTY DRAIN TO UNNAMED TRIBUTARIES OF THE MIDDLE PATUXENT RIVER. THE MIDDLE PATUXENT RIVER IS A TRIBUTARY OF THE LITTLE PATUXENT RIVER. THE CODE OF MARYLAND REGULATIONS STREAM USE CLASSIFICATION INDEX LISTS THE LITTLE PATUXENT RIVER AND ALL TRIBUTARIES ABOVE OLD FORGE BRIDGE, AS USE I-P (WATER CONTACT RECREATION, PROTECTION OF AQUATIC LIFE, AND PUBLIC WATER SUPPLY).

16. ACCORDING TO MR. LEOPOLDO MIRANDA, SUPERVISOR WITH THE UNITED STATES FISH AND WILDLIFE SERVICE, "EXCEPT FOR OCCASIONAL TRANSIENT INDIVIDUALS, NO FEDERALLY PROPOSED OR LISTED ENDANGERED OR THREATENED SPECIES ARE KNOW TO EXIST WITHIN THE PROJECT IMPACT AREA."

17. ACCORDING TO MS. LORI BYRNE, ENVIRONMENTAL REVIEW COORDINATOR, FOR THE MARYLAND DEPARTMENT OF NATURAL RESOURCE'S WILDLIFE AND HERITAGE SERVICE, "THE WILDLIFE AND HERITAGE SERVICE HAS DETERMINED THAT THERE ARE NO STATE OF FEDERAL RECORDS FOR RARE, THREATENED OR ENDANGERED SPECIES WITHIN THE BOUNDARIES OF THE PROJECT SITE AS DELINEATED." MS. BYRNE THEN STATES, "OUR ANALYSIS OF THE INFORMATION PROVIDED ALSO SUGGESTS THAT THE FORESTED ARE ON THE PROJECT SITE CONTAINS FOREST INTERIOR DWELLING BIRD HABITAT (FIDS)....THE CONSERVATION OF FIDS HABITAT IS STRONGLY ENCOURAGED."

18. ACCORDING TO MS. MARY A. COLLIGAN, ASSISTANT REGIONAL ADMINISTRATOR FOR PROTECTED RESOURCES, WITH THE NATIONAL MARINE FISHERIES SERVICE, "NO SPECIES LISTED UNDER THE JURISDICTION OF NOAA'S NATIONAL MARINE FISHERIES SERVICE ARE KNOWN TO OCCUR WITHIN THE VICINITY OF YOUR PROJECT."

19. ACCORDING TO MERLIN ON-LINE, MARYLAND'S ENVIRONMENTAL RESOURCE AND LAND INFORMATION NETWORK, THERE ARE NO HISTORIC OR CULTURAL RESOURCES IDENTIFIED BY THE NATIONAL REGISTER OF HISTORIC PLACES OR THE MARYLAND INVENTORY OF HISTORIC PROPERTIES. FURTHERMORE, THE WEBSITE SHOWS NO MARYLAND HISTORIC TRUST EASEMENTS ON THE SUBJECT PROPERTY.

20. NO ROCK OUTCROPPINGS WERE OBSERVED ON THE SUBJECT PROPERTY.

21. THE FOREST STAND DELINEATION FIELD WORK WAS PERFORMED BY GTA ON MAY 6, 2011 AND AUGUST 13, 2012.

22. THIRTY-EIGHT SPECIMEN TREES WERE IDENTIFIED WITHIN THE TWO PROJECT AREAS ON THE SUBJECT PROPERTY. SPECIMEN TREES IDENTIFIED WITHIN PROJECT AREA 1 WERE SURVEY LOCATED BY MRA IN JUNE AND JULY 2008 AND ARE NOT MARKED IN THE FIELD. SPECIMEN TREES IDENTIFIED WITHIN PROJECT AREA 2 WERE LOCATED USING A TRIMBLE PRO-XR, BACKPACK, GLOBAL POSITIONING SYSTEM (GPS) UNIT, AND MEASURED USING A DIAMETER TAPE ON AUGUST 15, 2012. THESE SPECIMEN TREES WERE MARKED IN THE FIELD BY BLUE FLAGGING TIED AROUND THEIR TRUNKS. ALL SPECIMEN TREES ARE SHOWN ON THIS PLAN AT THE SIZE OF THEIR CRITICAL ROOT ZONES. SEE SPECIMEN TREE LISTS ON SHEETS 2 AND 3 OF THIS PLAN.

23. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN WETLANDS, WETLAND BUFFERS, AND FOREST CONSERVATION EASEMENT AREAS, EXCEPT AS PERMITTED BY THE HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING, THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, AND THE U.S. ARMY CORPS OF ENGINEERS.

24. THE FOREST STAND DELINEATION PLAN IS ACCOMPANIED BY FOREST STAND ANALYSIS TABLES. THE TABLES AND THE PLAN TOGETHER COMPRISE THE COMPLETE FOREST STAND DELINEATION.

25. THIS FOREST STAND DELINEATION PLAN WAS PREPARED ON A BASE PLAN PROVIDED BY MRA.

26. GTA'S CONCLUSIONS REGARDING THIS SITE ARE PRELIMINARY AND HAVE BEEN BASED ON OBSERVATIONS OF EXISTING CONDITIONS, PROFESSIONAL EXPERIENCE, AND GENERALLY ACCEPTED PROFESSIONAL ENVIRONMENTAL PRACTICE UNDER SIMILAR CIRCUMSTANCES. SEASONAL VEGETATION CYCLES AND FLUCTUATIONS IN PRECIPITATION OR WEATHER CONDITIONS CAN RESULT IN DIFFERENCES IN THE PERCEPTION OF HYDROLOGIC CONDITIONS AND THE PRESENCE OF PREDOMINANTLY HYDROPHYTIC VEGETATION, WHICH CAN ALTER GTA'S EVALUATION OF WETLANDS/WATERWAYS. FOR THESE REASONS, A DETAILED WETLAND DELINEATION SHOULD BE PERFORMED PRIOR TO FINAL DESIGN.

27. IT IS IMPORTANT TO NOTE THE UNITED STATES ARMY CORPS OF ENGINEERS (CORPS) IS THE FEDERAL AGENCY THAT DETERMINES THE OFFICIAL JURISDICTIONAL STATUS OF WETLANDS/WATERWAYS. FURTHERMORE, THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CAN REGULATE WETLANDS/WATERWAYS CONSIDERED NON-JURISDICTIONAL BY THE CORPS. THE CORPS AND MDE SHOULD BE CONTACTED TO DETERMINE IF EITHER AGENCY WILL TAKE JURISDICTION OVER ANY AREAS OF THE PROPERTY.

28. THIS PLAN WAS PREPARED BY GTA FOR THE SOLE AND EXCLUSIVE USE OF MORRIS & RITCHIE ASSOCIATES, INC. ANY REPRODUCTION OF THIS PLAN BY ANY OTHER PERSON WITHOUT THE EXPRESSED WRITTEN PERMISSION OF GTA AND MORRIS & RITCHIE ASSOCIATES, INC. IS UNAUTHORIZED, AND SUCH USE IS AT THE SOLE RISK OF THE USER.

29. WITHIN PROJECT AREA #2 THERE IS AN EXISTING STREAM AND A 100' STREAM BUFFER.

30. WITHIN AND ADJACENT TO PROJECT AREA #2 THERE IS AN EXISTING WETLAND AND A 25' WETLAND BUFFER.

31. WITHIN PROJECT AREA #2 THERE ARE STEEP SLOPES (25% OR GREATER, WITH A 10' OR GREATER VERTICAL CHANGE IN ELEVATION).

32. THE FOREST STAND DELINEATION (FSD) PLAN WAS PREPARED FOR AN AREA EQUALING 15.3± ACRES OF PARCEL 'A'. THE PROPOSED PROJECT ARE COVERED BY THIS SDP IS EQUAL TO 8.4 ACRES WHICH REPRESENTS ONLY A PORTION OF THE AREA COVERED BY THE FSD.

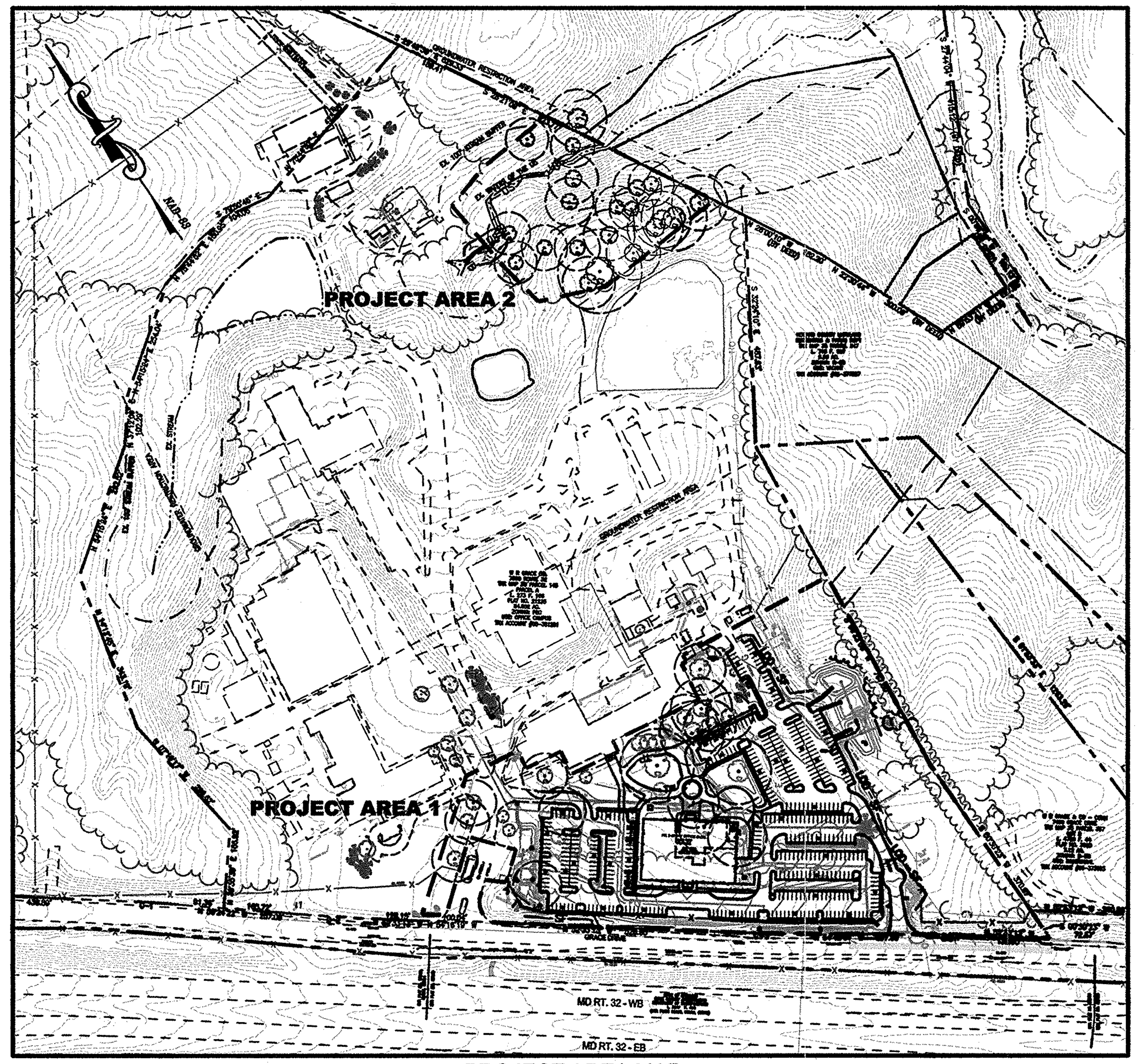
FOREST STAND SUMMARY NARRATIVE - OVERALL PROPERTY:

THE W.R. GRACE PROPERTY IS CURRENTLY DEVELOPED AS AN OFFICE CAMPUS. DEVELOPMENT ON THE OVERALL PROPERTY IS CONCENTRATED IN THE CENTRAL SOUTHERN PORTION OF THE PROPERTY WITH FOREST GROWING ALONG THE WEST, NORTH, AND EAST BORDERS. AN EXPANSION OF CAMPUS FACILITIES IS PROPOSED WITHIN THE DEVELOPED PORTION OF THE PROPERTY, BETWEEN THE EXISTING BUILDINGS AND GRACE DRIVE. THE PROPERTY IS LOCATED AT 7500 GRACE ROAD, IN THE COLUMBIA AREA OF HOWARD COUNTY, MARYLAND. THE OVERALL PROPERTY IS BOUNDED BY GRACE ROAD AND MD ROUTE 32 TO THE SOUTH, RESIDENTIAL DEVELOPMENT TO THE WEST, FOREST TO THE NORTH, AND THE MIDDLE PATUXENT RIVER TO THE EAST.

