

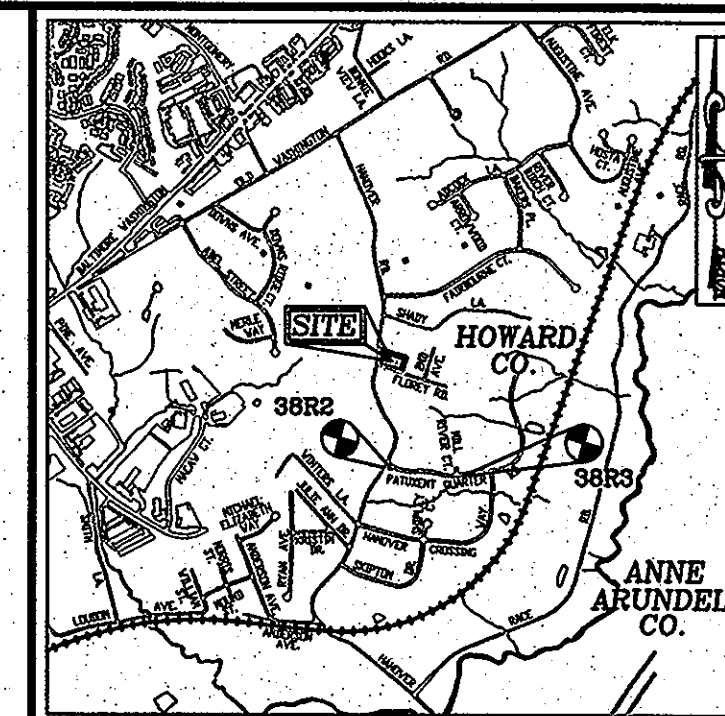
**GENERAL NOTES**

- 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 START OF WORK.
- THE CONTRACTOR IS TO NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE DAYS BEFORE STARTING WORK ON THESE DRAWINGS:
  - MISS UTILITY 1-800-257-7777
  - BELL ATLANTIC TELEPHONE CO. 725-9976
  - HOWARD COUNTY BUREAU OF UTILITIES: 313-2366
  - VERIZON CABLE LOCATION DIVISION: 393-3553
  - B.G.&E. CO. CONTRACTOR SERVICES: 850-4820
  - B.G.&E. CO. UNDERGROUND DAMAGE CONTROL: 757-4620
  - STATE HIGHWAY ADMINISTRATION: 531-5533
- THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON A TOPOGRAPHIC SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED AUGUST 18, 2010. OFFSITE TOPOGRAPHY FROM HOWARD COUNTY GIS.
- THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED AUGUST 18, 2010.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 38R2 AND 38R3 WERE USED FOR THIS PROJECT.
- EXISTING UTILITIES LOCATED FROM TOPOGRAPHIC SURVEY AND AS-BUILT DRAWINGS. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE.
- ANY DAMAGE TO PUBLIC RIGHT-OF-WAY, PAVING, OR EXISTING UTILITIES WILL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
- FOR DRIVEWAY ENTRANCE DETAILS REFER TO THE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD DETAIL R-6.03.
- THE SUBJECT PROPERTY IS ZONED "R-12" IN ACCORDANCE WITH THE 2/2/04 COMPREHENSIVE ZONING PLAN AND THE COMP. LITE ZONING REGULATIONS EFFECTIVE ON COMPREHENSIVE ZONING PLAN AND THE COMP. LITE ZONING REGULATIONS EFFECTIVE ON 7/28/06, AND IS SUBJECT TO THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/2/03 PER COUNCIL BILL 75-2003.
- IN ACCORDANCE WITH SECTION 128 OF THE HOWARD COUNTY ZONING REGULATIONS, BAY WINDOWS, CHIMNEYS, OR EXTERIOR STAIRWAYS NOT MORE THAN 16 FEET IN WIDTH MAY PROJECT NOT MORE THAN 4 FEET INTO ANY SETBACKS, PORCHES OR DECKS, OPEN OR ENCLOSED MAY PROJECT NOT MORE THAN 10 FEET INTO THE FRONT OR REAR YARD SETBACK.
- 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.
- DRIVEWAYS SHALL BE PROVIDED PRIOR TO ISSUANCE OF A USE AND OCCUPANCY PERMIT FOR ANY NEW DWELLINGS TO INSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
  - A) WIDTH - 12' (16' IF SERVING MORE THAN ONE RESIDENCE);
  - B) SURFACE - 6" OF COMPACTED CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-1/2" MIN.);
  - C) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE, AND MINIMUM 45' TURNING RADIUS;
  - D) STRUCTURES (CULVERTS / BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOADING);
  - E) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100-YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY SURFACE;
  - F) MAINTENANCE - SUFFICIENT TO INSURE ALL WEATHER USE.
- NO WETLANDS OR STREAMS ARE LOCATED ONSITE. NO FLOODPLAIN IS LOCATED ONSITE.
- NO STEEP SLOPES OVER 20,000 SF CONTIGUOUS ARE LOCATED ONSITE.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL/CEMETERY LOCATIONS ON SITE.
- THIS PROJECT IS EXEMPT FROM THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION BECAUSE THE THREE LOTS HAVE A COMBINED AREA OF 39,522 SQUARE FEET WHICH IS BELOW THE 40,000 REQUIREMENT THRESHOLD.
- WATER AND SEWER HOUSE CONNECTION LOCATIONS DETERMINED BY BUREAU OF UTILITIES AUGUST 31, 2010.
- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL. A FINANCIAL SURETY IN THE AMOUNT OF \$4,800.00 FOR THE REQUIRED 12 SHADE TREES AND 8 EVERGREEN TREES SHALL BE POSTED WITH THE DEVELOPERS AGREEMENT FOR THIS PLAN.

