

AA 381-07 The Villas @ Severna Park
SUB 07-0112 Addition

51829-6285



Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor



Margaret G. McHale
Chair

Ren Serey
Executive Director

STATE OF MARYLAND
CRITICAL AREA COMMISSION
CHESAPEAKE AND ATLANTIC COASTAL BAYS

1804 West Street, Suite 100, Annapolis, Maryland 21401

(410) 260-3460 Fax: (410) 974-5338

www.dnr.state.md.us/criticalarea/

December 10, 2009

Mr. Tom Burke
Anne Arundel County
Office of Planning and Zoning
2664 Riva Road, MS 6301
Annapolis, Maryland 21401

Re: The Villas at Severna Park
S01-038, P 07-0112 00NF

Dear Mr. Burke:

Thank you for forwarding revised plans for the above referenced subdivision request. The applicant is proposing to subdivide a 12.55 acre bulk parcel which appears to be located within a previously reviewed 26.4 acre subdivision, with 6.04 acres in the Critical Area and designated as a Limited Development Area (LDA). Within the bulk parcel, there are 2.07 acres within the Critical Area which are currently undeveloped. The applicant proposes to create four new lots, a roadway, and a recreation area within the Critical Area portion of the bulk parcel. The applicant has addressed most of this office's comments from my July 17, 2009 letter. I have outlined my remaining comments below:

1. The applicant previously indicated that additional information would be submitted to address the following comment with future submittals. However, the revised plans have not addressed this comment. Based on aerial photography and the State's wetland resource maps, it appears that there is a stream that flows through the floodplain to the rear of proposed lot 29. As clearly stated in State Law and in County Code, intermittent and perennial streams are classified as tributary streams where they flow through the Critical Area. These streams require a 100-foot Buffer that is measured from the landward edge of the bank on both sides. This Buffer may be expanded to include contiguous hydric or highly erodible soils and slopes 15% or greater.
 - Please have the applicant label the stream and map the Buffer on the plans as based on a field delineated survey.
 - It appears that the Buffer may overlap with the proposed lot lines of lots 28 and 29. If so, it may be necessary to reconfigure or reduce the proposed number of lots. Disturbances within the Buffer on a newly created lot will require variances, which this office can not support. Therefore, we recommend that no new lots be created within the 100-foot Buffer.
 - If a site visit is necessary to resolve questions regarding the presence or location of the stream, Commission staff would be glad to participate in such a visit.

TTY for the Deaf

Annapolis: (410) 974-2609 D.C. Metro: (301) 586-0450



Mr. Burke
December 10, 2009
Page 2 of 2

2. The applicant's materials indicate that a 45,893 square foot conservation easement will be provided within the Critical Area portion of the bulk parcel, which is 52% of the existing forested area in the Critical Area portion of the bulk parcel. Please have the applicant quantify the total area of existing forest cover that will be retained within the two phases of development, as COMAR 27.02.04.C(2)(c) provides that "no more than 20 percent of any forest or developed woodland may be removed from forest use, except as provided in §C(4), below. The remaining 80 percent shall be maintained through recorded, restrictive covenants or similar instruments."

Thank you for the opportunity to provide comments for this revised subdivision plat. Please have the applicant address the comments above and submit a revised subdivision plat. If a site visit is necessary to resolve the outstanding issues, please make Commission staff aware of that need. If you have any questions, please contact me at 410-260-3481.

Sincerely,



Amber Widmayer
Natural Resources Planner

cc: AA381-07

Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor

*See my email -
KG*



Margaret G. McHale
Chair

Ren Serey
Executive Director

**STATE OF MARYLAND
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July 17, 2009

Mr. Tom Burke
Anne Arundel County
Office of Planning and Zoning
2664 Riva Road, MS 6301
Annapolis, Maryland 21401

Re: The Villas at Severna Park
S01-038, P 07-0112 00NF

Dear Mr. Burke:

Thank you for forwarding revised plans for the above referenced subdivision request. The applicant is proposing to subdivide a 12.55 acre bulk parcel which appears to be located within a previously reviewed 26.4 acre subdivision, with 6.04 acres in the Critical Area and designated as a Limited Development Area (LDA). Within the bulk parcel, there are 2.07 acres within the Critical Area which are currently undeveloped. The applicant proposes to create four new lots, a roadway, and a recreation within the Critical Area portion of the bulk parcel. The applicant has addressed most of this office's comments from my April 15, 2009 letter. I have outlined my remaining comments below:

1. We note that the applicant has indicated that additional information will be submitted to address the following comment with future submittals. There appears to be a stream that flows through the floodplain to the rear of proposed lot 29. If this is an intermittent or perennial stream, it is a tributary stream where it flows through the Critical Area which requires a 100-foot Buffer that is measured from the landward edge of its bank on both sides. This Buffer may be expanded to include contiguous hydric or highly erodible soils and slopes 15% or greater. Please have the applicant map this Buffer on the plans as based on a field delineated survey. It appears that this Buffer may overlap with the proposed lot lines of lot 29. If so, we recommend that these lot lines be altered so that the Buffer is not within the lot. Disturbances within the Buffer on a newly created lot will require variances, which this office can not support. Therefore, we recommend that no new lots be created within the 100-foot Buffer.
2. We note that the applicant has requested a current Wildlife and Heritage Service evaluation of the property from DNR to ensure that no new species have been located within the Critical Area portion of the property in the last several years. Please provide a copy of this letter once it is received.



Mr. Burke
July 17, 2009
Page 2 of 2

Thank you for the opportunity to provide comments for this revised subdivision plat. Please have the applicant address the comments above and submit a revised subdivision plat. If you have any questions, please contact me at 410-260-3481.

Sincerely,



Amber Widmayer
Natural Resources Planner

cc: AA381-07

Martin O'Malley
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April 15, 2009

Mr. Tom Burke
Anne Arundel County
Office of Planning and Zoning
2664 Riva Road, MS 6301
Annapolis, Maryland 21401

Re: The Villas at Severna Park
S01-038, P 07-0112 00NF

Dear Mr. Burke:

Thank you for providing information regarding the above referenced revised subdivision. The applicant is proposing to subdivide a 12.68 acre bulk parcel which appears to be located within a previously reviewed subdivision containing 24.94 acres, with 6.04 acres in the Critical Area and designated as a Limited Development Area (LDA). It is unclear how much of the bulk parcel is in the Critical Area, but it appears that portions of four new lots, a roadway, and a recreation area are proposed within the Critical Area within this bulk parcel. It appears that the applicant has addressed some of this office's comments from my March 14, 2008 letter. I have outlined my remaining comments below:

1. It remains unclear whether the subdivision of the 12.68 acre bulk parcel is a subdivision request that is completely separate from the previously reviewed Villas at Severna Park subdivision. If the bulk parcel subdivision proposal is separate, then the applicant must provide the necessary information and calculations for the currently proposed bulk parcel subdivision application. For instance, the most recently received plat indicates that the acreage of Critical Area within the bulk parcel is 6.04 acres and the existing forested area within this area is 5.64 acres. Since the Critical Area portion of the 12.68 acre bulk parcel is only a small sliver, it does not seem that these figures can be accurate, and the applicant must correct them. Alternatively, if the bulk parcel subdivision constitutes a revision to the previously reviewed Villas at Severna Park subdivision on the 24.94 acre property, the applicant must provide clearly distinguishable Critical Area information and calculations for both the subdivision as a whole, and for the bulk parcel subdivision request.

2. Please provide documentation that the bulk parcel that is proposed to be subdivided was not considered part of the total property area of the Villas at Severna Park for purposes of calculating maximum lot coverage, clearing thresholds and 80% forest retention requirements. If this 12.68 acre parcel was considered part of the 24.94 acre property in that subdivision request, it seems that at this time, this parcel would only be able to be subdivided with additional clearing and additional lot coverage if there were surplus allowances for lot coverage and clearing within that original subdivision proposal.
3. While it does not appear that it is provided on the most recently submitted plat and plans, a previous set of plans this office received in June 2007 indicates that the Critical Area portion of the bulk parcel is 2.12 acres, that the existing forested area within this area is 2.02 acres, and that the total proposed clearing is 0.26 acres. Please have the applicant confirm that these numbers are still accurate. Also, this information must be on future versions of the plat and plans.
4. As noted above, the plans no longer indicate how much clearing is proposed for development of the bulk parcel. But, the cover sheet of the plans does include a note which states "fee-in-lieu for clearing up to 30% in the Critical Area was paid on June 1, 2005 (Receipt # 6318073)." It is unclear what this means. If this project is not separate from the larger Villas at Severna Park subdivision, and that project was already allowed the maximum 30% clearing, it seems that no additional clearing would be allowed for this project, since 30% is the County's clearing limit in the LDA. Alternatively, if this is a separate subdivision request, it is unclear how clearing that was not proposed prior to this 2007 subdivision request could have been accounted for by a 2005 fee-in-lieu payment for a separate project. Please have the applicant clarify how much clearing is currently proposed, and how it will currently be addressed. If it will be done by planting on site, the applicant must submit a planting plan showing the size, number and type of species to be planted. If it will be done by fee-in-lieu payment, the amount of clearing that will be addressed by this option should be noted on the plans.
5. There appears to be a stream that flows through the floodplain to the rear of proposed lot 29. If this is an intermittent or perennial stream, it is a tributary stream where it flows through the Critical Area which requires a 100-foot Buffer that is measured from the landward edge of its bank on both sides. This Buffer may be expanded to include contiguous hydric or highly erodible soils and slopes 15% or greater. Please have the applicant map this Buffer on the plans as based on a field delineated survey. It appears that this Buffer may overlap with the proposed lot lines of lot 29. If so, we recommend that these lot lines be altered so that the Buffer is not within the lot. Disturbances within the Buffer on a newly created lot will require variances, which this office can not support. Therefore, we recommend that no new lots be created within the 100-foot Buffer.
6. It appears that there may be disturbance proposed within the nontidal wetland buffer and possibly within the 100-foot Buffer for a new stormwater outfall. If so, please have the applicant provide information as to the status of the required MDE wetland permit. Also, if the proposed outfall will require disturbance within the Critical Area 100-foot Buffer, the area of disturbance from grading or clearing must be mitigated at a 2:1 ratio. Please have the applicant

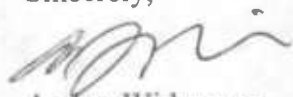
clarify whether such disturbance is proposed, provide the area of disturbance, and show how any resulting mitigation requirement will be addressed.

7. It does not appear that the applicant has responded to the following comments which were included in my previous letter and I have reiterated them below. Please have the applicant provide further information about the proposed lot coverage on the property as described below:
 - We note that a portion of the proposed driveway for lot 26 is within the Critical Area, even though the lot lines for lot 26 are not. Because this proposed lot coverage appears to be within the boundaries of lot 27, please confirm that the area for both driveways is included within the proposed lot coverage calculation for lot 27. If the driveway for lot 26 is not already included in the proposed lot coverage area for lot 27, perhaps a shared driveway could be used for both lots within the Critical Area.
 - There is a portion within the proposed recreation area that fronts Dividing Creek Road which is identified as an active recreation area. Please provide proposed lot coverage calculations for this area.
 - Please provide calculations confirming that the entire portion of the property that is within the Critical Area, including the previously developed condominium area, is under the 15% lot coverage limit.
8. We note that the applicant has requested a current Wildlife and Heritage Service evaluation of the property from DNR to ensure that no new species have been located within the Critical Area portion of the property in the last several years. Please provide a copy of this letter once it is received.
9. The applicant has noted that 70% of the existing forested area within the Critical Area, or 3.95 acres, has been placed in a conservation easement. However, it is unclear where these 3.95 acres are located. I was only able to locate the 1.05 acres of protected forested area labeled as "Critical Area Conservation Property." Please clarify where the other 2.9 acres of protected forested area is located within the Critical Area on the property. Also, please include this conservation easement area on the plat. If only the 1.05 acre conservation property is proposed, we note that this is only 52% of the existing 2.02 acres of existing forested area within the Critical Area portion of the bulk parcel. Under COMAR 27.01.02.04.C(3)(c) no more than 20% of any forested area may be removed from use and the remaining 80% shall be maintained through recorded, restrictive covenants or similar instruments. Therefore, it appears that at least 1.61 acres of existing forested area within the Critical Area portion of the bulk parcel should be included within the proposed easement. If this can not be accomplished within the proposed footprint of development, the applicant may need to reconfigure the proposed lot lines or reduce the number or lots to meet the development requirements.

Mr. Burke
April 15, 2009
Page 4 of 4

Thank you for the opportunity to provide comments for this revised subdivision plat. Please have the applicant address the comments above and submit a revised subdivision plat. If you have any questions, please contact me at 410-260-3481.

Sincerely,



Amber Widmayer
Natural Resources Planner

cc: AA381-07

Martin O'Malley
Governor



Anthony G. Brown
Lt. Governor

Margaret G. McHale
Chair

Ren Serey
Executive Director

STATE OF MARYLAND
CRITICAL AREA COMMISSION
CHESAPEAKE AND ATLANTIC COASTAL BAYS

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March 14, 2008

Ms. Kelly Krinetz
Anne Arundel County
Office of Planning and Zoning
2664 Riva Road, MS 6301
Annapolis, Maryland 21401

Re: The Villas at Severna Park
S01-038, Tax Map 32H, Parcel 148

Dear Ms. Krinetz:

Thank you for providing information regarding the above referenced revised subdivision. The applicant is proposing to subdivide a 24.94 acre property, 6.04 acres of which are located within the Critical Area and are designated as a Limited Development Area (LDA). Within the Critical Area, it appears that portions of four new lots are proposed in addition to a roadway and recreation area. It appears that the applicant has addressed most of this office's comments from my November 29, 2007 letter. I have outlined my remaining comments below:

1. The applicant has provided the proposed impervious surface areas for each proposed lot within the Critical Area as requested. Please provide further information about the proposed impervious surfaces on the property as described below:
 - We note that a portion of the proposed driveway for lot 26 is within the Critical Area, even though the lot lines for lot 26 are not. Because this proposed impervious surface area appears to be within the boundaries of lot 27, please confirm that the area for both driveways is included within the proposed impervious surface calculation for lot 27. If the driveway for lot 26 is not already included in the proposed impervious surface area for lot 27, perhaps a shared driveway could be used for both lots within the Critical Area.
 - There is a portion within the proposed recreation area that fronts Dividing Creek Road which is identified as an active recreation area. Please provide proposed impervious surface area calculations for this area.
 - Please provide calculations confirming that the entire portion of the property that is within the Critical Area, including the previously developed condominium area, is less than 15% impervious surface area.

Ms. Krinetz
March 14, 2008
Page Two

2. We note that the applicant has requested a current Wildlife and Heritage Service evaluation of the property from DNR to ensure that no new species have been located within the Critical Area portion of the property in the last several years. Please provide a copy of this letter once it is received.
3. The applicant has noted that 70% of the existing forested area within the Critical Area, or 3.95 acres, has been placed in a conservation easement. However, it is unclear where these 3.95 acres are located. I was only able to locate the 1.05 acres of protected forested area labeled as "Critical Area Conservation Property." Please clarify where the other 2.9 acres of protected forested area is located within the Critical Area on the property. Also, please include this conservation easement area on the plat.

Thank you for the opportunity to provide comments for this revised subdivision plat. Please have the applicant address the comments above and submit a revised subdivision plat. If you have any questions, please contact me at 410-260-3481.

Sincerely,



Amber Widmayer
Natural Resources Planner
AA381-07

Martin O'Malley
Governor

Anthony G. Brown
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Margaret G. McHale
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November 29, 2007

Ms. Kelly Krinetz
Anne Arundel County
Office of Planning and Zoning
2664 Riva Road, MS 6301
Annapolis, Maryland 21401

Re: The Villas at Severna Park
S01-038, Tax Map 32H, Parcel 148

Dear Ms. Krinetz:

Thank you for providing information regarding the above referenced revised subdivision. The applicant is proposing to subdivide a 24.94 acre property, 6.04 acres of which are located within the Critical Area and are designated as a Limited Development Area (LDA). Within the Critical Area, it appears that portions of four new lots are proposed in addition to a roadway and recreation area. It appears that the applicant has addressed some of this office's comments from Kerrie Gallo's July 2, 2007 letter. I have outlined my remaining comments below:

1. We note that as requested, the applicant has provided a chart listing the proposed impervious surface areas for the portions of the proposed lots that are within the Critical Area. However, the applicant has not provided the total area of each lot and other proposed areas of the subdivision that are within the Critical Area. In response to this office's request for this information, the applicant states, "...we are allocating total impervious from previous approved plat, agreed upon at final review. We cannot demonstrate per lot allowable by square footage per lot, only by mass area of entire lot totals." It is unclear what this means.

It is this office's understanding that on the previously developed portion of the lot which includes units 9 and 19, the applicant has proposed common areas surrounding the dwellings instead of lot lines and calculated the impervious surface area for the property as a whole. Please have the applicant clarify whether proposed lots 24-29 are actually also common areas even though it appears that lot lines are drawn on the most recently submitted materials. If the proposed lots are common areas, calculating the impervious surface area for the portion of the subdivision that is within the Critical Area as a whole is an acceptable method for showing that the proposed subdivision is under the 15% impervious limit. However, if the applicant proposes to create individually owned lots and not common areas, the impervious surface limits of 25% of the portion of the lot that is in the Critical Area will apply. It appears that some of the

proposed lots within the Critical Area are well over this 25% limit and would have to be reconfigured in order to be platted as individually owned lots.

Further, the applicant must provide the proposed impervious surface calculations with respect to proposed roads and recreation areas. In response to this office's previous request for this information, the applicant states, "no activity table will take place with in recreation area." Please have the applicant clarify what this means and describe what is proposed within the active recreation area.

2. We note that the applicant has requested a current Wildlife and Heritage Service evaluation of the property from DNR to ensure that no new species have been located within the Critical Area portion of the property in the last several years. Please provide a copy of this letter once it is received.
3. Please have the applicant correct notation number 5 under the Critical Area Analysis on the plans which states that 30% of woodlands are allowed to be cleared. Under Anne Arundel County's Critical Area program, only 20% of the existing forested area may be cleared on a property within the Critical Area. An applicant is only allowed to clear more than 20% and not more than 30% of the existing forested area if permission is granted by the County to do so. Further, COMAR 27.01.02.04 requires that the remaining 80% of existing forested area be maintained through recorded restrictive covenants or similar instruments. Accordingly, the applicant should place an additional 10% of the existing forested area in a forest conservation easement.
4. In response to this office's previous request for the applicant to resolve the inconsistent acreage figures provided for the total Critical Area acreage on the property, the applicant states, "Critical area property will contain previous recorded plat area (Plat Book 114, Page 30) difference in chart, indicated on sketch plan is to include additional proposed area. (Previous Bulk Area allocated more than necessary area)." It is unclear what this means. Please have the applicant indicate the correct Critical Area acreage total for the proposed subdivision.

Thank you for the opportunity to provide comments for this revised subdivision plat. Please have the applicant address the comments above and submit a revised subdivision plat. If you have any questions, please contact me at 410-260-3481.

Sincerely,



Amber Widmayer
Natural Resources Planner
AA381-07

Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor



Margaret G. McHale
Chair

Ren Serey
Executive Director

STATE OF MARYLAND
CRITICAL AREA COMMISSION
CHESAPEAKE AND ATLANTIC COASTAL BAYS

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July 3, 2007

Ms. Kelly Krinetz
Anne Arundel County
Office of Planning and Zoning
2664 Riva Road, MS 6301
Annapolis, Maryland 21401

Re: The Villas at Severna Park
S01-038, Tax Map 32H, Parcel 148

Dear Ms. Krinetz:

Thank you for providing information regarding the above referenced revised subdivision. The applicant is proposing to subdivide a 24.94- acre property, 2.12 acres of which are located within the Critical Area and are designated as a Limited Development Area (LDA). Within the Critical Area, portions of four new lots appear proposed in addition to a roadway and multiple recreation areas.

Based on the latest subdivision plat, we have the following comments:

1. While the applicant's Critical Area plans contain general notes regarding impervious surface area limits, additional information is needed to ensure that the proposed subdivision is consistent with the State and County laws regarding impervious surface area. Specifically, a chart is needed listing the different types of impervious surface areas proposed within the Critical Area in square feet, including roadways. Further, since only portions of Lots 24, 27 and 28 lie within the Critical Area, it is necessary for the applicant to demonstrate that the proposed impervious surfaces per lot in the Critical Area have been calculated based on the Critical Area acreage of each lot and not on the entire square footage of the lot. Please have the chart added to the plans. If there are to be any impervious surface areas included within the passive or active recreation areas within the Critical Area, these need to be included in the chart as well.
2. The letter provided by the Department of Natural Resources' (DNR) Wildlife and Heritage Division is six years old. Screenings for rare, threatened, and endangered species are required to be less than two years old. As such, a new evaluation of the property by DNR will be required to ensure that no new species have been located within the Critical Area portion of the property. Please provide a copy of this letter once it is received.

Kelly Krinetz
The Villas at Severna Park Subdivision
July 3, 2007
Page 2

3. We note that the Critical Area report states that the property contains 1.65 acres within the Critical Area, but the subdivision plat states that 2.12 acres are located within the Critical Area. Please ensure that these documents are consistent in future submittals.

Thank you for the opportunity to provide comments for this revised subdivision plat. Please have the applicant address the concerns above and submit a revised subdivision plat. If you have any questions, please contact me at 410-260-3482.

Sincerely,



Kerrie L. Gallo
Natural Resources Planner
AA381-07

**DECLARATION OF EASEMENT
CONDITIONS AND RESTRICTIONS**

THIS DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS is made this 15th day of June, 2005, by **Mandrin Homes LTD, a Maryland Corporation** (Owners) (hereinafter individually or collectively called the "Declarant") to ANNE ARUNDEL COUNTY, MARYLAND (Hereinafter called the "County") in order to create a Conservation Property.

RECEIVED

JUN 10 2008

PLANNING AND ZONING
DEVELOPMENT

WHEREAS, the Declarant is the owner(s) of a tract or parcel of land, containing (**26.401**) acres of land, more or less, which is more particularly described in a deed from **Ann R. Heymann and Mary K. Burack, Sucessor Trustee and Mercantile Safe Deposit and Trust Company, Trustee to Mandrin Homes, LTD** dated **April 15, 2003** and recorded among the Land Records of Anne Arundel County, Maryland in Liber **12914**, Folio **516** of which (**20.43**) acres are more particularly shown as Exhibit "A", attached hereto and made a part hereto as "Conservation Property" and are the subject of the covenants, conditions and restrictions set forth below; and

WHEREAS, the Conservation Property of **3.95** acres is located in the Critical Area as defined in Article 21, Title 2 of the Anne Arundel County Code;

TRF TO BURE & RECORDING FEE
JUN 08 2005
REC'D # 00565
PL # 1447
2005

WHEREAS, the Conservation Property of **6.01** acres is subject to the requirements of County Bill 71-94/Maryland Forest Conservation Act (hereafter called "Act") established in Natural Resources Article Section 5-1601 – 5-1612, inclusive, Annotated Code of Maryland; and

WHEREAS, the creation of the Conservation Property will benefit the citizens of the County and, therefore, the Developer desires to grant the County the right to enforce the covenants, conditions and restrictions for the Conservation Property established under this Declaration.