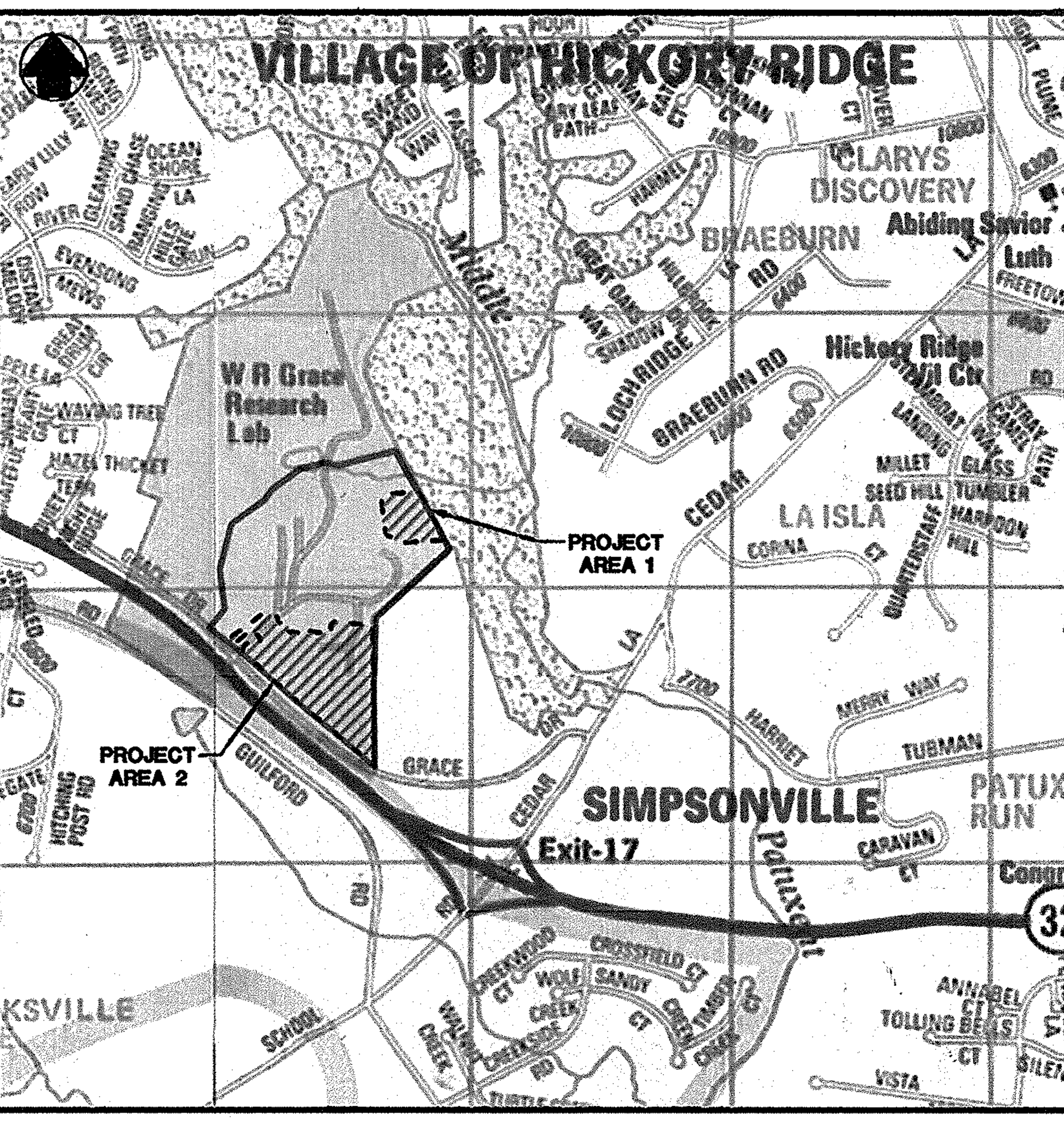
TWO PROJECT AREAS WITHIN THE OVERALL PROPERTY WILL BE THE SUBJECT OF THIS FOREST STAND DELINEATION (FSD). PROJECT AREA 1 ENCOMPASSES 12.6± ACRES, AND IS LOCATED ALONG GRACE ROAD IN FRONT OF THE EXISTING CAMPUS BUILDINGS. PROJECT AREA 2 ENCOMPASSES 2.7± ACRES, AND IS LOCATED NORTH OF THE EXISTING BUILDINGS ON AN UNDEVELOPED PORTION OF THE OVERALL PROPERTY. BOTH PROJECT AREAS ARE IDENTIFIED WITH A THICK, GRAY, DASHED LINE ON THIS SHEET.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature]	4/29/12
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	DATE
[signature]	11/14/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION HSP	DATE
[signature]	11/19/12
CHIEF, DIVISION & LAND DEVELOPMENT	DATE



PROJECT AREA MAP
SCALE: 1" = 200'



© ADC, THE MAP PEOPLE,
BY PERMISSION PUN 21006237
MAP NO. 4934 GRIDS E-9/10, F-9/10 &
MAP NO. 5052 GRID F-1

VICINITY MAP
SCALE: 1" = 1,000'

OPTION 5: ON-SITE/OFF-SITE PLANTING AND REFORESTATION	FOREST CONSERVATION DATA SUMMARY		
File Number: SDP-12-077	Project/Subdivision Name: Grace Tech Park, Parcel A, Office Building		
Net Tract Area (Net tract area under review) 8.4 AC.	Area of Floodplain: unforested 0 AC., forested 0 AC., total 0 AC.	Existing Forest (Forest in net tract area minus floodplain) 0.3 AC.	Cleared Forest (All forest cleared including floodplain) 0.3 AC.
Retained Forest (Retained forest minus floodplain): onsite 1.6 AC., offsite 0 AC., total 1.6 AC.	Planted Forest: onsite 0 AC., offsite 0 AC., total 0 AC.	Long Term Protection (Total amount of forest placed into LTP) 1.6 AC.	Suerty Amount Posted (Total amount of surety posted) N/A
In-Lieu Fees Amount Collected N/A	Forested Stream Buffers: Linear Length 263 L.F., Acreage 1.0 AC.	Planted Stream Buffers: Linear Length 0 L.F., Acreage 0 AC.	

CURVE TABLE

CURVE	RADIUS	DELTA	ARC	TANGENT	CHORD BEARING	CHORD
C-1	3849.00'	2°08'51"	144.27'	72.14'	S51°28'48"E	144.26'
C-2	3791.00'	2°08'51"	142.10'	71.06'	S51°28'48"E	142.09'
C-3	3788.00'	2°08'51"	141.98'	71.00'	S53°37'39"E	141.97'
C-4	3852.00'	2°08'51"	144.37'	72.20'	S53°37'39"E	144.37'

FOREST STAND SUMMARY NARRATIVE - STANDS & VEGETATION:

PROJECT AREA 1
PROJECT AREA 1 ENCOMPASSES A PORTION OF THE SITE THAT HAS ALREADY BEEN DEVELOPED AS PART OF AN OFFICE CAMPUS. THE LAND COVER IS PREDOMINANTLY LAWN, PAVING, AND LANDSCAPE AREAS WITH TWO SMALL AREAS OF FOREST. PROJECT AREA 1 IS LOCATED ON A HIGH POINT OF THE OVERALL PROPERTY, WHICH DRAINS TO THE EAST TO THE MIDDLE PATUXENT RIVER.

A NUMBER OF LARGE INDIVIDUAL TREES GROW WITHIN PROJECT AREA 1. SEVENTEEN OF THEM HAVE ATTAINED SPECIMEN TREE SIZE. THE SPECIMEN TREES AND THEIR CONDITIONS ARE LISTED ON THIS SHEET AND THEIR LOCATIONS ARE SHOWN ON THIS PLAN.

GTA'S FIELD REVIEW IDENTIFIED TWO FOREST STANDS WITHIN PROJECT AREA 1 THAT TOTAL 0.7± ACRES. THE REMAINING LAND COVER CONSISTS OF TWO HEDGEROWS, TWO MEADOW AREAS, AND NINE LAWN AREAS. A SUMMARY DESCRIPTION OF EACH OF THESE AREAS FOLLOWS:

F-1
FOREST STAND F-1 ENCOMPASSES 0.4 AC± AND IS LOCATED ALONG THE EASTERN BOUNDARY OF PROJECT AREA 1. THIS STAND IS A COPSE OF JAPANESE ZELKOVA TREES ACHIEVING 90%± CANOPY COVERAGE WITH A FEW INDIVIDUALS OF NORWAY MAPLE AND BLACK CHERRY. TREES WITHIN THIS STAND RANGE FROM 6" TO 14" DBH AND EXHIBIT AN UNDERSTORY OF JAPANESE ZELKOVA AND FLOWERING DOGWOOD. ZELKOVA SEEDLINGS AND WHIPS ALSO DOMINATE THE SHRUB AND HERB LAYERS OF THIS STAND.

THIS FOREST STAND ABUTS A HEDGEROW OF MATURE WHITE PINES THAT CONNECT IT TO A MATURE, MIXED HARDWOOD FOREST, OFF-SITE TO THE EAST. THIS STAND CONTAINS NO FOREST AREAS IN SENSITIVE ENVIRONMENTS. DUE TO ITS COMPOSITION OF EXOTIC SPECIES, THIS STAND PROVIDES LITTLE MORE THAN COVER IN THE WAY OF WILDLIFE HABITAT. ACCORDING TO THE 1968 SOIL SURVEY OF HOWARD COUNTY, THE SUITABILITY INDEX FOR THIS SOIL TYPE IS 43, AND THE TYPICAL FOREST COVER FOR THIS SOIL TYPE IS 'MIXED UPLAND HARDWOODS, MAINLY OAKS." STAND F-1'S LOCATION ADJACENT TO THE PROPOSED CAMPUS IMPROVEMENTS MAY RESULT IN THE CLEARING OF SOME OR ALL OF THE STAND.

F-2
FOREST STAND F-2 ENCOMPASSES 0.3 AC±. LIKE FOREST STAND F-1, FOREST STAND F-2 ALSO GROWS ALONG THE EASTERN BOUNDARY OF PROJECT AREA 1, EXHIBITS 90%± CANOPY COVERAGE, AND IS CONNECTED TO OFF-SITE FOREST RESOURCES BY THE SAME HEDGEROW OF MATURE WHITE PINES. DOMINANT TREE SPECIES INCLUDE BLACK CHERRY, NORWAY MAPLE, TULIPTREE, JAPANESE ZELKOVA, AND JAPANESE CRYPTOMERIA. THE TULIP TREES IN THIS STAND ARE SIGNIFICANTLY LARGER THAN THE REMAINING SPECIES, AVERAGING 24-28 INCHES IN DIAMETER, AND LIKELY PREDATE THE VOLUNTEER AND LANDSCAPE SPECIES THAT NOW GROW WITH THEM. THESE YOUNGER TREES AVERAGE 10-20 INCHES AND GROW ABOVE AN UNDERSTORY OF CREPE MYRTLE, AND FLOWERING DOGWOOD. THE SHRUB LAYER EXHIBITS 15%± DENSITY AND IS COMPRISED PREDOMINANTLY OF, SILVERBERRY AND BITTERSWEET VINES. GROUND COVER SPECIES EXHIBIT 50%± COVERAGE AND DOMINATED BY EXOTIC INVASIVE SPECIES SUCH AS JAPANESE ZELKOVA, SILVERBERRY, JAPANESE HONEYSUCKLE, MULTIFLORA ROSE, ASIATIC TEARTHUMB, AND GARLIC MUSTARD.

THIS STAND CONTAINS NO FOREST AREAS IN SENSITIVE ENVIRONMENTS. DUE TO ITS SMALL SIZE, DISTURBED NATURE, AND PREDOMINANCE OF EXOTIC AND INVASIVE SPECIES, THIS STAND PROVIDES LITTLE MORE THAN COVER IN THE WAY OF WILDLIFE HABITAT. ACCORDING TO THE 1968 SOIL SURVEY OF HOWARD COUNTY, THE SUITABILITY INDEX FOR THIS SOIL TYPE IS 43, AND THE TYPICAL FOREST COVER FOR THIS SOIL TYPE IS 'MIXED UPLAND HARDWOODS, MAINLY OAKS." STAND F-2'S LOCATION ADJACENT TO THE PROPOSED CAMPUS IMPROVEMENTS MAY RESULT IN THE CLEARING OF SOME OR ALL OF THE STAND.

H-1
HEDGEROW H-1 ENCOMPASSES 0.9± ACRES AND GROWS WITHIN THE SOUTHERN PORTION OF PROJECT AREA 1, ROUGHLY PARALLEL WITH GRACE ROAD. THIS HEDGEROW IS COMPRISED OF MATURE WHITE PINES THAT WERE PLANTED TWO ROWS DEEP APPROXIMATELY 35 TO 45 YEARS AGO. TREES WITHIN THIS HEDGEROW AVERAGE 18-24 INCHES IN DIAMETER, WITH ONE EXCEPTION, A PINE THAT MEASURES 34 INCHES AROUND BOTH OF ITS TWIN TRUNKS. HEDGEROW H-1 IS LOCATED WITHIN A MAINTAINED LAWN AREA, WHICH PREVENTS THE DEVELOPMENT OF AN UNDERSTORY OR SHRUB LAYER.

THIS HEDGEROW ACTS AS A LANDSCAPE SCREEN BETWEEN THE CAMPUS AND GRACE ROAD. THE HEDGEROW IS LOCATED WITHIN THE CENTER OF THE PROPOSED CAMPUS IMPROVEMENTS AND WILL LIKELY BE REMOVED.

H-2
HEDGEROW H-2 ENCOMPASSES 0.4± ACRES. HEDGEROW H-2 GROWS ALONG THE EASTERN BOUNDARY OF PROJECT AREA 1, ADJACENT TO AN OFF-SITE, MIXED HARDWOOD FOREST. HEDGEROW H-2 IS ALSO COMPRISED OF MATURE WHITE PINES PLANTED APPROXIMATELY 35-45 YEARS AGO, BUT H-2'S LOCATION ADJACENT TO AN OFF-SITE FOREST HAS ALLOWED THE INFILTRATION OF SOME ADDITIONAL SPECIES INTO ITS UNDERSTORY, SHRUB, AND VINE LAYERS. THESE SPECIES INCLUDE BLACK CHERRY, SASSAFRAS, WHITE MULBERRY, RED OAK, ZELKOVA, MULTIFLORA ROSE, POISON IVY, JAPANESE HONEYSUCKLE, AND BITTERSWEET. TREES WITHIN THIS HEDGEROW RANGE FROM 18" TO 24" DBH.

THE LOCATION OF THIS HEDGEROW, ALONG THE BOUNDARY OF PROJECT AREA 1, WILL LIKELY RESULT IN MINIMAL IMPACT FROM THE PROPOSED DEVELOPMENT. THE HEDGEROW PROVIDES A YEAR-ROUND SOURCE OF SHADE ALONG THE EDGE OF THE ADJACENT FOREST, REDUCING LIGHT INFILTRATION ALONG THAT FOREST EDGE. THE HEDGEROW DOES NOT CONTAIN ANY SENSITIVE ENVIRONMENTAL AREAS, BUT DOES INCREASE THE CANOPY OF THE ADJACENT FOREST AND PROVIDES HABITAT BENEFITS OF SHELTER, COVER, AND FOOD FROM PINE NUTS.

PROJECT AREA 2
PROJECT AREA 2 IS LOCATED NEAR THE NORTHEAST BOUNDARY IN AN UNDEVELOPED PORTION OF THE OVERALL PROPERTY. THIS PROJECT AREA IS LOCATED IN THE STREAM VALLEY OF AN UNNAMED TRIBUTARY TO THE MIDDLE PATUXENT RIVER. PROJECT AREA 2 IS PART OF A LARGER FORESTED AREA THAT FLANKS THE MIDDLE PATUXENT RIVER, AND WAS SELECTED TO SATISFY FOREST CONSERVATION REQUIREMENTS GENERATED BY THE PROPOSED DEVELOPMENT ADJACENT TO GRACE DRIVE.

TWENTY-ONE SPECIMEN TREES GROW WITHIN OR HAVE A PORTION OF THEIR CRITICAL ROOT ZONES LOCATED WITHIN PROJECT AREA 2. THE SPECIMEN TREES AND THEIR CONDITIONS ARE LISTED ON THIS SHEET AND THEIR LOCATIONS ARE SHOWN ON THIS PLAN.

GTA'S FIELD REVIEW IDENTIFIED ONE FOREST STAND WITHIN PROJECT AREA 2 THAT TOTALS 2.7± ACRES. A SUMMARY DESCRIPTION OF THIS STAND FOLLOWS.