# ENVIRONMENTAL CONCEPT PLAN

## NORTH STAR

6080 FLOREY ROAD  
LOTS 1, 2, & 11  
PLAT OF "HENRY W. FLOREY"  
L. 3401 / F. 293  
HOWARD COUNTY, MARYLAND



**VICINITY MAP**

SCALE: 1"=2000'  
ADC MAP COORDINATE: PG. 4937 EB & E9

**BENCHMARKS**

HOWARD COUNTY BENCHMARK - 38R2 (3/4" IRON ROD)  
N 557,500.66 E 1,391,227.05 ELEV. 168.79  
LOCATION: SOUTHEAST CORNER OF PATUXENT QUARTER ROAD AND HANOVER ROAD.

HOWARD COUNTY BENCHMARK - 38R3 (3/4" IRON ROD)  
N 557,417.82 E 1,391,983.18 ELEV. 124.95  
LOCATION: SOUTH SIDE OF PATUXENT QUARTER ROAD, 65' EAST OF THE CL FOR MILL RIVER COURT.

**LEGEND**

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- PROP. VARIABLE WIDTH PRIVATE SEWER & WATER CONNECTION EASEMENT

**PERMIT INFORMATION CHART**

|                  |                |   |
|------------------|----------------|---|
| SUBDIVISION NAME | SECTION / AREA | LOT / PARCEL                              |
| NORTH STAR       | -              | LOTS 1, 2, & 11 / PARCEL 243              |
| PLAT REF.        | BLOCK NO       | ZONE / TAX MAP / ELECT DIST. / CENSUS TR. |
| PLAT 1/92        | 15             | R-12 / 38 / 1ST / -                       |

**SHEET INDEX**

| DESCRIPTION  | SHEET NO. |
|--------------|-----------|
| COVER SHEET  | 1 OF 3    |
| LAYOUT       | 2 OF 3    |
| DETAIL SHEET | 3 OF 3    |

**ENVIRONMENTAL CONCEPT PLAN AND SITE DEVELOPMENT PLAN  
STORMWATER MANAGEMENT PLAN**

**INTRODUCTION**

The North Star site development plan consists of three previously created lots (total 0.91 acres) located in the Elkridge community in Howard County, Maryland. The lots are located at the northeast quadrant of the Florey Road and Hanover Road intersection. The lots currently contain one primary residential structure and one secondary residential structure. The structures are proposed to be removed. The cumulative wooded area of all three lots is less than 40,000 square feet and since all three lots could be addressed independently the project is exempt from forest conservation. The limit of disturbance has been minimized to the greatest extent possible to retain as many existing landscape trees as possible.