NOW, THEREFORE, WITNESSETH: In consideration of the premises and the sum of One Dollar (\$1.00) and other good and valuable consideration, the receipt whereof is hereby acknowledged, the Declarant does hereby establish the covenants, conditions and restrictions hereafter set forth to create a Conservation Property of the nature and character and to the extent hereafter expressed to be and constitute a servitude upon the Property, which estate, interest, easements and servitude will result from the restrictions hereby imposed upon the use of the Conservation Property of the Declarant and to that end for the purposes of accomplishing the intent hereof, the Declarant covenants on behalf of (him/her/it/them) and/or (his/her/it/their) personal representatives, legal representatives, successors and assigns, as applicable, to do so and refrain from doing upon the Conservation Property, the various acts hereinafter

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JUN 12 2009
CRITICAL AREA COMMISSION
Chesapeake & Atlantic Coastal Bays

mentioned, it being hereby agreed and expressed that doing and refraining from said act, and each therefore, upon the Conservation Property, is and will be for the benefit of the Declarant and the County.

The restrictions hereby imposed upon the Conservation Property and the acts which the Declarant so covenants to do and refrain from doing upon the Property in connection therewith are as follows:

1. No construction or alteration of residential, commercial, industrial, or other structures of any kind will be placed or erected upon the Conservation Property or any use in connection therewith shall be made of the Conservation Property.
2. No cutting or removing of vegetation or grading, filling or other activities shall be permitted upon the Property except as permitted under a Forest Management Plan or a Reforestation Plan approved by the County.
3. The general topography of the landscape of the Conservation Property shall be maintained in its present condition and no excavation or topographic changes shall be made.

TO HAVE AND TO HOLD unto the County, its successors, legal representatives, and assigns, forever, subject, however, to the right of the County to terminate such estate, interest, easements and servitude hereby granted upon the execution of an instrument and recordation thereof among the Land Records of Anne Arundel County, Maryland declaring that the estate, interest, easements and servitude created under this Declaration is terminated and no longer in force and effect.

The County is hereby granted the right to enforce this Declaration and the covenants, conditions and restrictions set forth herein.

WITNESS the hand and seal of the Declarant(s) on the day hereinafter first written.

Mandrin Homes, LTD.

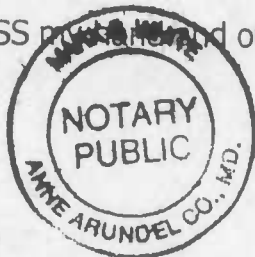
Mark A. White

BY: Thomas P. Allhoff (SEAL)
Thomas P. Allhoff,
Executive Vice President

STATE OF MARYLAND, COUNTY OF ANNE ARUNDEL, to wit:

I HEREBY CERTIFY, that on this 19TH day of MAY, 2005, before me, the undersigned authority personally appeared **Thomas P. Allhoff** who is Executive Vice President for Mandrin Homes, LTD, known to me (or satisfactorily proven) to be the person described in and who executed the foregoing instrument and acknowledged the same to be his/her act and deed for the purposes therein contained.

WITNESS my hand and official seal.



Mark S. White
Notary Public

NOTARY SEAL
My commission expires: 11-01-05

APPROVED AND ACCEPTED
THIS 1st DAY OF June,
2005.

ANNE ARUNDEL COUNTY,
MARYLAND
BY: Robert D. Miller (SEAL)
Robert D. Miller, Land Use and
Environment Officer for
Janet S. Owens, County Executive

STATE OF MARYLAND, COUNTY OF ANNE ARUNDEL:

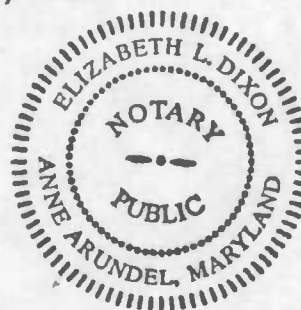
I HEREBY CERTIFY, that on this 1st day of June, 2005, before me the subscriber, a Notary Public in and for the State and County aforesaid personally appeared **Robert D. Miller, Land Use and Environment Officer for Janet S. Owens, County Executive of Anne Arundel County, Maryland**, a political subdivision of the State of Maryland, and acknowledge the foregoing Conservation Easement to be the act of said body corporate.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

Elizabeth L. Dixon
Notary Public

NOTARY SEAL

My commission expires: 11/21/07



APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

[Signature]
Office of Law

5-27-05
Date

Anaery
203 Naples Rd. Suite 114
Millersville Md. 21108

N 508,400

BK 16396 PG 0611

N 508,400

E 1,445,900

E 1,446,400

NAD-83 GRID NORTH



CONSERVATION PROPERTY (INSIDE CRITICAL AREA) 0.37 Ac.

RONALD J. & ROBIN J. MUIR
530 MANHATTAN BEACH ROAD
SEVERNA PARK, MD, 21148
9555/508
T.A.# 3-000-13303354
TAX MAP 32H BLOCK 2 PARCEL 34
ZONING: R-2

CONSERVATION PROPERTY (OUTSIDE CRITICAL AREA) 0.93 Ac.

TRACY S. SCHEMANT
233 KENNEDY COURT
SEVERNA PARK, MD, 21148
10047/23
T.A.# 3-000-80021111
TAX MAP 32H BLOCK 2 PARCEL 33
ZONING: R-2

FRANK G. TAYLOR
C/O MELBA R. TAYLOR
1836 AMERICANA CR APT. 103
OLEN BURNE, MD, 21080
812/23
T.A.# 3-000-29954800
TAX MAP 32H BLOCK 2 PARCEL 34
ZONING: R-2

ISABELLA WATTS
930 FITCHE HWY.
SEVERNA PARK, MD, 21148
5068/267
T.A.# 3-000-80021110
TAX MAP 32H BLOCK 2 PARCEL 35
ZONING: R-2

CONSERVATION PROPERTY (OUTSIDE CRITICAL AREA) 0.91 Ac.

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Chesapeake & Atlantic Coastal Bays

CONSERVATION PROPERTY (INSIDE CRITICAL AREA) 0.37 Ac.
CONSERVATION PROPERTY (OUTSIDE CRITICAL AREA) 0.93 Ac.
TOTAL CONSERVATION PROPERTY (PLAT 1) 1.30 Ac.

TOTAL CONSERVATION PROPERTY (OVERALL) 3.96 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL) (OUTSIDE CRITICAL AREA) 3.01 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL) (INSIDE CRITICAL AREA) 3.95 Ac.



203 Nejezick Road - Suite 114
Middletown, MD 21108-2312
Phone: 410-981-0901

EXHIBIT 'A'

DRAWN BY: W.D.N.
TRACED BY: W.D.N.
CHECKED BY: M.J.W.
DRAWING NO: _____

ANNE ARUNDEL COUNTY
OFFICE OF PLANNING AND ZONING
CONSERVATION PROPERTY PLAT 1 OF 5
THE VILLAS OF SEVERNA PARK
3RD DISTRICT A.A. CO., MD

SCALE: 1"=100'
DATE: MAY 2005
PROJECT NO. _____

REVISIONS	
DATE	BY

APPROVED

CHIEF ENGINEER DATE: _____

LOUISE D. & CLIFTON F. WHITE
 9145 E. STAYMAN DRIVE
 ELLICOTT CITY, MD. 21042
 3449/7
 T.A.# 3-000-79233400
 TAX MAP 32H BLOCK 3 PARCEL 36
 ZONING: R-2

BK 16396 PG 0612

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 JUN 12 2009
 CRITICAL AREA COMMISSION
 Chesapeake & Atlantic Coastal Bays

N 508,100
 E 1,446,900



DAVID A. & HANCI C. CORRELL
 749 DIVIDING ROAD
 SEVERNA PARK, MD. 21148
 3429/855
 T.A.# 3-000-9008436
 TAX MAP 32E BLOCK 17 PARCEL 45
 ZONING: R-2

CONSERVATION PROPERTY
 (INSIDE CRITICAL AREA)
 2.53 Ac.

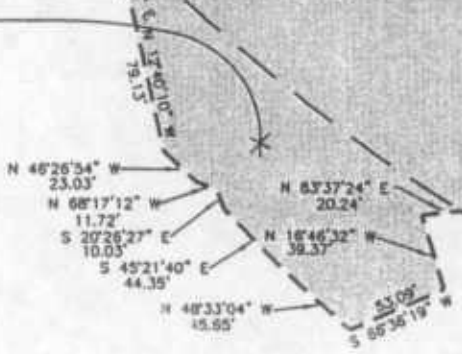
WINCENT J. AYERS SR.
 779 DIVIDING ROAD
 ARNOLD, MD. 21012
 14496/768
 T.A.# 3-000-00772840
 TAX MAP 32H BLOCK 9 PARCEL 11
 ZONING: R-2



E 1,446,900
 N 507,700

MARK A. & DEBORAH L. EHGLE
 787 DIVIDING CREEK ROAD
 ARNOLD, MD. 21012
 5631/820
 T.A.# 3-000-90081413
 TAX MAP 32H BLOCK 9 PARCEL 118
 ZONING: R-2

CONSERVATION PROPERTY
 (INSIDE CRITICAL AREA)
 2.52 Ac.



CONSERVATION PROPERTY (INSIDE CRITICAL AREA)	2.53 Ac.
CONSERVATION PROPERTY (OUTSIDE CRITICAL AREA)	0.31 Ac.
TOTAL CONSERVATION PROPERTY (PLAT 2)	2.84 Ac.

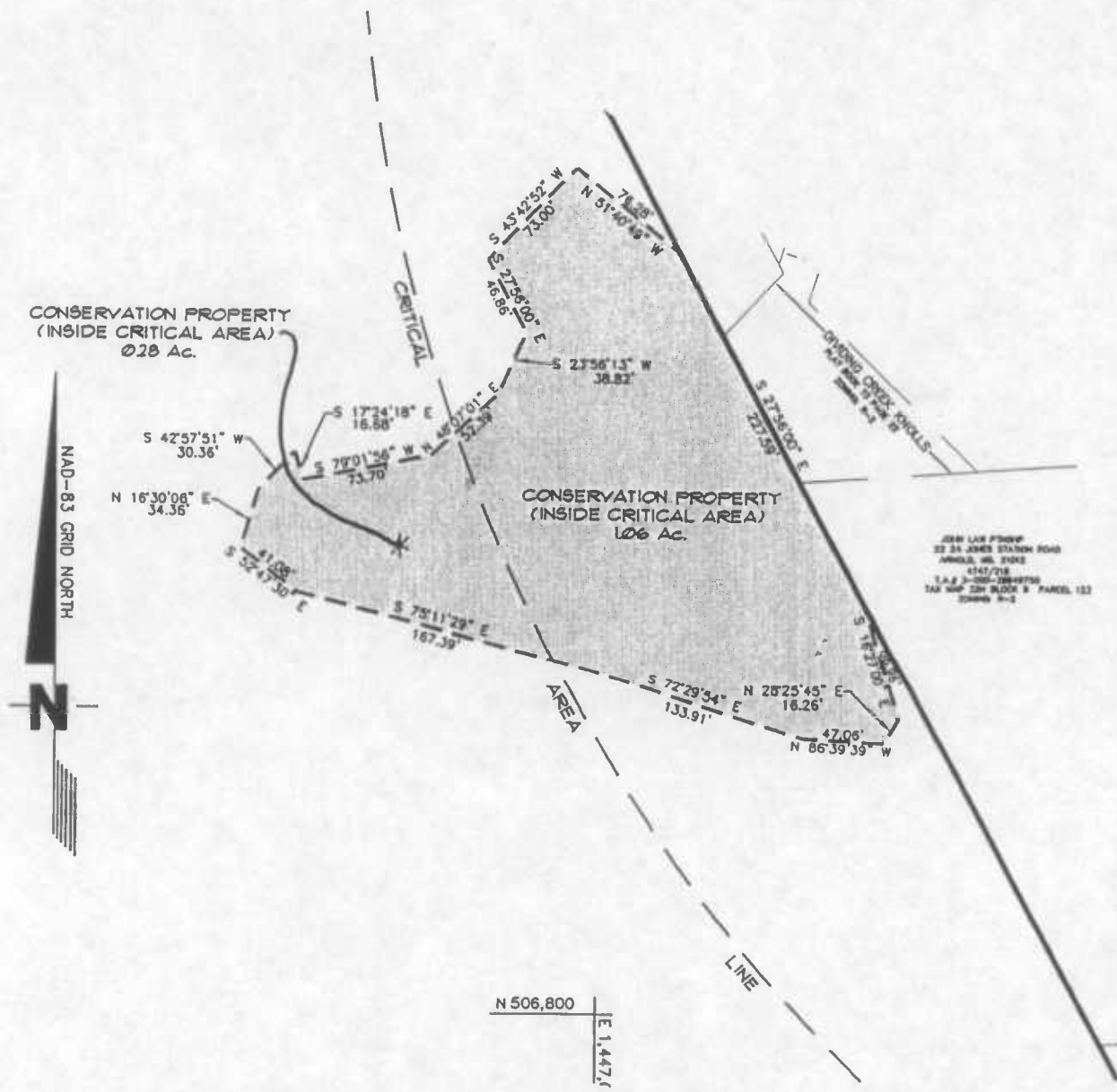
TOTAL CONSERVATION PROPERTY (OVERALL)	9.96 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL) (OUTSIDE CRITICAL AREA)	6.01 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL) (INSIDE CRITICAL AREA)	3.95 Ac.



303 Nejeles Road - Suite 114
 Millersville, MD 21108-2512
 Phone: 410-987-6901

EXHIBIT 'B'

DRAWN BY: <u>W.D.N.</u> TRACED BY: <u>W.D.N.</u> CHECKED BY: <u>M.J.W.</u> DRAWING NO: _____	ANNE ARUNDEL COUNTY OFFICE OF PLANNING AND ZONING	SCALE: <u>1"=100'</u>	REVISIONS	
	CONSERVATION PROPERTY PLAT 2 OF 5	DATE: <u>MAY 2005</u>	DATE	BY
	THE VILLAS OF SEVERNA PARK	PROJECT NO. _____		
3 RD DISTRICT	A.A. CO., MD	APPROVED	CHIEF ENGINEER DATE: _____	



CONSERVATION PROPERTY (INSIDE CRITICAL AREA)	1.06 Ac.
CONSERVATION PROPERTY (OUTSIDE CRITICAL AREA)	0.28 Ac.
TOTAL CONSERVATION PROPERTY (PLAT 3)	1.34 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL)	9.98 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL) (OUTSIDE CRITICAL AREA)	8.01 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL) (INSIDE CRITICAL AREA)	3.95 Ac.



303 Najoles Road - Suite 114
Millersville, MD 21108-2512
Phone: 410-987-6901

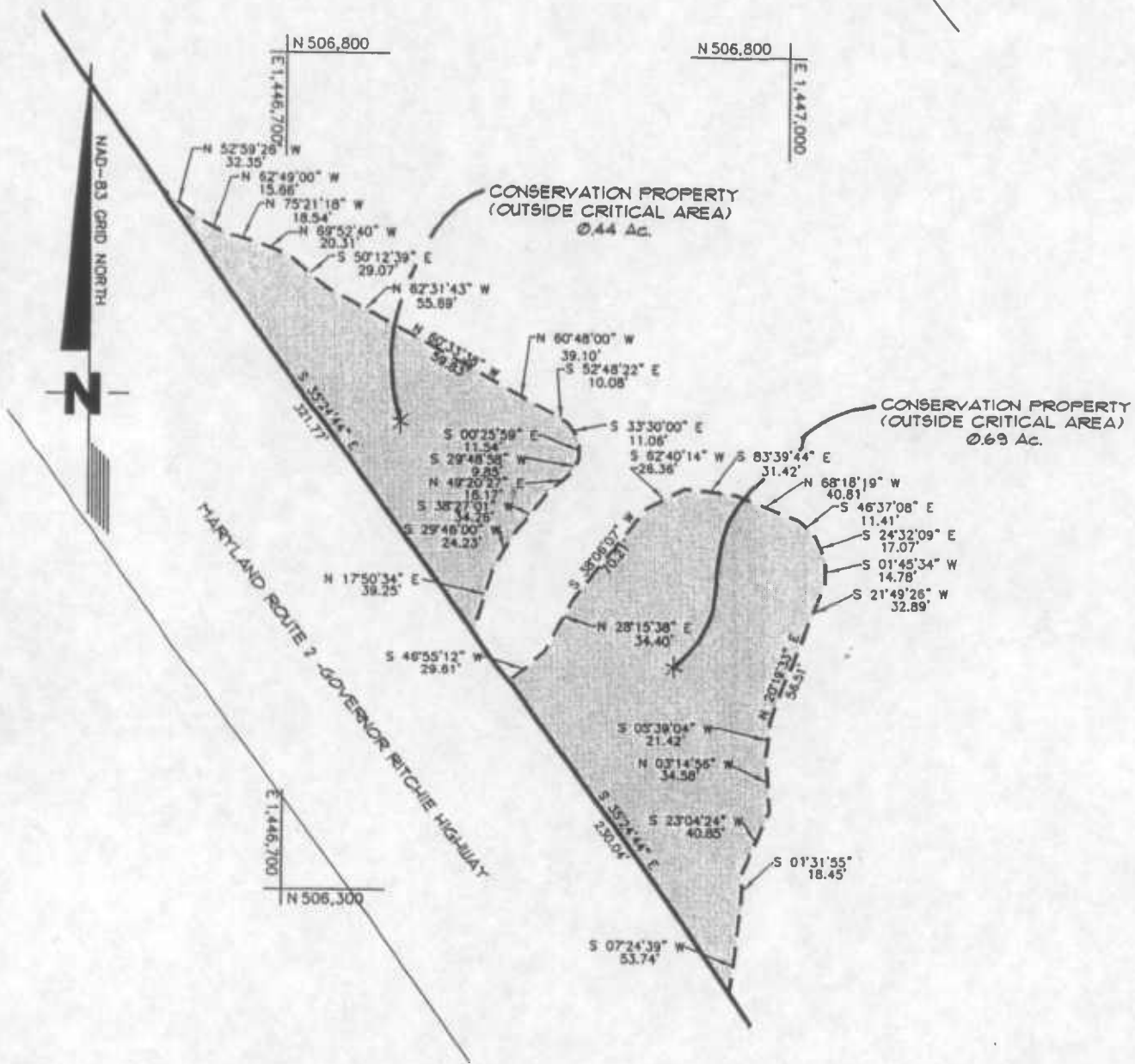
RECEIVED

JUN 12 2009

CRITICAL AREA COMMISSION
Chesapeake & Atlantic Coastal Bays

EXHIBIT 'C'

DRAWN BY: <u>W.D.N.</u> TRACED BY: <u>W.D.N.</u> CHECKED BY: <u>M.J.W.</u> DRAWING NO: _____	ANNE ARUNDEL COUNTY OFFICE OF PLANNING AND ZONING	SCALE: <u>1"=100'</u>	REVISIONS
	CONSERVATION PROPERTY PLAT 3 OF 5	DATE: <u>MAY 2005</u>	DATE BY
THE VILLAS OF SEVERNA PARK	PROJECT NO. _____	APPROVED	
3 RD DISTRICT	A.A. CO., MD	CHIEF ENGINEER DATE:	



CONSERVATION PROPERTY (INSIDE CRITICAL AREA)	0.00 Ac.
CONSERVATION PROPERTY (OUTSIDE CRITICAL AREA)	1.13 Ac.
TOTAL CONSERVATION PROPERTY (PLAT 4)	1.13 Ac.

TOTAL CONSERVATION PROPERTY (OVERALL)	9.96 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL) (OUTSIDE CRITICAL AREA)	6.01 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL) (INSIDE CRITICAL AREA)	3.95 Ac.