F-3
FOREST STAND F-3 ENCOMPASSES 2.7 AC± AND GROWS OVER THE MODERATE AND STEEP STREAM VALLEY SLOPES OF AN UNNAMED TRIBUTARY TO THE MIDDLE PATUXENT RIVER. STAND F-3 IS A MATURE, HEALTHY, UPLAND, HARDWOOD FOREST, 50 TO 70 YEARS IN AGE, WITH NEARLY 100 PERCENT CANOPY CLOSURE. DOMINANT TREE SPECIES IN STAND F-3 INCLUDE TULIPTREE WITH WHITE, BLACK, AND RED OAK WITH A FEW RED MAPLES AND SYCAMORES GROWING IN THE VALLEY BOTTOM, NEAR THE STREAM. THE DOMINANT TREES IN THIS STAND AVERAGE 18-36 INCHES IN DIAMETER. THE UNDERSTORY IS DOMINATED BY BLACKGUM WITH FLOWERING DOGWOOD, YOUNG TULIPTREE, AND AMERICAN HORNBEAM. A FEW INDIVIDUALS OF RED MAPLE, SLIPPERY ELM, AND WITCH HAZEL GROW NEAR THE STREAM. THE SHRUB LAYER IS RELATIVELY ABSENT WITHIN THE STAND, REPRESENTED BY AN OCCASIONAL YOUNG TREE OF ONE OF THE CANOPY SPECIES. SOME SILVERBERRY MIXED WITH SOME JAPANESE BARBERRY HAVE COLONIZED AREAS NEAR THE FOREST EDGE WHERE LIGHT INFILTRATION SUPPORTS THESE EXOTIC SPECIES. THE GROUND LAYER HAS ACHIEVED APPROXIMATELY 80% COVERAGE, MANIFESTING AS A CARPET OF NEPALESE BROWNTOP WITH COLONIES OF FALSE NETTLE GROWING IN THE MOIST AREAS.

FOREST STAND F-3 HAS GOOD RETENTION POTENTIAL. ITS LOCATION PROVIDES A FORESTED BUFFER OVER STEEP SLOPES AND A STREAM. AS A PART OF THE FOREST ADJACENT TO THE MIDDLE PATUXENT RIVER, STAND F-3 ADDS TO A RIPARIAN/WILDLIFE CORRIDOR THAT STRETCHES FROM ROUTE 32 TO ROUTE 100, AN AREA OF FOREST LARGE ENOUGH TO SUPPORT FOREST INTERIOR DWELLING BIRD SPECIES (FIDS). STAND F-3 SUFFERS SOME ENCROACHMENT BY EXOTIC SPECIES IN THE SHRUB AND GROUND LAYERS. STAND F-3 CONTAINS 0.8± ACRES OF STEEP SLOPES, WHICH APPEAR TO BE WELL STABILIZED BY THE FOREST GROWING ON THEM.

ACCORDING TO THE 1968 SOIL SURVEY OF HOWARD COUNTY, THERE ARE FOUR SOIL TYPES UNDERLYING THIS FOREST STAND: Ba, MID3, MnD, AND MnF. THE SUITABILITY GROUPS FOR THESE SOIL TYPES ARE 1, 44, 44, AND 45, RESPECTIVELY. THE TYPICAL FOREST COVER FOR Ba IS "WETLAND HARDWOODS," AND FOR MID3, MnD, AND MnF IS "MIXED UPLAND HARDWOODS, MAINLY OAKS."

ADDRESS CHART	
PARCEL #	STREET ADDRESS
P-A / P-145	7500 GRACE DRIVE

PERMIT INFORMATION CHART					
SUBDIVISION NAME: W R GRACE & CO.					PARCEL NO.: PARCEL 145
PLAT NO. OR L/F	GRID #	ZONING	TAX MAP NO.	ELECT. DIST.	CENSUS TRACT
PLAT NO. 21235 & 21236	21 & 22	PEC	35	5	6055.11
WATER CODE: 6580000			SEWER CODE: E-24		

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-38

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

FOREST CONSERVATION PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

STATE OF MARYLAND — COURTNEY M. GRIBER — 3457 — LANDSCAPE ARCHITECT
10-17-12

MD PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 3457, EXPIRATION DATE: 03/18/2014.

DATE	REVISIONS	
		JOB NO.: 12039
		SCALE: 1" = 40'
		DATE: 10/16/2012
		DRAWN BY: CMG
		DESIGN BY: CMG
		REVIEW BY: CMG
		SHEET: 38 OF 46

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-38-FCP.dwg, 10/17/2012 4:30:24 PM, RHall,
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LEGEND

- EX. 10' CONTOUR
- EX. 2' CONTOUR
- EX. SOILS LINE
- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. ZONING LINE
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. OVERHEAD LINE
- EX. WATER LINE
- EX. SEWER LINE
- EX. STREAM
- EX. STREAM BUFFER
- EX. RIP-RAP CHANNEL
- EX. TREE LINE
- EX. GUARD RAIL
- EX. ELECTRIC CONDUIT
- EX. LIGHT POLES
- EX. GAS LINE
- EX. STORM DRAIN
- EX. CONDUIT
- EX. FIBER OPTIC
- EX. TV LINE
- EX. ELECTRIC MANHOLE
- EX. TELEPHONE MANHOLE
- EX. UNKNOWN UTILITY
- EX. WETLAND
- EX. 25' WETLAND BUFFER

- PR. 2' CONTOUR
- PR. 10' CONTOUR
- PR. 1' CONTOUR
- PR. BUILDING FOOTPRINT
- PR. BUILDING OVERHANG
- PR. EDGE OF CONCRETE
- PR. CURB
- PR. SIDEWALK
- PR. RETAINING WALL
- PR. TREELINE
- PR. HEDGEROW
- PR. ELECTRIC CONDUIT
- PR. TELEPHONE CONDUIT
- PR. FIBER OPTIC
- PR. GAS
- PR. SANITARY SEWER
- PR. STORM DRAIN
- PR. WATER LINE
- PR. LIMITS OF DISTURBANCE
- PR. SUPER SILT FENCE
- PR. TREE PROTECTION FENCE
- REMOVAL PUMPING STATION
- SLOPES ≥ 15% & < 25%
- SLOPES ≥ 25%

FOREST CONSERVATION LEGEND

- EX. SPECIMEN TREE & CRITICAL ROOT ZONE
- EX. DECIDUOUS TREE
- EX. EVERGREEN TREE
- LIMITS OF FOREST STAND DELINEATION
- EX. FOREST – TO BE REMOVED
- PR. FOREST RETENTION AREA & EASEMENT
- PR. FOREST RETENTION SIGN
- EX. FOREST WITHIN PROJECT AREA
- EX. HEDGEROW, SCURB/SHRUB VEGETATION, OR TREE GROUP WITHIN PROJECT AREA

SPECIMEN TREE LIST (THIS SHEET ONLY)

NUMBER	SCIENTIFIC NAME	COMMON NAME	DBH	CONDITION	
ST-1	ACER RUBRUM	RED MAPLE	41"	FAIR	(TO BE REMOVED)
ST-2	ACER RUBRUM	RED MAPLE	36"	GOOD	(TO BE REMOVED)
ST-3	ACER RUBRUM	RED MAPLE	36"	GOOD	(TO BE REMOVED)
ST-4	ACER RUBRUM	RED MAPLE	46"	GOOD	(TO BE REMOVED)
ST-5	QUERCUS PHELLOS	WILLOW OAK	33"	POOR	
ST-6	QUERCUS PHELLOS	WILLOW OAK	36"	GOOD	
ST-7	QUERCUS PHELLOS	WILLOW OAK	45"	GOOD	
ST-8	ACER PLATANOIDES	NORWAY MAPLE	36"	GOOD	
ST-9	QUERCUS PHELLOS	WILLOW OAK	43"	GOOD	
ST-10	QUERCUS PHELLOS	WILLOW OAK	33"	GOOD	
ST-11	QUERCUS PHELLOS	WILLOW OAK	52"	GOOD	
ST-12	QUERCUS COCCINEA	SCARLET OAK	33"	FAIR	(TO BE REMOVED)
ST-13	QUERCUS COCCINEA	SCARLET OAK	32"	GOOD	
ST-14	QUERCUS COCCINEA	SCARLET OAK	32"	FAIR	
ST-15	QUERCUS COCCINEA	SCARLET OAK	31"	GOOD	
ST-16	QUERCUS COCCINEA	SCARLET OAK	32"	GOOD	
ST-17	PINUS STROBUS	WHITE PINE	34"	GOOD	(TO BE REMOVED)

DEMOLITION NOTES

(1) EXISTING SPECIMEN TREE TO BE REMOVED.

EX. FOREST TO BE REMOVED 0.3 AC

CONTIGUOUS STEEP SLOPES IN FSD PROJECT AREA=0.21± AC. OFF FSD PROJECT AREA=0.01± AC. IN SDP PROJECT AREA = 0.0 AC

EX. FOREST (OUTSIDE FOREST CONSERVATION PROJECT AREA) TO REMAIN - 0.3 AC

PR. 3-STORY OFFICE BLDG. BLDG #100 67,471 S.F. FFE: 416.50 BSMT: 404.25 MECH. RM: 402.50

EX. HEDGEROW TO BE REMOVED

EX. OFFICE BUILDING BLDG. #1/1A

EX. GUARD BUILDING

GRACE DRIVE

MD RT. 32 - WB

STATE OF MARYLAND
STATE HIGHWAY ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
L. 3347 F. 408
(SHA PLATS 52408, 53059, 53313)

E 1340000 N 544000

FOREST CONSERVATION PLAN
SCALE: 1"=40'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	10/29/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
CHIEF, DIVISION & LAND DEVELOPMENT	11/15/12 DATE

SOILS CHART

SYMBOL [1]	NAME/DESCRIPTION [1]	HYDRIC [2] SOIL	HYDRIC [2] COMPONENT	PERCENTAGE OF [1] MAPPING UNIT	POSITION IN [1] LANDSCAPE	K [1] FACTOR
GgB	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	NO	-	-	-	0.20
GnB	GLENELG-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	NO	-	-	-	NONE LISTED
MaB	MANOR LOAM, 3 TO 8 PERCENT SLOPES	NO	-	-	-	0.24
MaC	MANOR LOAM, 8 TO 15 PERCENT SLOPES	NO	-	-	-	0.24
MaD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	NO	-	-	-	0.24

1. SOURCE: K FACTOR VALUES FOR WHOLE SOIL FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE'S WEB SOIL SURVEY, CONSULTED ON MAY 30, 2011, AVAILABLE ON-LINE AT <HTTP://WEBSOILSURVEY.NRCS.USDA.GOV/>
2. HYDRIC SOILS INFORMATION ADAPTED FROM THE NATURAL RESOURCE CONSERVATION SERVICE'S NATIONAL HYDRIC SOILS LIST, CONSULTED ON MAY 5, 2011, AVAILABLE ON-LINE AT <HTTP://SOILS.USDA.GOV/USE/HYDRIC>.

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

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FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND — COURTNEY M. MARTIN — No. 3457 — LANDSCAPE ARCHITECT — 10-17-12

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GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

FOREST CONSERVATION PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

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		DRAWN BY:	CMG
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		SHEET:	39 OF 46

SHEET: SDP-39

SDP-12-077

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LEGEND

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- EX. 2' CONTOUR
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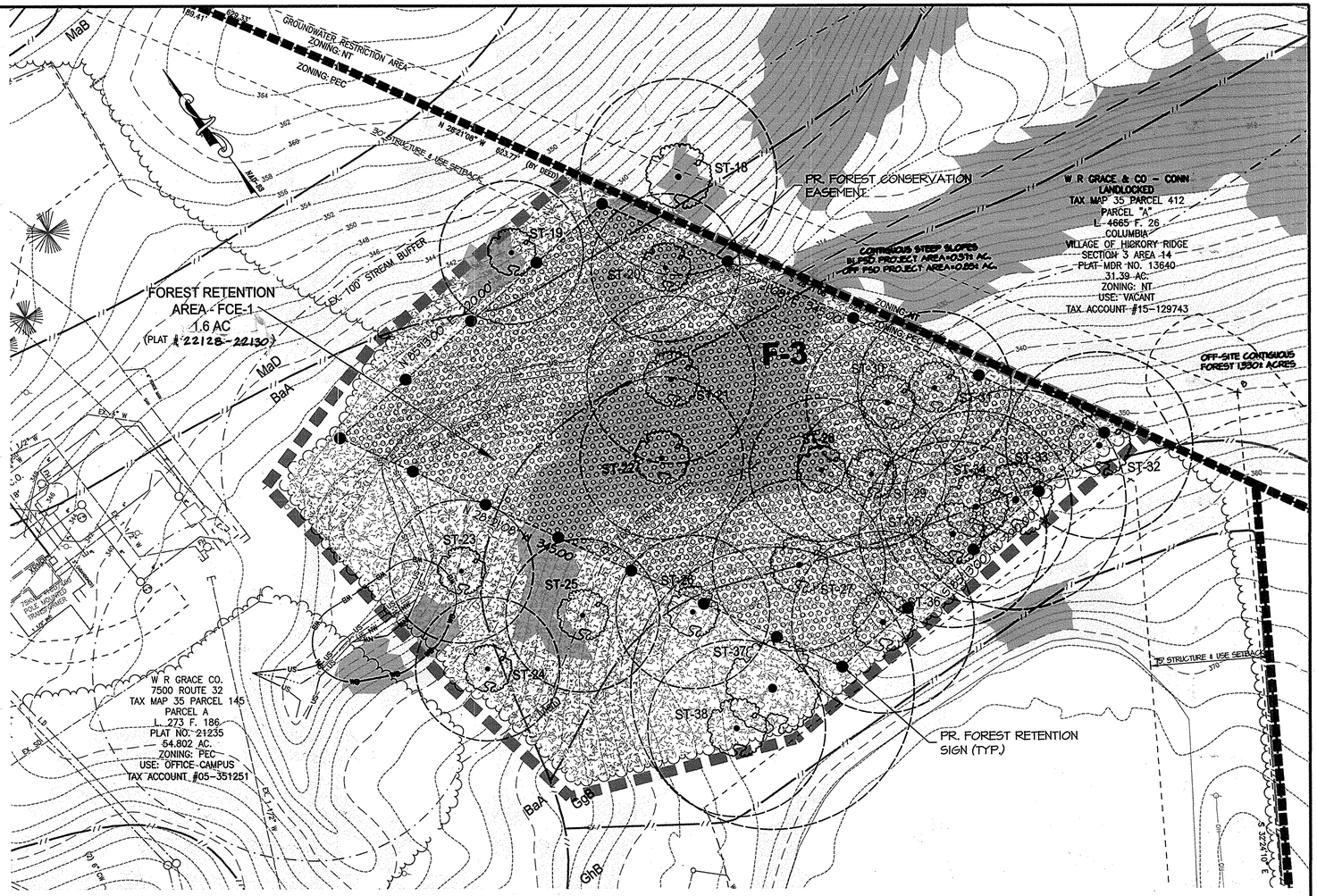
- EX. STORM DRAIN
- EX. CONDUIT
- EX. FIBER OPTIC
- EX. TV LINE
- EX. ELECTRIC MANHOLE
- EX. TELEPHONE MANHOLE
- EX. UNKNOWN UTILITY
- EX. WETLAND
- EX. 25' WETLAND BUFFER
- PR. 2' CONTOUR
- PR. 10' CONTOUR
- PR. 1' CONTOUR
- PR. BUILDING FOOTPRINT
- PR. BUILDING OVERHANG
- PR. EDGE OF CONCRETE
- PR. CURB
- PR. SIDEWALK
- PR. RETAINING WALL
- PR. LIMITS OF DISTURBANCE
- PR. SUPER SILT FENCE
- PR. TREE PROTECTION FENCE
- REMOVAL PUMPING STATION
- PR. STONE CHECK DAM
- PR. PAVEMENT MILL AND OVERLAY
- PR. TREELINE
- PR. ELECTRIC CONDUIT
- PR. TELEPHONE CONDUIT
- PR. FIBER OPTIC
- PR. GAS
- PR. SANITARY SEWER
- PR. STORM DRAIN
- PR. WATER LINE
- PR. STREET LIGHT