Currently the site is maintained lawn and landscape trees. The soils are generally Chillum loam (HSG "B") and Urban Land, Chillum/Beltsville Complex (HSG "C"). The site slopes east towards Hanover Road and south towards Florey Road. There are limited moderate slopes and no steep slopes on the site.

**METHODOLOGY**

The proposed development consists of three new homes, one on each existing lot. The 2000 Maryland Stormwater Design Manual in conjunction with the 2007 Environmental Site Design Chapter 5 addendum has been utilized in the design of the stormwater management system. In addition to the Maryland Department of the Environment, July 2010, Environmental Site Design Process and Computation was implemented.

Rooftop disconnection credit was utilized when the slopes were 5.0% or less. Otherwise the stormwater management has been provided utilizing microbioretention practices. It is noted that Howard County does not accept the new MDE rain garden design and therefore microbioretention has been utilized which can accommodate up to 20,000 square feet.

The computations reflect that the site can successfully mimic "woods in good condition".

Sediment control is provided for the proposed house and driveway construction. Silt fence and stabilized construction entrances are the practices employed to control sediment runoff during construction. Erosion control matting and stabilization are specified accordingly.

**CONCLUSION**

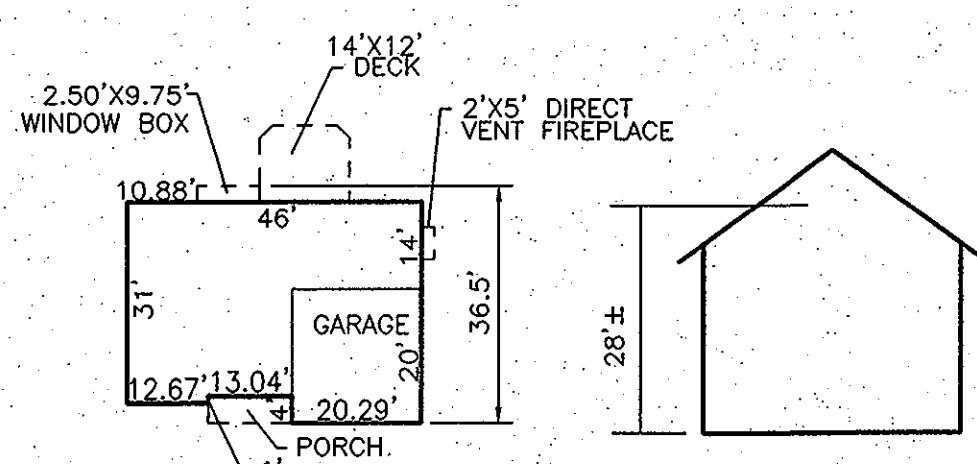
The proposed site development plan fulfills the intent of the current MDE and Howard County requirements through the implementation of rooftop disconnects and microbioretention practices. As developed, the site successfully mimics "woods in good condition".