303 Najoles Road - Suite 114
 Millersville, MD 21108-2512
 Phone: 410-987-6901

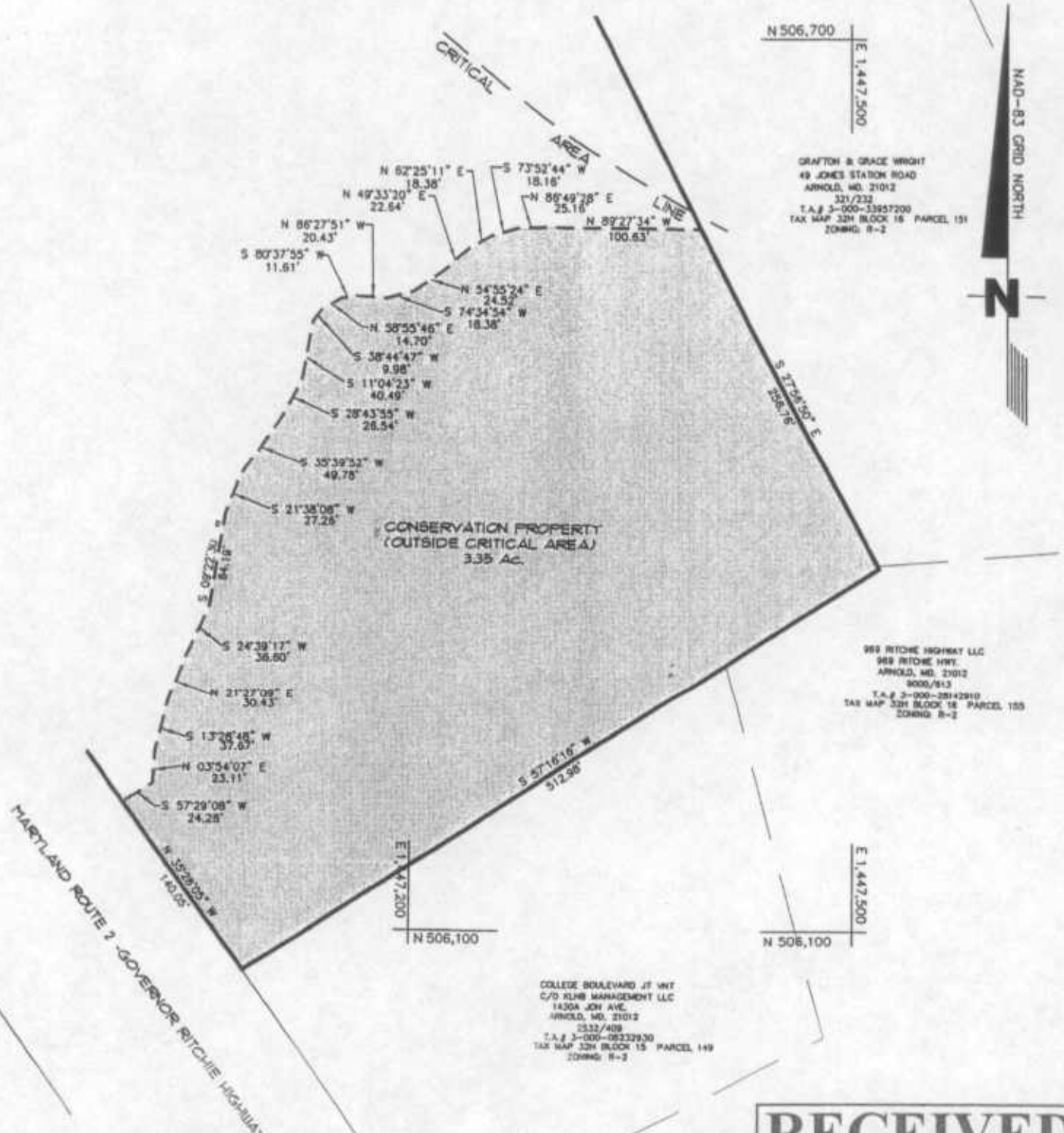
RECEIVED

JUN 12 2009

CRITICAL AREA COMMISSION
 Chesapeake & Atlantic Coastal Bays

EXHIBIT 'D'

DRAWN BY: <u>W.D.N.</u> TRACED BY: <u>W.D.N.</u> CHECKED BY: <u>M.J.W.</u> DRAWING NO: _____	ANNE ARUNDEL COUNTY OFFICE OF PLANNING AND ZONING	SCALE: <u>1"=100'</u>	REVISIONS
	CONSERVATION PROPERTY PLAT 4 OF 5 THE VILLAS OF SEVERNA PARK	DATE: <u>MAY 2005</u>	DATE
	3 RD DISTRICT A.A. CO., MD	PROJECT NO. _____	
		APPROVED	CHIEF ENGINEER DATE:



GRAFTON & GRACE WRIGHT
49 JONES STATION ROAD
ARNOLD, MD. 21012
321/232
T.A.# 3-000-53957200
TAX MAP 32H BLOCK 16 PARCEL 151
ZONING: R-2

989 RITCHIE HIGHWAY LLC
989 RITCHIE HWY.
ARNOLD, MD. 21012
9009/813
T.A.# 3-000-28142910
TAX MAP 32H BLOCK 16 PARCEL 155
ZONING: R-2

COLLEGE BOULEVARD JT WNT
C/O KLME MANAGEMENT LLC
14304 JOY AVE.
ARNOLD, MD. 21012
3532/409
T.A.# 3-000-09332930
TAX MAP 32H BLOCK 15 PARCEL 149
ZONING: R-2

CONSERVATION PROPERTY (INSIDE CRITICAL AREA)	0.00 Ac.
CONSERVATION PROPERTY (OUTSIDE CRITICAL AREA)	3.35 Ac.
TOTAL CONSERVATION PROPERTY (PLAT 5)	3.35 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL)	9.96 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL) (OUTSIDE CRITICAL AREA)	6.01 Ac.
TOTAL CONSERVATION PROPERTY (OVERALL) (INSIDE CRITICAL AREA)	3.95 Ac.

EXHIBIT 'E'

RECEIVED

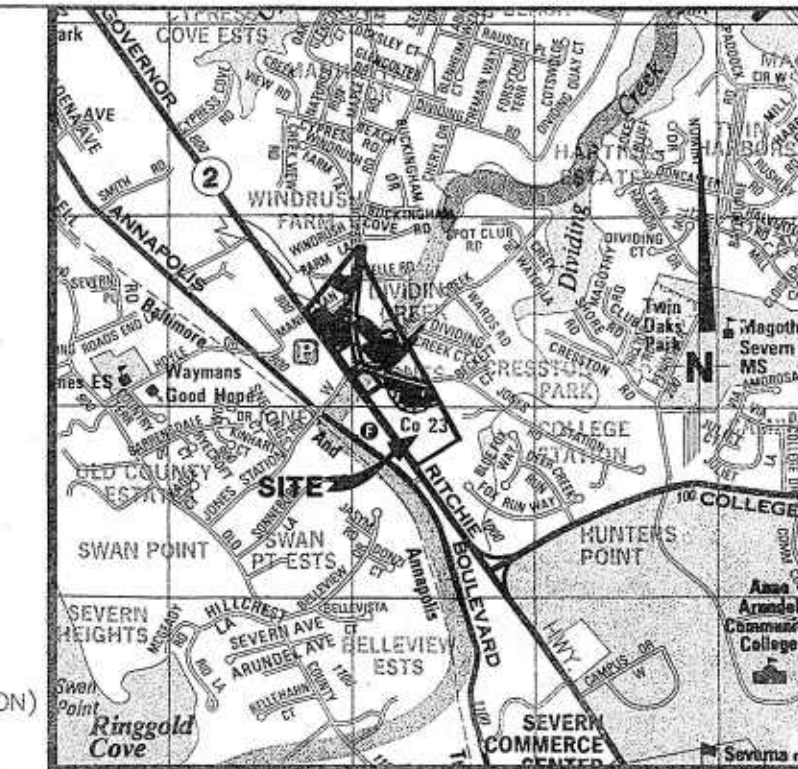
JUN 12 2009

CRITICAL AREA COMMISSION
Chesapeake & Atlantic Coastal Bays

DRAWN BY: <u>W.D.N.</u> TRACED BY: <u>W.D.N.</u> CHECKED BY: <u>M.J.W.</u> DRAWING NO: _____	ANNE ARUNDEL COUNTY OFFICE OF PLANNING AND ZONING	SCALE: <u>1"=100'</u>	REVISIONS	
	CONSERVATION PROPERTY PLAT 5 OF 5	DATE: <u>MAY 2005</u>	DATE	BY
THE VILLAS OF SEVERNA PARK	PROJECT NO. _____	APPROVED		
3 RD DISTRICT	A.A. CO., MD			

THE VILLAS AT SEVERNA PARK ADDITION

FINAL DEVELOPMENT PLANS



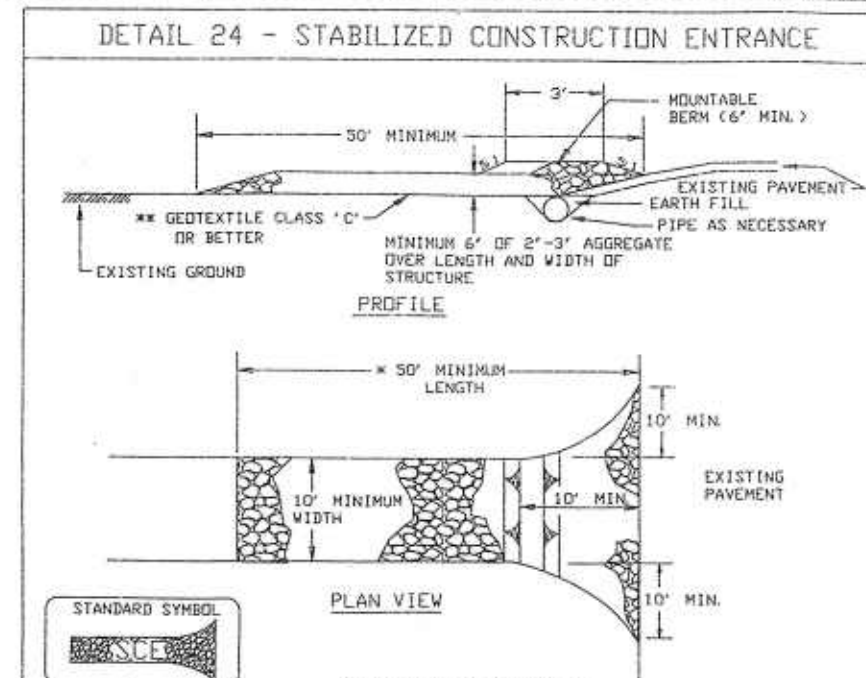
INDEX OF SHEETS

SHEET 1 OF 10	---DRAINAGE AREA & VICINITY MAPS, DETAILS & SITE ANALYSIS
SHEET 2 OF 10	---PLAN VIEW
SHEET 3 OF 10	---DRAINAGE AREA MAP (EX. CONDITIONS)
SHEET 4 OF 10	---DRAINAGE AREA MAP (PROP. CONDITIONS)
SHEET 5 OF 10	---DRAINAGE AREA MAP (CHANNEL PROTECTION)
SHEET 6 OF 10	---SWIM COMPS AND DETAILS
SHEET 7 OF 10	---P.O.I. DRAINAGE AREA MAP
SHEET 8 OF 10	---BIO-RETENTION DETAILS & SPECIFICATIONS
SHEET 9 OF 10	---RAIN GARDEN DETAILS

VICINITY MAP
SCALE: 1" = 2,000'
Copyright ADC The Map People
Permitted Use Number 20403131

FLOW TABULATION CHART

LOCATION	AREA	ACRES	COEFF. "C"	CA	#CA	TIME CONC. MIN.	INTEN. "I"	Q=CIA	PIPE n=0.014	REMARKS
FROM	TO	SUB	TOTAL							
CURB OUT "A"	A	0.77	0.51	0.39	11.6	11.6	5.9	2.3		
CURB OUT "B"	B	0.49	0.41	0.34	11.5	11.5	5.9	1.2		

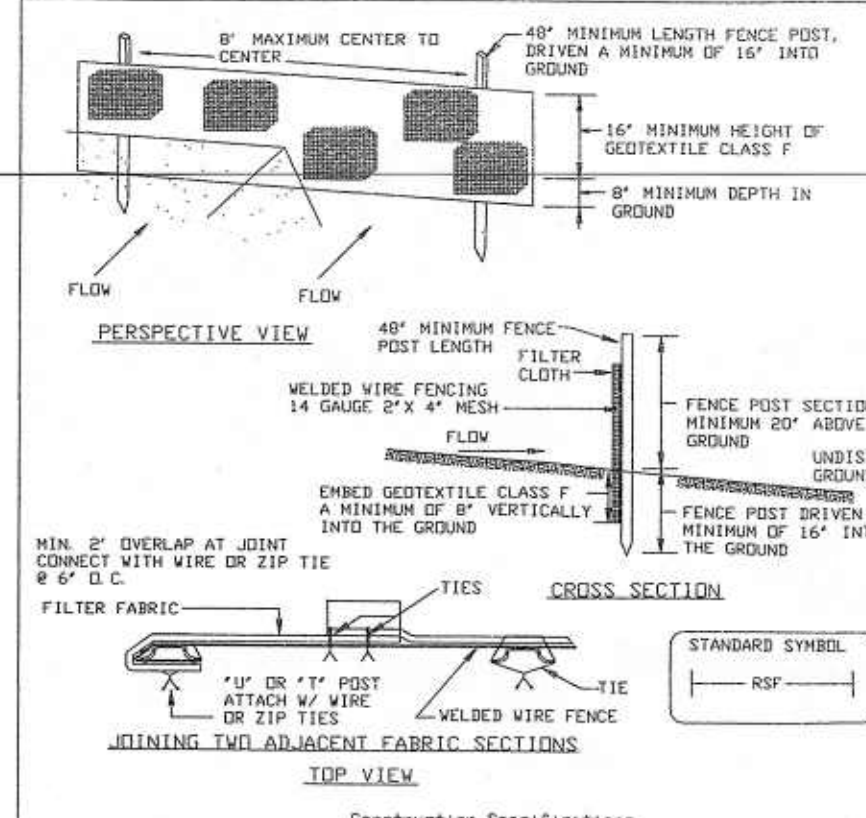


Construction Specifications

- Length - minimum of 30' (40' for single residence lots).
- Width - 10' minimum, should be flared at the existing road to provide a turning radius.
- Geotextile fabric (filter class) shall be placed over the existing ground prior to placing stone. After plan approval authority may not require single family residences to use geotextile.
- 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.
- 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 berm with 3:1 slopes and a minimum of 6" of stone over the pipe. Pipe shall be sized according to the area when the size 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 4' minimum will be required.
- 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-11-3, MARYLAND DEPARTMENT OF ENVIRONMENT & WATER MANAGEMENT ADMINISTRATION

DETAIL 22A - REINFORCED SILT FENCE APPROVED BY MDC 2-7-05

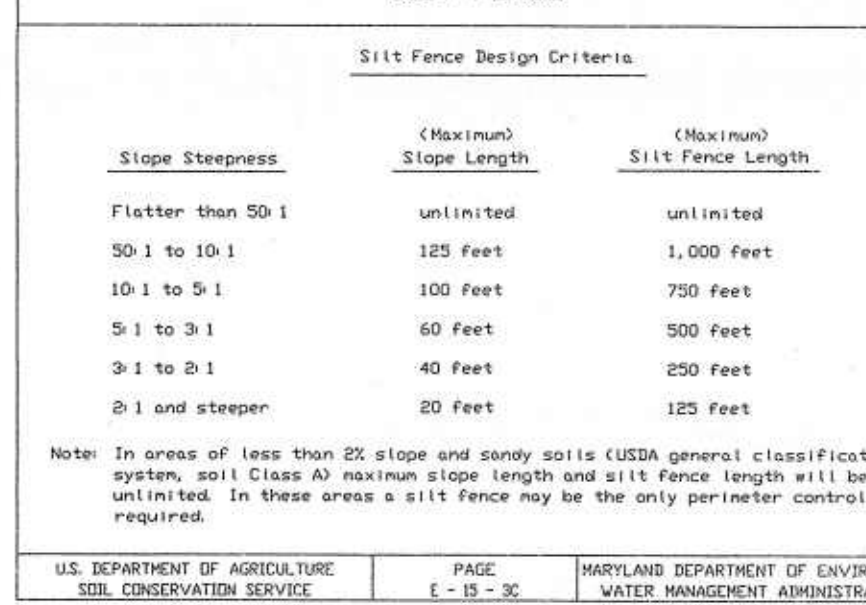


Construction Specifications

1. Metal fence post shall be a minimum of 48" long driven 16" minimum into the ground. Post shall 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 zip ties at top and mid section and shall meet the following requirements for geotextile Class F:
Tensile Strength: 50 lbs/in. (min.) Test: HST 509
Tensile Modulus: 20 lbs/in. (min.) Test: HST 509
Flow Rate: 0.3 gal. P.V. minute (max.) Test: HST 302
Filtering Efficiency: 75% (min.) Test: HST 302
3. Where ends of geotextile fabric come together, they shall be overlapped, folded and wired tied or zip tied to prevent sediment bypass.
4. Silt fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

ANNE ARUNDEL SOIL CONSERVATION DISTRICT, PAGE C-18-38, MARYLAND DEPARTMENT OF ENVIRONMENT & WATER MANAGEMENT ADMINISTRATION

DETAIL 22B - REINFORCED SILT FENCE APPROVED BY MDC 2-7-05



SILT FENCE

Silt Fence Design Criteria:

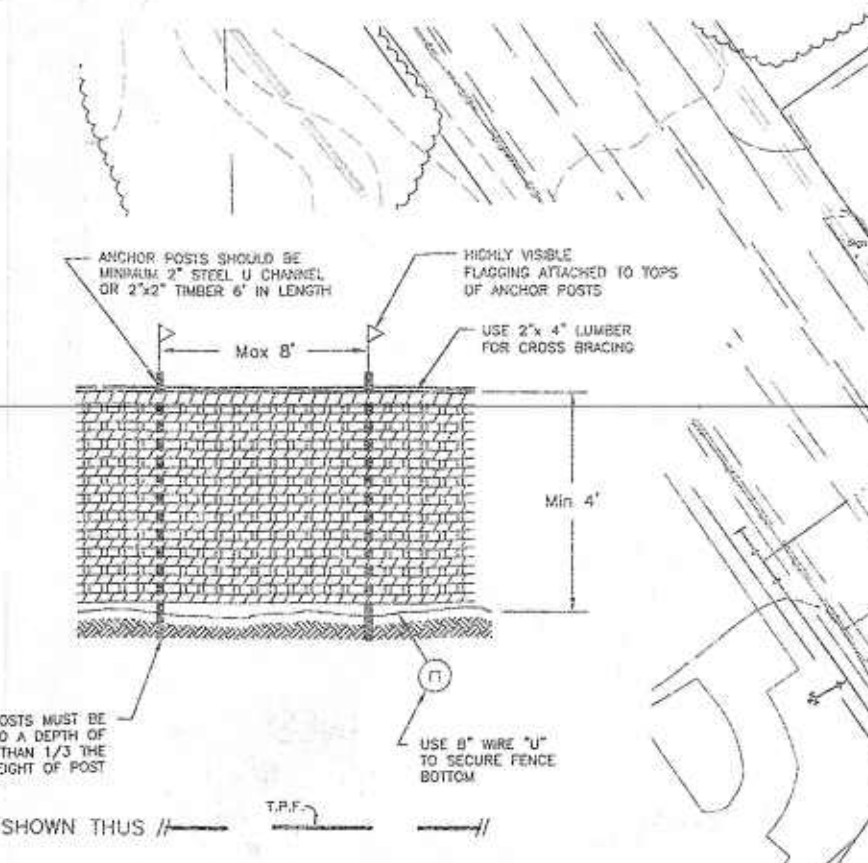
Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 Feet	1,000 Feet
10:1 to 5:1	100 Feet	750 Feet
5:1 to 3:1	60 Feet	500 Feet
3:1 to 2:1	40 Feet	250 Feet
2:1 and steeper	20 Feet	125 Feet

Note: In areas of less than 2:1 slope and sandy soils USDA general classification system, soil Class A0 maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only particle control required.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, PAGE E-15-38, MARYLAND DEPARTMENT OF ENVIRONMENT & WATER MANAGEMENT ADMINISTRATION

OUTFALL STATEMENT

A field investigation has been performed by Anarex, Inc. at the site outfall. Drainage Area "A" discharges onto the ground and flows 80' to a channel which flows 15' downstream to the site outfall and down through offsite properties 300'± to Dividing Creek. Drainage Area "B" discharges onto the ground and flows 140'± to a channel which is 700'± upstream from the site outfall. The rear of the lots sheet flow into the channel which discharges at the site outfall. The channel is a stable wooded upland non-tidal wetlands area in platted Flood Plain with no evidence of erosion, and the future condition will not be effected by runoff from the subdivision.



Notes:
1. Tree canopy or this shall mean for forest protection details only.
2. Installation of Retention Area will be established as part of the forest conservation plan.
3. Foundation of Retention Area should be staked and flagged prior to installing fence.
4. Avoid damage to critical root zone. Do not damage or sever large roots when installing.
5. Protection signs are required.
6. Fence should be maintained throughout construction.
7. State Forest Conservation Technical Manual Third Edition, 1997, Figure D-5.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, PAGE F-11-3, MARYLAND DEPARTMENT OF ENVIRONMENT & WATER MANAGEMENT ADMINISTRATION

CRITICAL AREA ANALYSIS FOR CLEARING

- LDA: LIMITED DEVELOPMENT AREA
1. TOTAL SITE AREA WITHIN CRITICAL AREA: 90,098 s.f. (2.07 AC.)
 2. TOTAL WOODLANDS IN CRITICAL AREA: 86,722 s.f. (2.02 AC.)
 3. TOTAL WOODLANDS ALLOWED TO BE CLEARED IN CRITICAL AREA: 30% OF 86,722 S.F. = 26,016 S.F.
 4. TOTAL WOODLANDS TO BE CLEARED IN CRITICAL AREA: 25,810 S.F. OR 28.2%.
 5. EXISTING CONSERVATION INSIDE CRITICAL AREA: 45,983 s.f. (1.06 AC.)
- NOTES:
1. NO DISTURBANCE CLEARING, CUTTING, TRIMMING, STORAGE OR STRUCTURES WILL BE PERMITTED.
2. THE REFORESTATION FOR CLEARING IN THE CRITICAL AREA WAS INCLUDED ON THE ORIGINAL SUBDIVISION PLAT OF "THE VILLAS AT SEVERNA PARK" RECORDED AS PLAT BOOK 272 PAGES 20-23. THE FEE OF \$66,167.40 WAS PAID ON 6/1/05 (RECEIPT #6318073).

