

FOREST PROTECTION PROCEDURES - Preconstruction Phase

- The edge of the woods to be protected will be marked (staked or flagged) in the field per the limits of forest conservation easement shown in the approved site development plan prior to the start of construction activity. All areas within protective easement are to be considered "off limits" to any construction activities. The optional protective fencing shall be installed at the outside edge of forested areas and should be combined with sediment control devices when possible. The limit of the critical root zone and therefore the location of the protective devices is to be determined as follows:
Edge of Forested Area - 1 foot of protective radius/inch of DBH or an eight foot protective radius, whichever is greater.
Critical Root Zone for the forest on this site is an average of 12 feet from the trunk of the tree. Critical root zones for Specimen Tree #1 and #2 are 34' and 30'.
- Construction activities expressly prohibited within the preservation areas are:
Placing or stockpiling backfill or top soil in protected areas
Felling trees into protected areas
Driving construction equipment into or through protected areas
Burning in or in close proximity to protected areas
Stocking or storing supplies of any kind
Concrete wash-off areas
Conducting trenching operations
Grading beyond the limits of disturbance
Parking vehicles or construction equipment
Removal of root mat or topsoil
Siting and construction of:
Utility lines
Access roads
Impervious surfaces
Stormwater management devices
Staging areas
- Protective fencing (see Figure "Protective Fencing") shall be the responsibility of the general contractor. The general contractor shall affix signs to the fencing at 25' minimum intervals indicating that these areas are "Forest Retention Area" (see Figure "Signage"). The general contractor shall take great care to assure the restricted areas are not violated and that root systems are protected from smothering, flooding, excessive wetting from dewatering operations, off-site runoff, spillage, and drainage or solutions containing materials hazardous to tree roots.
- The general contractor shall be responsible for any tree damaged or destroyed within the preservation areas whether caused by the contractor, his agents, employees, subcontractors, or licensees.
- Foot traffic shall be kept to a minimum in the protective areas.
- All trees which are not to be preserved within fifty feet of any tree preservation areas are to be removed in a manner that will not damage those trees that are designated for preservation. It is highly recommended that tree stumps within this fifty foot area be ground out with a stump grinding machine to minimize damage.
- The general contractor shall designate a "wash out" area onsite for concrete trucks which will not drain toward a protected area.
- A pre-construction meeting shall be held with local authorities before any disturbance has taken place on site.

FOREST PROTECTION PROCEDURES - Construction Phase

Forest and tree conditions should be monitored during construction and corrective measures taken when appropriate. The following shall be monitored:

- Soil compaction
- Root injury - prune and monitor; consider crown reduction
- Limb injury - prune and monitor
- Flooded conditions - drain and monitor; correct problem
- Drought conditions - water and monitor; correct problem
- Other stress signs - determine reason, correct, and monitor

FOREST PROTECTION PROCEDURES - Post Construction Phase

- The following measures shall be taken:
- Corrective measures if damages were incurred due to negligence:
 - Stress reduction
 - Removal of dead or dying trees. This may be done only if trees pose an immediate safety hazard.
 - Removal of temporary structures:
 - No burial of discarded materials will occur onsite within the conservation area.
 - No open burning within 100 feet of a wooded area.
 - All temporary forest protection structures will be removed after construction.
 - Remove temporary roads by removing stone or broadcasting mulch; pre-construction elevation should be maintained.
 - Aerate compacted soil.
 - Replant disturbed sites with trees, shrubs and/or herbaceous plants.
 - Retain signs for retention areas or specimen trees.
 - A County official shall inspect the entire site.
 - Future protection measures:
 - Howard County and the developer shall arrange for the dedication of an appropriate forest conservation easement at a later date.

FOREST PROTECTION PROCEDURES - Preconstruction Phase

Stress Reduction and Protection of Specimen Trees Isolated from Forest Retention Areas and General Forest Retention Areas (as they may apply)

Isolated specimen trees that are to be preserved will be examined to determine if stress reduction techniques are needed. Protective measures and their evaluation criteria are provided on this plan only if they are employed herein.

Root Pruning

Evaluation Criteria

Will the critical root zone be affected by construction activities such as grade changes, digging for foundations and roads or utility installation?

Design Considerations

- Prune prior to construction as shown on the plan (see Figure "Root Pruning Detail.")
- Prune root with a clean cut using proper pruning equipment such as a vibratory knife.
- Exact location of pruning trench should be identified, and immediately backfilled to cover exposed roots after pruning with soil removed other topsoil, peat moss, or other suitable material or with other high organic soil.
- For trees over 15" in diameter, root pruning may be done up to one year in advance of construction.
- Tree(s) will be monitored for signs of stress.