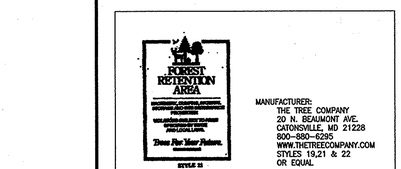
FOREST CONSERVATION LEGEND

- EX. SPECIMEN TREE & CRITICAL ROOT ZONE
- EX. DECIDUOUS TREE
- EX. EVERGREEN TREE
- LIMITS OF FOREST STAND DELINEATION
- EX. FOREST – TO BE REMOVED
- PR. FOREST RETENTION AREA & EASEMENT
- PR. FOREST RETENTION SIGN
- SLOPES ≥ 15% & < 25%
- SLOPES ≥ 25%
- EX. FOREST WITHIN PROJECT AREA
- EX. HEDGEROW, SCURB/SHRUB VEGETATION, OR TREE GROUP WITHIN PROJECT AREA



FOREST CONSERVATION PLAN

SCALE: 1"=40'



MANUFACTURER:
THE TREE COMPANY
20 N. BEAUMONT AVE.
CATONSVILLE, MD 21228
800-880-8295
WWW.THETREECOMPANY.COM
STYLES 19.21 & 22
OR EQUAL

FOREST RETENTION SIGN
TYPICAL DETAIL NO SCALE

NOTE:
1. FOREST CONSERVATION AREAS WILL BE MARKED WITH PERMANENT FOREST RETENTION SIGNS PLACED AS SHOWN ON THE PLAN WITH A MAXIMUM OF 100' SPACING.
2. BOTTOM OF SIGNS TO BE HIGHER THAN TOP OF TREE PROTECTION FENCE.
3. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.

SPECIMEN TREE LIST -THIS SHEET ONLY

NUMBER	SCIENTIFIC NAME	COMMON NAME	DBH	CONDITION
ST-18	QUERCUS RUBRA	RED OAK	41"	GOOD
ST-19	QUERCUS VELUTINA	BLACK OAK	30"	GOOD
ST-20	LIRIODENDRON TULIPIFERA	TULIPTREE	31"	GOOD
ST-21	QUERCUS ALBA	WHITE OAK	35"	GOOD
ST-22	QUERCUS RUBRA	RED OAK	34"	FAIR
ST-23	PINUS STROBUS	WHITE PINE	30"	GOOD
ST-24	PINUS STROBUS	WHITE PINE	30"	GOOD
ST-25	QUERCUS RUBRA	RED OAK	32"	FAIR
ST-26	QUERCUS ALBA	WHITE OAK	32"	GOOD
ST-27	LIRIODENDRON TULIPIFERA	TULIPTREE	36"	GOOD
ST-28	LIRIODENDRON TULIPIFERA	TULIPTREE	30"	GOOD
ST-29	LIRIODENDRON TULIPIFERA	TULIPTREE	31"	GOOD
ST-30	LIRIODENDRON TULIPIFERA	TULIPTREE	34"	GOOD
ST-31	LIRIODENDRON TULIPIFERA	TULIPTREE	32"	GOOD
ST-32	QUERCUS VELUTINA	BLACK OAK	39"	GOOD
ST-33	LIRIODENDRON TULIPIFERA	TULIPTREE	46"	GOOD
ST-34	QUERCUS ALBA	WHITE OAK	40"	POOR
ST-35	LIRIODENDRON TULIPIFERA	TULIPTREE	39"	POOR
ST-36	QUERCUS VELUTINA	BLACK OAK	38"	GOOD
ST-37	QUERCUS VELUTINA	BLACK OAK	59"	FAIR
ST-38	QUERCUS VELUTINA	BLACK OAK	37"	GOOD

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	DATE 11/29/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 11/14/12
CHIEF, DIVISION & LAND DEVELOPMENT	DATE 11/19/12

FOREST CONSERVATION WORKSHEET

PROJECT NAME:	WR GRACE - PR. OFFICE BUILDING	DATE:	1/26/2012
LOCATION:	HOWARD COUNTY	REVISION:	
REVIEWED BY:		APPROVAL DATE:	

I. BASIC SITE DATA	ACRES (0.1 acre)
GROSS SITE AREA (development site only)	8.4
AREA WITHIN 100 YEAR FLOODPLAIN	0.0
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL (if applicable)	0.0
AREA IN OVERHEAD TRANSMISSION LINE EASEMENTS (if applicable)	0.0
NET TRACT AREA	8.4
LAND USE CATEGORY	COMMERCIAL

II. INFORMATION FOR CALCULATIONS		ACRES (0.1 acre)
A. NET TRACT AREA		8.4
B. FOREST CONSERVATION THRESHOLD	(15% X A)	1.3
C. AFFORESTATION THRESHOLD	(15% X A)	1.3
D. EXISTING FOREST ON NET TRACT AREA		0.3 *
E. EXISTING FOREST ABOVE FOREST CONSERVATION THRESHOLD		0.0
F. BREAK-EVEN POINT (the amount of forest to be retained for no mitigation) ((E x 0.2) + B)		1.3
G. FOREST TO BE CLEARED		0.3
H. FOREST TO BE RETAINED		0.0

IV. AFFORESTATION CALCULATIONS		ACRES (0.1 acre)
A. NET TRACT AREA		8.4
C. AFFORESTATION THRESHOLD	(15% X A)	1.3
D. EXISTING FOREST ON NET TRACT AREA		0.3
G. FOREST AREAS TO BE CLEARED		0.3
H. FOREST AREAS TO BE RETAINED		0.0
Select the alternative that applies:		
1. No clearing:		
If existing forest areas are below the Afforestation Threshold (if D is less than C) and no clearing is proposed, the following calculations apply:		
TOTAL AFFORESTATION REQUIRED C - D		N/A
Afforestation must make the forest area equal to the minimum required by the Afforestation Threshold.		
2. Clearing:		
If existing forest areas are below the Afforestation Threshold (if D is less than C) and clearing is proposed, the following calculations apply:		
AFFORESTATION FOR UNFORESTED AREAS BELOW AFFORESTATION THRESHOLD C - D		1.0
REFORESTATION FOR CLEARING BELOW AFFORESTATION THRESHOLD G x 2		0.6
TOTAL PLANTING REQUIRED (C - D) + (G X 2)		1.6
The afforestation planting brings the site up to the minimum forest required (the Afforestation Threshold). The reforestation component compensates for clearing.		

* WHILE THE FSD SHOWS 0.7 ACRES OF EXISTING FOREST WITHIN PROJECT AREA 1, ONLY 0.3 ACRES OF EXISTING FOREST ARE WITHIN THE PROJECT AREA COVERED BY THIS SDP.

SOILS CHART

SYMBOL [1]	NAME/DESCRIPTION [1]	HYDRIC [2] SOIL	HYDRIC [2] COMPONENT	PERCENTAGE OF [1] MAPPING UNIT	POSITION IN [1] LANDSCAPE	K [1] FACTOR
BaA	BAILE SILT LOAM, 3 TO 8 PERCENT SLOPES	YES	BAILE	85	DEPRESSIONS, DRAINAGEWAYS, & SWALES	0.32
GgB	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	NO	-	-	-	0.20
MaD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	NO	-	-	-	0.24

1. SOURCE: THE UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE'S WEB SOIL SURVEY, CONSULTED ON MAY 30, 2011, AVAILABLE ON-LINE AT <HTTP://WEBSOILSURVEY.NRCS.USDA.GOV/>
2. HYDRIC SOILS INFORMATION ADAPTED FROM THE NATURAL RESOURCE CONSERVATION SERVICE'S NATIONAL HYDRIC SOILS LIST, CONSULTED ON MAY 5, 2011, AVAILABLE ON-LINE AT <HTTP://SOILS.USDA.GOV/USE/HYDRIC/>.

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

SHEET: SDP-40

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FAX: (410) 792-7395
MRAGTA.COM

STATE OF MARYLAND · COURTNEY M. CRAGER · 3457 · REGISTERED LANDSCAPE ARCHITECT · 10-17-12

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

FOREST CONSERVATION PLAN

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING: PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

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		SHEET:	40 OF 46

SDP-12-077

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SEGMENTAL RETAINING WALL SPECIFICATIONS

PART 1 - GENERAL

1.1 WORK INCLUDES

FURNISHING AND INSTALLING SEGMENTAL RETAINING WALL UNITS, GEOGRID REINFORCEMENT, WALL FILL, AND BACKFILL TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS AND AS SPECIFIED HEREIN. THE CONTRACT ALSO INCLUDES THE FURNISHING AND INSTALLING ALL APPURTENANT MATERIALS, EQUIPMENT, AND LABOR REQUIRED FOR CONSTRUCTION OF THE GEOGRID REINFORCED, SEGMENTAL RETAINING WALL. ALL EXISTING AND PROPOSED CONSTRUCTION AND SITE GRADING INFORMATION WAS REFERENCED FROM THE ELECTRONIC COPIES OF THE SITE PLAN, PREPARED AND PROVIDED BY MORRIS & RITCHIE ASSOCIATES, INC. (MRA), THE PROJECT CIVIL ENGINEER, ON DECEMBER 5, 2011.

1.2 REFERENCE STANDARDS

A. ASTM C90-75 (1981 REV) – HOLLOW LOAD BEARING MASONRY UNITS.
B. ASTM C140-75 (1981 REV) – SAMPLING AND TESTING CONCRETE MASONRY UNITS.
C. ASTM C145-75 (1981 REV) – SOLID LOAD BEARING CONCRETE MASONRY UNITS.
D. GEOSYNTHETIC RESEARCH INSTITUTE (GRI), GRI-GG4 – DETERMINATION OF LONG TERM DESIGN STRENGTH OF GEOGRIDS.
E. ASTM D 638 – TEST METHOD FOR TENSILE PROPERTIES OF PLASTIC.
F. ASTM D 1248 – SPECIFICATION OF POLYETHYLENE PLASTICS MOLDING AND EXTRUSION MATERIALS.
G. ASTM D 4218 – TEST METHOD FOR CARBON BLACK CONTENT IN POLYETHYLENE COMPOUNDS BY THE MUFFLE FURNACE TECHNIQUE.
H. ASTM D 3034 – SPECIFICATION FOR POLYVINYL CHLORIDE (PVC) PIPE.
I. ASTM C 1372 – SPECIFICATIONS FOR SEGMENTAL RETAINING WALL UNITS.

1.3 DELIVERY, STORAGE AND HANDLING

A. CONTRACTOR SHOULD CHECK THE MATERIALS UPON DELIVERY TO ASSURE THAT PROPER MATERIAL HAS BEEN RECEIVED.
B. CONTRACTOR SHOULD PREVENT EXCESSIVE MUD, WET CEMENT, EPOXY, AND LIKE MATERIALS WHICH MAY AFFIX THEMSELVES, FROM COMING IN CONTACT WITH THE MATERIALS.
C. GEOGRIDS SHOULD BE STORED ABOVE -20° F.
D. CONTRACTOR SHOULD PROTECT THE MATERIALS FROM DAMAGE. DAMAGED MATERIAL SHOULD NOT BE INCORPORATED INTO THE REINFORCED RETAINING WALL.

1.4 SUBMITTALS/CERTIFICATION

THE CONTRACTOR SHALL SUBMIT A MANUFACTURER'S CERTIFICATION, PRIOR TO THE START OF THE WORK, THAT THE RETAINING WALL SYSTEM COMPONENTS MEET THE REQUIREMENTS OF ASTM C 1372 AND OTHER REQUIREMENTS SPECIFIED HEREIN. THIS CERTIFICATION SHOULD BE PROVIDED TO THE GEOTECHNICAL ENGINEER FOR REVIEW AND APPROVAL PRIOR TO WALL CONSTRUCTION.

PART 2 - PRODUCTS

2.1 DEFINITIONS

A. GEOGRID IS A HIGH DENSITY POLYETHYLENE, POLYESTER, OR POLYPROPYLENE GRID, SPECIFICALLY FABRICATED FOR USE AS A SOIL REINFORCEMENT.
B. CONCRETE RETAINING WALL UNITS ARE AS DETAILED ON THE DRAWINGS AND AS SPECIFIED HEREIN.
C. GEOSYNTHETIC DRAINAGE COMPOSITES ARE POLYETHYLENE NET STRUCTURE WITH NON-WOVEN GEOTEXTILES BONDED TO BOTH SIDES.
D. EROSION CONTROL BLANKETS CONSIST OF A WEB OF POLYOLEFIN FIBERS SECURELY BOUNDED BY POLYOLEFIN THREADS BETWEEN TWO HIGH STRENGTH POLYOLEFIN NETS.
E. BACKFILL IS THE SOIL WHICH IS USED AS FILL FOR THE REINFORCED SOIL MASS.
F. FOUNDATION SOIL IS THE IN-SITU SOIL OR CONTROLLED COMPACTED FILL PLACED BELOW THE BOTTOM OF THE RETAINING WALL AND GEOGRID ZONE.

2.2 MATERIALS

THE CONTRACTOR SHOULD SUBMIT MANUFACTURER'S CATALOG AND SAMPLES OF THE PROPOSED MATERIALS FOR APPROVAL BY THE PROJECT GEOTECHNICAL ENGINEER A MINIMUM OF SEVEN DAYS BEFORE THE START OF CONSTRUCTION. MATERIALS SHOULD BE TRANSPORTED TO THE SITE ONLY AFTER APPROVAL OF THE PROPOSED MATERIALS BY THE PROJECT GEOTECHNICAL ENGINEER.