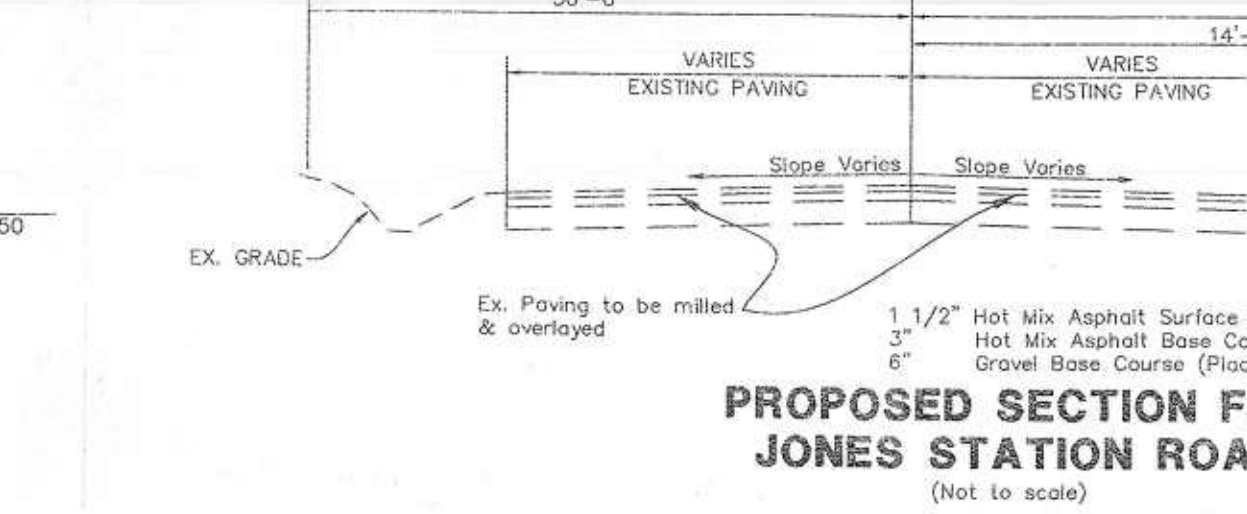
IMPERVIOUS CHART INSIDE CRITICAL AREA

TOTAL AREA WITHIN CRITICAL AREA	ALLOWABLE IMPERVIOUS COVERAGE
OPEN SPACE #1	52,653 S.F.
OPEN SPACE #2	11,455 S.F.
OPEN SPACE #3	65 S.F.
FLOOD PLAIN	5,580 S.F.
LOT 24	193 S.F.
LOT 26	354 S.F.
LOT 27	3,974 S.F.
LOT 28	84 S.F.
LOT 29	10,038 S.F.
TOTAL AREA	88,897 S.F.
	4,575 S.F. (5.09%)

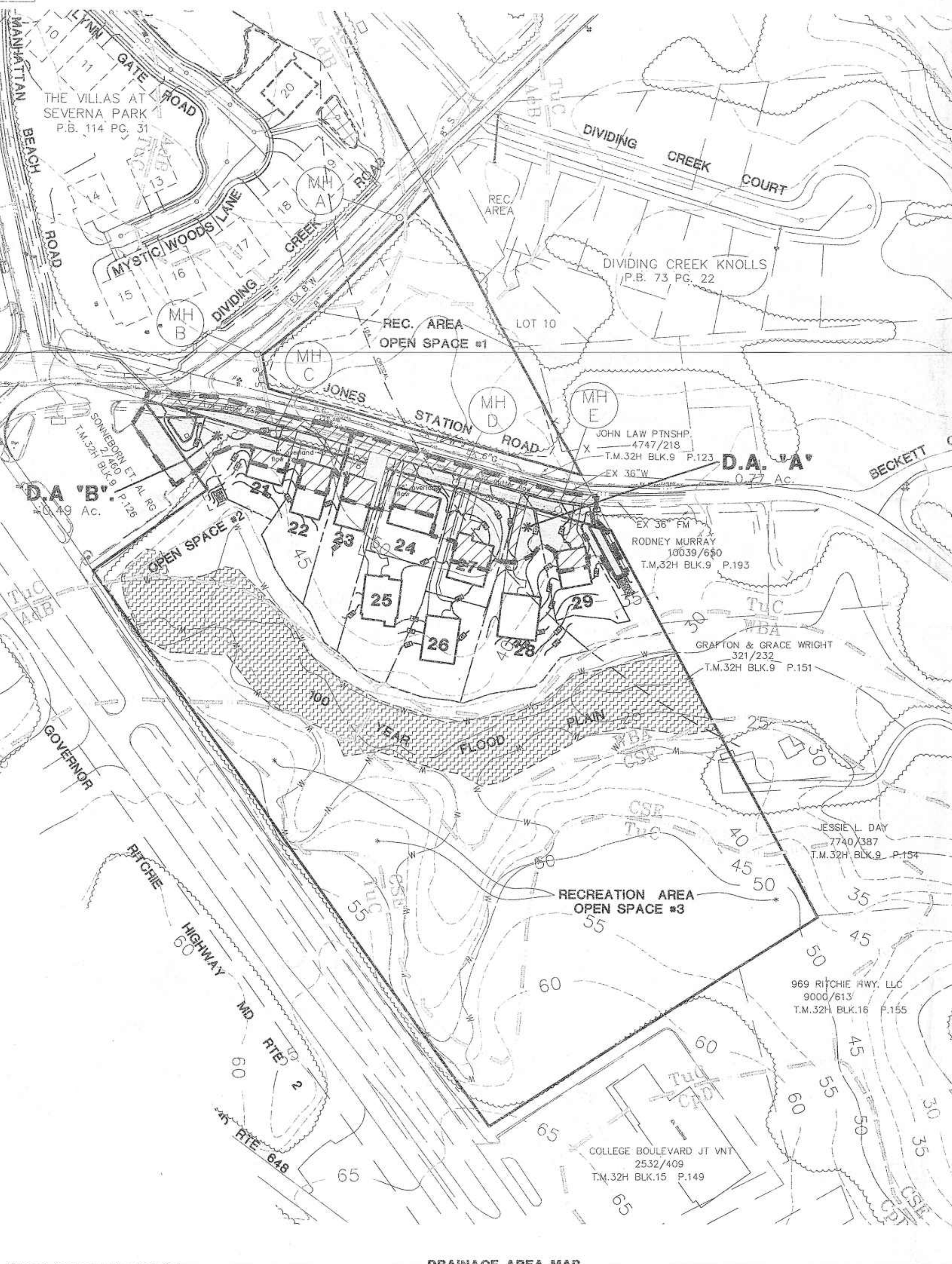
IMPERVIOUS BREAKDOWN PER LOT

LOT	HOUSE	DRIVEWAY	PORCH	TOTAL
LOT 24	0 S.F.	0 S.F.	0 S.F.	0 S.F.
LOT 26	0 S.F.	217 S.F.	0 S.F.	217 S.F.
LOT 27	72 S.F.	508 S.F.	24 S.F.	604 S.F.
LOT 28	84 S.F.	1,054 S.F.	0 S.F.	1,138 S.F.
LOT 29	2,000 S.F.	566 S.F.	5 S.F.	2,571 S.F.
TOTAL	2,156 S.F.	2,345 S.F.	74 S.F.	4,575 S.F.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, PAGE F-11-3, MARYLAND DEPARTMENT OF ENVIRONMENT & WATER MANAGEMENT ADMINISTRATION



U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, PAGE F-11-3, MARYLAND DEPARTMENT OF ENVIRONMENT & WATER MANAGEMENT ADMINISTRATION



STORMWATER MANAGEMENT NOTE

1. The Water Quality Volume (WqV) has been provided using the Natural Area Credit, Rooftop Disconnect Credit, and non-rooftop disconnect credit. The reduced volume is being provided in the 2 private onsite bio-retention areas.
2. The Recharge Volume (Rev) is being provided in both of the private onsite bio-retention areas. The total volume required 2,146 cubic feet is being provided in both of the bio-retention areas.
3. Channel Protection is not required on the 1 year runoff in less than 2 c.f.s.
4. Overbank Flood Protection has been provided as the developed flow at the site outfall is the same as the existing flow of the site outfall.
5. Extreme Flood Protection is not required as the site outfall is in a dedicated Flood Plain area and there is no downstream erosion.

STORMWATER MANAGEMENT CREDIT NOTE

- ROOFTOP DISCONNECTION CREDIT
Rooftop Disconnection Credit has been provided for lots 21-29. These lots are draining via sheet flow and meet the runoff credit for non-structural / structural stormwater management practice.
- NATURAL AREA CONSERVATION CREDIT
A reduction in the water Quality Volume (WqV) requirements for the site has been provided using the natural area conservation credit for the 7.95 acres of onsite woody vegetation placed in conservation easement, and the platted flood plain area.

STORMWATER MANAGEMENT CREDIT NOTE

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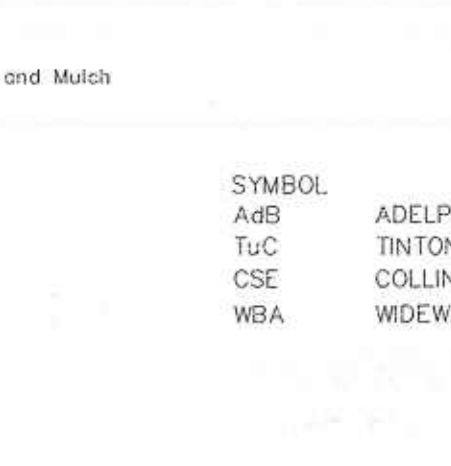
ANAREX, INC.
CIVIL ENGINEERING SERVICES
LAND SURVEYING
303 Najoles Road - Suite 114
Millersville, MD 21108-2512
Phone: 410-987-6901



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. 23380, Expiration date 8-19-2010.

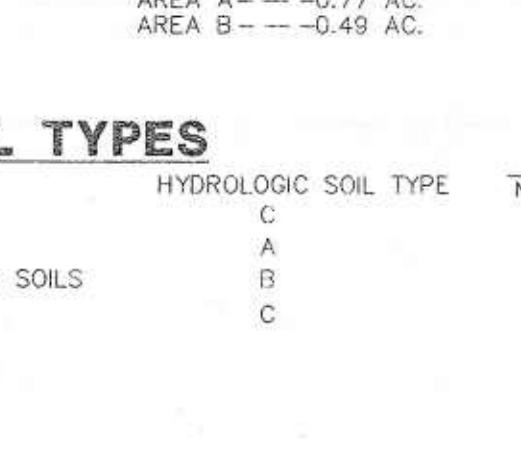
DRAINAGE AREA MAP

SCALE: 1"=100'



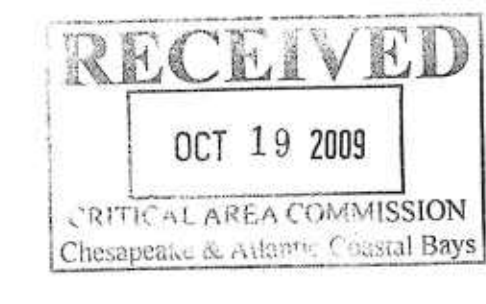
DRAINAGE AREAS

AREA A --- 0.77 AC.
AREA B --- 0.49 AC.



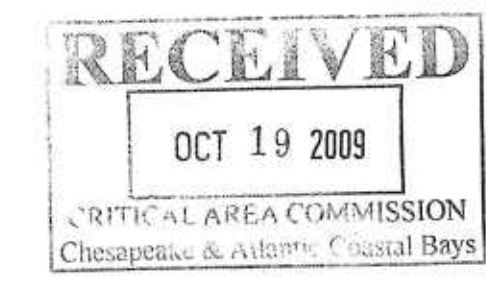
MAPPED SOIL TYPES

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL TYPE
AdB	ADELPHOA-HOLMDEL COMPLEX	C
TuC	TINTON-URBAN LAND COMPLEX	A
CSE	COLLINGTON, WST AND WESTPHALIA SOILS	B
WBA	WIDEWATER AND ISSUE SOILS	C



SHEET 1 of 10
FINAL PLANS
THE VILLAS AT SEVERNA PARK ADDITION

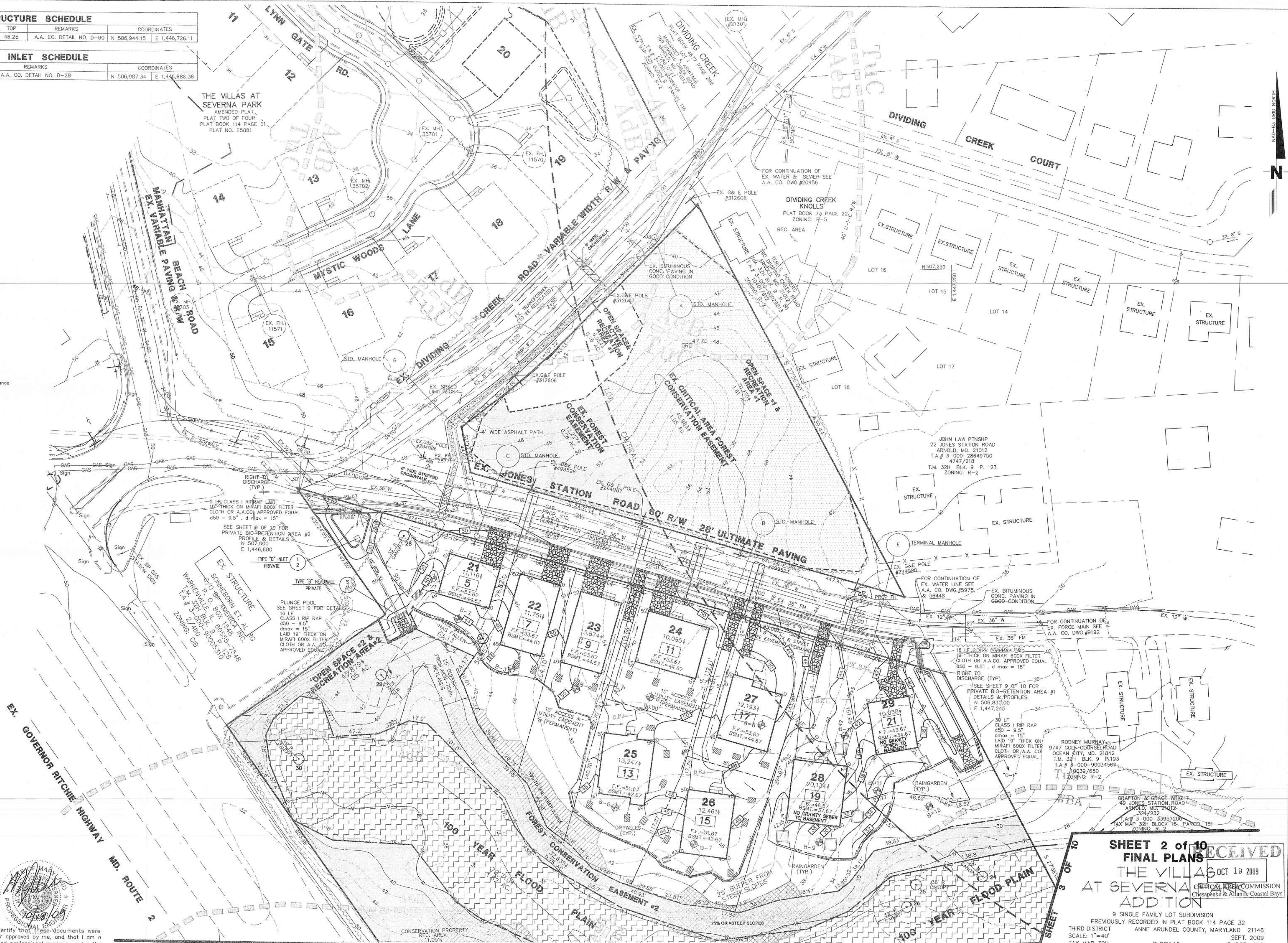
9 SINGLE FAMILY LOT SUBDIVISION
PREVIOUSLY RECORDED IN PLAT BOOK 114 PAGE 32
THIRD DISTRICT ANNE ARUNDEL COUNTY, MARYLAND 21146
SCALE: AS SHOWN
TAX MAP 32H BLOCK 15 PARCEL 148
ZONING: R-2 CLUSTER ZIP CODE: 21146
SUB.# 2001-038 PROJECT# 2007-0112
T.A.# 03-825-90224024



STRUCTURE SCHEDULE						
NO.	TYPE	INV.	TOP	REMARKS	COORDINATES	
S-2	"B" HEADWALL	44.00	46.25	A.A. CO. DETAIL NO. D-60	N 506,944.15	E 1,446,726.11

INLET SCHEDULE						
NO.	TYPE	OUT	TOP	REMARKS	COORDINATES	
I-2	"D"	45.00	48.83	A.A. CO. DETAIL NO. D-28	N 506,987.34	E 1,446,686.36

- LEGEND**
- 152- Existing Contours
 - 152- Proposed Contours
 - - - Existing Tree Line
 - L.O.D. Limit of Disturbance
 - RSF-RSF- Reinforced Silt Fence
 - [Pattern] Stabilized Construction Entrance (S.C.E.)
 - [Pattern] +25% SLOPES
 - [Pattern] 15-25% SLOPES
 - [Pattern] NON-TIDAL WETLANDS
 - [Pattern] CONSERVATION PROPERTY INSIDE CRITICAL AREA
 - [Pattern] 100 YEAR FLOOD PLAN
 - - - CRITICAL AREA LINE
 - - - TREE PROTECTION FENCE
 - [Pattern] CONSERVATION PROPERTY (OUTSIDE CRITICAL AREA)
 - EX. SPECIMEN TREE
 - EX. SPECIMEN TREE (TO BE REMOVED)
 - CSE TuC SOILS LINE
 - [Symbol] ROOFTOP DISCONNECTS
 - [Symbol] RAIN GARDENS
 - CRITICAL ROOT ZONE



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 SHEET 2 of 10
 FINAL PLANS
 THE VILLAS AT SEVERNA
 ADDITION
 OCT 19 2009
 CRITICAL AREA COMMISSION
 Chesapeake & Atlantic Coastal Bays

9 SINGLE FAMILY LOT SUBDIVISION
 PREVIOUSLY RECORDED IN PLAT BOOK 114 PAGE 32
 THIRD DISTRICT ANNE ARUNDEL COUNTY, MARYLAND 21146
 SCALE: 1"=40'
 TAX MAP 32H BLOCK 15 PARCEL 148
 ZONING: R-2 CLUSTER BLOCK 15
 SUB.# 2001-038 ZIP CODE: 21146
 T.A.# 03-825-90224024 PROJECT# 2007-0112

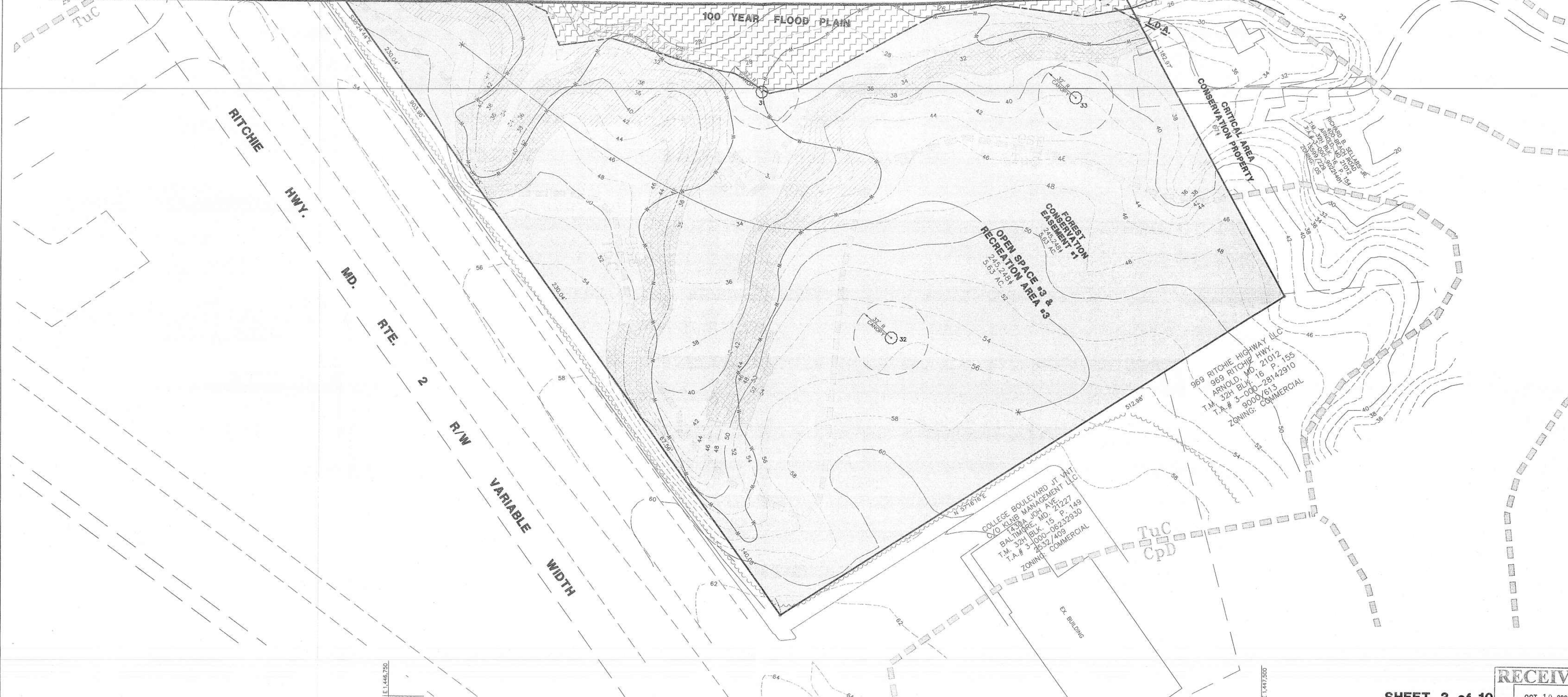
LEGEND

- 152- Existing Contours
- [152] Proposed Contours
- Existing Tree Line
- [Hatched Box] +25% SLOPES
- [Hatched Box] 15-25% SLOPES
- [Dotted Box] NON-TIDAL WETLANDS
- [Dashed Box] 100 YEAR FLOOD PLAIN
- - - CRITICAL AREA LINE
- [CSE TuC] SOILS LINE
- EX. SPECIMEN TREE
- 24
- 23
- EX. SPECIMEN TREE (TO BE REMOVED)
- POND #1
- [Dashed Box] CONSERVATION PROPERTY (OUTSIDE CRITICAL AREA)
- [Circle with Center] CRITICAL ROOT ZONE
- [Diagram] FLOOD PLAIN SECTION

SHEET 2 OF 10



MATCH LINE SEE



N 506,000
E 1,446,750

N 506,000
E 1,447,500



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SHEET 3 of 10
FINAL PLANS
THE VILLAS AT SEVERNA PARK ADDITION

9 SINGLE FAMILY LOT SUBDIVISION
PREVIOUSLY RECORDED IN PLAT BOOK 114 PAGE 32
THIRD DISTRICT ANNE ARUNDEL COUNTY, MARYLAND 21146
SCALE: 1"=40'
TAX MAP 32H BLOCK 15 SEPT. 2009
ZONING: R-2 CLUSTER PARCEL 148
SUB.# 2001-038 ZIP CODE: 21146
T.A.# 03-825-90224024 PROJECT# 2007-0112

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LEGEND

- - - 275 - - - = EXISTING GRADE
- - - 275 = PROPOSED GRADE
- - - - - = FLOW ARROWS
- - - - - = EXISTING WOODLINE
- - - - - = EXISTING DRAINAGE AREA
- - - - - = SOIL CLASSIFICATION
- - - - - = EXISTING TIME OF CONCENTRATION

D.A.=84.11 AC.
 CN=65
 $T_c=0.57$ HR.
 $Q_{0EX}=106$ CFS

N 906,500
 E L 444,600



D.A.=84.11 AC.

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DRAINAGE AREA MAP
 TO SITE OUTFALL
 EXISTING CONDITIONS-10 YR. ANALYSIS
 SCALE: 1"=100'

SHEET 4 of 10
FINAL PLANS RECEIVED
THE VILLAS AT SEVERNA PARK
ADDITION
 OCT 19 2009
 ANNE ARUNDEL COUNTY, MARYLAND
 9 SINGLE FAMILY LOT SUBDIVISION
 PREVIOUSLY RECORDED IN PLAT BOOK 114 PAGE 32
 ANNE ARUNDEL COUNTY, MARYLAND 21146
 SCALE: 1"=40'
 TAX MAP 32H BLOCK 15 PARCEL 148
 ZONING: R-2 CLUSTER ZIP CODE: 21146
 SUB.# 2001-038 PROJECT# 2007-0112
 T.A# 03-825-90224024

LEGEND

- - - 215 - - - EXISTING GRADE
- - - 215 - - - PROPOSED GRADE
- - - - - FLOW ARROWS
- - - - - EXISTING WOODLINE
- - - - - EXISTING DRAINAGE AREA
- - - - - SOIL CLASSIFICATION
- - - - - EXISTING TIME OF CONCENTRATION

D.A.=84.11 AC.
 CN=66
 $T_c=0.57$ HR.
 $Q_{0PR}=110$ CFS

N 506.500
 E 1444.500



D.A.=84.11 AC.