Crown Reduction or Pruning

Evaluation Criteria

Has the root system been significantly reduced (>30%) or are there dead, damaged, or diseased limbs?

Design Considerations

- Reduce only at specified times of the year:
Flowering trees - only after flowering and before bud set
Non-flowering trees - in late winter, early spring or mid summer
- No more than 1/3 of the crown should be removed at one time using acceptable pruning methods (see Figure "Crown Reduction Detail")
- Monitor for signs of stress

Watering

Evaluation Criteria

Will construction activities alter the hydrology of the site? Has or will root pruning occur?

Design Considerations

- Water only as necessary
- Monitor for signs of stress (see Figure "Tree Planting and Maintenance Calendar")

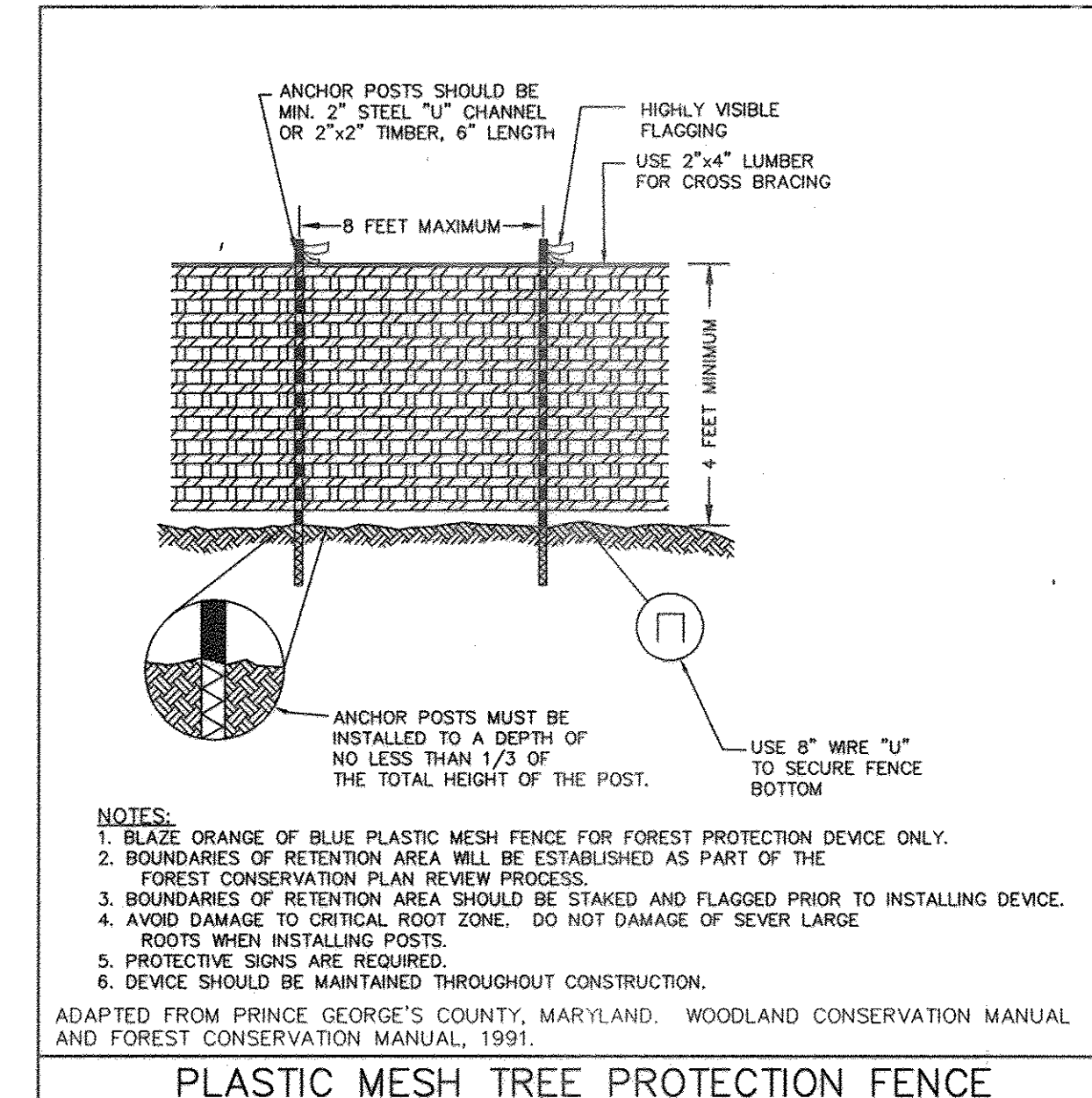
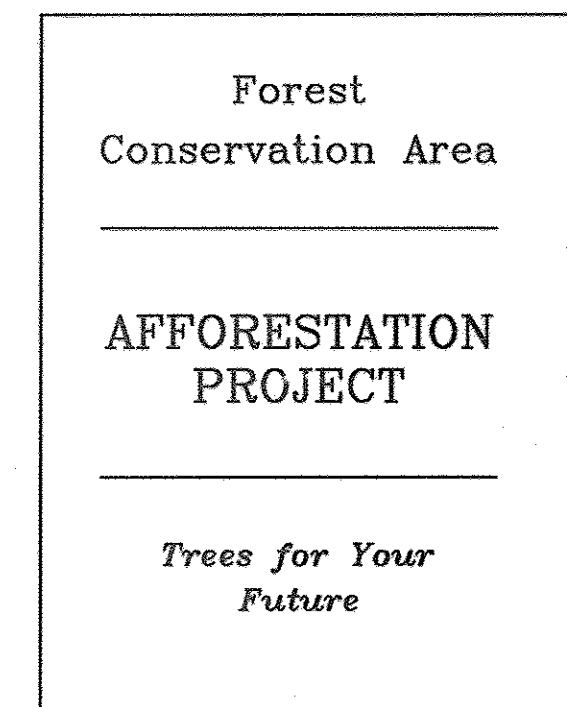
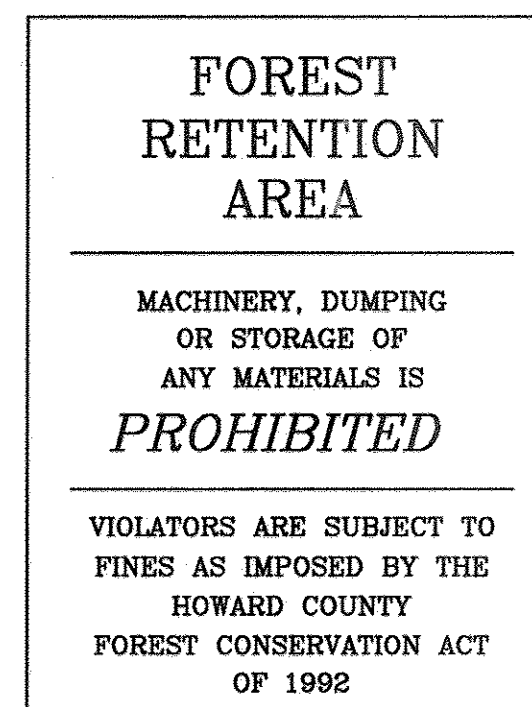
Fertilizing