A. CONCRETE UNITS

1. MASONRY UNITS SHOULD BE KEYSTONE STANDARD II RETAINING WALL UNITS. SUBSTITUTION OF OTHER CONCRETE UNITS OF SIMILAR SIZE MAY BE ALLOWED WITH THE PRIOR APPROVAL OF THE GEOTECHNICAL ENGINEER.
2. CONCRETE WALL UNITS SHOULD HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI, IN ACCORDANCE WITH ASTM C-90. THE CONCRETE SHOULD HAVE ADEQUATE FREEZE/THAW PROTECTION WITH A MAXIMUM MOISTURE ABSORPTION OF 6 PERCENT.
3. MODULAR CONCRETE MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C 1372 – STANDARD SPECIFICATIONS FOR SEGMENTAL RETAINING WALL UNITS.
4. THE UNITS SHALL PASS 100 FREEZE/THAW CYCLES IN WATER WITH LESS THAN 1% WEIGHT LOSS IN ACCORDANCE WITH ASTM C 1372.
5. EXTERIOR DIMENSIONS MAY VARY. UNITS ARE REQUIRED TO HAVE A MINIMUM OF ONE SQUARE FOOT OF FACE AREA EACH.
6. UNITS SHOULD HAVE ANGLED SIDES AND BE CAPABLE OF ATTAINING CONCAVE AND CONVEX ALIGNMENT CURVES IN ACCORDANCE UNITS SHOULD BE INTERLOCKED WITH NON-CORROSIVE REINFORCED FIBERGLASS PINS.
7. UNITS SHOULD BE INTERLOCKED AS TO PROVIDE A MAXIMUM OF 1 INCH OF SETBACK PER BLOCK, WHERE REQUIRED.

B. LEVELING PAD

MATERIAL FOR LEVELING PAD/FOOTING SHOULD CONSIST OF COMPACTED FREE-DRAINING COARSE AGGREGATES MEETING THE REQUIREMENTS OF ASTM #57 STONE OR GRADED AGGREGATE BASE (GAB) PER MARYLAND STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS. A MINIMUM OF 6 INCHES DEEP AND 30 INCHES WIDE COMPACTED LEVELING PAD IS REQUIRED.

C. FIBERGLASS CONNECTING PINS

1. THERMOSET ISOPTHALIC POLYESTER RESIN PULTRUDED FIBERGLASS REINFORCEMENT RODS, A MINIMUM ONE-HALF INCH IN DIAMETER.
2. PINS SHOULD HAVE A MINIMUM FLEXURAL STRENGTH OF 128,000 PSI AND SHORT BEAM SHEAR OF 6400PSI.
3. FOR SUBSTITUTE CONCRETE UNITS, USE OF OTHER COMPATIBLE CONNECTOR SYSTEMS MAY BE ALLOWED WITH THE PRIOR APPROVAL OF THE GEOTECHNICAL ENGINEER.

D. GEOGRID

GEOGRID SHOULD BE MIRAGRID 03XT, OR EQUIVALENT AS APPROVED BY THE GEOTECHNICAL ENGINEER. THE GEOGRID SHOULD HAVE AN ALLOWABLE STRENGTH OF 946 POUNDS PER FOOT. THE ALLOWABLE STRENGTH IS DEFINED AS THE ULTIMATE STRENGTH DIVIDED BY REDUCTION FACTORS FOR CREEP, DURABILITY, INSTALLATION DAMAGE AND AN OVERALL FACTOR OF SAFETY.

E. REINFORCED BACKFILL

REINFORCED BACKFILL SOILS SHOULD BE NON-PLASTIC, CONTROLLED FILL MEETING THE REQUIREMENTS OF AASHTO A-2-4, OR MORE GRANULAR. BASED ON THE AVAILABLE SUBSURFACE INFORMATION, SUITABLE MATERIALS MAY BE AVAILABLE FROM ON-SITE EXCAVATIONS. HOWEVER, SEGREGATION AND STOCKPILING OF SUITABLE MATERIALS WILL BE REQUIRED. IF ADEQUATE QUANTITIES OF THIS MATERIAL ARE NOT AVAILABLE ON-SITE, IMPORTED BACKFILL SHOULD MEET THE ABOVE REQUIREMENTS AND SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER.

F. CONTROLLED FILL

CONTROLLED FILL SOILS TO BE PLACED OUTSIDE THE REINFORCED BACKFILL AREA AND WHERE SPECIFIED SHOULD CONSIST OF ON-SITE OR BORROW SOILS MEETING THE REQUIREMENTS OF AASHTO A-4 OR MORE GRANULAR. ALL FILL MATERIALS PROPOSED TO BE PLACED BEHIND THE REINFORCED BACKFILL SHOULD BE PLACED AS CONTROLLED FILL COMPACTED TO 95 PERCENT OF MAXIMUM DRY DENSITY IN ACCORDANCE WITH THE STANDARD PROCTOR, ASTM D-698.

G. LOW-PERMEABILITY SOIL

LOW-PERMEABILITY SOILS TO BE PLACED AT THE TOP OF THE WALL WHERE SPECIFIED SHOULD CONSIST OF SANDY, SILTY OR CLAYEY SOILS MEETING THE REQUIREMENTS OF ML, CL, SM, OR SC WITH A MINIMUM OF 25% PASSING THE #200 SIEVE.

H. DRAINAGE PIPE

THE DRAINAGE PIPES SHOULD BE PERFORATED OR SLOTTED PVC PIPE MANUFACTURED IN ACCORDANCE WITH ASTM D-3034.

I. FILTER FABRIC

FILTER FABRIC SHOULD BE NON-WOVEN, POLYPROPYLENE GEOTEXTILE, 140 N MANUFACTURED BY NICOLON MIRAFI GROUP OR APPROVED EQUIVALENT.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12 DATE
[signature] CHIEF, DEVELOPMENT ENGINEERING DIVISION HSR	11/14/12 DATE
[signature] CHIEF, DIVISION OF LAND DEVELOPMENT	11/19/12 DATE

PART 3 - EXECUTION

A. EXCAVATION

1. THE CONTRACTOR SHOULD EXCAVATE TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS. UNDER NO CIRCUMSTANCES SHOULD THE EXCAVATION LINES AND GRADES BE EXCEEDED, EXCEPT WITH OWNER'S APPROVAL. THE CONTRACTOR SHOULD PROTECT THE EXCAVATION FROM SLOUGHING BY PLACING A MEMBRANE OVER THE FACE OF THE EXCAVATION.
2. PRIOR TO RETAINING WALL CONSTRUCTION AND THE PLACEMENT OF FILL, ALL TOPSOIL SHOULD BE STRIPPED AND REMOVED FROM THE SITE.
3. EXCAVATIONS SHOULD BE SLOPED OR OTHERWISE SUPPORTED IN ACCORDANCE WITH OCCUPATION SAFETY AND HEALTH ADMINISTRATION (OSHA) AND OTHER LOCAL AND STATE REGULATIONS.

B. FOUNDATION SUBGRADE PREPARATION

1. FOUNDATION SOIL SHOULD BE EXCAVATED AS REQUIRED FOR INSTALLATION OF LEVELING PAD, GEOGRID AND OTHER ELEMENTS AND AS SHOWN ON THE CONSTRUCTION DRAWINGS.
2. FOUNDATION SOIL SHOULD BE EXAMINED BY THE ENGINEER TO ASSURE THAT THE ACTUAL FOUNDATION SOIL STRENGTH MEETS OR EXCEEDS ASSUMED DESIGN STRENGTH. SOILS NOT MEETING REQUIRED STRENGTH SHOULD BE REMOVED AND REPLACED WITH CONTROLLED, COMPACTED MATERIAL.
3. OVER-EXCAVATED AREAS SHOULD BE FILLED WITH SELECT AND APPROVED MATERIAL AND COMPACTED TO 95 PERCENT OF MAXIMUM DRY DENSITY IN ACCORDANCE WITH THE STANDARD PROCTOR, ASTM D-698.
4. ALLOWABLE BEARING PRESSURE FOR NATURAL AND CONTROLLED, COMPACTED FILL SOILS SHOULD BE AS SPECIFIED IN PART 5.
5. THE EXPOSED FOUNDATION SUBGRADE SHOULD BE PROOFROLLED WITH A LOADED DUMP TRUCK. ANY SOFT OR UNSTABLE AREAS IDENTIFIED DURING PROOFROLLING SHOULD BE OVEREXCAVATED AND BACKFILLED WITH CONTROLLED FILL.
6. ANY FILLS REQUIRED TO ESTABLISH SLOPING SURFACES IN FRONT OF THE WALLS SHOULD CONSIST OF CONTROLLED FILL AND SHOULD BE PLACED, COMPACTED AND FIELD TESTED IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED HEREIN.

C. LEVELING PAD

1. THE LEVELING PAD SHOULD BE PLACED AS SHOWN ON THE CONSTRUCTION DRAWINGS WITH A MINIMUM THICKNESS OF 6 INCHES.
2. LEVELING PAD MATERIALS SHOULD BE INSTALLED UPON UNDISTURBED IN-SITU SOILS OR CONTROLLED, COMPACTED BACKFILL.
3. LEVELING PAD SHOULD BE PREPARED TO INSURE COMPLETE CONTACT OF RETAINING WALL UNIT WITH BASE. GAPS SHOULD NOT BE ALLOWED.

D. UNIT INSTALLATION

1. FIRST COURSE OF CONCRETE WALL UNITS SHOULD BE PLACED ON THE LEVELING PAD. THE UNITS SHOULD BE CHECKED FOR LEVEL AND ALIGNMENT. THE FIRST COURSE IS THE MOST IMPORTANT TO PROVIDE ACCURATE AND ACCEPTABLE RESULTS.
2. INSURE THAT UNITS ARE IN FULL CONTACT WITH BASE.
3. UNITS ARE PLACED SIDE BY SIDE FOR FULL LENGTH OF WALL ALIGNMENT. ALIGNMENT MAY BE DONE BY MEANS OF A STRING LINE OR OFFSET FROM BASE LINE.
4. INSTALL FIBERGLASS CONNECTING PIN.
5. LAY UP EACH COURSE INSURING THAT THE CONNECTING PINS ARE INSERTED THROUGH FRONT SLOT OF THE UNIT, AND INTO THE RECEIVING SLOT IN THE COURSE BENEATH. REPEAT PROCEDURE TO THE EXTENT OF WALL HEIGHT.
6. AT THE END OF EACH COURSE WHERE THE WALL CHANGES ELEVATION, UNITS SHOULD BE TURNED INTO THE BACKFILL. UNITS SHOULD BE LAID AS TO CREATE THE MINIMUM RADIUS POSSIBLE. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, A MINIMUM OF ONE UNIT SHOULD BE INSTALLED INTO THE GRADE. ONLY THE FRONT FACE OF THE UNITS SHOULD BE VISIBLE FROM THE SIDE OF THE WALL.
7. CONVEX AND CONCAVE CURVES SHOULD BE MADE USING COMPAC UNITS OR BY TRIMMING THE STANDARD II UNITS AS REQUIRED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
8. CAP UNITS SHOULD BE INSTALLED AND BONDED WITH CONSTRUCTION ADHESIVE OR EPOXY CEMENT AS REQUIRED BY MANUFACTURER.
9. CONTRACTOR SHOULD PROVIDE POSITIVE DRAINAGE FOR THE BACK OF THE RETAINING WALL DURING CONSTRUCTION.

E. GEOGRID INSTALLATION

1. ALL UTILITIES IN THE VICINITY OF ANY RETAINING WALL OR GEOGRID REINFORCEMENT MUST BE INSTALLED AND PROPERLY BACKFILLED PRIOR TO PLACING THE GEOGRID SOIL REINFORCEMENT OR CONSTRUCTING THE WALL.
2. THE GEOGRID SOIL REINFORCEMENT SHOULD BE LAID HORIZONTALLY ON COMPACTED BACKFILL, CONNECTED TO THE CONCRETE WALL UNITS. HOOK GRID OVER THE FIBERGLASS CONNECTING PIN, PULL TAUT, AND ANCHOR BEFORE BACKFILL IS PLACED ON THE GEOGRID.
3. SLACK IN THE GEOGRID AT THE WALL UNIT CONNECTIONS SHOULD BE REMOVED IN A MANNER, AND TO SUCH A DEGREE, AS APPROVED BY THE ENGINEER.
4. GEOGRID SHOULD BE LAID AT THE PROPER ELEVATION AND ORIENTATION AS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE ENGINEER.
5. CORRECT ORIENTATION (ROLL DIRECTION) OF THE GEOGRID SHOULD BE VERIFIED BY THE CONTRACTOR.
6. GEOGRID SHOULD BE SECURED IN-PLACE WITH STAPLES, PINS, SAND BAGS, OR BACKFILL AS REQUIRED BY FILL PROPERTIES, FILL PLACEMENT PROCEDURES, OR WEATHER CONDITIONS, OR AS DIRECTED BY THE ENGINEER.
7. OVERLAPS.
   a. UNIAXIAL GEOGRID DOES NOT NEED TO BE OVERLAPPED IN THE ACROSS THE ROLL DIRECTION, EXCEPT TO CONTAIN THE FILL AT THE SLOPE FACE WHEN WRAP-AROUND FACING IS USED. UNIAXIAL GRID SHOULD BE OVERLAPPED 48" IN THE ROLLED DIRECTION.
   b. A LAYER OF SOIL A MINIMUM OF 4 INCHES IN THICKNESS SHOULD BE SPREAD BETWEEN UNIAXIAL GEOGRID LAYERS IN THE AREA TO BE OVERLAPPED, OR AS DIRECTED.

F. FILL PLACEMENT

1. WALL BACKFILL MATERIAL SHOULD BE PLACED IN NO MORE THAN 8-INCH LIFTS AND COMPACTED TO 95 PERCENT OF THE STANDARD PROCTOR (ASTM D-698).
2. BACKFILL SHOULD BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF WRINKLES IN AND/OR MOVEMENT OF THE GEOGRID.
3. ONLY HAND-OPERATED COMPACTION EQUIPMENT SHOULD BE ALLOWED WITHIN 4 FEET OF THE WALL FACE.
4. BACKFILL SHOULD BE PLACED FROM THE WALL OUTWARD TO INSURE THAT THE GEOGRID REMAINS TAUT.
5. TRACKED CONSTRUCTION EQUIPMENT SHOULD NOT BE OPERATED BEHIND OR ABOVE THE WALL.
6. RUBBER-TIRED EQUIPMENT MAY PASS OVER THE GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHOULD BE AVOIDED.
7. PLACE FILTER FABRIC BETWEEN THE UNIT CORE FILL AND THE REINFORCED BACKFILL AS SHOWN ON PLANS. THE FILTER FABRIC SHOULD BE EMBEDDED A MINIMUM OF TWO FEET INTO THE REINFORCED FILL.
8. THE FINISHED SLOPING SURFACE ON THE TOE SIDE OF RETAINING WALLS SHOULD BE PROTECTED BY INSTALLING THE PERMANENT EROSION CONTROL BLANKET AND LOAMING AND SEEDING IN ACCORDANCE WITH PROJECT REQUIREMENTS.