DRAINAGE AREA MAP
 TO SITE OUTFALL
 PROPOSED CONDITIONS- 10 YR. ANALYSIS
 SCALE: 1"=100'

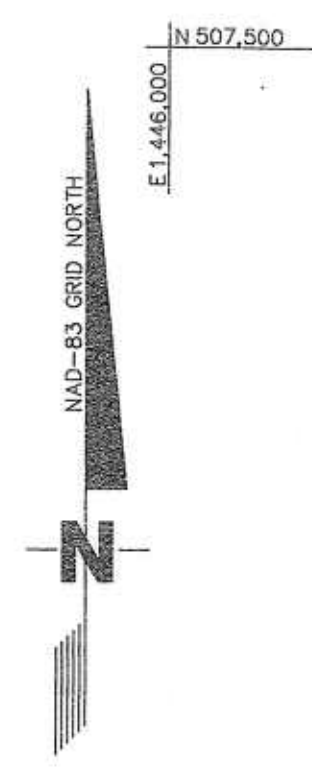
SHEET 5 of 10
FINAL PLANS
 THE VILLAS
 AT SEVERNA PARK
 ADDITION

9 SINGLE FAMILY LOT SUBDIVISION
 PREVIOUSLY RECORDED IN PLAT BOOK 114 PAGE 32
 THIRD DISTRICT ANNE ARUNDEL COUNTY, MARYLAND 21146
 SCALE: 1"=40' SEPT. 2009
 TAX MAP 32H BLOCK 15 PARCEL 148
 ZONING: R-2 CLUSTER ZIP CODE: 21146
 SUB.# 2001-038 PROJECT# 2007-0112
 T.A# 03-825-90224024

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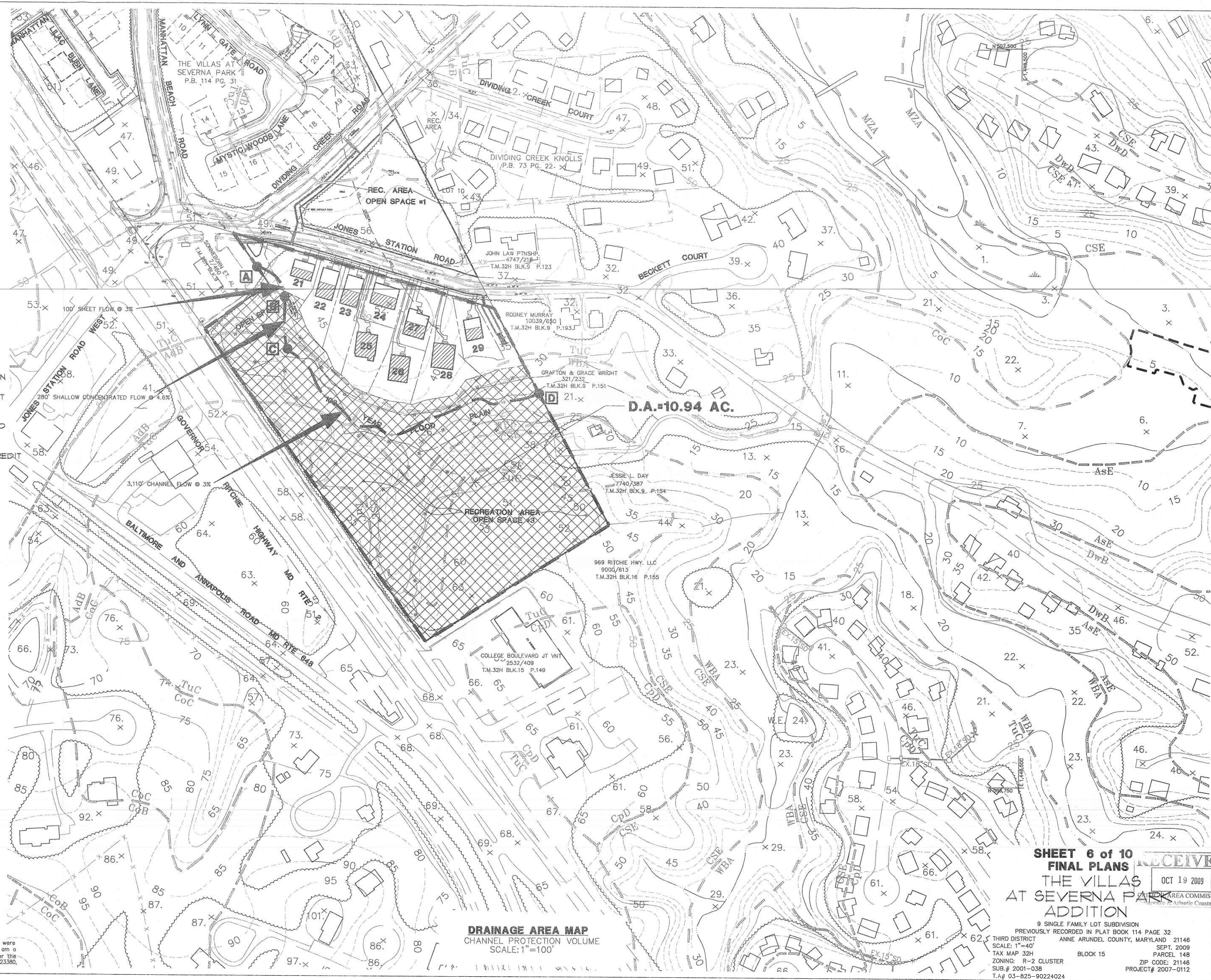
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 AREA COMMISSION



- LEGEND**
- - - - - 36 - - - - - EXISTING GRADE
 - - - - - 36 - - - - - PROPOSED GRADE
 - - - - - FLOW ARROWS
 - - - - - EXISTING WOODLINE
 - - - - - EXISTING DRAINAGE AREA
 - - - - - SOIL CLASSIFICATION
 - - - - - PROPOSED TIME OF CONCENTRATION
 - [Hatched Box] - SUM ROOFTOP DISCONNECT CREDIT
 - [Solid Grey Box] - IMPERVIOUS AREA TO BE MANAGED BY ONSITE DRYWELLS
 - [Cross-hatched Box] - NATURAL AREA CONSERVATION CREDIT

CHANNEL PROTECTION VOLUME:
 D.A.=10.94 AC.
 CN=55
 T_c=0.25 HR.
 Q₁=0.76 CFS



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DRAINAGE AREA MAP
 CHANNEL PROTECTION VOLUME
 SCALE: 1"=100'

SHEET 6 of 10
FINAL PLANS
 RECEIVED
 OCT 19 2009
 THE VILLAS AT SEVERNA PARK
 ADDITION
 ANNE ARUNDEL COUNTY, MARYLAND
 9 SINGLE FAMILY LOT SUBDIVISION
 PREVIOUSLY RECORDED IN PLAT BOOK 114 PAGE 32
 THIRD DISTRICT
 SCALE: 1"=40'
 TAX MAP 32H
 ZONING: R-2 CLUSTER
 SUB.# 2001-038
 T.A.# 03-825-90224024

Figure 5.1 Schematic of Dry Well

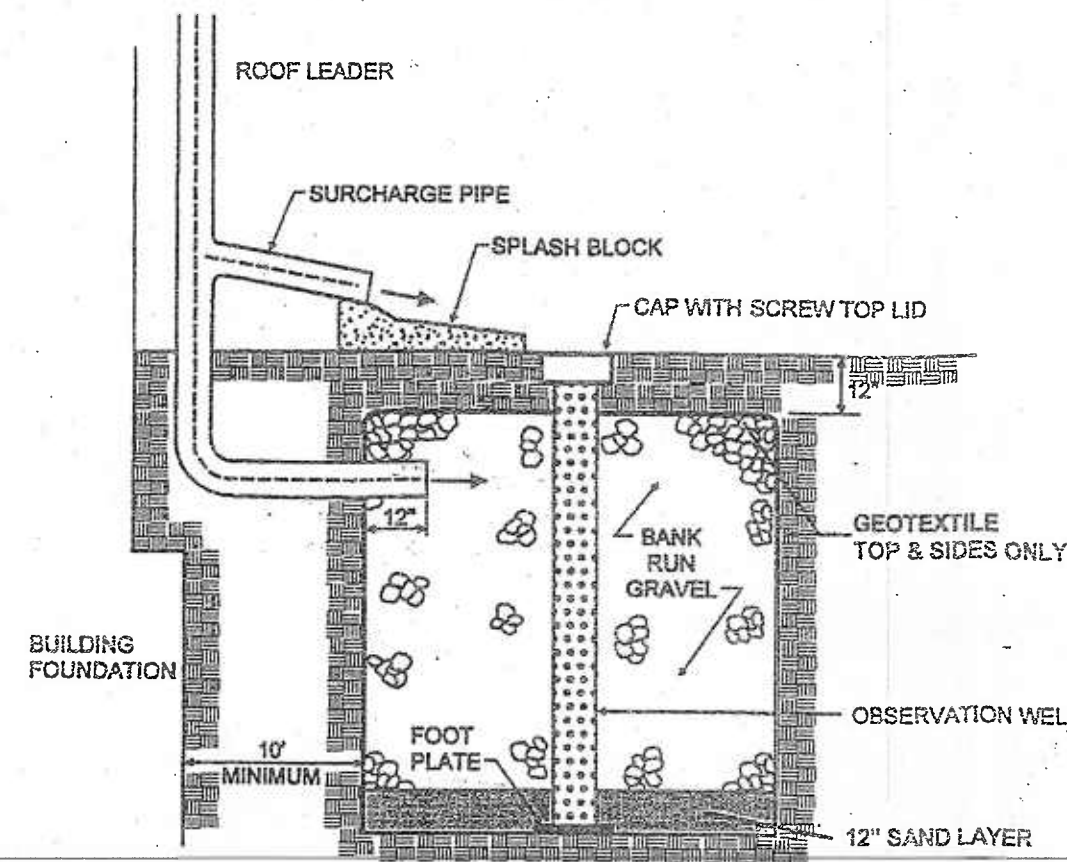


Table 5.2 Rooftop Disconnection Compensation Storage Volume Requirements (Per Disconnection Using Drywells, Raingardens, etc.)

Disconnection Length Provided	0 - 14 ft.	15 - 29 ft.	30 - 44 ft.	45 - 59 ft.	60 - 74 ft.	≥ 75 ft.
% WQ. Treated by Disconnect	0%	20%	40%	60%	80%	100%
% WQ. Treated by Storage	100%	80%	60%	40%	20%	0%
Max. Storage Volume* (Eastern Rainfall Zone)	40 cu-ft.	32 cu-ft.	24 cu-ft.	16 cu-ft.	8 cu-ft.	0 cu-ft.
Max. Storage Volume (Western Rainfall Zone)	36 cu-ft.	28.8 cu-ft.	21.6 cu-ft.	14.4 cu-ft.	7.2 cu-ft.	0 cu-ft.

*Assuming 500 square foot roof area to each downspout.

57

Rooftop Disconnection Compensation Storage Volume Requirements *

LOT #	Total Rooftop Area (Sq. Ft.)	Max. Area per Device	Devices Required	Percent WQv Treated	WQv Storage Required	Void Ratio	Total Volume Required	WQv Storage Provided	Size	Quantity	Device Type
21	500	500	1	100%	40 cu.ft.	0.40	100 cu.ft.	100 cu.ft.	10'x5'x2' DEEP	1	Drywell
21	500	500	1	100%	50 sq. ft.	-	50 sq. ft.	50 sq. ft.	10'x5'	1	Raingarden
22	1400	500	3	100%	40 cu.ft.	0.40	279 cu.ft.	300 cu.ft.	10'x5'x2' DEEP	3	Drywells
23	1400	500	3	100%	40 cu.ft.	0.40	279 cu.ft.	300 cu.ft.	10'x5'x2' DEEP	3	Drywells
24	1500	500	3	100%	40 cu.ft.	0.40	300 cu.ft.	300 cu.ft.	10'x5'x2' DEEP	3	Drywells
25**	2826	500	6	100%	40 cu.ft.	0.40	564 cu.ft.	600 cu.ft.	SEE BELOW	6	Drywells
26**	2721	500	6	100%	40 cu.ft.	0.40	546 cu.ft.	600 cu.ft.	SEE BELOW	6	Drywells
27	1469	500	3	100%	40 cu.ft.	0.40	284 cu.ft.	300 cu.ft.	10'x5'x2' DEEP	3	Drywells
28**	2958	1000	3	100%	100 sq.ft.	-	300 sq.ft.	300 sq.ft.	SEE BELOW	4	Raingardens
29	1000	500	2	100%	50 sq. ft.	-	50 sq. ft.	50 sq. ft.	10'x5'	2	Raingardens

* See MDE Stormwater Design Manual Chapter 5 Section 5.2

- Maximum 500 square foot roof area to each rooftop disconnect drywell
- Raingardens: up to 500 square foot roof area = 50 square foot of raingarden
501-1000 square foot roof area = 100 square foot raingarden
- Additional driveway impervious area lots 25,26,28 has been divided evenly in each swm device.

** CHART INCLUDES DRIVEWAY IMPERVIOUS AREA TO BE ADDED TO THE ROOFTOP DEVICES

LOT #	Total Driveway Area (Sq. Ft.)	Volume Required	Volume Provided	Void Ratio	Total Volume Required Driveway	Total Volume Required Rooftop	Total Volume Req.	Size	Total Volume Provided	Quantity	Device Type
25	1250	1250'1"112"	104 cu ft	0.40	280 cu ft	564 cu ft	824 cu ft	10' * 5' * 3' DEEP	900 cu ft	6	Drywells
26	1300	1300'1"112"	108 cu ft	0.40	270 cu ft	546 cu ft	819 cu ft	10' * 5' * 3' DEEP	900 cu ft	6	Drywells
28	707	707'1"	707 sq ft	-	707 sq ft	2858 sq ft	3665 sq ft	10'x10'	4000 sq ft	4	Raingardens

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Water Quality & Recharge Volume

Drainage Area "A"
Site Area 0.77 Acres 33,541 Sq. Ft. 0.001 Sq. Mi.
Impervious Area 0.34 Acres 14,760 Sq. FT

Site Area Table			
HSG A	0.77 Acres	S = 0.42	S'A = 0.32
HSG B	Acres	S = 0.29	S'A = 0.00
HSG C	Acres	S = 0.14	S'A = 0.00
HSG D	Acres	S = 0.08	S'A = 0.00
Total	0.77 Acres	S =	Total 0.32

Avg HSG 0.42
Precipitation Depth P = 1.00
Percent Impervious I = 44 %
Compute WQv $WQv = \frac{(P)(Rv)(A)}{12}$
 $Rv = 0.05 + (0.009)I = 0.45$
 $WQv = 0.029 \text{ ac-ft} = 1,247 \text{ cu-ft} = 0.029 \text{ ac-ft}$

Impervious Table			
HSG A	0.34 Acres	S = 0.42	S'A = 0.14
HSG B	0 Acres	S = 0.29	S'A = 0.00
HSG C	0 Acres	S = 0.14	S'A = 0.00
HSG D	0 Acres	S = 0.08	S'A = 0.00
Total	0.34 Acres	S =	Total 0.14

Avg HSG 0.42
Compute Rev $Rev = \frac{(s)(Rv)(A)}{12}$
 $Rev = 0.012 \text{ ac-ft} = 524 \text{ cu-ft} = 0.012 \text{ ac-ft}$

Rev is included WQv if Rev Provided separately WQv = 0.017 ac-ft = 723 cu-ft

Water Quality & Recharge Volume

Drainage Area "B"
Site Area 0.49 Acres 21,344 Sq. Ft. 0.001 Sq. Mi.
Impervious Area 0.15 Acres 6,650 Sq. FT

Site Area Table			
HSG A	0.49 Acres	S = 0.42	S'A = 0.21
HSG B	Acres	S = 0.29	S'A = 0.00
HSG C	Acres	S = 0.14	S'A = 0.00
HSG D	Acres	S = 0.08	S'A = 0.00
Total	0.49 Acres	S =	Total 0.21

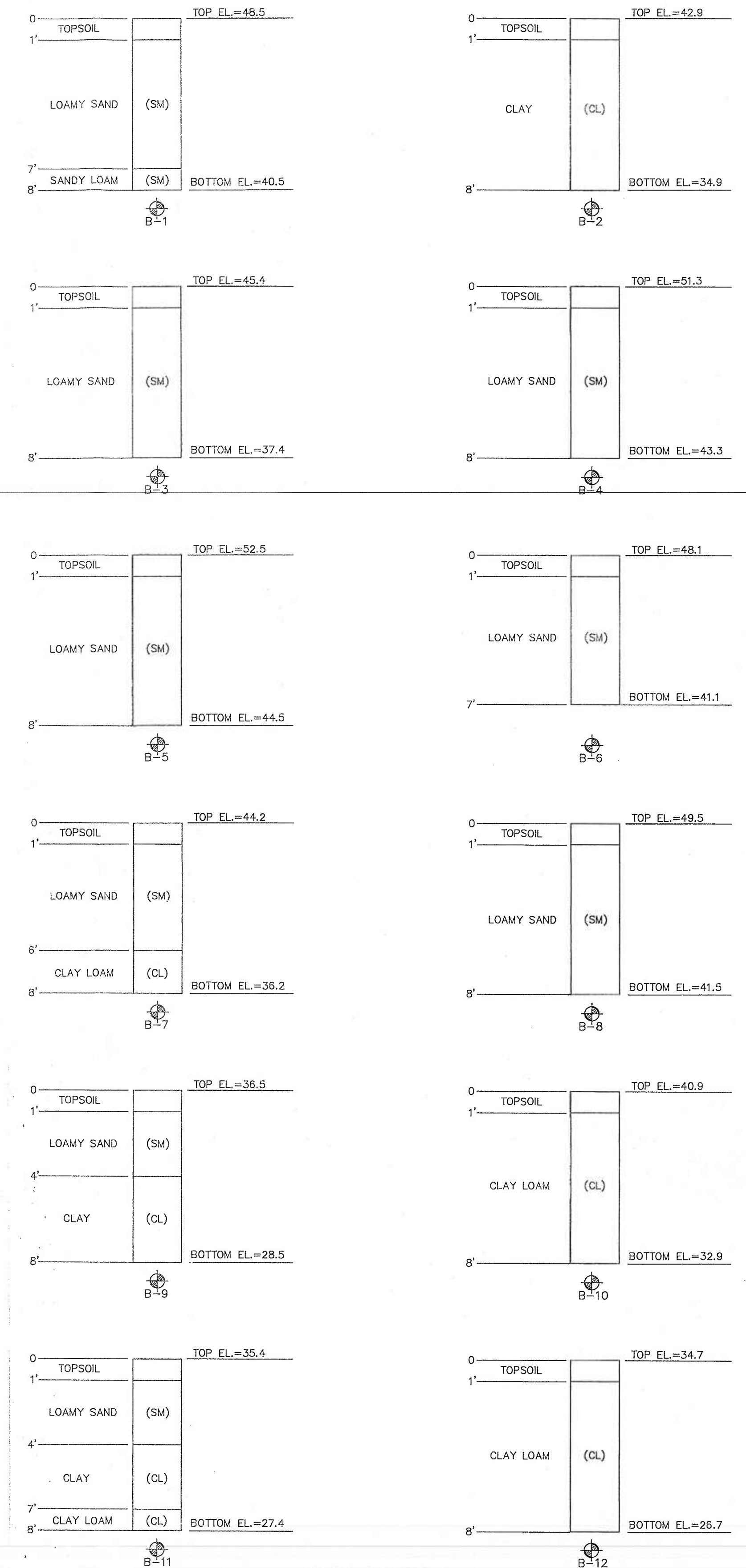
Avg HSG 0.42
Precipitation Depth P = 1.00
Percent Impervious I = 31 %
Compute WQv $WQv = \frac{(P)(Rv)(A)}{12}$
 $Rv = 0.05 + (0.009)I = 0.33$
 $WQv = 0.013 \text{ ac-ft} = 588 \text{ cu-ft} = 0.013 \text{ ac-ft}$

Impervious Table			
HSG A	0.15 Acres	S = 0.42	S'A = 0.06
HSG B	0 Acres	S = 0.29	S'A = 0.00
HSG C	0 Acres	S = 0.14	S'A = 0.00
HSG D	0 Acres	S = 0.08	S'A = 0.00
Total	0.15 Acres	S =	Total 0.06

Avg HSG 0.42
Compute Rev $Rev = \frac{(s)(Rv)(A)}{12}$
 $Rev = 0.006 \text{ ac-ft} = 247 \text{ cu-ft} = 0.006 \text{ ac-ft}$

Rev is included WQv if Rev Provided separately WQv = 0.003 ac-ft = 341 cu-ft

STORMWATER MANAGEMENT SUMMARY TABLE							
Minimum Sizing Criteria	Symbol	Drainage Area (Acres)	Volume Required (cubic-feet)	Volume Req. After Credits (cubic-feet)	Volume Provided (cubic-feet)	SWM Practice	Notes
Water Quality Volume (WQv)	Total Site	10.84	2,904	1,303	1,303	Bio-retention#1 Bio-retention#2	The rooftop disconnect credit, non-rooftop disconnect credit, & natural area credit have been applied to this site
	DA "A"	0.77	723	723	1181		
	DA "B"	0.49	341	341	971		
Recharge Volume (Rev)	Total Site	10.84	2,148	2,148	2,148	Bio-retention#1 Bio-retention#2	The rooftop disconnect credit, non-rooftop disconnect credit, & natural area credit have been applied to this site
	DA "A"	0.77	524	524	1,050		
	DA "B"	0.49	247	247	1,073		
Channel Protection Volume (CvP)	(CpV)	10.84	0	0	0	Q1 < 2 cfs	CvP is not required; Q1 = 0.75 cfs
Overbank Flood Protection (Op10)	(Op10)	84.11	0	0	0	N/A	Q10 existing = 105 cfs Q10 proposed = 110 cfs
Extreme Flood Volume (Qf)		N/A	N/A	N/A	N/A	N/A	