Evaluation Criteria

Is or will be tree(s) be under stressful conditions? Has or will root pruning occur?

Design Considerations

- Use low nitrogen and slow release fertilizers.
- Apply in late fall or early spring (see Figure "Tree Planting and Maintenance Calendar")
- For small trees (<3" in diameter), use punch hole method or pressurized injection method (see Figure "Application of Fertilizers by Injection.")
- For larger trees (>3" in diameter), use punch hole method or pressurized injection method (see Figure "Application of Fertilizers by Injection.")
- Do not apply fertilizer any closer than 3' from tree trunk for pressurized injection method.
- Monitor for signs of stress.



- NOTES:**
- BLAZE ORANGE OR BLUE PLASTIC MESH FENCE FOR FOREST PROTECTION DEVICE ONLY.
 - BOUNDARIES OF RETENTION AREA WILL BE ESTABLISHED AS PART OF THE FOREST CONSERVATION PLAN REVIEW PROCESS.
 - BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
 - AVOID DAMAGE TO CRITICAL ROOT ZONE. DO NOT DAMAGE OF SEVER LARGE ROOTS WHEN INSTALLING POSTS.
 - PROTECTIVE SIGNS ARE REQUIRED.
 - DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.
- ADAPTED FROM PRINCE GEORGE'S COUNTY, MARYLAND. WOODLAND CONSERVATION MANUAL AND FOREST CONSERVATION MANUAL, 1991.

PLASTIC MESH TREE PROTECTION FENCE

PLANTING SCHEDULE

FCE Reforestation Area - 0.10 acres

Planting units Required: 70
Planting units Provided: 70

Qty	Species	Size	Spacing	Total FCA Units
7	Acer rubrum - Red maple	2-3' whip	11' o.c.	
7	Nyssa sylvatica - Black gum	2-3' whip	11' o.c.	
7	Platanus occidentalis - Sycamore	2-3' whip	11' o.c.	
7	Ulmus rubra - Slippery Elm	2-3' whip	11' o.c.	
7	Quercus palustris - Pin oak	2-3' whip	11' o.c.	
35		Total whip plantings x 2 units/tree = FCA unit credit		70
			Total Unit Credit	70

Planting Notes:

Planting density based on 700 planting units per acre. 2" caliper trees = 7 planting units, 1" caliper trees = 3.5 planting units, whips with shelter = 2 planting units.