G. DRAINAGE

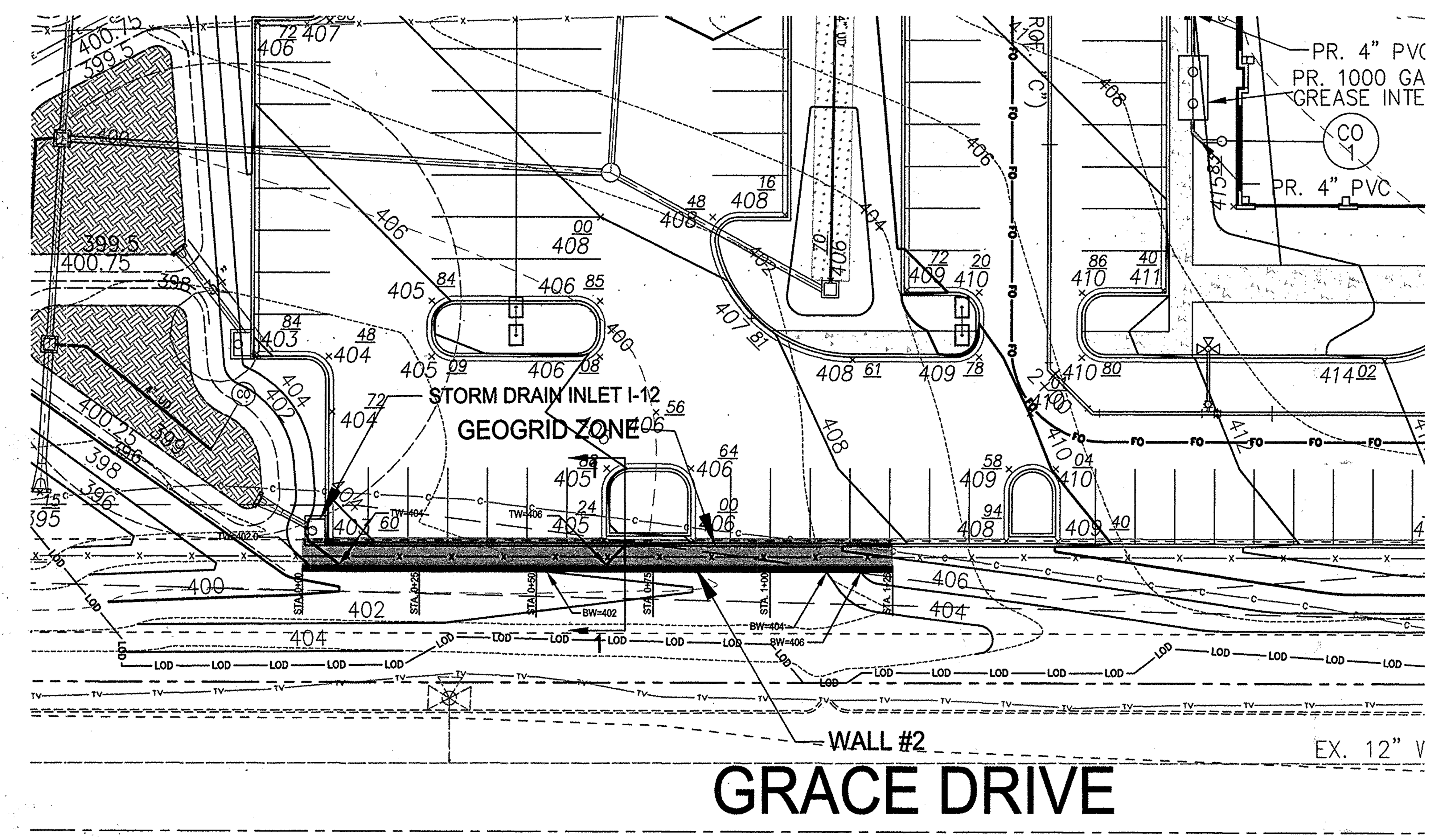
1. DRAINAGE FILL SHOULD BE PLACED BEHIND THE WALL TO THE LIMITS SHOWN. THE DRAINAGE FILL SHOULD BE A MINIMUM OF 12-INCHES THICK. THE DRAINAGE FILL SHOULD BE ASTM #57 STONE. THE DRAINAGE FILL SHOULD BE WRAPPED IN FILTER FABRIC (MIRAFI 140N OR EQUAL) AS SHOWN ON THE DRAWINGS.
2. POSITIVE DRAINAGE SHOULD BE MAINTAINED DURING AND AFTER CONSTRUCTION. SOILS WITHIN THE REINFORCED ZONE THAT BECOME WET DURING CONSTRUCTION SHOULD BE DRIED TO OPTIMUM MOISTURE OR REMOVED.
3. INSTALL THE PERFORATED DRAINAGE PIPES AND LATERAL DRAINAGE PIPES INCREMENTALLY ALONG WITH THE INSTALLATION OF CONCRETE UNITS AND PLACEMENT OF FILL.

PART 4 - CONSTRUCTION OBSERVATION AND TESTING

A. RETAINING WALLS SHOULD ONLY BE CONSTRUCTED UNDER THE OBSERVATION OF A REGISTERED PROFESSIONAL ENGINEER AND A CERTIFIED (NICET, WACEL, OR EQUIVALENT) SOILS TECHNICIAN.
B. THE REQUIRED BEARING PRESSURE BENEATH THE FOOTING OF THE WALL SHOULD BE VERIFIED IN THE FIELD BY A CERTIFIED SOILS TECHNICIAN. TESTING DOCUMENTATION MUST BE PROVIDED TO THE GEOTECHNICAL ENGINEER PRIOR TO THE START OF WALL CONSTRUCTION. THE REQUIRED TEST PROCEDURE SHALL BE THE DYNAMIC CONE PENETROMETER (DCP) TEST ASTM STP-399.
C. THE SUITABILITY OF FILL MATERIAL SHOULD BE CONFIRMED BY THE ON-SITE SOILS TECHNICIAN.

PART 5 - DESIGN CRITERIA

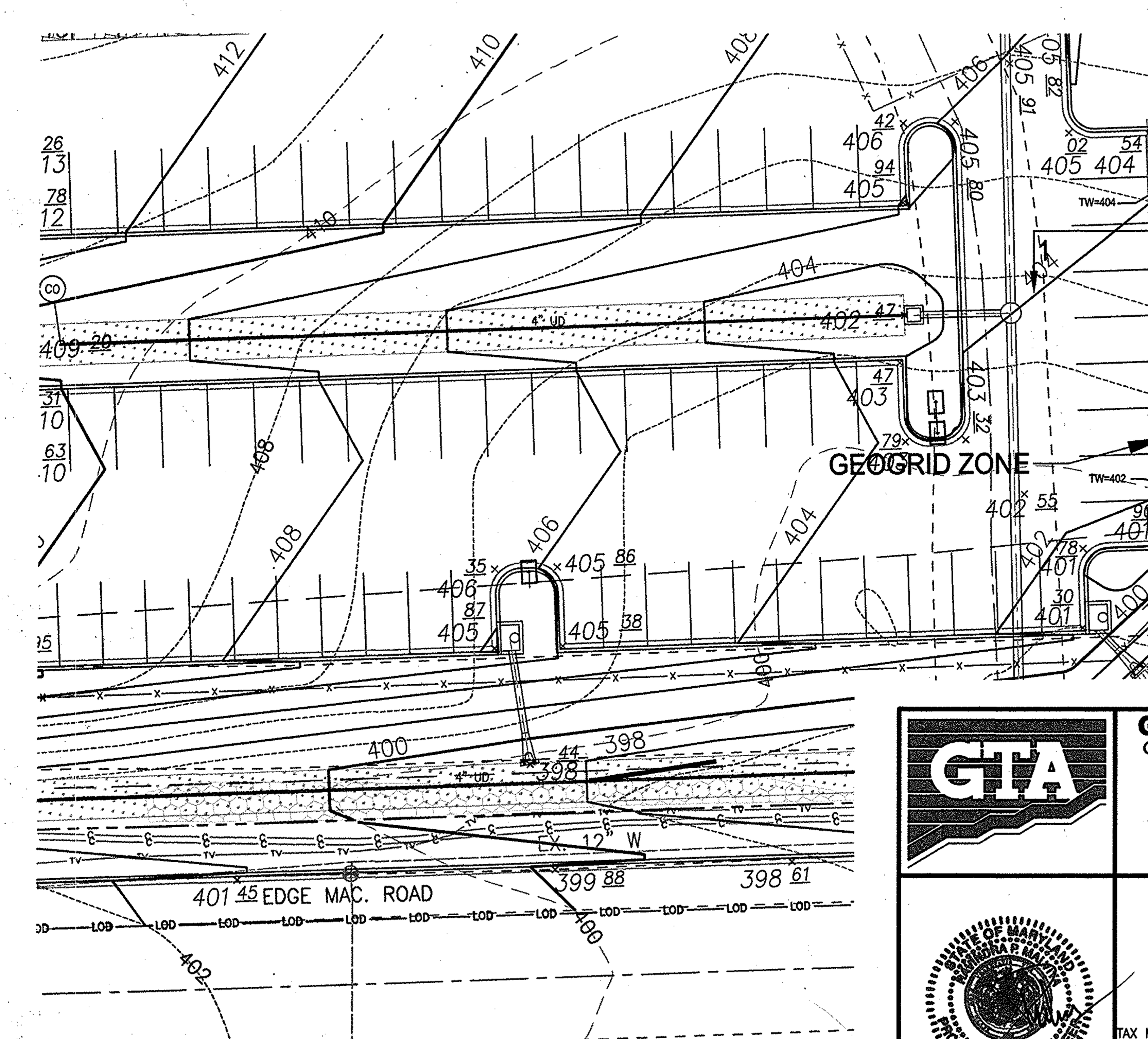
1. REQUIRED MINIMUM ALLOWABLE FOUNDATION BEARING PRESSURE IS 2,000 PSF.
2. DESIGN INTERNAL FRICTION ANGLE FOR REINFORCED SOIL = 30 DEGREES.
3. DESIGN MOIST UNIT WEIGHT FOR REINFORCED SOIL = 120 PCF.
4. FOUNDATION AND RETAINED SOIL INTERNAL FRICTION ANGLE = 28 DEGREES AND COHESION = 0 PSF.
5. FOUNDATION AND RETAINED SOIL DESIGN MOIST UNIT WEIGHT = 120 PCF.
6. RETAINING WALLS ARE NOT DESIGNED TO RESIST HYDROSTATIC PRESSURE.



RETAINING WALL #2 LOCATION PLAN

SCALE: 1" = 20'

LOCATION PLAN WAS ADAPTED FROM ELECTRONIC COPIES OF THE SITE PLAN, PROVIDED BY MORRIS & RITCHIE ASSOCIATES, INC., ON DECEMBER 5, 2011.



RETAINING WALL #1 LOCATION PLAN

SCALE: 1" = 20'

LOCATION PLAN WAS ADAPTED FROM ELECTRONIC COPIES OF THE SITE PLAN, PROVIDED BY MORRIS & RITCHIE ASSOCIATES, INC., ON DECEMBER 5, 2011.

SDP-41

RW-1

GEO-TECHNOLOGY ASSOCIATES, INC.
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GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN
PROPOSED RETAINING WALLS
PLAN AND GENERAL NOTES

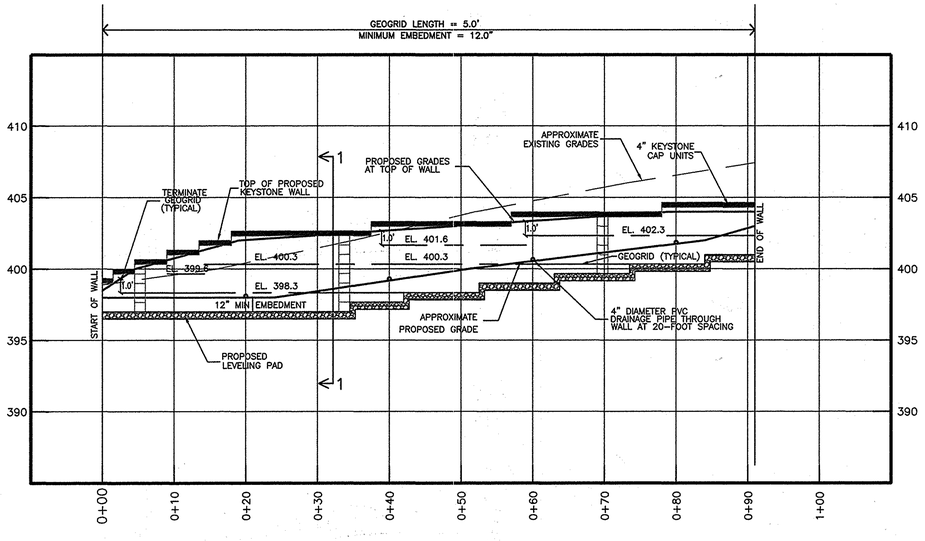
TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

STATE OF MARYLAND ~ PROFESSIONAL ENGINEER ~ 24495

MD PROFESSIONAL CERTIFICATION:

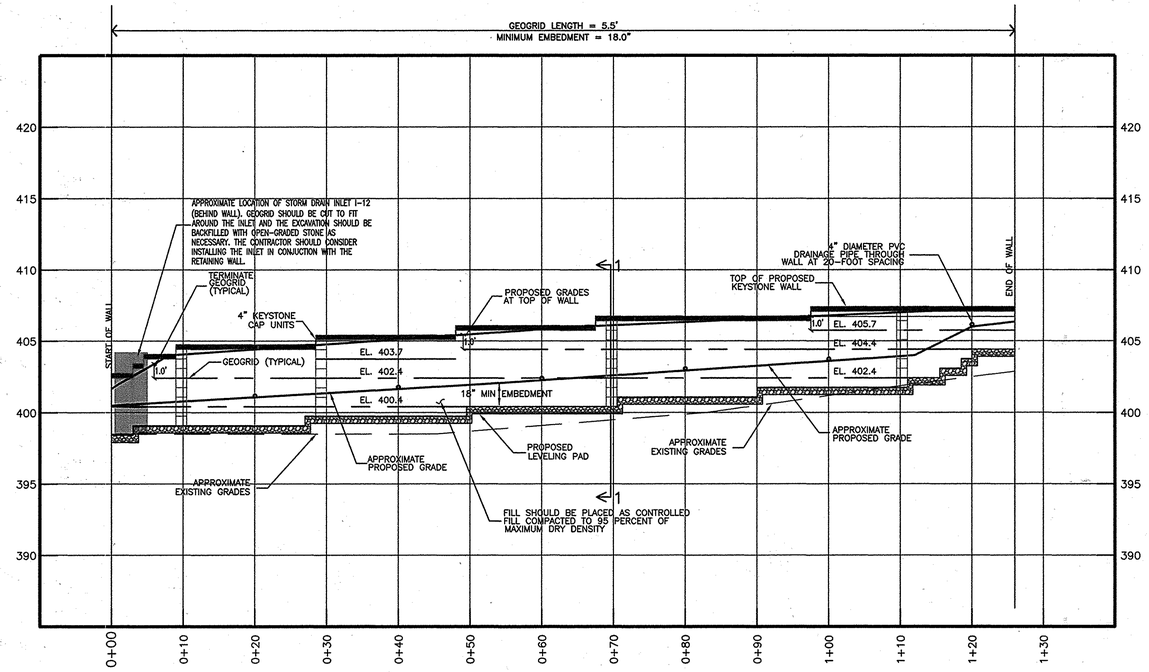
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 24495, EXPIRATION DATE: 10/30/13.