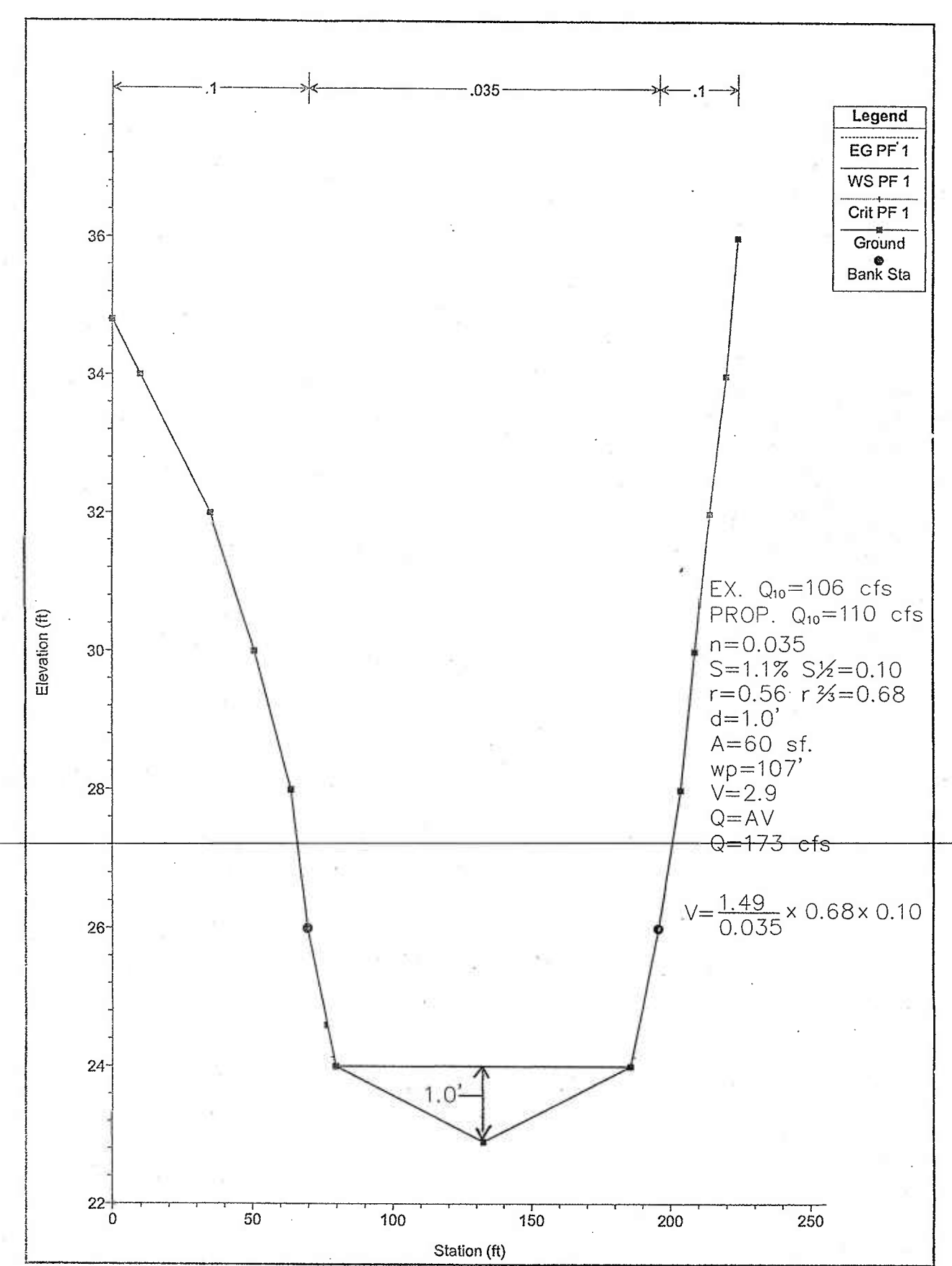
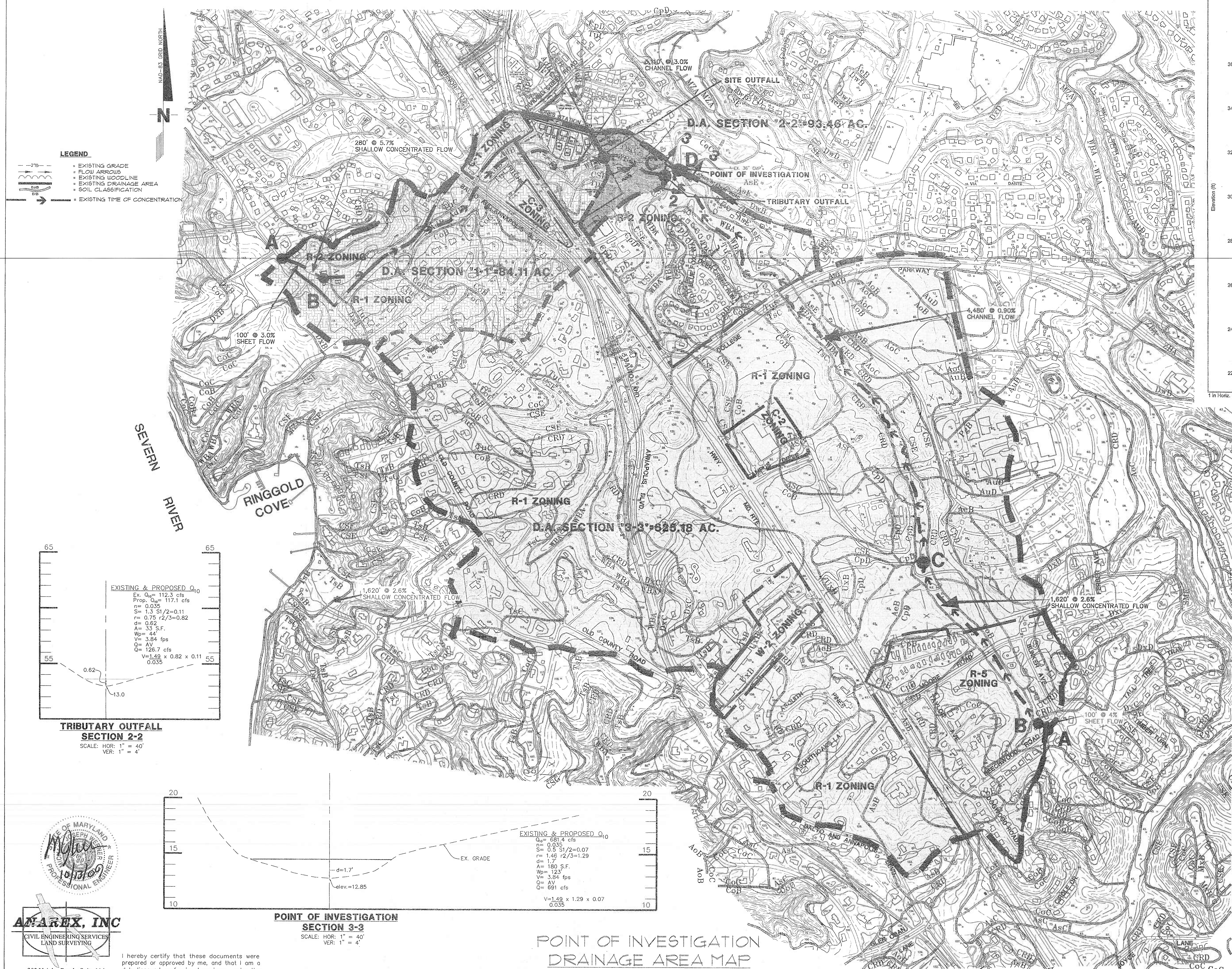


SOIL BORINGS
SCALE: 1"=4' VERT.

SHEET 7 of 10
FINAL PLANS RECEIVED
THE VILLAS AT SEVERNA PARK
ADDITION
OCT 19 2009
ANNE ARUNDEL COUNTY COMMISSION

9 SINGLE FAMILY LOT SUBDIVISION
PREVIOUSLY RECORDED IN PLAT BOOK 114 PAGE 32
THIRD DISTRICT ANNE ARUNDEL COUNTY, MARYLAND 21146
SCALE: 1"=40'
TAX MAP 32H PARCEL 148
BLOCK 15 SEPT. 2009
ZONING: R-2 CLUSTER ZIP CODE: 21146
SUB.# 2001-038 PROJECT# 2007-0112
T.A# 03-825-90224024

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SITE OUTFALL SECTION 1-1
SCALE: 1"=50' HORZ.
1"=2' VERT.

SITE OUTFALL

CONDITION	D.A.	CN	Tc	Q ₁₀	Q ₁₀₀
EXISTING	84.11Ac	65	0.57	106 cfs	206 cfs
PROPOSED	84.11Ac	66	0.57	110 cfs	213 cfs

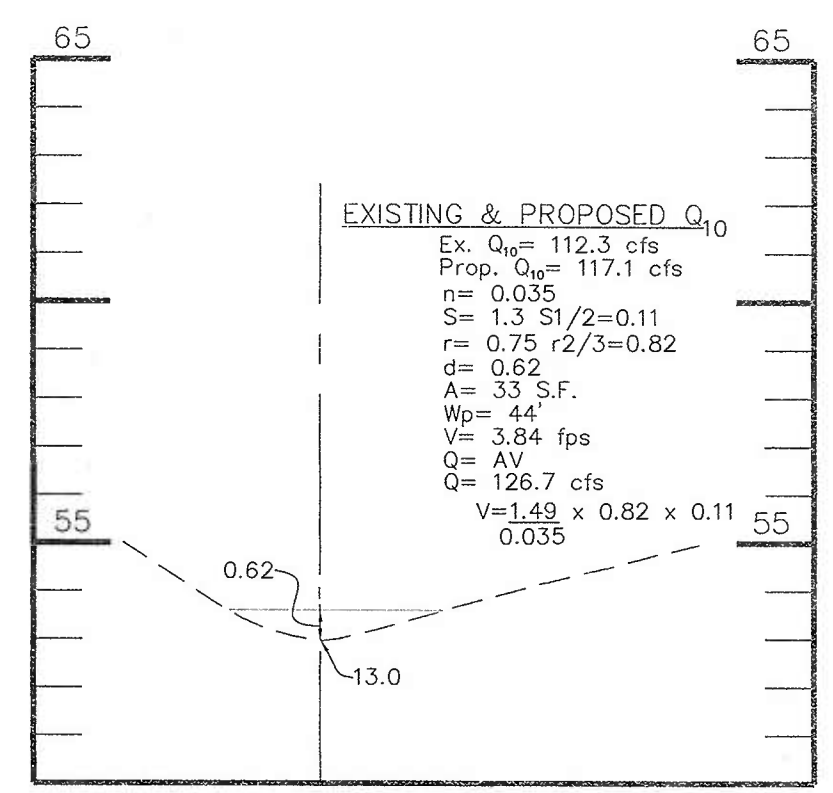
TRIBUTARY OUTFALL

CONDITION	D.A.	CN	Tc	Q ₁₀	Q ₁₀₀
EXISTING	93.46 Ac.	65	0.62	112.3 cfs	224.4 cfs
PROPOSED	93.46 Ac.	66	0.62	117.1 cfs	231.4 cfs

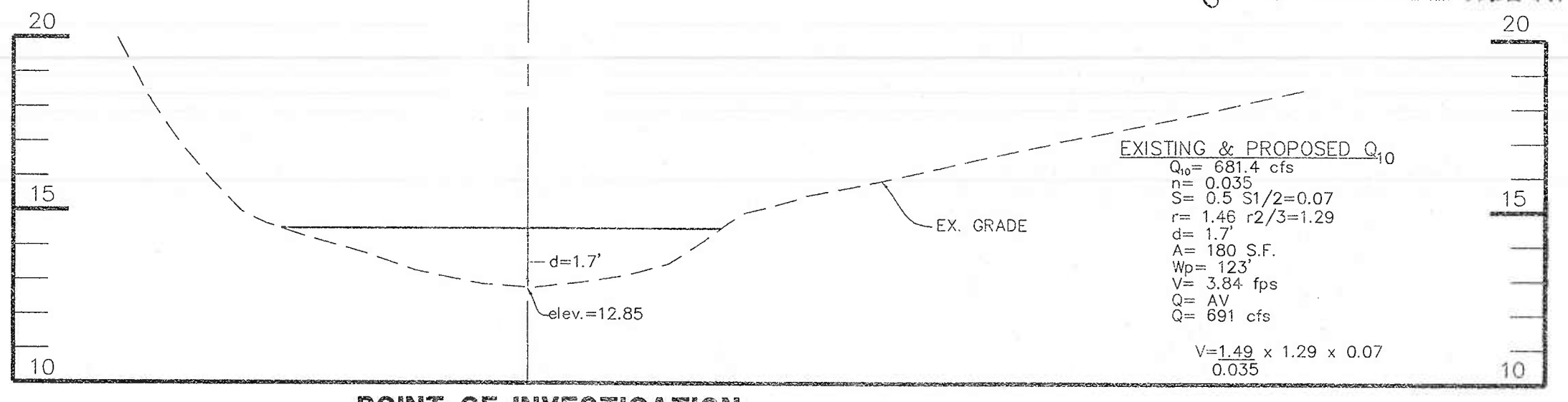
POI (POINT OF INVESTIGATION)

CONDITION	D.A.	CN	Tc	Q ₁₀	Q ₁₀₀
EXISTING	623.44 Ac.	66	0.78	681.4 cfs	1312.2 cfs
PROPOSED	623.44 Ac.	66	0.78	681.4 cfs	1372.2 cfs

- 1.) THE EXISTING AND PROPOSED FLOWS AT THE SITE OUTFALL, TRIBUTARY OUTFALL AND POINT OF INVESTIGATION HAVE BEEN COMPUTED.
- 2.) THE VELOCITY IN ALL 3 SECTIONS ARE NON-EROSIVE.



TRIBUTARY OUTFALL SECTION 2-2
SCALE: HOR: 1"=40'
VER: 1"=4'



POINT OF INVESTIGATION SECTION 3-3
SCALE: HOR: 1"=40'
VER: 1"=4'

POINT OF INVESTIGATION DRAINAGE AREA MAP
SCALE: 1"=400'

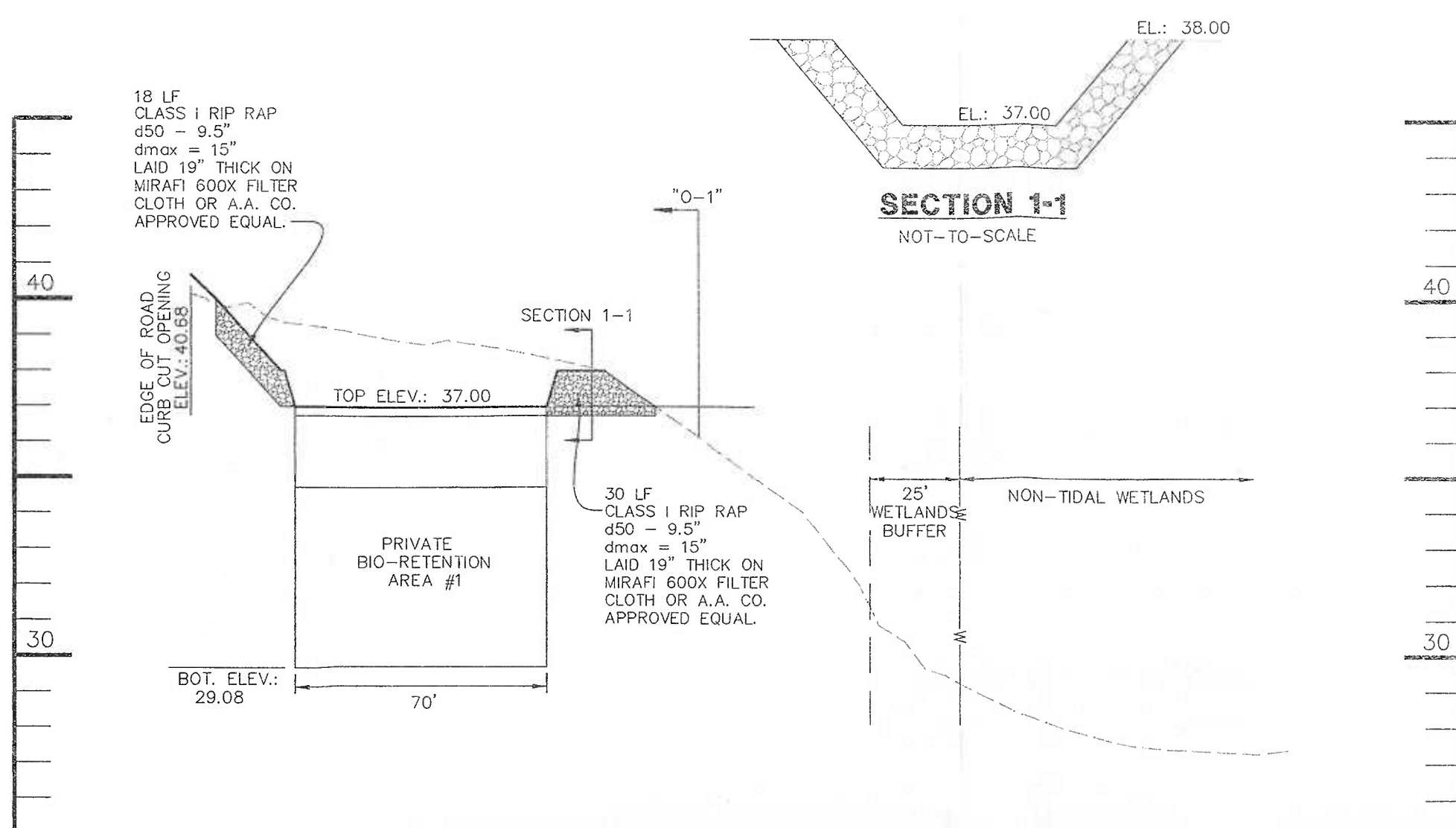
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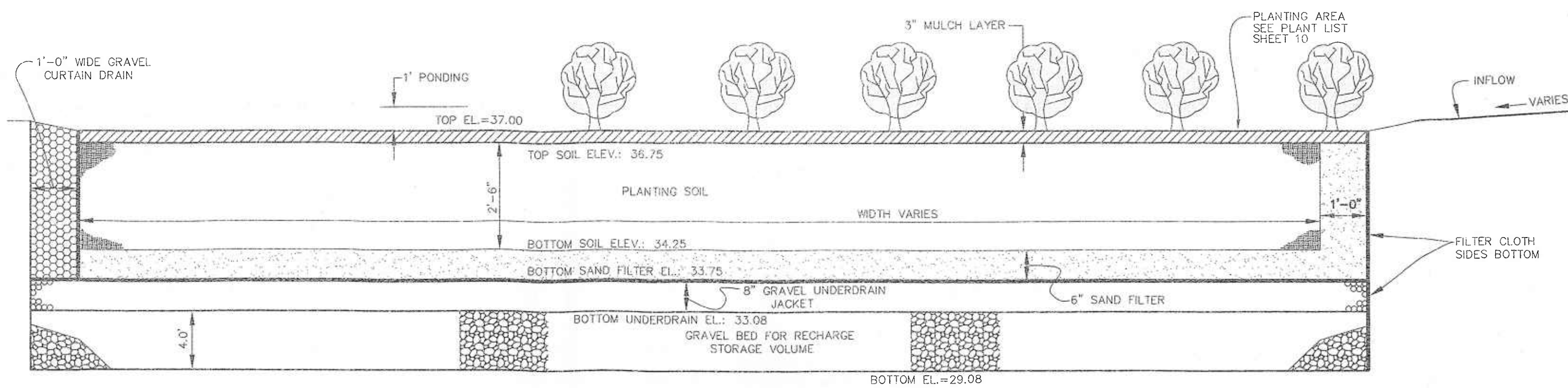
SHEET 8 of 10
FINAL PLANS
THE VILLAS
AT SEVERNA PARK
ADDITION

9 SINGLE FAMILY LOT SUBDIVISION
PREVIOUSLY RECORDED IN PLAT BOOK 114 PAGE 32
THIRD DISTRICT ANNE ARUNDEL COUNTY, MARYLAND 21146
SCALE: 1"=400' PARCEL 148
TAX MAP 32H BLOCK 15 SEPT. 2009
ZONING: R-2 CLUSTER ZIP CODE: 21146
SUB.# 2001-038 PROJECT# 2007-0112
T.A.# 03-825-90224024



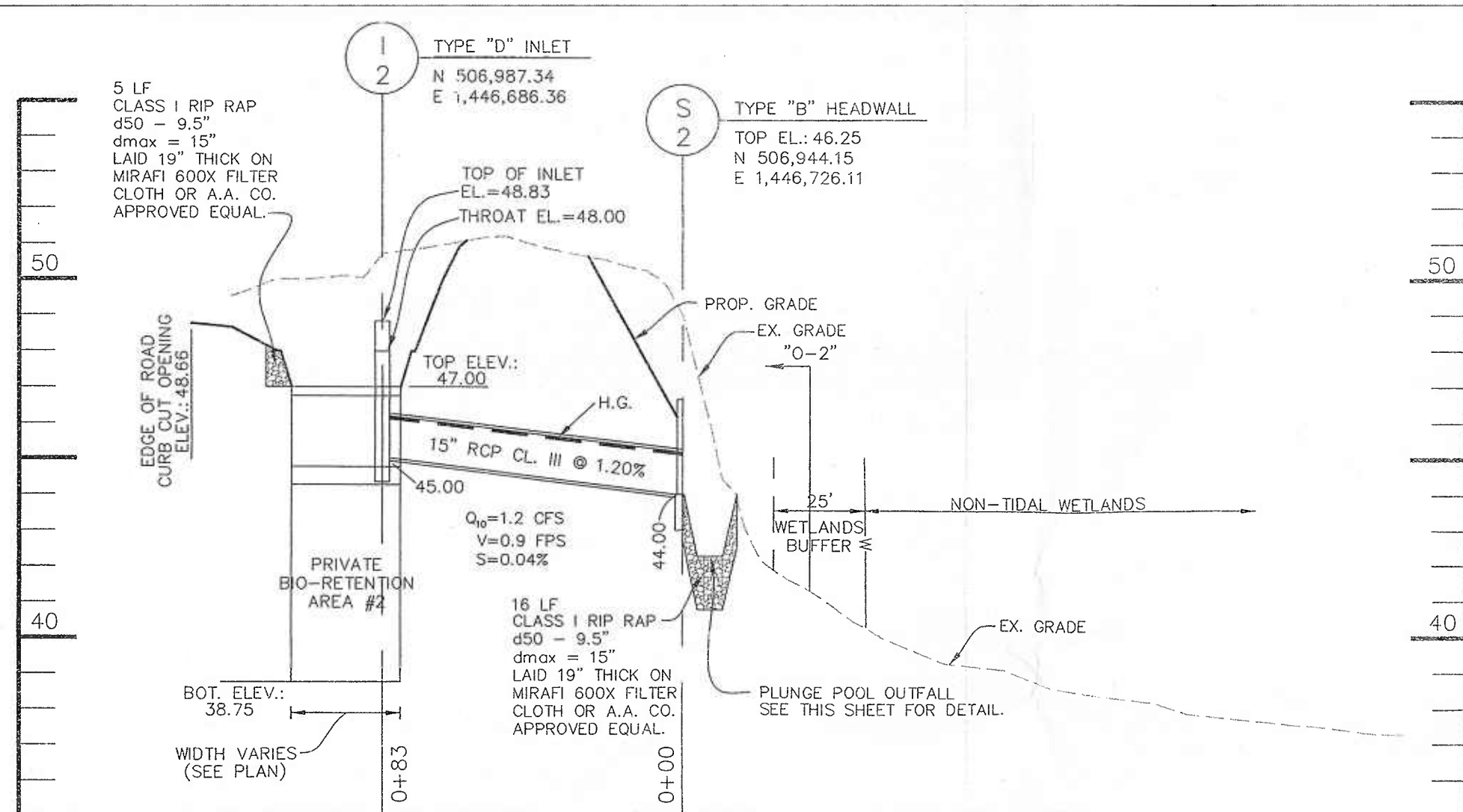
BIO-RETENTION AREA #1 PROFILE

SCALE: HORZ. 1"=40'
VERT. 1"=4'