** - These species should not be planted within the wetland limits.

1" caliper trees should be staggered along the outer perimeter of the planting area to serve as demarcation of the boundary. The trees should be no closer than 15 foot spacing.

Planting shall be made in a curvilinear fashion along contour. The planting should avoid a grid appearance but should be spaced to facilitate maintenance

Multiflora rose/heavy brush removal/control may be required prior to installation of planting.

All whips are required to be installed with tree shelters per Howard County FCA requirements.

BASED ON REV. 0.0093/405.8 S.F. OF FOREST CONSERVATION EASEMENT AREA WILL BE ABANDONED A FEE-IN-LIEU IN THE AMOUNT OF \$ 507.25 WILL BE PAID TO THE HOWARD COUNTY FOREST CONSERVATION FUND.

FCP NOTES

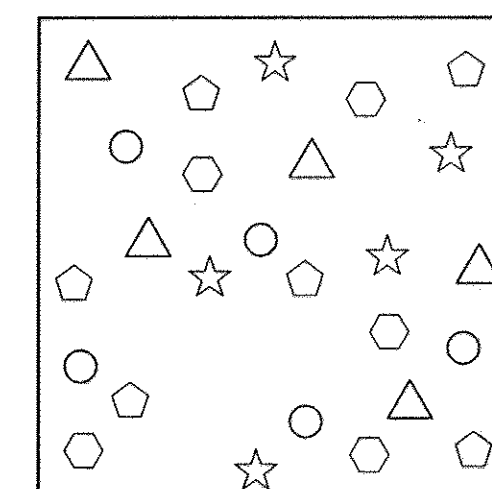
- ANY FOREST CONSERVATION EASEMENT (FCE) AREA SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF HOWARD COUNTY WHICH RESTRICT THE DISTURBANCE AND USE OF THESE AREAS.
- THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT. NO CLEARING, GRADING, OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENTS; HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.
- FORESTED AREAS OCCURRING OUTSIDE OF THE FCE SHALL NOT BE CONSIDERED PART OF THE FCE AND SHALL NOT BE SUBJECT TO PROTECTIVE LAND COVENANTS.
- LIMITS OF DISTURBANCE SHALL BE RESTRICTED TO AREAS OUTSIDE THE LIMIT OF TEMPORARY FENCING OR THE FCE BOUNDARY, WHICHEVER IS GREATER.
- THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST CONSERVATION EASEMENT, EXCEPT AS PERMITTED BY HOWARD COUNTY DPZ.
- NO STOCKPILES, PARKING AREAS, EQUIPMENT CLEANING AREAS, ETC. SHALL OCCUR WITHIN AREAS DESIGNATED AS FOREST CONSERVATION EASEMENTS.
- TEMPORARY FENCING SHALL BE USED TO PROTECT FOREST RESOURCES DURING CONSTRUCTION. THE FENCING SHALL BE INSTALLED ALONG LIMITS OF DISTURBANCE OCCURRING WITHIN 50 FEET OF THE PROPOSED FCE LIMITS. PERMANENT SIGNAGE WILL BE POSTED AT A 50-100 FOOT INTERVALS ALONG ALL FCE LIMITS.
- THE FOREST CONSERVATION OBLIGATION FOR THIS SUBDIVISION HAS BEEN MET BY PROVIDING AN ONSITE FOREST CONSERVATION EASEMENT CONTAINING 0.3 ACRES OF RETENTION AND 0.07 ACRES OF REFORESTATION AND A FEE-IN-LIEU PAYMENT OF \$10,236.60 TO THE HO. CO. FOREST CONSERVATION FUND FOR THE REMAINING OBLIGATION OF 0.47 ACRES OF REFORESTATION.
- FOREST CONSERVATION SURTY IN THE AMOUNT OF \$4,138.20 WILL BE POSTED AS PART OF THE DEVELOPER'S AGREEMENT FOR THE ONSITE FOREST CONSERVATION EASEMENT.