**COORDINATE TABLE**

| POINT | NORTHING  | EASTING    |
|-------|-----------|------------|
| 701   | 558689.88 | 1391383.29 |
| 702   | 558618.35 | 1391361.05 |
| 703   | 558621.12 | 1391100.15 |
| 704   | 558696.35 | 1391110.83 |
| 951   | 558546.73 | 1391338.97 |
| 955   | 558773.22 | 1391118.25 |

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

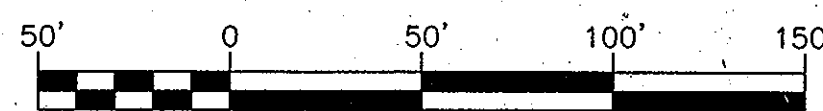
CHIEF, DEVELOPMENT ENGINEERING DIVISION SR DATE 1/6/11  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE 1/05/11



**CYPRESS SPRING HOUSE PLAN**  
1"=30'

**LOCATION MAP**

SCALE: 1"=50'



**SITE ANALYSIS DATA CHART**

- A. TOTAL PROJECT AREA: 39,522 S.F. OR 0.9073 AC.
- B. AREA OF PLAIN SUBMISSION: SAME AS ABOVE
- C. LIMIT OF DISTURBED AREA: 35,897 S.F. OR 0.8241 AC.
- D. PRESENT ZONING DESIGNATION: R-12
- E. PROPOSED USES FOR SITE AND STRUCTURES: RESIDENTIAL SINGLE FAMILY DETACHED HOMES
- F. TOTAL NUMBER OF UNITS ALLOWED: 3
- G. TOTAL NUMBER OF UNITS PROPOSED: 3
- H. DPZ FILE REFERENCES: 1

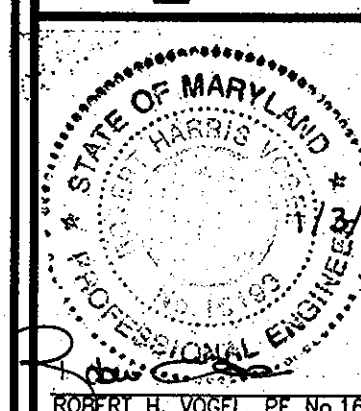
**OWNER**

JOHN C. HALE  
RA'NELL DAVISHALE  
7 MCKIM AVENUE  
BALTIMORE, MD 21212

**DEVELOPER**

MICHAEL L. PFUJ  
3675 PARK AVENUE  
ELICOTT CITY, MD 21043  
PHONE: (410) 480-0023

**ROBERT H. VOGEL ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
8407 MAIN STREET ELICOTT CITY, MD 21043 TEL: 410-461-7666 FAX: 410-461-8961