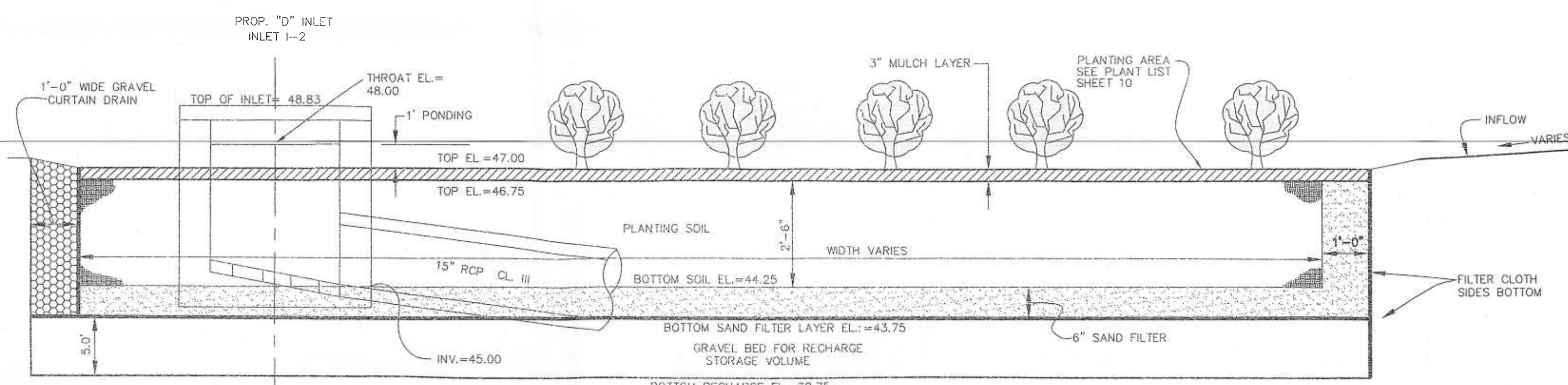
SECTION THUR BIO-RETENTION AREA #1

NOT TO SCALE



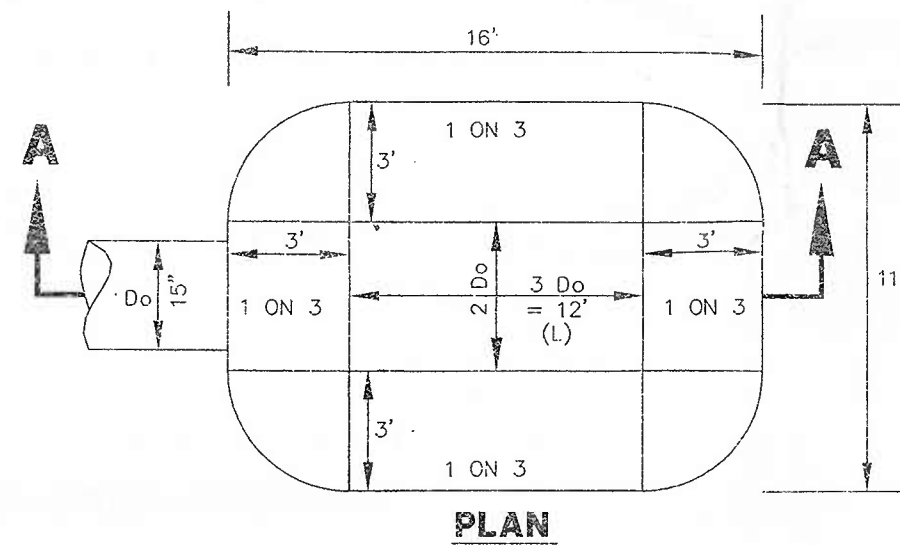
BIO-RETENTION AREA #2 PROFILE

SCALE: HORZ. 1"=40'
VERT. 1"=4'

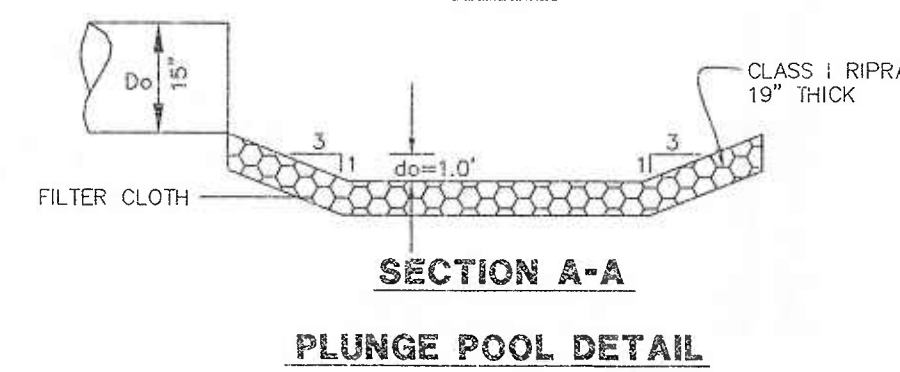


SECTION THUR BIO-RETENTION AREA #2

NOT TO SCALE



PLAN



SECTION A-A PLUNGE POOL DETAIL

- GENERAL NOTES**
1. Check location of all underground utilities. Call "MISS UTILITY" at 1-800-257-7777 at least 5 days prior to commencing any excavation.
 2. Contractor is required to carry any/all Workmen's Compensation and other Liability insurances as required by the General Contractor and/or Owner.
 3. Contractor is required to comply with any/all laws, codes, regulations & ordinances that apply to the work performed on this Project.
 4. Contractor shall co-ordinate the execution of all work performed with the General Contractor/Owner and shall complete all work in a timely fashion.
 5. General Contractor/Owner is responsible for obtaining site permits and paying fees unless otherwise specified.
 6. All clearing, grubbing, rough and fine grading, installation and maintenance of erosion control devices, sodding and seeding are separate operations and not included in this Landscape Plan. Except as specifically stated, disturbed areas of site shall be seeded or sodded in all areas that are not landscaped, as shown.

Stormwater Management Filter Systems

- Surface Filtering Systems:**
1. Filtering systems must be inspected regularly. When ponding is evident on the surface of the filter bed for more than 72 hours, the top few inches of discolored material shall be removed and replaced with fresh material and disposed of properly.
 2. Silt/sediment removal shall be performed when sediment accumulates a depth that exceeds one inch.
 3. Filters with a grass cover shall be mowed a minimum of three times per growing season to maintain grass heights that do not exceed 12 inches.
 4. Dead or diseased plant material shall be replaced. Areas devoid of mulch should be re-mulched on an annual basis.
 5. Direct maintenance access to the pre-treatment area and filter bed shall be maintained.
 6. Vigorous and dense growth should be maintained. Any bare spots, burned out areas, or eroded areas must be re-seeded or re-sodded immediately. Watering and/or fertilization should be provided during the first few months after strip establishment and may periodically be needed during periods of drought.

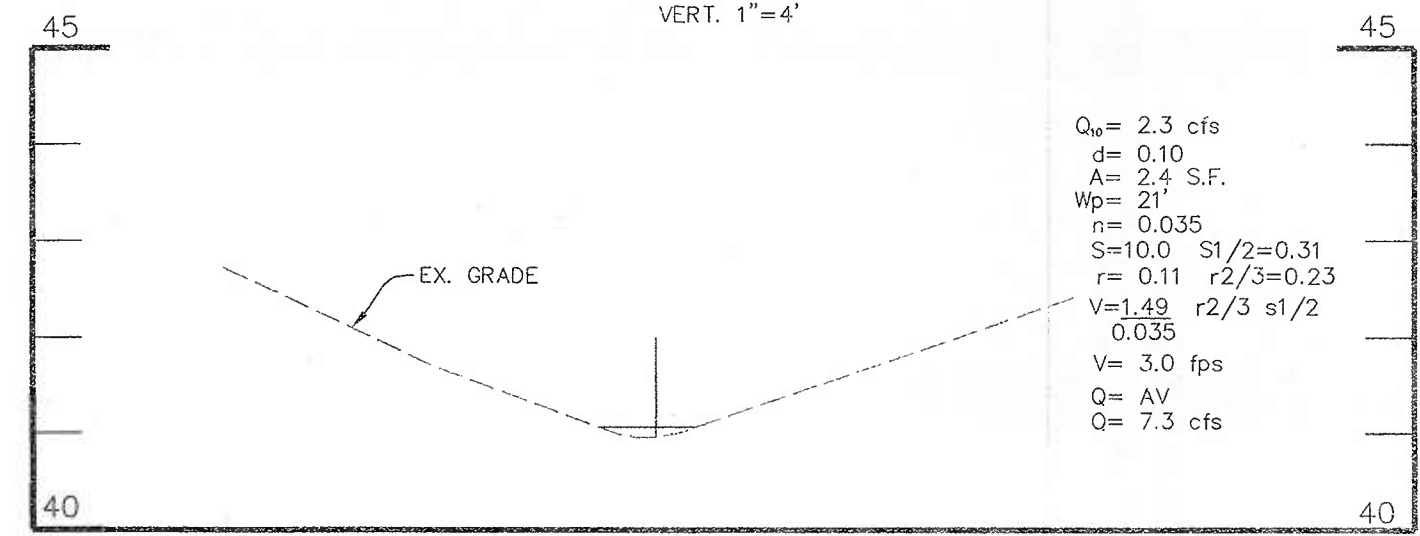
- 1. Materials Specifications**
The allowable materials to be used in bioretention area are detailed in Table B.3.2.
- 2. Planting Soil**
The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the bioretention area 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 following criteria:
- | | |
|---|-----------------------|
| pH range | 5.2 - 7.0 |
| organic matter | 1.5 - 4% (by weight) |
| magnesium | 35 lb./ac |
| phosphorus (phosphate - P ₂ O ₅) | 75 lb./ac |
| potassium (potash - K ₂ O) | 85 lb./ac |
| soluble salts | not 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 tests of organic matter, and soluble salts. A textural analysis is required from the site stockpile topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the top soil was excavated.
- Since different labs 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 modified (higher) 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 excavation hoses to remove original soil. If bioretention areas 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 bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to restructure 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.
- 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.
- 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 (6 to 12 months) for acceptance.
- Root stock of the plant materials shall be kept moist during transport and on-site storage. The plant root ball should be planted so 1/8 th 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 bioretention structure is to improve water quality. Adding fertilizers, deers, 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 are to be placed on a 3'-0" wide section of 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 wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).

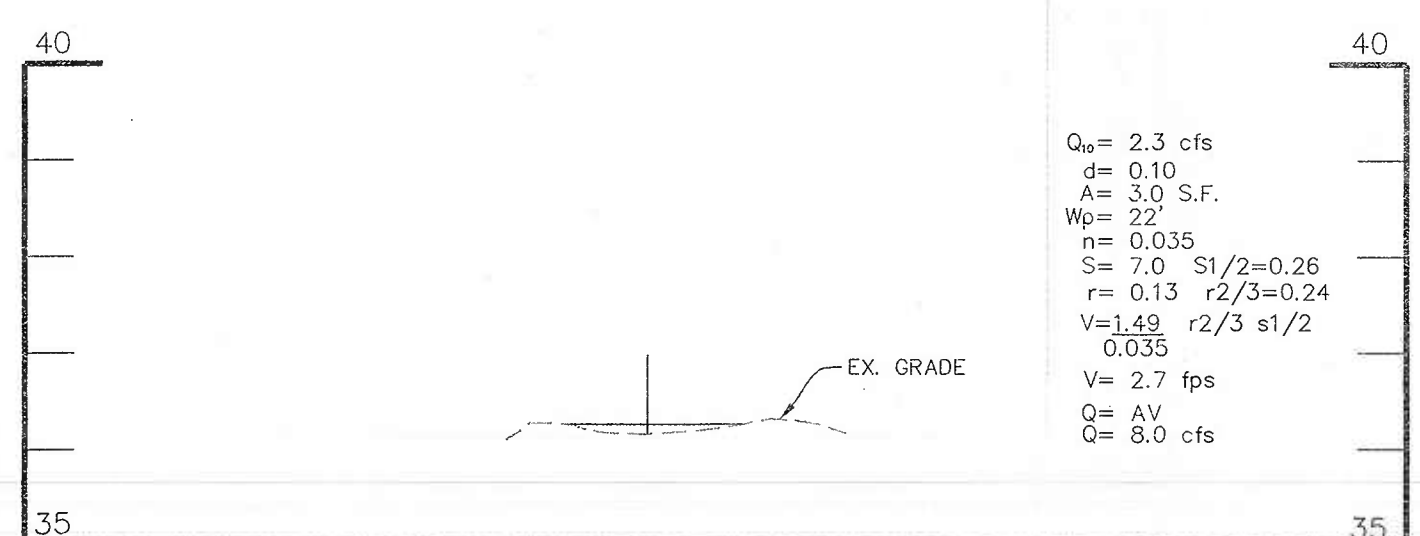
- 7. Miscellaneous**
The bioretention facility may not be constructed until all contributing drainage area has been stabilized.



SECTION 'O-2'

SCALE: HOR. 1" = 20'
VERT. 1" = 2'

Q_u = 2.3 cfs
d = 0.10
A = 2.4 S.F.
W_p = 21
n = 0.035
S = 10.0 S₁/2 = 0.31
r = 0.11 r₂/3 = 0.23
V = 1.49 r₂/3 s₁/2 = 0.35
V = 3.0 fps
Q = AV
Q = 8.0 cfs



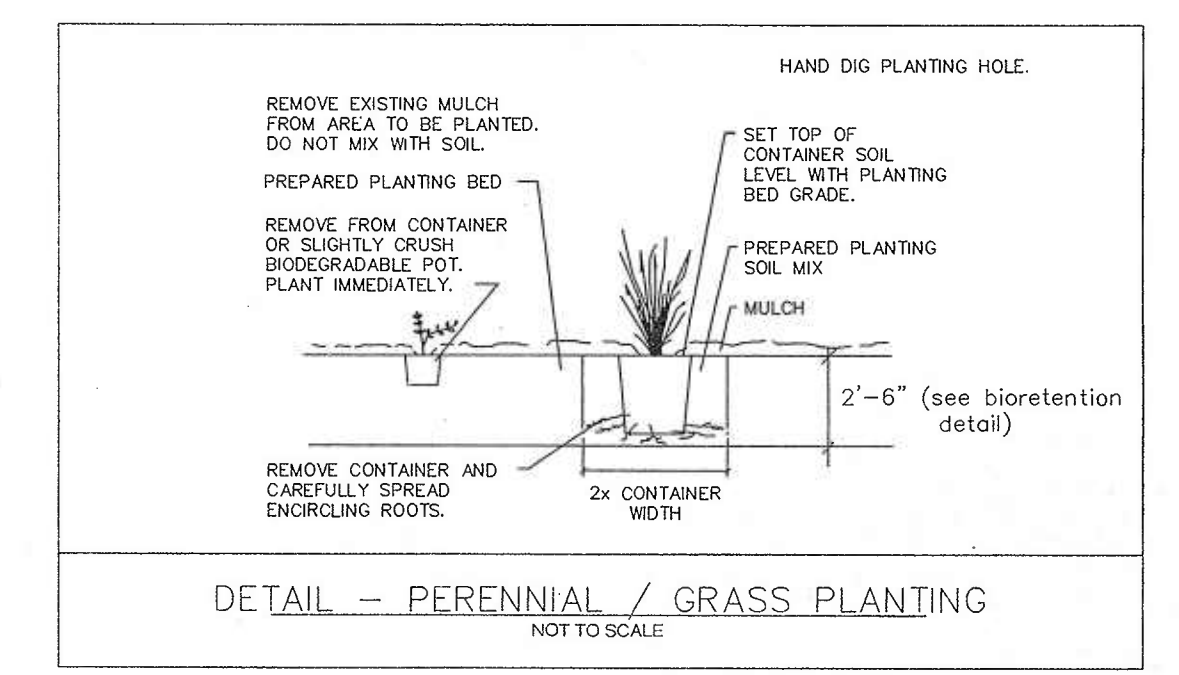
SECTION 'O-1'

SCALE: HOR. 1" = 20'
VERT. 1" = 2'

Q_u = 2.3 cfs
d = 0.10
A = 3.0 S.F.
W_p = 22
n = 0.035
S = 7.0 S₁/2 = 0.26
r = 0.13 r₂/3 = 0.24
V = 1.49 r₂/3 s₁/2 = 0.35
V = 2.7 fps
Q = AV
Q = 8.0 cfs

Materials Specifications for Bio-retention

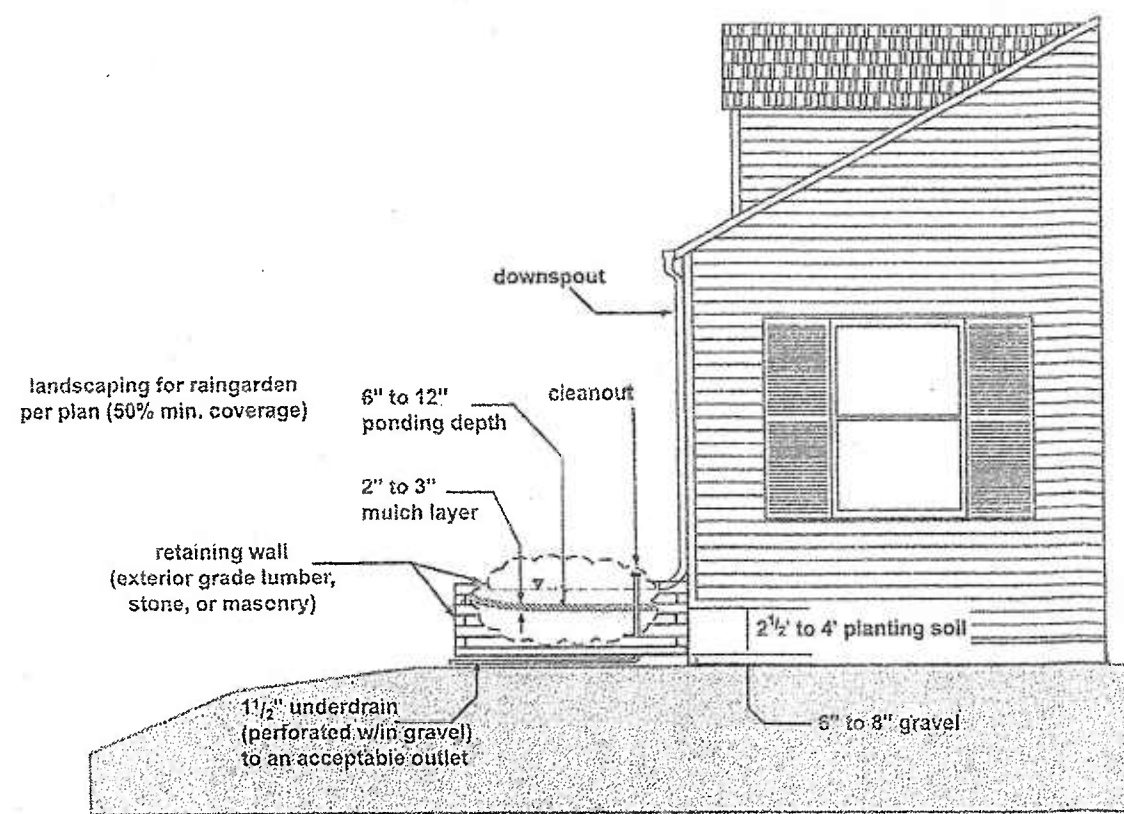
Material	Specification	Size	Notes
Plantings	See plant list this sheet	see plant list	plantings are per design by Landscape Architect
planting soil (2.5' to 4' deep)	sand 35 - 60% silt 30 - 55% clay 10 - 25%	n/a	USDA Soil Type: Loamy Sand, Sand Loam, or Loam
mulch	shredded hardwood		aged 6 months, minimum
pea gravel diaphragm and curtain drain	pea gravel: ASTM-D-448 ornamental stone: washed cobbles	pea gravel: No. 6 stone 2" to 5"	
geotextile	Class "C" - apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D-4532), puncture resistance (ASTM-D-4833)	n/a	for use as necessary beneath underdrains only
underdrain gravel	AASHTO M-43	0.375" to 0.75"	
underdrain piping	F 758, Type PS 28 or AASHTO M 278	4" to 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 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 days strength and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved State or local standard requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350R/89; vertical loading (H-10 or H-20); allowed horizontal loading (based on soil pressures); and analysis of potential cracking
sand (1' deep)	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Grystone # 10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.



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SHEET 9 of 10
FINAL PLANS OCT 19 2009
THE VILLAGE AT SEVERNA PARK
AT SEVERNA PARK ADDITION
9 SINGLE FAMILY LOT SUBDIVISION
PREVIOUSLY RECORDED IN PLAT BOOK 114 PAGE 32
THIRD DISTRICT ANNE ARUNDEL COUNTY, MARYLAND 21146
SCALE: 1" = 40' SEPT. 2009
TAX MAP 32H PARCEL 148
BLOCK 15
ZONING: R-2 CLUSTER ZIP CODE: 21146
SUB.# 2001-038 PROJECT# 2007-0112
T.A# 03-825-90224024

ANAREX, INC
CIVIL ENGINEERING SERVICES
LAND SURVEYING
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. 23380, Expiration date 8-19-2010.

Option 3. Raingardens - Profile View



GUIDANCE FOR BUILDING RAINGARDENS

Raingardens are small-scale practices designed to treat stormwater by using planting soils and vegetation to filter runoff. Raingardens are versatile and may be used in areas with limited space or steep slopes. This method may be used as an alternative for the front yard, back yard, or both in areas with steep slopes, small lots, or other constraints to provide adequate treatment of all proposed impervious surfaces.

TREATMENT REQUIREMENTS

To be considered for stormwater management, the following conditions must be met:

- The maximum drainage area to each raingarden cannot exceed 1,000 square feet.
- Raingardens shall consist of the following components:
 - A 2 1/2 to 4-foot deep planting soil bed,
 - A surface mulch layer, and
 - A 1/4 to 1-foot deep surface ponding area.
- A minimum 1 1/2-inch perforated pipe underdrain in a gravel layer shall be provided unless waived by the local approval authority. The underdrain shall be located at the invert of the raingarden and provide a non-erosive discharge to an acceptable outlet.
- A landscaping plan that covers at least 50% of the surface area of the raingarden shall be provided (see Landscaping Details).
 - Native plants are recommended over non-native species,
 - Plants should be selected based on tolerance zones,
 - A selection of trees or shrubs should be included in the plan, and
 - Woody vegetation should not be located at inflow locations.
- The contributing drainage area shall be stabilized prior to installation.
- The raingarden shall be located to prevent basement or foundation seepage, erosion, or flooding of adjacent properties.