Eco-Science Professionals, Inc. CONSULTING ECOLOGISTS
10000 Rockville Pike, Suite 200, Rockville, MD 20850
John P. Casella 3/6/07

NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET

Professional Engineer
Dorrell Mann
3/6/07

Professional Certification. I hereby certify that these drawings 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. 21443, Expiration Date: 12-21-14



- SYCAMORE
- ☆ BLACK GUM
- △ RED MAPLE
- ◇ SLIPPERY ELM
- PIN OAK

RANDOM PLANTING DETAIL
NOT TO SCALE

FLOODPLAIN NOTE:

PORTIONS OF THE SITE OCCURRING WITHIN THE 100 YEAR FLOODPLAIN ARE NOT INCLUDED AS PART OF THE NET TRACT AREA ON THE SITE. AREAS OF FLOODPLAIN FOREST OCCURRING WITHIN THE LIMITS OF A FOREST CONSERVATION EASEMENT WILL BE PROTECTED BY THE EASEMENT RESTRICTIONS BUT HAVE NOT BEEN CREDITED TOWARD THE PROJECTS FCA OBLIGATIONS.

BENCHMARK ENGINEERING, INC.
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8480 BALTIMORE NATIONAL PIKE • SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

OWNER: BELLE GROVE CORP. 4024 BELLE GROVE ROAD BALTIMORE, MD 21225-2657 410-789-7070

PROJECT: EUCLID CORNERS - PARCEL 'A', LOTS 1276-1278 AND O/S LOT 1279 A RESUBDIVISION OF HARWOOD PARK LOTS 324-350 AND 510-525

LOCATION: TAX MAP: 38, GRID: 13 PART OF PARCEL: 873 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: FOREST CONSERVATION PLAN

DATE: AUGUST, 2005 MARCH, 2007 PROJECT NO. 1465

DESIGN: RPS DRAFT: RPS CHECK: DAM SCALE: 1"=30' SHEET 3 OF 4

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

NO. DATE REVISION

APPROVED: [Signature] 3/27/07 DATE

APPROVED: [Signature] 3/27/07 DATE

SEAL & SIGNATURE FOR REV. ONLY



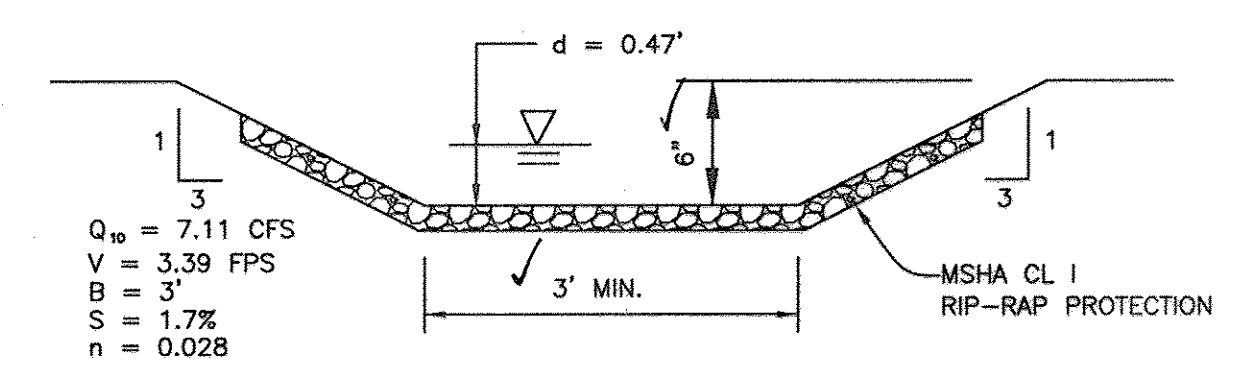
PLAN VIEW
SCALE: 1" = 50'

MAP SYMBOL		SOIL GROUP	SOIL TYPE
*	IuB	C	ILICA LOAM, LOCAL ALLUVIUM, 1 TO 5 PERCENT SLOPES
	Id	C	MADE LAND
	ScD	C	SAND AND CLAYEY LAND, MODERATELY STEEP
	ScE	C	SAND AND CLAYEY LAND, MODERATELY SLOPING
	Ha	D	HARBOR SILT LOAM

* INDICATES HYDRIC SOILS
TAKEN FROM SOILS SURVEY, ISSUED JULY 1968, MAP NO. 7

LEGEND

- SOILS CLASSIFICATION
- SOILS DELINEATION
- EXISTING CONTOURS
- PROPOSED CONTOURS
- STEEP SLOPES 15% TO 24.99%
- STEEP SLOPES 25% +
- 100 YEAR FLOODPLAIN DRAINAGE AND UTILITY EASEMENT
- DRAINAGE AREA LIMITS
- TC PATH
- DRAINAGE AREA DESIGNATION
- LIMITS OF DISTURBANCE