**PROFESSIONAL CERTIFICATE**  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2012

DESIGN BY: RHV  
DRAWN BY: JMR  
CHECKED BY: RHV  
DATE: DECEMBER 2010  
SCALE: AS SHOWN  
W.O. NO.: 10-23

1 SHEET OF 3



**LEGEND:**

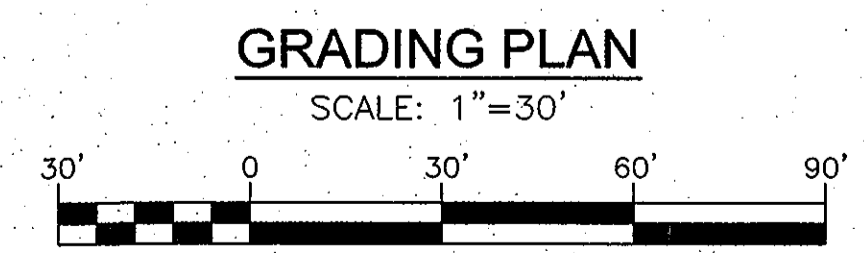
|  |  |
|--|--|
|  | PROPERTY LINE  |
|  | RIGHT-OF-WAY LINE  |
|  | ADJACENT PROPERTY LINE   |
|  | EXISTING CURB AND GUTTER                                       |
|  | EXISTING UTILITY POLE  |
|  | EXISTING LIGHT POLE  |
|  | EXISTING MAILBOX   |
|  | EXISTING SIGN  |
|  | EXISTING SANITARY MANHOLE                                      |
|  | EXISTING SANITARY LINE   |
|  | EXISTING CLEANOUT  |
|  | EXISTING FIRE HYDRANT  |
|  | EXISTING WATER LINE  |
|  | EXISTING 10' CONTOUR   |
|  | EXISTING 2' CONTOUR  |
|  | SOILS  |
|  | EXISTING TREE LINE (FIELD LOCATED)                             |
|  | EXISTING TREES (FIELD LOCATED)                                 |
|  | EXISTING FENCE   |
|  | PROPOSED STORMDRAIN  |
|  | PROPOSED STORMDRAIN INLET                                      |
|  | PROPOSED SIDEWALK  |
|  | PROPOSED TREE LINE   |
|  | PROPOSED CURB  |
|  | PROPOSED STREET LIGHT  |
|  | PROPOSED 10' CONTOUR   |
|  | PROPOSED 2' CONTOUR  |
|  | PROPOSED SPOT ELEVATION  |
|  | PROPOSED STABILIZED CONSTRUCTION ENTRANCE                      |
|  | PROPOSED SILT FENCE  |
|  | PROPOSED SUPER SILT FENCE                                      |
|  | PROPOSED LIMIT OF DISTURBANCE                                  |
|  | PROPOSED TREE PROTECTION FENCE                                 |
|  | PROPOSED EROSION CONTROL MATTING                               |
|  | PROPOSED CURB INLET PROTECTION                                 |
|  | PROPOSED AT-GRADE INLET PROTECTION                             |
|  | PROPOSED EARTH DIKE  |
|  | PROPOSED MODERATE SLOPES                                       |
|  | PROPOSED STEEP SLOPES  |
|  | PROP. VARIABLE WIDTH PRIVATE SEWER & WATER CONNECTION EASEMENT |
|  | PROPOSED ROOF DRAIN AREA                                       |

**SPECIMEN TREE CHART**

| NO.  | SIZE    | COMMON NAME | CONDITION | COMMENTS  |
|------|---------|-------------|-----------|-----------|
| ST-1 | 36" DBH | OAK         | GOOD      | TO REMAIN |
| ST-2 | 36" DBH | BIRCH       | GOOD      | TO REMAIN |

**SOILS LEGEND**

| SYMBOL | DESCRIPTION   | TYPE |
|--------|---|------|
| ChB    | CHILLUM LOAM, 2 TO 5 PERCENT SLOPES                           | B    |
| ChD    | CROOM AND EVESBORO SOILS, 10 TO 15 PERCENT SLOPES             | C    |
| RaD    | RUSSETT FINE SANDY LOAM, 10 TO 15 PERCENT SLOPES              | C    |
| SfB    | SASSAFRAS GRAVELLY SANDY LOAM, 2 TO 5 PERCENT SLOPES          | B    |
| UcD    | URBAN LAND-CHILLUM-BELTSVILLE COMPLEX, 5 TO 15 PERCENT SLOPES | D    |



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*John C. Hale*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION 5/8 DATE 1/6/11

*Walter D. Lewis*  
CHIEF, DIVISION OF LAND DEVELOPMENT 1/05/11 DATE

| NO. | REVISION | DATE |
|-----|----------|------|
|     |          |      |
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|     |          |      |
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**SITE DEVELOPMENT PLAN  
ENVIRONMENTAL CONCEPT PLAN**

**LAYOUT PLAN**  
NORTH STAR  
(SFD RESIDENTIAL)  
6080 FLOREY ROAD  
LOTS 1, 2, & 11  
PLAT OF "HENRY W. FLOREY"  
L. 3401 / F. 293

1ST ELECTION DISTRICT  
TAX MAP: 38, GRID: 15  
DPZ REFS:

PARCEL: 243  
ZONED: R-12  
HOWARD COUNTY, MARYLAND

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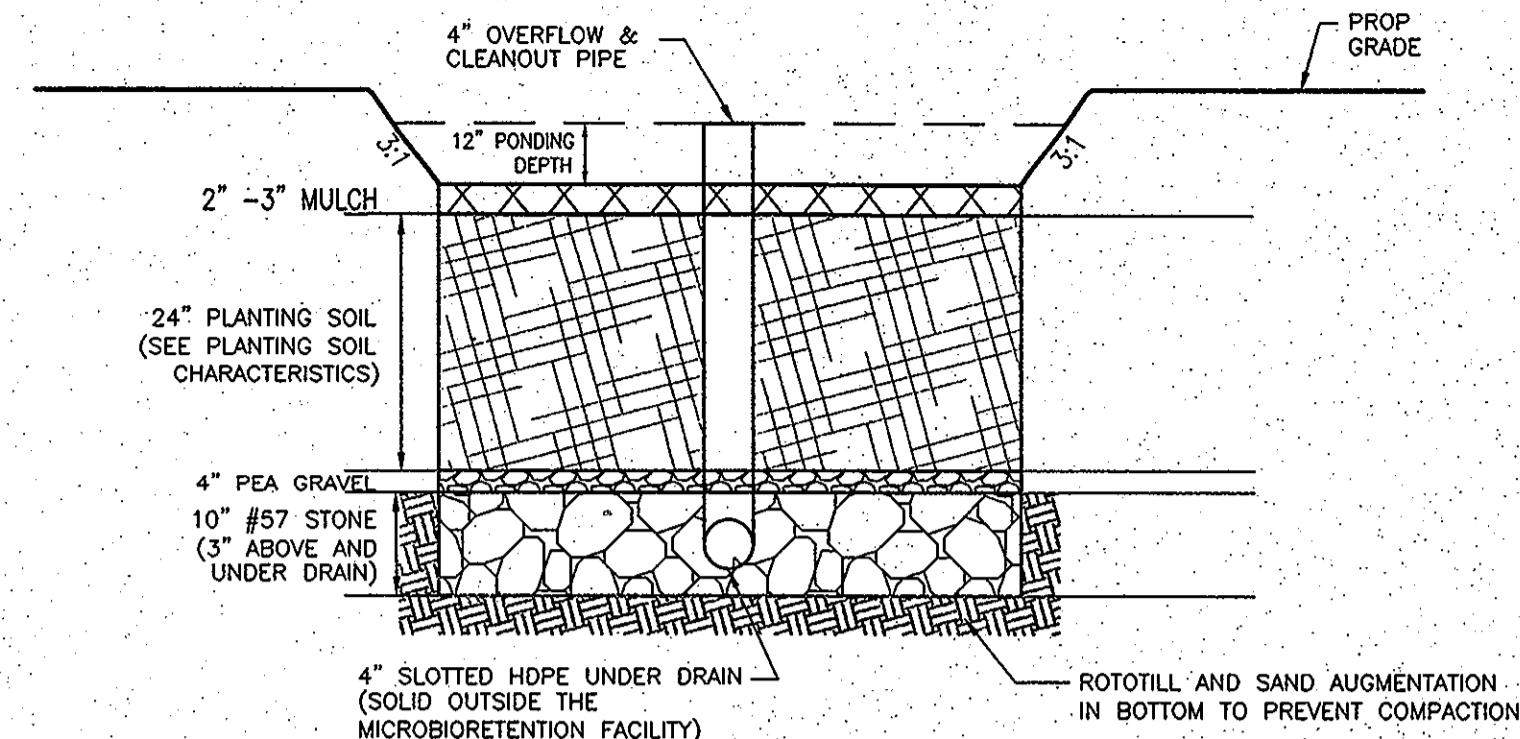
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DESIGN BY: RHV  
DRAWN BY: JMR  
CHECKED BY: RHV  
DATE: DECEMBER 2010  
SCALE: AS SHOWN  
W.O. NO.: 10-23

2 SHEET OF 3

ROBERT H. VOGEL, PE No.16183



**DETAIL - MICROBIORETENTION**  
NOT TO SCALE

**OPERATION AND MAINTENANCE SCHEDULE FOR BIO-RETENTION AREAS**

1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING.
2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, TREATMENT OF ALL DEFICIENT STAKES AND WIRES.
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
4. SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