SPECIFICATIONS FOR RAINGARDENS

The allowable materials to be used in raingardens are detailed in Table A.

A. PLANTING SOIL

The characteristics of planting soil for raingardens are as important to the longevity and success of the design as location, size, and treatment volume. The soil must be permeable enough to allow stormwater runoff to filter through the raingarden, while still being capable of promoting and sustaining vigorous vegetative cover. Additionally, much of the nutrient pollutant uptake is through the absorption and microbial activity within the soil profile. As a result, planting soils must balance chemical and physical properties to support biotic communities both above and below the ground surface.

Planting soil should be sandy loam, loamy sand, or a loam/sand mix and should contain a minimum 35 to 60% sand by volume. The clay content should be less than 25%. The soil should be free of stones, stumps, roots, or other woody material over 1" in diameter. Brush or seeds from noxious weeds (e.g., Johnson Grass, Mugwort, Nutsedge, and Canada Thistle) should not be present in the soils. One simple method for producing suitable planting soil is to mix three parts of commercially available washed sand with two parts topsoil to produce a homogeneous soil. Planting soil should be placed in 12" to 18" layers that are loosely compacted (e.g., tamped lightly with a backhoe bucket) to a depth of 2 1/2 to 4 feet.

B. MULCH

Another important feature of the raingarden is the surface mulch layer. Mulch helps maintain soil moisture and traps finer sediments that may lead to premature failure. Mulch also prevents erosion and serves as an important microenvironment for soil biota.

Raingarden mulch used should be standard landscape style, single or double shredded hardwood mulch. The mulch should be well aged (stockpiled or stored for at least twelve months), uniform in color, and free of other materials such as weeds or roots. Grass clippings are unacceptable as a mulch material. Mulch should be applied to a maximum depth of three inches. Raingardens should be re-mulched on an annual basis.

C. UNDERDRAINS

Raingardens require positive drainage conditions and permeable soils for long term, trouble-free performance. Installing a perforated pipe underdrain system provides consistent drainage for the raingarden. While optional in porous well-drained soils, underdrains are required in silt or clay soils (hydrologic soil groups C and D) or in areas where groundwater is less than two feet below the bottom of the raingarden.

Underdrains should be installed below the planting soil bed (between 2 1/2 to 4 feet below surface). The underdrain may be installed as shallow as 18" below the surface if necessary to provide an outlet. In this extreme case, the underdrain should be installed within the planting soil bed.

Underdrains shall consist of a 1 1/2" to 4" diameter rigid schedule 40 (or SDR 35) PVC pipe (slotted HDPE is also acceptable) that is perforated within the raingarden. Perforations shall be 3/8" diameter minimum at 6" on center with a minimum of 4 holes per row. Underdrains shall be placed on a 3" wide section of filter cloth (Class "C" geotextile, see Table R.1). The pipe is placed next, followed by the gravel bedding. The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. At least one observation well/cleanout must be provided per raingarden.

A rodent guard should be installed at the downstream end of underdrains to prevent mice and larger rodents from entry. A typical rodent guard consists of a 3/4" hex-head bolt through the pipe horizontally. Nuts are placed on both the inside and outside of the pipe. This discourages rodents and prevents crushing of the pipe.



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. 23380, Expiration date 8-19-2010.

303 Najoles Road - Suite 114
Millsville, MD 21108-2512
Phone: 410-987-6901

MISCELLANEOUS

Raingardens shall not be constructed until all contributing drainage area has been stabilized.

TABLE A. - MATERIALS SPECIFICATIONS FOR RAINGARDENS

Material	Specification	Size	Notes
Plantings	See Table R.5	n/a	Plantings are site specific
Planting Soil (2 1/2' to 4' deep)	Sand: 30% to 60% Silt: 30% to 55% Clay: 0% to 25%	n/a	USDA soil types loamy sand, sandy loam or loam
Mulch	Shredded hardwood	n/a	Aged six months minimum
Geotextile	Class "C" - apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D-4632), puncture resistance (ASTM-D-4833)	n/a	Use as necessary beneath underdrains only
Underdrain:			
Gravel	AASHTO M-43 #57 or #67	3/4" to 3/2"	
Piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC, SDR35, or HDPE	3/8" perforations @ 6" on center, 4 holes per row, minimum of 3" gravel over pipes, gravel not necessary beneath pipes

D. PLANT INSTALLATION

Mulch should be placed to a uniform thickness of 2 to 3 inches. Root stock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so that 1/8" of the ball is above final grade surface. The diameter of the planting pit should be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight (upright) during the 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 specifications.

The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the raingarden is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch is used to amend the soil.

E. PLANTING GUIDANCE

Plant material selection should be based on the goal of simulating a terrestrial community of native species but may be tailored to various gardening themes. Raingardens simulate upland-species ecosystems that are dominated by shrubs and herbaceous materials but may also contain trees. By creating a diverse, dense plant cover, the raingarden will be able to treat stormwater runoff and withstand urban stresses from insects, disease, drought, temperature, wind, and exposure.

The proper selection and installation of plant materials is key to a successful system. There are essentially three zones within a raingarden. The lowest elevation supports plant species that are adapted to standing and fluctuating water levels. The middle elevation supports plants that like drier soil conditions but may tolerate occasional inundation by water. The outer edge is the highest elevation and generally supports plants adapted to drier conditions. A listing of appropriate plant materials is included in Appendix A of the 2000 Maryland Stormwater Design Manual, Vol. 1 & II (see www.mde.state.md.us). The layout of plant material should be flexible, but should also follow the general principles outlined in Table B. The objective is to have a system that resembles a random and natural plant layout, while maintaining optimal plant conditions for plant establishment and growth.

TABLE B. - PLANTING DESIGN CONSIDERATIONS

- Native plant species should be specified over exotic or foreign species.
- Appropriate vegetation should be selected based on the zone of tolerance.
- Species layout should generally be random and natural.
- A canopy may be established with an understory of shrubs and herbaceous material.
- Woody vegetation (shrubs and trees) should not be in the vicinity of inflow locations.
- Trees and shrubs should be planted primarily along the perimeter of the raingarden.
- Stressors (e.g., wind, sun, exposure, insects and disease infestation, and drought) should be considered when developing the planting plan.
- Noxious weeds shall not be specified or used.
- Aesthetics and visual characteristics should be a prime consideration.
- Safety issues must be considered.
- Existing and proposed utilities (e.g., water, sewer, or electric) must be identified and considered.

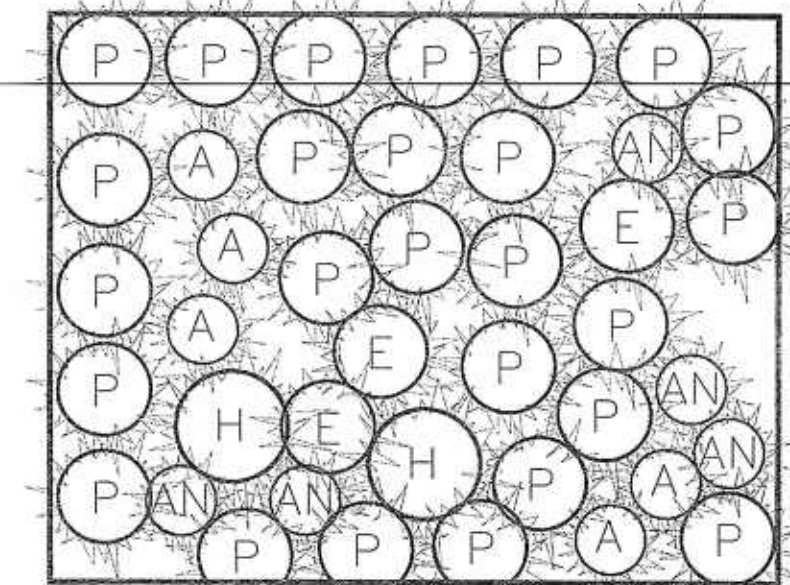
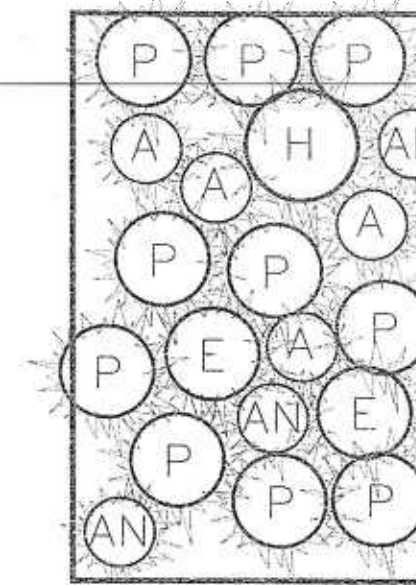
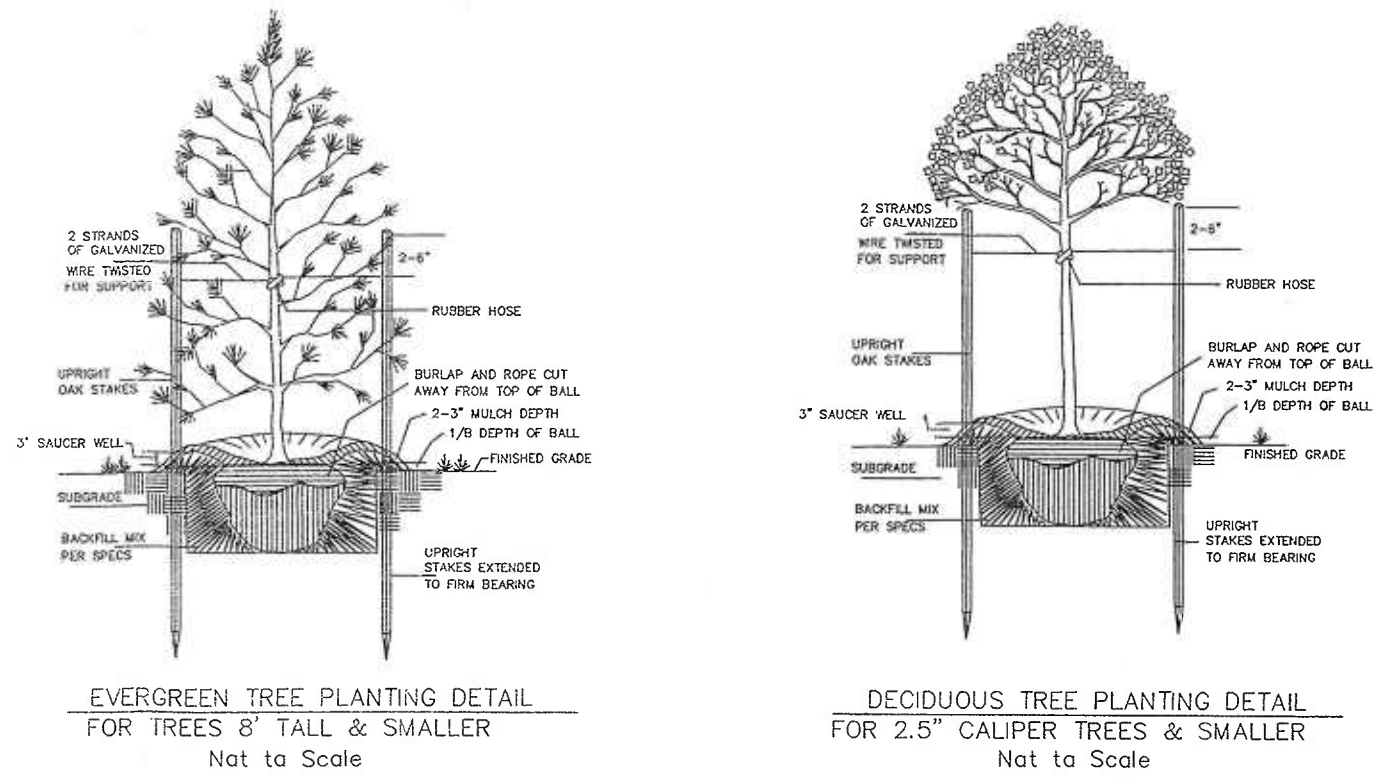
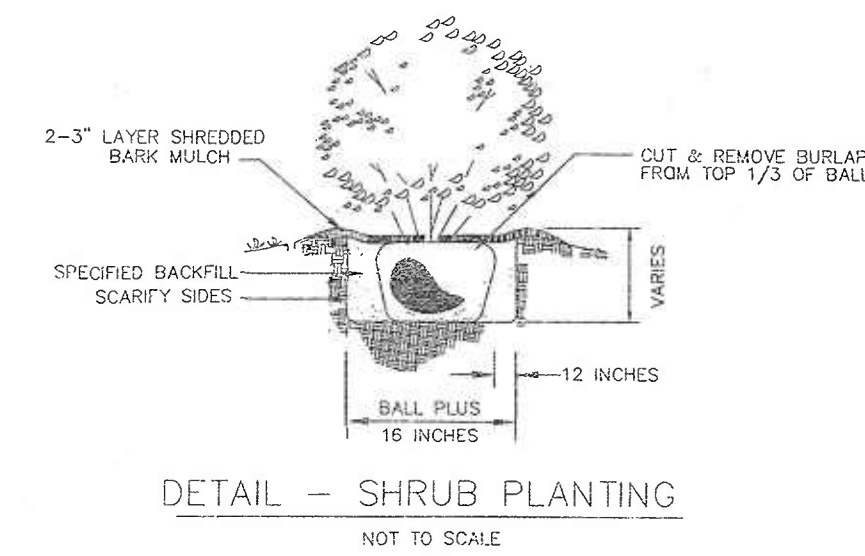
Plant materials should conform to the American Association of Nurserymen's publication, the American Standard Nursery Stock. The planting plan should include a sequence of construction, a description of the contractor's responsibilities, a planting schedule and installation specifications, initial maintenance requirements, and a warranty period stipulating requirements for plant survival. Table C. presents some typical issues for planting specifications.

TABLE C. - PLANTING SPECIFICATION ISSUES

Specification Element	Issues
Sequence of Construction	Describe the preparation activities, soil amendments, etc.; address erosion and sediment control procedures; specify step-by-step procedure for plant installation through site clean-up.
Contractor's Responsibility	Specify the contractor's responsibilities such as watering, care of plant material during transport, timeliness of installation, repairs due to vandalism, etc.
Planting Schedule and Specifications	Specify the plants to be installed, the type of materials (e.g., balled and burled, bare root, containerized), time of year for installations, sequence of installation, fertilization, stabilization seeding if needed, watering, and general care
Maintenance	Specify mulching frequency (annual mulching is most common), removal and replacement of dead or diseased vegetation, watering schedule (once per day for 14 days is common).
Warranty	Specify the warranty period, the required survival rate, and the expected condition of plant species at the end of the warranty period

TABLE D. - RAINGARDEN SEQUENCE OF CONSTRUCTION

- Subsequent to final grading and stabilization of lot, excavate raingarden area to proper dimensions.
- Install gravel envelope, geotextile, underdrain, and observation well.
- Place and loosely compact planting soil.
- Install plants at proper depth and location (see species and zone specifications) according to the planting plan.
- Mulch the surface of the raingarden to a thickness of 2" to 3".
- Water and fertilize according to the plan and specifications and as necessary.

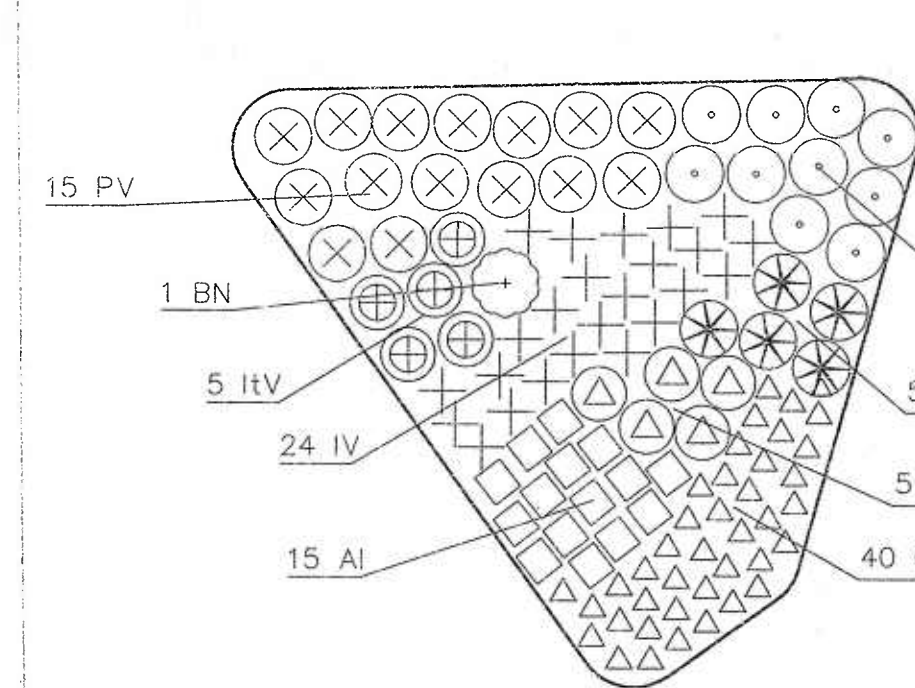


TYPICAL PLANTINGS FOR 50 S.F. GARDEN

TYPICAL PLANTINGS FOR 100 S.F. GARDEN

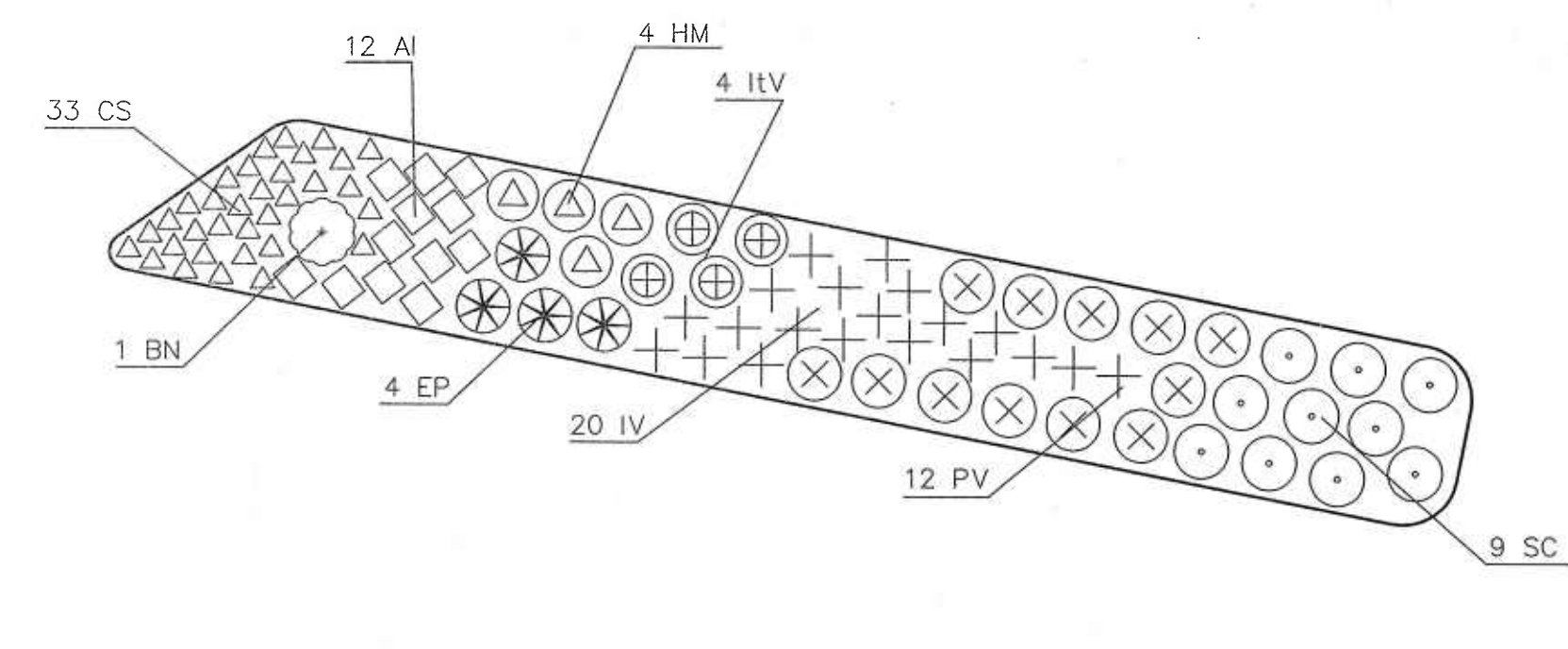
RAIN GARDEN PLANTINGS

QTY.	COMMON NAME	BOTANICAL NAME
25	SWITCH GRASS (P)	PANICUM VIRGATUM
3	ROSE MALLOW (H)	HIBISCUS MOSCHEUTOS
5	JOE PYE WEED (E)	EUPATORIUM GATEWAY
9	BUTTERFLY WEED (A)	ASCLEPIAS INCARNATA
7	NEW ENGLAND ASTER (AN)	ASTER NOUAE ANGLIAE



BIO-RETENTION AREA #2

SCALE: 1"=10'



BIO-RETENTION AREA #1

SCALE: 1"=10'

BIO-RETENTION AREA PLANT LIST

LABEL	SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	SPACING
AI	◇	15 12	Asclepias incarnata	Swamp Butterflyweed	1 gal.	cant.	2'
BN	●	1 1	Magnolia virginiana	Sweetbay Magnolia	6' - 8'	"	Shawn
CS	△	40 33	Cyperus strigosus	Straw colored flatsedge	1 gal.	"	18"
EP	⊗	5 4	Eupatorium purpureum	Joe-Pye-Weed	1 gal.	"	3'
HM	⊕	5 4	Hibiscus moscheutos	Marsh Hibiscus	1 gal.	"	3'
IV	+	24 20	Iris versicolor	Blue Flag Iris	1 qt.	"	15"
IV	⊕	5 4	Itea virginata	Virginia Sweetspire	1 gal.	"	3'6"
PV	⊗	15 12	Panicum virgatum	Switch Grass	1 qt.	"	2'6"
SC	○	10 9	Dichanthium clandestinum	Deer-tongue Witchgrass	1 qt.	"	3'
		SUM					

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SHEET 10 of 10
FINAL PLANS
THE VILLAS
AT SEVERNA PARK
ADDITION
9 SINGLE FAMILY LOT SUBDIVISION
PREVIOUSLY RECORDED IN PLAT BOOK 114 PAGE 32
THIRD DISTRICT ANNE ARUNDEL COUNTY, MARYLAND 21146
SCALE: AS SHOWN
TAX MAP 32H BLOCK 15
ZONING: R-2 CLUSTER
SUB.# 2001-038
I.A.# 03-825-90224024
OCT 19 2009
CRITICAL AREA COMMISSION
Chesapeake & Atlantic Coastal Bays
SEPT. 2009
PARCEL 148
ZIP CODE: 21146
PROJECT# 2007-0112