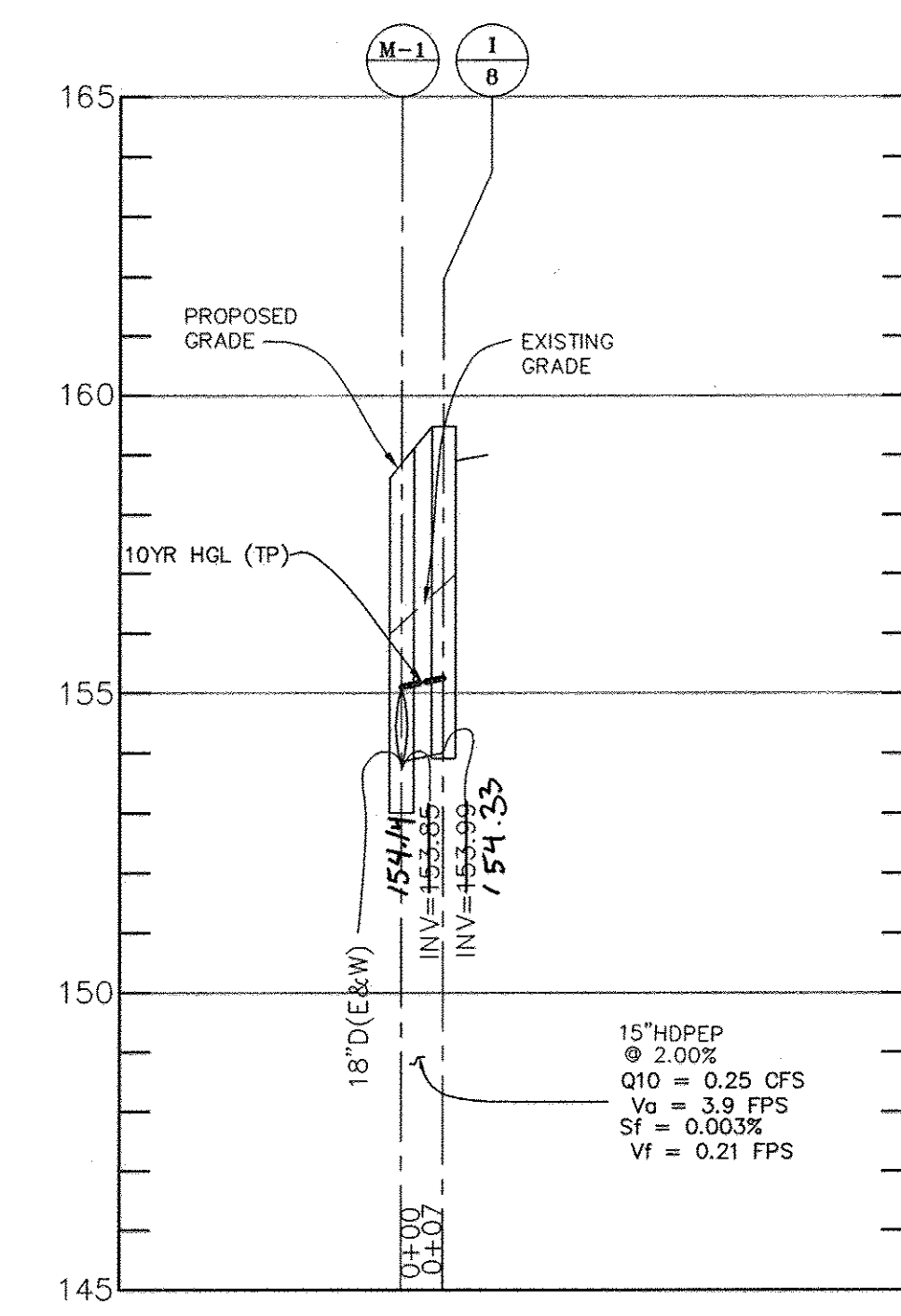


CHANAL SECTION (TYP.)
N.T.S.