DATE	REVISIONS	
		JOB NO.: 080972.1
		SCALE: AS SHOWN
		DATE: 12/7/11
		DRAWN BY: JE
		DESIGN BY: ADM/BTD
		REVIEW BY: RPM
		SHEET: 41 OF 46



RETAINING WALL #1 PROFILE

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 5'



RETAINING WALL #2 PROFILE

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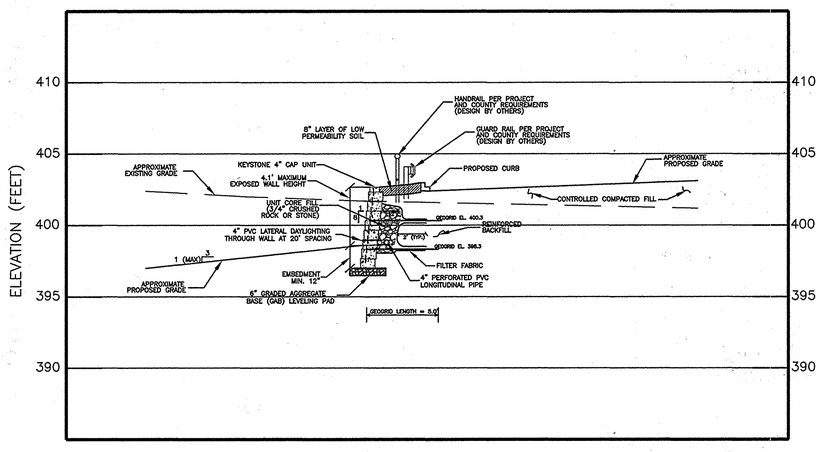
VERTICAL SCALE: 1" = 5'



RETAINING WALL #1 – SECTION 1 (APPROXIMATE STATION 0+32)

HORIZONTAL SCALE: 1" = 5'
VERTICAL SCALE: 1" = 5'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/29/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/19/12

SDP-42
RW-2

GEO-TECHNOLOGY ASSOCIATES, INC.
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STATE OF MARYLAND — ROBERT P. MOORE — 24495 — PROFESSIONAL ENGINEER

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN
PROPOSED RETAINING WALLS
WALLS #1 AND #2
PROFILES AND WALL #1 TYPICAL SECTION

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044–4098 ~ HOWARD COUNTY

MD PROFESSIONAL CERTIFICATION:

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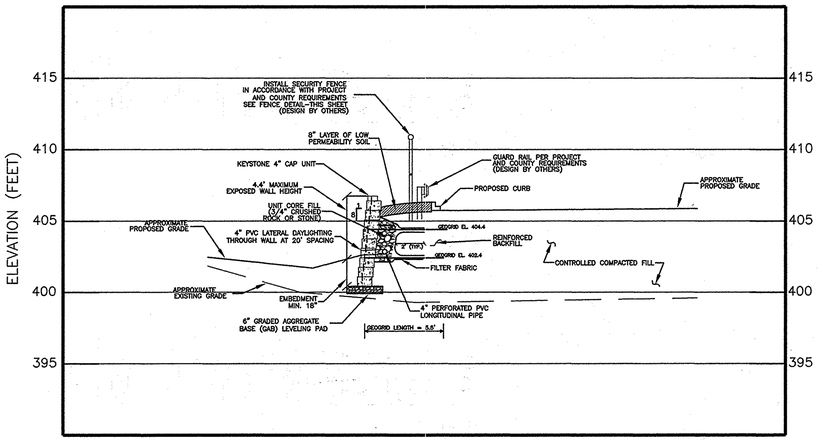


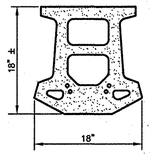
RETAINING WALL #2 – SECTION 1 (APPROXIMATE STATION 0+69)

HORIZONTAL SCALE: 1" = 5'
VERTICAL SCALE: 1" = 5'

STANDARD II ELEVATION

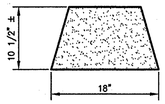
CAP UNIT ELEVATION

CAP UNIT ELEVATION



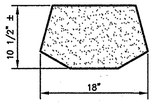
STANDARD II PLAN

STANDARD II UNIT



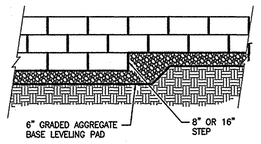
CAP UNIT PLAN

UNIVERSAL CAP UNIT OPTION



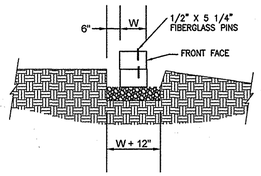
CAP UNIT PLAN

3-PLANE SPLIT CAP UNIT OPTION



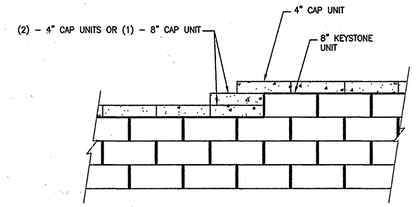
Elevation

Note:
1. The leveling pad is to be constructed of graded aggregate base.



Section

Leveling Pad Detail



Note:
1. Secure all cap units with Keystone Kapseal or equal.

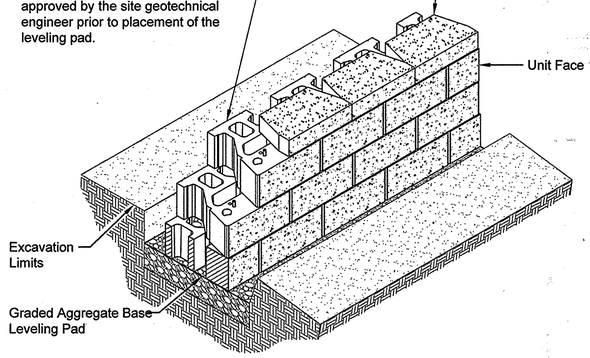
Top of Wall Steps

Base Leveling Pad Notes:

1. The leveling pad is to be constructed of Graded Aggregate Base.
2. The base foundation is to be approved by the site geotechnical engineer prior to placement of the leveling pad.

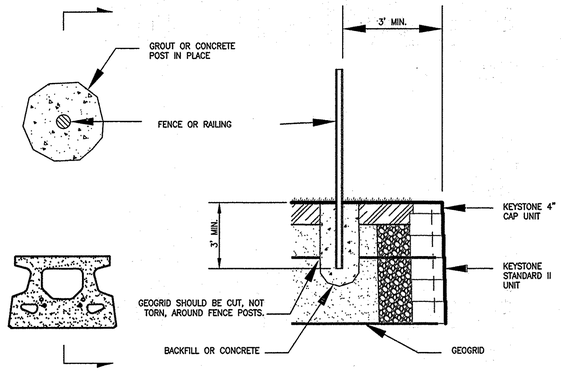
Standard Unit	
Width:	18"
Depth:	18"
Height:	8"
Weight:	108 lbs

Cap Unit	
Width:	18"
Depth:	10 1/2"
Height:	4"
Weight:	50 lbs



Standard Unit/Base Pad Isometric Section View

NOT TO SCALE



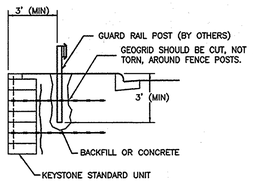
Fence Plan Detail

Rail/Fence Typical Detail

NOTE: Fence should be layed out to block entry to the top of the wall from both ends.

Fence Section Detail

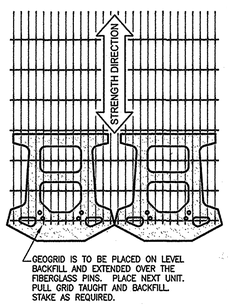
Standard II Unit - 1" Setback



TYPICAL GUARD RAIL DETAIL

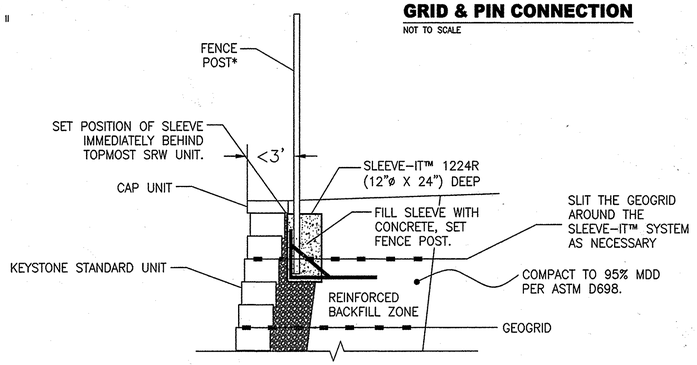
APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/16/12 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT	11/09/12 DATE



GRID & PIN CONNECTION

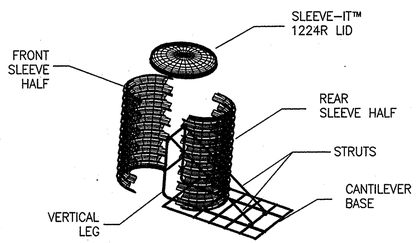
NOT TO SCALE



*FENCING SYSTEMS APPROVED FOR USE WITH THE SLEEVE–IT™ 1224R ARE LIMITED TO THE FOLLOWING HEIGHTS: CHAIN LINK – UP TO 8–FT, PRIVACY – UP TO 6–FT (WOODEN, PVC, METAL). POST SIZE 4"X4" MAX.

ALTERNATE FENCE DETAIL

NOT TO SCALE



SDP-43
RW-3

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENIVRONMENTAL CONSULTANTS
14280 PARK CENTER DRIVE, SUITE: A
LAUREL, MARYLAND 20707
(410) 792-9792 OR (301) 776-1690
FAX: (410) 792-7395
WWW.MRAGTA.COM

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN
PROPOSED RETAINING WALLS
RETAINING WALL #2 TYPICAL SECTION AND TYPICAL DETAILS

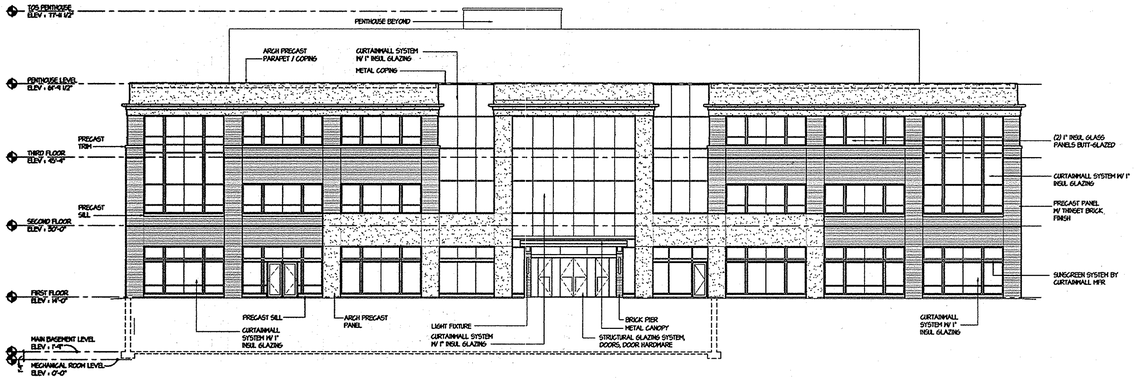
TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044–4098 ~ HOWARD COUNTY

STATE OF MARYLAND — STEPHEN RAY PRICE — 24495 — PROFESSIONAL ENGINEER

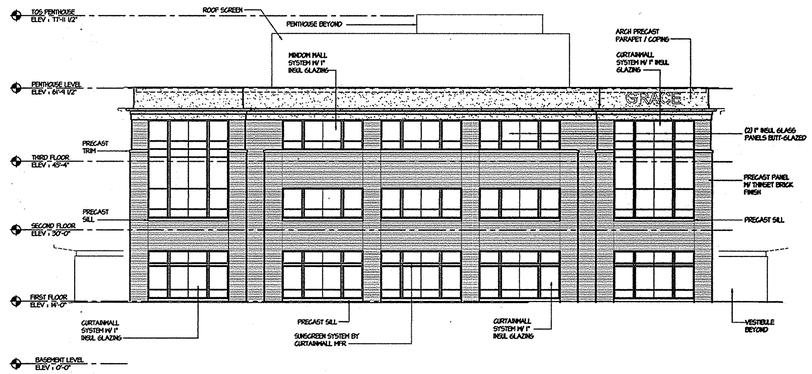
MD PROFESSIONAL CERTIFICATION:

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. 24495, EXPIRATION DATE: 10/30/13.