APPENDIX B.3. CONSTRUCTION SPECIFICATIONS FOR SAND FILTERS, BIORETENTION AND OPEN CHANNELS  
SPECIFICATIONS FOR BIORETENTION

1. MATERIAL SPECIFICATIONS  
THE ALLOWABLE MATERIALS TO BE USED IN BIORETENTION AREA ARE DETAILED IN TABLE B.3.2.

2. 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 COMBINED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE AN OBSTACLE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERBERIS GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 16.06.01.06.  
THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

PH RANGE 6.2 TO 7.0  
ORGANIC MATTER 1.5 - 4 % (BY WEIGHT)  
NITROGEN 18 LB/Ac  
PHOSPHORUS (PHOSPHATE - P) 206 LB/Ac  
POTASSIUM (POTASH - K) 200 LB/Ac  
SOLUBLE SALTS 180 TO EXCEED 500 PPM

ALL BIORETENTION AREAS SHALL HAVE A MINIMUM OF ONE TEST. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, PHOSPHORUS, AND POTASSIUM AND ADDITIONAL TEST OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOP SOIL WAS EXCAVATED.

SINCE DIFFERENT LAB CALIBRATE THEIR TESTING EQUIPMENT DIFFERENTLY, ALL TESTING RESULTS SHALL COME FROM THE SAME TESTING FACILITY. SHOULD THE PH FALL OUT OF THE ACCEPTABLE RANGE, IT MAY BE ADJUSTED (PROPER) WITH LIME OR (LOWER) WITH IRON SULFATE PLUS SULFUR.

3. COMPACTION  
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AREA AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE HOES TO REMOVE ORIGINAL SOIL. IF BIORETENTION AREAS ARE EXCAVATED USING LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TIRE. 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 OXIDATION FAILURE.

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CASS, PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO RESTRUCTURE THE SOIL PROFILE THROUGH THE 18 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE REQUIRED SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE.

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12 TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

4. PLANT MATERIAL  
RECOMMENDED PLANT MATERIAL FOR BIORETENTION AREAS CAN BE FOUND IN APPENDIX A, SECTION A.2.3. OF THE 2000 MARYLAND STORMWATER DESIGN MANUAL.

5. PLANT INSTALLATION  
MULCH SHOULD BE PLACED TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (8 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 1/10TH 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.  
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-CRASS GROUND COVER PLANTING SPECIFICATIONS.  
THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, DELAYS 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 OF NITROGEN PER 100 SQUARE FEET.

6. UNDERDRAINS  
UNDERDRAINS ARE TO BE PLACED ON A 2" WIDE SECTION FILTER CLOTH. PIPE IS PLACED NEXT, FOLLOWED BY THE GRAVEL BEDDING. THE ENDS OF UNDERDRAIN PIPES NOT TERMINATING IN AN OBSERVATION WELL SHALL BE CAPPED.  
THE MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELL AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS  
THE BIORETENTION FACILITY MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

| NO. | REVISION | DATE |
|-----|----------|------|
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**SITE DEVELOPMENT PLAN  
ENVIRONMENTAL CONCEPT PLAN**

**NORTH STAR  
(SFD RESIDENTIAL)  
6080 FLOREY ROAD  
LOTS 1, 2, & 11  
PLAT OF "HENRY W. FLOREY"  
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1ST ELECTION DISTRICT TAX MAP: 38, GRID: 15 DPZ REF: PARCEL: 243 ZONED: R-12 HOWARD COUNTY, MARYLAND

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ELLICOTT CITY, MD 21043  
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DESIGN BY: RHV  
DRAWN BY: JMR  
CHECKED BY: RHV  
DATE: DECEMBER 2010  
SCALE: AS SHOWN  
W.O. NO.: 10-23

PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2012

ROBERT H. VOGEL, PE No. 16193

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* SR DATE 1/6/11  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

*[Signature]* DATE 1/5/11  
CHIEF, DIVISION OF LAND DEVELOPMENT