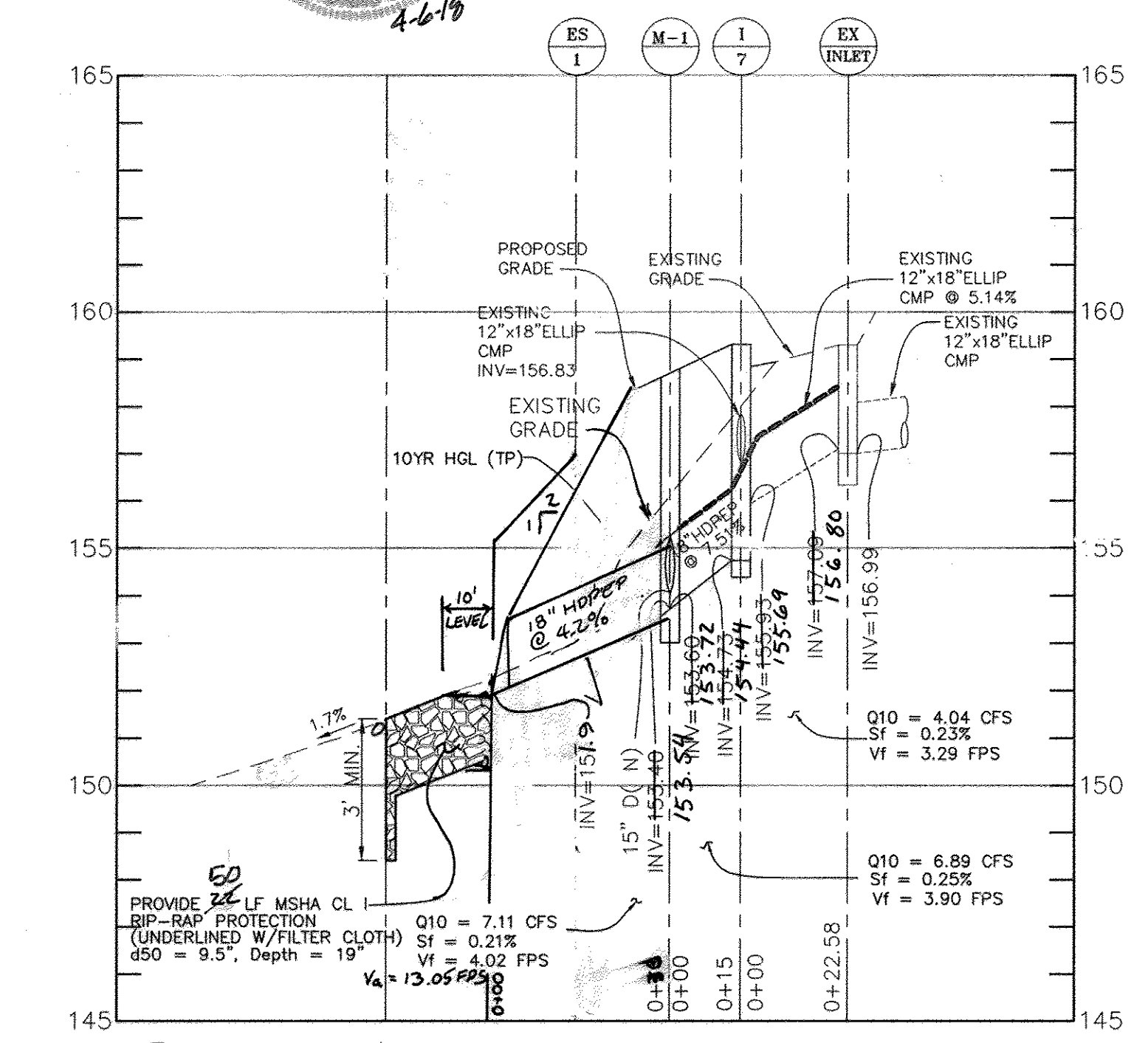
Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-16



AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E. Date: 4-6-16



M-1 TO INLET 8
SCALE: VERT. = 1"=3', HORIZ. = 1"=30'



ES-1 TO INLET 7
SCALE: VERT. = 1"=3', HORIZ. = 1"=30'

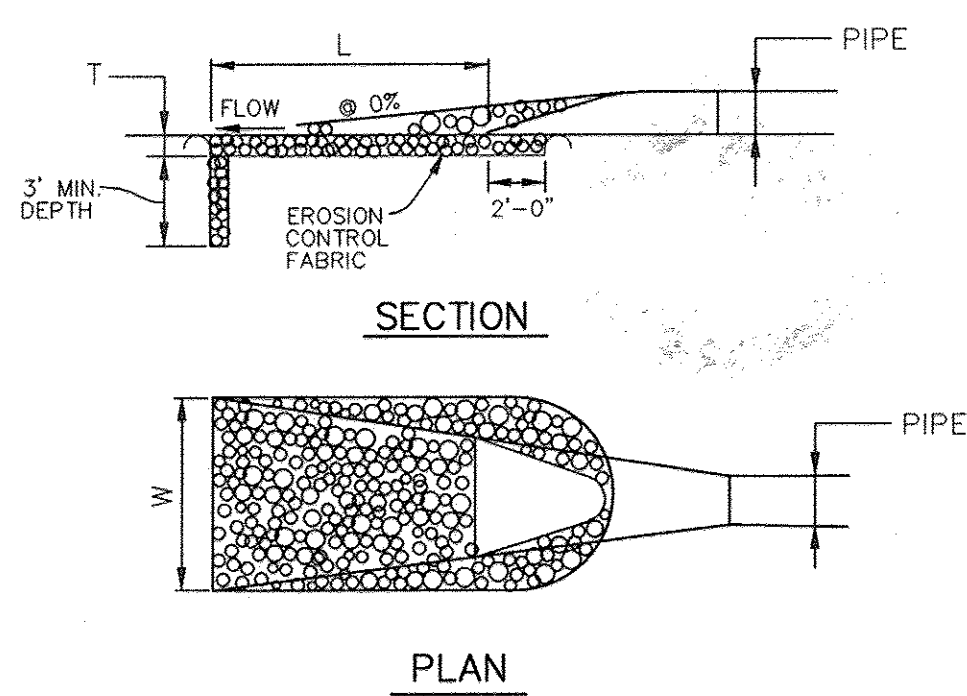
PIPE SCHEDULE			
TYPE & CLASS	SIZE	LENGTH	
HDPEP	15"	7'	
HDPEP	18"	57'	