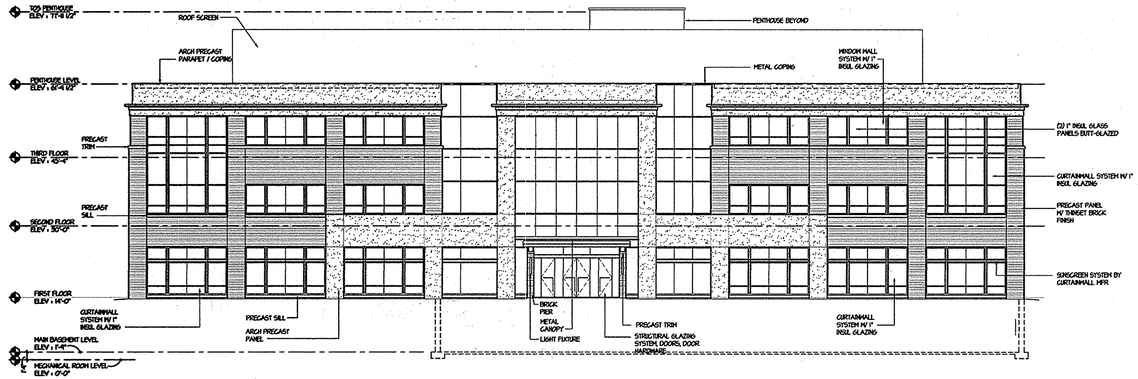
DATE	REVISIONS	JOB NO.: 080972.1
		SCALE: AS SHOWN
		DATE: 12/7/11
		DRAWN BY: JE
		DESIGN BY: ADM/BTD
		REVIEW BY: RPM
		SHEET: 43 OF 46



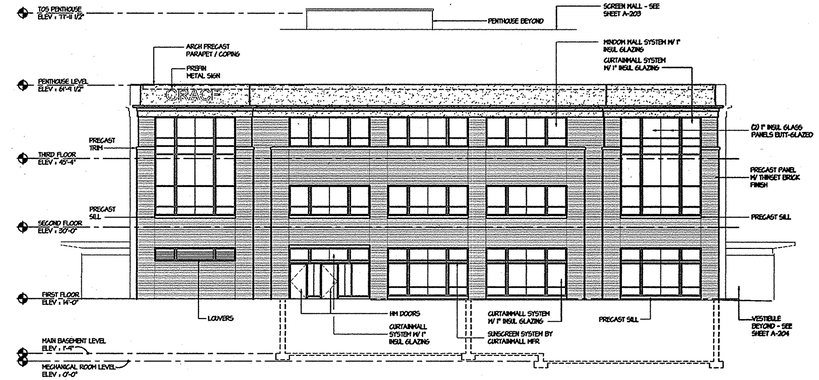
NORTHEAST BUILDING ELEVATION



NORTHWEST BUILDING ELEVATION



SOUTHWEST BUILDING ELEVATION



SOUTHEAST BUILDING ELEVATION

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	11/29/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/14/12 DATE
CHIEF, DIVISION & LAND DEVELOPMENT	11/19/12 DATE

OWNER / APPLICANT / DEVELOPER:

ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

STATE OF MARYLAND — THOMAS C. NEUGHAUS — 29203 — PROFESSIONAL ENGINEER — 10-17-12

SHEET: SDP-44

MRA

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE
LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395

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GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

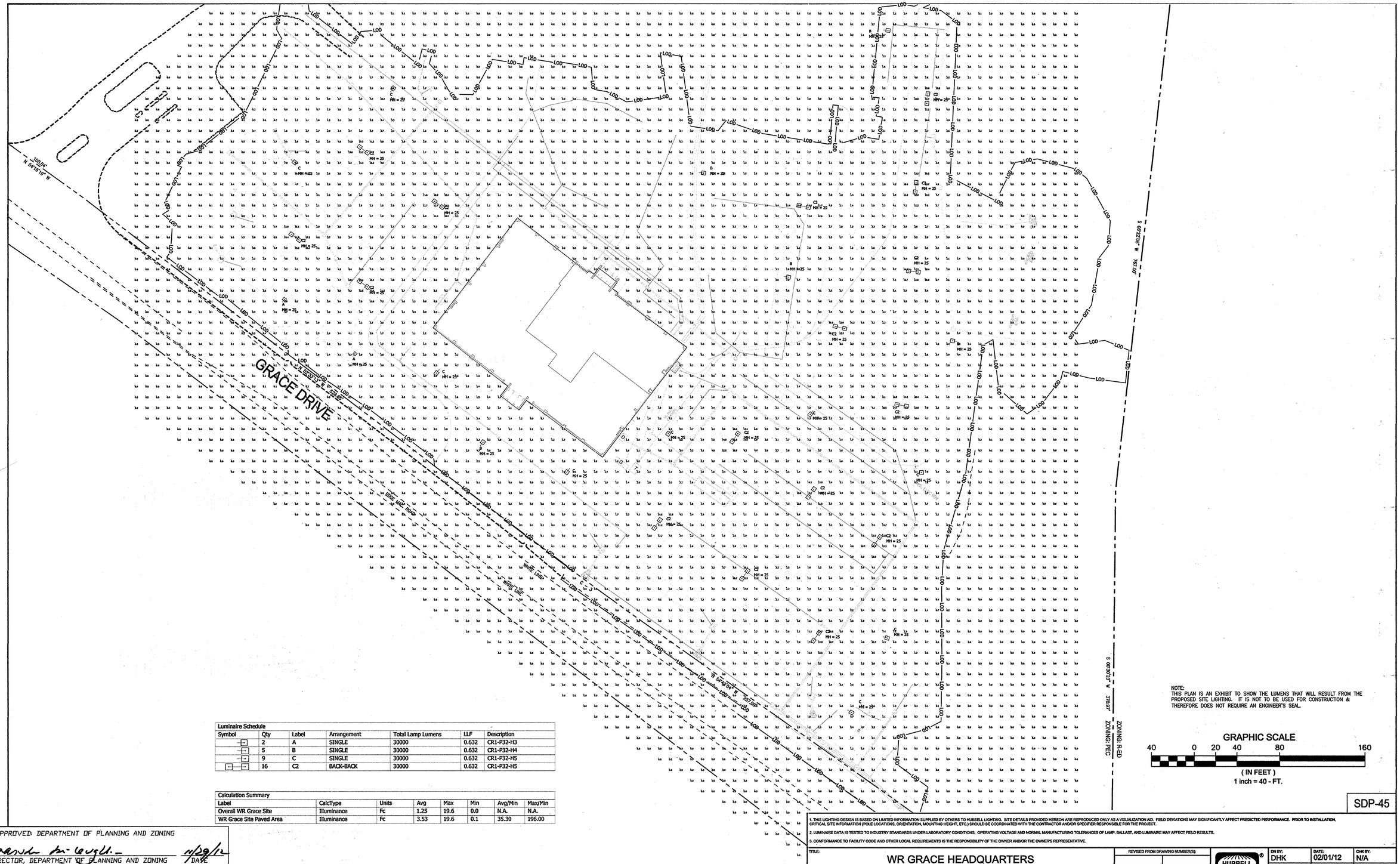
BUILDING ELEVATIONS

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS	JOB NO.: 12039
		SCALE: 1/16"=1'-0"
		DATE: 10/16/2012
		DRAWN BY: RAH
		DESIGN BY: MK
		REVIEW BY: TCN
		SHEET: 44 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-44-BLDG ELEV.dwg, 10/17/2012 10:20:15 AM, RHall
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.



Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	2	A	SINGLE	30000	0.632	CR1-P32-H3
	5	B	SINGLE	30000	0.632	CR1-P32-H4
	9	C	SINGLE	30000	0.632	CR1-P32-H5
	16	C2	BACK-BACK	30000	0.632	CR1-P32-H5

Calculation Summary								
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Overall WR Grace Site	Illuminance	Fc	1.25	19.6	0.0	N.A.	N.A.
WR Grace Site Paved Area	Illuminance	Fc	3.53	19.6	0.1	35.30	196.00

NOTE:
THIS PLAN IS AN EXHIBIT TO SHOW THE LUMENS THAT WILL RESULT FROM THE PROPOSED SITE LIGHTING. IT IS NOT TO BE USED FOR CONSTRUCTION & THEREFORE DOES NOT REQUIRE AN ENGINEER'S SEAL.

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 - FT.

SDP-45

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING — DATE 11/29/12

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/14/12

CHIEF, DIVISION & LAND DEVELOPMENT — DATE 11/19/12

1. THIS LIGHTING DESIGN IS BASED ON LIMITED INFORMATION SUPPLIED BY OTHERS TO HUBBELL LIGHTING. SITE DETAILS PROVIDED HEREON ARE REPRODUCED ONLY AS A VISUALIZATION AID. FIELD DEVIATIONS MAY SIGNIFICANTLY AFFECT PREDICTED PERFORMANCE. PRIOR TO INSTALLATION, CRITICAL SITE INFORMATION (POLE LOCATIONS, ORIENTATION, MOUNTING HEIGHT, ETC.) SHOULD BE COORDINATED WITH THE CONTRACTOR AND/OR SPECIFIER RESPONSIBLE FOR THE PROJECT.

2. LUMINAIRE DATA IS TESTED TO INDUSTRY STANDARDS UNDER LABORATORY CONDITIONS. OPERATING VOLTAGE AND NORMAL MANUFACTURING TOLERANCES OF LAMP, BALLAST, AND LUMINAIRE MAY AFFECT FIELD RESULTS.

3. CONFORMANCE TO FACILITY CODE AND OTHER LOCAL REQUIREMENTS IS THE RESPONSIBILITY OF THE OWNER AND/OR THE OWNER'S REPRESENTATIVE.

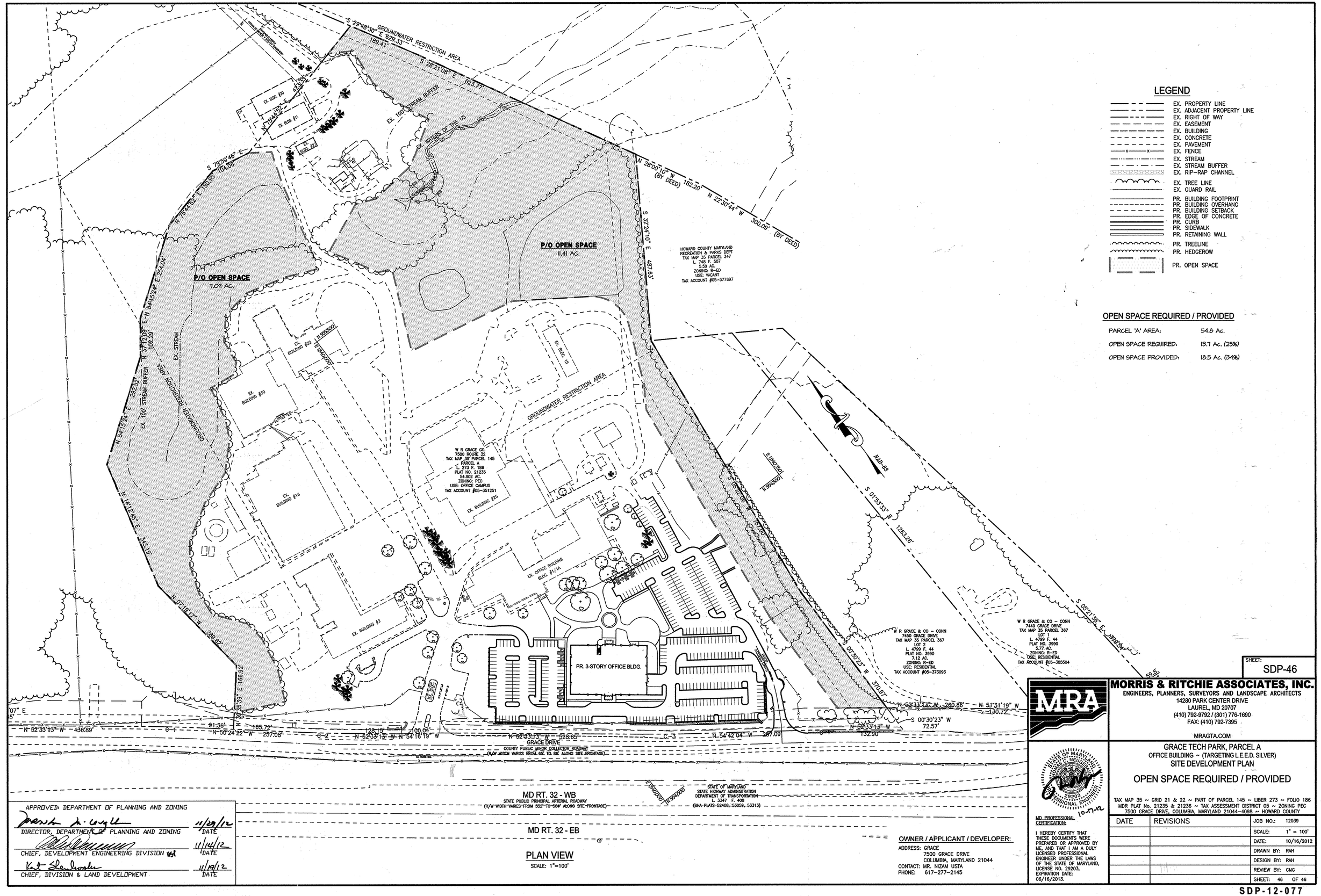
TITLE:

WR GRACE HEADQUARTERS
PARKING LOT LIGHTING
LED OPTION

REVISED FROM DRAWING NUMBER(S):

HUBBELL®
Hubbell Lighting, Inc.
701 MILLENNIUM BLVD.
GREENVILLE, SC 29607

DN BY: DHK	DATE: 02/01/12	CHK BY: N/A
REV. BY:	DATE:	SCALE: AS NOTED
QUOTE: N/A	DRAWING / DESIGN NO.: 1257326C	



LEGEND

- EX. PROPERTY LINE
- EX. ADJACENT PROPERTY LINE
- EX. RIGHT OF WAY
- EX. EASEMENT
- EX. BUILDING
- EX. CONCRETE
- EX. PAVEMENT
- EX. FENCE
- EX. STREAM
- EX. STREAM BUFFER
- EX. RIP-RAP CHANNEL
- EX. TREE LINE
- EX. GUARD RAIL
- PR. BUILDING FOOTPRINT
- PR. BUILDING OVERHANG
- PR. BUILDING SETBACK
- PR. EDGE OF CONCRETE
- PR. CURB
- PR. SIDEWALK
- PR. RETAINING WALL
- PR. TREELINE
- PR. HEDGEROW
- PR. OPEN SPACE

OPEN SPACE REQUIRED / PROVIDED

PARCEL 'A' AREA:	54.8 Ac.
OPEN SPACE REQUIRED:	13.7 Ac. (25%)
OPEN SPACE PROVIDED:	18.5 Ac. (34%)

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING AND ZONING	DATE 11/29/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 11/14/12
CHIEF, DIVISION & LAND DEVELOPMENT	DATE 11/9/12

OWNER / APPLICANT / DEVELOPER:
ADDRESS: GRACE
7500 GRACE DRIVE
COLUMBIA, MARYLAND 21044
CONTACT: MR. NIZAM USTA
PHONE: 617-277-2145

MD 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. 29203, EXPIRATION DATE: 06/16/2013.

STATE OF MARYLAND · RICHARD A. HOOKS JR. · 29203 · PROFESSIONAL ENGINEER · 10-17-12

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
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LAUREL, MD 20707
(410) 792-9792 / (301) 776-1690
FAX: (410) 792-7395
MRAGTA.COM

SHEET: SDP-46

GRACE TECH PARK, PARCEL A
OFFICE BUILDING ~ (TARGETING L.E.E.D. SILVER)
SITE DEVELOPMENT PLAN

OPEN SPACE REQUIRED / PROVIDED

TAX MAP 35 ~ GRID 21 & 22 ~ PART OF PARCEL 145 ~ LIBER 273 ~ FOLIO 186
MDR PLAT No. 21235 & 21236 ~ TAX ASSESSMENT DISTRICT 05 ~ ZONING PEC
7500 GRACE DRIVE, COLUMBIA, MARYLAND 21044-4098 ~ HOWARD COUNTY

DATE	REVISIONS		
		JOB NO.:	12039
		SCALE:	1" = 100'
		DATE:	10/16/2012
		DRAWN BY:	RAH
		DESIGN BY:	RAH
		REVIEW BY:	CMG
		SHEET:	46 OF 46

SDP-12-077

P:\PROJ\12039 GRACE\PLANS\LDE\SDP\PLOT\Plan Sets\12039-SDP-46-OPENSPACE.dwg, 10/17/2012 10:21:24 AM, RHall,
1:1, Copyright 2012 Morris & Ritchie Associates, Inc.