ACSP = ALUMINIZED CORRUGATED STEEL PIPE
HDPEP = SMOOTH BORE HIGH DENSITY POLYVINYL CHLORIDE PIPE
PVC = POLYVINYL CHLORIDE PIPE

STRUCTURE SCHEDULE						
STORM INLETS						
NO.	TYPE	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.
ES-1	END SECTION	N 557329.8 E 1388067.5	152.11	153.88	SD-4.37	
I-7	A-5 INLET	N 557367.5 E 1386111.7	155.69	154.44	159.42	SD-4.40
I-8	A-5 INLET	N 557363.532 E 1386093.2894	153.99	154.35	159.46	SD-4.40
M-1	MANHOLE	N 557356.4523 E 1386098.1766	154.14	153.72	154.50	SD-4.40

- STRUCTURE TOP ELEVATION AND LOCATION FOR MANHOLES IS AT THE TOP AND CENTER OF RIM.
- STRUCTURE TOP ELEVATION AND LOCATION FOR INLETS IS AT THE TOP, CENTER FACE OF THE INLET FOR CURB INLETS AND AT THE CENTER TOP FOR YARD INLETS.
- STRUCTURE TOP ELEVATION AND LOCATION FOR END SECTIONS IS AT THE CONNECTION OF PIPE AND END SECTION AT CENTERLINE.

- CONSTRUCTION SPECIFICATIONS
- THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
 - THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
 - GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS, WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.
 - STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR THE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE HOLES BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HANA PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
 - THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.



STRUCTURE	D-50	LENGTH (L)	WIDTH (W)	THICKNESS (T)	SHA CLASS
ES-1	30'	22'	6.0'	19"	I

OUTLET PROTECTION DETAIL
NOT TO SCALE

- STORM DRAIN RUNOFF
- | INLET | DA (Ac.) | C | %IMP | ZONE |
|-----------|----------|-----|------|------|
| I-7 | 0.48 | .56 | 57 | R-12 |
| I-8 | 0.06 | .64 | 38 | R-12 |
| Ex. Inlet | 2.21 | .33 | 67 | R-12 |
- TIME OF CONCENTRATION DRAINAGE AREA I-7:
J1 TO J2 = LAWN, SHEET FLOW, 60', SLOPE 2.0%
J2 TO J3 = PAVED CONCENTRATED FLOW, 298', SLOPE 6.7%
- TIME OF CONCENTRATION DRAINAGE AREA EX. INLET:
K1 TO K2 = LAWN, SHEET FLOW, 100', SLOPE 8.0%
K2 TO K3 = UNPAVED, CONCENTRATED FLOW, 144', SLOPE 6.4%

APPROVED: DEPARTMENT OF PUBLIC WORKS
William J. Mahan 3-21-07
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
John J. Mahan 2/27/07
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Donald Mason 2/26/07
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

REVISIONS

NO.	DATE	REVISION
2	6-17-17	REVISE LOCATION OF ES-1, UPDATE RIP-RAP
1	8-6-12	ADD CAPITAL PROJECT D-1124-03 (BECHFIELD AVE IMPROVEMENTS) BY NOLAN ASSOC.

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OWNER: BELLE GROVE CORP.
4024 BELLE GROVE ROAD
BALTIMORE, MD 21225-2657
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PROJECT: EUCLID CORNERS- PARCEL 'A', LOTS 1276-1278 and O/S LOT 1279
A RESUBDIVISION OF HARWOOD PARK LOTS 324-350 AND 510-525

LOCATION: TAX MAP: 38, GRID: 14
PART OF PARCEL: 873
1st ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: I-7 TO ES-1 PROFILE, STRUCTURE SCHEDULE, PIPE SCHEDULE FOR I-7 TO ES-1 & DRAINAGE AREA MAP

DATE: AUGUST, 2005 PROJECT NO. 1465
MARCH, 2007

SCALE: AS SHOWN SHEET 4 OF 4